

#59-F-216C

W.P. # 940-59

BRIDGE #16

ROCHESTER ST.,

THE QUEENSWAY

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59-F-216C

REPORT
OF
SOIL INVESTIGATION
SITE OF BRIDGE NO. 16, AT ROCHESTER STREET,
THE QUEENSWAY
FOR
DE LEUW, CATHER & COMPANY OF CANADA, LIMITED.
CONSULTING ENGINEERS

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Report No. S - 109-59.

Ottawa, October 5th, 1959.

1. Introduction:

At the request of De Leuw, Cather & Company of Canada, Limited, Consulting Engineers for the Queensway, Ottawa, a soil investigation was conducted at the site of proposed Bridge No. 16 located at Rochester Street.

2. Field Work Procedure:

Six test holes were put down at the locations shown on the Test Borings Plan included in this report. The locations conform to those shown on Sketch Plan No. SK - III - 29, dated July, 1958.

Since bedrock is very close to the ground surface in this area cone probes were not initially driven but, instead, standard casing was drilled a short distance into the rock and then the bedrock was core-drilled. A standard drilling rig mounted on a truck was used for this work which was supervised at all times by a member of our staff.

3. Sampling and Testing:

Because of the shallow depth of the overburden overlying bedrock samples of the soil were not taken but the material was classified. Samples of the bedrock were taken by core drilling, to a depth approximately of 5 feet below the footing elevations, as supplied to us by Mr. Marshall. The core was logged and carefully examined for possible fault zones which are known to occur immediately to the west.

One representative core sample was selected from each test hole in the vicinity of the proposed footing elevation. These specimens were tested for compressive strength.

4. Observations:

(a) Soil and Rock Types

As mentioned above there was very little soil overlying bedrock and this proved to be a mixture of miscellaneous fill materials with some clayey gravel. The depth of this material ranged from 9" to 4' 6" below ground surface. The bedrock horizon was found to be relatively flat with the range in elevation from 210.0 to 212.6. The bedrock is limestone containing some thin shale bands, carbonate-filled fissures, and fossils. Geologically, it is typical Ottawa Formation of the Trenton and Black River Sub-Epoch belonging to the Ordovician Period.

Due to the proximity of this bridge site to the Gloucester fault there has been some alteration which explains the numerous carbonate-filled fissures. However, this does not appear to have weakened the rock to any serious extent.

The drilling

The drilling was carried to the following depths at each test hole:

<u>Hole No.</u>	<u>Depth</u>	<u>Elevation</u>
1	20' 9"	192.8
2	11' 0"	202.6
3	18' 7"	196.0
4	17' 7"	196.4
5	14' 2"	199.6
6	18' 7"	194.3

The detail of the investigation is shown on the Soil Profile and Laboratory Test Sheets included in this report.

(b) Ground Water

The ground water table is located at the surface of the bedrock. There is very little, if any, water circulating within the bedrock.

(c) Test Results

Compressive Strength test results on the samples of rock core selected, as mentioned previously, are as follows:

<u>Hole No.</u>	<u>Elevation</u>	<u>Compressive Strength</u>
1	197.0	4050 lbs. per sq.in.
2	202.0	6100 " " " "
3	197.0	8950 " " " "
4	197.0	8550 " " " "
5	202.0	5200 " " " "
6	197.0	11800 " " " "

You will note that there is considerable variation in the strength test results which is partly due to abnormal fracturing in the test specimen and partly due to alteration in the rock itself on account of its proximity to a fault zone.

5. Conclusions and Recommendations:

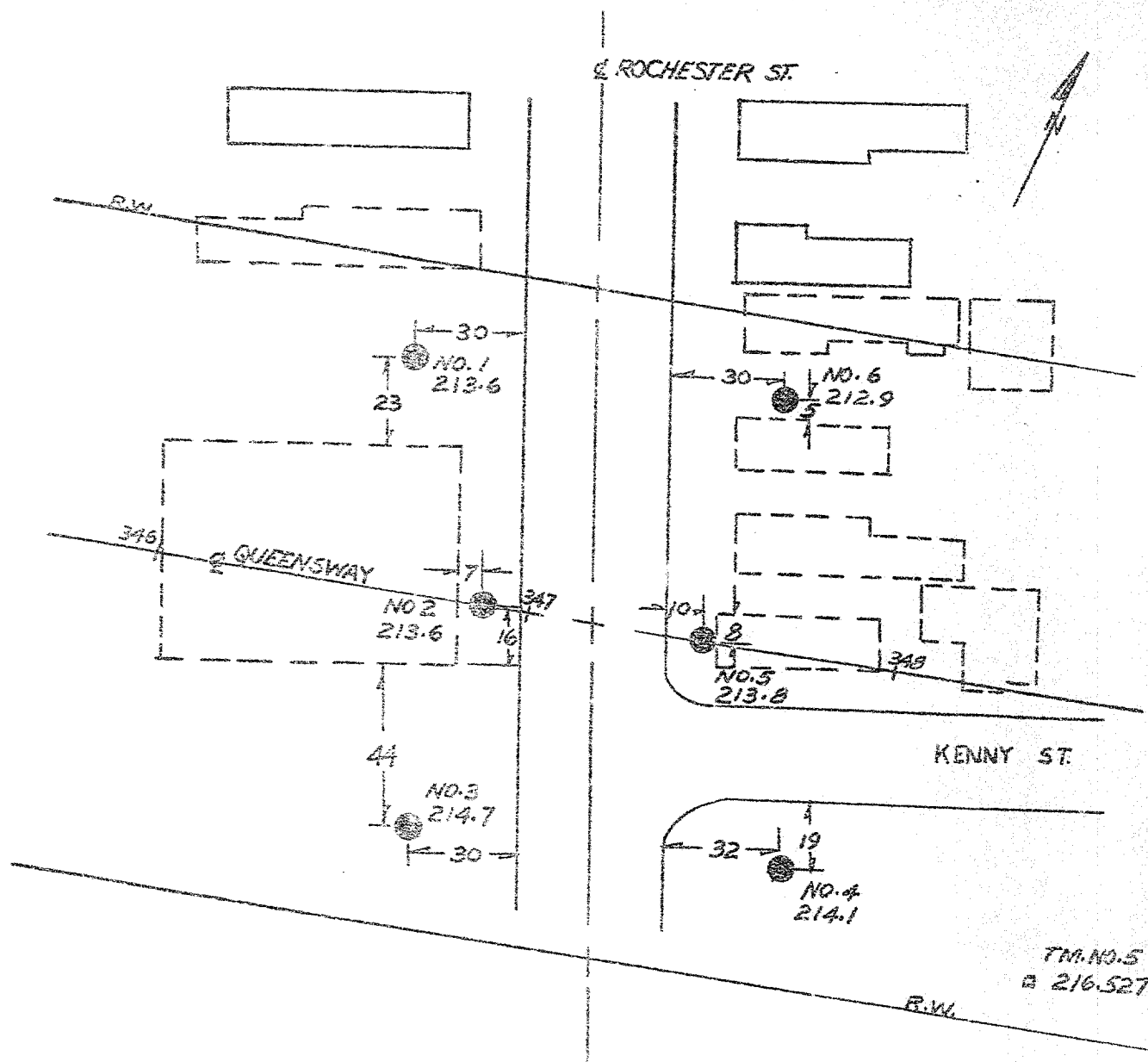
The bedrock as found at this location can be considered as quite satisfactory on which to place the bridge footings and retaining walls.

The rock at the footing elevations is capable of being loaded to 40,000 lbs. per square foot.

JDP/MMC.



J. D. Paterson
J. D. Paterson, P. Eng.



TEST BORING PLAN
PROPOSED BRIDGE NO. 16
AT ROCHESTER ST.
OTTAWA, ONT.

SCALE 1"=40'
JOB NO C-44-K

SEPT, 1959
STAGE III

SOIL DESCRIPTION	SAMPLES		Uncon. Comp. Strength Tons/Sq. Ft.	Depth in Feet	Elev.	Moisture Content Per Cent.							
	Type	No.				30	40	50	60	70	80	90	
Ground Surface				0	213.6								
Clay and Gravel Fill				1'6"									
Bedrock													
Limestone with narrow shale bands, carbonate fissures and fossil replacement by carbonate.	Core Recovery		80%	5	208.6								
				10	203.6								
				15	198.6								
	Core	1	291	20	193.6 192.8								
				25									

Rochester and Kenny
Ottawa

Elevation (Zero Depth): 213.6

Remarks: **Test Borings**

Sheet No. 2 of 6

Hole No. 2

Drilling by: F.E. Johnston Drilling Co., Ltd.

Date: Sept. 3, 1959

[illegible]

JOHN D. PATERSON
CONSULTING ENGINEER
OTTAWA CANADA

SOIL PROFILE
&
LABORATORY TESTS

Location: Bridge No. 16
Rochester and Kenny,
Ottawa.

Elevation (Zero Depth): 214.7

Remarks: Test Borings

Sheet No.
3 of 6
Hole No. 3

Borings by: F. E. Johnston Drilling Co., Ltd. Date: Sept. 8, 1959.

BLOWS PER FOOT	SOIL DESCRIPTION	SAMPLES		Uncon. Comp. Strength Tons/Sq. Ft.	Depth in Feet	Elev.	Moisture Content Per Cent.							
		Type	Nb.				30	40	50	60	70	80	90	
	Ground Surface													
	Cinders 0 6"				0	214.7								
	Clayey Gravel - probably Fill on surface 4' 6"													
	Bedrock - Limestone with shale bands. Carbonate Fissures and Fossils.	Core Recovery		73%	5	209.7								
		Core Recovery		93%	10	204.7								
		Core Recovery		100%	15	199.7								
		Core	3	645		196.0								
					20									

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CONSULTING ENGINEER
OTTAWA CANADA

SOIL PROFILE

&

LABORATORY TESTS

Location: Bridge No. 16
Rochester and Kenny
Ottawa

Elevation (Zero Depth): 214.1

Remarks: Test Borings

Sheet No. 4 of 6

Hole No.

4

Borings by: F.E. Johnston Drilling Co., Ltd.

Date: Sept. 8, 1959.

BLOWS PER FOOT	SOIL DESCRIPTION	SAMPLES		Uncons. Comp. Strength Tons/Sq. Ft.	Depth in Feet	Elev.	Moisture Content Per Cent.					
		Type	No.				20	40	50	60	70	80
	Ground Surface				0	214.1						
	Clayey Gravel				2' 6"							
	Bedrock	Core		85%	5	209.1						
	Limestone with narrow bands of shale, carbonate fissures and fossil replacement	Recovery										
		Core Recovery 97%			10	204.1						
		Core		98%	15	199.1						
		Recovery										
		Core	4	618		196.4						
	17' 7"				20							

JOHN D. PATTERSON
CONSULTING ENGINEER
OTTAWA CANADA

SOIL PROFILE

&

LABORATORY TESTS

Location: Bridge No. 16
Rochester and Kenny
Ottawa.

Elevation (Zero Depth): 213.8

Remarks: Test Borings

Sheet No. 5 of 6

Hole No.

5

Borings by: F.E. Johnston Drilling Co., Ltd.

Date: Sept. 2 & 4, 1959

Elev. Feet	SOIL DESCRIPTION	SAMPLES		Unconf. Comp. Strength Tons/Sq. Ft.	Depth in Feet	Elev.	Moisture Content Per Cent.					
		Type	No.				30	40	50	60	70	80
	Ground Surface		0		0	213.8						
	Gravel and Clay Fill		2'		1							
					2							
	Bedrock Limestone with narrow shale bands, carbonate fissures and carbonate fossil replacement.	Core Recovery		88%	3							
					4							
					5	206.8						
					6							
					7							
					8							
					9							
		Core Recovery		75%	10	203.8						
					11							
		Core	5	375	12							
					13							
					14	199.6						
					15							

14' 2"

SOIL PROFILE & LABORATORY TESTS

Location: Bridge No. 16
Rochester and Kenny
Ottawa

Estimated Total Cost: 212.9

Remarks: **Test Borings**

Sheet No. 5 of 6

Hole No. 6

Workings by: **F.E. Johnston Drilling Co., Ltd.**

Date: Sept. 3 & 4 / 59.

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