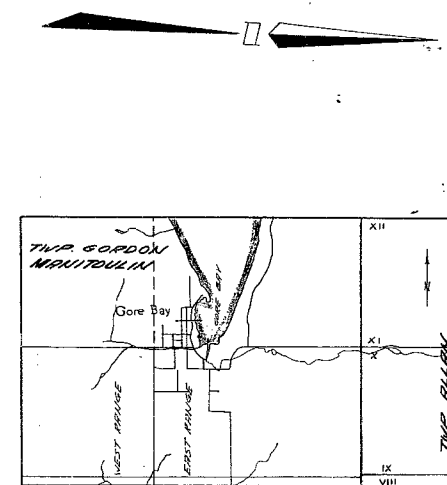
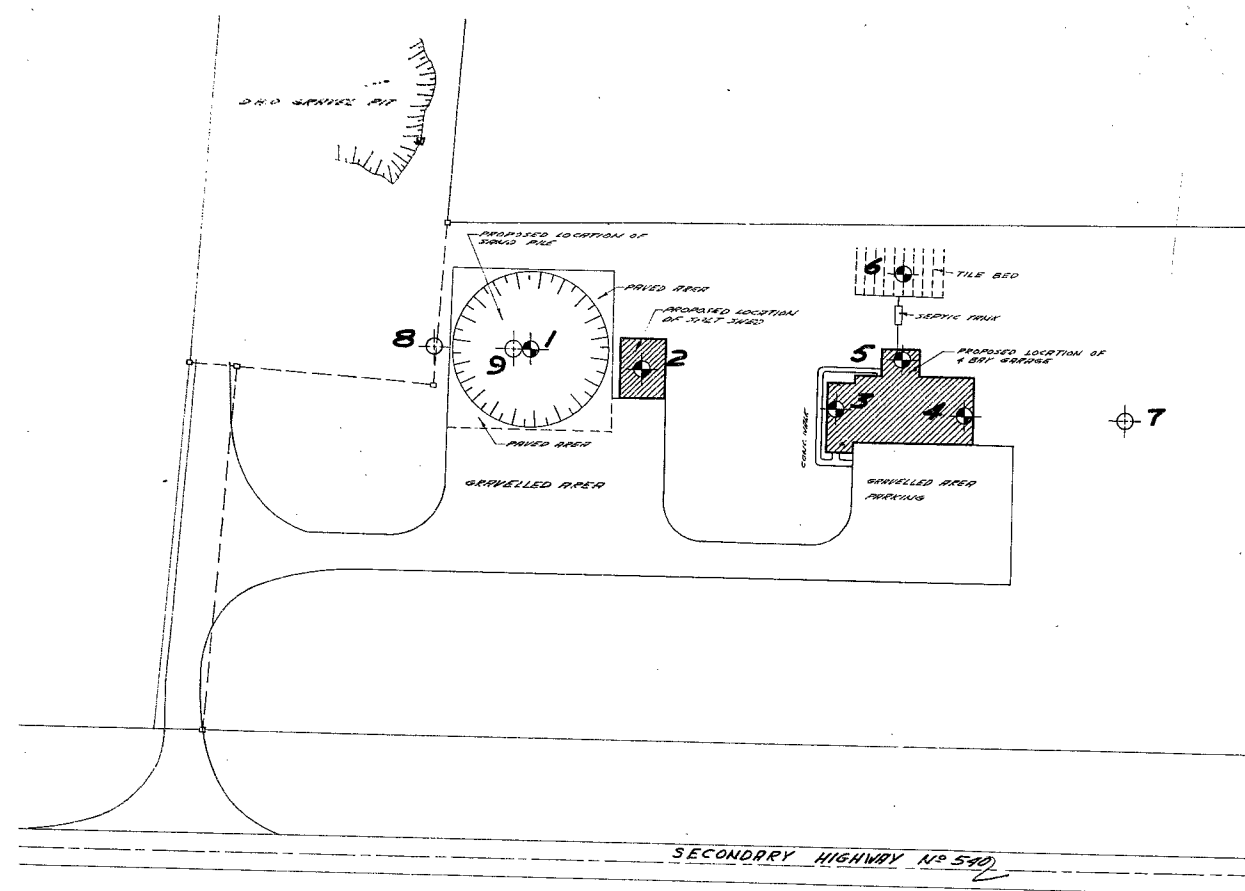





#  
59-F-64  
D.H.O. GARAGE  
AT  
GORE BAY



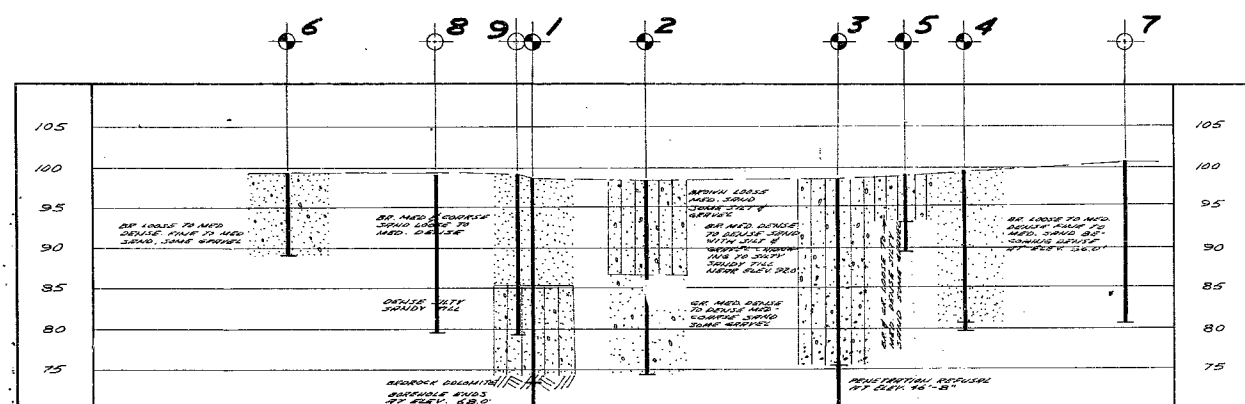
**LEGEND**

BORE HOLE	
PENETRATION HOLE	
BORE & PENETRATION HOLE	

<u>MORE</u>	<u>HOLD</u>	<u>RISK</u>
1	99.1	
2	98.6	
3	98.5	
4	98.8	
5	99.1	
6	99.1	
7	100.6	
8	99.6	
9	99.4	

• NOTE

THE BOUNDARIES BETWEEN SOIL STRATA HAVE BEEN ESTABLISHED ONLY AT BORE HOLE LOCATIONS. BETWEEN BORE HOLES THE BOUNDARIES ARE ASSUMED FROM GEOLOGICAL EVIDENCE AND MAY BE SUBJECT TO CONSIDERABLE ERROR.



DEPARTMENT OF HIGHWAYS - ONTARIO		
MATERIALS & RESEARCH SECTION		
<p align="center"><b>GORE BRY GARAGE PROPOSED SITE</b></p>		
SHOWING POSITIONS & ELEVATIONS OF HOLES		
HWY. NO. 40	DISTRICT 17	COUNTY NORTH DUFFERIN
TOWNSHIP GERRARD	LOT 5	CON. II
LOCATION AT EDGE OF		
DRAWN BY: T. MELLOTT	CHECKED BY:	W.P. AIN
DATE: OCT 1/53	APPROVED BY:	DRAWING NO.
SCALE: 1" = 30'		559-64R

28-11.

Mr. F. E. Cavell,  
Superintendent,  
Special Services Section.

May 1, 1961.

D.H.O. FOUNDATION INVESTIGATION  
REPORT.

Materials & Research Section.  
(Foundations Office).

W.J. 59-F-64.

RE: PROPOSED SITE OF D.H.O. GARAGE AT GORE BAY, ONT. - DIST. #17.

1. INTRODUCTION:

Presented in this report are the results of a detailed foundation investigation carried out at the proposed site of a D.H.O. Patrol Garage at Gore Bay, Ontario. Field work at this site was carried out in June, 1959.

2. SUMMARY OF RECOMMENDATIONS:

Spread footings two feet wide with a load of two tons per square foot can be used for the proposed garage. These must be established five feet below existing ground. No difficulty will be encountered in excavating. The proposed sand pile can be built to any height without danger of failure.

3. DESCRIPTION OF SITE AND GEOLOGY:

The Gore Bay garage site lies in the Manitoulin Island physiographic region. The whole site is underlain by sediments which were laid down under glacial Lake Algonquin. Bedrock at the site is dense Manitoulin dolomite.

cont'd. /2 ...

4. SOIL CONDITIONS:

The whole site is underlain by heterogeneous granular materials. These materials range from gravel to silt in particle size and are randomly distributed. Although the 'N' values in the upper ten feet are variable, the relative density can be said to be 'medium'. Below this level, the relative density increases quickly until the material is in a dense condition. Standard penetration tests carried out in the first ten feet gave an average 'N' value of 8 blows with a range of 1 to 16 blows. Bedrock was established in borehole 1 at a depth of 75'. Full recovery from an A-X Diamond drill run showed grey dolomite.

5. WATER CONDITIONS:

No water was observed in any borehole at the time of the investigation.

6. CONCLUSIONS & RECOMMENDATIONS:

The mixed grained granular material underlying the site was established to have an average 'N' value of 8 blows within the upper 10 feet. Because of the small overburden pressure at this depth, the figure of 8 blows for the standard penetration test can be interpreted, according to Gibbs & Holtz (H.G. Gibbs & W.G. Holtz: Research on Determining the Density of Sands by Spoon Penetration Testing; Proceedings Fourth International Conference on Soil Mechanics and Foundation Engineering), to indicate that the material has a relative density of approximately 55%. On this basis, the safe bearing pressure for spread footings 2 feet wide established at a

6. CONCLUSIONS & RECOMMENDATIONS: (cont'd.) ...

depth of 5 feet below ground level, can be conservatively set at 2 tons per square foot. No difficulty will be encountered in excavating for these footings and no water will be encountered.

The sand pile may be built to any height on this material without danger of a base failure.

JB/ndef

L. G. Soderman,  
PRINCIPAL FOUNDATION ENGINEER

REPORT PREPARED BY:

*John Brown*  
.....  
B. McKenzie, PROJECT FOUNDATION ENGINEER.

REPORT APPROVED BY:

*A. G. Stermac*  
.....  
A. G. Stermac, SUPERVISING FOUNDATION ENGR.

cc: Messrs. P. E. Cavell (2)  
H. A. Tregaskes  
H. D. McMillan  
E. H. Saint  
J. Hamilton  
H. C. Taackaberry  
T. A. Sharpe

Foundations Office ✓  
Gen. Files.

APPENDIX I

[illegible]

TABLE NO. I - (cont'd.) ...

SUMMARY OF FIELD & LABORATORY TESTS

JOB F 59-64

Page - 2 -

W.P. -

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS FT	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
3	S1	0'-2'	Medium dense light-brown dry silty sand and gravel.	15	-	-	-	-	-	
	S2	2'-4'	" " " " "	20	-	-	-	-	-	
	S3	4'-5.5'	Dense light-brown dry gravel-sand.	32	1.6	-	-	-	-	
	S4	5.5'-6.5'	Dense light-brown dry gravel-sand.	38	-	-	-	-	-	
	S5	7.5'-9'	Dense grey-brown sandy gravel or till.	32	-	-	-	-	-	
	S6	10'-11.5'	Very dense grey-brown silty sandy till.	51	-	-	-	-	-	
	S7	15'-17'	Dense grey-brown gravel-sand.	44	-	-	-	-	-	
	S8	20'-22'	Dense grey-brown gravel-sand.	40	-	-	-	-	-	
4	S1	0'-2'	Loose orange-brown fine to medium sand.	7	-	-	-	-	-	
	S2	2'-4'	Loose orange-brown medium to coarse sand.	7	-	-	-	-	-	
	S3	4'-6'	" " " " "	7	2.5	-	-	-	-	
	S4	6'-7.5'	Medium dense orange-brown medium sand.	13	-	-	-	-	-	
	S5	7.5'-9.5'	Loose to medium dense grey-brown fine to medium sand.	10	8.8	-	-	-	-	
	S6	13'-15'	Dense grey-brown fine to medium sand.	43	-	-	-	-	-	
5	S1	25'-5.0'	Loose to medium dense light-greyish gravel-sand.	10	-	-	-	-	-	

cont'd. /3 ...



SUMMARY OF FIELD & LABORATORY TESTS

JOB F 59-64  
W.P. -

Page - 3 -

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
6	S1	0'-2.5'	Brown loose to medium-dense fine-med. sand with some gravel.	6	-	-	-	-	-	
	S2	2.5'-5'	" " " "	7	-	-	-	-	-	
	S3	5'-6.5'	" " " "	5	-	-	-	-	-	
	S4	6.5'-8.5'	" " " "	15	-	-	-	-	-	
	S5	8.5'-10'	" " " "	30	-	-	-	-	-	
7										} - Cone Penetrations. } }
8										
9										
10	1	18"-24"	Brown loose to med.-dense fine-med. sand with some gravel.	-	-	-	-	-	-	
	2	39"-48"	" " " "	-	-	-	-	-	-	
			S - Denotes Split-Spoon Sample. R - Denotes Rock Core Sample.							

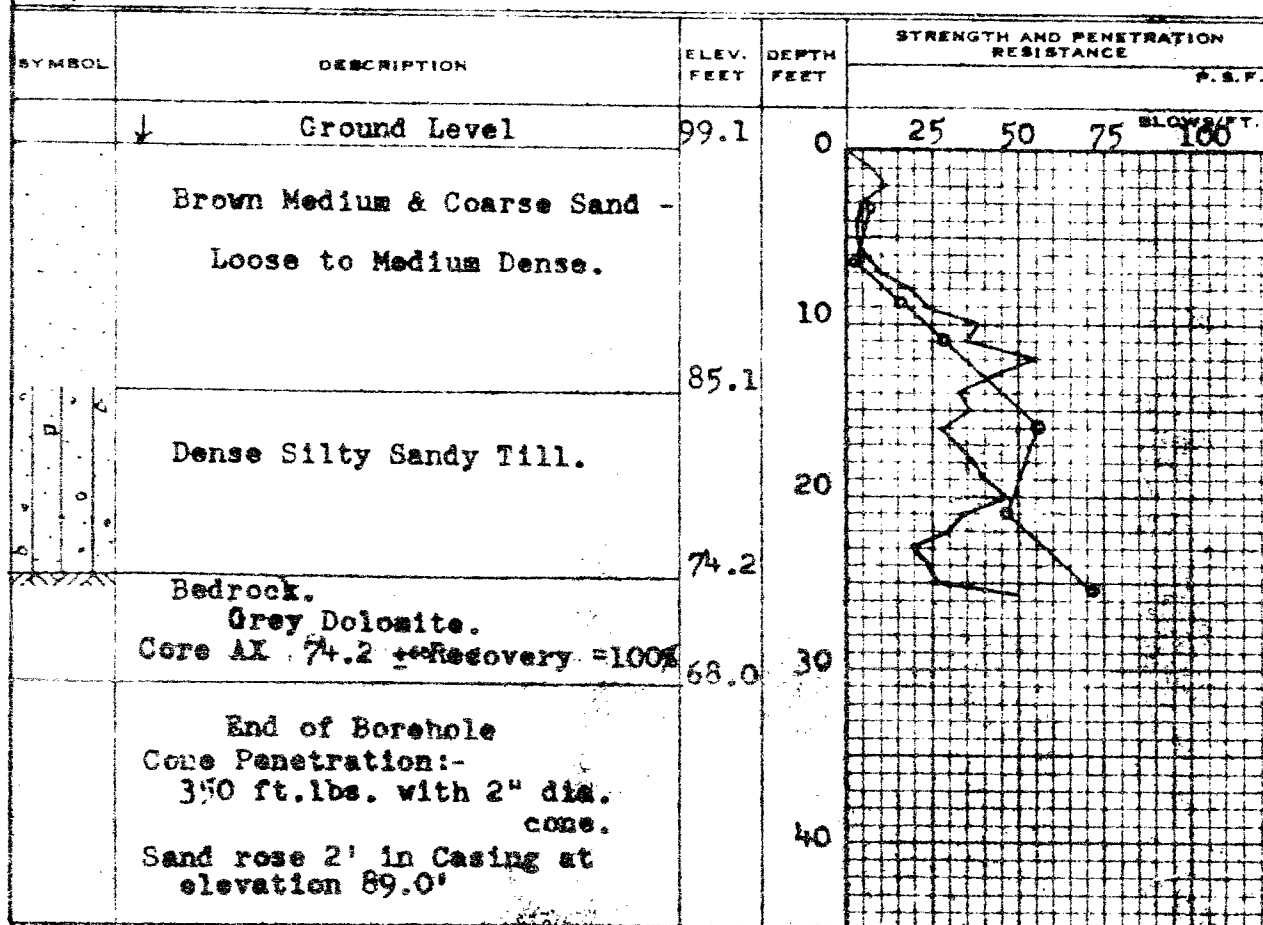
# DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. None BORE HOLE NO. 1  
 JOB F 59-64 STATION (See Drawing)  
 DATUM 99.1' COMPILED BY B.K.  
 BORING DATE June 23/59 CHECKED BY K.P.

2" DIA. SPLIT TUBE  
 2" SHELBY TUBE  
 2" SPLIT TUBE  
 2" DIA. CONE  
 2" SHELBY  
 CASING

## LEGEND

1/2 UNCONFINED COMPRESSION ( $Q_u$ ) — O  
 VANE TEST (C) AND SENSITIVITY (S) — +  
 NATURAL MOISTURE AND LIQUIDITY INDEX — LI  
 LIQUID LIMIT — X  
 PLASTIC LIMIT —



CONSISTENCY	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.	
	S1
	S2
	S3
	S4
	S5
	S6
	S7

Borehole No. 1.

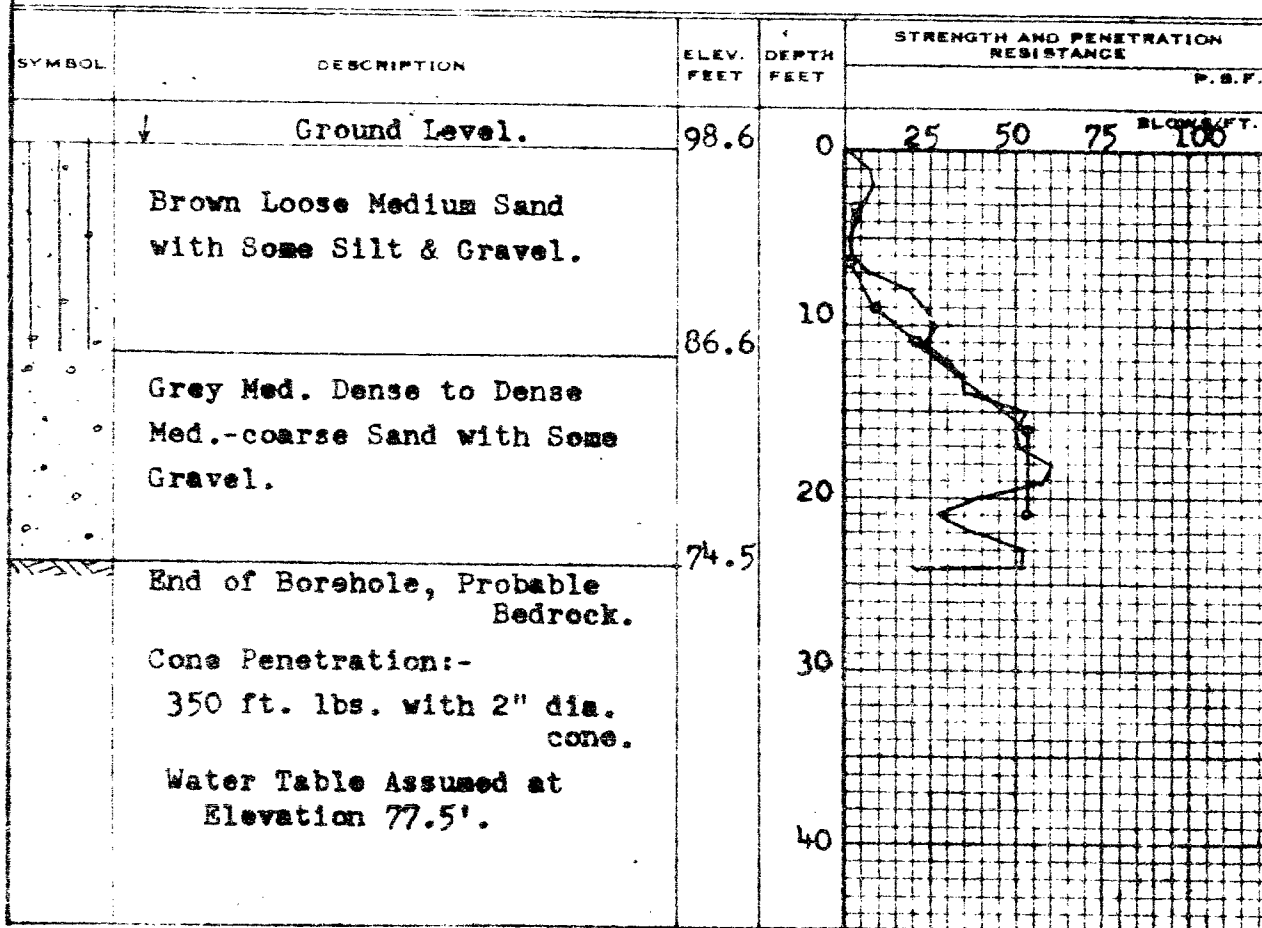
DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS AND RESEARCH SECTION

W.P. None BORE HOLE NO. 2  
JOB F 59-64 STATION (See Drawing)  
DATUM 98.6' COMPILED BY B.K.  
BORING DATE June 24/59 CHECKED BY K.P.

2" DIA. SPLIT TUBE  
2" SHELBY TUBE  
2" SPLIT TUBE  
2" DIA. CONE  
2" SHELBY  
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) O  
VANE TEST (C) AND SENSITIVITY (S) +  
NATURAL MOISTURE AND LIQUIDITY INDEX LI  
LIQUID LIMIT X  
PLASTIC LIMIT



CONSISTENCY	SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.		
	S1	-
	S2	-
	S3	-
	S4	-
	S5	-
	S6	-

Borehole No. 2.

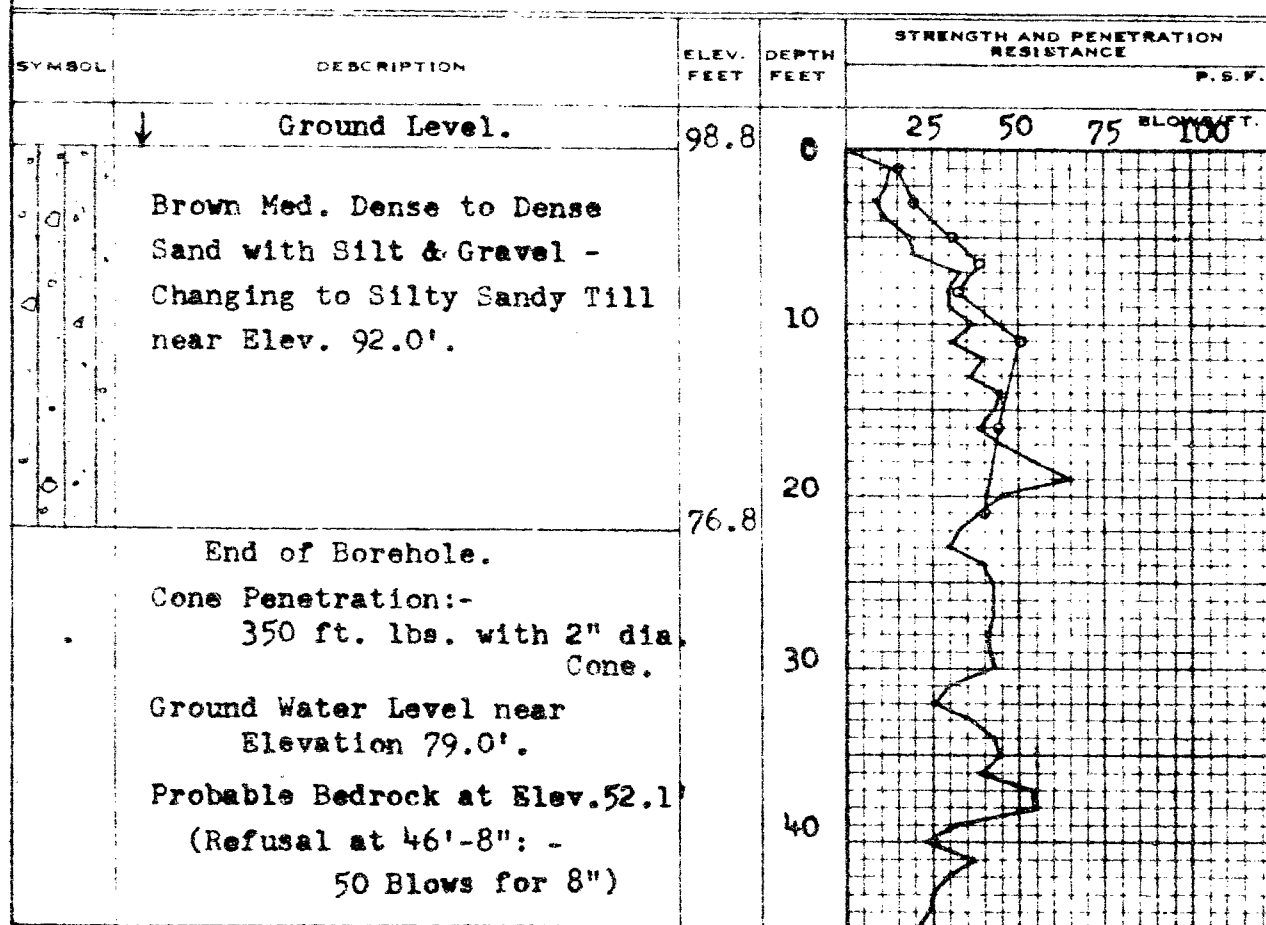
DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS AND RESEARCH SECTION

W.P. None BORE HOLE NO. 3.  
 JOB F 59-64 STATION (See Drawing)  
 DATUM 98.8' COMPILED BY B.K.  
 BORING DATE June 25/59 CHECKED BY K.P.

2" DIA. SPLIT TUBE  
 2" SHELBY TUBE  
 2" SPLIT TUBE  
 2" DIA. CONE  
 2" SHELBY  
 CASING

## LEGEND

1/2 UNCONFINED COMPRESSION (Qu) ○  
 VANE TEST (C) AND SENSITIVITY (S) +\*  
 NATURAL MOISTURE AND LIQUIDITY INDEX LI  
 LIQUID LIMIT X  
 PLASTIC LIMIT —



CONSISTENCY	SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.		
5	10	
	S1	-
	S2	-
	S3	-
	S4	-
	S5	-
	S6	-
	S7	-
	S8	-

Borehole No. 3.

**DEPARTMENT OF HIGHWAYS - ONTARIO**  
**MATERIALS AND RESEARCH SECTION**

W.P. None BORE HOLE NO. 4  
JOB F 59-64 STATION (See Drawing)  
DATUM 99.8' COMPILED BY B.K.  
BORING DATE June 26/59 CHECKED BY K.P.

2" DIA. SPLIT TUBE \_\_\_\_\_  
2" SHELBY TUBE \_\_\_\_\_  
2" SPLIT TUBE \_\_\_\_\_  
2" DIA. CONE \_\_\_\_\_  
2" SHELBY \_\_\_\_\_  
CASING \_\_\_\_\_

**LEGEND**

1/2 UNCONFINED COMPRESSION (Qu) \_\_\_\_\_ O  
VANE TEST (C) AND SENSITIVITY (S) \_\_\_\_\_ +  
NATURAL MOISTURE AND LIQUIDITY INDEX \_\_\_\_\_ LI  
LIQUID LIMIT \_\_\_\_\_ X  
PLASTIC LIMIT \_\_\_\_\_

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE
				P.S.F.
↓	Ground Level	99.8	0	25 50 75 100
	Brown loose to med. dense fine to med. sand becoming dense at elevation 86.0'.		10	
		80.6	20	
	End of Borehole.			
	Cone Penetration:- 350 ft.lbs. with 2" cone.		30	
	No Water noted in Borehole.		40	

CONSISTENCY		SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.			
5	10	S1	-
		S2	-
		S3	-
		S4	-
		S5	-
		S6	-

# DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. None BORE HOLE NO. 5  
JOB P 59-64 STATION (See Drawing)  
DATUM 99.1' COMPILED BY B.K.  
BORING DATE June 27/59 CHECKED BY K.P.

2" DIA. SPLIT TUBE -----  
2" SHELBY TUBE -----  
2" SPLIT TUBE -----  
2" DIA. CONE -----  
2" SHELBY -----  
CASING -----

## LEGEND

1/2 UNCONFINED COMPRESSION ( $Q_u$ ) -----  
VANE TEST ( $G$ ) AND SENSITIVITY ( $S$ ) -----  
NATURAL MOISTURE AND LIQUIDITY INDEX -----  
LIQUID LIMIT -----  
PLASTIC LIMIT -----

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE	
				P.S.F.	
	Ground Level.	99.1	0	24 50 75 100	BLOW/FT.
	Brown and grey loose to med. dense silty sand with some gravel.	93.1			
	End of Borehole.				
			10		REVEAL AT 8 ft.
			20		
			30		
			40		

Cone Penetration:-  
350 ft.lbs. with 2" dia. cone.

CONSISTENCY	SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.		
	S1	-

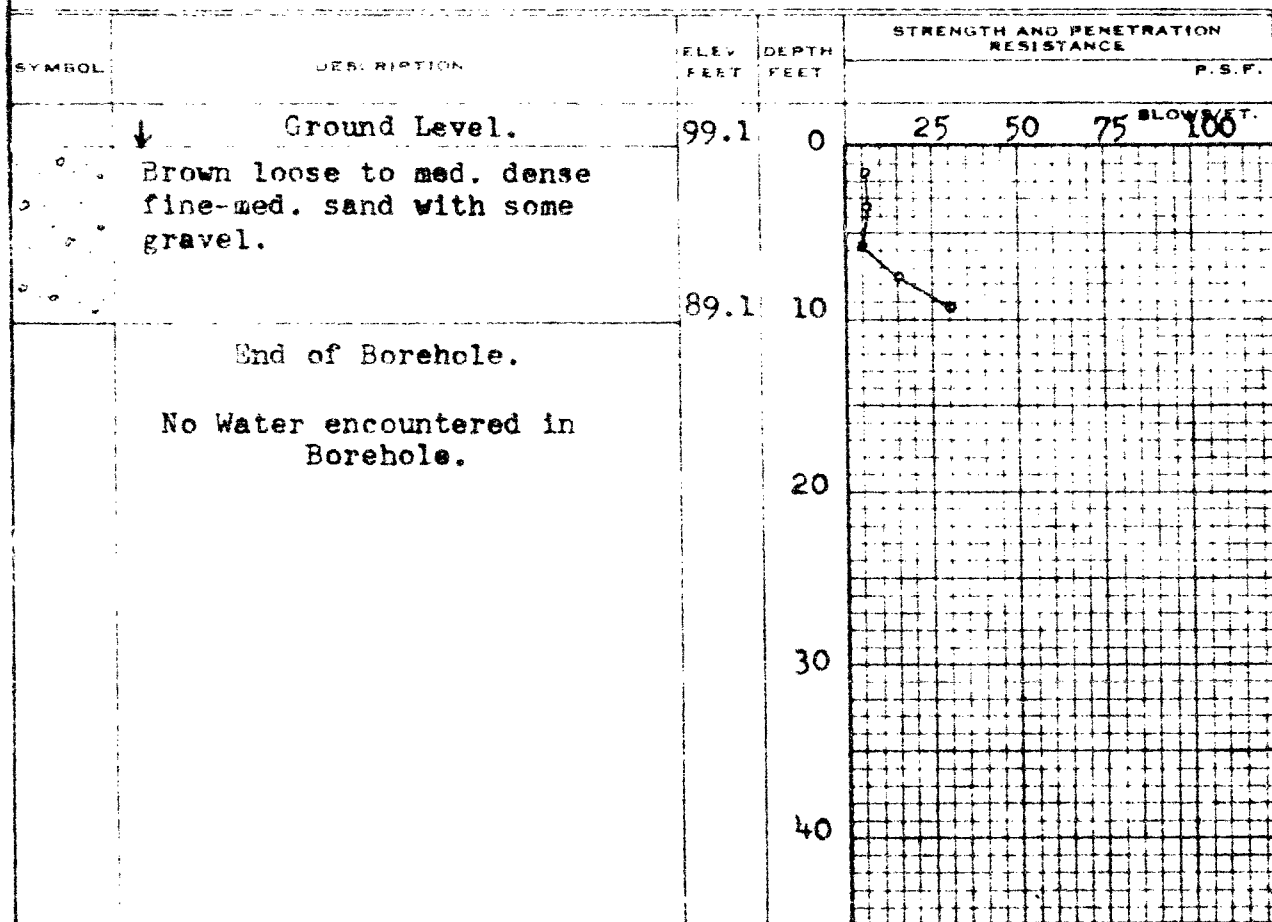
DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS AND RESEARCH SECTION

W.P. None BORE HOLE NO. 6.  
 JOB P 59-64 STATION (See Drawing)  
 DATUM 99.1' COMPILED BY B.K.  
 BORING DATE June 27/59 CHECKED BY K.P.

2" DIA. SPLIT TUBE \_\_\_\_\_  
 2" SHELBY TUBE \_\_\_\_\_  
 2" SPLIT TUBE \_\_\_\_\_  
 2" DIA. CONE \_\_\_\_\_  
 2" SHELBY \_\_\_\_\_  
 CASING \_\_\_\_\_

LEGEND

1/2 UNCONFINED COMPRESSION ( $Q_u$ ) \_\_\_\_\_ O  
 VANE TEST (C) AND SENSITIVITY (S) \_\_\_\_\_ +  
 NATURAL MOISTURE AND LIQUIDITY INDEX \_\_\_\_\_ X  
 LIQUID LIMIT \_\_\_\_\_  
 PLASTIC LIMIT \_\_\_\_\_



CONSISTENCY	SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT- % DRY WT.		
	S1	-
	S2	-
	S3	-
	S4	-
	S5	-

Borehole No. 6

[illegible]



DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS AND RESEARCH SECTION

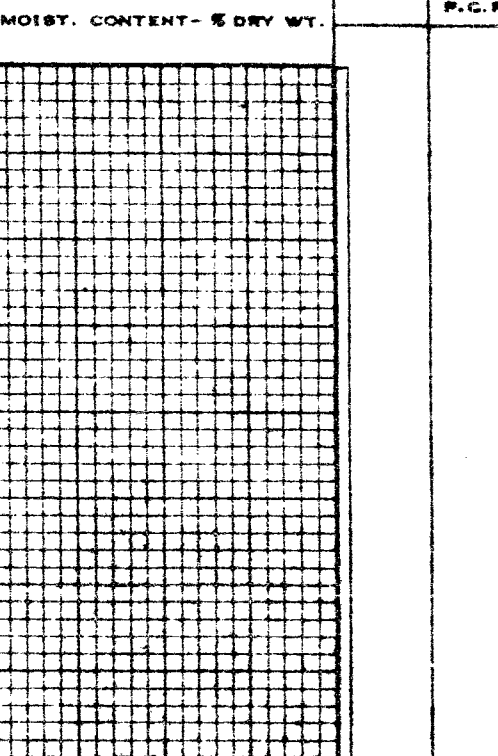
W.P. None BORE HOLE NO. 8.  
JOB F 59-64 STATION (See Drawing)  
DATUM 99.6' COMPILED BY B.K.  
BORING DATE June 27/59 CHECKED BY K.P.

2" DIA. SPLIT TUBE -----  
 2" SHELBY TUBE -----  
 2" SPLIT TUBE -----  
 2" DIA. CONE -----  
 2" SHELBY -----  
 CASING -----

## LEGEND

1/2 UNCONFINED COMPRESSION (Qu)	---	O
VANE TEST (C) AND SENSITIVITY (S)	---	+ *
NATURAL MOISTURE AND		
LIQUIDITY INDEX	---	LI
LIQUID LIMIT	---	X
PLASTIC LIMIT	---	

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE			
				P.S.F.			
	↓ Ground Level.	99.6	0	25	50	75	100
				BLOW/FT.			
				Penetration ends at Elevation 79.6'			
		</					

CONSISTENCY	
SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.	
	

Borghese No. 8.

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS AND RESEARCH SECTION

W.P. None BORE HOLE NO. 9  
JOB F 59-64. STATION (See Drawing)  
DATUM 99.4' COMPILED BY B.K.  
BORING DATE June 27/59 CHECKED BY K.P.

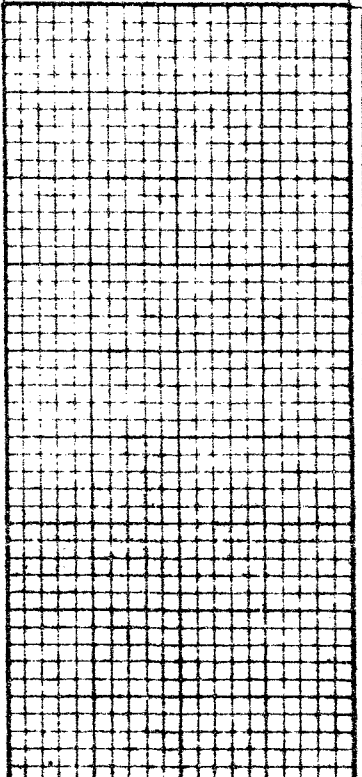
2" DIA. SPLIT TUBE  
2" SHELBY TUBE  
2" SPLIT TUBE  
2" DIA. GONE  
2" SHELBY  
CASING

## LEGEND

1/2 UNCONFINED COMPRESSION (QU) _____	O
VANE TEST (C) AND SENSITIVITY (S) _____	+ S
NATURAL MOISTURE AND	
LIQUIDITY INDEX _____	X
LIQUID LIMIT _____	
PLASTIC LIMIT _____	

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE			
				P.S.F.			
↓	Ground Level.	99.4	0	25	50	75	100
				BLOW/FT.			
			10				
			20	Penetration ends at Elevation 79.6'			
			30				
			40				

Cone Penetration:-  
350 ft.lb. with 2" dia.  
cone.

CONSISTENCY		NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.	SAMPLE	
		

**Bureau No. 9.**