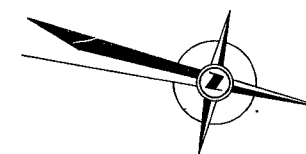


#64-F-101

W.P. #157-60

Hwy. #403 :

Cty. Rd. #27



- 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 DIVISION - FOUNDATION SECTION

KING'S HIGHWAY NO. 403 LINE 'G' DIST. NO. 2

CO. BRANT  
TWP BRANTFORD LOT 18 & 19 CON. II

BORE HOLE LOCATIONS &amp; SOIL STRATA

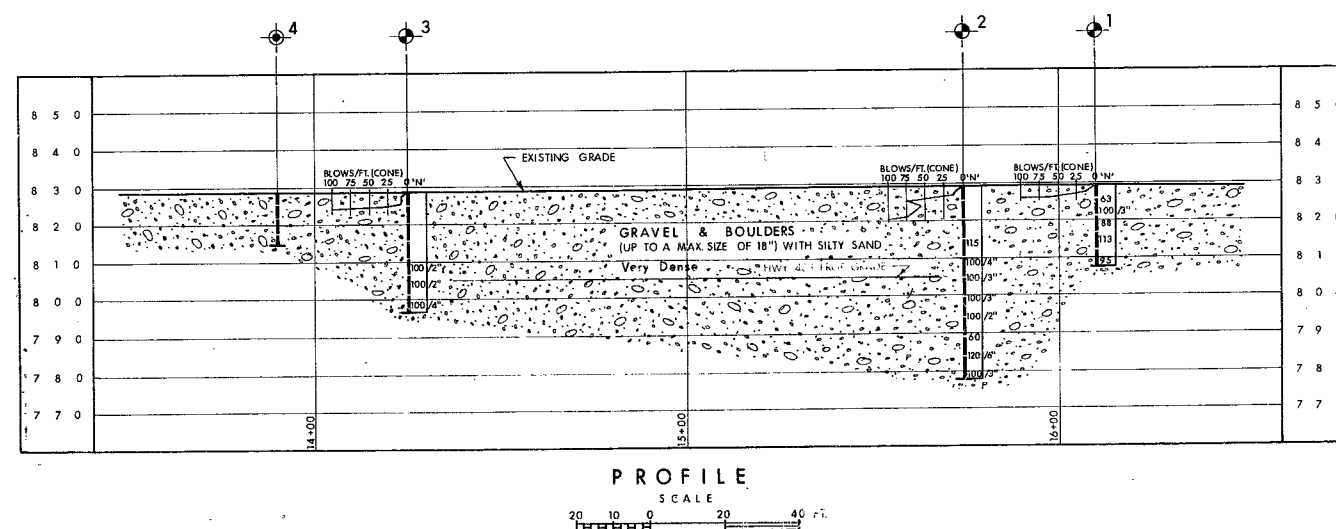
SUBM'D V. K.	CHECKED:	WP. NO. 157-60	M.B.R. DRAWING NO.
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DRAWN D.A.M.	CHECKED <i>[Signature]</i>	JOB NO. 64-F-101	64-F-101A
			BRIDGE DRAWING NO.

DATE 7 JAN. 1964	SITE NO	BRIDGE DRAWING NO
11.12.1963	CONC NO	

**APPROVED** *A. J. Thomas* CONT NO  
FORM FOR INFORMATION OF THE

REF. N° E-4325-1

[illegible]

## PROFILE

SCALE

20    10    0    20    40

## MEMORANDUM

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

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

Attention: Mr. S. McCombie

DATE: February 9, 1965

OUR FILE REF.

IN REPLY TO

SUBJECT:

## FOUNDATION INVESTIGATION REPORT

For

Proposed Structure at the Crossing  
of Hwy. 403 (Line 'G') & Co. Rd. #2, 27,  
Twp. of Brantford, Co. of Brant,  
Lot 18 & 19, Con. II, District #4.

W.J. 64-F-101 -- W.P. 157-60

It is proposed to extend Hwy. 403 from the western limits of Brantford towards Paris, Ontario. County Rd. No. 27 crosses the proposed Highway 403 at Sta. 425+73.15 (Line 'G') and an underpass structure is proposed at this crossing. A request for a foundation investigation was received from Mr. G. Scott, Regional Bridge Location Engineer, in a memo dated November 2, 1964.

In order to determine the properties of the subsoil and decide on the type of foundations, an investigation was carried out by this Section. The field investigation was confined to three sampled boreholes, one power auger hole and three dynamic cone penetration tests. Because of the presence of large gravel and boulders in the subsoil, it was impossible to penetrate into the soil by ordinary drilling methods. In general, the borings were advanced by the use of a tri-cone bit adopting wash boring procedures. In B.H.'s #2 and 3, the upper 15 to 20 feet of

cont'd. /2 ...

material was penetrated using the D.H.O. power auger and from there onwards, the sampling was carried out using a diamond drill. The locations as well as the elevations of all the boreholes are shown on Dwg. No. 64-F-101A, attached to this report.

Subsoil at the site consists mainly of very dense gravel and boulders up to 18" in diameter, with silty sand. This deposit was proved to a maximum depth of 52 ft. in B.H. #2. Standard Penetration resistances or 'N' values of 60 blows/ft. to in excess of 100 blows/ft. indicate a relative density of very dense. It can be argued that the Standard Penetration Test in such soils should be interpreted with caution. However, irrespective of the high 'N' values, the subsoil is very competent due to its composition and visual appearance. No ground water was observed in any of the boreholes during the time of the field investigation.

A four-span structure (37' - 73' - 37') is proposed at this site, with perched abutments. The subsoil conditions are favourable and it is therefore recommended that the new structure be supported on spread footings with a safe design load of 4 t.s.f. The footings should be located at least 5 ft. below the finished grade so that they will have adequate frost protection.

The proposed grade of Hwy. 403 will be at approx. elev. 805.0 which requires some 25 ft. of excavation for the new roadway. Because of the presence of gravel and boulders, no approach cut stability problems are anticipated for the standard 2 horizontal to 1 vertical side slopes.

cont'd. /3 ...

The field work was carried out during November 26, 1964 to December 23, 1964, by Mr. V. Korlu, Project Foundation Engineer, who also prepared this report. The report was reviewed by Mr. M. Devata, Senior Foundation Engineer. The field equipment was provided by Dominion Soil Investigation Ltd., Toronto, Ontario.

We trust that the data contained in this report will suffice for your future design requirements. Should additional information be required, please do not hesitate to contact our Office.

VK/MdeF  
Attach.

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

cc: Messrs. A. M. Toye (2)  
H. A. Tregaskes  
H. D. McMillan  
G. K. Hunter (2)  
H. Greenland  
T. J. Kovich  
A. Watt

Foundations Office  
Gen. Files ✓

APPENDIX I.

DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

## RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

JOB 64-F-101LOCATION Hwy 403 & Co Rd 27; 425/55 (110' to Rt.)ORIGINATED BY V.K.W.P. 157-60BORING DATE Nov 26, 1964.COMPILED BY V.K.DATUM GeodeticBOREHOLE TYPE Drill NX Casing & Wash.CHECKED BY M.D.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	WATER CONTENT %			
329.0	Groundlevel					830						
0.0	Gravel & Boulders (up to a max. size of 18") with silty sand.  (Very Dense)	0.0	1	SS	63							
		0.0	2	SS	100	for 3"						
		0.0	3	SS	88							
		0.0	4	SS	113							
807.5		0.0				810						
21.5	End of Borehole.		5	SS	95							
						800						

CHECKED BY \_\_\_\_\_ M.D.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	Liquid Limit ——— WL	BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	ROWS / FOOT		20    40    60    80    100	PLASTIC LIMIT ——— WP		
							SHEAR STRENGTH P.S.F.	WATER CONTENT ——— W		
								WP                  W                  WL		
								WATER CONTENT %		
829.5	Groundlevel					830				
0.0										
	Gravel & Boulders (up to a max. size of 18") with silty sand (V. dense.)					820				
			1	SS	115					
						810				
			2	SS	100for4"					
			3	SS	100for3"					
						800				
			4	SS	100for3"					
			5	SS	100for2"					
						790				
			6	SS	60					
			7	SS	120for6"					
						780				
778.0			8	SS	100for3"					
51.5	End of Borehole					770				



## MATERIALS &amp; TESTING DIVISION

JOB 64-F-91

W. P. 157-60

DATUM Geodetic

RECORD OF BOREHOLE NO. 3

LOCATION Hwy 403 & Co Rd 27; 425/40 (73' to Lt.)

BORING DATE Dec 15, 1964.

BOREHOLE TYPE Drill HX Casing & Wash & DNO Power Auger

FOUNDATION SECTION

ORIGINATED BY V.K.

COMPILED BY V.K.

CHECKED BY M.D.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— w <sub>L</sub>		BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	PLASTIC LIMIT ——— w <sub>p</sub>	WATER CONTENT ——— w		
828.0	Groundlevel					830						
0.0	Gravel & Boulders (up to a max. size of 18") with silty sand.  (V. dense.					820						
			1	SS	100	810						
			2	SS	100	800						
796.5			3	SS	100	790						
31.5	End of borehole.					780						

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS &amp; TESTING DIVISION

## RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

JOB 64-F-101 LOCATION Hwy 403 & Co Rd 27; 425/89 (110° to Lt.) ORIGINATED BY V.K.  
W.P. 157-60 BORING DATE Nov. 31, 1964. COMPILED BY V.K.  
DATUM Geodetic BOREHOLE TYPE DHO Power Auger CHECKED BY M.D.

SOIL PROFILE			SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT _____ W <sub>L</sub> PLASTIC LIMIT _____ W <sub>P</sub> WATER CONTENT _____ W			BULK DENSITY P C F	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P.S.F.				W <sub>P</sub> ——— W ——— W <sub>L</sub> WATER CONTENT %				
828.0	Groundlevel					830									
0.0	Gravel & Boulders (up to a max. of 18") with silty sand.	0.0													
	Very dense	0.0				820									
814.5		0.0													
13.5	End of borehole.					810									
						800									

Mr. G. Scott,  
Regional Bridge Location Engr.,  
Bridge Division.

Attn: Mr. N. Zoltay

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

February 28, 1966

W.P. 157-60, Site 1-139,  
Brant County Road No. 27 Underpass,  
Hwy. 403, District 4 (Hamilton).

We have reviewed the Preliminary Plan D 5659-P1  
for the above mentioned structure. The designer appears  
to have complied with the recommendation contained in our  
Foundation Report.

MD/MdeP

*M. Devata*

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

cc: Foundations Office ✓  
Gen. Files

MEMORANDUM

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

FROM: Bridge Division,  
Downsview, Ontario.

DATE: February 23, 1966.

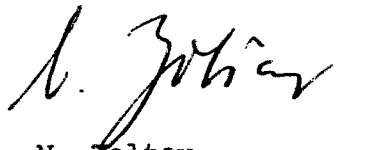
OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 157-60, Site 1-139,  
Brant County Road No. 27 Underpass,  
Hwy. 403, District 4

We are sending to you herewith one print of Preliminary  
Plan D 5659-P1 of the above structure.

Would you please let us have your written comments.



NZ/ag  
c.c. S. McCombie  
G. Scott  
A. Watt

N. Zoltay,  
for G. Scott,  
Regional Bridge Location Engineer.

Encl.

64 - F 101

checked . r.k.

MEMORANDUM

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

FROM: Bridge Division,  
Downsview, Ontario.

DATE: November 2, 1964.

OUR FILE REF.


IN REPLY TO

SUBJECT: W.P. 157-60  
Br. Site 1-139  
County Rd. No. 27  
Underpass  
Hwy. 403 - Dist. 2

64-F-101

We are sending to you herewith two prints of Bridge Site Plan E-4325-1 on which we have marked in red the proposed location of the above structure.

Please make the necessary arrangements for foundation soils investigation. We anticipate your Foundation Investigation Report on or before June 2nd., 1965.



GS/sp

G. Scott,  
Regional Bridge Location Engineer.  
cc. S. McCombie  
N. D. Smith  
R. Fitzgibbon

64 F 101