

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 31G5-120

W.P. No. _____

CONT. No. _____

W. O. No. _____

STR. SITE No. 3-33

HWY. No. _____

LOCATION Co. Rd. # 31 &
CARP RIV., BRIDGE

=====

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.

NONE

REMARKS: _____

JOHN D. PATERSON, B.SC., P.ENG.

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INSPECTION SERVICES
LABORATORY TESTING
APPRAISALS, RESEARCH
SOIL INVESTIGATIONS

June 6th, 1962.

3165-120

GEOCREs No.

Mr. A. J. Graham, P. Eng.,
County Engineer,
County of Carleton,
Court House,
O t t a w a .

STRUCTURE SITE No.

3-33

Soil Investigation
Proposed New Bridge over Carp River
County Road No. ~~31~~ 31

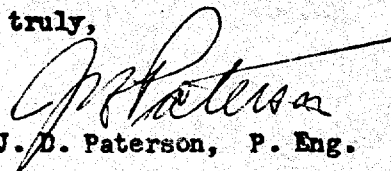
Dear Mr. Graham,

In July, 1961, a soil investigation was conducted at the site of a proposed new bridge over the Carp River on County Road No. 31, March Township. This Report, No. S 214-61, indicated that the bridge would have to be founded on piles. However, it was felt that additional information was required to determine the actual bedrock horizon. Therefore one additional hole, which we have called No. 4, was put down at the location shown on the attached test boring plan.

Knowing the soil conditions overlying bedrock this hole was simply put down to bedrock and the bedrock was drilled. Using the same bench mark as in the previous investigation it was found that bedrock lies at Elevation Minus 9.6, or, approximately 104.3 feet below ground surface at the hole location.

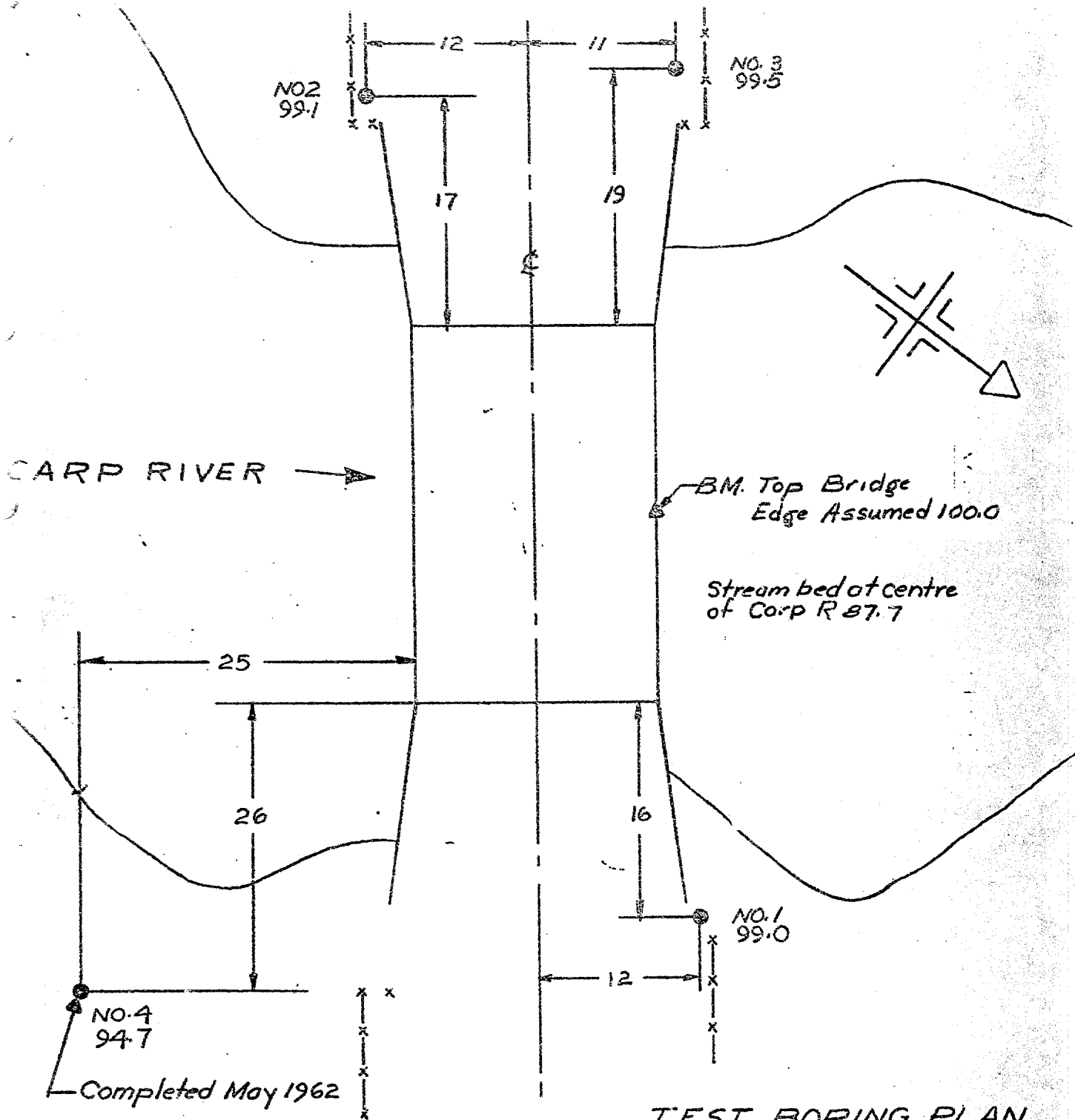
A 5-foot core was drilled and the bedrock was found to be shaly limestone. Assuming that the elevation of the base of the pile caps for the new bridge will be at 84 (approximately 4 feet below bottom of river) the length of steel "H" piles (which were previously recommended) will be about 94 feet when driven to bedrock, which, in this case, is recommended.

Yours truly,


J. D. Paterson, P. Eng.

Report No. S 214-A-62.

JDP/MMC.



TEST BORING PLAN
PROPOSED
BRIDGE REPLACEMENT
OVER THE CARP RIVER
COUNTY ROAD NO 31
LOTS 5-6 CONC. 1
MARCH TOWNSHIP
CARLETON COUNTY
SCALE 1"=10'
JULY, 1961

JOHN D. PATERSON, B.Sc., P.ENG.

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REPORT

OF

SOIL INVESTIGATION

PROPOSED NEW BRIDGE OVER CARRP RIVER

COUNTY ROAD NO. 31

LOTS 5 - 6, CON. I

MARCH TOWNSHIP

FOR

COUNTY OF CARLETON

Report No. S 214-61.

Ottawa, July 27, 1961.

Introduction:

At the request of Mr. A. J. Graham, County Engineer for the County of Carleton a soil investigation was conducted at the site of a proposed new bridge over the Carp River located on County Road No. 31 in March township. The existing bridge has a span of 28 feet and a width of 18 feet. There are signs of failure in the concrete abutments which would suggest settlement.

Field Work Procedure:

Three test holes were put down at the locations shown on the test boring plan. In Hole No. 1 the soils were sampled to a depth of $26\frac{1}{2}$ feet and a cone probe was pushed to a depth of 53 feet and driven to 86 feet. In Hole No. 2 the soils were sampled to a depth of $23\frac{1}{2}$ feet and a cone probe was pushed to 60 feet. In Hole No. 3 a cone probe was driven to refusal at a depth of 88.3 feet.

All drilling operations were directed and supervised by an engineer member of our staff. The equipment used consisted of a standard drilling rig mounted on a trailer and fully equipped for soil testing.

Sampling and Testing:

Samples of the soils from Holes Nos. 1 and 2 were taken by means of Shelby thin-walled tubes (peat and clay samples) and by means of the split spoon sampler (granular soils). The Shelby tube samples were taken to the laboratory and tested for unconfined compressive strength. Samples from the split spoon were classified and retained in plastic bags. At the time of driving the split spoon sampler the standard penetration test was conducted.

Observations:

(a) Soil Types.

In Hole No. 1 the following soil profile was encountered: 5 feet of gravel fill followed by 9 feet of interbanded silt and silty clay. From 14 feet to $26\frac{1}{2}$ feet the soil is a soft to very soft, silty, grey clay. Cone probe results indicate that this clay extends to a depth of 86 feet.

In Hole No. 2 there was some 6 feet of gravel fill followed by a mixture of peat, silt and clay to a depth of 13 feet. Below the peat there was 3 feet of a mixture of marl and sand. From 16 feet to the depth sampled ($23\frac{1}{2}$ feet) there is a soft, grey, clayey silt. The cone probe was pushed to a depth of 60 feet.

(b) River Level.

At the time of this investigation the level of the water in the river was Elevation 93.7 which is related to a bench mark on the bridge deck given an assumed elevation of 100.0. The river bottom at the deepest point was found to be at Elevation 87.7.

(c) Test Results.

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(c) Test Results.

The unconfined compressive strength test results indicate that the clay and silty clay, to a depth of 11 feet, is of medium to stiff consistency and the clay below this level is of soft consistency. The average shear strength of the upper clay is 1160 p.s.f. and from a depth of 14 feet in Hole No. 1 and 16 feet in Hole No. 2 the average shear strength is 490 p.s.f.

Conclusions & Recommendations:

The soil conditions in the upper 14 feet have been found to vary somewhat in that peat and marl occur on the west bank of the river whereas none was found on the east bank.

Below a depth of 16 feet conditions are similar and soft clays occur to a depth of 88 feet.

Because of the presence of the deep clay layer with an average shear strength of only 490 lbs. per square foot it is our recommendation that the new bridge be founded on piles driven to a depth of 88 feet. The actual pile length would be in the vicinity of 77 feet. Based on our findings with the cone probe a pile of the steel "H" type would probably require very little driving until almost the full depth is reached.



J. D. Paterson, P. Eng.

JDP/MMC.



CARP RIVER →

NO. 2
99.1

NO. 3
99.5

BM. Top Bridge
Edge Assumed 100.0

NO. 1
99.0

TEST BORING PLAN
PROPOSED
BRIDGE REPLACEMENT
OVER THE CARP RIVER
COUNTY ROAD NO. 31
LOTS 5-6 CONC. 1
MARCH TOWNSHIP
CARLETON COUNTY
SCALE 1" = 10' JULY, 1961

JOHN D. PATERSON
CONSULTING ENGINEERS
OTTAWA CANADA

SOIL PROFILE
&
LABORATORY TESTS

Location: County Road No. 21
Carleton County

ELEVATION (Zero Depth): 99.0.

Remarks: Cone Probe and Test Boring.

Sheet No:
1 of 3

Hole No:
1

Borings by: F. E. Johnston Drilling Company. Date: July 11, 1961.

BLOWS PER FOOT	SOIL DESCRIPTION	Samples		Uncon. Comp. Strength lbs./Sq.Ft.	Depth in Feet	ELEV.	MOISTURE CONTENT PER CENT.				
							30	40	50	60	70
Cone	Ground Surface			and Standard Pen. Test N Values	0	99.0					
	Gravel Fill										
	5										
	Interbanded weathered silt and silty clay, slightly organic.	SS	1	N = 8	5						
		TW	2	1.15							
	9	SS	3	N = 3							
	Soft, fissured clay lenses interbanded with slightly weathered silt and silty clay - slightly organic.	TW	4	1.17	10	89.0					
	14										
	Soft, grey, silty clay with an odd white shell.	TW	5	0.41	15						
		TW	6	0.48	20	79.0					
	25										
Pushed to 53 Feet.	Soft to very soft, silty, grey clay to 86 feet.	TW	7	0.61	25						
					30	69.0					
					35						

Stream Level
93.7, July 11/61.

Stream Bottom, 87.7.

JOHN D. PATERSON
CONSULTING ENGINEERS
OTTAWA CANADA

SOIL PROFILE
&
LABORATORY TESTS

Location: County Road 31
Carleton County

ELEVATION (Zero Depth): 99.1.
Remarks: Cone Probe and Test Boring.

Sheet No:
2 of 3
Hole No:
2

Borings by: F. E. Johnston Drilling Company. Date: July 11, 1961.

BLOWS PER FOOT	SOIL DESCRIPTION	Samples		Uncon. Comp. Strength Tons/Sq.Ft. and Standard Pen. Test N Values	Depth in Feet	ELEV.	MOISTURE CONTENT PER CENT.				
							30	40	50	60	70
	Ground Surface				0	99.1					
	Gravel Fill				5						
	Mixed peat and clayey silt.										
	Black, fibrous peat with some silty clay and sand.	SS	8	N = 2	10	89.1					
	Marl with shells and sand.	TW	9	No Value							
	Soft, grey, clayey silt with some shells.	TW	11	0.53	20	79.1					
	Very soft, silty clay and/or clayey silt to 60'.	TW	12	0.44	25						
					30	69.1					
					35						

Stream Level,
July 11/61 - 93.7.

Stream Bottom - 87.7.

Pushed
to
60
Feet

SOIL PROFILE & LABORATORY TESTS

ELEVATION (Zero Depth): 99.5.
Remarks: Cone Probe only.

Sheet No: 3 of 3

Surings by: F. E. Johnston Drilling Company. Date: July 14, 1961.

Hole No: 3

[illegible]