REPORT BOOK

DEPARTMENT OF MINES AND ENERGY

SOUTH AUSTRALIA

GEOLOGICAL SURVEY

NOARLUNGA REGIONAL CENTRE COMMUNITY COLLEGE FOUNDATION INVESTIGATION

-PUBLIC BUILDINGS DEPARTMENT-

by

J.C. BEAL

ENGINEERING GEOLOGY SECTION

Rept.Bk.No. 79/22
G.S. No. 6141
Eng. No. 79/3
D.M. No. 652/78

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DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept.Bk.No. 79/22
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NOARLUNGA REGIONAL CENTRE COMMUNITY COLLEGE FOUNDATION INVESTIGATION

ABSTRACT

A total of 15 auger holes drilled to a maximum depth of 10 m, has shown a gently dipping sequence of Quaternary silt and clay, passing down at about 6 m into dense Tertiary sandstone.

The highly calcareous, plastic silt which occurs immediately beneath the topsoil, would provide a suitable foundation for light structures but requires field density checks as it may be of windblown origin and have collapse potential.

Stiff mottled clay, occurring at a depth of up to 2.5 m, forms a more certain bearing horizon which should have adequate strength for large structures. Both the silt and the mottled clay are highly plastic and effective drainage particularly away from footings will be important on this site.

No groundwater was encountered.

INTRODUCTION

Following a request from Mr. S. Warwyck, Public Buildings Department, foundation drilling for a proposed Community College has been carried out at the Noarlunga Regional Centre.

METHOD OF INVESTIGATION

Investigation was restricted to auger-coring and selected soil samples were tested by the E. & W.S. Department Soils Laboratory (Netley) for plasticity index (PI), grading curves, linear shrinkage (LS), and moisture content (Appendix II).

The first eight drill holes (CC1 to CC8) were cored using a Gemco Auger rig with hollow auger flights and taken down to a maximum of 10 metres or until drilling refusal, whichever proved the shallower.

A further six holes (CC9 - CC15) were drilled down to 2.5 m using a solid auger bit to check thickness of the upper soil layers.

Detailed geological logs of all holes are given in Appendix I, and Fig. 2 shows their location.

RESULTS OF DRILLING

Drilling showed a horizontal to gently dipping sequence of Quaternary clay and silt, resting on partially cemented Tertiary sandstone.

TABLE I

SUMMARY OF GEOLOGICAL SEQUENCE

Thickness range (m)	Unit	Engineering Properties
0.2 to 0.3	Black topsoil	Organic silty clay (OL)*
1.2 to 2.2	Cream clayey silt	Strongly calcareous, variable plasticity (ML-MH); possibly of low density windblown origin; PI 20-25, LS 10-12%.
1.0 to 2.2	Mottled red-brown clay	a) stiff to very stiff, high plasticity (CH); PI 58, LS 20%
0.8 to 1.5		b) very stiff, lower plasticity (CL), becoming sandy at base; PI 10, LS 5-10%.
4.0 +	Clayey sand	very stiff clayey sand (SC); PI 7, LS 5%; transitional to dense sandstone bedrock.

*Unified soil classification symbol.

The units could be easily correlated between holes and geological sections across the site are given in Fig. 3.

No groundwater was encountered.

DISCUSSION

A final decision on where to place shallow footings on this site will depend on an assessment of whether the calcareous silt, occurring at shallow depth beneath the topsoil, is low density windblown material having collapse potential. This

will require further testing; if this proves the case, it is considered that footings for rigid light structures should be taken down to the underlying mottled plastic clay which occurs at a depth of from 1.4 to 2.5 m beneath the site. This clay would also form an adequate bearing horizon for deeper footings involving larger structures, and is considered to be the first major bearing horizon beneath the area.

Results of laboratory testing show that this mottled clay is highly plastic and is expansive. For this reason it is considered essential that drainage water be prevented from penetrating via any means to this level by careful back-filling with impervious material around excavated footings. The sloping nature of the site will facilitate natural surface runoff, and final site landscaping should ensure that runoff does not collect in pools on the surface.

John C. Beal.

JCB:ZV

J.C. BEAL

GEOLOGIST

APPENDIX I

LOG OF FOUNDATION HOLES

PROJECT: COMMUNITY COLLEGE

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE

SEC. HD.

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

EL Surface
EL ref. point Datum

HOLE NO. C.C.1
UNIT/STATE NO:
SERIAL NO:
FOLDER NO.

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia	DEPTH m	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966	WATER LEVEL	Casing	MOISTURE CONTENT	Consistency Compact Densy	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
QUATERNARY CLAY — TOPSOIL				OL	Black	Dry		H			
QUATERNARY CLAY — Plastic clay-Calcareous		1		ML-MH	Cream - white high - low plastic Clay with minor silt content.				St - V.St		
		2									
QUATERNARY CLAY — Plastic clay		3		CH-MH	Mottled cream-red high plastic clay.						
QUATERNARY CLAY — Plastic clay-sand		4		CL-ML	Mottled cream-orange low plastic clay with silt.						
TERTIARY SAND — sandy clay grading into clayey sand		5		SML	Medium to coarse sand content increasing with depth. Low plastic clayey sand derived from poorly cemented sandstone Refusal @ 7.70 m.				VD		
		6									
		7									
		8									

WATER LEVELS	MOISTURE CONTENT	CONSISTENCY (Clays)	COMPACTNESS (Silts)	RELATIVE DENSITY (Sonds)	TYPE OF SAMPLE
7 Dec. '66. Casing; Water level (date); WC Water Cut	H — Humid	VS — Very Soft	Ls—Loose	VL — Very Loose	OPEN TUBE ..... A Shoe ..... D Shoe
	D — Damp	S — Soft	MC—Moderately Compact	L — Loose	SEALED TUBE WITH NUMBER A 1 2 3 4 5
	M — Moist	F — Firm	C — Compact	MD—Medium Dense	STANDARD PENETRATION TESTS 9 (2,3,4) Total blows for 0·3m (in 0·1m increments)
	W — Wet	St — Stiff	VC—Very Compact	D — Dense	
	S — Soturated	V.St — Very Stiff		VD — Very Dense	
	LL — Liquid Limit	H — Hard			
	PL — Plastic Limit				

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO | LOGGED BY: JCB
CIRCULATION: | DATE: 21/11/78
START: 21/11/78 | TRACED BY:
FINISH: | DATE:
SHEET 1 OF 1

PF No S6676 b MB

PROJECT: COMMUNITY COLLEGE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

HOLE NO. C.C.2

UNIT/STATE NO:

SERIAL NO:

FOLDER NO.

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE

SEC. HD.

EL Surface

EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia	DEPTH m	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966	WATER LEVEL	MOISTURE CONTENT	Consistency Compct Densy	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
Topsoil				OL	Black		H			
Plastic clay-Calcareous		1		ML-MH	Cream As for C.C.1			St - V. St		
		2								
Plastic Clay		3		CH-MH	Mottled cream-red As for C.C.1					
		4								
Plastic silty clay				CL-ML	Red-brown sandy clay	Dry				
		5								
plastic clayey sand, (low silt content)		6		SM	Red-brown			VD		
		7								
Clayey sand					Refusal Red-orange 7-35					
		8								

QUATERNARY CLAY

TERTIARY SAND

WATER LEVELS	MOISTURE CONTENT	CONSISTENCY (Clays)	COMPACTNESS (Silts)	RELATIVE DENSITY (Sonds)	TYPE OF SAMPLE
7 Dec. '66. Casing Water level (date) WC Water Cut	H — Humid D — Damp M — Moist W — Wet S — Soturated LL — Liquid Limit PL — Plastic Limit	VS — Very Soft S — Soft F — Firm St — Stiff V.St — Very Stiff H — Hard	Ls — Loose MC — Moderately Compact C — Compact VC — Very Compact	VL — Very Loose L — Loose MD — Medium Dense D — Dense VD — Very Dense	OPEN TUBE ..... A Shoe ..... D Shoe SEALED TUBE WITH NUMBER A 1 2 3 4 5 STANDARD PENETRATION TESTS 9 (2,3,4) Total blows for 0·3m (in 0·1m increments)

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO	LOGGED BY: JCB
CIRCULATION:	DATE: 21/11/78
START: 21/11/78	TRACED BY:
FINISH: 21/11/78	DATE:

SHEET 1 OF 1

PF No S6676b MB

PROJECT: COMMUNITY COLLEGE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

HOLE NO. C.C.3
UNIT/STATE NO:
SERIAL NO:
FOLDER NO.

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE
SEC. HD.
EL Surface
EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia / DEPTH m	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME (Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966)	WATER LEVEL / Casing	MOISTURE CONTENT	Consistency Compct Densy	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
QUATERNARY CLAY — Topsoil			OL	Black		H			
Plastic clay calcareous	1		ML-MH	Cream As for C.C.			St		
Low-high plastic clay	2		CH-MH	Mottled red cream clay.			V. St		
Silty clay	3		CL-ML	as above					
TERTIARY SAND — Silty, clayey sand	4			Orange plastic sand. as for C.C.1 (CL)	Dry				
Silty sand			SM	Orange brown low plastic sand Refusal 5.0m			VD		
	5								
	6								
	7								
	8								

WATER LEVELS	MOISTURE CONTENT	CONSISTENCY (Clays)	COMPACTNESS (Silts)	RELATIVE DENSITY (Sands)	TYPE OF SAMPLE
7 Dec. '66. Casing. Water level (date) WC Water Cut	H — Humid D — Damp M — Moist W — Wet S — Saturated LL — Liquid Limit PL — Plastic Limit	VS — Very Soft S — Soft F — Firm St — Stiff V.St — Very Stiff H — Hard	Ls — Loose MC — Moderately Compact C — Compact VC — Very Compact	VL — Very Loose L — Loose MD — Medium Dense D — Dense VD — Very Dense	OPEN TUBE: A Shoe, D Shoe SEALED TUBE WITH NUMBER (A 1 2 3 4 5) STANDARD PENETRATION TESTS: 9 (2,3,4) Total blows for 0-3m (in 0-1m increments)

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO	LOGGED BY: JCB
CIRCULATION:	DATE: 22/11/78
START: 22/11/78	TRACED BY:
FINISH: 22/11/78	DATE:

SHEET 1 OF 1

PF No S6676 b MB

PROJECT: COMMUNITY COLLEGE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

HOLE NO. C.C.4
UNIT/STATE NO:
SERIAL NO:
FOLDER NO.

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE

SEC. HD.

EL Surface
EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia / DEPTH	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME (Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966)	WATER LEVEL	MOISTURE CONTENT	Consistency Compact Density	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
SANDY CLAY									
Topsoil	0		OL	Black		H			
Plastic clay, calcareous				Cream			St		
	1		ML-MH						
As for C.C.1				Pale brown			V. St		
	2								
Plastic clay				mottled red-brown					
	3		CH-MH	As for C.C.1					
Sandy clay				mottled red-orange	Dry				
	4								
			CL-ML	As for C.C.1					
	5								
TERTIARY SANDS									
Sandy clay grading into clayey sand.				As for C.C.1			VD		
	6		SM						
	7			Refusal					
	8								

WATER LEVELS	MOISTURE CONTENT	CONSISTENCY (Clays)	COMPACTNESS (Silts)	RELATIVE DENSITY (Sonds)	TYPE OF SAMPLE
7 Dec. '66. Casing; Water level (date); WC Water Cut	H — Humid	VS — Very Soft	Ls—Loose	VL — Very Loose	OPEN TUBE ..... A Shoe ..... D Shoe
	D — Damp	S — Soft	MC—Moderately Compact	L — Loose	SEALED TUBE WITH NUMBER A 1 2 3 4 5
	M — Moist	F — Firm		MD—Medium Dense	STANDARD PENETRATION TESTS 9 (2,3,4) Total blows for 0-3m (in 0-1m increments)
	W — Wet	St — Stiff	C — Compact		
	S — Soturated	V.St — Very Stiff	VC—Very Compact	D — Dense	
	LL — Liquid Limit	H — Hard		VD — Very Dense	
	PL — Plastic Limit				

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO | LOGGED BY: JCB
CIRCULATION: | DATE: 22/11/78
START: 22/11/78 | TRACED BY:
FINISH: 22/11/78 | DATE:
SHEET 1 OF 1

PF No S6676 b MB

PROJECT: COMMUNITY COLLEGE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

HOLE NO. C.C.5

UNIT/STATE NO:

SERIAL NO:

FOLDER NO.

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE

SEC. HD.

EL Surface

EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia / DEPTH	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966	WATER LEVEL / Casing	MOISTURE CONTENT	Consistency Compact Density	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
QUATERNARY CLAY	Topsoil		OL	Black		H			
	Plastic calcareous clay		ML-MH	Cream As for C.C.1			St		
	Plastic clay		CH-MH	Mottled red cream clay with minor silt content			V St		
	Sandy clay - clayey sand		CL-ML	Orange-red low plastic clay end of rig	Dry				
TERTIARY SAND	Clayey sand		SM	orange-yellow sand		H D	D		
				near refusal with solid auger			WD		

WATER LEVELS	MOISTURE CONTENT	CONSISTENCY (Clays)	COMPACTNESS (Silts)	RELATIVE DENSITY (Sands)	TYPE OF SAMPLE
7 Dec. '66. Casing Water level (date) WC Water Cut	H — Humid D — Damp M — Moist W — Wet S — Saturated LL — Liquid Limit PL — Plastic Limit	VS — Very Soft S — Soft F — Firm St — Stiff V.St — Very Stiff H — Hard	Ls—Loose MC—Moderately Compact C — Compact VC—Very Compact	VL — Very Loose L — Loose MD—Medium Dense D — Dense VD — Very Dense	OPEN TUBE ..... A Shoe ..... D Shoe SEALED TUBE WITH NUMBER A 1 2 3 4 5 STANDARD PENETRATION TESTS 9 (2,3,4) Total blows for 0-3m (in 0-1m increments)

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO LOGGED BY: JCB

CIRCULATION: DATE: 23/11/78

START: 23/11/78 TRACED BY:

FINISH: 23/11/78 DATE:

SHEET 1 OF 1

PF No S6676 b MB

PROJECT: COMMUNITY COLLEGE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

HOLE NO. C.C.6

UNIT/STATE NO:

SERIAL NO:

FOLDER NO.

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE

SEC. HD.

EL Surface

EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia	DEPTH m	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966	WATER LEVEL	Casing	MOISTURE CONTENT	Consistency Compact Density	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
QUATERNARY CLAY											
Top Soil					Black			H			
Plastic calcareous clay		1		ML-MH	Cream As for C.C.1				St		
Plastic clay		2		CH-MH	Red clay (sand content increasing with depth)				V. St		
Sandy clay - clayey sand		3		CL-ML	Red orange. low plastic sand						
		4			End of coring				D		
TERTIARY SAND						Dry					
Clayey sand		5		SM							
		6						D			
		7									
		8							VD		
					Refusal @ 8.50 m with solid auger						
		9									

WATER LEVELS	MOISTURE CONTENT	CONSISTENCY (Clays)	COMPACTNESS (Silts)	RELATIVE DENSITY (Sonds)	TYPE OF SAMPLE
Water level (date) 7 Dec. '66 Casing WC Water Cut	H — Humid D — Damp M — Moist W — Wet S — Saturated LL — Liquid Limit PL — Plastic Limit	VS — Very Soft S — Soft F — Firm St — Stiff V.St — Very Stiff H — Hard	Ls—Loose MC—Moderately Compact C — Compact VC—Very Compact	VL — Very Loose L — Loose MD—Medium Dense D — Dense VD — Very Dense	OPEN TUBE ..... A Shoe ..... D Shoe SEALED TUBE WITH NUMBER A 1 2 3 4 5 STANDARD PENETRATION TESTS 9 (2,3,4) Total blows for 0-3m (in 0-1m increments)

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO	LOGGED BY: JCB
CIRCULATION:	DATE: 23/11/78
START: 23/11/78	TRACED BY:
FINISH: 23/11/78	DATE:
SHEET 1 OF 1	

PF No S6676 b MB

PROJECT: COMMUNITY COLLEGE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

HOLE NO. C.C.7

UNIT/STATE NO:

SERIAL NO:

FOLDER NO.

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE

SEC. HD.

EL Surface
EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia	DEPTH m	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966	WATER LEVEL	MOISTURE CONTENT	Consistency Compct Densy	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
SANDY CLAY										
Topsoil				OL	Black		H			
Plastic calcareous clay		1		ML-MH	Cream See C.C.1			St		
Plastic clay		2		CH-MH	Mottled See C.C. 1			V. St		
Sandy clay - clayey sand		3		CL-ML	Red-orange					
		4			end of coring					
TERTIARY SAND						Dry		D		
Clayey sand		5		SM	Orange-red		D			
		6								
		7						VD		
		8			Refusal @ 8.0 m with solid auger					

WATER LEVELS	MOISTURE CONTENT	CONSISTENCY (Clays)	COMPACTNESS (Silts)	RELATIVE DENSITY (Sands)	TYPE OF SAMPLE
7 Dec. '65. Casing. Water level (date) WC Water Cut	H — Humid D — Damp M — Moist W — Wet S — Saturated LL — Liquid Limit PL — Plastic Limit	VS — Very Soft S — Soft F — Firm St — Stiff V.St — Very Stiff H — Hard	Ls — Loose MC — Moderately Compact C — Compact VC — Very Compact	VL — Very Loose L — Loose MD — Medium Dense D — Dense VD — Very Dense	OPEN TUBE ..... A Shoe ..... D Shoe SEALED TUBE WITH NUMBER A 1 2 3 4 5 STANDARD PENETRATION TESTS 9 (2,3,4) Total blows for 0-3m (in 0-1m increments)

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO	LOGGED BY: JCB
CIRCULATION:	DATE: 24/11/78
START: 24/11/78	TRACED BY:
FINISH: 24/11/78	DATE:

SHEET 1 OF 1

PF No S6676 b MB

PROJECT: COMMUNITY CENTRE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

HOLE NO. C.C.8
UNIT/STATE NO:
SERIAL NO:
FOLDER NO.

LOCATION OR CO-ORDS: NORTHERN REGIONAL CENTRE
SEC. HD.
EL Surface
EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia	DEPTH m	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966	WATER LEVEL	MOISTURE CONTENT	Consistency Compct Densy	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	SOIL TEST PENETROMETER Units * (1 2 3 4)
QUATERNARY										
Topsoil				OL	Black					
Plastic, calcareous clay		1		ML-MH	Cream As for C.C.1		H	St		
Plastic Clay		2			Mottled red-brown					
		3		CH-MH	As for C.C.1			St VSt		
Silty clay		4		CL-ML	Red low plastic clay with minor silt content					
TERTIARY										
Sandy clay - clayey sand		5		SM-ML	Orange red As for C.C. 1	Dry		D		
		6			End of coring					
Clayey sand		7		SM	Poorly sorted coarse grained, clayey sand		D	VD		
		8			Refusal @ 8.0 m with solid auger					

WATER LEVELS	MOISTURE CONTENT	CONSISTENCY (Clays)	COMPACTNESS (Silts)	RELATIVE DENSITY (Sonds)	TYPE OF SAMPLE
7 Dec. '66. Casing Water level (date) WC Water Cut	H — Humid D — Damp M — Moist W — Wet S — Soturated LL — Liquid Limit PL — Plastic Limit	VS — Very Soft S — Soft F — Firm St — Stiff V.St — Very Stiff H — Hard	Ls—Loose MC—Moderately Compact C — Compact VC—Very Compact	VL — Very Loose L — Loose MD—Medium Dense D — Dense VD — Very Dense	OPEN TUBE ..... A Shoe ..... D Shoe SEALED TUBE WITH NUMBER A 1 2 3 4 5 STANDARD PENETRATION TESTS 9 (2,3,4) Total blows for 0-3m (in 0-1m increments)

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO — LOGGED BY: JCB
CIRCULATION: — DATE: 24/11/78
START: 24/11/78 — TRACED BY:
FINISH: 24/11/78 — DATE:
SHEET 1 OF 1

PF No S6676 b MB

PROJECT: COMMUNITY COLLEGE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

HOLE NO. C.C.9,
UNIT/STATE NO: 10,1.
SERIAL NO:
FOLDER NO.

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE

SEC. HD.

EL Surface
EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia	DEPTH m	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966	WATER LEVEL	Casing	MOISTURE CONTENT	Consistency Compct Densy	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
C.C.9 Topsoil Plastic calcareous clay		1		OI ML-MH CH-MH	Black Cream See C.C.1						
PLASTIC Clay		2		CH-MH	Red-brown end of hole 2.50 m						
Topsoil Plastic calcareous clay		0 1 2		ML-MH	Black Cream See C.C.1	Dry					
Plastic Clay				(CH-MH)	Red-brown End of hole 2.50 m						
Topsoil Plastic calcareous Clay		0 1 2		ML-MH	Black Cream C.C.1						
Plastic clay				(CH-MH)	red-brown end of hole 2.50 m						

WATER LEVELS	MOISTURE CONTENT	CONSISTENCY (Clays)	COMPACTNESS (Silts)	RELATIVE DENSITY (Sonds)	TYPE OF SAMPLE
Casing 7-Dec. '66 Water level (date) WC Water Cut	H — Humid D — Damp M — Moist W — Wet S — Saturated LL — Liquid Limit PL — Plastic Limit	VS — Very Soft S — Soft F — Firm St — Stiff V.St — Very Stiff H — Hard	Ls — Loose MC — Moderately Compact C — Compact VC — Very Compact	VL — Very Loose L — Loose MD — Medium Dense D — Dense VD — Very Dense	OPEN TUBE ..... A Shoe ..... D Shoe SEALED TUBE WITH NUMBER A 1 2 3 4 5 STANDARD PENETRATION TESTS 9 (2,3,4) Total blows for 0·3m (in 0·1m increments)

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE	LOGGED BY: JCB
CIRCULATION:	DATE: 27/11/78
START 27/11/78	TRACED BY:
FINISH 27/11/78	DATE:

SHEET 1 OF 1

PF No S6676b MB

PROJECT: COMMUNITY COLLEGE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

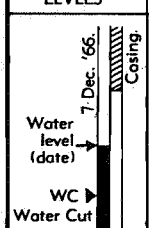
LOG OF FOUNDATION HOLE

HOLE NO. C.C.12,
UNIT/STATE NO: 13, 14
SERIAL NO:
FOLDER NO.

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE
SEC. HD.
EL Surface
EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia	DEPTH m	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966	WATER LEVEL	Casing	MOISTURE CONTENT	Consistency Compact Densy	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
C.C.12 Topsoil				OL	Black						
Plastic calcareous clay		1		ML-MH	Cream. See C.C.1						
Plastic Clay		2		(CH-MH)	red-brown end of hole 2.50 m						
C.C.13 Topsoil		0			Black						
Plastic calcareous clay		1		ML-MH	Cream See C.C.1	DRY					
Plastic clay		2		(CH-MH)	red-brown end of hole 2.50 m						
C.C.14 Topsoil		0			Black						
Plastic calcareous clay		1		ML-MH	Cream C.C.1						
Plastic clay		2		(CH-MH)	red-brown end of hole 2.50 m						
		3									

WATER LEVELS



MOISTURE CONTENT
H — Humid
D — Damp
M — Moist
W — Wet
S — Saturated
LL — Liquid Limit
PL — Plastic Limit

CONSISTENCY (Clays)
VS — Very Soft
S — Soft
F — Firm
St — Stiff
V.St — Very Stiff
H — Hard

COMPACTNESS (Silts)
Ls—Loose
MC—Moderately Compact
C — Compact
VC—Very Compact

RELATIVE DENSITY (Sonds)
VL — Very Loose
L — Loose
MD—Medium Dense
D — Dense
VD — Very Dense

TYPE OF SAMPLE
OPEN TUBE
..... A Shoe
..... D Shoe
SEALED TUBE WITH NUMBER
A 1 2 3 4 5
STANDARD PENETRATION TESTS
9 (2,3,4)
Total blows for 0·3m (in 0·1m increments)

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO
LOGGED BY: JCB
CIRCULATION:
DATE: 27/11/78
START 27/11/78
TRACED BY:
FINISH: 27/11/78
DATE:
SHEET 1 OF 1

PF No S6676 b MB

PROJECT: COMMUNITY COLLEGE

DEPARTMENT OF MINES — SOUTH AUSTRALIA
ENGINEERING DIVISION

LOG OF FOUNDATION HOLE

HOLE NO. C.C.15

UNIT/STATE NO:

SERIAL NO:

FOLDER NO.

LOCATION OR CO-ORDS:
NORTHERN REGIONAL CENTRE

SEC. HD.

EL Surface

EL ref. point Datum

GEOLOGICAL DESCRIPTION OF CORE	HOLE Dia	DEPTH m	GRAPHIC LOG	GROUP SYMBOL	SOIL DESCRIPTION GROUP NAME Unified Soil Classification, U.S.B.R. Earth Manual 2nd Edition 1966	WATER LEVEL	Casing	MOISTURE CONTENT	Consistency Compct Densy	FIELD TEST DATA: BLOWS PER 30 cm (4 8 16 32 64)	FIELD TEST DATA: SOIL TEST PENETROMETER Units * (1 2 3 4)
Topsoil				OL	Black						
Plastic calcareous clay		1		ML-MH	Cream See C.C.1	Dry					
Plastic clay		2		CH-MH	Red-brown See C.C.1						
					end of hole 2.50 m						

WATER LEVELS
7 Dec. '66. Casing
Water level (date)
WC Water Cut

MOISTURE CONTENT
H — Humid
D — Damp
M — Moist
W — Wet
S — Saturated
LL — Liquid Limit
PL — Plastic Limit

CONSISTENCY (Clays)
VS — Very Soft
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F — Firm
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TYPE OF SAMPLE
OPEN TUBE
..... A Shoe
..... D Shoe
SEALED TUBE WITH NUMBER
A 1 2 3 4 5
STANDARD PENETRATION TESTS
9 (2,3,4)
Total blows for 0-3m (in 0-1m increments)

* These values refer to clay soils only and provide an indication of their consistency.

DRILL TYPE GEMCO LOGGED BY: JCB

CIRCULATION: DATE: 27/11/78

START: 27/11/78 TRACED BY:

FINISH: 27/11/78 DATE:

SHEET 1 OF 1

PF No S6676 b MB

APPENDIX II

SOILS LABORATORY TEST RESULTS

EWS DEPARTMENT

Soils Laboratory
SOIL TEST SUMMARY

LOCATION

PROJECT NOARLUNGA REG. CENTRE COMMUNITY COLLEGE

BH	Depth (m)	Description	Remarks	M.C. %	Lime %	Dry Densities t/m³			Rel. Density %	Grading				Atterberg Limits			Linear Shrink %
						Insitu	Max.	Min.		Clay	Silt	Sand	Gravel	wL	wP	I.P.	
cc 8-4	2.6	- 2.8 CH												85	20	65	20.5
cc 8.5	3.5	- 4.7 ? CL	3.5 - 3.7 ?											39	14	25	10
cc 8.6	4.2	- 4.4 CL												24	14	10	5
cc 8-7	5.0	- 5.3 CL												26	15	11	5
cc 8-8	5.7	- 6.0 - NON PLASTIC												NON PLASTIC			
cc 8	6.2			5													
		CL-ML												22	15	7	5
cc 8-10	?	CL-ML												20	16	4	2.5
cc 9	1.6			19													
cc 12	1.6			20													

EWS DEPARTMENT

Soils Laboratory
SOIL TEST SUMMARY

PROJECT: NOARLUNGA REG. CENTRE COMMUNITY COLLEGE

LOCATION

BH	Depth (m)	Description	Remarks	M.C. %	Lime %	Dry Densities t/m³			Rel. Density %	Grading				Atterberg Limits			Linear Shrink %
						Insitu	Max.	Min.		Clay	Silt	Sand	Gravel	wL	wP	I.P.	
cc 3-1	0.10 - 0.30									16	15	37	32				
cc 3-2	1.0 - 1.3	ML												41	19	22	10
cc 3-3	1.9 - 2.1	MH												79	21	58	20.5
cc 3-4	2.5 - 2.7	MH												73	18	55	18
cc 3-5	3.4 - 3.6	ML												43	13	30	10
cc 306	4.1 - 1.43	ML												34	21	13	5
cc5	5.2			7													
cc6	0.8			19													
cc6	1.10			17													
cc 8-1	0.10 - 0.25									27	28	27	18				
cc 8-2	1.0 - 1.3	ML												47	23	24	12.5
cc 8-3	1.8 - 2.0	MH												70	26	44	17.5

EWS DEPARTMENT

Soils Laboratory
MECHANICAL ANALYSIS

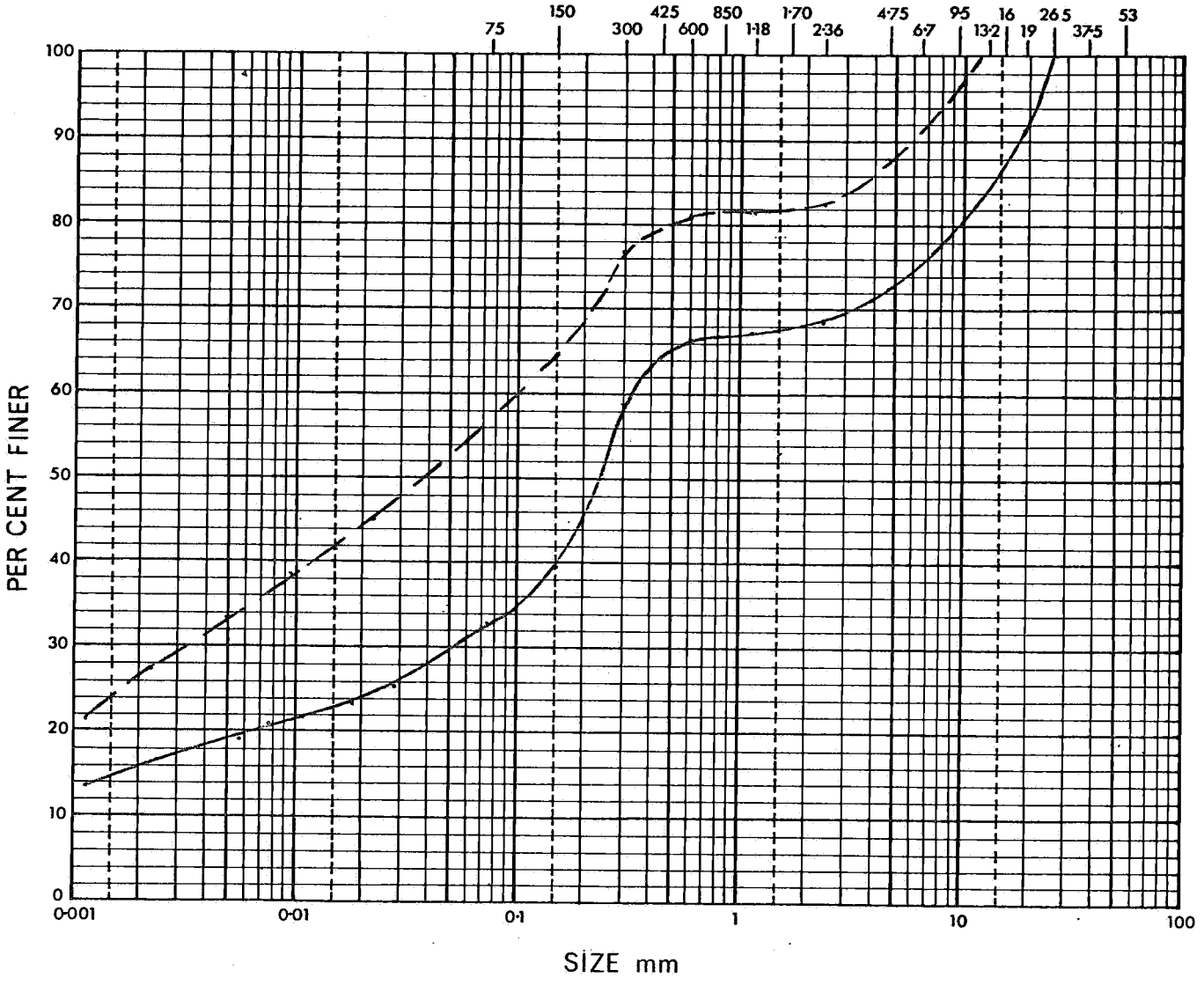
TRIAL HOLE

DEPTH

PROJECT NOARLUNGA REGIONAL CENTRE COMMUNITY COLLEGE DATE 7-12-78

LOCATION

OPERATOR P.U.



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	GRAVEL
	SILT			SAND			

B.S.S. & M.I.T. Classifications

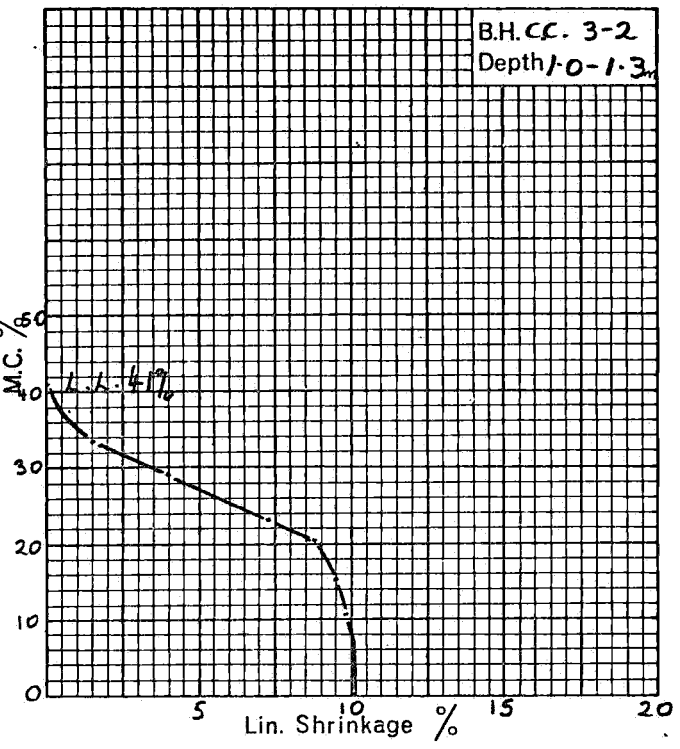
B.H.	Depth metres	Description	Line	M.C. %	Lime Cont.	Hydrometer			Sand Fraction				
						Clay	Silt	Sand	-200	Fine	Med.	Coarse	Gravel
C3-1	0·1-0·3		———			16	15	37		14	21	2	32
CC8-1	0·1-0·25		— — — —			27	28	27		14	12	1	18
			—·—·—										
			—x—x—										
			—Δ—Δ—										

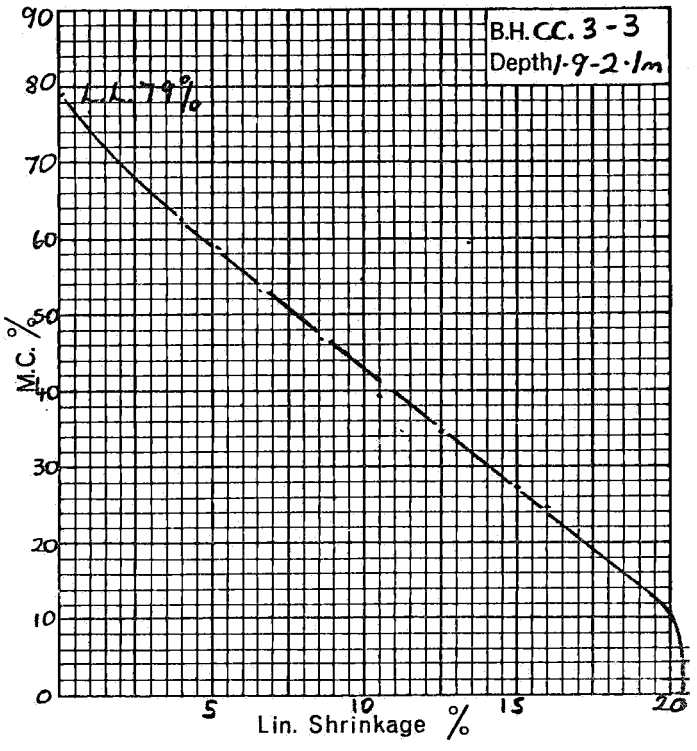
EWS DEPARTMENT

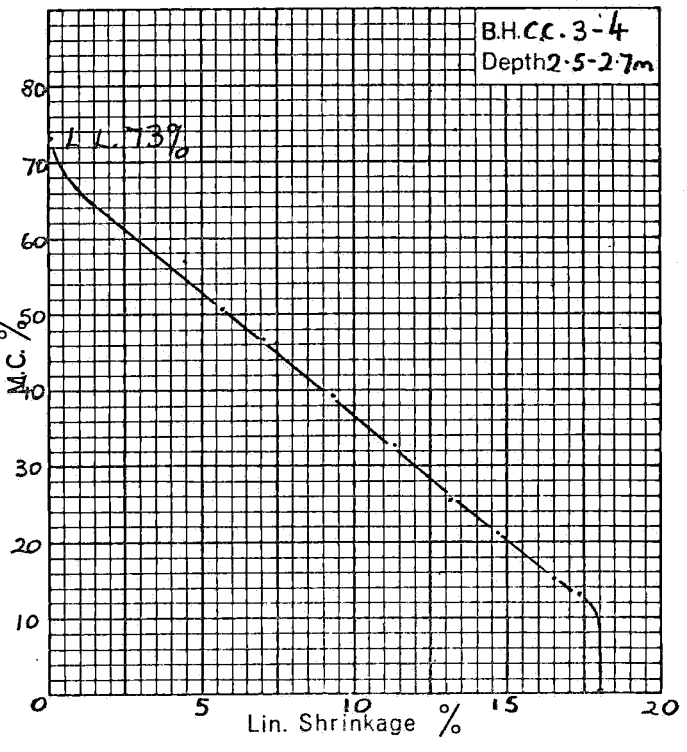
Soils Laboratory
LINEAR SHRINKAGE RESULTS

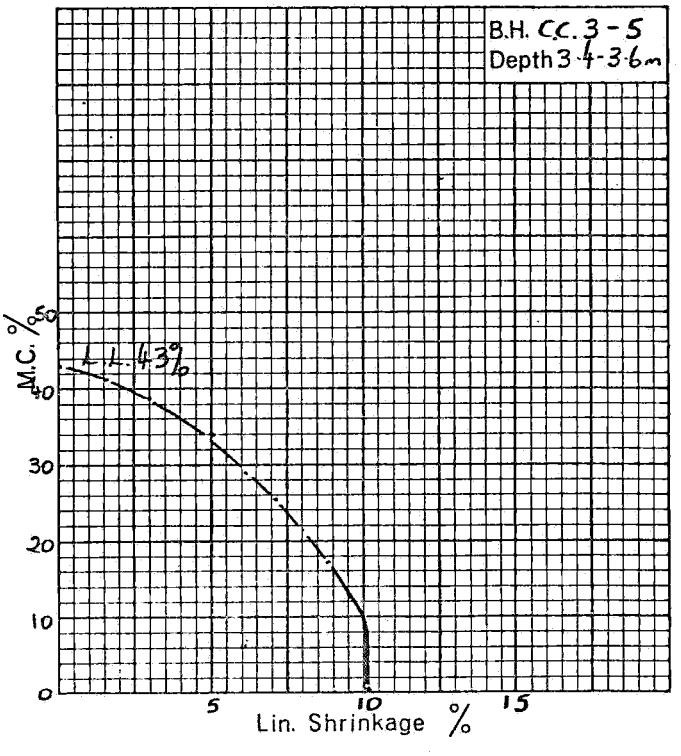
NOARLUNGA REG. CENTRE. COMMUNITY COLLEGE
PROJECT

LOCATION C.C.3







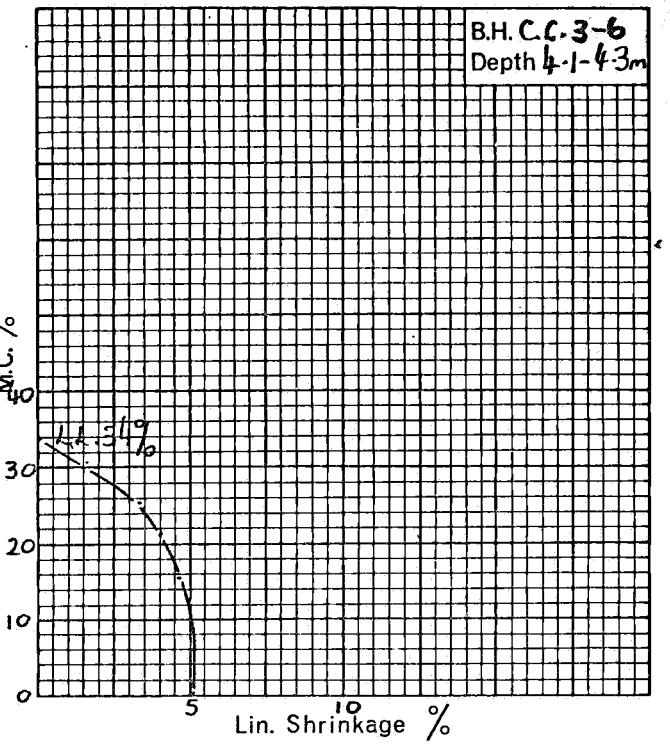


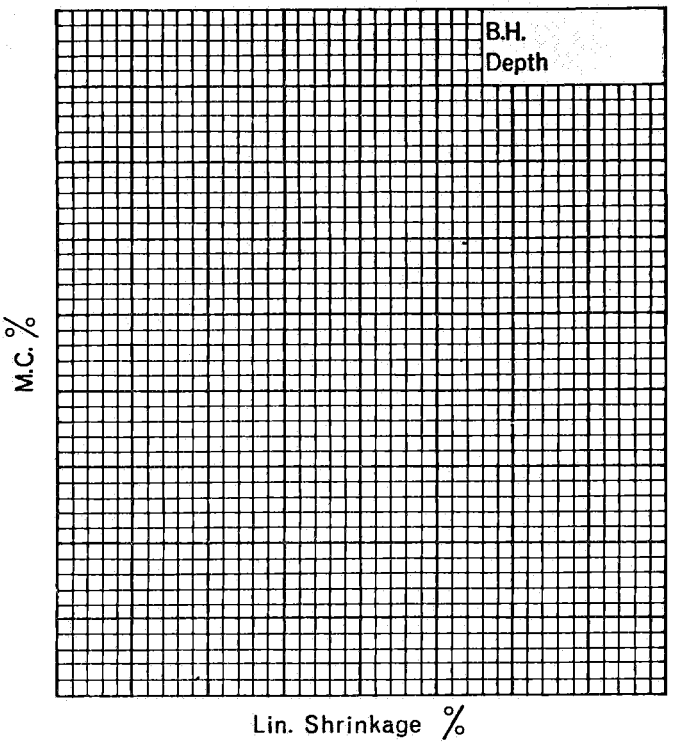
EWS DEPARTMENT

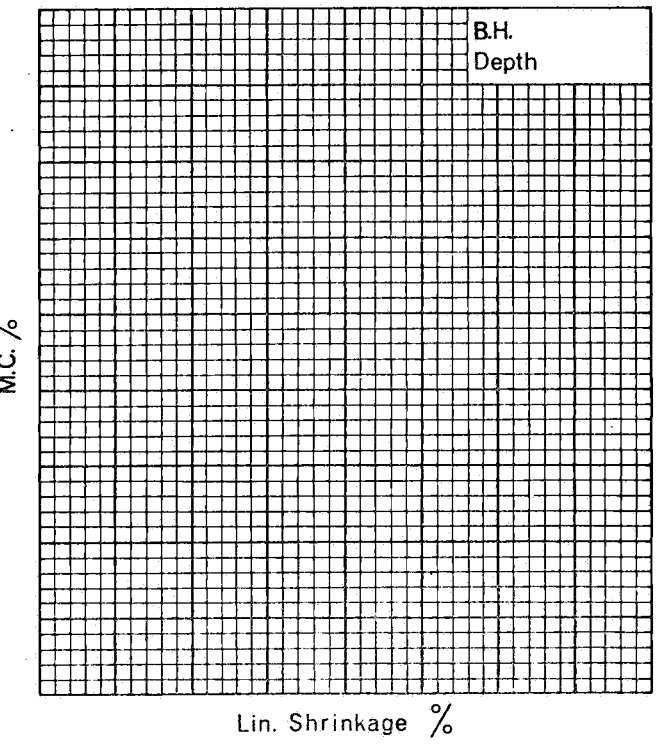
Soils Laboratory
LINEAR SHRINKAGE RESULTS

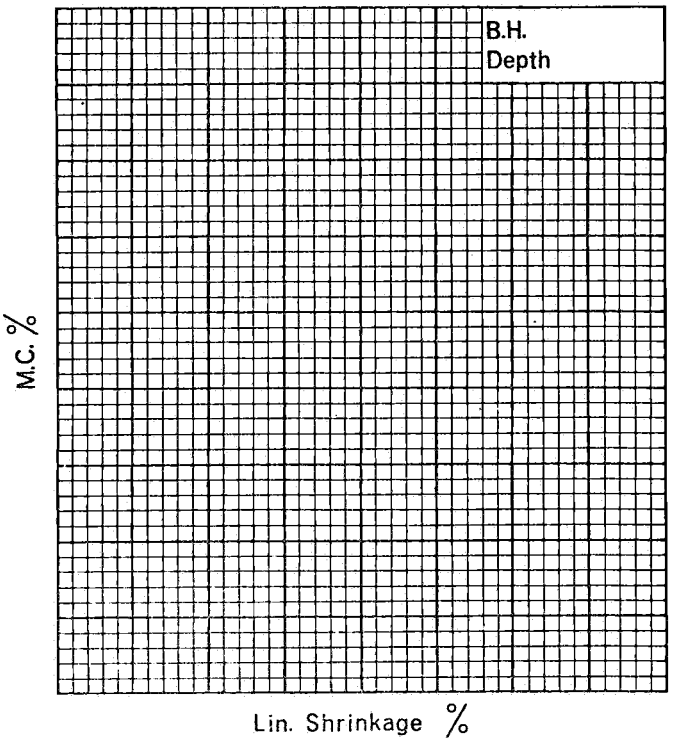
NOARLUNGA REGIONAL CENTRE. COMMUNITY COLLEGE
PROJECT

LOCATION C.C.3.







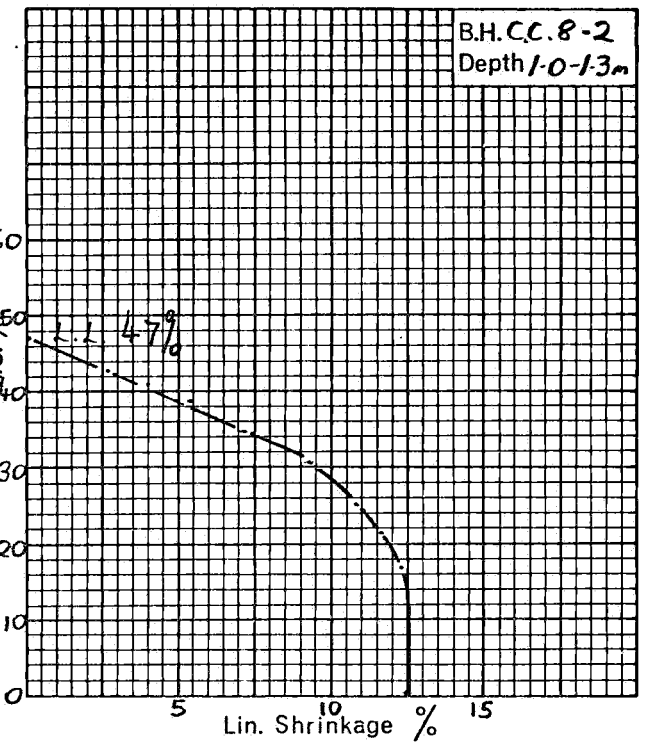


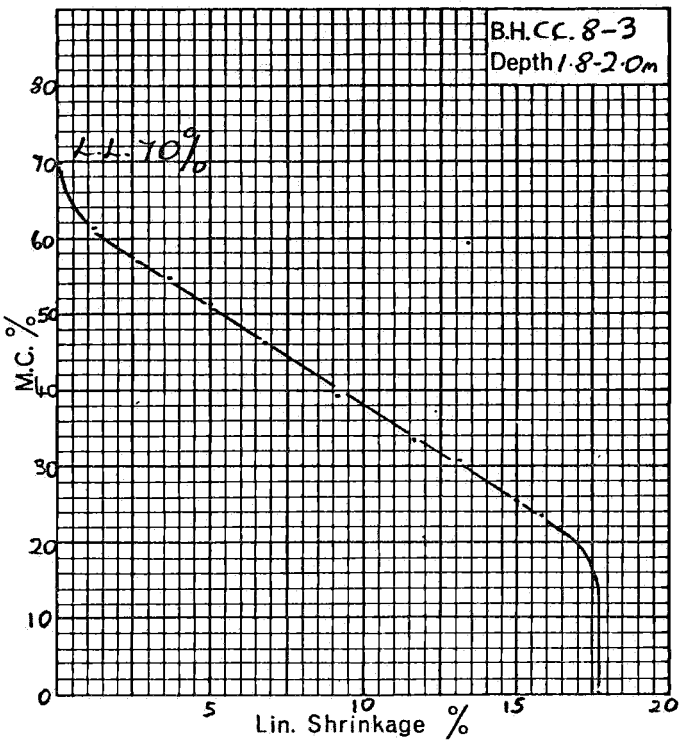
EWS DEPARTMENT

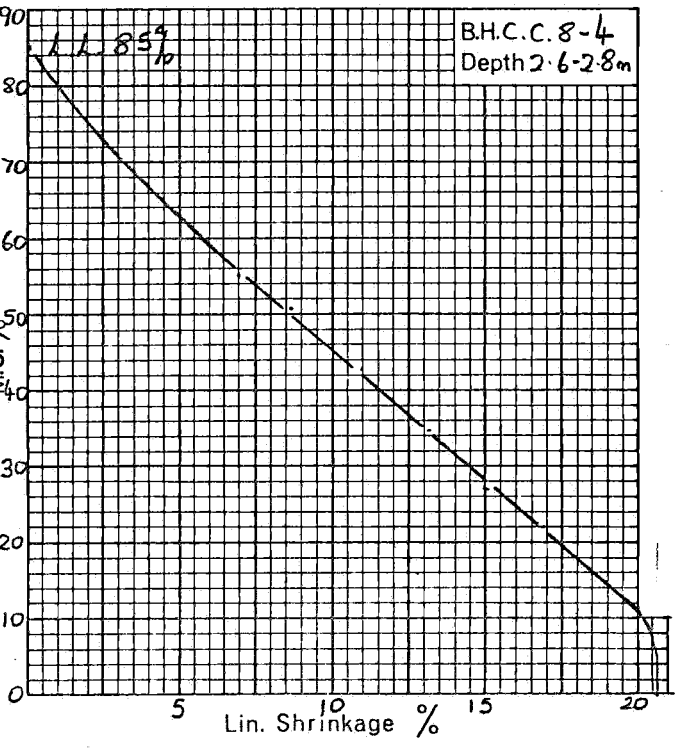
Soils Laboratory
LINEAR SHRINKAGE RESULTS

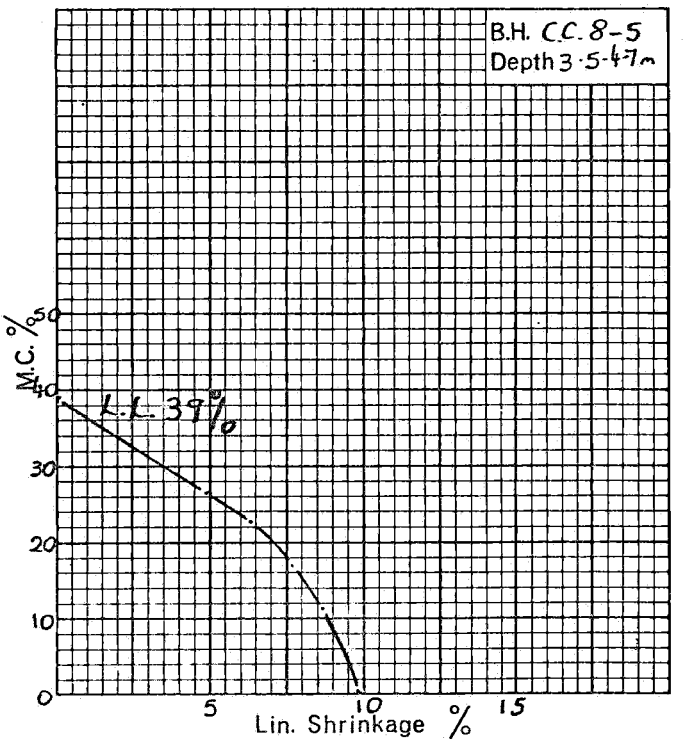
NOARLUNGA REGIONAL CENTRE. COMMUNITY COLLEGE
PROJECT

LOCATION C.C. 8







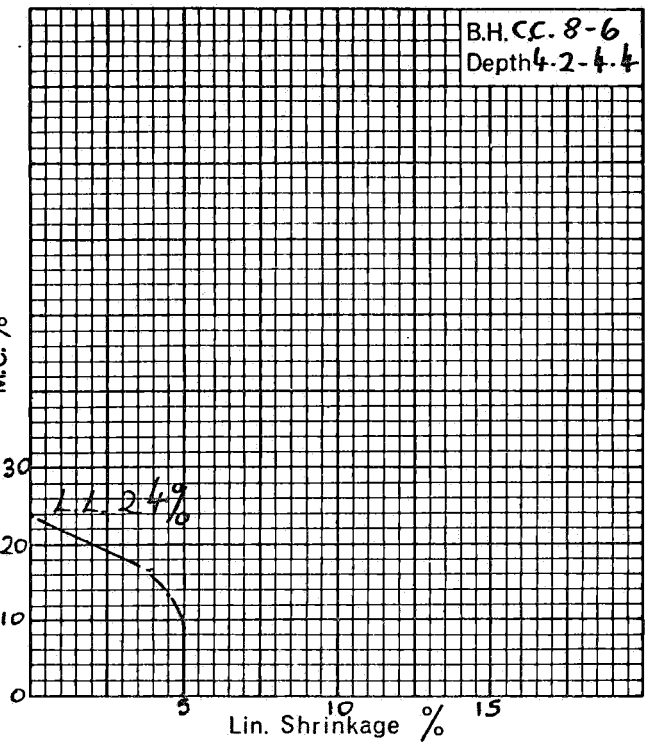


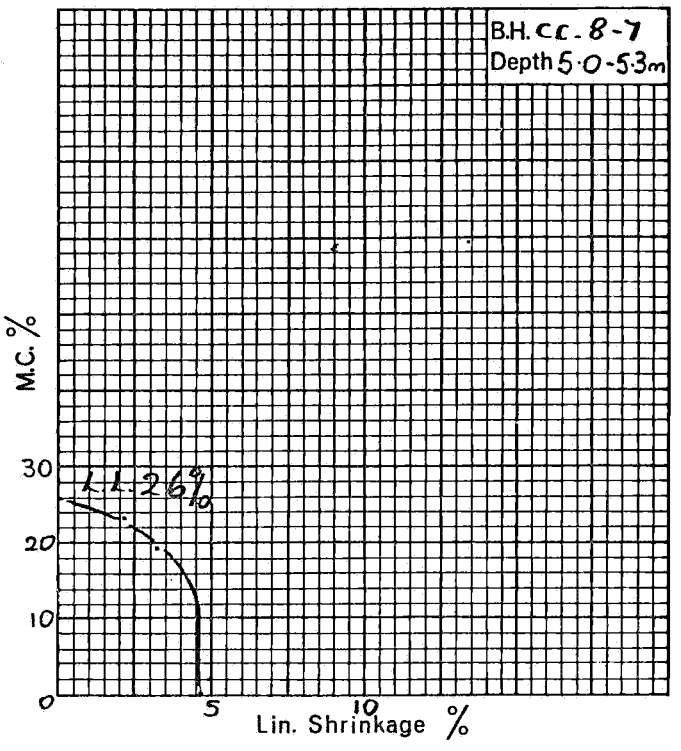
EWS DEPARTMENT

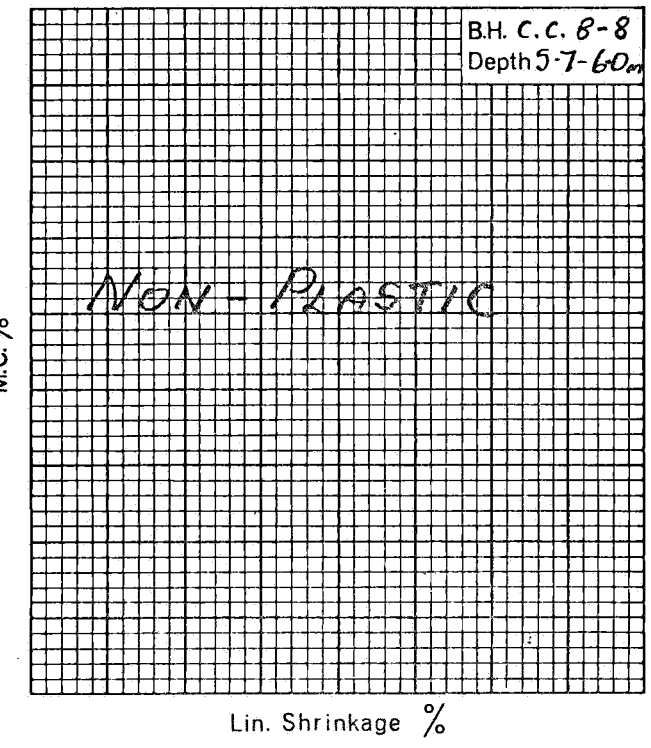
Soils Laboratory
LINEAR SHRINKAGE RESULTS

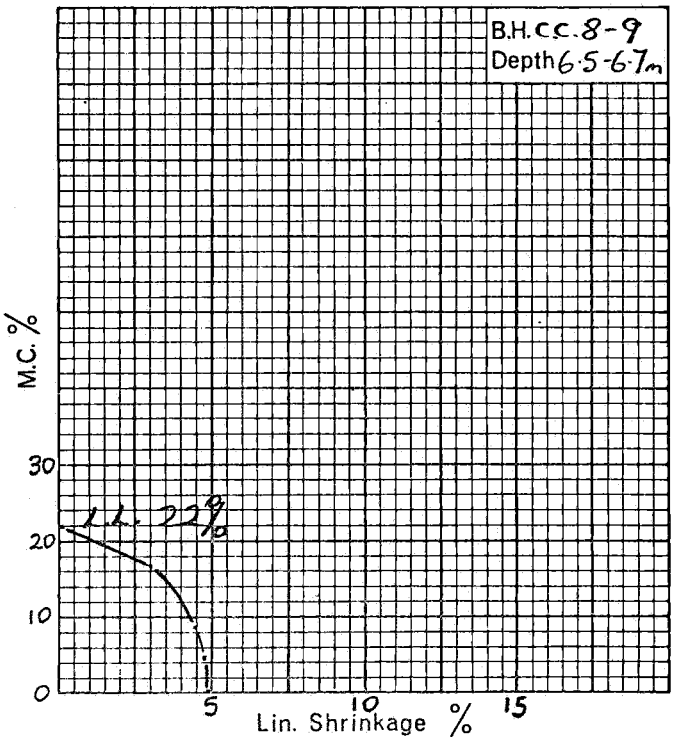
NOARLUNGA REGIONAL CENTRE. COMMUNITY CENTRE
PROJECT

LOCATION C.C.8







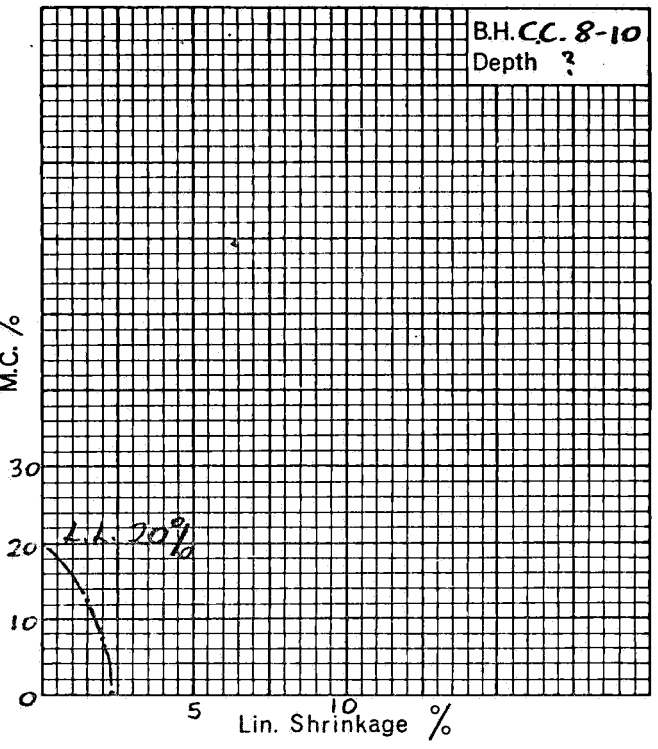


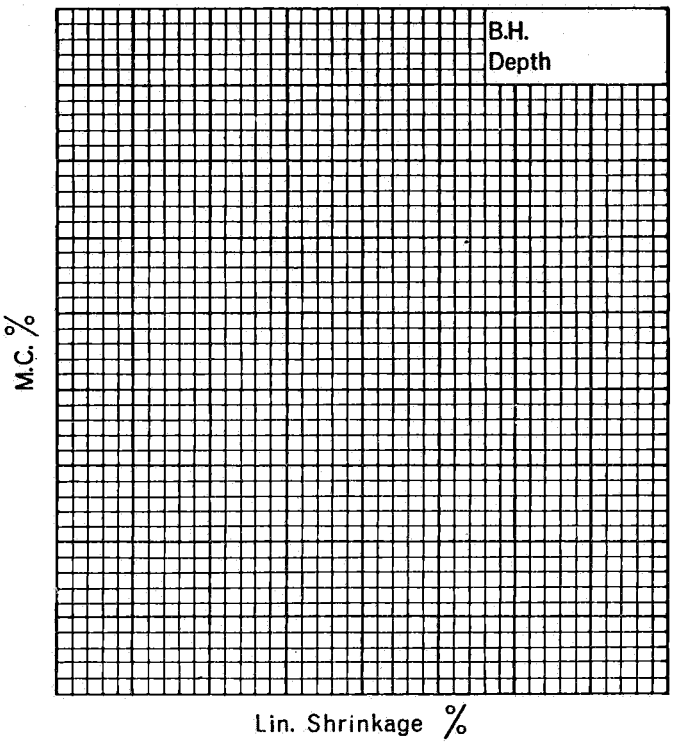
EWS DEPARTMENT

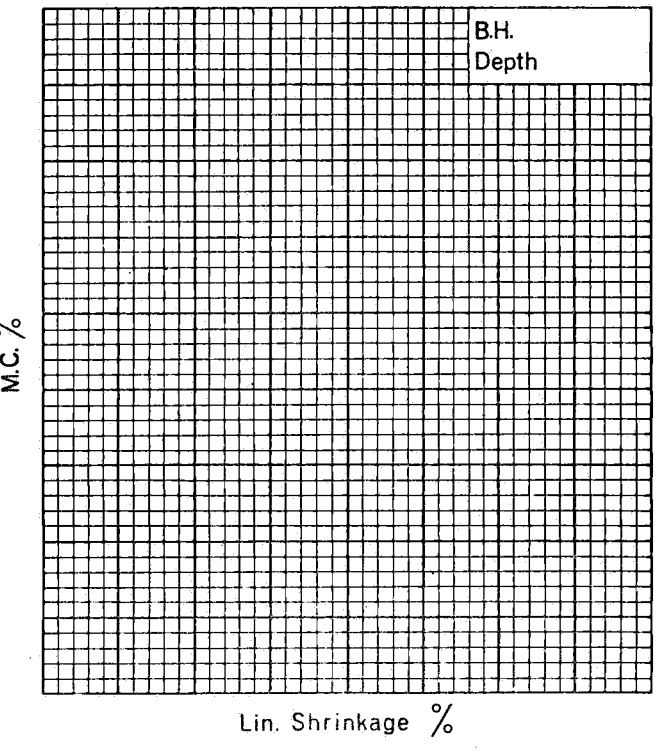
Soils Laboratory
LINEAR SHRINKAGE RESULTS

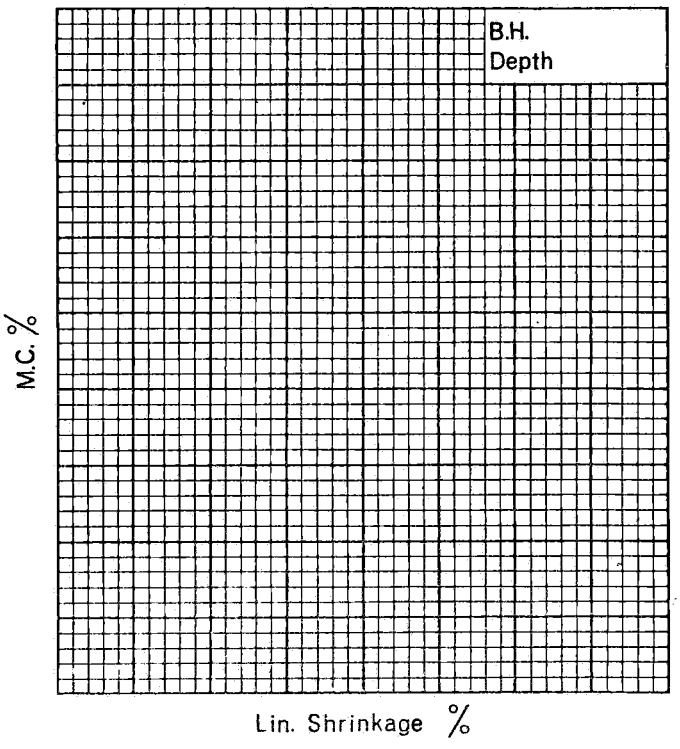
NOARLUNGA REGIONAL CENTRE. COMMUNITY COLLEG
PROJECT

LOCATION C.C.8









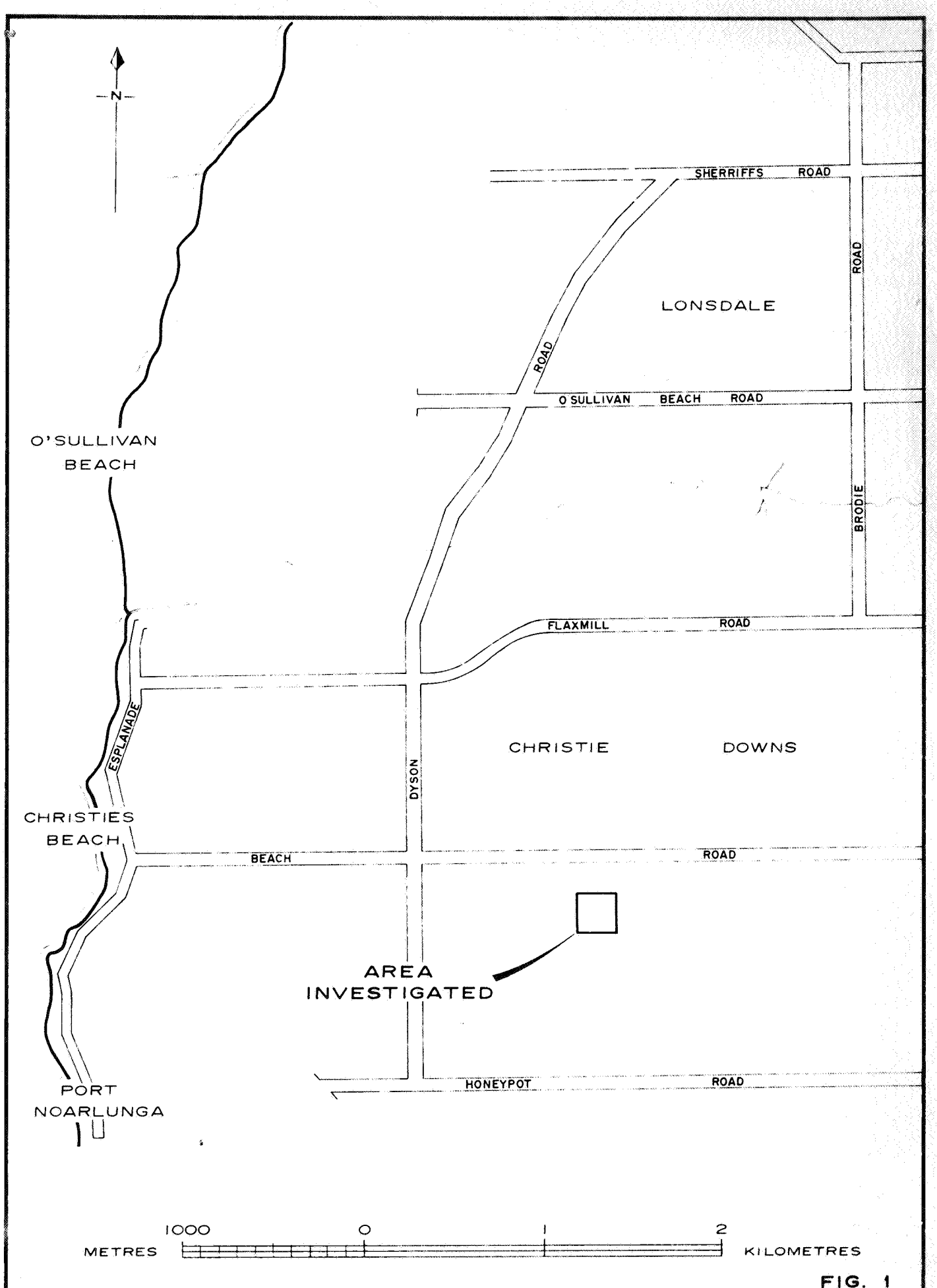


FIG. 1

	DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	SCALE 1 27 700
COMPILED: J. C. Beal	NOARLUNGA REGIONAL CENTRE	DATE 11-1-79
DRN: N.S. CKD:	COMMUNITY COLLEGE FOUNDATION INVESTIGATION	PLAN NUMBER
	LOCALITY PLAN	S 13849

JOB No. 1122

(61·3) 012 Auger cored hole (with elevation in metres).

57·5 Topographic contours (A.H.D.)

63 Contours on base of calcareous silt (A.H.D.) : ML–MH

A' A" Line of section.

road

development

commercial

future

bus stop

local government complex

office complex

tavern

pedestrian mall

town plaza

colonnades

shopping

future shopping development

pedestrian mall

expansion area

service road

car park

METRES

10 0 10 20 30 40 50

FIG. 2

	DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	SCALE 1:500
COMPILED J. C. Beal	NOARLUNGA REGIONAL CENTRE	DATE 12-1-79
DRN N. S. CKD	COMMUNITY COLLEGE FOUNDATION INVESTIGATION	PLAN NUMBER
	LOCATION OF DRILLHOLES	79-38

JOB N° 1122

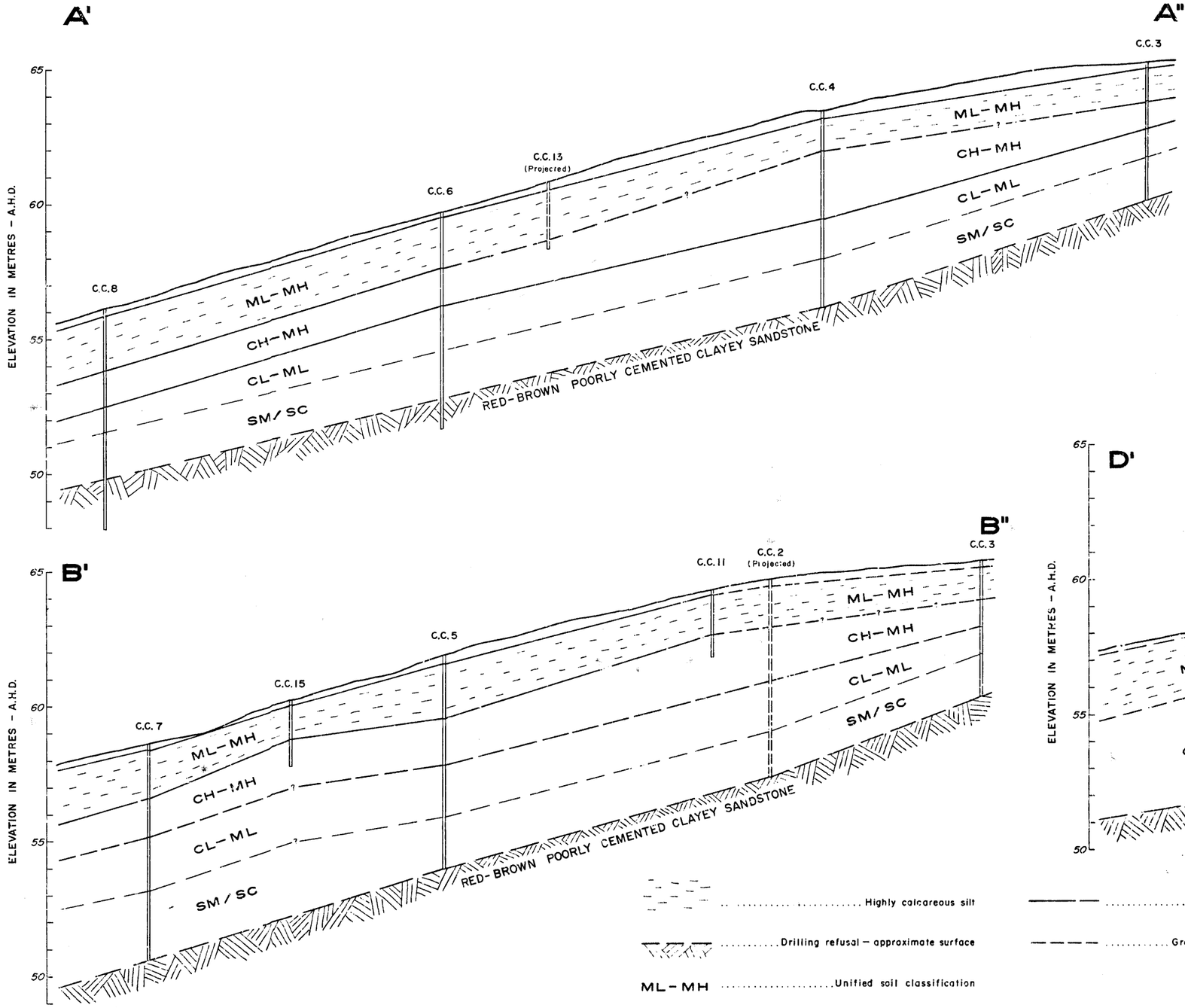


FIG. 3

DEPARTMENT OF MINES AND ENERGY – SOUTH AUSTRALIA

NOARLUNGA REGIONAL CENTRE

COMMUNITY COLLEGE FOUNDATION INVESTIGATION

GEOLOGICAL CROSS SECTIONS

	COMPILED J.C.B.	DRN N.S.	SCALE Hor 1:1000 Vert 1:250	PLAN NUMBER 73-39
DIRECTOR GENERAL		CKD	DATE 12-1-78	

JOB No 1122