

25-63-172
Mr. A. M. Foye,
Bridge Engineer,
Bridge Division.

Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Attention: Mr. J. Keen
Senior Bridge Project Eng.

November 12, 1964.

Amable Du Fond River Bridge
W.P. 71-60, Dist. #13, W.J. 60-F-97

Further to your memo dated November 3rd, 1964 we have reviewed the subsoil conditions at the above mentioned project in the light of Hydrological requirements. As outlined in your memo the maximum scour depth could be in the order of 20 to 30 feet below the river bed, i.e. down to elevation 515.0. The proposed footings for the structure will be at approximate elevation 551.0. Since the scour depth is so great, the use of timber piles or short steel piles is not possible. In view of this, our comments pertaining to the structure foundations are as follows:

The proposed single span structure may be supported on 12 3/4" O.D. steel tube piles. It is estimated that a design load of 60 tons per pile can be achieved at or above elevation 470.0. Driving in the field should be controlled by means of the Hiley formula according to D.H.C. current standards DD 1218 and DD 1219.

In order to provide an accurate estimate of the pile length requirements it would be preferable to carry out a pile load test prior to construction. If it is decided not to proceed with pile load tests prior to construction, provision should be made to carry these out in the main contract. This may be necessary if the pile capacities as indicated by the Hiley Formula are less than the design requirements.

We believe that the above information is sufficient for your present design purposes; however, if you need any further information, please contact this office.

M. Devata
M. Devata
Senior Foundation Engineer

Per

A. G. Stermac
Principal Foundation Engineer

MD/P b

23-68-172

Mr. A. H. Doye,
Bridge Engineer,
Materials & Research Section.

January 30, 1961.

D.B.C. FOUNDATION INVESTIGATION
REPORT.

Attention: Mr. A. McInnis.

Re: Hwy. #17 and Amable du Fond Creek
Crossing, 11 miles West of Mattawa,
W.P. 71-60, A.J. 60-2-37, District #13
Plan No. 25546 -- Profile No. C 1546-1.

This memo accompanies our detailed foundation
report for the above site.

We believe you will find the information contained
therein, self-explanatory; however, should you require further
assistance in connection with this project, please do not
hesitate to contact our Office.

L. C. Sterman,
PRINCIPAL FOUNDATION ENG.

Per:

Sterman

(L. C. Sterman,
CH. PRINCIPAL FOUNDATION ENG.)

101/1008
Attach.

cc: Messrs. A. H. Doye (2)
E. A. Trogaskas
D. C. McInnis
J. E. Hunter
L. Foster
E. V. Saint
A. Hall
Foundations Office
Gen. Files.

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Foundation Investigation
at
Hwy. 17 and Amable du Fond Crk
crossing, 11 miles West of Mattawa
District 13. W.P. 71-60,
W.J. 60-P-97, Plan No. 2B546,
Profile No. C 1546-1

1. INTRODUCTION:

It is proposed to replace the existing bridge on Hwy. 17 over the Amable du Fond creek. The site is about 11 miles West of Mattawa (Con. IX, Lot 14, Twp. of Calvin).

The soil investigation was carried out in order to determine the subsoil stratification, the soil properties and recommend the type of foundations.

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

2. DESCRIPTION OF SITE & GEOLOGY:

Amable du Fond Creek is a tributary of the Ottawa River. Topographically the country consists of forested hills with old stream beds where the rivers deposit the eroded material from the surrounding area.

Geologically, the area is in the Precambrian Shield, with bedrock mainly granite. The overburden has been formed by glacial drifts and spillways, etc.

3. FIELD AND LABORATORY WORK:

The investigations were carried out by means of a coredrill machine adapted for soil sampling. During the investigations four boreholes were made, two holes corresponding to the two corners of the east abutment and two to the west abutment.

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

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. 60-F-97A, are attached under Appendix I.

4. SOIL TYPES ENCOUNTERED:

1. General:

The investigations at the site revealed the following subsoil conditions:

The top layer is loose to medium, mostly uniform brown sand. It is underlain by a layer of loose uniform grey silty sand. Underlying this material is a layer of dense, pebbly, bouldery, silty sand (till).

2. Brown loose to medium sand:

This layer extends down to elevations 506-511 ft. and appears to be a more recent deposit. It is spotted with occasional pieces of decayed wood and the presence of a small amount of clay gives it, its brown colour. The material is mostly a medium size sand. In the upper about 10 ft. it is mixed with coarse size particles the amount of which decreases with depth.

cont'd /3 ...

3. Grey loose fine silty sand:

This material underlies the upper brown sand layer and extends down to elevations 478 ft. under the west abutment and 492 ft. under the east abutment. The grain size distribution indicates that the material is mostly uniform fine sand with silt and some clay. In borehole No. 1 the amount of silt particles increased to 70%. In borehole No. 1 and 3 the presence of some stones was the cause of higher Standard penetration resistance values.

4. Grey dense pebbly, bouldery silty sand (till):

This stratum was intersected below the loose silty sand material. The borings in this layer were continued down to elevation 458 ft. and stopped. No bedrock was encountered. The matrix in the layer is fine silty sand. The coarse material varied from pebble size particles to boulders up to 2 ft. in size.

5. GROUND WATER CONDITIONS:

During the time of the investigation the creek water level was at elevation 554 ft. which was also the ground water level in the boreholes.

6. DISCUSSION AND RECOMMENDATIONS:

1. Spread footings:

The subsoil at the investigated site is mostly composed of granular materials. Accordingly prior consideration will be given to the use of spread footings.

It is assumed that 6 ft. wide footings will be placed at about elevation 548 ft. From field Standard Penetration Test results $N=10$ is considered as representative for a depth

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

1. Spread footings:

of three times the width of the footing below elevation 548 ft. However, due to the fact that the elevation 548 ft. is near to the top and overburden pressure is small a modified N value (according to H. J. Gibbs and W. G. Holtz chart), indicates that the granular material is actually dense and an average representative value of $N=20$ could be taken.

The calculated bearing pressure will be:

$$Q = \frac{1}{2} \gamma B D + \gamma D F N_q$$

where:

γ = 60 lbs. (Submerged unit weight of the material)

D = 6 ft. (Depth to bottom of footing. Ground level reduced due to scouring)

B = 6 ft. (Width of the footing)

N_q = 45 (Bearing capacity factors)

$$\begin{aligned} Q &= \frac{1}{2} \times 60 \times 6 \times 45 + 60 \times 6 \times 45 \\ &= 8100 + 15480 = 23580 \\ &= \frac{23580}{2000} = 11.8 \text{ T/sq. ft.} \end{aligned}$$

For a safety factor of 3:

$$\text{Safe bearing pressure} = \frac{11.8}{3} = 3.9 \text{ T/sq. ft.}$$

Due to excessive settlements a safe bearing pressure of 2.5 t.s.f. will be used.

The proposed footing elevation being 548 ft. and the ground water level 554 ft. the excavations and placing of footings will present a problem.

It is recommended that sheet piles be driven and the

cont'd /5 ...

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

1. Spread Footings:

excavation carried out within these sheet piles and the water pumped out. In order to prevent boiling and piping conditions to develop, the sheet piles should be driven below the excavation elevation at least for a distance equal to the difference between the ground water elevation and the bottom elevation of the excavation. At this site under the present conditions the sheet piles should be driven down to elevation 542 ft.

7. SUMMARY:

It is recommended to support the proposed structure on spread footings. These footings placed at about elevation 548 ft. can be provided with a safe bearing capacity of 2.5 t.s.f. by the subsoil.

It will be necessary to seal the abutment locations by driving sheet piles, excavate inside, pump the water out and then place the footings. Under the present circumstances sheet piles driven down to elevation 542 ft. will prevent hazards of boiling and piping conditions during excavations.

8. MISCELLANEOUS:

The field work was carried out during Nov. 30 to Dec. 17, 1960, under the supervision of Project Foundation Engineer, V. Korlu. All the laboratory testing was done by the Materials and Research Section.

REPORT PREPARED BY:


V. Korlu
Project Foundation Eng.

January 1961.

REPORT APPROVED BY:


A. G. Stermac
Senior Foundation Eng.

APPENDIX I.

SUMMARY OF FIELD & LABORATORY TESTS

JOB 60-F-97

W.P. 71-60

TEST NO	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENETN RESIST. BLOWS/FT	MOIST CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHR & R SHR. RATIO	UNIT WEIGHT PCF	REMARKS
1	S1	5'-6.5'	Brown fine to coarse sand.	4	-	-	-	-	-	
	S2	7'-10.5'	" " " "	10	-	-	-	-	-	
	S3	15'-16.5'	" " " "	9	-	-	-	-	-	
	S4	20'-21.5'	Brown fine to medium sand.	11	-	-	-	-	-	
	S5	25'-26.5'	" " " "	18	-	-	-	-	-	
	S6	30'-31.5'	" " " "	16	-	-	-	-	-	
	S7	35'-36.5'	Brown fine to coarse sand.	20	-	-	-	-	-	
	S8	44'-44.5'	Boulder	200-6"	-	-	-	-	-	
	S9	50'-51.5'	Grey fine silty sand (stone)	50	-	-	-	-	-	
	S10	55'-56.5'	Grey fine silty sand.	13	-	-	-	-	-	
	S11	60'-61.5'	Grey fine silty sand.	6	-	-	-	-	-	
	S12	70'-71.5'	Grey fine silty sand (stone).	24	-	-	-	-	-	
	S13	80'-81.5'	Boulder	110-6"	-	-	-	-	-	
	S14	85'-86.5'	Grey fine pebbly silty sand.	77	-	-	-	-	-	
	AC15	88.8'-89.3'	Boulder	-	-	-	-	-	-	
	AC16	89.3'-90'	Boulder	-	-	-	-	-	-	
2	S1	5'-6.5'	Brown clayey fine to coarse sand.	23	-	-	-	-	-	
	S2	10'-11.5'	Brown fine to coarse sand.	7	-	-	-	-	-	
	S3	15'-16.5'	" " " "	7	-	-	-	-	-	

SUMMARY OF FIELD & LABORATORY TESTS

JOB 60-F-97

W.P. 71-60

PILE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET. RESIST. (BLows/in)	MOIST. CONTE. (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	SHRINKAGE (%)	UNIT WEIGHT (pcf)	REMARKS
2	S4	20'-21.5'	Brown fine to coarse sand.	8	-	-	-	-	-	
	S5	23'-26.5'	" " " " "	13	-	-	-	-	-	
	S6	30'-31.5'	" " " " "	11	-	-	-	-	-	
	S7	35'-36.5'	" " " " "	34	-	-	-	-	-	
	S8	40'-41.5'	" " " " "	30	-	-	-	-	-	
	S9	45'-46.5'	Brown fine to medium sand.	32	-	-	-	-	-	
	S10	50'-51.5'	Brown fine to coarse sand.	28	-	-	-	-	-	
	S11	55'-56.5'	Grey fine to medium sand with silt and some clay.	11	-	-	-	-	-	
	S12	60'-61.5'	Grey fine to medium sand with silt and some clay.	8	-	-	-	-	-	
	S13	65'-66.5'	Grey fine to medium silty sand.	8	-	-	-	-	-	
	S14	70'-71.5'	Grey fine to medium silty sand.	9	-	-	-	-	-	
	S15	75'-76.5'	Grey fine to medium sand with silt and some clay.	8	-	-	-	-	-	
	S16	80'-81.5'	grey pebbly silty sand.	38	-	-	-	-	-	
	S17	85'-86.5'	Grey pebbly silty sand.	51	-	-	-	-	-	
	S18	90'-91.5'	Grey pebbly silty sand with boulders	265	-	-	-	-	-	
	S19	95'-95.8'	" " " " "	140-9"	-	-	-	-	-	
	RC20	95.8'-100'	Boulder	-	-	-	-	-	-	

SUMMARY OF FIELD & LABORATORY TESTS

JOB 60-P-97

W.P. 71-60

HOLE NO.	SAMP NO.	SYMBOL DEPTH (FEET)	MATERIAL DESCRIPTION	PENETRATION TEST, BLOW/FT	MOISTURE CONTENT, %	FLUIDITY, %	REMARKS	WATER	WATER
3	S1	9'-10.5'	Brown, grey fine silty sand with pieces of decayed wood.	4	-	-	-	-	-
	S2	12'-13.5'	Brown fine to coarse sand.	11	-	-	-	-	-
	S3	15'-16.5'	" " " "	12	-	-	-	-	-
	S4	20'-21.5'	Brown fine to medium sand.	10	-	-	-	-	-
	S5	25'-26.5'	Brown fine to coarse sand.	9	-	-	-	-	-
	S6	30'-31.5'	Brown fine to coarse sand.	15	-	-	-	-	-
	S7	35'-36.5'	Brown fine to coarse sand.	15	-	-	-	-	-
	S8	40'-41.5'	Brown fine to coarse sand.	7	-	-	-	-	-
	S9	45'-46.5'	Brown fine to coarse sand.	5	-	-	-	-	-
	S10	50'-51.5'	Brown fine to coarse sand.	6	-	-	-	-	-
	S11	55'-56.5'	Grey fine to coarse sand with some silt.	33	-	-	-	-	-
	S12	60'-61.5'	Grey fine to coarse silty sand.	42	-	-	-	-	-
	S13	69'-69.5'	Grey sand with boulder	100-6"	-	-	-	-	-
	S14	75'-76.5'	Grey pebbly silty sand.	30	-	-	-	-	-
	S15	80'-81.5'	Grey pebbly silty sand.	62	-	-	-	-	-
	S16	85'-86.5'	Grey pebbly silty sand.	60	-	-	-	-	-
	S17	90'-91.5'	Grey pebbly silty sand with boulders	139	-	-	-	-	-
	S18	95'-96.5'	Grey pebbly silty sand with boulders	137	-	-	-	-	-

SUMMARY OF FIELD & LABORATORY TESTS

JOB 40-P-97

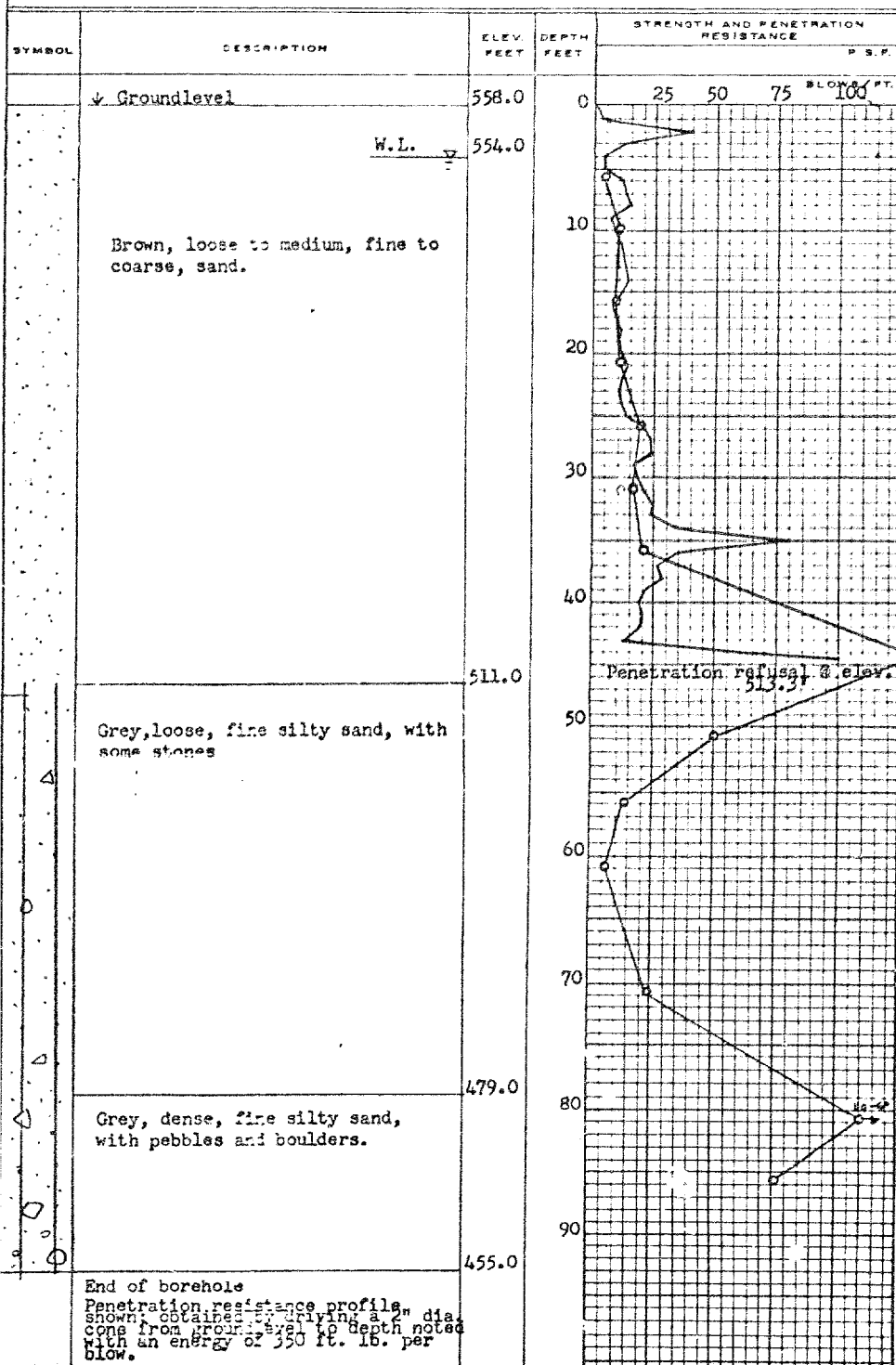
WP 71-60

WELL NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENETRATION TEST RESULT (BLOWS/FT)	MOISTURE CONTENT (%)	PHASE RELATION (%)	LIQUID LIMIT (%)	SHRINKAGE INDEX (%)	PLASTICITY INDEX (%)	REMARKS
4	S1	5'-6.5'	Brown clayey fine to coarse sand.	10	-	-	-	-	-	
	S2	10'-11.5'	Brown fine to coarse sand.	7	-	-	-	-	-	
	S3	15'-16.5'	Brown fine to coarse sand.	13	-	-	-	-	-	
	S4	20'-21.5'	Brown fine to coarse sand.	19	-	-	-	-	-	
	S5	25'-26.5'	Brown fine to medium sand.	22	-	-	-	-	-	
	S6	30'-31.5'	Brown fine coarse sand.	17	-	-	-	-	-	
	S7	35'-36.5'	" " " "	23	-	-	-	-	-	
	S8	40'-41.5'	" " " "	25	-	-	-	-	-	
	S9	45'-46.5'	" " " "	117	-	-	-	-	-	
	S10	51'-51.5'	Grey fine silty sand with stones.	39	-	-	-	-	-	
	S11	55'-56.5'	Grey fine silty sand.	5	-	-	-	-	-	
	S12	60'-61.5'	Grey fine to coarse sand with silt and some clay.	5	-	-	-	-	-	
	S13	65'-66.5'	Grey fine silty sand with stones.	38	-	-	-	-	-	
	S14	70'-71.5'	Grey pebbly silty sand with boulders	109	-	-	-	-	-	
	S15	75'-76.5'	Boulders	146	-	-	-	-	-	
			S denotes split spoon sample MC " rock core							

DEPARTMENT OF HIGHWAYS - ONTARIO
 MATERIALS AND RESEARCH SECTION

 W.P. 71-60 BORE HOLE NO. 1
 JOB 60-F-97 STATION 311+05 (24' Rt)
 DATUM 558.0' COMPILED BY B.K.
 BORING DATE Nov. 30, 60 CHECKED BY V.K.

LEGEND

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


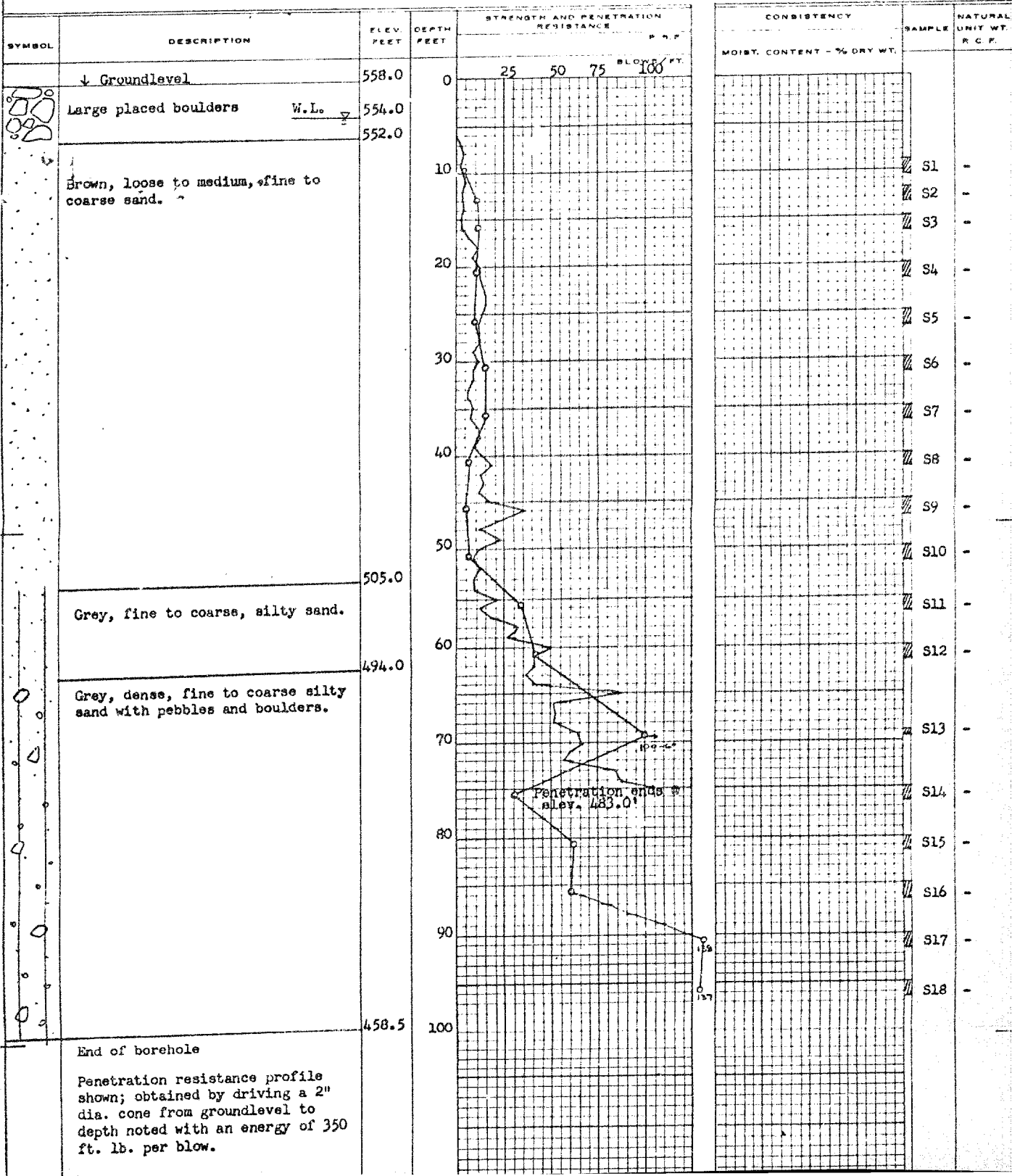
CONSISTENCY	SAMPLE	NATURAL UNIT WT. R.C.P.
MOIST. CONTENT - % DRY WT.		
	S1	-
	S2	-
	S3	-
	S4	-
	S5	-
	S6	-
	S7	-
	S8	-
	S9	-
	S10	-
	S11	-
	S12	-
	S13	-
	S14	-
	RC15	-
	RC16	-

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. 71-60 BORE HOLE NO. 3
JOB 60-F-97 STATION 312+14 (22' Rt)
DATUM 558.0' COMPILED BY B.K.
BORING DATE Dec. 7/60 CHECKED BY V.K.

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 -



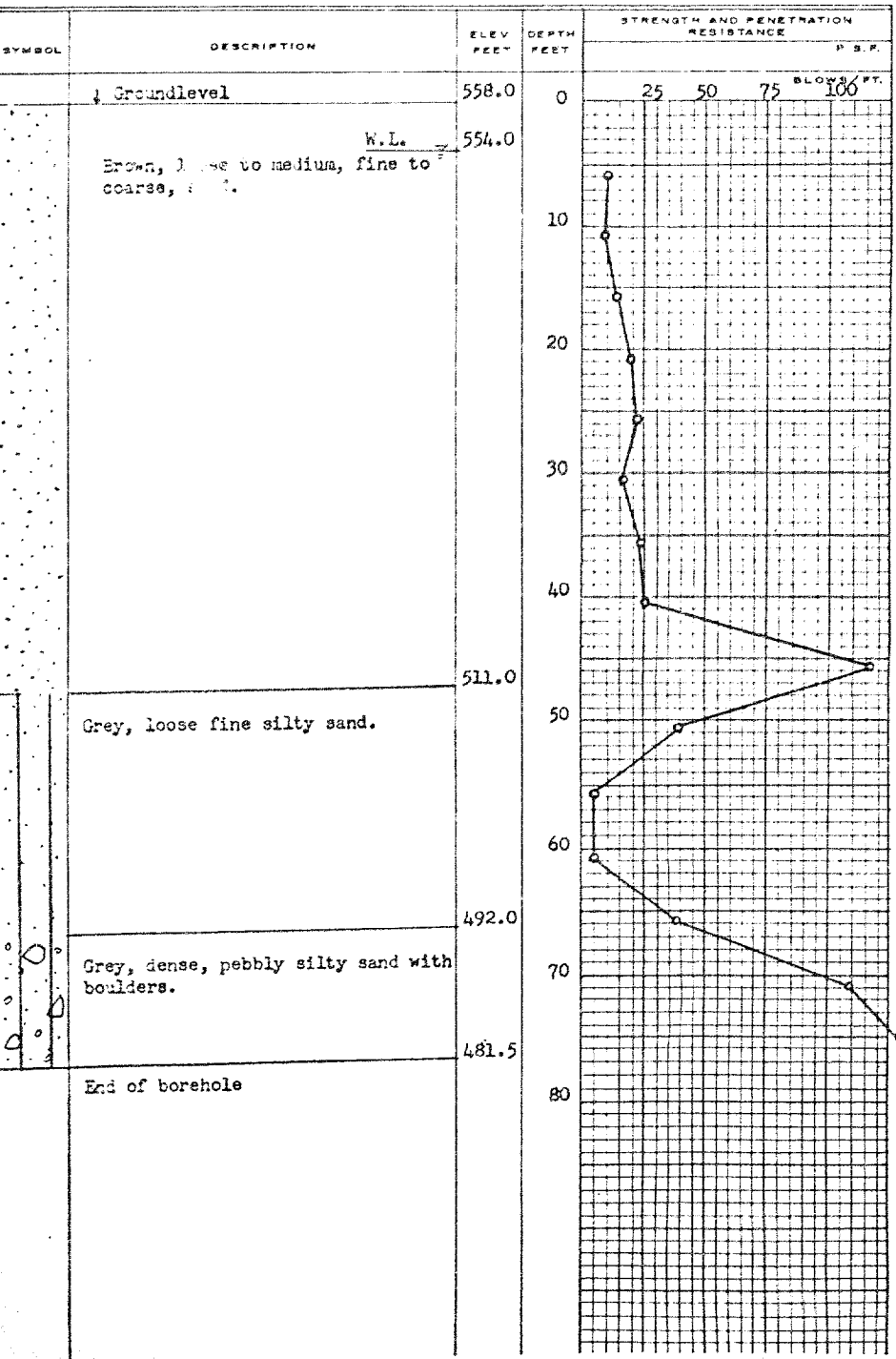
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. 71-60 BORE HOLE NO. 4
JOB 60-F-97 STATION 312+16 (21' Lt)
DATUM 558.0' COMPILED BY B.K.
BORING DATE Dec. 15/60 CHECKED BY V.K.

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

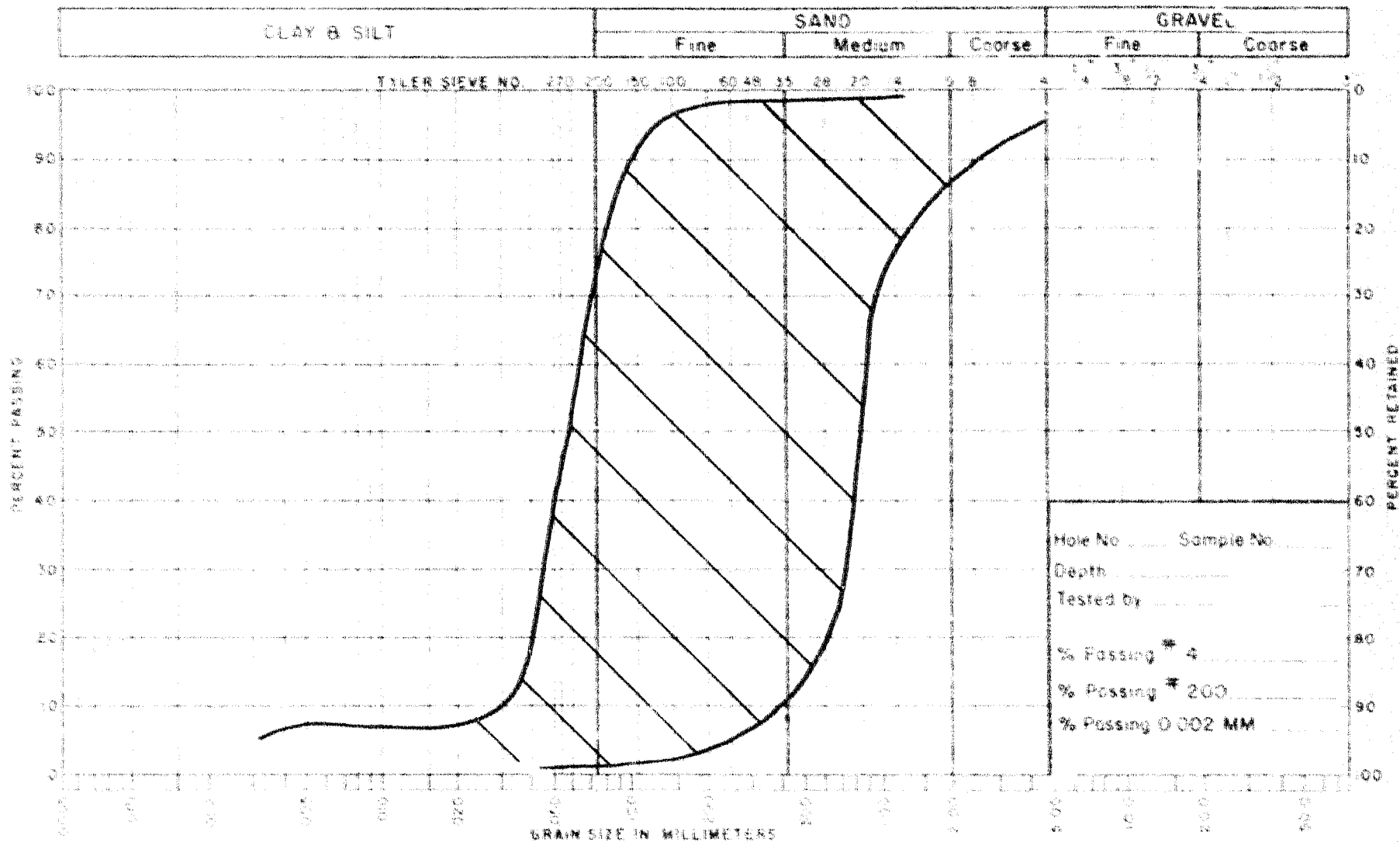
LEGEND

1/2 UNCONFINED COMPRESSION (Qu) O
VANE TEST (C) AND SENSITIVITY (S) +S
NATURAL MOISTURE AND LIQUIDITY INDEX 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	-
		S10	-
		S11	-
		S12	-
		S13	-
		S14	-
		S15	-

UNIFIED SOIL CLASSIFICATION SYSTEM



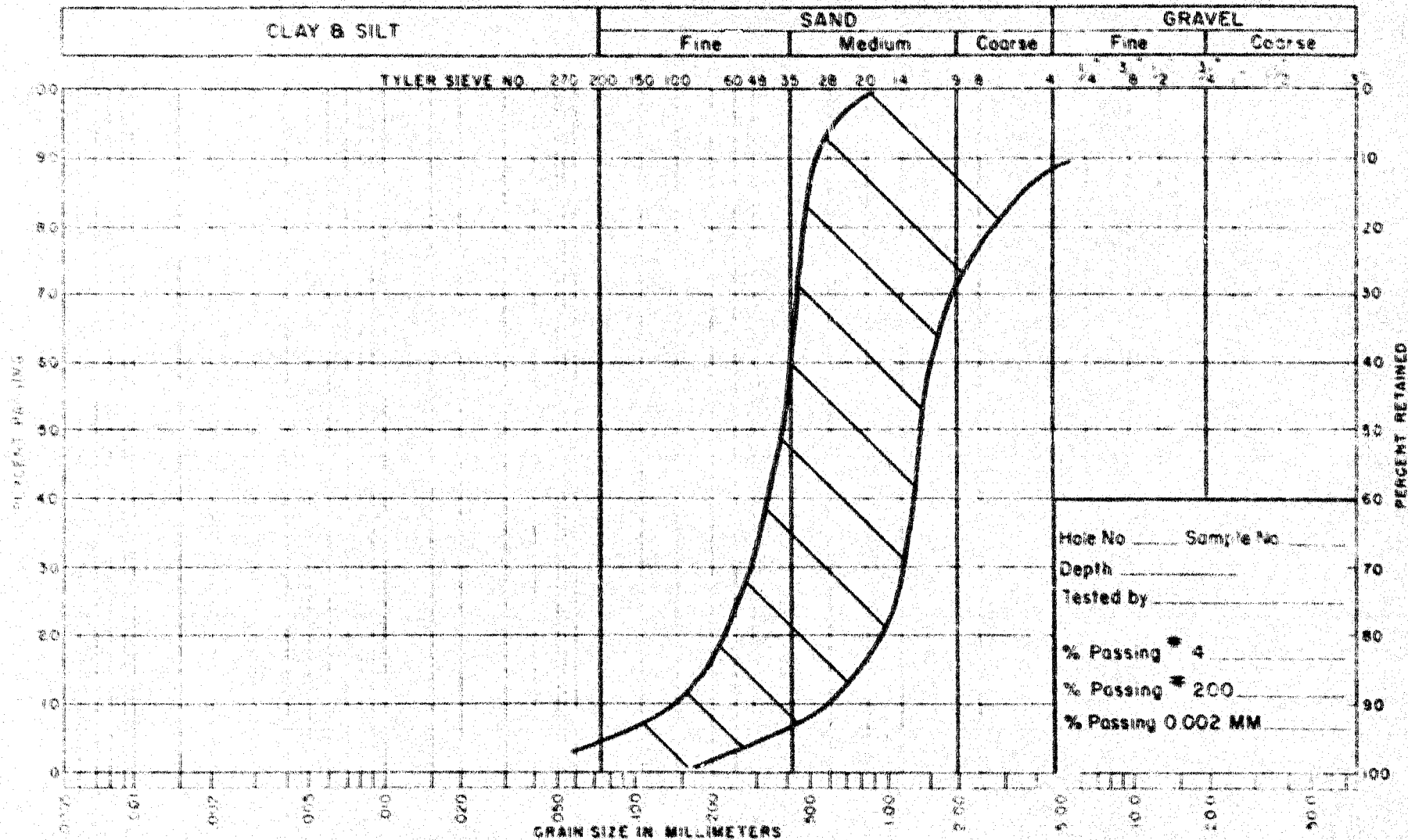
NOTES: GREY FINE SILTY SAND

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

Job No. 60-F-97 WP No. 71-60

Location AMABLE ON FOND RIVER & HWY. 17

UNIFIED SOIL CLASSIFICATION SYSTEM



NOTES: BROWN FINE TO COARSE SAND

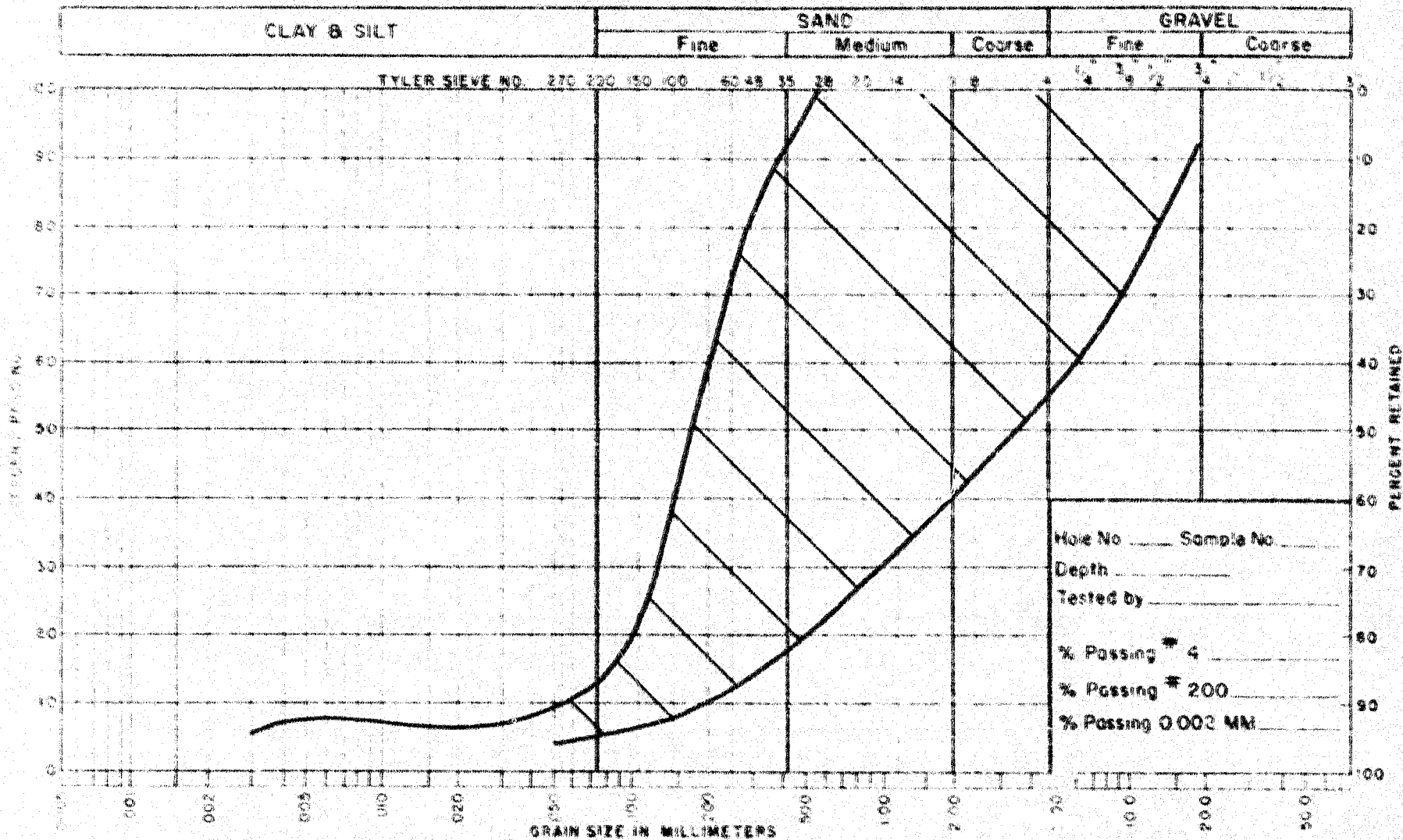
DEPARTMENT OF HIGHWAYS - ONTARIO
 MATERIALS & RESEARCH SECTION
GRAIN SIZE DISTRIBUTION

Job No. 60-F-97

W.P. No. 71-60

Location: AVAILABLE ON FOND DU LAC RIVER & HWY 17

UNIFIED SOIL CLASSIFICATION SYSTEM



GREY Pebbly SILTY SAND (TILL)

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

Job No. 60-F-97

W.P. No. 71-60

Location, AMABLE ON POND RIVER & HWY 17

OFFICE LOCATION—

DOWNSVIEW AVE.,
KEELE ST. — HIGHWAY 401
TORONTO, ONTARIO.



ONTARIO
DEPARTMENT OF HIGHWAYS

POSTAL ADDRESS—

DEPARTMENT OF HIGHWAYS,
PARLIAMENT BUILDINGS,
TORONTO 8, ONTARIO.

Bridge Division,
April 26, 1961.

MEMORANDUM TO:

Mr. L.G. Soderman,
Principal Soils & Foundation Engineer,
Department of Highways,
Lab Bldg. Downsview,

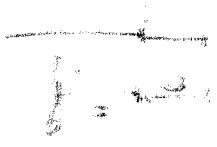
RE: W.P. 71-60,
Amable Du Fond,
Hwy. 17, District 13.

Attached please find print of preliminary plan D-4853-1
for the above structure.

This plan is in accordance with the foundation report
sent to us. The only exception being that the sheet pile
protection has been driven to elev. 531.00 for hydrological
reasons.

JCMcA;jk

J.C. McAllister
J.C. McAllister,
for; S. McCombie,
Bridge Planning Engineer.



THE ANSWER IS THE EXPL.



Bridge Division,
August 9, 1961.

MEMORANDUM TO:

Mr. L. G. Soderman,
Principal Soils &
Foundations Engineer,
Department of Highways,
Room 107, Lab. Bldg.,
Downsview, Ontario.

RE: Bearing Capacity of "H" piles
May. 17 and Amable du Fond
Creek crossing - W.P. 71-60, DIST. 13

We have the foundation report made by your section
in January 30, 1961 for the bridge mentioned above. (BA 1179)

This report has a recommendation of a spread footing
on the Elevation of 548.0 and the recommended bearing capacity
has been based upon a 6' wide Footing.

Due to our design by using 2.5 to t.s.f. the width of
footing has been 15', this width considering the tough un-
watering by the boiling soil condition found on site won't
be economical.

✓ According to that case later Mr. Soderman recommended
to design pile foundation with a lower Abutment height to avoid
the dangerous and expensive unwatering and the wide foundation.

The Bridge Office has taken this proposition and designed
both the Abutment and Retaining wall footing on steel "H" piles
on the elevation of 555.0 (Top of piles). The piles under the
Abutment are designed to take care of 44 Tons/pile since under-
neath the R.F. 20 Tons/pile only. The two kinds of Footing will
be built separately.

After the datas given above would you please give us the
length of both kind of piles needed to take care of the designed
loads.

JB/bm

J. Banyay
J. Banyay, P. Eng.,
Bridge Design Office.

Mr. A. M. Toys,
Bridge Engineer.
Materials & Research Section,
(Foundations Office).

August 16, 1961.

RECOMMENDATIONS FOR DESIGN AND
CONSTRUCTION OF FOOTINGS -

Attention: Mr. J. Keen.

Re: Hwy. 17 and Amable du Fond
Creek Crossing - W.F. 71-60,
District No. 13.

We have received your memo dated August 9, 1961, regarding the above structure. The contents of this memo were discussed with Mr. J. Keen on August 15. Here, below, we are submitting for your consideration, our recommendations concerning the design and the construction of the footings of the mentioned structure.

The abutments should be founded on spread footings. In our original report, a safe load of 2.5 T/sq.ft. was recommended for footings approx. 6 feet wide. It seems now that the width of the footings would have to be 15 feet. For such a wide footing the bearing capacity regarding shear failure becomes greater, but the settlements also increase. The material being predominantly granular, most of the settlements will be practically instantaneous. However, in order to provide for any subsequent settlements, provisions for jacking up of the bridge superstructure should be made. In this particular case, such provisions should present no problem, the structure being basically a simply supported beam.

In order to obtain the desired bearing capacity, the piles would have to be driven down for a considerable distance (some 60 - 70 feet) which thus renders this solution most probably quite uneconomical.

If spread footings are used, dewatering of the excavation will be necessary. Because of hydrological reasons, steel sheet piling is required in front of the abutment and wing wall footings. The required tip elevation is indicated as 531.0' which is well below the required depth for prevention of boiling during pumping operations (520.0'). To ensure that piping does not occur during

pumping, the whole excavation area has to be encircled by a sheet pile wall. Since the sheet piles in the back of the footings are for temporary use only, it is suggested that timber sheeting driven down to elevation 540.0' be used. This timber sheeting can also be used as forms for the abutment and wing wall footings. Later, it could be retrieved or left in the ground.

We believe that the above explanations which have been also discussed with Mr. J. Keen, as mentioned earlier, are sufficient for your future design work. However, should there be any additional information you might require, please feel free to call on our Office.

AGS/XdeF

A. G. Sternac
A. G. Sternac,
PRINCIPAL FOUNDATION ENGINEER

cc: Mr. E. Davis
Foundations Office
Gen. Files.

MEMORANDUM

To: A. G. Stermac, P. Eng., FROM: Bridge Division,
Principal Foundation Engineer, Downsview, Ontario.
Room 107, Lab. Bldg.

Att.: M. Devata, P. Eng. DATE: November 3, 1964.

Our File Ref.

IN REPLY TO

SUBJECT: Amable Du Fond River Bridge
W.P. 71-60 District #13
(Your Job No. 60 F 97)

I am presently reviewing the design of the above bridge which we are in the process of re-drawing. Mr. John Harris, Hydrology Engineer is of the opinion that scour could be extremely severe. In the case of a severe flood he estimates that scour could be 20 to 30 feet below streambed. In such a case sheet piles as indicated on drawings No. D 4853-1 and 2 would offer little structural stability. In view of the questionable stability of the existing sheet pile arrangement I intend to eliminate the sheet piles and place the structure on bearing piles.

Would you please investigate and supply us with your opinion and recommendations as to what design loads may be used, type of pile, and approximate lengths or tip elevations.

JLK:go
c.c. J. Harris
G. Martens
M. Stoyanoff
K. Howe

J. L. Keen, P. Eng.,
Sr. Bridge Project Engineer.

60-F-97

W.P. # 71-60

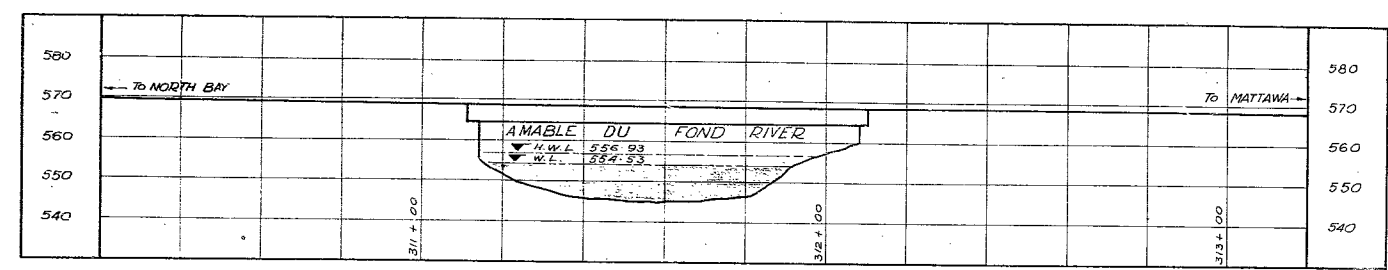
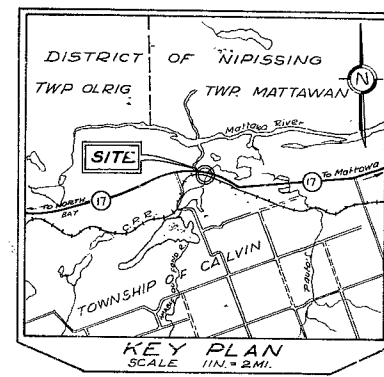
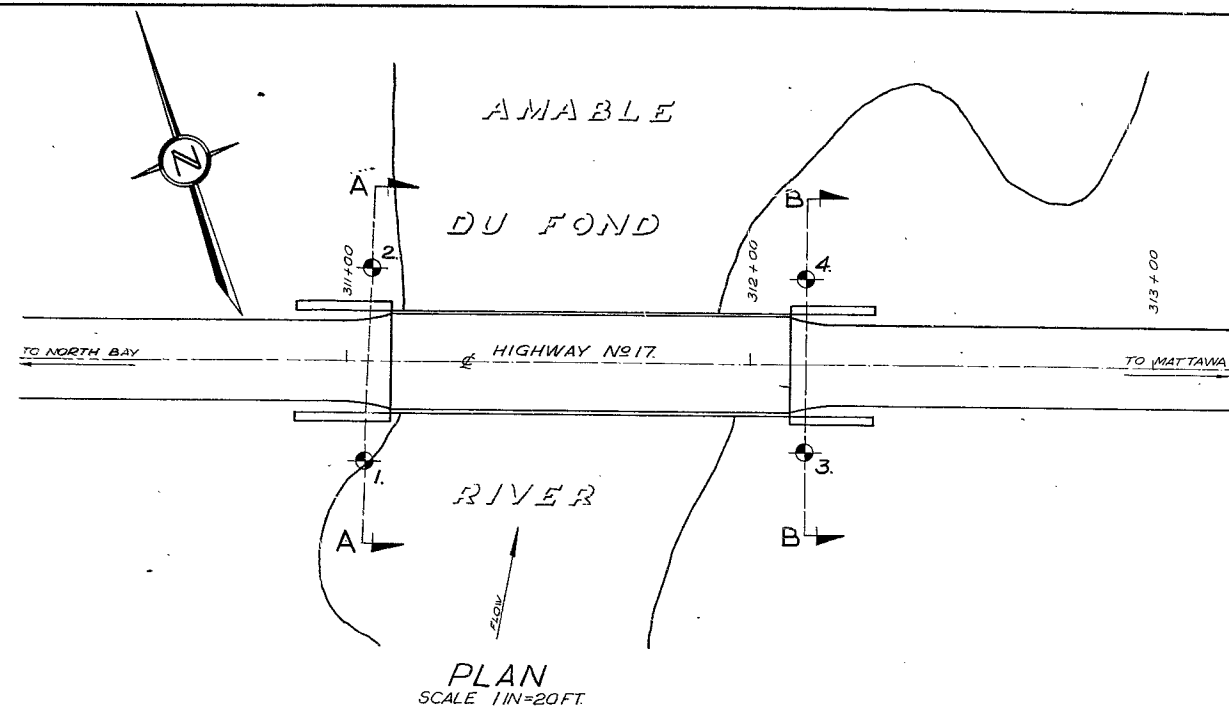
Hwy. # 17

CROSSING

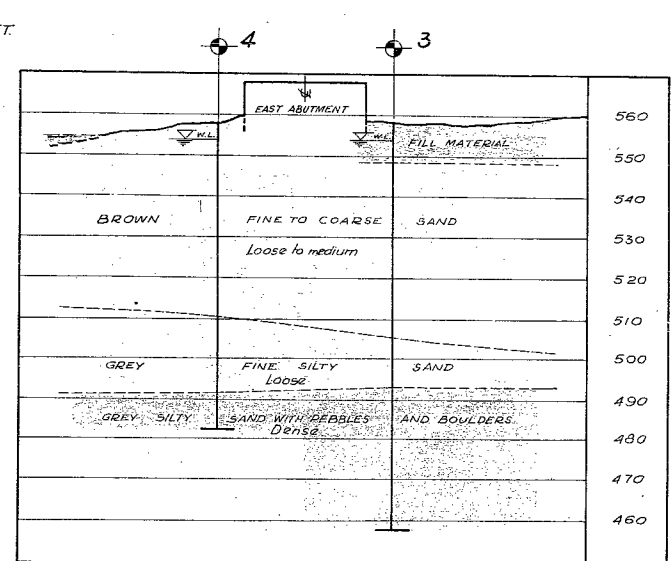
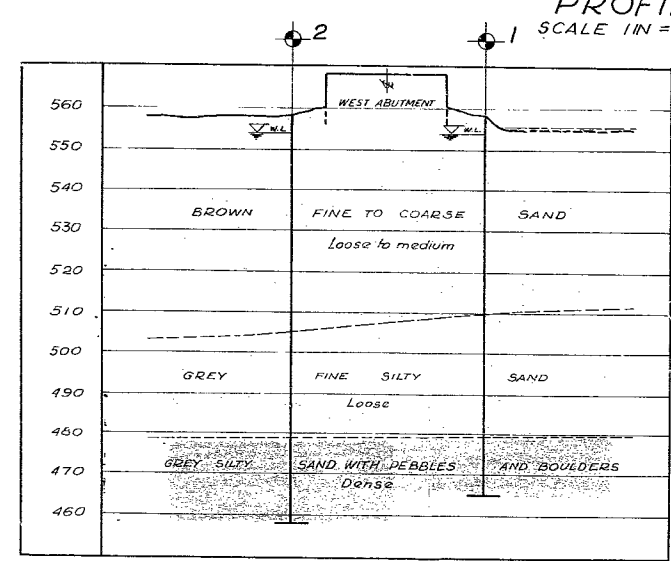
AMABLE DU FOND

CR. - 11 MILES

W. OF MATTAWA



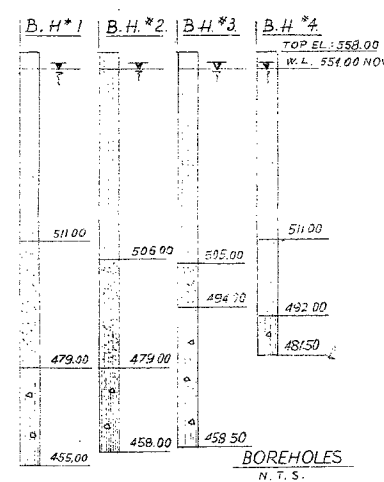
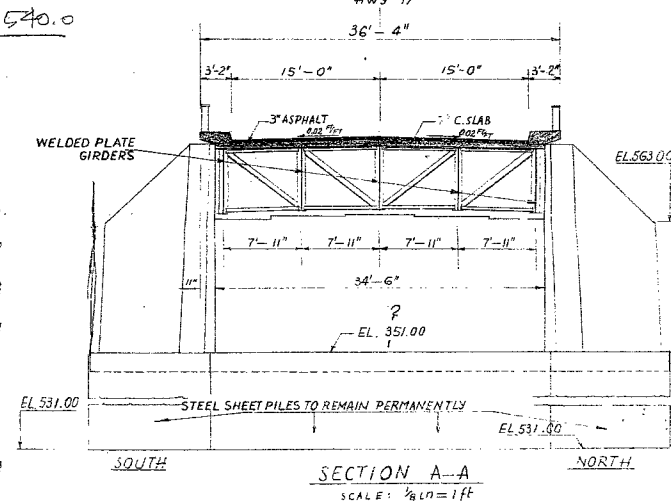
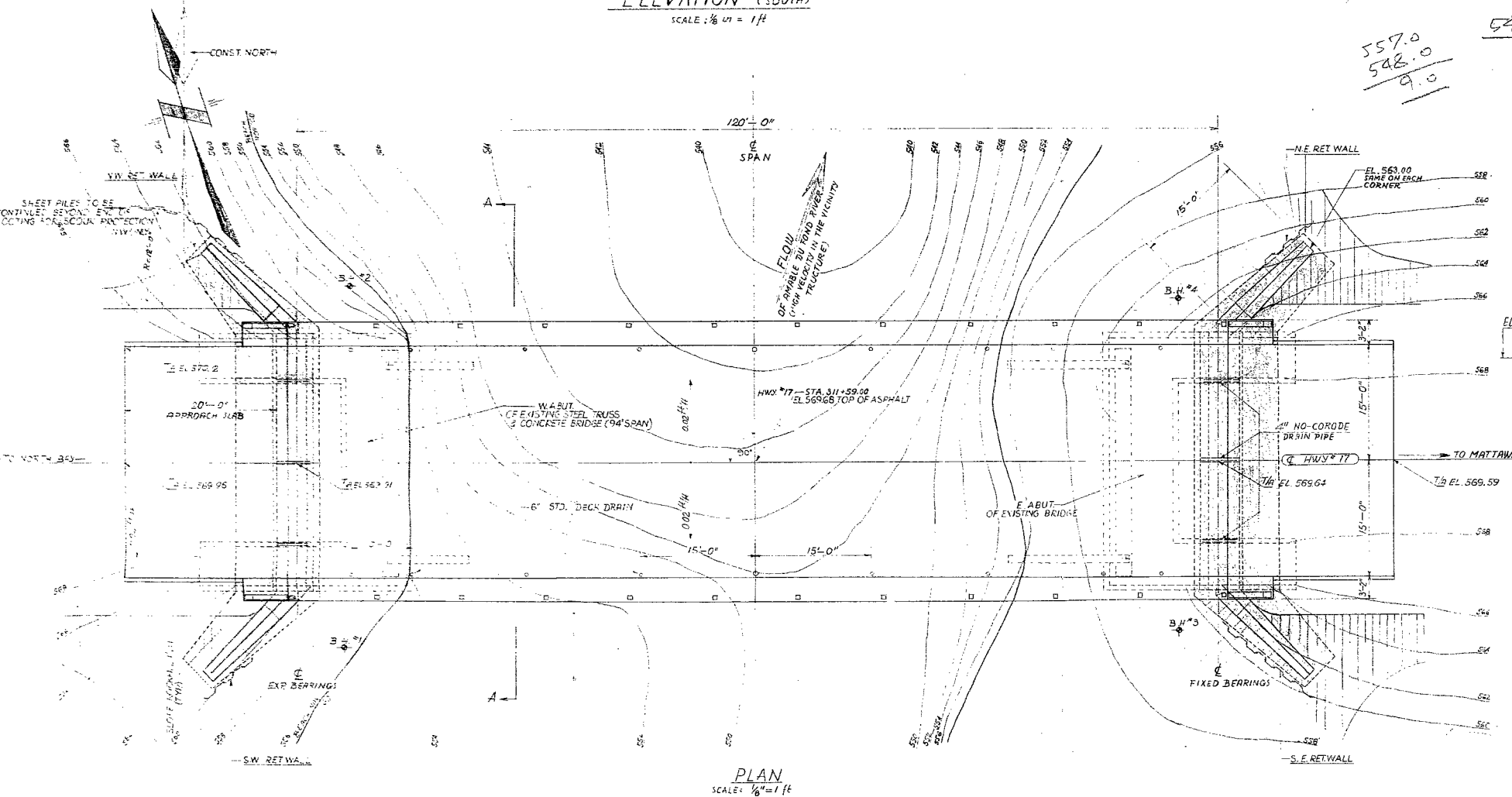
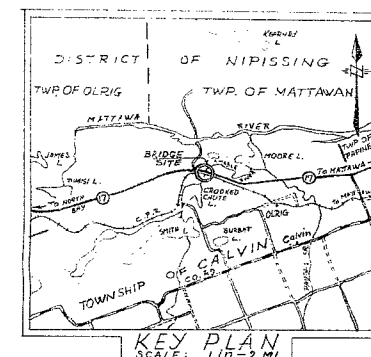
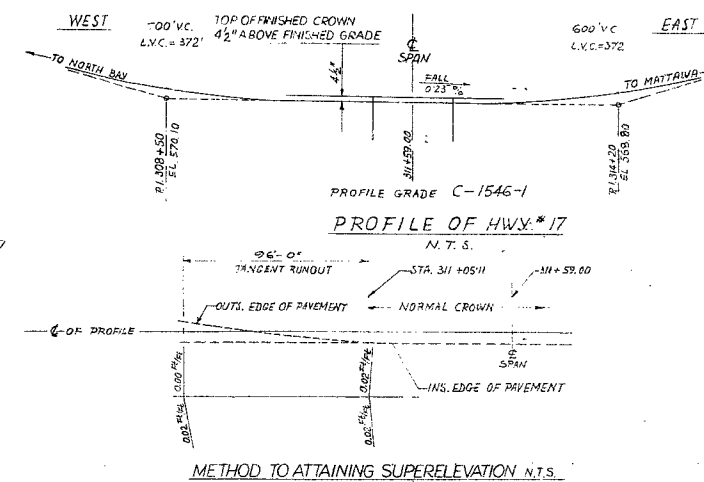
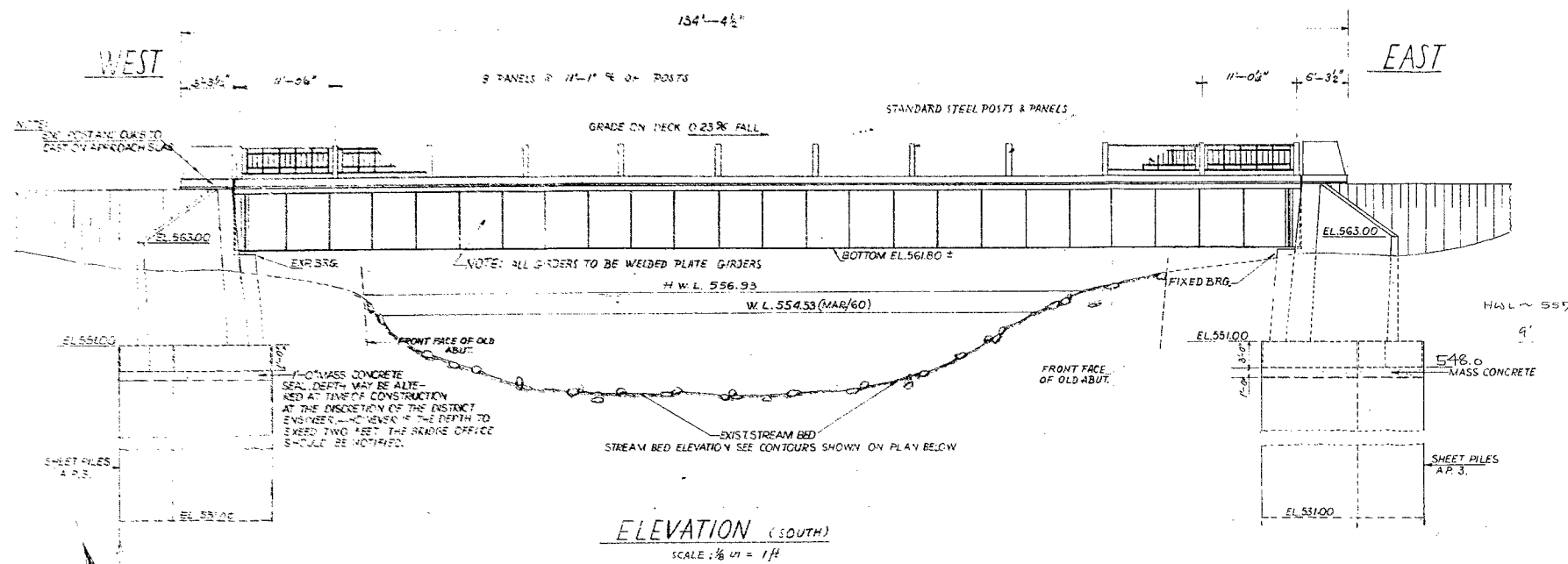
LEGEND			
BORE & PENETRATION HOLE			
HOLE	ELEVATION	STATION	DISTANCE FROM
1	558'-0"	311+05	24' RT.
2	558'-0"	311+06	23' LT.
3	558'-0"	312+14	22' RT.
4	558'-0"	312+14	21' LT.



DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH SECTION

PROPOSED NEW BRIDGE AT
AMABLE DU FOND RIVER
AND
HIGHWAY 17.

ORIGINATED BY: J. A. KORLU	DISTRICT NO: 13	DATE: 27 JAN 1961
DRAWN: J. A. KORLU	W.P. NO: 71-60	JOB NO: 60-F-97
CHECKED: J. A. KORLU	SCALE: 1 IN = 20 FT.	DRAWING NO: 60-F-97A
APPROVED: J. A. KORLU		



- LEGEND:**
- BROWN LOOSE TO MEDIUM DENSE, FINE TO COARSE SAND
 - GREY LOOSE FINE SILTY SAND
 - GREY DENSE PERBBY SILTY SAND WITH BOULDERS

WP 71-60

DEPARTMENT OF HIGHWAYS-ONTARIO
BRIDGE OFFICE - TORONTO

AMABLE DU FOND RIVER BRIDGE

THE KING'S HIGHWAY NO. 17 DIST. NO. 13

CD. CALVIN LOT 14 CON. IX

PRELIMINARY PLAN

APPROVED

BRIDGE ENGINEER DESIGN ENGINEER

DESIGN J.B. CHECK CONTRACT NUMBERS

DRAWING J.B. CHECK

TRACING H 20 5 16

DATE APR. 960

DRAWING NUMBER D-4653-P1

REVISIONS	DATE	BY	DESCRIPTION
1			
2			
3			
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