

#58-F-231-C

W.P. #928-58

PINECREST AVE.

E. OTTAWA

QUEENSWAY

BRIDGE #1

BA 775

58-F-2310

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

226 SPARKS STREET
OTTAWA 4, ONTARIO
CENTRAL 3-9663

August 13th, 1958.

Mr. F.I. Hewson,
Consultant Liaison Engineer,
Bridge Design Office,
Department of Highways,
280 Davenport Road,
Toronto 2, Ontario.

Dear Sir:

Re: Bridge No. 1 at Pinecrest Ave. W.P. No. 928-58
Queensway Ottawa - District 9

We enclose herewith 3 copies of McRostie and Associates soils foundation report No. SF-369 for the above structure.

Yours very truly,

DE LEUW, CATHER & CO. OF CANADA LIMITED,

Leon J. Marshall

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

LJM/PM
Encls.

MCROSTIE & ASSOCIATES

CONSULTING ENGINEERS AND SURVEYORS

OTTAWA 1

CANADA

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FOUNDATION REPORT BRIDGE NO. 1

1. Field Work

Six boreholes were completed at the site in the locations shown on Plate ONE. Two inch split barrel samples were recovered for visual classification and standard penetration tests were performed in the boreholes. The underlying bedrock was diamond drilled, cores recovered for inspection, and a record kept of core recovery percentages. A careful watch was kept for drops or discontinuities and for loss of water during drilling operations.

The levels of groundwater were observed during the field programme.

2. Observations

The surface elevation of boreholes varies by 5 feet and there is a uniform depth of 1 foot of top soil. Below this is from 1½ to 5 feet of dense till with boulders. Rock occurs at elevations 227 to 230 feet. The rock is principally shaly limestone interbedded with shales and comprises the basal layers of the Ottawa Formation.

The upper surface of the rock is weathered and in 3 of the boreholes, namely 1, 3, and 6, a drop of about one inch was detected. The significance of these drops is discussed later in the report. Low core recoveries at EL.220 in hole 3 were likely due to hole caving at higher elevations making difficult the recovery of core actually obtained.

Groundwater observations indicated that all boreholes were dry during the investigation but during the preliminary investigation in February 1955 groundwater was at the surface.

3. Recommendations

3.1 Foundation Type

The support of a structure on * rock is the obvious answer at this site.

3.2 Foundation Strengths

The indications of sound limestone rock at the time of the preliminary report were not confirmed in this design stage investigation. Hence bearing capacities consistent with the weakest shale layers must be assigned and are set out below with regard for the different elevation of the upper surface of suitable material at each of the abutments.

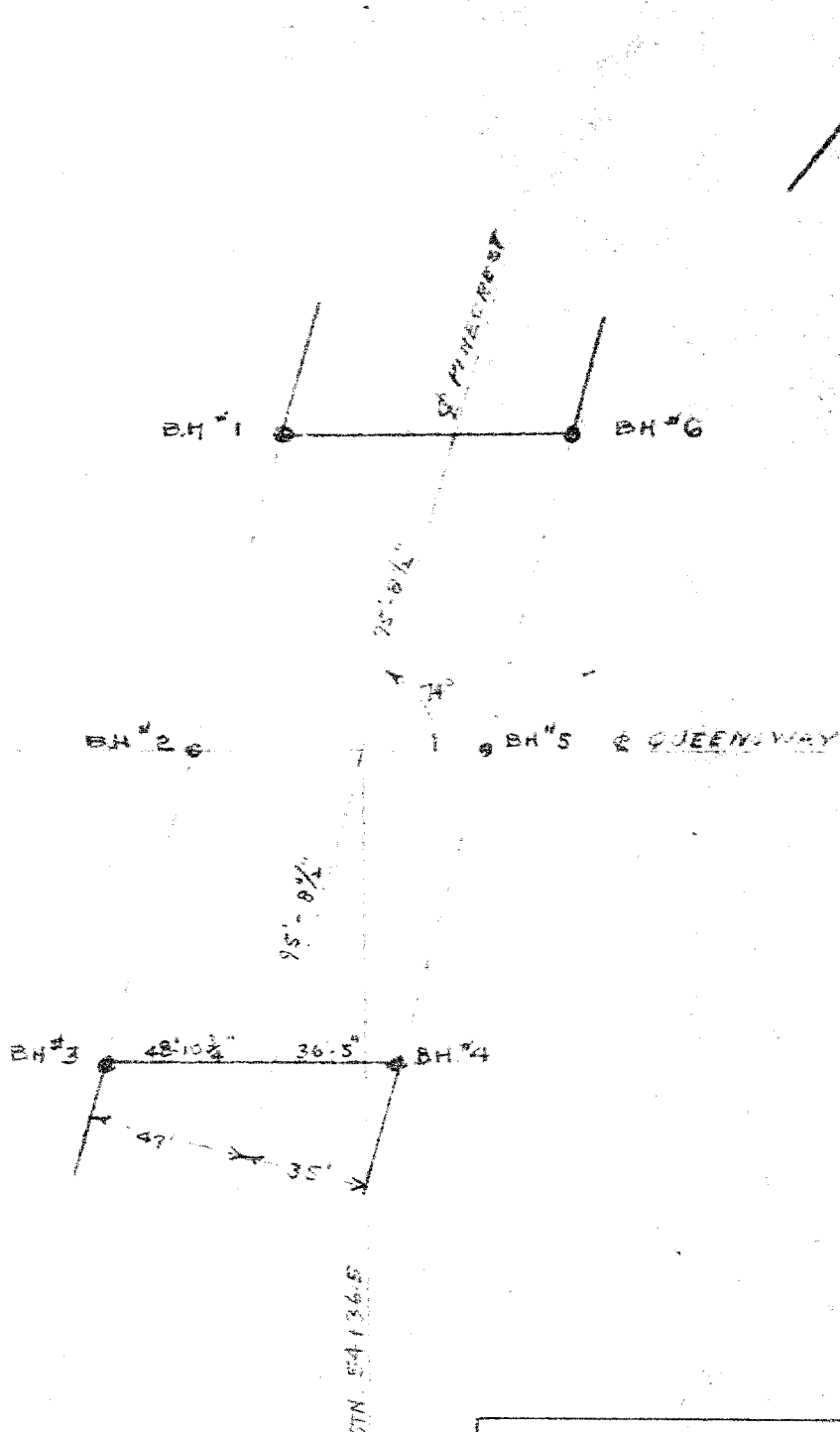
South abutment	- Rock below elevation 223
	- 20,000 pounds per sq. ft.
Center pier	- Rock below elevation 225
	- 20,000 pounds per sq. ft.
North abutment	- rock below elevation 228
	- 20,000 pounds per sq. ft.

4. Construction Precautions

Comments pertaining to the rock which have been previously made for other similar sites are repeated here.

The occurrence of drops or discontinuities in the drilling programme indicates the possibility of the existence of seams of unconsolidated material imbedded between layers of shaly limestone. If these are 5 feet or more below the footing levels, they are not a cause for concern.

A program of construction drilling to check that drops do not occur in the first five feet below heavily loaded piers or columns should be considered. If drops are detected a decision to grout the possible open spaces in these drops or to lower the excavation below them can be made pending upon the conditions existing at the time.



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CONSULTING ENGINEERS

BOREHOLE LOCATIONS
QUEENSWAY AT PINECREST RD.
BRIDGE No. 1

SCALE 1" = 50'

PLATE 1

SEE L.C. SK-II-35

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SOIL PROFILE AND SUMMARY OF LABORATORY TESTS

QUEENSWAY AT PINECREST
BRIDGE No. 1

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 235.1

HOLE NO. 1

REMARKS REF. B.M. QUEENSWAY No. 11-4

EL. 234.1, GEODETIC DATUM

DATE JUNE 5, 1958

UNCONFINED COMPRESSIVE STRENGTH KIPS/FT. ²	SMALL SCALE PENETROMETER KIPS/FT. ²	STANDARD PENETRATION BLOWS/FT.	SAMPLE NUMBER	DESCRIPTION OF SOIL	DEPTH IN FEET	ELEVATION	PENETRATION TEST	
							LB. HAMMER INCH DROP	NO CASING INCH DIA. ROD
							BLOWS PER FOOT	
							NO OVERNIGHT WATER	
				GROUND SURFACE	0	235.1		
				TOP SOIL	1.0	234.1		
				DENSE TILL	1.1			
					4			
					5.2	229.9		
				LIMEY SHALE (DRILLED)	6			
				BEDDING THICKNESS 2"	8			
				CORE RECOVERY 88%	9.2			
					9.7	225.4		
				SHALY LIMESTONE	10			
				LIMESTONE (DRILLED)	12			
				CORE RECOVERY 96%	14			
				BEDDING THICKNESS 3"	14.7	220.4		
				(1" DROP AND WATER LOST)	16			
				BOTTOM OF HOLE	16			
							% WATER CONTENT	
							PLATE Z	

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SOIL PROFILE AND SUMMARY OF LABORATORY TESTS

QUEENSWAY AT PINECREST
BRIDGE No. 1

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 232.3
REMARKS SEE PLATE 2

HOLE NO.

2

DATE JUNE 4, 1958

UNCONFINED COMPRESSIVE STRENGTH KIPS/FT. ²	SMALL SCALE PENETROMETER KIPS/FT. ²	STANDARD PENETRATION BLOWS/FT.	SAMPLE NUMBER	DESCRIPTION OF SOIL	DEPTH IN FEET	ELEVATION	PENETRATION TEST	
							LB. HAMMER INCH DROP	NO CASING INCH DIA. ROD
							BLOWS PER FOOT	
				GROUND SURFACE			NO OVERNIGHT WATER	
				TOP SOIL	0	232.3		
				DENSE TILL WITH BOULDERS	1.0	231.3		
38	2-1			SHALY LIMESTONE (DRILLED-CORE RECOVERY 53%)	3.5	228.8		
				SHALY LIMESTONE BEDDING 2 1/2" THICK	6.5	225.8		
				DRILLED CORE RECOVERY 95%	10.0	222.3		
				SHALE (DRILLED)	11.7	220.6		
				CORE RECOVERY 33%	12.5	219.8		
				BOTTOM OF HOLE				
							% WATER CONTENT	
							PLATE 3	

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SOIL PROFILE AND SUMMARY OF LABORATORY TESTS

QUEENSWAY AT PINECREST
BRIDGE No. 1

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 232.6

REMARKS SEE PLATE 2

HOLE No.

5

DATE MAY 28, 1958

UNCONFINED COMPRESSIVE STRENGTH KIPS/FT. ²	SMALL SCALE PENETROMETER KIPS/FT. ²	STANDARD PENETRATION BLOWS/FT.	SAMPLE NUMBER	DESCRIPTION OF SOIL	DEPTH IN FEET	ELEVATION	PENETRATION TEST	
						LB. HAMMERINCH DROP	NO CASINGINCH DIA. ROD
							BLOWS PER FOOT	
				GROUND SURFACE—				
							NO OVERNIGHT WATER	
				TOP SOIL	0	232.6		
					1.0	231.6		
		46	5-1	DENSE TILL WITH BOULDERS	4.0	228.6		
				SHALY LIMESTONE (DRILLED) CORE RECOVERY 61% BEDDING 2" THICK	8.3	224.3		
				SHALE (DRILLED) CORE RECOVERY 100% BEDDING 3" THICK	13.3	219.3		
				BOTTOM OF HOLE				
							% WATER CONTENT	
							PLATE 6	

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OTTAWA CANADA

SOIL PROFILE AND SUMMARY OF LABORATORY TESTS

QUEENSWAY AT PINECREST
BRIDGE No. 1

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 233.7

HOLE No.

REMARKS SEE PLATE 2

DATE MAY 27-28, 1958

6

UNCONFINED COMPRESSIVE STRENGTH Kips/Ft. ²	SMALL SCALE PENETROMETER Kips/Ft. ²	STANDARD PENETRATION BLOWS/FT.	SAMPLE NUMBER	DESCRIPTION OF SOIL	DEPTH IN FEET	ELEVATION	PENETRATION TEST	
						 L.S. HAMMER	NO CASING
						 INCH DROP INCH DIA. ROD
							BLOWS PER FOOT	
				GROUND SURFACE				
					0	233.7		
				TOP SOIL	1.9	232.7		
				TILL WITH SMALL BOULDERS	2			
					3.9	230.9		
				VERTICAL JOINT 1" DROP	4			
				SHALY LIMESTONE WITH SHALE LAYERS (DRILLED-CORE RECOVERY 86%)	6			
				BEDDING 2" THICK				
					8.1	225.6		
				SHALY LIMESTONE WITH SHALE LAYERS (DRILLED) CORE RECOV. 87% BEDDING 2" THICK	10			
					12			
				VERTICAL JOINT	13.3	220.4		
				BOTTOM OF HOLE	14			
				</				