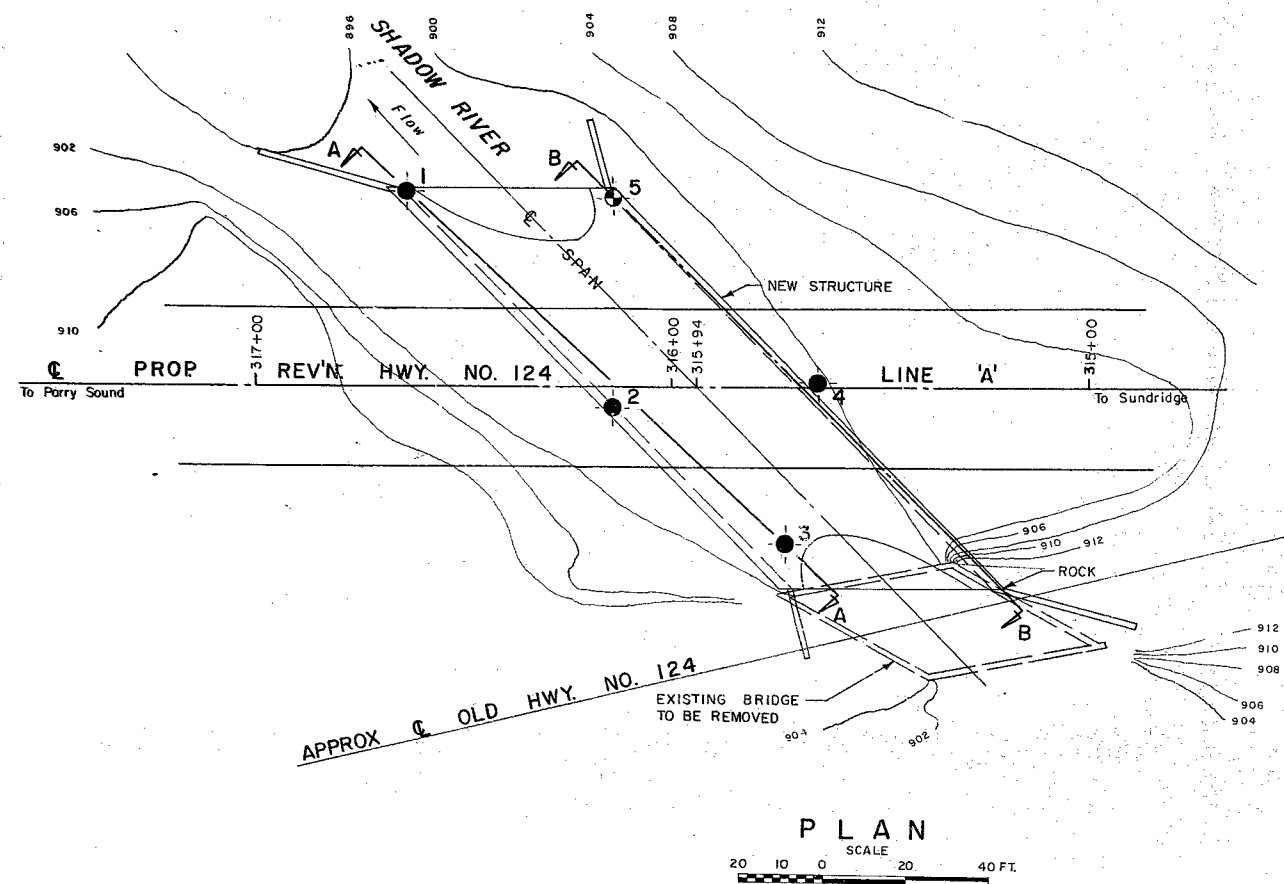






#64-F-224C
W.P. # 87-57
HWY # 124
SHADOW R.



HOLE	BEDROCK ELEV
1	891.2
2	895.6
3	893.6
4	895.8

LEGEND

-  Bore Hole
 Cone Penetration Hole
 Probe Hole
 Water Levels established at time of field investigation.

NO.	ELEVATION	STATION	OFFSET
1	8 9 6 . 8	3 1 6 + 6 3	4 7 ' R
2	8 9 6 . 8	3 1 6 + 1 5	5 ' L
3	8 9 7 . 8	3 1 5 + 7 3	3 7 ' L
4	8 9 7 . 6	3 1 5 + 6 5	1 ' R
5	8 9 5 . 8	3 1 6 + 1 5	4 5 ' R

- 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.

[illegible]

WILLIAM A. TROW AND ASSOCIATES LIMITED

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION - FOUNDATION SECTION

SHADOW RIVER

KING'S HIGHWAY NO. 124 LINE 'A' DIST NO. 11
CO. PARRY SOUND
TWP. CROFT LOT 16 CON. IX

BORE HOLE LOCATIONS & SOIL STRATA

SUBM'D.	CHECKED	W.P. NO	87 - 57	M.R. GRADING NO
DRAWN E.F.K	CHECKED	JOB NO.		J 1706
DATE DEC. 1964		SITE NO.	56 - 68	NO. OF SHEETS
APPROVED		CONT. NO		

REF. NO. D-5550-P

1850 Jane Street
Weston, Ontario
241-4644

William A. Trow

23-66-260

Project: J1706

Soil Mechanics
Consultants
W. A. Trow
MSc. MEIC. P. Eng.
K. Peaker
PhD. MEIC. P. Eng.
D. H. Shields
PhD. MEIC. P. Eng.



Associates Ltd.

Mr. A. Rutka, P.Eng.,
Chief Materials & Research Engineer,
Materials and Research Section,
Department of Highways of Ontario,
Parliament Buildings,
Toronto, Ontario.

December 1, 1964.

Attention: Mr. A.G. Stermac, P.Eng.

Re: Foundation Investigation
Shadow River
W.P. 87-57; Hwy. 124

Dear Sirs:

In accordance with your letter of authorization dated November 6, 1964, we have completed a foundation investigation at the above site. Because the nature of the investigation was only to determine the elevation of bedrock our report has been limited to this letter form.

SITE INVESTIGATION AND SUBSOIL

A total of four boreholes and one probe comprise the field work at this site. The detailed information for each boring appears in the borehole logs Dwg. 1 to 4 while the bedrock profile and borehole locations are shown on the site plan drawing.

Boreholes were advanced using conventional diamond drill equipment and rotary drilling procedures. The elevation of the boreholes

has been referenced to the bench mark located on the S.E. corner of the south rail of the existing bridge. The elevation of the river at the time of the investigation was established at 897.0. Photographs of the site are included as drawings no. 5 and 6.

The subsoil at the site consists of a variable depth of broken rock, sand and gravel which overlies a gneiss bedrock.

The bedrock on both sides consists of massively fractured and jointed gneiss and paragneiss of Archean, or early Precambrian, age. The rock normally has the irregular appearance of an injection complex. It is extremely hard, and very resistant to both mechanical and chemical weathering processes.

FOUNDATIONS

Preliminary information indicates that an arch culvert is proposed for this site. These foundations will be founded directly on sound bedrock. The elevation of bedrock along the two proposed lines of footings has been indicated on the site plan drawing and shows that excavation for and installation of the footing should proceed without problem.

Allowable bearing pressures on the sound rock may be taken as 20 tsf. Because of the horizontal thrust from the arch type structure a 6 inch key into sound rock should be incorporated into all proposed footings.

The settlement of the structure will be negligible. No problems associated with the stability of approach embankments exist at this site.



If we can be of further assistance in connection with the foundations of this structure please do not hesitate to contact this office.

Yours very truly,

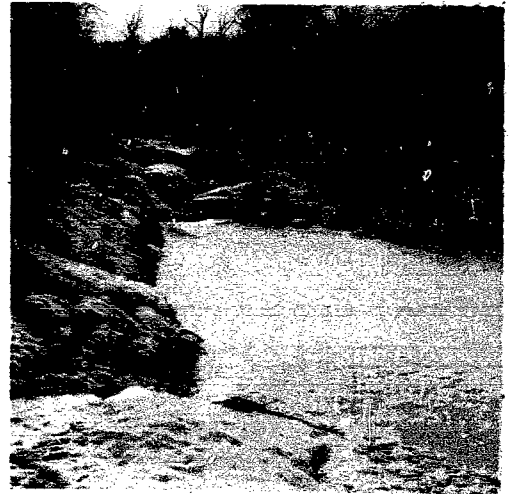
K. Peaker

K.R. Peaker, P.Eng.

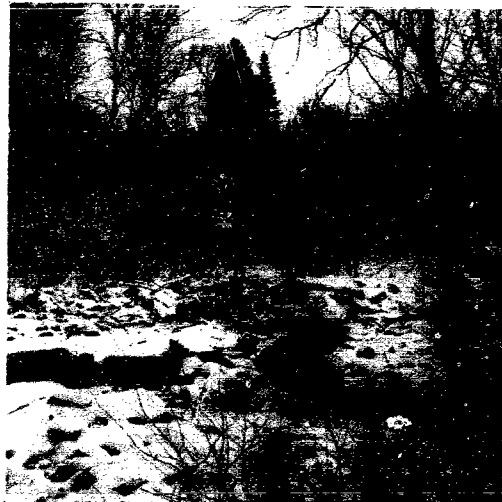
KRP/bs.
Encls.



From the North West



From the North



Looking East Along Proposed CL



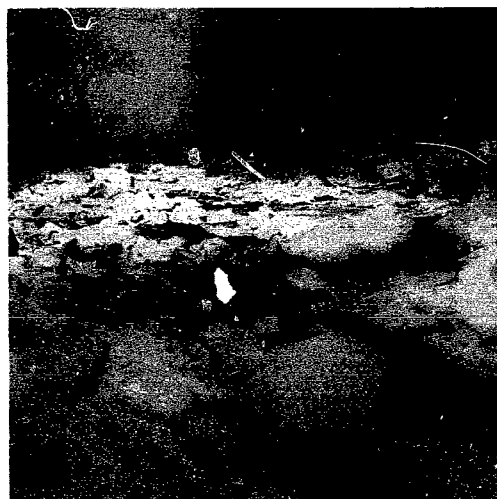
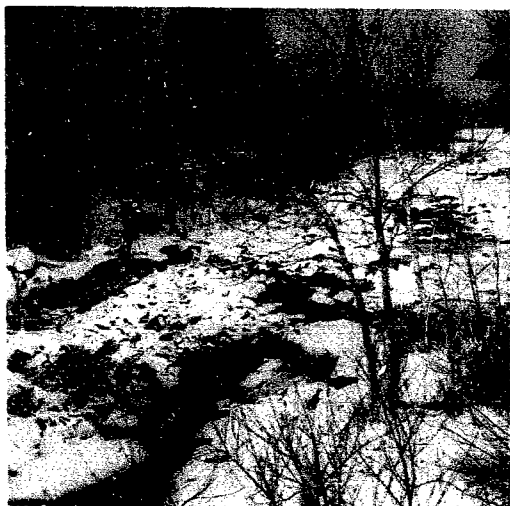
From the North West



From the North

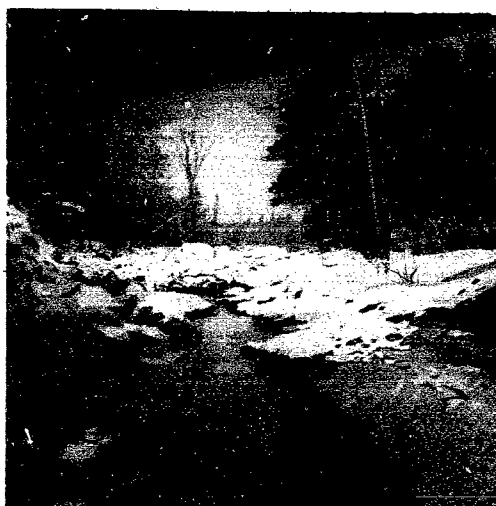


Looking East Along Proposed CL



Looking North
From the Existing Bridge

Looking North



Looking North



Looking North
From the Existing Bridge



Looking North



Looking North

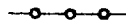
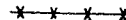

WILLIAM A. TROW & ASSOCIATES LTD.

SITE INVESTIGATIONS · SOIL MECHANICS CONSULTATION




DRAWING No. 1
PROJECT No. J1706.

LEGEND

PENETRATION RESISTANCE


2" O.D. SPLIT TUBE 
2" I.D. SHELBY TUBE 
2" DIA. CONE 

SHEAR STRENGTH




UNDRAINED TRIAXIAL
AT OVERBURDEN PRESSURE 
UNCONFINED COMPRESSION 
VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE CONTENT
AND LIQUIDITY INDEX 



ATTERBERG LIMITS

LIQUID LIMIT 
PLASTIC LIMIT 

SAMPLE TYPE

2" O.D. SPLIT TUBE 
2" I.D. SHELBY TUBE 
3" O.D. SHELBY TUBE 

BOREHOLE No. 1.
PROJECT Shadow River Arch.
LOCATION Highway 124.
HOLE LOCATION See Dwg. of Site Plan
HOLE ELEVATION 896.8 ft.
DATUM See Dwg. of Site Plan

SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	SAMPLE TYPE AND No.	NATURAL UNIT WEIGHT P.C.F.
				20	40	60	350 FT. LB. BLOWS/FT. 80			
		896.8	0	SHEAR STRENGTH						
	Boulders, gravel and sands.									
	BEDROCK	891.2								
	GNEISS -banded gneiss and paragneiss; extremely hard; massivley fractured and jointed.		10							
	End of Bore	883.3								
Notes:	1) Borehole advanced through over- burden by rotating BX casing and cleaning out using AX core barrel.		20							
	2) Cored AX from 891.2 to 883.3 recovery 100.0%.		30							
			40							

100%
core
recovery.

WILLIAM A. TROW & ASSOCIATES LTD.




SITE INVESTIGATIONS - SOIL MECHANICS CONSULTATION

DRAWING NO. 2
PROJECT NO. J1706.




LEGEND

BOREHOLE NO. 2.
PROJECT Shadow River Arch.
LOCATION Highway 124.
HOLE LOCATION See Dwg. of Site Plan
HOLE ELEVATION 896.7 ft.
DATUM See Dwg. of Site Plan

PENETRATION RESISTANCE

2" O.D. SPLIT TUBE 
2" I.D. SHELBY TUBE 
2" DIA. CONE 

SHEAR STRENGTH

UNDRAINED TRIAXIAL
AT OVERBURDEN PRESSURE 
UNCONFINED COMPRESSION 
VANE TEST AND SENSITIVITY (S) 

NATURAL MOISTURE CONTENT AND LIQUIDITY INDEX

X LI

ATTERBERG LIMITS


LIQUID LIMIT 

PLASTIC LIMIT 

SAMPLE TYPE

2" O.D. SPLIT TUBE 

2" I.D. SHELBY TUBE 

3" O.D. SHELBY TUBE 

SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE				NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	SAMPLE TYPE AND NO.	NATURAL UNIT WEIGHT P.C.F.
				20	40	60	350 FT. LB. BLOWS/FT. 80			
		896.7	0	SHEAR STRENGTH						
	BOULDERS? SAND AND GRAVEL	895.6								
	REDROCK- GNEISS-banded gneiss and paragneiss; extremely hard;massively fractured and jointed. End of Bore	888.0	10							
Notes:	1) Borehole advanced through over- burden by rotating BX casing and cleaning out using AX core barrel.		20							
	2) Cored AX from 895.6 to 888.0 recovery 95.6%		30							
			40							

WILLIAM A. TROW & ASSOCIATES LTD.




SITE INVESTIGATIONS · SOIL MECHANICS CONSULTATION

LEGEND




DRAWING No. 3
PROJECT No. J1706

BOREHOLE No. 3
PROJECT Shadow River Arch.
LOCATION Highway 124.
HOLE LOCATION See Dwg. of Site Plan
HOLE ELEVATION 897.8 ft.
DATUM See Dwg. of Site Plan

PENETRATION RESISTANCE

2" O.D. SPLIT TUBE 
2" I.D. SHELBY TUBE 
2" DIA. CONE 

SHEAR STRENGTH




UNDRAINED TRIAXIAL
AT OVERBURDEN PRESSURE 
UNCONFINED COMPRESSION 
VANE TEST AND SENSITIVITY (S) 



NATURAL MOISTURE CONTENT
AND LIQUIDITY INDEX 

ATTERBERG LIMITS

LIQUID LIMIT 
PLASTIC LIMIT 

SAMPLE TYPE

2" O.D. SPLIT TUBE 
2" I.D. SHELBY TUBE 
3" O.D. SHELBY TUBE 

SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE		350 FT. LB. BLOWS/FT.	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	SAMPLE TYPE AND NO.	NATURAL UNIT WEIGHT P.C.F.
				20	40				
		897.8	0	SHEAR STRENGTH		P.S.F.			
	BOULDERS-sand and gravel.	893.6							
	BEDROCK GNEISS-banded gneiss and paragneiss; extremely hard; massively fractured and jointed.		10						
	End of Bore	884.1							
Notes:	1) Borehole advanced through overburden by rotating BX casing and cleaning out using AX core barrel.			20					
	2) Cored AX from 893.6 to 884.1 recovery 94.8%.								
			30						
			40						




WILLIAM A. TROW & ASSOCIATES LTD.

SITE INVESTIGATIONS · SOIL MECHANICS CONSULTATION




DRAWING NO. 4
PROJECT NO. J1706

LEGEND

PENETRATION RESISTANCE

2" O.D. SPLIT TUBE 
2" I.D. SHELBY TUBE 
2" DIA. CONE 


SHEAR STRENGTH

UNDRAINED TRIAXIAL
AT OVERBURDEN PRESSURE 
UNCONFINED COMPRESSION 
VANE TEST AND SENSITIVITY (S) 




NATURAL MOISTURE CONTENT
AND LIQUIDITY INDEX

LI
X



ATTERBERG LIMITS

LIQUID LIMIT 
PLASTIC LIMIT 

SAMPLE TYPE

2" O.D. SPLIT TUBE 
2" I.D. SHELBY TUBE 
3" O.D. SHELBY TUBE 

BOREHOLE NO. 4.
PROJECT Shadow River Arch.
LOCATION Highway 124.
HOLE LOCATION See Dwg. of Site Plan
HOLE ELEVATION 897.5 ft.
DATUM See Dwg. of Site Plan

SYMBOL	SOIL DESCRIPTION	ELEV. FEET	DEPTH FEET	PENETRATION RESISTANCE				350 FT. LB. BLOWS/FT.	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS % DRY WEIGHT	SAMPLE TYPE AND NO.	NATURAL UNIT WEIGHT P.C.F.
				20	40	60	80				
				SHEAR STRENGTH				P.S.F.			
	BOULDERS- SAND & GRAVEL	897.5	0								
	BEDROCK	895.8									
	GNEISS-banded gneiss and paragneiss; extremely hard; massively fractured and jointed.	889.7									
Notes: 1) Borehole advanced through overburden by rotating BX casing and cleaning out using AX core barrel. 2) Cored AX from 895.8 to 889.7 recovery 97.3%.											
			10								
			20								
			30								
			40								

Mr. A. M. Toye,
Bridge Engineer,
Bridge Division.

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

Attention: Mr. S. McCombie

December 7, 1964

FOUNDATION INVESTIGATION REPORT BY:
William A. Trow & Associates, Limited -
Shadow River, Hwy. 124, District 11, Huntsville.
W.P. 87-57

Attached, please find the above-mentioned report prepared and submitted by the Consultant, Wm. A. Trow and associates.

We have reviewed the report and are in agreement with the recommendations. The foundation conditions can be considered as very favourable, and no problems of any nature are expected.

Should there be any additional questions that you would like to discuss, please feel free to contact our office.

AGB/ndef
attach.

cc: Messrs. A. M. Toye (2)
H. A. Tregaskes
H. D. McMillan
H. McArthur
L. H. Jones
T. J. Kovach
A. Watt

Foundations office ✓
Gen. Files

after review
A. G. Sternac,
PRINCIPAL FOUNDATION ENGINEER

for letter - Jan 1965
see W.P. 54-57