

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 31G-175

W.P. No. \_\_\_\_\_

CONT. No. \_\_\_\_\_

W. O. No. \_\_\_\_\_

STR. SITE No. \_\_\_\_\_

HWY. No. \_\_\_\_\_

LOCATION Co. RD. N° 27 &  
S. BRANCH of RAISIN RIV.

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OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.

NONE

REMARKS: \_\_\_\_\_

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\_\_\_\_\_

BA/878

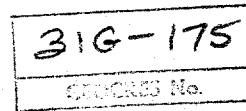
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INSPECTION SERVICES  
LABORATORY TESTING  
APPRAISALS, RESEARCH  
SOIL INVESTIGATIONS



REPORT OF SOIL INVESTIGATION  
PROPOSED NEW BRIDGE COUNTY RD. NO. 27  
SOUTH BRANCH OF RAISIN RIVER  
CHARLOTTENBURGH TOWNSHIP

FOR  
UNITED COUNTIES OF STORMONT, DUNDAS & GLENGARRY

ALEX J. GRAHAM  
CONSULTING DESIGN ENGINEER  
OTTAWA

REPORT NO. S363-64  
APRIL 16, 1964



## INTRODUCTION:

At the request of Alex J. Graham, Consulting Civil Engineer, on behalf of United Counties Stormont, Dundas and Glengarry, a soil investigation was conducted at the site of a proposed new bridge over the South Branch of the Raisin River on County Road No. 27 in Charlottenburgh Township.

The existing bridge is too narrow to accommodate dual lane traffic.

## FIELD WORK PROCEDURE:

One full scale test hole and a cone probe driven to refusal were put down at the locations shown on the Test Boring Plan.

Three attempts to drive a cone probe in conjunction with test hole No. 1 resulted in a maximum penetration of 3.4 feet. However, casing was drilled, the soils sampled, and bedrock located.

A standard drilling rig mounted on a trailer and operated by a crew of two was used for the field work. Their work was supervised and directed at all times by a soils technician from our staff.

## SAMPLING AND TESTING:

Samples of cohesive soils below the elevation of the bottom of the stream were recovered by means of Shelby thin-walled tubes. These were extruded and tested for unconfined compressive strength at the laboratory.

A sample of glacial till was recovered by means of the split spoon sampler. During the recovery of the split spoon sample the Standard Penetration Test was conducted and the result is recorded as an "N" value.

Samples of boulders and bedrock were recovered by diamond drilling. Core samples of boulders and the split spoon sample were retained in plastic bags. The core sample of bedrock was classified and retained in a core box.

Cont'd.../2

OBSERVATIONS:

(a) Soil Types

In hole No. 1 the following soil profile occurs:

0	-	7.5	Granular fill with boulders.
7.5	-	10.5	Medium stiff, oxidized silty clay with minor roots.
10.5	-	15.5	Medium stiff, partially oxidized, silty clay.
15.5	-	19.5	Soft grey and pinkish grey silty clay.
19.5	-	27.5	Med. dense glacial till with boulders.
27.5	-	32.5	Bedrock - limestone with thin shale lenses.

Details of bore hole 1 and an interpretation of cone probe 2 based on blows per foot are shown on the Soil Profile sheets.

(b) Ground Water

Because hole No. 1 collapsed when the casing was withdrawn the actual ground water level could not be determined. However, at the abutments the ground water level is expected to be equal to and fluctuate with the river surface.

(c) Test Results

The results of pocket penetrometer tests on the clay indicate it is of soft consistency. The Standard Penetration test on the glacial till indicates that it is medium dense in consistency.

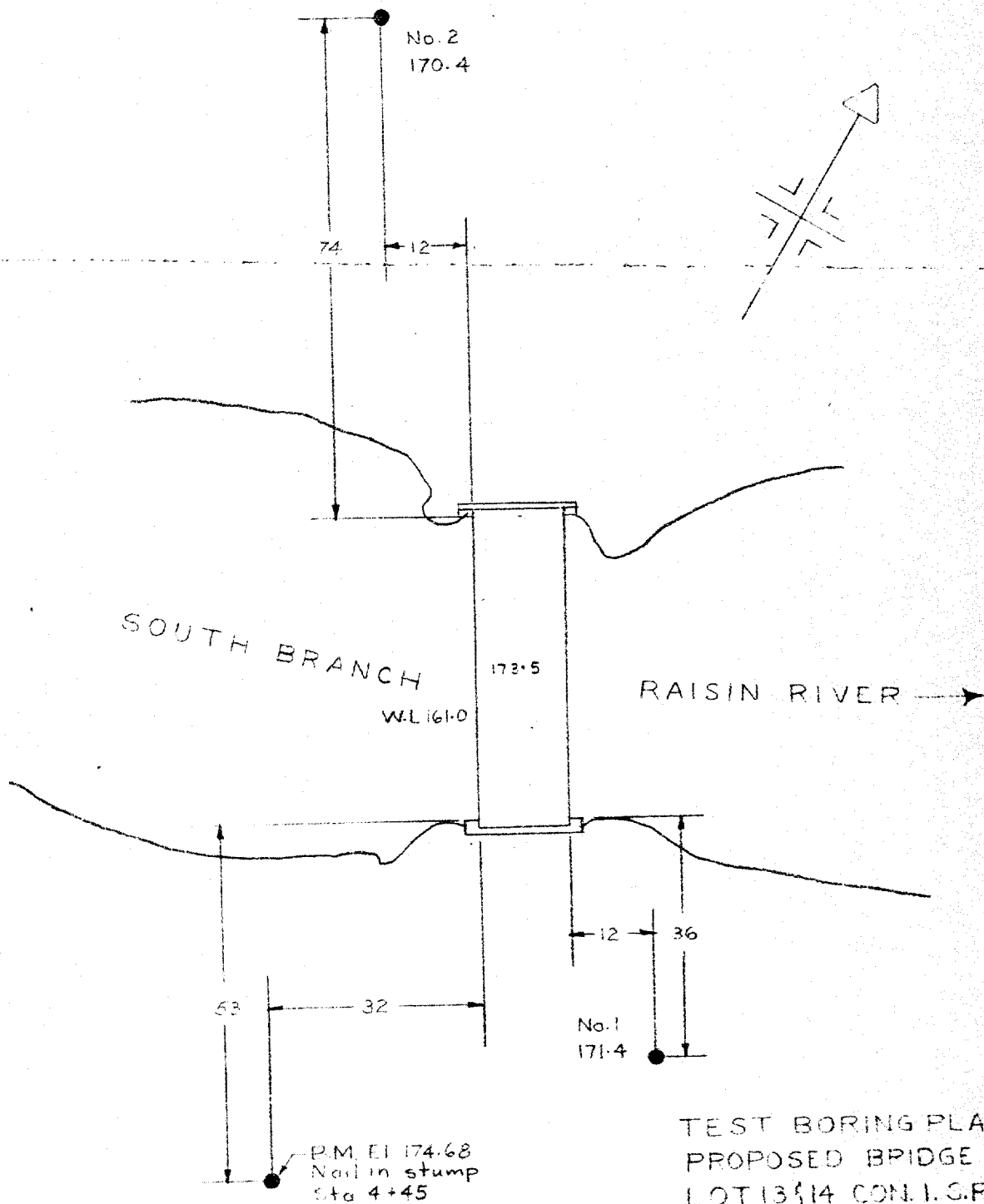
CONCLUSIONS AND RECOMMENDATIONS:

The glacial till underlying the soft clay is dense and considered suitable on which to place footings for the bridge structure. Since the elevation of the stream bed is 156 and the dense till commences at approximately elevation 152 no deep excavation to reach the till will be required. However, of course it is important that the till surface be undisturbed prior to the placing of any concrete. The recommended maximum loading on undisturbed till is 3,400 lbs per square foot. This loading is recommended on the assumption that there will be a surcharge over the footings of at least 4 feet and the footings themselves approximately 5 feet wide. Settlement is expected to be minor providing the soil below the footings is undisturbed.

If the design loads for the new structure exceed the recommended unit loading, then it is recommended that short piles be used which would be driven into the till and possibly to refusal at bedrock. The bedrock lies at approximately elevation 144 - a depth of about 8 feet below the top of the glacial till layer. If piles are decided upon, we would recommend that steel H piles be used rather than timber. Because of the bouldery nature of the till, considerably more difficulty in driving might be encountered with wooden piles. Lateral stability of a short pile in this type of soil would not be a problem.

*L. Bredeson*

L. Bredeson, P. Eng.



TEST BORING PLAN  
 PROPOSED BRIDGE  
 LOT 13 & 14 CON. I. C. R.R.  
 COUNTY RD 27  
 CHARLOTTEBURGH TWP  
 GLENGARRY CY

Scale 1"=20'

Apr. 1964

JOHN D. PATERSON & ASSOCIATES  
CONSULTING ENGINEERS

OTTAWA

CANADA

SOIL PROFILE AND LABORATORY TESTS

County Road No. 27

LOCATION: Township of Charlottenburgh  
Glengarry County

Elevation (Zero Depth): 171.4

Remarks: Cone probe and test boring  
P.P. = pocket penetrometer

Sheet NO: 1 of 2

Borings by: F.E. Johnston Drilling Co. Date: Apr. 3, 1964.

Hole No: 1

Blows per Foot	Soil Description	Samples		N	Depth in Feet	Elev.	Moisture Content Per Cent.				
		Type	No.				30	40	50	60	70
	Ground Surface										
21 21 70 for 0.4'	Granular fill with boulders	Core	1		0	171.4					
		Core	2		3						
					6	165.4					
	Medium stiff, oxidized, silty clay with minor roots.	SS	3	7	9						
	Medium stiff partially oxidized silty clay.	SS	4	6	12	159.4					
					15						
	Soft grey & pinkish grey silty clay.	TW	5	0.30 PP	18	153.4					
		TW	6	0.22 PP	21						
	Medium dense saturated glacial fill with boulders.	SS	7	24	24	147.4					
					27						
	Bedrock	Run	1	Core 90 %	Recovery						
	Limestone with thin shale lenses.	Run	2	Core 88 %	Recovery						
		Run	3	Core 96 %	Recovery						
					33						
					36	135.4					

El. stream bed  
at centre of  
bridge

## SOIL PROFILE AND LABORATORY TESTS

CANADA

LOCATION:

County Road No. 27  
Township of Charlottenburgh  
Glengarry County

Elevation (Zero Depth): 170.4

Remarks: Cone probe only. Interpretation based on cone  
blows per foot.

Sheet NO: 2 of 2

**Borings by:** F.E. Johnston Drilling

Date: Apr. 6, 1964.

Hole No: 2

[illegible]