



ONTARIO

DEPARTMENT OF PUBLIC WORKS

Parliament Buildings,  
Toronto 2, Ontario,  
June 19, 1964.

MEMORANDUM TO:

Mr. A.T.C. McNab  
Deputy Minister  
Department of Highways

RE: C.F.P. District Headquarters Building  
DEARSVILLE, Ontario

Reference our discussion in your office on June 4, 1964, regarding the removal of earth from the site of the proposed subject noted building.

Since the above discussion, we have examined the site data recently provided by your Department and our Chief Structural Engineer now advises that we can proceed to design the building foundations using spread footings instead of piles as previously considered.

This office has also been advised that after removal of earth from the present Highway project, very little fill will be required by us to bring the grade to the desired levels.

May I express our appreciation for your personal assistance and that of your staff, in particular, the assistance rendered by your Mr. D. Farren, Assistant Road Design Engineer.

  
E. J. Stone,  
Assistant Chief Architect.

cc: Mr. D.G. Urwin  
Mr. G.L. Brown  
Mr. P. Van't Hof  
Mr. C. Daniel  
Mr. A. L. Pipe

## MEMORANDUM

To: Mr. D. W. Farren,  
Assistant Road Design Engr.,  
Road Design Division,  
Admin. Bldg.

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

DATE: July 29, 1964

Our File Ref.

IN REPLY TO

SUBJECT:

## REPORT ON SUBSOIL CONDITIONS

At

D.H.C. Borrow Area - Keele St.,  
and Hwy. #401, Toronto By-Pass,  
District #6

W.J. 64-7-42 -- Cont. 64-108

Attached, we are forwarding to you, our report  
on the subsoil conditions existing at the above site.

We believe that the information contained therein  
will be sufficient for your purposes. If further information  
is required, please do not hesitate to contact our Office.

KGS/MdeP  
Attach.

T. J. Kovich

cc: Foundations Office  
Gen. Files

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

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# REPORT ON SUBSOIL CONDITIONS

At

D.H.O. Borrow Area - Keele St.  
and Hwy. #401, Toronto By-Pass,  
District #6  
W.J. 64-F-42 -- Cont. 64-108

## 1. INTRODUCTION:

The Foundation Section were requested verbally, on June 4, 1964, by Mr. D. Farren, Assistant Road Design Engineer, to carry out a number of borings on the D.H.O. borrow area at the South-West corner of the Hwy. #401 and Keele St. intersection in order to determine the subsoil conditions existing at the site. The following report contains the findings of this investigation.

## 2. SUBSOIL CONDITIONS:

A total of ten borings was carried out at the site. Similar material was encountered in all drill holes. The material consisted of at least 35 ft. of stiff to hard clayey silt with traces of sand and gravel. Undrained shear strengths, as determined from field vane tests, ranged from 1600 p.s.f. to more than 2000 p.s.f. The lower values of shear strength were found to occur below a depth of about 20 ft. as measured from existing ground level. Detailed description of the soil types, together with the results of field and laboratory tests, are shown on the accompanying bore log sheets attached to this report. Drawing #64-F-42 shows the borehole locations together with the inferred subsoil stratigraphy.

3. CONCLUSIONS:

The investigation has revealed the presence of at least 35 ft. of stiff to hard clayey silt. Up to 12 ft. of material will be removed during the present construction of Hwy. #401. After removal of this material, the area will be utilized by the Department of Public Works, and it is intended to construct some buildings on the site. Generally speaking, safe net footing pressures in the order of 2000 to 4000 p.s.f. can be assumed for design purposes for the future buildings, depending on the actual depth of the footing within the clayey silt deposit. Actual design pressures, whilst falling within the above range, cannot be recommended until such time as the details of the proposed buildings are known.

4. SUMMARY:

A foundation investigation at the site of the D.H.O. borrow area at the Keele St. and Hwy. #401 intersection is reported.

Subsoil at the site was found to consist of at least 35 ft. of stiff to hard clayey silt.

When the present stripping programme is completed, buildings intended to be constructed on the area may be supported on spread footings with net design pressures ranging from 2000 to 4000 p.s.f. The actual design pressure will be dependent on the depth of footing. Recommendations for the latter can be made when full details of the proposed buildings are known.

5. MISCELLANEOUS:

The field work was carried out on June 5, 6, and 8, 1964, by Dominion Soil Investigation Ltd., under the supervision of Mr. P. Payer and Mr. H. Szymanski. This report was prepared by Mr. K. G. Selby, Senior Foundation Engineer.

July 1964.

APPENDIX I.



DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH DIVISION

## RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 64-R-42 LOCATION Sta. 240+00 (400' Lt.) ORIGINATED BY H.S.  
W.P.                      BORING DATE June 5, 1964. COMPILED BY H.S.  
DATUM G.S.C. BOREHOLE TYPE 4" Auger. CHECKED BY K.S.

SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT ----- WL PLASTIC LIMIT ----- WP WATER CONTENT ----- W		BULK DENSITY PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER TYPE	ELEV SCALE	SHEAR STRENGTH P.S.F.  + Field Vane Test Unconfined Shear Strength 400 800 1200 1600 2000	Wp	WL		
552.0	Groundlevel								
0.0									
				550					
			1 SS 16 for 2"						(Boulder) El. 548.0 = 1 day after drilling.
			2 SS 40						Gr-5% Sa-25% Si-49% Cl-21%
			3 SS 37						
				540					
			4 SS 38						Gr-3% Sa-28% Si-51% Cl-18%
			5 SS 21						
			6 TW PM						142.0 142.0 141.0 140.0
				530					
			7 TW PM						131.0 138.0 135.0
			8 SS 36						Gr-11% Sa-25% Si-47% Cl-17%
				520					
519.0									
33.0	End of borehole.								
				510					



DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH DIVISION

## RECORD OF BOREHOLE NO. 3

FOUNDATION SECTION

JOB 64-F-42 LOCATION Sta. 241+00 (400' Lt.) ORIGINATED BY H.S.  
W.P. \_\_\_\_\_ BORING DATE June 6, 1964. COMPILED BY H.S.  
DATUM G.S.C. BOREHOLE TYPE 4" Auger CHECKED BY K.S.

SOIL PROFILE		SAMPLES		BLOWS / FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT _____ W <sub>L</sub> PLASTIC LIMIT _____ W <sub>P</sub> WATER CONTENT _____ W <sub>c</sub> *p _____		BULK DENSITY p <sub>o</sub> p <sub>r</sub>	REMARKS	
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE			SHEAR STRENGTH P.S.F. + Field Vane Test o Unconfined Shear Strength 400 800 1200 1600 2000		WATER CONTENT % 10 20 30				
549.5	Groundlevel											
	Clayey silt with some sand and traces of gravel. Hard to firm.	1	SS	11							6 days after drilling. ▽ El. 546 Gr-8% Sa-11% Si-63% Cl-18%  Gr-2% Sa-24% Si-53% Cl-21%	
		2	SS	47								
		3	SS	52	54.0							
		4	SS	43								
		5	SS	19								
		6	SS	18	53.0							
		7	TW	PM		b	+ 2.0					114.0
		8	TW	PM		b	> +					133.0
		9	SS	21	52.0		+ 1.8					
		10	SS	16			+ 1.7					
514.5												
35.0	End of borehole.				51.0							

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

JOB 64-F-42 LOCATION Sta. 242+00 (400' Lt.) ORIGINATED BY H.S.  
W.P. June 6, 1964. BORING DATE June 6, 1964. COMPILED BY H.S.  
DATUM G.S.C. BOREHOLE TYPE 4" Auger CHECKED BY K.S.

SOIL PROFILE		SAMPLES		BLOWS / FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W			BULK DENSITY P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE			SHEAR STRENGTH P.S.F. + Field Vane Test o Unconfined Shear Strength 400 800 1200 1600 2000					wp	w	wL		
550.0	Groundlevel				550										
0.0															
	Clayey silt with some sand and traces of gravel. Very stiff to stiff.	1	SS	31											
					540										
		2	SS	29											
		3	SS	32											
		4	SS	29											
		5	SS	23	530										
		6	TW	PM 7" for 11"											
		7	SS	16	520										
		8	SS	23											
516.0															
34.0	End of borehole.														
					510										

542.2  
6 days  
after drill-  
ing.  
Gr-0%  
Sa-30%  
Si-52%  
Cl-18%

Gr-1%  
Sa-26%  
Si-53%  
Cl-20%

137.0

Gr-1%  
Sa-22%  
Si-53%  
Cl-24%

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH DIVISION

## RECORD OF BOREHOLE NO. 5

FOUNDATION SECTION

JOB 64-F-42

LOCATION Sta. 243+00 (400' Lt.)

ORIGINATED BY H.S.

W. P.

BORING DATE June 6, 1964.

COMPILED BY H.S.

DATUM G.S.C.

BOREHOLE TYPE 4" Auger

CHECKED BY K.S.

SOIL PROFILE		SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT ——— WL	PLASTIC LIMIT ——— WP	WATER CONTENT ——— W	BULK DENSITY	REMARKS	
ELEV DEPTH	DESCRIPTION	STRAT. PLT.	NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	SHEAR STRENGTH P.S.F.  + Field Vane Test Unconfined Shear Strength 400 800 1200 1600 2000	WATER CONTENT % WP      W      WL 10    20    30	P C F		
544.0	Groundlevel										
0.0											
	Clayey silt with some sand and traces of gravel. Very stiff to stiff.		1	SS	22	540		○		Gr-1% Sa-25% Si-52% Cl-22%  ▽ 535.7 6 days after drilling.	
			2	SS	23			○			
			3	SS	28			○			
				4	SS	20	530		○		Gr-3% Sa-25% Si-50% Cl-22%
				5	SS	22			○		
				6	SS	19			○		
				7	SS	18	520		○		Gr-1% Sa-22% Si-47% Cl-30%
				8	SS	16			○		
				9	SS	10			○		
512.0							+ 2.0				
32.0	End of borehole.					510					

DEPARTMENT OF HIGHWAYS - OREGON  
MATERIALS & RESEARCH DIVISION

## RECORD OF BOREHOLE NO. 6

FOUNDATION SECTION

109 64-F-42

LOCATION Sta. 244700 (400' Lt.)

ORIGINATED BY **H.S.**

22

June 6, 1964.

COMPILED BY H.S.

DATUM G.S.C.

BORNTON 1200 4" Auger

CHECKED BY                      K.S.

SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT ——— W <sub>L</sub> PLASTIC LIMIT ——— W <sub>P</sub> WATER CONTENT ——— W	BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER  TYPE	BLOWS / FOOT  DEEPLY SCALE	SHEAR STRENGTH P.S.F.  + Field Vane Test o Unconfined Shear Strength	WATER CONTENT % w <sub>p</sub> w      w <sub>L</sub>	
540.0 0.0	Groundlevel			540	400    800    1200    1600    2000	10    20    30	
	Clayey silt with some sand and traces of gravel. Hard to stiff.		1 SS 30	530			
			2 SS 53				
			3 SS 43		>+		
			4 SS 24				
			5 SS 17	520	>+		
			6 SS 37				
			7 SS 31				
			8 SS 22	510			
507.0 33.0	End of borehole.		9 TW PM				
				500			

Gr-3%  
Sa-23%  
Si-52%  
Cl-22%

▼ 526.7  
6 days after drilling.

Gr-2%  
Sa-23%  
Si-53%  
Cl-22%

Gr-1%  
Sa-18%  
Si-49%  
Cl-32%

124.0  
137.0  
141.0  
142.0

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH DIVISION

## RECORD OF BOREHOLE NO. 7

FOUNDATION SECTION

JOB 64-F-42

LOCATION Sta. 245+00 (400' Lt.)

ORIGINATED BY H.S.

W. P.

BORING DATE June 8, 1964.

COMPILED BY H.S.

DATUM G.S.C.

BOREHOLE TYPE 4" Auger

CHECKED BY K.S.

[illegible]



RECORD OF BOREHOLE NO. 9

FOUNDATION SECTION

JOB 64-F-42 LOCATION Sta. 243+00 (300' Lt.) ORIGINATED BY H.S.  
W.P.  BORING DATE June 8, 1964. COMPILED BY H.S.  
DATUM G.S.C. BOREHOLE TYPE 4" Auger CHECKED BY K.S.

SOIL PROFILE		SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT <u>WL</u> PLASTIC LIMIT <u>WP</u> WATER CONTENT <u>W</u>			BULK DENSITY POUND / FT <sup>3</sup>	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE		SHEAR STRENGTH P.S.F. + Field Vane Test o Unconfined Shear Strength					WATER CONTENT % 10 20 30				
545.8 0.0	Groundlevel														
	Clayey silt with some sand and traces of gravel.  Very stiff to stiff.		1	SS	36	540									
			2	SS	36										
			3	SS	26										
			4	SS	25	530									
			5	SS	20										
			6	SS	23										
			7	TW	PH	520									
515.0 30.8	End of borehole.		8	TW	PH										
						510									

132.0  
126.0

Gr-2%  
Sa-17%  
Si-47%

Cl-34%  
518.3

2 days a  
drilling.

Sa-25%  
Si-57%  
Cl-18%

132.0 Gr-2% Cl-  
126.0 Sa-17% 34%  
Si-47% 518.3  
2 days a  
drilling.

## RECORD OF BOREHOLE NO. 10

FOUNDATION SECTION

JOB 64-F-42 LOCATION Sta. 24300 (500' Lt.) ORIGINATED BY H.S.  
W.P.  BORING DATE June 8, 1964. COMPILED BY H.S.  
DATUM G.S.C. BOREHOLE TYPE 4" Auger CHECKED BY K.S.

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT			LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— WL			BULK DENSITY P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F. + Field Vane Test o Unconfined Shear Strength 400 800 1200 1600 2000			WATER CONTENT % 10 20 30				
545.7	Groundlevel													
0.0	Clayey silt with some sand and traces of gravel.  Firm to very stiff.		1	SS	5	540								
			2	SS	14									
			3	SS	23									
			4	SS	25	530								
			5	TW	PH									
524.2														
21.5	End of borehole.					520								



#64-F-42

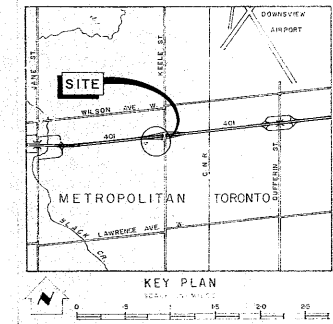
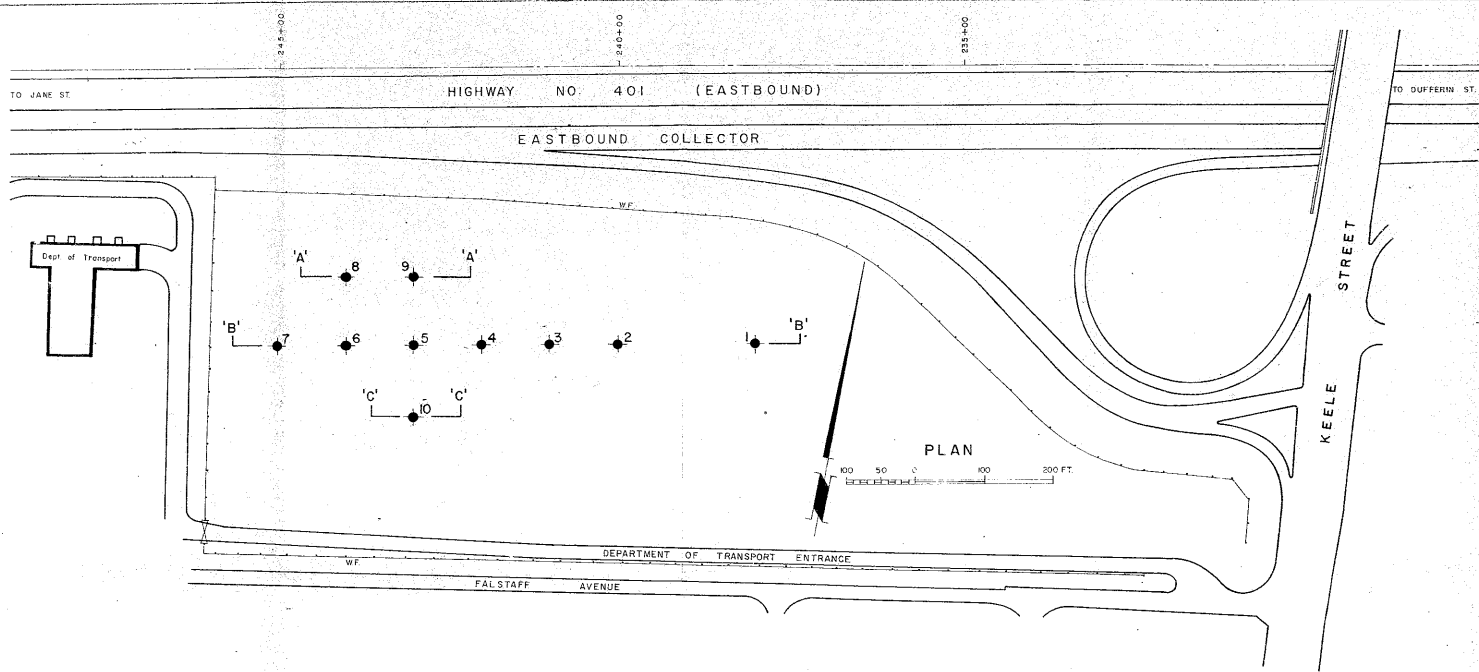
WP. #85-59-3

HWY #401

D.H.O. BORROW

AREA KEELE

STREET



**LEGEND**

- Bore Hole
- ⊕ Cone Penetration Hole
- ⊙ Bore & Cone Penetration Hole
- Water Levels established at time of field investigation, June 1964

NO.	ELEVATION	STATION	OFFSET
1	558.0	238+00	400'LT
2	552.2	240+00	400'LT
3	549.5	241+00	400'LT
4	550.0	242+00	400'LT
5	544.2	243+00	400'LT
6	540.0	244+00	400'LT
7	536.7	245+00	400'LT
8	540.0	244+00	300'LT
9	545.8	243+00	300'LT
10	545.8	243+00	500'LT

**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.

DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH DIVISION - TORONTO REGION

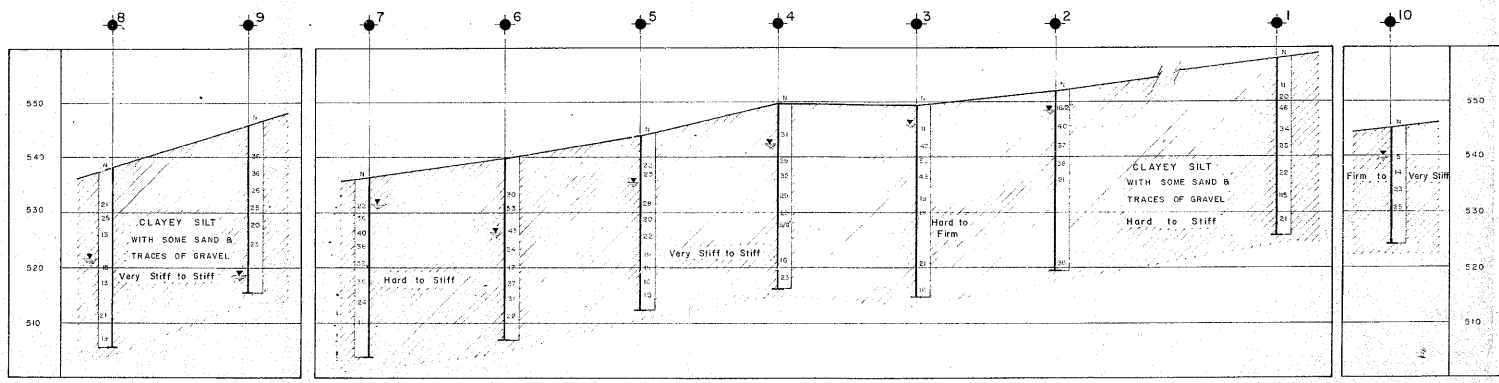
**DEPARTMENT OF HIGHWAYS BORROW AREA**

KING'S HIGHWAY NO. 401 DIST. NO. 6  
CO. METROPOLITAN TORONTO  
TWP. NORTH YORK LOT CON

**BORE HOLE LOCATIONS & SOIL STRATA**

SUBSID. H.S.	CHECKED	W.P. NO.	85-59-3
DRAWN	CHECKED	CON. NO.	64-F-42
DATE	JULY 14, 1964	SITE NO.	
APPROVED		POINT NO.	64-108

64-F-42 A



**PRINT RECORD**

NO.	FOR	DATE

