

67-F-225M

JOLLIFFE BRIDGE

LOT 14, CON. 5-6

N. DORCHESTER



DOMINION SOIL INVESTIGATION LIMITED
CONSULTING SOIL & FOUNDATION ENGINEERS

HEAD OFFICE

104 CROCKFORD BLVD.
SCARBOROUGH, ONT.
CANADA
TELEPHONE: 751-6365

BRANCH OFFICE

283 QUEENS AVE.
LONDON, ONT.
TELEPHONE: 433-0851

London

November 24th, 1967

Report

7-11-L10.

ASSOCIATED COMPANY

SOIL TESTING AND ENGINEERING LTD.
39 BRENTFORD ROAD
KINGSTON 8, JAMAICA
WEST INDIES

67-F-225 M

A.M. Spriet & Associates Ltd.,
264 Wellington Street,
London, Ontario.

Gentlemen:

Soil Investigation for Jolliffe Bridge
Lot 14, Concessions 5-6,
Township of North Dorchester.

REPORT.

We have completed the project in accordance with your verbal authorization of November 14, 1967. This report contains a record of our findings and presents our recommendations for the foundation design of the proposed structure.

FIELD WORK.

The field work consisting of one borehole was carried out on November 17th, 1967, at the location shown on Enclosure 1.

Standard penetration tests, using a 2-inch diameter split-spoon sampler were performed at frequent intervals of depth, using a driving force of a 140 lb. hammer falling freely through 30-inches. The tube is first driven an initial 6-inches to allow for the presence of disturbed material at the bottom of the borehole. The number of standard blows required to drive the sampler a further 12 inches was recorded as the standard penetration resistance (or 'N' value).

8

This test determines the relative density of granular strata and gives an indication of the consistency of cohesive strata. It also enables samples to be obtained for classification purposes.

The results of the field tests are presented on the Borehole Log Sheet, comprising Enclosure 2. Elevations were referred to a nail in a tree at the location shown on Enclosure 1. The benchmark was given the assumed El. 100 feet.

SUBSURFACE CONDITIONS.

The borehole penetrated 6 feet of fill material which is associated with the construction of the road embankment. Natural subsoil, consisting of glacial silty clay containing a trace of gravel, was encountered at El. 92.5 and the borehole was terminated in this stratum at El. 78.

The consistency of the clay till is described as 'very stiff' to 'hard' as indicated by 'N' values ranging from 19 to 39 blows per foot. Atterberg Limit tests performed on a sample of the clay till gave a Liquid Limit value of 30%, Plastic Limit of 15%, and Plasticity Index of 15, indicating that the clay has a low plasticity and compressibility. The Liquidity Index which relates the natural moisture content to the Atterberg Limits was 0.25 indicating a generally stiff consistency.

The water level observed in the borehole was at El. 94.5, while the water level in the adjacent creek was at El. 95.1.

DISCUSSION.

The natural subsoil below the creek bed consists of very stiff to hard silty clay till which is suitable for the support of spread footing foundations. The bed of the creek extends to El.94.6 therefore consideration should be given to a footing grade at about El. 90.5. On the basis of the borehole results a maximum net soil pressure of 8000 p.s.f. is appropriate for the design of footings at or below El.90.5. Furthermore the footings will have a factor of safety of 3 against shear failure of the underlying soil.

Total settlement of footings mobilizing the above soil pressure will be less than 1-inch.

The very stiff cohesive soil will present no unusual construction problems. The sides of excavations will remain vertical for short periods of time which will be sufficient to pour footings against undisturbed soil. Seepage into excavations will be very slow, and if necessary it should be collected in sumps dug below the footing grade and removed by pumping.



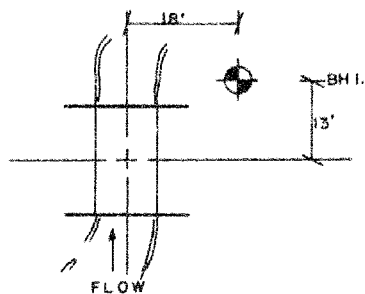
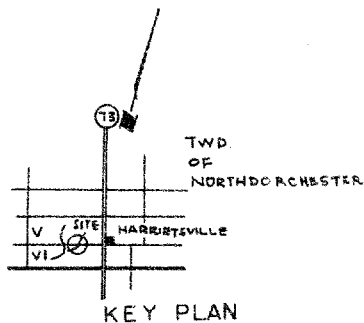
Yours very truly,

DOMINION SOIL INVESTIGATION LIMITED

C.J.W. Atkinson


C.J.W. Atkinson, M.Sc., P.Eng.,
Branch Manager.,

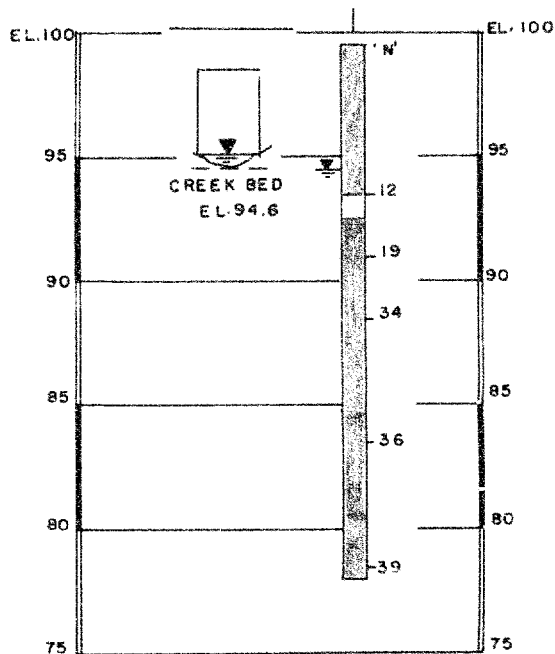
CJWA/jb



● B.M. NAIL IN 4' ELM ABOUT 54' W. 21' N. OF CENTRE OF THE EXISTING CULVERT.

LEGEND

-  CLAY FILL
-  SILTY SAND
-  VERY STIFF TO HARD SILTY CLAY TILL



LOG OF BOREHOLE 1.....









Our Reference No. 7-11-L10.

Enclosure No. 2.

CLIENT: A.M. Sprlet & Associates, Ltd.,
 PROJECT: Jolliffe Bridge.
 LOCATION: Lot 14. Conc. S-6, Twp. of N. Dorchester.,
 DATUM ELEVATION: 100 feet..

DRILLING DATA

Method: Washboring
 Diameter: 8x (3-inch)
 Date: November 17, 1967.

| SUBSURFACE PROFILE | | | | SAMPLES | | | PENETRATION RESISTANCE Blows / Foot | | | | | WATER CONTENT % | | | REMARKS | | | | | | |
|--------------------|--------------|--------------------------|---|-----------------|--------|------|--|-------------------------------------|--|--|--|-----------------|--------------------|----------------------------|---------|-----------------|--|----------------|---|----------------|--|
| ELEVATION Ft. | DEPTH Ft. | DESCRIPTION | SYMBOL | GROUND WATER | NUMBER | TYPE | 'N' Blows / Foot | 20 40 60 80 100 | | | | | PLASTIC LIMIT | NATURAL | | LIQUID LIMIT | | | | | |
| | | | | | | | | UNDRAINED SHEAR STRENGTH | | | | | lbs./sq. ft. | | | | | W _p | W | W _L | |
| | | | | | | | | + FIELD VANE TEST | | | | | * COMPRESSION TEST | | | | | | | | |
| 99.5 | 0.0 | Ground Surface | | | | | | | | | | | | 10 20 30 40 50 | | | | | | | |
| | 0.5 | Topsoil |  | | | | | | | | | | | | | | | | | | |
| | | Silty clay (Fill) |  | | | | | | | | | | | | | | | | | | |
| 95 | 6.0 | Silty sand. |  | | 1 | SS | 12 | | | | | | | | | | | | | | |
| | 7.0 | Very stiff to hard |  | | 2 | SS | 19 | | | | | | | | | | | | | | |
| 90 | | greyish brown silty clay |  | | 3 | SS | 34 | | | | | | | | | | | | | | |
| 85 | | sand & gravel seam |  | | 4 | SS | 36 | | | | | | | | | | | | | | |
| | | with a trace of gravel. |  | | | | | | | | | | | | | | | | | | |
| 80 | | (Glacial Till) |  | | 5 | SS | 39 | | | | | | | | | | | | | | |
| 71.5 | | End of Borehole | | | | | | | | | | | | | | | | | | | |

VERTICAL SCALE: 1 inch to 5 feet

DOMINION SOIL INVESTIGATION LIMITED

MADE

CHECKED