

#60-F-2
PATROL
GARAGE,
ELMIRA

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

March 4, 1960.

D.H.O. FOUNDATION INVESTIGATION

Materials & Research Section.

W.J. F 60-2.

Attention: Mr. J. Hamilton.

Re: Proposed Patrol Garage
Elmira, Ontario.
District No. 3.

A detailed foundation investigation has been completed at the above site. The results of this investigation accompany this memo.

No problems associated with the construction of foundations are anticipated. Recommendations for foundation type and bearing pressures have been summarized at the end of the report.

Information obtained verbally, regarding the location of a domestic water supply, has been included.

If we can be of further assistance in connection with this report, please contact the Foundation Section.

L. G. Soderman,
PRINCIPAL SOILS & FOUNDATIONS ENGR.
per:

EP/ndef
Attach.

cc: Messrs. F. E. Cavell (2)
J. Hamilton
H. A. Tregaskes
C. Tackaberry
H. D. McMillan
L. D. Barrett
J. Roy
Foundations Office
Gen. Files.

(K. Peaker,
FOUNDATION FIELD SUPERVISING ENGR.)

FOUNDATION INVESTIGATION

for

Proposed Patrol Garage

Elmira, Ontario.

Dist. 3 --- W.J. F 60-2.

INTRODUCTION:

Presented in this report are the results of a foundation investigation carried out at the site of a proposed Patrol Yard located on Highway 86, 2 miles West of Elmira.

SITE DESCRIPTION:

The proposed site is located in the physiographic region known as the Waterloo Hills. This area is characterized by sandy hills (some ridges of sandy till) and other kames. The soil types consist of a surface deposit of silty clay till overlying layers of dense sand and silt.

FIELD AND LABORATORY WORK:

The field work, carried out from Jan. 20 to Jan. 29, 1960, consisted of fourteen sampled boreholes and one dynamic cone penetration test. The borings were advanced by means of a continuous flight auger.

In cohesive soils, undisturbed thin-walled Shelby tube samples were recovered, while, in granular materials, disturbed samples were taken with a 2" O.D. split spoon sampler. The dimensions and driving energy conformed to the requirements of the Standard Penetration Test.

In the laboratory, the Shelby samples were tested for their shear strength and index properties. The granular soils were classified and their moisture content measured.

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

The results have been summarized in Tables 1, 2 and 3, attached to this report. The locations and elevations of the boreholes are shown in the attached Borehole Logs and Drawing No. F 60-2A.

SOIL CONDITIONS:

The entire site is covered with a layer of organic topsoil varying in thickness from 6 to 10 inches. Under this, a stratum of stiff silty glacial clay till, 14' thick, was encountered. Underlying the till stratum, a dense to very dense silt and sand stratum was intersected. The ground water was located between 1'8" and 8'0" below the ground surface.

Laboratory tests indicate that the moisture content varies between 10.9% and 25.4% for the silty clay stratum. The average density of this material was approximately 130 p.c.f.

FOUNDATION CONSIDERATIONS:

For footings placed at a depth of 4 feet below the existing ground, a safe allowable bearing pressure of 2 tons/sq.ft. may be used. Under a footing pressure of 2 tons/sq.ft., consequent settlement will be within tolerable limits.

Seepage into the excavations during construction, will be minor and can be removed by pumping.

SERVICE ROADS:

It is recommended that the organic topsoil be stripped from beneath all roadway and driveway areas. A minimum depth of 18 inches of granular material should be placed in these areas. The upper 6 inches should consist of G.B.C. "A" or 5/8" crushed material. The remainder may be G.B.C. "B" or Sand Cushion material.

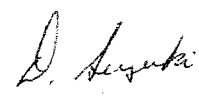
cont'd. /3 ...

WATER SUPPLY:

As indicated by the borings carried out, a waterbearing silt and sand stratum was intersected at a depth of 15' to 20' below the ground. However, it appears that this stratum does not supply sufficient water since local domestic wells are drilled to bedrock which would be about 160' below ground level at the site. Local residents indicated that an adequate supply of water is available from wells drilled to the indicated depth. No other source of water is present in the vicinity.

RECOMMENDATIONS:

1. Spread footings can be designed to support the structure proposed at this Patrol Yard site. An allowable bearing capacity of 2 tons/sq.ft. may be used.
2. Footings should be placed to provide a minimum frost cover of 4 feet. The organic topsoil should be removed over the area of the structure and the footings placed in the clay till layer. If a slab on grade is to be used for the garage floor, a base of G.B.C. "B" will be required under the floor after removal of the topsoil. Ground water seepage into excavations will be minor and can be removed by pumping.
3. Topsoil should be stripped from all driveways and parking areas. A minimum thickness of 18 inches of granular material will be required. The upper 6 inches is to consist of G.B.C. class "A" or 5/8" crushed material and the remainder, G.B.C. "B" or Sand Cushion.
4. A well can be developed at this site, but will have to be drilled to about 160 feet. Adequate water may be expected from this source.


D. Suzuki,
Project Foundation Engr.

APPENDIX I.

SUMMARY OF FIELD & LABORATORY TESTS

JOB F 60-2

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
1	T1	3'-4.5'	Stiff brown silty clay	31	160	16.7	31.2	2735	136.0	
	VANE	5.5'	Stiff brown silty clay	-	-	-	-	72000	-	
	S2	7'-8.5'	Stiff grey-brown silty clay	53	15.5	-	-	-	135.0	
	S3	14'-15.5'	Stiff grey silty clay stony	114	14.6	-	-	-	-	
	S4	24'-25.5'	Dense grey very fine sand and silt							
	S5	34'-35.5'	Dense grey silty clay	80	18.4	-	-	-	-	
				59	23.0	-	-	-	-	
2	T1	3'-4.5'	Stiff brown silty clay	44	18.1	21.4	35.9	5210	128.4	
	VANE	5.5'	Stiff brown silty clay	-	-	-	-	72000	-	
	S2	7'-8.5'	Stiff brown silty clay	70	14.4	-	-	-	115.7	
	S3	14'-15.5'	Dense gr. very fine sand and silt	79	17.1	-	-	-	-	
	S4	24'-25.5'	Dense gr. very fine sand and silt	85	17.9	-	-	-	-	
	S5	34'-35.5'	Stiff gr. silty clay (stony)	176	17.0	-	-	-	-	
3										
4	T1	3'-4.5'	Stiff brown silty clay	P	25.4	20.6	40.2	2300	122.5	
	VANE	5.5'	Stiff brown silty clay	-	-	-	-	72000	-	
	S2	7'-8.5'	Stiff brown silty clay	23	21.4	-	-	-	-	
	S3	14'-15.5'	Dense gr. very fine sand and silt	74	13.8	-	-	-	-	
	S4	24'-25'	Very stiff gr. silty clay (stony)	89	14.2	-	-	-	-	
	S5A	34'-35'	Dense grey fine sand		18.5	-	-	-	-	
	B	35'-35.5'	Dense gr. v. fl. sand & silt)	153-85	17.1	-	-	-	-	

SUMMARY OF FIELD & LABORATORY TESTS

JOB F 60-2

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
5	T1	3'-4.5'	Stiff brown silty clay	P	24.7	20.1	37.7	2940	128.8	
	VANE	5.5'	Stiff brown silty clay	-	-	-	-	72000	-	
	S2	8.5'-10'	Dense brown clayey silt	63	12.7	-	-	-	144.0	
	S3	14'-15.5'	Dense grey silty. stony	69	12.5	-	-	-	86.4	
	S4	24'-25.5'	Med. dense grey very fine sand and silt with some fine sand.	45	21.2	-	-	-	-	
	S5	34'-35.5'	Dense grey silt (stony)	66	13.9	-	-	-	-	
6	T1	3'-4.5'	Stiff brown silty clay	27	17.9	17.3	30.3	6520	132.7	
	VANE	5.5'	Stiff brown silty clay	-	-	-	-	72000	-	
	S2	7'-8.5'	Stiff brown silty clay	44	16.5	-	-	-	131.8	
	S3	14'-15.5'	Med. dense gr. clayey silt (stony)	56	10.9	-	-	-	-	
	S4	24'-25.5'	Med. dense grey very fine sand and silt	34	20.1	-	-	-	-	
	S5	34'-35.5'	Dense grey fine sand	52	16.7	-	-	-	-	
7	T1	3'-4.5'	Stiff brown silty clay	P	18.2	14.6	23.7	-	127.6	
	VANE	5.5'	Stiff brown silty clay	-	-	-	-	-	-	Vane stopped by stone
	S2	7'-8.5'	Stiff brown silty clay	45	14.3	-	-	-	-	
	S3	14'-15.5'	Stiff grey silty clay (stony)	86	12.5	-	-	-	-	
	S4	24'-25.5'	Very stiff grey silty clay (stony)	39	18.6	-	-	-	-	
	S5	34'-35.5'	Very stiff grey silty clay (stony)	59	15.6	-	-	-	151.6	

SUMMARY OF FIELD & LABORATORY TESTS

JOB F 60-2

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	T1	3'-4.5'	Stiff brown silty clay	27	16.5	18.1	25.0	3710	135.2	
	S2	7'-8.5'	Stiff brown silty clay	38	19.0	-	-	-	128.2	
	S3	14'-15.5'	Stiff grey silty clay with layer of fine sand	70	13.1	-	-	-	-	
	S4	24'-25.5'	Stiff grey silty clay (stony)	132	13.5	-	-	-	-	
	S5	34'-35.5'	Med. dense grey very fine sand and silt	26	22.0	-	-	-	-	
10	T1	3'-4.5'	Med. dense br. clayey silt	P	11.1	17.6	24.5	2680	133.7	
	VANE	5.5'	Medium clay silt	-	-	-	-	1200	-	Sens. 4.3
	S2	7'-8.5'	Med. dense brown clayey silt	29	18.6	-	-	-	-	
	S3	14'-15.5'	Dense grey fine sand	59	17.8	-	-	-	-	
	S4	24'-25.5'	Stiff grey silty clay (stony)	91	13.0	-	-	-	131.3	
	S5	34'-35.5'	Dense grey silty clay	73	20.1	-	-	-	-	
11	T1	3'-4.5'	Stiff brown silty clay	52	15.1	14.2	23.1	5210	141.9	
	VANE	5.5'	Stiff brown silty clay					22000		
	S2	7'-8.5'	Stiff brown silty clay	23	19.8	-	-	-	-	
	S3	14'-15.5'	Stiff grey silty clay (stony) with dense grey very fine sand and silt	129	12.4	-	-	-	-	
	S4	24'-25.5'	Dense grey very fine sand and silt	36	20.6	-	-	-	-	
	S5	34'-35.5'	Dense grey clayey silt (stony)	108	17.7	-	-	-	132.4	
	S6	40'-41.5'	Dense grey silt and fine sand	54	-	-	-	-	-	

SUMMARY OF FIELD & LABORATORY TESTS

JOB F 60-2

W.P. Garage

HOLE NO	SAMP NO	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENETIN RESIST. BLOWS FT	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
12	T1	3'-4.5'	Med. stiff brown silty clay (stony)	P	34.7	22.5	45.0	844	120.0	
	VANE	5.5'	Med. stiff br. silty clay(stony)					1120		
	S2	7'-8.5'	Stiff brown silty clay (stony)	40	15.7	-	-	-	135.3	
	S3	14'-15.5'	Dense grey very fine sand and silt	56	16.3	-	-	-	-	
	S4	24'-25.5'	Dense grey very fine sand and silt	118	19.2	-	-	-	-	
13	T1	3'-4.5'	Stiff brown silty clay (stony)	P	21.5	16.5	28.9	2638	132.0	Vane stopped by stones
	VANE									
	S2	7'-8.5'	Stiff brown silty clay (very stony)	31	20.6	-	-	-	-	
	S3	14'-15.5'	Stiff grey silty clay	39	14.3	-	-	-	-	
	S4	24'-25.5'	Dense brown fine sand	32	21.6	-	-	-	-	
16	S5	34'-35.5'	Dense grey fine sand	84	17.4	-	-	-	-	
	T1	3'-4.5'	Stiff brown silty clay	15	18.4	22.5	31.3	5030	122.3	
	VANE		Stiff brown silty clay	-	-	-	-	2000	-	
	S2	4.5'-6'	Stiff brown silty clay	19	20.3	-	-	-	-	
	S3	9'-10.5'	Stiff grey brown silty clay	42	17.1	-	-	-	-	
	S4	14'-15.5'	Stiff grey silty clay (stony)	51	14.1	-	-	-	120.9	
	S5	19'-20.5'	Dense to very dense grey very fine sand and silt	155	15.9	-	-	-	-	
	S6	27'-28.5'	Med. dense grey-brown fine sand	31	16.6	-	-	-	-	
	S7	34'-35.5'	Med.dense br. fine sand	34	19.0	-	-	-	-	

SUMMARY OF FIELD & LABORATORY TESTS

JOB F 60-2
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 psf.	UNIT WEIGHT pcf.	REMARKS
19	T1	3'-4.5'	Stiff brown silty clay	24	13.7	16.3	26.5	-	135.3	
	S2	4.5'-6'	Stiff brown silty clay	67	15.1	-	-	-	119.5	
	S3	9'-10.5'	Stiff brown silty clay	47	11.5	-	-	-	129.7	
	T4	14'-15.5'	Dense grey clayey silt	35	14.0	-	-	4160	136.2	
	S5	19'-20.5'	Dense grey very fine sand and silt	88	16.4	-	-	-	-	
	S6	27'-28.5'	Dense grown very fine sand and silt	90	20.4	-	-	-	-	
	S7	34.2'-35.5'	Grey silty clay, stony. stiff	97	16.3	-	-	-	-	
20	T1	3'-4.5'	Stiff brown silty clay	32	14.4	14.7	24.9	2890	138.2	
	S2	4.5'-6'	Stiff brown silty clay	40	15.6	-	-	-	93.7	
	S3	9'-10.5'	Stiff grey-brown silty clay	35	13.4	-	-	-	-	
	S4	14'-15.5'	Dense grey very fine sand and silt	53	18.4	-	-	-	-	
	S5	19'-20.5'	Med. dense to loose grey very fine sand	25	18.9	-	-	-	-	
	S6	27'-28.5'	Med. dense brown-grey fine sand	41	21.4	-	-	-	-	
	S7	34'-35.5'	Dense grey very fine sand and silt	85	10.0	-	-	-	-	
			S Denotes split spoon sample T Denotes shelby tube sample							

DEPARTMENT OF HIGHWAYS - ONTARIO

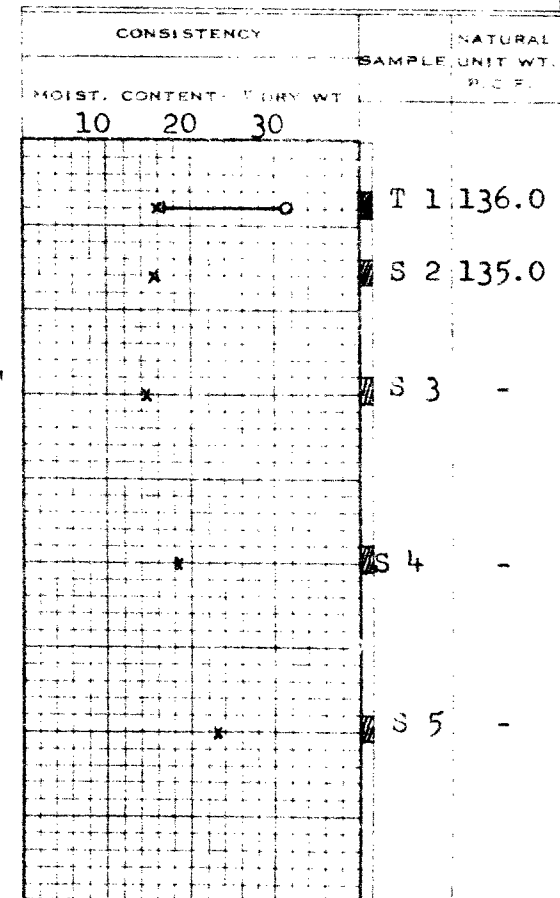
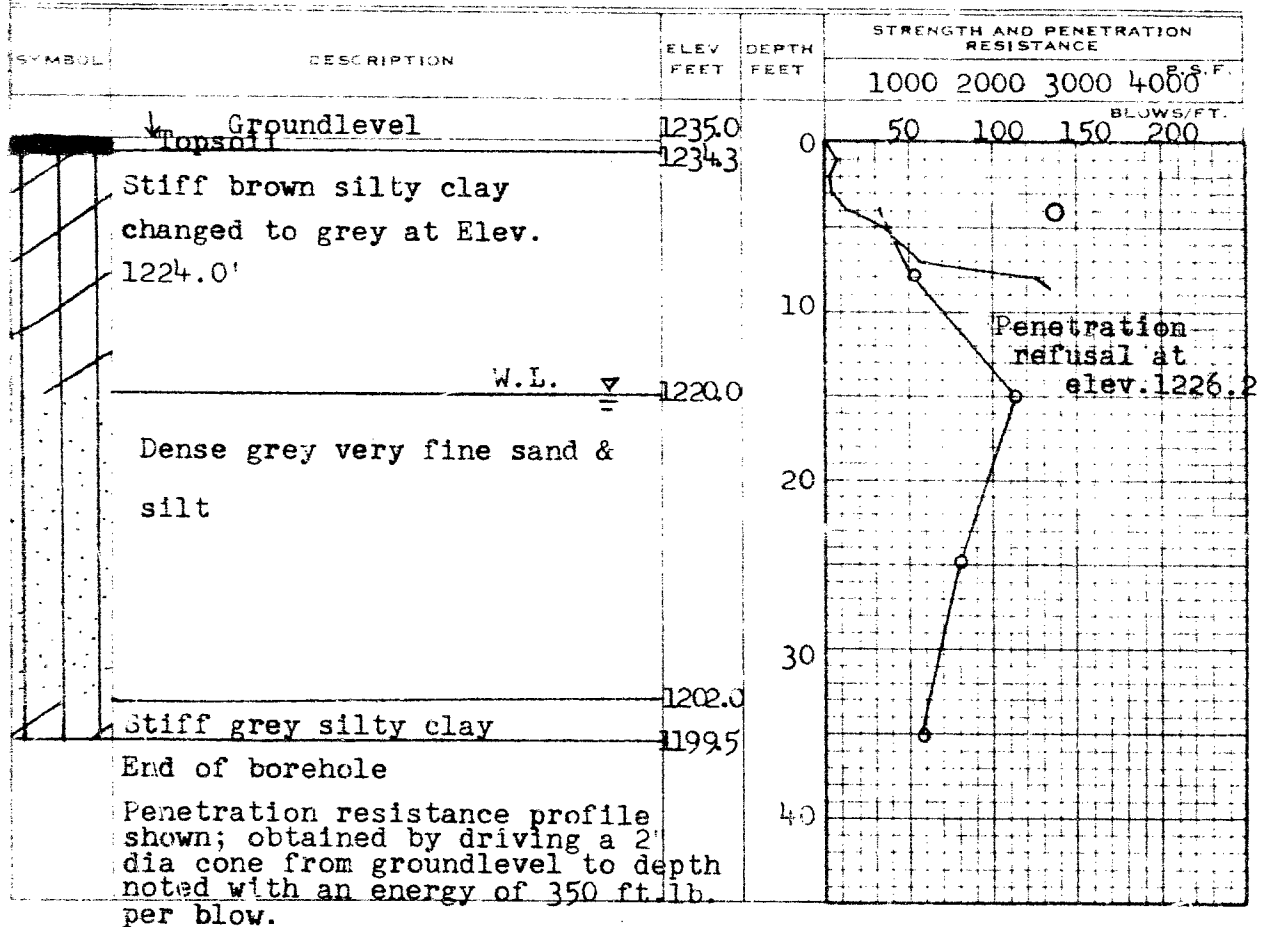
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 1
 JOB F 60-2 STATION See drawing
 DATUM Elev. 1235.0' COMPILED BY B.K.
 BORING DATE Jan. 20/60 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





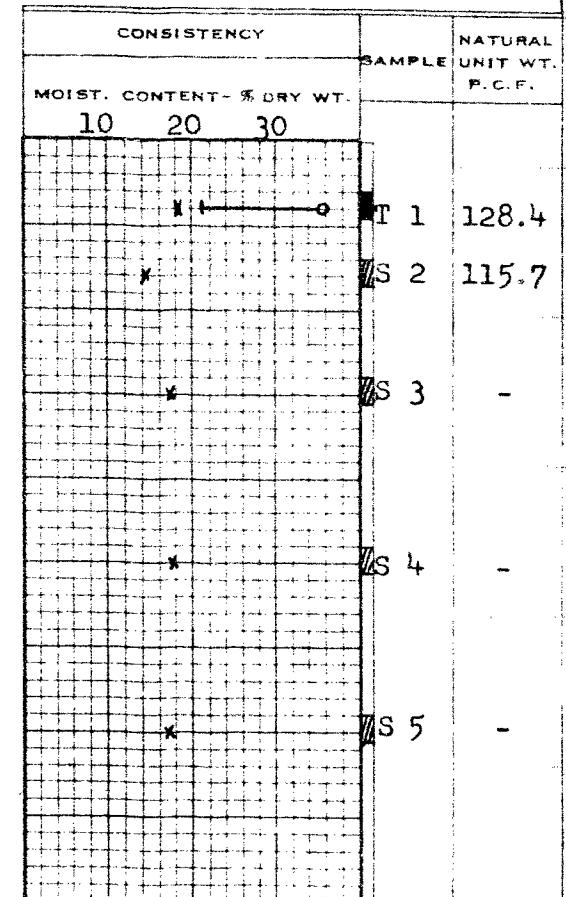
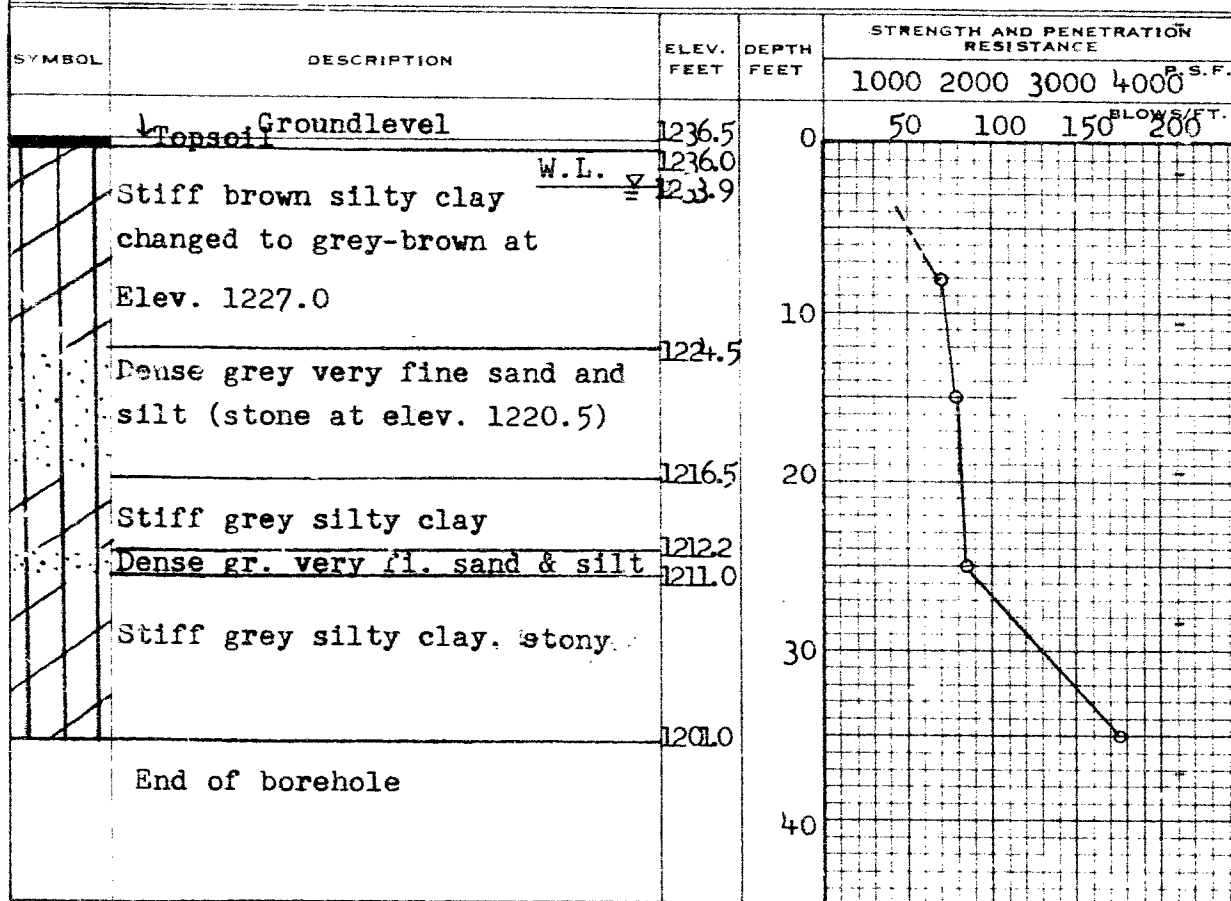
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. Garage ----- BORE HOLE NO. 2
 JOB F 60-2 ----- STATION See drawing
 DATUM Elev. 1236.5' ----- COMPILED BY B.K.
 BORING DATE Jan. 20/60 ----- 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 LIQUIDITY INDEX ----- X
 LIQUID LIMIT ----- 
 PLASTIC LIMIT ----- 



MATERIALS AND RESEARCH SECTION

BORE HOLE NO. 4

STATION See drawing

COMPILED BY B.K.

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) ———— + S
NATURAL MOISTURE AND LIQUIDITY INDEX ———— LI
LIQUID LIMIT ———— X
PLASTIC LIMIT ———— X

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE			
				1000	2000	3000	4000
				P.S.F. BLOWS/FT.			
	Topsoil Groundlevel	1238.0	0	50.	100	150	200
	Stiff brown silty clay <u>W.L.</u>	1237.3					
	changed to grey brown at Elev. 1229.0	1235.8					
	Grey very fine sand & silt	1228.0					
	Stiff grey silty clay	1227.7					
	Dense gr. very fine sand & silt	1223.9					
	Stiff grey silty clay	1222.0					
		1208.0					
	Dense grey very fine sand and silt with a layer of fine sand	12050					
		12030					
		12025					
	End of borehole						

153 for 85°

CONSISTENCY		SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.			
10	20	30	
	x	x	T 1 122.5
	x		S 2 -
x			S 3 -
x			S 4 -
	x		S 5 -

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 5

JOB F 60-2 STATION See drawing

DATUM Elev. 1236.5 COMPILED BY B.K.

BORING DATE Jan. 21/60 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) _____ 0
VANE TEST (G) AND SENSITIVITY (S) _____ +5
NATURAL MOISTURE AND LIQUIDITY INDEX _____ LI
LIQUID LIMIT _____ X
PLASTIC LIMIT _____

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE			
				1000	2000	3000	4000 P.S.F.
	Groundlevel	1236.5	0	50	100	150	200
	Topsoil	1235.7					
	W.L. ∇	1234.5					
	Stiff brown silty clay						
	Dense brown clayey silt changed to gr. br. at Elev. 1226.5	1228.0	10				
	Dense grey silty (stony)	1222.5					
		1221.0					
	Dense grey very fine sand and silt. with layers of grey fine sand.		20				
			30				
	Dense gr. silt (stony) (cohesive)	12020					
		1201.2					
	End of borehole		40				

CONSISTENCY		SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.			
10	20	30	
	x	o	T 1 128.8
x			S 2 144.0
x			S 3 86.4
	x		S 4 -
x			S 5 -

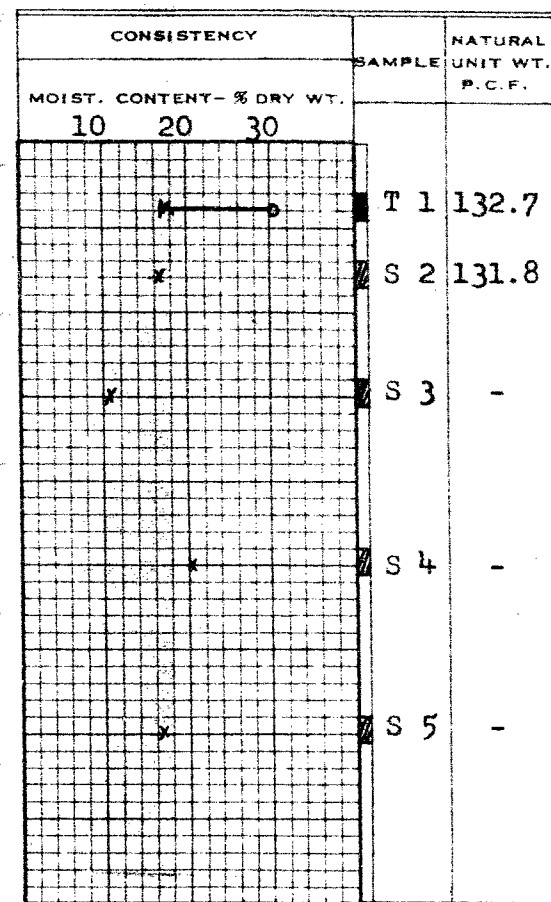
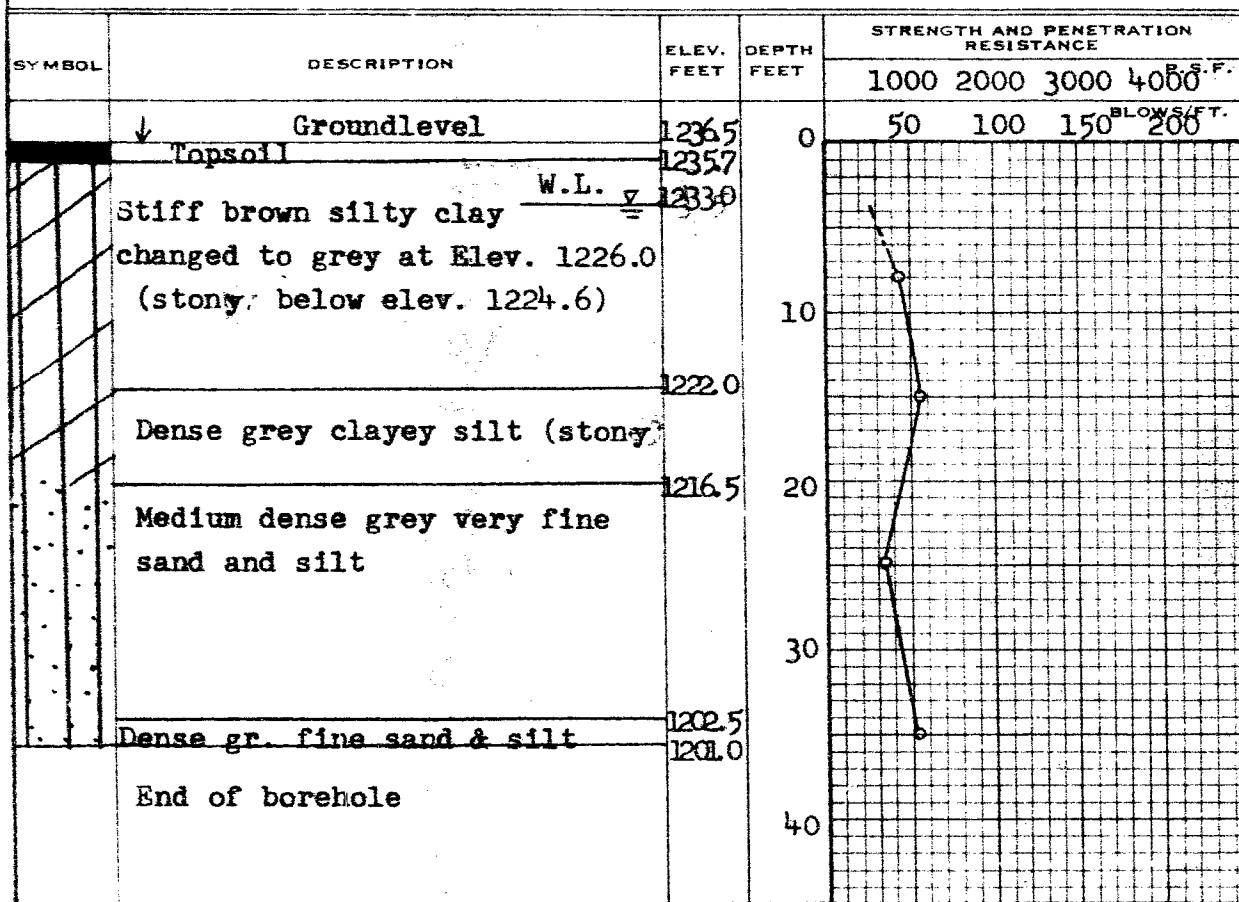
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 6
 JOB F 60-2 STATION See drawing
 DATUM Elev. 1236.5 COMPILED BY B.K.
 BORING DATE Jan. 22/60 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 _____



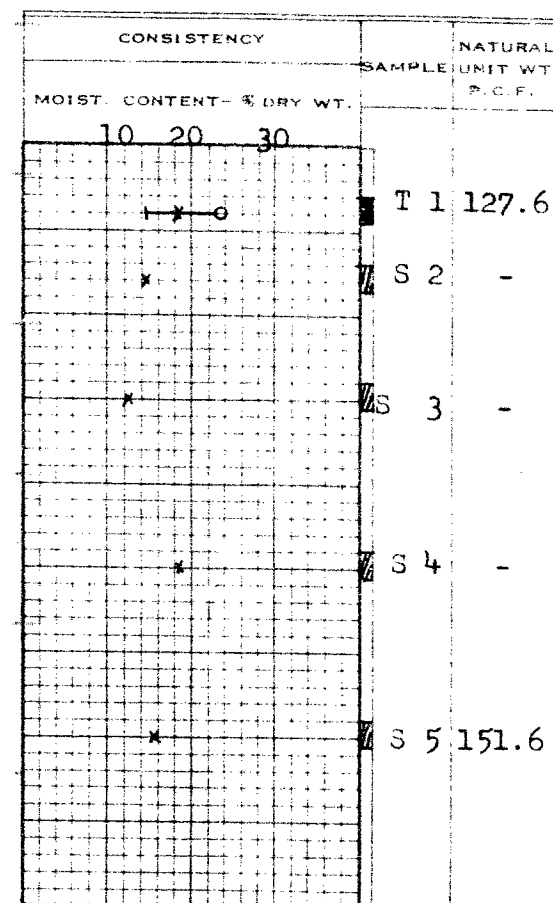
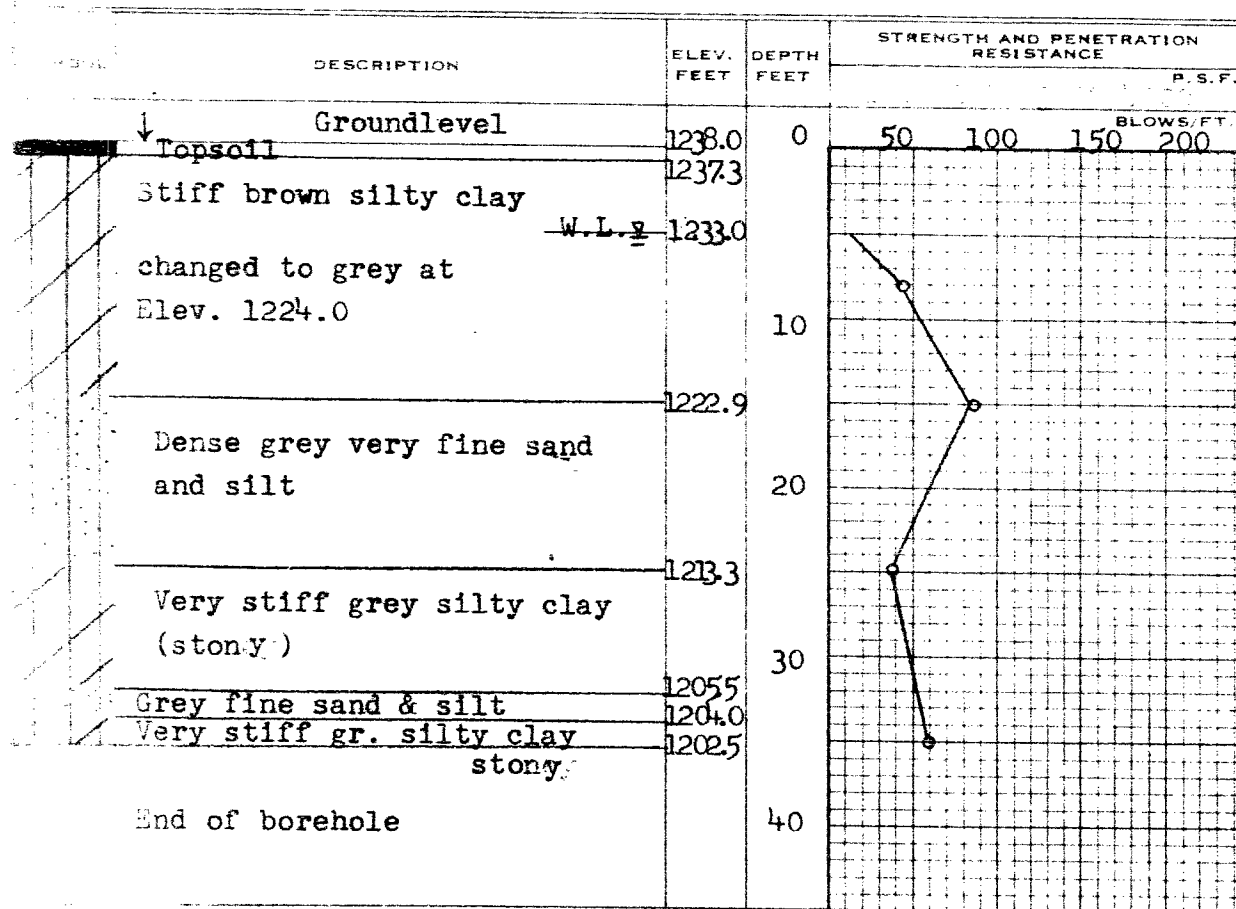
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

A.P. Garage ----- BORE HOLE NO. 7 -----
 JOB F 60-2 ----- STATION See drawing -----
 DATUM Elev. 1238.0 ----- COMPILED BY B.K. -----
 BORING DATE Jan. 22/60 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) _____ 0
VANE TEST (C) AND SENSITIVITY (S) _____ +5
NATURAL MOISTURE AND _____
LIQUIDITY INDEX _____ L
LIQUID LIMIT _____ Y
PLASTIC LIMIT _____



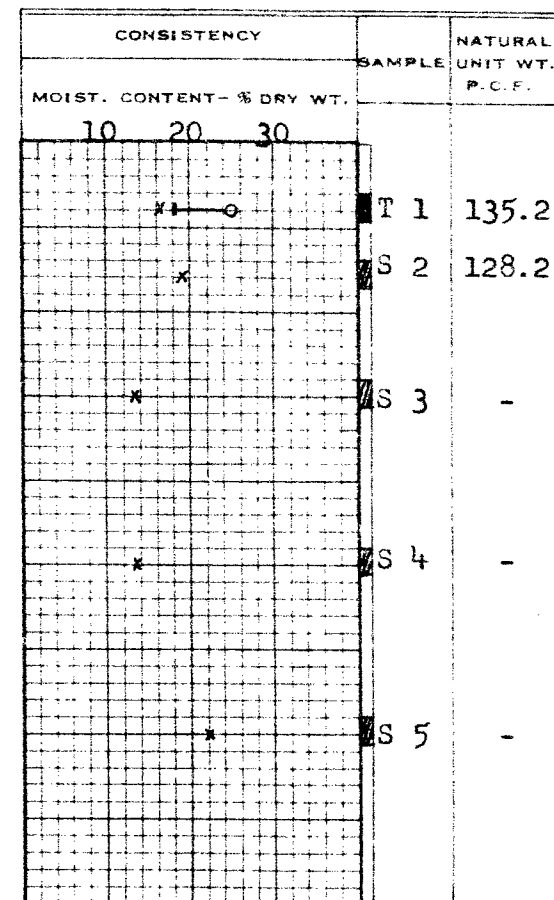
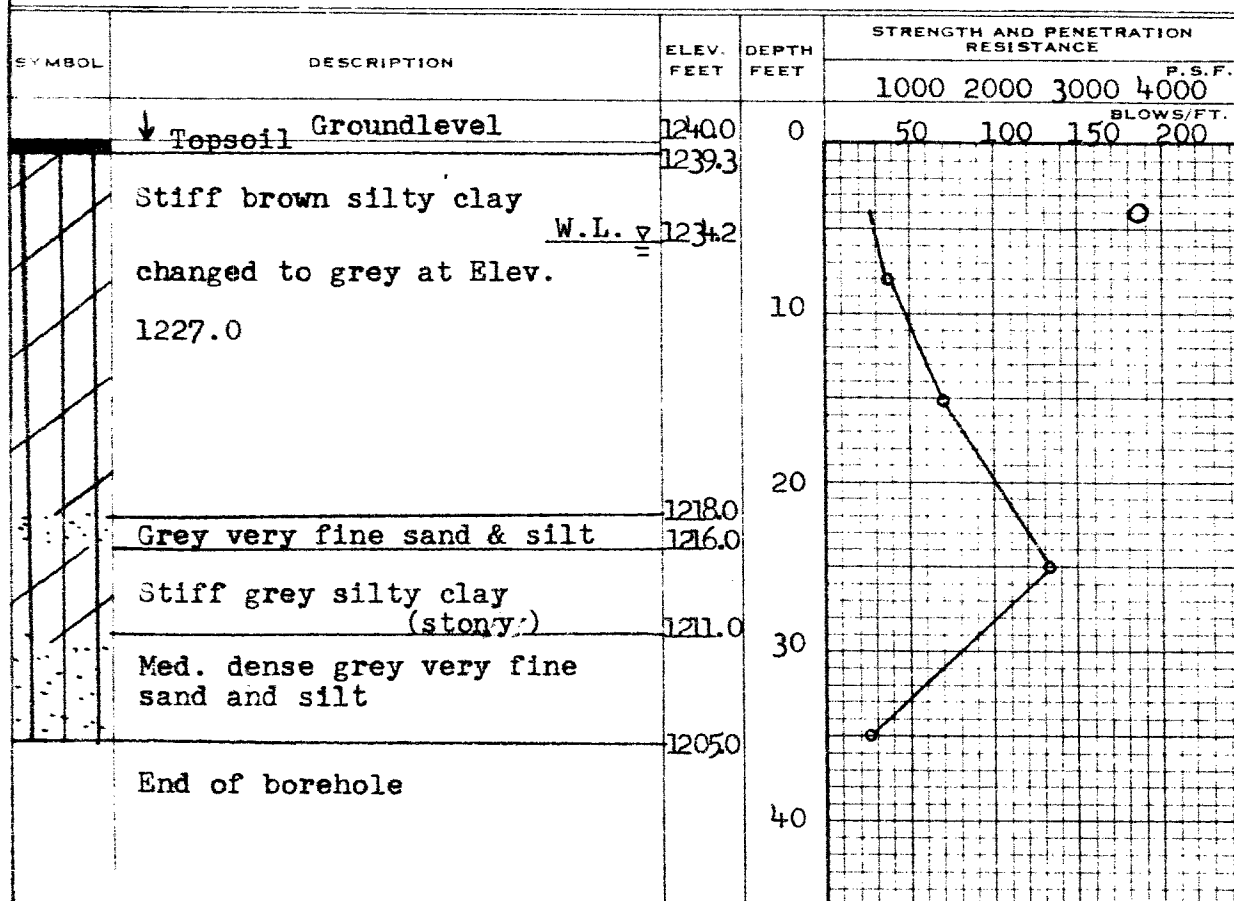
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 9
 JOB F 60-2 STATION See drawing
 DATUM Elev. 1240.0 COMPILED BY B.K.
 BORING DATE Jan. 25/60 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 _____



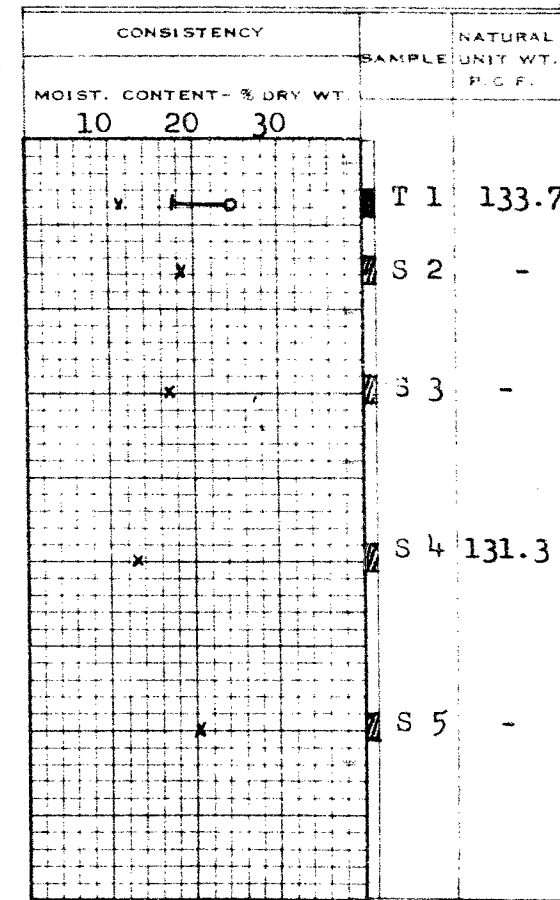
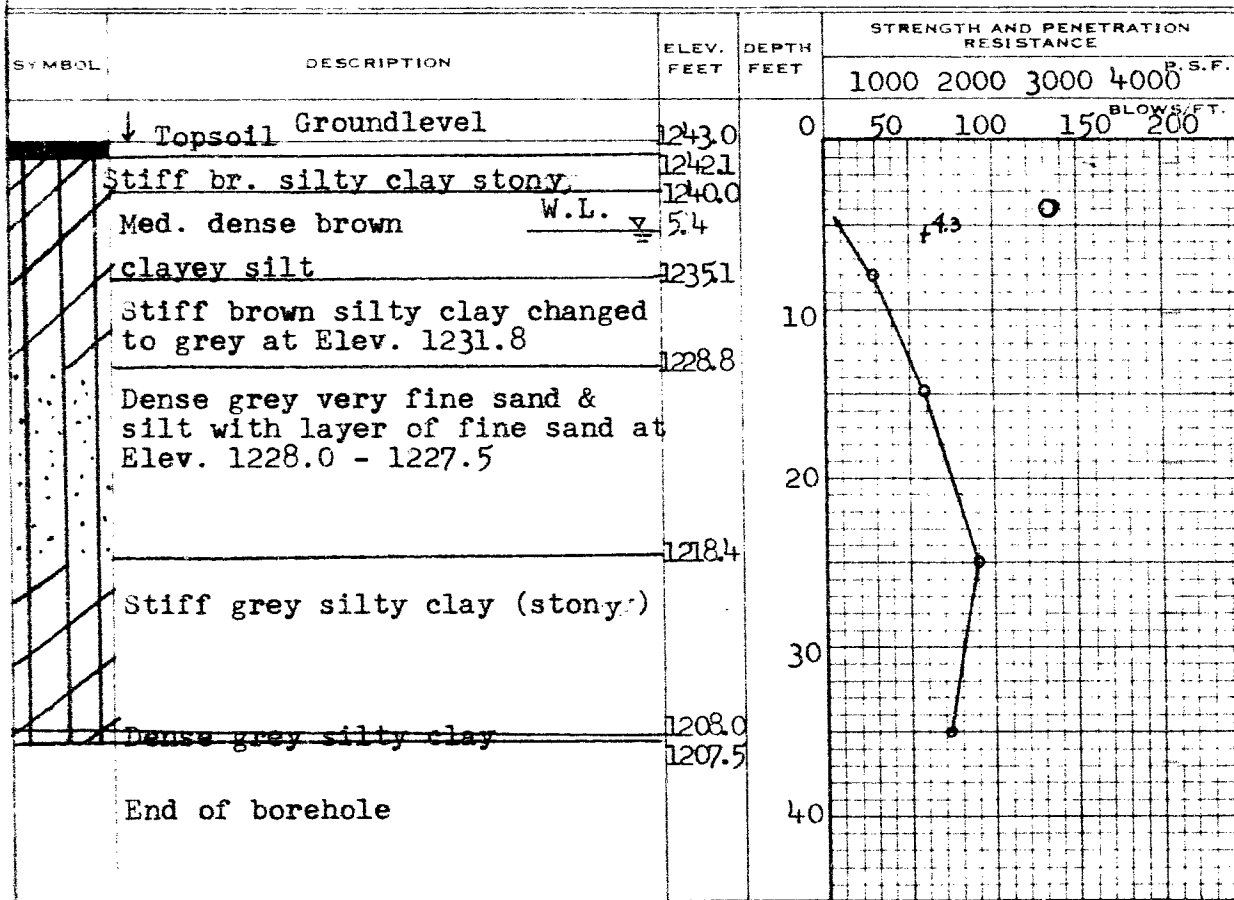
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 10
 JOB F 60-2 STATION See drawing
 DATUM Elev. 1243.0' COMPILED BY B.K.
 BORING DATE Jan. 25/60 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. 11
 JOB P 60-2 ----- STATION See drawing
 DATUM Elev. 1241.5 COMPILED BY B.K.
 BORING DATE Jan. 26/60 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) ----- 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			
				1000	2000	3000	4000
	↓ Topsoil Groundlevel	1241.5	0	50	100	150	200
	Stiff brown silty clay stony changed to grey at Elev. W.L. 1229.5	1240.5					
		1233.5	10				
		1226.5	20				
	Dense grey very fine sand and silt	1207.3	30				
		1206.0	40				
	Dense gr. clayey silt stony						
	Dense grey silt and very fine sand	1200.0					
	End of borehole						

CONSISTENCY			SAMPLE	NATURAL UNIT WT. P. C. F.
MOIST. CONTENT- % DRY WT.				
10	20	30		
			T 1	141.9
			S 2	-
			S 3	-
			S 4	-
			S 5	132.4
			S 6	-

DEPARTMENT OF HIGHWAYS - ONTARIO

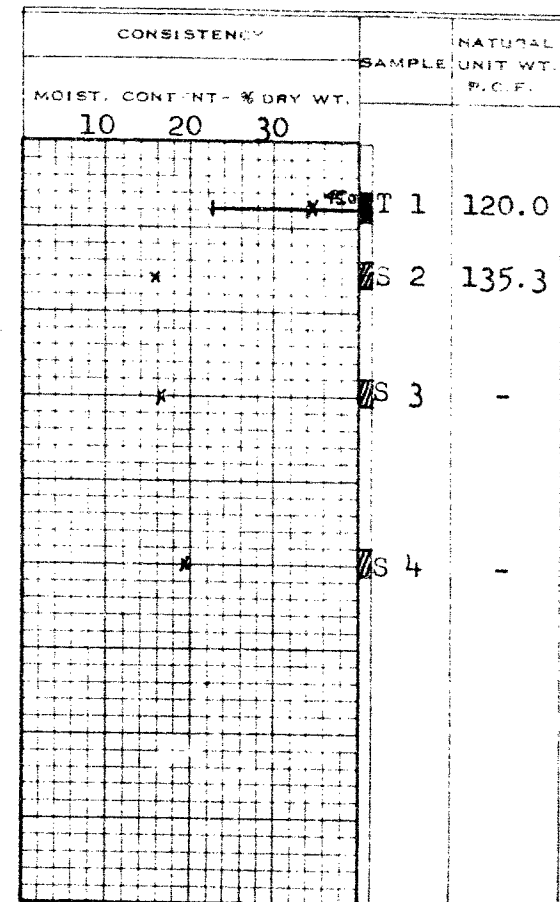
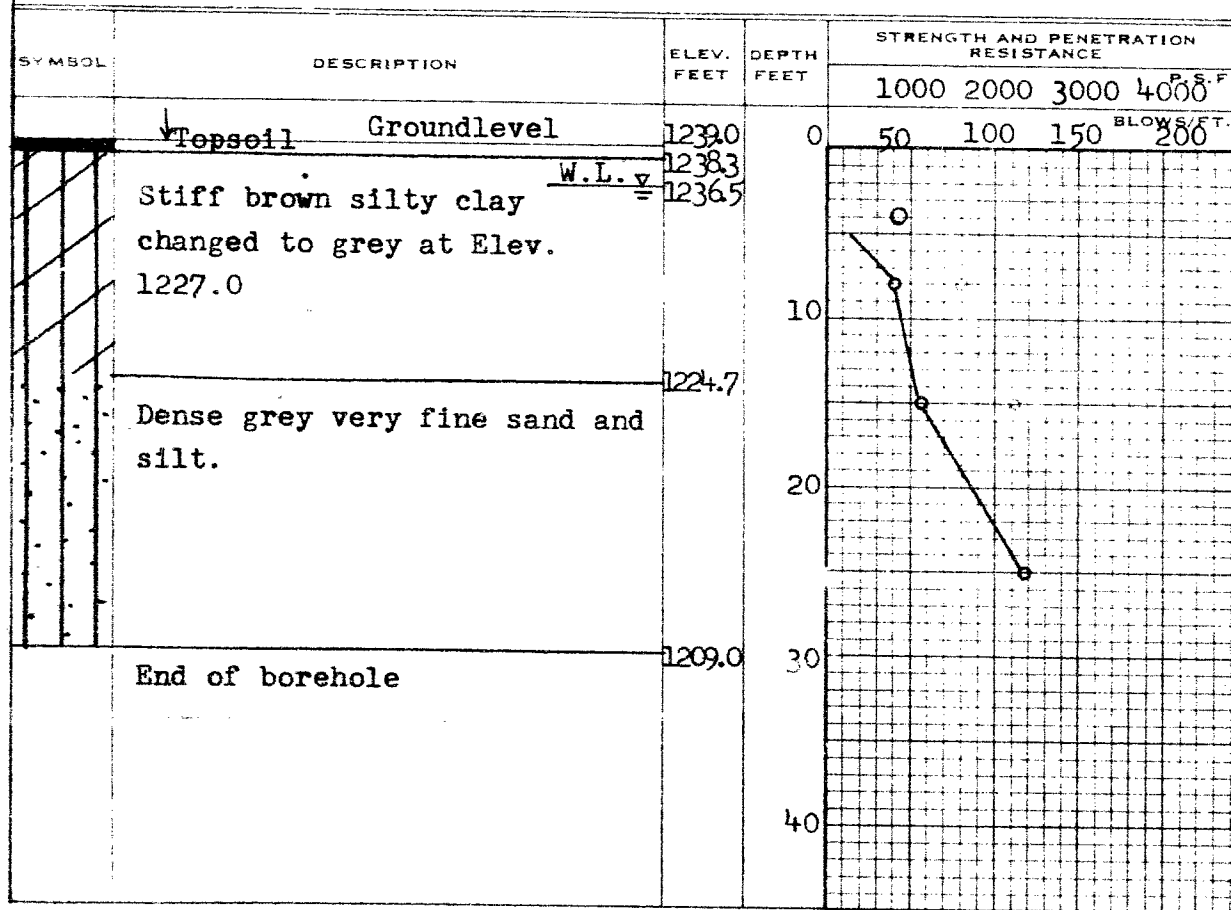
MATERIALS AND RESEARCH SECTION

W.P. Garage ----- BORE HOLE NO. 12
 JOB F 60-2 ----- STATION See drawing
 DATUM Elev. 1239.0 ----- COMPILED BY B.K.
 BORING DATE Jan. 26/60 ----- 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) -----
 VANE TEST (C) AND SENSITIVITY (S) -----
 NATURAL MOISTURE AND LIQUIDITY INDEX -----
 LIQUID LIMIT -----
 PLASTIC LIMIT -----



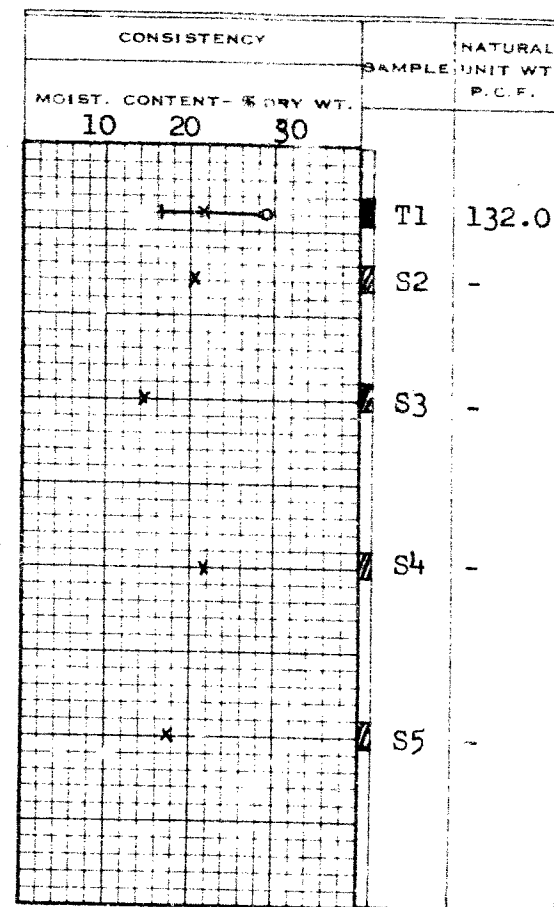
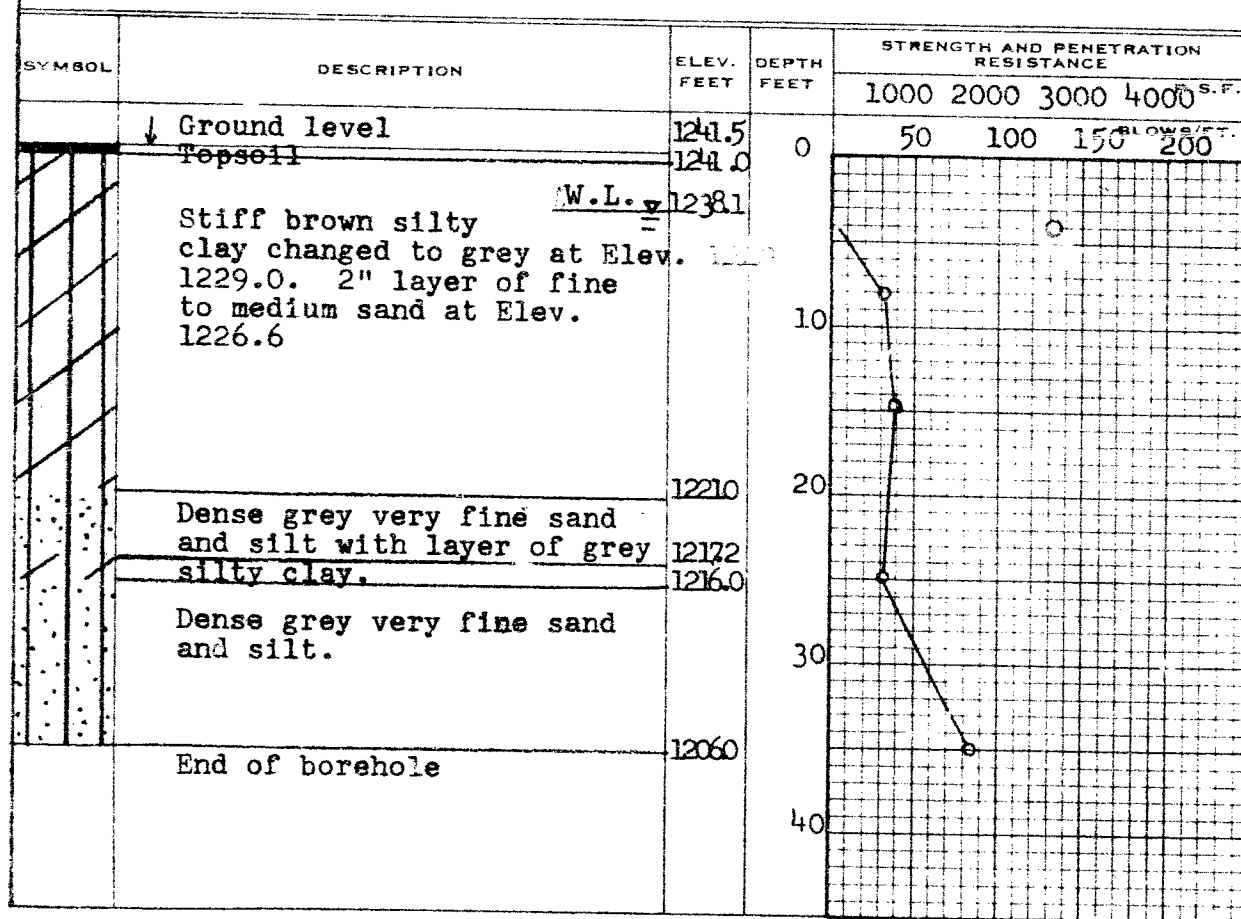
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 13
JOB F60-2 STATION See drawing
DATUM Elev. 1241.5 COMPILED BY B.K.
BORING DATE Jan. 28/60 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

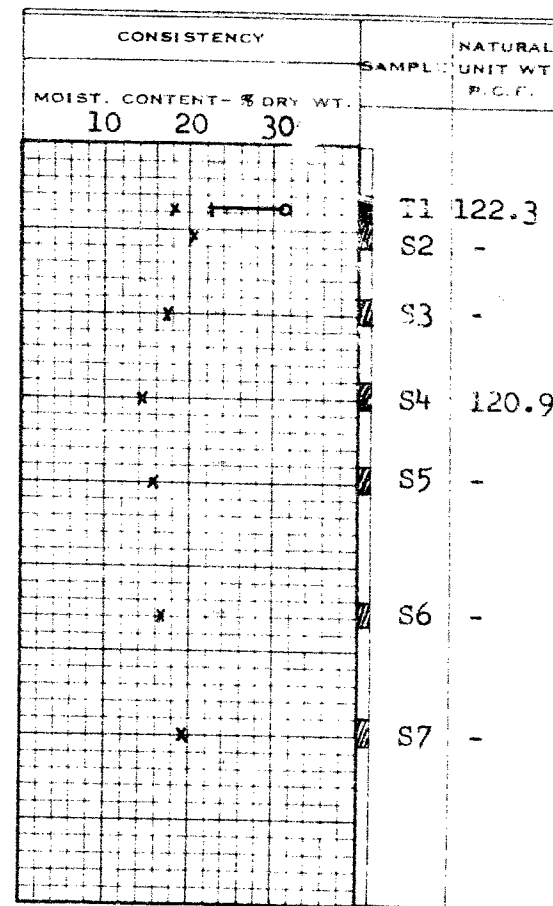
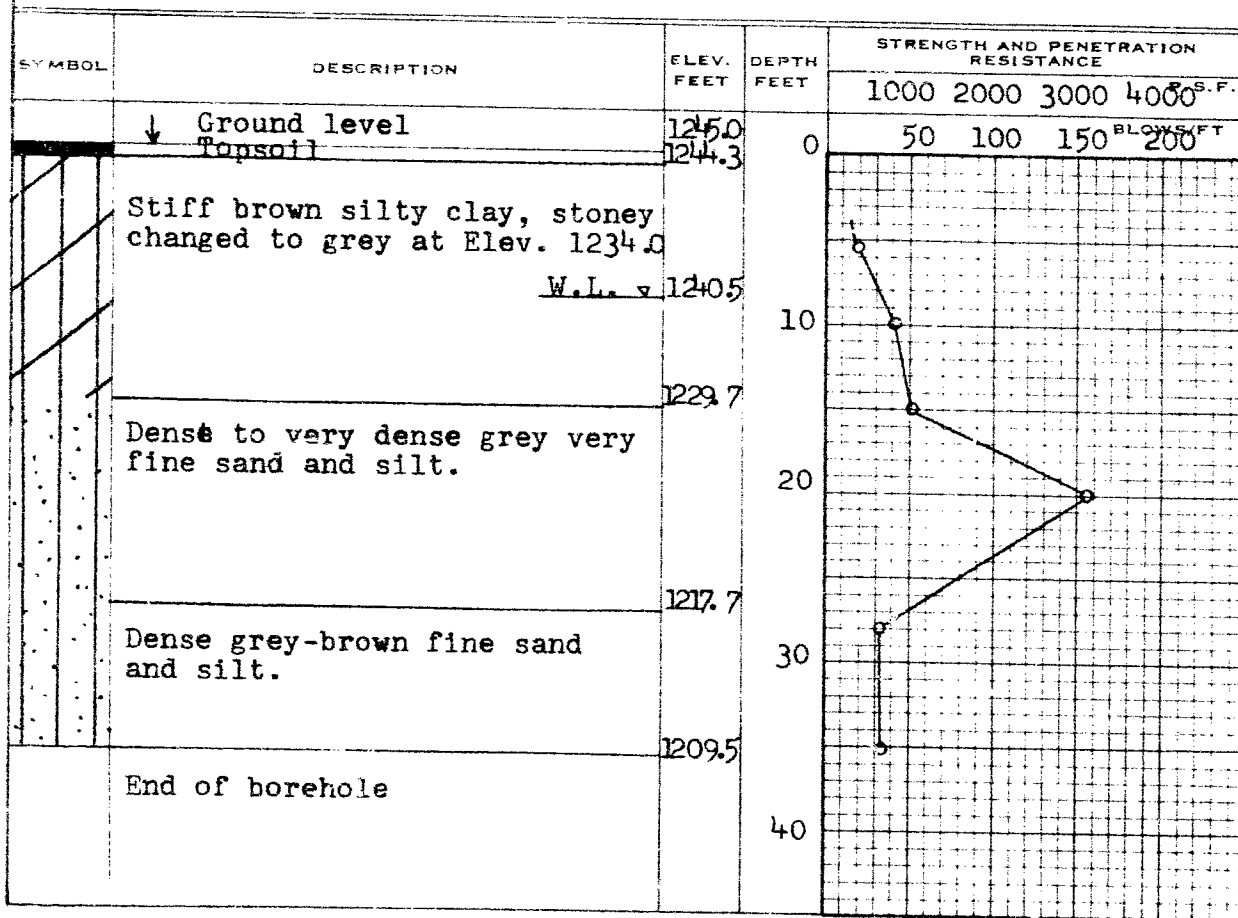
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 16
 JOB F 60-2 STATION See drawing
 DATUM Elev. 1245.0 COMPILED BY B.K.
 BORING DATE Jan. 28/60 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



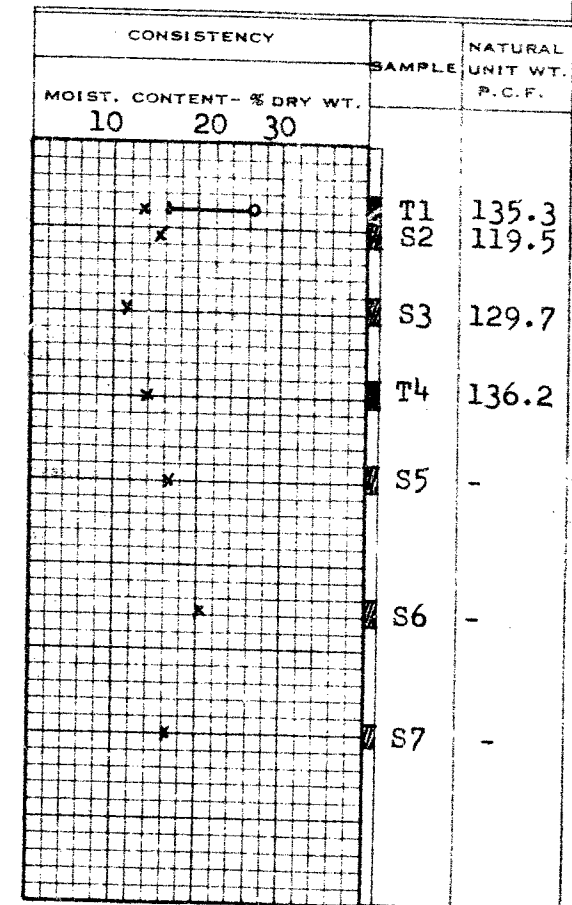
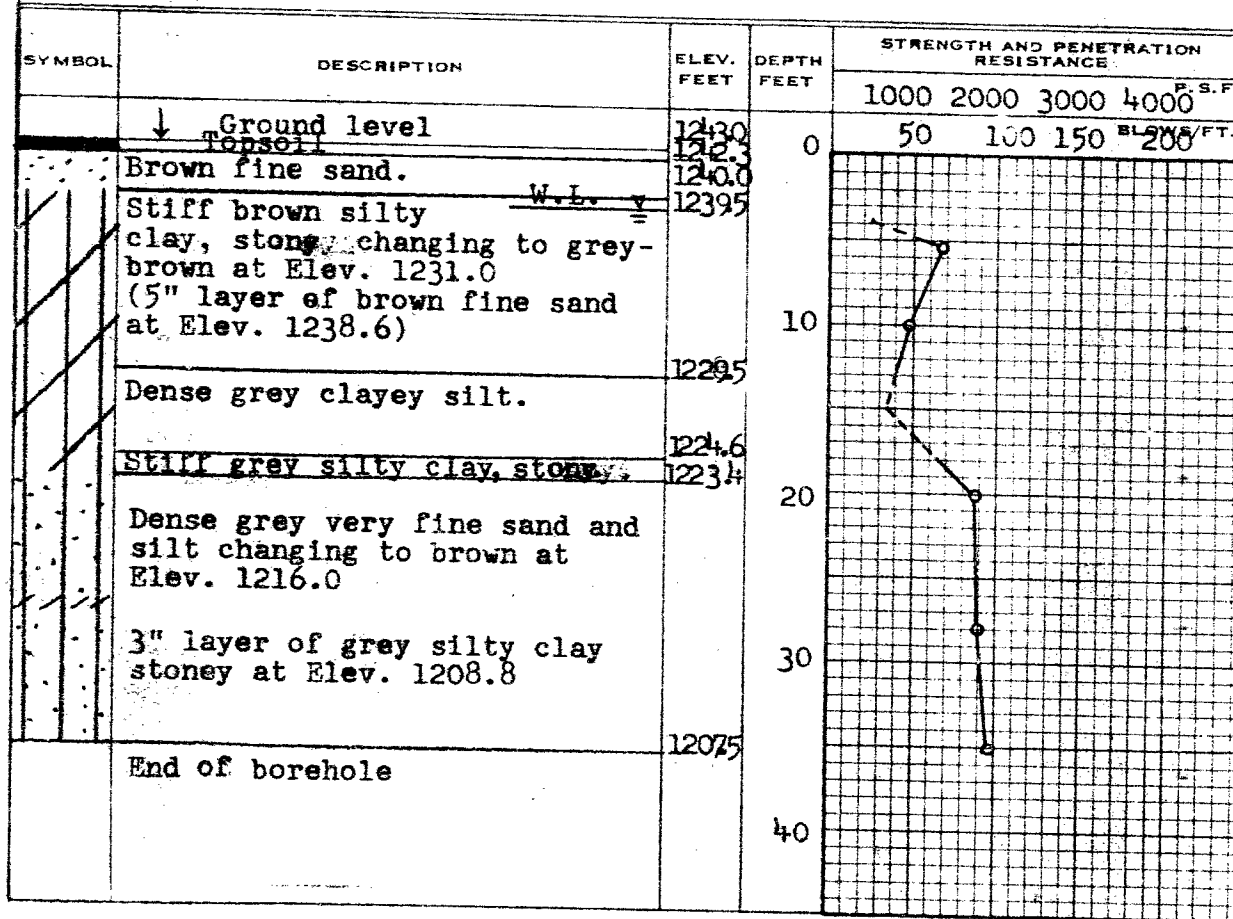
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 19
 JOB F 60-2 STATION See drawing
 DATUM Elev. 1243.0 COMPILED BY B.K.
 BORING DATE Jan. 29/60 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) +s
 NATURAL MOISTURE AND LIQUIDITY INDEX LI
 LIQUID LIMIT X
 PLASTIC LIMIT —



DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 20
JOB F 60-2 STATION See drawing
DATUM Elev. 1242.0 COMPILED BY B.K.
BORING DATE Jan. 29/60 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

