

61-F-21

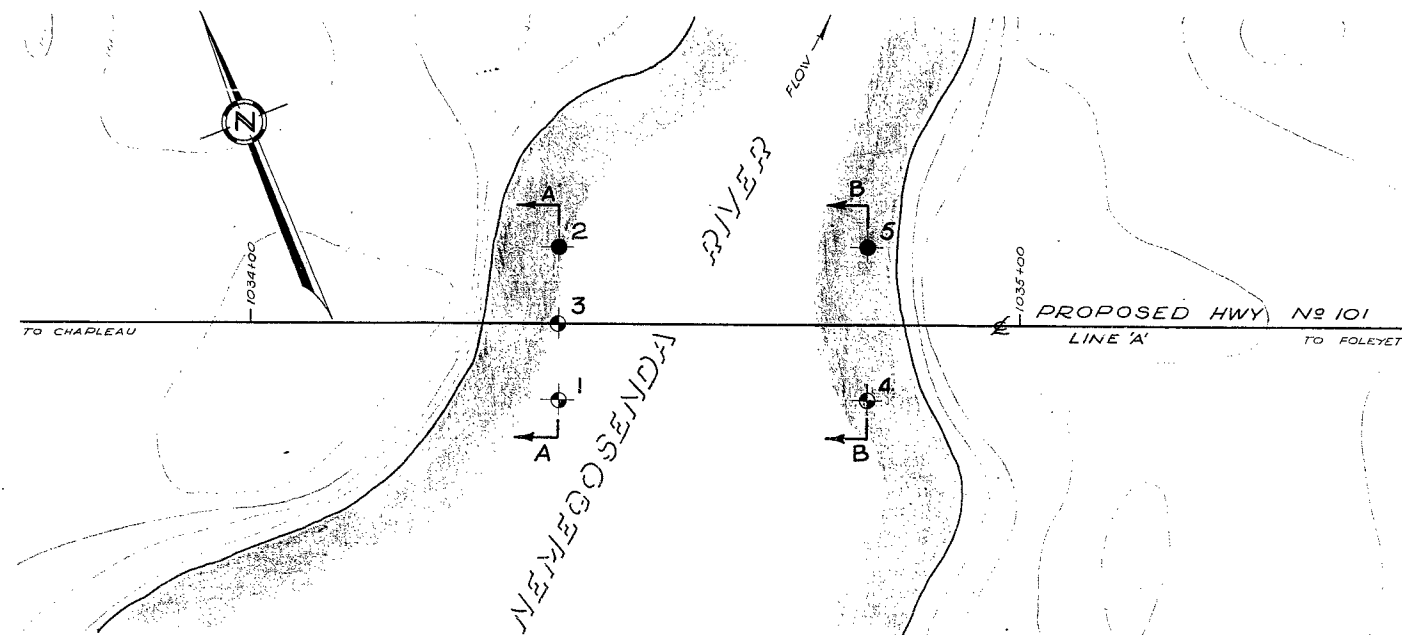
Hwy. # 101 &

NEMOGOSENDA R.

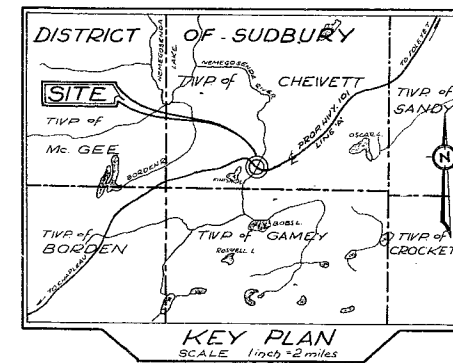
CROSSING BTWN.

CHAPLEAU &

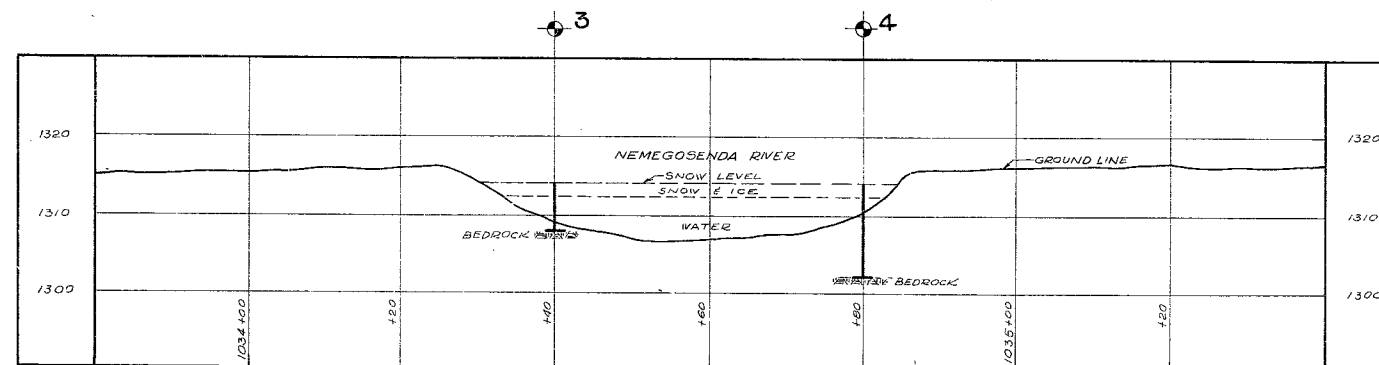
FOLEYET



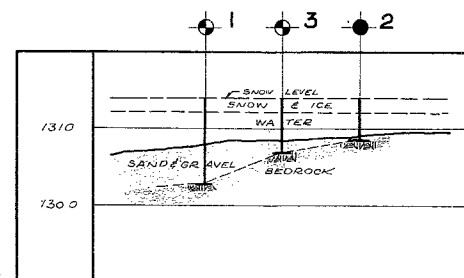
PLAN
SCALE 1 inch = 10 feet



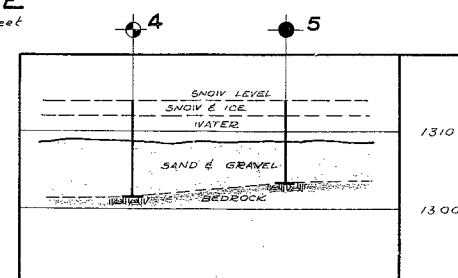
KEY PLAN
SCALE 1 inch = 2 miles



PROFILE
SCALE 1 inch = 10 feet



A - A



B - B

LEGEND

	BORE HOLE		
	BORE AND PENETRATION HOLE		
HOLE	ELEVATION	STATION	DISTANCE FROM
1	1314.00	1034 + 40	10' RT.
2	1314.00	1034 + 40	10' LT.
3	1314.00	1034 + 40	±
4	1314.00	1034 + 80	10' RT.
5	1314.00	1034 + 80	10' LT.

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH SECTION

NEMEGOSENDA RIVER AND PROPOSED HIGHWAY No 101 LINE 'A'

ORIGINATED VAB KORLI	DISTRICT NO. 17	DATE 27 APR. 1961
DRAWN BY [Signature]	W.P. NO.	JOB NO. 61-F-21
CHECKED VAB 1	SCALE 1 inch = 10 feet	DRAWING NO.
APPROVED [Signature]		61-F-21A

REFERENCE PLAN E-3630-1

Mr. A. M. Toye,
Bridge Engineer.
Materials & Research Section.
(Foundations Office)
Attention: Mr. S. McCombie.

April 25, 1961.

D.H.O. FOUNDATION INVESTIGATION
REPORT.
W.J. 61-F-21 -- W.P. (N11).

Re: Nemogosenda River and Hwy. 101 Crossing,
between Chapleau and Poleyet, Dist. #18.

We are forwarding to you our subsoil investigation
report for the above mentioned structure site.

The factual data and recommendations contained
therein are, we believe, self-explanatory and should prove
adequate for your future design work. If, however, further
assistance is required, we would appreciate hearing from you
in this connection.

L. G. Boderman,
PRINCIPAL FOUNDATION ENGR.
Per:

AGS/MdeF
Attach.

cc: Messrs. A. M. Toye (2)
H. A. Tregaskes
H. D. McMillan
G. E. Hunter
D. F. Collins
E. R. Saint
A. Watt
Foundations Office
Gen. Files. ✓

Agsternmac
(A. C. Sternmac,
SUPERVISING FOUNDATION ENGR.)

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FOUNDATION INVESTIGATION

For

Nemegosenda River and Hwy. 101 Crossing,
Between Chapleau and Foleyet
W.J. 61-F-21 -- District #18.

1. INTRODUCTION:

A soil investigation was carried out in order to determine the subsoil stratification, the soil properties, and to recommend the type of foundations to support the proposed new structure.

The location of the site is at new secondary Hwy. 101 and Nemegosenda River crossing. The site is about 20 miles North-East of Chapleau in the Twp. of Chewett, District No. 18.

The results of the investigation, together with the discussion and recommendations, are given in this report.

2. DESCRIPTION OF SITE & GEOLOGY:

The topography of the area is undulating with thickly wooded rolling hills. The ground is mostly covered with decayed vegetation and depressed areas form swampy terrain.

Geologically, the area is in the Precambrian Shield. This Shield consists mainly of igneous rocks, but includes also, remnants and patches of volcanic and sedimentary rocks. The overburden has been formed by glacial drifts and spillways.

cont'd. /2 ...

3. FIELD AND LABORATORY WORK:

The investigation was carried out by means of a coredrill machine adapted for soil sampling. During the investigation, two boreholes were made; one hole under each footing. In addition, three dynamic cone penetrations were made to confirm the bedrock contact elevation.

In granular soils, samples were taken by means of a 2" O.D. split barrelled spoon sampler. The dimensions of the spoon sampler and the energy used in driving it, conform to the requirements of the Standard Penetration Test.

The split spoon samples were visually examined in the field and representative samples were brought to the laboratory for further tests.

The logs of the boreholes and their location, shown on Drawing No. 61-F-21A, are attached under Appendix I.

4. SOIL TYPES ENCOUNTERED:

4.1) General:

The investigation at the site revealed the following subsoil conditions:-

The top material is medium to dense sand with gravel and boulders. Underlying this top deposit is bedrock.

4.2) Sand and Gravel:

Overlying the bedrock is a deposit layer of sand and gravel with occasional boulders. The grain size distribution indicates that the material is well graded with fine to coarse size particles. The layer is 1' - 6' thick and is in a medium to dense state of compaction.

5. DISCUSSION AND RECOMMENDATIONS:

The subsoil at the investigated site is bedrock with a shallow granular deposit on the top. This subsoil situation is favourable for founding the new bridge on spread footings.

At the East pier the bedrock elevation is established at 1302' - 1303.5', inclining from South to North. At the West pier the bedrock elevation is 1303' - 1309', inclining from North to South. The core samples revealed that the bedrock is igneous granite at the West side and metamorphic gneiss on the East side.

It is recommended to found the new bridge on spread footings and place the footings on bedrock. A bearing pressure of at least 5 tons/sq.ft. can be used.

At the eastern pier, in order to reach the bedrock, it will be necessary to excavate or dredge about 6' - 7' of the top deposit which is mainly sand gravel with boulders. As sheet pile driving will be impractical, the sealing of the footing area could be accomplished by placing tight braced forms into the excavation and pump the water out. A second alternative would be to build an earth dyke cofferdam around the footing area, and again pump the water out. In both cases, the concreting would be done in the dry. The choice of either method will depend upon the locally established bedrock conditions.

At the western pier, the bedrock is just under the water. It will be necessary to key in the footing about 5 ft. into the bedrock. The sealing of this footing area for dewatering, could be accomplished along the same lines as described above.

cont'd. /4 ...

6. SUMMARY:

It is recommended to found the new bridge on spread footings placed on bedrock. A bearing pressure of at least 5 tons/sq.ft. can be used.

At the western pier, it is recommended to key in the footing about 5 ft. into the bedrock.

The dewatering of the excavated footing areas could be accomplished by either encircling the footing with tight braced forms or by an earth dyke.

7. MISCELLANEOUS:

The field work was carried out during March 25 to 26, 1961, under the supervision of Project Foundation Engineer, V. Korlu. All laboratory testing was done by the Materials and Research Section.

April 1961.

REPORT PREPARED BY:

K. L. Smith

for

V. Korlu,
PROJECT FOUNDATION ENGR.

REPORT APPROVED BY:

A. G. Stermac

A. G. Stermac,
SUPERVISING FOUNDATION ENGR.

APPENDIX I

SUMMARY OF FIELD & LABORATORY TESTS

JOB 61-F-21

W.P. -

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
1	S1	6'-10.5'	Sand & gravel	P	-	-	-	-	-	
	RC2	11'-15.5'	Igneous Rock	-	-	-	-	-	-	
2										
3										
4										
5	S1	0'-9.5'	Sand & gravel.	Washed	-	-	-	-	-	
	S2	9.5'-10.5'	Sand & gravel.	125-11"	10.5	-	-	-	-	
	RC3	10.5'-15.5'	Igneous Rock.	-	-	-	-	-	-	
			S denotes split spoon RC " rock core							

DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. ----- BORE HOLE NO. 1
 JOB 61-F-21 STATION 1034+40 (10' Lt.)
 DATUM 1313.0' COMPILED BY B.K.
 BORING DATE Mar. 25/61 CHECKED BY V.K.

2" DIA. SPLIT TUBE ----- ☒
 2" SHELBY TUBE ----- ☒
 2" SPLIT TUBE ----- ☐
 2" DIA. CONE ----- ☐
 2" SHELBY ----- ☐
 CASING ----- * *

LEGEND

1/2 UNCONFINED COMPRESSION (Q_u) ----- ☐
 VANE TEST (C) AND SENSITIVITY (S) ----- +
 NATURAL MOISTURE AND LIQUIDITY INDEX ----- LI
 LIQUID LIMIT ----- X
 PLASTIC LIMIT ----- ☐

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE			
				P. S. F.			
	↓ Snow Level	1313.0	0	25	50	75	100
---	Snow & ice	1310.5					
---	Water	1307.0	5				
o . .	Coarse sand & gravel	1302.0	10				
	Bedrock	1297.5	15				
End of borehole				Penetration resistance profile shown; obtained by driving a 2" dia. cone from ground level to depth noted with an energy of 350 ft. lb. per blow.			

CONSISTENCY	SAMPLE	NATURAL UNIT WT. P. C. F.
MOIST. CONTENT - % DRY WT.		
	RC1	-

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE		CONSISTENCY	SAMPLE	NATURAL UNIT WT. P.C.F.
				P.S.F.	BLOWS/FT			
	Snow Level	1313.0	0					
— —	Snow & ice	1310.5						
— —	Water	1308.3	5					
	Bedrock?		10					
			15					

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. _____ BORE HOLE NO. 3
JOB 61-F-21 STATION 1034/40 E
DATUM 1313.0' COMPILED BY B.K.
BORING DATE Apr. 25/61 CHECKED BY V.K.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) _____	0
VANE TEST (C) AND SENSITIVITY (S) _____	+3
NATURAL MOISTURE AND	
LIQUIDITY INDEX _____	LI
LIQUID LIMIT _____	X
PLASTIC LIMIT _____	PL

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE				CONSISTENCY	SAMPLE	NATURAL UNIT WT. P.C.P.
				P.S.F.						
	↓ Snow Level	1313.0	0	25	50	75	100			
---	Snow & ice	1310.5								
---	Water	1308.0	5							
° ° °	Sand & gravel	1306.0								
	Bedrock?									

Penetration resistance profile shown; obtained by driving a 2" dia. cone from groundlevel to depth noted with an energy of 350 ft. lb. per blow.

Penetration refusal at elev. 1306.0

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. - BORE HOLE NO. 4
JOB 61-F-21 STATION 1034.80 (10' Rt.)
DATUM 1313.0' COMPILED BY B.K.
BORING DATE Apr. 25/61 CHECKED BY V.K.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (QU) _____	0
VANE TEST (C) AND SENSITIVITY (S) _____	+5
NATURAL MOISTURE AND	
LIQUIDITY INDEX _____	1
LIQUID LIMIT _____	
PLASTIC LIMIT _____	

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION	
				RESISTANCE	P.S.F.
↓	Snow Level	1313.0	0		
---	Snow & ice	1311.8			

---	Water				
---		1307.5	5		
○					
○					
○			10		
○		1301.0			
	End of cone penetration Bedrock?				

Penetration refusal at elev. 1301.0

[illegible]

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W P - - - - - BORE HOLE NO. 5
JOB 61-F-21 - - - - - STATION 1034/80 (10' Lt.)
DATUM 1313.0' - - - - - COMPILED BY B.K.
BORING DATE Apr. 25/61 - - - - - CHECKED BY V.K.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu)	0
VANE TEST (C) AND SENSITIVITY (S)	+9
NATURAL MOISTURE AND	
LIQUIDITY INDEX	11
LIQUID LIMIT	Y
PLASTIC LIMIT	

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE				
				P.S.F. BLOWS/FT.				
	↓ Snow Level	1313.0	0	25	50	75	100	
---	Snow & ice	1312.0						

---	Water	1308.0	5					
o								
o	Sand and gravel							
o								
o		1302.5	10					
	Bedrock							
		1297.5	15					
	End of borehole		20					

CONSISTENCY			SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT				
10	20	30		
			S1	-
			S2	-
			RC3	-