

#58-F-241-C

HOUSE RIVER

STR. ON

VICTORIA ST.

NORWOOD

BA 712

Department of Highways,
280, Davenport Road,
Toronto - Ontario.

58-F-241C

FOUNDATION INVESTIGATION FOR
PROPOSED BRIDGE REPLACEMENT,
NORWOOD - ONTARIO.

Reference: S-500/T-1048

Racey, MacCallum and Associates
Limited.

3 March, 1958

Reference: S-500/T-1048

3 March, 1958

FOUNDATION INVESTIGATION FOR
PROPOSED BRIDGE REPLACEMENT,
NORWOOD - ONTARIO.

LOCATION OF THE SITE AND SCOPE OF THE REPORT :

This report covers the field investigation of the subsoil conditions at the site of the proposed bridge over the River Ouse diversion at Victoria Street, Norwood, Ontario. The location of the site is shown on Enclosure No 1. A description of the subsoil is given together with recommendations concerning the depth at which the bridge foundations may be placed. Consideration has been given to the presence of a high water table and its effect on the foundation support.

FIELD WORK AND SUBSOIL DESCRIPTION :

The locations of the investigation boreholes are shown on Enclosure No 2. This enclosure also shows the existing channel of the River Ouse and the existing Victoria Street bridge. Drilling was carried out using a conventional diamond drill adapted for soil sampling. Samples were taken by means of a 2-inch outside diameter standard split spoon or a 2-inch inside diameter thin walled Shelby tube. Penetration of the standard split spoon was achieved by driving it with a 140 lb hammer allowed to fall freely through a height of 30 inches. The penetration test results and soil profiles are shown on Enclosures 3 to 6 inclusive.

The subsoil consists of loose organic sandy silt or silty sand to a depth of 10 - 11½ feet. Below this loose material there is a boulder layer 3 - 4 feet thick, which overlies limestone bedrock at a depth of approximately 14 feet or Elevation 630 to 632. As a check, six feet of limestone core was obtained from Borehole No 4 with one hundred percent recovery.

DISCUSSION OF THE RESULTS :

The upper ten feet of loose soil is not competent to support the type of structure proposed for this site. The foundations must therefore be taken down either to the boulder stratum or bedrock. The high water table will probably make any excavation difficult, particularly immediately above the gravel and boulder layer.

It seems, therefore, that some form of caisson or pile system should be used to support the structure on the

underlying bedrock. Wooden piles should not be used because of danger of brooming them while driving, and due to the probability of decay above the water table. Short driven concrete piles will probably offer the cheapest form of support. Such piles could be constructed at the site and should be easily handled due to their relatively light weight. The exact length of pile required cannot be determined since it is not known if it will be possible to drive through the boulder layer overlying bedrock. However, piles may be expected to become end bearing between Elevations 634 and 630 feet.

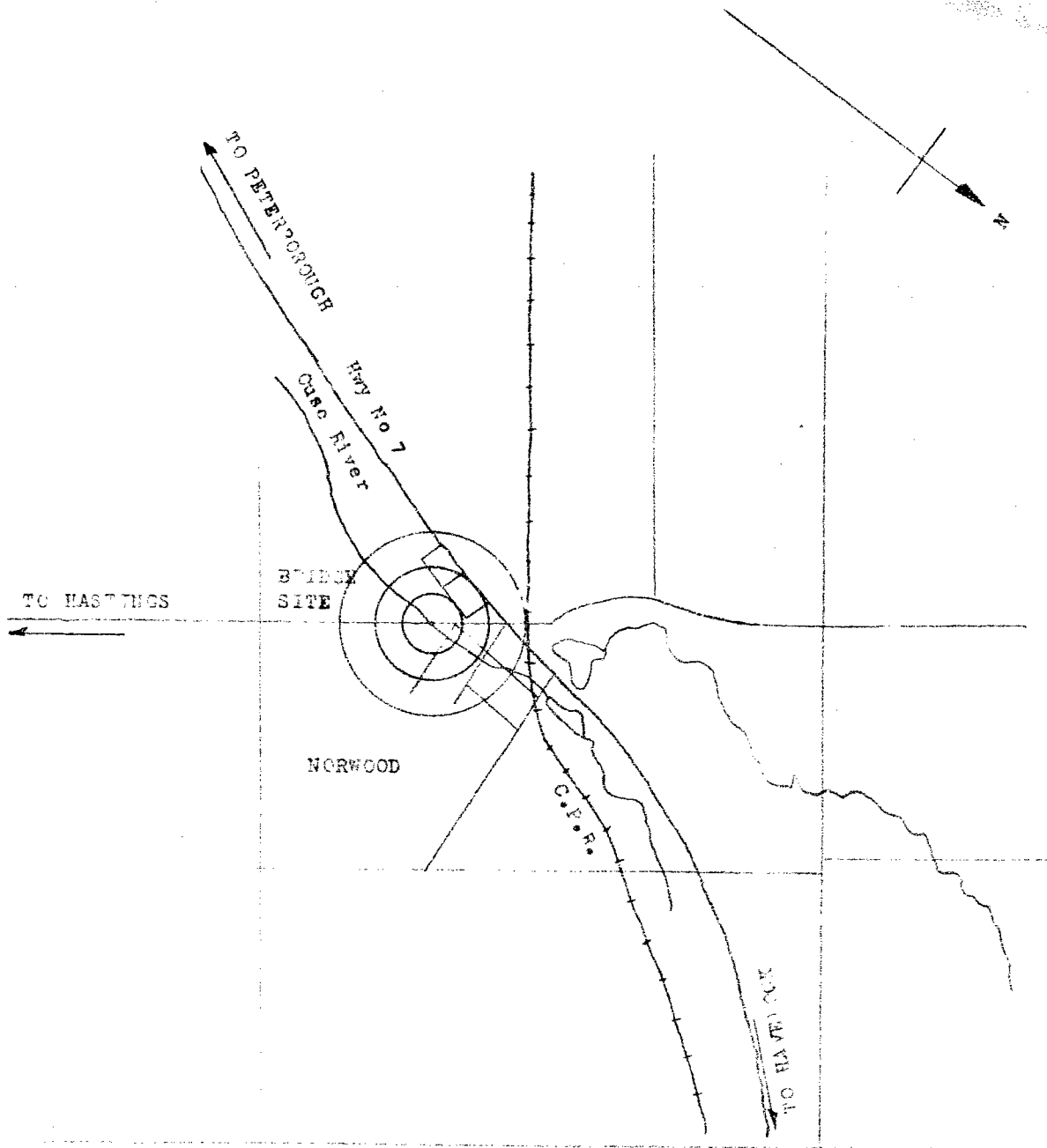
CONCLUSIONS :

1. The upper 10 feet of subsoil consisting of loose silty sand and sandy silt with some organic material is not competent to support the proposed bridge.
2. The bridge must be founded on either the gravel or boulder layer which overlies the bedrock or upon bedrock itself.
3. Due to the high water table, subsoil drainage particularly in the gravel-boulder layer would prove difficult.
4. The structure should therefore be supported on short piles which may be expected to become end bearing between Elevations 634 and 630 feet.

Peter E. Martin Monk

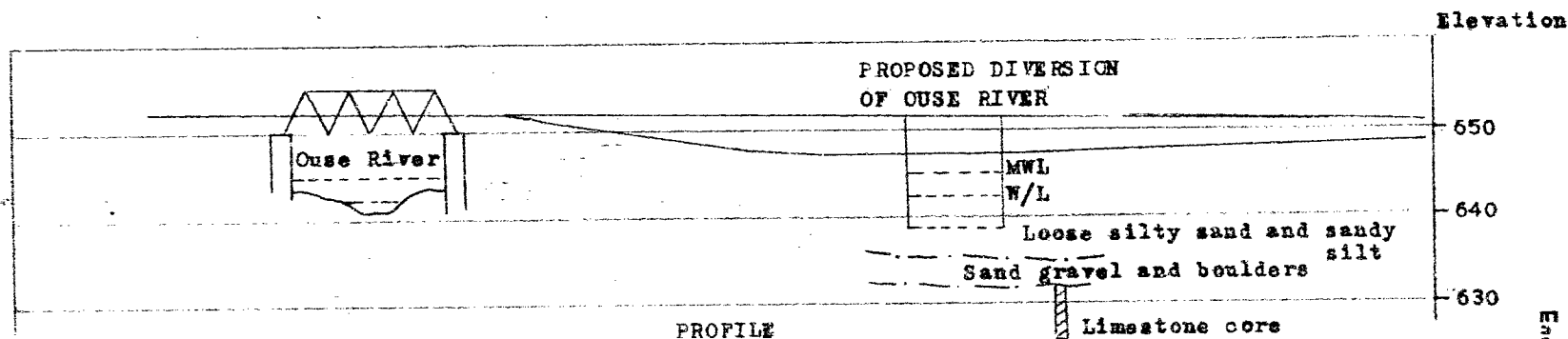
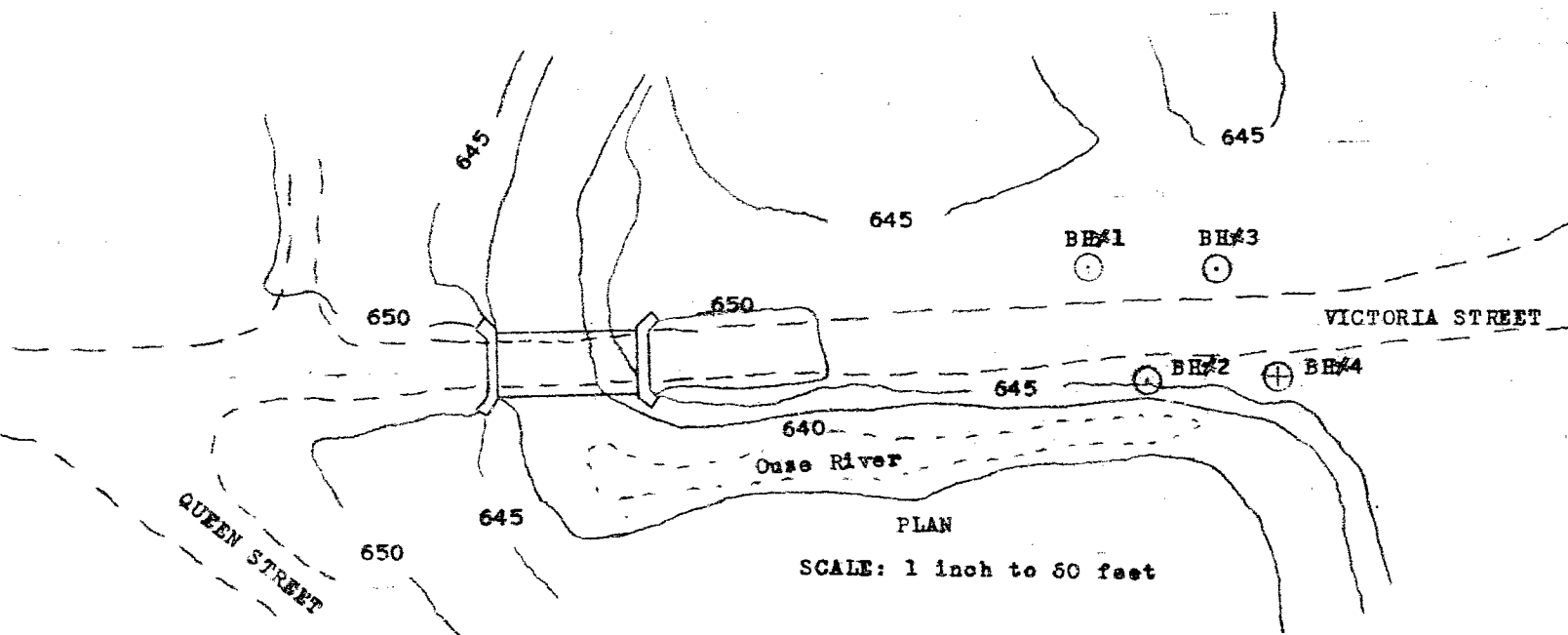
P. E. M. Monk, P.Eng.,

Prep. By P.E.M.



SKETCH PLAN SHOWING LOCATION
OF SITE OF PROPOSED BRIDGE
REPLACEMENT AT NORWOOD, ONTARIO.

SCALE : 1 inch to 75,000 feet.



SKETCH PLAN SHOWING LOCATION OF
 SOIL INVESTIGATION BOREHOLES AND
 PROFILE SHOWING SUBSOIL STRATI-
 FICATION AT THE SITE OF THE
 PROPOSED RIVER OUSE DIVERSION
 NORWOOD, ONTARIO.

Horizontal Scale : 1 inch to 50 feet
 Vertical Scale : 1 inch to 20 feet

RACEY MacCALLUM AND ASSOCIATES LTD.

Foundation Engineering Division

Engineering Data Sheet for Borehole: 1

Project: FOUNDATION INVESTIGATION FOR PROPOSED BRIDGE
Location: NORWOOD, ONTARIO.

REPLACEMENT.

Hole Location: See Enclosure No 2

Hole Elevation and Datum: 647.0

Field Supervisor: H.G. Prep.: P.M.

Driller: F.V. Checked:

Date: 27 Feb., 1958

LEGEND

Shear Strength (C)

Unconfined compression

Vane test and sensitivity (S)

Penetration Resistance (P)

2" Split tube

2" Dia. Cone

Casing

⊕
+3

⊕ ⊕

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE				
				C	P.S.F.			
		647.0		P	20	40	60	80 100 BLOWS/FT
	Brown sandy silt with organics Layers of grey silty sand							SS1
								SS2
	Gray medium sand		10					SS3
	END OF HOLE	633.0						
	Boulders		20					
			30					

RACEY MacCALLUM AND ASSOCIATES LTD.

Foundation Engineering Division

Engineering Data Sheet for Borehole: 2

Project: FOUNDATION INVESTIGATION FOR PROPOSED BRIDGE

Location: NORWOOD, ONTARIO.

Hole Location: See Enclosure No 2.

Hole Elevation and Datum: 646.0

Field Supervisor: H.G. Prep.: P.M.

Driller: F.V. Checked:

Date: 27 February, 1958

LEGEND

Shear Strength (C)

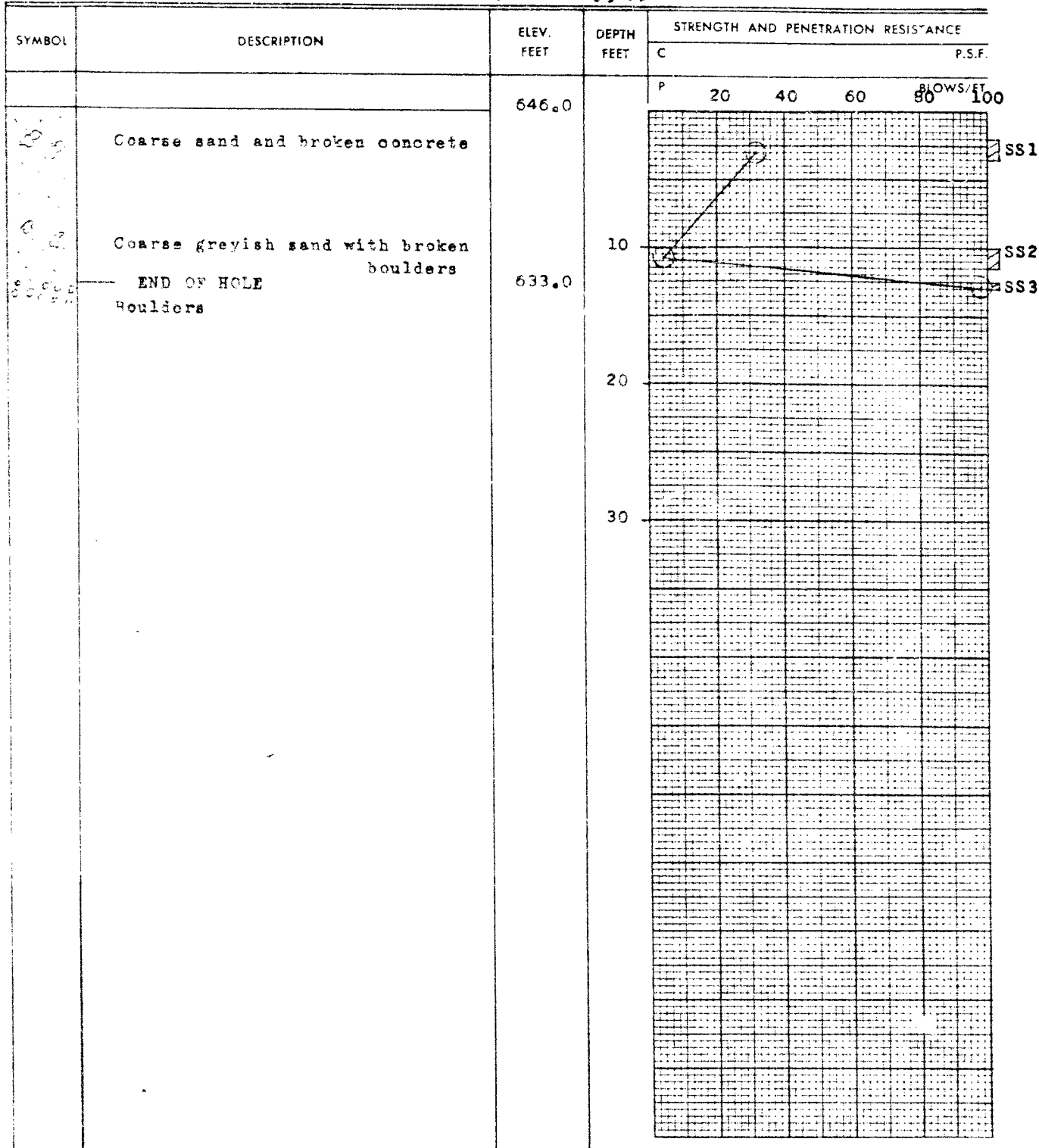
Unconfined compression
Vane test and sensitivity (S)

Penetration Resistance (P)

2" Split tube

2" Dia. Cone

Casing

⊕
+
⊗⊗
⊗

RACEY MacCALLUM AND ASSOCIATES LTD.

Foundation Engineering Division

Engineering Data Sheet for Borehole: 3

Project: FOUNDATION INVESTIGATION FOR PROPOSED BRIDGE
 Location: NORWOOD, ONTARIO. REPLACEMENT.

Hole Location: See Enclosure No 2.

Hole Elevation and Datum: 646.0

Field Supervisor: H.G. Prep.: P.W.

Driller: F.V. Checked:

Date: 27 February, 1958

LEGEND

Shear Strength (C)

Unconfined compression
 Vane test and sensitivity (S)

Penetration Resistance (P)

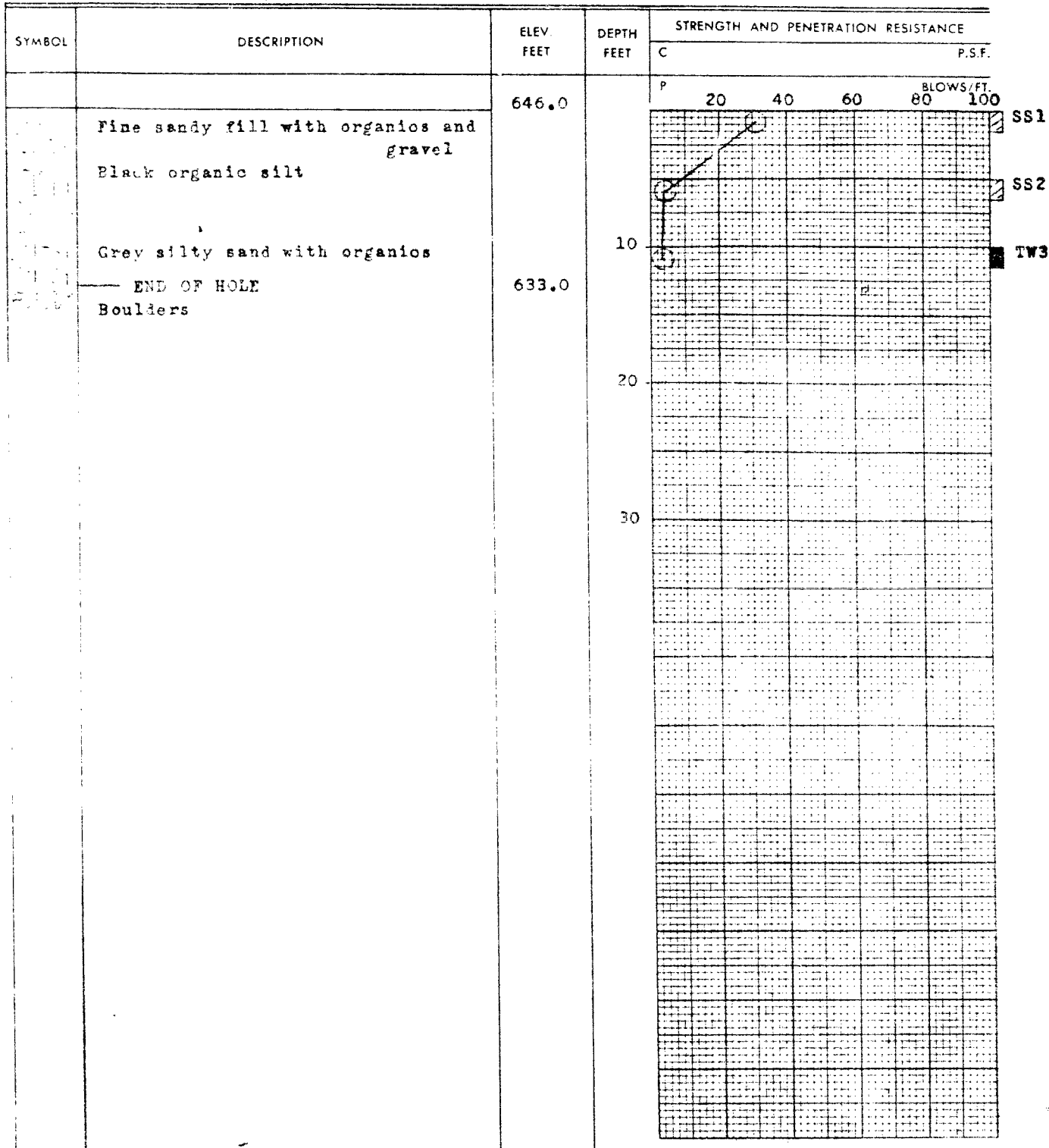
2" Split tube

2" Dia. Cone

Casing

⊕
+s

⊕ ⊕



RACEY MacCALLUM AND ASSOCIATES LTD.

Foundation Engineering Division

Engineering Data Sheet for Borehole: 4

Project: FOUNDATION INVESTIGATION FOR PROPOSED BRIDGE
Location: NORWOOD, ONTARIO.

Hole Location: See Enclosure No 2

Hole Elevation and Datum: 646.5

Field Supervisor: H.G. Prep.:

Driller: I.V. Checked:

Date: 27 February, 1958

LEGEND

Shear Strength (C)

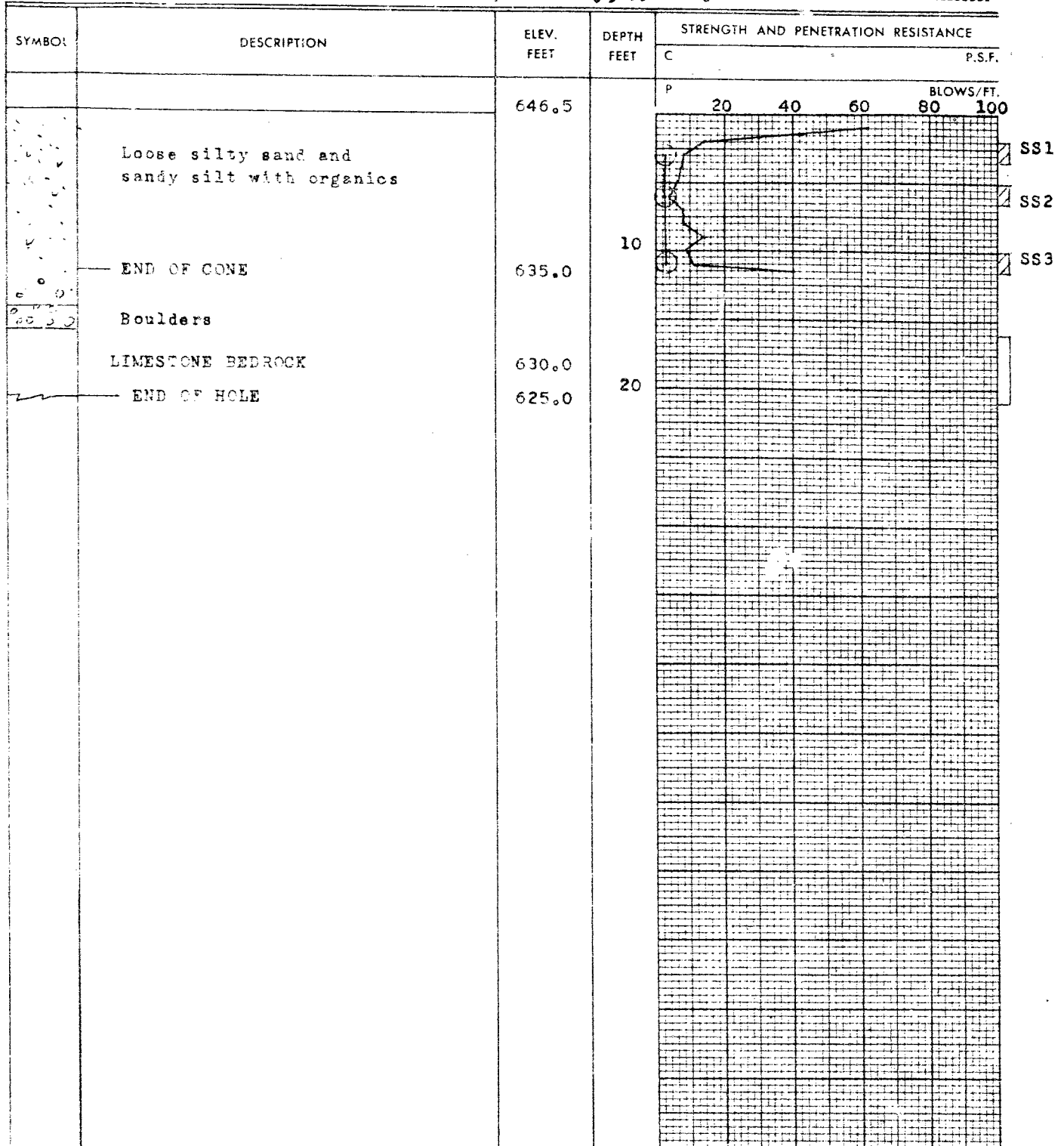
Unconfined compression
Vane test and sensitivity (S)

Penetration Resistance (P)

2" Split tube

2" Dia. Cone

Casing

⊕
+s⊕ ⊕
-----

WP 62-57
BA 712

RACEY, MACCALLUM AND ASSOCIATES
LIMITED

A COMPANY OWNED, DIRECTED AND OPERATED BY

Consulting Engineers
AND ASSOCIATED STAFF

MONTREAL



VANCOUVER

TORONTO

DONALD C. MACCALLUM, B.ENG., M.E.I.C., P.ENG.

H. JOHN RACEY, B.SC., M.E.I.C., P.ENG.

A. ERIC RANKINE, B.SC., M.E.I.C., A.M.I.ELEC.E., P.ENG.

TORONTO DIVISION
27 CARLTON STREET

Reference: S-500/T-1048

3 March, 1958

Department of Highways,
280, Davenport Road,
TORONTO - Ontario.

Attention: Mr. J. G. McAllister

RE: FOUNDATION INVESTIGATION FOR
PROPOSED BRIDGE REPLACEMENT,
Ouse River NORWOOD - ONTARIO.

Dear Sirs,

The enclosed report presents the results
of our soil investigation at the above location.

We hope the report is satisfactory to you;
if you have any questions about it do not hesitate to
get in touch with us.

Thank you for this opportunity of being of
service to you.

Yours sincerely,
RACEY, MACCALLUM AND ASSOCIATES LIMITED

Ronald F. Scott.

Ronald F. Scott, P.Eng.,
Divisional Soil Engineer.

RFS/YDP