

Mr. A. Tove,

December 6, 1955

Bridge Engineer.

Re: Foundation Investigation

F. C. Brownridge,  
Materials & Research Engineer.

330. P.M.#3 East Bound Lane over CRR.  
N.P.2-56 Site Plan 129.3-1 Project F55-35

ATTENTION: - Mr. S. McCombie

Attached herewith is the foundation report for the above noted structure which is self explanatory.

You will note that spread footings will be satisfactory with a maximum recommended bearing capacity of the sub soil of 5000 lbs/sq.ft. The sub soil will easily support the approach fills constructed to the standard cross section.

F. C. Brownridge  
Materials and Research Engineer

Per:

*A. Lutka*

(A. Lutka)

12/15/55.  
attach.

Copies to:

Mr. A. Tove (2)  
Mr. S. Irigashen (1)  
Mr. W. Walter (1)  
Mr. A. J. Richardson (1)  
Mr. S. Parentatos (1) ✓  
File



ONTARIO

DEPARTMENT OF HIGHWAYS

Memo to Mr. A. Foye

Date January 11, 1956

Bridge Engineer

Subject T.O.M. Highway #17: Foundation  
Investigation: Black Sturgeon Creek:  
5 miles South of Red Rock Turn.  
Station 2679/50. Project 55-7-36.

From Highways Laboratory, Sheppard Ave.

Attached herewith is the foundation report for the above noted structure which is self-explanatory.

This proposed structure is located between two grading contracts, namely Contract 55-170 and 55-176 now under construction. It is not shown on any present preparation list and consequently does not have a work project number. It was, however, shown on previous preparation lists.

As no site plan was available, the location of the bore holes was made for the line plan 22461. The grade over the structure as shown on Profile G118-6 is satisfactory.

F. C. Brownridge  
Materials and Research Engineer

Per:

(A. Rutka)

AM:GEP

Copies to: Mr. H. Tregeaskes  
Mr. J. Walter  
Mr. J. E. Garland  
Mr. G. Parantatos  
File

## I N D E X

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REPORT  
ON THE  
FOUNDATION INVESTIGATION  
FOR THE PROPOSED C.N.R. OVERHEAD  
FOR THE EAST BOUND LANE  
AT STATION 27+75.33 C. A. H.  
IN THE TOWNSHIP OF  
NELSON  
NEAR  
BURLINGTON

PROJECT F 55-35

Copies to:

Mr. A. Toye, Bridge Engineer (2)  
Mr. H. Tregaskes, Const. Engineer (1)  
Mr. J. Walter, Design Engineer (1)  
Mr. E. Richardson, Dist. Engineer,  
Hamilton, (1)  
Mr. G. Farantatos (1)

Plan F2407-26

Profile F2407-27

File

## INTRODUCTION

A recent investigation was completed to ascertain the soil profile beneath the footings of the proposed structure at the intersection of the single line C.N.R. track and the centre-line of the East bound lane of the C.A.H. at Station 27+75.33, profile F 2407-27, in the Township of Nelson (see plan F55-35A).

Unfortunately due to the bough nature of the ground adjacent to the C.N.R. tracks and the type of equipment available, it occasionally proved impossible to drill on the centre-line of the footing. However, the uniformity of soil condition in this area is such that small displacements are of little consequence.

## PROCEDURE

Core drilling operations at this site were preceded by a preliminary power auger survey. This survey was used to determine the soil profile for a depth of some 20'0". (See dwg. F55-35A & Appendix I).

The operations by power auger were followed immediately by the core drill in an attempt to ascertain soil and rock quality.

Difficulty was experienced in all departments of sampling. Refusal after short penetrations of the samples is common in this soil material except in the upper 4'0" - 5'0", and it was found that the core barrel sampler was the only sampling equipment which dealt successfully with this material.

### SOIL TESTING

The nature of the soil type in this area is such that it proved almost impossible to deliver to the laboratory an undisturbed sample. As a result of this testing proved very difficult, and in many cases no results for unconfined strength were recorded. The sample, after sampling appeared to be undisturbed, but extraction and trimming of the samples was found to be very difficult, because the samples were very friable.

### SOIL CONDITIONS (see dwg. F55-35A)

Generally the area is one of a laminated soil formed of alternating layers of shale and red clay. The amount of shale appeared to increase with depth. Borehole 1 shows a minimum of 40% shale below an elevation of 331.0, whilst bore hole 4B shows a minimum of 25% shale after 333.0. Borehole 4B also indicated shattered shale rock with an 80% shale core below 325.0, though borehole 1 only indicated a similar condition from 326.0. to 328.0. However, the core sample indicated a minimum of 40-50% of shale below 326.0.

Observations on the hydraulic device on the boring machine, and the occasional samples recovered in the core barrel, indicated that the separation layers between the shale layers consisted of a stiff red brown clay.

From existing ground level for a depth of 4'0" - 5'0" a layer of dry stiff clay occurs. This was the only layer from which 2" samples could be recovered.

### WATER CONDITIONS

There was no evidence of a static water table, but seepage occurred along the upper face of highest impervious shale layer at a depth of some 6'0" in the case of boreholes 1 & 2. (elev. 333.0).

### RECOMMENDATION

The laminated soil strata is suitable for a rigid framed structure if a bearing strength of 5000 lb/sq. ft. is not exceeded.

The allowable bearing stress can be increased to a maximum of 6000 lb/sq. ft. if a simply supported structure is constructed.

In any case the footings should be carried below the level of frost penetration and be founded upon sound material.



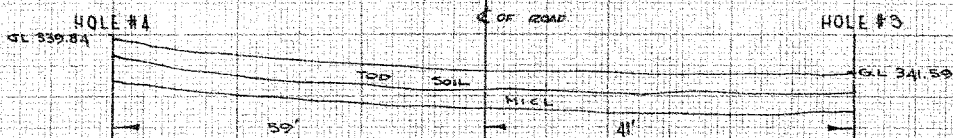
G. Farantatos  
Foundation Engineer.

F 55-35

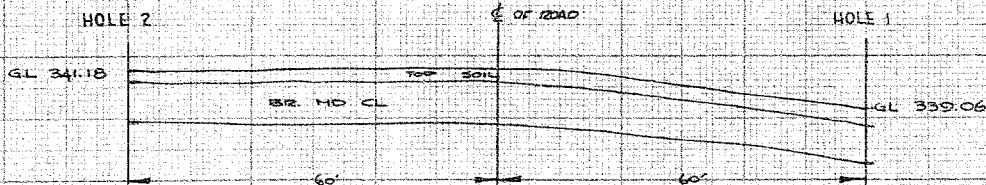
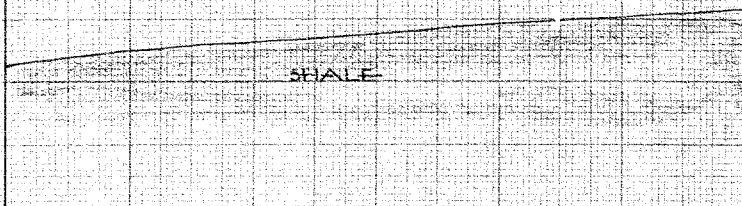
INTERSECTION OF EAST BOUND LANE AND C.N.R.

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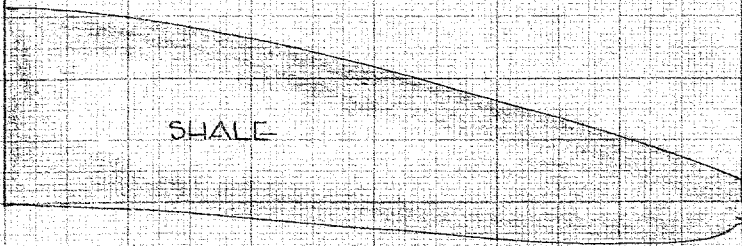
GEOCREES No.



RED MCL & LAYER OF SHALE



RED MEDIUM CLAY / LAYERS OF SHALE



Vertical Scale 1" = 6'

SOIL PROFILE FROM AUGER HOLES.



# 55-F-35  
W.P. 2-56  
C. A. H.  
T.W.P NELSON  
NEAR  
BURLINGTON





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

DRILL RIG #1

CASING - 5X - (STANDARD SAMPLERS TO FIT UNLESS NOTED)  
SAMPLER HAMMER WT. # DROP - INCHES

JOB F-55-35 BORING NO. 3  
 DATUM 242.32 QGL 300 27475.33 ELLIOTT CAN DATE REPORT 7/0/56  
 COMPILED BY AT CHECKED BY BORING DATE 7/0/57

### SAMPLE CONDITION

DISTURBED  
GOOD  
LOST

## SAMPLE TYPES

C3 - CHUNK  
OO - DRIVE OPEN  
DFV - DRIVE FOOT VALVE  
TO - THIN WALLED OPEN

WS - WASHED SAND  
RC - ROCK CORE

## ABBREVIATIONS

ABBREVIATIONS

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

## SOIL PROFILE

③ SHEAR STRENGTH  
TONS/SQ.FT. OR  $Q_u/2$

WATER CONTENT  
W %

## SAMPLES

CONDITION	TYPE	NO	PENETRATION	RESISTANCE	ELE	RECO
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KIND OF AIRCRAFT

RED BROWN  
CLAY WITH THIN  
SHALE LAYERS

T.O	2'	HYD <sup>L</sup>	100%
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54.90


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

DELL INC. #

CASING... *01* ... (STANDARD SAMPLERS TO FIT UNLESS NOTED)  
SAMPLER HAMMER WT... *10* ... (NOTES - UNLESS NOTED)

1015 F. 55-35 HOLDING NO. 4A  
 DATUM 10-76 ON 27-75-33 C.R. LAND CAM UNIT REPORT 7 NOV 55  
 COMPILED BY A.T. CHECKED BY BORING DATE 7 NOV 55

### SAMPLE CONDITION



DISTURBED  
GOOD  
LOST

### SAMPLE TYPES

G.S. - CHUNK.  
UO - DRIVE OPEN  
DF - DRIVE FOOT VALVE  
YO - THIN WALLED OPEN

W.B. WASHED SAND  
R.C. BLOCK CORP.

## ABBREVIATIONS

V. IN-SITU VANE SHEAR TEST      W. UNIT WEIGHT  
 M. MECHANICAL ANALYSIS      K. PERMEABILITY  
 U. UNCONFINED COMPRESSION      C. CONSOLIDATION  
 Q<sub>c</sub>. TRIAXIAL CONSOLIDATED QUICK      CA. CASING  
 Q. TRIAXIAL QUICK      WL. WATER LEVEL IN CASING  
 U. TRIAXIAL SLOW      WT. WATER TABLE M. GCH

### SOIL PROFILE

SHEAR STRENGTH  
TONS/100 FT.  $\approx 2000$

WATER CONTENT  
W %

## SAMPLES

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RED BROWN  
CLAY WITH THIN  
SHALE LAYERS

NOT ADVANCED AS A/C ?  
ONLY SMALL SMALL COUN

