

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 30 M11-191

DIST. 6 REGION

W.P. No. 149-87-00 (A)

CONT. No.

W. O. No.

STR. SITE No.

HWY. No. 400

LOCATION High Mast Poles on Hwy 400  
Between Hwy 401 & Steeles Ave

No of PAGES -

=====

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.

REMARKS:



Ministry  
of  
Transportation

*File*

---

## FOUNDATION DESIGN SECTION

**foundation  
investigation and  
design report**

ENGINEERING MATERIALS OFFICE  
FOUNDATION DESIGN SECTION

WP 149-87-00(A) DIST 6  
HWY 400 STR SITE

High Mast Light Poles on Hwy. 400

DISTRIBUTION

V.F. Boehnke (3)  
D. Billings  
W. Peck (2)  
E. Ellard (3)  
M. Holowka  
J. Robinson  
E.A. Joseph  
F. Bacchus (Cover Only)  
File

FOUNDATION INVESTIGATION REPORT  
For  
High Mast Light Poles on Hwy 400  
Between Hwy 401 and Steeles Avenue  
W.P. 149-87-00(A)  
District 6, Toronto

INTRODUCTION

The subsoil information contained in this report was obtained from various foundation investigations carried out for existing structures in the area under W.P. 233-60, W.P. 131-85-02, W.P. 105-70-01, W.P. 699-64 and W.P. 164-79-06. No additional borings were carried out in the area where the high mast light poles are proposed to be constructed.

SITE DESCRIPTION

The site is located between Hwy 401/Hwy 400 and Steeles Avenue and Hwy 400 in the City of North York.

As a part of the upgrading of Hwy 400, it is proposed to illuminate Hwy 400 with high mast lighting. The height of the poles is anticipated to be about 35m. The site is located within the physiographic region known as the "Peel Plain". The underlying geological material of this plain is a till or boulder clay containing large amounts of Palaeozoic shale and limestone.

SUBSURFACE CONDITIONS

The underlying subsoil in the area proposed for high mast light poles consists mainly of cohesive material. The underlying subsoil in the area between Hwy 401 and Hwy 400 and Hwy 400 and Sheppard Avenue consists of very stiff to firm clayey silt to silty clay. However, the area north of Hwy 400 and Sheppard Avenue consists of very stiff to hard heterogeneous mixture of clayey silt, sand and gravel (glacial till). In addition, compacted fills were observed in the area where there are approach embankments. The extent of the area involved covers

more than a kilometre in length and it is not practical to give detail description for the individual strata. Reference should be made to the Record of Borehole sheets where details of the stratification at a particular boring location are given. However, for classification purposes, the soils encountered in the project area can be divided into six different zones.

- a) Clayey Silt (Fill Material)
- b) Clayey Silt
- c) Clayey Silt to Silty Clay
- d) Heterogeneous Mixture of Clayey Silt, Sand and Gravel (Glacial Till)
- e) Silty Sand
- f) Shale Bedrock

The subsurface conditions that may be expected in the proposed area of the high mast light poles, together with the field and laboratory test results are shown on the Record of Borehole Sheets contained in the Appendix of this report. The results of the Atterberg Limit Test are shown on Figures 1, 2 and 3. The location of the boreholes are shown on the Drawing No. 1498700-A.

As indicated before, no borings were carried out in the area where the high mast light poles are proposed to be constructed. However, a table indicating the borehole related to each high mast light pole is provided below for reference purposes.

<u>HML Pole No.</u>	<u>Related Borehole</u>
P1, P2, P3, P4, P5, P6, P39 and P40	BH #1, 2, 3 and 4
P7, P8, P9, P10, P11 P12, P13 and P14	BH #5, 6, 7, 8 and 9
P15	BH #10
P16 to P35	BH #11, 12, 13 and 14
P36, P37 and P38	BH #15

Groundwater Conditions

It appears that the groundwater was encountered in all the boreholes, with the exception of borehole 9. The groundwater level in each borehole is as follows.

<u>Borehole No.</u>	<u>Elevation</u>	<u>Remarks</u>
1	122.6	
2	114.7	
3	123.2	
4	120.6	
5	145.4	
6	141.7	
7	138.8	Not stabilized
8	145.4	
9	-	Not observed
10	143.5	
11	166.4	
12	164.9	
13	164.6	
14	-	Not established
15	182.2	

Since these boreholes were not advanced at the locations where the high mast poles are proposed, the groundwater conditions may vary from those given in the Record of Borehole Sheets.

## DISCUSSION AND RECOMMENDATIONS

### General

It is proposed to construct forty high mast light poles between Hwy 401 and Hwy 400 and Hwy 400 and Steeles Avenue. The location of poles is as follows:

POLE NO	NORTHING	EASTING	STATION
P1	4 842 099.4	303 008.8	10+564
P2	4 842 241.1	302 944.8	10+719
P3	4 842 386.2	302 906.1	10+868.5
P4	4 842 534.0	302 880.9	14+068
P5	4 842 681.8	302 855.6	14+218
P6	4 842 829.7	302 830.3	14+368
P7	4 842 975.6	302 805.3	14+516
P8	4 843 124.4	302 779.9	14+667
P9	4 843 271.3	302 754.7	14+816
P10	4 843 419.1	302 729.4	14+966
P11	4 843 566.0	302 704.3	15+115
P12	4 843 713.8	302 679.0	15+265
P13	4 843 861.7	302 653.7	15+415
P14	4 844 009.5	302 628.4	15+565
P15	4 844 157.4	302 603.1	15+715
P16	4 844 306.2	302 577.6	15+866
P17	4 844 454.1	302 552.3	16+016
P18	4 844 601.9	302 527.0	16+166
P19	4 844 749.3	302 501.8	16+315.5
P20	4 844 897.6	302 476.4	16+466
P21	4 845 045.5	302 451.1	16+616
P22	4 845 193.3	302 425.8	16+766
P23	4 845 341.2	302 400.5	16+916

P24	4 845 479.2	302 376.9	17+056
P25	4 845 599.9	302 356.3	17+178.5
P26	4 845 751.0	302 296.0	400/Finch Interchange
P27	4 845 673.0	302 466.5	"
P28	4 845 842.0	302 479.5	"
P29	4 845 917.0	302 351.0	"
P30	8 845 968.0	302 205.0	"
P31	4 845 829.0	302 160.0	"
P32	4 846 091.3	302 272.2	17+677
P33	4 846 263.8	302 242.7	17+852
P34	4 846 396.8	302 219.9	17+987
P35	4 846 538.8	302 195.6	18+131
P36	4 846 686.6	302 170.3	18+281
P37	4 846 836.5	302 144.7	18+433
P38	4 846 985.3	302 119.2	18+584
P39	4 841 851.5	303 144.0	400/Wilson
P40	4 841 975.0	303 074.0	"

### Foundation Design

The design of the foundation for the high mast light poles (single concrete caisson) should be in accordance with the method as outlined in the following papers.

Brohms, B.B. "Lateral Resistance of Piles in Cohesive Soil" Journal of the Soil Mechanics and Foundation Division. ASCE Vol. 90 No. SM2, paper 3285, March 1964.

Brohms, B.B. "Lateral Resistance of Piles in Cohesionless Soil" Journal of the Soil Mechanics and Foundation Division, ASCE Vol. 90 No. SM3, paper 3909 May 1964.



The design parameters are given in Table 1 appended to this report. The material located within the zone of frost penetration (1.2 m) should be neglected in the calculation of lateral resistance.

### Construction Considerations

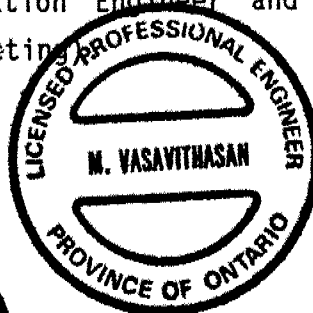
The Contractor is advised that variable types of surface material may be encountered at the high mast pole locations and for estimating purposes it should be assumed that:

- 1) Groundwater is at or near the surface.
- 2) If cohesionless material is encountered, it would be susceptible to disturbance under conditions of unbalanced hydrostatic head.
- 3) If glacial deposits are encountered, there is probability that occasional cobbles and boulders may be encountered within the deposit.

The Contractor shall be responsible for constructing the high mast light pole foundations without disturbing the material at the sides or base of the foundations.

### MISCELLANEOUS

This report was prepared by M. Vasavithasan, Foundation Engineer, reviewed by Tae C. Kim, Senior Foundation Engineer and approved by Mr. D. Dundas, Chief Foundation Engineer (Acting)



*M. Vasavithasan*  
M. Vasavithasan, P. Eng.  
Foundation Engineer

*D. Dundas*  
D. Dundas, P. Eng.  
Chief Foundation Engineer (Acting)

Table 1

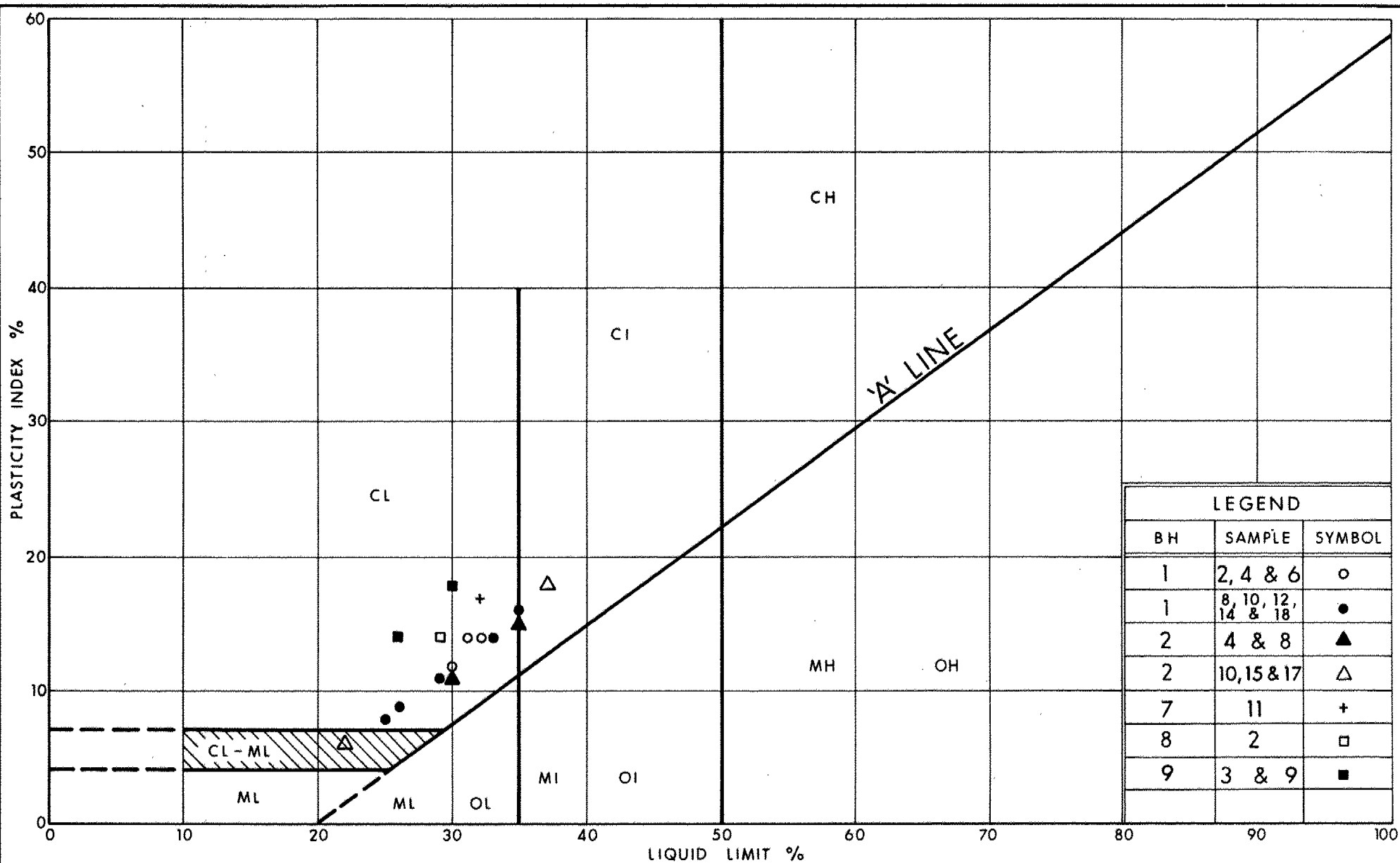
POLE NO.	SOIL BOUNDARY ELEVATION	SOIL TYPE	DESIGN PARAMETERS	
			$q_u$ (kPa)	$\gamma$ (kN/m <sup>3</sup> )
P1	132.8 - 130.0	C	120	18.5
	130.0 - 122.0	C	200	19.0
P2	133.9 - 132.0	C	120	18.5
	132.0 - 123.0	C	200	19.0
P3	135.1 - 131.5	C	120	18.5
	131.5 - 123.0	C	200	19.0
P4	137.1 - 133.0	C	120	18.5
	133.0 - 124.0	C	200	19.0
P5	139.9 - 137.5	C	120	18.5
	137.5 - 128.0	C	200	19.0
P6	142.2 - 140.0	C	120	18.5
	140.0 - 131.0	C	200	19.0
P7	144.7 - 143.0	C	150	18.5
	143.0 - 134.0	C	300	19.0
P8	147.1 - 145.5	C	150	18.5
	145.5 - 146.0	C	300	19.0
P9	149.4 - 139.0	C	300	19.0
P10	151.5 - 150.0	C	150	18.5
	150.0 - 140.0	C	300	19.0
P11	151.7 - 150.0	C	150	18.5
	150.0 - 140.0	C	300	19.0
P12	149.6 - 148.0	C	150	18.5
	148.0 - 139.0	C	300	19.0
P13	147.3 - 145.5	C	150	18.5
	145.5 - 136.0	C	300	19.0
P14	145.9 - 144.0	C	150	18.5
	144.0 - 135.0	C	300	19.0
P15	146.2 - 144.5	C	120	18.5
	144.5 - 135.0	C	400	20.0
P16	146.8 - 136.0	C	400	20.0
P17	147.9 - 136.0	C	400	20.0

P18	148.0 - 138.0	C	400	20.0
P19	150.4 - 149.0 149.0 - 139.0	C C	150 400	18.5 20.0
P20	153.2 - 151.5 151.5 - 141.0	C C	120 300	18.5 20.0
P21	156.3 - 154.0 154.0 - 144.0	C C	120 300	18.5 20.0
P22	159.3 - 157.5 157.5 - 147.5	C C	120 300	18.5 20.0
P23	162.2 - 159.5 159.5 - 150.0	C C	120 300	18.5 20.0
P24	165.1 - 163.5 163.5 - 153.0	C C	150 400	18.5 20.0
P25	167.5 - 166.0 166.0 - 156.0	C C	150 400	18.5 20.0
P26	169.7 - 159.0	C	400	20.0
P27	169.8 - 159.0	C	400	20.0
P28	170.4 - 160.0	C	400	20.0
P29	171.3 - 161.0	C	400	20.0
P30	172.3 - 162.0	C	400	20.0
P31	164.1 - 154.0	C	400	20.0
P32	175.3 - 165.0	C	400	20.0
P33	176.2 - 175.0 175.0 - 165.0	C C	150 400	18.5 20.0
P34	176.9 - 175.5 175.5 - 165.0	C C	150 400	18.5 20.0
P35	177.0 - 175.5 175.5 - 165.0	C C	150 400	18.5 20.0
P36	177.5 - 176.0 176.0 - 166.0	C C	150 400	18.5 20.0
P37	179.5 - 178.0 178.0 - 168.0	C C	150 400	18.5 20.0
P38	182.9 - 180.5 180.5 - 170.0	C C	150 400	18.5 20.0
P39	133.5 - 127.5 127.5 - 122.0	C C	120 200	18.5 19.0

P40	131.4 - 128.0	C	120	18.5
	128.0 - 120.0	C	200	19.0

NOTE:  $q_u$  = Unconfined Compressive Strength (kPa)  
 $\gamma$  = Bulk Unit Weight (kN/m<sup>3</sup>)  
C = Cohesive

## APPENDIX



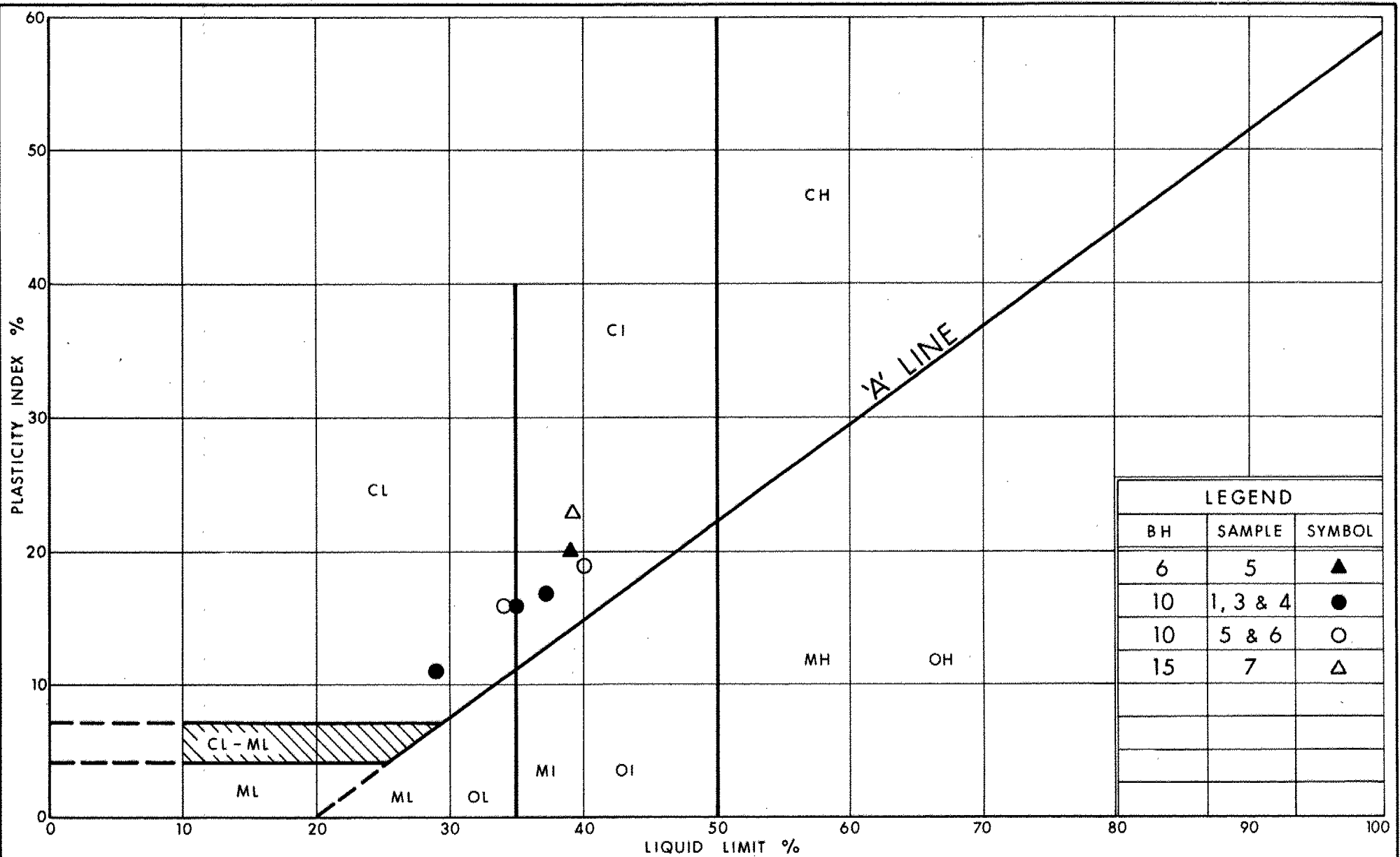
Ministry of  
Transportation

Ontario

# PLASTICITY CHART CLAYEY SILT

FIG No 1

W P 149 - 87 - 00 (A)



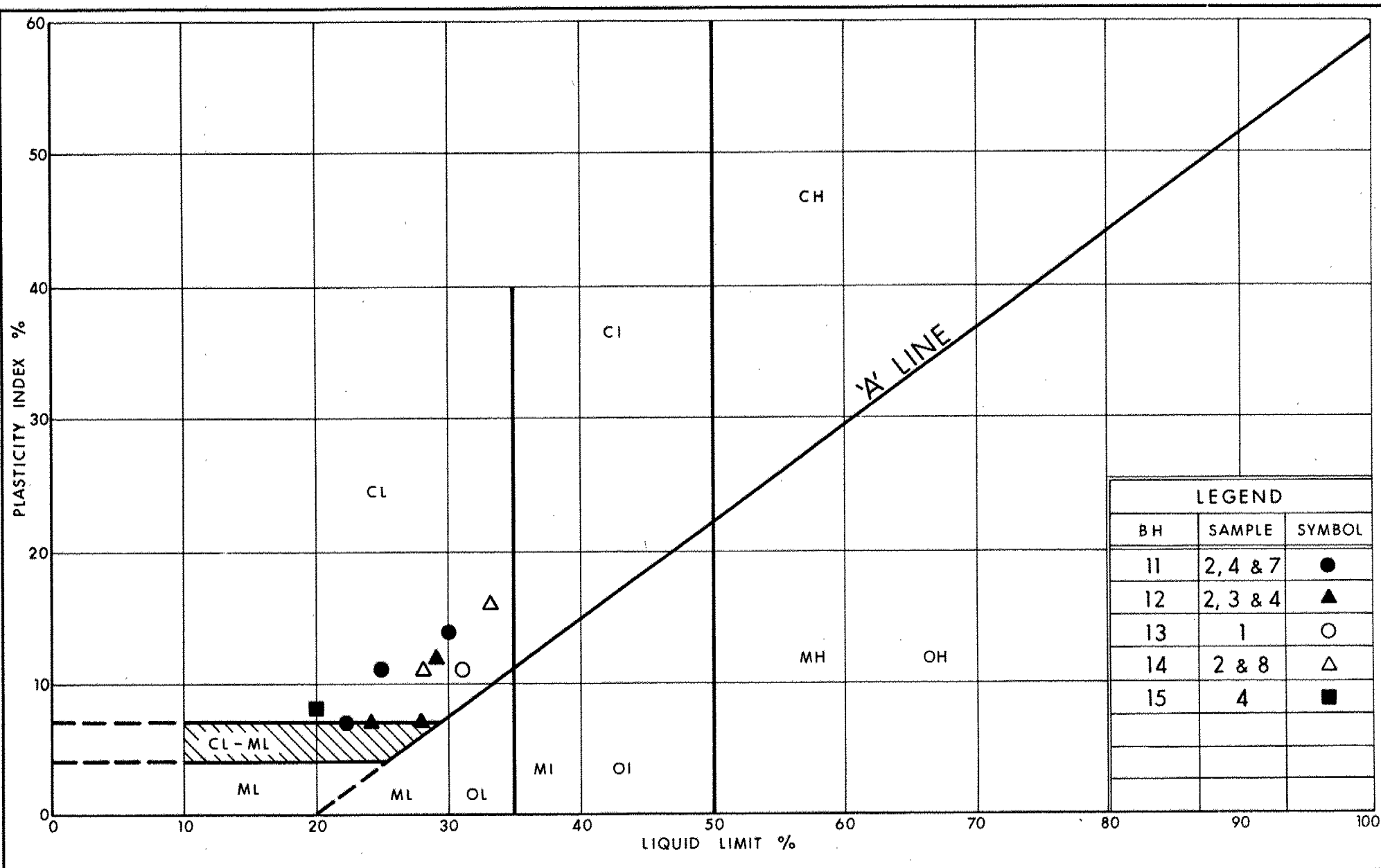
Ministry of  
Transportation

Ontario

# PLASTICITY CHART CLAYEY SILT TO SILTY CLAY

FIG No 2

W P 149-87-00(A)



Ministry of  
Transportation

Ontario

# PLASTICITY CHART HETEROGENEOUS MIXTURE OF CLAYEY SILT, SAND & GRAVEL (Glacial Till)

FIG No 3

W P 149-87-00 (A)



## EXPLANATION OF TERMS USED IN REPORT

**N VALUE:** THE STANDARD PENETRATION TEST (SPT) N VALUE IS THE NUMBER OF BLOWS REQUIRED TO CAUSE A STANDARD 51mm O.D. SPLIT BARREL SAMPLER TO PENETRATE 0.3m INTO UNDISTURBED GROUND IN A BOREHOLE WHEN DRIVEN BY A HAMMER WITH A MASS OF 63.5kg, FALLING FREELY A DISTANCE OF 0.76m. FOR PENETRATIONS OF LESS THAN 0.3m N VALUES ARE INDICATED AS THE NUMBER OF BLOWS FOR THE PENETRATION ACHIEVED. AVERAGE N VALUE IS DENOTED THUS  $\bar{N}$ .

**DYNAMIC CONE PENETRATION TEST:** CONTINUOUS PENETRATION OF A CONICAL STEEL POINT (51mm O.D. 60° CONE ANGLE) DRIVEN BY 475 J IMPACT ENERGY ON 'A' SIZE DRILL RODS. THE RESISTANCE TO CONE PENETRATION IS MEASURED AS THE NUMBER OF BLOWS FOR EACH 0.3m ADVANCE OF THE CONICAL POINT INTO THE UNDISTURBED GROUND.

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

**CONSISTENCY:** COHESIVE SOILS ARE DESCRIBED ON THE BASIS OF THEIR UNDRAINED SHEAR STRENGTH ( $c_u$ ) AS FOLLOWS:

$c_u$ (kPa)	0 - 12	12 - 25	25 - 50	50 - 100	100 - 200	> 200
	VERY SOFT	SOFT	FIRM	STIFF	VERY STIFF	HARD

**DENSENESS:** COHESIONLESS SOILS ARE DESCRIBED ON THE BASIS OF DENSENESS AS INDICATED BY SPT N VALUES AS FOLLOWS:

N (BLOWS/0.3 m)	0 - 5	5 - 10	10 - 30	30 - 50	> 50
	VERY LOOSE	LOOSE	COMPACT	DENSE	VERY DENSE

ROCKS ARE DESCRIBED BY THEIR COMPOSITION AND STRUCTURAL FEATURES AND / OR STRENGTH.

**RECOVERY:** SUM OF ALL RECOVERED ROCK CORE PIECES FROM A CORING RUN EXPRESSED AS A PERCENT OF THE TOTAL LENGTH OF THE CORING RUN.

**MODIFIED RECOVERY:** SUM OF THOSE INTACT CORE PIECES, 100mm+ IN LENGTH EXPRESSED AS A PERCENT OF THE LENGTH OF THE CORING RUN. THE ROCK QUALITY DESIGNATION (RQD), FOR MODIFIED RECOVERY, IS:

RQD (%)	0 - 25	25 - 50	50 - 75	75 - 90	90 - 100
	VERY POOR	POOR	FAIR	GOOD	EXCELLENT

**JOINTING AND BEDDING:**

SPACING	50mm	50 - 300mm	0.3m - 1m	1m - 3m	> 3m
JOINTING	VERY CLOSE	CLOSE	MOD. CLOSE	WIDE	VERY WIDE
BEDDING	VERY THIN	THIN	MEDIUM	THICK	VERY THICK

## ABBREVIATIONS AND SYMBOLS

### FIELD SAMPLING

S S	SPLIT SPOON	T P	THINWALL PISTON
W S	WASH SAMPLE	O S	OSTERBERG SAMPLE
S T	SLOTTED TUBE SAMPLE	R C	ROCK CORE
B S	BLOCK SAMPLE	P H	T W ADVANCED HYDRAULICALLY
C S	CHUNK SAMPLE	P M	T W ADVANCED MANUALLY
T W	THINWALL OPEN	F S	FOIL SAMPLE

### STRESS AND STRAIN

$u_w$	kPa	PORE WATER PRESSURE
$r_u$	1	PORE PRESSURE RATIO
$\sigma$	kPa	TOTAL NORMAL STRESS
$\sigma'$	kPa	EFFECTIVE NORMAL STRESS
$\tau$	kPa	SHEAR STRESS
$\sigma_1, \sigma_2, \sigma_3$	kPa	PRINCIPAL STRESSES
$\epsilon$	%	LINEAR STRAIN
$\epsilon_1, \epsilon_2, \epsilon_3$	%	PRINCIPAL STRAINS
E	kPa	MODULUS OF LINEAR DEFORMATION
G	kPa	MODULUS OF SHEAR DEFORMATION
$\mu$	1	COEFFICIENT OF FRICTION

### MECHANICAL PROPERTIES OF SOIL

$m_v$	kPa <sup>-1</sup>	COEFFICIENT OF VOLUME CHANGE
$C_c$	1	COMPRESSION INDEX
$C_s$	1	SWELLING INDEX
$C_\alpha$	1	RATE OF SECONDARY CONSOLIDATION
$c_v$	m <sup>2</sup> /s	COEFFICIENT OF CONSOLIDATION
H	m	DRAINAGE PATH
$T_v$	1	TIME FACTOR
U	%	DEGREE OF CONSOLIDATION
$\sigma'_{vo}$	kPa	EFFECTIVE OVERBURDEN PRESSURE
$\sigma'_p$	kPa	PRECONSOLIDATION PRESSURE
$\tau_f$	kPa	SHEAR STRENGTH
$c'$	kPa	EFFECTIVE COHESION INTERCEPT
$\phi'$	-°	EFFECTIVE ANGLE OF INTERNAL FRICTION
$c_u$	kPa	APPARENT COHESION INTERCEPT
$\phi_u$	-°	APPARENT ANGLE OF INTERNAL FRICTION
$\tau_R$	kPa	RESIDUAL SHEAR STRENGTH
$\tau_r$	kPa	REMOULDED SHEAR STRENGTH
$S_t$	1	SENSITIVITY = $\frac{c_u}{\tau_r}$

### PHYSICAL PROPERTIES OF SOIL

$\rho_s$	kg/m <sup>3</sup>	DENSITY OF SOLID PARTICLES	e	1, %	VOID RATIO	$e_{min}$	1, %	VOID RATIO IN DENSEST STATE
$\gamma_s$	kN/m <sup>3</sup>	UNIT WEIGHT OF SOLID PARTICLES	n	1, %	POROSITY	$I_D$	1	DENSITY INDEX = $\frac{e_{max} - e}{e_{max} - e_{min}}$
$\rho_w$	kg/m <sup>3</sup>	DENSITY OF WATER	w	1, %	WATER CONTENT	D	mm	GRAIN DIAMETER
$\gamma_w$	kN/m <sup>3</sup>	UNIT WEIGHT OF WATER	$S_r$	%	DEGREE OF SATURATION	$D_n$	mm	n PERCENT - DIAMETER
$\rho$	kg/m <sup>3</sup>	DENSITY OF SOIL	$w_L$	%	LIQUID LIMIT	$C_u$	1	UNIFORMITY COEFFICIENT
$\gamma$	kN/m <sup>3</sup>	UNIT WEIGHT OF SOIL	$w_p$	%	PLASTIC LIMIT	h	m	HYDRAULIC HEAD OR POTENTIAL
$\rho_d$	kg/m <sup>3</sup>	DENSITY OF DRY SOIL	$w_s$	%	SHRINKAGE LIMIT	q	m <sup>3</sup> /s	RATE OF DISCHARGE
$\gamma_d$	kN/m <sup>3</sup>	UNIT WEIGHT OF DRY SOIL	$I_p$	%	PLASTICITY INDEX = $w_L - w_p$	v	m/s	DISCHARGE VELOCITY
$\rho_{sat}$	kg/m <sup>3</sup>	DENSITY OF SATURATED SOIL	$I_L$	1	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$	i	1	HYDRAULIC GRADIENT
$\gamma_{sat}$	kN/m <sup>3</sup>	UNIT WEIGHT OF SATURATED SOIL	$I_C$	1	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$	k	m/s	HYDRAULIC CONDUCTIVITY
$\rho'$	kg/m <sup>3</sup>	DENSITY OF SUBMERGED SOIL	$e_{max}$	1, %	VOID RATIO IN LOOSEST STATE	j	kN/m <sup>3</sup>	SEEPAGE FORCE
$\gamma'$	kN/m <sup>3</sup>	UNIT WEIGHT OF SUBMERGED SOIL						

# RECORD OF BOREHOLE No 1

1 OF 2

METRIC

W.P. 149 - 87 - 00 ( A ) LOCATION CO - ORDS. N 4 841 851.0; E 303 162.0 ORIGINATED BY G&ASSO.  
DIST 6 HWY 400 BOREHOLE TYPE POWER AUGER & CONE TEST COMPILED BY M.V.  
DATUM GEODETIC DATE 1962 09 20 & 21 CHECKED BY TCK

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES		20 40 60 80 100	20 40 60 80 100					
132.8	Ground Surface												
0.0	CLAYEY SILT, Some Sand, Some Gravel, Very Stiff ( Fill )		1	SS	21								
			2	SS	19								
			3	SS	20								
			4	SS	23								
			5	SS	19								
			6	SS	17								
			7	SS	21								
125.5	Some Sand		8	SS	29								
7.3			9	SS	14								
			10	TW	PH							18.9	
			11	TW	PH							20.1	
			12	TW	PH							20.3	
			13	TW	PH								
			14	TW	PH								
	CLAYEY SILT, Some Sand, Some Gravel, Stiff to Very Stiff		15	SS	5							21.0	
			16	TW	PH								
			17	SS	11								
			18	SS	9								
			19	SS	13								
102.3													
30.5													

Continued

+3, x5 Numbers refer to  
Sensitivity

20  
15-0.5 (%) STRAIN AT FAILURE  
10

Continued

# RECORD OF BOREHOLE No 1

2 OF 2

METRIC

W.P. 149 - 87 - 00 (A) LOCATION CO - ORDS. N 4 841 851.0; E 303 162.0 ORIGINATED BY G&ASSO.  
 DIST 6 HWY 400 BOREHOLE TYPE POWER AUGER & CONE TEST COMPILED BY M.V.  
 DATUM GEODETIC DATE 1962 09 20 & 21 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40					
102.2	Continued													
30.6	End of Borehole													
	Note: Formerly BH #5 of W. P. 233 - 80													

# RECORD OF BOREHOLE No 2

1 OF 1

METRIC

W.P. 149 - 87 - 00 ( A ) LOCATION CO - ORDS. N 4 B41 B61.0; E 303 230.0 ORIGINATED BY G&ASSO.

DIST 6 HWY 400 BOREHOLE TYPE POWER AUGER COMPILED BY M V

DATUM GEODETIC DATE 1962 09 26 & 27 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			UNIT WEIGHT $\gamma$ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			SHEAR STRENGTH kPa				
								20	40	60		
128.1	Ground Surface											
0.0	SILTY SAND , Loose ( Fill )		1	SS	15							
0.7			2	SS	29							
	Occasional Sand Seams		3	SS	25							
			4	TW	PH							
			5	SS	12							
			6	TW	PH							
			7	SS	9							
	CLAYEY SILT, Trace of Sand, Trace of Gravel, Very Stiff to Stiff		8	TW	PH							
			9	SS	10							
			10	TW	PH							
			11	SS	11							
			12	TW	PH							
			13	SS	27							
111.6												
16.5	SILTY SAND, Loose to Compact		14	TW	PH							
110.1												
18.0	CLAYEY SILT, Trace of Sand, Trace of Gravel, Pockets of Sand Layers, Stiff to Hard		15	SS	14							
			16	SS	14							
			17	SS	24							
104.9			18	SS	35							
23.2	End of Borehole											
* Note: Formerly BH #7 of W. P. 233 - 60												

# RECORD OF BOREHOLE No 3

1 OF 1 METRIC

W.P. 149 - 87 - 00 ( A ) LOCATION CO - ORDS. N 4 841 833.0; E 303 147.0 ORIGINATED BY G&ASSO.  
 DIST 6 HWY 400 BOREHOLE TYPE POWER AUGER & CONE TEST COMPILED BY M.V.  
 DATUM GEODETIC DATE 1962 09 27 TO 1962 10 01 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40					
127.3	Ground Surface													
0.0	CLAYEY SILT, Some Sand, Very Stiff to Stiff ( Fill )		1	SS	17									
125.2			2	SS	8									
2.1			3	SS	6									
			4	SS	8									
			5	SS	17									
			6	SS	19									
			7	TW	PH									
			8	SS	13									
			9	TW	PH									
			10	SS	10									
	CLAYEY SILT, Trace of Sand, Trace of Gravel, Occasional Sand Seams, Very Stiff to Stiff		11	TW	PH									
			12	SS	13									
			13	TW	PH									
			14	SS	8									
			15	TW	PH									
			16	SS	6									
			17	SS	8									
105.0														
22.3	End of Borehole													
	* Note: Formerly BH #8 of W. P. 233 - 60													

# RECORD OF BOREHOLE No 4

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS. N 4 841 802.0; E 303 101.0 ORIGINATED BY G&ASSO.  
DIST 6 HWY 400 BOREHOLE TYPE POWER AUGER COMPILED BY M.V.  
DATUM GEODETIC DATE 1982 10 02 & 03 CHECKED BY TCK

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT $\gamma$ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			'N' VALUES	20	40	60	80	100	W <sub>p</sub>	W			W <sub>L</sub>
127.0	Ground Surface																
0.0	SAND and GRAVEL (Fill)																
0.6	CLAYEY SILT, Trace of Sand, Trace of Gravel, Occasional Sand Seams, Very Stiff		1	SS	6												
			2	SS	13												
			3	SS	17												
			4	SS	18												
			5	SS	19												
			6	TW	PH												
			7	SS	12												
			8	SS	15												
			9	TW	PH												
			10	SS	22												
			11	TW	PH												
			12	TW	PH												
			13	SS	16												
			14	TW	PH												
106.7			15	SS	12												
20.3	End of Borehole																
	* Note: Formerly BH #9 of W. P. 233 - 60																

# RECORD OF BOREHOLE No 5

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS N 4 843 766.9; E 302 625.8 ORIGINATED BY STRATA  
DIST 6 HWY 400 BOREHOLE TYPE HOLLOW STEM AUGER COMPILED BY M.V.  
DATUM GEODETIC DATE 1989 02 06 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W <sub>P</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
147.0	Ground Surface																
0.0	Topsoil																
	Some Sand		1	SS	18		146										
	Very Stiff		2	SS	27		144									22.7	
	CLAYEY SILT, Stiff to Firm		3	SS	15		142										
140.5			4	SS	4		140										
6.5			5	TW	PH		138										
	Heterogeneous Mixture of CLAYEY SILT, SAND and GRAVEL, Very Stiff to Hard ( Glacial Till )		6	SS	51		136										
			7	SS	41		134									23.8	
133.8			8	SS	118		132										
133.0	SHALE BEDROCK																
14.0	End of Borehole																
	* Note: Formerly BH #4 of W. P. 131 - 85 - 02																

# RECORD OF BOREHOLE No 6

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS N 4 843 812.6; E 302 658.9 ORIGINATED BY STRATA  
DIST 6 HWY 400 BOREHOLE TYPE HOLLOW STEM AUGER COMPILED BY M V  
DATUM GEODETIC DATE 1989 02 03 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
148.1	Road Surface																
0.0	Asphalt																
148.9	SAND and GRAVEL ( Fill )																
1.2			1	SS	13		146										
	Some Sand		2	SS	25		144										
			3	SS	23		142										
	CLAYEY SILT to SILTY CLAY, Occasional Sand Seams, Very Stiff to Stiff		4	SS	14		140										
139.9			5	TW	PH		138										
8.2			6	SS	15		136										
			7	SS	12		134										
	Heterogeneous Mixture of CLAYEY SILT, SAND and GRAVEL, Very Stiff to Hard ( Glacial Till )		8	SS	113		132										
			9	SS	60	/8cm											
			10	SS	80												
131.5			11	SS	100	/13cm											
16.6	SHALE BEDROCK		12	SS	60	/3cm											
130.1																	
18.0	End of Borehole																
	* Note: Formerly BH #5 of W. P. 131 - 85 - 02																



# RECORD OF BOREHOLE No 7

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS N 4 843 819.8; E 302 624.6 ORIGINATED BY STRATA  
DIST 6 HWY 400 BOREHOLE TYPE HOLLOW STEM AUGER COMPILED BY M V  
DATUM GEODETIC DATE 1989 01 31 & 1989 02 01 CHECKED BY TCK

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N' VALUES		20	40	60	80	100					
154.1	Road Surface															
0.0	Asphalt															
153.0	SAND and GRAVEL ( Granular Base )															
1.1	CLAYEY SILT, Some Sand, Stiff to Very Stiff ( Fill )		1	SS	8											
			2	SS	8											
			3	SS	17											
			4	SS	10											
			5	SS	28											
146.2	Occasional Cobbles		6	SS	50	/8cm										
7.9	Very Stiff to Hard  CLAYEY SILT, Stiff		7	SS	21											
			8	SS	33											
			9	SS	36											
			10	SS	11											
			11	SS	8											
139.5	Heterogeneous Mixture of CLAYEY SILT, SAND and GRAVEL, Hard ( Glacial Till )		12	TW	PH											
14.6			13	SS	36											
			14	SS	46											
			15	SS	99											
			16	SS	128											
			17	SS	81											
			18	SS	70	/1cm										
130.2	SHALE BEDROCK		19	RC	REC											
23.9			BX	80%												
128.1	End of Borehole • Note: Formerly BH #1 of W. P. 131 - 85 - 02  Water Level Not Stabilized															
26.0																

# RECORD OF BOREHOLE No 8

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS N 4 843 787.4; E 302 701.5 ORIGINATED BY STRATA  
DIST 6 HWY 400 BOREHOLE TYPE HOLLOW STEM AUGER COMPILED BY M.V.  
DATUM GEODETIC DATE 1989 02 22 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ KN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100	W <sub>p</sub>	W	W <sub>L</sub>		
147.2	Ground Surface																
0.0	Topsoil																
	CLAYEY SILT, Very Stiff																
	Firm		1	SS	8												
141.4			2	TW	PH												
5.8	End of Borehole																
	* Note: Formerly BH #14 of W. P. 131 - 85 - 02																

# RECORD OF BOREHOLE No 9

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS N 4 843 840.2; E 302 891.0 ORIGINATED BY STRATA  
DIST 6 HWY 400 BOREHOLE TYPE HOLLOW STEM AUGER COMPILED BY M.V.  
DATUM GEODETIC DATE 1989 01 25 CHECKED BY TCK

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100					
154.1	Road Surface															
0.0	Asphalt															
0.6	SAND and GRAVEL															
			1	SS	9											
			2	SS	17											
	CLAYEY SILT, Some Sand, Stiff to Very Stiff ( Fill )		3	SS	23											
			4	SS	19											
146.2			5	SS	29											
7.9	Very Stiff to Hard		6	SS	52											
	Some Sand, Trace of Gravel		7	SS	19											
	CLAYEY SILT, Trace of Sand, Firm		8	SS	6											
			9	TW	PM											
139.2			10	TW	PM											
14.9	Heterogeneous Mixture of CLAYEY SILT, SAND and GRAVEL, Very Stiff to hard ( Glacial Till )		11	SS	15											
			12	SS	39											
134.6			13	SS	72											
19.5	SHALE BEDROCK		14	SS	65	1cm										
132.8																
21.3	End of Borehole * Note: Formerly BH # 6 of W. P. 131 - 85 - 02 Water Level Not Observed															

# RECORD OF BOREHOLE No 10

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS. N 4 844 040.0; E 302 577.0 ORIGINATED BY V K  
DIST 6 HWY 400 BOREHOLE TYPE PENDRILL & CONE TEST COMPILED BY M V  
DATUM GEODETTIC DATE 1971 02 09 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	WATER CONTENT (%) 10 20 30	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES									
144.1	Ground Surface													
0.0	<p>Very Stiff</p> <p>SILTY CLAY to CLAYEY SILT, Trace of Sand, Occasional Silt Seams, Firm</p>		1	SS	30		<p>19.0</p>	<p>18.2</p>	<p>18.2</p>					
			2	SS	24									
			3	SS	16									
			4	TW	PM									
			5	TW	PM									
			6	TW	PM									
138.5														
7.6	End of Borehole													
	<p>* Note: Formerly BH #4 of W. P. 105 - 70 - 01</p>													

# RECORD OF BOREHOLE No 11

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS. N 4 845 807.5; E 302 358.0 ORIGINATED BY V.K.  
 DIST 6 HWY 400 BOREHOLE TYPE PENDRILL & CONE TEST COMPILED BY M.V.  
 DATUM GEODETIC DATE 1985 12 22 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ KN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES													
171.1	Ground Surface																	
0.0	Heterogeneous Mixture of CLAYEY SILT, SAND and GRAVEL. Very Stiff to Hard ( Glacial Till )		1	SS	20		170						0 22 38 40					
			2	SS	42													
			3	SS	50													
			4	SS	65													
			5	SS	87													
			6	SS	100		13cm											
			7	SS	117													
			8	SS	50													
161.5	End of Borehole																	
9.8	* Note: Formerly BH #1 of W. P. 699 - 64																	

# RECORD OF BOREHOLE No 12

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS. N 4 B45 802.0; E 302 284.0 ORIGINATED BY V.K.  
 DIST 6 HWY 400 BOREHOLE TYPE PENDRILL & CONE TEST COMPILED BY M.V.  
 DATUM GEODETIC DATE 1965 12 21 CHECKED BY TCK

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W <sub>p</sub> NATURAL MOISTURE CONTENT W LIQUID LIMIT W <sub>L</sub>	WATER CONTENT (%) 10 20 30	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE							
168.0	Ground Surface										
0.0	Very Stiff to Stiff		1	SS	16						
			2	SS	10						
			3	SS	43						
	Heterogeneous Mixture of CLAYEY SILT, SAND and GRAVEL, Very Stiff to Hard ( Glacial Till )		4	SS	18						
			5	SS	34						
			6	SS	111						
			7	SS	72						
158.4			8	SS	57						
9.6	End of Borehole										
	• Note: Formerly BH #2 of W. P. 899 - 84										

# RECORD OF BOREHOLE No 13

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS. N 4 845 838.5; E 302 277.0 ORIGINATED BY V K  
 DIST 6 HWY 400 BOREHOLE TYPE PENDRILL & CONE TEST COMPILED BY M V  
 DATUM GEODETIC DATE 1985 12 20 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W <sub>p</sub> NATURAL MOISTURE CONTENT W LIQUID LIMIT W <sub>L</sub>	WATER CONTENT (%) 10 20 30	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES							
186.4	Ground Surface											
0.0	Suff		1	SS	9		168					0 1 54 45
			2	SS	48		164					
			3	SS	54							
	Heterogeneous Mixture of CLAYEY SILT, SAND and GRAVEL, Hard ( Glacial Till )		4	SS	79		162					
			5	SS	32		160					
			6	SS	42							
			7	SS	55		158					
157.0			8	SS	100	13cm						
8.4	End of Borehole											
	* Note: Formerly BH #4 of W. P. 899 - 64											

# RECORD OF BOREHOLE No 14

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS. N 4 845 878.0; E 302 348.0 ORIGINATED BY V.K.  
DIST 6 HWY 400 BOREHOLE TYPE PENDRILL & CONE TEST COMPILED BY M.V.  
DATUM GEODETIC DATE 1965 12 21 CHECKED BY TCK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60						80	100
SHEAR STRENGTH kPa								WATER CONTENT (%)									
172.8	Ground Surface																
0.0	Heterogeneous Mixture of CLAYEY SILT, SAND and GRAVEL, Hard ( Glacial Till )		1	SS	30	/8cm								1 25 47 27			
			2	SS	41												
			3	SS	60												
			4	SS	48												
			5	SS	100												
			6	SS	125												
			7	SS	100												
163.2					8		SS	100	/13cm								
9.4	End of Borehole																
	• Note: Not Established  Formerly BH #5 of W. P. 699 - 64																



# RECORD OF BOREHOLE No 15

1 OF 1

METRIC

W.P. 149 - 87 - 00(A) LOCATION CO - ORDS. N 4 847 100.5; E 302 139.5 ORIGINATED BY K Z  
DIST 6 HWY 400 BOREHOLE TYPE SOLID STEM AUGER & CONE TEST COMPILED BY M V  
DATUM GEODETIC DATE 1988 02 08 CHECKED BY TCK

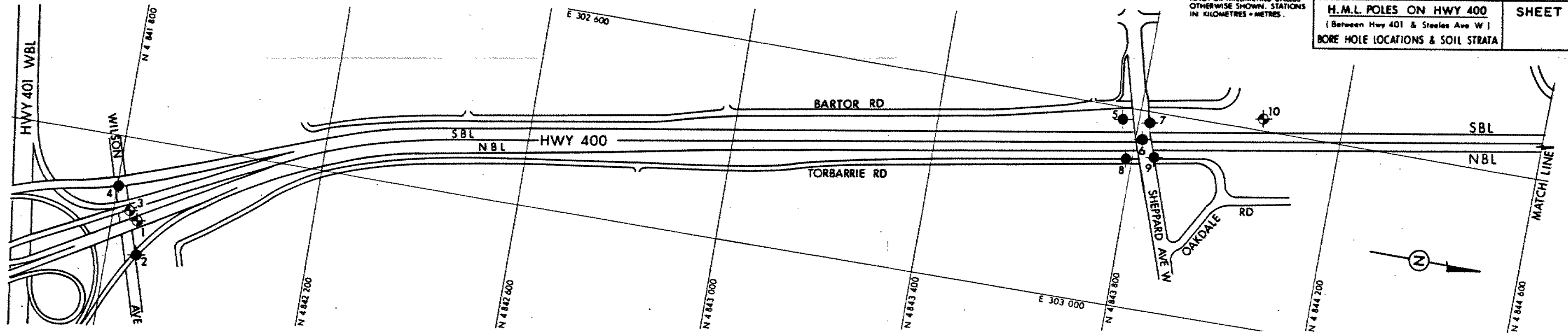
SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL * LAB VANE 20 40 60 80 100	PLASTIC LIMIT W <sub>P</sub> NATURAL MOISTURE CONTENT W LIQUID LIMIT W <sub>L</sub>	WATER CONTENT (%) 10 20 30	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE								'N' VALUES
182.9	Ground Surface											
0.0	Heterogeneous Mixture of CLAYEY SILT, SAND and GRAVEL, Hard. ( Glacial Till )		1	SS	31							
			2	SS	130							
			3	SS	100	/10cm						
			4	SS	100	/15cm						10 19 46 25
			5	SS	110	/25cm						
			6	SS	84							
172.8	SILTY CLAY, Trace of Sand, Occasional Pockets of Silt, Hard		7	SS	72							
10.1												0 2 36 62
170.3			8	SS	136	/23cm						
12.6	End of Borehole											
	* Note: Formerly BH #C1 of W. P. 154 - 79 - 06											

MUN OF METROPOLITAN TORONTO  
CITY OF NORTH YORK

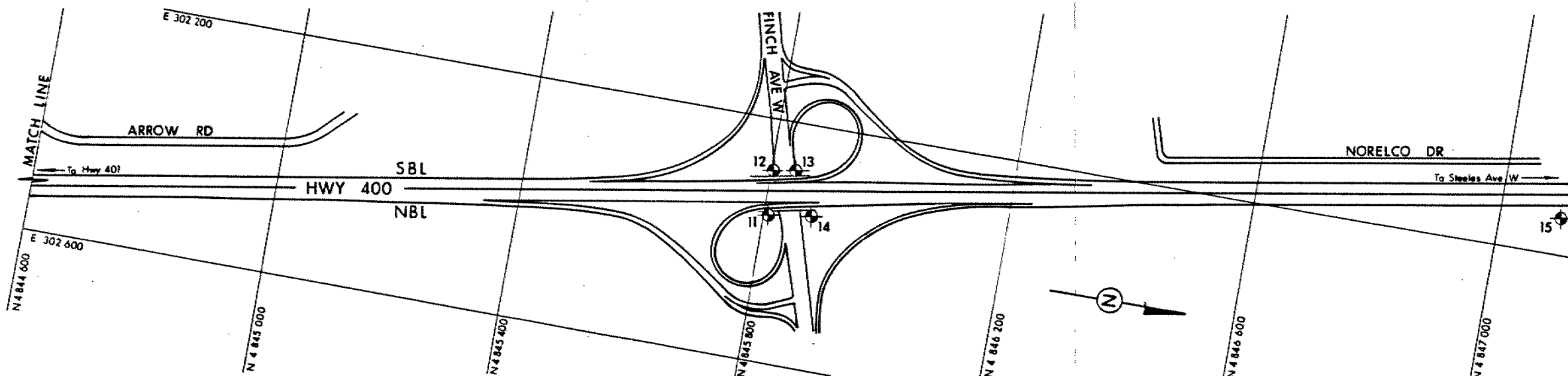
**METRIC**  
DIMENSIONS ARE IN METRES  
AND/OR MILLIMETRES UNLESS  
OTHERWISE SHOWN. STATIONS  
IN KILOMETRES + METRES.

CONT No  
WP No 149-87-00(A)

H.M.L. POLES ON HWY 400  
(Between Hwy 401 & Steeles Ave W)  
BORE HOLE LOCATIONS & SOIL STRATA



**NOTE**  
For Subsoil information refer  
to Record of Borehole Sheets.



**PLANS**

SCALE  
0 80m

LEGEND			
◆	Bore Hole		
⊕	Dynamic Cone Penetration Test (Cone)		
◆	Bore Hole & Cone		
N	Blows/0.3m (Std Pen Test, 475 J/blow)		
CONE	Blows/0.3m (60° Cone, 475 J/blow)		
⬇	WL at time of investigation		
	1962 09 & 10, 1965 12, 1971 02, 1988 02, 1989 01 & 02		

No	ELEVATION	CO-ORDINATES NORTH	EAST
1	132.8	4841 851.0	303 162.0
2	128.1	4841 861.0	303 230.0
3	127.3	4841 833.0	303 147.0
4	127.0	4841 802.0	303 101.0
5	147.0	4843 766.9	302 625.8
6	148.1	4843 812.6	302 658.9
7	154.1	4843 819.8	302 624.6
8	147.2	4843 787.4	302 701.5
9	154.1	4843 840.2	302 691.0
10	144.1	4844 040.0	302 577.0
11	171.1	4845 807.5	302 358.0
12	168.0	4845 802.0	302 284.0
13	166.4	4845 838.5	302 277.0
14	172.6	4845 878.0	302 348.0
15	182.9	4847 100.5	302 139.5

**NOTE**

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

NOTE: The complete foundation investigation and design report for this project and other related documents may be examined at the Engineering Materials Office, Downsview. Information contained in this report and related documents is specifically excluded in accordance with the conditions of Section GC 2.01 of OPS Gen. Cond.



REV	DATE	BY	DESCRIPTION
1			

Geocres No 30M11-191

HWY No 400	DIST 6
SUBMITED BY [checked] DATE 1994 04 08	SITE
DRAWN BY [checked] APPROVED [checked]	DWG 1498700(A)-A