APPENDIX ‘A’

GEOTECHNICAL REPORT

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"Engineering and Testing Solutions That Work for You"

Date: May 31, 2024 **File No.:** 24-035-01

Client: WSP Canada Inc.

Address: 1600 Buffalo Place
Winnipeg, Manitoba
R3T 6B8

Attention: Scott Suderman, P.Eng.

Project: CW749 – 2023 Pavement Renewals on Dugald Road and Plessis Road, Winnipeg, Manitoba Canada

Introduction

ENG-TECH Consulting Limited (ENG-TECH) was retained by WSP Canada Inc. (WSP) to complete a geotechnical investigation inclusive of test holes and pavement cores for a future rehabilitation project along a section of Dugald Road and Plessis Road in Winnipeg, Manitoba, Canada. This report contains the Plessis Road portion of the project.

Scope of Work

The scope of work for the project entailed drilling a total of 24 test holes inclusive of recovering cores from the existing pavement structure, documenting findings in accordance with Appendix B – Site Investigation Requirements for Public Works Street Projects and providing a report outlining the work conducted, including photographs and pavement core summary tables showing the pavement core thicknesses and locations using UTM coordinates.

The section of road covered in the investigation was Northbound and Southbound Plessis Road between Dugald Road and Tillage Way.

Field Program

ENG-TECH conducted the coring and drilling program between April 3rd and 10th, 2024 and May 21st and May 22nd across 24 site locations in the road section previously stated. The cores were obtained by ENG-TECH at locations determined by WSP using 100mm and 150mm diameter diamond end core barrels. None of the cores were recovered for compressive strength determination. The test holes were drilled using a Lone Star T1A+ drill rig equipped with 100 mm diameter solid stem continuous flight augers owned and operated by ENG-TECH. The test holes were advanced to 2.5 m below the pavement structure in the Northbound and Southbound lanes at the locations as shown on Coring and Drilling Location Plan Figures 1 to 4. Soil samples were collected off the auger flights, as measured from the bottom of the pavement structure, at depth intervals of 0.6, 0.9, 1.2, 1.6, 2.0, and 2.5 m as specified in the Site Investigation Requirements for Public Works Street Projects. After sample collection the test holes were backfilled with soil auger cuttings and granular fill. ENG-TECH repaired the core apertures where required with a City of Winnipeg approved material (cold mix asphalt) that has been accepted on previous street renewal projects. Upon review of the soil samples collected, it was determined that additional drilling was required in 5 of the test holes (TH2, TH5, TH7, TH12 and TH13). The additional drilling was conducted on May 21st and 22nd following the above methodology.

Laboratory Program

The soil samples collected were retained for testing in ENG-TECH'S laboratory. The moisture content of each sample depth collected was determined and select samples were tested for particle size and Atterberg Limits. The moisture content, particle size and Atterberg Limit test results are summarized on Table 1 and in the attached test hole logs. The Particle Size Analysis and Liquid Limit, Plastic Limit and Plasticity Index of Soils results with ASTM D2487 and D3282 classifications are shown on Table 1 and separate reports enclosed.

Composite samples for standard proctor (moisture-density relationships) and California Bearing Ratio (CBR) testing were recovered from Test Holes (TH) 20, 22 and 24 as directed by WSP. Results of the standard proctor test are enclosed and the CBR results will be provided separately upon completion.

The pavement core thicknesses were measured and photographed. Photographs of each core are shown in the attached Photographs 1 to 24.

Soil Stratigraphy Summary

The existing pavement structure ranged from 0.159m to 0.270m. The shoulders generally consisted of a layer of layer of granular material ranging between 0.15 to 0.4m. However, test holes 4, 10 and 23 contained no granular materials at the surface and the upper layer was comprised of clay fill. As measured from the bottom of the pavement structure, there was typically 0.9m to 2.0m of clay fill underlain by another layer of predominately high plastic clay with minor irregular sections of slight silty clay to depth explored.

Closure

ENG-TECH trusts this is all the information required. If you have any questions, please contact the undersigned.

Sincerely,
ENG-TECH Consulting Limited

Darci Babisky, C.E.T.
Operations Manager – Laboratory

Email: WSP Canada Inc. Contact Group

Enclosures:

- Table 1 – Summary of Pavement Structure – Plessis Road, Dugald Road to Tillage Way
- Figures 1 to 3 – Core and Test Hole Location Plan
- Specimen Photographs (15 pages)
- Test Hole Logs (24 pages)
- Atterberg Limits, Plastic Index and Plasticity Index of Soil Reports Ref. No.'s 24-35-1-3, 4, 5, 6, 7 and 8
- Particle Size Analysis Reports Ref. No.'s 24-35-1-9, 10, 11, 12, 13 and 14
- Moisture-Density Relationship Report Ref. No. 24-35-1-15

Table 1
Summary of Pavement Structure
Plessis Road between Dugald Road and Tillage Way

Test Hole	GPS Coordinates		Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
	UTM (N)	14U (E)	Type	Depth (mm)	Type	Depth (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH1	5525245	641796	Asphalt	265	Sand Fill	135	Clay Fill	0.6	22.9	-	-	-	-	-	-	-
								0.9	30.8							
								1.2	31.3	-	-	-	-	-	-	-
								1.6	27.3	-	-	-	-	-	-	-
							Clay	2.0	40.3	-	-	-	-	-	-	-
								2.5	39.1	-	-	-	-	-	-	-
TH2	5525415	641784	Concrete	226	Gravel Fill	274	Clay Fill	0.6	23.7	-	-	-	-	-	-	-
								0.9	32.1	-	-	-	-	-	-	-
								1.2	29.6	-	-	-	-	-	-	-
								1.6	23.5	-	-	-	-	-	-	-
							Clay	2.0	38.6	-	-	-	-	-	-	-
								2.5	46.8	-	-	-	-	-	-	-
TH3	5525417	641781	None	0	-	-	-	0.6	-	-	-	-	-	-	-	-
								0.9	-	-	-	-	-	-	-	-
								1.2	-	-	-	-	-	-	-	-
								1.6	-	-	-	-	-	-	-	-
								2.0	-	-	-	-	-	-	-	-
								2.5	-	-	-	-	-	-	-	-
TH4	5525546	641793	None	0	Topsoil	125	Silty Clay Fill	0.6	24.8	-	-	-	-	-	-	-
								0.9	26.7	-	-	-	-	-	-	-
								1.2	30.1	-	-	-	-	-	-	-
							Clay	1.6	29.3	-	-	-	-	-	-	-
								2.0	33.3	-	-	-	-	-	-	-
								2.5	36.0	-	-	-	-	-	-	-

Table 1
Summary of Pavement Structure
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Test Hole	GPS Coordinates		Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
	UTM (N)	14U (E)	Type	Depth (mm)	Type	Depth (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH5	5525550	641787	Asphalt	159	Gravel Fill	441	Clay Fill	0.6	24.3	-	-	-	-	-	-	-
								0.9	25.8	-	-	-	-	-	-	-
								1.2	29.1	-	-	-	-	-	-	-
								1.6	29.7	-	-	-	-	-	-	-
							Clay	2.0	33.9	-	-	-	-	-	-	-
								2.5	37.7	-	-	-	-	-	-	-
TH6	5525590	641775	Concrete	230	Gravel Fill	300	Clay	0.6	29.1	-	-	-	-	-	-	-
								0.9	30.8	-	-	-	-	-	-	-
								1.2	32.3	-	-	-	-	-	-	-
								1.6	33.5	-	-	-	-	-	-	-
								2.0	36.3	-	-	-	-	-	-	-
								2.5	40.1	-	-	-	-	-	-	-
TH7	5525629	641784	Asphalt	160	Gravel Fill	300	Clay Fill	0.6	29.0	-	-	-	-	-	-	-
								0.9	30.6	-	-	-	-	-	-	-
								1.2	31.9	-	-	-	-	-	-	-
								1.6	30.6	-	-	-	-	-	-	-
								2.0	28.9	-	-	-	-	-	-	-
							Clay	2.5	37.5	-	-	-	-	-	-	-
TH8	5525747	641774	None	0	Sand Fill	900	Sand Fill	0.6	6.9	-	-	-	-	-	-	-
								0.9	7.5	-	-	-	-	-	-	-
							-	1.2	-	-	-	-	-	-	-	-
								1.6	-	-	-	-	-	-	-	-
								2.0	-	-	-	-	-	-	-	-
								2.5	-	-	-	-	-	-	-	-

Table 1
Summary of Pavement Structure
Plessis Road between Dugald Road and Tillage Way

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	5525860	641772	Concrete	198	Sand Fill	1000	Sand Fill	0.6	6.2	-	-	-	-	-	-	-
								0.9	7.7	-	-	-	-	-	-	-
							-	1.2	-	-	-	-	-	-	-	-
								1.6	-	-	-	-	-	-	-	-
								2.0	-	-	-	-	-	-	-	-
								2.5	-	-	-	-	-	-	-	-
TH10	5525930	641782	None	0	Clay Fill	800	Clay Fill	0.6	14.7	-	-	-	-	-	-	-
							Fat Clay	0.9	26.9	8.3	11.2	29.1	51.4	70	22	48
								1.2	23.0	-	-	-	-	-	-	-
							Clayey Sand	1.6	12.0	30.0	46.4	14.9	8.8	41	21	20
							Clay	2.0	30.5	-	-	-	-	-	-	-
								2.5	44.9	-	-	-	-	-	-	-
TH11	5525927	641764	Concrete	200	Silty Sand with Gravel	800	Silty Sand with Gravel	0.6	6.8	-	-	-	-	-	-	-
								0.9	8.0	33.9	47.8	15.6	2.8	13	12	1
							-	1.2	-	-	-	-	-	-	-	-
								1.6	-	-	-	-	-	-	-	-
								2.0	-	-	-	-	-	-	-	-
								2.5	-	-	-	-	-	-	-	-
TH12	5526240	641773	Asphalt	161	Gravel Fill	339	Clayey Sand	0.6	8.2	20.6	50.4	20.5	8.5	31	14	17
							Clay	0.9	22.9	-	-	-	-	-	-	-
								1.2	30.0	-	-	-	-	-	-	-
								1.6	31.7	-	-	-	-	-	-	-
								2.0	31.4	-	-	-	-	-	-	-
								2.5	41.9	-	-	-	-	-	-	-

Table 1
Summary of Pavement Structure
Plessis Road between Dugald Road and Tillage Way

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
TH13	5526358	641776	Asphalt	176	Gravel Fill	275	Fat Clay with Sand	0.6	33.4	-	-	-	-	-	-	-
								0.9	30.6	1.6	14.1	23.1	61.2	71	24	47
								1.2	33.5	-	-	-	-	-	-	-
								1.6	29.9	-	-	-	-	-	-	-
								2.0	30.3	-	-	-	-	-	-	-
								2.5	26.1	-	-	-	-	-	-	-
TH14	5526361	641773	None	0	Gravel Fill	450	Clay Fill	0.6	26.0	-	-	-	-	-	-	-
								0.9	30.8	-	-	-	-	-	-	-
							Clay	1.2	39.5	-	-	-	-	-	-	-
								1.6	27.1	-	-	-	-	-	-	-
							Silty Clay	2.0	39.5	-	-	-	-	-	-	-
								2.5	39.5	-	-	-	-	-	-	-
TH15	5526676	641752	Asphalt	180	Gravel Fill	100	Clay Fill	0.6	32.6	-	-	-	-	-	-	-
								0.9	32.4	-	-	-	-	-	-	-
								1.2	32.0	-	-	-	-	-	-	-
								1.6	36.1	-	-	-	-	-	-	-
							Clay	2.0	38.9	-	-	-	-	-	-	-
								2.5	41.6	-	-	-	-	-	-	-
TH16	5526680	641748	None	0	Gravel Fill	400	Clay Fill	0.6	35.3	-	-	-	-	-	-	-
							Clay	0.9	36.0	-	-	-	-	-	-	-
								1.2	36.8	-	-	-	-	-	-	-
								1.6	37.9	-	-	-	-	-	-	-
								2.0	44.6	-	-	-	-	-	-	-
								2.5	45.6	-	-	-	-	-	-	-

Table 1
Summary of Pavement Structure
Plessis Road between Dugald Road and Tillage Way

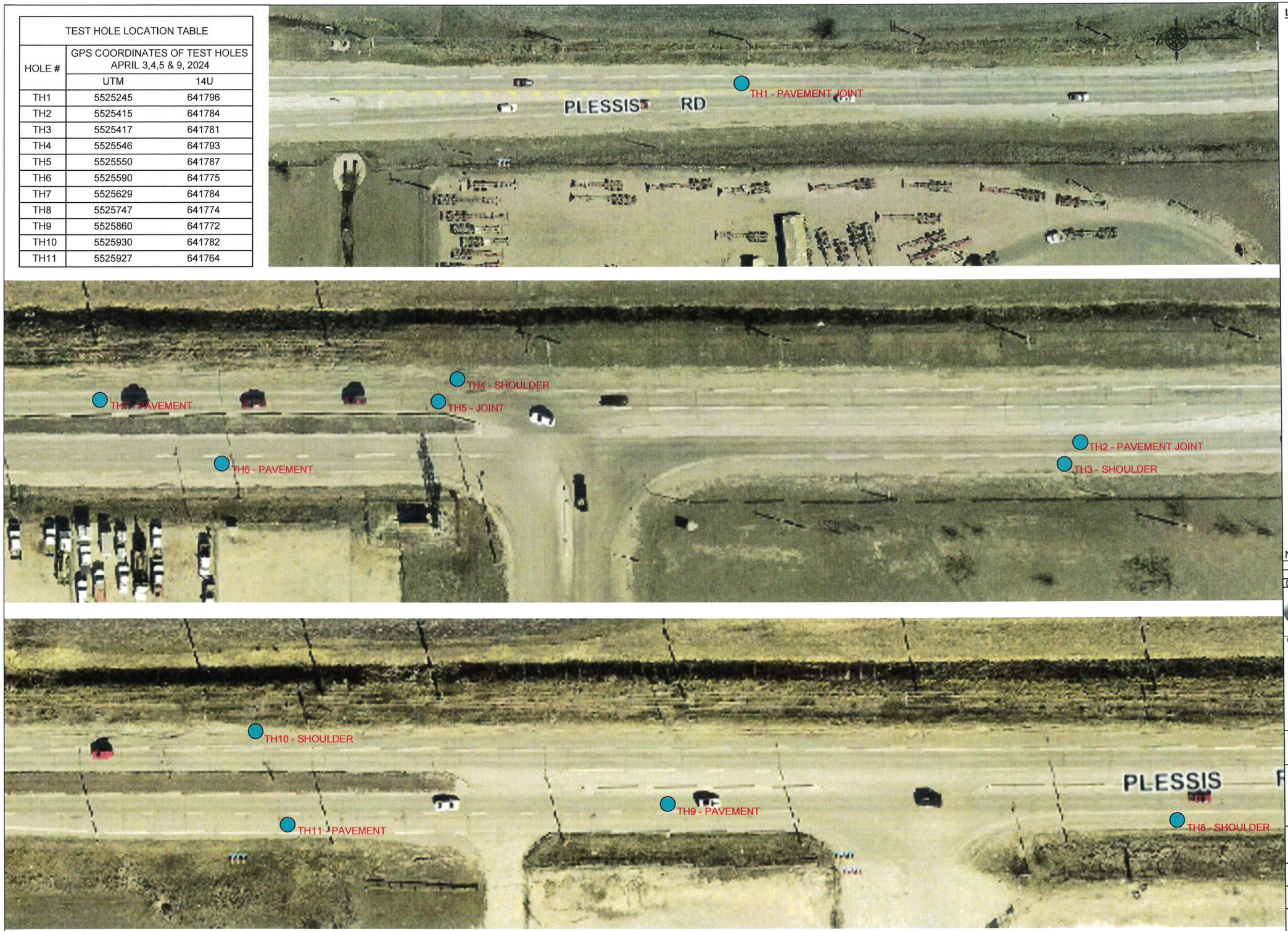
Test Hole	GPS Coordinates		Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
	UTM	14U	Type	Depth (mm)	Type	Depth (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH17	5526882	641757	Asphalt	270	Gravel Fill	30	Clay Fill	0.6	37.2	-	-	-	-	-	-	-
								0.9	36.0	-	-	-	-	-	-	-
								1.2	36.4	-	-	-	-	-	-	-
							Clay	1.6	37.1	-	-	-	-	-	-	-
								2.0	37.3	-	-	-	-	-	-	-
								2.5	38.3	-	-	-	-	-	-	-
TH18	5526885	641744	Asphalt	170	Gravel Fill	230	Clay Fill	0.6	32.7	-	-	-	-	-	-	-
								0.9	34.3	-	-	-	-	-	-	-
								1.2	30.5	-	-	-	-	-	-	-
								1.6	35.0	-	-	-	-	-	-	-
							Clay	2.0	38.1	-	-	-	-	-	-	-
								2.5	42.0	-	-	-	-	-	-	-
TH19	5526889	641740	None	0	Gravel Fill	150	Clay Fill	0.6	35.2	-	-	-	-	-	-	-
								0.9	33.6	-	-	-	-	-	-	-
								1.2	34.8	-	-	-	-	-	-	-
							Clay	1.6	35.5	-	-	-	-	-	-	-
								2.0	43.9	-	-	-	-	-	-	-
								2.5	45.8	-	-	-	-	-	-	-
TH20	5527036	641748	Asphalt	165	Gravel Fill	175	Clay Fill	0.6	32.9	-	-	-	-	-	-	-
								0.9	30.2	-	-	-	-	-	-	-
								1.2	28.2	-	-	-	-	-	-	-
								1.6	34.2	-	-	-	-	-	-	-
								2.0	35.8	-	-	-	-	-	-	-
							Clay	2.5	40.6	-	-	-	-	-	-	-

Table 1
Summary of Pavement Structure
Plessis Road between Dugald Road and Tillage Way

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
TH21	5527040	641751	None	0	Sand Fill	300	Sandy Fat Clay	0.6	35.8	-	-	-	-	-	-	-
								0.9	30.6	6.8	30.0	17.8	45.4	64	22	42
								1.2	35.7	-	-	-	-	-	-	-
							Clay	1.6	34.6	-	-	-	-	-	-	-
								2.0	36.5	-	-	-	-	-	-	-
								2.5	40.5	-	-	-	-	-	-	-
TH22	5527242	641743	Asphalt	164	Gravel Fill	236	Clay Fill	0.6	39.5	-	-	-	-	-	-	-
								0.9	31.1	-	-	-	-	-	-	-
								1.2	32.3	-	-	-	-	-	-	-
								1.6	34.6	-	-	-	-	-	-	-
							Clay	2.0	39.2	-	-	-	-	-	-	-
								2.5	41.3	-	-	-	-	-	-	-
TH23	5527245	641745	None	0	Clay Fill	1800	Clay Fill	0.6	38.9	-	-	-	-	-	-	-
								0.9	35.6	-	-	-	-	-	-	-
								1.2	31.9	-	-	-	-	-	-	-
								1.6	34.3	-	-	-	-	-	-	-
							Clay	2.0	41.9	-	-	-	-	-	-	-
								2.5	36.7	-	-	-	-	-	-	-
TH24	5527415	641742	Asphalt	197	Gravel Fill	123	Clay Fill	0.6	40.2	-	-	-	-	-	-	-
								0.9	36.3	-	-	-	-	-	-	-
								1.2	34.7	-	-	-	-	-	-	-
								1.6	35.7	-	-	-	-	-	-	-
							Clay	2.0	38.5	-	-	-	-	-	-	-
								2.5	41.7	-	-	-	-	-	-	-

FIGURES 1 TO 3 - CORE AND TEST HOLE LOCATION PLAN

TEST HOLE LOCATION TABLE		
HOLE #	GPS COORDINATES OF TEST HOLES APRIL 3,4,5 & 9, 2024	
	UTM	14U
TH1	5525245	641796
TH2	5525415	641784
TH3	5525417	641781
TH4	5525546	641793
TH5	5525550	641787
TH6	5525590	641775
TH7	5525629	641784
TH8	5525747	641774
TH9	5525860	641772
TH10	5525930	641782
TH11	5525927	641764



LEGEND

TH — TEST HOLE

NO.	DATE	ISSUE / REVISION
0	Jun. 2024	Report

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

CLIENT: WSP CANADA INC.

PROJECT: CW749 - 2023 PAVEMENT RENEWALS ON DUGALD RD AND PLESSIS RD

DWG DESCRIPTION: CORE AND TEST HOLE LOCATION PLAN

SCALE: N.T.S.

DRAWN BY: SZ

DATE: JUNE 2024

FILE No.: 24-035-01

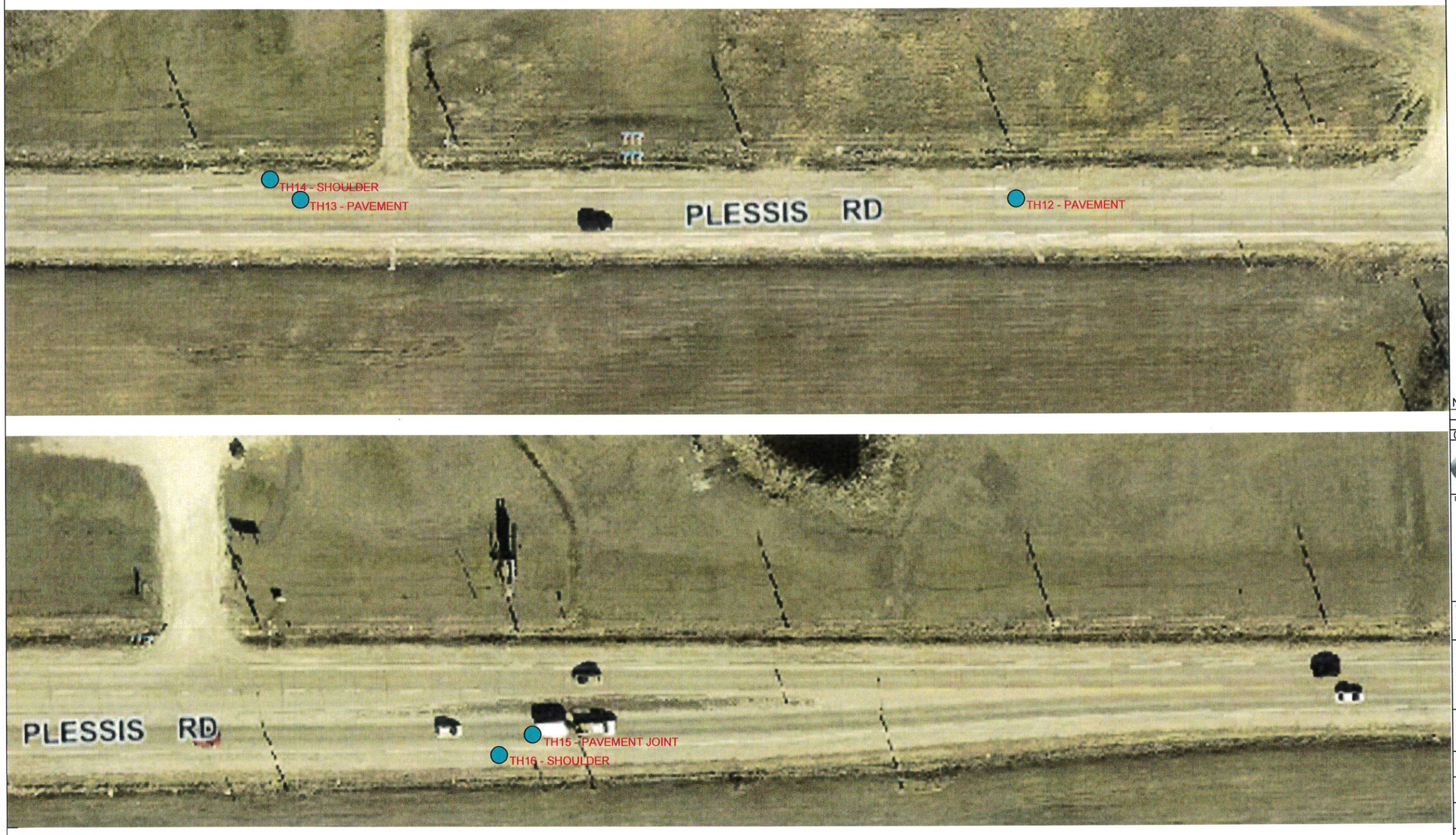
CLIENT DWG/FIG. No.:

ENG-TECH DWG/FIG. No.: 1 of 3

NO.:

P:\2024\035(WSP)\01(Dugald & Plessis Pavement Renewals)\Drawing\24-035-01.dwg

TEST HOLE LOCATION TABLE		
HOLE #	GPS COORDINATES OF TEST HOLES APRIL 3,8 & 9, 2024	
	UTM	14U
TH12	5526240	641773
TH13	5526358	641776
TH14	5526361	641773
TH15	5526676	641752
TH16	5526680	641748



LEGEND

TH — TEST HOLE

NO.	DATE	ISSUE / REVISION
0	Jun. 2024	Report

ENG-TECH CONSULTING LIMITED
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Certificate of Authorization
ENG-TECH Consulting Limited
No.2475

CLIENT: WSP CANADA INC.

PROJECT: CW749 - 2023 PAVEMENT RENEWALS ON DUGALD RD AND PLESSIS RD

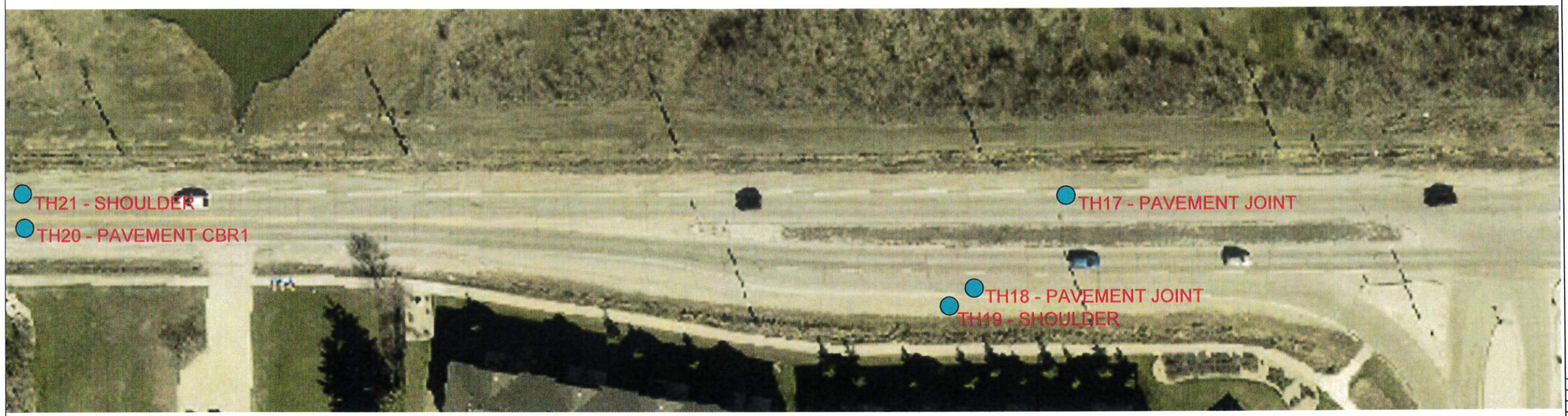
DWG DESCRIPTION: CORE AND TEST HOLE LOCATION PLAN

SCALE: N.T.S.

DRAWN BY:	DATE:
SZ	JUNE 2024
FILE No.: 24-035-01	CLIENT DWG/FIG. No.:
ENG-TECH DWG/FIG. No.: 2 of 3	NO.:

P:\2024\035(WSP)\01(Dugald & Plessis Pavement Renewals)\Drawing\24-035-01.dwg

TEST HOLE LOCATION TABLE		
HOLE #	GPS COORDINATES OF TEST HOLES APRIL 3,8,9 &10, 2024	
	UTM	14U
TH17	5526882	641757
TH18	5526885	641744
TH19	5526889	641740
TH20	5527036	641748
TH21	5527040	641751
TH22	5527242	641743
TH23	5527245	641745
TH24	5527415	641742



LEGEND

TH TEST HOLE

NO.	DATE	ISSUE / REVISION
0	Jun. 2024	Report

ENG-TECH CONSULTING LIMITED
420 Turenne Street
Winnipeg, MB
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ENG. STAMP:

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

CLIENT: WSP CANADA INC.

PROJECT: CW749 - 2023 PAVEMENT RENEWALS ON DUGALD RD AND PLESSIS RD

DWG DESCRIPTION: CORE AND TEST HOLE LOCATION PLAN

SCALE: N.T.S.

DRAWN BY: SZ

DATE: JUNE 2024

FILE No.: 24-035-01

CLIENT DWG/FIG. No.:

ENG-TECH DWG/FIG. No.: 3 of 3

NO.:

P:\2024\035(WSP)\01(Dugald & Plessis Pavement Renewals)\Drawing\24-035-01.dwg

SPECIMEN PHOTOGRAPHS
(15 pages)

Photograph 1: Specimen from Plessis Road, Northbound Lane

TH 1
Full Depth of Pavement
Ø = 150 mm

TH 1
Top of Asphalt Pavement
Ø = 150 mm

Photograph 2: Specimen from Plessis Road, Southbound Lane

TH 2
Full Depth of Pavement
Ø = 150 mm

TH 2
Top of Concrete Pavement
Ø = 150 mm

Photograph 3: Specimen from Plessis Road, Northbound Lane

TH 5
Full Depth of Pavement
Ø = 150 mm

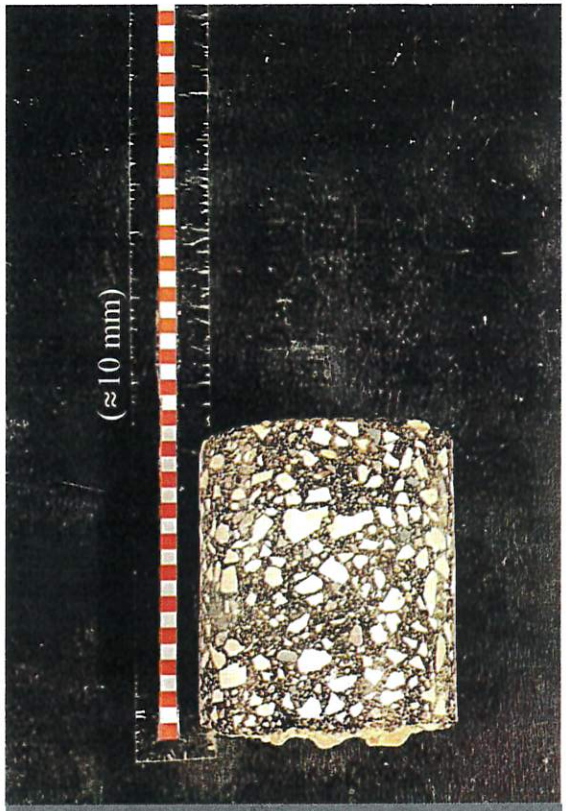
TH 5
Top of Asphalt Pavement
Ø = 150 mm

Photograph 4: Specimen from Plessis Road, Southbound Lane

TH 6
Full Depth of Pavement
Ø = 150 mm

TH 6
Top of Concrete Pavement
Ø = 150 mm

Photograph 5: Specimen from Plessis Road, Northbound Lane



TH 7
Full Depth of Pavement
Ø = 150 mm

TH 7
Top of Asphalt Pavement
Ø = 150 mm

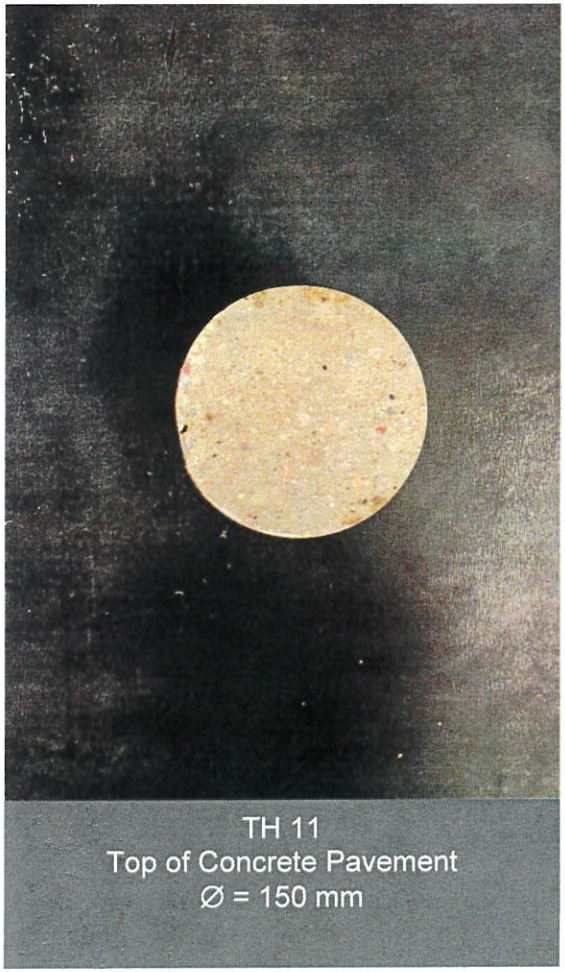
Photograph 6: Specimen from Plessis Road, Southbound Lane

TH 9
Full Depth of Pavement
∅ = 150 mm

TH 9
Top of Concrete Pavement
∅ = 150 mm

Photograph 7: Specimen from Plessis Road, Southbound Lane

TH 11
Full Depth of Pavement
Ø = 150 mm



TH 11
Top of Concrete Pavement
Ø = 150 mm

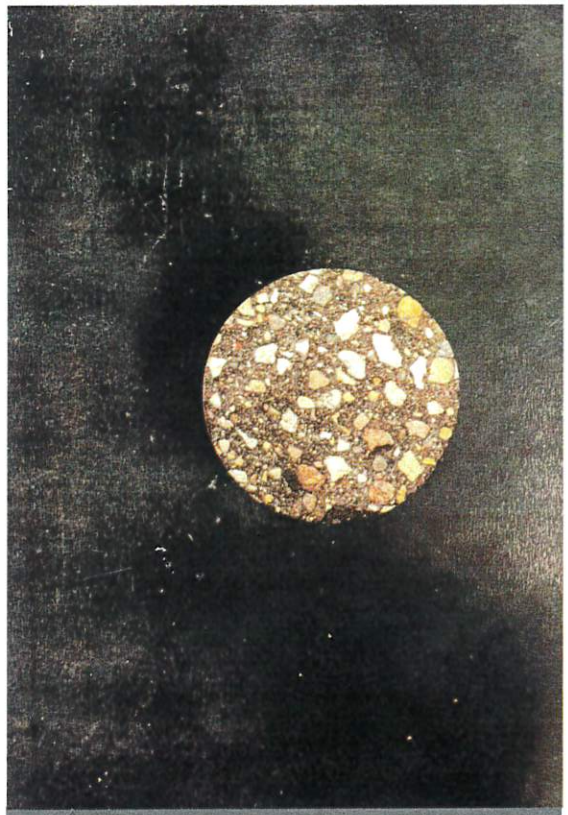
Photograph 8: Specimen from Plessis Road, Northbound Lane

TH 12
Full Depth of Pavement
Ø = 150 mm

TH 12
Top of Asphalt Pavement
Ø = 150 mm

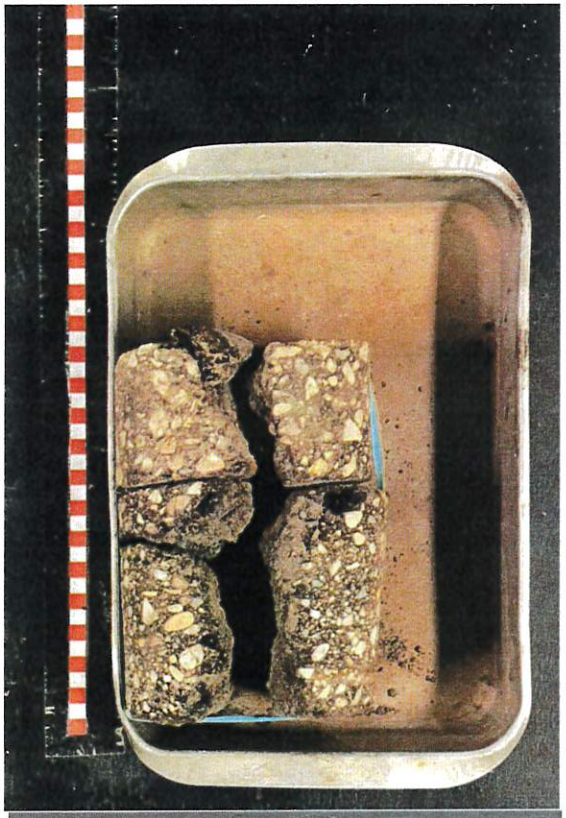
Photograph 9: Specimen from Plessis Road, Southbound Lane

TH 13
Full Depth of Pavement
Ø = 150 mm



TH 13
Top of Asphalt Pavement
Ø = 150 mm

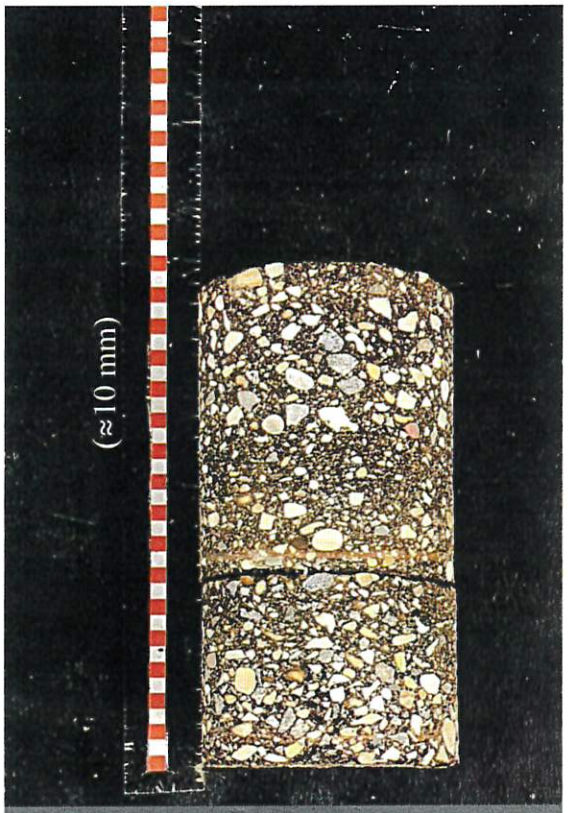
Photograph 10: Specimen from Plessis Road, Southbound Lane



TH 15
Full Depth of Pavement
Ø = 150 mm

TH 15
Top of Asphalt Pavement
Ø = 150 mm

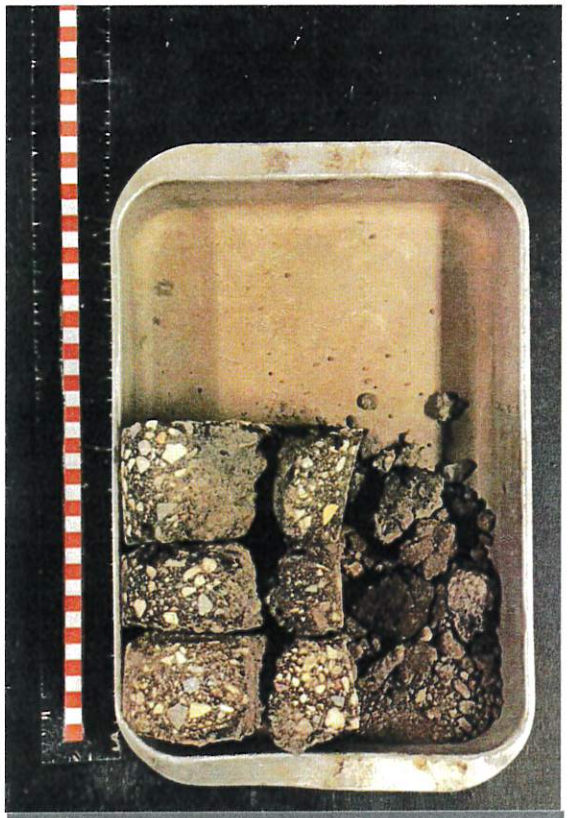
Photograph 11: Specimen from Plessis Road, Northbound Lane



TH 17
Full Depth of Pavement
Ø = 150 mm

TH 17
Top of Asphalt Pavement
Ø = 150 mm

Photograph 12: Specimen from Plessis Road, Southbound Lane



TH 18
Full Depth of Pavement
Ø = 150 mm

TH 18
Top of Asphalt Pavement
Ø = 150 mm

Photograph 13: Specimen from Plessis Road, Southbound Lane

TH 20
Full Depth of Pavement
Ø = 150 mm

TH 20
Top of Asphalt Pavement
Ø = 150 mm

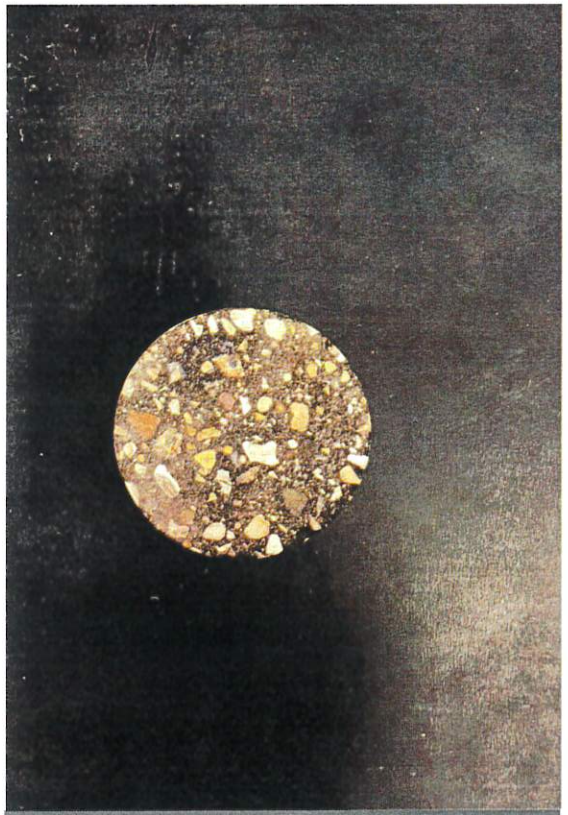
Photograph 14: Specimen from Plessis Road, Southbound Lane

TH 22
Full Depth of Pavement
Ø = 150 mm

TH 22
Top of Asphalt Pavement
Ø = 150 mm

Photograph 15: Specimen from Plessis Road, Northbound Lane

PC #15
Full Depth of Pavement
Ø = 150 mm



PC #15
Top of Asphalt Pavement
Ø = 150 mm

TEST HOLE LOGS
(24 pages)

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH1

Client: WSP Canada Inc.

Site: Plessis Rd, Winnipeg, Manitoba

Location: See Figure 1

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 5, 2024

Grade Elevation: 100.0 m

Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
	Asphalt (265 mm)					
	Sand Fill	0.0				
	Clay Fill - light to medium brown, moist, medium plastic, trace to some silt & gravel.		S1		22.9	
1.0		-1.0	S2		30.8	
	- below 1.2 m, dark brown to black.		S3		31.3	
			S4		27.3	
2.0	***Clay*** - medium brown, moist, highly plastic, trace to some silt.	-2.0	S5		40.3	
			S6		39.1	
3.0		-3.0				
	End of Test Hole - end of test hole at 3.3 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.					
4.0						

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 3.3 m

Completion Elevation: 96.7 m

Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH2

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 1
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: May 22, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
0	***Asphalt (226 mm)***	0.0				
	Gravel Fill					
	Clay Fill - dark brown, moist, highly plastic, trace to some silt, sand & gravel.		S1		23.7	
1.0		-1.0	S2		32.1	
			S3		29.6	
			S4		23.5	
2.0	***Clay*** - dark brown, moist, highly plastic.	-2.0	S5		38.6	
			S6		46.8	
3.0	***End of Test Hole*** - end of test hole at 2.8 m below grade. - seepage observed at 2.1 m. - no sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0						

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: PZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 2.8 m
Completion Elevation: 97.2 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH3

Client: WSP Canada Inc.

Site: Shoulder Plessis Rd, Winnipeg, Manitoba

Location: See Figure 1

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 4, 2024

Grade Elevation: 100.0 m

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					SHEAR STRENGTH (kPa)		
Depth (m)	Soil Symbol	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%) PL I----------X----------I LL 20 40 60 80	P. Pen	Torvane	UC
		- 2 locations were attempted. - refusal at 0.45 m. - no samples were obtained.									
1.0			-1.0								
2.0			-2.0								
3.0			-3.0								
4.0			-4.0								

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 0 m

Completion Elevation: 100.0 m

Sheet: 1 of 1

SAMPLE TYPE — SPLIT BARREL — SHELBY TUBE — AUGER CUTTINGS — SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH4

Client: WSP Canada Inc.
Site: Shoulder Plessis Rd, Winnipeg, Manitoba
Location: See Figure 1
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: April 4, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
	Topsoil (125 mm)					
	Silty Clay Fill - medium brown to dark brown, moist, medium plastic, some silt, trace gravel.		S1		24.8	
1.0		-1.0	S2		26.7	
			S3		30.1	
	Clay - medium brown, moist, highly plastic, trace to some silt.		S4		29.3	
2.0		-2.0	S5		33.3	
			S6		36.0	
3.0	***End of Test Hole*** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0		-4.0				

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH5

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 1
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: May 22, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
	Asphalt (159 mm)	0.0				
	Gravel Fill					
	Clay Fill - dark brown, moist, medium plastic, trace to some silt, sand & gravel.		S1		24.3	
1.0		-1.0	S2		25.8	
			S3		29.7	
			S4		29.1	
2.0	**Clay** - medium brown, moist, highly plastic, trace to some silt.	-2.0	S5		33.9	
	Clay - light to medium brown, medium plastic, trace to some silt.		S6		37.7	
3.0	**End of Test Hole** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0						

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH6

Client: WSP Canada Inc.

Site: Plessis Rd, Winnipeg, Manitoba

Location: See Figure 1

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 9, 2024

Grade Elevation: 100.0 m

Water Elevation: --

Depth (m)	Soil Symbol	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%) PL I----------X----------I LL 20 40 60 80	P. Pen	Torvane	UC
		Concrete (230 mm)	0.0								
		Gravel Fill									
		Clay - dark to medium brown, moist, highly plastic, trace silt.		S1		29.1					
1.0			-1.0	S2		30.8					
				S3		32.3					
				S4		33.5					
2.0			-2.0	S5		36.3					
				S6		40.1					
		End of Test Hole - end of test hole at 2.5 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0								
3.0											
4.0											

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

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

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH7

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 1
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: May 22, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
0.0	**Asphalt (160 mm)**	0.0				
	Gravel Fill					
	Clay Fill - dark brown to grey, moist, medium plastic, trace to some silt, trace sand & gravel.		S1		29.0	
1.0		-1.0	S2		30.6	
			S3		31.9	
			S4		30.6	
2.0		-2.0	S5		28.9	
	Clay - medium brown, moist, highly plastic, trace to some silt.		S6		37.5	
3.0	**End of Test Hole** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0						

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH8

Client: WSP Canada Inc.

Site: Shoulder Plessis Rd, Winnipeg, Manitoba

Location: See Figure 1

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 3, 2024

Grade Elevation: 100.0 m

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					SHEAR STRENGTH (kPa)		
Depth (m)	Soil Symbol	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%) PL I----------X----------I LL 20 40 60 80	P. Pen	Torvane	UC
0		***Sand Fill*** - light brown, moist.									
				S1		6.9					
				S2		7.5					
1.0		***End of Test Hole*** - auger refusal at 0.9 m below grade. - no seepage or sloughing encountered. - test hole backfilled with sand fill.	-1.0								
2.0			-2.0								
3.0			-3.0								
4.0			-4.0								

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm

Completion Depth: 0.9 m

Completion Elevation: 99.1 m

Sheet: 1 of 1

SAMPLE TYPE — SPLIT BARREL — SHELBY TUBE — AUGER CUTTINGS — SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH9

Client: WSP Canada Inc.

Site: Plessis Rd, Winnipeg, Manitoba

Location: See Figure 1

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 5, 2024

Grade Elevation: 100.0 m

Water Elevation: --

Depth (m)	Soil Symbol	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%) PL I----------X----------I LL 20 40 60 80	SHEAR STRENGTH (kPa) P. Pen	Torvane	UC
		Concrete (198 mm)	0.0								
		Sand Fill - light brown, moist.		S1		6.2					
1.0			-1.0	S2		7.7					
		End of Test Hole - auger refused at 1.2 m below grade. - no seepage or sloughing encountered. - test hole backfilled with sand fill upon completion of drilling.									
2.0			-2.0								
3.0			-3.0								
4.0											

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm

Completion Depth: 1.2 m

Completion Elevation: 98.8 m

Sheet: 1 of 1

SAMPLE TYPE — SPLIT BARREL — SHELBY TUBE — AUGER CUTTINGS — SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH10

Client: WSP Canada Inc.
Site: Shoulder Plessis Rd, Winnipeg, Manitoba
Location: See Figure 1
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: April 4, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
	Clay Fill - medium brown, moist, medium plastic, trace to some silt & gravel.		S1		14.7	
1.0	**Fat Clay (CH)** - medium brown, moist, highly plastic, with sand, with silt.	-1.0	S2		26.9	
			S3		23.0	
	Clayey Sand (SC) - medium brown, damp, with gravel.		S4		12.0	
2.0	**Clay** - medium brown, moist, highly plastic, trace to some silt.	-2.0	S5		30.5	
	- below 2.5 m, medium plastic.		S6		44.9	
3.0	**End of Test Hole** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0		-4.0				

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH11

Client: WSP Canada Inc.

Site: Plessis Rd, Winnipeg, Manitoba

Location: See Figure 1

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 5, 2024

Grade Elevation: 100.0 m

Water Elevation: --

Depth (m)	Soil Symbol	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%) PL I----------X----------I LL 20 40 60 80	SHEAR STRENGTH (kPa) P. Pen	Torvane	UC
		Concrete (200 mm)	0.0								
		Silty Sand with Gravel (SM) - light brown, moist, fine to coarse grained, some silt, with gravel.		S1		6.8					
				S2		8.0					
1.0		***End of Test Hole*** - auger refusal at 1.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-1.0								
2.0			-2.0								
3.0			-3.0								
4.0											

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 1.2 m

Completion Elevation: 98.8 m

Sheet: 1 of 1

SAMPLE TYPE — SPLIT BARREL — SHELBY TUBE — AUGER CUTTINGS — SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH12

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 2
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: May 21, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Soil Symbol	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
		Asphalt (161 mm)	0.0				
		Gravel Fill					
		Clayey Sand (SC) - brown, damp, with silt, with gravel.		S1		8.2	
1.0		***Clay*** - dark brown, moist, medium to highly plastic, some sand, trace silt. - below 0.9 m, stiff.	-1.0	S2		22.9	
				S3		30.0	
				S4		31.7	
2.0		- below 2.0 m, brown.	-2.0	S5		31.4	
				S6		41.9	
3.0		***End of Test Hole*** - end of test hole at 2.7 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0							

Moisture Content (%): PL I----------X----------I LL; 20 40 60 80

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: AA

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 2.7 m
Completion Elevation: 97.3 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH13

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 2
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: May 21, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Moisture Content (%)
	Asphalt (176 mm)	0.0		
	Gravel Fill			
	Fat Clay (CH) - dark brown, moist, medium to highly plastic, with sand.		S1	33.4
1.0		-1.0	S2	30.6
			S3	33.5
			S4	29.9
2.0	- below 2.1 m, light brown, and silt.	-2.0	S5	30.3
			S6	26.1
	End of Test Hole - end of test hole at 2.8 m below grade. - seepage encountered at 2.1 m. - no sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0		
3.0				
4.0				

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: AA

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 2.8 m
Completion Elevation: 97.2 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH14

Client: WSP Canada Inc.
Site: Shoulder Plessis Rd, Winnipeg, Manitoba
Location: See Figure 2
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: April 3, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
	Gravel Fill					
	Clay Fill - dark brown, moist, medium to highly plastic, trace to some silt, sand & gravel.		S1		26.0	
1.0		-1.0	S2		30.8	
	Clay - dark brown, highly plastic, trace to some silt & sand, trace gravel.		S3		32.0	
			S4		27.1	
	Silty Clay - dark grey, moist, medium to highly plastic.					
2.0		-2.0	S5		39.5	
			S6		39.5	
	End of Test Hole - end of test hole at 2.5 m below grade. - seepage encountered at 1.8 m - no sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.					
3.0		-3.0				
4.0		-4.0				

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
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

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH15

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 2
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: April 8, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	P. Pen	Torvane	UC
0.0	**Asphalt (180 mm)**	0.0							
	Gravel Fill								
	Clay Fill - dark brown, moist, highly plastic, trace silt, sand & gravel.		S1		32.6				
1.0		-1.0	S2		32.4				
			S3		32.0				
			S4		36.1				
2.0	**Clay** - dark brown, moist, highly plastic.	-2.0	S5		38.9				
			S6		41.6				
3.0	**End of Test Hole** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0							
4.0									

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa)

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH16

Client: WSP Canada Inc.

Site: Shoulder Plessis Rd, Winnipeg, Manitoba

Location: See Figure 2

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 3, 2024

Grade Elevation: 100.0 m

Water Elevation: --

SUBSURFACE PROFILE

Depth (m)	Soil Symbol	Description	Sample Depth from Pavement Bottom (m)
		Gravel Fill	
		Clay Fill - dark brown, moist, highly plastic, trace to some silt & sand.	
1.0		***Clay*** - medium brown, moist, highly plastic, trace to some silt.	-1.0
2.0			-2.0
3.0		***End of Test Hole*** - end of test hole at 3.0 m below grade. - seepage encountered at 1.8 m. - no sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0
4.0			-4.0

SAMPLE DATA

Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
S1		35.3	
S2		36.0	
S3		36.8	
S4		37.9	
S5		44.6	
S6		45.6	

Moisture Content (%)

PL I----------X----------I LL

20 40 60 80

SHEAR STRENGTH (kPa)

P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

SAMPLE TYPE — SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH17

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 3
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: April 9, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
0.0	***Asphalt (270 mm)***	0.0				
	Gravel Fill					
	Clay Fill - dark brown, moist, medium to highly plastic, trace silt, sand & gravel.		S1		37.2	
1.0		-1.0	S2		36.0	
			S3		36.4	
	Clay - dark brown, moist, highly plastic, trace to some silt.		S4		37.1	
2.0		-2.0	S5		37.3	
			S6		38.3	
3.0	***End of Test Hole*** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0						

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH18

Client: WSP Canada Inc.

Site: Plessis Rd, Winnipeg, Manitoba

Location: See Figure 3

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 8, 2024

Grade Elevation: 100.0 m

Water Elevation: --

Depth (m)	Soil Symbol	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
		Asphalt (170 mm)	0.0				
		Gravel Fill					
		Clay Fill - dark brown, moist, medium to highly plastic, trace to some silt, sand & gravel.		S1		32.7	
1.0			-1.0	S2		34.3	
				S3		30.5	
				S4		35.0	
2.0		***Clay*** - dark brown, moist, highly plastic, trace to some silt.	-2.0	S5		38.1	
				S6		42.0	
3.0		***End of Test Hole*** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0							

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH19

Client: WSP Canada Inc.
Site: Shoulder Plessis Rd, Winnipeg, Manitoba
Location: See Figure 3
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: April 3, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
	Gravel Fill					
	Clay Fill - dark brown, moist, medium plastic, trace to some silt, sand & gravel.					
			S1		35.2	
		-1.0	S2		33.6	
1.0			S3		34.8	
	Clay - medium brown, moist, highly plastic, trace to some silt.					
			S4		35.5	
2.0		-2.0	S5		43.9	
			S6		45.9	
3.0	**End of Test Hole** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0		-4.0				

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH20

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 3
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: April 8, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
0.0	***Asphalt (165 mm)***	0.0				
	Gravel Fill					
	Clay Fill - dark brown, moist, medium plastic, trace to some silt, sand & gravel.		S1		32.9	
1.0		-1.0	S2		30.2	
			S3		28.2	
			S4		34.2	
2.0		-2.0	S5		35.8	
	Clay - medium brown, moist, highly plastic, trace to some silt.		S6		40.6	
3.0	***End of Test Hole*** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0						

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH21

Client: WSP Canada Inc.

Site: Shoulder Plessis Rd, Winnipeg, Manitoba

Location: See Figure 3

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 8, 2024

Grade Elevation: 100.0 m

Water Elevation: --

SUBSURFACE PROFILE

Depth (m)	Soil Symbol	Description
		Sand Fill
		Sandy Fat Clay Fill (CH) - dark brown, moist, highly plastic, with sand & silt, trace gravel.
1.0		
		Clay - dark brown, moist, highly plastic, trace silt.
2.0		
3.0		***End of Test Hole*** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.
4.0		

SAMPLE DATA

Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
	S1		35.8	
-1.0	S2		30.6	
	S3		35.7	
	S4		34.6	
-2.0	S5		36.5	
	S6		40.5	
-3.0				
-4.0				

Moisture Content (%)

PL I----------X----------I LL

20 40 60 80

SHEAR STRENGTH (kPa)

P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

SAMPLE TYPE — SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH22

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 3
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: April 8, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
	Asphalt (164 mm)	0.0				
	Gravel Fill					
	Clay Fill - dark brown, moist, medium plastic, trace silt, sand & gravel.		S1		39.5	
1.0		-1.0	S2		31.1	
			S3		32.5	
			S4		34.6	
2.0	**Clay** - medium brown, moist, highly plastic, trace to some silt.	-2.0	S5		39.2	
			S6		41.3	
3.0	**End of Test Hole** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0						

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH23

Client: WSP Canada Inc.

Site: Shoulder Plessis Rd, Winnipeg, Manitoba

Location: See Figure 3

Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01

Date Drilled: April 3, 2024

Grade Elevation: 100.0 m

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					SHEAR STRENGTH (kPa)		
Depth (m)	Soil Symbol	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm	Moisture Content (%) PL I----------X----------I LL 20 40 60 80	P. Pen	Torvane	UC
		Clay Fill - dark brown, moist, medium plastic, trace to some silt, sand & gravel.		S1		38.9					
1.0			-1.0	S2		35.6					
				S3		31.9					
				S4		34.3					
		Clay - medium brown, moist, medium plastic, trace to some silt.									
2.0			-2.0	S5		41.9					
		- below 2.4 m, light to medium brown, medium to highly plastic.		S6		36.7					
3.0		***End of Test Hole*** - end of test hole at 3.0 m below grade. - seepage encountered at 2.0 m. - no sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0								
4.0			-4.0								

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.

Drill Rig: Lone Star T1A+

Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

SAMPLE TYPE — SPLIT BARREL — SHELBY TUBE — AUGER CUTTINGS — SPLIT SPOON

ENG-TECH CONSULTING LIMITED

Engineering And Testing Solutions That Work For You

Test Hole #: TH24

Client: WSP Canada Inc.
Site: Plessis Rd, Winnipeg, Manitoba
Location: See Figure 3
Project: CW749 - 2023 Pavement Renewals on Dugald Rd and Plessis Rd

File No.: 24-035-01
Date Drilled: April 10, 2024
Grade Elevation: 100.0 m
Water Elevation: --

Depth (m)	Description	Sample Depth from Pavement Bottom (m)	Sample No.	Sample Type	Moisture Content (%)	Blows/300 mm
0.0	**Asphalt (197 mm)**	0.0				
	Gravel Fill					
	Clay Fill - dark brown to black, moist, medium plastic, trace to some silt, sand & gravel.		S1		40.2	
1.0		-1.0	S2		36.3	
			S3		34.7	
			S4		35.7	
2.0	**Clay** - dark brown to black, moist, highly plastic, trace to some silt.	-2.0	S5		38.5	
			S6		41.7	
3.0	**End of Test Hole** - end of test hole at 3.0 m below grade. - no seepage or sloughing encountered. - test hole backfilled with auger cuttings upon completion of drilling.	-3.0				
4.0						

Moisture Content (%): PL I----------X----------I LL (20, 40, 60, 80)

SHEAR STRENGTH (kPa): P. Pen | Torvane | UC

ENG- TECH Consulting Limited

Logged by: SZ

Reviewed by:

Drilled By: ENG-TECH Consulting Limited.
Drill Rig: Lone Star T1A+
Auger Size: 100 mm Solid Stem

Completion Depth: 3.0 m
Completion Elevation: 97.0 m
Sheet: 1 of 1

SAMPLE TYPE: SPLIT BARREL | SHELBY TUBE | AUGER CUTTINGS | SPLIT SPOON

ATTERBERG LIMTS, PLASTIC INDEX AND PLASTICITY INDEX OF SOILS REPORTS

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LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS

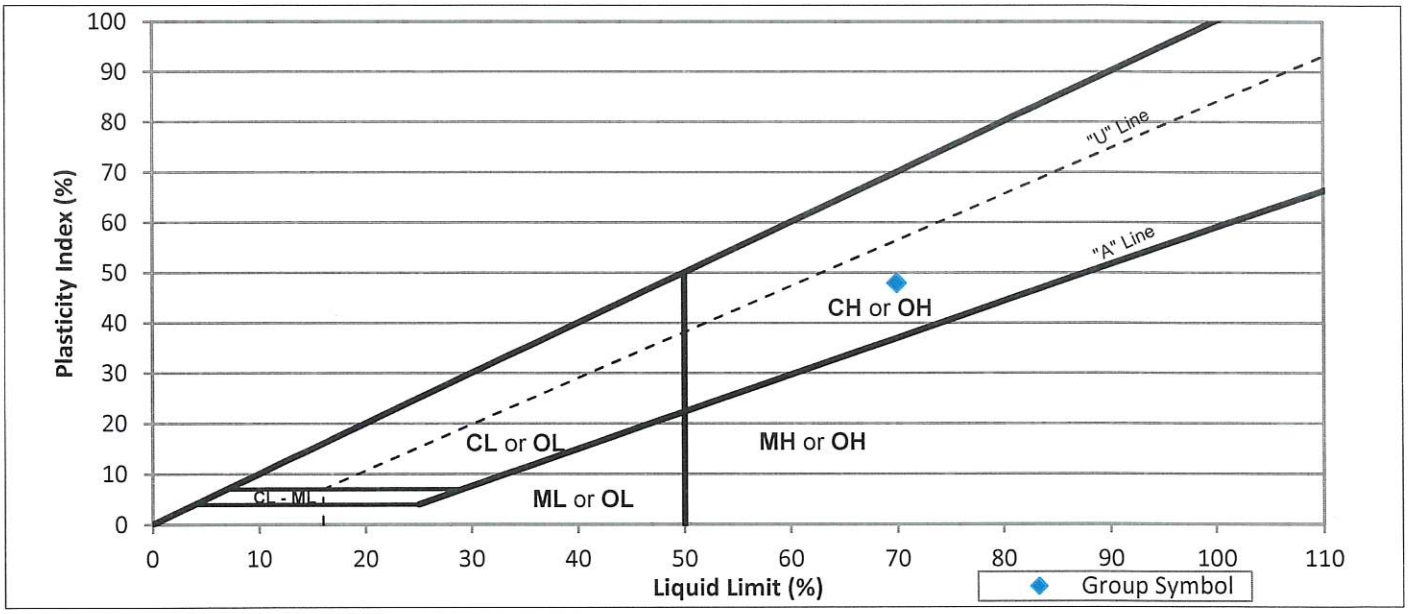
CERTIFIED BY CCIL Canadian Council of Independent Laboratories For specific tests as listed on www.ccil.com

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

File No.: 24-035-01
Ref. No.: 24-35-1-3

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Shoulder, Plessis Road
Material Type: -
Material Description: Sandy clay
Test Hole No.: 10
Date Sampled: Apr 5/24
Date Received: May 25/24
Sample No.: 2
Sampled By: ENG-TECH (Shah Zeb)
Date Tested: May 28/24
Depth: 0.9 m
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 (%): 70 **Plastic Limit (%):** 22 **Plasticity Index (%):** 48

Percentage of sand particles retained on 0.425mm sieve: 16.3

Classification: ASTM D2487: Fat clay with sand, CH
ASTM D3282: A-7-6 (40)

As Received Moisture Content (%): 26.9

Comments:
-

ENG-TECH Consulting Limited

Per _____

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

Email: WSP Canada Inc. Contact Group

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

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LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS

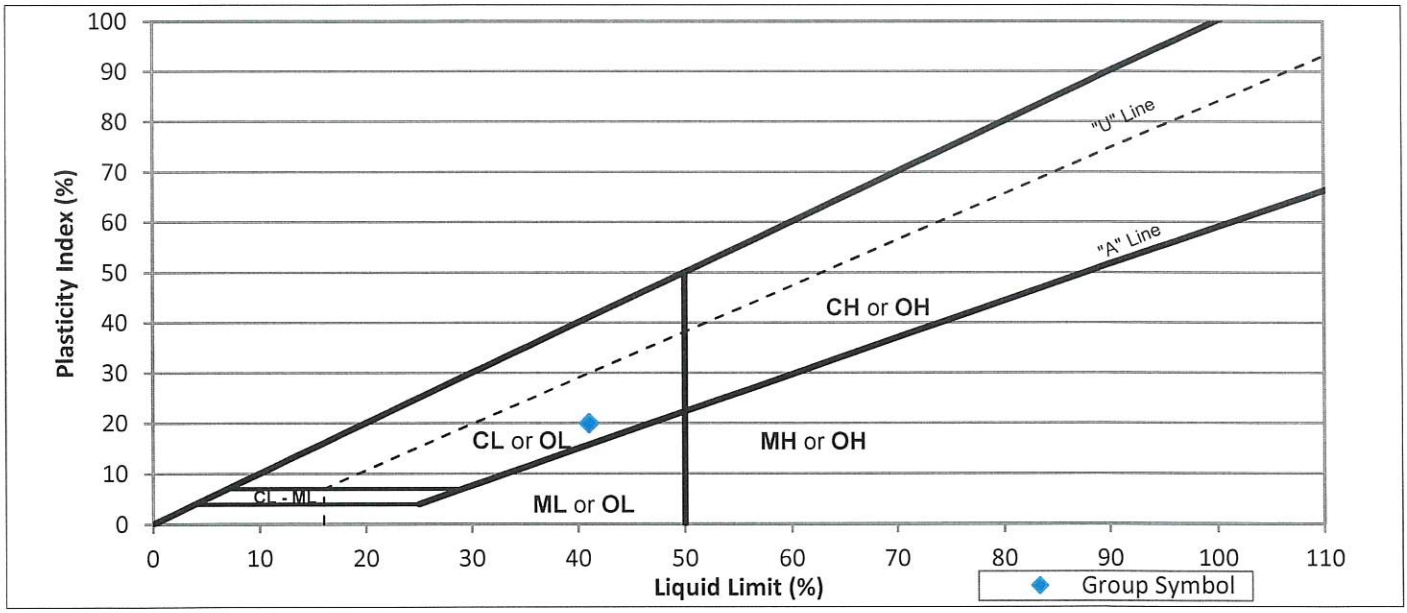
CERTIFIED BY CCIL Canadian Council of Independent Laboratories For specific tests as listed on www.ccil.com

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

File No.: 24-035-01
Ref. No.: 24-35-1-4

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Shoulder, Plessiis Road
Material Type: -
Material Description: Clayey sand
Test Hole No.: 10
Date Sampled: Apr 5/24
Date Received: May 25/24
Sample No.: 4
Sampled By: ENG-TECH (Shah Zeb)
Date Tested: May 28/24
Depth: 1.6 m
Tested By: ENG-TECH (Jerssica 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 (%): 41 **Plastic Limit (%):** 21 **Plasticity Index (%):** 20

Percentage of sand particles retained on 0.425mm sieve: 55.0

Classification: ASTM D2487: Clayey sand with gravel, SC
ASTM D3282: A-2-7 (0)

As Received Moisture Content (%): 12.0

Comments:
-

ENG-TECH Consulting Limited

Per _____

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

Email: WSP Canada Inc. Contact Group

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

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LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS

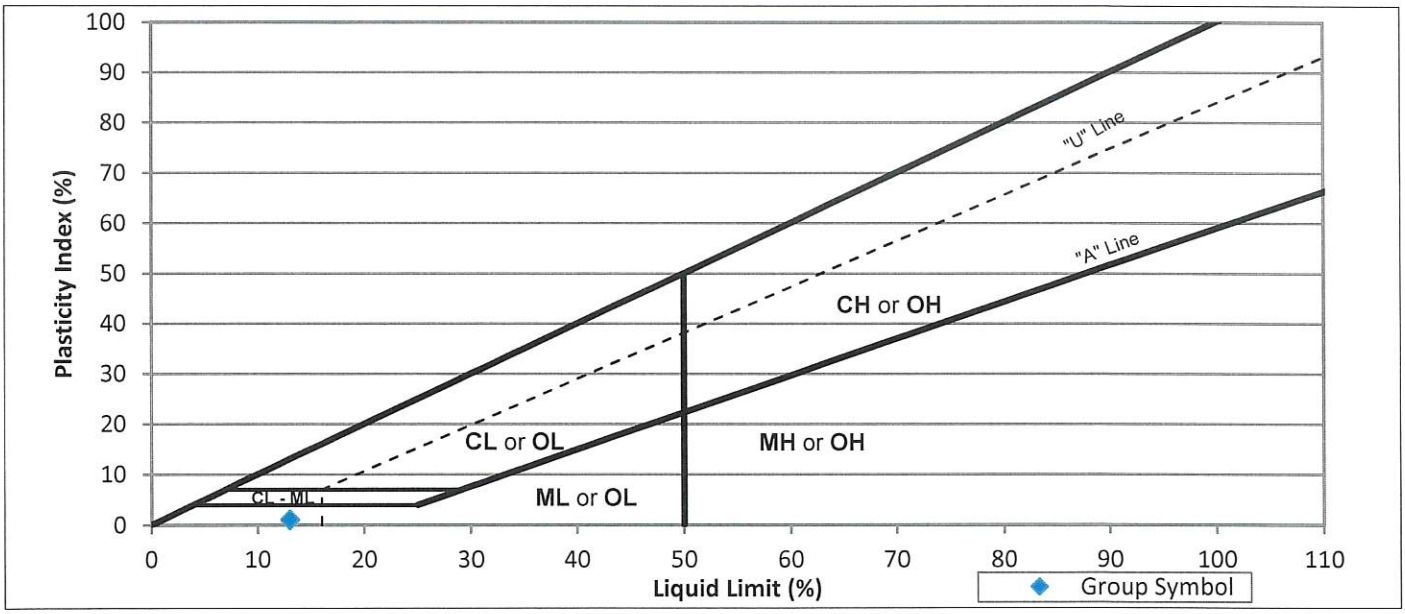
CERTIFIED BY CCIL Canadian Council of Independent Laboratories For specific tests as listed on www.ccil.com

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

File No.: 24-035-01
Ref. No.: 24-35-1-5

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Plessis Road
Material Type: -
Material Description: Silty sand
Test Hole No.: 11
Date Sampled: Apr 5/24
Date Received: May 25/24
Sample No.: 2
Sampled By: ENG-TECH (Shah Zeb)
Date Tested: May 28/24
Depth: 0.9 m
Tested By: ENG-TECH (Jessica Bauer)
Test Method: ASTM D4318 - B (Single Point)
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 (%): 13 **Plastic Limit (%):** 12 **Plasticity Index (%):** 1

Percentage of sand particles retained on 0.425mm sieve: 52.3

Classification: ASTM D2487: Silty sand with gravel, SM
ASTM D3282: A-1-b (0)

As Received Moisture Content (%): 8.0

Comments:
-

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LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS

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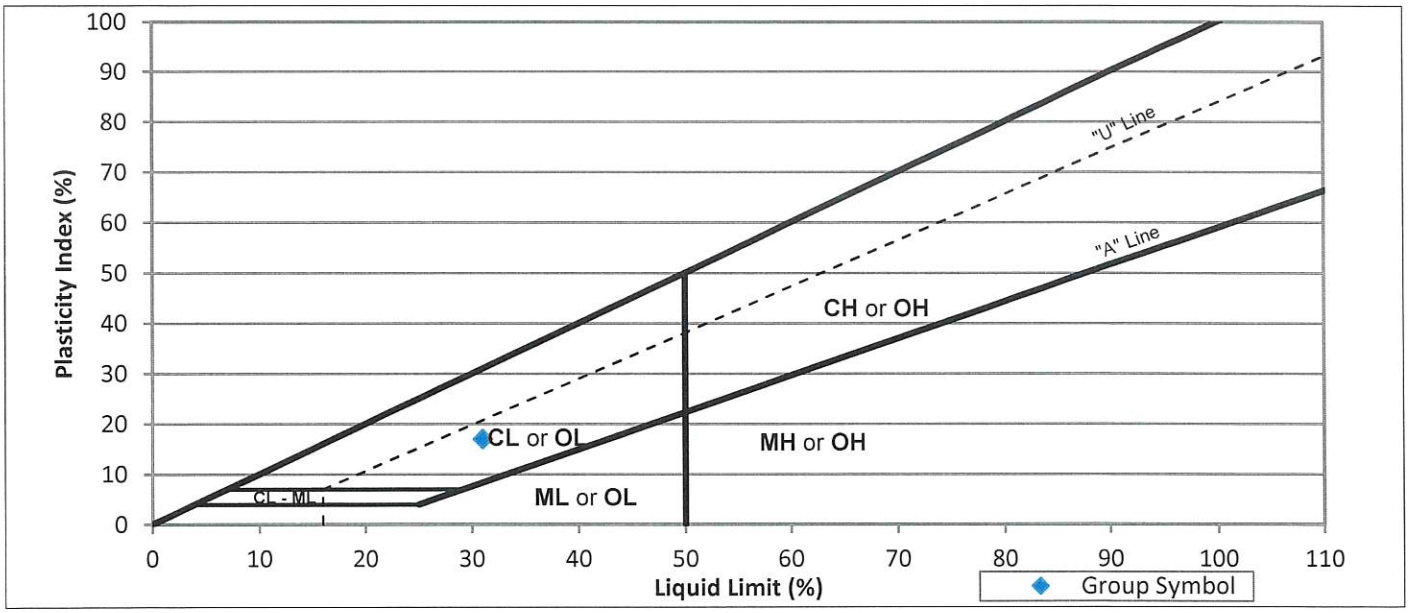
WSP Canada Inc.
1600 Buffalo Place
Winnipeg, Manitoba
R3T 6B8

File No.: 24-035-01
Ref. No.: 24-35-1-6

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Plessis Road
Material Type: -
Material Description: Clayey sand
Test Hole No.: 12
Date Sampled: Apr 5/24
Date Received: May 25/24
Sample No.: 1
Sampled By: ENG-TECH (Shah Zeb)
Date Tested: May 28/24
Depth: 0.6 m
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 (%): 31 **Plastic Limit (%):** 14 **Plasticity Index (%):** 17

Percentage of sand particles retained on 0.425mm sieve: 45.3

Classification: ASTM D2487: Clayey sand with gravel, SC
ASTM D3282: A-2-6 (1)

As Received Moisture Content (%): 8.2

Comments:
-

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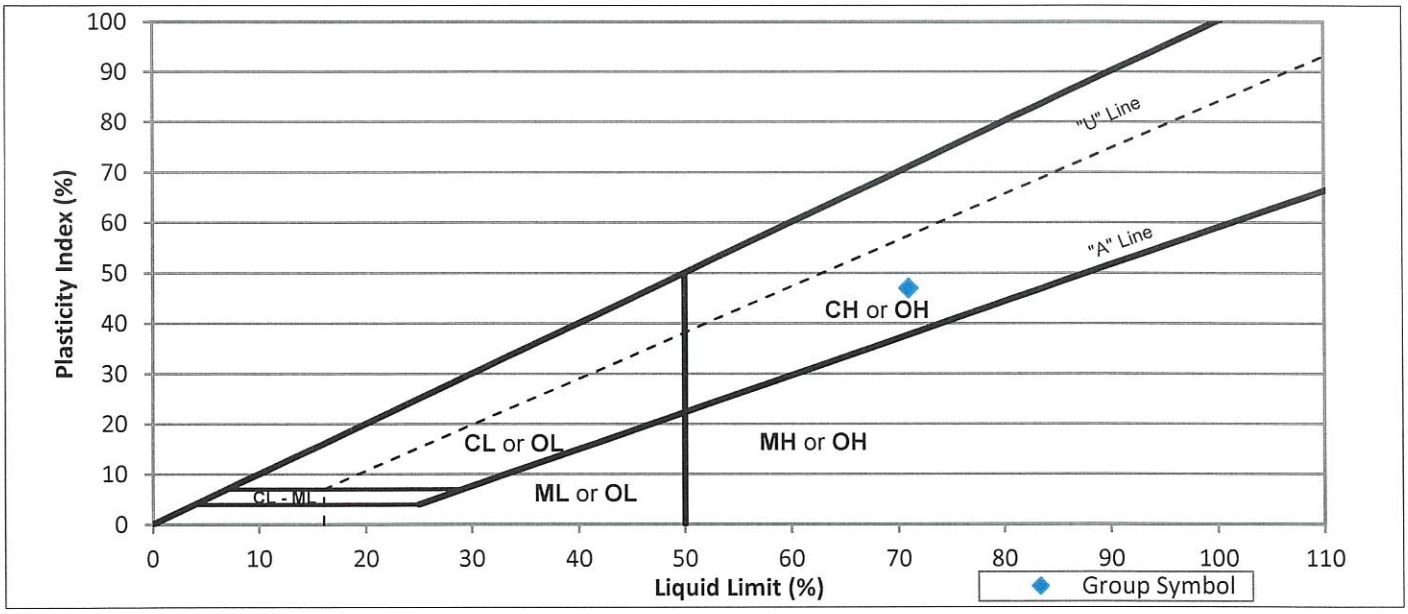
1600 Buffalo Place
Winnipeg, Manitoba
R3T 6B8

File No.: 24-035-01
Ref. No.: 24-35-1-7

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Plessis Road
Material Type: -
Material Description: Sandy clay
Test Hole No.: 13
Date Sampled: Apr 5/24
Date Received: May 25/24
Sample No.: 2
Sampled By: ENG-TECH (Shah Zeb)
Date Tested: May 28/24
Depth: 0.9 m
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 (%): 71 **Plastic Limit (%):** 24 **Plasticity Index (%):** 47

Percentage of sand particles retained on 0.425mm sieve: 9.4

Classification: ASTM D2487: Fat clay with sand, CH
ASTM D3282: A-7-6 (43)

As Received Moisture Content (%): 30.6

Comments:
-

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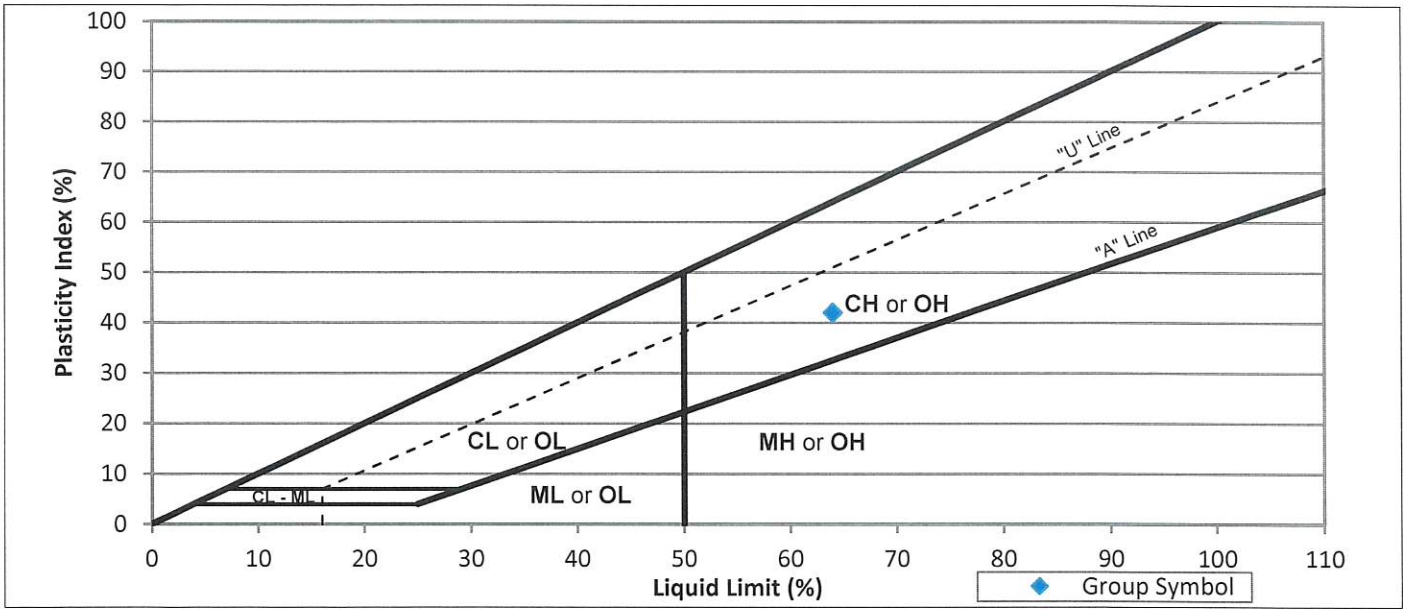
R3T 6B8

File No.: 24-035-01
Ref. No.: 24-35-1-8

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Shoulder, Plessis Road
Material Type: -
Material Description: Sandy clay
Test Hole No.: 21
Date Sampled: Apr 5/24
Date Received: May 25/24
Sample No.: 2
Sampled By: ENG-TECH (Shah Zeb)
Date Tested: May 28/24
Depth: 0.9 m
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 (%): 64 **Plastic Limit (%):** 22 **Plasticity Index (%):** 42

Percentage of sand particles retained on 0.425mm sieve: 24.1

Classification: ASTM D2487: Sandy fat clay, CH
ASTM D3282: A-7-6 (24)

As Received Moisture Content (%): 30.6

Comments:
-

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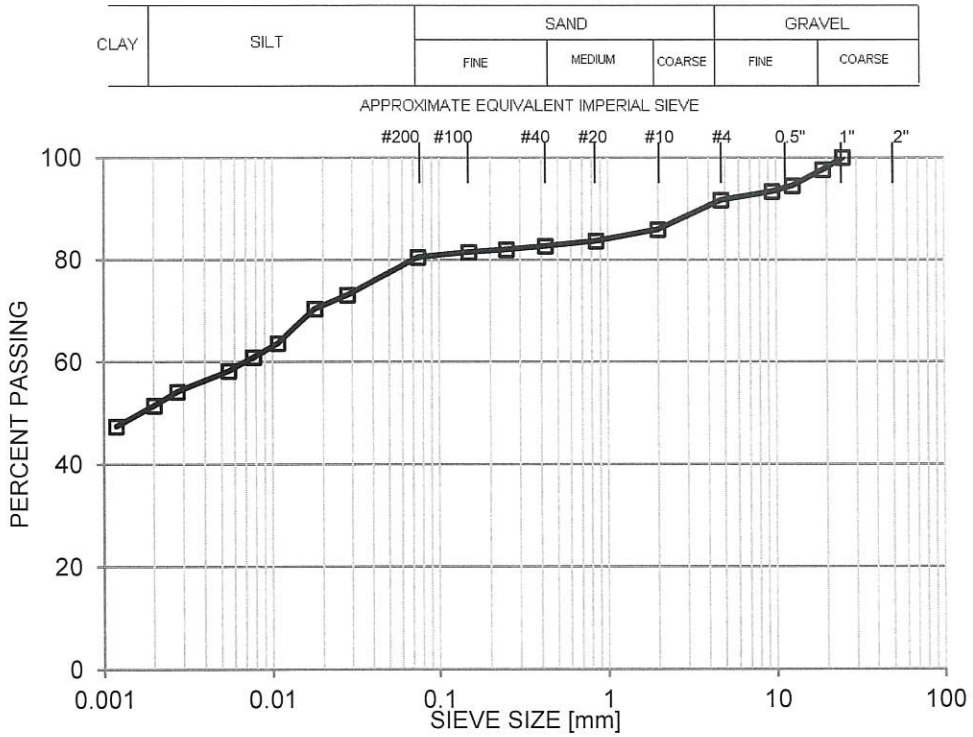
File No.: 24-035-01
Ref. No.: 24-35-1-9

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Shoulder, Plessis Road
Material Description: Sandy clay

Test Hole No.:	10	**Date Sampled:**	Apr 5/24	**Sampled By:**	ENG-TECH (Shah Zeb)
Sample No.:	2	**Date Received:**	May 25/24	**Sample Type:**	Auger cutting
Depth:	0.9 m	**Date Tested:**	May 28/24	**Tested By:**	ENG-TECH (Tim Christensen)
Test Method:	ASTM D6913 & D7928	**Drying Method:**	Air	**Specific Gravity:**	Estimated 2.7
Method Used:	A	**Dispersion Process:**	Stirrer / Tipping	**Separating Sieve Size (mm):**	2.0
Dispersion Device:	Apparatus A: Humboldt Mechanical Analysis Stirrer			**Dispersion Time (min.):**	1



SIEVE SIZE (mm)	PERCENT PASSING
25.0	100
19.0	98
12.5	95
9.5	93
4.75	92
2.0	85.9
0.850	84
0.425	83
0.250	82
0.150	81
0.075	80.5
0.028	73
0.018	70
0.011	64
0.0078	61
0.0055	58
0.0028	54
0.0020	51
0.0012	47

Percent of: GRAVEL (8.3 %), SAND (11.2 %), SILT (29.1 %), CLAY (51.4 %)
Classification: ASTM D2487: Fat clay with sand, CH
ASTM D3282: A-7-6 (40)
As Received Moisture Content (%): 26.9
Comments:

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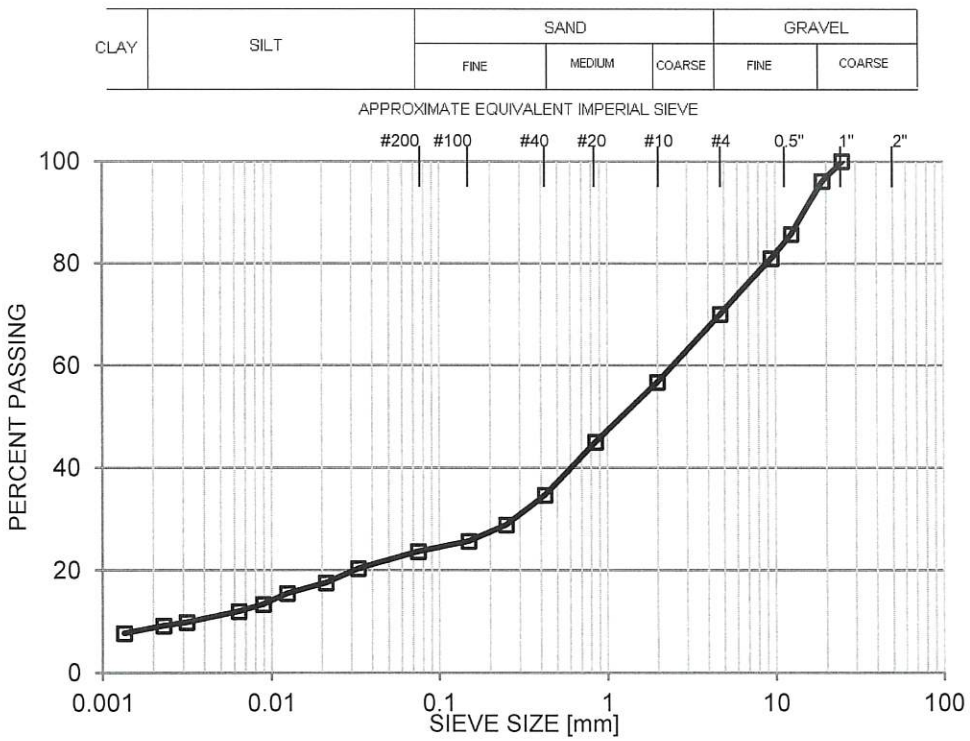
File No.: 24-035-01
Ref. No.: 24-35-1-10

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Shoulder, Plessis Road
Material Description: Clayey sand

Test Hole No.:	10	**Date Sampled:**	Apr 5/24	**Sampled By:**	ENG-TECH (Shah Zeb)
Sample No.:	4	**Date Received:**	May 25/24	**Sample Type:**	Auger cutting
Depth:	1.6 m	**Date Tested:**	May 29/24	**Tested By:**	ENG-TECH (Tim Christensen)
Test Method:	ASTM D6913 & D7928	**Drying Method:**	Air	**Specific Gravity:**	Estimated 2.7
Method Used:	A	**Dispersion Process:**	Stirrer / Tipping	**Separating Sieve Size (mm):**	2.0
Dispersion Device:	Apparatus A: Humboldt Mechanical Analysis Stirrer			**Dispersion Time (min.):**	1



SIEVE SIZE (mm)	PERCENT PASSING
25.0	100
19.0	96
12.5	86
9.5	81
4.75	70
2.0	56.7
0.850	45
0.425	35
0.250	29
0.150	26
0.075	23.6
0.033	20
0.021	18
0.012	15
0.0089	13
0.0064	12
0.0031	10
0.0023	9
0.0013	8

Percent of: GRAVEL (30.0 %), SAND (46.4 %), SILT (14.9 %), CLAY (8.8 %)
Classification: ASTM D2487: Clayey sand with gravel, SC
ASTM D3282: A-2-7 (0)
As Received Moisture Content (%): 12.0
Comments:

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File No.: 24-035-01
Ref. No.: 24-35-1-11

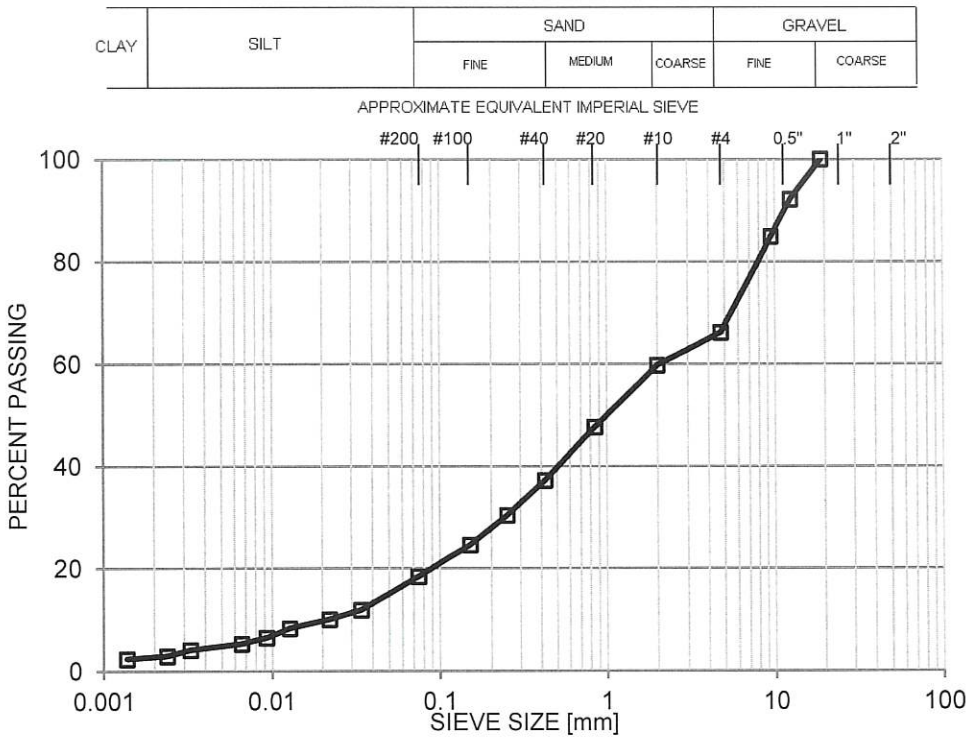
Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Plessis Road
Material Description: Silty sand with gravel

Test Hole No.: 11
Sample No.: 2
Depth: 0.9 m
Test Method: ASTM D6913 & D7928
Method Used: A
Dispersion Device: Apparatus A: Humboldt Mechanical Analysis Stirrer

Date Sampled: Apr 5/24
Date Received: May 25/24
Date Tested: May 29/24
Drying Method: Air
Dispersion Process: Stirrer / Tipping

Sampled By: ENG-TECH (Shah Zeb)
Sample Type: Auger cutting
Tested By: ENG-TECH (Tim Christensen)
Specific Gravity: Estimated 2.7
Separating Sieve Size (mm): 2.0
Dispersion Time (min.): 1



SIEVE SIZE (mm)	PERCENT PASSING
19.0	100
12.5	92
9.5	85
4.75	66
2.0	59.8
0.850	48
0.425	37
0.250	30
0.150	25
0.075	18.4
0.034	12
0.022	10
0.013	8
0.0093	7
0.0066	5
0.0033	4
0.0024	3
0.0014	2

Percent of: GRAVEL (33.9 %), SAND (47.8 %), SILT (15.6 %), CLAY (2.8 %)
Classification: ASTM D2487: Silty sand with gravel, SM
ASTM D3282: A-1-6 (0)
As Received Moisture Content (%): 8.0
Comments:

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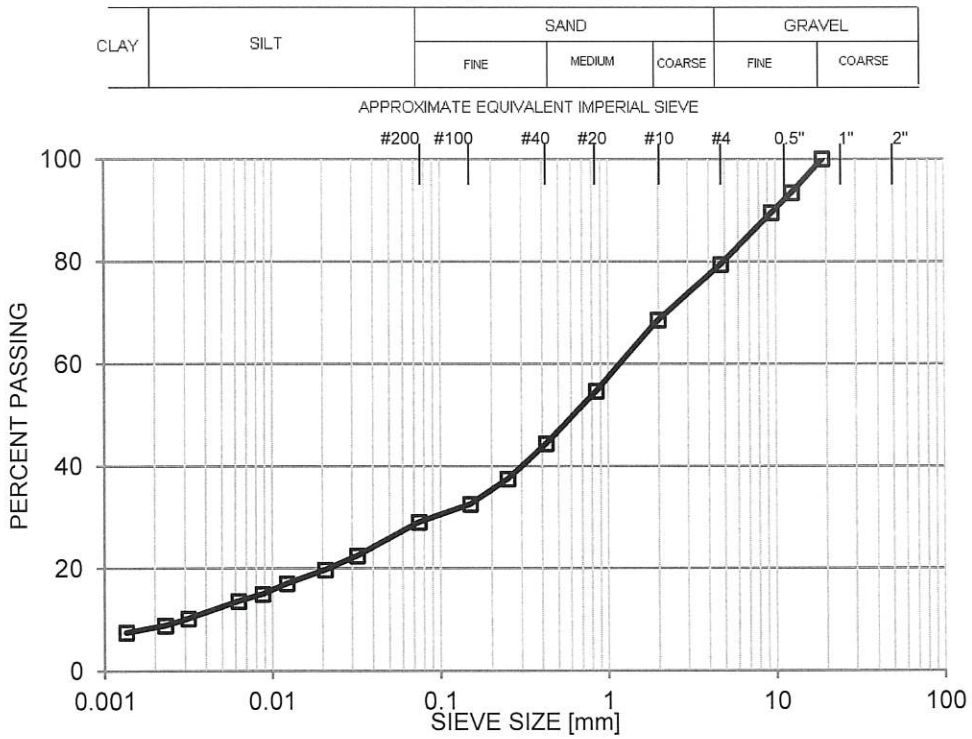
File No.: 24-035-01
Ref. No.: 24-35-1-12

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Plessis Road
Material Description: Clayey sand

Test Hole No.:	12	**Date Sampled:**	Apr 5/24	**Sampled By:**	ENG-TECH (Shah Zeb)
Sample No.:	1	**Date Received:**	May 25/24	**Sample Type:**	Auger cutting
Depth:	0.6 m	**Date Tested:**	May 29/24	**Tested By:**	ENG-TECH (Tim Christensen)
Test Method:	ASTM D6913 & D7928	**Drying Method:**	Air	**Specific Gravity:**	Estimated 2.7
Method Used:	A	**Dispersion Process:**	Stirrer / Tipping	**Separating Sieve Size (mm):**	2.0
Dispersion Device:	Apparatus A: Humboldt Mechanical Analysis Stirrer			**Dispersion Time (min.):**	1



SIEVE SIZE (mm)	PERCENT PASSING
19.0	100
12.5	93
9.5	90
4.75	79
2.0	68.6
0.850	55
0.425	44
0.250	37
0.150	33
0.075	29.0
0.032	22
0.021	20
0.012	17
0.0088	15
0.0063	14
0.0031	10
0.0023	9
0.0013	7

Percent of: GRAVEL (20.6 %), SAND (50.4 %), SILT (20.5 %), CLAY (8.5 %)
Classification: ASTM D2487: Clayey sand with gravel, SC
ASTM D3282: A-2-6 (1)
As Received Moisture Content (%): 8.2
Comments:

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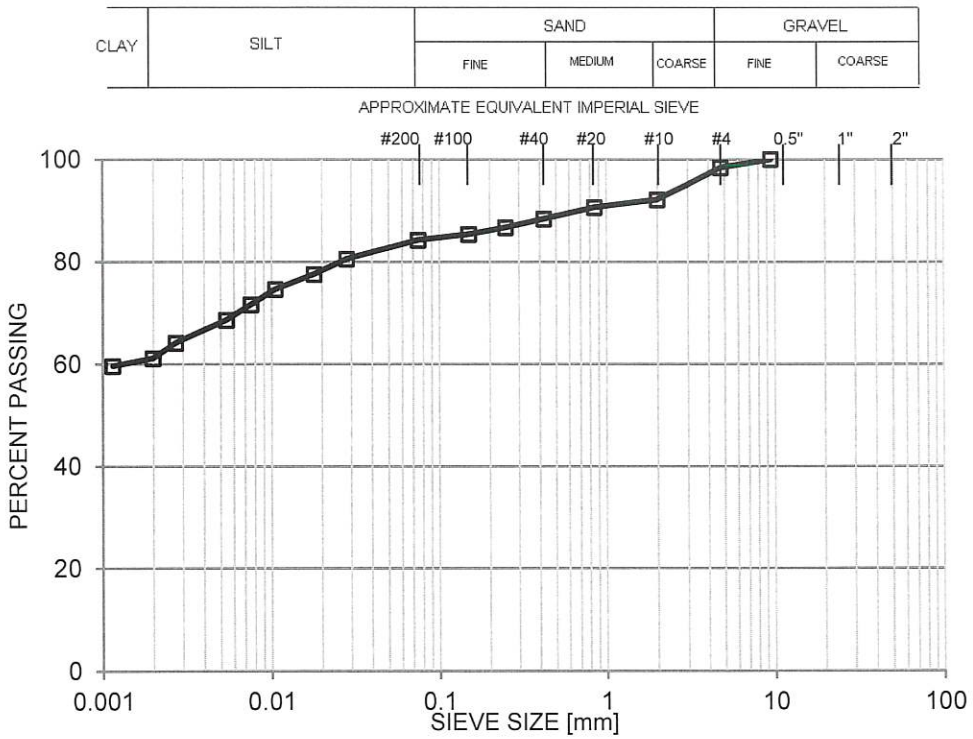
File No.: 24-035-01
Ref. No.: 24-35-1-13

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Plessis Road
Material Description: Sandy clay

Test Hole No.:	13	**Date Sampled:**	Apr 5/24	**Sampled By:**	ENG-TECH (Shah Zeb)
Sample No.:	2	**Date Received:**	May 25/24	**Sample Type:**	Auger cutting
Depth:	0.9 m	**Date Tested:**	May 29/24	**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



SIEVE SIZE (mm)	PERCENT PASSING
9.5	100
4.75	98
2.0	92.1
0.850	91
0.425	88
0.250	87
0.150	85
0.075	84.3
0.028	81
0.018	78
0.011	75
0.0076	72
0.0054	69
0.0027	64
0.0020	61
0.0011	60

Percent of: GRAVEL (1.6 %), SAND (14.1 %), SILT (23.1 %), CLAY (61.2 %)
Classification: ASTM D2487: Fat clay with sand, CH
ASTM D3282: A-7-6 (43)
As Received Moisture Content (%): 30.6
Comments:

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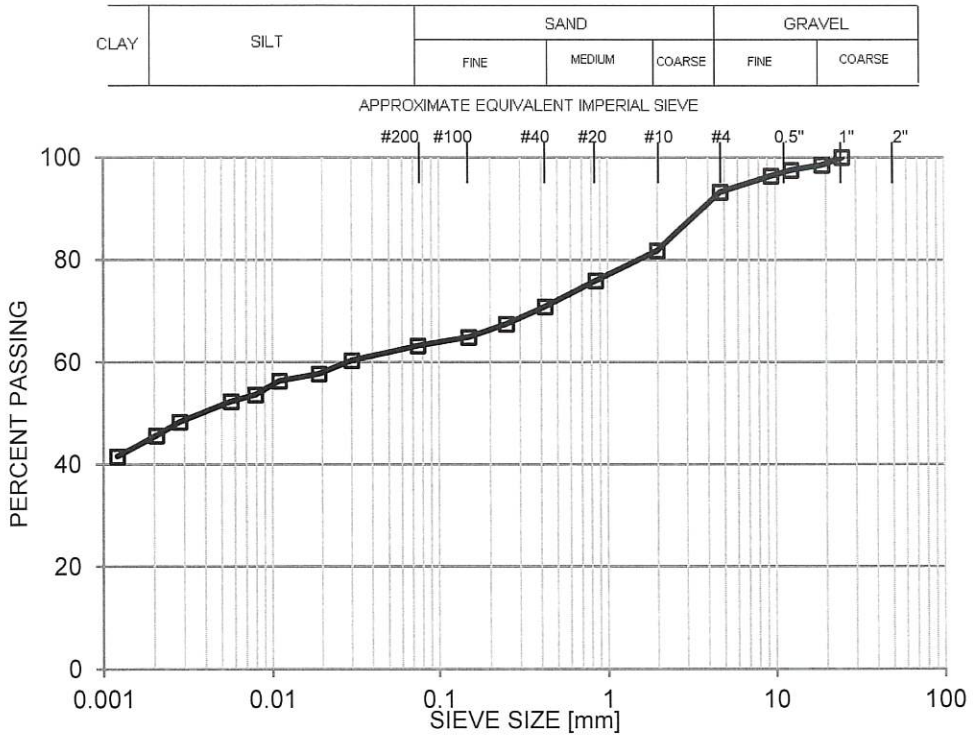
File No.: 24-035-01
Ref. No.: 24-35-1-14

Attention: Scott Suderman, C.E.T., P. Eng.
Project: CW 749 - 2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Shoulder, Plessis Road
Material Description: Sandy clay

Test Hole No.:	21	**Date Sampled:**	Apr 5/24	**Sampled By:**	ENG-TECH (Shah Zeb)
Sample No.:	2	**Date Received:**	May 25/24	**Sample Type:**	Auger cutting
Depth:	0.9 m	**Date Tested:**	May 29/24	**Tested By:**	ENG-TECH (Tim Christensen)
Test Method:	ASTM D6913 & D7928	**Drying Method:**	Air	**Specific Gravity:**	Estimated 2.7
Method Used:	A	**Dispersion Process:**	Stirrer / Tipping	**Separating Sieve Size (mm):**	2.0
Dispersion Device:	Apparatus A: Humboldt Mechanical Analysis Stirrer			**Dispersion Time (min.):**	1



SIEVE SIZE (mm)	PERCENT PASSING
25.0	100
19.0	99
12.5	97
9.5	96
4.75	93
2.0	81.8
0.850	76
0.425	71
0.250	67
0.150	65
0.075	63.2
0.030	60
0.019	58
0.011	56
0.0079	54
0.0057	52
0.0028	48
0.0021	46
0.0012	42

Percent of: GRAVEL (6.8 %), SAND (30.0 %), SILT (17.8 %), CLAY (45.4 %)
Classification: ASTM D2487: Sandy fat clay, CH
ASTM D3282: A-7-6 (24)
As Received Moisture Content (%): 30.6
Comments:

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File No.: 24-035-01
Ref. No.: 24-35-1-15

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

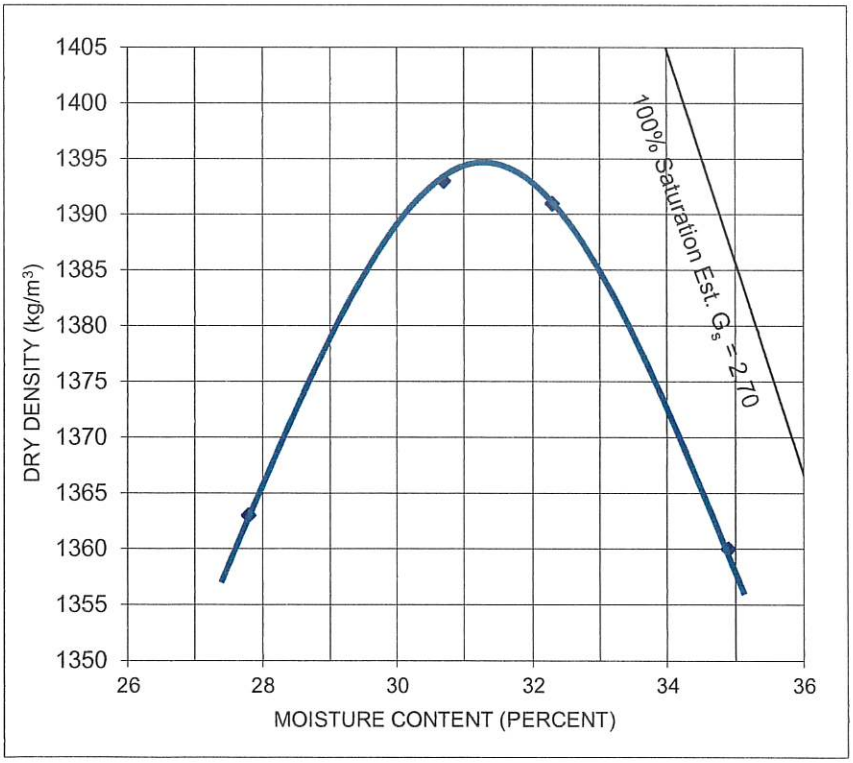
Attention: Scott Suderman, C.E.T., P. Eng.

Project: CW 749-2023 - PAVEMENT RENEWALS ON DUGALD ROAD AND PLESSIS ROAD

Source: Plessis Road, composite of TH20, TH22 and TH24, 0.6 to 1.2 m
Material Type: Sub-grade Description: Clay fill, dark brown, moist, medium plastic, trace to some silt, sand and gravel
Date Sampled: Apr 8/24 to Apr 10/24 Date Received: Apr 8/24 to Apr 10/24 Date Tested: Jun 3/24
Sampled By: ENG-TECH (Shah Zeb) Tested By: ENG-TECH (Jasraj Nanda)
Compaction Standard Method: [✓] ASTM D698 [ ] ASTM D1557
Correction Standard Method: [ ] ASTM D4718
Preparation Method: Moist Compaction Method: Manual

Test Compaction Method: A

Material Oversize:
4.75 mm: 0.4 %
19.0 mm: - %



Dry Density (kg/m³)	Moisture Content (%)
1363	27.8
1393	30.7
1391	32.3
1360	34.9

Maximum Dry Density (MDD): 1395 kg/m³
Optimum Moisture (OM): 31.3 %

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

Received Moisture Content: - %

Comments:

Email: WSP Canada Inc. Contact Group

ENG-TECH Consulting Limited

Per _____

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