



Stantec Consulting Ltd.
199 Henlow Bay
Winnipeg MB R3Y 1G4

December 15, 2022

Project/File: 123316272

Ali Campbell
Dillon Consulting Limited
1558 Willson Place
Winnipeg, MB R3T 0Y4

Good day Ali,

Reference: Goulet Street Rehabilitation and Des Meurons Street Reconstruction

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the Goulet Street rehabilitation and Des Meurons Street reconstruction projects located in Winnipeg, MB. Use of this report is subject to the Statement of General Conditions provided in **Appendix A**.

The subsurface coring and drilling sampling program was conducted on November 29-30 and December 5, 2022. Pavement coring was performed by our geotechnical field personnel, and drilling services were provided by Maple Leaf Drilling Ltd. under the supervision of our personnel. The borehole locations are shown on the attached Borehole Location Plan provided in **Appendix B**. The pavement cores were sampled with a 150 mm bit and boreholes were drilled with 125 mm solid stem augers. Geotechnical drilling boreholes were terminated at a depth of 2.3 m (Goulet St) and 2.9 m (Des Meurons St). Soil samples were obtained directly from the auger flights at depths of 0.6 m, 0.9 m, 1.2 m, 1.6 m, 2.0 m and 2.5 m from the bottom of the existing pavement. Upon completion of drilling, the testholes were examined for evidence of sloughing and groundwater seepage. The borehole records are provided in **Appendix C**. The soil classification used in the borehole records is as per ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes*. Core photographs are provided in **Appendix D**.

The following laboratory tests were conducted on select soil samples:

- ASTM D2216 - *Laboratory Determination of Water (Moisture) Content of Soil by Mass*
- ASTM D4318 - *Liquid Limit, Plastic Limit, and Plasticity Index of Soils*
- ASTM D7928 - *Particle-Size Distribution of Fine-Grained Soils Using The Sedimentation Analysis*
- ASTM D698 - *Laboratory Compaction Characteristics of Soil Using Standard Effort*
- ASTM D1883 - *California Bearing Ratio (CBR) of Laboratory-Compacted Soils*
- CSA A23.2-14C - *Obtaining and testing drilled cores for compressive strength testing*

The CBR tests were performed at 95% maximum dry density and under soaked conditions, and the concrete compressive strength tests were conducted under wet conditions. The moisture content results are shown on the borehole records, and the laboratory test reports are provided in **Appendix E**.

We appreciate the opportunity to assist you on this project. Please contact the undersigned if you have any questions regarding this report.

Reference: Goulet Street Rehabilitation and Des Meurons Street Reconstruction

Regards,

STANTEC CONSULTING LTD.



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Attachment: Appendix A – Statement of General Conditions
Appendix B – Borehole Location Plan
Appendix C – Borehole Records
Appendix D – Core Photographs
Appendix E – Laboratory Test Reports

APPENDIX A

Statement of General Conditions

STATEMENT OF GENERAL CONDITIONS

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Stantec and the Client. Any use which a third party makes of this report is the responsibility of such third party.

BASIS OF THE REPORT: The information, opinions, and/or recommendations made in this report are in accordance with Stantec's present understanding of the site-specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site-specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Stantec is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

STANDARD OF CARE: Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state or province of execution for the specific professional service provided to the Client. No other warranty is made.

INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock, and groundwater conditions as influenced by geological processes, construction activity, and site use.

VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Stantec will not be responsible to any party for damages incurred as a result of failing to notify Stantec that differing site or sub-surface conditions are present upon becoming aware of such conditions.

PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Stantec, sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc.), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec cannot be responsible for site work carried out without being present.



APPENDIX B

Borehole Location Plan



\\CA0194\PPF501\Work\Group\123316272\field_data\drawings\16272_BHLP.dwg 1
 2022/12/13 9:21 PM By: Boughton, Lee

95

ORIGINAL SHEET - ISO 11x17 - v17.05

2022-12-13
123316272



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Legend

 APPROXIMATE BOREHOLE LOCATION

Scale



Client/Project

DILLON CONSULTING LTD.
 GOULET STREET REHABILITATION AND DES MEURONS STREET
 RECONSTRUCTION, WINNIPEG, MB

Figure No.

1

Title

BOREHOLE LOCATION PLAN

APPENDIX C

Borehole Records

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis:

<i>Rootmat</i>	- vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
<i>Topsoil</i>	- mixture of soil and humus capable of supporting vegetative growth
<i>Peat</i>	- mixture of visible and invisible fragments of decayed organic matter
<i>Till</i>	- unstratified glacial deposit which may range from clay to boulders
<i>Fill</i>	- material below the surface identified as placed by humans (excluding buried services)

Terminology describing soil structure:

<i>Desiccated</i>	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
<i>Fissured</i>	- having cracks, and hence a blocky structure
<i>Varved</i>	- composed of regular alternating layers of silt and clay
<i>Stratified</i>	- composed of alternating successions of different soil types, e.g. silt and sand
<i>Layer</i>	- > 75 mm in thickness
<i>Seam</i>	- 2 mm to 75 mm in thickness
<i>Parting</i>	- < 2 mm in thickness

Terminology describing soil types:

The classification of soil types are made on the basis of grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488) which excludes particles larger than 75 mm. For particles larger than 75 mm, and for defining percent clay fraction in hydrometer results, definitions proposed by Canadian Foundation Engineering Manual, 4th Edition are used. The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):

Terminology describing materials outside the USCS, (e.g. particles larger than 75 mm, visible organic matter, and construction debris) is based upon the proportion of these materials present:

<i>Trace, or occasional</i>	Less than 10%
<i>Some</i>	10-20%
<i>Frequent</i>	> 20%

Terminology describing compactness of cohesionless soils:

The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test (SPT) N-Value - also known as N-Index. The SPT N-Value is described further on page 3. A relationship between compactness condition and N-Value is shown in the following table.

Compactness Condition	SPT N-Value
<i>Very Loose</i>	<4
<i>Loose</i>	4-10
<i>Compact</i>	10-30
<i>Dense</i>	30-50
<i>Very Dense</i>	>50

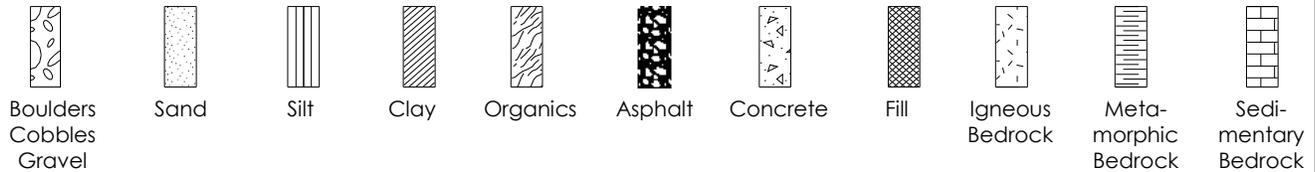
Terminology describing consistency of cohesive soils:

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests. Consistency may be crudely estimated from SPT N-Value based on the correlation shown in the following table (Terzaghi and Peck, 1967). The correlation to SPT N-Value is used with caution as it is only very approximate.

Consistency	Undrained Shear Strength		Approximate SPT N-Value
	kips/sq.ft.	kPa	
<i>Very Soft</i>	<0.25	<12.5	<2
<i>Soft</i>	0.25 - 0.5	12.5 - 25	2-4
<i>Firm</i>	0.5 - 1.0	25 - 50	4-8
<i>Stiff</i>	1.0 - 2.0	50 - 100	8-15
<i>Very Stiff</i>	2.0 - 4.0	100 - 200	15-30
<i>Hard</i>	>4.0	>200	>30

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.



SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
DP	Direct-Push sample (small diameter tube sampler hydraulically advanced)
PS	Piston sample
BS	Bulk sample
HQ, NQ, BQ, etc.	Rock core samples obtained with the use of standard size diamond coring bits.

WATER LEVEL MEASUREMENT



measured in standpipe, piezometer, or well



inferred

RECOVERY

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

N-VALUE

Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (63.5 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (300 mm) into the soil. In accordance with ASTM D1586, the N-Value equals the sum of the number of blows (N) required to drive the sampler over the interval of 6 to 18 in. (150 to 450 mm). However, when a 24 in. (610 mm) sampler is used, the number of blows (N) required to drive the sampler over the interval of 12 to 24 in. (300 to 610 mm) may be reported if this value is lower. For split spoon samples where insufficient penetration was achieved and N-Values cannot be presented, the number of blows are reported over sampler penetration in millimetres (e.g. 50/75). Some design methods make use of N-values corrected for various factors such as overburden pressure, energy ratio, borehole diameter, etc. No corrections have been applied to the N-values presented on the log.

DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to 'A' size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (300 mm) into the soil. The DCPT is used as a probe to assess soil variability.

OTHER TESTS

S	Sieve analysis
H	Hydrometer analysis
k	Laboratory permeability
y	Unit weight
G _s	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
C	Consolidation
Q _u	Unconfined compression
I _p	Point Load Index (I _p on Borehole Record equals I _p (50) in which the index is corrected to a reference diameter of 50 mm)

	Single packer permeability test; test interval from depth shown to bottom of borehole
	Double packer permeability test; test interval as indicated
	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer



BOREHOLE RECORD

BH-1

CLIENT: Dillon Consulting Ltd.

PROJECT NO. : 123316272

PROJECT: Goulet Street Rehabilitation and Des Meurons Street Reconstruction

BH ELEVATION: N/A

LOCATION: Winnipeg, MB

DATUM: N/A

DATE BORED: December 5, 2022

WATER LEVEL: N/A

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES				OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa)				BACKFILL / MONITOR WELL / PIEZOMETER	ELEVATION (m)	
				TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %		LABORATORY TEST	FIELD VANE TEST	POCKET PEN.	POCKET SHEAR VANE			
								50 kPa	100 kPa	150 kPa	200 kPa				
								WATER CONTENT & ATTERBERG LIMITS							
								SPT (N-value) BLOWS/0.3m							
								Water Content (%) and Blow Count							
								10	20	30	40	50	60	70	80
0		Asphalt (0 - 90 mm)													
		Concrete (90 - 300 mm)													
		End of Borehole • Borehole was terminated at a depth of 300 mm.													

- BACKFILL SYMBOL
- ASPHALT
- GROUT
- CONCRETE
- BENTONITE
- DRILL CUTTINGS
- SAND
- SLOUGH

Drilling Contractor: Stantec
 Drilling Method: Coring
 Completion Depth: 0.300 m
 Logged By: LB
 Reviewed By: GB
 Page 1 of 1

Printed Dec 14 2022 15:24:4 STANTEC GEO 2016 123316272_GOULET_ST.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 12/14/22

CLIENT: Dillon Consulting Ltd.

PROJECT NO. : 123316272

PROJECT: Goulet Street Rehabilitation and Des Meurons Street Reconstruction

BH ELEVATION: N/A

LOCATION: Winnipeg, MB

DATUM: N/A

DATE BORED: December 5, 2022

WATER LEVEL: N/A

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES				OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa)				BACKFILL / MONITOR WELL / PIEZOMETER	ELEVATION (m)		
				TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %		LABORATORY TEST	FIELD VANE TEST	POCKET PEN.	POCKET SHEAR VANE				
									50 kPa	100 kPa	150 kPa	200 kPa				
									WATER CONTENT & ATTERBERG LIMITS							
									SPT (N-value) BLOWS/0.3m							
									Water Content (%) and Blow Count							
									10	20	30	40	50	60	70	80
0		Asphalt (0 - 45 mm)														
		Concrete (45 - 225 mm)						Compressive strength test result = 52.2 MPa								
		End of Borehole • Borehole was terminated at a depth of 225 mm.														

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Stantec
 Drilling Method: Coring
 Completion Depth: 0.225 m
 Logged By: LB
 Reviewed By: GB
 Page 1 of 1



BOREHOLE RECORD

BH-3

CLIENT: Dillon Consulting Ltd.

PROJECT NO. : 123316272

PROJECT: Goulet Street Rehabilitation and Des Meurons Street Reconstruction

BH ELEVATION: N/A

LOCATION: Winnipeg, MB

DATUM: N/A

DATE BORED: December 5, 2022

WATER LEVEL: N/A

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES				OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa)				BACKFILL / MONITOR WELL / PIEZOMETER	ELEVATION (m)	
				TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %		LABORATORY TEST	FIELD VANE TEST	POCKET PEN.	POCKET SHEAR VANE			
								50 kPa	100 kPa	150 kPa	200 kPa				
								WATER CONTENT & ATTERBERG LIMITS							
								SPT (N-value) BLOWS/0.3m							
								Water Content (%) and Blow Count							
								10	20	30	40	50	60	70	80
0		Asphalt (0 - 120 mm)													
		Concrete (120 - 315 mm)													
		End of Borehole • Borehole was terminated at a depth of 315 mm.													

- BACKFILL SYMBOL
- ASPHALT
- GROUT
- CONCRETE
- BENTONITE
- DRILL CUTTINGS
- SAND
- SLOUGH

Drilling Contractor: Stantec
 Drilling Method: Coring
 Completion Depth: 0.315 m
 Logged By: LB
 Reviewed By: GB
 Page 1 of 1

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CLIENT: Dillon Consulting Ltd.

PROJECT NO. : 123316272

PROJECT: Goulet Street Rehabilitation and Des Meurons Street Reconstruction

BH ELEVATION: N/A

LOCATION: Winnipeg, MB

DATUM: N/A

DATE BORED: November 29-30, 2022

WATER LEVEL: N/A

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES				OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa)				BACKFILL / MONITOR WELL / PIEZOMETER	ELEVATION (m)
				TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %		LABORATORY TEST	FIELD VANE TEST	POCKET PEN.	POCKET SHEAR VANE		
0		Asphalt (0 - 90 mm)	[Symbol]											
		Concrete (90 - 229 mm)	[Symbol]											
		Soft black organic SILT (OH) - trace sand	[Symbol]											
			AS											
			AS											
			AS											
		Stiff brown fat CLAY (CH)	[Symbol]											
			AS											
			AS											
		End of Borehole • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole was terminated at a depth of 2.3 m.	[Symbol]											

Sieve/Hydro at 0.8 m
 C S M C
 0% 3% 37% 60%

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆
 POCKET PEN. ★ POCKET SHEAR VANE ◻

50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_p W W_L

SPT (N-value) BLOWS/0.3m

Water Content (%) and Blow Count

10 20 30 40 50 60 70 80

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- | | | | |
|--------------------|-------------------------|----------------|-------------------|
| BACKFILL SYMBOL | [Symbol] ASPHALT | [Symbol] GROUT | [Symbol] CONCRETE |
| [Symbol] BENTONITE | [Symbol] DRILL CUTTINGS | [Symbol] SAND | [Symbol] SLOUGH |

Drilling Contractor: Maple Leaf Drilling Ltd.	Logged By: LB
Drilling Method: 125 mm SSA	Reviewed By: GB
Completion Depth: 2.3 m	Page 1 of 1



BOREHOLE RECORD

BH-5

CLIENT: Dillon Consulting Ltd.

PROJECT NO. : 123316272

PROJECT: Goulet Street Rehabilitation and Des Meurons Street Reconstruction

BH ELEVATION: N/A

LOCATION: Winnipeg, MB

DATUM: N/A

DATE BORED: December 5, 2022

WATER LEVEL: N/A

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES				OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa)				BACKFILL / MONITOR WELL / PIEZOMETER	ELEVATION (m)	
				TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %		LABORATORY TEST	FIELD VANE TEST	POCKET PEN.	POCKET SHEAR VANE			
								50 kPa	100 kPa	150 kPa	200 kPa				
								WATER CONTENT & ATTERBERG LIMITS							
								SPT (N-value) BLOWS/0.3m							
								Water Content (%) and Blow Count							
								10	20	30	40	50	60	70	80
0		Asphalt (0 - 60 mm)													
		Concrete (60 - 290 mm)													
		End of Borehole • Borehole was terminated at a depth of 290 mm.													

BACKFILL SYMBOL ASPHALT GROUT CONCRETE
 BENTONITE DRILL CUTTINGS SAND SLOUGH

Drilling Contractor: Stantec
 Drilling Method: Coring
 Completion Depth: 0.290 m
 Logged By: LB
 Reviewed By: GB
 Page 1 of 1

Printed Dec 14 2022 15:24:7 STANTEC GEO 2016 123316272_GOULET_ST.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 12/14/22

CLIENT: Dillon Consulting Ltd.

PROJECT NO. : 123316272

PROJECT: Goulet Street Rehabilitation and Des Meurons Street Reconstruction

BH ELEVATION: N/A

LOCATION: Winnipeg, MB

DATUM: N/A

DATE BORED: November 29-30, 2022

WATER LEVEL: N/A

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES				OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa)				BACKFILL / MONITOR WELL / PIEZOMETER	ELEVATION (m)
				TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %		LABORATORY TEST	FIELD VANE TEST	POCKET PEN.	POCKET SHEAR VANE		
0		Asphalt (0 - 55 mm) Concrete (55 - 295 mm)												
		Stiff brown fat CLAY (CH) - trace organics												
		- no organics below 0.9 m.		AS				Sieve/Hydro at 0.7 m G S M C 1% 4% 24% 71%						
		- firm at 1.52 m.		AS										
				AS										
				AS										
		End of Borehole • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole was terminated at a depth of 2.3 m.												

BACKFILL SYMBOL	ASPHALT	GROUT	CONCRETE
BENTONITE	DRILL CUTTINGS	SAND	SLOUGH

Drilling Contractor: Maple Leaf Drilling Ltd.	Logged By: LB
Drilling Method: 125 mm SSA	Reviewed By: GB
Completion Depth: 2.3 m	Page 1 of 1

Printed Dec 14 2022 15:24:8 STANTEC GEO 2016 123316272_GOULET_ST.GPJ_GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 12/14/22

CLIENT: Dillon Consulting Ltd.
 PROJECT: Goulet Street Rehabilitation and Des Meurons Street Reconstruction
 LOCATION: Winnipeg, MB
 DATE BORED: December 5, 2022

PROJECT NO.: 123316272
 BH ELEVATION: N/A
 DATUM: N/A

WATER LEVEL: N/A

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES				OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, C_u (kPa)								BACKFILL / MONITOR WELL / PIEZOMETER	ELEVATION (m)
				TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %		50 kPa	100 kPa	150 kPa	200 kPa	WATER CONTENT & ATTERBERG LIMITS					
									LABORATORY TEST ▲ FIELD VANE TEST ◆ POCKET PEN. ★ POCKET SHEAR VANE ◻				SPT (N-value) BLOWS/0.3m Water Content (%) and Blow Count					
									W _p W W _L				10 20 30 40 50 60 70 80					
0		Asphalt (0 - 35 mm)																
		Concrete (35 - 230 mm)																
		End of Borehole • Borehole was terminated at a depth of 230 mm.																

BACKFILL SYMBOL	ASPHALT	GROUT	CONCRETE
BENTONITE	DRILL CUTTINGS	SAND	SLOUGH

Drilling Contractor: Stantec	Logged By: LB
Drilling Method: Coring	Reviewed By: GB
Completion Depth: 0.230 m	Page 1 of 1

CLIENT: Dillon Consulting Ltd.

PROJECT NO. : 123316272

PROJECT: Goulet Street Rehabilitation and Des Meurons Street Reconstruction

BH ELEVATION: N/A

LOCATION: Winnipeg, MB

DATUM: N/A

DATE BORED: November 29-30, 2022

WATER LEVEL: N/A

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES				OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa)				BACKFILL / MONITOR WELL / PIEZOMETER	ELEVATION (m)
				TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %		LABORATORY TEST	FIELD VANE TEST	POCKET PEN.	POCKET SHEAR VANE		
0		Asphalt (0 - 190 mm)												
		Concrete (190 - 320 mm)												
		Stiff brown fat CLAY (CH) - trace wood chips												
1		- no wood chips, firm at 1.22 m.		AS				Sieve/Hydro at 0.8 m G S M C 0% 2% 22% 76%						
2				AS										
3		End of Borehole • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole was terminated at a depth of 2.9 m.		AS										

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BACKFILL SYMBOL	ASPHALT	GROUT	CONCRETE
BENTONITE	DRILL CUTTINGS	SAND	SLOUGH

Drilling Contractor: Maple Leaf Drilling Ltd.	Logged By: LB
Drilling Method: 125 mm SSA	Reviewed By: GB
Completion Depth: 2.9 m	Page 1 of 1

APPENDIX D

Core Photographs



Figure 1 – Core No. 1 (Goulet St)

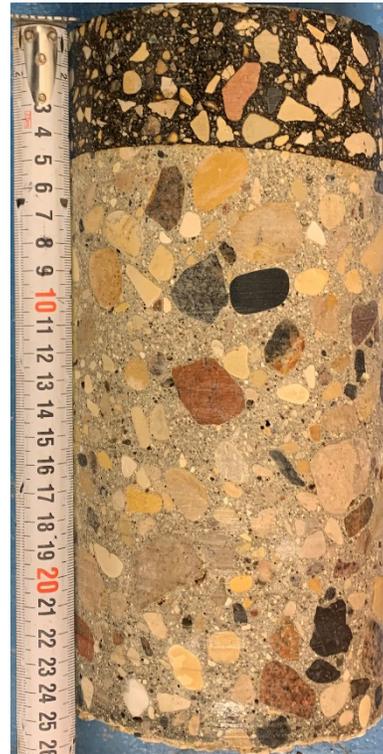


Figure 2 – Core No. 2 (Goulet St)



Figure 3 – Core No. 3 (Goulet St)

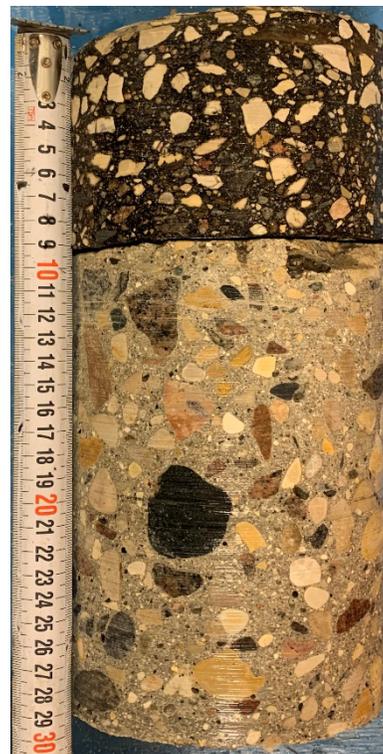


Figure 4 – Core No. 4 (Goulet St)



Figure 5 – Core No. 5 (Goulet St)



Figure 6 – Core No. 6 (Goulet St)

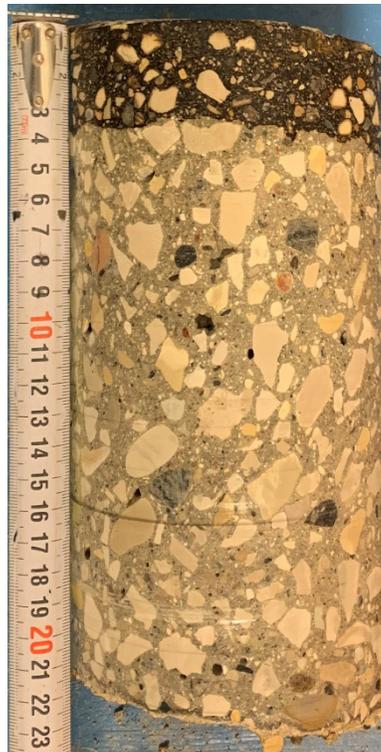


Figure 7 – Core No. 7 (Goulet St)

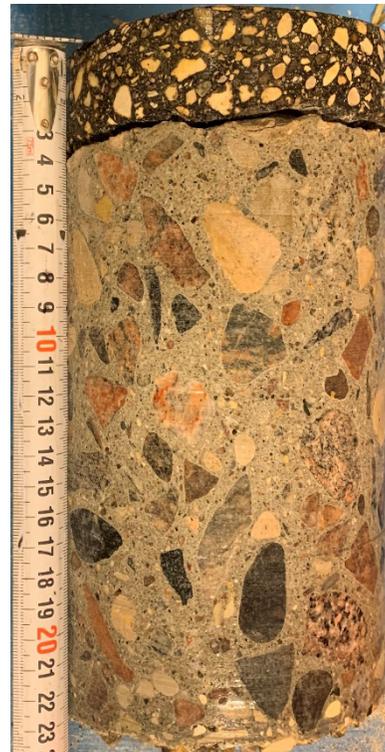


Figure 8 – Core No. 8 (Goulet St)

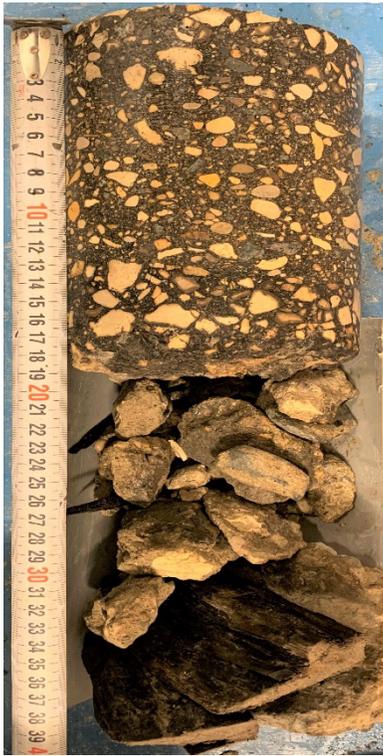


Figure 9 – Core A (Des Meurons St)



Figure 10 – Core B (Des Meurons St)

APPENDIX E

Laboratory Test Reports



Stantec Consulting Ltd.
 199 Henlow Bay, Winnipeg, MB R3Y 1G4
 Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO Dillon Consulting Limited
 1558 Willson Place
 Winnipeg, MB R3T 0Y4

PROJECT Goulet Street Rehabilitation and
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

ATTN: Ali Campbell

REPORT NO. 1

DATE SAMPLED: 2022.Nov.30

DATE RECEIVED: 2022.Nov.30

DATE TESTED: 2022.Dec.07

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

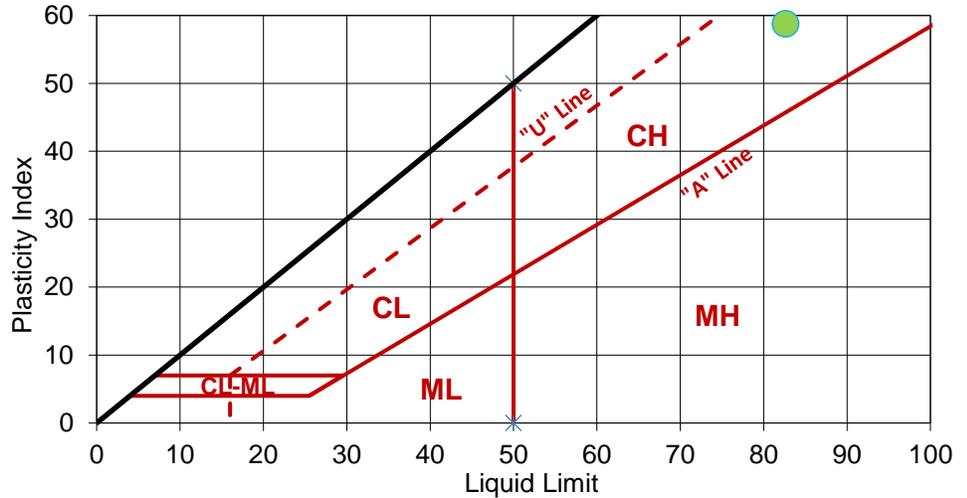
TESTED BY: Larry Presado

SAMPLE ID: BH-A, AC at 0.91 m

TRIAL	LIQUID LIMIT	
	1	2
BLOWS	22	21
MC (%)	84	84
Corr. MC (%)	83	82

TRIAL	PLASTIC LIMIT	
	1	2
MC (%)	24	24

LIQUID LIMIT, LL	83
PLASTIC LIMIT, PL	24
PLASTICITY INDEX, PI	59
AS REC'D MC (%)	34.1



COMMENTS:

REPORT DATE 2022.Dec.08

REVIEWED BY *Guillaume Beauce*
 Guillaume Beauce, P.Eng.
 Associate - Materials Testing Services

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided on written request. The data presented is for sole use of client stipulated above. Stantec is not responsible, nor can be held liable, for the use of this report by any other party, with or without the knowledge of Stantec.



Stantec Consulting Ltd.
 199 Henlow Bay, Winnipeg, MB R3Y 1G4
 Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO Dillon Consulting Limited
 1558 Willson Place
 Winnipeg, MB R3T 0Y4

PROJECT Goulet Street Rehabilitation and
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

ATTN: Ali Campbell

REPORT NO. 2

DATE SAMPLED: 2022.Nov.30

DATE RECEIVED: 2022.Nov.30

DATE TESTED: 2022.Dec.07

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

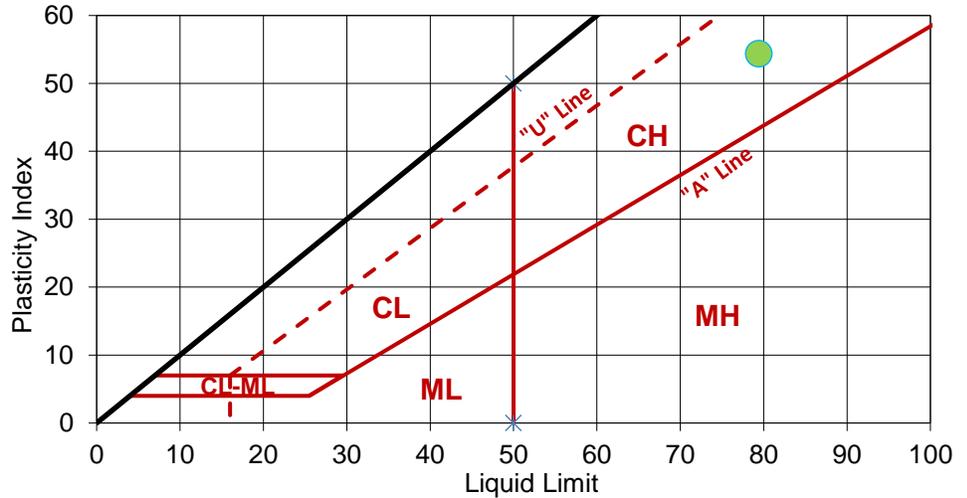
TESTED BY: Larry Presado

SAMPLE ID: BH-B, AC at 0.95 m

TRIAL	LIQUID LIMIT	
	1	2
BLOWS	28	28
MC (%)	78	78
Corr. MC (%)	80	79

TRIAL	PLASTIC LIMIT	
	1	2
MC (%)	25	25

LIQUID LIMIT, LL	79
PLASTIC LIMIT, PL	25
PLASTICITY INDEX, PI	54
AS REC'D MC (%)	30.8



COMMENTS:

REPORT DATE 2022.Dec.08

REVIEWED BY *G. Beauce*
 Guillaume Beauce, P.Eng.
 Associate - Materials Testing Services

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ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO Dillon Consulting Limited
 1558 Willson Place
 Winnipeg, MB R3T 0Y4

PROJECT Goulet Street Rehabilitation and
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

ATTN: Ali Campbell

REPORT NO. 3

DATE SAMPLED: 2022.Nov.30

DATE RECEIVED: 2022.Nov.30

DATE TESTED: 2022.Dec.07

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

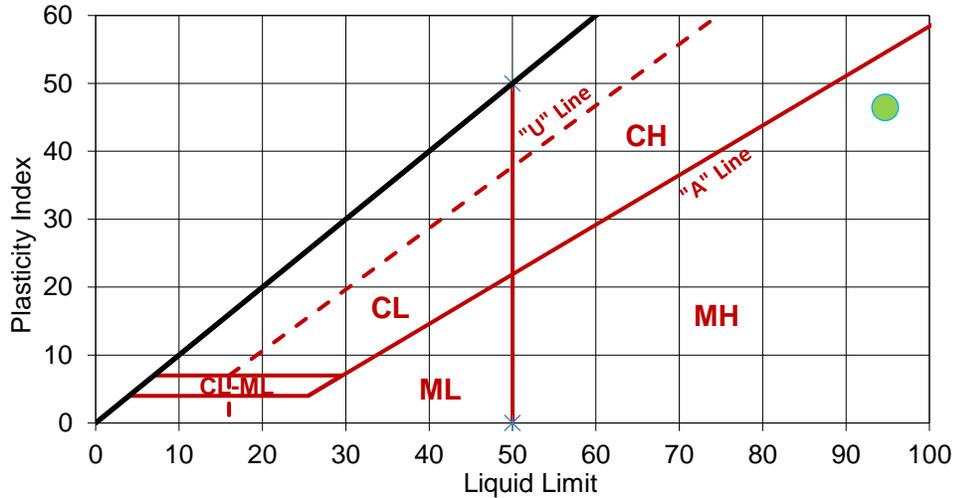
TESTED BY: Jemal Ibrahim

SAMPLE ID: BH-4, AC at 0.88 m

	LIQUID LIMIT	
TRIAL	1	2
BLOWS	22	22
MC (%)	96	97
Corr. MC (%)	94	95

	PLASTIC LIMIT	
TRIAL	1	2
MC (%)	49	48

LIQUID LIMIT, LL	95
PLASTIC LIMIT, PL	48
PLASTICITY INDEX, PI	47
AS REC'D MC (%)	69.9



COMMENTS:

REPORT DATE 2022.Dec.08


 REVIEWED BY Guillaume Beauce, P.Eng.
 Associate - Materials Testing Services

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Stantec Consulting Ltd.
 199 Henlow Bay, Winnipeg, MB R3Y 1G4
 Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO Dillon Consulting Limited
 1558 Willson Place
 Winnipeg, MB R3T 0Y4

PROJECT Goulet Street Rehabilitation and
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

ATTN: Ali Campbell

REPORT NO. 4

DATE SAMPLED: 2022.Nov.30

DATE RECEIVED: 2022.Nov.30

DATE TESTED: 2022.Dec.07

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

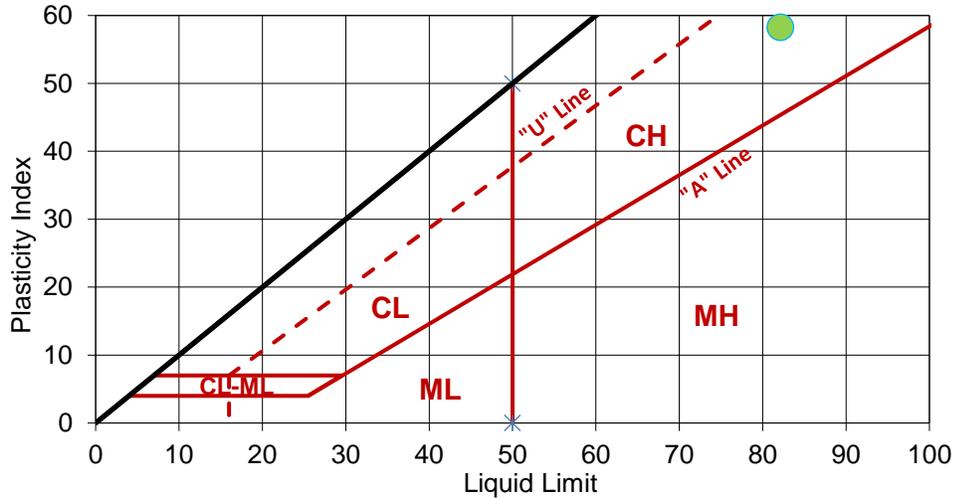
TESTED BY: Larry Presado

SAMPLE ID: BH-6, AC at 0.82 m

TRIAL	LIQUID LIMIT	
	1	2
BLOWS	25	25
MC (%)	82	82
Corr. MC (%)	82	82

TRIAL	PLASTIC LIMIT	
	1	2
MC (%)	24	24

LIQUID LIMIT, LL	82
PLASTIC LIMIT, PL	24
PLASTICITY INDEX, PI	58
AS REC'D MC (%)	58.4



COMMENTS:

REPORT DATE 2022.Dec.08

REVIEWED BY *Guillaume Beauce*
 Guillaume Beauce, P.Eng.
 Associate - Materials Testing Services

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Stantec Consulting Ltd.
 199 Henlow Bay, Winnipeg, MB R3Y 1G4
 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO Dillon Consulting Limited
 1558 Willson Place
 Winnipeg, MB R3T 0Y4

PROJECT Goulet Street Rehabilitation and
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

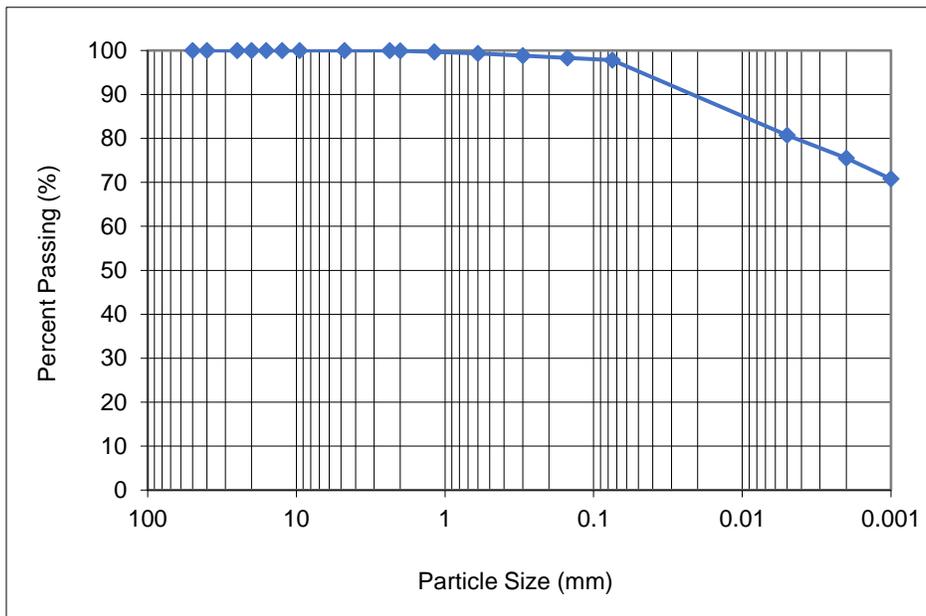
ATTN: Ali Campbell

REPORT NO. 1

DATE SAMPLED: 2022.Nov.30
 SAMPLED BY: Blair Dawson

DATE RECEIVED 2022.Nov.30
 SUBMITTED BY: Blair Dawson

DATE TESTED: 2022.Dec.02
 TESTED BY: Larry Presado



SIEVE SIZE (mm)	% PASSING
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	99.9
1.18	99.7
0.600	99.3
0.300	98.8
0.150	98.3
0.075	97.8
0.005	80.7
0.002	75.5
0.001	70.8

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.1	0.6	1.5	22.3	75.5	70.8

COMMENTS:

Material tested identified as BH-A, AC at 0.91 m.

REPORT DATE 2022.Dec.08


 REVIEWED BY Guillaume Beauce, P. Eng.
 Associate - Materials Testing Services

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Stantec Consulting Ltd.
 199 Henlow Bay, Winnipeg, MB R3Y 1G4
 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO Dillon Consulting Limited
 1558 Willson Place
 Winnipeg, MB R3T 0Y4

PROJECT Goulet Street Rehabilitation and
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

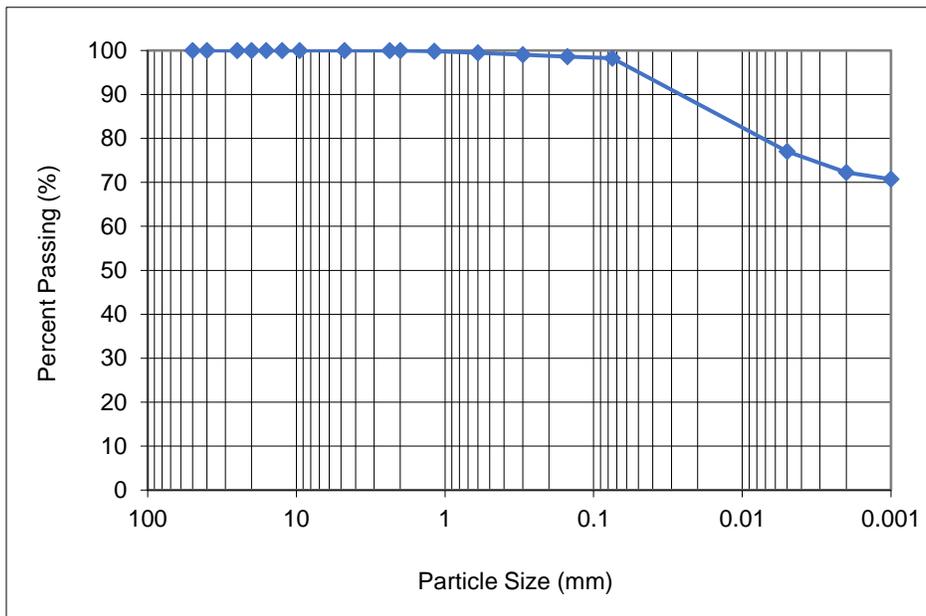
ATTN: Ali Campbell

REPORT NO. 2

DATE SAMPLED: 2022.Nov.30
 SAMPLED BY: Blair Dawson

DATE RECEIVED 2022.Nov.30
 SUBMITTED BY: Blair Dawson

DATE TESTED: 2022.Dec.02
 TESTED BY: Larry Presado



SIEVE SIZE (mm)	% PASSING
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	99.8
0.600	99.5
0.300	99.0
0.150	98.6
0.075	98.2
0.005	77.0
0.002	72.2
0.001	70.7

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	0.5	1.3	26.0	72.2	70.7

COMMENTS:

Material tested identified as BH-B, AC at 0.95 m.

REPORT DATE 2022.Dec.08

REVIEWED BY Guillaume Beauce, P. Eng.
 Associate - Materials Testing Services

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Stantec Consulting Ltd.
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ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO Dillon Consulting Limited
 1558 Willson Place
 Winnipeg, MB R3T 0Y4

PROJECT Goulet Street Rehabilitation and
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

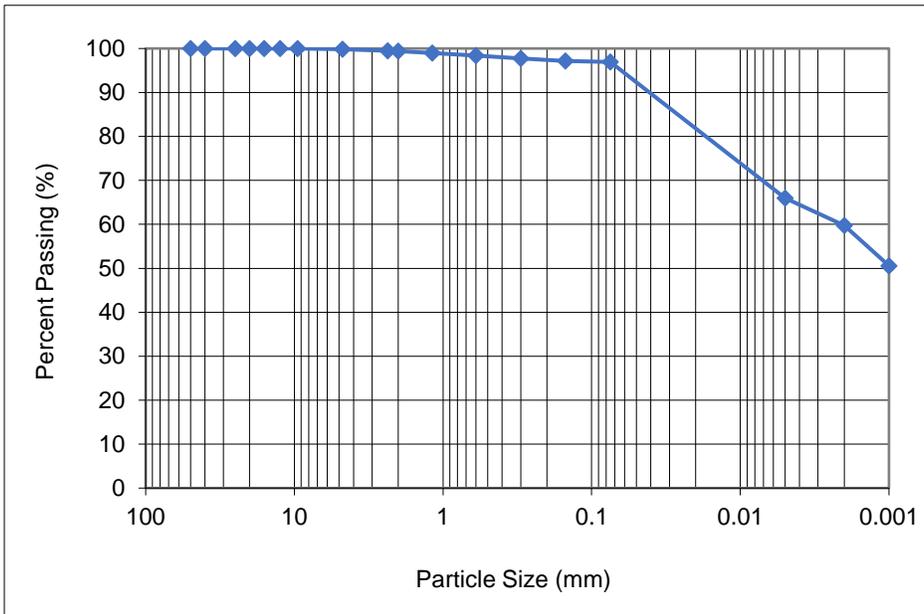
ATTN: Ali Campbell

REPORT NO. 3

DATE SAMPLED: 2022.Nov.30
 SAMPLED BY: Blair Dawson

DATE RECEIVED 2022.Nov.30
 SUBMITTED BY: Blair Dawson

DATE TESTED: 2022.Dec.02
 TESTED BY: Larry Presado



SIEVE SIZE (mm)	% PASSING
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	99.9
2.36	99.5
2.00	99.4
1.18	99.0
0.600	98.4
0.300	97.7
0.150	97.2
0.075	96.9
0.005	65.9
0.002	59.7
0.001	50.6

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.1	0.5	1.0	1.5	37.2	59.7	50.6

COMMENTS:

Material tested identified as BH-4, AC at 0.88 m.

REPORT DATE 2022.Dec.08

REVIEWED BY Guillaume Beauce, P. Eng.
 Associate - Materials Testing Services

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Stantec Consulting Ltd.
 199 Henlow Bay, Winnipeg, MB R3Y 1G4
 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO Dillon Consulting Limited
 1558 Willson Place
 Winnipeg, MB R3T 0Y4

PROJECT Goulet Street Rehabilitation and
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

ATTN: Ali Campbell

REPORT NO. 4

DATE SAMPLED: 2022.Nov.30

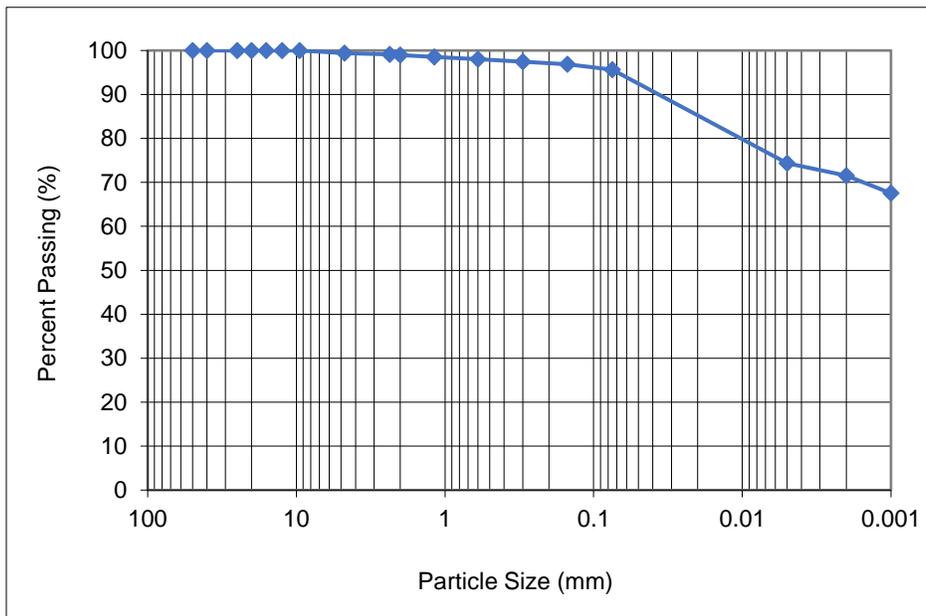
DATE RECEIVED 2022.Nov.30

DATE TESTED: 2022.Dec.02

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

TESTED BY: Larry Presado



SIEVE SIZE (mm)	% PASSING
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	99.4
2.36	99.1
2.00	98.9
1.18	98.5
0.600	98.0
0.300	97.4
0.150	96.8
0.075	95.6
0.005	74.4
0.002	71.5
0.001	67.5

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.6	0.5	0.9	2.4	24.1	71.5	67.5

COMMENTS:

Material tested identified as BH-6, AC at 0.82 m.

REPORT DATE 2022.Dec.08

REVIEWED BY Guillaume Beauce, P. Eng.
 Associate - Materials Testing Services

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PROCTOR TEST REPORT

TO Dillon Consulting Limited
1558 Willson Place
Winnipeg, MB
R3T 0Y4

CLIENT Dillon Consulting Limited
C.C.

ATTN: Ali Campbell

PROJECT Goulet Street Rehabilitation and
Des Meurons Street Reconstruction

PROJECT NO. 123316272

PROCTOR NO. 1

DATE SAMPLED 2022.Nov.30

DATE RECEIVED 2022.Nov.30

DATE TESTED 2022.Dec.02

INSITU MOISTURE 25.2 %

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE Subgrade

MAX. NOMINAL SIZE

MATERIAL TYPE Clay

SUPPLIER Existing Materials

SOURCE BH-A, AC at 0.91 m

COMPACTION STANDARD

COMPACTION PROCEDURE

RAMMER TYPE

PREPARATION

OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

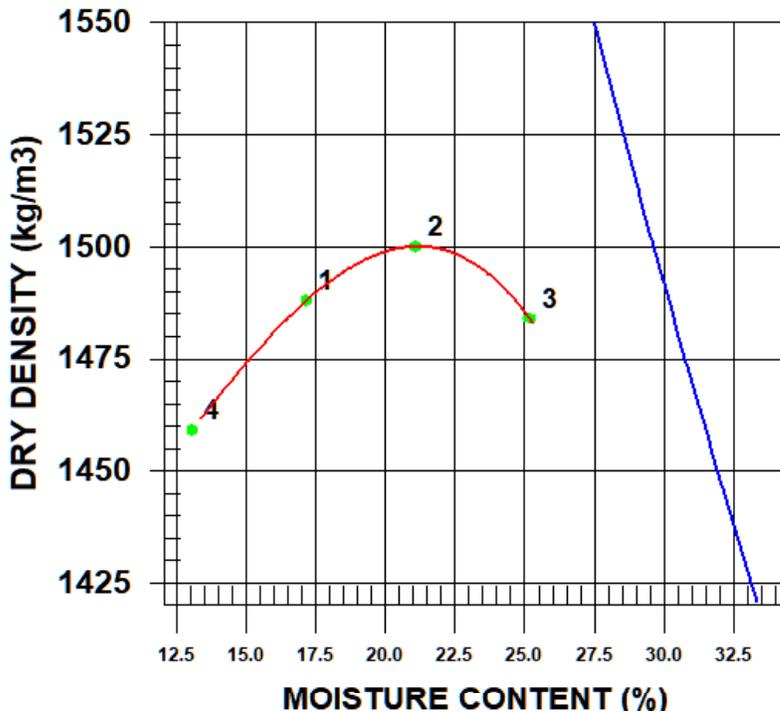
Standard Proctor,
ASTM D698

A: 101.6mm Mold,
Passing 4.75mm

Manual

Moist

None



TRIAL NUMBER	WET DENSITY (kg/m ³)	DRY DENSITY (kg/m ³)	MOISTURE CONTENT (%)
1	1744	1488	17.2
2	1817	1500	21.1
3	1858	1484	25.2
4	1650	1459	13.1

	MAXIMUM DRY DENSITY (kg/m ³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1500	21.0

COMMENTS

PROCTOR TEST REPORT

TO Dillon Consulting Limited
1558 Willson Place
Winnipeg, MB
R3T 0Y4

CLIENT Dillon Consulting Limited
C.C.

ATTN: Ali Campbell

PROJECT Goulet Street Rehabilitation and
Des Meurons Street Reconstruction

PROJECT NO. 123316272

PROCTOR NO. 2

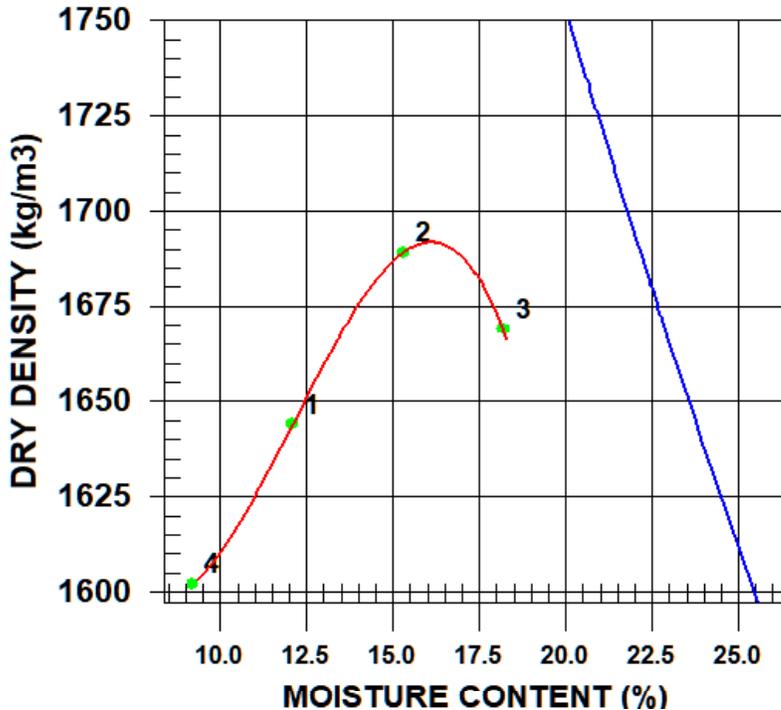
DATE SAMPLED 2022.Nov.30

DATE RECEIVED 2022.Nov.30

DATE TESTED 2022.Dec.02

INSITU MOISTURE 25.2 %
TESTED BY Donald Eliazar
MATERIAL IDENTIFICATION
MATERIAL USE Subgrade
MAX. NOMINAL SIZE
MATERIAL TYPE Clay
SUPPLIER Existing Materials
SOURCE BH-B, AC at 0.95 m

COMPACTION STANDARD Standard Proctor, ASTM D698
COMPACTION PROCEDURE A: 101.6mm Mold, Passing 4.75mm
RAMMER TYPE Manual
PREPARATION Moist
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m ³)	DRY DENSITY (kg/m ³)	MOISTURE CONTENT (%)
1	1843	1644	12.1
2	1947	1689	15.3
3	1973	1669	18.2
4	1749	1602	9.2

	MAXIMUM DRY DENSITY (kg/m ³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1690	16.0

COMMENTS

REVIEWED BY  Jason Thompson, C.E.T.

PROCTOR TEST REPORT

TO Dillon Consulting Limited
1558 Willson Place
Winnipeg, MB
R3T 0Y4

CLIENT Dillon Consulting Limited
C.C.

ATTN: Ali Campbell

PROJECT Goulet Street Rehabilitation and
Des Meurons Street Reconstruction

PROJECT NO. 123316272

PROCTOR NO. 3

DATE SAMPLED 2022.Nov.30

DATE RECEIVED 2022.Nov.30

DATE TESTED 2022.Dec.05

INSITU MOISTURE 69.9 %

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE Subgrade

MAX. NOMINAL SIZE

MATERIAL TYPE Organic Silt

SUPPLIER Existing Materials

SOURCE BH-4, AC at 0.88 m

COMPACTION STANDARD

COMPACTION PROCEDURE

RAMMER TYPE

PREPARATION

OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

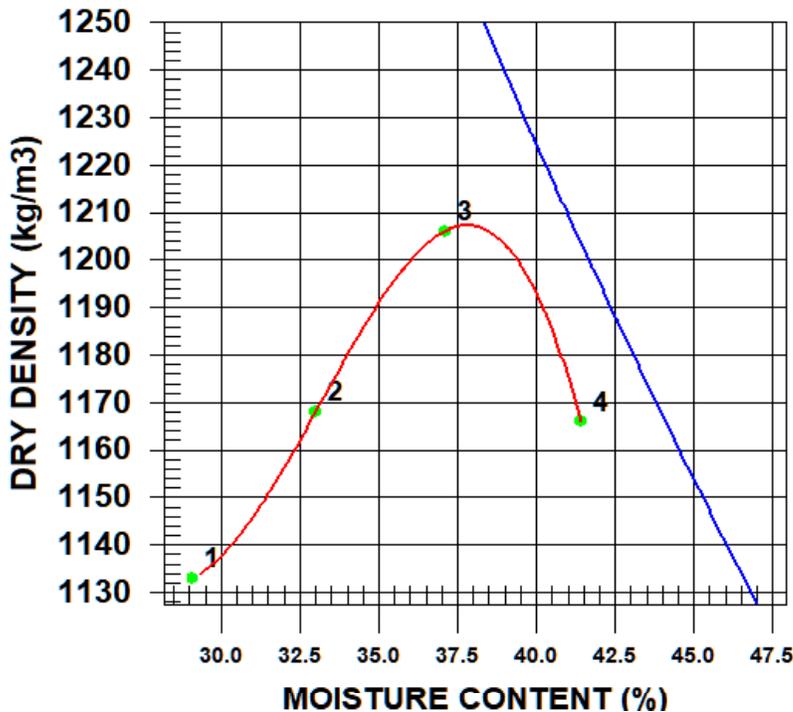
Standard Proctor,
ASTM D698

A: 101.6mm Mold,
Passing 4.75mm

Manual

Moist

None



TRIAL NUMBER	WET DENSITY (kg/m ³)	DRY DENSITY (kg/m ³)	MOISTURE CONTENT (%)
1	1463	1133	29.1
2	1554	1168	33.0
3	1654	1206	37.1
4	1649	1166	41.4

	MAXIMUM DRY DENSITY (kg/m ³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1210	38.0

COMMENTS

PROCTOR TEST REPORT

TO Dillon Consulting Limited
1558 Willson Place
Winnipeg, MB
R3T 0Y4

CLIENT Dillon Consulting Limited
C.C.

ATTN: Ali Campbell

PROJECT Goulet Street Rehabilitation and
Des Meurons Street Reconstruction

PROJECT NO. 123316272

PROCTOR NO. 4

DATE SAMPLED 2022.Nov.30

DATE RECEIVED 2022.Nov.30

DATE TESTED 2022.Dec.05

INSITU MOISTURE 25.2 %

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE Subgrade

MAX. NOMINAL SIZE

MATERIAL TYPE Clay

SUPPLIER Existing Materials

SOURCE BH-6, AC at 0.82 m

COMPACTION STANDARD

COMPACTION PROCEDURE

RAMMER TYPE

PREPARATION

OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

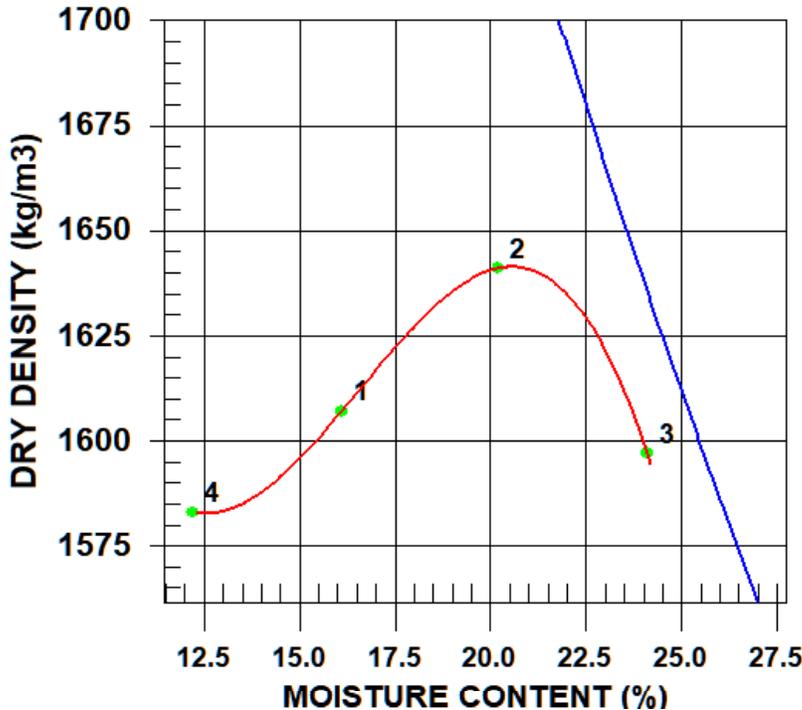
Standard Proctor,
ASTM D698

A: 101.6mm Mold,
Passing 4.75mm

Manual

Moist

None



TRIAL NUMBER	WET DENSITY (kg/m ³)	DRY DENSITY (kg/m ³)	MOISTURE CONTENT (%)
1	1866	1607	16.1
2	1973	1641	20.2
3	1982	1597	24.1
4	1776	1583	12.2

	MAXIMUM DRY DENSITY (kg/m ³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1640	20.5

COMMENTS

REVIEWED BY  Jason Thompson, C.E.T.

ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO Dillon Consulting Ltd.
 1558 Willson Place
 Winnipeg, MB
 R3T 0V4

PROJECT Goulet Street Rehabilitation &
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

ATTN: Ali Campbell

REPORT NO. 1 (Data page - see Page 2 for Chart)

DATE SAMPLED: 2022.Nov.30

DATE RECEIVED: 2022.Nov.30

DATE TESTED: 2022.Dec.08

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	In-Situ
MATERIAL TYPE	Clay	SAMPLE LOCATION	BH-A, AC at 0.91 m
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4788

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1500 kg/m ³
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	21.0 %
SURCHARGE MASS	4.54 kg	AS-COMPACTED MAX. DRY DENSITY	1432 kg/m ³
SWELL OF SAMPLE	5.0%	AS-COMPACTED MOISTURE CONTENT	21.1 %
		POST-TEST MOISTURE CONTENT (TOP 25 mm)	39.9 %

CBR VALUE AT 2.54 mm PENETRATION	2.4
CBR VALUE AT 5.08 mm PENETRATION	2.1

COMMENTS:

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.
 We appreciate the opportunity to assist you on this project. Please contact the undersigned if you have any questions regarding this report.

REPORT DATE 2022.Dec.13

REVIEWED BY  Jason Thompson, C.E.T.
 Principal - Manager of Materials Testing Services

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ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO Dillon Consulting Ltd.
 1558 Willson Place
 Winnipeg, MB
 R3T 0V4

PROJECT Goulet Street Rehabilitation &
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

ATTN: Ali Campbell

REPORT NO. 1 (Chart page - See Page 1 for Data)

DATE SAMPLED: 2022.Nov.30

DATE RECEIVED: 2022.Nov.30

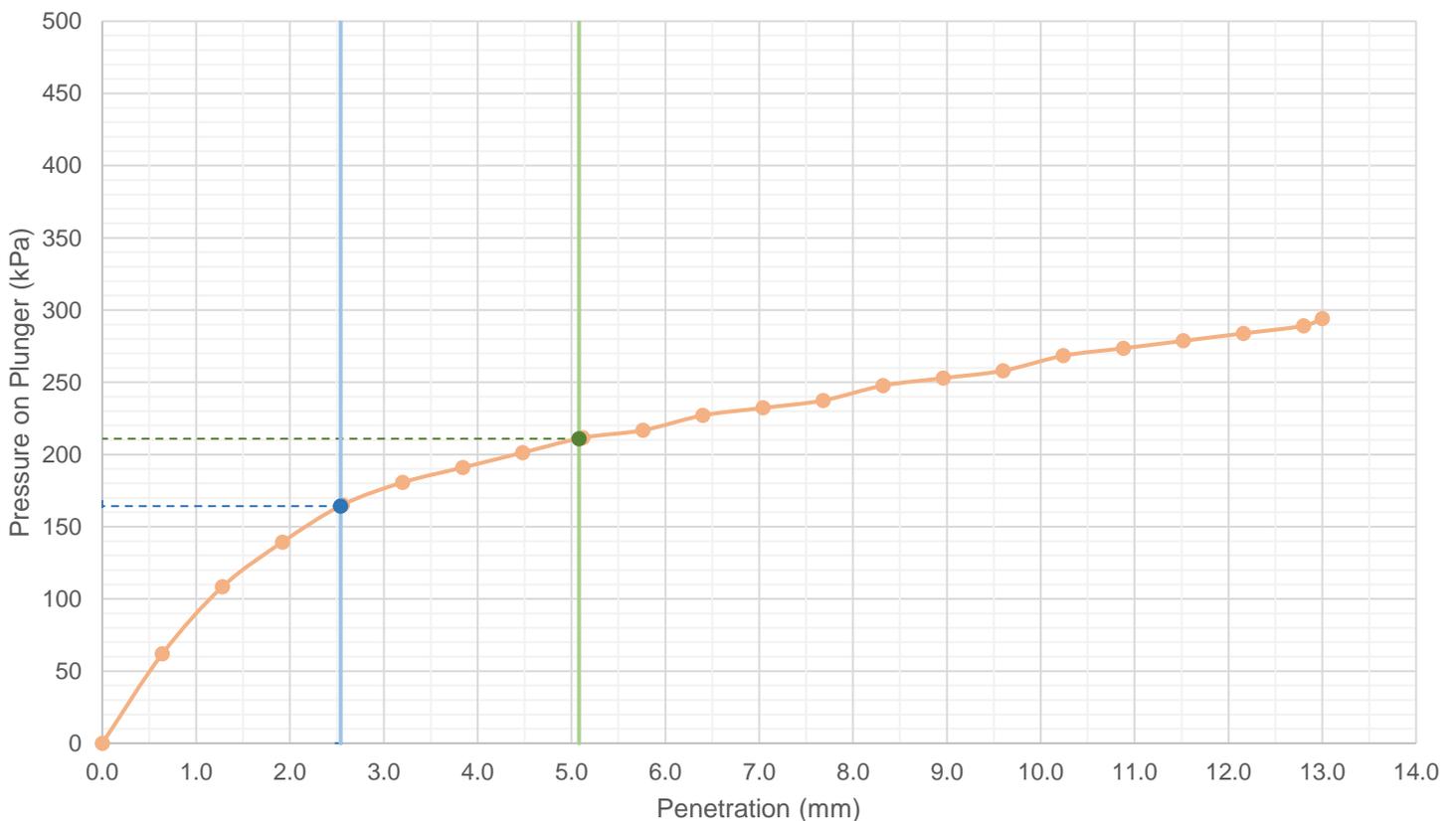
DATE TESTED: 2022.Dec.08

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

TESTED BY: Donald Eliazar

LOAD PENETRATION CURVE



REPORT DATE 2022.Dec.13

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ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO Dillon Consulting Ltd.
 1558 Willson Place
 Winnipeg, MB
 R3T 0V4

PROJECT Goulet Street Rehabilitation &
 Des Meurons Street Reconstruction

PROJECT NO. 123316272

ATTN: Ali Campbell

REPORT NO. 2 (Data page - see Page 2 for Chart)

DATE SAMPLED: 2022.Nov.30

DATE RECEIVED: 2022.Nov.30

DATE TESTED: 2022.Dec.08

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	In-Situ
MATERIAL TYPE	Clay	SAMPLE LOCATION	BH-B, AC at 0.95 m
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4789

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1690 kg/m ³
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	16.0 %
SURCHARGE MASS	4.54 kg	AS-COMPACTED MAX. DRY DENSITY	1610 kg/m ³
SWELL OF SAMPLE	0.9%	AS-COMPACTED MOISTURE CONTENT	16.0 %
		POST-TEST MOISTURE CONTENT (TOP 25 mm)	28.1 %

CBR VALUE AT 2.54 mm PENETRATION 3.9

CBR VALUE AT 5.08 mm PENETRATION 3.6

COMMENTS:

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.
 We appreciate the opportunity to assist you on this project. Please contact the undersigned if you have any questions regarding this report.

REPORT DATE 2022.Dec.13

REVIEWED BY  Jason Thompson, C.E.T.
 Principal - Manager of Materials Testing Services

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REPORT NO. 2 (Chart page - See Page 1 for Data)

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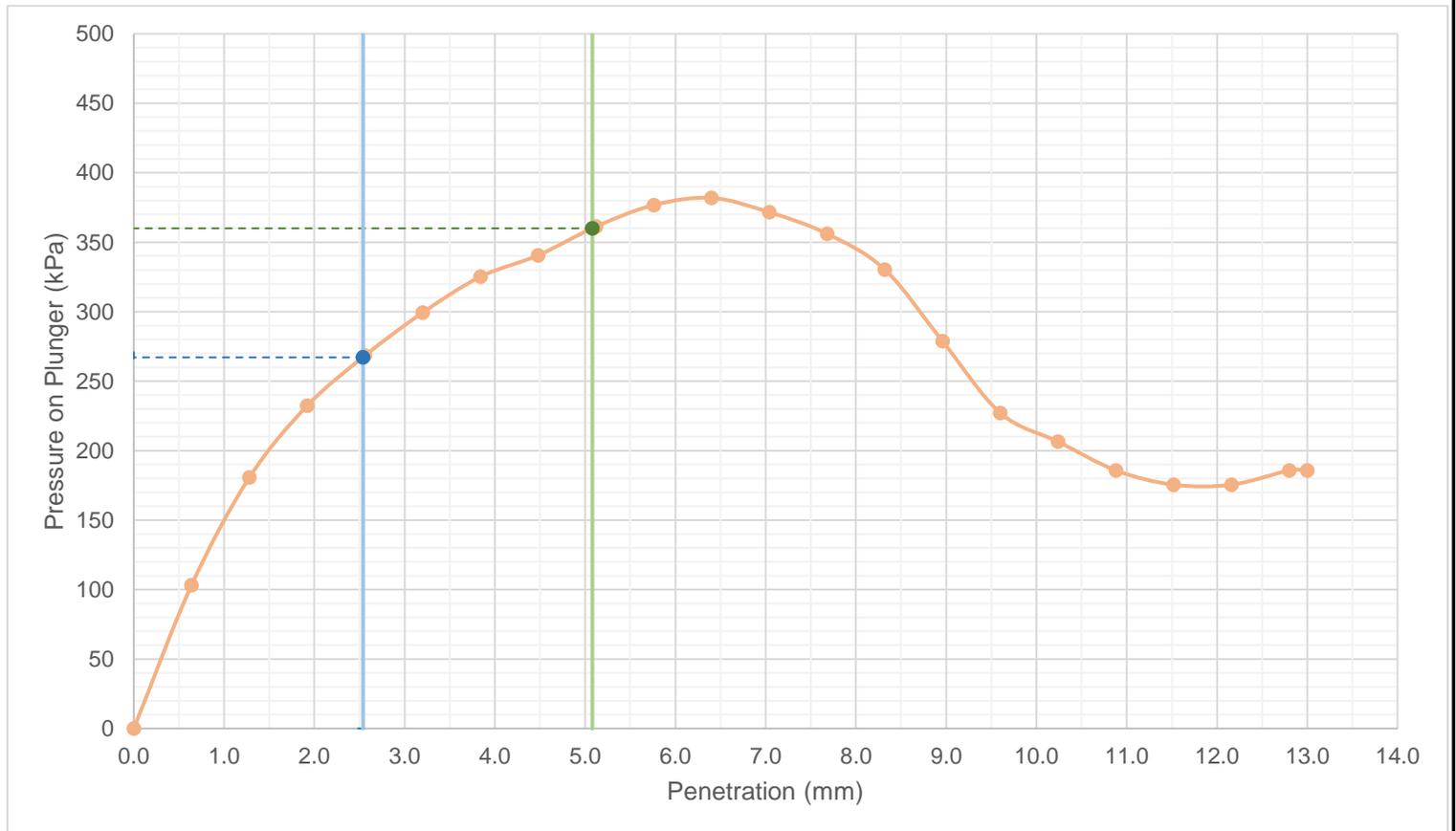
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ATTN: Ali Campbell

REPORT NO. 3 (Data page - see Page 2 for Chart)

DATE SAMPLED: 2022.Nov.30

DATE RECEIVED: 2022.Nov.30

DATE TESTED: 2022.Dec.08

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	In-Situ
MATERIAL TYPE	Organic Silt	SAMPLE LOCATION	BH-4, AC at 0.88 m
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4790

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1210 kg/m ³
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	38.0 %
SURCHARGE MASS	4.54 kg	AS-COMPACTED MAX. DRY DENSITY	1151 kg/m ³
SWELL OF SAMPLE	1.2%	AS-COMPACTED MOISTURE CONTENT	37.9 %
		POST-TEST MOISTURE CONTENT (TOP 25 mm)	46.0 %

CBR VALUE AT 2.54 mm PENETRATION	5.5
CBR VALUE AT 5.08 mm PENETRATION	5.0

COMMENTS:

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.
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REPORT DATE 2022.Dec.13

REVIEWED BY  Jason Thompson, C.E.T.
 Principal - Manager of Materials Testing Services

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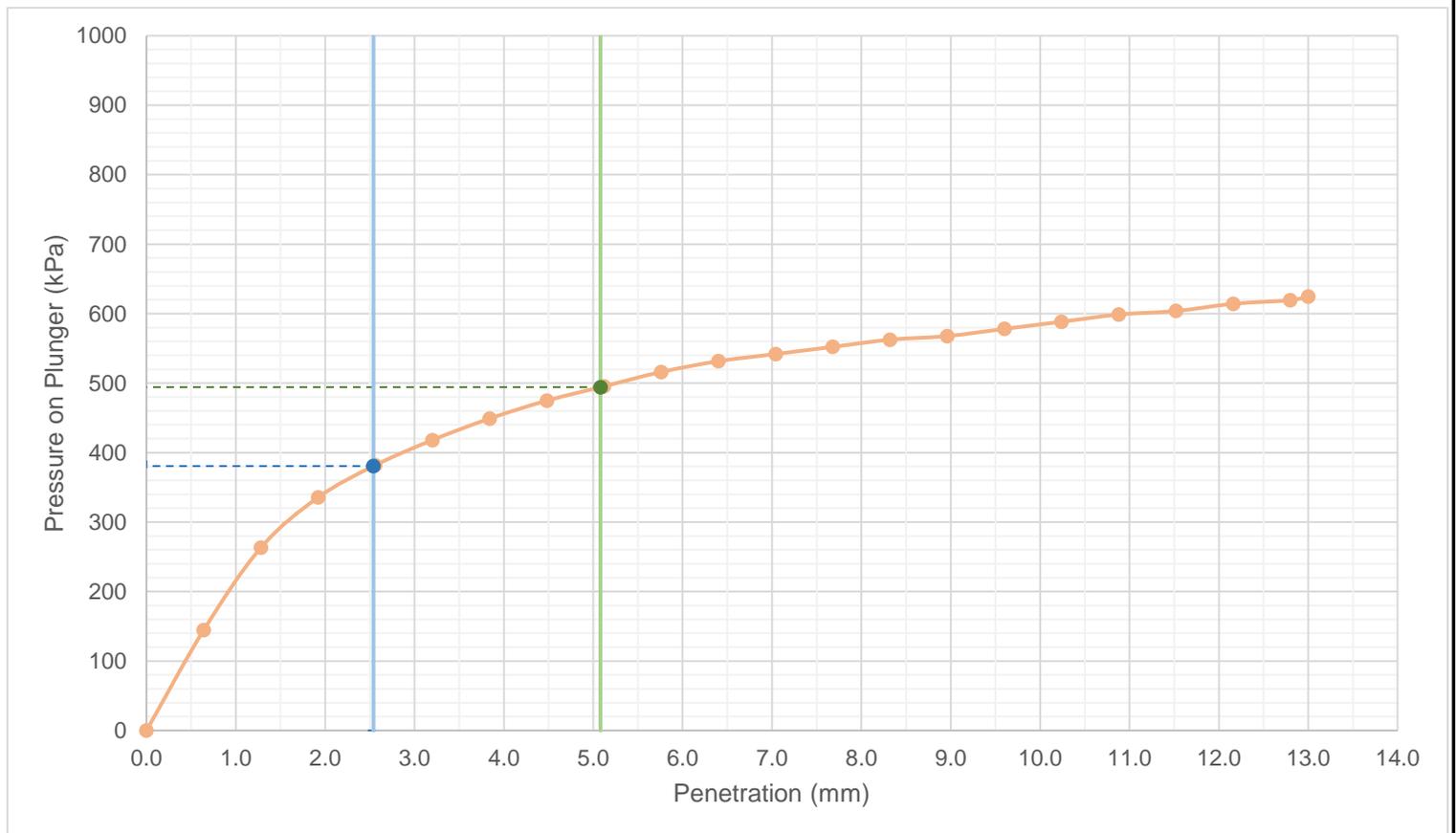
DATE TESTED: 2022.Dec.08

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

TESTED BY: Donald Eliazar

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ATTN: Ali Campbell

REPORT NO. 4 (Data page - see Page 2 for Chart)

DATE SAMPLED: 2022.Nov.30

DATE RECEIVED: 2022.Nov.30

DATE TESTED: 2022.Dec.08

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	In-Situ
MATERIAL TYPE	Clay	SAMPLE LOCATION	BH-6, AC at 0.82 m
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4791

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1640 kg/m ³
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	20.5 %
SURCHARGE MASS	4.54 kg	AS-COMPACTED MAX. DRY DENSITY	1557 kg/m ³
SWELL OF SAMPLE	1.3%	AS-COMPACTED MOISTURE CONTENT	20.4 %
		POST-TEST MOISTURE CONTENT (TOP 25 mm)	25.8 %

CBR VALUE AT 2.54 mm PENETRATION	5.5
CBR VALUE AT 5.08 mm PENETRATION	4.6

COMMENTS:

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.
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REPORT DATE 2022.Dec.13


 REVIEWED BY Jason Thompson, C.E.T.
 Principal - Manager of Materials Testing Services

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ATTN: Ali Campbell

REPORT NO. 4 (Chart page - See Page 1 for Data)

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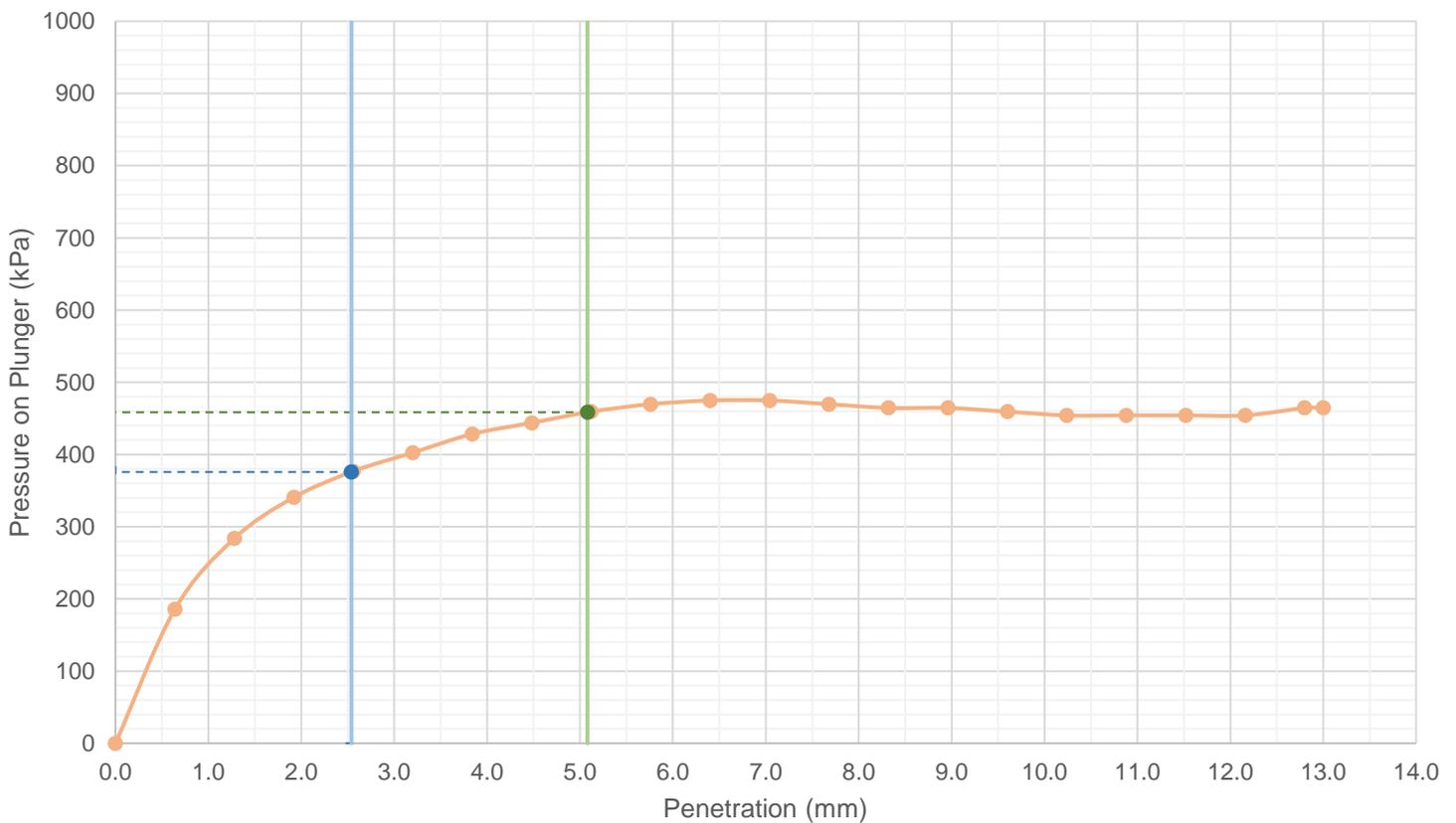
DATE TESTED: 2022.Dec.08

SAMPLED BY: Blair Dawson

SUBMITTED BY: Blair Dawson

TESTED BY: Donald Eliazar

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Table 1 - Compressive Strength Test Data

Test No.	Core Identification	Diameter (mm)	Length (mm)	L/D Ratio	Correction Factor	Peak Load (kN)	Compressive Strength (MPa)	
							Measured	Corrected
1	BH-2	144	200	1.39	0.947	898.0	55.1	52.2
2	BH-7	144	177	1.23	0.925	997.2	61.2	56.6