

Mr. A. Toys
Bridge Engineer
F. C. Brownridge
Per: A. Rutka

October 15th, 1956.
Re: Foundation Report
Ray 401, C.P.R. Crossing
North of Streetsville
Station 510400 W.P. 561-56

Attached herewith are 2 copies of the above
mentioned report.

The subsoil consists of a medium clay till over
a very bouldery hard till and consequently spread footings
are recommended.

AR:JA
Encl.

F. C. Brownridge
MATERIALS & RESEARCH ENGINEER

Per:

A. Rutka
A. Rutka
PRINCIPAL SOILS ENGINEER

c.c. to:

Mr. H. Tregaskes
Mr. J. Walter
Mr. F. Fowles
Foundation ✓
File

FOUNDATION REPORT

Highway #401 and C.P.R. Crossing

2 Miles North of Streetsville

Township of Toronto

Station 905+10: Profile No. 401-B-30

Distribution:

Mr. A. Toye
Bridge Engineer (2)

Mr. H. Tregaskes
Construction Engineer (1)

Mr. J. Walter
Design Engineer (1)

Mr. F. Fowles
District Engineer, Toronto (1)

Foundation Section (1)

File (1)

W.P. 561-56

W.J. F-56-7

Introduction

A subsoil investigation was carried out for the construction of an overpass at Highway 401 and C.P.R. Crossing 2 miles North of Streetsville, Township of Toronto, Profile No. 401-D-30, Station 505+10.

The work was started on July 10, 1956 and was completed on July 16, 1956.

Procedure

The investigation was done by a core-drill machine and flight auger. On the Eastern side of the railway, one borehole was investigated by core-drill machine. The penetration was carried down to the elevation of 546 ft. Of this, the last 11 feet were drilled by diamond bit through the boulders. The Western side of the railway could only be reached by auger. Here three holes were investigated. Each time, after penetrating down to the elevation of 555.5 feet, the auger could not push down through the boulders.

The locations and elevations of the boreholes are shown in drawing F-56-7 A and their logs under Appendix I.

Subsoil Findings and Analysis

The investigation of the subsoil indicated the following stratigraphy:

Underneath the topsoil there is a layer of brown clay. Its consistency varies from light (at elevation 565.8) to stiff (at elevation 557.6). After this the layer is hard, bouldery till. It refused penetration at elevation 557'. Due to the nature of this layer, only some disturbed samples were extracted and necessary tests performed.

Underground Water

Within the penetrated depth no underground water was encountered.

Conclusions and Recommendations

From the results of the investigations and tests, it is concluded that:

- (a) The clay layer at elevation 562 has unconfined compression strength of 1.5 tons per sq. ft. and density 133 lbs. per cu. ft. The soil at this elevation could provide a bearing value of 1.5 tons per sq. ft. with safety factor of 2.5. However, at this elevation the nature of the stratum will present some risk of settlement.
- (b) The actual dense till layer starts at elevation 557.8 feet. Here the soil has a bearing value of 2 tons per sq.ft. with safety factor of three and 146 lbs. per cu.ft. of density. As a typical till layer, any risk of settlement is unlikely.

For the proposed overpass spread footing foundations will be satisfactory. It is advisable to put these foundations at the elevation of 557.8 feet by using 2 tons per sq.ft. as bearing value of the soil.

The approach fill to the proposed structure does not present any particular difficulty.

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-56-7 WP 561-56 BORING 1 STA. 504+62.1
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JULY 1954
SAMPLER HAMMER WT. 250 LBS. DROP 23 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 11 JULY 1954

ABBREVIATIONS

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

SAMPLE TYPES

CS - CHUNK DO - DRIVE OPEN
DS - DRIVE OPEN DF - DRIVE FOOT VALVE
TO - THIN WALLED OPEN

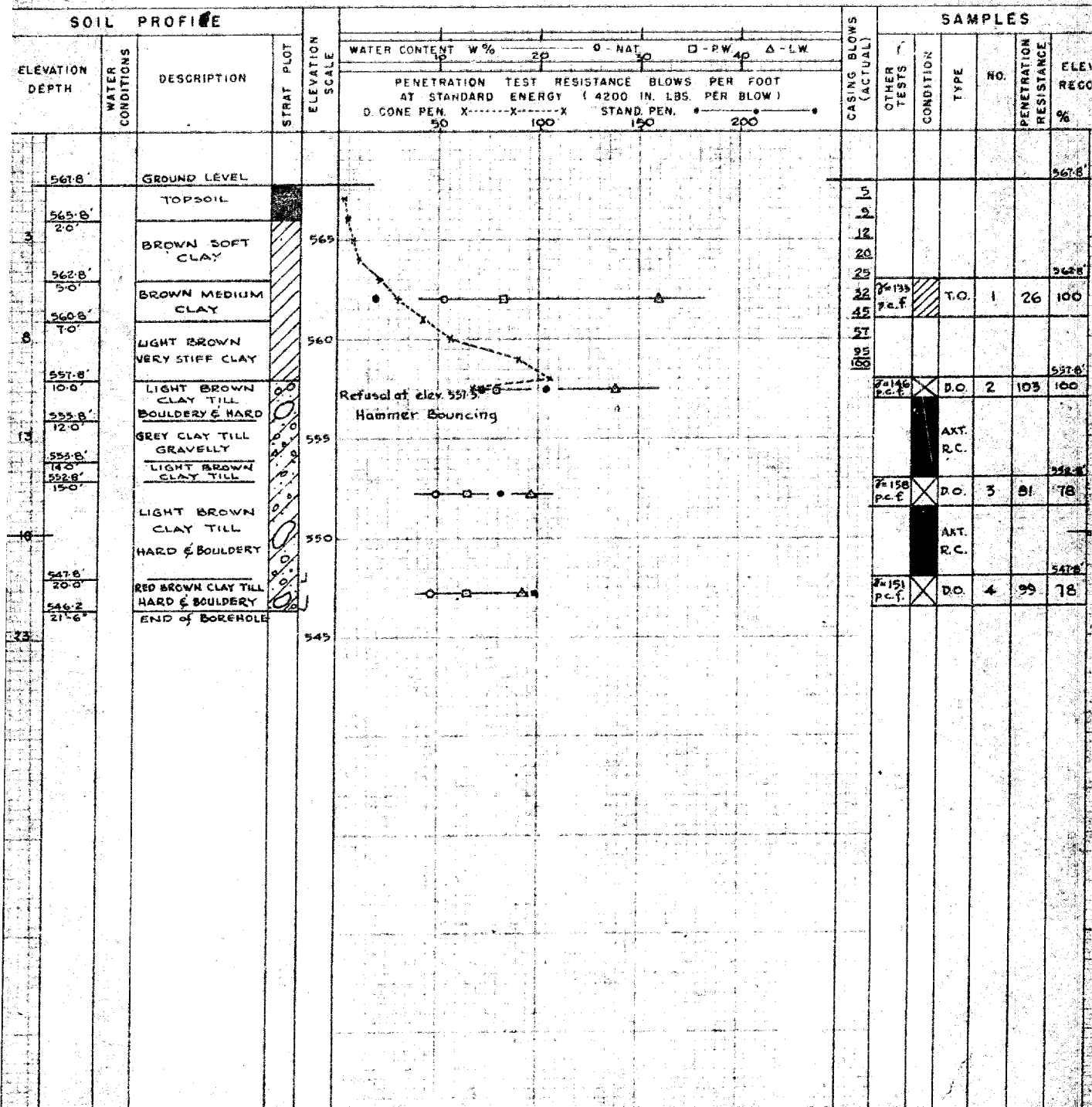
SAMPLE CONDITION



- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE

SAMPLES



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

DRILL RIG FLITE AUGER OPERATION BORE
CASING _____ (standard samplers to fit unless noted)
SAMPLER HAMMER WT. _____ LBS. DROP _____ INCHES

JOB F-56-7 WP 561-56
 DATUM GEODETIC
 COMPILED BY CHECKED BY

BORING 2 STA. 505+37 E
DATE REPORT 24 AUG. 56
DATE BORING 24 AUG. 56

ABBREVIATIONS

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

SAMPLE TYPES


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

SAMPLE CONDITION



- DISTURBED
 - FAIR
 - GOOD
 - LOST

SOIL PROFILE

SOIL PROFILE					SAMPLES											
ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	WATER CONTENT W% O NAT O 2W O 1W			CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV.		
				PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (14200 IN LBS PER BLOW) O CONE PEN. X-----X-----X STAND. PEN. •-----•-----•												
568.5 0		GROUND LEVEL														
567.0 1.5		BROWN LIGHT CLAY & TOPSOIL MIX														
		BROWN MEDIUM CLAY TILL		565												
		HARD & DRY		560												
558.5 10.0		END OF BOREHOLE			No Progress Due to Boulders											
				555												

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

DRILL RIG FLIGHT AUGER OPERATION BORE
CASING _____ (standard samplers to fit unless noted)
SAMPLER HAMMER WT. _____ LBS. DROP _____ INCHES

JOB F-56-7 WP 561-56
 DATUM GEODETIC
 COMPILED BY CHECKED BY

BORING 3 STA. 505 + 37 40' LT.
DATE REPORT 24 AUG. 56
DATE BORING 24 AUG. 56

ABBREVIATIONS

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

SAMPLE TYPES

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

SAMPLE CONDITION



- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE

SOIL PROFILE					SAMPLES										
ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	WATER CONTENT W% ———— O - NAT □ - PW △ - LW			CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV.	
					PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (1400 IN. LBS PER BLOW) D. CONE PEN. X-----X-----X STAND PEN. ●-----●-----●										
562.5 0		GROUND LEVEL													
560.5 14		BROWN MEDIUM CLAY MIX													
559.7 18		BLACK CLAY LOAM TOPSOIL													
554.9 27		BROWN MEDIUM CLAY		565											
		LIGHT BROWN MEDIUM CLAY TILL		560											
		HARD & DRY													
552.5 100		GREY LIGHT - MEDIUM CLAY TILL													
550.5 100		END OF BOREHOLE		555	No Progress Due to Probable Boulder										

#56-F-7

WP# 561-56

HWY#401 & C.P.R.

CROSSING 2 MI.

N. OF STREETSVILLE

TWP. OF TORONTO



