

DEPARTMENT OF HIGHWAYS ONTARIO

## MEMORANDUM

23-17-136  
W.P. 217-63-1

To: Mr. B. R. Davis,  
Bridge Engineer,  
Bridge Division.  
  
Attention: Mr. S. McCombie

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

Date: July 14, 1966

Our File Ref.

In Reply To

JUL 27 1966

Subject:

FOUNDATION INVESTIGATION REPORT  
For  
Proposed Fifty Road Underpass and  
Q.E.W., Twp. of Saltfleet, Co. of  
Wentworth, District #4 (Hamilton).  
W.J. 66-F-55 -- W.P. 217-63-1

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/MaeF  
Attach.

cc: Messrs. B. R. Davis (2)  
H. A. Tregaskes  
D. W. Farren  
G. K. Hunter (2)  
H. Greenland  
W. S. Melinyshyn  
T. J. Kovich  
A. Watt

Foundations Office  
Gen. Files

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

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  2. SUBSOIL CONDITIONS.
  3. DISCUSSION AND RECOMMENDATIONS.
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FOUNDATION INVESTIGATION REPORT  
For  
Proposed Fifty Road Underpass and  
Q.E.W., Twp. of Saltfleet, Co. of  
Wentworth, District #4 (Hamilton).  
W.J. 66-F-55    --    W.P. 217-63

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1. INTRODUCTION:

A request to carry out a foundation investigation for the proposed underpass at the crossing of the Q.E.W. and Fifty Road, was received from the Bridge Location Section (memorandum from Mr. W. S. Melinyshyn, Regional Bridge Location Engineer, dated May 4, 1966). An investigation was subsequently carried out by this Section to determine the subsoil conditions at the site of the proposed structure. Presented in this report are the results of our investigation, together with recommendations pertaining to the foundations for the structure and the stability of the proposed approach embankments.

The site is located in the Niagara peninsula between the Niagara escarpment and Lake Ontario, approximately 4 miles west of the town of Grimsby. In particular, it is located in lots 2 and 3 of concession I, township of Saltfleet and county of Wentworth. The surrounding topography is flat and the area is generally in use for orchards or vineyards.

2. SUBSOIL CONDITIONS:

Five borings, together with dynamic cone penetration tests on boreholes 1 and 4, were carried out during the course of field work, revealing subsoil conditions to be generally uniform over the site area. The entire site is underlain by an extensive deposit of very stiff to hard clayey silt with traces of sand and gravel. This deposit was proved to a maximum depth of some 33 ft. in B.H. #1. Occasional pockets of silt were observed within this deposit.

cont'd. /2 ...

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

Physical properties as determined from field and laboratory tests, are summarized as follows:

Liquid Limit	--	21% - 36%
Plastic Limit	--	11% - 20%
Moisture Content	--	7% - 21%
'N' Values	--	18 - 108 blows/ft.

Observations carried out during the time of the field investigation, indicated that the water level in the boreholes was approximately between elev. 269 and 272. The exact water levels are shown on the borehole logs.

3. DISCUSSION AND RECOMMENDATIONS:

It is proposed to reconstruct the existing Q.E.W. as a controlled access highway from Stoney Creek traffic circle to St. Catharines. In addition, two-lane service roads are proposed to be built on both sides of the Q.E.W. This reconstruction program necessitates the construction of several underpass structures.

At the crossing of Fifty Road and the Q.E.W., an underpass structure is proposed. Present proposals call for a six-span (35' - 71' - 76.5' - 76.5' - 71' - 35') structure with approach fills having a maximum height of 22 ft. above existing ground level.

Since the subsoil consists of hard clayey silt with sand and occasional gravel, conditions are favourable for spread footing support, and in the case of the proposed piers, it is recommended that footings be placed 5 ft. below the top of finished grade within the hard clayey silt stratum, with an allowable pressure of 2.5 t.s.f.

The proposed abutments may be constructed within the approach fills and supported on 12"  $\emptyset$  displacement piles driven

cont'd. /3 ...

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

to, but not beyond elev. 255. A 12"  $\emptyset$  pile could carry an allowable load of 30 tons/pile. During construction of the approaches, care should be taken to ensure no bouldery fill is placed at the locations through which piles have to be driven. As an alternative, the abutments may be supported on spread footings placed within the approach fills. The fill material below the tops of the footings should consist of well compacted granular material (G.B.C. class 'A') and should extend for a horizontal distance of at least 10 ft. from the footing edges in the plane of the footing tops. This portion of the fill should be built with side slopes 2:1. The remainder of the fill should be completed to about profile grade for re-excavating for the abutment footings. A design load of 2 t.s.f. may be used for the abutment foundations.

No major dewatering problems are anticipated during the construction of pier footings in view of the low permeability of the subsoil; however, care should be taken to prevent softening of the subsoil at the footing levels by surface run-off.

No stability problems are anticipated provided that standard 2:1 slopes are constructed.

4. MISCELLANEOUS:

The field work, performed during period June 6 to June 10, 1966, together with the preparation of this report, was undertaken by Mr. L. Palmer, Project Foundation Engineer. The investigation was carried out under the general supervision of Mr. M. Devata, Supervising Foundation Engineer, who reviewed the report.

Equipment used was owned and operated by Canadian Longyear Co. Ltd.

July 1966

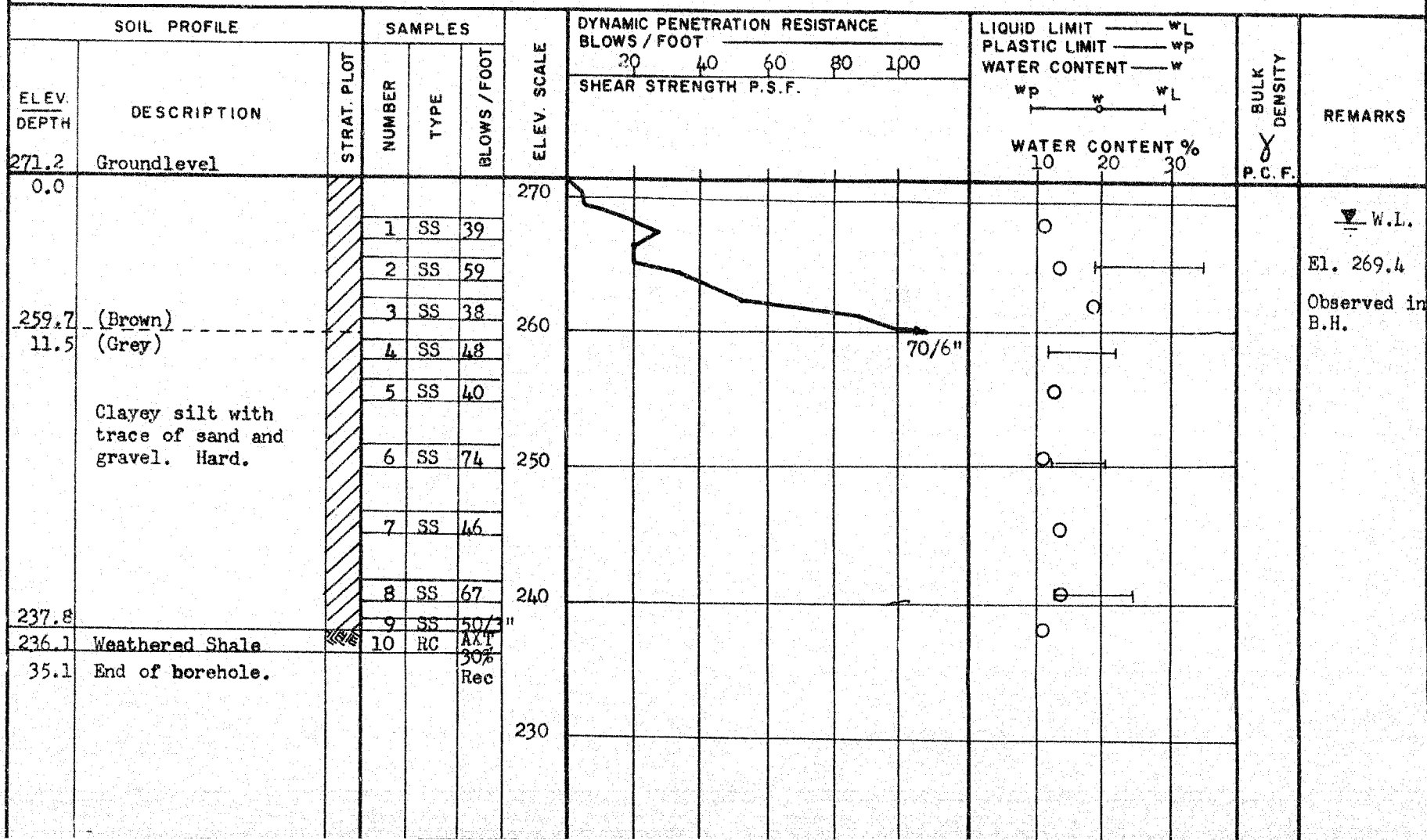
APPENDIX I

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS &amp; TESTING DIVISION

## RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

JOB 66-F-55LOCATION QEW & Fifty Rd.; Sta. 28/19, O/S 38' Rt.ORIGINATED BY L.P.W.P. 217-63BORING DATE June 6 & 7, 1966.COMPILED BY W.T.E.DATUM GeodeticBOREHOLE TYPE Cone; Washboring BX; AXTCHECKED BY W.T.E.

DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 66-F-55

LOCATION Gen & Fifty Rd.; Sta. 29/21, O/S 40' Rt.

ORIGINATED BY L.P.

W. P. 217-63


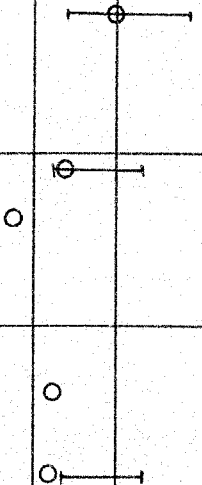


BORING DATE June 7 & 8, 1966.

COMPILED BY \_\_\_\_\_ W.T.E.

DATUM Geodetic

BOREHOLE TYPE Washboring NX-BX; BXL

CHECKED BY JK

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			
272.1	Groundlevel												
	Clayey silt with traces of sand and gravel. Very stiff to hard. (Brown) ----- (Grey)		1	SS	23	270						<div style="text-align: center;"><p>WATER CONTENT %</p><p>10 20 30</p></div>	<div style="text-align: center;"><p>W.L.</p><p>El. 270.3</p></div>
			2	SS	73								
262.6			3	SS	18								
9.5			4	SS	28	260							
			5	SS	51								
			6	SS	69	250							
			7	SS	54								
240.1			8	SS	75/4"	240							
32.0	Bedrock		9	RC	BXL								
234.0			10	RC	BXL								
38.1	End of borehole.				Rec	230							



# RECORD OF BOREHOLE NO. 3

FOUNDATION SECTION

LOCATION QEW & Fifty Rd.; Sta. 28/34; O/S 28' Lt.



ORIGINATED BY L.P.

BORING DATE June 8, 1966.

COMPILED BY W.T.E.

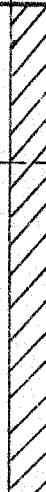


BOREHOLE TYPE Washboring NX-BX

CHECKED BY AK

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W wp ——— w ——— WL WATER CONTENT % 10 20 30	BULK DENSITY P.C.F.	REMARKS		
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT						SHEAR STRENGTH P.S.F.	
271.2	Groundlevel											
261.7 9.5	Clayey silt with traces of sand and (Brown) (Grey Brown) gravel - pockets of silt - Hard.		1	SS	36	270					WL El. 269.4 Observed in B.H.	
			2	SS	46							
			3	SS	38							
			4	SS	34	260						
			5	SS	37							
			6	SS	70	250						
			7	SS	46							
			8	SS	70	240						
238.3	Weathered Shale		9	SS	71/6"					No Recovery		
32.9	End of borehole.											
						230						

FOUNDATION SECTION

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— w <sub>L</sub> PLASTIC LIMIT ——— w <sub>p</sub> 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	w <sub>p</sub>
273.7	Groundlevel													
264.7 9.0	Clayey silt with traces of sand and (Grey Brown) (Grey) gravel - pockets of silt - Very stiff to hard.		1	SS	40	270							WL  El. 270.6 Observed in B.H.  No recovery	
			2	SS	33									
			3	SS	22									
			4	SS	24	260								
			5	SS	52									
			6	SS	61									
			7	SS	33	250								
245.7			8	SS	50/3"									
28.0	Dedrock				BXL									
240.3	Sound Shale		9	RC	97% Rec	240								
33.4	End of borehole.													
						230								

DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

JOB 66-F-55

LOCATION QEW & Fifty Rd.: Sta. 30+66.5 O/S 49' Lt.

ORIGINATED BY L.P.

W. P. 217-63

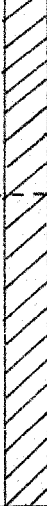

BORING DATE June 10 & 13, 1966.

COMPILED BY W.T.E.

DATUM Geodetic

BOREHOLE TYPE Washboring NX-BX; BXL

CHECKED BY                     

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			
273.3	Groundlevel											
	Hard clayey silt with some sand and traces of gravel.		1	SS	36	270						
			2	SS	40							
262.3	(Brown)		3	SS	34							
11.0	(Grey Brown)		4	SS	30	260						
			5	SS	33							
			6	SS	42	250						
			7	SS	39							
243.8			8	SS	108							
29.5	Weathered Shale											
241.3	(Red)											
32.0	Sound Shale (Red)				BXL	240						
236.1			9	RC	100%	Rec						
37.2	End of borehole.											
						230						

DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

JOB 66-F-55

LOCATION QEW & Fifty Rd.; Sta. 31+18 O/S 55' Rt.

W. P. 217-63

BORING DATE March 22, 1965.

DATUM G.S.C.

BOREHOLE TYPE Penndrill

## RECORD OF BOREHOLE NO. 6

PREVIOUSLY USED AS  
BH. NO. 6 OF  
JOB NO. 65-F-28.

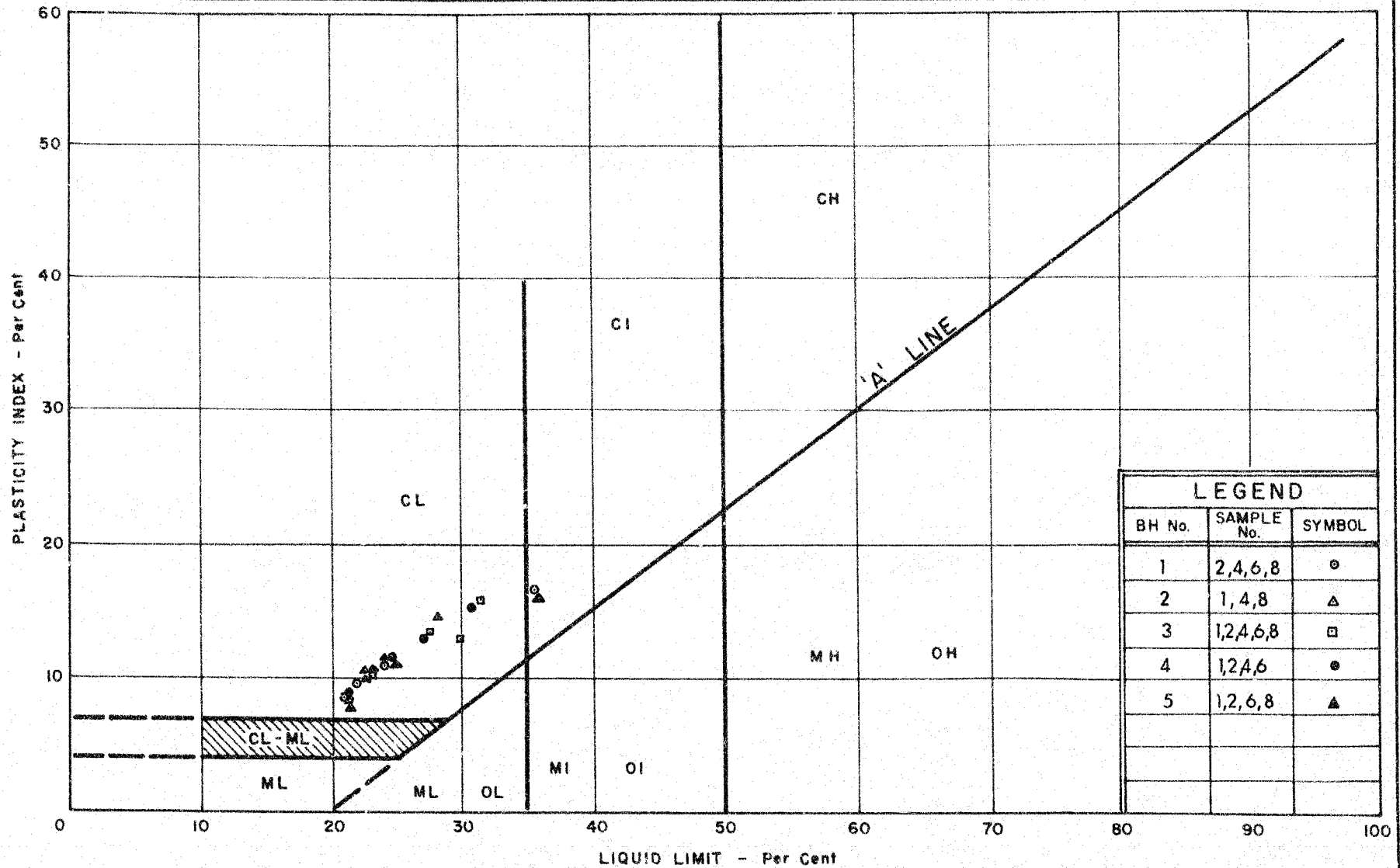
FOUNDATION SECTION

ORIGINATED BY T.C.

COMPILED BY T.C.

CHECKED BY M.D. [Signature]

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 %			
272.5 0.0	Groundlevel					270						El. 272 Observed in B.H.  Gr 3% Sal 8% Si 48% Cl 31%
			1	SS	37							
			2	SS	38							
263.0 9.5	(Brown) (Grey)		3	SS	17							
			4	SS	34	260						
	Clayey silt with sand and occasional gravel.		5	SS	39							
	V. stiff to hard.		6	SS	43	250						
			7	SS	42							
242.0 30.5	Refusal (Probably Shale) End of borehole.		8	SS	42 1/2"	240						



LEGEND		
BH No.	SAMPLE No.	SYMBOL
1	2,4,6,8	○
2	1,4,8	△
3	1,2,4,6,8	□
4	1,2,4,6	●
5	1,2,6,8	▲



DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

ONTARIO

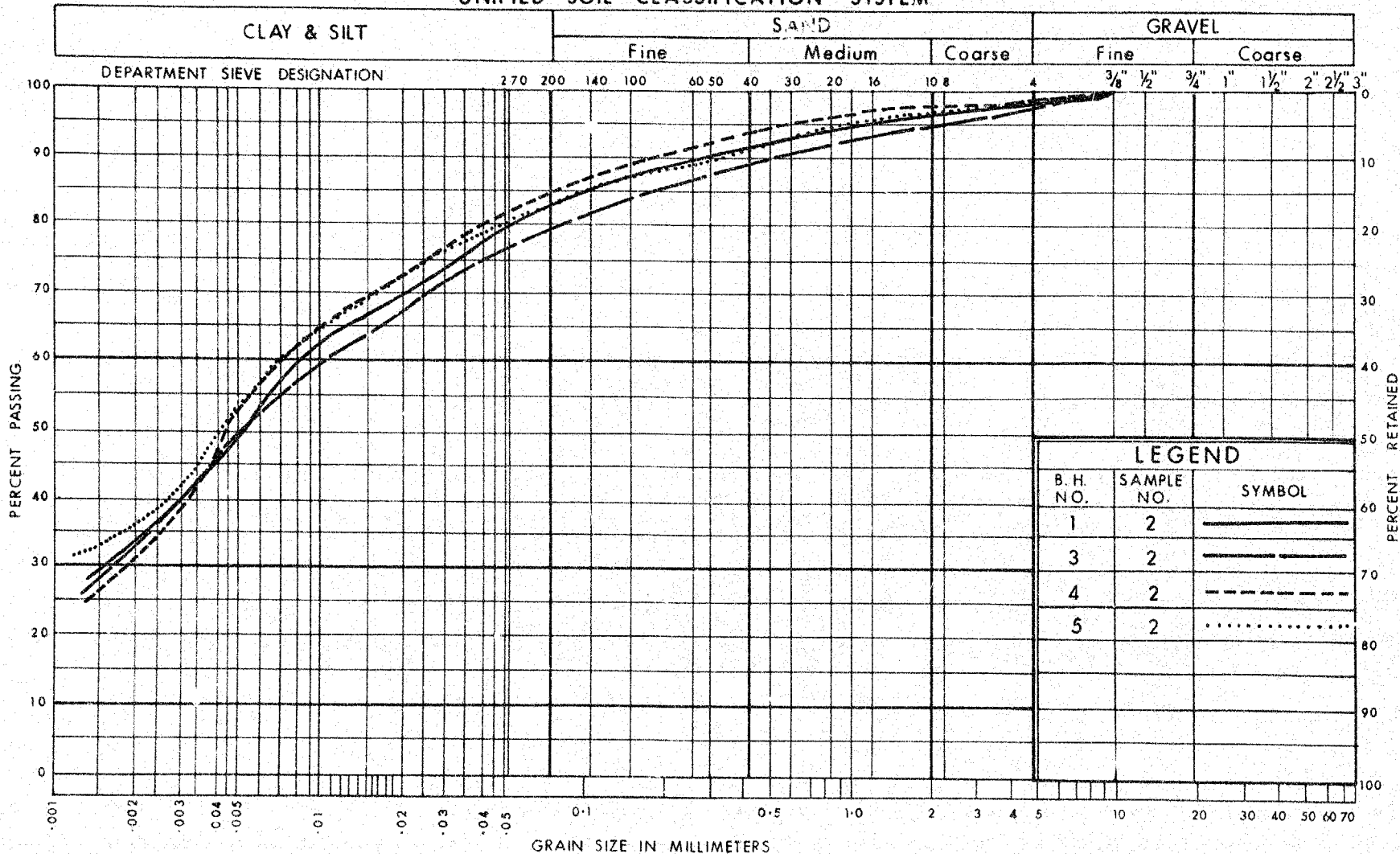
## PLASTICITY CHART

W.P. No. 217 - 63

JOB No. 66 - F - 55

Q.E.W. & FIFTY ROAD

# UNIFIED SOIL CLASSIFICATION SYSTEM



ONTARIO

DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

## GRAIN SIZE DISTRIBUTION

W.P. No. 217 - 63

JOB No. 66 - F - 55

G.E.W. & FIFTY ROAD

## 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
$c_u$	APPARENT COHESION
$\phi_u$	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
$\mu$	COEFFICIENT OF FRICTION
$S_r$	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
$\sigma'$	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



*ago*

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

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

March 30, 1967

Fifty Road Underpass --  
18.6 Miles West of St. Catharines, W. Limits,  
H.P. 217-63-1 -- W.J. 66-P-55  
Q.E.W., District #4, (Hamilton).

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We have reviewed the Preliminary Bridge Plan Drawing D-6028-P1 for the above mentioned structure, and submit the following comments:

We note that the pier foundations are shown at elev. 271.50, which is some 6 to 12 inches below the existing ground surface. The subsoil conditions are not favourable at this elevation and, therefore, we recommend that the pier footings be located at or below elev. 269.0 as noted in our Foundation Report.

AD/mief

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

*M. Devata*

M. Devata,  
SUPERVISING FOUNDATION ENGR.  
For:

A. G. Sterzac,  
PRINCIPAL FOUNDATION ENGR.

Copy for the information of

Mr. A. Stermac, Principal Foundation Engineer,  
Room 107, Lab. Building

Mr. W. Melinyshyn,  
Regional Bridge Location Engineer,  
Central Region,  
Administration Building

Bridge Division,  
Downsview, Ontario

March 22, 1967

Fifty Rd. Underpass  
18.6 Miles West of St. Catharines W. Limits  
W.P. 217-63-1, Site 36-208  
Q.E.W., District No. 4

Attached herewith are prints of the Preliminary Bridge  
Plan Drawing B-6028-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$372,000.  
This cost includes tender, materials, engineering and sundry  
construction.

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

CSG:rd

C.S. Grabski,  
Bridge Design Engineer

Attach.

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

1 JUN 7 11:57

The following information was given to Tom Kovich  
by phone

0142

B

HAMN DOWN 1 JUNE 7/66 11.45 A VR

H GREENLAND DIST ENGR

ATT W D HAM MAINTCE ENGR

RE NO. 1 WINONA ROAD UNDER PASS WP 216-63, WJ66-S-49

NO. 2 FIFTY-ROAD INTERCHANGE WP217-63, WJ66-F-55 ✓

NO. 3 OAKES ROAD UNDER PASS WP218-63 WJ-66-F-16

NO. 4 OFIELD ROAD INTERCHANGE WP224-63, WJ66-F-54

THE FIELD WORK FOR THE ABOVE MENTIONED FOUNDATION PROJECTS IS  
IN PROGRESS THIS IS FOR YOUR INFORMATION .

W DEVATA SENIOR FOUND ENGR FOR A G STERNAC PRINC FOUND ENGR

T  
E  
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## MEMORANDUM

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

From: Bridge Division,  
Downsview, Ontario.

DATE: May 9th, 1966.

OUR FILE REF.

IN REPLY TO:

SUBJECT: W.P. #216-63, Site #36-207, 66-A-49  
Winona Road Underpass,  
W.P. #217-63, Site #36-208, 66-A-50  
Fifty Road Interchange,  
W.P. #218-63, Site #18-191, 66-A-51  
Oakes Road Underpass,  
W.P. #224-63, Site #18-196, 66-A-52  
Ofield Road Interchange.

Herewith one print each of the following bridge site plans for the above structures, E-4731-1, E-4732-1, E-4728-1, and E-4729-1. The probable location of footings have been marked in red. Please arrange for a foundation investigation of sufficient scope to enable us to proceed with the design.

Also enclosed are the preliminary structure site report sheets.

JFW/cew  
Attach.  
cc. R. Forrest  
A. Crowley

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

COMPLETION DATE JULY 27, 1966.

# 66-F-55

W.P. #217-63-1

Q.E.W. &

FIFTY RD.

UNDERPASS

