

28-2

Mr. F. E. Cavell,
Superintendent of
Special Building Services.
Materials & Research Section.

March 21, 1960.

D.E.C. FOUNDATION INVESTIGATION
W.J. F 59-97.

Attention: Mr. J. Hamilton.

Re: Proposed Regional & District Office Site
including Patrol Yard & Service Station,
London, Ontario.

A detailed foundation report for the above site has been prepared by the Foundation Section. No problems associated with the construction of foundations at any of the above locations, is apparent.

In designing the proposed buildings, consideration should be given to the conclusions and recommendations summarized at the end of the report.

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

EP/MdeP
Attach.

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

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

(K. Peaker,
FOUNDATION FIELD SUPERVISING ENGR.)

FOUNDATION INVESTIGATION F 59-97
PROPOSED REGIONAL & DISTRICT OFFICE SITE
INCLUDING PATROL YARD & SERVICE STATION,
LONDON, ONTARIO.

INTRODUCTION:

Presented in this report are the results of a foundation investigation programme carried out at the proposed site of the London Regional & District Office. The site is located at the junction of Hwys. 401 & 135, on the outskirts of the City of London.

This report presents the detailed results of field and laboratory findings as well as recommendations for the foundation of the proposed structures.

DESCRIPTION OF SITE:

The site is located on the South side of Hwy. 135, just West of the junction of Hwy. 135 and Wellington Rd. South. This junction is approximately 400 yds. North of the cloverleaf at Hwy. 401 & Wellington Rd. South.

The site is located in flat, cultivated farmland. There are a few scattered trees and bushes on the property with the majority located along fence lines.

Due to the impermeable nature of the clay till, poor natural drainage has been reported in this area.

Electricity and water should be readily available at the site. At the time of this investigation, a trunk sewer to serve this site, was in the process of being constructed.

GEOLOGY OF AREA:

The site is located in an area known as the Stratford Till Plain, which extends from London in the South, to Blyth and Listowel in the North. This is an area of ground moraine interrupted by several terminal moraines. The soil is a uniform glacial till, being a poorly drained brown, calcareous, silty clay with occasional shallow surface deposits of silt.

cont'd. /2 ...

GEOLOGY OF AREA: (cont'd.) ...

At the actual site the predominant soil type is a stiff silty clay till which is characteristic of this formation.

DESCRIPTION OF FIELD WORK:

The field work commenced on Sept. 11 and was completed on Sept. 18. The soil testing was carried out by a trailer-mounted flight auger.

The investigation consisted of ten sampled boreholes to a depth of 30' and one to 50'. Cone penetration tests were conducted adjacent to each borehole. Boreholes were advanced using a continuous flight auger with 3 samples in the first ten feet and samples at 5' intervals below 10'.

In the cohesive silty clay material, relatively undisturbed samples were obtained using 2" Ø thin-walled tubes.

In the top layer of stiff clay till a 2" O.D. split-barrelled spoon sampler was used. The dimensions of this sampler and the energy used in driving it, conform to the requirements of the Standard Penetration Test.

Field shear strength values were obtained, where possible, from in-situ vane tests.

The results of field and lab. tests can be found in tabular and borehole log form in Appendix I.

The site investigation was divided into three parts:-

- (1) Investigation at the site of proposed Office Building --
(B.H.'s 1 - 5)
- (2) Investigation at the site of proposed Garage --
(B.H.'s 6 - 7)
- (3) Investigation at site of proposed Service Station on Hwy. 401 --
(B.H.'s 8, 9 & 10)

Drawing No. P-59-97A shows the Borehole locations and subsoil profiles.

cont'd. /3 ...

SOIL TYPES:

The soil in the immediate vicinity of the sites, consists of an upper crust of very stiff, brown, silty clay till extending to approximately 10' in depth. This material is underlain by a very stiff, grey, silty clay till, extending to a depth in excess of 50'.

Office Building: (B.H.'s 1 - 5)

(a) G.L. to \approx 10' in depth -

A stiff, brown, silty clay till with traces of fine sand and gravel.

Average properties of this material, are:-

Moisture Content	=	15.4%
Plastic Limit	=	16.7%
Liquid Limit	=	29.8%
Unit Wt.	=	139.6 p.c.f.

A shear strength sample was obtained at 10 - 11.5' in B.H. #3 and was found to be 4580 p.s.f.

(b) From \approx 10' to 50' -

A stiff grey, silty clay with occasional pockets of fine sand and irregular seams of silt and fine sand occurring below 20'.

Averaged values for this material are as follows:-

Moisture Content	=	18.7%
Plastic Limit	=	15.4%
Liquid Limit	=	25.2%
Unit Wt.	=	131.7 p.c.f.

Shear strengths vary from approx. 4700 at 10-ft. depth to 1700 at a depth of 30 feet.

cont'd. /4 ...

SOIL TYPES: (cont'd.) ...

Patrol Garage: (B.H.'s 6, 7)

(a) G.L. to \approx 15.0' -

An irregular mixture composed of brown, silty, clayey sand, sandy clay and silty clay. This strata also has irregular seams and pockets of grey sand and brown sand.

Averaged values for this material are as follows:-

Moisture Content	=	13.1%
Plastic Limit	=	18.6%
Liquid Limit	=	32.8%
Unit Wt.	=	145 p.c.f.

(b) 15.0' to 31.0' -

Stiff, grey, silty clay with seams of sand.

Averaged values for this material are:-

Moisture Content	=	16.7%
Plastic Limit	=	16.1%
Liquid Limit	=	28.3%
Unit Wt.	=	132.1 p.c.f.

Shear strength of 3944 p.s.f. was obtained at a depth of 20' - 21.5' in B.H. #6.

Service Station: (B.H.'s 8, 9, 10)

(a) From G.L. to \approx 9.5' -

A stiff, brown, silty clay.

Shear strength value obtained, is approx. 2500 p.s.f.

Averaged values for this material are as follows:-

Moisture Content	=	16.7%
Unit Wt.	=	138.7 p.c.f.

SOIL TYPES: (cont'd.) ...

Service Station: (B.H.'s 8, 9, 10) - (cont'd.)

(b) From $\approx 9.5'$ to 30' -

Medium to stiff, grey, silty clay with traces of fine sand.

Averaged values for this material are as follows:-

Moisture Content	=	19.4%
Plastic Limit	=	15.3%
Liquid Limit	=	27.5%
Unit Wt.	=	129.1 p.c.f.

GROUND WATER CONDITIONS:

(1) Office Building - (B.H.s 1 - 5)

Ground water level was found to be approximately 6' below G.L.

(2) Patrol Garage - (B.H.'s 6, 7)

Ground water level is approx. 6' below G.L.

(3) Service Station - (B.H.'s. 8, 9, 10)

Free water was encountered at ≈ 29.0 feet below G.L. during the investigation.

However, it is assumed that the static water table was $\approx 6'$ below G.L.

cont'd. /6 ...

FOUNDATION CONSIDERATIONS & RECOMMENDATIONS:

(1) Office Building:

Foundations should be placed at a depth of 5' or lower, below G.L. The foundations will be of the spread footing type with a minimum width of 2'. These spread footings may be designed for a bearing pressure of 2-1/2 T/ft.². This design load incorporates a safety factor of 3.5; consequently, no appreciable settlement is anticipated.

Since the excavation may go below ground water level, some seepage will probably be encountered. This seepage will be of a very minor nature due to the relative impermeability of the clay and should be easily handled by low-capacity pumps.

(2) Patrol Garage & Service Station:

Foundations of the spread footing type are recommended placed at a minimum depth of 5' below existing G.L.

The footings can support 2-1/2 t.s.f. (Safety Factor = 3.0) using a minimum footing width of 2'.

No appreciable settlement is anticipated.

Since the bottom of the excavation may coincide with the ground water level (~6' below G.L.), some seepage may be encountered. This seepage should be of a very minor nature due to the relative impermeability of the clay and should be easily handled by low-capacity pumps.

CONCLUSIONS & RECOMMENDATIONS: (for District & Regional Office,
Patrol Garage & Service Station).

- (1) Spread footings are recommended placed at a minimum depth of 5'.
- (2) Footings can carry 2-1/2 t.s.f. with a minimum footing width of 2'.

cont'd. /7 ...

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

- (3) Seepage of water into the excavations should be of a very minor nature and can be handled by a low-capacity pumping system.
- (4) If the ground at the bottom of the footings is found to be wet, a thin concrete pad should be placed immediately after excavation to prevent softening of the underlying material and to ensure a dry surface on which to pour the footings.
- (5) In the area of service roads, parking lots, etc., the topsoil should be stripped and replaced with 18" of G.B.C. "B", and 6" of G.B.C. class "A".
A 3-1/2" thickness of H.L.-4 is recommended for all paved areas. This should be comprised of a 2" base course and a 1-1/2" wearing surface.

G.G. Cherrington

G.G. Cherrington,
Project Foundation Engr.

APPENDIX 1.

SUMMARY OF FIELD & LABORATORY TESTS

JOB F59-97

W.F. Garage

HOLE NO	SAMP NO	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENETN RESIST. BLOWS FT	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH psi	UNIT WEIGHT pcf	REMARKS
1	S1	3'-4.5'	Stiff grey silty clay with small pebbles.	22	17.1	-	-	-	138.0	Glacial till formation.
	S2	5'-6.5'	Stiff brown silty clay with trace of sand.	29	13.4	16.5	32.4	-	144.0	
	S3	10'-11.5'	Stiff grey silty clay.	21	16.2	-	-	-	130.0	
	T4	15'-16.5'	Grey silty clay.	P	20.6	16.3	33.4	2320	128.0	
	T5	20'-21.5'	Grey silty clay.	P	20.5	-	-	-	130.5	
	T6	25'-26.5'	Grey silty clay with silty seams and pockets.	P	18.0	-	-	-	132.1	
2.	S1	3'-4.5'	Stiff grey brown silty clay.	27	14.6	-	-	-	141.5	No recovery.
	T2	5'-6.5'	Very stiff grey brown silty clay.	33	15.7	17.1	31.4	-	135.1	
	T3	10'-11.5'		17	-	-	-	-	-	
	T4	14'-15.5'	Stiff grey silty clay with sand.	22	17.2	16.3	28.1	4060	137.0	
	T5	20'-21.5'	Grey silty clay with clay seams	14	17.1	-	-	-	-	
	T6	25'-26.5'	Grey silty clay.	P	-	-	-	-	-	
3.	S1	3'-4.5'	Very stiff brown silty clay with sand and gravel.	36	11.9	-	-	-	-	Glacial till formation
	S2	5'-6.5'	Stiff grey brown silty clay with small pebbles.	29	10.5	13.6	23.3	-	149.0	
	T3	10'-11.5'	Stiff brown fine sandy clay	21	10.5	13.4	20.4	4580	142.8	
	T4	15'-16.5'	Stiff grey silty clay	11	18.6	13.3	15.6	3110	133.0	
	T5	21'-21.5'	Grey clay, to very fine sandy silt.	P	20.0	-	-	-	131.6	

SUMMARY OF FIELD & LABORATORY TESTS

JOB F50-97

W.P. None

HOE NO.	SAMP NO.	DEPTH (FEET)	MATERIAL DESCRIPTION	PENETR. RESIST. BLOWS/FT	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH PSI	UNIT WEIGHT PCF	REMARKS
3	T6	25-26.5'	Grey silty clay	P	19.3	-	-	-	132.0	
	T7	30-31.5'	Grey silty clay	P	23.3	-	-	-	-	
	vane	33.5'		-	-	-	-	1680	-	Sens: 3.8
4	S1	3'-4.5'	Medium brown silty clay with pockets of fine grey silty sand.	11	22.4	-	-	-	126.8	
	T2	5'-6.5'	Stiff brown silty clay with pockets of fine grey sand.	P	17.1	18.7	28.8	-	134.6	
	T3	10-11.5'	Stiff grey silty clay	P	17.5	-	-	4560	133.0	Glacial till formation
	T4	15-16.5'	Stiff light brown slightly silty clay	23	18.6	15.7	27.0	-	134.2	
	T5	20'-21.5'	Stiff grey silty clay with seams.	14	18.5	15.8	25.6	-	128.7	
	T6	25'-26.5'	Stiff grey silty clay - traces of sand.	P	17.6	-	-	-	127.6	
	S7	40-41'	Stiff grey silty clay.	P	21.8	15.4	22.7	-	-	
5	S1	3'-4.5'	Stiff grey brown silty clay with fine sand.	23	6	-	-	-	145.5	
	S2	5'-6.5'	Very stiff brown silty clay - trace of sand.	35	16.8	17.8	33.3	-	142.2	Glacial till formation
	T3	10'-11.5'	Stiff grey-brown silty clay.	22	17.5	15.9	29.1	5040	132.5	
	T4	15'-16.5'	Grey very fine sandy silt with layers of clay.	P	15.8	-	-	-	-	
	T5	20-21.5'	Grey slightly silty clay with pockets of fine sand.	P	22.4	-	-	-	125.0	
	T6	25'-26.5'	Grey silt with clay varves.	P	-	-	-	-	-	
	T7	30-31.5'	Grey silty clay with fine seams of silt.	P	21.0	-	-	-	123.5	

SUMMARY OF FIELD & LABORATORY TESTS

JOB F 59-97

W.P. None

HOLE NO.	SAMPLE NO.	SAMPLE DEPTH FEET	MATERIAL DESCRIPTION	PENETN RESIST. BLOW/FT	MOIST CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH PSI	UNIT WEIGHT PCF	REMARKS
6	S1	3'-4.5'	Very stiff grey brown silty clay with sand and traces of gravel.	38	15.8	-	-	-	145.5	Glacial till formation
	S2	5'-6.5'	Very stiff brown silty clay with traces of sand.	38	15.0	18.6	32.8	-	144.0	
	S3	7.5-9'	Stiff grey brown fine sandy clay - trace of coarse sand to fine gravel.	18	7.1	-	-	-	-	
	S4	15'-16.5'	Stiff grey silty clay	11	17.7	-	-	-	-	
	T5	20'-21.5'	Stiff grey silty clay - trace of sand.	P	19.0	16.1	28.3	3944	131.3	
7	S1	3'-4.5'	Very stiff brown clayey very fine sand.	25	12.2	-	-	-	-	Glacial till formation
	S2	5'-6.5'	Very stiff brown silty very fine sand.	34	13.7	-	-	-	-	
	S3	10'-11.5'	Brown clayey very fine sand.	12	15.1	-	-	-	-	
	T4	15-16.5'	Stiff grey silty clay-trace of sand.	P	18.2	-	-	-	132.0	
	T5	20-21.5'	Stiff grey silty clay.	P	16.5	-	-	-	133.1	
	T6	25-26.5'	"	-	-	-	-	-	-	No recovery
	S7	25-27.'	Brown clayey very fine sand.	7	11.9	-	-	-	-	
8	S1	3'-4.5'	Very stiff brown silty clay.	36	16.0	-	-	-	143.6	Glacial till formation
	S2	5'-6.5'	Stiff brown silty clay.	23	17.2	15.5	29.5	3340	138.5	
	T3	10'-11.5'	Firm brown silty clay.	P	19.0	14.8	29.3	-	131.0	
	T4	13.5'-15'	Stiff grey silty clay.	P	17.0	-	-	-	135.1	
	T5	20-21.5'	Firm grey silty clay.	P	21.0	-	-	-	-	

W.P. None

HOLE NO.	SAMP. NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENETR. RESIST. BLOWS/FT	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH P.S.F.	UNIT WEIGHT P.C.F.	REMARKS
8	T6	25-26.5'	Medium grey silty clay.	P	20.1	-	-	-	124.5	
9	S1	3'-4.5'	Very stiff brown silty clay with traces of fine gravel.	32	16.3	-	-	-	-	Glacial till formation.
	T2	8'-9.5'	Medium grey silty clay	P	18.5	18.3	27.0	2130	128.6	
	T3	13'-14.5'	Firm grey silty clay.	P	19.6	15.3	26.1	-	-	
	T4	20'-21.5'	Firm grey silty clay.	P	20.2	15.9	25.6	-	124.3	
	T5	25-26.5'	Firm grey silty clay.	P	20.6	-	-	-	121.5	
10	S1	3'-4.5'	Very stiff brown silty clay.	32	15.9	17.0	30.0	-	144.0	Glacial till formation.
	S2	6'-7.5'	Very stiff grey brown silty clay	32	16.7	-	-	-	-	
			Stiff brown silty clay changing to							
	T3	9'-10.5'	Stiff grey silty clay.	24	16.5	-	-	3265	137.7	
	T4	15'-16.5'	Stiff grey silty clay with fine sand.	P	18.0	-	-	-	131.3	
	T5	25'-26.5'	Stiff grey silty clay with silt seams.	P	22.0	17.8	28.5	-	123.0	
			S denotes Split Spoon Sample T denotes Shelby Tube Sample							

DEPARTMENT OF HIGHWAYS - ONTARIO

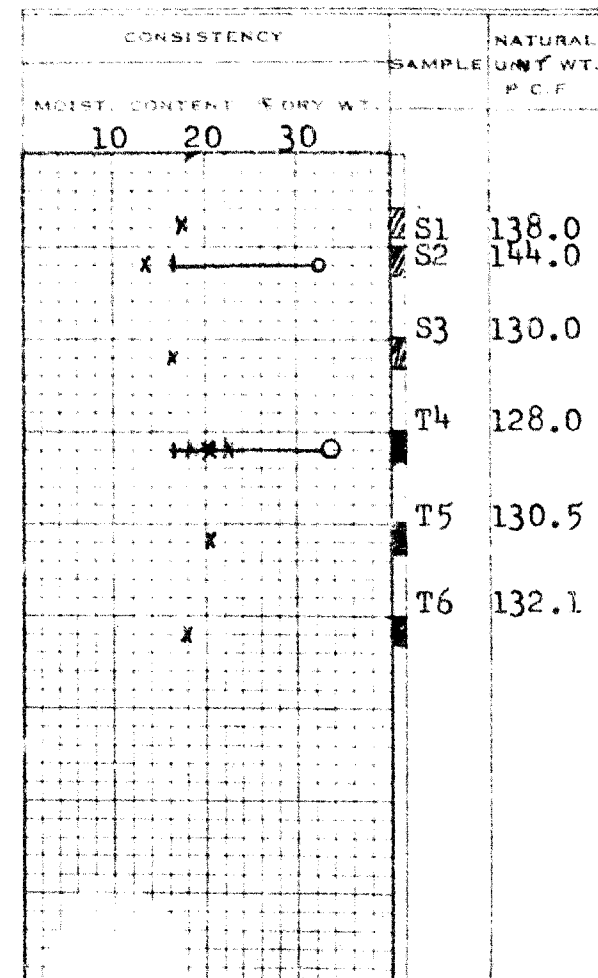
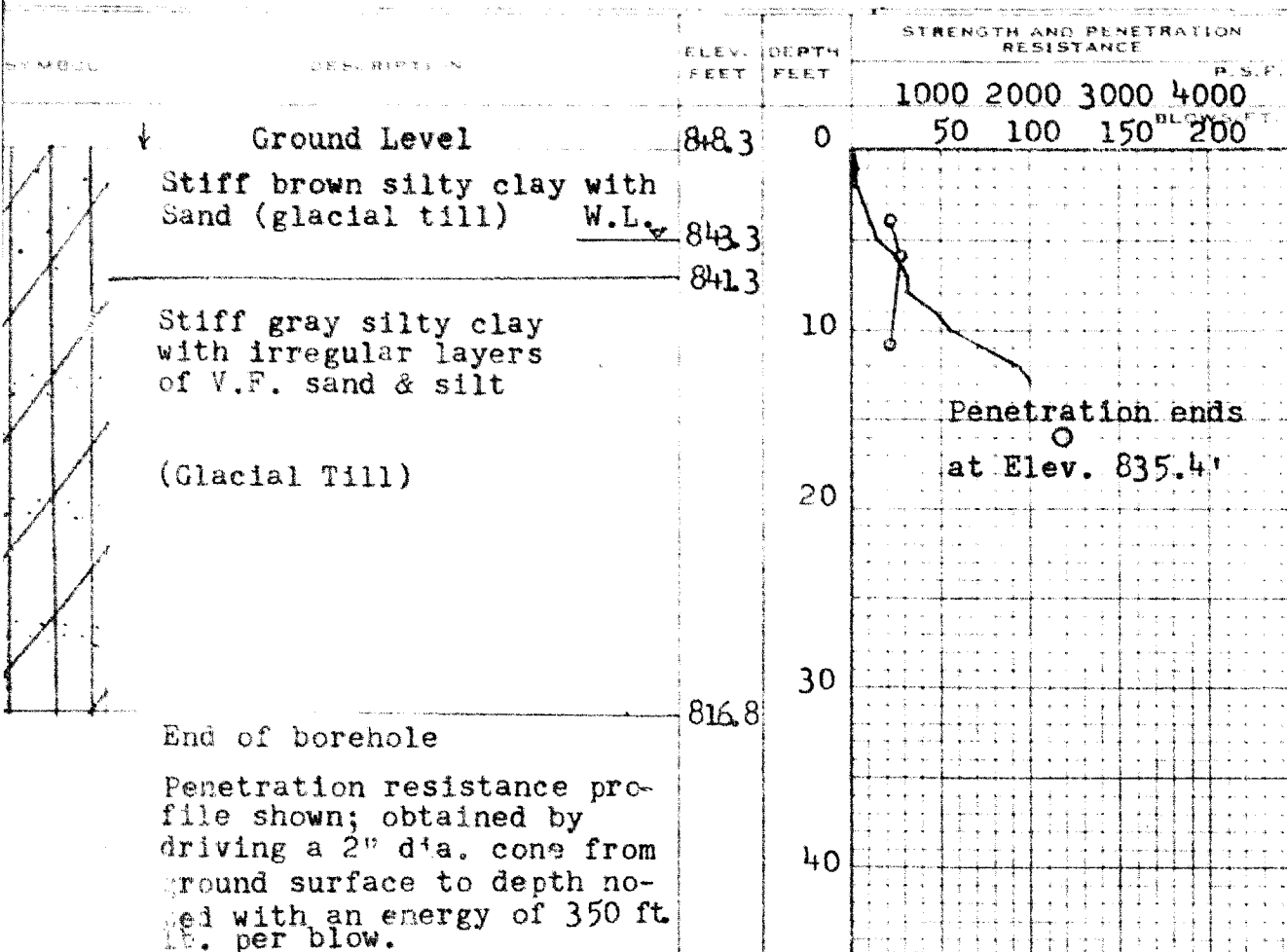
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 1
 JOB F 59-97 STATION See drawing
 DATUM 848.3' COMPILED BY B.K.
 BORING DATE Sept. 15/59 CHECKED BY G.G.C.

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 (ST) +
 NATURAL MOISTURE AND LIQUIDITY INDEX X
 LIQUID LIMIT
 PLASTIC LIMIT



DEPARTMENT OF HIGHWAYS - ONTARIO

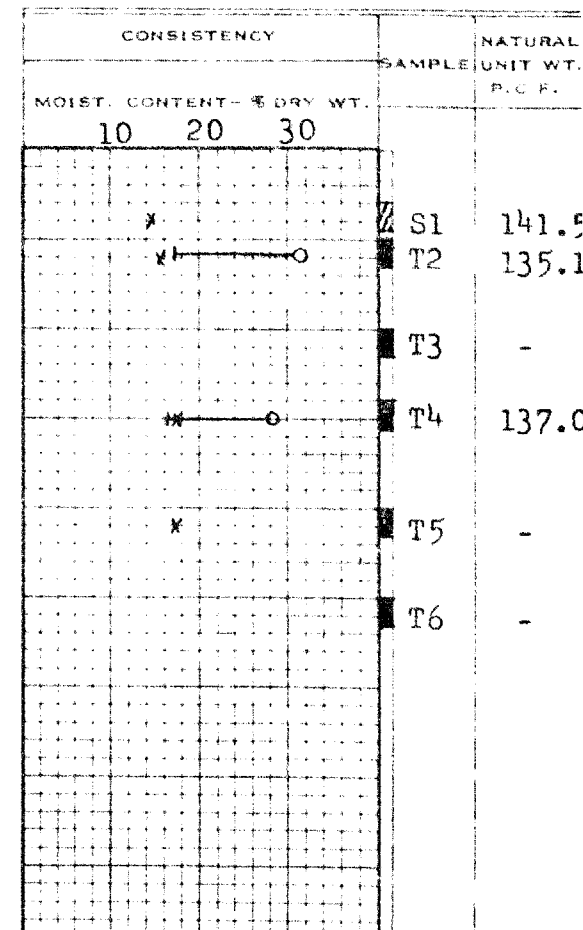
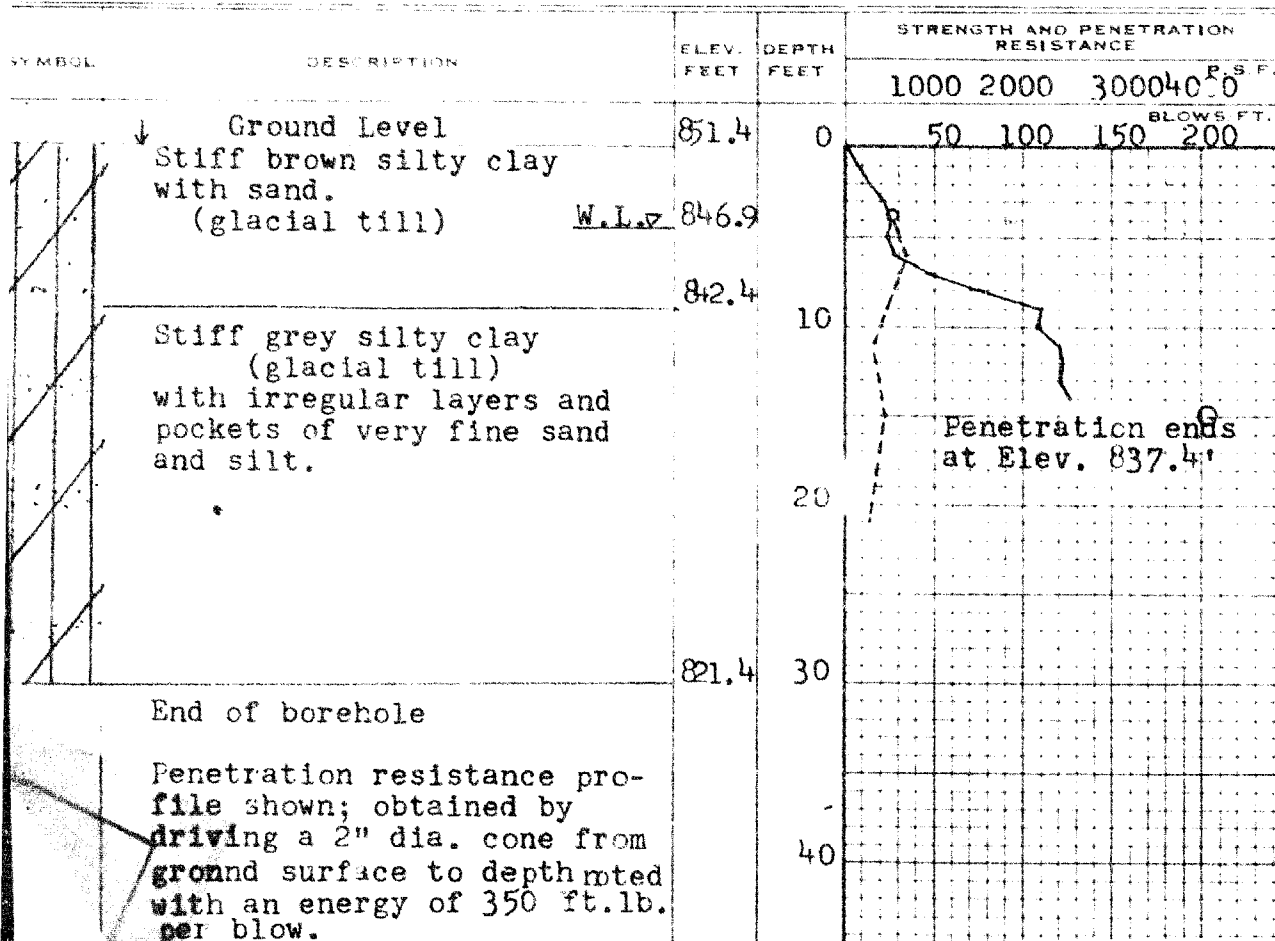
MATERIALS AND RESEARCH SECTION

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 JOB F 59-97 STATION See drawing
 DATUM 851.4' COMPILED BY B.K.
 BORING DATE Sept. 14/59 CHECKED BY G.G.C.

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

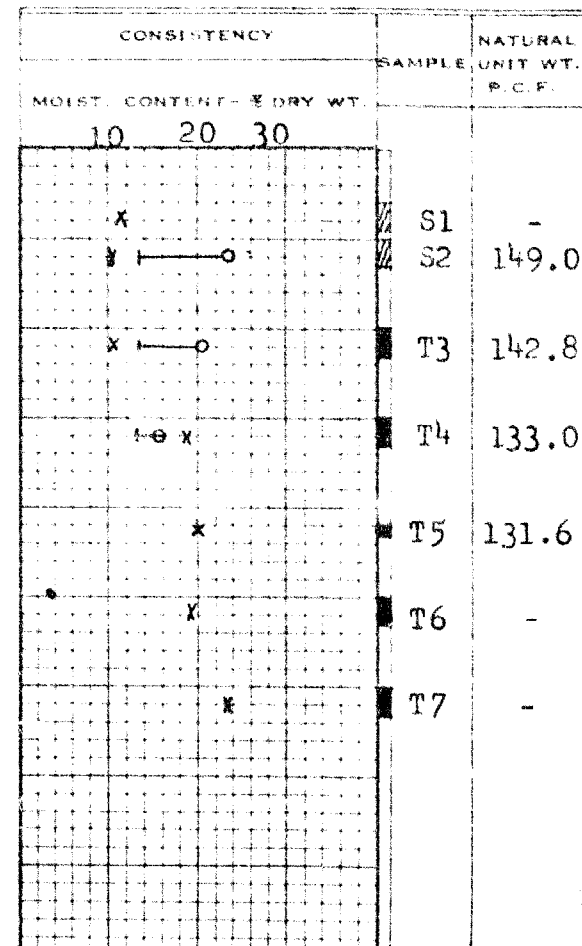
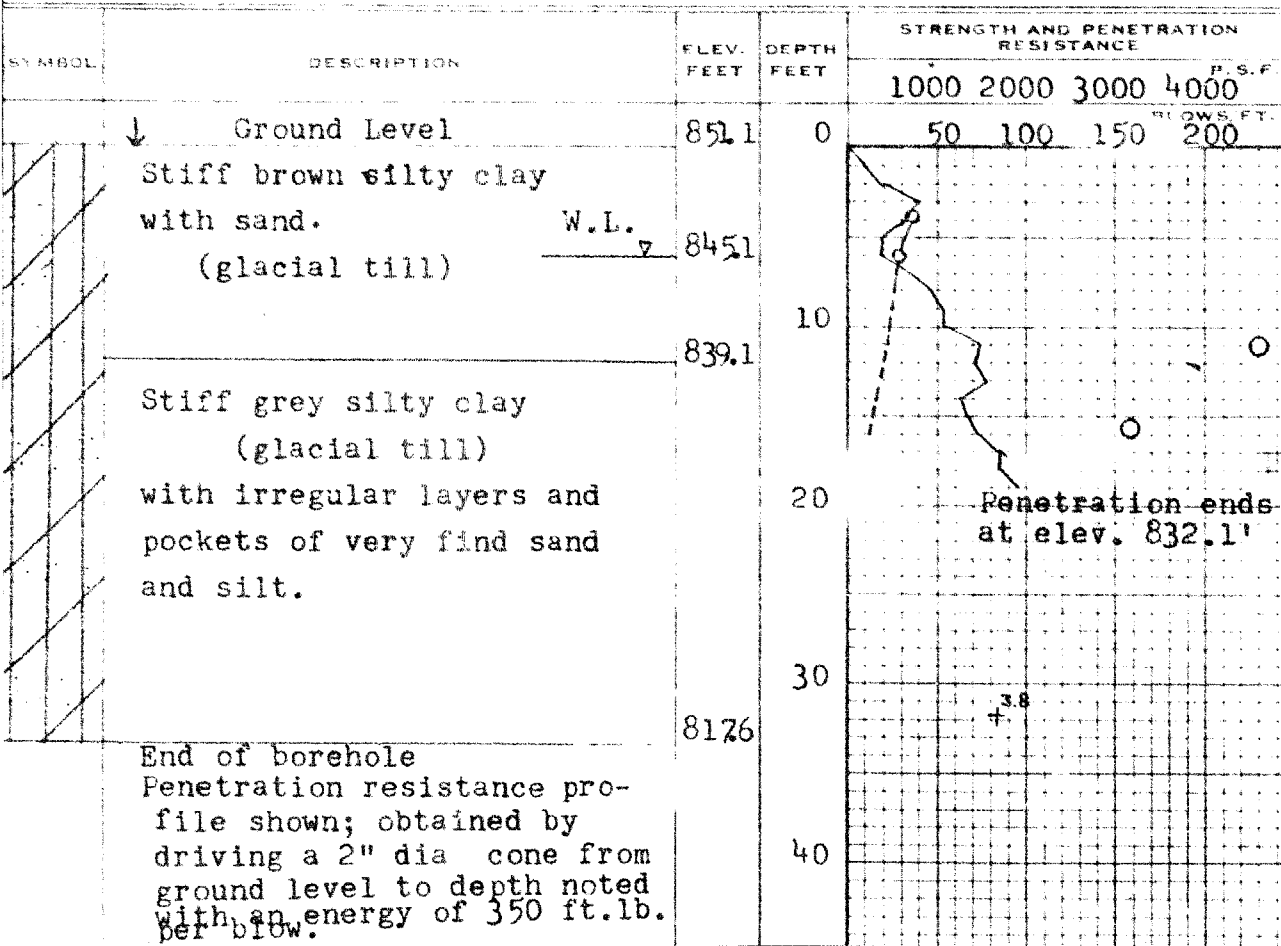
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 3
 JOB F 59-97 STATION See drawing
 DATUM 851.1' COMPILED BY B.K.
 BORING DATE Sept. 14/59 CHECKED BY C.G.C.

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 U
 LIQUID LIMIT X
 PLASTIC LIMIT



DEPARTMENT OF HIGHWAYS - ONTARIO

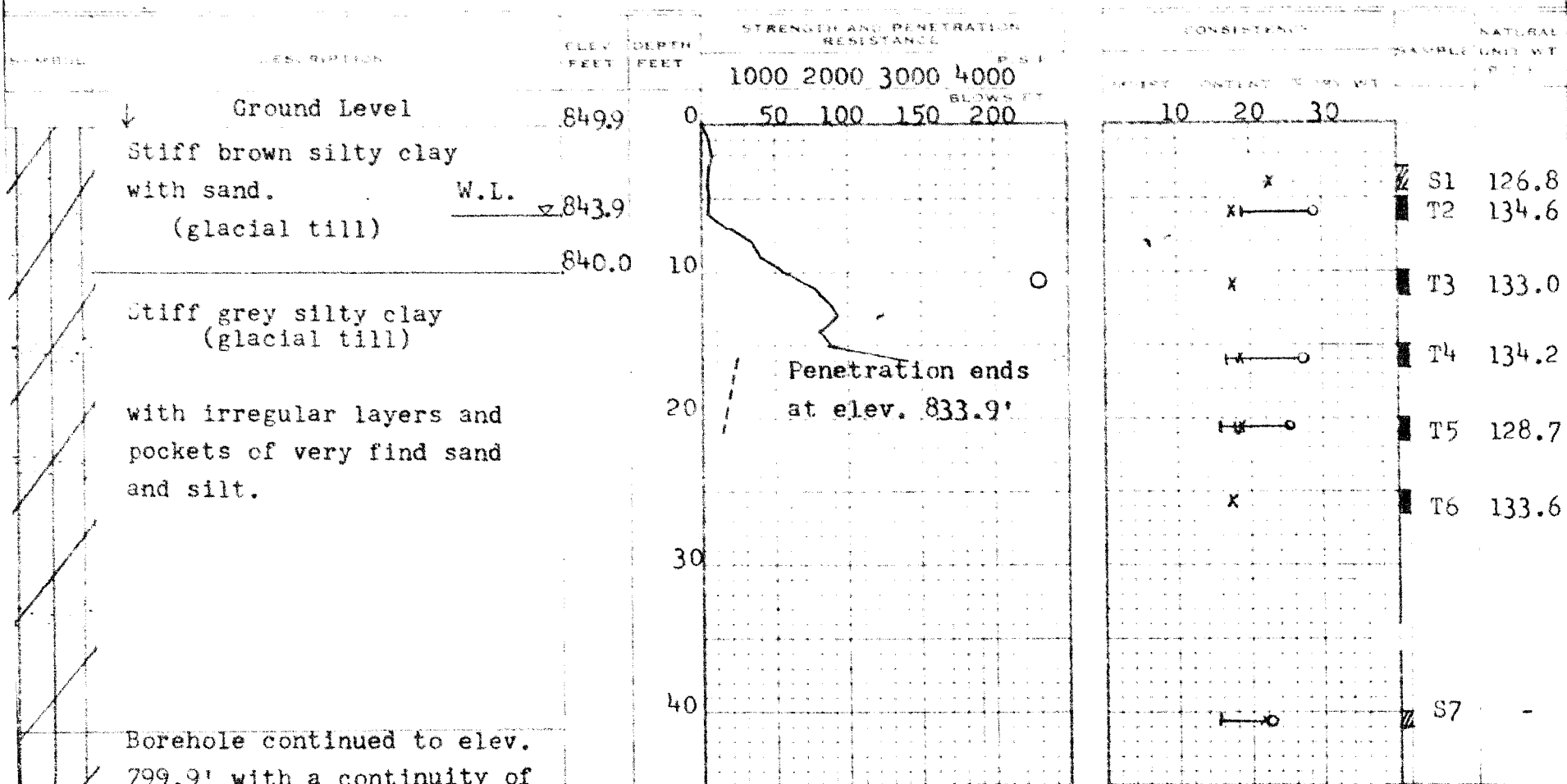
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 4
 JOB F 59-97 STATION See drawing
 DATUM 849.9' COMPILED BY B.K.
 BORING DATE Sept. 16/59 CHECKED BY G.G.C.

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

LEGEND

UNCONFINED COMPRESSION (Qu) O
 VANE TEST (C) AND SENSITIVITY (S) +S
 NATURAL MOISTURE AND LIQUIDITY INDEX N
 LIQUID LIMIT L
 PLASTIC LIMIT P



Borehole continued to elev. 799.9' with a continuity of the above station.

Penetration resistance profile shown; obtained by driving a 2" dia. cone from ground level to depth noted with an energy of 350 ft. lb. per blow.

DEPARTMENT OF HIGHWAYS - ONTARIO

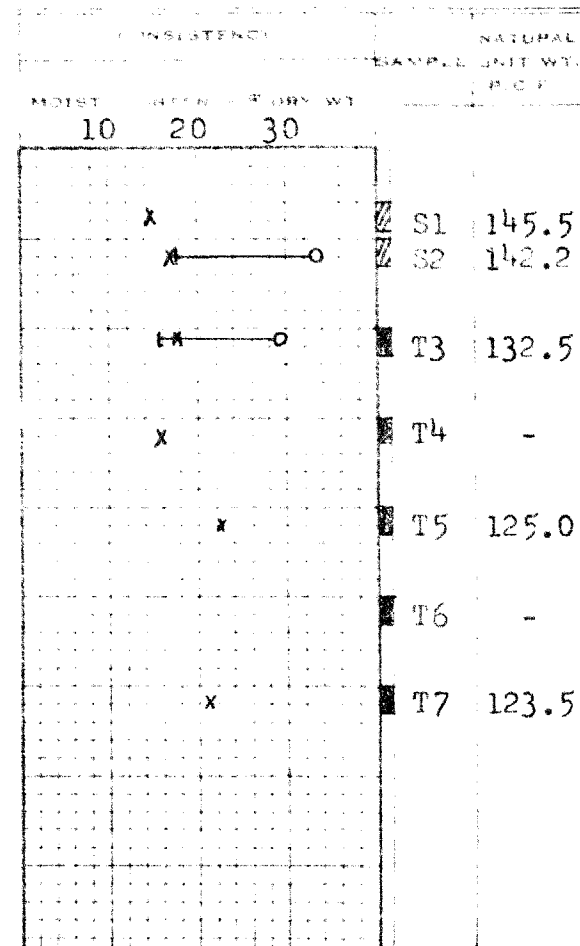
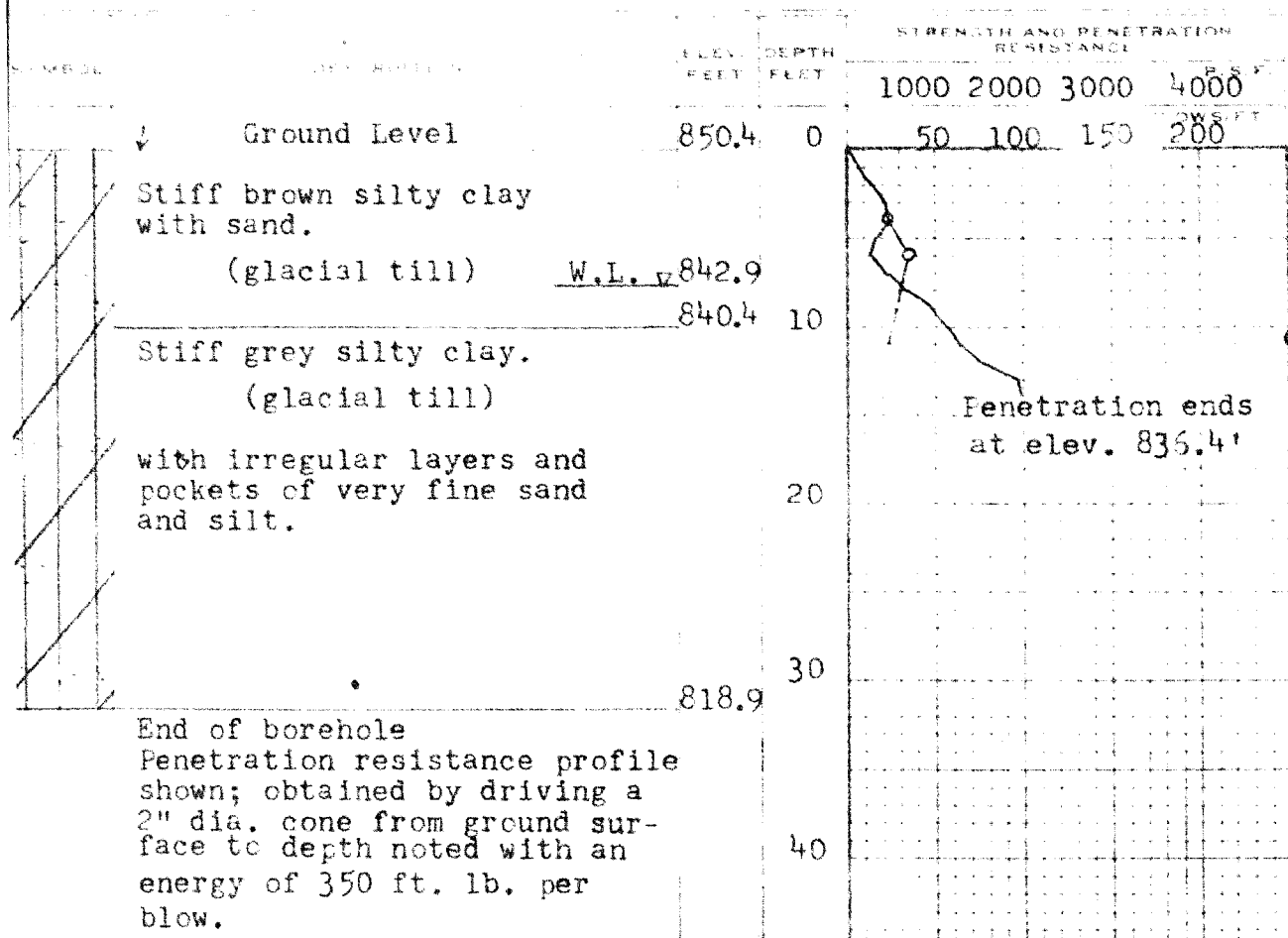
MATERIALS AND RESEARCH SECTION

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 JOB F 59-97 STATION See drawing
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 BORING DATE Sept. 15/59 CHECKED BY G.G.C.

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 L
 PLASTIC LIMIT P



DEPARTMENT OF HIGHWAYS - ONTARIO

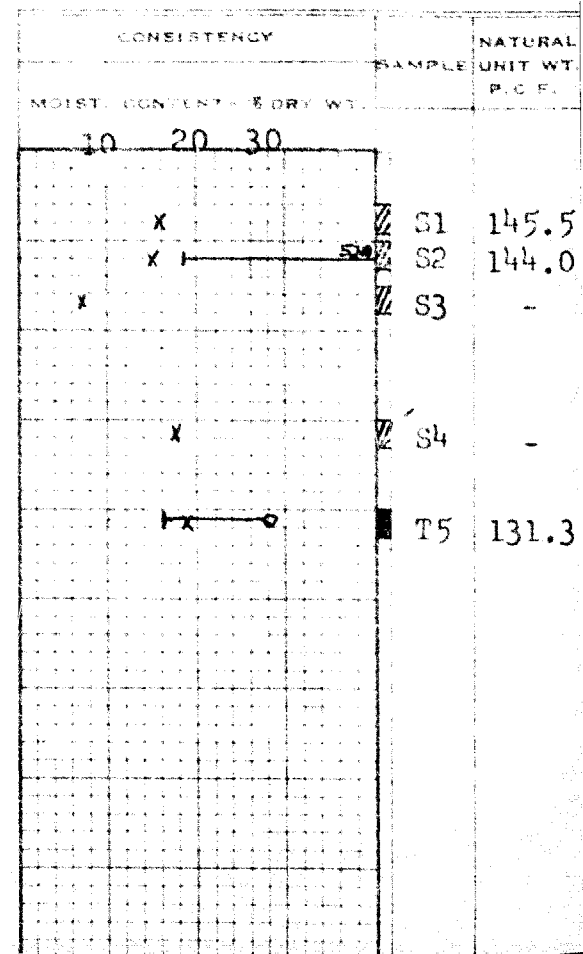
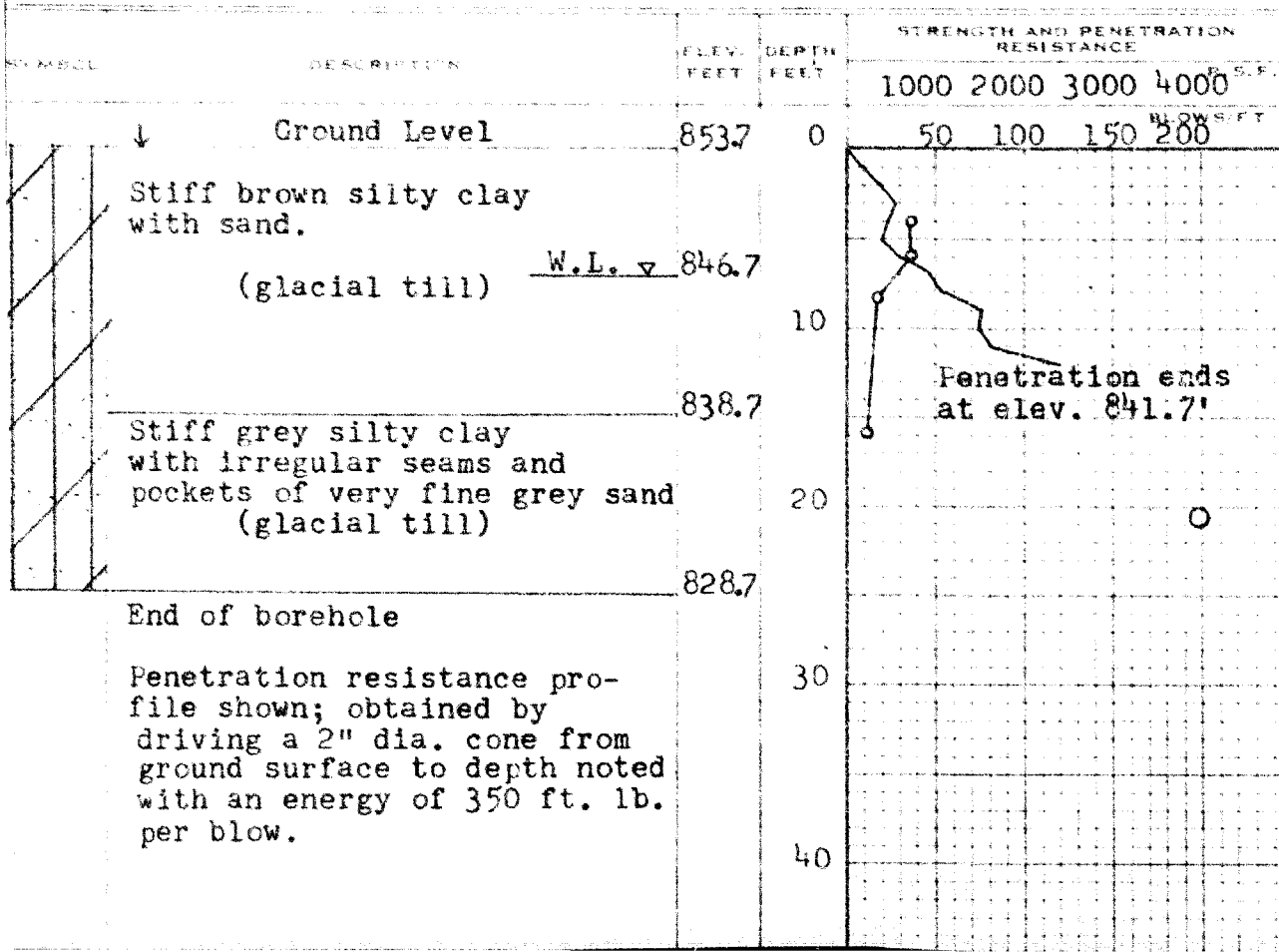
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 6
 JOB F 59-97 STATION See drawing
 DATUM 853.7' COMPILED BY B.K.
 BORING DATE Sept. 10/59 CHECKED BY G.G.C.

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 L
 LIQUID LIMIT X
 PLASTIC LIMIT —



DEPARTMENT OF HIGHWAYS - ONTARIO

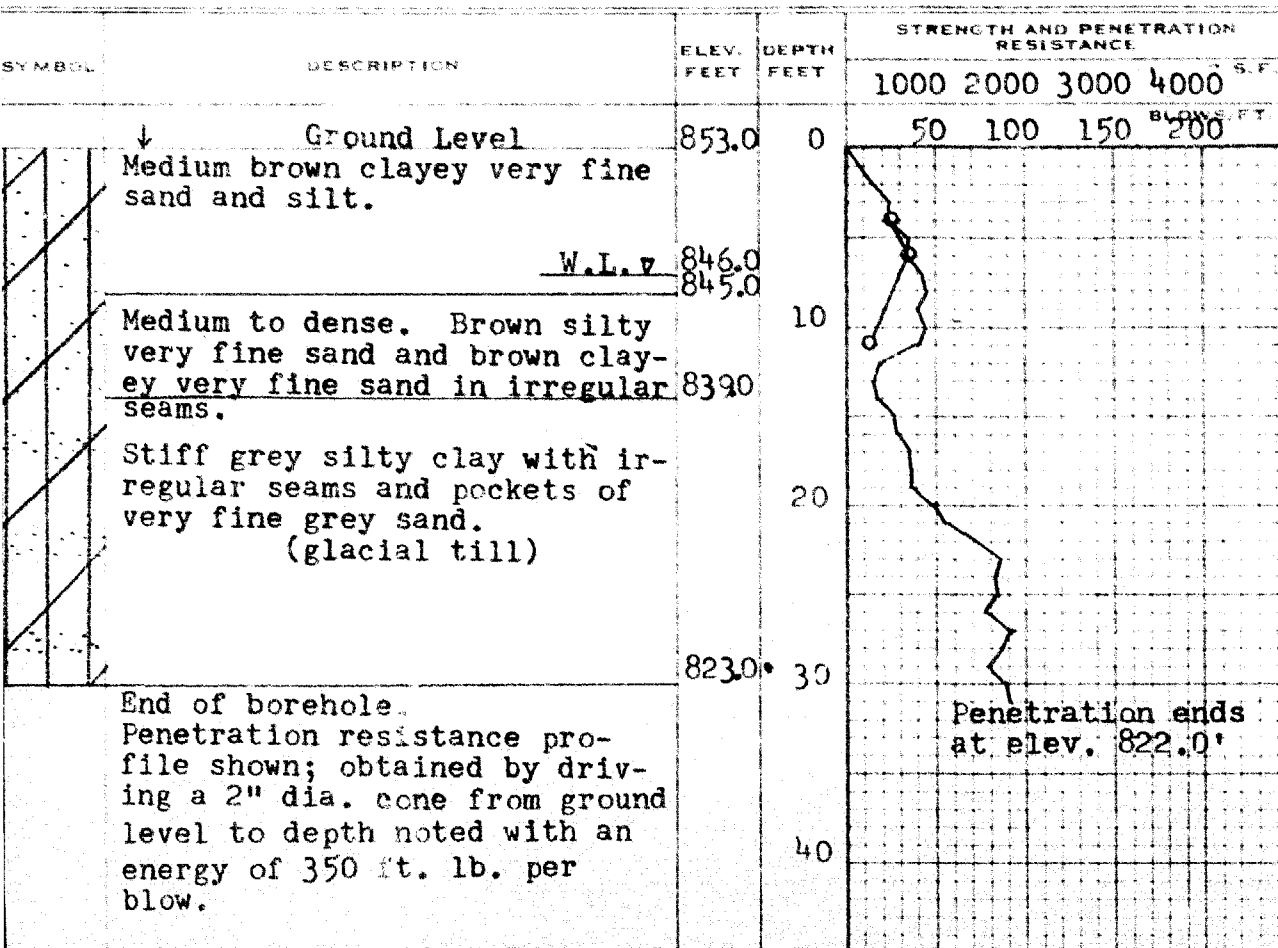
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 7
 JOB F 59-97 STATION See drawing
 DATUM 853.0' COMPILED BY B.K.
 BORING DATE Sept. 17/59 CHECKED BY G.G.C.

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		NATURAL UNIT WT. P.C.F.	
MOIST. CONTENT - % DRY WT.		SAMPLE	
		S1	-
		S2	-
		S3	-
		T4	132.0
		T5	133.1
		T6	lost
		S7	-

DEPARTMENT OF HIGHWAYS - ONTARIO

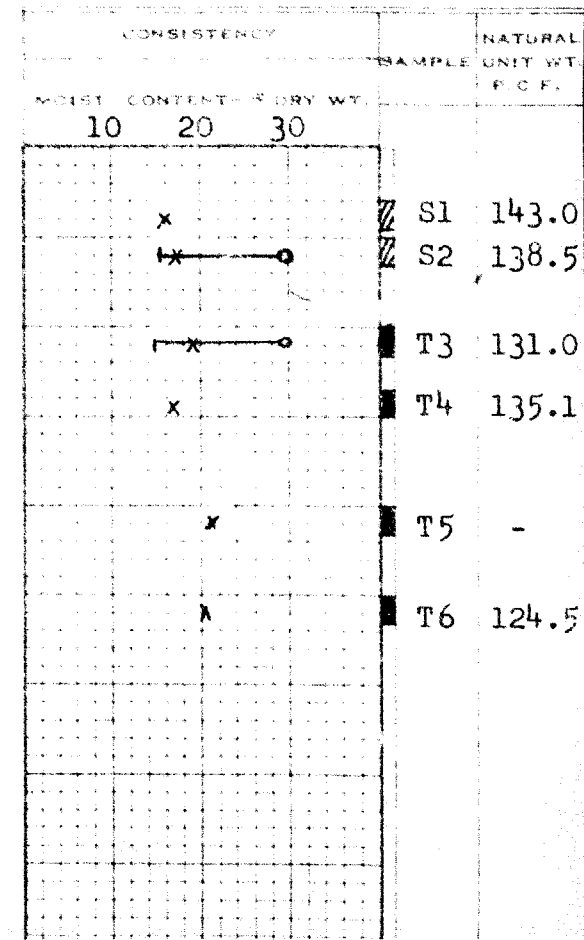
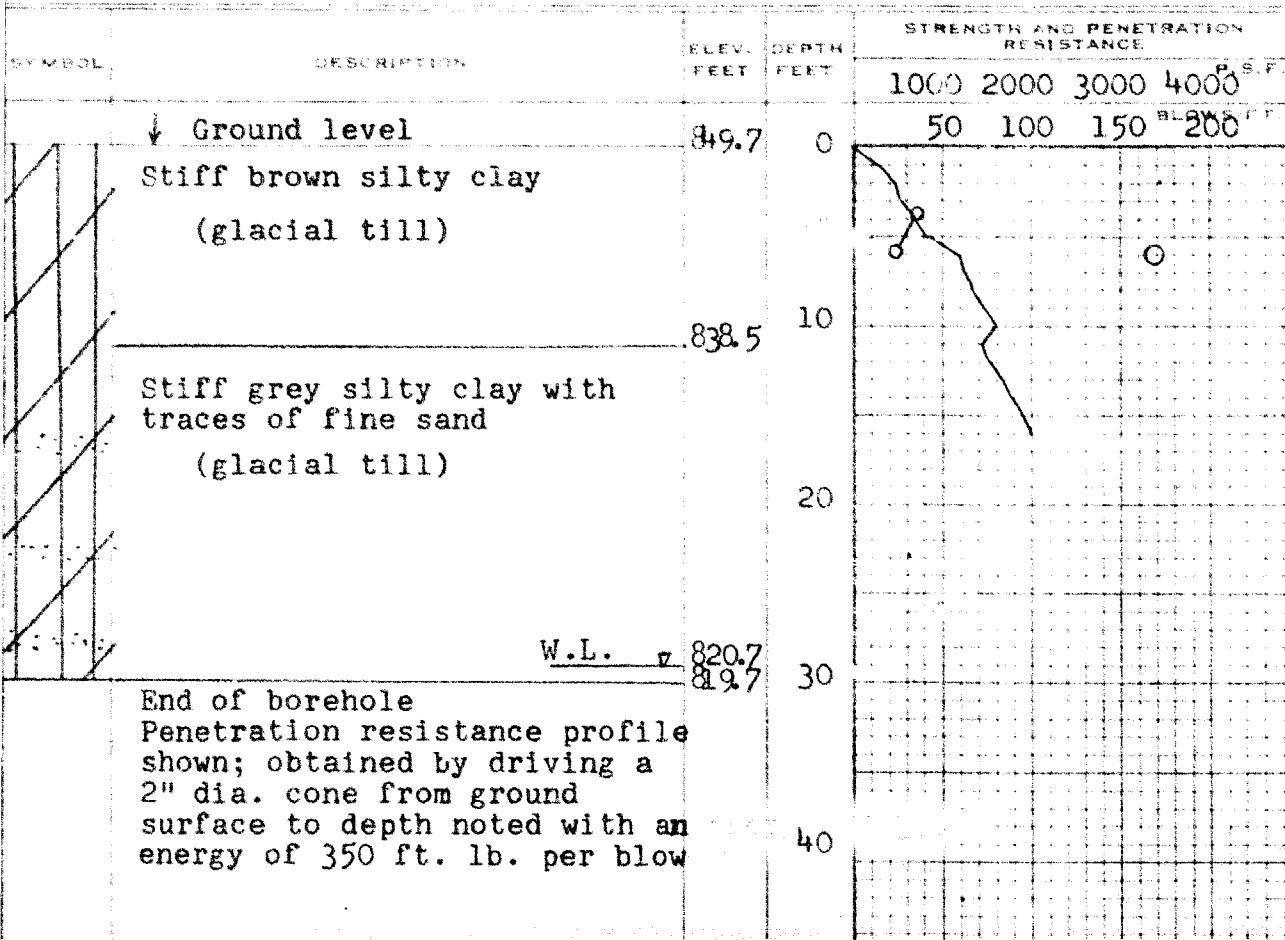
MATERIALS AND RESEARCH SECTION

W.P. Garage ----- BORE HOLE NO. 8
 JOB F59-97 ----- STATION See drawing
 DATUM 849.7' ----- COMPILED BY B.K.
 BORING DATE Sept 18/59 ----- CHECKED BY G.G.C.

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 -----



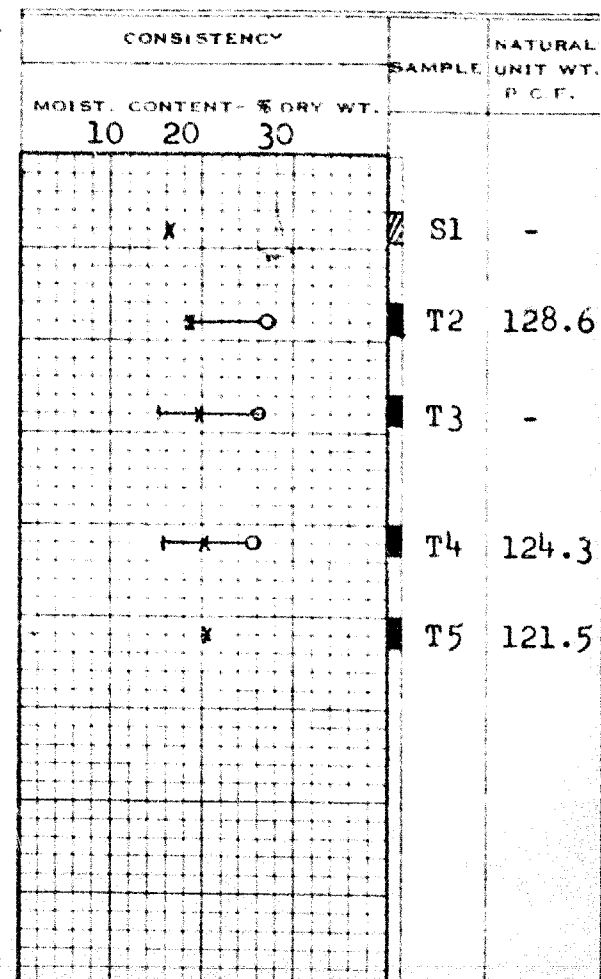
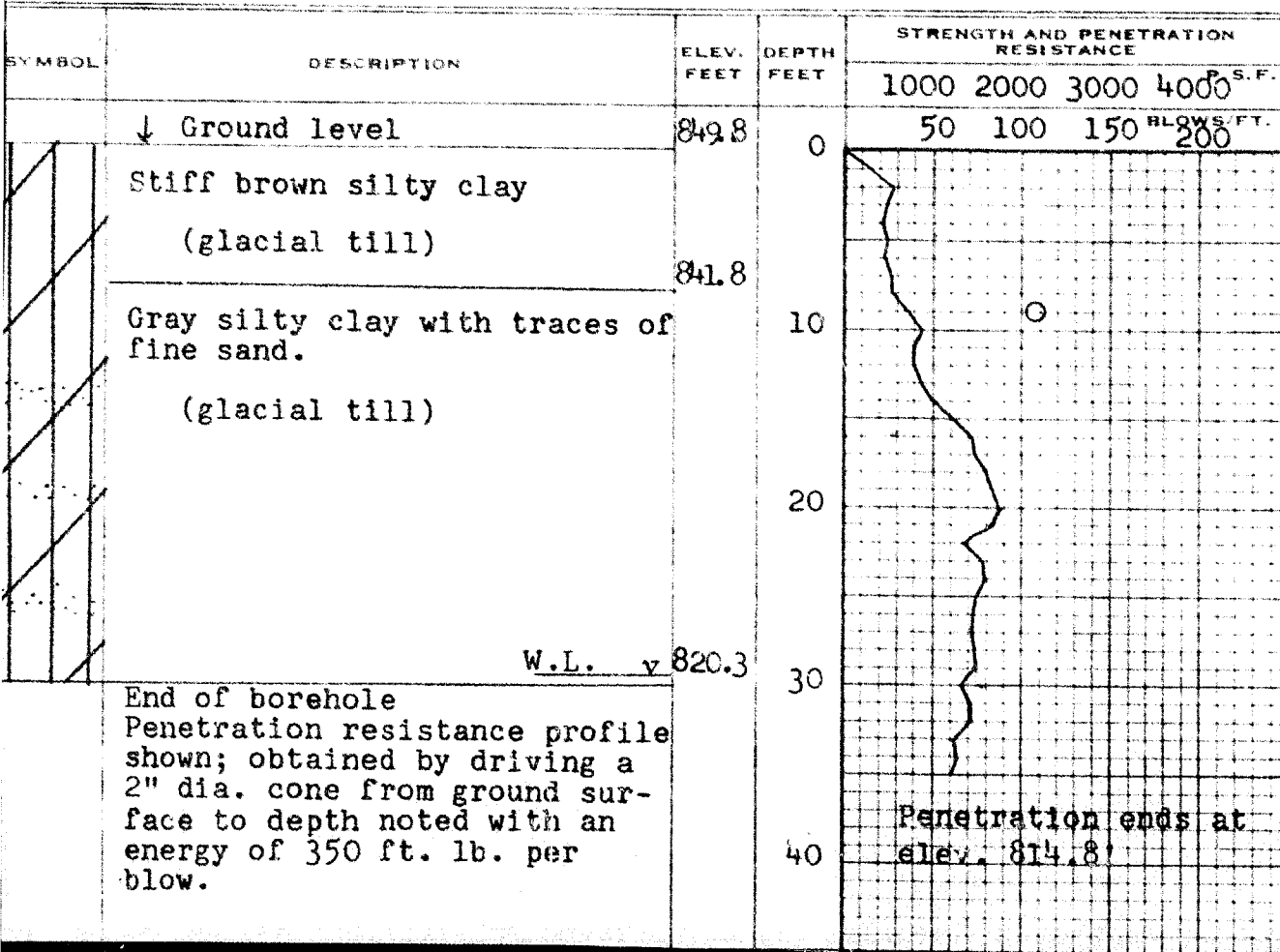
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. Garage BORE HOLE NO. 9
 JOB F59-97 STATION See drawing
 DATUM 842.8' COMPILED BY B.K.
 BORING DATE Sept. 18/59 CHECKED BY G.G.C.

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

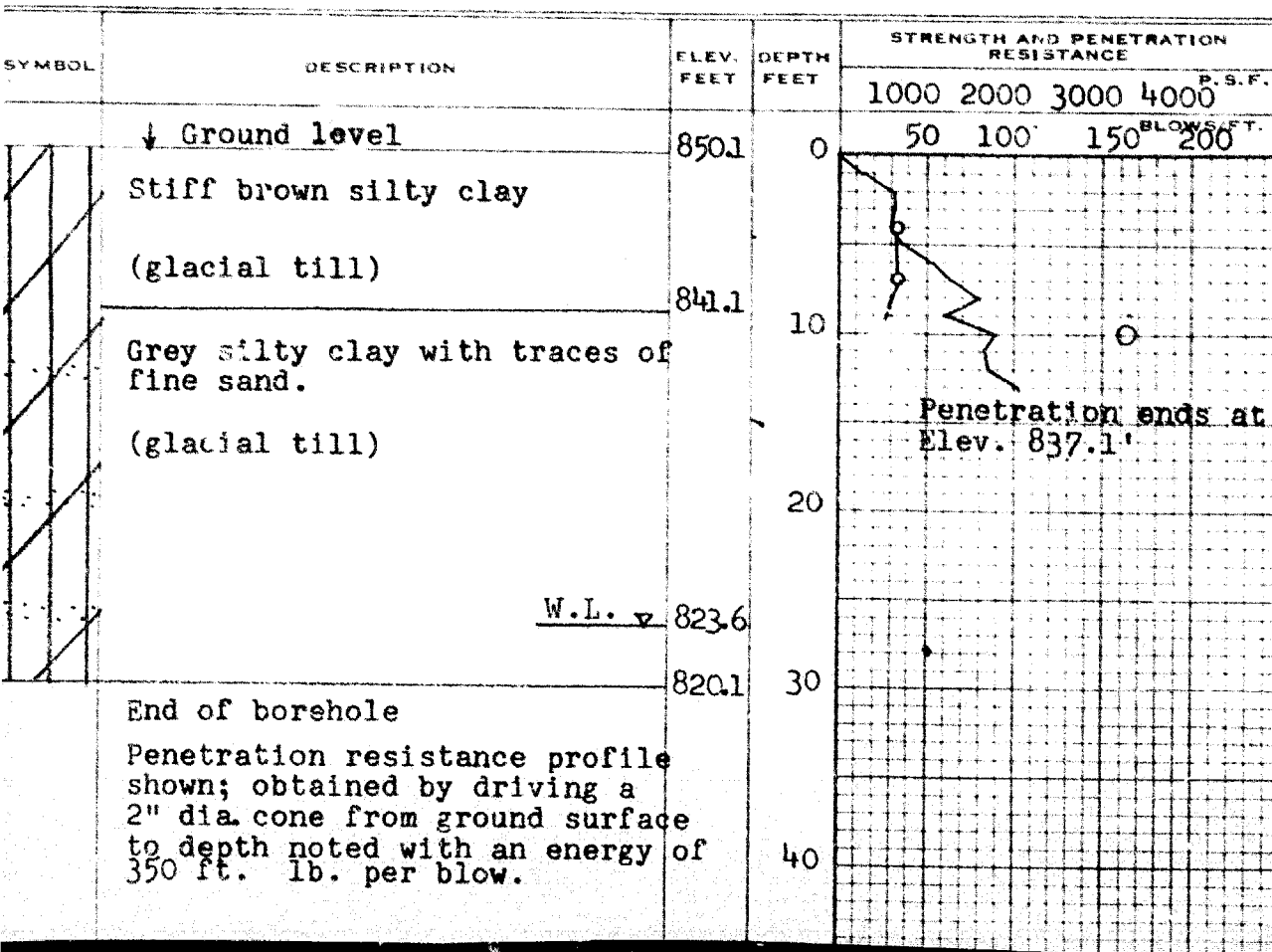
MATERIALS AND RESEARCH SECTION

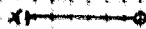



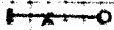
W.P. Garage BORE HOLE NO. 10
 JOB F59-97 STATION See drawing
 DATUM 850.1 COMPILED BY B.K.
 BORING DATE Sept. 18/50 CHECKED BY G.G.C.

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

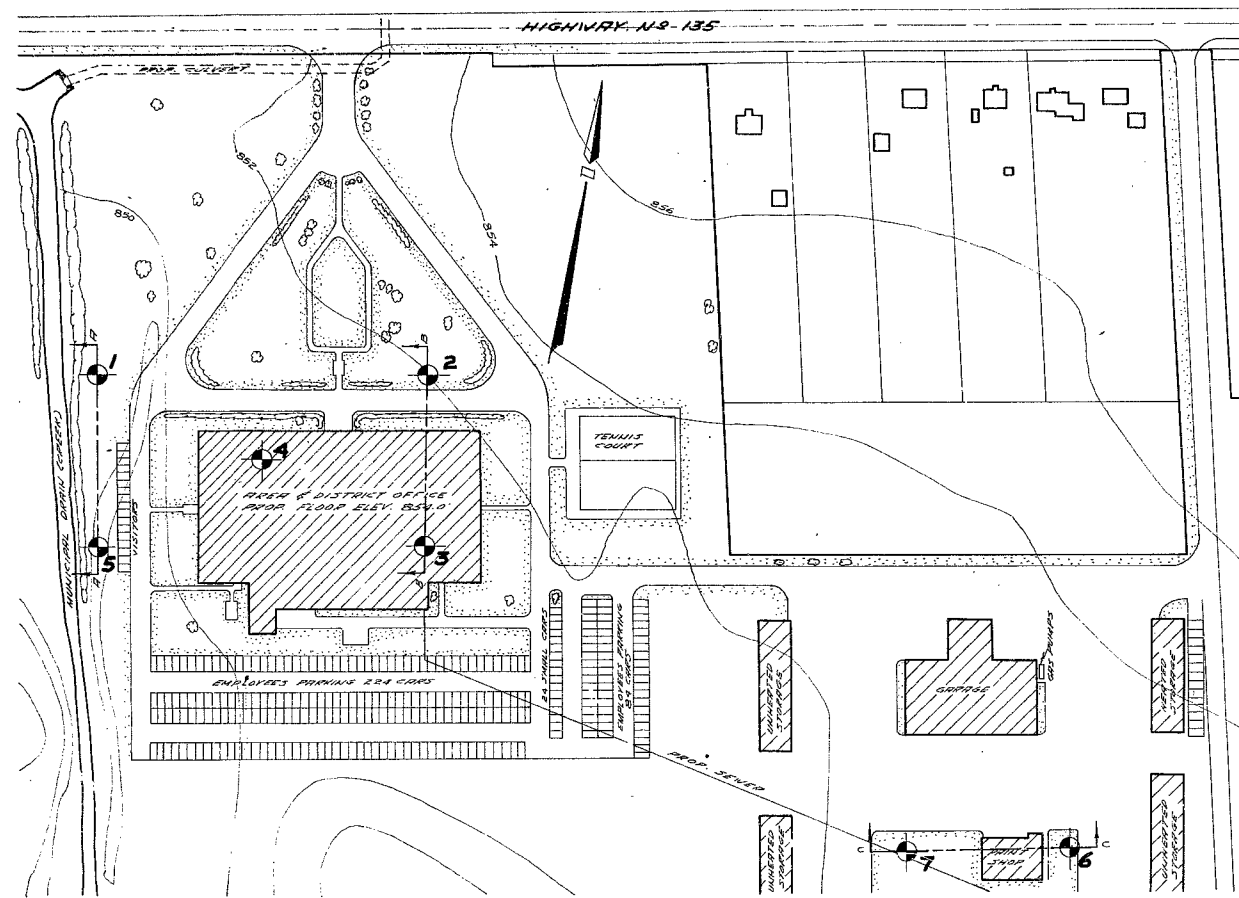
LEGEND

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

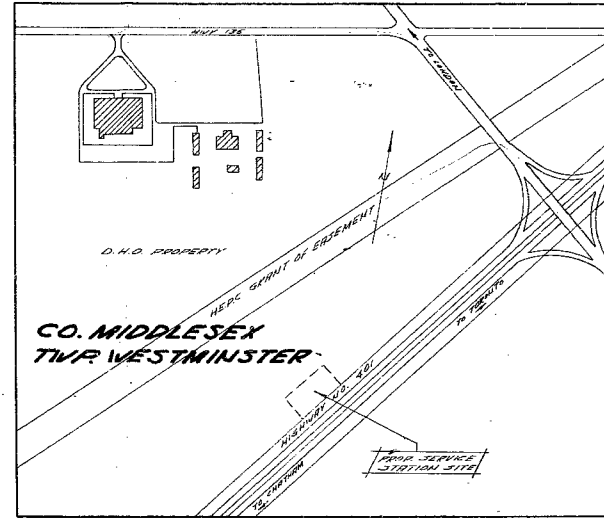


CONSISTENCY		SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.			
10	20	30	
			S1 144.0
			S2 -
			T3 137.7
			T4 131.3
			T5 123.0

#59-F-97
PROP. REGIONAL
& DIST. OFFICE
SITE — PATROL
YARD & SERVICE
STATION
LONDON



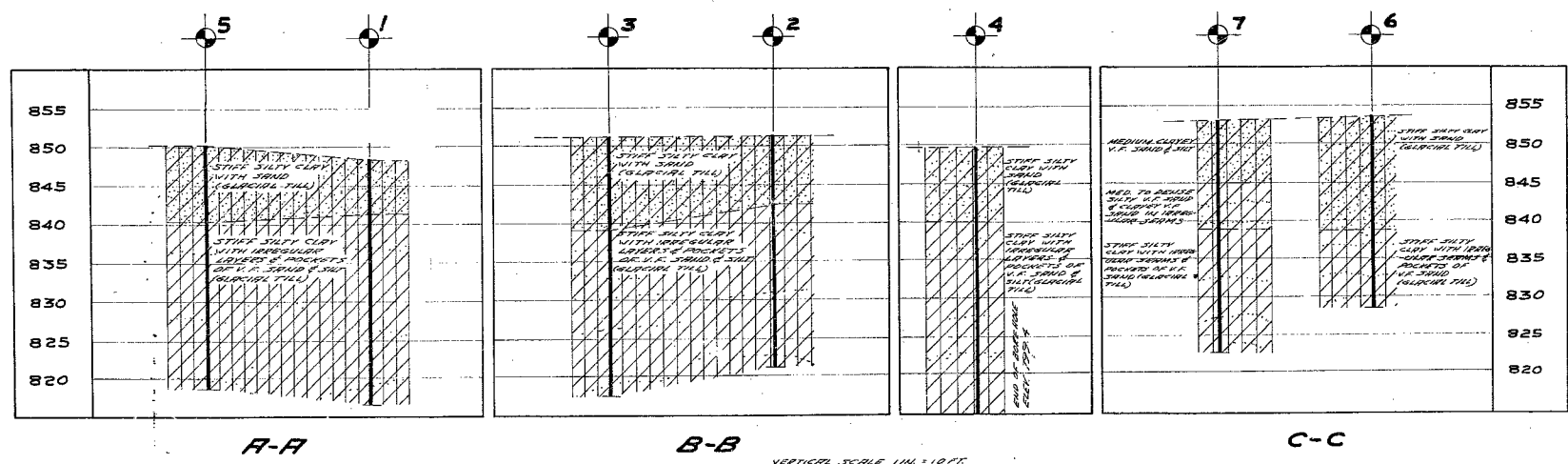
PLAN
SCALE 1 IN. = 100 FT.



KEY PLAN
SCALE 1" = 600'

LEGEND			
BORE HOLE PENETRATION HOLE			
BORE HOLE NO.	ELEVATION	LOCATION	DISTANCE FROM E.
1	848.3	SEE PLAN	SEE PLAN
2	851.4	"	"
3	851.1	"	"
4	849.9	"	"
5	852.4	"	"
6	853.7	"	"
7	853.0	"	"

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



A-A

B-B

C-C

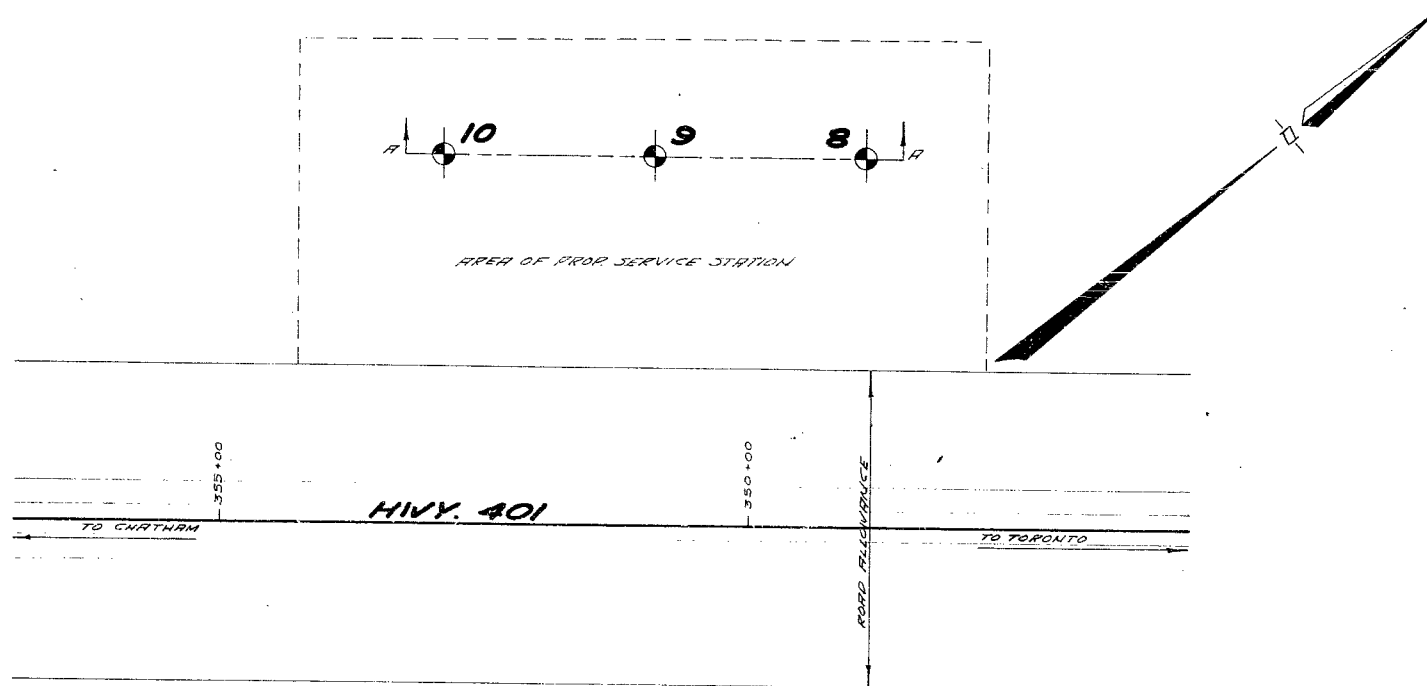
VERTICAL SCALE 1 IN. = 10 FT.

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH SECTION

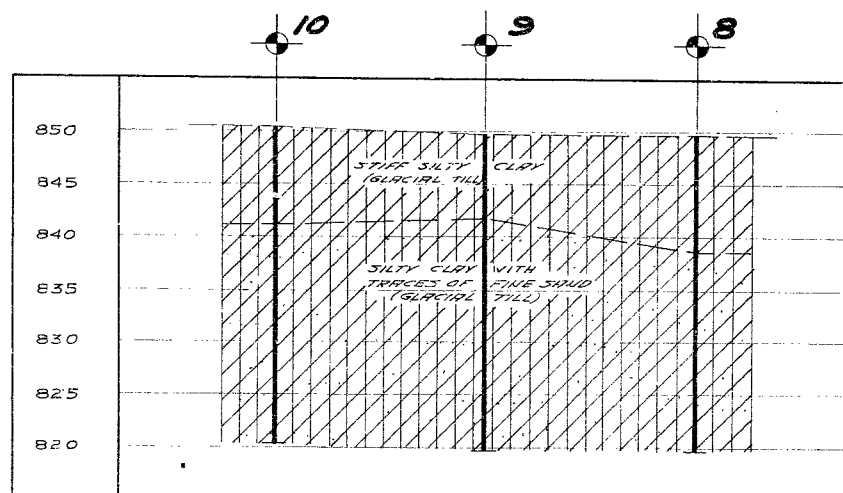
**DISTRICT OFFICE
PROPOSED SITE**

SHOWING POSITIONS & ELEVATIONS OF HOLES

HWY. 135 DISTRICT 2 COUNTY MIDDLESEX
TOWNSHIP WESTMINSTER LOT 17 CON III
LOCATION RT. 135
DRAWN BY T. MELLORCH CHECKED BY [Signature] W.P. MUIR
DATE JUN 1960 APPROVED BY [Signature] DRAWING NO.
SCALE 1/32" = 1' FS9-97A



PLAN
SCALE 1 IN. = 50 FT.



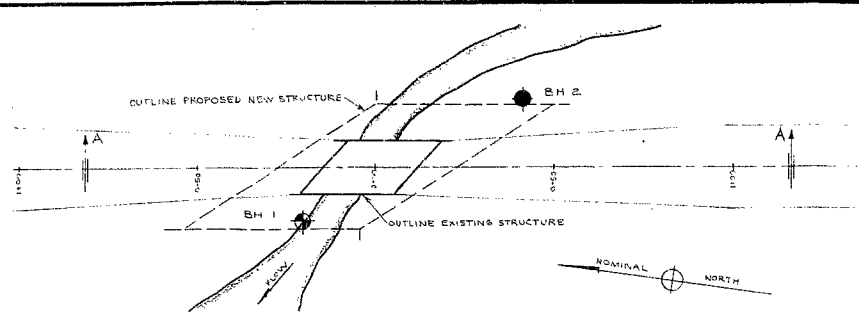
A-A

LEGEND

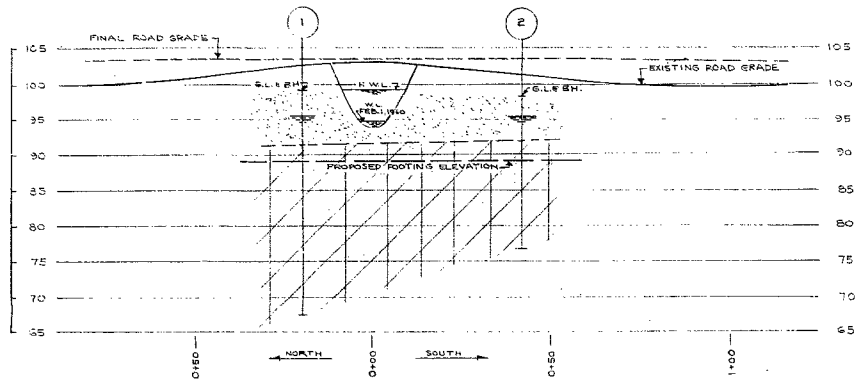
- BORE HOLE
- PENETRATION HOLE
- BORE & PENETRATION HOLE

HOLE NO	ELEVATION	STATION	DISTANCE FROM E
8	849.7	348+92	350' RT.
9	849.8	350+92	350' RT.
10	850.1	352+92	350' RT.

PROPOSED SERVICE STATION SITE (TO BE PART OF DNR F-59-977)

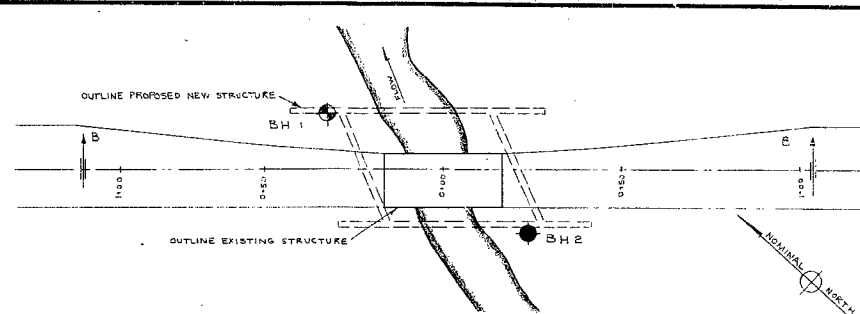


PLAN
SCALE 1"=20'-0"

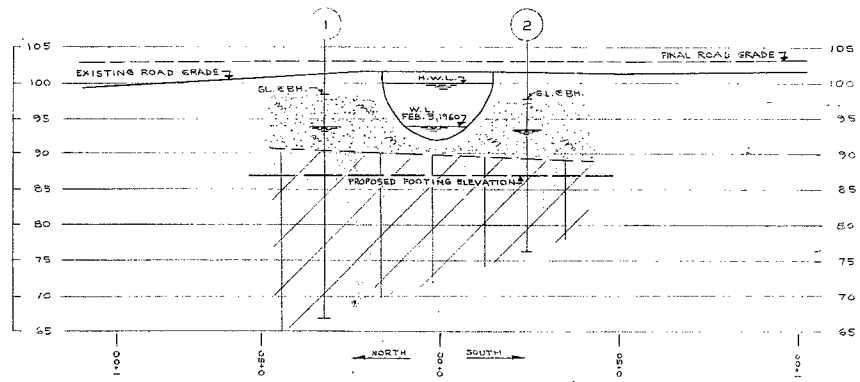


SECTION A-A
HORIZ. SCALE 1"=20'-0"
VERT. SCALE 1"=10'-0"

BRIDGE No. 41

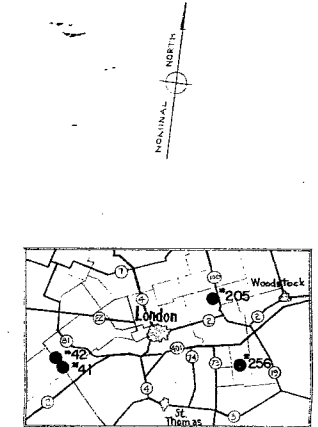


PLAN
SCALE 1"=20'-0"

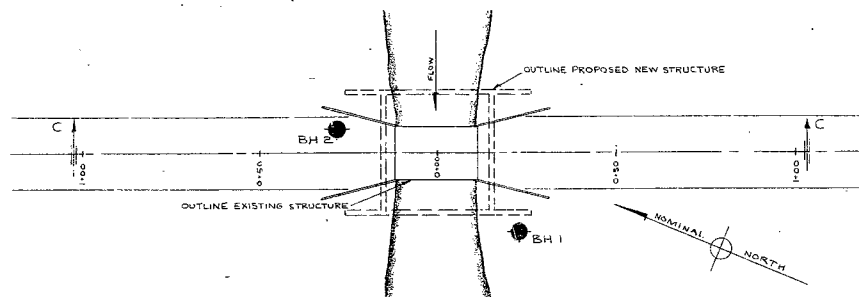


SECTION B-B
HORIZ. SCALE 1"=20'-0"
VERT. SCALE 1"=10'-0"

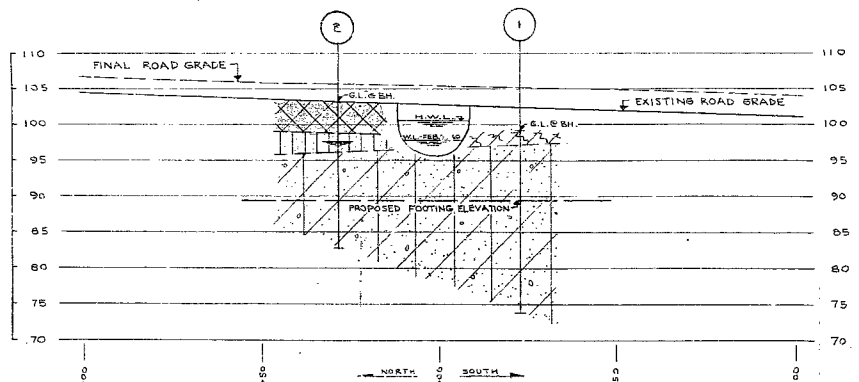
BRIDGE No. 42



KEY PLAN
SCALE 1"=1.5 MILES

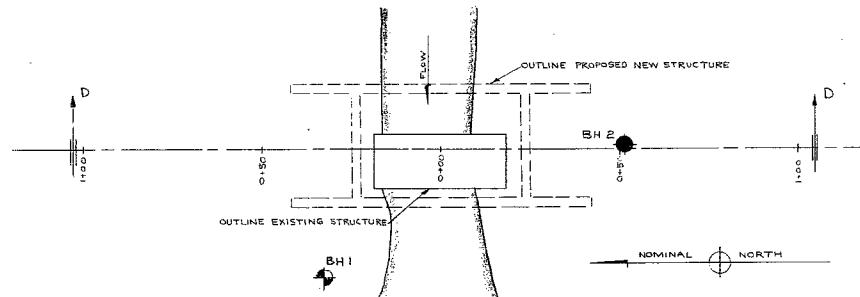


PLAN
SCALE 1"=20'-0"

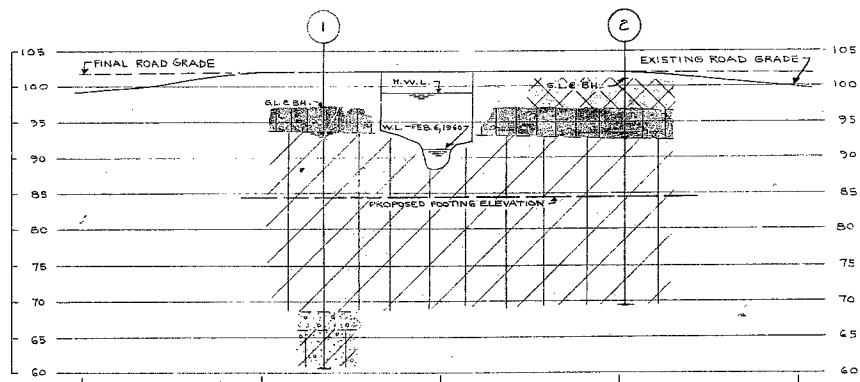


SECTION C-C
HORIZ. SCALE 1"=20'-0"
VERT. SCALE 1"=10'-0"

BRIDGE No. 205



PLAN
SCALE 1"=20'-0"



SECTION D-D
HORIZ. SCALE 1"=20'-0"
VERT. SCALE 1"=10'-0"

BRIDGE No. 256

LEGEND

- BOREHOLE WITH PENETRATION TEST IN PLAN
- BOREHOLE IN PLAN
- BOREHOLE IN ELEVATION
- WATER LEVEL - FEBRUARY, 1960

STRATIGRAPHY

- DARK BROWN SILTY TOPSOIL
- BROWN SILTY TILL FILL
- BROWN SAND AND GRAVEL FILL
- VERY LOOSE TO COMPACT DARK BROWN TO GREY-BROWN FINE SAND WITH ORGANIC MATTER
- SOFT TO FIRM BLACK TO GREY-BROWN SILT WITH ORGANIC MATTER
- FIRM TO STIFF MOTTLED BROWN SILT
- FIRM TO VERY STIFF GREY-BROWN LAYERED SILT AND CLAYEY SILT
- FIRM TO VERY STIFF GREY-BROWN CLAYEY SILT
- COMPACT TO VERY DENSE MOTTLED BROWN TO GREY SILTY TILL
- COMPACT SAND AND GRAVEL

SPECIAL NOTE: DATA CONCERNING THE VARIOUS STRATA HAVE BEEN OBTAINED AT BOREHOLE LOCATIONS ONLY. THE SOIL STRATIGRAPHY BETWEEN BOREHOLES HAS BEEN INFERRED FROM GEOLOGICAL EVIDENCE AND SO MAY VARY FROM THAT SHOWN.

REVISIONS				REVISIONS				REFERENCE				REFERENCE			
NO.	DATE	DESCRIPTION	BY	NO.	DATE	DESCRIPTION	BY	NO.	DATE	DESCRIPTION	BY	NO.	DATE	DESCRIPTION	BY
1				1				1				1			
2				2				2				2			
3				3				3				3			
4				4				4				4			
5				5				5				5			
6				6				6				6			
7				7				7				7			
8				8				8				8			
9				9				9				9			
10				10				10				10			

R.C. DUNN AND ASSOCIATES LIMITED
LONDON, ONTARIO
PROPOSED COUNTY OF MIDDLESEX BRIDGES
Nos. 41, 42, 205 AND 256
NEAR LONDON, ONTARIO
BORING PLAN AND SOIL STRATIGRAPHY

GEOCON LTD
DATE MARCH 5, 1961 SCALE AS SHOWN
PAGE 1 OF 1
NO. 57035-1