DEPARTMENT OF HIGHWAYS ONTARIO

23-18-24.

MEMORANDUM

To: Mr. B. R. Davis
Bridge Engineer
Bridge Division

Attn: Mr. S. McCombie

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

Date: May 16, 1967

Our File Ref.

In reply to

MAY 24 1967

Subject:

FOUNDATION INVESTIGATION REPORT

For Bridge #21
Hwy. #401, 27 and Richview
Expressway Interchange

District #6 (Toronto)

W.J. 67-F-38 --- W.P. 391-65

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:mt
Attach.

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

Foundation Files
General Files

TABLE OF CONTENTS

FOUNDATION INVESTIGATION REPORT

For Bridge #21
Hwy. #401, 27 and Richview
Expressway Interchange
District #6 (Toronto)

W.J. 67-F-38 -- W.P. 391-65

1. INTRODUCTION:

A foundation investigation at the site of Bridge #21 was requested by Mr. W. Melinyshyn, Regional Bridge Location Engineer, in a memo, dated April 27, 1967. Bridge #21 which is part of the proposed Hwy. #401, 27 and Richview Expressway Interchange was originally included in the yellow contract (Report #66-F-102). We were advised however, by the Bridge Location Section, that this structure would be built earlier, consequently it was taken out of the contract.

According to the request a field and laboratory investigation was undertaken by this section, the results of which are discussed in this report together with recommendations pertaining to the foundations.

2. DESCRIPTION OF THE SITE AND THE FIELD INVESTIGATION:

The site of the proposed bridge is located south east of the existing Hwy. #401 West bound lanes, on each side of the existing Hwy. #27. East of Hwy. #27 the ground is rather flat, while west of it is somewhat hilly.

Two boreholes, numbers 27 and 28 were carried out during the preliminary investigation in December 1966. Three (3) additional boreholes (1, 2, 3) were placed for this present report at the locations of the proposed piers. The boreholes were performed by means of a continuous flight auger, taking split spoon samples at regular intervals. The penetration of

Cont'd. /2.....

the samples, driven by a 140 lb. hammer, falling freely a distance of 30 inches, was recorded as Standard Penetration "N" values.

The locations and elevations of the boreholes, as well as the soil profile through the borings, are shown on Drawing #67-F-38A.

(3) SOIL CONDITIONS:

3.1) General:

The subsoil was found to be glacial till and it is divided into fine and coarse layers. It is believed that footing excavations within the cohesive strata may be achieved without major dewatering scheme; in the excavations extending to the coarse layer however, dewatering problems may be encountered.

Detailed description of the subsoils were presented in our preliminary report 66-F-102, therefore, just a brief summary is given here.

3.2) Clayey silt with sand:

This is the uppermost layer, extending from ground level down to El. 462 - 465', the total depth being 8 - 28 ft. The consistency of the layer is very stiff to hard, with penetration "N" values between 20 and over 100 blows per foot. The layer exhibits slight plasticity, the plastic limit averaging 18 - 20% and the liquid limit 28 - 31%. The natural moisture content was observed to be below the plastic limit.

3.3) Silty sand and sand:

Underlying the clayey silt a 6 - 10 ft. thick layer of silty sand and sand follows having very dense relative density. Some gravel and occasionally traces of clay were also found in the samples. Laboratory grain size analyses indicated some 1-37% of gravel, 37-62% of sand and 27-58% of silt and clay within the samples tested.

/3.....

3.4) Clayey silt with sand and shale fragments:

The coarse layer was underlain by a hard stratum of clayey silt containing some sand and fragments of shale. This is a transition between overburden and bedrock, it changes gradually to weathered and sound shale. The obtained penetration "N" values were all much above 100 blows per foot.

3.5) Ground water:

Groundwater was observed in the boreholes in depths of 2-5ft. below ground level, corresponding to geodetic elevations of 466-489 feet.

4. RECOMMENDATIONS:

Bridge #21 is proposed to be a five span structure and will carry the east-south ramp of Hwy. #401 over Ramp N-E (local) and Brown's Line. According to the profiles provided by the Bridge Location Section, the top of pavement of Brown's Line at the crossing is assumed to be at approximate elevation 476 ft., and that of ramp N-E (local) about elevation 478 ft.

Subsoils at the site appear to display sufficient strength to support the structure on spread footings at relatively shallow depth.

Footing for the south abutment may be placed anywhere below elevation 486 ft., but a cover of min. 4 ft. above the base of the footing should be provided for frost protection. A safe design pressure of 4 TSF may be assumed on the footing.

Spread footings for Pier #1 and 2 (see plan on Drawing 67-F-38A) may be placed 4 ft. below finished grade, but not higher than elevation 475 ft., using a design pressure of 4 TSF.

Pier #3 should also be supported on spread footing at or below elevation 470 ft. with an allowable load of 4 TSF.

/4.....

4. RECOMMENDATIONS (cont'd)

Pier #4 and the North Abutment might be supported on spread footing at elevation not higher than 463 ft. Since the footing excavations would be somewhat deep, piled foundation appears to be more practical. It is assumed that $12\frac{3}{4}$" x 1/4" diam. steel tube piles will penetrate to approximate elevation 450-455 ft. and 12 BP @ 53 steel H piles to about elev. 445-455 ft. 70 T/pile safe load may be suggested on the above type piles.
The working load on the piles however, must be checked during pile driving by means of the Hiley formula (D.H.O. Standard DD 1218 and 1219).

For perched abutment the pile cap may be placed within the approach fill. In this case care should be taken not to have bouldery fill at the location of the abutment footing.

5. MISCELLANEOUS:

The field work performed during the period May 5 to May 8, 1967 was supervised by Mr. A. Prakash, Project Foundation Engineer. Equipment used was owned and operated by Canadian Longyear Ltd., Toronto. This report was written by Mr. A. K. Barsvary, Senior Foundation Engineer and reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

May 1967

APPENDIX I

FORM OB-MT-126
66-4546

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

JOB 67-F-38 LOCATION Hwy. 401 & 27, 870,400 N, 979,277 E ORIGINATED BY AP
W.P. 391-65 BORING DATE May 5, 1967 COMPILED BY KAL
DATUM Geodetic BOREHOLE TYPE Flight Auger 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.	LIQUID LIMIT w_L — PLASTIC LIMIT w_P — WATER CONTENT w — WATER CONTENT % (10, 20, 30)	BULK DENSITY P.C.F.	REMARKS
483.2	GROUND LEVEL									
0.0	Clayey silt (1/2" thick seam of sand at 9.0 ft. depth)		1	SS	23	480				▼WL. 477.6'
	Very stiff to Hard		2	SS	82					
			3	SS	70	470				
463.7			4	SS	100/7"					
463.1	Sand (fine to med.)									Gr.5, Sa.37 Si.&Cl. 58
20.1	End of Borehole					460				

FORM DB-MT-126
66-4548

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 67-F-38 LOCATION Hwy 401 & 27 870,495 N, 979,295 E ORIGINATED BY AP
W.P. 391-65 BORING DATE May 5, 1967 COMPILED BY AP
DATUM Geodetic BOREHOLE TYPE Bombardier Flight Auger CHECKED BY

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT / SHEAR STRENGTH P.S.F.	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w — WATER CONTENT % 10 20 30	BULK DENSITY γ P.C.F.	REMARKS
475.5	GROUND LEVEL									
0.0	Clayey silt with sand. (Glacial Till) Hard		1	SS	46	470				WL.470.8
465.0			2	SS	100/4"					
10.5	Sand to silty sand with some gravel. Very dense.		3	SS	130	460				Gr.27,Sa.46 Si.& Cl.27
455.5			4	SS	150/4½"					Gr.10,Sa.43 Si.& Cl.47
20.0	Clayey Silt Hard		5	SS	100/1"					
451.9										
23.6	End of Borehole					450				

FORM 08-MT-126
66-4546

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 3

FOUNDATION SECTION

JOB 67-F-38 LOCATION Hwy. 401 & 27, 870,562 N, 979,355 E ORIGINATED BY AP
W.P. 391-65 BORING DATE May 8, 1967 COMPILED BY AP
DATUM Geodetic BOREHOLE TYPE Bombardier Flight Auger 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.	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w — WATER CONTENT % (10, 20, 30)	BULK DENSITY γ P.C.F.	REMARKS
472.0 GROUND LEVEL										
0.0	Clayey silt to silt with sand. Very stiff to hard.		1	SS	20	470				
462.5			2	SS	65					
9.5	Sand to sandy silt with gravel. Very dense.		3	SS	155/11"	460				Gr.37,Sa.38 Si.& Cl. 25
452.0			4	SS	165/6"					Gr.21,Sa.39 Si.& Cl. 40
20.0	Clayey silt with sand and fragments of shale. Hard.		5	SS	185/6"	450				
			6	SS	160/6"					Gr.39,Sa.43 Si.& Cl. 18
438.9			7	SS	100/1"	440				
33.1	End of Borehole									

FORM 08-MT-126
66-4546

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 27

FOUNDATION SECTION

JOB 67-F-38 (66-F-102) LOCATION 870,273 N; 979,195 E., Hwy. 401 & 27 ORIGINATED BY D S.
W.P. 391-65 BORING DATE Dec. 20, 21, 1966 COMPILED BY D M
DATUM Geodetic BOREHOLE TYPE Augering CHECKED BY AR

SOIL PROFILE ELEV./DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE
491.8	GROUND LEVEL					
0.0	Clayey silt with sand		1	SS	112	490
	Brown / Grey		2	SS	62	480
	(glacial till) hard		3	SS	42	
			4	SS	55	470
463.8			5	SS	45	
28.0	Silty sand with a trace of gravel. Very dense.		6	SS	60/4"	460
457.8						
34.0	Clayey silt with sand. (glacial till) hard		7	SS	70/4"	
			8	SS	70/6"	450
446.8			9	SS	100/6"	
45.5	End of Borehole					

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT — 20 40 60 80 100
SHEAR STRENGTH P.S.F.

LIQUID LIMIT ——— w_L
PLASTIC LIMIT ——— w_P
WATER CONTENT ——— w
w_P w w_L
WATER CONTENT % 20 40 60

BULK DENSITY γ P.C.F.

REMARKS

∇ 489.3' Dec.22/66

Gr.8, Sa.37 Si.39, Cl.16

Gr.8, Sa.48 Si.37, Cl.7

FORM 08-MT-126
66-4546

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 28

FOUNDATION SECTION

JOB 67-F-38 (66-F-102) LOCATION 870,609 N; 979,356 E., Hwy. 401 & 27 ORIGINATED BY D.S
W.P. 391-65 BORING DATE December 16, 1966 COMPILED BY D.M
DATUM Geodetic BOREHOLE TYPE Augering 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 1000) / SHEAR STRENGTH P.S.F.	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w — WATER CONTENT % (20 40 60)	BULK DENSITY γ P.C.F.	REMARKS
471.1	GROUND LEVEL									
0.0	Clayey silt with sand. Brown - slightly weathered. (glacial till) Firm to v.stiff. Hard.		1	SS	34	470				WL.465.6'
463.1										
8.0	Silty sand Very dense Grey		2	SS	74	460				Gr.1,Sa.62 Si.32,Cl.5
455.8			3	SS	54/6"					
15.3	Clayey silt with sand. Hard dry		4	SS	70/6"	450				
	Shale Fragments		5	SS	69/6"					Gr.7,Sa.50 Si.24,Cl.19
			6	SS	110/3"	440				
436.0			7	SS	65/½"					
35.1	End of Borehole									

ABBREVIATIONS USED IN THIS REPORT

SOIL PROPERTIES

γ	UNIT WEIGHT OF SOIL (BULK DENSITY)
γ_s	UNIT WEIGHT OF SOLID PARTICLES
γ_w	UNIT WEIGHT OF WATER
γ_d	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
γ'	UNIT WEIGHT OF SUBMERGED SOIL
G	SPECIFIC GRAVITY OF SOLID PARTICLES $G = \frac{\gamma_s}{\gamma_w}$
e	VOID RATIO
n	POROSITY
w	WATER CONTENT
S_r	DEGREE OF SATURATION
w_L	LIQUID LIMIT
w_P	PLASTIC LIMIT
I_P	PLASTICITY INDEX
s	SHRINKAGE LIMIT
I_L	LIQUIDITY INDEX $= \frac{w - w_P}{I_P}$
I_C	CONSISTENCY INDEX $= \frac{w_L - w}{I_P}$
e_{max}	VOID RATIO IN LOOSEST STATE
e_{min}	VOID RATIO IN DENSEST STATE
I_D	DENSITY INDEX $= \frac{e_{max} - e}{e_{max} - e_{min}}$
	RELATIVE DENSITY D_r IS ALSO USED
h	HYDRAULIC HEAD OR POTENTIAL
q	RATE OF DISCHARGE
v	VELOCITY OF FLOW
i	HYDRAULIC GRADIENT
k	COEFFICIENT OF PERMEABILITY
j	SEEPAGE FORCE PER UNIT VOLUME
m_v	COEFFICIENT OF VOLUME CHANGE $= \frac{-\Delta e}{(1+e)\Delta \sigma'}$
c_v	COEFFICIENT OF CONSOLIDATION
C_c	COMPRESSION INDEX $= \frac{\Delta e}{\Delta \log_{10} \sigma'}$
T_v	TIME FACTOR $= \frac{c_v t}{d^2}$ (d, DRAINAGE PATH)
U	DEGREE OF CONSOLIDATION
τ_f	SHEAR STRENGTH
c'	EFFECTIVE COHESION INTERCEPT
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
	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
$\log_e a$ 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 (YOUNGS 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_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

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

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

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

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

From: Bridge Division,
Downsview, Ontario.

Date: April 27th, 1967.

Our File Ref.

In reply to

Subject: W.P. 391-65, Bridge No. 21,
Highway No. 401/27 Richview Interchange,
District No. 6.

67F-38

Attached are two prints of site plan 3214-8A-21 showing the approximate location of pier and abutment footings for the proposed structure.

Two boreholes, No. 27 and No. 28 in report WJ. 66-F-102 have already been done for this structure, however staging of the interchange entails building of this structure and eastern approach fill prior to the start of the "Yellow Contract" i.e. late summer award of this year. We expect to get the structure design underway this coming week and would like to have the foundation report as soon as possible.

for J. C. McAllister,
For A. Mesingyshyn,
Regional Bridge Location Engineer.

JCMcA/av
Attach.

c.c. - J. Crowle,
- P. Pomeat

401 & Keele St.
Downsview, Ontario

June 20, 1967

Canadian Longyear Limited
35 Brydon Drive
Rexdale, Ontario

Dear Sirs:

This is to confirm our request of May 2, 1967 for the supply of a Penn Drill together with all necessary equipment, as specified under the terms of our Contract Agreement, at Hwy. 401 and Hwy. 27 Interchange, Toronto, Ontario

This project bears Job Number 67-F-38.

Yours truly,

K. Selby

KS:mt

K. Selby
Supervising Foundation Engineer
for A. G. Stermac
Principal Foundation Engineer

Department of Highways Ontario

Copy for the information of
Mr. A. Stermac, Principal Foundation Engineer,
Room 107, Lab. Building
Mr. W. Melinyshyn,
Reg. Bridge Location Engineer,
Central Region,
Administration Building

Bridge Division,
Downsview, Ontario

June 15, 1967

(1287. 97) 67-F-38 CONT #11

Bridge #21
Ramp E-S over Brown's Line
W.P. 391-65, Site 37-914
Hwys. 401 & 27, District 6

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-6236-P for the above-mentioned structure.

The estimated cost of the proposed structure is $370,000. This cost includes tender, materials, engineering and sundry construction.

Any comments or revisions you may have should be submitted within three weeks.

C.S. Grebski,
Bridge Design Engineer

CSG:rd

Attach.

c.c. S. McCombie
A. Stermac
R. Forrest
E. Cross

PILES - EL 445 - EL 455

SOIL IS NOT BEDROCK BUT IS -
CLAYEY SILT WITH SAND & SMALL FRAGMENTS

No other comment M. L. Sully June 27th 67

cc: Foundations Files

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

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

June 29, 1967

Bridge #21, W.P. 391-65, Contract #11, W.J. 67-F-38
-- Hwy's. #401 & #27, District #6 (Toronto) --

We have reviewed Preliminary Plan D-6236-P for the above mentioned structure.

Our recommendations state that practical refusal of the piles should be reached between El. 445 and El. 455 in the 'clayey silt with sand and shale fragments' stratum. Your drawing shows bedrock at approximate elevation 440.0. This is incorrect. No bedrock was encountered in any boring for this structure.

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

KGS/MdeF

cc: Messrs. S. McCombie
W. S. Melinyshyn
Foundations Files
Gen. Files

401 & Keele Street
Downsview, Ontario

November 10, 1967

Master Soil Investigation
104 Kenhar Drive
Weston, Ontario

Dear Sirs:

This is to confirm our request of October 24, 1967 for the supply of a Penn Drill together with all necessary equipment, as specified under the terms of our Contract Agreement, at Hwy. 401 & Hwy. 27, Toronto, Ontario, on October 26, 1967.

This project bears Job Number 67-F-38.

Yours truly,

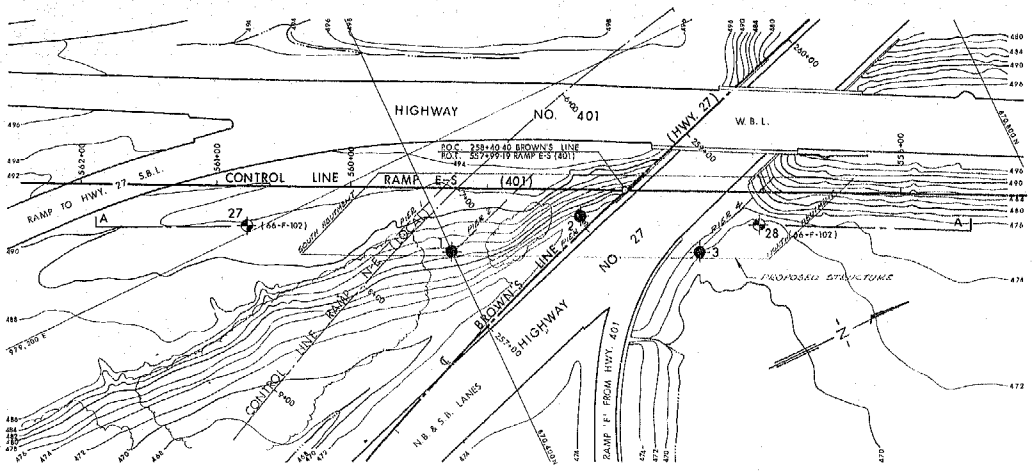
K. G. Selby

KGS:mt

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

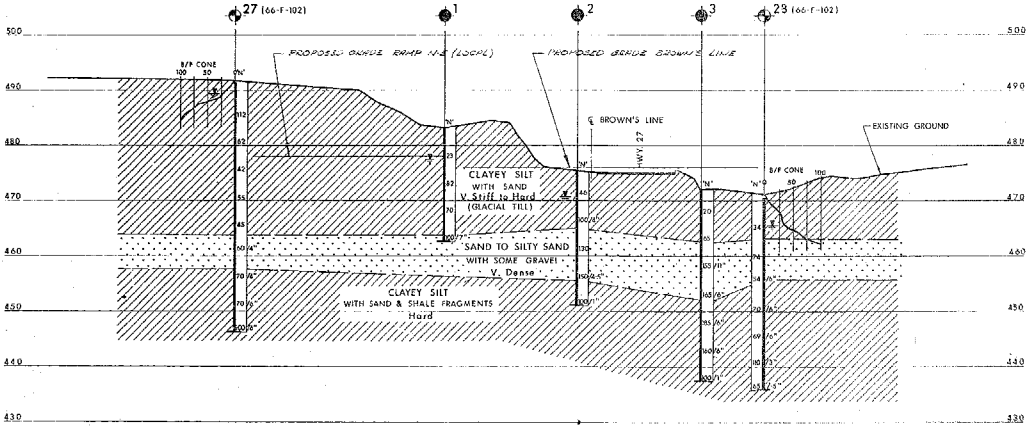
cc: H. Konings
Foundation Files 110
General File

#67. F. 38
W. P. #391-65
HWY. #401, 27 AND
RICHVIEW
EXPRESSWAY
INTERCHANGE
BRIDGE #21



PLAN

SCALE 40 20 0 40 80 FT

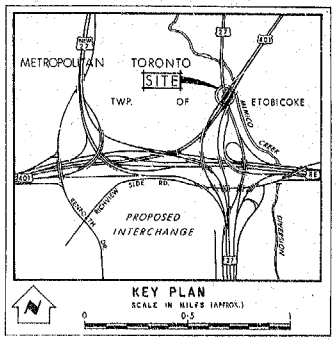


SECTION A-A

SCALE

VERT. 10 5 0 10 20

HORIZ. 40 20 0 40 80 FT.



KEY PLAN

SCALE IN MILES (APPROX.)

0 0·5

LEGEND

- Bore Hole
- Cone Penetration Hole
- Bore & Cone Penetration Hole
- Water Levels established at time of Field Investigation. DEC. 65 & MAY 67

NO.	ELEVATION	CO-ORDINATES NORTH	CO-ORDINATES EAST
1	483·2	870,400	979,277
2	475·5	870,495	979,295
3	472·0	870,562	979,353
27	491·8	870,273	979,195
28	471·1	870,609	979,356

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		
DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS – ONTARIO

MATERIALS & TESTING DIVISION – FOUNDATION SECTION

BRIDGE Nº 21

RAMP E-S (401) OVER HWY. 27

KING'S HIGHWAY NO. 401 & 27 INTERCHANGE DIST. NO. 6

CO. YORK METRO TORONTO

TWP. ETOBICOKE LOT CON.

BORE HOLE LOCATIONS & SOIL STRATA

SUBM'D A.B.	CHECKED J.J.	W.P. NO. 391-65F	M.B.T. DRAWING NO. 67-F-38A
DRAWN S.O.	CHECKED	JOB NO. 67-F-38	
DATE 15 MAY 1967		SITE NO.	BRIDGE DRAWING NO.
APPROVED		CONT. NO.	

REF. NO. B80-80