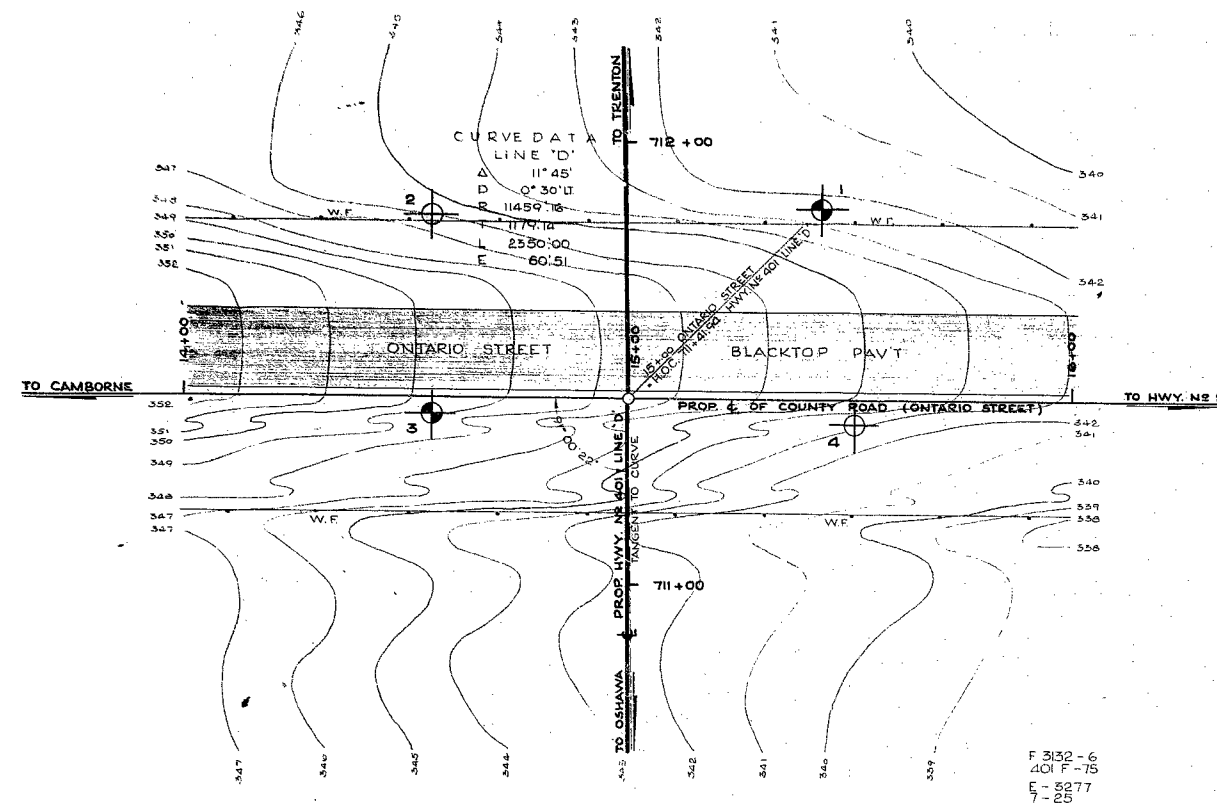
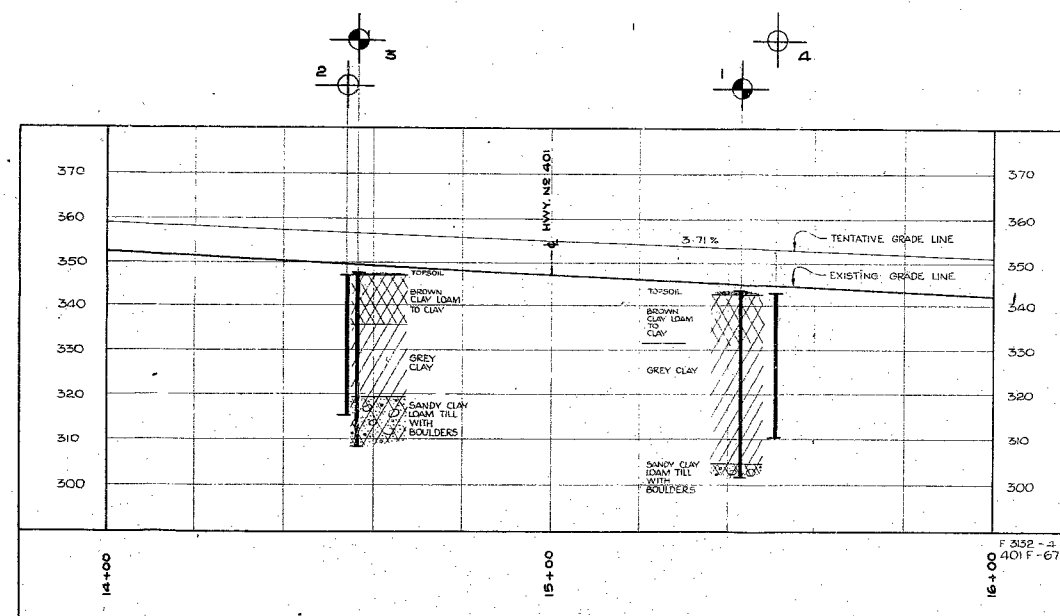


#57-F-24
W.P.# 52-57
Hwy.# 401
CROSSING
ONTARIO ST.
COBOURG T.

EDITED
FOR MICROFILMING
BY *JB* DATE *4/11/22*



PLAN SCALE 1 IN = 20 FT



PROFILE SCALE 1 IN = 20 FT

LEGEND			
BORE HOLES			
PENETRATION HOLE			
BORE & PENETRATION HOLE			
HOLE NO.	ELEVATION	STATION	DISTANCE FROM &
1	343.9'	711+84'	44' RT
2	347.45'	711+84'	44' LT
3	347.7'	711+39'	44' LT
4	342.6'	711+36'	51' 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			
ONTARIO STREET PROPOSED CROSSING IN THE TOWN OF COBOURG			
THE KING'S HIGHWAY No. 401 (LINE 'D')		DIV. No. 7	
CO. NORTHUMBERLAND			
TWP. HAMILTON	LOT	CON.	
POSITION & ELEVATION OF HOLES			
APPROVED			
ENGINEER		CHIEF ENGINEER	
DESIGN	CHECK	CONTRACT NUMBERS	W.P.
DRAWING	REF.	52-57	
TRACING	CHECK	LOADING	DRAWING NUMBER
DATE	SEPTEMBER 19, 1957		F-57-24 A

c.c. Foundation Section.

Mr. A.M. Toye.

November 13th, 1957.

Bridge Engineer.

Materials & Research Section.

Re: Foundation Report. Highway 401.
Ontario Street, Cobourg.
W.J. 52-57. W.J. F-57-24.

We are forwarding herewith two copies of the above mentioned Foundation Report. The sub-soil in this area consists of soft clay over till. The soft clay layer cannot support a spread footing foundation and if this type of foundation is used it should be carried down to the firm till.

This, then, boils down to a question of economics. In view of the fact that the till layer is not located at a uniform depth below the surface, the depth of excavation for each footing will be considerably at variance. While it appears feasible to place the spread footings on the till for the north footing, considerably more excavation would be required for the south footing. If this deeper excavation seems unreasonable, some consideration could be given to the use of short end bearing piles.

F. C. BROWNIDGE.
Materials & Research Engineer.

per: *A. Rutka*

A. RUTKA.
Principal Soils Engineer.

c.c. Mr. A. Toye.
Mr. H. Tregaskes.
Mr. D.G. Ramsay.
Mr. H.D. Duff.
Foundation Section.
Files.

Foundation Report
on
New Bridge at Highway 401
Crossing Ontario Street, Cobourg
Town, County of Northumberland.

Plan No: F-3132-6

Station No: 711/42

Distribution:

Mr. A. Toye
Bridge Engineer (2)

Mr. H. Tregaskes
Construction Engineer (1)

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

Mr. H. D. Duff
Dist.Eng. FORT HOPE (1)

Foundation Section (1)

File (1)

W.F. 52-57

W.J. F-57-24

Introduction:

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

The location is where Highway No. 401 (proposed line "D") crosses the Ontario Street in the town of Cobourg, Township of Hamilton, county of Northumberland (Station 711/42, Profile F-3132-6).

The work started on July 16, 1957, and was completed on July 22, 1957.

Procedure:

The subsoil investigations were carried out by means of a skid mounted coredrill machine. In the course of investigations two boreholes with dynamic cone penetration and two separate dynamic cone penetration tests were made. Boreholes No. 2 & 3 were located on the north side and boreholes No. 1 & 4 on the south side of the proposed highway No. 401 centre line.

The location of the holes is shown on drawing F-57-24A and their elevations on log sheets under Appendix I.

Subsoil Findings and Analysis:

The topography of the area is undulating and is believed to be within the boundaries of late Iroquois lake. The site stands elevated due to the depressions of Dye Works Creek on the west side and the Cobourg Creek on the east side. The terrain is lacustrine deposit of clay, silt and fine sand loam placed on dense sand and gravel glacial base.

The subsoil investigations revealed the following stratigraphy:

Under the topsoil, down to elevation 332 ft. in borehole No. 1, and 335 ft. in borehole No. 3, the soil is brown clay, silt, and fine sand loam. Below this layer down to elevation 305 ft. in borehole No. 1, and 319.7 ft. in borehole No. 3, the soil is again grey loam but more clayey. Below elevation 305 ft. in borehole No. 1, and 319.7 ft. in borehole No. 3, the layer is very dense sand and gravel with large size boulders. The boreholes were stopped in this layer.

The samples tested from the clay loam layers indicate average plastic limit 14%, liquid limit 26%, moisture content of 22%, and density 125 p.c.f. The soil is identified as inorganic clay with low plasticity. The unconfined compression tests indicated shear values of 0.30 - 1.00 T.s.f. The field cone penetration and standard penetration test results show moist and soft nature of the layer.

The bouldery sand and gravel layer is very dense. The penetrations were stopped in this layer. In borehole No. 3 the casing was lowered by drilling and wash/samples were used to identify the material.

CONCLUSIONS AND RECOMMENDATIONS:

From the above discussion it will follow that:

1. The site is believed to be within the boundaries of late Iroquois lake.
2. The stratigraphy down to elevations 305 ft. in borehole No. 1, and 319.7 ft. in borehole No. 3, is found to be

made up of soft, saturated loamy clay and silt and fine sand. Below these elevations the layer is very dense sandy clay loam till with boulders.

3. The proposed gradeline indicates a cut, down to elevation 332 ft., at this crossing. Accordingly, it is assumed that the footings of the structure will be placed at elevation about 324 ft. Under these circumstances the use of spread footing foundations could be considered. For the northern footing a bearing value of 2.5 T.s.f. would be located at about elevation 315 ft., while for the southern footing the same amount of bearing value would be located at elevation about 303 ft.

This will incur excavations of some 6 ft. for the northern footing, and some 21 ft. for the southern footing. Besides the routine cofferdam support no other difficulty is anticipated for the excavations.

4. The approach fills to the new 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 BORE & PENET'N JOB F-57-24 W.P. 52-57 BORING 1 STA. 711+64(4' RT)

CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT SEPT 1957

SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY H.S. CHECKED BY AL DATE BORING 15 JULY 1957

- ABBREVIATIONS
- V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
QC - 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

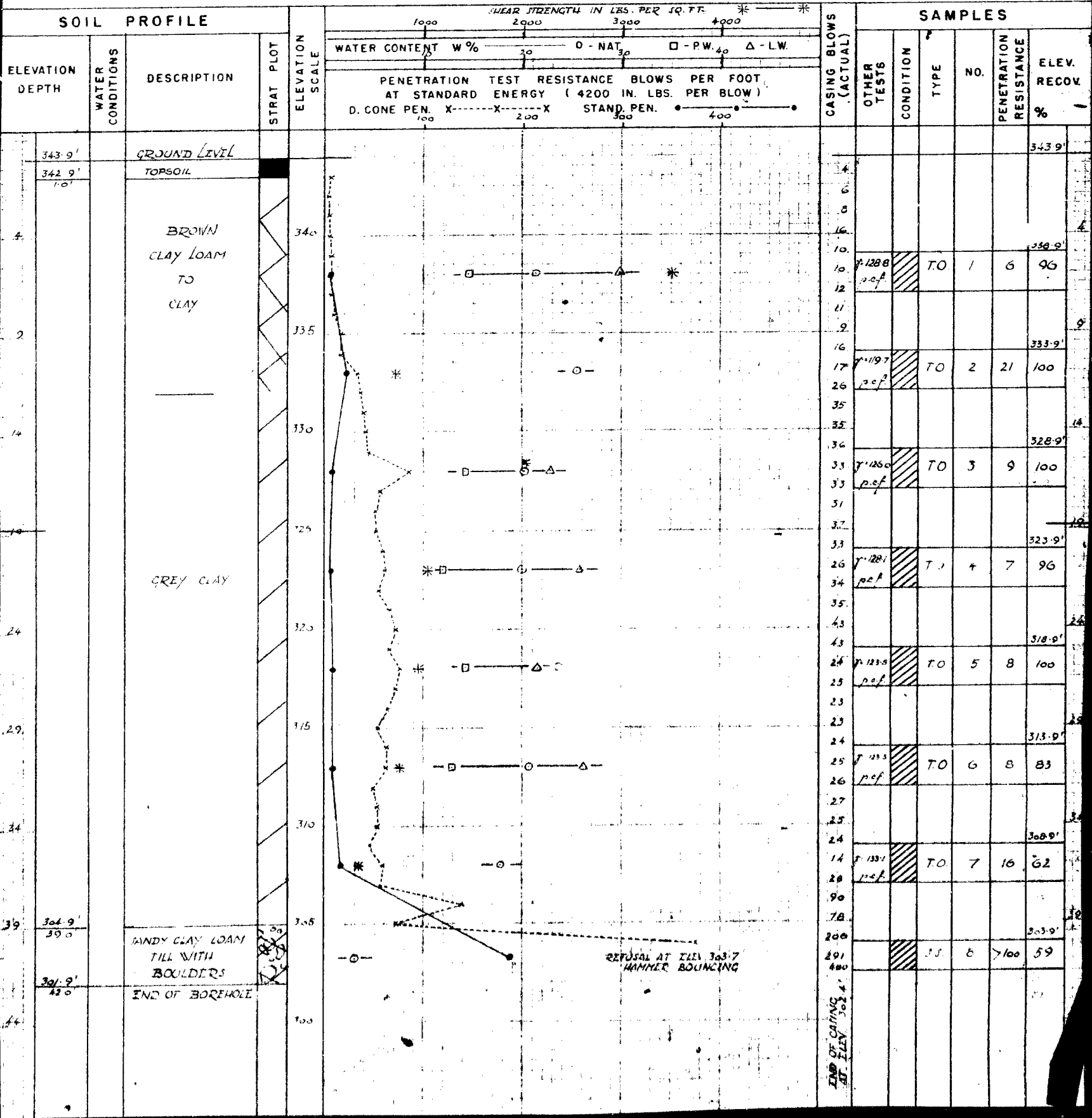
CS - CHUNK
DO - DRIVE OPEN
DF - DRIVE FOOT VALVE
TO - THIN WALLED OPEN

SAMPLE TYPES

SS - SLEEVE SAMPLE
PS - PISTON SAMPLE
WS - WASHED SAMPLE
RC - ROCK CORE

SAMPLE CONDITION





 - DISTURBED
 - FAIR
 - GOOD
 - LOST

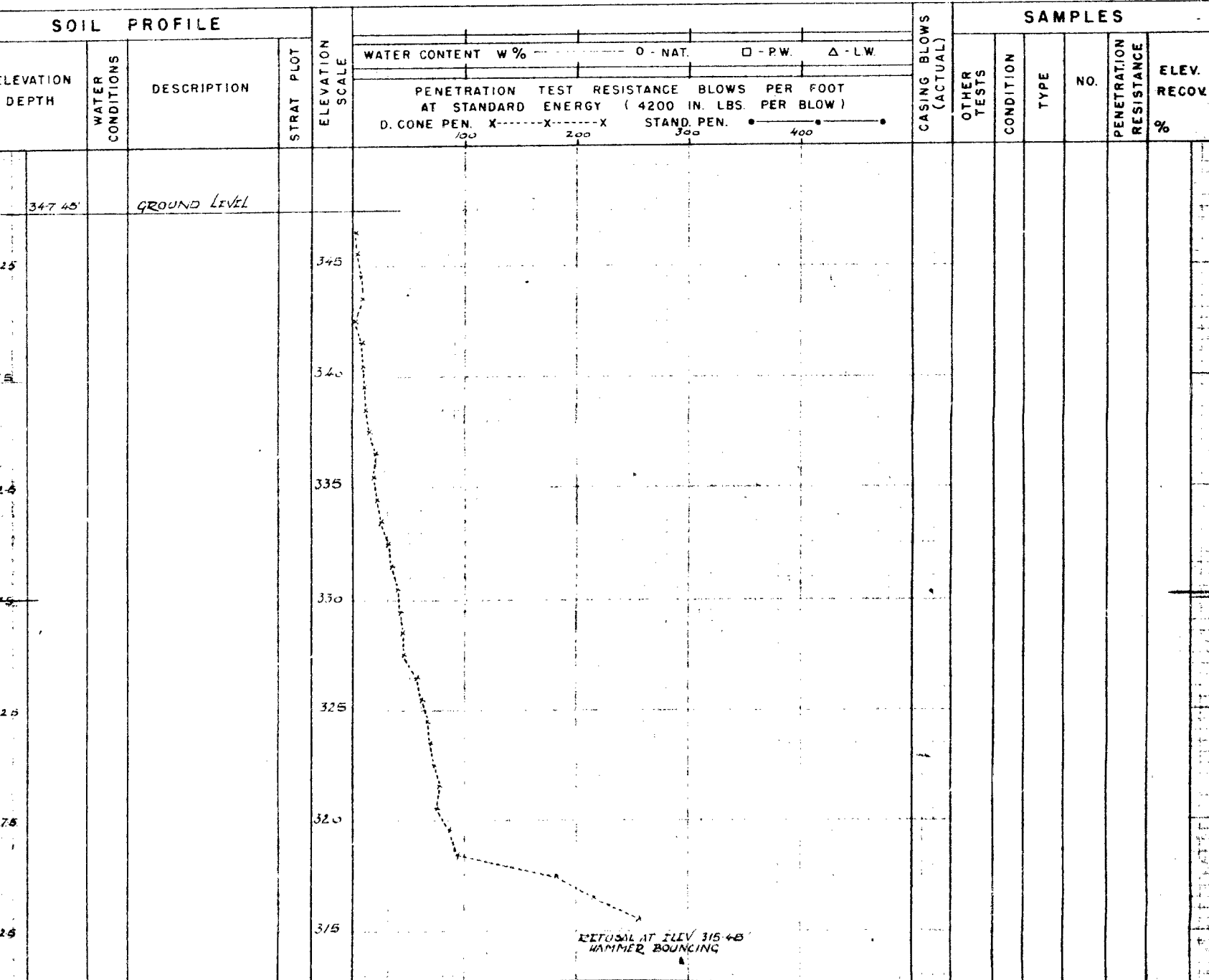


DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-1 OPERATION PENETRATION JOB T 57-24 WP 52-37 BORING 2 STA. 711+84 (44' LT)
CASING BK. (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT SEPT. 1957
SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 17 JULY 1957

ABBREVIATIONS SAMPLE TYPES SAMPLE CONDITION
V - INSITU VANE SHEAR TEST Q - TRIAXIAL QUICK K - PERMIABILITY C.S. - CHUNK S.S. - SLEEVE SAMPLE
M - MECHANICAL ANALYSIS S - TRIAXIAL SLOW C - CONSOLIDATION DO - DRIVE OPEN P.S. - PISTON SAMPLE
U - UNCONFINED COMPRESSION WL - WATER LEVEL IN CASING CA - CASING DE - DRIVE FOOT VALVE WS - WASHED SAMPLE
Qc - TRIAXIAL CONSOLIDATED QUICK WT - WATER TABLE IN SOIL γ - UNIT WEIGHT T.O. - THIN WALLED OPEN R.C. - ROCK CORE

 - DISTURBED
 - FAIR
 - GOOD
 - LOST



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-52-24 WP 52-57 BORING 3 STA. 711+39 (44' 1")
CASING BX (standard samplers to fit unless noted) DATUM CIODITIC DATE REPORT SEPT 1957
SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY H.I. CHECKED BY A.L. DATE BORING 18 JULY 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

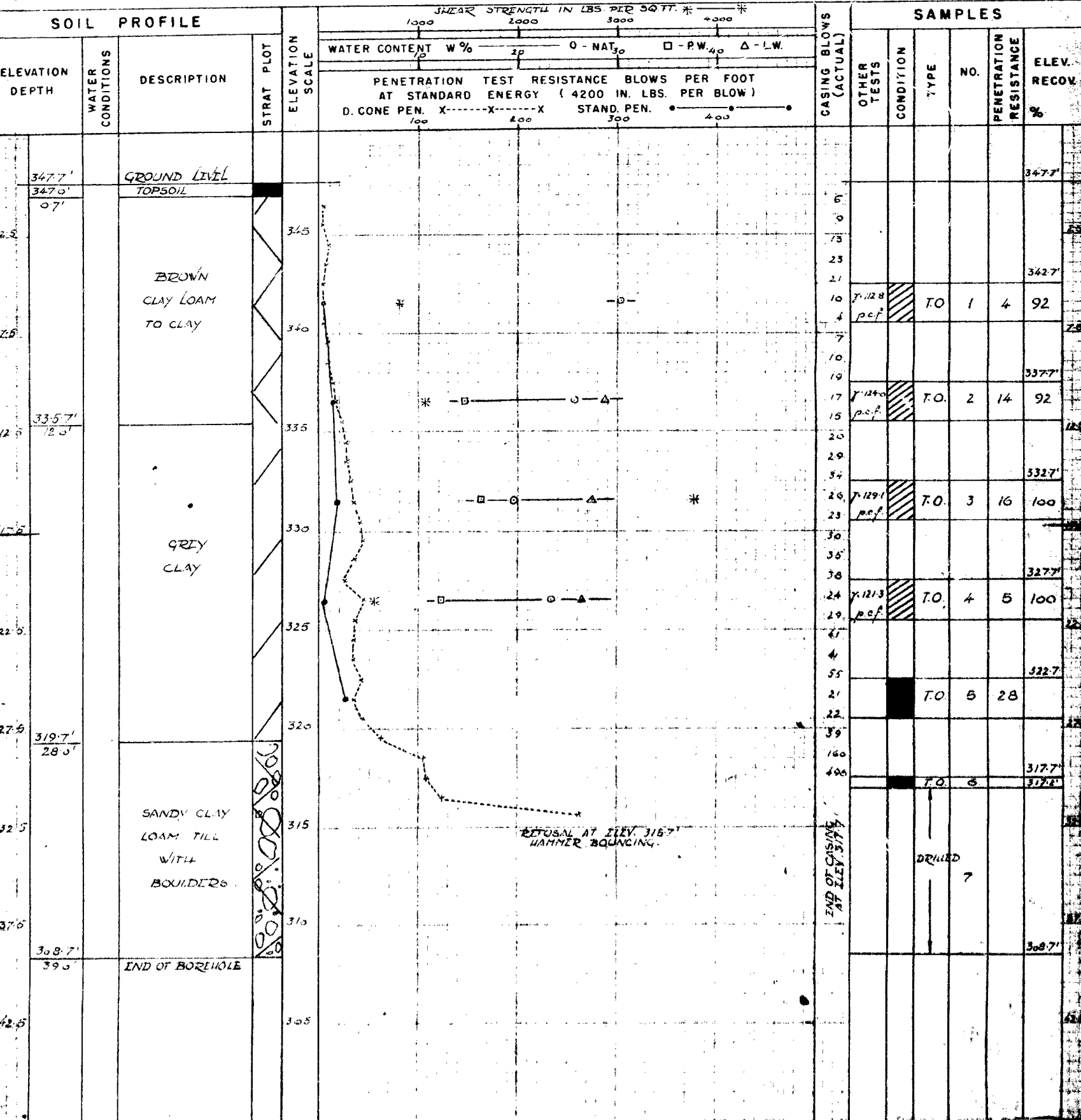
SAMPLE TYPES

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



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

DRILL RIG 54-1 OPERATION PENITRATION JOB 7-57-24 WP. 52-57 BORING 4 STA. 711+36 (51' BT.)
 CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT SEPT. 1957
 SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY HS CHECKED BY AL DATE BORING 20 JULY 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

