

#62-F-261M

CREEK

LOTS <sup>#</sup>15 <sup>#</sup>16

CON. #10

OSGOODE TWA

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62-F-261M

REPORT OF SOIL INVESTIGATION

PROPOSED NEW STRUCTURE

AT CREEK

LOTS 15 & 16 - CONCESSION 10

TOWNSHIP OF OSGOODE

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A. J. GRAHAM, P. ENG.

CONSULTING ENGINEER

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REPORT NO. S 263 - 62

OTTAWA, MAY 24, 1962



### Introduction:

At the request of Mr. A. J. Graham, Consulting Engineer, on behalf of the Township of Osgoode, a soil investigation was conducted at the site of a proposed bridge over a stream on Lots 15 and 16, Concession 10.

It is proposed to build the new structure about 20 feet to the east. The existing structure is steel I beams supported on timber cribwork with a timber deck.

### Fieldwork Procedure:

Two test holes were put down both to the east of the existing bridge. Hole 1 consisted of a cone probe driven to 40 feet. Hole 2 consisted of a cone probe driven to 40 feet and a test hole to 26.7 feet.

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

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

### Sampling and Testing:

Only cohesive soils were encountered. Shelby tube samples were taken in Hole No. 2 to a depth of 26.7 feet. Samples 2 to 6, inclusive, were extruded at the laboratory and tested for unconfined compressive strengths.

### Observations:

#### (a) Soil Types.

Hole 2  
0 - 1' - Soft, clayey topsoil.  
1' - 4' - Soft, weathered, silty clay.  
4' - 7' - Medium stiff pinkish grey silty clay with minor organic inclusions (roots).  
7' - 38' - Soft to very soft, silty, grey, sensitive clay, breaking in places easily along horizontal and vertical planes of weakness and containing irregular patches of black organic mottling.  
38' - 40' - Probably very dense glacial till or gravel.

An interpretation of the soil profile at Hole No. 1 based on cone blows per foot is shown on Soil Profile Sheet 1. Details of Hole No. 2 are shown on Sheet 2.

#### (b) Groundwater.

The groundwater level in Hole No. 2 at the completion of the investigation was 14 feet below ground surface. However, the actual level is expected to be between 3' and 6' below the ground surface.

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

(c) Test Results.

The results of the unconfined compressive strength tests indicate that to Elevation 82 the consistency of the clay is stiff to medium stiff and below Elevation 82 it is soft.

Conclusions and Recommendations:

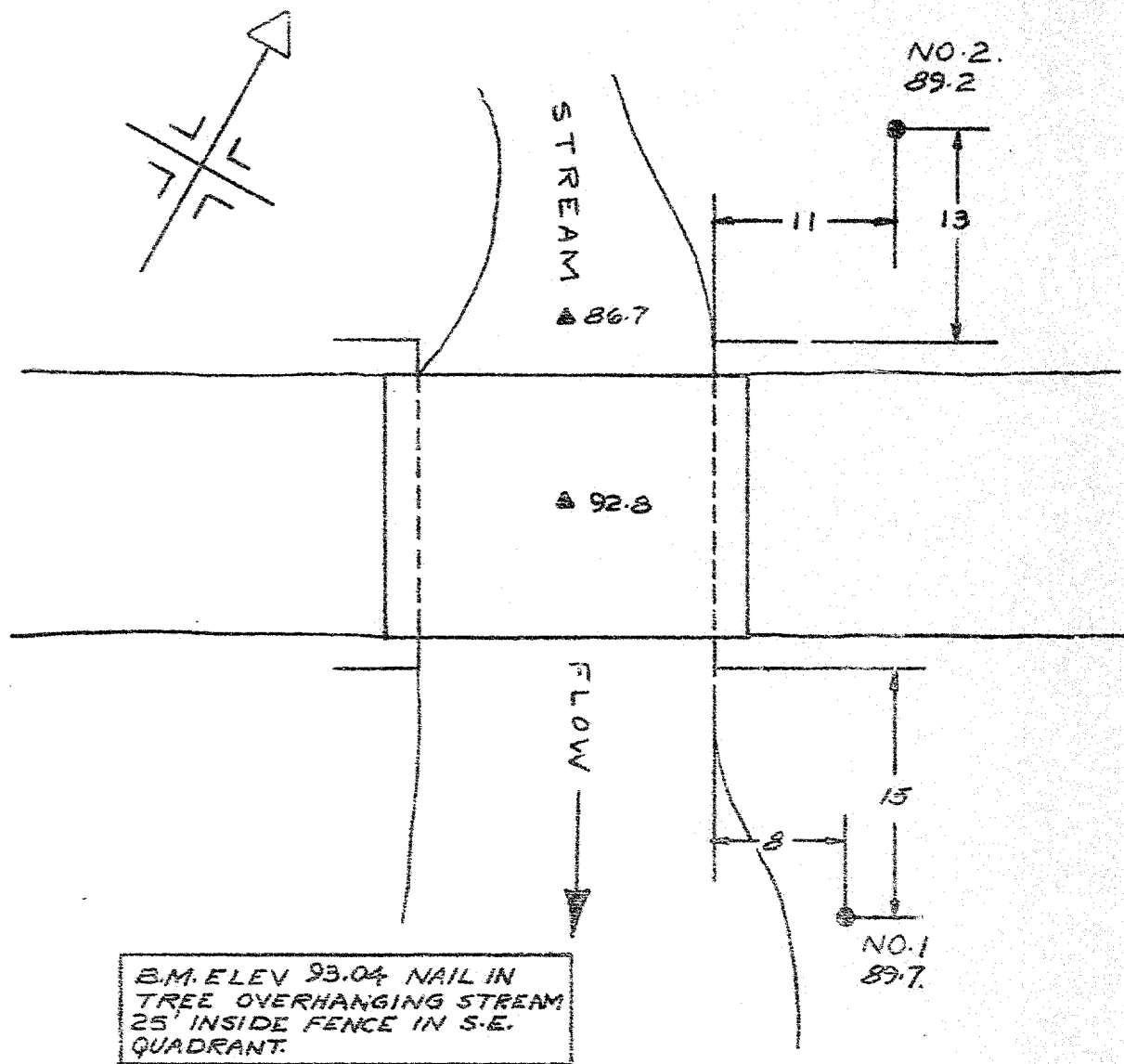
Aside from an approximate 4' thick layer of stiff to medium stiff clay the soil down to a depth of 33 to 38 feet is extremely soft clay. Two types of structure can be considered for this location, one a pipe culvert and the other a bridge. If there is sufficient clearance a culvert pipe will, of course, be very much cheaper and advantage can be taken of the stiff clay layer. The pipe should be installed on a 6" layer of compacted granular material with at least a 6" camber at the centre point of the pipe.

If a bridge is necessary we can see no alternative but to recommend that the abutments be placed on piles driven into the dense glacial till occurring at a depth of 33 to 38 feet. Creosoted timber piles would be satisfactory and the expected length of these piles after cut-off would be approximately 35 feet.

Using a safety factor of 1.5 the stability analysis indicates that the maximum safe height of fill above Elevation 82 is 10 feet. If the safety factor is reduced to 1.2 the height of fill embankment can be raised an additional three feet, or, approximately, to Elevation 95. It is important that the soil be disturbed as little as possible below Elevation 83.7 if a pipe culvert is used.

  
J. B. Paterson, P. Eng.

JDP/MMC.



TEST BORING PLAN  
 PROPOSED CULVERT  
 LOT 15 & 16 CON 10  
 TOWNSHIP of OSGOODE

SCALE 1"=10'

MAY 1962.

JOHN D. PATTERSON  
CONSULTING ENGINEERS  
OTTAWA CANADA

# SOIL PROFILE AND LABORATORY TESTS

Location: Lot 15 & 16, Concession 10,  
Township of Osgoode.

Elevation (Zero Depth): 89.7.

Remarks: Cone Probe only.

Sheet No:  
1 of 2

Borings by: F.E. Johnston Drilling Co., Ltd. Date: May 7, 1962.

Hole No:  
1

Blows per Foot	Soil Description	Samples	U'c T/n'	N	Depth in Feet	Elev.	Moisture Content				
							30	40	50	60	70
Cone	Ground Surface										
2	Topsoil 1				0	89.7					
7	Soft, weathered, silty clay with organic inclusions. 4										
7											
9					3						
11	Medium stiff, silty clay with minor organic in- clusions (roots). 8										
14											
15					6						
19											
15	Soft to very soft, silty, grey, sensitive clay.				9	80.7					
17											
18											
19					12						
18											
19											
15					15						
16											
17											
17											
16					18	71.7					
16											
18											
20	Very dense glacial till. 33				21						
19											
17											
15					24						
13											
10											
10					27	62.7					
8											
9											
10					30						
12											
23					33						
51	Very dense glacial till. 40.0										
55											
71					36	53.7					
70											
78											
53					39						
56											
					42						

Elevation Stream  
Bed 83.7.

## Note:

Interpretation based on  
cone blows per foot and  
associated bore hole.

## SOIL PROFILE AND LABORATORY TESTS

**Location:** Lots 15 & 16, Concession 10,  
Township of Osgoode.

Elevation (Zero Depth): 89.2.

Remarks: Cone Probe and Test Boring.

Sheet No :  
2 of 2

Surings by: F.F. Johnston Drilling Co., Ltd. Date: May 7 & 8, 1962.

Hole No: 2

[illegible]