

c.c. Foundation Section.

Mr. A.M. Toye.
Bridge Engineer.

Materials & Research.

September 30th, 1957.

Re: Foundation Report -

W.P. 75-57. W.J.F. 57-12.

Highway #401 and road allowance
between Concessions 3 & 4, one
mile south of Meadowvale.

Attached herewith are two copies of the above mentioned Foundation Report. The sub-soil consists of a shallow layer of clay over till. If the spread footing is placed on this till layer, the bearing value of this layer at about elevation 552 would be competent to support approximately two tons per square foot. This bearing value may be increased if the footings are placed at a lower elevation.

This structure has already been given for design to Mr. Lee, consultant at Kingston, and we advised him on August 19th that the bearing value of 2 tons per square foot would be satisfactory at elevation 552.

F.C. Brownridge.
Materials & Research Engineer.

per:



A. RUTKA.
Principal Soils Engineer.

c.c. Mr. A. Toye.
Mr. H. Tregaskes.
Mr. D.G. Ramsay.
Mr. J.E. Wilkes.
Foundation Section.
File.

Foundation Report

on

Underpass Bridge at Highway 401
crossing road allowance between
concessions 111 & 1V, one mile
south of Meadowvale, Township of
Toronto.

Plan No.: F-3522-9

Station: 491/56.67

Distribution.

Mr. A. Toye
Bridge Engineer (2)

Mr. H. Tregaskes
Construction Engineer (1)

Mr. D. G. Ramsay
Design Engineer (1)

Mr. J. B. Wilkes
District Engineer, Toronto (1)

Foundation Section (1)

File (1)

W. P. 75-57

W. J. P-57-12

Introduction.

A subsoil investigation was carried out to determine the bearing values of the layers for supporting the foundations of the proposed structure.

The site is located at about one mile south of Meadowvale, where the new Highway 401 crosses the road allowance between Concessions III & IV in the township of Toronto, County of Peel, (profile no. P-3522-8, station 491/56.67).

The work started on May 13, 1957 and was interrupted on May 17, 1957, due to unsettled status of the property. However, after the arrangements to enter the property were made, the work was resumed and was completed on August 14, 1957.

Procedure.

The investigation was carried out by a skid mounted coredrill machine. In the course of investigations 2 boreholes with dynamic cone penetration and 2 separate penetration tests were made.

The location of the boreholes are shown in Drawing F-57-12A and their elevations on log sheets under Appendix I.

Subsoil findings and Analysis.

The terrain is till plain with a veneer of presumably lacustrine deposit. The subsoil explorations revealed the following stratigraphy.

Under the topsoil down to elevation about 553 ft. the layer is brown, loamy clay. Below this elevation the soil is gravelly grey clay till. The borings were stopped at elevations 521 ft. (borehole no. 2), and 531 ft. (borehole no. 3) where dense boulders were encountered.

The samples extracted from the boreholes were tested in the laboratory. The test results show that the soil in the top brown clay layer (above elevation 553 ft.) has higher moisture content (24%) compared to 12%

moisture content of the soil below this elevation.

The standard penetration results, from the ground level down to 20 ft. depth, show an average of 25 blows per foot penetration. Due to gravelly nature of the soil the attempts for unconfined compression tests did not yield reliable results.

Conclusions and Recommendations.

From the above discussion it will follow that:

1. The terrain is till plain. The subsoil is brown loamy clay at the top, changing to grey gravelly clay till below elevation 553 ft.
2. The nature of the stratification and of the soil is convenient for spread footing type foundations. However, if due consideration were given to relatively soft consistency recorded in the upper 10 ft. from the ground level, it would seem advisable to place the footings not higher than elevation about 552 ft. At this elevation the layer can provide a bearing value of 2 T.s.f. and at elevation 550 ft. 2.5 T.s.f. For higher bearing values it would be safer to place the footings below this elevation 550 ft.
3. The approach fills to the structure do not present any stability problem.

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 PENETRATION JOB F-57-12 W.P. 75-57 BORING 1 STA. 491+16 (43' LT.)
 CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG 1957
 SAMPLER HAMMER WT. 250 LBS. DROP 23 INCHES COMPILED BY H.S. CHECKED BY AL DATE BORING 13 MAY 1957

ABBREVIATIONS

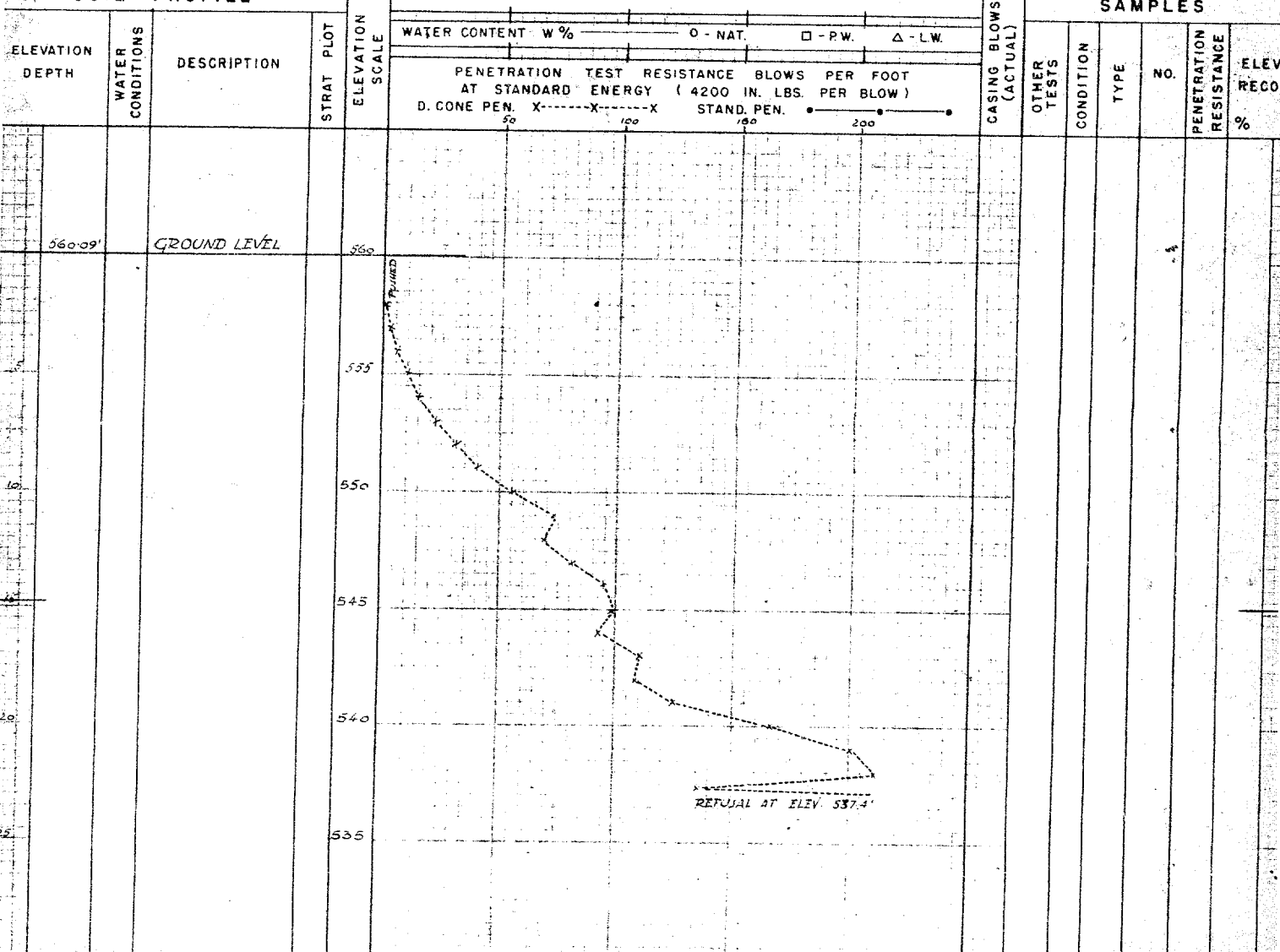
V - INSITU VANE SHEAR TEST Q - TRIAXIAL QUICK K - PERMIABILITY
 M - MECHANICAL ANALYSIS S - TRIAXIAL SLOW C - CONSOLIDATION
 U - UNCONFINED COMPRESSION WL - WATER LEVEL IN CASING CA - CASING
 QC - TRIAXIAL CONSOLIDATED QUICK WT - WATER TABLE IN SOIL γ - UNIT WEIGHT

SAMPLE TYPES

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

SOIL PROFILE**SAMPLES**

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

DRILL RIG 54-2 OPERATION BORE + PENETN JOB F-57-12 WP 75-57 BORING 2 STA. 42+37.38 (RT)
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG. 1957
SAMPLER HAMMER WT. 250 LBS. DROP 23 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 14 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
γ - UNIT WEIGHT

SAMPLE TYPES

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

SAMPLE CONDITION



- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE

| LEVATION DEPTH | WATER CONDITIONS | DESCRIPTION | STRAT PLOT ELEVATION SCALE |
|-------------------|------------------------------|------------------|----------------------------------|
| 559.79' | | GROUND LEVEL | |
| 558.79' | | TOPSOIL | |
| 553.79' | W.L. RECORDED 1201 BORING | BROWN CLAY | |
| 521.29' | | GREY CLAY TILL | |
| 500.00' | | BOULDERS | |
| 500.00' | | END OF BORE-HOLE | |

1000 SHEAR STRENGTH IN LBS PER SQ. FT. 10000

WATER CONTENT W% 20 0 - NAT 40 Δ - LW

PENETRATION TEST RESISTANCE BLOWS PER FOOT

AT STANDARD ENERGY (14200 IN. LBS. PER BLOW)

D. CONE PEN. X-----X-----X STAND. PEN. 100 200

SAMPLES

| CASING BLOWS (ACTUAL) | OTHER TESTS | CONDITION | TYPE | NO. | PENETRATION RESISTANCE | ELEV. RECOV. |
|-----------------------------|----------------|-----------|------|-----|---------------------------|-----------------|
| 2 | | | | | | 559.79' |
| 4 | | | | | | 557.79' |
| 12 | 129.5 p.c.f. | T.O. | 1 | 11 | 75 | |
| 21 | 126.5 p.c.f. | T.O. | 2 | 15 | 79 | |
| 32 | | | | | | 549.79' |
| 50 | 131.5 p.c.f. | S.S. | 3 | 41 | 67 | |
| 70 | | | | | | 544.79' |
| 72 | | | | | | |
| 89 | 133.0 p.c.f. | S.S. | 4 | 14 | 61 | |
| 105 | | | | | | 539.79' |
| 148 | 148.0 p.c.f. | S.S. | 5 | 36 | 72 | |
| 182 | | | | | | 534.79' |
| 92 | 140.0 p.c.f. | D.O. | 6 | 63 | 72 | |
| 187 | | | | | | 528.79' |
| 295 | | | | | | |
| 180 | 123.5 p.c.f. | D.O. | 7 | 56 | 83 | |
| 323 | | | | | | |
| 100 | | | | | | |
| 300 | | | | | | |
| END OF CASING at 523.29' | | | | | | 521.95' |

NOTE UNCONFINED COMPRESSION TEST RESULTS ARE INACCURATE
DUE TO PRESENCE OF GRAVEL SIZE PEBBLES

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

DRILL RIG 54-2 OPERATION BORE & PENIT'N JOB F-57-12 WP 75-57 BORING 3 STA. 491+81 (40' LT.)
CASING BY (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG 1957
SAMPLER HAMMER WT. 250 LBS. DROP 22 INCHES COMPILED BY HJ CHECKED BY AL DATE BORING 13 AUG 1957

ABBREVIATIONS

V - INSITU VANE SHEAR TEST Q - TRIAXIAL QUICK K - PERMIABILITY
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Qc - TRIAXIAL CONSOLIDATED QUICK WT - WATER TABLE IN SOIL γ - UNIT WEIGHT

SAMPLE TYPES

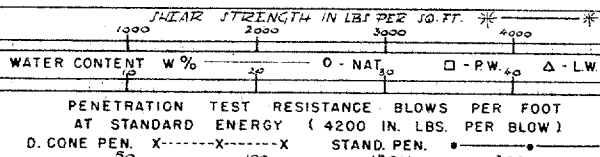
CS - CHUNK S.S. - SLEEVE SAMPLE
DO - DRIVE OPEN PS - PISTON SAMPLE
DF - DRIVE FOOT VALVE WS - WASHED SAMPLE
TO - THIN WALLED OPEN RC - ROCK CORE

SAMPLE CONDITION



- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE



SAMPLES

| ELEVATION DEPTH | WATER CONDITIONS | DESCRIPTION | STRAT PLOT | ELEVATION SCALE | CASING BLOWS (ACTUAL) | OTHER TESTS | CONDITION | TYPE | NO. | PENETRATION RESISTANCE | ELEV. RECOVER. |
|-----------------|------------------|----------------------|------------|-----------------|-----------------------|-------------|-----------|------|-----|------------------------|----------------|
| 561'3" | | GROUND LEVEL TOPSOIL | | 560 | | | | | | | 561'3" |
| 560'0" | | BROWN CLAY | | 555 | | | | | | | 556'3" |
| 553'3" | | | | 550 | | | | | | | 551'3" |
| | | GREY CLAY TILL | | 545 | | | | | | | 546'3" |
| | | | | 540 | | | | | | | 541'3" |
| | | BOULDERS | | 535 | | | | | | | |
| 531'3" | | END OF BOREHOLE | | 530 | | | | | | | |

NOTE: UNCONFINED COMPRESSION TEST RESULTS ARE INACCURATE DUE TO PRESENCE OF GRAVEL OR PEBBLES

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

DRILL RIG 54-2 OPERATION PENETRATION JOB F-57-12 WP 75-57 BORING 4 STA. 491+98 (40' BT)
 CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG. 1957
 SAMPLER HAMMER WT. 250 LBS. DROP 22 INCHES COMPILED BY H.J. CHECKED BY A.L. DATE BORING 14 AUG. 1957

ABBREVIATIONS

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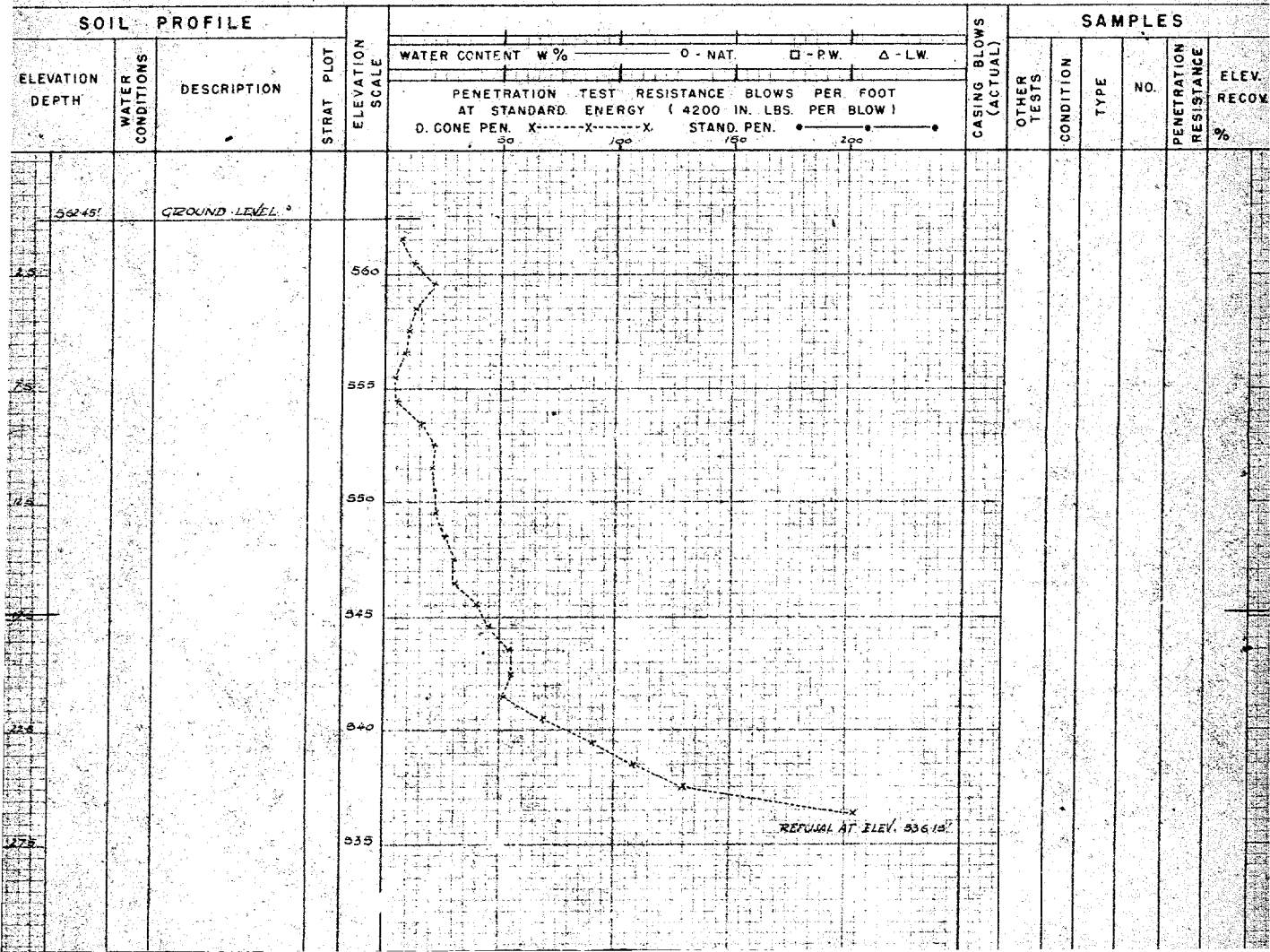
SAMPLE CONDITION



- DISTURBED
 - FAIR
 - GOOD
 - LOST

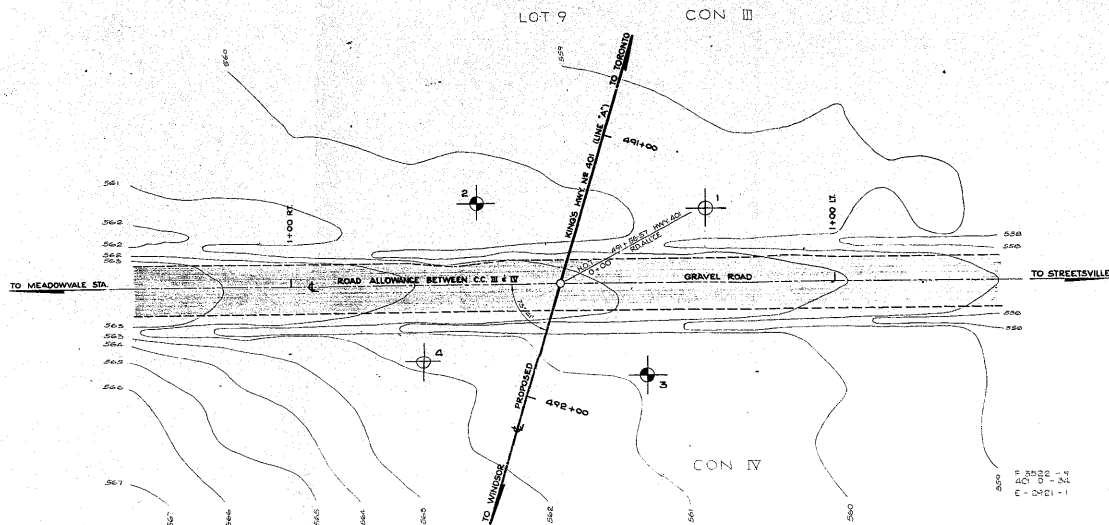
SOIL PROFILE

SAMPLES

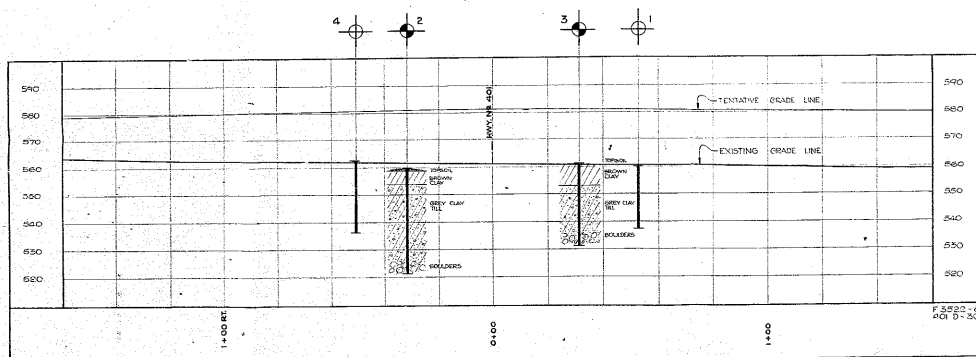


57-F-12
W.P.# 75-57
Hwy.# 401
UNDERPASS BRIDGE
CON.# 3 & # 4
1 MILE S. OF
MEADOWVALE





PLAN SCALE 1 IN = 20 FT



PROFILE SCALE HOR VER 1 IN = 20 FT

| LEGEND | | | |
|-------------------------|-----------|---------|-----------------|
| BORE HOLES | | | |
| PENETRATION HOLE | | | |
| BORE & PENETRATION HOLE | | | |
| HOLE NO. | ELEVATION | STATION | DISTANCE FROM 4 |
| 1 | 560.09' | 491+16' | 45' LT |
| 2 | 559.79' | 491+57' | 34' RT |
| 3 | 561.13' | 491+81' | 40' LT |
| 4 | 562.45' | 491+98' | 40' RT |

- 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 1/2 MILE S.E. OF MEADOWVALE STA. | | | |
| THE KING'S HIGHWAY NO. 401 (LINE 'A') | | DIV. NO. 4 | |
| PEEL | | TWP. TORONTO | |
| LOT 9 | | CON. III & IV | |
| POSITION & ELEVATION OF HOLES | | | |
| APPROVED | | | |
| ENGINEER | | CHIEF ENGINEER | |
| DESIGNED | CHECKED | DATE | 75-57 |
| REVIEWED | CHECKED | DATE | 75-57 |
| SEPT 25 1987 | | F-57-12 A | |