

## DEPARTMENT OF HIGHWAYS ONTARIO

## MEMORANDUM

BA 2304

To: Mr. G. K. Hunter,  
Regional Road Design Engr.,  
Central Region (Toronto).

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

DATE: March 29, 1966

OUR FILE REF.

IN REPLY TO

APR - 6 1966

SUBJECT:

## FOUNDATION INVESTIGATION REPORT

For

Proposed Storm Sewers at Hwy. 401,  
Dixon Rd. - Kipling Ave., Toronto.

District #6 (Toronto)

W.J. 66-F-25 -- W.P. 85-59-7

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

We believe that you will find the factual data and recommendations contained therein, adequate for your design requirements.

Should additional information be required, please do not hesitate to contact our Office.

AGS/MdeF  
Attach.

cc: Messrs. G. K. Hunter (3)  
H. A. Tregaskes  
D. W. Farren  
B. R. Davis (2)  
J. C. Thatcher  
T. J. Kovich  
A. Watt

Foundations Office  
Gen. Files

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

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# FOUNDATION INVESTIGATION REPORT

For

Proposed Storm Sewers at Hwy. 401,  
Dixon Rd. - Kipling Ave., Toronto.

District #6 (Toronto)

W.J. 66-F-25 -- W.P. 85-59-7

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## 1. INTRODUCTION:

The Foundation Section was requested by the Toronto Regional Road Design Section (Mr. E. J. McCabe, Expressway Consultant Control Engineer), in a memo dated February 8, 1966, to carry out a foundation investigation at the site of the proposed storm sewer tunnels at the crossing of Hwy. 401 between Kipling Ave. and Dixon Rd. Subsequently, a foundation investigation was carried out by this Section to determine the subsoil conditions existing at the site. This report contains the results of this investigation.

The site is located between the crossing of Kipling Ave. and Dixon Rd. with Hwy. 401 in Metropolitan Toronto, Twp. of Etobicoke. The topography of the site is generally flat to undulating. The general area contains both residential dwellings and light industry. Physiographically, the site is located in the region referred to as the Iroquois Plain.

A total of eight boreholes was carried out during the course of the field work. Borings were achieved by means of a Diamond drill and Penn. auger. All the survey work was carried out by the personnel from the Construction Section of District #6. The locations and elevations of all boreholes, together with the estimated stratigraphical profiles, are shown on Dwg. 66-F-25A.

## 2. SUBSOIL CONDITIONS:

Subsoil at the site consists mainly of an extensive deposit of clayey silt, sand and gravel (glacial till). This deposit extends at least to a maximum depth of 36 ft. below the existing level of Hwy. 401. Fill material of Hwy. 401 at this location, is of a

cont'd. /2 .....

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

similar nature and has probably been obtained locally. The consistency of the deposit is essentially stiff to hard with 'N' values ranging randomly from a low of 13 blows/ft. to a maximum of over 100 blows/ft. Physical properties as determined from field and laboratory tests, are summarized as follows:

Liquid Limit	--	13% - 20%
Plastic Limit	--	11% - 19%
Moisture Content	--	6% - 19%

Mechanical analyses indicated the following average grain size distributions: gravel 6%, sand 31%, silt 46%, clay 17%.

Ground water levels ranged from about 12 to 20 ft. below existing ground surface.

3. DISCUSSION:

It is proposed to construct sewers at three locations on Hwy. 401 (Sta. 462+40, Sta. 525+55 and Sta. 548+15). Subsoil at these locations consists of stiff to hard deposits of cohesive type glacial till. In this type of subsoil no special problems are anticipated for the proposed sewer construction. However, due to the very hard and dense nature of the material, jacking of the pipes may at times, be slow and the digging or augering quite cumbersome.

We would suggest that a distance of 5 ft. be left between the 66" Ø concrete storm sewer and the 48" Ø Metro. water main. The suggested distance will provide adequate cover for either of the pipes while any work is being carried out in connection with either of them. The five-foot distance is not based on any analysis, but is rather, chosen as a distance believed to be safe and acceptable.

cont'd. /3 .....

4. MISCELLANEOUS:

The field work, performed during the period March 2 to 10, 1966, was undertaken by Mr. V. Korlu, Project Foundation Engineer, who also prepared the report. The investigation was carried out under the general supervision of Mr. M. Devata, Senior Foundation Engineer.

Equipment used was owned and operated by Master Soil Investigation Ltd.

March 1966

APPENDIX I

MATERIALS &amp; TESTING DIVISION

FOUNDATION SECTION

LOCATION Sta. 462+02 54' Rt.

ORIGINATED BY V.K.

BORING DATE March 2, 1966.

COMPILED BY V.K.

BOREHOLE TYPE Drive BX Casing and Wash.

CHECKED BY M.D.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W		BULK DENSITY  P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT						
							SHEAR STRENGTH P.S.F.	WATER CONTENT % 10      20      30			
504.3	Groundlevel										
	Heterogeneous mixture of clayey silt, sand and gravel.  (Glacial Till)  Dense to very dense.		1	SS	36	500					
			2	SS	97						
			3	SS	149						
			4	SS	74	490					
			5	SS	168						
			6	SS	169						
			7	SS	187						
			8	SS	130for 3"						
			9	SS	128for 6"	480					
			10	SS	113						
			11	SS	158	470					
467.8			12	SS	156						
36.5	End of borehole.					460					

DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

JOB 66-F-25

LOCATION Sta. 462/35 E

ORIGINATED BY V.K.

W. P. 85-59-7

BORING DATE March 7, 1966.

COMPILED BY V.K.

DATUM Geodetic

BOREHOLE TYPE Penn Drill

CHECKED BY           M.D.          

# RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W		BULK DENSITY P.C.F.	REMARKS		
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT		WATER CONTENT %					
							20	40	60	80			100	WP
							SHEAR STRENGTH P.S.F.							
504.0	Groundlevel													
	Heterogeneous mixture of clayey silt, sand and gravel.  (Glacial Till)  Dense to very dense.		1	SS	30	500							Gr3%Sa33% Si48%Cl 16%  W.L. 489.5  Gr9%Sa39% Si 39% Cl 13%	
			2	SS	43									
			3	SS	88									
			4	SS	42	490								
			5	SS	61									
			6	SS	88									
			7	SS	98									
			8	SS	34									
			9	SS	109	480								
			10	SS	100	for 4"								
			11	SS	95	470								
467.7			12	SS	100	for 5"								
36.5	End of borehole.					460								

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

# RECORD OF BOREHOLE NO. 3

FOUNDATION SECTION

JOB 66-F-25

LOCATION Sta. 462+75 67' Lt.

ORIGINATED BY V.K.

W.P. 85-59-7

BORING DATE March 7, 1966.

COMPILED BY V.K.

DATUM Geodetic

BOREHOLE TYPE Drive NX Casing & Wash.

CHECKED BY M.D.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	20	40	60	80	100	WP	W		
502.5	Groundlevel															
0.0																
	Heterogeneous mixture of clayey silt sand and gravel.  (Glacial Till)  Very dense.		1	SS	80	500										
			2	SS	109											
			3	SS	163											
			4	SS	58	490										
			5	SS	67											
			6	SS	117											
			7	SS	153											
			8	SS	107											
			9	SS	130	480										
			10	SS	101											
			11	SS	74	470										
466.0			12		161											
36.5	End of borehole.					460										

Heterogeneous mixture of clayey silt sand and gravel.

(Glacial Till)

Very dense.

Gr6%Sa34%  
Si142%Cl 18%

Gr13%Sa41%  
Si136%Cl 10%

Gr17%Sa39%  
Si136%Cl 8%

DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

JOB 66-F-25

LOCATION Sta. 524/55 C

ORIGINATED BY V.K.

W.P. 85-59-7

BORING DATE March 8, 1966

COMPILED BY V.K.

DATUM Geodetic

BOREHOLE TYPE Penn Drill

CHECKED BY M.D. *[Signature]*

# RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— WL		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	PLASTIC LIMIT ——— WP	WATER CONTENT ——— W		
							20 40 60 80 100		WP ——— W ——— WL	WATER CONTENT % 10 20 30		
524.2	Groundlevel											
0.0	Heterogeneous mixture of clayey silt, sand and gravel.  (Glacial Till)  Compact to dense.	0.0				520						Sa16%Si155% Cl 29% Gr8%Sa27% Si149%Cl 16%  ▼ W.L. 510.2   Gr6%Sa34% Si142%Cl 18%
		1	SS	16								
		2	SS	33								
		3	SS	40								
		4	SS	43			510					
		5	SS	31								
		6	SS	32								
		7	SS	32								
		8	SS	32								
		9	SS	27			500					
		10	SS	30								
493.7			11	SS	33							
30.5	End of borehole.					490						

DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

JOB 66-F-25

LOCATION Sta. 524/60 54' Lt.

W. P. 85-59-7

BORING DATE March 8, 1966.

DATUM Geodetic

BOREHOLE TYPE Penn Drill

ORIGINATED BY V.K.

COMPILED BY V.K.

CHECKED BY                      M.D. *[Signature]*

FOUNDATION SECTION

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE	LIQUID LIMIT ——— W <sub>L</sub>	BULK DENSITY	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	PLASTIC LIMIT ——— W <sub>P</sub>			WATER CONTENT ——— W
							20 40 60 80 100	W <sub>P</sub> ——— W ——— W <sub>L</sub>			
							SHEAR STRENGTH P.S.F.	WATER CONTENT %	P.C.F.		
524.4	Groundlevel							10 20 30			
0.0	Heterogeneous mixture of clayey silt, sand and gravel.  (Glacial Till)  Compact to dense.	0.0				520				Sal5%Si50% Cl 35%  W.L. 510.4 ▼ Gr3%Sa27% Si51%Cl 19%	
		1	SS	18							
		2	SS	20							
		3	SS	28							
		4	SS	60		510					
		5	SS	42							
		6	SS	29							
		7	SS	21							
		8	SS	34							
		9	SS	23		500					
		10	SS	21							
493.9		0.0	11	SS	40					Sal3%Si68% Cl 19%	
30.5	End of borehole.					490					

FOUNDATION SECTION

CHECKED BY M.D.

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— WL		BULK DENSITY	REMARKS		
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	BLOWS / FOOT	PLASTIC LIMIT ——— wp	WATER CONTENT ——— w					
524.4	Groundlevel						20 40 60 80 100		wp ——— w ——— WL				
							SHEAR STRENGTH P.S.F.		10 20 30				
	Heterogeneous mixture of clayey silt, sand and gravel.  (Glacial Till)  Compact to dense.		1	SS	13	520						Gr1%Sa23% Si53%Cl 23% Gr6%Sa28% Si48%Cl 18% W.L.512.4 12.0	
			2	SS	36								
			3	SS	46								
			4	SS	57								
			5	SS	46	510							
			6	SS	40								
			7	SS	44								
			8	SS	38								
			9	SS	36	500							
			10	SS	38								
493.9			11	SS	43							Gr7%Sa31% Si44%Cl 18%	
30.5	End of borehole.												
						490							

FOUNDATION SECTION

MATERIALS &amp; TESTING DIVISION

JOB 66-F-25

LOCATION Sta. 548+08 95' Rt. of Edge of Pavement.

ORIGINATED BY V.K.

W. P. 85-59-7

BORING DATE March 9, 1966

COMPILED BY V.K.

DATUM Geodetic

BOREHOLE TYPE Penn Drill

CHECKED BY M.D.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— WL		BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	PLASTIC LIMIT ——— WP	WATER CONTENT ——— W		
500.0	Groundlevel											
0.0												
	Heterogeneous mixture of clayey silt, sand and gravel.		1	SS	46							
			2	SS	40							
			3	SS	70	490						
			4	SS	30							
			5	SS	37							
			6	SS	33							
	(Glacial Till)		7	SS	26	480						
			8	SS	70							
	Dense to very dense.		9	SS	36							
			10	SS	75							
467.5			11	SS	114	470						
32.5	End of borehole. (Bedrock)					460						

FOUNDATION SECTION

CHECKED BY M.D. *[Signature]*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W			BULK DENSITY Y P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT					WATER CONTENT %				
							20	40	60	80	100	wp	w	wL		
SHEAR STRENGTH P.S.F.																
500.5	Groundlevel					500										
0.0	Heterogeneous mixture of clayey silt, sand and gravel.  (Glacial Till)  Dense to very dense.	.0	1	SS	61	490										Gr4%Sa29% Si146%Cl 21%
		.0	2	SS	66											
		.0	3	SS	42											
		.0	4	SS	29											
		.0	5	SS	28											
		.0	6	SS	42											
		.0	7	SS	41											
		.0	8	SS	64	480										
		.0	9	SS	100	for 5"										
		.0	10	SS	101											
		.0	11	SS	112	470										
467.5	End of borehole.					460										
33.0																

# ABBREVIATIONS USED IN THIS REPORT

## PENETRATION RESISTANCE

STANDARD PENETRATION RESISTANCE 'N' :- THE NUMBER OF BLOWS REQUIRED TO ADVANCE A STANDARD SPLIT SPOON SAMPLER 12 INCHES INTO THE SUBSOIL, DRIVEN BY MEANS OF A 140 POUND HAMMER FALLING FREELY A DISTANCE OF 30 INCHES.

DYNAMIC PENETRATION RESISTANCE :- THE NUMBER OF BLOWS REQUIRED TO ADVANCE A 2 INCH, 60 DEGREE CONE, FITTED TO THE END OF DRILL RODS, 12 INCHES INTO THE SUBSOIL, THE DRIVING ENERGY BEING 350 FOOT POUNDS PER BLOW.

## DESCRIPTION OF SOIL

THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE DENSITY OR DENSENESS OF COHESIONLESS SOILS ARE DESCRIBED IN THE FOLLOWING TERMS :-

<u>CONSISTENCY</u>	<u>'N' BLOWS / FT.</u>	<u>c LB. / SQ. FT.</u>	<u>DENSENESS</u>	<u>'N' BLOWS / FT.</u>
VERY SOFT	0 - 2	0 - 250	VERY LOOSE	0 - 4
SOFT	2 - 4	250 - 500	LOOSE	4 - 10
FIRM	4 - 8	500 - 1000	COMPACT	10 - 30
STIFF	8 - 15	1000 - 2000	DENSE	30 - 50
VERY STIFF	15 - 30	2000 - 4000	VERY DENSE	> 50
HARD	> 30	> 4000		

## TYPE OF SAMPLE

S.S.	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.B.	SCRAPER BUCKET SAMPLE	O.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE
S.T.	SLOTTED TUBE SAMPLE		
	P.H.	SAMPLE ADVANCED HYDRAULICALLY	
	P.M.	SAMPLE ADVANCED MANUALLY	

## SOIL TESTS

Qu	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Qcu	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Qd	DRAINED TRIAXIAL	S	SENSITIVITY

# ABBREVIATIONS USED IN THIS REPORT

## SOIL PROPERTIES

$\gamma$	UNIT WEIGHT OF SOIL (BULK DENSITY)
$\gamma_s$	UNIT WEIGHT OF SOLID PARTICLES
$\gamma_w$	UNIT WEIGHT OF WATER
$\gamma_d$	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
$\gamma'$	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
$\tau_f$	SHEAR STRENGTH
$c'$	EFFECTIVE COHESION
	INTERCEPT
$\phi'$	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF EFFECTIVE STRESS $\tau_f = c' + \sigma' \tan \phi'$
$c_u$	APPARENT COHESION
$\phi_u$	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF TOTAL STRESS $\tau_f = c_u + \sigma \tan \phi$
$\mu$	COEFFICIENT OF FRICTION
$S_t$	SENSITIVITY

## GENERAL

$\pi$	= 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
$\sigma$	NORMAL STRESS
$\bar{\sigma}$	NORMAL EFFECTIVE STRESS ( $\bar{\sigma}$ IS ALSO USED)
$\tau$	SHEAR STRESS
$\epsilon$	LINEAR STRAIN
$\gamma$	SHEAR STRAIN
$\nu$	POISSON'S RATIO ( $\mu$ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
$\eta$	COEFFICIENT OF VISCOSITY

## EARTH PRESSURE

d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
$\delta$	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
$K_0$	COEFFICIENT OF EARTH PRESSURE AT REST

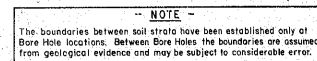
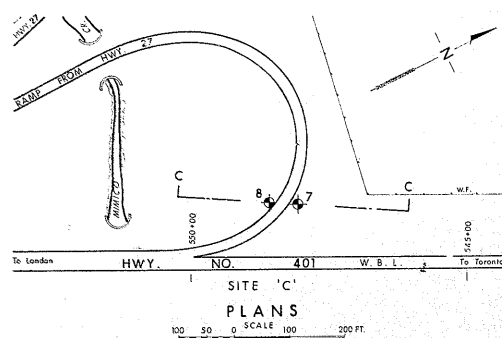
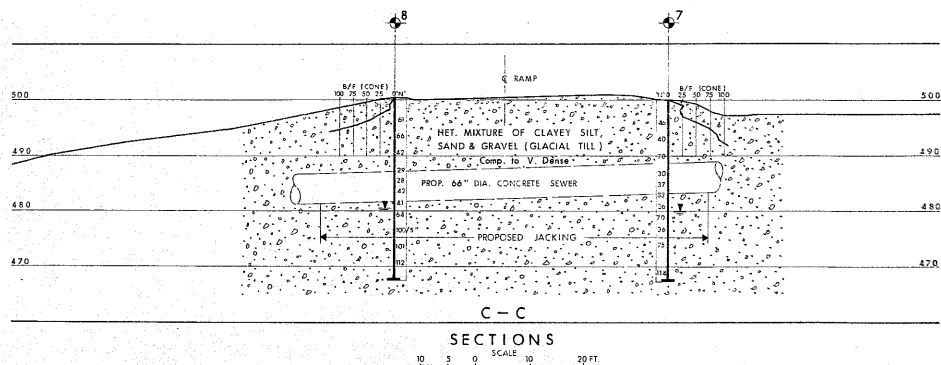
## FOUNDATIONS

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

## SLOPES

H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
$\beta$	ANGLE OF SLOPE TO HORIZONTAL

# 66-F-25  
W.P. # 85-59-7  
Hwy. # 401 :  
DIXON RD.  
PROPOSED  
STORM SEWERS  
KIPLING AVE  
TO HWY. # 27

[illegible]

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

CROSS - SECTIONS  
PROPOSED SEWER  
(KIPLING AVE. to HWY. 27)

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

## BORE HOLE LOCATIONS &amp; SOIL STRATA

SUBM'D. V. K.	CHECKED	W.P. NO. 85-59-7	M.S.T. DRAWING NO.
DRAWN S.O.	CHECKED	JOB NO. 66-F-25	66-F-25 A
DATE 29 MAR. 1966		SITE NO.	BRIDGE DRAWING NO.
APPROVED <i>A. B. Thomas</i>		CONT. NO.	

[illegible]

REF. NO. B-80-31  
B-80-55