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GEOCRES No. 30M13-40

G.I.-30 SEPT. 1976

W.P. No. —

CONT. No. —

W. O. No. —

STR. SITE No. —

HWY. No. -

LOCATION PROP. BRIDGE, KING TWP. NEAR SHOMBERG

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. NONE

REMARKS:

FA 1394

FRANKI OF CANADA, LIMITED
SOIL INVESTIGATIONS

30M13-40
CROCKS No.

214 MERTON ST. TORONTO
HU. 1-6426-7

R E P O R T

to

VICTOR G. BARDAWILL

CONSULTING ENGINEER

on

PROPOSED BRIDGE

KING TOWNSHIP

NEAR SCHOMBERG, ONTARIO

Distribution:

3 copies : Victor G. Bardawill
Consulting Engineer

2 copies : Franki of Canada Ltd.

Our Reference
PC 1092
OP 4762

28 March 1962

INTRODUCTION

Franki of Canada Limited has been retained by Victor G. Bardawill, Consulting Engineer, to carry out a soil investigation at the site of a proposed bridge in the Township of King, near Schomberg, Ontario.

The object of the investigation was to determine and interpret the soil conditions at the site as they affect the foundation design of the proposed bridge.

PROCEDURE

The field work was carried out on March 21st, 22nd and 23rd 1962 and consisted of 1 detailed borehole with adjacent dynamic penetration test and one additional dynamic penetration test. The locations of the borings are shown on Drawing FC 1092-1. A detailed log for each boring is given on the Boring Records.

The samples obtained will be stored until October 1st 1962 and then discarded unless other instructions are received.

Because the ground surface at the borings is approximately level, no elevations were taken and in this report reference is made only to depth below ground level.

SUMMARISED SOIL CONDITIONS

Road fill, consisting of sand and gravel was encountered in both borings to a depth of 3 feet. Below this is a stratum of very soft brown to black peat, occasionally changing to very organic silty clay to a depth of about 19 feet below ground level. Although not encountered in the borehole, the dynamic penetration test adjacent to borehole 1 indicates the presence of logs at a depth between 6 and 10 feet. The peat is underlain by a stratum of firm grey clayey silt to silty clay with some sand seams to a depth of 25 and 23 feet in borings 1 and 2 respectively. This material is underlain by a stratum of grey silty fine to occasionally medium sand to the depth explored. The sand is stratified and contains seams of coarse sand with some fine gravel. In borehole 1 a layer of grey stratified sandy to clayey silt was

encountered within the sand stratum between depths of 29 and 34 feet. The pattern of the dynamic penetration test in boring 2 as well as the material clinging to the rod after the test, showed fine sand to the depth explored.

WATER CONDITIONS

Ground water was encountered at a depth of about 6 feet which corresponds to the level of the river at the time of the investigation. After penetrating the sand stratum however, the water in the hole rose steadily in boring 1 to a depth of 6 inches below ground level and it flowed out of the hole in boring 2, indicating excess hydrostatic pressures in the sand stratum. The maximum head is estimated to be about 1 foot above ground level. The water kept on flowing throughout the duration of the sampling procedures, but could be blocked after completion of the hole. It is possible however that after blocking, the excess pressure dissipates through the road fill which could not be checked due to the snow cover.

FOUNDATIONS

The proposed bridge will be a wooden plank and beam structure with light loadings.

Unless considerable settlement can be tolerated or designed for, spread footings are not a suitable solution and piles must be employed. Under normal conditions wooden piles with a tip diameter of 6 inches would have to be driven to a depth of about 30-feet to give a safe bearing capacity of the order of 20 tons. However, due to the artesian conditions in the sand stratum, the pile may theoretically have no bearing capacity at all until the excess hydrostatic pressure is sealed off. While the excess pressure is free to dissipate however, the sand below and around the pile may be in a quick condition, which will result in a loosening of the sand, which will remain after the excess pressure has been sealed off.

This effect may be seen from the results of the dynamic penetration tests. At location 2, the density inferred remains low to a depth of about 40 to 45 feet. In borehole 1 the density increases after reaching the sand stratum and through the stratified silt stratum and drops sharply after leaving the silt

stratum. The standard penetration or 'N' value also confirms this trend. Below a depth of about 45 feet, the sand becomes coarser and the gravel content probably increases. This results in a higher permeability and consequently the soil does not become quick and remains in its natural density.

Driven piles will follow the same trend and should therefore be about 45 feet long, in order to bear in the coarser material. In this case, it would be advisable to drive some shorter piles as well and subject them to a load test. In this way, depending on the results of the load tests, it may be possible to save on pile length.

FRANKI OF CANADA LIMITED

REGISTERED PROFESSIONAL ENGINEER A. PRIOR PROVINCE OF ONTARIO

A. Prior, P. Eng.
Divisional Soils Engineer

AP/DRB

BORING . RECORDS

The boring records on the following pages give a comprehensive picture of the soils information obtained from each boring. The explanation of the various headings is given below:

SOIL PROFILE

Under this heading is given a short form description of the various soils encountered. The elevations given are referred to the Datum shown on the general heading.

In the description of the soil, the consistency of cohesive soils and the relative density of non-cohesive soils are described by the following terms :

Consistency	Shear Strength pounds/sq.foot	Relative Density	Standard Penetration blows/foot
Very soft	less than 250	Very loose	less than 4
Soft	250 - 500	Loose	4 - 10
Firm	500 - 1000	Compact	10 - 30
Stiff	1000 - 2000	Dense	30 - 50
Very Stiff	2000 - 4000	Very dense	more than 50
Hard	more than 4000		

STANDARD PENETRATION RESISTANCE
DYNAMIC PENETRATION RESISTANCE

Under this heading are shown graphically the penetration resistances as a function of blows per foot. The dynamic penetration resistance is obtained by the continual driving of a standard 2-inch 60-degree cone and observing the blows required for each foot of penetration. The standard penetration resistance is obtained during driving of a standard 2-inch drive or split-spoon sampler and observing the blows required to advance the sampler 1-foot. For both tests the driving force consists of a 140-pound hammer dropping 30-inches.

SAMPLES

Under this heading the samples taken are plotted to vertical scale in the first column. The second column shows the type of sampler used. The fourth column indicates the recovery as the percentage of the length over which the sampler is driven.

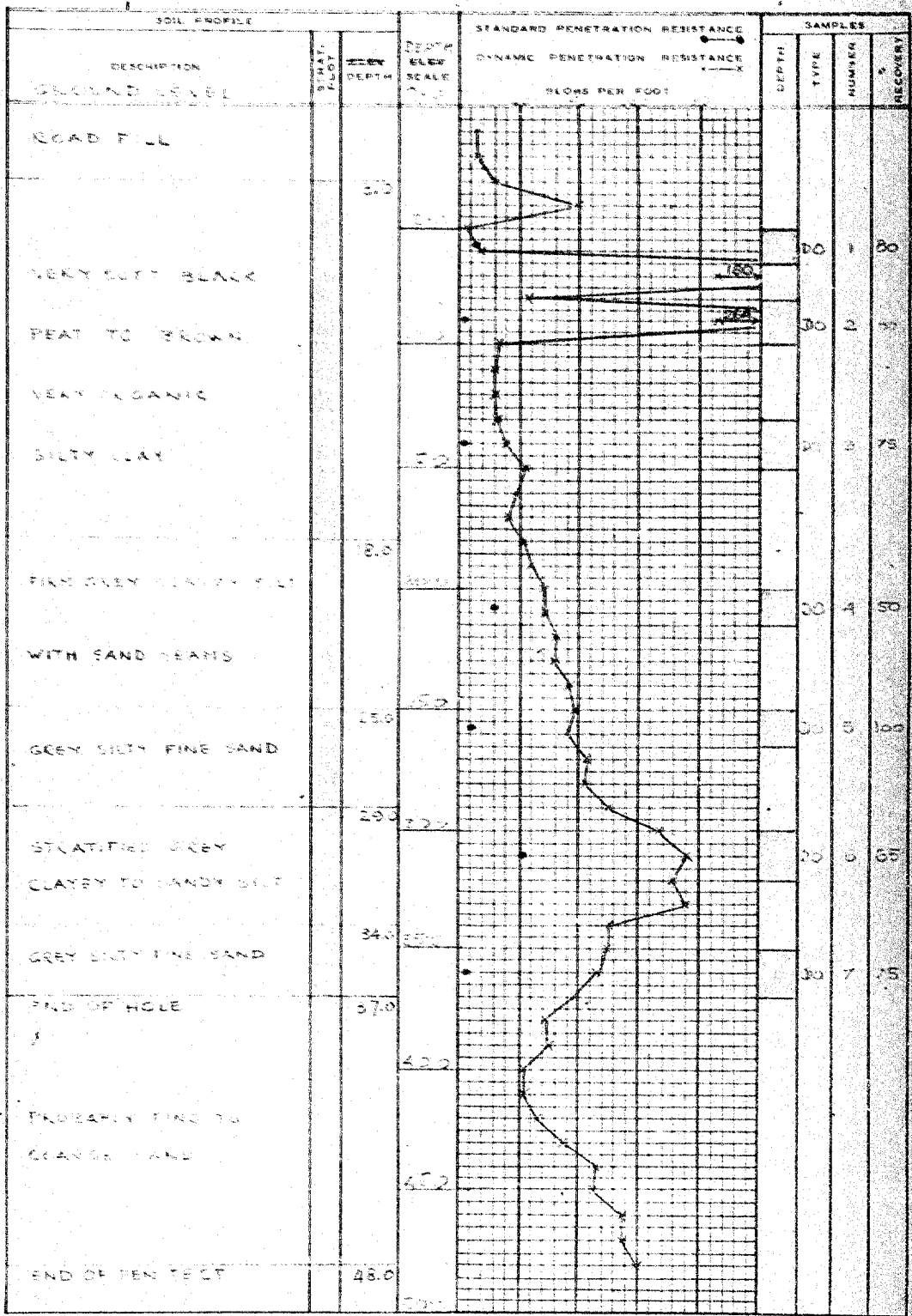
LABORATORY TESTS

When laboratory tests on samples obtained are carried out, the results are given on the right hand side of the form. The symbols used for individual tests are explained in the legend.

FRANKI OF CANADA LTD. **BORING RECORD**

CONTRACT _____ BORING _____ BORING DATE _____

DATUM _____ DIAM. 4½ HAMMER 140 LBS. DROP 30 IN.



SAMPLE TYPES

AS	AUGER SAMPLE
DO	DRIVE OPEN
DF	DRIVE FOOT VALVE
SO	SLEEVE OPEN
SF	SLEEVE FOOT VALVE
TO	THIN WALLED OPEN
TP	THIN WALLED PISTON
WS	WASHED SAMPLE
RC	ROCK CORE
K_F	FIELD PERMEABILITY TEST
▼	GROUND WATER LEVEL AT TIME OF BORING

REMARKS _____

FRANKI OF CANADA LTD.

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CONTRACT _____ BORING _____ BORING DATE MAR 23 62

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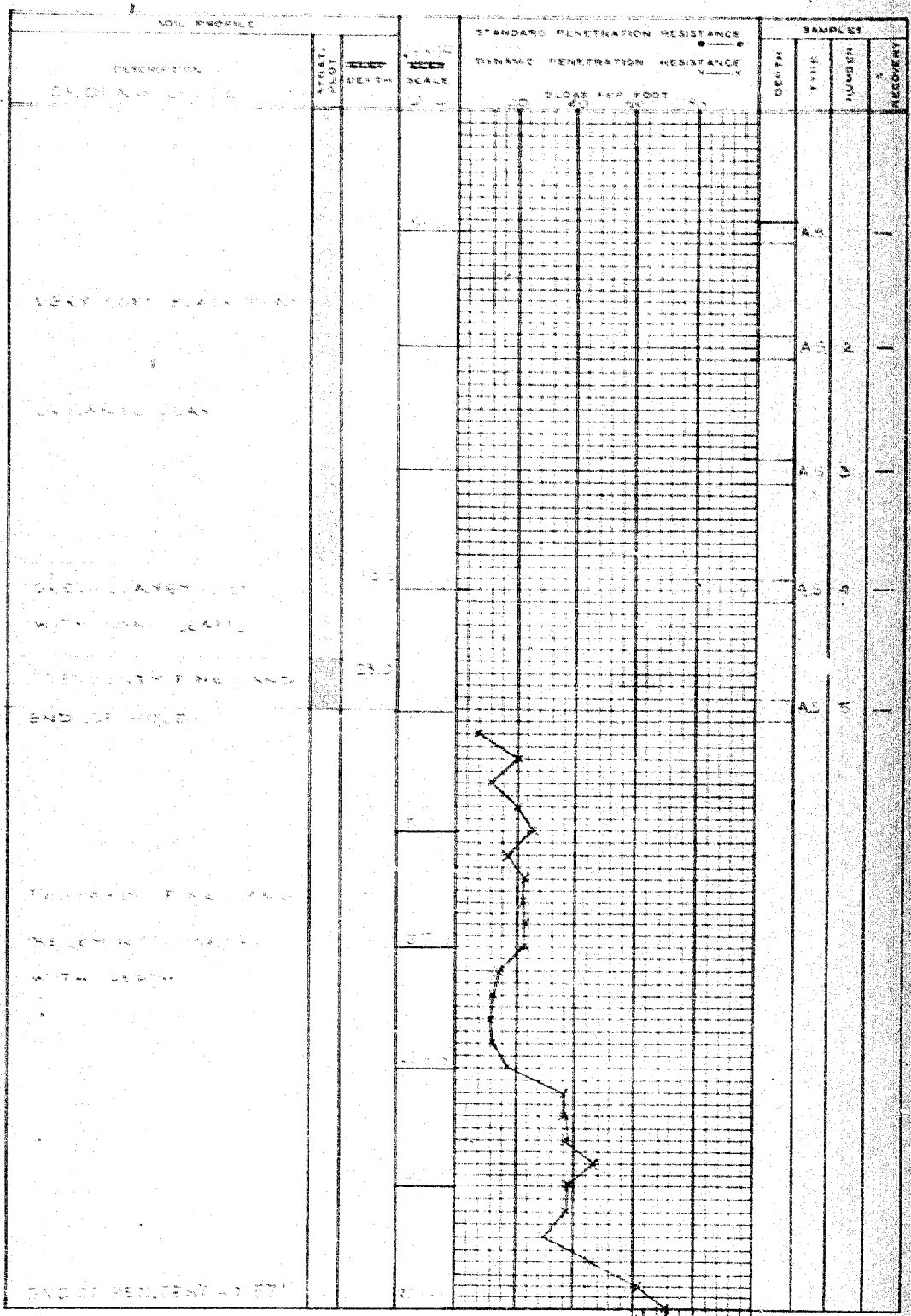

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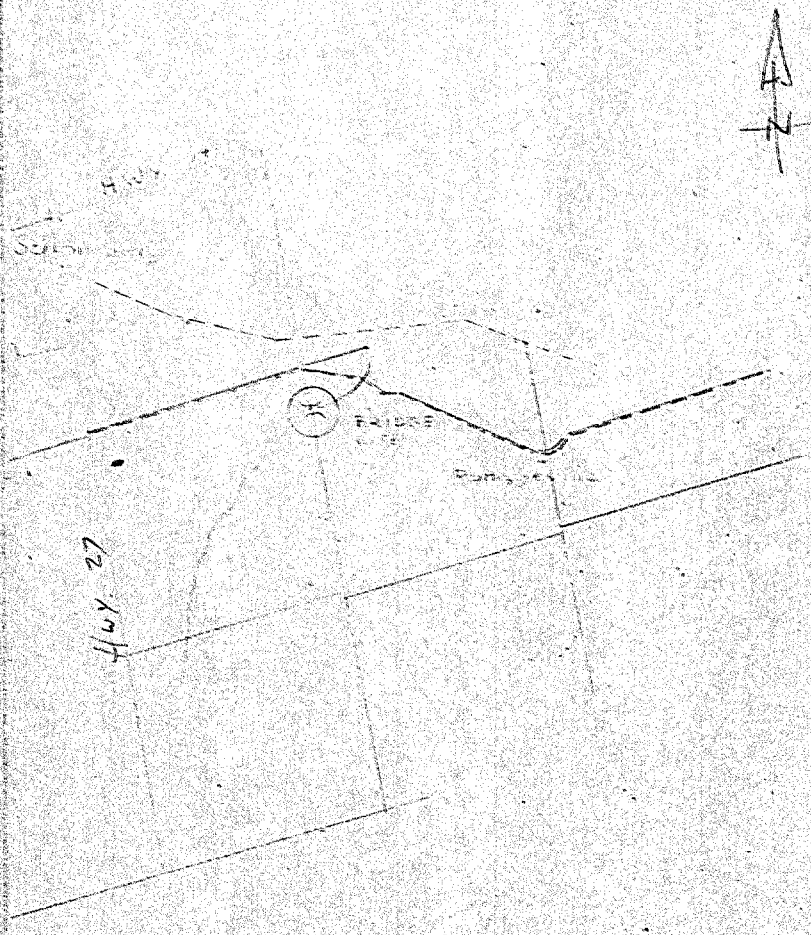
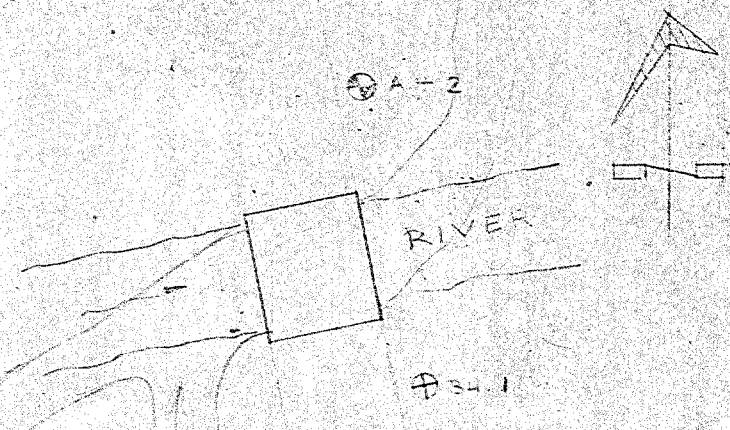
REMARKS



LOCATION PLAN



ENLARGED DETAIL AT BRIDGE

PC 1092

DATE 28. 3. 62.