

#62-F-298M

COUNTY RD #1

LOT #7 CONC 5



ONTARIO

DEPARTMENT OF HIGHWAYS

Bridge Division

Memo to Mr. A. Stermac
Principal Foundation Eng.
Lab. Bldg. Downsview

Date May 4, 1962

Subject United Counties of Stormont
Dundas & Glengarry, New Bridge
South of Mountain. Twp. of
Mountain, County of Dundas
Lot 7, Con. V, Our File BA 1401


From G.C.E. Burkhardt

We are enclosing herewith one copy of the Foundation Report, by John D. Patterson, and a copy of the Preliminary plan for your comments.

Our Hydrology Engineer is visiting the site at the present time, we expect that the H. W. L. is higher by several feet than the one given on the plan.

We would like to approve the plan before May 16, 1962 and would appreciate it very much if we could have your comments prior to this date.

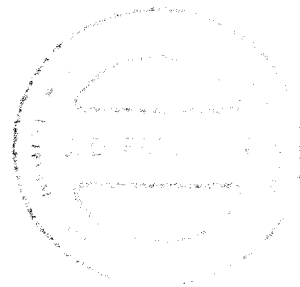
GCER/m


G. C. E. Burkhardt,
for K.L. Kleinsteinber
Municipal Bridge Liaison Engineer

By phone May 8, 1962
AGJ

[illegible]

2017



Introduction:

At the request of Mr. D. C. Grams, P. Eng., C. C. Parker and Associates, Ltd., on behalf of the United Counties of Stormont, Dundas and Glengarry, a soil investigation was conducted at the site of a proposed new bridge over a tributary of the South Nation River on County Road No. 1, Lot 7, Concession 5, Mountain Township.

The proposed bridge is to replace the existing bridge now inadequate for present-day traffic and in poor condition structurally.

The investigation was undertaken to obtain sufficient information for foundation design of the new structure and for construction procedure for the road embankment approaches.

Fieldwork Procedure:

Two test holes were put down at diagonally opposite sides of the bridge at locations shown on the Test Boring Plan.

At each location a cone probe was driven to refusal to check the uniformity of the soils. At Hole 1 casing was driven, the soils sampled to 39 feet, and bedrock located. At Hole 2, casing was driven and the soils sampled to 25.3 feet.

All drilling equipment was supplied by the firm of F. E. Johnston Drilling Co., Ltd., and their work was directed and supervised at all times by a member of our staff. The equipment consisted of a standard drilling rig fully equipped for soil testing and mounted on a trailer.

Sampling and Testing:

Samples of the various soils were taken by means of Shelby thin-walled tubes (for cohesive soils) and Split Spoon Sampler (for granular soils).

The Shelby Tube samples were taken to the laboratory, extruded, and tested for unconfined compressive strength.

The split spoon samples were classified and retained in plastic bags. The Standard Penetration Test was conducted during the split spoon sampling and the results are recorded as "N" values.

The core samples of bedrock were examined, classified and retained in a core box.

Observations:

Observations:

(a) Soil Types.

In Hole No. 1 the following soil profile occurs:

- 0 - 1' Silty topsoil.
- 1' - 3' Weathered sandy silt and sand.
- 3' - 5.5' Stiff, fissured, weathered, silty clay with organic inclusions to 4.5 feet.
- 5.5' - 10' Stiff, grey, silty clay with minor sand and pockets of fissuring.
- 10' - 19' Stiff to hard, grey, silty clay with minor free sand and some fissuring.
- 19' - 26' Loose, grey, saturated silt.
- 26' - 28' Medium dense glacial till.
- 28' - 39.0' Very dense glacial till.
- 39.0' - 45.6' Bedrock. Limestone with minor shale lenses and some calcite.

In Hole No. 2 the following soil profile occurs:

- 0 - 2' Stony topsoil.
- 2' - 8' Soft, weathered, clayey silt.
- 8' - 14.2' Intermixed brown, fibrous peat and marl.
- 14.2' - 15' Very loose, gray silt.
- 15' - 22.5' Medium dense glacial till.
- 22.5' - 25.3' Very dense glacial till.

Details of borings and test holes are shown on the Soil Profile and Laboratory Test Sheets which form part of this report.

There is considerable difference in the soil types underlying each bank of the stream above the glacial till.

In Hole No. 1 the till is overlain by a 7-foot layer of silt which decreases in thickness to one foot at Hole No. 2.

Above the silt in Hole No. 2 is a thick band of peat and marl which pinches out to the north in the direction of Hole No. 2. The silt in Hole No. 1 is overlain by a stiff to hard clay.

(b) Groundwater.

The groundwater level at the completion of the investigation was found to be two feet below ground surface in both holes.

(c) Test Results.

The unconfined compressive strength test results are shown on the Soil Profile Sheets. The results indicate that the clay in Hole No. 1 is consistent and fairly stiff from 3 feet to about 15 feet but this layer is lacking in Hole No. 2 (South Bank).

Conclusions and Recommendations:

Conclusions and Recommendations:

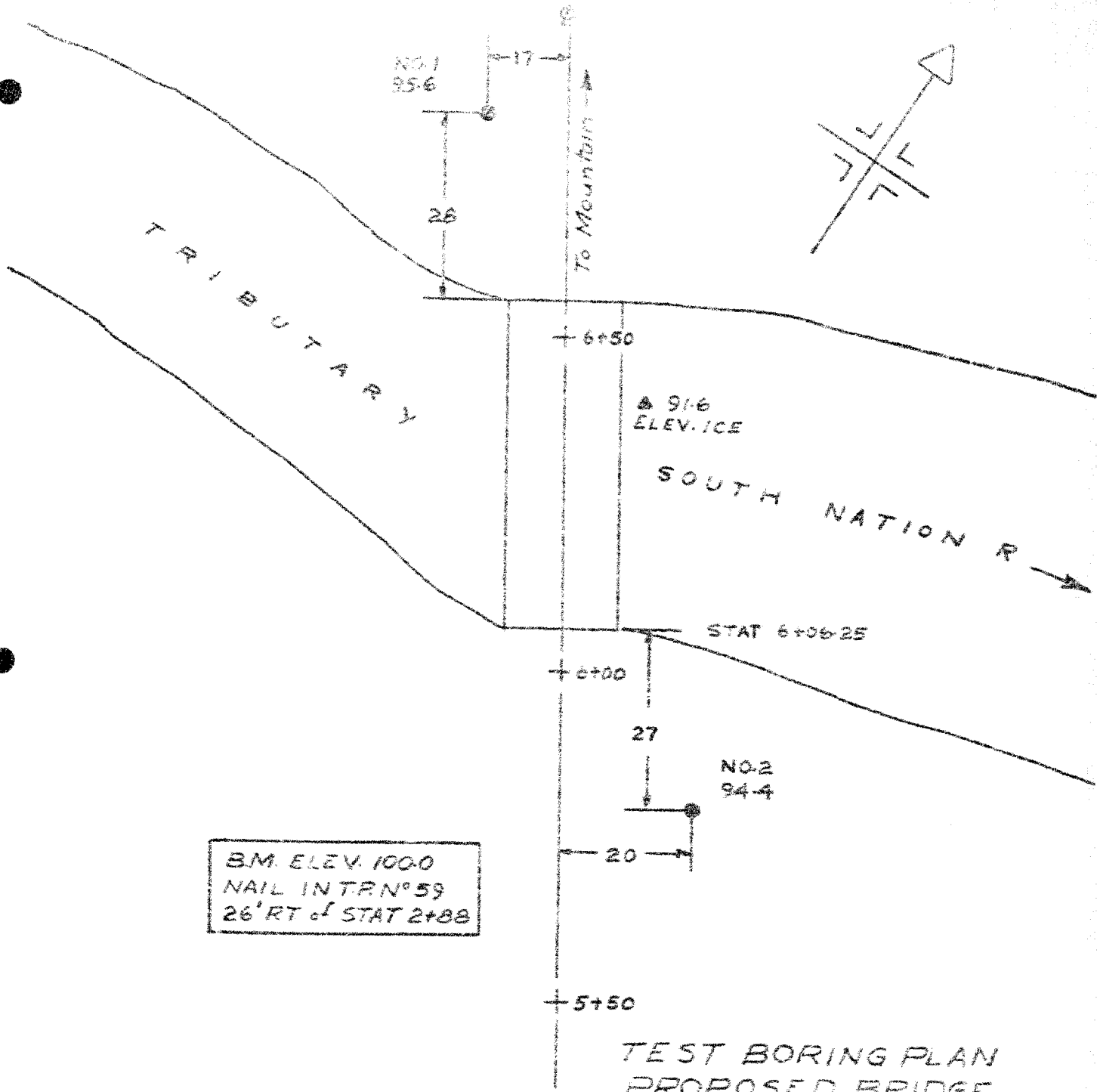
Because of the difference in the underlying soil conditions at the north and south abutments the use of spread footings cannot be recommended. It is, therefore, recommended that piles be driven to refusal in the dense glacial till or to the bedrock. Pressure-creosoted timber piles could be used but the driving will be hard for the first few feet on the north side of the stream. Steel "H" piles should also be considered as the driving will be easier through the stiff clay. Assuming that the pile caps will be approximately at Elevation 88 the expected length of the piles will be 30 to 32 feet — if steel piles are used.

The existing road profile indicates that additional embankment approach fill will be in the order of two to three feet. If this is the case no stability problem exists but the additional fill should consist of well compacted granular material.



J. D. Paterson, P. Eng.

JEP/MHC.



TEST BORING PLAN
PROPOSED BRIDGE
COUNTY ROAD 1
LOT 7 CON. 5
TOWNSHIP MOUNTAIN

SCALE 1"=20' MAR 1962

SOIL PROFILE AND LABORATORY TESTS

Location:

County Road 1, Lot 7, Con. 5,
Township of Mountain.

Elevation (Zero Depth): 64.6

Remarks: Zone 10000 and 100000

Sheet No. 1

4010 4010

Springs of: W. Johnston, Portland, Me., U.S.A. Date: March 26, 1949

Blows per Foot	Soil Description	Samples	U/c	N	Depth in Feet	Elev.	Moisture Content				
							30	40	50	60	70
Cone	Ground Surface										
14	Silty Topsoil 1				0	75.6					
3	Weathered sandy silt and sand 3				0						
7	Stiff, fissured, weathered, silty clay with organic inclusions to 1.5' 3.5	TV 2	1.80								
11					6						
20	Stiff, gray, silty clay with minor sand and pockets of fissuring.	TV 3	1.27								
26		TV 4	1.40								
26	10				0	68.6					
24		TV 5	1.57								
25	Stiff to hard gray, silty clay with minor fine sand and pockets of fissuring.	TV 6	1.64		12						
30					20						
26											
25											
23											
22											
20											
19					18	77.6					
36	Loose, gray, saturated silt.	TV 7	Disturbed		21						
31											
26											
24											
21				6	24						
20	26	SS 8									
31	Medium dense glacial till.	SS 9		22	27	68.6					
95	28										
122		SS 10		62							
Refused	Very dense glacial till.				30						
					33						
		SS 11		72	36	59.6					
	39.0				39						
	<u>BEDROCK.</u>										
	Limestone with minor shale lenses and some calcite.	Core 9%			42						
		Recovery.									
	45.6				45	50.6					

JOHN D. PATTERSON
CONSULTING ENGINEERS
OTTAWA CANADA

100-443887-100

Remarks: Bone Frogs and Toad Springs

100

Borings by: F. J. Johnston Drilling Co., Ltd. Date: March 7, 1936

5000

2

Blows per Foot	Soil Description	Samples	U'c	N	Depth in Feet	Elev.	Moisture			Content	
			T/n'				30	40	50	60	70
Cone	Ground Surface										
1					0	64.4					
2	Stony till.	2			2						
3					4						
4	Soft, sandy, clayey				6						
5	silt.				8						
6					10						
7		TW	21	1.16	12						
8					14						
9		TW	22	Feet	16						
10					18						
11	Intermixed brown, fibrous				20	64.2					
12	peat and silt.				22						
13					24						
14					26						
15					28						
16	Very loose, grey silt.	SS	23		30						
17					32						
18					34						
19	Medium dense, glacial till.	SS	24		36						
20					38						
21					40						
22					42						
23					44						
24					46						
25		SS	25		48	64.4					
26					50						
27					52						
28					54						
29					56						
30					58						
31					60						
32					62						
33					64						
34					66						
35					68						
36					70						
37					72						
38					74						
39					76						
40					78						
41					80						
42					82						
43					84						
44					86						
45					88						
46					90						
47					92						
48					94						
49					96						
50					98						
51					100						
52					102						
53					104						
54					106						
55					108						
56					110						
57					112						
58					114						
59					116						
60					118						
61					120						
62					122						
63					124						
64					126						
65					128						
66					130						
67					132						
68					134						
69					136						
70					138						
71					140						
72					142						
73					144						
74					146						
75					148						
76					150						
77					152						
78					154						
79					156						
80					158						
81					160						
82					162						
83					164						
84					166						
85					168						
86					170						
87					172						
88					174						
89					176						
90					178						
91					180						
92					182						
93					184						
94					186						
95					188						
96					190						
97					192						
98					194						
99					196						
100					198						
101					200						
102					202						
103					204						
104					206						
105					208						
106					210						
107					212						
108					214						
109					216						
110					218						
111					220						
112					222						
113					224						
114					226						
115					228						
116					230						
117					232						
118					234						
119					236						
120					238						
121					240						
122					242						
123					244						
124					246						
125					248						
126					250						
127					252						
128					254						
129					256						
130					258						
131					260						
132					262						
133					264						
134					266						
135					268						
136					270						
137					272						
138					274						
139					276						
140					278						
141					280						
142					282						
143					284						
144					286						
145					288						
146					290						
147					292						
148					294						
149					296						
150					298						
151					300						
152					302						
153					304						
154					306						
155					308						
156					310						
157					312						
158					314						
159					316						
160					318						
161					320						
162					322						
163					324						
164					326						
165					328						
166					330						
167					332						
168					334						
169					336						
170					338						
171					340						
172					342						
173					344						
174					346						
175					348						
176					350						
177					352						
178					354						
179					356						
180					358						
181					360						
182					362						
183					364						
184					366						
185					368						
186					370						
187					372						
188					374						
189					376						
190					378						
191					380						
192					382						
193					384						
194					386						
195					388						
196					390						
197					392						
198					394						
199					396						
200					398						
201					400						
202					402						
203					404						
204					406						
205											