Section

Rept.Bk. 60/41
G.S. 3093
D.M. 187/65
E. G. No. 65-7

DEPARTMENT OF MINES
SOUTH AUSTRALIA

ENGINEERING AND SOILS GEOLOGY SECTION
GEOLOGICAL SURVEY

REPORT ON SITE EXAMINATION

PROPOSED SUBDIVISION, WEST BEACH.

Section 222, Hundred of Adelaide.

by

J. A. C. Painter,
Geologist.

4th March, 1965.

D.M. 187/65

65/769

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INTRODUCTION

The site of a proposed subdivision at West Beach, five miles west of Adelaide, has been examined for the purpose of determining foundation characteristics and footing recommendations for a number of brick and masonry houses being erected by Mayfair Homes Pty. Ltd.

Three test pits were examined, on Lot Nos. 17, 22 and 27. Soil profiles are described in Appendix A.

SOIL UNITS AND FOUNDATION CHARACTERISTICS

The three test pits examined revealed an estuarine soil of the Patawalonga Association overlain by a variable thickness of assorted fill material.

Estuarine Soil.

The only reasonably constant horizon over the entire area is a layer of dark grey, silty clay to very clayey silt. It varies mainly in its position in the soil profile at the various points, and the relative proportions of silt and clay.

This horizon would be subject to very slight seasonal swelling and shrinkage movements, due to the reaction of the clay minerals present when water evaporates or is absorbed. However, due to the cushioning effect of the overlying sand and fill, movements at the soil surface would be negligible. The clay would also be subject to some settlement under load, particularly when the water table is high.

On lot No. 27, the clay horizon is overlain by at least 1ft. 7in. of very fine grained sand. The sand is fairly compact to loose, and would also be subject to some settlement under load.

Fill Material

This material overlies the estuarine soil over the entire area of the subdivision, having a minimum exposed thickness of 1ft. 4in. on Lot No. 22, and a maximum thickness of 2ft. 10ins. on Lot No. 17. The composition of the fill varies to a certain extent. The surface layer is mainly a red-brown sandy and silty clay, apparently well compacted and containing abundant stone fragments and rubble. The clay has a vague granular structure and may be subject to small seasonal swelling and shrinkage movements.

On Lot No. 17, the surface layer is very fine grained sand to a depth of 1ft. 4in. This sand is mainly fairly compact and dense, but is loose and friable in parts, and may be subject to slight settlements under load. Surface indications are that the sand is a local pocket.

In general, the fill consists of a heterogeneous admixture of clays, sandy clays and silty sands. These are moderately well compacted, but to varying degrees, and may give rise to small differ ential settlements under load.

FOOTING RECOMMENDATIONS

The recommended foundation practice is the use of a very rigid strip footing, of wide bearing area, seated on or near the surface. Suggested dimensions for the beams are:

EXTERNAL WALLS: 15" deep, 21" wide, reinforced by seven ½" diameter rods (4 top, 3 bottom)

INTERNAL WALLS: 15" deep, 18" wide, reinforced by six ½" diameter rods (3 top, 3 bottom)

It is important to note that on soils requiring a wide footing such as this, the chimney piece should be supported on a similarly wide base.

The Department does not have at its disposal a ready means of determining actual bearing capacities, especially for fill material. These figures could possibly be supplied by some competent soil testing organisation.

GENERAL RECOMMENDATIONS

All surplus surface water and roof run-off should be carried well away from the footings in properly constructed drains of adequate capacity. Lawns and gardens should be kept well clear of the footings area to prevent damage resulting from overwatering.

A wide concrete, or heavy asphalt paving completely surrounding the house will minimise soil moisture variations beneath the footings.

The suggestions regarding types and sizes of footings are intended as a guide to the foundation characteristics of soils at the site. Alternative designs are not necessarily excluded by the suggestions made in this report.

J. A. C. PAINTER,
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4.3.65

APPENDIX A.

SOIL PROFILES

Lot No. 17

0'0" - 1'4" Fill. Greyish-brown very fine grained sand with yellow-brown banding in parts. Well compacted generally, but sometimes loose and friable.

1'4" - 2'10" Fill. Red-brown silty and sandy clay, vaguely granular, overlying grey-brown sands and clayey silt. Abundant solid material (masonry, rubble, stone, etc.).

2'10" - 4'0" Dark grey to dark grey-brown silty clay to very clayey silt. Few plant remains, some carbonaceous material. Compact to stiff. Damp.

Lot No. 22

0'0" - 1'4" Fill. Red-brown very sandy and silty clay. Vague granular structure. Abundant solid material (stone, masonry, rubble, etc.)

1'4" - 3'4" Dark grey, clayey silt to very silty clay. Common plant remains and carbonaceous material. Scattered quartzite pebbles up to 2" size. Stiff to compact and dense. Damp.

3'4" - 4'0" Grey-brown, silty and clayey very fine grained sand, with dark grey and yellow-brown patches and pockets of silty, very carbonaceous clay. Compact. Damp.

Lot No. 27

0'0" - (1'3"-1'7") Fill Red-brown, very sandy clay with abundant stone fragments, overlying silty clay, sands, clay with stone fragments and silty very fine grained sand. Scattered pebbles, masonry, rubble, etc. throughout.

(1'3"-1'7")-(3'2"-4'0") Whitish, very fine grained sand. Abundant shell fragments and few, small, rounded pebbles. Porous. Friable and loose.

(3'2"-4'0")- 4'0" Dark grey to dark grey-brown, silty clay. Vague nutty structure with dull to moderate sheens on individual units. Numerous plant root remains and abundant carbonaceous material. Stiff to compact. Damp.