

Mr. K. L. Kleinsteinber,
Municipal Bridge Liaison Engr.,
Bridge Division.

Attn: Mr. G.C.E. Burkhardt

Mr. A. G. Stermac,
Principal Foundation Engr.,
Foundation Section,
Materials & Research Division.

June 20, 1963

Waba Creek Bridge,
Lot 2, Con. IV/V,
Twp. of McNab, County of Renfrew.
(Bridge Office Ref. BA 1651)

As requested, we have reviewed the Foundation Report for the above-mentioned proposed structure which was prepared by John D. Paterson & Associates, together with the Final Bridge Drawings by Alex J. Graham, Consulting Civil Engineer.

Our comments are as follows:

The investigation consisted of one sampled borehole supplemented by two dynamic cone tests and one cone test pushed by hand. The soil stratification was established only at the location of the sampled borehole, while at the other two locations, it was inferred from the results of the cone tests. The borehole was drilled to a depth of 23 ft. - i.e., elev. 27.3, while the other two cones were driven and pushed to elev. 26.0 and 39.5, respectively.

The Soil Consultant has made recommendations pertaining to the foundations of a culvert, while the Bridge Consultant has chosen to design a timber trestle with piles driven to elev. 25.0 at the bent locations, and to elev. 38.0 at the two abutments. No information can be found on the bearing capacity of these piles - either in the soils report or on the bridge drawing.

The length of the structure will be about 190 ft. The subsoil stratigraphy, as stated earlier, was reliably determined at one location only, and we feel that this is inadequate.

Also, the boring and the cone penetration were carried down only to elev. 27.3 and 26.0, respectively, which is higher than the proposed pile tip elevation 25.0. This, we also consider inadequate.

cont'd. /2 ...

Mr. K. L. Kleinstelber,
Attn: Mr. G.C.E. Burkhardt.

June 20, 1963

According to the bridge drawing, the piles of the abutments should be driven to elev. 38.0, which is the approx. elevation where the till layer starts. Unless the stratification at the abutment location is different, we consider the above pile depth to be inadequate.

The grade of the new crossing will be raised and, therefore, the stability of the banks has to be investigated and commented upon.

AGS/MdeF

A. G. Stermac
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Foundations Office
Gen. Files

MEMORANDUM

To: Mr. A. Stermac,
Principal Foundation Eng.,
Lab. Bldg.

FROM: G. C. E. Burkhardt

DATE: June 18, 1963.

OUR FILE REF.

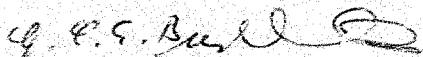
IN REPLY TO

SUBJECT: Township of McNab,
Waba Creek Bridge,
Lot 2, Con. IV/V,
County of Renfrew,
Our File No. BA 1651.

Attached please find one copy of the Foundation Report, by John D. Patterson & Associates, and one copy of the Final Plans for your comments.

We would like to approve the plans as soon as possible. Therefore, we would appreciate it very much if we could have your comments at your earliest convenience.

GCEB:ah


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

INSPECTION SERVICES
LABORATORY TESTING
APPRAISALS, RESEARCH
SOIL INVESTIGATIONS

JOHN D. PATERSON & ASSOCIATES

CONSULTING ENGINEERS & GEOLOGISTS

OTTAWA 3, CANADA

OFFICES AND LABORATORY:
1479 LAPERRIERE AVE.

TEL. PA 8-3505

REPORT OF SOIL INVESTIGATION

63-F-2814

PROPOSED CULVERT

WABA CREEK

LOT 2, CONCESSIONS 4 & 5

MCNAB TOWNSHIP

* * * * *

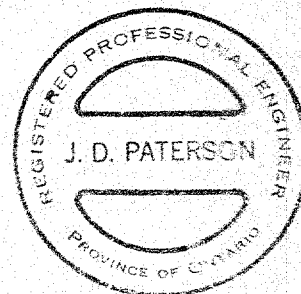
ALEX. J. GRAHAM

CONSULTING ENGINEER

* * * * *

REPORT NO. S 311 - 63

OTTAWA, MARCH 6, 1963



Introduction:

At the request of Mr. Alex. J. Graham, Consulting Engineer, on behalf of the Township of McNab, a soil investigation was conducted at the site of a proposed culvert.

The culvert is to replace a wooden bridge spanning Waba Creek at the Duncan Stewart Saw Mill at Waba.

It was determined that the centre of stream flow is slightly south of the centre of the existing bridge and the test holes were located accordingly.

Drilling from the ice was hazardous since several thin layers of ice on the creek were separated by water. The drilling rig broke through the ice and sank approximately four feet when moving from Hole 1 to Hole 2, and considerable difficulty was encountered withdrawing it.

Because of the ice conditions the drilling rig could not be moved to Hole No. 3.

Fieldwork Procedure:

Three test holes were put down at the locations shown on the Test Boring Plan. At Holes 1 and 2 cone probes were driven to 23 and 24 feet, respectively, and at Hole 1 the soils were sampled to 24 feet. At Hole 3 a cone probe was driven by hand to refusal.

The firm of F. E. Johnston Drilling Company was employed for all drilling operations. Their work was directed and supervised at all times by a member of our staff.

The equipment used consisted of a standard drilling rig fully equipped for soil testing and mounted on a trailer. A large skid was attached to the front of the trailer after it was recovered from the water.

Sampling and Testing:

Because the soils were granular all the samples were recovered from Hole No. 1 by means of the split spoon sampler. Each sample was retained in a plastic bag.

The Standard Penetration Test was conducted on each split spoon sample and the results are recorded as "N" values on Soil Profile Sheet 1.

Observations:

Observations:

(a) Soil Types.

In Hole No. 1 the following soil profile occurs:

0	-	1'	Ice.
1'	-	5'	Water.
5'	-	11.4'	Sawdust and bark.
11.4'	-	12.5'	Muck and sand.
12.5'	-	18'	Medium dense sandy glacial till.
18'	-	23'	Dense to very dense sandy glacial till.

Details of the test hole and an interpretation of the soil profile at Hole 2 based on cone blows per foot and an interpretation of the cone probe by hand at Hole 3 are shown on the Soil Profile and Laboratory Tests sheets which form part of this report.

Test Results:

The results of the Standard Penetration Tests indicate that the glacial till increases in density from medium dense to very dense with depth.

Conclusions & Recommendations:

The bed of the creek is covered with about six feet of sawdust, bark and muck which is incapable of sustaining any load. However, the glacial till below this is quite satisfactory on which to place the culvert. Recommended maximum soil loadings at various elevations are shown below:

<u>Elevation</u>	<u>Recommended Loading</u>
37 - 35	1400 pounds per square foot
Below 35	3000 " " " "

In order to eliminate possible large settlements of the backfill material consideration should also be given to removing the sawdust layer on both sides of the new culvert and for a distance up and down stream equal to the length of the culvert.

Care should be taken to ensure that the till is undisturbed prior to the placing of concrete.

JOHN D. PATERSON & ASSOCIATES,

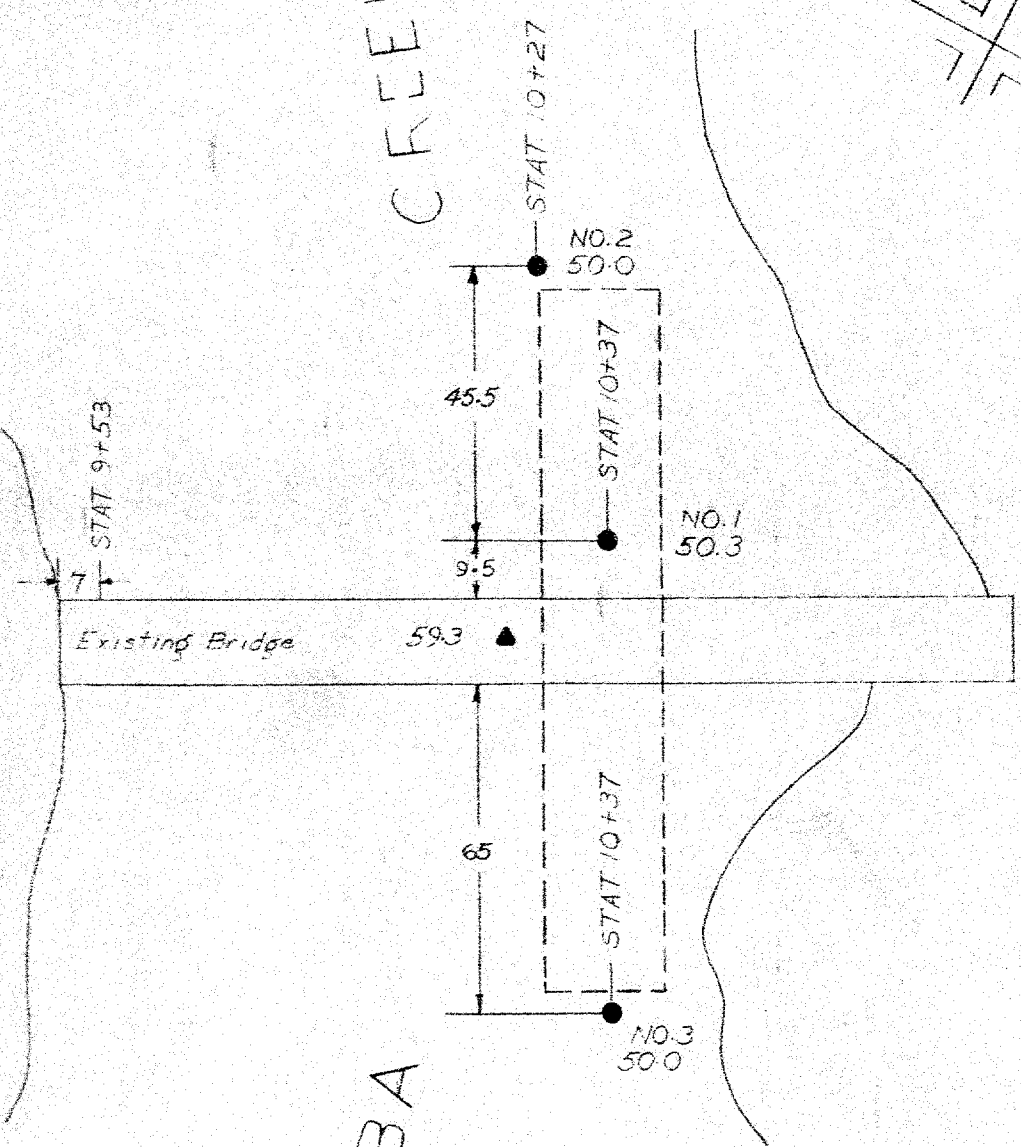
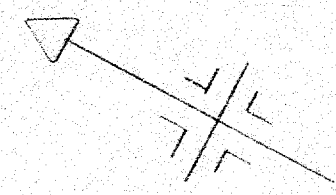

J. D. Paterson, P. Eng.

Report No. S 311-63.

Ottawa, March 6, 1963.

JDP/MMC.

CREEK



WABA

TEST BORING PLAN
PROPOSED CULVERT
LOT 2 CON 4 & 5
MCNAB TOWNSHIP

SCALE 1"=30' FEB 1963

JOHN D. PATTERSON & ASSOCIATES

CONSULTING ENGINEERS
OTTAWA CANADA

Location:

Village of Waba,
Ontario.

Elevation (Zero Depth): Ice: 50.3; Water 50.2.

Remarks: Cone Probe and Test Boring.

Sheet No:

1 of 2

Hole No:

1

Borings by: F.E. Johnston Drilling Co., Ltd. - February 19 & 20, 1963.

Blows per Foot	Soil Description	Samples	No	Depth in Feet	Elev.	Moisture Content Per Cent.				
						30	40	50	60	70
	Ice Surface					Water Level 50.2.				
	Ice (Variable Thickness) 1				0 - 50.3					
	Water				3 -					
		5			6 - 44.3					
1	Sawdust and Bark				9 -					
1										
1										
1		11.4								
58	Muck and Sand	12.5			12 - 38.3					
37		SS 1	17							
34										
10	Medium dense sandy	SS 2	18		15 -					
21	Glacial Till.									
36		SS 3	27							
37		18			18 - 32.3					
45	Dense to very dense sandy Glacial Till.									
48										
70					21 -					
74										
80		23	SS 4	27						
					24 - 26.3					

COL. HEDLEY AND HIS LABORATORY RESEARCH

Location:

Village of Waba,
Ontario.

Sheet No:

2 of 2

Hole No:

2 & 3

Blows per Foot	Soil Description <u>Hole No. 2</u>	Sample	P	e	W	Depth in Feet	Elev.	Moisture Content Per Cent.				
								30	40	50	60	70
Cone	Ice Surface					0	50.0					
	Ice (Variable Thickness) 2											
	Water					3						
	6.5					6	44.0					
1												
1												
2	Sawdust and Bark					9						
1												
2												
4	12					12	38.0					
50												
31												
17	Medium dense sandy					15						
27	Glacial Till.											
29												
27						18	32.0					
32												
38	20											
47	Dense to very dense sandy					21						
60	Glacial Till.											
61												
70	24					24	26.0					
	<u>Hole No. 3</u>											
	Ice Surface											
	Ice 1					0	50.00					
	Water											
	4					3						
	Sawdust and Bark					6	44.0					
	10.5					9						
	Glacial Till.					12	38.0					

#63-F-281m

WABA CREEK

BRIDGE

LOT. 2, CON. IV/V

MCNAB

Twp.

