

54-F-34

Hwy. # 6

BELL CREEK &

C.P.R. CROSSING

TL 119
54-00

MATERIALS LABORATORY - DEPARTMENT OF HIGHWAYS - ONTARIO
OFFICE REPORT ON SOIL EXPLORATION

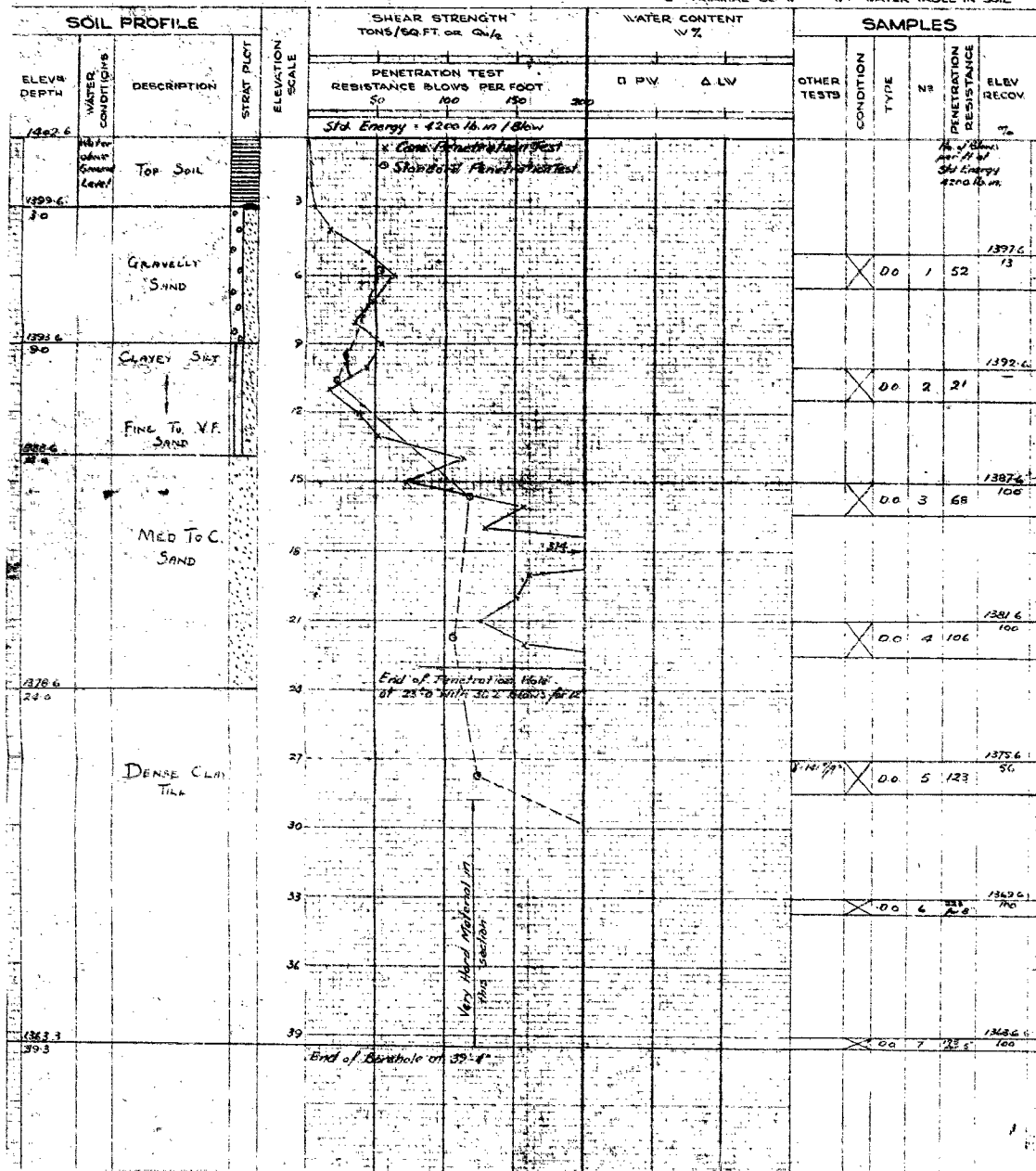
DRILL RIG: *CONC. DRILL NO. 2*
CASING: *2 1/2" (STANDARD SAMPLERS TO FIT UNLESS NOTED)*
SAMPLER HAMMER WT: *250*
DROP: *25 INCHES*

JOB: *F-54-34*
DATUM: *100' (11667.45' ELEVATION)*
COMPILED BY: *B.H.* CHECKED BY: *B.H.*
BORING NO: *1*
DATE REPORT: *8 April 1955*
BORING DATE: *4-6 April 1955*

SAMPLE CONDITION
DISTURBED
GOOD
LOST

SAMPLE TYPES
CS - CHUNK
DO - DRIVE OPEN
DF - DRIVE FOOT VALVE
TC - THIN WALLED OPEN
WS - WASHED SAMPLE
RC - ROCK CORE

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



TL 119
54-00

MATERIALS LABORATORY - DEPARTMENT OF HIGHWAYS - ONTARIO
OFFICE REPORT ON SOIL EXPLORATION

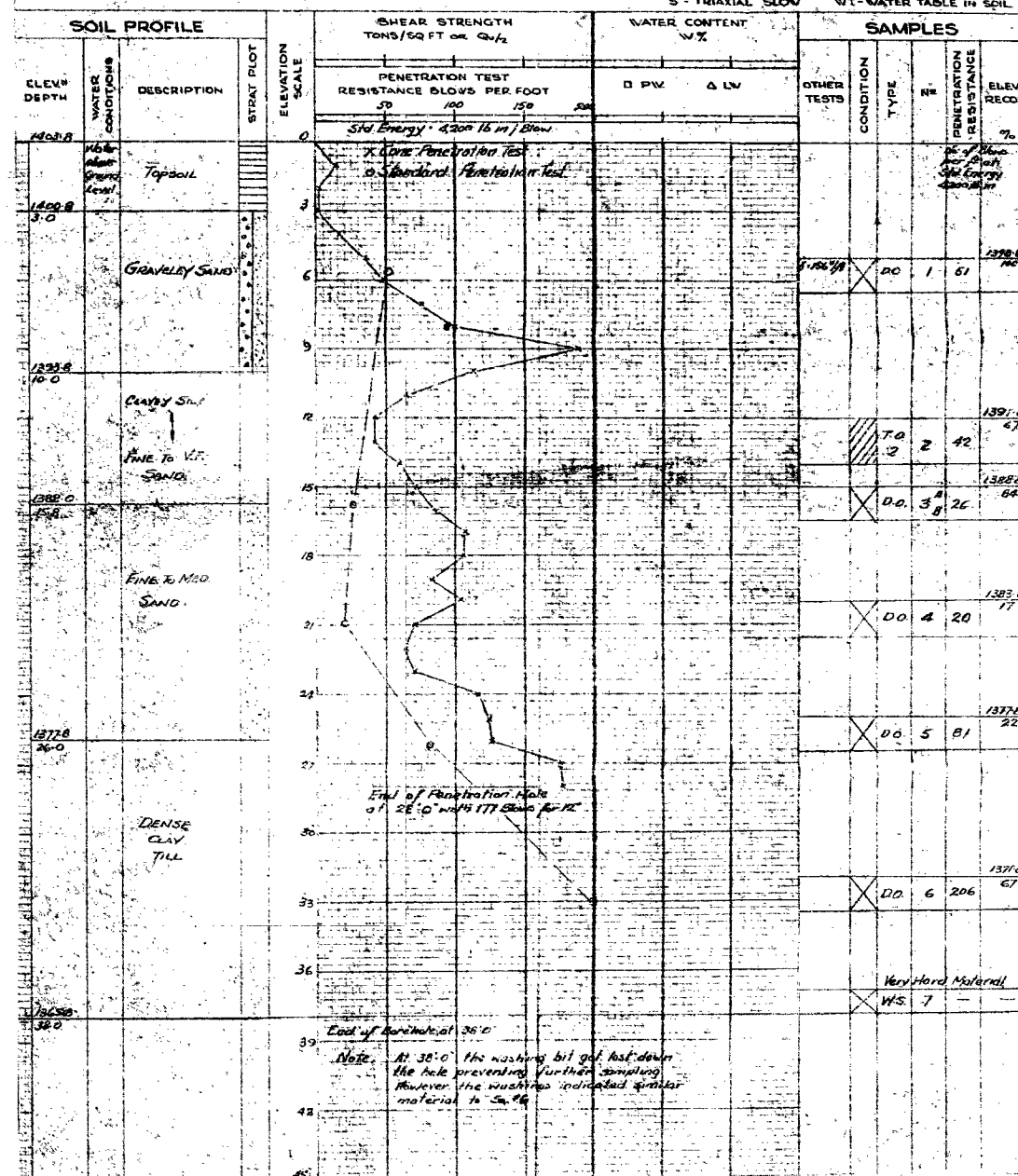
DRILL RIG: *CONC. DRILL NO. 2*
CASING: *2 1/2" (STANDARD SAMPLERS TO FIT UNLESS NOTED)*
SAMPLER HAMMER WT: *250*
DROP: *25 INCHES*

JOB: *F-54-34*
DATUM: *100' (11667.45' ELEVATION)*
COMPILED BY: *B.H.* CHECKED BY: *B.H.*
BORING NO: *4*
DATE REPORT: *31 April 1955*
BORING DATE: *21 April 1955*

SAMPLE CONDITION
DISTURBED
GOOD
LOST

SAMPLE TYPES
CS - CHUNK
DO - DRIVE OPEN
DF - DRIVE FOOT VALVE
TC - THIN WALLED OPEN
WS - WASHED SAMPLE
RC - ROCK CORE

ABBREVIATIONS
V - INSITU VANE SHEAR TEST
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Z - UNIT WEIGHT
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CA - CASING
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL



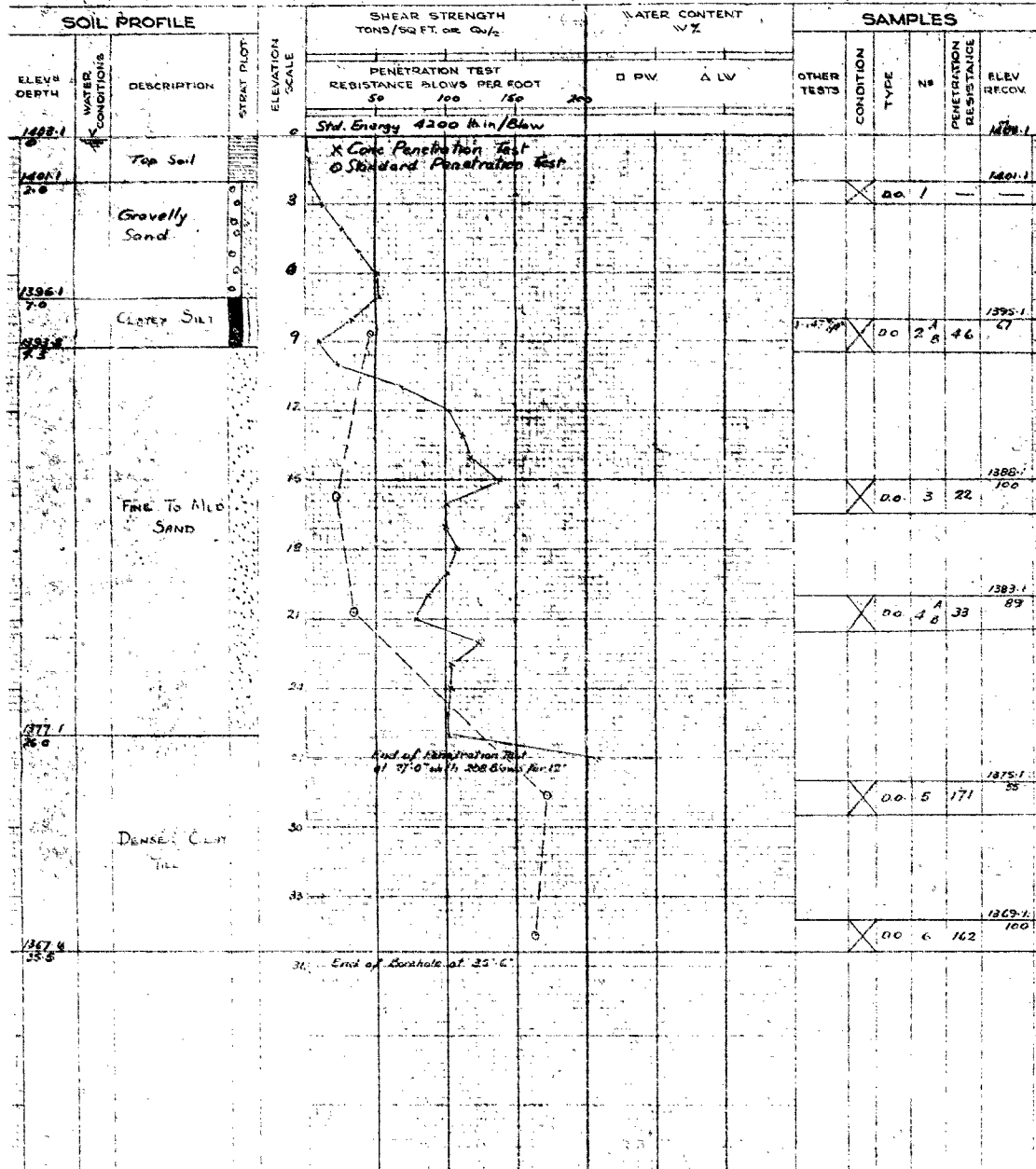
MATERIALS LABORATORY-DEPARTMENT OF HIGHWAYS - OHT 210
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG *CORE DRILL #2* JOB *F54-34* BORING NO. *6*
CASING *BX* (STANDARD SAMPLERS TO FIT UNLESS NOTED) DATUM *505.20' LT NO. 145° E. 1403.1* DATE REPORT *14 April 1965*
SAMPLER HAMMER WT. *250* INCHES COMPILED BY *B.H.* CHECKED BY *W.W.* BORING DATE *12 April 1965*

SAMPLE CONDITION
DISTURBED
GOOD
LOST

SAMPLE TYPES
CS - CHUNK
DO - DRIVE OPEN
UF - DRIVE FOOT VALVE
TO - THIN WALLED OPEN
WS - WASHED SAMPLE
RC - ROCK CORE

ABBREVIATIONS
V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
Qc - TRIAXIAL CONSOLIDATED QUICK
Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
K - PERMEABILITY
C - CONSOLIDATION
CA - CASING
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL



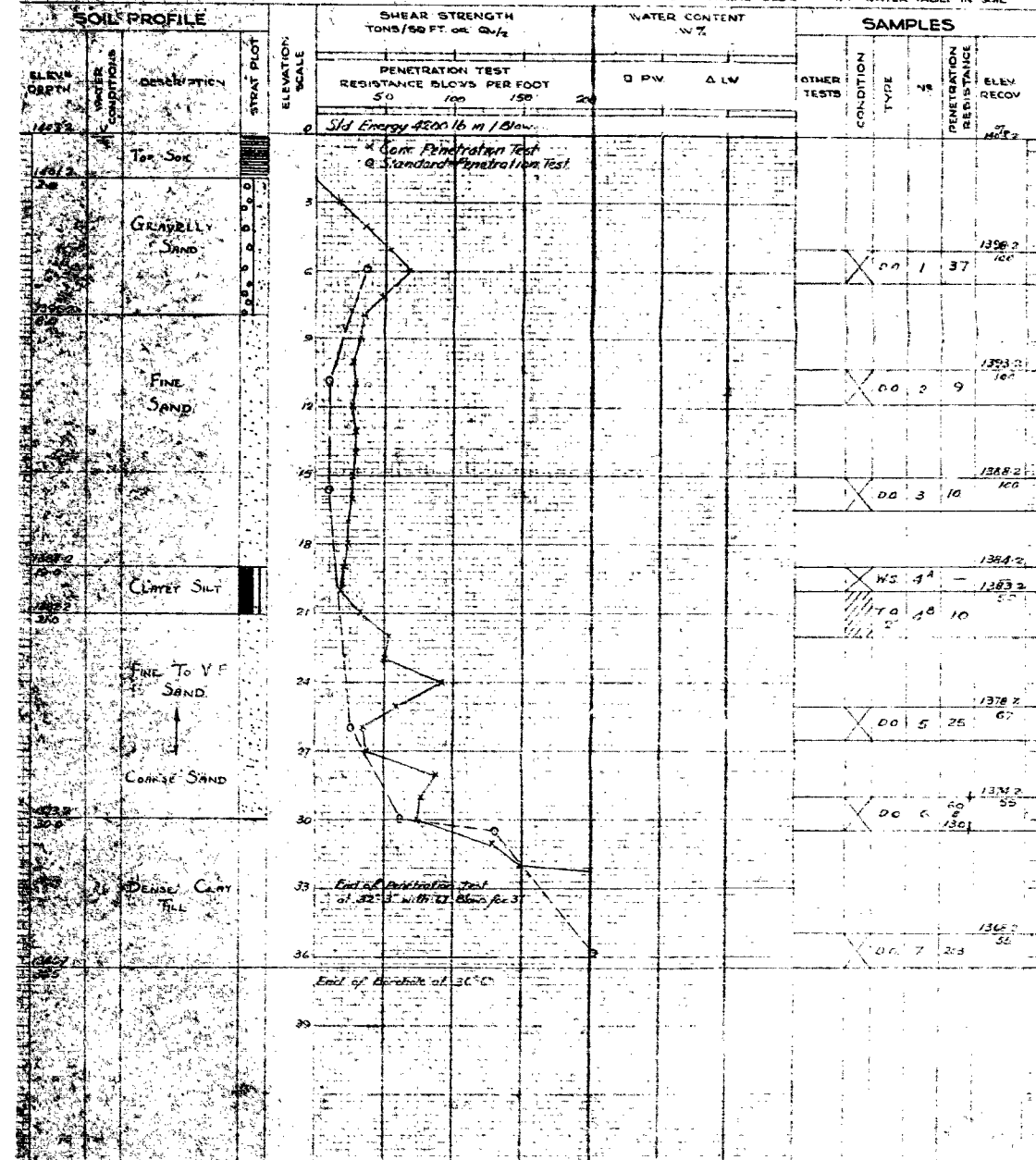
MATERIALS LABORATORY-DEPARTMENT OF HIGHWAYS - OHT 210
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG *CORE DRILL #2* JOB *F54-34* BORING NO. *10*
CASING *BX* (STANDARD SAMPLERS TO FIT UNLESS NOTED) DATUM *505.20' LT NO. 145° E. 1403.2* DATE REPORT *13 April 1965*
SAMPLER HAMMER WT. *250* INCHES COMPILED BY *B.H.* CHECKED BY *W.W.* BORING DATE *12 April 1965*

SAMPLE CONDITION
DISTURBED
GOOD
LOST

SAMPLE TYPES
CS - CHUNK
DO - DRIVE OPEN
UF - DRIVE FOOT VALVE
TO - THIN WALLED OPEN
WS - WASHED SAMPLE
RC - ROCK CORE

ABBREVIATIONS
V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
Qc - TRIAXIAL CONSOLIDATED QUICK
Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
K - PERMEABILITY
C - CONSOLIDATION
CA - CASING
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL



SL 115
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MATERIALS LABORATORY - DEPARTMENT OF HIGHWAYS - ONTARIO
OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG CORR. CELL No 2
CASING 2X (STANDARD SAMPLERS TO FIT UNLESS NOTED)
SAMPLER HAMMER WT 350

JOB F54-34

DATUM 506.14

COMPILED BY B.H.

BORING NO 13

DATE REPORT 18th April 1955

BORING DATE 14-17 April 1955

SAMPLE CONDITION



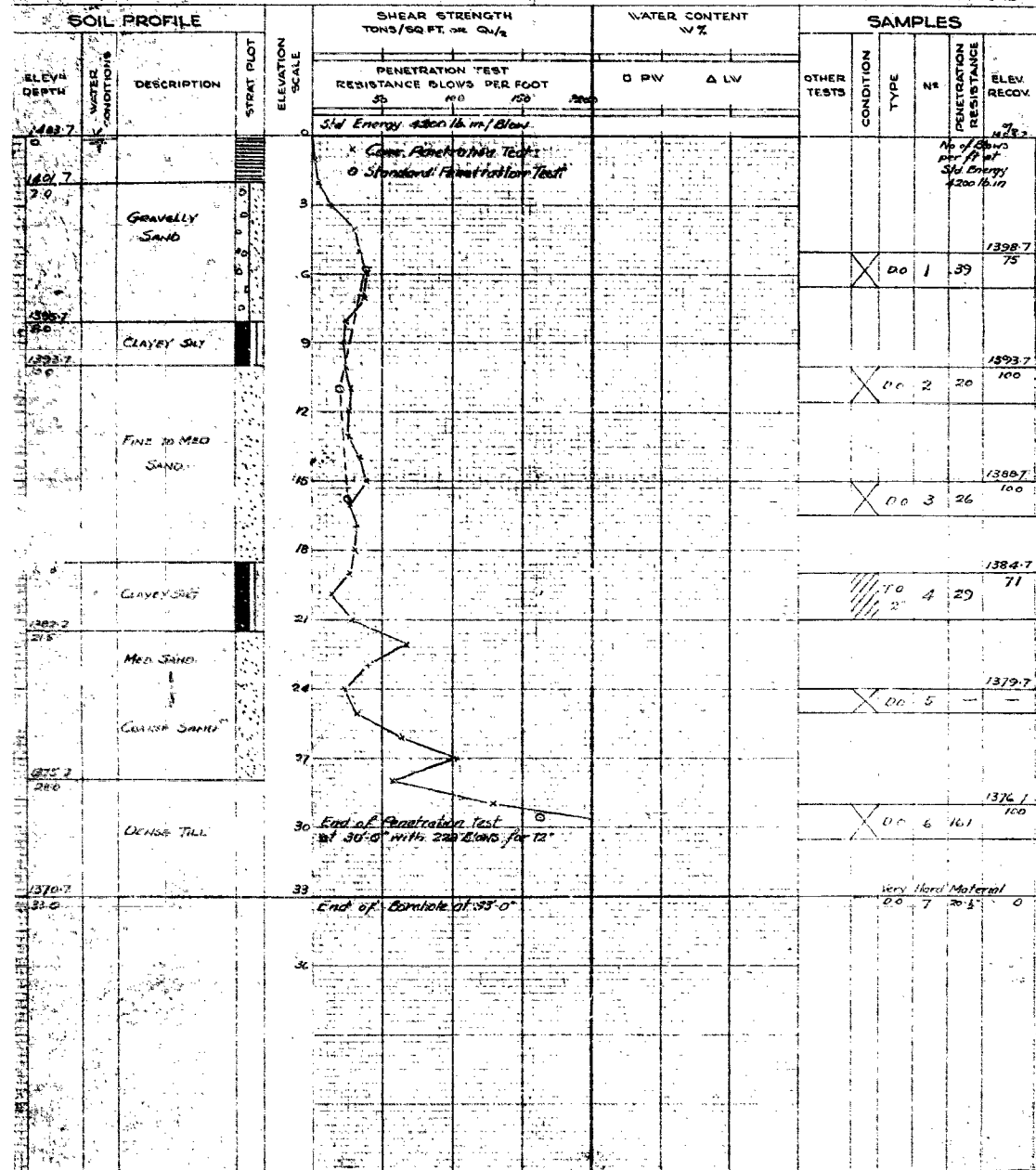
CS - CHUNK
DO - DRIVE OPEN
DF - DRIVE FOOT VALVE
TO - THIN WALLED OPEN

SAMPLE TYPES

WS - WASHED SAMPLE
RC - ROCK CORE

ABBREVIATIONS

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



DRILL RIG COME DRILL 4"
 CASING 4" (STANDARD SAMPLERS TO FIT UNLESS NOTED)
 SAMPLER HAMMER WT 250 • DROP INCHES

JOB F54-34 BORING NO. 16
 DATUM 506+66 L106+45 FI 106+7 DATE REPORT 27 APRIL 1955
 COMPILED BY B.H. CHECKED BY W.W. BORING DATE 23-24 April 1955

SAMPLE CONDITION


 DISTURBED
 GOOD
 LOST

SAMPLE TYPES

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

ABBREVIATIONS

V-INSITU VANE SHEAR TEST γ-UNIT WEIGHT
M-MECHANICAL ANALYSIS Kc-PERMEABILITY
U-UNCONFINED COMPRESSION Cc-COMPACTION
Qc-TRIAXIAL CONSOLIDATED QUICK CA-CASING
Q-TRIAXIAL QUICK WL-WATER LEVEL IN CASING
S-TRIAXIAL SLOW WT-WATER TABLE IN SOIL

DRILL RIG COKE DRILL No 2
CASING ØX (STANDARD SAMPLERS TO FIT UNLESS NOTED)
SAMPLER HAMMER WT 250 # DROP INCHES

JOB F54-34 BORING No. 20
 DATUM 506+65 RL 11' at 135° E. 406.3 DATE REPORT 24 April 1955
 COMPILED BY BH CHECKED BY W. W. Waring BORING DATE 20-22 Apr 1955

SAMPLE CONDITION



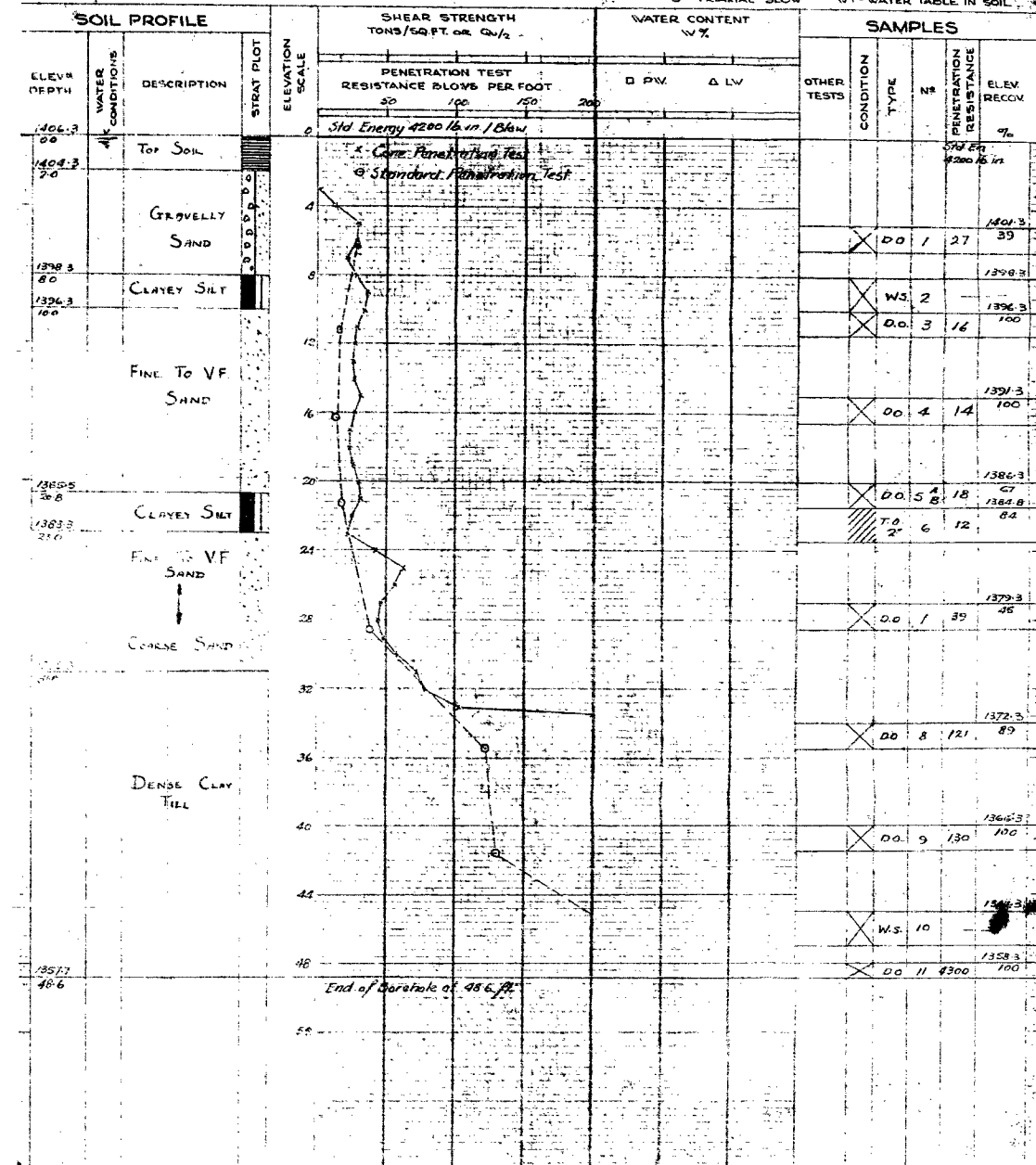
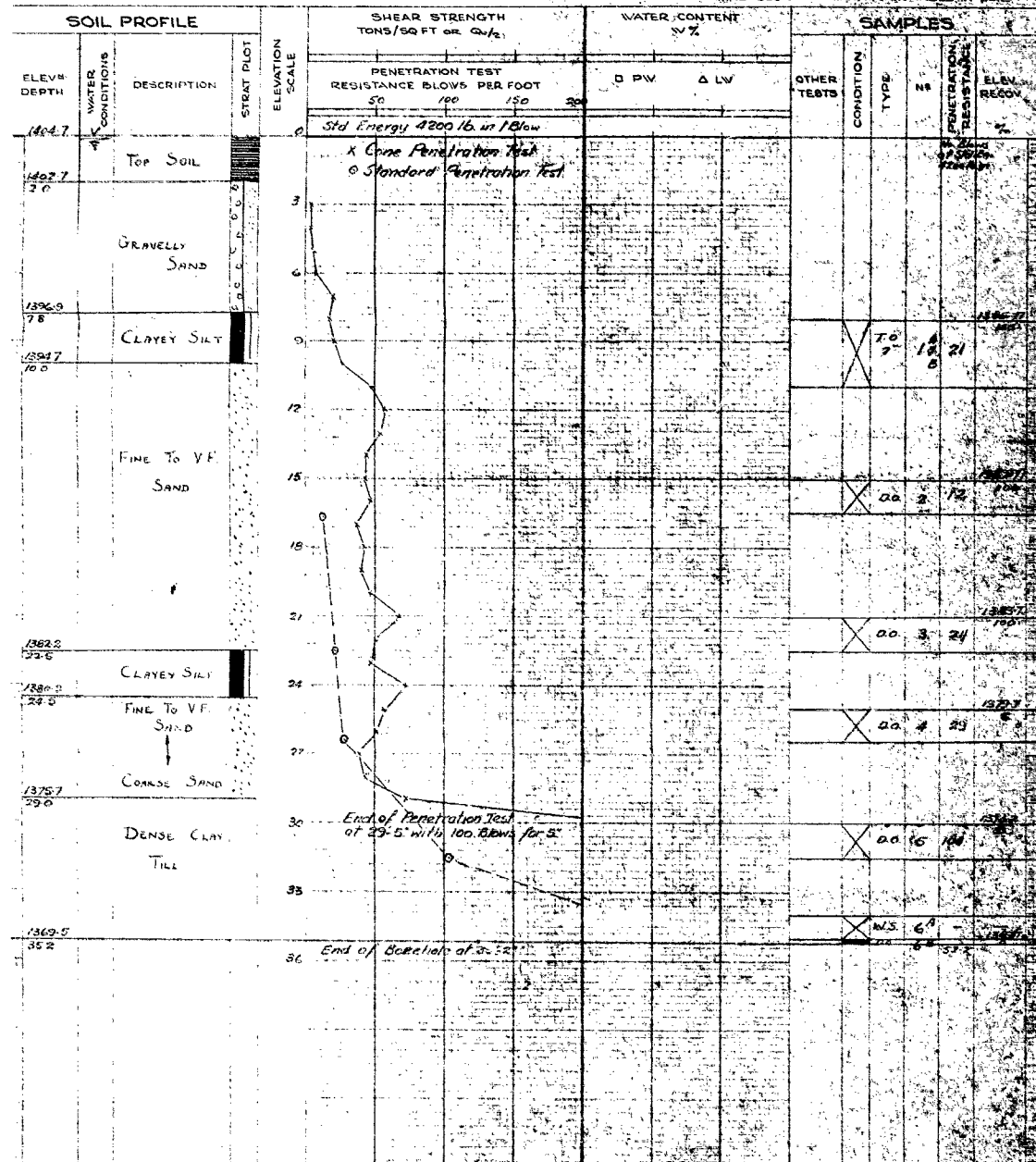
DISTURBED
GOOD
LOST

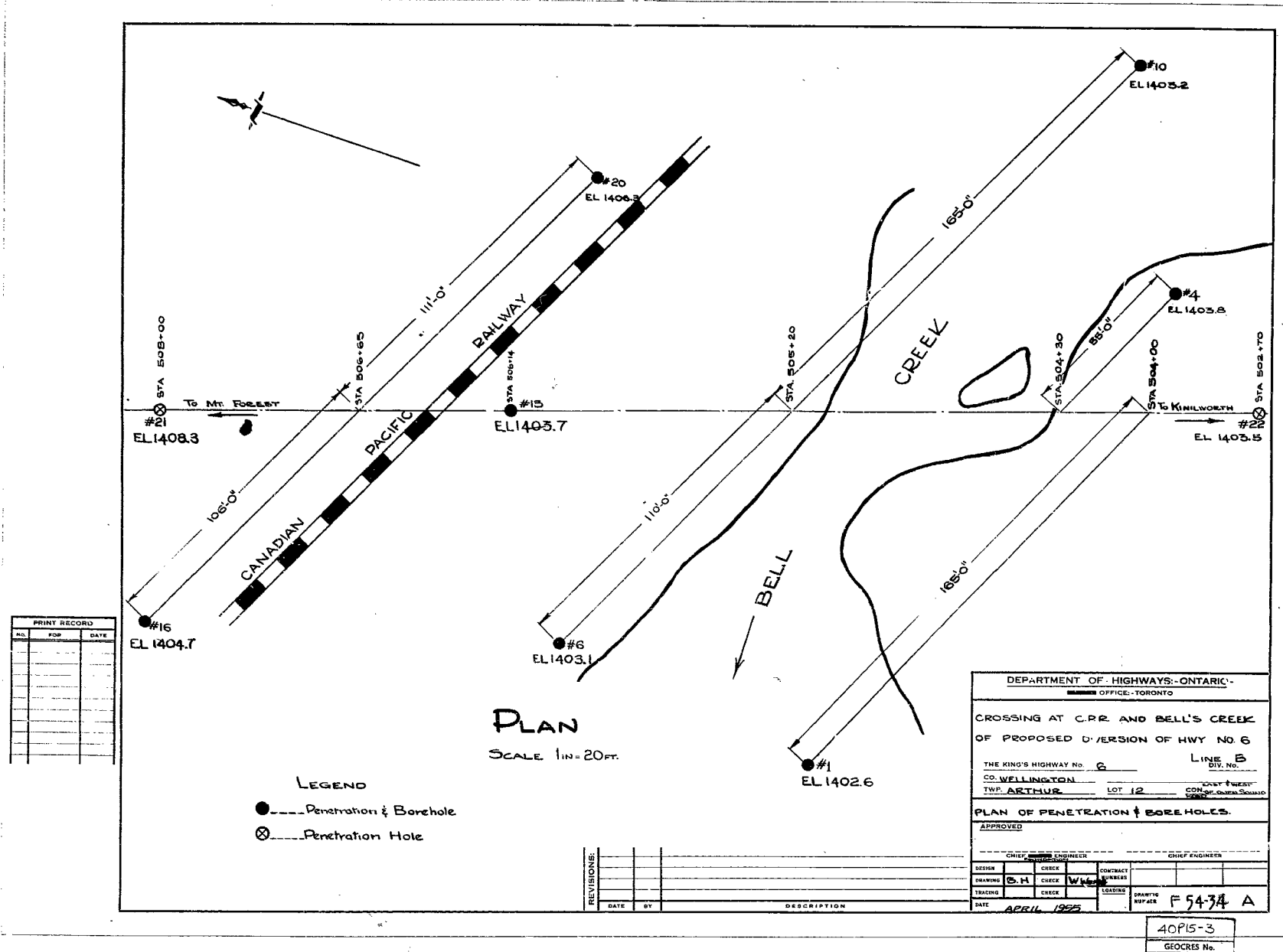
SAMPLE TYPES

C.S - CHUNK
DO - DRIVE OPEN
DF - DRIVE FOOT VALVE
TO - THIN WALLED OPEN

ABBREVIATIONS

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





B.A 435

Report of Foundation Investigation for
Bell Creek
and
C.P.R. Crossing
on Highway No. 6.

Copies to:

Bridge Eng. (2)
Const. Eng. (1)
Div. Eng. (Stratford) (1)
G. Farantatos (1)
File (1)

Project F-54-34

INTRODUCTION:

A bridge is to be built over the Bell Creek, 2 miles South of the Town of Mount Forest.

There is also a C.P.R. overpass to be constructed about 150 feet from the creek.

A subsurface investigation was carried out to determine the best founding method for the two above proposed bridges.

This report includes recommendations for both the bridge sites over the Bell Creek and C.P.R. Crossing.

BELL CREEK SITE

PROCEDURE:

The soil investigation started on March 31st and ended April 21st.

Four boreholes, each one with a dynamic penetration test, were done. The log of the boreholes and their locations are shown on Appendix I and plan F-54-34A respectively.

ANALYSIS OF TEST RESULTS & RECOMMENDATIONS:

As is shown in Appendix I the top 24'-30' of soil is saturated loose sand. Below that is very dense clay till.

Standard penetration tests were run in all the bore holes.

The minimum numbers of blows obtained per foot of penetration for BH #4, #1 and #6 was 20. B.H. #10 gave a minimum penetration of 10.

Calculations for bearing capacity, taking into consideration the position of the water table, give 1 ton per square foot.

A spread footing foundation on fine sand is not recommended.

The sand is liable to scour easily.. On account of the low bearing capacity of the material and its scouring properties, a pile foundation is thought to be more suitable. Wooden piles of a length of 17-21 ft. for the South footing will be sufficient. For the North side a length of 20-25' will be adequate.

The approach embankment could be safely made on a 1;2 slope and there will be no danger of slipping.

CONCLUSIONS:

Due to scour and low bearing capacity of the sand, spread foundation is not recommended.

Wooden piles of a length from 17-21 ft. for the South side and 20-25' for the North side of the creek is recommended.

In a discussion with Mr. Loch, chief Designer at the Bridge Office the undersigned suggested to him that Franki' piles of length 20-25', and each capable of carrying 100 tons, battered or not, be used as foundation for this bridge.

C.P.R. OVERPASS

A total of three boreholes, with one dynamic cone penetration on each was done on this proposed bridge site.

The locations and logs of the boreholes are shown on plan F-54-34A and Appendix II respectively.

ANALYSIS OF TEST RESULTS & RECOMMENDATIONS:

A 29-33' layer of sand mixed with layers of clayey silt overlies a dense clay till layer.

The exact log profile of the boreholes is shown in Appendix II.

Standard penetrations were done, on each borehole and a minimum value of penetration of 12 was obtained in B.H. 16

Calculations on bearing capacity of the sand, taking into consideration the water table, gave a value of 1.2 tons per square foot.

If a pile foundation is to be used, wooden piles of 25-29 ft. long could be used.

CONCLUSION:

For spread footing foundation a bearing load of 1.2 tons per square ft. is recommended.

If piles are preferred, wooden piles of lengths 25-29 feet are recommended.

F.C. Brownridge
Materials & Research Engr.

Per:

GNF:JH

(G.N. Farantatos)

APPENDIX I.

APPENDIX II



ONTARIO

DEPARTMENT OF HIGHWAYS

B.A. 435

Memo to Mr. A. Toye Date July 12, 1955
Bridge Engineer
Subject Foundation Investigation:
From Highways Laboratory, Sheppard Ave. Bell Creek and C.N.R. Highway #6
Project F-54-74.

Attached please find a copy of the report on the subsoil exploration of the above site. One copy of the report has been delivered to Mr. L. Locke.

Because of the low bearing capacity and susceptibility to scour of the sand near the surface, either timber or Franki-piles are recommended for the Bell Creek structure. For the railway structure either spread footings or piles may be used. No slope stability problems are expected.

F. C. Brownridge
Materials and Research Engineer

Per:

Merritt M. Davis
(M. M. Davis)

MMD:GGP
Encl 1

Copies to: Mr. J. Walter
Mr. L. D. Barrett, Stratford
Mr. G. Farantatos
File