

DOCUMENT MICROFILMED IDENTIFICATION

GEOCRES No. 31E-95

DIST. 11 REGION Northern

W.P. No. 74-74-07

CONT. No. 78-28

W. O. No. _____

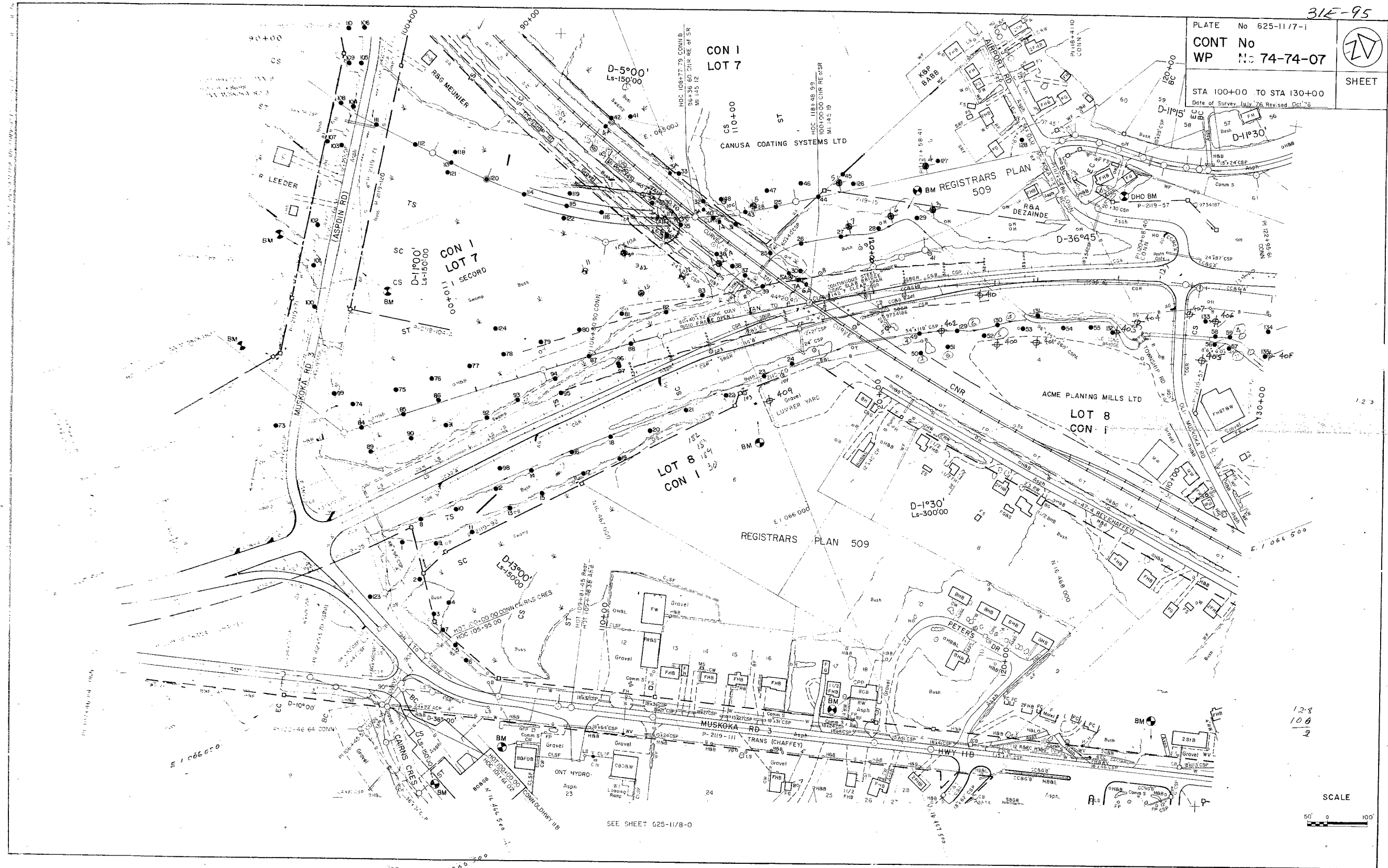
STR. SITE No. _____

HWY. No. 11

LOCATION Hwy. 11, Sta. 104 to 145,
Huntsville Bypass

OVER-SIZE PRINTING IS TO BE INDICATED BY THE NUMBER 3

REMARKS _____



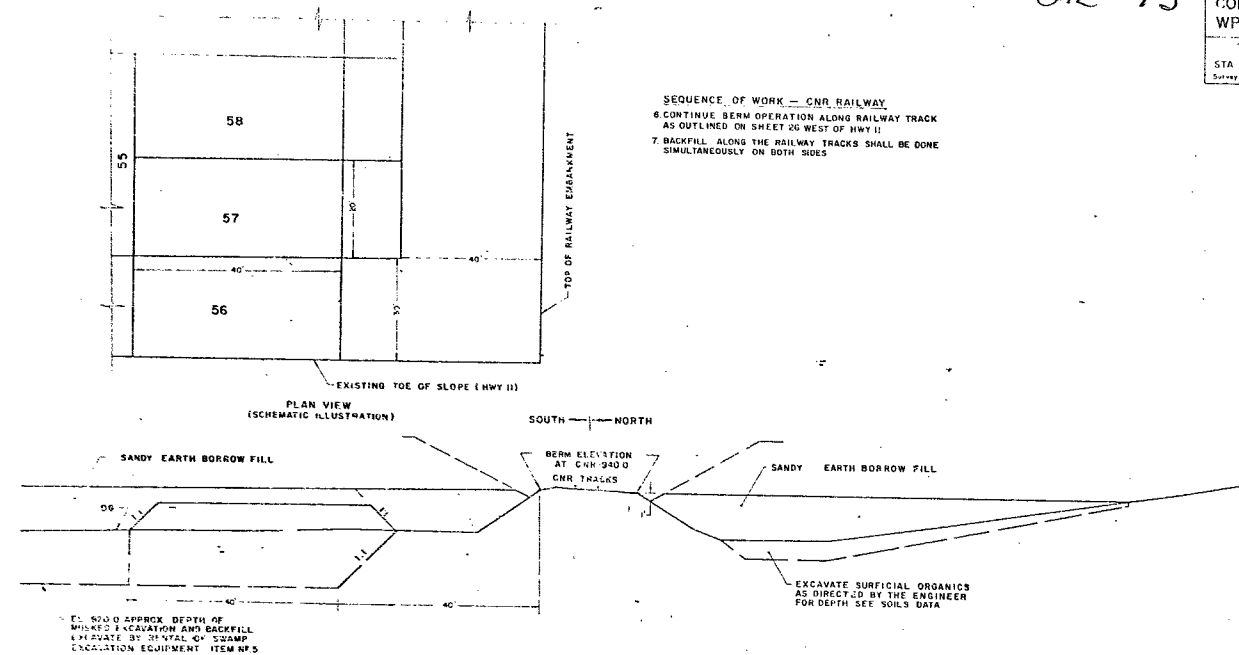
31E-95

PLATE	No
CONT	No
WP	No 74-74-07
STA	TO STA

31E-95

PLATE	No	
CONT	No 78-28	
WP	No 74-74-07	
TYPICAL SECTIONS		SHEET
STA	TO STA	27
Survey	Revised	

SEQUENCE OF WORK - CNR RAILWAY
 6 CONTINUE BERM OPERATION ALONG RAILWAY TRACK
 AS OUTLINED ON SHEET 26 WEST OF HWY 11
 7 BACKFILL ALONG THE RAILWAY TRACKS SHALL BE DONE
 SIMULTANEOUSLY ON BOTH SIDES



SECTION N° 2

Not To Scale

FOUNDATION INVESTIGATION REPORT

For

G.D. & G.B. - Sta. 104 to Sta. 145
Huntsville Bypass, District No. 11 (Huntsville)
W.P. 74-74-07

INTRODUCTION

This report contains the results of a number of foundation investigations which were carried out at various times between February 1956 and May 1978 in connection with the portion of Huntsville Bypass lying between Stas. 104 and 145. Fieldwork was accomplished using conventional diamond drills adapted for soil sampling purposes, continuous flight auger machines equipped with 3 1/4-inch I.D. hollow stem augers or 4-inch O.D. solid augers and by 2-inch O.D. hand augers. Where diamond drills were used holes were cased with NX size (3 inch I.D.) and BX size (2 3/8-inch I.D.) casings. Borings done in Hunters Bay were drilled by a diamond drill mounted on a raft designed for the purpose.

SITE DESCRIPTION

The site is located just north of the existing intersection of Hwy 11 and Muskoka Road No. 3 and extends for a distance of about 4000 ft. to a point just south of Vernon Narrows bridge. This area is traversed from east to west by the C.N.R. which consists of a single track constructed on an embankment approximately 12 ft. wide and generally 3 to 4 ft. high. Existing Hwy 11 which runs north-south, is located on the east side of the site and consists of a 24 ft. wide asphalt pavement with 10 ft. wide gravel shoulders. This road crosses the C.N.R. tracks via a 3 span steel plate girder, concrete deck overhead structure with perched abutments. The structure is founded on concrete filled, 12 1/4-inch O.D. & 1/4-inch wall thickness steel tube piles driven closed-ended to approximate el. 880-890. The approaches to the structure consist of embankments of maximum height about 35 ft. with 2:1 side and forward slopes. These embankments were constructed using stage construction techniques as follows:

-initially about 8 ft. of swamp deposit was removed by excavating and the resulting void backfilled to about el. 940 with fine sand. Remaining lifts of fill were placed in amounts controlled by the pore pressures induced in the subsoil below the embankment which were monitored in piezometers installed for this purpose. Total construction time to full height was about 13 months in 1958/59. The terrain in the southern half of the site consists mostly of swampy bush whilst the northern half is rolling, moderately hummocky land partially bush covered. The northern portion is bounded to the east by Hunter's Bay which ranges in depth from 10 to 15 ft. in the area covered by the foundation investigation.

SUBSURFACE CONDITIONS

General

Subsoil over the site area consists mainly of deposits of organic silt or clay (also referred to as muck), followed by cohesive deposits of silty clay or clayey silt (sometimes containing silt layers) followed by deposits of silt and of sand, gravel & boulders all overlying schist bedrock. The depths and consistency or densness of these deposits are extremely variable and reference should be made to the Record of Borehole Sheets contained in the report appendix on which are shown the boundaries between different soil types and summarized results of all field and laboratory tests. Reference should also be made to Sheet Nos. 32-1, 32-2, 32-3, 32-4 and 32-5 of the Contract Drawings which show the locations and elevations of all borings together with the inferred subsoil stratigraphy along various longitudinal and transverse lines. In general the area south of the C.N.R. tracks and Hunters Bay contain the deepest and softest muck and other cohesive deposits. In Hunters Bay up to 20 ft. of very soft muck is underlain by up to 50 ft. of very soft to stiff clayey silt to silty clay. In the area south of the C.N.R. tracks up to 8 ft. of muck is followed by up to 40 ft. of very soft to stiff clayey silt. North of and including subsoil below the railway embankment conditions are generally more favourable than to the south although subsoil

strata are essentially similar as to type and depth but the consistency of the cohesive deposits generally ranges from firm to stiff.

A more detailed description of the various soil types prevailing over the site is given below.

Fill Material

Fill material at the site is contained in the various roadbeds and embankments for existing Hwy 11, the C.N.R. tracks Muskoka Rd. No. 3, Old Muskoka Rd., and various abandoned Twp. roads and old driveways. The material in the Hwy 11 embankment consists mainly of fine sand and silt down to el. 925, roughly 8 to 10 feet below original ground level. The material in the C.N.R. embankment consists of about 18 inches of stone ballast followed by about 7 to 10 ft. of a sand and clayey silt mixture in a compact or firm state. The remaining Twp. and other old roadbeds consist mainly of gravel and sand to depths of about 2 to 3 feet below the original ground surface.

Muck. (Hunters Bay Area-Sta. 128-145)

This deposit exists along the shoreline of Hunters Bay and within the bay also. Its thickness is variable, ranging from 2 or 3 feet to as much as 20 feet, generally increasing toward the centre and the southern portion of Hunter's Bay. The muck is amorphous and consists mainly of clay and silt with very high organic contents. In conjunction with this, its moisture content is found to be very high, in some cases in excess of 300%. The muck also has a very high compressibility and very low undrained shear strength, generally less than 200 psf. as measured by field vane tests.

Silty Clay/Clayey Silt. (Hunters Bay Area-Sta. 128-145)

Directly under the above-mentioned muck deposit is a deposit of silty clay/clayey silt. Its thickness varies from about 10 feet to about 50 feet. This cohesive stratum also tends to be thicker,

as does the muck deposit near the centre and southern portions of Hunter's Bay. It is stratified with frequent silt seams, a feature generally associated with glacio-lacustrine deposits. Because of the presence of numerous more permeable silt seams, this material is likely to have a relatively high rate of consolidation. The moisture contents and Atterberg limits are found to scatter over a wide range of values, reflecting the stratified nature of the deposit. In general, the moisture contents are found to be very close to or somewhat higher than the liquid limits, suggesting the material to be probably normally consolidated. On the basis of the undrained shear strengths, which vary from less than 200 psf. to over 1500 psf., the consistency of the deposit can be classified as very soft to stiff, generally increasing with depth.

Silt. (Hunters Bay Area-Sta. 128-145).

The above mentioned silty clay/clayey silt deposit is followed by a deposit of silt, which is also slightly stratified and contains traces of clay. The change from silty clay/clayey silt to silt is somewhat transitional and the boundary between the two deposits is not always very distinct. According to the 'N' values recorded in this material, the silt probably has a "compact" relative density. Some of the boreholes were drilled beyond the silt deposit and revealed the silt is underlain by a deposit of sand and gravel, consistent with our findings at adjacent sites.

Muck. (Area South of Hunters Bay-Sta. 104-128)

This deposit covers most of the area investigated south of Hunters Bay except where it has been excavated or displaced by the various existing road and railway embankments. The deepest deposits are mainly found in the swampy areas on both sides of existing Hwy 11 south of the C.N.R. tracks. The material is amorphous and it is composed mainly of organic clay and silt. It has a very high moisture content, sometimes in excess of 300%. Its undrained shear strength is very low, and is estimated to be less than 200 psf. The average depth is in general about 4 to 8 feet.

Silty Clay/Clayey Silt. (Area South of Hunters Bay Sta. 104-128)

This is the predominant deposit in the area. It has a thickness of about 15 ft. to 50 ft. It is stratified throughout its entire depth, with frequent silt seams, a feature generally associated with glacio-lacustrine deposits. Because of the presence of the more permeable silt seams, this material is likely to have a relatively high rate of consolidation. The silty clay/clayey/ silt tends to be thicker and softer in the swamp areas than in areas north of the railway track. On the basis of undrained shear strength tests the silty clay/clayey silt in the swamp areas can be described as very soft to stiff and in areas north of the railway track, soft to stiff. Representative undrained shear strengths are in the order of 1000 to over 2000 psf. for the stiffer material and 250 to 800 psf. for the softer material. The silty clay/clayey silt in the swamp probably is a normally consolidated material as its moisture contents are generally found to be close to its liquid limits. From laboratory test results, the moisture contents and Atterberg limits show a wide range of variation, reflecting the stratified nature of this material.

Silt. (Area South of Hunters Bay Sta. 104-128)

Underlying the above-mentioned cohesive clayey silt/silty clay deposit is a layer of silt some 10 to 20 ft. thick. The exact boundary between this silt deposit and the upper cohesive stratum is however not always very distinct. The silt is slightly stratified with occasional clay seams suggesting that this material is also a glacio-lacustrine deposit. On the basis of the 'N' values, the relative density of the silt can be assessed as 'compact'.

Sand and Gravel. (Area South of Hunters Bay Sta. 104-128)

Under the silt layer is a deposit of sand and gravel, containing cobbles and boulders. The lower boundary of this deposit was not investigated in full, partly because of the presence of large

boulders and partly because of artesian conditions. Inferred from information at adjacent sites and from boreholes in which bedrock was proven by rock-coring, the sand and gravel layer is believed to be underlain by metamorphic granitic bedrock. The angularity of the particles and the unsorted grain sizes of this material which range from very fine sand to large boulders, suggest the sand and gravel layer is a glacio-fluvial deposit. Because of the presence of large size particles and unsorted matrices, the 'N' values cannot be taken at face value to estimate the relative densities of the material. However, judging from the manner in which the NX casing was advanced, it is probable that the sand and gravel layer is dense to very dense.

Bedrock. (Area South of Hunters Bay Sta. 104-128).

Bedrock at the site is a fine grained micaceous schist and a medium grained biotite gneiss, with occasional quartz inclusions. Both rock types are metamorphosed granite of precambrian age.

On the basis of high rock core recovery ratios and large average core sizes, the bedrock is considered to be in a sound condition.

Groundwater.

Groundwater levels which were observed during the fieldwork operations are recorded on each individual Record of Borehole Sheet together with the boring date. In general these levels corresponded with the levels of adjacent bodies of water such as exist in the swampy areas, drainage ditches and in Hunters Bay. The levels were found to range from el. 931 (Hunters Bay level at the time) and el. 938 in the higher ground to the southwest. An artesian condition was found to exist in the sand and gravel strata which underlies existing Hwy 11 in the vicinity of Sta. 106. This artesian water was found to have a head to el. 941 some 4 to 6 feet higher than the adjacent swamp levels.

K. G. Selby

K.G. Selby, P. Eng.
Supervising Engineer

May, 1978

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 701

WP 74-74-07

LOCATION Co-ords N 16,466,528 E; 1,065,533 E.

ORIGINATED BY EL

DIST 11 HWY 11

BORING DATE September 10, 1975

COMPILED BY BL

DATUM Geodetic

BOREHOLE TYPE Washboring with NX & BX Casings

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ PCF	REMARKS ∇ Art. Head %
ELEV DEPTH	DESCRIPTION	STRAT. P.O.T.	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
936.7	Ground Level															
0.0	Muck															
928.7			1	SS	3	930									69	8.9% Org.
8.0	Clayey silt Soft to firm, with frequent clay seams and fine sand partings Sensitive Becoming silty below El. 910.0		2	SS	7											0 0 86 14
			3	TW	PM	920									105	
			4	SS	3											0 0 71 29
			5	TW	PM	910									116	
904.7			6	SS	28											
32.0	Silt Loose to Compact trace of clay & sand		7	SS	16	900										0 0 99 1
			8	SS	6											
891.7																
45.0	Sand - fine to medium Dense to Very Dense some gravel frequent boulders below el. 870.±		9	SS	31	890										∇ Art. Head encountered
			10	SS	85%	880										
			11	RC	58%	870										
862.7			12	RC	47%											
74.0	End of Borehole															
N.B.: 1. C.W.L. at elev. 934.2 on Sept. 15/75. 2. Artesian pressure encountered at El. 890.± with a head 3'-9" above ground surface.																

RECORD OF BOREHOLE No 702

WP	<u>74-74-07</u>	LOCATION	<u>Co-ords. 16,466,504 N; 1,065,423 E.</u>	ORIGINATED BY	<u>BL</u>
DIST	<u>11</u> HWY <u>11</u>	BORING DATE	<u>September 15, 1975</u>	COMPILED BY	<u>BL</u>
DATUM	<u>Geodetic</u>	BOREHOLE TYPE	<u>Washboring with NK & BX Casing</u>	CHECKED BY	<u></u>

SOIL PROFILE		SAMPLES		GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT	LIQUID LIMIT ——— w_L	UNIT WEIGHT	REMARKS
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE		70 80 90 100	PLASTIC LIMIT ——— w_p	γ	
					SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	WATER CONTENT % $w_p \quad w \quad w_L$		
936.5	Ground Level							
0.0	Clayey silt, with frequent clay seams & fine sand partings	1	SS	16				GR SA SI CL
		2	SS	3				
	Grey	3	SS	9				
913.5		4	SS	20				
23.0	Silt	5	SS	15				
	Compact Grey	6	SS	2/6"				
903.5		7	SS	14				
33.0	Sand, fine to medium dense to very dense some gravel	8	SS	60/6"				
	frequent cobbles and boulders below	9	WS	-				
	El. 896.±	10	WS	-				
866.5								
70.0	End of Borehole							
	N.B.: Artesian pressure encountered at El. 900.± with a head 4' above ground surface.							

15 ϕ 5 % STRAIN AT FAILURE

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORT, HIGHWAY AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 703

WP 74-74-07

LOCATION Co-ords. 16,466,533 N: 1,065,302 E.

ORIGINATED BY BL

DIST 11 HWY 11

BORING DATE September 10, 1975

COMPILED BY BL

DATUM Geodetic

BOREHOLE TYPE Washboring with NX & BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
941.0	Ground Level															Art. Head
0.0	Clayey stiff, with frequent clay seams and fine sand partings		1	SS	19											
			2	SS	10											0 0 72 25
			3	SS	20											
	Grey		4	SS	22											
918.0	Silt Compact traces of clay		5	SS	17											0 0 95 5
			6	SS	21											
908.0	Sand-fine to medium, dense to very dense some gravel		7	SS	25											Art. Head encountered
			8	SS	45											0 96 (10)
	frequent cobbles and boulders below EL. 900.±		9	SS	100											
			10	SS	90											
879.5	End of Borehole															
61.5	N.B.: Artesean pressure encountered at EL. 907± with a head up to ground surface.															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 704

W/P 74-74-07

LOCATION Co-ords. 16,466,478 N; 1,065,885 E.

ORIGINATED BY

DIST 11 HWY 11

BORING DATE October 24, 1974

COMPILED BY GP

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger & Cone Test

CHECKED BY


SOIL PROFILE			SAMPLES			GROUND WATER	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_P WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N-VALUES		20	40	60	80	100	w_p	w	w_L		
925.5	Ground Level					ELEV										
0.0	Clayey silt to silty clay layers of silt	Firm --- soft --- firm	1	SS	24	930									124.5	
			2	TW	PH										104	
			3	TW	PH											
			4	TW	PH	920									123	0 2 72 20 0 2 86 12
			5	TW	PH											
905.5			6	TW	PH	910									115	
30.0	Silt, some clay		7	SS	10											
			8	TW	PH	900										
890.5	Silty sand, some clay		9	SS	33											
888.5	Very loose															
47.0	End of borehole															
876.5	End of Cone Test															

20
15 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 705

WP 7A-74-07 LOCATION Co-ords. 16,466,462 N; 1,065,682 E. ORIGINATED BY AP
 DIST 11 HWY 11 BORING DATE October 25, 1974 COMPILED BY GP
 DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger & Cone Test CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w			UNIT WEIGHT γ PCF	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLCT	NUMBER	TYPE	N-VALUES		20	40	60	80	100	w_p	w	w_L		
937.9	Ground Level															
0.0	Clayey  stiff to very stiff with layers of silt		1	TW	PH											
			2	TW	PH											
			3	TW	PH											
919.9			4	TW	PH											
18.0	Silt trace of clay		5	TW	PH											
909.0			6	SS	8											
28.9	Silty sand, fine, some gravel		7	SS	7											
899.9			8	SS	9											
38.0	End of Borehole															
891.1																
46.8	End of Cone Test															

20
15 \diamond 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 706

WP 74 - 74 - 07LOCATION Co-ords. 16,466,790 N; 1,065,300 E.ORIGINATED BY EVVDIST 11 HWY 11BORING DATE February 10, 1976COMPILED BY EVVDATUM GeodeticBOREHOLE TYPE Washboring with 1 1/2" CasingCHECKED BY

SOIL		ICE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES	20 40 60 80 100					w_p — w — w_L						
						SHEAR STRENGTH PSF					WATER CONTENT %						
						O UNCONFINED + FIELD VANE X QUICK TRIAXIAL X LAB VANE					20 40 60						
930.0	Ice Surface																
0.0	Water																
926.0																	
4.0	Muck Very Soft		1	SS	PM		+ 5								54%	Org.	
918.5			2	SS	PM										64%	Org.	
11.5	clayey silt Stratified		3	TW	PM		+ 2								22		
909.0			4	SS	1		+ 11										
21.0	Silty clay to clayey silt Stratified Soft to Firm		5	SS	PM		+ 2										
			6	TW	PM		+ 8										
	Firm to stiff		7	TW	PM										108		
891.0																	
29.0	Silt, Compact Trace of clay and stratified		8	SS	15		+ 9								0	0 92	
			9	SS	11												
	Possible sand & gravel at 61.5'		10	SS	17												
368.0															0	11 71 18	
62.0	End of Hole																

20
15 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 707

WP 74-74-07

LOCATION Co-ords. 16,466,275 N; 1,065,875 E.

DIST 11 HWY 11

BORING DATE February 11, 1976

ORIGINATED BY BT

DATUM Geodetic

BOREHOLE TYPE Washboring with NX Casing

COMPILED BY BVV

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	IN VALUES		20	40	60	80	100	w_p	w	w_L		
934.0	Ground Level					ELEV										
0.0	topsoil					930										
	Clayey silt, stratified with clay and silt seams	Stiff Soft	1	SS	24											
			2	SS	2											
			3	SS	8	920										
	becomes very silty		4	SS	17											
912.0																
22.0	Silt Compact occ. clay seams		5	SS	15	910										
900.0																
34.0	Sand, gravel					900										
897.5	Very Dense		6	SS	105	10"										
36.5	End of Borehole															

20
15 \diamond 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 708

WP 74 - 74 - 07 LOCATION Co-ords. 16,467,557 N; 1,065,457 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE August 14, 1975 COMPILED BY BL
 DATUM Geodetic BOREHOLE TYPE Washboring with NX & BX CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			UNIT WEIGHT γ P.C.F.	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	W_P	W	W_L	
935.6	Ground Level														
0.0	Sand Fill														
931.1															
4.5	Clayey silt		1	SS	22	930									
	Firm to Stiff		2	TW	PM										108
			3	TW	PM	920									
915.6															
20.0	Silt		4	SS	20										
	Compact														
	some clay		5	SS	20	910									0 0 88 12
904.6															
31.0	Sand, some gravel														
	Boulders		6	RC	83%	900									
895.6			7	RC	50%										
40.0	Gneiss Bedrock		8	RC	94%										
889.6			9	RC	98%										
46.0	End of Borehole														

20
15 ϕ 5 % SILTIN AT FAILURE
30

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 709

WP 74-74-07

LOCATION Co-ords. 16,467,502 N; 1,065,391 E.

ORIGINATED BY BL

DIST 11 HWY 11

BORING DATE August 13, 1975

COMPILED BY BL

DATUM Geodetic

BOREHOLE TYPE Washboring with NX & BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT Y	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
935.2	Ground Level															
0.0	Sand Fill - old road bed, with crushed stone		1	SS	20	930										
929.7	Silt and sandy silt		2	SS	8											
5.5	Fill		3	TW	PM	920										
922.2	Clayey silt		4	TW	PM											
13.0	Firm to Stiff		5	TW	PM	910										
906.2	Silt - Compact stratified trace of clay		6	TW	PM											
29.0			7	SS	12	900										
893.2			8	SS	20											
42.0	Sand and gravel		9	SS	44	890										
387.7																
47.5	End of Borehole															
	NB: BX casing bouncing at 47.5'															

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 710

WP 74 - 74 - 07 LOCATION Co-ords. 16,467,680 N; 1,065,477 E. ORIGINATED BY RL
 DIST 11 HWY 11 BORING DATE August 29, 1975 COMPILED BY BL
 DATUM Geodetic BOREHOLE TYPE Washboring with NX & BX CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			UNIT WEIGHT γ	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	VALUES		20	40	60	80	100	W_p	W	W_L		
933.7	Ground Level															
0.0	Muck		1	SS	3	930										
925.7	Silty clay to clayey silt		2	SS	4											
8.0	Firm to Stiff layered		3	TW	PM	920										
			4	TW	PM											
908.2			5	SS	23	910										
25.5	Silt Compact		6	SS	34											
	Trace of sand and clay seams		7	SS	15	900										
895.7			8	SS	5											
38.0	Sand, trace of fine gravel					890										
338.4																
45.3	End of Borehole N.B: Refusal at 45.3'															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE No 711

WP 74 - 74 - 07 LOCATION Co-ords. 16,467,739 N; 1,065,481 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE August 26, 1975 COMPILED BY BL
 DATUM Geodetic BOREHOLE TYPE Washboring with NX & BX CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w			UNIT WEIGHT γ	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20 40 60 80 100					SHEAR STRENGTH PSF				
												○ UNCONFINED + FIELD VANE				
												● QUICK TRIAXIAL x LAB VANE				
						1000 2000					w_p ——— w ——— w_L WATER CONTENT %					
935.2	Ground Level															
0.0	Sand all															
930.2						930										
5.0			1	SS	0											
	Muck		2	SS	1.6"											
922.2																
13.0	Clayey silt		3	TW	PM	920										
	Firm and layered		4	TW	PM								+ s4.0			
	some silt and clay seams		5	SS	1.6"	910							+ s3.0			
			6	TW	PM											
899.2			7	SS	9	900							+ s3.3			
36.0	Silt		8	SS	11											
	Compact															
	trace of clay		9	SS	35	890										
878.2						880										
57.0	Sand and gravel		10	RC	89%											
	with boulders		11	RC	133%	870										
866.7																
68.5	Gneiss Bedrock		12	RC	97%	860										
856.8			13	RC	95%											
78.4	End of Borehole															

20
15 ϕ 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORT AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE N^o 712WP 74 - 74 - 07LOCATION Co-ords. 16,467,852 N; 1,065,461 E.ORIGINATED BY ELDIST 11 HWY 11BORING DATE August 28, 1975COMPILED BY BLDATUM GeodeticBOREHOLE TYPE Washboring with MX & BXCHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
934.6	Ground Level															
0.0	Silt and organics		1	TW	PM	930										
926.6			2	TW	PM											
8.0	Clayey silt		3	SS	14	920										
	stratified		4	TW	PM											
	Soft		5	SS	14	910										
	Firm		6	SS	13											
901.6			7	SS	20	900										
33.0	Silt		8	SS	14											
	Compact		9	SS	59	890										
	trace of clay		10	SS	N/R											
889.6	Sand - medium															
45.0	some fine gravels															
883.1																
51.5	End of Borehole															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO

RECORD OF BOREHOLE N^o 713

WP 74-74-07 LOCATION Co-ords. 16,467,657 N; 1 065,652 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE September 5, 1975 COMPILED BY BL
 DATUM Geodetic BOREHOLE TYPE Washboring with NX & BX Casings CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w		UNIT WEIGHT γ P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	W _p	W _L	
938.9	Ground Level						SHEAR STRENGTH PSF				FIELD VANE LAB VANE			
							○ UNCONFINED ● QUICK TRIAXIAL				1000 2000			
932.9	Sand Fill, some clay & brick fragments		1	SS	8									
6.0	Clayey silt Very Stiff, Stratified some clay seams		2	SS	20									
			3	FW	FM									
	more silty		4	SS	23									
914.9	Silt Compact		5	SS	17									
24.0	trace of sand													
904.9	Sand and gravel		6	SS	37									
29.0	Very Dense occasional boulders encountered		7	SS	100									
892.4														
46.5	End of Borehole N.B.: BX casings met refusal at 46.5'													

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 714

V/P 74-74-07

LOCATION Co-ords. 16,467,846 N; 1,065,659 E.

ORIGINATED BY BL

DIST 11 HWY 11

BORING DATE August 21, 1975

COMPILED BY BL

DATUM Geodetic

BOREHOLE TYPE Washboring with NX & BX Casings

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20 40 60 80 100				w_p — w — w_L				
							SHEAR STRENGTH PSF				WATER CONTENT %				
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL * LAB VANE				20 40 60				
947.5	Ground Level														
0.0	Fill mostly sand (Embankment of Hwy.11)		1	SS	48										
935.5															
12.0	Silty clay to clayey silt, with silt seams & sand partings		2	SS	42										
			3	SS	14										
	Firm		4	TW	PM										
			5	TW	PH										
899.5															
48.0	Sand		6	SS	52										
	Very Dense some gravel and boulders		7	RC	50Z										
868.0															
79.5	End of Borehole NB: Si-cone met refusal at 868.0'														

20
15 0.5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 715

WP 74-74-07

LOCATION Co-ords. 16,467,772 N; 1,065,634 E.

ORIGINATED BY BL

DIST 11 HWY 11

BORING DATE September 2, 1975

COMPILED BY BL

DATUM Geodetic

BOREHOLE TYPE Washboring with NX & BX Casings

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
939.2	Ground Level															
0.0	Fill: sand & silt, some clay															
931.2	and gravel		1	SS	5											
8.0	Clayey silt: Stiff & stratified some fine sand partings		2	SS	21											
			3	SS	15											
			4	SS	16"											
			5	SS	15											
	Clayey silt Stiff and stratified		6	SS	22											
908.2			7	SS	25											
31.0	Silt Compact trace of clay		8	SS	13											
396.2			9	SS	13											
43.0	Sand and gravel															
	Very Dense															
	occasional boulders		10	SS	78											
876.7																
62.5	Micaceous Schist Rock		11	RC	83%											
367.9			12	RC	83%											
71.3	End of Borehole															

20
15 ϕ 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORT AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 716

WP 74-74-07 LOCATION Co-ords. 16,467,560 N; 1,065,683 E. ORIGINATED BY AP
 DIST 11 HWY 11 BORING DATE October 21 & 22, 1974 COMPILED BY GP
 DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger & Cone Test CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
936.5	Ground Level															
0.0	Mix of clayey silt, sand, gravel & bricks															
934.0																
2.5	Clayey silt with layers of silt		1	SS	11											
			2	TW	PH											
			3	TW	PH											
			4	SS	5											
			5	TW	PH											
	Stiff to Very Stiff		6	TW	PH											
910.5			7	SS	8											
26.0	Silt traces of clay		8	SS	9											
			9	SS	12											
	Loose to Compact		10	SS	5											
993.4			11	TW	PH											
38.1	End of Borehole															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 717

WP 74-74-07 LOCATION Co-ords. 16,467,455 N; 1,065,687 E. ORIGINATED BY AP
 DIST 11 HWY 11 BORING DATE October 23, 1974 COMPILED BY GP
 DATUM Geodetic BOREHOLE TYPE Cone Test Only CHECKED BY

SOIL PROFILE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT		LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w		UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		N' VALUES	20 40 60 80 100	WATER CONTENT %			
938.0	Ground Level										
0.0											
918.0											
20.4	End of Cone Test						refusal				

MINISTRY OF TRANSPORT AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 718

WP 74-74-07

LOCATION Co-ords. 16,467,913 N; 1,065,607 E.

ORIGINATED BY Racey
McCallum

DIST 11 HWY 11

BORING DATE February 1956

COMPILED BY

DATUM Geodetic

BOREHOLE TYPE Washboring with NX & BX

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
931.0	Ground Level															
0.0	Fill					930										
925.0			1	TM	PM		+s3.0									
6.0	Silty clay to clayey silt		2	TM	PM	920	+s3.7									
	Soft		3	TM	PM		+s1.7									
	stratified		4	TM	PM		+s3.0									
			5	TM	PM	910	+s1.3									
			6	TM	PM		+s3.4									
			7	TM	PM		+s3.8									
			8	TM	PM		+s2.9									
896.0			9	TM	PM	900	+s2.4									
35.0	Silt Compact		11	SS	13											
892.0			12	SS	19											
39.0	End of Borehole															

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 719

WP 74-74-07 LOCATION Co-ords. 16,467,418 N; 1,065,560 E. ORIGINATED BY Racey
 DIST 11 HWY 11 BORING DATE February 1956 COMPILED BY McCallum
 DATUM Geodetic BOREHOLE TYPE Washboring with BX & BX CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT Y	REMARKS % OR S A S C
ELEV DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	VALUES		20	40	60	80	100	w_p	w	w_L		
932.0	Ground Level															
930.0	Organic clayey Silt															
928.0	Very Soft															
914.5	clayey silt with silt layers		1	TW	PM											
			2	TW	PM											
	Firm		3	TW	PM											
917.5	Silt		4	TW	PM											
908.0	Compact		5	SS	N/R											
24.0	End of Borehole															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 720

WP 74 - 74 - 07

LOCATION Co-ords. 16,468,010 N; 1,065,535 E.

ORIGINATED BY BVV

DIS 11 HWY 11

BORING DATE February 11, 1976

COMPILED BY BVV

DATUM Geodetic

BOREHOLE TYPE Washboring with NX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			UNIT WEIGHT γ PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	W _P	W	W _L		
936.0	Ground Level															
0.0	Topsoil															
933.0																
3.0	Clayey silt to silt Brown, oxidized some organics stratified		1	SS	8	930										
			2	SS	11											0 1 80 15
918.0			3	SS	21	920										
18.0	Silty clay to clayey silt, Grey and stratified Soft to Firm		4	SS	3											
			5	TW	PM	910										
			6	TW	PM										110.5	
902.0																
34.0	Silt, trace of clay Compact		7	SS	18	900										
			8	SS	19											0 0 95 5
890.0						890										
46.0	Sand and Gravel Very Dense															
884.0			9	SS	100 2"											
52.0	End of Borehole N.B.: Probable bedrock at El. 884.0±															

20
15 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 721

WP 74 - 74- 07 LOCATION Co-ords. 16,467,325 N: 1,065,295 E. ORIGINATED BY PL
 DIST 11 HWY 11 BORING DATE February 9, 1976 COMPILED BY NL
 DATUM Geodetic BOREHOLE TYPE Washboring with NX Casing CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N VALUES		20	40	60	80	100	w_p	w	w_L		
0.0	Ice Surface															
0.0	Water															
5.0	Bottom of Swamp Muck - fibrous and silty		1	SS	0	920	+4								109	13.6% Org.
11.0	Clayey silt - very silty clay soft to stiff stratified		2	SS	0		+3									7.4% Org.
			3	TW	PH	910	+3									
			4	TW	PH		+8									0 1 78 22
			5	SS	16	900	+8									
	becoming more silty		6	TW	PH										116	
33.0	Silt - Cohesive trace of clay stratified		7	SS	16	890										0 0 83 17
	trace of cohesion cohesionless		8	SS	20											
			9	SS	16	880										
34.0	A boulder @ 54'															
34.0	Znd of Borehole															
367.0																
63.0	End of Cone Test															

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 722

WP 74-74-07 LOCATION Co-ords. 16,467,418 N; 1,065,242 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE August 19, 1975 COMPILED BY
 DATUM Geodetic BOREHOLE TYPE Washboring CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
935.0	Ground Level															
931.5	Fill - old road bed															
929.0	Muck		1	SS	16	930										5.5% Org.
925.0	Clayey silt Firm to Stiff		2	TW	PM											
	stratified with clay seams and fine sand partings		3	TW	PM	920										
			4	SS	6											
			5	TW	PM	910										
907.0	Silt Compact and trace of clay		6	SS	20											
900.0	Sand with some gravel and boulders		7	SS	60, 4"	890										
897.5	Gneiss Rock		8	RC	92%											
832.0	End of Borehole		9	RC	80%											

20
15
10
5
% STRAIN AT FAILURE

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 723

WP 74-74-07

LOCATION Co-ords. 16,467,585 N; 1,065,230 E.

ORIGINATED BY BL

DIST 11 HWY 11

BORING DATE September 9, 1975

COMPILED BY

DATUM Geodetic

BOREHOLE TYPE Washboring with NX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			UNIT WEIGHT γ P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	W_P	W	W_L		
936.1	Ground Level															
0.0	topsoil	1	1	SS	18											
	Clayey silt Very Stiff		2	SS	27	930										0 0 82 18
	Stratified with clay seams & occasional fine sand partings		3	SS	14											
921.1																
15.0	Silt stratified, occ. clay seams		4	SS	27	920										0 0 92 8
913.1			5	SS	13											
23.0	Sand, some gravel, frequent boulders		6	RC	50%	910										
905.1																
31.0	End of Borehole															
	NB: Artesean water encountered at El. 913±															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 724

WP 74-74-07

LOCATION Co-ords. 16,467,425 N; 1,065,255 E.

ORIGINATED BY BK

DIST 11 HWY 11

BORING DATE September 29, 1961

COMPILED BY BK

DATUM Geodetic

BOREHOLE TYPE Washboring

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	W _P	W	W _L		
935.0	Ground Level															
932.5	Fill. Silty sand with organics.		1	SS	7											
2.5	Silty clay to clayey silt stratified with occ. silt layers. Stiff		2	SS	18											
			3	TW	PH											
			4	TW	PH											
			5	TW	PH											
910.0			6	TW	PH											
25.0	Silt Compact		7	TW	PH											
			8	TW	PH											
899.5	Sand and gravel Dense		9	SS	42											
894.5			10	SS	100/5"											
40.5	Schist Rock		11	RC												
886.5	End of Borehole		12	RC												
48.5																

NB: Artesian pressure observed at 899.5

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 725

WP 74-74-07 LOCATION Co-ords. 16 467,650 N: 1,065,265 E. ORIGINATED BY _____
 DIST 11 HWY 11 BORING DATE October 6, 1961 COMPILED BY _____
 DATUM Geodetic BOREHOLE TYPE Washboring CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
937.0	Ground Level															
935.0	Topsoil															
2.0	trace organic		1	SS	25											
	Silty clay to		2	SS	17											
	clayey silt		3	TW	PH											
	Stratified		4	TW	PH											
	Stiff		5	TW	PH											
	becoming very silty		6	TW	PH											
915.0																
22.0	Silt		7	TW	PH											
	Compact		8	TW	PH											
905.0																
32.0	Sand and gravel		9	SS	7											
	Loose to Very Dense															
893.5			10	SS	82.6"											
43.5	End of Borehole															
	NB: Artesian pressure noted at El. 905.															

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 726

WP 74-74-07 LOCATION Co-ords. 16,467,360 N; 1,065,180 E. ORIGINATED BY BK
 DIST 11 HWY 11 BORING DATE October 10, 1961 COMPILED BY BK
 DATUM Geodetic BOREHOLE TYPE Washboring CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	VALUES		20	40	60	80	100	w_p	w	w_L	
935.0	Ground Level														
932.5	Fill-old road bed		1	SS	13										
2.5	Muck Soft some clay		2	SS	9										
927.0			3	TW	PH										
8.0	Silty clay to clayey silt stratified Soft to Firm		4	TW	PH										
			5	TW	PH										
			6	TW	PH										
903.0			7	TW	PH										
32.0	Silt Compact		8	TW	PH										
			9	SS	10										
891.0			10	SS	19										
44.0	Sand and gravel														
448.5	Compact														
46.5	End of Borehole														
276.2	NB: 1. Artesian pressure noted at EL. 891.1														
46.7	2. Cone refusal at 885.0														

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 727

W.P. 74-74-07 LOCATION Co-ords. 16,467,310 N; 1,065,255 E. ORIGINATED BY LE
 DIST. 11 11 BORING DATE October 12, 1961 COMPILED BY RK
 DATUM Geodetic BOREHOLE TYPE Washboring CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w			UNIT WEIGHT γ P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
932.0	Water Level															
931.0	Muck, with clayey silt.		1	SS	P	930										
	Very Soft		2	SS	1	19"										
924.0			3	SS	1	13"	+ 6.0									
8.0	Clayey silt/silty clay, stratified		4	SS	4											
	Very Soft to Soft		5	SS	1	24"	+ 7.5									
			6	SS	2		+ 8.0									
			7	SS	1	18"										
	Firm		8	SS	4		+ 3.8									
			9	SS	6		+ 3.3									
900.0			10	SS	8		+ 4.0									
32.0	Silt		11	SS	10											
	Compact						+ 1.7									
891.0			12	SS	9											
41.0	Sand and gravel		13	SS	16											
383.4	Compact to Dense															
48.6	Schist Rock															
878.4			14	RC	76%	880										
52.6	End of Borehole															
	NB: Artesian pressure observed at 891.4															

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 728

WP 74-74-07

LOCATION Co-ords. 16,469,010 N; 1,066,210 E.

ORIGINATED BY RL

DIST 11 HWY 11

BORING DATE July 21, 1975

COMPILED BY RD

DATUM Geodetic

BOREHOLE TYPE Washboring with NX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS % GRS S: CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	VALUES		20	40	60	80	100	w_p	w	w_L		
931.1	Water															
0.3	Water					930										
927.6																
3.5	Mud - spongy and slightly fibrous Very Soft		1	SS	1/20"										3260	22% Org.
			2	SS	0/18"											
			3	SS	0/18"											
			4	SS	0/18"	920										
916.1			5	SS	PM											
15.0	Clayey silt with organics very soft, layered, frequent clay seams		6	SS	0/18"											2.5% Org.
			7	SS	0/18"	910										
			8	SS	1/18"											0 1 78 21
			9	SS	0/18"	900										
894.6			10	SS	0/18"											0 0 53 47
16.5	End of Borehole															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 729

W.P. 74-74-07 LOCATION Co-ords. 16,469,155 N: 1,066,250 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE July 22, 1975 COMPILED BY RD
 DATUM Geodetic BOREHOLE TYPE Washboring N: Casing CHECKED BY RD

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	VALUES		20	40	60	80	100	w_p	w	w_L		
931.1	Ground Level															
0.0	Water					930										
918.1						920										
13.0	clayey silt, layered & very soft frequent silt seams		1	SS	0/18"	910										
			2	SS	0/18"											
			3	SS	PM											
						900										
893.1	Firm to Stiff		4	SS	15											
38.0	End of Borehole															

MINISTRY OF TRANSPORT AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 730

WP 74-74-07

LOCATION Co-ords. 16,462,500 N; 1,066,475 E.

ORIGINATED BY BL

DIST 11 HWY 11

BORING DATE July 22, 1975

COMPILED BY RD

DATUM Geodetic

BOREHOLE TYPE Washboring Nx Casing

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLCT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
931.1	Water Level															
0.0	Water					930										
922.1																
9.0	Muck		1	SS	PM	920										
916.1	Silty clay Very Soft															
15.0	Clayey silt Firm to Stiff		2	SS	9											
	changes to coarse sand below El. 907±		3	SS	16	910										0 0 95
906.1			4	SS	45											
25.0	End of Borehole															
	Note: Vane Tip in sand															

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 731

WP 74-74-07 LOCATION Co-ords. 15,469,710 N; 1,056,615 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE July 22, 1975 COMPILED BY PD
 DATUM Geodetic BOREHOLE TYPE Washboring NX Casing CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPT.	DESCRIPTION	STRAT. PLOT	NUMBEP	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
931.1	Water Level															
0.0	Water					930										
924.1																
7.0	Muck															
921.2																
9.5	Clayey silt, firm & layered with silt seams		1	SS	10	920										
	changes to sand at El. 910±		2	SS	10											
909.6																
			3	SS	60/4	910										
21.5	End of Borehole															

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS—ONTARIO

RECORD OF BOREHOLE NO 732

WP 74-74-07 LOCATION Co-ords. 16,469,935 N; 1,066,705 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE July 22, 1975 COMPILED BY RD
 DATUM Geodetic BOREHOLE TYPE Washboring with NX Casing CHECKED BY 22

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	IN VALUES		20	40	60	80	100	w_p	w	w_L		
931.1	Water Level															
0.0	Water					930										
924.1																
7.0	Silty clay	Muck														
918.1	Very Soft		1	SS	2/18"	920										
13.0	Clayey silt firm to stiff and layered with silty seams		2	SS	12											
			3	SS	7	910										
			4	SS	14											
902.1	sand possibly at El. 902±		5	SS	39											0 2 94
23.0	End of Borehole															22 52 (26)

20
15 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 733

WP 74-74-07

LOCATION Co-ords. 16,468,920 N; 1,066,070 E.

ORIGINATED BY BL

DIST 11 HWY 11

BORING DATE July 29, 1975

COMPILED BY RD

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT Y	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L	
936.6	Ground Level														
0.0	Clayey silt Grayish brown and stiff		1	SS	11	930						0			0 8 75 12
	Grey and firm some wood chips at 10'		2	SS	6							10			0 3 87 10
			3	SS	5	920									
913.6			4	SS	11							10			
23.0	Silt with traces of clay		5	SS	22	910									
903.6	Compact		6	SS	21							0			0 1 90 9
33.9	Sand and gravel		7	SS	27	900									
995.1	Dense		8	SS	41							0			33 45 (19)
41.5	End of Borehole Note: WL established on July 29/75 on completion of borehole.														

20
15 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS—ONTARIO

RECORD OF BOREHOLE NO 734

WP 74-74-07

LOCATION Co-ords. 16,469,100. N; 1,066,155 E.

ORIGINATED BY BL

DIST 11 HWY 11

BORING DATE July 29/75

COMPILED BY RD

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	N° VALUES		20	40	60	80	100	w_p	w	w_L		
933.7	Ground Level															
0.0	Sand fill, some gravel and silt, also some wood chips		1	SS	9	930										
920.7			2	SS	18											
13.0	Clayey silt Very Soft Trace of wood chips		3	SS	2	920										0 0 64 36
10.7			4	SS	4											
23.0	Silt, trace of clay		5	SS	16	910										
904.7	Compact															
29.0	Sand, some gravel and silt		6	SS	26	900										
897.2			7	SS	29											23 61 (14)
36.5	End of Borehole Note: Water Level not established															

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 735

WP 7A-74-07 LOCATION Co-ords. 16,468,575 N: 1,066,235 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE October 2, 1975 COMPILED BY BL
 DATUM Geodetic BOREHOLE TYPE Washboring with NX Casing CHECKED BY BL

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
931.1	Water Level															
0.0	Water					930										
927.1																
4.0	Muck		1	TW	PM		+s2.5									
	V. Soft					920	+s1.28								83.5	
	slightly fibrous		2	TW	PM		+s2.0								87.5	4.2% org
907.1			3	TW	PM	910	+s1.5								120.0	
24.0	Silty Clay		4	TW	PM		+s2.25									
	Very Soft		5	TW		900	+s2.1									
894.1			6	TW			+s3.5									
37.0	Clayey silt					890	+s2.5									
	layered		7	SS	3											
	some silt seams		8	SS	9	880										
	Soft to Firm															
	Stiff						+s1.7									
	Very hard at El. 869															
867.1	Refusal at El. 867		9	SS	10.0"	870										
0.0	End of Borehole															

MINISTRY OF TRANSPORT, HIGHWAYS AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 736

WP 74-74-07 LOCATION Co-ords. 16,468,995 N; 1.066,165 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE October 2, 1975 COMPILED BY BL
 DATUM Geodetic BOREHOLE TYPE Washboring with NX Casing CHECKED BY BL

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT W_L PLASTIC LIMIT W_P		UNIT WEIGHT γ	REMARKS % GR SAND
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES						WATER CONTENT W			
						SHEAR STRENGTH PSF						WATER CONTENT %		
						O UNCONFINED + FIELD VANE								
						● QUICK TRIAXIAL X LAB VANE								
						1000 2000								
931.1	Water Level					930								
928.6	Muck					920								
923.1	Silty clay					910								
905.1	Soft					900								
25.0	Clayey silt Firm to Stiff and layered													
891.1														
40.0	End of Borehole													

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE No 737

WP 74-74-07LOCATION Co-ords. 16,469,250 N: 1,066,365 E.ORIGINATED BY ELDIST 11 HWY 11BORING DATE October 1975COMPILED BY BLDATUM GeodeticBOREHOLE TYPE Washboring with NXCHECKED BY EL

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
931.1	Water Level															
0.0	Water					930										
918.1						920										
13.0	Silty clay															
912.1	Very Soft															
19.0	Clayey silt					910										
	Stiff & layered		1	SS	12											
	becoming very silty					900										
894.6			2	SS	24											
36.5	End of Borehole															

MINISTRY OF TRANSPORT AND COMMUNICATIONS - ONTARIO

RECORD OF BOREHOLE NO 738

WP 74-74-07 LOCATION Co-ords. 16,469,305 N; 1,066,320 E. ORIGINATED BY RL
 DIST 11 HWY 11 BORING DATE October 3, 1975 COMPILED BY RL
 DATUM Geodetic BOREHOLE TYPE Washboring with NX Casing CHECKED BY RL

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ P.C.F. OR SA SI CL	REMARKS %
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
931.1	Water Level															
0.0	Water					930										
927.1	Muck															
4.0	Silty clay Very Soft		1	TW	PM											
914.1			2	TW	PM	920									109	
17.0	Clayey silt Stiff to Very Stiff. Layered.		3	TW	PM	910									117	
399.6	Silt possibly at El. 900±															
31.5	End of Borehole		4	SS	15	900										

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 739

WP 74-74-07

LOCATION Co-ords. 16,465,865 N; 1,066,190 E.

ORIGINATED BY BL

DIST 11 HWY 11

BORING DATE February 28, 1975

COMPILED BY BL

DATUM Geodetic

BOREHOLE TYPE Hand Auger

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w		UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	WATER CONTENT % $w_p \quad w \quad w_L$			
931.1	Water Level														
929.1	Water					930									
2.0	Muck														
	Amorphous					920									
917.1															
14.0	Silty Clay														
	to clayey silt														
	Soft to Firm					910									
909.1															
22.0	N.F.P. Firm Bottom														

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO

RECORD OF BOREHOLE NO 740

WP 74-74-07 LOCATION Co-ords. 16,468,850 N; 1,066,230 E ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE February 28, 1975 COMPILED BY PL
 DATUM Geodetic BOREHOLE TYPE Hand Auger CHECKED BY PL

SOIL PROFILE			SAMPLES			GROUND WATER	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	SHLAR STRENGTH				
												O UNCONFINED + FIELD VANE				
												● QUICK TRIAXIAL x LAB VANE				
						WATER CONTENT %					w_p ——— w ——— w_L					
931.1	Water Level					ELEV										
0.0	Water					930										
927.1																
4.0	Muck	~ ~														

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE No 741

WP. 74-74-07 LOCATION Co-ords. 16,469,045 N; 1,066,280 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE February 28, 1975 COMPILED BY BL
 DATUM Geodetic BOREHOLE TYPE Hand Auger CHECKED BY BL

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			UNIT WEIGHT γ	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	W_P	W	W_L		
931.1	Water level															
0.0	Water					930										
922.1																
9.0	Muck					920										
913.1																
18.0	Silty Clay to clayey silt Soft					910										
904.1																
27.0	N.F.P. Firm Bottom															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 742

WP 74-74-07 LOCATION Co-ords. 16,469,075 N; 1,066,225 E. ORIGINATED BY BL
 DIST 11 HWY 11 BORING DATE February 28, 1975 COMPILED BY BL
 DATUM Geodetic BOREHOLE TYPE Hand Auger CHECKED BY BL

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
931.1	Water Level															GR SA SI CI
0.0	Water					930										
923.1																
8.0	Muck					920	+s10.0									
917.1							+s4.0									
14.0	Silty Clay to clayey silt						+s5.0									
	Soft					910	+s8.0									
							+s4.5									
							+s5.5									
							+s4.7									
							+s4.0									
							+s3.7									
							+s4.0									
900.1						900	+s3.8									
31.0	Firm Bottom						+s3.8									

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 743

WP 74-74-07 LOCATION Co-ords. 16,468,895 1,066.120 E. ORIGINATED BY RL
 DIST 11 HWY 11 BORING DATE February 5, 1976 COMPILED BY EVV
 DATUM Geodetic BOREHOLE TYPE Washboring with NX Casing CHECKED BY EVV

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N° VALUES		20	40	60	80	100	w_p	w	w_L		
933.0	Ground Level															
0.0	Organic clayey silt, Soft					930										
	interbedded with		1	SS	8											0.71% Org.
	Muck layers		2	TV	PM											4.7% Org.
921.0	Organic clay, soft					920										1.2% Org.
12.0	with black streaks		3	SS	0/	18"										
915.0	Silty clay		4	TW	PM											
18.0	Firm & somewhat		5	SS	12	910									105	0 0 50 50
904.5	Silt, trace of clay		6	SS	17	900										0 1 94 5
28.5	Grey Compact															
894.0	Sand & gravel		7	SS	70/	6"										
41.0	End of Borehole															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE No 744

WP 74-74-07 LOCATION Co-ords. 16,468,922 N; 1 066,362 E. ORIGINATED BY RVV
 DIST J1 HWY 11 BORING DATE February 5, 1976 COMPILED BY RL
 DATUM Geodetic BOREHOLE TYPE Washboring with NX Casing CHECKED BY 62

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			UNIT WEIGHT γ P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	20	60	80	100	W_P	W	W_L		
929.0	Ice Surface															
0.0	Water															
917.0	Bottom of Lake					920										
12.0	Muck, spongy and trace of silt		1	SS	PM											8.8% Org.
911.0																
18.0	Clayey silt, very soft organic trace of organic		2	SS	PM	910										4.0% org.
			3	SS	PM		+S2									0.3% Org.
900.5							+S4									
28.5	Silty clay/clayey silt.		4	SS	PM	900										
			5	SS	PM		+S3									
	Soft & stratified		6	TW	PM	890	+S2									0 0 59 4
883.0			7	SS	16		+S3									
46.0	Silt, trace of clay stratified, grey		8	SS	12	880										0 0 (100)
							+V 2000									
267.5	Compact to Dense					870										
61.5	End of Borehole		9	SS	30											

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

RECORD OF BOREHOLE NO 745

WP 74-74-07 LOCATION Co-ords. 16,469,180 N. 1,066,490 E. ORIGINATED BY 3W
 DIST 11 HWY 11 BORING DATE February 4, 1976 COMPILED BY EL
 DATUM Geodetic BOREHOLE TYPE Washboring, NX Casing CHECKED BY 3W

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			UNIT WEIGHT γ P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	W VALUES		20	40	60	80	100	W_p	W	W_L		
929.0	Ice Surface															
0.0	Water															
914.0	Bottom of Lake															
15.0	Muck, some silt and spongy.		1	SS	PM											5.5% Org.
904.0	trace of organics		2	SS	PM											0.8% Org.
25.0	Silty clay Very Soft to Soft Grey		3	TW	PM										117	
			4	SS	PM											0 0 79 21
			5	TW	PM										108	
			6	SS	PM											
869.0																
60.0	Clayey silt Firm & stratified		7	SS	12											0 0 85 1
	becoming very silty & sandy		8	SS	18											
852.5																
76.5	End of Borehole															

RECORD OF BOREHOLE NO 746

W/P	<u>74-74-07</u>	LOCATION	<u>Co-ords. 16,469,460 N; 1,066,600 E.</u>	ORIGINATED BY	<u>BT</u>
DIST	<u>11</u> HWY <u>11</u>	BORING DATE	<u>February 4, 1976</u>	COMPILED BY	<u>BTG</u>
DATUM	<u>Geodetic</u>	BOREHOLE TYPE	<u>Washboring with NX Casing</u>	CHECKED BY	<u>10</u>

[illegible]

15 $\overset{20}{\underset{10}{\circ}}$ 5 % STRAIN AT FAILURE

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 747

WP 74-74-07

LOCATION Co-ords. N 16,468,070; E 1,065,800

ORIGINATED BY MK

DIST 11 HWY 11

BORING DATE August 5, 1976

COMPILED BY JC

DATUM Geodetic

BOREHOLE TYPE NX Casing & Washboring & Cone Test

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w		
941.9	Ground Level														
0.0	Fill material Mixture of sand & wood chips		1	SS	5										
			2	SS	8										
			3	SS	8										
926.9			4	SS	5										
15.0	Clayey silt Some sand, Trace of gravel		5	SS	10										
	Very soft to Firm		6	TW	PM										
			7	SS	0										
			8	TW	PM										
			9	SS	4										
			10	SS	11										
880.4			11	TW	PM										
61.5	Sand & gravel Trace of silty & clay Very dense		12	SS											
867.4			13	SS	104										
74.5	End of Borehole														

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 748

W-P 74-74-07 LOCATION Co-ords N 16 468 165 E 1065835 ORIGINATED BY WK
 DIST 11 HWY 11 BORING DATE August 9, 1976 COMPILED BY JC
 DATUM Geodetic BOREHOLE TYPE NX Casing and Washboring and Cone Test CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
940.0 0.0	Ground Level															
	Fill Material Some Sand and Wood Chip		1	SS	6											
			2	SS	7											
			3	SS	11											
			4	SS	12											
924.0 16.0			5	SS	5											
	Clayey Silt Some Sand Trace of Gravel Soft to Stiff		6	TW	PM											
			7	TW	PM											
			8	SS	1/18"											
			9	TW	PM											
			10	SS	1"											
			11	TW	PM											
884.0 56.0	Sand and Gravel Traces of Silt and clay Compact		12	SS	26											
874.5 65.5			13	SS	25											
871.5 68.5	End of Borehole															
	End of Cone Test															

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

WP 74-74-07 LOCATION Co-ords. N 16,467,455; E 1,065,730 ORIGINATED BY MK
DIST 11 HWY 11 BORING DATE Aug. 11 & 12, 1976 COMPILED BY PP
DATUM Geodetic BOREHOLE TYPE Washbore, NX Casing & Cone Test CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT		LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N° VALUES		SHEAR STRENGTH PSF		WATER CONTENT %			
							○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE x LAB VANE	w_p — w — w_L			
934.4	Ground Level						1000	2000				
0.0	Trace of organics ----- Clayey silt Some sand, trace of gravel Occassional silt Layers Very soft to Firm		1	SS	4							
			2	SS	1 1/2"							
			3	SS	11							
			4	SS	1/18"							
			5	TW	PM							
			6	SS	1							
			7	TW	PM							
			8	TW	PM							
			9	SS	19							
			10	SS	13							
878.9			11	SS	48							
55.5	End of Borehole											
867.1												
67.3	End of Cone test							100/4"				

20
15 ϕ 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 750

WP 74-74-07 LOCATION Co-ords N 16 468 355 E 1065895 ORIGINATED BY WK
 DIST 11 HWY 11 BORING DATE August 16, 1976 COMPILED BY JC
 DATUM Geodetic BOREHOLE TYPE NX Casing and washboring and Cone Test CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w w_p — w — w_L WATER CONTENT %	UNIT WEIGHT γ	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES					
935.5	Ground Level									
0.0	Fill Material Mixture of Sand, Silt, Ore and Wood Chips		1	SS	2					
			2	SS	2					
924.5			3	SS	5					
11.0	Clayey Silt some Sand and Trace of of Gravel occasional Silt Layers Very Soft to Stiff		4	SS	2					
			5	TW	PM					
			6	TW	PM					
			7	SS	19					
			8	SS	16					
900.5										
35.0	Silty Sand Some Gravel		9	SS	19					
894.0	Compact to Dense		10	SS	50					
41.5	End of Borehole									

100/4'

890

20
15
10

% STRAIN AT FAILURE

HIGHWAY ENGINEERING DIVISION · ENGINEERING MATERIALS OFFICE · SOIL MECHANICS SECTION

RECORD OF BOREHOLE № 751

WP 74-74-07 LOCATION Co-ords N 16468420 E 1065885 ORIGINATED BY MK
DIST 11 HWY 11 BORING DATE August 4, 1976 COMPILED BY JC
DATUM Geodetic BOREHOLE TYPE NX Casing and Washboring and Cone Test CHECKED BY _____

SOIL PROFILE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT	LIQUID LIMIT ———— ^{w_L} PLASTIC LIMIT ———— ^{w_p} WATER CONTENT ———— ^w	UNIT WEIGHT ^γ	REMARKS % GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		'N' VALUES	20 40 60 80 100			WATER CONTENT % w _p ———— w ———— w _L
							SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE			
938.5	Ground Level					ELEV 1000 2000				
0.0	Fill Material Mixture of Sand, Silt, Ore, and wood chips		•			▼				
			1	SS	9	930				
			2	SS	80/4					
929.5			3	SS	15					
9.0	Clayey Silt some Sand and trace of Gravel occasional Silt Layers Soft to Stiff		4	SS	20					
			5	SS	2	920				
			6	TP	PM					
			7	TP	PM	910				
			8	SS	15					
903.5			9	SS	18	900				
35.0	Sandy Silt Compact		10	SS	-					
899.0										
39.5										
896.5	End of Borehole									
42.0	End of Cone Test						100/12"			
						890				

20
15 ϕ 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 752

WP 74-74-07 LOCATION Co-ords N 16468510 E 1066035 ORIGINATED BY MK
 DIST 11 HWY 11 BORING DATE August 19, 1976 COMPILED BY JC
 DATUM Geodetic BOREHOLE TYPE NX Casing and Washboring and Cone Test CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w $w_p \quad w \quad w_L$ WATER CONTENT %	UNIT WEIGHT γ	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES					
946.2	Ground Level									
0.0	Fill material (Sand)									
941.2	Clayey Silt Trace of Sand and Gravel, Occasional Silt Layers Stiff to very Stiff		1	SS	7	940				
5.0			2	SS	20					
			3	SS	17					
			4	SS	10					
928.2	Sandy Silt Trace of Gravel Compact to Dense		5	SS	22	930				
18.0			6	SS	14					
			7	SS	31	920				
			8	SS	43					
916.7	End of Borehole									
29.5						910				

20
15 5 % STRAIN AT FAILURE
10

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 753

WP 74-74-07 LOCATION Co-ords N 16468600 E 1065950 ORIGINATED BY MY
 DIST 11 HWY 11 BORING DATE August 20, 1976 COMPILED BY JC
 DATUM Geodetic BOREHOLE TYPE NY Casing and Washboring and Cone Test CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w		UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p w w_L		
938.4	Ground Level													
0.0	Fill Material													
933.4	Organic Silt and Bricks		1	SS	12									
5.0	Clayey Silt some sand occasional Silt Layers Stiff to very Stiff		2	TW	PM									
			3	SS	13									
			4	TP	PM									
920.4			5	TW	PM									
18.0	Sandy Silt some Gravel Compact		6	SS	19									
26.5	End of Borehole		7	SS	21									
902.5	End of Cone Test													
35.9														

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 754

WP 74-74-07 LOCATION Co-ords N 16468545 E 1065915 ORIGINATED BY MK
 DIST 11 HWY 11 BORING DATE August 23, 1976 COMPILED BY JC
 DATUM Geodetic BOREHOLE TYPE NX Casing and Washboring and Cone Test CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w w_p — w — w_L WATER CONTENT %	UNIT WEIGHT Y	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	'N' VALUES					
954.4	Ground Level									
0.0	Fill Material Silty Sand Some Gravel Compact to Dense		1	SS	38	950				
			2	SS	28					
			3	SS	33					
			4	SS	28	940				
			5	SS	24					
934.9			6	SS	32					
19.5	Clayey Silt some Sand occasional Silt Layers, Stiff to very stiff		7	SS	41					
			8	SS	35	930				
			9A	TW	PM					
			10	TW	PM					
			11	TW	PM					
			12	SS	21	920				
			13	TW	PM					
913.4			14	TW	PM					
41.0	Sandy Silt		15	SS		910				
908.9	some Gravel dense									
45.5	End of Borehole									
						900				

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 755

WP 74-74-07 LOCATION Co-ords N 16 468 760 E 1066115 ORIGINATED BY MR
 DIST 11 HWY 11 BORING DATE August 25, 1976 COMPILED BY JC
 DATUM Geodetic BOREHOLE TYPE NX Casing and Washbore and Cone Test CHECKED BY

SOIL PROFILE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w w_p — w — w_L WATER CONTENT %	UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE					
934.4 0.0	Ground Level								
926.9 7.5	Mixture of Sand and Organic Silt Soft		1	TP	PM				
			2	SS	5				
			3	SS	1				
			4	TP	PM				
	Clayey Silt some Sand occasional Silt layers Firm to Stiff		5	SS	7				
			6	TW	PM				
			7	TW	PM				
			8	TW	PM				
			9	TP	PM				
911.4 23.0	Sandy Silt Dense		10	SS	32				
899.2 25.2	End of Borehole		11	SS	100/20				

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 756

WP 74-74-07

LOCATION Co-ords. N 16,468,075; E 1,065,675

ORIGINATED BY R.VV

DIST 11 HWY 11

BORING DATE August 30 - Sept. 1, 1976

COMPILED BY R. VV

DATUM Geodetic

BOREHOLE TYPE NX Casing & Washbore

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
967.3	Ground Level															
0.0	Fill material															
	Silty sand to sandy silt		1	SS	66	960										
	Some gravel (Layered)		2	SS	58/6	"										
			3	SS	73/3	"										
	Very Dense		4	SS	93	950										
			5	SS	34											
			6	SS	94	940										
			7	SS	42											
			8	SS	43											
			9	SS	25	930										
			10	SS	37											
925.5			11	SS	20											
42.0	Layers of sand, silt & clayey silt		12	SS	19	920										
	Transition zone		13	TW	PM											
	Clayey silt		14	SS	12											
	Some sand, Trace of gravel.		15	TW	PM											
	Occasional silt layers		16	TW	PM	910										
			17	TW	PM											
	Very stiff		18	SS	24											
			19	SS	15	900										
892.3			20	TW	PM											
75.0	Sandy silt, Trace of gravel & clay		21	SS	23	890										
885.3	Compact to dense		22	SS	50											
82.0			23	SS	33											

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 757

WP 74-74-07 LOCATION Co-ords. N 16,467,500; E 1,065,725 ORIGINATED BY MK
 DIST 11 HWY 11 BORING DATE August 26, 1976 COMPILED BY JC
 DATUM Geodetic BOREHOLE TYPE NX Casing, Washbore & Cone Test CHECKED BY

SOIL PROFILE		STRAT. PLOT	SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH PSF O UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE 1000 2000	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w w_p — w — w_L WATER CONTENT %	UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION		NUMBER	TYPE	'N' VALUES					
938.0	Ground Level									
0.0	Fill material clayey silt and brick		1	SS	14					
930.5			2	SS	9					
7.5	Clayey silt some sand. Trace of gravel. Occasional silt layers		3	SS	22					
			4	SS	16					
			5	SS	9					
			6	TP	PM					
	Firm to Stiff		7	TP	PM					
			8	TW	PM					
			9	SS	20					
908.0			10	SS	25					
30.0	Sandy silt some gravel Trace of clay		11	SS	17					
			12	SS	14					
	Compact to Very Dense		13	SS	19					
894.0			14	SS	55					
44.0	End of Borehole									

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 758

WP 74 - 74 - 07 LOCATION Co-ords N. 16 467 515 E 1 065 725 ORIGINATED BY _____
 DIST 11 HWY 11 BORING DATE September 27, 1961 COMPILED BY R.N.O.
 DATUM Geodetic BOREHOLE TYPE _____ CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
934.5	Ground Level															
0.0	Fill Material															
930.5	Silty $\frac{1}{2}$ Loose Brown, Grey		1	SS	8	930										Artesian Head EL 340.0
4.0	Clayey Silt to Silty Clay Very Soft to stiff grey Stratified		2	SS	9											
			3	SS	4	920										
			4	SS	1											
			5	SS	5											
914.5			6	SS	20	910										
20.0	Silt Compact grey		7	SS	21											
			8	SS	10											
901.5																
33.0	End of Borehole															Artesian Encounter EL 901.5

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 759

WP 74-74-07 LOCATION Co-ords N 16 468 055 E 1 065 435 ORIGINATED BY BMG
 DIST 11 HWY 11 BORING DATE October 3, 1961 COMPILED BY RNO
 DATUM Geodetic BOREHOLE TYPE Hollow Stem auger CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
943.0	Ground Level															
941.0	Topsoil															
2.0	Silty Clay to Clayey Silt Some Organics at EL. 927.0 Firm to Stiff gray		1	SS	9	940										
			2	SS	22											
			3	SS	7											
			4	SS	14	930										
923.0																
20.0	Silt Compact gray		5	SS	17											
916.0			6	SS	21	920										
915.3	Sand and Gravel															
27.7	End of Borehole															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 760

WP 74-74-07 LOCATION Co-ords N 16 468 080 E 1 065 330 ORIGINATED BY BMG
 DIST 11 HWY 11 BORING DATE October 4, 1961 COMPILED BY RNO
 DATUM Geodetic BOREHOLE TYPE Hollow Stem auger and Rock Coring CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	IN' VALUES		20	40	60	80	100	w_p	w	w_L		
948.0	Ground Level															
946.5	Topsoil															
1.5	Clayey Silt to Silt Stiff brown gray		1	SS	15	940										
			2	SS	10											
938.0	Silt Compact		3	TV	PH											
10.0			4	SS	38	930										
935.0	Sand and Gravel Dense		5	SS	50											
13.0			6	RC												
931.0	Bedrock Quartz Micaceous Schist															
17.0																
926.0																
22.0	End of Borehole															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 761

WP 74-74-07 LOCATION Co-ords N 16 467 865 E 1 065 290 ORIGINATED BY _____
 DIST 11 HWY 11 BORING DATE Oct. 4, 1961 COMPILED BY RNO
 DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
943.0	Ground Level															
941.5	Topsoil															
1.5	Clayey silt to silt		1	SS	26	940										
	Stratified		2	SS	9											
	Stiff		3	SS	12											
930.0	Brown-Grey		4	SS	13	930										
13.0	Silt		5	SS	14											
	Compact		6	SS	15											
	Grey					920										
919.0																
24.0	Sand & Gravel															
916.5	Dense		7	SS	48											
26.5																

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 762

WP 74-74-07 LOCATION Co-ords N 16 467 950 E 1 065 415 ORIGINATED BY _____
 DIST 11 HWY 11 BORING DATE October 5, 1961 COMPILED BY RNO
 DATUM Geodetic BOREHOLE TYPE Hollow Stem auger CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS	
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20 40 60 80 100				w_p w w_L					
							SHEAR STRENGTH PSF				WATER CONTENT %					
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
ELEV						1000	2000			20	40	60	PCF	GR SA SI CL		
935.0	Ground Level															
933.0	Topsoil															
	Silty Clay and Clayey Silt Organics at EL. 922.0-923.0 Firm to Stiff gray		1	SS	9	930								118.8		
			2	SS	21											
			3	SS	11											
			4	SS	4											
			5	TW	PM		920									110.8
			6	TW	PM											
909.0	Silt Compact gray to brown gray		7	TW	PM	910								124.8		
8			TW	PM												
26.0			9	SS	14											
899.0	Sand and Gravel		10	SS	28	900										
898.7	End of Borehole															
36.5																

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 763

WP 74-74-07 LOCATION Co-ords N 16 467 845 E 1 065 400 ORIGINATED BY BMG
 DIST 11 HWY 1 BORING DATE October 5, 1961 COMPILED BY RNO
 DATUM Geodetic BOREHOLE TYPE Hollow Stem auger CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
933.0	Ground Level															
931.0	Topsoil															
2.0	Silty Clay and Silt stratified Trace of organics at EL. 923.0 Firm to Stiff		1	SS	5	930									117.0	
			2	SS	10										108.0	
			3	TW	PH										121.7	
			4	TW	PH	920										
			5	TW	PH											
912.0																
21.0	Silt Compact gray		6	TW	PH	910									125.9	
			7	TW	PH											
900.0			8	SS	7	900										
33.0	Sand and Gravel		9	SS	11											
895.0	Compact gray		10	SS	27											
38.0	End of Borehole															

Artesian
Condition
Encountered
EL. 900.01

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 764

WP 74-74-07 LOCATION Co-ords N 16 467 200 E 1 065 260 ORIGINATED BY _____
 DIST 11 HWY 11 BORING DATE Oct. 16, 1961 COMPILED BY RNO
 DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger & Cone Test CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
931.5	Water Level															
924.0	Black with clayey silt Very soft		1	SS	NA											
7.5	Silty clay to clayey silt Stratified Firm to stiff		4	TW	PM											
903.0			5	TW	PH											
28.5	Silt Compact		6	TW	PH											
			7	TW	PH											
888.5			8	TW	PH											
886.5	Sand & Gravel Compact		9	SS	19											
45.0	End of Borehole															Artesian Encountered
882.8																FL 888.5
48.7	End of Cone Test															Refusal

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 765

WP 74 - 74 - 07

LOCATION Co-ords N 16 467 415 E 1 065 360

ORIGINATED BY

DIST 11 HWY 11

BORING DATE October 16, 1961

COMPILED BY R.N.O.

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger & Cone Test

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
932.0	Water Level					ELEV	1000	2000				20	40	60	PCF	% GR SA SI CL
931.0	Ground Level					930										
925.0	Muck With Silty Clay Very Soft		1	SS	N.A.											
7.0	Silty Clay to Clayey Silt Stratified Soft to Stiff					920										
			4	TW	P.H.	910										
905.0			5	TW	P.H.											
27.0	Silt Compact		6	TW	P.H.	900										
			7	SS	13											
893.5	Sand and Gravel		8	SS	54	890										
890.7	End of Borehole															
41.3																
886.5																
45.5	End of Cone Test															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 766

WP 74-74-07 LOCATION Co-ords N 16 467 310 E 1 065 365 ORIGINATED BY BMG
 DIST 11 HWY 11 BORING DATE October 18, 1961 COMPILED BY R.N.O.
 DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
931.8	Water Level					ELEV	SHEAR STRENGTH PSF					WATER CONTENT %				
							O UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE									
							1000 2000					20 40 60				
0.8	Ground Level					930										
0.8	Muck		1	SS	N.A.											
0.8	With Clayey silt		2	SS	N.A.											
0.8	Very Soft.															
7.0	Silty Clay to Clayey Silt					920										
	Stratified															
	Soft to Stiff.															
			5	TW	P.H.	910										
			6	TW	P.H.											
204.8																
27.0	Silt		7	TW	P.H.	900										
	Compact		8	SS	7											
802.8																
39.0	Sand and Gravel															
890.3	Dense		9	SS	42	890										
41.0	End of Borehole															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 767

WP 74-74-07

LOCATION Co-ords. N 16,467,345; E 1,065,670

ORIGINATED BY AP

DIST 11 HWY 11

BORING DATE Oct. 22, 23, 1974

COMPILED BY RNO

DATUM Geodetic

BOREHOLE TYPE Continuous Flight Auger (H.S. 8½" I.D.)

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ PCF	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L	
935.0	Water Level														
8.0	Ground Level														
	Clayey silt Silt & Clay Layers		1	TW	PH	930									
			2	TW	PH										
			3	SS	4										
			4	TW	PH										
			5	TW	PH	920									
			6	TW	PH										
	Very Soft to Stiff		7	TW	PH	910									
907.0															
28.0	Silt Occasional silty clay seams		8	SS	13										
			9	SS	14										
	Compact														
892.5			10	SS	12										
890.8	End of Borehole														
44.2	End of Cone Test														

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 768

WP 74-74-07

LOCATION Co-ords. N 16,467,120; E 1,065,175

ORIGINATED BY AP

DIST 11 HWY 11

BORING DATE Nov. 6, 1974

COMPILED BY RNO

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY

SOIL PROFILE		STRAT. PLOT	SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT w			UNIT WEIGHT γ PCF	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION		NUMBER	TYPE	VALUES		20	40	60	80	100	W_P	w	W_L	
935.7	Ground Level														
0.0	Clayey silt with organics Some sand Stiff		1	SS	17	18"						$W_P=93$	$W=124$	$W_L=120$	
928.7			2	TW	PH	930									
7.0	Clayey silt Layers of silt & clay Soft to Firm		3	TW	PH	920									
			4	TW	PH										
			5	TW	PH										
			6	TW	PH										
904.7															
31.0	Silt, Occasional silty clay seams		7	SS	7	900									
298.7	Compact		8	SS	22										
37.0															

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO

HIGHWAY ENGINEERING DIVISION - ENGINEERING MATERIALS OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 769

WP 74-74-07

LOCATION Co-ords. N 16,466,950; E 1,065,170

ORIGINATED BY AP

DIST 11 HWY 11

BORING DATE Nov. 6, 1974

COMPILED BY RNO

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

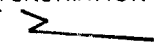


CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w			UNIT WEIGHT γ PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
935.0	Ground Level															
0.0	Clayey silt with organics Some sand		1	SS	3	930						$w_p=5$	$w=117$	$w_L=62$	86	
	Firm		2	TW PM-1												
			3	TW PM												
923.0																
12.0	Clayey silt		4	TW PM		920						$w_p=84$	$w=263$	$w_L=94$	114	0 0 87 13
	Layers of silt & clay		5	TW PM												
	Firm to Stiff		6	TW PM		910										
			7	TW PH												
899.0																
36.0	Silt, Silty clay		8	SS	11	900										
896.0	layers Compact		9	SS	17											0 0 85 15
39.0	End of Borehole															



RECORD OF BOREHOLE No 770

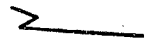





W P 74-74-07 LOCATION Coords. N 16 467 460 E 1 065 158 ORIGINATED BY PP
DIST 11 HWY 11 BOREHOLE TYPE Washbore, NX Casing COMPILED BY PP
DATUM Geodetic DATE May 4, 1978 CHECKED BY Le

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
940.0	Ground Level																
0.0	Fill Material Sand and Clayey Silt		1	TW	PM		930										
932.0			2	TW	DR												
8.0	Clayey Silts (Stratified) Occasional Silt Partings Firm to Stiff		3	TW	PM												
			4	TW	PM												
			5	TW	PM												
			6	TW	PM												
			7	TW	PM												
	Silt to Clayey Silt, Loose		8	TW	PM												
			9	TW	PM												
915.5			10	TW	PM												
24.5	End of Borehole																
Note: DR: Driven																	



RECORD OF BOREHOLE No 771

W P 74-74-07 LOCATION Coords. N 16 467 479 E 1 065 190 ORIGINATED BY PP
 DIST 11 HWY 11 BOREHOLE TYPE Washbore, NX Casing COMPILED BY PP
 DATUM Geodetic DATE May 1, 2, 1978 CHECKED BY PP

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
940.0	Ground Level																
0.0	Fill Material Sand (Compact) and Clayey Silt (Stiff)		1	SS	24		930										
			2	SS	12												
			3	SS	11												
928.5			4	SS	17												
11.5	Clayey Silts (Stratified) Occasional Silt Partings, Firm to Stiff		5	SS	22						+	<					
			6	SS	6												
			7	SS	4												
	Silt to Clayey Silt, Loose		8	SS	2												
914.5			10	SS	11												
25.5	Silt Compact		11	SS	17												
908.5			12	SS	14												
31.5	End of Borehole						910										



RECORD OF BOREHOLE No 772

W P 74-74-07 LOCATION Coords. N 16 467 514 E 1 065 232 ORIGINATED BY PP
DIST 11 HWY 11 BOREHOLE TYPE Washbore, NX Casing COMPILED BY PP
DATUM Geodetic DATE May 2, 1978 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100		
938.5	Ground Level													
0.0	Fill Material Sand (Compact) and Clayey Silt (Firm)		1	SS	15									
			2	SS	22									
929.0			3	TW	11		930							
9.5	Clayey Silts (Stratified) Occasional Silt Partings Firm to Very Stiff		4	TW	PM								114	
			5	TW	PM								125.5	
			6	TW	PM								117	
			7	TW	PM		920						127	
			8	TW	PM								123	
914.0			9	TW	PM								126	
24.5	Silt Compact		10	SS	16		910							
			11	SS	19									
905.5														
33.0	Sand and Gravel													
901.5	Compact		12	SS	28									
37.0	End of Borehole													



W P 74-74-07 LOCATION Coords. N 16 467 535 E 1 065 285 ORIGINATED BY PP
DIST 11 HWY 11 BOREHOLE TYPE Washbore, NX Casing COMPILED BY PP
DATUM Geodetic DATE May 3, 1978 CHECKED BY _____

[illegible]

ON SOIL EXPLORATION

VOID RATIO - PRESSURE CURVES

JOB NO. 74-74-07

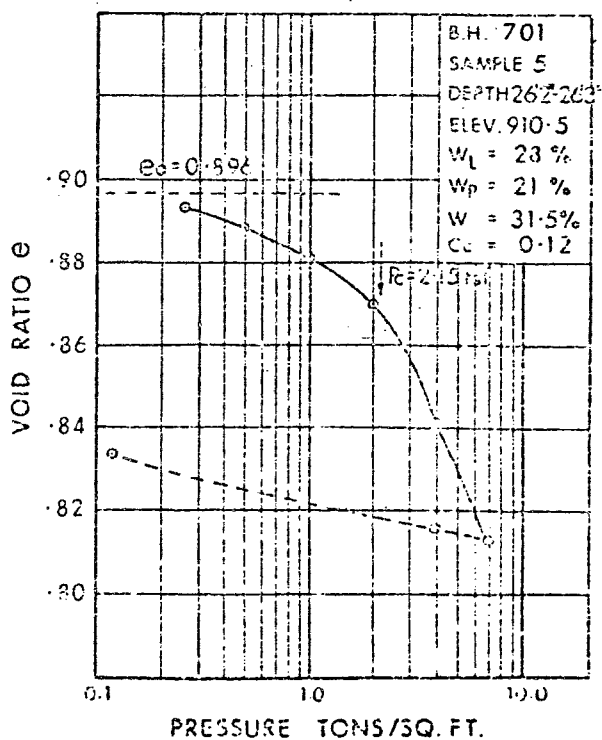
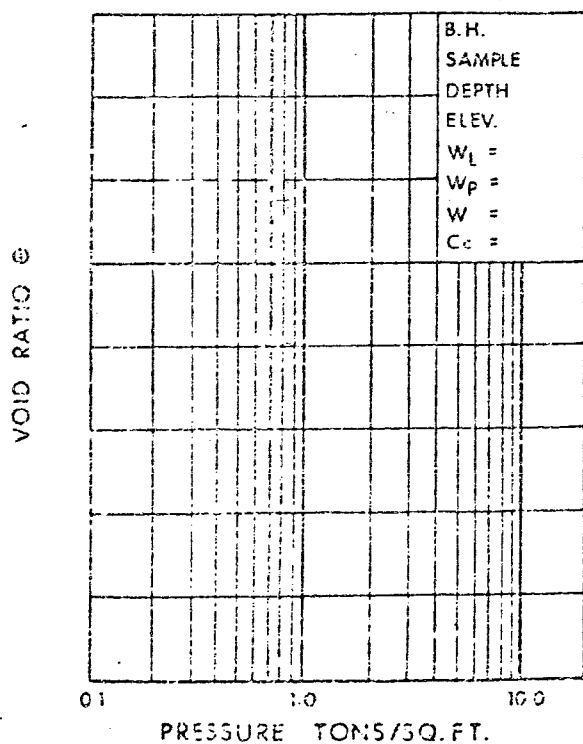
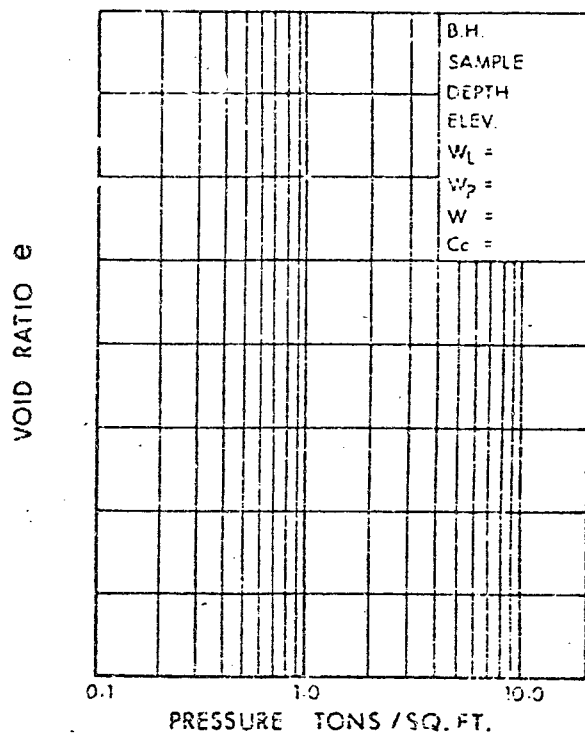
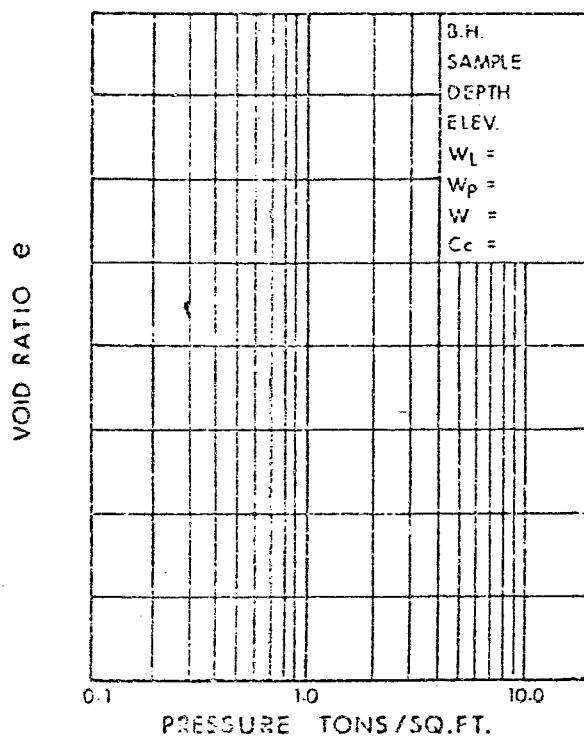


FIG. 1

VOID RATIO-PRESSURE CURVES

JOB NO. 74-74-07

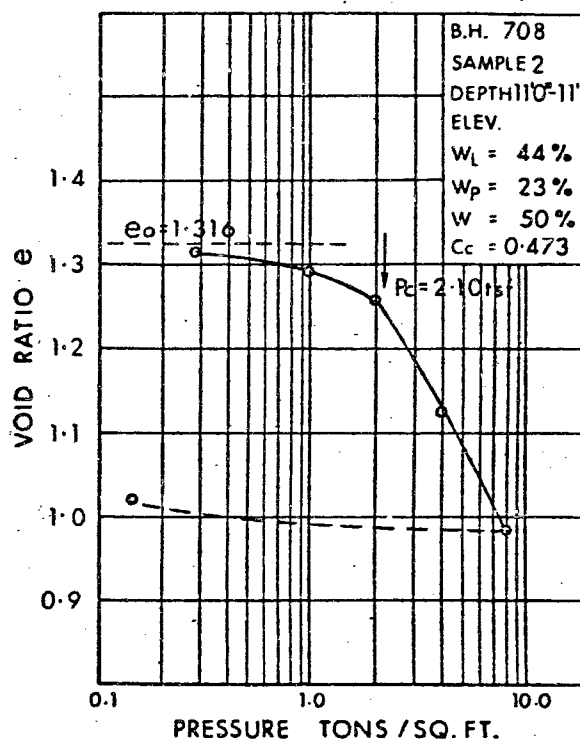
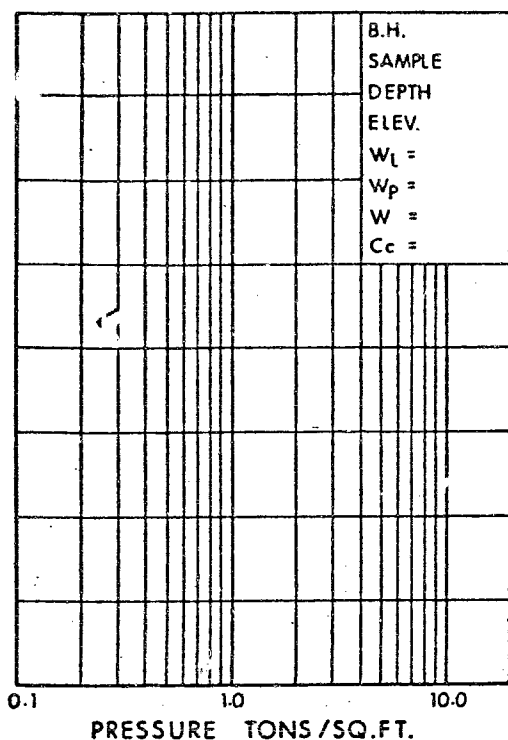
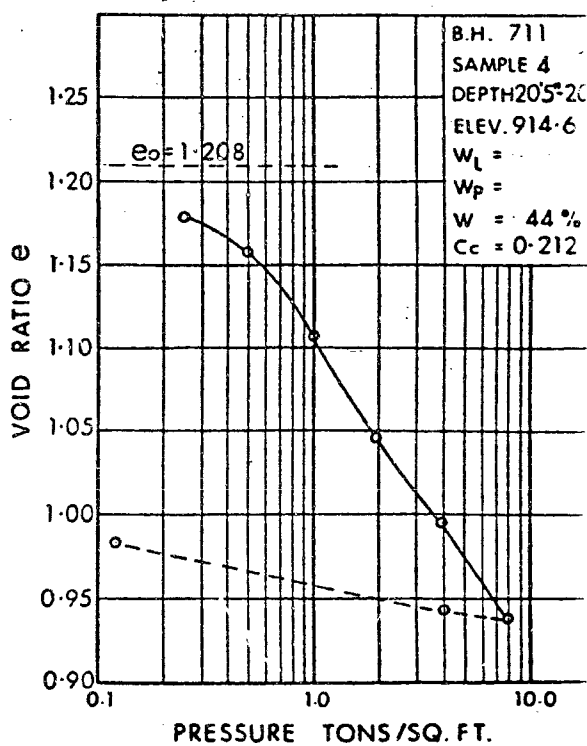
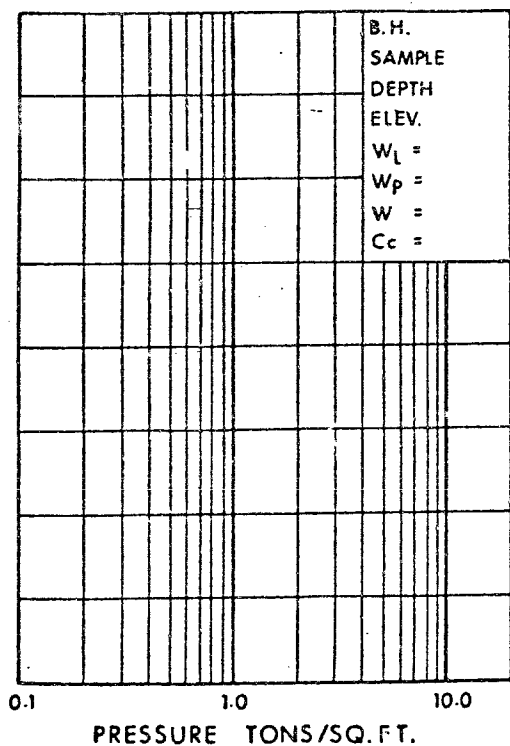
VOID RATIO e VOID RATIO e 

FIG. 2

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT

SAND

GRAVEL

Fine

Medium

Coarse

Fine

Coarse

MINISTRY SIEVE DESIGNATION

270 200 140 100 60 50 40 30 20 16 10 8 4 3/4" 1/2" 3/4" 1" 1 1/2" 2" 2 1/2" 3"

PERCENT PASSING

PERCENT RETAINED

LEGEND

BH	SAMPLE	SYMBOL
701	8	—————
702	5	- - - - -
703	5

GRAIN SIZE IN MILLIMETERS



Ministry of
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Communications

GRAIN SIZE DISTRIBUTION
SILT
TRACES OF VERY FINE SAND & CLAY

FIG No 3

W P 74-74-07

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT

SAND

GRAVEL

Fine

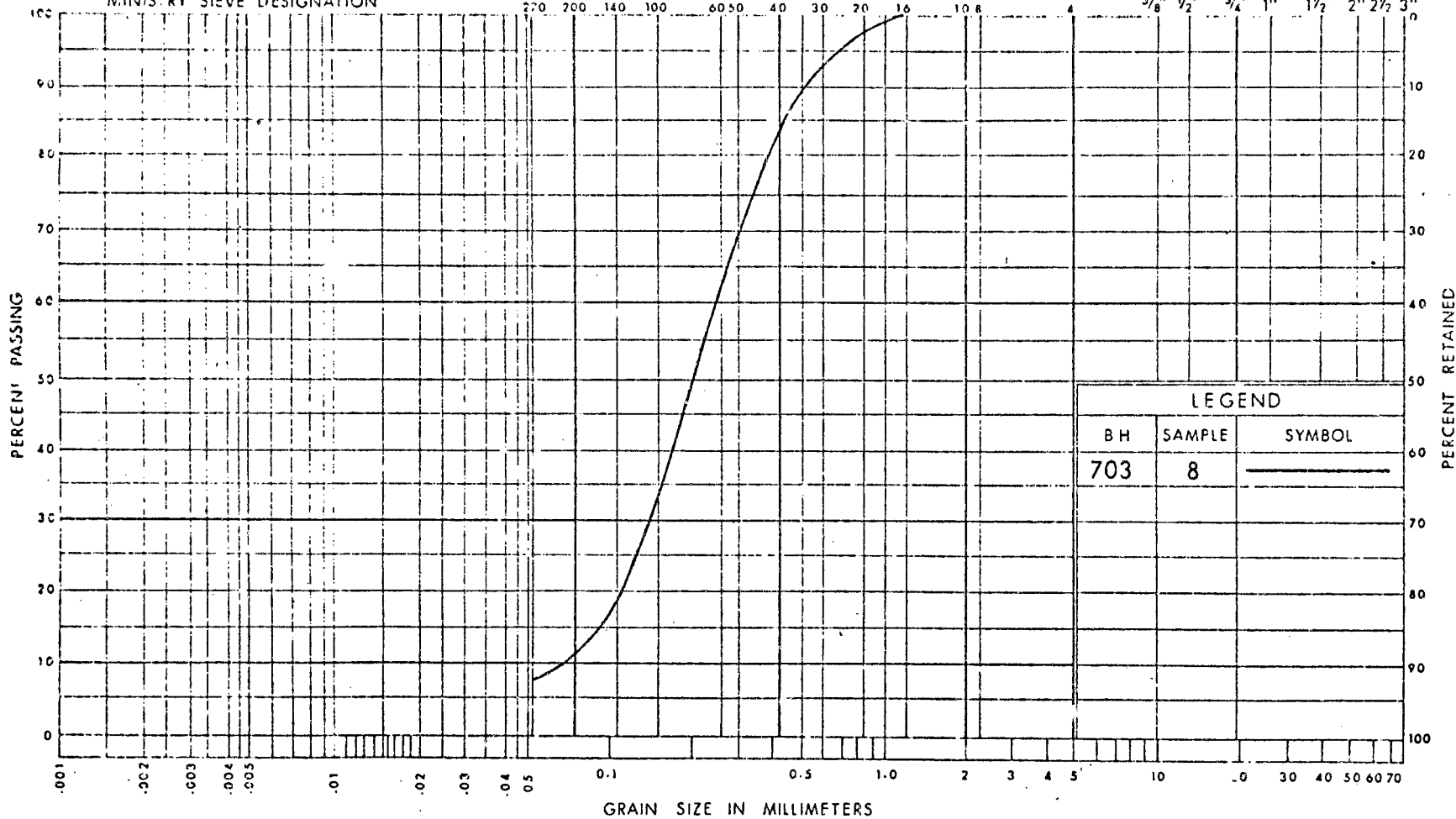
Medium

Coarse

Fine

Coarse

MINISTRY SIEVE DESIGNATION



Ministry of
Transportation and
Communications

GRAIN SIZE DISTRIBUTION
SAND
MEDIUM

FIG No 4
W P 74-74-07

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT

SAND

GRAVEL

Fine

Medium

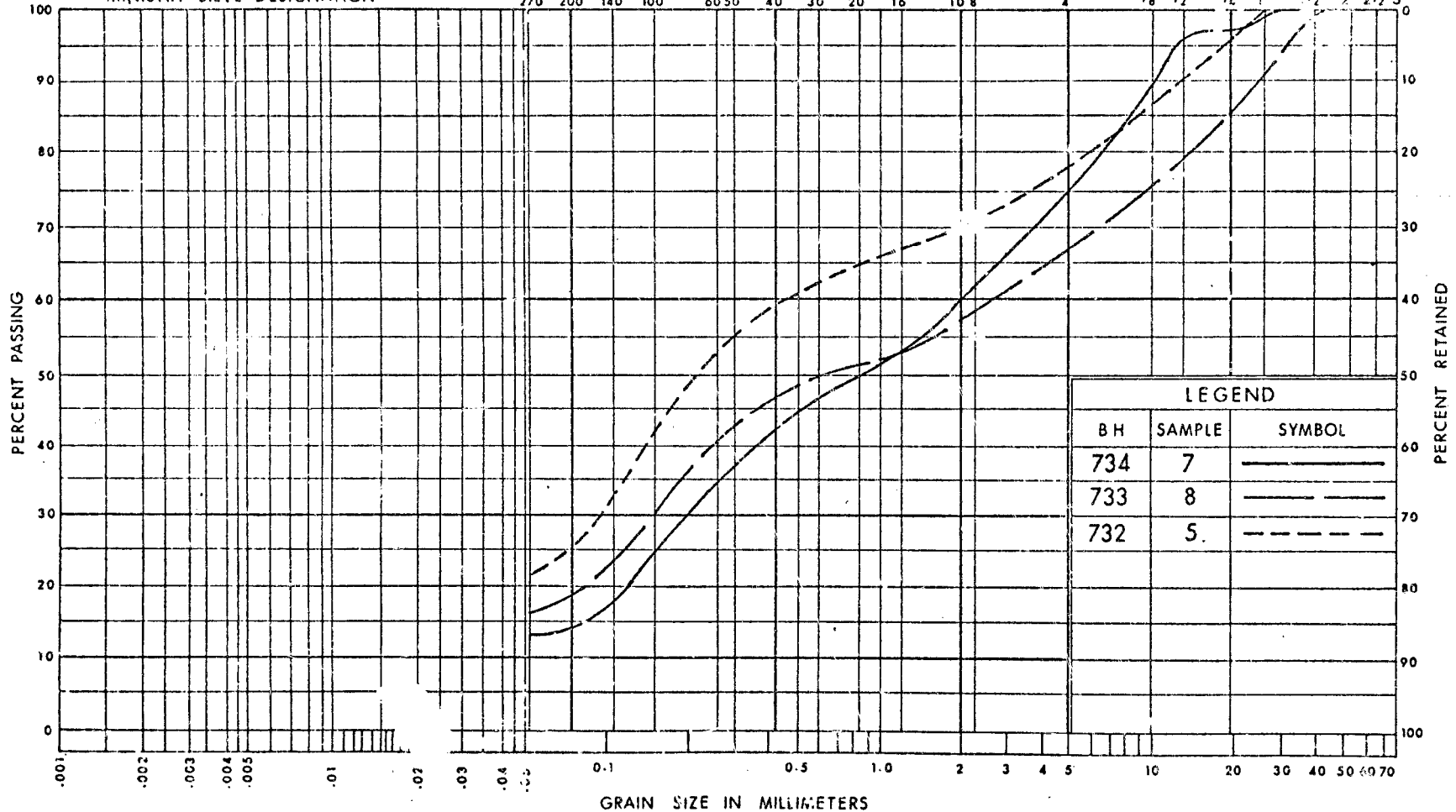
Coarse

Fine

Coarse

MINISTRY SIEVE DESIGNATION

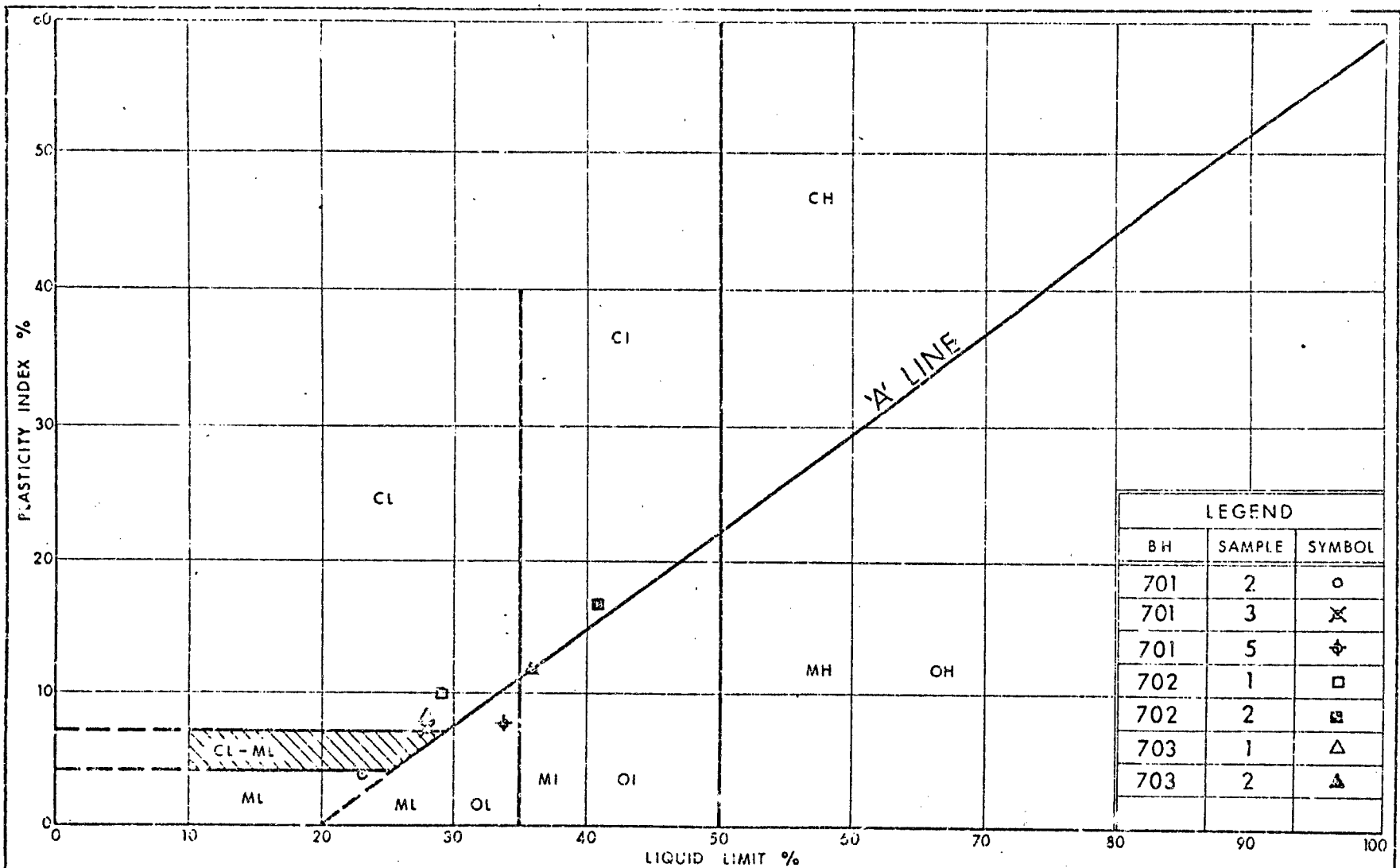
270 200 140 100 60 50 40 30 20 16 10 8 4 3/8" 1/2" 3/4" 1" 1 1/2" 2" 2 1/2" 3"



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GRAIN SIZE DISTRIBUTION
SAND & GRAVEL

FIG No 5
W P 74-74-07



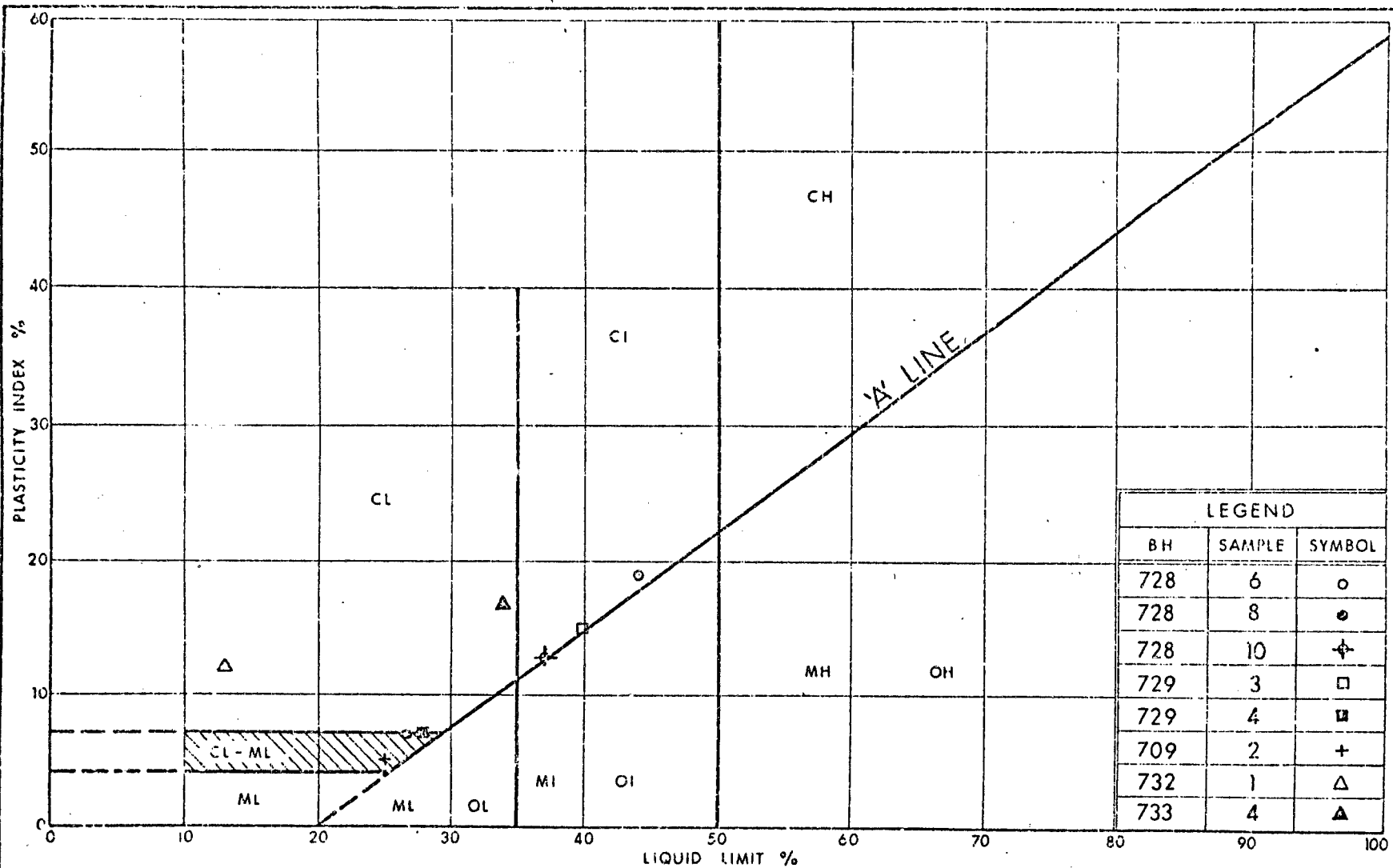
Ontario

Ministry of
Transportation and
Communications

PLASTICITY CHART SILTY CLAY TO CLAYEY SILT

FIG No 6

W P 74-74-07

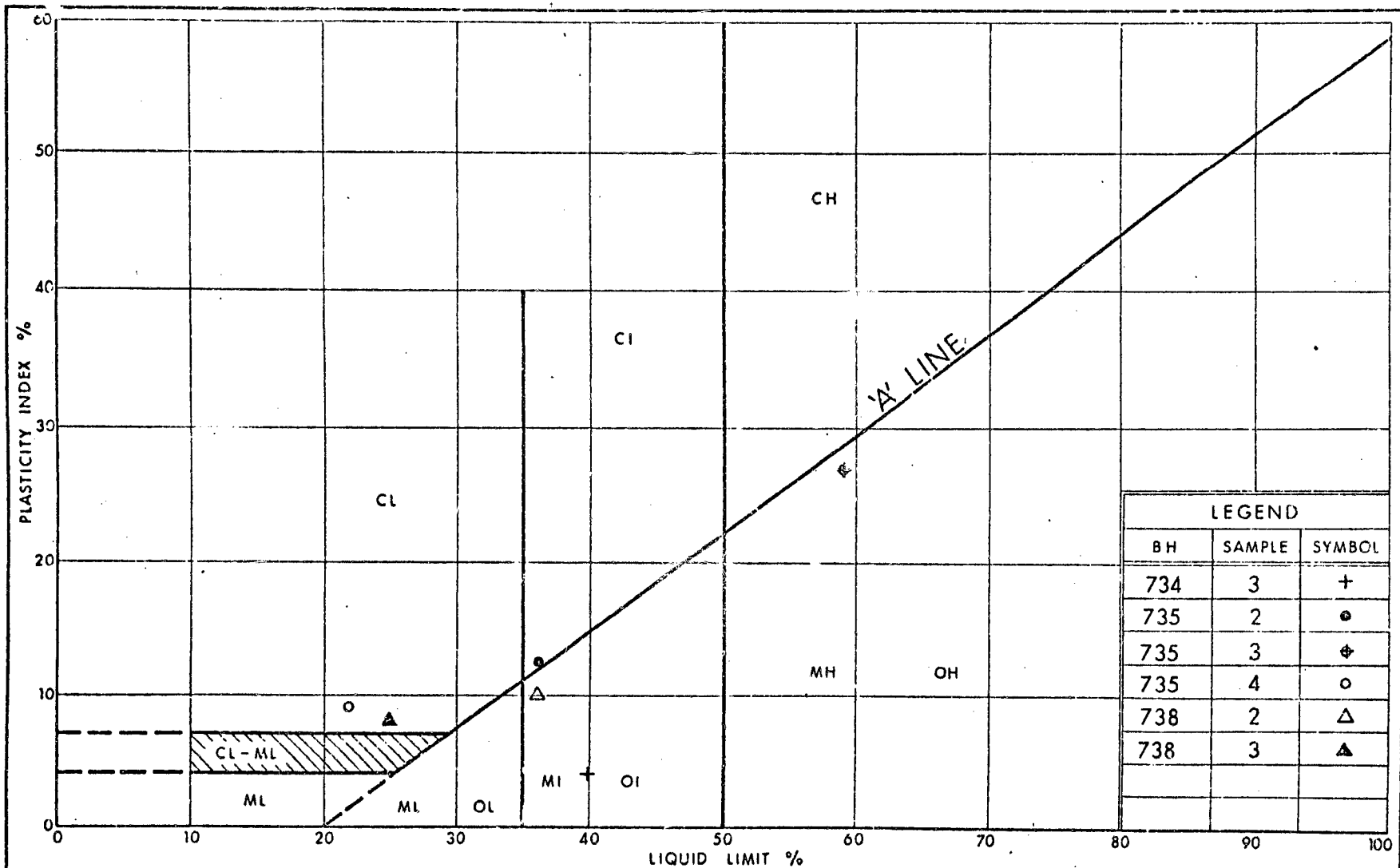


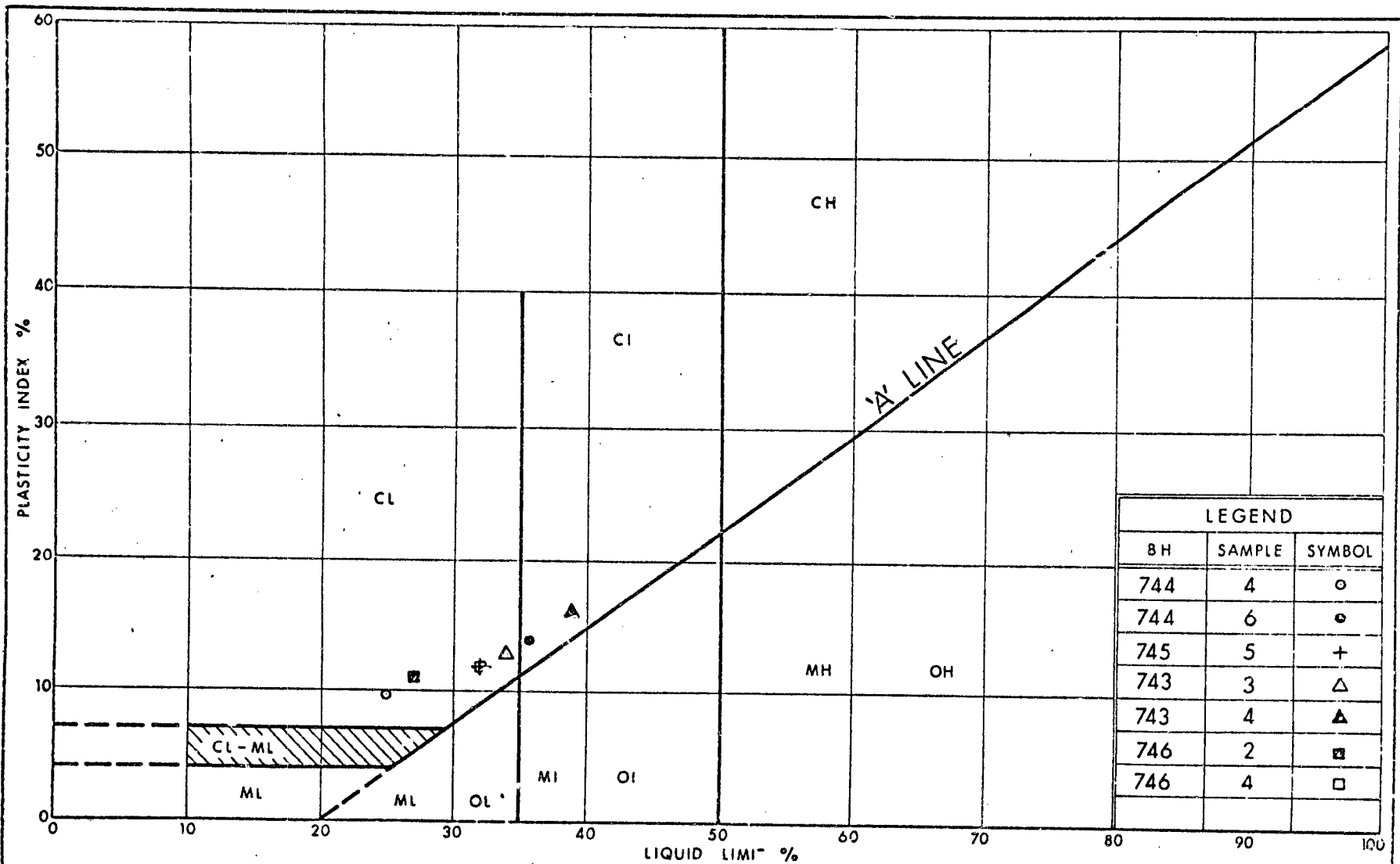
Ministry of
Transportation and
Communications

PLASTICITY CHART SILTY CLAY TO CLAYEY SILT.

FIG No 7

W P 74-74-07



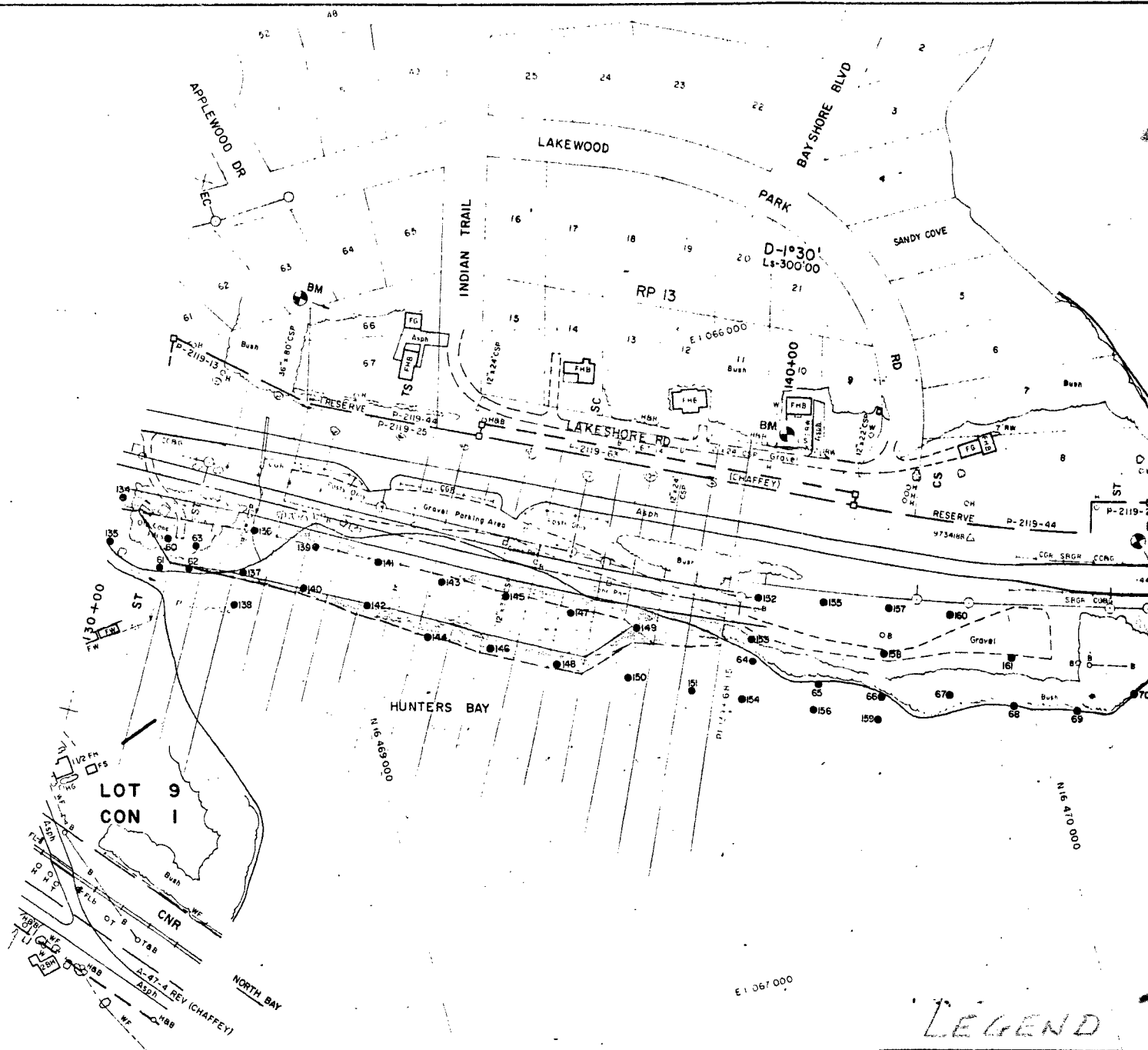


Ministry of
Transportation and
Communications

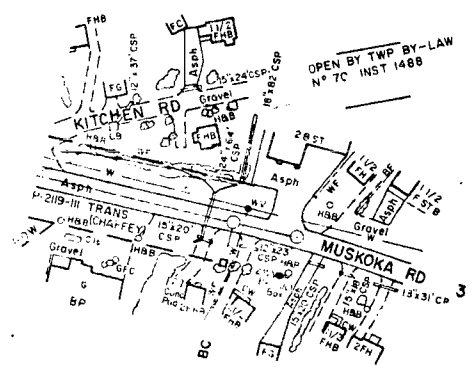
PLASTICITY CHART SILTY CLAY TO CLAYEY SILT

FIG No 9

W P 74-74-07



LOT 9
CON 1



OPEN BY TWP BY-LAW
N° 70 INST 1488

LEGEND

- BLUE - ROADWAY
- BROWN - FILL SL
- GREEN - FILL M

PLATE No 625-11/10-1

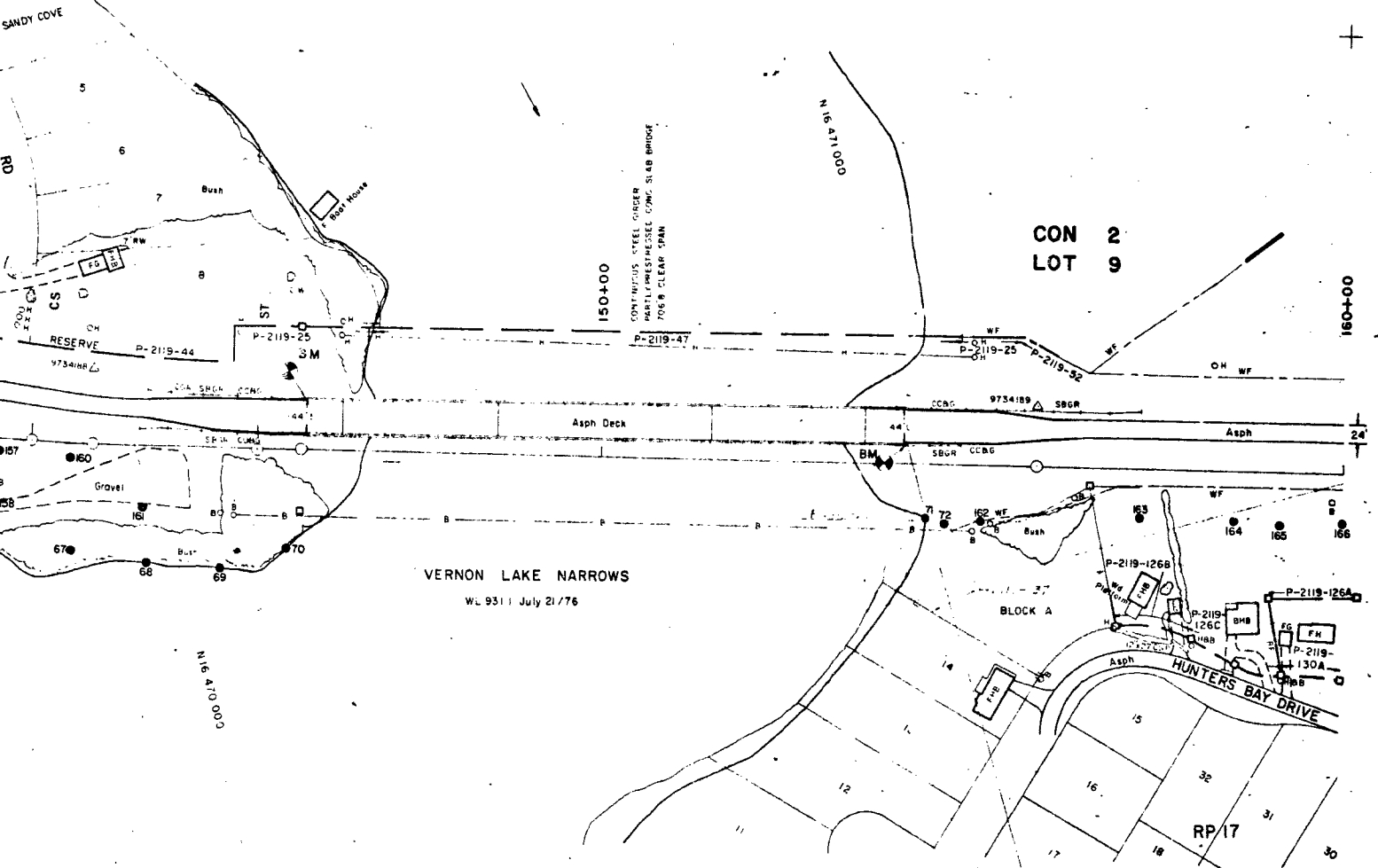
CONT No
WP No 74-74-07



SHEET

STA 130+00 TO STA 160+00

Date of Survey July '76, Revised Oct '76



CON 2
LOT 9

VERNON LAKE NARROWS

WL 9311 July 21/76

BLOCK A

HUNTERS BAY DRIVE

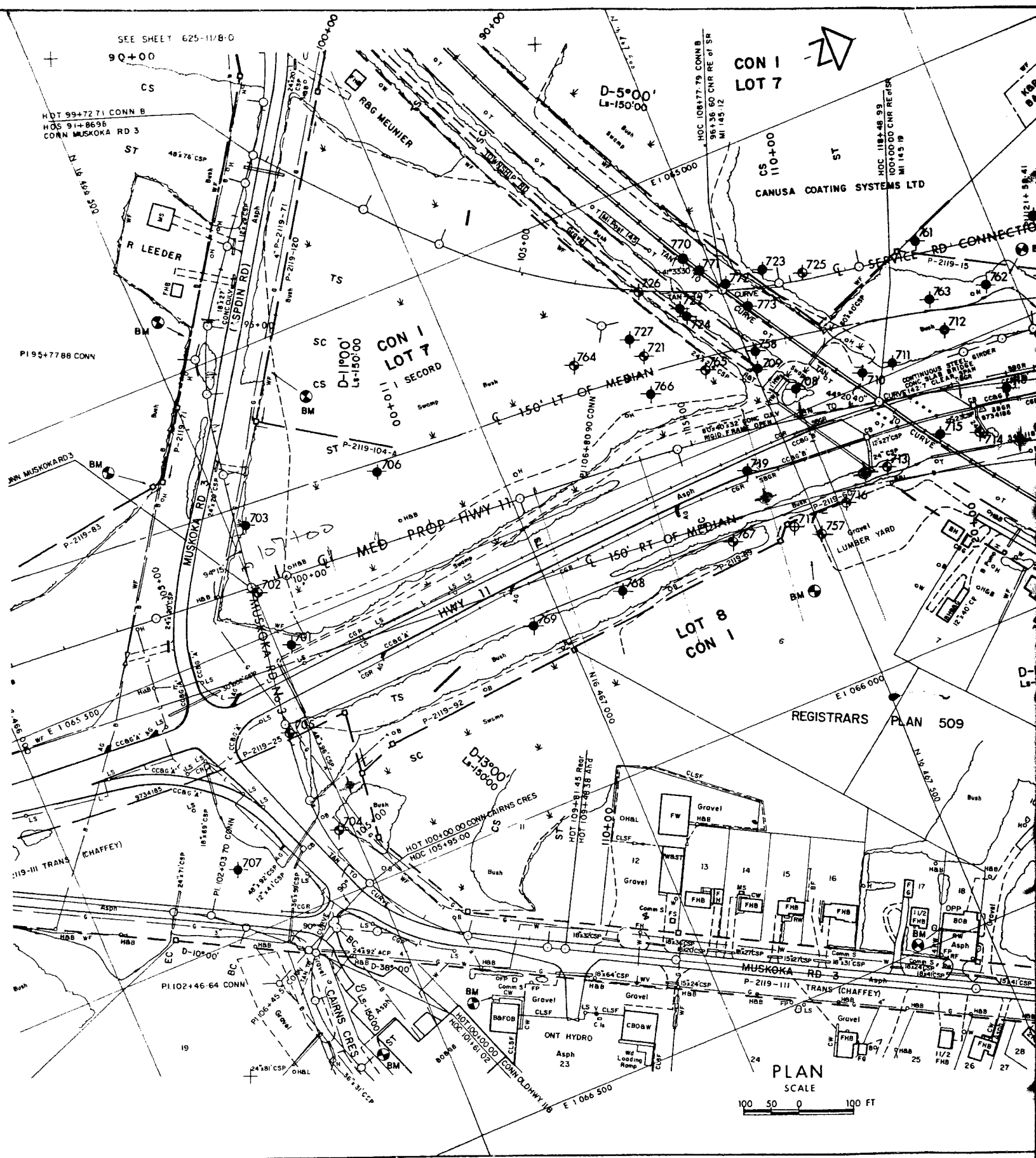
RP 17

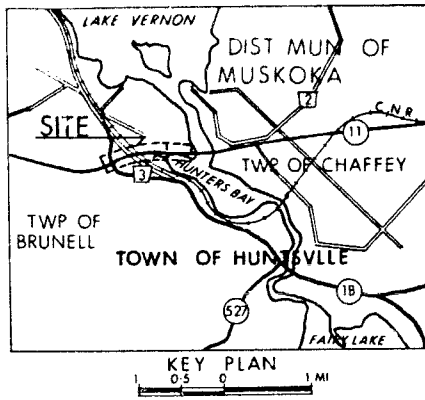
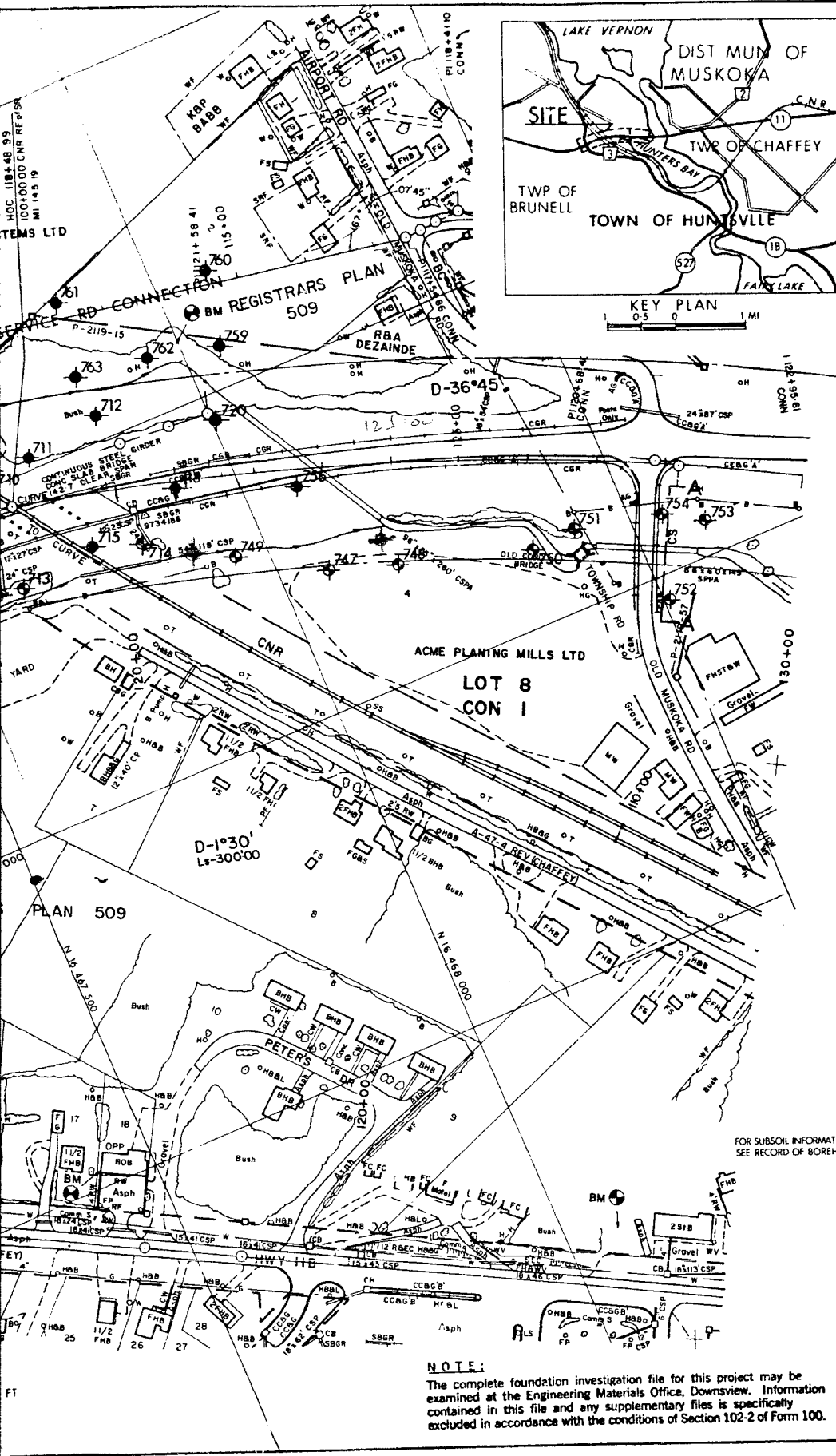
LEGEND

— ROADWAY
— FILL SLOPE

SCALE







CONT No 78 - 28
WP No 74-74-07



HUNTSVILLE BYPASS

SHEET
32-1

BORE HOLE LOCATIONS & SOIL STRATA

LEGEND

- ◆ Bore Hole
- ⊕ Dynamic Cone Penetration Test (Cone)
- ⊕ Bore Hole & Cone
- 'N' Blows/ft (Std Pen Test 350ft lbs energy)
- CONE Blows/ft (60° Cone 350ft lbs energy)
- ↓ W.L. at time of investigation

No	ELEVATION	CO-ORDINATES	
		NORTH	EAST
701	936.7	16 466 528	1 065 533
702	936.5	16 466 504	1 065 423
703	941.0	16 466 533	1 065 885
704	935.5	16 466 462	1 065 885
705	937.9	16 466 462	1 065 682
706	930.0	16 466 790	1 065 300
707	934.0	16 466 275	1 065 875
708	935.6	16 467 557	1 065 457
709	935.2	16 467 502	1 063 391
710	933.7	16 467 680	1 065 477
711	935.2	16 467 739	1 065 481
712	934.6	16 467 852	1 065 461
713	938.9	16 467 657	1 065 652
714	947.5	16 467 846	1 065 659
715	939.2	16 467 772	1 065 634
716	936.5	16 467 560	1 065 683
717	938.0	16 467 455	1 065 687
718	931.0	16 467 913	1 065 607
719	932.0	16 467 418	1 065 560
720	936.0	16 468 010	1 065 535
721	930.0	16 467 325	1 065 295
722	935.0	16 467 418	1 065 242
723	936.1	16 467 585	1 065 230
724	935.0	16 467 425	1 065 235
725	937.0	16 467 650	1 065 265
726	935.0	16 467 360	1 065 180
727	931.0	16 467 310	1 065 255
747	941.9	16 468 070	1 065 800
748	940.0	16 468 165	1 065 835
749	934.4	16 467 455	1 065 730
750	935.5	16 468 355	1 065 895
751	938.5	16 468 420	1 065 885
752	946.2	16 468 510	1 066 035
753	938.4	16 468 600	1 065 950
754	954.4	16 468 545	1 065 915
755	934.4	16 468 760	1 066 115
756	967.3	16 468 075	1 065 675
757	938.0	16 467 500	1 065 725
758	934.5	16 467 515	1 065 365
759	943.0	16 468 055	1 065 435
760	948.0	16 468 080	1 065 330
761	943.0	16 467 865	1 065 290
762	935.0	16 467 950	1 065 415
763	933.0	16 467 845	1 065 400
764	931.5	16 467 200	1 065 230
765	932.0	16 467 415	1 065 300
766	931.8	16 467 310	1 065 365
767	935.0	16 467 345	1 065 670
768	935.7	16 467 120	1 065 175
769	935.0	16 466 950	1 065 170
770	940.0	16 467 460	1 065 158
771	940.0	16 467 479	1 065 190
772	938.5	16 467 514	1 065 232
773	940.0	16 467 535	1 065 285

-NOTE-

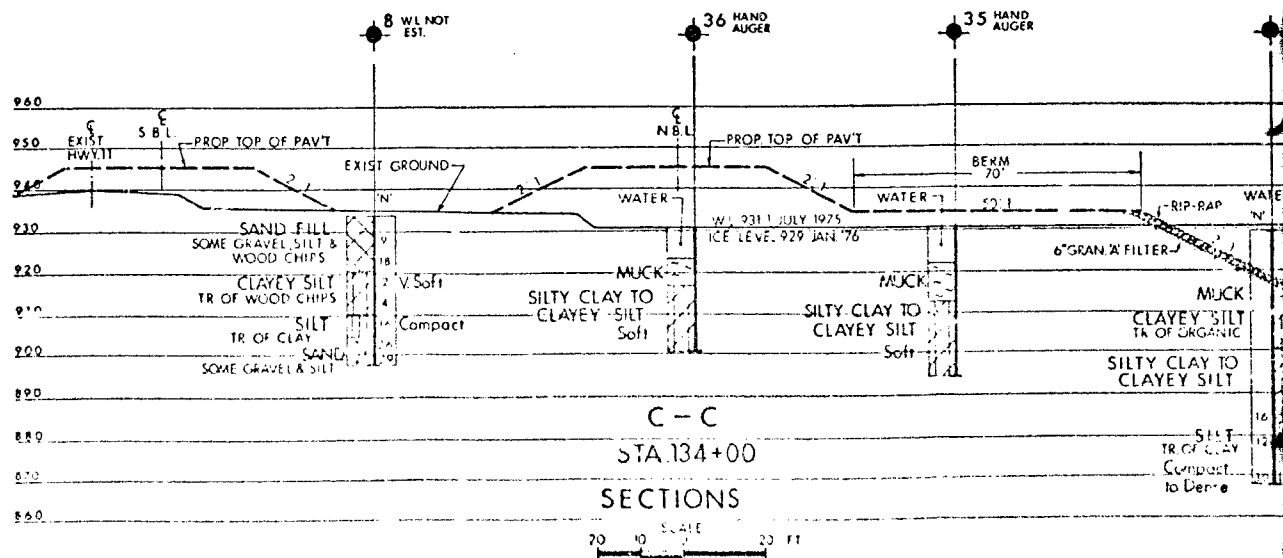
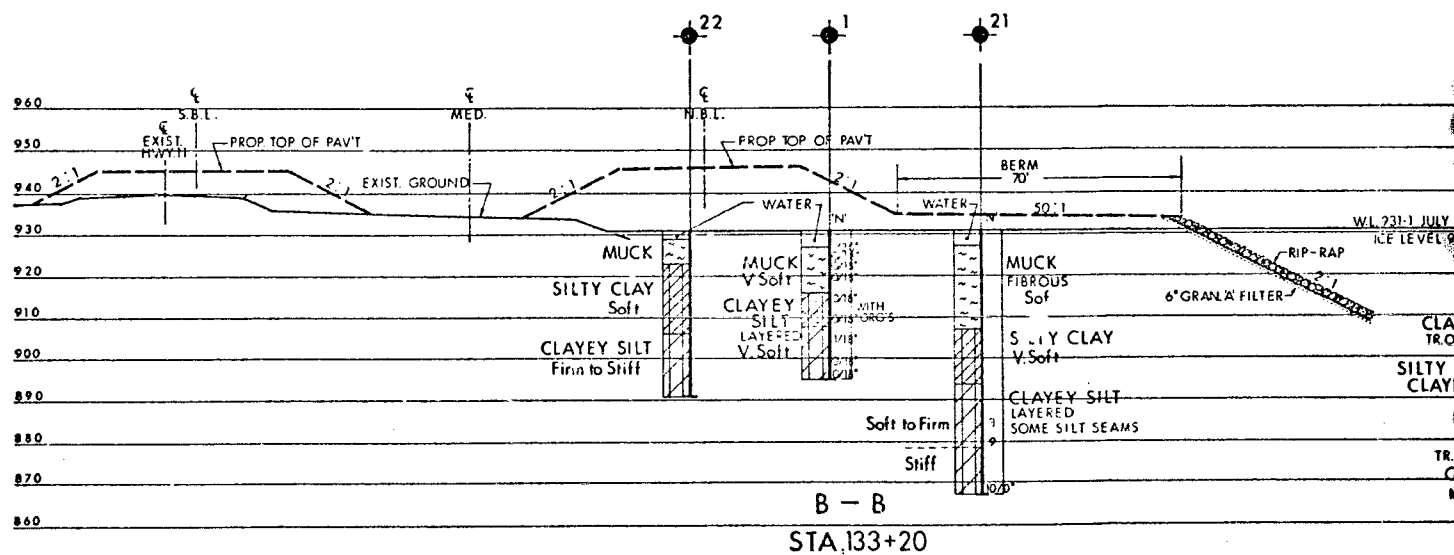
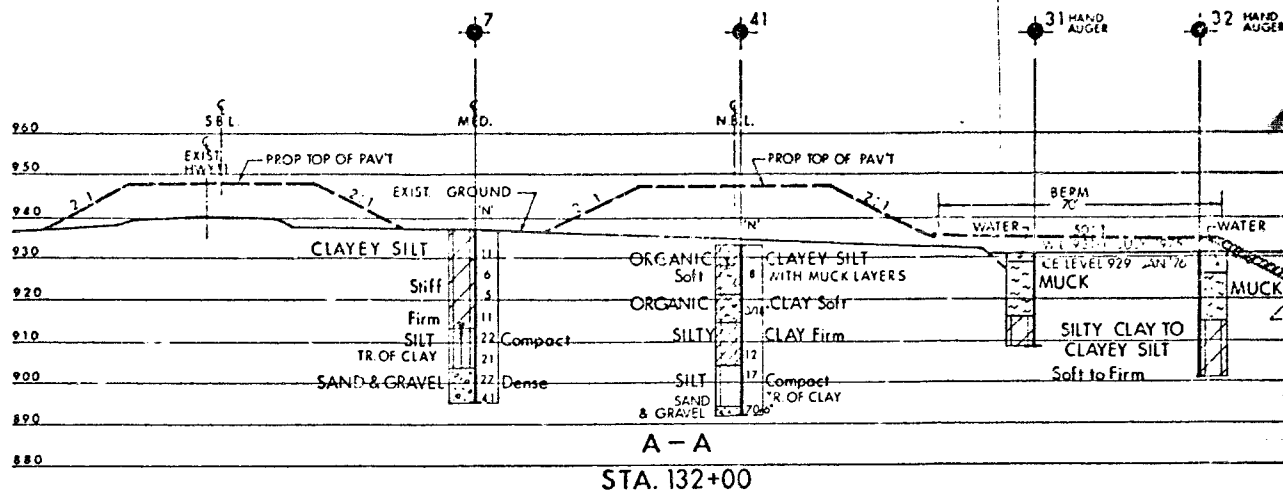
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence

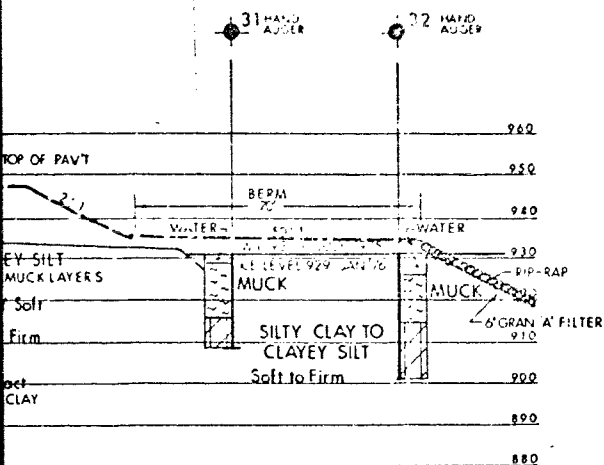
REVISIONS	DATE	BY	DESCRIPTION

NOTE:

The complete foundation investigation file for this project may be examined at the Engineering Materials Office, Downsview. Information contained in this file and any supplementary files is specifically excluded in accordance with the conditions of Section 102-2 of Form 100.

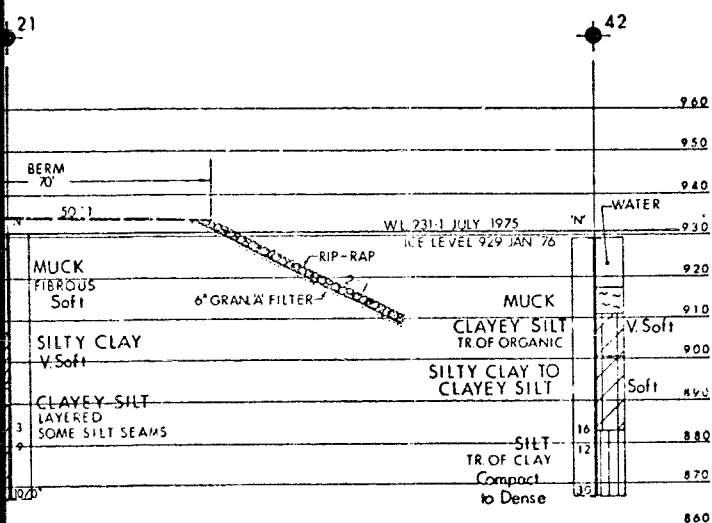
HWY No 11
SUBM D P P CHECKED DATE 6 JULY 1977 SITE
DRAWN O L J CHECKED APPR HED DWG 747407-A





SEE DWG. NO. 1507301-A

KEY PLAN



LEGEND

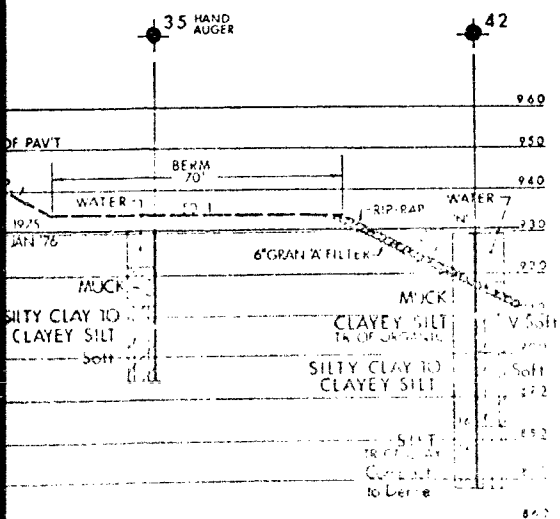
- Bore Hole
- ⊕ Dynamic Cone Penetration Resistance Test
B/P CONE - Blow/Ft Cone Test (350ft lbs energy/blow)
- ⊕ Bore Hole & Cone Test
- W Water Levels established at time of field investigation, JULY 1975

NO.	ELEVATION		



— NOTE —

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



REVISION	DATE	BY	DESCRIPTION

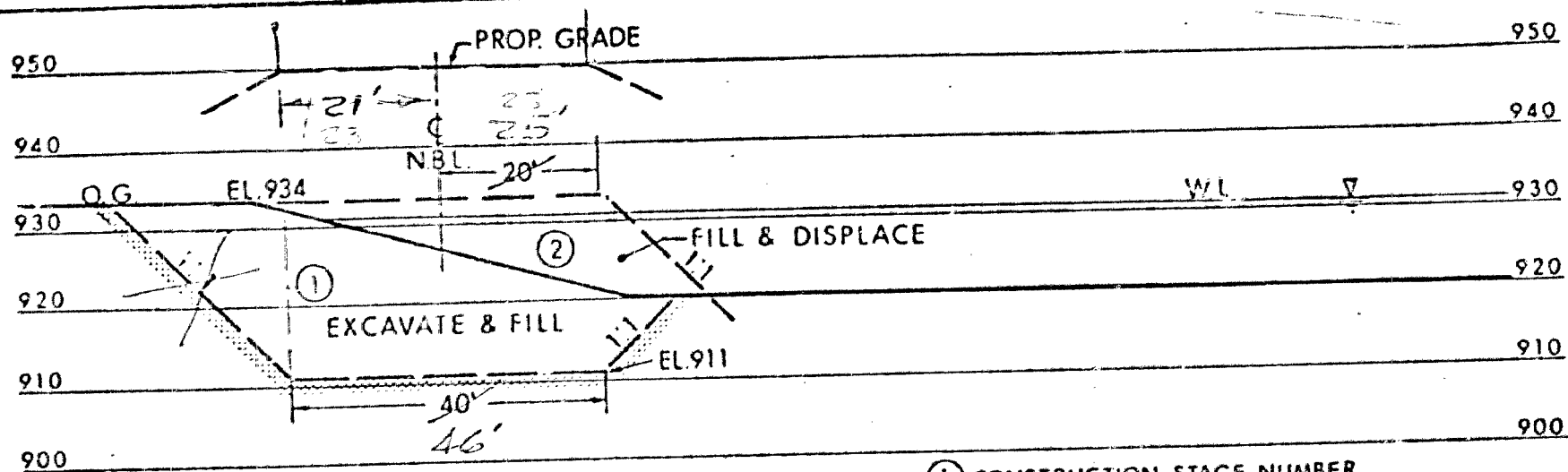
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO
ENGINEERING SERVICES BRANCH—HIGHWAY ENGINEERING SECTION

HUNTERS BAY

HIGHWAY NO. 11 PROP. LINE 'E' DIST NO. 11
DIST. MUNICIPALITY MUSKOKA TOWN OF HUNTSVILLE
TWP. CHAFFEY

BORE HOLE LOCATIONS & SOIL STRATA

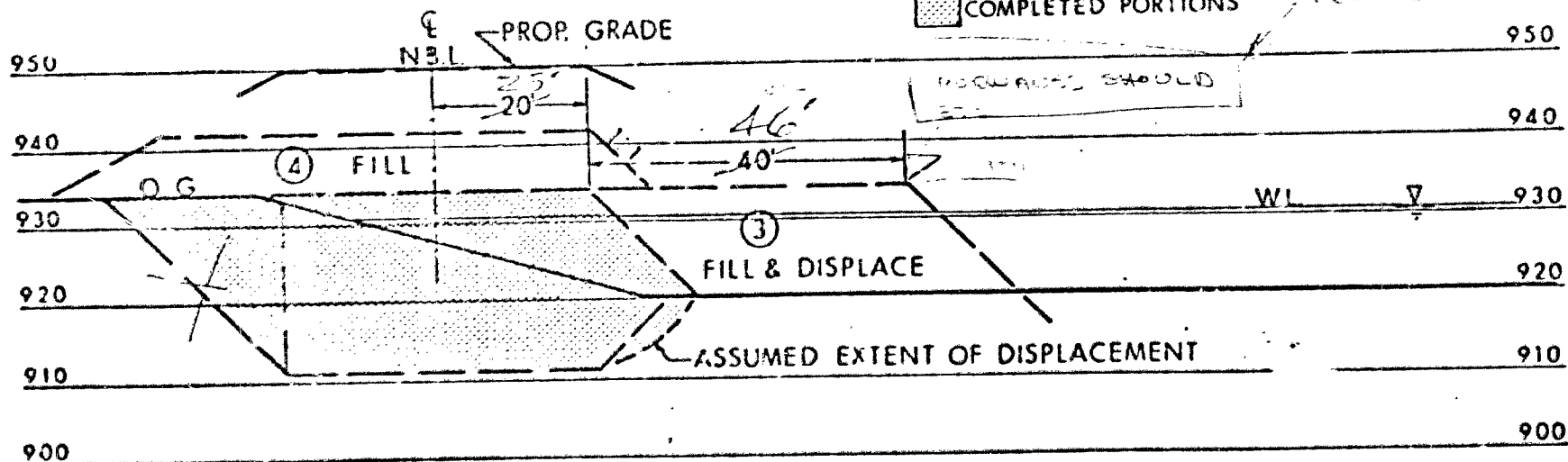
SUBMITTAL NUMBER	DATE 23 APR 1975	PROJECT NO. 1507301-B	1507301-B
DRAWN BY	DATE 23 APR 1975	SCALE	AS SHOWN
APPROVED	DATE NO	BY	DATE NO



LEGEND: (1) CONSTRUCTION STAGE NUMBER

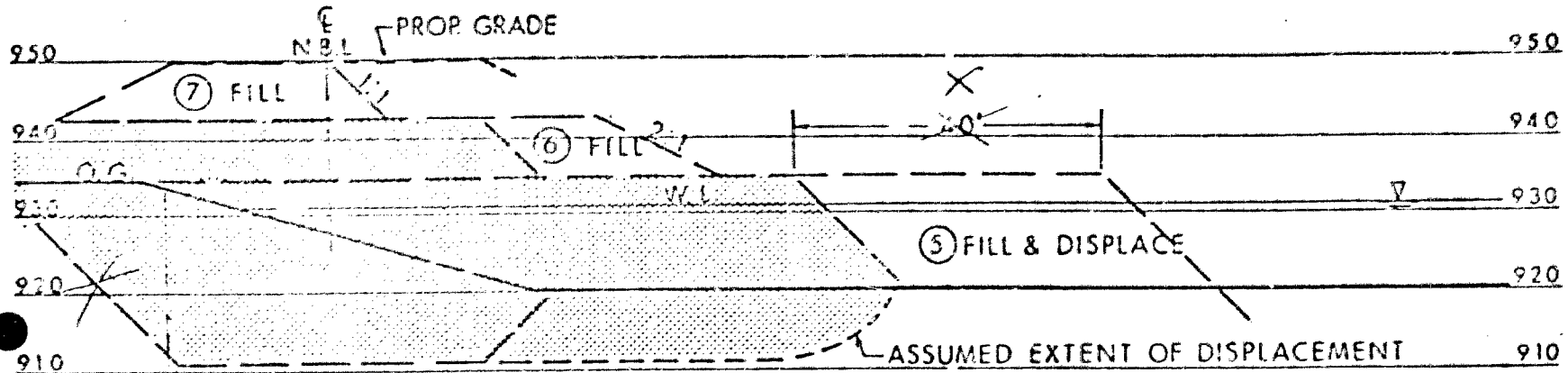
COMPLETED PORTIONS

Note

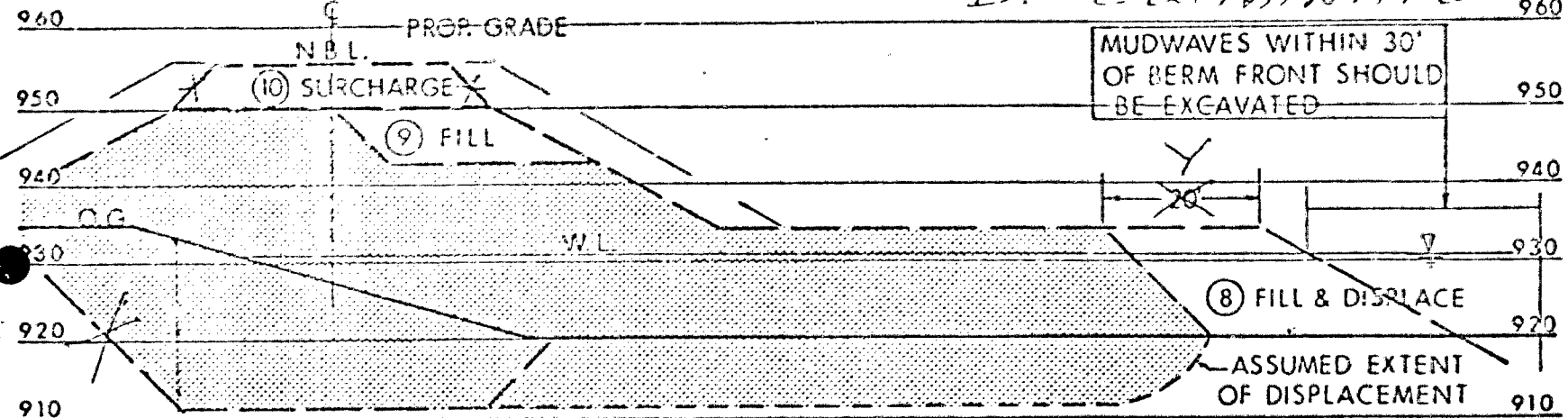


TYPICAL X-SECTIONS
PROP. SEQUENCE OF WORKS

X A. VAR. 41.70' TO 46.00'
B. VAR. 41.70' TO 50.20'



Y A. VAR. 0' TO 4.20'
B. ELIMINATE



TYPICAL X-SECTIONS
PROP. SEQUENCE OF WORKS

SEE DWG NO 1507301-A



KEY PLAN

LEGEND

- Bore Hole
- ⊕ Dynamic Cone Penetration Resistance Test
B/C CONE - Blow/ft Cone Test (1501 lbs energy/blow)
- ⊕ Bore Hole & Cone Test
- ⊕ Water Levels established at time
of field investigation JULY 1975

NO.	ELEVATION		

— NOTE —

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

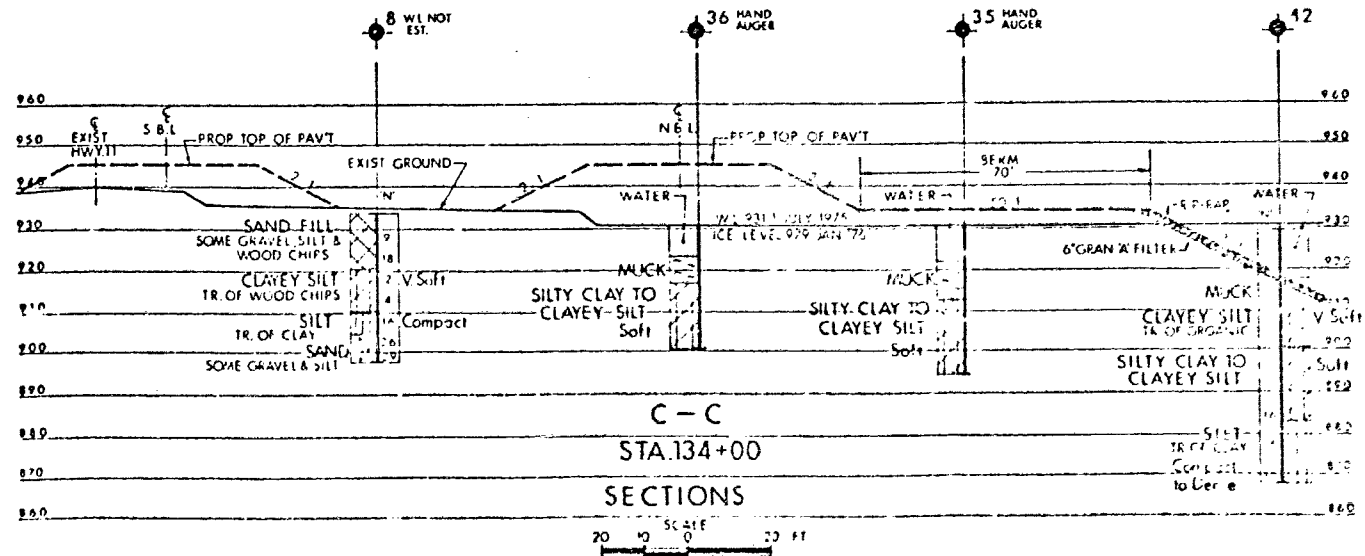
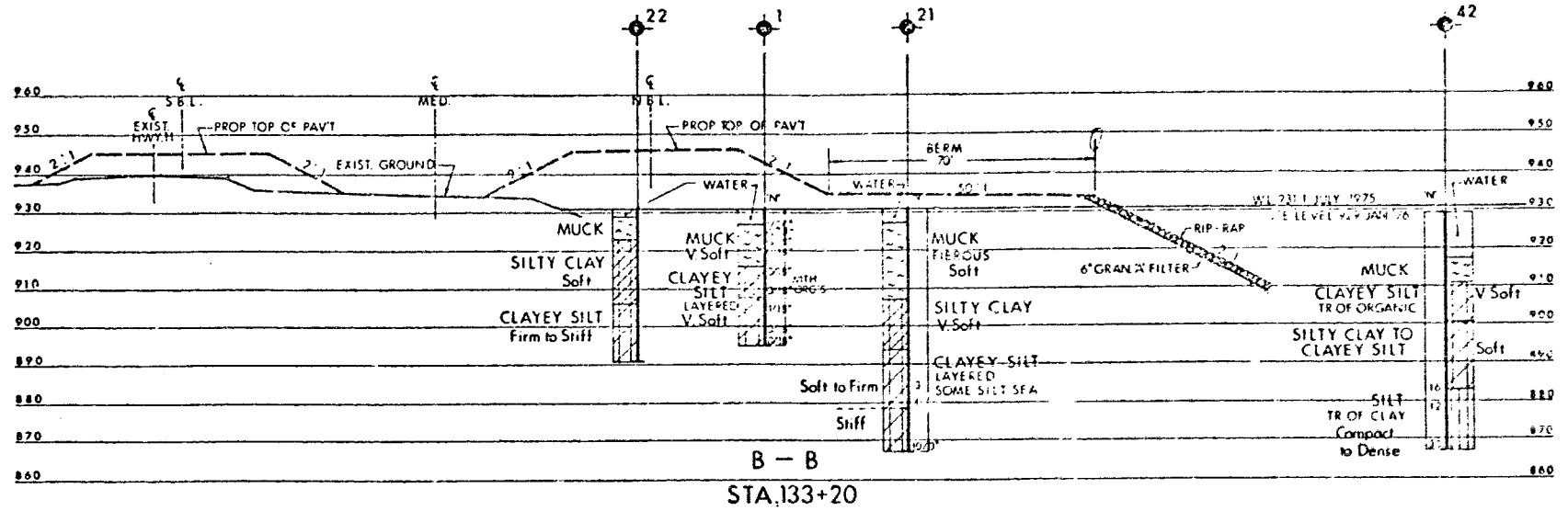
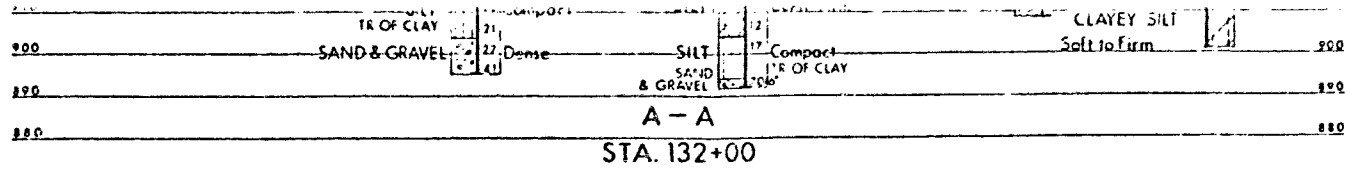
DATE	BY	CHKD

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
ENGINEERING DIVISION

HUNTERS BAY

HIGHWAY NO. 11 FROM LINE 11 DIST NO. 11
DISTRICT NO. 11 TOWN OF HUNTSVILLE
TWP. CHAFFIN

BORE HOLE		LITHOLOGY & SOIL STRATA	
DATE	BY	CHKD	
13 AUG 1975			1507301-B
LA	13 AUG 1975	AT	13 AUG 1975
CH		CH	



*Correct
stratigraphic
profile only*

OK ✓ Upon completion of the construction of the surcharge this Section will install eight settlement plates in order to monitor the fill.

(iv) Construction Staging

In order to ensure the maximum amount of time to allow for consolidation of the embankment between 131 + 00 and 139 + 50 it is recommended that the following construction staging be employed:

- OK ✓ 1. Construct the berms, fills and surcharge under WP 74-74-07.
- OK ✓ 2. The placement of the granular materials and pavement should be included in WP 150-73-01 to be awarded approximately three years after WP 74-74-07.

B. Construction of E-N Ramp
Station 105 to 131

OK (i) ✓ From discussions with Mr. Selby it was agreed that in order to resolve transition problems and need for monitoring that the following construction sequences would be followed between Station 105 and 118 + 50 and 120 + 00 to 127 + 00.

- Not correct
Refer to
cut made at
Station 30+00
Page 105-131
Stas. 105-131
Points 2, 3 & 4.
1. Excavate to provide for a 3 foot thick Granular B blanket commencing at the toe of the existing embankment fill and extending outward to where the toe of the 2:1 slope for the added E-N Ramp intersects the original ground line..
2. Construct the fill to the 12 foot height under WP 74-74-07 employing standard 2:1 slopes as early as possible in 1977. OK
3. Construct the next 9 feet of fill in 3 foot increments commencing in May or June of 1978. A special provision shall be inserted in the contract drawings indicating that a two month period must elapse prior to placement of the next 3 foot lift. A typical construction sequence would be:

Subject to slight modification and partial control between Stas. 114-121

June 1, 1978	Construct first 3 foot lift
August 1, 1978	Construct second 3 foot lift
October 1, 1978	Construct third 3 foot lift

4. Construct the remainder of the fill in 1979 using three foot lifts spaced two months apart as outlined in 3 above.

OK ✓ 5. Prior to placement of any fill as detailed in steps 2 to 4 above, all topsoil and waste materials should be removed from the existing embankment slope. NO REMOVAL IS REQUIRED IF SAME TYPE OF FILL IS USED AS IN EXISTING EMBANKMENT.

C. South Service Road

OK ✓ 1. Mr. Selby indicated that at the second meeting held in Huntsville to discuss the recommendations for the treatment on the south side of the CNR tracks that the excavation for Roadway Protection for Railway Tracks (refer Foundation Report April 6, 1976) commence at the southerly toe of the gravel road adjacent to the tracks.

The toe of slope of the berm to be constructed in the north west quadrant should tie into the gravel road.

No fill will be required to be placed between the gravel road and the railway embankment.

EXCEPT WITHIN LIMITS OF SOUTH APPROACH EMBANKMENT AT S. SERVICE RD.

Cont... 4



01 ✓ 2. Mr. Selby will be analysing the effect that the construction of the berm will have on the soft muck deposit approximately two hundred feet west of the centreline of the Service Road on the north side.

OK ✓ Any requirements for placement of counterbalancing berms on the north side of the track will be detailed (if required) upon completion of this analysis.

3. The excavation to elevation 920 shown on the Preliminary Bridge Drawings for the South Service Road on the north side is not required and Mr. Selby will notify the Bridge Office to make the necessary adjustments to the Drawings.

4. It is not anticipated that the construction operations will cause any movements of the CNR tracks.

If the representatives of the CNR require any further information I would be available to discuss our proposals and take any action required to alleviate any concern they may have regarding movement of the track.

D. Construction of Underground Utilities

OK ✓ Mr. Parnamagi queried the settlements which may occur on underground utilities north of the CNR track under the proposed NBL and SBL structures and in the north west quadrant.

OK ✓ From discussions with Mr. Selby, as long as the underground utilities are located as far as possible away the toe of fills in this location excessive settlements are not anticipated and normal construction practices could be employed.

If you have any queries regarding any of the information contained in this memo please do not hesitate to contact the writer.

WJP/sj

c.c. K. Selby ✓
G. A. Wrong
E. Burke
M. J. Bernhardt
D. A. O. White
C. G. Campbell

W. J. Peck

W. J. Peck
Head, Geotechnical Section





Memorandum

To: Mr. D. Fry
Administrative Officer
Systems Design Office
East Building, Downsview

From: Regional Planning Design &
Structural Office
North Bay, Ontario

Attention:

Date: November 19, 1976

Our File Ref.

In Reply to

Subject:

Consultant Assignment
WP 74-74-07, Highway 11
From 4.6 miles North of Highway 141 Northerly to 1.2 miles North of Highway 60
District 11, Huntsville

Due to the inability to securing adequate soils design information with Ministry equipment in the bouldery soils encountered we will require the services of a consultant to conduct a seismic survey (with test pit verification) and prepare a report outlining the bedrock profile on a portion of WP 74-74-07.

A consultant client committee consisting of Mr. S. McCombie, Manager, Regional Planning, Design and Structural Office; Mr. B. D. MacKinnon, Manager, Resources, Planning and Scheduling; and Mr. W. J. Peck, Head, Geotechnical Section recommend the Firm of Fulop J. and Associates of Toronto be retained for this project. This recommendation was discussed with Mr. A. Stermac, ex officio member of the committee.

Second and third choices would be Hosain and Associates of Sudbury and Golder Associates of Toronto.

Our estimate of the cost of this investigation, based on previous estimates, is \$2,500.

Due to the onset of inclement weather and the difficulty of securing accurate seismic results in frozen ground, it is imperative that the field investigation for this project commence as soon as possible.

Would you please submit this proposal to the Consulting Assignment Committee as soon as possible.

SM/sj

c.c. G. F. Wetherall
B. D. MacKinnon
A. Stermac
File

S. McCombie
Manager, Planning Design and
Structural Office



Memorandum

To: Mr. K.G. Selby
Supervising Engineer
Soils Mechanics Section
Geotechnical Office, Downsview

Attention:

From: Regional Planning & Design Office
P.O. Box 3030
North Bay, Ontario

Date: August 13, 1976

Our File Ref.

In Reply to

Subject:

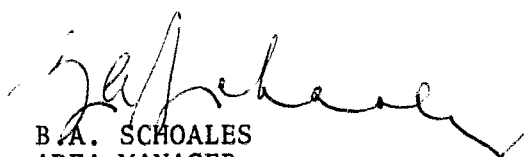
W.P. 74-74-01, -02, -03, -04, Muskoka Road 3
to Vernon Lake, Highway 11, District 11
Huntsville

Attached is a memo copy by R.G. Matthews, Signs and Buildings Inspector, which outlines the latest thinking relative to the proposed Muskoka Mall.

Also attached is a Site Plan (sheet 2) dated June 1976 prepared by Martin M. Poizner, Architect.

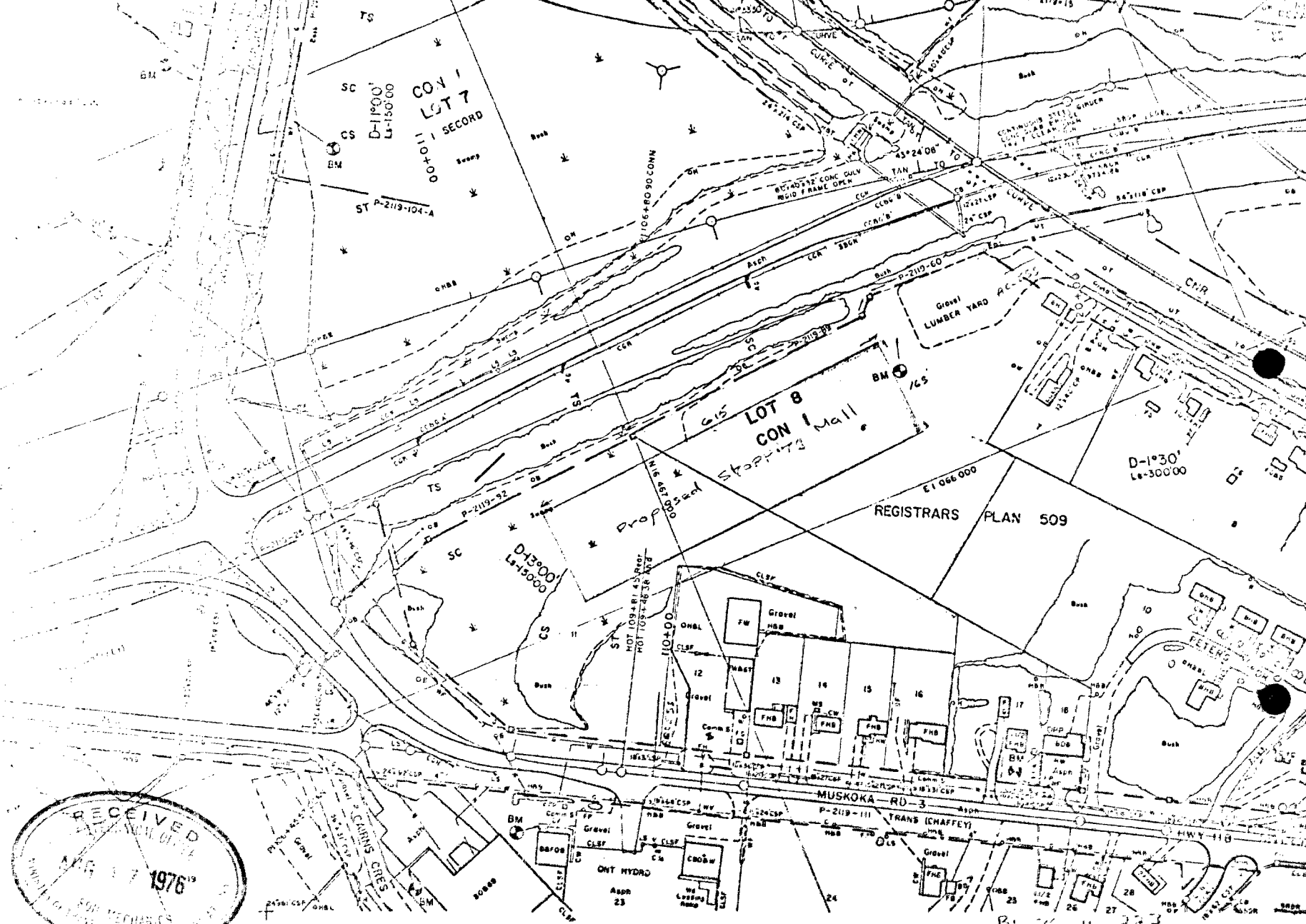
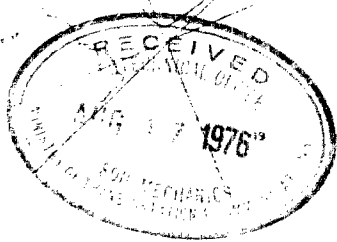
This is forwarded for your information in assessing the overall situation in the subject area.

BAS/SMcC/jb
Att:


B.A. SCHOALES
AREA MANAGER
FOR:
S. McCOMBIE
MANAGER, PLANNING & DESIGN

cc: W.J. Peck





SEE SHEET 625-11/8-0

BL-76-11-223
MUSKOKA RD-3
LOT 8, CON 1 CHAFFEY
STR-625-11

To: Mr. R. A. Schreiber, Jr.,
Planning and Design,
NO. T. B. 1.

From: R. G. Matthews,
Signs & Bldgs. Inspector,
Dist. #71, HUNTSVILLE.

Attention: Mr. R. A. Schreiber.

Date: August 12, 1976.

Our File Ref.

In Reply to

Subject:

RE: Proposed Shopping Mall, Lot 8, Con. 1, Chaffey Twp., Hwy. #11,
Muskoka Mall Ltd., ET-625-11.

Attached is a layout plan showing the proposed location of the above mall.

Access to this mall will be via Muskoka Road #3 and the old Ferguson Highway. The access on Muskoka Road #3 is as far from Hwy. 11 as possible.

Surface drainage will all go towards the highway then north.

The setback of 45 feet from the highway is the maximum for the developer without altering the size of the building or encroaching further onto Beaver Lumber property.

Parking provided is 560 spaces which I feel will be somewhat inadequate but all of the remainder of the property has been developed for parking.

Fill that is planned to be put in this area will not exceed three feet in depth according to the developer, Mr. Goodman.

We are advised that the contractor has been selected and the project is scheduled to start in approximately two weeks.

May we have your comments please.

RGM/bgm
Att.

R. G. Matthews
R. G. Matthews,
Signs & Bldgs. Inspector,

