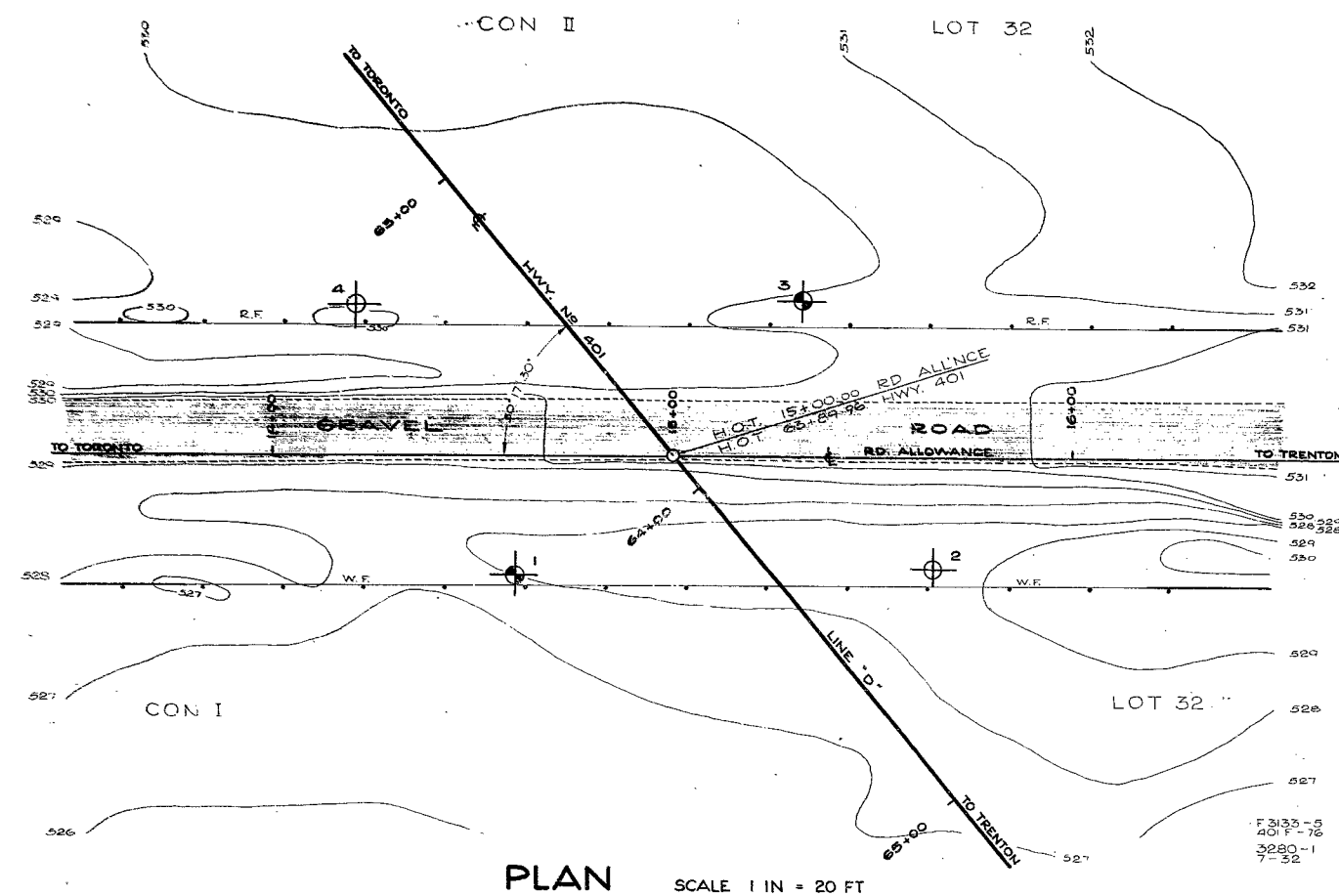


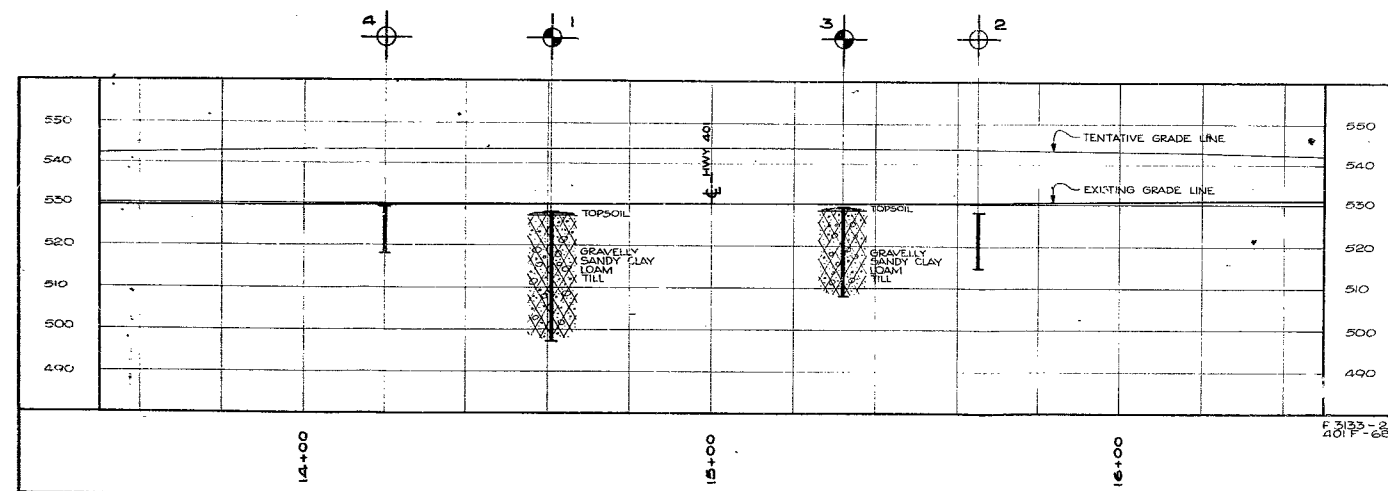
57-F-38
W.P.# 89-57
Hwy. # 401
CROSSING RD.
BETWEEN CON. #1 & #2
3 MILES W. OF
GRAFTON





LEGEND			
BORE HOLE			
PENETRATION HOLE			
BORE & PENETRATION HOLE			
HOLE NO.	ELEVATION	STATION	DISTANCE FROM E
1	528.5'	63+88'	49' RT
2	528.0'	64+53'	52' LT
3	529.5'	63+80'	49' LT
4	529.8'	63+10'	37' 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 0.5 MILE W. OF THE GULLY SHOWING POSITION & ELEVATION OF HOLES		
HWY. NO. 401	W.P. 89-57	DIV. NO. 7
CO. NORTHUMBERLAND	LOT. 32	CON. I & II
TWP. HALDIMAND		
SCALE AS SHOWN	SUBMITTED BY	DATE 20 NOV. 57
DRAWN BY R.E.F.	APPROVED BY	DRAWING NO. F-57-38A

c.c. Foundation Section.

Mr. A. L. Toye.
Bridge Engineer.
Materials & Research.

January 14th, 1958.
Re: Foundation Report.

Highway #401 and Road Between Cons.
1 & 2. Haldimand Township.
H.P. 89-57. H.S.F. 57-38.

We are forwarding herewith two copies of the above mentioned Foundation Report for your use and information, which you will find self-explanatory.

F.C. Brownridge.
Materials & Research Engineer.

per:

A. Rutka
ppzw

A. RUTKA.
Principal Soils Engineer.

c.c. Mr. A. Toye.
Mr. P. Trepaskes.
Mr. D.G. Ramsay.
Mr. H.G. Duff.
Foundation Section.
Mr. A.W. Watt.
Mr. P. Karrow.
File.

FOUNDATION REPORT

on

New Bridge at Highway No. 401 Crossing
Road between Concessions I and II (Lot 32)
about three miles west of Grafton

Plan No. F-3133-5

Station: 63+90

Distribution:

Mr. A. Foye Bridge Engineer	(2)
Mr. M. Tregaskes Construction Engineer	(1)
Mr. D.G. Ramsay Design Engineer	(1)
Mr. H.B. Gaff Dist. Eng. Port Hope	(1)
Foundation Section	(3)
FILE	(1)

W.P. 89-57

W.D. F-57-38

INTRODUCTION

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

The location is about three miles west of Grafton, where the new highway 401 crosses road allowance between concessions I and II (lot 32), Township of Malden (Station 63+90, Profile F-3133-2).

The work started on Sept. 25, 1957 and was completed on Oct. 2, 1957.

PROCEDURE

The subsoil investigations were carried out by means of a skid mounted core drill machine. In the course of investigations two boreholes with dynamic cone penetration tests and two separate dynamic cone penetration tests were made.

The location of the boreholes is shown on drawing No. F-57-38A, and their elevations on log sheets under appendix I.

SUBSOIL FINDINGS AND ANALYSIS

The location of the site is within the shoreline of late Iroquois lake. The terrain is primarily a till plain.

The subsoil explorations revealed the following stratigraphy:

Under the topsoil down to the end of the boreholes the layer is fairly uniform hard till. The matrix is primarily sandy clay loam, and the soil contains about 14% gravel.

From the boreholes samples were extracted and tested in the laboratory: From the test results the soil is inorganic and has very low plastic and liquid limits (less than 10%). The natural moisture content was found to be 6.5% and density 145-150 p.c.f.

SUMMARY FINDINGS AND ANALYSIS (Cont'd.)

Despite the presence of considerable gravel in the samples the unconfined compression tests registered as high as 6000 p.s.f. The field standard penetration tests, performed during sampling, registered 100 or more blows per foot penetration.

CONCLUSIONS AND RECOMMENDATIONS

From the above discussion it will follow that:

1. The layer is fairly uniform hard till all the way down to the end of the boreholes (elevations 497-508 ft.).
2. The approved grade line indicates a cut down to elevation about 520 ft. It will be convenient to support the structure on spread footing type foundations. These footings of necessity will be placed in the vicinity of elevation 513 ft. At this elevation or below the layer can provide a bearing value of 3 T.s.f. with sufficient safety factor.
3. The approach fills to the structure do not present any stability problems.

V. Korla
Foundation Engineer

APPENDIX I

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

DRILL RIG 54-1 OPERATION BORING & PENET'N JOB F-57-38 WP. 84-57 BORING 1 STA. 63+88(49' RT.)
 CASING BX (standard samplers to fit unless noted) DATUM GEODETRIC DATE REPORT NOV. 1957
 SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING SEPT. 27th 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

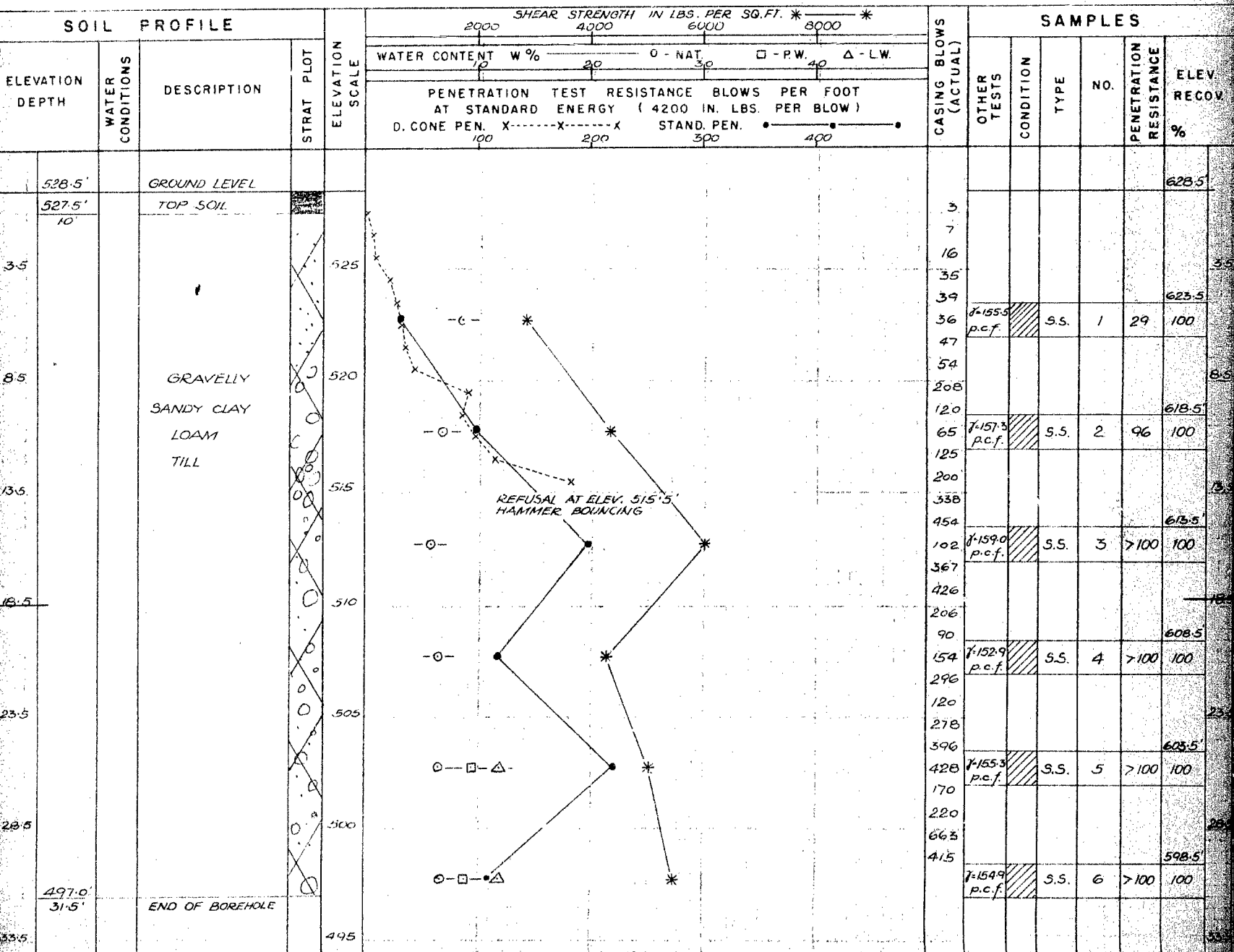
SAMPLE TYPES

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 PENETRATION JOB F-57-38 W.P. 89-57 BORING 2 STA. 64+53 (32' LT.)
 CASING Bx (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT NOV. 1957
 SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 30 SEPT. 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
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SAMPLE TYPES

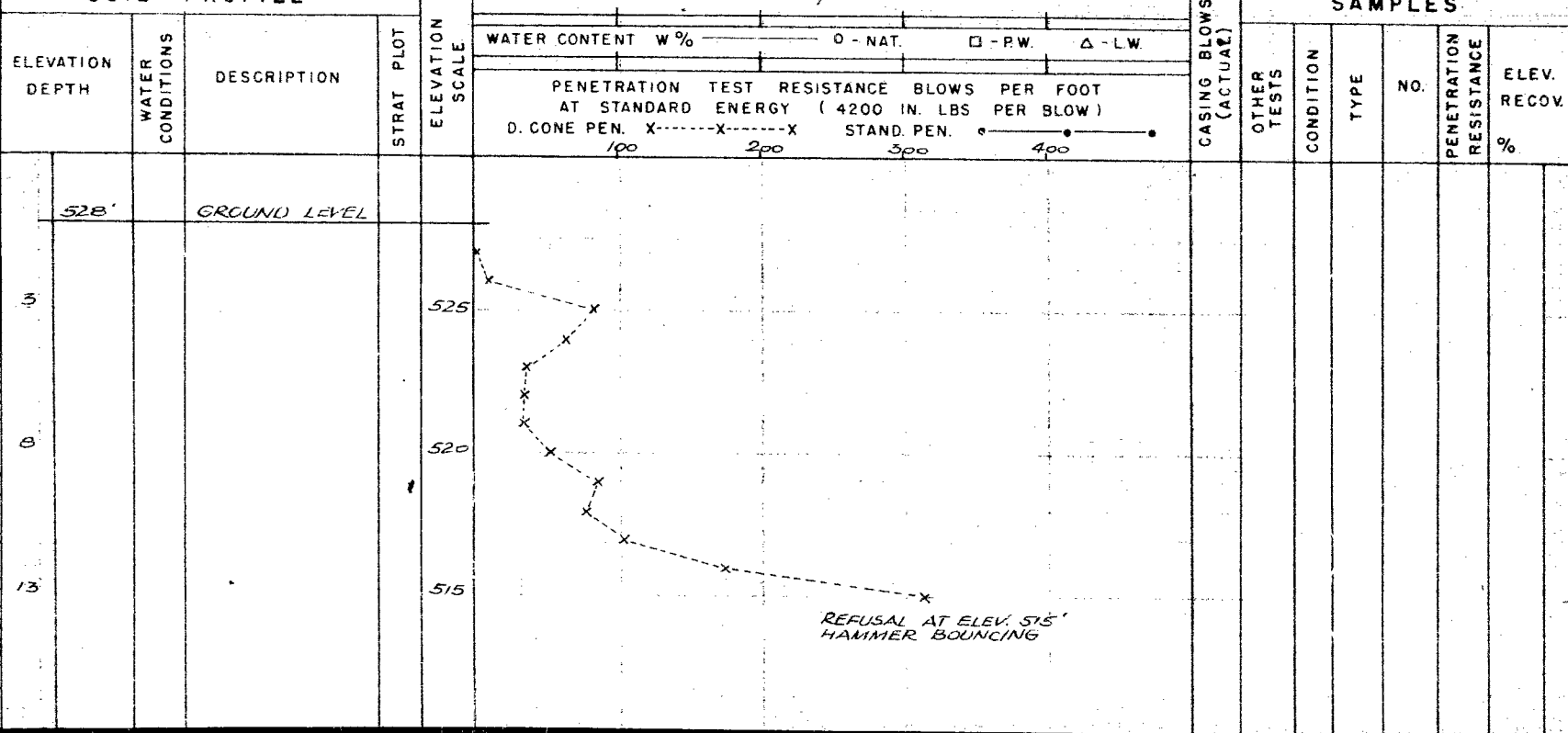
C.S. - CHUNK S.S. - SLEEVE SAMPLE
 D.O. - DRIVE OPEN P.S. - PISTON SAMPLE
 D.F. - DRIVE FOOT VALVE W.S. - WASHED SAMPLE
 T.O. - THIN WALLED OPEN R.C. - ROCK CORE

SAMPLE CONDITION



- DISTURBED
 - FAIR
 - GOOD
 - LOST

SOIL PROFILE



OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-1 OPERATION BORE & PENET'N
CASING 8X (standard samplers to fit unless noted)
SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES

JOB F-57-38 W.P. 89-57
 DATUM GEODETIC
 COMPILED BY H.S. CHECKED BY A.L.

BORING 3 STA. 63+80(49'IT.)
DATE REPORT NOV. 1957
DATE BORING 1 OCT. 1957

ABBREVIATIONS

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

[illegible]

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

DRILL RIG 54-1 OPERATION PENETRATION JOB F-57-38 W.P. 89-57 BORING 4 STA. 63+10 (37' RT.)
 CASING Bx (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT NOV. 1957
 SAMPLER HAMMER WT. 250 LBS. DROP 19 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 2 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

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

SAMPLE CONDITION



- DISTURBED
 - FAIR
 - GOOD
 - LOST

SOIL PROFILE

SAMPLES

