

#57-F-4

W.P.#706-56

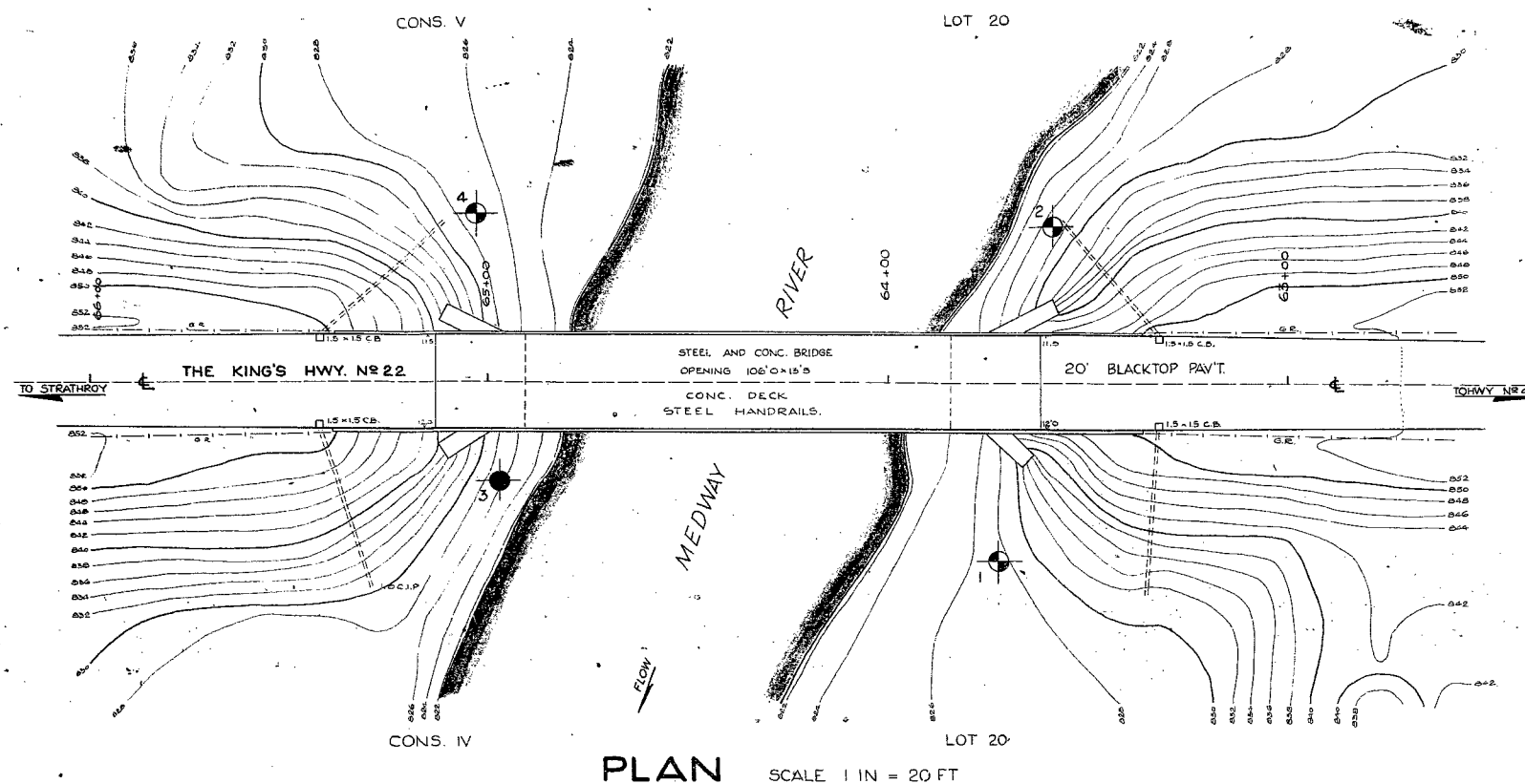
Hwy. #22

MEDWAY RIVER

CROSSING

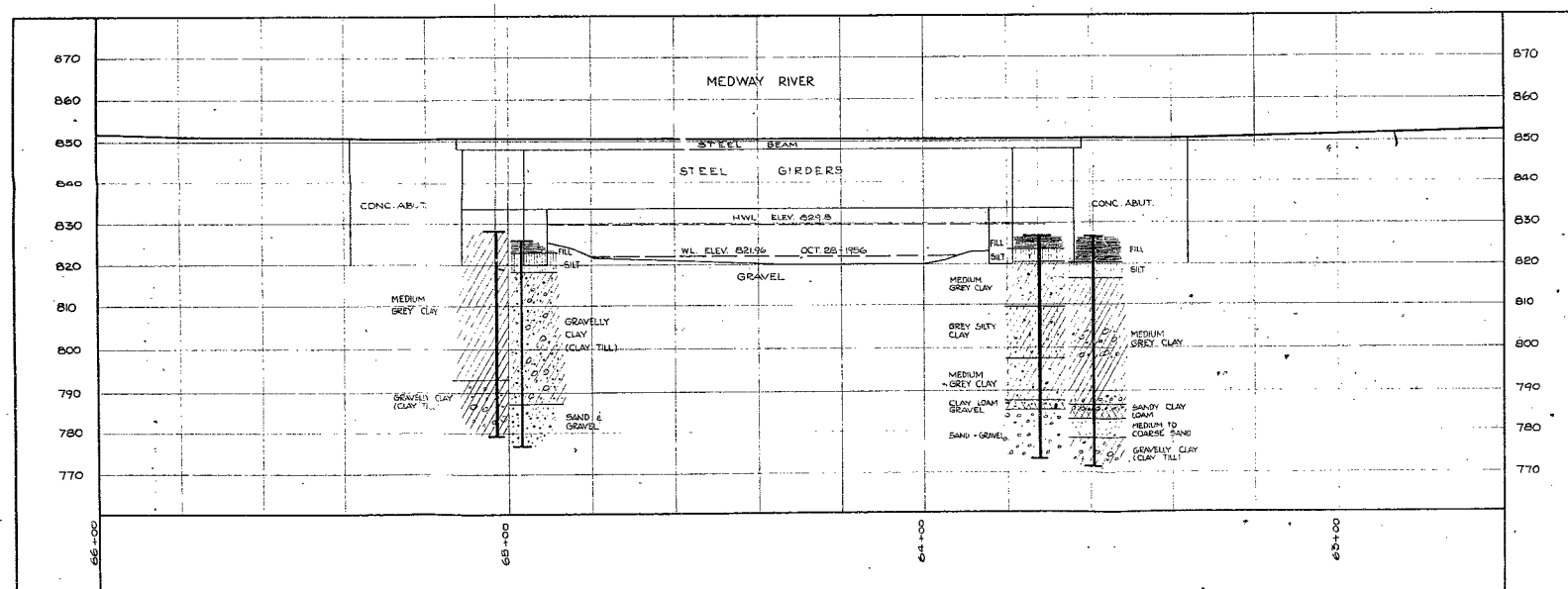
LONDON





| LEGEND | | | |
|-------------------------|-----------|---------|---------------|
| BORE HOLES | | | |
| PENETRATION HOLE | | | |
| BORE & PENETRATION HOLE | | | |
| HOLE NO. | ELEVATION | STATION | DISTANCE FROM |
| 1 | 827.4' | 63+72' | 45' LT. |
| 2 | 826.3' | 63+59' | 39' RT. |
| 3 | 826.1' | 64+97' | 25' LT. |
| 4 | 828.2' | 65+03' | 42' 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.



| | | | |
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| DEPARTMENT OF HIGHWAYS - ONTARIO | | | |
| MATERIALS & RESEARCH SECTION - DOWNSVIEW | | | |
| MEDWAY RIVER CROSSING | | | |
| 1 MILE WEST OF MASONVILLE | | | |
| THE KING'S HIGHWAY No. 22 | | DIV. No. 2 | |
| CO. MIDDLESEX | | | |
| TWP. LONDON | LOT 20 | CON. IV & V | |
| POSITION & ELEVATION OF HOLES | | | |
| APPROVED | | | |
| ENGINEER | | CHIEF ENGINEER | |
| DESIGN | CHECK | CONTRACT NUMBERS | V.P. |
| DRAWING | D.F. | 706-56 | |
| TRACING | CHECK | LOADING | BRIDGE NUMBER |
| DATE APRIL 16, 1957 | | F 57-4-A | |

Mr. A. Toye.

June 28th, 1957.

Bridge Engineer.

Re: Foundation Report -

Mr. F.C. Brownridge.

Medway River Crossing. Hwy #22.

R.P. 706-56. Station 64/40.

R.J. F-57-4

We are forwarding herewith two copies of the above mentioned Foundation Report. In view of the fairly dense till it appears that a spread footing foundation will be satisfactory.

While it is not obvious that scouring action appears to be serious at this location, nevertheless the high water level would indicate that this factor should be considered in the design.

F.C. BROWNBRIDGE.
Materials & Research Engineer.

Per;



A. RUTKA.
Principal Soils Engineer.

c.c. Mr. H. Tregaskes.
Mr. D.G. Ramsay.
Mr. W.L. Fraser.
Foundation Section.
File.

FOUNDATION REPORT

On

New Bridge at Highway No. 22
and Medway River Crossing --
some 7 miles west of London.

Site Plan No.: 22 A-5

Station: 64/40

Distribution:

Mr. A. Toye,
Bridge Engineer (2)

Mr. H. Tregaskes,
Construction Engineer (1)

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

Mr. W. L. Fraser,
District Engineer, (1)
London, Ontario.

Foundation Section (1)

File (1)

W. J. F-57-4

W. P. 706-56

INTRODUCTION:

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

The location is some 7 miles west of London where Highway No. 22 crosses the Medway River.

The new structure is meant to replace the existing one in the same location. The present bridge is single span slab reinforced with additional trusses underneath and is supported on old pier abutments. The pier abutments do not show any settlement cracks. The flow of the water is very slow and there is no indication of any substantial scouring action near the existing piers.

The work started on 22 January 1957 and was completed on 23 February 1957.

PROCEDURE:

The subsoil investigation was made by means of a skid-mounted core drill machine.

Four boreholes were made, two on each side of the river. The location of the boreholes is shown on Drawing F-57-4A and the elevations on log sheets under Appendix I.

SUBSOIL FINDINGS AND ANALYSIS:

The terrain is till plain. The flow of the river is slow. At times of flood season the water level rises some 8 ft.

The subsoil investigations revealed the following stratigraphy.

SUBSOIL FINDINGS AND ANALYSIS: (cont'd.)

The top layer is fill material under which a layer of silt of 4 ft. depth was encountered in the boreholes No. 1, 2 and 3. Underlying this layer is bouldery clay till layer. This layer is underlain by very compact gravel and sand layer. The boring was carried down some 50 ft. and, in the absence of any bedrock, drilling was stopped. In boreholes No. 1 and 2 at elevation about 784 ft. some artesian water was encountered. The presence of underground water was observed in boreholes No. 1, 2 and 3 at elevation about 823 ft.; however, this is more likely to be infiltration water in the top layer. The rest of the strata are considered to be impervious.

From the boreholes undisturbed samples were extracted and tested in the laboratory. The results of these tests indicate that the average liquid limit is about 23%, the plastic limit 14%. The natural moisture content is found to be about 13% and its density about 140 p.c.f. The soil is identified as inorganic clay of low plasticity.

The unconfined compression results gave an average value of 2-3 T.s.f. The standard penetration tests showed average 40 blows per foot. From these results the soil can be credited with a 2.5 T.s.f. bearing value.

CONCLUSIONS AND RECOMMENDATIONS:

From the above discussion it follows that:

1. The soil, as a whole, has typical clay till qualities.

cont'd. /3

CONCLUSIONS AND RECOMMENDATIONS: (cont'd.)

2. If spread footing foundations are placed at elevation 816 ft., the layer can provide 2.5 T.s.f. bearing value with a safety factor of 3.
3. At elevation 816 ft. the layer is hard till. Placing the spread footings at this elevation will minimize any hazard of scouring.
4. The approach fill does not present any special problem. The following should be given due consideration:
 - (a) Side slope 2:1 for the fill.
 - (b) Granular soil for fill material.

It would appear advisable to improve the approach grades to the structure by raising the elevation of the new replacing bridge. This raising of the new structure elevation (higher piers?) will not affect the above conclusions about the new foundations.

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 BORING & PENET'N JOB F-57-4 WP 706-56 BORING 1 STA. 63+72 (45' LT)
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT APRIL 1957
SAMPLER HAMMER WT. 250 LBS. (ROP 20 1/2 INCHES) COMPILED BY H.S. CHECKED BY AL DATE BORING JAN. 25, 1957

ABBREVIATIONS

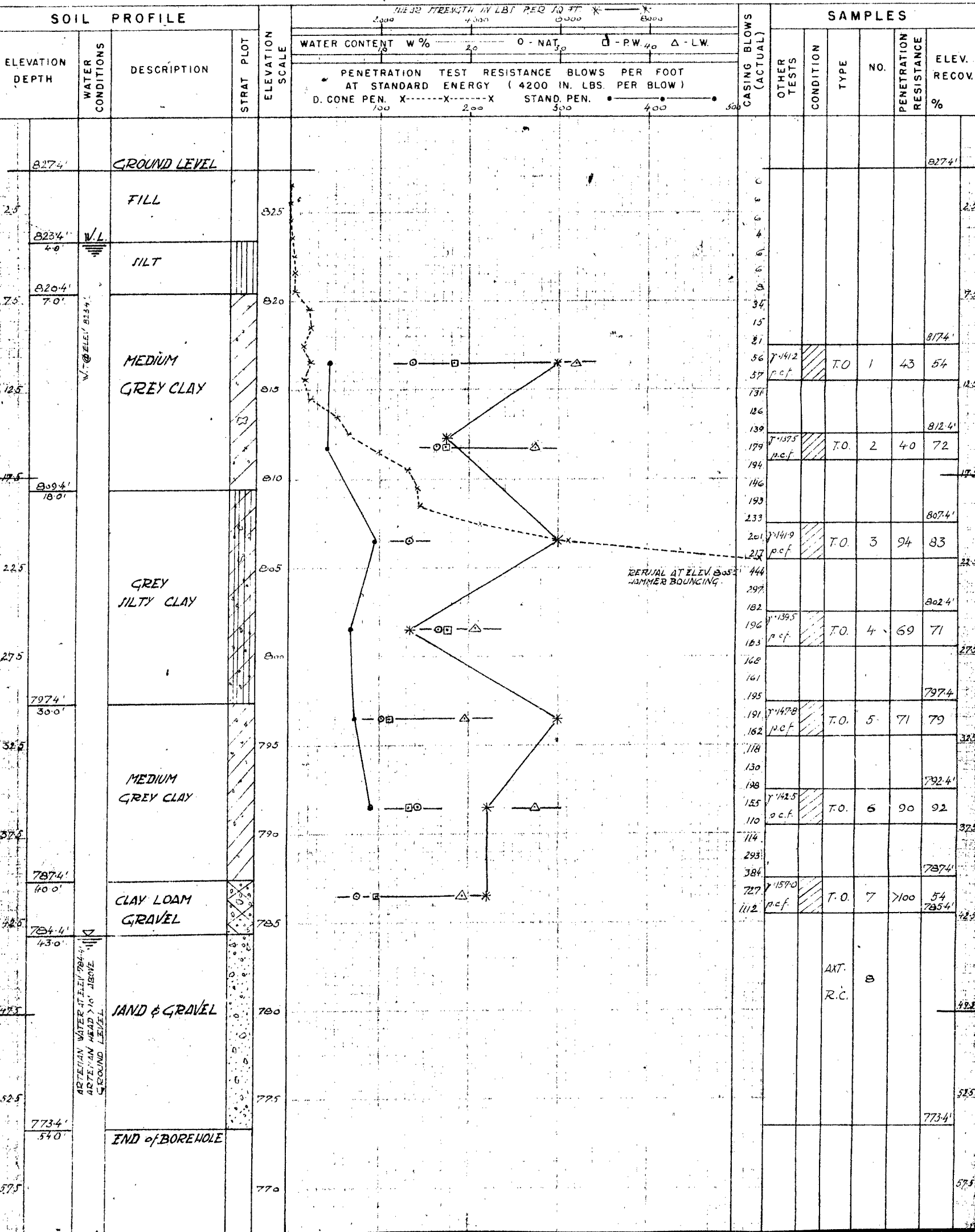
V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
Q_c TRIAXIAL CONSOLIDATED QUICK
Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL
K - PERMIABILITY
C - CONSOLIDATION
CA - CASING
γ - UNIT WEIGHT

SAMPLE TYPES

CS - CHUNK
D.O. - DRIVE OPEN
D.F. - DRIVE FOOT VALVE
T.O. - THIN WALLED OPEN
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 BORE & PENET'N JOB F-57-4 WP 706-56 BORING 2 STA. 63+59.39 (RT)

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

SAMPLER HAMMER WT. 250 LBS. DROP 20 1/4 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING FEB 1957





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

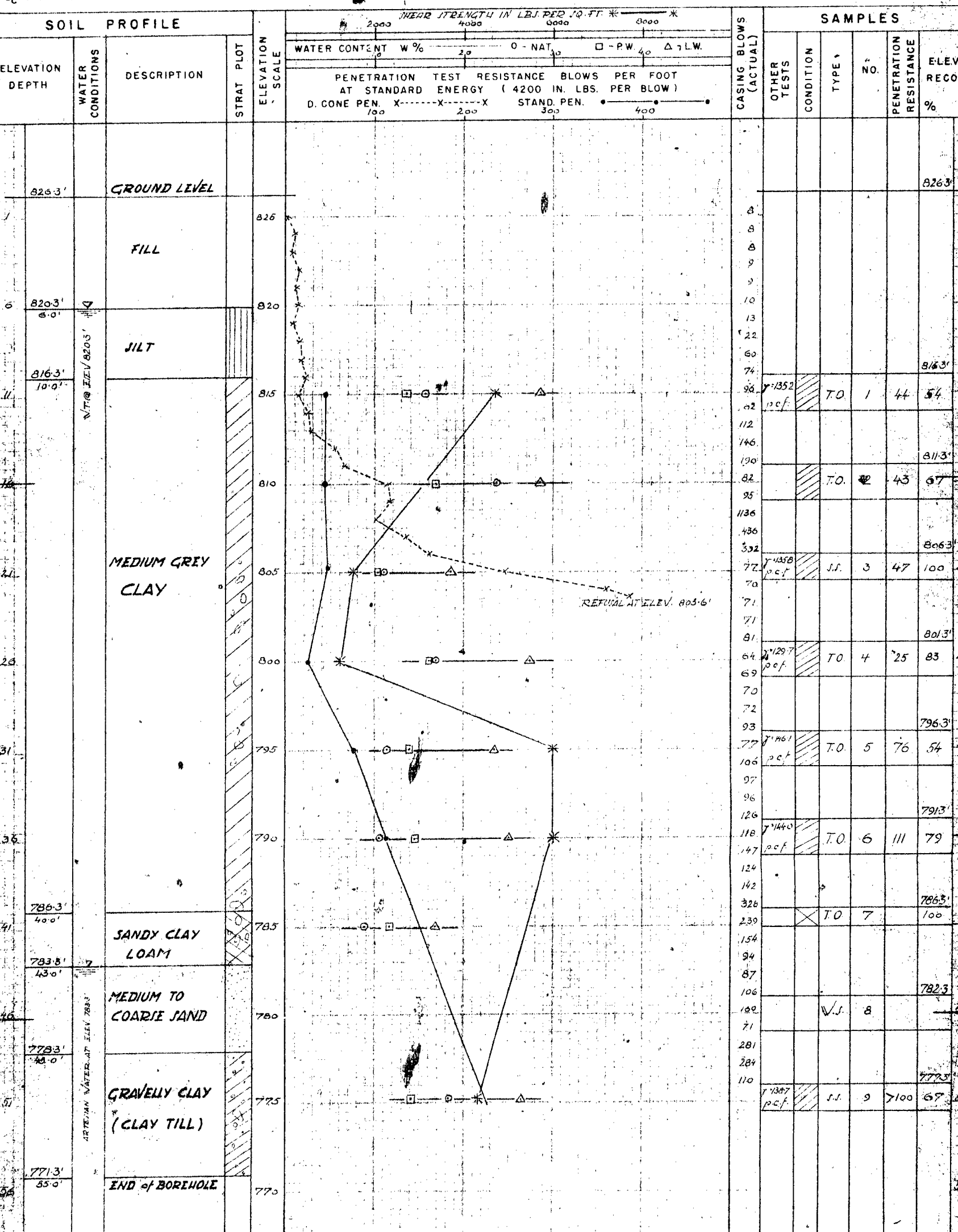
Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL

K - PERMIABILITY
C - CONSOLIDATION
CA - CASING
γ - UNIT WEIGHT

C.S. - CHUNK
D.O. - DRIVE OPEN
D.F. - DRIVE FOOT VALVE
T.O. - THIN WALLED OPEN

SAMPLE TYPES
SS - SLEEVE SAMPLE
PS - PISTON SAMPLE
WS - WASHED SAMPLE
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 BORE JOB F-57-4 WP 706-56 BORING 3 STA. 64+97 (25' LT.)
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT APRIL 1957
SAMPLER HAMMER WT. 250 LBS. DROP 20 1/2 INCHES COMPILED BY H.J. CHECKED BY A.L. DATE BORING 19 FEB. 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

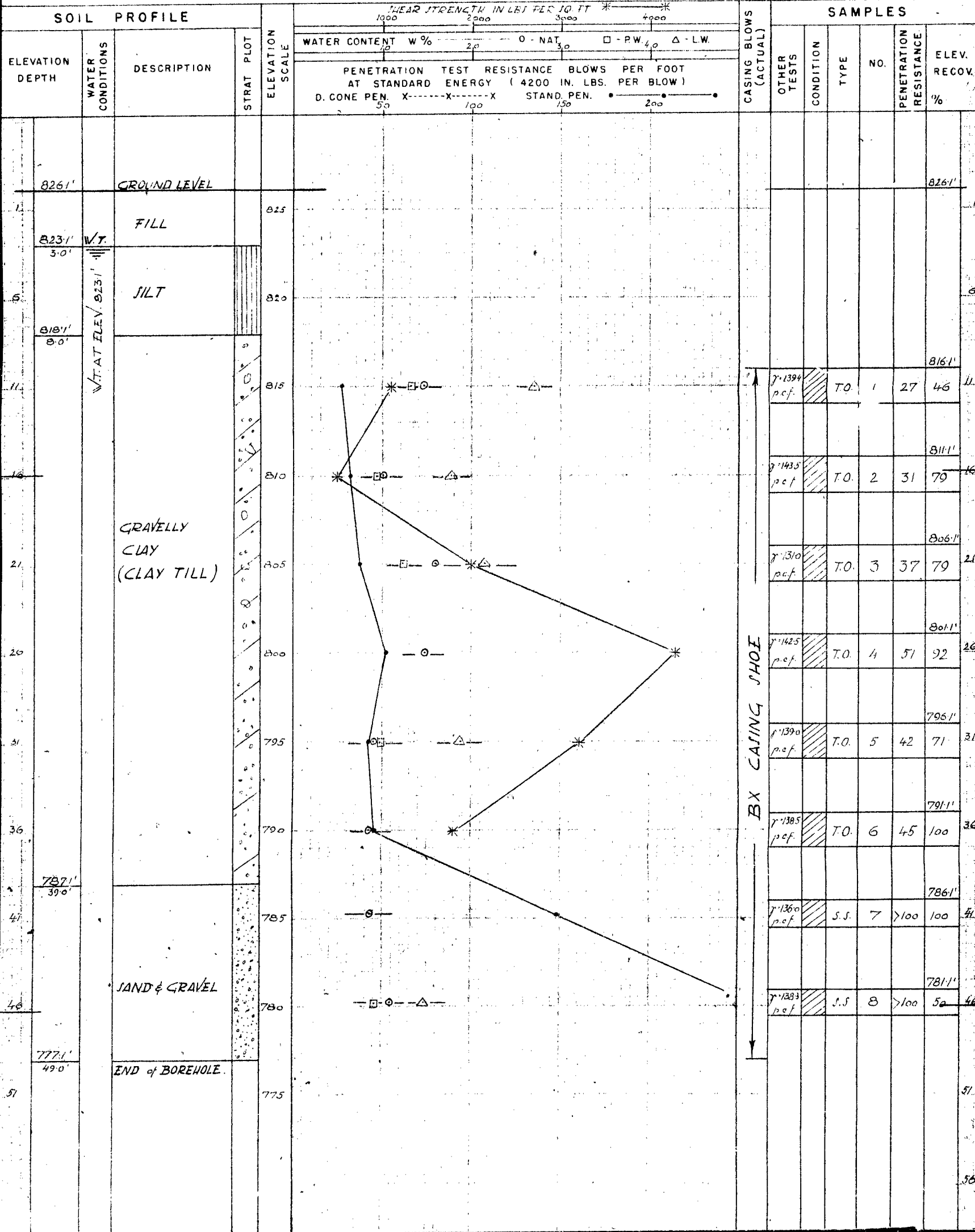
CS - CHUNK SS - SLEEVE SAMPLE
DO - DRIVE OPEN PS - PISTON SAMPLE
DF - DRIVE FOOT VALVE WS - WASHED SAMPLE
TO - THIN WALLED OPEN RC - ROCK CORE

SAMPLE CONDITION



- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE



DRILL RIG 54-1 OPERATION BORING PENIT'N JOB F-57-4 W.P. 706-56 BORING 4 STA. 65+03 (42' RT)
CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT APRIL 1957
SAMPLER HAMMER WT. 250 LBS. DROP 20 1/2 INCHES COMPILED BY H.J. CHECKED BY A.L. DATE BORING FEB. 1957

ABBREVIATIONS

SAMPLE TYPES

SAMPLE CONDITION

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

| SOIL PROFILE | | | | SAMPLING | | | |
|--------------------|---------------------|-------------|-------------|---|-------|-----------|------|
| ELEVATION DEPTH | WATER CONDITIONS | DESCRIPTION | STRAT. FLOT | SAMPLING | | | |
| | | | | ELEVATION SCALE | TESTS | CONDITION | TYPE |
| | | | | PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW) | | | |
| | | | | D. CONE PEN. X-----X-----X STAND. PEN. •-----•-----• | | | |
| | | | | WATER CONTENT W% 0 - NAT. □ - P.W. Δ - L.W. | | | |
| | | | | SHEAR STRENGTH IN LBS. PER SQ. FT. *-----* | | | |
| | | | | C. CASING BLOWS (ACTUAL) | | | |
| | | | | OTHER TESTS | | | |
| | | | | NO. | | | |
| | | | | PENETRATION RESISTANCE | | | |
| | | | | ELEV. RECOVER % | | | |
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