DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

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

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

Attention: Mr. S. McCombie

Date: October 3, 1969

Our File Ref:

In reply to OCT 17 1969

Subject:

FOUNDATION INVESTIGATION REPORT
For
Proposed Crossing
Reconstructed Q.E.W. - Mimico Creek
Etobicoke Borough, Metropolitan Toronto
District No. 6 (Toronto)
W.J. 69-F-68 -- W.P. 314-65-04

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.

A. G. Stermac
PRINCIPAL FOUNDATION ENGINEER

AGS/MdeF
Attach.

cc: Messrs. B. R. Davis (2)
H. A. Tregaskes
D. W. Parren
G. K. Hunter (2)
F. G. Allen
W. S. Melnyshyn
T. J. Kovich
B. A. Singh

Foundations Files
Gen. Files

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FOUNDATION INVESTIGATION REPORT
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1. INTRODUCTION:

It is proposed to reconstruct the Q.E.W. from the Gardiner Expressway easterly. In connection with this programme, the Foundation Section was requested to carry out a subsurface investigation for the proposed structure which will replace the existing structures at the crossing of the Q.E.W. and Mimico Creek. The request was contained in a memo from the Bridge Office - (Mr. W. S. Melinyshyn, Regional Bridge Location Engineer), dated August 11, 1969. Subsequently, an investigation to determine the subsoil conditions at the aforementioned site was carried out by this Section. The results of this investigation, together with our recommendations pertaining to the structure foundations and approaches, are contained in this report.

2. DESCRIPTION OF THE SITE AND GEOLOGY:

The site is located at the existing crossing of the Q.E.W. and Mimico Creek in the Borough of Etobicoke, Metropolitan Toronto. At this location, the East and Westbound lanes of the Q.E.W. are carried over Mimico Creek by means of twin 3-span concrete arch type structures which are separated by a 30-ft. wide median.

Mimico Creek, at this site, is a shallow meandering stream with a channel width of about 40 ft. The valley floor width varies across the site, being a maximum of about 150 ft. just north of the existing structures. Some 200 ft. south of the existing crossing, the southerly direction of the creek is changed

..... 2

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

abruptly to an easterly direction. At this bend, the overburden and the bedrock have been exposed in the form of a 25-ft.± high bluff. Underlying a nominal cover of glacial till is a weathered to sound shale bedrock containing limestone interbeds. The limestone beds protrude out from the bluff, since erosion and weathering appear to have affected only the shale portions of the bedrock. The limestone beds are 5 to 8 inches thick typically. Both the shale and the limestone are horizontally bedded. The available geological information indicates the bedrock to be of the Meaford - Dundas Formation, Ordovician Period. Physiographically, the site is situated in the "Iroquois Plain" region.

3. FIELD AND LABORATORY WORK:

A total of seven boreholes was carried out at the site by means of two standard diamond drill rigs adapted for soil sampling purposes. Six of the boreholes were accompanied by dynamic cone penetration tests. Soil samples were obtained from the overburden by hammering a 2-inch O.D. split-spoon sampler into the ground in accordance with the specifications for the Standard Penetration Test. The same procedure was used to advance the dynamic cone penetration tests. Bedrock was proven at all the borehole locations, by diamond core drilling in BX size.

Surveying was carried out by personnel from the Central Region Engineering Surveys Section. The boreholes were initially located by reference to the existing structures; these locations were later referred to a coordinate system. All the elevations given in this report are referenced to a geodetic datum. The locations and elevations of the boreholes, together with an estimated stratigraphical profile and sections, are shown on Drawing 69-F-68A.

All soil and rock core samples were carefully examined in the field and subsequently in the laboratory following which, tests were carried out to determine the physical properties of the subsoil, namely:

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

Natural Moisture Contents
Atterberg Limits
Grain-Size Distributions

The results of these tests are plotted on the Record of Borelog sheets and on Figures 1 and 2 in the Appendix to this report.

4. SUBSOIL CONDITIONS:

4.1) General:

Within the valley floor area and adjoining the banks of Mimico Creek, the overburden is a glacial till deposit consisting of sand and gravel with some silt, and ranging in thickness between some 2 and 5 ft. The glacial till is directly underlain by weathered shale bedrock encountered between elevations 255 and 259. Beyond the valley floor, the overburden consists of about 9 ft. of a laminated clayey silt to silty clay stratum directly underlain, at about elevation 275, by weathered shale bedrock. At the approaches to the existing structures, the fill material consists of clayey silt with some sand and gravel and varies between 28 and 37 ft. in thickness. The fill is directly underlain by the glacial till. The various soil strata are discussed in greater detail below:

4.2) Fill Material:

Fill material was encountered at the locations of Boreholes 2 and 6. The fill consists of clayey silt with some sand and gravel and occasional silt and fine sand layers some 6 to 12 inches in thickness. The fill material ranges in thickness between 28 ft. (B.H. 6) and 37 ft. (B.H. 2). At Borehole 2 the lower 13 ft. of the fill material contained occasional boulders up to 8 inches in size and organic inclusions, such as pieces of decayed wood.

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

4.2) Fill Material: (cont'd.) ...

The natural moisture content of the fill material ranged between 15 and 19 per cent. Typical grain-size distribution curves for this material are shown on Figure 1 in the Appendix. The Standard Penetration Resistance 'N' values varied randomly between 13 and 25 blows/ft. within the fill material above elevation 268 at B.H. 2. At B.H. 6 the 'N' values ranged between 12 and 33 blows/ft. above about elevation 277. These 'N' values indicate a stiff to hard consistency for the fill material. However, at B.H. 6, below about elevation 277, 'N' values as low as 4 to 6 blows/ft. were obtained. These low 'N' values indicate that this portion of the fill material is poorly compacted.

4.3) Clayey Silt to Silty Clay:

Underlying a superficial cover of topsoil, a 9-ft. thick deposit of clayey silt to silty clay was encountered at Borehole 1, which was located on the high ground beyond the valley floor. This deposit was found to be laminated. One test on a typical sample resulted in values of the liquid limit, plastic limit and natural moisture content of respectively, 37, 22 and 12 per cent. The 'N' values within this deposit, increased from 48 blows/ft. near the surface to 125 blows/ft. at depth, indicating a hard consistency.

4.4) Sand and Gravel with Some Silt and a Trace of Clay - (Glacial Till):

A thin stratum of sand and gravel with some silt and a trace of clay (glacial till) was encountered beneath a surficial cover of topsoil at Boreholes 3, 5, and 7 and immediately below the fill material at Borehole 6. The glacial till was encountered at the ground surface at the location of Borehole 4 adjacent to the creek. The upper boundary of this deposit was found to lie between elevations 258 and 262. The thickness of the deposit ranged between 2 and 5 ft.

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

4.4) Sand and Gravel with Some Silt and a Trace of Clay - (Glacial Till): (cont'd.) ...

The results of grain-size distribution analyses on typical samples of this material are shown on Figure 2. These indicate an average sand and gravel content of about 75 per cent for this deposit. The natural moisture content of the glacial till averaged about 10 per cent. Standard Penetration Test 'N' values ranged between 19 and 72 blows/ft., and varied at random. These indicate the relative density of the deposit to range between compact and very dense.

4.5) Shale Bedrock:

Shale bedrock was encountered between elevations 253 and 259 at the locations of Boreholes 2 - 7 inclusive, and at elevation 275 at the location of Borehole 1. At the locations of all the boreholes except Borehole 3, the upper 1.5 to 10 ft. of the shale was found to be weathered. Occasional beds of limestone, some 2 to 6 inches in thickness, were encountered at random within the weathered and sound shale bedrock. These limestone interbeds were found to be generally sound.

Although core drilling was necessary to advance the boreholes through the weathered shale, split-spoon samples could also be taken, on occasion, in this material. The samples obtained indicate that the weathered shale consists of shale fragments separated occasionally by thin mudseams. The Standard Penetration Resistance 'N' values within the weathered shale, ranged between 81 blows/ft. and in excess of 100 blows/ft. Core recoveries in this material were generally low, averaging about 33 per cent.

Sound shale was encountered immediately below the weathered zones. Core recoveries in the sound shale were generally in excess of 85 per cent.

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5. GROUNDWATER CONDITIONS:

Water level observations were carried out in the open boreholes during the period of this investigation. These observations are shown on the individual Borelog sheets and are summarized on Drawing 69-P-68A.

The results of these measurements indicate that the groundwater level is situated between elevations 257 and 261 at the locations of Boreholes 2 to 7 inclusive. At Borehole 1, which is located on higher ground beyond the creek channel, the groundwater level is at about elevation 266. During the period of the investigation the creek water level was at about elev. 257.

6. DISCUSSION AND RECOMMENDATIONS:

6.1) General:

It is proposed to replace the existing twin structures at the crossing of the Q.E.W. and Mimico Creek with a three-span (50'-90'-50') skew structure. The reconstructed Q.E.W. centre-line will be located some 80 ft. north of the existing Q.E.W. centre-line. The proposed profile grade will be at about elevation 303± - i.e., some 10 ft. higher than the existing Q.E.W. grade.

According to the available information, Mimico Creek will be rechannelled at this crossing. The new channel will be approximately 60 ft. wide with an invert elevation of 259±. The side slopes of the channel will be 2:1. The channel will be concrete lined up to about elevation 273 for some distance beyond either side of the reconstructed Q.E.W. The remaining portions of the new channel will be rip-rapped.

At this site, the overburden within the valley floor area consists of 2 to 5 ft. of a granular type of glacial till which is underlain by shale bedrock, the upper 2 to 10 ft. of which is weathered. Beyond the valley floor the overburden is a laminated clayey silt and silty clay deposit of some 9 ft. thickness, which is

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

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

directly underlain by weathered shale bedrock. In the area of the existing median, a clayey silt fill material of 28 to 37 ft. thickness, overlies the glacial till deposit.

6.2) Structure Foundations:

6.2.1) Pier Footings -

Since the piers will be constructed within the relocated channel, the pier footings should be founded some 4 to 5 ft. below the invert elevation of the channel ($259\pm$) in order to have adequate frost protection - i.e., the footings should be located at or below elevation 254. At this elevation the northern portions of the footings will be situated on or within the sound shale bedrock, whereas the remaining portions of the footings will be located within the weathered shale. Such footings can be designed for an allowable bearing pressure of up to 5 TSF. In order to accommodate any differential movements, a construction joint should be provided between the portions of the footings founded on the sound shale and the weathered shale.

Alternatively, the pier footings may be located entirely on or within the sound shale bedrock. Such footings may be designed for an allowable bearing pressure of 10 TSF. Any large differences in elevation between the surface of the sound bedrock from one end of a footing to the other, should be made up by the use of mass concrete.

The excavations for the pier footings will be carried out below the creek and groundwater levels. In view of the granular type of glacial till deposit and the fractured nature of the weathered shale, a dewatering scheme will be necessary. This can be achieved by constructing a sheeted cofferdam, or by any other suitable method. If a sheeted cofferdam is used, the sheet piling should be driven to the surface of the sound shale bedrock.

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

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

6.2.2) Abutment Footings -

The proposed abutments may be 'perched' within the approach fills. Due to the proposed realignment, the northern portions of the abutment footings will be located within newly placed fill, while the southern portions will be underlain by the existing fill material. For a spread footing scheme, the integrity of the abutments could be adversely affected due to the differential in settlements induced within the existing and newly placed fill. It is therefore recommended that the abutments be supported on end-bearing piles driven into the weathered shale bedrock. For estimating purposes, it can be assumed that steel H-piles will penetrate 2 to 3 ft. into the weathered shale. The allowable loads will depend on the pile section chosen - (e.g., 12 BP 74 steel H-piles may be designed for 90 Tons/pile).

No rock or bouldery fill should be placed within the plan limits of the piles.

6.3) Approach Embankments:

The existing embankments will be increased in height by about 10 ft.; in addition, they will be widened in a northerly direction for a distance of some 90 ft. from the existing shoulder. The maximum height of the newly placed fills will be about 45 ft. No stability problems are anticipated for the proposed embankments constructed with standard 2:1 slopes, provided that the additional fills are properly keyed into the existing embankment in accordance with current D.H.O. specifications.

Any approach cuts through the existing fill material or overburden should be made with 2:1 slopes.

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7. MISCELLANEOUS:

The field work, performed during the period August 18 - 23, 1969, was carried out by Mr. K. Kwan (Student).

Equipment used was owned and operated by Canadian Longyear Limited, and Dominion Soil Investigation Ltd.

This report was prepared by Mr. C. Mirza, Project Foundation Engineer.

The entire project was under the general supervision of Mr. M. Devata, Supervising Foundation Engineer, who also reviewed the report.

October 1969

APPENDIX I

FORM OB-MT-126 (REV 1969)

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 1

FOUNDATION SECTION

JOB 69-F-68 LOCATION Co-ords. 193,027 N; 225,~~472~~ 502 E. ORIGINATED BY KKK
W P 314-65-04 BORING DATE August 16-19, 1968 COMPILED BY CM
DATUM Geodetic BOREHOLE TYPE Washboring-NX Casing; Core CHECKED BY

ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT 20 40 60 80 100	LIQUID LIMIT, PLASTIC LIMIT, WATER CONTENT % 10 20 30	UNIT WEIGHT PCF	REMARKS GR SA SI CL
285.7	Ground Level						SHEAR STRENGTH PSF ○ UNCONFINED ● QUICK TRIAXIAL • FIELD VANE × LAB. VANE			
0.0	Topsoil		1	SS	15					
1.5	Clayey silt & silty clay; trace sand		2	SS	48					
	Laminated		3	SS	125	280				
275.0	Hard		4	SS	125					
10.7	Shale Bedrock with limestone interbeds		5	SS	~~100/5"~~					
			6	BX	20%					
			7	SS	~~100/6"~~	270				
265.7	Weathered		8	BX	100%					▼ 266.5
20.0										
261.7	Sound		9	BX	79%					
24.0	End of Borehole					260				

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 69-F-68 LOCATION Co-ords: 182,895 N; 225,560 E. ORIGINATED BY KKK
W.P. 314-65-04 BORING DATE August 20-22, 1969 COMPILED BY CM
DATUM Geodetic BOREHOLE TYPE Washboring-NX Casing; Cone CHECKED BY

ELEV. / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	REMARKS GR. SA. SI. CL.
291.9	Ground Level					
0.0	Topsoil		1	SS	14	
1.5	Fill Material		2	SS	13	
	Clayey silt with some		3	SS	13	11 15 54 20
	sand and gravel		4	SS	25	
	Stiff		5	SS	25	12 17 46 25
	occ. silt & sand seams		6	SS	20	
	6" - 12" thick.		7	SS	13	0 14 74 12
267.9						
24.0	occ. boulders up to 8"		8	BX	50%	
	in size.		9	BX	10%	
	some organic matter		10	BX	10%	
	(dec. wood)		11	SS	55	▼257.0
254.9			12	BX	10%	
37.0	Shale bedrock with limestone interbeds		13	BX	10%	
			14	SS	81	
244.9	(weathered)		15	BX	29%	
47.0						
	Sound		16	BX	93%	
233.6			17	BX	100%	
58.3	End of Borehole					

ELEV. SCALE: 290, 280, 270, 260, 250, 240, 230

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT — 20 40 60 80 100

SHEAR STRENGTH P.S.F.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

LIQUID LIMIT —— w_L
PLASTIC LIMIT —— w_p
WATER CONTENT —— w
w_p w w_L
WATER CONTENT % 10 20 30

BULK DENSITY γ P.C.F.

20
15 ⊹ 5 % STRAIN AT FAILURE
10

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 3

FOUNDATION SECTION

JOB 69-F-68 LOCATION Co-ords. 183,002 N; 225,406 E. ORIGINATED BY KKK
W.P. 314-65-04 BORING DATE August 20, 1969 COMPILED BY CM
DATUM Geodetic BOREHOLE TYPE Washboring-BX Casing; Cone CHECKED BY

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV SCALE
262.6	Ground Level					
0.0	Topsoil		1	SS	17	
1.0	Glacial Till		2	SS	27	
259.3	Compact		3	SS	50/7"	
3.3	Shale Bedrock with limestone interbeds		4	BX	89%	
249.6	Sound		5	BX	100%	
13.0	End of Borehole					

DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT — 20 40 60 80 100
SHEAR STRENGTH PSF
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

LIQUID LIMIT ——— w_L
PLASTIC LIMIT ——— w_P
WATER CONTENT ——— w
w_P w w_L
WATER CONTENT % 10 20 30

BULK DENSITY γ P.C.F.

REMARKS

GR. SA. SI. CL.
41 28 26 5

▼ 259.5

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4

FOUNDATION SECTION

JOB 69-F-68 LOCATION Co-ords. 182,864 N; 225,472 E. ORIGINATED BY KKK
W.P. 314-65-04 BORING DATE August 20-21, 1969 COMPILED BY CM
DATUM Geodetic BOREHOLE TYPE Washboring-BX Casing CHECKED BY

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV SCALE
258.0	Ground Level					
0.0	Glacial Till Sand & grav. with some silt, trace clay.		1	SS	65	
			2	SS	19	
253.5	Compact - Very dense		3	SS	22	
4.5			4	SS	50/4"	
	Weathered		5	BX	12%	250
247.0			6	BX	30%	
11.0	Shale Bedrock with limestone interbeds		7	BX	83%	
	(Fractured to Sound)		8	BX	100%	240
237.0						
21.0	End of Borehole					230

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT

SHEAR STRENGTH PSF
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

LIQUID LIMIT w_L
PLASTIC LIMIT w_P
WATER CONTENT w
w_P w w_L
WATER CONTENT %
10 20 30

BULK DENSITY γ PCF

REMARKS

GR. SA. SI. CL.

▽ 257.0

41 26 22 5

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 5

FOUNDATION SECTION

JOB 69-F-68 LOCATION Co-ords. 183,002 N; 225,326 E. ORIGINATED BY KKK
W.P. 314-65-04 BORING DATE August 21, 1969 COMPILED BY CM
DATUM Geodetic BOREHOLE TYPE Washboring-BX Casing; Cone CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT
262.0	Ground Level				
260.5	Topsoil		1	SS	21
1.5	Glacial Till		2	SS	73
257.5	Dense		3	BX	33%
256.0	Weathered		4	BX	33%
6.0	Shale Bedrock with limestone interbeds		5	BX	87%
251.0	(Sound; occ.weathered zone)				
11.0	End of Borehole				

ELEV. SCALE: 260, 250

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT — 20 40 60 80 100

SHEAR STRENGTH P.S.F.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

LIQUID LIMIT w_L
PLASTIC LIMIT w_P
WATER CONTENT w
w_P — w — w_L
WATER CONTENT % 10 20 30

BULK DENSITY γ P.C.F.

REMARKS

260.0
GR SA SI CL
5 53 27 16 4

FORM OB-MT-126 (REV 1969)

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 6

FOUNDATION SECTION

JOB 69-F-68 LOCATION Co-ords. 182,834 N; 225,364 E. ORIGINATED BY KKK
W P 314-65-04 BORING DATE August 22-23, 1969 COMPILED BY CM
DATUM Geodetic BOREHOLE TYPE Washboring-BX Casing; Cone CHECKED BY

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV SCALE
288.4	Ground Level					
0.0	Fill Material		1	SS	12	
	Clayey silt, some sand and gravel		2	SS	20	
			3	SS	25	
	Soft - very stiff		4	SS	33	
			5	SS	6	
	occ. silt and fine sand seams 6" - 12" thick		6	SS	4	
			7	SS	5	
260.4			8	SS	4	
28.0	Glacial Till					
257.0	Dense		9	SS	34	
31.4	Weathered		10	SS	100/4"	
252.0			11	SS	100/4"	
36.4	Shale Bedrock with occ. limestone interbeds		12	BX	87%	
242.4	Sound		13	BX	58%	
46.0	End of Borehole					

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT
20 40 60 80 100

SHEAR STRENGTH PSF
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

LIQUID LIMIT ——— w_L
PLASTIC LIMIT ——— w_P
WATER CONTENT ——— w
w_P w w_L
WATER CONTENT %
10 20 30

BULK DENSITY
P C F

REMARKS
GR SA SI CL

6 12 74 8

0 7 83 10

▼259.0
50 25 23 2

No recovery

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 7

FOUNDATION SECTION

JOB 69-F-68 LOCATION Co-ords. 182,981 N; 225,260 E. ORIGINATED BY KKK
W.P. 314-65-04 BORING DATE August 19-21, 1969 COMPILED BY CM
DATUM Geodetic BOREHOLE TYPE Washboring-BX Casing, Cone CHECKED BY

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT
262.3	Ground Level				
260.8	Topsoil		1	SS	6
1.5	Glacial Till				
258.0	Dense		2	SS	32
4.3	Weathered		3	BX	33%
255.0					
7.3	Shale Bedrock with limestone interbeds		4	BX	92%
			5	BX	83%
245.8	Sound		6	BX	100%
16.5	End of Borehole				

ELEV SCALE: 260, 250, 240

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT: 20 40 60 80 100
SHEAR STRENGTH PSF: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE

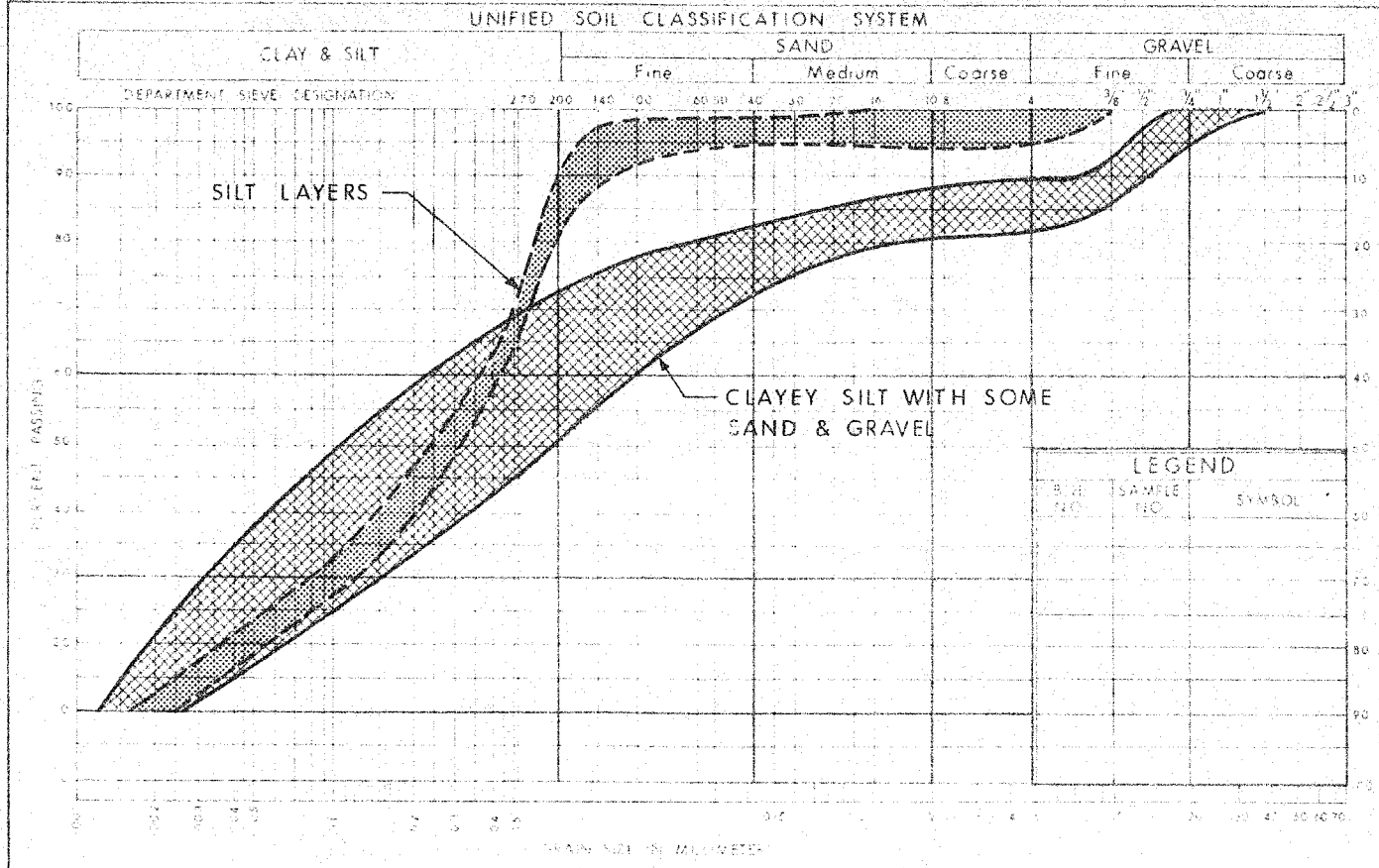
LIQUID LIMIT —— %
PLASTIC LIMIT —— %
WATER CONTENT —— %
WATER CONTENT %: 10 20 30

BULK DENSITY PCF

REMARKS

▼ 261.0
41 32 22 5

FORM DR MT-12
REV. APR. 1965

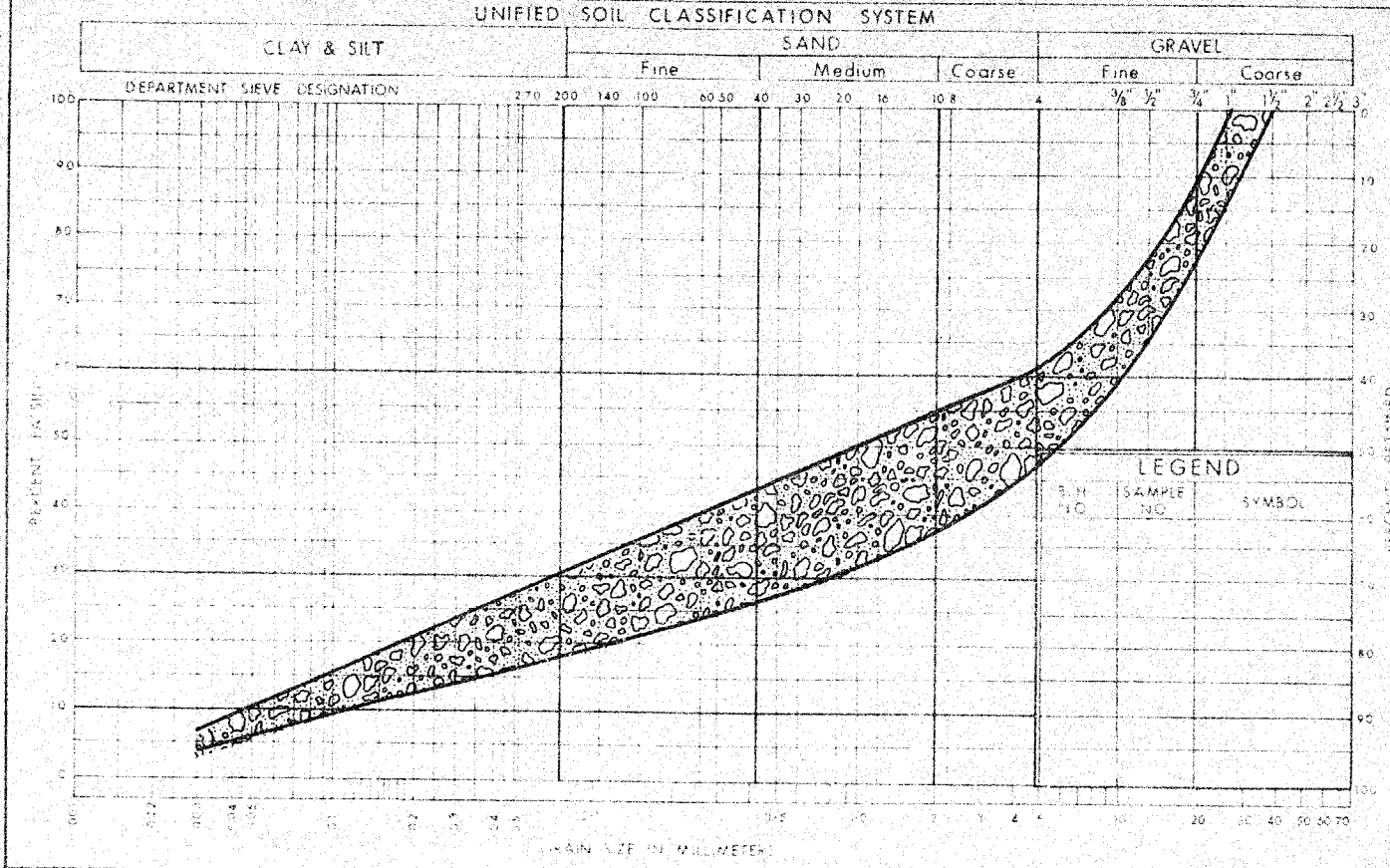


DEPARTMENT OF HIGHWAYS
MATERIALS AND TESTING DIVISION

GRAIN SIZE DISTRIBUTION
FILL MATERIAL

W.P. No. 314 – 65 – 04
JOB No. 69 – F – 68
FIG. NO. 1

FORM 08 MT-17
REV APR 1965



DEPARTMENT OF HIGHWAYS
MATERIALS and TESTING DIVISION

GRAIN SIZE DISTRIBUTION
GLACIAL TILL

W.P. No. 314-65-04
JOB No. 69-F-68
FIG NO. 2

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 :-

CONSISTENCY	'N' BLOWS / FT.	c LB. / SQ FT.
VERY SOFT	0 - 2	0 - 250
SOFT	2 - 4	250 - 500
FIRM	4 - 8	500 - 1000
STIFF	8 - 15	1000 - 2000
VERY STIFF	15 - 30	2000 - 4000
HARD	> 30	> 4000

DENSENESS	'N' BLOWS / FT.
VERY LOOSE	0 - 4
LOOSE	4 - 10
COMPACT	10 - 30
DENSE	30 - 50
VERY DENSE	> 50

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

Q_u	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Q_{cu}	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Q_d	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 LIM
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
	IN TERMS OF EFFECTIVE STRESS $\tau_f = c' + \sigma' \tan\phi'$
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF TOTAL STRESS $\tau_f = c_u + \sigma \tan\phi$
μ	COEFFICIENT OF FRICTION
S_t	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 (YOUNGS MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
η	COEFFICIENT OF VISCOSITY

EARTH PRESSURE

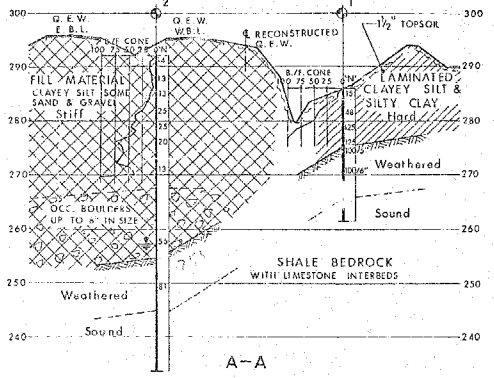
a	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_o	COEFFICIENT OF EARTH PRESSURE AT REST

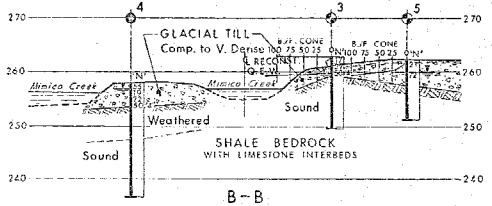
FOUNDATIONS

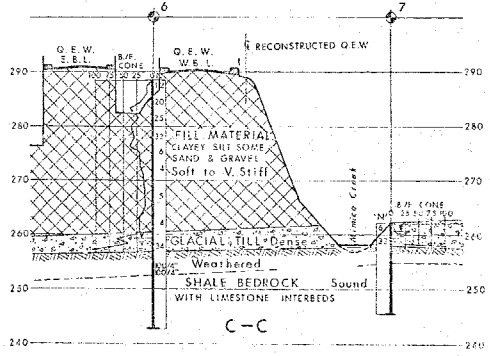
B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
β	ANGLE OF SLOPE TO HORIZONTAL





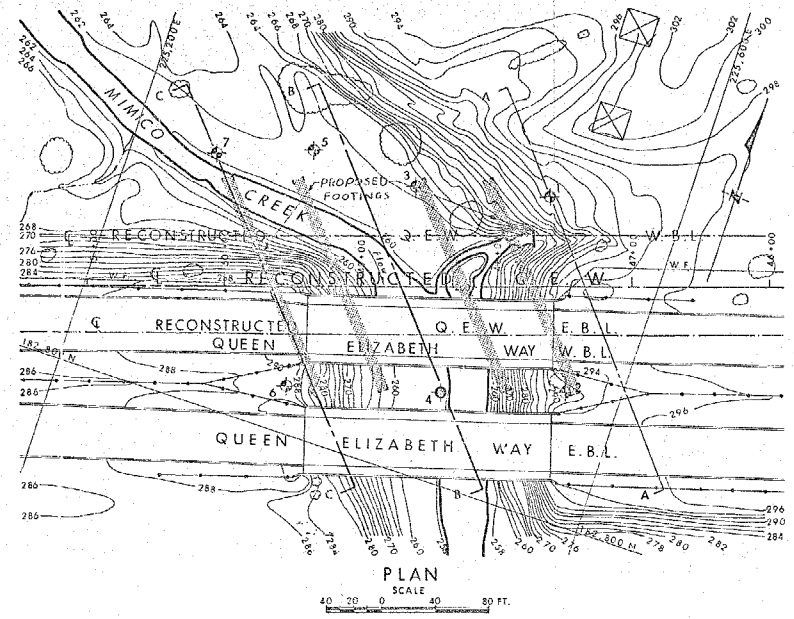


SECTIONS

SCALE

HORIZ. 40 20 0 40 80 FT.

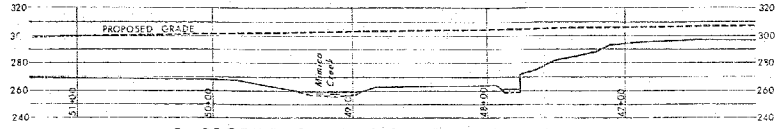
VERT. 10 5 0 10 20 FT.



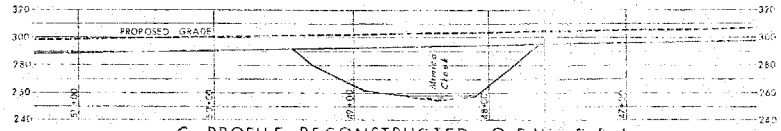
PLAN

SCALE

40 20 0 40 80 FT.



℄ PROFILE RECONSTRUCTED Q.E.W. W.B.L.

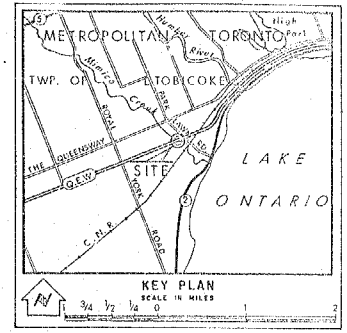


℄ PROFILE RECONSTRUCTED Q.E.W. E.B.L.

SCALE

40 20 0 40 80 FT.

REF. NO. B-80-73



LEGEND

- Bore Hole
- Cone Penetration Hole
- Bore & Cone Penetration Hole
- Water Levels established at time of field investigation. Aug. 1969

NO.	ELEVATION	CO-ORDINATES NORTH	CO-ORDINATES EAST
1	285.7	183,027	225,[illegible]
2	291.9	182,895	225,560
3	262.6	183,002	225,406
4	258.0	182,864	225,477
5	262.0	183,002	225,376
6	288.4	182,834	225,364
7	262.3	182,981	225,260

- 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.

PRINT RECORD		
NO.	FOR	DATE

REVISIONS		
NO.	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DEFILE - FOUNDATION SECTION

MIMICO CREEK

KING'S HIGHWAY NO. Q. E. W. (RECONST.) DIST NO. 6
CO. YORK METRO. TORONTO
TWP. of TOBICOKE LOT CON.

BORE HOLE LOCATIONS & SOIL STRATA

DRAWN C. M.	CHECKED	W.P. NO. 314-65-04	DEPT. DRAWING NO. 69-F-68A
DRAWN G. P	CHECKED	JOB NO. 69-F-68	
DATE Oct. 10 1969	SITE NO.		BRIDGE DRAWING NO.
APPROVED [signature]	CONT. NO.		

Mr. G. S. Grebski
Bridge Design Engineer
Bridge Office
Admin. Bldg.

Foundation Section
Materials & Testing Office
Laboratory Bldg.
Downsview, Ont.
January 6, 1971

Proposed Structure Crossing
Reconstructed Q.E.W. - Mimico
Creek, Bridge No. 3
Borough of Etobicoke - Metro
Toronto. District #6(Toronto)
W.J. 69-F-68 W.P. 314-65-04

We have reviewed the bridge drawings for the aforementioned structure (No's D-6761-1 and 3, dated December, 1970); the following comment is being submitted.

The end-bearing 12BP74 steel H piles can be designed using an allowable load of 95 tons/pile, rather than the 90 tons/pile quoted on the two drawings.

If we can be of any further assistance to you on this project please contact this office.

B. T. Darch
Senior Foundation Engineer
For
A. G. Stermac
Principal Foundation Engineer

BTD/jt

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 8

FOUNDATION SECTION

JOB 69-F-68 LOCATION Mimico Creek & Q.E.W. 182,794 N; 225,538 E. ORIGINATED BY VK

W.P. 314-65-04 BORING DATE March 6, 1970 COMPILED BY VK

DATUM Geodetic BOREHOLE TYPE Washboring with BX Casing CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT — SHEAR STRENGTH P.S.F. o UNCONFINED + FIELD VANE • QUICK TRIAXIAL x LAB. VANE	LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w — w_P w w_L — WATER CONTENT %	BULK DENSITY γ P.C.F.	REMA GR. SA. SI. CL.
258.2	Ground Level									
0.0	Silty sand & gravel & large boulders. Dense									▽ 257.2
253.7										
4.5	Sound		1	BXL	100%	250				
	Grey Shale		2	BXL	100%					
243.7										
14.5	End of Borehole					240				

FORM OB-MT-126 (REV 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 9

FOUNDATION SECTION

JOB 69-F-68 LOCATION Mimico Creek & Q.E.W. 182,743 N; 225,591 E. ORIGINATED BY VK
W.P. 314-65-04 BORING DATE March 3, 1970 COMPILED BY VK
DATUM Geodetic BOREHOLE TYPE Washboring with BX Casing CHECKED BY

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV SCALE
259.6	Ground Level					
0.0	Clayey silt with sand & gravel. Very stiff to hard		1	SS	48	
255.6			2	SS	20	
4.0	weathered shale		3	SS	72	
	Sound grey shale with limestone inclusions in the upper 2 ft.		4	BXL	100%	250
			5	BXL	100%	
245.6			6	BXL	100%	
14.0	End of Borehole					240
						230

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT
20 40 60 80 100

SHEAR STRENGTH PSF
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE

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
GR. SA. SI. CL.
▼ 257.1

FORM OB-MT-126 (REV 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 10

FOUNDATION SECTION

JOB 69-F-68 LOCATION Mimico Creek & Q.E.W. 182,698 N; 225,655 E. ORIGINATED BY VK

W.P 314-65-04 BORING DATE March 6, 1970 COMPILED BY VK

DATUM Geodetic BOREHOLE TYPE Washboring with BX Casing CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT 20 40 60 80 100 / SHEAR STRENGTH PSF: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	LIQUID LIMIT w_L / PLASTIC LIMIT w_p / WATER CONTENT w — WATER CONTENT %	BULK DENSITY γ P.C.F.	REMARKS
256.3	Ground Level									
0.0 / 254.0	Clayey silt with sand & gravel. Firm		1	SS	6					GR.SA.SI.CL.
2.3 / 251.8	Weathered shale		2	SS	22					▼ 256.7
4.5	Sound grey shale with limestone inclusions in upper 2 ft.		3	BXL	100%					
246.3			4	BXL	100%	250				
10.0	End of Borehole					240				
						230				

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 10A

FOUNDATION SECTION

JOB 69-F-68 LOCATION Mimico Creek & Q.E.W., 182,667 N; 225,755 E. ORIGINATED BY VK
WP 314-65-04 BORING DATE March 5, 1970 COMPILED BY VK
DATUM Geodetic BOREHOLE TYPE Washboring with BX Casing CHECKED BY

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 / SHEAR STRENGTH PSF ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w WATER CONTENT %	BULK DENSITY γ P.C.F	REMARKS
256.4	Ground Level									
0.0	Clayey silt with sand & occ. gravel. Stiff weathered shale		1	SS	11					GR.SA.SI.CL. ▼ 254.9
250.9			2	SS	17					
5.5			3	SS	18					
			4	SS	100%	250				
	Sound Grey Shale		5	BXL	100%					
			6	BXL	100%					
239.9			7	BXL	100%	240				
16.5	End of Borehole									
						230				

FORM OB-MT-126 (REV 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 11

FOUNDATION SECTION

JOB 69-F-68 LOCATION Mimico Creek & Q.E.W. 183,048 N; 225,283 E. ORIGINATED BY VK

W.P. 314-65-04 BORING DATE March 2, 1970 COMPILED BY VK

DATUM Geodetic BOREHOLE TYPE Washboring with BX Casing CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV. SCALE
263.3	Ground Level					
0.0	Clayey silt with sand & gravel. Stiff		1	SS	10	
259.3			2	SS	13	
4.0	weathered grey shale		3	SS	110/8"	260
5.5	Sound grey shale with limestone inclusions & seams of weathering in the upper 2.5 ft.		4	BXL	100%	
250.3			5	BXL	100%	250
13.0	End of Borehole					240

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT
20 40 60 80 100

SHEAR STRENGTH PSF
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

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

GR.SA.SI.CL.

▼ 261.8

FORM OB-MT-126 (REV. 1969)

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 12

FOUNDATION SECTION

JOB 69-F-68 LOCATION Mimico Creek & Q.E.W. 183,066 N; 225,188 E. ORIGINATED BY VK

W.P. 314-65-04 BORING DATE March 2, 1970 COMPILED BY VK

DATUM Geodetic BOREHOLE TYPE Washboring with BX Casing CHECKED BY

SOIL PROFILE ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE
264.9	Ground Level					
0.0	Clayey silt with sand		1	SS	24	
260.9	& gravel. Very stiff.		2	SS	22	
			3	SS	132	260
4.0	Weathered		4	BXL	70%	
255.4						
9.5	Sound		5	BXL	100%	
250.9	Grey shale					
14.0	End of Borehole					250
						240

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT 20 40 60 80 100

SHEAR STRENGTH P.S.F.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

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

GR. SA. SI. CL.

▼ 263.1

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 13

FOUNDATION SECTION

JOB 69-F-68 LOCATION Mimico Creek & Q.E.W. 183,076 N; 225,081 E. ORIGINATED BY VK

W.P. 314-65-04 BORING DATE February 27, 1970 COMPILED BY VK

DATUM Geodetic BOREHOLE TYPE CHECKED BY

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE
261.1	Ground Level					
0.0	Silty sand with gravel. Loose		1	SS	5	
258.1	Clayey silt with sand & gravel. Hard		2	SS	35	260
257.1	Weathered shale		3	SS	43	
			4	SS	45	
7.0	Sound grey shale with limestone inclusions in upper 3 ft.		5	BXL	100%	
248.1			6	BXL	100%	250
16.0	End of Borehole					240

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT
20 40 60 80 100

SHEAR STRENGTH P.S.F
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

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

GR. SA. SI. CL.

▼ 262.4

FORM 08-MT-126 (REV 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 14

FOUNDATION SECTION

JOB 69-F-68 LOCATION Minico Creek & Q.E.W. 183,120 N; 224,976 E. ORIGINATED BY VK
W P 314-65-04 BORING DATE February 27, 1970 COMPILED BY VK
DATUM Geodetic BOREHOLE TYPE Washboring with BX Casing CHECKED BY

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE
265.3	Ground Level					
263.3 2.0	Silty sand with some organics. Compact		1	SS	14	
	Clayey silt with sand & occ gravel. Very stiff to hard.		2	SS	20	
259.8 5.5			3	SS	32	260
			4	SS	100/4"	
257.0 8.3	Weathered Sound grey shale with limestone incls.& seams of weathered shale		5	BXL	100%	
253.3 12.0	End of Borehole		6		100%	250
						240

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT
20 40 60 80 100

SHEAR STRENGTH - p.s.f.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

LIQUID LIMIT ——— w_L
PLASTIC LIMIT ——— w_p
WATER CONTENT ——— w

w_p w w_L

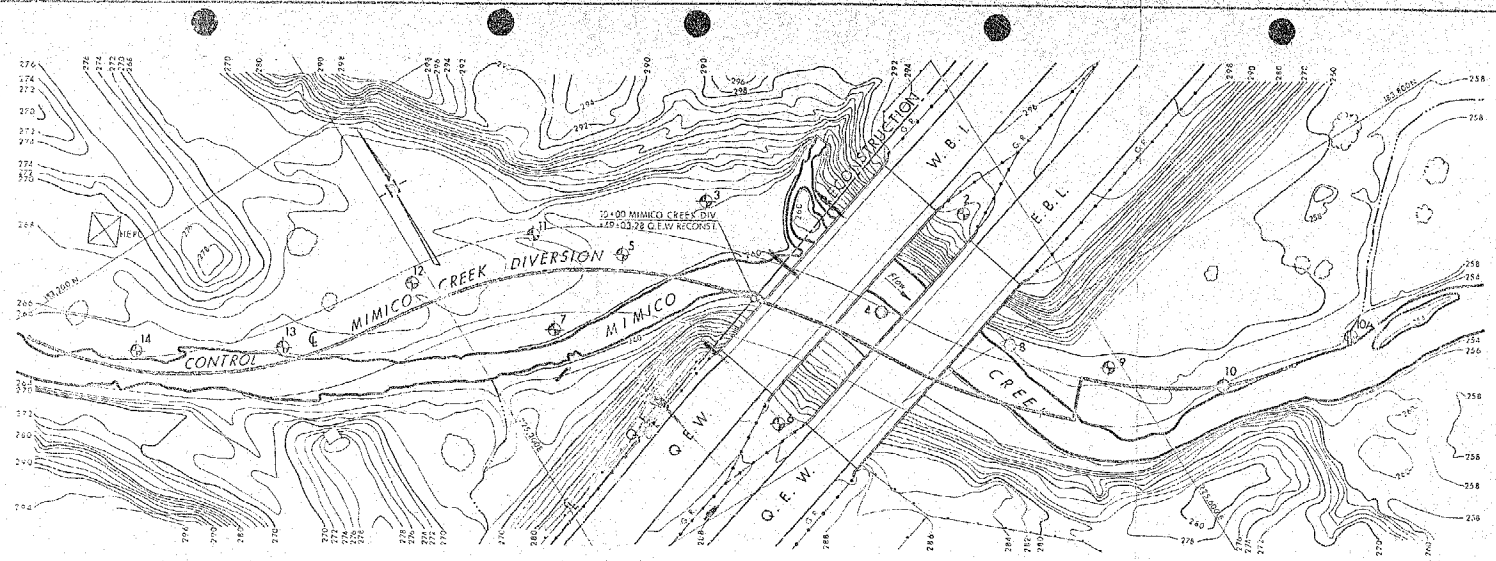
WATER CONTENT %

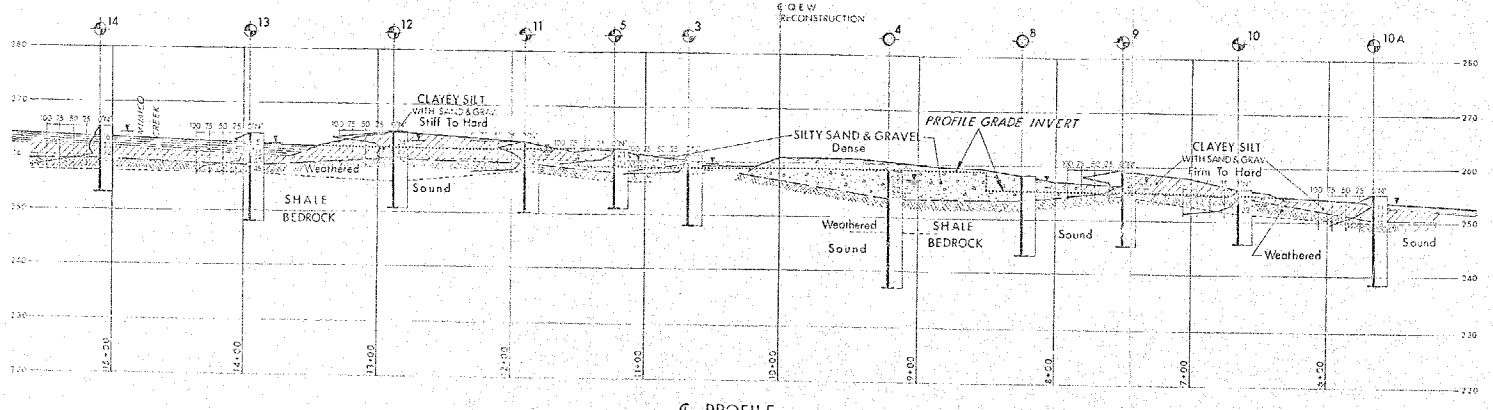
UNIT DENSITY γ pcf

REMARKS

GR SA SI CL

▽ 264.3





SEE DWG. 69-F-68A

KEY PLAN
SCALE IN MILES

LEGEND

- Bore Hole
- Cone Penetration Hole
- Bore & Cone Penetration Hole
- Water Levels established at time of field investigation, MAR. 1970

NO.	ELEVATION	CO-ORDINATES NORTH	CO-ORDINATES EAST
8	258.2	182,794	225,838
9	259.6	182,743	225,591
10	256.3	182,688	225,655
10A	256.4	182,667	225,715
11	263.3	183,048	225,283
12	264.9	183,066	225,188
13	264.1	183,076	227,081
14	265.3	183,120	224,976

- 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.

REVISIONS		
DATE	BY	DESCRIPTION

PRINT RECORD

NO.	FOR	DATE

REF. NO. FENCO 3552-11-13 REF. NO. 1
& PLAN NO. 880-73

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE - FOUNDATION SECTION

MIMICO CREEK DIVERSION

KING'S HIGHWAY NO. Q.E.W. DIST. NO. 6
CO. YORK METRO TORONTO
TWP. ETOBICOKE LOT CON

BORE HOLE LOCATIONS & SOIL STRATA

SUBMD. V.K.	CHECKED	W.P. NO. 332-65-04	M.H.T. DRAWING NO. 69-F-68B
DRAWN E.D.	CHECKED	JOB NO. 69-F-60	
DATE MARCH 25, 1970	SITE NO.		BRIDGE DRAWING NO.
APPROVED	CONT. NO.		

Re: Additional Subsoil Investigation -
Proposed Mimico Creek Diversion - Q.E.W. Reconstruction
W.J. 69-F-68 -- W.P. 314-65-04 .....

elevations 247 and 257. Water level observations carried out in the open boreholes indicate that the groundwater level, in the area of the proposed diversion, corresponds to the prevailing creek water level.

According to the available information, the profile grade of the channel invert will vary between elevation 262 at Sta. 13+60 and elevation 255 at Sta. 7+20. The new channel will be concrete-lined. The lining will be 9 inches in thickness and will be underlain by a granular mattress of about 12 inches thickness. The elevation of the base of the excavation for the proposed diversion will therefore range between 260 and 253. The investigation reveals that, for the proposed grades, the base of the excavation will be situated within the overburden for a major portion of the diversion. However, in the vicinity of Boreholes 12 and 10, about 12 inches of excavation will be required through the weathered shale, whereas in the vicinity of Boreholes 3 and 9, the excavation will extend into the sound bedrock as well for depths of about 2.5 to 3 feet below the surface of the shale bedrock.

We trust that the aforementioned factual information will be adequate for your design requirements. If you should need further clarification on the above, please feel free to call us.

M. Devata

MD/MdeF

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

cc: Messrs. T. J. Kovich
B. R. Davis
H. A. Tregaskes
D. W. Farren
G. K. Hunter (2)
H. Greenland
W. S. Melinyshyn (2)
B. A. Singh
Foundation Co. of Canada - Mr. H. Adachi
Foundations Files
Gen. Files

cc: Foundations - Rm. 110

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

250

To: Mr. T. J. Kovich,
Regional Materials Engineer,
Central Region,
Room 134-A, Lab. Bldg.

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

Attention:

Date: April 2, 1970

Our File Ref.

In reply to

Subject:

ADDITIONAL SUBSOIL INVESTIGATION
For
Proposed Mimico Creek Diversion
At the Q.E.W. Reconstruction
Borough of Etobicoke
Metropolitan Toronto
District No. 6 (Toronto)
W.J. 69-F-68 -- W.P. 314-65-04

In a memo dated February 5, 1970, the Foundation Section was requested by Mr. T. J. Kovich, Regional Materials Engineer (Central Region), to carry out an additional subsurface investigation for the proposed Mimico Creek Diversion in the vicinity of the existing Q.E.W. and Mimico creek crossing. Subsequently, 8 boreholes (#8 to #14 inclusive), were carried out at this site using a standard diamond drill rig adapted for soil sampling purposes. In addition, Boreholes #2 to #7 inclusive, put down previously at this site for the proposed structure at the crossing of Mimico Creek and Q.E.W. (refer Foundation Report W.J. 69-F-68 of October 3, 1969), have been incorporated into the present study. The locations and elevations of Boreholes #8 to #14 were surveyed by personnel from the Central Region Engineering Surveys Section and are shown on Drawing 69-F-68B, together with an estimated stratigraphical profile along the control centre-line of the proposed creek diversion. For completeness, we suggest that this memo and Drawing 69-F-68B, together with additional Borelog sheets, be incorporated into the Foundation Report W.J. 69-F-68.

The investigation has revealed that the overburden in the vicinity of the proposed diversion consists of either a stiff to hard clayey silt with sand and gravel, or dense silty sand and gravel. The total thickness of the overburden ranges between about 2 ft. and 6 ft. Shale bedrock was encountered between elevations 251 (B.H. 10-A) and 260.5 (B.H. 12) in the area of the investigation. The upper few inches to 6 ft. of the shale bedrock is in a weathered condition. At some boreholes it was possible to drive a 2-inch O.D. split-spoon sampler into the weathered zone. Sound shale bedrock with occasional limestone interbeds was encountered immediately below the weathered shale, between

..... 2

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

69-F-68

To: A. A... Laming,
Principal Foundation Eng.,
[illegible],
[illegible] Building.

From: W.G. McIlroy, Bridge Office.

Date: August 11th, 1969.

Our File No.

In reply to

Subject: [illegible] Bridge,
[illegible], Site 37-2A,
[illegible] Twp., Hwy. 4, E.W.

The attached marked up partial print, B-60-66, details the approximate location of the proposed footing for the above detailed structure. Also enclosed are prints taken from the Functional Planning Report showing the proposed grade.

Would you kindly arrange to have a foundation investigation of sufficient magnitude to allow the Bridge Office to proceed with the structure design.

J. Robertson.
BRIDGE LOCATION SUPERVISOR
for:
W.G. McIlroy,
REGIONAL BRIDGE LOCATION ENGINEER.

Encl.

62-F-65 A20

FOUNDATION OF CANADA ENGINEERING
CORPORATION LIMITED

TELEPHONE
481-4481

2200 YONGE STREET
TORONTO 12

CABLE ADDRESS
"FOUNDANENG" TORONTO

March 13, 1970

Mr. A.G. Stermac, P.Eng.
Principal Foundation Engineer
Materials & Testing Office
Department of Highways, Ontario
Lab Building
Downsview 464, Ontario

Attention: Mr. Devata

Dear Sir,

QUEEN ELIZABETH WAY
HUMBER RIVER TO ROYAL YORK ROAD
W.P.314-65-01
MIMICO CREEK DIVERSION

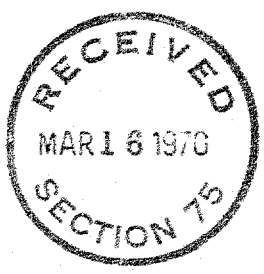
As requested during Progress Meeting No. 12, we enclose two prints of our drawing 3552-1T-13 Rev. 1 which indicates our intended profile of Mimico Creek diversion.

Yours very truly,
FOUNDATION OF CANADA ENGINEERING
CORPORATION LIMITED

Ronald J. Williams, P.Eng.
SENIOR PROJECT ENGINEER

RJW/bhw
3552-101-
Encl.

cc: Mr. W.C. Friedmann - D.H.O., Downsview



DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

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

FROM: C.S. Grebski,
Bridge Office

ATTENTION:

DATE: December 29, 1970

OUR FILE REF.

IN REPLY TO

SUBJECT: Mimico Creek - Bridge #3
W.P. 314-65-4, Site No. 37-243
Q.E.W., District No. 6

69-F-65

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,
Bridge Design Engineer

CSG:rd

Attach.

c.c. Foundation Office

Letter written Jan. 6/71

26 Jan 71

A. Starnes.
69-E-66

NOTES OF CONFERENCE

PROGRESS MEETING No. 12

QUEEN ELIZABETH WAY
HUMBER RIVER TO ROYAL YORK ROAD
W.P. 314-65-01

DATE: March 3, 1970

PLACE: FENCO, Toronto Office

PRESENT: Messrs:

W.C. Friedmann	-	Department of Highways Ontario
J. Robertson		
W. Lin		
N.D. Smith		
M. Robinson		
R. Franks		
D. Smith		
R. Strain		
W. Melinyshyn		
N. Austin		
M. Devata		(Part-time)
R.J. Williams	-	Foundation of Canada Engineering Corp. Limited
R.S. Adachi		
K. Hutchinson		
Z. Mekinda		

PROCEEDINGS:

		Action By
1.	Discussions were held regarding Bridge No. 5 structure and affected vicinity. The Bridge Office advised that copies of the preliminary bridge drawing had been sent to the C.N.R. for their approval. FENCO requested six (6) copies of the bridge drawing together with a plan of the retaining wall protection to be sent to the H.E.P.C. for their approval, and further to arrange a meeting with the H.E.P.C. for agreement of easement and installations within their right-of-way. It was noted that permanent easement would be required for sewer, utilities, etc. within this right-of-way.	DHO FENCO

FENCO

PROCEEDINGS (continued)

Action By

2. Referring to the borehole information in the vicinity of Mimico Creek diversion, the Department indicated that the boring programme would be finished by the end of this week. — DHO

Soils information resulting from this work would be incorporated in an addendum to the existing soils report in this area. It was envisaged that the final report together with the addendum would be available by the end of March. In order to facilitate recommendations to be contained within the report, FENCO would provide the department with anticipated invert elevations of the proposed creek diversion. — FENCO

It was noted during the discussions that the intended structure crossing the creek would be a three span design.

3. Discussing the early fill placed in the Parklawn - CNR crossing vicinity, the Department indicated their satisfaction in materials and methods used. — RESOLVED

It was indicated that compaction within the lower eight feet of the fill section was slightly sub-standard but was anticipated to attain required standards prior to intended 1972 construction, without producing excessive settlements in the ultimate construction.

4. General discussions were held on the retaining walls required within the contract limits. The Department indicated that several schemes for the retaining wall construction were being considered by their Soils Department, in order that design criteria could be assessed. The Bridge Office agreed to assist the Soils Department in ascertaining wall and fill heights. It was agreed that this information could be extracted from previously submitted FENCO drawings indicating pavement elevations. — DHO FENCO

PROCEEDINGS (continued)

Action BY

presented a drawing example of their intensions for the standard presentation of geometric data associated with retaining walls on the project.

Mr. Melinyshyn agreed to review the intended form of presentation and advise FENCO of approval. The intended full height retaining wall R1 was discussed by FENCO and noted that this form of construction necessitated relocation of utilities on the west side of the Royal York structure. The Department agreed this was an acceptable imposition in view of the advantages associated with a full height wall.

Discussing retaining walls generally, the Bridge Office indicated their preference regarding batter intensions on exposed faces as follows:-

a) Retaining Walls in Fill, batter exposed face
b) Retaining Walls in Cut - Exposed face vertical. FENCO
c) Retaining Walls Forming part or connecting to structures - Exposed face vertical.

5. Regarding pavement selection for this contract, Mr. N.D. Smith indicated that an independent meeting with FENCO was held to discuss the changes necessary after his review of the detour staging drawings. He further indicated that agreement was reached on the minor necessary changes to facilitate detour staging, and FENCO's intentions accommodated the Department requirements. RESOLVED

6. Referring to cost sharing agreements associated with trunk storm sewer treatment within the contract limits, FENCO indicated that Borough of Etobicoke intentions for this work had recently been received, provisional with this, cost sharing recommendations were not as yet completed. FENCO

PROCEEDINGS (continued)

Action By

In addition to the above, general discussions were held on the intended storm sewer on the south side of Lakeshore Boulevard in the Motel vicinity.

The following summarize this discussion:

a) The intended storm sewer drains a considerable area to the north and outlets into the Humber River; it was noted that whilst the alignment of this trunk sewer was in accordance with the agreed scheme, the proximity of several utility lines created problems. These problems mainly related to relocation, protection and care to be exercised during construction and subsequent to further design, will be reported in greater detail at a later date. — FENCO

b) In order that sewer design can be finalized, FENCO requested that an additional borehole programme and investigation by the Department, to determine the rock elevation throughout the length of the trunk sewer, are required. From other work in this area, a preliminary indication was that rock line approximates elevation 245, but verification was necessary. — DHO

c) It was anticipated that construction of this storm sewer could be staged within the general contract.

d) In order to further the requested soils programme, the Department asked FENCO to submit alignment and intended profile drawings for their consideration. — FENCO

e) FENCO agreed to layout, by survey, the required borehole locations. — FENCO

PROCEEDINGS (continued)

Action By

f) Mr. Friedmann indicated that this borehole programme, in order of priority, should follow that required for Bridges.

g) FENCO submitted at the meeting two sewer drawings and one utility plan to the Department, it is noted that the Department's Critical Path Section requires an additional set of sewer drawings to facilitate their programme. — DHO, FENCO

7. Regarding the lighting, overhead signs and messages, Mr. Friedmann advised that subsequent to contact with Metro, he was informed that jurisdiction in this area was that of Local Authority's. Their requirements, namely Borough of Etobicoke, would be operative. He further indicated that both the Borough of Etobicoke and the Department's Traffic Section have been notified of current intentions and a request made for their comments and recommendations. To date the Borough had not replied, but assurance was given that the Department's Traffic Section were checking sign messages and other applicable details. — DHO

8. Discussing final property requirements, FENCO requested six copies of Bridge No. 5 preliminary drawing and agreed to arrange meetings with both the H.E.P.C. and the CN Railways. — DHO
After dates have been set for these meetings FENCO will advise the Road Design Office in order that representatives from the Department's staff could attend. — FENCO
With the proviso that the above meeting can be arranged, FENCO agreed to meet the final property date of March 15, 1970.

FENCO indicated that further design in the Royal York Road and Manitoba Street area, necessitated an extra easement and agreed to send this information to the Department's Mr. John Nichols. — DHO, FENCO

PROCEEDINGS (continued

Action By

9. Further discussions were held on possible advancement of contract award from the Fall of 1972 to Fall 1971 programme. It was noted that the Department's Bridge Maintenance Office were requested to reinspect the CNR Bridge crossing and advise current recommendation of the life expectency of the structure. To date this current recommendation has not been received. — DHO

10. Regarding protection of existing utilities FENCO advised that a meeting had been held with Consumers' Gas Company on February 9, 1970, and minutes documenting this meeting had been forwarded to the Department.

Mr. Robinson indicated that property requirements should be accelerated to accommodate utility relocation and FENCO agreed to provide details of property request to him. — FENCO

During discussions on relocation of 20" gas main on the south side of Q.E.W., it was agreed that this relocation should be from the existing Borough easement to within the Department's existing right-of-way, and as such would avoid conflict with the existing storm trunk sewer. To facilitate this relocation the Road Design Office agreed to issue criteria reducing the controlled access to this right-of-way. — DHO

11. Reviewing the requirement for structures 7 and 8, it was agreed that adequate clearance would be provided in the design of the structures, to accommodate an operating ramp speed of 32 m.p.h. — DHO

12. FENCO agreed to provide details of T.T.C. structure alignment, to the Bridge Office by the end of the week. — FENCO

PROCEEDINGS (continued)

Action By

Further to the above Notes of Conference, the following is a summary of pertinent points requiring follow-up by parties concerned:

A) Department of Highways

1) Approved Bridge No. 5 Preliminary - 6 copies
✓2) Soils Mimico Creek
3) Retaining Wall presentation approval
✓4) Soils programme - sewer - Lakeshore Boulevard
5) Critical Path - Sewer
6) Signing
7) Property Royal York Road - Manitoba intersection
8) Bridge Maintenance Office - recommendations
9) Property - Utilities relocation

B) FENCO

1) H.E.P.C. Meeting
2) CNR Meeting
— 3) Lakeshore - Storm Sewer - Invert Elevations
4) Retaining Walls - Exposed face - incorporated requirements
5) Storm Sewer - Cost Sharing and Utilities
— 6) Borehole Stake out, Survey
7) Sewer details to Critical Path
8) Property, acceleration
9) T.T.C. Structure alignment

The next Progress Meeting will be held on Tuesday, April 7, 1970, at FENCO's offices, 2200 Yonge Street at 9:30 a.m.

Ronald J. Williams
Secretary of the Meeting

RJW/bhw
3552-120

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 69F68 SITE MIMICO CR - O CW BOREHOLE No. 1 GROUND EL

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION: LARGEST GRAIN SIZE	SHAPE	PERCENTAGE: GRAVEL	SAND	SILT & CLAY	DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DE
1	0-1½														TOPSOILS
2	3-4½	⅛"	angul.	0	15	85	Med	dull	none	High	organic	Grey Brown	str.	V. Stiff	clayey silt with some
3	6-7.5	—	—	0	Tr	100	Low	dull	none to slow	High	Earthy	Mott. Grey Brown	str.	"	clayey SILT.
4	9-10.5	—	—	0	Tr	100	"	"	"	"	"	"	"	"	" "
5	12-12.4	1.5"	angul	Tr	Tr	100	"	"	"	"	"	"	"	"	" " — Shal Tr. Gravel
6	15-15.5	—	—	0	Tr	100	"	"	"	"	"	"	"	"	clayey SILT — WEA

NOTES:— VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES RE

REMARKS:— From Sa. 2 — 6 inclusive — deposit has thinly laminated app. some laminae are coated w/ rusty colour.

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

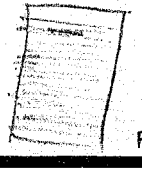
VISUAL CLASSIFICATION SHEET

SITE MIMICO CR - O (E-W) BOREHOLE No. 1 GROUND ELEVATION

DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
								TOPSOILS	
Med	dull	none	High	organic	Grey Brown	str.	V stiff	clayey silt with some sand	
Low	dull	none to slow	High	Earthy	Mott. Grey Brown	str	"	clayey SILT.	CL
"	"	"	"	"	"	"	"	" "	CL
"	"	"	"	"	"	"	"	" " - Shaly appearance Tr. Gravel WEATHER?	
"	"	"	"	"	"	"	"	clayey SILT - WEATHERED SHALY APPEARANCE	

Y CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

2 — 6 inclusive — deposit has thinly laminated appearance some laminae are coated w/ rusty colour.



FF 22

Rock Core

PXL SIZE:

10.5 — 12.0: WEATHERED SHALE WITH 3" LIMESTONE

12.4 — 15.0: " " " THIN LS INTERBEDS

15.0 — 20.0: " " " LS INTERBEDS.

20.0 — 24.0: MAINLY LIMESTONE. GENERALLY SOUND.

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT ~~MINICO-69F68~~ SITE MINICO CR - QEW BOREHOLE No. 2 GROUND ELE

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION: LARGEST GRAIN SIZE	SHAPE	PERCENTAGE: GRAVEL	SAND	SILT & CLAY	DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DE
1	0-1.5'										org	Brown			TOPSOIL
2	3-4.5'	3/16"	Subround	Tr	15	85	low	dull	slow to none	low	Earthy	Brown (seam) grey	sli.		clayey silt with some
3	6-7.5'	1/2"	flat (shaly)	5	15	80	"	"	none	"	"	mott Br.	"		clayey silt w/ some
4	9-10.5'	1/8"	Subroun	0 Tr	100 15	0 FS	-		Quick none	low	"	"	"		Fine Sand w/ clayey silt one seam
5	12-13.5'	1/2"	Subround	10	10	80	-	dull	none	med	"	Grey	"	Firm to Soft	(Glacial Till like) clayey silt
6	15-16 1/2'	1 1/4"	"	15	20	65	-	~~dull~~	Quick none	none low	"	Grey to Br	"		Glacial till f-m Sand
7	20-21.5'	1/4"	ang (shale)	Tr	90	10	-	dull	Quick	—	"	Brown	"		silty f Sand; occ clay
8	33 1/2-35'	1"	angul	20	20	60	low	dull	slow	low	organ	Dark Br to Black	weak		FILL- clayey silt w/ s matter (dec
9	42-43'	1"	Flat angu												DECOMPOSED SHALE (finger pressu

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REA

REMARKS:- Sa 1—7 could be fill material

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

SITE MINICO CL-QEW BOREHOLE No. 2 GROUND ELEVATION

DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
				org	Brown			TOPSOIL	
low	dull	slow none	low	earthy	Brown Grey	sl.		clayey silt with some sand - Till?	
"	"	none	"	"	mott Br.	"		clayey silt w some sand & shale fragments (till?)	
"	"	Quick none	low	"	"	"		F-m Sand w clayey silt seams & one seam of glacial till (cobbles)	
"	dull	none	med	"	Grey	"	Firm to stiff	(Glacial Till like) clayey silt w some S & gr.	CL
"	dull	Quick none	none low	"	Grey to Br	"		Glacial till & f-m Sand	
"	dull	Quick	—	"	Brown	"		silty f Sand : occ clayey silt seams	SM
low	dull	slow	low	organ	Dark Br to Black	weak		FILL - clayey silt w S & gr & org matter (occ wood chips).	
								DECOMPOSED SHALE (crumbles when fingers pressure into clay).	

ARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

ld be fill material

B&L Rc.

24–25.5: some gravel & one 8" length of LS.

25.5–31.5 gravel – probably from boulder also.

31.5–37.2 LS boulders & gravel.

37.2–42. gravel

43–47 – pebbles & gravel (including quartz, granite – these known)

47 ⟶ 58 – Sound rock – shale interbedded w/ L.S.

BxL RC.

25.5: some gravel & one 8" length of LS.

31.5 — gravel — probably from boulder also.

37.5 LS boulders & gravel.

42. gravel

47 — pebbles & gravel (including quartz, granite etc.) ← these throw out argument that some hard weathered shale (not sound rock)

→ 58 — Sound rock — shale interbedded w/ L.S. ? ?

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 69-F-68. SITE MIMICO CR - QEW BOREHOLE No. 3 GROUND EL

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH D
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE											
				GRAVEL	SAND	SILT & CLAY									
1	0-1.5	1/4"	angu	Tr	15	85	-	dull	none	low	org	Brown Dk	wk.		Topsoil, & clayey Silt
2	1.5-3.0	1 1/2"	angula	15	20	65	-	"	quick / none	low	earthy	Br - to Dark	Sltr.		HET. MIX CLAY → SAND SILT w/
3	3-3.3	1"	Flat ang	20	25	55	-	"	slow-none	"	"	"	wk.		clayey Silt w/ S & Gr & TILL LIKE w/ PEA

NOTES:— VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES R

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PE MIMICO CR - QEW BOREHOLE No. 3 GROUND ELEVATION

SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
dull	none	low	org	Brown	wk.		TOPSOIL, & clayey silt w/ sand & fine gravel.	●
"	quick / none	low	earthy	Br-to Red	Str.		HET. MIX CLAY → SAND w/ silt gravel & shale frags.	
"	slow-none	"	"	"	wk.		clayey silt w/ sand & shale fragments Till like appearance	
								●

IED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

#3: BxL PC

3.5 — 8' BR. interbedded shale & L.S. Sou

8 — 13 Shale Bedrock occ L.S. seam. Sou

— 8' BR. interbedded shale & LS. Sandy
13 — shale bedrock ~~on~~ LS seam. Sandy Recovery

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 69F68 SITE MILTON CUT-OFF BOREHOLE No. 4 GROUND ELEV

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION: LARGEST GRAIN SIZE	SHAPE	PERCENTAGE: GRAVEL	SAND	SILT & CLAY	DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCR
1	0-1.5	1"	angul	40	50	10	—	—	Quick	—	Earthy	Dirty Brn	Sli		S&G Fill.
2	1.5-3	1½"	"	50	10	40	-	—	none	low	"	Grey	"		WEATHERED RED with DECO glacia
3	3-4.5	¾"	angular to subround	40	20	40	—	—	M	"	"	"	"		Mixed clayey Till w/ We
4	4.5-4.9														WEAT. SHALE.

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

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

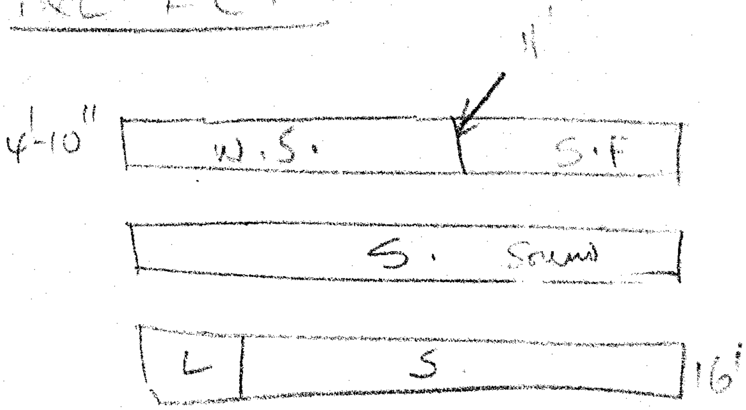
VISUAL CLASSIFICATION SHEET

TE MIMICO CR - QEW BOREHOLE No. 4 GROUND ELEVATION

SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
—	Quick	—	Earthy	Dirty Brn	Sh		SOIL FILL.	
—	none	low	"	Grey	"		WEATHERED DECOMPOSED SHALE with glacial till.	
—	M	"	"	"	"		Mixture of glacial till & weathered shale	
							WEAT. SHALE.	

ED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

PCL R.C.



F = fractured
W = weathered
S = shale
L = limestone

16–21' Sound shale, few LS interbeds (LS could be dolomitic no reaction to acid & no fizzing).

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 69F68 SITE Mimico Cr-QEW BOREHOLE No. 5 GROUND ELEVA

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION: LARGEST GRAIN SIZE	SHAPE	PERCENTAGE: GRAVEL	SAND	SILT & CLAY	DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCR
1	0-1.5	1 1/4"	Subang												TOPSOIL
2	1.5-3.0	1 1/4"	"	50	40	10	—	—	Quick?	—	Earth	Dirty Br	S.w		Glacial Till w/ Shale (essentially Material

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

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

38 SITE MIMICO CK-OCW BOREHOLE No. 5 GROUND ELEVATION

RIBUTION PERCENTAGE GRAVEL	SAND	SILT & CLAY	DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
0											TOPSOIL	
50	40	10	—	—	quick	—	Earth.	Dark Grey	Lo		Glacial Till w/ Shale fragments (essentially Matrix is clayey silt)	

TION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

FXL RC

3 – 4.5 – L.S. gravel ~~cc~~: granite & other igneous types
4.5 – 6.0 – shale & L.S. — could be bedrock.
6.0 – 11.0 – Sound shale FR.

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 63-56 SITE Pinco Creek BOREHOLE No. 6 GROUND ELEVAT

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIP
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE GRAVEL	SAND	SILT & CLAY									
1	0-1.5'	—		0	10	90	—	dull	none	low	org	Br	sli		TOPSOIL & Mott. Br. clay
2	3-4.5'	1/2"	Subround	0 / 15	100 / 20	0 / 65		"	Quick / None	"	Earthy	Br & Grey	"		Brown Sand & Grey
3	6-7.5'	1/2"	Subround	0 / 15	100 / 20	0 / 65		"	Quick / none	"	Earthy	Br & gr.	"		" "
4	9-10½'	3/4"	Subrd. to Rounded	Tr	20	80		"	Quick / slow	"	"	Mott. Brown	"		clayey SILT to SILT
5	12-13½'	—									"	Br & grey	"		clayey SILT w/ SAND SEAMS GLAC. TILL
6	15-16½'	—		Tr	25	75		"	slow	"	"	Brown	"		clayey SILT w/ fine SA
7	20-21.5'	—	—	Tr	30	70		"	"	"	"	Dark Br.	"		" " "
8	25-26½'	1/4"	Subround	5	25	70		"	slow to Quick	"	"	" & Grey	"		" " "
9	28-31½'	1½"	Sub angul	50	35	15	—	"	none	"	org	grey to Black	wk.		HET. MIX. SI. SA. GR. to CO & occ. SHALE FRAG

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

REMARKS:—

Sa. 1—8 wid. could be Fill

#11 — weathered shale.

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

SITE [illegible] BOREHOLE No. 6 GROUND ELEVATION

ION / NTAGE SAND	SILT & CLAY	DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
10	90	—	dull	none	low	org	Br	slt		TOPSOIL & mott. Br. clayey SILT, Tr Sand	
20	0		"	Quick / None	"	Earthy	Br & Grey	"		Brown Sand & Grey glacial Till (cobbles)	
30	0 / 65		"	Quick / none	"	earthy	Br & gr.	"		" " "	
20	80		"	Quick / slow	"	"	mott. Brown	"		clayey SILT to SILT w/ Sand Seams & Gravel	
						"	Br & grey	"		clayey SILT w/ SAND SEAMS, ONE GREY GLAC. TILL SEAM.	
25	75		"	slow	"	"	Brown	"		clayey SILT w/ fine SAND Seams	
30	70		"	"	"	"	Dark Br.	"		" " " "	
25	70		"	slow to Quick	"	"	" & Grey	"		" " " " occ. TILL POCKETS	
35	15	—	"	none	"	org	grey to Black	wk.		HET N/K. SILTSTONE w CLAY BINDER & occ. CLAYEY FILM. ONE TILL LIKE ZONE	

JST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

Sa. 1—8 incl. could be FILL MATERIAL.

shale.

FF 22

fxl. weathered to 36.5

Green shale thereafter, on L.S. interbeds

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 69F68 SITE MIMICO CR-OEA BOREHOLE No. 7 GROUND EL.

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION						DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DE
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	0-1½											ORG	BRN			SANDY TOPSO
2	3-4½	1"	angular to mild	40	40	20	—	dull	none	low	tough	ORG	GRY	sl.		clayey silt w/ sand & gr &

NOTES:— VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES R

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

8 SITE MIMICO CR OEA BOREHOLE No. 7 GROUND ELEVATION

TION / CENTAGE SAND	SILT & CLAY	DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
						STS	Brn			Sandy TOPSOIL	
4020	—	dull	none	low	earth		grey	ch		clay, silty, sa. gr. & shale fragments,	

MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

Rock Core 1 x 6 -

4.5 - 12', Weathered shale & fractured LS to 7.5'.
From 7.5 - Sound shale w/ interbedded LS.

12.5 - 16.5 - Fractured but sound shale.

HON. GEORGE E. GOMME
MINISTER

A. T. C. McNAB
DEPUTY MINISTER

DEPARTMENT OF HIGHWAYS

Bridge Office,
Downsview 464, Ontario,
July 24th, 1969.

Mr. E.F. Sutter,
Ass't Director of Operations,
Metropolitan Toronto and Region
Conservation Authority,
P.O. Box 720,
WOODBRIDGE, Ontario.

RE: Our File: BW 2092,
Channel Diversion of Mimico Creek
at Q.E.W., W.P. 314-65, Site 37-243,
District No. 6.

Dear Sir:

Enclosed please find a copy of our preliminary hydrology recommendations for the reconstruction of the Q.E.W. crossing at Mimico Creek.

Would you kindly return your comments to us at your earliest convenience.

Yours very truly,

K.B. Johns, P.Eng.,
ASS'T BRIDGE HYDROLOGY ENGINEER,
for:
J.D. Harris, P.Eng.,
BRIDGE HYDROLOGY ENGINEER.

KBJ/cew
Encl.
cc W.S. Melinyshyn

Mr. W.S. Melinyshyn,
Reg. Br. Loc. Engineer,
Administration Bldg.

J.D. Harris,
Bridge Office.

July 24th, 1969.

BW 2092

Mimico Creek at C.E.W.,
W.P. 314-65, Site 37-243,
District No. 6.

PRELIMINARY HYDROLOGY RECOMMENDATIONS

After considering various alternatives for the stream diversion more closely the following solution appears to be the most favourable.

Enclosed sketch illustrates the channel diversion as well as a typical cross-section and possible future extensions of the channel improvement.

A proposed channel improvement scheme upstream at the Queensway by the M.T.R.C.A. has been taken into consideration and the channel under the bridge was chosen accordingly.

SUMMARY OF RECOMMENDATIONS

Effective Opening: 80 feet (Minimum) measured at right angles to the abutments and at approximately Elev. 264.0 (or about 5' above channel base).

Location: ℄ of bridge at approximately Station ~~21~~ + ~~30~~. 48+70

Skew Angle: 22° left.

Minimum Soffit Elevation: 275.0 (H.W.L. ± 272.0).

Foundation: To be taken well into the shale bedrock (depth is subject to Foundation Report).

Channel: 60 ft. base width for about 500 to 600 ft. and transition sections at both ends to match with existing channel width.

... 2

RE: Mimico Creek at Q.E.W.,
W.P. 314-05, Site 37-243,
District No. 6.

Slope Protection: Concrete lined 2:1 slopes up to Elev. 273.0 under the bridge and rip-rap protected slopes up to Elev. 273.0 as illustrated on sketch will most likely be required.

These recommendations will be mailed to Mr. Sutter of the M.T.R.C.A. for comments, which in turn shall be forwarded to you as soon as they have been received.

KBJ/cew
Encl.

K.B. Johns,
ASS'T BRIDGE HYDROLOGY ENGINEER,
for:
J.D. Harris,
BRIDGE HYDROLOGY ENGINEER.

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A. G. Stermac,
Pr. Foundation Engr.,
Materials & Testing Office.

From: Materials & Testing Office,
Central Region,
Room 134, Lab. Bldg.

Attention: Mr. M. Devata.

Date: February 5, 1970.

Our File Ref.

In reply to

Subject: W.P. 314-65-04 (Group No. W.P. 314-65-01)
Q.E.W., Mimico Creek Diversion
Toronto District

This memorandum will confirm our discussion today in which you agreed to undertake the necessary soils investigation.

For your use I am enclosing the following:

(1) plan showing the location of the diversion

(2) Bridge Office hydrology report dated January, 1970.

Your contact man for any further information would be Mr. Bob Adachi of Fenco.

TJK/js,
Enclosures.

F. J. Kovich,
Regional Materials Engineer.

cc: Fenco
(Attn: R. S. Adachi)

HYDROLOGY REPORT

MIMICO CREEK @ Q.E.W.

W.P. 314-65-04, SITE # 37-243

BW 2092, DISTRICT 6

JANUARY 1970

DEPARTMENT OF HIGHWAYS, ONTARIO

DESIGN BRANCH, DOWNSVIEW

CONTENTS

1. INTRODUCTION

This report summarizes the hydrologic study and gives hydraulic recommendations for the proposed replacement structure(s) at the aforementioned site.

Preliminary recommendations were made in July 1969 and sent to the Metropolitan Toronto and Region Conservation Authority for their comments. In principle our recommendations were accepted, however the Authority would like to receive final plans of the diversion details.

Some of the information presented in this report is based on the H.G. Acres & Co. Report "Study of Mimico Creek Watershed".

2. DESCRIPTION OF WATERSHED

The area drained through the subject crossing consists of about 30 square miles of clay and clay loam soils. The topography is undulating with a rather steep stream gradient. The area is heavily built up in the lower part of the watershed, and the upper part is in the process of being industrialized and urbanized, leaving only very little of the area in a natural agricultural state. Because of the lack of appreciable wooded areas, swamps, lakes or other flood retarding features on the watershed its elongated shape has little effect on the runoff.

The overall effect of the factors mentioned above is to produce a high runoff.

...2

3. EXISTING BRIDGES

The twin structures at the site were built in 1939. The main span measures about 80 feet clear and the end spans about 40 feet giving an effective opening of 120 feet. The HWL assumed at the time of construction was at Elev. 266.5 but Hurricane Hazel exceeded this elevation by more than 2 feet, and water flowed through the spill-thru-spans, washing out part of the fill.

About 800 feet downstream is a CNR bridge with an effective opening of about 90 feet. Due to a river bend between the Q.E.W. and the C.N.R. it is endangered by scour and erosion along the east embankment. A retaining wall more than 200 feet long was constructed along the east embankment but it already shows signs of possible undermining. (Fig. 6.4.2). A diving report of 1954 lists considerable voids under the footings of both abutments after Hurricane Hazel.

The bridge at Hwy. 2 just above the streams mouth at Lake Ontario consists of a two span (each 46.5 feet effective) steel beam structure which was constructed in at least three different sections not in line with each other, thus forcing the flow into a slight bend. The span on the inside of the curve is silted up at least 3 feet above the lake level while under the other span the water is more than six feet deep.

...3

Upstream of the Q.E.W. on the Queensway a new single span steel girder and concrete slab structure (91.0' eff.) was built in 1956, replacing an old three span steel structure which had an effective span of approximately 70 feet. According to a local resident this bridge took the hurricane Hazel flood without serious damage. The bed and banks are shale. (Drg. Mun. 7777-2).

The second road bridge upstream is a single span concrete rigid frame built on shale in 1937 at Royal York Rd. It has an effective opening of 59 feet and took all the Hazel flood without damage.

The third road bridge upstream at Bloor St. was replaced in 1958 with a continuous steel beam structure (40'-47'-40') having an effective opening of about 80 feet (+). The former reinforced concrete beam and slab structure built in 1921 and widened in 1946 had only one opening of 40 x 7 feet. The spread footings were undermined and the road behind both abutments washed out in hurricane Hazel.

4. PROPOSED STRUCTURE

4.1 Description of Site

The existing structures at the site are high three span twin concrete beam rigid frame bridges. They cross a comparatively deep valley with practically no flood plain at a heavy skew angle causing the flood flow to become turbulent (Fig. 6.4.1). Downstream the creek circles around a shale outcrop before it passes through the CNR structure.

Below the railraod bridge the channel is reasonably straight passing under Hwy. 2 and discharges into Lake Ontario just below the Hwy. 2 bridge.

The stream gradient is steep, creating high velocities in flood.

4.2 Design Flood

The design flood used was the largest regional flood for the area and was calculated by various methods, agreeing quite closely with the design discharge for the channel improvements proposed at the Queensway in "Study of the Mimico Creek Watershed" by Acres and Co. made for MTRCA. The actual Hurricane Hazel Flood level on the upstream side of the existing structures was at El. 268.6 and the estimated regional flood level at the same location and for the present conditions will be at ± El. 272.0. Under the anticipated new conditions the HWL was estimated to be about 14 feet above invert elevation. (See Channel Realignment 4.4).

4.3 Proposed Bridge

Two main alternatives are hydraulically suitable for the bridge: an arch and a high level bridge.

An arch (70' span) would require a stepped concrete invert to reduce the gradient to 0.1%, with a cutoff wall at the downstream end taken into sound shale.

The length of a high-level bridge could be reduced considerably by partly or fully lining the channel through the structures, as described later.

4.4 Channel Realignment

Figure 6.2 shows the approximate layout of the proposed realignment.

A fully lined concrete channel should have a base width of 40 feet with 2:1 slopes, whereas a partly lined channel having a natural shale invert should be 50 feet wide. In both cases the ends of the lining should be turned well into the banks and bed to prevent out-flanking by the high-velocity flows. The height of lining need only be 15 feet above invert. A longitudinal slope not exceeding 0.1% should be provided, by using suitable steps or other means.

The land on the downstream side east of the river should be kept at or below El. 261 to permit overflow. Upstream on the east side the low land south of the old Cambridge Street fill should be raised to el. 263.0 to allow a uniform channel to be constructed.

4.5 Foundations

As the channel will be lined with concrete no special precaution against scour will be necessary for the structure foundations, provided the recommendations of the Foundation Report are followed. (EA 3111).

5. SUMMARY OF RECOMMENDATIONS

Effective Opening: a) Arch structure: About 70 feet span or 950 sq. ft. for a depth of water of 14 feet.

b) Partly lined channel (bridge): Base 50 feet, slopes 2:1; or 1100 sq. ft. for 14 foot depth.

...6

c) Fully lined channel (bridge): Base 40 feet, slopes 2:1; or 950 sq. ft. for 14 foot depth.

Minimum Soffit Elevation: 275.0 or 3 feet above upstream side Design HWL (272.0).

Location: As shown on Fig. 6.2.1 & 6.2.2

Foundation: As per BA 3111 Chapter 6.2

Channel: Gradient 0.1% maximum, slopes 2:1, drop structures or other means to achieve above gradient, channel base 40 or 50 feet for fully or partly lined channel respectively. The ends of the lining should have cutoff walls or should be turned into banks to prevent outflanking. The part lining should have cutoff walls as toe protection as well.

Alternative: Arch structure as described above with stepped invert and gradient of 0.1% max. Flared wingwalls should be added to the final stage (bridging of the proposed ramps). During the intermediate stage gabion wings on the upstream side only and provisions for the arch extensions should suffice. The lined invert should have cutoff walls into sound shale at the ends.

...7

The approximate extent of the channel work and the arch structure is shown on Figures 6.2.1 and 6.2.2 respectively.

prepared by _____

K.B. Jorns
ASS'T. BRIDGE HYDROLOGY ENGINEER.

approved by _____

J.D. Harris
BRIDGE HYDROLOGY ENGINEER

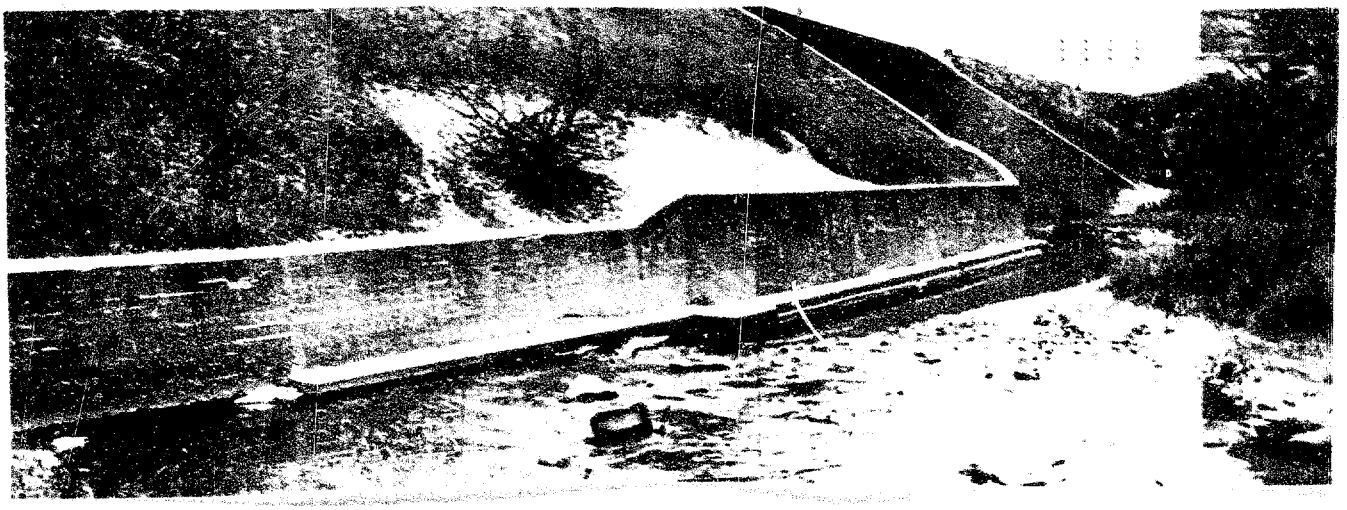
6. APPENDIX

Minico Creek at Q.E.W. Looking SE (Downstr.)

Looking Downstream from QEW to CNR-Bridge

Looking Upstream from CNR Bridge to QEW

Dr. 2058 Fig. C.4.1

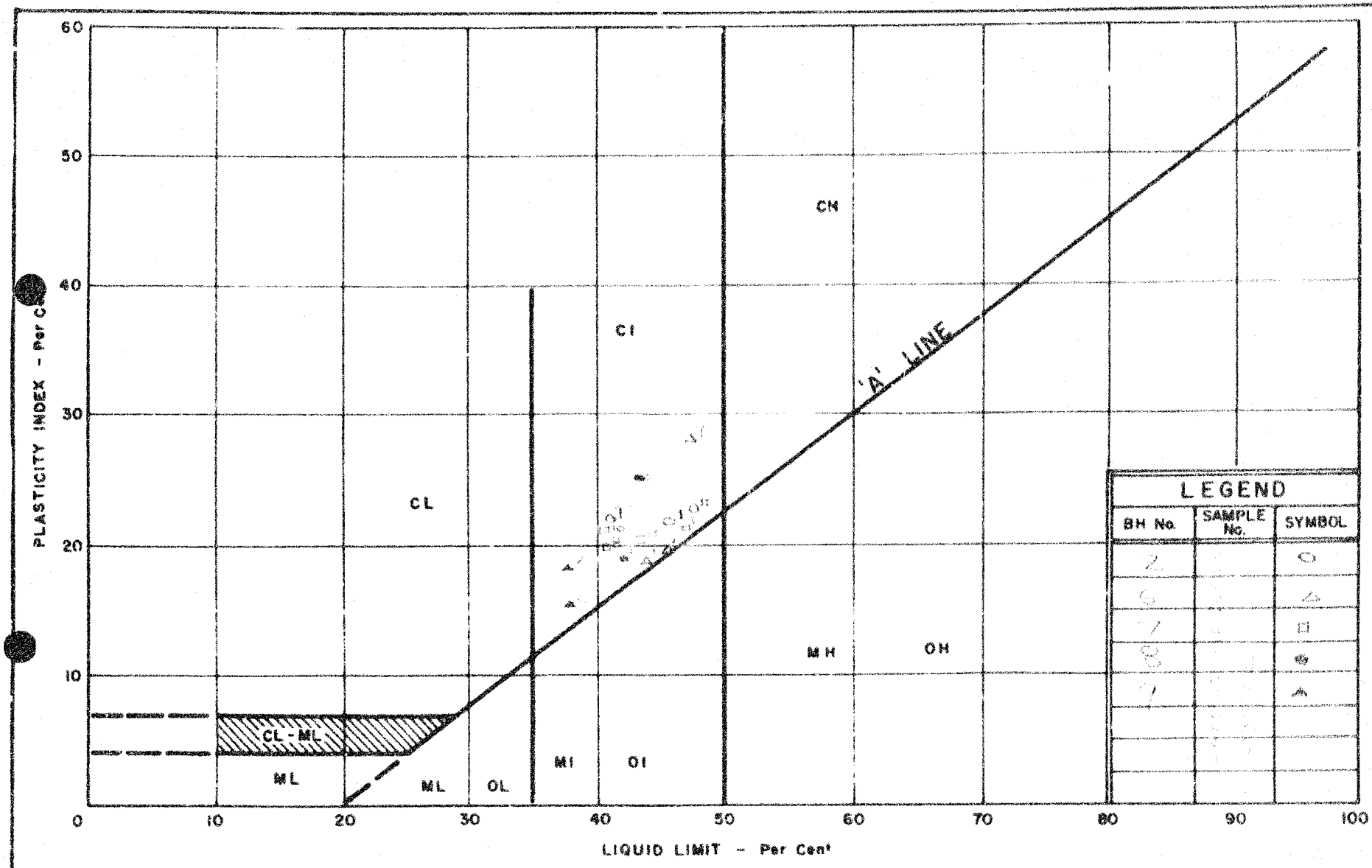


Retaining Wall on NE Side of CNR-Bridge

River Bend Between QEW and CNR

Looking Downstream from CNR to Hwy. 2 Bridge

FORM OB-MT-252
REVISED JULY, 1966



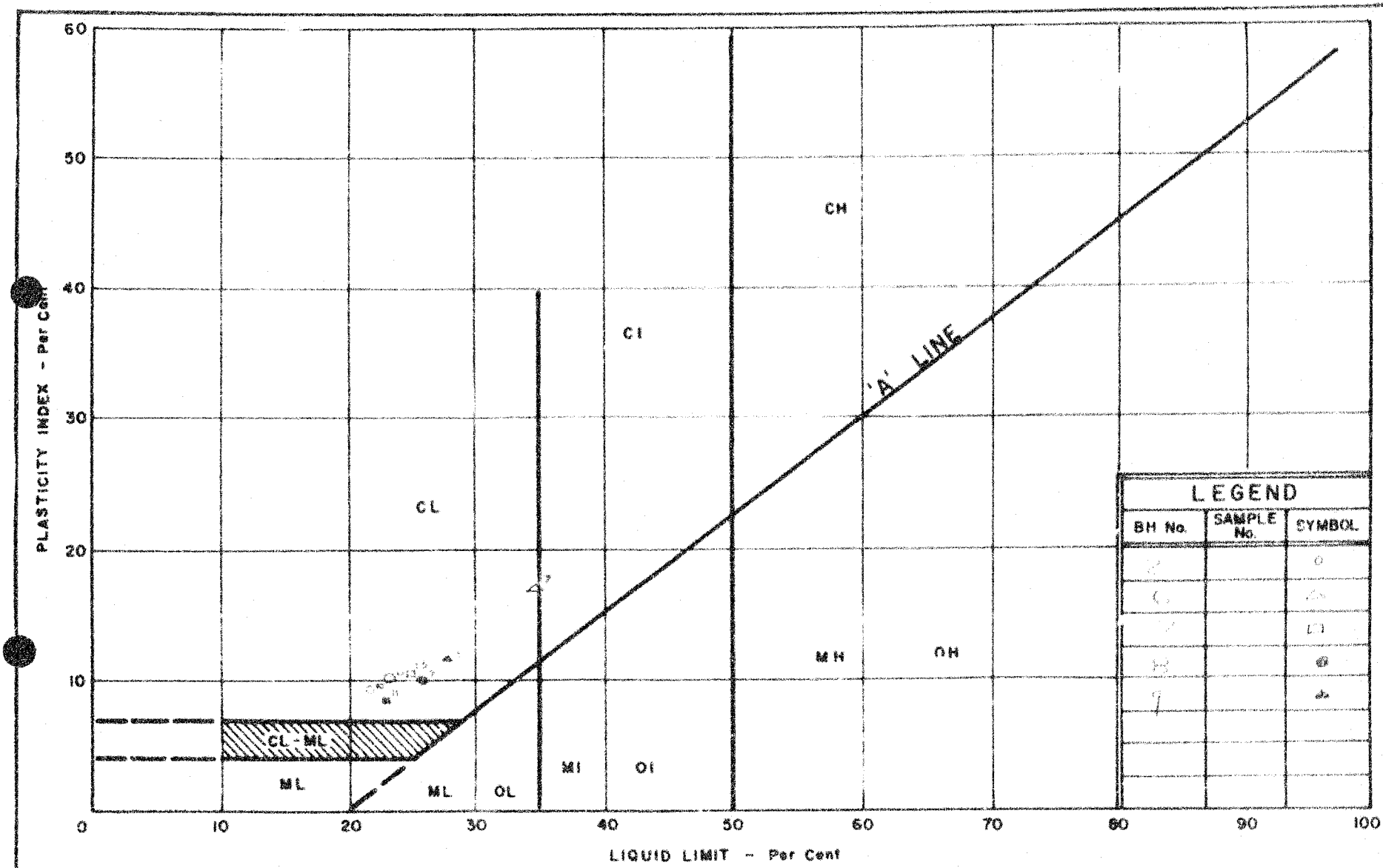
DEPARTMENT OF HIGHWAYS
MATERIALS and TESTING DIVISION

PLASTICITY CHART

SILTY CLAY

W.P. No. 12-66
JOB No. [illegible]
Fig. No. 1

FORM OB-MT-252
REVISED JULY, 1966



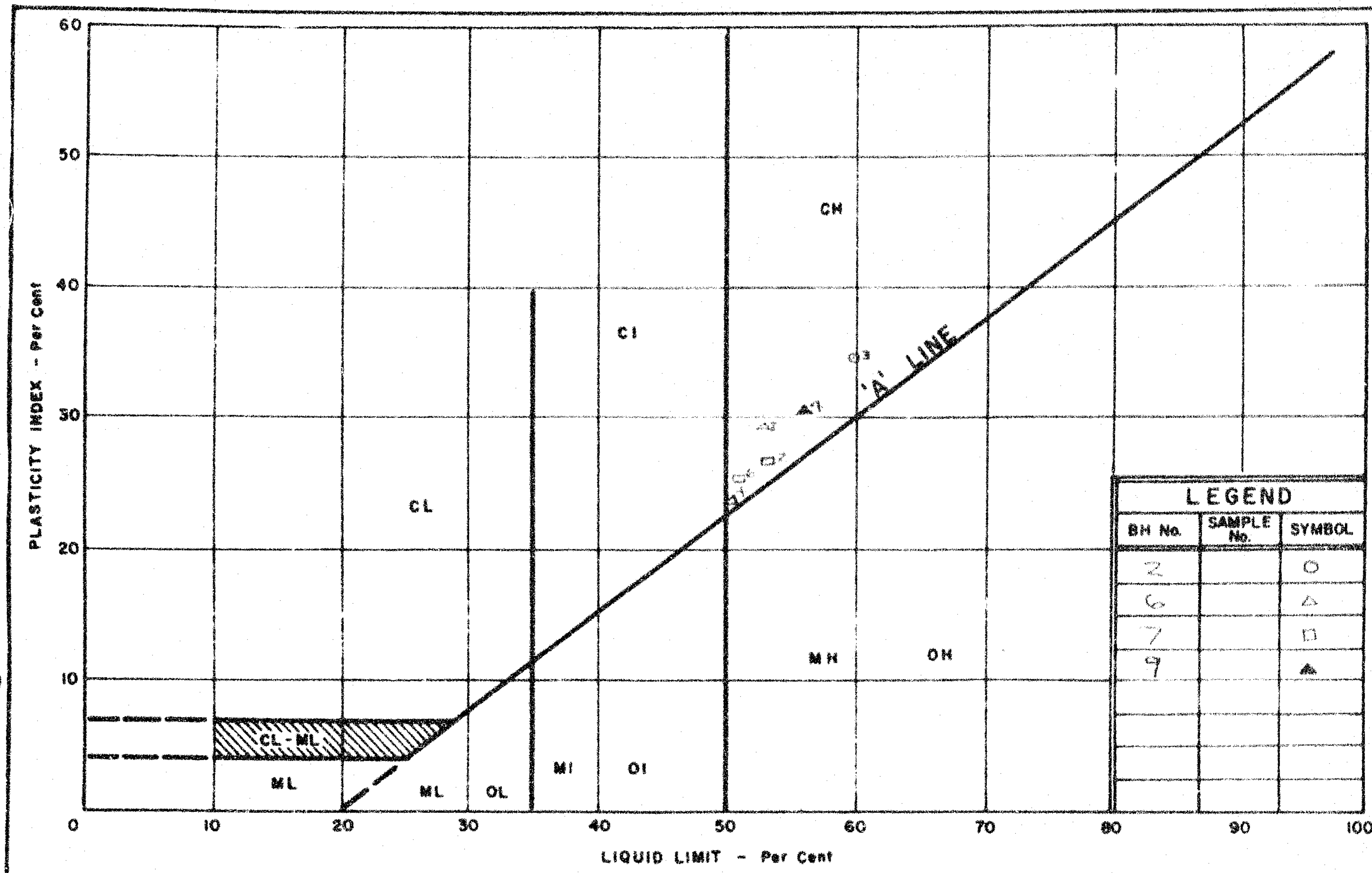
DEPARTMENT OF HIGHWAYS
MATERIALS and TESTING DIVISION

FIGURE 2 PLASTICITY CHART

W.P. No.

JOB No.

FORM OB-MT-252
REVISED JULY, 1966



DEPARTMENT OF HIGHWAYS
MATERIALS and TESTING DIVISION

FIGURE 3 **PLASTICITY CHART**

W.P. No. 13-66
JOB No. 70-11068

FOUNDATION OF CANADA ENGINEERING
CORPORATION LIMITED

TELEPHONE
481-4481

2200 YONGE STREET
TORONTO 12

CABLE ADDRESS
"FOUNDAHENG" TORONTO

March 17, 1970

Mr. A.G. Stermac, P.Eng.
Principal Foundation Engineer
Materials & Testing Office
Department of Highways, Ontario
Lab Building
Downsview 464, Ontario

Attention: Mr. M. Devata

Dear Sir,

QUEEN ELIZABETH WAY
HUMBER RIVER TO ROYAL YORK ROAD
W.P. 314-65-01

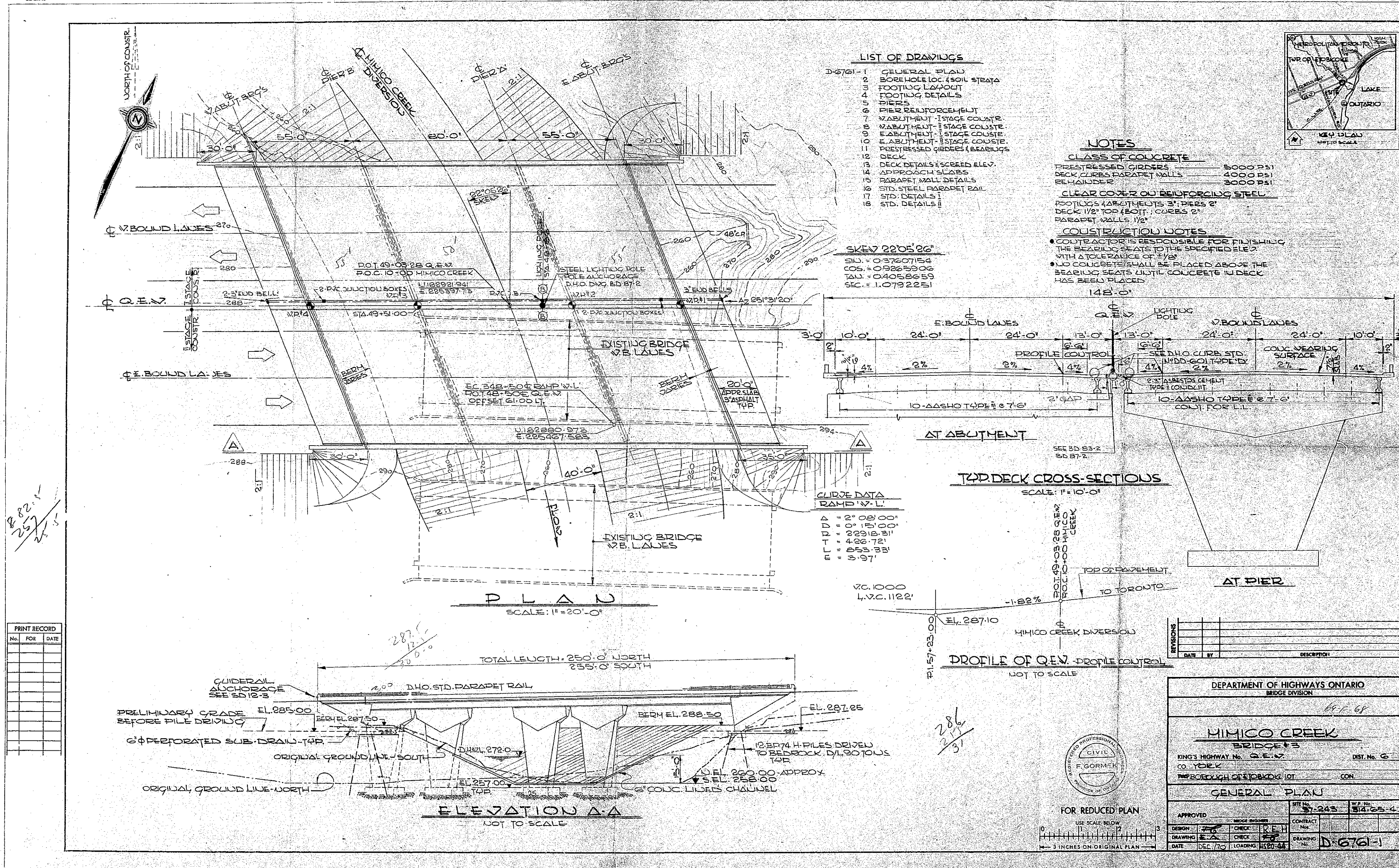
Further to our telephone conversation of today's date, we enclose herewith one (1) print of plan B-80-73 (sketch No. 46) showing the revised alignment of Mimico Creek. Please disregard the preliminary alignment now in your possession.

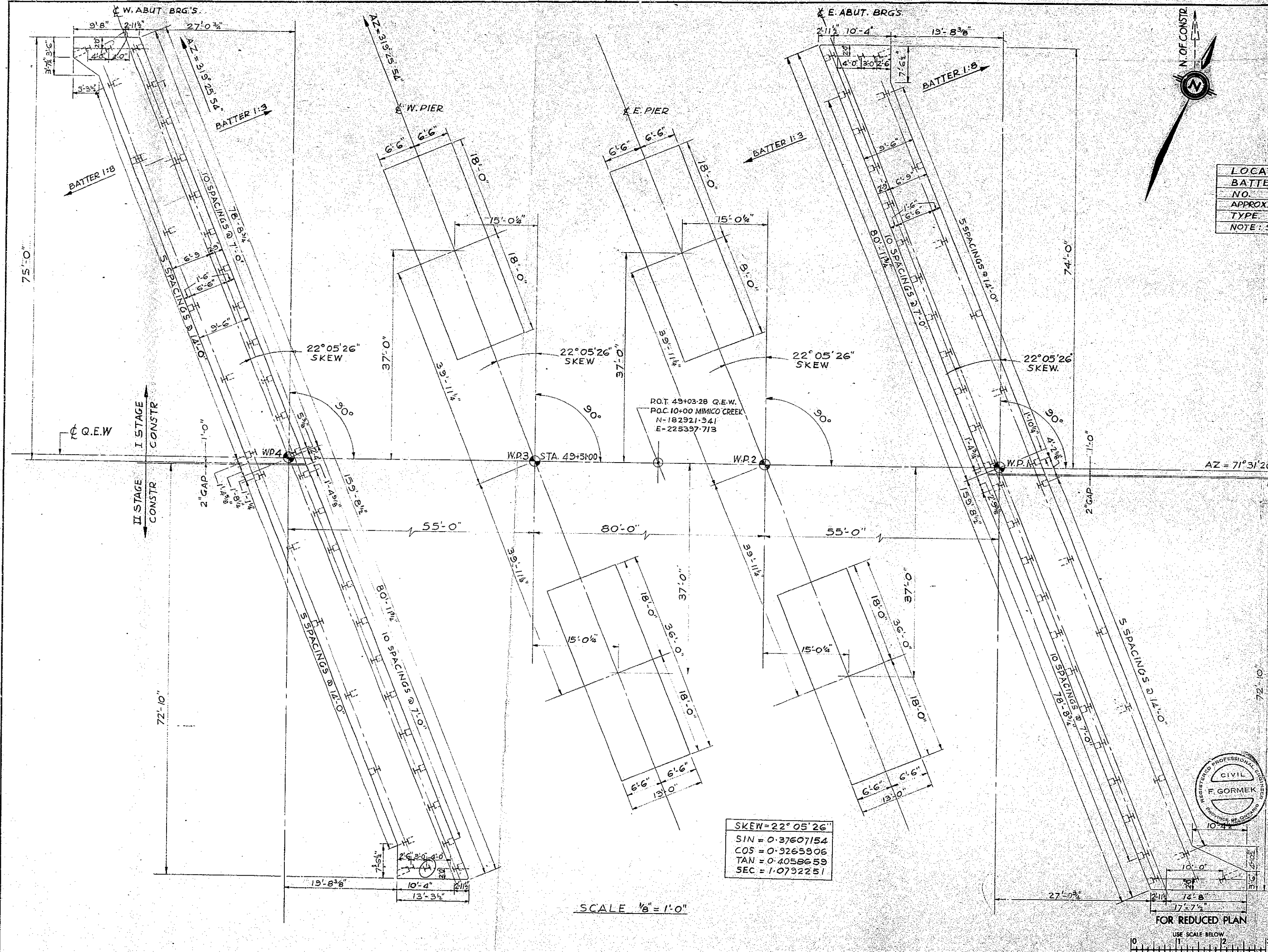
Yours very truly,
FOUNDATION OF CANADA ENGINEERING
CORPORATION LIMITED

Ronald J. Williams, P.Eng.
SENIOR PROJECT ENGINEER

KEH/bhw
3552-101-1
Encl.

cc: Mr. W.C. Friedmann - D.H.O., Downsview


LIST OF DRAWINGS
D-6761-1 GENERAL PLAN
2 BOREHOLE LOC. & SOIL STRATA
3 FOOTING LAYOUT
4 FOOTING DETAILS
5 PIERS
6 PIER REINFORCEMENT
7 W.ABUTMENT - I STAGE CONSTR.
8 W.ABUTMENT - II STAGE CONSTR.
9 E.ABUTMENT - I STAGE CONSTR.
10 E.ABUTMENT - II STAGE CONSTR.
11 PRESTRESSED GIRDERS & BEARINGS
12 DECK
13 DECK DETAILS & SCREED ELEV.
14 APPROACH SLABS
15 PARAPET WALL DETAILS
16 STD. STEEL PARAPET RAIL
17 STD. DETAILS I
18 STD. DETAILS II
NOTES
CLASS OF CONCRETE
PRESTRESSED GIRDERS 5000 PSI
DECK, CURBS, PARAPET WALLS 4000 PSI
REMAINDER 3000 PSI
CLEAR COVER ON REINFORCING STEEL
FOOTINGS & ABUTMENTS 3"; PIERS 2"
DECK 1 1/2" TOP & BOTT.; CURBS 2"
PARAPET WALLS 1 1/2"
CONSTRUCTION NOTES
• CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BEARING SEATS TO THE SPECIFIED ELEV. WITH A TOLERANCE OF ±1/8"
• NO CONCRETE SHALL BE PLACED ABOVE THE BEARING SEATS UNTIL CONCRETE IN DECK HAS BEEN PLACED
SKEW 22°05'26"
SIN. = 0.37607154
COS. = 0.92659906
TAN. = 0.4058659
SEC. = 1.0792251
KEY PLAN
NOT TO SCALE
METROPOLITAN TORONTO
TWP. OF ETOBICOKE
SITE
LAKE ONTARIO
NORTH OF CONSTR.
℄ MIMICO CREEK DIVERSION
℄ PIER 'B'
℄ PIER 'A'
℄ W.ABUT. BRG'S
℄ E.ABUT. BRG'S
30'-0" 55'-0" 80'-0" 55'-0" 30'-0"
22°05'26" SKEW
℄ W.BOUND LANES
℄ Q.E.W.
℄ E.BOUND LANES
I STAGE CONSTR.
II STAGE CONSTR.
P.O.T. 49+03.28 Q.E.W.
P.O.C. 10+00 MIMICO CREEK
N.182921.941
E.225397.713
STA. 49+51.00
2-P.V.C. JUNCTION BOXES
2-3" END BELLS
STEEL LIGHTING POLE
POLE ANCHORAGE
D.H.O. DWG. SD 87-2
EXISTING BRIDGE W.B. LANES
E.C. 348+50 ℄ RAMP 'W-L'
P.O.T. 48+50 ℄ Q.E.W.
OFFSET 61.00 LT.
N.182880.973
E.225467.585
BERM VARIES
APPR. SLAB 3" ASPHALT TYP.
FLOW
PLAN
SCALE: 1" = 20'-0"
CURVE DATA
RAMP 'W-L'
Δ = 2° 08' 00"
D = 0° 15' 00"
R = 22918.31'
T = 426.72'
L = 853.33'
E = 3.97'
148'-0"
℄ E.BOUND LANES
℄ Q.E.W.
LIGHTING POLE
℄ W.BOUND LANES
3'-0" 10'-0" 24'-0" 24'-0" 13'-0" 13'-0" 24'-0" 24'-0" 10'-0" 3'-0"
PROFILE CONTROL
SEE D.H.O. CURB STD. No. DD-601 TYPE 'D'
CONC. WEARING SURFACE
2-3" ASBESTOS CEMENT TYPE II CONDUIT
10-AASHO TYPE III @ 7'-6"
2' GAP
CONT. FOR L.L.
AT ABUTMENT
AT PIER
SEE SD 83-2
SD 87-2
TYP. DECK CROSS-SECTIONS
SCALE: 1" = 10'-0"
P.O.T. 49+03.28 Q.E.W.
P.O.C. 10+00 MIMICO CREEK
TOP OF PAVEMENT
TO TORONTO
V.C. 1000
L.V.C. 1122'
-1.82%
EL. 287.10
P.I. 57+23.00
℄ MIMICO CREEK DIVERSION
PROFILE OF Q.E.W. - PROFILE CONTROL
NOT TO SCALE
TOTAL LENGTH - 250'-0" NORTH
255'-0" SOUTH
GUIDERAIL ANCHORAGE SEE SD 12-3
D.H.O. STD. PARAPET RAIL
PRELIMINARY GRADE BEFORE PILE DRIVING
EL. 285.00
BERM EL. 287.50
BERM EL. 288.50
EL. 287.25
6" ϕ PERFORATED SUB-DRAIN - TYP.
ORIGINAL GROUND LINE - SOUTH
D.H.W.L. 272.0
12-BP74 H-PILES DRIVEN TO BEDROCK. D/L 90 TONS TYP.
N.EL. 260.00 - APPROX
S.EL. 258.00
EL. 257.00 TYP.
ORIGINAL GROUND LINE - NORTH
6" CONC. LINED CHANNEL
ELEVATION A-A
NOT TO SCALE
PRINT RECORD
No. FOR DATE
REVISIONS
DATE BY DESCRIPTION
DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE DIVISION
MIMICO CREEK
BRIDGE #3
KING'S HIGHWAY No. Q.E.W.
DIST. No. 6
CO. YORK
BOROUGH OF ETOBICOKE LOT CON
GENERAL PLAN
SITE No. 37-243
W.P. No. 314-65-4
APPROVED
DESIGN
CHECK
DRAWING
DATE DEC. '70
LOADING HS20-44
DRAWING No. D-6761-1
CIVIL
F. GORMEK
FOR REDUCED PLAN USE SCALE BELOW
3 INCHES ON ORIGINAL PLAN



PILES SUPPLIED

LOCATION	WEST. ABUT.			EAST ABUT.		
BATTER	1:3 ✓	1:8 ✓	0 ✓	1:3 ✓	1:8 ✓	0 ✓
NO.	30 ✓	8 ✓	2 ✓	30 ✓	8 ✓	2 ✓
APPROX. LENGTH(FT)	30 ✓	30 ✓	29 ✓	37 ✓	37 ✓	36 ✓
TYPE	12BP74 90 TONS. CAPACITY					
NOTE : SPACING OF PILES MEASURED AT UNDERSIDE OF FOOTING						

PRINT RECORD		
No.	FOR	DATE

REVISIONS		
DATE	BY	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER — CIVIL — F. GORMEK — PROVINCE OF ONTARIO

FOR REDUCED PLAN USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE OFFICE

69-F-68

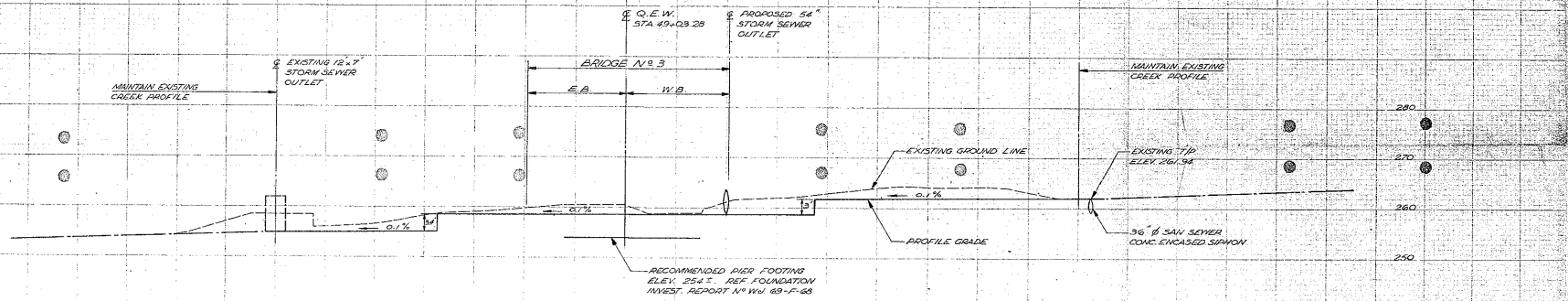
MIMICO CREEK

BRIDGE # 3

KING'S HIGHWAY No. Q E W. DIST. No. 6
CO. YORK
BOROUGH OF ETOBICOKE LOT CON.

FOOTINGS LAYOUT

APPROVED	BRIDGE ENGINEER			SITE No. 37-243	W.P. No. 314-65-4
DESIGN	FG	CHECK	R.E.H	CONTRACT Nos.	
DRAWING	M.J.Y	CHECK	FG	DRAWING No.	D-6761-3
DATE	DEC/70	LOADING	HS20-44		



FOR INFORMATION ONLY

SCALE	HOR. 1"=40' VERT. 1"=10'	DEPARTMENT OF HIGHWAYS	FENCO
DATE		TORONTO ONTARIO	FOUNDATION OF CANADA ENGINEERING CORPORATION LIMITED
	COMP.	DESIG.	QUEEN ELIZABETH WAY
DRAWN	A.J.	F.D.T.	PROFILE
CHKD.	K.E.H.	K.E.H.	MIMICO CREEK DIVERSION
APPD.			No. 3552-17-13 REV. No. 1