

DOCUMENT MICROFILMING IDENTIFICATION

G.I.-30 SEPT. 1976

GEOCRES No. 40P13-13  
DIST. 3 REGION Southwestern  
W.P. No. \_\_\_\_\_  
CONT. No. \_\_\_\_\_  
W. O. No. \_\_\_\_\_  
STR. SITE No. \_\_\_\_\_  
HWY. No. \_\_\_\_\_  
LOCATION LOT 12 & 13  
CONCESSION 2 ASHFIELD TWP.

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OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. \_\_\_\_\_

REMARKS: DOCUMENT TO BE UNFOLDED BEFORE  
MICROFILMED

C2. HURON, Ashfield Twp. Con. II Lot 12 & 13 **BH 2030**

**D O M I N I O N   S O I L   I N V E S T I G A T I O N   L I M I T E D**  
77 CROCKFORD BOULEVARD - SCARBOROUGH ONTARIO CANADA - TELEPHONE 421-2567

BRANCH  
365 QUEENS AVENUE  
LONDON, ONTARIO  
TELEPHONE GE. 9-3851

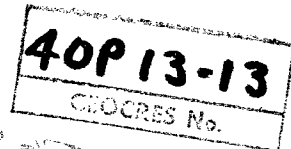


**FOUNDATION ENGINEERS**

ASSOCIATED COMPANY  
SOIL TESTING AND ENGINEERING LTD.  
34 BRENTFORD ROAD,  
KINGSTON 5, JAMAICA, WEST INDIES  
TELEPHONE: 68989

London, November 30th, 1964

4-10-L16  
Report



Mr. J. W. Britnell, P. Eng.,  
Huron County Engineer,  
Court House,  
GODERICH, Ontario.

Dear Mr. Britnell:

Report on Soil Investigation for  
Culvert No. 1, Sta. 24 + 96.5  
Huron County Road 27

We have completed this project in accordance with your letter dated 27th October, 1964. This report is a record of our findings and recommendations.

FIELD WORK

The field work was done on 4th November, 1964 and consisted of one borehole at the location specified on the sketch plan supplied to us.

The hole was advanced by washboring and lined with Bx casing. Standard penetration tests were performed at frequent intervals of depth to determine the consistency of the clay strata and to recover representative samples. A dynamic cone penetration test was performed adjacent to the borehole position.

The results of the field tests are recorded on the geotechnical data sheet, enclosure 2. Elevations have been referred to a local geodetic datum as shown on enclosure 2.

SUBSURFACE CONDITIONS

Detailed descriptions of the strata encountered are given on the geotechnical data sheet. The general profile consists of 2 foot thickness of topsoil and a 3 foot thickness of silty sand and gravel, overlying a very stiff glacial clay till deposit which was penetrated a distance of 9 feet 6 inches.

Due to the impermeable nature of the clay till it is difficult to detect a free standing ground water table, but it can be assumed to be about the same elevation as the water level in the stream. (818.5 feet at the time of the field work)

DISCUSSION

It is proposed that the foundation level for the new culvert will be about elevation 812.0. In this case it would be founded in the glacial deposit of very stiff clay and it would be appropriate to use a nett allowable soil pressure of 5,000 pounds per square foot. Settlement for the above loading would be very small.

It is anticipated that the discharge of groundwater into the excavation will be easily controlled by pumping from a sump. The excavation in the clay till can be made with vertical sides which will require a minimum of bracing. The layer of granular material at the surface will stand with a slope of about 1:1.

If we can be of any further service to you in this matter, please do not hesitate to get in touch with us.

Soil samples are normally stored for a period of 3 months from the date of issue of the report, and thereafter destroyed. Kindly advise us if you have any other instruction.

Yours very truly

DOMINION SOIL INVESTIGATION LIMITED



C. J. W. Atkinson, M. Sc.,  
Project Engineer.

CA/sg

Encl. 2

# LIST OF SYMBOLS, ABBREVIATIONS AND NOMENCLATURE.

## SOIL COMPONENTS AND GROUND WATER CONDITIONS.

BOULDER	COBBLE	GRAVEL		SAND			SILT	CLAY	ORGANICS	BEDROCK	GROUND WATER LEVEL	DEPTH OF CAVE-IN
		COARSE	FINE	COARSE	MEDIUM	FINE						
Ø > 8"	3"	3/4"	4.76mm	2.0	0.42	0.074	0.002	>	NO SIZE LIMIT			
U.S. Standard Sieve Size :		No.4	No.10	No.40	No.200							

## SAMPLE TYPES.

AS	Auger sample	RC	Rock core	TP	Piston, thin walled tube sample
CS	Sample from casing	%	Recovery	TW	Open, thin walled tube sample
CHS	Chunk sample	SS	Split spoon sample	WS	Wash sample

SAMPLER	ADVANCED BY	static weight :	w	OBSERVATIONS	Steady pressure
"		pressure :	p	MADE WHILE	No pressure
"		tapping :	t	CORING	Intermittent pressure

Washwater returns  
Washwater lost

## PENETRATION RESISTANCES.

**DYNAMIC PENETRATION RESISTANCE :** to drive a 2"  $\phi$ , 60° cone attached to the end of the drilling rods into the ground, expressed in blows per foot.

**STANDARD PENETRATION RESISTANCE, -N- :** to drive a 2" outside dia, split spoon sampler 1 foot into the ground, expressed in blows per foot.

### EXTRAPOLATED -N- VALUE

The energy for the penetration resistances is supplied by a 140 lb. hammer falling 30 inches

SYMBOL :



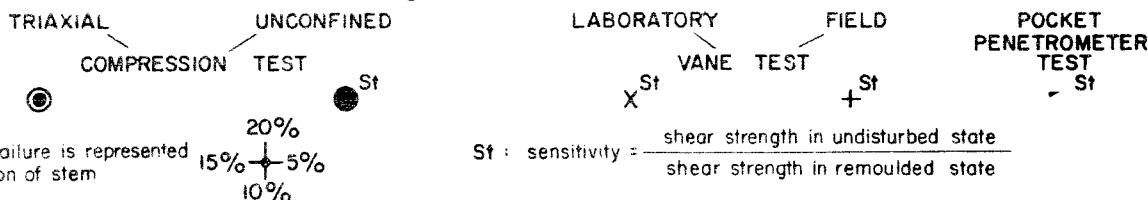
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## SOIL PROPERTIES.

W %	Water content	$\gamma$	Natural bulk density (unit weight)	k	Coeff. of permeability
LL %	Liquid limit	e	Void ratio	C	Shear strength
PL %	Plastic limit	RD	Relative density	$\phi$	Angle of int. friction
PI %	Plasticity index	$C_v$	Coeff. of consolidation	$C'$	Cohesion
LI	Liquidity index	$m_v$	Coeff. of volume compressibility	$\phi'$	Angle of int. friction

## UNDRAINED SHEAR STRENGTH.

- DERIVED FROM -



## SOIL DESCRIPTION.

COHESIONLESS SOILS :	RD :	COHESIVE SOILS :	C lbs/sq ft.
Very loose	0 - 15 %	Very soft	less than 250
Loose	15 - 35 %	Soft	250 - 500
Compact	35 - 65 %	Firm	500 - 1000
Dense	65 - 85 %	Stiff	1000 - 2000
Very dense	85 - 100 %	Very stiff	2000 - 4000
		Hard	over 4000

# GEOTECHNICAL DATA SHEET FOR BOREHOLE . . . . .

OUR REFERENCE NO. 4-10-116

CLIENT: County of Huron  
PROJECT: Culvert

METHOD OF BORING  
DIAMETER OF BOREHOLE

ENCLOSURE NO 2

LOCATION: County Road Sta. 24+82.5, 26.5' East of  
DATE

DATUM ELEVATION 824.95 geodetic, 1' of road center  
Sta. 24+96.5

ELEVATION ft.	DEPTH ft.	STRATIFICATION DESCRIPTION	STRATIFICATION SYMBOL	SAMPLES			PENETRATION RESISTANCE		CONSISTENCY water content % PL W LI	REMARKS
				NUMBER	TYPE	N- or Advancement of Sampler	blows per foot	SHEAR STRENGTH lbs/sq ft		
820.5	0.0	Ground Surface								
818.5	2.0	Topsoil								
815.5	5.0	Grey silty sand & gravel (Fill)		1	SS	25				
		Very stiff fissured grey slightly sandy silty Clay with a little fine gravel (Glacial Till)		2	SS	30				
				3	SS	46				
				4	SS	36				
806.0	14.5		End of borehole							

2" dia. cone

Borehole 1

Geodetic Datum  
Sta. 24+96.5  
1' of road  
E1. 824.95