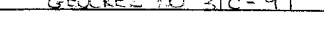


CONT. 73-76

HWY. 620 4

CROWE RIVER

31C-97



STOCKS TO 31C-4

31C-97
GEOCRES No.

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

73-76

TO: Mr. E. R. Davis,
Bridge Engineer,
Bridge Office,
Admin. Bldg.

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

ATTENTION: Mr. S. McCombie

DATE: January 20, 1971

OUR FILE REF.

IN REPLY TO

JAN 28 1971

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For
Proposed Structure
At the Crossing of Highway #620
(Revision Line 'H') and Crowe River
District No. 10 (Bancroft)
W.O. 70-11118 -- W.P. 212-66-02

CONT. 73-76

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 do not hesitate to contact our Office.

AGS/MdeF
Attach.

cc: Messrs. B. R. Davis
H. A. Tregaskes
D. W. Farren
S. J. Markiewicz
D. A. Osborne-White
T. C. Kingsland (2)
M. R. Ernesaks (2)
J. E. Gruspier
B. J. Giroux
B. A. Singh
Foundations Files
Gen. Files

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

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 2. DESCRIPTION OF THE SITE AND GEOLOGY.
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 6. EXISTING STRUCTURE.
 7. DISCUSSION AND RECOMMENDATIONS:
 - 7.1) General.
 - 7.2) Structure Foundations.
 - 7.3) Approach Embankments.
 8. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION REPORT
For
Proposed Structure
At the Crossing of Highway #620
(Revision Line 'H') and Crowe River
District No. 10 (Bancroft)
W.O. 70-11118 -- W.P. 212-66-02

1. INTRODUCTION:

The Foundation Section was requested to carry out a subsurface investigation at the proposed structure crossing of Hwy. #620 (Revision Line 'H') and Crowe River, in Chandos Township, County of Peterborough. This structure is to replace the existing one. The request was contained in a memo from the Eastern Regional Bridge Office (Mr. T. C. Kingsland, Regional Bridge Planning Engineer), dated November 2, 1970. Subsequently, an investigation was carried out by this Section to determine the subsoil, bedrock and groundwater conditions at the site.

The factual information obtained from this investigation is presented in this report, together with our recommendations pertaining to the design of the structure foundations and related earth works.

2. DESCRIPTION OF THE SITE AND GEOLOGY:

The site is located at the intersection of Hwy. #620 and Crowe River, near the western limits of the Village of Glen Alda. The ground surface in this area consists generally of a rolling topography. East of the site the area has been developed for residential purposes; to the west, however, the land is unoccupied.

The river channel, at the crossing, is approximately 68 ft. wide and 11 feet deep. The water level in the river, on December 7, 1970, was found to be at elevation 1009 - i.e.,

2. DESCRIPTION OF THE SITE AND GEOLOGY: (cont'd.) ...

it is some 5 feet deep. There is an existing structure at the crossing, the pertinent details of which will be discussed in Section #6.

Geologically, the area is in the Precambrian Shield, which consists of crystalline rocks over 1 billion years old. The area has been deeply buried within the earth's crust and the rocks have been highly metamorphosed or changed by intense heat and pressure. The characteristic bedrock type encountered is a gneiss belonging to the Hastings - Highland gneiss complex. Also found in this region are remnants and patches of volcanic and sedimentary rocks.

The bedrock in the immediate vicinity of the site is generally overlain by silts and sands of glacio-fluvial origin. These deposits are part of the Dummer formation.

3. FIELD AND LABORATORY WORK:

A total of four boreholes was carried out during the course of the field investigation; all were accompanied by a dynamic cone penetration test. In addition, five dynamic cone penetration tests were also carried out to delineate the subsoil and bedrock boundaries more accurately. The boreholes and the dynamic cone penetration tests were advanced by means of a diamond drill rig adapted for soil sampling purposes.

Samples of the overburden were obtained at required depths in a 2-inch O.D. split-spoon sampler, which was hammered into the soil in accordance with the specifications for the Standard Penetration Test. The same method was used to advance the dynamic cone penetration tests. Bedrock was proven at three of the boring locations by obtaining BX and AXF size rock core samples. During sampling and drilling operations, detailed logs of the borings were made; these logs contain a record of the drilling and sampling techniques used, together with the soil and bedrock types encountered.

3. FIELD AND LABORATORY WORK: (cont'd.) ...

The location and elevations of all the boreholes are shown on Drawing #70-11118A, together with estimated stratigraphical sections across the site. The elevations given in this report are referred to a Geodetic datum.

All samples were subjected to a careful visual examination in the field and subsequently in the laboratory. Following this examination, laboratory testing was carried out on selected representative samples to determine the following physical properties of the overburden:

Natural Moisture Contents

Organic Contents

Bulk Densities

Grain-Size Distributions

The results of these tests are plotted on the Record of Borelog sheets as well as on Figure No. 1 in Appendix I.

4. SUBSOIL AND BEDROCK CONDITIONS:

4.1) General:

The natural overburden at this site consists of a deposit of loose to dense silty sand to silt, having a thickness which varies from 7 ft. on the east bank, to 33 ft. on the west bank. The granular subsoil is underlain by sound granite bedrock.

The existing roadway fills in this area, which are up to 12 feet high, are composed of sand which has been moderately compacted.

The boundaries of the various deposits are shown on the accompanying Borelog sheets. The stratigraphical sections, inferred from these borelogs, are plotted on Drawing No. 70-11118A.

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

4.1) General: (cont'd.) ...

From ground surface downward, the various soil and bedrock types encountered, are as follows:

4.2) Roadway Fill (Sand):

B.H.'s #1 and 3 were put down through the existing west approach fill; the fill is up to 12 feet deep. The fill is composed of a uniformly graded sand. At B.H. #3 boulders up to 6 inches in size were encountered.

Standard penetration resistance tests carried out within the material, gave 'N' values which vary from 1 blow/ft. at the surface, increasing to 60 blows/ft. with depth. Based on these results, it is estimated that the fill was subjected to a compactive effort which ranged from low to moderate.

4.3) Silty Sand to Sandy Silt:

Underlying the roadway fill, where it exists, or immediately below ground surface elsewhere, is a stratum of silty sand to sandy silt. The overall thickness of this deposit varies from 7 feet at B.H. #4 (East bank) to 33 feet at B.H. #1 (West bank). At B.H.'s #1 and 3, located on the west bank of the river, a deposit of silt, between 14 and 16 feet in thickness, is sandwiched within the stratum. Grain-size distribution testing was carried out on typical samples of this deposit. The results are plotted on Figure No. 1 in Appendix I.

Laboratory testing was carried out on samples from the granular stratum in order to determine the organic content. This testing gave values which varied from 0.7 to 3.5 percent by weight, indicating that a trace of organic matter is present throughout.

Standard penetration resistance testing carried out within this deposit, gave 'N' values which vary from 2 to 48 blows/ft., being generally between 12 to 20 blows/ft. Based on this testing, it is estimated that the relative density of the granular stratum varies from loose to dense, being typically in the compact range.

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

4.4) Granite Bedrock:

The granular stratum is directly underlain by bedrock. Bedrock was established at B.H.'s #1, 2 and 4 by obtaining up to 18 feet of AXT or BX size rock core samples. At other locations the bedrock surface was inferred to be at the point where the dynamic cone penetration tests met practical refusal. The surface of the bedrock, across the site, was found to vary between depths of 7 ft. (B.H. #4) to 39.5 ft. (B.H. #1). In the vicinity of the site, the bedrock appears to dip in a northwesterly direction.

The bedrock is composed of a grey, metamorphosed granite. Throughout its depth the bedrock was found to be sound, as indicated by the high percentage of core recovered.

5. GROUNDWATER CONDITIONS:

The groundwater level conditions across the site, during the period of the investigation (December, 1970), were observed by taking readings in the open boreholes. The results of the readings are summarized on Drawing No. 70-1118A.

The observations indicate that the groundwater level is located between elevations 1008 and 1012 - i.e., some 1 to 11 feet below existing ground surface. At the time of the investigation the Crowe River was ice-covered; the surface of the ice was at elevation 1009.

6. EXISTING STRUCTURE:

The existing structure is a single-span (71 feet), 16 feet wide concrete and steel structure. The abutments are of a closed type; it is believed that they are founded directly on bedrock.

The profile grade of Hwy. #620, in the vicinity of the structure, is at an elevation of 1021. At this grade the heights of the existing west and east approach embankments are of the

6. EXISTING STRUCTURE: (cont'd.) ...

order of 9 and 7 ft., respectively. The slopes of the approaches in the transverse direction are of the order of 2:1.

In general, the structure and approaches appear to be performing quite satisfactorily.

7. DISCUSSION AND RECOMMENDATIONS:

7.1) General:

It is proposed to replace the existing structure at the crossing of Crowe River and Hwy. #620 with a new one. Details of the proposed scheme are shown on Drawing No. E-5204-1, dated October, 1970. The new structure, which will be 34 feet wide, is to have a single span; two possible span lengths are being considered, namely, (i) 44 feet, and (ii) 66 feet.

The proposed profile grade of Hwy. #620, in the vicinity of the structure, will be about elevation 1026. This will mean that the existing approaches will be heightened and widened. At this grade the maximum height of the west and east approach fills will be of the order of 14 feet and 12 feet, respectively.

The predominant deposit across the site is composed of a very loose to dense silty sand to sandy silt, the thickness of which varies from 6.5 feet (East bank) to 29 feet (West bank). This granular deposit is underlain by bedrock consisting of metamorphosed granite.

7.2) Structure Foundations:

a) East Abutment
- - - - -

Sound bedrock is located at a shallow depth below ground surface (4 to 10 feet) at the two possible locations for the east abutment. The closed-type abutment can, therefore, be supported on a spread footing bearing on or within bedrock. At least 3 feet of earth cover should be provided to the underside of the footing for frost protection purposes. If the footing is

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

7.2) Structure Foundations: (cont'd.) ...

a) East Abutment: (cont'd.) ...

founded as recommended, an allowable bearing value of up to 20 t.s.f. can be used in design.

As discussed previously, the bedrock surface, across the site, dips in a northwesterly direction. It may, therefore, be necessary to step up the footing in a southerly direction - (refer to Drawing No. W.O. 70-11118A). Further, there may be a tendency for the footing to slide, in a westerly direction, along the sloping bedrock surface. This could be prevented by 'keying' the footing into the bedrock.

The abutment is to be located in the existing Crowe River channel. A dewatering scheme will, therefore, be required in order to facilitate construction in the dry. This abutment excavation could be carried out from within a cofferdam formed of interlocking steel sheeting driven to bedrock. Any inflow into the enclosure could be controlled by pumping from sumps. Alternatively, the river could be diverted and the excavation carried out from within a dyke composed of relatively impervious soil.

b) West Abutment:

At this abutment location in excess of 20 feet of loose to compact granular subsoil overlies the bedrock. This would preclude the economical use of a spread footing foundation for this particular structure element. It is recommended, therefore, that this abutment be supported on end-bearing piles driven to bedrock. For estimating purposes, it can be assumed that the pile tips will be located between elevations 985 and 938. Allowable loads will depend on the pile section chosen (e.g., 12 BP 74 steel H-piles may be designed for 95 tons/pile).

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

7.2) Structure Foundations: (cont'd.) ...

b) West Abutment: (cont'd.) ...

No bouldery or rock fill should be used in areas in which piles are to be driven. The pile caps should be provided with a minimum of 4 feet of earth cover for frost protection purposes.

The pile cap excavation will extend anywhere from 5 to 7 feet below the groundwater level recorded during the period of the investigation. Seepage will occur in the excavation; further, the base may boil due to the unbalanced hydrostatic water pressure head existing. A dewatering scheme will, therefore, be required. If steel sheeting is incorporated into the scheme, it should be driven to a depth below the base of the excavation equal to the unbalanced water pressure head above this level.

If the structure is designed as a rigid frame, then a coefficient of earth pressure at rest (K_0) of 0.5 should be used for the granular fill material behind the wall when designing the abutments. However, if some movement of the top of the wall is permitted, then a coefficient of active earth pressure (K_a) of 0.33 can be used. The granular backfill behind the wall should be allowed to drain in order to prevent the buildup of excess hydrostatic water pressures in this area. This can be accomplished by providing weep-holes at the base of the walls.

7.3) Approach Embankments:

As discussed previously, the existing embankments are to be heightened and widened. No stability problems are anticipated for the expanded sections, which will have 2:1 slopes in the transverse direction.

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

7.3) Approach Embankments: (cont'd.) ...

In order to have a smooth transition from the existing to the new fill sections, it is recommended that:

a) all topsoil be stripped from the existing fill sections prior to placing future fill, and

b) the future fill be 'keyed' into the existing approaches as per current D.H.O. methods.

The structure approaches should be protected against the scour action of the Crowe River; this could be accomplished by placing a rip-rap cover in this area.

8. MISCELLANEOUS:

The field work was performed during the period of December 4 to 15, 1970.

Equipment used was owned and operated by Master Soil Investigation, Ltd., Toronto.

The field work was carried out under the supervision of Mr. S. Ahmad, Project Foundation Engineer, who also prepared this report.

The report was reviewed by Mr. B. T. Darch, Senior Foundation Engineer.

January, 1971

APPENDIX I

FOUNDATION SECTION

CHECKED BY

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY Y P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	20	40	60	80	100	SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE					WATER CONTENT % 10 20 30
1020.3	Ground Level														GR. 5A. SI. CL.	
0.0	Sand (Roadway Fill)		1	SS	1											
1013.8	Very Loose to Loose Brown		2	SS	5											
6.5	Sandy silt to silty sand		3	SS	10											
	Grey		4	SS	6											
1002.3	Loose to compact		5	SS	10											
18.0	Silt		6	SS	25											
	Compact		7	SS	14											
	Grey		8	SS	17											
986.3	Sandy silt to silty sand.		9	SS	15											
980.9	Compact. Grey															
976.3	Bedrock - Granite		10	AXT	95%											
976.3	Sound															
976.3	End of Borehole															

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 70-11118 LOCATION Sta. 707 + 18 o/s 23' Lt. ORIGINATED BY SAA
 W.P. 212-66-02 BORING DATE December 3-9, 1970 COMPILED BY SAA
 DATUM Geodetic BOREHOLE TYPE Washboring, NX & BX Casing, AXT Rock Core CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		20	40	60	80	100	SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE				
1013.0	Ground Surface															
0.0	Sandy silt to silty sand		1	SS	2	1010										
	Very Loose - Loose Brown		2	SS	4											
1003.9			3	SS	6											
9.1	Bedrock - Granite		4	AXT	100%	1000										
	Sound		5	AXT	100%											
	Grey		6	AXT	100%	990										
986.2			7	AXT	100%											
26.8	End of Borehole					980										

120/2"

Org. 12






In open BH Dec. 10/70 0 68 28 4

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 3

FOUNDATION SECTION

JOB 70-11118 LOCATION Sta. 706 + 28 o/s 16' Lt. ORIGINATED BY SAA
 W.P. 212-66-0? BORING DATE December 10, 1970 COMPILED BY SAA
 DATUM Geodetic BOREHOLE TYPE WASH BORING - NX & BX CASING CHECKED BY SR

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE		WATER CONTENT % w_p — w — w_L			
1018.0	Ground Level											
0.0	Sand (Roadway Fill)											
	Boulders up to 6" in size		1	SS	12							
	Compact to Very Dense Brown		2	SS	60							
			3	SS	44	1010						
1007.0			4	SS	8							
12.0	Sandy silt to silty sand.		5	SS	14							
	Loose to Compact Grey											
999.0			6	SS	25	1000						
20.0	Silt											
	Compact to Dense Grey		7	SS	30							
			8	SS	24	990						
985.0												
34.0	Sandy silt to silty sand. Dense. Grey		9	SS	48							
981.0												
38.0	End of Borehole Probable Bedrock					980						

Org. 0.8%
 1008.0
 In open BH
 Dec. 11/70

0 86 11 3

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4

FOUNDATION SECTION

JOB 70-11118

LOCATION Sta. 707 + 35 o/s 18' Rt.

ORIGINATED BY SAA

W.P. 212-66-02

BORING DATE December 11, 1970

COMPILED BY SAA

DATUM Geodetic

BOREHOLE TYPE Washboring, NX Casing, BX Rock Core

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY Y P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		20	40	60	80	100	WATER CONTENT % 10 20 30				
1015.0	Ground Level															
0.0	Sandy silt to silty sand		1	SS	13											
1008.2	Compact Brown		2	SS	25											
6.8	Bedrock - Granite		3	BX	100%											
	Sound		4	BX	100%											
999.0																
16.0	End of Borehole															

1010

100/3"

1000

990

Org. 0.7%

0 14 80 6
3 78 16 3

In open BH
Dec. 15/70

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 5

FOUNDATION SECTION

JOB 70-11118 LOCATION Sta. 706 + 60 o/s 6' Rt. ORIGINATED BY SAA
 W.P. 212-66-02 BORING DATE December 15, 1970 COMPILED BY SAA
 DATUM Geodetic BOREHOLE TYPE Dynamic Cone Test CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		20	40	60	80		
1009.0	Ice Level											
0.5	River Bottom											
	Probably Silt and Sand											
991.2												
17.8	End of Cone Test											
	Probably Bedrock											

1000

990

100/4"

○ UNCONFINED + FIELD VANE
 ● QUICK TRIAXIAL x LAB. VANE

W_p — W — W_L
 WATER CONTENT %

GR. SA. SI. CL.

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 6

FOUNDATION SECTION

JOB 70-11118 LOCATION Sta. 706 + 60 o/s 6' Lt.ORIGINATED BY SAAW.P. 212-66-02 BORING DATE December 15, 1970COMPILED BY SAADATUM Geodetic BOREHOLE TYPE Dynamic Cone TestCHECKED BY [Signature]

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		20	40	60	80	100	WATER CONTENT % w_p — w — w_L			
1009.0	Ice Level														
0.0	River Bottom														
1006.5															
2.5	Probably Sand and silt														
						1000									
994.8															
14.2	End of Cone Test Probably Bedrock					990									

SHEAR STRENGTH P.S.F.

○ UNCONFINED

+ FIELD VANE

● QUICK TRIAXIAL

x LAB. VANE

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 7

FOUNDATION SECTION

JOB 70-11118

LOCATION Sta. 706 + 80 o/s 6' Rt.

ORIGINATED BY **SAA**

W.F. 212-66-02

BORING DATE December 15, 1970

COMPILED BY SAA

DATUM Geodetic

BOREHOLE TYPE Dynamic Cone Test

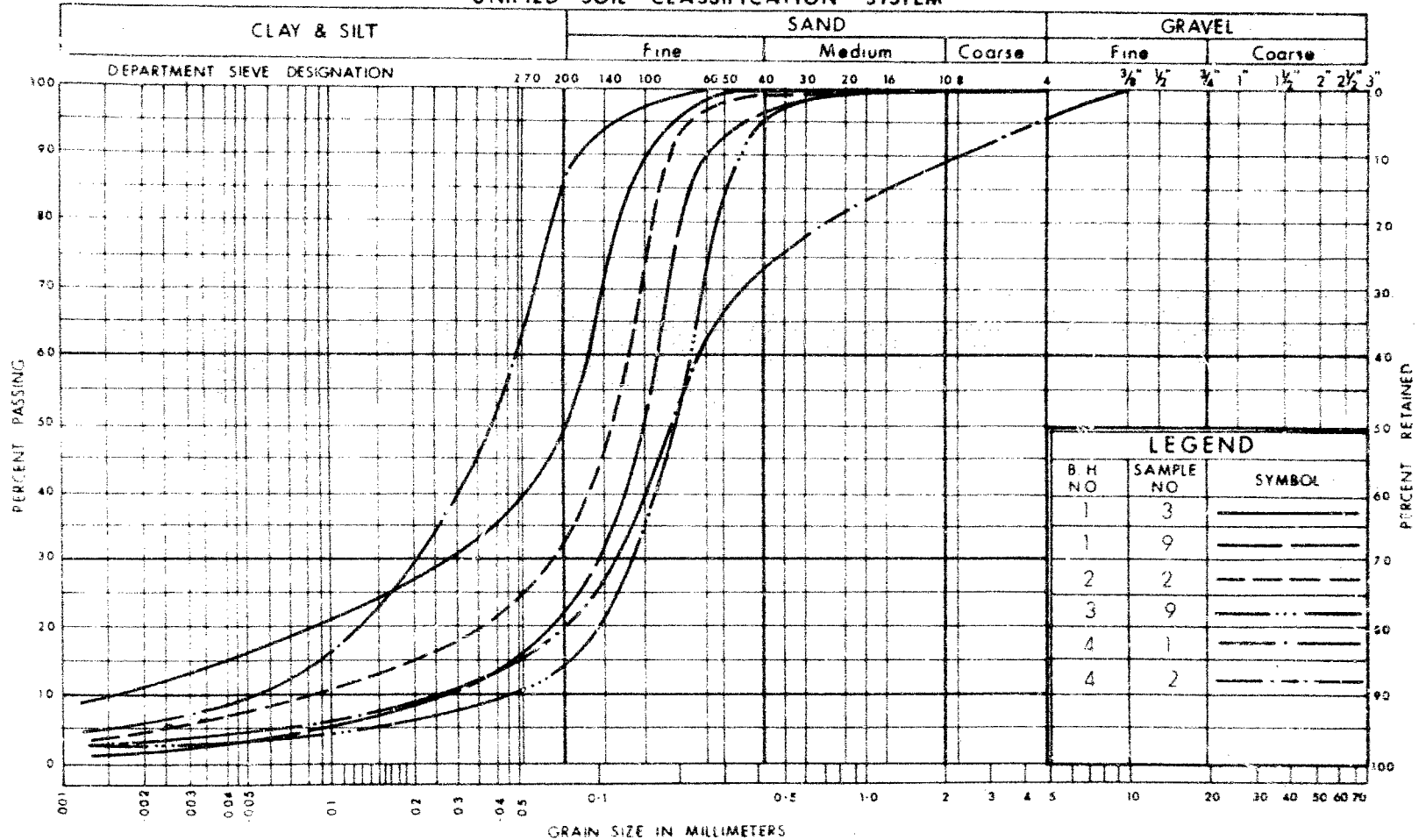
CHECKED BY

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100	LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE				
1009.0	Ice Level River Bottom							
0.5	Probably Sand and Silt							
998.2					1000			
10.8	End of Cone Test Probably Bedrock				990	100/4"		

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100	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
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT					
1009.0	Ice Level									
0.0	River Bottom									
1005.0										
4.0	Probably Sand and Silt					1000				
997.3										
11.7	End of Cone Test Probably Bedrock					990				

UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

GRAIN SIZE DISTRIBUTION
SILTY SAND TO SANDY SILT

W.P. No. 212-66-02

JOB No. 70-1111S

FIG. NO. 1

MEMORANDUM

TO: Mr. A. G. Stermac,
Principal Foundation Engineer,
Downsview, Ontario.

410 700-1118
W.P. 212-66-02
FROM: Bridge Section,
Kingston, Ontario.

ATTENTION:

DATE: November 2, 1970.

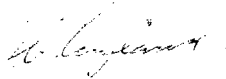
OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 212-66-02, Site 26-11,
Crowe River Bridge at Glen Alda,
Sec. Hwy. 620, District 10-Bancroft

We are sending you herewith two prints of Bridge Site Plan E-5204-1 on which we have marked the proposed location of the above structure. Also enclosed are two copies of your Field Reconnaissance Report.

We would be pleased if you will make arrangements for the necessary foundation investigation and to have your report, the scheduled date for which is February 10, 1971.



T. C. Kingsland
Regional Bridge Planning Engineer

TCK/hl

Encls.

c.c. (with encl.)

Mr. S. McCombie

c.c. Mr. R. Forrest

FIELD RECONNAISSANCE REPORT
REQUIRED BY FOUNDATION SECTION
FOR

FF-69
SEPT. 1968

70-11118

W.P. NO. 212-66-02 HIGHWAY NO. 620 DISTRICT 10 SITE PLAN NO. E5204-1 PROFILE NO. C-678-6
RIVER CROSSING ☒ GRADE SEPERATION ☐ R.R.X. ☐ OTHER (SPECIFY) _____
ALTERNATE SCHEME (IF ANY) _____

EXISTING SITE CONDITIONS

DESCRIPTION:

TOPOGRAPHY: HILLY ☒ ROLLING ☐ VALLEY ☐ GULLIED ☐ FLAT ☐
VEGETATION: TREES ☐ BRUSH ☒ GRASS ☒ SWAMP ☐ FARM CROPS ☐ CLEARED ☐
SNOW COVER: 0"-6" ☐ 6"-12" ☐ >12" ☐
ROCK OUTCROP (SPECIFY LOCATIONS) 150' N.W. in streambed and probably top of bank S.E. corner

UNDERGROUND UTILITIES: UTILITY COMPANY _____ TELEPHONE NO. FOR DEFINITE LOCATION _____

1 None

2 _____

Aerial 3 Bell telephone and hydro wires in vicinity

4 _____

5 _____

EXISTING STRUCTURE(S):

FOUNDATIONS: SPREAD FOUNDATIONS ☐ SIZE _____ ELEVATION(S) _____
PILES ☐ TYPE _____ LENGTH(S) _____
DESIGN LOAD _____ T.S.F. _____ TONS / PILE _____
CONDITION OF STRUCTURE Fair

APPROACHES: CUT ☐ FILL ☒ SIDE SLOPES _____
BERMS YES ☐ NO ☐

OTHER OBSERVATIONS (USE BACK OF SHEET TO DESCRIBE ANY FAILURES IN AREA, PAST PERFORMANCE OF EXISTING APPROACHES & STRUCTURE, ETC.)

ACCESSIBILITY

IS STRUCTURE LOCATED ON D.H.O. RIGHT OF WAY? YES ☒ NO ☐ IF NO,
HAS PERMISSION BEEN OBTAINED TO ENTER PROPERTY? YES ☐ NO ☐ IF NO,
PROPERTY OWNER(S):

NAME

ADDRESS

TELEPHONE NO.

1 _____

2 _____

3 _____

4 _____

WHO WILL OBTAIN NECESSARY PERMISSION? _____

HAS SITE BEEN SURVEYED & STAKED? YES ☐ NO ☐ IF YES, DATE OF MOST RECENT SURVEY _____

WILL CLEARING BE NECESSARY TO ENTER SITE AREA? YES ☐ NO ☒

IS SITE ACCESSIBLE TO WHEELED VEHICLES? YES ☒ NO ☐

IF RIVER CROSSING:

WILL A RAFT BE NECESSARY? YES ☒ NO ☐ IF YES, GIVE MAX. DEPTH OF WATER 2 to 4 FT.

CURRENT: SWIFT ☐ MODERATE ☒ SLOW ☐

DRILLING OPERATIONS

NEAREST SOURCE OF WATER (GIVE HAULING DISTANCE, IF KNOWN) At site

ADDITIONAL INVESTIGATION REQUIRED FOR THE FOLLOWING PURPOSES:

ALTERNATE SCHEME: YES ☐ NO ☐ IF YES, SPECIFY _____

HYDROLOGIC REASONS: YES ☐ NO ☐ IF YES, SPECIFY (SCOUR, ETC.) _____

REMARKS

NEAREST AVAILABLE ACCOMODATION: Motels in Apsley, Int. Hwys. 28 & 620

OTHER COMMENTS: _____

DATE November 5, 1969

REGIONAL BRIDGE LOCATION ENGINEER

Planning

H. H. Thompson

Department of Highways Ontario

Copy for the information of

Mr. A. Stermac

~~Mr. T. C. Kingsland,~~ Bridge Office,
Regional Bridge Planning Engineer, Downsview.
Kingston Regional Office.

April 30, 1971.

Crowe River Bridge
At Glen Alda,
W.P. #212-66-02 Site #26-11
Sec. Hwy. 620 District #10.

Attached herewith are prints of the Preliminary Bridge
Plan Drawing D-7023-P1 for the above mentioned structure.

The estimated cost of the proposed structure is
\$75,000.00 which 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/mh

Attach.

cc: B. Davis,
A. Stermac (2),
J. Anderson,
E. Forrest.

MEMORANDUM

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

FROM: C. S. Grebski,
Structural Office.

ATTENTION:

DATE: August 4, 1971.

OUR FILE REF.

IN REPLY TO

SUBJECT: Crowe River Bridge
at Glen Alda,
W.P. 212-66-02, Site #26-11,
Highway #620, District #10.

70-11-118²

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
C. S. Grebski,
Structural Design Engineer.

CSG/mh
ENCL*
cc: Foundation Office.

CSG
15 Aug. 71

Letter
Aug 30 / 71

Ontario
Department of Transportation and Communications
XXXXXXXXXXXXXXXXXXXX

C. S. Grebski,
Structural Design Engineer,
Foundations Office,
West Bldg., Downsview.

Foundations Section,
Design Services Branch,
Central Bldg., Downsview.
August 31, 1971.

Crowe River Bridge, Hwy. No. 620 (Near Glen Alda),
W.P. 212-66-02, Site #26-11, District No. 10,
W.O. 70-11118

We have reviewed the Final Bridge Drawings D-7023-1 & 3
for the above-mentioned structure and submit the following
comments:

1. The vertical and 1:12 batter piles at the west abutment location should be fitted with Oslo Points to prevent any lateral movement on the sloping bedrock surface.
2. The bedrock at the site ranges in elevation from 971 to 981 at the location of the west abutment and from elevation 995 to 1000 at the location of the west abutment. The pile lengths shown on Drawing D-7023-3 should be modified to comply with these bedrock elevations.

MD/ao
c.c. Foundation Files
Documents

M. Devata
M. Devata,
Supervising Foundation Engineer,
For:
A. G. Stermac,
Principal Foundation Engineer.

MX KINR APRIL 11/73 3.45 PM

BANC 1 TO D A O WHITE DIST ENGR

DOWN 8 COPY TOB GIROUX ESTIMATING OFFICE

KINR COPIES TO: P BILLINGS REG DIRECTOR

E SAINT M AND T

B MCKAY ENG AUDIT

T KINGSLAND STRUCTURAL PLANNING ✓

L FRASER REG INSP SPEC SVCS

RE WP 510-64-01 HWY 28, BURLEIGH FALLS TO APSLEY

THE PRE-CONTRACT REVIEW MEETING FOR THE ABOVE WORK PROJECT WILL BE
HELD ON THURSDAY 19 APRIL 1973 AT 10.30 AM IN BOARDROOM NO. 1 IN
THE KINGSTON REGIONAL OFFICE.

J R BESTVATER FOR H R MCINTYRE SYSTEMS DESIGN

JM

Copies made for: (TCK: 12/4/73)

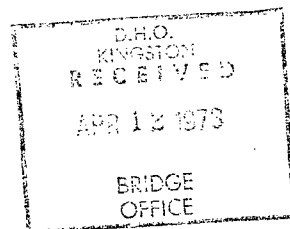
K. Bassi

W. D. Birch

M. Devata

INCL.

W.P. 212-66-02 SITE 26-11
CROWE RIVER BRIDGE.



70-11-118

Agreed with Tom Kingstand that he may not be
required to see this.

M.D.

7-16

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-1118 SITE hwy 504 and Hwy 620 BOREHOLE No. 1 GROUND ELEVATION

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALTANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	2'-0" - 3'-6"	—	—		95	5	Low	Dull	Quick		Earthy org.	Brown	low		UNIFORM SAND, TRACE OF ORGANICS	SU
2	5'-0" - 6'-6"				95	5	"	"	"		"	Brown black	"		UNIFORM SAND, TRACE OF ORGANICS	SU
3	8'-0" - 9'-6"	—	—	—	40	60	"	"	"		Earthy	Brown	"		SANDY SILT	ML
4	12'-0" - 13'-6"				70	30	"	"	"		"	Gray	"		SILTY SAND, TRACE OF ORGANICS	SF
5	15'-0" - 16'-6"				70	30	"	"	"		"	"	"		SILTY SAND, TRACE OF ORGANICS	SF
6	20'-0" - 21'-6"					100	"	"	"		"	"	"		SILT	ML
7	25'-0" - 26'-6"					100	"	"	"		"	"	"		SILT	ML
8	30'-0" - 31'-6"					100	"	"	"		"	"	"		SILT	ML
9	33'-0" - 35'-6"				70	30	"	"	"		"	"	"		SILTY SAND	SF

NOTES:- VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-1118 SITE Hwy 504 & Hwy 620 BOREHOLE No. 1 GROUND ELEVATION _____

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION			DRY STRENGTH	SHRINKAGE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE										
	2'-0" 3'-6"	-	-	-	40	60	Low	Dull	Quick	Earthy Org.	Brown		SANDY SILT, TRACE OF ORGANICS	ML
1	5'-0" 6'-6"	-	-	-	40	60	"	"	"	Earthy	Brown grey		SANDY SILT, TRACE OF ORGANICS	ML
3	8'-0" 9'-6"	-	-	-	40	60	"	"	"	"	grey		SANDY SILT TRACE OF ORGANICS	ML

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.
REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-1118 SITE Hwy SD4 & Hwy 620 BOREHOLE No. 3 GROUND ELEVATION _____

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
	2'-0" 3'-6"	3/8	SUB ANGULAR	5	90	5	Low	Dull	Quick		Earthy brown	low		UNIFORM SAND, TRACE OF GRAVEL	SU	
1	5'-0" 6'-6"	1/4	"	5	90	5	low	"	"		"	"	"	UNIFORM SAND, TRACE OF GRAVEL	SU	
3	8'-0" 9'-6"	—	—	—	95	5	"	"	"		"	"	"	UNIFORM SAND, TRACE OF GRAVEL	SU	
4	10'-0" 13'-6"				40	60	"	"	"		"	Gray	"	SANDY SILT, trace of organics	ML	
5	15'-0" 16'-6"				60	40	"	"	"		"	"	"	SILTY SAND, trace of organics	SF	
6	20'-0" 21'-6"					100	"	"	"		"	"	"	SILT	ML	
7	25'-0" 26'-6"					100	"	"	"		"	"	"	SILT	ML	
8	30'-0" 31'-6"					100	"	"	"		"	"	"	SILT	ML	
9	35'-0" 36'-6"				60	40	"	"	"		"	"	"	SILTY SAND.	SF	

NOTES:— VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-11118 SITE Hwy 604 & 622 BOREHOLE No. 4 GROUND ELEVATION _____

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION			DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE										
				GRAVEL	SAND	SILT & CLAY								
1	2'-0" 3'-6"				30		LOW DMP	QUICK		Lightly Brown	Low		SANDY SILT, TRACE OF ORGANIC	ML
2	5'-0" 6'-6"				60	40	" "	"		"	"		SILT SAND,	SF
3A	"				40	60	" "	"		"	"		SANDY SILT	ML
4														
5														
6														
7														
8														
9														

NOTES:- VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-