

NOTE:

Len 23-64-42

STREAM BED ELEVATION SEEMS TO BE 666.0
AND NOT 665.0 AS ASSUMED IN THE REPORT
(SECOND IC A 665.0). TELEPHONE TED HEWSTON.
MAY 9, 1967.

Mr. A. M. Toye,

March 7, 1962.

Bridge Engineer.

D.H.O. FOUNDATION INVESTIGATION
REPORT.

Materials and Research Division

W.J. 62-F-11 -- W.P. 82-61.

(Foundation Section)

Attention: Mr. S. McCombie.

Re: Proposed New Bridge at Hwy. #10 and
Etobicoke Creek, Town of Brampton,
4.7 Miles North of Hwy. #401,
District #6, Toronto.

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

We believe the factual data and recommendations
contained therein, should prove adequate for your future
design work. If further assistance is required in connection
with this project, please feel free to contact our Office.

AGS/MdeF
Attach.

cc: Messrs.

A. M. Toye (2)
H. A. Tregaskes
H. D. McMillan
I. C. Campbell
C. Fraser
T. J. Kovich
J. Roy
J. E. Gruspier
E. R. Saint
F. Norman
A. Watt
Foundations Office
Gen. Files.

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

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FOUNDATION INVESTIGATION

For

Proposed New Bridge at Hwy. #10 and
Etobicoke Creek, Town of Brampton,
4.7 Miles North of Hwy. #401,
District #6, Toronto.

W.J. 62-F-11 -- W.P. 82-61

1. INTRODUCTION:

A request for a foundation investigation to be carried out at the following location, was contained in a memo from the Bridge Location Section, dated February 5, 1962.

It is proposed to construct a new single span structure on Hwy. #10 in the Town of Brampton, the centre of the structure being at Sta. 630+30, opposite the Brampton Mall Shopping Centre.

A foundation investigation was carried out by this Section to determine the subsoil conditions at this site. This report contains the results of the above investigation, together with a discussion and recommendations pertaining to the foundations for the proposed new structure.

2. DESCRIPTION OF SITE:

The proposed crossing is located in a shallow valley, about 110' south of the existing structure directly opposite the Brampton Shopping Centre. The present channel is 30' wide, on the average.

No water flow was observed at the time of the investigation except at the outlet of a sanitary sewer some 200' west of the bridge site.

3. FIELD INVESTIGATION PROCEDURE:

Six boreholes were drilled at the site, utilizing a conventional diamond drill rig. Disturbed samples were recovered, using a 2-inch O.D. split-spoon sampler driven into the soil with an energy of 350 ft.-lbs. per blow. Because of the very dense and gravelly nature of the soil, no undisturbed samples were taken.

Bedrock was established in 4 of the 6 boreholes. In two boreholes, rock samples were recovered in an AX core barrel, in two other boreholes, bedrock was assumed at absolute refusal of the BX casing. Boreholes #5 & #6 were drilled only to establish the depth of the dense stratum overlying bedrock, the latter borehole serving only to provide information for scour depth determination.

The locations and elevations of all boreholes are shown on the attached Plan No. 62-F-11A. All elevations are referred to a D.H.C. B.M. located on the South-East corner of the existing structure and were set by a D.H.C. survey crew in the vicinity at that time. The B.M. elevation is 680.74 and is of geodetic origin.

Each sample of subsoil was visually classified in the field.

4. LABORATORY INVESTIGATION:

Each sample, taken in the field, was again classified visually in the laboratory. Liquid limit, plastic limit, moisture content and grain size distribution analyses were also carried out on certain representative samples. The results of these tests accompany this report.

5. SUBSAIL CONDITIONS:

5.1) General:

Conditions at the site were found to be generally uniform, including depth to bedrock and the elevation of the water table.

From groundlevel downwards, the various soil types encountered are as follows:-

5.2) Brown Clayey-Silt with Sand and Gravel and Decayed Wood and Vegetation:

This organic deposit was found in all boreholes except #6. The maximum depth was 10.0', but in this location, drilling was done through some fill material. In general, this deposit is from 6' - 8' in thickness.

5.3) Clayey-Silt with Sand & Fine Gravel - (Glacial Till):

This is a very dense till material consisting of a heterogeneous mixture of clayey silt, sand and fine gravel. It extends down to elevation 653 ± in all holes, at which elevation weathered shale bedrock was encountered.

5.4) Bedrock:

Sound shale bedrock of alternate brown and green layers was established in B.H.'s #1 & #2, while at B.H.'s #3 & 4, its surface was assumed to be at the refusal depth of the BX casing.

The depth of sound bedrock is generally uniform to elevation 653.0'. Above these elevations, however, a badly weathered zone was observed, varying from one to three feet in thickness.

cont'd. /4 ...

6. GROUND WATER CONDITIONS:

The water table was found to coincide with the stream elevation (667.5) in all cases. The elevation of the water table was established by measuring the water level in each hole, either at the end of each day, the start of the following day, or both.

7. DISCUSSION AND RECOMMENDATIONS:

A single span structure of approximate length 70' is proposed for this location. The hydrological requirements, as determined by the Bridge Office, are such that a minimum foundation depth of 10' below the stream bed is necessary for scour protection. The elevation at this level is 655.0. Subsoil at the site consists of about 6 to 8 feet of loose clayey silt, sand and gravel, followed by about 14' of very dense glacial till, underlain by shale bedrock. The bedrock surface elevation varies between 650.0 and 653.0. The very dense till stratum can support spread footings placed below el. 665.0 with a design load of 3 t.s.f.

In view of the foregoing, four alternative types of foundation are suggested for consideration in order to determine the most economical solution:-

(1) Spread footings at el. 655.0, with a design load of 3 t.s.f.

(2) Spread footings on sound bedrock, with a design load of 10 t.s.f.

cont'd. /5 ...

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

Types of foundation - (cont'd.) ...

(3) Spread footings at el. 661.0 (sufficient depth for frost protection, only), with a design load of 3 t.s.f. The front and sides of the footings should be encased in interlocking steel sheet piling driven to el. 655.0.

(4) Footings supported by bored-in concrete caissons. Large design loads are possible for these caissons. For example, a 30" Ø concrete caisson with the lower portion belled, could provide a design load of 120 tons. The maximum cost of a caisson of this type would be approximately \$15.00 per lin. ft.

Dewatering of the excavations at this site should present no special problems as the till stratum is relatively impermeable.

No stability problems are anticipated with regard to the approach embankments for this structure.

8. SUMMARY:

Subsoil at the site consists of about 6' to 8' of loose clayey silt, sand and gravel, followed by 14' of very dense glacial till, followed by shale bedrock. Bedrock elevation varies from 650.0 to 653.0. The very dense till deposit can provide a safe bearing capacity of 3.0 t.s.f. Hydrological requirements are such that scour protection is necessary down to el. 655.0.

cont'd. /6 ...

8. SUMMARY: (cont'd.) ...

In view of these facts, four alternatives are suggested for consideration in order to determine the most economical solution:-

(1) Spread footings at el. 655.0, with a design load of 3 t.s.f.

(2) Spread footings on sound bedrock, with a design load of 10 t.s.f.

(3) Spread footings at el. 661.0, encased by steel sheeting driven to el. 655.0. The design load may be 3 t.s.f.

(4) Footings supported by bored-in concrete caissons.

No dewatering problems are anticipated.

No stability problems for the approach embankments are anticipated.

9. MISCELLANEOUS:

The field investigation was commenced on February 9, 1962 and completed on February 20, 1962, under the supervision of Mr. G. Mierzynski, Materials and Research Division, D.H.O.

Equipment was owned and operated by the Johnston Drilling Company of Ottawa.

March 1962

REPORT PREPARED BY:

A. J. Stern
for
G. Mierzynski,
PROJECT FOUNDATION ENGINEER.

REPORT APPROVED BY:

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

APPENDIX II.

JOB 62-F-11 LOCATION 40' Lt. of Str. 629/60 ORIGINATED BY G.M.
W.P. 82-61 BORING DATE Feb. 9 & 12, 1962. COMPILED BY G.M.
DATUM Geodetic BOREHOLE TYPE Wash Boring - BX Casing. CHECKED BY B.M.G.

SOIL PROFILE		SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W			BULK DENSITY Y P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P.S.F.		WP	W	WL		
672.0 0.0	Groundlevel											W.L. from observa- tion in Borehole.
	Brown oxidized clayey-silt with organic matter and some fine sand and gravel	1	S.S.	8	670							
		2	S.S.	10								
666.0 6.0		3	S.S.	60								
	Very dense clayey. Silt with fine to coarse sand and fine gravel - Grey changing to reddish brown between 8.5' and 14.0'	4	S.S.	76	660							
		5	S.S.	68								
		6	S.S.	50								
652.0 20.0	Red shale with grey- green bands-upper 2.0'	7	S.S.	>100								
650.0 22.0	Weathered. End of Borehole.	8	R.C.	-	650							

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 62-F-11 LOCATION 40' Lt. of Sta. 630+50 ORIGINATED BY G.M.
W. P. 82-61 BORING DATE Feb. 12, 13 & 14, 1962. COMPILED BY G.M.
DATUM Geodetic BOREHOLE TYPE Wash Boring - BX Casing. CHECKED BY B.M.G.

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT			LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F.			W P W L WATER CONTENT % 10 15			
678.5 0.0	Groundlevel Green-brown Clayey-silt with fine sand and fine gravel containing decayed roots and vegetation (Fill Material)		1	S.S.	8	670.0							W.L. from observa- tion in Borehole. y 667.5 7
668.5 10.0	Very dense greyish- brown clayey-silt with fine to coarse sand and fine gravel.		2	S.S.	6								
			3	S.S.	18	660.0							
			4	S.S.	48								
			5	S.S.	63								
656.5 22.0	Hard Reddish-brown silty clay with fine sand and green shale fragments		6	S.S.	62	650.0							
654.0 24.5			7	R.C.	-								
	Red and green shale Upper 3.0' badly weathered.		8	S.S.	100 for								
			9	R.C.	6 1/2								
			10	R.C.	-	640.0							
641.5 37.0	End of Borehole.												

FOUNDATION SECTION


SOIL PROFILE		SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W wp ——— w ——— WL		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F.	WATER CONTENT % 10 ——— 15		
673.0 0.0	Groundlevel									
	Brown clayey-silt with fine sand and decayed vegetation.		1	S.S.	11	670				
			2	S.S.	8					
665.0 8.0	Very dense grey changing to greyish brown clay-silt with fine to coarse sand and fine gravel.		3	S.S.	83					
			4	S.S.	87	660				
			5	S.S.	76					
			6	S.S.	99					
653.0 20.0	Reddish brown silty clay with mixture of fine sand and weathered green shale		7	S.S.	69					
649.3 23.7	End of borehole.		8	casing sample		650				

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION


RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

JOB <u>62-F-11</u>	LOCATION <u>40' Rt. of Sta. 631+00</u>	ORIGINATED BY <u>G.M.</u>
W.P. <u>82-61</u>	BORING DATE <u>Feb. 15 & 16, 1962.</u>	COMPILED BY <u>G.M.</u>
DATUM <u>Geodetic</u>	BOREHOLE TYPE <u>Wash Boring - EX Casing.</u>	CHECKED BY <u>B.M.G.</u>

SOIL PROFILE		SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	SHEAR STRENGTH P.S.F.		WATER CONTENT % 5 10 15		
673.0 0.0	Groundlevel Brown clayey-silt with fine sand and coarse gravel (Fill Material)					670					Waterlevel from observation in borehole 7.667.5
			1	S.S.	17						
665.0 8.0	Very dense greyish brown clayey-silt with mixture of fine to coarse sand and fine gravel.		2	S.S.	139						
			3	S.S.	85	660					
			4	S.S.	120						
654.0 19.0	Green shale bedrock Badly weathered for upper 3.0'		5	S.S.	90 fbr 6"						
650.7 22.3	End of borehole.					650					

CHECKED BY B.M.G.

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT			LIQUID LIMIT ——— WL PLASTIC LIMIT ——— wp WATER CONTENT ——— w			BULK DENSITY P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F.			wp ——— w ——— WL 5 10 15 WATER CONTENT %			
673.0 0.0	Groundlevel Brown clayey-silt with fine sand and fine gravel.					670							Waterlevel from observation in Bore- hole. 667.5
			1	S.S.	8								
664.0 9.0	Very dense greyish- brown clayey-silt with fine to coarse sand and fine gravel		2	S.S.	108		660						
657.5 15.5	End of borehole.		3	S.S.	97								

61-4391

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 6

FOUNDATION SECTION

JOB 62-F-11 LOCATION 40' Lt. of Sta. 631/40 in Stream Bed ORIGINATED BY G.M.
W.P. 82-61 BORING DATE Feb. 20, 1962. COMPILED BY G.M.
DATUM Geodetic BOREHOLE TYPE Washboring - BX Casing. CHECKED BY B.H.G.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE			LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W			BULK DENSITY Y P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT			WP	W	WL		
							SHEAR STRENGTH P.S.F.			WATER CONTENT % 5 10 15				
668.0	Ice Elevation					670								2.0' of Ice.
0.0	Very loose grey-black medium to coarse organic sand mixed with oil													
663.0			1	S.S.	P									
5.0	Brown very dense clayey silt with fine to coarse sand and occasional fine gravel		2	casing sample										
			3	S.S.	67	660								
659.0														
9.0	As above but grey-changing to brown silty clay at 10.5'		4	S.S.	91									
657.5														
10.5	End of borehole.													
						650								

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 :-

<u>CONSISTENCY</u>	<u>'N' BLOWS / FT.</u>	<u>c LB. / SQ. FT.</u>	<u>DENSENESS</u>	<u>'N' BLOWS / FT.</u>
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
	P.M.		SAMPLE ADVANCED MANUALLY
	P.H.		SAMPLE ADVANCED HYDRAULICALLY

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
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
μ	COEFFICIENT OF FRICTION
S_f	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 (YOUNG'S 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_0	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



ONTARIO
DEPARTMENT OF HIGHWAYS

FILE WITH
62-F-11

Memo to	<u>Mr. A. Stermac</u>	Date	<u>May 28, 1962.</u>
	<u>Principal Foundations Engineer</u>		
	<u>D.H.O., Room 107, Lab. Bldg.,</u>	Subject	<u>W.P. 82-61 Etobicoke Cr. Br.</u>
	<u>DOWNSVIEW, Ontario.</u>		<u>4.9 Mi. north of Hwy. 401</u>
From	<u>F. DeVisser</u>		<u>Hwy. 10 - District #6</u>

Attached is one print of the preliminary plan for the subject structure. If you have any comments, please let us know.

F. DeVisser

FDeV/bm

F. DeVisser,
Bridge Location Engineer.

Comments of Mr. Stermac should be checked against
Print (62-F-11) should be checked against

Mr. A. M. Toye,
Bridge Engineer.

April 6, 1962.

ADDITIONAL RECOMMENDATIONS -

Materials & Research Division,
(Foundation Section)

Attention: Mr. F. DeVisser.

Re: W.P. 82-61
W.J. 62-F-11
Etobicoke Creek &
Hwy. #10 - 4.9 Miles
North of Hwy. #401.
District #6.

With regard to your memo of March 28th in which you state that it is now proposed to construct a 3-span structure at the above location, we submit the following additional recommendations:

(1) The proposed abutments should be supported on spread footings founded in the very dense clayey silt, sand and gravel stratum, the approximate boundaries of which are shown on Drawing #62-F-11A. At approximate el. 665.0 or below, a design load of 3 tons per sq. ft. may be used.

(2) The proposed approaches should be well rip-rapped to an elevation above the H.W.L. to protect the embankments against scour.

(3) No dewatering problems are anticipated as the till stratum below el. 665.0 is relatively impermeable.

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

KGS/MdeF

cc: Mr. B. Davis

Foundations Office ✓
Gen. Files.

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

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

62-FM

Low

March 28. 1962
alg

ONTARIO

DEPARTMENT OF HIGHWAYS

Bridge Division,

Memo to	Mr. A. Stermac, Principal Foundation Engineer, Room 107, Lab. Building	Date	March 26, 1962.
		Subject	W.P. 82-61 Etobicoke Creek Structure 4.9 mi. N. of Hwy. #401 District #6
From	F. DeVisser		

We have received the Foundation Report on the above noted structure and after studying it have come to the conclusion that a three span structure will most likely be designed.

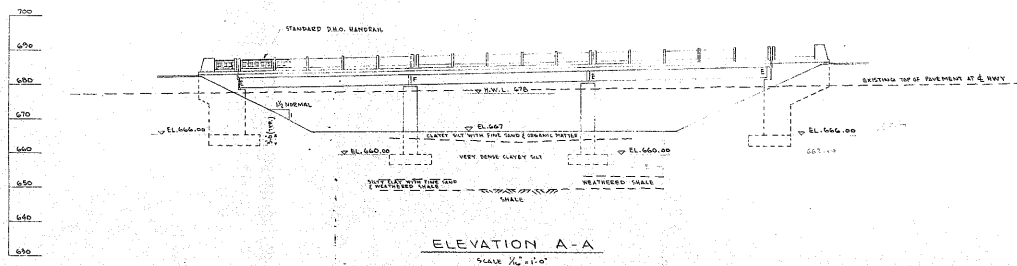
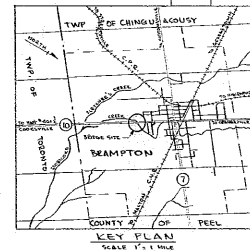
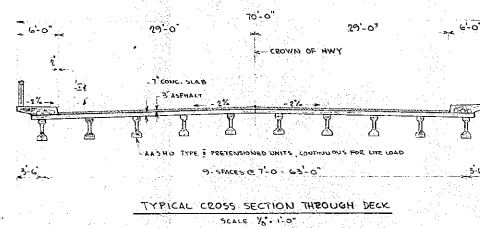
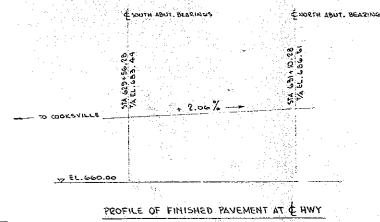
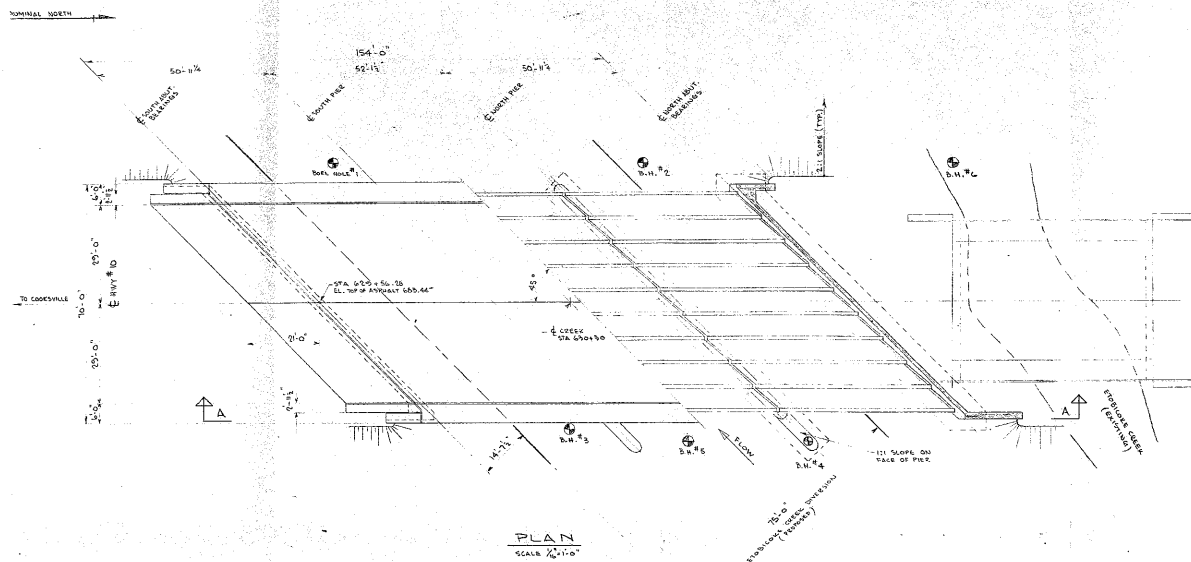
Would you kindly let us have your recommendations for the abutment footings. Centre span will be in the order of 70', approach spans 35' to 40'.

F. DeVisser

FDeV/ea

F. DeVisser,
Bridge Location Engineer.*Reply Letter sent**April 5th 1962*

62-F-11
W.P. # 82-61
Hwy. # 10
CROSSING
ETOBICOKE CR.
4.7 MILES N. OF
Hwy. # 401

[illegible]

REVISIONS		
DATE	BY	DESCRIPTION

PRELIMINARY

DEPARTMENT OF HIGHWAYS ONTARIO

BRIDGE DIVISION

ETOBICOKE CREEK BRIDGE

4.9 MILES NORTH OF HWY. #401

KING'S HIGHWAY No. 10 DIST. No. 6

CO. PEEL

TWP. CHINGUACOUSY LOT 4 CON. 1E & 1W

PROPOSED GENERAL ARRANGEMENT

APPROVED			SITE No.		W.P. No. 82-61	
BRIDGE ENGINEER						
DESIGN	J.C.H.	CHECK	CONTRACT			
DRAWING	V.W.	CHECK	No.			
DATE	MAY 1962	LOADING	H20 - S16	DRAWING	D5066 - P1	
			No.			

**FOUNDATION OF CANADA ENGINEERING
CORPORATION LIMITED**

FENCO DWG No 2551 - T-1