

Mr. A. Toye.

November 7th, 1937.

Bridge Engineer.

Materials & Research Section.

Re: Foundation Report on New Bridge at
Highway No. 401 crossing the Oakville
Creek, 2 miles south west of Milton
Heights, county of Halton.
W.P. 32-57. W.J. F-57-26

Attached herewith are two copies of the above mentioned
Foundation Report for your use and information.



A. RUTKA.
Principal Soils Engineer.

c.c. Mr. A. Toye (2)
Mr. H. Tregaskes.
Mr. B. C. Ramsay.
Mr. R. E. Richardson.
Foundation Section.
File.

FOUNDATION REPORT

on

New bridge at Highway No. 401 crossing
the Oakville Creek, 2 miles south west
of Milton Heights, county of Halton.

Plan No. F-3523-13
Station: 131+00

DISTRIBUTION:

Mr. A. Toye Bridge Engineer	(2)
Mr. H. Tregaskes Construction Engineer	(1)
Mr. D. C. Ramsay Design Engineer	(1)
Mr. R. E. Richardson Dist. Eng. Hamilton	(1)
Foundation Section	(1)
File	(1)

W. F. 324-57

W. J. F-57-26

INTRODUCTION:

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

The location is where the new highway 401 crosses Oakville Creek about two miles south west of Milton Heights, Halton county, Township of Nassagaweya, (station 131+00, profile no. F-3523-14).

The work started on 29 July 1957, and was completed on 7 August 1957.

PROCEDURE:

The subsoil investigation was carried out by means of skid mounted coredrill machine. In the course of investigations three boreholes with dynamic cone penetrations and one separate dynamic cone penetration test were made.

The location of the boreholes is shown on plan F-57-26A, and the elevations on log sheets under Appendix 1.

SUBSOIL FINDINGS AND ANALYSIS:

The stream is one of the several tributaries that collect the waters from the slopes of Niagara Escarpment. At this site the terrain is basically "glacial stream deposit." The subsoil investigations revealed that at the site there was no well defined stratification. The soil is sandy loam, containing various amounts of gravel, silt, and clay mixed with sand.

On the western side of the creek the borehole No. 1 shows the subsoil as gravelly sandy loam extending down to elevation 820 ft. Below this down to elevation 808 ft. the

soil is silty loam with some 75% silt and about 23% moisture content. Below this the layer is dense bouldery sand. The findings from borehole No. 2, on the same side of the creek, confirm the same structure of the subsoil.

The borehole No. 3 was made on the other (eastern) side of the creek. Here the ground level is somewhat elevated. From the borehole findings, under the topsoil down to elevation 855 ft., there is a layer of silty loam, with some 60% silt. Below this the soil is gravelly sandy loam. Between elevations 847 to 850 ft. the sand was found to be very fine and having a moisture content of about 30%. However the rest of the findings confirmed the corresponding similarity in the basic structure of the subsoil at this site.

Due to the nature of the soil only disturbed samples could be extracted. From the laboratory tests the soil was classified as indicated on log sheets. Also from these samples the moisture content of the layers were calculated. Besides the relatively high moisture content of silty loam and very fine sand layers mentioned above, the average moisture content for the rest of the subsoil is about 13 - 15%. All attempts for plastic and liquid limit indications failed confirming the dominantly granular nature of the layers.

During the sampling regular standard penetration tests were carried out and the results have been recorded on the log sheets.

The general structure of the subsoil is convenient for spread footing type foundations. However, due to the alluvial nature of the site it appears that it will be necessary to go down to elevation about 842 ft. to find the competent dense layer which will provide a bearing value of

2 T.s.f.

CONCLUSIONS AND RECOMMENDATIONS:

From the above discussion it follows that:

1. The site is glacial stream deposit, made up of mainly granular material in loamy state.
2. The subsoil is convenient for spread footing type of foundations. At about elevation 842 ft. the layer can provide a bearing value of 2 T.s.f.
3. This foresees excavations of some 20 ft. below the ground level, which would necessitate the use of coffer-dam protection while excavating.
4. It would also seem worth while to give consideration to pile foundation support for the structure. A comparative cost analysis would be necessary to choose the type of foundations to be used. In case the use of piles is found to be preferable the piles will have to be driven to refusal and this elevation might be somewhere in the neighbourhood of 808 ft.
5. Due to the alluvial nature of the top layers due consideration should also be given to scouring hazards at this site. Judging from measurements the high water level shows only about 4 ft. rise. Some hundred yards to the north of the site the river is dammed (temporary structure) to provide a swimming pool to the surrounding community people. At the site of the highway crossing the river shows winding tendency due to certain amount of eddying. With a little correction the stream may be straightened. The recommended depth of 842 ft. for placing the spread footing foundations is believed

will take care of the scouring hazards at this site.

6. It is believed that the approach fills to the structure will be placed after removing the topsoil, otherwise the proposed gradeline does not present any stability problem for the approach fills.

V. Korlu





Foundation Engineer.

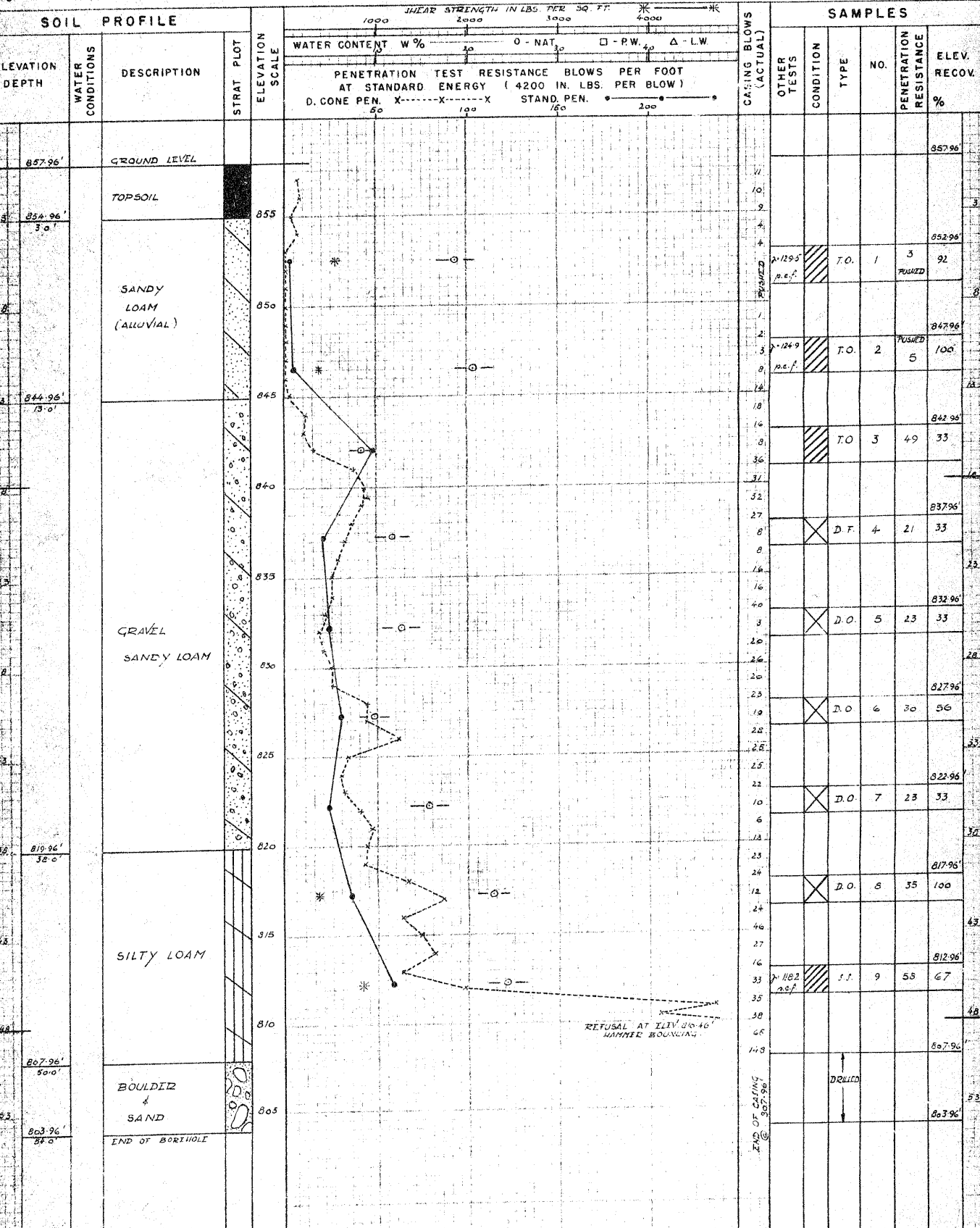
A P P E N D I X 1.

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

DRILL RIG 54-2 OPERATION BORE & PENET'N JOB F-57-26 WP 32-57 BORING 1 STA. 131+78 (50' LT)
CASING BX (standard samplers to fit unless noted.) DATUM GEODETIC DATE REPORT AUG. 1957
SAMPLER HAMMER WT. 250 LBS. DROP 23 INCHES COMPILED BY H.L. CHECKED BY A.L. DATE BORING 30 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 D.O. - DRIVE OPEN PS - PISTON SAMPLE
U - UNCONFINED COMPRESSION WL - WATER LEVEL IN CASING CA - CASING D.F. - DRIVE FOOT VALVE WS - WASHED SAMPLE
Qc - TRIAXIAL CONSOLIDATED QUICK WT - WATER TABLE IN SOIL γ - UNIT WEIGHT T.O. - THIN WALLED OPEN RC - ROCK CORE

 - DISTURBED
 - FAIR
 - GOOD
 - LOST



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OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-2 OPERATION BORE & PENET'N
 CASING BY (standard samplers to fit unless noted)
 SAMPLER HAMMER WT. 250 LBS. DROP 25 INCHES

JOB F-57-26 WP 32-57
 DATUM GEODETIC
 COMPILED BY H.S. CHECKED BY A.L.

BORING 2 STA. 132+36.44 (RT.)
 DATE REPORT AUG. 1957
 DATE BORING 1 AUG. 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

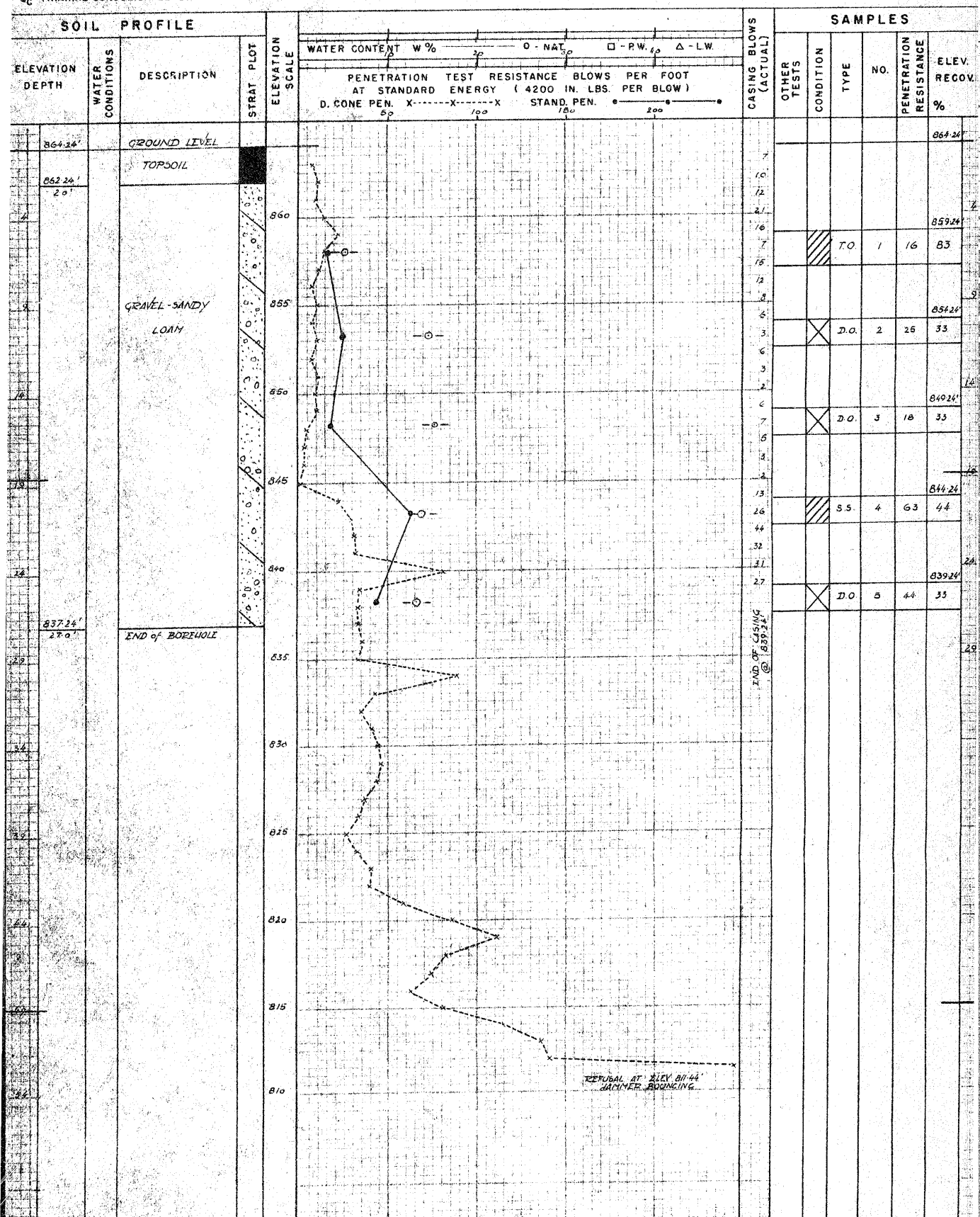
SAMPLE CONDITION



- DISTURBED
 - FAIR
 - GOOD
 - LOST

SOIL PROFILE

SAMPLES



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DRILL RIG 54-2 OPERATION BORE & PENET JOB F 57-26 WP 32-57 BORING 3 STA 130 +59 (45 FT.)
 CASING RY (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG 1957
 SAMPLER HAMMER WT. 250 LBS. DROP 23 INCHES COMPILED BY M.B. CHECKED BY A.L. DATE BORING 6 AUG 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
 Q_c - TRIAXIAL CONSOLIDATED QUICK WT - WATER TABLE IN SOIL γ - UNIT WEIGHT

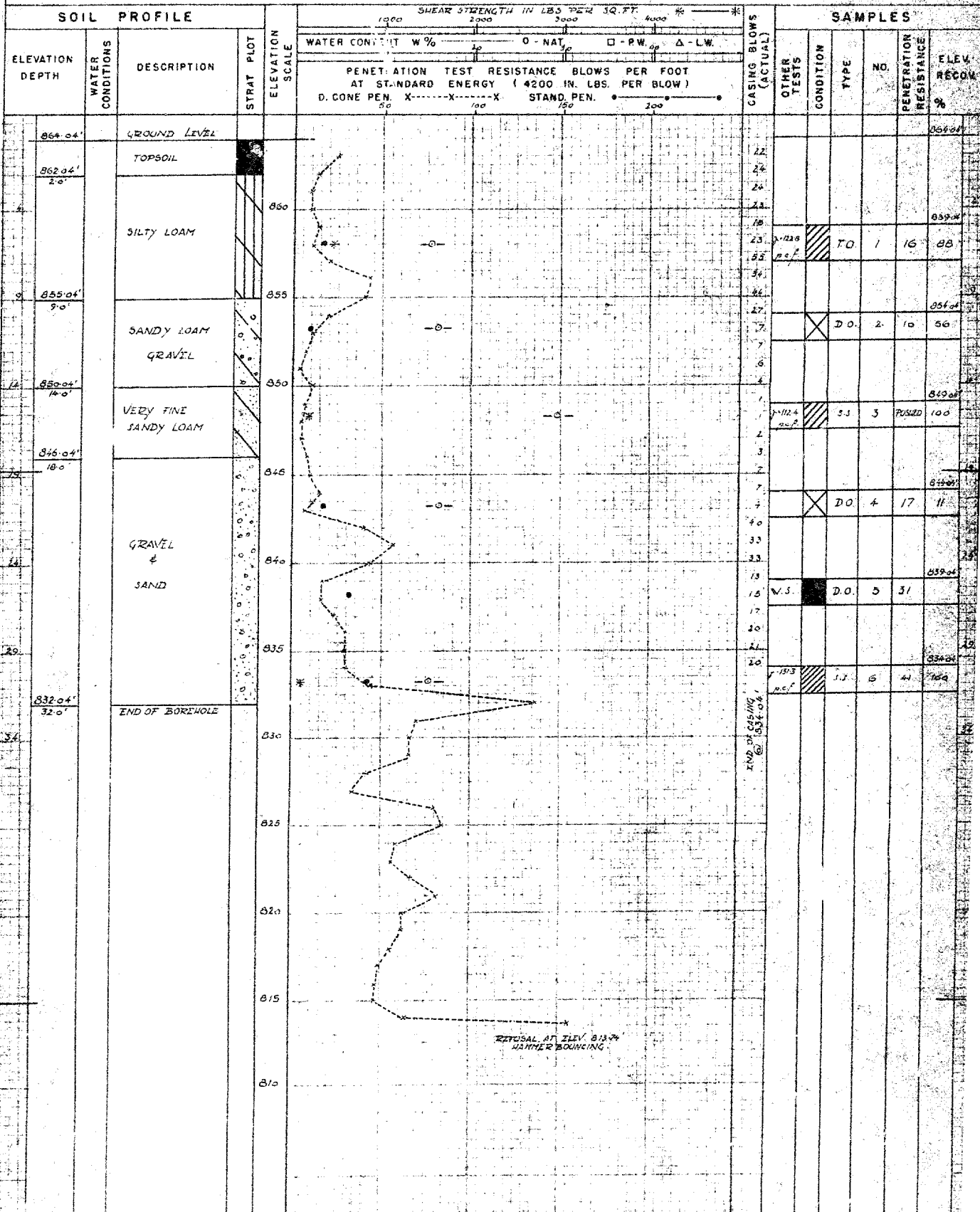
SAMPLE TYPES

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



DEPARTMENT OF HIGHWAYS - ONTARIO
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OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-2 OPERATION PENETRATION JOB F-57-26 WP 32-57 BORING 4 STA. 130+16 (47' LT)
CASING B3 (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT AUG 1957
SAMPLER HAMMER WT. 250 LBS. DROP 21 INCHES COMPILED BY HJ CHECKED BY AL DATE BORING 7 AUG 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 SCIL 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

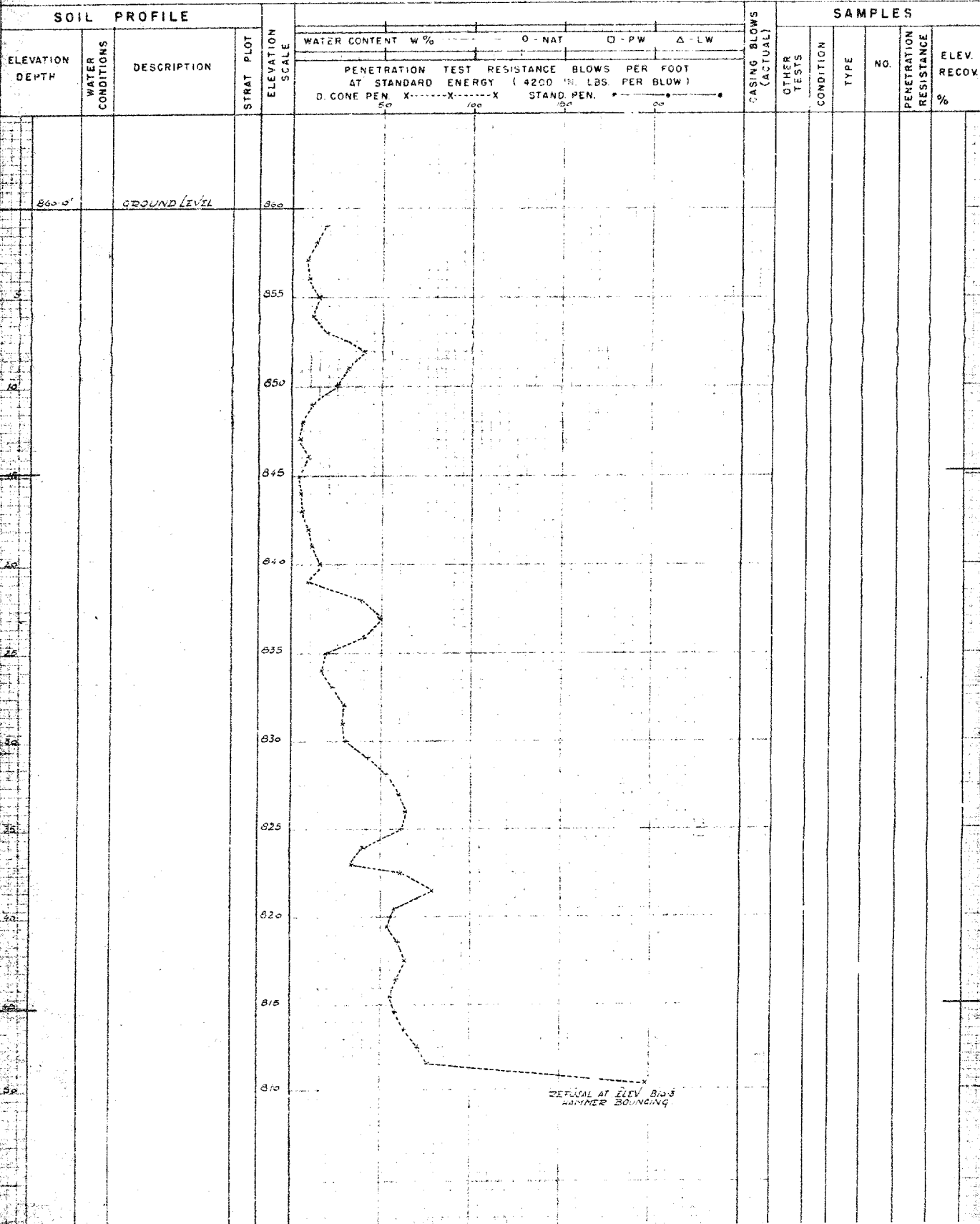
SAMPLE CONDITION



- DISTURBED
- FAIR
- GOOD
- LOST

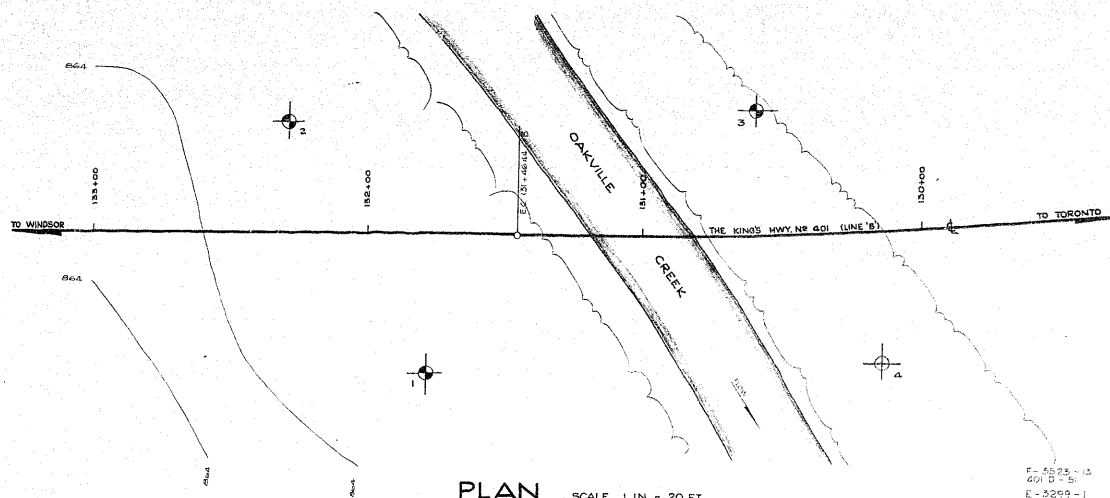
SOIL PROFILE

SAMPLES

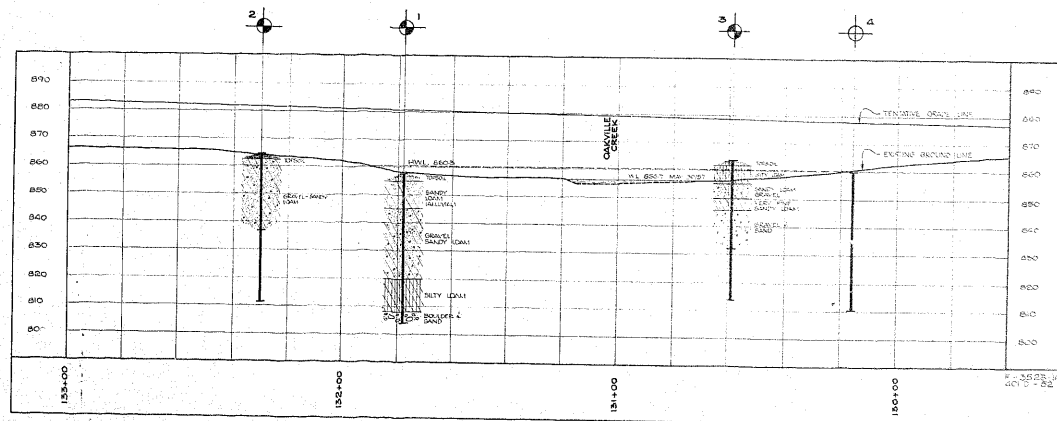


57-F-26
W.P. # 32-57
Hwy. # 401
CROSSING
OAKVILLE
CREEK
2 MILES S.W. OF
MILTON HEIGHTS





PLAN SCALE 1 IN = 20 FT



PROFILE SCALE 1 IN = 20 FT

LEGEND			
BORE HOLE			
PENETRATION HOLE			
BORE & PENETRATION HOLE			
HOLE NO.	ELEVATION	STATION	DISTANCE FROM 'A'
1	657.96	131+78	50 FT
2	664.24	132+50	40 FT
3	664.04	130+85	40 FT
4	662.00	130+16	47 FT

NOTE
THE BOUNDARIES BETWEEN SOIL STRATA HAVE BEEN ESTABLISHED ONLY AT BORE HOLE LOCATIONS. BETWEEN BORE HOLES THE BOUNDARIES ARE ASSUMED FROM GEOTECHNICAL DATA AND MAY BE SUBJECT TO CONSIDERABLE ERROR.

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH SECTION - DOWNSVIEW

**OAKVILLE CREEK
PROPOSED CROSSING
2 MILES S.W. OF MILTON HEIGHTS**

THE KING'S HIGHWAY NO. 401 (LINE 'B') SITE NO. 4

TO: HALTON

FROM: NASSAGAWBY LOT 5 CON. V

POSITION & ELEVATION OF HOLES

APPROVED

DESIGNED BY: W.P. 32-57

CHECKED BY: W.P. 32-57

DATE: SEPTEMBER 9, 1957

BY: F-57-26A