

DOCUMENT MICROFILMING IDENTIFICATION.

G.I.F-30 SEPT. 1976

GEOCRES No. 316-180

DIST. 9 REGION EASTERN

W.P. No. _____

CONT. No. _____

W. O. No. _____

STR. SITE No. _____

HWY. No. _____

LOCATION SOUTH BRIDGE PRISON

RIVER RUSSELL CO

=====

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. _____

REMARKS: DOCUMENTS TO BE UNFOLDED BEFORE

MICROFILMED

McROSTIE SETO GENEST

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316-180

GEOCREs No.

1. TERMS OF REFERENCE

We were requested by the Ottawa Office of De Leuw Cather & Company to make an investigation of subsurface conditions at the proposed three span open abutment structure.

2. RECOMMENDATIONS2.1 Foundation Type

The central piers of the structure should be supported on piles since the soils at suitable depths for footings would not, in our opinion, remain stable under the upward flow of groundwater from the pervious materials below them. Fortunately suitable rock is at convenient depths and the piles need not be long.

If pile driving equipment is brought to the site in order to make the centre pier foundations, then foundations for the abutments can be made using pile supports just as cheaply as using footings supported on the clay soils. In addition, the pile supported abutment allows significant savings to be made in the portion of the structure above foundation level. We therefore recommend that the abutments be supported on piles in a similar manner to the centre piers.

2.2 Pile Types

Either steel H-piles, steel tube piles, or precast concrete piles would be suitable to provide end bearing support at this site. We would recommend that steel

H-piles be specified since no site fabrication problems can then arise. However the alternatives mentioned above could be accepted if they are proposed as a more economical alternative by the bidders.

2.3 River Bed Stability

With the centre piers supported on piles to rock, undermining of the piers by scour or erosion is no concern. In addition, the gravel and boulder sizes of the till material would gradually accumulate in areas of local high velocity after the finer grain portions of the till soils had been removed.

3. DETAILS OF THE INVESTIGATION

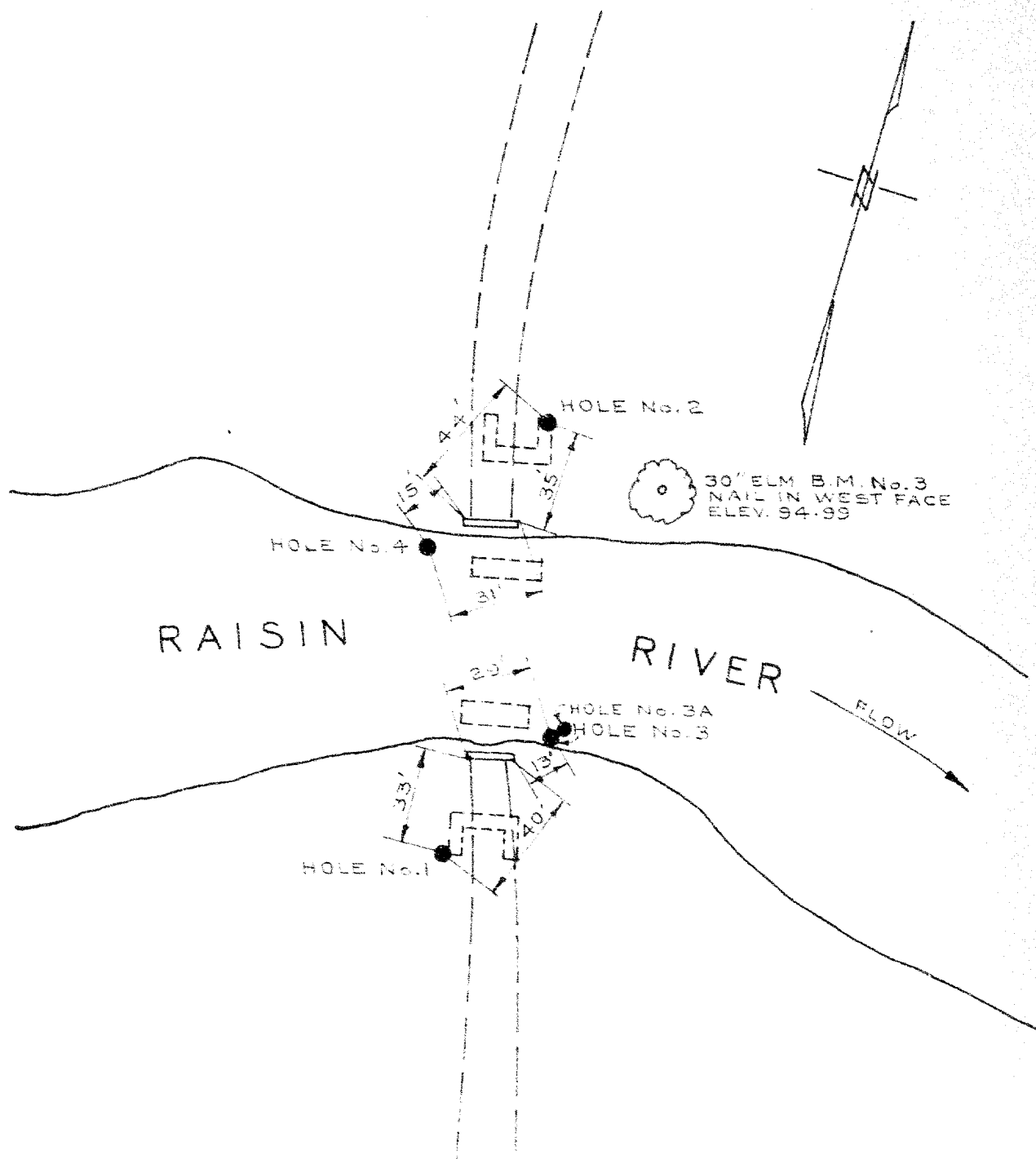
Four test holes were made at the site in the locations shown on Plate 1 using our test drilling rig. Two of the test holes were made on temporary islands prepared by filling a small section of the river bank to enable access without the costly use of floating equipment.

Two inch split barrel samples were taken and the standard penetration test performed in granular materials. Two inch thin wall tube samples were recovered from the cohesive soil layers and borehole vane tests made in these layers. Groundwater levels were observed during the test drilling program, rock beneath the site was diamond drilled and cores recovered for logging by a Foundation Engineer. During the rock drilling a careful watch was kept for drops of the drill rods which would indicate seams of unconsolidated material and other important aspects of the rock structure.

All samples were visually reclassified at our laboratory and water content tests performed to aid in estimating other soil properties. A group of small scale penetrometer tests was made on each tube sample to obtain information on the soil shear strength and its variation within each sample.

Soil and rock conditions are shown in detail on Plates 2 to 6 but can be generalized as consisting of a layer of fill from the existing bridge approaches underlain by stiff clay soils to a depth of about 15 feet. Beneath the clays are glacial tills (a mixture of boulders, gravel, sand, silt and clay) extending down to limestone rock which occurs at depths of 20 to 25 feet. Groundwater was observed near the present

surface in the river bank locations which is not unusual but a special feature of the site was the occurrence of artesian water pressures at Hole No. 3 in the river bed. The significance of the artesian pressure has already been considered in the recommendations for foundation type of the centre piers.



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BOREHOLE LOCATIONS - POSITIONS DES FORAGES

RAISIN RIVER - SOUTH BRIDGE

SCALE
ECHELLE

1" = 50'

PLATE
PLAQUE

1

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OTTAWA CANADA

SOIL PROFILE & TEST SUMMARIES PROFIL SOUTERRAIN ET RÉSUMÉ DES ESSAIS

RAISIN RIVER
SOUTH BRIDGE

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 100.6'

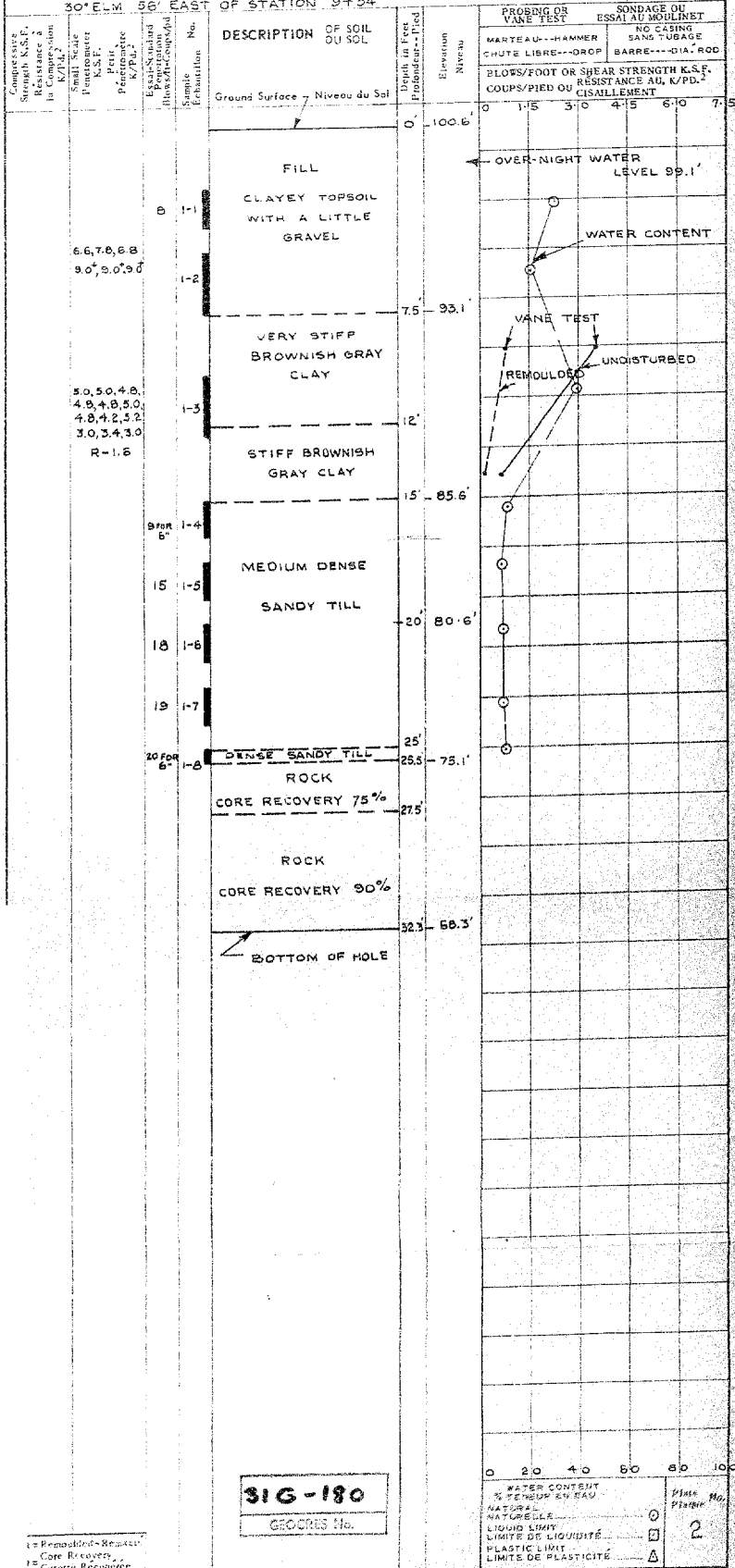
DATE OCT. 20/65

HOLE FORAGE No. 1

NIVEAU DU SOL (PROFONDEUR ZÉRO)

NOTES B.M. (E.L. 94.99') ASSUMED B.M. N°3 NAIL IN WEST FACE OF

30° ELM 56' EAST OF STATION 9+54



1. Remoulded - Remanié
2. Core Recovery - Cote Récupérée

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ELEVATION OF GROUND SURFACE (ZERO DEPTH) 93.3'
NIVEAU DU SOL (PROFONDEUR ZÉRO) 93.3'
NOTES SEE PLATE No. 2

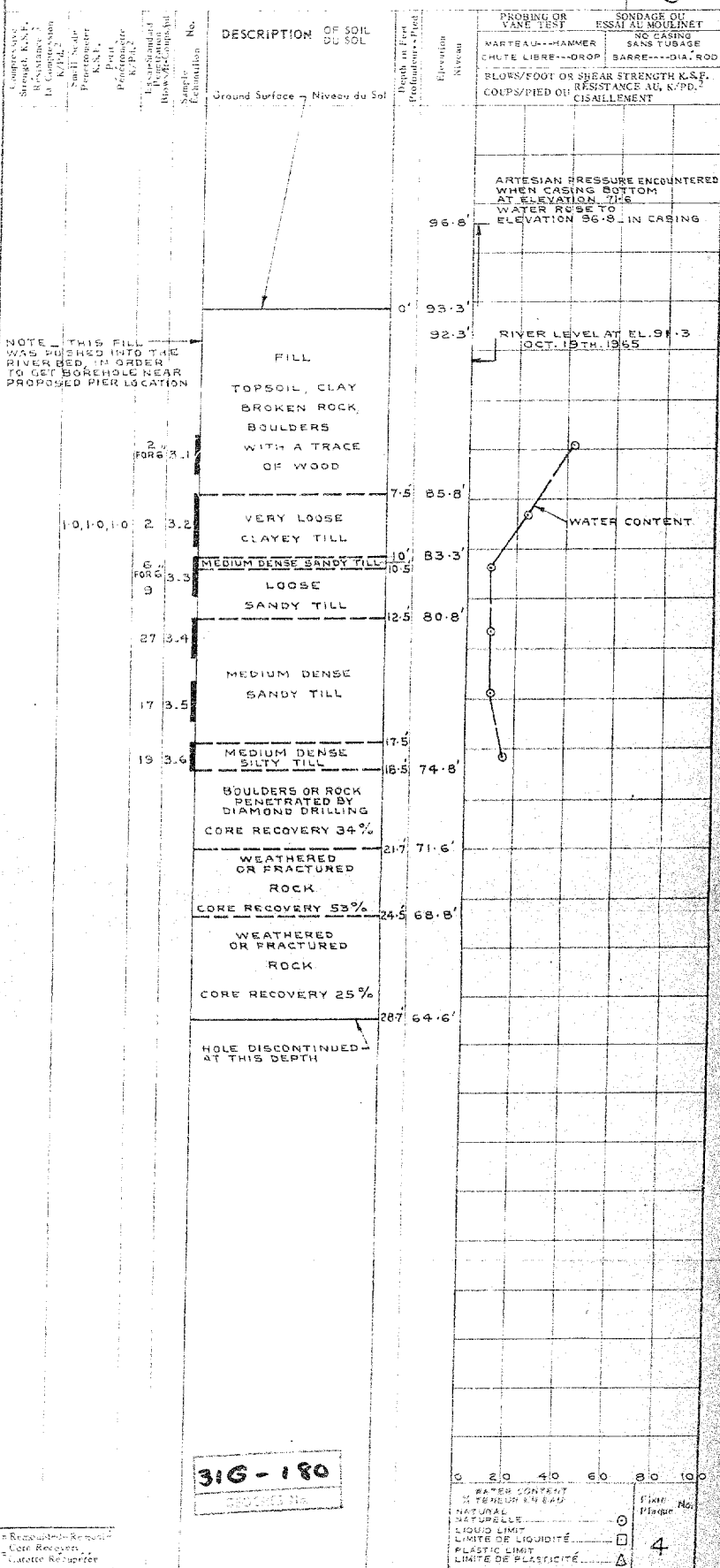
SOIL PROFILE & TEST SUMMARIES

PROFIL SOUTERRAIN ET RÉSUMÉ DES ESSAIS

RAISIN RIVER
SOUTH BRIDGE

DATE OCT. 24, 1965

HOLE FORAGE No. 3



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CONSULTING ENGINEERS - INGÉNIEURS CONSEILS

OTTAWA CANADA

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 93.3'

NIVEAU DU SOL (P. 0) (NIVEAU ZÉRO)

NOTES SEE PLATE No. 2

SOIL PROFILE & TEST SUMMARIES

PROFIL SOUTERRAIN ET RÉSUMÉ DES ESSAIS

RAISIN RIVER
SOUTH BRIDGE

DATE OCT. 22ND, 1965

HOLE
FORAGE No.
3A

1. Compressive Strength K.S.F. Resistance à la compression K/Psq. 2 3. Soil Sample Description K.S.F. Pénétromètre Pétri Pénétromètre K/Psq. 2 4. Sample No. 5. Sample Description K.S.F. Pénétromètre Pétri Pénétromètre K/Psq. 2	DESCRIPTION OF SOIL DU SOL	Depth in Feet Profondeur en Pied	Elevation Niveau	PROBING OR VANE TEST		SONDAGE OU ESSAI AU MOULINET	
				MARTEAU---HAMMER CHUTE LIBRE---DROP	NO CASING SANS TUBAGE	BARRE---DIA. ROD	
	Ground Surface - Niveau du Sol			BLUETS/FOOT OR SHEAR STRENGTH K.S.F. COUPS/PIED OU RÉSISTANCE AU X/PD. CISAILLEMENT			
				ARTESIAN PRESSURE ENCOUNTERED WHEN CASING BOTTOM AT ELEVATION 74.5 WATER ROSE TO ELEVATION 96.8 IN CASING			
			96.8				
				RIVER LEVEL AT ELEV. 91.3' OCTOBER 19TH, 1965			
			0' 93.3'				
	FILL						
	TOPSOIL, CLAY, BROKEN ROCK, BOULDERS WITH A TRACE OF WOOD						
		7.5	85.8'				
	SOIL						
		20.8	72.5'				
	ROCK CORE RECOVERY 42%						
		23.6	69.7'				
	ROCK CORE RECOVERY 54%						
		26.5	66.8'				
	ROCK CORE RECOVERY 78%						
		30.6	62.7'				
	BOTTOM OF HOLE						

NOTE: THIS FILL WAS
PUSHED INTO THE
RIVER BED IN ORDER
TO GET BOREHOLE NEAR
PROPOSED PIER LOCATION

31G-180

GEOCREP No.

R = Rejected - Remercié
C = Core Recovery
R = Coteau Recupéré

WATER CONTENT
% TENEUR EN EAU
NATURAL
NATURELLE
LIQUID LIMIT
LIMITE DE LIQUIDITÉ
PLASTIC LIMIT
LIMITE DE PLASTICITÉ

Plate No.
Plaque

5

ELEVATION OF GROUND SURFACE (ZERO DEPTH) 92.1
NIVEAU DU SOL (PROFONDEUR ZÉRO)
NOTES SEE PLATE No. 2

RAISIN RIVER
SOUTH BRIDGE

DATE OCT. 23, 1965

HOLE No. 1
FORGE

