

# 55-F-27

Hwy. # 17

CULVERT NEAR  
GOULAIS RIVER  
BRIDGE

EDITED  
FOR MICROFILMING  
BY *K.T.* DATE *30/10*

54-90

MATERIALS LABORATORY - DEPARTMENT OF HIGHWAYS - ONTARIO  
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG C-1082 (54-2)

CASING # BX (STANDARD SAMPLERS TO FIT UNLESS NOTED)

SAMPLER HAMMER WT 250 # DROP INCHES

JOB F 55-27

DATUM STA 798+00, 44' RT, ELEV 588.5

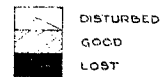
COMPILED BY S.T.B. CHECKED BY S.T.B.

BORING N°

DATE REPORT SEPT 27, 1955

BORING DATE SEPT 24, 26, 27, 1955

## SAMPLE CONDITION



DISTURBED

GOOD

LOST

## SAMPLE TYPES

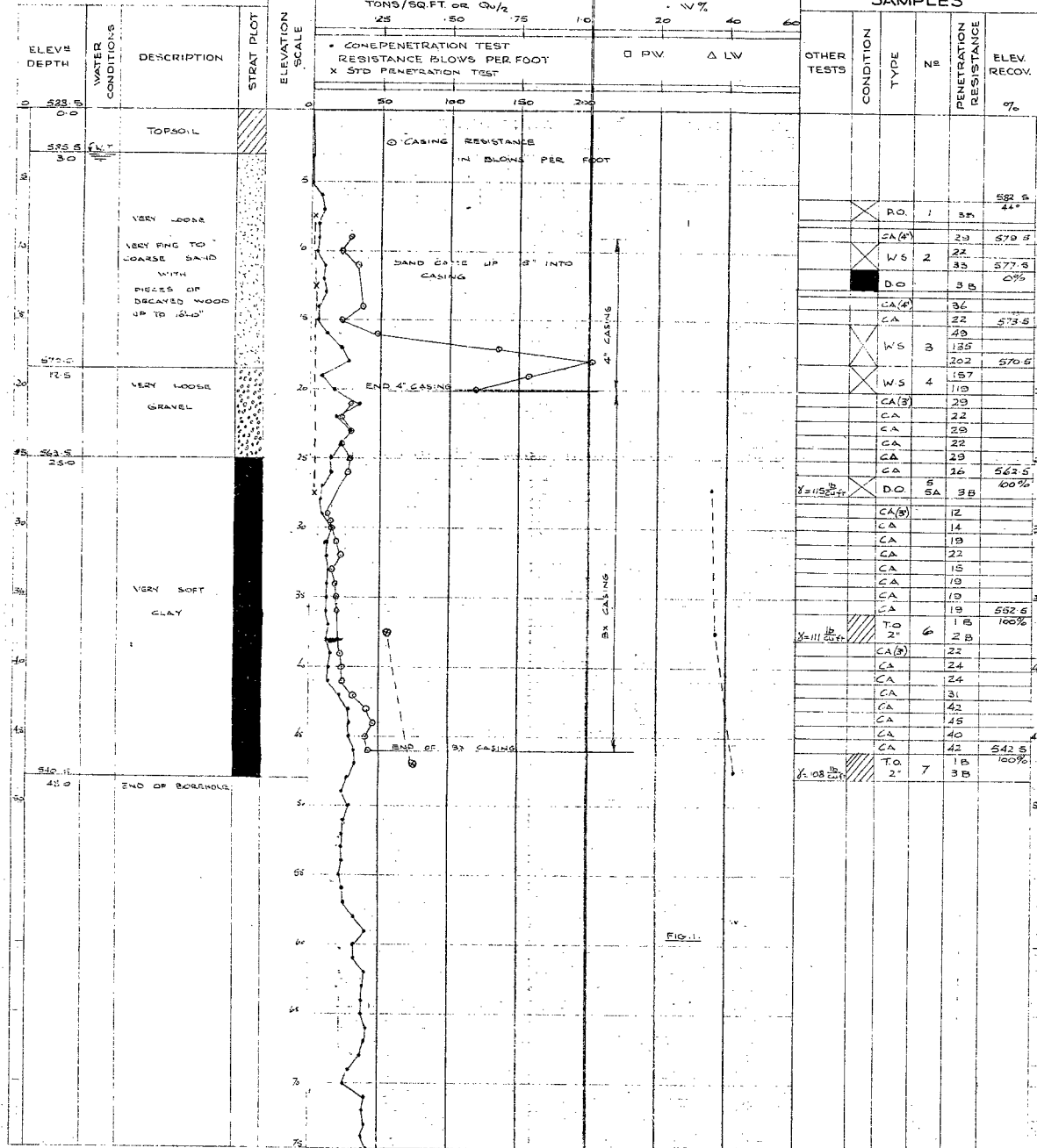
CS - CHUNK  
DO - DRIVE OPEN  
DF - DRIVE FOOT VALVE  
TO - THIN WALLED OPEN

VS - WASHED SAMPLE  
RC - ROCK CORE

## ABBREVIATIONS

V - INSITU VANE SHEAR TEST  
M - MECHANICAL ANALYSIS  
U - UNCONFINED COMPRESSION  
QC - TRIAXIAL CONSOLIDATED QUICK  
Q - TRIAXIAL QUICK  
S - TRIAXIAL SLOW  
Y - UNIT WEIGHT  
K - PERMEABILITY  
C - CONSOLIDATION  
CA - CASING  
WL - WATER LEVEL IN CASING  
WT - WATER TABLE IN SOIL

## SOIL PROFILE



REPORT AT 75' 0"

54-90

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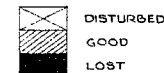
COMPILED BY S.T.B. CHECKED BY S.T.B.

BORING N° 2

DATE REPORT SEPT 28, 1955

BORING DATE SEPT 27, 1955

## SAMPLE CONDITION



DISTURBED

GOOD

LOST

## SAMPLE TYPES

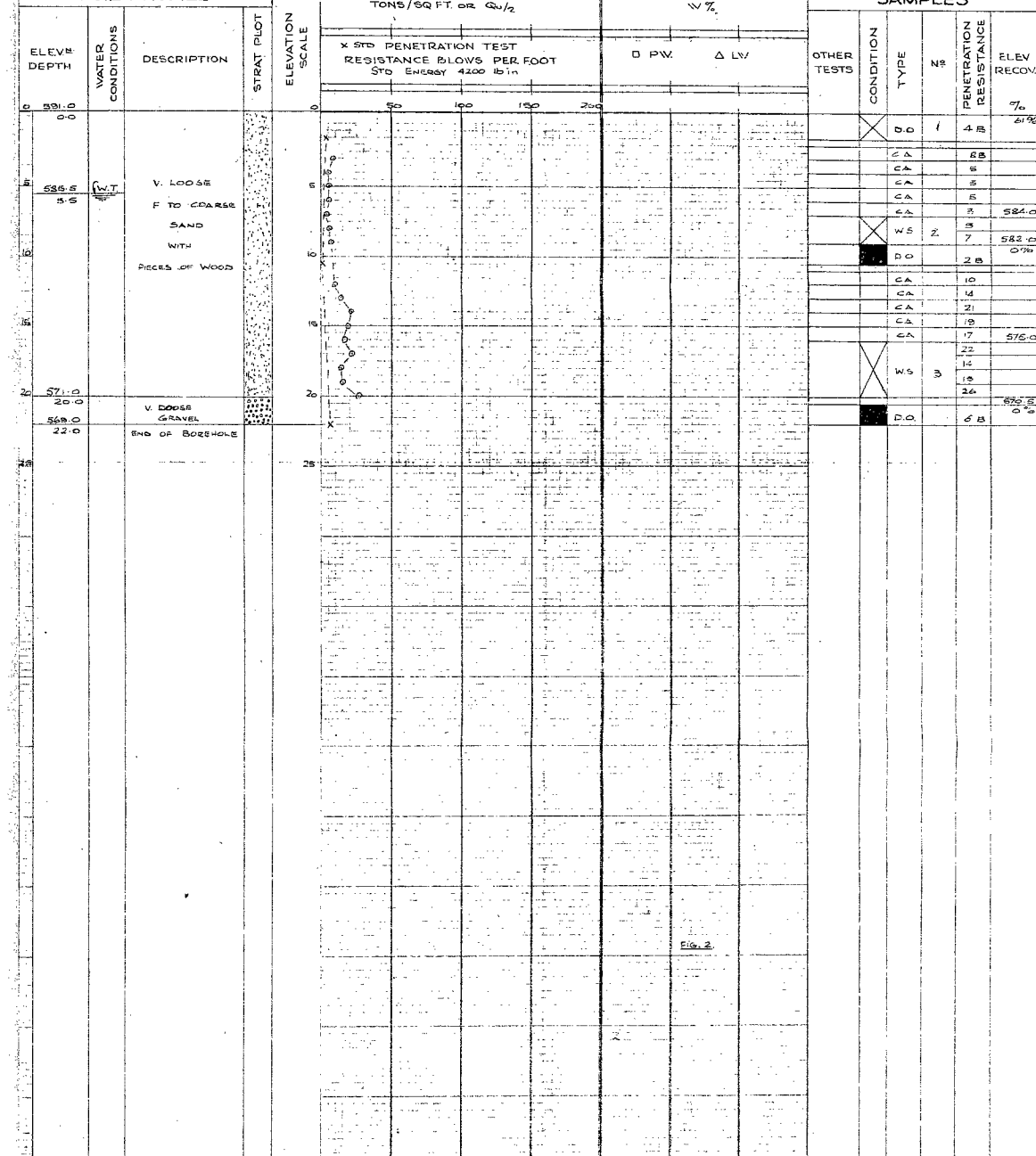
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## SOIL PROFILE



Mr. A. Tapp  
Bridge Engineer

Re: Foundation Investigation  
Hwy #17 and Proposed Relief Culvert  
Sta 798+50 - P 2252-3

Project 55-F-27

We are forwarding herewith two copies of report as the above. This is a proposed relief culvert apparently required during flood stages of Youlais River.

A flexible type structure is proposed for the unconsolidated foundation site. Sheet piling is also proposed to prevent piping and washout of the non-cohesive materials surrounding and underlying the proposed structure.

Copies to

Mr. A. Tapp, Bridge Engineer (2)

" H. Thompson Cont " (1)

" J. Walter Design " (1)

" W. Collins, West Eng Flint River (1)

" G. Farantatos (1)

File (1)

J. T.  
V. C. B.  
m. m. h.

REPORT  
ON THE SUBSURFACE INVESTIGATION  
FOR THE CULVERT AT  
STA. 798/50, HWY. # 17  
NEAR  
GOULAI'S RIVER BRIDGE

Copies to:

Mr. A. Toye,  
Bridge Engineer (2)

Mr. J. Walter,  
Design Engineer (1)

Mr. D. Collins,  
Div. Eng. Blind River (1)

Mr. G. N. Farantatos (1)

File

PROJECT: 55-F-27

P-2852-3

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## INTRODUCTION

A subsurface investigation was carried out on Highway 17 a quarter of a mile South of Goulais River Bridge, between Sept. 23. - 28. 1955, where it is proposed to install an Overflow Culvert.

At present, there is no Culvert at this location and it was observed that the Highway was being undermined in the past by the overflow water from Goulais River during Spring thaw.

## PROCEDURE

One dynamic cone penetration test and two boreholes were carried out ; one on each side of the Highway. The location of penetration and boreholes is shown on the attached drawing No. F55-27A, and all the information concerning subsoil encountered, ground and water elevations etc., in Appendix I.

## SOIL CONDITIONS AND TESTS

Excluding fill, 15 to 20 feet thick stratum of a very loose sand with pieces of decayed wood in it, overlies a stratum of a very loose gravel 7 ft. in thickness which in turn rests over soft red clay layer.

Dynamic cone penetration test yielded 5 to 25 blows per foot in the sand, 10 - 35 in gravel and 7 - 30 in clay. A number of standard penetration tests were carried out in both boreholes and 3 to 6 blows per foot obtained. Samples were obtained from clay for unconfined compression tests using 2" Shelby tubes. Results obtained: 550-750 lb/sq. ft. in shear stress.

### WATER CONDITIONS

Ground water level was observed at 3'-0" in borehole # 1 and 5'-6" in borehole # 2 below ground level.

### ANALYSIS OF THE RESULTS

Applying Standard Penetration test results and using safety factor = 3, it was estimated that a bearing value of 1.25 ton per square foot would be permissible providing the grade of the highway is maintained at the present level.

Due to sand and gravel layers being in a very loose state there will be a settlement of 3-4" approx. but 80% of it will take place during construction period. However, there will be a risk of the water seeping through the sand around the culvert thus for this reason provisions should be made to prevent the seepage and wash-out around culvert.

### RECOMMENDATIONS

To accommodate any differential settlement, the culvert used should be of a flexible type preferably a corrugated pipe with a small camber at the centre which should be backfilled according to the manufacturers instructions to prevent wash-out. It is also recommended that a sheet piling be used (driven to the layer of clay to .560.0' elevation) on both sides of the culvert.

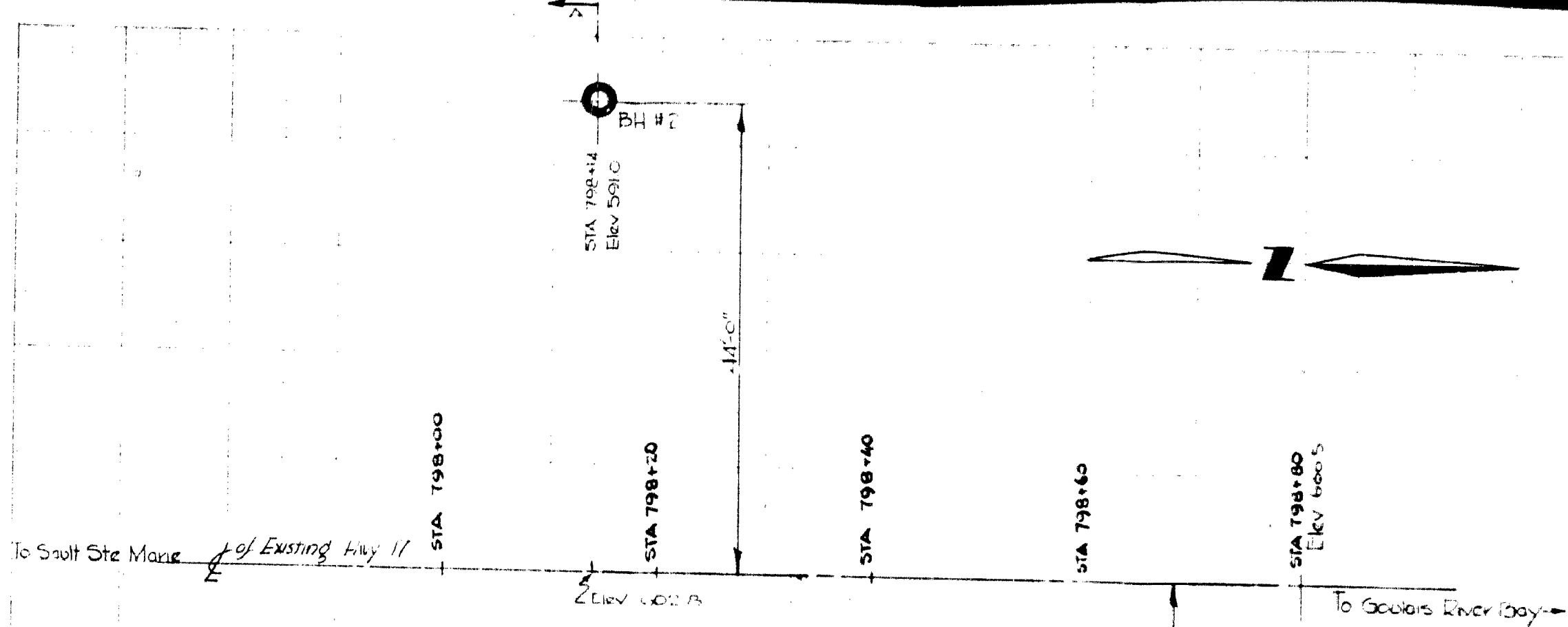
The size of the culvert should be carefully estimated taking into account both the rate of flow and the high water level of backwater from the Goulais River during Spring floods.

The permissible bearing capacity value of 1.25 tons/sq.ft. should be used in design of culvert.

G. N. Farantatos  
Foundation Engineer.







# **LOCATION OF PROPOSED CULVERT**

AT STA 798+50  
ON HIGHWAY NO 17

SAULT STE. MARIE - AGAWA RIVER.  
DIST OF ALBOMA. TWP VANCOUGHNET S.E. 1/4 SEC 33.

JOB NO F-55-27-A.  
PLAN DRWG NO F-55-27-A

Scale 1" = 10'-0"

Traced by NDM