



Memo to Mr. A. M. Toye, **Date** September 7, 1960.
Bridge Engineer. **Subject** D.H.O. FOUNDATION INVESTIGATION
From Materials & Research Section. W.P. 517-56 -- W.J. 60-F-73.

Attention: Mr. S. McCombie.

Re: The Proposed New Bridge at Dodd's Creek
on Hwy. #3, 1.8 Miles West of Talbotville,
District #2.

This memo accompanies our detailed report on the subsoil conditions existing at the above site.

The conclusions and recommendations to be followed in your future design work, are summarized in the report, and are self-explanatory.

If we can be of further assistance to you in connection with this project, please do not hesitate to contact our Office.

L. G. Soderman,
PRINCIPAL FOUNDATIONS ENGR.

Per:

AS/MdeF
Attach.

cc: Messrs. A. M. Toye (2)
H. A. Tregaskes
D. G. Ramsay
A. Gater
W. L. Fraser
J. Roy
A. Watt

Foundations Office
Gen. Files.

L. G. Soderman
(A. Soderman,
FOUNDATIONS OFFICE ENGR.)

TABLE OF CONTENTS

1. INTRODUCTION.
2. DESCRIPTION OF THE SITE.
3. FIELD INVESTIGATION PROCEDURE.
4. LABORATORY INVESTIGATIONS.
5. DESCRIPTION OF SOIL TYPES AND SOIL CONDITIONS.
 - 5.1 General.
 - 5.2 Fill Material.
 - 5.3 Clay, Sand & Gravel (Till Material).
 - 5.4 Sand.
6. DISCUSSION AND RECOMMENDATIONS.
 - 6.1 General.
 - 6.2 Structure Footings.
 - 6.3 Structure Approaches.
7. SUMMARY.
8. MISCELLANEOUS.

FOUNDATION INVESTIGATION

For

The Proposed New Bridge at Dodd's Creek
on Hwy. #3, 1.8 Miles West of Talbotville
W.J. 60-F-73 -- W.P. 517-56 -- Dist. 2

1. INTRODUCTION:

Dodd's Creek Bridge is located on Hwy. #3, 1.8 miles West of the Village of Talbotville. The structure consists of a single 50' span reinforced concrete arched bridge supported on spread footings. The width of the roadway across the bridge is 20', and on the North side, a steel frame sidewalk with a wooden deck has been attached to the bridge by means of bolts grouted into the concrete.

Although the concrete in the structure shows considerable weathering on exposed sections, and looks in poor condition, there are no visible signs of fractures caused by differential settlement.

The existing bridge was constructed in 1918 and the sidewalk was added in 1952. Prior to 1918, a steel bridge supported on timber piles, existed at the same location. Some of these piles are still in position at each side of the creek, close to the footings of the present structure.

It is proposed to construct a new bridge at this location with the same centre line. This new bridge will be approximately 50' wide and 10' higher than the present structure.

The following investigation was carried out to determine the existing subsoil conditions at the proposed footing locations assuming that the new structure will have, either a 50' single span, or three spans of total length, 150'.

cont'd. /2 ...

2. DESCRIPTION OF THE SITE:

The topography in this area consists mostly of flat open farmland. Dodd's Creek is approximately forty feet wide at the site of the proposed structure, and about two feet deep. The direction of flow is North to South. H.W.L. has been established as Elev. 727.8'. At the time of the investigation, the water level was at Elev. 720.0'. This can be assumed to be the normal summer water level of the creek at this location.

From about four hundred feet East of the creek to the edge of the creek, the ground falls fairly uniformly in elevation about twenty-five feet, then rises about the same amount at a distance, some four hundred feet to the West of the Creek. As the deck of the existing structure is only about fifteen feet above the ground, the present situation is somewhat hazardous to traffic. It is, however, proposed to eliminate this hazard by raising the grade about ten feet.

3. FIELD INVESTIGATION PROCEDURE:

A total of six borings was carried out using conventional diamond drill equipment adapted for soil sampling purposes. The holes were cased with NX casing to a distance of ten feet below G.L., except in the instance of the two boreholes #4 and #5, located in the abutments of the existing structure, where AX casing was used.

Samples were recovered in the disturbed state using a 2-inch O.D. split spoon, which was driven into the soil by a 140 lb. hammer with an energy of 350 foot lbs. per blow. Undisturbed samples were recovered using 2-inch I.D. Shelby Tubes. These were pushed into the soil by hand. In some instances, Shelby Tube samples were obtained by hammering the tubes into the soil with an energy of 350 foot lbs./blow.

Owing to the stiff nature of the clay till deposits, it was not possible to carry out in-situ vane tests to determine in-situ shear strength.

3. FIELD INVESTIGATION PROCEDURE: (cont'd.) ...

Two boreholes were drilled through the existing bridge abutments, the purpose of which was to determine the elevation of the bottom of the abutment footings. This was done at the request of the Bridge Office.

All elevations were established using a T.B.M. Elev. 734.0' located at Sta. 97+69, 14' Left, - top of opening of concrete arch bridge.

Locations of all boreholes were established prior to boring operations by the Field Engineer. These are shown on Drawing #60-F-73A which forms part of this report.

4. LABORATORY INVESTIGATIONS:

Laboratory tests were carried out on a selection of Shelby Tube samples to determine the following properties of the clay till deposits:-

1. Liquid Limit
2. Plastic Limit
3. Moisture Content
4. Undrained Shear Strength (Triaxial).
5. Density (Bulk).

From the information thus obtained, it was possible to produce curves showing variation of the above properties with depth. These, together with detailed test results, are shown in Appendix #1 of this report.

cont'd. /4 ...

5. DESCRIPTION OF SOIL TYPES AND SOIL CONDITIONS:

5.1 General:

Detailed descriptions of the various soil types are given below and are also shown in Appendix #1 of this report. The estimated stratigraphical profiles shown in Drawing #60-F-73A are based upon this information.

From ground level downward, the soil types are as follows:-

5.2 Fill Material:

This material was used to construct the existing bridge approaches and varies from zero to fifteen feet in depth. It consists partly of a poorly compacted medium to stiff clay, partly a loose granular material, and partly a mixture of both. On the West approach, penetration tests indicated the presence of large boulders in the fill, particularly in the vicinity of Sta. 98+44. Some brick rubble and decayed wood was observed in the East approach in B.H. #2.

5.3 Clay Sand And Gravel (Glacial Till):

This material extends from ground level except where it is covered by the above-mentioned fill. The depth of the deposit is indeterminate as no borings penetrated it completely. At about twenty-eight feet below ground level the stratum contains a ten-foot thick layer of dense sand which is described below under 5.4.

The till deposit is a heterogeneous mixture of clay sand and fine gravel, the main constituent being a clay of low plasticity. The consistency of the deposit varies from stiff at the surface, to very hard at twenty-five feet, and the shear strength increases from about 1200 p.s.f. at Elev. 725.0', to about 3000 p.s.f. at Elev. 705.0'.

The bulk density is approximately 120 p.c.f. at Elev. 725.0' and increases to about 140 at Elev. 705.0'. The moisture content varies with depth from 30.0% at the surface, to about 15.0% at twenty feet.

5. DESCRIPTION OF SOIL TYPES AND SOIL CONDITIONS: (cont'd.) ...

5.3 Clay Sand and Gravel (Glacial Till): (cont'd.) ...

Complete results of the physical properties of this material, determined by laboratory tests, are given in Appendix #1 of this report.

5.4 Sand:

A layer of very dense well-graded, fine to coarse sand was observed between Elev. 697.5' and 688.5' in B.H. #1 and in B.H. #8, the top of what is assumed to be the same deposit was found to be at Elev. 696.1'. Standard penetration tests in this material were of the order of seventy blows per foot, indicating that the density is very high, indeed. A slight artesian head in this deposit was observed to be about 2.0' at ground level, with a very slight flow - less than one gallon in five minutes.

5.5 Groundwater Conditions:

The natural water table over the whole site is about Elev. 722.0'. Because of the stiff impermeable nature of the till material, no major dewatering problems are to be anticipated in excavations carried out in this material. Further, it is not anticipated that any excavations will be carried out in the artesian water-bearing stratum described in 5.4 above.

6. DISCUSSION AND RECOMMENDATIONS:

6.1 General:

It is proposed to construct a new bridge at this location some fifty feet in width and approximately ten feet higher than the existing structure. The new construction will maintain the present existing centre line. The approaches to the existing structure will be built up and widened to accommodate the proposed raise in profile grade.

Particular problems dealt with by this report are discussed under the appropriate headings.

6. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

6.2 Footings:

Prior to this investigation being carried out, a request was made by the Bridge Office for two boreholes to be drilled, one in each abutment of the existing bridge, to determine the depth of the existing concrete footings. This was done, and the elevation of the bottom of the concrete footing of the West abutment was found to be 713.5' and the East abutment 713.0'. It is intended, if possible, to lengthen the existing footings and utilize them for the new structure. The investigation was carried out under the assumption that the new bridge will have either, a single span of 50', or three spans of total length, 150', the centre span being 50'.

It is recommended that the structure be supported on spread footings and for design purposes, it has been assumed that these will be 50' in length and 6' in width. It is estimated that the safe bearing capacity of the subsoil at the location of the existing footings is 2.5 t.s.f. at Elev. 713.0'. At the location of the proposed abutments, in the case of a three-span bridge, it is estimated that the safe bearing capacity of the subsoil is 2.5 t.s.f. at Elev. 716.0'.

6.3 Approaches:

In view of the high shear strength of the subsoil in the vicinity of the proposed structure, no problems are anticipated with regard to the proposed structure approaches.

7. SUMMARY:

The investigation findings and resulting recommendations are summarized in the following paragraphs:-

Subsoil in this area consists of a stiff to very stiff silty clay till with a high shear strength, adequate to support

7. SUMMARY: (cont'd.) ...

spread footings. In the case of a single 50' span structure the safe bearing capacity of the subsoil at the proposed footing locations is 2.5 t.s.f. at Elev. 713.0'. In the case of a three span bridge of total length 150' with a centre span of 50', the safe bearing capacity of the subsoil at the proposed abutment footings is 2.5 t.s.f. at Elev. 716.0'.

No major problems are anticipated with regard to the proposed widening and heightening of the bridge approaches.

No major problems are anticipated with regard to the dewatering of excavations carried out for the proposed footings.

8. MISCELLANEOUS:

The field investigation was carried out during the period August 10th to August 23rd, 1960, under the supervision of Mr. K. G. Selby. Equipment used was owned and operated by the Department of Highways, Ontario.

August 29, 1960. REPORT PREPARED BY:

K. G. Selby
.....
K. Selby,
Project Foundations Engr.

REPORT APPROVED BY:

.....
A. Stermac,
Foundations Office Engr.

APPENDIX I.

SUMMARY OF FIELD & LABORATORY TESTS

JOB 60-F-73

W.P. 517-56

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	S1	5'-6.5'	Fill material, clay sand & gravel loosely compacted	5	-	-	-	-	-	
	S2	10'-11.5'	Clay sand & fine gravel mixture stiff to very stiff glacial till	37	-	-	-	-	-	
	S3	13'-14.5'	"	18	-	-	-	-	-	
	S4	16'-17.5'	"	20	-	-	-	-	-	
	S5	19'-20.5'	"	27	-	-	-	-	-	
	S6	25'-26.5'	"	39	-	-	-	-	-	
	S7	30'-31.5'	Sand well graded, fine to coarse, very dense	60	-	-	-	-	-	
	S8	35'-35.7'	"	57-10"	-	-	-	-	-	
	S9	40'-40.7'	Clay, sand and fine gravel mixture, very hard (glacial till)	36-8"	-	-	-	-	-	

SUMMARY OF FIELD & LABORATORY TESTS

JOB 60-F-73

W.P. 517-56

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
2	S1	5'-6.5'	Fill material, clay sand & gravel loosely compacted	8	-	-	-	-	-	
	T2	10'-11'	Clay, sand, and fine gravel mixture-stiff to very stiff (glacial till)	8	22.7	18.1	33.8	950	134.0	
	T3	13'-14.5'	"	P	29.2	20.4	44.0	1375	120.0	
	T4	16'-17.5'	"	P	25.8	18.7	37.8	1650	126.0	
	T5	19'-20.5'	"	17	18.1	17.9	33.5	1750	130.0	
	T6	25'-26.5'	"	20	-	-	-	-	-	
3	Cone penetration only									
4	S1	24'-25.5'	Clay, sand, gravel mixture very stiff	24	-	-	-	-	-	
5	S1	23.5'-25'	Clay sand & gravel mixture very stiff	19	-	-	-	-	-	
6 7	(Cone penetrations only									

SUMMARY OF FIELD & LABORATORY TESTS

JOB 60-F-73

W.P. 517-56

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PERM'T'N RESIST. BLOWS/FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
8	S1	5'-6.5'	Fill material - clay-loosely compacted	4	-	-	-	-	-	
	S2	8'-9.5'	Sand well graded, very loose	14	-	-	-	-	-	
	T3	10'-11.5'	Clay, sand & fine gravel mixture, stiff to very stiff (glacial till)	P	15.3	13.5	20.9	1825	136	
	T4	13'-14.5'	"	P	19.3	13.8	23.9	2355	137	
	T5	16'-17.5'	"	20	15.1	10.4	17.9	2550	139.5	
	T6	19'-20.5'	"	28	15.2	12.8	24.9	2200	141.0	
	T7	24'-25.5'	"	31	-	-	-	-	-	
	S8	30'-31.5'	Sand, well graded, very dense	70	-	-	-	-	-	
	S9	32'-33.5'	"	56	-	-	-	-	-	

SUMMARY OF FIELD & LABORATORY TESTS

JOB 60-F-73

W.P. 517-56

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	5'-6.5'	Fill material-sand gravel and clay-loosely compacted contains some boulders	8	-	-	-	-	-	
	S2	10'-11.5'	"	11	-	-	-	-	-	
	S3	15'-16.5'	"	5	-	-	-	-	-	
	S4	20'-21.5'	Clay, sand and fine gravel mixture stiff-very stiff (glacial till)	17	-	-	-	-	-	
	S5	25'-26.5'	"	19	-	-	-	-	-	
	S6	30'-31.5'	"	32	-	-	-	-	-	
10	Cone penetration only									
			S denotes split spoon sample							
			T " shelby tube sample							

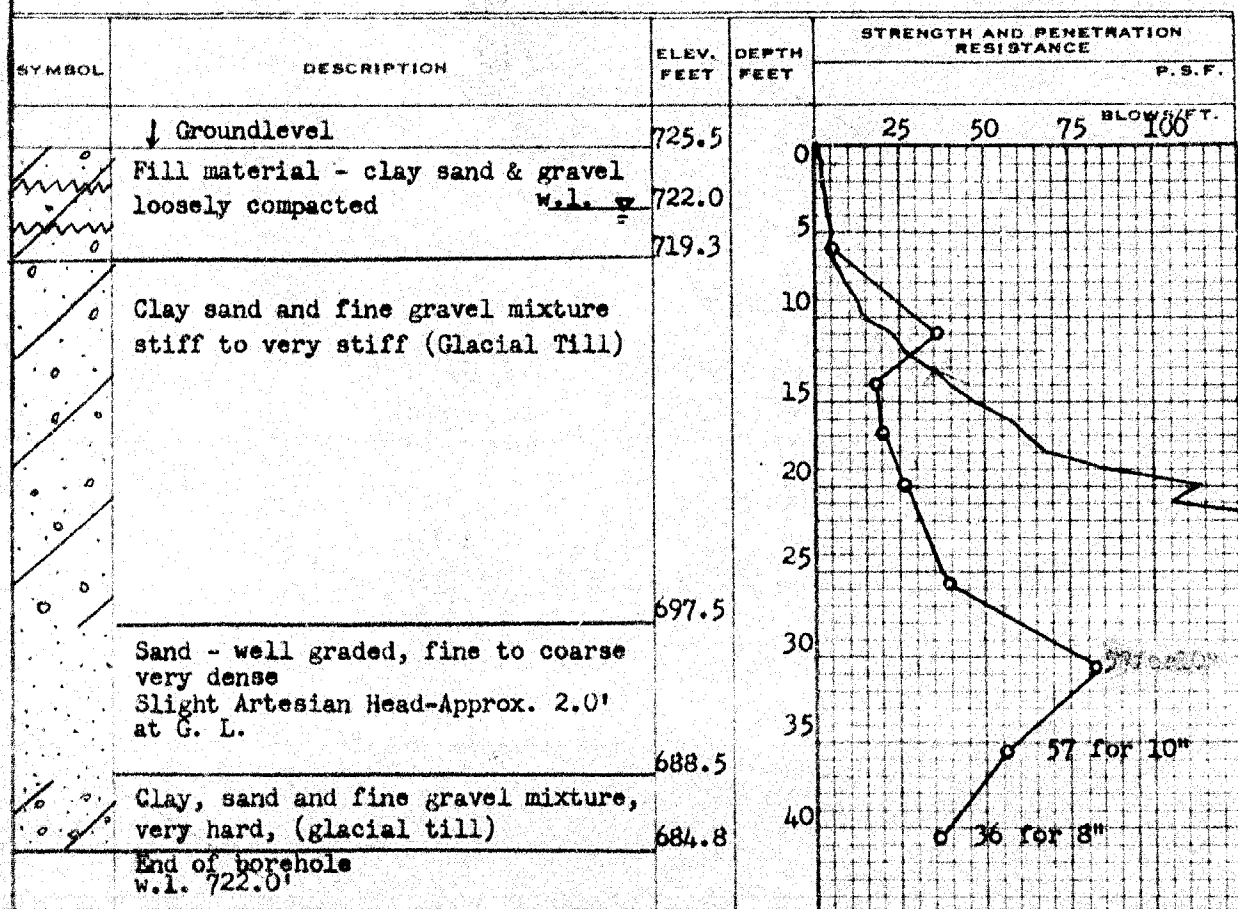
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. 517-56 BORE HOLE NO. 1
JOB 60-F-73 STATION 27+39.35' Rt
DATUM G.S.C. COMPILED BY B.K.
BORING DATE Aug. 11/60 CHECKED BY K.S.

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	-
	S7	-
	S8	-
	S9	-

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

DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. 517-56 BORE HOLE NO. 2

JOB 60-F-73 STATION 96+84 20' Rt

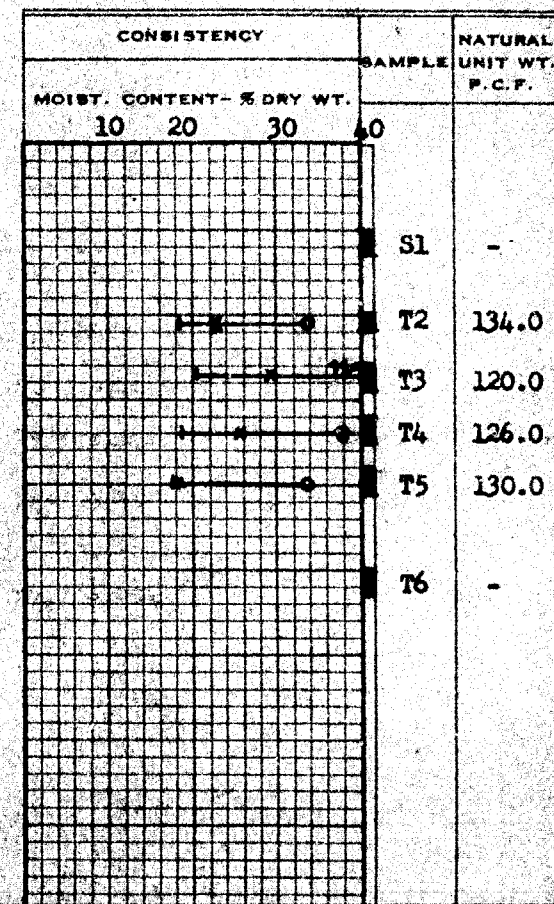
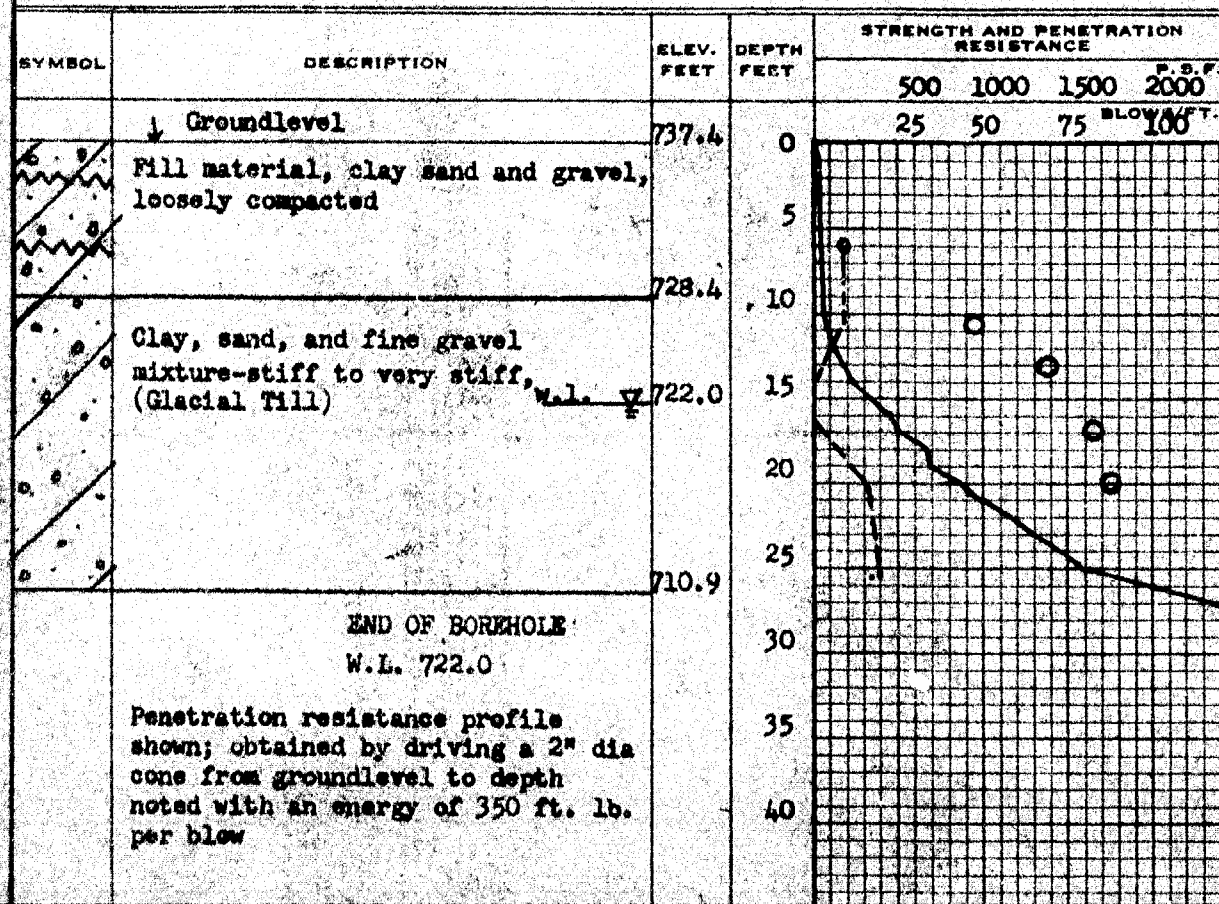
DATUM G.S.C. COMPILED BY B.K.

BORING DATE Aug. 15/60 CHECKED BY K.S.

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. 517-56 _____ BORE HOLE NO. 3 (Cone Test Only)

JOB 60-F-73 STATION 96/84 11' Left

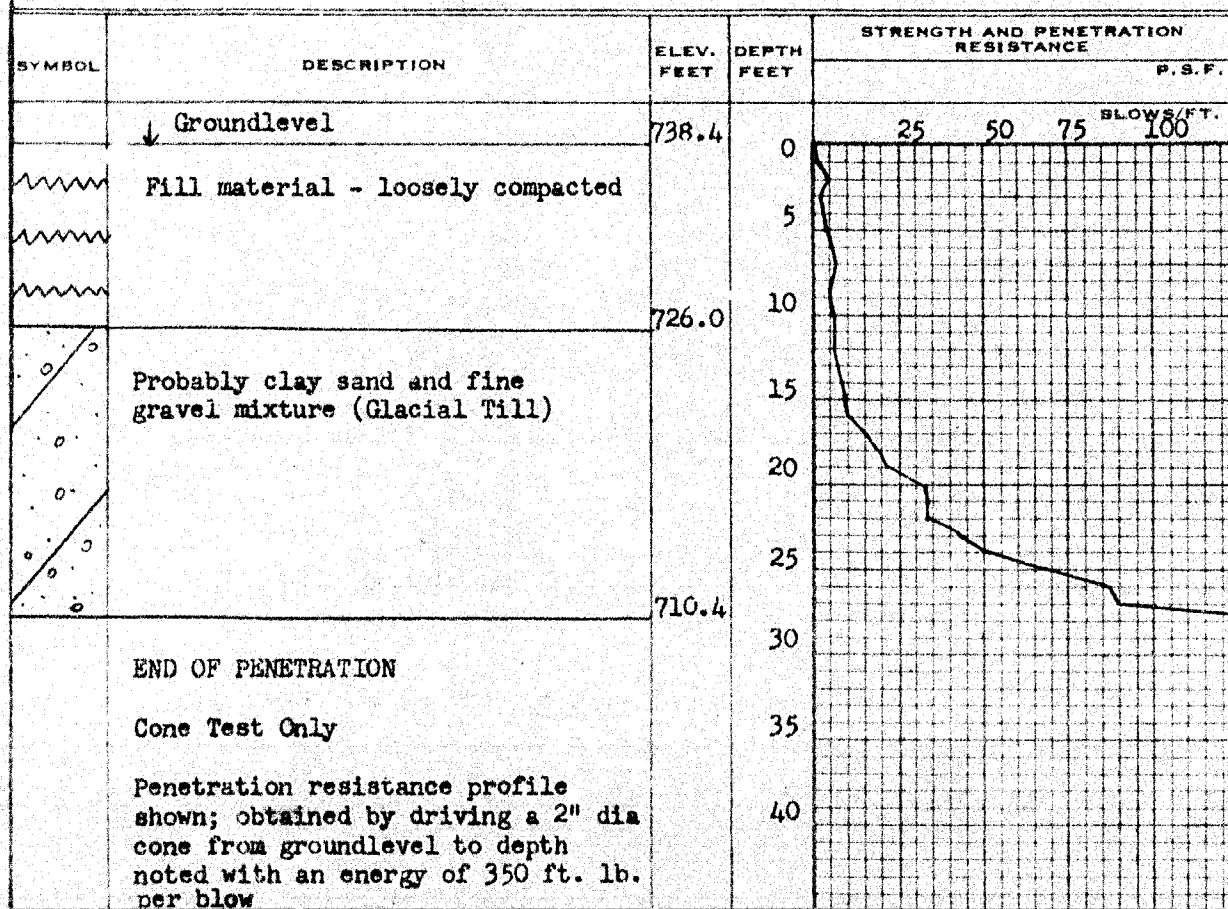
DATUM G.S.C. COMPILED BY B.K.

BORING DATE Aug. 16/60 CHECKED BY K.S.

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 -----	o

[illegible]

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. 517-56 BORE HOLE NO. 4

JOB 60-F-73 STATION 97+42 8' Left

DATUM G.S.C. COMPILED BY B.K.

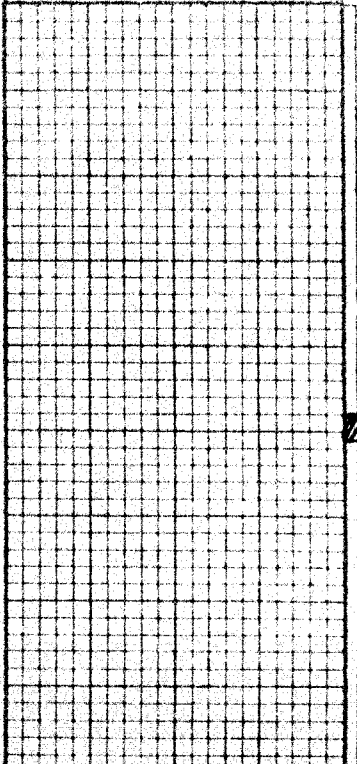
BORING DATE Aug. 16/60 CHECKED BY K.S.

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	---	X
LIQUID LIMIT	---	0
PLASTIC LIMIT	---	

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE			
				P.S.F.			
	1. Groundlevel (Pavement)	737.0					
	Asphalt (2")	736.8	0	25	50	75	100
	Concrete (9") Bridge Deck	736.0					
	Fill material - sand & gravel		5				
		728.0	10				
	Concrete		15				
			20				
		713.0	25				
	Clay, sand & gravel mixture-v. stiff	711.5	25				
	END OF BOREHOLE		30				
			35				
			40				

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

DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. 517-56 BORE HOLE NO. 5
JOB 60-F-73 STATION 97+96 8' Rt
DATUM G.S.C. COMPILED BY B.K.
BORING DATE Aug. 17/60 CHECKED BY K.S.

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					CONSISTENCY	SAMPLE	NATURAL UNIT WT P.C.F.
				P. S. F.							
	Groundlevel	737.0		25	50	75	BLOW T.				
	Asphalt 3"	736.7	0								
A A	Concrete 8 1/2" (Bridge Deck)	736.0									
	Fill material - Sand & gravel	728.5	5								
			10								
A			15								
4			20								
4	Concrete	713.5									
		712.0	25	6							
	Clay, sand and gravel mixture - stiff										
	END OF BOREHOLE		30								

W.P. 517-56 BORE HOLE NO. 6 (Cone Test Only)

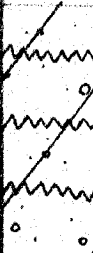

STATION 97+27 10' Left

COMPILED BY B.K.

CHECKED BY _____ K.S.

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

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

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE	
				P.S.F. BLOWS/FT.	
	↓ Groundlevel	736.5	0		
	Fill material clay sand and gravel loosely compacted		5		
		721.5	15		
	Probably clay, sand and fine gravel mixture (glacial Till)		20		
		708.5	25		
	END OF PENETRATION CONE TEST ONLY		30		
Penetration resistance profile shown; obtained by driving a 2" dia cone from groundlevel to depth noted with an energy of 350 ft. lb. per blow					

[illegible]

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. 517-56

BORE HOLE NO. 7 (Cone Test Only)

JOB 60-F-73

STATION 98/44 10' Left

DATUM G.S.C.

COMPILED BY B.K.

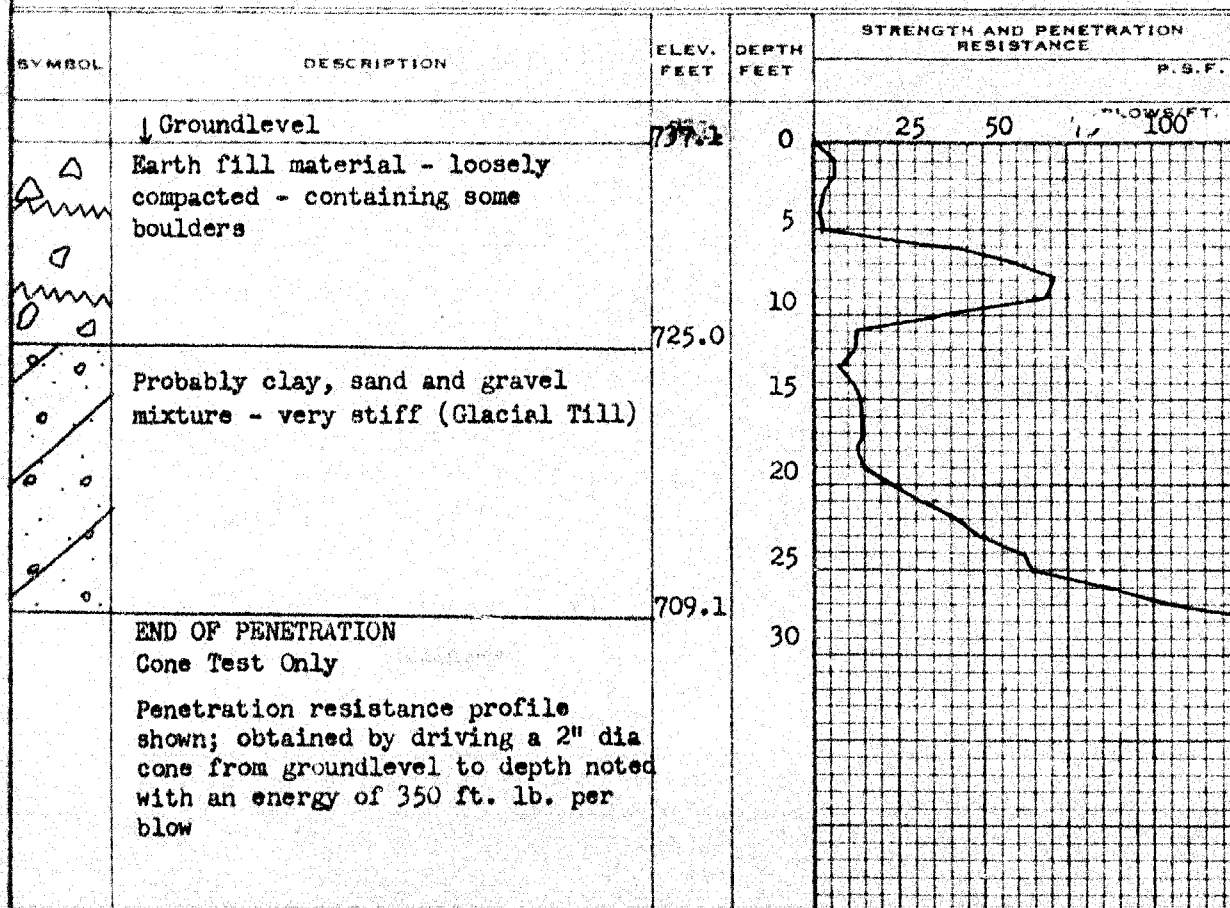
BORING DATE Aug. 17/60

CHECKED BY K.S.

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 _____	X
LIQUID LIMIT _____	
PLASTIC LIMIT _____	

[illegible]

DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. 517-56

BORE HOLE NO. 8

JOB 60-F-73

STATION 97+96 23' Left

DATUM G.S.C.

COMPILED BY B.K.

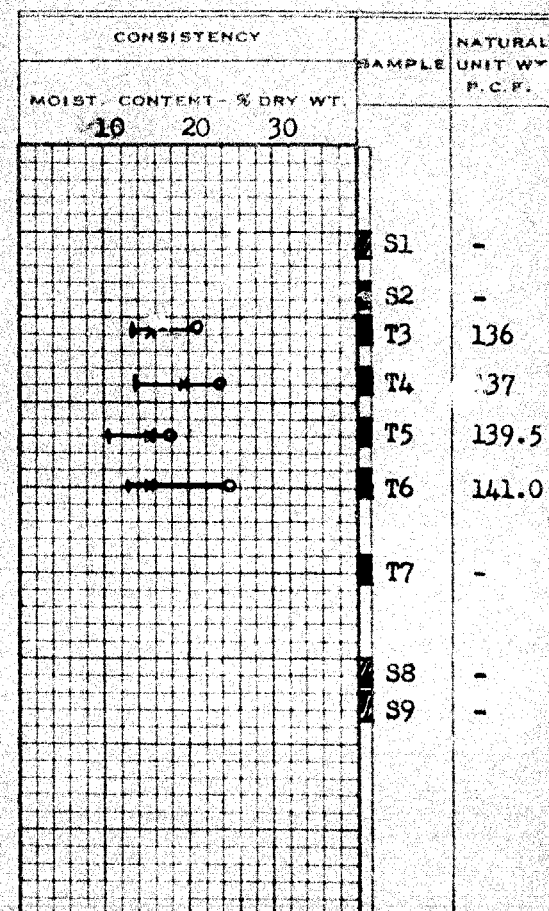
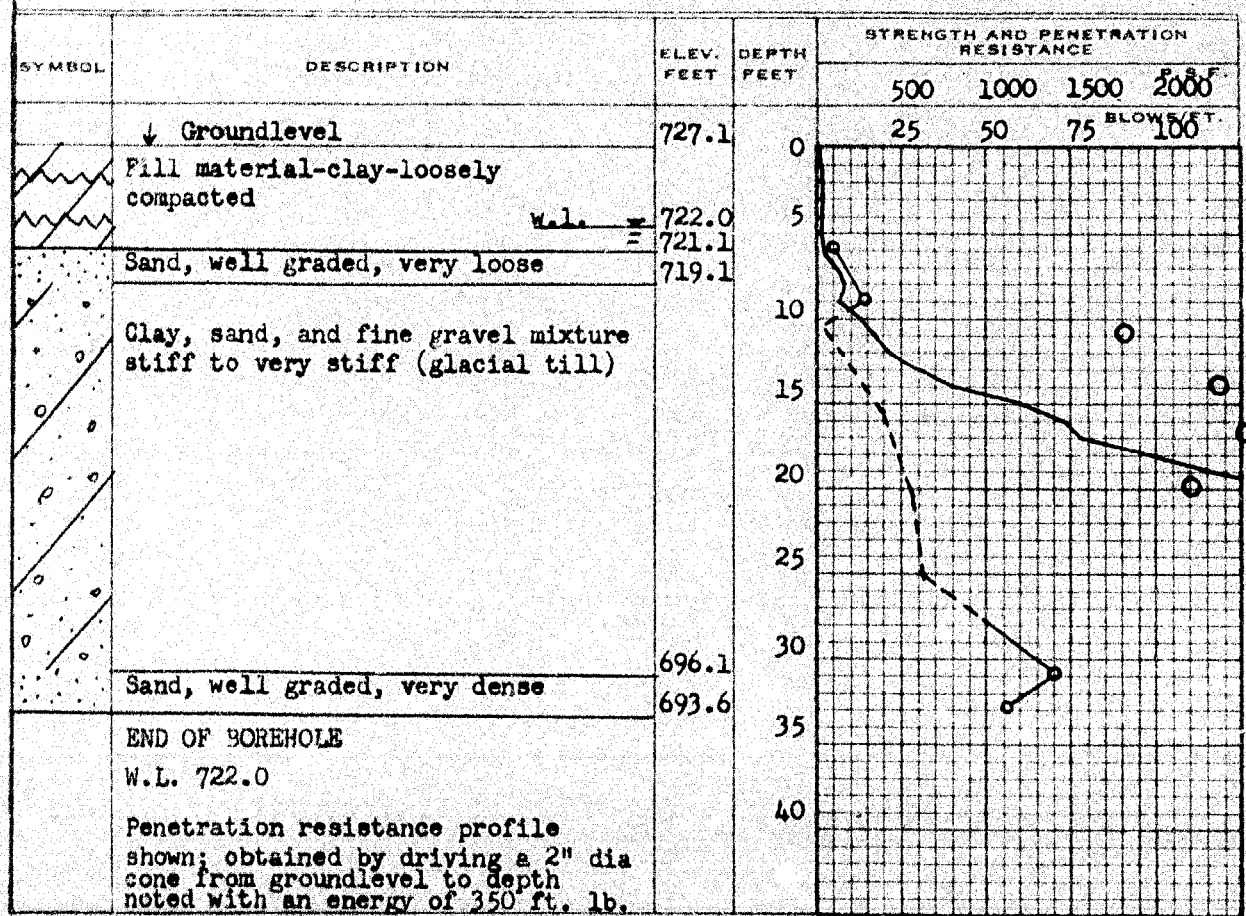
BORING DATE Aug 18/60

CHECKED BY K.S.

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

LEGEND

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



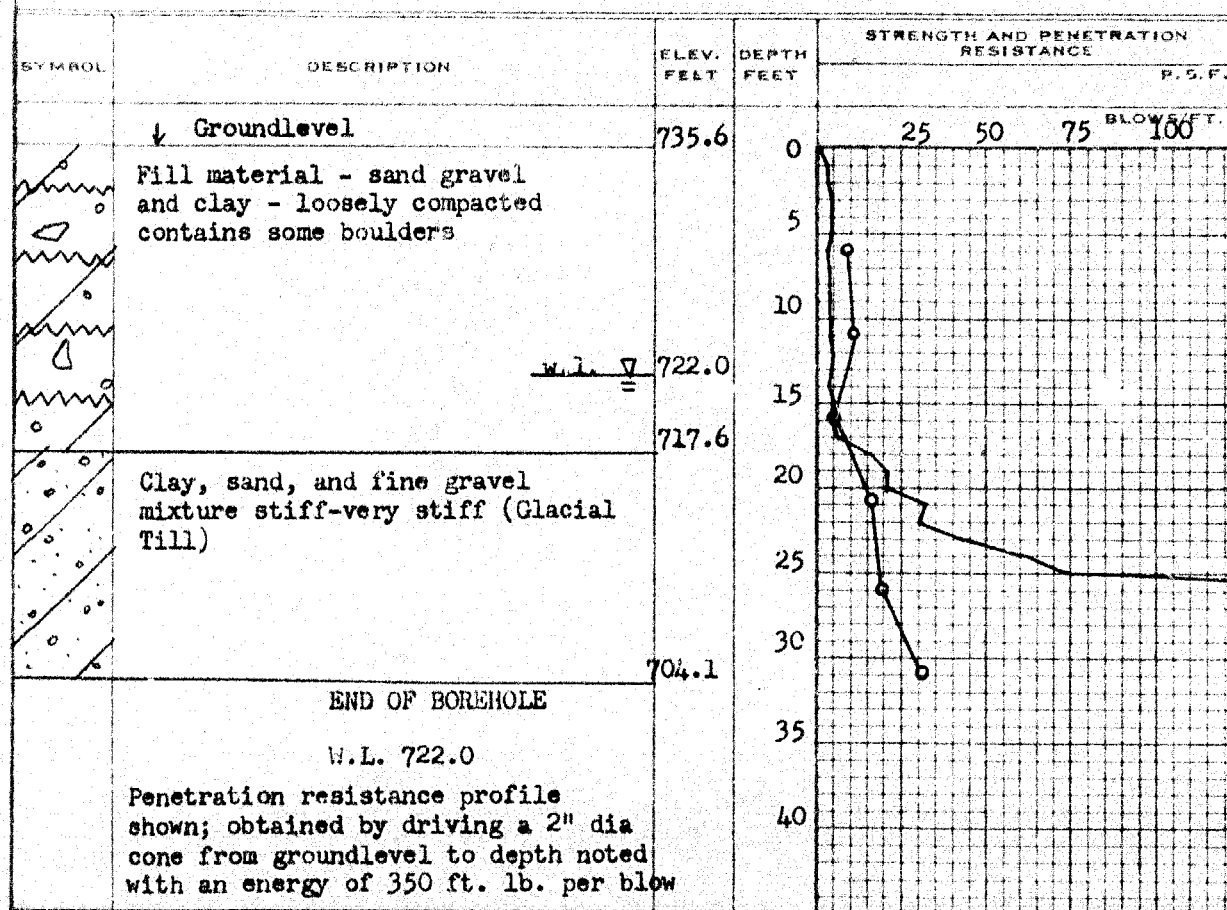
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. 517-56 BORE HOLE NO. 9
 JOB 60-F-73 STATION 98/44 17th Rt
 DATUM G.S.C. COMPILED BY B.K.
 BORING DATE Aug. 22/60 CHECKED BY K.S.

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	-

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. 517-56 BORE HOLE NO. 10 (Cone Test Only)

JOB 60-F-73 STATION 98+12 10' Rt

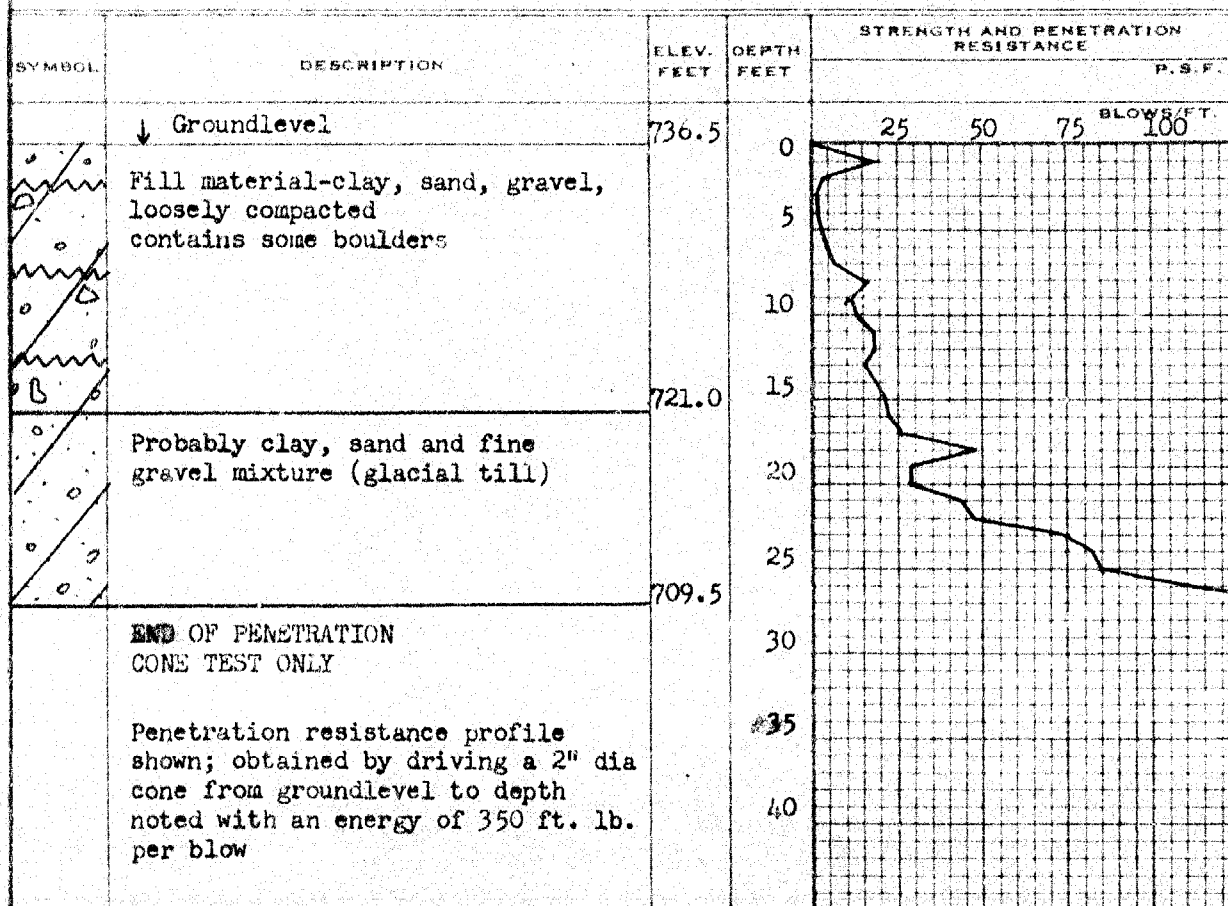
DATUM G.S.C. _____ COMPILED BY B.K. _____

BORING DATE Aug. 23/60 CHECKED BY K.S.

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

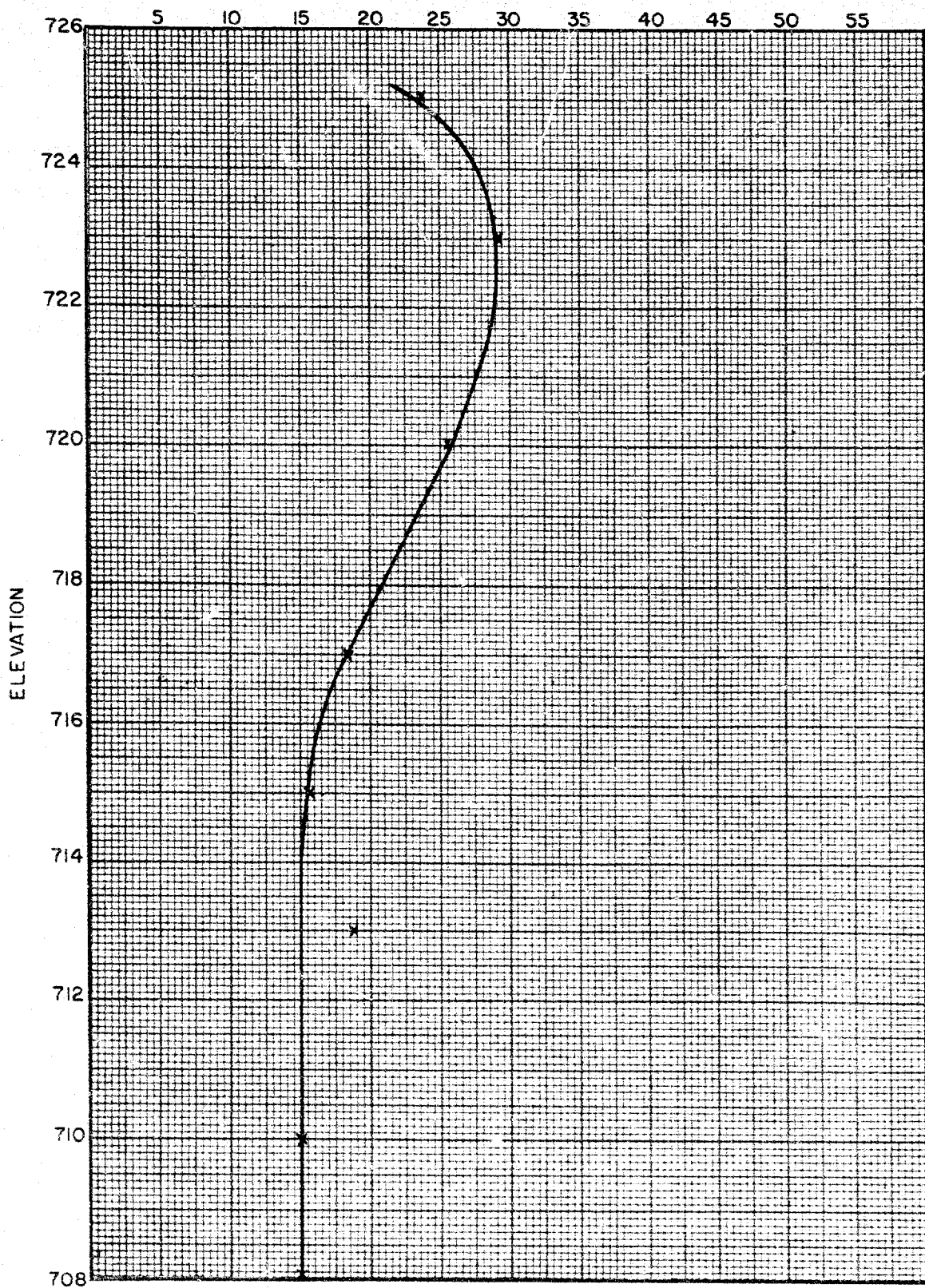
LEGEND

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

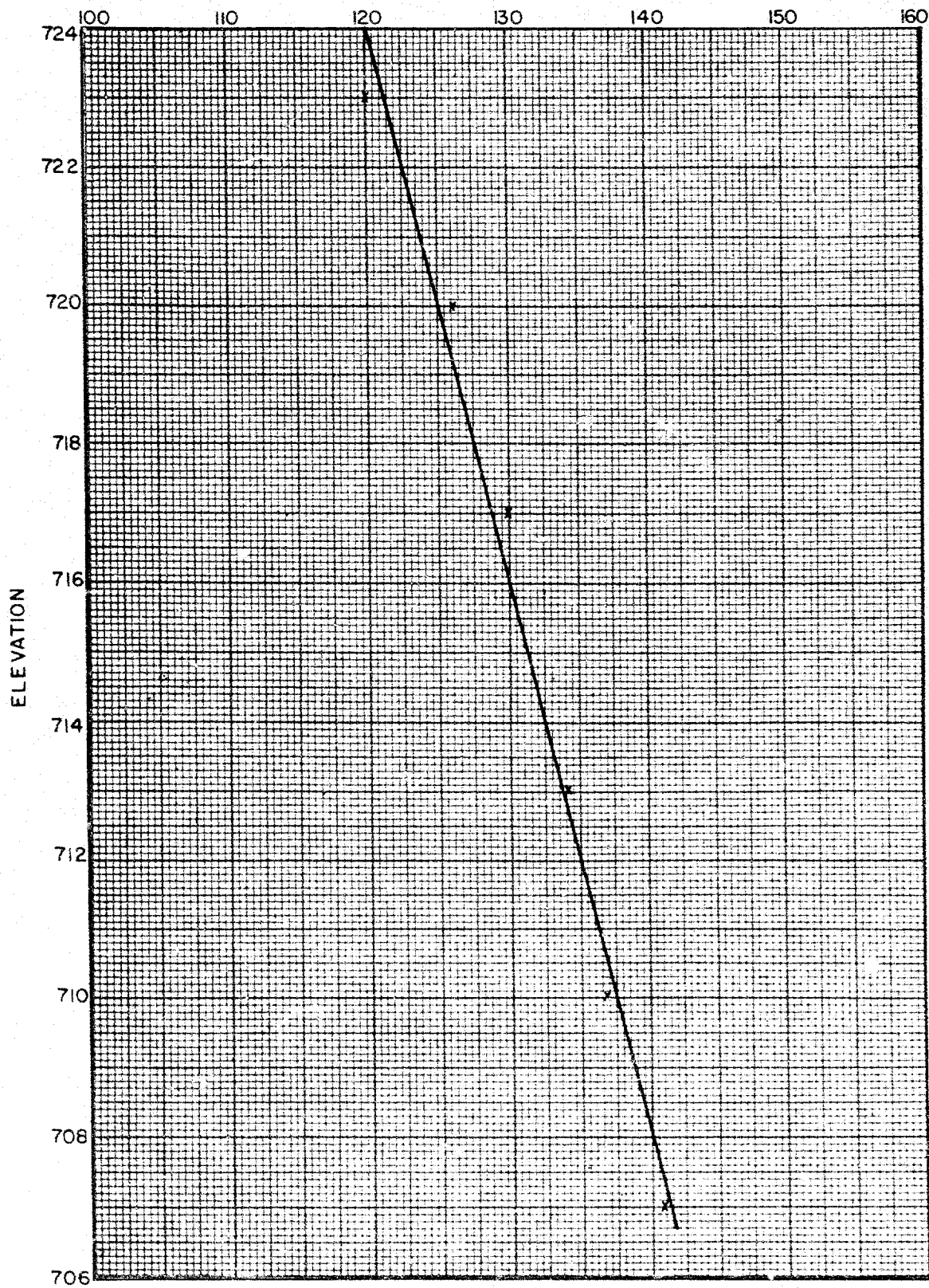
[illegible]

VARIATION OF NATURAL MOISTURE CONTENT WITH DEPTH

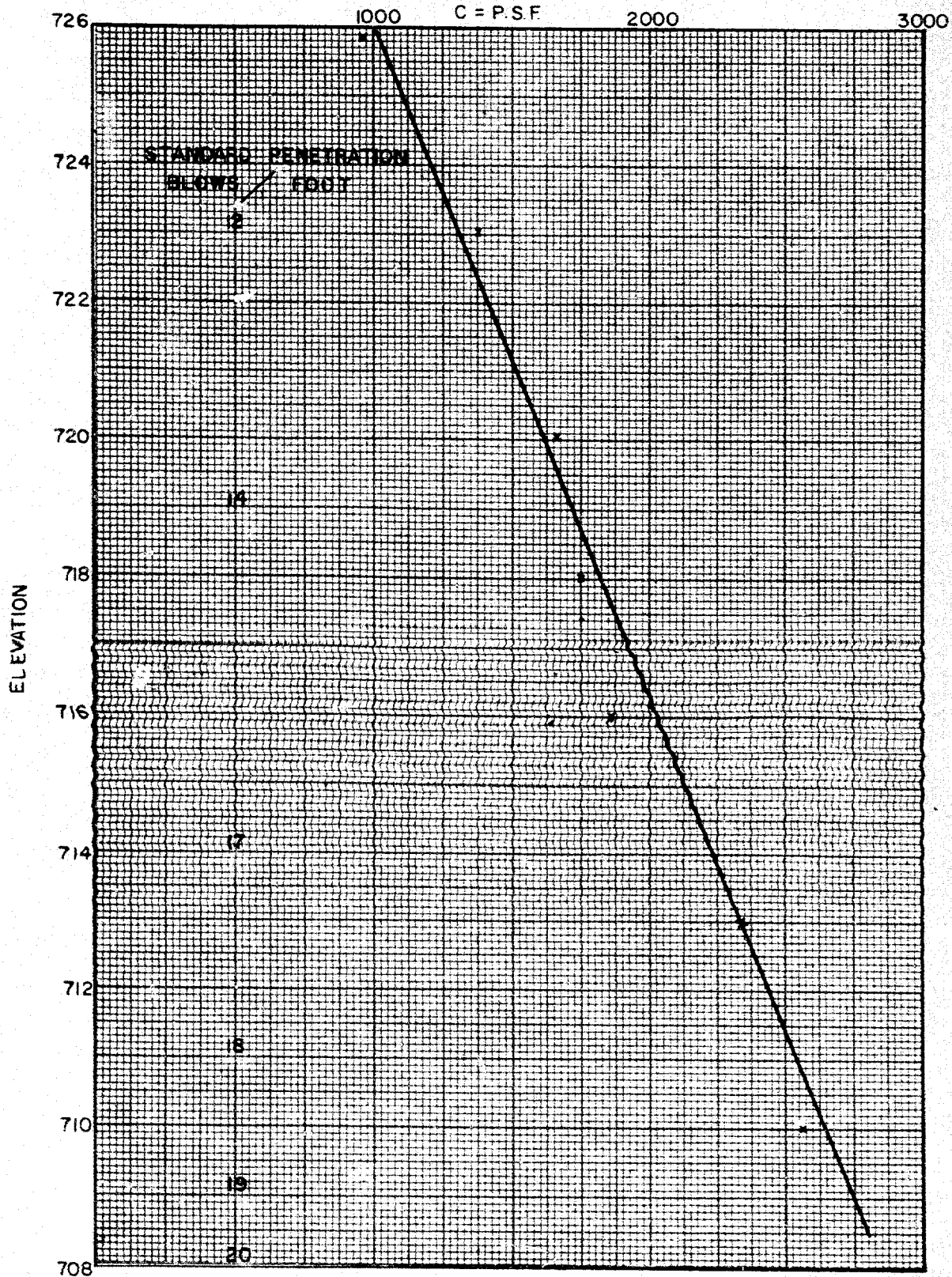
M = %



VARIATION OF BULK DENSITY WITH DEPTH

 $\gamma \rightarrow$ P.C.F.

VARIATION OF UNDRAINED SHEAR STRENGTH WITH DEPTH



#60-F-73

W.P. # 517-56

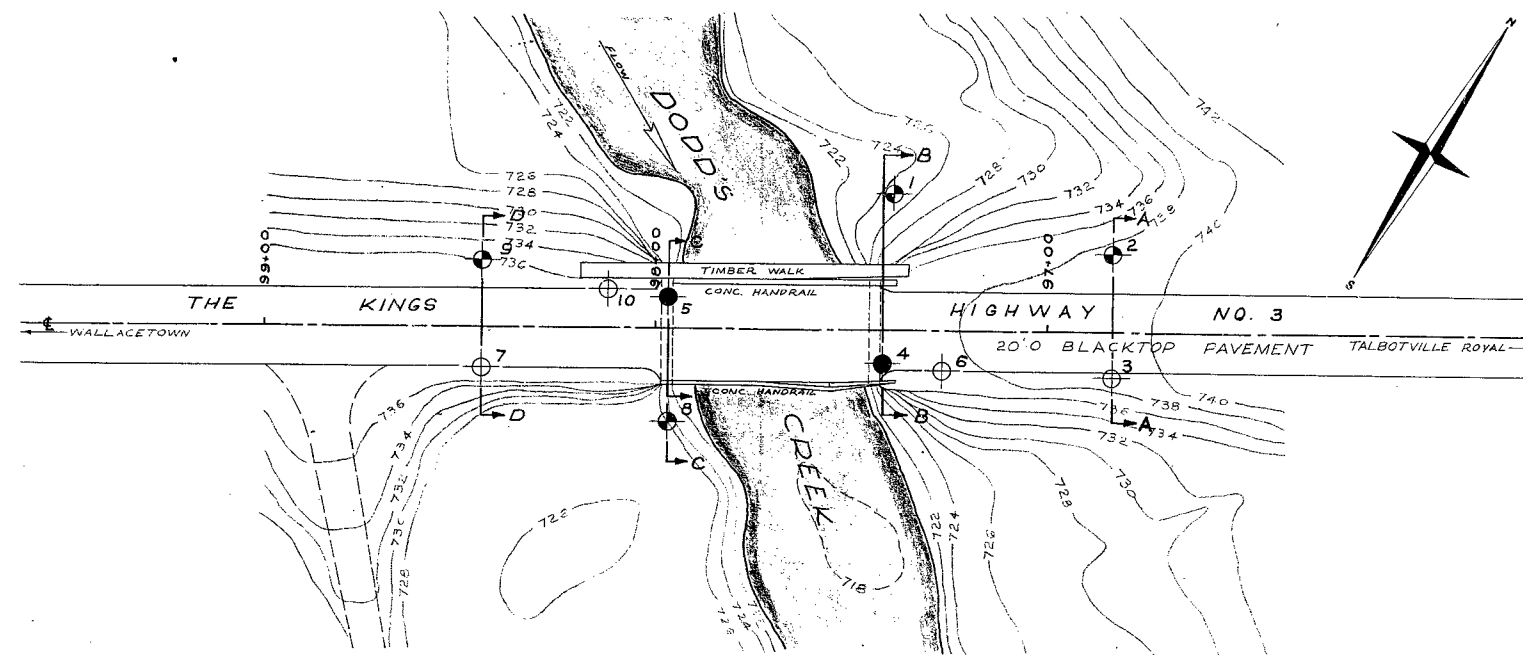
Hwy. # 3 E

DODD'S CR. PROP.

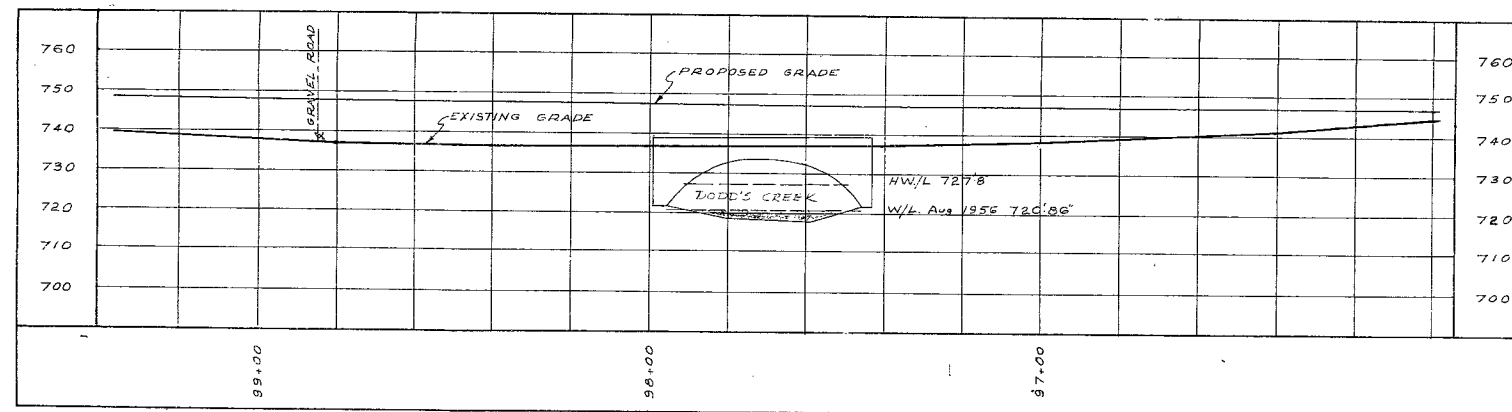
NEW BRIDGE

1.8 MILES W. OF

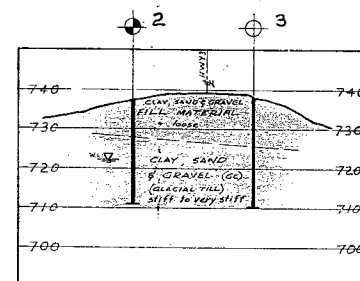
TALBOTVILLE



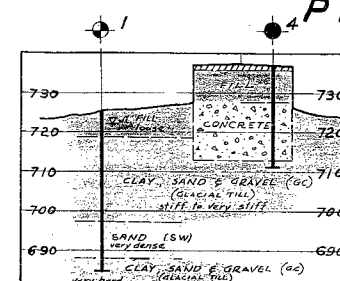
PLAN



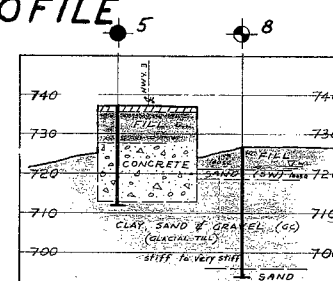
PROFILE



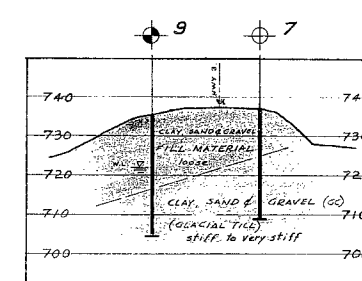
A-A



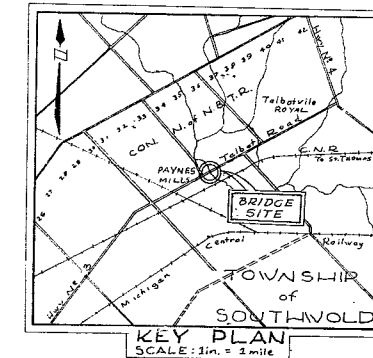
B-B



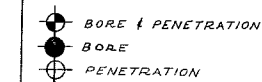
C-C



D-D



LEGEND



HOLE	ELEVATION	STATION	DISTANCE FROM #
1	725.5	97+39	35' RT.
2	737.4	96+84	20' RT.
3	738.4	96+84	11' LT.
4	737.0	97+42	8' LT.
5	737.0	97+96	8' RT.
6	736.5	97+27	10' LT.
7	737.1	98+44	10' LT.
8	727.1	97+96	23' LT.
9	735.6	98+44	17' RT.
10	736.5	98+12	10' RT.

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

DODD'S CREEK (AT PAYNES MILLS)

SHOWING POSITIONS & ELEVATIONS OF HOLES

HWY 3 DISTRICT 2 COUNTY ELGIN
TOWNSHIP SOUTHWOLD LOT 34 CON.
LOCATION APPROX. 18 MILES W. OF TALBOTVILLE ROYAL
DRAWN BY D.A.M. CHECKED BY J.K. W.P. 517-56
DATE 8 SEPT 1960 APPROVED BY J.K. DRAWING NO.
SCALE 1 inch = 80 feet **60-A-73**