

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

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

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

Attention: Mr. S. McCombie

DATE: October 11, 1967

OUR FILE REF.

IN REPLY TO

OCT 18 1967

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For Proposed Creek Diversion -
Mimico Creek and Hwy. #7, Line 'E'
Twp. of Chinguacousy & Toronto Gore
Lots 5 and 6, Con's 6 EHS and 7 ND
District No. 6 (Toronto)
W.J. 67-F-71 -- W.P. 298-66

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 (2)
H. A. Tregaskes
D. W. Farren
G. K. Hunter (2)
F. Allen
W. S. Melinyshyn
T. J. Kovich
B. A. Singh

Foundations Files
Gen. Files

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

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FOUNDATION INVESTIGATION REPORT
For Proposed Creek Diversion at
Mimico Creek and Hwy. #7, Line 'E'
Twp. of Chinguacousy & Toronto Gore
Lots 5 and 6, Conc's 6 EHS and 7 ND
District No. 6 (Toronto)
W.J. 67-F-71 -- W.P. 298-66

1. INTRODUCTION:

A request to carry out a foundation investigation for the proposed creek diversion at Mimico Creek and Hwy. #7, Line 'N', was received from Mr. W. S. Melnyshyn, Regional Bridge Location Engineer, in a memo dated August 8, 1967.

An investigation was subsequently carried out by this Section to determine the subsoil conditions existing at the site of the proposed bridge.

This report contains the results of our field and laboratory investigation, together with our recommendations for the foundations of the new structure.

2. DESCRIPTION OF SITE:

The new structure is proposed to be located at the crossing of Hwy. #7 and Toronto International Airport Road. It will replace two culverts, one each on Hwy. #7 and Airport Road.

The creek flows through fields. The topography of the land at the site is flat and gently rolling to the south of the structure.

The proposed alignment of the creek passes under the intersection of Hwy. #7 and Airport Road.

cont'd. /2 ...

3. FIELD AND LABORATORY WORK:

The field work at the proposed bridge location consisted of five sampled boreholes and six dynamic cone penetration tests. All holes were advanced using conventional diamond drilling equipment adapted for soil sampling purposes. A driving energy of 350 ft.-lbs. per blow was used for the dynamic cone penetration tests.

Samples were obtained using a 2-inch O.D. split-spoon sampler driven according to the specifications of the Standard Penetration Test. Bedrock and boulder samples were obtained in boreholes 2, 3 and 6 using BXT, in borehole 1 using AXT, and borehole 5 using BXL coring equipment.

Samples were visually examined in the field and subsequently in the laboratory. The following tests were carried out on selected samples.

- 1) Grain-Size Distribution.
- 2) Atterberg Limits.
- 3) Natural Moisture Content.
- 4) Organic Content.

The creek was almost dry, with water collected in only low spots, during the investigation.

The results of the laboratory and field tests are summarized in the Record of Borehole sheets which are contained in the appendix to the report.

The locations and elevations of the boreholes are given on Drawing No. 67-F-71A, which is also contained in the appendix to this report.

cont'd. /3 ...

4. SUBSOIL CONDITIONS:

4.1) General:

The site lies in the physiographical region known as "Oak Ridges."

The subsoil consists essentially of a heterogeneous mixture of clayey silt, sand and gravel (glacial till) overlying the bedrock on the west side of Airport Road, and underlain by boulders - limestone with shale - and occasional pebbles on the east side of Airport Road.

The boundaries between the different deposits are shown on the attached Record of Borehole sheets. The estimated stratigraphical profiles shown on Drawing No. 67-F-71A, are based upon this information.

From ground level downwards, the different soil deposits are described as follows:

4.2) Heterogeneous Mixture of Clayey Silt, Sand and Gravel - (Glacial Till):

This deposit occurred in all boreholes. It is mainly a heterogeneous mixture of clayey silt, sand and gravel (glacial till). In boreholes 1, 3 and 5, the material is predominantly clayey silt with a little sand and gravel; in boreholes 2 and 6, it contained relatively larger percentages of sand and gravel. In borehole 1, the top 5 ft. of the layer contained some organics (7 - 8%), also. The range of Atterberg Limits was as follows:

Liquid Limit	:	22.5	-	33.0%
Plastic Limit	:	14.0	-	21.0%
Moisture Content	:	9.0	-	26.0%

The grain-size distribution as determined from samples obtained from boreholes 2 and 6, was found to be:

Gravel	:	6	-	25%
Sand	:	31	-	60%
Silt	:	24	-	48%
Clay	:	5	-	17%

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

4.2) Heterogeneous Mixture of Clayey Silt, Sand and Gravel - (Glacial Till): (cont'd.) ...

The 'N' values indicate a firm to hard consistency.

On the west quadrant of Airport Road, the depth of the layer is 11.9 to 13.2 ft., while on the east quadrant, it is 8.5 ft.

4.3) Boulders - Limestone with Shale - and occasional Pebbles:

This deposit was encountered in boreholes 5 and 6 only in the east quadrant, from a depth of 8.5 ft. downwards. Boreholes were terminated in this stratum at 18.0 - 18.3 ft. depth. Boreholes in this deposit were advanced by means of diamond drilling. The core samples were examined by Mrs. Z. Koniuszy, Geologist, Materials and Testing Division, and her report is as follows:

"BH #5

8.4 - 18.3 - Rubble consisting of grey, fine grained, hard arenaceous limestone with shale seams and occasional pebbles. Appears that most of the shale has been ground out and lost. Recovery about 50%.

BH #6

8.5 - 18.0 - Arenaceous hard grey limestone rubble with occasional pebbles. Appears that shale has been ground out and lost. From 8.5 - 13.0 ft. recovery ranging from 30 - 50%, on the last 5 ft. only 10%.

Boreholes #5 and #6 seem to be drilled in loose rock, contain few pebbles and they do not have appearance of the bedrock samples."

The stratum is very hard.

cont'd. /5 ...

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

4.4) Bedrock - Shale and Limestone:

The bedrock was proven in boreholes 1, 2 and 3 in the west quadrant. The bedrock core samples were examined by

Mrs. Z. Koniuszy, Geologist, whose report is as follows:

"BH #1

13.7 - 16.0 - grey thinly bedded shale with (2) 1 in. thick layers of grey shaley arenaceous limestone.

BH #2

13.5 - 13.9 - weathered grey shale.

13.9 - 16.5 - grey thinly bedded shale with few thin layers of shaley arenaceous limy layers.

BH #3

12.0 - 12.6 - weathered grey shale.

12.6 - 18.0 - grey shale, thin seams of light grey fine grain arenaceous limestone between 14.6 and 15.0.

Boreholes #1, #2 and #3 were drilled in Dundas-Meadford Formation (Upper Ordovician) and produce typical soft shales with seams or layers of more or less arenaceous grey limestone."

The elevations of the bedrock in various boreholes, are as below:

			<u>Weathered Bedrock</u>	<u>Sound Bedrock</u>
Borehole	1	615.8	614.1
Borehole	2	616.8	616.1
Borehole	3	617.2	616.5

cont'd. /6 ...

5. GROUNDWATER:

The creek was almost dry except for some water in low spots. Water level in borehole 2 was found to be at El. 626.0. It may be assumed that the groundwater level in the vicinity of the creek is equal to or slightly higher than the prevailing water level in the creek.

6. DISCUSSION AND RECOMMENDATIONS:

It is proposed to divert Mimico Creek such that it passes directly under the intersection of Hwy. #7 and Airport Road. The new bridge will replace the existing ones, one each on Hwy. #7 and Airport Road. An approach fill of about 6 ft. is required, resulting in a maximum approach height of about 18 ft. above the creek bed.

The bedrock was intersected on the west side only. On the east side, a clayey silt layer was underlain by boulders in which boreholes 5 and 6 were terminated.

It is recommended that spread footing type foundations be provided to support the new structure. The safe bearing pressure at or below El. 618.0, may be assumed to be 5.0 tons/square foot. If the foundations are taken down to the sound bedrock, a safe bearing pressure of 10.0 tons/sq.ft. may be assumed. The actual depth of foundations will depend upon the hydrological requirements and should be checked with the Hydrological Section.

No stability problems are anticipated for the construction of the embankments, with standard 2 to 1 side slopes.

Because of the probable shallow depth of excavations, no major dewatering problems are anticipated.

7. SUMMARY:

A foundation investigation of a proposed new structure at Hwy. #7 and Mimico Creek is reported.

cont'd. /7 ...

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

Subsoil conditions at the site consist of a heterogeneous mixture of clayey silt, sand and gravel (glacial till), underlain by shale and limestone bedrock on the west side, and by boulders - limestone with shale and occasional pebbles - on the east side.

It is recommended that the structure be supported on spread footings at or below El. 618.0, depending upon the hydrological requirements.

No stability problems are anticipated for the proposed embankments.

No major dewatering problems are anticipated.

8. MISCELLANEOUS:

The field work for this project was carried out during the period August 14 - 18, 1967, under the supervision of Mr. A. Prakash, Project Foundation Engineer, who also prepared this report.

The equipment used was owned and operated by Dominion Soil Investigation Ltd., and Master Soil Investigations Ltd.

This report was reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

October 1967

APPENDIX I

DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 67-F-71

LOCATION Sta. 160+55 82' Rt.

ORIGINATED BY AP

W. P. 298-66

BORING DATE Aug. 14, 1967

COMPILED BY AP, SN

DATUM Geodetic

BOREHOLE TYPE Washboring, BX Casing, Cone

CHECKED BY

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— % PLASTIC LIMIT ——— % WATER CONTENT ——— %		BULK DENSITY γ _{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 %				
627.8	Ground Level						20 40 60 80 100	20 40 60				
0.0	Heterogeneous Mixture of Clayey Silt, Sand and Gravel (Glacial Till) Firm to Hard		1	SS	8						Org. 7.8%	
			2	SS	52							
			3	SS	100	9"						
615.8			4	SS	150	4"						
12.0	Bedrock-Weathered											
614.1	Bedrock - Shale and Limestone - Sound		5	RC	AXT 70%							
13.7												
611.8												
16.0	End of Borehole					610.0						

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

JOB 67-F-71

W.P. 298-66

DATUM Geodetic

RECORD OF BOREHOLE NO. 2

LOCATION Sta. 160+32 24' Rt. (Line 'N')

BORING DATE Aug. 15, 1967

BOREHOLE TYPE Washboring, BX Casing, Cone

FOUNDATION SECTION

ORIGINATED BY AP

COMPILED BY AP, SN

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	Liquid Limit ———— W _L Plastic Limit ———— W _P Water Content ———— W _c	BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P.S.F.	WATER CONTENT %		
							20 40 60 80 100	20 40 60		
630.0	Ground Level									
0.0	Heterogeneous Mixture of Clayey Silt, Sand and Gravel					620.0				Fr. Sa. Sl. C 25 36 34 5 ↓ 626.0 6 32 48 14 9 60 24 7
	(Glacial Till)		1	SS	22					
	Firm to Hard		2	SS	7					
			3	SS	76					
616.8			4	SS	140					
616.1	Bedrock-Weathered									
13.9	Bedrock - Shale and Limestone Sound		5	RC	BXT 60%					
613.5										
16.5	End of Borehole					610.0				

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 3

FOUNDATION SECTION

JOB 67-F-71

LOCATION Sta. 160+04 60' Rt.

ORIGINATED BY AP

W.P. 298-66


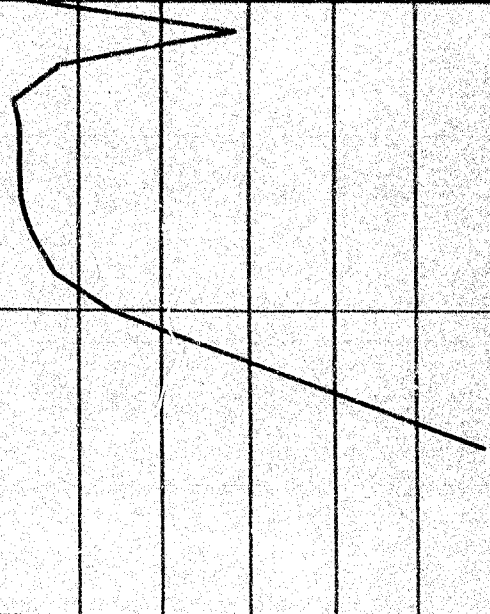

BORING DATE Aug. 16 - 17, 1967

COMPILED BY AP, SN

DATUM Geodetic

BOREHOLE TYPE Washboring, BX Casing, Cone

CHECKED BY *SLR*

SOIL PROFILE			SAMPLES			ELEV. SCALE	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		SHEAR STRENGTH P.S.F.					WP	W	WL		
629.1	Ground Level						20	40	60	80	100	20	40	60		
0.0	Heterogeneous Mixture of Clayey Silt, Sand and Gravel. (Glacial Till) Firm to Hard		1	SS	6	620.0						o	—			
			2	SS	16							c				
			3	SS	78							o	—			
617.2			4	SS	112							o	—			
616.5			Bedrock-Weathered		5							RC	BXT 65%			
12.6	Bedrock - Shale and Limestone															
	Sound															
611.1																
18.0	End of Borehole					610.0										

CHECKED BY [Signature]

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 %			
628.4	Ground Level						20 40 60 80 100	WP W WL			
0.0											
618.8						620.0					
9.6	End of Cone Test										
						610.0					

DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 5

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 67-F-71 LOCATION Sta. 159+35 28' Lt. ORIGINATED BY KL
W.P. 298-66 BORING DATE Aug. 17 - 18, 1967 COMPILED BY AP, SN
DATUM Geodetic BOREHOLE TYPE Washboring, BX Casing, Cons CHECKED BY JK

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F.	WATER CONTENT %			
629.0	Ground Level						20 40 60 80 100	20 40 60			
0.0	Heterogeneous Mixture of Clayey Silt, Sand and Gravel (Glacial Till) Firm to Hard		1	SS	5						
			2	SS	100	3"					
620.5			3	SS	100	1"		100			
8.5	Boulders - Limestone with shale and occasional Pebbles		4	RC	BXL 50%						
610.7											
18.3	End of Borehole					610.0					

RECORD OF BOREHOLE NO. 6

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 67-F-71

LOCATION Sta. 159+36, 72' Lt.

ORIGINATED BY AP

W. P. 298-60

BORING DATE Aug. 17 - 18, 1967

COMPILED BY AP, SN

DATUM Geodetic

BOREHOLE TYPE Washboring, BX Casing, Cone

CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	Liquid Limit — WL	Plastic Limit — WP	WATER CONTENT % WP W WL	BULK DENSITY γ_{pc}	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P.O.F.					
631.3	Ground Level						20 40 60 80 100			20 40 60		
0.0	Heterogeneous Mixture of Clayey Silt, Sand and Gravel (Glacial Till)		1	SS	105	630.0						Gr.Sa.Sl.Cl.
	Firm to Hard		2	SS	164	10"						8 31 44 17
622.8												
8.5	Boulders - Limestone, with Shale and occasional Pebbles		3	RC	BXT 25%	620.0						
613.3												
18.0	End of Borehole					610.0						

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
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
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_t	SENSITIVITY

GENERAL

π	= 3.1416
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e a$ OR $\ln a$	NATURAL LOGARITHM OF a
$\log_{10} a$ OR $\log a$	LOGARITHM OF a 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

Mr. C. S. Grebski,
Bridge Design Engineer,
Bridge Office,
Admin. Bldg.

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

January 6, 1969

-- MIMICO CREEK CULVERT --

W.P. 298-66 -- Site 24-281 -- W.J. 67-F-71
Hwy. #7 -- District No. 6 (Toronto)

We have reviewed the final bridge drawing D-6378-1 for the above mentioned structure. We would like to draw your attention to the following:

(1) The cross section on the drawing shows rock at the footing elevation ~~el.~~ 4.0 - 6.0. During the foundation investigation, bedrock was proved in B.H.'s 1, 2 and 3 only. In B.H.'s 5 and 6, bedrock was not proved and the stratum penetrated by the drilling equipment between el. 622.0 and el. 610.0 was classified as boulders.

(2) In our Foundation Report we have stated that no major dewatering problems are anticipated because of the fact that excavations would be relatively shallow. We note, however, that the depth of excavation could be 8 to 10 feet below groundwater level, in which case, problems might very well occur - particularly where the footings are located within the abovementioned bouldery stratum. The Contractor should be advised of these facts.

K. G. Selby

KGS/mdeP

K. G. Selby,
SUPERVISING FOUNDATION ENGR.
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

cc: Messrs. S. McCombie
W. S. Melnyshyn

Foundations Files
Gen. Files

MEMORANDUM

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

From: Bridge Division,
Downsview, Ontario,

Date: August 8th, 1967.

Our File Ref.

IN REPLY TO

SUBJECT: Nimico Creek Bridge,
W.P. 298-66, Site 24-281,
Highway #7, Line "N",
District #6.

JOB 67-F-71

Attached please find two copies of bridge site plans #E-4782-1 for the above structure.

Shown in red are the probable lines of footing locations and proposed grade.

Would you kindly arrange to have a foundation investigation carried out at the above mentioned site.

MB/cew
Attach.
cc R. Forrest
A. Crowley

M. Bendayan
M. Bendayan,
for W. S. Melnyshyn,
Regional Bridge Location Engineer.

401 & Keele St.
Downsview, Ontario

August 15, 1967

Dominion Soil Investigation Ltd.
77 Crockford Blvd.
Scarborough, Ontario

Dear Sirs:

This is to confirm our request of August 10, 1967 for the supply of a Diamond Drill together with all necessary equipment, as specified under the terms of our Contract Agreement, at Brampton, Ontario on August 14, 1967.

This project bears Job Number 67-F-71.

Yours truly,

KCS:mt

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

cc: H. Konings
Foundation Files /10
General File

1401 & Keele Street
Downsview, Ontario

September 8, 1967

Dominion Soil Investigation Ltd.
77 Crookford Blvd.
Scarborough, Ontario

Dear Sirs:

This is to confirm our request of August 12, 1967 for the supply of a Diamond Drill together with all necessary equipment, as specified under the terms of our Contract Agreement, at Erempton (East) on August 14, 1967 (Mimico Creek & Hwy. 7).

This project bears job number 67-F-71.

Yours truly,

H. G. Selby

HGS:st

H. G. Selby
Supervising Foundation Engineer
for A. G. Sternac
Principal Foundation Engineer

cc: H. Konings
Foundation Files
General File

121 & 121 1/2 Street
Windsor, Ontario

September 8, 1967

Master Soil Investigation
121 Master Drive
Windsor, Ontario

Dear Sirs:

This is to confirm our request of August 12, 1967 for the supply of a Diamond Drill together with all necessary equipment, as specified under the terms of our Contract Agreement, at Exemption (East) (Stobie's Creek & Hwy. 7) on August 15, 1967.

This project bears job numbers 67-F-75 and 67-F-71.

Yours truly,

H. G. Selby

RG:ent

H. G. Selby
Supervising Foundation Engineer
for A. O. Starnes
Principal Foundation Engineer

cc: H. Hovings
Foundation Files (//)
General File

Department of Highways Ontario

Copy for the information of

Mr. A. Stermac

Mr. W. Melingshyn,
Reg. Bridge Location Engineer,
Central Region,
Administration Building

Bridge Division,
Downsview, Ontario

May 14, 1968

Mimico Creek Culvert
W.P. 298-66, site 24-281
Highway 7, District No. 6

67-F-71

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-6378-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$60,000. This cost includes tender, materials, engineering and sundry construction.

We question the advisability of locating this culvert diagonally across Highway 7, as it will make detouring of traffic somewhat difficult. Providing two culverts as presently exist would help in this regard. Please review this aspect with Road Design.

CSG:rd

C.S. Greboki,
Bridge Design Engineer

Attach.

C.C. S. McConbie
A. Stermac (2)
J. Anderson

MAY 27 1968

NO COMMENTS

A.K.B.

H. L. Smith

MEMORANDUM

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

From: Bridge Office,
Downsview, Ontario

ATTENTION:

DATE: December 23, 1968

Our File Ref.

IN REPLY TO

SUBJECT: Mimico Creek Culvert
W.P. 298-66, Site 24-281
Highway 7, District No. 6

67-F-71

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.

J. L. Kan

CSG:rd

for C.S. Grebski,
Bridge Design Engineer

Attach.

c.c. Foundation Section

file
ag

Mr. C. S. Grebski,
Bridge Design Engineer,
Bridge Office,
Admin. Bldg.

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

January 6, 1969

-- MIRICO CREEK CULVERT --

W.P. 298-66 -- Site 24-281 -- W.J. 67-F-71
Hwy. #7 -- District No. 6 (Toronto)

We have reviewed the final bridge drawing D-6378-1 for the above mentioned structure. We would like to draw your attention to the following:

(1) The cross section on the drawing shows rock at the footing elevation 614.0 - 616.0. During the foundation investigation, bedrock was proved in B.H.'s 1, 2 and 3 only. In B.H.'s 5 and 6, bedrock was not proved and the stratum penetrated by the drilling equipment between el. 622.0 and el. 610.0 was classified as boulders.

(2) In our Foundation Report we have stated that no major dewatering problems are anticipated because of the fact that excavations would be relatively shallow. We note, however, that the depth of excavation could be 8 to 10 feet below groundwater level, in which case, problems might very well occur - particularly where the footings are located within the abovementioned bouldary stratum. The Contractor should be advised of these facts.

K. G. Selby

KGS/wdeF

K. G. Selby,
SUPERVISING FOUNDATION ENGR.
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

cc: Messrs. S. McCombie
W. S. Belinskyshyn

Foundations Files
Gen. Files

#

67-F-71

W.P.[#] 298-66

Hwy # 7

MIMICO CREEK

CULVERT

