

APPENDIX 'A'

GEOTECHNICAL REPORT



Table 1 - Summary of Pavement Core Structure
 Leila Avenue, Garden Park Drive to McGregor Street

Core No.	Lane	Test Hole Location		Pavement Surface		
		UTM (N)	14U (E)	Type	Core Diameter (mm)	Thickness (mm)
PC01	Westbound Curb	5534821	633493	Asphalt	150	95
				Concrete	150	160
PC02	Westbound Curb	5534819	633496	Asphalt	150	85
				Concrete	150	180
PC03	Westbound Curb	5534819	633495	Asphalt	100	105
				Concrete	100	190
PC04	Eastbound Curb	5334587	633952	Asphalt	150	80
				Concrete	150	155
PC05	Eastbound Curb	5534557	634013	Asphalt	100	80
				Concrete	100	200
PC06	Eastbound Curb	5534555	634016	Asphalt	150	80
				Concrete	150	200
PC07	Eastbound Curb	5534486	634165	Asphalt	100	105
				Concrete	100	200
PC08	Eastbound Curb	5534491	634159	Asphalt	150	85
				Concrete	150	190
PC09	Eastbound Curb	5534487	634162	Asphalt	150	105
				Concrete	150	205
PC10	Eastbound Curb	5534466	634209	Asphalt	150	100
				Concrete	150	140
PC11	Eastbound Median	5534469	634213	Asphalt	100	95
				Concrete	100	250
PC12	Eastbound Curb	5534463	634218	Asphalt	150	80
				Concrete	150	230



Table 2 - Summary of Pavement Core Structure
 McGregor Street, Forrest Avenue to Leila Avenue

Core No.	Lane	Test Hole Location		Pavement Surface		
		UTM (N)	14U (E)	Type	Core Diameter (mm)	Thickness (mm)
PC13	Northbound Median	5534345	634429	Asphalt	150	50
				Concrete	150	220
PC14	Southbound Median	5534334	634419	Asphalt	150	90
				Concrete	150	190
PC15	Northbound Curb	5534252	634390	Asphalt	150	145
				Concrete	150	200
PC 16	Southbound Curb	5534236	634371	Asphalt	150	70
				Concrete	150	200

Table 3 - Summary of Pavement Core Structure
 Eastbound Partridge Avenue, McGregor Street to Main Street

Core No.	Lane	Test Hole Location		Pavement Surface		
		UTM (N)	14U (E)	Type	Core Diameter (mm)	Thickness (mm)
PC17	South Curb	5534261	634444	Asphalt	150	65
				Concrete	150	200
PC18	Middle	5534201	634541	Asphalt	100	30
				Concrete	100	195
PC19	North Curb	5534181	634589	Asphalt	150	80
				Concrete	150	210
PC20	South Curb	5534110	634722	Asphalt	150	70
				Concrete	150	190
PC21	Middle	5534048	634863	Asphalt	150	80
				Concrete	150	200
PC22	North Curb	5534010	634954	Asphalt	150	0
				Concrete	150	205
PC23	Middle	5533952	635086	Asphalt	100	75
				Concrete	100	195
PC24	South Curb	5533937	635090	Asphalt	150	80



Core No.	Lane	Test Hole Location		Type	Pavement Surface	
		UTM (N)	14U (E)		Core Diameter (mm)	Thickness (mm)
		Table 3 - Summary of Pavement Core Structure Eastbound Partridge Avenue, McGregor Street to Main Street				
PC25	North Curb	5533917	635151	Asphalt	150	65
PC26	South Curb	5533870	635233	Concrete	150	185
				Asphalt	150	75
				Concrete	150	205



Table 4
Summary of Pavement Structure
McGregor Street, Seven Oaks Avenue to Forrest Avenue

Test Hole	GPS Coordinates		Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis			Atterberg Limits			
	UTM	14U	Type	Depth (mm)	Type	Depth (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH1	5533349	633956	Asphalt	125	Clay	2500		0.6	27.0	-	-	-	-	-	-	
								0.9	22.7	-	-	-	-	-	-	
			Concrete	165				1.2	23.0	-	-	-	-	-	-	
								1.6	35.7	-	-	-	-	-	-	
TH2	5533429	634002	Asphalt	85	Clay	2500		0.6	27.3	-	-	-	-	-	-	
								0.9	28.4	-	-	-	-	-	-	
			Concrete	200				1.2	25.1	-	-	-	-	-	-	
								1.6	22.4	-	-	-	-	-	-	
TH3	5533550	634050	Asphalt	70	Clay	2500	Silty Clay	0.6	17.8	-	-	-	-	-	-	
								0.9	16.4	0.0	2.9	85.8	11.3	23	18	5
			Concrete	180				1.2	17.9	-	-	-	-	-	-	-
								1.6	36.5	-	-	-	-	-	-	-
TH4	5533687	634121	Asphalt	75	Clay	2500		0.6	30.7	-	-	-	-	-	-	
								0.9	19.7	-	-	-	-	-	-	
			Concrete	170				1.2	21.4	-	-	-	-	-	-	
								1.6	43.3	-	-	-	-	-	-	
				2.0	48.7	-	-	-	-	-	-					
				2.5	51.0	-	-	-	-	-	-					



Table 4
Summary of Pavement Structure
McGregor Street, Seven Oaks Avenue to Forrest Avenue

Test Hole	GPS Coordinates		Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits			
	UTM	14U	Type	Depth (mm)	Type	Depth (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index	
TH5	5533762	634146	Asphalt	35	Clay	2500		0.6	17.0	-	-	-	-	-	-	-	
			Concrete	0.9				19.2	-	-	-	-	-	-	-	-	-
				1.2				23.1	-	-	-	-	-	-	-	-	-
				1.6				35.9	-	-	-	-	-	-	-	-	-
TH6	5533832	634193	Asphalt	65	Clay	2500	Fat Clay	1.2	29.9	0.0	2.9	28.4	68.7	79	25	54	
			Concrete	1.6				37.2	-	-	-	-	-	-	-	-	-
				2.0				41.4	-	-	-	-	-	-	-	-	-
				2.5				44.4	-	-	-	-	-	-	-	-	-
TH7	5533927	634227	Asphalt	70	Clay	2500	Lean Clay	0.6	17.2	-	-	-	-	-	-	-	
			Concrete	0.9				21.5	0.0	4.3	75.7	20.0	29	19	10		
				1.2				29.5	-	-	-	-	-	-	-	-	-
				1.6				44.7	-	-	-	-	-	-	-	-	-
TH8	5534014	634276	Asphalt	90	Clay	2500		0.6	28.6	-	-	-	-	-	-	-	
			Concrete	0.9				26.5	-	-	-	-	-	-	-	-	-
				1.2				22.0	-	-	-	-	-	-	-	-	-
				1.6				24.3	-	-	-	-	-	-	-	-	-
			2.0	24.9	-	-	-	-	-	-	-	-	-	-			
			2.5	35.1	-	-	-	-	-	-	-	-	-	-	-		



Table 4
Summary of Pavement Structure
McGregor Street, Seven Oaks Avenue to Forrest Avenue

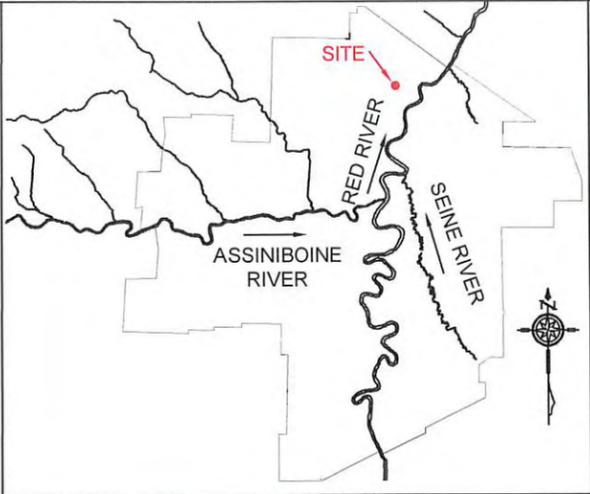
Test Hole	GPS Coordinates		Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
	UTM	14U	Type	Depth (mm)	Type	Depth (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH9	5534115	634313	Asphalt	90	Clay	2500	Silty Clay	0.6	31.6	-	-	-	-	-	-	-
				0.9				21.7	-	-	-	-	-	-	-	-
			Concrete	225	-	-		5.0	82.6	12.4	23	18	5			

Table 5
Summary of Pavement Structure
Leila Avenue, Monsey Street to Sinclair Street

Test Hole	GPS Coordinates		Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
	UTM	14U	Type	Depth (mm)	Type	Depth (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH10	5534685	633780	Asphalt	60	Clay	2500	Fat Clay	0.6	31.7	-	-	-	-	-	-	-
				Concrete				180	-	-	-	-	-	-	-	-
			Asphalt	55	-	-		-	-	-	-	-	-	-	-	
TH11	5534650	633856	Concrete	180	Clay	2500	Fat Clay	0.9	36.2	-	-	-	-	-	-	-
				Asphalt				55	-	-	-	-	-	-	-	-
			Concrete	180	-	-		-	-	-	-	-	-	-	-	
TH12*	5534664	633825	Asphalt	75	Clay	1600	0.9 – 1.6	-	-	-	-	-	-	-	-	
Concrete	195	-	-	-				-	-	-	-	-	-			

*TH12 was an additional test hole drilled on Leila Avenue to recover sufficient sample to complete the Moisture-Density Relationship and California Bearing Ratio testing.

TEST HOLE & PAVEMENT CORE LOCATION TABLE			
HOLE NUMBER	CORING COMPLETED ON NOVEMBER 28, 29 AND 30, 2023; DECEMBER 1 AND 13-19, 2023		LOCATION DESCRIPTIONS
	UTM COORDINATE		
	UTM	14U	
PC 01	5534821	633493	LEILA AVE, WB CURB LANE, 0.1 M SOUTH OF ϵ OF LANE
PC 02	5534819	633496	LEILA AVE, WB CURB LANE, 0.2 M NORTH OF ϵ OF LANE
PC 03	5534819	633495	LEILA AVE, WB CURB LANE, ON ϵ OF LANE
PC 04	5534587	633952	LEILA AVE, EB CURB LANE, ON ϵ OF LANE
TH 10	5534685	633780	LEILA AVE, WB CURB LANE, 1 M SOUTH OF ϵ OF LANE
TH 11	5534650	633856	LEILA AVE, WB CURB LANE, 1.3 M SOUTH OF ϵ OF LANE
TH 12	5534664	633825	LEILA AVE, WB CURB LANE, ON ϵ OF LANE



LEGEND

TH 01 TEST HOLE

PC 01 CORING



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ENG-TECH
CONSULTING LIMITED

420 Turenne Street
Winnipeg, MB
R2J 3W8
Phone: (204) 233-1694
Fax: (204) 235-1579

ENG. STAMP:

**ENGINEERS
GEOLOGISTS
MANITOBA**
Certificate of Authorization
ENG-TECH Consulting Limited
No. 2475

CLIENT:
WSP CANADA INC.

PROJECT:
2022-2025 CW REGIONAL STREET
RENEWAL - LEILA AVENUE,
PARTRIDGE AVENUE, MCGREGOR
STREET, WINNIPEG, MANITOBA,
CANADA

DWG DESCRIPTION:
CORING AND DRILLING LOCATION
PLAN

SCALE:
NTS

DRAWN BY: DT DATE: JANUARY 2024

FILE No.: 23-035-04 CLIENT DWG/FIG. No.:

ENG-TECH DWG/FIG. No.: 1 of 6 NO.:

TEST HOLE & PAVEMENT CORE LOCATION TABLE			
HOLE NUMBER	CORING COMPLETED ON NOVEMBER 28, 29 AND 30, 2023; DECEMBER 1 AND 13-19, 2023		LOCATION DESCRIPTIONS
	UTM COORDINATE		
	UTM	14U	
PC 05	5534557	634013	LEILA AVE, EB CURB LANE, ON ϵ OF LANE
PC 06	5534555	634016	LEILA AVE, EB CURB LANE, ON ϵ OF LANE
PC 07	5534486	634165	LEILA AVE, EB CURB LANE, ON ϵ OF LANE
PC 08	5534491	634159	LEILA AVE, EB CURB LANE, 1 M NORTH OF ϵ OF LANE
PC 09	5534487	634162	LEILA AVE, EB CURB LANE, ON ϵ OF LANE
PC 10	5534466	634209	LEILA AVE, EB CURB LANE, ON ϵ OF LANE
PC 11	5534469	634213	LEILA AVE, EB MEDIAN LANE, ON ϵ OF LANE
PC 12	5534463	634218	LEILA AVE, EB CURB LANE, 1 M NORTH OF ϵ OF LANE



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CORING AND DRILLING LOCATION PLAN

SCALE:
NTS

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FILE No.: 23-035-04	CLIENT DWG/FIG. No.:
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ENG-TECH DWG/FIG. No.:	NO.:
2 of 6	

TEST HOLE & PAVEMENT CORE LOCATION TABLE

HOLE NUMBER	CORING COMPLETED ON NOVEMBER 28, 29 AND 30, 2023; DECEMBER 1 AND 13-19, 2023		LOCATION DESCRIPTIONS
	UTM COORDINATE		
	UTM	14U	
PC 13	5534345	634429	MCGREGOR ST, NB MEDIAN LANE, ON � OF LANE
PC 14	5534334	634419	MCGREGOR ST, SB MEDIAN LANE, ON � OF LANE
PC 15	5534252	634390	MCGREGOR ST, NB CURB LANE, ON � OF LANE
PC 16	5534236	634371	MCGREGOR ST, SB CURB LANE, ON � OF LANE
PC 17	5534261	634444	PARTRIDGE AVE, EB SOUTH CURB LANE, ON � OF LANE
PC 18	5534201	634541	PARTRIDGE AVE, EB MIDDLE LANE, ON � OF LANE



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DWG DESCRIPTION:
CORING AND DRILLING LOCATION PLAN

SCALE:
NTS

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FILE No.: 23-035-04	CLIENT DWG/FIG. No.:
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ENG-TECH DWG/FIG. No.:	NO.:
3 of 6	

TEST HOLE & PAVEMENT CORE LOCATION TABLE			
HOLE NUMBER	CORING COMPLETED ON NOVEMBER 28, 29 AND 30, 2023; DECEMBER 1 AND 13-19, 2023		LOCATION DESCRIPTIONS
	UTM COORDINATE		
	UTM	14U	
PC 19	5534181	634589	PARTRIDGE AVE, EB NORTH CURB LANE, ON ϵ OF LANE
PC 20	5534110	634722	PARTRIDGE AVE, EB SOUTH CURB LANE, ON ϵ OF LANE
PC 21	5534048	634863	PARTRIDGE AVE, EB MIDDLE LANE, ON ϵ OF LANE
PC 22	5534010	634954	PARTRIDGE AVE, EB NORTH CURB LANE, ON ϵ OF LANE
PC 23	5533952	635086	PARTRIDGE AVE, EB MIDDLE LANE, ON ϵ OF LANE
PC 24	5533937	635090	PARTRIDGE AVE, EB SOUTH CURB LANE, ON ϵ OF LANE
PC 25	5533917	635151	PARTRIDGE AVE, EB NORTH CURB LANE, ON ϵ OF LANE
PC 26	5533870	635233	PARTRIDGE AVE, EB SOUTH CURB LANE, ON ϵ OF LANE



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PLAN

SCALE:
NTS

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FILE No.: 23-035-04	CLIENT DWG/FIG. No.:

ENG-TECH DWG/FIG. No.: NO.:

4 of 6

TEST HOLE & PAVEMENT CORE LOCATION TABLE			
HOLE NUMBER	CORING COMPLETED ON NOVEMBER 28, 29 AND 30, 2023; DECEMBER 1 AND 13-19, 2023		LOCATION DESCRIPTIONS
	UTM COORDINATE		
	UTM	14U	
TH 01	5533349	633956	MCGREGOR ST, SB LANE, ON E OF LANE
TH 02	5533429	634002	MCGREGOR ST, NB LANE, ON E OF LANE
TH 03	5533550	634050	MCGREGOR ST, SB LANE, ON E OF LANE
TH 04	5533687	634121	MCGREGOR ST, NB LANE, ON E OF LANE
TH 05	5533762	634146	MCGREGOR ST, SB LANE, ON E OF LANE
TH 06	5533832	634193	MCGREGOR ST, NB LANE, ON E OF LANE
TH 07	5533927	634227	MCGREGOR ST, SB LANE, ON E OF LANE
TH 08	5534014	634276	MCGREGOR ST, NB LANE, ON E OF LANE



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CORING AND DRILLING LOCATION PLAN

SCALE:
NTS

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FILE No.: 23-035-04	CLIENT DWG/FIG. No.:
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ENG-TECH DWG/FIG. No.:	NO.:
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TEST HOLE & PAVEMENT CORE LOCATION TABLE			
HOLE NUMBER	CORING COMPLETED ON NOVEMBER 28, 29 AND 30, 2023; DECEMBER 1 AND 13-19, 2023		LOCATION DESCRIPTIONS
	UTM COORDINATE		
	UTM	14U	
TH 09	5534115	634313	MCGREGOR ST, SB LANE, ON 6 OF LANE



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DWG DESCRIPTION:
CORING AND DRILLING LOCATION PLAN

SCALE:
NTS

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FILE No.: 23-035-04	CLIENT DWG/FIG. No.:
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ENG-TECH DWG/FIG. No.: 6 of 6	NO.:
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Test Hole #: TH01

Client: WSP Canada Inc.

Site: SB McGregor Street, Winnipeg, Manitoba

Location: See Figure 5

Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

File No.: 23-035-04

Date Drilled: December 1, 2023

Grade Elevation: 100.0 m

Water Elevation: --

Engineering And Testing Solutions That Work For You

SUBSURFACE PROFILE				SAMPLE DATA				SHEAR STRENGTH (kPa)			
Depth (m)	Soil Symbol	Description	Elevation (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%)			
								PL	X	LL	P. Pen
0.0		Ground Surface	100.0								
		Asphalt (125 mm)									
		Concrete (165 mm)									
		Clay									
		- dark brown, moist, firm, silty, trace sand.		S1	Split Barrel	27.0					
		- below 0.8 m, brown, soft.		S2	Split Barrel	22.7					
1.0			99.0	S3	Split Barrel	23.0					
		- below 1.6 m, dark brown, stiff.		S4	Split Barrel	35.7					
2.0			98.0	S5	Split Barrel	43.0					
		- below 2.3 m, dark brown, stiff.		S6	Split Barrel	49.1					
		End of Test Hole									
		- end of test hole at 2.5 m below grade.									
		- no seepage or sloughing encountered during drilling.									
		- test hole backfilled with auger cuttings and gravel and patched with cold mix asphalt upon completion of drilling.									
3.0			97.0								
4.0			96.0								
5.0			95.0								

ENG-TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH02

File No.: 23-035-04

Client: WSP Canada Inc.

Date Drilled: November 30, 2023

Site: NB McGregor Street, Winnipeg, Manitoba

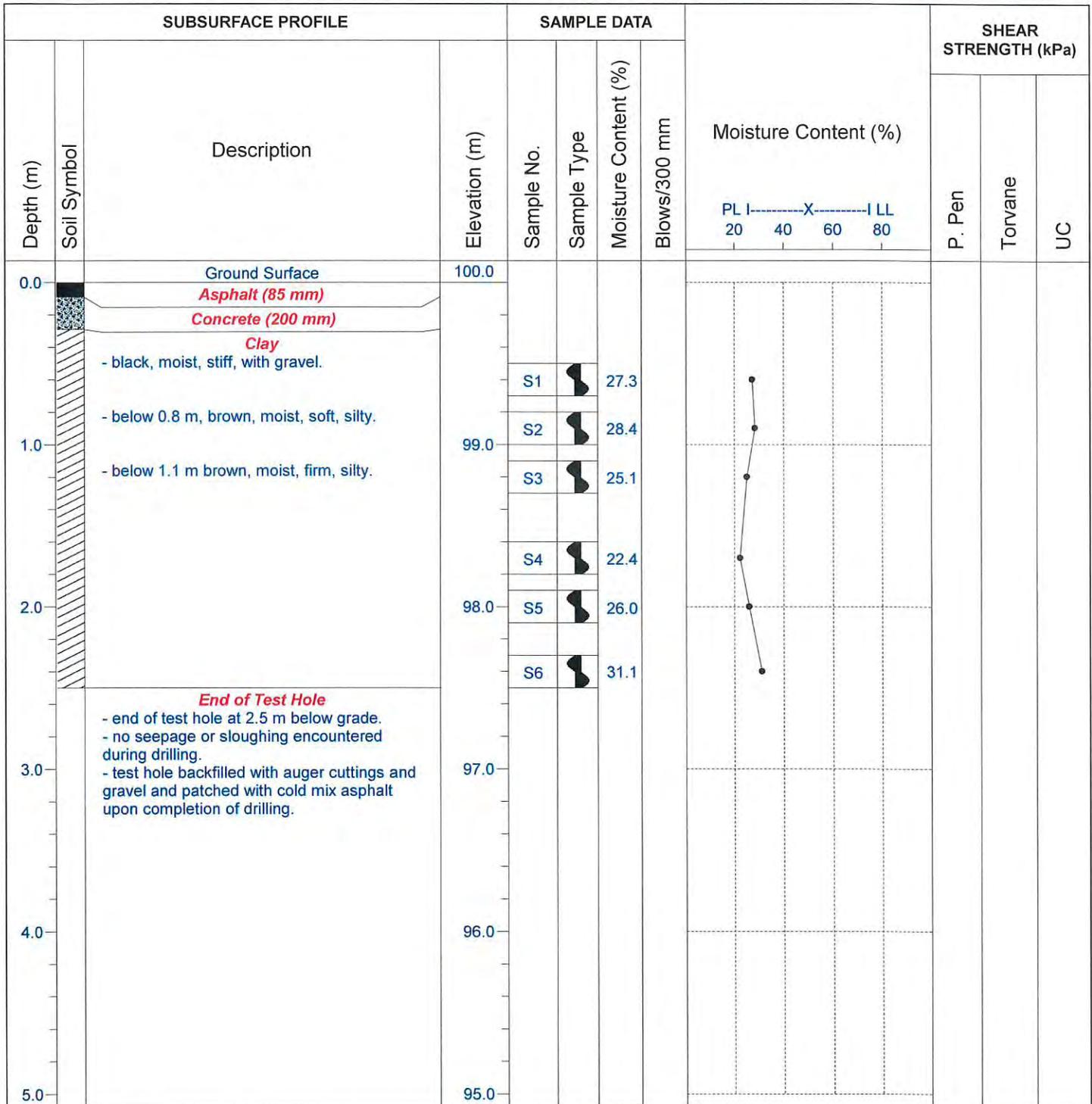
Grade Elevation: 100.0 m

Location: See Figure 5

Water Elevation: --

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Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor



ENG- TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH03

Client: WSP Canada Inc.

Site: SB McGregor Street, Winnipeg, Manitoba

Location: See Figure 5

Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

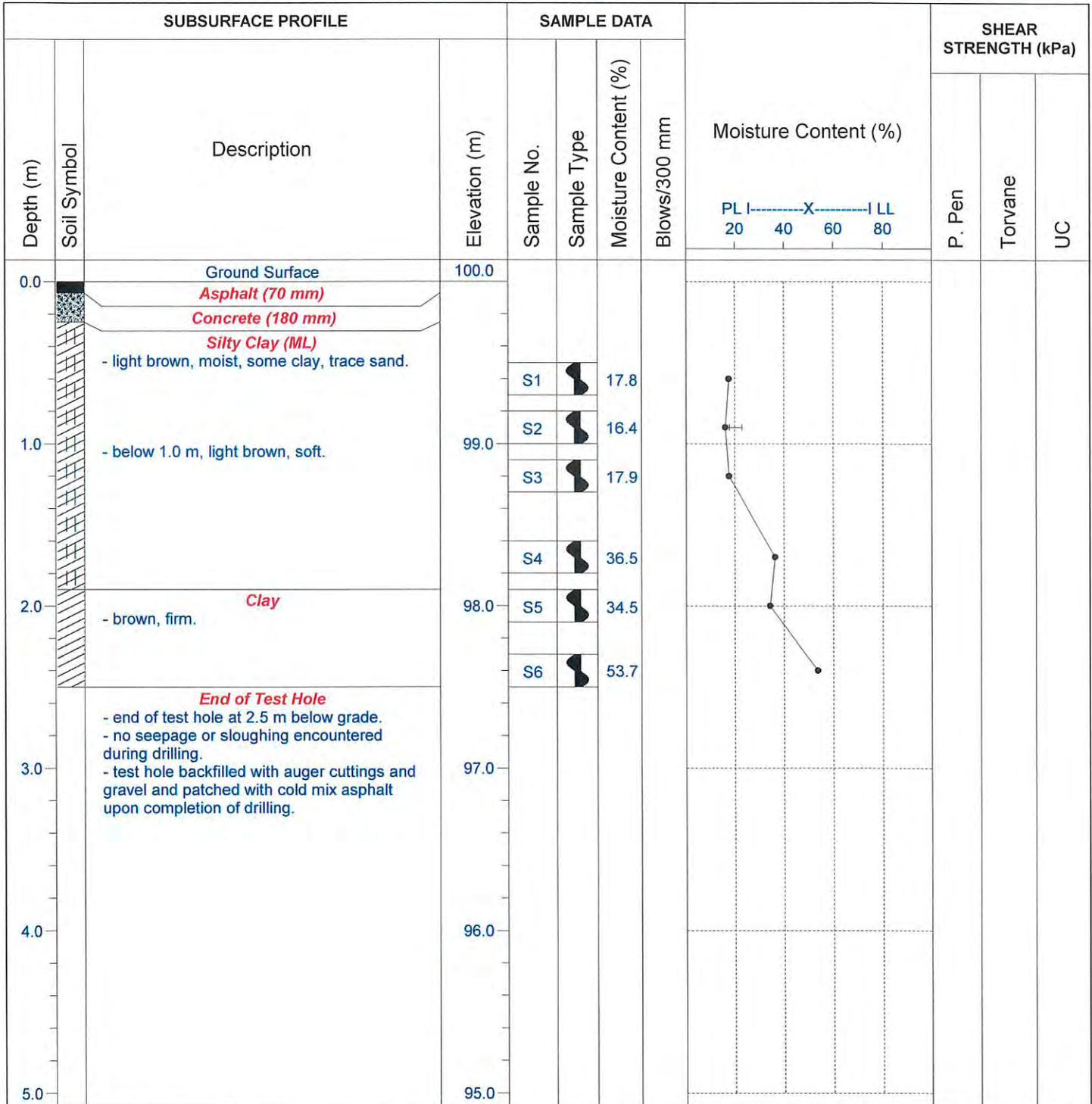
File No.: 23-035-04

Date Drilled: December 1, 2023

Grade Elevation: 100.0 m

Water Elevation: --

Engineering And Testing Solutions That Work For You



ENG-TECH Consulting Limited

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Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH04

Client: WSP Canada Inc.

Site: NB McGregor Street, Winnipeg, Manitoba

Location: See Figure 5

Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

File No.: 23-035-04

Date Drilled: November 30, 2023

Grade Elevation: 100.0 m

Water Elevation: --

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Solutions That Work For You**

SUBSURFACE PROFILE				SAMPLE DATA				SHEAR STRENGTH (kPa)				
Depth (m)	Soil Symbol	Description	Elevation (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%)				
								PL	X	LL	P. Pen	Torvane
0.0		Ground Surface	100.0									
		Asphalt (75 mm)										
		Concrete (170 mm)										
		Fat Clay (CH) - dark brown, moist, firm, high plastic, with silt, trace sand.		S1	Split Barrel	30.7						
1.0		Clay - brown, moist, soft, silty.	99.0	S2	Split Barrel	19.7						
				S3	Split Barrel	21.4						
		- below 1.6 m, brown, silty. - below 1.8 m, brown firm.		S4	Split Barrel	43.3						
2.0			98.0	S5	Split Barrel	48.7						
				S6	Split Barrel	51.0						
3.0		End of Test Hole - end of test hole at 2.5 m below grade. - no seepage or sloughing encountered during drilling. - test hole backfilled with auger cuttings and gravel and patched with cold mix asphalt upon completion of drilling.	97.0									
4.0			96.0									
5.0			95.0									

ENG-TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH05

File No.: 23-035-04

Client: WSP Canada Inc.

Date Drilled: December 1, 2023

Site: SB McGregor Street, Winnipeg, Manitoba

Grade Elevation: 100.0 m

Location: See Figure 5

Water Elevation: --

Engineering And Testing Solutions That Work For You

Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

SUBSURFACE PROFILE				SAMPLE DATA				SHEAR STRENGTH (kPa)				
Depth (m)	Soil Symbol	Description	Elevation (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%)				
								PL	X	LL	P. Pen	Torvane
0.0		Ground Surface	100.0									
		Asphalt (35 mm)										
		Concrete (160 mm)										
		Silty Clay (ML)										
		- light brown, moist, some clay, trace sand.		S1	[Symbol]	17.0						
		-light brown, soft		S2	[Symbol]	19.2						
1.0			99.0	S3	[Symbol]	23.1						
				S4	[Symbol]	35.9						
		Clay		S5	[Symbol]	42.2						
2.0		- below 1.9 m, brown, firm.	98.0	S6	[Symbol]	49.0						
		End of Test Hole										
		- end of test hole at 2.5 m below grade.										
		- no seepage or sloughing encountered during drilling.										
		- test hole backfilled with auger cuttings and gravel and patched with cold mix asphalt upon completion of drilling.										
3.0			97.0									
4.0			96.0									
5.0			95.0									

ENG-TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH06

Client: WSP Canada Inc.

Site: NB McGregor Street, Winnipeg, Manitoba

Location: See Figure 5

Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

File No.: 23-035-04

Date Drilled: November 30, 2023

Grade Elevation: 100.0 m

Water Elevation: --

Engineering And Testing Solutions That Work For You

SUBSURFACE PROFILE			SAMPLE DATA				SHEAR STRENGTH (kPa)				
Depth (m)	Soil Symbol	Description	Elevation (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%)			
								PL	X	LL	P. Pen
0.0		Ground Surface	100.0								
		Asphalt (65 mm)									
		Concrete (190 mm)									
		Fat Clay (CH) - dark brown, moist, firm, high plastic, with silt, trace sand.		S1	Split Barrel	29.6					
1.0			99.0	S2	Split Barrel	31.4					
				S3	Split Barrel	29.9					
		- below 1.6 m, brown, firm, some silt.		S4	Split Barrel	37.2					
2.0		Clay - brown, moist, stiff. - below 2.2 m, moist, firm.	98.0	S5	Split Barrel	41.4					
				S6	Split Barrel	44.4					
3.0		End of Test Hole - end of test hole at 2.5 m below grade. - no seepage or sloughing encountered during drilling. - test hole backfilled with auger cuttings and gravel and patched with cold mix asphalt upon completion of drilling.	97.0								
4.0			96.0								
5.0			95.0								

ENG-TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH07

Client: WSP Canada Inc.

Site: SB McGregor Street, Winnipeg, Manitoba

Location: See Figure 5

Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

File No.: 23-035-04

Date Drilled: December 1, 2023

Grade Elevation: 100.0 m

Water Elevation: --

Engineering And Testing
Solutions That Work For You

SUBSURFACE PROFILE				SAMPLE DATA				SHEAR STRENGTH (kPa)			
Depth (m)	Soil Symbol	Description	Elevation (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%)			
								P. Pen	Torvane	UC	
0.0		Ground Surface	100.0								
		Asphalt (70 mm)									
		Concrete (185 mm)									
		Silty Clay (ML) - brown, moist, soft, some clay, trace sand.		S1	Split Barrel	17.2					
		Lean Clay (CL) - medium / dark brown, moist, soft, low plastic, trace sand.	99.0	S2	Split Barrel	21.5					
		Silty Clay - brown, moist, stiff.		S3	Split Barrel	29.5					
		Clay - brown, moist, firm.	98.0	S4	Split Barrel	44.7					
				S5	Split Barrel	45.9					
				S6	Split Barrel	49.1					
3.0		End of Test Hole - end of test hole at 2.5 m below grade. - no seepage or sloughing encountered during drilling. - test hole backfilled with auger cuttings and gravel and patched with cold mix asphalt upon completion of drilling.	97.0								
4.0			96.0								
5.0			95.0								

ENG- TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH08

File No.: 23-035-04

Client: WSP Canada Inc.

Date Drilled: November 30, 2023

Site: NB McGregor Street, Winnipeg, Manitoba

Grade Elevation: 100.0 m

Location: See Figure 5

Water Elevation: --

Engineering And Testing Solutions That Work For You

Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

SUBSURFACE PROFILE			SAMPLE DATA					SHEAR STRENGTH (kPa)				
Depth (m)	Soil Symbol	Description	Elevation (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%)				
								PL	X	LL	P. Pen	Torvane
0.0		Ground Surface	100.0									
		Asphalt (90 mm)										
		Concrete (205 mm)										
		Clay										
		- dark brown, moist, firm, silty, trace sand.		S1	Split Barrel	28.6						
		- below 0.8 m, brown, stiff.		S2	Split Barrel	26.5						
1.0		- below 1.1 m, brown, soft.	99.0	S3	Split Barrel	22.0						
		- below 1.8 m, firm.		S4	Split Barrel	24.3						
2.0			98.0	S5	Split Barrel	24.9						
				S6	Split Barrel	35.1						
		End of Test Hole										
		- end of test hole at 2.5 m below grade.										
		- no seepage or sloughing encountered during drilling.										
3.0		- test hole backfilled with auger cuttings and gravel and patched with cold mix asphalt upon completion of drilling.	97.0									
4.0			96.0									
5.0			95.0									

ENG-TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: **ENG-TECH Consulting Ltd.**

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH09

File No.: 23-035-04

Client: WSP Canada Inc.

Date Drilled: November 30, 2023

Site: SB McGregor Street, Winnipeg, Manitoba

Grade Elevation: 100.0 m

Location: See Figure 6

Water Elevation: --

Engineering And Testing Solutions That Work For You

Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

SUBSURFACE PROFILE				SAMPLE DATA				SHEAR STRENGTH (kPa)			
Depth (m)	Soil Symbol	Description	Elevation (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%)			
								PL	X	LL	P. Pen
0.0		Ground Surface	100.0								
		Asphalt (90 mm)									
		Concrete (225 mm)									
		Clay									
		- black, moist, soft, some sand, some gravel.		S1	[Symbol]	31.6					
		Silty Clay (CL-ML)									
1.0		- light brown, moist, soft, trace sand.	99.0	S2	[Symbol]	21.7					
				S3	[Symbol]	20.5					
		Clay									
		- dark brown, moist, firm.		S4	[Symbol]	38.6					
2.0			98.0	S5	[Symbol]	45.2					
		- below 2.3 m, dark brown, stiff.		S6	[Symbol]	47.3					
		End of Test Hole									
3.0		- end of test hole at 2.5 m below grade.	97.0								
		- no seepage or sloughing encountered during drilling.									
		- test hole backfilled with auger cuttings and gravel and patched with cold mix asphalt upon completion of drilling									
4.0			96.0								
5.0			95.0								

ENG-TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH10
 Client: WSP Canada Inc.
 Site: WB Leila Ave, Winnipeg, Manitoba
 Location: See Figure 1
 Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

File No.: 23-035-04
 Date Drilled: December 1, 2023
 Grade Elevation: 100.0 m
 Water Elevation: --

Engineering And Testing
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SUBSURFACE PROFILE				SAMPLE DATA				SHEAR STRENGTH (kPa)				
Depth (m)	Soil Symbol	Description	Elevation (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%)				
								PL	X	LL	P. Pen	Torvane
0.0		Ground Surface	100.0									
		Asphalt (60 mm)										
		Concrete (180 mm)										
		Fat Clay (CH) - dark brown, moist, firm, high plastic, with silt, trace sand, trace gravel.		S1	SPLIT BARREL	31.7						
1.0			99.0	S2	SPLIT BARREL	36.6						
				S3	SPLIT BARREL	35.9						
		Clay - light brown, soft, silty, trace sand.		S4	SPLIT BARREL	23.7						
2.0			98.0	S5	SPLIT BARREL	22.0						
		- below 2.3 m, light brown, firm, silty.		S6	SPLIT BARREL	31.7						
3.0		End of Test Hole - end of test hole at 2.5 m below grade. - no seepage or sloughing encountered during drilling. - test hole backfilled with auger cuttings and gravel and patched with cold mix asphalt upon completion of drilling.	97.0									
4.0			96.0									
5.0			95.0									

ENG- TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON



Test Hole #: TH11

Client: WSP Canada Inc.

Site: WB Leila Ave, Winnipeg, Manitoba

Location: See Figure 1

Project: 2022 - 2025 CW Regional Street Renewal - Leila, Partridge, McGregor

File No.: 23-035-04

Date Drilled: December 1, 2023

Grade Elevation: 100.0 m

Water Elevation: --

Engineering And Testing
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SUBSURFACE PROFILE			SAMPLE DATA				SHEAR STRENGTH (kPa)					
Depth (m)	Soil Symbol	Description	Elevation (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%)				
								PL	X	LL	P. Pen	Torvane
0.0		Ground Surface	100.0									
		Asphalt (55 mm)										
		Concrete (180 mm)										
		Fat Clay (CH) - dark brown, moist, stiff, high plastic, some silt, trace sand.		S1	Split Barrel	35.5						
1.0			99.0	S2	Split Barrel	36.2						
				S3	Split Barrel	36.8						
		Clay - medium brown, firm.		S4	Split Barrel	43.3						
2.0			98.0	S5	Split Barrel	46.4						
				S6	Split Barrel	54.0						
3.0		End of Test Hole - end of test hole at 2.5 m below grade. - no seepage or sloughing encountered during drilling. - test hole backfilled with auger cuttings and gravel and patched with cold mix asphalt upon completion of drilling.	97.0									
4.0			96.0									
5.0			95.0									

ENG-TECH Consulting Limited

Logged by: DO

Reviewed by:

Drilled By: ENG-TECH Consulting Ltd.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 2.5 m

Completion Elevation: 97.5 m

Sheet: 1 of 1

SAMPLE TYPE



SPLIT BARREL



SHELBY TUBE



AUGER CUTTINGS



SPLIT SPOON

Photograph 1: Specimen from Leila Avenue, Westbound Curb Lane



Photograph 2: Specimen from Leila Avenue, Westbound Curb Lane



PC 02
Full Depth of Pavement
Ø = 150 mm



PC 02
Top of Asphalt Pavement
Ø = 150 mm



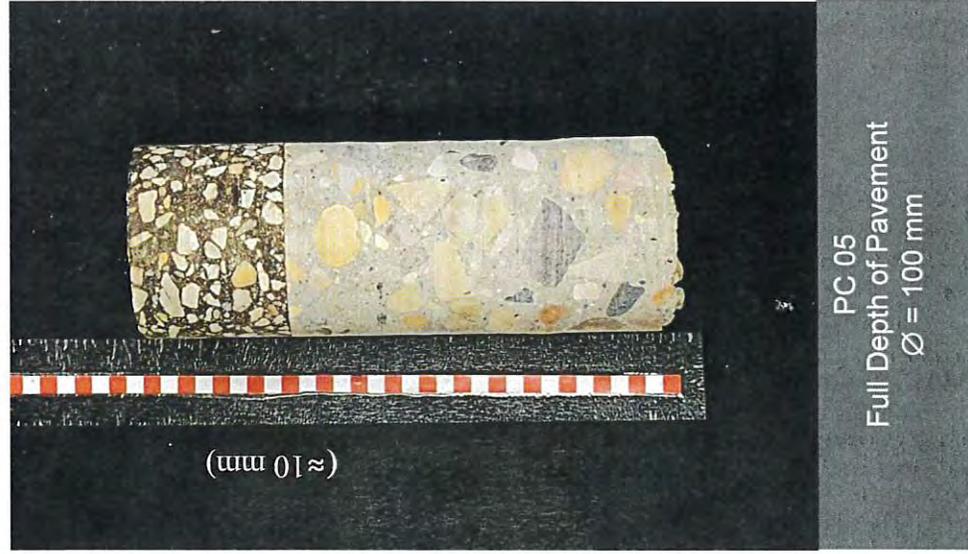
Photograph 3: Specimen from Leila Avenue, Westbound Curb Lane



Photograph 4: Specimen from Leila Avenue, Eastbound Curb Lane



Photograph 5: Specimen from Leila Avenue, Eastbound Curb Lane



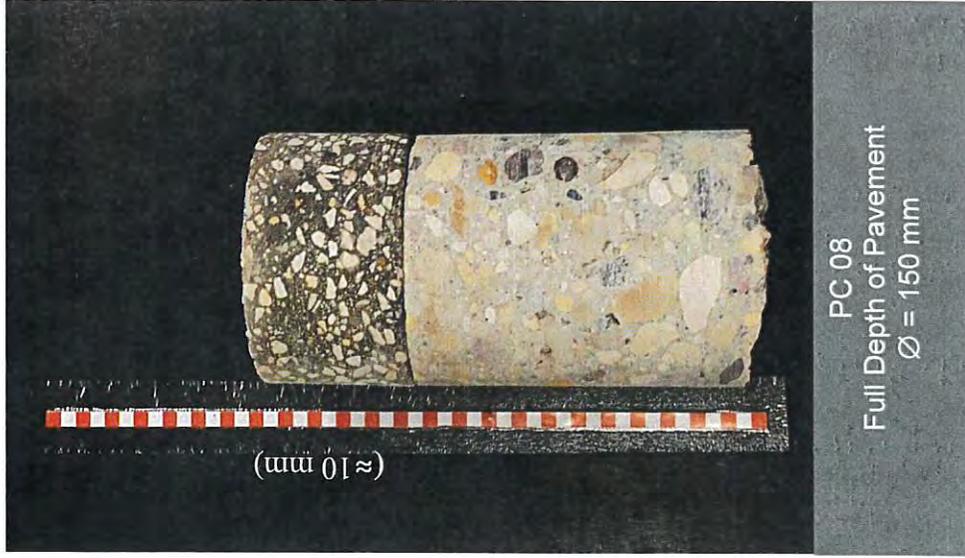
Photograph 6: Specimen from Leila Avenue, Eastbound Curb Lane



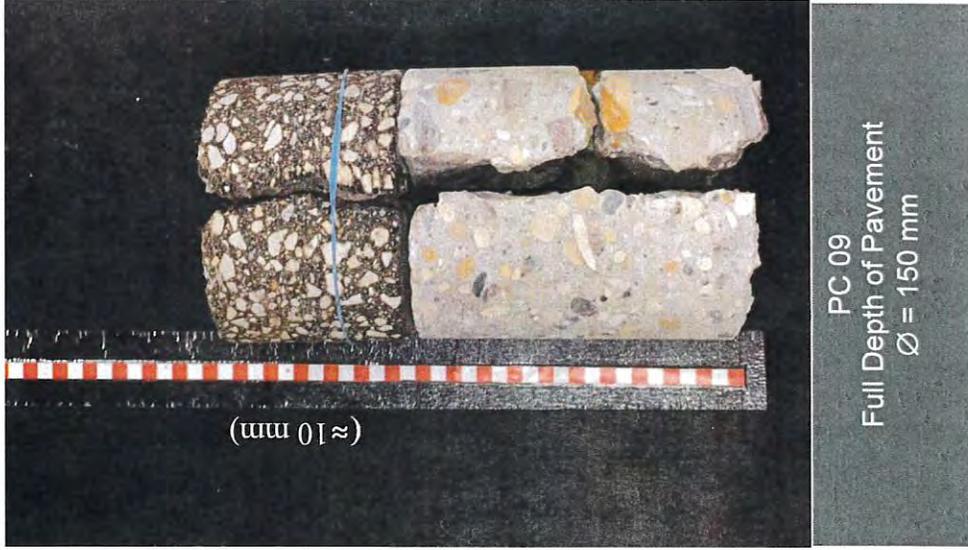
Photograph 7: Specimen from Leila Avenue, Eastbound Curb Lane



Photograph 8: Specimen from Leila Avenue, Eastbound Curb Lane



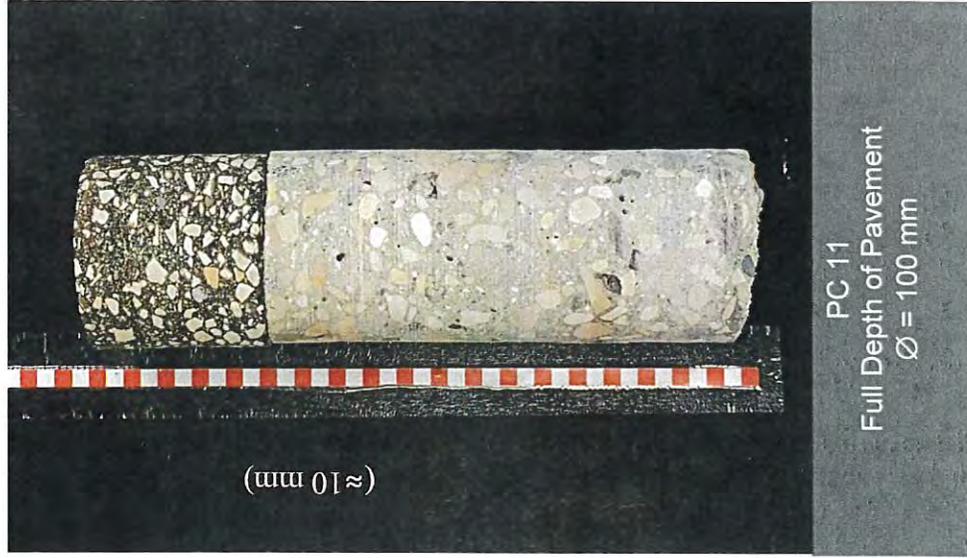
Photograph 9: Specimen from Leila Avenue, Eastbound Curb Lane



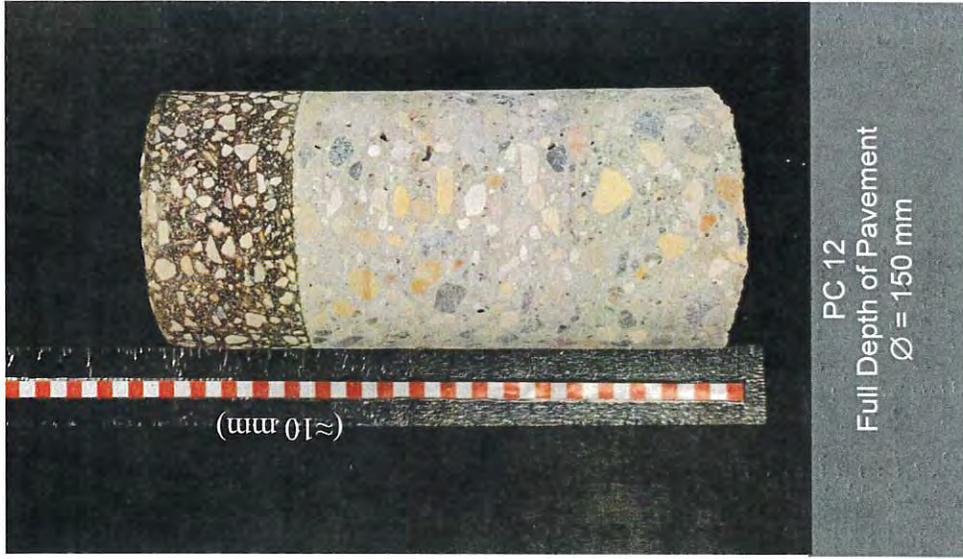
Photograph 10: Specimen from Leila Avenue, Eastbound Curb Lane



Photograph 11: Specimen from Leila Avenue, Eastbound Median Lane



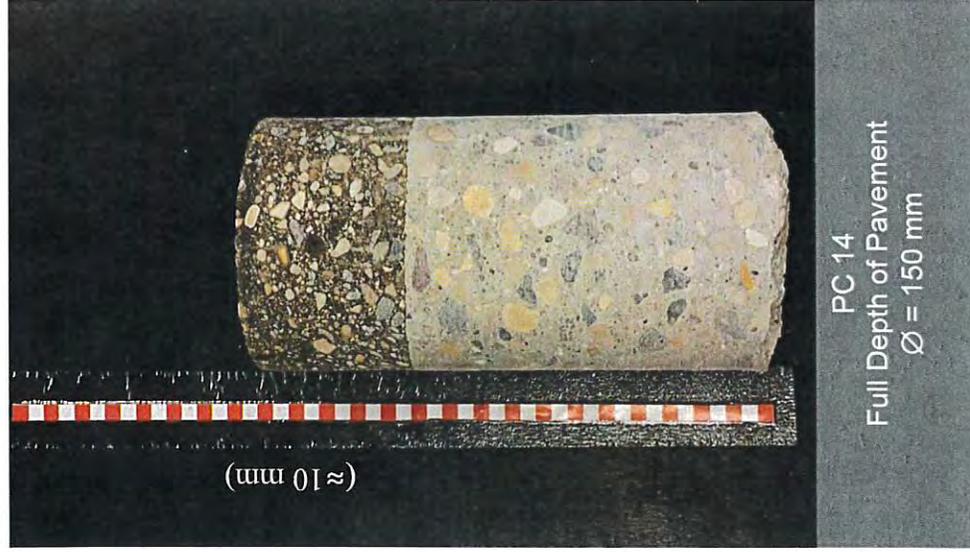
Photograph 12: Specimen from Leila Avenue, Eastbound Curb Lane



Photograph 13: Specimen from McGregor Street, Northbound Median Lane



Photograph 14: Specimen from McGregor Street, Southbound Median Lane



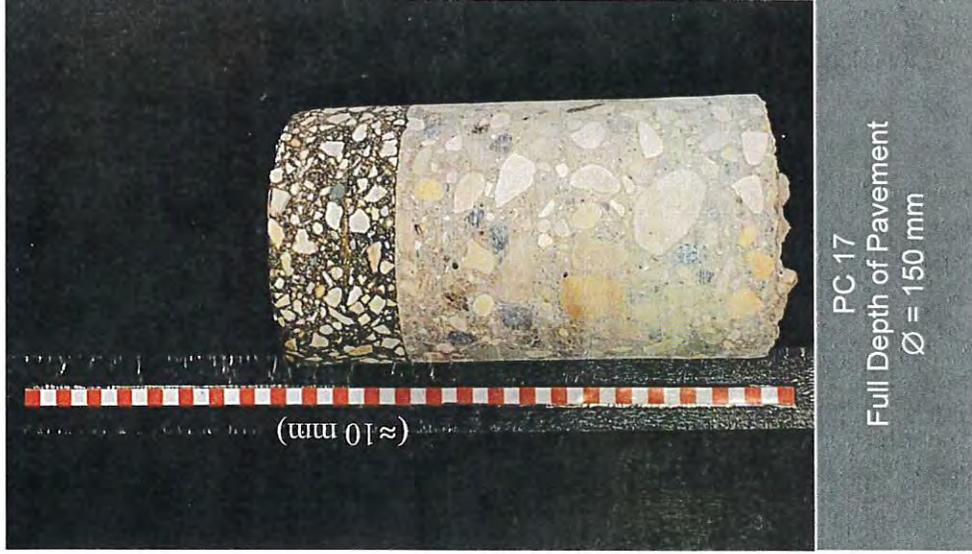
Photograph 15: Specimen from McGregor Street, Northbound Curb Lane



Photograph 16: Specimen from McGregor Street, Southbound Curb Lane



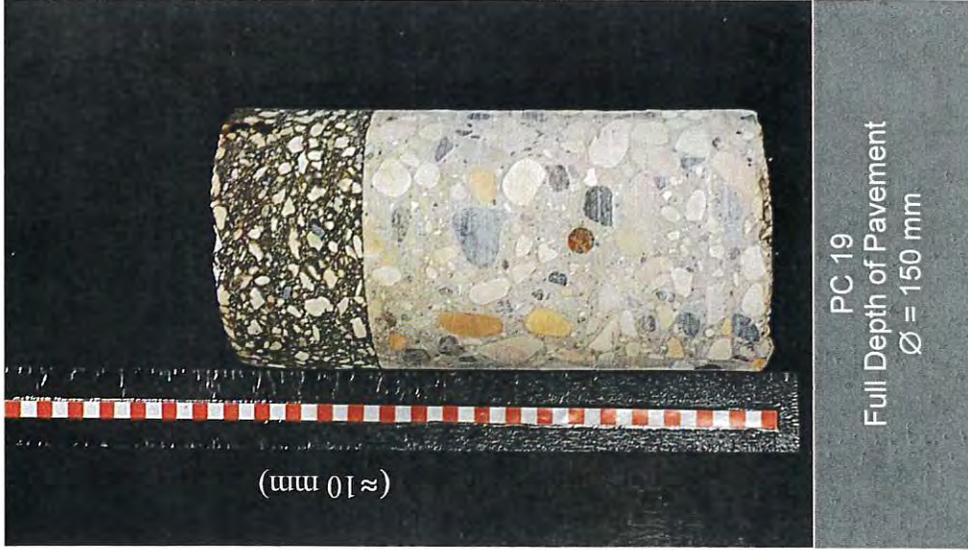
Photograph 17: Specimen from Partridge Avenue, South Curb Lane



Photograph 18: Specimen from Partridge Avenue, Eastbound Middle Lane



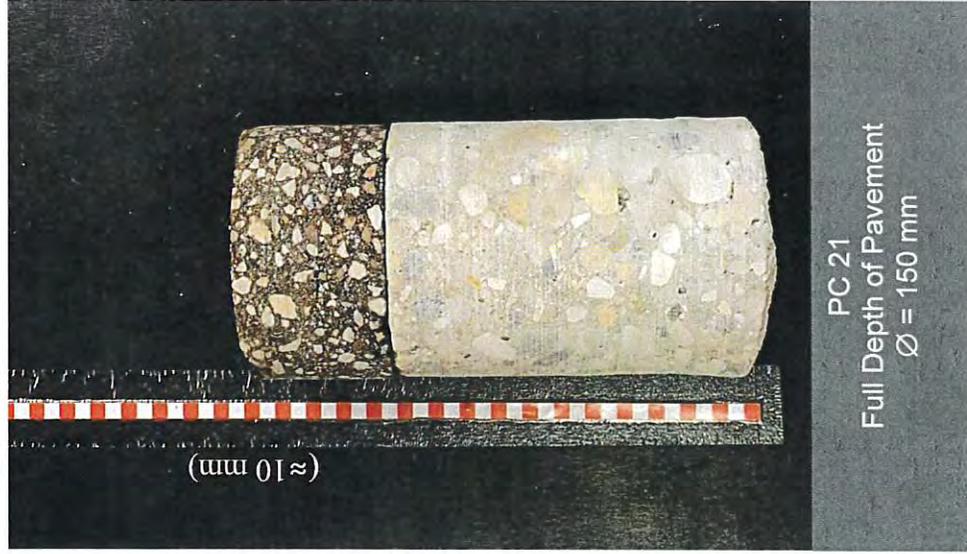
Photograph 19: Specimen from Partridge Avenue, Eastbound North Curb Lane



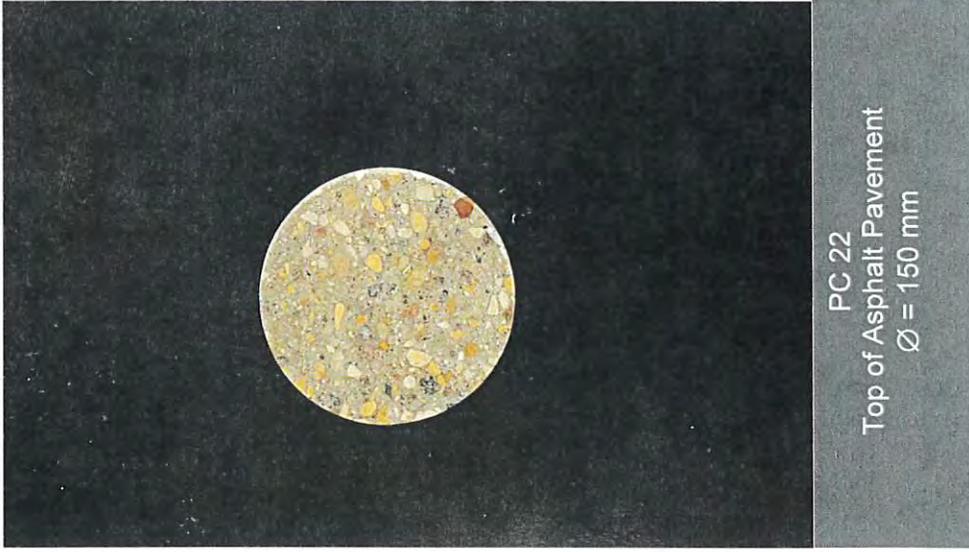
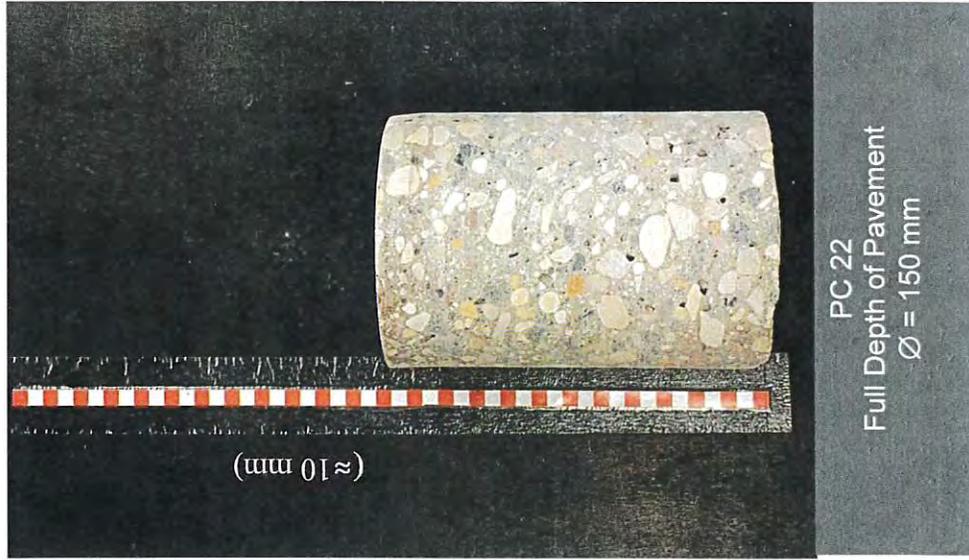
Photograph 20: Specimen from Partridge Avenue, Eastbound South Curb Lane



Photograph 21: Specimen from Partridge Avenue, Eastbound Middle Lane



Photograph 22: Specimen from Partridge Avenue, Eastbound North Curb Lane



Photograph 23: Specimen from Partridge Avenue, Eastbound Middle Lane



Photograph 24: Specimen from Partridge Avenue, Eastbound South Curb Lane



Photograph 25: Specimen from Partridge Avneue, Eastbound North Curb Lane



Photograph 26: Specimen from Partridge Avenue, Eastbound South Curb Lane



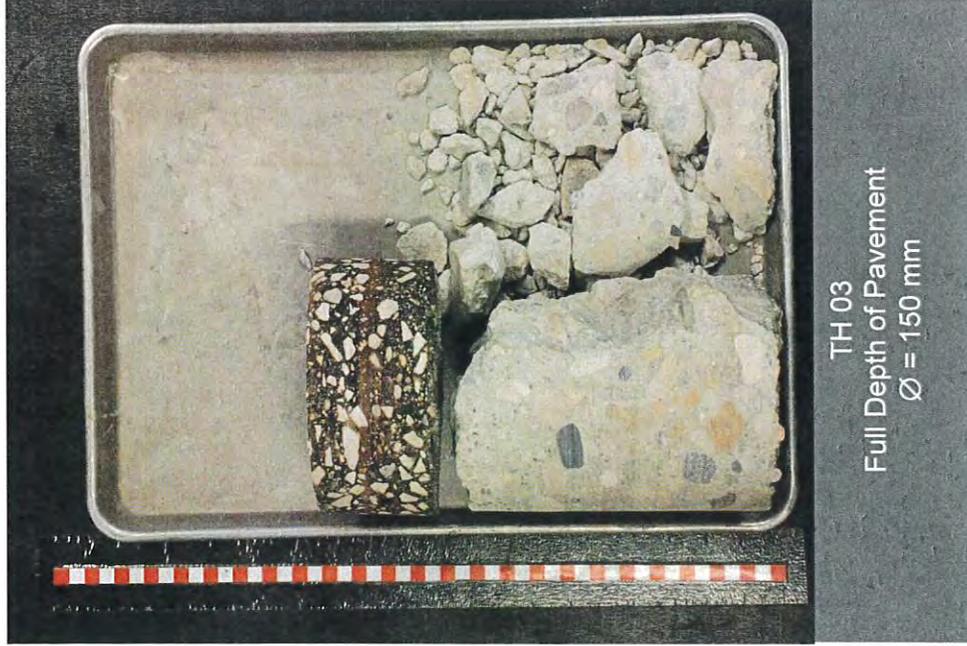
Photograph 27: Specimen from McGregor Street Southbound Lane



Photograph 28: Specimen from McGregor Street, Northbound Lane



Photograph 29: Specimen from McGregor Street, Southbound Lane



Photograph 30: Specimen from McGregor Street, Northbound Lane



Photograph 31: Specimen from McGregor Street, Southbound Lane



Photograph 32: Specimen from McGregor Street, Northbound Lane



Photograph 33: Specimen from McGregor Street, Southboud Lane



Photograph 34: Specimen from McGregor Street Northbound Lane



Photograph 35: Specimen from McGregor Street, Southboud Lane



Photograph 36: Specimen from Leila Avenue, Westbound Curb Lane



Photograph 37: Specimen from Leila Avenue, Westbound Curb Lane



Photograph 38: Specimen from Leila Avenue, Westbound Curb Lane





420 Turenne Street
Winnipeg, Manitoba
R2J 3W8
engtech@mymts.net
www.eng-tech.ca

**OBTAINING AND TESTING
DRILLED CORES**



"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
1600 Buffalo Place
Winnipeg, Manitoba
R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-1

Attention:

Project: 2022- 2025 CW REGIONAL STREET RENEWAL – LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Location: Leila Avenue
Date Cored: Nov & Dec 2023 Cored By: ENG-TECH (Kyle Zebiere) Page: 1 of 1
Date Received: Nov & Dec 2023 Received By: ENG-TECH (Kyle Zebiere) Structure: Road pavement
Age of Concrete: - Concrete Design Strength: - Direction of Load: Parallel
Core Conditioning: As per CSA A23.2-14C Clause 7.3.1 (moist) Test Method: CSA A23.2-14C, 9C
Strength Specification: Minimum 85% of design strength on an average of 3 cores - no single core less than 75% as per CSA A23.1 Clause 4.4.2.2.2

Core No.	Location on Structure	Length		Average Diameter (mm)	Date Tested (m/d/y)	Compressive Strength (MPa)	Type of Fracture	Tested By ENG-TECH
		Cored (mm)	Tested (mm)					
PC03	Westbound curb lane, Northing: 5534819 Easting: 633495 Centerline of lane	190	186	100	Jan 17/24	57.01*	1	Rey Batac
PC05	Eastbound curb lane, Northing: 5534557 Easting: 634013 Centerline of lane	200	131	100	Jan 17/24	40.01*	1	Rey Batac
PC07	Eastbound curb lane, Northing: 5534486 Easting: 634165 Centerline of lane	200	190	100	Jan 17/24	45.63*	1	Rey Batac
PC11	Eastbound middle lane, Northing: 5534469 Easting: 634213 Centerline of lane	248	175	100	Jan 17/24	66.3*	1	Rey Batac

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.
*Denotes corrected strength for Length/Diameter ratio less than 2.0 to 1.0. Type of fracture indicated when cylinder fails to meet 85% of design strength or if different than CSA A23.2-19-9C Table 3 Type 1.

Comments: All core ends were trimmed prior to compressive strength testing and were end prepared using a high strength capping compound.

Deviations from test procedure: None

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per 

Darci Babisky, C.E.T.
Operations Manager - Laboratory
Ph: (204) 233-1694 Fx: (204) 235-1579

Supplementary information may be provided upon request.
Restrictions and additional fees may apply.





420 Turenne Street
Winnipeg, Manitoba
R2J 3W8
engtech@mymts.net
www.eng-tech.ca

**OBTAINING AND TESTING
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"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
1600 Buffalo Place
Winnipeg, Manitoba
R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-2

Attention: Scott Suderman, C.E.T., P. Eng.

Project: 2022- 2025 CW REGIONAL STREET RENEWAL – LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Location: Partridge Avenue

Date Cored: Nov & Dec 2023 **Cored By:** ENG-TECH (Kyle Zebiere)

Page: 1 of 1

Date Received: Nov & Dec 2023 **Received By:** ENG-TECH (Kyle Zebiere)

Structure: Road pavement

Age of Concrete: - **Concrete Design Strength:** -

Direction of Load: Parallel

Core Conditioning: As per CSA A23.2-14C Clause 7.3.1 (moist)

Test Method: CSA A23.2-14C, 9C

Strength Specification: Minimum 85% of design strength on an average of 3 cores - no single core less than 75% as per CSA A23.1 Clause 4.4.2.2.2.2

Core No.	Location on Structure	Length		Average Diameter (mm)	Date Tested (m/d/y)	Compressive Strength (MPa)	Type of Fracture	Tested By
		Cored (mm)	Tested (mm)					
PC18	Eastbound middle lane, Northing: 5534201 Easting: 634541 Centerline of lane	194	192	100	Jan 17/24	51.19*	1	Rey Batac
PC23	Eastbound middle lane, Northing: 5533952 Easting: 635086 Centerline of lane	195	193	100	Jan 17/24	64.89*	1	Rey Batac

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.
*Denotes corrected strength for Length/Diameter ratio less than 2.0 to 1.0. Type of fracture indicated when cylinder fails to meet 85% of design strength or if different than CSA A23.2-19-9C Table 3 Type 1.

Comments: All core ends were trimmed prior to compressive strength testing and were end prepared using a high strength capping compound.

Deviations from test procedure: None

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per 

Darci Babisky, C.E.T.
Operations Manager - Laboratory
Ph: (204) 233-1694 Fx: (204) 235-1579

Supplementary information may be provided upon request.
Restrictions and additional fees may apply.





420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS



File No.: 23-035-04

Ref. No.: 23-35-4-3

"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street

Material Description: Silty clay

Test Hole No.: 3

Date Sampled: Dec 1/23

Date Received: Dec 7/23

Sample No.: 2

Sampled By: ENG-TECH

Date Tested: Dec 13/23

Depth: 0.9 m

(Denys Ostrovskiy)

Tested By: ENG-TECH (Jessica Bauer)

Test Method: ASTM D4318 - A (Multipoint)

Sampling Method: Auger

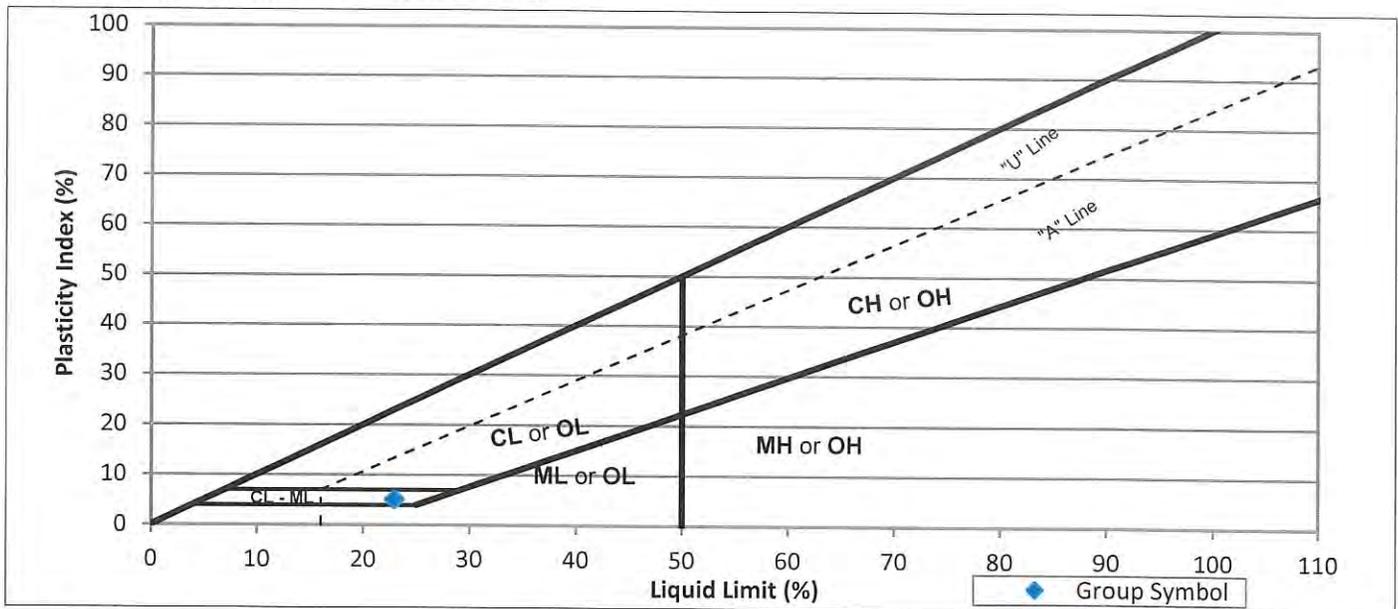
Specimen Preparation Procedure: 2 (Dry)

Drying Method: Air

Liquid Limit Device: Manual

Grooving Tool: Metal

Plastic Limit Rolling Procedure: 1 (Hand Rolled)



Liquid Limit (%): 23

Plastic Limit (%): 18

Plasticity Index (%): 5

Percentage of sand particles retained on 0.425mm sieve: 0.0

Classification: ASTM D2487; CL - ML, Silty clay
 ASTM D3282: A-4 (3)

As Received Moisture Content (%): 16.4

Comments:

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per

Darci Babisky, C.E.T.
 Operations Manager - Laboratory
 Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS



"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-4

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street

Material Description: Clay

Test Hole No.: 6

Date Sampled: Nov 30/23

Date Received: Dec 7/23

Sample No.: 3

Sampled By: ENG-TECH

Date Tested: Dec 13/23

Depth: 1.2 m

(Denys Ostrovskiy)

Tested By: ENG-TECH (Jessica Bauer)

Test Method: ASTM D4318 - A (Multipoint)

Sampling Method: Auger

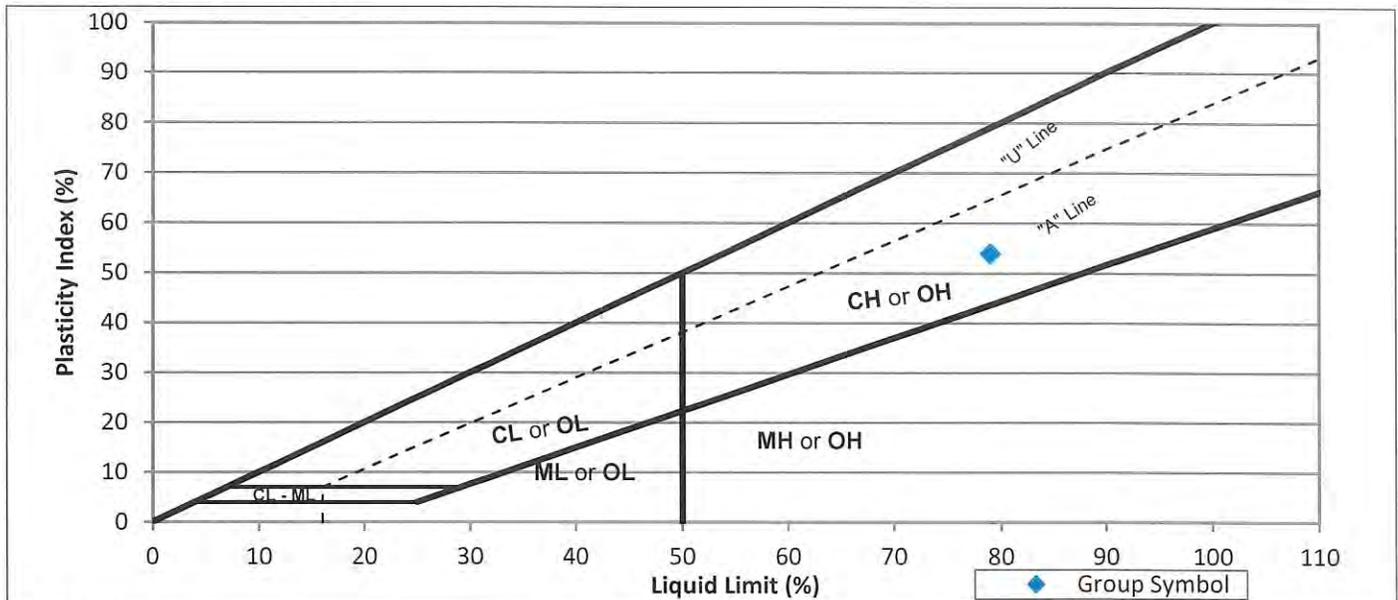
Specimen Preparation Procedure: 2 (Dry)

Drying Method: Air

Liquid Limit Device: Manual

Grooving Tool: Metal

Plastic Limit Rolling Procedure: 1 (Hand Rolled)



Liquid Limit (%): 79

Plastic Limit (%): 25

Plasticity Index (%): 54

Percentage of sand particles retained on 0.425mm sieve: 2.0

Classification: ASTM D2487, CH, Fat clay
 ASTM D3282: A-7-6 (61)

As Received Moisture Content (%): 29.9

Comments:

ENG-TECH Consulting Limited

Email: WSP Canada Inc. Contact Group

Per

Darci Babisky, C.E.T.
 Operations Manager - Laboratory
 Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

**LIQUID LIMIT, PLASTIC LIMIT, AND
 PLASTICITY INDEX OF SOILS**



"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-5

Attention: Mark Vogt, M. Sc., P. Eng.
Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street

Material Description: silty clay

Test Hole No.: 7

Date Sampled: Dec 1/23

Date Received: Dec 7/23

Sample No.: 2

Sampled By: ENG-TECH

Date Tested: Dec 13/23

Depth: 0.9 m

(Denys Ostrovskyi)

Tested By: ENG-TECH (Jessica Bauer)

Test Method: ASTM D4318 - A (Multipoint)

Sampling Method: Auger

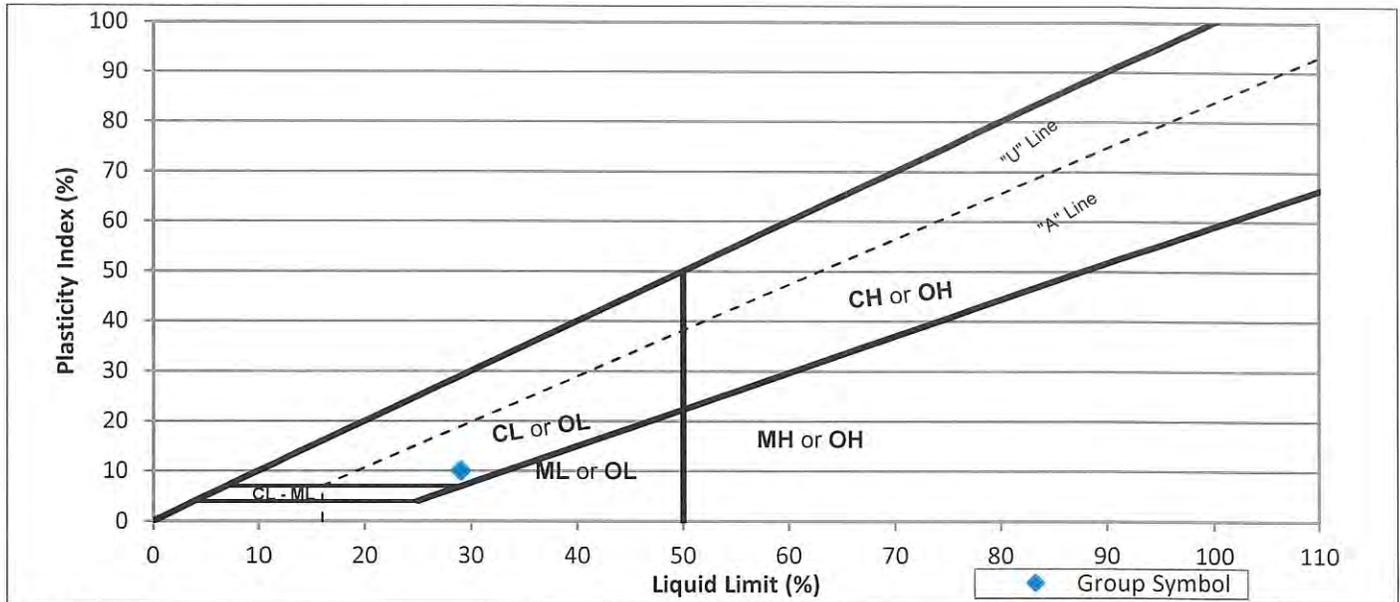
Specimen Preparation Procedure: 2 (Dry)

Drying Method: Air

Liquid Limit Device: Manual

Grooving Tool: Metal

Plastic Limit Rolling Procedure: 1 (Hand Rolled)



Liquid Limit (%): 29 Plastic Limit (%): 19 Plasticity Index (%): 10

Percentage of sand particles retained on 0.425mm sieve: 1.0

Classification: ASTM D2487, CL, Lean clay
 ASTM D3282: A-4 (8)

As Received Moisture Content (%): 21.5

Comments:

ENG-TECH Consulting Limited

Email: WSP Canada Inc. Contact Group

Per

Darci Babisky, C.E.T.
 Operations Manager - Laboratory
 Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
Winnipeg, Manitoba
R2J 3W8
engtech@mymts.net
www.eng-tech.ca

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS



"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
1600 Buffalo Place
Winnipeg, Manitoba
R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-6

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street

Material Description: Silty clay

Test Hole No.: 9

Date Sampled: Nov 30/23

Date Received: Dec 7/23

Sample No.: 3

Sampled By: ENG-TECH

Date Tested: Dec 13/23

Depth: 1.2 m

(Denys Ostrovskiy)

Tested By: ENG-TECH (Jessica Bauer)

Test Method: ASTM D4318 - A (Multipoint)

Sampling Method: Auger

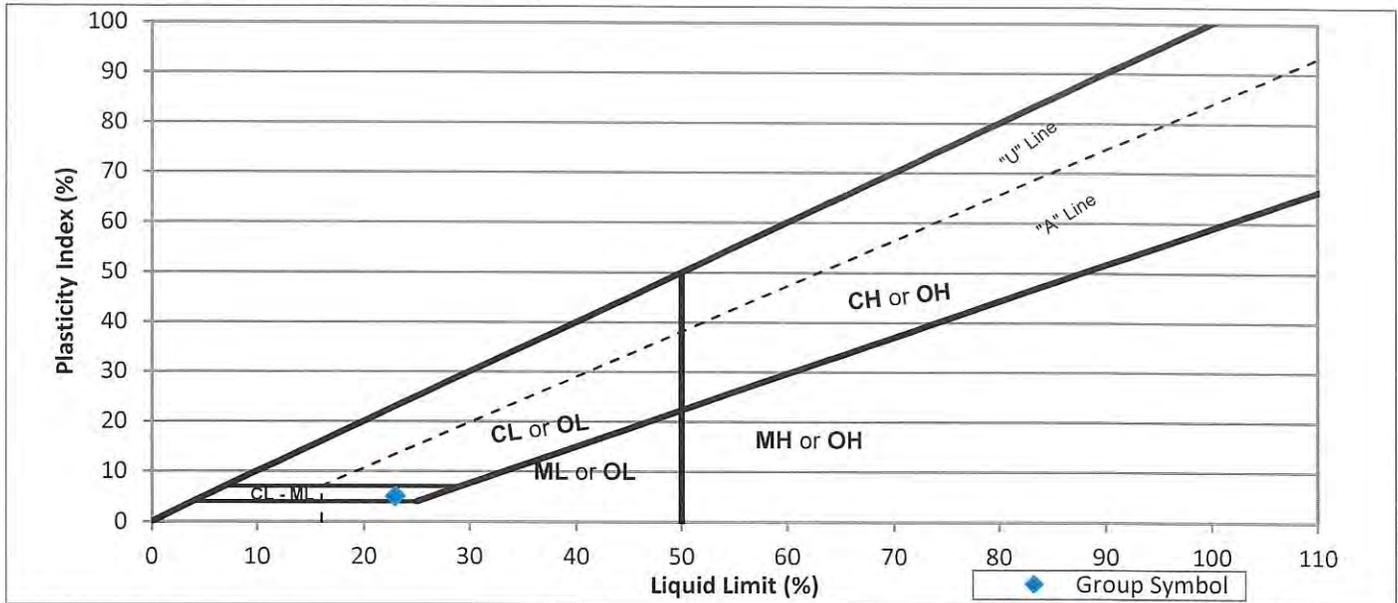
Specimen Preparation Procedure: 2 (Dry)

Drying Method: Air

Liquid Limit Device: Manual

Grooving Tool: Metal

Plastic Limit Rolling Procedure: 1 (Hand Rolled)



Liquid Limit (%): 23

Plastic Limit (%): 18

Plasticity Index (%): 5

Percentage of sand particles retained on 0.425mm sieve: 0.0

Classification: ASTM D2487, CL-ML, Silty clay
ASTM D3282: A-4 (3)

As Received Moisture Content (%): 20.5

Comments:

ENG-TECH Consulting Limited

Email: WSP Canada Inc. Contact Group

Per

Darci Babisky, C.E.T.
Operations Manager - Laboratory
Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
Winnipeg, Manitoba
R2J 3W8
engtech@mymts.net
www.eng-tech.ca

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS



"Engineering and Testing Solutions That Work for You"

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1600 Buffalo Place
Winnipeg, Manitoba
R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-7

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: Leila Avenue

Material Description: Clay

Test Hole No.: 10

Date Sampled: Dec 1/23

Date Received: Dec 7/23

Sample No.: 3

Sampled By: ENG-TECH

Date Tested: Dec 13/23

Depth: 1.2 m

(Denys Ostrovskyi)

Tested By: ENG-TECH (Jessica Bauer)

Test Method: ASTM D4318 - A (Multipoint)

Sampling Method: Auger

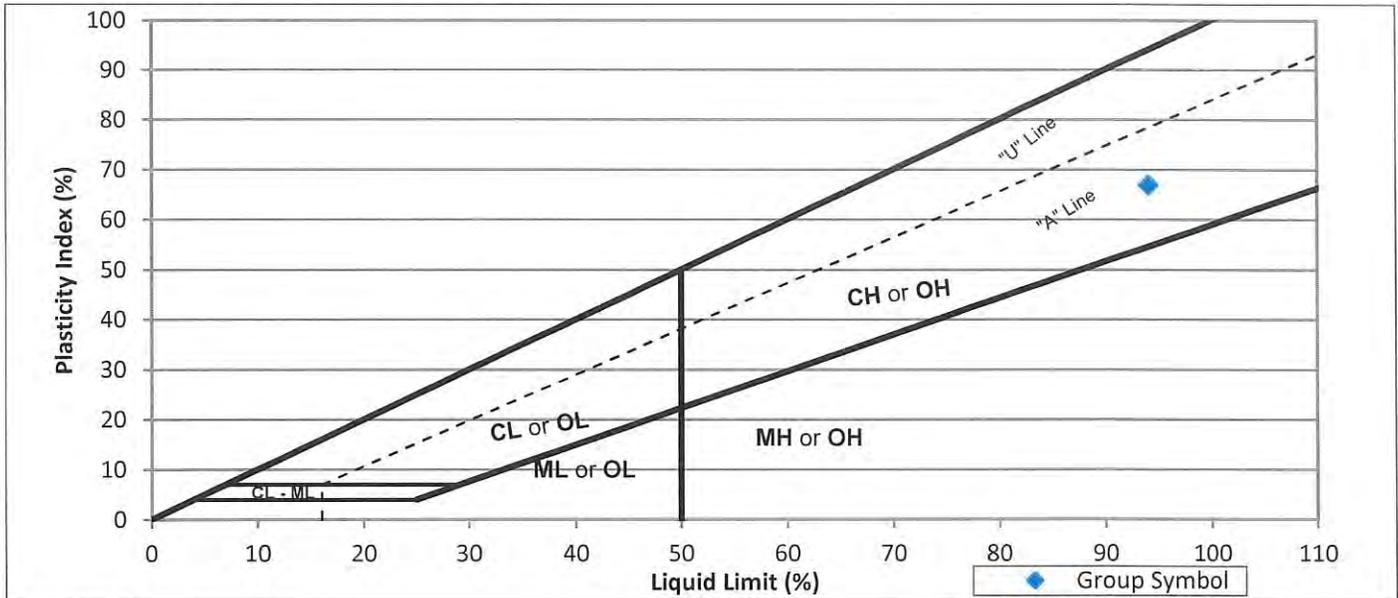
Specimen Preparation Procedure: 2 (Dry)

Drying Method: Air

Liquid Limit Device: Manual

Grooving Tool: Metal

Plastic Limit Rolling Procedure: 1 (Hand Rolled)



Liquid Limit (%): 94

Plastic Limit (%): 27

Plasticity Index (%): 67

Percentage of sand particles retained on 0.425mm sieve: 5.1

Classification: ASTM D2487, CH, Fat clay
ASTM D3282: A-7-6 (72)

As Received Moisture Content (%): 35.9

Comments:

ENG-TECH Consulting Limited

Email: WSP Canada Inc. Contact Group

Per

Darci Babisky, C.E.T.
Operations Manager - Laboratory
Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
Winnipeg, Manitoba
R2J 3W8
engtech@mymts.net
www.eng-tech.ca

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS



File No.: 23-035-04

Ref. No.: 23-35-4-8

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1600 Buffalo Place
Winnipeg, Manitoba
R3T 6B8

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: Leila Avenue

Material Description: Clay

Test Hole No.: 11

Date Sampled: Dec 1/23

Date Received: Dec 7/23

Sample No.: 2

Sampled By: ENG-TECH

Date Tested: Dec 13/23

Depth: 0.9 m

(Denys Ostrovskiy)

Tested By: ENG-TECH (Jessica Bauer)

Test Method: ASTM D4318 - A (Multipoint)

Sampling Method: Auger

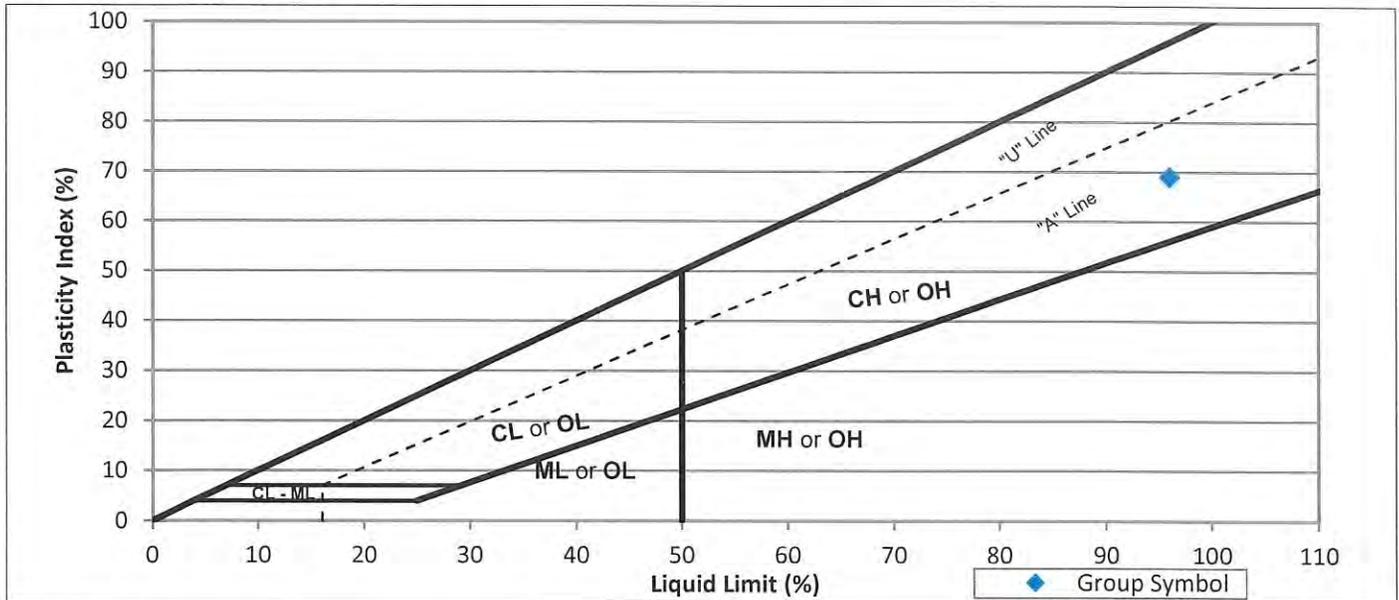
Specimen Preparation Procedure: 2 (Dry)

Drying Method: Air

Liquid Limit Device: Manual

Grooving Tool: Metal

Plastic Limit Rolling Procedure: 1 (Hand Rolled)



Liquid Limit (%): 96

Plastic Limit (%): 27

Plasticity Index (%): 69

Percentage of sand particles retained on 0.425mm sieve: 1.0

Classification: ASTM D2487, CH, Fat clay
ASTM D3282: A-7-6 (80)

As Received Moisture Content (%): 36.2

Comments:

ENG-TECH Consulting Limited

Email: WSP Canada Inc. Contact Group

Per

Darci Babisky, C.E.T.
Operations Manager - Laboratory
Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

PARTICLE SIZE ANALYSIS

"Engineering and Testing Solutions That Work for You"

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 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-9

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street

Material Description: Silty clay

Test Hole No.: 3

Date Sampled: Dec 1/23

Sampled By: ENG-TECH (Denys Ostrovskiy)

Sample No.: 2

Date Received: Dec 7/23

Sample Type: Auger cutting

Depth: 0.9 m

Date Tested: Dec 13/23

Tested By: ENG-TECH (Tim Christensen)

Test Method: ASTM D7928

Drying Method: Air

Specific Gravity: Estimated 2.7

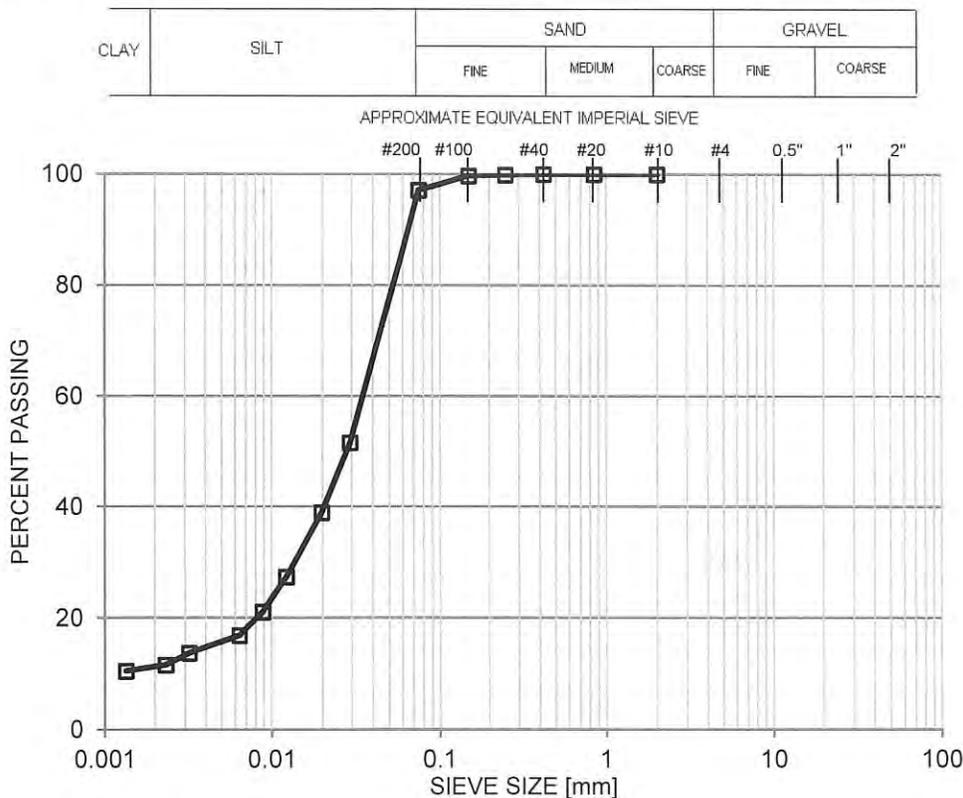
Method Used: -

Dispersion Process: Stirrer / Tipping

Separating Sieve Size (mm): 2.0

Dispersion Device: Apparatus A: Humboldt Mechanical Analysis Stirrer

Dispersion Time (min.): 1



Percent of: GRAVEL (0.0 %), SAND (2.9 %), SILT (85.8 %), CLAY (11.3 %)

Classification: ASTM D2487, CL - ML, Silty clay

ASTM D3282: A-4 (3)

As Received Moisture Content (%): 16.4

Comments:

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per

Darci Babisky, C.E.T.
 Operations Manager - Laboratory
 Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

PARTICLE SIZE ANALYSIS

"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-10

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE,
 MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street

Material Description: Clay

Test Hole No.: 6

Date Sampled: Nov 30/23

Sampled By: ENG-TECH (Denys Ostrovskiy)

Sample No.: 3

Date Received: Dec 7/23

Sample Type: Auger cutting

Depth: 1.2 m

Date Tested: Dec 13/23

Tested By: ENG-TECH (Tim Christensen)

Test Method: ASTM D7928

Drying Method: Air

Specific Gravity: Estimated 2.7

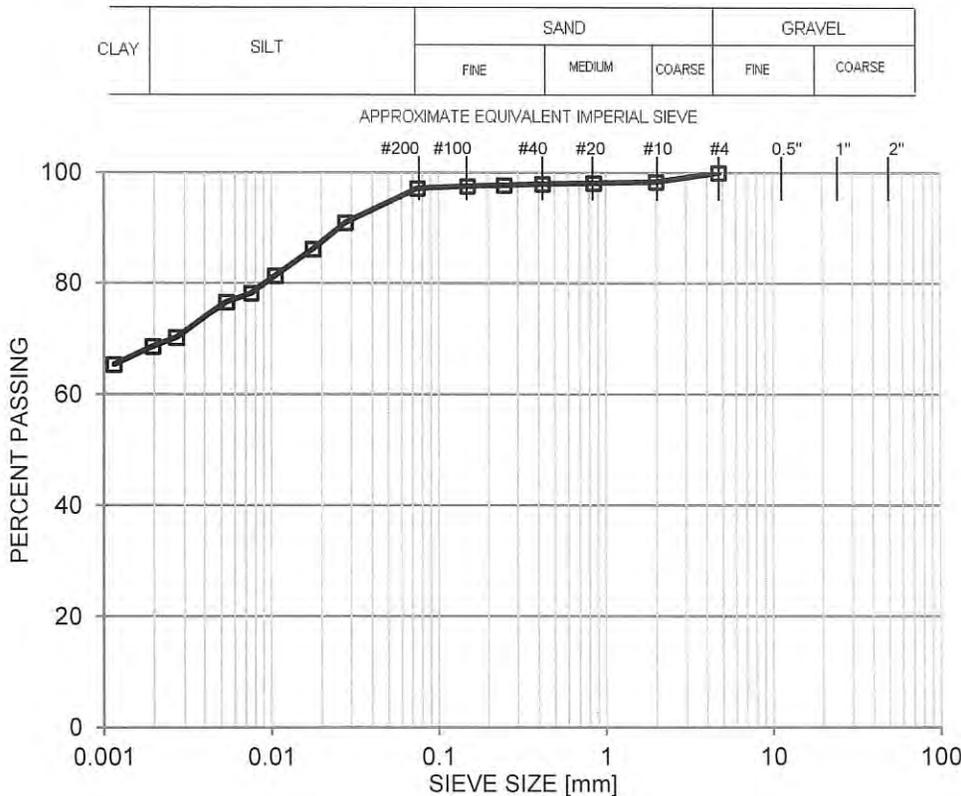
Method Used: -

Dispersion Process: Stirrer / Tipping

Separating Sieve Size (mm): 2.0

Dispersion Device: Apparatus A: Humboldt Mechanical Analysis Stirrer

Dispersion Time (min.): 1



Percent of: GRAVEL (0.0 %), SAND (2.9 %), SILT (28.4 %), CLAY (68.7 %)

Classification: ASTM D2487, CH, Fat clay

ASTM D3282: A-7-6 (61)

As Received Moisture Content (%): 29.9

Comments:

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per

Darci Babisky, C.E.T.

Operations Manager - Laboratory

Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

PARTICLE SIZE ANALYSIS

"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04
 Ref. No.: 23-35-4-11

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street

Material Description: Silty clay

Test Hole No.: 7

Date Sampled: Dec 1/23

Sampled By: ENG-TECH (Denys Ostrovskiy)

Sample No.: 2

Date Received: Dec 7/23

Sample Type: Auger cutting

Depth: 0.9 m

Date Tested: Dec 13/23

Tested By: ENG-TECH (Tim Christensen)

Test Method: ASTM D7928

Drying Method: Air

Specific Gravity: Estimated 2.7

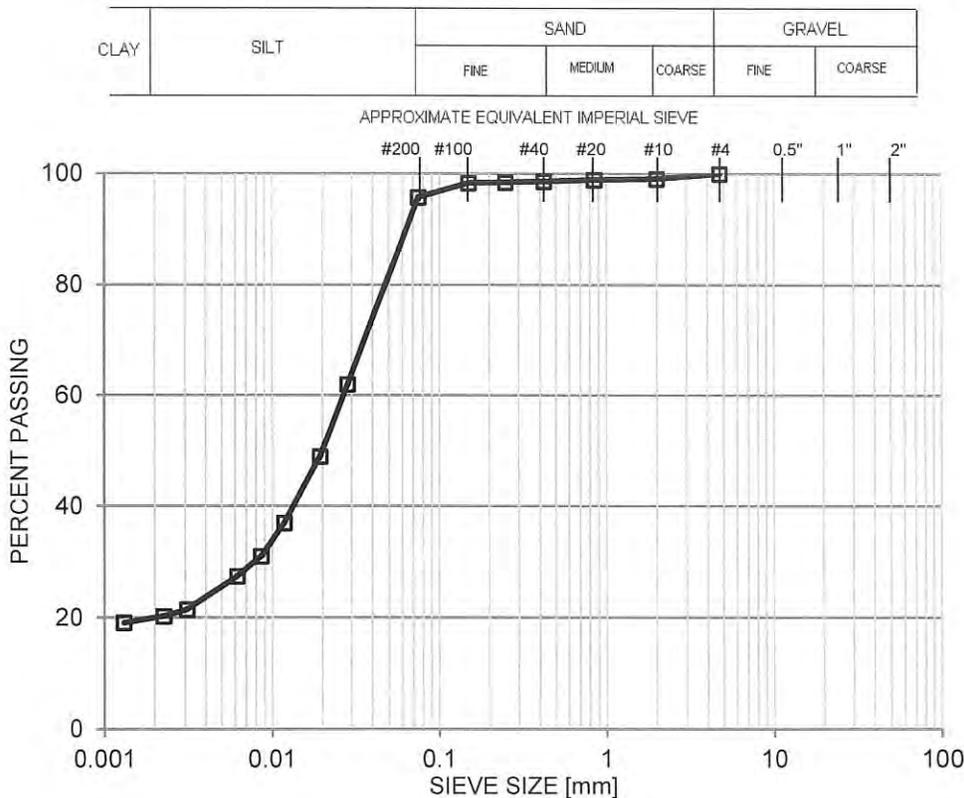
Method Used: -

Dispersion Process: Stirrer / Tipping

Separating Sieve Size (mm): 2.0

Dispersion Device: Apparatus A: Humboldt Mechanical Analysis Stirrer

Dispersion Time (min.): 1



Percent of: GRAVEL (0.0 %), SAND (4.3 %), SILT (75.7 %), CLAY (20.0 %)

Classification: ASTM D2487, CL, Lean clay
 ASTM D3282: A-4 (8)

As Received Moisture Content (%): 21.5

Comments:

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per

Darci Babisky, C.E.T.
 Operations Manager - Laboratory
 Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

PARTICLE SIZE ANALYSIS

"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04
 Ref. No.: 23-35-4-12

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE,
 MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street

Material Description: Silty clay

Test Hole No.: 9

Date Sampled: Nov 30/23

Sampled By: ENG-TECH (Denys Ostrovskiy)

Sample No.: 3

Date Received: Dec 7/23

Sample Type: Auger cutting

Depth: 1.2 m

Date Tested: Dec 14/23

Tested By: ENG-TECH (Tim Christensen)

Test Method: ASTM D7928

Drying Method: Air

Specific Gravity: Estimated 2.7

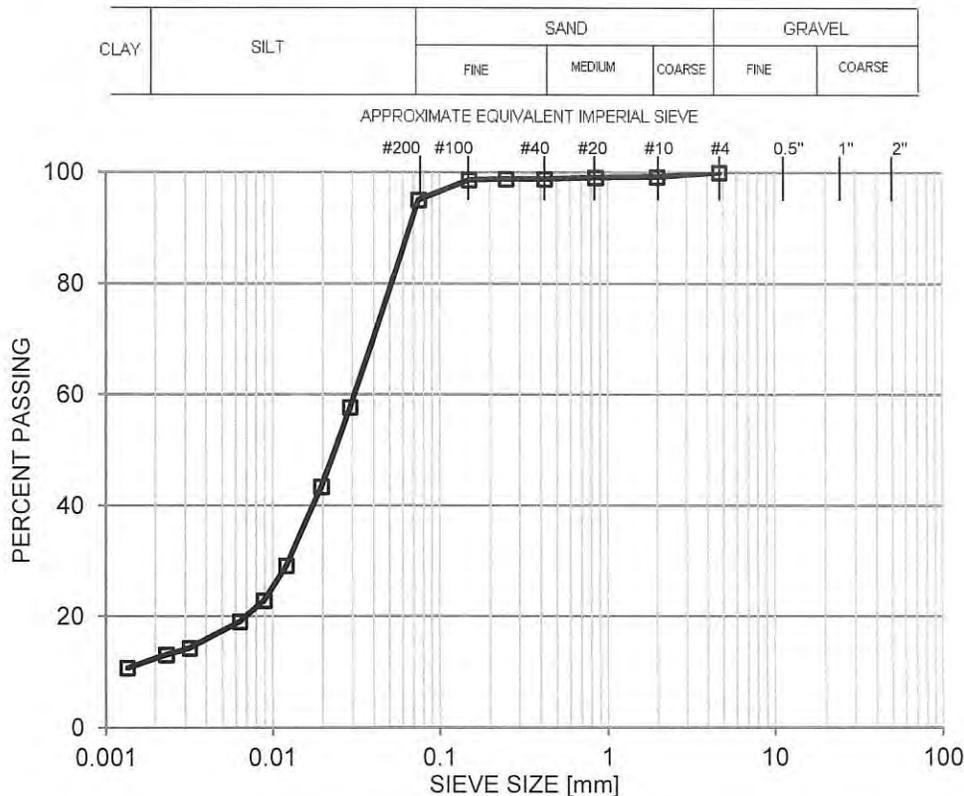
Method Used: -

Dispersion Process: Stirrer / Tipping

Separating Sieve Size (mm): 2.0

Dispersion Device: Apparatus A: Humboldt Mechanical Analysis Stirrer

Dispersion Time (min.): 1



Percent of: GRAVEL (0.0 %), SAND (5.0 %), SILT (82.6 %), CLAY (12.4 %)

Classification: ASTM D2487, CL-ML, Silty clay
 ASTM D3282: A-4 (3)

As Received Moisture Content (%): 20.5

Comments:

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per 
 Darci Babisky, C.E.T.
 Operations Manager - Laboratory
 Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

PARTICLE SIZE ANALYSIS

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 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-13

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: Leila Avenue

Material Description: Clay

Test Hole No.: 10

Date Sampled: Dec 1/23

Sampled By: ENG-TECH (Denys Ostrovskiy)

Sample No.: 3

Date Received: Dec 7/23

Sample Type: Auger cutting

Depth: 1.2 m

Date Tested: Dec 14/23

Tested By: ENG-TECH (Tim Christensen)

Test Method: ASTM D7928

Drying Method: Air

Specific Gravity: Estimated 2.7

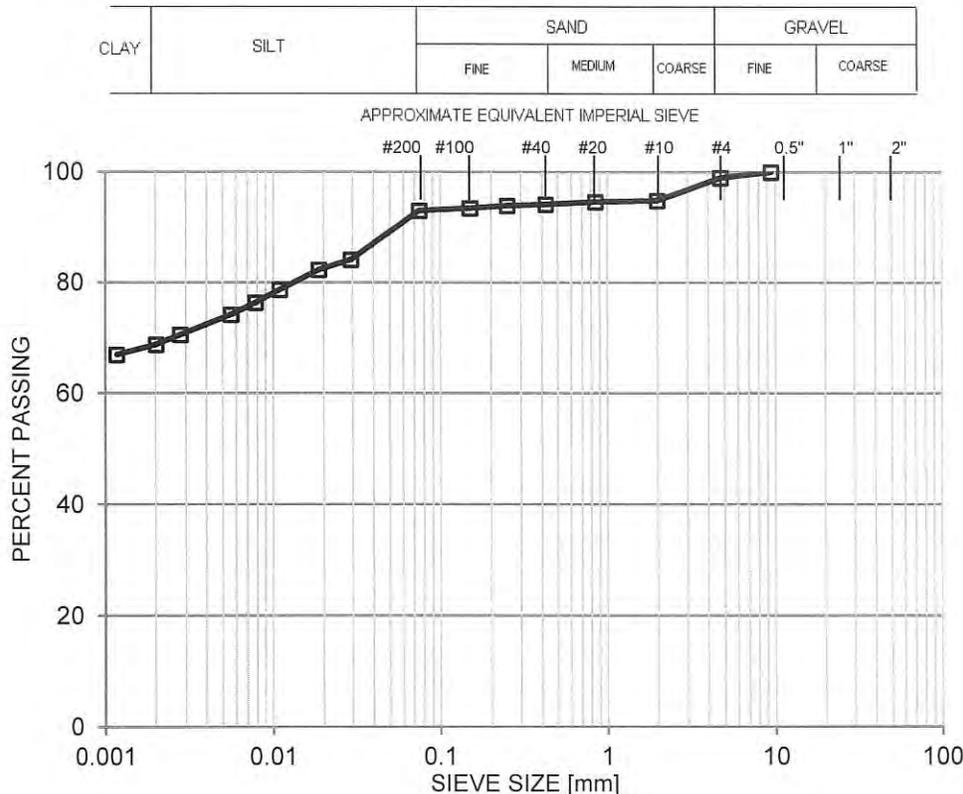
Method Used: -

Dispersion Process: Stirrer / Tipping

Separating Sieve Size (mm): 2.0

Dispersion Device: Apparatus A: Humboldt Mechanical Analysis Stirrer

Dispersion Time (min.): 1



Percent of: GRAVEL (1.0 %), SAND (6.0 %), SILT (24.3 %), CLAY (68.7 %)

Classification: ASTM D2487, CH, Fat clay

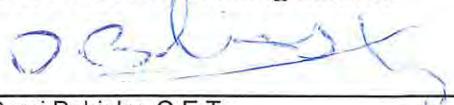
ASTM D3282: A-7-6 (72)

As Received Moisture Content (%): 35.9

Comments:

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per 

Darci Babisky, C.E.T.

Operations Manager - Laboratory

Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

PARTICLE SIZE ANALYSIS

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 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04
 Ref. No.: 23-35-4-14

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE,
 MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: Leila Avenue

Material Description: Clay

Test Hole No.: 11

Date Sampled: Dec 1/23

Sampled By: ENG-TECH (Denys Ostrovskiy)

Sample No.: 2

Date Received: Dec 7/23

Sample Type: Auger cutting

Depth: 0.9 m

Date Tested: Dec 14/23

Tested By: ENG-TECH (Tim Christensen)

Test Method: ASTM D7928

Drying Method: Air

Specific Gravity: Estimated 2.7

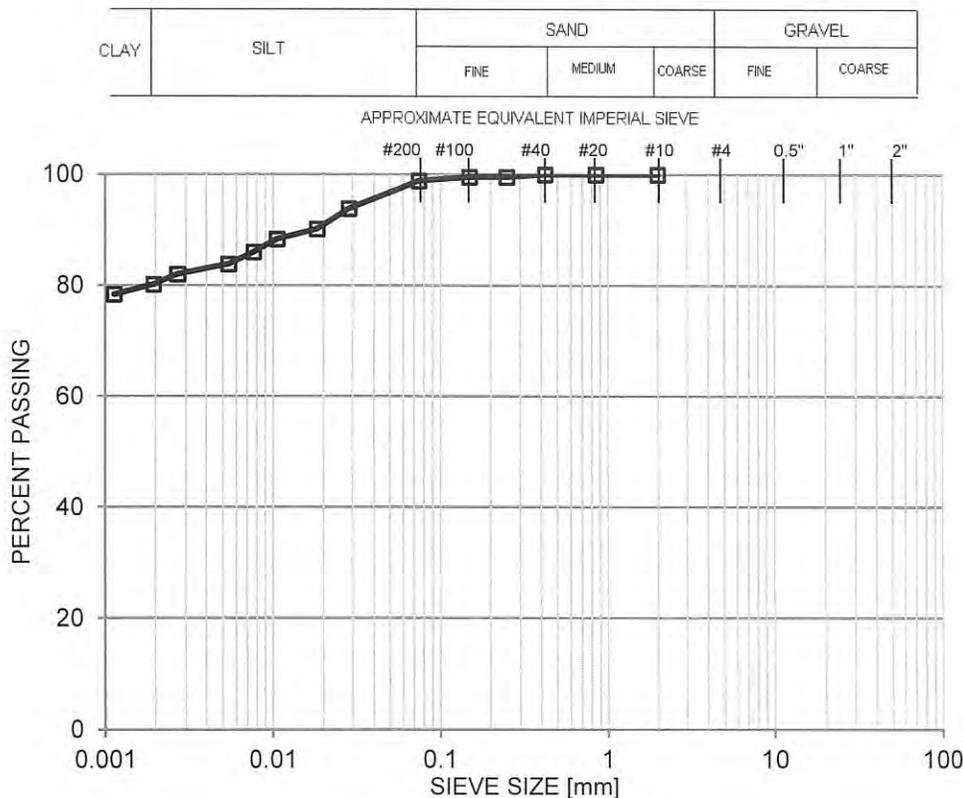
Method Used: -

Dispersion Process: Stirrer / Tipping

Separating Sieve Size (mm): 2.0

Dispersion Device: Apparatus A: Humboldt Mechanical Analysis Stirrer

Dispersion Time (min.): 1



Percent of: GRAVEL (0.0 %), SAND (1.1 %), SILT (18.6 %), CLAY (80.3 %)

Classification: ASTM D2487, CH, Fat clay
 ASTM D3282: A-7-6 (80)

As Received Moisture Content (%): 36.2

Comments:

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per

Darci Babisky, C.E.T.
 Operations Manager - Laboratory
 Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

**MOISTURE-DENSITY
 RELATIONSHIP**



"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04
Ref. No.: 23-35-4-15

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street, between Seven Oaks Avenue and Forest Avenue; Composite sample from TH1, S4, 1.6 m; TH2, S3, 1.2 m; TH3, S4, 1.6 m; TH4, S4, 1.6 m;

Material Type: Sub-grade

Date Sampled: Dec 1/23

Date Received: Dec 7/23

Sampled By: ENG-TECH (Denys Ostrovskiy)

Description: Clay

Date Tested: Dec 16/24

Compaction Standard Method: ASTM D698 ASTM D1557

Tested By: ENG-TECH (Kristian Pajda)

Correction Standard Method: ASTM D4718

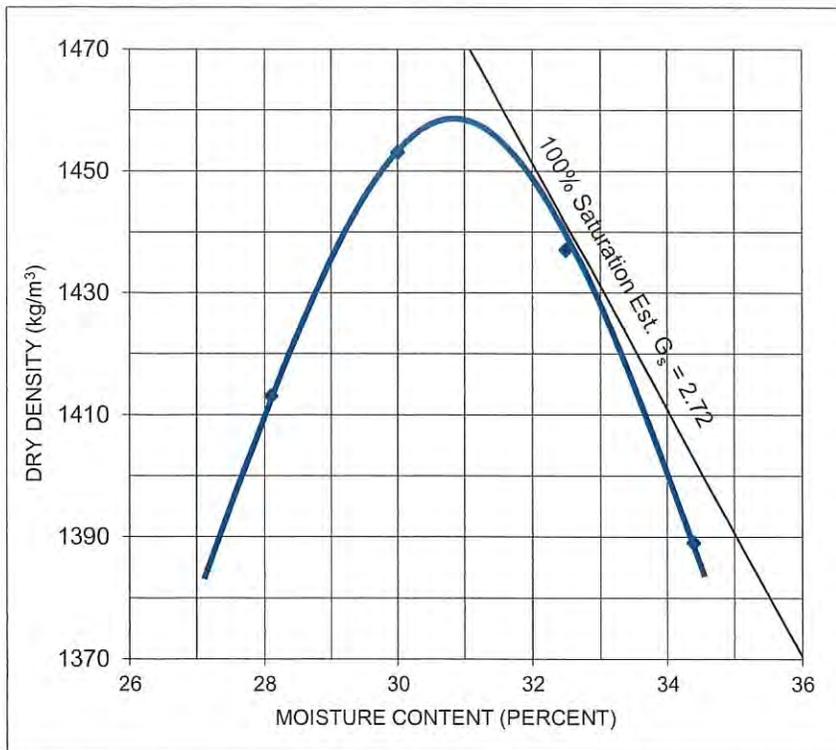
Preparation Method: Moist

Compaction Method: Manual

Test Compaction Method: A

Material Oversize:

4.75 mm: %
 19.0 mm: %



Dry Density (kg/m³)	Moisture Content (%)
1413	28.1
1453	30.0
1437	32.5
1389	34.4

Maximum Dry Density (MDD): 1459 kg/m³
Optimum Moisture (OM): 30.9 %

MDD Corrected: - kg/m³
OM Corrected: - %

Received Moisture Content: - %

Comments:

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per

Darci Babisky, C.E.T.
 Operations Manager – Laboratory
 Ph: (204) 233-1694 Fx: (204) 235-1579



420 Turenne Street
 Winnipeg, Manitoba
 R2J 3W8
 engtech@mymts.net
 www.eng-tech.ca

"Engineering and Testing Solutions That Work for You"

WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, Manitoba
 R3T 6B8

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

**MOISTURE-DENSITY
 RELATIONSHIP**



File No.: 23-035-04

Ref. No.: 23-35-4-17

Source: Leila Avenue, between Monsey Street and Sinclair Street; Composite sample from TH10, S2 - S4, 0.9 - 1.6 m; TH11, S2 - S4, 0.9 - 1.6 m; and TH12, 0.9 - 1.6 m

Material Type: Sub-grade

Date Sampled: Dec 1/23 and Dec 14/23 **Date Received:** Dec 14/23

Sampled By: ENG-TECH (Pei Zhao)

Compaction Standard Method: ASTM D698 ASTM D1557

Correction Standard Method: ASTM D4718

Preparation Method: Moist

Compaction Method: Manual

Description: Clay

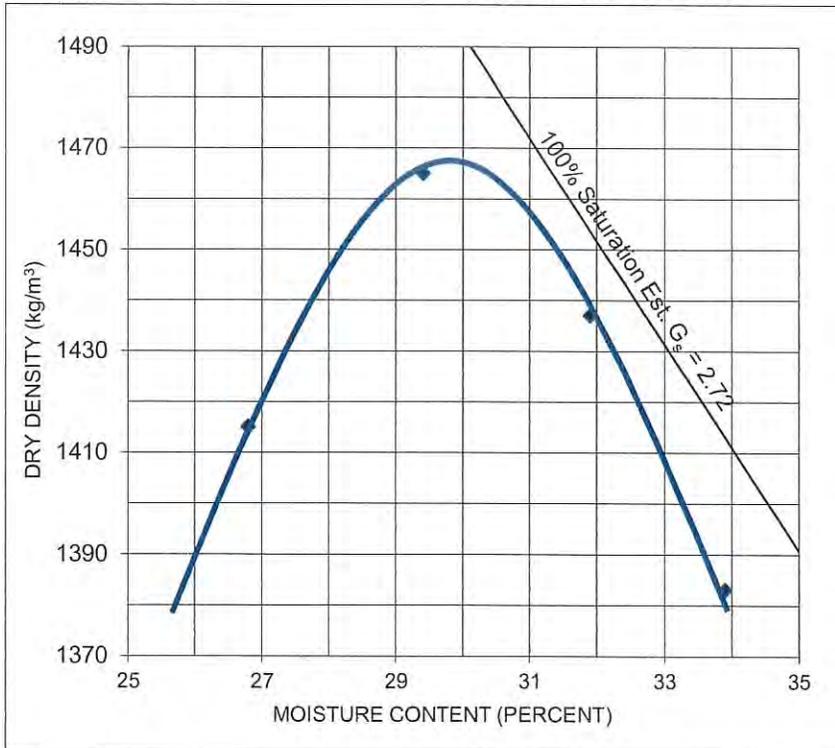
Date Tested: Jan 4/24

Tested By: ENG-TECH (Kristian Pajda)

Test Compaction Method: A

Material Oversize:

4.75 mm:	0.8	%
19.0 mm:	-	%



Dry Density (kg/m³)	Moisture Content (%)
1415	26.8
1465	29.4
1437	31.9
1383	33.9

Maximum Dry Density (MDD): 1466 kg/m³
Optimum Moisture (OM): 29.8 %

MDD Corrected: - kg/m³
OM Corrected: - %

Received Moisture Content: - %

Comments:

Email: WSP Canada Inc. Contact Group

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Supplementary information may be provided upon request. Restrictions and additional fees may apply.





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File No.: 23-035-04

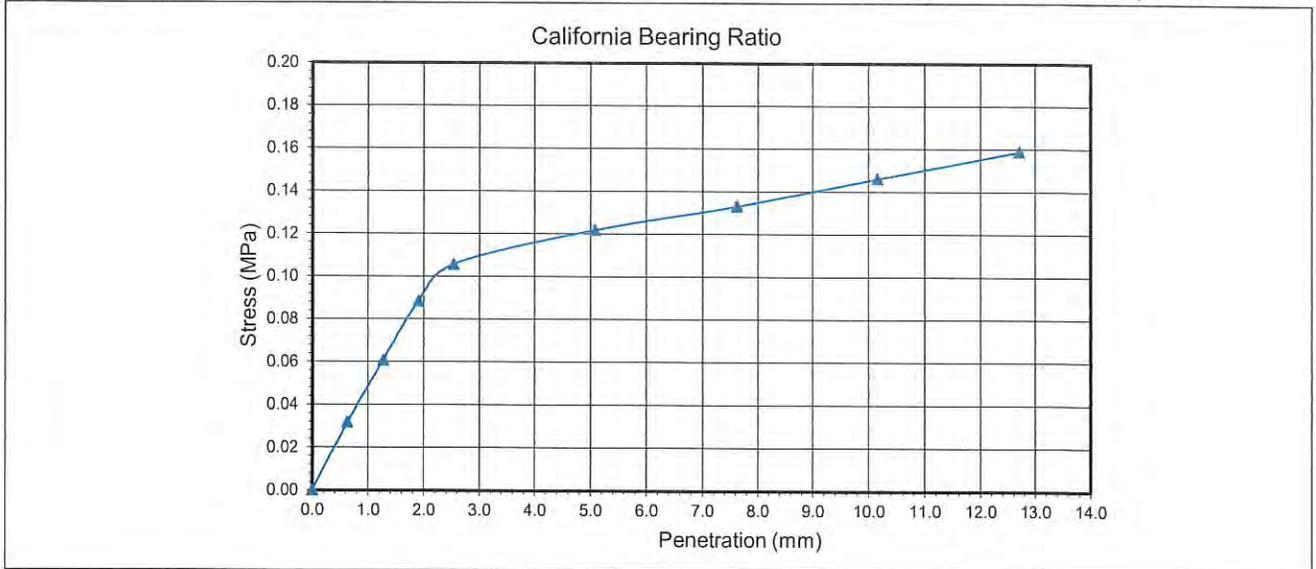
Ref. No.: 23-35-4-16

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA, CANADA

Source: McGregor Street, between Seven Oaks Avenue and Forest Avenue; Composite samples from TH1, S4, 1.6 m; TH2, S3, 1.2 m; TH3, S4, 1.6 m; TH4, S4, 1.6 m; TH5, S4, 1.6 m; TH6, S3, 1.2 m; TH6, S4, 1.6 m; TH7, S4, 1.6 m and TH9, S4, 1.6 m

Material Type:	Sub-grade	Date Sampled:	Dec 1/23
Material Description:	Clay	Date Received:	Dec 7/23
Sampled By:	ENG-TECH (Denys Ostrovskiy)	Date Tested:	Dec 26/23
Immersion Period:	95 Hours	Tested By:	ENG-TECH (Kevin Dowbeta)
Required Compactive Effort (Density):	95% Actual: 94.4%	Test Methods:	ASTM D698, D1883



Test Data				
	Soaked		Unsoaked	
Dry Density: As Compacted;	1377	kg/m ³	-	kg/m ³
Moisture Content: As Compacted;	30.7	%	-	%
Moisture Content: Top 25 mm;	46.0	%	-	%
CBR Values: 2.54mm (0.1in);	1.5	%	-	%
CBR Values: 5.08mm (0.2in);	1.2	%	-	%
Swell: 5.4 % of Initial Height	Oversize Correction:	0.0 %	Surcharge Mass:	4.54 kg
Maximum Load: 305.6 N	Penetration Depth:	12.7 mm		

Comments:

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 Winnipeg, Manitoba
 R3T 6B8

File No.: 23-035-04

Ref. No.: 23-35-4-18

Attention: Mark Vogt, M. Sc., P. Eng.

Project: 2022 - 2025 CW REGIONAL STREET RENEWAL - LEILA AVENUE, PARTRIDGE AVENUE, MCGREGOR STREET, WINNIPEG, MANITOBA

Source: Leila Avenue, between Monsey Street and Sinclair Street; Composite sample from TH10, S2 - S4, 0.9 - 1.6m; TH11, S2 - S4, 0.9 - 1.6 m; TH12, 0.9 - 1.6 m

Material Type: Sub-grade

Date Sampled: Dec 1/23 and Dec 14/23

Material Description: Clay

Date Received: Dec 14/23

Sampled By: ENG-TECH (Pei Zhao)

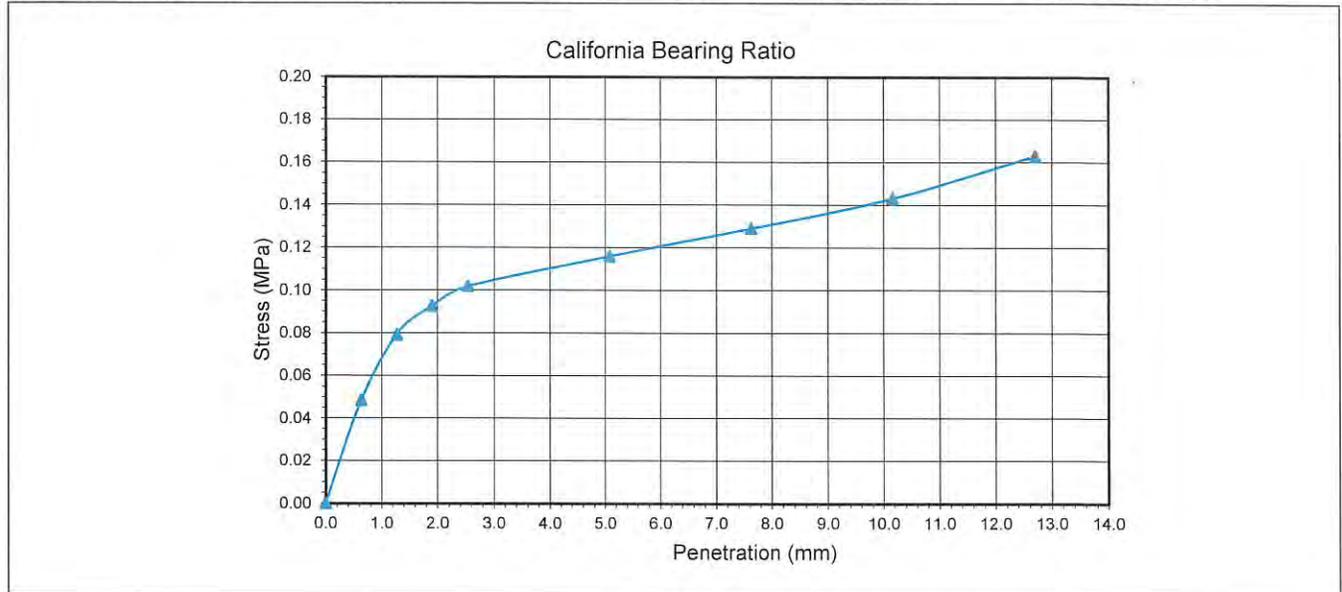
Date Tested: Jan 12/24

Immersion Period: 95.5 Hours

Tested By: ENG-TECH (Kevin Dowbeta)

Required Compactive Effort (Density): 95% Actual : 94.1%

Test Methods: ASTM D698, D1883



Test Data				
	Soaked		Unsoaked	
Dry Density: As Compacted;	1388	kg/m ³	-	kg/m ³
Moisture Content: As Compacted;	30.0	%	-	%
Moisture Content: Top 25 mm;	44.4	%	-	%
CBR Values: 2.54mm (0.1in);	1.5	%	-	%
CBR Values: 5.08mm (0.2in);	1.1	%	-	%
Swell: 4.6 % of Initial Height	Oversize Correction:	0.8 %	Surcharge Mass:	4.54 kg
Maximum Load: 313.1 N	Penetration Depth:	12.7 mm		

Comments:

Email: WSP Canada Inc. Contact Group

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