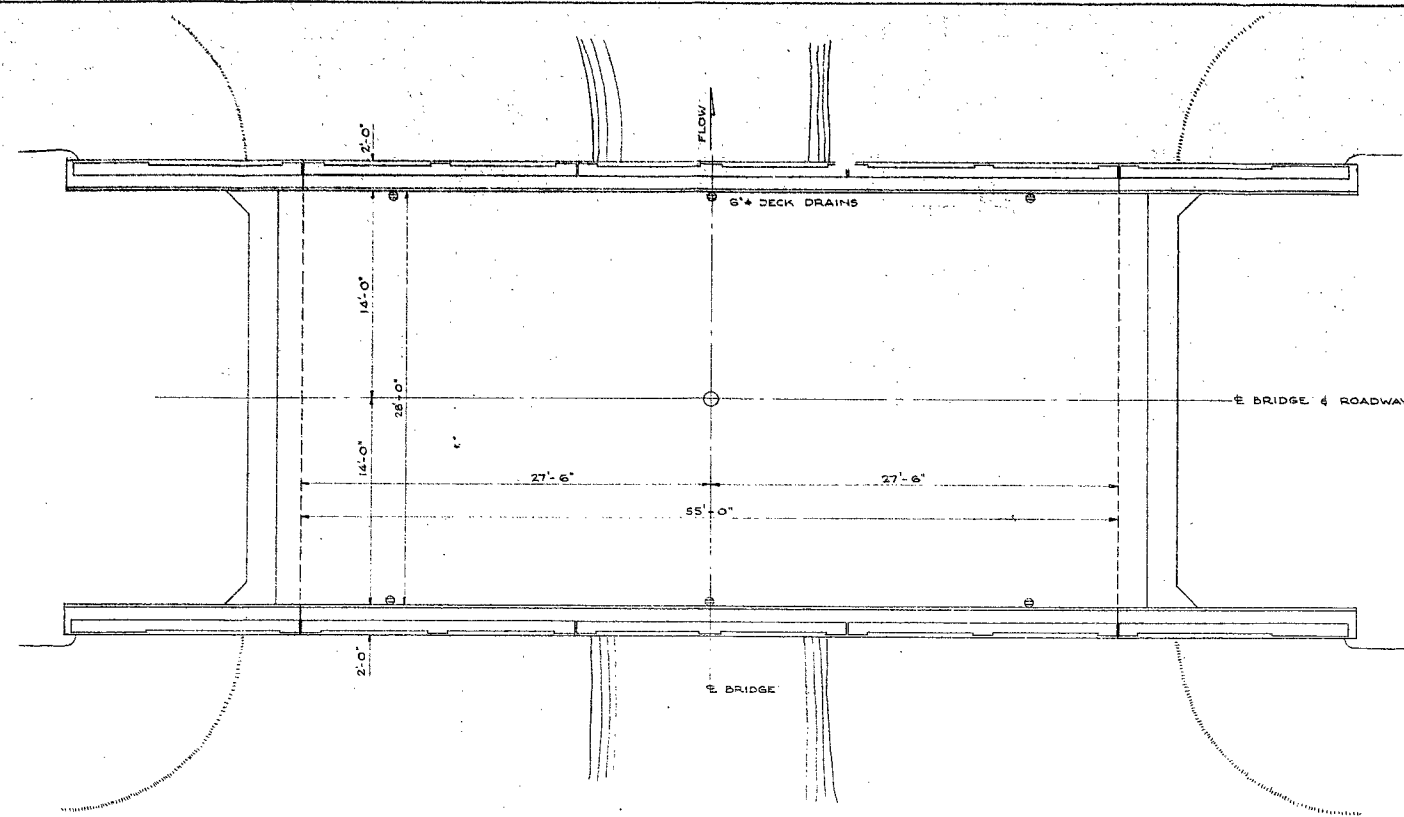


#62-F-321 M

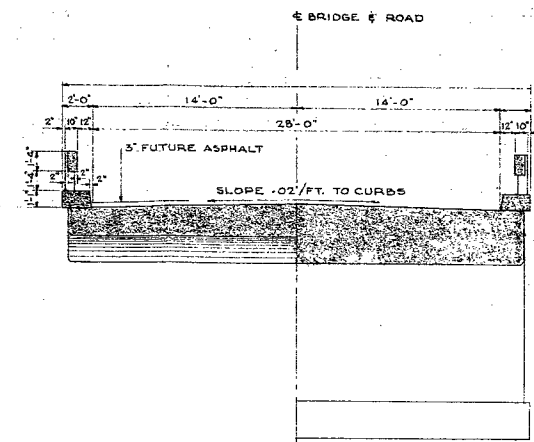
WHEELER BRIDGE

ERAMOSA TWP.



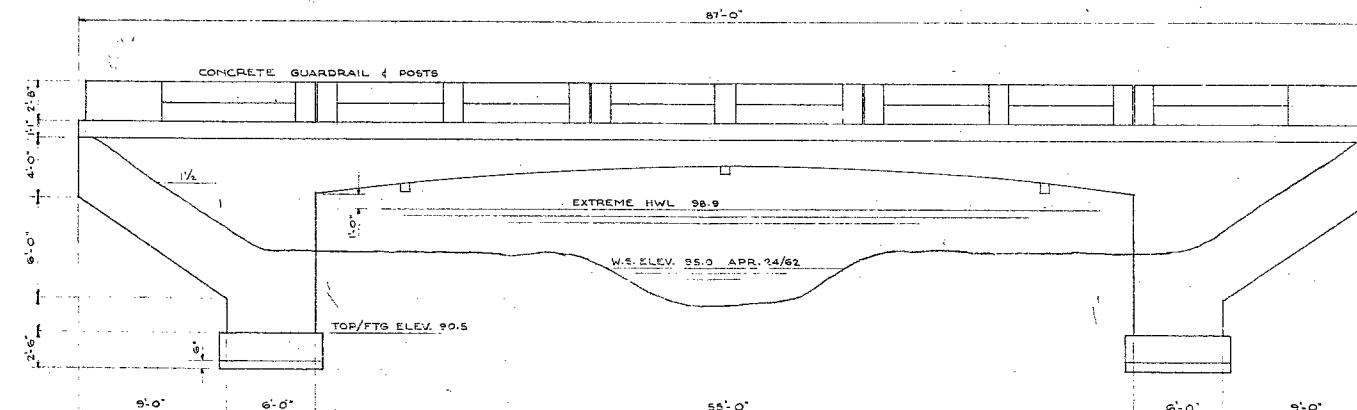
DECK PLAN

3/16" = 1'



HALF SECTION AT MID SPAN    HALF SECTION AT ABUT.

3/16" = 1'



EAST ELEVATION

3/16" = 1'



D. H. O. TORONTO RECEIVED JUN 18 1962		DESIGNED BY VRA
WHEELER BRIDGE		DRAWN BY VRA
LOT 22 CONCESSIONS II & III TOWNSHIP OF ERAMOSA COUNTY OF WELLINGTON		CHECKED BY VRA
GENERAL ARRANGEMENT		DATE
V. R. ASTROP CONSULTING ENGINEER		JOB NO. 14
		DWG NO. 2

-P2

T O W N S H I P O F E R A M O S A

CONSULTING ENGINEER  
V. R. ASTROP

WHEELER BRIDGE

F O U N D A T I O N   C O N D I T I O N S

Submitted by

DOMINION SOIL INVESTIGATION LIMITED  
77 Crockford Boulevard  
SCARBOROUGH                      ONTARIO

OUR REFERENCE: 2-5-12

June 1962

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GEOTECHNICAL DATA SHEETS .....	Encls. #2 & #3

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## INTRODUCTION

A letter of authorization dated May 10th, 1962 was received from Mr. V. R. Astrop, Consulting Engineer, 105 Pine Street, Ancaster, Ontario to conduct a foundation investigation at the site of a proposed bridge over the Lutrell Creek in Eramosa Township.

The proposed project will replace an existing bridge. It will be a one-span structure.

Number and location of the boreholes were as directed. The site was located with the aid of a Drawing (No. 1) provided to us.

The purpose of the investigation was to reveal the subsurface conditions and determine the necessary soil properties for the design and construction of foundations.

## I. DESCRIPTION OF SITE AND GEOLOGY

The proposed structure will carry a gravel road in Eramosa Township, County of Wellington. The road runs between Concessions II and III and provides an access to Highway No. 24.

Lutrell Creek occupies a shallow, broad valley, the morphology of which suggests an ancient glacial spillway. The water from the melting ice shield cut its way into the fill deposit which covers the entire surrounding area. Upon the retreat of the ice, the flow of water became less and less; finally it was reduced to the present creek. An existing dam upstream regulates the amount of water flowing in Lutrell Creek.

## II. FIELD AND LABORATORY WORK

Field work was carried out on May 16th and 17th, 1962 and comprised two boreholes and two dynamic cone penetration tests at the locations shown on Enclosure #1. The positions of the test holes were set out on the site with the assistance of a drawing referred to in the Introduction provided to us. Elevations were measured relative to the southeast corner of east curb on south bridge (=el. 100.0) as indicated on the mentioned drawing.

The boreholes were of 2 7/8 in. diameter. They were lined or partly lined with Bx casing advanced to the required sampling depths by the repetitious procedure of alternately driving and washing.

Standard penetration tests were made at frequent intervals using a 2 in. outside diameter split spoon driven into the bottom of the clean borehole by a constant driving energy (140 pound hammer dropping 30 ins.). The dynamic cone penetration test is one type of deep sounding in which the Bx rods with a 2 in. diameter 60 degree apex cone driving point are

driven into the subsoil without casing and applying the same driving energy as above. The former test provided disturbed samples of the substrata indicating their relative density and consistency and the latter a continuous record of soil density.

Where bedrock or boulder was encountered, the holes were advanced by diamond drilling. A x size 1 1/8 in. diameter core was recovered.

The samples were shipped to our laboratory where they were thoroughly examined and classified. The results of this analysis together with the data obtained in the field comprise the basis on which the geotechnical properties of the substrata are being evaluated.

The stratification of the subsoil, sampling depths and the results of the penetration (std. and cone) tests together with percentages of core recovery are recorded on geotechnical data sheets comprising enclosures #2 and #3.

### III. SUBSURFACE CONDITIONS

Borehole #1 was drilled through the shoulder of the road; hence gravel and sand fill was encountered first. The side is protected by boulders which sometimes obstructed the advancement of the hole. (This was the reason why the hole had to be relocated once).

Flood deposit and silty, sandy topsoil were found in both boreholes between elevations 92 and 95 ft. This material, of course, should be entirely removed because of its adverse properties due to the high organic content and looseness.

The subsoil proper is a buff coloured gravelly sand with silt - a decomposed limestone. It is well graded, very densely packed, has little or no plasticity. The shape of the grains is sharp, angular, indicating that the place of origin was not far from the site. The material, essentially, is a glacial till - i.e. a sediment deposited by glaciers. The high relative density is due to the enormous preconsolidating weight of the ice shields having lain above for thousands of years.

Fine to medium, densely packed sand layers and pockets are present in the main material.

The bedrock, encountered at elevation 80 ft. is a buff limestone and dolomite of the Silurian origin.

The ground water level corresponds to that in the creek.

#### IV. DISCUSSION AND RECOMMENDATIONS

##### (A) D e s i g n

The subsoil at the site is capable of supporting the proposed structure on spread footings. The recommended bearing pressures are based on the standard penetration resistances. Settlements will be in the order of one in. and they will immediately follow the construction. Elevation 88 ft. seems to be the most probable base level; however, for the sake of completeness, values at higher elevations are also included in the table following:



South Abutment

<u>ELEVATION</u>	<u>GROSS ALLOWABLE BEARING PRESSURE</u>
92 ft.	4,000 psf
90 "	5,000 psf
88 " and lower	6,000 psf plus

A test pit was excavated and subsequently backfilled prior to the present subsurface exploration. The bottom of this hole was around elevation 86 ft. Any material above this level in the hole is an unconsolidated fill; therefore, no footings should be placed onto or into it. The approximate location of the test pit is shown on Enclosure #1.

North Abutment

<u>ELEVATION</u>	<u>GROSS ALLOWABLE BEARING PRESSURE</u>
92 ft.	4,000 psf
90 "	4,100 psf
88 "	6,000 psf plus

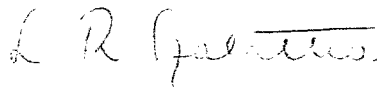
(B) C o n s t r u c t i o n

The footing grade should be thoroughly checked before the construction of the foundations and loose spots - if any encountered - removed and the cavity backfilled with lean concrete. The above examination should be particularly careful in the western part of the south abutment where disturbance may have been caused by the excavation for the test pit, and the footing grade lowered or stepped down if necessary.

The dewatering of the excavation depends on height of water level above the proposed footing grade. Should this be less than about 2 ft., no special precautions are needed, if the length of the period while the excavation remains open is short. As soon as the final footing grade has been reached, a lean concrete blanket should be poured on it and seepage water can be removed thereafter by pumping from a temporary sump. The lean concrete will prevent the washing out of the fine grains from the subsoil. Should, however, the ground water table exceed 2 ft. above the bottom of the excavation, the dewatering should be done by one of the two methods suggested below:

- (a) Advance dewatering by the vacuum wellpoint system.
- (b) Enclosing of the excavation by sheet piles driven to a depth below the bottom of excavation to a distance equal to the height of water table above the bottom of excavation. Thereafter the water can be removed by pumping from a temporary sump.

DOMINION SOIL INVESTIGATION LIMITED

  
L. R. Szalatnay, P.Eng.,  
Senior Soils Engineer.

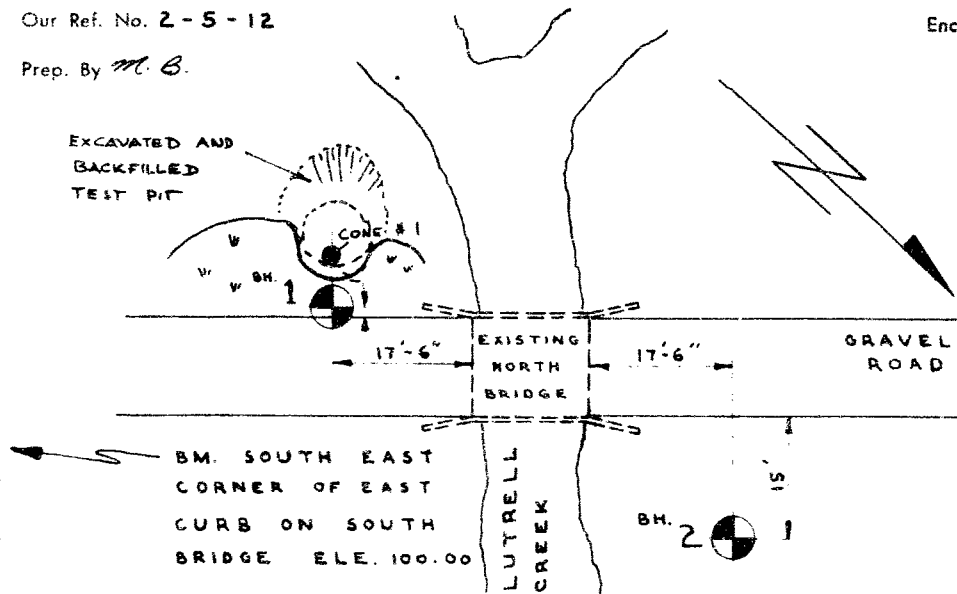
LRS/oed

V. REFERENCES

- (1) Procedures for Testing Soils - ASTM, April 1958, pp 186 to 198. (Unified Soil Classification System by A. A. Wagner).
- (2) Terzaghi and Peck - Soil Mechanics in Engineering Practice. John Wiley and Sons, New York 1948.
- (3) The Physiography of Southern Ontario by L.J. Chapman and D.F. Putnam of the Ontario Research Foundation - University of Toronto Press - 1951.

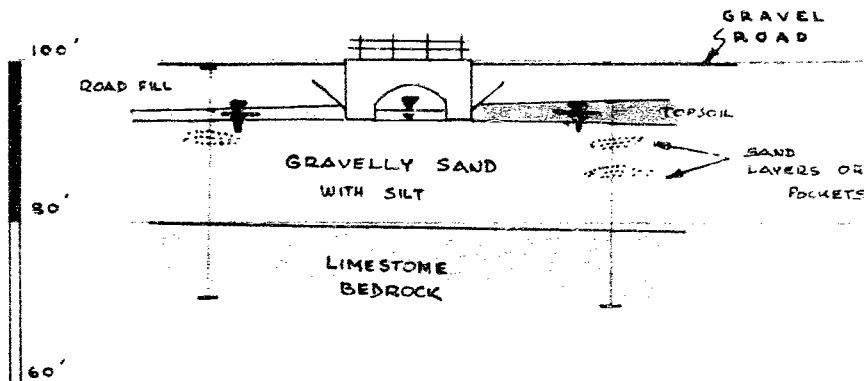
E n c l o s u r e s

Prep. By *M. B.*



## LAYOUT OF BOREHOLES

SCALE 1" = 20'



## SUBSURFACE PROFILE

VERT. SCALE 1" = 20'

OUR REFERENCE NO. 2-5-12

# GEOTECHNICAL DATA SHEET FOR BOREHOLE 1

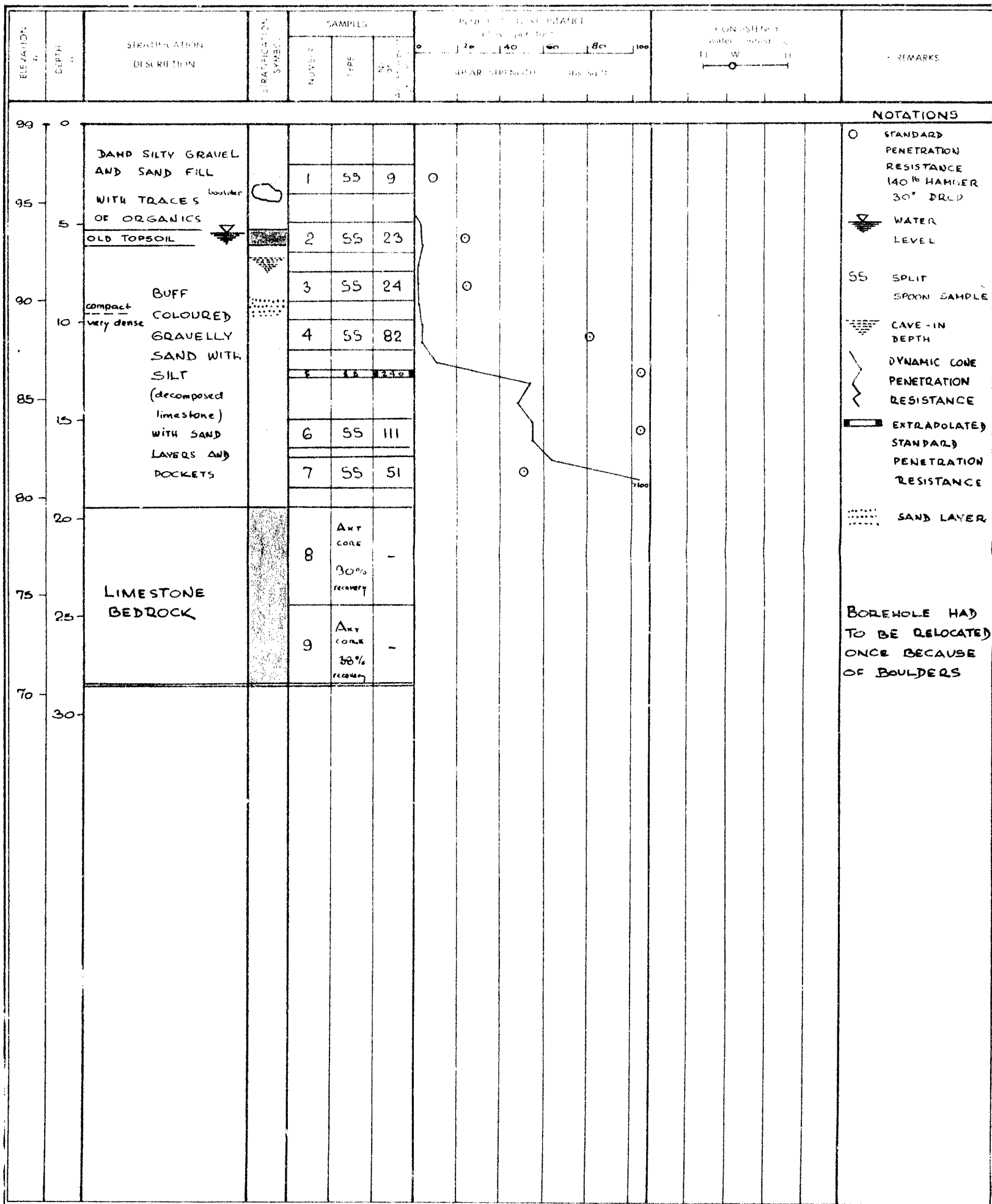
CLIENT: TOWNSHIP OF ERAMOSA  
PROJECT: WHEELER BRIDGE

METHOD OF BORING: WASHBORING  
DIAMETER OF BOREHOLE: 2 7/8"  
DATE: JUNE 5, 1962

ENCLOSURE NO. 2

LOCATION: OVER THE LUTRELL CREEK

DATUM ELEVATION: BOREHOLE 1: 99.04 CONE 1: 94.5 R



# GEOTECHNICAL DATA SHEET FOR BOREHOLE . . 2 . .

OUR REFERENCE NO. 2-5-12

CLIENT: TOWNSHIP OF ERAMOSA  
PROJECT: WHEELER BRIDGE  
LOCATION: OVER THE LUTRELL CREEK  
DATUM ELEVATION: 95.0 ft

METHOD OF BORING: WASHBORING  
DIAMETER OF BOREHOLE: 2 1/8"  
DATE: JUNE 5, 1962.

ENCLOSURE NO. 3

ELEVATION ft.	DEPTH ft.	STRATIFICATION DESCRIPTION	STRATIFICATION SYMBOL	SAMPLES			PENETRATION RESISTANCE lb/sq. ft.		CONSISTENCY water content %		REMARKS
				NUMBER	TYPE	% Adjustment of Sample	0	20 40 60 80 100	0	10 20 30 40	
95	0	DARK SILTY FINE SAND with organics (TOPSOIL)		1	SS	29					FOR NOTATIONS SEE ENCL. 2.
90	5	compact very dense BUFF COLOURED GRAVELLY SAND WITH SILT (decomposed limestone) WITH SAND LAYERS AND POCKETS		2	SS	21					
				3	SS	72					
85	10			4	SS	76					
80	15			5	SS	840					
75	20	LIMESTONE BEDROCK		6	ACT CORE	-					
70	25				ACT CORE	-					
					92% recovery						
					100% recovery						

VERTICAL SCALE: 1 IN. TO 5 FT.

DOMINION SOIL INVESTIGATION LIMITED

MADE:

CH'D: