

Mr. A. Tove.

August 14th, 1957.

Bridge Engineer.

Re. Foundation Report -

Mr. F.C. Brownridge.

Hwy. 401 & road allowance between

Cons. 2 & 3. Toronto Twp.

M.P. 74-57. S.D.P. 57-13.

Attached herewith are two copies of the above mentioned Foundation Report. It is pointed out also that the foundation soils for the Meadowvale Creek, which is located approximately 100 yards west of this proposed structure, is also included.

The sub-soil at the structure location will be satisfactory for a spread footing foundation with a bearing capacity of 2.5 tons per square foot. The sub-soil at the proposed culvert location at Meadowvale Creek consists of similar till material, but in view of the fact it is located lower in the topography than the structure, only 2 tons per square foot is recommended.

F. C. BROWNBRIDGE.  
Materials & Research Engineer.

per:



A. RUTKA.  
Principal Soils Engineer.

c.c. Mr. T. Tregaskes.  
Mr. D.C. Ramsay.  
Mr. J.D. Wilkes.  
Foundation Section.  
File.

FUNDATION REPORT

ON

Underpass Bridge at Highway 401 and road allowance  
between concessions II and III crossing.

Site plan: P-2741-1

Station: 444+25

Distribution

Mr. A. Toye  
Bridge Engineer (2)

Mr. B. Tregaskes  
Construction Engineer (1)

Mr. C. J. Cassay  
Design Engineer (1)

Mr. D. B. Wilkes  
Dist. Eng. Toronto (1)

Foundation Section (1)

P.L.R. (1)

P.L.R. P-27-13

P.L.R. 74-57

## INTRODUCTION

This report covers the subsoil investigations carried out to determine the bearing values of the layers for supporting the foundations of the proposed structure.

The location is a proximately one mile Southeast of Meadowvale where the new Highway No. 401 crosses the road allowance between concessions II and III in the Township of Toronto, County of Peel, (profile No. P-3522-S, Station 444+25.28).

The work started on May 28, 1957 and was completed on June 5, 1957.

## PROCEDURE

The investigation work was carried out by means of a skid mounted coredrill machine. In the course of investigation 3 boreholes with dynamic cone penetration and one separate dynamic cone penetration test were made.

Also two flite auger holes were made to investigate the approach fill stability on the western side.

The locations of the boreholes are shown in drawing No. P-57-13A and their logs under Appendix I.

## SUBSOIL FINDINGS AND ANALYSIS

The terrain is till plain. The investigations revealed the following stratigraphy:

Under the topsoil the layer is brown bouldery clay till and by depth it is changing to grey clay till (about elevation 555 ft.). The bouldery nature of the soil has handicapped the regular extracting of undisturbed samples. In most of the undisturbed samples which were extracted the bouldery nature of the soil rendered the unconfined compression results rather unreliable.

The samples which were tested in the laboratory gave the average values of liquid limit 22, plastic limit 14.5. The soil is inorganic clay of low plasticity. From laboratory tests the moisture content of the layer is rather uniform, with an average of about 11%. However, the indications are that the layer is somewhat saturated by infiltration water from the ground surface.

This situation was detected in the boreholes as perched water table at about elevation 504 ft.

With the above considerations, and judging from some unconfined compression and field standard penetration results the layer is convenient for spread footing type foundations and could provide a safe bearing value of 2.5 T.s.f. at elevation about 504 ft. If higher bearing values are required the footing should be placed at a lower elevation.

#### CONCLUSIONS AND RECOMMENDATIONS

From the above discussion it will follow that:

1. From subsoil findings the layer is typical bouldery clay till. It is considered quite convenient for supporting spread footing foundations.
2. The proposed structure can be supported on spread footing foundations, placed at about elevation 504 ft. Here the layer can provide a bearing value of 2.5 T.s.f. with a safety factor of 3.
3. To the west of the crossing there exists a depression in the form of a small valley with a small creek bed at its center (Meadowvale Creek, station 448+65). The creek during the time of investigations was dry and apparently serves more for the drainage of seasonal flood waters in that depression. The subsoil investigations by means of a flite auger in the area revealed the layer to be gravelly clay till. The upper section of the layer is partly saturated by infiltration water and apparently rather soft. However, for a maximum fill of some 18 ft. if a side slope of 2:1 and granular fill material is used, it will not present any stability problem. Also, the creek could be crossed by means of a culvert, provided necessary measures are taken for scouring hazard.

V. Korlu  
Foundation Engineer

APPENDIX I

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

DRILL RIG 54-2 OPERATION BORING & PENET'N JOB T-57-13 W.P. 74-57 BORING 1 STA. 44+43 (35' RT.)  
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JUNE 1957  
SAMPLER HAMMER WT. 250 LBS. DROP 25 INCHES COMPILED BY H.J. CHECKED BY AL DATE BORING 28 MAY 1957

**ABBREVIATIONS**

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

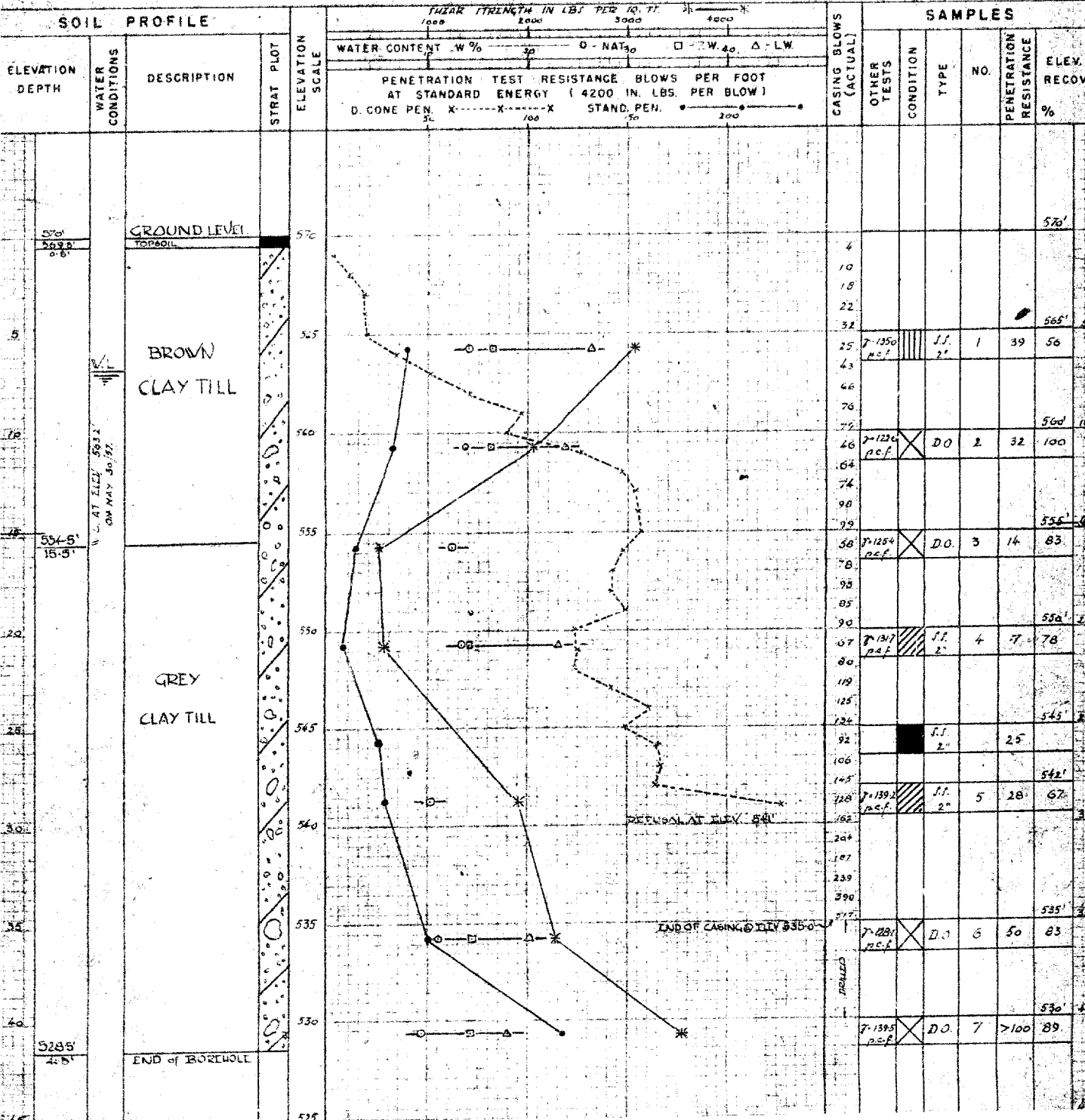
**SAMPLE TYPES**

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

**SAMPLE CONDITION**

 - DISTURBED  
 - FAIR  
 - GOOD  
 - LOST

**SOIL PROFILE**



**הערה:**



## SAMPLE TYPES

### SAMPLE CONDITION

- DISTURBED
- FAIR
- GOOD
- LOST

## SAMPLES

SOIL PROFILE				SAMPLES											
ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT. PLOT	ELEVATION SCALE	WATER CONTENT W %		PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD - ENERGY ( 4200 IN. LBS. PER BLOW )		CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE %	ELEV. RECOV.
570		GROUND LEVEL		570											570'
		GRAVEL FILL													
		ORGANIC LOAM													
564				563											565'
		BROWN CLAY TILL		550											560'
558.5		END OF BOREHOLE		555											560'

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

DRILL RIG 54-2 OPERATION PENETRATION JOB F-57-13 W.P. 74-57 BORING 3 STA. 443+93(33'27")  
CASING Bx (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JUNE 1957  
SAMPLER HAMMER WT. 250 LBS. DROP 23 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 31 MAY 1957

**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  
QC - 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

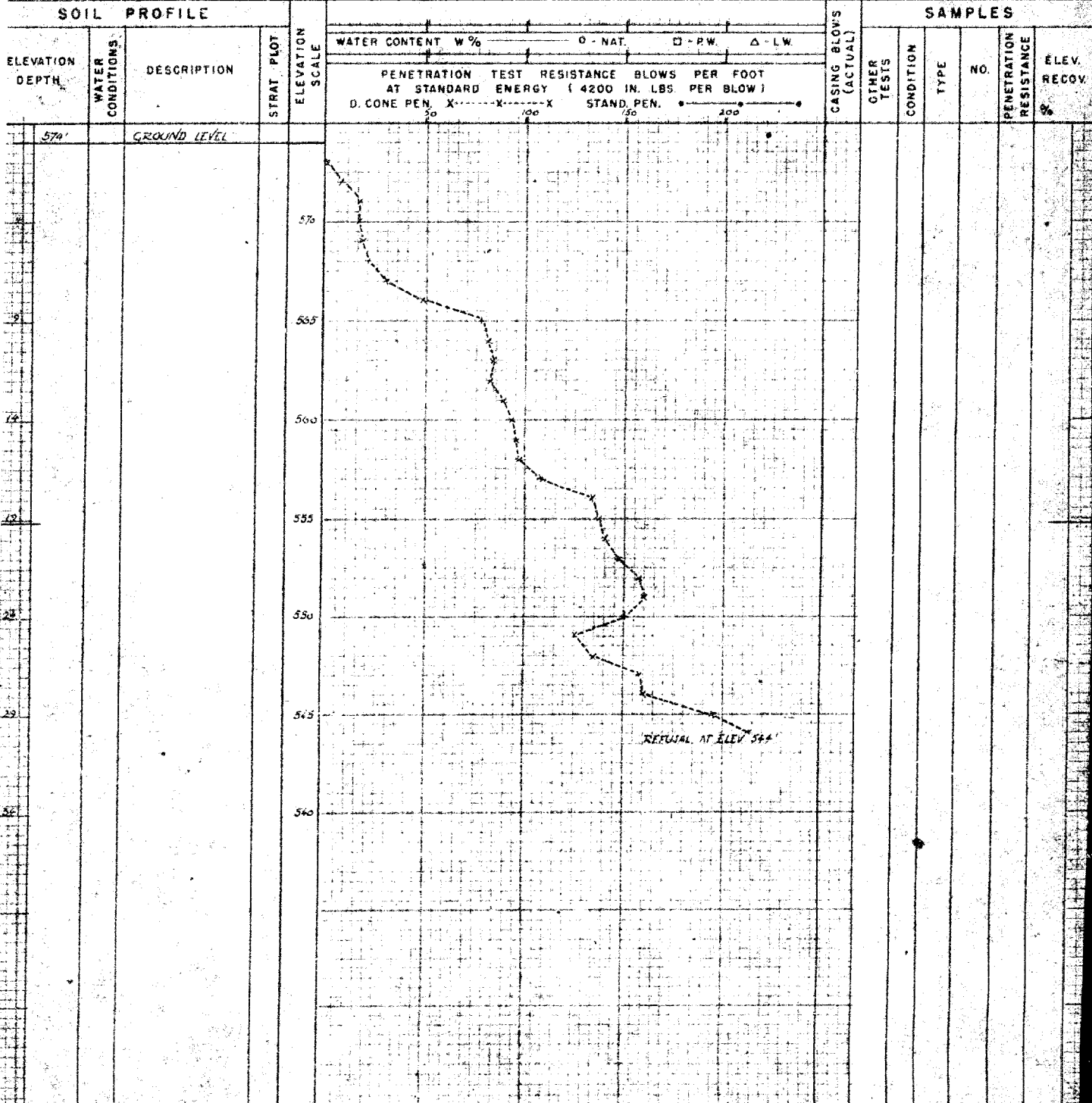
**SAMPLE CONDITION**



- DISTURBED  
- FAIR  
- GOOD  
- LOST

**SOIL PROFILE**

**SAMPLES**







DRILL RIG FLITE AUGER OPERATION BORE JOB F-57-13 WP 74-57 BORING 5 STA. 447.00 ±  
CASING - (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JUNE 1957  
SAMPLER-HAMMER WT. - LBS. DROP - INCHES COMPILED BY A.L. CHECKED BY - DATE BORING JUNE 5/1957

## SAMPLE TYPES

**SAMPLE CONDITION**

C.S. - CHUCK	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



- DISTURBED
- FAIR
- GOOD
- LOST

## SAMPLES

[illegible]

DRILL RIG FLITE AUGER OPERATION BORE JOB F-57-13 WP 74-57 BORING 6 STA. 446.00 ~~4~~  
CASING \_\_\_\_\_ (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JUNE 1957  
SAMPLER HAMMER WT. \_\_\_\_\_ LBS. DROP \_\_\_\_\_ INCHES COMPILED BY AL CHECKED BY \_\_\_\_\_ DATE BORING JUNE 5 1957

## SAMPLE TYPES

**SAMPLE CONDITION**

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

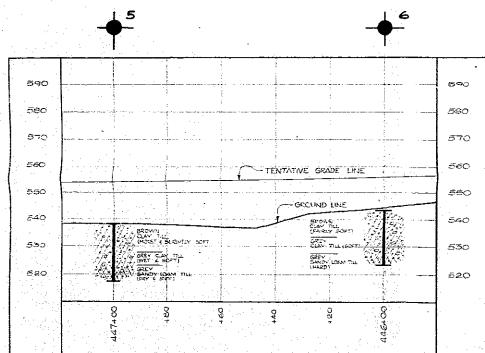
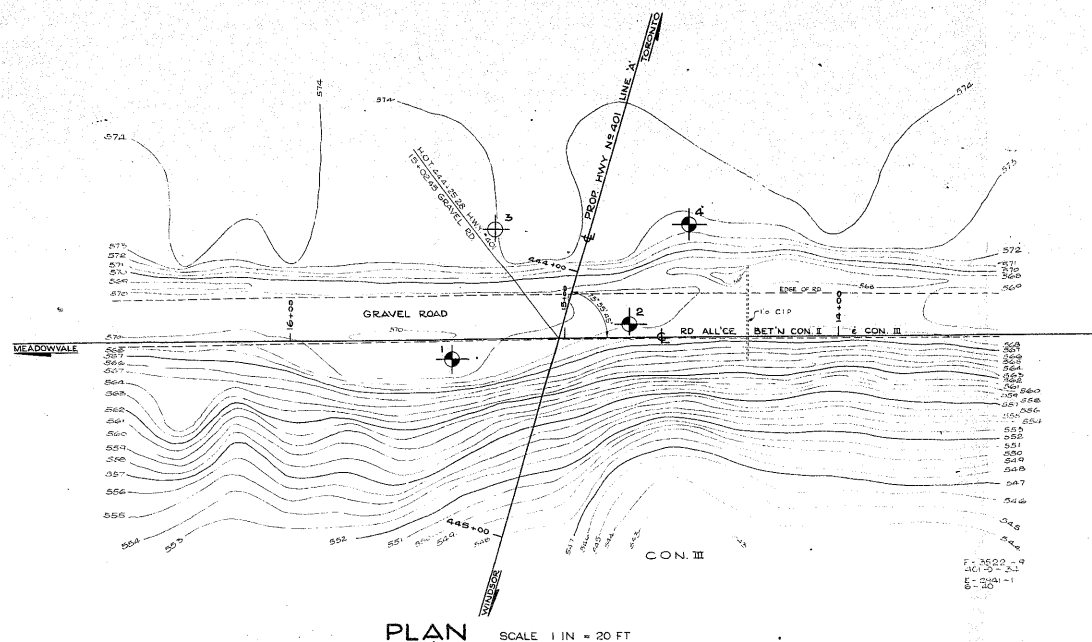
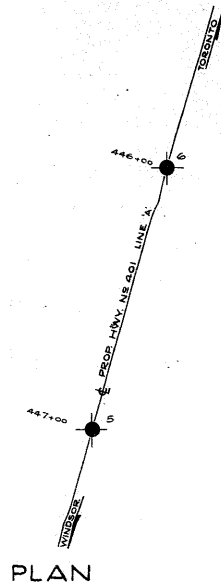
- DISTURBED
- FAIR
- GOOD
- LOST

## SAMPLES

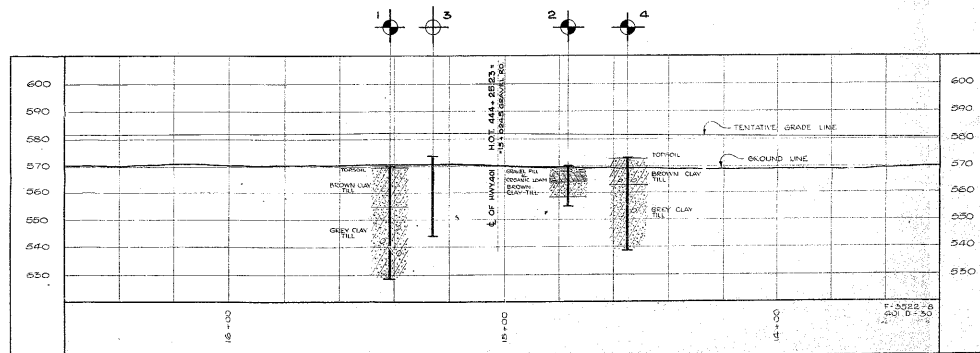
SOIL PROFILE					WATER CONTENT W%			O - NAT			□ - RW			Δ - LW			CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO	PENETRATION RESISTANCE	ELEV. RECOV %					
ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY ( 4200 IN. LBS. PER BLOW ) D. CONE PEN. X-----X-----X STAND PEN. .-----.																							
543.4'		GROUND LEVEL																										
533.4'		BROWN CLAY TILL (FAIRLY SOFT.)		540																								
527.4'		GREY CLAY TILL (SOFT)		535																								
523.4'		GREY SANDY LOAM TILL (HARD)		530																								
523.4'		END OF BOREHOLE		525																								
				520																								

# 57-F-13  
W.P. # 74-57  
Hwy. # 401  
UNDERPASS BRIDGE  
CON. # 2 & # 3  
TORONTO TWP.

EDITED  
FOR MICROFILMING  
BY *BB* DATE *4/6/72*



PROFILE OF HWY No 401



PROFILE OF GRAVEL RD. SCALE HOR VER 1 IN = 20 FT

LEGEND			
BORE HOLE			
PENETRATION HOLE			
BORE & PENETRATION HOLE			
HOLE NO.	ELEVATION	STATION	DATA FROM
1	570.0'	446+45'	35
2	570.0'	446+15'	25
3	574.0'	443+95'	25
4	575.36'	445+72'	34
5	556.5'	447+00'	16
6	545.4'	446+00'	16

NOTE  
THE BOUNDARIES BETWEEN SOIL TYPES  
ESTABLISHED ONLY AT BORE HOLES  
BETWEEN BORE HOLES THE BOUNDARIES  
FROM GEOLOGICAL EVIDENCE AND  
TO CONSIDERABLE ERROR.

DEPARTMENT OF  
MATERIALS & RESEARCH

**GRAVEL PROPOSED  
1 MILE S.E. OF**

THE KING'S HIGHWAY NO. 401  
CO. PEEL

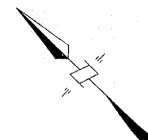
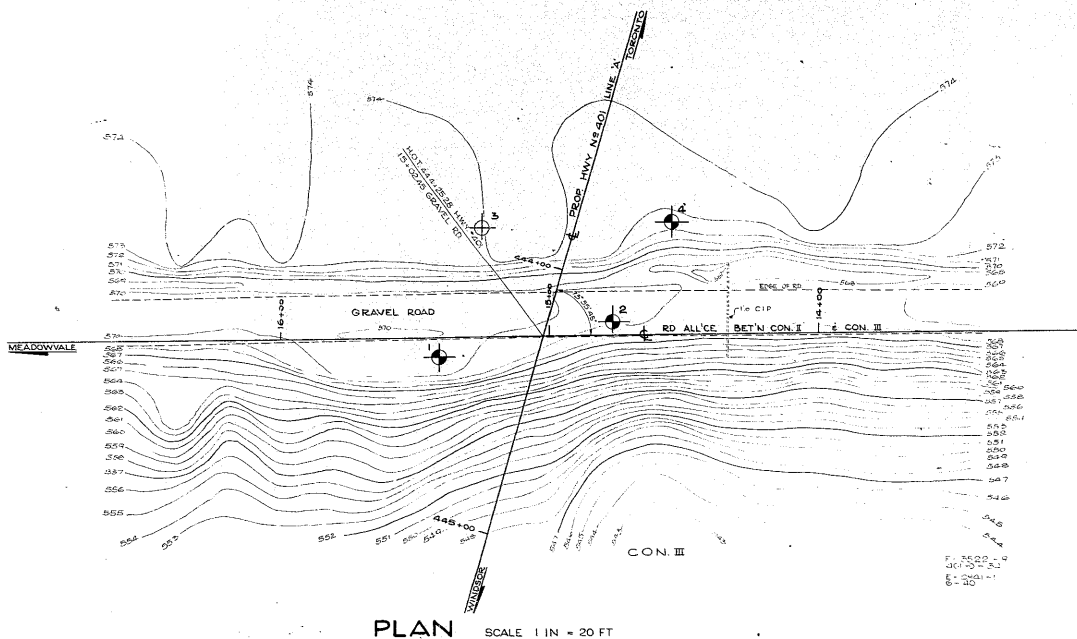
TWP. TORONTO

POSITION & ELEVATION

APPROVED

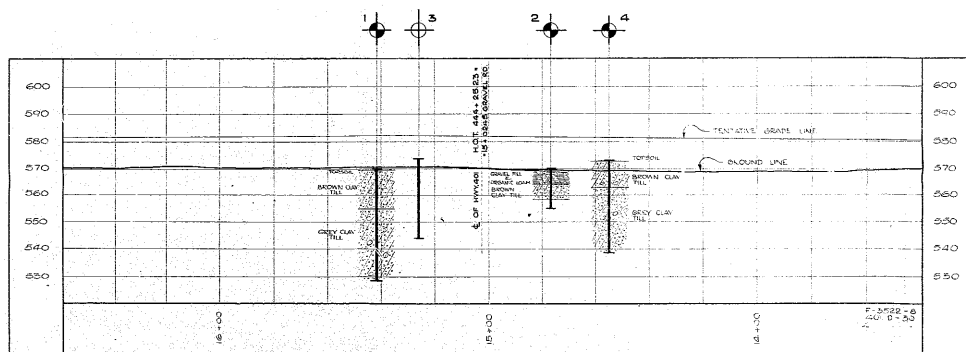
DATE: JULY 12, 1957

REVISIONS	DATE	DESCRIPTION	APPROVED
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			



LEGEND			
BORE HOLE			
PENETRATION HOLE			
BORE & PENETRATION HOLE			
NO.	ELEVATION	STATION	DISTANCE FROM 444+00
1	570.0'	444+45'	55' RT
2	570.0'	444+150'	22' LT
3	574.0'	445+95'	55' RT
4	573.56'	445+72'	54' LT
5	558.5'	447+00'	CL
6	545.4'	446+00'	CL

— NOTE —  
THE BOUNDARIES BETWEEN SOIL STRATA HAVE BEEN ESTABLISHED ONLY AT BORE HOLE LOCATIONS. BETWEEN BORE HOLES THE BOUNDARIES ARE ASSUMED FROM GEOLOGICAL EVIDENCE AND MAY BE SUBJECT TO CONSIDERABLE ERROR.



DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & RESEARCH SECTION - DOWNSVIEW

### GRAVEL ROAD PROPOSED CROSSING 1 MILE S.E. OF MEADOWVALE

THE KING'S HIGHWAY NO. 7 (LINE X) DIV. NO. 6  
CO. PEEL

TWP. TORONTO LOT 8 CON. II & III

#### POSITION & ELEVATION OF HOLES

APPROVER

ENGINEER

CHIEF ENGINEER

W.P. 74-57

DATE JULY 12, 1957

REVISIONS

DATE

DESCRIPTION

REFERENCE PLANS

DESIGN: D.F. CHECK: [ ]

DRAWING: D.F. CHECK: [ ]

TRACING: D.F. CHECK: [ ]

DATE JULY 12, 1957