DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY

ENVIRONMENT AND RESOURCE DIVISION

TEPKO SAND DEPOSIT
Sections 107 & 110 Hundred of Finnis

Concrete Industries (Monier) Limited.

by

A.M. PAIN
GEOLOGIST
Extractive Minerals Section

Rept.Bk.No. 75/10
G.S. No. 5550
D.M. No. ~~76/75~~ 762/74

CONTENTS

PLANS ACCOMPANYING REPORT

Plan No.	Title	Scale
S11148	Monarto Construction Sand Investigation. Tepko Sand Deposit. Locality Plan.	1:500 000
S11137	Monarto Construction Sand Investigation. Drill hole locations. Tepko Area.	1:20 000
74-1007	Monarto Construction Sand Investigation. Tepko Sand Deposit. Sections 107,110 Hd. Finnis. Geology and Drill-Hole Locations	1:1000
74-1008	Monarto Construction Sand Investigation. Tepko Sand Deposit Sections 107,110 Hd. Finnis. Geological Sections.	1:1000

TABLES

DEPARTMENT OF MINES

SOUTH AUSTRALIA

Rept.Bk. No. 75/10
G.S. No. 5550
D.M. No. ~~76/75~~ 762/74

TEPKO SAND DEPOSIT

Sections 107 & 110 Hundred of Finnis

Concrete Industries (Monier) Limited.

ABSTRACT

Coarse sands and gravels equivalent to the Parilla Sand Formation outcrop in road and rail cuttings 4 km north of Tepko railway station.

Detailed auger drilling in sections 107 & 110 Hundred of Finnis indicated 464000 cubic metres of coarse construction sand and 187000 cubic metres of fine construction sand are overlain by 124000 cubic metres of overburden.

82 000 cubic metres of coarse sand and 13 000 cubic metres of fine sand occur beneath a road which crosses the deposit. It is recommended that approval to entract this material be sought from the appropriate Authorities.

Sieve sizing analyses and petrographic examinations have shown this material to be suitable for construction purposes.

INTRODUCTION

The proposed new city of Monarto with a possible population of 250 000 is to be built near Murray Bridge west of the River Murray.

Estimated construction sand requirements are 14 million cubic metres within 20 years of the commencement of building, of which 3 million will be required during the first 5 years

(data provided by the Monarto Commission)

Firman and Rogers (1972) provide preliminary data on construction materials, and Nichol (1974) summarises the resource potential of the area. The work described in this report was carried out on behalf of Concrete Industries (Monier) Ltd as a service attached to the hire of a Departmental drilling plant. The area was selected by the Company, who are negotiating a Private Mine agreement with the freehold landowners.

GEOLOGICAL SETTING

The regional geology is shown on Mobilong (Johns, 1960) and Mannum (White and Thatcher, 1957) from which the geology shown on plan S11137 is compiled.

Nichol (1974) has detailed age, lithology, thickness, stratigraphic relationships and potential use of rock units in the area, and his table (plan 74-236) is reproduced in this report.

The Monarto region comprises two distinctive physiographic units; the Eastern Mount Lofty Ranges consisting of folded Lower Palaeozoic schists, migmatites and granites, and the Murray Basin containing younger, flatlying sediments of Tertiary to Quaternary age. These contrasting rock suites have different lithological and physical properties, and are confined to topographically well defined portions of the area except in a marginal zone where the Murray Basin sediments overlap the older rocks of the ranges. Most of the work described in this report was carried out in the marginal zone.

AGE	ROCK UNIT	LITHOLOGY	THICK-NESS	STRATIGRAPHIC RELATIONSHIPS	REMARKS	POTENTIAL USE
RECENT		Alluvial gravels, sands and clays.	Variable, but up to about 5m	Deposits of modern streams, not differentiated.	——	Sand
	COONAMBIDGAL FORMATION	Clays, silts and sands.	About 15m	Deposits of modern streams; not differentiated.	Upper valley fill. Restricted to riverine deposits with geomorphic expression in the Murray River tract and adjacent stranded deposits once connected.	Sand and clay
	MOLINEAUX SAND	Yellow quartz sand.	About 6 - 9m in dunes	Stratigraphic position similar to Bunyip Sand.	Longitudinal dunes trending west - east and north west - southeast, and as parabolic dunes.	Sand
	BUNYIP SAND	Light red brown quartz sand.	Variable, but up to about 5m in dunes	Stratigraphic position similar to Molineaux Sand	Dunes or as a veneer on older units.	
UPPER PLEISTOCENE	CALLABONNA CLAY	Red-brown sandy clay and clayey sand	Up to 1m	Overlies Pooraka Formation.	——	Clay
	POORAKA FORMATION	Clayey sands, sands and gravels containing carbonate of the LOVEDAY SOIL.	About 5m	Occupying stream channels incised through older materials on the flanks of the ranges.	Colluvial and alluvial material	
MIDDLE PLEISTOCENE	BAKARA SOIL	Fossil soil. Hard massive, nodular and sheet calcrete. RIPON CALCRETE at base in many places.	About 2m	——	——	Rock filling and aggregate
	BRIDGEWATER FORMATION	Medium to coarse-grained calcarenites with varying proportions of quartz.	About 15m	Stranded coastal dunes, beach ridges and beach deposits.	——	—
LOWER PLEISTOCENE	BLANCHETOWN CLAY	Greenish-grey and red-brown and green mottled sandy clay.	Up to about 20m	Overlies late Pliocene deposits and other Tertiary sediments.	——	Clay
UPPER PLIOCENE	NORWEST BEND FORMATION	Pale grey, brown and yellow quartz sand, calcareous, fossiliferous in places and containing oyster beds which characterise the formation	About 6m	Overlies Mannum Formation. Overlain by Pleistocene to Recent deposits, mainly Blanchetown Clay.	In the Murray River tract between Monteith and Tailem Bend.	—
	PARILLA SAND	Grey, pale brown and yellow fine to medium grained clayey quartz sand with thin beds of olive sandy clay near the top.	Up to 15m	Grades laterally into Norwest Bend formation near Kingston-on-Murray and is equivalent in part to that formation.	——	Sand
UPPER PLIOCENE?	UNNAMED	White quartz sand, pebbly conglomerate and sandy clay.	Not known	Probably equivalent to Parilla Sand.	Tepko area.	
LOWER PLIOCENE	LOXTON SANDS	Pale yellow fine grained sand and micaceous clayey sand.	Up to 10m	Overlies Mannum Formation, overlain by Pleistocene to Recent deposits mainly Blanchetown Clay.	Can be traced in the Murray River cliffs north of Monteith, widespread in the Murray Basin area of the map.	
LOWER MIOCENE	FINNISS CLAY	Grey-green and brown clays.	1-5m thick.	Overlies Mannum Formation with a pronounced unconformity.	Crops out in the hundred of Finniss.	Clay
	MANNUM FORMATION	Yellow-brown sandy limestone and calcareous sandstone.	About 30m	Overlain by Finniss Clay with a marked unconformity, underlain by Ettrick formation and Compton Conglomerate.	Transgressive onto Kanmantoo Group rocks.	Coarse aggregate building stone
OLIGOCENE	ETTRICK FORMATION	Glauconitic and calcarenitic marls.	About 3m	——	Crops out at the base of river cliffs near Tailem Bend (Firman and Rogers, 1972).	—
	COMPTON CONGLOMERATE	Quartz and ironstone gravel and conglomerate		Overlies Kanmantoo Group rocks and underlies Mannum Formation.	Crops out in railway cuttings near 'Kalibar'	—
ORDOVICIAN	MURRAY BRIDGE GRANITE	Coarse grained red-brown granite.	—	Intrusive, discordant.	Crops out at Sturt Reserve and Swanport.	Aggregate building stone
	MONARTO GRANITE	Light grey, fine grained gneissic adamellite	—	Concordant.	Produced by complete granitization of Kanmantoo Group during the Delamerian Orogeny.	
	PALMER GRANITE AND RELATED ROCKS	Medium-to coarse grained granodiorite, aplite, adamellite and albitised granite.	—	Intrusive; discordant.	——	Aggregate
LOWER CAMBRIAN	KANMANTOO GROUP	Siliceous schists, micaceous quartzites and phyllites with pyritic beds gneisses and migmatites	At least 10,000m	——	Regional metamorphism during Delamerian Orogeny	

S.A. DEPARTMENT OF MINES

MONARTO PROJECT

TABLE I

STRATIGRAPHIC TABLE SHOWING ECONOMIC MINERALS AND ROCKS

COMPILED BY D NICHOL

74-235
HB7/8

In the Tepko area, gravels, sands and clays equated by Nichol (1974) to the Parilla Sand unconformably overlie Lower Palaeozoic migmatites and granites. They in turn are overlain by plastic clays of the Pooraka Formation, calcretes and aeolian "Bunyip Sand".

TEPKO SAND DEPOSIT

Drilling

13 holes totalling 102.5 metres were drilled between 29th August and 2nd September, 1974, using a Gemco auger mounted on the tray of a Land Rover utility. A programme of drilling for the Monarto Commission was carried out in conjunction with the project, and additional information from this source is included in the report. Logs of all relevant holes are presented in Appendix I.

General

The deposit is located 4 km north of Tepko railway station in sections 107 and 110 Hundred of Finnis. A geological plan and cross-sections were drawn from a plane table survey (see plans 74-1007 and 74-1008).

To the north of the road, the deposit consists of yellow-orange coarse-grained micaceous sand with low "clay" contents averaging only 11% in the -200 mesh B.S.S. fraction.

Coarse sand is also found south of the road, but most of the material in this section is fine sand with -200 mesh "clay" contents averaging 12.4%.

Microscopic examination has shown the sand to be suitable for concrete aggregate, and petrographic descriptions are given in Appendix III.

Gravel lenses occur within the deposit, and numerous quartz pebbles up to 15 cm in diameter are scattered over the surface of the ground. However, in drilling the deposit the auger pushes the pebbles aside or crushes them so that accurate sampling is not possible.

The sediments were deposited in a fluvio-lacustrine environment on an irregular basement consisting of migmatites and granites from which they were derived. Some idea of the basement topography can be gained from section A-A' (plan 74-1008) where the sand reaches a depth of 10.8 m in hole no. M.C.15, only 80 m from outcropping migmatites.

Contacts between the coarse and fine construction sand, and the waste silt and clay are shown on the cross sections in a schematic, lenticular style. The exact nature of the gradation between the two will become apparent when extraction of sand is commenced. Many of the sieve sizing analyses show a bimodal distribution (ie. two distinct populations of grain sizes are present). It is therefore likely that the sediments were derived from two separate sources, and this local concentration of coarse sand may have been the point of entry of a fast-flowing river channel into a fresh water lake, with finer sediments being deposited elsewhere. In this case, a gradational contact passing from predominantly coarse sand in the north to fine sand in the south of the deposit will be expected.

Some re-working of the upper part of the deposit occurred after deposition, and an accumulation of rounded quartz pebbles is commonly encountered in the top metre of each hole. This was heavily impregnated by white calcrete in Pleistocene times, and together with a thin veneer of Recent and aeolian sand constitutes the overburden.

Calcareous material has also impregnated the upper 3-4 metres of the sand deposit, the quantity decreasing with depth. The carbonate appears to be very fine grained and most would be removed in the washing process (see Appendix III).

SIEVE SIZING ANALYSIS & PETROGRAPHIC EXAMINATION.

Samples from selected drill holes were submitted to AMDEL for petrographic examination (see Appendix III) and for sieve sizing according to A77 specifications (ie. dry and weigh and sieve the +200 mesh fraction).

Fineness modulus values were calculated from sieve sizing data, by expressing cumulative amounts retained on successive sieves as a percentage of the dry +200 mesh fraction. Cumulative percentages retained on the 100, 52, 25, 14, 7, $^{3}/_{16}$ and $^{3}/_{8}$ B.S.S. sieves are summed and divided by 100. The A77 envelope has a F.M. value of 1.35 for the finest permissible material and 4.00 for the coarsest.

Graphical plots of sieve sizing analyses are shown in Appendix II. Fineness modulus values and "clay" contents (-200 mesh B.S.S.) are shown on the cross-sections (plan 74-1008) and on logs in Appendix I.

Bimodal distributions were obtained from most holes containing coarse construction sand, with low amounts retained

on 52 and 25 mesh B.S.S. sieves.

RESERVE CALCULATIONS

For convenience, the sediments were divided into the following categories, based on fineness modulus figures and "clay" contents.

(a) Coarse Construction Sand: Fineness modulus between 1.35 and 2.00; "clay" content less than 20%.

(b) Fine Construction Sand: Fineness modulus between 2.00 and 4.00; "clay" content less than 20%.

Reserves were calculated from polygonal areas of influence surrounding each drill hole (see Appendix IV). Edges of polygons near the margins of the deposit were inferred from the cross-sections. For the purposes of this calculation, a buffer zone of 5 metres was allowed along the edge of the road, to allow for battering down of the slopes should the material beneath the road be unavailable. It should be noted that reserve estimates of construction sand south of the road are less accurate than those north of the road, due to wider drill-hole spacings: they are probably best regarded as "inferred reserves".

A summary of the data is presented in the table below: detailed calculations may be consulted in Appendix IV.

TABLE II

Reserve Estimates (Cubic metres in situ)

	Section 107 (North of Road)	Road	Section 110 (South of Road)	Total
Overburden	39 000	12 000	72 000	123 000
Coarse Construction Sand	244 000	82 000	138 000	464 000
Fine Construction Sand	1 000	13 000	173 000	187 000
Waste	9 000	-		9 000

It should be noted that in addition to the reserves quoted above, use could be made of some material which because of its fineness is presently regarded as "waste" or "overburden" (e.g. material intersected in holes CI5, CI6, CI10 & CI11). Judicious blending of this material could increase reserves by as much as 20%.

CONCLUSIONS AND RECOMMENDATIONS

It is recommended that the Tepko deposit be worked as a single operation. Although some of the fine sand to the south of the road may be suitable for such purposes as plastering sand or brick laying sand, better use would probably be made of the deposit if it could be blended with the coarser material to produce concrete sand.

2. Substantial reserves occur beneath the road which crosses the deposit (see table 2). Operation of the deposit will be easier, and more attractive economically if this material can be extracted. An approach should be made to the appropriate authorities to secure approval. Procedures for this are outlined in the Regulations under the Mining Act, 1971. Section C-C' on plan 74-1008 shows the basement surface in the vicinity of the road to be fairly flat, so that when the operating is complete a level surface will be exposed for the formation of a new road.

The worked-out pit should present no problems in rehabilitation, which will be more effective if the material beneath the road is removed.

3. Clay contents are generally low, and acceptable products could be obtained from possibly one third of the deposit simply by dry-screening. However, because of the relatively high clay contents of much of the very fine material, blending will reduce the volume available for dry-screening.

A supply of water will be necessary for washing operations, and some of this could come from Reedy Creek. Adequate settling dams and flocculants should be used to ensure that there is no unacceptable discharge of silt into the Reedy Creek system.

4. Due to the nature of the auger sampling, no estimate could be made of the quantity of gravel present. If quantities are sufficient, it may be feasible to install a small crusher and re-cycle the screen oversize.

5. After working of the sand has commenced, samples of slime from the settling dams should be tested to assess suitability of inclusion in a brick clay blend.

A.M. Pain

A.M. PAIN
GEOLOGIST
EXTRACTIVE MINERALS SECTION.

REFERENCES

Firman, J.B., 1971. Regional Stratigraphy of Surficial Deposits in the Murray Basin and Gambier Embayment, S.A. Rept. Invest., Geol. Surv. S. Aust., 39.

Firman, J.B., and Rogers, P.A., 1972. The Murray New Town Area - Progress Report No. 1. Construction Materials and Foundation Conditions. Dept. Mines. S. Aust., Unpublished Report RB 72/140.

Johns, R.K., 1960. Mobilong map sheet. Geological Atlas of South Australia. 1:63 360 Series. Geol. Surv. S. Aust.

Johns, R.K., 1961. The Geology of the Mobilong Military Sheet. (Explanation of the Geological Map) Rept. Invest. Geol. Surv. S. Aust., 17.

Nichol, D., 1964. Construction Materials Resources, Monarto Area. Dept. Mines S. Aust., Unpublished Report RB 74/84.

White, A.J.R. and Thatcher, D., 1957. Mannum map sheet. Geological Atlas of South Australia 1:63 360 series. Geol. Surv. S. Aust.

Appendix I

Logs of Gemco Auger Holes.

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – | LONG – | PURPOSE – | MINERAL SAND | BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND | PLAN REF. 74-1007 SEC 110 HD Finnis | D.M. 762/74 REPT. BK.

HOLE NO CI 1 | RIG Gemco | DEPTH 13·0m | ANGLE Vertical | AZIMUTH – | ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Rec.	O/B	Brown clayey soil						
		Brown gravelly sandy clay grading down to sandy quartz gravel.						
TERTIARY	COARSE CONSTRUCTION SAND	Sandy quartz GRAVEL. White and off-white		1			FM = 4·07 11·23% Clay.	5
		Pale orange-brown coarse SAND		2				
		Orange coarse SAND		3			FM = 2·46 9·92% Clay.	10
		Orange coarse SAND		4				
		Orange very coarse SAND		5			FM = 3·68 6·09% Clay	15
		Orange coarse SAND grading to yellow-orange silty fine-medium SAND.		6				20
		Orange coarse SAND and fine GRAVEL		7			FM = 2·89 6·14% Clay. Bimodal	25
		Orange SAND & fine GRAVEL		8				
		Orange fine-medium SAND.		9			FM = 2·13 6·48% Clay.	30
		Orange fine-medium SAND		10				35
		Orange fine-med SAND grading to coarse SAND & FINE GRAVEL.		11			FM = 2·32 6·93% Clay. Bimodal	
		Orange coarse SAND & FINE GRAVEL		12				40
		13·0m - End of hole.		13				

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ | Damp ▨ | Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 | LOGGED
TYPE Auger | A.M. PAIN
DRILLER A. van Rens | DATE 26.8.74
START 26.8.74 | TCD. D.W.W.
FINISH 26.8.74 | CKD. A.F.

SHEET 1 OF 1 | DRG. NO. S 11168

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... –
LONG ... –
PURPOSE ... –
MINERAL SAND
BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 112 HD Finnis
D.M. 762/74 REPT. BK

HOLE NO CI 2
RIG Gemco
DEPTH 50m
ANGLE Vertical
AZIMUTH ... –
ELEV ... –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	WASTE	Red-brown aeolian SAND.						
PLEISTOCENE		Stiff red-brown CLAY.		1				5
		Orange-brown to red-brown plastic CLAY.		2				10
		Red-brown stiff plastic CLAY.		3				
		Red-brown stiff plastic CLAY.		4				15
		Red-brown, stiff plastic CLAY.		5				
		5·0m End of Hole.						

GRAIN SIZE	(mm)
VF Very fine sand	0·05 – 0·15
F Fine sand	0·15 – 0·25
M Medium sand	0·25 – 0·50
C Coarse sand	0·50 – 1·00
VC Very coarse sand	1·00 – 2·00
P Pebbles	2·00 – 64·00
CO Cobbles	64·00 – 256·0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A.van Rens
START 29·8·74
FINISH 29·8·74

LOGGED A.M. Pain
DATE 29·8·74
TCD D.W.W.
CKD. A.F.

SHEET 1 OF 1 | DRG.NO. S11169

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT –
LONG –
PURPOSE –
MINERAL SAND
BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 111 HD FINNIS
D.M. 762/74 REPT. BK

HOLE NO CI 3
RIG Gemco
DEPTH 6·5m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Recent		Red-brown fine SAND						
		Pinkish-brown calcareous plastic CLAY						
PLEISTOCENE	Waste	Red-brown calcareous sandy stiff plastic CLAY.		1				5
				2				
		Grey-brown stiff plastic CLAY		3				10
		CLAY as above		4				
		CLAY as above		5				15
		CLAY as above		6				20
		6·5m End of hole Difficult penetration & no sample return in stiff plastic clay.						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A. van Rens
START 29·8·74
FINISH 29·8·74

LOGGED A.M. Pain
DATE 29·8·74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1 | DRG. NO. S11170

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – LONG – PURPOSE – MINERAL Sand BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND PLAN REF. 74-1006 SEC 112 HD. Finnis D.M. 762/74 REPT. BK.

HOLE NO C14 RIG Gemco DEPTH 5.0m ANGLE Vertical AZIMUTH – ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Red-brown, soft aeolean SAND		1				5
Palaeozoic	Basement Gneiss	Olive-brown sandy CLAY (weathered GNEISS)	+ +	2				10
		Olive-green micaceous SILT (weathered GNEISS)	+ +	3				
		Weathered GNEISS - as above	+ +	4				15
		Weathered GNEISS - as above	+ +	5				
		5.0m. End of hole						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 LOGGED A.M. PAIN
TYPE Auger DRILLER A.van Rens DATE 29·8·74
START 29·8·74 TCD. D.W.W.
FINISH 29·8·74 CKD. A.F.

SHEET 1 OF 1 DRG.NO. S11171

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... –
LONG ... –
PURPOSE ... –
MINERAL Sand
BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 110 HD FINNIS
D.M. 762/74 REPT. BK.

HOLE NO CI 5
RIG Gemco
DEPTH 10.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT
Pleist		Orange-brown silty SOIL with calcareous staining.						
TERTIARY	Waste and Overburden.	Orange-brown micaceous fine SAND - slightly calcareous		1			F.M. = 2.31 26.90% Clay.	5
		Pale orange-brown sandy SILT slightly calcareous.		2				
		Orange-brown fine SAND slightly calcareous.		3			F.M. = 1.10 26.29% Clay.	10
		Orange fine SAND		4				
		Orange SAND		5				15
		Orange SAND		6			F.M. = 1.33 30.38% Clay.	20
	Crse Coarse Fine Coarse sand	Orange SAND		7			F.M. = 1.51 19.67% Clay. Bimodal.	25
		Orange SAND		8				
		Orange SAND Some pebbles at base of interval		9			F.M. = 2.30 14.80% Clay. Bimodal	30
		10.0m End of hole. Hole stopped by coarse gravel		10				

GRAIN SIZE	(mm)
VF Very fine sand	0.05 – 0.15
F Fine sand	0.15 – 0.25
M Medium sand	0.25 – 0.50
C Coarse sand	0.50 – 1.00
VC Very coarse sand	1.00 – 2.00
P Pebbles	2.00 – 64.00
CO Cobbles	64.00 – 256.0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A van Rens
START 29.8.74
FINISH 29.8.74

LOGGED A.M. Pain
DATE 29.8.74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1 | DRG.NO. S11172

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – LONG – PURPOSE – MINERAL Sand BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF. 74-1007 SEC 110 HD. Finnis
D.M. 762/74 REPT. BK.

HOLE NO C1 6 RIG Gemco DEPTH 5.0m ANGLE Vertical AZIMUTH – ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Overburden	Soft red-brown aeolean SAND						
Pleisto-cene		Red-brown sandy clay SOIL		1				5
		Red-brown clayey sandy SOIL with white calcareous patches.		2				
Tertiary	Waste	Orange micaceous SAND		3			F.M. = 1.90 24.52% Clay.	10
		Orange micaceous SAND		4				
		Yellow-orange SAND		5			F.M. = 1.43 22.59% Clay.	15
		5.0m End of hole (Drill would not penetrate)						

GRAIN SIZE	(mm)
VF Very fine sand	0.05 – 0.15
F Fine sand	0.15 – 0.25
M Medium sand	0.25 – 0.50
C Coarse sand	0.50 – 1.00
VC Very coarse sand	1.00 – 2.00
P Pebbles	2.00 – 64.00
CO Cobbles	64.00 – 256.0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 TYPE Auger DRILLER A van Rens START 30.8.74 FINISH 30.8.74
LOGGED A.M. PAIN DATE 30.8.74 TCD. D.W.W. CKD. A.F.

SHEET 1 OF 1 DRG.NO. S11173

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – LONG – PURPOSE – MINERAL Sand BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF. 74-1007 SEC 110 HD. Finnis
D.M. 762/74 REPT. BK.

HOLE NO CI 7
RIG Gemco
DEPTH 9.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY : SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Red aeolean SAND						
Pleisto-cene		Orange-brown fine SAND with calcareous staining.		1			F.M. = 2.06 29.93% clay	5
Tertiary		Reddish-orange SAND slightly calcareous		2				
Palaeozoic	Basement Gneisses	Reddish-orange SILT (with'd GNEISS)		3				10
		Reddish-orange SILT (with'd GNEISS)		4				
		Yellow-orange, red, purple & white CLAY (with'd GNEISS)		5				15
		CLAY (with'd GNEISS) as above		6				20
		CLAY (with'd GNEISS) as above		7				
		CLAY (with'd GNEISS) as above		8				25
		CLAY (with'd GNEISS) as above		9				

GRAIN SIZE (mm)		CLAY : SAND (%Clay)	
VF Very fine sand	0·05 – 0·15	SA Clean sand	0 – 5
F Fine sand	0·15 – 0·25	SC Slightly clayey	5 – 15
M Medium sand	0·25 – 0·50	MC Moderately clayey	15 – 30
C Coarse sand	0·50 – 1·00	VC Very clayey	30 – 45
VC Very coarse sand	1·00 – 2·00	CS Clay sand	45 – 55
P Pebbles	2·00 – 64·00	VS Very sandy	55 – 70
CO Cobbles	64·00 – 256·0	MS Moderately sandy	70 – 85
		SS Slightly sandy	85 – 95
		CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 LOGGED A.M. PAIN
TYPE Auger DATE 30.8.74
DRILLER A van Rens TCD. D.W.W.
START 30.8.74 CKD. A.F.
FINISH 30.8.74
SHEET 1 OF 1 DRG.NO. S11174

P.F NO S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT –
LONG –
PURPOSE –
MINERAL Sand
BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 110 HD Finnis
D.M. 762/74 REPT. BK.

HOLE NO CIB
RIG Gemco
DEPTH 5.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Red-brown aeolean SAND						
Pleisto-cene	Waste	Pale brown calcareous SOIL						
Tertiary.	Waste	Orange-brown clayey SILT						
Palaeozoic	Basement	White micaceous CLAY (weathered GNEISS)		1				5
		Wtathered GNEISS (As above).		2				
		Weathered GNEISS (As above).		3				10
		Weathered GNEISS (As above).		4				
		5.0m End of hole		5				15

GRAIN SIZE (mm)

VF	Very fine sand	0.05 – 0.15
F	Fine sand	0.15 – 0.25
M	Medium sand	0.25 – 0.50
C	Coarse sand	0.50 – 1.00
VC	Very coarse sand	1.00 – 2.00
P	Pebbles	2.00 – 64.00
CO	Cobbles	64.00 – 256.0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A van Rens
START 30.8.74
FINISH 30.8.74

LOGGED A.M. PAIN
DATE 30.8.74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1 | DRG.NO. S11175

P.F NO S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... –
LONG ... –
PURPOSE ... –
MINERAL Sand
BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 110 HD Finnis
D.M. 762/74 REPT. BK.

HOLE NO CI 9
RIG Gemco
DEPTH 6.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	WASTE	Red aeolean SAND						
		Pale brown Coarse SAND & fine GRAVEL						
Tertiary		Pale brown silty fine SAND		1				5
		Pale brown silty fine SAND		2				
		Orange-brown silty fine SAND		3				10
		Orange-brown silty fine SAND		4				
		Orange-brown silty CLAY		5				15
				6				
		6.0m End of hole No sample return in sticky clay.						

GRAIN SIZE (mm)

VF	Very fine sand	0.05 – 0.15
F	Fine sand	0.15 – 0.25
M	Medium sand	0.25 – 0.50
C	Coarse sand	0.50 – 1.00
VC	Very coarse sand	1.00 – 2.00
P	Pebbles	2.00 – 64.00
CO	Cobbles	64.00 – 256.0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A van Rens
START 30.8.74
FINISH 30.8.74

LOGGED A.M. PAIN
DATE 30.8.74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1 | DRG. NO. S11176

P.F. NO S10323 MG

6738-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – LONG – PURPOSE – MINERAL SAND BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND PLAN REF 74-1007 SEC 110 HD Finnis D.M. 762/74 REPT. BK

HOLE NO CI 10 RIG Gemco DEPTH 13.0m ANGLE Vertical AZIMUTH – ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Recent		Red-brown aeolean SAND						
TERTIARY	OVERBURDEN	Pale brown calcareous SAND		1			F.M. = 0.95 28.34% Clay	5
		Pale brown sl. calcareous SAND		2				
		Pale brown sl. calcareous SAND		3			F.M. = 1.03 32.75% Clay	10
		Pale brown sl. calcareous SAND		4				15
	FINE CONSTRUCTION SAND	Pale brown micaceous SAND		5			F.M. = 1.86	
		Pale brown micaceous SAND		6			16.19% Clay	20
		Orange micaceous SAND		7			F.M. = 1.81 12.05% Clay	25
		Orange micaceous SAND		8			F.M. = 1.70 12.63% Clay	
		Orange micaceous SAND		9				30
	WASTE	Pale yellow-orange SAND		10			F.M. = 1.15 12.51% Clay	35
		Pale yellow-orange SAND		11				
		Pale yellow-orange SAND		12			F.M. = 0.94 19.69% Clay	40
		13.0m End of hole Hole stopped as no more auger flights were available		13				

GRAIN SIZE	(mm)
VF Very fine sand	0.05 – 0.15
F Fine sand	0.15 – 0.25
M Medium sand	0.25 – 0.50
C Coarse sand	0.50 – 1.00
VC Very coarse sand	1.00 – 2.00
P Pebbles	2.00 – 64.00
CO Cobbles	64.00 – 256.0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 LOGGED A.M. DAIN
TYPE Auger DATE 30.8.74
DRILLER A van Rens TCD D.W.W.
START 30.8.74 CKD A.F.
FINISH 30.8.74

SHEET 1 OF 1 DRG. NO. S11177

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – LONG – PURPOSE – MINERAL SAND BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND PLAN REF. 74-1007 SEC 110 HD. Finnis D.M. 762/74 REPT. BK.

HOLE NO CI 11 RIG Gemco DEPTH 17.0m ANGLE Vertical AZIMUTH – ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	overburden	Red-brown aeolean SAND						
Pleisto-cene	overburden	Red-brown silty CLAY						
	overburden	Red-brown silty CLAY						
TERTIARY	Coarse Consd Sand	orange-brown clayey SAND		1				5
	Coarse Consd Sand	Orange SAND & GRAVEL		2			F.M. = 3·13 16·62% Clay	
	Coarse Consd Sand	Orange SAND		3				10
	Fine Constr. Sand	Pale yellow-orange SAND		4			F.M. = 1·81 20·29% Clay	15
	Fine Constr. Sand	off-white pale yellow SAND		5				
	Fine Constr. Sand	yellow-orange SAND		6			F.M. = 1·98 16·99% Clay	20
	Fine Constr. Sand	yellow-orange SAND		7				
	Coarse Constr. Sand	yellow-orange SAND		8			F.M. 2·33 11·99% Clay	25
	Coarse Constr. Sand	yellow-orange SAND		9				30
	Coarse Constr. Sand	yellow-orange SAND		10			F.M. = 2·71 12·07% Clay.	
	Coarse Constr. Sand	yellow-orange SAND		11				35
	Fine construction sand	yellow-orange SAND		12			F.M. = 1·63 10·65% Clay.	40
	Fine construction sand	Orange SAND		13				45
	Fine construction sand	Orange SAND		14			F.M. = 1·86 11·95% Clay	
	Fine construction sand	orange SAND		15				50
	Fine construction sand	Orange SAND		16				
Base-ment		Pale brown plastic CLAY (with GNEISS)		17				55
		17·0m End of hole.						

GRAIN SIZE	(mm)
VF Very fine sand	0·05 – 0·15
F Fine sand	0·15 – 0·25
M Medium sand	0·25 – 0·50
C Coarse sand	0·50 – 1·00
VC Very coarse sand	1·00 – 2·00
P Pebbles	2·00 – 64·00
CO Cobbles	64·00 – 256·0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 TYPE Auger DRILLER A van Rens START 2·9·74 FINISH 2·9·74

LOGGED A.M. PAIN DATE 2·9·74 TCD. D.W.W. CKD. A.F.

SHEET 1 OF 1 DRG.NO. S 11178

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – LONG – PURPOSE – MINERAL Sand BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 110 HD Finnis
D.M. 762/74 REPT. BK

HOLE NO CT 12 RIG Gemco DEPTH 6.0m ANGLE Vertical AZIMUTH – ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Red-brown aeolean SAND		1				5
		Red-brown aeolean SAND		2				
		Red-brown aeolean SAND		3				10
		Red-brown aeolean SAND		4				
Pleistocene		Red-brown SAND & Calcrete stains						15
		Fine red-brown SAND		5				
		Fine red-brown SAND		6				
		6.0m End of hole (No sample return)						

GRAIN SIZE (mm)

VF	Very fine sand	0.05 – 0.15
F	Fine sand	0.15 – 0.25
M	Medium sand	0.25 – 0.50
C	Coarse sand	0.50 – 1.00
VC	Very coarse sand	1.00 – 2.00
P	Pebbles	2.00 – 64.00
CO	Cobbles	64.00 – 256.0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 TYPE Auger DRILLER A van Rens START 2.9.74 FINISH 2.9.74
LOGGED A.M. PAIN DATE 2.9.74 TCD D.W.W. CKD. A.F.

SHEET 1 OF 1 DRG.NO. S11179

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT –
LONG –
PURPOSE –
MINERAL Sand
BORE S/No 911/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 110 HD Finnis
D.M. 762/74 REPT. BK.

HOLE NO C.I.13
RIG Gemco
DEPTH 6.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Fine red-brown aeolean SAND		1				5
		Pale red-brown clayey SAND		2				
		Pale reddish-orange SAND		3				10
		Pale red-brown SAND		4				
		No sample		5				15
Pleistocene		Pale pinkish-brown calcareous SOIL		6				
		6.0m End of hole (Hole stopped by hard Calcrete)						

GRAIN SIZE	(mm)
VF Very fine sand	0·05 – 0·15
F Fine sand	0·15 – 0·25
M Medium sand	0·25 – 0·50
C Coarse sand	0·50 – 1·00
VC Very coarse sand	1·00 – 2·00
P Pebbles	2·00 – 64·00
CO Cobbles	64·00 – 256·0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A. van Rens
START 2.9.74
FINISH 2.9.74

LOGGED A.M. PAIN
DATE 2.9.74
TCD. D.W.W.
CKD. A.F.

SHEET 1 OF 1
DRG. NO. S11180

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... –
LONG ... –
PURPOSE ... –
MINERAL ... SAND
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF. 74-1007 SEC 110 HD. Finnis
D.M. 770/74 REPT. BK.

HOLE NO. MC1
RIG Gemco
DEPTH 8.75 m
ANGLE Vertical
AZIMUTH –
ELEV. –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Pleistocene	O/B	soft, off-white to pale pink calcareous plastic clay		1				5
TERTIARY	COARSE CONSTRUCTION SAND	brownish-orange very coarse SAND		2			F.M. = 2.69 8.27% clay Bimodal	10
		brownish-orange very coarse SAND		3			F.M. = 1.62 7.41% Clay	
		yellow-orange coarse – V.C. SAND grading down to very fine SAND		4			F.M. = 1.71 5.66% Clay	15
		pale yellow fine silty SAND		5			F.M. = 1.96 7.46% clay Bimodal	
		yellow-orange fine silty SAND		6			F.M. = 1.98 7.71% clay.	20
		orange fine silty SAND		7			F.M. = 2.31 7.86% clay Bimodal	25
		orange fine-medium SAND		8			F.M. = 2.86 8.00% clay Bimodal	
		orange SAND & fine GRAVEL						
		8.75m. End of hole.						

GRAIN SIZE	(mm)
VF Very fine sand	0.05 – 0.15
F Fine sand	0.15 – 0.25
M Medium sand	0.25 – 0.50
C Coarse sand	0.50 – 1.00
VC Very coarse sand	1.00 – 2.00
P Pebbles	2.00 – 64.00
CO Cobbles	64.00 – 256.0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 | LOGGED A.M. PAIN
TYPE Auger | DATE 26.8.74
DRILLER A. van Rens | TCD D.W.W.
START 26.8.74 | CKD A.F.
FINISH 26.8.74 | SHEET 1 OF 1 | DRG. NO. S11181

P.F. NO. S10323 MG

G728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... – ...
LONG ... – ...
PURPOSE ... – ...
MINERAL SAND ...
BORE S/No 910/75 ...

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 110 ... HD Finnis ...
D.M. 770/74 ... REPT. BK. ...

HOLE NO MC 2 ...
RIG Gemco ...
DEPTH 4.5m ...
ANGLE Vertical
AZIMUTH ... – ...
ELEV ... – ...

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY : SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT
Recent	Waste	Red-brown clayey soil ALLUVIUM		1				5
		Red-brown clay - as above		2				10
		Red-brown clay - as above		3				
		Red-brown clay - as above		4				15
		Red-brown clay - as above						
		4.5m End of hole						

GRAIN SIZE	(mm)
VF Very fine sand	0·05 – 0·15
F Fine sand	0·15 – 0·25
M Medium sand	0·25 – 0·50
C Coarse sand	0·50 – 1·00
VC Very coarse sand	1·00 – 2·00
P Pebbles	2·00 – 64·00
CO Cobbles	64·00 – 256·0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE
Dry
Damp
Wet

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 ...
TYPE Auger ...
DRILLER A. van Rens
START 26·8·74 ...
FINISH 26·8·74 ...

LOGGED A.M. PAIN ...
DATE 26·8·74 ...
TCD D.W.W. ...
CKD A.F. ...

SHEET 1 OF 1 | DRG NO. S11182 ...

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT –
LONG –
PURPOSE –
MINERAL SAND
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 110 HD Finnis
D.M. 770/74 REPT. BK

HOLE NO MC 3
RIG Gemco
DEPTH 1.5m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT
Recent	Waste	Very fine red-brown aeolean SAND						
		Brown silty soil (ALLUVIUM)		1				
Pleist.		overlying hard white CALCRETE		1.5				5
		1.5m. End of hole (stopped by hard Calcrete).						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A. von Rens
START 27.8.74
FINISH 27.8.74
LOGGED A.M. PAIN
DATE 27.8.74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1 DRG. NO. S11183

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – LONG – PURPOSE – MINERAL SAND BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND PLAN REF 74-1006 SEC 110 HD Finnis D.M. 770/74 REPT. BK

HOLE NO MC 3A RIG Gemco DEPTH 1.5m ANGLE Vertical AZIMUTH – ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY : SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT
Recent	Waste	Very fine red-brown aeolian SAND						
		Brown silty soil (ALLUVIUM)		1				
Pleist.		Overlying hard white Calcrete		1.5				5
		1.5m End of hole (stopped by hard Calcrete)						
		Note: hole is located 2m. East of MC 3.						

GRAIN SIZE	(mm)
VF Very fine sand	0·05–0·15
F Fine sand	0·15–0·25
M Medium sand	0·25–0·50
C Coarse sand	0·50–1·00
VC Very coarse sand	1·00–2·00
P Pebbles	2·00–64·00
CO Cobbles	64·00–256·0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 LOGGED A.M. PAIN
TYPE Auger
DRILLER A.van Rens DATE 27.8.74
START 27.8.74 TCD D.W.W.
FINISH 27.8.74 CKD A.F.
SHEET 1 OF 1 DRG.NO. S11184

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... – ' ...
LONG ... –
PURPOSE ... –
MINERAL SAND
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 110 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC4
RIG Gemco
DEPTH 4.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Pleistocene	OVERBURDEN	Very fine silty red-brown SOIL						
		Hard, off-white & pink CALCRETE rubble in fine SOIL		1				5
		Red-brown calcareous clayey SOIL		2				
		Brown clayey soil & QUARTZ GRAVEL		3				10
		End of hole 4.0m. Hole stopped by QUARTZ GRAVEL						

GRAIN SIZE	(mm)
VF Very fine sand	0·05 – 0·15
F Fine sand	0·15 – 0·25
M Medium sand	0·25 – 0·50
C Coarse sand	0·50 – 1·00
VC Very coarse sand	1·00 – 2·00
P Pebbles	2·00 – 64·00
CO Cobbles	64·00 – 256·0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A van Rens
START 27.8.74
FINISH 27.8.74

LOGGED A.M. PAIN
DATE 27.8.74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1 | DRG.NO. S11185

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... –
LONG ... –
PURPOSE ... –
MINERAL ... SAND
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF. 74-1006 SEC. 110 HD. Finnis
D.M. ... REPT. BK. ...

HOLE NO MC5
RIG ... Gemco
DEPTH ... 4·0m
ANGLE ... Vertical
AZIMUTH ... –
ELEV ... –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Soft fine red aeolean SAND						
Pleistocene		Red-brown clayey SOIL						
		Hard massive CALCRETE						
		Brown clayey calcareous soil & calcrete & quartz fragments		1				5
		As Above		2				
		Brown silty clay SOIL		3				10
		Brown silty clay & 20% QUARTZ GRAVEL		4				
		4·0m End of hole Hole stopped by Quartz Gravel						

GRAIN SIZE		(mm)
VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND		(%Clay)
SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 | LOGGED A.M. PAIN
TYPE Auger | DATE 27.8.74
DRILLER A.von Rens | TCD. D.W.W.
START 27.8.74 | CKD. A.F.
FINISH 27.8.74 | SHEET 1 OF 1 | DRG.NO. S11186

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

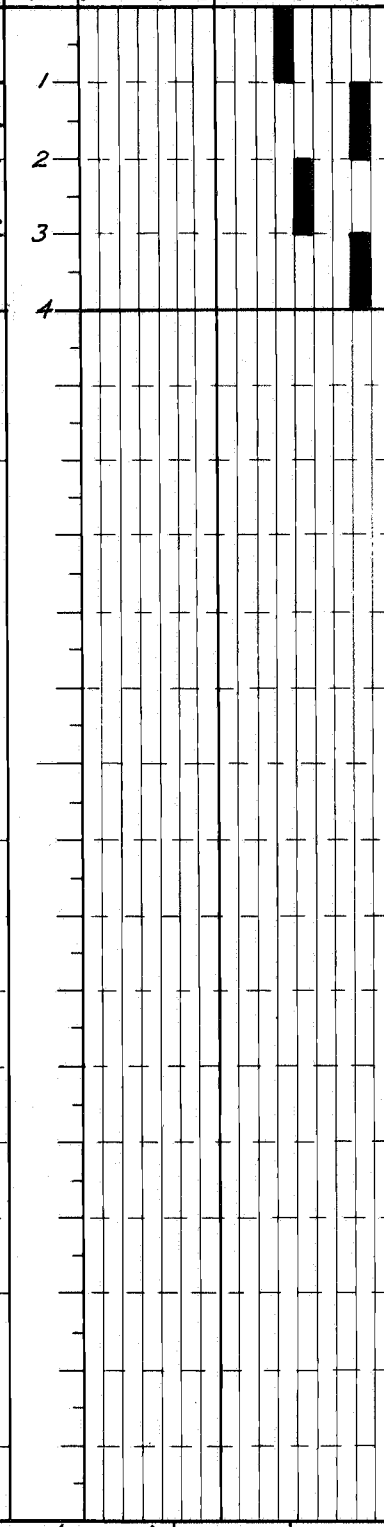
LOG OF ROTARY DRILL HOLE

LAT –
LONG –
PURPOSE –
MINERAL SAND
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 109 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 6
RIG Gemco
DEPTH 4.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY: SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Dark brown clayey sandy SOIL						
		Dark brown sandy plastic CLAY		1				5
		Pale brown micaceous plastic CLAY		2				
		Grey-brown gravelly, micaceous clayey SAND.		3				10
		Grey-green slightly sandy CLAY – wet.		4				
		4.0m End of hole.						



GRAIN SIZE	(mm)
VF Very fine sand	0·05 – 0·15
F Fine sand	0·15 – 0·25
M Medium sand	0·25 – 0·50
C Coarse sand	0·50 – 1·00
VC Very coarse sand	1·00 – 2·00
P Pebbles	2·00 – 64·00
CO Cobbles	64·00 – 256·0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE
Dry
Damp
Wet

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A.van Rens.
START 27.8.74
FINISH 27.8.74

LOGGED A.M.PAIN
DATE 27.8.74
TCD. D.W.W.
CKD. A.F.

SHEET 1 OF 1
DRG.NO. S 11187

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... –
LONG ... –
PURPOSE ... –
MINERAL SAND
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 109 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 7
RIG Gemco
DEPTH 3.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Soft red-brown fine SAND						
Pleistocene		Red-brown clayey SOIL with pale pinkish-brown limy patches.		1				5
		CALCRETE in pinkish limy SOIL		2				
				3				
		3.0m End of hole Hole stopped by hard Calcrete						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A. van Rens
START 27.8.74
FINISH 27.8.74

LOGGED A.M. PAIN
DATE 27.8.74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1
DRG.NO. S11188

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ..–.....
LONG ..–.....
PURPOSE ..–.....
MINERAL Sand.....
BORE S/No 910/75...

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 341 HD Tungkillo
D.M. 770/74 REPT. BK.....

HOLE NO MCB...
RIG Gemco....
DEPTH 12.0m...
ANGLE Vertical..
AZIMUTH ..–.....
ELEV.....–.....

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Red-brown fine aedeon SAND						
Pleisto-cene	Waste	Red-brown silty SOIL with hard patches of CALCRETE						5
Palaeozoic	Basement Gneisses	Pale off-white to creamish-grey micaceous CLAY		1				
		CLAY - as above		2				10
		CLAY - as above		3				
		CLAY - as above		4				15
		Micaceous CLAY - as above but becoming slightly more orange		5				
		Creamish orange micaceous CLAY		6				20
		Micaceous CLAY - as above		7				
		Micaceous CLAY - as above		8				25
		Olive-brown silty CLAY		9				
		Olive silty micaceous plastic CLAY		10				30
		12.0m End of hole		11				
				12				35

GRAIN SIZE (mm)		CLAY : SAND (%Clay)		MOISTURE
VF Very fine sand	0·05 – 0·15	SA Clean sand	0 – 5	Dry ■
F Fine sand	0·15 – 0·25	SC Slightly clayey	5 – 15	Damp ▨
M Medium sand	0·25 – 0·50	MC Moderately clayey	15 – 30	Wet ⁘
C Coarse sand	0·50 – 1·00	VC Very clayey	30 – 45	
VC Very coarse sand	1·00 – 2·00	CS Clay sand	45 – 55	
P Pebbles	2·00 – 64·00	VS Very sandy	55 – 70	
CO Cobbles	64·00 – 256·0	MS Moderately sandy	70 – 85	
		SS Slightly sandy	85 – 95	
		CL Clay	95 – 100	

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 | LOGGED A.M. PAIN
TYPE Auger | DATE 28·8·74
DRILLER A.van Rens. | TCD. D.W.W.
START 28·8·74 | CKD. A.F.
FINISH 28·8·74 |

SHEET 1 OF 1 | DRG.NO. S11189

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... –
LONG ... –
PURPOSE ... –
MINERAL Sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 342 HD Tungkillo
D.M. 770/74 REPT. BK.

HOLE NO MC 9
RIG Gemco
DEPTH 3.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Recent		Soft red-brown aeolean SAND						
Pleistocene	Waste	Red-brown silty CLAY becoming paler brown with depth.						
		Brown silty CLAY.		1				5
		Brown to olive-brown sandy CLAY.		2				
		Olive to grey sandy CLAY.		3				
		3.0m. End of hole. Hole bottomed in weathered gneiss.						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A. van Rens.
START 28.8.74
FINISH 28.8.74

LOGGED A.M. PAIN
DATE 28.8.74
TCD D.W.W.
CKD. A.F.

SHEET 1 OF 1 DRG.NO. S.11190

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT .-. HOLE NO MC10
LONG .-. RIG Gemco
PURPOSE .-. DEPTH 3.0m
MINERAL Sand ANGLE Vertical
BORE S/No 910/75 PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 118 HD Finnis
D.M. 770/74 REPT. BK. AZIMUTH .-
ELEV .-

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY : SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Soft red-brown aeolean SAND						
Pleistocene		Pinkish-brown calcareous SOIL		1				5
		Pale red-brown CLAY		2				
		Red-brown plastic CLAY		3				
		3.0m End of hole						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 104 LOGGED A.M.PAIN
TYPE Auger DATE 28·8·74
DRILLER A van Rens TCD D.W.W.
START 28·8·74 CKD A.F.
FINISH 28·8·74
SHEET 1 OF 1 DRG.NO. S 11191

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ..-.. LONG ..-.. PURPOSE ..-.. MINERAL Sand BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 112 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 11 RIG Gemco DEPTH 2.5m ANGLE Vertical AZIMUTH ..-.. ELEV ..-..

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY : SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Red-brown aeolean SAND						
Pleistocene		Pale red-brown calcareous SOIL		1				5
		Red-brown sl. sandy clayey SILT						
		Red-brown sl. sandy silty CLAY		2				
		2.5m End of hole Drilled stopped in sticky clay						

GRAIN SIZE	(mm)
VF Very fine sand	0·05–0·15
F Fine sand	0·15–0·25
M Medium sand	0·25–0·50
C Coarse sand	0·50–1·00
VC Very coarse sand	1·00–2·00
P Pebbles	2·00–64·00
CO Cobbles	64·00–256·0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 LOGGED A.M. PAIN
TYPE Auger
DRILLER A. van Rens. DATE 28.8.74
START 28.8.74 TCD D.W.W.
FINISH 28.8.74 CKD. A.F.

SHEET 1 OF 1 DRG.NO. S11192

P.F. NO. S10323 MG

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT -
LONG -
PURPOSE -
MINERAL Sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 117 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 12
RIG Gemco
DEPTH 7.0m
ANGLE Vertical
AZIMUTH -
ELEV -

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY : SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent		Red-brown aeolean SAND.						
		Red-brown & CALCAREOUS STAINS.						
Pleistocene	Waste	Red-brown plastic CLAY		1				5
		CLAY - as above		2				
		CLAY - as above		3				10
		CLAY - as above		4				
		CLAY - as above		5				15
		CLAY - as above but grades to orange-brown clayey fine SAND.		6				
				7				20
		7.0m End of hole Hole stopped because of no sample return.					!	

GRAIN SIZE	(mm)
VF Very fine sand	0.05 – 0.15
F Fine sand	0.15 – 0.25
M Medium sand	0.25 – 0.50
C Coarse sand	0.50 – 1.00
VC Very coarse sand	1.00 – 2.00
P Pebbles	2.00 – 64.00
CO Cobbles	64.00 – 256.0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A. van Rens
START 28.8.74
FINISH 28.8.74

LOGGED A.M. PAIN
DATE 28.8.74
TCD D.W.W.
CKD. A.F.

SHEET 1 OF 1 | DRG. NO. S11193

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... -
LONG ... -
PURPOSE ... -
MINERAL ... Sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1006 SEC 117 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 13
RIG Gemco
DEPTH 6.0m
ANGLE Vertical
AZIMUTH -
ELEV -

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	Waste	Red-brown aeolean SAND						
Pleistocene		pinkish-brown calcareous SOIL						
		Red-brown plastic CLAY		1				5
		CLAY - as above		2				
		CLAY - as above		3				10
		CLAY - as above		4				
		CLAY - as above		5				15
		CLAY - as above		6				
		6.0m End of hole (Flight of auger jamming in clay).						

GRAIN SIZE (mm)		CLAY : SAND	(%Clay)
VF Very fine sand	0.05 – 0.15	SA Clean sand	0 – 5
F Fine sand	0.15 – 0.25	SC Slightly clayey	5 – 15
M Medium sand	0.25 – 0.50	MC Moderately clayey	15 – 30
C Coarse sand	0.50 – 1.00	VC Very clayey	30 – 45
VC Very coarse sand	1.00 – 2.00	CS Clay sand	45 – 55
P Pebbles	2.00 – 64.00	VS Very sandy	55 – 70
CO Cobbles	64.00 – 256.0	MS Moderately sandy	70 – 85
		SS Slightly sandy	85 – 95
		CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A.van Rens
START 28.8.74
FINISH 28.8.74

LOGGED A.M.PAIN
DATE 28.8.74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1
DRG.NO. S11194

P.F NO S10323 MG

6728-111

DEPARTMENT OF MINES—SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... - ...
LONG ... - ...
PURPOSE ... - ...
MINERAL sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF. 74-1007 SEC 107 HD Finnis
D.M. 770/74 REPT. BK. ...

HOLE NO MC 14
RIG Gemco
DEPTH 12.0m
ANGLE Vertical
AZIMUTH -
ELEV -

AGE FORMN	CLASS	DESCRIPTION	DEPTH m	SPECIAL COMMENTS	DEPTH FT.
Recent	9/8	Soft white CALCRETE			
Tertiary	COARSE CONSTRUCTION SAND	Orange SAND & GRAVEL	1		
		Orange SAND & GRAVEL	2	F.M. = 3.52 11.78% clay	5
		Orange SAND & GRAVEL	3		
		Orange SAND & GRAVEL	4	F.M. = 3.67 11.01% clay	10
		Orange SAND & GRAVEL	5		15
		Orange SAND & GRAVEL	6	F.M. = 3.62 8.88% clay	20
		Orange SAND & GRAVEL	7		
		Yellow-orange fine SAND grading to orange SAND & GRAVEL	8	F.M. = 3.10 7.35% clay	25
		Orange SAND & GRAVEL	9		30
		Orange SAND & GRAVEL	10		
		Orange SAND	11	F.M. = 2.59 22.73% clay Bimodal	35
	Basement	Grey plastic micaceous CLAY (Weathered GNEISS)	12		
		12.0m End of hole			

GRAIN SIZE		(mm)
VF	Very fine sand	0.05 – 0.15
F	Fine sand	0.15 – 0.25
M	Medium sand	0.25 – 0.50
C	Coarse sand	0.50 – 1.00
VC	Very coarse sand	1.00 – 2.00
P	Pebbles	2.00 – 64.00
CO	Cobbles	64.00 – 256.0

CLAY : SAND		(%Clay)
SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry / Damp / Wet

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A. van Rens
START 3.9.74
FINISH 3.9.74

LOGGED A.M. PAIN
DATE 3.9.74
TCD. D.W.W.
CKD. A.F.

SHEET 1 OF 1 DRG.NO. S11195

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT .-
LONG .-
PURPOSE .-
MINERAL Sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 107 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 15
RIG Gemco
DEPTH 11.0m
ANGLE Vertical
AZIMUTH .-
ELEV .-

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Pleistocene	%	Red-brown SOIL & nodular CALCRETE	o o					
	COARSE CONSTRUCTION SAND	Coarse quartz GRAVEL		1				
		Coarse quartz GRAVEL					F.M. = 3.89 20.86% Clay	5
		Coarse quartz GRAVEL		2				
		Orange SAND		3			F.M. = 2.68 11.25% Clay	10
		Orange SAND & GRAVEL		4				15
		Orange SAND & GRAVEL		5			F.M. = 3.51 9.67% Clay Bimodal	
		Orange SAND & GRAVEL		6				20
		Orange SAND & GRAVEL		7			F.M. = 3.02 9.67% Clay Bimodal	25
		Orange SAND & GRAVEL		8				
		Orange SAND & GRAVEL		9			F.M. = 2.63 12.93% Clay Bimodal	30
		Orange SAND & GRAVEL		10				
		Orange SAND & GRAVEL						35
Basement		White CLAY (weathered GNEISS)	+ + +	11				
		11.0m End of hole						

GRAIN SIZE	(mm)
VF Very fine sand	0.05 – 0.15
F Fine sand	0.15 – 0.25
M Medium sand	0.25 – 0.50
C Coarse sand	0.50 – 1.00
VC Very coarse sand	1.00 – 2.00
P Pebbles	2.00 – 64.00
CO Cobbles	64.00 – 256.0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE
Dry
Damp
Wet

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A.van Rens
START 3.9.74
FINISH 3.9.74

LOGGED A.M.PAIN
DATE 3.9.74
TCD D.W.W.
CKD. A.F.

SHEET 1 OF 1 | DRG.NO. S11196

P.F. NO. S10323 MG

G728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ..... LONG ..... PURPOSE ..... MINERAL Sand BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND PLAN REF 74-1007 SEC 107 HD Finnis D.M. 770/74 REPT. BK.

HOLE NO MC 16 RIG Gemco DEPTH 6.0m ANGLE Vertical AZIMUTH ..... ELEV .....

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Pleisto-cene		Red-brown SOIL & nodular CALCRETE						
		Red-brown & pink calcareous SOIL						
Tertiary	Coarse Construction Sand	Orange SAND & GRAVEL		1			F.M. 3.90 17.48% Clay	5
		Orange SAND & GRAVEL		2				
		Orange SAND & GRAVEL		3			F.M. = 3.74 9.96% Clay	10
		Orange SAND & GRAVEL		4				
Palaeo-zoic Base-ment		Off-white weathered GNEISS		5				15
		Off-white CLAY (Wthr'd GNEISS)		6				
		6.0m End of hole						

GRAIN SIZE	(mm)
VF Very fine sand	0.05 – 0.15
F Fine sand	0.15 – 0.25
M Medium sand	0.25 – 0.50
C Coarse sand	0.50 – 1.00
VC Very coarse sand	1.00 – 2.00
P Pebbles	2.00 – 64.00
CO Cobbles	64.00 – 256.0

CLAY : SAND	(%Clay)
SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 104 TYPE Auger DRILLER A.van Rens START 3.9.74 FINISH 3.9.74

LOGGED A.M.PAIN DATE 3.9.74 TCD. D.W.W. CKD. A.F.

SHEET 1 OF 1 DRG.NO. S11197

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... –
LONG ... –
PURPOSE ... –
MINERAL Sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 107 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 17
RIG Gemco
DEPTH 15.0 m
ANGLE Vertical
AZIMUTH –
ELEV. –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Pleisto-cene	O/B	Red-brown SOIL & nodular CALCRETE						
		Quartz GRAVEL in limy SOIL						
Tertiary	Coarse Construction Sand	Red-brown SAND & GRAVEL		1				
		Red-brown GRAVEL		2				
		Red-brown SAND & GRAVEL		3				
		Orange SAND		4				
		Orange SAND		5				
		Orange SAND		6				
		Orange SAND		7				
		Orange SAND		8				
		Orange SAND		9				
		Orange SAND		10				
		Orange SAND		11				
		Orange SAND		12				
		Orange SAND & GRAVEL		13				
		Orange SAND & GRAVEL		14				
		Orange SAND & GRAVEL						
Palaeozoic Basement		Grey CLAY (wthr'd GNEISS)		15				
		15.0m End of hole						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A van Rens
START 3·9·74
FINISH 3·9·74

LOGGED A.M. PAIN
DATE 3·9·74
TCD D.W.W.
CKD. A.F.

SHEET 1 OF 1 | DRG. NO. S11198

P.E. NO. S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT .....–.....
LONG .....–.....
PURPOSE ...–.....
MINERAL ..Sand.....
BORE S/No 910/75..

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF. 74-1007 SEC 107 HD. Finnis..
D.M. 770/74 ...REPT. BK. .....

HOLE NO MC 18..
RIG .Gemco.....
DEPTH .12.0m...
ANGLE Vertical..
AZIMUTH ..–.....
ELEV.....–.....

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Quaternary	Overburden	Red-brown SOIL & nodular CALCRETE						
		Quartz GRAVEL in limy SOIL						
Tertiary	Coarse Constr. Sand	Pale brown SAND & GRAVEL		1			F.M. = 3·73 12·52% Clay	5
		Pale brown SAND & GRAVEL		2				
		Orange-brown SAND & GRAVEL		3			F.M. = 3·33 11·82% Clay	10
		Pale orange SAND		4				15
	Waste	Pale yellow-orange SAND		5			F.M. = 1·28 4·78% Clay	
		Pale yellow-orange SAND		6				20
	Coarse Construction Sand	Pale yellow-orange SAND		7			F.M. = 2·22 5·63% Clay	
		Pale yellow-orange SAND		8				25
		orange SAND & GRAVEL		9			F.M. = 3·03 7·97% Clay Bimodal	30
		orange SAND & GRAVEL		10				
		orange SAND & GRAVEL		11				35
Palaeozoic Basement		Blue-grey CLAY (wthr'd GNEISS)		12				
		12·0m End of hole						

GRAIN SIZE (mm)		CLAY : SAND (%Clay)		MOISTURE
VF Very fine sand	0·05 – 0·15	SA Clean sand	0 – 5	Dry ■
F Fine sand	0·15 – 0·25	SC Slightly clayey	5 – 15	
M Medium sand	0·25 – 0·50	MC Moderately clayey	15 – 30	Damp ▨
C Coarse sand	0·50 – 1·00	VC Very clayey	30 – 45	
VC Very coarse sand	1·00 – 2·00	CS Clay sand	45 – 55	Wet ⁘
P Pebbles	2·00 – 64·00	VS Very sandy	55 – 70	
CO Cobbles	64·00 – 256·0	MS Moderately sandy	70 – 85	
		SS Slightly sandy	85 – 95	
		CL Clay	95 – 100	

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184.....
TYPE . Auger.....
DRILLER A.van Rens
START . 4·9·74...
FINISH . 4·9·74..

LOGGED A.M. PAIN....
DATE 4·9·74...
TCD. D.W.W.....
CKD. A.F.....

SHEET 1 OF 1 | DRG.NO. S11199..

P.F. NO. S10323 MG

G128-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT .-
LONG .-
PURPOSE .-
MINERAL Sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 107 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC19
RIG Gemco
DEPTH 2.0m
ANGLE Vertical
AZIMUTH .-
ELEV .-

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
	9/8	Brown SOIL & nodular CALCRETE						
Pleisto-cene		SAND & GRAVEL in calcareous SOIL						
Tertiary	Coarse Gravel Sand	SAND & GRAVEL		1			F.M. = 3.95 12.55% Clay	-5
Robeozoic		Grey CLAY – wthr'd GNEISS		2				
		2.0m End of hole						

GRAIN SIZE (mm)

VF Very fine sand	0·05 – 0·15
F Fine sand	0·15 – 0·25
M Medium sand	0·25 – 0·50
C Coarse sand	0·50 – 1·00
VC Very coarse sand	1·00 – 2·00
P Pebbles	2·00 – 64·00
CO Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA Clean sand	0 – 5
SC Slightly clayey	5 – 15
MC Moderately clayey	15 – 30
VC Very clayey	30 – 45
CS Clay sand	45 – 55
VS Very sandy	55 – 70
MS Moderately sandy	70 – 85
SS Slightly sandy	85 – 95
CL Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 104
TYPE Auger
DRILLER A.van Rens.
START 4.9.74
FINISH 4.9.74

LOGGED A.M.PAIN
DATE 4.9.74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1 | DRG.NO. S11200

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – LONG – PURPOSE – MINERAL Sand BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND PLAN REF 74-1007 SEC 107 HD Finnis D.M. 770/74 REPT. BK.

HOLE NO MC 20 RIG Gemco DEPTH 5·0m ANGLE Vertical AZIMUTH – ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT.
Pleistocene	9/8	Brown SOIL & nodular CALCRETE						
		SAND & GRAVEL in calcareous SOIL						
Tertiary	Coarse Consth. Sand	Orange-brown SAND & GRAVEL		1				5
		Orange-brown SAND & GRAVEL		2				
		Orange SAND		3				10
		Orange SAND		4				
				5				15
		5·0m End of hole Note: – Weathered Gneiss at bottom of hole						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 104 TYPE Auger DRILLER A. van Rens START 4·9·74 FINISH 4·9·74

LOGGED A.M. PAIN DATE 4·9·74 TCD D.W.W. CKD. A.F.

SHEET 1 OF 1 DRG. NO. S11201

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT –
LONG –
PURPOSE –
MINERAL Sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 107 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 21
RIG Gemco
DEPTH 5·5m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P CO	CLAY : SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Pleistocene	Waste	Dark brown sandy SOIL		1				5
		Red-brown sandy SOIL		2				10
		No sample		3				15
		No sample		4				
		No sample		5				
		Pale brown SAND						
		Pale brown SAND						
		5·5m End of hole Hole bottomed in wthr'd GNEISS						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 104
TYPE Auger
DRILLER Avan Rens
START 4·9·74
FINISH 4·9·74

LOGGED A.M. PAIN
DATE 4·9·74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1 | DRG. NO. S 11202

P.F. NO. S10323 MG

6728-111

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT ... –
LONG ... –
PURPOSE ... –
MINERAL ... Sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 107 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 22
RIG Gemco
DEPTH 5.0m
ANGLE Vertical
AZIMUTH –
ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC P B	CLAY : SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT.
Recent	overburden	Red brown aeolean SAND						
Tertiary	Coarse Constr. Sand	CALCRETED pale orange SAND		1				5
		Orange SAND		2				
		Orange SAND		3				10
		Orange SAND & GRAVEL		4				
		5.0m End of hole Hole stopped by GRAVEL		5				15

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A. van Rens
START 4.9.74
FINISH 4.9.74

LOGGED A.M. PAIN
DATE 4.9.74
TCD D.W.W.
CKD A.F.

SHEET 1 OF 1 DRG.NO. S11203

P.F. NO. S10323 MG

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT .-
LONG .-
PURPOSE .-
MINERAL Sand
BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND
PLAN REF 74-1007 SEC 107 HD Finnis
D.M. 770/74 REPT. BK.

HOLE NO MC 23
RIG Gemco
DEPTH 5.5m
ANGLE Vertical
AZIMUTH -
ELEV -

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE VF F M C VC Va Co	CLAY: SAND SA SC MC VC CS VS MS SS CL	SPECIAL COMMENTS	DEPTH FT
Recent	Overburden	Soft red-brown SOIL						
Pleistocene		off-white & pink nodular CALCRETE						
Tertiary	Coarse Constr. Sand	Red-brown to pinkish-brown Gravelly calcareous SOIL		1				5
		Orange SAND & GRAVEL		2				
		Orange GRAVEL & SAND		3				10
		Orange GRAVEL		4				
		Orange GRAVEL		5				15
		5.5m End of hole Hole stopped by GRAVEL						

GRAIN SIZE (mm)

VF	Very fine sand	0·05 – 0·15
F	Fine sand	0·15 – 0·25
M	Medium sand	0·25 – 0·50
C	Coarse sand	0·50 – 1·00
VC	Very coarse sand	1·00 – 2·00
P	Pebbles	2·00 – 64·00
CO	Cobbles	64·00 – 256·0

CLAY : SAND (%Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry ■ Damp ▨ Wet ⁘

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184
TYPE Auger
DRILLER A.van Rens
START 4.9.74
FINISH 4.9.74

LOGGED A.M.PAIN
DATE 4.9.74
TCD. D.W.W.
CKD. A.F.

SHEET 1 OF 1 | DRG.No. S11204

P.F. NO S10323 MG

6728-111

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LOG OF ROTARY DRILL HOLE

LAT – | LONG – | PURPOSE – | MINERAL Sand | BORE S/No 910/75

PROJECT MONARTO CONSTRUCTION SAND | PLAN REF 74-1006 SEC 341 HD Tungkillo | D.M. 770/74 | REPT. BK

HOLE NO MC 42 | RIG Gemco | DEPTH 4.0m | ANGLE Vertical | AZIMUTH – | ELEV –

AGE FORMN	CLASS	DESCRIPTION	LOG	DEPTH m	GRAIN SIZE (VF F M C VC P CO)	CLAY : SAND (SA SC MC VC CS VS MS SS CL)	SPECIAL COMMENTS	DEPTH FT
Recent	Waste	soft red-brown aeolean SAND						
Pleisto-cene	Waste	off-white & pink calcreted SOIL		1				5
		off-white & pink calcreted SOIL						
Palaeozoic	Basement	Grey-buff CLAY (w thrd GNEISS)		2				
		Grey-buff CLAY (w thrd GNEISS)						10
		Pale grey-brown CLAY (w thrd GNEISS)		3				
		4.0m End of hole		4				

GRAIN SIZE (mm)

VF	Very fine sand	0.05 – 0.15
F	Fine sand	0.15 – 0.25
M	Medium sand	0.25 – 0.50
C	Coarse sand	0.50 – 1.00
VC	Very coarse sand	1.00 – 2.00
P	Pebbles	2.00 – 64.00
CO	Cobbles	64.00 – 256.0

CLAY : SAND (% Clay)

SA	Clean sand	0 – 5
SC	Slightly clayey	5 – 15
MC	Moderately clayey	15 – 30
VC	Very clayey	30 – 45
CS	Clay sand	45 – 55
VS	Very sandy	55 – 70
MS	Moderately sandy	70 – 85
SS	Slightly sandy	85 – 95
CL	Clay	95 – 100

MOISTURE: Dry | Damp | Wet

ENVIRONMENT & RESOURCE DIVISION

DRILL NO. 184 | TYPE Auger | DRILLER A. van Rens | START 27.9.74 | FINISH 27.9.74

LOGGED A.M. PAIN | DATE 27.9.74 | TCD D.W.W. | CKD A.F.

SHEET 1 OF 1 | DRG NO. S11223

PE NO S10323 MG

6728-III

APPENDIX II

Results of Sieve Sizing Analysis

Hole No. CI1 Depth 1-2m.

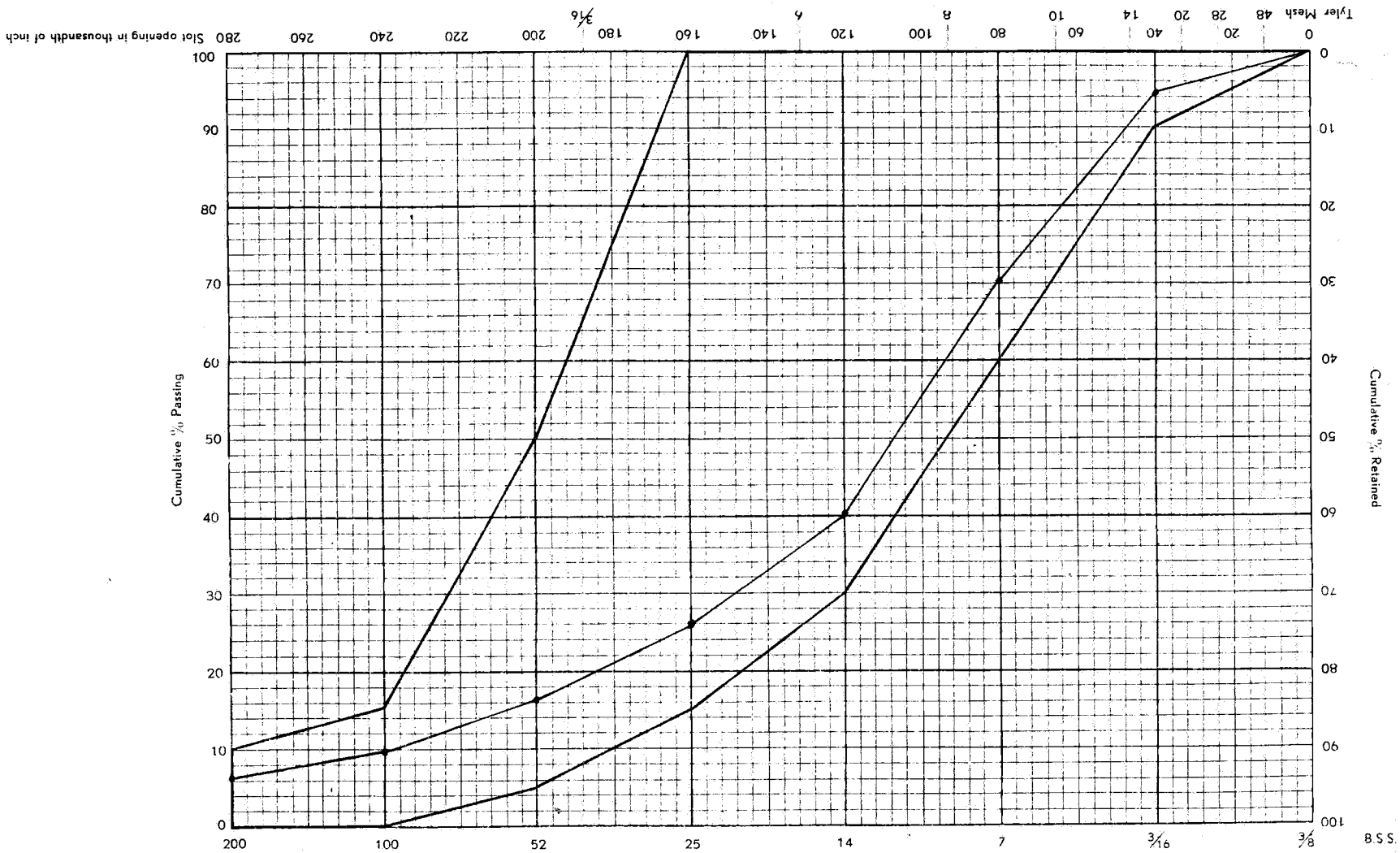
F.M. = 4.07

11.23% "Clay"

Hole No. CI1. Depth 3-4m.

F.M. = 2·47

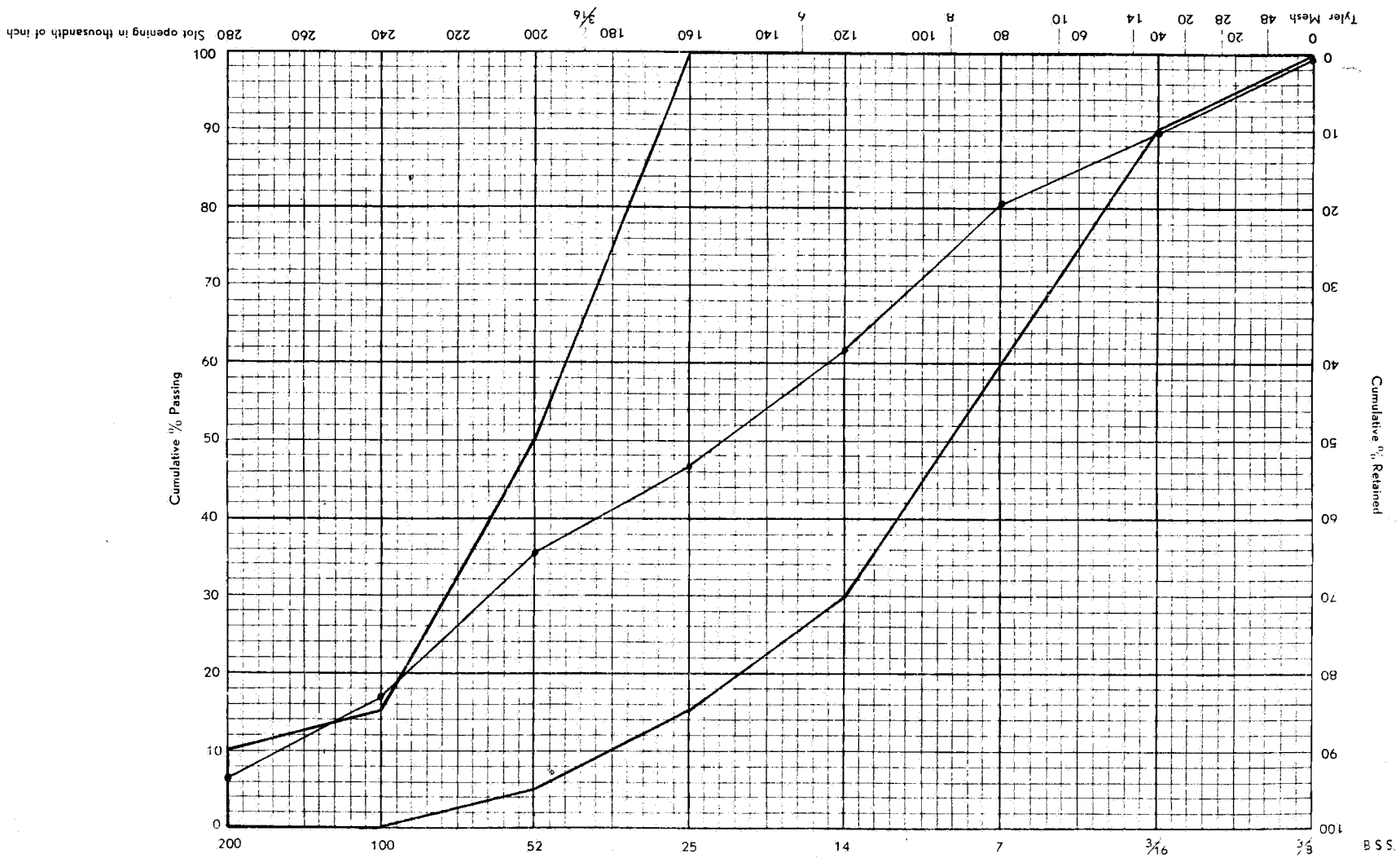
9·92% "Clay"



Hole No. CI1 Depth 5-6m.

F.M. = 3.66

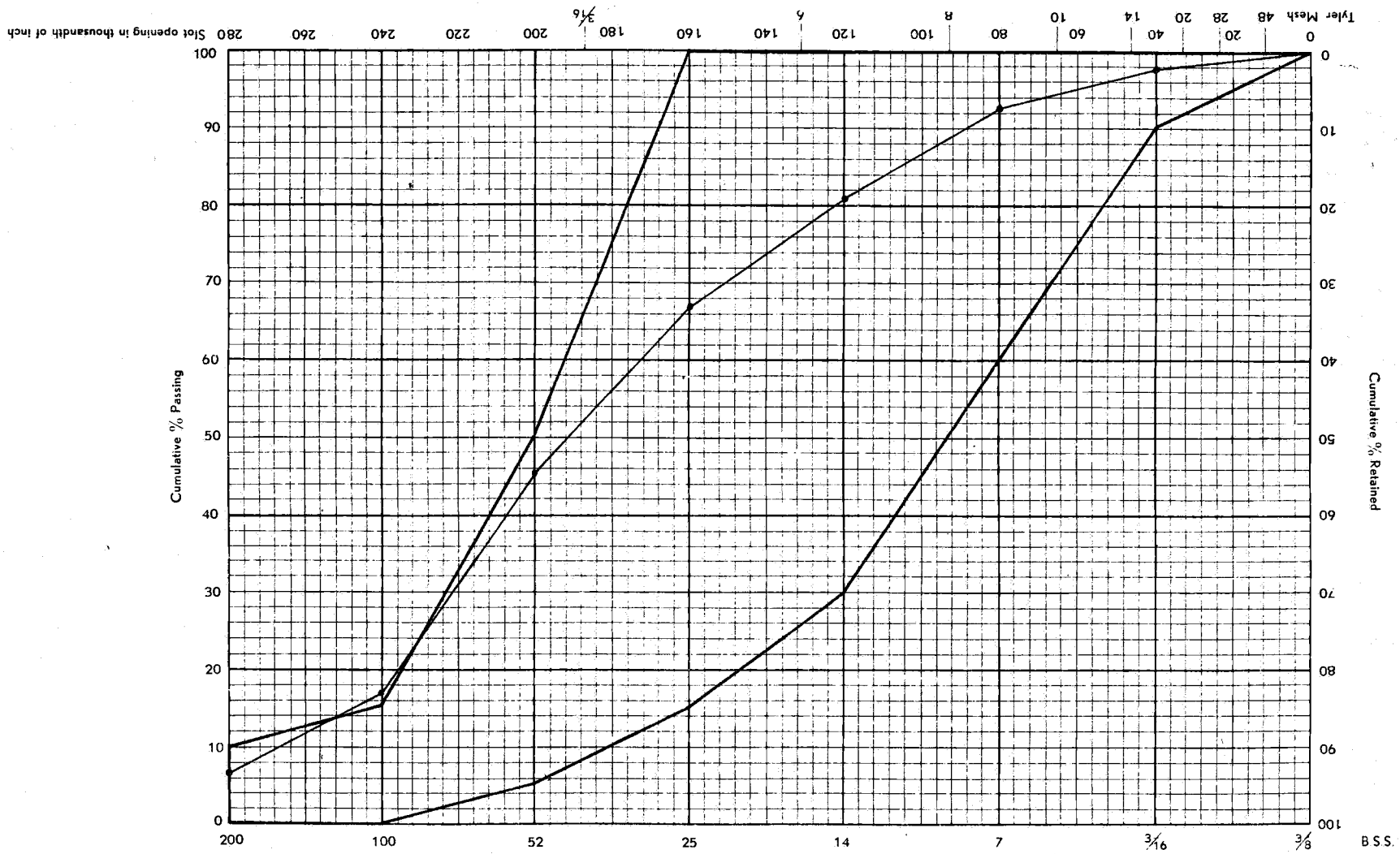
6.09% "Clay"



Hole No. CI1 . Depth 7-8m.

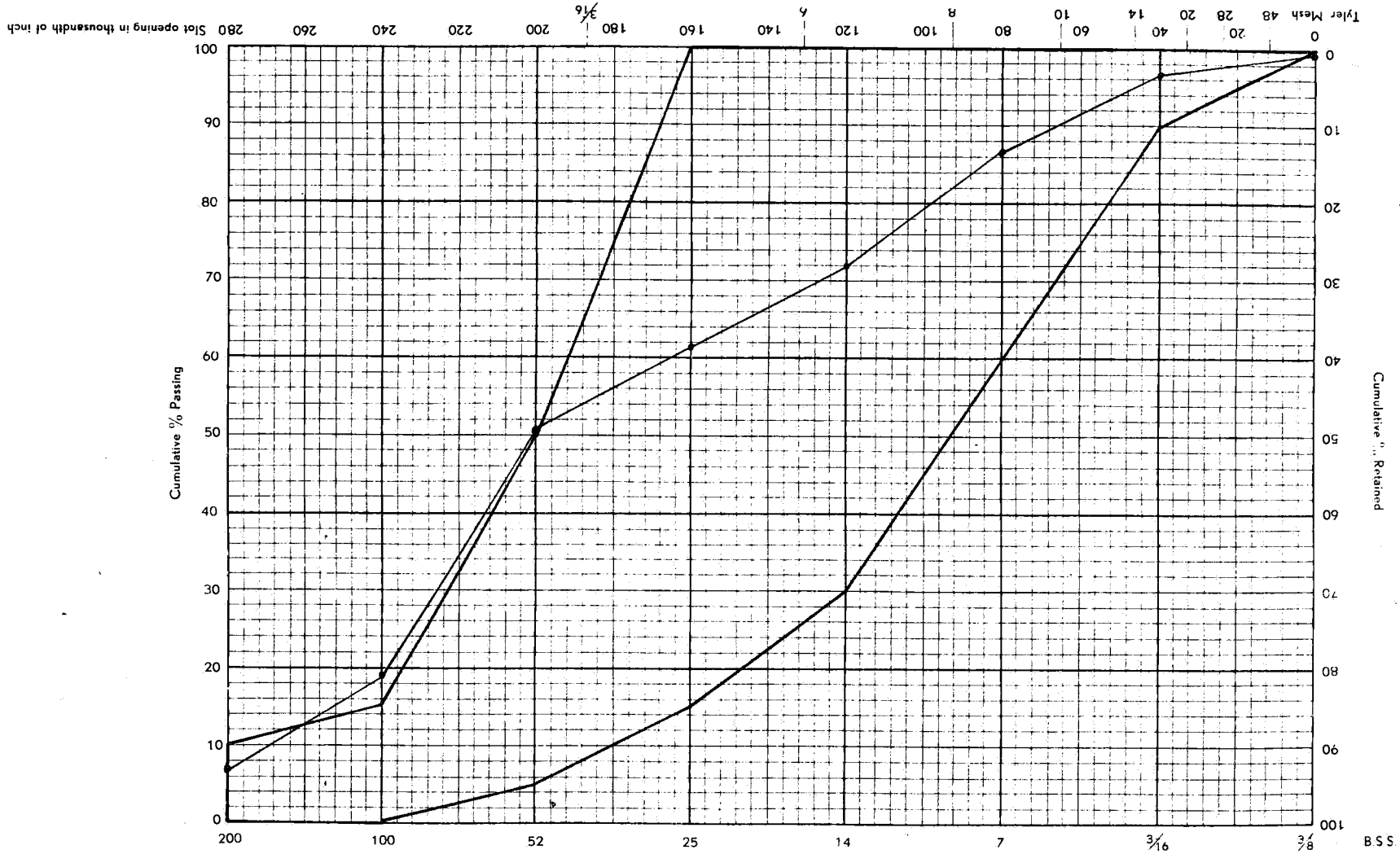
F.M. = 2·89

6·14% "clay"



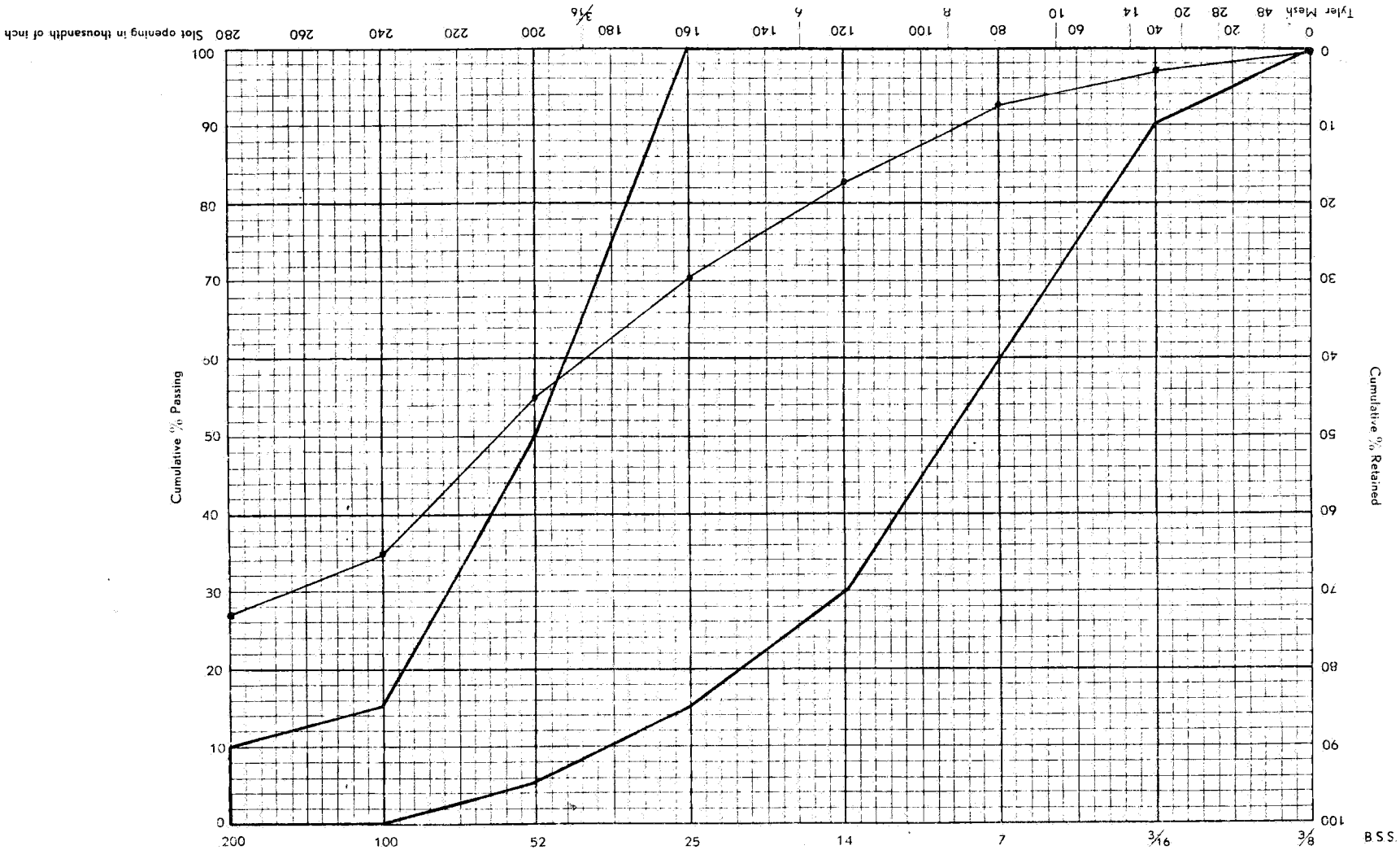
Hole No. CI1 . Depth 9-10m.

F.M. = 2·13
6·48% "Clay"



Hole No. CI1. Depth 11-12m.

F.M.: 2·32
6·93% "Clay"



Hole No. CI5 Depth 1-2m.

F.M. = 2.31

26.90% "clay"

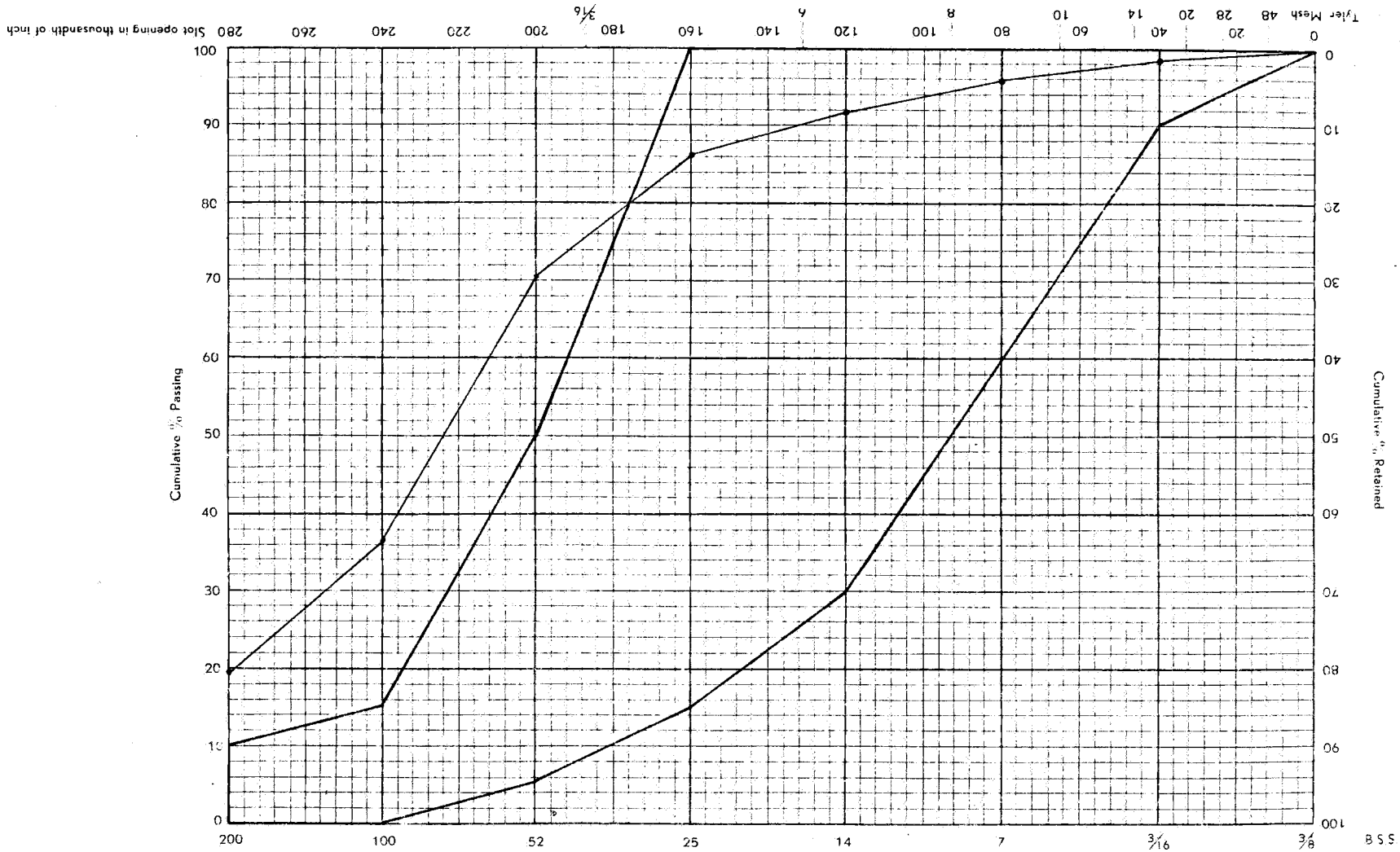
Hole No. CI5 Depth 3-4m.

F.M. = 1·10
26·29% "Clay".

Hole No. CI5. Depth 5-7m.

F.M. = 1·33

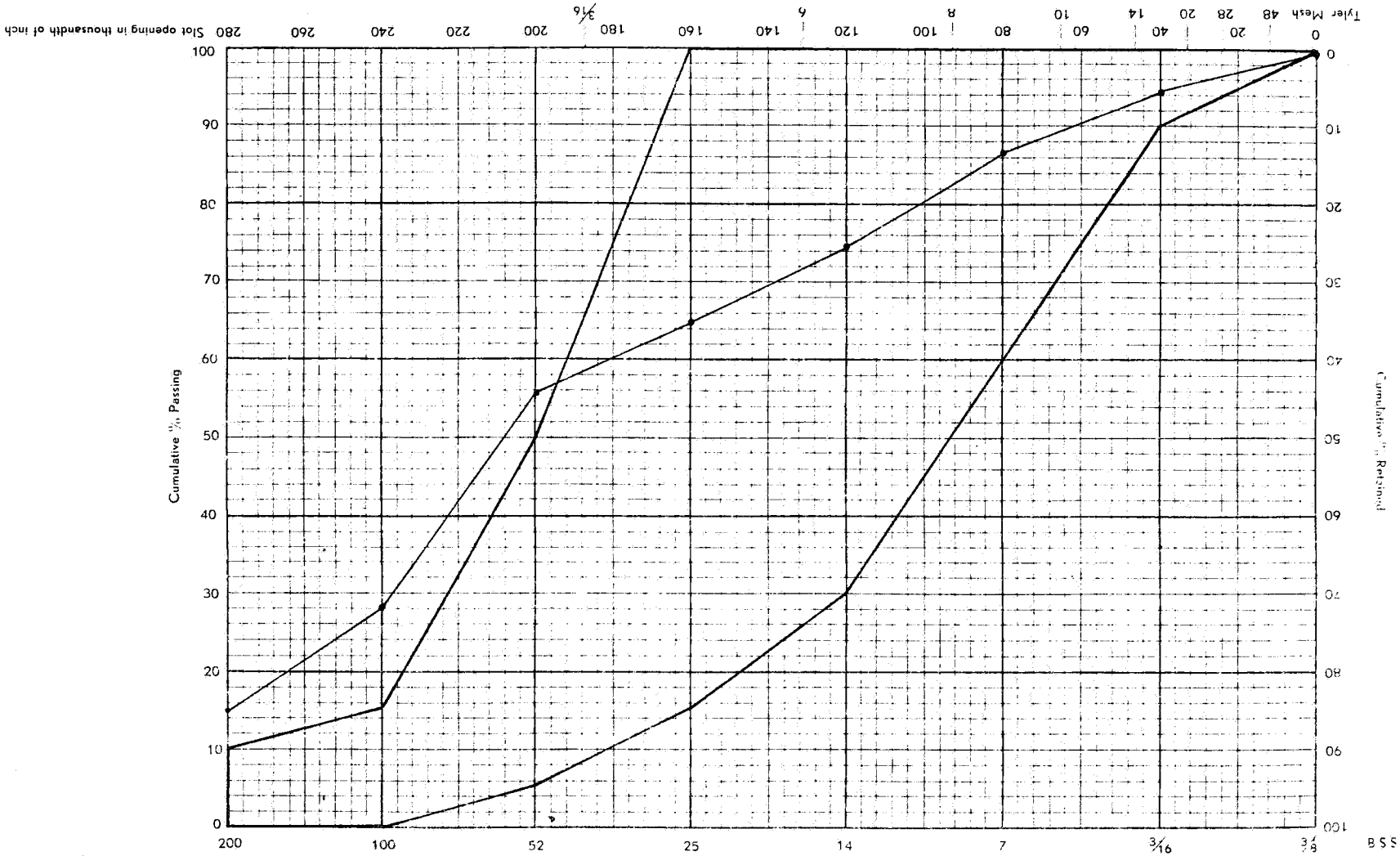
30·38% "Clay"



Hole No CI5. Depth 7-8m.

F.M. = 1.51

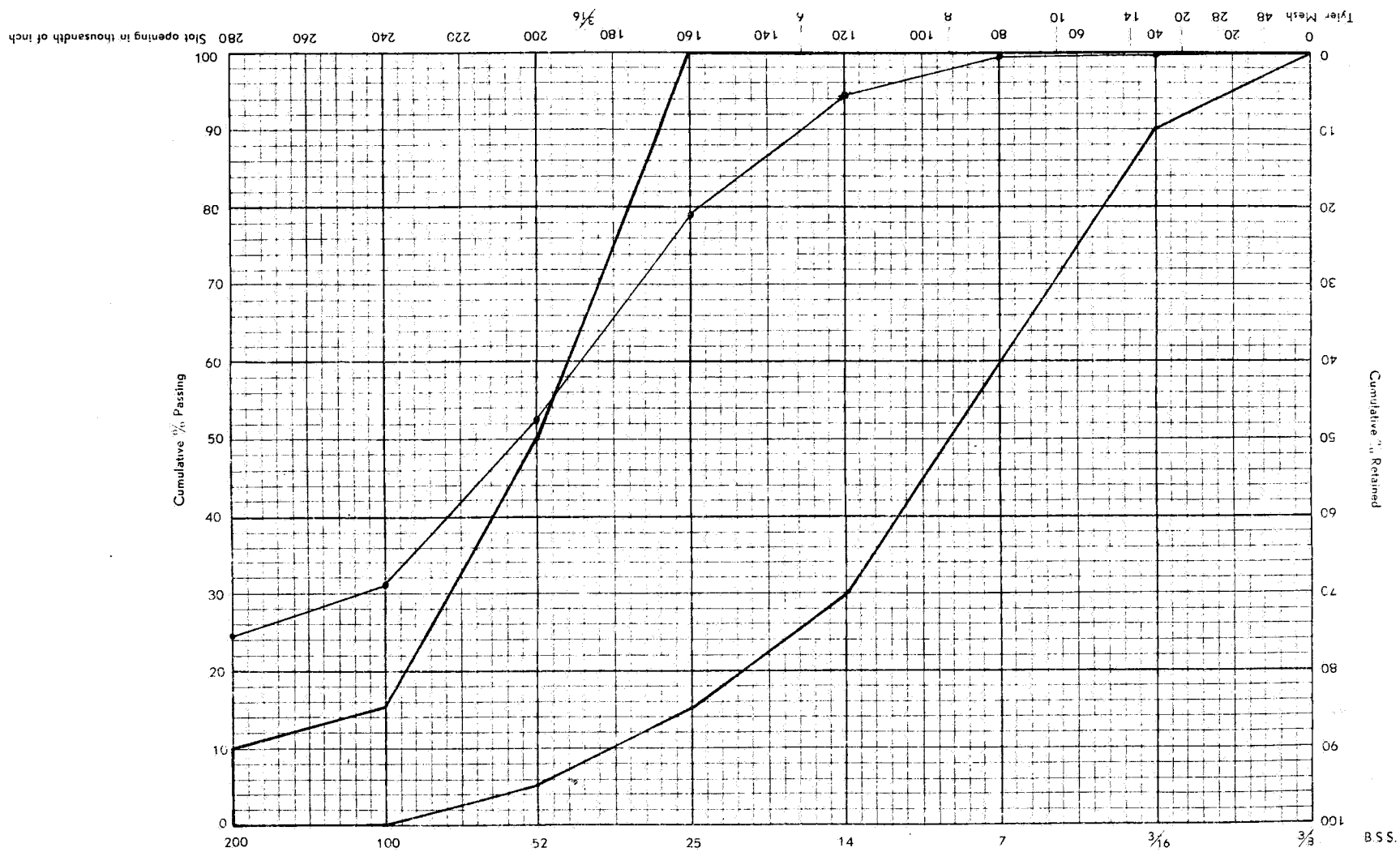
19.67% "Clay"



Hole No CI5 Depth 9-10m.

F.M.-2.30

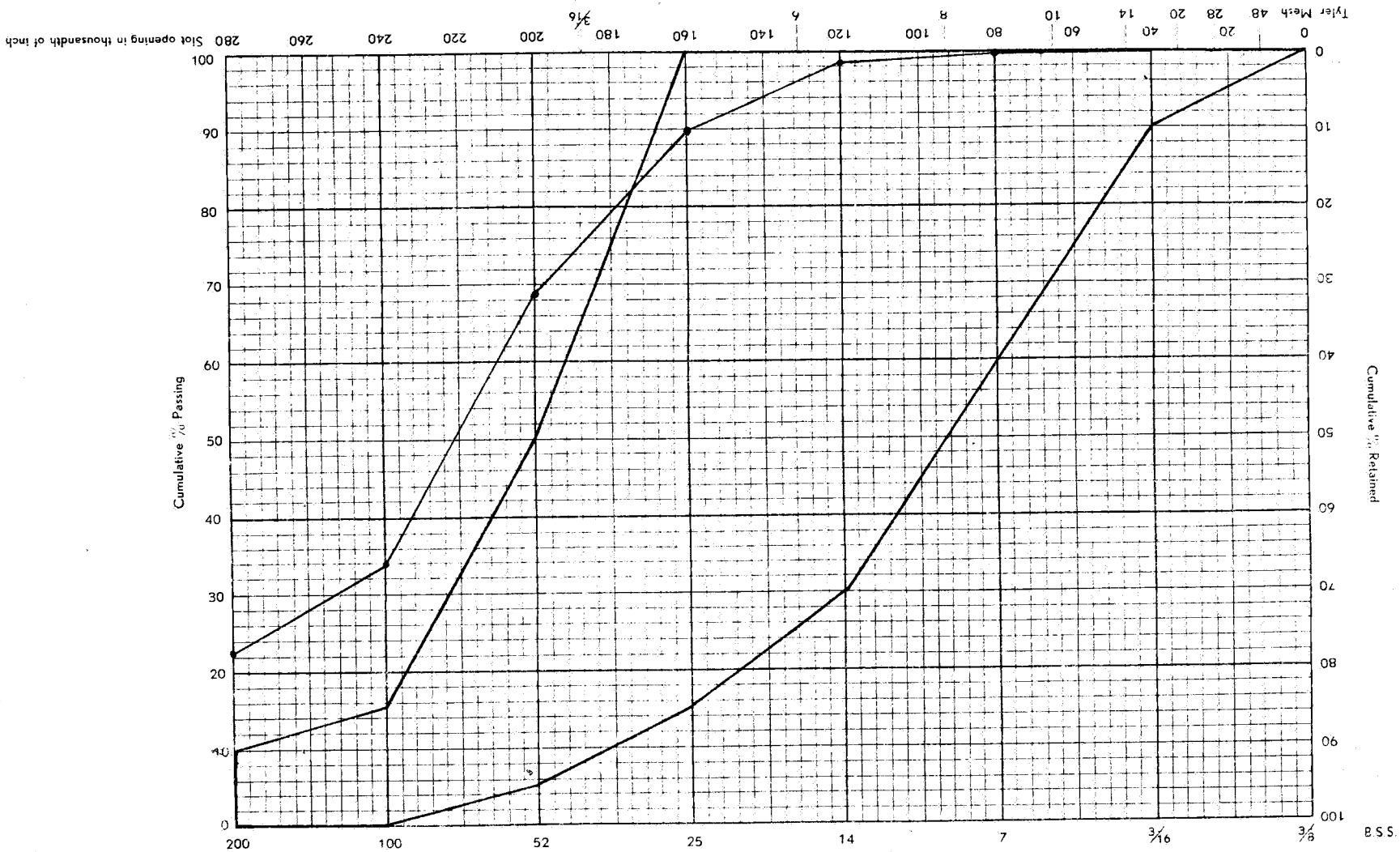
14.80% "Clay"



Hole No. CI6 Depth 2-3m.

F.M. = 1·90

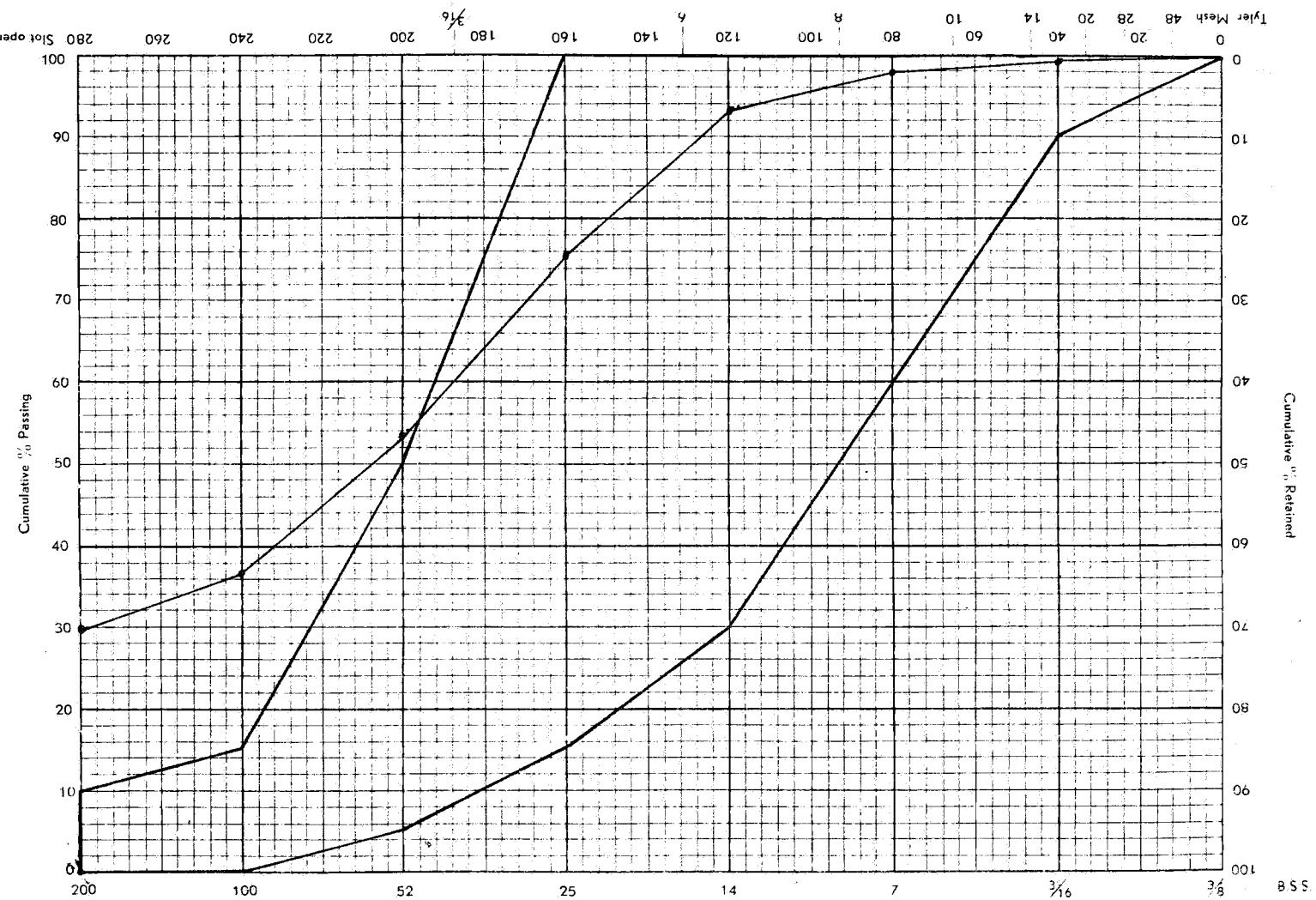
24·52% "Clay"



Hole No. CI6 Depth 4-5m

F.M. = 1·43

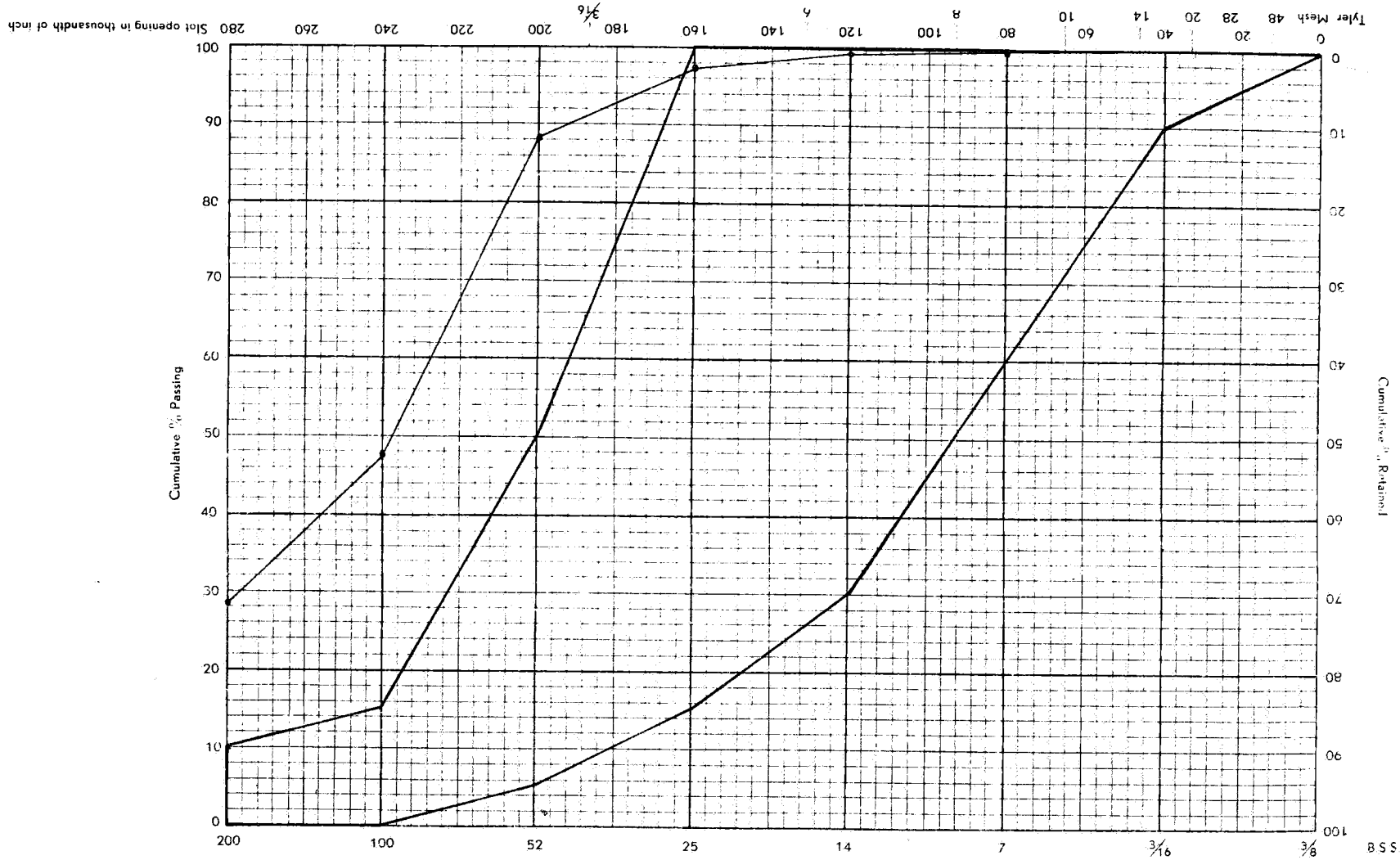
22·59% "Clay"



Hole No. CI7. Depth 1-2m.

F.M.=2·06

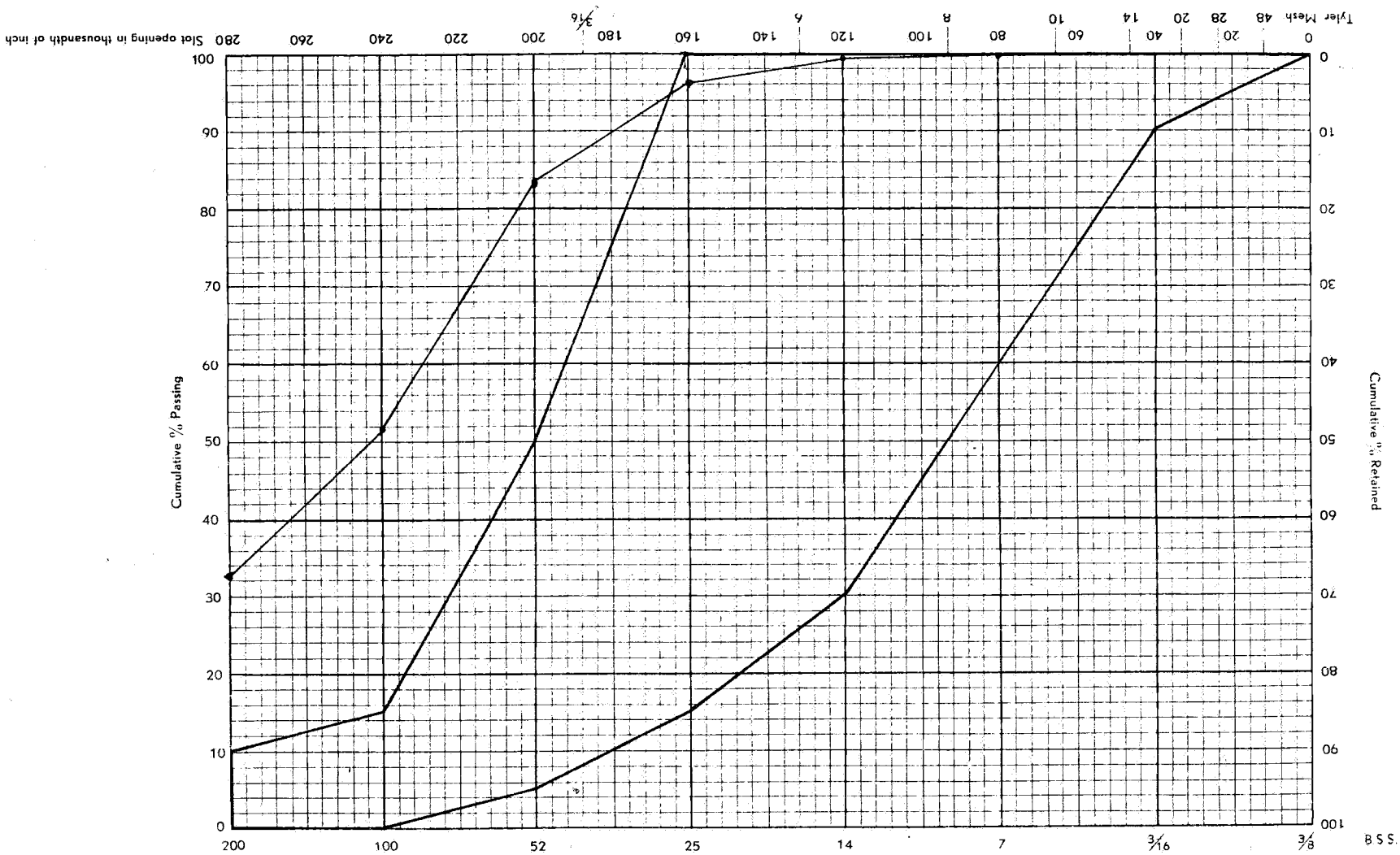
29·93% "Clay."



Hole No. CI10 Depth 1-2m.

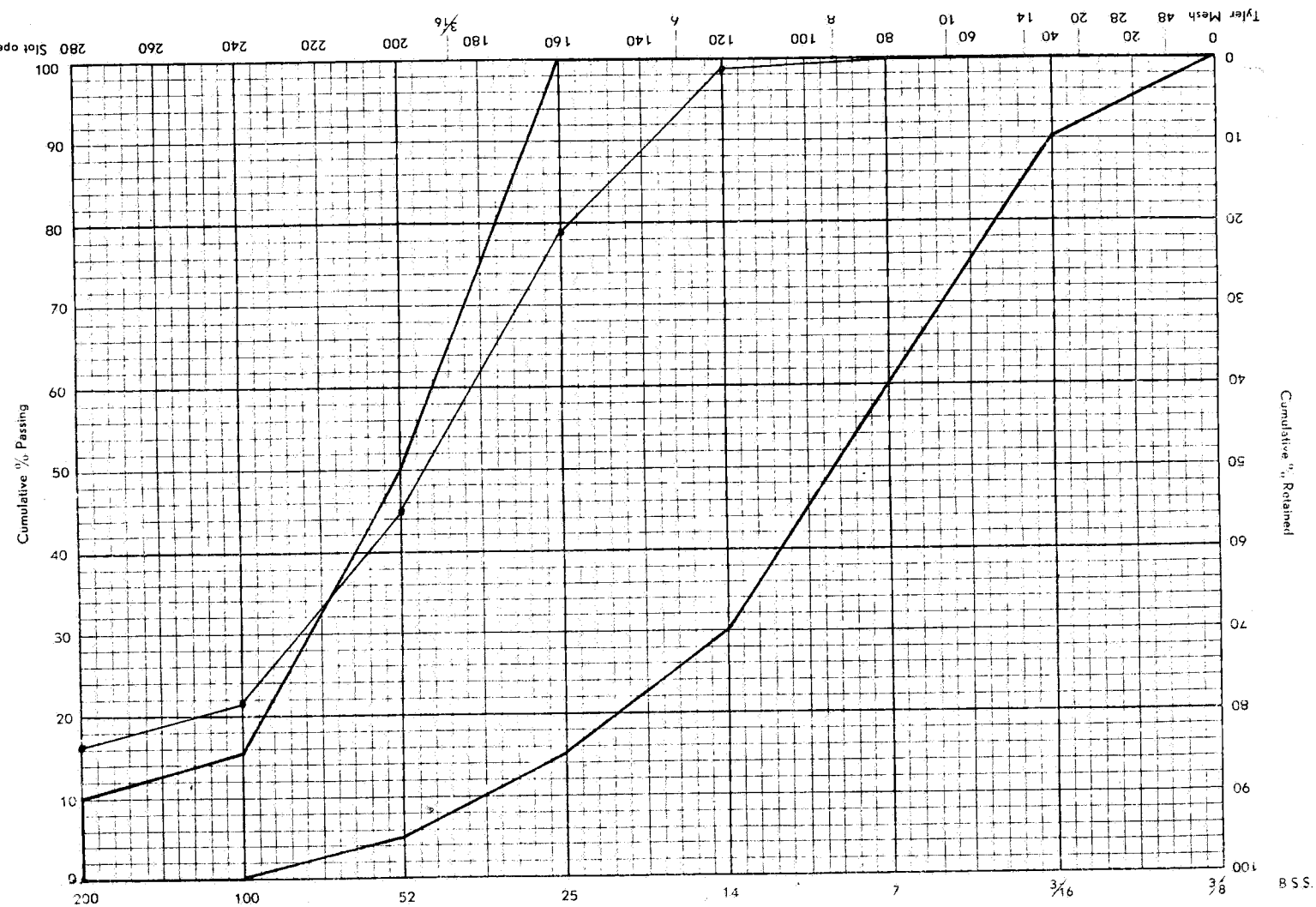
F.M. = 0.95

28.34% "Clay"



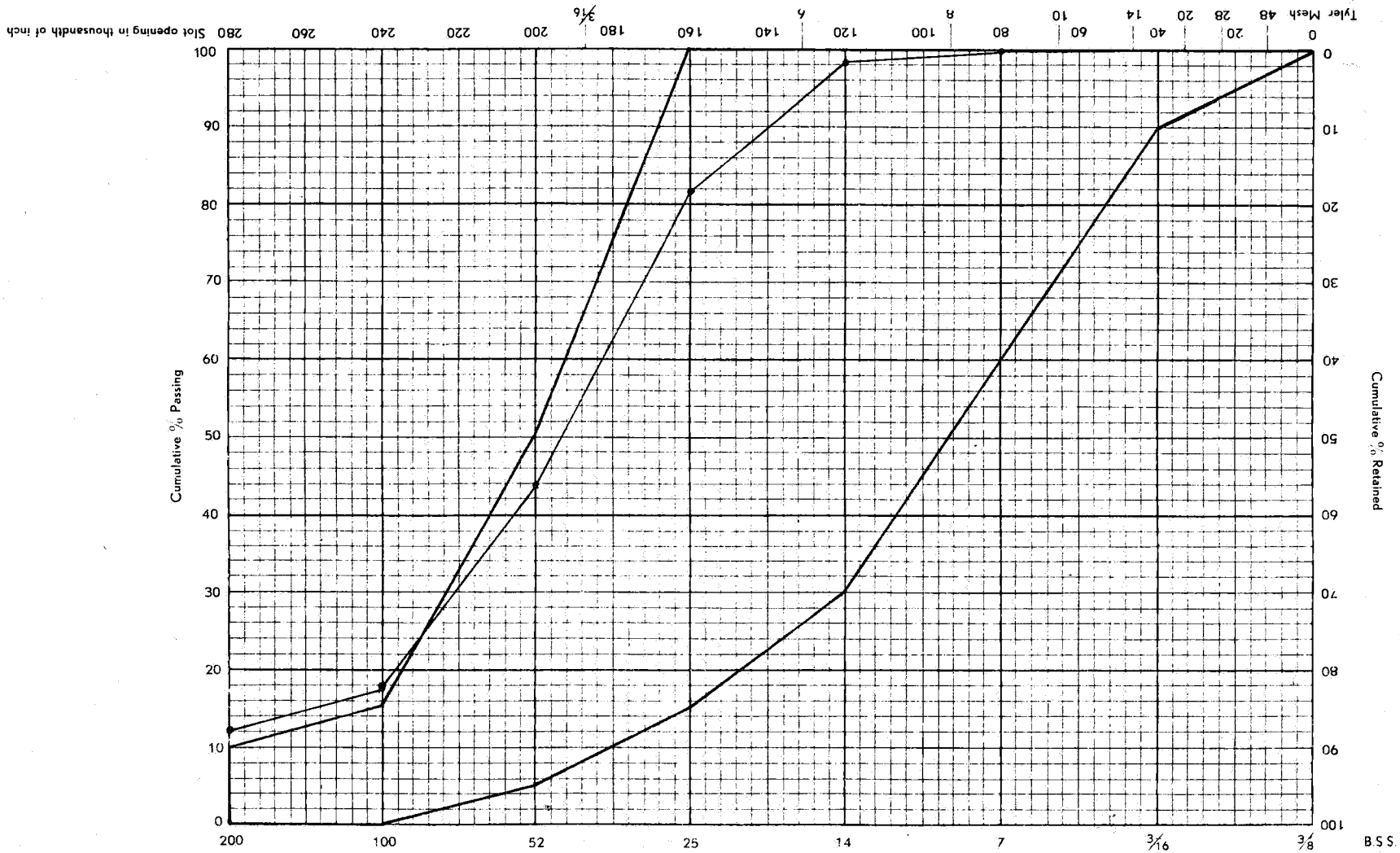
Hole No. CI10 Depth 3-4m.

F.M. = 1.03
32.75% "Clay"



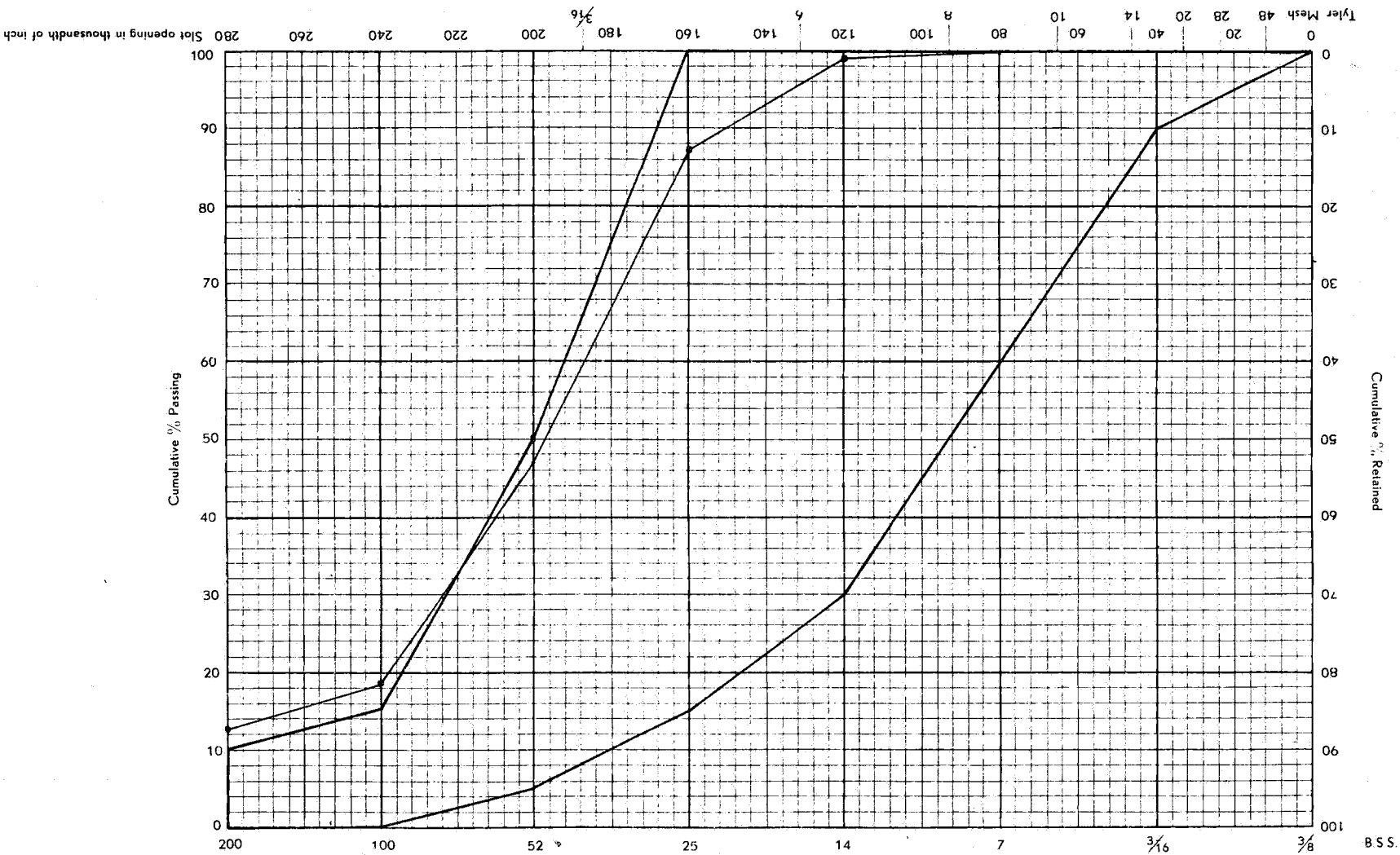
Hole No. CI10 Depth 5-7m.

F.M = 1.86
16.19% "Clay"



Hole No. CI10 Depth 7-8m.

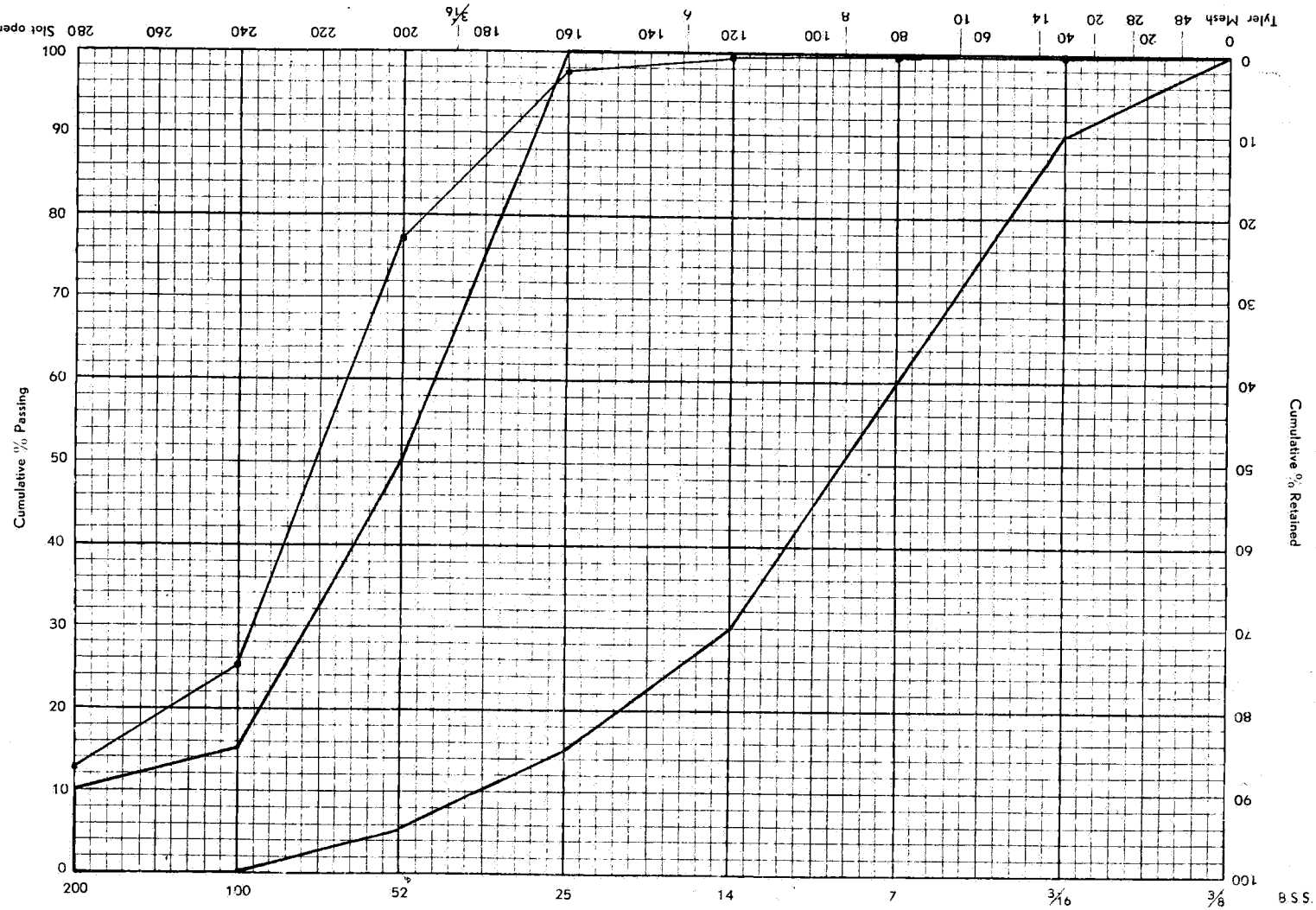
F.M. = 1.81
12.05% "clay".



Hole No. CI10 Depth 8-9m.

F.M. = 1.70

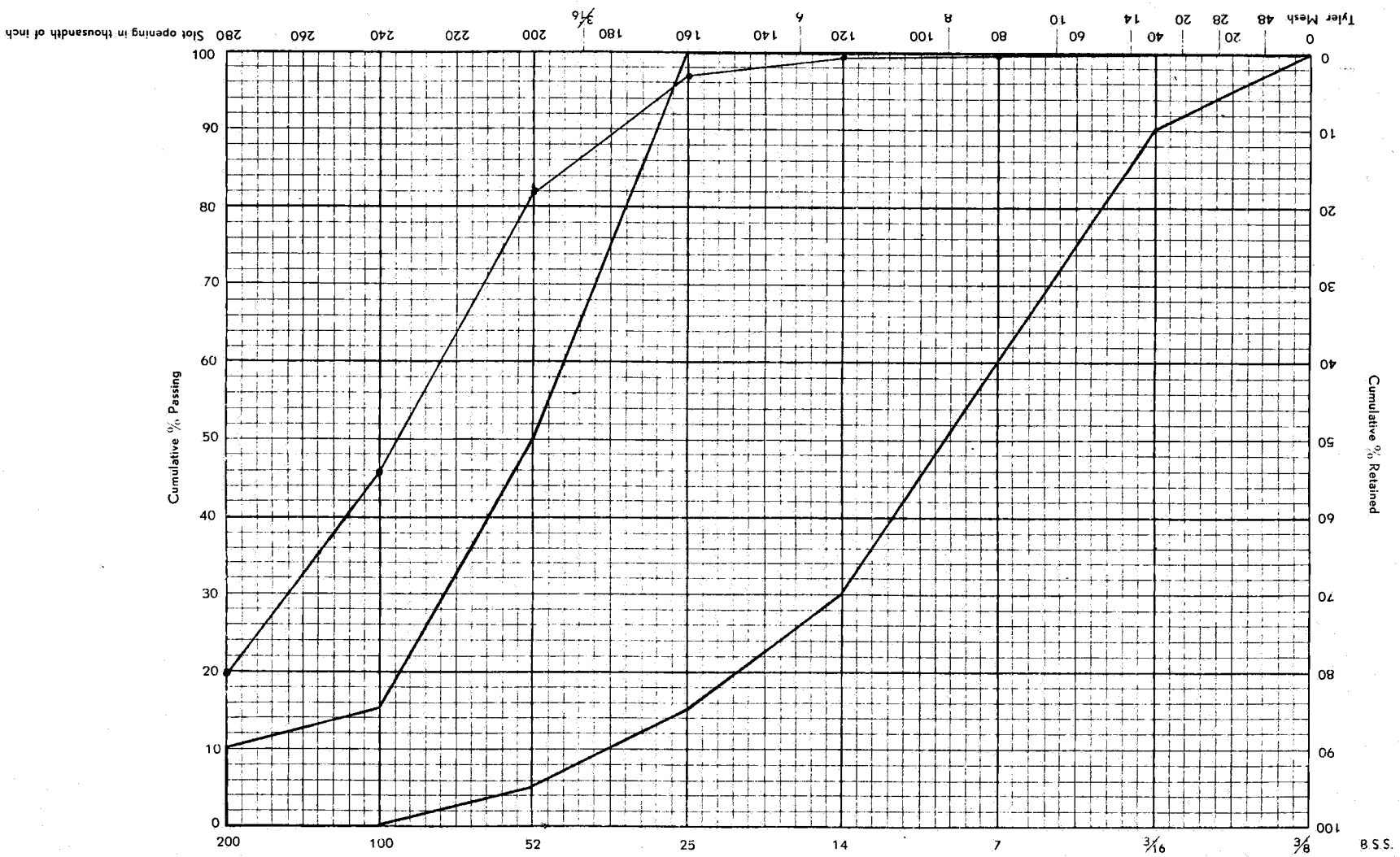
12.63% "clay"



Hole No. CI10 Depth 10-11m.

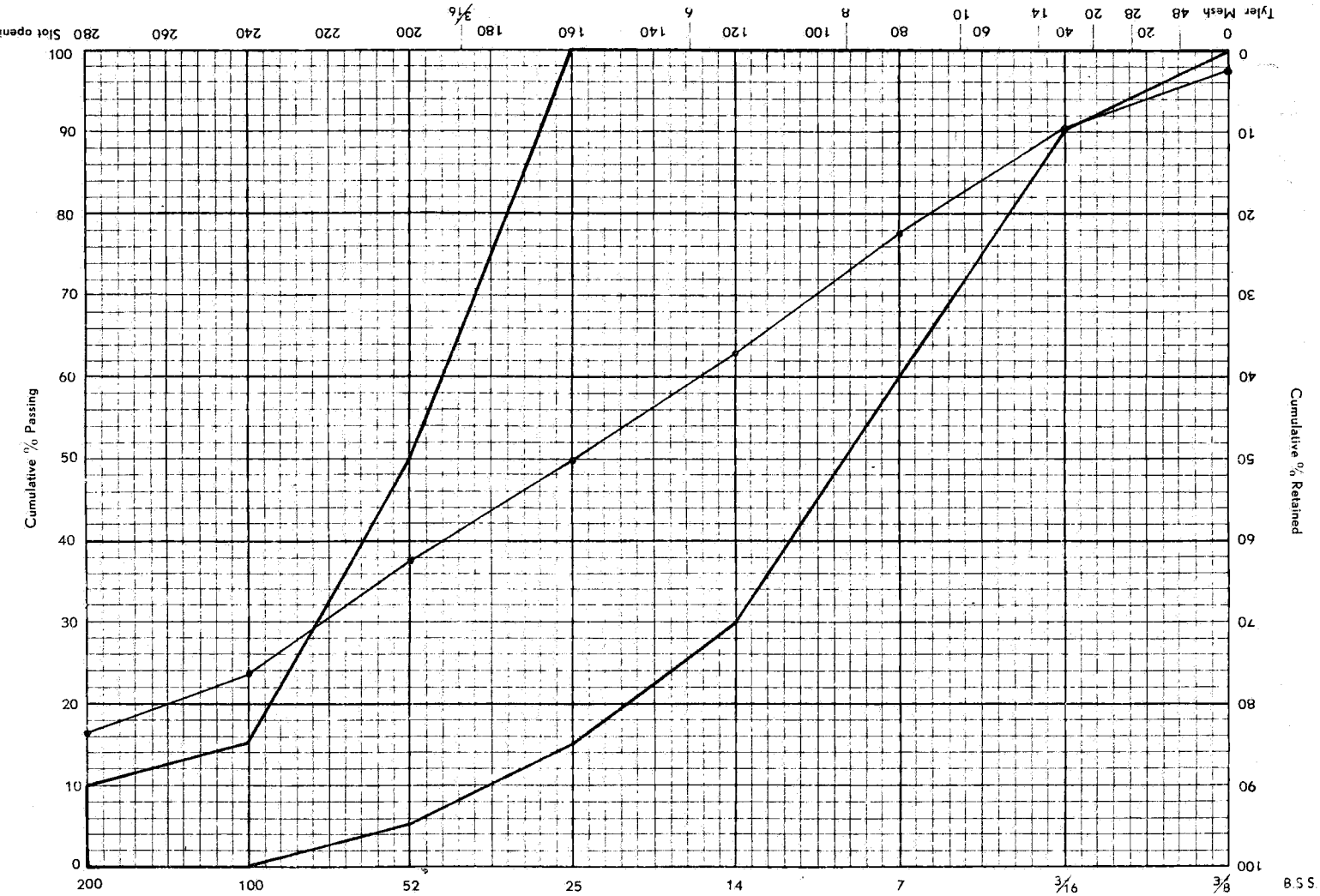
F.M. = 1.15

12.51% "Clay"



Hole No. CI10. Depth 12-13m.

F.M. = 0.94
19.69% "Clay"



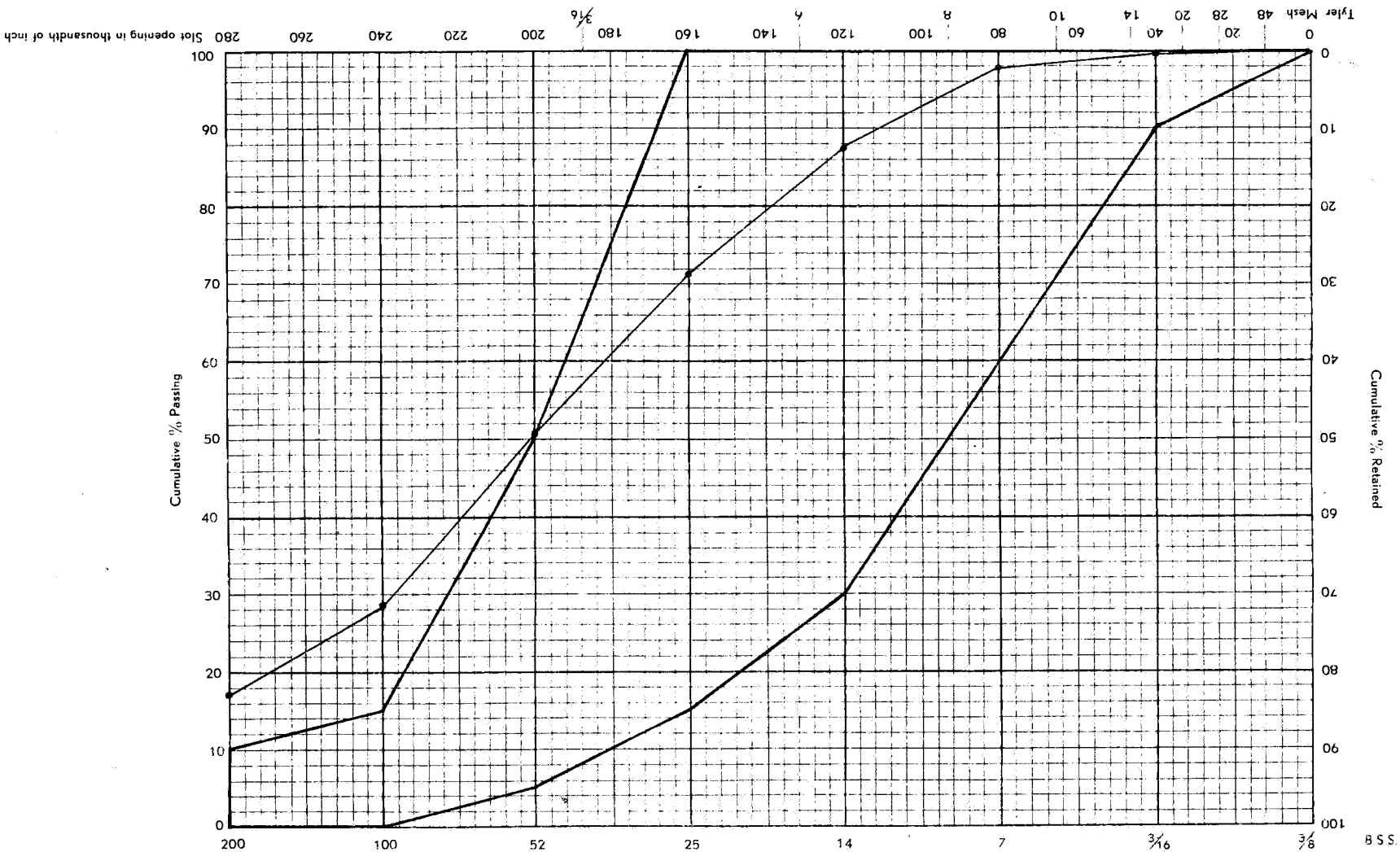
Hole No. CII1 Depth 2-3m.

F.M. = 3·13
16·62% "Clay"

Hole No CI11 Depth 4-5m.

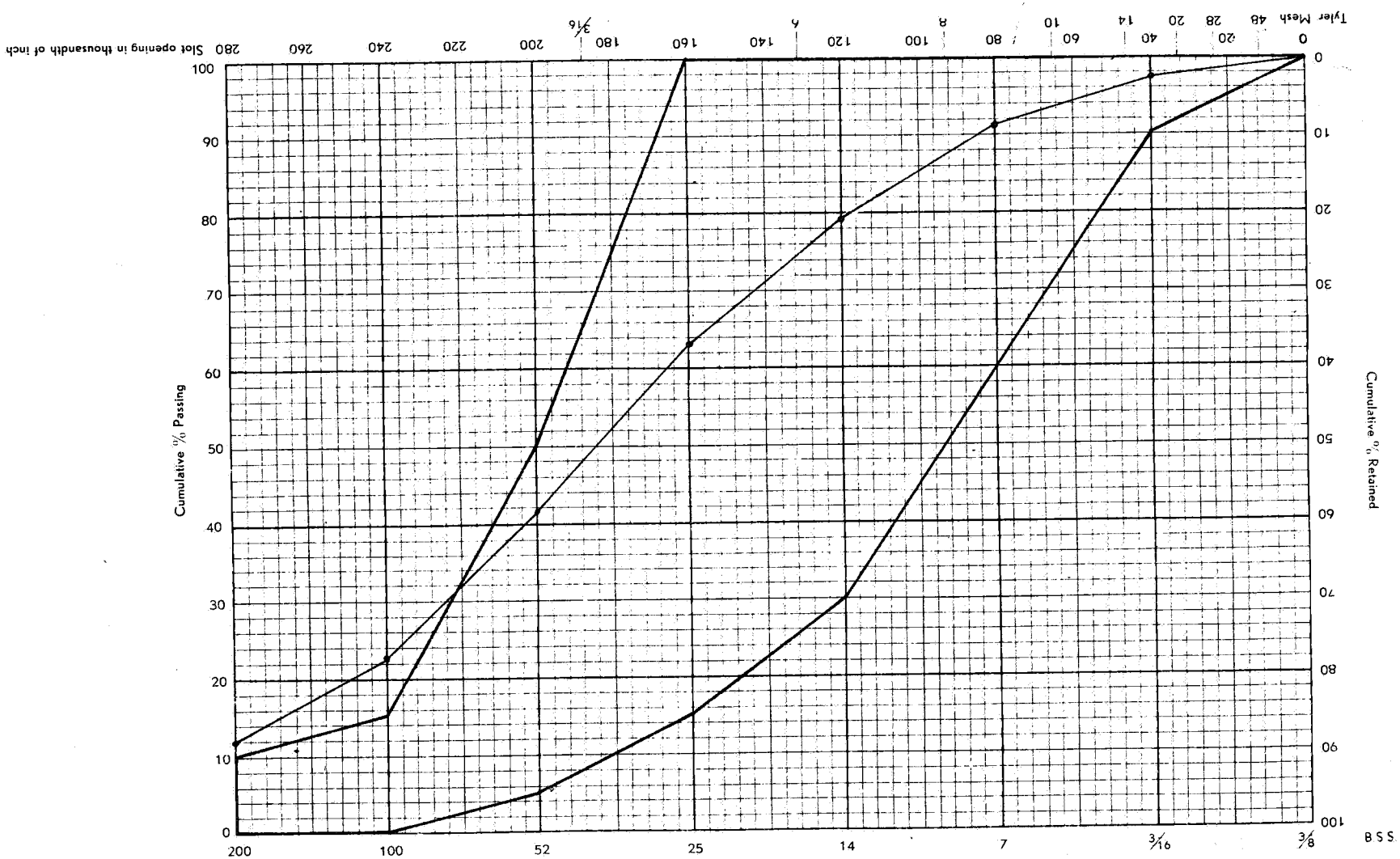
F.M. = 1.81

20.29% "Clay"



Hole No. CI11 Depth 6-7m.

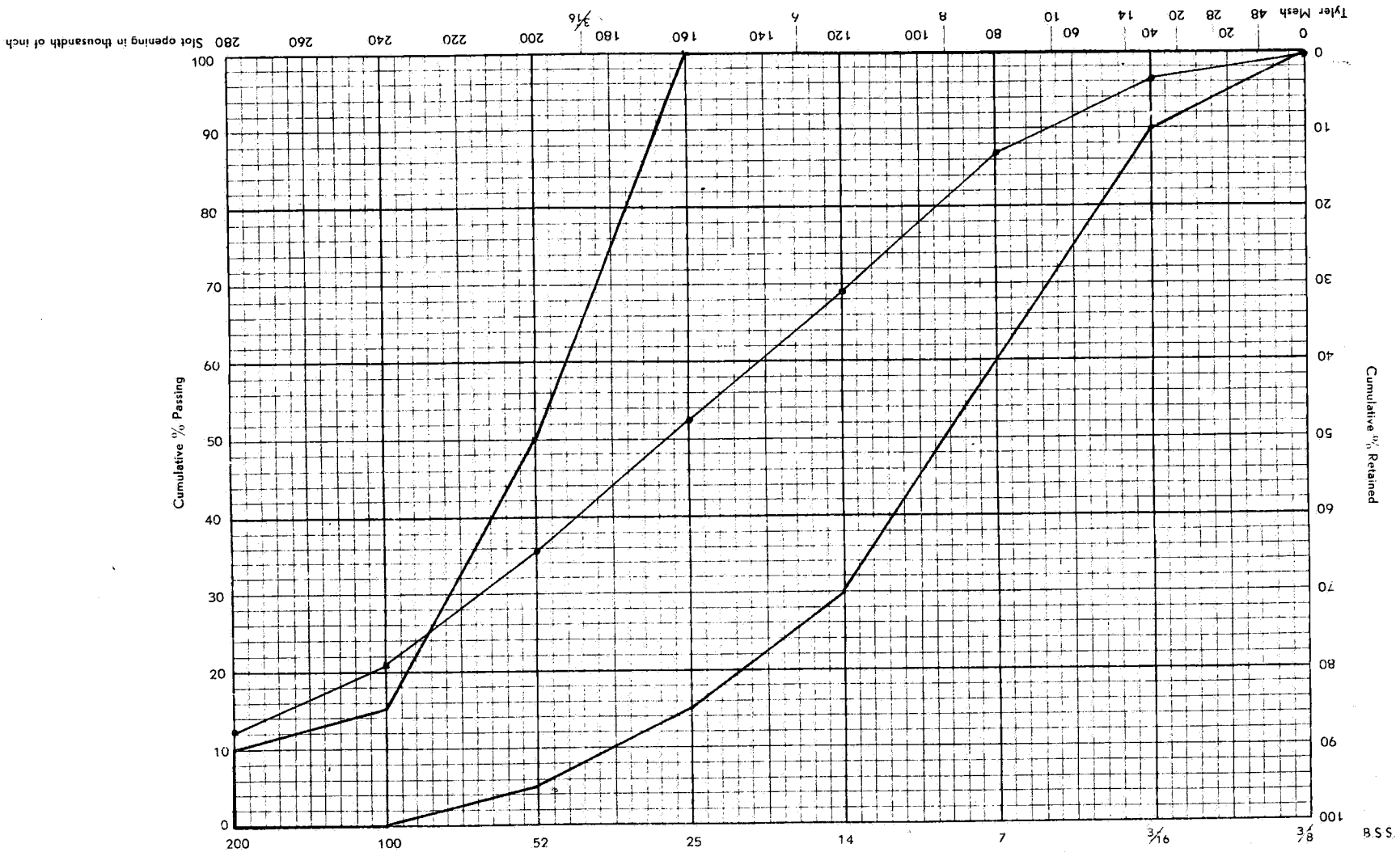
F.M. = 1·98
16·99% "Clay"



Hole No. CI11 Depth 8-9m

F.M. = 2.33

11.99% "Clay"



Hole No. CI11 Depth 10-11m.

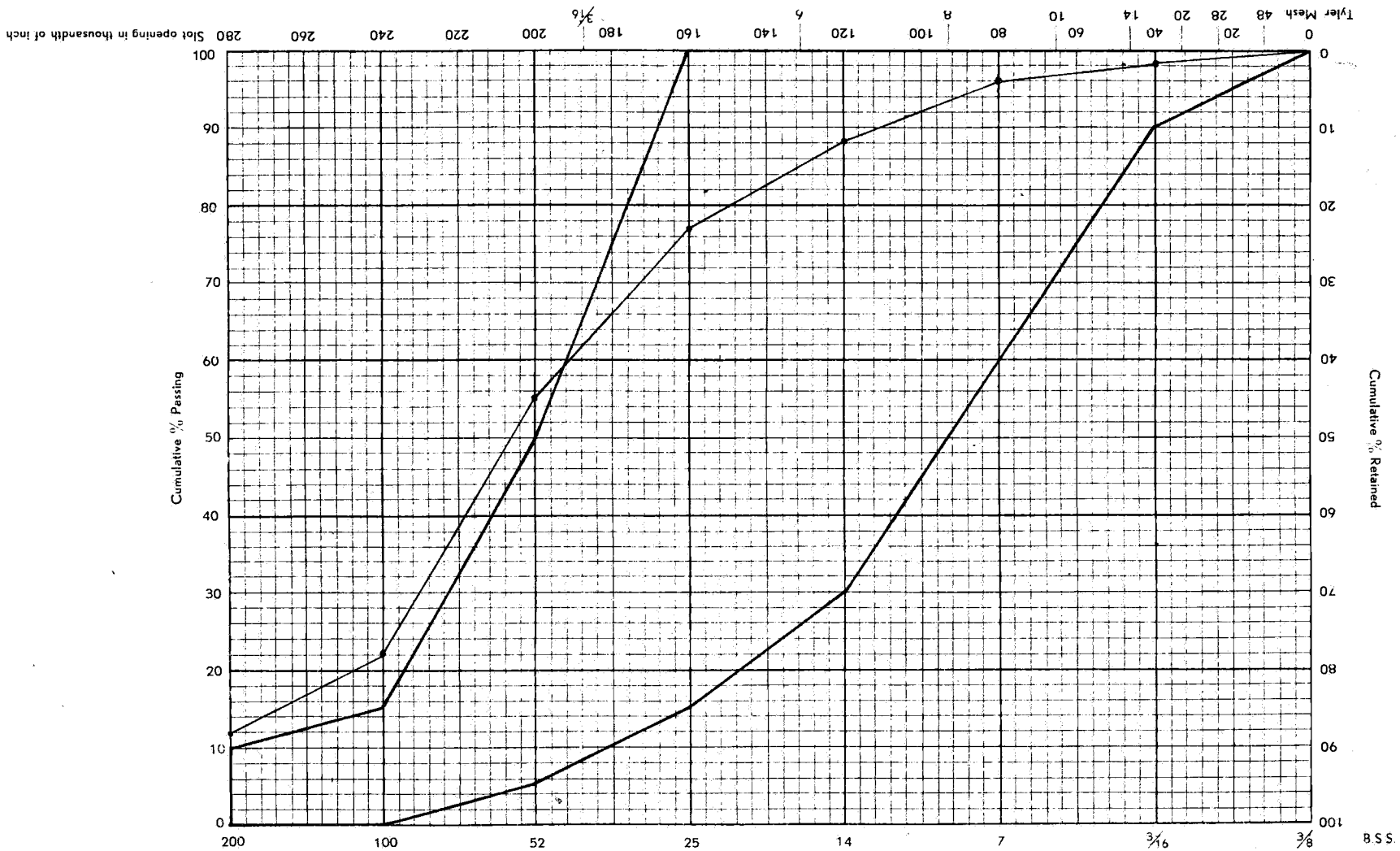
F.M.=2.71

12.07% "clay".

Hole No. CI 11 Depth 12-13m.

F.M. = 1.63

10.65% "clay"

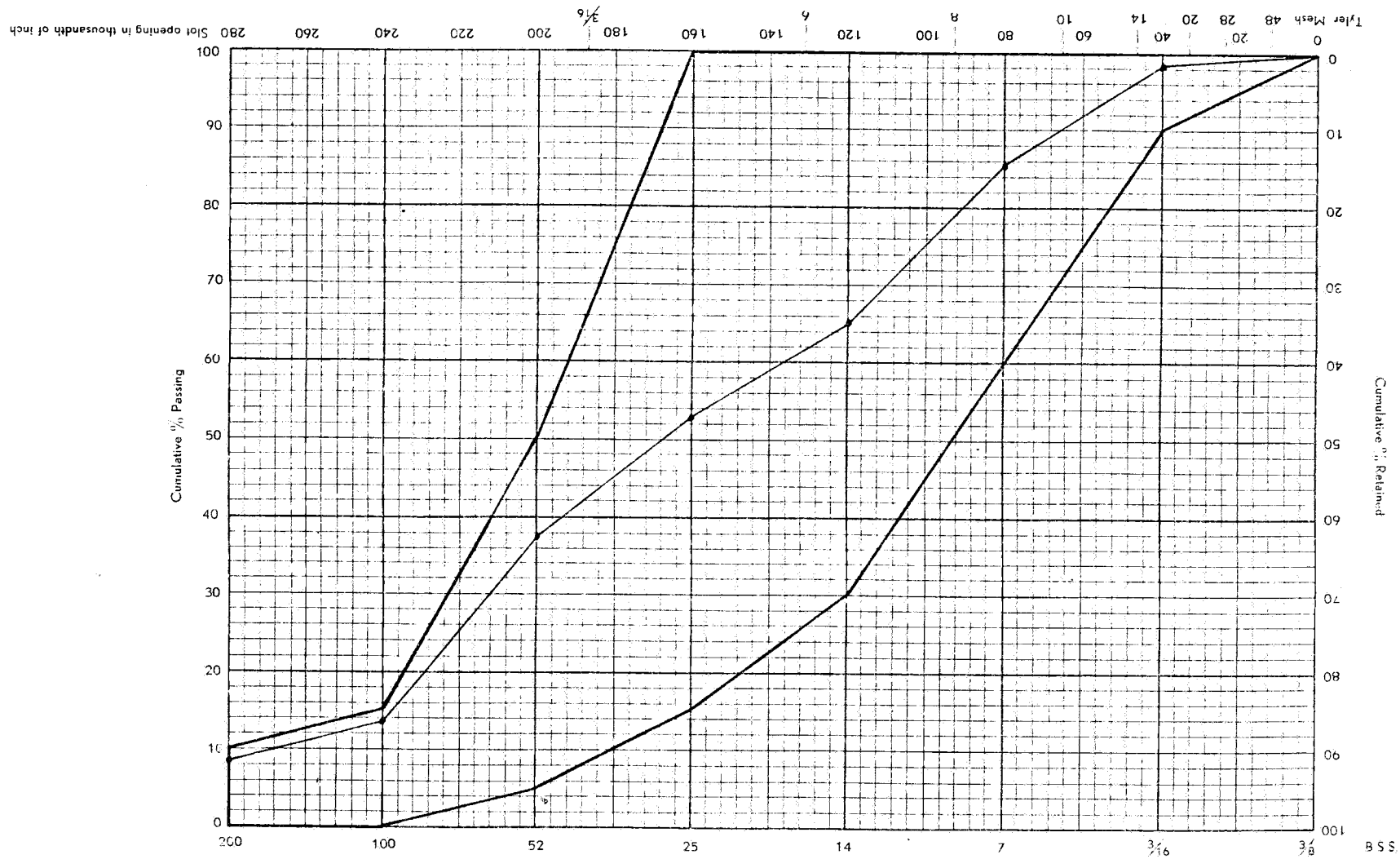


Hole No. C I 11

Depth 14 – 15 m

F.M. = 1·86

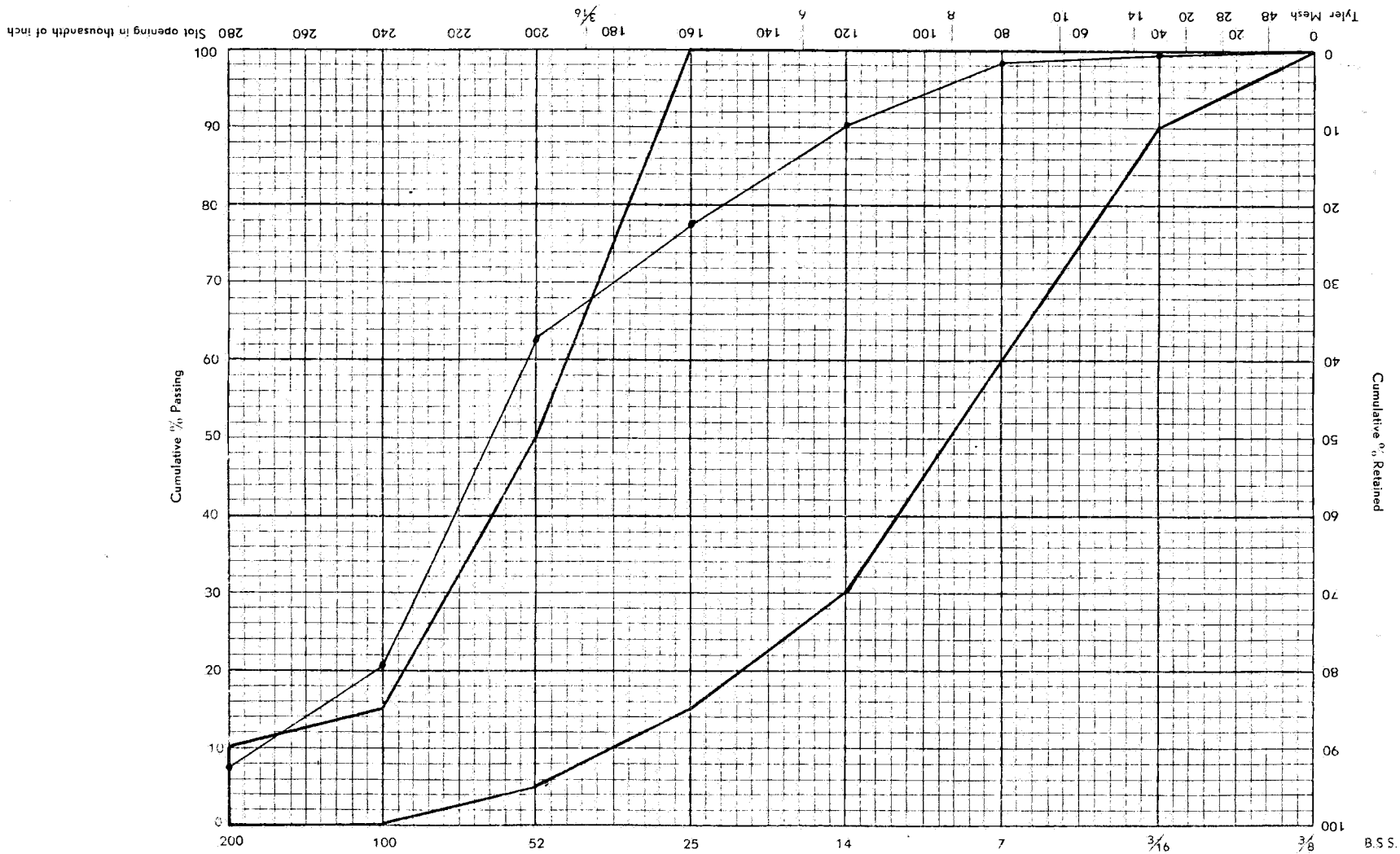
11·95% "Clay."



Hole No. MC1. Depth 2-3m.

F.M = 2.69

8.27% "Clay"



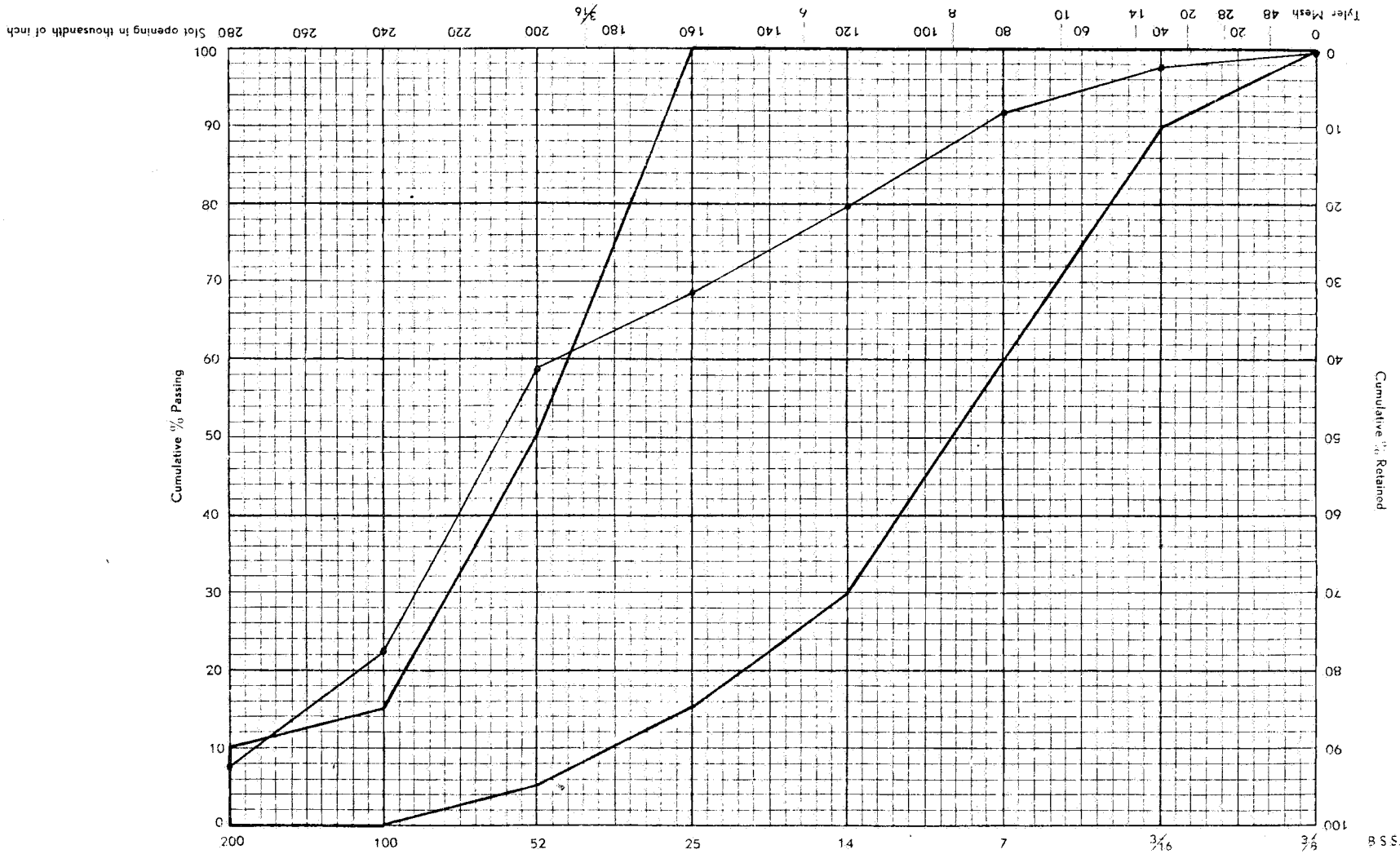
Hole No. MC1. Depth 3-4m.

F.M = 1·62

7·41% "Clay"

Hole No. MC 1. Depth 4-5m.

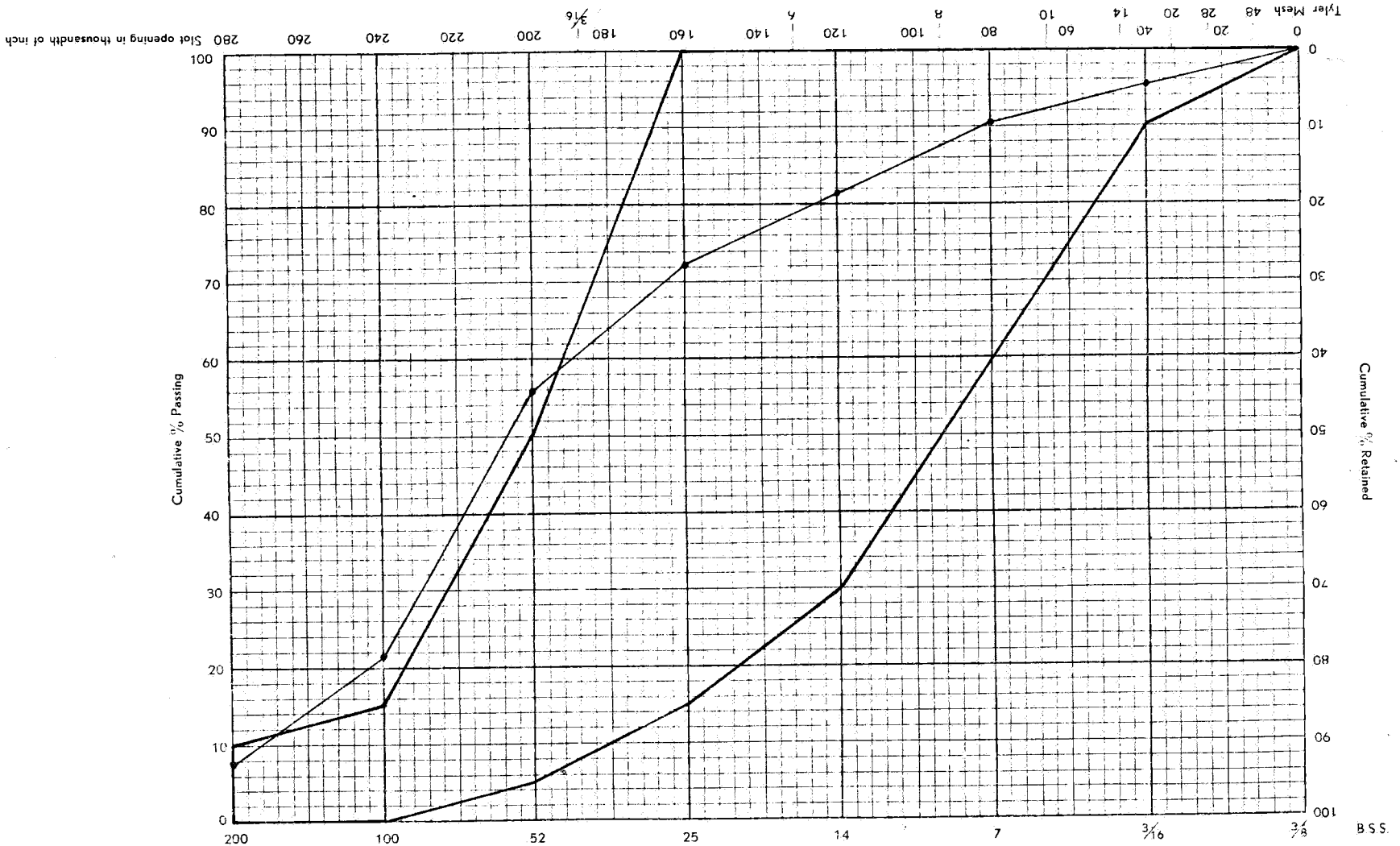
F.M. = 1·71
5·66% "Clay"



Hole No. MC1. Depth 5-6m.

F.M. = 1.96

7.46% "Clay"



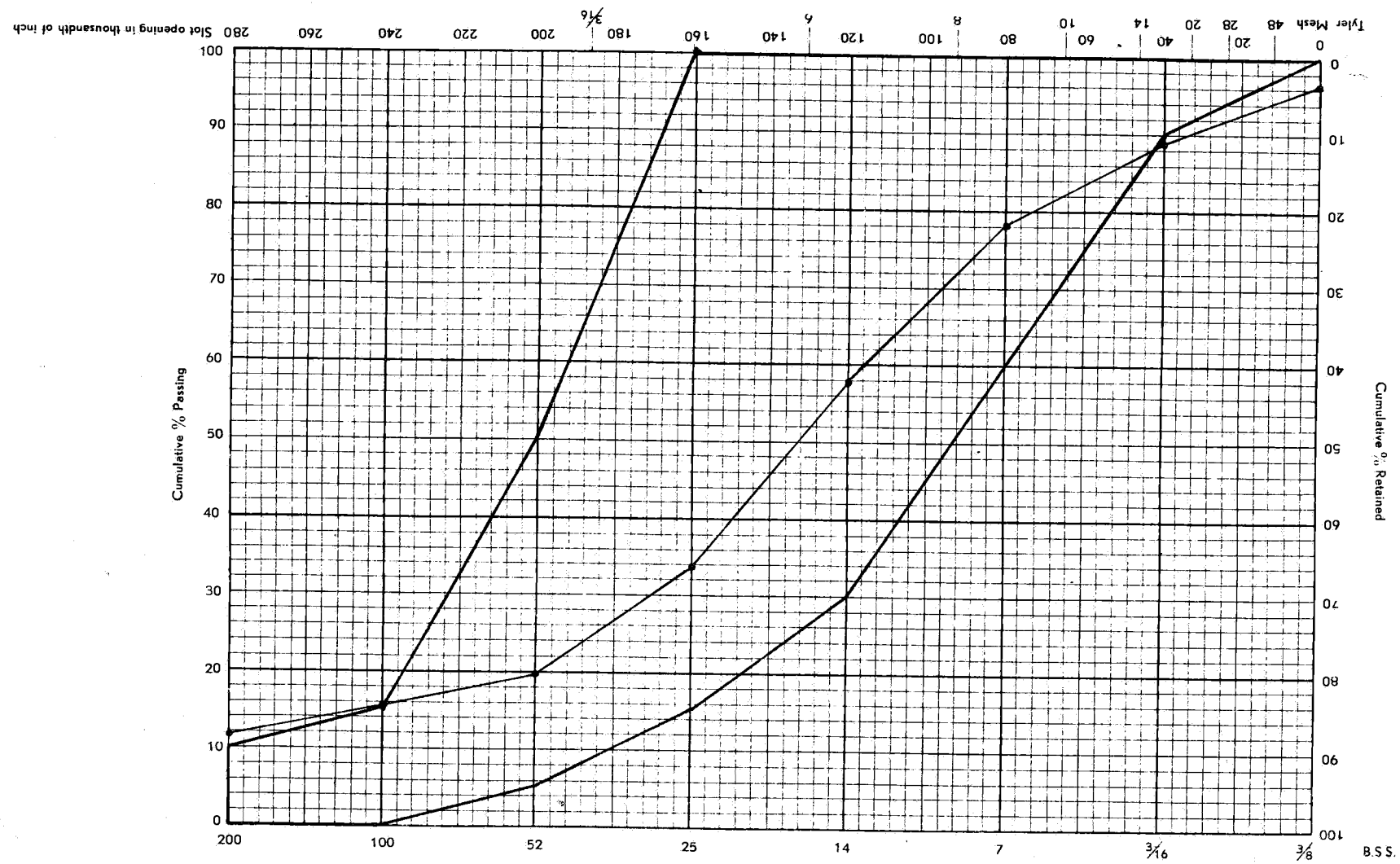
Hole No. MC1. Depth 6-7m.

F.M. = 1·98
7·71% "Clay"

Hole No. MC1. Depth 7-8m.

F.M. = 2·31

7·86% "Clay"

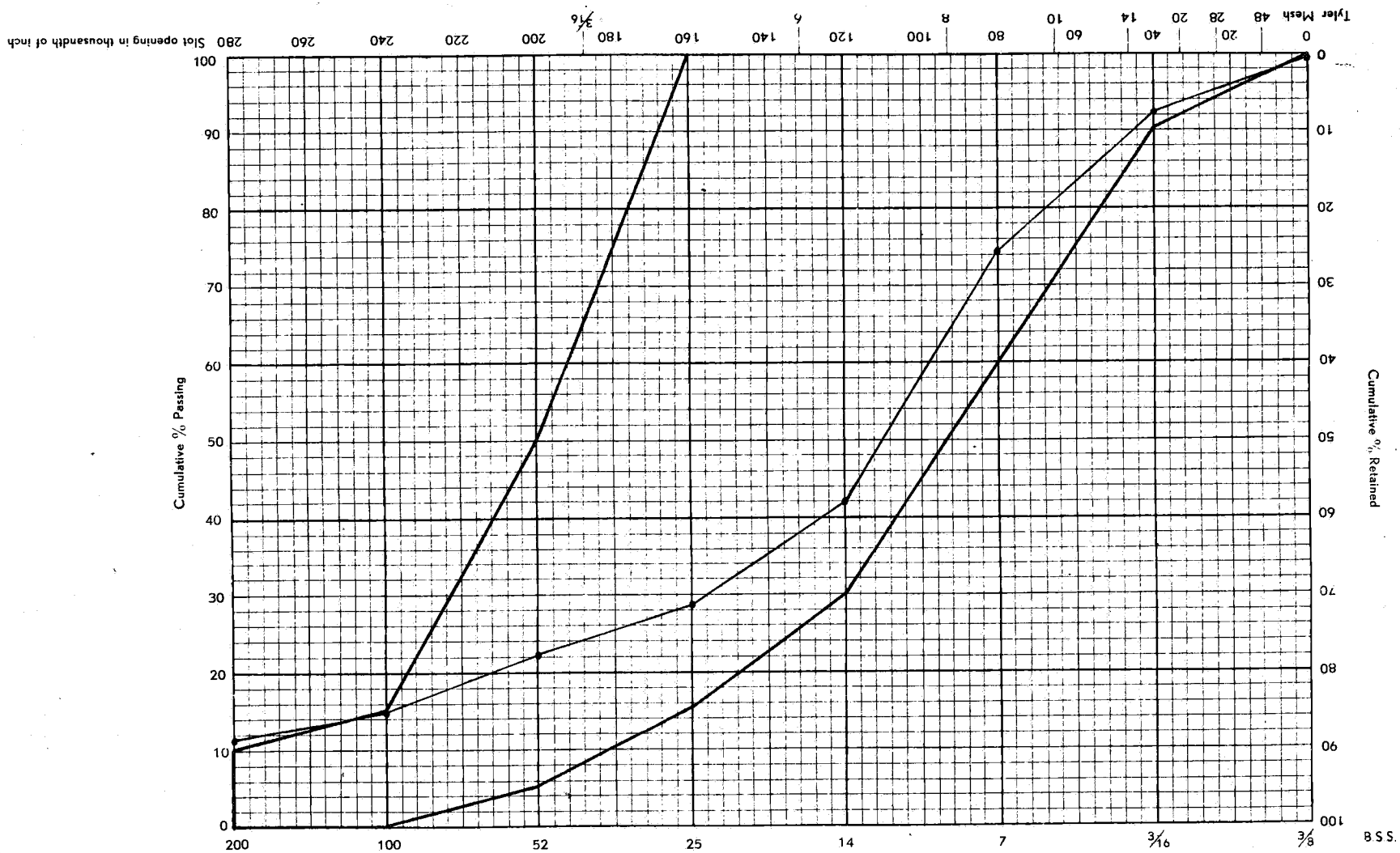


Hole No. MC 14

Depth 1 – 2 m

F.M. = 3·52

11·78% "Clay."



Hole No. MC 14

Depth 3-4 m

F.M = 3.67

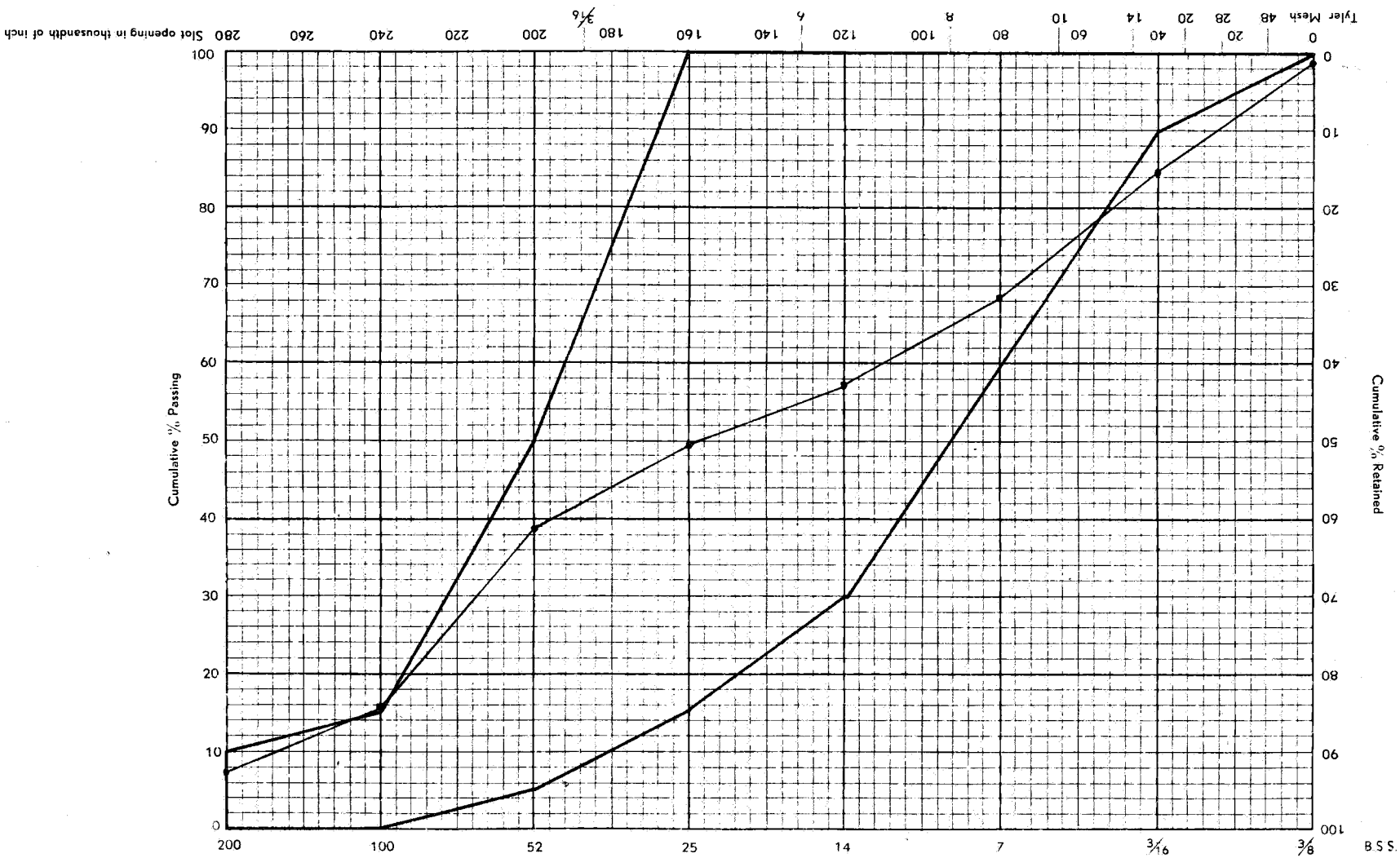
11.01 % "Clay"

Hole No. MC 14

Depth 5-6 m

F.M. = 3·62

8·88% "clay"

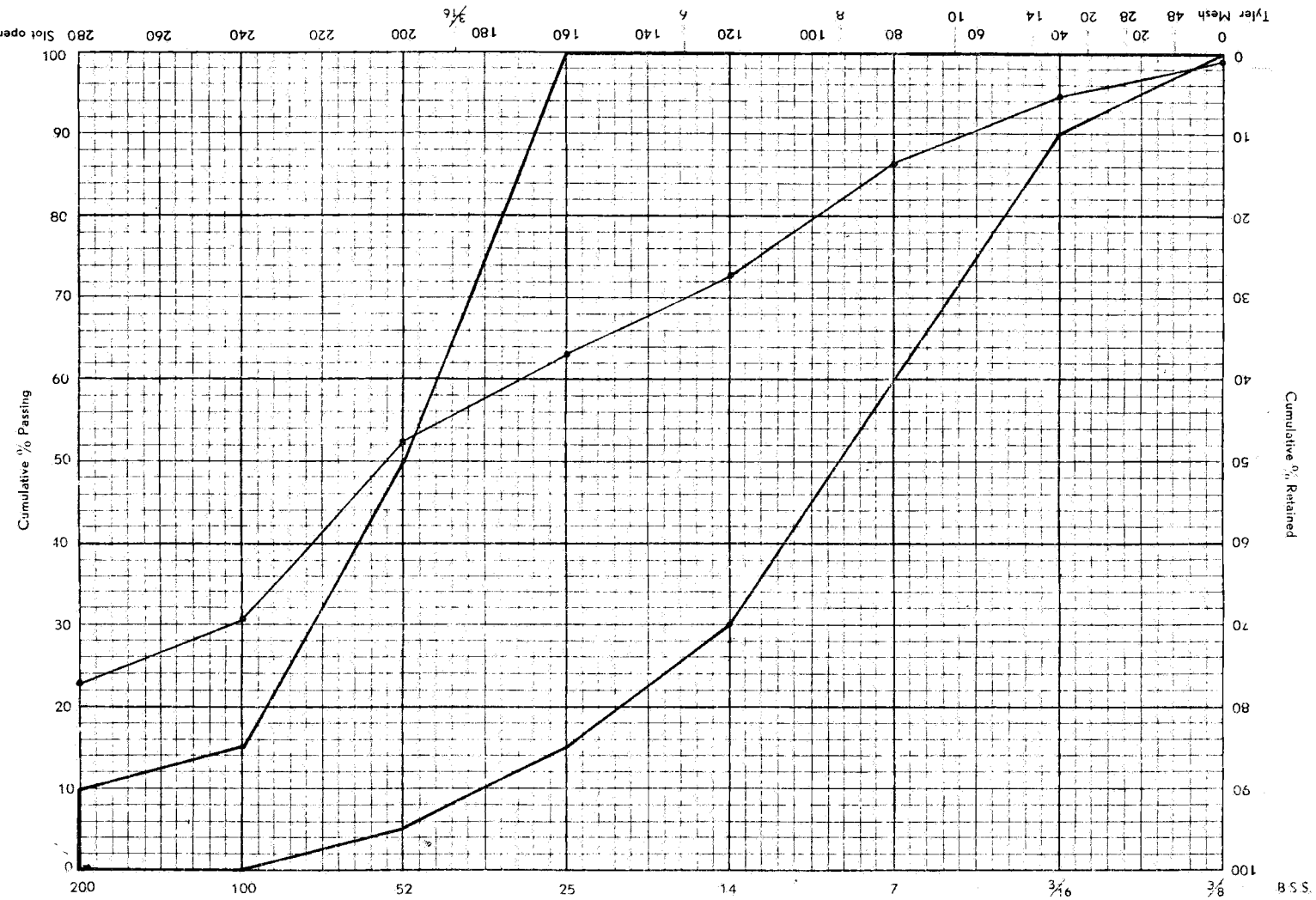


Hole No. MC 14

Depth 7 – 8 m

F.M. = 3·10

7·35% "Clay"

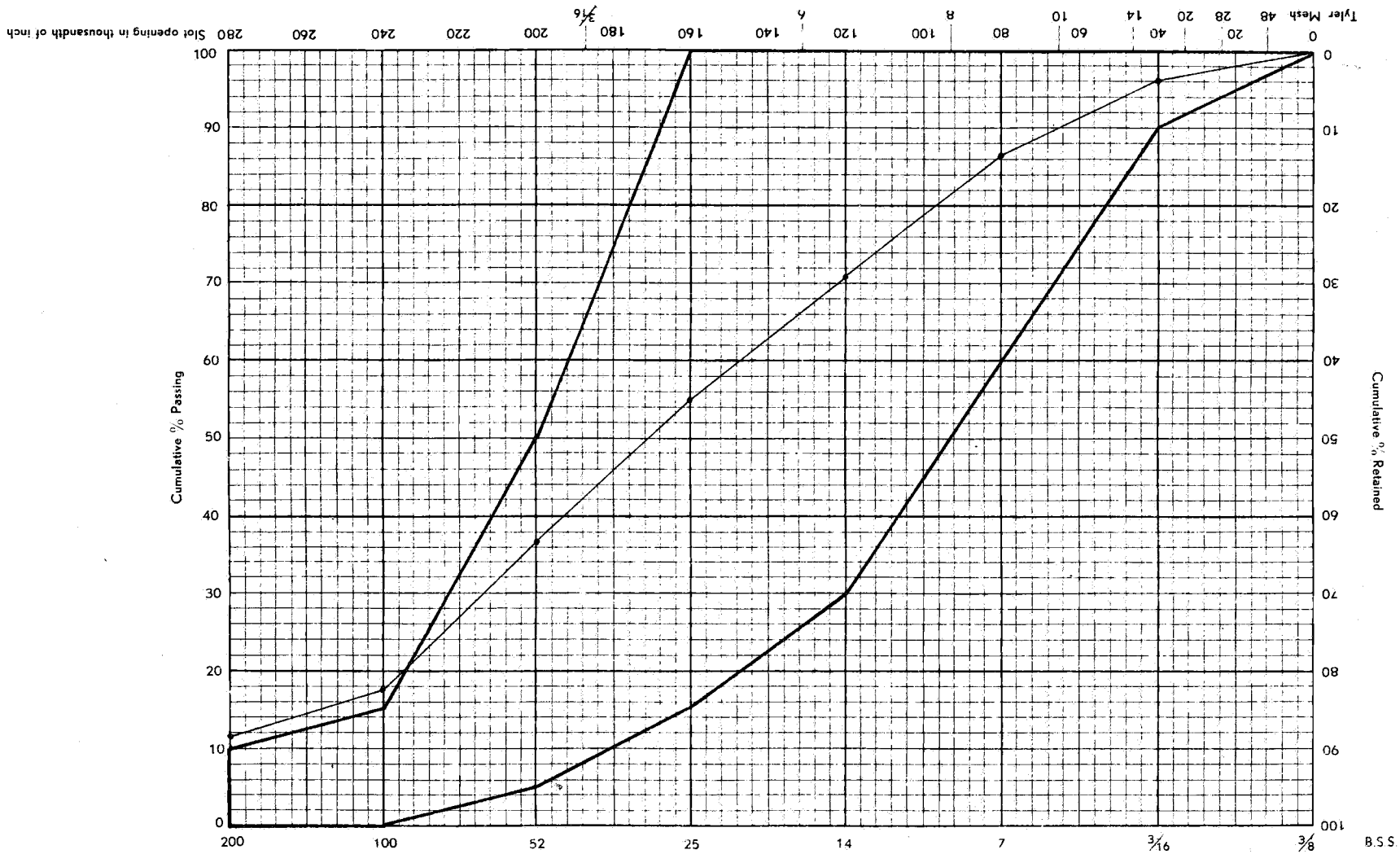


Hole No. MC 14
Depth 10 - 11m

F.M. = 2·59
22·73% "Clay"

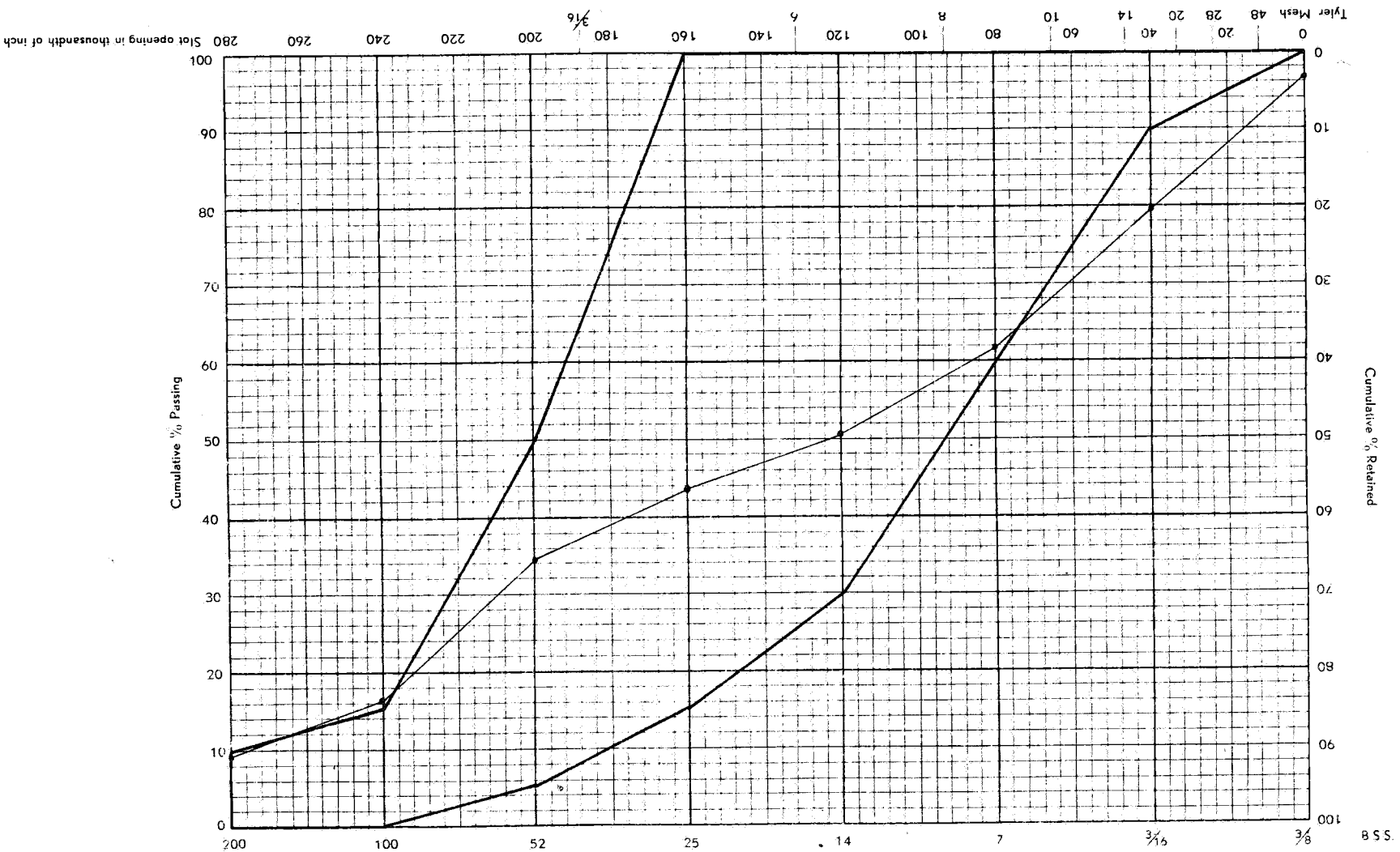
Hole No. MC 15
Depth 1-2 m

F.M. < 3.89
20.86% "Clay".



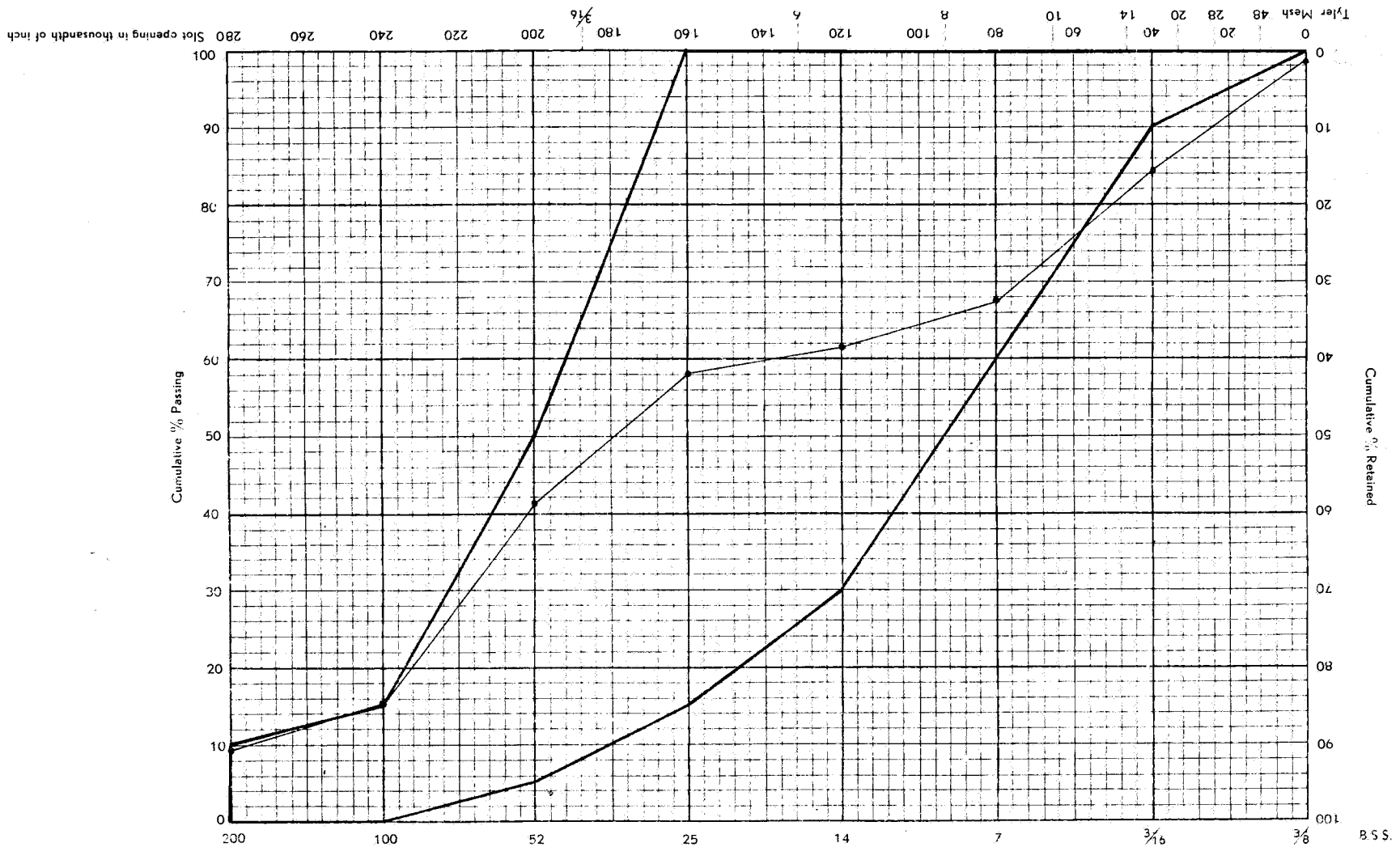
Hole No. MC 15
Depth 3 – 4 m

F.M. = 2.68
11.25% "Clay."



Hole No. MC 15
Depth. 5-6 m

F.M. = 3.51
9.67% "clay"

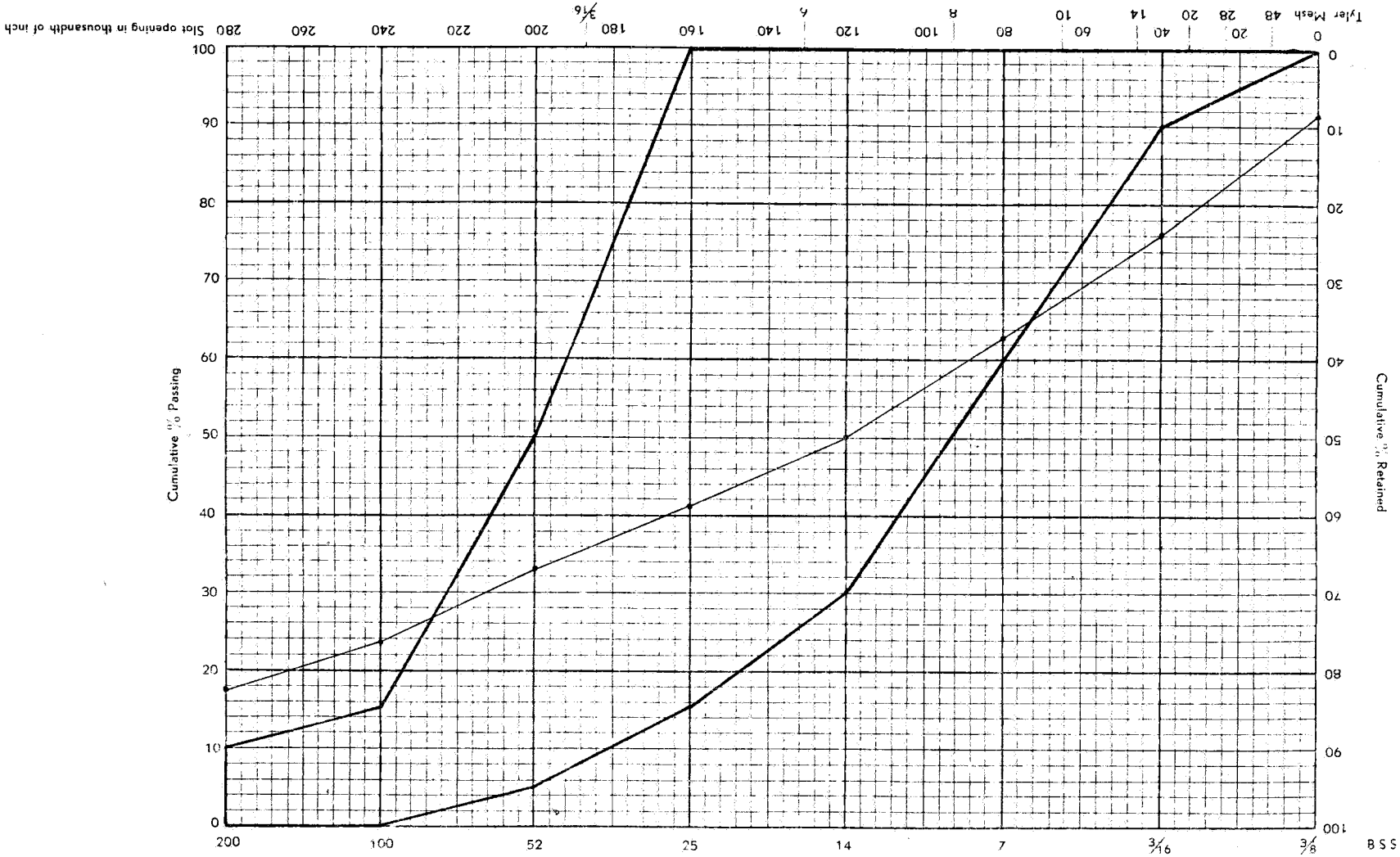


Hole No. MC 15
Depth 7 – 8 m

F.M. = 3.02
9.67% Clay

Hole No. MC 15
Depth 9 – 10m

F.M. = 2.63
12.932 "Clay."



Hole No. MC 16

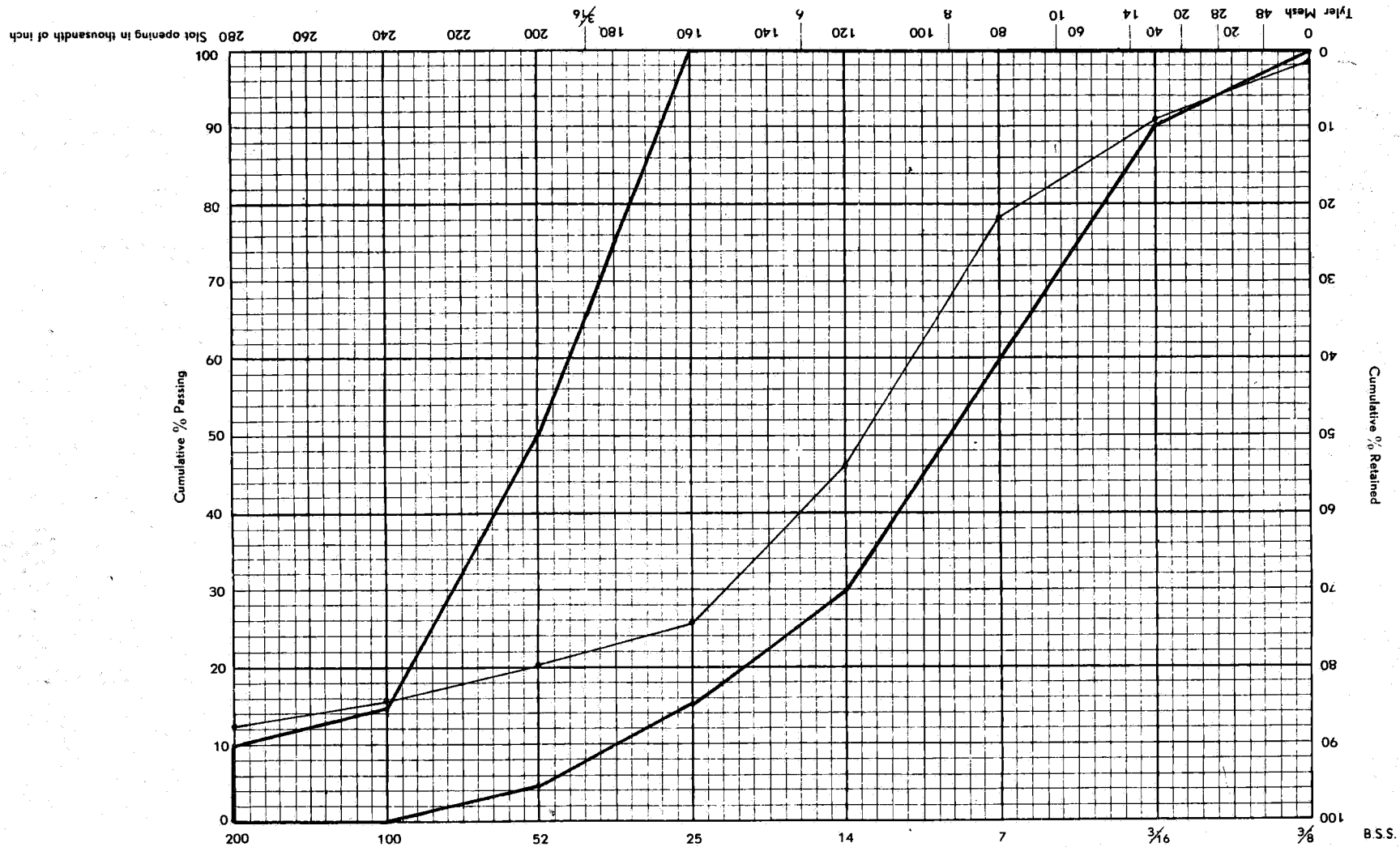
Depth. 1-2m

F.M. = 3.90

17.48% "Clay."

Hole No. MC 16
Depth 3-4 m

F.M. = 3.74
9.96% "Clay".

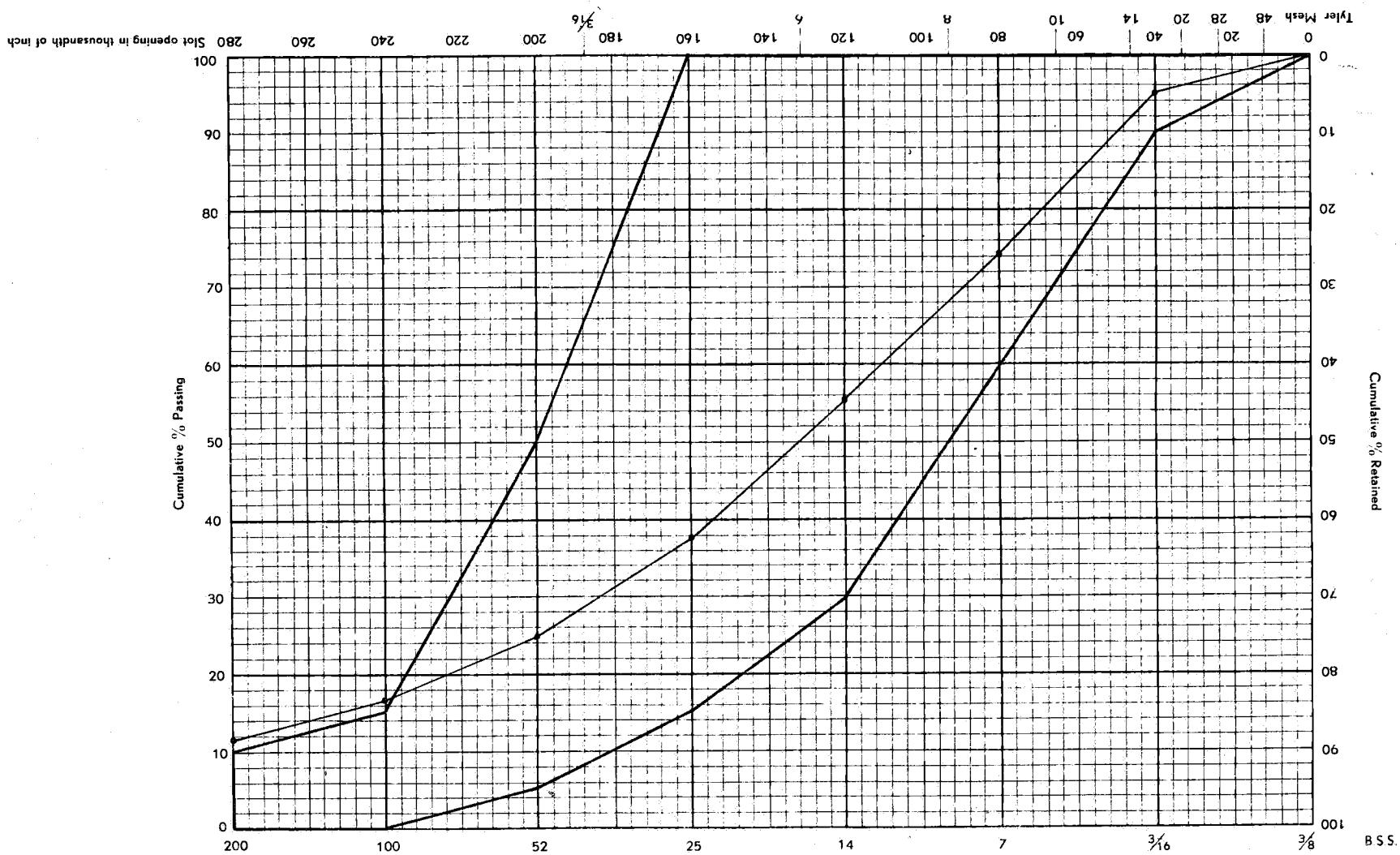


Hole No. MC 18

Depth 1–2m

F.M. = 3·73.

12·52% "Clay."

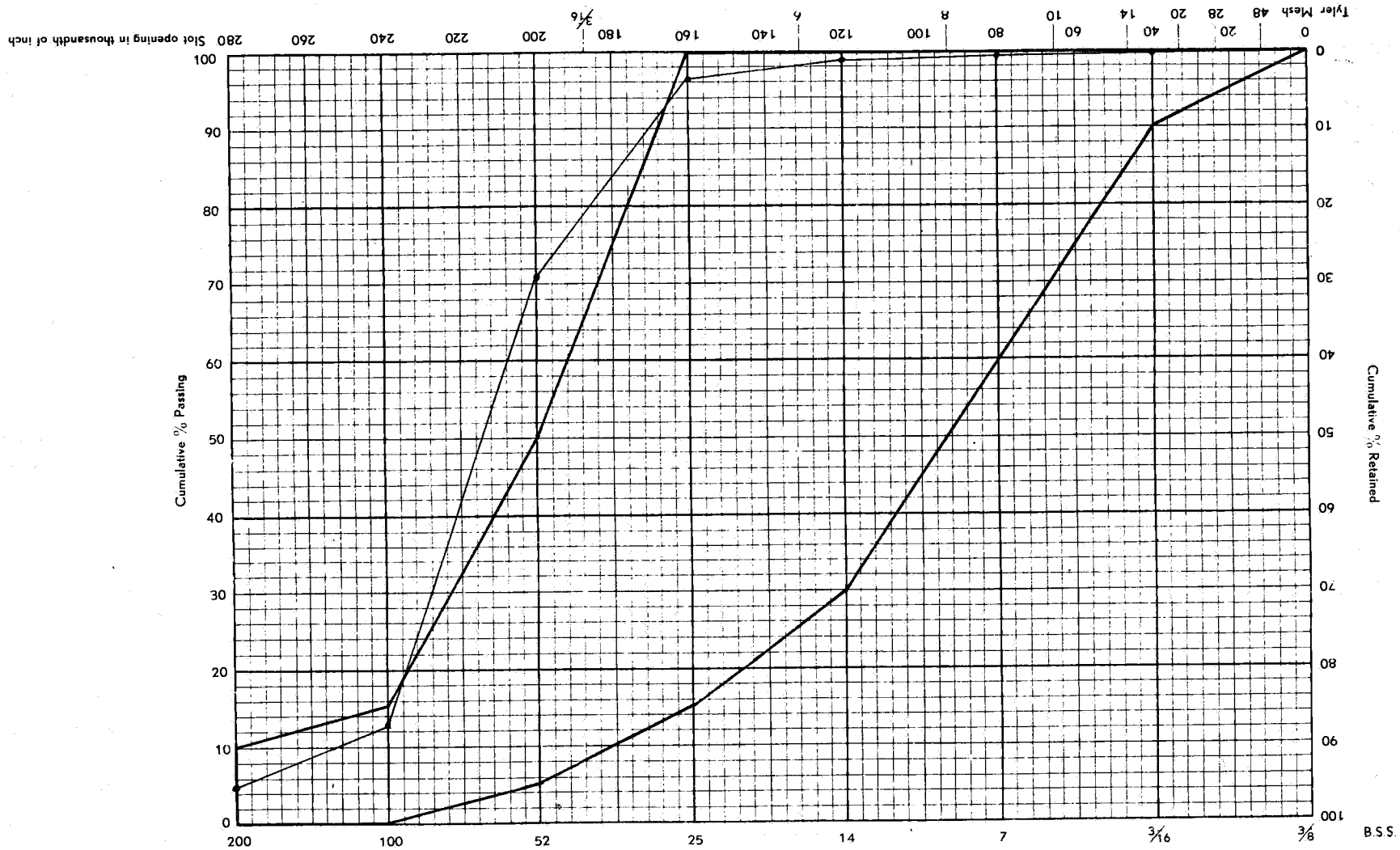


Hole No. MC 18

Depth 3-4 m

F.M. = 3.33.

11.82% "clay"

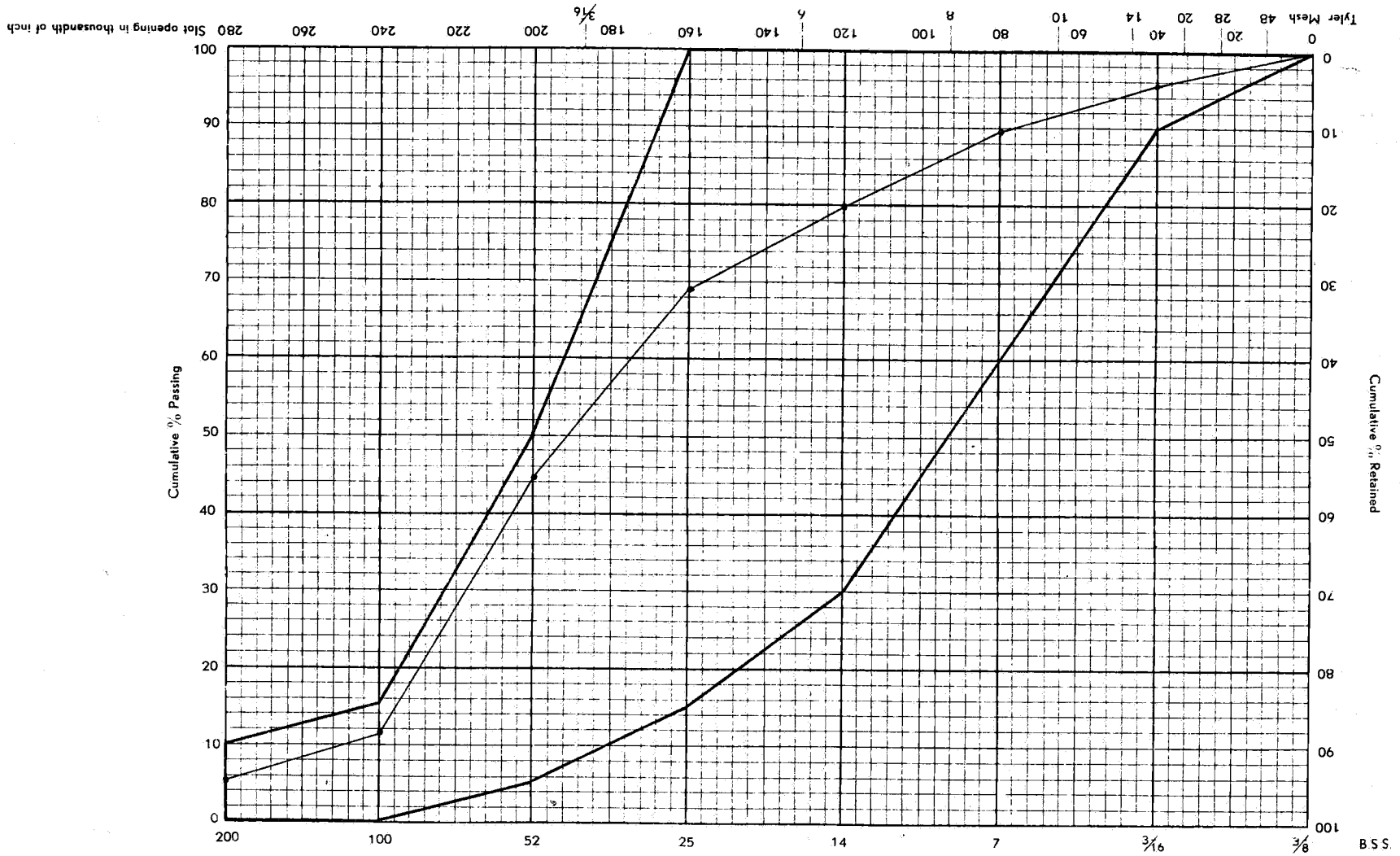


Hole No. MC 18

Depth 5 – 6 m

F.M. = 1·28

4·78% "Clay"



Hole No. MC 18
Depth 7–8 m.

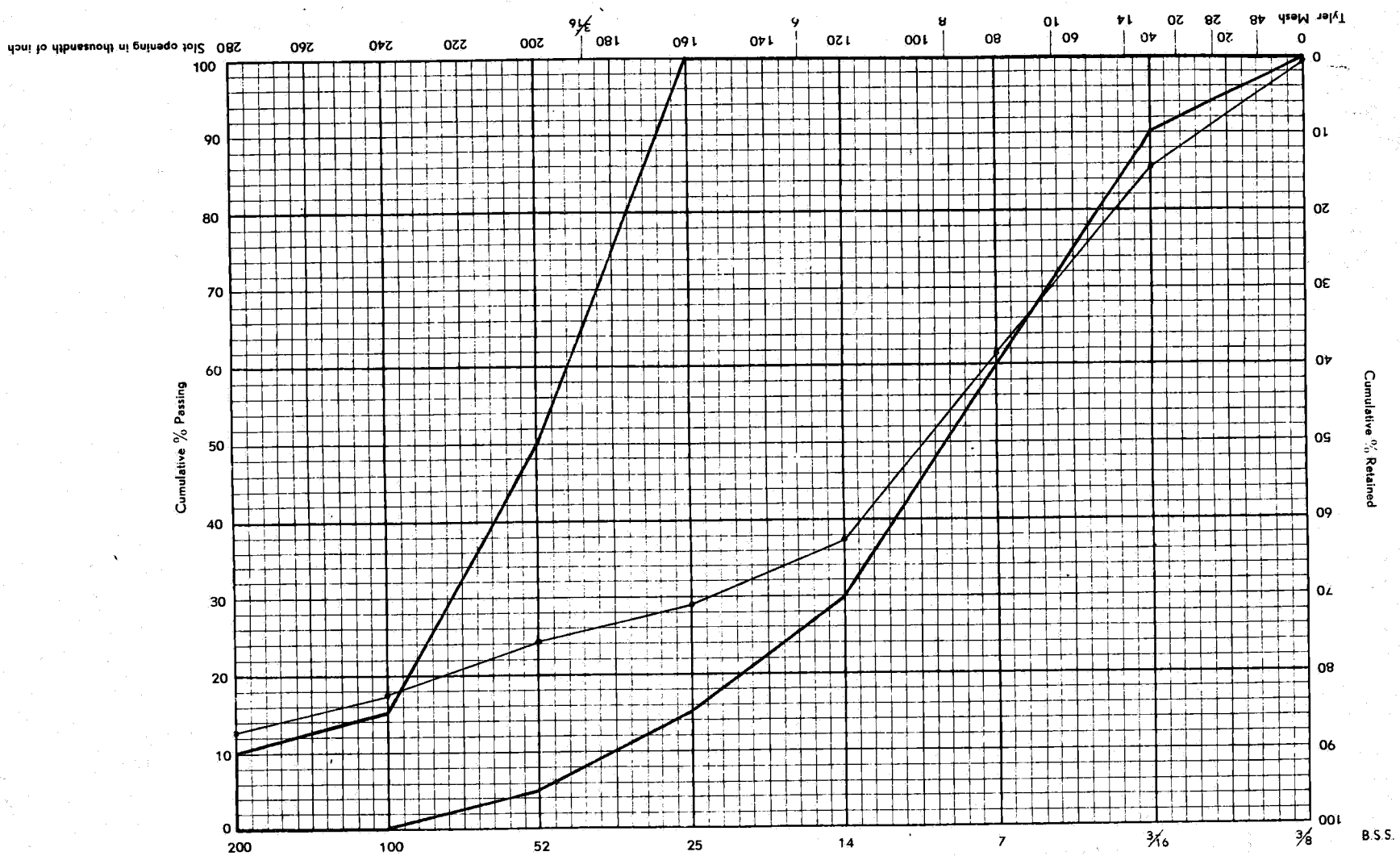
F.M. = 2.22
5.63% 'clay'

Hole No: MC 18

Depth: 9 – 10 m

F.M. = 3.03

7.97% "clay"



Hole No. MC 19
Depth 1–2 m

F.M. = 3.95
12.55% "clay."

APPENDIX III

Petrographic Descriptions.

AMDEL REPORT N.P. 1268/75

Investigation and report by Dr. P.G. Moeskops.

Sample P214/74; TS 32902 Hole No. CI1 Depth 1-2m

Rock Name:

Poorly sorted, clayey quartz gravel.

Hand Specimen:

Gravel to sand sized clasts of quartz and minor feldspar associated with minor amounts of clay and calcrete.

Thin Section:

An optical estimate of the constituents gives the following:-

	%
Quartz	75
Feldspar	10
Clay	5-10
Calcrete	5
Muscovite	2-3
Opaques	1-2

Clasts are angular to subrounded in shape and range in size from 0.01 mm to 2 cm although the majority are 2-4 mm in diameter.

Most of the feldspar is fresh microcline although the section also contains traces of fresh orthoclase and some sericitized plagioclase.

A small proportion of the clasts (?1-2%) consist of fine angular quartz grains cemented by limonite-stained calcrete.

Clay and calcrete together constitute a small proportion of the aggregate and the latter is mainly very finely divided and intimately mixed with the clay, although a few clasts are partially coated by calcrete and clay.

The aggregate contains 2-3% muscovite mainly as 0.1 - 0.5mm long flakes associated with free clay.

When the free clay, mica and fine calcrete are washed out of the material the remaining clasts should contain only a small amount of adhering calcrete and clay (1-2% max.), hence after washing the material will probably be suitable for use in concrete sand.

Sample: P215/74; TS 32903 Hole No. CI1 Depth 5-6m

Rock Name:

Sandy gravel.

Hand Specimen:

Clay-coated silt to gravel sized quartz clasts.

Thin Section:

An optical estimate of the constituents gives the following:-

	%
Quartz	95
Clay	3-5
Feldspar	2
Accessories; including tourmaline, muscovite.	trace

Clasts are angular to subangular and range in size from 0.1 to 6 mm, although he majority are 2 - 4 mm long. Clasts are typically coated by brown clay; however, most of this is liberated simply by washing.

The section contains traces of feldspar, muscovite and tourmaline.

The material is suitable for use in concrete sand.

Sample: P216/74; TS 32904 Hole No. MC1 Depth 4-5m

Rock Name;

Gravelly sand.

Hand Specimen:

Quartz sand containing a few large quartz clasts plus minor amounts of clay, calcrete and muscovite.

Thin Section:

An optical estimate of the constituents gives the following:-

	%
Quartz	95
Clay	2-3
Calcrete	2-3
Muscovite and other accessories; (heavy mineral grains)	1

This is a relatively clean and well-sorted quartz sand composed largely of angular 0.5 to 1.0 mm sized quartz grains which are thinly coated with clay and calcrete. About 5-10% of the sample consists of 3-10 mm sized clasts.

The section contains a few grains composed of fine quartz cemented by calcrete; however, overall the proportion of calcrete is low. Non adhering muscovite flakes constitute the main accessory mineral and there are a few opaque and other heavy mineral grains.

The material is most probably suitable for use in concrete sand.

Sample P217/74; TS 32905 Hole No. MC18 Depth 5-6m

Rock Name:

Quartz sand.

Hand Specimen:

Clean, well-sorted quartz sand.

Thin Section:

An optical estimate of the constituents gives the following:-

	%
Quartz	98
Clay	1-2
Muscovite	trace

This is a clean, well-sorted quartz sand composed almost entirely of angular, 0.2 - 0.5 mm sized quartz grains. A few larger (1 - 3 mm) quartz grains are present and most grains are very thinly coated with clay (mainly removed by washing). The main accessory minerals are muscovite and iron oxide grains.

The material is suitable for use in concrete sand.

Sample P218/74; TS 32906 Hole No. MC 15 Depth 1-2m

Rock Name:

Calcreted clayey-gravelly quartz sand.

Hand Specimen:

Poorly sorted calcreted, clayey gravely quartz sand.

Thin Section:

An optical estimate of the constituents gives the following:-

	%
Quartz	55
Clay	25
Calcrete	15
Feldspars	2-3
Accessories (mainly muscovite)	1

Clasts are angular to rounded and range in size from 0.01 - 10 mm; however, the majority are about 1 - 2 mm long.

Calcreted clay forms a moderate proportion of the clasts and adheres strongly to the smaller (0.5 - 2 mm) grains.

The Section contains minor amounts of relatively fresh feldspar (mainly microcline) and accessory muscovite.

*Because of the presence of calcrete clasts and because much of the adhering calcreted clay on quartz and feldspar clasts could not be removed by washing the material is unsuitable for use in concrete sand.

*Geologists Note. The calcrete clasts described from this thin section are most likely to be contaminants from higher in the hole; consequently sand from this depth (1-2m) is probably quite useable.

AMPain

Sample P219/74; TS 32907 Hole No. MC15 Depth 5-6m

Rock Name:

Gravelly quartz sand.

Hand Specimen:

Poorly sorted gravelly quartz sand containing traces of clay and calcrete.

Thin Section:

An optical estimate of the constituents gives the following:-

	%
Quartz	95
Clay -	2-3
Calcrete	1-2
Muscovite and other accessories	trace

Clasts are subrounded to angular and range in size from 0.01 mm to 12 mm; however, the majority are 0.3 to 0.5 mm long.

Calcrete and clay mainly occur as thin coatings on clasts, although some clay is free and can be easily removed by washing.

The material is most probably suitable for use in concrete aggregate.

ADDITIONAL NOTES

a) All samples contain traces of ferricrete, tourmaline and dark (?) organic material.

b) Addition of dilute HCl to the samples gives the following responses;

Sample	Response.
P214/74	Moderate effervescence
P215/74	Very slight effervescence
P216/74	Very slight effervesconce.
P217/74	No effervescence
P218/74	Very intense effervescence
P219/74	Very very slight effervescence

APPENDIX IV

Reserve Calculations (including plan 74-1009)

SECTION 107

HOLE NUMBER		MC 18	MC 17	MC 14	MC 23	MC 19	MC 20	MC 15	MC 16	MC22	MC 1	TOTAL
AREA OF INFLUENCE (m²)		4,450	4,300	3,050	5,750	3,250	4,550	3,825	3,650	5,100	275	–
OVERBURDEN	DEPTH (m)	1·0	1·0	0·3	1·5	1·0	1·0	0·4	1·0	1·5	1·5	–
	VOLUME (m³)	4,450	4,300	920	8,630	3,250	4,550	1,530	3,650	7,650	410	39,340
COARSE SAND	DEPTH (m)	8·5	13·5	10·7	4·0	0·8	4·0	10·4	3·5	3·5	3·3	–
	VOLUME (m³)	37,830	58,050	32,640	23,000	2,600	18,200	39,780	12,780	17,850	910	243,640
FINE SAND	DEPTH (m)	–	–	–	–	–	–	–	–	–	4·0	–
	VOLUME (m³)	–	–	–	–	–	–	–	–	–	1,100	1,100
WASTE	DEPTH (m)	2·0	–	–	–	–	–	–	–	–	–	–
	VOLUME (m³)	8,900	–	–	–	–	–	–	–	–	–	8,900

ROAD

HOLE NUMBER		C1 1	MC 18	MC 17	MC 1	MC 23	TOTAL
AREA OF INFLUENCE (m²)		3,650	825	1,250	3,200	1,050	–
OVERBURDEN	DEPTH (m)	1·0	1·0	1·0	1·5	1·5	–
	VOLUME (m³)	3,650	830	1,250	4,800	1,580	12,110
COARSE SAND	DEPTH (m)	12·0	8·5	13·5	3·3	4·0	–
	VOLUME (m³)	43,800	7,010	16,880	10,560	4,200	82,450
FINE SAND	DEPTH (m)	–	–	–	4·0	–	–
	VOLUME (m³)	–	–	–	12,800	–	12,800

COMBINED VOLUME TOTALS

Overburden ..... 123,500 m³

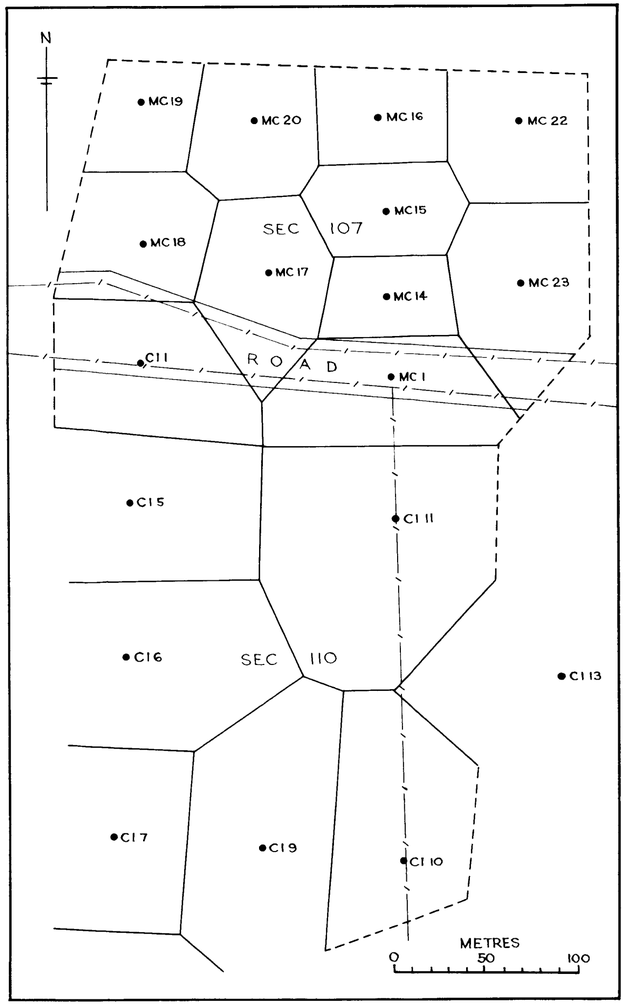
Coarse construction sand . 464,000 m³

Fine construction sand ..... 187,000 m³

Waste ..... 9,000 m³

SECTION 110

HOLE NUMBER		C1 1	MC17	MC 1	C1 11	C1 10	MC 23	TOTAL
AREA OF INFLUENCE (m²)		3,550	40	3,300	14,000	8,500	20	–
OVERBURDEN	DEPTH (m)	1·0	1·0	1·5	1·5	5·0	1·5	–
	VOLUME (m³)	3,550	40	4,950	21,000	42,500	30	72,070
COARSE SAND	DEPTH (m)	12·0	13·5	3·3	6·0	–	4·0	–
	VOLUME (m³)	42,600	540	10,890	84,000	–	80	138,110
FINE SAND	DEPTH (m)	–	–	4·0	9·0	4·0	–	–
	VOLUME (m³)	–	–	13,200	126,000	34,000	–	173,200



MONARTO CONSTRUCTION SAND INVESTIGATION

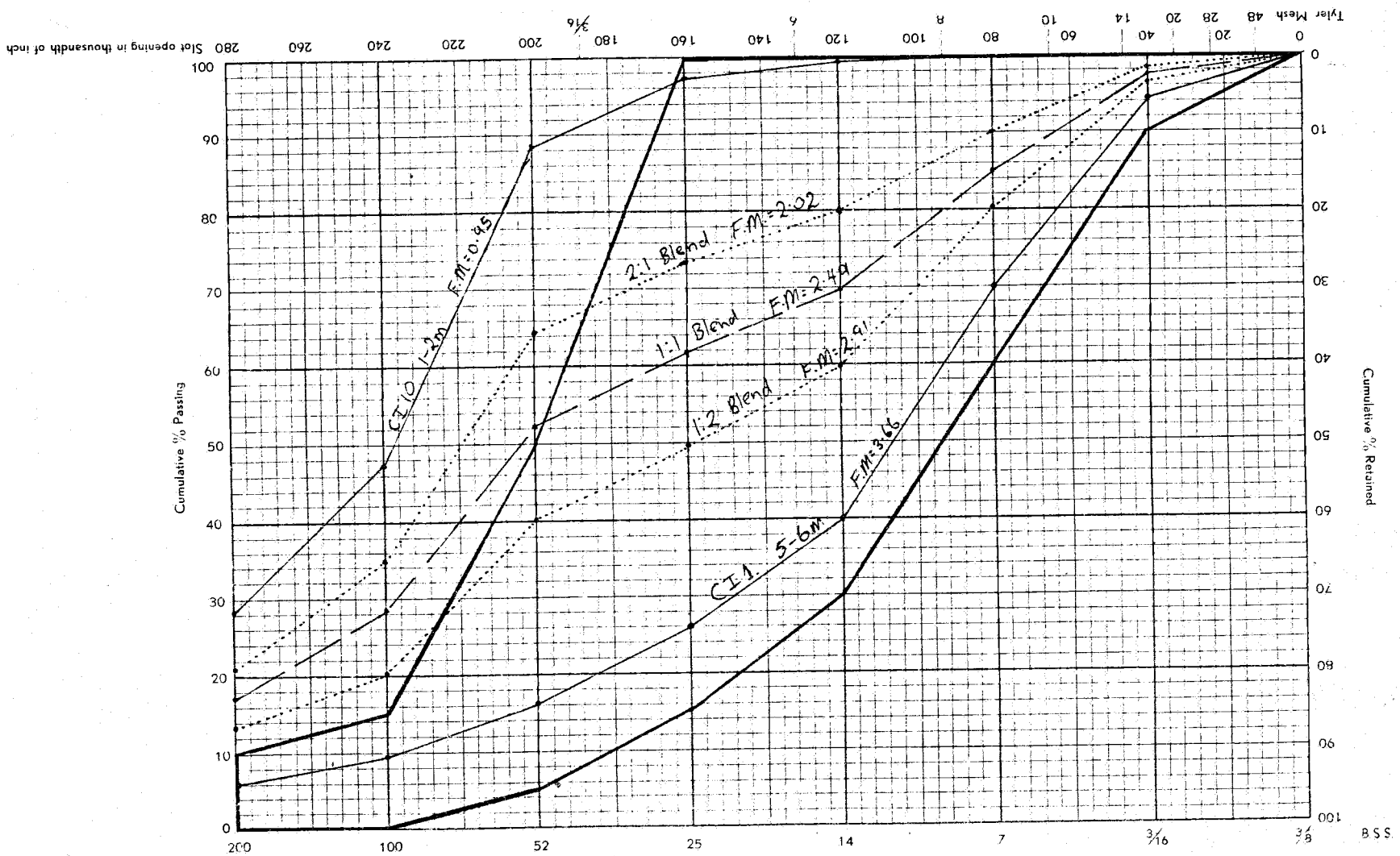
TEPKO SAND DEPOSIT

RESERVE CALCULATIONS

COMPILED BY A. M. PAIN

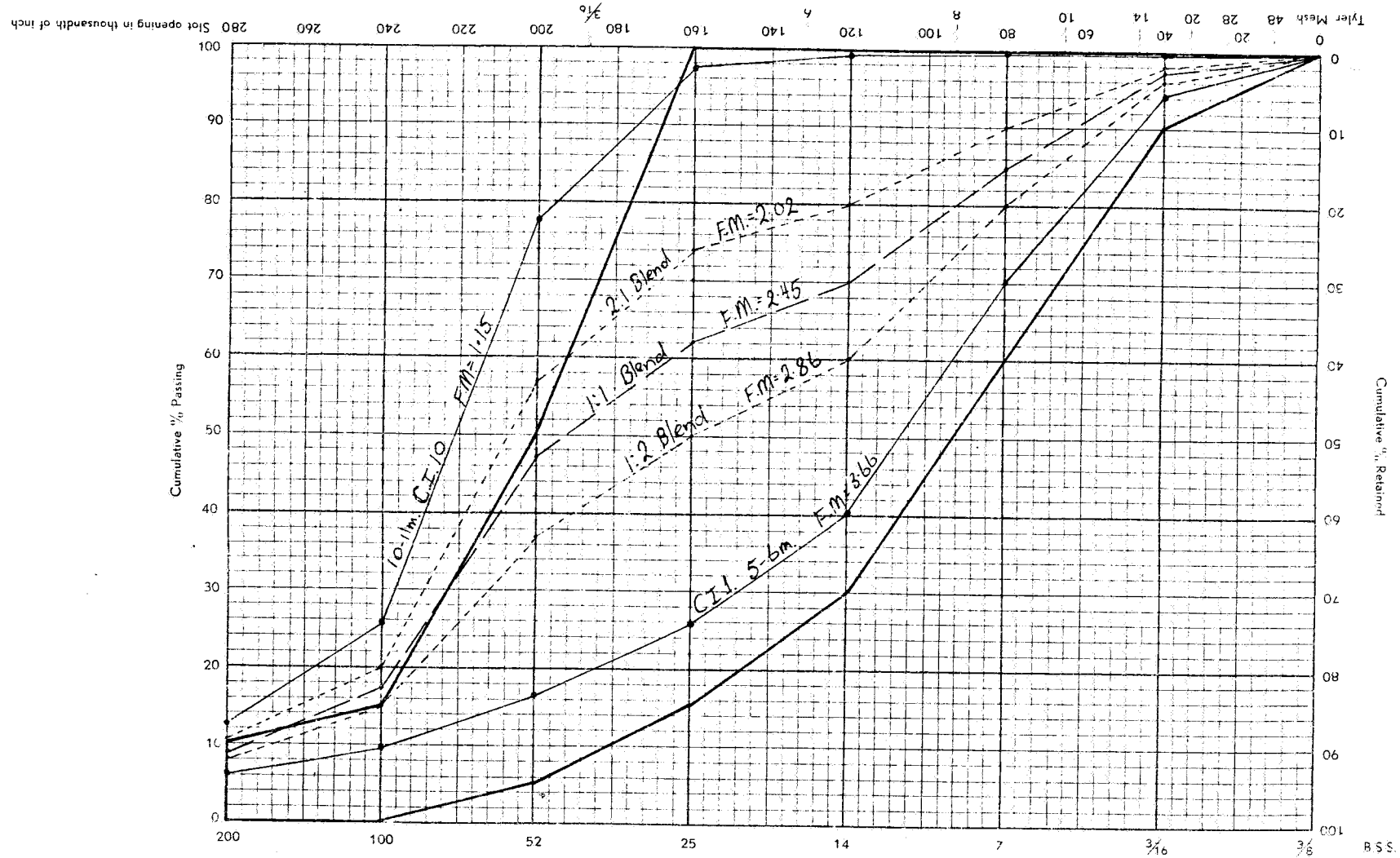
APPENDIX V

Examples of Blending Coarse and Fine Material



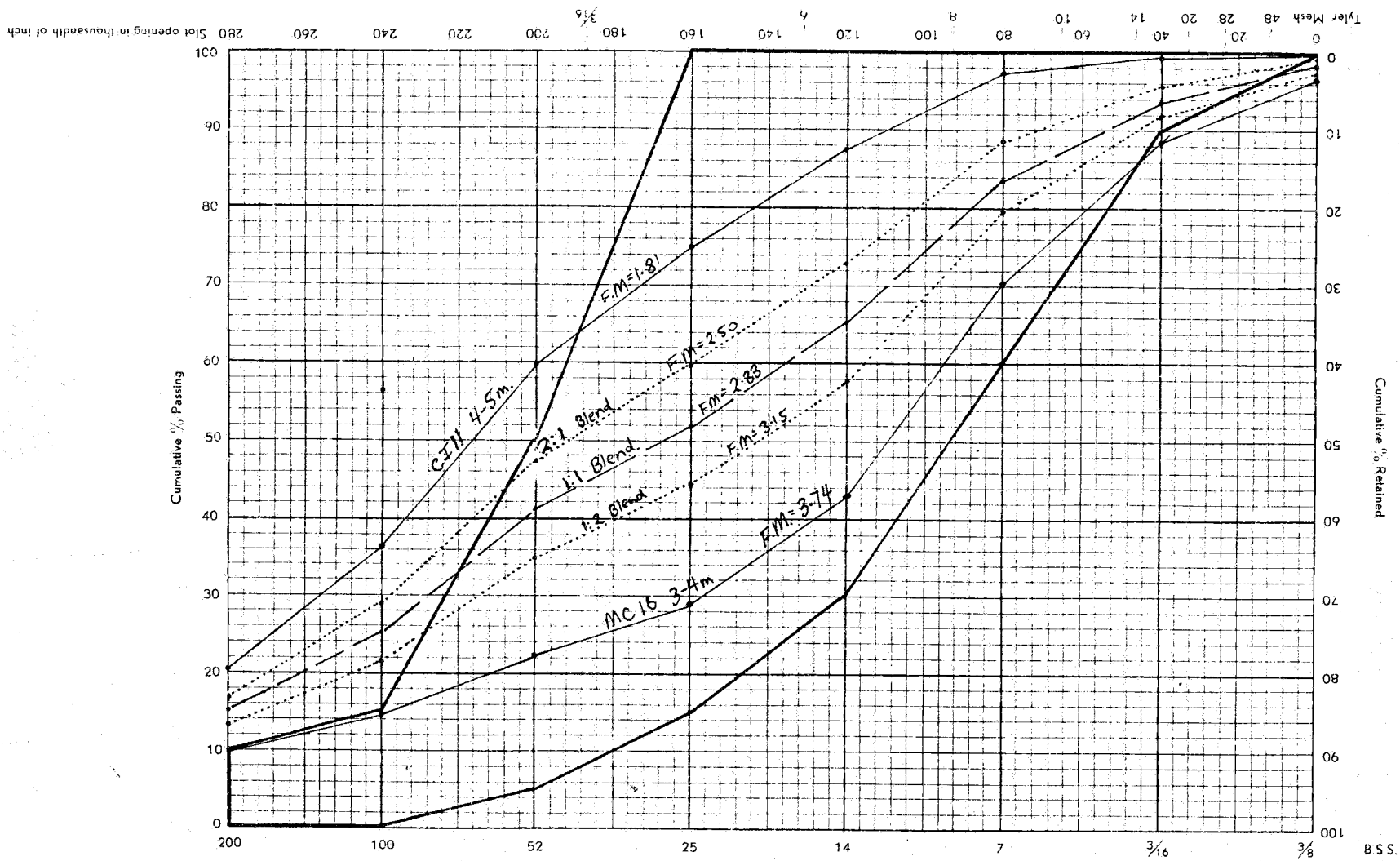
Size gradings obtained by blending CI 10 1-2m with CI 1 5-6m.

Note that CI 10 1-2m. is outside A77 envelope, but blending can produce useable materials.

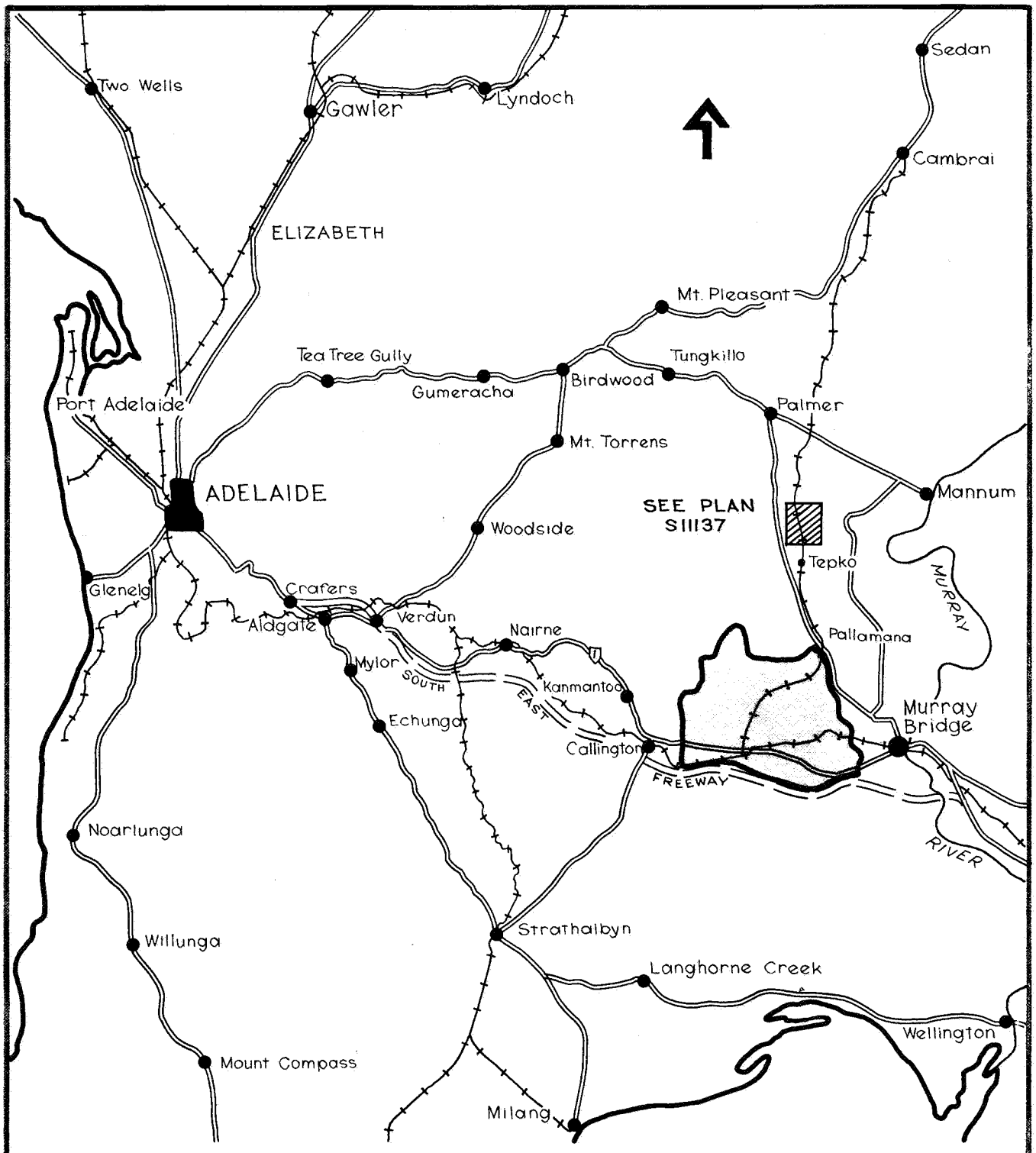


Size gradings obtained by blending . CI10, 10-11m. with CI1 5-6m.

Note that CI10 10-11m. is outside the A77 envelope, but blending can produce useable materials.



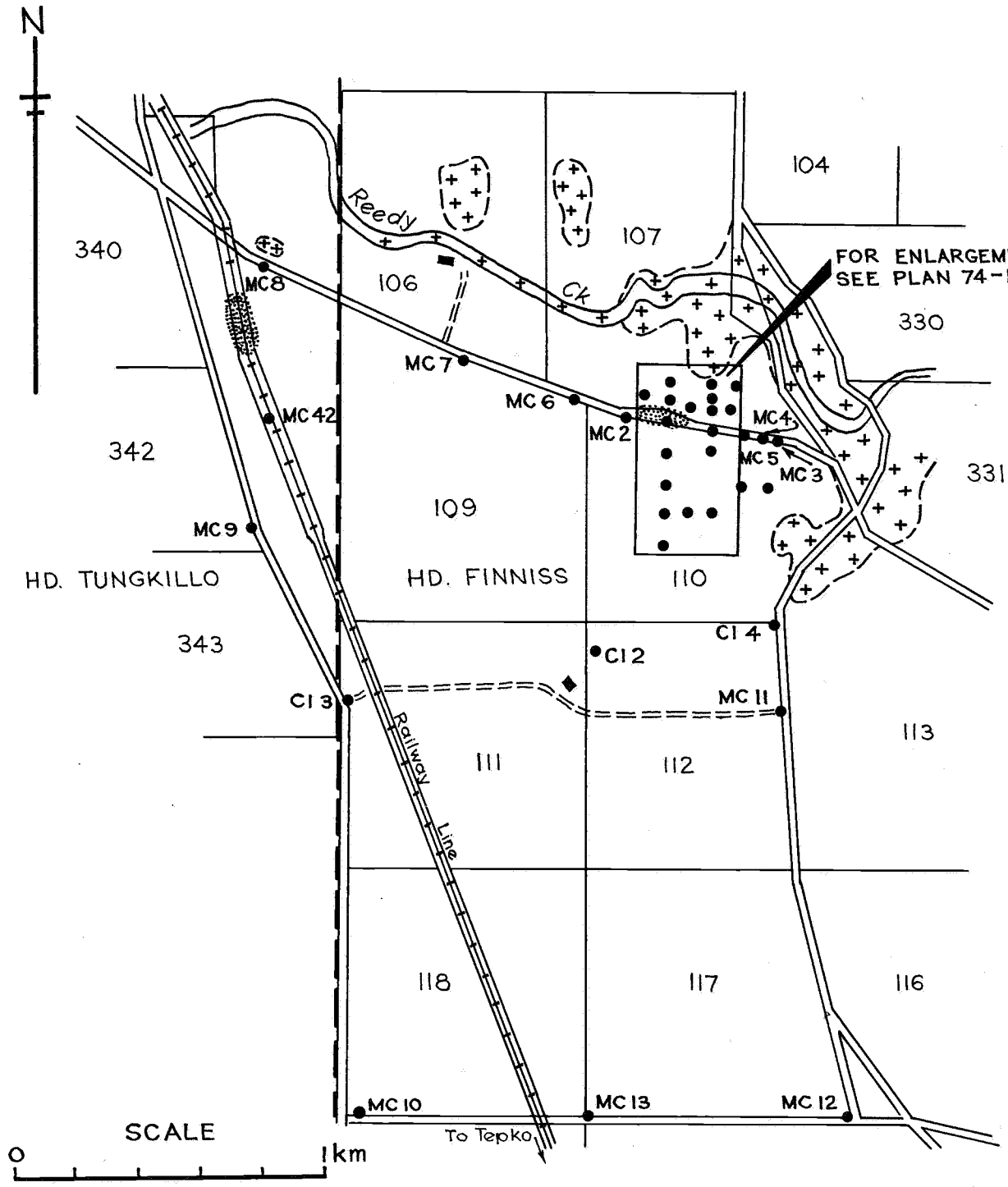
Size gradings obtained by blending C.I.11; 4-5m. with M.C.16; 3-4m



DEPARTMENT OF MINES — SOUTH AUSTRALIA

EXTRACTIVE MINERALS SECTION	*Drn.* A.M.P *Tcd.* A.F. *Ckd.* A.F. *Exd.*	MONARTO CONSTRUCTION SAND INVESTIGATION TEPKO SAND DEPOSIT LOCALITY PLAN (CONCRETE INDUSTRIES–MONIER PTY.LTD)	**SCALE:** 1:500 000 S11148 **DATE:** November 1974

6728–111
500–2.69 685



LEGEND

Migmatites of the Kanmantoo Group.

Outcrops of Parilla Sand Equivalent in road and railway cuttings.

• MC7 Gemco drill hole and number

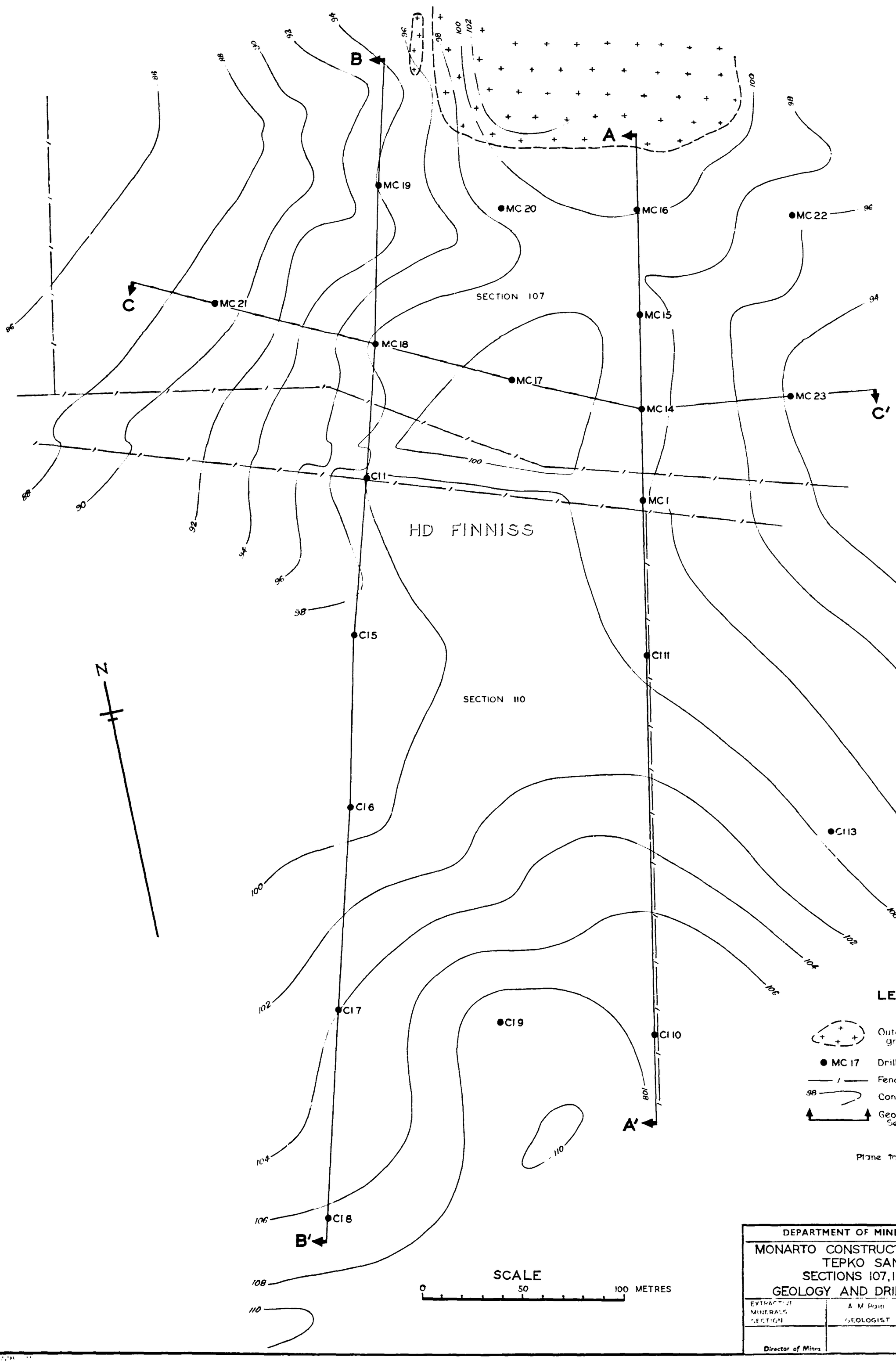
107 ..... Section number

DEPARTMENT OF MINES — SOUTH AUSTRALIA

EXTRACTIVE MINERALS SECTION	Drn. AMP	MONARTO CONSTRUCTION SAND INVESTIGATION	SCALE: 1:20 000
	Tcd. A.F.	TEPKO AREA	S11137
A.M. Pain	Ckd. A.F.	DRILL HOLE LOCATIONS	
GEOLOGIST	Exd.	(CONCRETE INDUSTRIES - MONIER PTY.LTD)	DATE: November 1974

6728-111

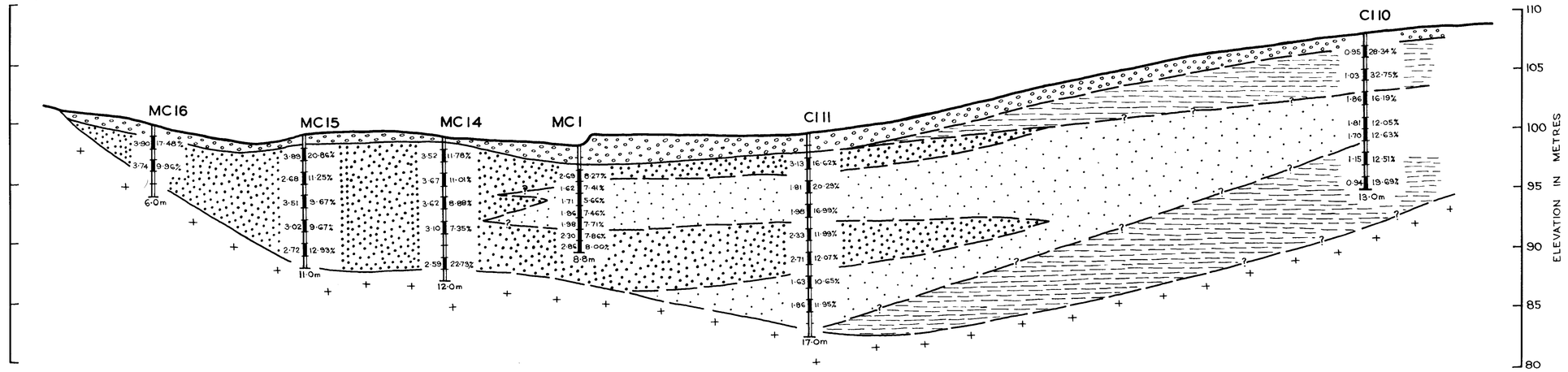
500-2.69 665

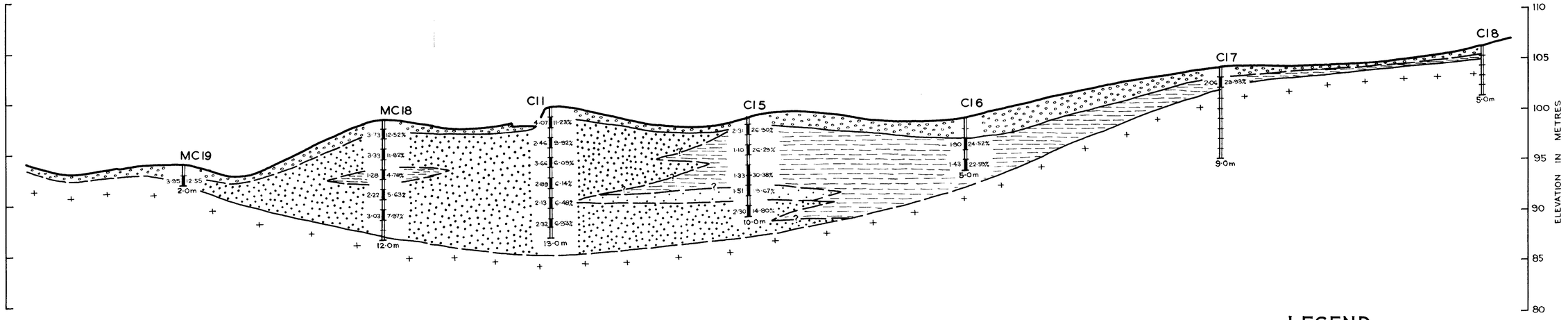


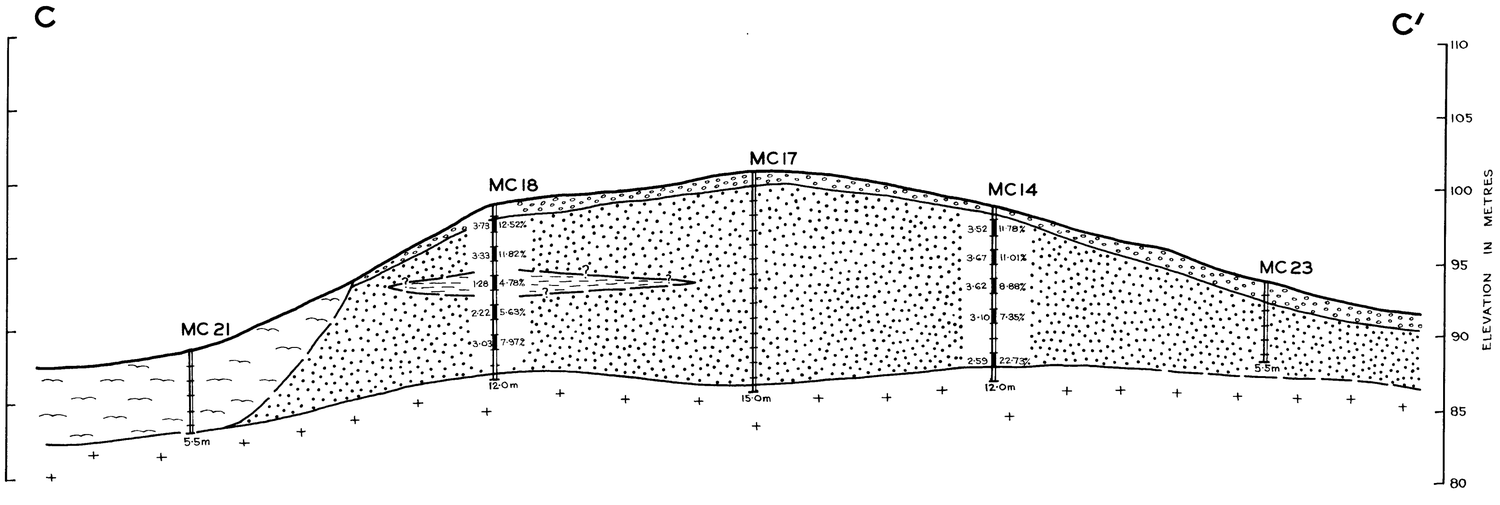
DEPARTMENT OF MINES — SOUTH AUSTRALIA

MONARTO CONSTRUCTION SAND INVESTIGATION
TEPKO SAND DEPOSIT
SECTIONS 107,110 HD FINNISS
GEOLOGY AND DRILL HOLE LOCATIONS

EXTRACTIVE MINERALS SECTION	A M Pain GEOLOGIST	Compiled A M P	Scale 1:1000
			Date: November 1974
Director of Mines		Drn. A F	Drg. No. 74–1007
		Ckd. A F	







HORIZONTAL SCALE 1:1000

0 50 100 METRES

VERTICAL SCALE 1:250 $\frac{V}{H} = 4{\cdot}0$

ELEVATION DATUM - ARBITRARY

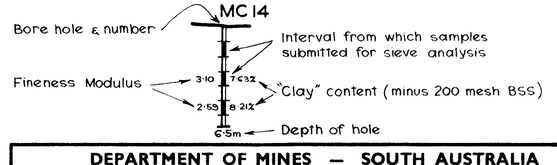
LEGEND

QUATERNARY – RECENT
- ALLUVIUM

QUATERNARY
- "OVERBURDEN": Discontinuous veneer of red-brown aeolian sand overlying off-white calcreted Tertiary sands and gravels.

TERTIARY
- COARSE CONSTRUCTION SAND: Yellow-orange coarse sand with gravel lenses. Fineness Modulus between 2·00 & 4·00; clay < 20%
- FINE CONSTRUCTION SAND: Yellow-orange fine sand and silty sand Fineness Modulus between 1·35 & 2·00; clay < 20%
- SILT AND CLAY: Yellow-orange very fine sand silt and clay. Fineness Modulus less than 1·35; clay > 20%

PALAEOZOIC
- "BASEMENT": Granite gneiss and migmatites.



DEPARTMENT OF MINES — SOUTH AUSTRALIA

MONARTO CONSTRUCTION SAND INVESTIGATION
TEPKO SAND DEPOSIT
SECTIONS 107, 110 HD FINNISS
GEOLOGICAL SECTIONS

EXTRACTIVE MINERALS SECTION	A. M. Pain GEOLOGIST	Drn. A.M.P.	SCALE: 1:1000 HORIZONTAL
		Tcd. A.F.	74—1008
Director of Mines		Ckd. A.F.	
		Exd.	DATE: November 1974

6728—111