

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 31 F - 89

W.P. No. \_\_\_\_\_

CONT. No. \_\_\_\_\_

W. O. No. \_\_\_\_\_

STR. SITE No. \_\_\_\_\_

HWY. No. \_\_\_\_\_

LOCATION PROP. NEW CULVERT &  
FILL, STA. 327+60,  
DUNROBIN RD.

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. NONE

REMARKS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

BA 1416

INSPECTION SERVICES  
LABORATORY TESTING  
APPRAISALS, RESEARCH  
SOIL INVESTIGATIONS

JOHN D. PATERSON, B.Sc., P.Eng.  
CONSULTING ENGINEERS & GEOLOGISTS  
OTTAWA, CANADA

MEMBERS:  
ASSOC. OF PROFESSIONAL ENGINEERS OF ONTARIO  
AMERICAN CONCRETE INSTITUTE

Head Office:  
250 BESSERER ST.  
TEL. CE 4-0001  
4-4537  
Laboratory:  
818A BOYD AVE.  
TEL. PA 9-3722

31F-89

GEOCREs No.

REPORT OF SOIL INVESTIGATION

SITE OF PROPOSED NEW CULVERT AND FILL

STATION 327 + 60

DUNROBIN ROAD

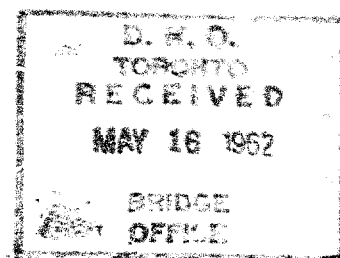
FOR

OTTAWA SUBURBAN ROADS COMMISSION

Lot 10. Con. III/IV  
TWP TORBOLTON  
CO. CARLETON

REPORT NO. S 258 - 62

OTTAWA, MARCH 15, 1962



## Introduction:

At the request of Mr. J. L. Shearer, P.Eng., Ottawa Suburban Roads Commission, a soil investigation was conducted at the site of a proposed 12' x 10' x 88' rigid concrete culvert to replace the existing 10' x 8' x 36' culvert. The additional length is necessary because of the embankment which will be formed by the addition of fill to bring the road elevation to 67.5 ±.

## Fieldwork Procedure:

Two test holes were put down at diagonally opposite sides of the existing culvert as shown on the Test Boring Plan.

Hole 1 consisted of a cone probe driven to 40 feet and a bore hole with samples recovered at regular intervals to 26.7 feet. Hole 2 consisted of a cone probe to 50 feet and a sample hole to 26.7 feet.

The cone probes were driven to check the uniformity of the soil.

The firm of F. E. Johnston Drilling Company was employed for all drilling operations and their work was supervised at all times by a member of our staff. The equipment consisted of a standard drilling rig fully equipped for soil testing and mounted on a trailer.

## Sampling and Testing:

For classification purposes samples of the near surface material were recovered by driving and withdrawing the BX casing. The remaining samples were recovered by Shelby thin-walled tubes. The Shelby tube samples were taken to the laboratory, extruded and tested for unconfined compressive strength.

## Observations:

### (a) Soil Types.

All the soils encountered were cohesive soils with minor variations. In general the strength increased with depth.

Details of borings are shown on the Soil Profile and Laboratory Test Sheets which form part of this report.

### (b) Groundwater.

The groundwater level several days after the completion of the investigation was found to be 6.5 feet below ground surface at Hole 1, and 7.5 feet below ground surface at Hole 2.

At present the stream is frozen solid, a depth of 18 inches. It can be expected that the water table will rise several feet during the next few months.

### (c) Test Results. ....

(c) Test Results.

The results of the unconfined compressive strength tests are recorded on the Soil Profile Sheets. The clay increases in strength with depth.

Conclusions & Recommendations:

The top five to seven feet of clay at this site has a relatively low shear strength and it is on this soil that the culvert must be placed. For this reason we are concerned that a rigid concrete culvert may fail due to settlement. The existing concrete culvert is in bad shape and indicates failure through settlement. Therefore, in this location, we would recommend that a multiplate culvert pipe be installed. The culvert should be placed on a 6" to 10" mat of well compacted granular material and there should be a 12" camber at the midpoint. The invert of the pipe should be in the vicinity of Elevation 42.5.

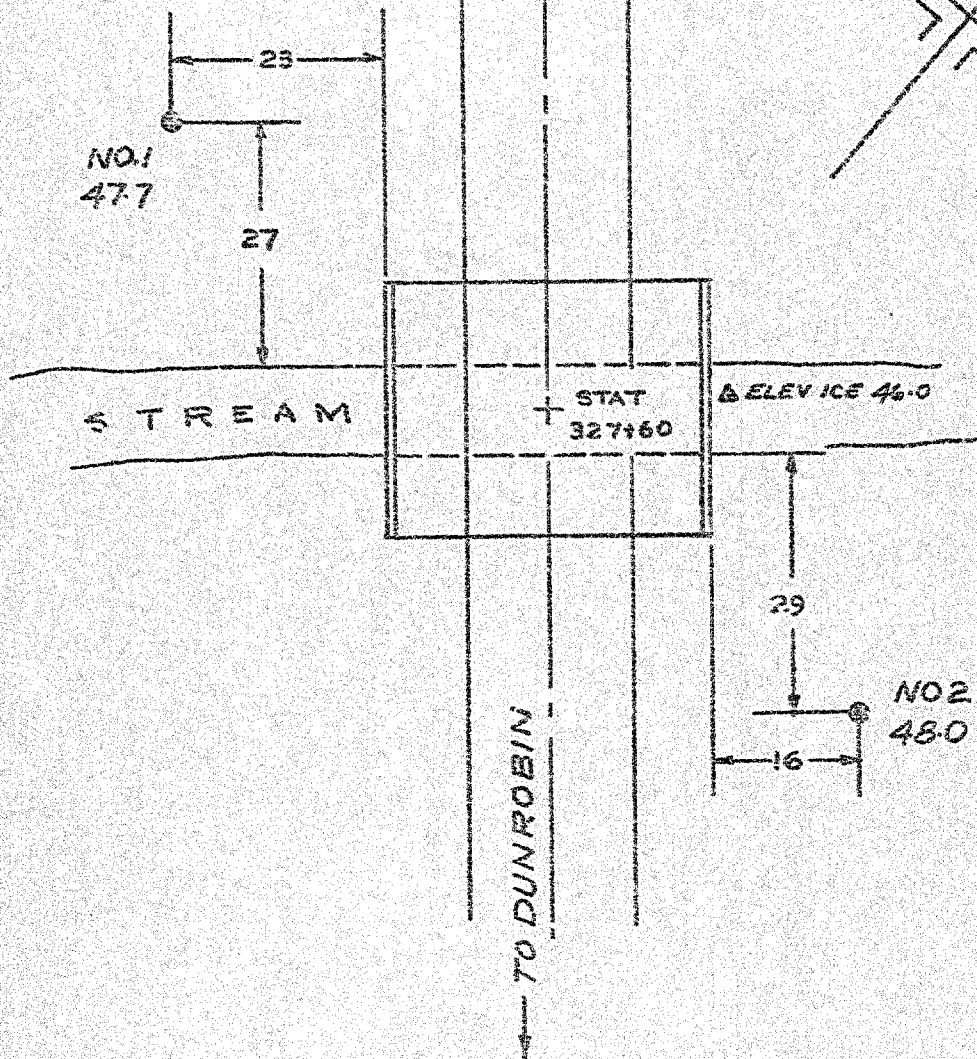
It is our understanding that the new road grade over the culvert will be at Elevation 67.5  $\pm$  and this will mean that approximately 25 feet of fill will be placed above the pipe invert.

A stability analysis based on the embankment side slope of 2, horizontal, to 1, vertical, and a safety factor of 1.5 indicates that up to 40 feet of fill can be safely placed on this site.

  
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J. D. Paterson. P. Eng.

JDP/MNC.

BM. ELEV. 52.92  
NAIL IN HYDRO POLE  
39' LT OF STA 328+03



TEST BORING PLAN  
PROPOSED CULVERT  
LOT 10 CON III  
TORBOLTON TOWNSHIP  
DUNROBIN ROAD

SCALE 1"=20'

MARCH 1962

Station 327 + 60.  
Dunrobin Road.

ELEVATION 17.7.  
Remarks Cone Probe and Test Boring.

1 of 2

Boring by: F.E. Johnston Drilling Co., Ltd. Date: Feb. 27, 1962.

1

BLAWS PSR FOOT	SOIL DESCRIPTION	Sample No.	Comp. Depth Strength in Blows Sq. Ft. Feet	12"	12"	12"
Cone	Ground Surface					
41	Clayey Topsoil	1		0	47.7	
8	Soft, weathered, silty clay with minor organic inclusions.					
4						
2						
2	5					
2		TW 2	0.63	5		
5						
5	Firm, grey, silty, fissured clay.					Ground Water Level 6.5 Feet, March 9, 1962.
5						
6						
5		TW 3	1.18	10	37.7	
5	11.5					
5						
5	Firm, grey, silty clay with black organic mottling.					
5						
6		TW 4	1.26	15		
5						
6						
6	18					
8						
8	Firm to stiff, grey, silty clay with black organic mottling.	TW 5	2.12	20	27.7	
9						
11						
10						
10						
12		TW 6	1.54	25		
12	26.7					
11						
13						
13						
17				30	17.7	
16						
17						
18						
18				35		
18						
17						
17						
18						
17	40.0					

JOHN D. PATENSON  
CONSULTING ENGINEERS  
OTTAWA CANADA

SOIL PROFILE  
&  
LABORATORY TESTS

Location:

Station 327 + 60.  
Dunrobin Road.

ELEVATION (Zero Depth): 48.0.  
Remarks: Cone Probe and Test Boring.

Sheet No:  
2 of 2

Hole No:  
2

Borings by: F.E. Johnston Drilling Co., Ltd. Date: Feb. 28 & March 1, 1962.

BLOWS PER FOOT	SOIL DESCRIPTION	Samples	Uncon. Comp. Strength lb./sq. ft.	Depth in Feet	ELEV.	MOISTURE CONTENT PER CENT.				
						30	40	50	60	70
Cone	Ground Surface									
65	Clayey Topsoil. 1			0	48.0					
18	Soft to firm, weathered, silty clay with minor organic inclusions.									
3										
2										
2										
4	7	TW	7	0.44	5					
3										
5										
6										
8	Firm, grey, silty clay, with black organic mottling and pockets of fissuring.									
8		TW	8	1.13	10	38.0				
9										
9										
10										
10										
12		TW	9	Disturbed	15					
13										
10										
10										
11										
13		TW	10	1.11	20	28.0				
13										
14										
14										
11										
12	26.7	TW	11	1.51	25					
11										
14										
13										
15										
14										
16										
16										
16										
16										
17										
19										
22	40.0									
14										
16										
16										

Ground Water  
Level 7.5 Feet,  
March 9, 1962.