

DOCUMENT MICROFILMING IDENTIFICATION.

G.I.-30 SEPT. 1975

GEOCRES No. 41K-40

DIST. 18 REGION NORTH WESTERN

W.P. No. _____

CONT. No. _____

W. O. No. -

STR. SITE No. 385-78

HWY. No. _____

LOCATION ROOT RIVER & 5th LINE
TARENTORUS TWP.

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. _____

REMARKS: DOCUMENTS TO BE UNFOLDED BEFORE

MICRO FILM

SITE N° 385-78

Plot on
41 K near
#24

BA. 1904

E. M. PETO

ASSOCIATES

LIMITED

Our Job Number 64188

1287 Caledonia Road,
Toronto 19, Ontario.
789-1126
August 21, 1964.

Proctor & Redfern,
Consulting Engineers,
718A Queen Street East,
Sault Ste Marie, Ontario.

41K - 40

GEOCRE No.

Attention: Mr. C. D. Couzens, P. Eng.

Dear Sir:

Re: Foundation Report, for Bridge
Fifth Line at Root River.

This report covers the foundation aspects of the proposed
bridge at this site.

Bearing capacities of 4 tons/Sq. Ft. have been recommended
at or below elevation 83.0. This places the foundation within an extreme-
ly dense glacial till.

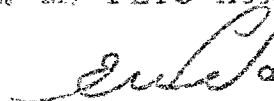
The soils above this elevation comprise a loose sandy embank-
ment fill over a lens of bouldery sandy gravel. Neither of these strata
appear suitable as a foundation medium.

Some difficulties may be encountered in excavating the bouldery
sandy gravel layer which is directly above the glacial till.

Should you wish a further discussion of these results, please
contact us.

Yours very truly,

E. M. PETO ASSOCIATES LTD.



E. M. Peto, P. Eng.

IEG/RM

7 cc: Proctor & Redfern.

PROCTOR and REDFERN
CONSULTING ENGINEERS.

FOUNDATION REPORT, FOR BRIDGE
FIFTH LINE AT ROOT RIVER

E. M. PETO ASSOCIATES LTD.

1287 Caledonia Road,
Toronto 19, Ontario.

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LABORATORY TESTING

BOREHOLE LOGS

SITE PLAN

PROFILE

1. INTRODUCTION

1.1 Terms of Reference

At the request of Proctor and Redfern, Consulting Engineers, (Letter dated July 21, 1964), a foundation investigation was carried out at this site.

It is proposed to construct a rigid frame, reinforced concrete structure, with a square clear span of 50 Ft.

1.2 Site and Existing Structure:

The present structure is a timber frame bridge, with a clear span of 58 Ft. and a traffic laneway of 20 Ft. The approach fills appear to be composed of a sand and gravel fill, about 10 Ft. in height near the bridge abutments.

1.3 Field Work:

Two boreholes were drilled using a flight auger in July 1964.

Some boulders had to be drilled with diamond bits. These borings were located as follows:

<u>Borehole No.</u>	<u>Location</u>	<u>Elevation</u>
# 1	12 Ft. east of bridge and 8 Ft. south of road centerline	97.6
# 2	17 Ft. west of bridge and 8 Ft. north of road centerline.	97.6

2. SUBSOIL CONDITIONS

The two borehole logs and soils profile appended to this report outline the detailed soils stratigraphy at the positions of the borings. The soils strata are comprised of the following:

2.1 Sandy Fill

This material forms part of the existing approach embankments. It consists of sand and gravel which is loose to compact, quite moist and about 10 Ft. to 12 Ft. deep.

2.2 Sandy Gravels:

These alluvial gravels lie beneath the sand fill and probably form part of the river bottom. They contain large boulders, cobbles and stones surrounded by various sized sand particles. A water table, which reflects the river level, was recorded in this stratum.

Standard penetration values are unreliable due to the numerous boulders. However the material is dense, and about 3 1/2 Ft. to 6 1/2 Ft. thick.

2.3 Silty Sand Till:

This stratum was uncovered below about the 14 Ft. depth. It is an extremely dense, well graded silty sand till, with the odd boulder. (See grading chart).

3. RECOMMENDATIONS

3.1 Foundations:

It is recommended that the proposed structure be supported by spread footings, placed within the silty sand till below elevation 83.0 (+ 14 Ft. depth). Bearing values of 4 tons/Sq. Ft. can be attained on this stratum.

The sandy fill of the approach embankments is not sufficiently dense to withstand the proposed loads. Also, the underlying sandy gravels may be a rather unstable foundation medium, due to their bouldery and heterogeneous nature. Thus, the natural foundation stratum is the silty sand till, which is extremely dense.

3.2 Construction Considerations:

Excavations for the footings will have to be carried through the sandy embankment and the gravel layer to the foundation elevation. Sheet piling could be driven through the sand, but would probably hit refusal in the bouldery gravel lens above the till. For this reason an earth cofferdam may be a more practical dewatering method than sheet piling.

In any case, the removal of the sandy gravel lens directly over the fill may prove difficult during construction, due to this boulder content.

The loose sands above the water level will not stand unaided in a vertical trench and should be either properly shored, or cut back to a 2:1 slope during construction.

3. RECOMMENDATIONS (Cont'd)

3.3 Scour Considerations:

The collection of data to determine the depth and rate of scour was not included in our terms of reference. However, it is suggested that the excavation around the footing be backfilled with lean concrete, and any large boulders encountered during excavation be placed back around the foundation. This will at least provide a very dense backfill beneath the water level, around the footings.

3.4 Backfill:

Sand backfill is recommended for behind the abutments and this should conform to sand cushion specifications of the D.H.O. Specification # 316). It appears that most of the sandy material intersected above the 10 Ft. depth in our borings would be suitable.

The backfill material should be free draining and not frost susceptible.

Report Prepared By:

E. M. PETO ASSOCIATES LTD.

C. F. Freeman

J. F. Gartner, P. Eng.

C. F. Freeman, P. Eng.
Chief Engineer.

John F. Gartner

JFG/RM

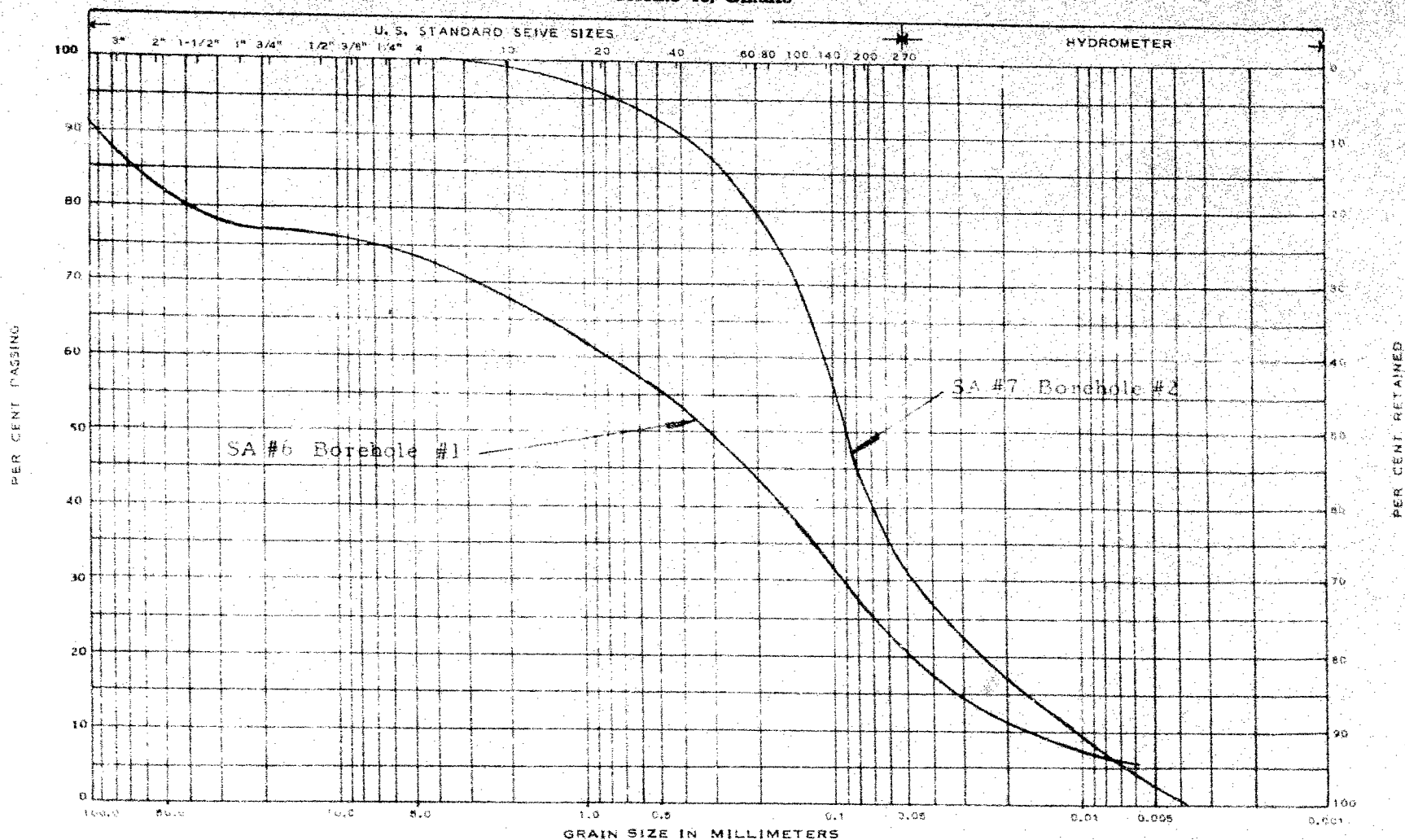
7 cc to Proctor & Redfern.

Our Job Number 64188

21st. August, 1964.

e. m. peto associates ltd.

Toronto 19, Ontario



STONES	GRAVEL	COARSE SAND	MED. SAND	FINE SAND	COARSE SILT	MED. SILT	FINE SILT	CLAY
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MASS. INST. OF TECH. CLASSIFICATION

JOB NAME Bridge-Fifth Line at Root River JOB NO. 64188

HOLE NO. As shown SAMPLE NO. As shown

DEPTH _____ ELEVATION _____ REMARKS Glacial Till

GRAIN SIZE DISTRIBUTION

e. m. pefo associates ltd.
SOIL ENGINEERING SERVICE - TORONTO, ONTARIO
BOREHOLE LOG





41K-40

● 11 ●

Job Name Pridge Fifth Line at Root River Job No. 64188
Client Township of Tarentorous Casing 4-1/2" Auger
Elevation 97.6 Compiled By B. L.

Borehole No. 1
Boring Date July 23, 1964
Checked By S. B.

SAMPLE CONDITION

	UNDISTURBED
	FAIR
	DISTURBED
	LOST

SAMPLE TYPE

A.S. AUGER SAMPLE
C.S. CASING SAMPLE
S.S. 2" STANDARD SPLIT TUBE SAMPLE
S.L. SPLIT BARREL WITH LINERS
S.T. THIN-WALLED SHELBY TUBE SAMPLE
W.S. WASH SAMPLE
R.C. ROCK CORE

ABBREVIATIONS

Y.T.	IN SITU VANE SHEAR TEST
M.	MOIST
W.L.	WATER LEVEL IN CASING
W.T.	GROUND WATER TABLE IN SOIL
W.T.P.L.	WETTER THAN PLASTIC LIMIT
D.T.P.L.	DRIER THAN PLASTIC LIMIT
A.P.L.	ABOUT PLASTIC LIMIT

[illegible]

e. m. peto associates ltd.

SOIL ENGINEERING SERVICE - TORONTO, ONTARIO

BOREHOLE LOG

Job Name Bridge Fifth Line at Root
Creek

Job No. 64188

Borehole No. 2

41K-40

Client Township of Tarentorou

Casing 4-1/2" Auger

Boring Date July 24, 1964. GEOCRES No.

Elevation 97.6

Compiled By B. L.

Checked By S. B.

SAMPLE CONDITION



UNDISTURBED



FAIR



DISTURBED



LOST

SAMPLE TYPE

A.S. AUGER SAMPLE

C.S. CASING SAMPLE

S.S. 2" STANDARD SPLIT TUBE SAMPLE

S.L. SPLIT BARREL WITH LINERS

S.T. THIN-WALLED SHELBY TUBE SAMPLE

W.S. WASH SAMPLE

R.C. ROCK CORE

ABERVIATIONS

V.T. IN SITU VANE SHEAR TEST

M. MOIST

W.L. WATER LEVEL IN CASING

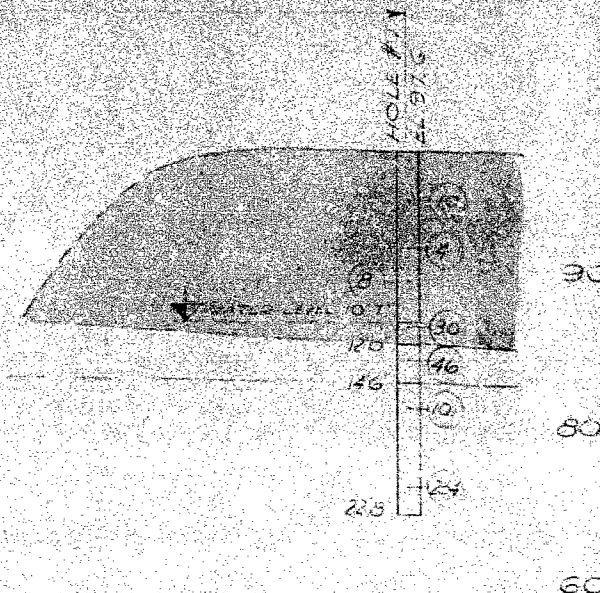
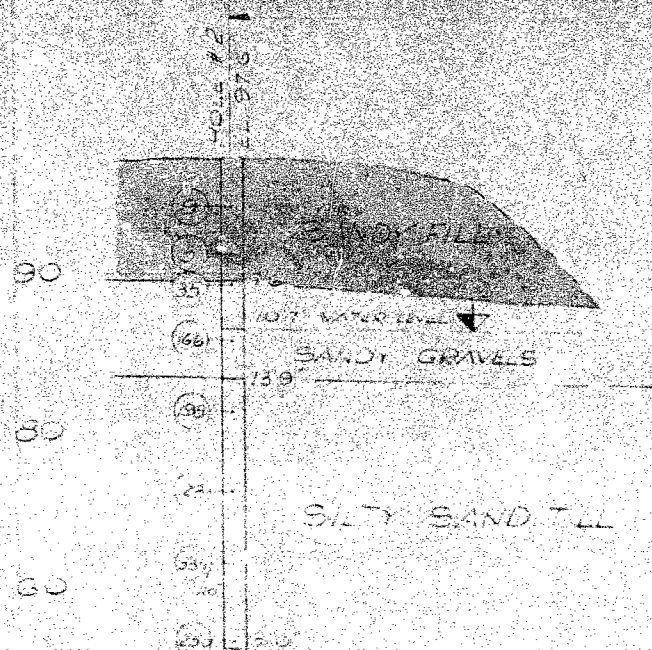
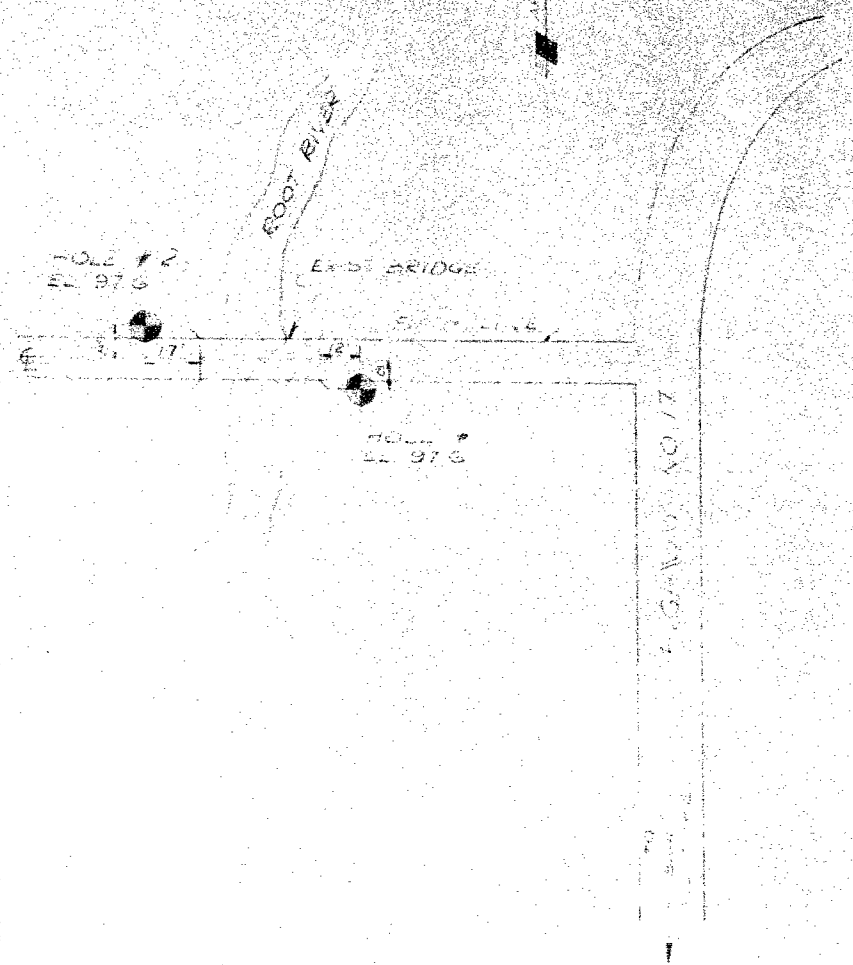
W.T. GROUND WATER TABLE IN SOIL

W.T.P.L. WETTER THAN PLASTIC LIMIT

D.T.P.L. DRIER THAN PLASTIC LIMIT

A.P.L. ABOUT PLASTIC LIMIT

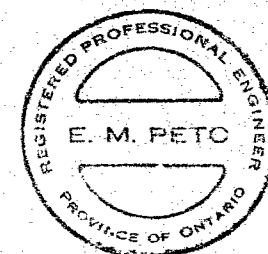
SOIL DESCRIPTION	COLOR	Density or Consistency	Depth Elevation	Legend	Sample No. and Condition	Sample Type	No. of Blows per Ft	Moisture Content	WATER LEVELS & REMARKS
Existing Grade			0'0"						
Fill (sand and gravel)	Grey - brown				1	AS			
Fill (fine-medium sand, stones)	Dark brown	Loose to Compact			2	SS	9	9.4	Quite moist
Fill (silty sand, some organic content)	As above	Very loose to loose			3	SS	3	27.5	Quite moist.
Coarse sand and gravel	Mixed brown	Dense	7'6"		4	SS	35	12.9	Boulder at 7'6" Refusal at 9'6" (boulder)
									Moved borehole (#2A)
Sandy gravel	Grey-brown	Extremely Dense	13'9"		5	SS	166	5.5	Wet-Saturated Boulder at 12' Boulder at 13'8"
Silty sand till	Grey with reddish tint	As above			6	SS	198	7.2	Wet
									Boulder at 18'
As above	As above	As above	20'0"		7	SS	123	10.4	Wet Saturated Seam 21'3"
As above	As above	As above			8	SS	335/10"	6.7	Wet Boulder at 25'10" Diamond drilled to 26'4"
As above	As above	As above	31'0"		9	SS	250	9.2	Wet W.L. at 10'7", casing at 25 Ft.
									Test Hole Terminated at 31'0"



SECTION THROUGH HOLES 2 & 1
VERTICAL SCALE 10 TO 1

LEGEND

- BOREHOLE
- 5' WIDE FOOT PATH



41K-40
GEOCRES No.

SITE PLAN
(NOT TO SCALE)

NOTE: The actual soil stratification has been verified from data obtained at the borehole locations only. The inferred contacts shown are based on geological evidence and these may vary from those shown between borings.

TOWNSHIP OF TARRANT
PROPOSED FIFTH LINE BRIDGE
ROOT RIVER

PREPARED BY
E. M. PETO C.E. (O.C.E.) 170

DATE: AUGUST 1964
SITE: X
DRAWN BY: JPK
CHECKED BY: JPK