

59-F-218C
W.P. # 903-59
BRIDGE # 9
HARMER AVE.
QUEENSWAY
OTTAWA

DE LEUW, CATHER & COMPANY
OF CANADA LIMITED
CONSULTING ENGINEERS
TORONTO OTTAWA

226 SPARKS STREET
OTTAWA 4, ONTARIO
CENTRAL 3-9663

August 20th, 1959

Mr. F. I. Hewson,
Consultant Liaison Engineer,
Bridge Design Office,
Dept. of Highways of Ontario,
280 Davenport Road,
Toronto, Ontario.

Dear Mr. Hewson:

Re: Bridge No. 9 at Harmer Avenue W.P. No. 903-5/
Queensway Ottawa, District 9

Enclosed are three copies of John D. Patterson's soils investigation report No. S107-59 for the above structure.

This is the first report on the Queensway carried out by this soils consultant. In giving permission for this, Larry Soderman requested that he study this report before soils investigation is commenced on the next two structures at Rochester and Booth Streets - both shallow investigations to rock.

The original intention was to use alternative consultants on the remaining Queensway structures to speed up the reports prior to structural design. Larry Soderman did mention a third consultant, E. O. Butts, but I understand he carries out all the laboratory tests for John D. Patterson.

I presume you will be forwarding a copy of this report to Larry Soderman for his inspection. If he is satisfied with the report, I would like to know as soon as possible if investigations can proceed on the other two structures.

Yours very truly,

DE LEUW, CATHER & CO. OF CANADA LIMITED

Leon J. Marshall

Leon J. Marshall, P. Eng.,
Senior Structural Engineer

LJM/id
Encls.

cc: L. Soderman

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August 20th, 1959

J. C. McAllister

Mr. F. I. Hewson,
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Bridge Design Office,
Dept. of Highways of Ontario,
280 Davenport Road,
Toronto, Ontario.

BA 934

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Queensway Ottawa, District 9

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cc:- L. Soderman

JOHN D. PATERSON, B.Sc., P.ENG.
CONSULTING ENGINEER AND GEOLOGIST
250 BESSERER STREET
OTTAWA 2, ONT.

REPORT
OF
SOIL INVESTIGATION
SITE OF BRIDGE NO. 9, AT HARMER AVENUE,
THE QUEENSWAY
FOR
DE LEUW CATHER & COMPANY OF CANADA, LIMITED,
CONSULTING ENGINEERS

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1. Introduction
2. Field Work Procedure
3. Sampling and Testing
4. Observations
5. Conclusions and Recommendations

Report No. S - 107 - 59.

Ottawa, August 19th, 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. 9 located at Harmer Avenue.

2. Field Work Procedure:

Six test holes were put down at the locations shown on the test borings plan included in this report.

With the exception of Hole No. 1, all test holes were located as designated on Sketch Plan No. SK-III - 22, dated July, 1958.

Hole No. 1 was misplaced some 38 feet due to a misunderstanding regarding the location of existing houses.

The uniformity of soil conditions at this site did not warrant the drilling of a further hole.

At each of the six locations cone probes were driven to refusal after which the soils were sampled and the bedrock was drilled in boreholes Nos. 1, 2, 4, 5 and 6.

The test borings were performed by means of a standard drilling rig equipped with the necessary tools for soil testing.

Field work was supervised at all times by one of our Field Engineers.

3. Sampling and Testing:

Samples of the various soils were taken at Holes Nos. 1, 2, 4, 5 and 6 by means of the 2" diameter split spoon sampler.

Where boulders were encountered they were drilled through and bedrock was drilled by means of a diamond drill.

The split spoon samples were retained in glass jars and the rock core in core boxes.

During the driving of the split spoon sampler the standard penetration test was also conducted.

4. Observations:

(a) Soil Types

The soil profile was found to be quite uniform over the entire area investigated and summarizing the results obtained in five of the boreholes the profile is as follows: Below the top soil there is from 4 to 7 feet of a brown, sandy clay. This overlies a grey boulder till of medium density containing boulders up to 2 feet in diameter which is approximately 15 feet thick and extends to the bedrock.

Bedrock

Bedrock occurs at an elevation ranging from 216.9 to 219.5.

The bedrock is a somewhat fractured limestone with shale partings, fossils, carbonate stringers, and minor mineralization.

Details of the soil profile for each borehole and the standard penetration test results are shown on the Soil Profile and Laboratory Test Sheets which are included in this report.

(b) Ground Water

The ground water level at the time of the investigation was found to be approximately 11 feet below ground surface at elevation 228.

(c) Test Results

No laboratory tests were performed on the boulder till samples which have been retained in glass jars. However, sufficient standard penetration tests were conducted in the field to indicate that the till is of medium density and is relatively uniform at all borehole locations.

5. Conclusions and Recommendations:

It is our conclusion that the boulder till at elevation 228 is sufficiently competent on which to place the bridge structure, providing the usual precautions are taken in handling a soil of this nature.

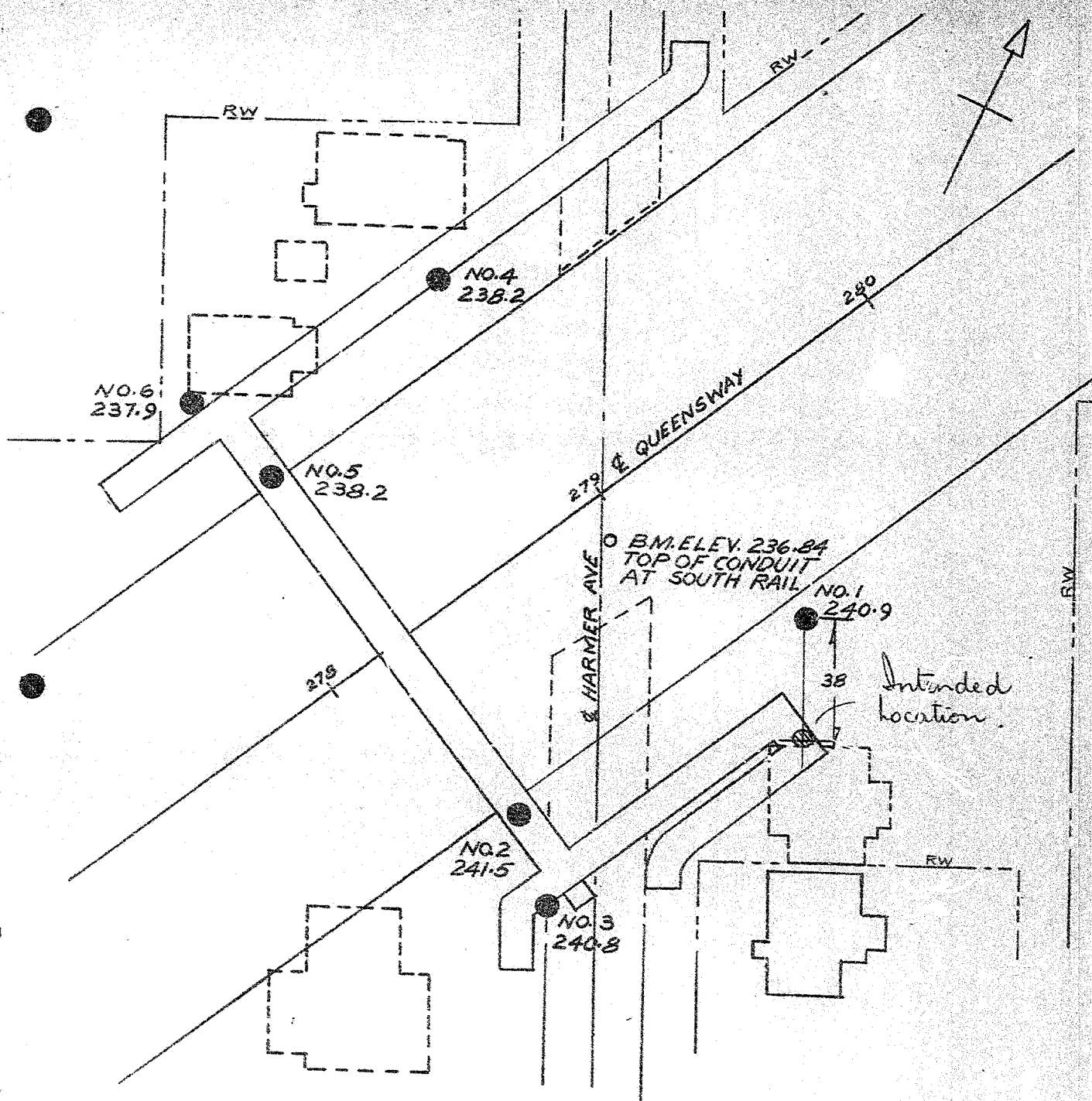
In calculating the safe loading at elevation 228 the following factors were taken into consideration:

- (1) There will be a surcharge of 6 feet from base of footing to ground surface.
- (2) The position of the water table.
- (3) The type of structure designed.

Based on the above factors the calculated safe loading at elevation 228, for spread footings placed on undisturbed till, is 3,500 lbs. per square foot. Providing the soil is undisturbed there should be no settlement at this recommended loading.

Precautions should be taken to ensure that the excavation for the footings is kept as dry as possible and we would suggest that as soon as the excavation has been completed a pad of weak concrete be placed on which the formwork for the footing could be constructed. This should help to eliminate the disturbance of the till below the footing.


J. D. Paterson, P. Eng.



TEST BORING PLAN
BRIDGE NO. 9 JOB NO. C-44-C
HARMER AVE., OTTAWA.

SCALE 1"=40' AUGUST, 1959.

SOIL PROFILE & LABORATORY TESTS

Location:

The Queensway
Bridge No. 9 at Harmer Ave.

Elevation (Zero Depth): 241.5

Remarks: Cone Test and Test Borings

Sheet No. 2 of 6

Hole No.

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

Date: July 31, 1959.

2

[illegible]

JOHN D. PATERSON
CONSULTING ENGINEER
OTTAWA CANADA

SOIL PROFILE
&
LABORATORY TESTS

Location: The Queensway
Bridge No. 9 at Harmer Avenue

Elevation (Zero Depth): 240.8

Remarks: Cone Test only.

Sheet No. 3 of 6.

Hole No. 3

Borings by: F. E. Johnston Drilling Co., Ltd. Date: Aug. 4, 1959

BLOWS PER FOOT	SOIL DESCRIPTION	SAMPLES		Depth in Feet	Elev.	Moisture Content Per Cent.					
		Type	No.			30	40	50	60	70	80
7	No Samples taken from this hole.			0	240.8						
9											
15											
10											
8											
10				5							
26											
32											
50											
35				10	230.8						
50	Blows reliable only to 20' because of bent rods.										
45											
37											
40											
35											
32				15							
31											
24											
33											
64				20	220.8						

SOIL PROFILE & LABORATORY TESTS

Location :

The Queensway

Bridge No. 9 at Harmer Avenue

Direction: 238.2

Remarks: Cone Test and Test Borings

Sheet No. 4 of 6

Hole No. 4

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

- Date: July 28, 1959

[illegible]

SOIL PROFILE & LABORATORY TESTS

Location:

The Queensway

Bridge No. 9 at Harmer Avenue

Elevation (Above Depth): 237.9

~~Remarks:~~ Cone Test and Test Boring

Sheet No. 6 of 6.

File No. 6.

Drillings by: F. E. Johnston Drilling Co., Ltd. Date: July 30, 1959.

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