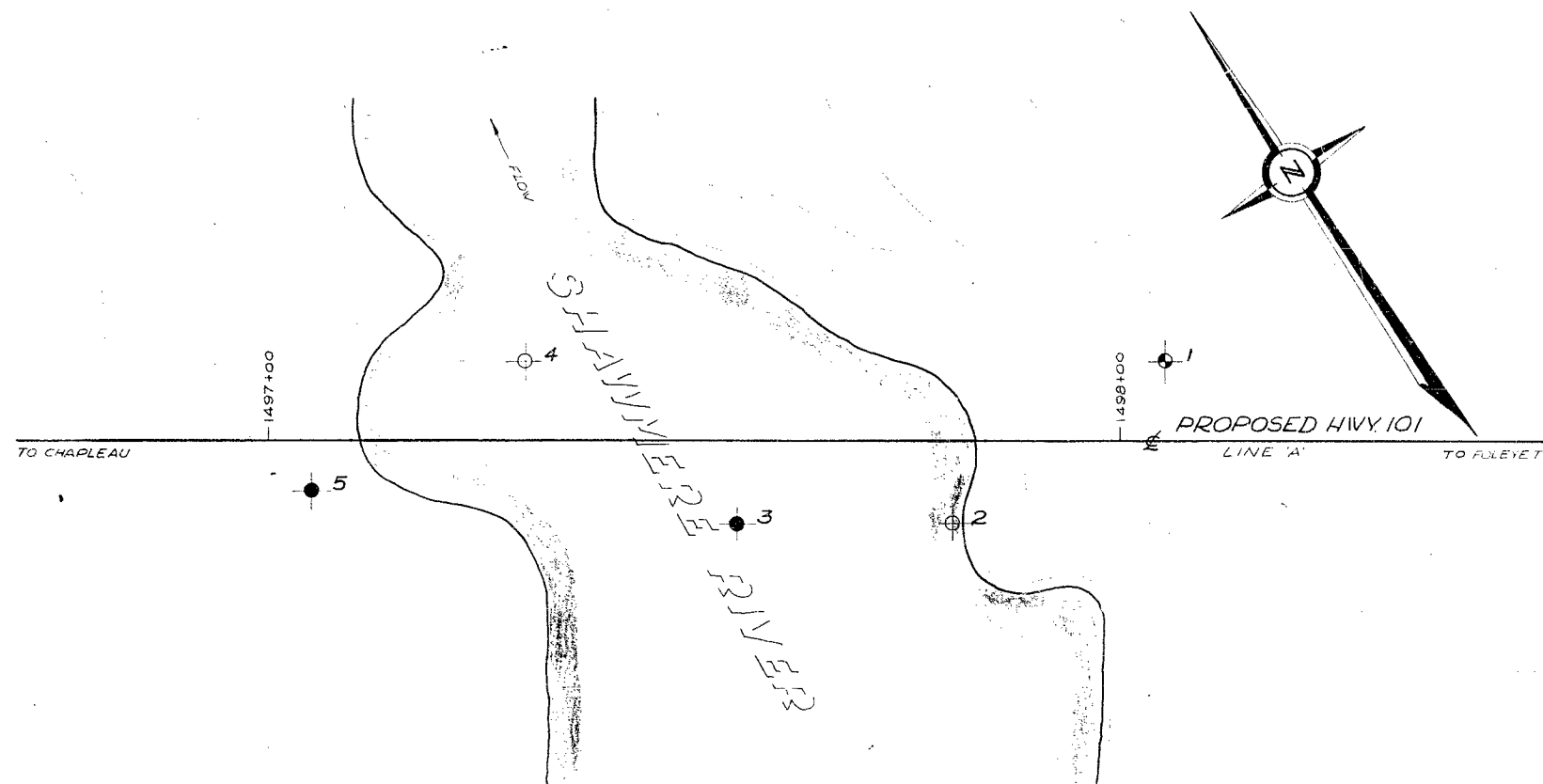
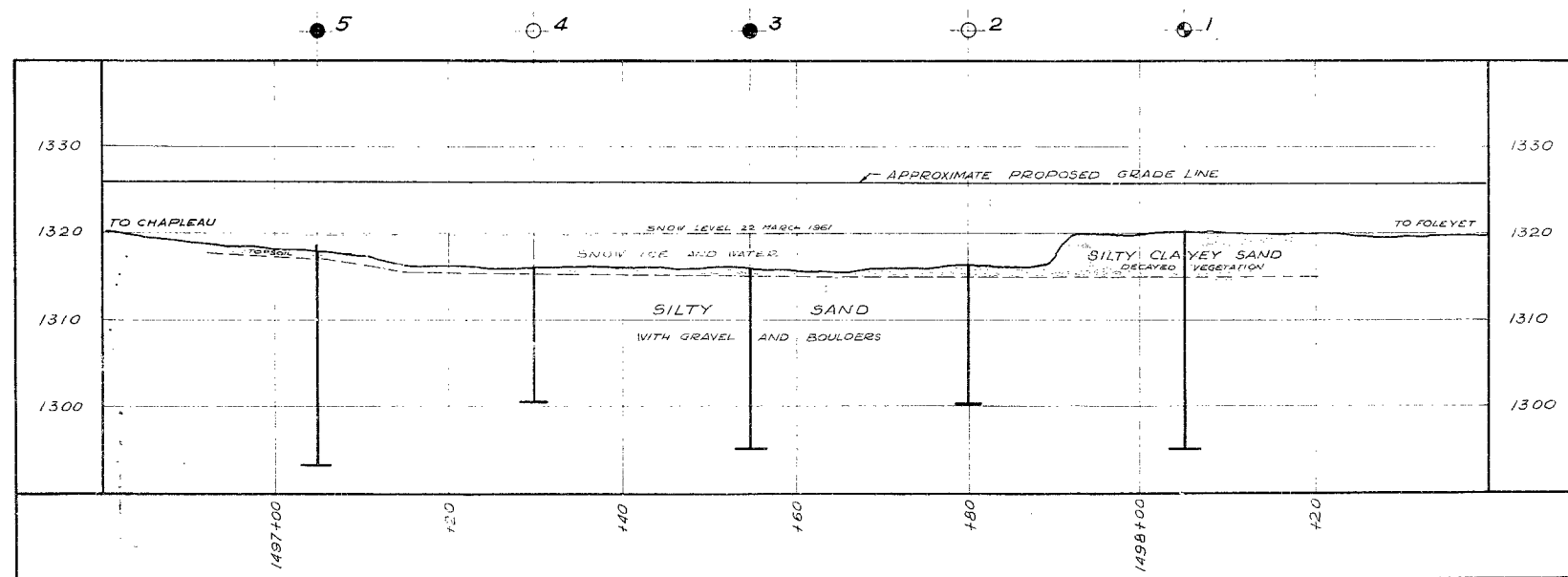


#61-F-20
Hwy. #101 &
SHAWMERE R.
CROSSING BTWN.
CHAPLEAU &
FOLEYET



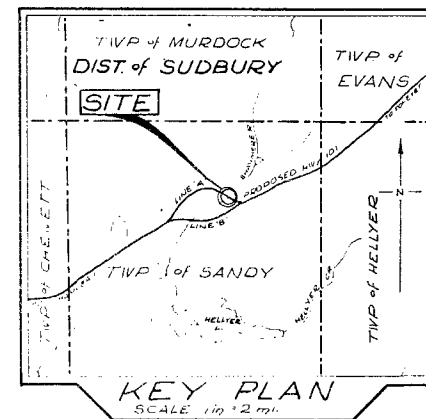
PLAN

SCALE 1 in. = 10 feet



PROFILE

SCALE 1 in. = 10 feet



LEGEND

- BORE HOLE
- PENETRATION HOLE
- PENETRATION HOLE
- BORE AND PENETRATION HOLE

HOLE	ELEVATION	STATION	DISTANCE FROM
1	1320.0'	1498+06	9'LT.
2	1317.0'	1497+80	10'RT.
3	1315.5'	1497+55	9'RT.
4	1316.0'	1497+30	9'LT.
5	1319.0'	1497+05	6'RT.

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH SECTION

SHAWMERE RIVER AND PROPOSED HIGHWAY 101 LINE 'A'

ORIGINATED VART KORLU DISTRICT NO. 17. DATE 20 APR. 1961
DRAWN J. J. C. W. P. NO. JOB NO. 61-F-20
CHECKED J. J. C. SCALE 1 inch = 10 feet DRAWING NO.
APPROVED J. J. C. 61-F-20A

Mr. A. M. Toye,
Bridge Engineer.
Materials & Research Section
(Foundations Office)
Attention: Mr. J. McCombie.

April 25, 1961.

D.H.C. FOUNDATION INVESTIGATION
REPORT.
W.J. 61-P-20 -- W.P. (Nil).

Re: Sawmere River and Hwy. 101 Crossing
Between Chapleau & Poleyet, Dist. #17.

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

The factual data and recommendations contained therein are, we believe, self-explanatory and should prove adequate for your future design work. If, however, further assistance is required, we would welcome a call from you in this respect.

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

AGS/ycsf
Attach.

cc: Messrs. A. M. Toye (2)
H. A. Tregaskes
H. D. McMillan
C. E. Hunter
T. A. Sharpe
C. E. Saint
A. Watt
Foundations Office
Gen. Files.

A. G. Sternac
(A. G. Sternac,
SUPERVISING FOUNDATION ENGR.)

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 - 4.2) Grey Silty Sand with Gravel & Boulders.
 5. DISCUSSION AND RECOMMENDATIONS.
 6. SUMMARY.
 7. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION

For

Shawmere River and Hwy. 101 Crossing
Between Chapleau and Foleyet
W.J. 61-F-20 -- District #17.

1. INTRODUCTION:

A soil investigation was carried out in order to determine the subsoil stratification, the soil properties, and to recommend the type of foundations to support the proposed new structure.

The location of the site is at the new secondary Hwy. 101 and Shawmere River crossing. This site is about 30 miles North-East of Chapleau in the Twp. of Sandy, District 18.

The results of the investigation, together with the discussion and recommendations, are given in this report.

2. DESCRIPTION OF SITE & GEOLOGY:

The topography of the area is undulating with thickly wooded, rolling hills. The ground is mostly covered with decayed vegetation and depressed areas form swampy terrain.

Geologically, the area is in the Precambrian Shield. This Shield consists mainly of igneous rocks, but includes, also, remnants and patches of volcanic and sedimentary rocks. The overburden has been formed by glacial drifts and spillways.

cont'd. /2 ...

3. FIELD AND LABORATORY WORK:

The investigation was carried out by means of a coredrill machine adapted for soil sampling. During the investigation, three boreholes were made; one hole on each side of the river and one hole in the middle. In addition, two dynamic cone penetration tests were made.

In granular soils, samples were taken by means of a 2" O.D. split barrelled spoon sampler. The dimensions of the spoon sampler and the energy used in driving it, conform to the requirements of the Standard Penetration Test.

The split spoon samples were visually examined in the field and representative samples were brought to the laboratory for further tests.

The logs of the boreholes and their location, shown on Drawing No. 61-F-20A, are attached under Appendix I.

4. SOIL TYPES ENCOUNTERED:

4.1) General:

The investigation at the site revealed the following subsoil conditions:-

The top material is soft, black, silty, clayey sand with decayed vegetation. Underlying this material, is the layer of grey, silty sand with some gravel and occasional boulders. The boreholes were terminated in this layer.

cont'd. /3 ...

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

4.2) Grey Silty Sand with Gravel and Boulders:

This material was intersected under the topsoil. The boreholes were discontinued at about 25 ft. below the ground elevation and the rest of the layer was not explored. The grain size distribution indicates that the material is well graded with fine to coarse size particles. It contains some gravel and occasional boulders of 3" to 24" size. The boulders were cleared by AXT diamond bit. The field Standard Penetration tests indicate that the material in the layer is in a dense state.

5. DISCUSSION AND RECOMMENDATIONS:

The subsoil at the investigated site is made up of granular material of favourable properties. Preference, therefore, will be given to the use of spread footings for foundations.

Based on the field Standard Penetration test measurements, it is recommended to use 3 tons/sq.ft. bearing pressure for the support of spread footings. The footings will be placed about 6 ft. below the ground level, at about elevation 1314 ft.

This elevation is below the water level and sealing the footing area during excavations, will be necessary. During the boring operations, several boulders were encountered at different elevations. This indicates that the subsoil in this area is spotted with boulders which would make sheet pile driving into this layer impractical.

cont'd. /4 ...

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

It is recommended to excavate or dredge the footing area down to the bottom of the footing elevation, then seal the area with a well braced form, pump out the water and then place the footings. If the dewatering of the excavation proves to be impossible, a tremie concrete slab should be poured. After dewatering is completed, further concreting will be continued in the dry.

Consideration has also been given to wooden pile support of the foundations. It is believed that the presence of boulders will handicap the driving of the piles to the desired depths.

6. SUMMARY:

It is recommended to found the structure on spread footings. The footings will be placed at about elevation 1314 ft. At this elevation a safe bearing pressure of 3 tons/sq.ft. can be used.

The placing of the footings below the water level could be accomplished by sealing the excavated area with tight forms and pumping the water out. A tremie concrete seal might prove to be necessary.

The presence of boulders in the subsoil makes sheet pile driving for this purpose impractical.

It is also believed that the presence of boulders in the subsoil will prevent the driving of the piles to the desired depths.

7. MISCELLANEOUS:

The field work was carried out during March 20 to March 24, 1961, under the supervision of Project Foundation Engineer, V. Korlu. All laboratory testing was done by the Materials and Research Section.

April 1961.

REPORT PREPARED BY:

R. G. Selby

for

V. Korlu,
PROJECT FOUNDATION ENGR.

REPORT APPROVED BY:

A. G. Stermac

A. G. Stermac,
SUPERVISING FOUNDATION ENGR.

APPENDIX I

SUMMARY OF FIELD & LABORATORY TESTS

JOB 61-F-20

W.P. -

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS/FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
1	S1	4'-5.5'	Silty, clayey sand with decayed vegetation.	34	89.0	54.0	72.0	-	-	
	S2	9'-9.7'	Silty sand with gravel.	130-8"	-	-	-	-	-	
	S3	12'-13.5'	" "	38	15.0	-	-	-	-	
	S4	18'-19.5'	" "	149	-	-	-	-	-	
2	cone penetration only									
3	S1	9'-10.5'	Silty sand with gravel.	37	6.9	-	-	-	-	
	S2	14.5'-16'	" " "	97	9.8	-	-	-	-	
	S3	19'-20.5'	" " "	64	9.4	-	-	-	-	
	S4	24'-24.7'	" " "	200-8"	-	-	-	-	-	

SUMMARY OF FIELD & LABORATORY TESTS

JOB 61-F-20

W.P. -

HOLE NO	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS FT	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
4		cone penetration only								
5	S1	4'-5.5'	Silty sand with gravel.	34	-	-	-	-	-	
	S2	9'-10.5'	" " "	36	10.1	-	-	-	-	
	S3	14'-15.5'	" " "	54	9.3	-	-	-	-	
	S4	19'-20.5'	" " "	96	-	-	-	-	-	
	S5	24'-25.5'	" " "	138	11.9	-	-	-	-	
			S denotes split spoon							

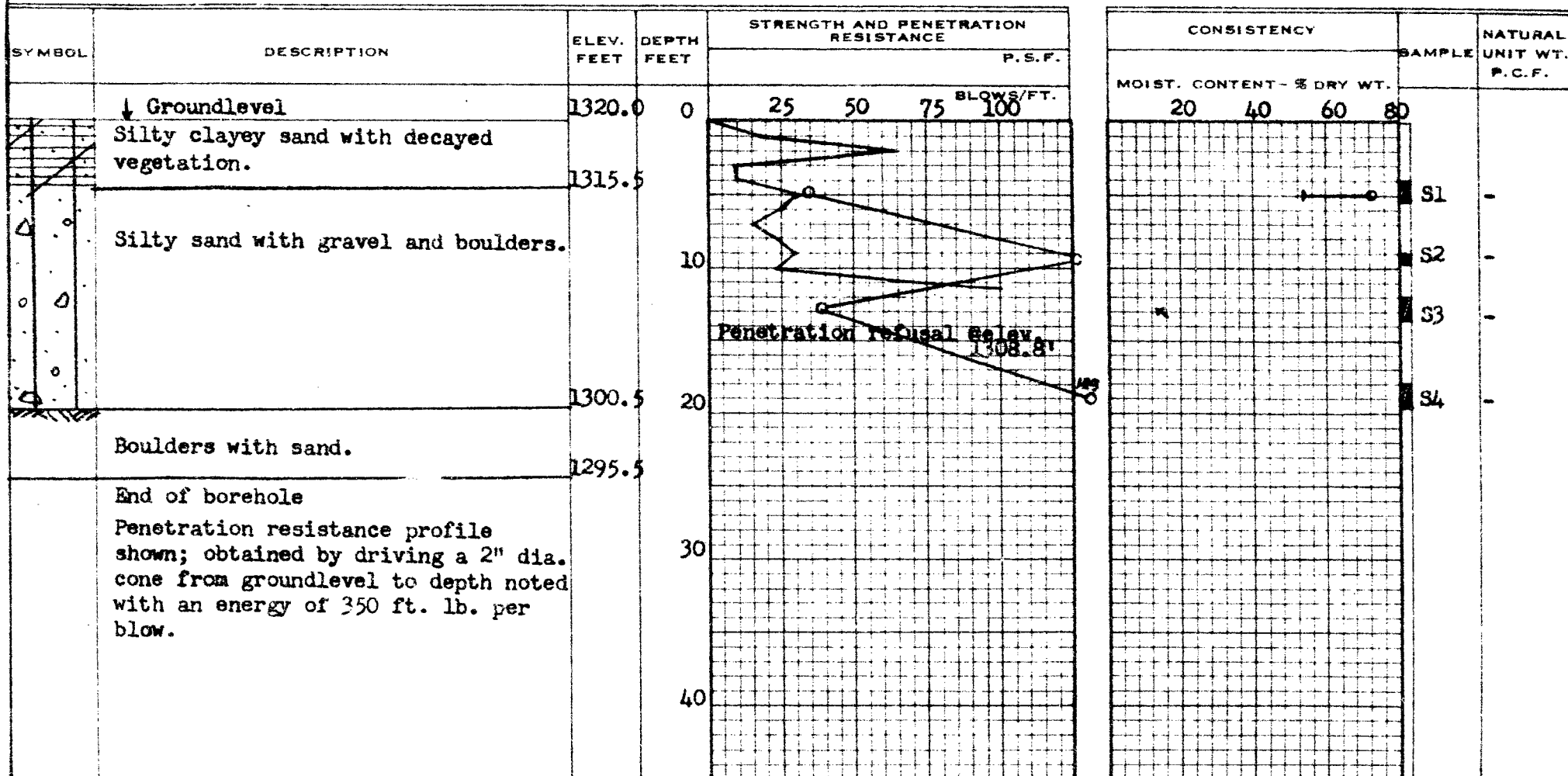
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. _____ BORE HOLE NO. 1
 JOB 61-F-20 STATION 1498+06 (9' It.)
 DATUM 1320.0' COMPILED BY B.K.
 BORING DATE Mar. 22/61 CHECKED BY V.K.

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 _____



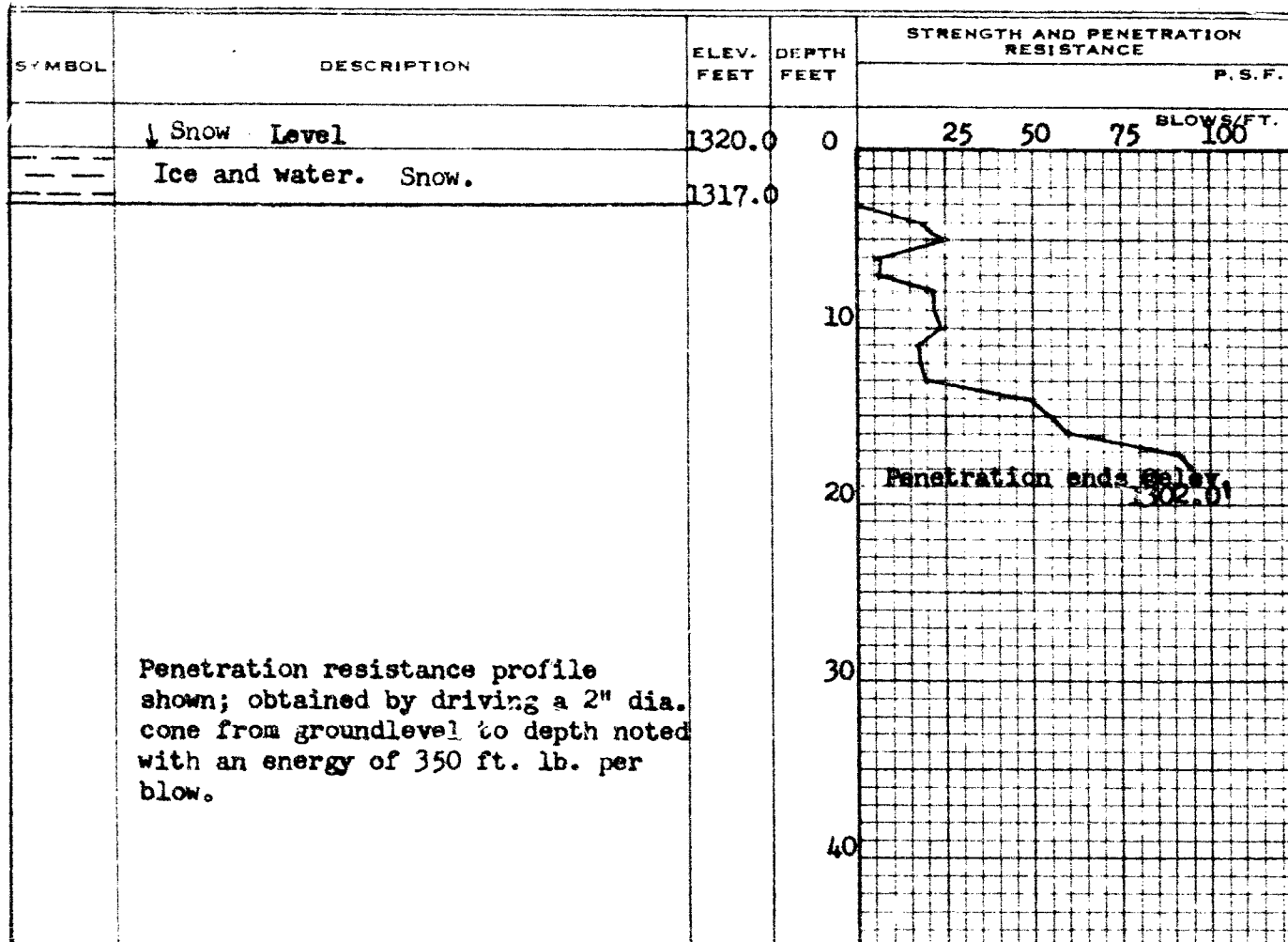
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. _____ BORE HOLE NO. _____ 2
JOB 61-F-20 _____ STATION 1497+80 (10' Rt.)
DATUM 1320.0' _____ COMPILED BY B.K. _____
BORING DATE Mar. 23/61 _____ CHECKED BY V.K. _____

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]

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

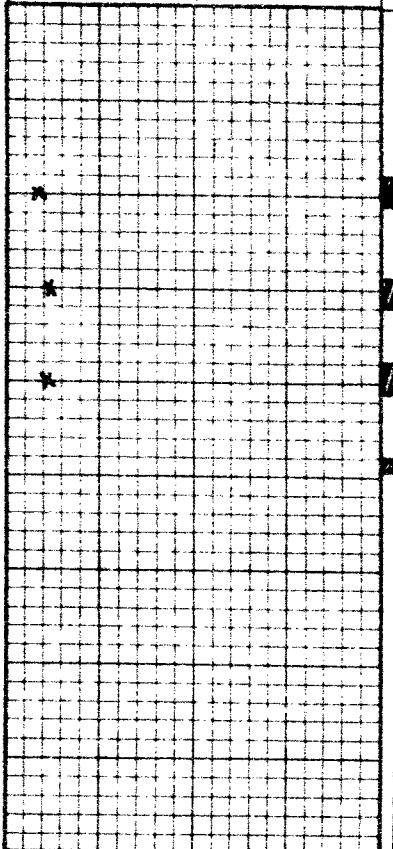
W.P. _____ BORE HOLE NO. 3
 JOB 61-P-20 STATION 1497+55 (9' Rt.)
 DATUM 1320.0' COMPILED BY B.K.
 BORING DATE Mar. 23/61 CHECKED BY V.K.

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.
	↓ Snow Level	1320.0	0	25 50 75 100 BLOWS/FT.
---	Ice and water. Snow.	1315.5		
---	Black mud.	1314.5		
○	Silty sand with gravel and boulders.		10	
			20	
		1295.8		
	End of borehole.		30	
			40	

CONSISTENCY			SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT- % DRY WT.				
20	40	60		
			S1	-
			S2	-
			S3	-
			S4	-

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

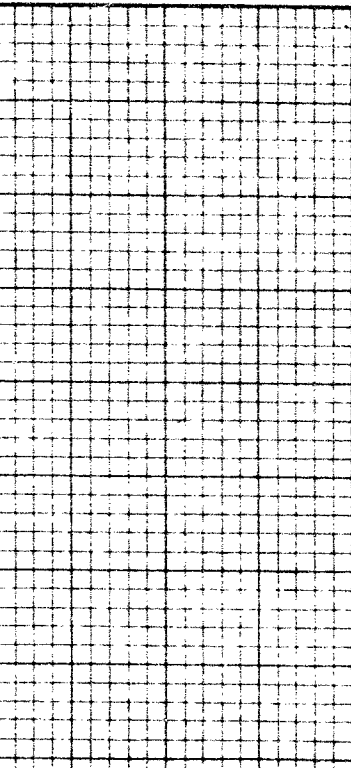
W.P. _____ BORE HOLE NO. _____ 4
JOB 61-F-20 _____ STATION 1497+30 (9' Lt)
DATUM 1320.0' _____ COMPILED BY B.K.
BORING DATE Mar. 24/61 _____ CHECKED BY V.K.

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)	---	+3
NATURAL MOISTURE AND		
LIQUIDITY INDEX	---	LI
LIQUID LIMIT	---	X
PLASTIC LIMIT	---	0

[illegible]

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

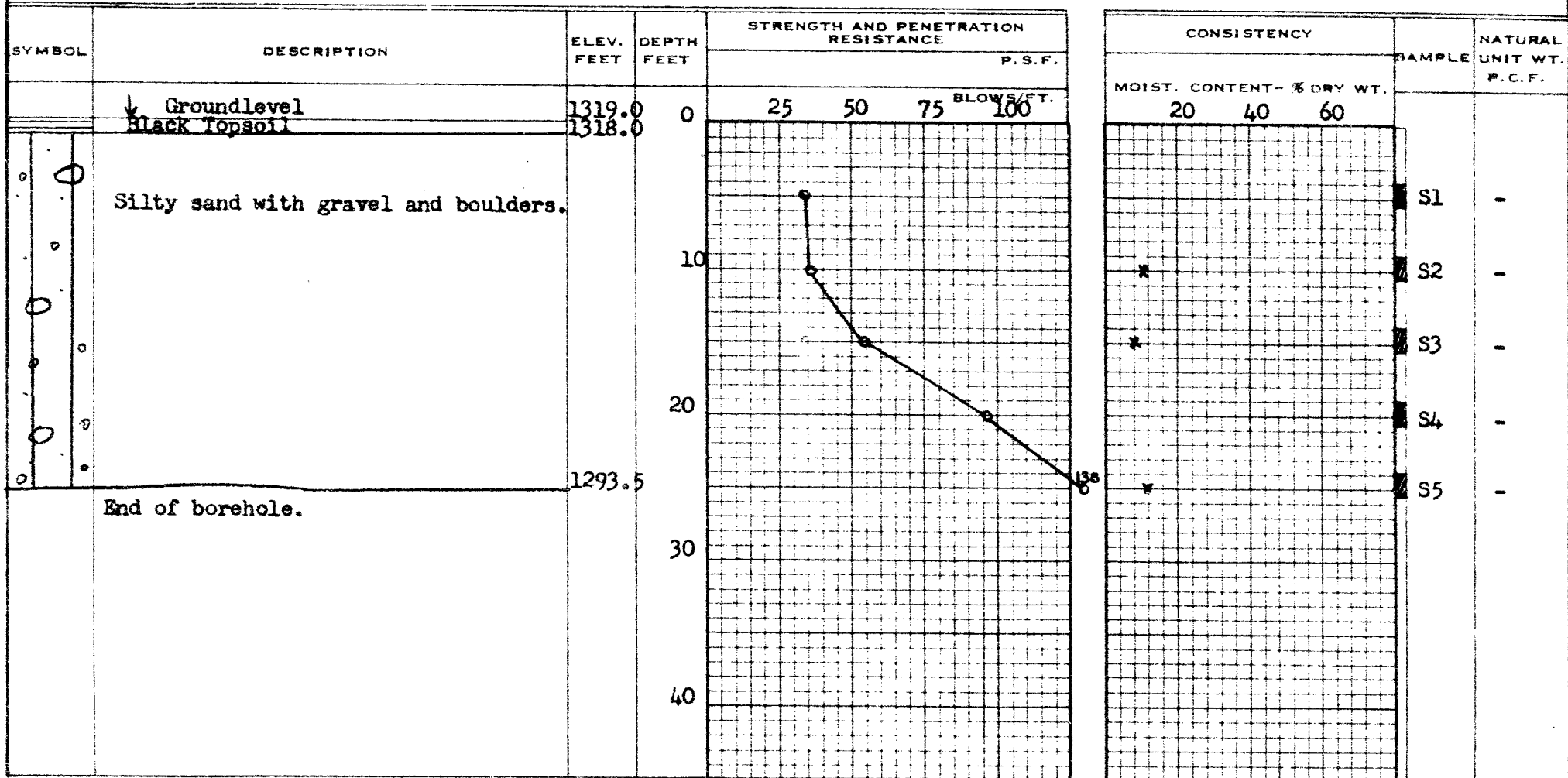
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. _____ BORE HOLE NO. 5
JOB 61-F-20 STATION 1497+05 (6' Pt.)
DATUM 1319.0' COMPILED BY B.K.
BORING DATE Mar. 24/61 CHECKED BY V.K.

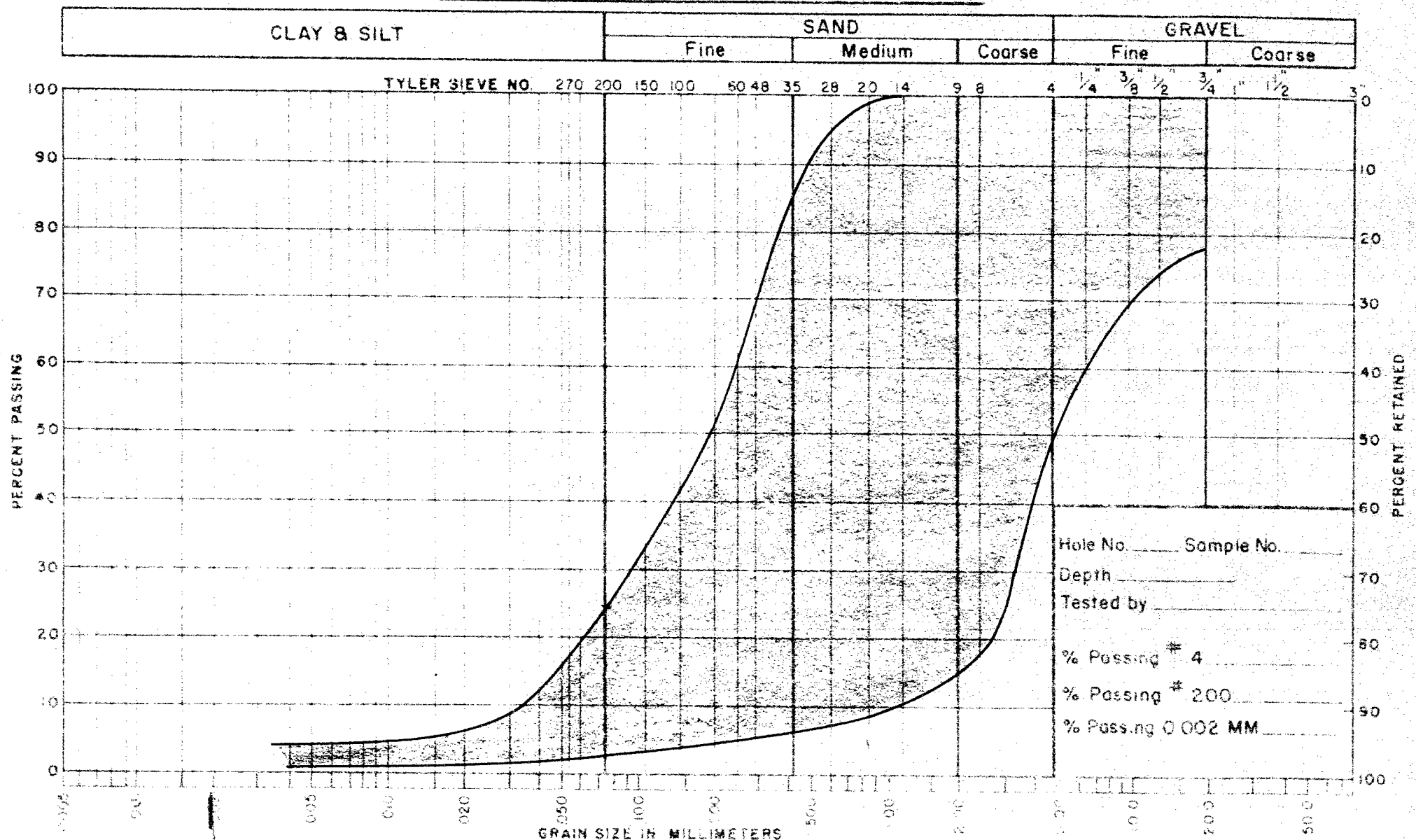
LEGEND

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

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



UNIFIED SOIL CLASSIFICATION SYSTEM



NOTES: SILTY SAND WITH GRAVEL & BOULDERS

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH SECTION
GRAIN SIZE DISTRIBUTION

Job No. 61-F-20 W.P. No. _____

Location SHAWMERE RI. & HWY 101

JUNE 1959

DEPARTMENT OF HIGHWAYS
TELETYPE MESSAGE

MARK WITH X

FROM A. E. McKim,
Bridge Control Eng.

TO E. A. Fletcher, Construction Engineer

NEW LISKEARD

SUBJECT - Shawmere River Bridge Hwy. #101

File
Jan 20 1962

URGENT

ROUTINE

DATE Jan. 19, 1962

TIME c.c. copy

X

Confirming our telephone conversation yesterday, we recommend the following measures to be taken in the construction of the timber cribs for this structure.

1. Level off and compact the bottom of the excavation to the elevation shown on plans.
2. Construct a one layer timber mat of 12 to 14 ft. long native timbers in bottom of excavation .
3. Construct timber crib on the mat. If possible fill inside of timber crib and backfill outside crib as it is constructed.

NOTE- MESSAGES OUTGOING AND MARKED URGENT ARE HANDLED AS SOON AS POSSIBLE. ROUTINE MESSAGES HANDLED WHEN CIRCUITS PERMIT. MESSAGES INCOMING TO TORONTO H.O. ARE MAILED TO ADDRESSEE. IF MARKED URGENT MESSAGES ARE TELEPHONED

A. E. McKim

SIGNATURE

Telephone call ~~Al~~ McKim Jan 17. 1962

Excavation for bridge shows very loose material. District afraid to build timber crib. Presumably dewatering caused boiling.

Telephone call Al McKim Jan 17. 1962

Dewatering was never attempted

Telephone call ~~Jim~~ Roy Wagh (ROY WAGH)

D. H. O. man at the site Jan 18. 1962.

Earth was pushed out and a small cofferdam was built. Excavating material did not disclose a dense stratum as was expected at 3' 6". Excavation was continued up to 11 ft below ground level and some 7 ft below creek water level. Excavation was discontinued and material ploughed in and filled hole up to 8 ft below ground level.

Explanation:

Uncovering the sandy stratum did not give impression of dense material so excavation was deepened. This caused a high hydraulic gradient which lead to unstable excavation bottom conditions

Remedial measures recommended:

Compact the bottom of excavation as best as possible. Erect a timber raft of native timber 12-14 (preferably 14 ft) long and build crib on top of it. As building of crib reaches certain height backfill excavation. Fill crib with rock.

Explanation of measures

Subsoil is basically granular material and bearing capacity is roughly proportional to the footing width. By increasing footing width, failure possibility is greatly reduced. Settlements will be more or less instantaneous.

Jan. 18. 1962.

Aylstermore

Recommendations given to Al McKinn who is supposed to get in touch with the Consts. Eng. Mr Fletcher.