

61-F-209-C

W.P. #225-61

RENFORTH DR.

2 AIRPORT ROAD

TORONTO

Mr. A. M. Toye,
Bridge Engineer.
Materials & Research Division,
(Foundation Section).
Attention: Mr. S. McCoolie.

January 3, 1962.

FOUNDATION INVESTIGATION REPORT

By: Frankl of Canada, Ltd.

Re: Proposed Benforth Drive
Access Overpass,
Toronto, Ontario.
M.P. 225-61, District #6.

Attached to this memo, we are sending you the report on the soil conditions for the above-mentioned structure, submitted by the Consultant, Frankl of Canada, Ltd.

We have reviewed the report and have found the factual information well presented. The soil conditions are such that at Elev. 520, a load of 4 tons/sq.ft. can be taken as allowable. Apparently, the Consultant has been in contact with the Bridge Designer and 4,500 p.s.f. seems to be all that is required.

We believe that the report contains all the information for further design work. However, should there be any other questions you would like to discuss, please feel free to contact our office.

AGS/MSF
Attach.

A. S. Sternac
A. S. Sternac,
PRINCIPAL FOUNDATION ENGINEER

cc: Messrs. A. M. Toye (2)
H. A. Tregashen
H. B. McMillan
I. C. Campbell
C. Fraser
T. J. Kovich
J. Roy
J. B. Guapier
E. R. Saint
F. Norman
A. Watt
Foundations Office
Gen. Files.

FRANKI OF CANADA, LIMITED

SOIL INVESTIGATIONS

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

R E P O R T

to

DEPARTMENT OF HIGHWAYS, ONTARIO

on

SOIL CONDITIONS

PROPOSED RENFORTH DRIVE
ACCESS OVERPASS

TOR ONTO ONTARIO

Distribution :

14 copies : Department of Highways,
Ontario

2 copies : Franki of Canada Limited

Our Reference

PC 1058
OP 20361

Your Reference
WP 225-61

27th December 1961

I N D E XSOILS REPORT

Introduction	Page	1
Procedure	"	1
Soil Conditions	"	1
Water Conditions	"	3
Discussion	"	3

BORING RECORDS

DRAWING PC 1058-1 : Borehole Locations and
Inferred Soil Strati-
graphy.

FIGURES : Laboratory Testing

INTRODUCTION

Franki of Canada Limited has been retained by the Department of Highways, Ontario, by letter of November 15th 1961 to carry out a soil investigation at the site of the proposed Renforth Drive Access Overpass near Malton Airport in Toronto, Ontario.

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

PROCEDURE

The field work was carried out on November 29th and 30th 1961 using two machines, and consisted of two detailed boreholes with adjacent dynamic penetration tests.

The locations of the boreholes are shown on Drawing PC 1058-1 which also shows the inferred soil stratigraphy. A detailed log for each boring is given on the Boring Records.

Soil testing on samples obtained was carried out in our laboratory and the results are given on Figure 1. Samples remaining after testing will be stored until July 1st, 1962 and then discarded unless other instructions are received.

Elevations referred to in this report are Geodetic and were obtained from a local D.H.O. benchmark.

SOIL CONDITIONS

The main soil strata encountered by the borings are as follows :

Topsoil

The site is covered by about 6 to 9 inches of dark brown silty topsoil.

Hard Brown Clayey Silt Till

The topsoil is underlain by a stratum of brown

2.

till, about 14 and 9 feet thick in boreholes 1 and 2 respectively. The till is composed of mixed grain sand and some gravel in a matrix of clayey silt to silt.

The till stratum is of hard consistency immediately below the topsoil. There is a tendency of the till to slightly decrease in strength at a depth of about 4 feet, after which it rapidly increases in strength again. This trend is confirmed by the dynamic penetration tests in boreholes 1 and 2 and the standard penetration tests in borehole 1.

Laboratory testing on the till was not considered necessary. The minimum shear strength is estimated to be of the order of 5000 pounds per square foot. The average in-situ unit weight and moisture content are estimated to be of the order of 145 pounds per cubic foot and 8 percent respectively.

Very Dense Grey Sandy Silt

Beneath the till is a stratum of grey sandy silt 9 and 5 feet thick in boreholes 1 and 2 respectively. The material is not uniform in composition; some grain size distribution curves obtained are given on Figure 1.

The standard penetration values obtained were generally in excess of 120 blows per foot, indicating the very dense nature of the material.

Shale Bedrock

The sandy silt rests on shale bedrock. The upper 7 feet of the bedrock in borehole 1 and the upper 16 feet in borehole 2 are very badly weathered and oxidized. The colour of this upper part of the bedrock varies between green and blue. 'N' values ranging from 50 to 100 blows per foot were obtained in the weathered rock.

Sound grey shale bedrock was encountered at about elevation 495 or at about 30 feet below ground level.

3.

WATER CONDITIONS

The boreholes remained dry during the sampling operations and water level observation pipe was installed in each hole for later readings. It was found that the ground water level took less than one day to come to equilibrium at elevation 516 and 517 in boreholes 1 and 2 respectively.

DISCUSSION

It is understood that the proposed structure will be a rigid frame with a 40 foot span. The phase of the abutment wall will be 160 feet long and will have provision for lateral movement.

The footing elevation is determined by grade and frost protection requirements and is understood to be at elevation 520. The design footing width is 6 feet and the design foundation pressure is 4500 pounds per square foot.

It is considered that this design is satisfactory. The proposed bearing pressure is well within the allowable limit and settlement should be negligible. At the proposed foundation elevation no difficulties with ground water in excavation will be encountered. Embankment fills will be stable if all topsoil is removed prior to placing the fill.

FRANKI OF CANADA LIMITED



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 stratigraphic plot is in accordance with the standard symbols of the National Research Council. The elevations given are referred to the Datum shown on the general heading.

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.

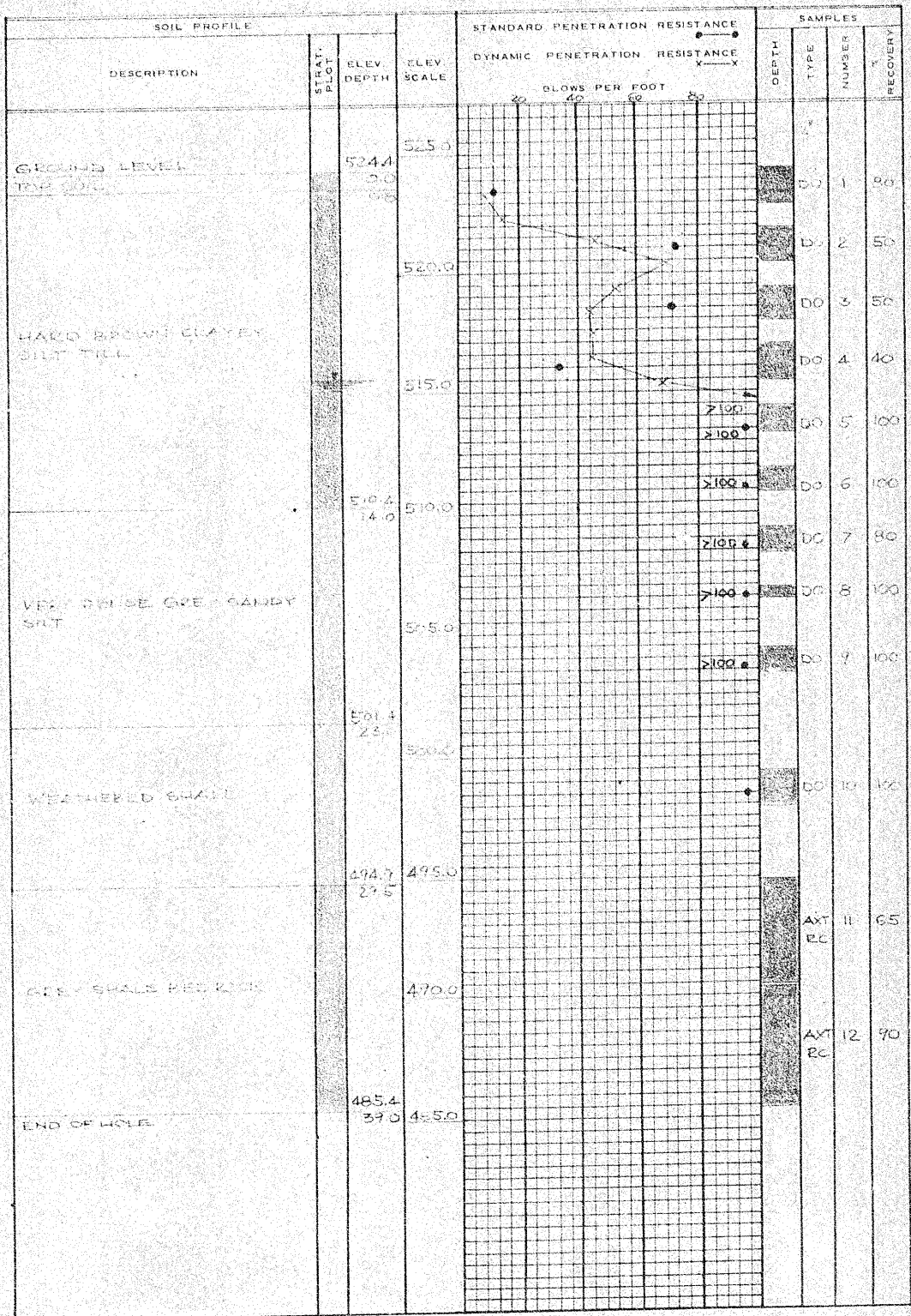
SAMPLES

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 a 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.

CONTRACT PL 1058 BORING 1 BORING DATE NOV 27
 DATUM CEOS DIAM. 4 1/2" HAMMER 14" LBS. DROP 30 IN



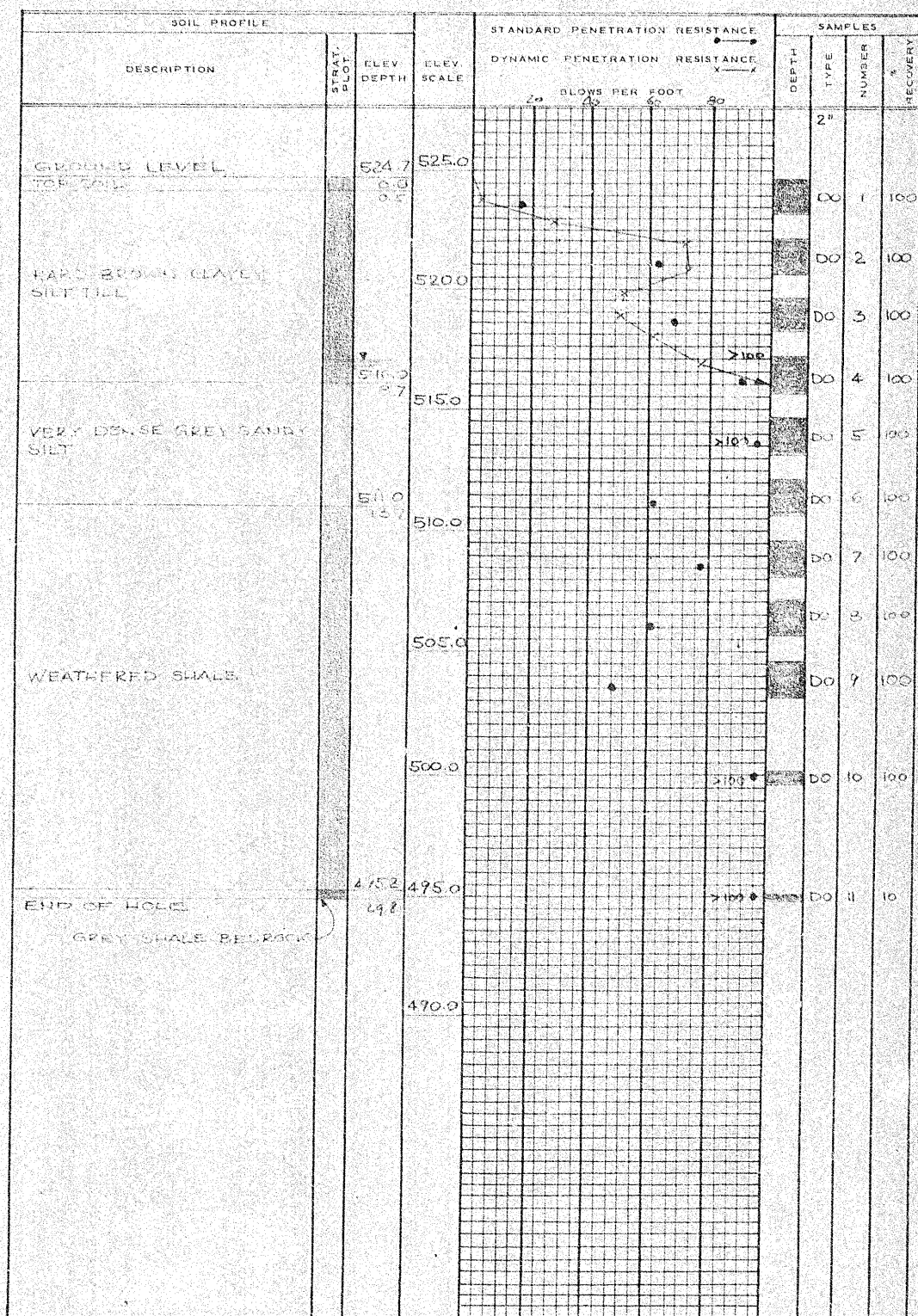
SAMPLE TYPES

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
 KF FIELD PERMEABILITY TEST
 ▽ GROUND WATER LEVEL
 AT TIME OF BORING

REMARKS

CONTRACT PC 1058 BORING 2 BORING DATE NOV 30 - 61
 DATUM G.T.O.D. DIAM. 4 1/2" HAMMER 140 LBS. DROP 30 IN

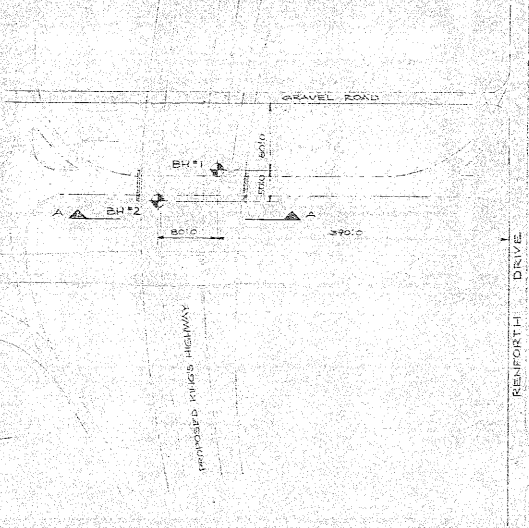


SAMPLE TYPES

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

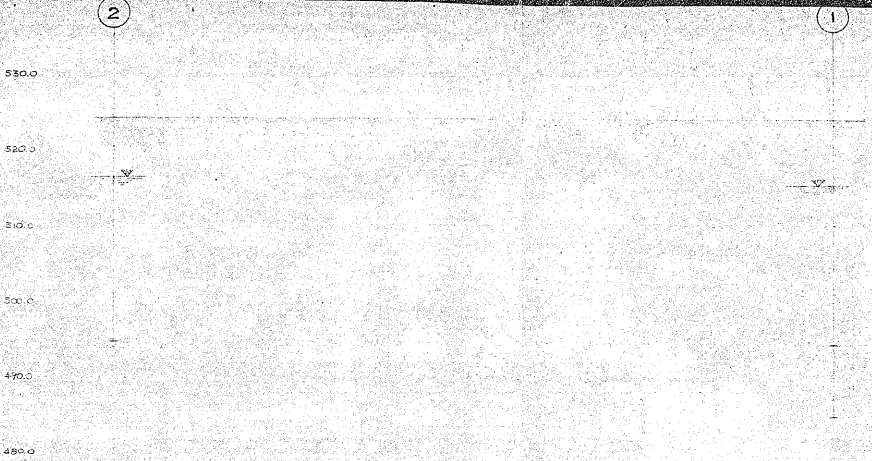
RC ROCK CORE
 K_F FIELD PERMEABILITY TEST
 W GROUND WATER LEVEL
 AT TIME OF BORING

REMARKS



BORING PLAN
SCALE 1" = 100.0'

BORE HOLE WITH
PENETRATION TEST



SECTION A-A
SCALE 1" = 10.0'

LEGEND

- TOP SOIL
- HARD BROWN CLAYEY SILT TILL
- VERY DENSE GREY SANDY SILT
- WEATHERED SHALE
- GREY SHALE BEDROCK
- WATER LEVEL DEC. 1961

PC 1055
DEC 26 61
AS NOTED
BH

DEPARTMENT OF HIGHWAYS — ONTARIO
OVERPASS RENFORTH DRIVE
DWS, PC 1055-BORING PLAN / SOIL STRATIGRAPHY

FRANKI OF CANADA
SOIL INVESTIGATIONS
MECHANICAL ANALYSIS

P.C. NO. 1058 LAB. NO. 1
PROJECT 140 851 FORD DR
FOREHOLS. NO. SAMPLE NO.
TESTED BY DATE
CHECKED BY DATE

PERCENT COARSER BY WEIGHT

