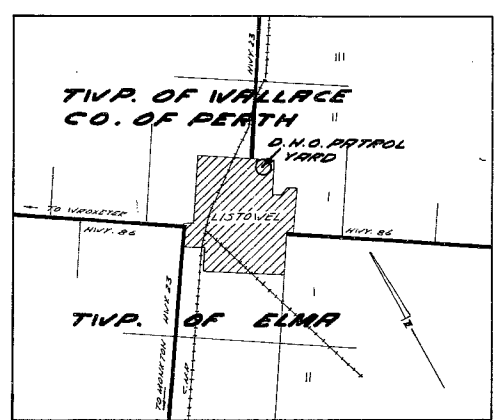
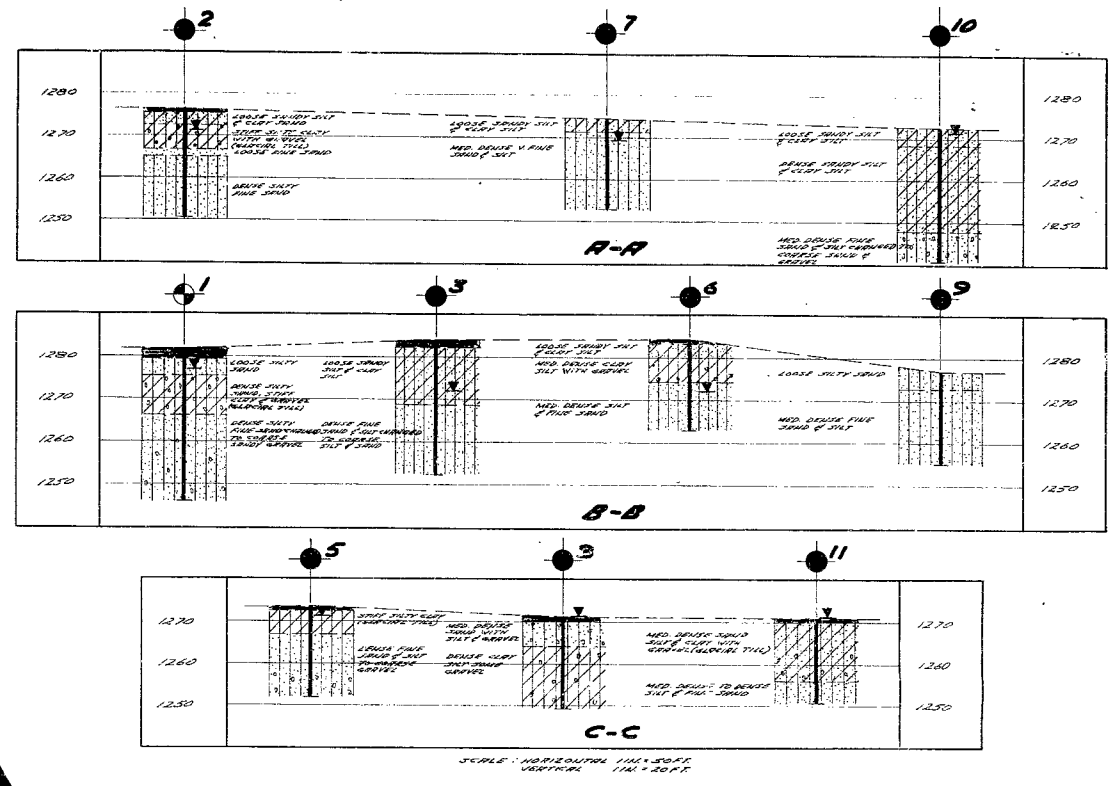
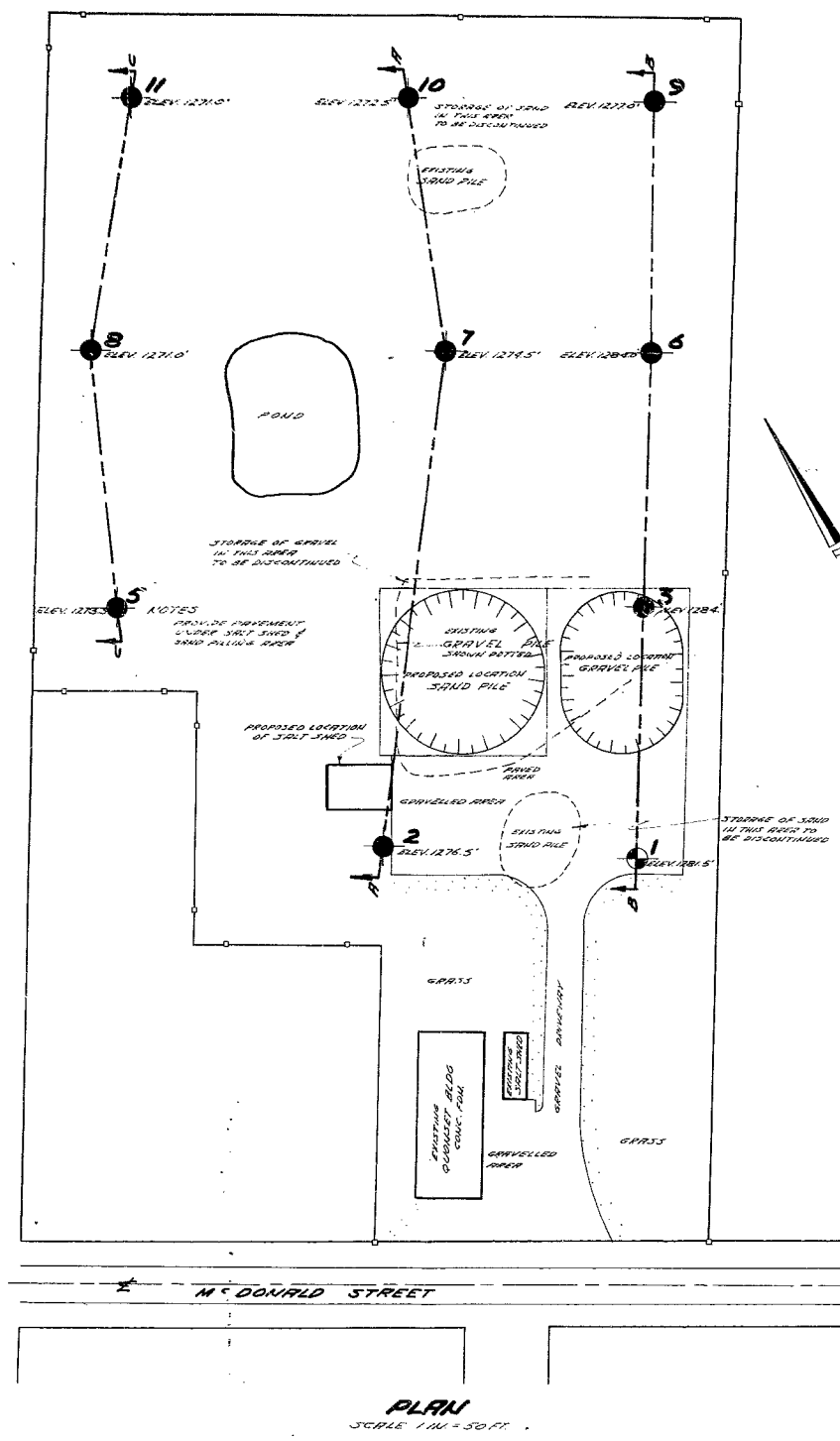


#60-F-1

LISTOWEL

GARAGE

WALLACE TWP.



BORE HOLE
BORE & PENETRATION HOLE

40 P10 W
E 504490.
9.4843000
2 17

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			
D.H.O. PATROL YARD			
LISTOWEL			
SHOWING POSITIONS & ELEVATIONS OF HOLES			
HWY. —	DISTRICT 3	COUNTY PERTH	
TOWNSHIP WALLACE & ELMA	LOT 24	COR 11	
LOCATION AT LISTOWEL			
DRAWN BY T. MELLORS	CHECKED BY	W.P. —	
DATE 25/10/40	APPROVED BY	DRAWING NO.	
SCALE AS SHOWN		60-F-1A	

33-67-147.

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

Materials & Research Section.
(Foundations Office)

May 1, 1961.

D.H.C. FOUNDATION INVESTIGATION
REPORT.

W.J. 60-F-1.

RE: PROPOSED LINTOWEL GARAGE SITE, WALLACE TWP. - DISTRICT #3.

We are forwarding to you our subsoil investigation report for the above mentioned location.

The factual data and recommendations contained in this report are self-explanatory, and we believe they will prove adequate for your future design work. If, however, there are any questions with respect to this project, please do not hesitate to contact our Office.

L. S. Goderman,
PRINCIPAL FOUNDATION ENGR.
Per:

ad / def
attach.

cc: Messrs. F. C. Cavell (2)

J. Hamilton

H. A. Tregaskes

E. E. McMillan

H. C. Tackaberry

L. E. Barrett

J. Boy

Foundations Office

Gen. Files.

terrac,
PRINCIPAL FOUNDATION ENGR.)

FOUNDATION INVESTIGATION

For

Proposed Listowel Garage Site,
Wallace Township, Lot 23, Cnn. II,
W.J. 60-F-1 -- District No. 3.

INTRODUCTION:

Presented herein are the results of a foundation investigation carried out at the site of a Patrol Yard located near Highway 23 at the northerly limit of the Town of Listowel. In addition to a description of the field work done, recommendations concerning the bearing capacity for small footings and water supply, are included in this report.

SITE DESCRIPTION:

The site is located in the physiographic region known as the Dundalk Till Plain. This area is characterized by gently undulating fluted till plains.

The soil types consist of a silty fine sand and a clay silt till. The silt till stratum is suitable for supporting spread footings.

FIELD AND LABORATORY WORK:

The field work which consisted of ten detailed sampled borings and one dynamic penetration test, was carried out from Jan. 11 to Jan. 19, 1960. The holes were advanced by means of a continuous flight auger.

Because of the granular nature of the underlying soil types, disturbed samples were recovered by means of a 2-inch split barrelled

FIELD AND LABORATORY WORK: (cont'd.) ...

sampler. The dimensions of this sampler and the dynamic energy used in driving it, conformed to the requirements of the Standard Penetration Test.

Laboratory work consisted of determining the moisture contents of all the samples recovered, as well as classifying some selected samples.

The results of this investigation are shown on the appended profile sheets.

EVALUATION OF BEARING CAPACITY:

The site is covered with a layer of organic topsoil varying in thickness from 1 to 2 feet. Underlying this shallow organic layer, a stratum of silty fine sand was encountered. Under the sand, a stratum of dense clay silt till stratum was underlain by a coarse gravel to coarse sand material at a depth of 30 feet.

The average 'N' value is 25. However, in the clay silt material in coreholes 3, 6, 7, and 9 on the hill, the 'N' values were between 10 and 15. For the proposed salt shed location, the 'N' value of 25 indicates that an allowable bearing capacity of 2 Tons/sq.ft. may be used for footings 2' wide, placed at least 5 feet below ground level. Subsequent settlement due to this footing pressure will be within tolerable limits due to the dense nature of the silt till material.

cont'd. /3 ...

EVALUATION OF BEARING CAPACITY: (cont'd.) ...

Water level at the site at the time of investigation was established at elevation 1273' approx. Excavations carried below this elevation will encounter local seepage. Control of this can be effected using low capacity pumps.

For the stockpiles, a safe bearing value of 2 Tons/sq.ft. is recommended.

DOMESTIC WATER SUPPLY:

The town water main is providing service to the existing patrol yard garage.

RECOMMENDATIONS:

- (1) Simple spread footings may be used as foundation members for the salt shed proposed at this Patrol Yard site. A minimum footing dimension of 2 feet should be specified and an allowable footing pressure of 2 Tons/sq.ft. may be used.
- (2) Footings designed according to the above criteria must be provided with a minimum frost cover of 5 feet. The organic topsoil should be stripped from the area of the structure and the footings founded on the dense underlying stratum. Some seepage may be expected in the excavation, but it is anticipated that this may be removed by pumping.
- (3) For the stockpiles, an allowable bearing capacity of 2 Tons/sq.ft. is recommended.

cont'd. /4 ...

RECOMMENDATIONS: (cont'd.) ...

(4) The town water main services the existing patrol yard garage.

April 1961.

John B. ...

REPORT PREPARED BY:

.....
for D. Suzuki,
PROJECT FOUNDATION ENGR.

REPORT APPROVED BY:

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

APPENDIX I

JOB F 60-1

W.P. Garage

[illegible]

JOB F 601
W.P. GADSDEN

[illegible]

SUMMARY OF FIELD & LABORATORY TESTS

JOB F 60-1
W.P. Garage

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
9	S1	4'-5.5'	Med. dense brown silt	11	21.1	-	-	-	-	No Recovery
	S2	7'-8.5'	Med. dense brown silt	16	26.1	-	-	-	-	
	S3	10'-11.5'	Med. dense brown silt	13	23.3	-	-	-	-	
	S4	15'-16.5'	Med. dense brown silt	21	24.4	-	-	-	-	
	S5	20'-21.5'	Grey silt & fine sand	14	-	-	-	-	-	
10	S1	4'-5.5'	Med. dense brown clay silt	26	16.3	-	-	-	-	
	S2	7'-8.5'	Dense grey clay silt	42	10.8	-	-	-	-	
	S3	10'-11.5'	Dense grey clay silt	32	10.3	-	-	-	-	
	S4	15'-16.5'	Med. dense grey sandy silt	13	21.6	-	-	-	-	
	S5	20'-21.5'	Med. dense grey sandy silt	15	23.3	-	-	-	-	
	S6	25'-26.5'	Med. dense grey silt	15	28.0	-	-	-	-	
	S7	30'-31.5'	Dense coarse gravel to coarse sand	46	10.0	-	-	-	-	
11	S1	4'-5.5'	Med. dense brown sandy silt	14	13.1	-	-	-	-	
	S2	7'-8.5'	Dense brown sandy silt & clay sand	41	6.5	-	-	-	-	
	S3	10'-11.5'	Med. dense grey clay silt	27	10.2	-	-	-	-	
	S4	15'-16.5'	Med. dense grey silt	13	7.4	-	-	-	-	
	S5	20'-21.5'	Dense grey silt	44	22.5	-	-	-	-	
			S denotes split spoon sample							

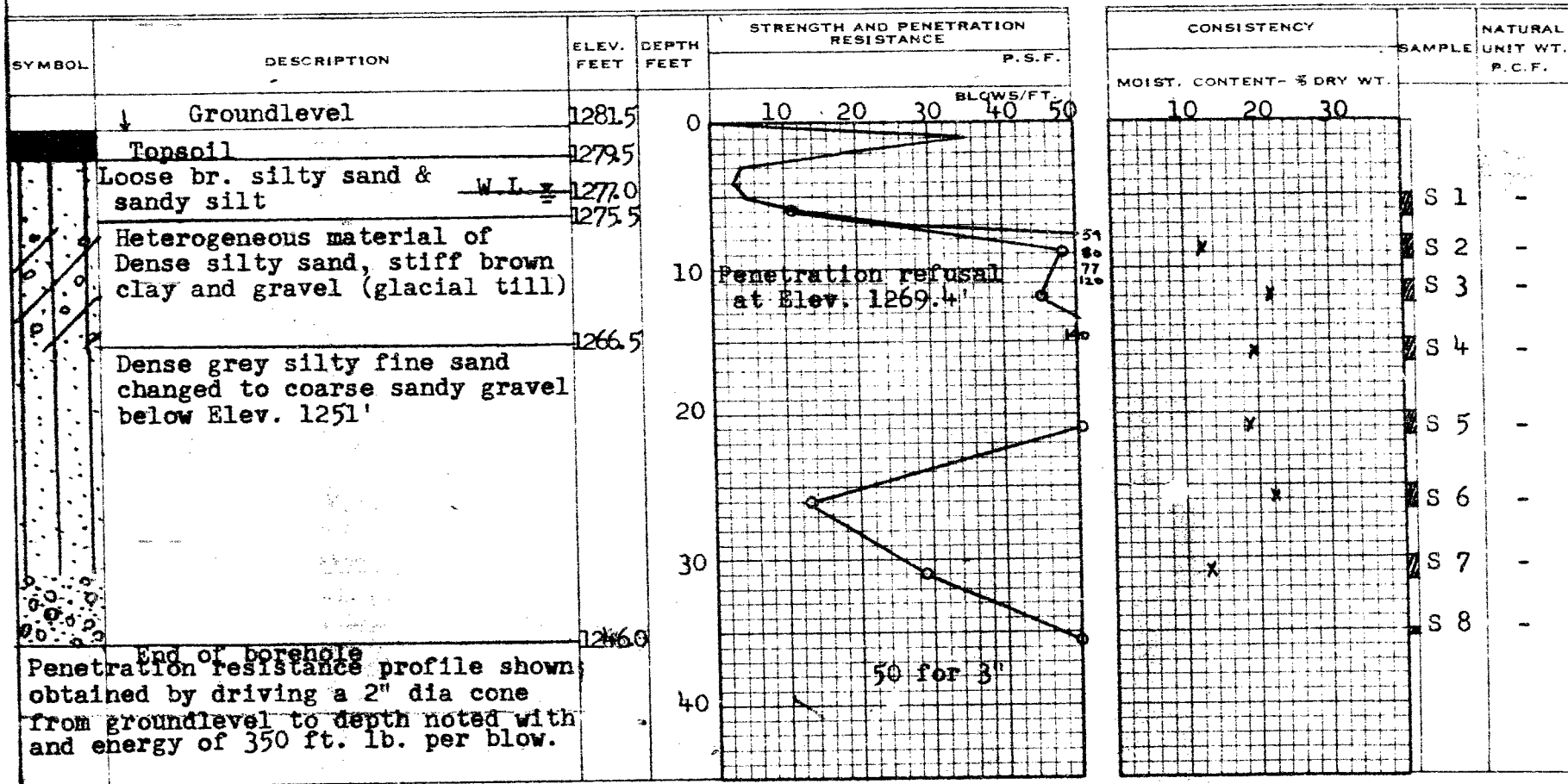
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 1
JOB F 60-1 STATION See drawing
DATUM 1281.5' COMPILED BY B.K.
BORING DATE JAN. 11/60 CHECKED BY A.L.

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 (C) AND SENSITIVITY (S)
NATURAL MOISTURE AND LIQUIDITY INDEX
LIQUID LIMIT
PLASTIC LIMIT

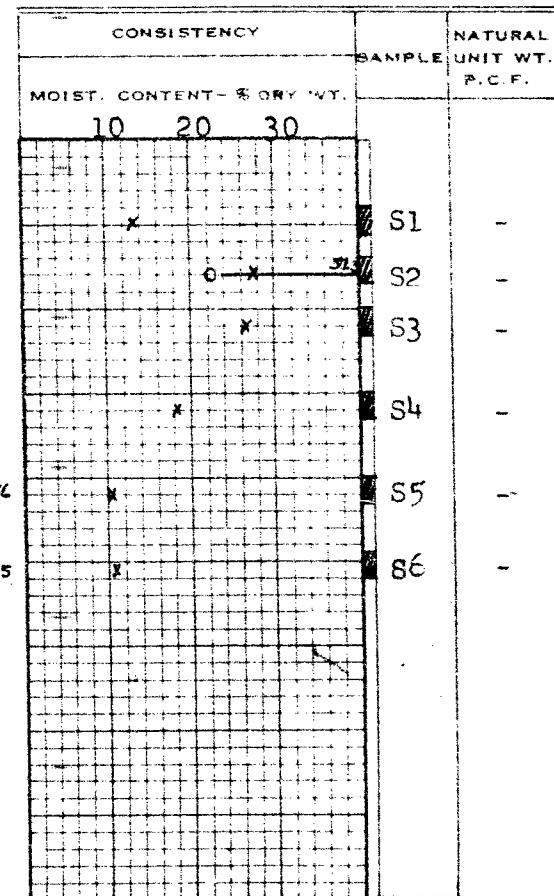
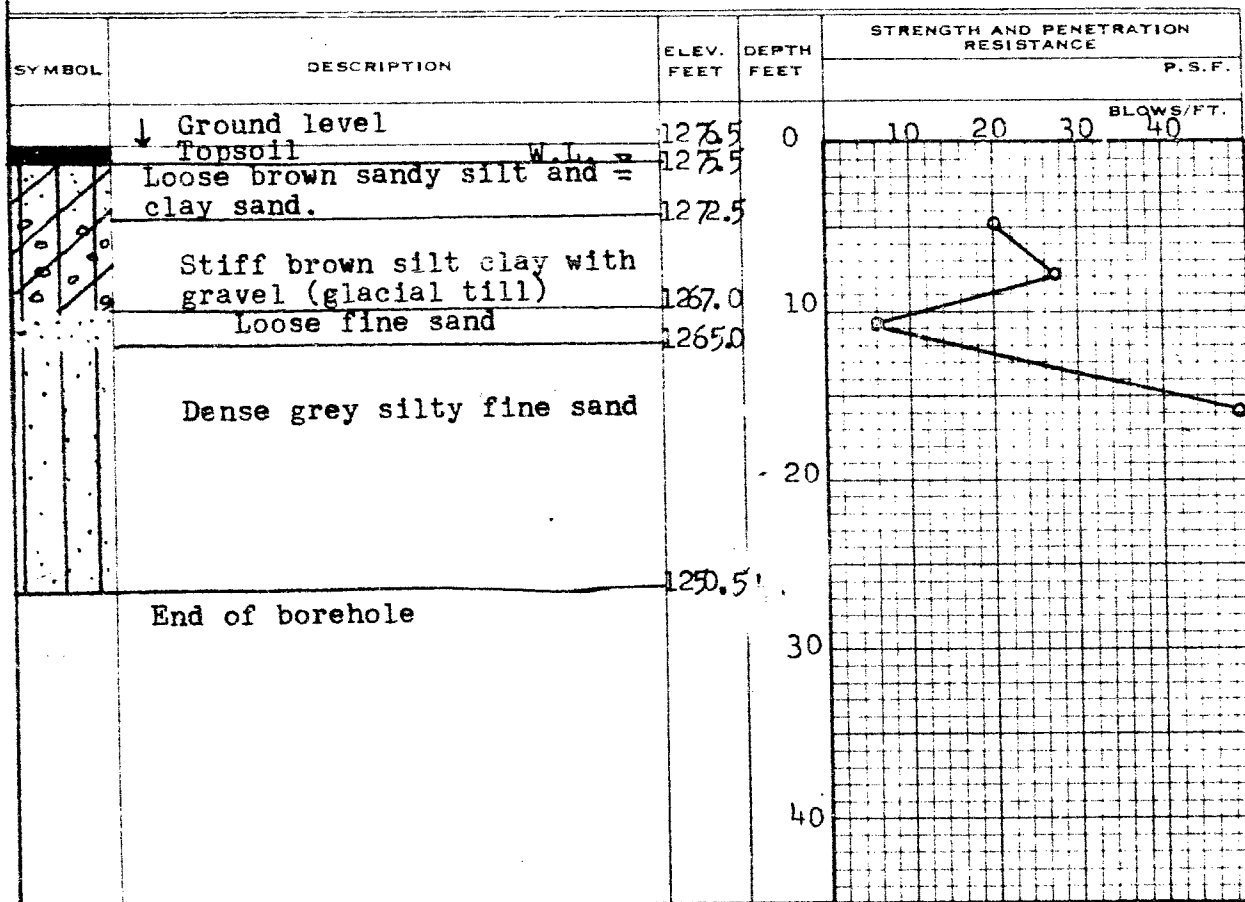


DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 2
JOB F 60-1 STATION See drawing
DATUM 1276.5 COMPILED BY B.K.
BORING DATE Jan. 18/60 CHECKED BY A.L.

LEGEND

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



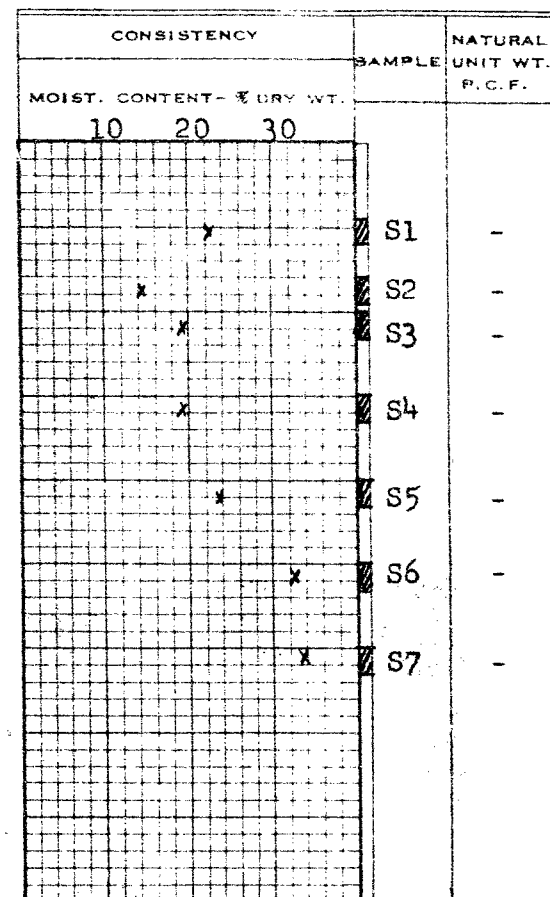
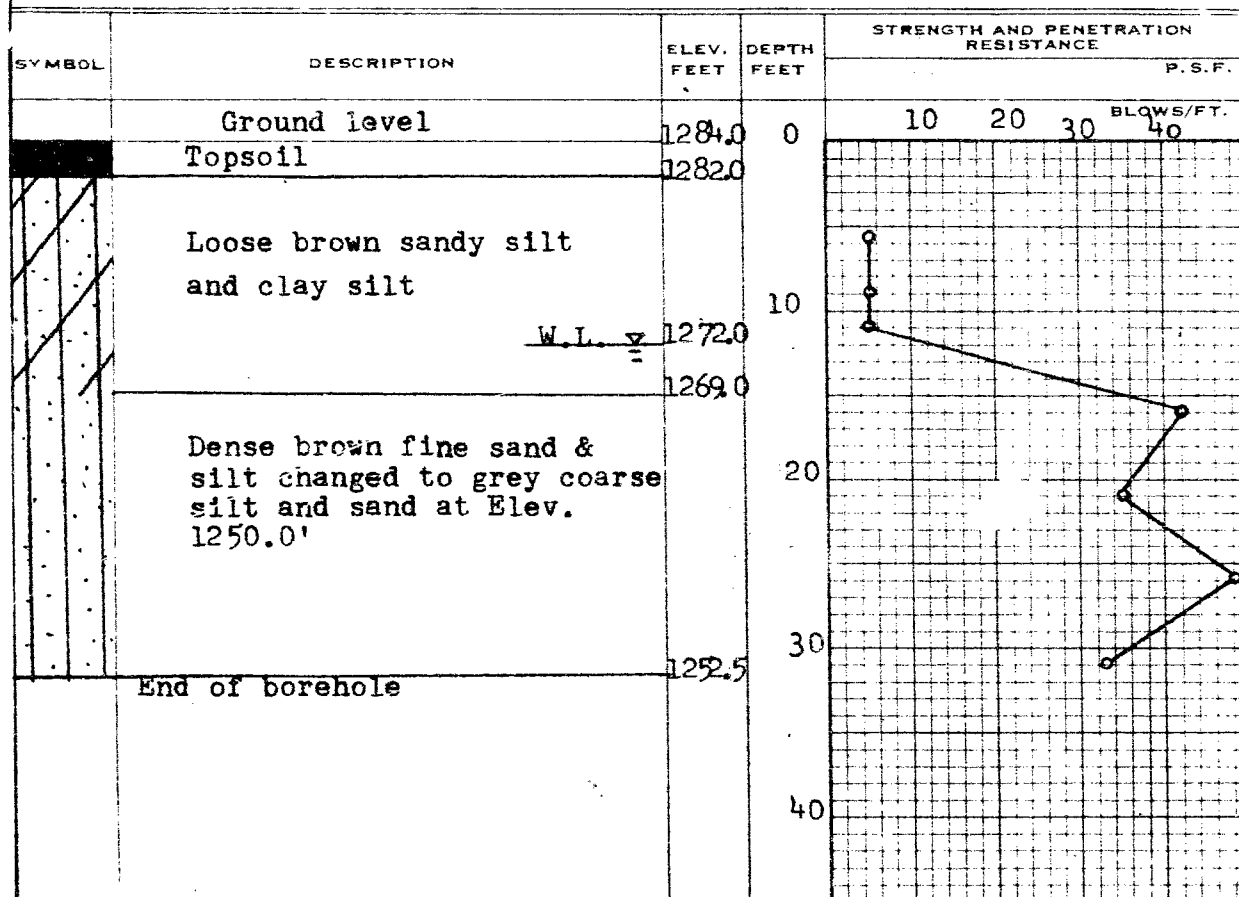
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 3
 JOB F 60-1 STATION See drawing
 DATUM 1284.0' COMPILED BY B.K.
 BORING DATE Jan. 12/60 CHECKED BY A.L.

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 (C) AND SENSITIVITY (S) _____
 NATURAL MOISTURE AND LIQUIDITY INDEX _____
 LIQUID LIMIT _____
 PLASTIC LIMIT _____



W.P. Garage ----- BORE HOLE NO. 5 -----
 JOB F 60-1 ----- STATION. See drawing -----
 DATUM 1273.5 ----- COMPILED BY B.K. -----
 BORING DATE Jan. 14/60 ----- CHECKED BY A.L. -----

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

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE	
				P.S.F.	
	Groundlevel	1273.5	0	BLOWS/FT.	
	Topsoil	1271.2			
	Stiff brown silty clay and clay silt (glacial fill)	12670			
	Dense brown fine Sand & Silt changed to coarse gravel at Elev. 1257.5'	1252.0			
	End of borehole				

CONSISTENCY		NATURAL	
MOIST. CONTENT- % DRY WT.		SAMPLE	UNIT WT. P.C.F.
10	20	30	
S 1			-
S 2			-
S 3			-
S 4			-
S 5			-

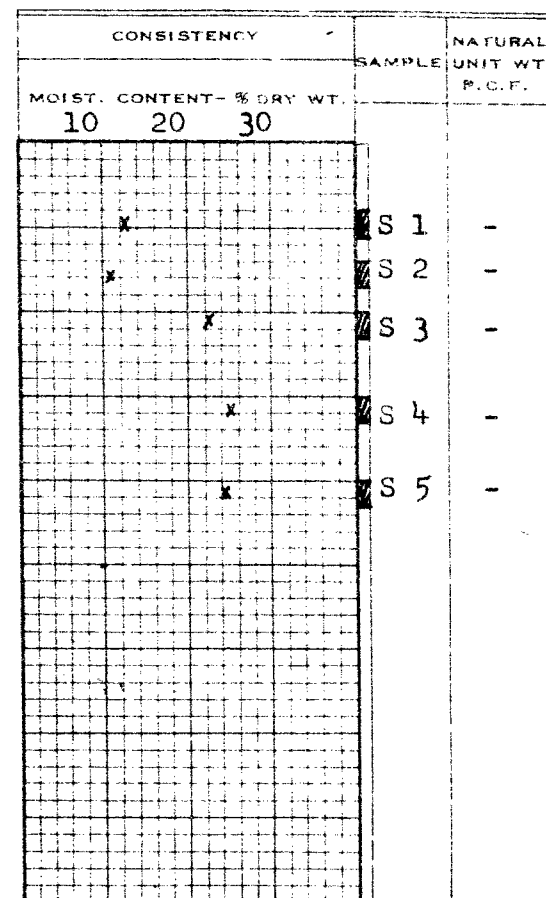
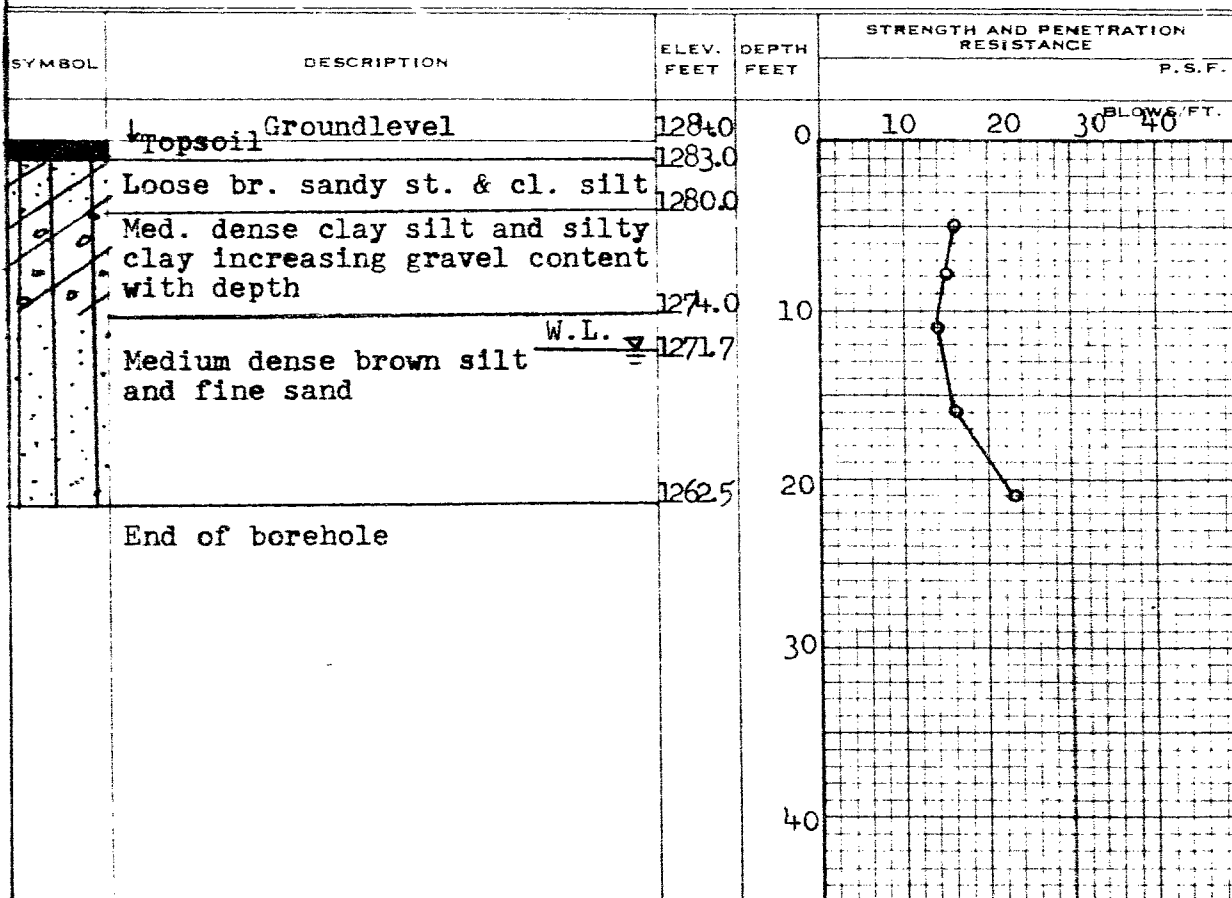
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 6
JOB F 60-1 STATION See drawing
DATUM 1284.0' COMPILED BY B.K.
BORING DATE Jan. 12/60 CHECKED BY A.L.

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 LI
LIQUIDITY INDEX X
LIQUID LIMIT
PLASTIC LIMIT



DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 7
 JOB F 60-1 STATION See drawing
 DATUM 1274.5' COMPILED BY B.K.
 BORING DATE Jan. 13/60 CHECKED BY A.L.

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 (C) 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.	BLOWS/FT.
	↓ Ground level	1274.5	0		
	Loose brown sandy silt & clay silt	1271.0			
	W.L. <u>1270.0</u>	1270.0			
	Medium dense brown very fine sand and silt changed to grey at Elev. 1250'		10		
			20		
	End of borehole	1253.0			

CONSISTENCY			SAMPLE	NATURAL UNIT WT. P. C. F.
MOIST. CONTENT - % DRY WT.				
10	20	30		
			S1	-
			S2	-
			S3	-
			S4	-
			S5	-

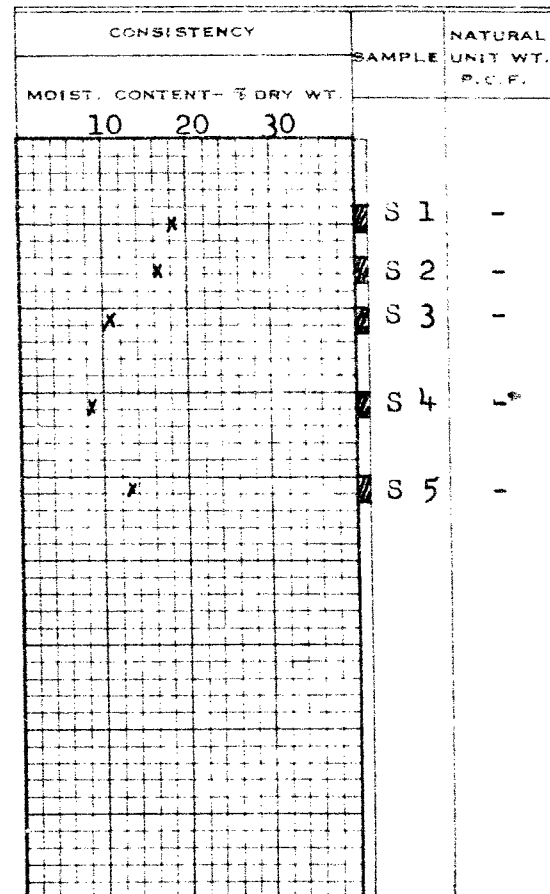
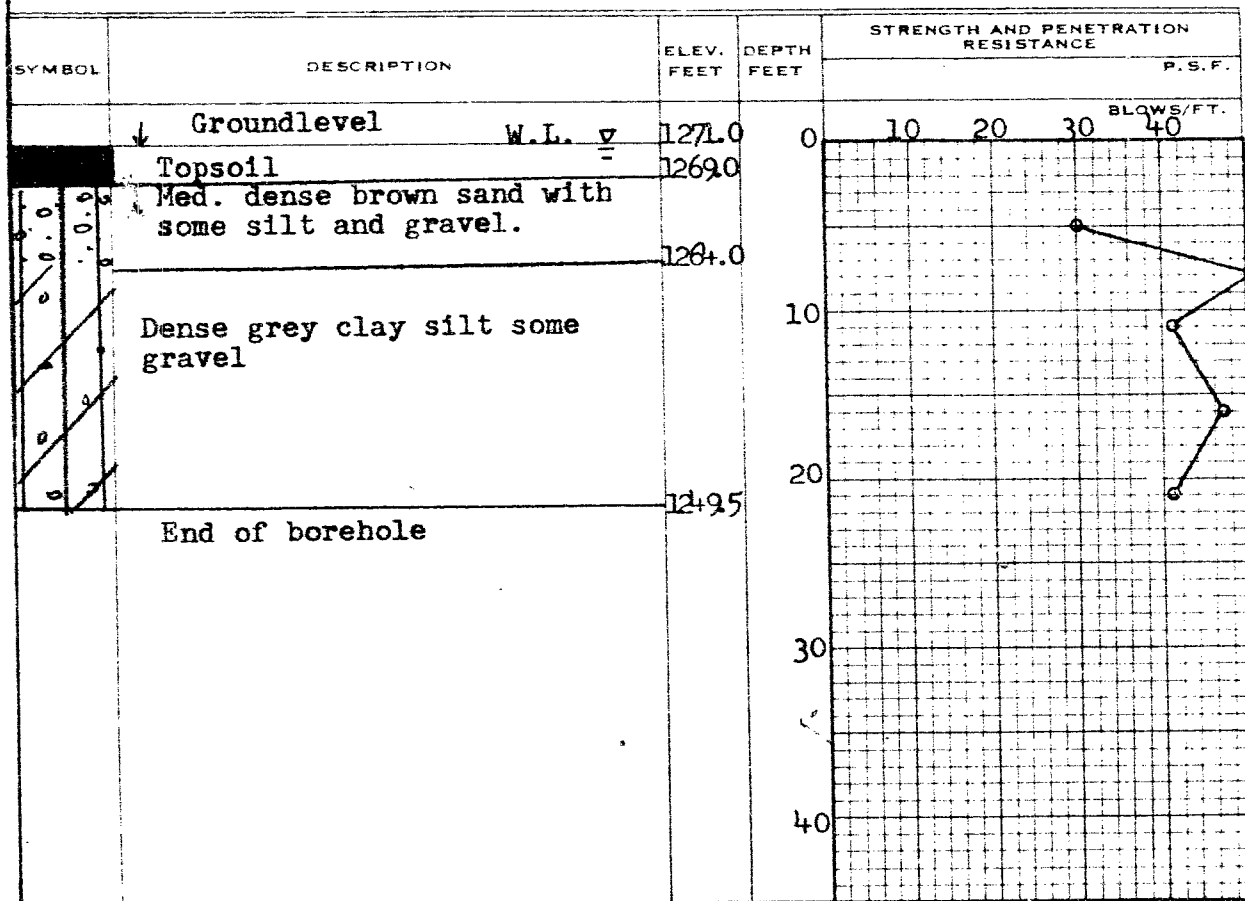
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 8
 JOB F 60-1 STATION See drawing
 DATUM 1271.0 COMPILED BY B.K.
 BORING DATE Jan. 14/60 CHECKED BY A.L.

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 (C) AND SENSITIVITY (S)
 NATURAL MOISTURE AND LIQUIDITY INDEX
 LIQUID LIMIT
 PLASTIC LIMIT



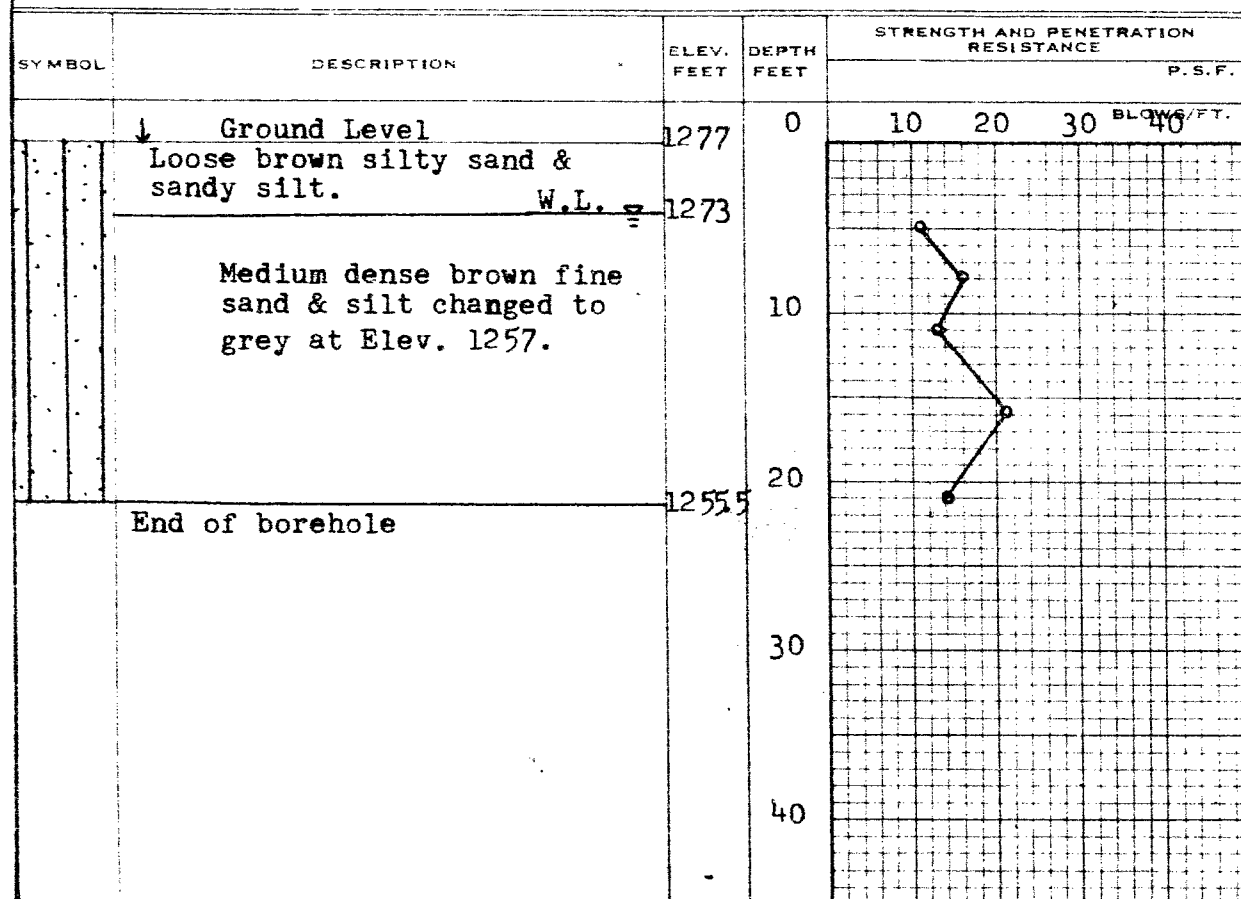
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 9
 JOB F 60-1 STATION See drawing
 DATUM 1277.0 COMPILED BY B.K.
 BORING DATE Jan. 12/60 CHECKED BY A.L.

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 (C) AND SENSITIVITY (S) _____ ☒
 NATURAL MOISTURE AND LIQUIDITY INDEX _____ ☒
 LIQUID LIMIT _____ ☒
 PLASTIC LIMIT _____ ☒



CONSISTENCY			SAMPLE	NATURAL UNIT WT. P. C. F.
MOIST. CONTENT - % DRY WT.				
10	20	30		

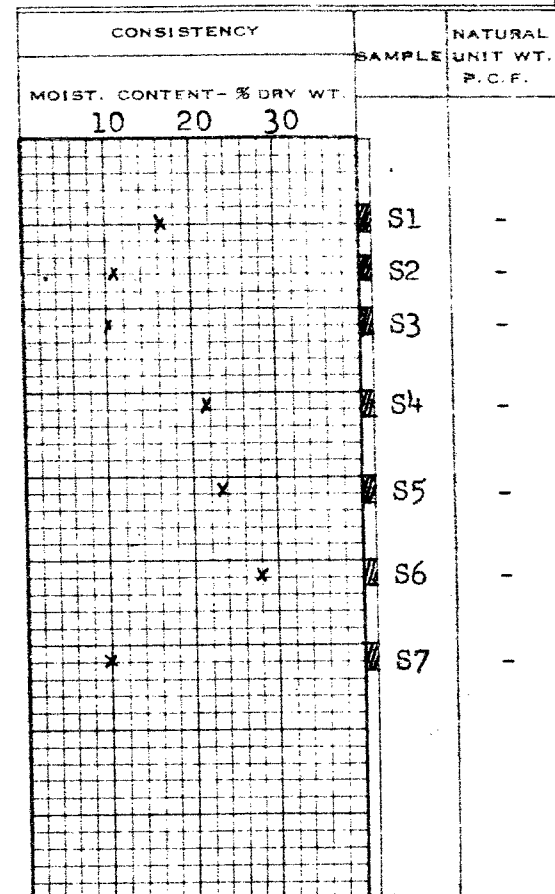
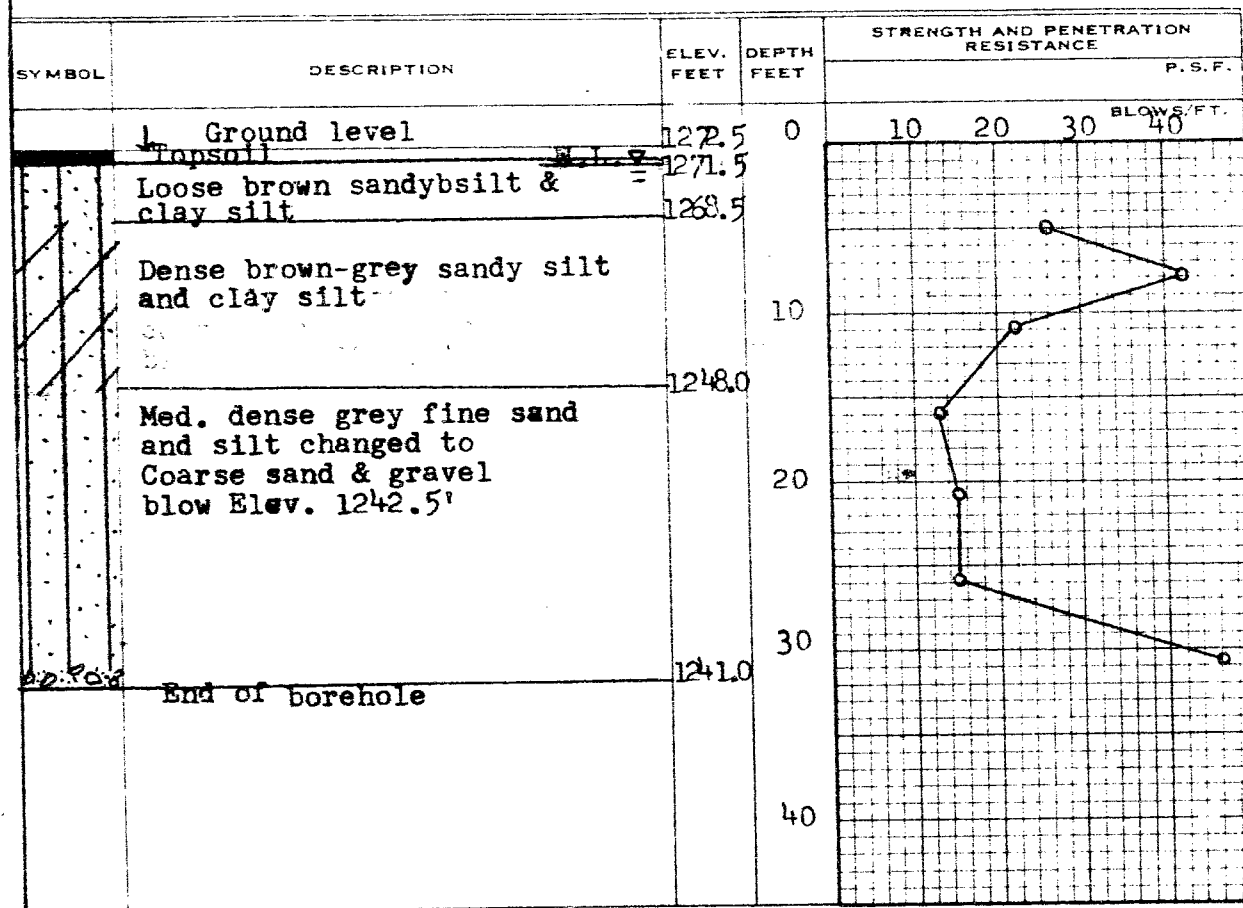
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 10
 JOB F 60-1 STATION See drawing
 DATUM 1272.5 COMPILED BY B.K.
 BORING DATE Jan. 13/60 CHECKED BY A.L.

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 (C) AND SENSITIVITY (S)
 NATURAL MOISTURE AND LIQUIDITY INDEX
 LIQUID LIMIT
 PLASTIC LIMIT



W.P. Garage ----- BORE HOLE NO. 11 -----
 JOB F 60-1 ----- STATION See drawing -----
 DATUM 1271.0 ----- COMPILED BY B.K. -----
 BORING DATE Jan. 14/60 ----- CHECKED BY A.L. -----

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

1/2 UNCONFINED COMPRESSION (Qu)	0
VANE TEST (C) AND SENSITIVITY (S)	+5
NATURAL MOISTURE AND	LI
LIQUIDITY INDEX	X
LIQUID LIMIT	0
PLASTIC LIMIT	1

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE	
				P.S.F.	
	Groundlevel	1271.0	0	10	20
	Topsoil W.L.			30	40
	Heterogeneous material of medium dense sandy silt, clay sand, sandy clay and gravel (glacial till)				
		1256.0	10		
	Medium dense to dense grey silt and fine sand				
		1250.5	20		
	End of borehole				

Penetration test graph showing blow counts per foot versus depth. The graph has a grid with depth in feet on the vertical axis (0 to 40) and blow counts per foot on the horizontal axis (10 to 40). A line connects four data points: (10, 0), (38, 8), (22, 18), and (35, 22).

CONSISTENCY		NATURAL
MOIST. CONTENT - % DRY WT.	SAMPLE UNIT WT.	P.C.F.
10 20 30		
	S1	-
	S2	-
	S3	-
	S4	-
	S5	-