

## MEMORANDUM

TO: Mr. A. M. Toye,  
Bridge Engineer,  
Bridge Division.

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

Attention: Mr. S. McCombie

DATE: June 9, 1965

OUR FILE REF.

IN REPLY TO

SUBJECT:

FOUNDATION INVESTIGATION REPORT  
For  
Proposed Structure at Hwy. #403,  
Ramp 'A' and Hwy. #2, Revised Line  
'A', Twp. of Ancaster, County of  
Wentworth, Con. III, Lot 38,  
District #4 (Hamilton)  
W.J. 65-F-29 -- W.P. 499-64

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

We believe that the factual data and recommendations  
contained therein, will be adequate for your design  
requirements. Should additional information be required,  
please do not hesitate to contact our Office.

KYL/MdeF  
Attach.

cc: Messrs. A. M. Toye (2)  
H. A. Tregaskes  
D. W. Farren  
G. K. Hunter (2)  
H. Greenland  
T. J. Kovich  
A. Watt

  
K. Y. Lo,  
SUPERVISING FOUNDATION ENGINEER

Foundations Office /  
Gen. Files

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# FOUNDATION INVESTIGATION REPORT

For

Proposed Structure at Hwy. #403,  
Ramp 'A' and Hwy. #2, Revised Line  
'A', Twp. of Ancaster, County of  
Wentworth, Con. III, Lot 38,  
District #4 (Hamilton)  
W.J. 65-F-29 -- W.P. 499-64

## 1. INTRODUCTION:

A request for a foundation investigation at the site of the proposed C.A.H. #403, Ramp 'A' and Hwy. #2 (Line 'A') crossing was contained in a memo from the Bridge Planning Section, dated February 5, 1965.

A foundation investigation was subsequently carried out by this Section to determine the subsoil conditions existing at the site of the proposed crossing.

Presented in this report are the results of the recommendations pertaining to the foundations for the proposed structure.

## 2. DESCRIPTION OF SITE:

The site is located approximately 2 miles west of Duff's Corner on Hwy. #2 in Ancaster Twp., County of Wentworth. The topography at the site is flat to undulating. Physiographically, the area is referred to as the "Norfolk Sand Plain".

## 3. DESCRIPTION OF FIELD AND LABORATORY WORK:

Field work consisted of eight boreholes and seven dynamic cone penetration tests. The boring was carried out by means of

cont'd. /2 ...

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

conventional diamond drilling equipment adapted for soil sampling purposes.

Samples were recovered at required depths by means of a 2" O.D. split-spoon sampler in the non-cohesive deposits. The dimensions of the split-spoon sampler and the energy used in driving it, conforms to the requirements of the Standard Penetration Test.

Detailed logs of each borehole and penetration test are given on the records of boreholes at the end of this report. The locations and elevations of all boreholes are shown on Dwg. No. 65-F-29A, appended to this report.

Samples were visually examined and identified in the field as well as in the laboratory. Tests were carried out in the laboratory on a selection of samples to determine:

- i) Natural moisture contents.
- ii) Bulk densities.
- iii) Grain size distributions.

4. SUBSOIL CONDITIONS:

4.1) General:

Subsoil at the site mainly consists of granular deposits having a relative density of loose to very dense. A detailed description of this granular deposit encountered in each boring, is given in Appendix I of this report. The estimated stratigraphical profile of Dwg. No. 65-F-29A is based upon this information.

cont'd. /3 ...

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

4.2) Silty Sand with Traces of Clay:

A deposit of silty sand with traces of clay was observed in all the boreholes immediately below the ground surface and extends down to approx. elev.  $\pm$  800. Natural moisture contents varied from 5% to 13%. Standard Penetration values ranged from 4 blows/ft. to 23 blows/ft. This indicates that the deposit is essentially loose to compact.

4.3) Sandy Silt to Silt:

This deposit underlies the upper silty sand layer and was investigated down to a depth of 80 ft. below ground surface in B.H. 1. The percentage of sand varied somewhat throughout the stratum but, in general, the deposit may be described as sandy silt to silt. In B.H. 1, below elev.  $\pm$  760, occasional seams of clayey silt (max. 2" thick) were encountered within this deposit. Moisture contents varied from 15% to 22%. The Standard Penetration tests indicate that the layer is compact to very dense having an 'N' value range of 19 to over 100 blows per foot.

5. GROUND WATER:

During the time of the field investigations, the water level in every borehole was measured and found to be at approximate elev. 795 - elev. 800. These levels are shown on the borehole log sheets contained in the Appendix of this report.

cont'd. /4 ...



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

It is proposed to construct a new bridge at this site in order to carry revised Hwy. #2 (Line 'A') over Ramp 'A' of C.A.H. #403. Present proposals call for a three-span structure with approach fills having a maximum height of about 14 feet above existing ground level.

Subsoil at the site generally consists of 10 to 16 ft. of loose to compact silty sand followed by compact to very dense, sandy silt to silt, extending at least to elev. 745 ±.

The proposed grade of Ramp 'A' of Hwy. #403 will be at approximate elev. 801 ±. Since the subsoil below elev. 800 mainly consists of compact to very dense sandy silt to silt, conditions are favourable for spread footing support, and in the case of the proposed piers, it is recommended that footings be placed at elev. 796.0 with an allowable pressure of 3 t.s.f. As it will be necessary to carry out the excavations for the pier footings at or below the ground water level, depending on the seasonal fluctuation of ground water table, a dewatering scheme may be required. The subsoil consists of fine-grained granular material and is highly susceptible to 'boiling' under conditions of unbalanced hydrostatic head. If steel sheeting is used in a dewatering scheme, this should be driven to a minimum depth below the excavation bottoms equal to the height of the prevailing water above them in order to prevent boiling.

The proposed abutments may be constructed within the approach fills and supported on 12 $\frac{1}{4}$ " O.D. x 0.25" steel tube piles. During construction of the approaches, care should be taken to

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

ensure that no bouldery fill is placed at locations through which piles have to be driven. It is estimated that piles driven to approx. elev. 785 will achieve a design capacity of 50 tons/pile. In any event, the actual proposed safe load should be checked in the field by means of the Hiley formula according to D.H.O. Standards DD 1218 and DD 1219.

No stability problems are anticipated for standard 2:1 side slopes.

7. SUMMARY:

The subsoil at the site is a granular deposit with the upper 10' - 15' loose to compact silty sand underlain by compact to very dense sandy silt to silt layer.

It is recommended to place the pier footings at about elev. 796 with a safe net bearing pressure of 3 t.s.f. Dewatering may be a problem for pier excavations and is discussed in Section 5. The abutments should be supported on 12 $\frac{3}{4}$ " O.D. x 0.25" tubular piles driven to an estimated tip elev. 785.0. These piles can support a safe load of 50 tons per pile. The proposed approaches do not present any stability problems.

8. MISCELLANEOUS:

The field work was carried out during March 15 to March 25, 1965, under the supervision of Mr. V. Kor'u, Project Foundation Engineer, who also wrote this report. The report was reviewed by Mr. M. Devata, Senior Foundation Engineer.

June 1965.

APPENDIX I.



## 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
$\phi'$	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
$c_u$	APPARENT COHESION
$\phi_u$	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
$\mu$	COEFFICIENT OF FRICTION
$S_t$	SENSITIVITY

## GENERAL

$\pi$	= 3.1416
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e \sigma$ OR $\ln \sigma$	NATURAL LOGARITHM OF $\sigma$
$\log_{10} \sigma$ OR $\log \sigma$	LOGARITHM OF $\sigma$ 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
$\sigma'$	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

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

# RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

JOB 65-F-29

LOCATION Hwy 403 @ Hwy 2 (Ramp A) Sta 287+64 40' Lt.

ORIGINATED BY V.K.

W.P. 499-64

BORING DATE March 16, 1965.

COMPILED BY V.K.

DATUM Geodetic

BOREHOLE TYPE Drive BX casing & wash.

CHECKED BY M.D.

SOIL PROFILE		STRAT. PLT	SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT ——— WL			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION		NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	20	40	60	80	100	PLASTIC LIMIT ——— WP	WATER CONTENT ——— W		
								SHEAR STRENGTH P.S.F.					WP	W	WL	
815.0	Groundlevel															
0.0																
	Silty sand with traces of clay.		1	SS	7	810										
	(Loose)		2	SS	6											
			3	SS	7											
799.5			4	SS	28	800										
15.5			5	SS	100 for 4"											
789.5			6	SS	100 for 5"	790										
25.5	(Grey)		7	SS	190											
	Sandy silt to silt.		8	SS	59	780										
	(Compact to v. dense)		9	SS	27											
	and		10	SS	33	770										
			11	SS	53											
757.0						760										
58.0	clayey silt		12	SS	43											
59.5						750										
	Occasional seams (max. 2" thick) of clayey silt.		13	SS	24											
						740										
733.5			14	SS	87											
81.5	End of borehole.					730										

Sa 84  
Si 16  
Cl 16

Gr 3  
Sa 25  
Si 68  
Cl 4

Sa 33  
Si 63  
Cl 4

Sa 11  
Si 85  
Cl 4

Sa 4  
Sa 91  
Cl 5

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS &amp; TESTING DIVISION

## RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 65-F-29LOCATION Hwy 403 & Hwy 2 (Ramp A) Sta 287+89 52' Rt.ORIGINATED BY V.K.W P 499-64BORING DATE March 25, 1965.COMPILED BY V.K.DATUM GeodeticBOREHOLE TYPE Drive BX casing and wash.CHECKED BY M.D. *ML*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT — WL			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	SIRAT PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.				PLASTIC LIMIT — WP	WATER CONTENT — W		
813.5	Groundlevel														
0.0	Silty sand with traces of clay. (Loose)		1	SS	5	810									
			2	SS	6										
799.5	▼					800									
14.0	Sandy silt to silt.		3	SS	100										
					for 5"										
			4	SS	100	790									
					for 4"										
	(V. dense)														
782.0			5	SS	96										
31.5	End of borehole.					780									
						770									

Sa 77  
Si 23  
Cl 23Sa 10  
Si 85  
Cl 5

135





DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

# RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

JOB 65-F-29

LOCATION Hwy 403 & Hwy 2 (Ramp A) Sta 288+27 53' Rt.

ORIGINATED BY V.K.

W P 499-64

BORING DATE March 24, 1965.

COMPILED BY V.K.

DATUM Geodetic

BOREHOLE TYPE Drive BX casing and wash.

CHECKED BY M.D. *dk*

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		20	40	60	80	100	WP	W	WL		
813.0	Groundlevel															
0.0	Silty sand with traces of clay.  (Loose)		1	SS	6	810										Sa 49 Si 51 Cl 51
			2	SS	6											
			3	SS	6											
798.0	(Brown)  Sandy silt to silt  (V. dense)		4	SS	108	800										133
15.0			5	SS	100											
			for 5"			790										
			6	SS	100											
			for 6"													129
781.5			7	SS	158	780										
31.5	End of borehole.					770										Gr 3 Sa 21 Si 71 Cl 5

DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

## RECORD OF BOREHOLE NO. 5

FOUNDATION SECTION

408 - 65-F-29

LOCATION Hwy 403 & Hwy 2 (Ramp A) Sta 288+47 38' Lt.

ORIGINATED BY V.K.

W 499-64

BORING DATE March 18, 1965.

COMPILED BY V.K.

DATUM Geodetic

BOREHOLE TYPE Drive BX Casing and wash.

CHECKED BY M.D.

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT						LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT — W			BULK DENSITY  POCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	BLOWS / FOOT		20	40	60	80	100	WP	WL	in %		
815.3	Groundlevel															
0.0	Silty sand with traces of clay.  (Loose)	[Pattern]	1	SS	7	810						o				Sa 67 Si ) Cl) 33
			2	SS	9							o				
			3	SS	6											
799.3			4	SS	12	800										
16.0	(Brown)  Sandy silt.	[Pattern]	5	SS	100											▼ EL 793.3 22.0'
					for 5"											
			6	SS	100	790						o				Sa 35 Si 60 Cl 5
	(V. dense)		7	SS	153											
			8	SS	89	780						o				Sa 44 Si 51 Cl 5
773.8			9	SS	95											
41.5	End of borehole.					770										



FOUNDATION SECTION

ORIGINATED BY V.K.

COMPILED BY V.K.

CHECKED BY \_\_\_\_\_ M.D. *Q*

SOIL PROFILE		SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— W <sub>L</sub>			BULK DENSITY	REMARKS		
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	PLASTIC LIMIT ——— W <sub>P</sub>	WATER CONTENT ——— W	WATER CONTENT %				
					20	40	60	80	100	W <sub>P</sub>	W	W <sub>L</sub>	P.C.F.	in %
										WATER CONTENT %				
										15	30	45		
814.3	Groundlevel													
0.0	Silty sand with traces of clay.  (loose to compact)	1	SS	6	810									Sa 51 Si 44 Cl 5
		2	SS	23										
		3	SS	18										
799.0		4	SS	100	800									Sa 43 Si 54 Cl 3
15.3		for 5"												
		5	SS	100										
		for 5"												
	(Brown)	6	SS	100	790									
	Sandy silt to silt.	for 5"												
		7	SS	100										
	(V. dense).	for 6"												
		8	SS	107	780									Gr 9 Sa 40 Si 47 Cl 4
775.3														
39.0		9	SS	19										
	Grey				770									Sa 7 Si 89 Cl 4
767.8		10	SS	28										
46.5	End of borehole.				760									

JOB 65-F-29

LOCATION Hwy 403 & Hwy 2 (Ramp A) Sta 288+11.56' Rt.

ORIGINATED BY V.K.

W P 499-64

BORING DATE March 23, 1965.

COMPILED BY V.K.

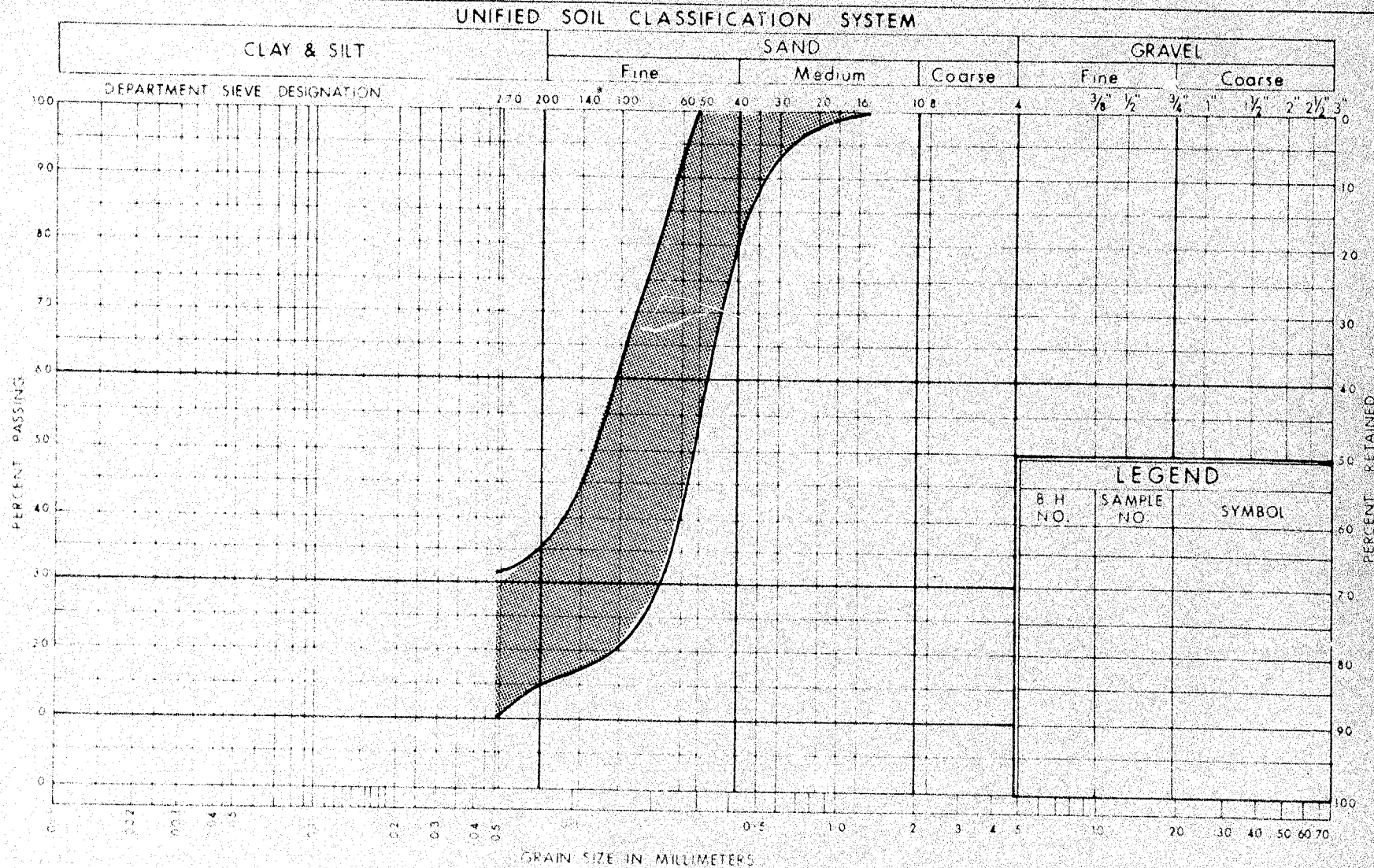
DATUM Geodetic

BOREHOLE TYPE Drive BX Casing and wash.

CHECKED BY M.D. *ok*

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— $w_L$			BULK DENSITY P.C.F.	REMARKS				
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	BLOWS / FOOT 20   40   60   80   100						PLASTIC LIMIT ——— $w_p$			
							SHEAR STRENGTH P.S.F.						WATER CONTENT ——— $w$ $w_p$ $w$ $w_L$			
												WATER CONTENT % 15   30   45				
809.5	Groundlevel															
0.0	Silt sand with traces of clay.		1	SS	8	800				137	Sa 79 Si 21 Cl 1					
800.0	(Loose)		2	SS	4											
9.5			3	SS	14											
	(Brown)		4	SS	100	790										
789.5			for 5"													
20.0	(Grey)	5	SS	100												
	Sandy silt to silt		6	SS	115	780										
			for 6"													
	(Compact to v. dense)	7	SS	84												
			8	SS	86	770										
			9	SS	78											
758.0			10	SS	38	760										
51.5	End of borehole.					750										





ONTARIO

DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

**GRAIN SIZE DISTRIBUTION**  
TOP LAYER - SILTY SAND (trace of Clay)  
(ENVELOPE FOR ALL BORE HOLES)

W.P. No. 499-64

JOB No. 65-F-29

GRAVEL

Coarse



IN REPLY TO

W. S. Melinyshyn,  
Regional Bridge Location Engineer.

Mr. S. McCombie,  
Bridge Planning Engr.,  
Bridge Division.

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

Attn: Mr. W. S. Malinrahyn

December 13, 1965

W.P. 194-61 - Hwy. #2 Underpass.  
W.P. 499-64 - Bridge over Ramp 'A'.  
W.P. 100-57 - Mohawk Rd. Underpass.  
- Hwy. 403, District #4, Hamilton -

We have reviewed the preliminary bridge plans for the above-mentioned projects and submit the following comments:

Hwy. #2 Underpass - W.P. 194-61 -

The piles for the pier footings should be driven at least 15 ft. below the footing bases, even if the dynamic formula indicates that the required capacity has been attained at a higher elevation. This information should be given on the Contract drawings.

Hwy. #2 Structure over Ramp 'A' - W.P. 499-64 -

The estimated pile tip elevation for the abutments was not shown on the drawings. It should also be noted that the pile driving during construction, should be controlled by the use of the Hilay formula as per current D.H.O. standards DD 1218 and DD 1219.

Mohawk Rd. Underpass - W.P. 100-57 -

We have no comments pertaining to structure foundations.

MD/MdeF

cc: Foundations Office

Gen. Files

*M. Devate*  
M. Devate,  
SENIOR FOUNDATION ENGR.  
For:  
A. G. Stermac,  
PRINCIPAL FOUNDATION ENGR.



## MEMORANDUM

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

FROM: Bridge Division,  
Downsview, Ontario.

DATE: February 5, 1965.

OUR FILE REF.

IN REPLY TO

SUBJECT: Mohawk Road Underpass W.P. 100-57  
Hamilton Drive Underpass W.P. 184-60  
Hwy. #2 Underpass W.P. 194-61  
Hwy. #2 Bridge over Ramp "A" W.P. 499-64  
Hwy. #403 - District #4

Please find attached a print of the site plan for each of the proposed structures with the probable location of footings marked in red.

Previous Foundations Investigations have been done at the above first three sites; however, new interchange designs have altered the bridge spans and in some cases the crossing location.

NAME	W.P.	FOUND. REPORT		CHANGE
		M. and R. No.	Bridge No.	
Mohawk	100-57	W.J.60-F-50	BA 1106	new location different spans
Hamilton	184-60	Franki of Canada	BA 1161	approx. same location different spans
Hwy. #2 and #403	194-61	W.J.62-F-100	BA 1508	same location different spans
Hwy. #2 and Ramp "A"	499-64	None	None	NEW

Would you kindly advise us if the recommendations as found in the existing reports are applicable to the proposed new footing locations and in the case of W.P. 499-64 arrange an investigation to provide us with the information necessary to design the new bridge.

WSM/im

cc. R. Fitzgibbon  
cc. N. D. Smith

*W. S. Melinyshyn*  
W. S. Melinyshyn,  
Regional Bridge Location Engineer.



Mr. W. S. Melinyshyn,  
Regional Bridge Location Engr.,  
Bridge Division.

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

February 12, 1965

Mohawk Road Underpass	--	W.P. 100-57	
Hamilton Drive Underpass	--	W.P. 184-60	no investigation
Hwy. #2 Underpass	--	W.P. 194-61	no investigation
Hwy. #2 Bridge over Ramp "A"		W.P. 499-64	
<u>Hwy. #403 -- District #4.</u>			

With reference to your memo of February 5, 1965,  
please note the following:

For Jobs W.P. 184-60 and 194-61, the available  
subsoil information and recommendations can be applied.

For Job W.P. 499-64, a subsoil investigation will  
be carried out. While at this location, two boreholes will  
be put down also at Job Site W.P. 100-57 in order to find out  
whether the available information can be used.

AGS/MdeF

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

cc: Foundations Office  
Gen. Files

#65-F-29

W.P. #499-64

Hwy. #403 :

Hwy. #2





#65-F-29

W.P. #499-64

Hwy. #403 :

Hwy. #2





