

DEPARTMENT OF MINES
SOUTH AUSTRALIA

REPORT ON SITE INVESTIGATION

SOUTH AUSTRALIAN CO-OPERATIVE BULK HANDLING LTD.

RAILWAY YARDS

WOLSELY, RD. TATIARA

INTRODUCTION

This report sets out the results of test boring for pile site foundations at Wolsely. The pile is to be situated in the railway yards, the appropriate map reference being Railway Reserve, Hundred of Tatiara.

Two sites were tested within the railway yards, Site A at the western end, and Site B at the eastern end. Bores to depths of 27 feet and 70 feet respectively were put down at each site. Sealed tube samples were taken at five foot intervals in each bore.

Geological logs and penetration data for the test bores are included in Appendix I. Locality maps showing the positions of the test bores are attached.

STRATA PENETRATED AND FOUNDATION CHARACTERISTICS.

The two sites tested are approximately 17 chains apart, and although the profiles at each site are essentially similar, precise correlation, particularly in the upper portion of the profile is not possible. For this reason each site will be discussed separately.

Site A (Western end of railway yards).

The materials encountered at this site are fill, soil, fluviatile clays, and estuarine and deltaic sands.

Fill: Surface to 2'6". This consists of sand and clayey silt. The continuity and physical character of this horizon cannot be predicted.

Soil: 2'6" to 5'. This consists of a sandy topsoil and sandy clay B horizon. The depth below the surface can be expected to vary throughout the site..

Fluviatile Clays: (Pleistocene), 5' to 17'. Red-brown and light-green mottled clays comprise this horizon. They may be expected to occur at similar depths, and be of similar thickness throughout the site.

Blows per foot and penetrometer readings indicate that the clay is of moderate strength, but would be subject to settlement under load.

Estuarine and Deltaic Sands, (Lorton Sands): 17' to 27'.

These consist of mottled clayey fine to medium grained clayey sands with localized strong iron oxide development. At the top of the sequence is a mottled sandy clay, produced by eluviation of the overlying clays.

The sands are moderately well compacted, and below a depth of 18 feet should be of relatively high strength, not subject to shear failure or settlement under load. They may be expected to occur at similar depths throughout the site.

Site B (Eastern end of railway yards).

The materials encountered at this site are in descending order, soil, alluvial clays, fluviatile sandy clays, and estuarine and deltaic sands.

Soil: Surface to 2'6". This consists of a sandy topsoil and sandy clay B horizon. The continuity of the horizon cannot be predicted, and at the time of testing the material was very wet, with a resultant low strength.

Alluvial Clays (Pleistocene to Recent): 2'6" to 8'. Sandy mottled clays containing occasional rounded quartz gravel comprise this horizon. The clays may be expected to occur at similar depths, and be of similar thickness throughout the site.

Blows per foot and penetrometer readings indicate that the material is of low to moderate strength, and would be subject to shear failure and settlement under load.

Fluviatile Sandy Clays, (Pleistocene): 8' to 15'. Mottled sandy and silty clays with occasional organic fibres.

They are of probable lacustrine origin, and may be expected to occur throughout the site with a similar thickness.

Blows per foot and penetrometer readings indicate a low compressive strength, and this horizon would be subject to shear failure and settlement under load.

Estuarine and Deltaic Sands. (Lexton Sands): 15' to 70'.

These are a series of fine to medium grained quartz sands, clayey in part, with thin sandy clay beds. At the top of the series minor eluviation of the overlying clays has occurred. Ferruginization and manganetting are common at the top, decreasing with depth, where the dominant colour is yellow-brown and light-grey. Small mica flakes occur below a depth of 36 feet.

The sands will occur at similar depths throughout the site. They are moderately dense, and the variation in blows per foot throughout the profile appears to be related to variation in clay and moisture content, and also with the degree of cementation with iron oxide in the upper portions.

Overall, the horizon will have moderately good load bearing properties, although variation depending upon grain size, clay and moisture content will occur.

GROUNDWATER

The test borers at both sites did not encounter the water table. In the nearest water bore, groundwater level is at a depth of approximately 120 feet, with a salinity of 90 grains per gallon.

CONCLUSIONS

Subsurface conditions at both sites A and B are essentially similar, consisting of a series of Pleistocene to Recent fluviatile clays overlying Pliocene estuarine and deltaic sands, (Lexton Sands). The Pliocene sediments occur at an approximate depth of 17 feet throughout the site.

At Site A the clays are of moderate strength, but would be subject to settlement under load. The Lexton Sands below a depth of 18 feet are compact and moderately dense, and of relatively high strength.

At site B the clays are of low strength and would be subject to both shear failure and settlement under load. The Lexton Sands are moderately dense below a depth of 18 feet, but due to an increase in clay and moisture content are inferior in strength to those underlying Site A.

P.G. Miller
P.G. MILLER
GEOLOGIST
GEOCHEMICAL SECTION

PCW:MIP
16.1.64

APPENDIX I.
PERCUSSION DRILL LOG

Department of Mines,
South Australia.

Bore No: A

Project: Sile Site Investigation

Purpose: Foundation Testing

Location: Wolsely

Hundred: Tatiara

Section: Railway Reserve

Depth: 27' R.L. Core Diameter: 6" Commenced: 3.9.63 Completed: 5.9.63 Bore Serial No. 601/64 Plant: 19

Bore Logged by: P.G. Miller

Date: 9.9.63

Driller: J. McGuire

Bocket No. 1086/63

Depth		Description	Sample Depth		Penetration Blows/feet.	Water Condition	Consistency or Density	Remarks.
From	To		From	To				
0'	1'	Pale brown limy medium grained sand with frequent small lime nodules (Fill?)	0'	1'	10'	Moist	Loose	
1'	2'6"	Brown and grey brown slightly clayey silt and fine sand. (Fill?)	1'	2'	13'	Moist	Compact	
2'6"	3'	Pale brown fine sandy loam.	2'	3'	18'	Moist	Friable	
3'	5'	Brown to reddish brown finely sandy clay with frequent lime grit near the top.	3'	4'	19	Moist	Firm to stiff	4.5
			4'	5'	27			
5'	16'9"	Red brown and light greenish-grey mottled clay. Occasional thin root fibres.	5'	6'3"	16	Wet	Firm to stiff	4.5
			6'3"	7'	15			
			7'	8'	19			
			8'	9'	21			
			9'	10'	24			
			10'	11'3"	20			
			11'3"	12'	11			
			12'	13'	15			
			13'	14'	19			
			14'	15'	18			
			15'	16'3"	15			
			16'3"	17'	13			

Depth		Description	Sample Depth		Penetration	Water Condition	Consistency or Density	Remarks.
From	To		From	To				
16'9"	17'9"	White, yellow-brown, and maroon mottled very sandy clay.	17'	18'	24	Moist	Stiff	4.5
17'9"	24'	Off white, yellow brown, red and maroon mottled slightly clayey fine to medium grained sand, with isolated pockets of sandy clay. Intense ferruginization has occurred in some of the maroon mottling leading to the development of sesquioxides.	18'	19'	52	Moist	Compact	4.5
			19'	20'	62			
			20'	21'3"	44			
			21'3"	22'	67			
			22'	23'	70			
			23'	24'	72			
24'	27'	White, pink and yellow brown coarsely mottled clayey fine to medium grained sand.	24'	25'	62	Damp	Compact	4.5
			25'	26'3"	68			
			26'3"	27'	35			

APPENDIX I.
PERCUSSION DRILL LOG

Department of Mines,
South Australia.

Bore No: B

Project: Silo Site Investigation

Purpose: Foundation Testing

Location: Wodely

Hundred: Tatiara

Section: Railway Reserve

Depth: 70' R.L. Core Diameter: 6" Commenced: 28.8.63 Completed: 3.9.63 Bore Serial No. 389/64 Plant: 19

Bore Logged by: P.G. Miller

Date: 9.9.63

Driller: J. McGuire

Docket No. 1086/63

Depth		Description	Sample Depth		Penetration	Water Condition	Consistency or Density	Remarks.
From	To		From	To				
0	9"	Dark grey sandy clay loam. Frequent hard lime nodules at base.	0'	1'	6	Wet	Soft	1.0
9"	2'6"	Reddish-brown and grey-brown vaguely mottled sandy clay.	1'	2'	6	Wet	Soft to firm	1.75
2'6"	3'6"	Yellow brown, orange and grey brown mottled clayey silt to silty clay. Frequent charcoal fragments near top.	2'	3'	9	Moist	Firm	4.5
			3'	4'	12			
3'6"	5'	Light grey-brown and light reddish-brown vaguely mottled sandy clay with pockets of clayey sand.	4'	5'	9	Wet	Firm	3.5
5'	8'	Pale grey-brown sandy clay. Occasional rounded quartz gravel. Occasional small brick red mottling.	5'	6'3"	12	Wet	Firm	1.75
			6'3"	7'	9			2.5
			7'	8'	11			1.75
8'	11'3"	Pale grey-brown, pale grey and yellowish-brown mottled sandy clay. Occasional blue-grey mottling. Occasional organic fibres.	8'	9'	8	Wet	Firm	2.25
			9'	10'	9			2.0
			10'	11'3"	7			2.25

Depth		Description	Sample Depth		Penetration Blows/feet.	Water Condition	Consistency or Density	Remarks.
From	To		From	To				
11'3"	15'	Light grey-brown, light-grey and light bluish-grey mottled slightly sandy clay.	11'3"	12'	7	Wet	Soft	2.25
			12'	13'	15			1.75
			13'	14'	14			2.0
			14'	15'	15			2.25
15'	17'	Light grey and yellow brown mottled clayey sand to sandy clay. Some maroon mottling associated with ferruginization, and some small ironstone nodules.	15'	16'3"	13	Moist	Firm to Compact	4.5
			16'3"	17'	20			4.5
17'	27'	Light grey and yellow brown mottled clayey fine grained quartz sand. Irregular patches of maroon ironstaining.	17'	18'	27	Moist to damp	Compact	4.5
			18'	19'	42			
			19'	20'	54			
			20'	20'3"	40			
			20'3"	22'	18			
			22'	23'	24			
			23'	24'	19			
			24'	25'	25			
			25'	26'3"	31			
			26'3"	27'	28			
27'	30'	Light grey and yellow-brown mottled very sandy clay.	27'	28'	26	Moist	Firm to stiff	
			28'	29'	27			
			29'	30'	28			
30'	35'	Off-white fine sand with pockets and bands of yellow, pale green to brown mottled sandy clay.	30'	31'3"	23	Moist	Sands Compact to loose. Clays stiff.	
			31'3"	32'	30			
			32'	33'	23			
			33'	34'	27			
			34'	35'	24			
35'	36'3"	Fine grained white sand.	35'	36'3"	28	Moist	Loose.	
36'3"	38'	Pale grey and yellow brown mottled very sandy clay. Slightly micaceous, with pockets of sand.	36'3"	37'	18	Moist	Stiff	4.5

Depth		Description	Sample Depth		Penetration Blows/feet.	Water Condition	Consistency or Density	Remarks.
From	To		From	To				
38'	42'	Pale grey and yellow brown mottled clayey fine to medium grained quartz sand to sandy clay. Micaceous.	38'	39'	23	Moist	Compact to loose	
			39'	40'	22			
			40'	41'	32			
			41'	42'	24			
42'	44'	Yellow brown reddish brown and light grey mottled coarsely sandy clay. Micaceous.	42'	43'	16	Moist	Stiff.	
			43'	44'	37			
44'	45'	Light grey and yellow brown mottled slightly clayey fine sand. Micaceous.	44'	45'	58	Damp	Compact	
45'	48'	Yellowish-brown medium to coarse grained sand. Micaceous.	45'	46'	68	Damp	Loose.	
			46'	47'	54			
			47'	48'	62			
48'	53'	Yellow brown fine grained sand with some off white mottling. Micaceous.	48'	49'	58			
			49'	50'	56			
			50'	51'	63			
			51'	52'	35			
			52'	53'	44			
53'	56'	Off-white fine to medium grained quartz sand. Micaceous.	53'	54'	48	Damp	Loose.	
			54'	55'	41			
			55'	56'	34			
56'	57'6"	White and yellow-brown mottled coarse grained sand.	56'	57'	32	Damp	Loose.	
			57'	58'	29			
57'6"	59'	Fine white sand with thin brown sandy clay bands. Micaceous.	58'	59'	33	Damp	Loose.	
59'	59'6"	Dark red-brown clayey fine grained sand with peckets of white sandy clay. Thin ironstone band, ($\frac{1}{4}$ "), at top.	59'	60'	28	Damp	Loose.	

PERCUSSION DRILL LOG. Bore No. B. (Contd.)

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Depth		Description	Sample Depth		Penetration Blows/foot.	Water Condition	Consistency or Density	Remarks.
From	To		From	To				
59'6"	70'	Fine to medium grained yellow-brown sand with patches of coarse grained sand. Micaceous.	60'	61'	32	Damp	Loose	
			61'	62'	24			
			62'	63'	28			
			63'	64'	32			
			64'	65'	33			
			65'	66'	36			
			66'	67'	32			
			67'	68'	36			
			68'	69'	34			
			69'	70'	28			

LOG OF PHYSICAL PROPERTIES

Location Wolseley

Bore No. B

Date: 9-9-63

MOISTURE

PENETRATION

PENETROMETER

Tons per □ foot.

TEXTURE CONDITION

Humid.
Damp.
Moist.
Wet.
O

Blows per foot.

0	1	2	3	4
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Depth below surface.
Depth water cut &
Static water level.
Sealed tube sample.

**GEOLOGICAL
FEATURES.**

*Fine grained
sand. Micaceous*

Fine to medium
grained
sand.

coarse grained
sand

Fine sand

Fine to
medium
grained
sand
Micaceous

Loose

Lorton Sanders

55

60-

165-

70-

S. A. DEPT OF MINES

To accompany report by P.G. Miller

Plan No.

S 3566 a

K b 8

LOG OF PHYSICAL PROPERTIES

Location Wolseley

Bore No. B

Date: 9-9-63

MOISTURE

PENETRATION

TEXTURE CONDITION

Humid. Damp. Moist. Wet.

Blows per foot.

PENETROMETER
Tons per sq. foot.

Depth below surface.
Depth water cut &
Static water level.
Sealed tube sample.
GEOLOGICAL
FEATURES.

0	20	40	60	80	0	1	2	3	4
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									

Pleistocene Alluvial clays & silts
Marl clays

Larton Sands

Sandy clay loam Soft
Sandy clay Soft to Firm
Clayey silt Firm
Sandy clay pockets clay sand
Sandy clay
Occas. Quartz gravel
Sandy Clay
Occas. organic fibres
Slightly sandy clay Soft
Clayey sand Firm to to sandy clay compact
Clayey fine grained quartz sand Compact
Very sandy stiff clay
Fine sandy Sands with bands compact of sandy clays stiff
Fine sand Loose
Very sandy clay Micaceous Stiff
Clayey fine to medium grained sand to loose Micaceous Compact
Coarsely sandy clay Micaceous Stiff
Clayey fine sand
Medium coarse grained sand Loose

Plan No.

S 3566
Kb8