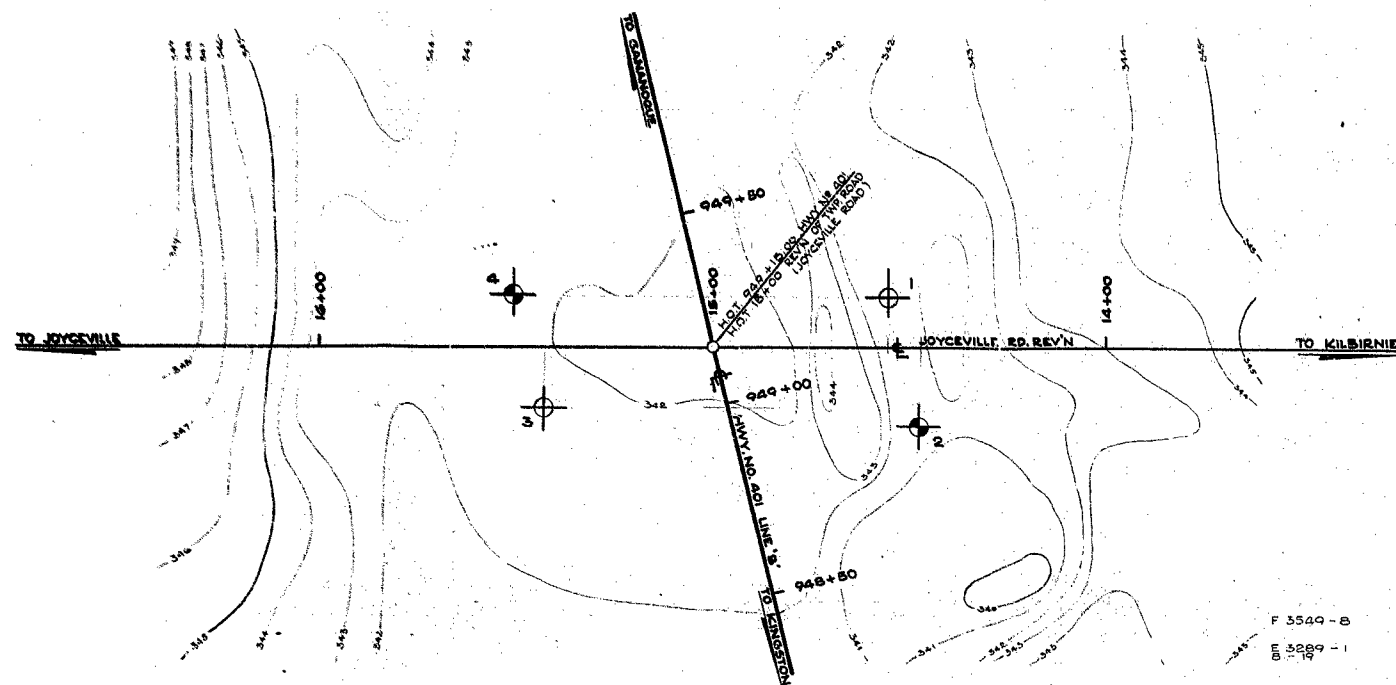
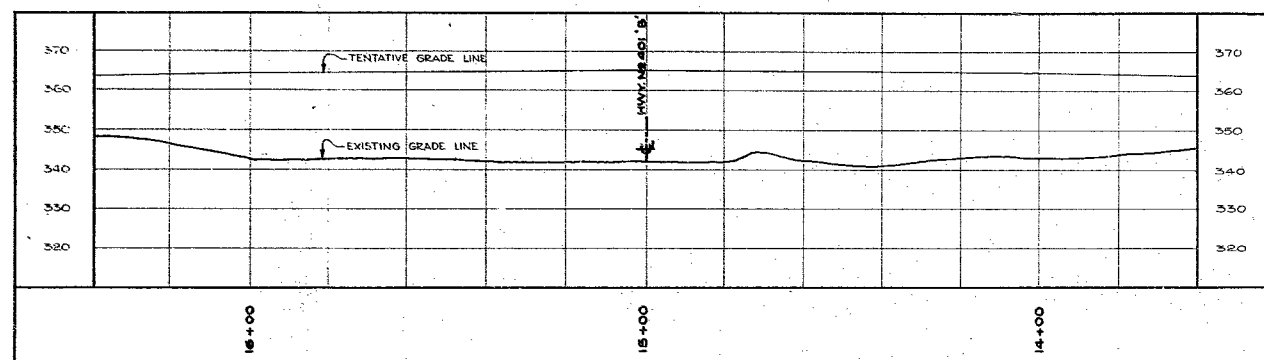


57-F-42
W.P. # 67-57
Hwy. # 401
CROSSING
JOYCEVILLE RD. REV.
2.5 MILES S. OF
JOYCEVILLE

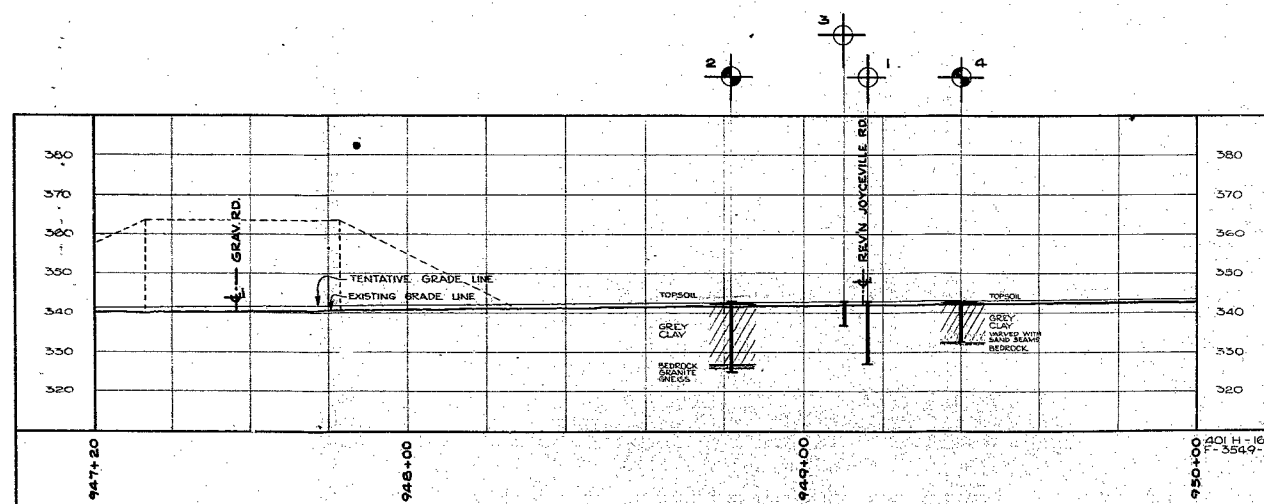
EDITED
FOR MICROFILMING
BY *hls* DATE *1/1/72*



PLAN



PROFILE OF GRAVEL ROAD REVISION



PROFILE OF HWY. NO 401

LEGEND			
BORE HOLE			
PENETRATION HOLE			
BORE & PENETRATION HOLE			
HOLE NO.	ELEVATION	STATION	DISTANCE FROM CL
1	343.0'	949+16'	46' RT
2	342.8'	948+82'	46' RT
3	343.0'	949+10'	45' LT
4	342.7'	949+40'	46' LT

— 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		
JOYDEVILLE ROAD REVISION PROPOSED CROSSING 2.5 MILES S. OF JOYDEVILLE		
SHOWING POSITION & ELEVATION OF HOLES		
HWY. NO. 401 LINE 'B'	W.P. 67-57	DIV. NO. 6
CO. FRONTENAC		
TWP. PITTSBURG	LOT. 19	CON. III
SCALE 1 IN = 20 FT	SUBMITTED BY	DATE 31 JAN. 58
DRAWN BY R.E.F.	APPROVED BY	DRAWING NO. F-57-42A

Mr. A. Teye,
Bridge Engineer.
Mr. A. Rutka,

March 14, 1958.

Re: Foundation Report -
Hwy. #401 - Joyceville Bideroad,
H.P. 67-57 W.J. F 57-42

We are forwarding herewith two copies of the above mentioned Foundation Report. This project was originally included in the 1958-59 construction program but has since been cancelled. This likely will be added on the list at some future date.

The soil in this area generally consists of clay over rock and consequently, it is recommended that the footings be taken down to bedrock. It is pointed out that rock was not proven in most of the boreholes, but the nature of the physiography would indicate that the clay rests directly upon the bedrock.

P. C. Brownridge,
MATERIALS & RESEARCH ENGR.

cc/Brief
Encl.

Per:

cc: Messrs. A. Teye
H. Trampuskas
D. G. Ramsay
C. E. Walker
A. Latt
P. Arrow

(A. Rutka,
Principal Soils Engineer)

Foundation Section
File

FOUNDATION REPORT

on

New Bridge at new Highway No. 401 line "B" crossing
Joyceville road revision, about 2.5 miles south of
Joyceville, Township of Pittsburg.

Plan No. E-3289-1

Station: 949+15

Distribution:

Mr. A. Toye
Bridge Engineer (2)

Mr. H. Tregaskes
Construction Engineer (1)

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

Mr. L.E. Walker
Dist. Engineer, Kingston (1)

Mr. A. Watt
Water Resources Com. (1)

Mr. P. Karrow
Department of Mines (1)

Foundation Section (1)

FILE (1)

W.P. 67-57

W.J. F-57-42

INTRODUCTION

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

The site is located some 2.5 miles south of Joyceville where new highway 401 line "B" crosses Joyceville road revision in lot 19 (Con. III), Township of Pittsburg, (Station 949+15, profile F-3549-8). The work started on Oct. 22, 1957 and was completed on Oct. 28, 1957.

PROCEDURE

The subsoil explorations were carried out by means of a skid mounted coredrill machine. In the course of the investigations two boreholes with dynamic cone penetration and two separate dynamic cone penetration tests were made. The locations of the boreholes are shown in drawing No. F-57-42A, and their elevations on log sheets under Appendix I.

SUBSOIL FINDINGS AND ANALYSIS

The area is characterized with rock-knobs and clay flats. Some 50 yards to the north east of the site an exposed knob of granite rock is apparent. These rock formations are assumed to be precambrian formation and the overburden clay left by the Champlain Sea.

The explorations at the site revealed the following stratigraphy:

Under the topsoil down to bedrock the soil is one layer of fairly uniform gray medium clay. The laboratory tests, performed on undisturbed samples extracted from the boreholes, gave the soil an average liquid limit 40%, plastic limit 19%, moisture content 32% and density about 120 p.s.f.

The soil is identified as inorganic and of low plasticity. From unconfined compression tests the shear value of the soil was found to be about 1700 p.s.f. The standard penetration tests registered about 11 blows per foot penetration. From the above results it appears that the soil layer can not provide a bearing value more than one T.s.f. for supporting spread footings.

SUBSOIL FINDINGS AND ANALYSIS (Cont'd.)

Underlying the soil layer (gray clay) is what appears to be bedrock layer. In borehole No. 2 on the south side the bedrock was reached at elevation 326.8 ft. (16 ft. below the ground surface). A core sample of 3 ft. was extracted with diamond bit. From the tests the rock was identified as granite gneiss. On the other three holes the depth of the assumed bedrock was established by dynamic cone penetration refusal. From these indications the assumed bedrock surface possibly forms an inclined plane.

On the north side in holes No. 3 & 4 the foundation footings of the structure can be placed on the assumed bedrock at elevations 337 and 332.7 ft. respectively. This necessitates some 6 and 10 ft. excavation. On the south side, in holes No. 1 & 2, in order to place the foundation footings on the established bedrock (elevation 327 ft.) some 16 ft. of excavation will be necessary. However, the calculation of the lateral thrust or active pressure P_A from the expression $P_A = \frac{1}{2} \gamma h^2 - 2C$ (where γ is the unit weight of the soil, and C is the cohesive shear strength of the soil), shows that no temporary shoring will be necessary for the 16 ft. excavation at this site. Furthermore, the idea of placing all the foundations horizontally at bedrock elevations 337/332.7 ft., established in holes No. 3 & 4 at the north side, will leave some 8 ft. thick layer of clay in between the south pier and the bedrock. Calculating from the established liquid limit of this soil a settlement of more than a foot is anticipated.

CONCLUSIONS AND RECOMMENDATIONS

From the above discussion it will follow that:

1. The clay layer overlying the bedrock does not provide a bearing value more than one T.s.f.
2. The foundations can be placed on bedrock. Presumably the bedrock will be reached at elevations 337 & 332.7 ft. on the north side, and at elevation 327 ft. on the south side.

RECOMMENDATIONS (Cont'd.)

3. The excavations (some 16 ft. on the south side) down to the bedrock, for placing the foundations, do not present any shoring problem.
4. The approach fills to the proposed 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 54-1 OPERATION PENETRATION JOB F-57-42 WP 67-57 BORING 1 STN. 949+16 (46 RT.)
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT DEC 1957
SAMPLER HAMMER WT. 250 LBS. DROP 19 1/2 INCHES COMPILED BY H.S. CHECKED BY AL DATE BORING 22 OCT 1957

ABBREVIATIONS

SAMPLE TYPES

SAMPLE CONDITION

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 G - UNIT WEIGHT

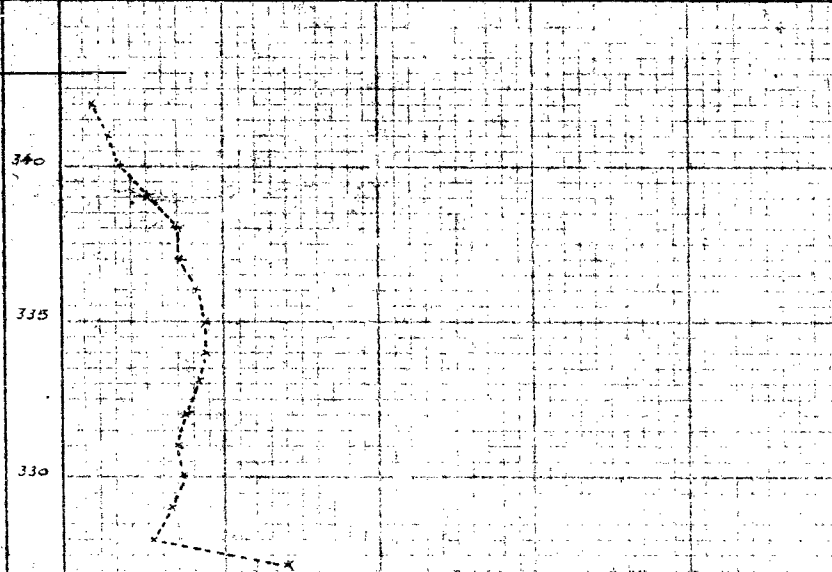
C.S. - CHUNK S.S. - SLEEVE SAMPLE
D.O. - DRIVE OPEN P.S. - PISTON SAMPLE
D.F. - DRIVE FOOT VALVE W.S. - WASHED SAMPLE
T.O. - THIN WALLED OPEN R.C. - ROCK CORE



- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE

SAMPLES

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	WATER CONTENT W %			CASING BLOW (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV.				
						O - NAT.	□ - P.W.								△ - L.W.			
					PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW) D. CONE PEN. X-----X-----X STAND. PEN. ●-----●-----●													
					50	100	150	200										
343'		GROUND LEVEL																
				340														
				335														
				330														
				325														
					REFUSAL AT ELEV 327'2" HAMMER BOUNCING													

REFUSAL AT ELEV 327'2"
HAMMER BOUNCING

OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-1 OPERATION BORE & PENET'N JOB F-57-42 WP 67-57 BORING 2 STA. 948+82 (46 RT.)
 C'SING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT DEC. 1957
 SAMPLER HAMMER WT. 250 LBS. DROP 19 1/2 INCHES COMPILED BY H.S. CHECKED BY AL DATE BORING 23 OCT. 1957

ABBREVIATIONS

SAMPLE TYPES

SAMPLE CONDITION

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

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



- DISTURBED
 - FAIR
 - GOOD
 - LOST

SOIL PROFILE

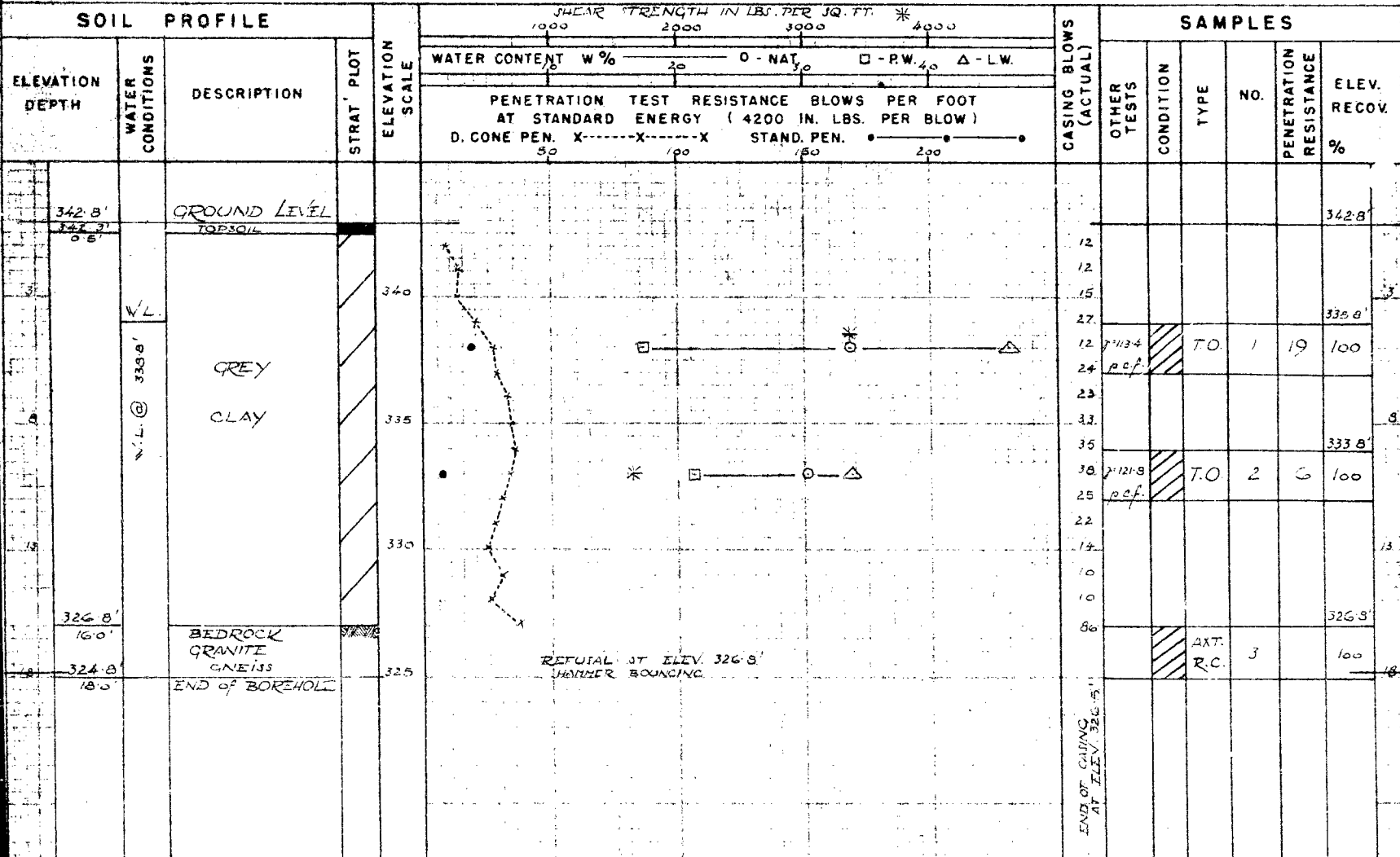
SHEAR STRENGTH IN LBS. PER SQ. FT. *

WATER CONTENT W % O - NAT □ - P.W. Δ - L.W.
 PENETRATION TEST RESISTANCE BLOWS PER FOOT
 AT STANDARD ENERGY (4200 IN. LBS. PER BLOW)
 D. CONE PEN. X-----X-----X STAND. PEN. •-----•-----•

CASING BLOWS (ACTUAL)

SAMPLES

OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
-------------	-----------	------	-----	------------------------	----------------



DRILL RIG 541 OPERATION PENETRATION JOB F-57-42 WP 67-57 BORING 3 STA. 949 + 16 (45' LT.)
CASING BK (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT DEC 1957
SAMPLER HAMMER WT. 250 LBS. DROP 19 1/2 INCHES COMPILED BY H.S. CHECKED BY AL DATE BORING 26 OCT 1957

SAMPLE TYPES

SAMPLE CONDITION

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
Q _c - TRIAXIAL CONSOLIDATED QUICK	WT - WATER TABLE IN SOIL	γ - UNIT WEIGHT

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

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	WATER CONTENT W% ———— O - NAT. □ - P.W. Δ - L.W.	PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW) D. CONE PEN. X-----X-----X STAND. PEN. ●-----●-----●	CASING BLOW (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
343'		GROUND LEVEL		340									
333						REFUSAL AT ELV. 336'9" HAMMER BOUNCING							

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

DRILL RIG 54-1 OPERATION BORE & PENET'N JOB F-57-42 WP. 67-57 BORING 4 STA. 949+ 49.45 (LT)
CASING Bx (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT DEC. 1957
SAMPLER HAMMER WT. 250 LBS. DROP 19 1/2 INCHES COMPILED BY H.S. CHECKED BY AL DATE BORING 26 OCT. 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

