

Handout for CHB bearing half of 11" to
W.I. 55-8

Lab test results -

BA#1

Depth	MC. %	Dist. of p.s.f.	Load p.s.f.	Penetration blows/ft.
6-7 1/6	153	184.0	1420	47
12-13 1/6	82	170.0	7600	85
21-23 1/6	95	169	1820	44

BA#2

5-6 1/6	10.4	Gravel		36
10-11 1/6	9.1	167.2	76000	41
15-16 1/6	11.8	158.5	3025	129
21-22 1/6	9.3	166.8	4175	156

BA#1

Spread footing @ 6 ft.

Shear strength from Lab test = 1420 p.s.f.

Meaning the till behaves like a clay.

Unclassified compression strength $q_u = 2 \times c = 2840$ p.s.f.
with a penetration resistance of 47 blows per ft. (730)

Terzaghi categorize the description of the clay as

very stiff to hard giving $q_u = 2$ to 4 T/p'

The ultimate bearing capacity $q_d = 570$ to 1140 T/p'

From Terzaghi's recommendation

the safe soil pressure $q_a = 1.9$ to 3.8 T/p'

with a safety factor of 3

Based on the Lab test result

the safe soil pressure with $S.F. = 3$ $q_a = 1.42$ T/p'

but the samples extracted were disturbed

A reasonable bearing capacity of $\frac{3.8 \times 1.62}{2} = 2.61$ T/p'

or $2 \frac{1}{2}$ T/p' can be taken

6822

Spread footing @ 4' x 4'

Shear strength for lab test = > 6000 p.s.f.

$q_u = 2 \times c = 12,000$ p.s.f. @ 6 T/ft'

Safe soil pressure with safety factor of 3 based on lab. result
 $q_a = 6$ T/ft'.

With a penetration resistance of 4' blow/ft. (720)
the clay is described as very stiff to hard.
 $q_a = 1.9$ to 3.8 T/ft'

Residual bearing capacity of $\frac{19 \times 6}{2} = 39$ T/ft'
or 4 T/ft' can be taken.

~~Bearing capacity @ 160.682~~

bH# 1

$2\frac{1}{2}$ T/ft'

bH# 2

4 T/ft'

Advised Harry Myhan of Consultants
that 2 1/2 tons will be okay instead of 2 tons.

al

Mr. A. Faye

July 27, 1946

Bridge Engineer

Foundation Reports by Mr. and

Mr. F. F. Brownbridge, Consulting Engineers, 1000 North 4th Street, St. Paul, Minn. Project 13-1.

Enclosed herewith is a copy of the Foundation Report for the above noted structure.

The material consists of fairly dense till, not extensively spread throughout the stratum, with a bearing value of 2 tons/sq. ft.

F. C. Brownbridge

Materials & Research Engineer

Per:

A. Rutka

(A. Rutka)

cc: Mr. F. F. Brownbridge
Mr. F. F. Brownbridge

Mr. F. F. Brownbridge
Mr. F. F. Brownbridge
Mr. F. F. Brownbridge
Foundation Reports ✓
File

DEFECTS IN NEGATIVE DUE TO
CONDITION OF ORIGINAL DOCUMENT

FOUNDATION REPORT

Hwy. No. 401 and C.N.R. crossing
North of Milton - Station 392/67
Profile No. 401 D 32

Dispersement:

Mr. A. Toye, Bridge Engineer.	(2)
Mr. H. Tregaskes, Construction Engineer.	(1)
Mr. J. Walter, Design Engineer.	(1)
Mr. H.D. Duff , <i>F. FOUNES</i> Dist. Eng. Port Hope. <i>TORONTO</i>	(1)
Foundation Section.	(1)
File	(1)

W.P. 562-56
W.J. F-56-8

INTRODUCTION

The following report covers the subsoil investigation for the construction of an overpass at Highway 401 and C.N.R. crossing North of Milton, Station 392/67, Profile No. 401D32.

The work was started on June 28, 1956, and was completed on July 9, 1956.

PROCEDURE

The subsoil investigation was performed by a coredrill machine. Two boreholes were investigated; a standard core penetration test was performed beside each borehole.

The locations and elevations of the boreholes are shown in drawing No. F-56-8, and their logs under Appendix I.

SUBSOIL FINDINGS AND ANALYSIS

From investigations the stratigraphy of the site is:

Underneath a couple of feet of topsoil is a compact sandy clay layer of some 4 feet deep. Underlying this layer is typical glacial till. It reaches the depth of 41 feet in borehole # 1 and 34 feet in borehole No. 2. (The depth of penetration for each hole). It is predominantly red clay, mixed with sand, gravel and boulders, in a very stiff and impervious state. As such, it was impossible to obtain completely undisturbed samples. However, samples were extracted with a split sampler and unconfined compression and other tests were carried out.

UNDERGROUND WATER

The investigations of boreholes No. 1 and 2 revealed no underground water down to the depths reached.

CONCLUSION AND RECOMMENDATIONS

From the results of the tests it can be concluded that:

- (a) Starting at elevation 682 feet and below, the stratum is typical till. It is variable in consistency, yet hard enough to refuse standard cone penetration at elevations 676 and 673 feet in boreholes No. 1 and 2 respectively.
- (b) At elevation 682 borehole No. 1 and 683 borehole No. 2 the unconfined compression tests indicate a shearing strength of 3 tons per sq. ft.

Accordingly it is satisfactory to construct the proposed structure on spread footing foundations at elevation 682. At this elevation the bearing value of the soil is calculated to be 2 tons per sq. ft. with a safety factor of 3.

The ground situation presents no problems for approach fill to the proposed structure.

V. Korlu

Foundation Engineer.

APPENDIX I.

DEPARTMENT OF HIGHWAYS - ONTARIO
 MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-1 OPERATION BORE & PENET JOB F-56-8 WP 562-56 BORING 1 STA 392+16.5 5'D
 CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JULY 1956
 SAMPLER HAMMER WT. 250 LBS. DROP 23 INCHES COMPILED BY A.L. CHECKED BY DATE BORING JUNE 29 1956

ABBREVIATIONS

V - INSITU VANE SHEAR TEST O - TRIAXIAL QUICK K - PERMIABILITY
 M - MECHANICAL ANALYSIS S - TRIAXIAL SLOW C - CONSOLIDATION
 U - UNCONFINED COMPRESSION WL - WATER LEVEL IN CASING CA - CASING
 QC - TRIAXIAL CONSOLIDATED QUICK WT - WATER TABLE IN SOIL γ - UNIT WEIGHT

SAMPLE TYPES

CS - CHUNK DO - DRIVE OPEN
 DF - DRIVE FOOT VALVE TO - THIN WALLED OPEN
 SS - SLEEVE SAMPLE PS - PISTON SAMPLE
 WS - WASHED SAMPLE RC - ROCK CORE

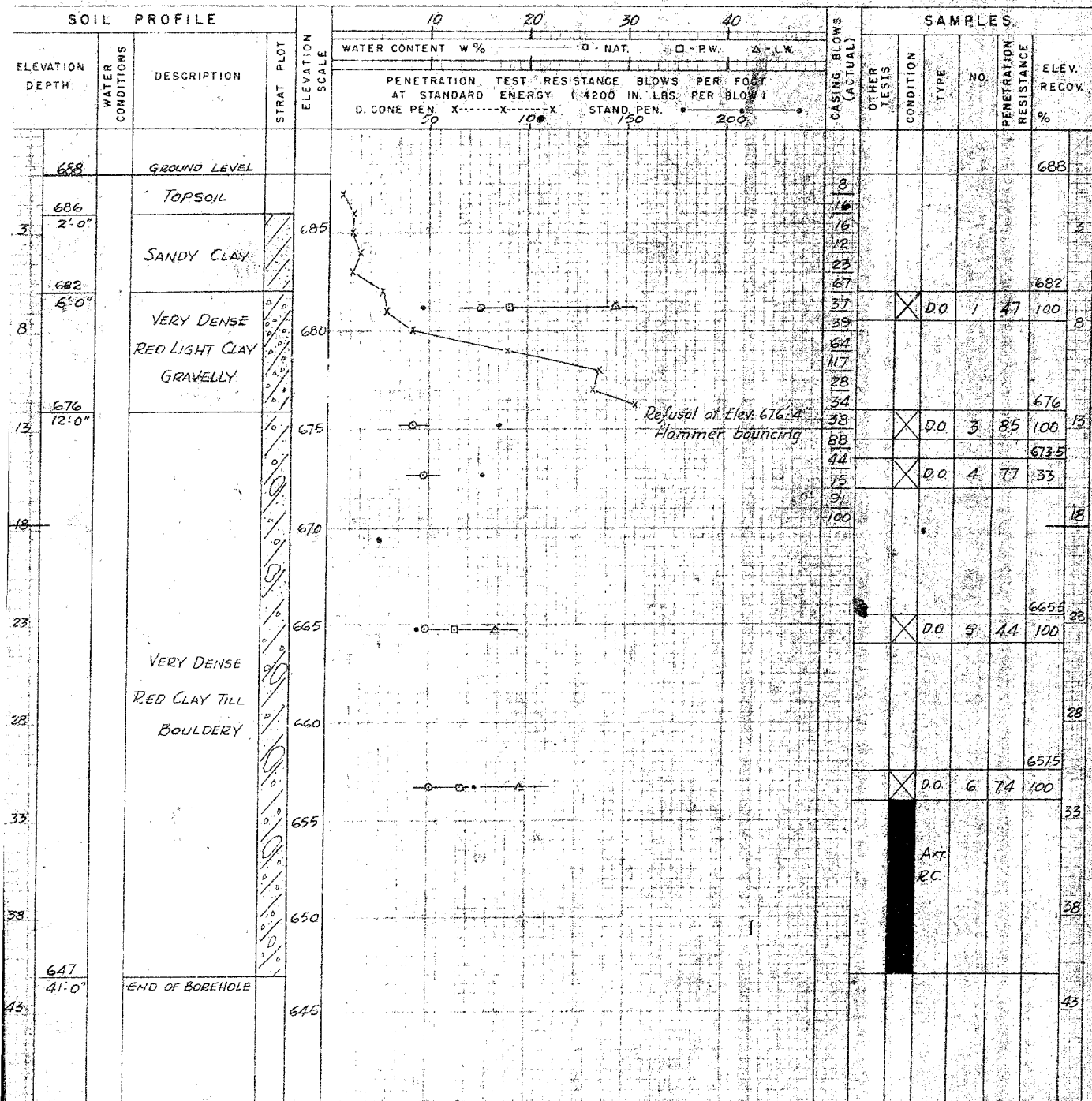
SAMPLE CONDITION



- DISTURBED
 - FAIR
 - GOOD
 - LOST

SOIL PROFILE

SAMPLES



DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-1 OPERATION BORE & PENET JOB F-56-B WP 562-56 BORING 2 STA. 393+195.22
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JULY 1956
SAMPLER HAMMER WT. 250 LBS. DROP 23 INCHES COMPILED BY AL CHECKED BY AL DATE BORING JULY 7, 1956

ABBREVIATIONS

ABBREVIATIONS

V - INSITU VANE SHEAR TEST	Q - TRIAXIAL QUICK	K - PERMIABILITY
M - MECHANICAL ANALYSIS	S - TRIAXIAL SLOW	C - CONSOLIDATION
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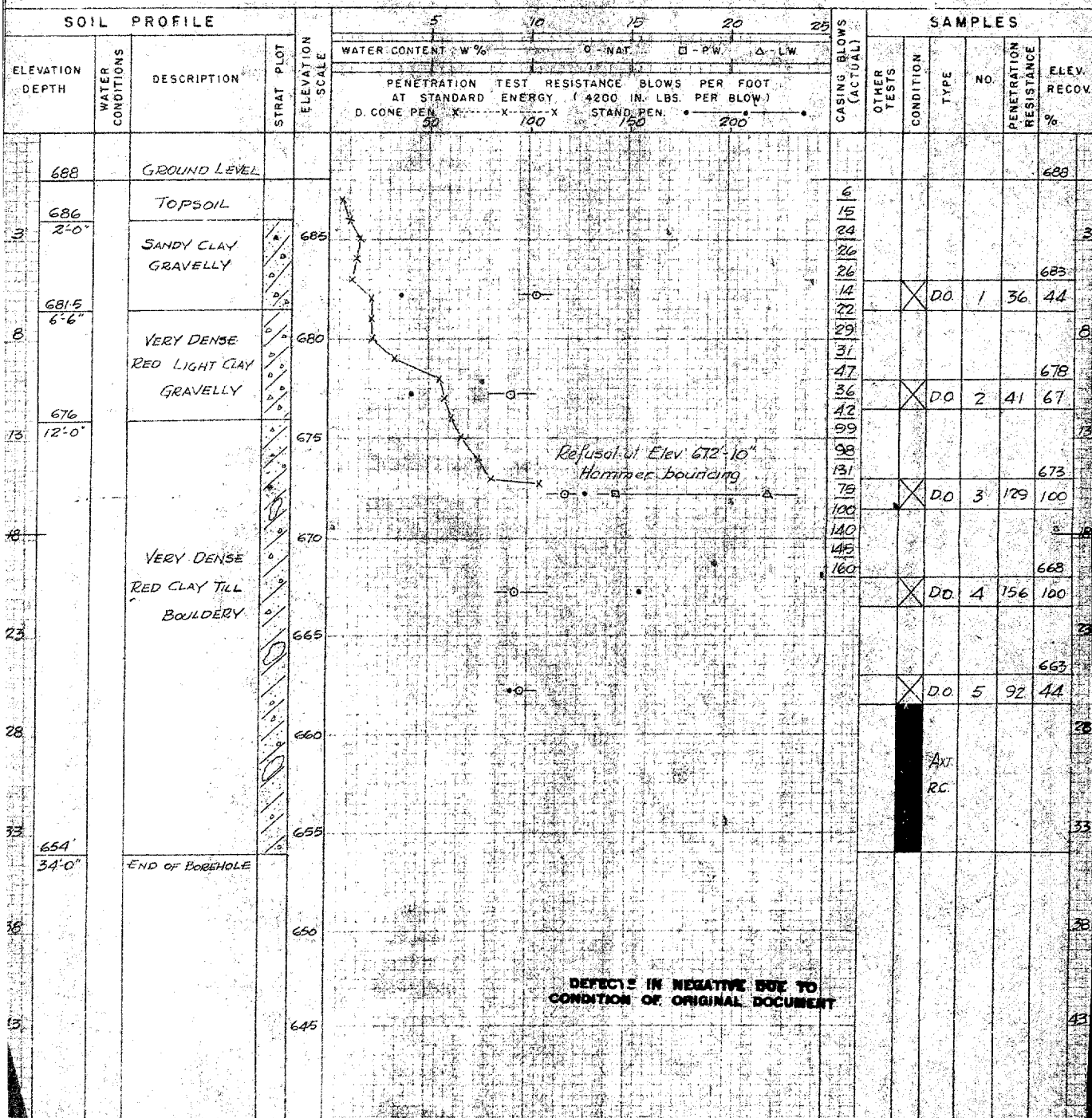
SAMPLE TYPES

SAMPLE TYPES	
C.S. - CHUNK	S.S. - SLEEVE SAMPLE
D.O. - DRIVE OPEN	P.S. - PISTON SAMPLE
D.F. - DRIVE FOOT VALVE	W.S. - WASHED SAMPLE
T.O. - THIN WALLED OPEN	R.C. - ROCK CORE

SAMPLE CONDITION



DISTURBED
 FAIR
 GOOD
 LOST



#56-F-8

W.P. #562-56

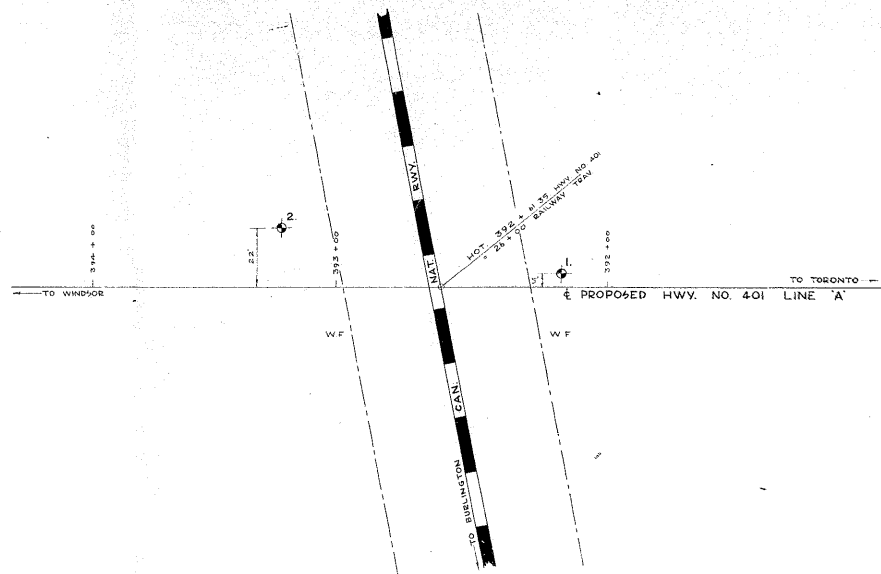
HWY #401 & C.N.R.

CROSSING N. OF

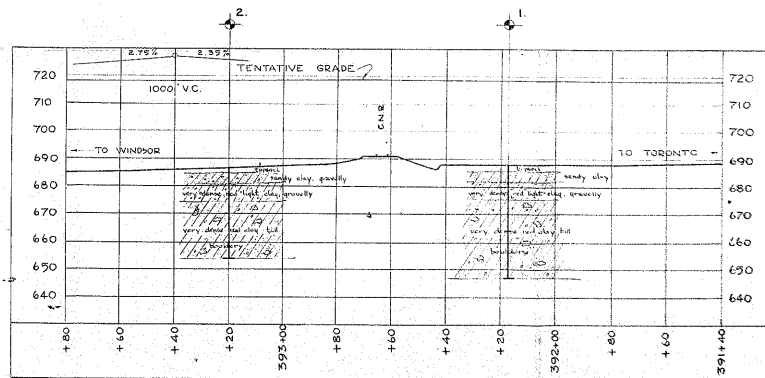
MILTON.



COUNTY OF HALTON - TOWNSHIP OF ESQUEWING
CONCESSION III - LOT II



PLAN
SCALE 1"=20'



PROFILE
SCALE 1"=20'

LEGEND		
BORE HOLE		
PENETRATION HOLE		
BORE & PENETRATION HOLES		
HOLE NO.	ELEVATION	STATION
1	688.0	392+14.5
2	685.0	393+19.5

NOTE
THE MICROGRAPHS BETWEEN SOIL STRATA HAVE BEEN
EXAMINED ONLY AT BORE HOLE LOCATIONS.
BETWEEN BORE HOLES THE ELEVATIONS ARE ASSUMED
FROM EXISTING C&G EVIDENCE AND MAY BE SUBJECT
TO CONSIDERABLE ERROR.

PROFILE N.F. 3523-11

DEPARTMENT OF HIGHWAYS, ONTARIO
MATERIALS & RESEARCH BRANCH - DOWNSVIEW

PROPOSED CROSSING AT C.N.R.

THE KING'S HIGHWAY NO. 401 LINE 'A' DIV. NO. 4
CO. HALTON
TWP. ESQUEWING LOT 2 CONCESSION III

POSITIONS & ELEVATIONS OF HOLES

APPROVED	DESIGNED BY	CHECKED BY
	J.M.B.	662-56
DATE	19 JULY 1956	FILE NO. F-56-8