

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

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

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

Attention: Mr. S. McCombie

DATE: July 26, 1966

OUR FILE REF.

IN REPLY TO

AUG 17 1966

SUBJECT:

FOUNDATION INVESTIGATION REPORT

For

Proposed Oakes Road Underpass  
And Q.E.W., Township of North  
Grimsby, County of Lincoln,  
District #4 (Hamilton)  
W.J. 66-F-56 -- W.P. 218-63

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 be adequate for your design requirements. Should additional information be required, please feel free to contact our Office.

AGS/MdeF  
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 ✓

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

## TABLE OF CONTENTS

1. INTRODUCTION.
  2. SUBSOIL CONDITIONS:
    - 2.1) General.
    - 2.2) Clayey Silt with traces of Sand and Gravel.
    - 2.3) Shale Bedrock.
  3. GROUNDWATER.
  4. DISCUSSION AND RECOMMENDATIONS.
  5. MISCELLANEOUS.
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FOUNDATION INVESTIGATION REPORT  
For  
Proposed Oakes Road Underpass  
And Q.E.W., Township of North  
Grimsby, County of Lincoln,  
District #4 (Hamilton)  
W.J. 66-F-56 -- W.P. 218-63

1. INTRODUCTION:

A request to carry out a foundation investigation for the proposed underpass at the crossing of the Q.E.W. and Oakes Road, was received from the Bridge Location Section (memorandum from Mr. W. S. Melinyshyn, Regional Bridge Location Engineer, dated May 9, 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 a portion of the "Niagara Fruit Belt," lying between the Niagara Escarpment and Lake Ontario, in the Township of North Grimsby, about 2.5 miles west of Grimsby.

During the Pleistocene Period the site was inundated by Lake Iroquois, which carved the present relatively flat topography from the underlying glacial till. The glacial deposit extends to the bedrock.

2. SUBSOIL CONDITIONS:

2.1) General:

Seven borings, together with dynamic cone penetration tests, were carried out during the course of field work, revealing subsoil conditions to be generally uniform at this site. Subsoil

3. GROUNDWATER:

Groundwater observations were carried out in boreholes during the time of the field investigation. These indicate the groundwater level to be at approximate elevation 268. The exact water levels in all the boreholes are shown on the accompanying borelog sheets.

4. DISCUSSION AND RECOMMENDATIONS:

It is proposed to reconstruct the existing Q.E.W. as a controlled access highway from Stoney Creek 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 Oakes Road and the Q.E.W., an underpass structure is proposed. Present proposals call for a six-span (35' - 59' - 76.5' - 76.5' - 59' - 35') structure, with approach fills having a maximum height of 22 ft. above existing ground level.

Since the subsoil from ground level consists of clayey silt with sand of a very stiff to hard consistency, conditions are favourable for spread footing support, and in the case of the proposed piers, it is recommended that footings be placed at approximate elev. 265 or lower, with an allowable pressure of 2.5 t.s.f.

The proposed abutments may be constructed within the approach fills and supported on 12" Ø displacement piles driven to but not beyond elev. 255. A 12" Ø pile could carry an allowable load of 30 tons/pile. Care should be taken to ensure that 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

cont'd. /4 ...

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

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 construction of footings in view of the low permeable nature of the subsoil; however, care should be taken to prevent softening of the subsoil at the footing levels by the surface run-off.

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

5. MISCELLANEOUS:

The field work, performed during June 1966, was undertaken by Mr. V. Korlu, who also prepared this report. The investigation was carried out under the general supervision of Mr. M. Devata, Supervising Foundation Engineer.

Equipment used was owned and operated by Canadian Longyear Drilling Company Limited.

July 1966

APPENDIX 1.

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FOUNDATION SECTION

ORIGINATED BY V.K.

COMPILED BY W.T.E.

CHECKED BY MD. *[Signature]*

Elev. 259.1

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 56-F-56 LOCATION QEW & Oakes Rd. Sta. 31/40, 11.0' Rt. ORIGINATED BY V.K.  
W.P. 218-53 BORING DATE June 14, 1966 COMPILED BY W.T.E.  
DATUM Geodetic BOREHOLE TYPE Pennndrill 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		20	40	60	80	100	wp	w	wL		
271.6	Groundlevel															
0.0						270										
			1	SS	26											
			2	SS	54											
			3	SS	100											
	Clayey silt with traces of sand and gravel.		4	SS	70	260										
			5	SS	65											
	V. stiff to hard.		6	SS	47											
			7	SS	39	250										
			8	SS	25											
240.6			9	SS	33	240										
31.0	Silty sand.															
235.1	Very dense		10	SS	100	3"										
36.5	Weathered shale.		11	SS	100	3"										
233.3																
38.3	Red Shale.					230										

WL  
Elev. 259.1



DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

JOE 66-F-56

LOCATION QBW & Oakes Rd. Sta. 30+74, 13.5' Lt.

ORIGINATED BY                      V.K.

W. P. 218-63

BORING DATE June 15, 1966.

COMPILED BY W.T.E.

DATUM Geodetic

SOREHOLE TYPE Penndrill

CHECKED BY     M.D.

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	SHEAR STRENGTH P.S.F.		WATER CONTENT % 10    20    30	P.C.F.	
271.7 0.0	Groundlevel									
	Clayey silt with traces of sand and gravel.  V. stiff to hard.		1	SS	25			O		
			2	SS	58			O	———	
			3	SS	40			O		
			4	SS	63					
			5	SS	63			O	———	
			6	SS	51					
			7	SS	45			O	———	
			8	SS	32					
			9	SS	29			O		
			10	SS	122					
231.7 40.0	Weathered shale.		11	SS	100/5"	230		O		
227.1 44.6	Red shale.		12	SS	100/1"					

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

JOB 66-F-56

LOCATION QEW & Cakes Rd. Sta. 30+05. 36.5' Lt.

ORIGINATED BY V.K.

W.P. 218-63

BORING DATE June 16, 1966.

COMPILED BY W.T.E.

DATUM Geodetic

BOREHOLE TYPE Pennndrill

CHECKED BY M.D.

SOIL PROFILE		SAMPLES			ELEV. SCALE		DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — WL PLASTIC LIMIT — WP		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	BLOWS / FOOT	BLOWS / FOOT	BLOWS / FOOT	WATER CONTENT — W	WATER CONTENT %		
270.5	Groundlevel											
	Clayey silt with traces of sand and gravel.  Hard.		1	SS	42							
			2	SS	44	260						
			3	SS	33							
			4	SS	35	250						
			5	SS	29							
			6	SS	29	240						
			7	SS	37							
			8	SS	100.5"	230						
227.2												
43.3	Weathered shale.		9	SS	100.1"							
223.6												
46.9	Red shale.					220						

DEPARTMENT OF HIGHWAYS - ONTARIO

## RECORD OF BOREHOLE NO. 5

FOUNDATION SECTION

MATERIALS &amp; TESTING DIVISION

JOB 66-F-56

LOCATION QEW & Oakes Rd. Sta. 29/21, 19.5' Rt.ORIGINATED BY V.K.

W.P. 218-63

BORING DATE June 17, 1966.COMPILED BY W.T.E.DATUM GeodeticBOREHOLE TYPE PenndrillCHECKED BY M.D. HR

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W		BULK DENSITY P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	20 40 60 80 100	WP — WL	WATER CONTENT %			
270.1	Groundlevel											
0.0	Clayey silt with traces of sand and gravel.  Hard.		1	SS	31							
			2	SS	49							
			3	SS	34							
			4	SS	32							
			5	SS	29							
			6	SS	39							
			7	SS	42							
			8	SS	38							
			9	SS	38							
			10	SS	31							
			11	SS	34							
226.1	Weathered shale		12	SS	100/1"							
222.0	Shale bedrock.											
48.1												

Dynamic Penetration Resistance (DPR) curve plotted on the right side of the form, showing resistance in blows per foot (BPF) versus depth in feet. The curve starts at approximately 20 BPF at 0.0 feet, rises to about 40 BPF at 1.0 feet, then drops to about 20 BPF at 2.0 feet, and continues to fluctuate between 20 and 40 BPF down to 10.0 feet. A label '100/10"' is placed near the curve at approximately 2.5 feet depth.

Water Content (W) and Plastic Limit (WP) data points are plotted on the right side of the form, showing values ranging from approximately 10% to 30% water content and 10% to 20% plastic limit.

Remarks: WL Elev. 267.6

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & TESTING DIVISION

## RECORD OF BOREHOLE NO. 6

FOUNDATION SECTION

JOB 66-F-56LOCATION QEW & Oakes Rd, Sta. 28+61, 9.0' Lt.ORIGINATED BY V.K.W.P. 218-63BORING DATE June 17, 1966.COMPILED BY W.T.E.DATUM GeodeticBOREHOLE TYPE PenndrillCHECKED BY M.D. HR

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 SHEAR STRENGTH P.S.F.	LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W Wp — W — WL WATER CONTENT %		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE			BLOWS / FOOT			
270.0	Groundlevel									
0.0	Clayey silt with traces of sand and gravel.		1	SS	35					WL Elev. 267.5
			2	SS	42					
			3	SS	34		260			
			4	SS	37					
			5	SS	34					
			6	SS	37		250			
			7	SS	51					
			8	SS	33					
			9	SS	38		240			
			10	SS	30					
			11	SS	31		230			
226.0	Weathered shale.		12	SS	100	1"				
44.0										
221.2	Shale Bedrock.					220				
48.8										

DEPARTMENT OF HIGHWAYS - ONTARIO

## RECORD OF BOREHOLE NO. 7

FOUNDATION SECTION

## MATERIALS &amp; TESTING DIVISION

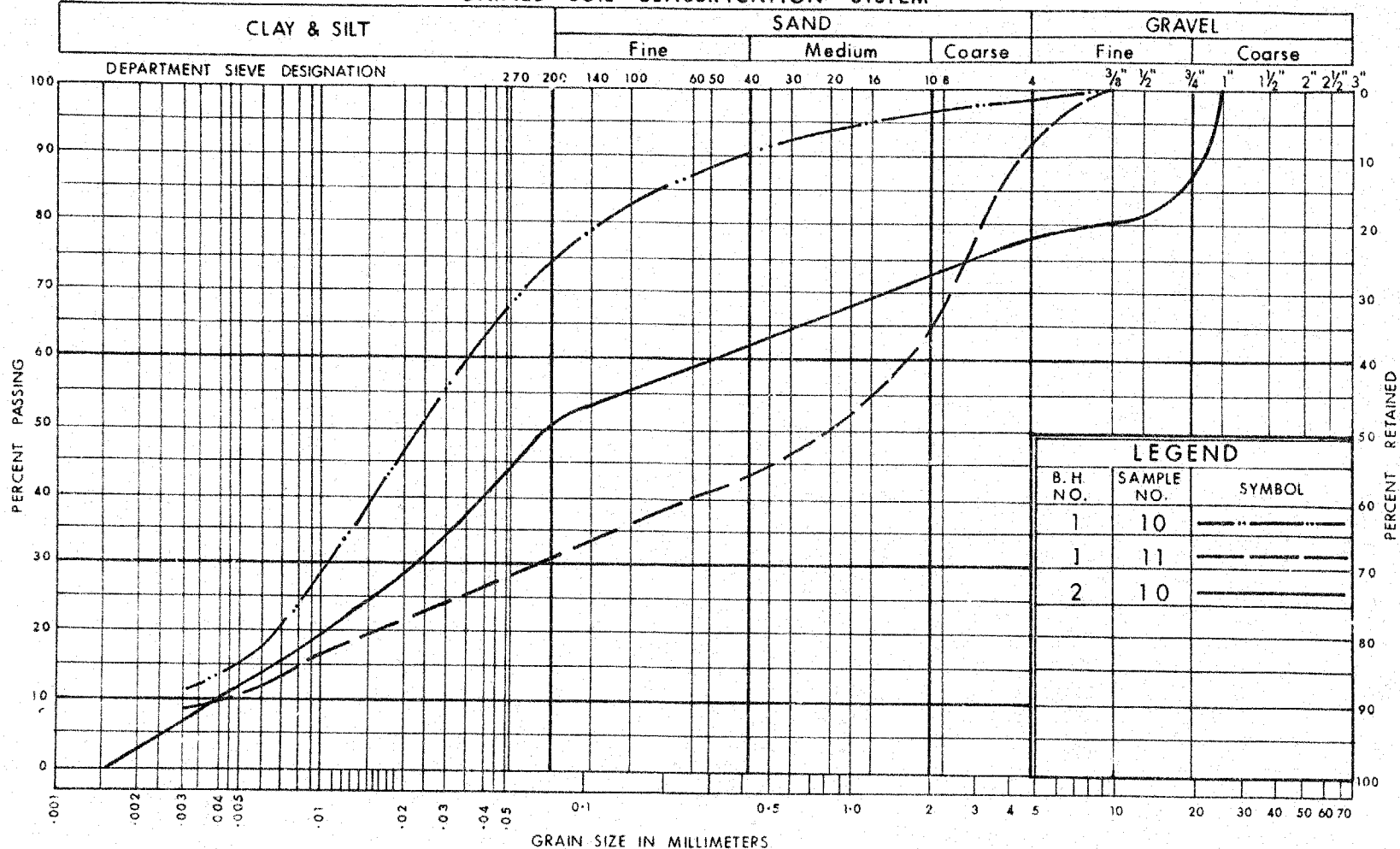
JOB 66-F-56 LOCATION QEW & Oakes Rd. Sta. 28+79, 11.0' Rt. ORIGINATED BY V.K.  
W.P. 218-63 BORING DATE June 20, 1966. COMPILED BY W.T.E.  
DATUM Geodetic BOREHOLE TYPE Penndrill CHECKED BY M.D. HR

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 SHEAR STRENGTH P.S.F.	LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W WP — W — WL WATER CONTENT %	BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT					
270.0	Groundlevel									
	Clayey silt with traces of sand and gravel.  Hard.		1	SS	32					
			2	SS	38	260				
			3	SS	31					
			4	SS	31	250				
			5	SS	33					
			6	SS	29	240				
			7	SS	43					
			8	SS	31	230				
225.0										
45.0	Reddish brow.									
222.0	Weathered shale.		9	SS	100/1"					
48.1	Shale Bedrock					220				

W.L.  
Elev. 267.5



# UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND		
B. H. NO.	SAMPLE NO.	SYMBOL
1	10	—————
1	11	—————
2	10	—————

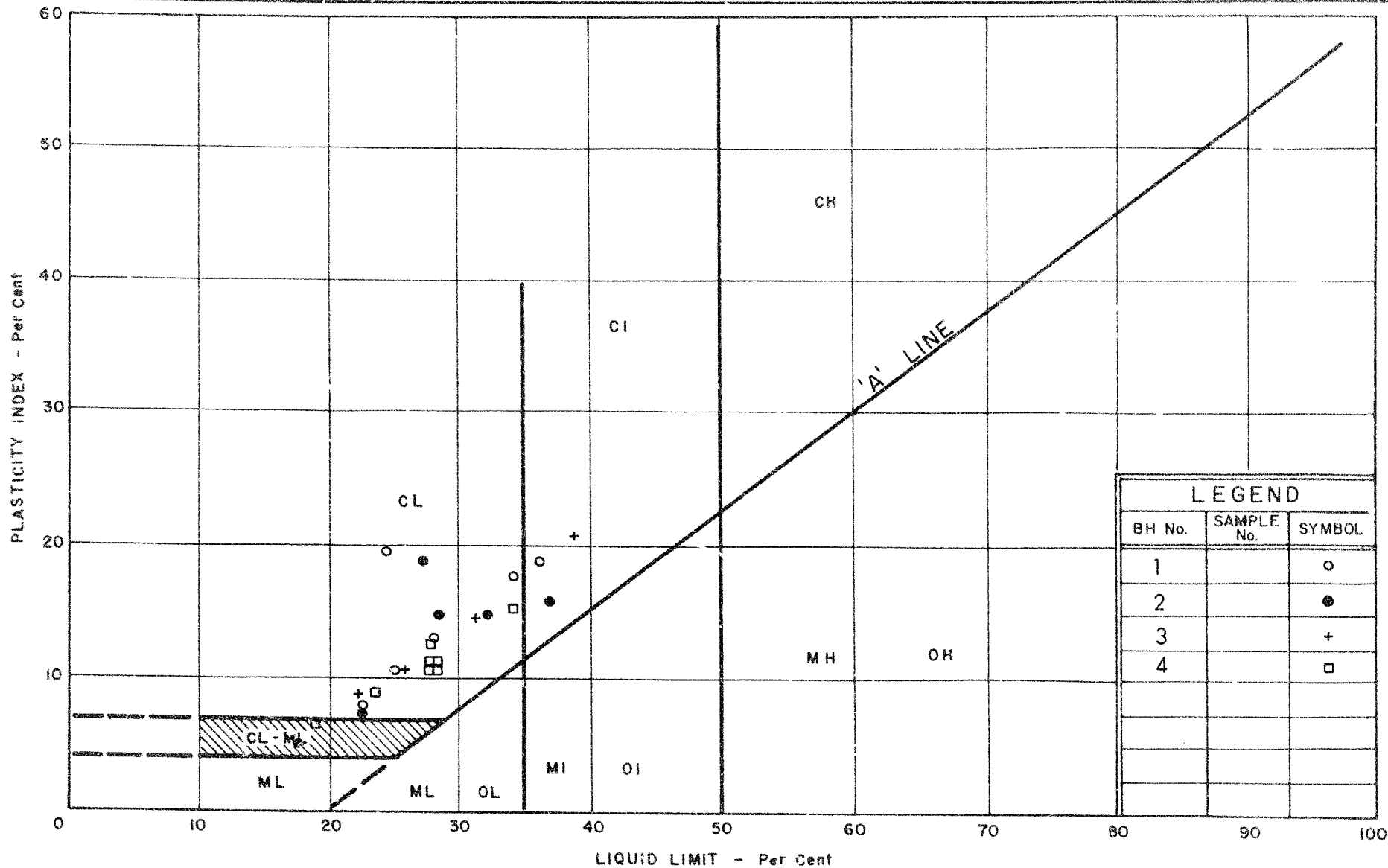


DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

GRAIN SIZE DISTRIBUTION  
FOR SILT & SAND STRATUM B.H. 1 & 2

W.P. No. 218-63

JOB No. 66-F-56



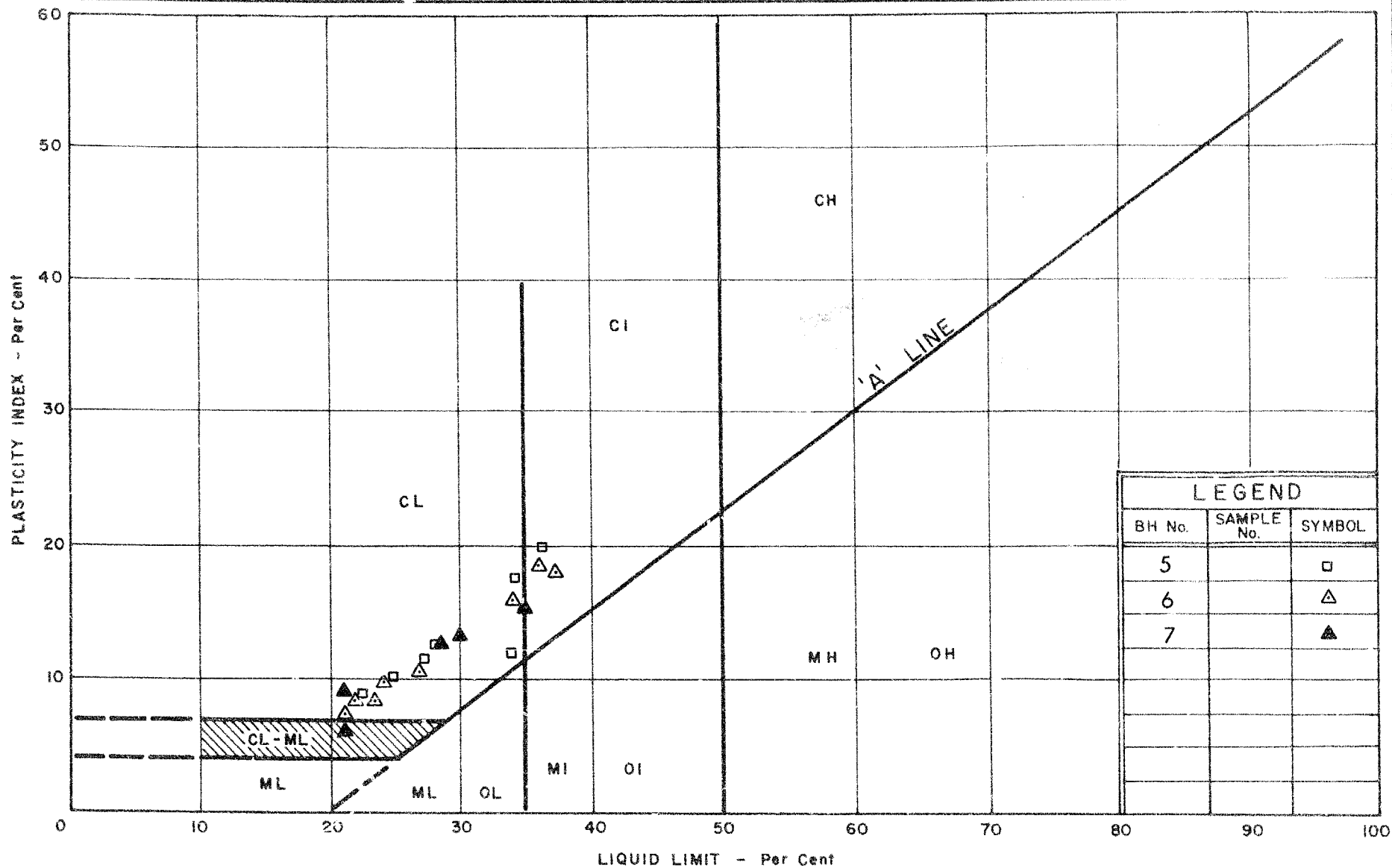
DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

## PLASTICITY CHART

W.P. No. 218 - 63

JOB No. 66 - F - 56





DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

## PLASTICITY CHART

W.P. No. 218 - 63

JOS No. 66-F-56

## 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

Q <sub>u</sub>	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Q <sub>cu</sub>	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Q <sub>d</sub>	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
$S_t$	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

## MEMORANDUM

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

FROM: Bridge Division,  
Downsview, Ontario.

DATE: May 9th, 1956.

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  
Offield 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.

Copy for the information of

Mr. A. Stermac, Principal Location Engineer,  
Room 197, Lab. Building

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

Bridge Division,  
Downsview, Ontario

February 13, 1967

Oakes Rd. Underpass  
1.5 Mi. West of Grimsby  
W.P. 218-63, Site 18-191  
O.E.W., District No. 4

Attached herewith are prints of the Preliminary Bridge  
Plan Drawing B-6042-21 for the above-mentioned structure.

The estimated cost of the proposed structure is \$136,000.  
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. Grebski,  
Bridge Design Engineer

Attach.

c.c. R. Forrest  
R. Cross  
S. McConble  
A. Stermac

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

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

March 3, 1967

Oakes Road Underpass --  
1.5 Miles West of Grimsby,  
W.P. 213-63, Site 13-191,  
Q.E.W., District #4 (Hamilton),  
A.J. 33-P-65.

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The Preliminary Bridge Plan Drawing D-6024-P1 for the above mentioned structure has been reviewed.

The designer appears to have complied with the recommendations contained in the foundation report. This Section would like to install settlement plates at the above mentioned site prior to the commencement of approach fill construction. A note should be made on the construction drawings, so that the District Office will contact the Foundation Section one week prior to the starting of the approach fill construction.

AD/adeF

cc: Messrs. S. McCombie  
W. S. Melinyshyn

Foundations Files  
Gen. Files

*M. Devata*

M. Devata,  
SUPERVISING FOUNDATION ENGR.  
For:  
A. G. Stermac,  
PRINCIPAL FOUNDATION ENGR.

#66-F-56

W.P. # 218-63

Q.E.W. &

OAKES RD.

UNDERPASS

