

#62-F-12

W.P. #112-59

Hwy. #401

CROSSING

ST. ANDREWS RD.

BRIDGE #14

CORNWALL TWP.

EXTRA

cc: Foundations Office (RR-110)

Dist. 28-2

62-F-12

Mr. L. E. Walker,
District Engineer,
Ottawa, Ontario.

February 21, 1962.

Re: Cornwall Twp. Bridge #14,
Over St. Andrews Rd., Hwy. 401,
Dist. #9. -- W.P. 112-59.

Materials & Research Division,

(Foundation Section)

Attention: Mr. G. A. Metcalfe, Const. Engr.

In response to a request from Mr. Peter Anderson of the District Office, an inspection of the excavation for the North-West and South-West piers of the above-mentioned structure was made by Mr. V. Korlu of this Section on February 5th, 1962. Mr. Anderson had stated that some soft blue clay was encountered at the footing elevation. Subsequently, an inspection trip was made by the writer on February 6th, 1962, to ascertain whether or not the subsoil conditions at the footing elevation are adequate to provide the design loads.

On February 5th, 1962, Mr. Korlu carried out the excavation approximately two feet below the footing elevation with a back-hoe and observed that the subsoil generally consisted of glacial till (silt - slightly plastic with sand and occasional gravel, also occasional boulders). On February 6th, 1962, the following observations were made by the writer:-

- 1) The pier excavations were carried out to the proposed footing elevation (elev. 201.0) and the subsoil at and above this elevation was predominantly silt (slightly cohesive) with sand and some gravel, occasional boulders up to a maximum size of 18".
- 2) No deposits of soft sensitive marine clay were observed within the excavation.
- 3) The ground water table was very close to the footing elevations, and in addition to this, some surface run-off water had entered the excavation and softened the excavation.

A subsoil investigation was carried out at the above-mentioned structure location during 1955. Only three boreholes were drilled and these do not cover the entire area. The foundation

cont'd. /2 ...

Mr. L. E. Walker, District Engr.
Attn: Mr. G. A. Metcalfe, Const. Engr.

Feb. 20/62

report does not contain enough detailed information for the proposed 120-ft. long three-span twin structure. In view of these facts, it was decided to carry out additional borings at the site. Recently, this Section completed the additional borings and found that the subsoil conditions are generally favourable for the structure foundations. We have reviewed all the information now available and would like to make the following recommendations:-

- 1) It is suggested that care should be taken to prevent softening of the material by surface water during construction.
- 2) It is recommended that a granular pad approx. 9" to 12" be provided below the footing. The material for the granular pad can be of Granular Base Course, Class 'A'.
- 3) Prior to placing the granular pad, any material at the bottom of excavation softened due to surface run-off water, should be removed.

A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.
Per:

M. Devata
(M. Devata,
SR. PROJECT FOUNDATION ENGR.)

MD/MdeF

cc: Mr. P. Anderson

Foundations Office ✓
Gen. Files.

Mr. A. G. Stermac,
Principal Foundation Engr.
Mr. M. Devata,
Sr. Project Foundation Engr.

February 9, 1962.
Inspection Trip

Re: Cornwall Twp. Br. #14,
Over St. Andrews Rd.,
Hwy. 401, District #9.
W.P. 112-59.

In response to a request from Mr. Peter Anderson of the District Office, an inspection of the excavation of the North-West and South-West piers of the above-mentioned structure was made by Mr. V. Korlu on February 5th, 1962. This was to investigate Mr. Anderson's statement that some soft blue clay had been encountered at the footing elevation. Subsequently, an inspection trip was made by the writer on February 6th, 1962 to ascertain whether the subsoil conditions at the footing elevation are adequate to provide safe bearing without significant reduction.

On February 5th, 1962, Mr. V. Korlu carried out the excavation approximately 2 ft. below the footing elevation with a back-hoe and observed that the subsoil generally consisted of glacial till (grey clayey silt with fine sand and occasional gravel, traces of boulders up to 18"). The writer also visited the site and observed the following:-

1. North-West Pier Excavation (approx. footing elev. 202.00)

The excavation was carried down to the required footing elevation. The subsoil generally consists as follows:-

- | | | | | |
|-----|---|-----|----|--|
| 0 | - | 5.0 | -- | brown, clayey silt with sand and gravel,
boulders up to 18" in size - very stiff to hard. |
| 5.0 | - | 6.0 | -- | grey, clayey silt with some sand and traces of
gravel; (the material is saturated) - stiff. |

Note:- No traces of marine clay.

cont'd. /2 ...

1. North-West Pier Excavation: CONT'D ...

The water table is very close to the footing elevations and in addition to this, some surface run-off water entered the excavation and softened the excavation.

2. South-West Pier Excavation:

At this location, the excavation was not completed to its full depth and the subsoil is generally clayey silt till material. Representative samples were collected from both North-West and South-West pier footing excavations.

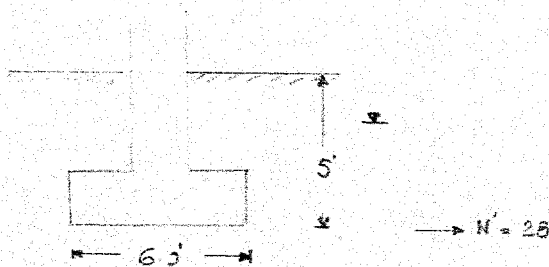
It is very difficult to determine the properties of the subsoil at the footing elevation with visual observations, and therefore, it was decided to carry out a few borings at the above-mentioned location to determine any localized soft pockets.

A subsoil investigation was carried out at the above-mentioned structure location in 1955. Only three boreholes were drilled and it is felt that they do not cover the entire area. The foundation report does not contain enough detailed information of subsoil conditions. The bridge is a three-span twin structure of total length about 120'. In view of this fact, it is advisable to carry out additional borings at the site.

MD/MdeF

cc: Foundations Office
Gen. Files.

M. Devata
M. Devata,
SR. PROJECT FOUNDATION ENGR.

Cornwall Trp Bridge #14 @ St Andrews Rd

$$N = 15 + \frac{1}{2}(N' - 15) \\ = 15 + \frac{1}{2}(28 - 15) = 21.5$$

Say $N = 21$ $B = 6.0$
 $N_r = 20$ $D_f = 5.0$
 $N_q = 20$ $\gamma' = 50$

$$q_d = \frac{1}{2} E \gamma N_r + \gamma D_f N_q \\ = \frac{1}{2} \times 6 \times 50 \times 20 + \frac{50 \times 5 \times 20}{2000} \\ = 3.5 \text{ Tons/sq ft}$$

$$q_o = \frac{q_d}{F_s} = \frac{3.5}{3} = \text{Say } 1.2 \text{ T/sq ft}$$

FOUNDATIONS
OFFICE

Copy

1962 FEB 21 PM 2:42

15514

0
OTTA DOWN 8 EB 21/62 210P VR

L E WALKER DIST ENGR

ATTN G A HEICALFE CONSTR ENGR

RE: CORNWALL TWP BRIDGE NO. 14 OVER ST. ANDREWS ROAD HWY 401

DIST 9 H.P. 112-39

IT IS SUGGESTED THAT CARE SHOULD BE TAKEN TO PREVENT SOFTENING
OF THE MATERIAL BY SURFACE WATER DURING CONSTRUCTION

(2) IT IS RECOMMENDED THAT A GRANULAR PAD APPROXIMATELY 9" TO 12"
BE PROVIDED BELOW THE FOOTING THE MATERIAL FOR GRANULAR PAD
CAN BE OF GRANULAR BASE COURSE CLASS "A"

(3) PRIOR TO PLACING THE GRANULAR PAD ANY MATERIAL AT THE BOTTOM
OF EXCAVATION SOFTENED TO SURFACE RUN OFF WATER SHOULD BE REMOVED

MEMO WILL FOLLOW - *memo PM 11/0*

A G STURMACK PRINC FOUNDATION ENGR

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ONTARIO
DEPARTMENT OF HIGHWAYS
Materials & Research Division.

File
Aug File 12-1962

Memo to Mr. A. G. Stermac, Date February 9, 1962.
Principal Foundation Engr. Subject Inspection Trip
From Mr. M. Devata,
Sr. Project Foundation Engr.

Re: Cornwall Twp. Br. #14,
Over St. Andrews Rd.,
Hwy. 401, District #9.
W.P. 112-59.

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Note:- No traces of marine clay.

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MD/MdeF

cc: Foundations Office
Gen. Files.

M. Devata
M. Devata,
SR. PROJECT FOUNDATION ENGR.

CONTR NO 61-203

W.P. 112-59

PORIDGE NO 14

IN CORNWALL

HWY 401 & ST ANDREW'S RD

BOULDERY CLAY - TILL

EXCEPT BLUE-GREY CLAY AT PIER
LOCATIONS

55-F-13 AUGUST 3, 1955

TWIN STRUCTURE (4 PIER)

BA 1007

WP 104-59

1. NW - South side? 2.0 below elevation

Now comes

1 ft. below

NW River

0 - 5' - laminated - layers of silt with some sand
and some gravel and some boulders
18" (max.)

5 - 2' - grey clay with silt

SW River

Finished at South corner

No water - Around no boulders some clay
but below water - 20000 strength (