

#

61-F-87

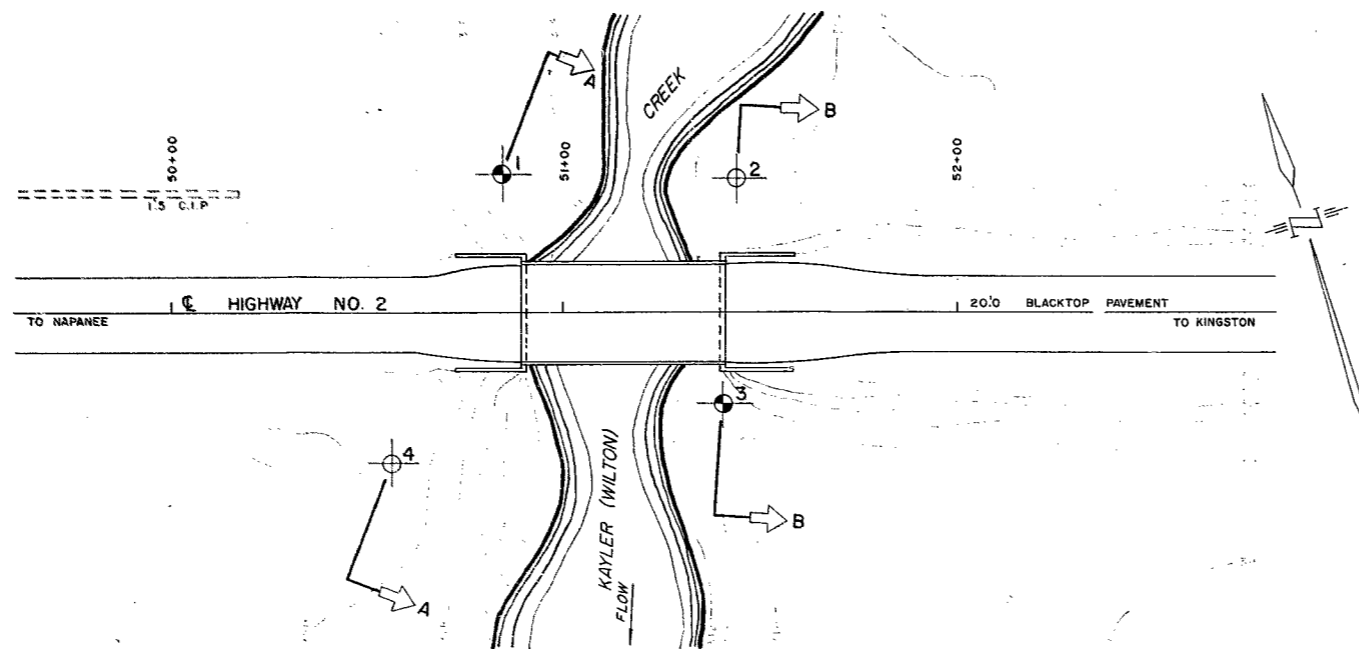
#

W.P. 202-61

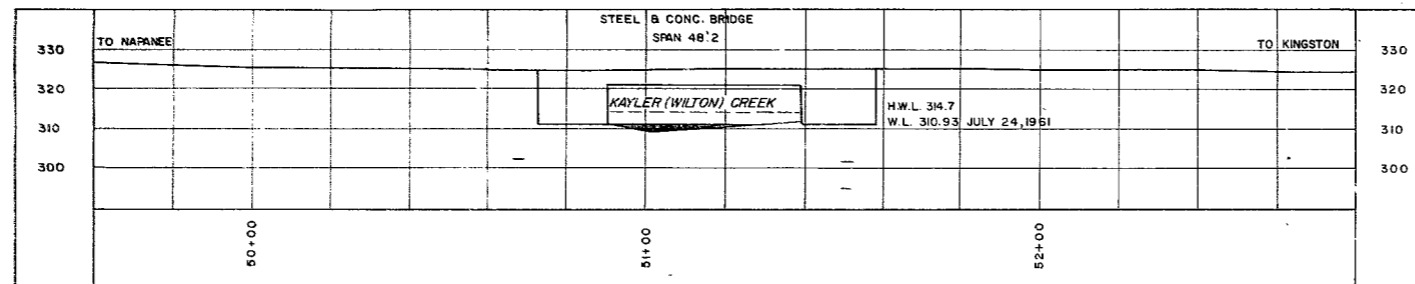
Hwy #2

KAYLER (WILTON)

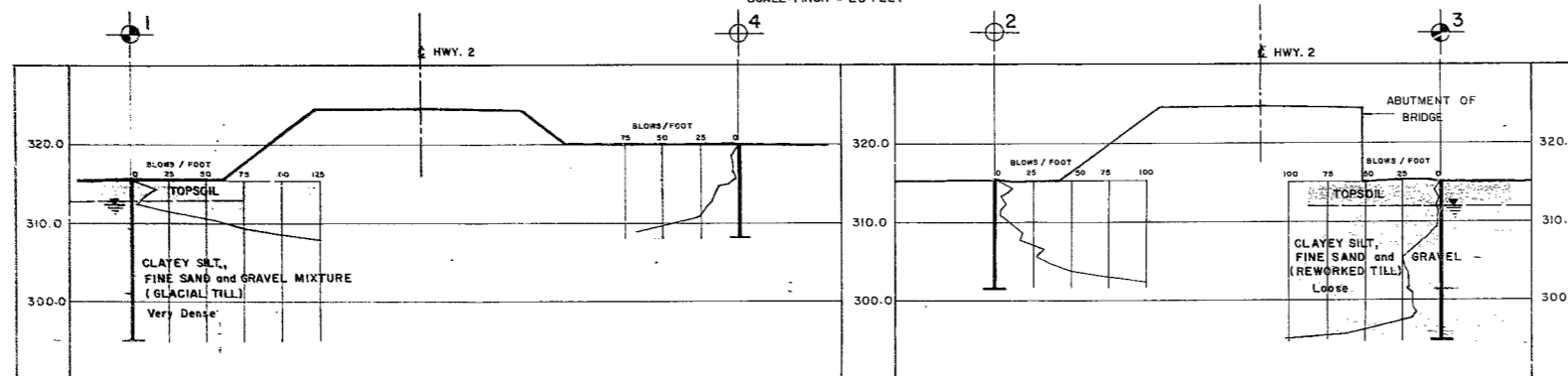
CREEK



PLAN
SCALE: 1 INCH = 20 FEET

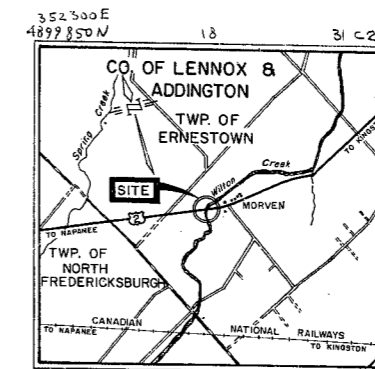


PROFILE
SCALE: 1 INCH = 20 FEET



A-A
SCALE: 1 INCH = 10 FEET

B-B
SCALE: 1 INCH = 10 FEET



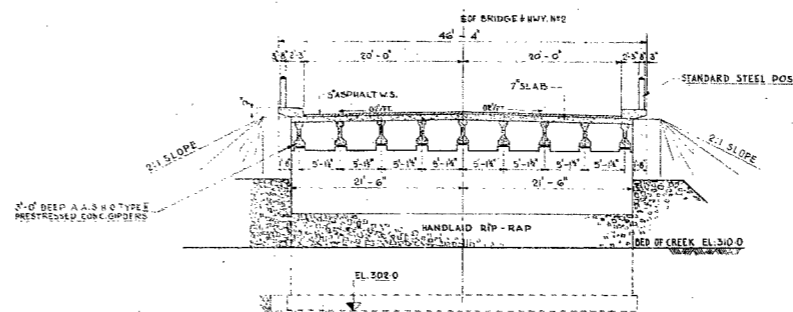
KEY PLAN
SCALE: 1 inch = 0.8 mile

LEGEND			
	BORE & PENETRATION HOLE		
	PENETRATION HOLE		
	BLOWS / FOOT - DYNAMIC CONE		
	WATER LEVELS established at the time of Field Investigation (Sept. 1961)		
HOLE	ELEVATION	STATION	OFFSET
1	315.4	50+84	35' LT.
2	315.2	51+43	34' LT.
3	315.1	51+40	23' RT.
4	320.0	50+56	38' RT.

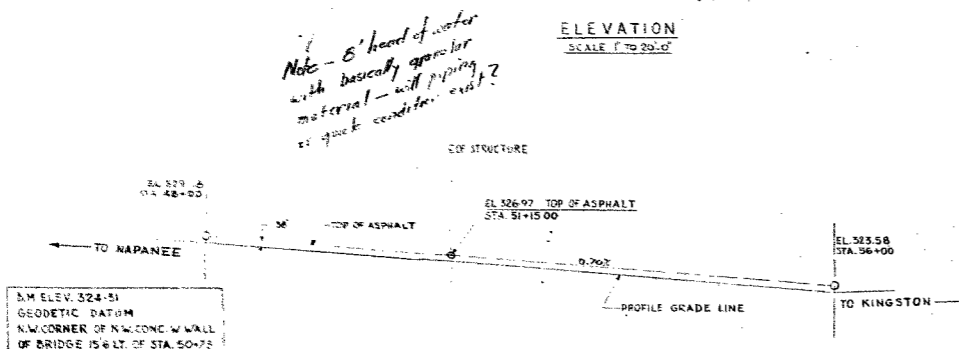
— NOTE —
THE BOUNDARIES BETWEEN SOIL STRATA HAVE BEEN ESTABLISHED ONLY AT BORE HOLE LOCATIONS. BETWEEN BORE HOLES THE BOUNDARIES ARE ASSUMED FROM GEOLOGICAL EVIDENCE AND MAY BE SUBJECT TO CONSIDERABLE ERROR.



DEPARTMENT OF HIGHWAYS - ONTARIO		
MATERIALS & RESEARCH SECTION		
KAYLER (WILTON) CREEK AND HIGHWAY NO. 2		
ORIGINATED BY: KULMATICAS	DISTRICT NO. 8	DATE: SEPT. 21, 1961
DRAWN: F. CLARK	W.P. NO. 202-61	JOB NO. 61-F-87
CHECKED: <i>[Signature]</i>	SCALE	DRAWING NO.
APPROVED: <i>[Signature]</i>	AS SHOWN	61-F-87A

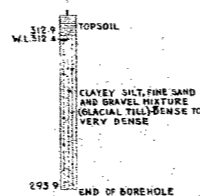
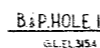
REF. NO. E-4017-1

[illegible]

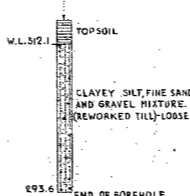
Note - 8' head of water
with basically granular
material - will piping
or quick condition exist?



 BORE & PENETRATION HOLE
 PENETRATION HOLE



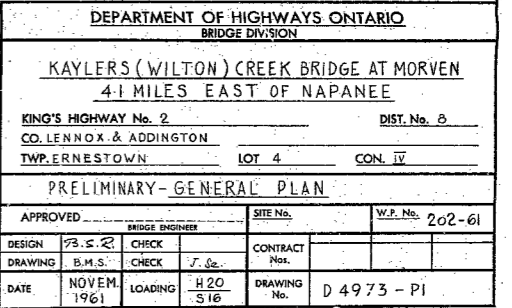
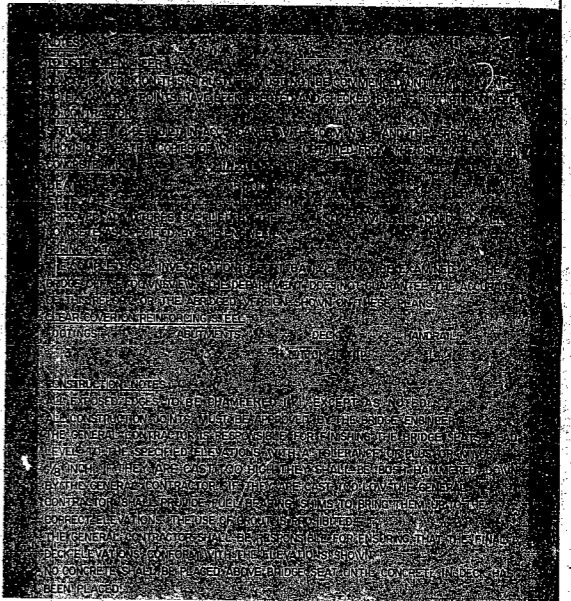
B. & P. HOLE 3
G.L. EL 315.1



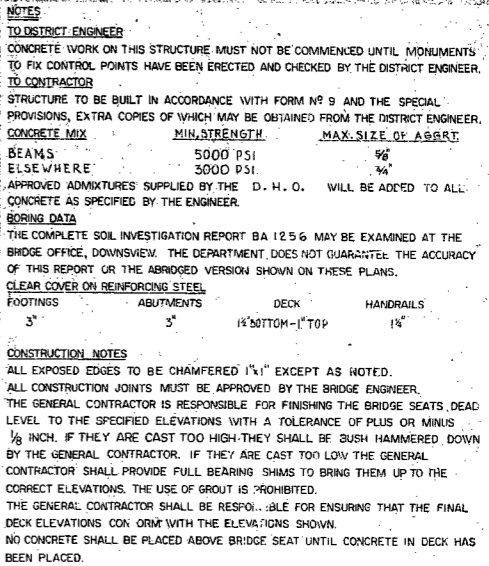
- DRAWING LIST
- 1- GENERAL PLAN
 - 2- ABUTM, FOOTING & WALL DIMENSIONS
 - 3- " " " " REINFORCING
 - 4- PRESTRESSED GIRDERS
 - 5- DECK, APP. SLAB & ENDPOST DIMENS. & REINF.
 - 6- HANDRAIL DETAILS
 - 7- REINF. STEEL SCHEDULE

REVISIONS			
	DATE	BY	DESCRIPTION

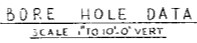
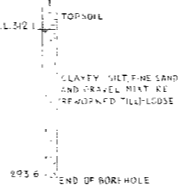
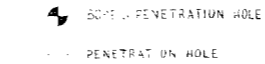
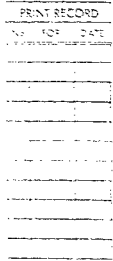
DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE DIVISION			
<u>KAYLERS (WILTON) CREEK BRIDGE AT MORVEN</u> <u>4.1 MILES EAST OF NAPANEE</u>			
KING'S HIGHWAY No. 2		DIST. No. 8	
CO. LENNOX & ADDINGTON		CON. IV	
TWP. ERNESTOWN		LOT 4	
GENERAL PLAN			
APPROVED		SITE No.	
BRIDGE ENG-YEAR		W.P. No. 202-61	
DESIGN	J. S.	CHECK	S. S.
DRAWING	R. M. S.	CHECK	S. S.
DATE	DEC. 1926	RE-DESIGN	H. 20
CONTRACT		DRAWING No.	
No. 1		D 4973 - 1	



COUNTY OF LEIRNOR
ADDINGTON
TOWNSHIP OF ERNESTOWN
TOWNSHIP OF NORTH WEST
BRIDGE SITE
CANADIAN NATIONAL RAILWAYS
1 IN = 0.5 KM
KEY PLAN

[illegible]

DEPARTMENT OF HIGHWAYS ONTARIO			
BRIDGE DIVISION			
KAYLERS (WILTON) CREEK BRIDGE AT MORVEN			
4 1 MILES EAST OF NANAFEE			
KING'S HIGHWAY No. 2		DIST. No. 8	
CO. LENTHOCK & ADDINGTON			
TWP. PRINCESTOWN		LOT 4	CON. 1
PRELIMINARY GENERAL PLAN			
APPROVED		SITE No.	W.P. No. 202-61
BRIDGE ENGINEER			
DESIGN	CHECK	CONTRACT	
DRAWING		No.	
DATE	LOADING	DRAWING No.	
NOVEMBER 1961	H 20 S 16	D 4973 - PI	



22-62-187

Mr. A. H. Foye,
Bridge Engineer.
Materials & Research Division,
(Foundations Section)

October 11, 1961.

D.H.C. FOUNDATION INVESTIGATION
REPORT.
W.J. 61-7-87 -- W.P. 202-61.

Attention: Mr. S. McCosbie.

Re: Proposed New Bridge - Hwy. #2 and
Milton (Hayler) Creek - 4.5 Miles
S. of Kapanee, Twp. of Brimstone,
County of Lennox and Addington,
District #8.

Accompanying this memo, is our detailed foundation
report on the subsoil conditions existing at the above site.

We believe you will find the conclusions and recom-
mendations summarized therein, self-explanatory and adequate for
your future design work.

Should you require further assistance in connection
with this project, please do not hesitate to contact our Office.

AGG/SCGF
Enc.

cc: Messrs. A. H. Foye (x)
H. A. Kregaskes
H. P. McMillan
J. Ford
A. L. Cash
J. L. Crumpler
R. J. Kovich
J. Roy
E. L. Saint
P. Norman
A. Watt
Foundations Office
Gen. Files.

agf
A. U. Sternsac,
PRINCIPAL FOUNDATION ENGINEER

TABLES OF CONTENTS

1. INTRODUCTION.
 2. DESCRIPTION OF THE SITE.
 3. FIELD AND LABORATORY WORK.
 4. SOIL CONDITIONS.
 5. DISCUSSION AND RECOMMENDATIONS.
 6. SUMMARY.
 7. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION

For

Proposed New Bridge - Hwy. #2 and
Wilton (Kayler) Creek - 4.5 Miles
E. of Napanee, Twp. of Ernestown,
County of Lennox and Addington,
W.J. 61-F-87 -- W.P.202-61 --Dist.#8

1. INTRODUCTION:

At the above location, it is proposed to construct a new bridge to carry Hwy. #2 over Wilton Creek.

A field investigation was carried out by this Section in order to determine the subsoil conditions at the site. The results and discussion of the field work and the laboratory testing, together with conclusions and recommendations, are presented in this report.

2. DESCRIPTION OF THE SITE:

The site is located in flat open country. The physiographic region is referred to as the Napanee Plain.

3. FIELD AND LABORATORY WORK:

Two sampled boreholes and four dynamic cone penetration tests were carried out at the site. Disturbed samples were recovered by means of a 2-inch O.D. split spoon. Driving energy to advance the split spoon, and the dynamic cone, was 350 ft. lbs. per blow. Relative densities of the subsoil were obtained in the field by means of the Standard Penetration Test. Laboratory tests were carried out on certain samples to determine the following physical properties:-

cont'd. /2 ...

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

- (1) Natural Moisture Content;
- (2) Grain Size Distribution.

Results of the above tests are given in the Appendix of this report.

4. SOIL CONDITIONS:

Subsoil at the site consists mainly of granular deposits. On the west bank of the river, a very dense till deposit of clayey silt, fine sand, and gravel, extends from below the topsoil to at least 20 feet. On the east bank of the river, a deposit of essentially the same material, but in a loose eroded condition, extends from the topsoil to a depth of about 17.0 feet. Below 17.0' on the east bank, a very dense till stratum was encountered. Grain size distribution tests showed the till stratum to consist of the following particle sizes:- Clay 11%, Silt 35%, Sand and Gravel 54%. Average 'N' value of the loose deposit was 8 blows per foot.

The water table as determined at the time of the investigation, was found to be about 3.0' below the ground surface.

5. DISCUSSION AND RECOMMENDATIONS:

On the west bank of the river, the structure may be supported by spread footings founded in the very dense till deposit at or below elevation 309.0'. A design load of 3 T.S.F. may be used. On the east bank of the river, the structure may be supported on

cont'd. /3 ...

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

short piles of large displacement. For steel tube piles, a design load of 35 tons per pile, may be used. For timber piles (treated if not completely below the lowest established water table), a design load of 15 tons per pile, may be used. It is estimated that the piles should reach practical refusal at, or below elev. 288.0' within two or three feet. A dewatering scheme will be necessary as excavations will be carried out below the creek level. On the west bank of the river, the subsoil is relatively impermeable, hence no major problems are anticipated. On the east bank, however, the subsoil is much more permeable because of its loose relative density.

Protection against scour will be necessary for the abutment footings. If sheeting is used for this, it may be incorporated into a scheme for dewatering.

Footings for falsework may be placed on the dry ground after removal of the topsoil. A safe load of 1 ton per sq. ft. may be employed.

6. SUMMARY:

Subsoil at the site consists of granular till deposits. On the west bank, the deposits are very dense. On the east bank, the deposits are loose for a depth of 17.0 feet. It is recommended to place spread footings on the west bank and short pile foundations on the east bank. A dewatering scheme will be necessary. Scour protection should be provided for the footings in the form of sheeting or other means.

cont'd. /4 ...

7. MISCELLANEOUS:

The field work was carried out during the period Aug. 30th to Sept. 2nd, 1961. Equipment used was owned and operated by Dominion Soil Investigations, Ltd., under the supervision of Mr. W. W. Kulmatickas of the Department of Highways, Ontario.

October 1961.

REPORT PREPARED BY: T. Hobbes
for W. W. Kulmatickas,
PROJECT FOUNDATION ENGINEER.

REPORT APPROVED BY: K. C. Selby
K. C. Selby,
CH. PROJECT FOUNDATION ENGINEER.

SUMMARY OF FIELD & LABORATORY TESTS

JOB 61-F-87

W.P. 202-61

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS/FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
1	S1	5'-6.5'	Clayey silt, fine sand and gravel mixture (Glacial Till) Very dense.	54	7.6	-	-	-	-	
	S2	10'-10.8'	" " "	74.9"	10.2	-	-	-	-	
	S3	15'-15.8'	" " "	115-9"	7.6	-	-	-	-	
	S4	20'-21.5'	" " "	135	7.3	-	-	-	-	
2	Penetration only.									
3	S1	5'-6.5'	Clayey silt, fine sand and gravel mixture. (Reworked Till)-Loose.	10	33.0	-	-	-	-	
	S2	10'-11.5'	" " "	5	21.2	-	-	-	-	
	S3	15'-16.5'	" " "	9	10.6	-	-	-	-	
	S4	20'-21.5'	Sample Lost.							
4	cons penetration only.									
			S denotes split spoon sample.							

DEPARTMENT OF HIGHWAYS - ONTARIO

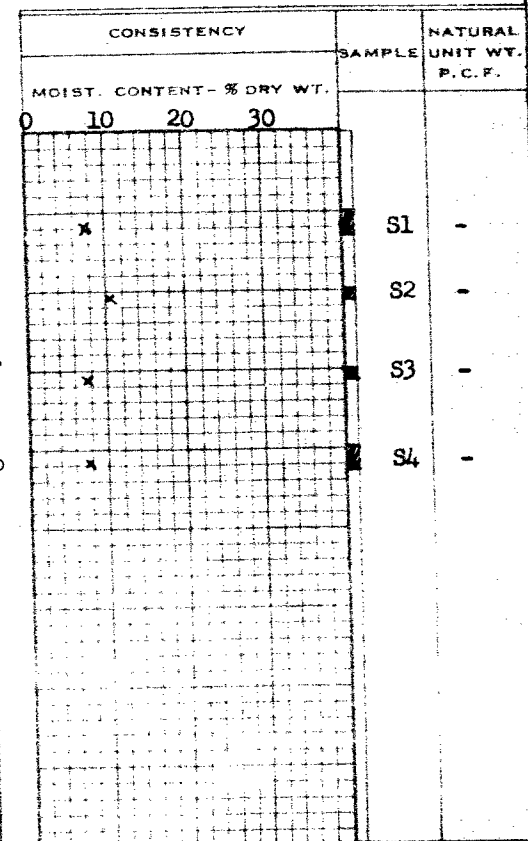
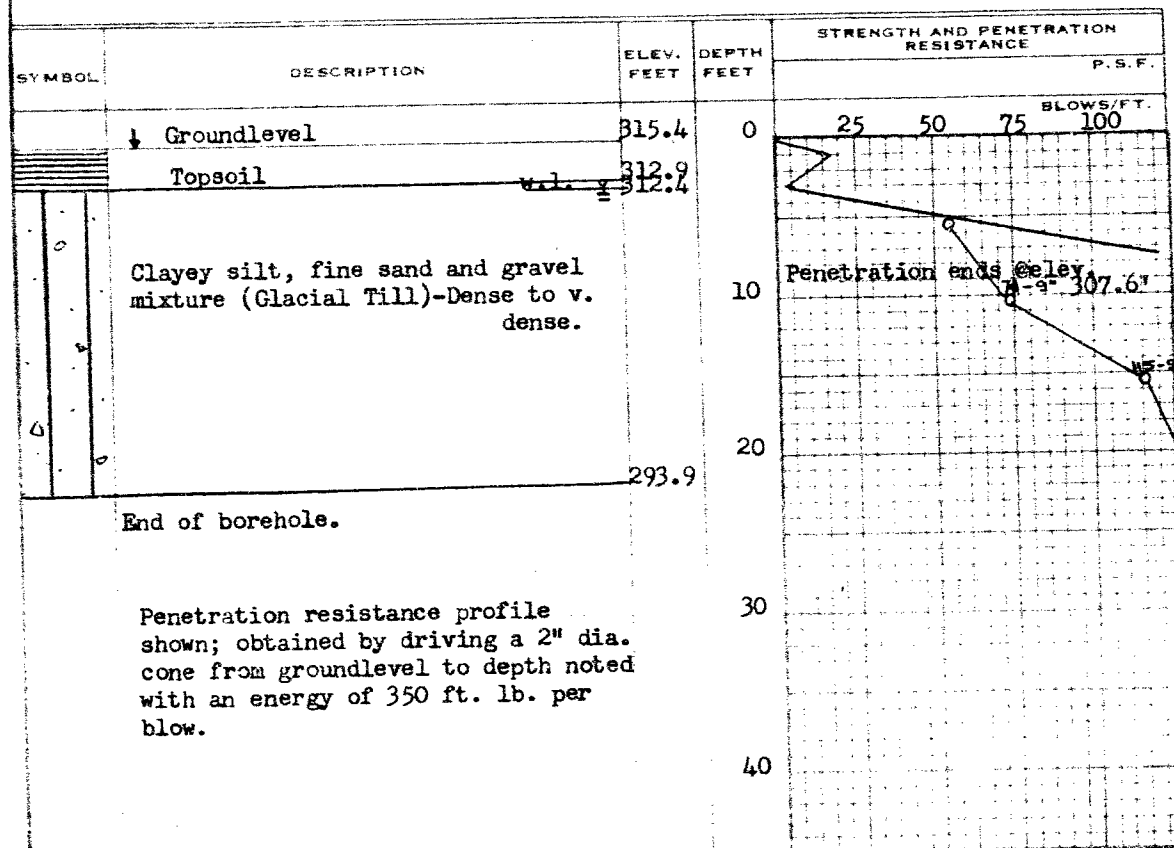
MATERIALS AND RESEARCH SECTION

W.P. 202-61 BORE HOLE NO. 1
 JOB 61-F-87 STATION 50+84 (35' Lt.)
 DATUM 315.4' COMPILED BY B.K.
 BORING DATE Aug. 31/61. CHECKED BY W.W.K. & M.D.

2" DIA. SPLIT TUBE
 2" SHELBY TUBE
 2" SPLIT TUBE
 2" DIA. CONE
 2" SHELBY
 CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Q_u)
 VANE TEST (C) AND SENSITIVITY (S)
 NATURAL MOISTURE AND LIQUIDITY INDEX
 LIQUID LIMIT
 PLASTIC LIMIT



W.P. 202-61 BORE HOLE NO. 2
JOB 61-F-87 STATION 5143 (34' Lt.)
DATUM 315.2' COMPILED BY B.K.
BORING DATE Sept. 1/61. CHECKED BY W.W.K.

1/2 UNCONFINED COMPRESSION (QU) _____	0
VANE TEST (C) AND SENSITIVITY (S) _____	+
NATURAL MOISTURE AND _____	LI
LIQUIDITY INDEX _____	X
LIQUID LIMIT _____	—
PLASTIC LIMIT _____	—

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE	
				P.S.F.	
	↓ Groundlevel	315.2	0	<div style="display: flex; justify-content: space-between; width: 100%;"> 25 50 75 100 </div> <div style="text-align: right; margin-top: -10px;">BLOWS/FT.</div>	
			10		
			20		
			30		
			40		

Penetration resistance profile shown; obtained by driving a 2" dia. cone from groundlevel to depth noted with an energy of 350 ft. lb. per blow.

[illegible]

DEPARTMENT OF HIGHWAYS - ONTARIO

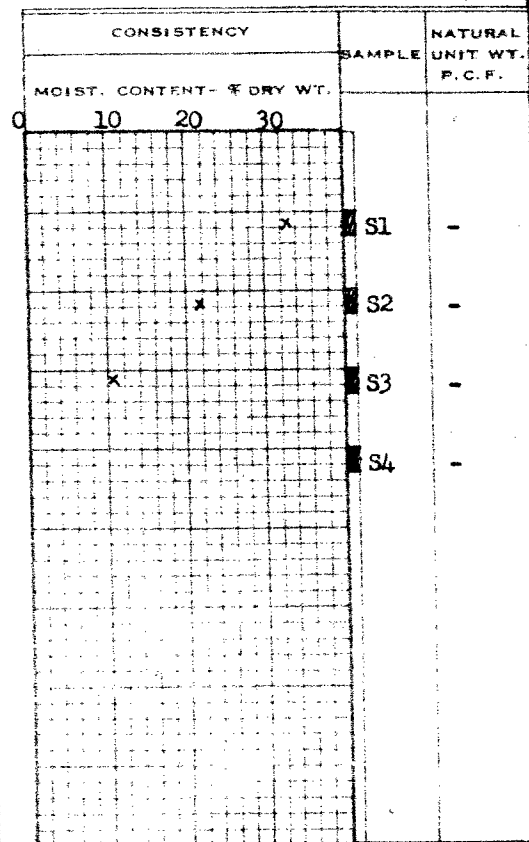
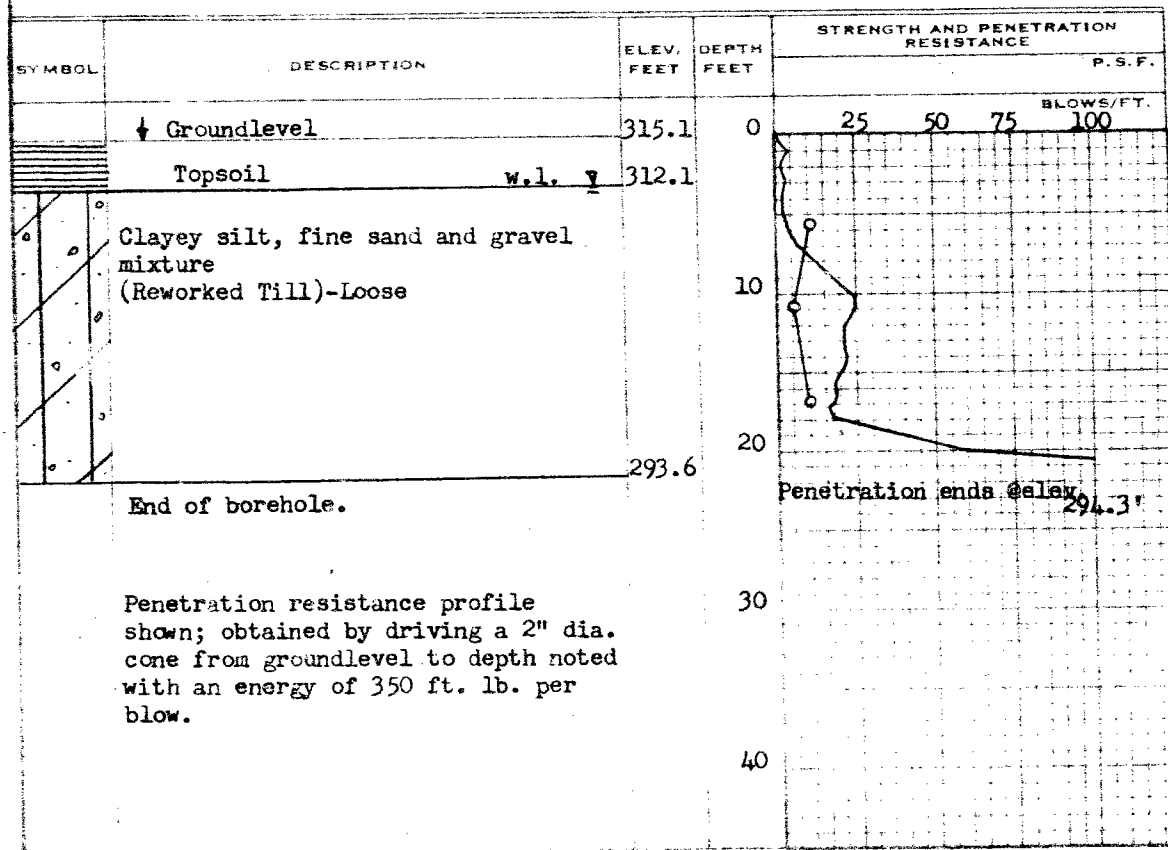
MATERIALS AND RESEARCH SECTION

W.P. 202-61 BORE HOLE NO. 3
 JOB 61-F-87 STATION 51+40 (23' Rt.)
 DATUM 315.1' COMPILED BY B.K.
 BORING DATE Sept. 1/61. CHECKED BY W.W.K. & M.D.

2" DIA. SPLIT TUBE
 2" SHELBY TUBE
 2" SPLIT TUBE
 2" DIA. CONE
 2" SHELBY
 CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) — O
 VANE TEST (C) AND SENSITIVITY (S) — +
 NATURAL MOISTURE AND LIQUIDITY INDEX — X
 LIQUID LIMIT —
 PLASTIC LIMIT —



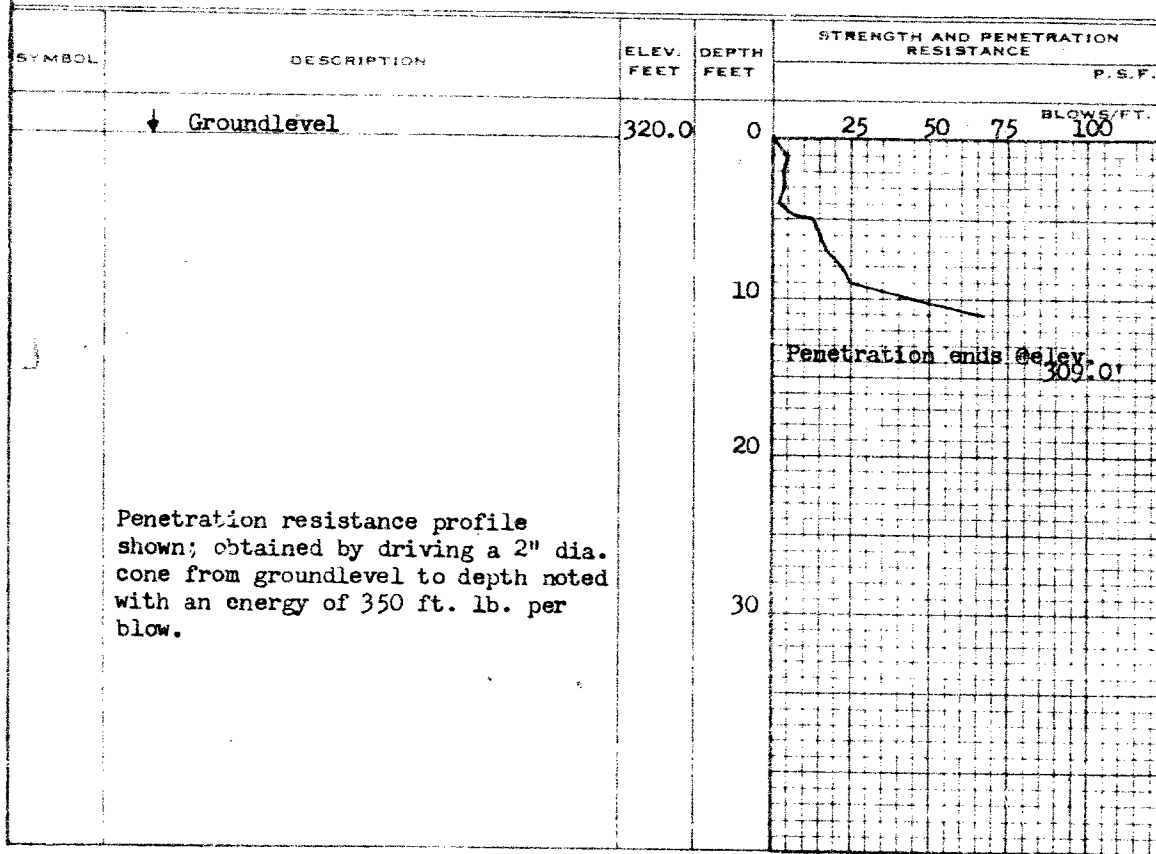
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. 202-61 _____ BORE HOLE NO. _____ 4
JOB 61-F-87 _____ STATION 50+56 (38' Rt.)
DATUM 220.0' _____ COMPILED BY _____ B.K.
BORING DATE Sept. 1/61. _____ CHECKED BY _____ W.W.K.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) _____	○
VANE TEST (C) AND SENSITIVITY (S) _____	+ %
NATURAL MOISTURE AND	
LIQUIDITY INDEX _____	LI
LIQUID LIMIT _____	X
PLASTIC LIMIT _____	○

[illegible]

July 19, 1963.

Mr. J. E. Gruspier,
Regional Materials Engineer,
Kingston, Ontario.

Attn: Mr. T. G. Smith.

Re: Hwy. #2, Contract 62-187
Kayler's Creek.

In the Foundation report for the above-mentioned site it is stated among others that "It is estimated that piles should reach practical refusal at, or below elevation 238.0 within two or three feet." We believe that the Bridge Office has prepared its contract drawing with the above statement in mind.

It appears now that the estimated elevation of 288.0 has been chosen too conservatively. However, it is very difficult at this stage to come to a definitive conclusion because the Contractor did not as we are made to understand to use the proper equipment for the pile driving.

We are also advised that the Contractor has now filed an intention of claim for the reduction in quantity. If all the necessary and proper pile driving equipment would have been used we are of the opinion that a claim would be justified. However, due to the above-mentioned reasons we believe that it will greatly depend on the District personnel's judgment as to how much has the Contractor fulfilled his obligations and therefore to what extent is his claim justified.

AGS/tt
cc: H. A. Tregaskes
L. R. Eadie
A. E. McKim
G. A. Wrong
Foundations Office
Gen. Files

A. G. Stermac
A. G. Stermac
Principal Foundation Engr.



ONTARIO
DEPARTMENT OF HIGHWAYS

WP 202-
61-F-87

Memo to Mr. T. Stermac Date July 12, 1963
Principal Foundation Engineer Subject Re: Hwy. 2, Cont. 62-187
From M. & R. Division, Kingston Kayler's Creek

The following is for your information.

During a telephone conversation with K. Westerby, Construction Engineer, Kingston District, on the above date, I was advised that the 12" steel tube piles for the east abutment for the above structure were driven to a depth of 10' rather than 25' as indicated on the contract drawings. The District blamed this on the contractor's lack of suitable equipment for driving the piles. The bridge office was informed and a decision was made to pour the footing as originally proposed. The contractor, G. O'Shaughnessy Ltd, has informed the District that he intends to claim due to the reduction in quantity. At the time that we were notified the footing had been poured.

In reviewing the foundation report, it is noted that a dynamic penetration cone was driven at this site with resulting 'N' values up to 25 blows per foot to an elevation of 297.0. At this point, resistance increased substantially to 100 blows per foot in the next three feet.

During construction, the depth of penetration of the actual piles would be to an elevation of 293 1/2 which, due to variations in the foundation, could possibly be the required dense stratum. It therefore appears that the contract drawings and Bridge Office were in error and that a claim by the contractor has reasonable ground.


T. G. Smith

for

J. E. Gruspier
Regional Materials Engineer

c.c. G.A. Wrong
File

Mr. A. M. Toye,
Bridge Engineer.
Materials & Research Division,
(Foundation Section)
Attention: Mr. M. Gvildys.

February 9, 1962.

Re: W.P. 202-61,
Kayler (Wilton) Creek,
Hwy. #2, District #8.

01-F-27

In reply to your memo of February 1st, 1962, we submit the following:-

- (1) We are of the opinion that 'quick' conditions will not occur during excavation or dewatering of the West abutment footing.
- (2) We suggest that the dewatering of all excavations be left entirely to the contractor. He should be allowed to bid on a scheme of his own choice.
- (3) We have reviewed General Plan D-4973-1 with regard to the bridge foundations, and are in accordance with your proposals.

If you have any further queries in connection with this project, please contact this Office.

A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.
Per:

K. G. Selby

(K. G. Selby,
SR. PROJECT FOUNDATION ENGR.)

KGS/MdeF

cc: Mr. B. Davis

Foundations Office ✓
Gen. Files.

OFFICE LOCATION -
DOWNSVIEW AVE.,
KEELE ST. - HIGHWAY 401
TORONTO, ONTARIO.



ONTARIO
DEPARTMENT OF HIGHWAYS

File with 67-F-87

POSTAL ADDRESS -
DEPARTMENT OF HIGHWAYS
PARLIAMENT BUILDINGS,
TORONTO 5, ONTARIO.

Bridge Division,
December 1, 1961.

MEMORANDUM TO:

Mr. A. G. Stermac,
Principal Foundation Eng.,
Department of Highways,
Room 107, Lab. Bldg.,
DOWNSVIEW, Ontario.

RE: W.P. 202-61
Kaylers (Wilton) Creek
at Morven, 4.1 Mi. E.
of Napanee
Hwy. #2 - Dist. #8

Enclosed find one copy of the preliminary
plan for the above structure.

The designer has followed closely the recommendations of the foundation report (W.J. 61-F-87) with the exception that he has not indicated any sheet piling at the abutments. It is felt that the material is too dense to drive sheet piles at the west abutment.

Would you kindly give us your comments on
this proposal.

A handwritten signature in ink, appearing to read 'J.B. Curtis'.

JBC/ea
cc. D. Smith

J. B. Curtis,
Bridge Location Engineer.

No Comment A handwritten signature in ink, appearing to read 'J.B. Curtis'.