

REPORT ON SUBSURFACE FOUNDATION CONDITIONS  
PROPOSED EXTENSION TO MASTER BUTCHERS ASSOCIATION BUILDING  
MORPHETT ST., ADELAIDE

by

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REPORT ON SUBSURFACE FOUNDATION CONDITIONS

PROPOSED EXTENSION TO MASTER BUTCHERS ASSOCIATION BUILDING

MORPHETT ST., ADELAIDE

1. SUMMARY

The site was tested by the construction of six percussion boreholes, to depths of 11' and 20', a total footage of 84' being drilled.

Twenty five undisturbed sealed tube samples were recovered and forwarded to GeoSurveys Ltd. for analysis.

Heterogeneous sandy fill material covers the site to a depth of 2', where it is underlain by a sandy marl horizon extending to a maximum depth of 9'. This material is somewhat variable in composition and distribution, and is relatively stable in the dry state. Rapid deterioration and loss of bearing strength would result should the marl become saturated.

A green-grey silty to sandy clay extends below the marl, to the maximum depth tested, i.e. 20'. This material is very stiff and plastic and would possess adequate bearing capacity.

Footings should be seated on a stable zone within this clay horizon, i.e. at approximately 11' below the soil surface. Alternatively, foundations should be supported on piles or piers extended to at least this depth.

2. INTRODUCTION

The enquiry for this investigation was initiated by Mr. R.J. Symon of R.G. Symon Ltd., formerly Symon, Cox and North Ltd., consulting and manufacturing engineers.

It was proposed to replace the existing Master Butchers Association Building, by a normal two storey steel fabricated structure. The site has a frontage of about 70 feet on the eastern side of Morphett Street, Adelaide, situated between the R.A.O.B. and some old buildings also belonging to the Master Butchers Association. The land is contained in Lands Title Reference; Volume 1651, Folio 182, Part of Town Acres 195, 224.

### 3. TEST DRILLING

Six shallow boreholes were constructed to test the subsurface foundation conditions present. The relative positions of these holes are shown on the accompanying plan (59-115).

Bore No. 1 was constructed to furnish a continuous geological profile to a depth of 20', and to provide a basis for selecting the most suitable depths for recovering sealed tube samples in subsequent holes.

Bores 2, 3, 4 and 5 were 11' deep. Sealed tube samples were obtained in each hole at 2'0" - 3'4", 4'4" - 5'8", 6'8" - 9'0", 9'8" - 11'0". Bore No. 6 was extended to 20', to secure a further series of undisturbed samples at 11'0" - 12'4", 12'4" - 13'8", 13'8" - 15'0", 15'0" - 16'4", 17'4" - 18'8", 18'8" - 20'0".

Boring commenced on 9/5/57 and was completed 14/5/57, using plant No. 44, operated by driller P.D. Hines. A total of 84' was drilled in the four day working period. The number of blows necessary to effect each successive foot of penetration were recorded. These figures are included with the appropriate borelogs appended to this report. The weight of the sampling tools was 508 lbs., drilling rate being maintained at 40 strokes per minute. Cores were obtained as 4" diam. samples, from tubes having an outside nominal diameter of 5½".

The respective borelogs were forwarded to GeoSurveys Ltd. at the completion of drilling, along with a plan showing their relative positions. This information, coupled with the data from their laboratory testing, would enable them to furnish a complete foundation report, so that the design and construction of the proposed building could be satisfactorily completed.

### 4. GEOLOGY OF THE SITE

A layer of greyish-brown sandy fill material, with heterogeneous gravel, rubble and cinder fragments, covers the site to a depth of 2'.

Underlying the fill is an horizon of brown to light brown sandy marl, containing travertine rubble in irregular

abundance. The marl becomes very limey from 3'6", with abundant chalky white lime pockets and travertine rubble fragments throughout. The lime disappears at 6' on the western side of the site, but extends deeper to 9', in the vicinity of Bores 4 and 5.

Greenish-grey sandy to silty clay was encountered at the following depths:-

Bore 1, (4'2")	Bore 2 (6'8")	Bore 3 (6'8")
Bore 4 (9'0")	Bore 5 (8'0")	Bore 6 (5'6"),

and extends to the maximum depth tested i.e. 20'. Brown, yellow-brown and reddish-brown mottling is irregularly evident.

Deeper bore holes put down in the vicinity, reveal that this clay material is of widespread occurrence and of a greater thickness than that tested in the above programme.

##### 5. CONCLUSIONS AND RECOMMENDATIONS

The sandy fill covering the surface of the site is poorly sorted and not well compacted. Footings supported on this material would be subject to settlement problems.


The marl horizon underlying the fill is relatively strong in the dry state, but undergoes rapid deterioration and loss of bearing strength when saturated. These limey subsoils are therefore insufficiently stable to safely support the load of a two storey building.

The lime extends unevenly down to a maximum depth of 9', where a stiff and plastic silty clay horizon is developed. This material becomes increasingly stiff with depth and should possess reasonably high bearing capacity. To avoid contamination from surface drainage, etc., footings should be seated at least 2' into this clay, i.e. at an arbitrary depth of 11' below the soil surface.

Whether it is more practicable to place footings at this depth, or to support them nearer the surface on piles or piers extended to at least 11', can best be determined from the data available from the sealed tube sample testing.

Precautions should be taken to prevent undue moisture penetration of the subsoil below the building area, with especial care taken to divert roof run-off etc., into council drainage systems.

RDS:AGK  
22/12/59

  
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PERCUSSION TEST BOREHOLE NO. 1

Locality: Proposed Extension to Master Builders Association Building  
at MORPHETT ST., ADELAIDE. R.J. SYMON & CO.

Purpose: Preliminary Test of Subsurface Foundation Conditions

Plant: No. 42 Docket No.: 655/57

Driller: P.D. Hines

Date Commenced: 9/5/57 Date Completed: 9/5/57

Bore Logged: R.D. Steel

Depth	Description
0 - 0'8"	Grey-brown sandy loam, with slight brownish mottling. Fairly abundant coarse gravel fill fragments.
8" - 1'0"	Brown fine sandy loam, with slight grey-brown mottling. Scattered small lime blobs.
1'0" - 2'2"	Dark grey-brown and brown mottled fine sandy loam. Scattered small lime nodules but abundant from 1'11". Fairly abundant grit fragments, quartz gravel and organic matter.
2'2" - 3'0"	Brown to light brown sandy and limey clay. Somewhat friable.
3'0" - 3'6"	Light brown sandy and very limey clay with pockets of brown silty clay. Few small lime nodules.
3'6" - 4'2"	Pale brown limey sandy clay, with patches of brown and grey-brown mottled silty clay increasing.
4'2" - 5'6"	Mottled green-grey, yellow-brown and slight reddish-brown very stiff and plastic silty clay.
5'6" - 6'4"	Mainly green-grey very stiff and plastic silty clay with slight yellow-brown and reddish-brown mottling.
6'4" - 10'0"	Green-grey very stiff and plastic silty clay with lesser red-brown mottling.
10'0" - 13'0"	Green-grey stiff and plastic silty clay with small pockets of reddish iron staining.
13'0" - 17'0"	Green-grey stiff and plastic silty clay with pockets of reddish iron-staining and yellow-brown mottling.
17'0" - 20'0"	Green-grey stiff and plastic silty clay with fairly abundant pockets of reddish iron staining.

END OF HOLE 20'.

PERCUSSION TEST BOREHOLE NO. 2

Locality: Proposed Extension to Master Butchers Association Building,  
MORPHETT ST., ADELAIDE. R.J. SYMON & CO.

Purpose: Preliminary Test of Subsurface foundation Conditions

Plant: No. 42 Docket No.: 655/57

Driller: P.D. Hines

Date Commenced: 10/5/57 Date Completed: 10/5/57

Bore Logged by: R.D. Steel

Depth	Description	Depth	No. of Blows
0 - 1'0"	Grey-brown sandy loam with brownish mottling. Some coarse fill material.	0-1'	-
1'0" - 1'10"	Dark brown, grey-brown and red-brown mottled sandy clay, with occasional grit and lime rubble fragments.	1-2'	31
1'10" - 2'0"	Dark brown, grey-brown and red-brown mottled very sandy clay, with abundant lime rubble fragments.		
2'0" - 3'4"	Sealed Tube sample	2'-3'4"	57
3'4" - 4'4"	Brown and light brown sandy and limey clay, with small isolated pockets of dark red-brown clay. Abundant small travertine nodules, becoming very limey at depth.	3'4"-4'4"	36
4'4" - 5'8"	Sealed Tube Samples	4'4"-5'8"	44
5'8" - 6'8"	Mainly light greenish-grey sandy to silty clay, with brown light red-brown and light yellow-brown mottling. Small whitish lime pockets. Becoming stiff and plastic with depth.	5'8"-6'8"	31
6'8" - 8'0"	Sealed Tube sample	6'8"-8'0"	40
8'0" - 9'8"	Light green-grey silty clay, with fairly abundant light brown and yellow-brown mottling. Occasional small lime pockets and odd travertine fragments. Becoming very stiff and plastic	8'0"-8'8"	23
9'8" - 11'0"	Sealed Tube sample	8'8"-9'8"	55
		9'8"-11'0"	65

END OF HOLE 11'.

PERCUSSION TEST BOREHOLE NO. 3

Locality: Proposed Extension to Master Builders Association Building, MORPHETT ST., ADELAIDE. R.J. SYMON LTD.

Purpose: Preliminary Test of Subsurface Foundation Conditions

Plant: No. 42 Docket No.: 655/57

Driller: P.D. Hines

Date Commenced: 10/5/57 Date Completed: 10/5/57

Bore logged by: R.D. Steel

Depth	Description	Depth	No. of Blows
0 - 1'0"	Grey-brown fine sandy loam, with odd small 0-1' limey fragments and black organic material. (Possibly fill).		25
1'0" - 2'0"	Light brown and grey-brown mottled fine sandy clay loam, with odd small lime fragments and small blobs of organic matter.	1-2'	20
2'0" - 3'4"	Sealed Tube Sample	2-3'4"	52
3'4" - 4'4"	Mainly pale brown sandy and limey clay, with small pockets of brown and reddish-brown clay. Scattered small whitish lime pockets and fairly abundant small travertine nodules.	3'4"-4'4"	25
4'4" - 5'8"	Sealed Tube sample.	4'4"-5'8"	19
5'8" - 6'0"	Green-grey silty clay, with large white lime pockets and fairly abundant small travertine nodules.	5'8"-6'8"	20
6'0" - 6'8"	Greenish-grey stiff and plastic silty clay. White lime pockets near top, decreasing with depth. Lesser brown, red-brown and yellow-brown mottling.		
6'8" - 8'0"	Sealed Tube sample.	6'8"-8'0"	36
8'0" - 9'8"	Mainly greenish-grey very stiff and plastic silty clay, with lesser brown, yellow-brown and reddish-brown mottling.	8'-9' 9'-9'8"	23 17
9'8" - 11'0"	Sealed Tube sample	9'8"-11'	30

END OF HOLE 11'.



PERCUSSION TEST BOREHOLE NO. 4

Location: Proposed Extension to Master Builders Association building,  
MORPHETT ST., ADELAIDE. R.J. SYMON LTD.

Purpose: Preliminary Test of Subsurface foundation Conditions

Plant: No. 42 Docket No.: 655/57

Driller: P.D. Hines

Date Commenced: 13/5/57 Date Completed: 13/5/57

Bore Logged: R.D. Steel

Depth	Description	Depth	No. of Blows
0'0" - 1'0"	Grey and brown fill material	0-1'	40
1'0" - 2'0"	Brown sandy fill material; small travertine nodules, stone and cinder fragments etc.	1-2'	15
2'0" - 3'4"	Sealed Tube sample	2'-3'4"	20
3'4" - 4'4"	Light brown sandy and limey clay, with small pockets of brown clay.	3'4"-4'4"	30
4'4" - 5'8"	Sealed Tube sample.	4'4"-5'8"	34
5'8" - 6'8"	Brown and light brown sandy and limey clay, with small isolated pockets of dark red-brown clay. Abundant whitish lime pockets and small travertine nodules.	5'8"-6'8"	20
6'8" - 8'0"	Sealed Tube Sample	6'8"-8'0"	15
8'0" - 9'0"	Pale grey stiff and plastic silty clay, Patches of brown to dark red-brown sandy clay decreasing with depth. Abundant chalky white lime pockets and odd small travertine nodules.	8'-9'	15
9'0" - 9'8"	Green-grey stiff and plastic silty clay, with small whitish lime pockets.	9'-9'8"	10
9'8" - 11'0"	Sealed Tube sample	9'8"-11'0"	25

END OF HOLE 11'.

PERCUSSION TEST BOREHOLE NO. 5

Locality: Proposed Extension to Master Builders Association Building, MORPHETT ST., ADELAIDE. R.J. SYMON LTD.

Purpose: Preliminary Test of Subsurface Foundation Conditions

Plant: No. 42 Docket No.: 655/57

Driller: P.D. Hines

Date Commenced: 13/5/57 Date Completed: 13/5/57

Bore Logged by: R.D. Steel

Depth	Description	Depth	No. of Blows
0 - 1'0"	Grey sandy fill material. Stone, plaster, cinder fragments etc.	0-1'	45
1'0" - 2'1"	Brown and grey-brown fine sandy fill material, with odd small stone, cinder and travertine fragments.	1-2'	40
2'1" - 3'4"	Sealed Tube sample	2'-3'4"	16
3'4" - 4'4"	Mottled light brown sandy and limey clay, with small peckets of lime and red-brown clay.	3'4"-4'4"	16
4'4" - 5'8"	Sealed Tube Sample	4'4"-5'8"	13
5'8" - 6'8"	Mottled brown and light brown sandy and limey clay, with abundant whitish lime peckets and small travertine nodules.	5'8"-6'8"	10
6'8" - 8'0"	Sealed Tube Sample	6'8"-8'0"	10
8'0" - 9'0"	Mottled pale brown and greenish-grey stiff and plastic silty clay with slight yellow-brown and red-brown mottling. Occasional lime peckets and travertine fragments.	8'-9'	9
9'0" - 9'8"	Mainly green-grey stiff and plastic silty clay, with brown, reddish-brown and yellow-brown mottling. Odd small lime peckets	9'-9'8"	12
9'8" - 11'0"	Sealed Tube Sample	9'8"-11'0"	30

END OF HOLE 11'

PERCUSSION TEST BOREHOLE NO. 6

Locality: Proposed Extension to Master Builders Association Building,  
MORPHETT ST., ADELAIDE. R.J. SYMON LTD.

Purpose: Preliminary Test of Subsurface Foundation Conditions

Plant: No. 42 Docket No.: 655/57

Driller: P.D. Hines

Date Commenced: 14/5/57 Date Completed: 14/5/57

Bore Logged: R.D. Steel

Depth	Description	Depth	No. of Blows
0 - 1'0"	Greyish sandy fill material, travertine fragments, organic matter etc.	0-1'	40
1'0" - 2'0"	Brown sandy clay fill, with light brown and red-brown mottling etc. Few whitish lime pockets and fairly abundant travertine rubble fragments.	1-2'	15
2'0" - 3'4"	Sealed Tube sample	2-3'4"	10
3'4" - 4'4"	Mottled light brown and greenish-grey silty to sandy clay, with some reddish-brown mottling. Stiff and plastic and with few small whitish lime pockets.	3'4"-4'4"	19
4'4" - 5'8"	Sealed Tube Sample	4'4"-5'8"	25
5'8" - 6'8"	Mainly green-grey stiff and plastic silty clay, with brown, reddish-brown and yellow-brown mottling. Occasional small travertine fragments.	5'8"-6'8"	14
6'8" - 8'0"	Sealed Tube sample.	6'8"-8'0"	20
8'0" - 9'8"	Green-grey stiff and plastic silty clay, with yellowbrown and reddish-brown mottling. Odd travertine fragments.	8'-9' 9'-9'8"	10 12
9'8" - 11'0"	Sealed Tube Sample	9'8"-11'	37
11'0" - 12'4"	Sealed Tube Sample	11'-12'4"	28
12'4" - 13'8"	Sealed Tube Sample	12'4"-13'8"	28
13'8" - 15'0"	Green-grey stiff and plastic silty clay with yellow-brown and reddish-brown mottling.	13'8"-15'0"	27
15'0" - 16'4"	Sealed Tube sample	15'-16'4"	35
16'4" - 17'0"	Open Tube Sample	16'4"-17'4"	32
17'4" - 18'8"	Sealed Tube Sample.	17'4"-18'8"	37
18'8" - 20'0"	Sealed Tube sample	18'8"-20'0"	37

END OF HOLE 20'.

