

Mr. A. Wye

August 20th, 1935

Bridge Engineer

Re: Bdy. at S. Creek Sta. 55+40

Highways Lab., 1200 Shepard Ave.

By: J. J. Dolan to Mr. Wye, Oct. 25-35

attached herewith in the foundation report for the above noted structures. You will note that this investigation was undertaken primarily to determine the slope stability of the increased fill. There was some doubt by Mr. W.L. Fisher from the setting at Head Office in connection with pre-engineering and preparation of B's on Jan. 20-35 that the subsoil could support a standard fill slope. However, in the subsequent investigation, the standard fill slopes will be maintained.

It is pointed out that the report recommends the extension of the existing 20 x 8 concrete culvert to consist of flexible pipe. In spite of the fact that the subsoil can support the increased fill over the existing structure, it is not known whether this culvert can support the fill structurally, therefore it is suggested that the original design be reviewed by the bridge office in this respect. The total depth of fill is in the neighborhood of 45'.

It is recommended that the bridge office review the existing culvert structurally. If it is found that the design is not adequate to carry the increased fill then it is suggested that this culvert be replaced with flexible pipe also, the size of which can be determined by the Division. It may be necessary to install 2 pipes if one pipe is not adequate to handle the water. These pipes should be installed with a slight curve.

P.O. Burnbridge,
Materials & Research Engineer

copies to: J. Wye

Per:

A. Wye
C.L. Brown
C. Burnbridge
File

A.R.

W.L. Fisher
attach.

(A. Wye)

Report of
Foundation Investigation
for the Culvert at North Creek
Station 66+00, Highway #3 near Delhi

Copies to: Mr. A. Togo
Bridge Engineer (2)

Mr. J. Walter
Design Engineer (1)

Mr. W. L. Fraser
Division Engineer, London (1)

Project F-55-12

Mr. G. N. Parantatos (1)

File (1)

APPENDIX I

Introduction:

A sub-surface investigation was carried out on Hwy. # 3 about one mile west of Delhi where it is proposed to raise the existing grade by approximately eighteen feet. An existing culvert carries the fill over the creek at this point.

Procedure:

Two dynamic cone penetrations tests and one borehole were carried out close to the existing culvert. The following is an account of the conditions encountered in the borehole.

Soil Conditions and Testing:

Speaking generally, the soil conditions encountered were alternative layers of sand and silty sand and clay or silty clay. Dynamic cone penetration tests gave fairly consistent results for their whole depth ranging between about fourteen and forty blows per foot with an average of about twenty blows per foot. Standard penetration is about half that of the dynamic cone and so it can be said that average ten blows per foot can be taken as standard penetration resistance for the sand. This was born out by a number of standard penetration tests carried out while sampling.

Water Conditions:

Water was observed to be at a depth of 4'6" in the borehole. This would put it at about the same elevation as the water in the creek. The penetration test (92) was carried out on the centre line of the creek and so it can be said that that is the elevation of the water on that side.

Some water pressure was encountered in the sand layer at a depth of 14'0".

ANALYSIS OF RESULTS AND RECOMMENDATIONS

Applying the results of the standard penetration and dynamic cone penetration tests to the material, it is estimated that a bearing value of 1½ tons/sq. ft. will be permissible; further, there will be no danger of a slide from the increased height of fill.

There will however, be a risk of differential settlement between the existing culvert and the proposed extensions.

..... cont'd 2.

This is because the soil beneath the present culvert is supporting twenty-five feet of fill and is therefore more consolidated than the soil which will support the culvert extensions, where at present - no fill exists. It is therefore to be expected that the culvert extensions will settle at a greater rate than the existing culvert, so that a flexible construction for the extensions is preferred.

Whether or not the existing culvert is removed, a flexible pipe culvert will be best suited to this situation.


Conclusions:

The sub-soil has a bearing value of $1\frac{1}{2}$ tons and is quite adequate to support the increased height of fill.

Due to the risk of differential settlement a flexible pipe should be used for the culvert extensions.

F.C. Brownridge,
Materials and Research Engineer.

Per:


(G.N. Parantatos)

GMP:af

55-F-12

Hwy. #3

N. CREEK

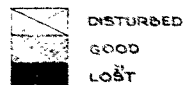
CULVERT NEAR

DELHI

EDITED
FOR MICROFILMING
BY *K.T.* DATE *2.7/60.*

MATERIALS LABORATORY-DEPARTMENT OF HIGHWAYS - ONTARIO
OFFICE REPORT ON SOIL EXPLORATIONDRILL RIG CORE DRILL
CASING 3X (STANDARD SAMPLERS TO FIT UNLESS NOTED)
SAMPLER HAMMER WT 35 * DROP 24 INCHESJOB F-55-12
DATUM 704.9 STA 65+60 56' RT.
COMPILED BY JLB CHECKED BYBORING NO 2
DATE REPORT 5 Jun 58
BORING DATE 2-3-58

SAMPLE CONDITION

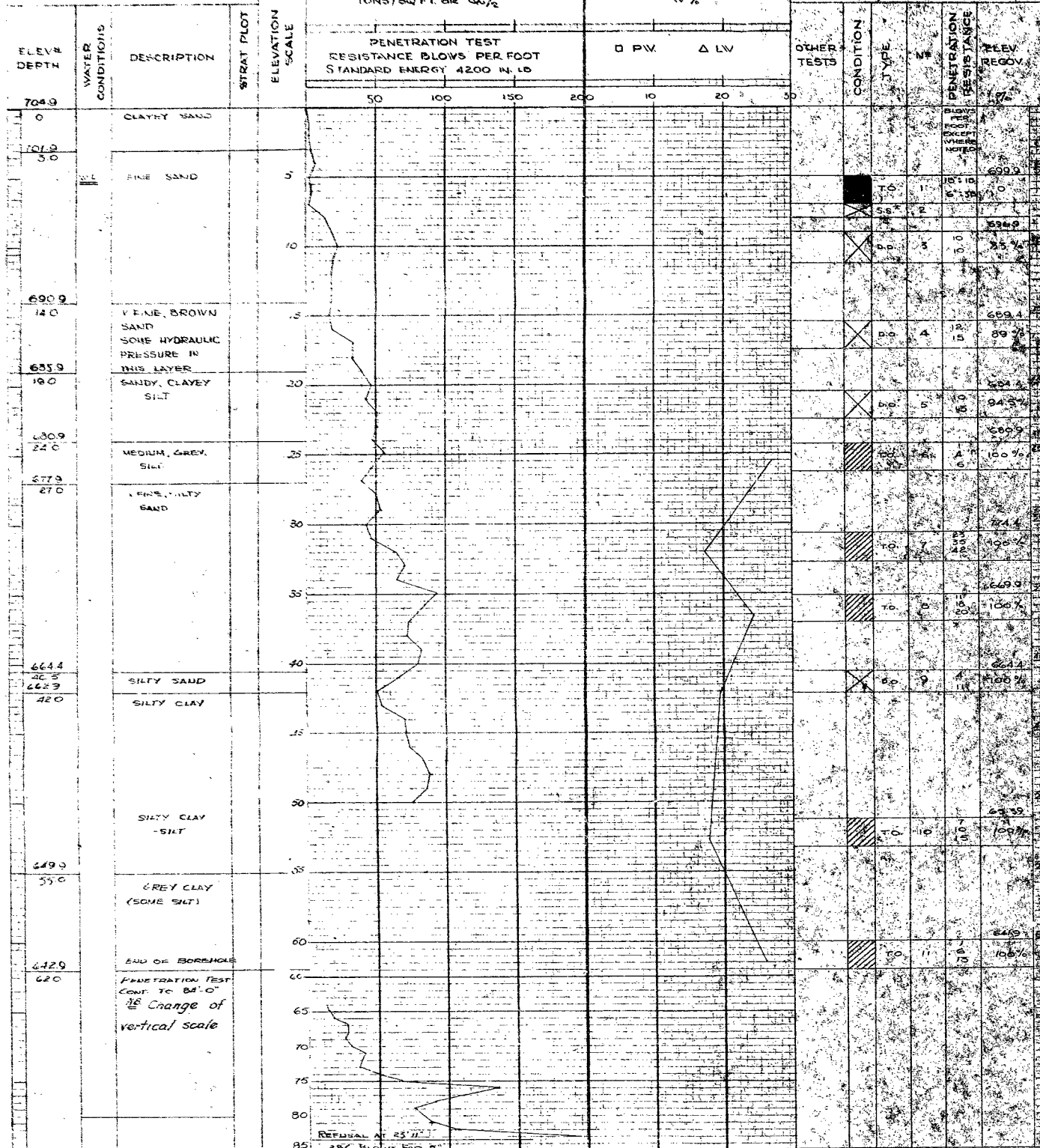
CS - CHUNK
DO - DRIVE OPEN
DF - DRIVE FOOT VALVE
TO - THIN WALLED OPEN
* SAND SAMPLER
WS - WASHED SAMPLE
RC - ROCK CORE

SAMPLE TYPES

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

SOIL PROFILE



REFUSAL AT 25' 11"

256 BLOWS FOR 1'

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DATUM 699.9 STA 65+60 56' RT.
COMPILED BY JLB CHECKED BYBORING NO 2
DATE REPORT 5 Jun 58
BORING DATE 2-3-58

SAMPLE CONDITION

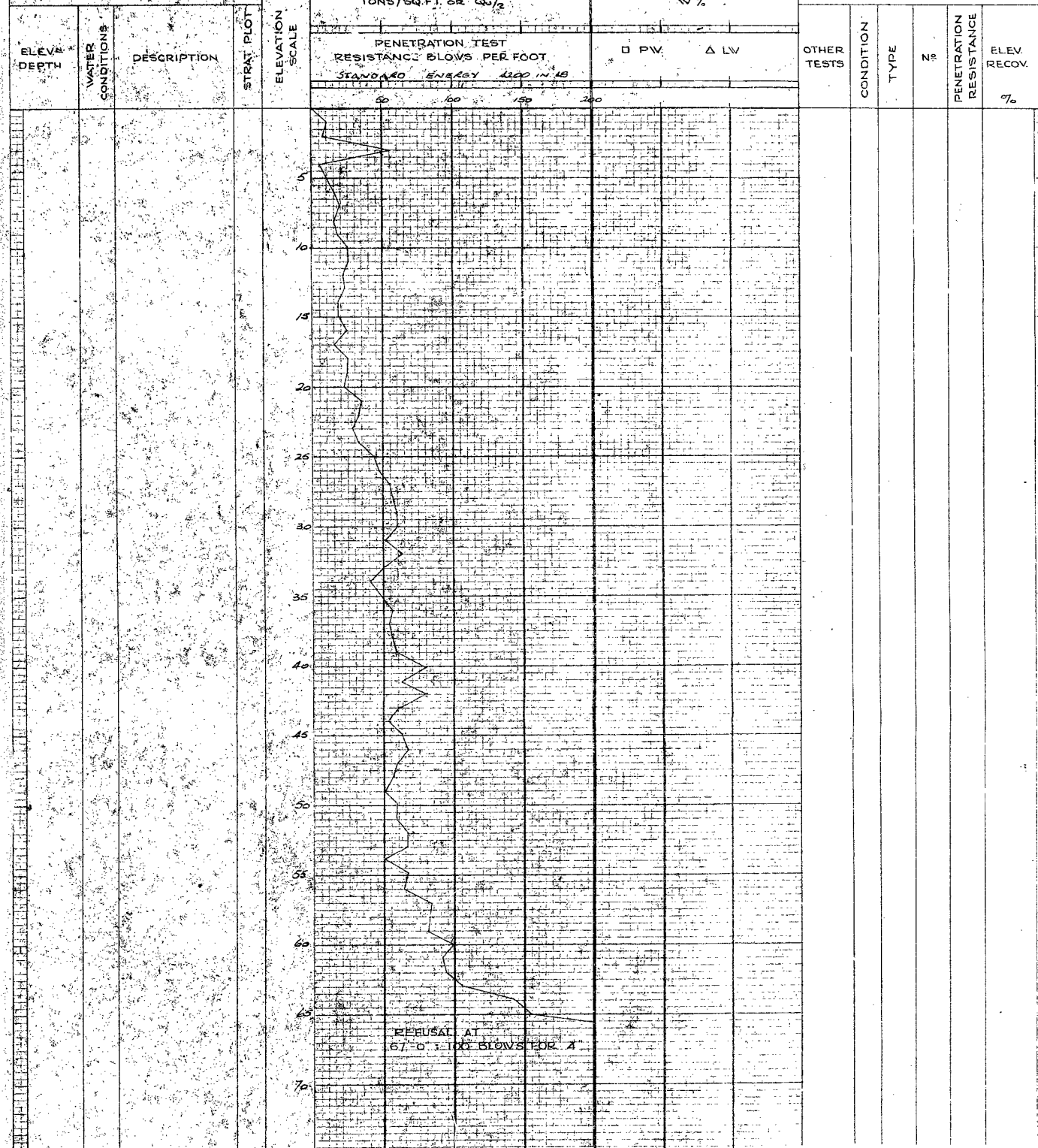
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SOIL PROFILE



REFUSAL AT 67'-0"

100 BLOWS FOR 1'