DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

W.P. 189-64

To: Mr. A. M. Toye,
Bridge Engineer,
Bridge Division.

From: Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Attention: Mr. S. McCarbie

Date: June 17, 1965

Your Ref.

In reply to

Subject:

FOUNDATION INVESTIGATION REPORT
For
Proposed Structure at the Crossing of
Sec. Hwy. 519 and Drag River in
Haliburton, Twp. of Dysart, Con.VIII,
Lot 17, District #11 (Huntsville)
W.J. 65-F-41 -- W.P. 189-64

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 be adequate for your design requirements. Should there be any queries in connection with this project, please feel free to contact our Office.

K. Y. Lo,
SUPERVISING FOUNDATION ENGINEER

KYL/MdeP
Attach.
cc: Messrs. A. M. Toye (2)
H. A. Tregaskes
D. W. Farren
H. McArthur
D. M. Jones
E. J. Kovich
A. Watt

Foundations Office
Gen. Files

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FOUNDATION INVESTIGATION REPORT

For

Proposed Structure at the Crossing of Sec. Hwy. 519 and Drag River in Haliburton, Twp. of Dysart, Con.VIII, Lot 17, District #11 (Huntsville).

W.J. 65-F-41 -- W.P. 189-64

1. INTRODUCTION:

A request for a foundation investigation at the site of the proposed structure where Sec. Hwy. 519 crosses Drag River, was contained in a memo from the Bridge Planning Section, dated March 4, 1965.

A foundation investigation was subsequently carried out by this Section to determine the subsoil conditions existing at the site of the proposed crossing.

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

2. DESCRIPTION OF SITE:

The site is located in the Village of Haliburton about 1/4 mile east of Head Lake. The area appears to be an old ravine formation. The Drag River flows along the southern edge of this ravine in an east to west direction. Haliburton is within the "Canadian Shield" physiographic region.

cont'd. /2 ...

3. DESCRIPTION OF FIELD & LABORATORY WORK:

Field work consisted of two boreholes and four dynamic cone penetration tests. The boring was carried out by means of conventional penetration tests. The boring was carried out by means of conventional diamond drilling equipment adapted for soil sampling purposes.

Samples were recovered at required depths by means of a 2" O.D. split-spoon sampler in the non-cohesive deposits. The dimensions of the split-spoon sampler and the energy used in driving it, conform to the requirements of the Standard Penetration Test.

Detailed logs of each borehole and penetration test are given on the records of boreholes at the end of this report. The locations and elevations of all boreholes are shown on Dwg. #65-F-41A, appended to this report.

Samples were visually examined and identified in the field as well as in the laboratory. Tests were carried out in the laboratory on a selection of samples to determine:

i) Natural Moisture Contents
ii) Grain Size Distributions
iii) Organic Content
iv) Atterberg Limits.

Laboratory and field test results have been summarized and are included in the Appendix of this report.

cont'd. /3 ...

4. SUBSOIL CONDITIONS:

4.1) General:

Subsoil at the site mainly consists of granular deposits having a relative density ranging from loose to very dense. Bedrock exists immediately below the granular deposits and the maximum and minimum depths to the rock were observed to be approximately 66 ft. and 79 ft. at the south and the north banks of the river, respectively.

A detailed description of various soil types encountered in each boring, is given in Appendix I of this report. The estimated stratigraphical profile of Dwg. 65-F-41A is based on this information.

From ground level downwards, the various soil types encountered are as follows:

4.2) Sand with Organics:

This layer of sand with organics, was encountered immediately below the topsoil in all the boreholes. The amount of organic matter varied somewhat throughout the stratum but, in general, the deposit may be described as sand with organic matter. The thickness of the stratum varied from 9 ft. in B.H. #1 to 15 ft. in B.H. #3. Standard Penetration resistances or 'N' values of 3 to 9 blows/ft. were obtained in this material. This indicates that the deposit is essentially very loose to loose.

4.3) Silt to Silty Fine Sand:

Underlying the deposit of sand with organics is a stratum of silt to silty fine sand. The lower boundary varied from elev. 985 to elev. 989. Occasional clayey silt seams (max. 4" thick), were encountered within this deposit. The percentage of sand varied considerably throughout the stratum but, in general, may be described as

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

4.3) Silt to Silty Fine Sand: (cont'd.) ...

silt to silty fine sand with occasional seams of clayey silt. Standard Penetration values ranged from 4 to 20 blows/ft. From these values, it is estimated that the relative density varies from loose to compact. Wherever possible in the cohesive seams of clayey silt, Atterberg limits and moisture contents were carried out. The liquid limit varies from 24% - 30%, and the plastic limit ranges from 20% - 22%; the moisture content is typically 15% - 28%.

4.4) Sand with Gravel:

This deposit underlies the silt to silty fine sand stratum and extends down to the bedrock. In B.H. #3 below elev. 971, several boulders (max. size up to 1.5 ft. ∅), were encountered within this stratum. The material is generally dense to very dense with 'N' values being in the order of 45 to 96.

4.5) Bedrock - Limestone:

The bedrock was encountered in B.H. 1 at 66.5 ft., and in B.H. 3 at 79 ft. below the ground surface. The bedrock was drilled and AXT core samples were extracted. The rock is identified as crystalline Limestone with mica schist.

5. GROUND WATER CONDITIONS:

The ground water level in the boreholes corresponded to the water level in the creek which was at elev. 1042.5 during the time of investigation.

cont'd. /5 ...

6. DISCUSSION AND RECOMMENDATIONS:

It is proposed to construct a new structure at this site to replace the existing one. The new centre line will be approximately the same as the existing, and the new profile grade will be 1 - 2 ft. higher. Present proposals call for a single 50-ft. span structure having a width of 38 ft.

Subsoil at the site generally consists of loose to very dense granular deposits followed by limestone bedrock. Maximum and minimum depths to bedrock were observed to be 66 and 79 ft. at the south and north banks of the river, respectively.

Because of the presence of 58 to 62 ft. of very loose to compact silt and sand, adequate bearing capacity may not be achieved for spread footing support to the structure. Therefore, the structure should be supported on end-bearing piles driven to practical refusal to bedrock. Design loads to be used are dependent on the pile section and may be 75 tons per pile in the case of 12 BP 74 steel H-piles.

As it will be necessary to carry out excavations for the pier caps below the river or ground water level in fine-grained granular material, a dewatering scheme will be required.

No approach fill stability problems are anticipated for the standard 2:1 side slopes.

Since the fine-grained alluvial deposits are considered highly susceptible to scour, some methods of scour protection may be required. Recommendations pertaining to this should be obtained from the Bridge Hydrology Section.

cont'd. /6 ...

7. SUMMARY:

Subsoil at the site consists of granular deposits followed by limestone bedrock. The bedrock was found to be at approximate elev. 980 - elev. 968.0.

A single-span structure is proposed to replace the existing structure where Sec. Hwy. 519 crosses Drag River.

The structure can be supported on end-bearing piles, Steel H-piles driven to bedrock. A safe design load of 75 tons/pile may be used for 12 BP 73 steel H-piles.

A dewatering scheme will be necessary for excavations for the pile caps of the abutments, carried out below river or ground water level.

No stability problems are anticipated for the standard 2:1 side slopes.

8. MISCELLANEOUS:

The field work, performed during the period April 26, 1965 to May 3, 1965, together with the preparation of this report, was undertaken by Mr. V. Korlu, Project Foundation Engineer. The investigation was carried out under the general supervision of Mr. M. Devata, Senior Foundation Engineer, who reviewed this report.

Equipment used was owned and operated by Dominion Soil Investigation Ltd.

June 1965

APPENDIX I.

FORM OB-ML-126-REVISED
64-3040

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

JOB 65-F-41 LOCATION Hwy 519 & Drag River (Sta. 4+83, 17' Rt. ℄) ORIGINATED BY V.K.
W.P. 189-64 BORING DATE April 26, 1965. COMPILED BY V.K.
DATUM Geodetic BOREHOLE TYPE Drive BX Casing & Wash. CHECKED BY M.D.S. HR

ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS / FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (20 40 60 80 100) / SHEAR STRENGTH P.S.F.	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w — WATER CONTENT % (20 30 40)	BULK DENSITY γ P.C.F.	REMARKS
1047.0	Groundlevel									
0.0	Silty sand and organics.		1	SS	4	1040				Gr 5% Sa 74% Si&Cl 21%
1037.5			2	SS	3					
9.5			3	SS	9	1030				Sa 22% Si 60% Cl 18%
			4	SS	9					
			5	SS	11	1020				Gr&Sa 11% Si 84% Cl 5%
	Silt to silty fine sand with occasional seams of clayey silt.		6	SS	4					
			7	SS	6	1010				
			8	SS	8					
			9	SS	10	1000				Sa 21% Si 75% Cl 4%
			10	SS	9					
			11	SS	12	990				Sa 2% Si&Cl 98%
985.0										
62.0	Sand with gravel- V. dense		12	SS	96					
980.5						980				
66.5	Bedrock		13	AXT	100% recovery					
975.5	Sound crystalline limestone									
71.5	End of borehole.					970				

FORM OB-ML-126-REVISED
61-3040

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 2 (Revised)

FOUNDATION SECTION

JOB 65-F-41 LOCATION Hwy 519 & Drag River (Sta. 4+80, 20' Lt. ℄) ORIGINATED BY V.K.
W.P. 189-64 BORING DATE April 28, 1965.; (June 13-16, 1967) COMPILED BY V.K.
DATUM Geodetic BOREHOLE TYPE Dynamic Cone Penetration & Washboring CHECKED BY M.D.

SOIL PROFILE			SAMPLES				DYNAMIC PENETRATION RESISTANCE	LIQUID LIMIT — w_L		
ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	BLOWS / FOOT 20 40 60 80 100	PLASTIC LIMIT — w_P	WATER CONTENT — w	BULK DENSITY P.C.F.	REMARKS
1047.5	Groundlevel						SHEAR STRENGTH P.S.F.		WATER CONTENT %		
0.0	Sand with some organics. Loose					1040					
	Silt to silty fine sand. Loose to compact					1030					
						1020					
						1010					
1005.5						1000					
42.0	Sand with gravel. Very dense.		1	RC							
						990					
	Elev. 985.5		2	RC							
	Boulders 6" - 12" ø		3	RC							
973.0											
74.5	End of Borehole										

FORM OB-ML-126-REVISED
64-3040

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 3

FOUNDATION SECTION

JOB 65-F-41 LOCATION Hwy 519 & Drag River (Sta. 543, 19' Rt. ℄) ORIGINATED BY V.K.

W.P. 189-64 BORING DATE April 28, 1965 (May 2, 1965) COMPILED BY V.K.

DATUM Geodetic BOREHOLE TYPE Drive BX Casing & Wash. CHECKED BY M.D.

ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS / FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 / SHEAR STRENGTH P.S.F.	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w (w_P w w_L) / WATER CONTENT % 20 30 40	BULK DENSITY γ P.C.F.	REMARKS
1047.0	Groundlevel									
0.0	Sand with some organics. Loose		1	SS	9	1040				Gr 2% Sa 90% Si&Cl 8% 2.1%Organic content
			2	SS	3					
1032.0										
15.0	Silt to silty-fine sand with occasional seams of clayey silt. Loose to compact.		3	SS	..	1030				Sa 12% Si&Cl 88%
			4	SS	20					Sa 49% Si&Cl 51%
			5	SS	9	1020				Sa 12% Si 83% Cl 5%
			6	SS	6					
			7	SS	8	1010				Sa 67% Si 29% Cl 4%
			8	SS	11					
			9	SS	13	1000				Sa 5% Si&Cl 95%
			10	SS	9					
			11	SS	9	990				
989.0										
58.0	Sand with gravel. (With boulders of max. size of 1½' Ø below elev. 971.0)		12	SS	45					Gr 36% Sa 46% Si&Cl 18%
	Occasional Boulders		13	AXT	20% recovery	980				
968.0			14	AXT	60% recovery	970				
79.0	Bedrock		15	AXT	100% recovery					
966.0	Sound crystalline limestone									
81.0	End of borehole.					960				

FORM 64-3040

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 4 (Revised)

FOUNDATION SECTION

JOB 65-F-41 LOCATION Hwy 519 & Drag River (Sta. 545, 17' Lt. ℄) ORIGINATED BY V.K.
W.P. 189-64 BORING DATE April 29, 1965. (June 16, 19, 20, 21, 1967) COMPILED BY V.K.
DATUM Geodetic BOREHOLE TYPE Dynamic Cone Penetration. & Washboring CHECKED BY M.D.

ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	SAMPLES TYPE	BLOWS / FOOT
1048.0	Groundlevel				
0.0	Silty sand Loose				
	Silt to silty fine sand. Loose to compact				
988.5					
59.5	Sand with gravel. Very dense.		1	RC	
	Elev. 976.2		2	RC	
	Boulders 6" - 12" Ø		3	RC	
970.2			4	RC	
77.8	End of Borehole				

ELEV. SCALE: 1040, 1030, 1020, 1010, 1000, 990, 980

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT — 20 40 60 80 100
SHEAR STRENGTH P.S.F.

LIQUID LIMIT — w_L
PLASTIC LIMIT — w_P
WATER CONTENT — w
w_P w w_L
WATER CONTENT %

BULK DENSITY γ P.C.F.

REMARKS

ABBREVIATIONS USED IN THIS REPORT

PENETRATION RESISTANCE

STANDARD PENETRATION RESISTANCE 'N' :- THE NUMBER OF BLOWS REQUIRED TO ADVANCE A STANDARD SPLIT SPOON SAMPLER 12 INCHES INTO THE SUBSOIL, DRIVEN BY MEANS OF A 140 POUND HAMMER FALLING FREELY A DISTANCE OF 30 INCHES.

DYNAMIC PENETRATION RESISTANCE :- THE NUMBER OF BLOWS REQUIRED TO ADVANCE A 2 INCH, 60 DEGREE CONE, FITTED TO THE END OF DRILL RODS, 12 INCHES INTO THE SUBSOIL, THE DRIVING ENERGY BEING 350 FOOT POUNDS PER BLOW.

DESCRIPTION OF SOIL

THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE DENSITY OR DENSENESS OF COHESIONLESS SOILS ARE DESCRIBED IN THE FOLLOWING TERMS :-

CONSISTENCY	'N' BLOWS/FT.	c LB./SQ.FT.	DENSENESS	'N' BLOWS/FT.
VERY SOFT	0 - 2	0 - 250	VERY LOOSE	0 - 4
SOFT	2 - 4	250 - 500	LOOSE	4 - 10
FIRM	4 - 8	500 - 1000	COMPACT	10 - 30
STIFF	8 - 15	1000 - 2000	DENSE	30 - 50
VERY STIFF	15 - 30	2000 - 4000	VERY DENSE	> 50
HARD	> 30	> 4000		

TYPE OF SAMPLE

S.S.	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.B.	SCRAPER BUCKET SAMPLE	O.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE
S.T.	SLOTTED TUBE SAMPLE		
	P.H. SAMPLE ADVANCED HYDRAULICALLY		
	P.M. SAMPLE ADVANCED MANUALLY		

SOIL TESTS

Qu	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Qcu	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Qd	DRAINED TRIAXIAL	S	SENSITIVITY

ABBREVIATIONS USED IN THIS REPORT

SOIL PROPERTIES

γ	UNIT WEIGHT OF SOIL (BULK DENSITY)
γ_s	UNIT WEIGHT OF SOLID PARTICLES
γ_w	UNIT WEIGHT OF WATER
γ_d	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
γ'	UNIT WEIGHT OF SUBMERGED SOIL
G	SPECIFIC GRAVITY OF SOLID PARTICLES $G = \frac{\gamma_s}{\gamma_w}$
e	VOID RATIO
n	POROSITY
w	WATER CONTENT
S_r	DEGREE OF SATURATION
w_L	LIQUID LIMIT
w_P	PLASTIC LIMIT
I_P	PLASTICITY INDEX
s	SHRINKAGE LIMIT
I_L	LIQUIDITY INDEX $= \frac{w - w_P}{I_P}$
I_C	CONSISTENCY INDEX $= \frac{w_L - w}{I_P}$
e_{max}	VOID RATIO IN LOOSEST STATE
e_{min}	VOID RATIO IN DENSEST STATE
I_D	DENSITY INDEX $= \frac{e_{max} - e}{e_{max} - e_{min}}$
	RELATIVE DENSITY D_r IS ALSO USED
h	HYDRAULIC HEAD OR POTENTIAL
q	RATE OF DISCHARGE
v	VELOCITY OF FLOW
i	HYDRAULIC GRADIENT
k	COEFFICIENT OF PERMEABILITY
j	SEEPAGE FORCE PER UNIT VOLUME
m_v	COEFFICIENT OF VOLUME CHANGE $= \frac{-\Delta e}{(1+e)\Delta \sigma'}$
c_v	COEFFICIENT OF CONSOLIDATION
C_c	COMPRESSION INDEX $= \frac{\Delta e}{\Delta \log_{10} \sigma'}$
T_v	TIME FACTOR $= \frac{c_v t}{d^2}$ (d, DRAINAGE PATH)
U	DEGREE OF CONSOLIDATION
τ_f	SHEAR STRENGTH
c'	EFFECTIVE COHESION INTERCEPT
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF EFFECTIVE STRESS $\tau_f = c' + \sigma' \tan \phi'$
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF TOTAL STRESS $\tau_f = c_u + \sigma \tan \phi$
μ	COEFFICIENT OF FRICTION
S_t	SENSITIVITY

GENERAL

π	= 3·1416
e	BASE OF NATURAL LOGARITHMS 2·7183
$\log_e \sigma$ OR $\ln \sigma$	NATURAL LOGARITHM OF σ
$\log_{10} \sigma$ OR $\log \sigma$	LOGARITHM OF σ TO BASE 10
t	TIME
g	ACCELERATION DUE TO GRAVITY
V	VOLUME
W	WEIGHT
M	MOMENT
F	FACTOR OF SAFETY

STRESS AND STRAIN

u	PORE PRESSURE
σ	NORMAL STRESS
σ'	NORMAL EFFECTIVE STRESS ($\bar{\sigma}$ IS ALSO USED)
τ	SHEAR STRESS
ε	LINEAR STRAIN
γ	SHEAR STRAIN
ν	POISSON'S RATIO (μ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNGS MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
η	COEFFICIENT OF VISCOSITY

EARTH PRESSURE

d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_o	COEFFICIENT OF EARTH PRESSURE AT REST

FOUNDATIONS

B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
β	ANGLE OF SLOPE TO HORIZONTAL

23-68-89 Fo

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

Hwy Twin Bridge

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

Attention: Mr. S. McCombie

From: Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Date: August 21, 1967

Our File Ref.

In reply to

Subject: Drag River Bridge, Highway 519,
Village of Haliburton, Ontario.
District No. 11 (Huntsville)
W.P. 189-64 -- W.J. 65-F-41

In a memo dated July 28, 1966, Mr. J. B. Curtis, Regional Bridge Location Engineer, requested us to make additional test borings at the proposed site so as to be in a better position to assess the requirements of piling for the foundation.

Two additional test borings have subsequently been carried out to determine supplementary information concerning the subsoil conditions and to review our previous recommendations pertaining to the foundations for the proposed bridge structure. It was found that the subsoil conditions were approximately the same nature as in our original investigation. In neither of the additional boreholes was bedrock actually encountered; however, it is believed that the bouldery stratum overlying the crystalline limestone bedrock is sufficiently dense that practical refusal of the steel H-piles will be obtained. The elevation of practical refusal of the steel H-piles is difficult to estimate in the bouldery stratum, but is likely to be between El. 985.0' to El. 980.0' on the south bank, and between El. 976.0' and El. 971.0' on the north bank of the river.

It is recommended that reinforcing tips be used on the steel H-piles since these will be driven into the dense bouldery stratum.

Enclosed are Record of Borehole sheets, No's. 2 (revised), 4 (revised), and Drawing 65-F-41A (revised July 12, 1967). These latter should be included with your copy(s) of Foundation Report No. 65-F-41.

M. Devata

M. Devata,
SUPERVISING FOUNDATION ENGR.
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

MD/MdeF
Encls.
cc: Messrs. B. R. Davis (2)
H. A. Tregaskes
D. W. Farren
H. McArthur
W. S. Aitken
J. B. Curtis
T. J. Kovich

Foundations Files
Gen. Files

file

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A. G. Stermac
Principal Foundation Engineer
Downsview, Ont.

From: Road Design Office
P. O. Box 67
North, Bay, Ont.

Attention:

Date: August 19, 1968

Our File Ref.

In reply to

Subject: FOUNDATION INVESTIGATION REPORT for Proposed Structure at the Crossing of Sec. Hwy. 519 and Drag River in Haliburton, Twp. of Dysart, Con. VIII, Lot 17, District 11, Huntsville
W.J. 65-F-41 - Our W.P. 189-64

I have forwarded our copy of the above to the Canadian National Railways for them to review the foundation conditions as affects a spur line 80 ft. from water's edge. A copy of the letter from the C.N.R. requesting information is enclosed.

Would you please forward a copy of the Foundation Report to complete our file.

J. R. Wear,
Sr. Project Design Engineer,
For H. McArthur,
Reg. Road Design Engineer.

JRW/les

Tony -

In accordance with above request, a copy of our report was mailed to H. McArthur on August 21, 1968.

Thanks Tom

Canadian National Railways
Rideau Area

Belleville, Ontario
19 July 1968

Our file RA710-H1-3

1968
2-2
#11

Mr. J. R. Wear, P. Eng.
Road Design Office
Department of Highways
P. O. Box 67
North Bay, Ontario

Dear Sir

Subject: Reconstruction of Drag River Bridge - Haliburton, Ontario

Further to your letters of 28 May and 10 June, we have sent your drawings indicating the extent of railway protection to our Bridges and Structures Department for checking. They advise us that since cars will be moved on this siding during construction, they wish to know the soil condition and water level in order to further check the structural adequacy from the Railway standpoint.

Also with reference to a letter from the Board of Transport to your office dated 8 June 1965, stating that a Board Order is not required for the reconstruction of the road over the crossings, our Legal Department advises that it would now be in order for you to contact the Canadian Transport Commission and have this re-confirmed.

The sewer crossing under the tracks mentioned in your letter of 28 May, will require an agreement between ourselves and the D.H.O. The matter of the tank car encroachment and raising of the spur line are presently being looked into and we will inform you in due course.

Yours truly

M. Ingram

I. L. Halborn, P. Eng.
Area Engineer

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

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

From: Bridge Division,
Downsview, Ontario.

Date: September 8, 1965.

Our File Ref.

In reply to

Subject: W.P. 189-64, Drag River in Haliburton,
Sec. Road No. 519, District No. 11.

65-F-41

Attached is a print of preliminary plan D 5782-P1 for the proposed structure over the Drag River.

The foundation has been designed in accordance with the recommendations contained in the foundation report submitted on 17th June 1965.

JCMcA/ag

J. C. McAllister,
for S. McCombie,
Bridge Planning Engineer.

Comments:-

As it will be necessary to carry out excavation for the piers below the river in the fine grained granular material, a deviation will be required.

Advised Mr. J. C. McAllister on the phone the above mentioned comments.

Sept 27/65

401 & Keele St.
Downsview, Ontario

July 11, 1967

Master Soil Investigation
104 Kenhar Drive
Weston, Ontario

Dear Sirs:

This is to confirm our request of June 9, 1967 for the supply of a Diamond Drill together with all necessary equipment, as specified under the terms of our Contract Agreement, at Hwy. 519 at Drag River, Haliburton, Ontario, on June 12, 1967.

This project bears Job Number 65-F-41.

Yours truly,

K. G. Selby
Supervising Foundation Engineer
for: A. G. Stermac
Principal Foundation Engineer

KGS:mt

65-F-41

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A. Stermac,
Principal Foundation Engineer,
Materials & Testing Division,
Downsview, Ontario.

From: Bridge Planning Section,
Northern Region.

Date: July 20th, 1966.

Our File Ref.

In reply to

Subject: Drag River Bridge, Highway 519,
Village of Haliburton, W.P. 189-64,
District 11, Huntsville.

A point came up during the pre-contract review meeting for the above-noted bridge held in Huntsville on July 20th, 1966. It was pointed out by the District that we had taken only two borings for the foundation investigation for this bridge to determine the location of bedrock. These two borings indicated a difference in bedrock elevation in the order of 14 feet. It was the District's opinion that the additional cost of borings, at the time of the initial investigation, was negligible compared to the cost of claims resulting from either an overrun of quantities or shortage of piling during the construction of the bridge. Perhaps in the future when we have such large discrepancies in the bedrock elevation we could have these additional borings made.

In order to avoid claims such as this, on this contract, it might be advisable to make additional borings on the alternate sides of the bridge in the near future as suggested by the District. We would then be in a better position to assess the requirements of piling for the foundation.

J. B. CURTIS,
REGIONAL BRIDGE LOCATION ENGINEER.

JBC/jr

NOTE: CONSTRUCTION SCHEDULED FOR 1968 AND THEREFORE THE ADDITIONAL BORINGS SHOULD BE DONE WHEN A CREW IS NEARBY.
(INFORMATION ON SCHEDULE FROM Mr C. McCOMBIG)
AUG 5. 1966. AGS

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr.A. Stermac,
Principal Foundation Eng.,
Room 107, LAB. BLDG.

From: Bridge Division,
Downsview, Ontario.

Date: March 4, 1965

65-F-4

Our File Ref.

In reply to

Subject: W.P. 189-64, Drag River at Haliburton,
Secondary Road #519, District #11

A foundation investigation is required for the design of the proposed replacement at the above crossing.

Attached are two (2) prints of site plan E 4414-1 showing the location of suggested test holes. The proposed replacement will be a single span structure approximately 50' span.

J. C. McAllister,
for S. McCombie,
Bridge Planning Engineer

JCMcA/m

c.c. R.Fitzgibbon
N.D.Smith

65 - F - 4

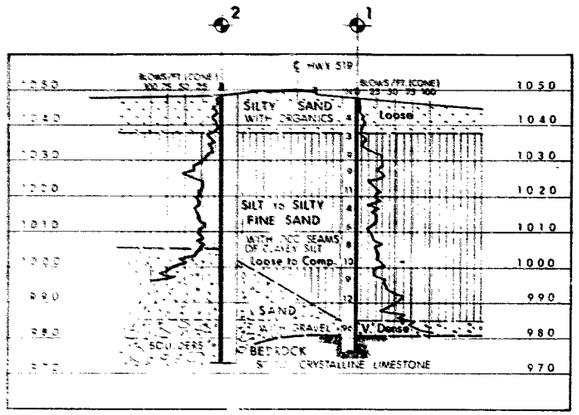
#65-F-41

W.P.# 189-64

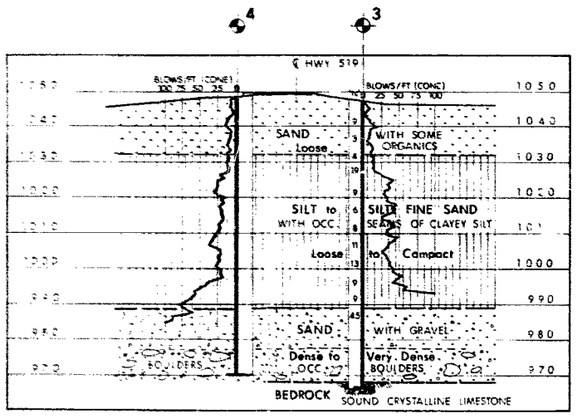
SEC. HWY. #519

CROSSING

DRAG R.



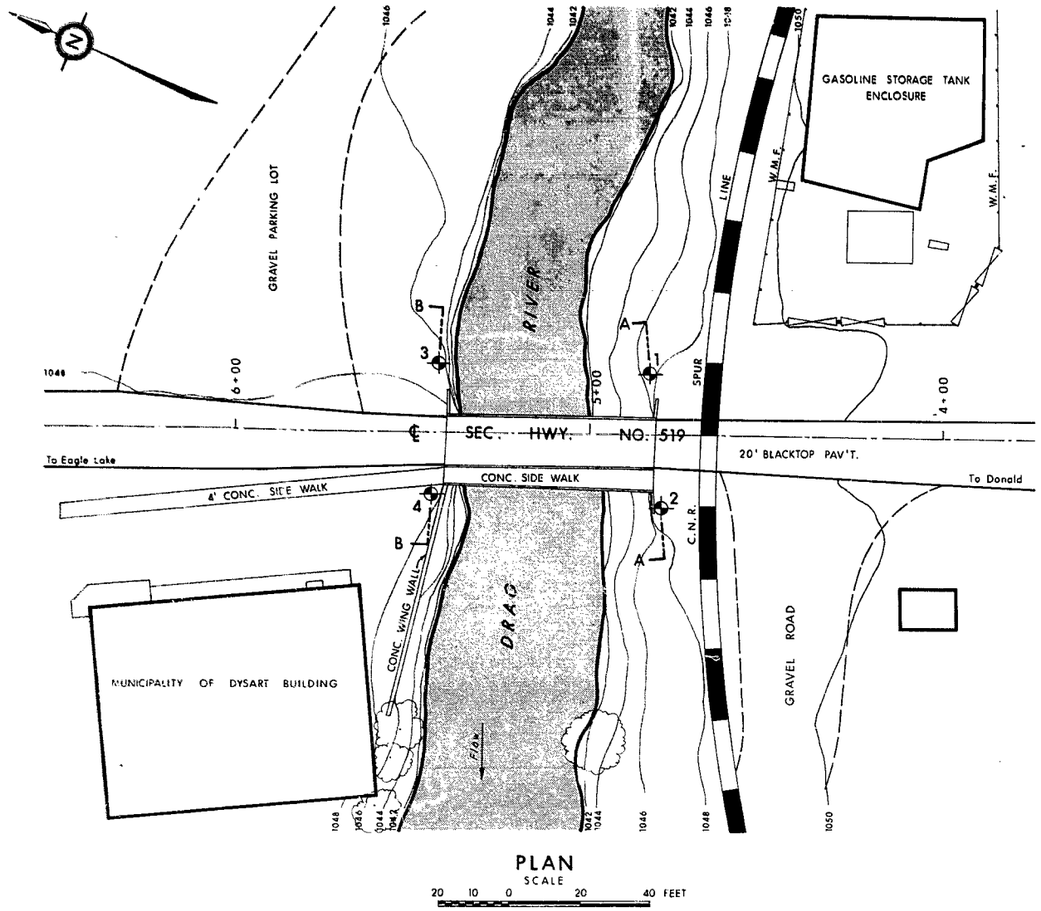
SECTION A-A



SECTION B-B

SCALE

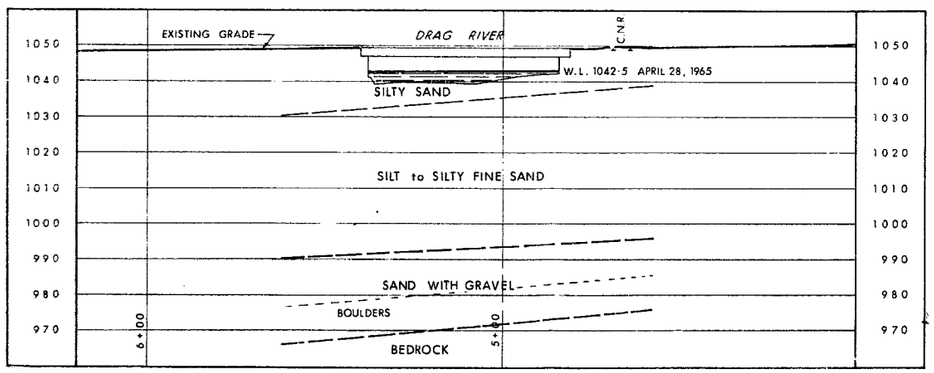
20 10 0 20 40 FEET



PLAN

SCALE

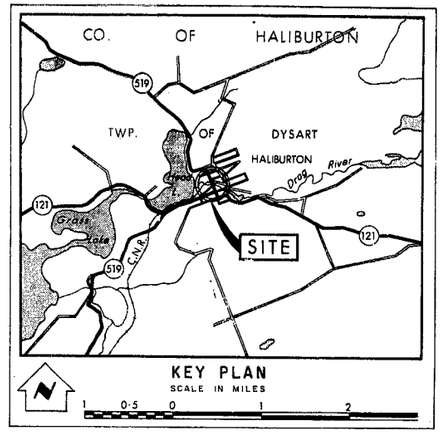
20 10 0 20 40 FEET



PROFILE

SCALE

20 10 0 20 40 FEET



KEY PLAN

SCALE IN MILES

1 0·5 0 1 2

LEGEND

- Bore Hole
- Cone Penetration Hole
- Bore & Cone Penetration Hole
- Water Levels established at time of field investigation. 28 APRIL 1965

NO.	ELEVATION	STATION	OFFSET
1	1047·0	4+83	17' RT.
2	1048·0	4+80	20' LT.
3	1047·0	5+43	19' RT.
4	1048·0	5+45	17' LT.

— NOTE —

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

REVISIONS			
DATE	BY	DESCRIPTION	
12 JULY 67	H.R.	BOREHOLES 2 & 4 ADDED SECTION A-A, B-B & ℄ PROFILE ADJUSTED.	

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION - FOUNDATION SECTION

DRAG RIVER

KING'S HIGHWAY NO. 519 DIST. NO. 11.

CO. HALIBURTON VILLAGE OF HALIBURTON

TWP. DYSART LOT 17 CON. VIII

BORE HOLE LOCATIONS & SOIL STRATA

SUBM'D. V.K.	CHECKED	W.P. NO. ~~187-65~~ 187-64	M.B.T. DRAWING NO. 65-F-41A
DRAWN S.O.	CHECKED LR	JOB NO. 65-F-41	
DATE 14 JUNE 1965		SITE NO.	BRIDGE DRAWING NO.
APPROVED FOR PRINCIPAL FOUNDATION ENGINEER		CONT. NO.	

REF. NO. E-4414-1