

APPENDIX A

**Gemtec
Factual Report for Geotechnical Investigation,
Kouchibouguac North Road**



**Factual Report
Kouchibouguac North Road**

Kouchibouguac, New Brunswick
July 17, 2015

Prepared for Public Works and Government Services
Canada
Project No. 4735.64 – R01





GEMTEC

CONSULTING ENGINEERS
AND SCIENTISTS

GEMTEC Limited tel: 506.453.1025
191 Doak Road fax: 506.453.9470
Fredericton, NB fredericton@gemtec.ca
E3C 2E6 www.gemtec.ca

17 July 2015

File: 4735.64 – R01

Public Works and Government Services Canada
1045 Main Street
Moncton, NB
E1C 1H1

Attention: Jean Girouard, P.Eng.

**Re: Factual Report, Kouchibouguac North Road
Kouchibouguac, New Brunswick**

Please find enclosed our factual report for the geotechnical investigation at the Kouchibouguac North Road in the village of Kouchibouguac, New Brunswick.

Corey Keats, M.Sc.E., P.Eng.

Neil Gillis, MIT

CK/ng

Enclosures

4735.64-R01 (Factual Report, Geotechnical Investigation).doc



**Factual Report,
Kouchibouguac North Road
Kouchibouguac, New Brunswick**

Table of Contents

Table of Contents.....	ii
Appendices	iii
List of Tables	iii
1.0 Introduction	1
2.0 Site Description	2
3.0 Subsurface Soil Description.....	3
3.1 Overburden Soils.....	4
3.2 Bedrock	4
4.0 Closure.....	5
5.0 References.....	6

**Factual Report,
Kouchibouguac North Road
Kouchibouguac, New Brunswick**

Appendices

- A Borehole Location Plan
- B Descriptive Terms and Detailed Borehole Logs
- C Moisture Content Analyses
- D Soils Sieve Analyses

List of Tables

Table 1	Summary of Subsurface Soil Conditions	3
---------	---	---

**Factual Report,
Kouchibouguac North Road
Kouchibouguac, New Brunswick**

1.0 Introduction

Public Works and Government Services Canada (PWGSC) retained GEMTEC Limited to conduct a geotechnical investigation for proposed road improvements on a 1.5 kilometre section of Kouchibouguac North Road in Kouchibouguac National Park, New Brunswick. This investigation was conducted according to the requirements of the Standing Offer Contract (EC373-152028/A) between PWGSC and GEMTEC Limited.

The purpose of this investigation was to characterize the soil conditions in the area of the existing roadway. It is our understanding that the roadway will be reconstructed along the 1.5 kilometre section. The scope of work included drilling seventeen boreholes, put down in 100 metre increments on alternating sides of the road. See Appendix A for borehole layout on site and Appendix B for descriptive terms and borehole logs.

On June 18, 2015 the boreholes were advanced at the site using track-mounted drill rig. GEMTEC personnel were onsite to log the soil conditions encountered at the borehole locations during the investigation.

During borehole advancement, SPT N¹-values were recorded throughout soil sampling and soil samples were collected for laboratory testing. Moisture content and sieve analyses of soil particle sizes were conducted on the subgrade soils (Appendices C and D, respectively). Boreholes were terminated in soils that consisted of glacial till, silty sand, or sandstone at depths of 1.65 to 2.40 metres below existing surface grade (elevation +13.0 metres to +19.6 metres, geodetic datum).

The subgrade soils at the site generally consist of glacial till interspersed with sand layers with varying quantities of silty, gravel, and/or clay. Possible bedrock was encountered at four borehole locations: one at the westernmost borehole and three on the eastern portion of the roadway (BH.

¹ The number of blows of a 475 Joule free fall hammer required to advance a 50 mm ø split spoon sampler a distance of 300 mm

2.0 Site Description

The North Kouchibouguac Road is located in the village of Kouchibouguac, New Brunswick. The road section proposed for reconstruction is located within the Kouchibouguac National Park. The section begins at the Kouchibouguac North Road and New Brunswick Highway 117 intersection and ends 1.5 kilometres westward.

Kouchibouguac North extends a further one kilometre westward and intersects with New Brunswick Highway 11. The roadway is currently asphalt with a shoulder on either side, is approximately 0.5 metres wide. Residential dwellings adjoin the westernmost 400 metre investigated portion of the roadway. The remainder of the investigated area is within the National Park. See Appendix A for a borehole location plan with a plan view of the site.

It is our understanding that reconstruction is proposed for the investigated portion of the roadway.

3.0 Subsurface Soil Description

The subsurface soil conditions at the site generally consist of silty sand interspersed with varying amounts of gravel and clay. The natural soils are overlain by approximately 0.15 metres of sand and gravel, which in turn is overlain by 0.05 to 0.1 metres of asphalt. Spoon refusal was encountered at four borehole locations indicating possible bedrock; spoon samples at these locations indicate the bedrock may be sedimentary sandstone rock.

See Appendix A for borehole location plan; Appendix B for detailed borehole logs, and Appendices C and D for laboratory results.

Table 1 Summary of Subsurface Soil Conditions

Borehole	Surface Elevation (m)	Borehole Depth (m)	Overburden Drilled (m)		Bedrock Elevation (m)
			Asphalt and Fill	Glacial Till	
BH1	14.60	1.65	0.3	1.2	13.10
BH2	19.03	1.80	0.3	1.8	-
BH3	21.10	2.40	0.3	2.1	-
BH4	21.22	1.80	0.2	1.6	-
BH5	21.69	2.40	0.2	2.2	-
BH6	21.93	2.40	0.2	2.2	-
BH7	21.02	2.40	0.2	2.2	-
BH8	19.26	2.40	0.3	2.1	-
BH9	18.44	2.40	0.2	2.2	-
BH10	20.31	2.40	0.2	2.2	-
BH11	21.47	2.40	0.2	2.2	-
BH12	22.03	2.40	0.2	2.2	19.63
BH13	21.45	2.40	0.3	1.8	19.35
BH14	20.78	2.40	1.1	1.1	18.38
BH15	19.79	2.40	0.3	1.8	17.79
BH16	18.02	2.40	0.2	2.2	-
BH17	15.85	2.40	0.3	2.1	-

3.1 Overburden Soils

At the surfaces of all boreholes 0.05 to 0.1 metres of asphalt was encountered above 0.1 to 0.25 metres of sand and gravel fill. The fill soils are underlain by native silty sand with trace to some gravel, and trace clay (glacial till). The composition of the glacial till varies between gravelly silty sand and silt with trace to some sand and gravel. Based on the SPT N-values (ranging from 1 to 56, with an average of 19), the compactness of the glacial till can be described as medium dense. Soils sieve and moisture content analyses conducted on representative samples reveal that it is composed of approximately 53% to 79% sand, 1% to 21% cobbles and gravel, and 19% to 36% silt and clay, with a moisture content ranging from 8% to 22%.

The lab results and field observations confirm the soil is relatively consistent at all borehole locations.

3.2 Bedrock

Bedrock samples were not cored at the site; however, spoon samples of the possible bedrock indicate weathered sandstone was present.

Geological mapping indicates that the overburden soils in the Kouchibouguac area rest on Pennsylvanian-aged or younger red to grey sandstone, conglomerate, and siltstone.

4.0 Closure

The boreholes put down at this site are widely scattered and soil and bedrock conditions may vary from those determined at the borehole locations. Although representative samples were taken, GEMTEC Limited personnel should be contacted immediately if the soils encountered during excavations are different than those encountered in our geotechnical investigation.

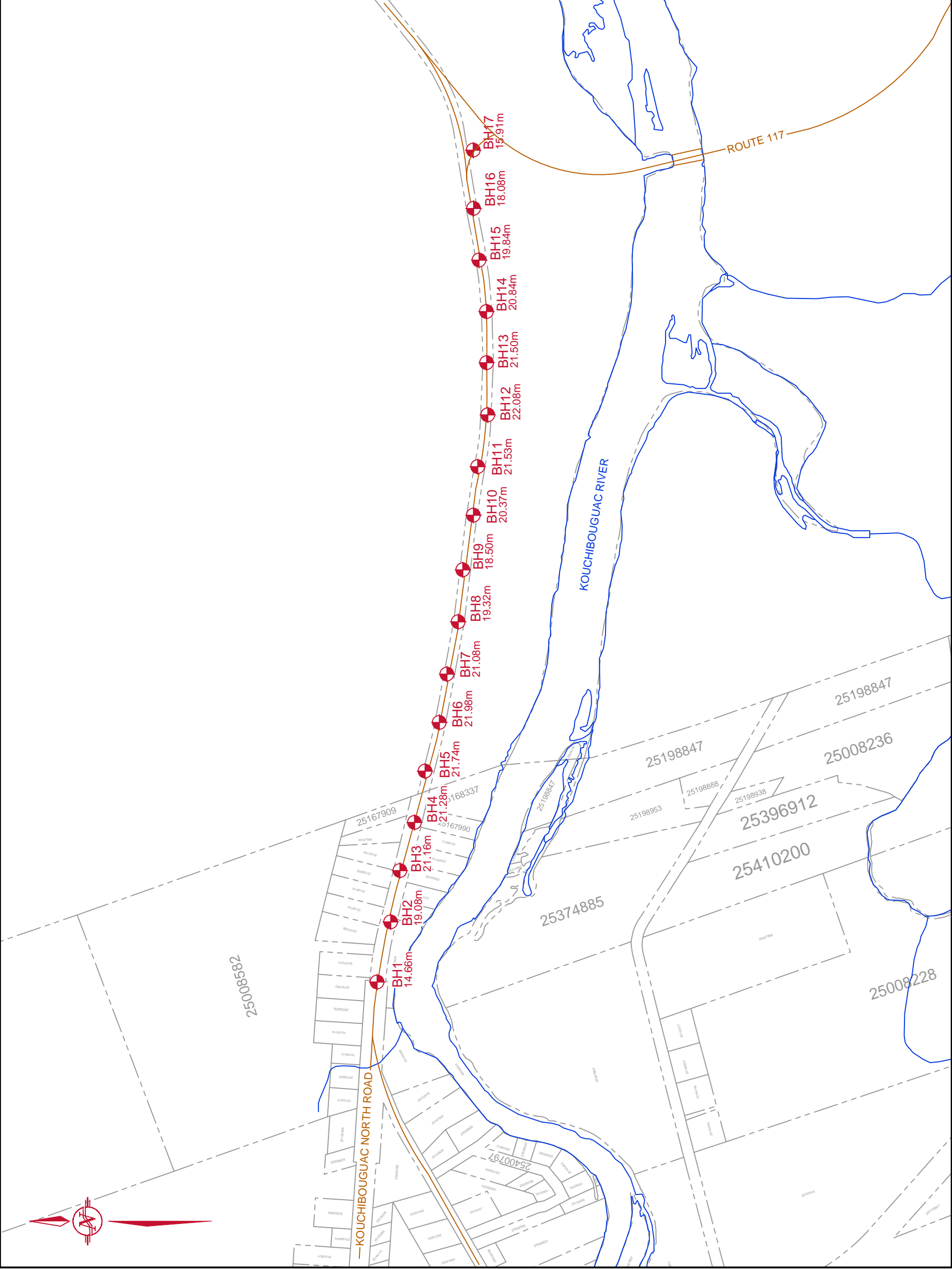
The investigation outlined in this report is strictly geotechnical in nature and should not be viewed as an environmental assessment of the site.

5.0 References

- (1) New Brunswick Department of Natural Resources and Energy, 2000. Bedrock Geology of New Brunswick. Minerals and Energy Division. Map NR-1 (2000 Edition). Scale 1:500 000.
- (2) Fyffe, L.R. and Richard, D.M. 2007. Lithological map of New Brunswick. New Brunswick Department of Natural Resources: Minerals, Policy and Planning Division: Plate 2007 – 18.

Appendix A

Borehole Location Plan



Legend



BOREHOLE LOCATION

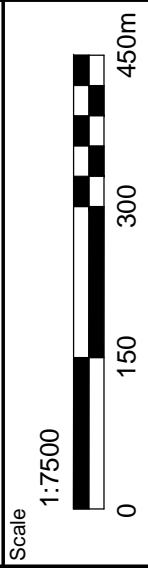
Drawn By	CHG	Checked By	AT
Calculations By	---	Checked By	----
Date	JULY 2015		

Project

GEOTECHNICAL INVESTIGATION
KOUCHIBOUGUAC NORTH ROAD, NB

Drawing

BOREHOLE LOCATION PLAN



File No.	Drawing	Revision No.
47356401	FIGURE 1	0



GEMTEC
CONSULTING ENGINEERS
AND SCIENTISTS

Appendix B

Descriptive Terms and Detailed Borehole Logs

DESCRIPTIVE TERMS- BOREHOLE/TEST PIT LOG

SOILS

GRAIN SIZE

0.01

0.1

1.0

10

100

1000mm

SILT CLAY

SAND

GRAVEL

Cobble

BOULDER

F

M

C

0.08

0.4

2

5

80

200

DESCRIPTIVE TERMINOLOGY

0

10

20

35

weight. % of material

TRACE	SOME	ADJECTIVE	and > 35% noun > 35% and main fraction
trace clay, etc.	some gravel, etc.	silty, etc.	sand and gravel, etc.

COMPACTNESS

gravels, sands, tills

N, RANGE	0 - 4	4 - 10	10 - 30	30 - 50	> 50
DENSITY	V. LOOSE	LOOSE	MEDIUM	DENSE	V. DENSE

CONSISTENCY

silt, clay

S, KPa	< 12.5	12.5 - 25	25 - 50	50 - 100	100 - 200
CONSISTENCY	V. SOFT	SOFT	MEDIUM	STIFF	V. STIFF

ROCK

RQD

0 - 25

25 - 50

50 - 75

75 - 90

90 - 100

OVERALL QUALITY

VERY POOR

POOR

FAIR

GOOD

EXCELLENT

FRACTURE SPACING

VERY CLOSE 20 - 60 mm

CLOSE 60 - 200 mm

MODERATE 200 - 600 mm

WIDE 600 - 2000 mm









VERY WIDE 2 - 6 m

COMP. STR. MPa	1 - 5	5 - 25	25 - 50	50 - 100	100 - 250
DESCRIPTION	V. WEAK	WEAK	MODERATE	STRONG	V. STRONG





SAMPLE TYPES (location to scale on log)

S SPLIT TUBE	G SHOVEL
T SHELBY TUBE	H CARVED BLOCK
P PISTON	K SLOTTED
F AUGER	V IN SITU VANE
W WASH	NR NO RECOVERY

LOG SYMBOLS

			
GRAVEL	SAND	SILT	CLAY
			
ORGANIC	BOULDER	ROCK	TILL

ROCK CORES A(30mm); B(41mm); N(54mm)

			
SCREEN WITH SAND	PIPE WITH SAND	PIPE WITH BENTONITE	PIPE WITH BACKFILL

WELL SYMBOLS

- N - standard penetration test; blows by 475 J drop hammer to advance Std. 50mm O.D. split tube sampler 0.3m
- RQD - percent of core consisting of hard, sound pieces in excess of 100mm long (excluding machine breaks)
- RECOVERY - sample recovery expressed as percent or length
- S - shear strength, kPa; vane \oplus ; penetrometer \blacksquare ; unconfined \circ ; U_c unconfined compressive strength
- S_r - shear strength, remoulded; vane \otimes ; penetrometer \square
- D_d - dry density; t/m³
- W - natural moisture content, percent *
- PL - plastic limit, percent —
- LL - liquid limit, percent —
- ND - non detect, total petroleum hydrocarbons (TPH) not detected in soil
- Groundwater Level ∇ ; Seepage ∇

BOREHOLE LOGS

Client				Public Works & Government Services Canada				Proj No.		473564		BOREHOLE	
Project				Geotechnical Investigation				Date Drilled		18June2015		BH1	
Location				Kouchibouguac North Road, Kouchibouguac, New Brunswick								Page 1 of 1	
Ground Level, m				14.60				Datum:		Geodetic		Logged By	
										NG			

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0						0.05 ASPHALT	14.55
	1	S	20	450		Brown SAND and GRAVEL	
						0.30	14.30
						Brown silty sand, some gravel, trace clay (TILL)	
	2	S	13	520			
1						- silt and sand, trace gravel (AASHTO A-4 to A-7)	
	3	S	100	330			
						1.50	13.10
						Grey SANDSTONE	
						1.65	12.95
						End of borehole at 1.65 mbgs	

0 25 50 75 100 Undrained Shear Strength - kPa_s

○ Unconfined Compression ■ Pocket Penetrometer

⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

Standard Penetration Test, blows/0.3m

W_p W_L

0 10 20 30 40 50 60 70 80 90 100

BOREHOLE LOGS

Client				Public Works & Government Services Canada				Proj No.		473564		BOREHOLE	
Project				Geotechnical Investigation				Date Drilled		18June2015		BH2	
Location				Kouchibouguac North Road, Kouchibouguac, New Brunswick								Page 1 of 1	
Ground Level, m				19.03				Datum:		Geodetic		Logged By	
										NG			

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0						0.05 ASPHALT	18.98
	1	S	18	450		Brown SAND and GRAVEL	
						0.30	18.73
						Brown silty sand, some gravel, trace clay (TILL)	
						0.60	18.43
	2	S	7	510		Brown silty SAND, trace gravel	
1						- sand, some gravel, some silt (AASHTO A-2-4)	
	3	S	18	480		1.30	17.73
						Brown silty sand, some gravel, trace clay (TILL)	
						1.80	17.23
						End of borehole at 1.8 mbgs Groundwater encountered at 1.3 mbgs	

0 25 50 75 100 Undrained Shear Strength - kPa_s

○ Unconfined Compression ■ Pocket Penetrometer
 ⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits
 Dynamic Penetration Test, blows/0.3m
 Standard Penetration Test, blows/0.3m

W_p W_L

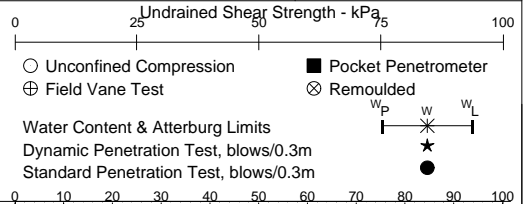
0 10 20 30 40 50 60 70 80 90 100

BOREHOLE LOGS

Client	Public Works & Government Services Canada	Proj No.	473564	BOREHOLE
Project	Geotechnical Investigation	Date Drilled	18June2015	BH3
Location	Kouchibouguac North Road, Kouchibouguac, New Brunswick			Page 1 of 1

Ground Level, m	21.10	Datum:	Geodetic	Logged By	NG
-----------------	-------	--------	----------	-----------	----











DEPTH m	SAMPLE				LOG	DESCRIPTION										
	No	TYPE	N (RQD)	REC (mm)												
0						0.05 ASPHALT	21.05									
	1	S	22	450		Brown SAND and GRAVEL										
						0.30	20.80									
						Brown silty sand, some gravel, trace clay with sand seams (TILL)										
	2	S	11	520												
						- silty sand, some gravel (AASHTO A-2-4)										
1																
	3	S	9	450												
						1.40	19.70									
						Brown silty SAND, trace gravel										
	4	S	16	500												
2						2.00	19.10									
						Brown silty sand, some gravel, trace clay (TILL)										
						2.40	18.70									
						End of borehole at 2.4 mbgs										





473564	BOREHOLE
18June2015	BH4 Page 1 of 1

Logged By	NG
--------------	----

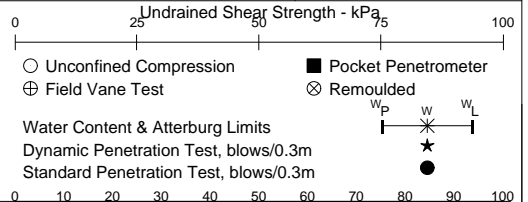
DEPTH m	SAMPLE				LOG	DESCRIPTION
	No	TYPE	N (RQD)	REC (mm)		
0						0.05 ASPHALT 21.17
	1	S	18	450		0.20 Brown SAND and GRAVEL 21.02
						Brown silty sand, some gravel, trace clay (TILL)
	2	S	7	550		
1						
	3	S	24	500		
						
						
						- silt, trace gravel, trace sand (AASHTO A-4 to A-7)
						1.80 19.42
						End of borehole at 1.8 mbgs

BOREHOLE LOGS

Client	Public Works & Government Services Canada	Proj No.	473564	BOREHOLE
Project	Geotechnical Investigation	Date Drilled	18June2015	BH5
Location	Kouchibouguac North Road, Kouchibouguac, New Brunswick			Page 1 of 1

Ground Level, m	21.69	Datum:	Geodetic	Logged By	NG
-----------------	-------	--------	----------	-----------	----

DEPTH m	SAMPLE				LOG	DESCRIPTION										
	No	TYPE	N (RQD)	REC (mm)												
0						0.05 ASPHALT	21.64									
	1	S	25	400		Brown SAND and GRAVEL	21.49									
						Brown silty sand, some gravel, trace clay (TILL)										
	2	S	6	300												
1																
	3	S	21	480												
						- silt, some sand, trace gravel (AASHTO A-4 to A-7)										
2	4	S	42	600												
						2.40	19.29									
						End of borehole at 2.4 mbgs										



BOREHOLE LOGS

Client Public Works & Government Services Canada				Proj No. 473564		BOREHOLE	
Project Geotechnical Investigation				Date Drilled 18June2015		BH6	
Location Kouchibouguac North Road, Kouchibouguac, New Brunswick						Page 1 of 1	
Ground Level, m 21.93		Datum: Geodetic		Logged By NG			

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0					0.10	ASPHALT	21.83
	1	S	24	450	0.20	Brown SAND and GRAVEL	21.73
						Brown silty sand, some gravel, trace clay (TILL)	
	2	S	11	500			
1					1.10	Brown SAND, some silt and gravel, trace clay	20.83
	3	S	20	510			
					1.50	Brown SAND, some silt	20.43
					1.60	Brown SAND, some silt and gravel, trace clay	20.33
2	4	S	25	600		- gravelly silty sand (AASHTO A-2-4)	
					2.40		19.53
						End of borehole at 2.4 mbgs	

0 25 50 75 100 Undrained Shear Strength - kPa_s

○ Unconfined Compression ■ Pocket Penetrometer
 ⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits
 Dynamic Penetration Test, blows/0.3m
 Standard Penetration Test, blows/0.3m

W_P W_L

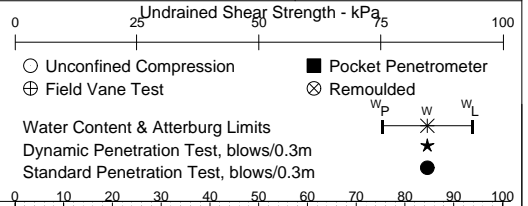
0 10 20 30 40 50 60 70 80 90 100

BOREHOLE LOGS

Client	Public Works & Government Services Canada	Proj No.	473564	BOREHOLE
Project	Geotechnical Investigation	Date Drilled	18June2015	BH7
Location	Kouchibouguac North Road, Kouchibouguac, New Brunswick			Page 1 of 1

Ground Level, m	21.02	Datum:	Geodetic	Logged By	NG
-----------------	-------	--------	----------	-----------	----

DEPTH m	SAMPLE				LOG	DESCRIPTION										
	No	TYPE	N (RQD)	REC (mm)												
0						0.10 ASPHALT	20.92									
	1	S	15	450		0.20 Brown SAND and GRAVEL - gravelly silty sand (AASHTO A-2-4) Brown silty sand, some gravel, trace clay (TILL)	20.82									
						0.60	20.42									
	2	S	9	550												
1						1.10	19.92									
						1.20	19.82									
	3	S	15	550		Brown SAND, some silt and gravel, trace clay Brown silty sand, some gravel, trace clay (TILL)										
	4	S	22	400												
2						2.20	18.82									
						Brown silty SAND, some gravel										
						2.40	18.62									
						End of borehole at 2.4 mbgs										



BOREHOLE LOGS

Client				Public Works & Government Services Canada				Proj No.		473564		BOREHOLE	
Project				Geotechnical Investigation				Date Drilled		18June2015		BH8	
Location				Kouchibouguac North Road, Kouchibouguac, New Brunswick								Page 1 of 1	
Ground Level, m				19.26				Datum:		Geodetic		Logged By	
												NG	

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0						0.10 ASPHALT	19.16
	1	S	16	400		Brown SAND and GRAVEL	
						0.30	18.96
						Brown SAND, some silt and gravel, trace clay	
	2	S	3	560			
						- silty sand, some gravel (AASHTO A-2-4)	
1						1.10	18.16
						Brown silty sand, some gravel, trace clay (TILL)	
	3	S	20	500			
						1.80	17.46
	4	S	18	510		Brown silty SAND, some gravel	
2						2.40	16.86
						End of borehole at 2.4 mbgs	

0 25 50 75 100

Undrained Shear Strength - kPa_s

○ Unconfined Compression ■ Pocket Penetrometer

⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

Standard Penetration Test, blows/0.3m

W_P W_L

0 10 20 30 40 50 60 70 80 90 100

BOREHOLE LOGS

Client		Public Works & Government Services Canada				Proj No.		473564		BOREHOLE		
Project		Geotechnical Investigation				Date Drilled		18June2015		BH9		
Location		Kouchibouguac North Road, Kouchibouguac, New Brunswick								Page 1 of 1		
Ground Level, m		18.44		Datum: Geodetic		Logged By		NG				
DEPTH m	SAMPLE				LOG	DESCRIPTION						
	No	TYPE	N (RQD)	REC (mm)								
0						0.10	ASPHALT					18.34
	1	S	31	450		0.20	Brown SAND and GRAVEL					18.24
							Brown silty sand, some gravel, trace clay, occasional cobble (TILL)					
	2	S	18	500								
1						1.00	- silty sand, some gravel (AASHTO A-2-4)					17.44
							Brown SAND, some silt and gravel, trace clay					
	3	S	1	550		1.40	Brown SAND, some silt, trace gravel					17.04
							- silty sand, trace gravel (AASHTO A-2-4)					
						1.80	Brown silty SAND					16.64
2	4	S	34	400								
							- silty sand, trace gravel (AASHTO A-2-4)					
						2.40						16.04
							End of borehole at 2.4 mbgs					

0255075100

Undrained Shear Strength - kPa_s

○

Unconfined Compression

⊕

Field Vane Test

■

Pocket Penetrometer

⊗

Remoulded

W_pW_L

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

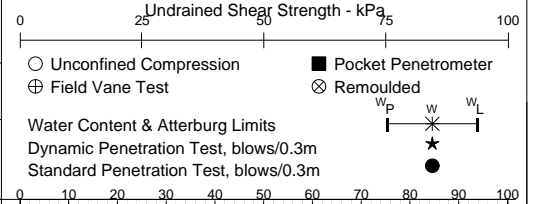
Standard Penetration Test, blows/0.3m

★

●

0102030405060708090100

</



BOREHOLE LOGS

Client					Public Works & Government Services Canada					Proj No.		473564		BOREHOLE	
Project					Geotechnical Investigation					Date Drilled		18June2015		BH10	
Location					Kouchibouguac North Road, Kouchibouguac, New Brunswick									Page 1 of 1	
Ground Level, m					20.31					Datum:		Geodetic		Logged By	
														NG	

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0						0.10 ASPHALT	20.21
	1	S	11	450		0.20 Brown SAND and GRAVEL	20.11
						Brown silty sand, some gravel, trace clay (TILL)	
	2	S	10	500			
1						1.00 Brown SAND, some silt and gravel, trace clay	19.31
	3	S	16	480		- silty sand, trace gravel (AASHTO A-2-4)	
	4	S	17	500			
2						2.10 Brown silty SAND, trace gravel	18.21
						2.40	17.91
						End of borehole at 2.4 mbgs	

Undrained Shear Strength - kPa_s

0 25 50 75 100

○ Unconfined Compression ■ Pocket Penetrometer

⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

Standard Penetration Test, blows/0.3m

W_P W_L

0 10 20 30 40 50 60 70 80 90 100

BOREHOLE LOGS

Client				Public Works & Government Services Canada				Proj No.		473564		BOREHOLE	
Project				Geotechnical Investigation				Date Drilled		18June2015		BH11	
Location				Kouchibouguac North Road, Kouchibouguac, New Brunswick								Page 1 of 1	
Ground Level, m				21.47				Datum:		Geodetic		Logged By	
										NG			

DEPTH m	SAMPLE				LOG	DESCRIPTION
	No	TYPE	N (RQD)	REC (mm)		
0						0.10 ASPHALT 21.37
	1	S	17	450		0.20 Brown SAND and GRAVEL 21.27
						Brown silty sand, some gravel, trace clay (TILL)
	2	S	7	530		
1						
	3	S	28	600		
						- sand and silt, some gravel (AASHTO A-4 to A-7)
	4	S	30	500		
2						
						2.40 19.07
						End of borehole at 2.4 mbgs

0 25 Undrained Shear Strength - kPa_s 100

○ Unconfined Compression ■ Pocket Penetrometer

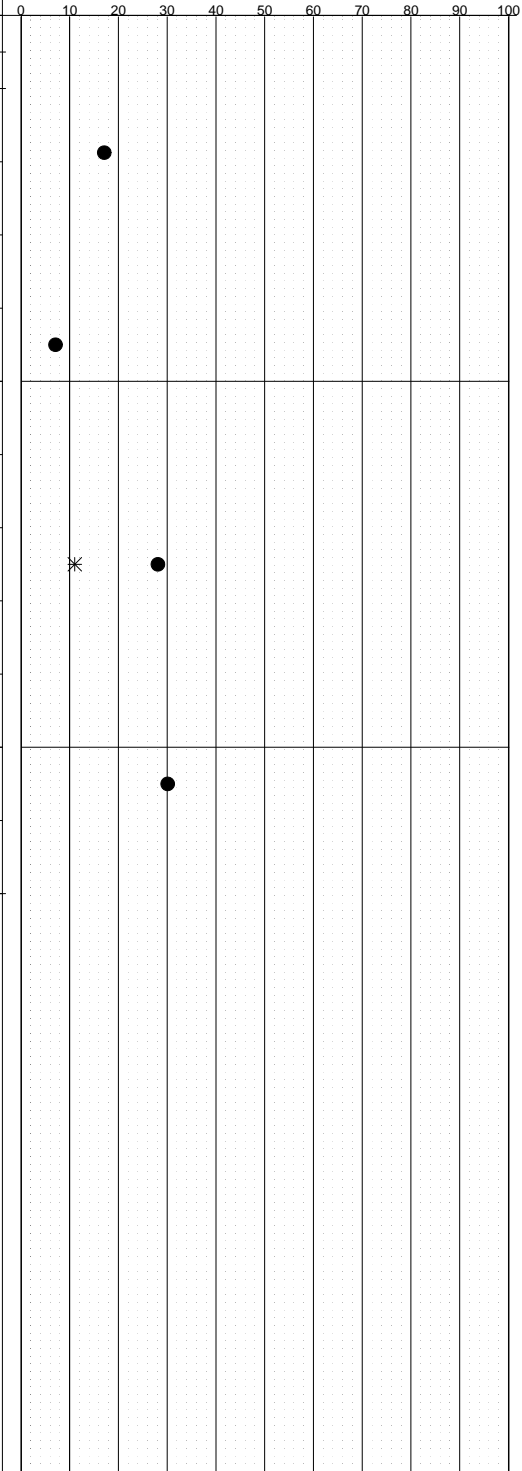
⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

Standard Penetration Test, blows/0.3m

W_P W_L



BOREHOLE LOGS

Client				Public Works & Government Services Canada				Proj No.		473564		BOREHOLE	
Project				Geotechnical Investigation				Date Drilled		18June2015		BH12	
Location				Kouchibouguac North Road, Kouchibouguac, New Brunswick								Page 1 of 1	
Ground Level, m				22.03				Datum:		Geodetic		Logged By	
										NG			

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0						0.10 ASPHALT	21.93
	1	S	33	450		0.20 Brown SAND and GRAVEL	21.83
						Brown silty sand, some gravel, trace clay (TILL)	
	2	S	26	550			
1							
	3	S	13	600		- sand and silt, trace gravel (AASHTO A-4 to A-7)	
2	4	S	22	600		2.00 Brown SAND, some silt and gravel, trace clay	20.03
						2.20 Brown SANDSTONE (possible bedrock)	19.83
						2.40	19.63
						End of borehole at 2.4 mbgs	

0 25 Undrained Shear Strength - kPa_s 100

○ Unconfined Compression ■ Pocket Penetrometer

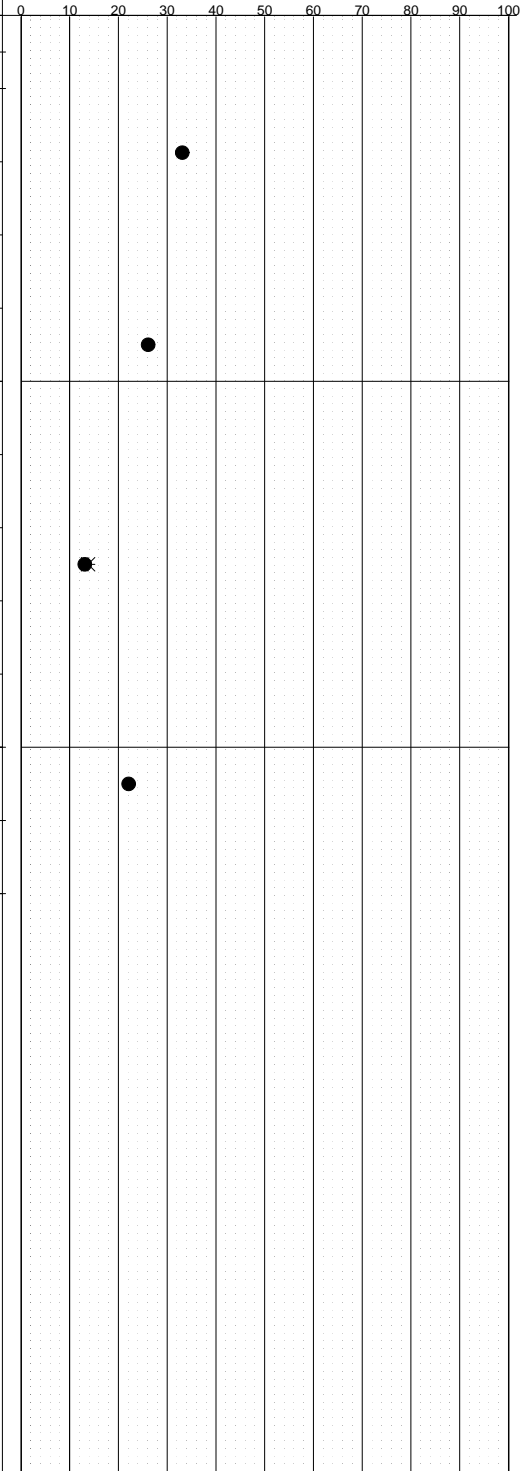
⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

Standard Penetration Test, blows/0.3m

W_P W_L



BOREHOLE LOGS

Client				Public Works & Government Services Canada				Proj No.		473564		BOREHOLE	
Project				Geotechnical Investigation				Date Drilled		18June2015		BH13	
Location				Kouchibouguac North Road, Kouchibouguac, New Brunswick								Page 1 of 1	
Ground Level, m				21.45				Datum:		Geodetic		Logged By	
										NG			

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0						0.05 ASPHALT	21.40
	1	S	27	450		Brown SAND and GRAVEL	
						0.30	21.15
						Brown silty sand, some gravel, trace clay (TILL)	
	2	S	20	450			
						- silty sand, trace gravel (AASHTO A-2-4)	
1							
	3	S	27	600			
	4	S	55	510			
2						2.10	19.35
						Brown SANDSTONE (possible bedrock)	
						2.40	19.05
						End of borehole at 2.4 mbgs	

0 25 50 75 100

Undrained Shear Strength - kPa_s

○ Unconfined Compression ■ Pocket Penetrometer

⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

Standard Penetration Test, blows/0.3m

W_P W_L

0 10 20 30 40 50 60 70 80 90 100



473564	BOREHOLE BH14 Page 1 of 1
18June2015	

Logged	
By	NG

Figure 1 consists of two horizontal plots. The top plot shows Undrained Shear Strength (kPa) on the x-axis (0 to 100) with data points for Unconfined Compression (open circles), Field Vane Test (circles with a cross), Pocket Penetrometer (solid squares), and Remoulded (circles with an X). The bottom plot shows Water Content & Atterburg Limits on the x-axis (0 to 100) with data points for Dynamic Penetration Test (blows/0.3m, open circles) and Standard Penetration Test (blows/0.3m, solid circles).

DEPTH m	SAMPLE				LOG	DESCRIPTION
	No	TYPE	N (RQD)	REC (mm)		
0						0.05 ASPHALT 20.73
	1	S	19	450		Brown SAND and GRAVEL
	2	S	4	550		
1						- silty sand, trace gravel (AASHTO A-2-4)
	3	S	15	600		
						1.10 19.68 Brown SAND, some silt and gravel, trace clay
						1.60 19.18 Brown silty sand, some gravel, trace clay (TILL)
	4	S	56	600		
2						
						2.20 18.58 Brown SANDSTONE (possible bedrock)
						2.40 18.38 End of borehole at 2.4 mbgs

BOREHOLE LOGS

Client					Public Works & Government Services Canada					Proj No.		473564		BOREHOLE					
Project					Geotechnical Investigation					Date Drilled		18June2015		BH15					
Location					Kouchibouguac North Road, Kouchibouguac, New Brunswick							Page 1 of 1							
Ground Level, m					19.79					Datum: Geodetic					Logged By NG				

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0						0.05 ASPHALT	19.74
	1	S	17	450		Brown SAND and GRAVEL	
						0.25	19.54
						Brown silty sand, some gravel, trace clay, occasional cobble (TILL)	
	2	S	21	520			
1							
	3	S	44	600		- gravelly silty sand (AASHTO A-2-4)	
	4	S	85	500			
2						2.00	17.79
						Brown SANDSTONE (possible bedrock)	
						2.40	17.39
						End of borehole at 2.4 mbgs	

0 25 Undrained Shear Strength - kPa_s 100

○ Unconfined Compression ■ Pocket Penetrometer

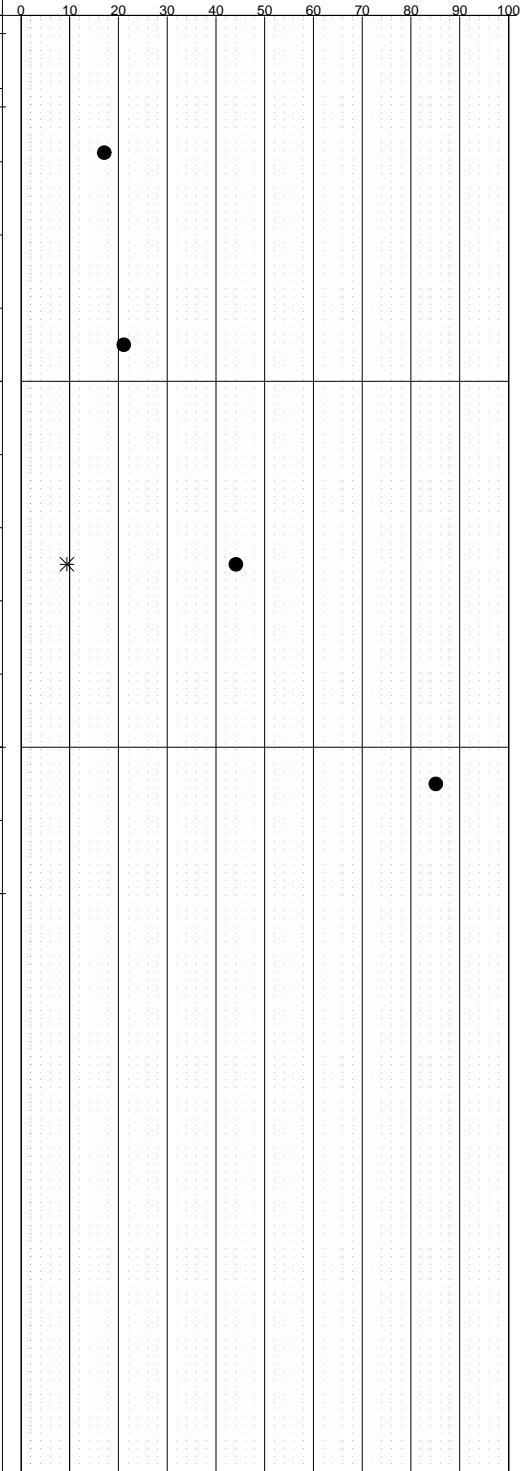
⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

Standard Penetration Test, blows/0.3m

W_P W_L



BOREHOLE LOGS

Client				Public Works & Government Services Canada				Proj No.		473564		BOREHOLE	
Project				Geotechnical Investigation				Date Drilled		18 June 2015		BH16	
Location				Kouchibouguac North Road, Kouchibouguac, New Brunswick								Page 1 of 1	
Ground Level, m				18.02				Datum:		Geodetic		Logged By	
										NG			

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0						0.05 ASPHALT	17.97
	1	S	17	450		Brown SAND and GRAVEL	17.82
						Brown silty sand, some gravel, trace clay (TILL)	
	2	S	9	520			
1						1.00	17.02
						Brown SAND, some silt and gravel, trace clay	
	3	S	11	600			
						1.40	16.62
						Brown SAND, some silt, trace gravel - silty sand, trace gravel (AASHTO A-2-4)	
						1.70	16.32
	4	S	6	600		Brown SAND, some silt and gravel, trace clay	
2						1.90	16.12
						Brown silty SAND, trace clay and gravel	
						2.40	15.62
						End of borehole at 2.4 mbgs	

0 25 50 75 100 Undrained Shear Strength - kPa_s

○ Unconfined Compression ■ Pocket Penetrometer

⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

Standard Penetration Test, blows/0.3m

W_P W_L

0 10 20 30 40 50 60 70 80 90 100

BOREHOLE LOGS

Client				Public Works & Government Services Canada				Proj No.		473564		BOREHOLE	
Project				Geotechnical Investigation				Date Drilled		18June2015		BH17	
Location				Kouchibouguac North Road, Kouchibouguac, New Brunswick								Page 1 of 1	
Ground Level, m				15.85				Datum:		Geodetic		Logged By	
										NG			

DEPTH m	SAMPLE				LOG	DESCRIPTION	
	No	TYPE	N (RQD)	REC (mm)			
0						0.05 ASPHALT	15.80
	1	S	18	450		Brown SAND and GRAVEL	
						0.30	15.55
						Brown SAND, some silt and gravel, trace clay	
	2	S	4	400			
1						1.00	14.85
						Brown silty sand, some gravel, trace clay (TILL)	
	3	S	20	450			
	4	S	42	400			
2						- silt, some sand, trace gravel (AASHTO A-4 to A-7)	
						2.40	13.45
						End of borehole at 2.4 mbgs	

0 25 50 75 100 Undrained Shear Strength - kPa_s

○ Unconfined Compression ■ Pocket Penetrometer

⊕ Field Vane Test ⊗ Remoulded

Water Content & Atterburg Limits

Dynamic Penetration Test, blows/0.3m

Standard Penetration Test, blows/0.3m

W_P W_L

0 10 20 30 40 50 60 70 80 90 100

Appendix C

Moisture Content Analyses

**GEMTEC**CONSULTING ENGINEERS
AND SCIENTISTS

Client Public Works & Government Services Canada

Project: Geotechnical Investigation, Kouchibouguac North Road,

Project #: 0473564

**Moisture Content
and Density**

Borehole: 1	Date/Time Sampled: 15/07/13 1:59:00 PM	Mass of Cont. + Wet Soil, g:	908.80
Depth: 0.6-1.2m	Date/Time Tested: 15/07/15 2:00:19 PM	Mass of Cont. + Dry Soil, g:	838.30
Sample: 2		Mass of Container, g:	205.30
Description:		Moisture Content, %:	11.14
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 6	Date/Time Sampled: 15/07/13 2:59:00 PM	Mass of Cont. + Wet Soil, g:	840.80
Depth: 1.8-2.4m	Date/Time Tested: 15/07/15 3:00:48 PM	Mass of Cont. + Dry Soil, g:	776.40
Sample: 4		Mass of Container, g:	172.05
Description:		Moisture Content, %:	10.66
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 2	Date/Time Sampled: 15/07/15 2:00:19 PM	Mass of Cont. + Wet Soil, g:	720.20
Depth: 0.6-1.2m	Date/Time Tested: 15/07/15 2:00:19 PM	Mass of Cont. + Dry Soil, g:	649.80
Sample: 2		Mass of Container, g:	166.50
Description:		Moisture Content, %:	14.57
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	

**GEMTEC**CONSULTING ENGINEERS
AND SCIENTISTS

Client Public Works & Government Services Canada

Project: Geotechnical Investigation, Kouchibouguac North Road,

Project #: 0473564

**Moisture Content
and Density**

Borehole: 3	Date/Time Sampled: 15/07/15 2:00:19 PM	Mass of Cont. + Wet Soil, g:	732.40
Depth: 0.6-1.2m	Date/Time Tested: 15/07/15 2:00:19 PM	Mass of Cont. + Dry Soil, g:	672.30
Sample: 2		Mass of Container, g:	177.20
Description:		Moisture Content, %:	12.14
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 4	Date/Time Sampled: 15/07/15 2:00:19 PM	Mass of Cont. + Wet Soil, g:	815.70
Depth: 1.2-1.8m	Date/Time Tested: 15/07/15 2:00:19 PM	Mass of Cont. + Dry Soil, g:	717.20
Sample: 3		Mass of Container, g:	202.39
Description:		Moisture Content, %:	19.13
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 5	Date/Time Sampled: 15/07/15 2:00:19 PM	Mass of Cont. + Wet Soil, g:	884.40
Depth: 1.2-1.8m	Date/Time Tested: 15/07/15 2:00:19 PM	Mass of Cont. + Dry Soil, g:	777.20
Sample: 3		Mass of Container, g:	172.50
Description:		Moisture Content, %:	17.73
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	

**GEMTEC**CONSULTING ENGINEERS
AND SCIENTISTS

Client Public Works & Government Services Canada

Project: Geotechnical Investigation, Kouchibouguac North Road,

Project #: 0473564

**Moisture Content
and Density**

Borehole: 7	Date/Time Sampled: 15/07/15 3:00:48 PM	Mass of Cont. + Wet Soil, g:	1136.30
Depth: 0.3-0.6m	Date/Time Tested: 15/07/15 3:00:48 PM	Mass of Cont. + Dry Soil, g:	1023.00
Sample: 1		Mass of Container, g:	171.72
Description:		Moisture Content, %:	13.31
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 8	Date/Time Sampled: 15/07/15 3:00:48 PM	Mass of Cont. + Wet Soil, g:	812.60
Depth: 0.6-1.2m	Date/Time Tested: 15/07/15 3:00:48 PM	Mass of Cont. + Dry Soil, g:	724.20
Sample: 2		Mass of Container, g:	170.76
Description:		Moisture Content, %:	15.97
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 9	Date/Time Sampled: 15/07/15 3:00:48 PM	Mass of Cont. + Wet Soil, g:	758.60
Depth: 1.2-1.8m	Date/Time Tested: 15/07/15 3:00:48 PM	Mass of Cont. + Dry Soil, g:	651.10
Sample: 3		Mass of Container, g:	107.72
Description:		Moisture Content, %:	19.78
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	

**GEMTEC**CONSULTING ENGINEERS
AND SCIENTISTS

Client Public Works & Government Services Canada

Project: Geotechnical Investigation, Kouchibouguac North Road,

Project #: 0473564

**Moisture Content
and Density**

Borehole: 9	Date/Time Sampled: 15/07/15 3:00:48 PM	Mass of Cont. + Wet Soil, g:	812.70
Depth: 0.6-1.2m	Date/Time Tested: 15/07/15 3:00:48 PM	Mass of Cont. + Dry Soil, g:	743.50
Sample: 2		Mass of Container, g:	122.88
Description:		Moisture Content, %:	11.15
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 9	Date/Time Sampled: 15/07/15 3:00:48 PM	Mass of Cont. + Wet Soil, g:	1837.10
Depth: 0.15-0.6m	Date/Time Tested: 15/07/15 3:00:48 PM	Mass of Cont. + Dry Soil, g:	1709.20
Sample: 1		Mass of Container, g:	171.98
Description:		Moisture Content, %:	8.32
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 9	Date/Time Sampled: 15/07/15 3:00:48 PM	Mass of Cont. + Wet Soil, g:	839.80
Depth: 1.8-2.4m	Date/Time Tested: 15/07/15 3:00:48 PM	Mass of Cont. + Dry Soil, g:	726.10
Sample: 4		Mass of Container, g:	163.28
Description:		Moisture Content, %:	20.20
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	

**GEMTEC**CONSULTING ENGINEERS
AND SCIENTISTS

Client Public Works & Government Services Canada

Project: Geotechnical Investigation, Kouchibouguac North Road,

Project #: 0473564

**Moisture Content
and Density**

Borehole: 10	Date/Time Sampled: 15/07/15 3:00:48 PM	Mass of Cont. + Wet Soil, g:	840.60
Depth: 1.2-1.8m	Date/Time Tested: 15/07/15 3:00:48 PM	Mass of Cont. + Dry Soil, g:	776.90
Sample: 3		Mass of Container, g:	171.47
Description:		Moisture Content, %:	10.52
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 11	Date/Time Sampled: 15/07/15 3:00:48 PM	Mass of Cont. + Wet Soil, g:	898.20
Depth: 1.2-1.8m	Date/Time Tested: 15/07/15 3:00:48 PM	Mass of Cont. + Dry Soil, g:	826.20
Sample: 3		Mass of Container, g:	168.57
Description:		Moisture Content, %:	10.95
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 12	Date/Time Sampled: 15/07/15 3:26:00 PM	Mass of Cont. + Wet Soil, g:	950.00
Depth: 1.2-1.8m	Date/Time Tested: 15/07/15 3:27:56 PM	Mass of Cont. + Dry Soil, g:	855.60
Sample: 3		Mass of Container, g:	165.37
Description:		Moisture Content, %:	13.68
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	

**GEMTEC**CONSULTING ENGINEERS
AND SCIENTISTS

Client Public Works & Government Services Canada

Project: Geotechnical Investigation, Kouchibouguac North Road,

Project #: 0473564

**Moisture Content
and Density**

Borehole: 13	Date/Time Sampled: 15/07/15 3:27:56 PM	Mass of Cont. + Wet Soil, g:	766.00
Depth: 0.6-1.2m	Date/Time Tested: 15/07/15 3:27:56 PM	Mass of Cont. + Dry Soil, g:	695.00
Sample: 2		Mass of Container, g:	106.51
Description:		Moisture Content, %:	12.06
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 14	Date/Time Sampled: 15/07/15 3:27:56 PM	Mass of Cont. + Wet Soil, g:	814.30
Depth: 0.6-1.2m	Date/Time Tested: 15/07/15 3:27:56 PM	Mass of Cont. + Dry Soil, g:	696.70
Sample: 2		Mass of Container, g:	170.57
Description:		Moisture Content, %:	22.35
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 15	Date/Time Sampled: 15/07/15 3:27:56 PM	Mass of Cont. + Wet Soil, g:	1199.30
Depth: 1.2-1.8m	Date/Time Tested: 15/07/15 3:27:56 PM	Mass of Cont. + Dry Soil, g:	1111.30
Sample: 3		Mass of Container, g:	170.42
Description:		Moisture Content, %:	9.35
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	

**GEMTEC**CONSULTING ENGINEERS
AND SCIENTISTS

Client Public Works & Government Services Canada

Project: Geotechnical Investigation, Kouchibouguac North Road,

Project #: 0473564

**Moisture Content
and Density**

Borehole: 16	Date/Time Sampled: 15/07/15 3:27:56 PM	Mass of Cont. + Wet Soil, g:	959.20
Depth: 1.2-1.8m	Date/Time Tested: 15/07/15 3:27:56 PM	Mass of Cont. + Dry Soil, g:	834.30
Sample: 3		Mass of Container, g:	106.87
Description:		Moisture Content, %:	17.17
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	
Borehole: 17	Date/Time Sampled: 15/07/15 3:27:56 PM	Mass of Cont. + Wet Soil, g:	1292.50
Depth: 1.8-2.4m	Date/Time Tested: 15/07/15 3:27:56 PM	Mass of Cont. + Dry Soil, g:	1149.40
Sample: 4		Mass of Container, g:	301.00
Description:		Moisture Content, %:	16.87
		Sample Length, mm:	
		Sample Diameter, mm:	
		Sample Mass, g:	
		Sample Volume, mm ³	
		Wet Density, kg/m ³	
		Dry Density, kg/m ³	

Appendix D

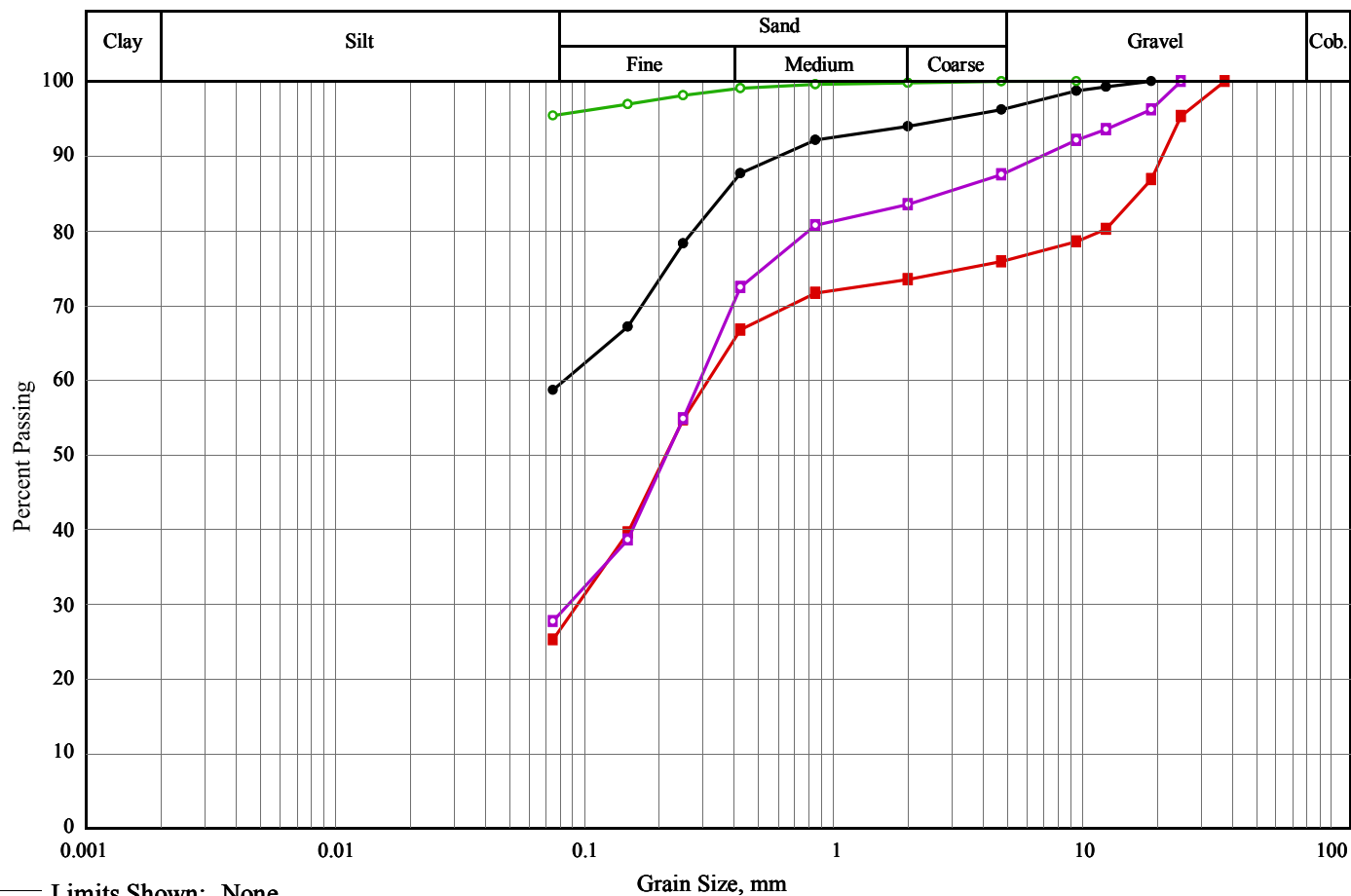
Soils Sieve Analyses



GEMTEC
CONSULTING ENGINEERS
AND SCIENTISTS

Client: Public Works & Government Services Canada
Project: Geotechnical Investigation, Kouchibouguac North Road,
Project #: 0473564

Soils Grading Chart



Limits Shown: None

Line Symbol	Description	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay	Date Sampled
—●—		1	2	0.6-1.2m	3.8	37.5	58.7		15/07/13
—■—		6	4	1.8-2.4m	24.1	50.6	25.2		15/07/13
—○—		4	3	1.2-1.8m	0.0	4.6	95.4		15/07/15
—□—		3	2	0.6-1.2m	12.5	59.8	27.7		15/07/15

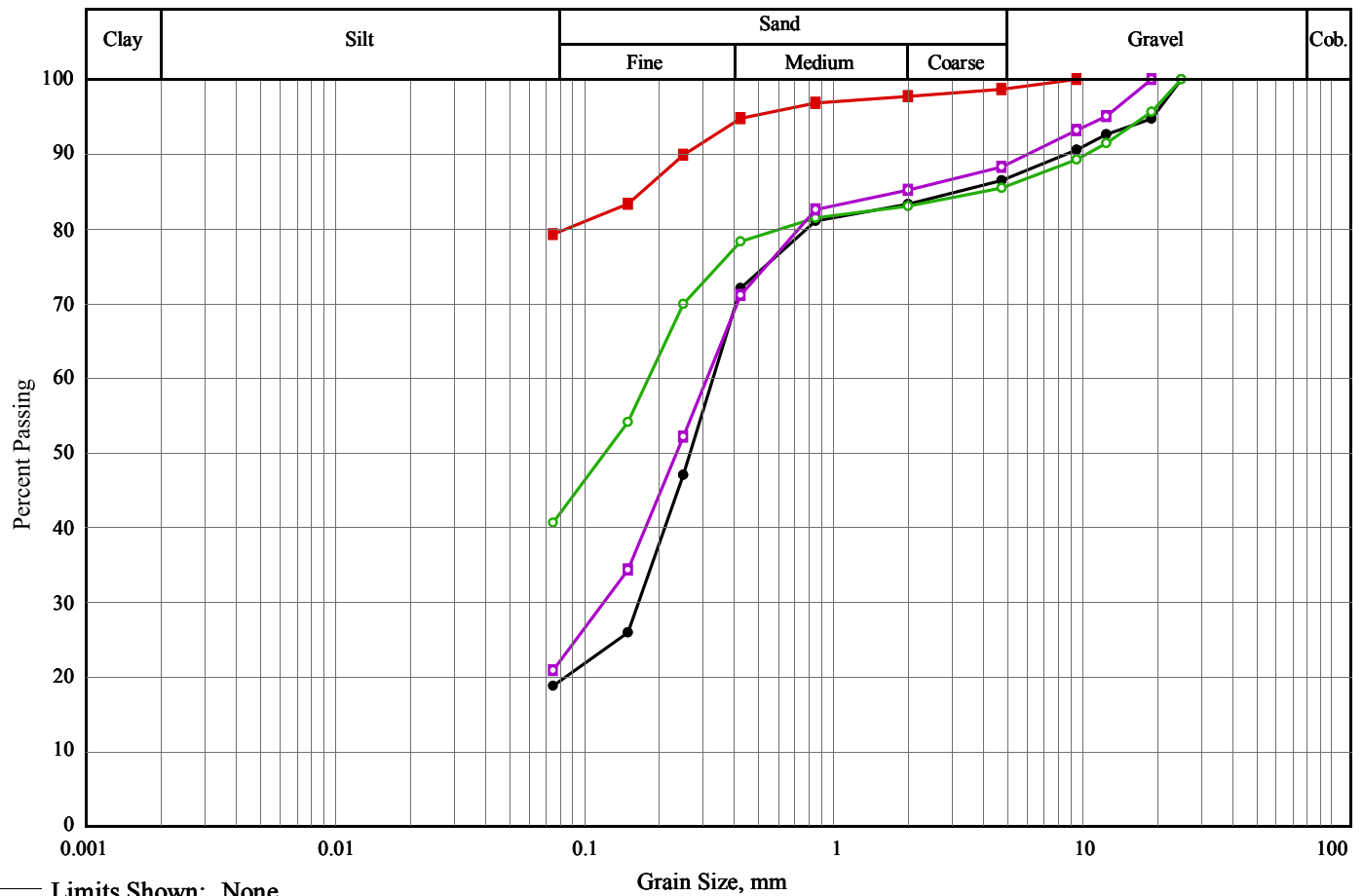
Line Symbol	Sample Description	AASHTO	D ₁₀	D ₁₅	D ₅₀	D ₈₅	% 5-75µm
—●—	Silt and sand , trace gravel	A-4 to A-7	---	---	---	0.37	---
—■—	Gravelly silty sand	A-2-4	---	---	0.21	16.90	---
—○—	Silt , trace gravel, trace sand	A-4 to A-7	---	---	---	---	---
—□—	Silty sand , some gravel	A-2-4	---	---	0.21	2.76	---



GEMTEC
CONSULTING ENGINEERS
AND SCIENTISTS

Client: Public Works & Government Services Canada
Project: Geotechnical Investigation, Kouchibouguac North Road,
Project #: 0473564

Soils Grading Chart



Line Symbol	Description	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay	Date Sampled
—●—		2	2	0.6-1.2m	13.5	67.7	18.8		15/07/15
—■—		5	3	1.2-1.8m	1.3	19.4	79.2		15/07/15
—○—		11	3	1.2-1.8m	14.6	44.8	40.6		15/07/15
—□—		9	2	0.6-1.2m	11.7	67.4	20.9		15/07/15

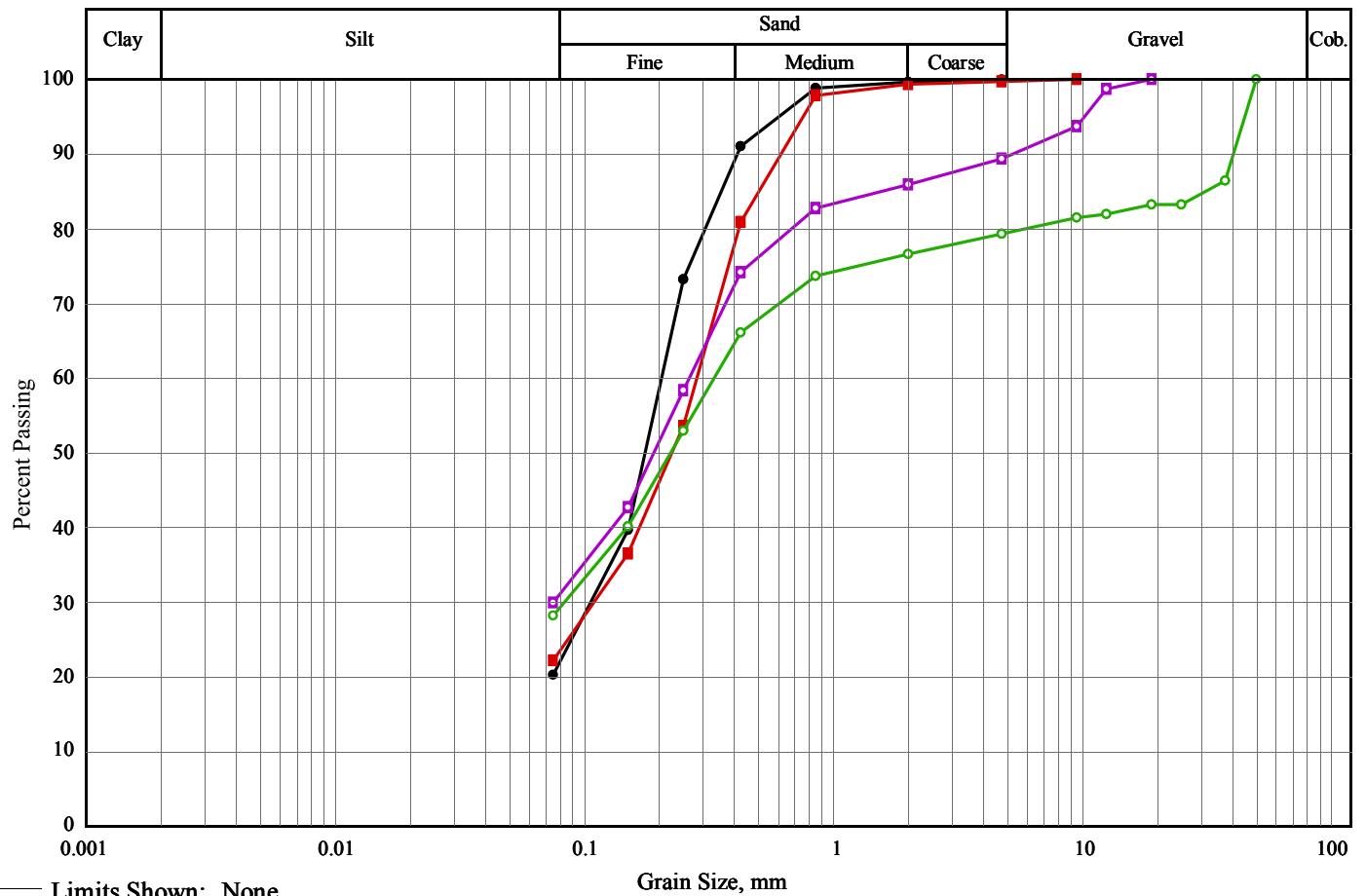
Line Symbol	Sample Description	AASHTO	D ₁₀	D ₁₅	D ₅₀	D ₈₅	% 5-75µm
—●—	Sand , some gravel, some silt	A-2-4	---	---	0.27	3.19	---
—■—	Silt , some sand , trace gravel	A-4 to A-7	---	---	---	0.17	---
—○—	Sand and silt , some gravel	A-4 to A-7	---	---	0.12	4.05	---
—□—	Silty sand , some gravel	A-2-4	---	---	0.24	1.89	---



GEMTEC
CONSULTING ENGINEERS
AND SCIENTISTS

Client: Public Works & Government Services Canada
Project: Geotechnical Investigation, Kouchibouguac North Road,
Project #: 0473564

Soils Grading Chart



Limits Shown: None

Line Symbol	Description	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay	Date Sampled
—●—		9	4	1.8-2.4m	0.1	79.7	20.3		15/07/15
—■—		9	3	1.2-1.8m	0.3	77.5	22.2		15/07/15
—○—		7	1	0.3-0.6m	20.7	51.1	28.2		15/07/15
—□—		8	2	0.6-1.2m	10.6	59.4	29.9		15/07/15

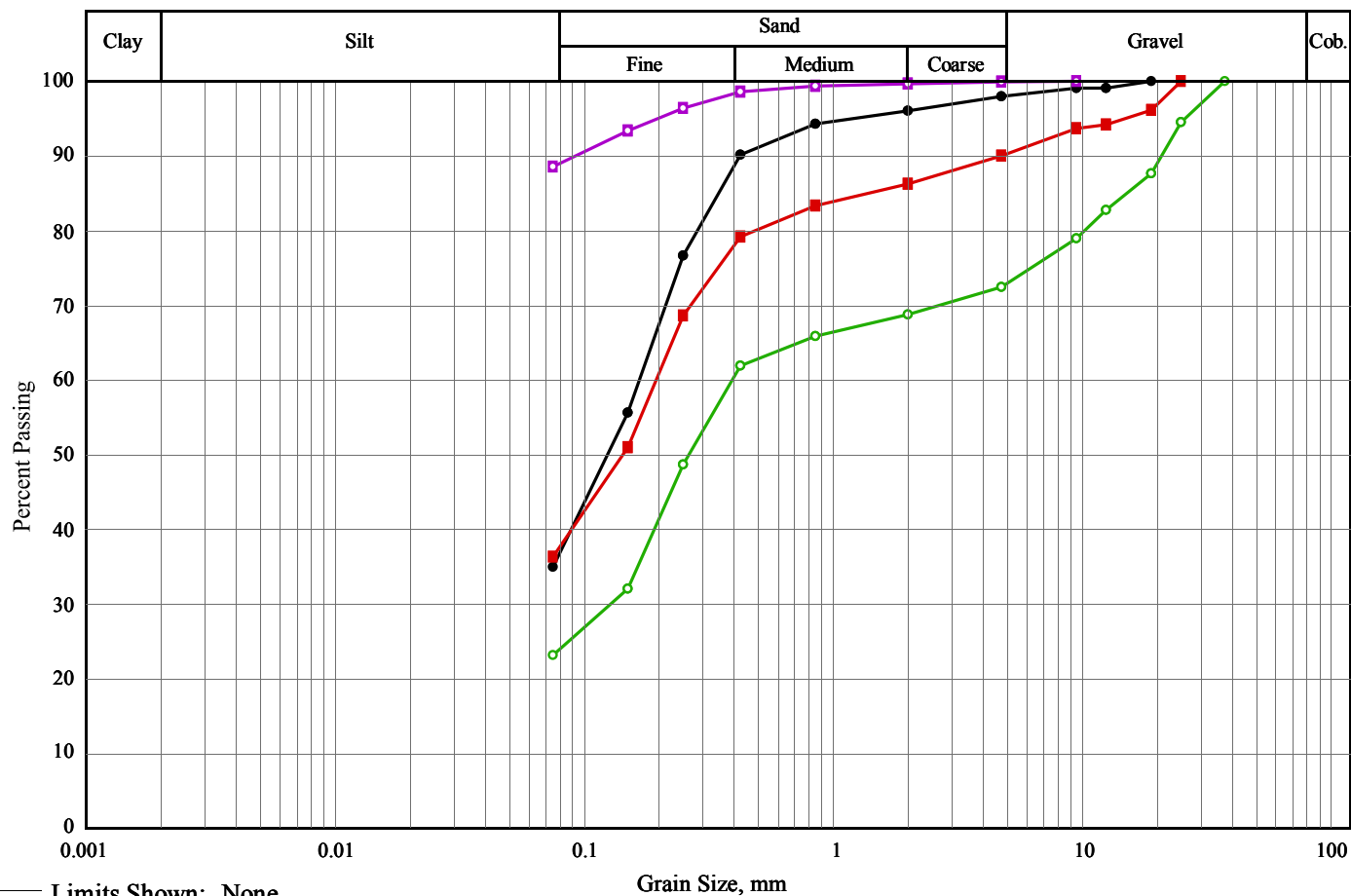
Line Symbol	Sample Description	AASHTO	D ₁₀	D ₁₅	D ₅₀	D ₈₅	% 5-75µm
—●—	Silty sand , trace gravel	A-2-4	---	---	0.18	0.36	---
—■—	Silty sand , trace gravel	A-2-4	---	---	0.22	0.50	---
—○—	Gravelly silty sand	A-2-4	---	---	0.22	31.30	---
—□—	Silty sand , some gravel	A-2-4	---	---	0.19	1.57	---



GEMTEC
CONSULTING ENGINEERS
AND SCIENTISTS

Client: Public Works & Government Services Canada
Project: Geotechnical Investigation, Kouchibouguac North Road,
Project #: 0473564

Soils Grading Chart



Line Symbol	Description	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay	Date Sampled
—●—		10	3	1.2-1.8m	2.0	63.0	35.0		15/07/15
—■—		12	3	1.2-1.8m	10.0	53.7	36.3		15/07/15
—○—		15	3	1.2-1.8m	27.5	49.3	23.2		15/07/15
—□—		17	4	1.8-2.4m	0.1	11.4	88.6		15/07/15

Line Symbol	Sample Description	AASHTO	D ₁₀	D ₁₅	D ₅₀	D ₈₅	% 5-75µm
—●—	Silty sand , trace gravel	A-2-4	---	---	0.12	0.35	---
—■—	Sand and silt , trace gravel	A-4 to A-7	---	---	0.14	1.39	---
—○—	Gravelly silty sand	A-2-4	---	---	0.26	15.13	---
—□—	Silt , some sand , trace gravel	A-4 to A-7	---	---	---	---	---



GEMTEC

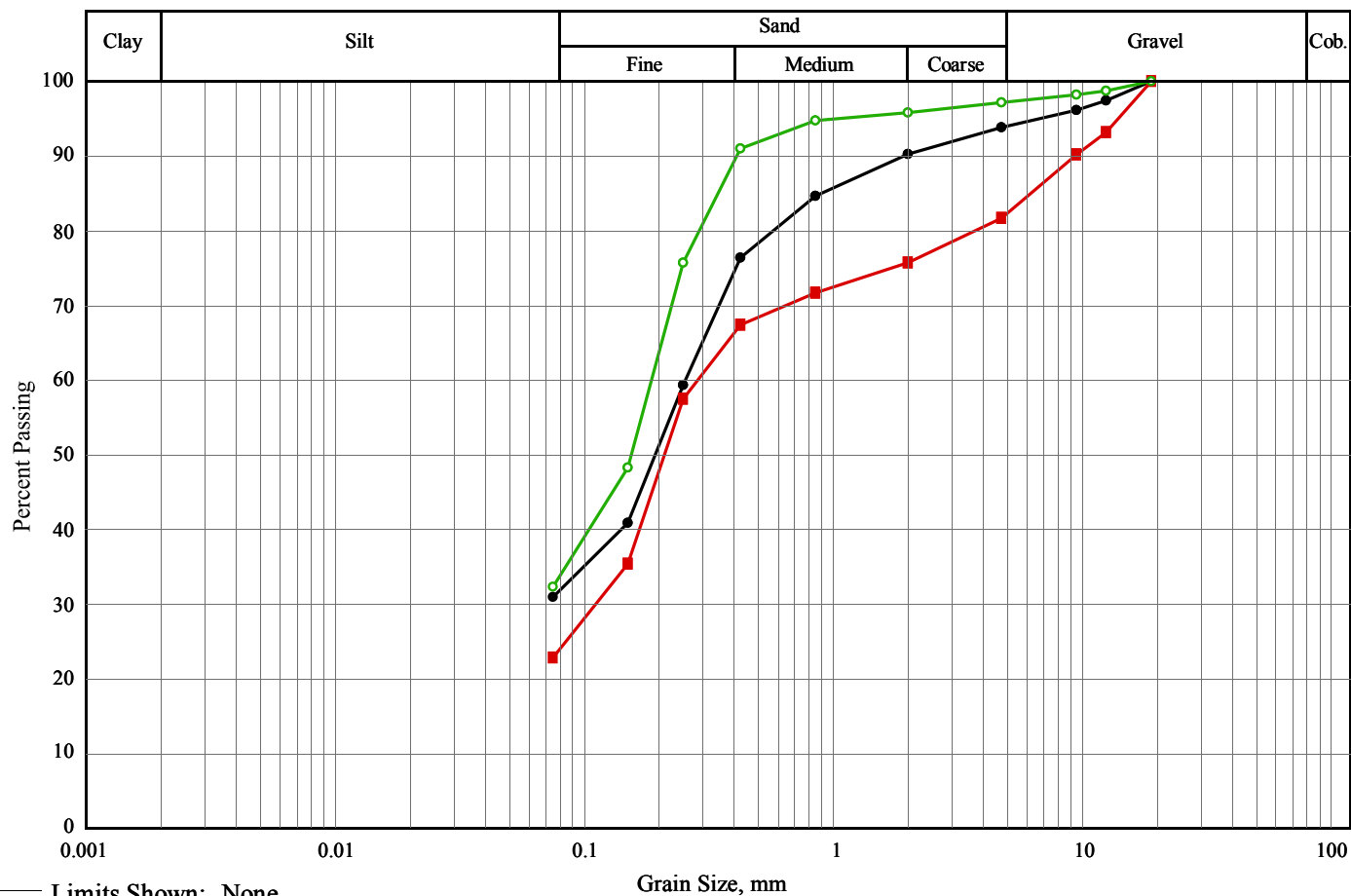
CONSULTING ENGINEERS
AND SCIENTISTS

Client: Public Works & Government Services Canada

Project: Geotechnical Investigation, Kouchibouguac North Road,

Project #: 0473564

Soils Grading Chart



Line Symbol	Description	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay	Date Sampled
—●—		14	2	0.6-1.2m	6.2	62.9	30.9		15/07/15
—■—		13	2	0.6-1.2m	18.3	58.8	22.8		15/07/15
—○—		16	3	1.2-1.8m	2.8	64.9	32.3		15/07/15

Line Symbol	Sample Description	AASHTO	D ₁₀	D ₁₅	D ₅₀	D ₈₅	% 5-75µm
—●—	Silty sand , trace gravel	A-2-4	---	---	0.19	0.90	---
—■—	Silty sand , some gravel	A-2-4	---	---	0.21	6.23	---
—○—	Silty sand , trace gravel	A-2-4	---	---	0.15	0.35	---