DEPARTMENT OF MINES
SOUTH AUSTRALIA

RB 53/71

Report on

TEST DRILLING OF SAND DEPOSIT

SEC. 142, HD. MILLUNGA

(Twin Power Excavations)

by

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Geologist
MINERAL RESOURCES SECTION
GEOLOGICAL SURVEY

CONTENTS

Map No.	Title	Scale
61-558	Sand Deposit Sec. 131, 132, 133, 140, 142, 143. Hd. Willunga.	1 inch = 200 feet
61-642	Graph of sieve analysis	-

Rept. Bk. No. 53/71
G.S. No. 2115
D.M. 1503/61

15th September, 1961

1. ABSTRACT

Further boring has confirmed the presence of 2½ million cubic yards of sand covered by 2 million cubic yards of overburden. The mean clay content of all samples tested from section 142 is 7.6% by weight. Unwashed sand has a slightly higher proportion of fines than specified in British Standards for building sand.

2. INTRODUCTION

A further 8 holes were bored on section 142, Bd. Willunga between 29th August and 1st September 1961 (J.G. Olliver unpublished report DR 1064/61). Complete geological logs of these boreholes are appended.

Samples of potential building sand were submitted for sieve analysis and determination of clay content, the results of which are also appended and represented graphically on plan no. 61-642.

The boreholes were surveyed on 6th September 1961 and added to the original plan no. 61-550.

Three holes (R1, R2 and R3) bored by a private contractor were also located.

3. RESULTS OF BORING

The boring results are consistent with those previously obtained.

Two feet of clay-loam, thicker in the creek, is underlain by fine sand and clay.

Potential building sand was intersected at the following depths:-

Borehole no. 31	from	16	to	90	feet	i.e.	74	feet of sand
32	"	24	"	90	"		66	" " "
33	"	12	"	58			46	" " "
36	"	16	"	88			72	" " "
37	"	76	"	90			14	" " "
38	"	66	"	86			20	" " "

The variegated brown to white sand is fine and clayey at the top becoming coarse and gravelly at depth. Borehole no. 34 penetrated clays to 56 feet, then clayey sand to 84 feet, at which depth the hole was abandoned.

Borehole no. 35 was stopped at 20 feet, where the auger struck impenetrable material.

Borehole 31 penetrated sandy clay to 32 feet, whereas sand was found below the topsoil in boreholes 32 and 33 to 73 feet and 34 feet respectively except for a seam of white clay in borehole 32 from 40 feet to 52 feet.

The base of the sand was reached in borehole no. 33 at 58 feet.

The average depth of overburden in section 142, omitting boreholes nos. 20, 22, and 34, is 27 feet (omitting boreholes nos. 37 and 38 as well - 22 feet).

4. RESULTS OF SIEVE ANALYSIS

Apart from hole no. 36, all samples have similar gradings to those previously tested with a higher proportion of fines passing the 100 mesh screen than specified in British Standard Specification 882 (1954): Sand for concrete fine aggregate (see plan no. 61-642).

The coarsest sand was obtained from borehole no. 33, the only sample from the deposit which includes the basal gravels lying directly on bedrock.

The clay content varies from 6.8 to 13.8% by weight. The weighted mean clay content for all samples from section 142 is 7.6% by weight.

5. CONCLUSIONS

No further reserves have been proved or disproved i.e. 2¼ million cubic yards of sand are covered by 2 million cubic yards of overburden.

Total reserves of sand within section 142 cannot be estimated because the base of the sand has only been reached in borehole no. 33 at 58 feet.

The average depth of overburden is 27 feet which increases to the southeast.

The sands generally coarsen with depth.

Although containing a slightly higher proportion of fines than British Standards, unwashed sand may be used for building purposes. Washing should produce an ideal sand.

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MINERAL RESOURCES SECTION

JGO:AGK
15/9/61

LOG OF PROLINE BOREHOLE NO. 31

PROJECT: TWIN POWER EXCAVATIONS

SEC.: 142 HD.: WILLUNGA CO.: ADELAIDE

R.L.: 148 feet DEPTH: 90 feet DRILLER: F. STURMER

LOGGED BY: J. G. OLLIVER DATE: 30/8/61

Depth (feet) From	To	Description
0	2	Dark red-brown clay loam.
2	8	Light brown limey clay.
8	10	Grey and red-brown clay
10	16	Light brown to white sandy clay
16	28	Yellow sand to yellow-brown clayey sand, the clay content increases with depth.
28	30	White clay and fine white sand.
30	32	Light brown sand with seams of white clay.
32	40	Coarse reddish brown sand.
40	42	Light brown sand.
42	66	Light red-brown sand with seams of white clay at 50-52 feet and 60-66 feet.
66	72	Light brown sand, slightly coarser than 42-66 feet.
72	86	Light redbrown gravelly sand with seams of white clay at 76-78 feet. The grain size increases with depth from ¼ inch to 1 inch rounded quartz pebbles.
86	90	Light brown slightly gravelly sand.

LOG OF PROLINE BOREHOLE NO. 32

PROJECT: TRIN POWER EXCAVATIONS

SEC.: 142 **HD.:** WILLUNGA **CO.:** ADELAIDE

R.L.: 131 feet **DEPTH:** 90 feet **DRILLER:** F. STUMMER

LOGGED BY: J. G. OLLIVER **DATE:** 30/8/61

Depth (feet) From	To	Description
0	4	Dark brown loam.
4	14	Brown sandy clay - lime nodules from 4 to 10 feet.
14	20	Brown gravelly clays with ¼ inch angular quartz pebbles.
20	22	Yellow-brown clayey sand.
22	24	Brown clayey sand with seams of white clay.
24	26	Red sand and white sandy clay.
26	28	Light pink sand with seams of white clay.
28	32	Brown sand with seams of white clay at 28-30 feet.
32	56	Yellow sand, fine to medium grained generally well-sorted.
56	72	White to pale brown sand, slightly coarser with depth, with a few thin seams of brown clay.
72	80	Brown gravelly sand, with minor brown clay.
80	82	Brown clayey gravel with 1 inch rounded quartz pebbles.
82	90	Light brown gravelly sand (maximum pebbles - 1 inch) with a few seams of white clay.

LOG OF PROLINE BOREHOLE NO. 33

PROJECT: TWIN POWER EXCAVATIONS

SEC.: 142 **HD.:** WILLUNGA **CO.:** ADELAIDE

R.L.: 121 feet **DEPTH:** 78 feet **DRILLER:** F. STUMMER

LOGGED BY: J. G. OLLIVER **DATE:** 30/8/61

Depth (feet) From	To	Description
0	12	Dark brown clay loam grading down into grey clay.
12	16	Yellow-brown clayey sand.
16	28	Light brown to white clayey sand with seams of white clay at 20-22 feet.
28	30	Pale yellow sand slightly clayey and coarser than 16-28 feet.
30	32	Pale yellow and light red brown slightly clayey sand.
32	34	Coarse brown sand, containing ¼ inch rounded quartz grains.
34	36	Light yellow brown gravelly sand (½ inch rounded quartz pebbles).
36	38	Very pale brown gravel with seams of white clay.
38	42	Light brown gravelly sand with 1 inch rounded quartz pebbles.
42	46	Light yellow-brown coarse sand, slightly gravelly.
46	48	Light brown gravelly sand.
48	50	Very pale brown gravel (quartz pebbles up to 1 inch).
50	58	Light brown gravelly sand.
58	78	White clay, sandy at top.

LOG OF PROLINE BOREHOLE NO. 34

PROJECT: TWIN POWER EXCAVATIONS

SEC.: 142 **HD.:** WILLUNGA **CO.:** ADELAIDE

R.L.: 135 feet **DEPTH:** 84 feet **DRILLER:** F. STUMER

LOGGED BY: J. G. OLLIVER **DATE:** 30/8/61

Depth (feet) From	To	Description
0	2	Dark brown loam and minor white clay.
2	20	Light brown clay containing lime nodules becoming sandy with depth.
20	22	Brown clayey sand containing quartz pebbles up to 1 inch, rounded but many flat and tabular.
22	24	Red brown clayey sand.
24	56	Brown clay, very sandy in parts.
56	84	Yellow-brown sand, clayey in parts.

LOG OF PROLINE BOREHOLE NO. 35

PROJECT: TWIN POWER EXCAVATIONS

SEC.: 142 **HD.:** WILLUNGA **CO.:** ADELAIDE

R.L. 159 feet **DEPTH:** 20 feet **DRILLER:** F. STUMMER

LOGGED BY: J. G. OLLIVER **DATE:** 29/8/61

Depth (feet) From	To	Description
0	2	Dark red-brown clay loam.
2	8	Light brown clay.
8	16	Light brown clayey sand.
16	18	Light brown sandy clay.
18	20	Light yellow-brown clayey sand.

Hole stopped as drill could not penetrate any deeper.

LOG OF FROLINE BOREHOLE NO. 36

PROJECT: TWIN POWER EXCAVATIONS

SEC.: 142 HD.: WILLUNGA CO.: ADELAIDE

R.L.: 146 feet DEPTH: 90 feet DRILLER: F. STUMMER

LOGGED BY: J. G. OLLIVIER DATE: 31/8/61

Depth (feet) From	To	Description
0	2	Dark red brown clay loam.
2	12	Light brown sandy clay.
12	16	Very pale brown to white sandy clay.
16	20	Light orange clayey sand.
20	28	White to very pale brown clayey sand.
28	30	Yellow-brown clayey sand.
30	34	White to very pale brown clayey sand.
34	36	Light red-brown sand.
36	38	Fine pale pink sand, slightly clayey.
38	40	Fine yellow to light brown clayey sand.
40	44	Light red fine clayey sand.
44	50	Light brown fine sand with seams of white clay at 46-48 feet.
50	54	Pink-brown fine sand.
54	68	Pale brown fine sand. The fine sand from 36 to 68 feet is slightly micaceous.
68	88	Pale brown sand, clayey in parts.
88	90	Yellow-brown sandy clay.

LOG OF PROLINE BOREHOLE NO. 37

PROJECT: TWIN POWER EXCAVATIONS

SEC.: 142 HD.: WILLUNGA CO.: ADELAIDE

R.L.: 151 feet DEPTH: 90 feet DRILLER: F. STUMMER

LOGGED BY: J. G. OLLIVER DATE: 31/8/61

Depth (feet) From	To	Description
0	2	Dark red-brown clay loam.
2	8	Light reddish brown sandy clay with some small lime nodules.
8	10	White to pale brown slightly sandy clay.
10	12	Light red-brown and white sand.
12	16	White clay with some light red-brown sand.
16	18	White to pale brown sand with many seams of white clay.
18	20	White clay with minor pale brown sand.
20	22	White clayey sand.
22	26	Brown clayey sand with many seams of white clay at 24-26 feet.
26	32	White clay with chips of red-brown sandstone at 30-32 feet.
32	38	Yellow-brown clayey sand to sandy clay.
38	44	Light yellow-brown slightly clayey fine sand.
44	50	Fine red-brown sand with yellow-brown clay at 48-50 feet.
50	52	Red-brown to light brown sandy clay.
52	58	Fine red, yellow-brown and white clayey sand with seams of white clay at 56-58 feet.
58	62	Grey clay and light brown slightly sandy clay.
62	66	Grey clay and white clayey fine sand.
66	70	Fine grey sand underlain by fine yellow clayey sand.
70	76	Light brown fine clayey sand with seams of white clay at 70-72 and pink and grey clay at 74-76 feet.
76	90	Brown sand becoming coarser with depth - slightly gravelly at 84-90 feet with ¼ inch rounded quartz pebbles.

LOG OF PROLINE BOREHOLE NO. 38

PROJECT: TWIN POWER EXCAVATIONS

SEC.: 142 **HD.:** MILLUNGA **CO.:** ADELAIDE

R.L.: 131 feet **DEPTH:** 86 feet **DRILLER:** F. STUMMER

LOGGED BY: J.G. OLLIVER **DATE:** 1/9/61

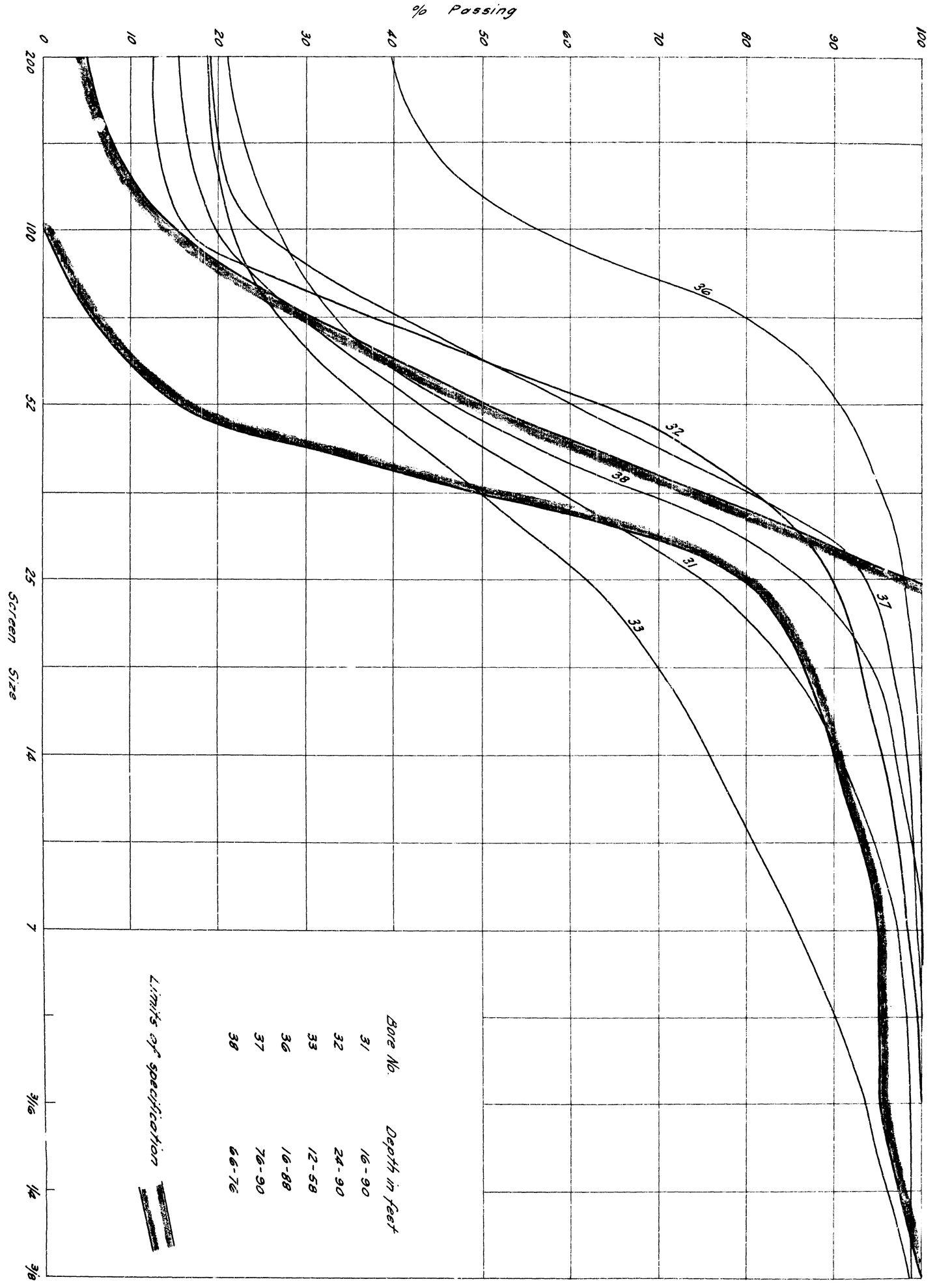
Depth (feet) From	To	Description
0	2	Dark brown to red brown clay loam.
2	10	Light brown clay, sandy at depth.
10	14	Red-brown gravelly clay containing ½ inch angular quartz pebbles.
14	20	Pale brown to yellow clayey sand. Clay content decreases with depth.
20	34	White to grey clayey sand with many seams of white clay at 22-24 feet.
34	36	Orange clayey sand.
36	40	White clay with minor sand.
40	46	Fine white clayey sand.
46	54	Light brown fine sand, slightly clayey in parts.
54	62	Light brown fine clayey sand.
62	66	Yellow clayey sand with seams of white clay at 62-64 feet.
66	76	Light brown coarse sand with thin bands of white clay and sandy clay.
76	80	Light brown clayey sand.
80	86	Pale brown coarse clayey sand (quartz pebbles up to ¼ inch).

APPENDIX II

RESULTS OF SIEVE ANALYSIS

Weight %

Mesh B.S.S.	Bore No. 31 (16°-90°)	Bore No. 32 ((24°-90°)	Bore No. 33 (12°-58°)	Bore No. 36 (16°-88°)	Bore No. 37 (76°-90°)	Bore No. 38 (66°-76°)
+ ½ inch	1.1	-	1.4	-	-	-
- ½ + 3/16 inch	0.2	-	5.5	-	-	-
- 3/16 + 7 mesh	1.5	1.4	7.7	0.1	0.5	0.5
- 7 + 14 mesh	6.5	3.0	10.3	0.3	1.4	2.3
- 14 + 25 mesh	15.4	5.7	13.3	1.9	4.6	11.0
- 25 + 52 "	32.2	26.6	25.2	7.2	32.7	40.5
- 52 + 100 "	23.6	46.9	15.6	34.3	36.4	19.1
-100 + 200 "	4.3	4.0	2.4	16.4	5.5	5.6
- 200 mesh	15.2	12.4	18.6	39.8	18.9	21.0
Clay content	9.0	6.8	11.2	13.8	11.6	11.0



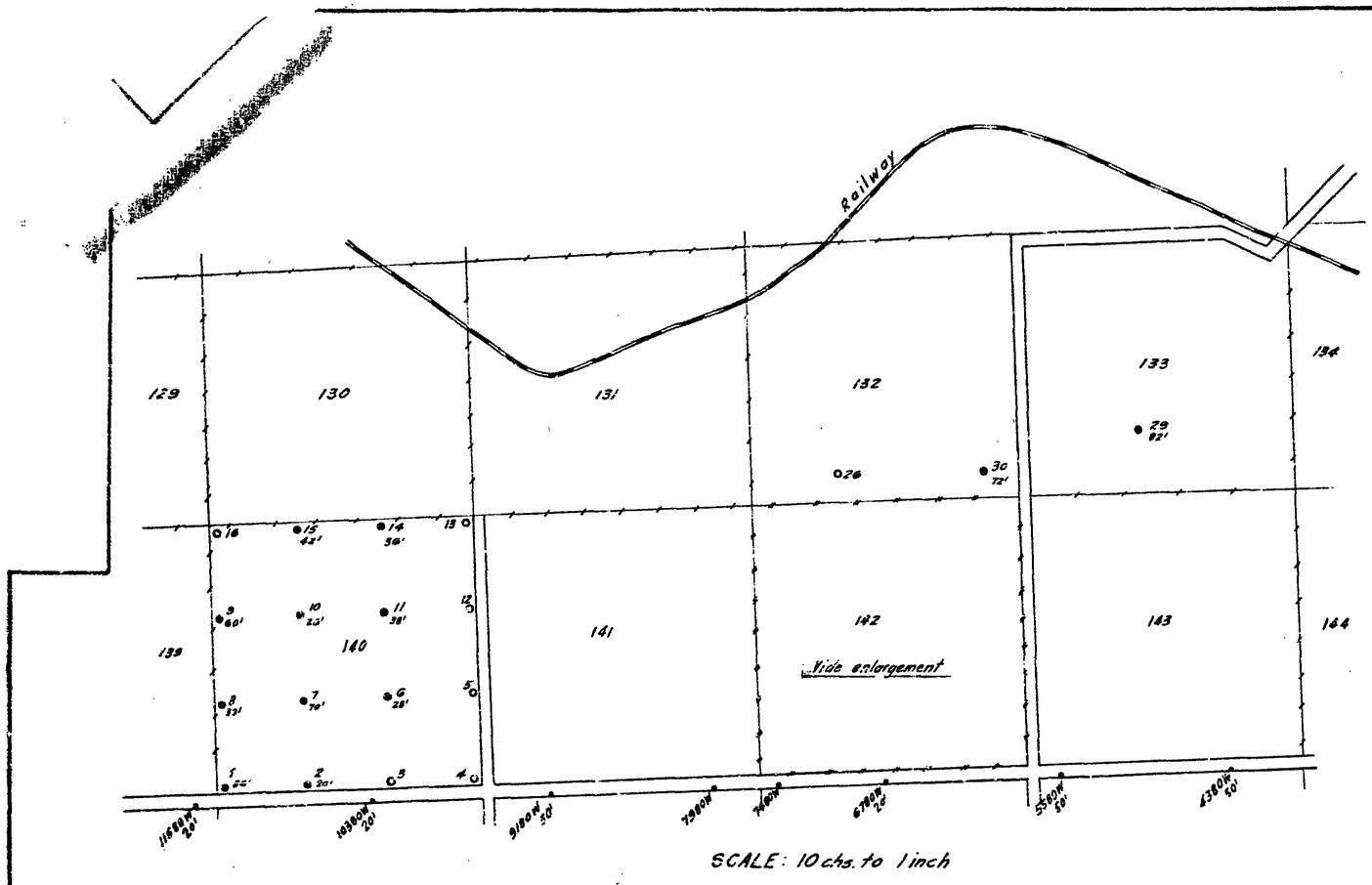
To accompany report by J.G. Olliver

S.A. DEPARTMENT OF MINES

No.	Amendment	Exc.	Date

B.S. SPECIFICATION 882 (1954)
SAND FOR CONCRETE FINE AGGREGATE
SEC. 142 HD. WILLUNGA
(TWIN POWER EXCAVATIONS)
ZONE 4

Approved	Passed		Scale:
		Drn. J.G.O.	61-642
		Tcd. A.O.W.	
		Ckd. R.R.	Hall
Director		Exd.	Date 12-8-61



LEGEND

QUATERNARY

Alluvium

TERTIARY

Sands clays and gravels

PROTEROZOIC

Marinean purple and grey slates

Area for which volume calculated

MACHINE AUGER HOLES

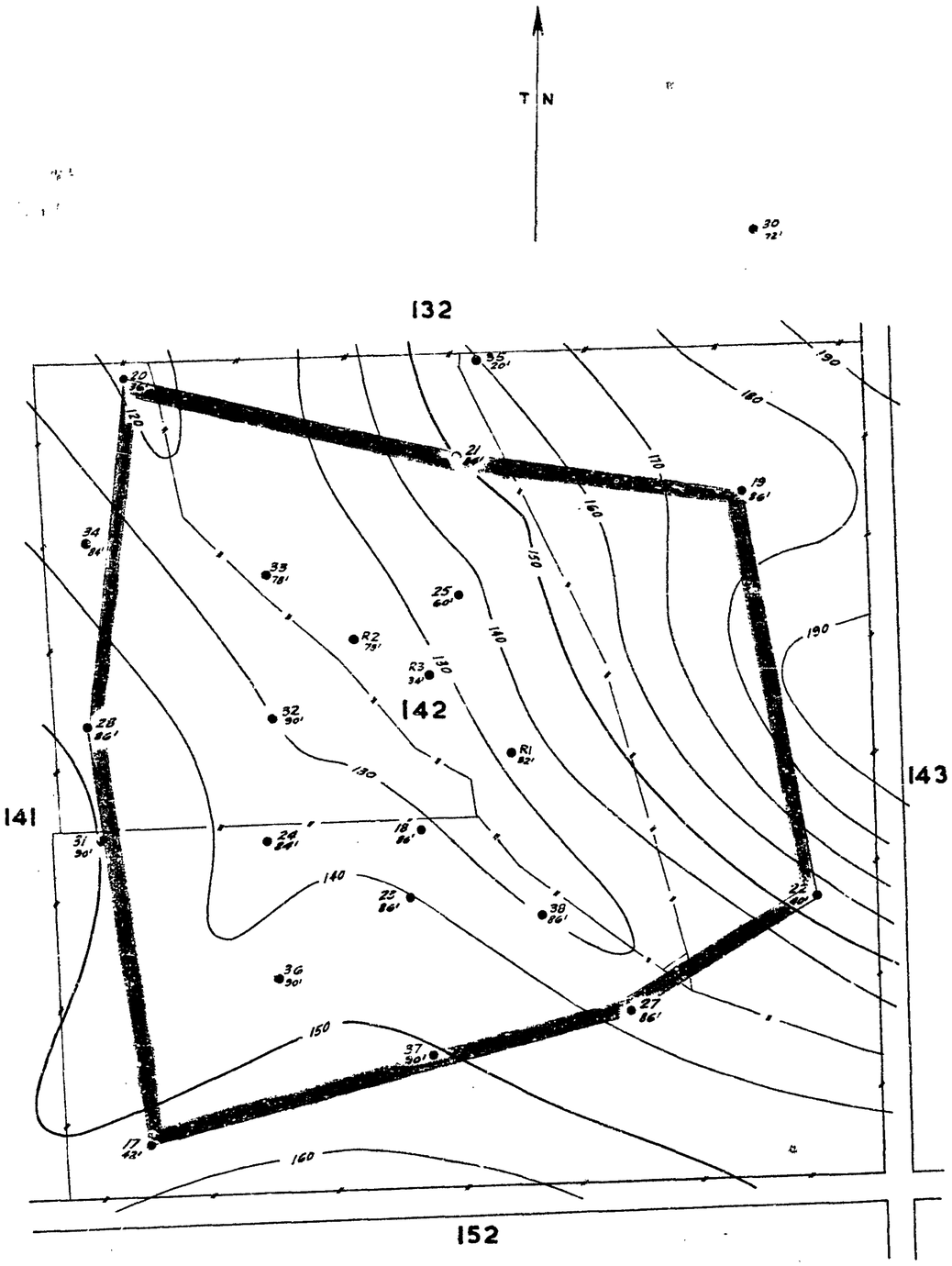
" " Drilled — 23 Number, 86' Depth

" " Pegged — 16 No.

Geophysical bore hole — G760W No. 20' Depth

Contour interval 10'

Datum M.S.L. approx.



Stadia Survey by M.B. Langsford. July 1961.
S.F.B. N°. 181

To accompany report by J.G. Oliver

S.A. DEPARTMENT OF MINES

SAND DEPOSIT
Ho. WILLUNGA SECS. 131/3, 140, 142/3.
LOCATION OF BOREHOLES
(MRS. G.D. STEVENS.)

Associated Drawing	No.	Amendment	Exd.	Date

Req. No.
D.M.
Compiled from

Approved	Passed		Scale: As Shown
		Drn. J.G.O.	61-558
		Tcd. A.O.W.	Hall
		Ckd. A.A.	
Director of Mines		Exd.	Date 4-8-61