

CONT. 72-87

WHITESTONE

LAKE &

HWY. 124

31 E - 45



## MEMORANDUM

To: Mr. B. R. Davis,  
Bridge Engineer,  
Bridge Office,  
Admin. Bldg.

ATTENTION: Mr. S. McCombie

FROM: Foundation Section,  
Materials & Testing Office,  
Room 107, Lab. Bldg.

DATE: May 12, 1970

OUR FILE REF.

IN REPLY TO

MAY 14 1970

SUBJECT:

31E-45

FOUNDATION INVESTIGATION REPORT  
For

Proposed Crossing at Whitestone Lake  
And Hwy. #124, Prop. Rev'n. Line 'C'  
Lot 60 - Concessions A & B  
Twp. of Hagerman, Dist. of Parry Sound  
District No. 11 (Huntsville)  
W.J. 70-11019 -- W.P. 33-70-01

CONT. 72-87

Attached, we are forwarding to you our detailed foundation investigation report on the subsoil conditions existing at the above structure site.

We believe that the factual data and recommendations contained therein, will prove adequate for your design requirements. Should additional information be required, please feel free to contact our Office.

AGS/XieF  
Attach.

*A. G. Stermac*  
A. G. Stermac  
PRINCIPAL FOUNDATION ENGINEER

cc: Messrs. B. R. Davis  
H. A. Tregaskes  
D. W. Farren  
H. McArthur  
W. S. Aitken  
J. C. McAllister (2)  
E. Saint  
B. A. Singh

Foundations Files  
Gen. Files

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FOUNDATION INVESTIGATION REPORT  
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Proposed Crossing at Whitestone Lake  
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Twp. of Hagerman, Dist. of Parry Sound  
District No. 11 (Huntsville)  
W.J. 70-11019 -- W.P. 33-70-01

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1. INTRODUCTION:

A memo, dated March 5, 1970, was received from Mr. J. C. McAllister, Regional Bridge Planning Engineer, requesting a foundation investigation at the above site. This was subsequently carried out by the Foundation Section.

Presented in this report are the results of the investigation, together with recommendations pertaining to the foundations of the above structure.

2. DESCRIPTION OF THE SITE:

The site is located in the Village of Dunchurch on Hwy. #124, 24 miles west of Sundridge. The existing bridge is of concrete and has a single span of 30 feet; it carries Hwy. #124 over Whitestone Lake. The lake lies some 11 feet below the road and is up to 5 feet deep. The bed is covered with numerous boulders, these being from the rock fill to the existing bridge.

The topography generally is undulating. The area is a popular tourist resort during the summer and the shoreline of the lake to the east and west of the crossing is built up with numerous cottages and commercial development.

3. FIELD INVESTIGATION:

The field investigation consisted of 3 boreholes only, each one placed as close to the proposed location of the new footings as practically possible. Boring was carried out using a

3. FIELD INVESTIGATION: (cont'd.) ...

diamond drill rig and all boreholes were drilled with a BX core barrel. Due to the nature of the subsoil, one Standard Penetration Test only was carried out, the samples obtained during the investigation, consisting of rock cores.

The locations and elevations of the boreholes may be seen on Dwg. No. 70-11019A accompanying this report.

4. SOIL CONDITIONS:

4.1) General:

The subsoil basically consists of bouldery fill overlying granite gneiss bedrock. The top 6 - 7 feet in boreholes 3 and 1, respectively, and the top 2 feet in borehole 2 can be classed as sand with traces of organics and gravel and occasional cobbles. Below this is a layer of boulders overlying bedrock. The rock cores were examined in the laboratory by Mr. K. Ingham, Geologist. The Following is his report:

4.2) Bedrock:

"Although somewhat variable in composition the rock is blocky in structure, with at least one set of horizontal and inclined fracture planes.

B.H. No. 1

7.5 ft. to 16.0 ft. : Boulders and broken rock. Upper 1.0 ft. weathered.

16.0 ft. to 21.8 ft.: Bedrock, fine grained quartz, mica gneiss with irregular veins of coarse grained calcite; inclined lineation, blocky structure, some horizontal fissures.

4. SOIL CONDITIONS: (cont'd.) ...

4.2) Bedrock: (cont'd.) ...

Report by K. Ingham, Geologist - (cont'd.) ...

B.H. No. 2

- 2.9 ft. to 3.5 ft.: Bedrock; fine grained gneiss, weathered and possibly rubbly.
- 3.5 ft. to 11.0 ft.: Fine grained quartz mica gneiss; inclined lineation, blocky structure, horizontal and occasional inclines fissures.
- 11.0 ft. to 12.8 ft.: Coarse grained pink calcitic marble with zenoliths or layers of fine grained gneiss, some coarse grained mica.
- 12.8 ft. to 13.7 ft.: Fine grained quartz mica gneiss with irregular calcite veins.
- 13.7 ft. to 14.0 ft.: Coarse grained pink calcitic marble.

B.H. No. 3

- 6.0 ft. to 12.5 ft.: Boulders and broken rock.
- 12.5 ft. to 19.0 ft.: Coarse grained white and pink calcitic marble.
- 19.0 ft. to 20.9 ft.: Fine grained quartz mica gneiss with calcite veins."

5. GROUNDWATER CONDITIONS:

The groundwater elevations in the boreholes, at the close of the operations, were found to be as follows:

#1 - 325.8      #2 - 325.6      #3 - 326.0

6. DISCUSSION AND RECOMMENDATIONS:

The existing bridge, carrying Hwy. #124 over Whitestone Lake in Dunchurch, is in poor condition and it is proposed to replace it with a new structure. The new bridge will have the same span and profile grade as the old one.

6. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

From old construction drawings, it was seen that the old bridge was founded on spread footings placed on bedrock; the bedrock, along the centre-line of the road, appeared to be 'dish-shaped' with the bottom of the dish falling in the centre of the crossing; this was overlain by rock fill in the region of the bridge. No elevations were given though, and the object of the investigation was to confirm bedrock in the region of the proposed new footings.

Boreholes 1 and 3 were located some 12 and 15 feet behind the proposed footings and 11 feet offset from the centre-line of the highway, while borehole 2 was some 36 feet offset from centre-line; the latter can be ignored for purposes of recommendations as bedrock here was found several inches above the top of the existing footings.

Considering boreholes 1 and 3 as being representative of the bedrock conditions at the footing locations, it is recommended that spread footings be adopted founded on the sound bedrock. In the case of the South abutment, bedrock can be assumed at elev. 822.3 and at the North abutment, at elev. 818.8. Should bedrock be found to be at lower elevations than the ones recommended, then mass concrete should be used to bring up the level to the recommended grades.

A safe bearing capacity of 20 T/sq.ft. can be assumed for design purposes.

If the proposed footing locations are changed in any way, the Foundation Section should be contacted to determine whether further investigation is needed.



7. MISCELLANEOUS:

The field work for this project was carried out between April 8 to April 10, 1970.

Equipment used was owned and operated by Johnston Drilling Co. Ltd.

Supervision of the field work was carried out by Mr. G. Allen, Project Foundation Engineer, who also prepared this report.

The report was reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

May, 1970

## FOUNDATION SECTION

ORIGINATED BY **GA**

COMPILED BY

CHECKED BY 

[illegible]

DEPARTMENT OF HIGHWAYS- ONTARIO  
MATERIALS & TESTING OFFICE

## RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 70-11019

LOCATION Sta. 25 + 87 o/s 36' Rt.

ORIGINATED BY GA

W.P. 33-70-01

BORING DATE April 9, 1970

COMPILED BY GA

DATUM Geodetic

BOREHOLE TYPE Washboring, NX, BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — $w_L$		BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	PLASTIC LIMIT — $w_p$	WATER CONTENT — $w$		
828.6	Ground Level											
0.0	Sand with some gravel											
825.5	& occ. cobbles (Fill)											
2.9	weathered		1	RC	100%							
			2	RC	100%							
	Bedrock Gneiss		3	RC	100%							
814.6			4	RC	100%							
114.0	End of Borehole											

JOB	70-11019	LOCATION	Sta. 26 + 05 o/s 10' Lt.	ORIGINATED BY	GA
W.P.	33-70-01	BORING DATE	April 10, 1970	COMPILED BY	GA
DATUM	Geodetic	BOREHOLE TYPE	Washboring, NX, BX Casing	CHECKED BY	1/2

[illegible]

72-87

DEPARTMENT OF HIGHWAYS ONTARIO

70-F-19  
Add to 31E-45

## MEMORANDUM

To: Mr. A. Stermac  
Principal Foundations Engineer  
Foundations Section, Downsview

FROM: Bridge Planning  
North Bay

ATTENTION:

DATE: March 5, 1970

OUR FILE REF.

IN REPLY TO

## SUBJECT:

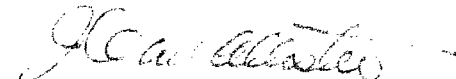
B.S. 44-67; W.P. 33-70-01;  
Whitestone Lake Bridge,  
Village of Dunchurch,  
Hwy. #124; District #11

Attached are two prints of survey plan E-5006-1 for the above crossing, on which I have shown the approximate layout of footings for a replacement structure.

The existing structure drawings indicate that it is founded on bedrock, however, boulders are visible on each side of the existing structure. I believe that the bedrock should be confirmed by drilling; at least at the locations indicated.

The proposed structure will have a span of the same order as existing and approximately the same grade. It may be of C. R. F. or concrete beam design. For your information I am also attaching drawings B-788-1 and D-2659 of the existing bridge.

Should you have any queries or difficulties in the field please contact me.



J. C. McAllister  
Regional Bridge  
Planning Engineer

AKS

Department of Highways Ontario

Copy for the information of

Mr. A. Stermac

Mr. J.C. McAllister,

Reg. Bridge Planning Supervisor,

North Bay Regional Office,

North Bay, Ontario

Bridge Office,  
Downsview

December 10, 1970

Whitestone Lake Bridge at Dunchurch  
W.P. 33-70-01, Site 44-67  
Highway 124, District No. 11

70-11019

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-6914-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$45,000. This cost includes tender, materials, engineering and sundry construction.

Any comments or revisions you may have should be submitted within three weeks.

C.S. Grebski,  
Bridge Design Engineer

CSG:rd

Attach.

c.c. B. Davis  
A. Stermac (2)  
J. Anderson  
R. Murphy

No comments

12.1.84  
Dec. 14<sup>th</sup> 1970

MEMORANDUM

TO: Mr. A. Stermac,  
Principal Foundation Engineer,  
Room 107, Lab. Bldg.

FROM: C.S. Grebski,  
Bridge Office

ATTENTION:

DATE: January 29, 1971

OUR FILE REF.

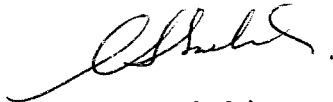
IN REPLY TO

SUBJECT: Whitestone Lake Bridge at Dunchurch  
W.P. 33-70-01, Site No. 44-67  
Highway 124, District No. 11

70-11019

Attached herewith we are submitting the final bridge drawings which show the foundation design for this structure.

Kindly give us your comments at your earliest convenience.



C.S. Grebski,  
Bridge Design Engineer

CSG:rd

Attach.

cc Foundation Office

No comments

APC 2/2/71

KL, B-44

18 Feb 71  
OK

107 107