DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept. Bk. No. 80/57

REFRACTION SEISMIC SURVEY ON OVAL SITE AT PROPOSED PRIMARY SCHOOL AT COROMANDEL VALLEY SOUTH

GEOLOGICAL SURVEY

GEOPHYSICS DIVISION

CLIENT
PUBLIC BUILDINGS DEPARTMENT

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GEOPHYSICAL SERVICES SECTION

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D.M. No. 1677/54

CONTENTS

PLANS

Fig. No.	Title	Drg. No.	Scale
1	Proposed Coromandel Valley South Primary School Oval Site. Location of seismic lines	80-330	1:1 000
2	Proposed Coromandel Valley South Primary School Oval Site. Seismic Cross Sections	80-331	as shown

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ABSTRACT

Shallow refraction seismic work was carried out over the site of the oval at the proposed Coromandel Valley South Primary School. The aim of the survey was to assess the rippability of the material that has to be excavated. Results show that the velocity of the material to be removed does not exceed 1 300 m/s and therefore should be rippable to the depth required for the majority of the area. However, at the periphery of the southern sector, some difficulty may be experienced in ripping as a high velocity layer has been recorded with a minimum depth approximately equal to that of the excavation.

INTRODUCTION

At the request of the Engineering Geology Section refraction seismic work was carried out in the vicinity of the oval at the proposed Coromandel Valley South Primary School. The aim of the survey was to assess the rippability of the material to be excavated. The work was carried out using a 12 channel Nimbus ES 1210 seismograph with 5 m geophone spacing spreads.

Four spreads were shot, at the locations shown in Figure 1. For each spread five shots were detonated, one in the centre and at each end and approximately 30 m from each end. The time-distance curves were interpreted using the reciprocal method as reviewed by Hawkins (1961).

RESULTS

Seismic velocity cross sections are shown on Figure 2, along with the depth to which the material is to be excavated. The cross sections show that the subsurface consists of four layers. The first layer with a velocity of 210 - 260 m/s material approximately 1 m thick consists of sand. The second layer (500 - 840 m/s) is probably due to clay and highly weathered rock. The third layer, assumed to relate to weathered rock, (1 125 - 1 300 m/s), was not detected on spread 3, therefore blind-zone calculations were made for this spread. These estimate the maximum thickness at which a layer of this velocity can exist without being detected on the time-distance curves. The blind-zone is shown by broken lines on spread 3 and where not detected on spread 4.

The fourth layer (1 675 - 3 250 m/s) probably consists of unweathered rock. The depth to this layer is an approximation, as reciprocal times for the off-end shots could not be accurately ascertained.

CONCLUSION

The seismic sections show that the velocity of the material to be excavated does not exceed 1 300 m/s, and therefore little difficulty should be encountered in excavating the material with D8 or D9 heavy duty tractor. However, the high velocity layer at the south-eastern end of spread 4 has been calculated to lie at the same depth as the proposed excavation. As the depths to this layer are approximate, it is possible that blasting may be needed to remove material at the base of the excavation, near the periphery of the southern sector of the oval.

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REFERENCES

HAWKINS, L.V., 1961. The reciprocal method of routine shallow refraction investigations. Geophysics, 26, 806-819.

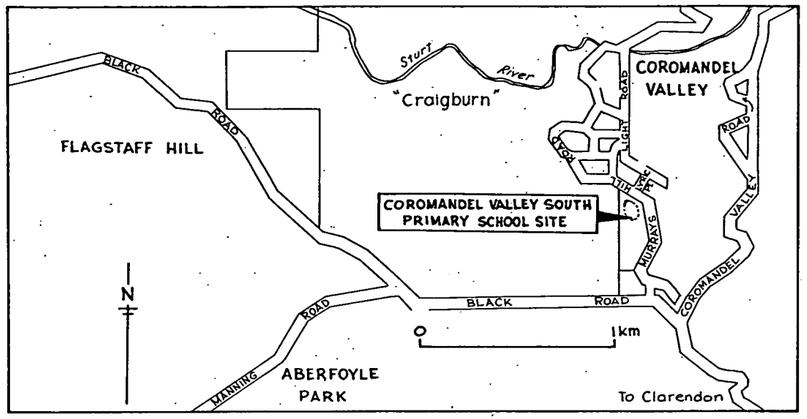
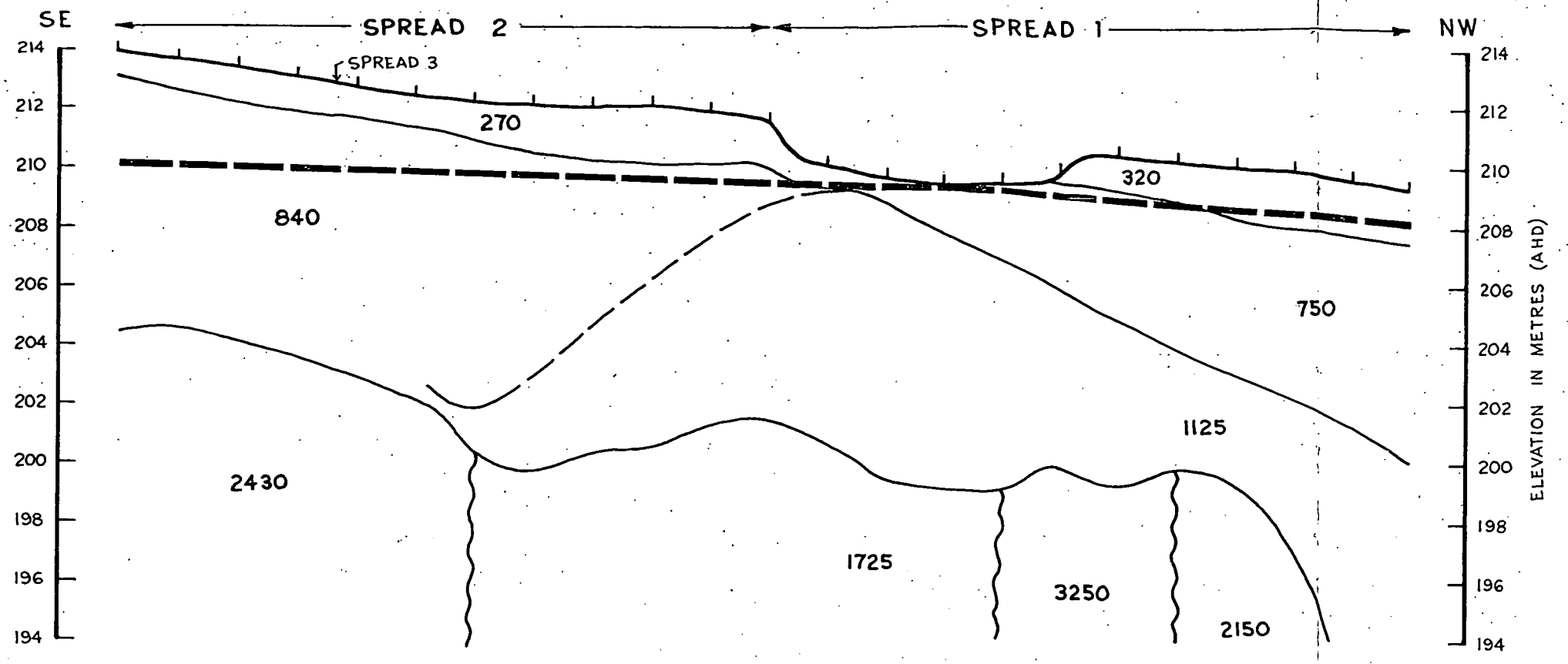
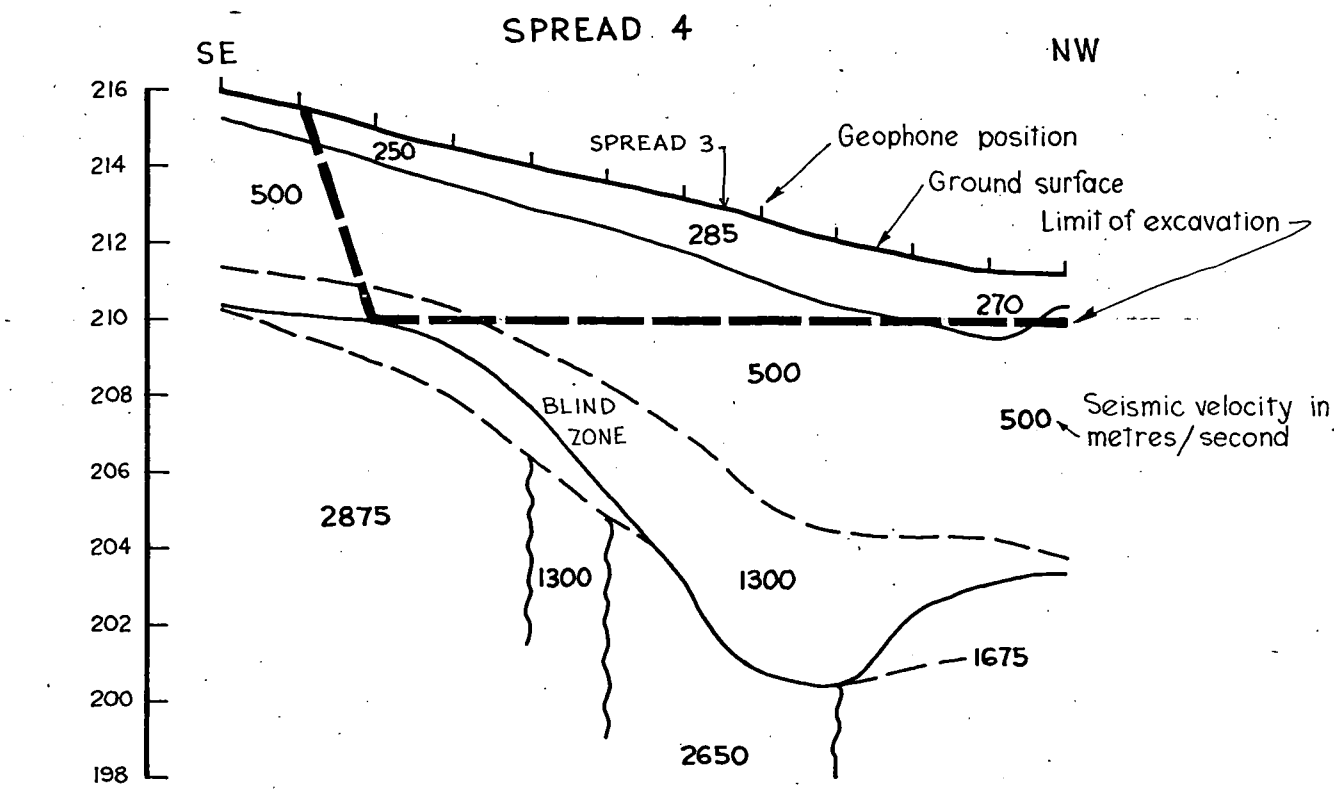


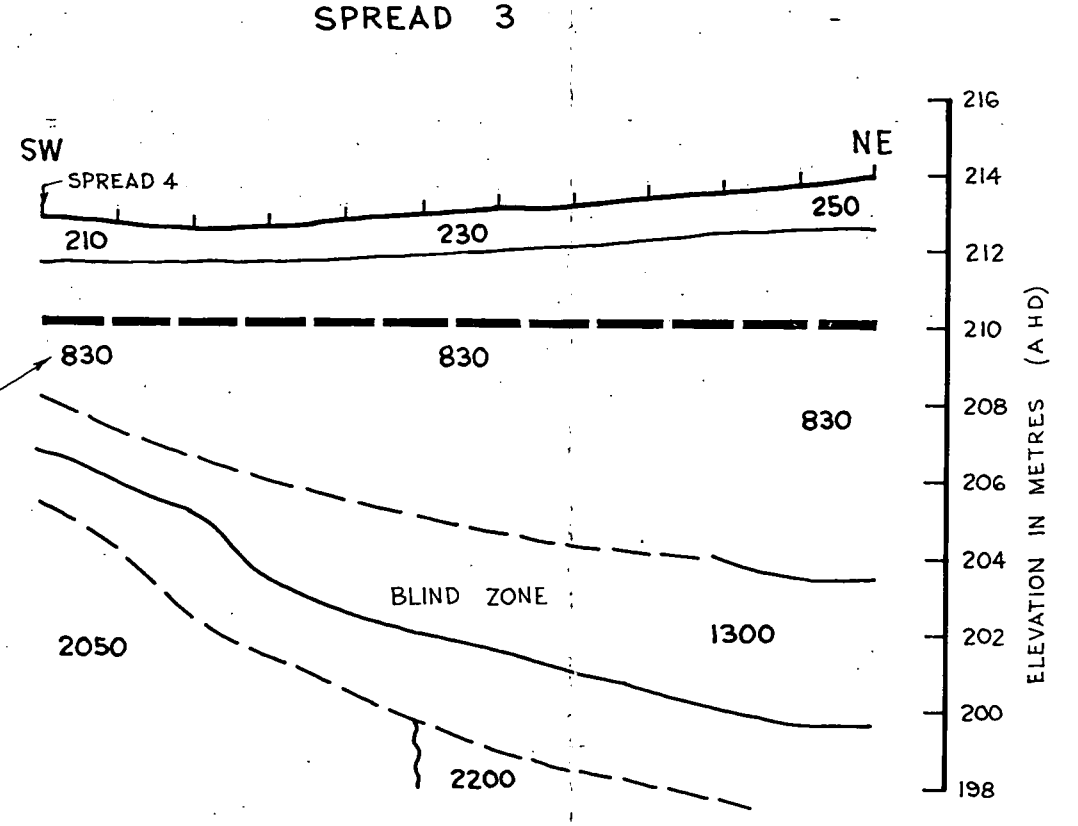
FIG. 1

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED B. Taylor	CDO 25·6·80 DATE
COROMANDEL VALLEY SOUTH PRIMARY SCHOOL OVAL SITE	DRAWN A.F.	SCALE 1:1000
LOCATION OF SEISMIC SPREADS	DATE 2-6-80	PLAN NUMBER 80-330
	CHECKED	

1975







HORIZONTAL SCALE

Metres 10 0 10 20 30 40 Metres

$\frac{V}{H} = 5$

FIG. 2

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CDO. 25 · 6 · 80 DATE

DRAWN A.F.

SCALE 1:500 HORIZ. 1:100 VERT.

DATE 2-6-80

CHECKED

PLAN NUMBER 80 – 331

COROMANDEL VALLEY SOUTH PRIMARY SCHOOL OVAL SITE

SEISMIC CROSS SECTIONS

1975