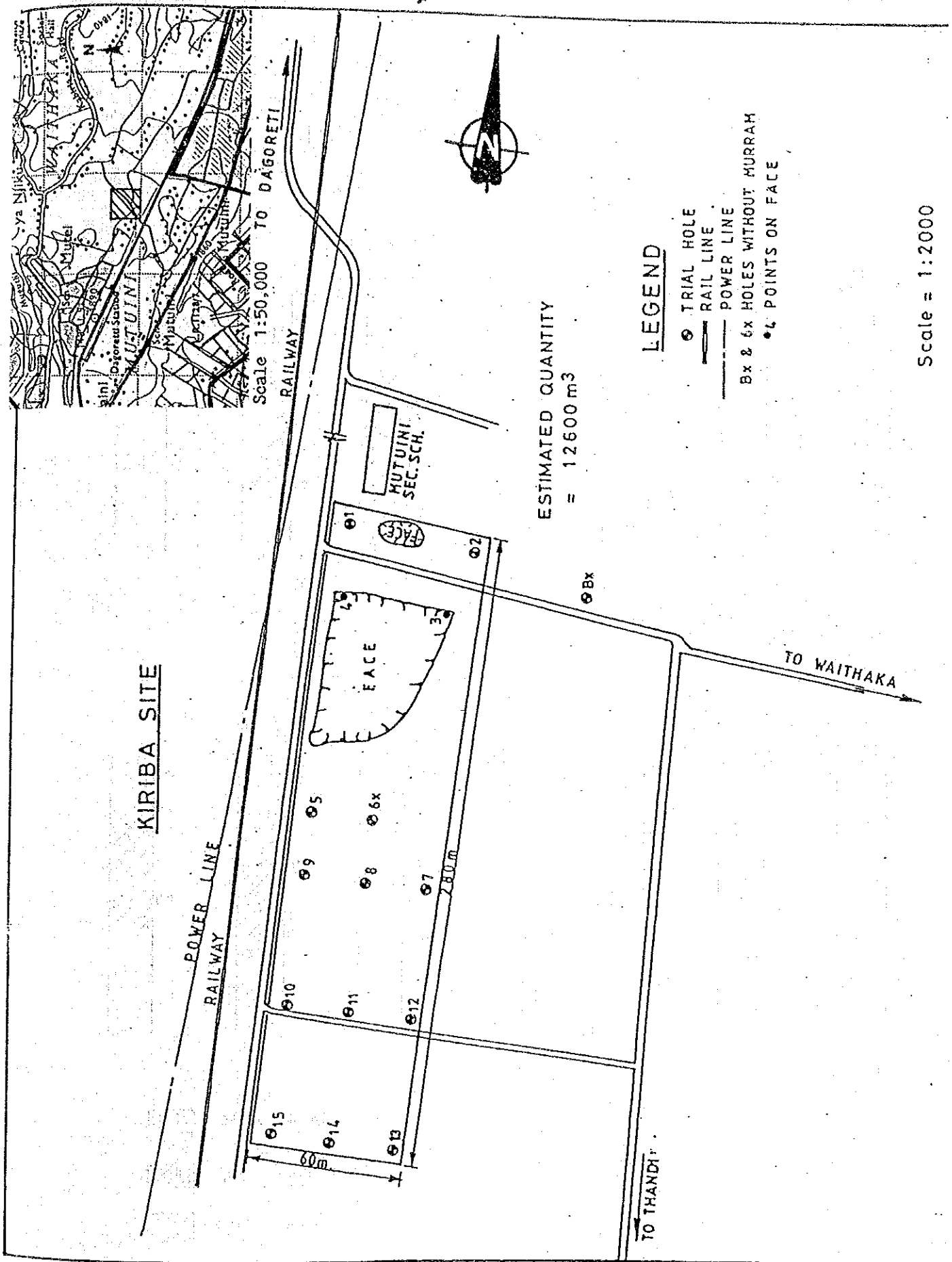
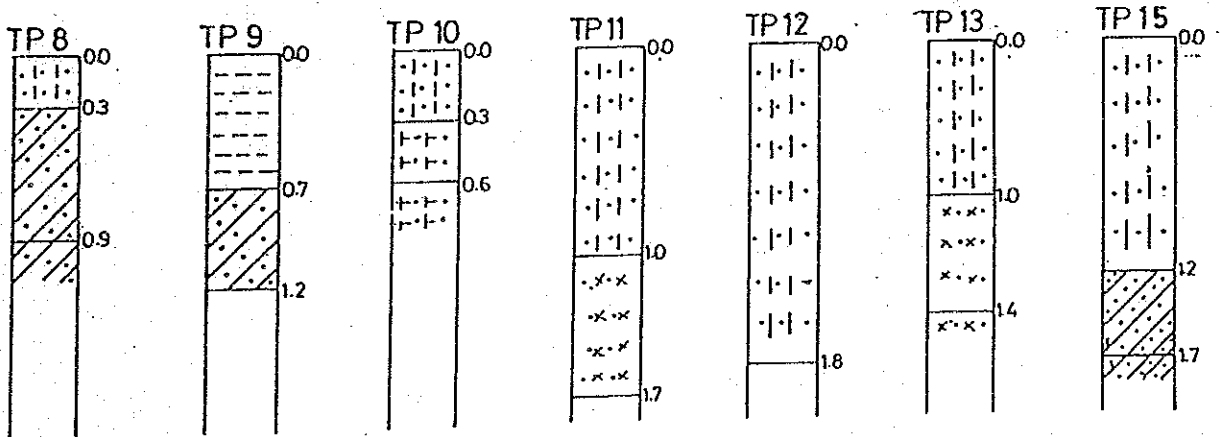
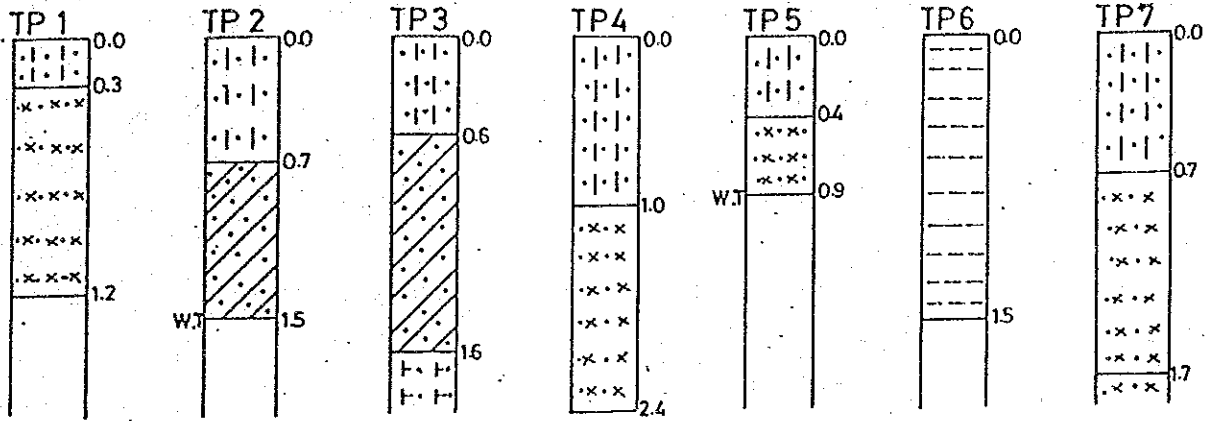







4. GRAVEL MATERIAL SITE INVESTIGATION RESULTS



Scale = 1:2000

GRAVEL MATERIAL SITE No.10 - KIRIBA



-  DARK BROWN SOIL
-  GREY BLACK GRAVEL
-  STIFF GRAVEL
-  BLACK COTTON SOIL
-  BLACK BROWN GRAVEL

KIRIBA GRAVEL QUARRY

HOLE NO.	DEPTH (M)	DESCRIPTION
1	0 - 0.3	Dark brown soil
	0.3 - 1.2 ⁺	Black brown gravel
2	0 - 0.7	Dark brown soil
	0.7 - 1.5	Grey black gravel
	1.5 ⁺ -	Water table level
3	0 - 0.6	Dark brown soil
	0.6 - 1.6	Grey black gravel
	1.6 ⁺	Compact murram
4	0 - 1.0	Dark brown soil
	1.0 - 2.4	Black brown gravel
5	0 - 0.4	Dark brown soil
	0.4 - 0.9	Black brown gravel
	0.9 ⁺	Water table level
6	0 - 1.5	Black cotton soil
7	0 - 0.7	Dark brown soil
	0.7 - 1.7 ⁺	Black brown gravel
8	0 - 0.3	Dark brown soil
	0.3 - 0.9	Grey black gravel
9	0 - 0.7	Black cotton soil
	0.7 - 1.2	Grey black gravel
10	0 - 0.3	Dark brown soil
	0.3 - 0.6 ⁺	Stiff gravel

HOLE NO.	DEPTH (M)	DESCRIPTION
11	0 - 1.0	Dark brown soil
	1.0 - 1.7 ⁺	Black brown gravel
12	0 - 0.8	Dark brown soil
13	0 - 1.0	Dark brown soil
	1.0 - 1.4 ⁺	Black brown gravel
15	0 - 1.2	Dark brown soil
	1.2 - 1.7 ⁺	Grey black gravel

KIRJBA MATERIAL SITE

Partly an old site with New extension.

Quantity estimate

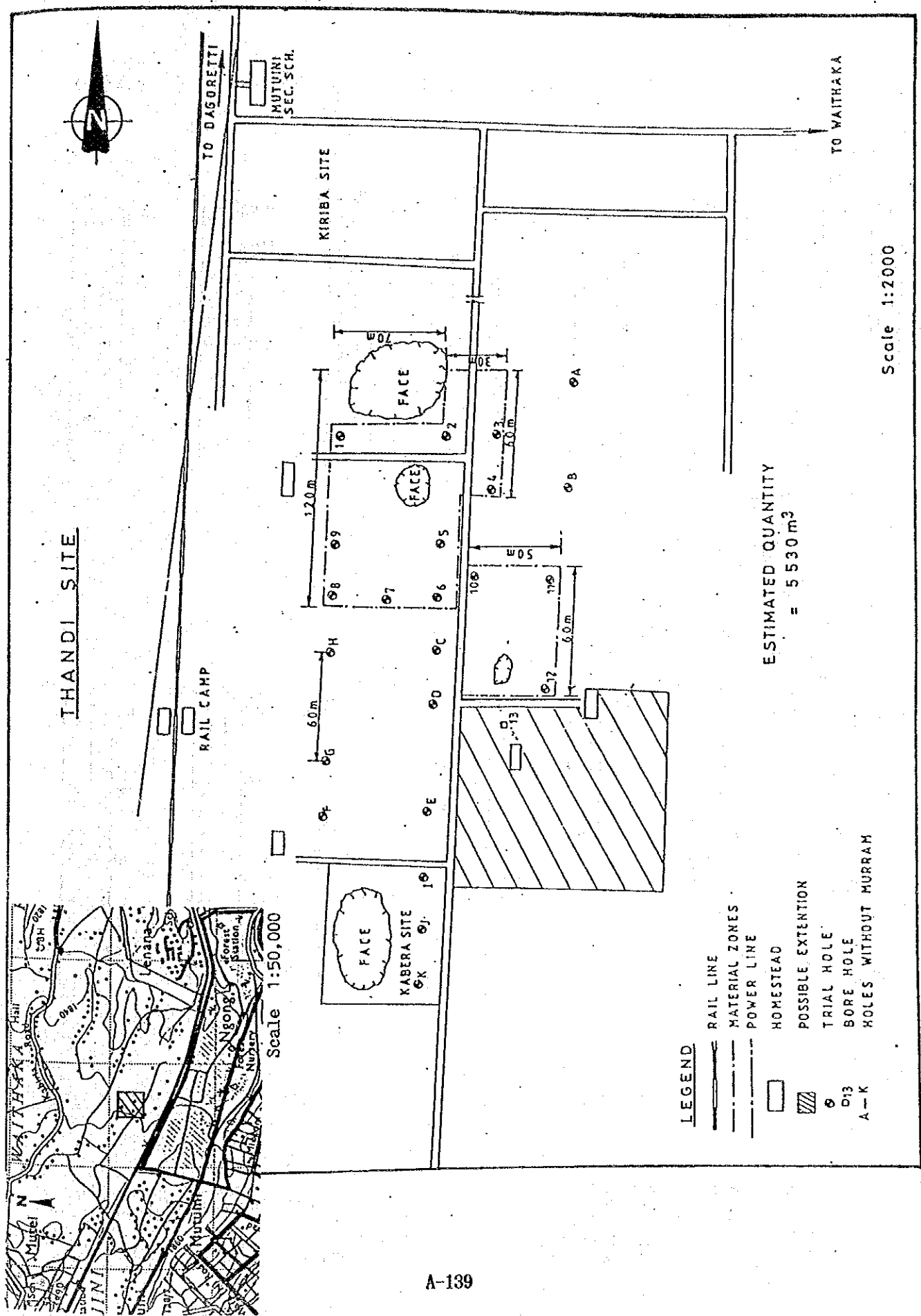
Area = 12600m²

Average thickness of gravel = 1m

Volume = 12600m³

The old quarry was exploited by individuals for house construction. It is out of use and water lodged.

Ownership - The old quarry is Government owned. While the extension is private.



THANDI SITE

TO DAGORETTI

RAIL CAMP

MUTINI SEC. SCH.

KIRIBA SITE

FACE

FACE

FACE
KABERA SITE
ØK 1Ø

TO WAITHAKA

ESTIMATED QUANTITY
= 5530 m³

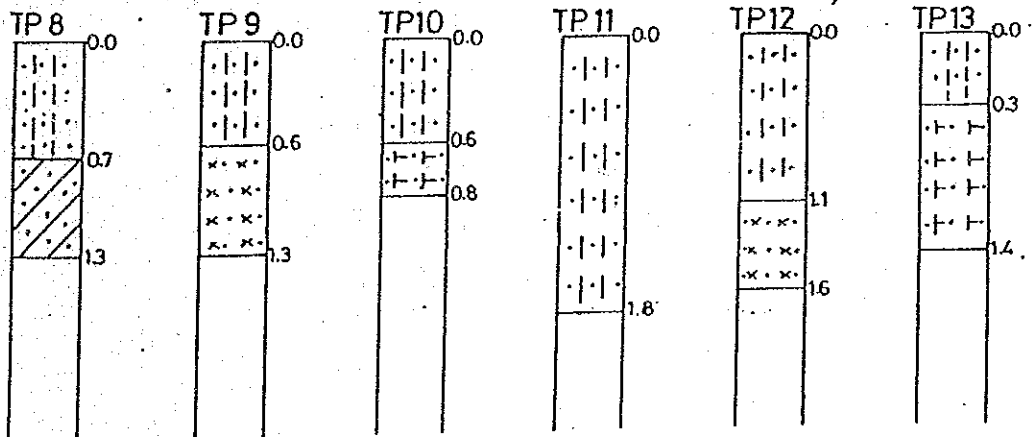
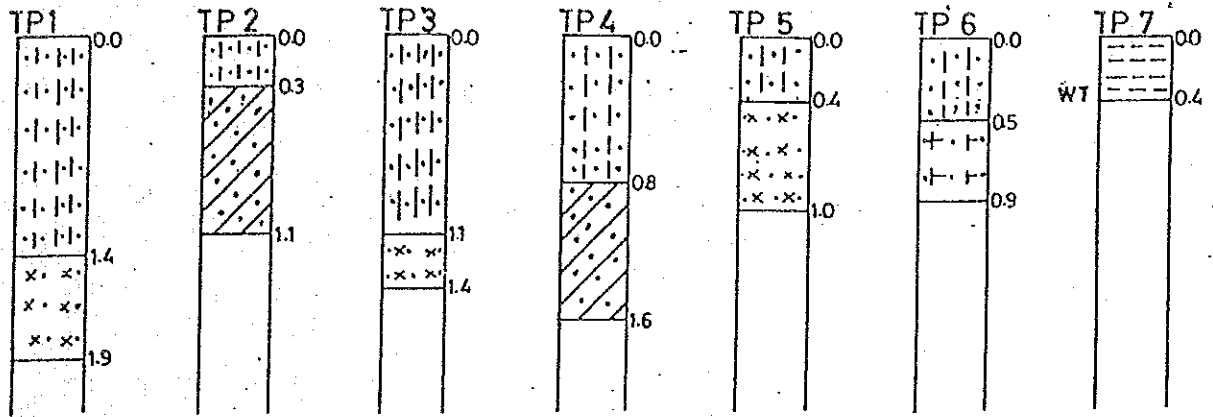
Scale 1:2000


LEGEND


- RAIL LINE
- MATERIAL ZONES
- POWER LINE
- HOMESTEAD
- POSSIBLE EXTENTION
- TRIAL HOLE
- BORE HOLE
- HOLES WITHOUT MURRAM


Scale 1:50,000


GRAVEL MATERIAL SITE No.9 - THANDI



 DARK BROWN SOIL

 GREY BLACK GRAVEL

 BLACK COTTON SOIL

 BLACK BROWN GRAVEL

 STIFF GRAVEL

THANDI MATERIAL SITE - LOGGING DETAILS

HOLE NO.	DEPTH (M)	DESCRIPTION
1	0 - 1.4	Dark brown soil
	1.4 - 1.9	Black Brown gravel
2	0 - 0.3	Dark brown soil
	0.3 - 1.1	Grey black gravel
3	0 - 1.10	Dark brown soil
	1.1 - 1.40	Black Brown gravel
4	0 - 0.3	Dark brown soil
	0.8 - 1.6	Grey black gravel
5	0 - 0.4	Dark brown soil
	0.4 - 1.0	Black Brown gravel
	0 - 0.5	Dark brown soil
	0.5 - 0.8	Stiff gravel
	0.8 - 0.9	Gravel with clay
7	0 - 0.4	Black cotton soil
	0.4	Water table level
8	0 - 0.7	Dark brown soil
	0.7 - 1.3	Grey black gravel
	1.3	Water table level
9	0 - 0.6	Dark brown soil
	0.6 - 1.3	Black Brown gravel

HOLE NO.	DEPTH (M)	DESCRIPTION
10	0 - 0.6	Dark brown soil
	0.6 - 0.8	Stiff gravel
11	0 - 1.8	Dark Brown soil
12	0 - 1.1	Dark brown soil
	1.1 - 1.6	Black Brown gravel
13	0 - 0.3	Dark brown soil
	0.3 - 1.4	Stiff gravel
A	0 - 2.0 ⁺	Dark brown soil
B	0 - 2.0 ⁺	Dark brown soil
C	0 - 1.0	Black cotton soil
	1.0	Water table level
D	0 - 0.9	Black cotton soil
E	0 - 1.5 ⁺	Black cotton soil
F	0 - 1.5 ⁺	Black cotton soil
G	0 - 1.5 ⁺	Black cotton soil
H	0 - 1.5 ⁺	Black cotton soil

THANDI MATERIAL SITE

It is largely a new site.

Quantity Estimate

Area = 9220

Average thickness of gravel = 0.6m

Volume = 5530

The quarry next to the proposed new site was exploited by Kiambu County Council for a road construction.

Lease / sell of plots

Plot owners are willing to lease their plots provided they will be backfilled preferably with borrow materials.

Future Development

No immediate development plans.

DAGORETTI SITE



TO NAIROBI

TO KIKUYU

TO MUTUINI SEC. SCH.

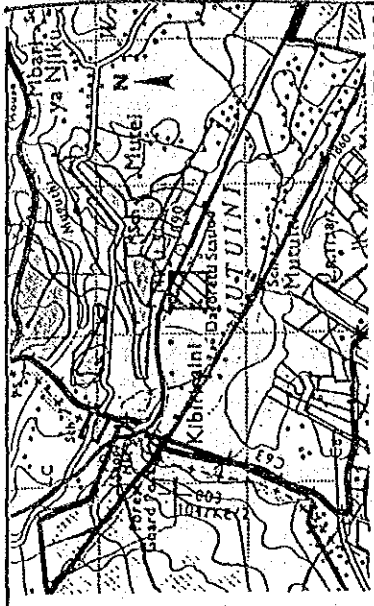
DAGORETTI MARKET

RAIL STATION

TO MUTUINI PRI. SCH.

TO KAREN

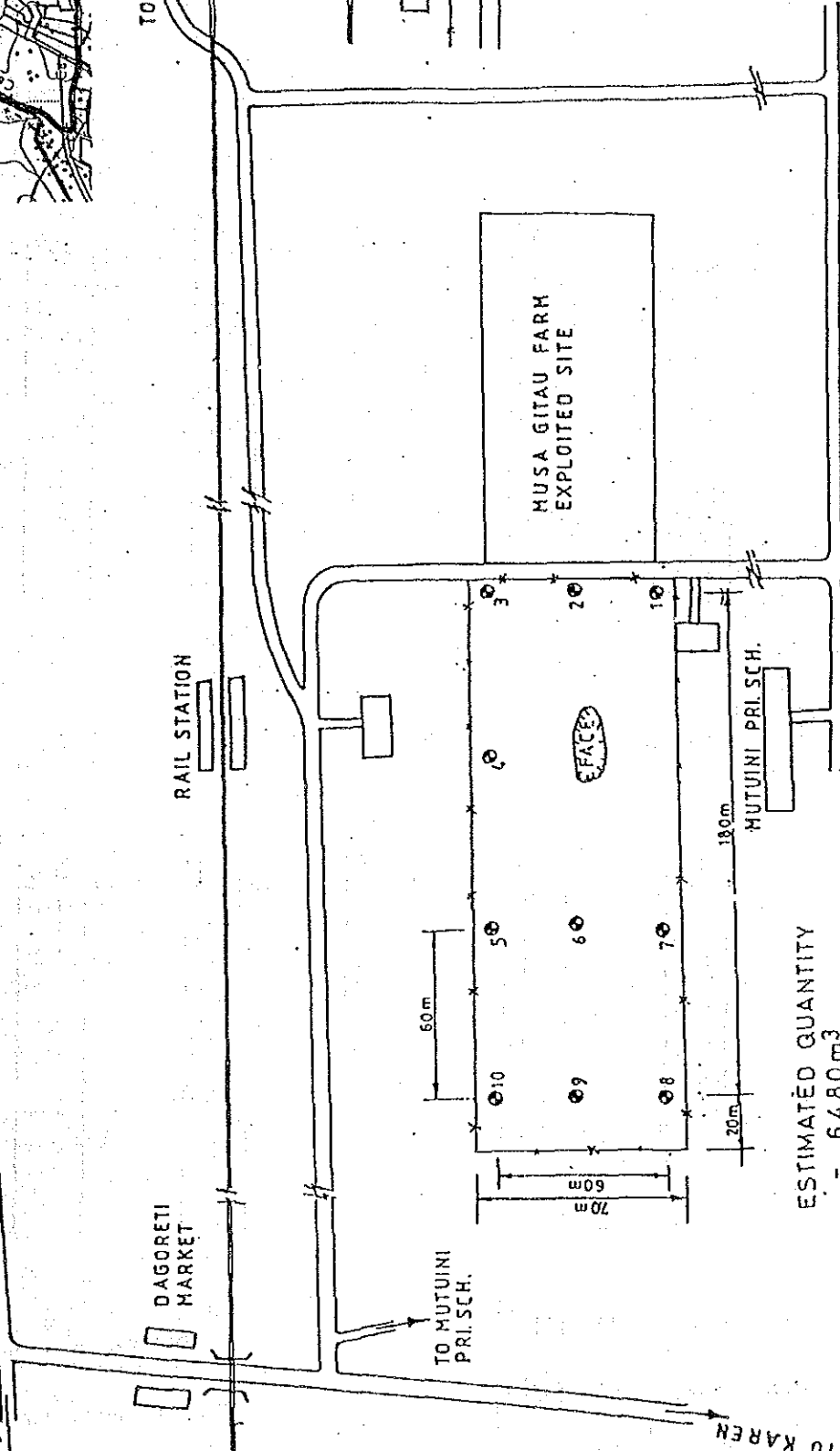
A-144



Scale 1:50,000

LEGEND

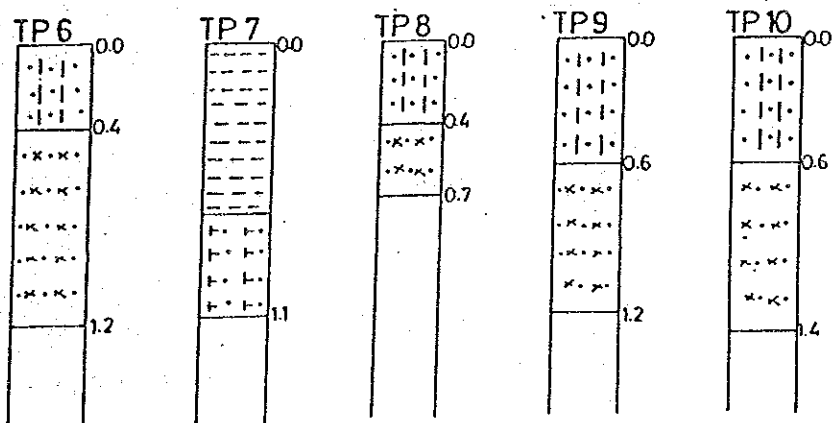
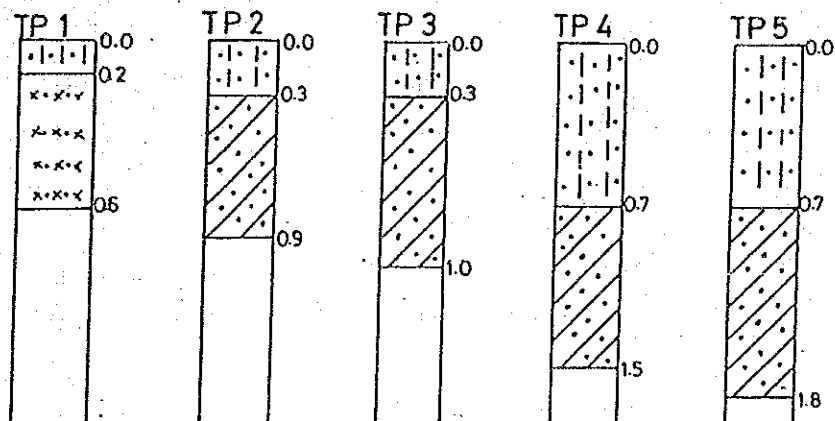
- RAIL LINE
- TRIAL HOLE
- HOMESTEAD
- SITE BOUNDARY
- ROADS



ESTIMATED QUANTITY
= 6480 m³

Scale 1:2000

GRAVEL MATERIAL SITE No.12 – DAGORETTI



DARK BROWN SOIL



BLACK BROWN GRAVEL



BLACK COTTON SOIL



STIFF GRAVEL



GREY BLACK GRAVEL

DAGORETTI GRAVEL QUARRY

<u>HOLE NO.</u>	<u>DEPTH (M)</u>	<u>DESCRIPTIONS</u>
1	0 - 0.2	Dark brown soil
	0.2 - 0.6	Black brown gravel
2	0 - 0.3	Dark brown soil
	0.3 - 0.9	Grey-black gravel
3	0 - 0.3	Dark brown soil
	0.3 - 1.0	Grey black gravel
4	0 - 0.7	Dark brown soil
	0.7 - 1.5	Grey gravel
5	0 - 0.7	Dark brown soil
	0.7 - 1.8	Grey gravel
6	0 - 0.4	Dark brown soil
	0.4 - 1.2	Black brown gravel
7	0 - 0.8	Black cotton soil
	0.8 - 1.1	Stiff gravel
8	0 - 0.4	Dark Brown Soil
	0.4 - 0.7	Black brown gravel
9	0 - 0.6	Dark brown soil
	0.6 - 1.2	Black brown gravel
10	0 - 0.6	Dark brown soil
	0.6 - 1.4	

DAGORETTI MATERIAL SITE

It is a new site.

Quantity estimate

Area = 10800 m²

Average thickness of gravel = 0.6m

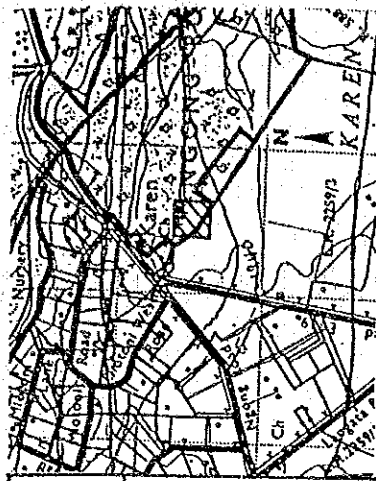
Volume = 6480m³

Lease/Sell of plots

Plot owner is willing to lease the plot

Future Development

No immediate development plans.



Scale 1:50,000

**SITE 7A-CHURCH
SITE**

KEY

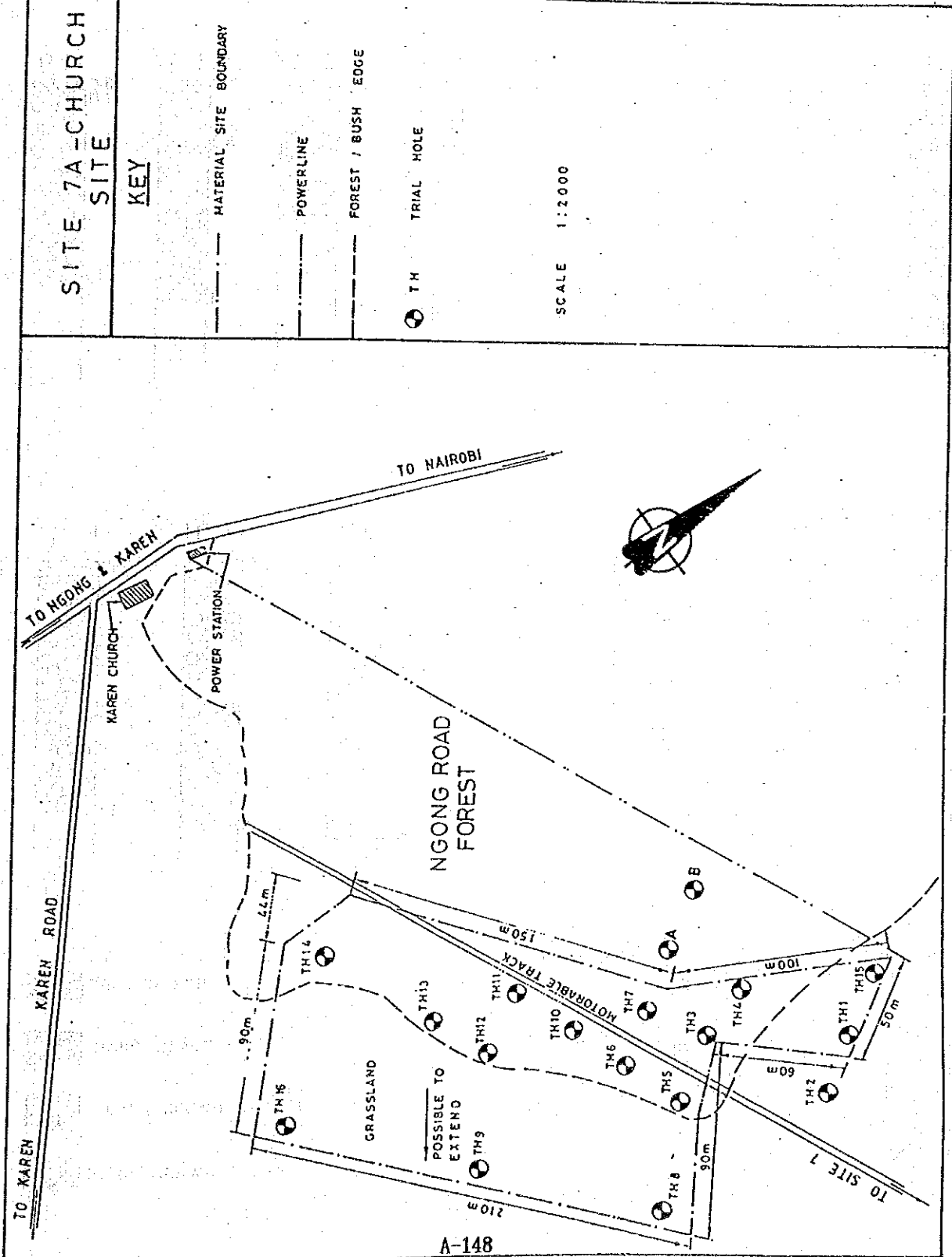
--- MATERIAL SITE BOUNDARY

--- POWERLINE

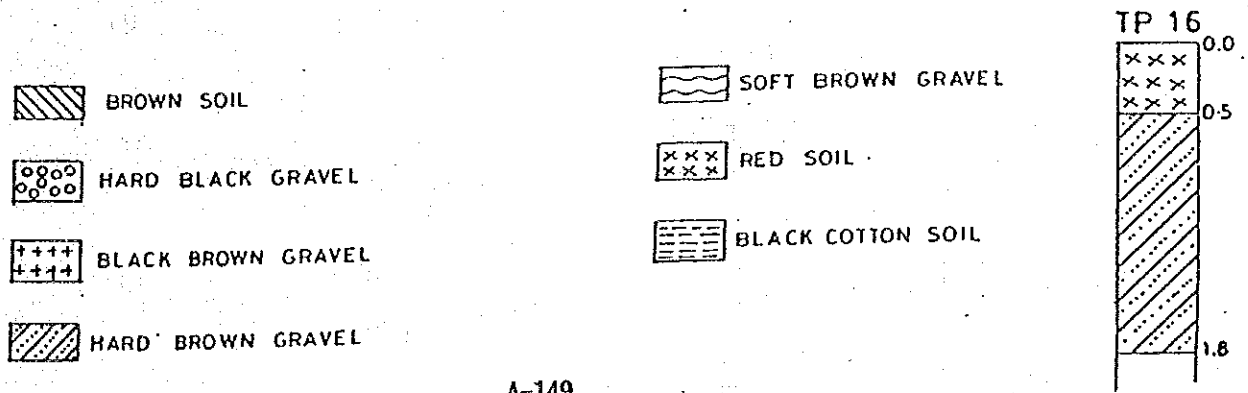
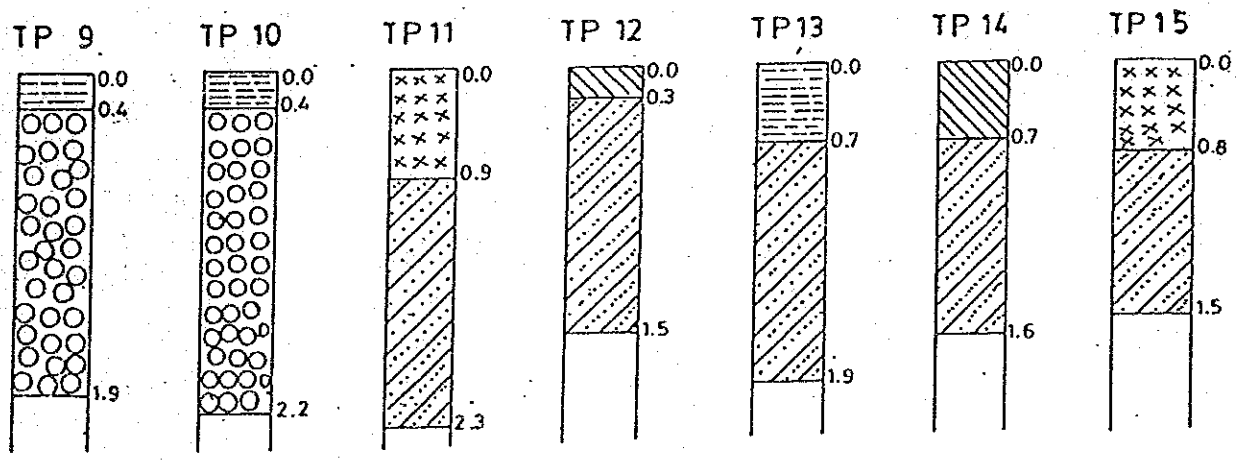
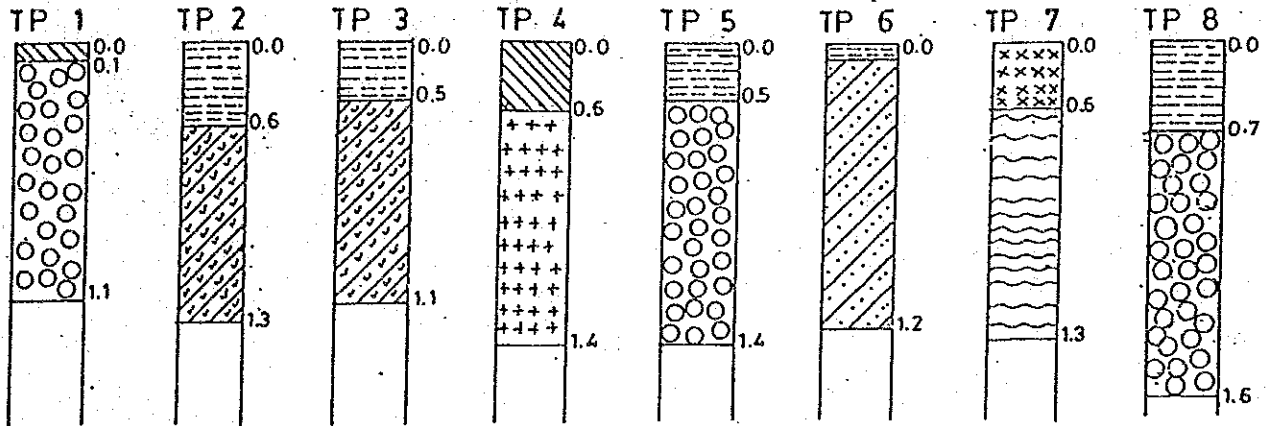
--- FOREST / BUSH EDGE

⊙ TH TRIAL HOLE

SCALE 1:2,000



GRAVEL MATERIAL SITE No. 7A - CHURCH



SITE NO. 7A

CHURCH QUARRY

<u>TRIAL HOLE</u>	<u>DEPTH</u>	<u>DESCRIPTION</u>
1	0.0 - 0.1m	Brown Soil
	0.10 - 1.1m	Hard Black Murram
2	0.0 - 0.6m	Black cotton soil
	0.6 - 1.3m	Yellow soft stone decomposed
3	0.0 - 0.5m	Black cotton soil
	0.5 - 1.1m	Yellow soft stone decomposed
4	0.0 - 0.6m	Brown soil
	0.6 - 1.4m	Black-Brown gravel
5	0.0 - 0.5m	Black cotton soil
	0.5 - 1.4m	Black gravel material
6	0.0 - 0.1m	Black cotton soil
	0.1 - 1.2m	Hard Brown gravel material
7	0.0 - 0.6m	Red soil
	0.6m - 1.3m	Hard Brown gravel materials
8	0.0 - 0.7	Black cotton soil
	0.1 - 1.6	Black gravel
9	0.0 - 0.4	Brown soil
	0.4 - 1.9m	Hard Brown gravel
10	0.0 - 0.4m	Black cotton soil
	0.40m - 2.2m	Black gravel
11	0.0 - 0.9m	Red soil
	0.9 - 2.3m	Hard Brown gravel material

<u>TRIAL HOLE NO.</u>	<u>DEPTH</u>	<u>DESCRIPTION</u>
12	0.0 - 0.3m	Brown soil
	0.3m - 1.5m	Hard Brown gravel material
13	0.0 - 0.7m	Black cotton soil
	0.7 - 1.9m	Hard Brown gravel material
14	0.0 - 0.7m	Brown soil
	0.7 - 1.6m	Hard Brown gravel material
15	0.0 - 0.8m	Red soil
	0.8 - 1.5m	Hard Brown gravel

ESTIMATION OF QUANTITY

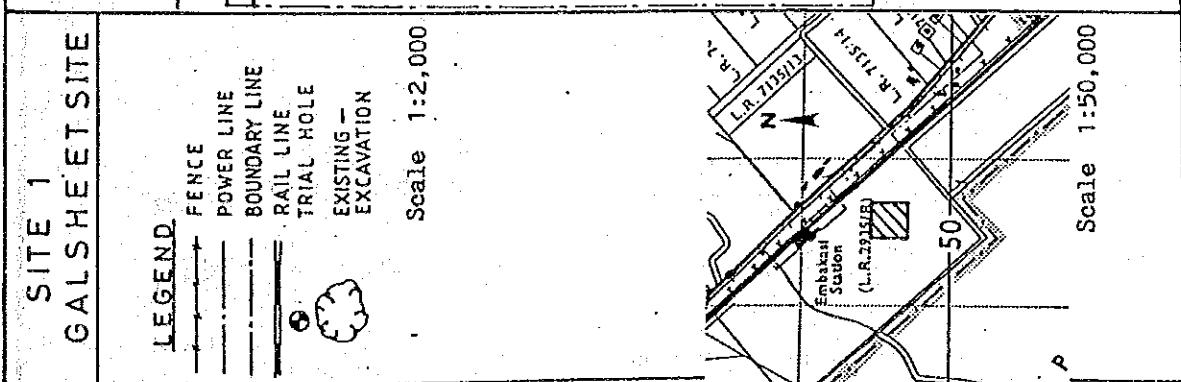
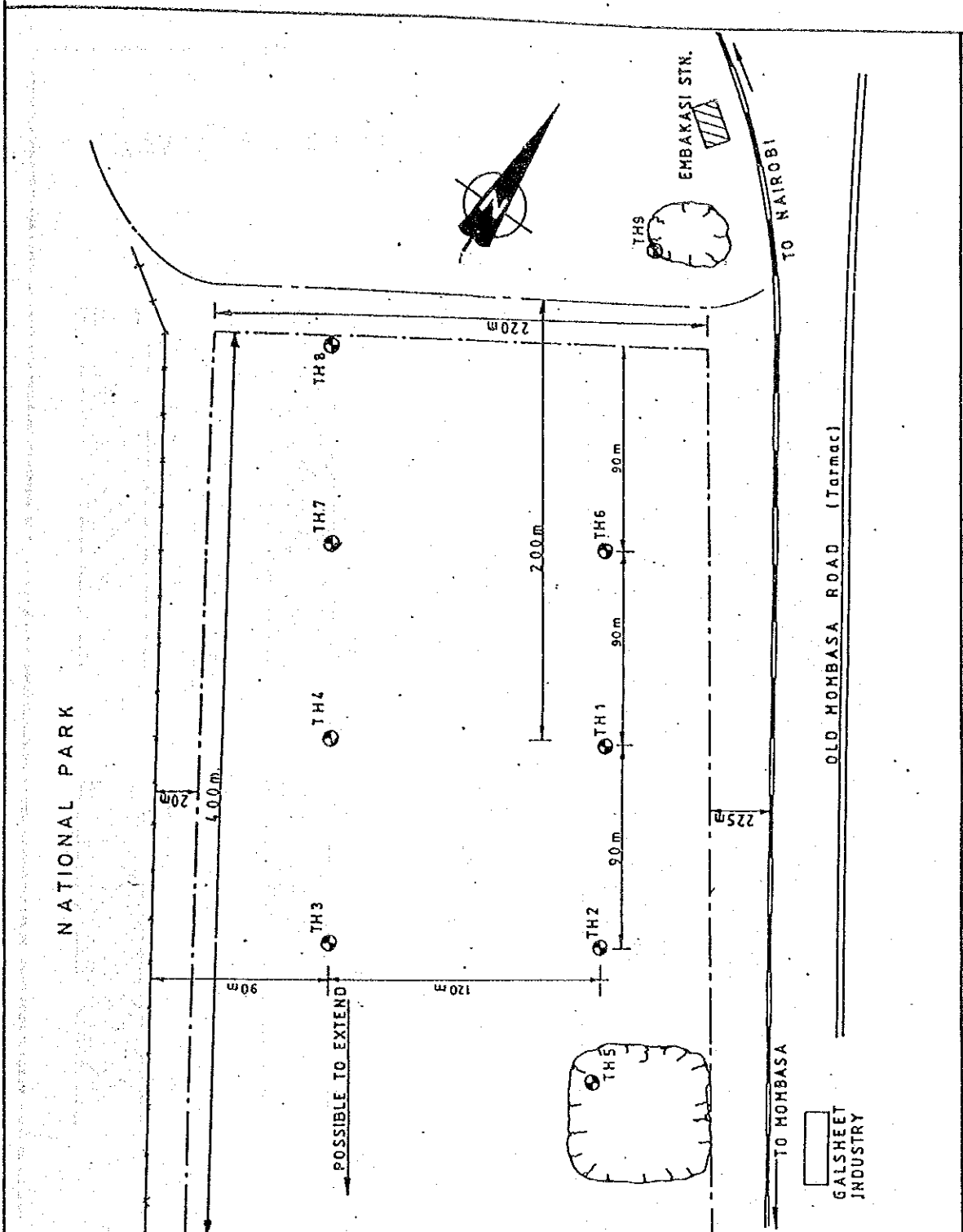
Area = 22050m²
Average overburden = 0.6m
Average Depth of Material = 1.0
Estimated Quantity = 22050

OWNERSHIP

This site is situated on Government land

FUTURE DEVELOPMENT

No immediate future development plans.



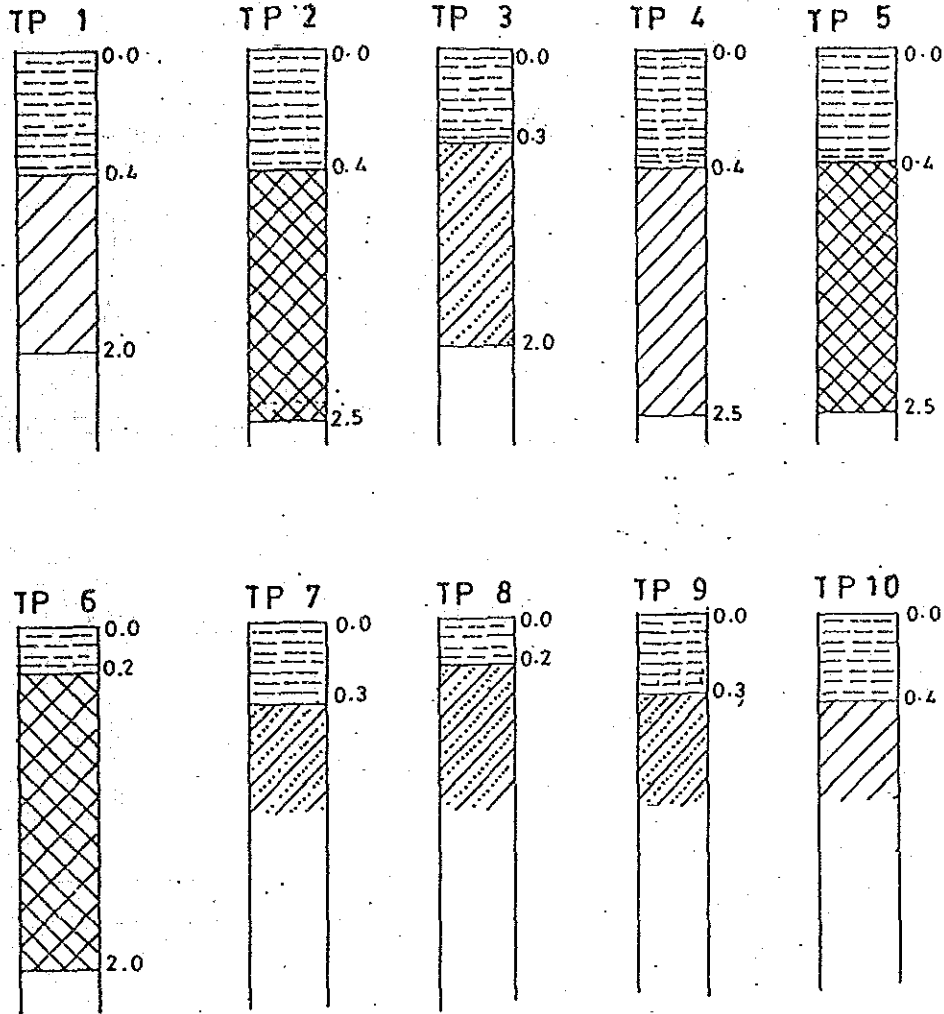
**SITE 1
GALSHEET SITE**


- LEGEND**
- FENCE
 - POWER LINE
 - BOUNDARY LINE
 - RAIL LINE
 - TRIAL HOLE
 - EXISTING - EXCAVATION


Scale 1:2,000


Scale 1:50,000


GRAVEL MATERIAL SITE No. 1 GALSHEET



 BLACK COTTON SOIL

 BLACK DECOMPOSED GRAVEL

 WHITE DECOMPOSED GRAVEL

 DECOMPOSED SOFT ROCK MATERIAL

NOTE:

1. ALL DIMENSIONS IN ALL LOGGING SHEETS ARE IN METRES
2. WT INDICATES WATER TABLE LEVEL

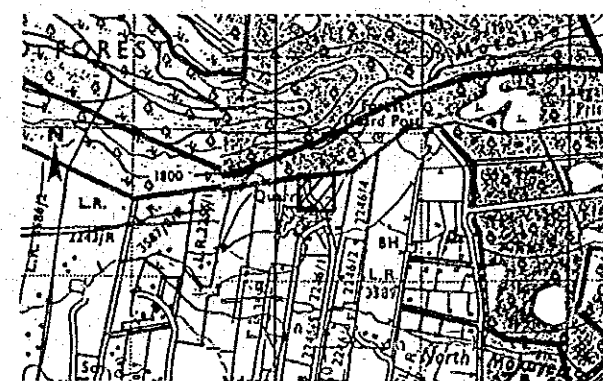
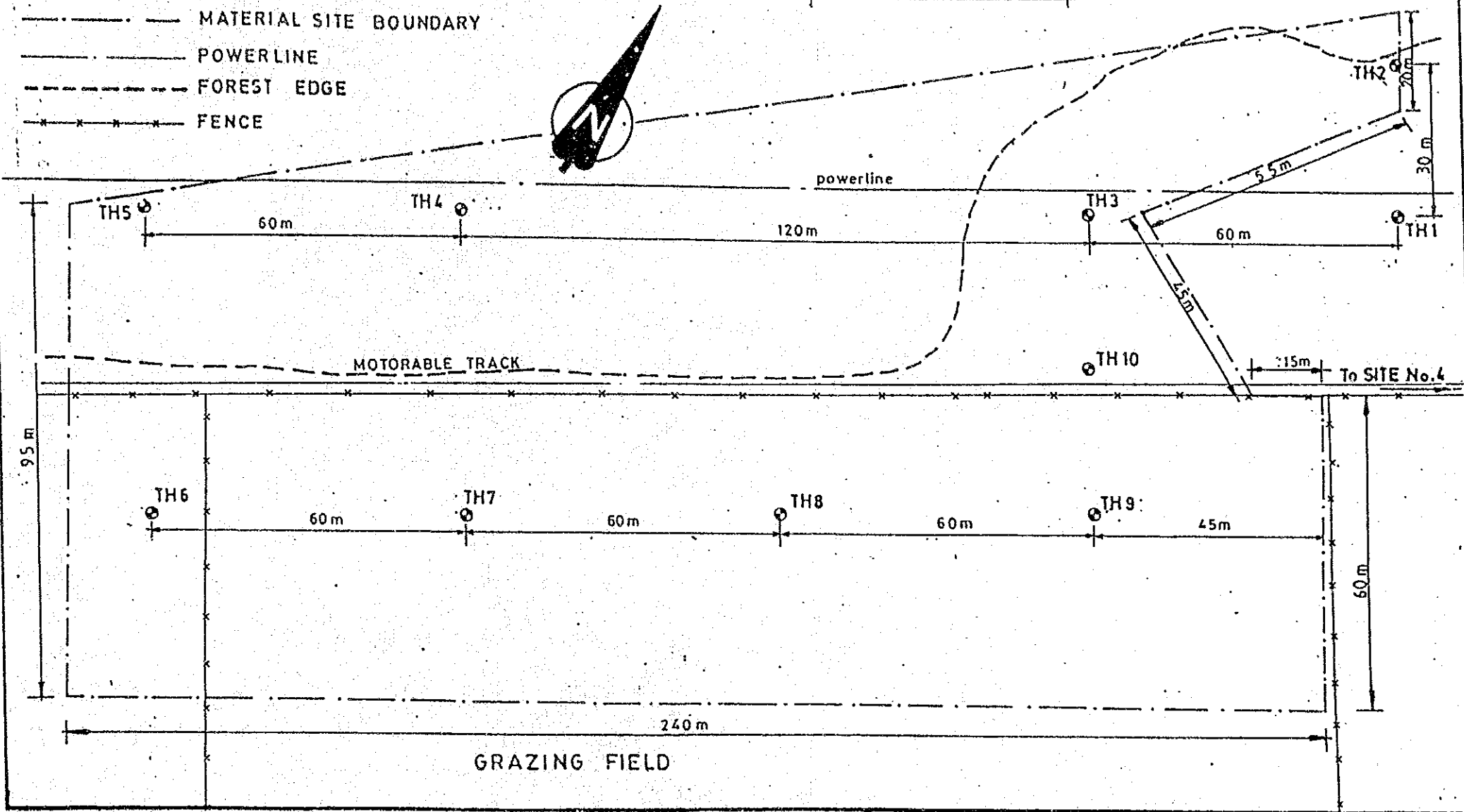
SITE No. 5 FOREST GUARD CAMP

SCALE: 1:1000

ESTIMATED QUANTITY
32 520 m³

KEY

- MATERIAL SITE BOUNDARY
- POWERLINE
- - - - - FOREST EDGE
- x x x x x FENCE



Scale 1:50,000

SITE NO. 7

KAREN

TRIAL HOLE NO.	DEPTH(M)	DESCRIPTIONS
1	0 - 0.30	Black soil on top
	0.30 - 1.30 ⁺	Hard Black hard murram
2	0 - 0.80	Black cotton soil
	0.80 - 1.50 ⁺	Hard Black gravel
3	0 - 0.10	Dark soil on top
	0.10 - 1.40 ⁺	Hard Black gravel
4	0 - 0.30	Black cotton soil
	0.30 - 1.4 ⁺	Hard Black gravel
5	0 - 0.7	Black cotton soil
	0.70 - 1.70 ⁺	Black - Brown gravel
6	0 - 0.7	Black cotton soil
	0.70 - 1.70 ⁺	Hard Brown gravel
7	0 - 1.10	Black wet clay soil on top
	1.10 - 1.3 ⁺	White stone Decomposed Material

ESTIMATION OF QUANTITY

AREA	=	36,000m ²
AVERAGE OVERBURDEN	=	0.4 m
AVERAGE DEPTH OF MATERIAL	=	1.0m
ESTIMATED QUANTITY	=	36000m ³

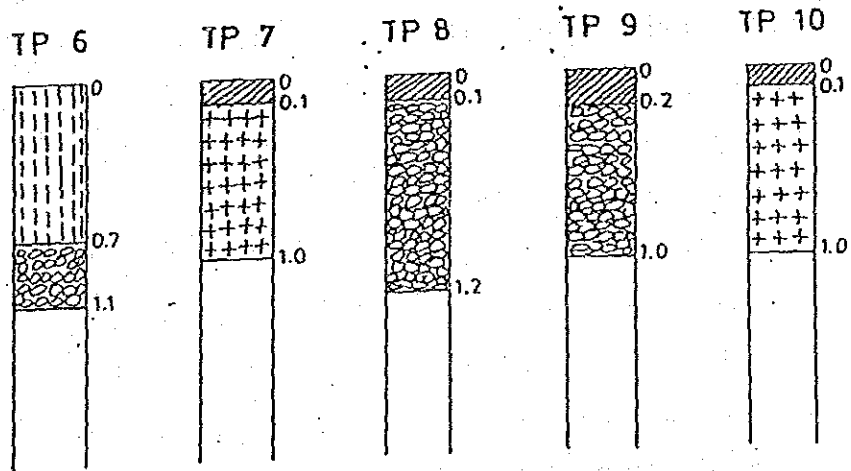
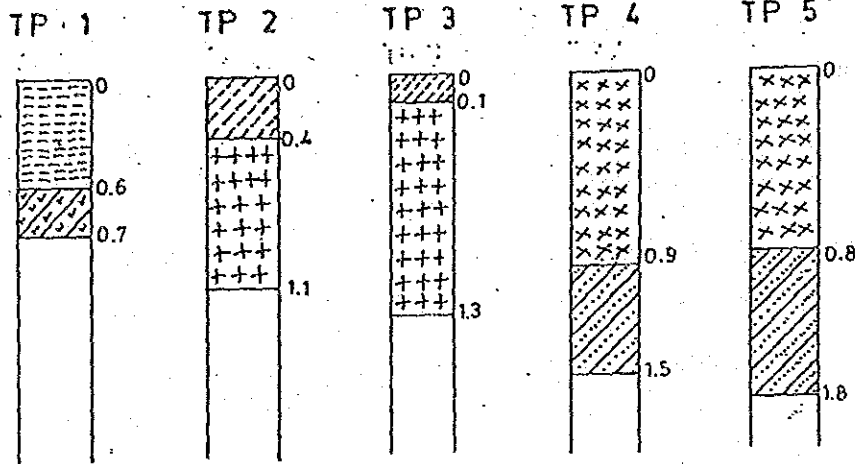
OWNERSHIP






This site is situated on Government Land





FUTURE DEVELOPMENT

No immediate future development plans

GRAVEL MATERIAL SITE No. 5 - FOREST GUARD



-  BLACK COTTON SOIL
-  BLACK WET CLAY
-  DARK SOIL
-  HARD BROWN GRAVEL
-  BLACK BROWN GRAVEL

-  RED SOIL
-  HARD BLACK GRAVEL
-  SOFT WHITE STONE
-  WHITE DRY CLAY SOIL

SITE NO. 5

FOREST GUARD

<u>TRIAL HOLE NO.</u>	<u>DEPTH(M)</u>	<u>DESCRIPTION</u>
1	0 - 0.60 0.6 - 0.7 ⁺	Black Cotton Soil on top White Soft Stone Decomposed Mate
2	0 - 0.4 0.4 - 1.1	Dark Soil on top Black - Brown gravel
3	0 - 0.1 0.1 - 1.3 ⁺	Dark soil on top Black - Brown gravel
4	0 - 0.90 0.90 - 1.5 ⁺	Red soil on top Hard Brown gravel
5	0 - 0.80 0.80 - 1.80 1.80 - 2.20 ⁺	Red soil on top Hard Brown gravel Yellow Soft Decomposed Material
6	0 - 0.70 0.70 - 1.10 1.10 - 1.4 ⁺	Black wet clay soil on top Hard Black gravel Soft Stone Decomposed Material
7	0 - 0.10 0.10 - 1.00 ⁺	White dry clay soil on top Black - Black gravel
8	0 - 0.10 0.10 - 1.20 ⁺	White dry clay soil on top Hard Black gravel Material
9	0 - 0.20 0.2 - 1.00	White dry clay soil on top Hard Black gravel
10	0 - 0.10 0.1 - 1.00	White dry clay soil on top Black - Brown gravel

ESTIMATION OF QUANTITY

AREA	=	23,550m ²
AVERAGE OVERBURDEN	=	0.5m
AVERAGE DEPTH OF MATERIAL	=	0. g
ESTIMATED QUANTITY	=	21200

OWNERSHIP

This site would be situated on land under three Ownerships

- The Kenya Government
- Two private persons

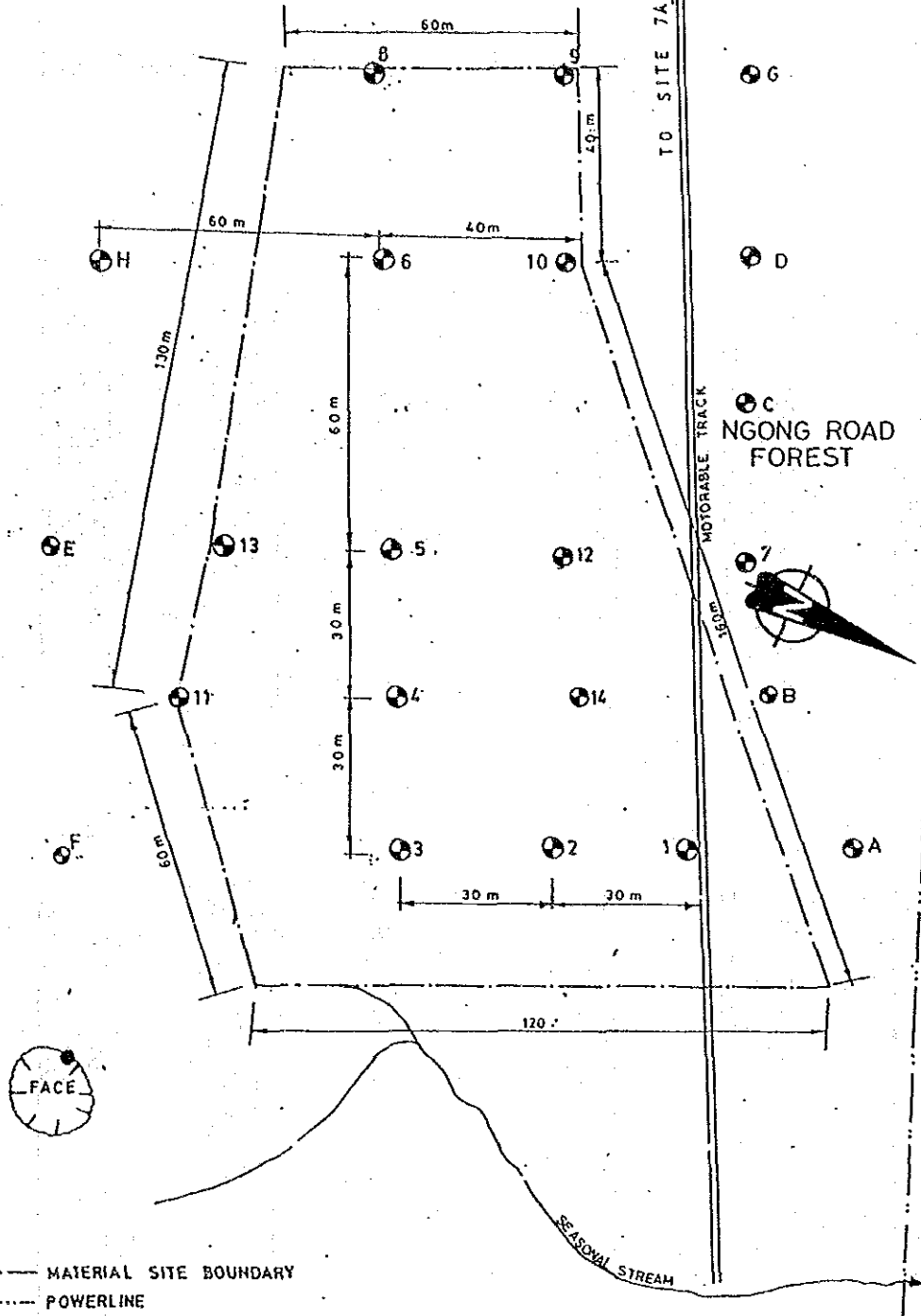
The two private persons could not be easily accessible for discussions on whether they would be willing to sell out or lease the land.

FUTURE DEVELOPMENT

- The portion belonging to the Government is under forest
- Currently the land belonging to private persons is used as a grazing field for Grade Cattle. Future plans could not be ascertained.

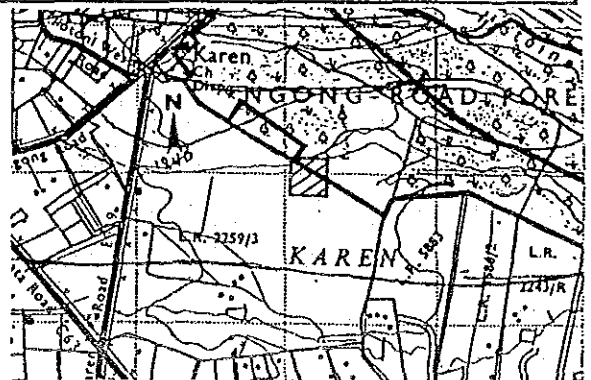
SITE No. 7 - KAREN

SCALE: 1:1000

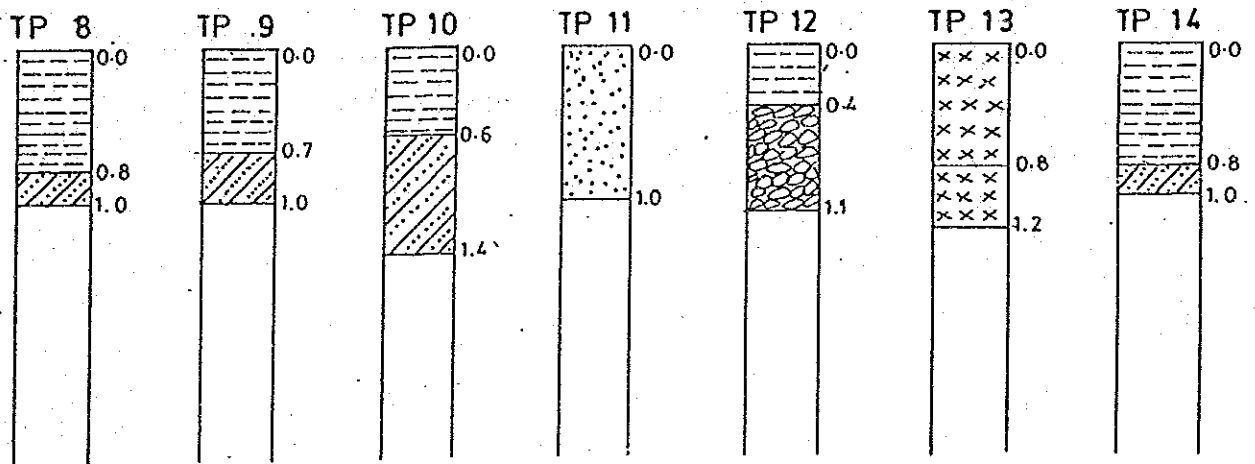
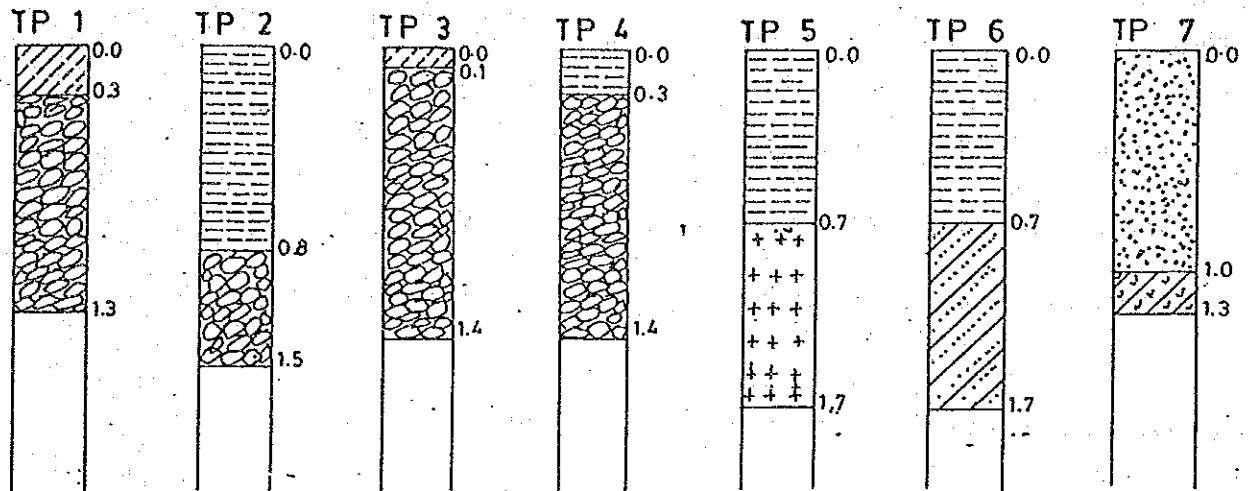


KEY

- MATERIAL SITE BOUNDARY
- POWERLINE
- ⊙ TRIAL HOLES
- A, B, etc. NO GRAVEL WAS FOUND



GRAVEL MATERIAL SITE No. 7 - KAREN



BLACK COTTON SOIL



HARD BLACK GRAVEL



DARK SOIL



WHITE STONE DECOMPOSED MATERIAL



BLACK BROWN GRAVEL



HARD BROWN GRAVEL



BLACK WET CLAY

GRAVEL SITE NO. 1

GALSHEET SITE

<u>TRIAL HOLE NO.</u>	<u>DEPTH (M)</u>	<u>DESCRIPTION</u>
1	0.0 - 0.4m 0.40m - 2.0m	Black Cotton Soil White decomposed gravel
2	0.0 - 0.4m 0.4 - 2.5m ⁺	Overburden Black Cotton Soil Black decomposed gravel
3	0.0 - 0.3m 0.30 - 2.0m ⁺	Black Cotton Soil decomposed soft rock material
4	0.0 - 0.40m 0.40 - 2.5m ⁺	Black Cotton Soil White decomposed gravel
5 to 10	0.0 - 0.2 upto 0.4	Black Cotton soil White decomposed gravel

ESTIMATION OF QUANTITY

AREA	=	26000
AVERAGE OVERBURDEN	=	0.40 m
AVERAGE DEPTH OF MATERIAL	=	Over 1.5m
ESTIMATED QUANTITY	=	39000m ³

OWNERSHIP

This site is situated on Government land.

FUTURE DEVELOPMENT

No immediate future development plans

5. HARD STONE MATERIAL SITE INVESTIGATION RESULTS

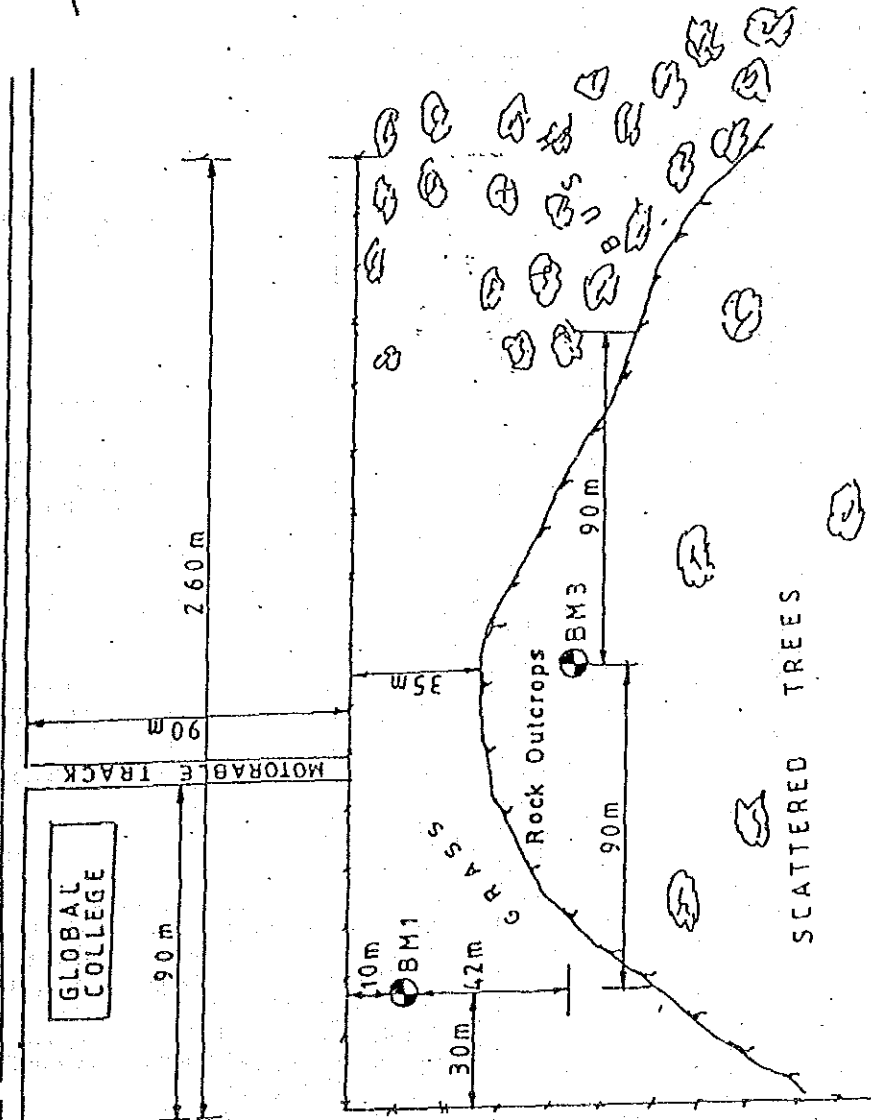
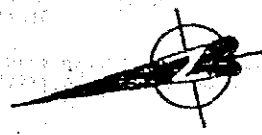
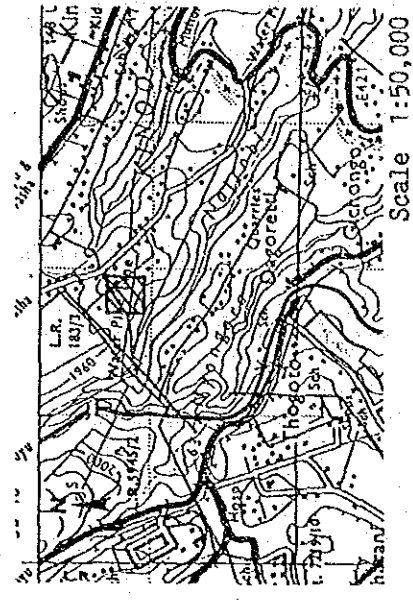
MUTHIGA ROCK QUARRY

NOTE

TOTAL DISTANCE FROM QUARRY TO
MAIN ROAD IS 600 m

LEGEND

- TREES
- FENCE
- CLIFF (Not very big)
- LOCATIONS OF DRILLING



Scale 1 : 2000

TO KABETE
LIMURU RD.

A-163



Equipment & Methods: Rotary auger 150mm dia.
0.1-0.60m, Rotary coring 86mm dia. 0.60-1.40m;
76mm dia. 1.40 - 15.05m

Location:

NAIROBI BY-PASS

Carried out for: JAPAN INTERNATIONAL
COOPERATION AGENCY

Ground Level

Coordinates

Date

5_7/8/79

Description	Reduced Level	Legend	Depth & Thickness	Samples / Tests			Field Records						
				Depth	Sample Type	Sample No	Test	E.I.	TCR	RQD	GRACE		
Roddlsh brown SILTY CLAY.		x	0.00 - 0.60	G.L. - 0.60									
Moderately weathered non intact light brownish grey fine grained porphyritic PHONOLITE.		VVVV	0.60 - 1.40	0.60 - 1.40									
Slightly weathered with medium spaced fractures light grey fine grained porphyritic PHONOLITE. Fractures medium steep rough clay filled/ilmenite coated.	50°	VVVV	1.40 - 2.90	1.40 - 2.90									
	40°	VVVV	2.90 - 4.15	2.90 - 4.15									
Faintly weathered grey fine grained porphyritic PHONOLITE.		VVVV	4.15 - 5.05	4.15 - 5.05									
		VVVV	5.05 - 6.45	5.05 - 6.45									
Moderately weathered with medium spaced fractures light grey fine grained porphyritic PHONOLITE. Fractures 40°, 70° rough ilmenite coated.	40°	VVVV	6.45 - 7.95	6.45 - 7.95									
	70°	VVVV	7.95 - 9.35	7.95 - 9.35									
Fresh with medium and widely spaced fractures grey fine grained porphyritic PHONOLITE. Fractures 90-60° rough ilmenite coated.		VVVV	9.35 - 10.65	9.35 - 10.65									
	90°	VVVV											

<p>S.P.T.: Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (Not N value)</p> <p>DEPTHS: All depths and reduced levels in metres. Thickness given in brackets in depth column</p> <p>W.R.L.: Water level observations during boring are given on the last sheet of log.</p>	<p>Sample / Test Key.</p> <p>D Disturbed sample</p> <p>B Bulk sample</p> <p>W Water sample</p> <p>P Piston (P) Tube (U) or core sample length to scale</p> <p>S Standard Penetration Test</p> <p>V Vane Test</p> <p>C Core recovery</p> <p>R Rock Quality Designation (RQD)</p>	<p>Remarks</p> <p>A-164</p>	<p>Logged by</p> <p>J. O.</p>
			<p>Scale</p> <p>1:50</p>
			<p>Fig.</p>



Equipment & Methods. See Sheet 1	Location. NAIROBI BY-PASS
-------------------------------------	------------------------------

Carried out for: JAPAN INTERNATIONAL COOPERATION AGENCY	Ground Level	Coordinates	Date 5-7/8/90
---	--------------	-------------	------------------

Description	Reduced Level	Legend	Depth & Thickness	Samples / Tests			Field Records			
				Depth	Sample Type	Test No	Test	Records		
(as above)				9.35-10.65						
Fresh with widely spaced fractures grey fine grained porphyritic PHONOLITE. Fractures 40-60° rough l/monite coated.	60° 40° 40°	VVVV	(2.65)	10.65-12.15				2	100	80
Slightly weathered with widely spaced fractures light grey fine grained porphyritic PHONOLITE.	40°	VVVV	(2.40)	12.15-13.55				0	100	100
				13.55-15.05				1	87	80
END OF BOREHOLE				15.05						

DATE	TIME	DEPTH (M)			REMARKS
		HOLE	CASING	W.R.L.	
5/8/90	10.30	NIL	NIL	DRY	
	18.00	0.60	NIL	DRY	
6/8/90	7.00	0.60	NIL	DRY	
	18.00	7.95	NIL	2.20	
7/8/90	7.00	7.95	NIL	3.00	
	18.00	15.05	NIL	2.75	

<p>S.P.T: Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (Not N value)</p> <p>DEPTHS: All depths and reduced levels in metres Thickness given in brackets in depth column</p> <p>W.R.L: Water level observations during boring are given on the last sheet of log.</p>	<p>Sample / Test Key.</p> <p>D Disturbed sample</p> <p>B Bulk sample</p> <p>W Water sample</p> <p>P Piston (P) Tube (U) or core sample length to scale</p> <p>S Standard Penetration Test</p> <p>V Vane Test</p> <p>C Core recovery</p> <p>r Rock Quality Designation (RQD - %)</p>	<p>Remarks</p> <p>A-165</p>	Logged by J. O.
			Scale 1:50
			Fig.



Equipment & Methods. Rotary auger 1500mm dia.
G.L. 0.40m, Rotary coring 86mm dia. 0.40-2.60m,
76mm dia. 2.60 - 10.25m

Location.

NAIROBI BY-PASS

Carried out for: JAPAN INTERNATIONAL
COOPERATION AGENCY

Ground Level

Coordinates

Date

8_10/8/90

Description	Reduced Level	Legend	Depth & Thickness	Samples / Tests			Field Records						
				Depth	Sample Type	Test No	FI	TCR	RQD	GRAB			
Reddish brown SILTY CLAY.		x x	0.40	G.L. - 0.40									
High weathered brown TRACHYTE. (as sandy clay with gravel).		VVVVV	(0.40)	0.40 - 1.40				NI	40	0			
		VVVVV	(2.20)	1.40 - 2.60				NI	25	0			
Moderately weathered with closely spaced fractures zonally non intact pinkish grey fine grained porphyritic TRACHYTE.		VVVVV	2.60	2.60 - 2.90				1	100	50			
Zonally vesicular with 50° flow structure.		VVVVV	(8.00)	2.90 - 3.75				NI	100	0			
Fractures subhorizontal and steep rough reddish brown clay filled limonite coated.		VVVVV		3.75 - 5.25				NI	67	12	III		
		VVVVV		5.25 - 6.75				3					
		VVVVV		6.75 - 8.25				5	80	8			
Completely weathered light grey clayey TRACHYTE.		VVVVV	8.40	8.40									V
Completely weathered Brown TRACHYTE. (as Brown sandy CLAY).		VVVVV	(1.25)	8.25 - 10.25				NI	26	0			

S.P.T. Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (Not N value)

DEPTHS: All depths and reduced levels in metres
Thickness given in brackets in depth column

W.R.L: Water level observations during boring are given on the last sheet of log.

Sample / Test Key.

- D Disturbed sample
- B Bulk sample
- W Water sample
- P Piston (P) Tube (U) or core sample length to scale
- S Standard Penetration Test
- V Vane Test
- C Core recovery
- r Rock Quality Designation (RQD)

Remarks

A-166

Logged by
J.O.

Scale
1:50

Fig.



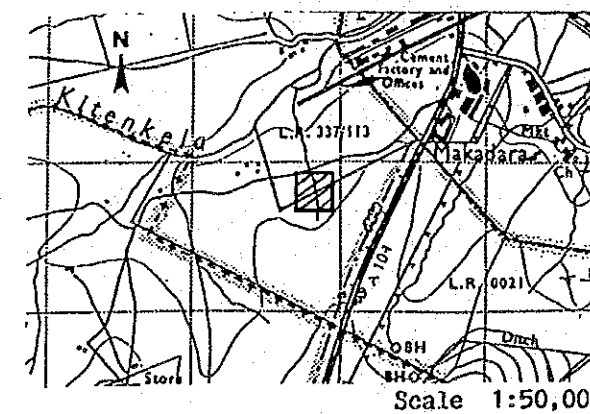
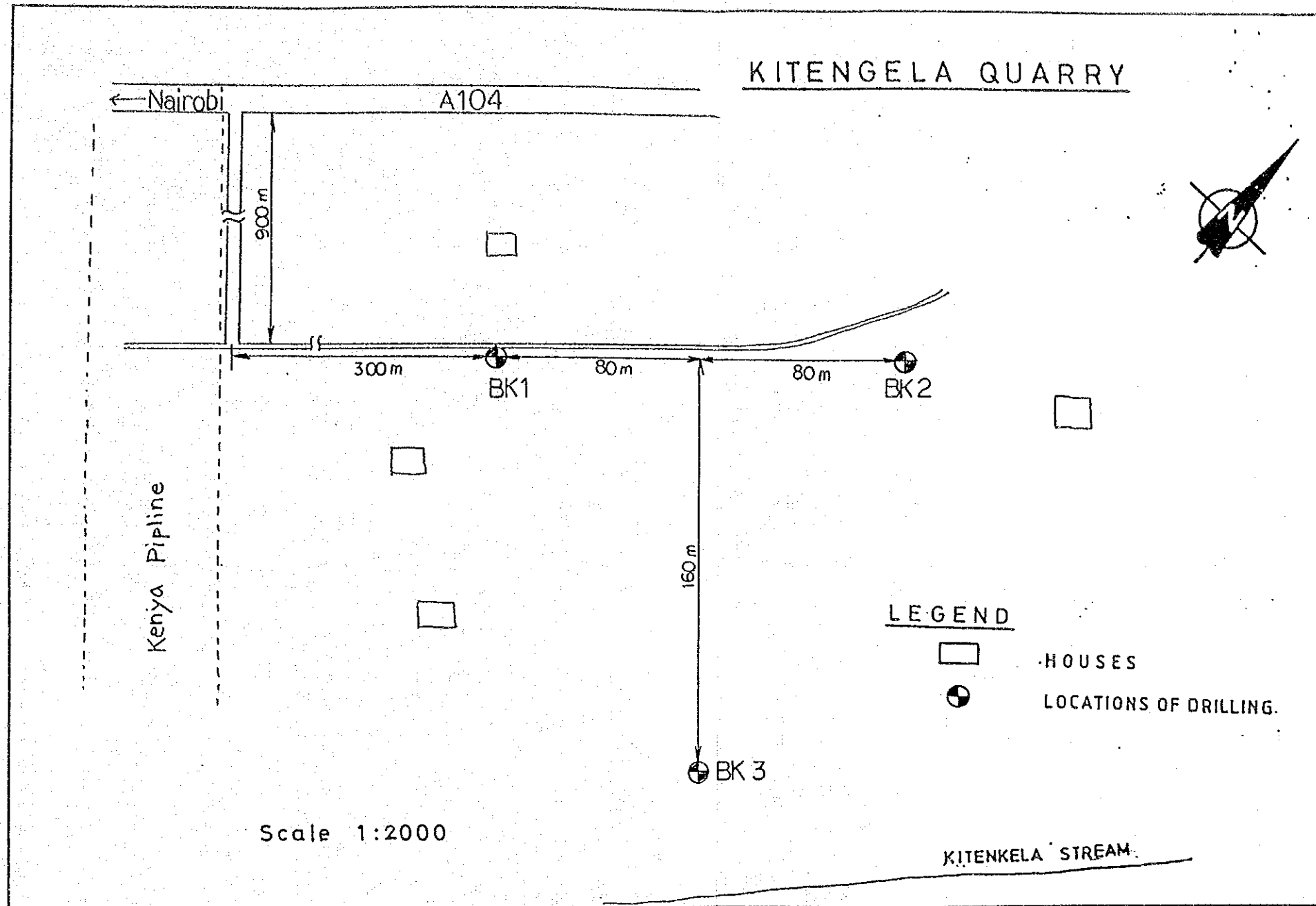
Equipment & Methods. See Sheet 1	Location. NAIROBI BY-PASS
-------------------------------------	------------------------------

Carried out for: JAPAN INTERNATIONAL COOPERATION AGENCY	Ground Level	Coordinates	Date 8-10/8/90
---	--------------	-------------	-------------------

Description	Reduced Level	Legend	Depth & Thickness	Samples/Tests			Field Records	
				Depth	Sample Type	Test No	Test	Records
(as above)		V V V V V	10.25					
END OF BOREHOLE								

DATE	TIME	DEPTH (M)			REMARKS
		HOLE	CASING	W.R.L.	
8/8/90	7.00	NIL	NIL	DRY	
	18.00	2.90	1.50	0.20	
9/8/90	7.00	2.90	1.50	0.40	
	18.00	8.25	1.50	4.10	
10/8/90	7.00	8.25	1.50	5.00	
	18.00	10.25	NIL	4.45	

<p>S.P.T: Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (Not N value)</p> <p>DEPTHS: All depths and reduced levels in metres. Thickness given in brackets in depth column</p> <p>W.R.L: Water level observations during boring are given on the test sheet of log.</p>	<p>Sample / Test Key.</p> <p>D Disturbed sample</p> <p>B Bulk sample</p> <p>W Water sample</p> <p>P Piston (P) Tube (U) or core sample length to scale</p> <p>S Standard Penetration Test</p> <p>V Vane Test</p> <p>C Core recovery</p> <p>R Rock Quality Designation (RQD - %)</p>	<p>Remarks</p> <p>A-167</p>	Logged by J.O.
			Scale 1:50
			Fig.





Mowlem Construction Co. Ltd.

Borehole No. BK 1

Sheet 1 of 2

Equipment & Methods. Rotary coring 101mm dia. 0.4-1.50m; 86mm dia. 1.50-15.00m	Location. NAIROBI BY-PASS
---	------------------------------

Carried out for: JAPAN INTERNATIONAL COOPERATION AGENCY	Ground Level	Coordinates	Date 11/13/8/90
---	--------------	-------------	--------------------

Description	Reduced Level	Legend	Depth & Thickness	Samples/Tests			Field Records												
				Depth	Sample		Test	EI	TCR	ROD	GRAD								
					Type	No													
Dark grey CLAY (Black cotton soil).		X X X X	(0.45)																
Completely weathered Brown PHONOLITE. (as Sandy silty clay with phonolite boulders)		V V V V	0.70	G.L. - 1.50					5	100	74								
		V V V V		1.50 - 3.00					1	100	82								
Slightly weathered with closely and medium spaced fractures grey fine grained porphyritic PHONOLITE.	40°	V V V V		3.00 - 4.50					3	100	83								
With rare cavities upto 2cm, calcite lined; and white amygdalae of zeolites upto 1cm.	40° 90°	V V V V		4.50 - 5.45					2	100	41								11
Fractures subhorizontal medium steep, rarely steep rough with clay varnec/limonite coating.	10° 40° 90°	V V V V	(9.30)	5.45 - 6.65					7	100	51								
	20° 40°	V V V V		6.65 - 7.95					4	100	51								
	40° 10°	V V V V		7.95 - 10.95					8	100	57								
	50° 50°	V V V V																	

S.P.T: Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (Not N value) DEPTHS: All depths and reduced levels in metres. Thickness given in brackets in depth column W.R.L: Water level observations during boring are given on the last sheet of log.	Sample / Test Key D Disturbed sample B Bulk sample W Water sample P Piston (P) Tube (U) or core sample length to scale S Standard Penetration Test V Vane Test C Core recovery r Rock Quality Designation (RQD)	Remarks A-169	Logged by J.O.
			Scale 1:50
			Fig.



Equipment & Methods. See Sheet 1	Location. NAIROBI BY - PASS
-------------------------------------	--------------------------------

Carried out for: JAPAN INTERNATIONAL COOPERATION AGENCY	Ground Level	Coordinates	Date 13_14/8/90
---	--------------	-------------	--------------------

Description	Reduced Level	Legend	Depth & Thickness	Samples / Tests			Field Records			
				Depth	Sample Type	Test No				
(as above)	20°	VVVV	(5.00)	7.95_10.95						
Slightly weathered with closely and medium spaced fractures grey fine grained porphyritic PHONOLITE.	30°	VVVV		(5.00)						
	50°	VVVV								
	10°	VVVV								
	40°	VVVV								
	5°	VVVV								
	40°	VVVV								
	0°	VVVV								
	40°	VVVV								
	40°	VVVV								
	40°	VVVV								
Fractures subhorizontal to medium steep rough black iron oxide coated/with clay veneer.	10°	VVVV		10.95_13.95			8	100	68	11
	40°	VVVV		13.95_15.00			6	100	61	
END OF BOREHOLE				15.00						

<p>S.P.T: Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (Not N value)</p> <p>DEPTHS: All depths and reduced levels in metres Thickness given in brackets in depth column</p> <p>W.R.L: Water level observations during boring are given on the test sheet of log.</p>	<p>Sample / Test Key.</p> <p>D Disturbed sample</p> <p>B Bulk sample</p> <p>W Water sample</p> <p>P Piston (P) Tube (U) or core sample length to scale</p> <p>S Standard Penetration Test</p> <p>V Vane Test</p> <p>C Core recovery</p> <p>R Rock Quality Designation (RQD - %)</p>	<p>Remarks</p> <p>A-170</p>	Logged by J.O.
			Scale 1:50
			Fig.



Equipment & Methods. Rotary casing 101cm dia.
0.1-3.00m; 86cm dia. 3.00 - 15.25m

Location.

NAIROBI BY-PASS

Carried out for: JAPAN INTERNATIONAL COOPERATION AGENCY

Ground Level

Coordinates

Date

8_9/8/90

Description	Reduced Level	Legend	Depth & Thickness	Samples/Tests			Field Records													
				Depth	Sample Type	Test No	Test	FI	TCR	RQD	GRA									
Grey slightly sandy SILTY CLAY (Black cotton soil).		X	0.40																	
Grey silty SAND.		•••••	(1.55)	G.L. - 1.50						NA100	NA									
Highly weathered with closely spaced fractures mainly non intact grey with green tinge fine grained porphyritic PHONOLITE. Fractures subhorizontal clay filled.	30°	VVVVV	(1.75)	1.50 - 3.00						NA100	0							IV		
Faintly weathered with closely and medium spaced fractures grey fine grained porphyritic PHONOLITE. Zone 6.00 - 15.25m with oval cavities gradually becoming larger upto 1cm with depth, calcite/bluish earthy material lined.	80°	VVVVV	(6.30)	3.00 - 4.50						5	80	15								
	60°			4.50 - 5.60							2	100	0							
	20°			5.60 - 6.15								1	100	0						
	80°			6.15 - 7.05								7	100	17						II
	60°			7.05 - 7.75								4	100	29						
	30°			7.75 - 9.25						2	100	36								
	70°			9.25 - 10.75						3	100	49								

S.P.T: Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (Not N value)
 DEPTHS: All depths and reduced levels in metres
 Thickness given in brackets in depth column
 W.R.L: Water level observations during boring are given on the test sheet of log.

Sample / Test Key.
 D Disturbed sample
 B Bulk sample
 W Water sample
 P Piston (P) Tube (U) or core sample length to scale
 S Standard Penetration Test
 V Vane Test
 C Core recovery
 R Rock Quality Designation (RQD - %)

Remarks
 A-171

Logged by
 J.O.
 Scale
 1:50
 Fig.



Equipment & Methods. See Sheet 1 Location. NAIROBI BY-PASS

Carried out for: JAPAN INTERNATIONAL COOPERATION AGENCY Ground Level Coordinates Date 9/8/90

Description	Reduced Level	Legend	Depth & Thickness	Samples / Tests			Field Records				
				Depth	Sample Type	Sample No	Test				
(as above)		VVVVV	(5.25)	10.75 - 12.25				4	100	68	11
Faintly weathered with medium spaced fractures grey fine grained porphyritic PHONOCLITE. With oval cavities upto 1cm. Fractures subhorizontal to steep rough clay lined/ ilmenite coated.	90° 20°	VVVVV		12.25 - 13.75				3	100	52	
	20° 0°	VVVVV		13.75 - 15.25				4	100	80	
END OF BOREHOLE		VVVVV	15.25								

<p>S.P.T: Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (Not N value)</p> <p>DEPTHS: All depths and reduced levels in metres Thickness given in brackets in depth column</p> <p>W.R.L: Water level observations during boring are given on the last sheet of log.</p>	<p>Sample / Test Key.</p> <ul style="list-style-type: none"> D Disturbed sample B Bulk sample W Water sample P Piston (P) Tube (U) or core sample length to scale S Standard Penetration Test V Vane Test C Core recovery R Rock Quality Designation (RQD) - % 	<p>Remarks</p> <p style="text-align: right;">A-172</p>	<p>Logged by J. O.</p> <p>Scale 1:50</p> <p>Fig.</p>
--	---	---	--



Equipment & Methods. Rotary coring 66mm dia.
Q.L-10,00m

Location. NAIROBI BY-PASS

Carried out for: JAPAN INTERNATIONAL COOPERATION AGENCY

Ground Level Coordinates Date
5-7/8/90

Description	Reduced Level	Legend	Depth & Thickness	Samples/Tests			Field Records			
				Depth	Sample Type	Test No	FI	TCR	RQD	GRAI
Greyish brown SILTY CLAY with phonolite boulders.		x x	(1.10)	G.L. - 1.50			NI	80	0	-
Moderately weathered non intact grey fine grained porphyritic PHONOLITE. Some feldspar phenocrysts altered to zeolites. Irregular clay filled/limonite coated fractures.	50°	VVVV	(2.25)	1.50 - 2.45			NI	52	0	III
	90°	VVVV		2.45 - 3.00			7	100	0	
		VVVV		3.35						
Slightly weathered with closely spaced fractures grey fine grained porphyritic PHONOLITE.		VVVV	(1.15)	3.00 - 4.50			7	73	47	
Fractures subhorizontal to steep rough limonite coated.	10°	VVVV		4.50 - 5.20			4	100		48
	5°	VVVV		5.20 - 6.00			3	100		
	40°	VVVV		6.00 - 7.10			4	100		II
	70°	VVVV		7.10 - 8.00			4	100		60
	60°	VVVV		8.00 - 9.05			2	100	97	
Faintly weathered with close and medium spaced fractures grey fine grained porphyritic PHONOLITE.	90°	VVVV	(5.50)	9.05 - 10.00			3	100	74	
	20°	VVVV								
	30°	VVVV								
END OF BOREHOLE	40°	VVVV								

S.P.T: Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (Not N value)
 DEPTHS: All depths and reduced levels in metres
 Thickness given in brackets in depth column
 W.R.L: Water level observations during boring are given on the last sheet of log.

Sample / Test Key:
 D Disturbed sample
 B Bulk sample
 W Water sample
 P Piston (P) Tube (U) or core sample length to scale
 S Standard Penetration Test
 V Vane Test
 C Core recovery
 R Rock Quality Designation (RQD - %)

Remarks
 A-173

Logged by
 J.O.
 Scale
 1:50
 Fig.

6. LABORATORY TEST RESULTS OF EMBANKMENT MATERIAL AND SUBGRADE

Laboratory test results of Subgrade and Fill materials

Pit No	Station KM	Depth (m)	Soil Type	*1 Type of Material	Grading Passing 75 μ m (%)	Liquid Limit LL (%)	Plasticity index PI	Shrinkage Limit SL (%)	*2 Plasticity Modulus	#3 Group Index	CBR at 100% M.D.D. 4days soak (%)	Swell at 100% M.D.D. 4days soak (%)	Compaction (T99)	
													M.D.D. (kg/m ³)	O.M.C. (%)
Tb- 1	0 + 900m	0.1~0.5	B.C.S	1	95	54	33	—	3,267	41.8	2	4.5	1,310	32
		0.7~1.1	W.Rock	15	21	62	21	—	525	-3.6	22	1.1	1,300	30
Tb- 2	1 + 435m	0.1~1.7	B.C.S	1	—	73	30	—	—	—	—	—	—	—
		1.7~1.9	W.Rock	15	36	47	17	—	731	1.7	—	—	—	—
Tb- 3	1 + 900m	0.1~1.1	B.C.S	1	93	80	42	—	4,116	48.1	1	5.0	1,330	30
		1.2~1.4	B.C.S	1	35	67	26	—	962	3.2	3	2.7	1,250	32
Tb- 4	2 + 400m	0.1~0.5	B.C.S	1	—	73	40	—	—	—	—	—	—	—
		0.5~0.9	B.C.S	1	30	73	34	—	1,122	1.7	2	4.5	1,300	31
Tb- 5	2 + 900m	0.1~0.5	B.C.S	1	89	78	30	—	2,850	35.8	1	4.4	1,340	31
		0.5~1.0	W.Rock	15	18	54	18	—	360	-4.3	9	1.4	1,370	25
Tb- 6	3 + 400m	0.1~0.6	B.C.S	1	—	79	42	—	—	—	—	—	—	—
Tb- 7	3 + 900m	0.1~0.6	B.C.S	1	92	74	43	20	4,171	46.5	2	5.5	1,390	29
Tb- 8	4 + 400m	0.1~0.6	B.C.S	1	—	73	32	—	—	—	—	—	—	—
Tb- 9	4 + 895m	0.1~0.3	Sandy Clay	9	41	39~41	14~16	—	700	2.2	5	1.3	1,590	23
		0.3~0.6	Sandy Clay	9	—	—	—	—	—	—	—	—	—	—

* 1 See Table 3.6.2

* 2 PI=No. 36 X PI

No. 36: Grading Passing 0.475mm (%)

* 3 GI=(F-35)[0.2+0.005(LL-40)]+0.01(F-15)(PI-10)

F: Grading Passing 75 μ m (%)

Laboratory test results of Subgrade and Fill materials

Pit No	Station KM	Depth (m)	Soil Type	#1 Type of Material	Grading Passing 75 μ m (%)	Liquid Limit LL (%)	Plasticity index PI	Shrinkage Limit SL (%)	#2 Plasticity Modulus	#3 Group Index	CBR at 100M.D.D. 4days soak (%)	Swell at 100M.D.D. 4days soak (%)	Compaction(T99)	
													M.D.D. (kg/m ³)	O.M.C. (%)
Tb-10	5+400m	0.7~1.1 1.1~1.3	Grey Clay B.C.S	1 1	— 92	83 70	30 31	— —	— 2,976	— 36.1	— 1	— 5.2	— 1,320	— 33
Tc-1	5+920m	0.7~0.9	L.G	17	20	46	15	—	360	-3.2	70	0.2	1,720	22
T-12	6+500m	0.2	L.G	17	82	49	16	—	1,408	15.5	—	—	—	—
Tc-2	7+400m	0.5~0.8	L.G	17	27	55	24	—	720	-0.5	5	0.9	1,780	20
Tc-3	7+800m	0.2~0.6	W.Rock	15	14	NP	NP	—	—	—	65	0.3	1,340	33
T-11	8+300m	1.4	L.G	17	39	55	19	—	893	3.2	33	0.1	1,476	29
Tc-4	8+600m	0.2~1.1 1.1~1.3	R.S W.Rock	4 15	68 18	50 55	17 18	— —	1,224 396	11.9 -4.4	19 65	0.1 0.5	1,490 1,410	26 28
Tc-5	9+110m	0.25~0.55 0.55~1.10	R.S W.Rock	4 15	71 27	55 53	19 18	— —	1,406 612	14.9 -1.1	23 45	0.4 0.2	1,400 1,240	29 34
Tc-6	9+900m	0.3~1.6	R.S	4	95	52	14	—	1,386	18.8	18	0.7	1,360	33
T-15	9+940m	1.2~1.4	R.S	4	94	60	19	—	1,881	24.8	18	0.3	1,380	32
T-13	10+350m	1.3	R.S	4	93	49	16	—	1,568	21.7	#4 (21)	—	—	—

* 1 See Table 3.6.2 * 3 $GI=(F-35)[0.2+0.005(LL-40)]+0.01(F-15)(PI-10)$

* 2 $PI=N_o.36 \times PI$ F:Grading Passing 75 μ m(%)

No.36:Grading Passing 0.475mm(%) * 4 inference CBR from PI

Laboratory test results of Subgrade and Fill materials

Pit No	Station KM	Depth (m)	Soil Type	#1 Type of Material	Grading Passing 75 μ m (%)	Liquid Limit LL (%)	Plasticity index PI	Shrinkage Limit SL (%)	#2 Plasticity Modulus	#3 Group Index	CBR at 100M.D.D. 4days soak (%)	Swell at 100M.D.D. 4days soak (%)	Compaction(T99)	
													M.D.D. (kg/m ³)	O.M.C. (%)
Tc-31	10+400m	1.0~1.3	R.S W.Rock	4	95	55	18	9	1,728	22.9	16	0.8	1,390	35
		2.5~2.7		15	52	21	10	798	0	30	0.2	1,360	30	
Tc-7	10+840m	0.3~2.0	R.S	4	96	57	18	—	1,782	23.8	11	0.2	1,320	37
T-10	11+300m	1.5	R.S	4	92	58	24	—	2,352	27.3	*4 (10)	—	—	—
Tc-32	11+380m	1.8~2.2	R.S R.S	4	94	50	18	9	1,764	21.1	15	0.3	1,460	33
		3.0~3.4		4	81	53	21	10	1,827	19.5	15	0.8	1,310	32
Tc-33	11+880m	0.4~0.7	B.C.S W.Rock	1	76	37	16	8	1,376	11.2	4	3.6	1,580	23
		0.8~1.0		15	6	NP	2	—	0	48	0.2	1,420	23	
Tc-8	12+100m	0.1~0.5	B.C.S	1	77	80	38	—	3,040	34.1	1	4.6	1,390	26
Tc-9	12+500m	0.4~1.0	R.S	4	97	54	13	—	1,287	19.2	26	0.6	1,360	33
Tc-37	12+575m	0.2~0.4	B.C.S	1	80	40	18	9	1,602	14.2	3	4.2	1,480	22
Tc-10	13+180m	0.1~0.5	B.C.S	1	83	64	26	—	2,340	26.2	2	4.4	1,360	28
Tc-34	13+660m	0.3~0.8	B.C.S	1	90	59	30	14	2,880	31.2	2	5.2	1,350	25

* 1 See Table 3.6.2

* 2 PV=No.36 \times PI

No.36:Grading Passing 0.475mm(%)

* 3 $GI=(F-35)[0.2+0.005(LL-40)]+0.01(F-15)(PI-10)$

F:Grading Passing 75 μ m(%)

* 4 inference CBR from PI

Laboratory test results of Subgrade and Fill materials

Pit No	Station KM	Depth (m)	Soil Type	*1 Type of Material	Grading Passing 75 μ m (%)	Liquid Limit LL (%)	Plasticity index PI	Shrinkage Limit SL (%)	*2 Plasticity Modulus	*3 Group Index	CBR at 100% M.D.D. 4days soak (%)	Swell at 100% M.D.D. 4days soak (%)	Compaction (T99)	
													M.D.D. (kg/m ³)	O.M.C. (%)
T-9	13+900m	1.5	R.S	4	97	58	18	—	1,782	24.5	*4 (17)	—	—	—
Tc-35	14+155m	1.0~1.3	R.S	4	92	51	21	11	2,058	23.0	9	1.5	1,420	30
Tc-11	14+380m	0.5~2.0	R.S	4	95	48	18	—	1,782	20.8	6	0.7	1,370	33
Tc-36	14+650m	2.9~3.2	R.S	4	89	57	23	11	2,116	25.0	16	0.7	1,510	29
		4.0~4.2	W.Rock	15	76	53	21	10	1,743	17.6	20	0.8	1,480	30
Tc-12	15+185m	0.5~4.0	R.S	4	97	54	19	—	1,862	24.1	15	1.2	1,390	33
BF-3	15+550m	0.0~1.0	Silty Clay	9	96	62	25	—	2,500	31.0	—	—	—	—
		1.0~2.0	Silty Clay	9	98	60	32	—	3,200	37.1	—	—	—	—
		2.0~3.0	Silty Clay	9	86	46	22	—	2,134	20.2	—	—	—	—
		3.0~4.0	Silty Clay	9	80	43	19	—	1,786	15.5	—	—	—	—
		4.0~5.0	Silty Clay	9	90	54	24	—	2,328	25.3	—	—	—	—
T-8	15+840m	3.0	R.S	4	82	61	19	—	1,577	20.3	16	1.2	1,388	32
Tc-13	16+90m	0.4~4.0	R.S	4	76	55	19	—	1,539	16.7	11	0.7	1,436	31
Tc-14	16+700m	0.1~0.4	Grey Silt	9	71	50	21	—	1,680	15.1	5	0.5	1,440	25
Tc-15	17+150m	0.5~4.0	R.S	4	98	60	18	—	1,782	25.5	27	0.6	1,390	33

* 1 See Table 3.6.2

* 2 PM=No.36 \times PI

* 3 No.36: Grading Passing 0.475mm(%)

* 4 inference CBR from PI

* 3 $GI=(F-35)[0.2+0.005(LL-40)]+0.01(F-15)(PI-10)$
 F: Grading Passing 75 μ m(%)

Laboratory test results of Subgrade and Fill materials

Pit No	Station KM	Depth (m)	Soil Type	#1 Type of Material	Grading Passing 75 μ m (%)	Liquid Limit LL (%)	Plasticity index PI	Shrinkage Limit SL (%)	#2 Plasticity Modulus	#3 Group Index	CBR at 100% M.D.D. 4days soak (%)	Swell at 100% M.D.D. 4days soak (%)	Compaction(T99)	
													M.D.D. (kg/m ³)	O.M.C. (%)
T-7	17+800m	1.8	Red Soil	4	94	53	17	—	1,666	21.1	*4 (19)	—	—	—
Tc-16	18+820m	0.4~2.0	R.S	4	96	56	16	—	1,584	21.9	28	0.1	1,390	31
Tc-17	19+305m	0.7~3.5 3.6~3.7	R.S W.Rock	4 15	92 38	56 39	22 14	—	2,112 728	25.2 1.5	13 38	0.2 0.7	1,330 1,290	36 32
T-6	19+940m	1.5	R.S	4	97	63	21	—	2,058	28.5	12	1.3	1,388	31
T-5	21+200m	1.5	R.S	4	83	56	17	—	1,513	18.2	30	0.2	1,460	28
Tc-18	21+480m	0.4~2.0	R.S	4	93	55	18	—	1,764	22.1	18	0.6	1,390	33
Tc-19	21+955m	0.3~2.0	R.S	4	95	60	22	—	2,178	27.6	28	0.3	1,350	34
T-4	22+230m	1.5	R.S	4	92	60	23	—	2,254	27.1	*4 (11)	—	—	—
T-3	23+180m	1.4	R.S	4	96	65	25	—	2,475	31.9	*4 (9)	—	—	—
Tc-20	24+178m	0.3~2.0	R.S	4	95	60	17	—	1,666	23.6	23	0.1	1,340	35
Tc-21	24+705m	0.5~2.0	R.S	4	91	52	15	—	1,425	18.3	8	0.6	1,400	30
Tc-22	25+288m	0.3~3.1 3.3~3.7	R.S W.Rock	4 13	95 75	61 49	16 18	—	1,568 1,458	23.1 14.6	17 22	0.9 0.4	1,370 1,440	33 26

* 1 See Table 3.6.2
 * 2 FM=No.36 \times PI
 * 3 $GI=(F-35)[0.2+0.005(LL-40)]+0.01(F-15)(PI-10)$
 F: Grading Passing 75 μ m(%)
 * 4 inference CBR from PI

Laboratory test results of Subgrade and Fill materials

Pit No	Station KM	Depth (m)	Soil Type	#1 Type of Material	Grading Passing 75 μ m (%)	Liquid Limit LL (%)	Plasticity index PI	Shrinkage Limit SL (%)	#2 Plasticity Modulus	#3 Group Index	CBR at 100%M.D.D. 4days soak (%)	Swell at 100%M.D.D. 4days soak (%)	Compaction(T99)	
													M.D.D. (kg/m ³)	O.M.C. (%)
Tc-23	25+775m	0.7~2.6	R.S	4	95	61	20	—	1,960	26.3	14	0.2	1,380	33
		2.6~2.8	W.Rock	13	41	39	14	—	770	2.2	21	0.7	1,620	16
Tc-24	26+158m	2.6~2.8	R.S	4	99	56	18	—	1,800	24.6	17	0.4	1,300	38
T-2	26+500m	1.5	R.S	4	95	67	22	—	2,112	29.7	#4 (12)	—	—	—
Tc-25	26+778m	0.2~1.2	R.S	4	98	63	20	—	1,980	28.1	22	0.2	1,370	35
Tc-26	27+178m	0.4~1.0	R.S	4	97	74	30	—	2,970	39.3	11	1.7	1,350	35
Tc-27	27+678m	0.6~1.0	Fill(R.S)	4	98	63	23	—	2,300	30.6	14	0.2	1,370	35
Tc-28	28+103m	0.55~1.0	Fill(R.S)	4	96	64	27	—	2,673	33.2	12	0.3	1,380	32
Tc-29		0.4~4.0	R.S	4	92	62	27	—	2,646	30.7	10	0.4	1,340	36
Tc-30		0.5~1.0	R.S	4	79	58	22	—	1,914	20.4	9	0.7	1,410	31

* 1 See Table 3.6.2

* 2 PM=No. 36 \times PI

No. 36: Grading Passing 0.475mm(%)

* 3 $GI = (F-35) [0.2 + 0.005(LL-40)] + 0.01(F-15)(PI-10)$

F: Grading Passing 75 μ m(%)

* 4 inference CBR from PI

CTL CENTRAL TESTING LABORATORIES LTD.

Client: **MOMKEN CONSTRUCTION CO (EA) LTD**
 Location: **MAYROBT BY PASS**
 Job No:

P.O. BOX 11987 TEL: 516027/23
 Beirut

Sheet No: 1 of 3
 Date: 27/12/1998

SOIL TEST RESULTS SUMMARY SHEET

SAMPLE DEPTH (m)	C.B.R. %	GRAADING % PASSING												COMPACTION		STRENGTH TESTS				U.C. 2.5	DEPTH (m)									
														T180		C.B.R. %		U.C. 2.5												
														D ₉₅ %		C.B.R. %														
														D ₃₀ %		C.B.R. %														
4650 TC1	" 2	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	70	101	0.2	B1	0.70-0.90					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											
4651 " 2	" "	100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22	120	95	0.2	"	0.50-0.80							
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27						1780	20					
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18						15	14	1340	33			
		1440	27																											
		1490	31																											
4652 " 3	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	130	100	0.3	"	0.20-1.10					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											
4653 TC4	" 4	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	19	100	0.1	"	0.20-1.10					
		100	98	95	92	89	79	74	73	72	72	71	69	68	1490	26														
		100	96	77	67	60	55	50	45	39	37	35	29	25	23	22	22	21	19	18						1410	28			
		100	99	97	96	91	89	86	78	75	74	74	72	71	1400	29														
		100	96	89	77	66	60	52	50	48	42	38	35	34	32	29	27	1260	34											
1490	31																													
4654 " 5	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	23	100	0.4	B1	0.25-0.55					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											
4655 " 5	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	45	100	0.2	B2	0.55-1.10					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											
4656 " 5	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	18	100	0.7	B1	0.30-1.60					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											
4657 " 6	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	20	90	0.2	"	"					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1490	31																											
4658 TC 7	" 7	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	11	100	0.2	"	0.30-2.00					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1490	31																											
4659 " 8	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	1	100	4.6	"	0.10-0.75					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											
4660 " 9	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	26	100	0.6	"	0.10-1.00					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											
4661 " 10	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	2	100	4.4	"	0.10-0.60					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											
4662 " 11	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	6	100	0.7	"	0.50-2.00					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											
4663 " 12	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	15	100	1.2	"	0.50-6.00					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1490	28																											
4664 TC 13	" "	75	53	58	37.5	76	28	14	18	6-3	5	4	7	1	988	588	425	308	158	75	10	100	2.7	"	"					
		100	98	93	86	75	57	45	33	27	25	24	24	23	21	20	1720	22												
		100	95	94	91	82	70	58	46	43	40	34	32	30	30	29	28	27	1780	20										
		100	95	86	76	69	62	55	48	41	38	35	29	24	21	20	19	18	15	14						1340	33			
		1440	27																											

CIL CENTRAL TESTING LABORATORIES LTD.

P. O. Box 10817 Tel. 55027/23

Client: MOWLEM CONSTRUCTION CO. (EA) LTD
Location: NAIROBI BY PASS
Job No.

Nairobi

Sheet No. 2 of 3
Date 27/8/1990

SOIL TEST RESULTS SUMMARY SHEET

SAMPLE NO	MATERIAL	L.L. (%)	GRADING % PASSING										T180 (%)	COMPACTION				STRENGTH TESTS				SAMPLE DEPTH (m)							
			75	63	50	37.5	20	15	10	6.3	5	4		2	1	T99	MDDs	W	C	U.C.S.	W.C.S.								
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm	mm	%	g/m ³	%	%	kg/cm ²	kg/cm ²								
4667	TC15	60	18																							B1	0.50-4.00		
4668	"	16	56	16																							"	0.40-2.00	
4669	"	17	56	22																							"	0.70-3.50	
4670	"	17	39	14																							B2	3.50-6.00	
4671	"	18	55	18																							B1	0.40-2.00	
4672	"	19	60	22																							"	0.30-2.00	
4673	"	20	60	17																							"	"	
4674	"	21	52	15																							"	0.50-2.00	
4675	"	22	61	16																							"	0.30-3.10	
4676	"	22	49	18																							B2	3.10-3.50	
4677	"	23	61	20																							B1	0.70-2.60	
																												"	"
																												"	"
																												"	"
																												"	"
4678	TC23	39	14																									B2	2.60-2.80
4679	"	24	56	18																								"	"
4680	"	25	63	20																								B1	0.20-1.20
4681	"	26	74	30																							"	0.40-1.00	
4682	"	27	63	23																							"	0.60-1.00	
4683	"	28	64	27																							"	0.55-1.00	
4684	"	29	62	27																							"	0.40-4.00	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	
																											"	"	

CTL - CENTRAL TESTING LABORATORIES LTD.

P.O. Box 10587 Tel. 55122/23

Sheet No. 3 of 3
Date 27/8/1990

Client: NOWLEM CONSTRUCTION CO (EA) LTD

Location: NAIROBI, BY PASS

SOIL TEST RESULTS SUMMARY SHEET

SAMPLE NO	MARKING	ATTEMPTED LIMITS	CLASSIFICATION	GRADING % PASSING													T99	COMPACTION			M/C	STRENGTH TESTS			SAMPLE DEPTH (m)		
				PASSING														T99	M/D	M/V		C.B.R. %					
				75	80	85	90	100	15	20	25	30	35	40	45	50						55	60	63		67	70
4685	TC30	58 22		100	99	97	93	90	88	87	85	81	79	1410	31							29.0	2.44		55	B1	0.50-1.00
4705	BF3	62 25		100	99	98	96															22.1	2.49		70	B1	0.00-1.00
4706	"	60 22		100	99	98	96															18.1	2.55		55	B3	1.00-2.00
4707	"	56 22		100	98	97	95	94	92	86	80											19.2	2.51		60	B5	2.00-3.00
4708	"	43 19		100	99	99	98	98	97	93	90											22.4	2.50		60	B7	3.00-4.00
4709	"	54 24																								B9	4.00-5.00

CTL CENTRAL TESTING LABORATORIES LTD.

Client: THE MORLEM CONSTRUCTION CO. (E.A.) LTD
 Location: NAIROBI, KENYA
 Job No:

P.O. Box 18597 Tel: 55922/23
 NAIROBI

Sheet No. 1 of 1
 Date: 14/10/1991

SOIL TEST RESULTS SUMMARY SHEET

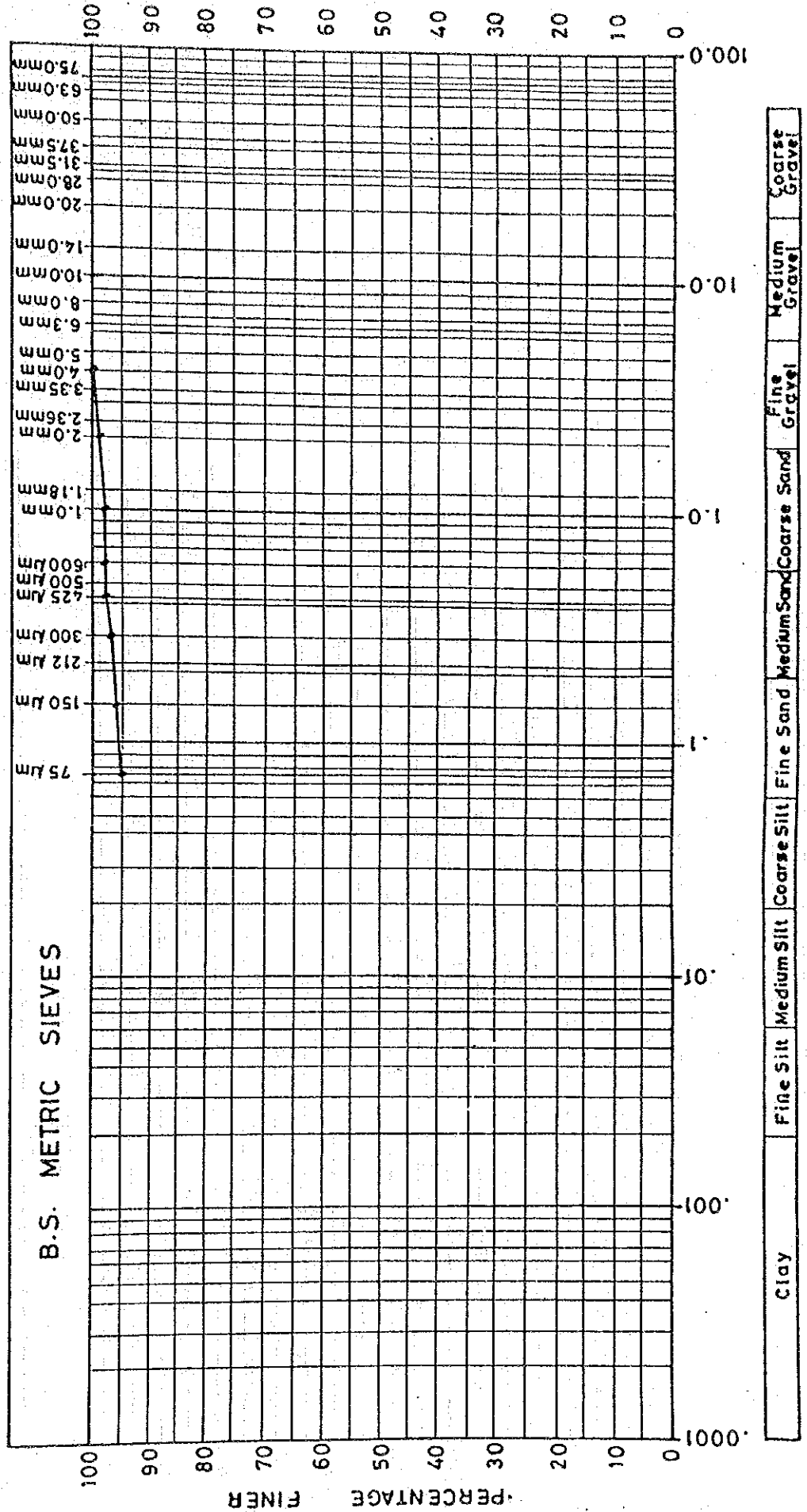
SAMPLE NO	SITE	MARKING	WATER %		PLASTICITY INDEX	FLUIDITY	GRADING % PASSING												COMPACTION		FREE SWELL %	M.C %	STRENGTH TESTS		SAMPLE DEPTH (m)						
			L.L	P.L			75	150	300	425	600	750	900	1060	1500	2000	2500	3000	3750	4750			C.B.R. %	H.C.S. (kg/cm ²)							
			55	18			9	100	99	98	98	98	97	96	95	1090	35	101.9	98	21						16	100	0.8			
7724	TC31	" "	55	18	9	100	99	98	98	98	97	96	95	1090	35	101.9	98	21	16	100	0.8	B1	1.00-1.30								
7725	" "	" "	52	21	10	100	99	98	98	98	97	96	95	1360	30	72.4	78	26	30	100	0.2	B2	2.50-2.70								
7726	TC32	" "	50	18	9	100	99	99	99	98	98	96	94	1460	33	101.9	98	21	15	100	0.3	B1	1.80-2.20								
7727	" "	" "	53	21	10	100	99	98	97	93	89	87	86	83	81	1310	32	101.9	98	21	15	100	0.8	B2	3.00-3.40						
7728	TC33	" "	37	16	8	100	99	98	95	90	87	87	85	84	79	76	1580	23	101.9	98	21	4	101	3.6	B1	0.40-0.70					
7729	" "	" "	"	"	"	100	99	98	95	90	87	87	85	84	79	76	1580	23	101.9	98	21	4	101	3.6	BLOCK	0.40-0.70					
7730	" "	" "	NP	2		100	83	70	59	51	40	35	32	27	25	23	19	15	12	11	10	9	7	6	1450	21	48	100	0.2	B2	0.80-1.00
7731	TC34	" "	59	30	14	100	99	99	99	99	98	97	96	95	92	90	1350	25	72.4	78	26	2	100	5.2	B2	0.30-0.80					
7732	" "	" "	"	"	"	100	99	99	99	99	98	98	97	97	94	92	1420	30	72.4	78	26	9	100	1.5	BLOCK	0.20-0.50					
7733	TC35	" "	51	21	11	100	99	99	99	99	98	98	97	97	94	92	1420	30	72.4	78	26	9	100	1.5	B1	1.00-1.30					
7734	TC36	" "	57	23	11	100	99	98	96	94	89	86	84	83	82	79	76	1480	30	72.4	78	26	16	101	0.7	B1	2.90-3.20				
7735	" "	" "	53	21	10	100	99	97	96	94	89	86	84	83	82	79	76	1480	30	72.4	78	26	20	100	0.8	B2	4.00-4.20				
7736	TC37	" "	40	18	9	100	97	93	90	90	89	88	83	80	1480	22	32.2	68	20	3	100	4.2	B2	0.20-0.40							
7737	" "	" "	"	"	"	100	97	93	90	90	89	88	83	80	1480	22	32.2	68	20	3	100	4.2	BLOCK	0.20-0.40							

CIL CENTRAL TESTING LABORATORIES LTD.

P.O. BOX 18507 TEL. 559422/23
NAIROBI.

PARTICLE SIZE DISTRIBUTION

Sample No. 7724	Location TC 31 1.00-1.30m	Description of Sample Slightly gravelly, slightly sandy SILT
-----------------	---------------------------	--



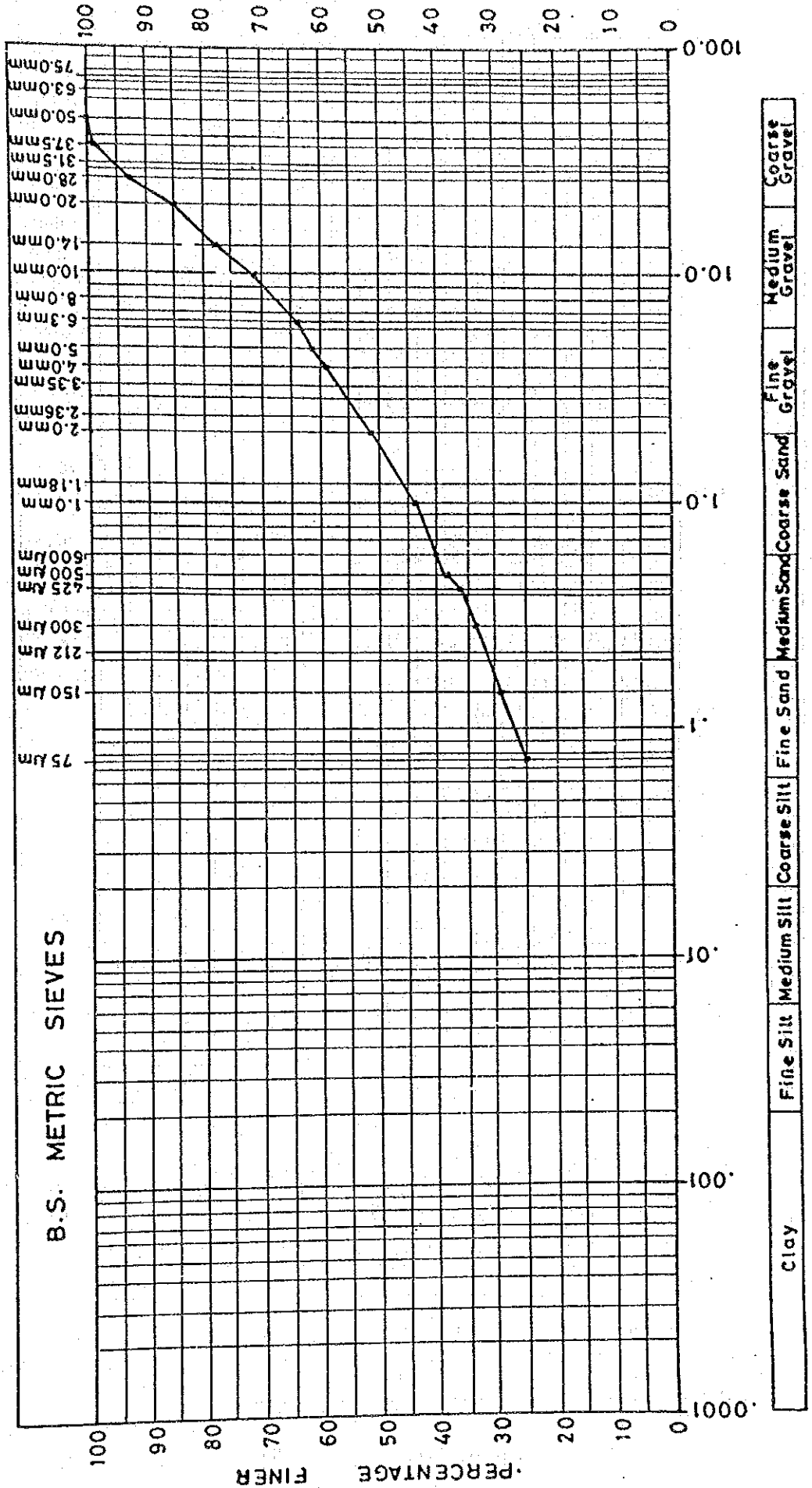
CIL CENTRAL TESTING LABORATORIES LTD.

P.O. BOX 18507 TEL. 559422/23

NAIROBI.

PARTICLE SIZE DISTRIBUTION

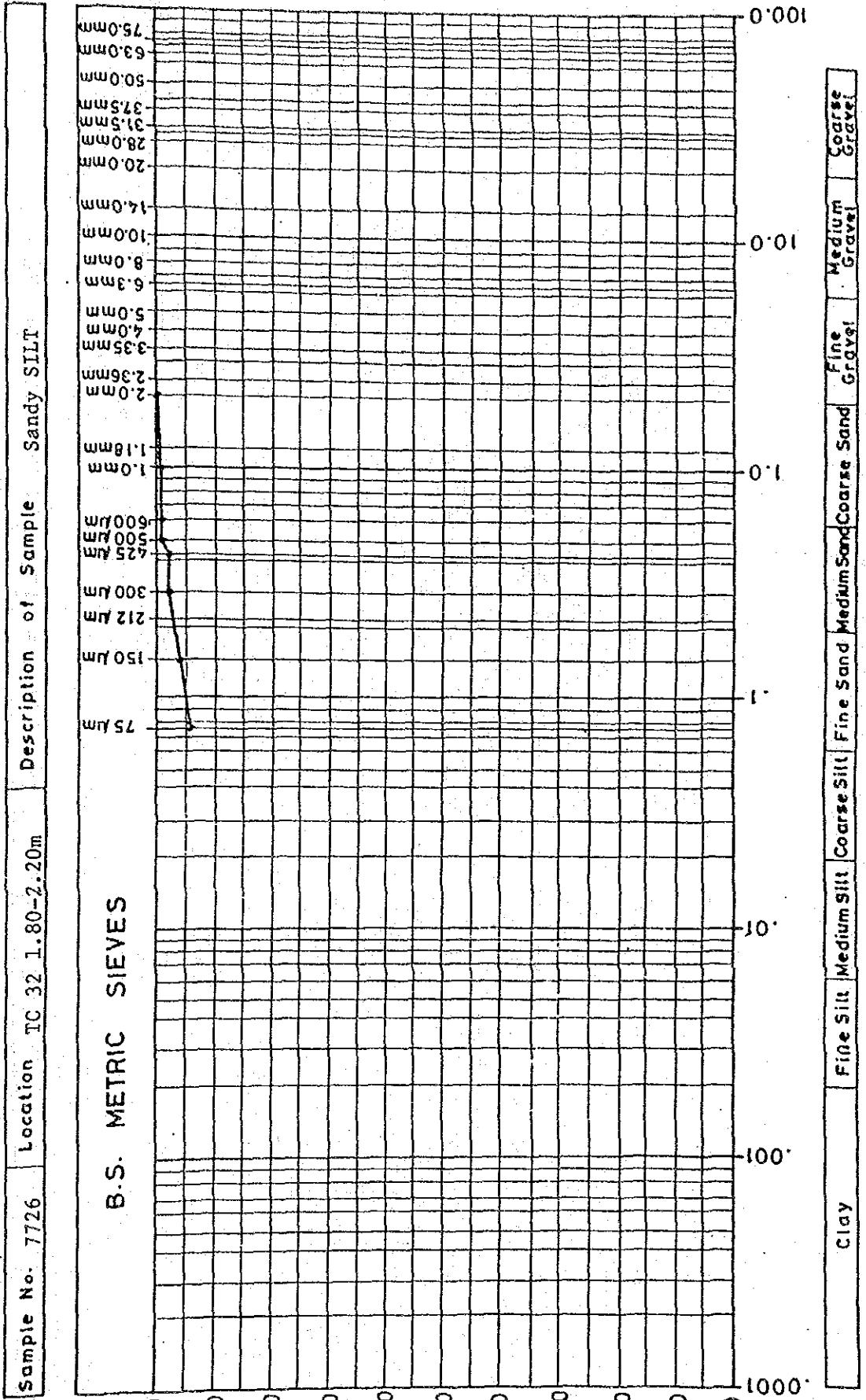
Sample No. 7725	Location TC 31 2.50-2.70m	Description of Sample Very sandy, very silty GRAVEL
-----------------	---------------------------	---



CIL CENTRAL TESTING LABORATORIES LTD.

P.O. BOX 18507 TEL. 559422/23
NAIROBI.

PARTICLE SIZE DISTRIBUTION

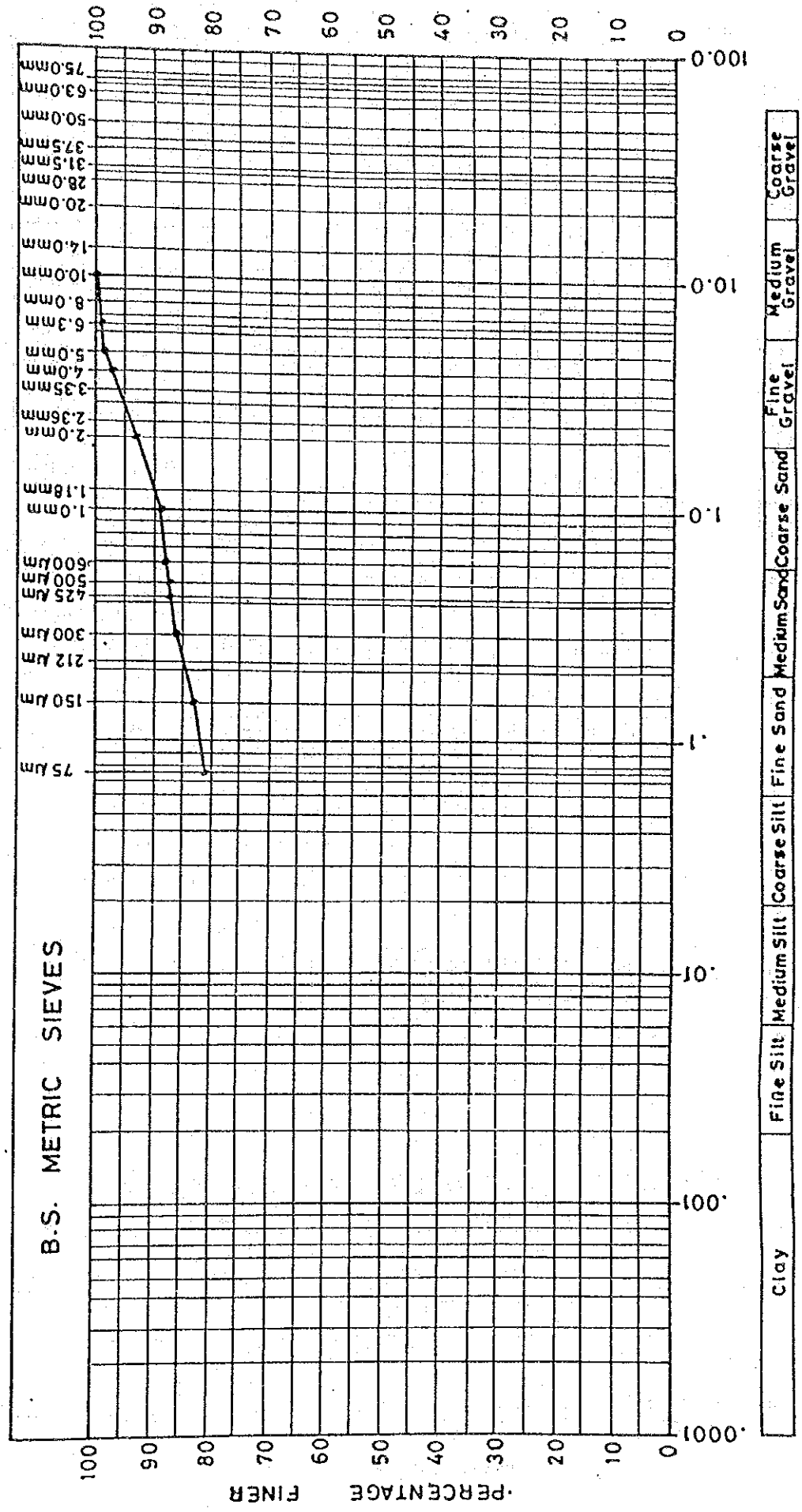


CIL CENTRAL TESTING LABORATORIES LTD.

P.O. BOX 18507 TEL. 559422/23
NAIROBI.

PARTICLE SIZE DISTRIBUTION

Sample No. 7727	Location TC 32 3.00-3.40m	Description of Sample Gravelly, sandy SILT
-----------------	---------------------------	--



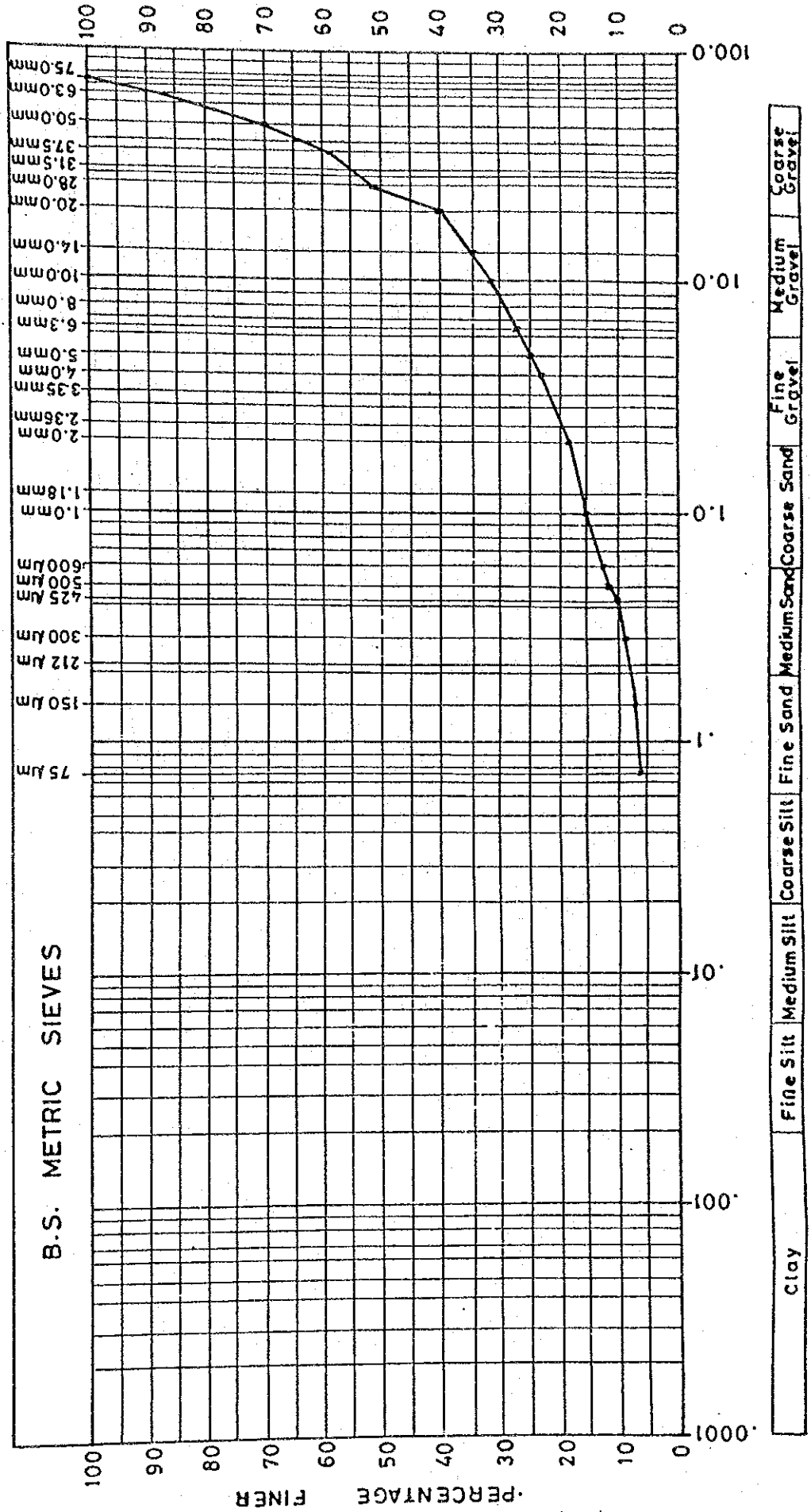
CIL CENTRAL TESTING LABORATORIES LTD.

P.O. BOX 18507 TEL. 559422/23

NAIROBI.

PARTICLE SIZE DISTRIBUTION

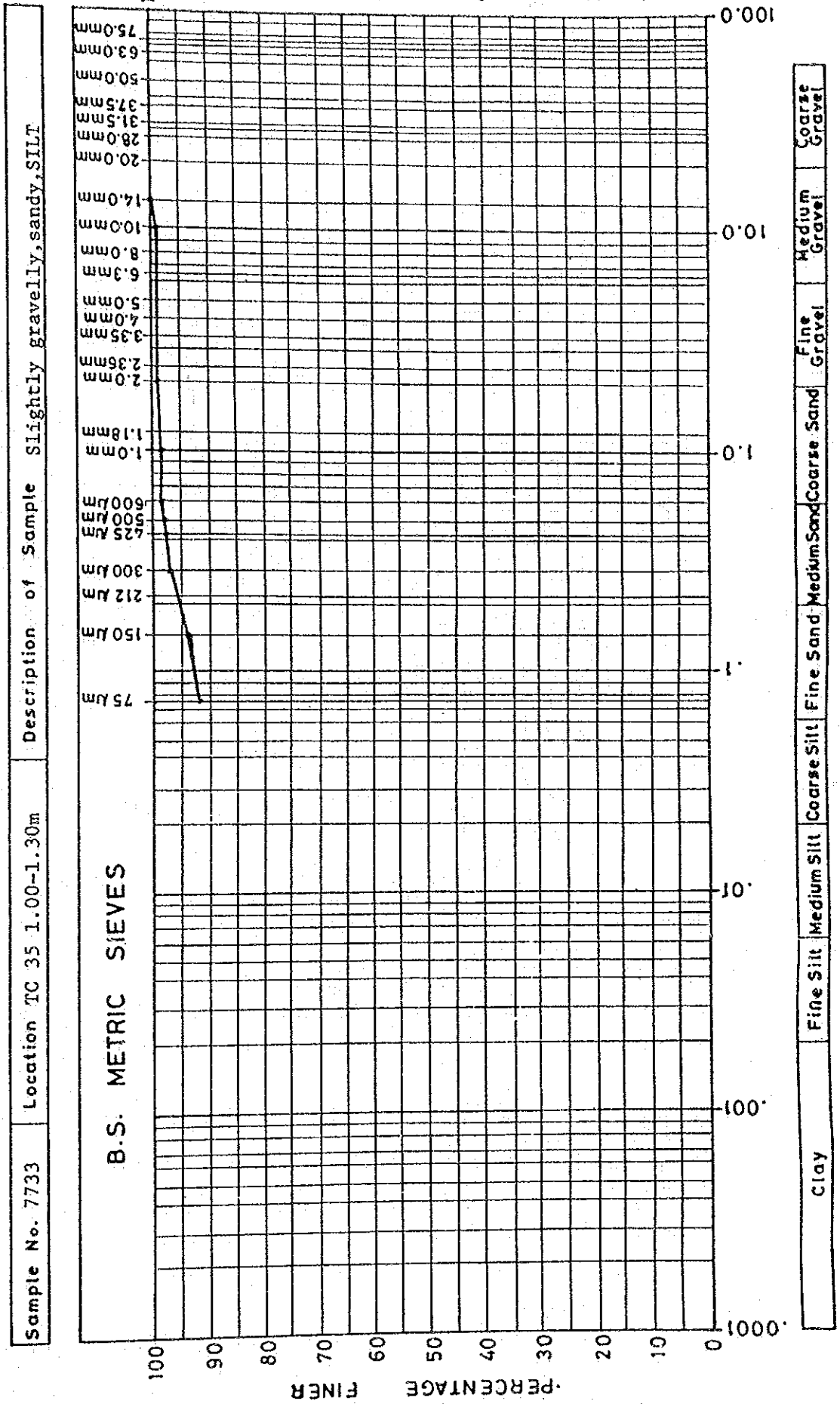
Sample No. 7730	Location TC 33 0.80-1.00m	Description of Sample	Sandy, silty GRAVEL
-----------------	---------------------------	-----------------------	---------------------



CIL CENTRAL TESTING LABORATORIES LTD.

P.O. BOX 18507 TEL. 559422/23
NAIROBI.

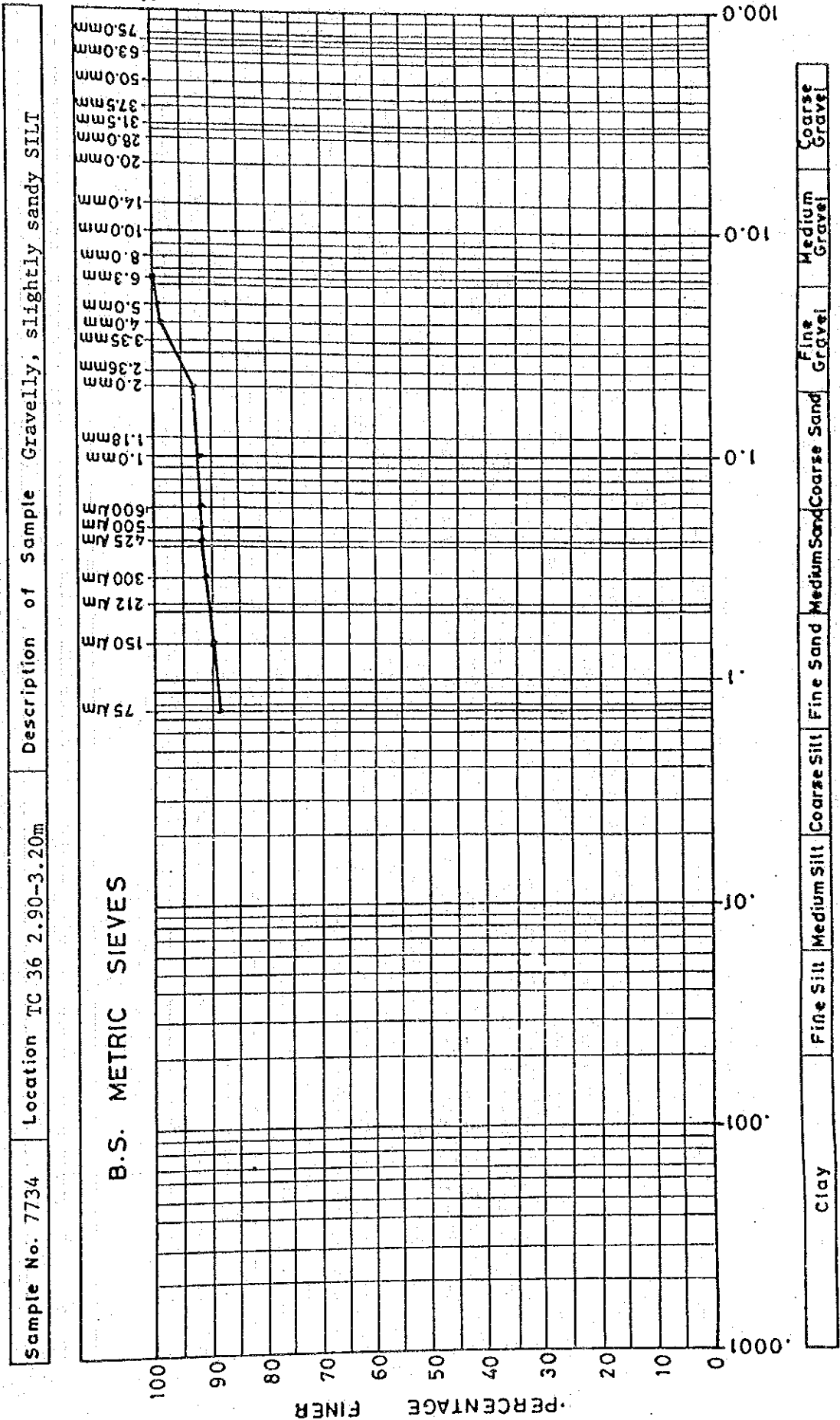
PARTICLE SIZE DISTRIBUTION



CIL CENTRAL TESTING LABORATORIES LTD.

P. O. BOX 18507 TEL. 559422/23
NAIROBI.

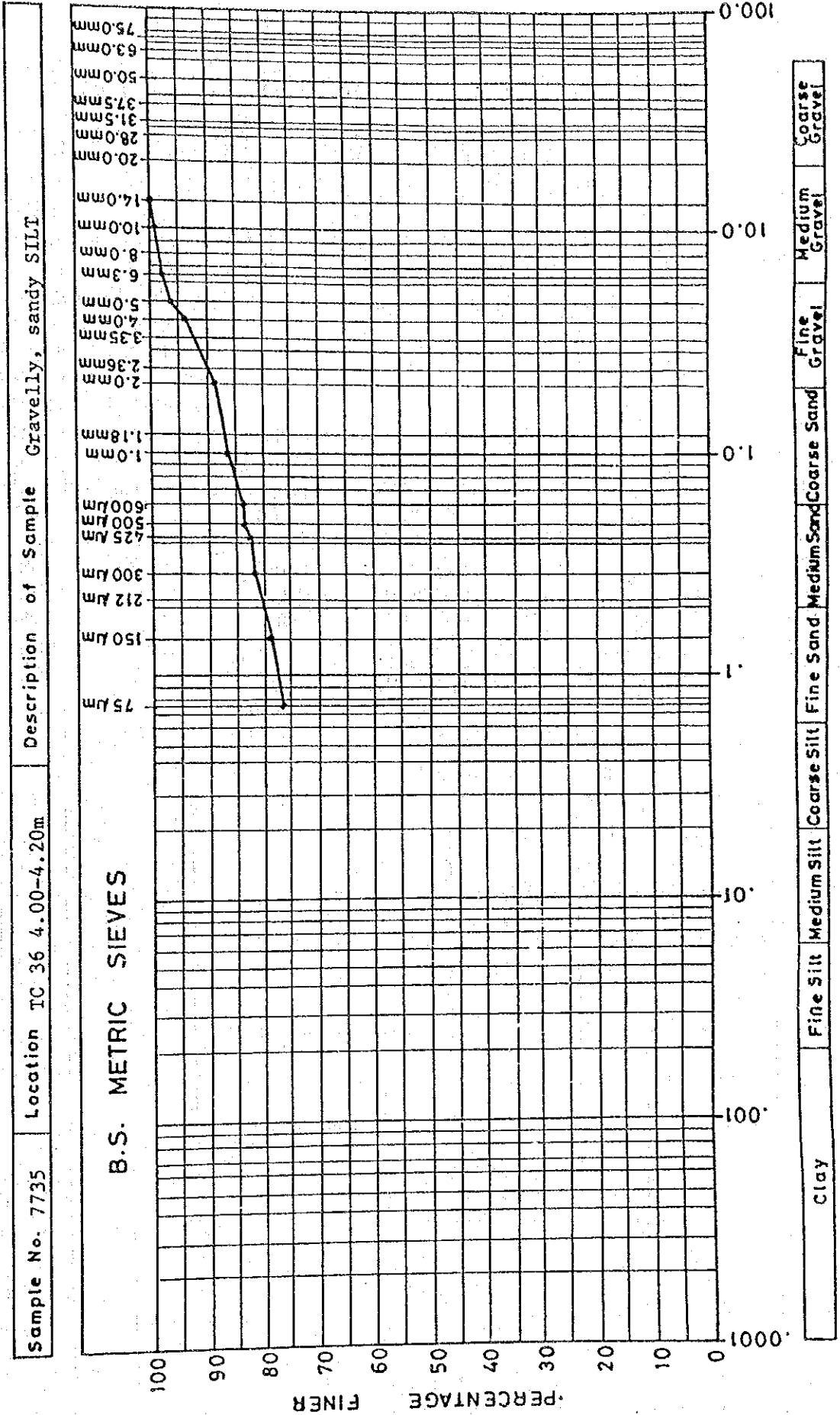
PARTICLE SIZE DISTRIBUTION



CIL CENTRAL TESTING LABORATORIES LTD.

P.O. BOX 18507 TEL. 559422/23
NAIROBI.

PARTICLE SIZE DISTRIBUTION



CENTRAL TESTING LABORATORIES LTD

P.O. Box 18507, NAIROBI, KENYA

MOWLEM CONSTRUCTION CO.(E.A.)LTD.

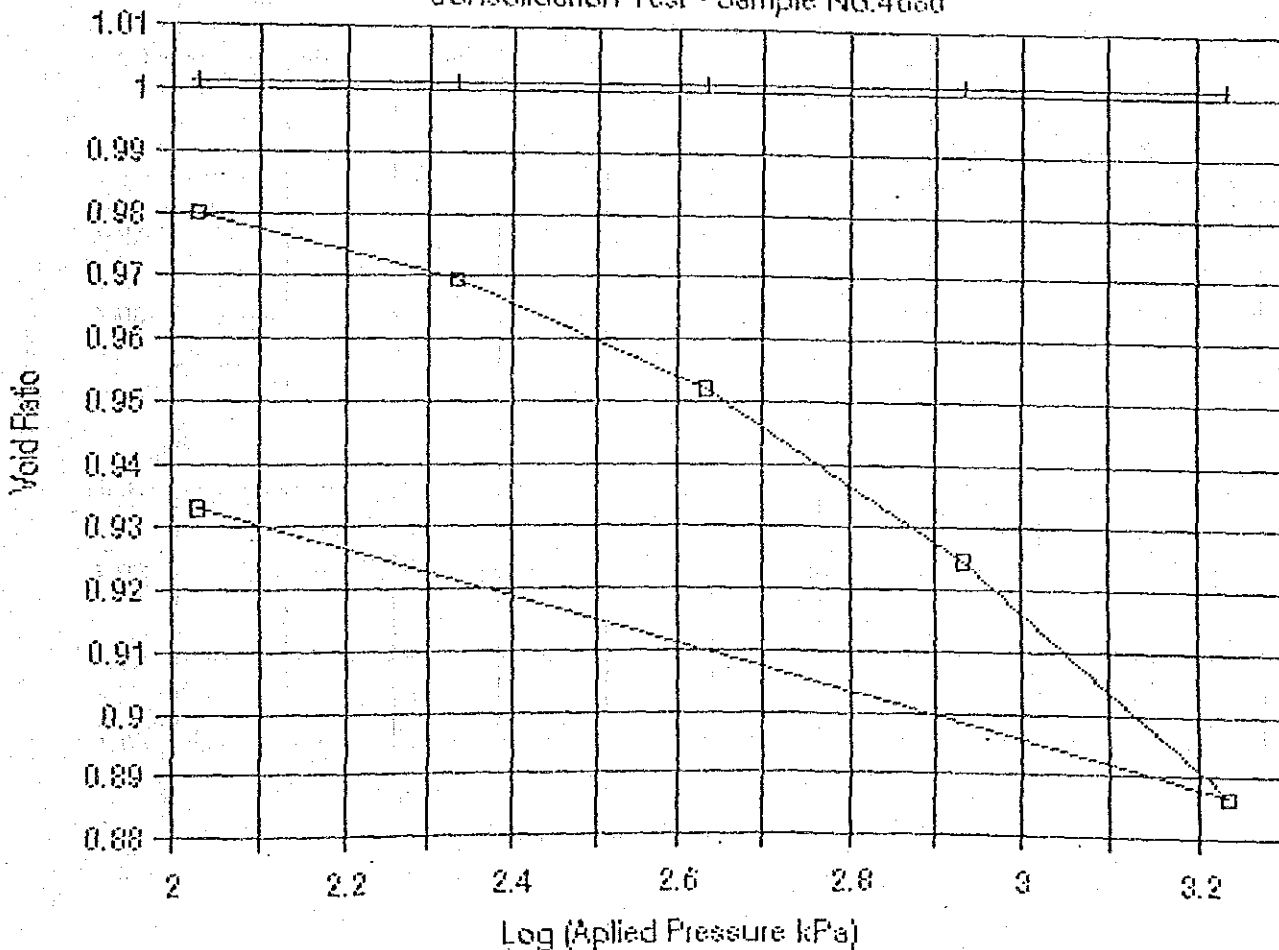
CONSOLIDATION TEST

4680 : sample number TC25 B1 0.2m-1.2m
 Sample Descr.: Red, slightly sandy SILT
 2.61 : relative density of soil
 1.30 : dry density of sample
 21.50 : initial height of sample
 1.00 : initial void ratio
 0.09 : void ratio reduction factor
 0.00 : dial gauge constant (positive if increases with settlement
 if not then negative)

pressure	dialread	hchange	voidchge	voidratio	sqrt90	cv m ² /yr	mv m ² /MN
	147	0.000	0.000	1.002			
107.3	238	0.231	0.022	0.980	2.8	6.4	0.10
214.5	282	0.343	0.032	0.970	0.8	77.3	0.05
429.0	356	0.531	0.049	0.952	1.2	33.9	0.04
858.0	472	0.826	0.077	0.925	2.6	7.1	0.03
1716.0	633	1.234	0.115	0.887	1.2	32.0	0.02
107.3	436	0.734	0.068	0.933			

CENTRAL TESTING LABORATORIES LTD

Consolidation Test - Sample No.4680



CENTRAL TESTING LABORATORIES LTD

P.O. Box 18507, NAIROBI, KENYA

CONSOLIDATION TEST

MOWLEM CONSTRUCTION CO. (E.A.) LTD.

4679 : sample number

TC24 B2 2.6m-2.8m

Sample Descr.: Fied, SILT

2.60 : relative density of soil

1.24 : dry density of sample

20.03 : initial height of sample

1.10 : initial void ratio

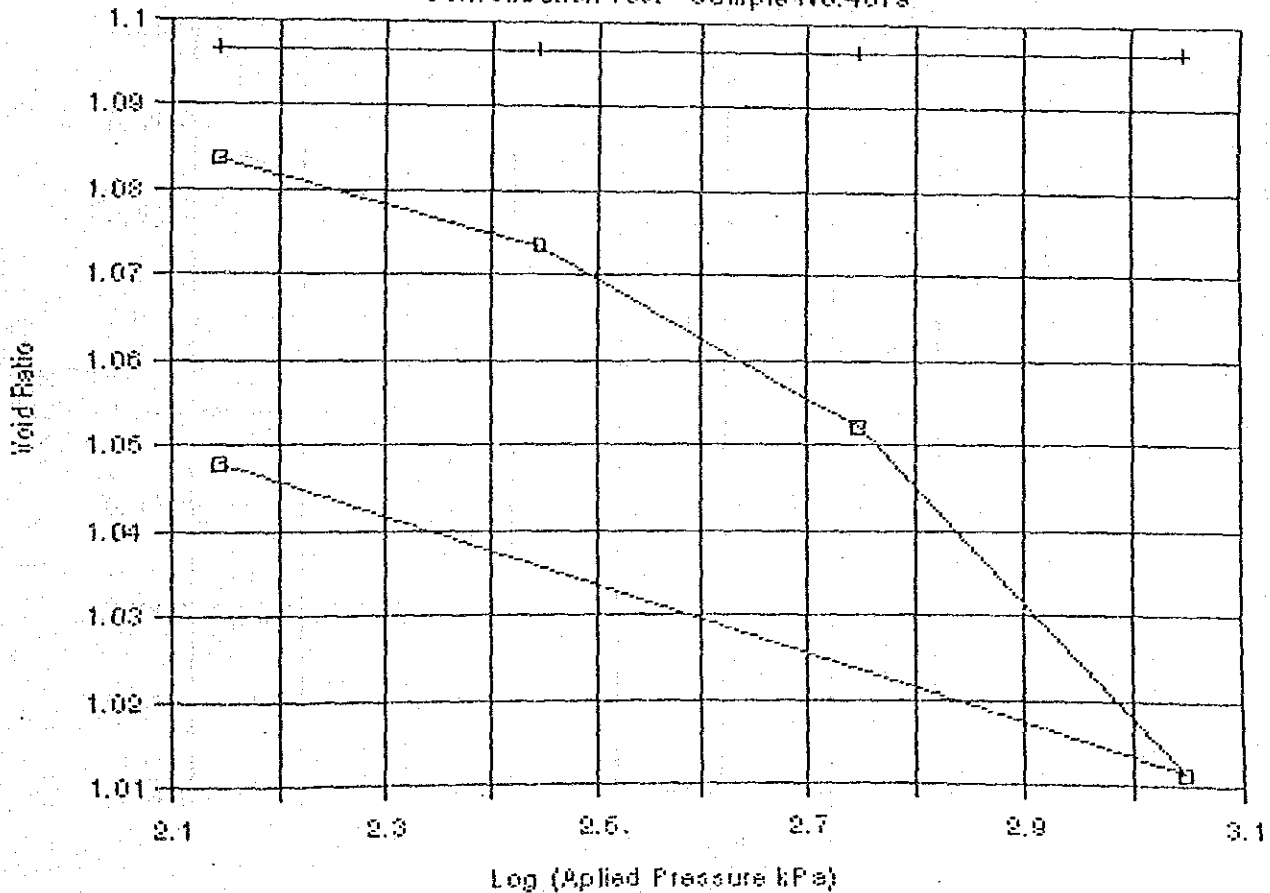
0.10 : void ratio reduction factor

-0.00 : dial gauge constant (positive if increases with settlement if not then negative)

pressure	dialread	htchange	voidchge	voidratio	sqrt90	cv m ² /yr	mv m ² /MN
	2739	0.000	0.000	1.097			
139.5	2690	0.124	0.013	1.084	1.7	15.2	0.04
279.0	2652	0.221	0.023	1.074	1.2	30.1	0.03
558.0	2571	0.427	0.046	1.052	1.2	29.7	0.04
1116.0	2418	0.816	0.085	1.011	1.1	34.2	0.04
139.5	2555	0.467	0.049	1.048	0.0	0.0	0.02

CENTRAL TESTING LABORATORIES LTD

Consolidation Test - Sample No. 4679



CENTRAL TESTING LABORATORIES LTD

P.O. Box 18507, NAIROBI, KENYA

MOWLEM CONSTRUCTION CO. (E.A.) LTD.

CONSOLIDATION TEST

4677 : sample number TC23 B1 0.7m-2.6m

Sample Descr.: - Red, sandy, SILT

2.58 : relative density of soil

1.31 : dry density of sample

21.50 : initial height of sample

0.98 : initial void ratio

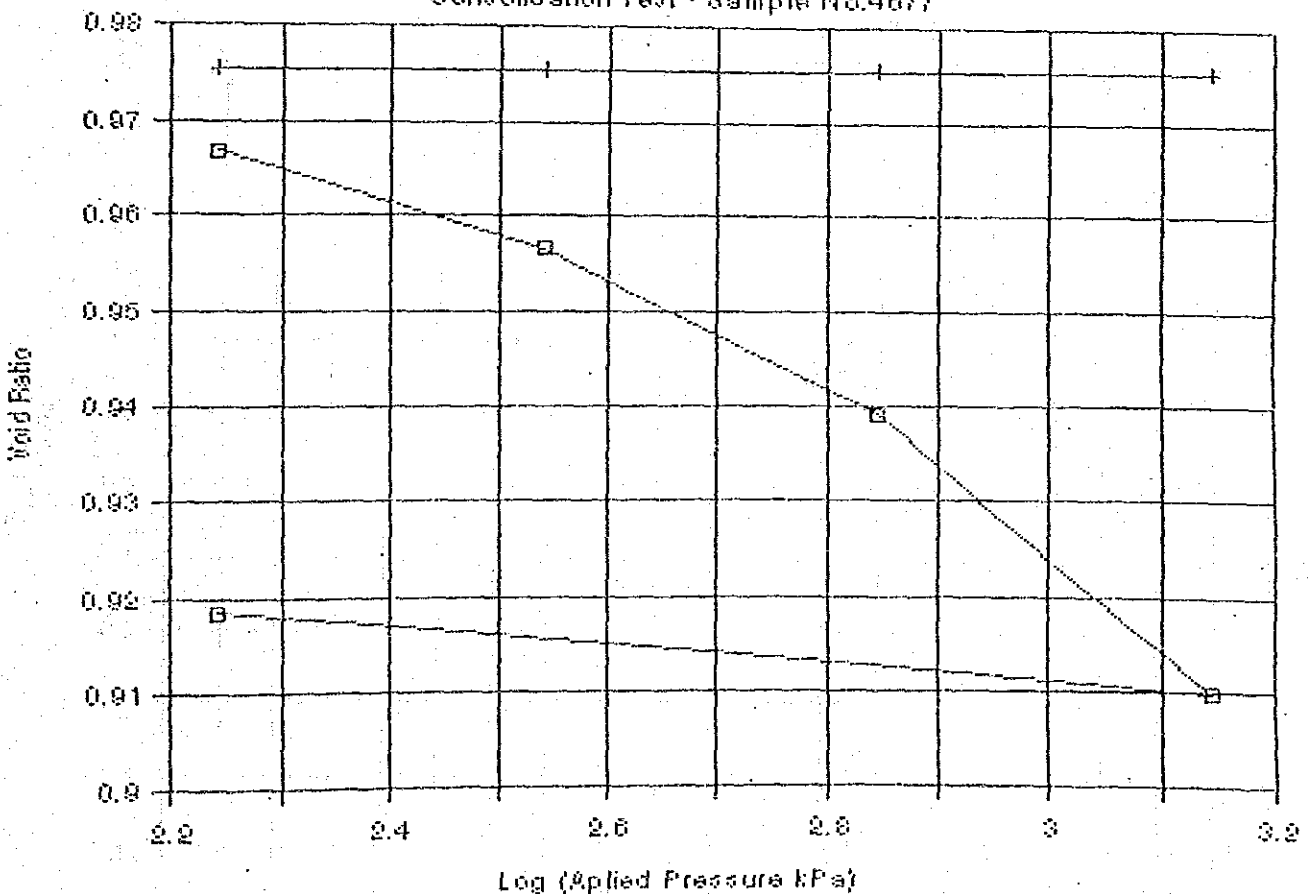
0.09 : void ratio reduction factor

0.00 : dial gauge constant (positive if increases with settlement if not then negative)

pressure	disread	htchange	voidchge	voidratio	sqrt90	cv m ² /yr	ntw m ² /MN
	144	0.000	0.000	0.975			
174.3	181	0.094	0.009	0.967	0.8	79.1	0.03
348.6	225	0.206	0.019	0.957	0.6	139.3	0.03
697.2	300	0.396	0.036	0.939	0.5	197.7	0.05
1394.4	425	0.714	0.066	0.910	0.8	75.4	0.02
174.3	388	0.620	0.057	0.919	0.0	0.0	0.00

CENTRAL TESTING LABORATORIES LTD

Consolidation Test - Sample No.4677



CENTRAL TESTING LABORATORIES LTD

P.O. Box 18507, NAIROBI, KENYA

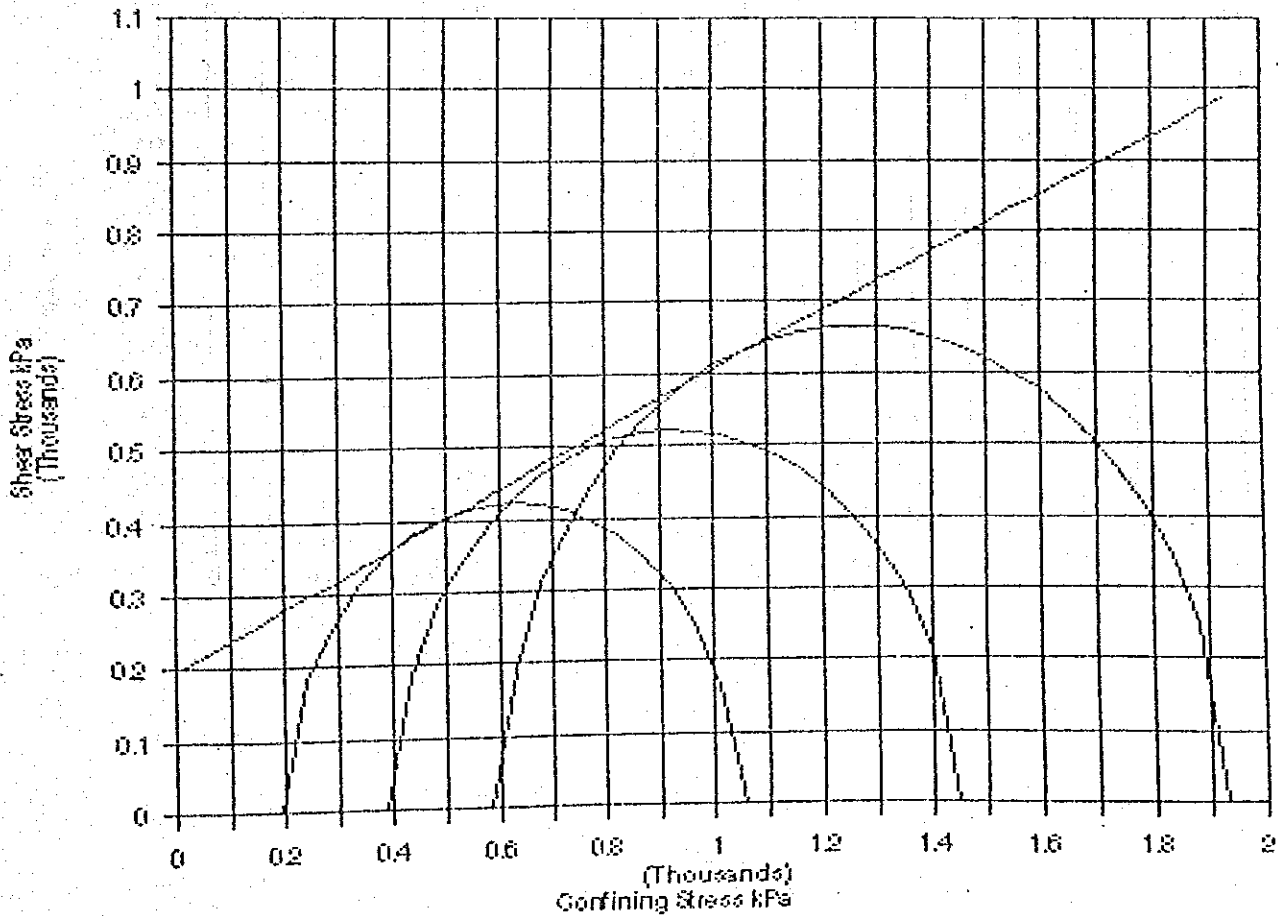
NAIROBI BY PASS
 TC23.B1 0.7m-2.6m
 QUICK UNDRAINED TRIAXIAL
 4677 Sample No.

Specimen No.	Bulk Density kg/m ³	Moisture Content %	Confining Pressure kN/m ²	1/2 Deviator Stress kN/m ²
1	1742	32.6	200	424
2	1743	32.7	400	523
3	1744	33.0	600	666

Slope: 22.2 degrees Intercept: 198 kN/m²

CENTRAL TESTING LABORATORIES LTD

Quick Undrained Txl - S. No. 4677



CENTRAL TESTING LABORATORIES LTD

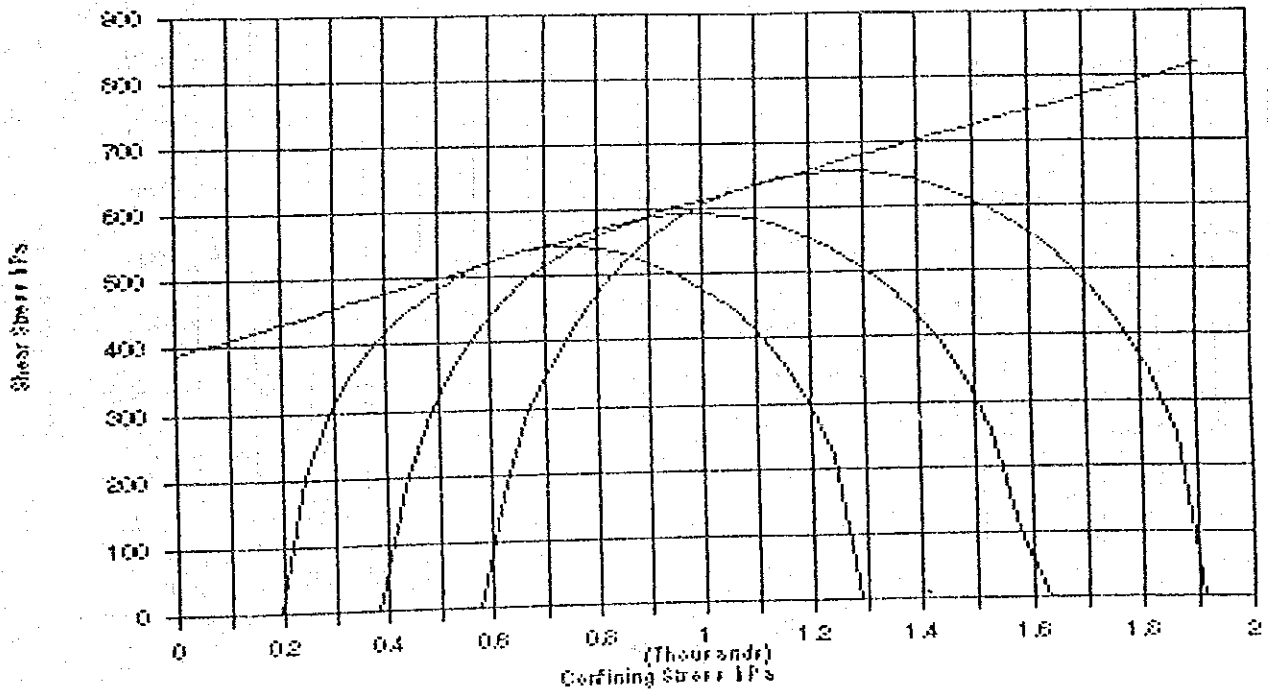
P.O. Box 18507, NAIROBI, KENYA

NAIROBI BY PASS
 TC24 B2 2.6m-2.8m
 QUICK UNDRAINED TRIAXIAL
 4679 Sample No.

Specimen No.	Bulk Density kg/m ³	Moisture Content %	Confining Pressure kN/m ²	1/2 Deviator Stress kN/m ²
1	1701	37.0	200	545
2	1705	37.8	400	594
3	1703	37.9	600	657

Slope 12.6 degrees Intercept 389 kN/m²

CENTRAL TESTING LABORATORIES LTD
 Quick Undrained Test - S. No. 4679



CENTRAL TESTING LABORATORIES LTD

P.O. Box 18507, NAIROBI, KENYA

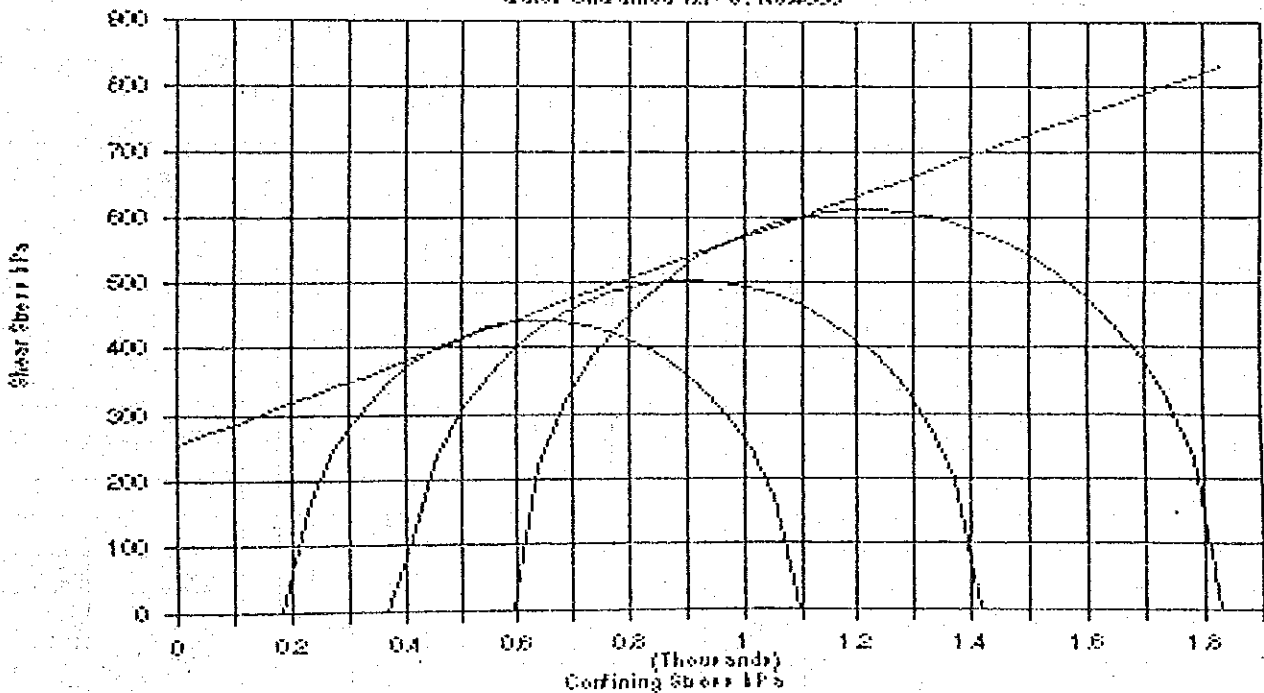
NAIROBI BY PASS
 TC25 B1 0.2m-1.2m
 QUICK UNDRAINED TRIAXIAL
 4680 Sample No.

Description: Red, slightly sandy, SILT
 Remoulded at 95% MDD & OMC

Specimen No.	Bulk Density kg/m ³	Moisture Content %	Confining Pressure kN/m ²	1/2 Deviator Stress kN/m ²
1	1753	34.3	200	443
2	1750	34.3	400	506
3	1752	34.3	600	614

Slope 17.5 degrees Intercept 256 kN/m²

CENTRAL TESTING LABORATORIES LTD
 Quick Undrained Tri - S. No. 4680



CENTRAL TESTING
LABORATORIES LTD.
P. O. Box 18507,
NAIROBI.

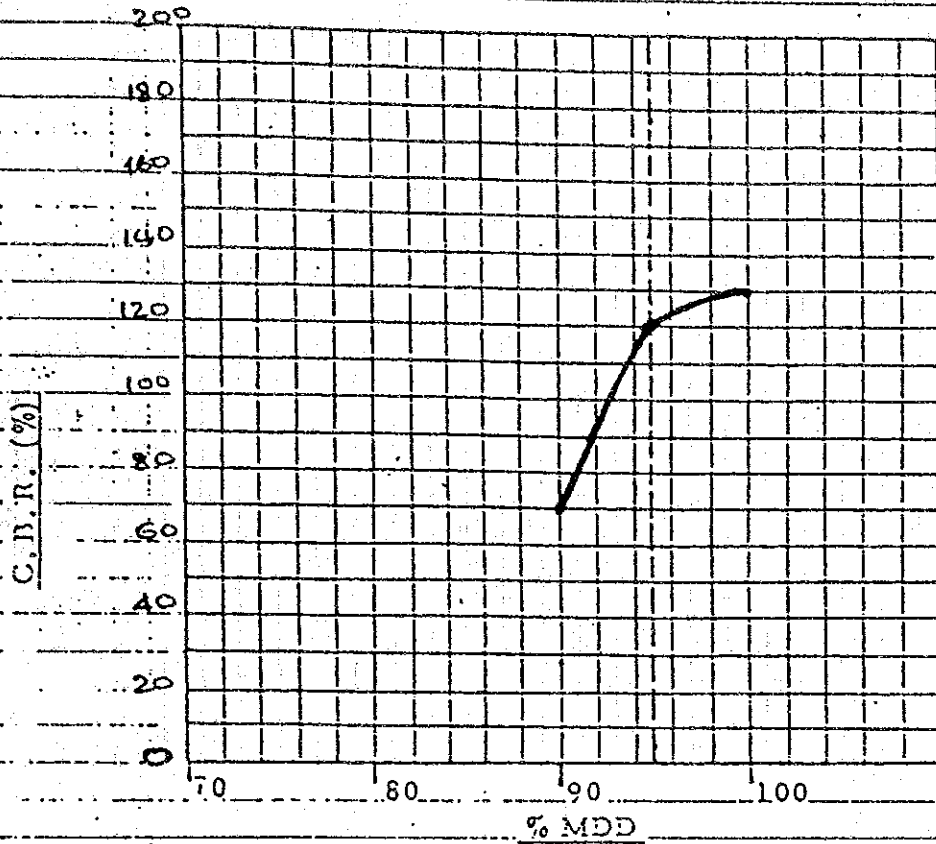
CALCULATIONS

FOR 3 POINT C.B.R.
AND SWELL MEASUREMENT

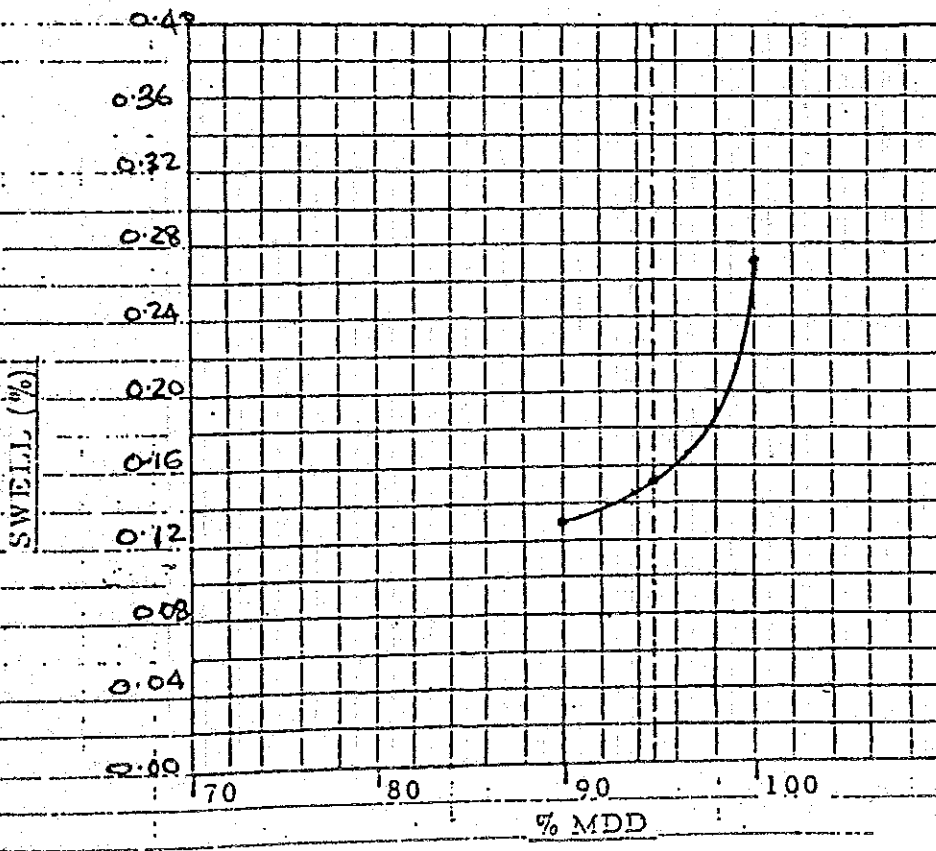
S/No.	Date	TC	Size
4652	27/8/90	3B1	0.20-0.60m

Client MOWLEM CONSTRUCTION CO (EA)LTD

Location NAIROBI BY PASS



C.B.R. AT
95% MDD:-
IMMEDIATE:-
N/A %
SOAKED:-
120 %



SWELL AT
95% MDD:-
0.2 %
(SOAKED
C.B.R. ONLY)

CENTRAL TESTING LABORATORIES LTD.
 P. O. Box 18507,
 NAIROBI.

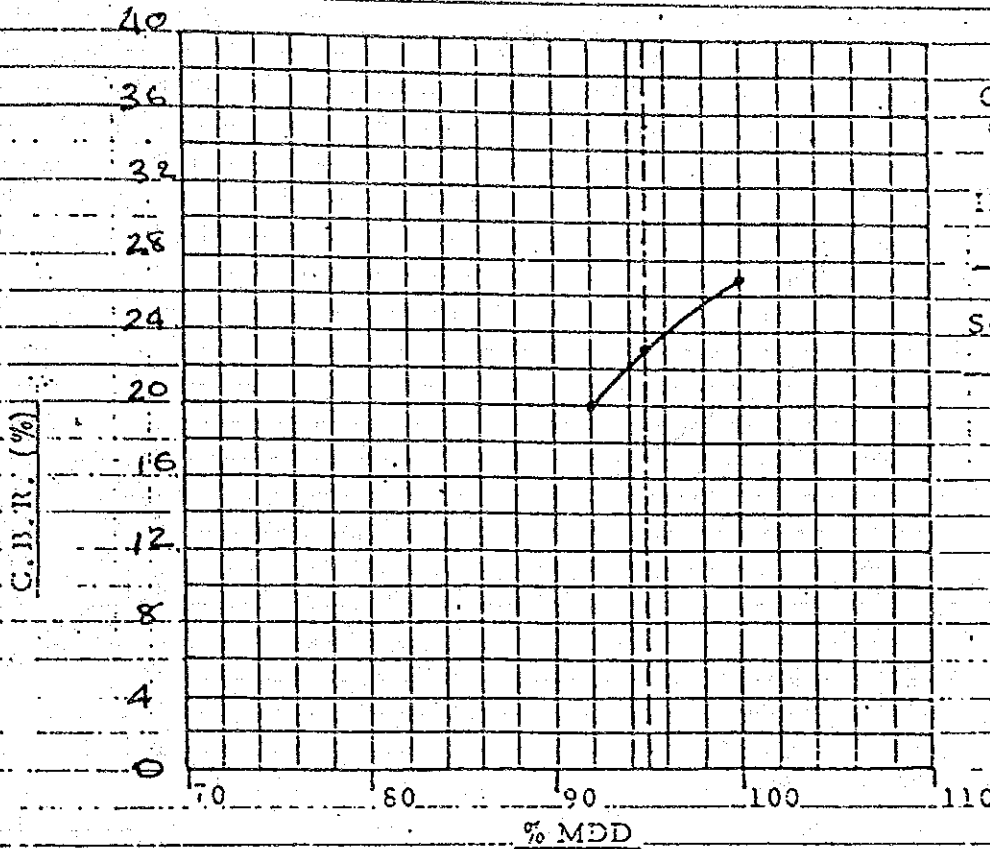
CALCULATIONS

FOR 3 POINT C.B.R.
 AND SWELL MEASUREMENT

S/No.	Date	TC6 B1	0.30-1.60mm
4657	27/8/90		

Client MOWLEM CONSTRUCTION CO (EA) LTD

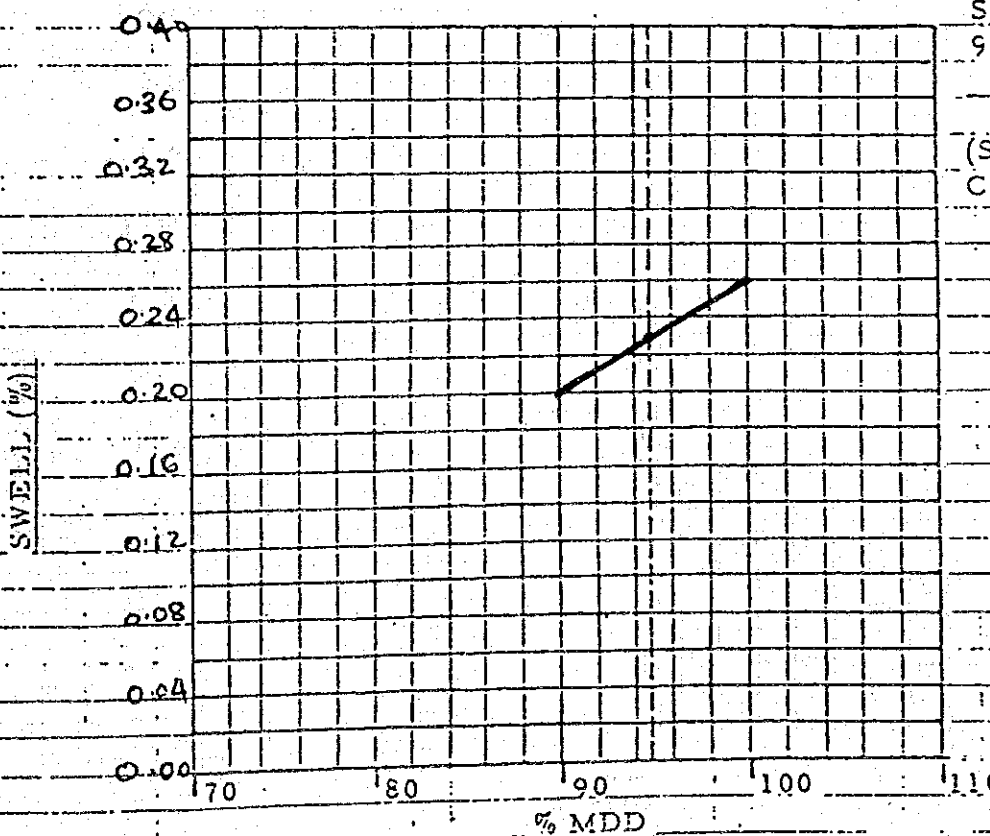
Location NAIROBI BY PASS



C.B.R. AT
 95% MDD:-

IMMEDIATE:-
 N/A %

SOAKED:-
 23 %



SWELL AT
 95% MDD:-
 0.2 %

(SOAKED
 C.B.R. ONLY)

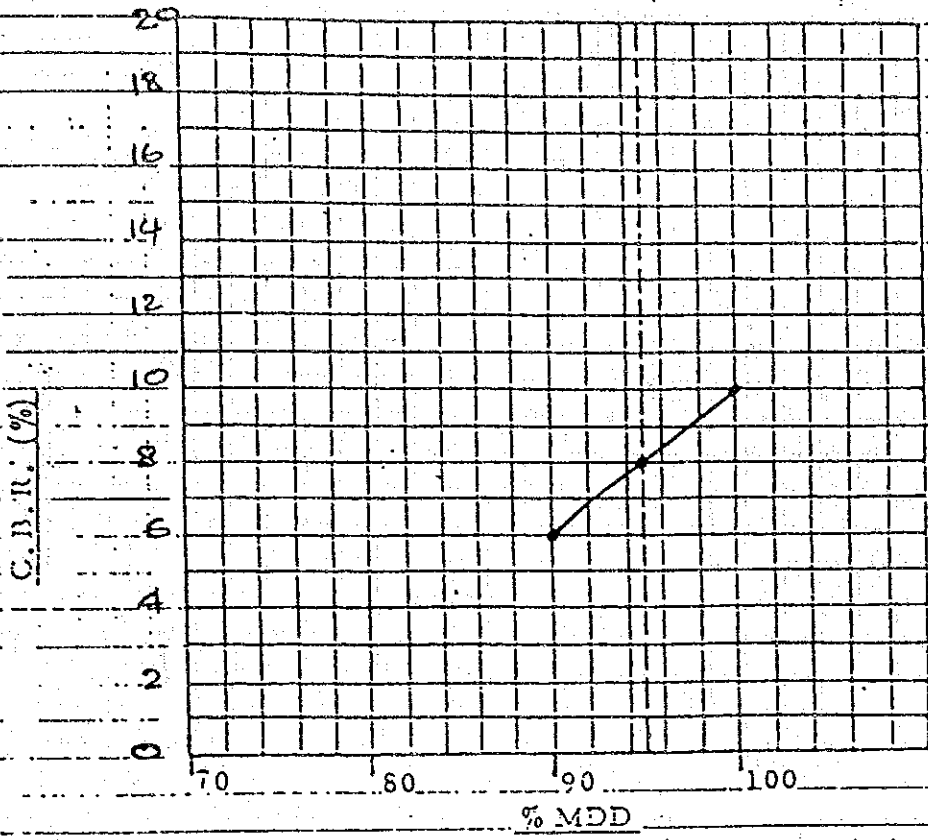
CENTRAL TESTING
 LABORATORIES LTD.
 P. O. Box 18507,
 NAIROBI.

CALCULATIONS
 FOR 3 POINT C. B. R.
 AND SWELL MEASUREMENT

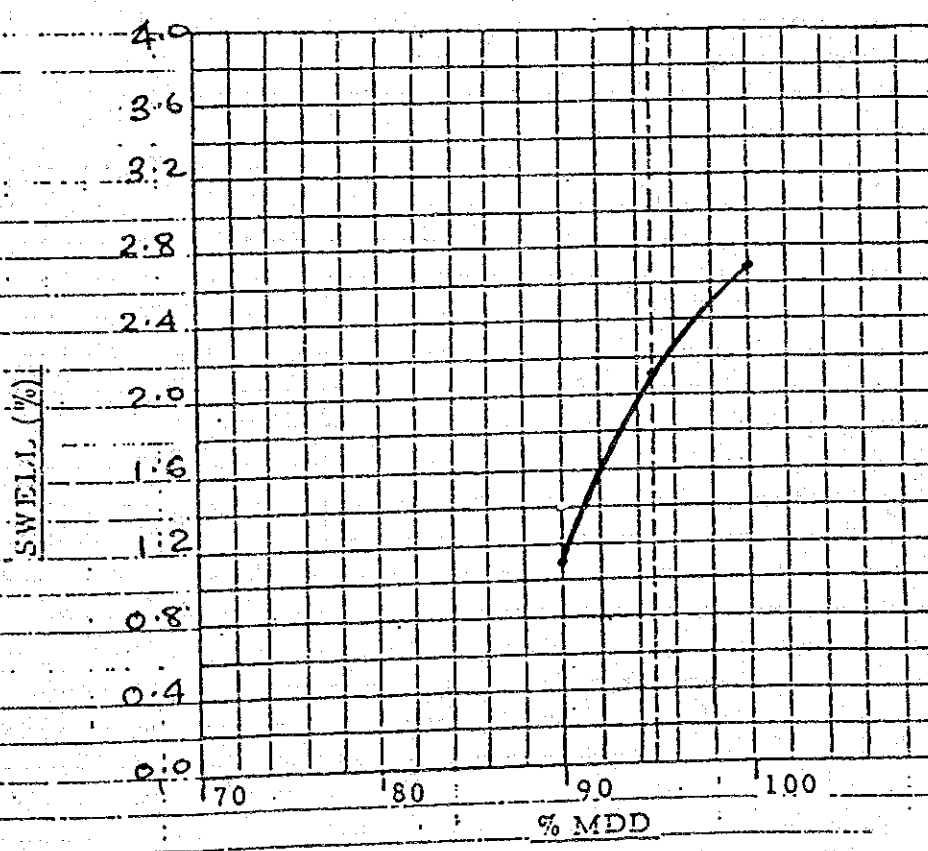
S/No.	Date	TC12B1	0.50-4.00m
4663	27/8/90		

Client -- MOWLEM CONSTRUCTION CO(EA)LTD

Location -- NAIROBI BY PASS



C. B. R. AT
 95% MDD: -
 IMMEDIATE: -
 N/A %
 SOAKED: -
 8 %



SWELL AT
 95% MDD: -
 0.2 %
 (SOAKED
 C. B. R. ONLY)

CENTRAL TESTING
 LABORATORIES LTD.
 P. O. Box 18507,
 NAIROBI.

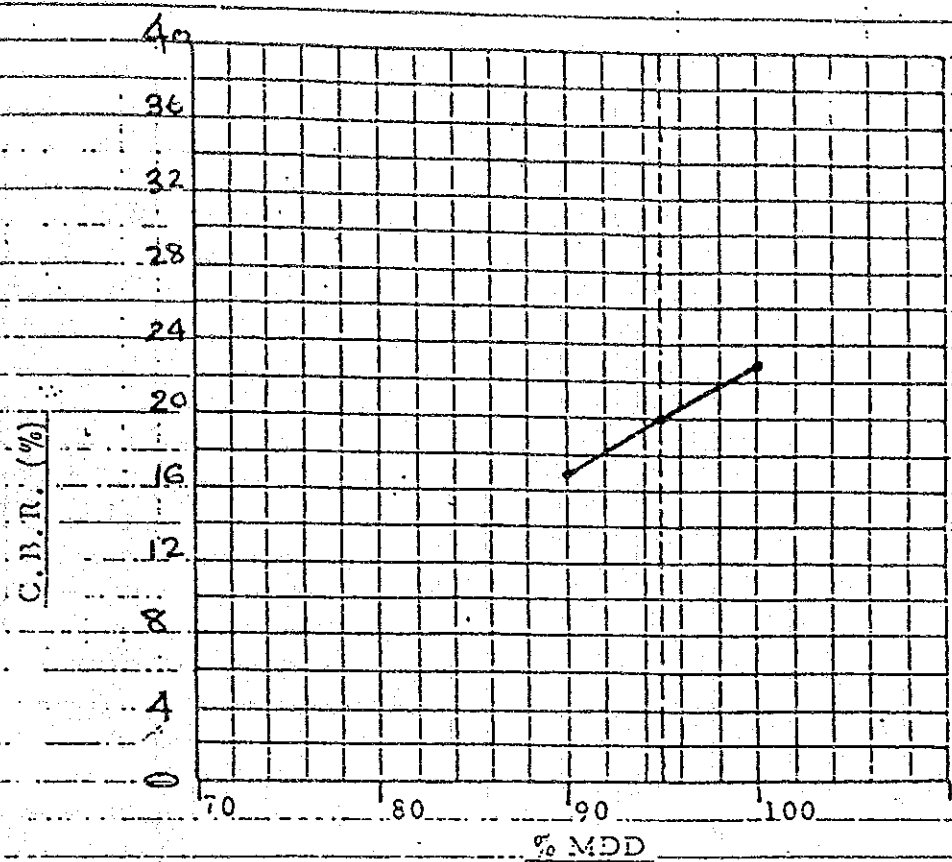
CALCULATIONS

FOR 3 POINT C.B.R.
 AND SWELL MEASUREMENT

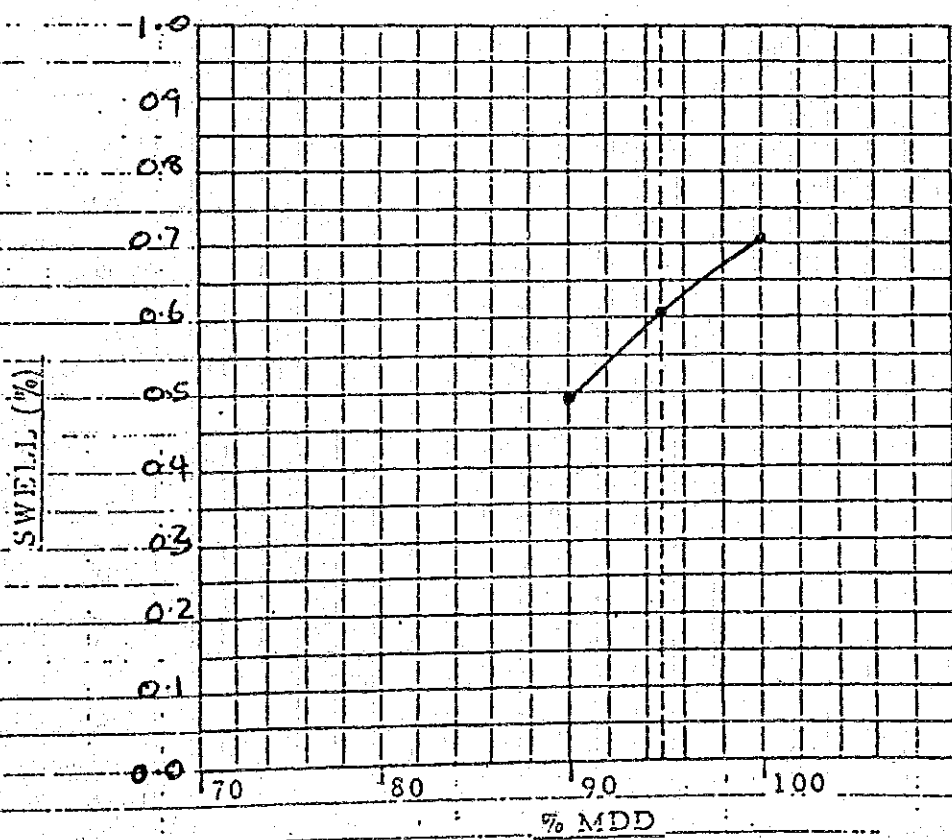
S/No.	Date	TC	Depth
4677	27/8/90	TC23B1	0.70-2.60m

Client MOWLEM CONSTRUCTION CO (EA) LTD

Location NAIROBI BY PASS



C.B.R. AT
 95% MDD: -
 IMMEDIATE: -
 N/A %
 SOAKED: -
 20 %



SWELL AT
 95% MDD: -
 0.6 %
 (SOAKED
 C.B.R. ONLY)

CENTRAL TESTING LABORATORIES LTD.
 P. O. Box 18507,
 NAIROBI.

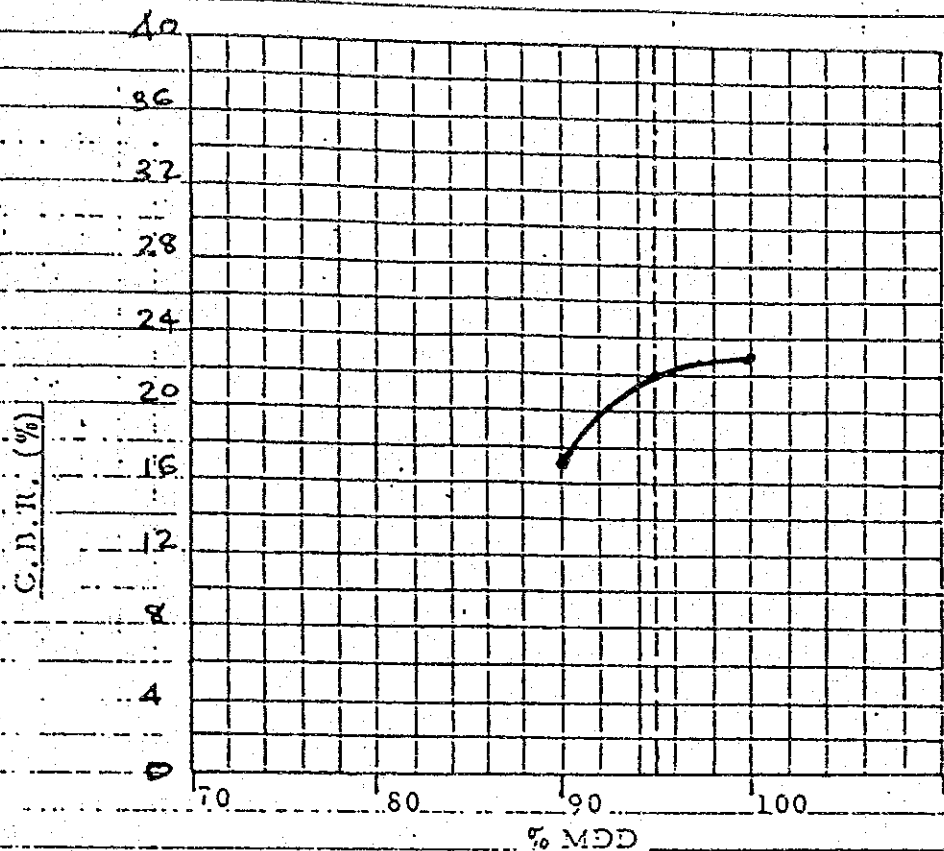
CALCULATIONS

FOR 3 POINT C.B.R.
 AND SWELL MEASUREMENT

S/No. 4684	Date 27/8/90	TC29B1	0.40-4.00m
---------------	-----------------	--------	------------

Client MOWLEM CONSTRUCTION CO (EA)LTD

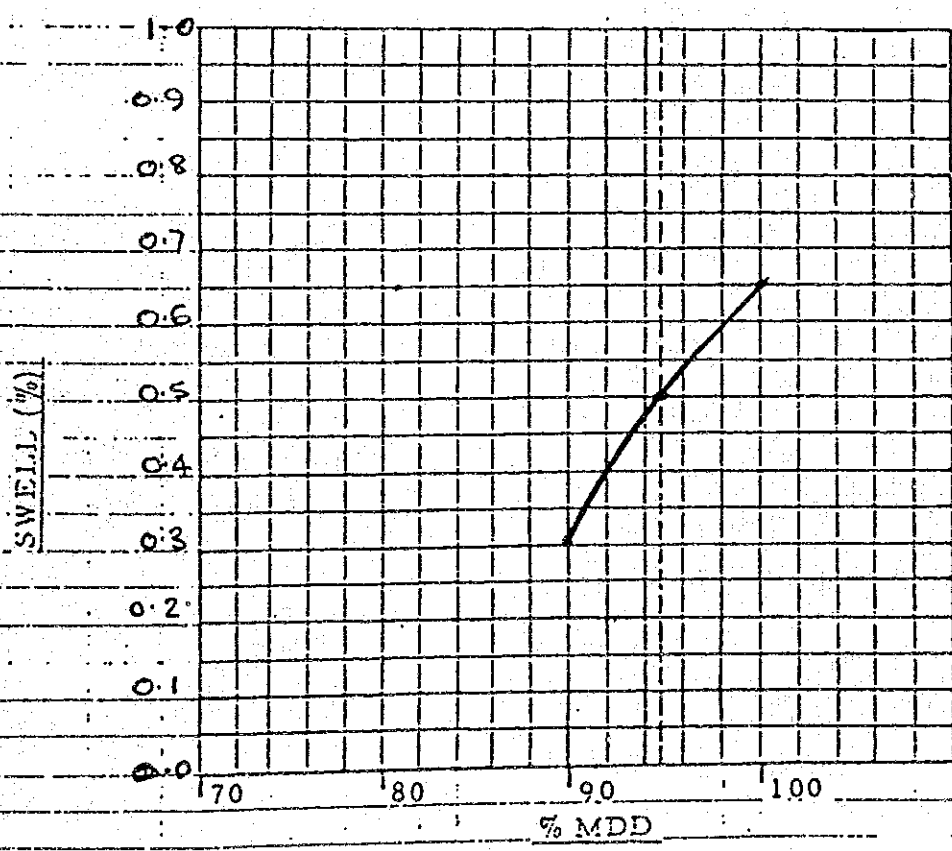
Location NAIROBI BY PASS



C.B.R. AT
 95% MDD:-

IMMEDIATE:-
 N/A %

SOAKED:-
 22 %



SWELL AT
 95% MDD:-
 0.5 %

(SOAKED
 C.B.R. ONLY)