

MINUTES OF DISCUSSIONS
ON BASIC DESIGN STUDY
ON THE RURAL HEALTH FACILITIES IMPROVEMENT
IN THE REPUBLIC OF MALAWI
(EXPLANATION ON DRAFT REPORT)

In February 2006, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for the Rural Health Facilities Improvement (hereinafter referred to as "the Project") to the Republic of Malawi (hereinafter referred to as "Malawi"), and through discussions, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

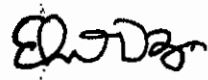
In order to explain and to consult the Malawi on the components of the draft report, JICA sent to Malawi the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Kyoji Mizutani, Resident Representative, JICA Malawi Office, from 10 August to 17 August 2006.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

Malawi, 16 August, 2006



Mr. Kyoji Mizutani
Leader
Draft Report Explanation Team
Japan International Cooperation Agency
Japan



Mr. Ellos E. Lodzeni
Director
Finance & Administration
Ministry of Health
Republic of Malawi

ATTACHMENT

1. Components of the Draft Report

The Malawi side accepted in principle the components of the draft report explained by the Team. As a result, both parties confirmed that the items described in Annex-1 are the final components of the Project, which the Malawi side requested.

2. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and submit it to the Malawi side around October 2006.

3. Other relevant issues

3-1 The Team confirmed that Ministry of Health (hereinafter referred to as "MOH") submitted to the Team title deed for 11 institutions as of August 15. The Team requested MOH to obtain remaining 2 from Mzimba and 3 from Lilongwe. The MOH agreed to submit them to JICA Malawi Office before August 31, 2006.

3-2 The MOH agreed to work with Ministry of Finance to allocate to the four targeted districts, Rumphi, Mzimba, Kasungu, and Lilongwe enough budget for operation and maintenance cost such as water and electricity charges for facilities, and expenses for repair services, spare parts and consumable items after hand-over of the Project.

3-3 The MOH agreed to secure the budget necessary for procurement of equipment and furniture for the facilities newly constructed, which are excluded from the scope of the Japanese grant aid. The detail list of the equipment and furniture which Malawi side will procure and install before February 2008, are shown as Annex-3.

3-3 The MOH agreed to assign a medical assistant to KHC-11 Chamwabvi Dispensary before completion of the construction.

3-4 The MOH requested to indicate the location of outside toilet for male, female and staff, elevated water tank for flush toilet and septic tank in the Health Centre plan in the final building layout plan for future construction by Malawi side.

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Annex-1: Components of the request by the Malawi side

1-1 Targeted Facilities

1-2 Basic Design Drawing

1-3 Equipment Plan

1-4 Breakdown of Equipment List for each health centre

Annex-2: Equipment and furniture list that Malawi side will procure

2-1 District Hospital

2-2 Health Centre

Annex-3: Tentative Implementation Schedule

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Annex-1: Components of the request by the Malawi side

1-1 Targeted facilities

No.	ID No.	Name	Construction	Type of Building	Medical Equipment.
Rumphi District					
	RDH	Rumphi District Hospital	yes	Paediatrics	yes
			yes	Maternity	yes
1	RHC-1	Chitimba HC	no		yes
2	RHC-2	Jalawe HC	no		yes
3	RHC-3	Katowo RH	yes	Maternity	yes
4	RHC-4	Mhuju HC	no		yes
5	RHC-5	Mpompha HC	no		yes
6	RHC-6	Mwazisi HC	yes	Maternity	yes
Mzimba District					
	MDH	Mzimba District Hospital	yes	Paediatric	yes
7	MHC-1	Bulala HC	no		yes
8	MHC-2	Bwengu HC	no		yes
9	MHC-3	Choma HC	no		yes
10	MHC-4	Emfeni HC	yes	Maternity	yes
11	MHC-5	Emsizini HC	no		yes
12	MHC-6	Endindeni HC	yes	Dispensary	yes
13	MHC-7	Enukweni HC	no		yes
14	MHC-8	Engucwini HC	no		yes
15	MHC-9	Euthini HC	yes	Maternity	yes
16	MHC-10	Hoho HC	no		yes
17	MHC-11	Jenda HC	no		yes
18	MHC-12	Kafukule HC	yes	Dispensary	yes
19	MHC-13	Kamteteka HC	no		yes
20	MHC-14	Khosolo HC	no		yes
21	MHC-15	Kabuwa HC	no		yes
22	MHC-16	Kamwe HC	no		yes
23	MHC-17	Luvwere HC	no		yes
24	MHC-18	Luwerezi HC	no		yes
25	MHC-19	Luzi HC	no		yes
26	MHC-20	Madede HC	no		yes
27	MHC-21	Malidade HC	no		yes
28	MHC-22	Manyamula HC	no		yes
29	MHC-23	Mbalachanda HC	no		yes

No.	ID No.	Name	Construction	Type of Building	Medical Equipment.
30	MHC-24	Mpherembe HC	no		yes
31	MHC-25	Msese HC	no		yes
32	MHC-26	Mtende HC	no		yes
33	MHC-27	Mtwalo HC	no		yes
34	MHC-28	Mzalangwe HC	no		yes
35	MHC-29	Mzuzu Urban HC	no		yes
36	MHC-30	Njuyu HC	no		yes
37	MHC-31	Kabwafu HC	no		yes
38	MHC-32	Thunduwike HC	no		yes
39	MHC-33	Mkoma HC	no		yes
40	MHC-34	Luwawa HC	no		yes
41	MHC-35	Nkhukuyu HC	no		yes
Kasungu District					
42	KHC-1	Chulu HC	yes	Dispensary	yes
43	KHC-2	Kamboni HC	no		yes
44	KHC-3	Kapelula HC	yes	Maternity	yes
45	KHC-4	Kawamba HC	no		yes
46	KHC-5	Mkhota HC	no		yes
47	KHC-6	Mtunthama HC	no		yes
48	KHC-7	Santhe HC	no		yes
49	KHC-8	Simulemba HC	yes	Dispensary	yes
50	KHC-9	Wimbe HC	no		yes
51	KHC-10	Khola HC	yes	Dispensary	yes
52	KHC-11	Chamwabvi Dispensary	yes	Maternity	yes
Lilongwe District					
53	LHC-1	Chiwamba HC	yes	Dispensary	yes
54	LHC-2	Mtentera HC	yes	Maternity	yes
55	LHC-3	Mbangombe 1 HC	yes	Dispensary	yes

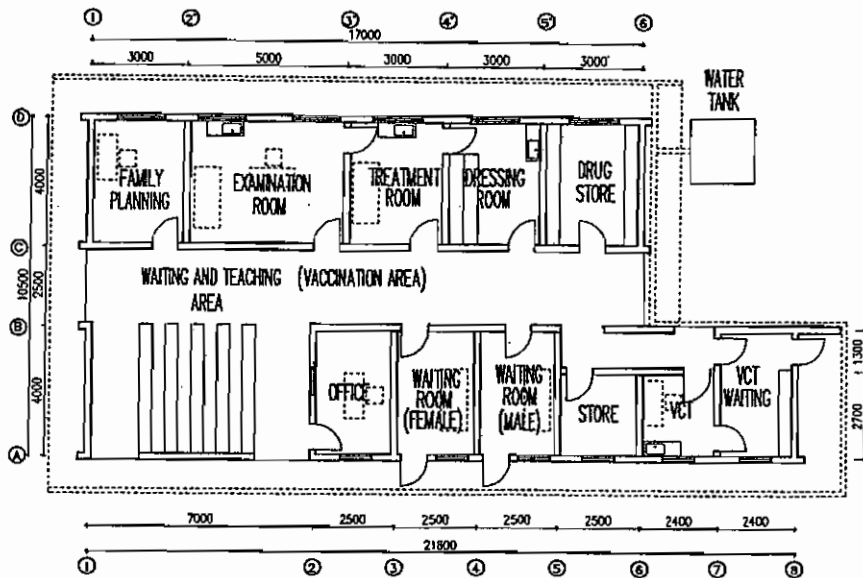
1-2 Basic Design Drawings

List of Drawings

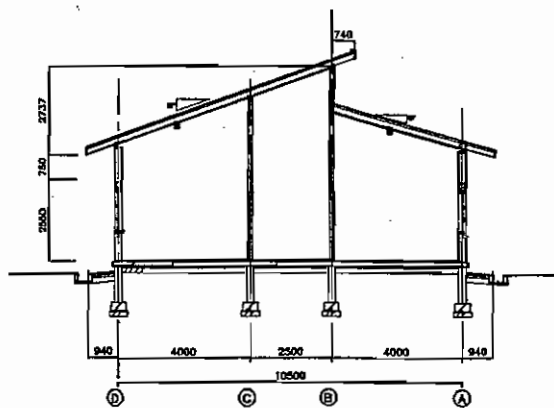
1. HC Dispensary Floor Plan and Section (Common Drawing)
2. HC Dispensary Elevation (Common Drawing)
3. HC Maternity Ward Floor Plan and Section (Common Drawing)
4. HC Maternity Ward Elevation (Common Drawing)
5. Rumphi District Hospital Layout Plan
6. Rumphi District Hospital Paediatric Ward Floor Plan
7. Rumphi District Hospital Paediatric Ward Elevation and Cross Section
8. Rumphi District Hospital Maternity Ward Floor Plan
9. Rumphi District Hospital Maternity Ward Elevation and Cross Section
10. RHC-3 Katowo Rural Hospital Layout Plan and Existing Facilities Floor Plan
11. RHC-6 Mwazisi HC Layout Plan and Existing Facilities Floor Plan
12. Mzimba District Hospital Layout Plan
13. Mzimba District Hospital Paediatric Ward Floor Plan
14. Mzimba District Hospital Paediatric Ward Elevation and Cross Section
15. MHC-4 Emfeni HC Layout Plan and Existing Facilities Floor Plan
16. MHC-6 Endindeni HC Layout Plan and Existing Facilities Floor Plan
17. MHC-9 Euthini HC Layout Plan and Existing Facilities Floor Plan
18. MHC-12 Kafukule HC Layout Plan and Existing Facilities Floor Plan
19. KHC-1 Chulu HC Layout Plan and Existing Facilities Floor Plan
20. KHC-3 Kapelula HC Layout Plan and Existing Facilities Floor Plan
21. KHC-8 Simulemba HC Layout Plan and Existing Facilities Floor Plan
22. KHC-10 Khola HC Layout Plan and Existing Facilities Floor Plan
23. KHC-11 Chamwabvi Dispensary Layout Plan and Existing Facilities Floor Plan
24. LHC-1 Chiwamba HC Layout Plan and Existing Facilities Floor Plan
25. LHC-2 Mtenthera HC Layout Plan and Existing Facilities Floor Plan
26. LHC-3 Mbangombe 1 HC Layout Plan and Existing Facilities Floor Plan

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DISPENSARY STANDARD PLAN

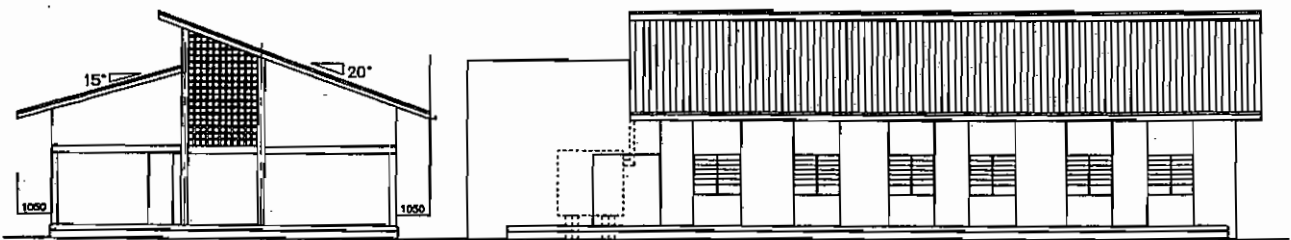
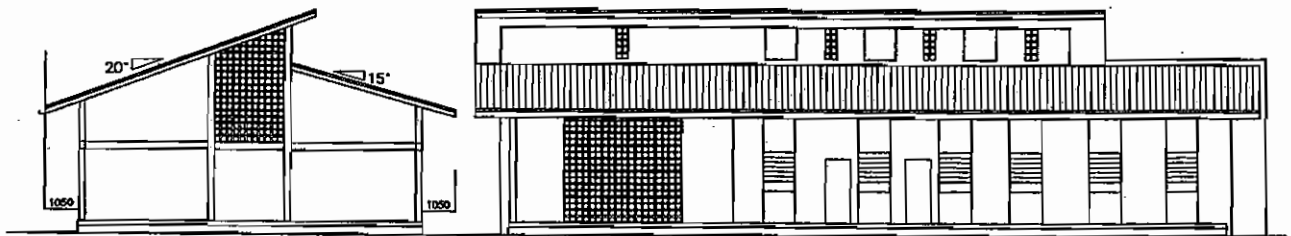


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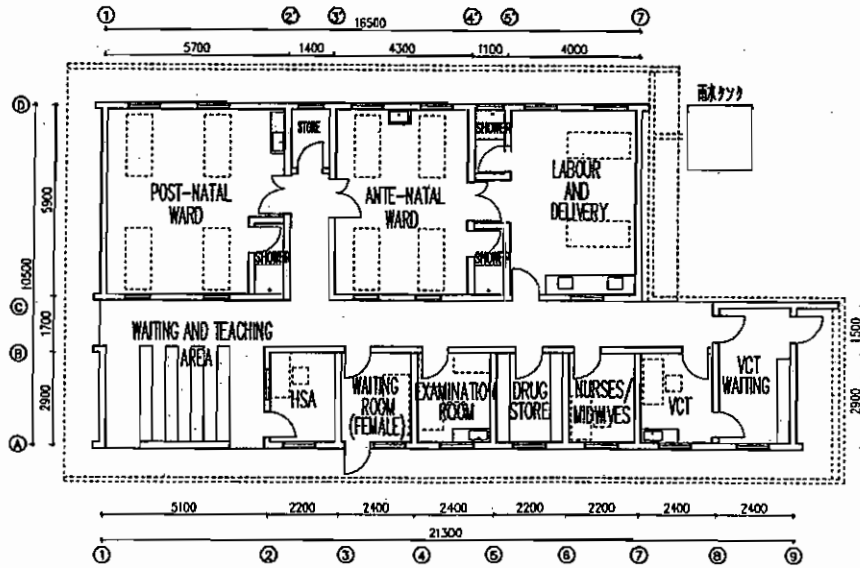
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THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

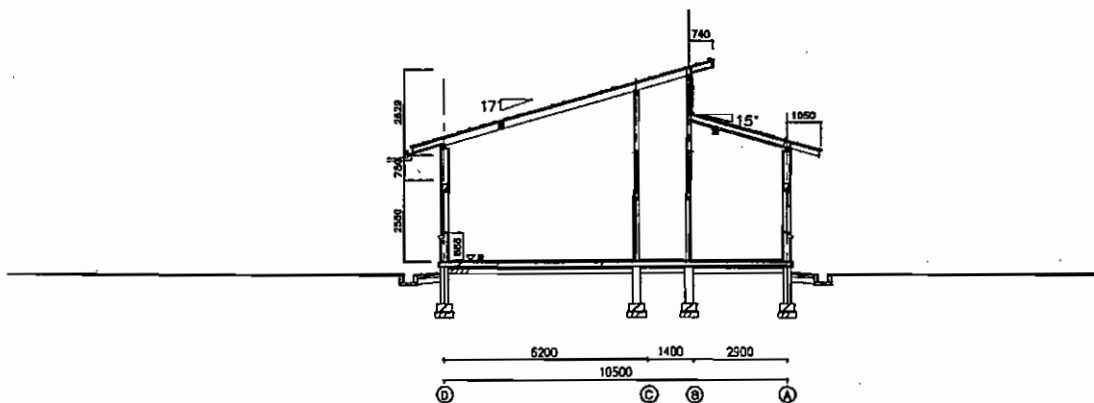
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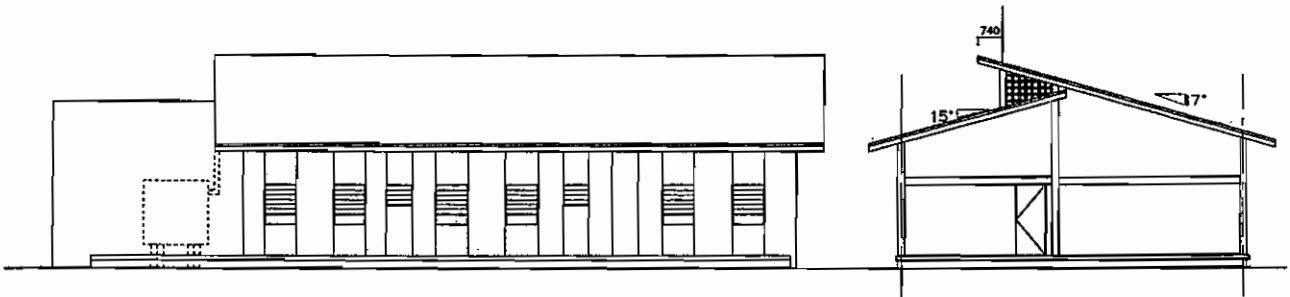
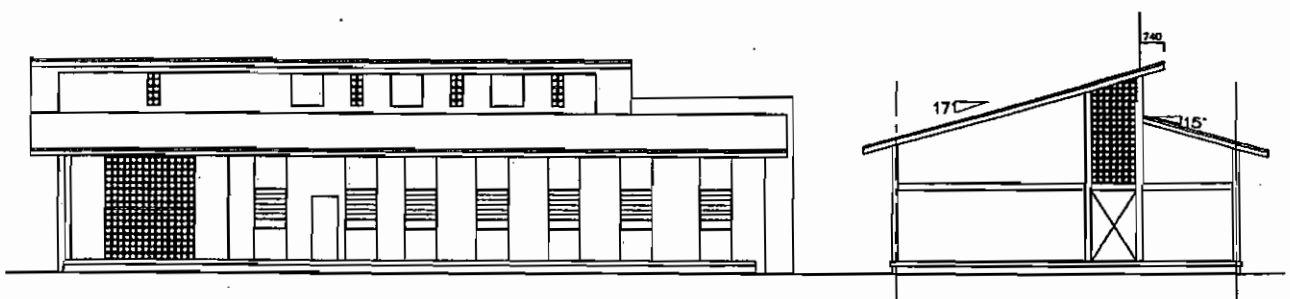
MATERNITY STANDARD PLAN



MATERNITY STANDARD SECTION

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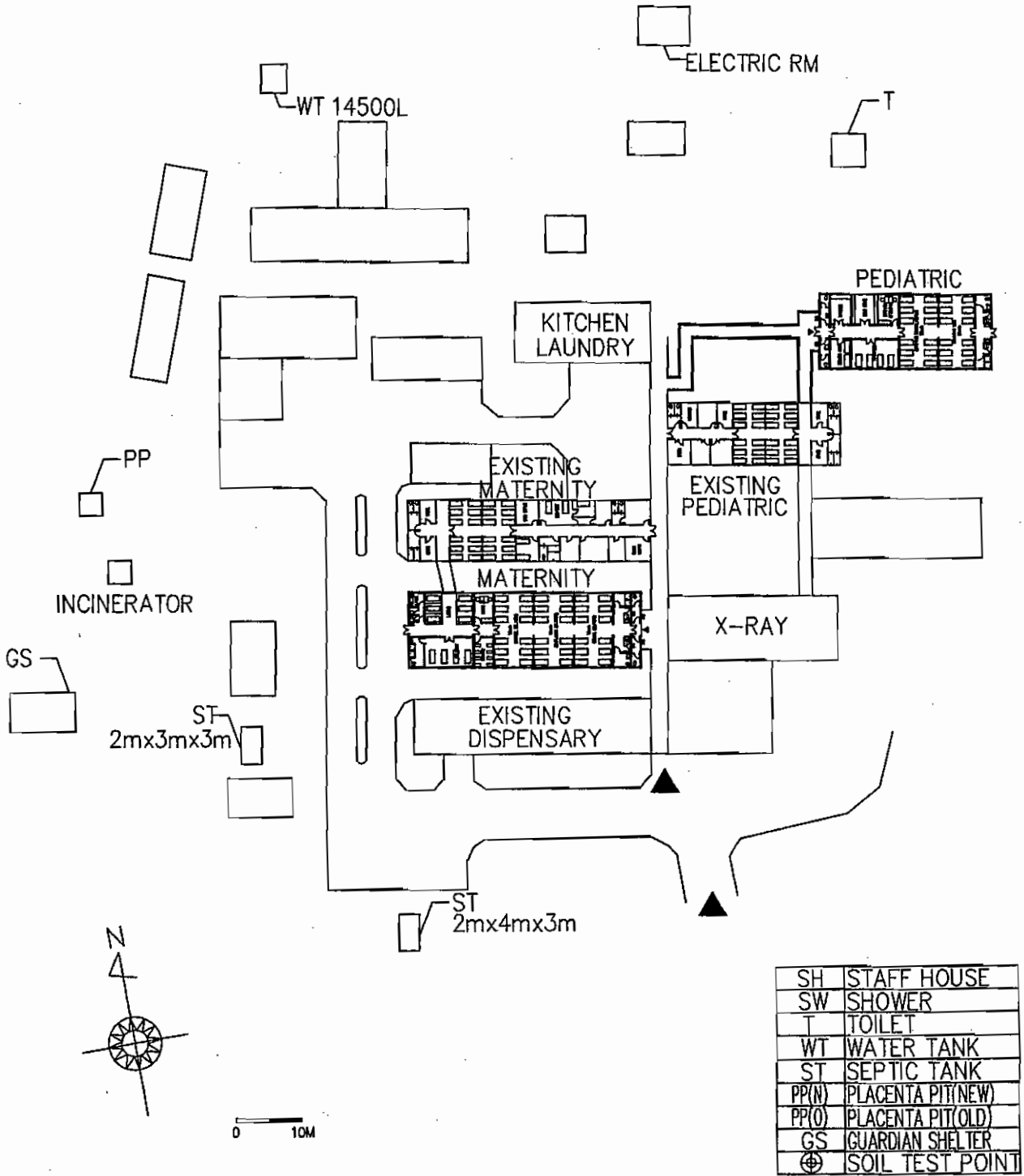
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THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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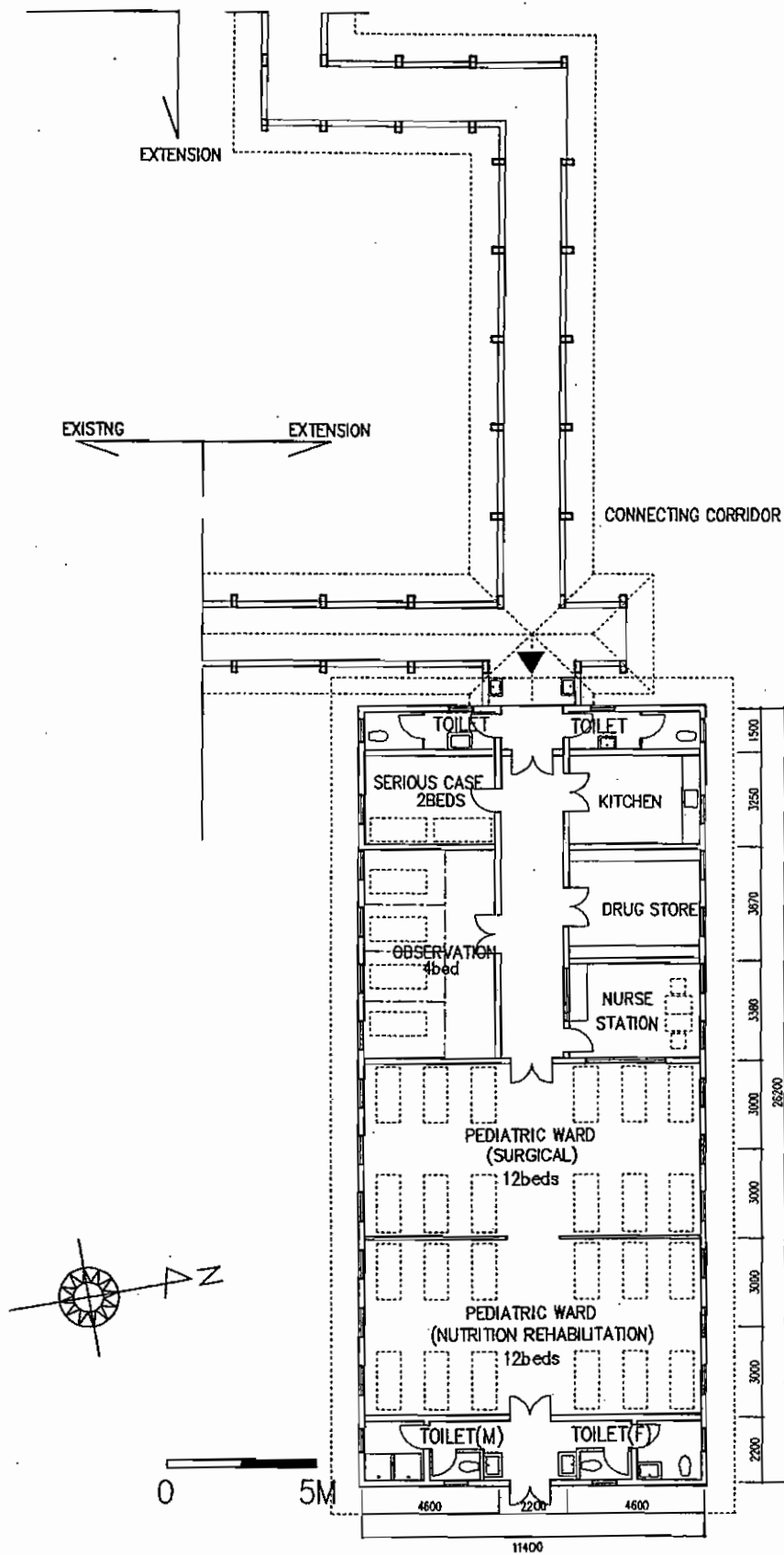
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GS	GUARDIAN SHELTER
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RUMPHI DISTRICT HOSPITAL SITE PLAN

THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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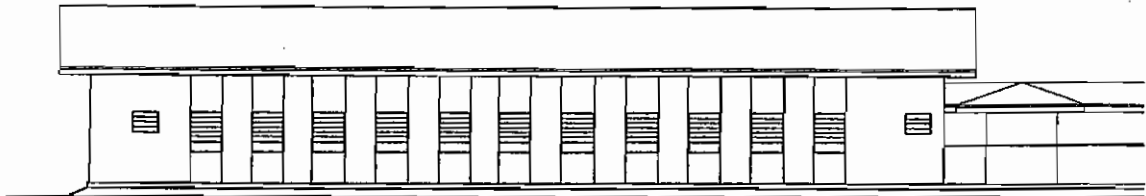
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THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

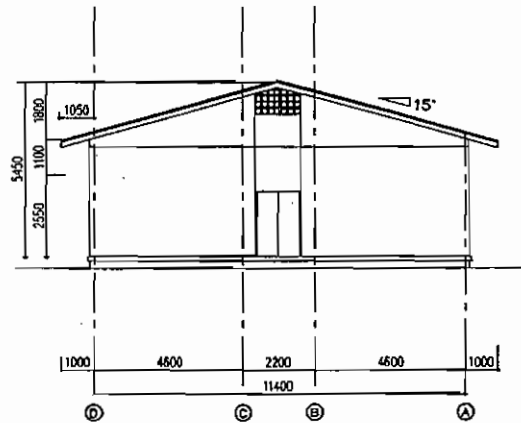
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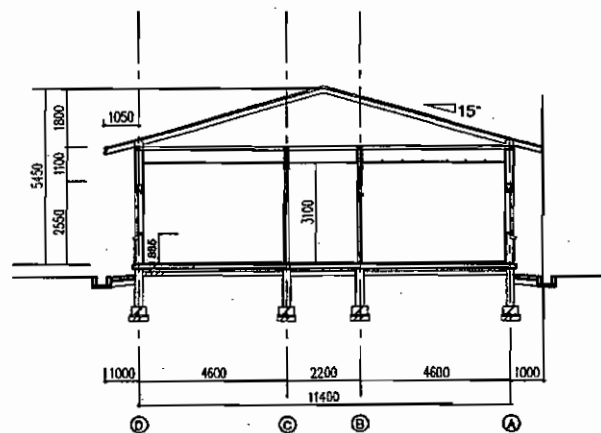
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EAST ELEVATION



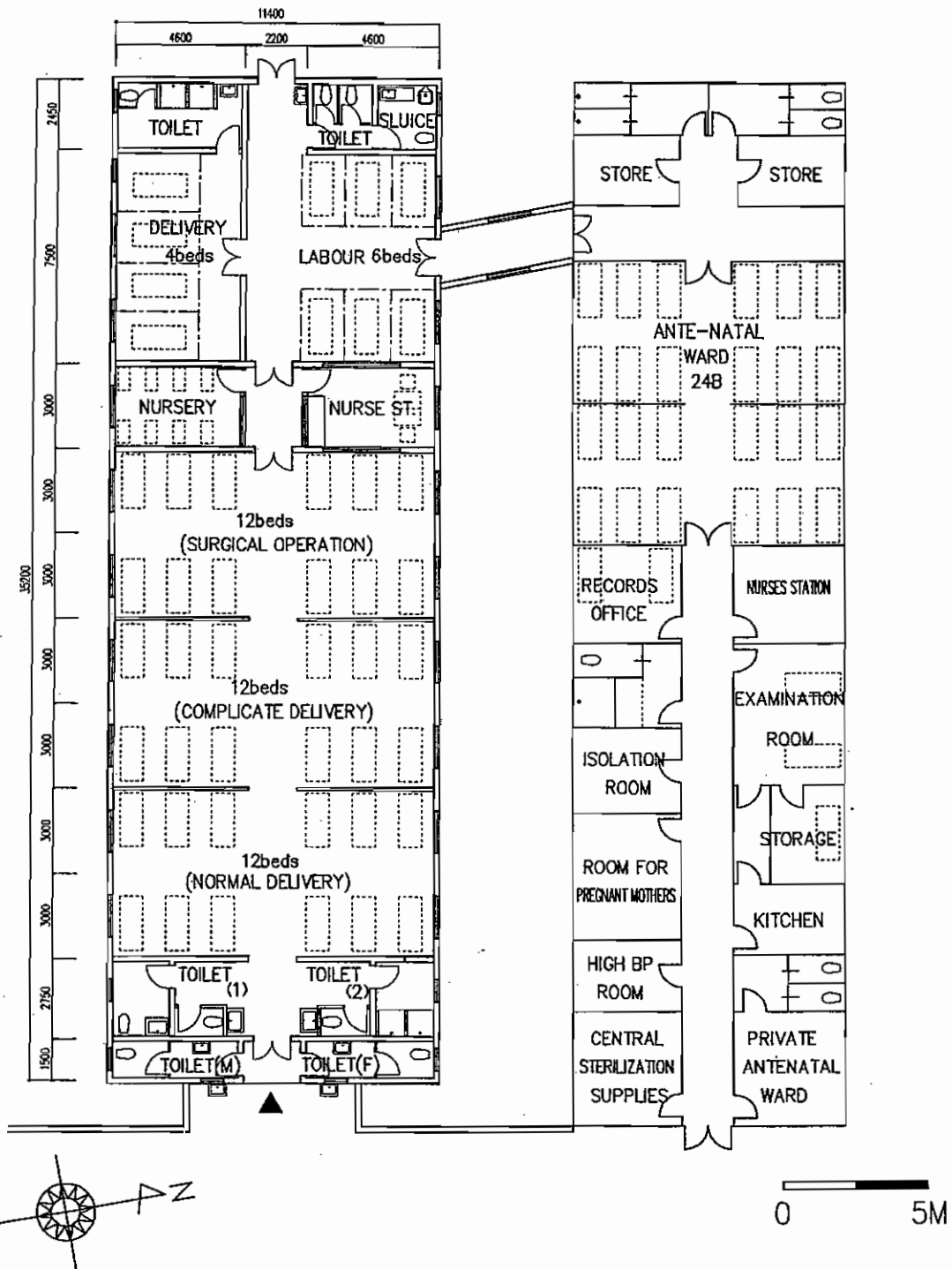
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THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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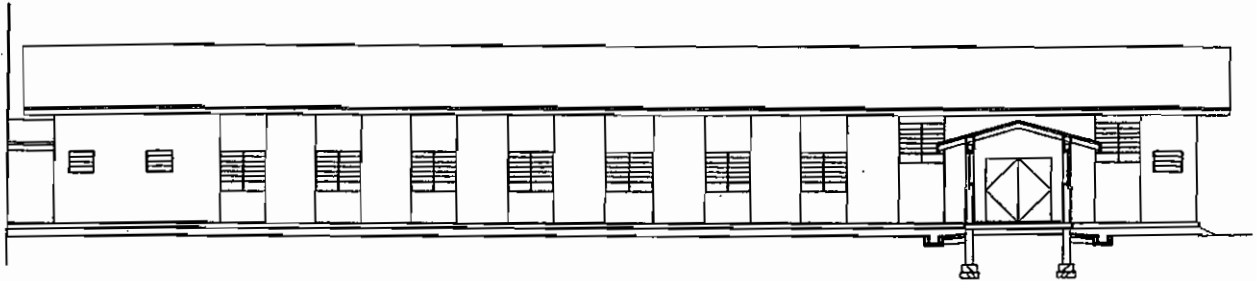


RUMPHI DISTRICT HOSPITAL MATERNITY PLAN

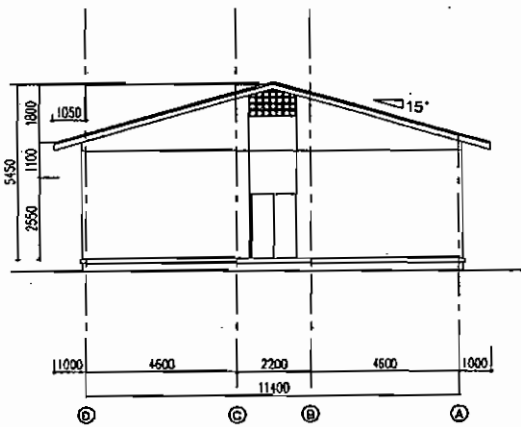
THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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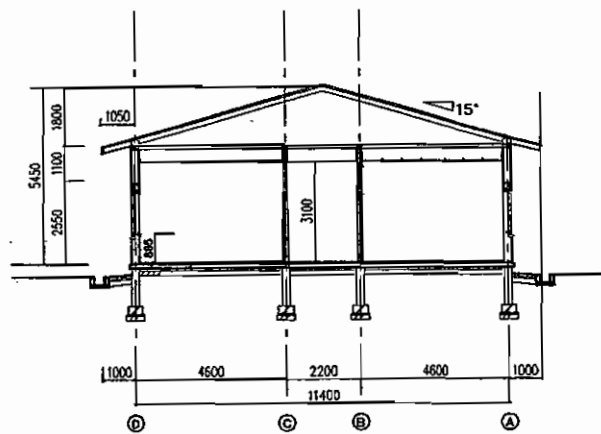
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WEST ELEVATION



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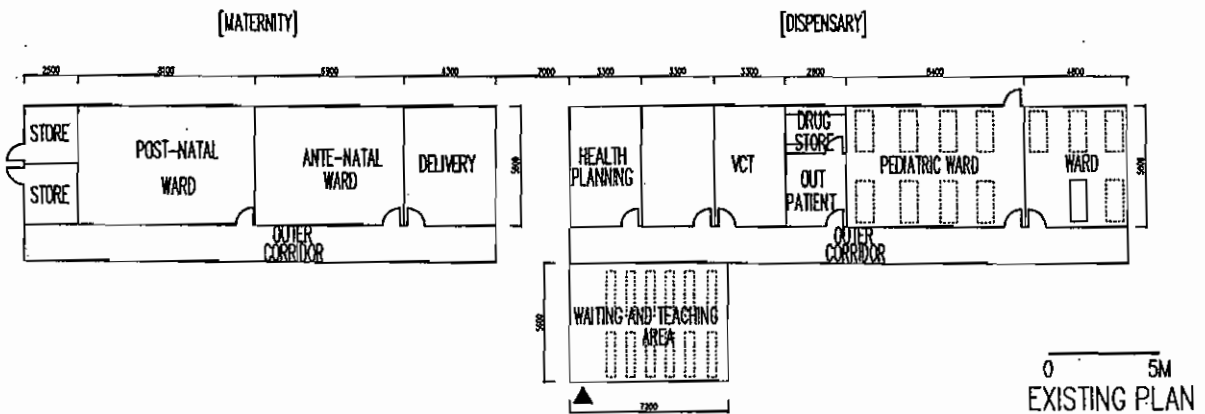
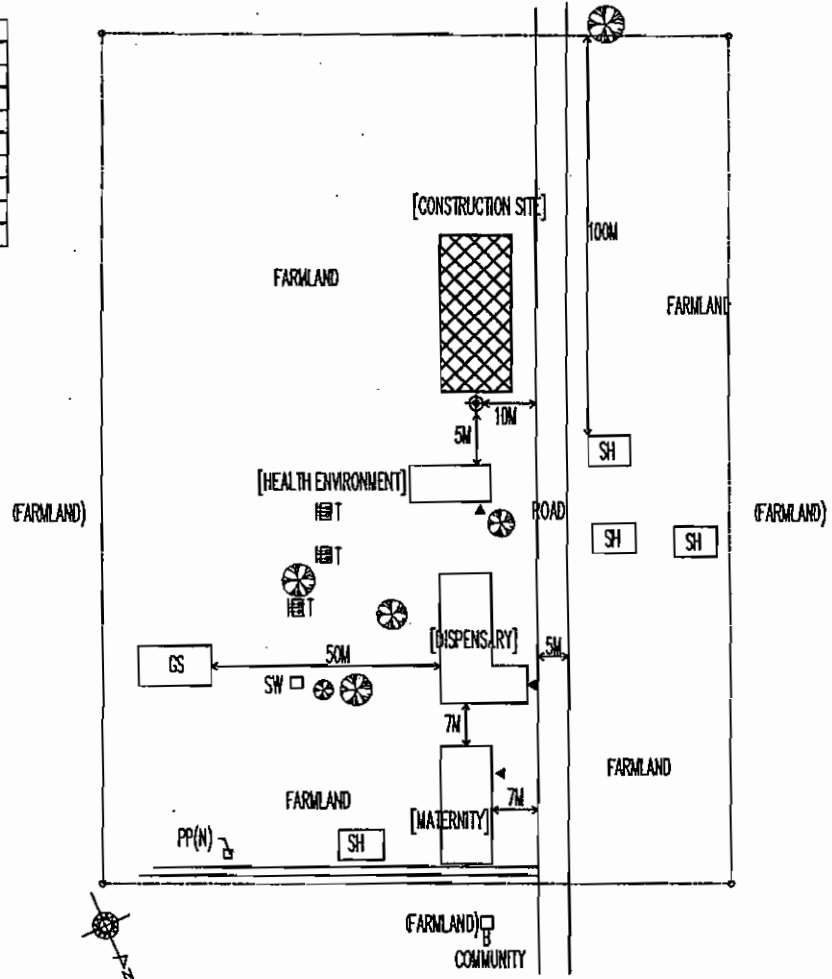
RUMPHI DISTRICT HOSPITAL MATANITY ELEVATION/SECTION

THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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SITE PLAN

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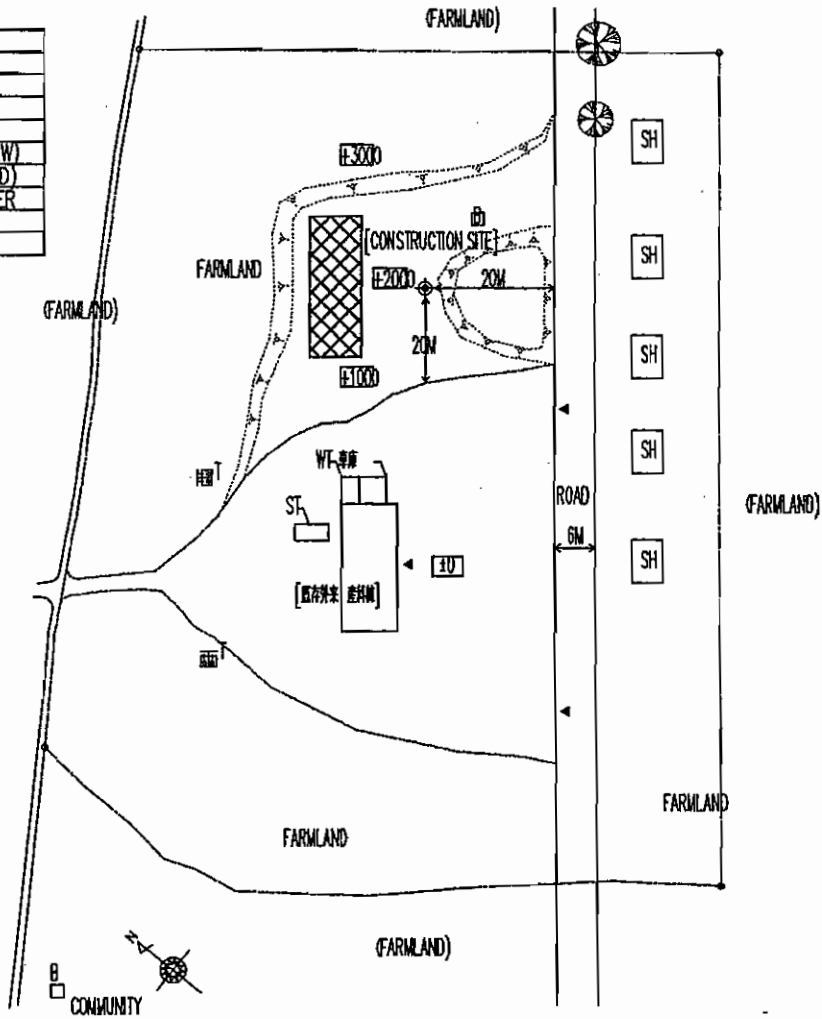


RHC-3 Katowo Rural Hospital (RUMPHI DS) MATERNITY
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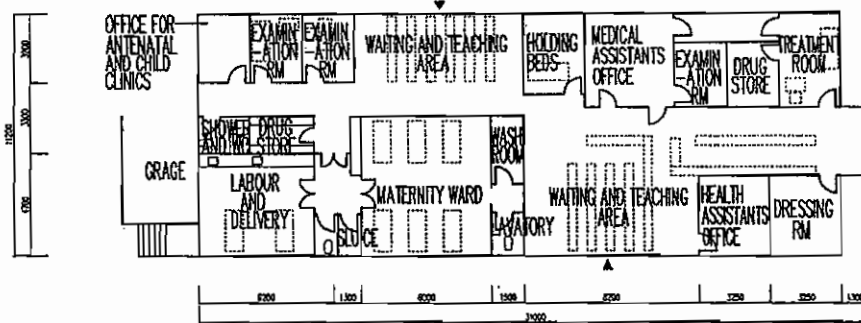
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SITE PLAN

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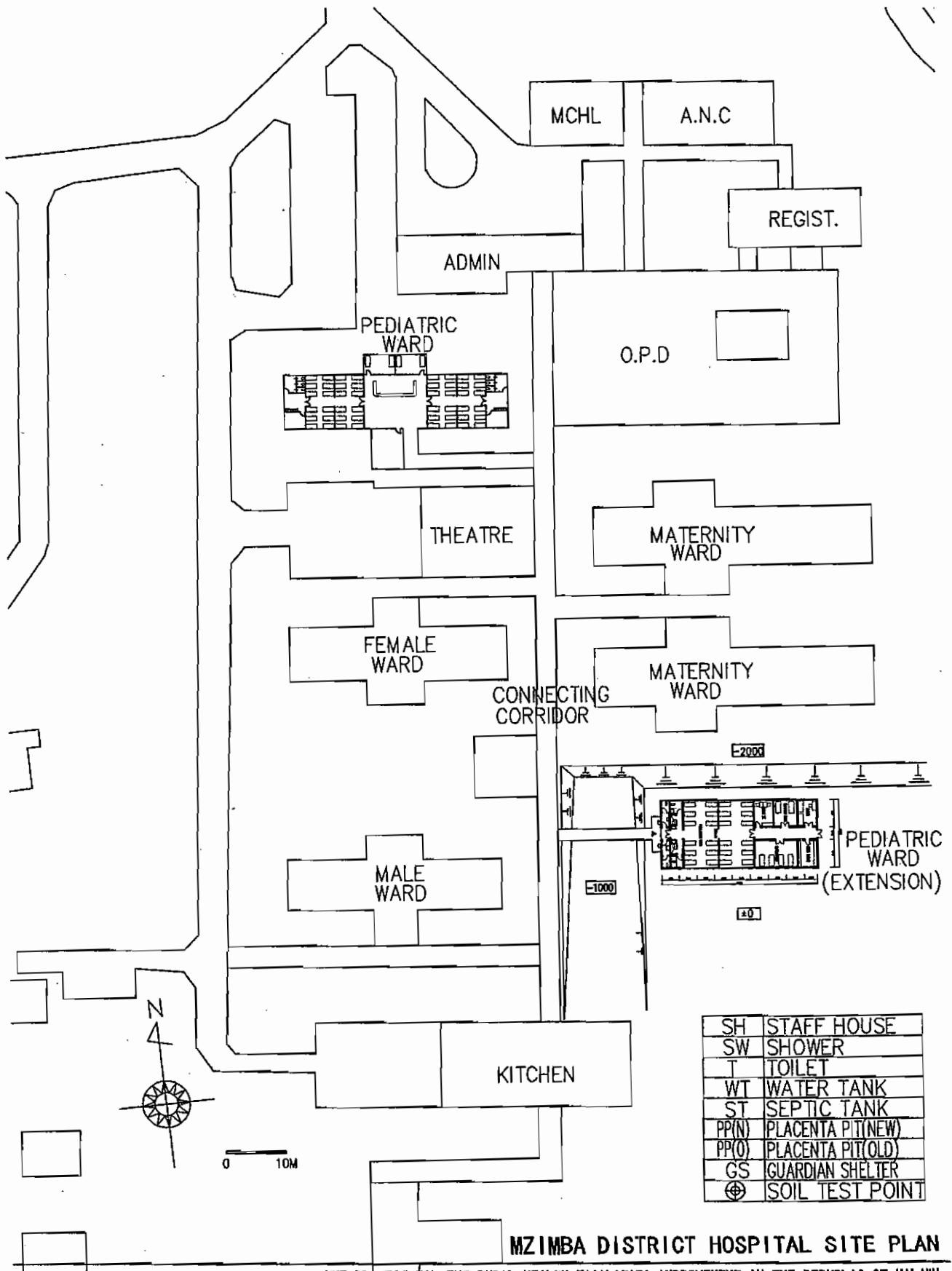


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RHC-6 MWAZISI HC (RUMPHI DS) MATERNITY
THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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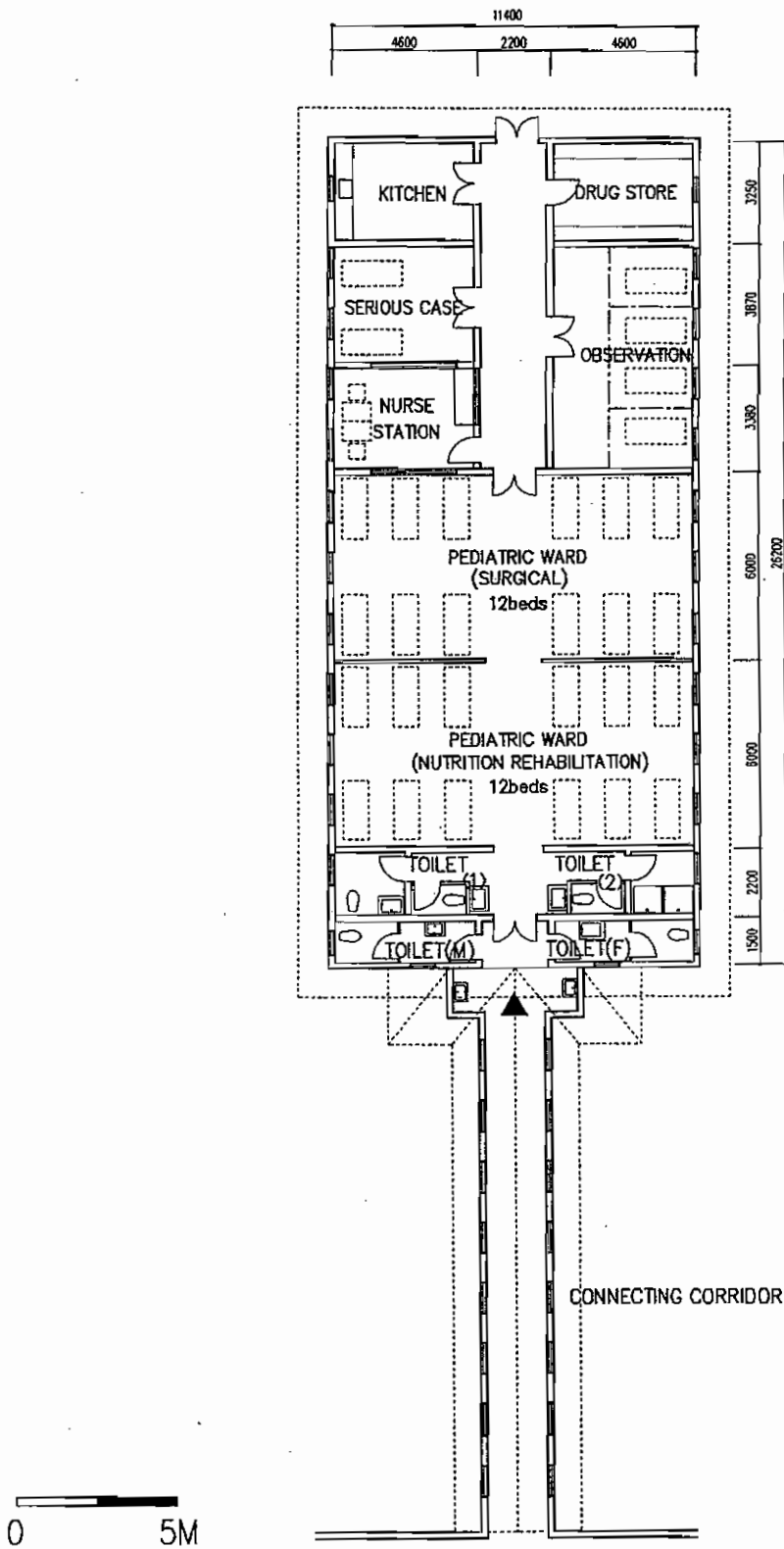


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GS	GUARDIAN SHELTER
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MZIMBA DISTRICT HOSPITAL SITE PLAN
 THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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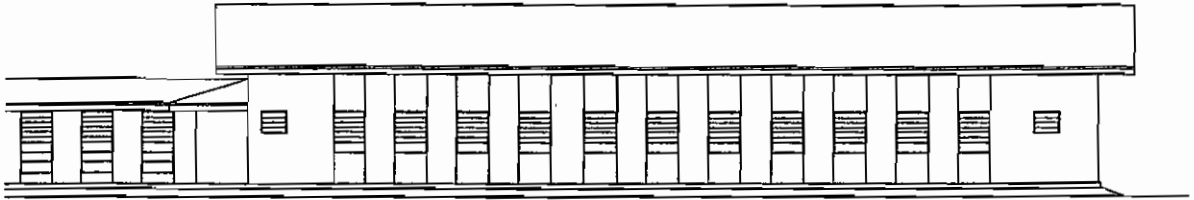


MZIMBA DISTRICT HOSPITAL PEDIATRIC PLAN

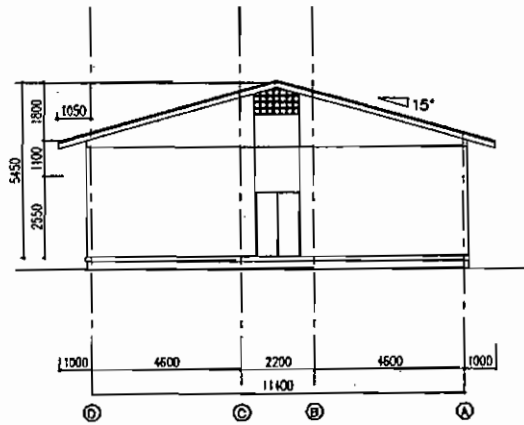
THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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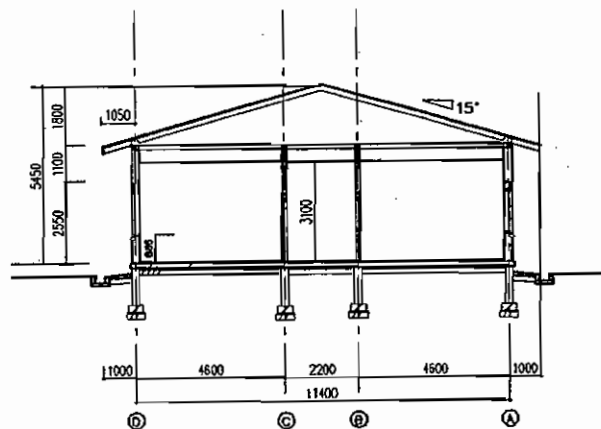
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SOUTH, NORTH ELEVATION



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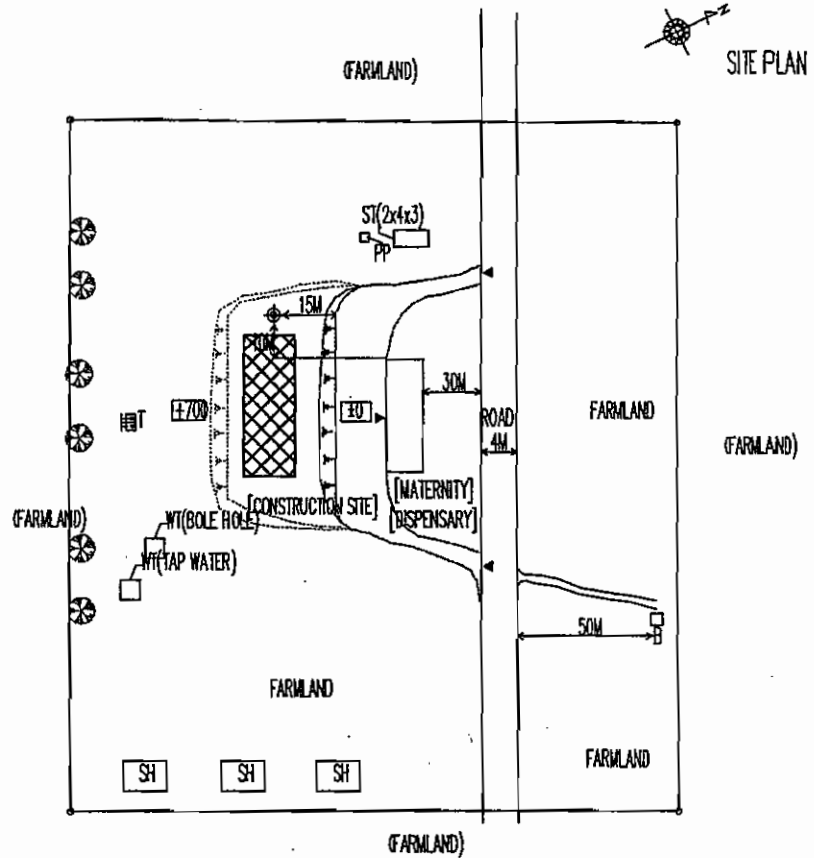
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MZIMBA DISTRICT HOSPITAL PEDIATRIC ELEVATION
 THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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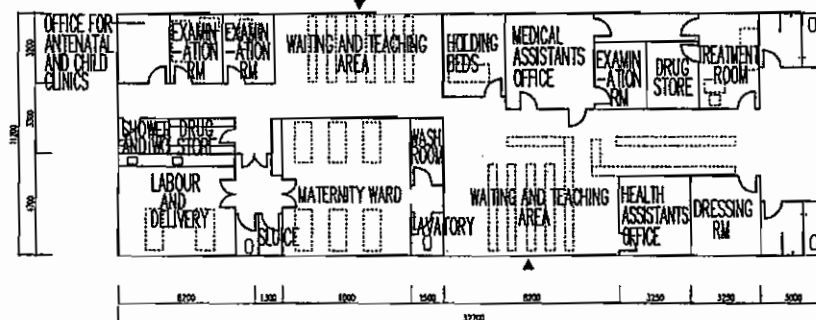
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MHC-4 EMFENI HC(MZIMBA DS) MATERNITY

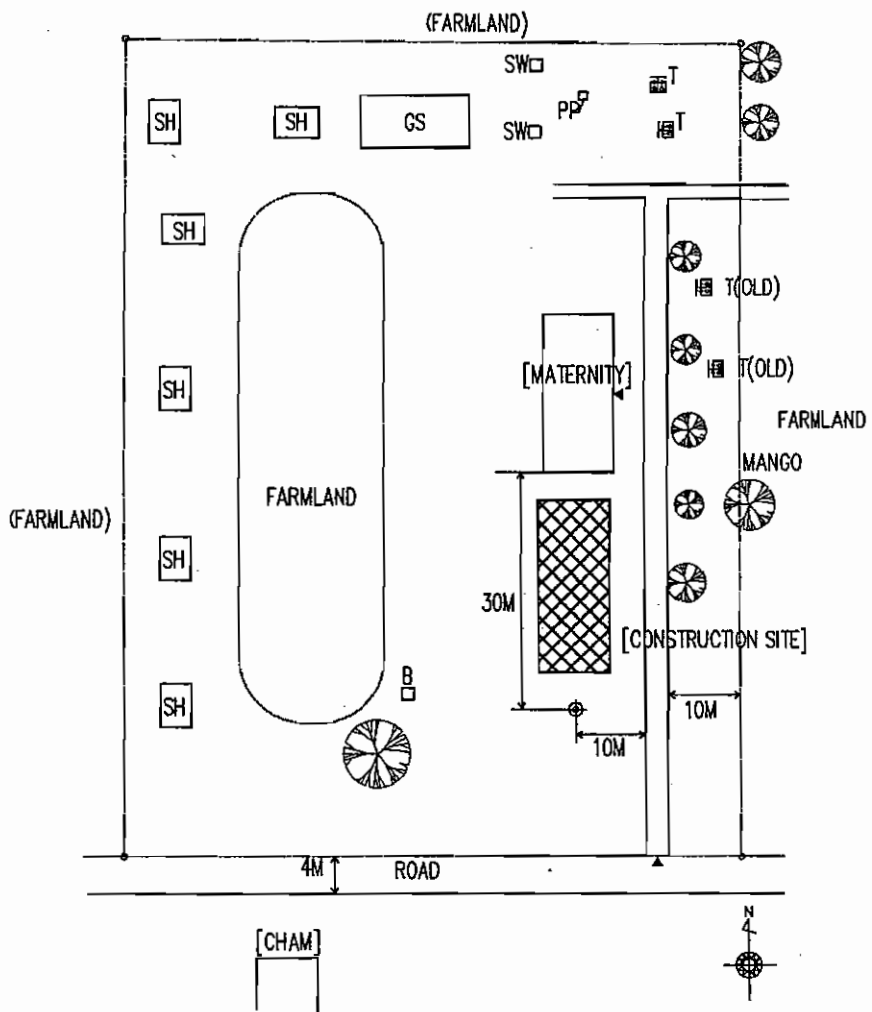
THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT (IN THE REPUBLIC OF MALAWI)

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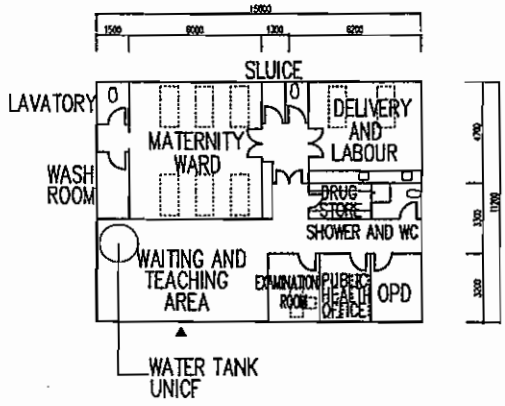
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SITE PLAN

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⊕	SOIL TEST POINT
B	BORE HOLE



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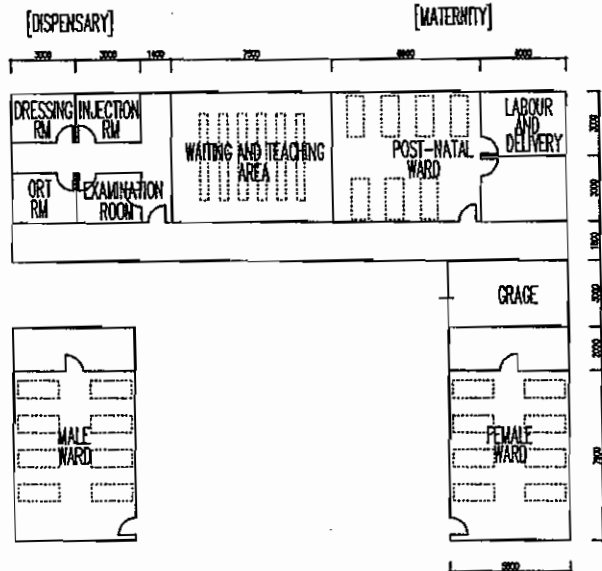
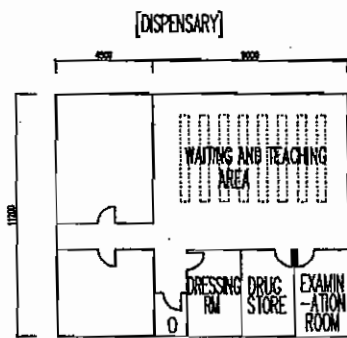
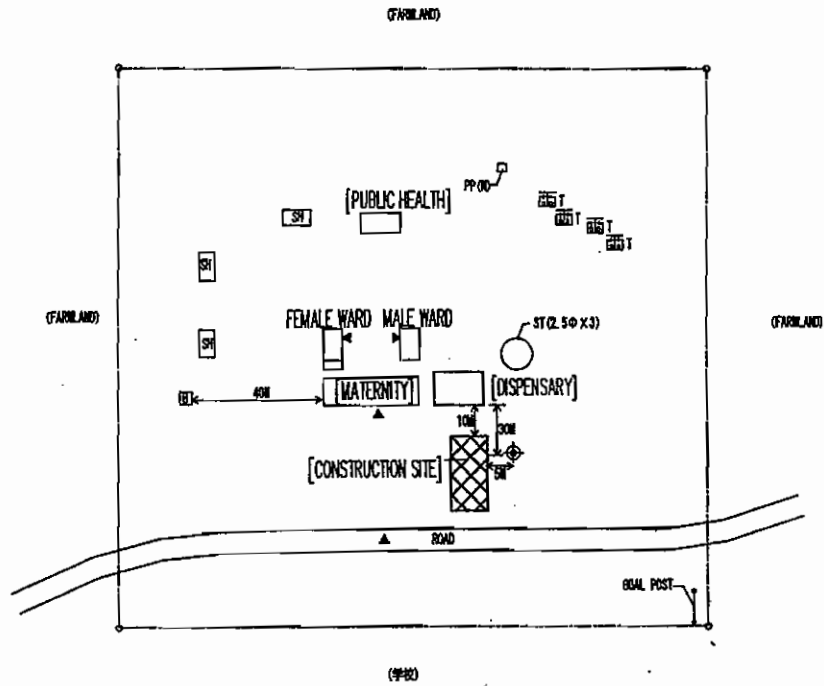
MHC-6 ENDINDENI HC(MZIMBA DS) DISPENSARY

THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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SITE PLAN

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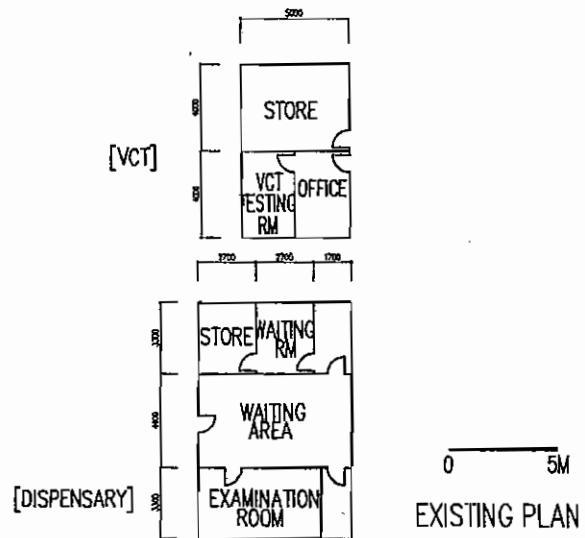
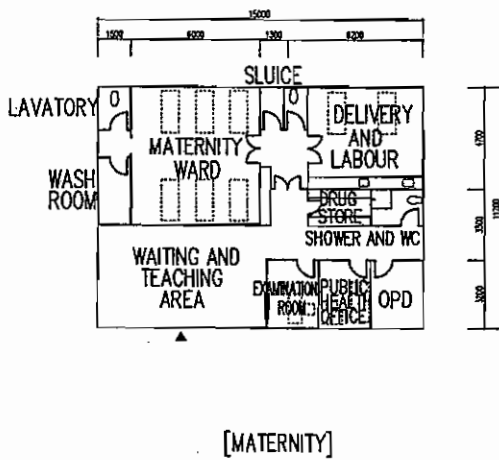
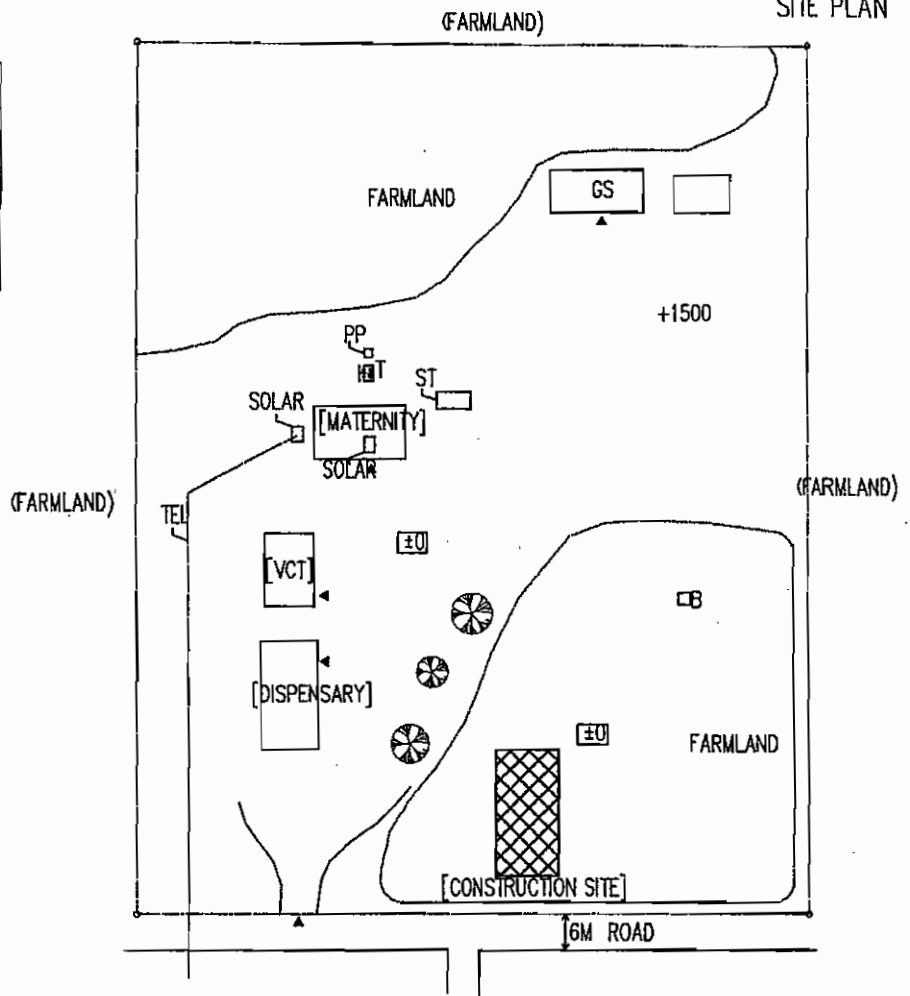
MHC-9 EUTHINI HC(MZIMBA DS) MATERNITY
THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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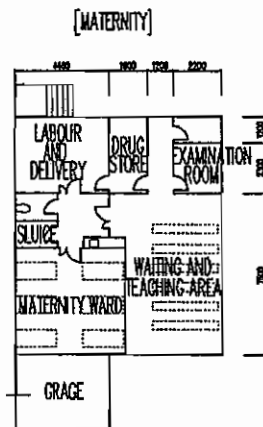
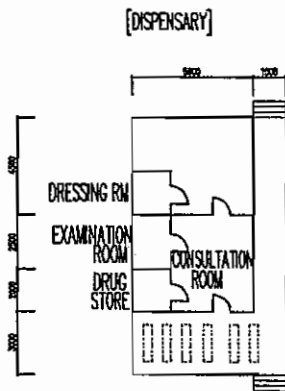
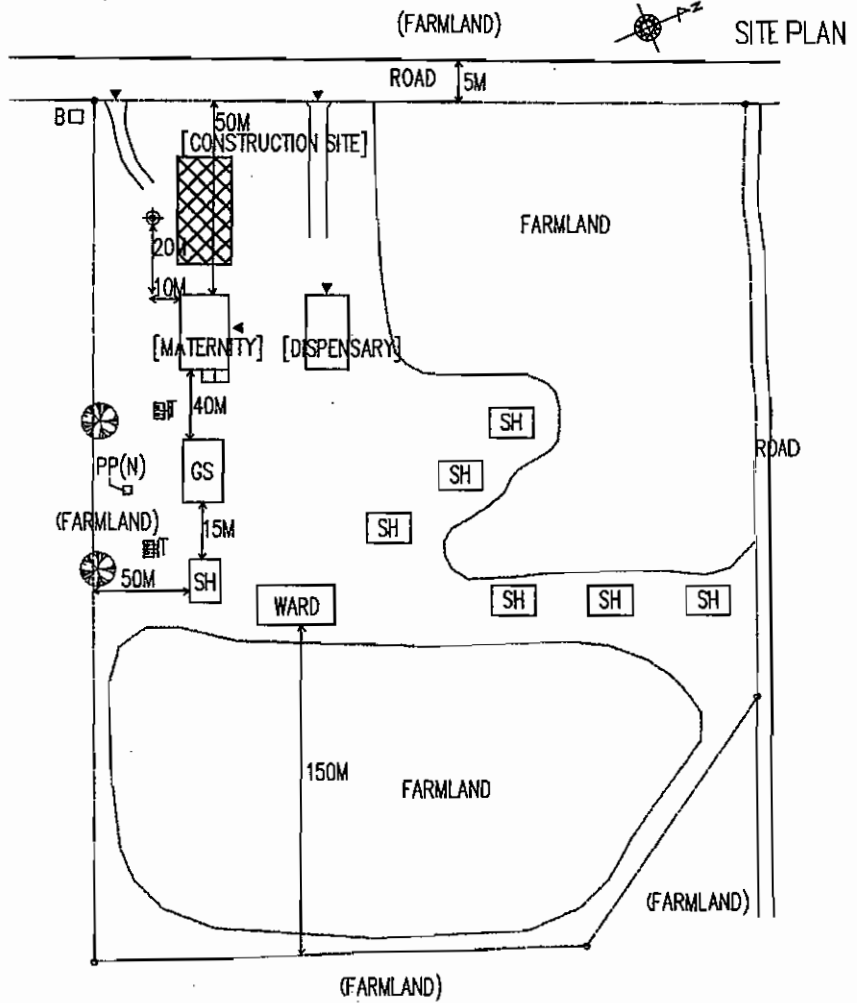
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GS	GUARDIAN SHELTER
⊕	SOIL TEST POINT
B	BORE HOLE



MHC-12 KAFUKULE HC (MZIMBA DS) DISPENSARY
 THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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GS	GUARDIAN SHELTER
⊕	SOIL TEST POINT
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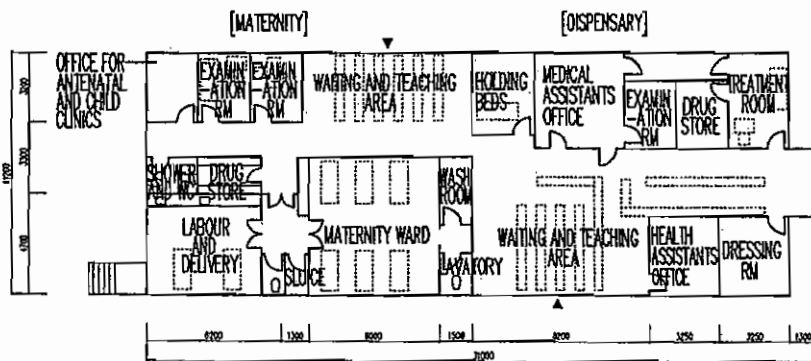
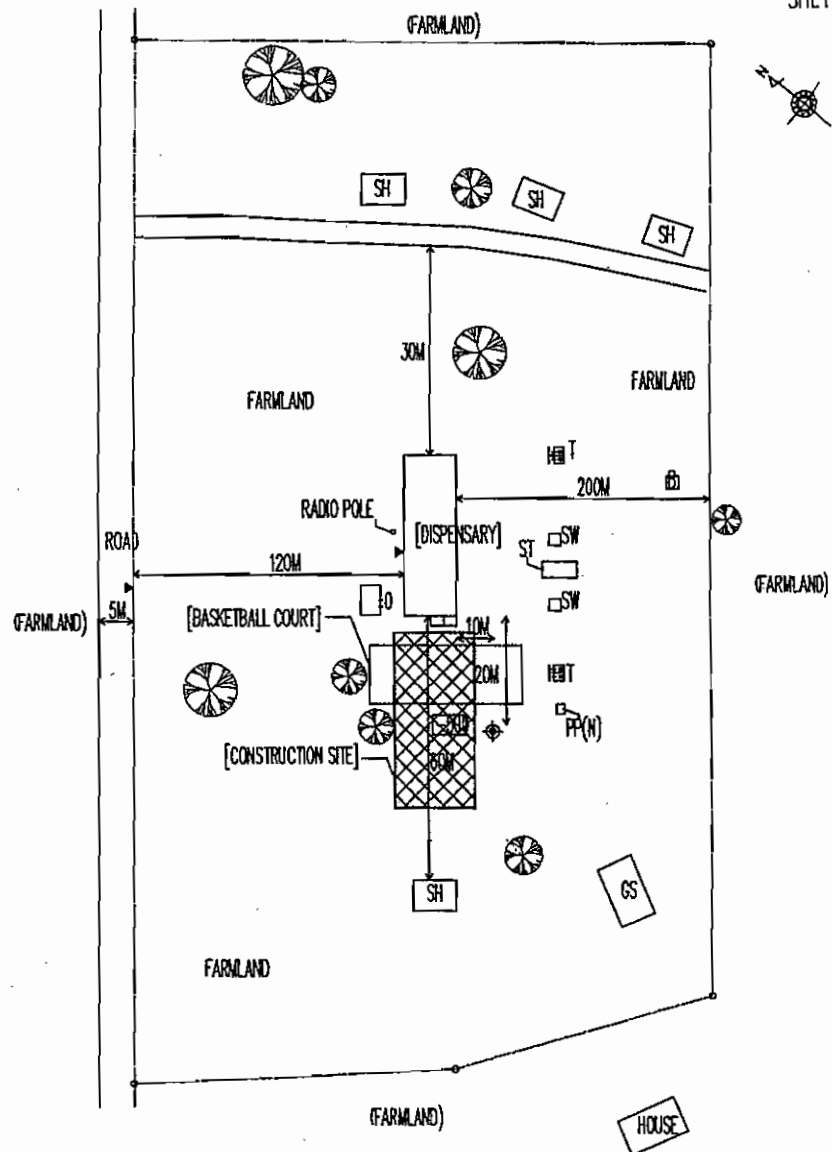
KHC-1 CHILU HC (KASJUNGU DS) DISPENSARY

THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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SITE PLAN

SH	STAFF HOUSE
SW	SHOWER
T	TOILET
WT	WATER TANK
ST	SEPTIC TANK
PP(N)	PLACENTA PIT(NEW)
PP(O)	PLACENTA PIT(OLD)
GS	GUARDIAN SHELTER
⊕	SOIL TEST POINT
B	BORE HOLE



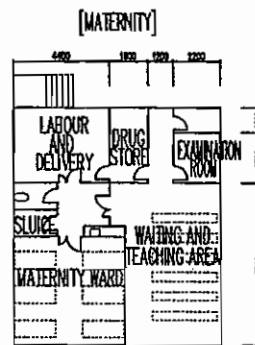
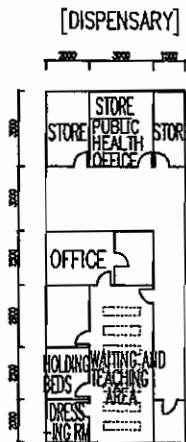
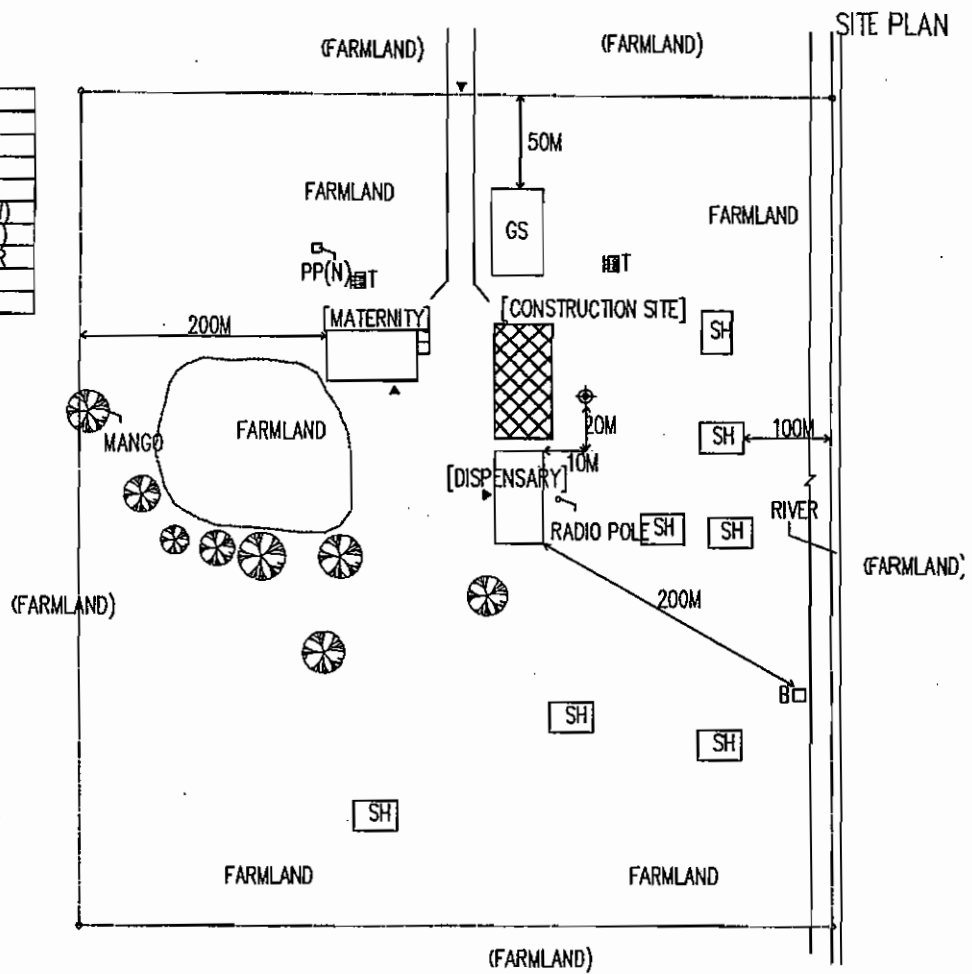
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EXISTING PLAN

KHC-3 KAPELULA HC (KASUNGU DS) MATERNITY

THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

KM

SH	STAFF HOUSE
SW	SHOWER
T	TOILET
WT	WATER TANK
ST	SEPTIC TANK
PP(N)	PLACENTA PIT(NEW)
PP(O)	PLACENTA PIT(OLD)
GS	GUARDIAN SHELTER
⊕	SOIL TEST POINT
B	BORE HOLE



0 5M
EXISTING PLAN

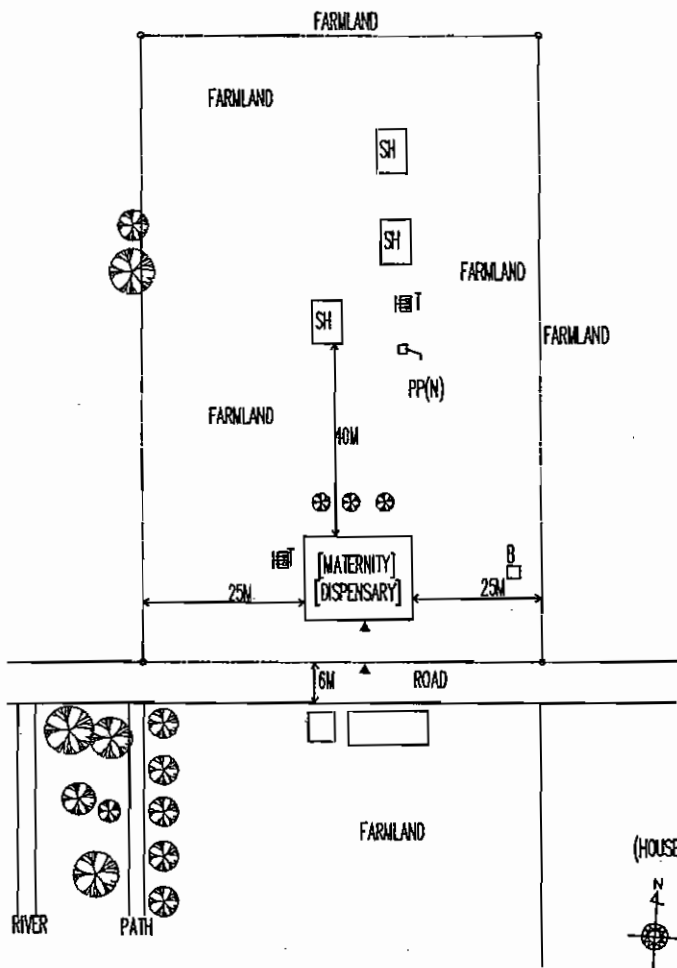
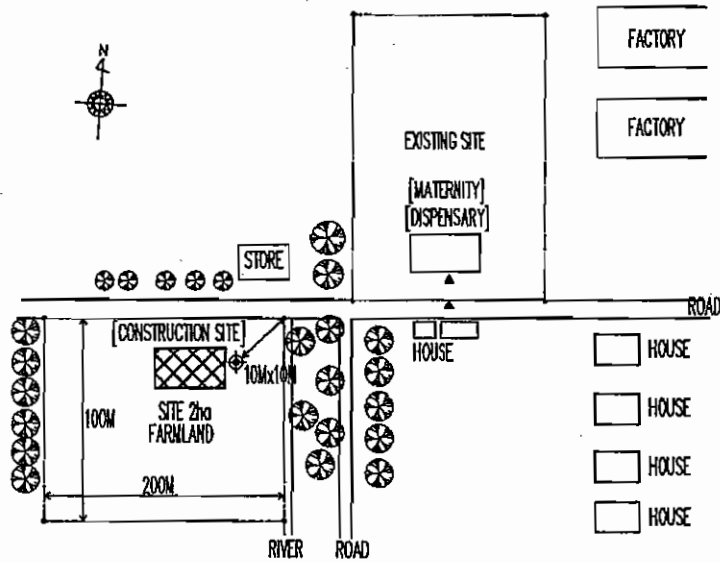
KHC-8 Simulemba HC (KASUNGU DS) DISPENSARY
THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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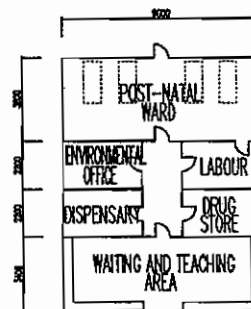
Q

SH	STAFF HOUSE
SW	SHOWER
T	TOILET
WT	WATER TANK
ST	SEPTIC TANK
PP(N)	PLACENTA PIT(NEW)
PP(O)	PLACENTA PIT(OLD)
GS	GUARDIAN SHELTER
⊗	SOIL TEST POINT
B	BORE HOLE

SITE PLAN



SITE PLAN



0 5M

EXISTING PLAN

KHC-10 KHOLA HC (KASUNGU DS) DISPENSARY

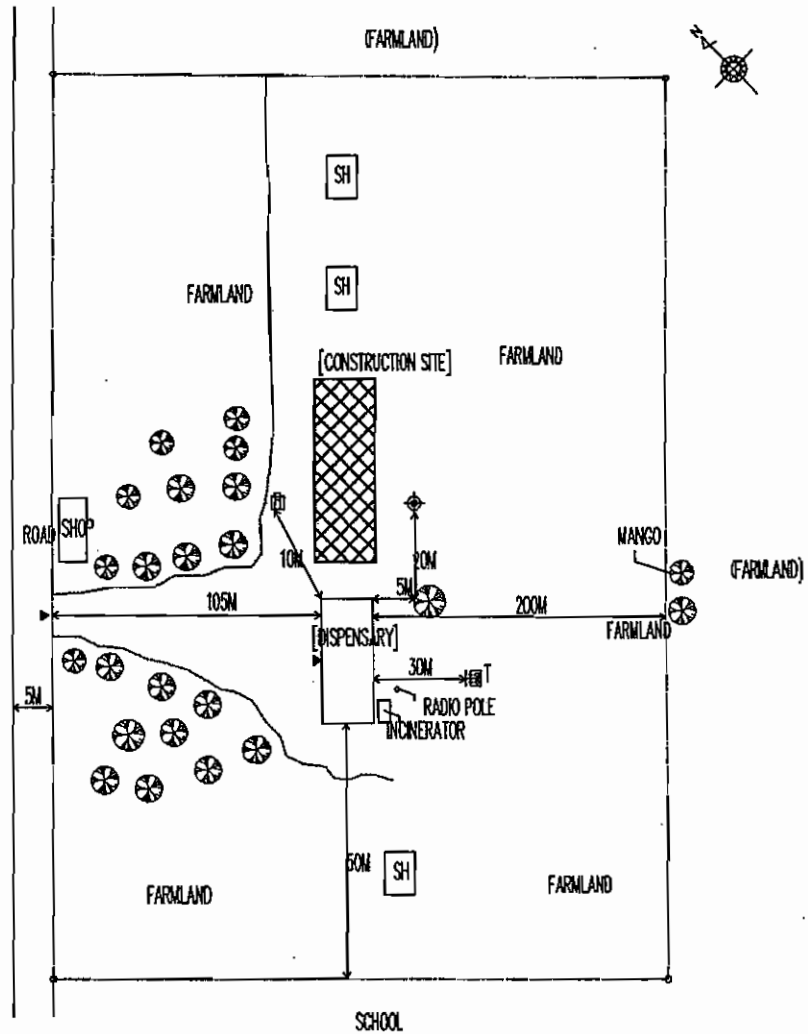
THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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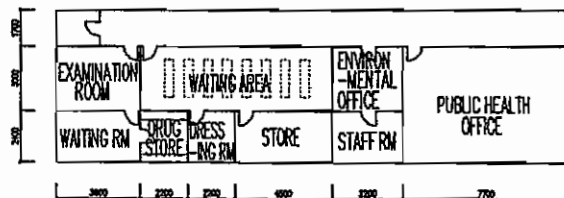
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SITE PLAN

SH	STAFF HOUSE
SW	SHOWER
T	TOILET
WT	WATER TANK
ST	SEPTIC TANK
PP(N)	PLACENTA PIT(NEW)
PP(O)	PLACENTA PIT(OLD)
GS	GUARDIAN SHELTER
⊕	SOIL TEST POINT
B	BORE HOLE



[DISPENSARY]



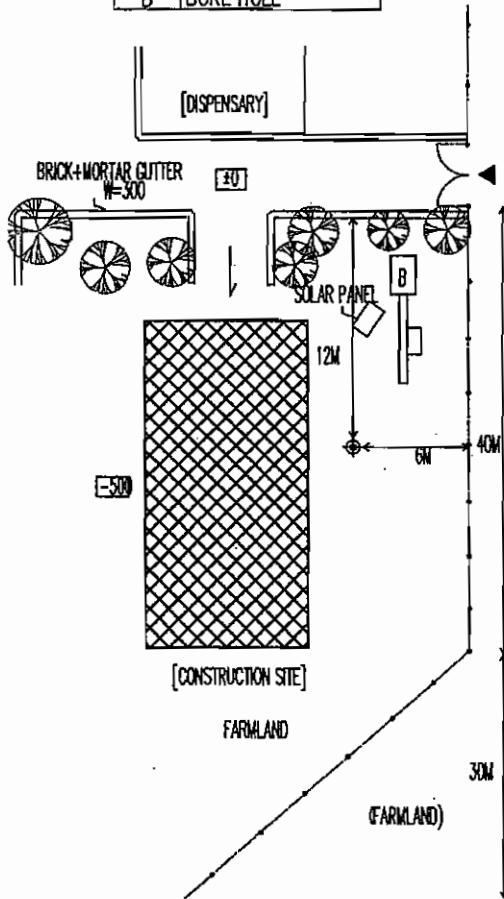
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EXISTING PLAN

KHC-11 Chamwabvi Dispensary (KASUNGU DS) MATERNITY

THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

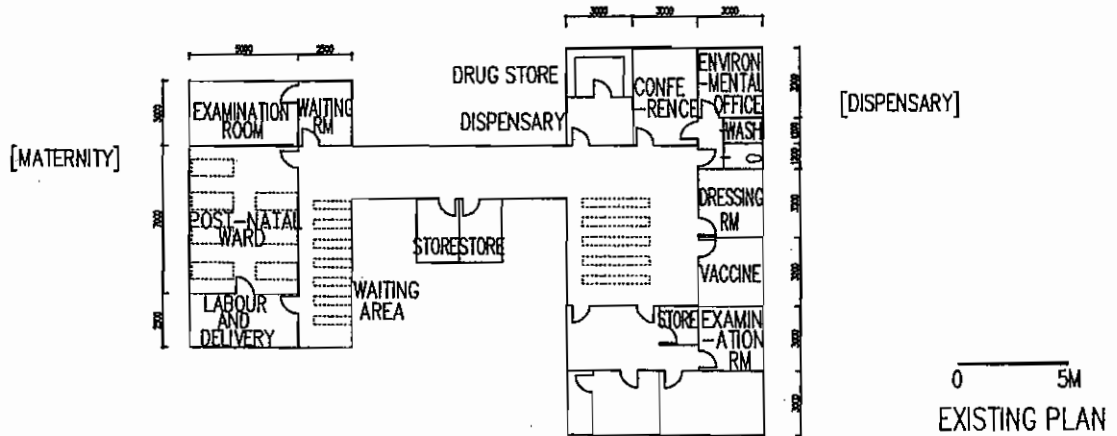
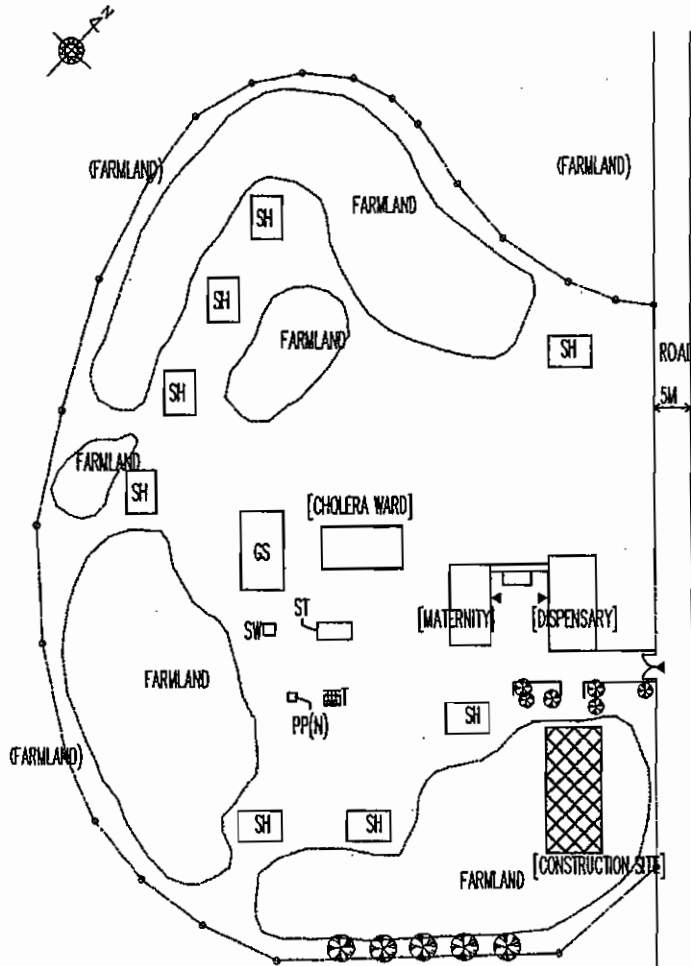
KM

SH	STAFF HOUSE
SW	SHOWER
T	TOILET
WT	WATER TANK
ST	SEPTIC TANK
PP(N)	PLACENTA PIT(NEW)
PP(O)	PLACENTA PIT(OLD)
GS	GUARDIAN SHELTER
⊕	SOIL TEST POINT
B	BORE HOLE



計画部分配置図

SITE PLAN



EXISTING PLAN

LHC-1 CHIWAMBA HC(LILONGWE DS) DISPENSARY

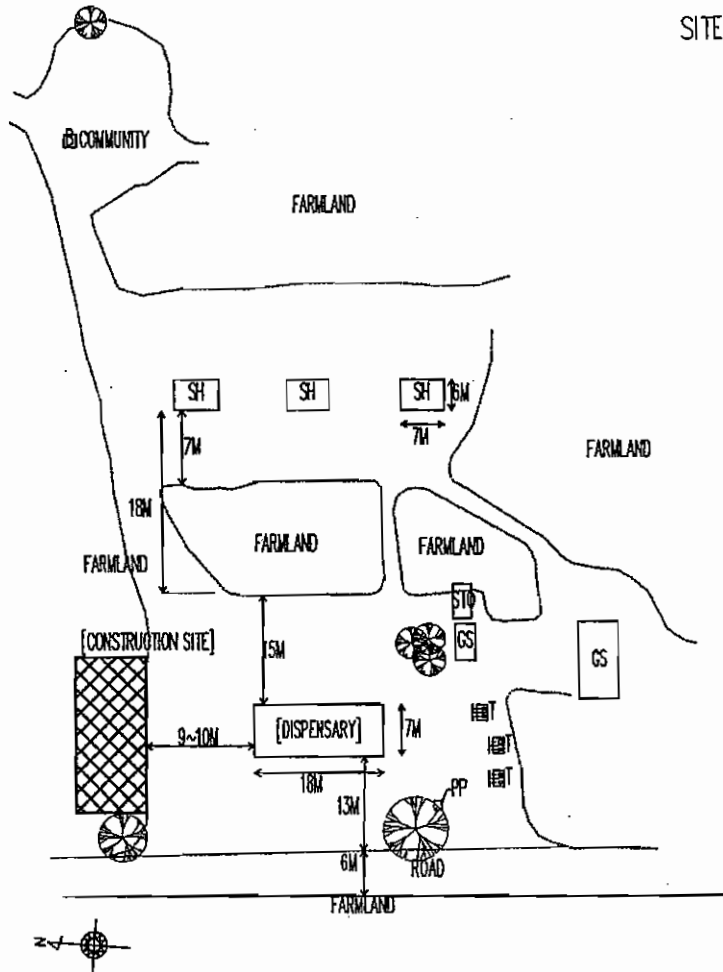
THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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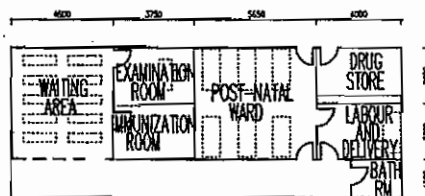
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SH	STAFF HOUSE
SW	SHOWER
T	TOILET
WT	WATER TANK
ST	SEPTIC TANK
PP(N)	PLACENTA PIT(NEW)
PP(O)	PLACENTA PIT(OLD)
GS	GUARDIAN SHELTER
⊕	SOIL TEST POINT
B	BORE HOLE

SITE PLAN



[MATERNITY]

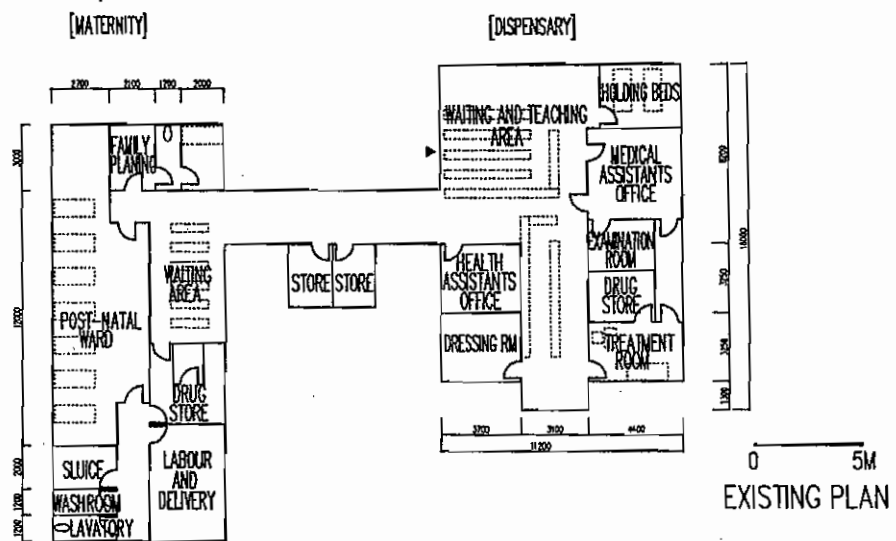
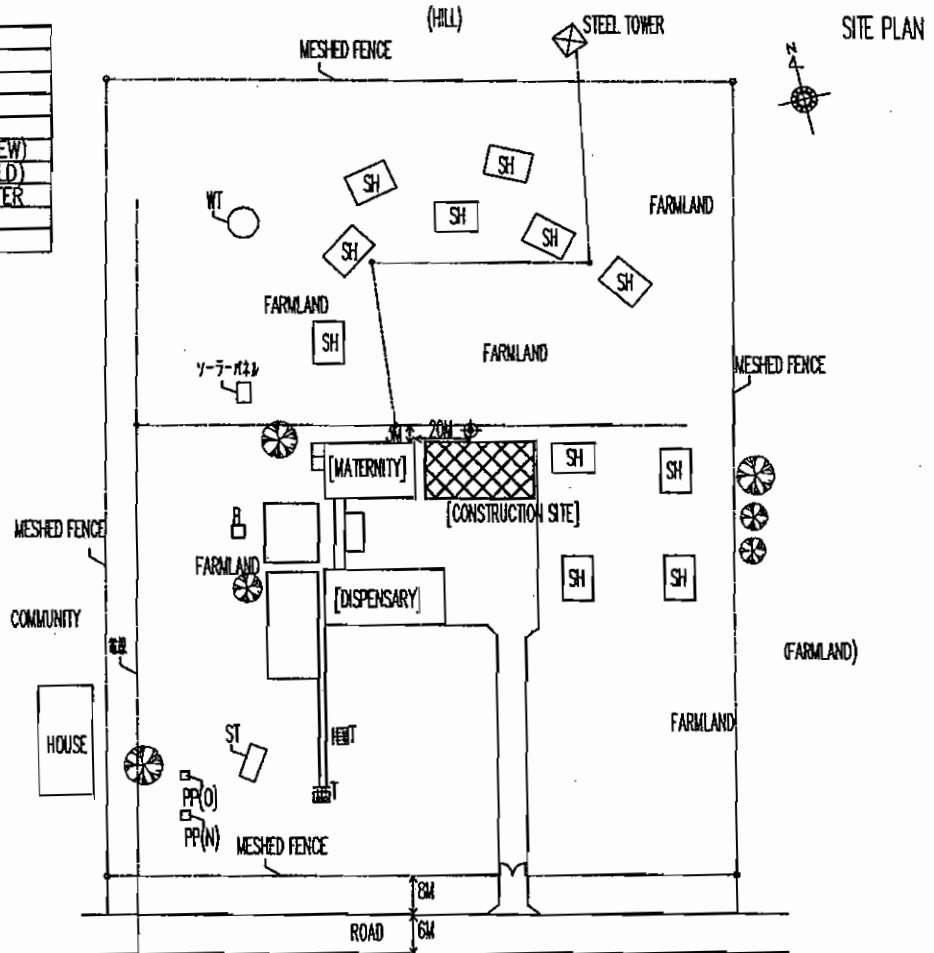


0 5M
EXISTING PLAN

LHC-3 MBANGOMBE 1 HC(LILONGWE DS) DISPENSARY
THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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SH	STAFF HOUSE
SW	SHOWER
T	TOILET
WT	WATER TANK
ST	SEPTIC TANK
PP(N)	PLACENTA PIT(NEW)
PP(O)	PLACENTA PIT(OLD)
GS	GUARDIAN SHELTER
⊕	SOIL TEST POINT
B	BORE HOLE



LHC-2 MTENTHERA HC (LILONGWE DS) MATERNITY
 THE PROJECT FOR THE RURAL HEALTH FACILITIES IMPROVEMENT IN THE REPUBLIC OF MALAWI

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1-3 Equipment List

District hospitals (2 sites)

Target institutions	Item no.	Equipment name	Quantity
1. Rumphi district hospital			
1-1 Maternity unit	A-1	Bedside lockers	36
	A-2	Beds	36
1-2 Paediatrics unit	A-3	Bedside lockers	24
	A-4	Beds	24
2. Mzimba district hospital			
Paediatrics unit	A-5	Bedside lockers	24
	A-6	Beds	24

Health centres (55sites)

Departments	Items no.	Equipment name	Quantity
1. Dispensary block			
1-1 Examination room	B-1	Weighing scales, adult	25
	B-2	Diagnostic equipment sets	49
	B-3	Sphygmomanometers	31
	B-4	Examination couches	22
1-2 Treatment room	B-5	Instrument sets, minor surgical sets	157
	B-6	Examination couches	45
1-3 Dressing room	B-7	Instrument sets, minor surgical sets	108
2. Maternity block			
2-1 Delivery room	B-8	Delivery tables	52
	B-9	Suction units, manual	29
	B-10	Resuscitators, manual, infant and adult	47
	B-11	Instrument sets, delivery and suturing	130
	B-12	Sphygmomanometers	29
	B-13	Weighing scales, baby	5
	B-14	Light with battery back-up	52
2-2 Maternity ward	B-15	Hospital beds with mattress, adult	98
	B-16	Bedside lockers	249
2-3 Holding room	B-17	Hospital beds with mattress, adult	50
	B-18	Drip stands, double hook, with castors	31

km

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1-4 Break-down of Equipment List for each Health Centre

No.	Equipment name	Districts					Rumphi					Mzimba																												
		1	2	3	4	5	6	Sub-ttl	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30								
B-1	Weighing scales, adult	0	1	0	1	1	0	3	0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0	1	1	0	1	1	0	1	0					
B-2	Diagnostic equipment sets	1	1	1	0	1	5	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
B-3	Sphygmomanometers	1	1	0	1	1	0	4	1	0	1	1	0	0	1	0	1	0	1	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	1	1				
B-4	Examination couches	0	1	0	0	0	1	0	0	0	1	1	0	0	1	0	1	0	1	0	1	0	1	1	1	1	0	1	0	1	0	1	0	1	0	0				
B-5	Instrument sets, minor surgical sets	3	3	3	3	3	18	3	3	2	3	3	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3			
B-6	Examination couches	1	1	1	0	1	5	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1			
B-7	Instrument sets, minor surgical sets	2	2	2	2	2	12	2	2	2	2	2	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
B-8	Delivery tables	0	2	2	2	2	0	8	1	1	0	0	0	0	1	1	0	1	1	0	1	1	2	0	2	0	0	1	2	1	0	1	2	1	0	1	1			
B-9	Suction units, manual	0	0	1	0	0	0	1	1	1	0	1	0	0	1	1	1	1	1	0	1	1	0	1	1	0	1	1	1	0	1	1	1	0	1	0	1	0		
B-10	Resuscitators, manual, infant and adult	0	1	0	1	1	4	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
B-11	Instrument sets, delivery and suturing	3	3	3	3	0	3	15	3	3	0	3	3	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
B-12	Sphygmomanometers	1	1	1	1	0	1	5	1	1	0	0	0	0	0	1	0	1	0	1	1	1	0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	
B-13	Weighing scales, baby	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B-14	Light with battery back-up	1	1	1	1	1	6	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
B-15	Hospital beds with mattress, adult	2	0	0	4	1	0	7	0	5	2	0	5	3	0	0	2	0	0	1	0	2	0	2	0	2	0	0	3	4	0	0	2	0	0	0	2	0		
B-16	Bedside lockers	1	6	8	3	3	0	21	5	5	2	8	8	6	0	8	3	4	8	2	2	0	8	5	0	8	8	3	0	8	3	0	8	2	0	8	2	0		
B-17	Hospital beds with mattress, adult	1	0	0	1	2	0	4	0	2	2	0	2	0	0	2	0	1	0	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	0	
B-18	Drip stands, double hook, with castors	0	0	0	0	1	0	1	1	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1		

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Distri cts	Districts	Mzimba												Kasungu												Lilongwe			Total													
		31	32	33	34	35	36	37	38	39	40	41	Sub-ttl	42	43	44	45	46	47	48	49	50	51	52	Sub-ttl	53	54	55		Sub-ttl												
B-1	Equipment name	0	1	1	0	0	1	0	1	0	1	0	18	0	0	1	0	1	1	0	0	0	0	3	0	0	1	0	0	1	1	1	1	1	1	1	3	1	1	1	25	
B-2	Weighing scales, adult	1	0	0	1	0	1	1	1	1	0	30	1	1	1	1	1	1	1	1	1	1	1	11	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	49		
B-3	Diagnostic equipment sets	0	0	1	1	0	0	1	1	0	0	20	1	1	0	0	1	1	0	0	1	1	0	6	1	0	0	1	1	0	0	1	0	0	1	31	1	0	0	31		
B-4	Sphygmomanometers	0	1	0	0	0	1	1	1	1	0	16	1	0	0	0	1	1	0	1	1	1	0	5	0	0	0	0	1	1	0	0	0	0	0	22	0	0	0	22		
B-5	Examination couches	3	3	3	3	1	3	3	3	3	3	99	3	3	3	3	3	3	3	3	3	3	3	31	3	3	3	3	3	3	3	3	3	3	3	9	3	3	3	157		
B-6	Instrument sets, minor surgical sets	0	0	1	1	1	1	1	1	1	0	29	1	0	1	1	1	1	0	1	1	1	1	8	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	45		
B-7	Examination couches	2	2	2	2	2	2	2	2	2	2	68	2	2	2	2	2	2	2	2	2	2	2	22	2	2	2	2	2	2	2	2	2	2	2	6	2	2	2	108		
B-8	Instrument sets, minor surgical sets	0	2	0	1	2	2	2	1	1	2	30	1	0	1	1	0	0	1	0	1	0	2	10	2	1	0	1	0	2	2	1	1	1	1	4	2	1	1	52		
B-9	Delivery tables	1	1	1	1	0	1	1	1	0	1	22	0	0	1	0	0	0	1	0	1	0	1	4	1	0	0	0	0	1	0	1	0	1	0	2	1	0	1	29		
B-10	Suction units, manual	1	1	1	1	1	1	1	1	1	0	30	1	1	1	1	1	1	1	1	1	1	1	10	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	47		
B-11	Resuscitators, manual, infant and adult	2	3	2	3	0	3	3	3	3	3	81	3	3	0	3	3	3	1	3	3	0	3	26	3	3	0	3	3	3	0	3	3	3	2	8	3	3	2	130		
B-12	Instrument sets, delivery and suturing	0	0	0	1	0	0	0	0	1	0	14	1	1	1	1	0	1	0	1	0	1	1	9	1	1	1	1	0	1	1	0	1	1	0	1	1	0	0	29		
B-13	Sphygmomanometers	0	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5		
B-14	Weighing scales, baby	1	1	1	1	1	1	1	1	1	1	32	1	1	1	1	1	1	1	1	1	1	1	11	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	52		
B-15	Light with battery back-up	3	4	1	3	0	4	1	6	0	2	56	2	1	2	1	2	3	1	2	3	1	2	8	3	1	2	1	2	3	1	1	2	8	3	1	2	4	1	1	2	98
B-16	Hospital beds with mattress, adult	3	2	1	4	5	7	7	5	4	4	153	7	1	8	2	3	4	3	4	3	4	8	8	8	8	8	8	8	8	8	8	8	8	8	19	8	3	8	249		
B-17	Bedside lockers	0	1	2	0	2	1	1	0	1	2	27	2	1	2	1	1	2	0	2	0	2	2	15	2	1	2	1	1	2	0	2	2	2	2	4	2	0	2	50		
B-18	Hospital beds with mattress, adult	1	0	1	1	0	1	1	1	1	1	23	0	0	1	0	1	1	1	1	1	1	0	6	1	1	0	1	1	1	1	1	1	1	0	1	1	0	0	31		
B-18	Drip stands, double hook, with castors	1	0	1	1	0	1	1	1	1	1	0	23	0	0	1	0	1	1	1	1	1	0	6	1	1	0	1	1	1	1	1	1	1	0	1	1	0	0	31		

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Annex 2: Equipment and furniture list that Malawi side will procure

2-1 District hospitals

2-1-1 Rumphi district hospital

1) Maternity ward

Departments	Equipment name	Qty
1 Delivery room	① Delivery lights	2
	② O ₂ cylinders	2
	③ Heaters	1
	④ Sterilizers	1
	⑤ Vacuum extractors	4
	⑥ Baby scale	1
	⑦ Suction units	2
	⑧ Baby cots	4
	⑨ Drug shelves	2
	⑩ Instruments cabinet	2
	⑪ Delivery tables	4
	⑫ Drip stands	4
	⑬ Doctor's chairs	4
	⑭ Instruments carts	2
	⑮ Office cabinets	2
2 Labour room	① Foetal heart detectors	2
	② Drip stands	6
	③ Labour beds	6
3 Nursery	① Incubators	2
	② O ₂ concentrators	1
	③ O ₂ cylinders	1
	④ Phototherapy units	1
	⑤ Heaters	1
	⑥ baby scales	1
	⑦ Baby cots	6
	⑧ Screens	1
	⑨ Stools	2
4 Nurse station	① Autoclaves	1
	② Stool, metallic	1
	③ Office chairs	1
	④ Cupboard, metallic	1
	⑤ Desks, metallic	1
	⑥ Shelves, metallic	1
5 Post-natal ward 1 (Surgical deliveries) (12 beds)	① Drip stands	6
	② Screen	4
	③ Treatment carts	1
	④ Instruments carts	1
	⑤ Suction units	1
6 Post-natal ward 2 (Complicated deliveries) (12 beds)	① Drip stands	6
	② Screens	4
	③ Treatment carts	1
	④ Instruments carts	1
	⑤ Suction units	1
7 Post-natal ward 3 (Normal deliveries) (12 beds)	① Drip stands	6
	② Screens	4
	③ Treatment carts	1
	④ Instruments carts	1
	⑤ Suction units	1

2) Paediatrics ward

Departments	Equipment name	Qty
1 Serious case room	① Beds	2
	② Bed side lockers	2
	③ Drip stands	1
	④ Screens	1
	⑤ Treatment carts	1
	⑥ Instruments carts	1
	⑦ Suction units	1
	⑧ Nebulizers	1
	⑨ O ₂ cylinders	1
2 Isolation room	① Beds	4
	② Bed side lockers	4
	③ Drip stands	2
	④ Screens	2
	⑤ Treatment carts	1
	⑥ Instruments carts	1
	⑦ Suction units	1
	⑧ Nebulizers	1
3 Kitchen	① Lacks	2
	② Tables	1
	③ Shelves, metallic	2
	④ Cookers	2
4 Medicine store	① Lacks	8
5 Nurse station	① Autoclaves	1
	② Stools, metallic	1
	③ Office chairs	1
	④ Cupboard, metallic	1
	⑤ Desks, metallic	1
	⑥ Shelves, metallic	1
6 Malnutrition room (12 beds)	① Drip stands	6
	② Screens	4
	③ Treatment carts	1
	④ Instruments carts	1
	⑤ Suction units	1
	⑥ Nebulizers	1
7 Paediatrics ward (12 beds)	① Drip stands	6
	② Screens	4
	③ Treatment carts	1
	④ Instruments carts	1
	⑤ Suction units	1
	⑥ Nebulizers	1

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2-1-2 Mzimba district hospital paediatrics ward

Departments	Equipment name	Qty
1 Kitchen	① Lacks	2
	② Tables	1
	③ Shelves, metallic	2
	④ Cookers	2
2 Serious patient	① Beds	4
	② Bedside lockers	4
	③ Drip stands	2
	④ Screens	2
	⑤ Treatment carts	1
	⑥ Instrument carts	1
	⑦ Suction units	1
	⑧ Nebulizers	1
	⑨ O ₂ cylinders	1
3 Nurse station	① Autoclaves	1
	② Stools, metallie	1
	③ Stool, office	1
	④ Shelves, metallic	1
	⑤ Desks, metallic	1
	⑥ Shelves, metallic	1
4 Medicine store	① Lacks	8
5 Isolation room	① Beds	4
	② Bedside lockers	4
	③ Drip stands	2
	④ Screens	2

KM

Departments	Equipment name	Qty
	⑤ Treatment carts	1
	⑥ Instruments carts	1
	⑦ Suction units	1
	⑧ Nebulizers	1
6 Malnutrition room (12 beds)	① Beds	12
	② Bedside lockers	12
	③ Drip stands	6
	④ Screens	4
	⑤ Treatment carts	1
	⑥ Instruments carts	1
	⑦ Suction units	1
	⑧ Nebulizers	1
7 Paediatrics ward (12 beds)	① Drip stands	6
	② Screens	4
	③ Treatment carts	1
	④ Instruments carts	1
	⑤ Suction units	1
	⑥ Nebulizers	1

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2.2 Health Centres

2.2.1 Dispensary Block

Room	No.	Equipment	Quantity
(1) Examination room	1	Weighing scale, baby, basin type	1
	2	Weighing scale, toddler, spring type	1
	3	Screen	1
	4	Water container 20 litters	1
	5	Chair, wood	2
	6	Cupboard, low, wood	1
	7	Desk, wood	1
	8	Dustbin, with lid	1
	9	Filing cabinet	1
(2) Family planning room	10	Stool, wood	1
	11	Chair, wood	2
	12	Desk, wood	1
	13	Dustbin, with lid	1
(3) Treatment room	14	Stove, charcoal	1
	15	Stove, kerosene	1
	16	Sterilizing unit	1
	17	Drip stand	1
	18	Screen	1
	19	Stretcher	1
	20	Trolley, instrument	1
	21	Water container, 20 litters	1
	22	Cupboard, high, wood	1
	23	Dustbin, with lid	1
	24	Stool, wood	2
(4) Dressing room	25	Stove, kerosene	1
	26	Centrifuge	1
	27	haemoglobin meter	1
	28	Sterilizing unit	1
	29	Water container 20 litters	1
	30	Chair, wood	1
	31	Cupboard, low, wood	1
	32	Dustbin, with lid	1

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Room	No.	Equipment	Quantity
	33	Shelves, wood	1
	34	Stool, wood	1
(5) Basket	35	Basket	1
	36	Cupboard, high, wood	1
	37	Shelves, wood	1
(6) Store	38	Cold box	1
	39	Refrigerator	1
	40	Vaccine carrier	2
	41	Cupboard, high, wood	1
	42	Shelves, wood	4
(7) Waiting room (male)	43	Hospital bed	1
	44	Bedside locker	1
	45	Drip stand	1
	46	Dustbin, with lid	1
(8) Waiting room (female)	47	Bedside locker	1
	48	Drip stand	1
	49	Dustbin, with lid	1
(9) Office	50	Stool, wood	1
	51	Chair, wood	1
	52	Desk, wood	1
	53	Dustbin, with lid	1
(10) VCT	54	Stool, wood	1
	55	Chair, wood	1
	56	Desk, wood	1
	57	Dustbin, with lid	1
(11) VCT waiting room	58	Bench	2

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2-2-2 Maternity Block

Room	No.	Equipment	Quantity
(12) Labour and delivery room	59	Lamp pressure, paraffin	1
	60	Stove, charcoal	1
	61	Stove, kerosene	1
	62	Sterilizing unit	1
	63	Baby cot	1
	64	Drip stand	1
	65	Screen	1
	66	Stool, surgeon's	1
	67	Trolley, instrument	1
	68	Water container 20 liters	1
	69	Cupboard, low, metal	1
	70	Dustbin, with lid	1
(13) Store	71	Shelves, wood	2
(14) Post-natal ward Ante-natal ward	72	Lamp, pressure, paraffin	2
	73	Drip stand	2
	74	Screen	2
	75	Water container 20 liters	2
	76	Chair, wood	8
	77	Dustbin, with lid	2
(15) Examination room	78	Weighing scale, adult	1
	79	Examination couch	1
	80	Weighing scale, baby, basin type	1
	81	Water container 20 liters	1
	82	Chair, wood	2
	83	Desk, wood	1
	84	Dustbin, with lid	1
(16) Waiting room (female)	85	Bedside locker	1
	86	Dustbin, with lid	1
(17) Drug office	87	Basket	1
	88	Cupboard, high, wood	1
	89	Shelves, wood	1
(18) Office	90	Stool, wood	1
	91	Bench	1

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Room	No.	Equipment	Quantity
	92	Desk, wood	1
	93	Dustbin, with lid	1
(19) Nurses/midwife room	94	Lamp, pressure, paraffin	1
	95	Cupboard, drugs	1
	96	Water container 20 litters	1
	97	Basket	2
	98	Bench	1
	99	Chair, wood	1
	100	Desk, wood	1
(20) VCT	101	Stool, wood	1
	102	Chair, wood	1
	103	Desk, wood	1
	104	Dustbin, with lid	1
(21) VCT waiting room	105	Bench	2

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Annex-3 Tentative Implementation Schedule

Schedule	Stage		Flow and Works
August 2003	Application		Request ↓
October 2005	Study	Preliminary	Preliminary study ↓
February 2006		Basic Design	Basic Design Study ↓
March 2006	Appraisal & Approval		Appraisal of project ↓
April 2006			Inter Ministerial Consultation ↓
August 2006			Presentation of Draft Notes ↓
October 2006			Approval by the Cabinet
November 2006	Implementation		E/N ↓
December 2006			Banking Arrangement ↓
December 2006			Consultant Contract ↓
December 2006			Detailed Design and Tender Documents ↓
April 2007			Tendering and Evaluation ↓
May 2007			Construction Contract ↓
February 2008			Completion of Construction ↓
March 2008			Operation

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資料 6. 事業事前計画表(基本設計時)

1. 案件名
マラウイ共和国地方保健医療施設改善計画
2. 要請の背景(協力の必要性・位置付け)
<p>マラウイ共和国(以後「マ」国)の出生時平均余命は 38 歳「マ」国の出生時平均余命は 38 歳(サブサハラ・アフリカ平均 46 歳)と低く、5 歳未満児死亡率は 178 人/千人(サブサハラ・アフリカ平均 175 人/千人)と、基本的な保健医療指標は最悪な数値を示しており、保健医療事情は極めて悪い状況にある(2005 年: UNICEF 世界子ども白書)。</p> <p>「マ」国保健省は保健医療事情の調査と改善のため、1997 年に全国の保健医療施設の現状調査を欧州連合の支援を得て実施、調査結果は 1998 年度 JICA 開発調査「プライマリーヘルスケア強化計画」により地理情報システムに盛り込まれ、2002 年には JICA 在外基礎調査「全国保健施設マッピング調査」により、全国 2850 の保健施設中、617 の施設の基礎情報が更新された。これら一連の調査を通じ、保健医療事情の悪化を招いている原因として、医療施設・機材の不足、保健医療の地域間格差、特に地方部における保健医療施設のアクセスの悪さやサービスの質の低さが指摘され、保健医療施設の改善が重要かつ急務な状況が明らかになった。</p> <p>係る状況を踏まえ、「マ」国政府は、第 4 次国家保健計画や EHP において保健医療施設の改善を盛り込み、県レベル以下の保健医療施設の整備に取り組む計画を策定した。しかしながら、改善が必要な施設は多数かつ広範囲な地域に及ぶこと、多額の予算が必要とされること等から、十分に取組みを進められない状況にあり、他方、アフリカ開発銀行の支援を受けた「地域医療改善」プロジェクトにて 2001 年より南・中部地域でヘルスセンター 20 施設を改善したものの、同プロジェクト以外は他ドナーからの支援も無く、現状では「EHP」が定める基礎保健医療サービスを提供可能な施設は全国で 1 割程度に留まっている。</p> <p>県レベル以下の保健医療施設は、中央病院、県病院、村落病院、ヘルスセンター、クリニック、母子保健ユニット等多岐にわたっているが、EHP 実践上、県病院及びヘルスセンターが中核的な役割を果たしており、住民の利用度も高い施設となっている。</p> <p>県病院は 2 次保健医療サービスを担っており、建設から約 40 年経過した病院もあるなど、施設・機材は必ずしも十分な状態では無いものの、概ね最低限の臨床機能を備えた総合病院として機能している。近年、人口の増加、保健医療事情の悪化、下位施設で機能低下が著しいヘルスセンターからの転送患者の受入増等により、定員の 2 倍以上の患者や床に寝かされた患者がいる病棟など、建設当時の想定を大幅に越えた患者が集まり、殆どの病院で施設の収容能力に重大な問題を抱えるようになっており、診断や治療の遅れが生じる、施設に収容しきれない等、病院としての機能低下をもたらす原因となっていることから、収容能力の改善が急がれている。特に、県病院は、乳幼児の救急医療や帝王切開などの難易度の高い出産が可能な限られた施設であること、「マ」国においては低栄養や下痢症、マラリアなど乳幼児がかかりやすい疾病が蔓延していること等から、産科棟・小児棟の拡充が必要とされており、ヘルスセンターからの転送も多く病院内の利用度が高い棟であることから、改善は急務となっている。</p> <p>ヘルスセンターは、外来棟と産科棟を有し、予防接種、感染症対策、妊産婦ケア、健康教育等、住民に密着した 1 次保健医療サービスを担っている。地方農村部の住民や貧困層等、多くの住民利用する施設であるもの、約 60 年前に建設された施設もあり、雨漏り、亀裂、カビなど全国的に施設の老朽化や損傷は激しく、機材は老朽化や損傷、不足が顕著・一般的となっており、ヘルスセンターとしての機能維持に支障がある施設が多数存在し、住民の信頼度の低下を招く等、改善が急がれている。</p> <p>当初要請は、改善を要請がある施設は全国 28 県、約 540 施設と多数かつ広範囲な地域に点在、要請施設のレベルは多岐(中央病院、県病院、村落病院、ヘルスセンター、クリニック、母子保健ユニット等県レベル以下全て)に亘り、施設の所管は公的施設のみならず民間施設が含まれて</p>

いた。

予備調査段階において、着実に本プロジェクトの効果を担保する観点からも協力の内容・範囲・規模を絞り込む必要性が確認された。対象地域については、現地調査及び「マ」国側との協議の結果、EHPの提供を必要とする社会的脆弱者層が多い地域、保健医療事情が比較的悪く保健医療施設の改善が著しい地域、技術協力（保健医療分野の青年海外協力隊等）との連携・シナジーによる協力効果の最適・最大化が期待出来る地域、ドナー等からの外部支援が及んでいない地域（南部・中部の一部でアフリカ開発銀行が支援）等を基準に絞り込みを行うことで合意し、該当する4県（北部のルンピ県とムジンバ県、中部のカスング県とリロングウェ県）が「マ」国側より要請された。また、対象施設については、プロジェクトがEHPに資することを目的としていることから、EHP実践上中核・拠点的な役割を果たし、住民の利用度も高く公的施設に絞り込むことで合意し、これに該当する県病院及びヘルスセンターが要請された。ヘルスセンターは各地に数多く点在しており、具体的な選定にあたっては絞り込みが必要となることから、本プロジェクトの効果発現には、現行で保健医療サービスが実施されており、かつ施設の運営・維持管理が見込める施設が望ましいことが確認されたため、既存施設でヘルスセンターに標準配置となっている看護・助産師が常駐している施設を基準として選定していくことが合意された。機材については、対象施設における基礎的かつ必要不可欠な機材を調達することが適当であること、「マ」国がEHP推奨機材リストを有していること等が確認され、EHP推奨機材リストに沿った基礎的な機材が要請された。

基本設計調査段階においては、現地調査及び「マ」国側との協議を経て、予備調査の結果を踏まえた詳細計画が検討され、最終的に「マ」国側より、県病院については、2県2県病院3棟の建設（ルンピ県病院の産科・小児棟、ムジンバ県病院の産科棟を増設）及び増設に伴う機材調達（ベッド及びベッドサイドテーブル）。ヘルスセンターについては、4県14ヘルスセンター14棟の新設（ルンピ・ムジンバ・カスング・リロングウェ県のヘルスセンターにて外来棟7棟・産科棟7棟を建て替え）及び4県55ヘルスセンターに対するEHP推奨機材リストに沿った機材調達が要請された。

3. プロジェクト全体計画概要

(1) プロジェクト全体計画の目標(裨益対象の範囲及び規模)

保健省のEHPの推進の一環として基礎的保健医療サービスの向上を図るため、北部（ルンピ県、ムジンバ県）及び中部（カスング県、リロングウェ県）の県病院及びヘルスセンターの施設及び基礎的な保健医療機材の改善を通じた各施設の保健医療サービスの向上を目的とする。

裨益人口：ルンピ県、ムジンバ県の97万人、カスング県、リロングウェ県のヘルスセンター近隣住民41.7万人(2005年)

(2) プロジェクト全体計画の成果：

ルンピ県病院の小児・産科棟、ムジンバ県病院の小児棟、及びルンピ県・ムジンバ県・カスング県・リロングウェ県の55施設における保健医療サービスが向上する。

(3) プロジェクト全体計画の主要活動

① ルンピ県病院の小児・産科棟、ムジンバ県病院の小児棟、及びルンピ県・ムジンバ県・カスング県・リロングウェ県のヘルスセンター14施設の外来棟7棟、産科棟7棟を整備する。

② ルンピ県病院の小児・産科棟、ムジンバ県病院の小児棟、及びルンピ県・ムジンバ県・カスング県・リロングウェ県のヘルスセンター55施設における基礎的医療機材を整備する。

(4) 投入(インプット)

ア. 日本側：無償資金協力 7.25億円（基本設計調査時）

イ. 相手国側

(ア) 本無償資金協力の実施に係る負担額：0.68億円

(イ) 施設・機材の運営・維持管理に係る経費：0.02億円

(5) 実施体制：

・ 主管官庁：保健省 実施機関：対象県病院及びヘルスセンター

4. 無償資金協力案件の内容

- (1) サイト
「マ」国ルンピ県、ムジンバ県、カスング県、リロングウェ県
- (2) 概要
施設建設：ルンピ県病院の小児・産科棟、ムジンバ県病院の小児棟
ルンピ県・ムジンバ県・カスング県・リロングウェ県のヘルスセンター14 施設の
外来棟7棟、産科棟7棟
機材整備：ルンピ県病院の小児棟・産科棟、ムジンバ県病院の産科棟、及びルンピ県・ムジ
ンバ県・カスング県・リロングウェ県のヘルスセンター55 施設における基礎的
医療機材
- (3) 相手国負担事項
樹木の伐採、抜根、敷地が畑の場合の表土すきとり、敷地境界フェンスの建設等
- (4) 概算事業費
概算事業費 7.93 億円（日本国側負担分 7.25 億円、「マ」国側負担分 0.68 億円）
- (5) 工期
詳細設計・入札期間を含め 15.0 ヶ月（予定）
- (6) 貧困、ジェンダー、環境及び社会面の配慮
特になし

5. 外部要因リスク

特になし

6. 過去の類似案件からの教訓の活用

特になし

7. プロジェクト全体計画の事後評価に係わる提案

- (1) プロジェクト全体計画の目標達成を示す成果指標
- ①ルンピ県病院の小児棟・産科棟、ムジンバ県病院の小児棟における病院の患者収容数（増
加）
- 増加するベッド数
- | | 2006年（現状）（台） | 2008年以降（台） |
|-------------|--------------|------------|
| ルンピ県病院 小児棟 | 24 | 48 |
| ルンピ県病院 産科棟 | 24 | 60 |
| ムジンバ県病院 小児棟 | 48 | 72 |
- ② ヘルスセンター産科棟における妊産婦収容数（増加）
- ③ ヘルスセンター産科棟における出産数（増加）
- ④ ヘルスセンター産科棟における、緊急産科ケアを除く、県病院など他施設へ紹介件数（減
少）
- ⑤ ヘルスセンター外来棟における施設利用者数（増加）
- (2) その他成果指標
なし。
- (3) 評価のタイミング
施設建設・機材調達完了（2009年）以降

資料7. 入手資料リスト

調査名 マラウイ国地方医療施設改善計画基本設計調査

番号	Title	形態	オリジナル・コピー	発行機関	発行年
1	Malawi: Demographic and Health Survey 2000	図書	E-data	USAID/Macro	2000年8月
2	Health Sector Support Project(HSSP) Project Appraisal Document	図書	E-data	WB	2004年
3	Health Sector Support Project(HSSP), Environment	図書	E-data	WB	
4	Health Sector Support Project(HSSP), Resettlement	図書	E-data	WB	2004年
5	Better Health Outcomes from Limited Resources, Focusing on Priority Services in Malawi	図書	E-data	WB	2002年
6	Baseline Survey of Physical Assets Providing Medical Services to the General Population, Kasungu District	図書	コピー	EU/MoHP	1998年8月
7	Baseline Survey of Physical Assets Providing Medical Services to the General Population, Rumphi District	図書	コピー	EU/MoHP	1998年8月
8	Baseline Survey of Physical Assets Providing Medical Services to the General Population, Mzimba District	図書	コピー	EU/MoHP	1998年1月
9	Malawi: Human Resources for Health Sector Strategic Plan 2003 to 2013 (Draft)	図書	E-data	MoHP	2003年10月
10	Malawi: Health Management Information Bulletin special Issue 2002	図書	E-data	MoHP	2002年
11	Malawi: Health Information Bulletin, Performance Data Analysis of Tertiary Care Facilities	図書	E-data	MoHP	2002年
12	Fourth National Health Plan 1999 to 2004	図書	E-data	MoHP	
13	Malawi: Millennium Development Goals Report 2003	図書	E-data	MEPD	2003年
14	Nutrition of Young Children and Mothers in Malawi	図書	E-data	Macro	2001年
15	Malawi National Health Plan 1999 to 2004 Volume 2 National Health Facilities	図書	E-data	MoHP	1999年
16	EHP: Malawi Essential Health Package 2002/3 FY Plan of Action "Reaching an EHP Implementation Plan"	図書	E-data	MoHP	2002年
17	Population and Housing Census 1998	図書	E-data	NSO	1998年
18	Malawi Poverty Reduction Strategy Paper	図書	E-data	MFEP	2002年

番号	Title	形態	オリジナル・コピー	発行機関	発行年
19	Health Information System: National Policy and Strategy	図書	コピー	MoHP	
20	Master plan study on strengthening primary health care services in the Republic of Malawi : final report	図書	コピー	JICA	1998年
21	Appraisal Report Support to the Health Sector Programme	図書	コピー	AfDB	2005年9月
22	Appraisal Report Rural Health CareSupport Project III	図書	コピー	AfDB	2000年9月
23	Human Development Report 2002 Human Development Index	図書	コピー	UNDP	
24	Road Map for Accelerating the Reduction Maternal and Newborn Mortality and Morbidity in Malawi	図書	コピー	MoH	2005年9月
25	Minimum Requirements Health Facilities	図書	コピー	CHAM	2001年11月
26	Malawi National Health Physical Assets Management Policy	図書	コピー	MoHP	2002年11月
27	Supply and Delivery of Medical Equipment	図書	コピー	MoH	2005年10月
28	To the Year 2020: A Vision for the Health Sector in Malawi	図書	オリジナル		
29	SWAp Financial Monitoring Report for Half Year Ended 31st December 2005	図書	オリジナル	MoH	2006年3月
30	Rumphhi District Socio Economic Profile	図書	オリジナル	MoH	2002年6月
31	Kasungu District Implementation Plan (DIP) 2005/2006	図書	コピー	Kasungu DHO	2005年2月
32	Rumphhi 2005/2006	図書	オリジナル	Rumphhi DHO	2005年2月
33	Mzimba District Implementation Plan (DIP) for 2006/2007	図書	コピー	Mzimba DHO	2006年2月
34	A Joint Programme of Work for A Health Sector Wide Approach (SWAp) [2004 - 2010]	図書	コピー	Dep. of Planning MOH	2004年12月

資料 8. 各ヘルス・センターの機材数量明細表

(1) ルンピ県ヘルスセンター用機材

機材コード	機材名称	ルンピ県					
		RHC-1	RHC-3	RHC-4	RHC-5	RHC-6	RHC-7
B-1	体重計、成人用	0	1	0	1	1	0
B-2	診断用器具セット	1	1	1	1	0	1
B-3	血圧計	1	1	0	1	1	0
B-4	検診台	0	1	0	0	0	0
B-5	器具セット、小外科用	3	3	3	3	3	3
B-6	検診台	1	1	1	0	1	1
B-7	器具セット、縫合用	2	2	2	2	2	2
B-8	分娩台	0	2	2	2	2	0
B-9	吸引器、マニュアル	0	0	1	0	0	0
B-10	蘇生器、マニュアル、小児・成人用	0	1	0	1	1	1
B-11	器具セット、分娩・縫合用	3	3	3	3	0	3
B-12	血圧計	1	1	1	1	0	1
B-13	体重計、小児用	0	0	0	0	0	0
B-14	診察灯、バッテリー付	1	1	1	0	1	0
B-15	成人ベッド	2	0	0	4	1	0
B-16	ベッドサイド・キャビネット	1	6	8	3	3	0
B-17	成人ベッド	1	0	0	1	2	0
B-18	点滴台	0	0	0	0	1	0

(2) ムジンバ県ヘルスセンター用機材

機材コード	機材名称	ムジンバ県 1											
		MHC-1	MHC-2	MHC-3	MHC-4	MHC-5	MHC-6	MHC-7	MHC-8	MHC-9	MHC-10	MHC-12	MHC-12
B-1	体重計、成人用	0	0	1	0	1	0	1	1	0	1	0	0
B-2	診断用器具セット	1	1	1	1	1	0	1	1	1	1	1	1
B-3	血圧計	1	0	1	1	0	0	0	0	1	0	1	1
B-4	検診台	0	0	0	1	1	0	0	1	0	1	0	1
B-5	器具セット、小外科用	3	3	2	3	3	0	3	3	3	3	3	3
B-6	検診台	1	1	1	1	1	0	0	1	1	1	1	1
B-7	器具セット、縫合用	2	2	2	2	2	0	2	2	2	2	2	2
B-8	分娩台	1	1	0	0	0	0	0	1	1	0	1	1
B-9	吸引器、マニュアル	1	1	0	1	0	1	0	0	1	1	1	0
B-10	蘇生器、マニュアル、小児・成人用	1	1	1	1	1	1	0	0	1	1	1	1
B-11	器具セット、分娩・縫合用	3	3	0	3	3	3	0	0	3	3	3	3
B-12	血圧計	1	1	0	0	0	0	0	0	1	0	1	1
B-13	体重計、小児用	0	0	0	0	0	0	0	1	1	1	0	0
B-14	診察灯、バッテリー付	1	1	1	1	1	0	0	1	1	1	0	1
B-15	成人ベッド	0	5	2	0	5	3	0	0	0	2	0	0
B-16	ベッドサイド・キャビネット	5	5	2	8	8	6	0	8	3	4	8	2
B-17	成人ベッド	0	2	2	0	2	0	0	2	0	1	0	0
B-18	点滴台	1	0	1	1	1	1	0	1	0	1	1	1

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機材コード	機材名称	ムジンバ県 2											
		MHC-13	MHC-14	MHC-15	MHC-16	MHC-17	MHC-18	MHC-19	MHC-20	MHC-21	MHC-22	MHC-23	MHC-24
B-1	体重計、成人用	1	1	1	0	1	0	0	1	1	0	0	1
B-2	診断用器具セット	1	1	1	1	1	1	1	0	0	1	0	1
B-3	血圧計	0	1	1	1	1	1	0	0	1	1	0	0
B-4	検診台	1	0	1	0	0	0	0	1	0	0	0	0
B-5	器具セット、小外科用	3	3	3	3	3	3	3	3	3	3	1	3
B-6	検診台	1	1	1	1	0	1	0	0	1	1	1	1
B-7	器具セット、縫合用	2	2	2	2	2	2	2	2	2	2	2	2
B-8	分娩台	2	1	2	1	1	1	0	2	0	1	2	2
B-9	吸引器、マニュアル	1	1	1	0	1	0	1	1	1	1	0	1
B-10	蘇生器、マニュアル、小児・成人用	1	1	1	1	1	1	1	1	1	1	1	1
B-11	器具セット、分娩・縫合用	3	3	3	3	3	3	2	3	2	3	0	3
B-12	血圧計	0	1	1	1	0	1	0	0	0	1	0	0
B-13	体重計、小児用	0	0	1	0	1	0	0	0	0	0	0	0
B-14	診察灯、バッテリー付	1	0	1	0	0	1	1	1	1	1	1	1
B-15	成人ベッド	3	4	8	0	2	0	3	4	1	3	0	4
B-16	ベッドサイド・キャビネット	8	3	8	8	2	0	3	2	1	4	5	7
B-17	成人ベッド	2	0	2	0	0	0	0	1	2	0	2	1
B-18	点滴台	0	1	1	1	0	1	1	0	1	1	0	1

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機材コード	機材名称	ムジンバ県 3											
		MHC-25	MHC-26	MHC-27	MHC-28	MHC-29	MHC-30	MHC-31	MHC-32	MHC-33	MHC-34	MHC-35	
B-1	体重計、成人用	0	1	0	1	0	0	0	1	0	1	0	0
B-2	診断用器具セット	1	1	1	1	0	1	1	1	1	1	0	0
B-3	血圧計	1	1	1	0	0	1	1	1	1	0	0	0
B-4	検診台	1	1	1	1	0	1	1	1	1	1	0	0
B-5	器具セット、小外科用	3	3	3	3	3	3	3	3	3	3	3	3
B-6	検診台	1	1	1	1	0	1	1	1	1	1	0	0
B-7	器具セット、縫合用	2	2	2	2	2	2	2	2	2	2	2	2
B-8	分娩台	2	1	1	2	0	1	2	1	1	2	0	0
B-9	吸引器、マニュアル	1	1	0	1	0	0	1	1	0	1	0	0
B-10	蘇生器、マニュアル、小児・成人用	1	1	1	1	0	1	1	1	1	1	0	0
B-11	器具セット、分娩・縫合用	3	3	3	3	1	3	3	3	3	3	1	1
B-12	血圧計	0	0	1	0	1	1	0	0	1	0	1	1
B-13	体重計、小児用	0	0	1	0	0	0	0	0	1	0	0	0
B-14	診察灯、バッテリー付	0	1	1	1	1	1	0	1	1	1	1	1
B-15	成人ベッド	1	6	0	2	1	2	1	6	0	2	1	1
B-16	ベッドサイド・キャビネット	7	5	4	4	8	7	7	5	4	4	8	8
B-17	成人ベッド	1	0	1	2	2	2	1	0	1	2	2	2
B-18	点滴台	1	1	1	1	0	0	1	1	1	1	0	0

(3) カスング県ヘルスセンター用機材

機材コード	機材名称	カスング県										
		KHC-1	KHC-2	KHC-3	KHC-4	KHC-5	KHC-6	KHC-7	KHC-8	KHC-9	KHC-10	KHC-11
B-1	体重計、成人用	0	0	1	0	1	1	0	0	0	0	0
B-2	診断用器具セット	1	1	1	1	1	1	1	1	1	1	1
B-3	血圧計	1	1	0	0	1	1	0	0	1	1	0
B-4	検診台	1	0	0	0	1	0	0	1	1	1	0
B-5	器具セット、小外科用	3	3	3	3	3	3	3	3	3	1	3
B-6	検診台	1	0	1	1	1	0	0	1	1	1	1
B-7	器具セット、縫合用	2	2	2	2	2	2	2	2	2	2	2
B-8	分娩台	1	0	1	1	0	0	1	0	2	2	2
B-9	吸引器、マニュアル	0	0	1	0	0	0	0	1	0	1	1
B-10	蘇生器、マニュアル、小児・成人用	1	1	1	1	1	1	1	1	0	1	1
B-11	器具セット、分娩・縫合用	3	3	0	3	3	2	3	3	0	3	3
B-12	血圧計	1	1	1	1	0	1	1	0	1	1	1
B-13	体重計、小児用	0	0	0	0	0	0	0	0	0	0	0
B-14	診察灯、バッテリー付	1	1	1	0	1	1	1	1	1	0	1
B-15	成人ベッド	2	1	2	1	2	3	1	1	2	8	8
B-16	ベッドサイド・キャビネット	7	1	8	2	3	4	3	4	8	8	8
B-17	成人ベッド	2	1	2	1	1	2	0	0	2	2	2
B-18	点滴台	0	0	1	0	1	1	1	0	1	0	1

(4) リロングウェ県ヘルスセンター用機材

機材コード	機材名称	リロングウェ県		
		LHC-1	LHC-2	LHC-3
B-1	体重計、成人用	0	0	1
B-2	診断用器具セット	1	1	1
B-3	血圧計	1	0	0
B-4	検診台	0	0	0
B-5	器具セット、小外科用	3	3	3
B-6	検診台	1	1	1
B-7	器具セット、縫合用	2	2	2
B-8	分娩台	2	1	1
B-9	吸引器、マニュアル	1	0	1
B-10	蘇生器、マニュアル、小児・成人用	1	1	1
B-11	器具セット、分娩・縫合用	3	3	2
B-12	血圧計	1	0	0
B-13	体重計、小児用	0	0	0
B-14	診察灯、バッテリー付	1	0	0
B-15	成人ベッド	1	1	2
B-16	ベッドサイド・キャビネット	8	3	8
B-17	成人ベッド	2	0	2
B-18	点滴台	1	0	0

DMR 357



MINISTRY OF TRANSPORT AND PUBLIC WORKS

RURAL HEALTH FACILITIES IMPROVEMENT PROJECT

REPORT ON

GEOTECHNICAL SOIL INVESTIGATIONS

APRIL, 2006

**Secretary for Transport and Public Works
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LILONGWE 3**

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LILONGWE**

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Appendices

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- Appendix B - Bore Hole Logs and Trial Pit Profiles
- Appendix C - Laboratory Test Results
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- Appendix D - Photographs

.0 INTRODUCTION

The Government of Malawi is intending to improve some of the Health Centers in Central and Northern Regions through assistance from Japanese Government. KUME SEKKEI CO. LTD, who are the Consulting Engineers of the project, contracted Materials Laboratory to carry out geotechnical investigations on the proposed sites. The field works were conducted from 20th March and were completed on 15th April, 2006.

.0 LOCATION OF THE SITES

The study comprises the following districts:-

1 Northern Region

- (i) Rumphu District Hospital
- (ii) Mwazisi Health Centre
- (iii) Katowo Health Centre
- (iv) Mzimba District Hospital
- (v) Euthini Health Centre
- (vi) Kafukule Health Centre
- (vii) Endindeni Health Centre
- (viii) Emfeni Health Centre.

2 Central Region

- (i) Kasungu District Hospital
- (ii) Simlemba Health Centre
- (iii) Kapeluka Health Centre
- (iv) Chamwavi Health Centre
- (v) Chulu Health Centre
- (vi) Kholo Health Centre.
- (vii) Chiwamba Health Centre
- (viii) M'bang'ombe Health Centre
- (ix) Mtenthela Health Centre

Location Map is in Appendix A

3.0 GEOLOGY OF THE SITES

Rumphi District

Rumphi District Hospital and Mwazisi Health Centre lie in an area which borders the Nyika Plateau and is underlain by undifferentiated paragneisses, schists and granulites. However, the geology of Katowo Health Centre is like that of the Nyika Plateau, which comprises of Pre- and synkinematic granite plutons. Mwazisi and Katowo sites are overlain by reddish-brown and yellowish-brown sandy silty CLAYS up to 1.0 m depth, respectively. Rumphi District Hospital site is overlain by brown silty sandy CLAY, brown gravelly sandy silty CLAY and hard brown cemented GRAVEL.

Mzimba District

Euthini, Endindeni and Kafukule Health Centre sites, in addition to that of Mzimba District Hospital are all underlain by semi-pelitic rocks: boitite- and hornblende-gneisses, commonly garnitiferous and locally graphitic. Reddish- to yellowish-brown sandy silty CLAYS predominantly overlie Euthini, Endindeni and Kafukule sites up to 1.0m depths. Mzimba District Hospital site is overlain by soft greyish brown silty SAND, reddish-brown and brown silty CLAY and yellowish brown micaceous sandy CLAY. The geology of Emfeni consists of Psammites: quartzites and quartofeldspathic granulites. The predominant overlying soil up to 1.0m depth is dark yellowish-brown gravelly sandy CLAY.

Kasungu District

Kasungu District Hospital in addition to Chulu, Kapelula and Khola Health Centres all lie on the Lilongwe-Mchinji-Kaungu Plain. The underlying material consists of semi-pelitic rocks composed of boitite- and hornblende-gneisses, commonly garnitiferous and locally graphitic.

Chamwabvi Health Centre's geology is similar to that of Emfeni; however the superimposing material consists of yellowish-brown sandy silty CLAY with quartz pebbles. Marbles and calc-silicate granites underlie Simlemba Health while brown sandy CLAY with quartz gravel overlies the site.

Lilongwe District

The geology of M'bang'ombe and Chiwamba Health Centres is the same as that of Chulu and Kapelula sites. The predominant overlying soils for M'bang'ombe and Chiwamba sites are reddish-brown sandy silty CLAY and dark brown sandy silty CLAY up to 1.0m depths respectively. Graitoid and pegmatoid gneisses underlie Mtenhela Health Centre while yellowish-brown sandy silty CLAY overlymainly overlies the site up to a depth of 1.0m.

4.0 ENVIRONMENTAL CONDITIONS

Rumphi District

Mean Rainfall	-	1165 mm
Mean Ambient temperature	-	25 °c
Mean Relative humidity	-	72 °c
Mean Evaporation	-	2496 mm
Mean Wind speed	-	3.8 m, measured at 2m above the ground.

Mzimba District

Mean Rainfall	-	780 mm
Mean Ambient temperature	-	27 °c
Mean Relative humidity	-	75 °c
Mean Wind speed	-	4.2 m/s

Kasungu District

Mean Rainfall	-	800 mm
Mean temperature	-	29 °c
Mean Relative humidity	-	65 °c
Mean Wind speed	-	4.9 m/s

Lilongwe District

Mean Rainfall	-	848 mm
Mean temperature	-	20 °c
Mean Relative humidity	-	70 °c
Mean Wind speed	-	4.9 m/s
Mean Pressure	-	889 HPA

5.0 SCOPE OF WORK

In the field, the following activities were performed according to BS 5930:1990:-

- (i) Percussive drilling and logging of 1 borehole to 10m at the following sites:-
 - (a) Rumphi District Hospital
 - (b) Mzimba District Hospital
 - (c) Kasungu District Hospital

However, only at Mzimba site was the full 10.0m required depth reached. At Rumphu and Kasungu District Hospitals, only 5.60m and 6.75m were drilled respectively due to encountered hard strata. In addition, SPTs for every drilled metre and undisturbed sampling were carried out in each borehole.

- (ii) Excavation of 1m trial pits, soil profile of the same and collection of UU Triaxial sample at 1.0m depth were performed at each health centre. However, triaxial sample for Chamwabvi was not collected due to Quartz pebbles present in the material.

Borehole Logs and Trial Pit profiles are appended in B.

6.0 LABORATORY TESTING

The following laboratory tests were performed on samples in accordance with BS 1377:1990:-

- (i) Determination of Atterberg Limit and Linear Shrinkage
- (ii) Determination of Particle Size Distribution
- (iii) Determination of Specific Gravity
- (iv) UU Triaxial Test
- (v) Natural Moisture Content

All Laboratory test results for boreholes and trial pits are in Appendix C.

7.0 ANALYSIS OF RESULTS

Percussive drilling at Rumphu District Hospital revealed brown silty sandy CLAY (Fill), brown gravelly sandy silty CLAY, hard brown decomposed cemented gravel and hard to very hard decomposed ROCK up to 1.0m, 2.30m, 4.20m and 5.60m depths respectively. SPT-N values increased with depth, ranging from 2 at 1.0m to 90 at 5.0m. Laboratory testing confirms both cohesive and frictional material from 3.50m-3.95m due to low moisture content (15.0%), big frictional angle (30°) and high percentage passing 75 microns-sieve (47%). From the SPT-N values, very dense material and bearing capacities of over 120 kN/m^2 occur after 4.0m depth downward.

Both Katowo and Mwazisi Health Centres have sandy silty CLAYS of medium plasticity and high natural moisture content. Laboratory tests further confirm that soils from the two sites are fine-grained because of the low shearing angles (6° for Katowo and 13° for Mwazisi). Fine grained soils are usually compressible and have low bearing capacities.

Mzimba District Hospital borehole log shows greyish brown silty clayey SAND, reddish-brown silty sandy CLAY, brown gravelly silty sandy CLAY, yellowish-brown micaceous sandy CLAY and hard decomposed ROCK up to depths of 1.30m, 2.7m, 4.3m, 6.80m and 10.45m respectively. SPT-N values ranged from 2 at 1.0m to 77 at 10.0m, increasing with depth. Dense to very dense material which has high bearing capacity occurs from 7.0m and deeper. Laboratory tests on the two undisturbed samples collected from the borehole also confirmed fine-grained materials of medium plasticity and low moisture content. Good bearing capacities of greater than 150kN/m^2 are only available from 7.0m down, according to SPT-N values.

Kafukule and Euthini Health Centre sites have sandy silty CLAYS while Endindeni and Emfeni have sandy CLAY and gravelly sandy CLAY respectively.

All the materials have medium plasticity and almost equal shrinkage characteristics except for that of Emfeni which is higher at 9.2%. Of the four, Kafukule has the highest bulk density, highest cohesion, highest shearing angle and the lowest moisture content, according to Triaxial tests.

Geotechnical investigation for Kasungu District Hospital indicates presence of silty sandy CLAY, yellowish-brown weathered rock, sandy silty CLAY and hard highly weathered ROCK up to depths of 3.75m, 4.80m, 5.25m and 6.75m respectively. SPT-N values, as is the case with Rumphu and Mzimba District Hospitals, also increase with depth from 2 at 1.0m to 102 at 6.0m. Bearing capacities of over 150kN/m^2 are realised from 4.0m depth going downwards.

Simlemba, Khola and Chulu Health Centres all have sandy CLAYS of medium plasticities and natural moisture contents except Chulu which has lower natural moisture content of 10.3%. Chamwabvi and Kapelula sites have soils of high plasticities with Kapelula having high natural moisture content.

Chiwamba and Mtenthela sites have fine-grained material with gravel particles and medium-low natural moisture contents. M'bang'ombe Health Centre material has medium plasticity but higher sand fraction than the other two.

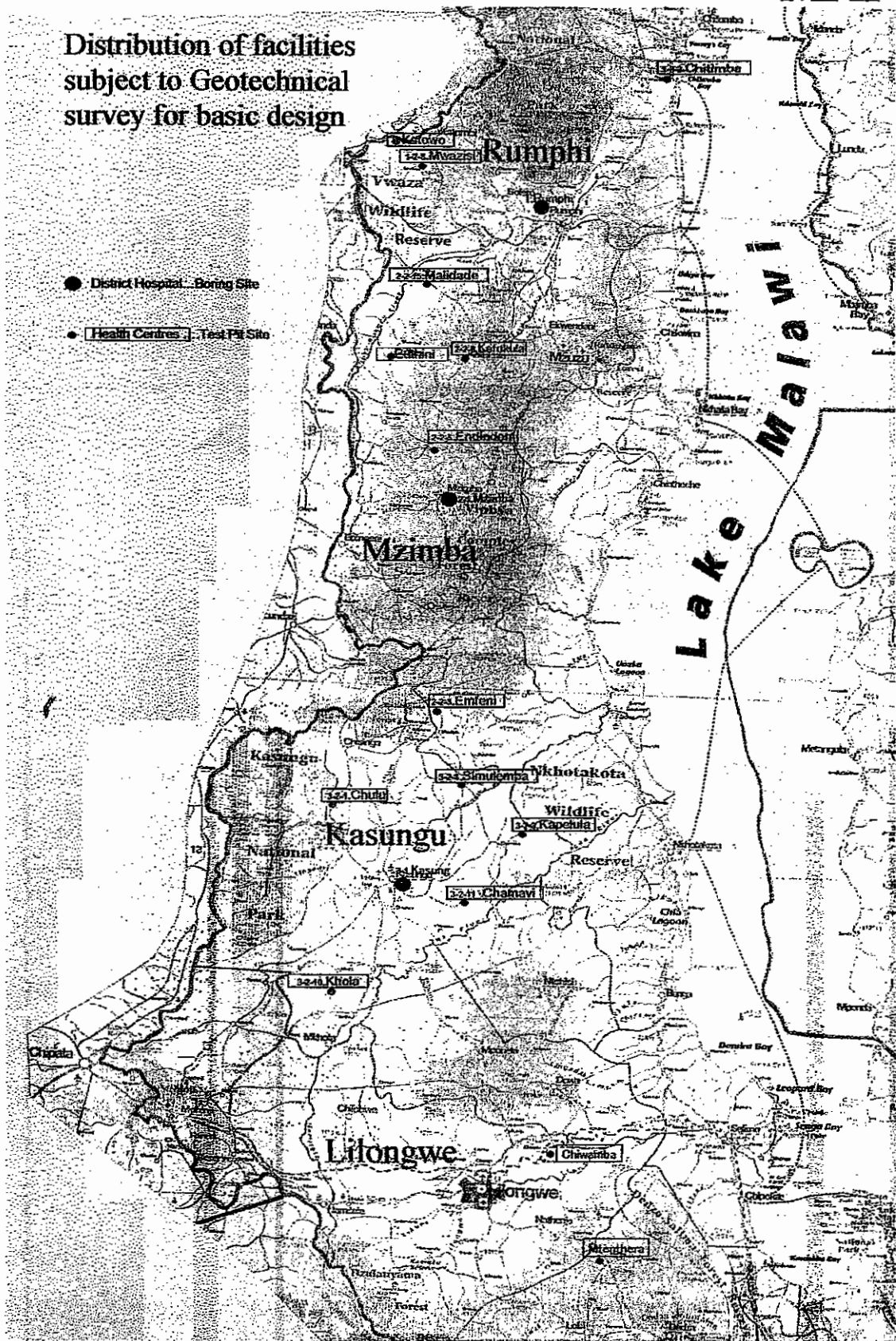
In summary, the fine-grained soils overlying all the Health Centre sites up to a depth of 1.0m have compressive and expansive characteristics. In addition, they usually have low bearing capacities. These materials have to be avoided when considering foundations for structures by excavating deeper for denser granular materials.

APPENDIX A

Location Map

MAP

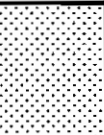
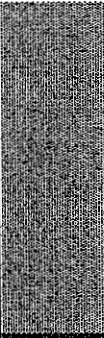
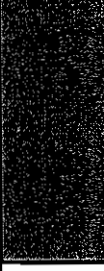

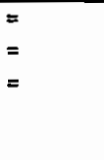

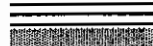


Distribution of facilities subject to Geotechnical survey for basic design



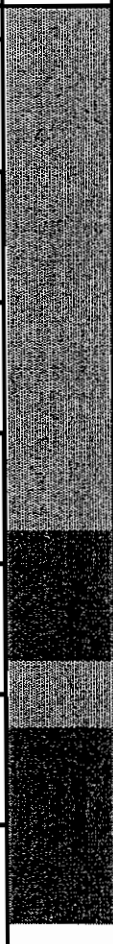

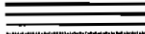


APPENDIX B

Borehole Logs and Trial Pit Profiles

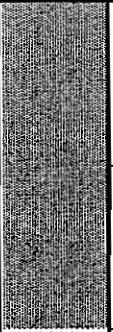

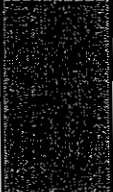





**MINISTRY OF TRANSPORT AND PUBLIC WORKS
MATERIALS LABORATORY
DRILLING HOLE LOG**

PROJECT		: Rural Health Facilities Improvement Project					
LOCATION		: Mzimba District Hospital					
GROUND ELEVATION		: SURVEYED BY M.Z. Zimba					
GROUND WATER LEV		: DATE: 03/04/2006					
BORE HOLE NO.		: 1					
ELEVATION (m)	DEPTH (m)	GRAPHIC OF STRATUM	THICKNESS OF STRATUM	DESCRIPTION OF MATERIAL	NO OF BLOWS IN 30cm (N-Value)	NO OF BLOWS SPT)/LENGTH OF PENETRATION (N/cm)	REMARKS
	0.00			Soft greyish brown silty clayey SAND	2	2/30	Percussive Drilling
	1.00		1.00				
	2.00		1.30	Reddish brown silty sandy CLAY	3	3/30	UD: 2.10-2.55
	3.00		2.00				
	4.00		2.70				
	5.00		3.00				
	6.00		4.00	Brown gravelly silty sandy CLAY	9	9/30	UD: 6.20-6.65
	7.00		4.30				
	8.00		5.00	Yellowish brown micaceous sandy CLAY	14	14/30	UD: 6.20-6.65
	9.00		6.00				
	10.00		6.80				
	11.00		7.00				
	12.00		8.00	Hard weathered ROCK	58	58/30	UD: 6.20-6.65
	13.00		9.00				
	14.00		10.00				
	15.00		10.45				
							END OF B.H.
UD = Undisturbed Sample  = Sand N = SPT N-Value  = Silt D = Disturbed Sample  = Clay  = Decomposed Rock							

**MINISTRY OF TRANSPORT AND PUBLIC WORKS
MATERIALS LABORATORY
DRILLING HOLE LOG**

PROJECT		: Rural Health Facilities Improvement Project						
LOCATION		: Kasungu District Hospital						
GROUND ELEVATION :			SURVEYED BY M.Z. Zimba					
GROUND WATER LEV :			DATE :					
BORE HOLE NO.		: 1						
ELEVATION (m)	DEPTH (m)	GRAPHIC	THICKNESS OF STRATUM	DESCRIPTION OF MATERIAL	NO OF BLOWS IN 30cm (N-Value)	NO OF BLOWS (SPT)/LENGTH OF PENETRATION (N/cm)	REMARKS	
	0.00						Percussive Drilling	
	1.00		1.00	Brown silty sandy CLAY	2	2/30		
	2.00		2.00		5	5/30		
	3.00		3.00		8	8/30		
	4.00			3.75				
				4.00	Soft yellowish brown weathered ROCK	43		43/30
	5.00			4.80				
				5.00	Firm to stiff sandy silty CLAY	48		46/30
				5.25				
	6.00			6.00	Very hard highly weathered ROCK	102		102/30
			6.75			55/0	END OF B.H.	
	7.00							
UD		=	Undisturbed Sample					
N		=	SPT N-Value					
D		=	Disturbed Sample					
						= Gravel		
						= Silt		
						= Clay		
						= Decomposed Rock		

**MINISTRY OF TRANSPORT AND PUBLIC WORKS
MATERIALS LABORATORY
DRILLING HOLE LOG**

PROJECT :		Rural Health Facilities Improvement Project					
LOCATION :		Rumphi District Hospital					
GROUND ELEVATION :		SURVEYED BY M.Z. Zimba					
GROUND WATER LEV :		DATE: 27/03/2006					
BORE HOLE NO. :		1					
ELEVATION (m)	DEPTH (m)	GRAPHIC	THICKNESS OF STRATUM	DESCRIPTION OF MATERIAL	NO OF BLOWS IN 30cm (N-Value)	NO OF BLOWS (SPT)/LENGTH OF PENETRATION (N/cm)	REMARKS
	0.00			Brown silty sandy CLAY (Fill)			Percussive Drilling
	1.00		1.00	2	2/30		
	2.00			Brown gravelly sandy silty CLAY			
	2.30		2.00	7	7/30		
	3.00			Hard brown decomposed cemented gravel			UD: 3.50-3.95
	4.00		3.00		8	8/30	
	4.20		4.00	52	52/30		
	5.00			Hard to very hard decomposed ROCK			END OF B.H.
	5.60		5.00		90	90/30	
	6.00						
	7.00						
UD =		Undisturbed Sample		 = Gravel  = Silt  = Clay  = Decomposed Rock			
N =		SPT N-Value					
D =		Disturbed Sample					

HEALTH CENTRES TRIAL PIT PROFILES

1. Katowo Health Centre

0-0.1.00m Soft yellowish brown sandy silty CLAY

2. Mwazisi Health Centre

0.00-1.00m Reddish brown sandy silty CLAY

3. Euthini Health Centre

0.00-0.28m Soft greyish brown silty SAND

0.28-1.00m Stiff reddish brown sandy silty CLAY

4. Kafukule Health Centre

0.00-0.35m Loose greyish brown silty SAND

0.35-1.00m Yellowish brown silty sandy CLAY

5. Endindeni Health Centre

0.00-0.15m Soft grayish brown silty sandy CLAY

0.15-1.00m Yellowish brown sandy CLAY

6. Emfeni Health Centre

0.00-0.40m Dark brown sandy silty CLAY

0.40-1.00m Dark yellowish brown sandy CLAY

7. Simlemba Health Centre

0.00-0.30m Dark brown sandy silty CLAY

0.30-1.00m Stiff brown sandy CLAY

8. Chulu Health Centre
0.00-0.25m Greyish brown sandy silty CLAY
0.25-1.00m Dark brown sandy silty CLAY
9. Khola Health Centre
0.00-0.34m Greyish brown clayey SAND
0.34-1.00m Dark brown sandy silty CLAY
10. Chamwabvi Health Centre
0.00-0.17m Dark brown sandy silty CLAY
0.17-1.00m Yellowish brown sandy silty CLAY with quartz pebbles
11. Kapelula Health Centre
0.00-1.00m Reddish brown sandy silty CLAY
12. M'bang'ombe Health Centre
0.00-0.16m Dark brown sandy silty CLAY
0.16-1.00m Reddish brown sandy silty CLAY
13. Chiwamba Health Centre
0.00-0.40m Reddish brown sandy silty CLAY
0.04-1.00m Dark brown sandy silty CLAY
14. Mtenthela Health Centre
0.00-0.20m Greyish brown sandy silty CLAY
0.20-1.00m Yellowish brown sandy silty CLAY mixed with laterite gravel

APPENDIX C

Laboratory Test Results (ii) Trial Pit Test Results

**MINISTRY OF TRANSPORT AND PUBLIC WORKS
LABORATORY TEST RESULTS**

CLIENT : KUME SEKKEI CO. LTD.
PROJECT : Rural Health Facilities Improvement
LOCATION: District Hospitals

SOURCE (UN DISTURBED SAMPLES)	SAMPLE DEPTH NO. (m)	PARTICLE SIZE DISTRIBUTION % PASSING SIEVE SIZE (mm)										ATTERBERG CLASSIFICATION	TEST			REMARKS			
		LIMITS											BULK DENS. Kg/m ³	M/C %	BOX SHEAR kN/m ²		SHRINKAGE %		
		19.0	13.2	9.5	4.75	2.36	.600	.425	.300	.150	.075							L.L.	P.I.
Rumphi District Hospital	1			100	99	99	87	80	71	56	47			1893	15	36.4	30.0	6.7	
	2																		U4 Failed
	3																		U4 Failed
Mzimba District Hospital	1				100	95	91	85	76	63	50			1897	10.7	23.0	38.7	7.1	
	2			100	99	98	86	79	70	53	41			2159	11.7	10.0	19.7	6.6	
	3																		U4 Failed
Kasungu District Hospital	1																		U4 Failed
	2																		U4 Failed
	3																		U4 Failed

Triaxial Test Mohr Circles

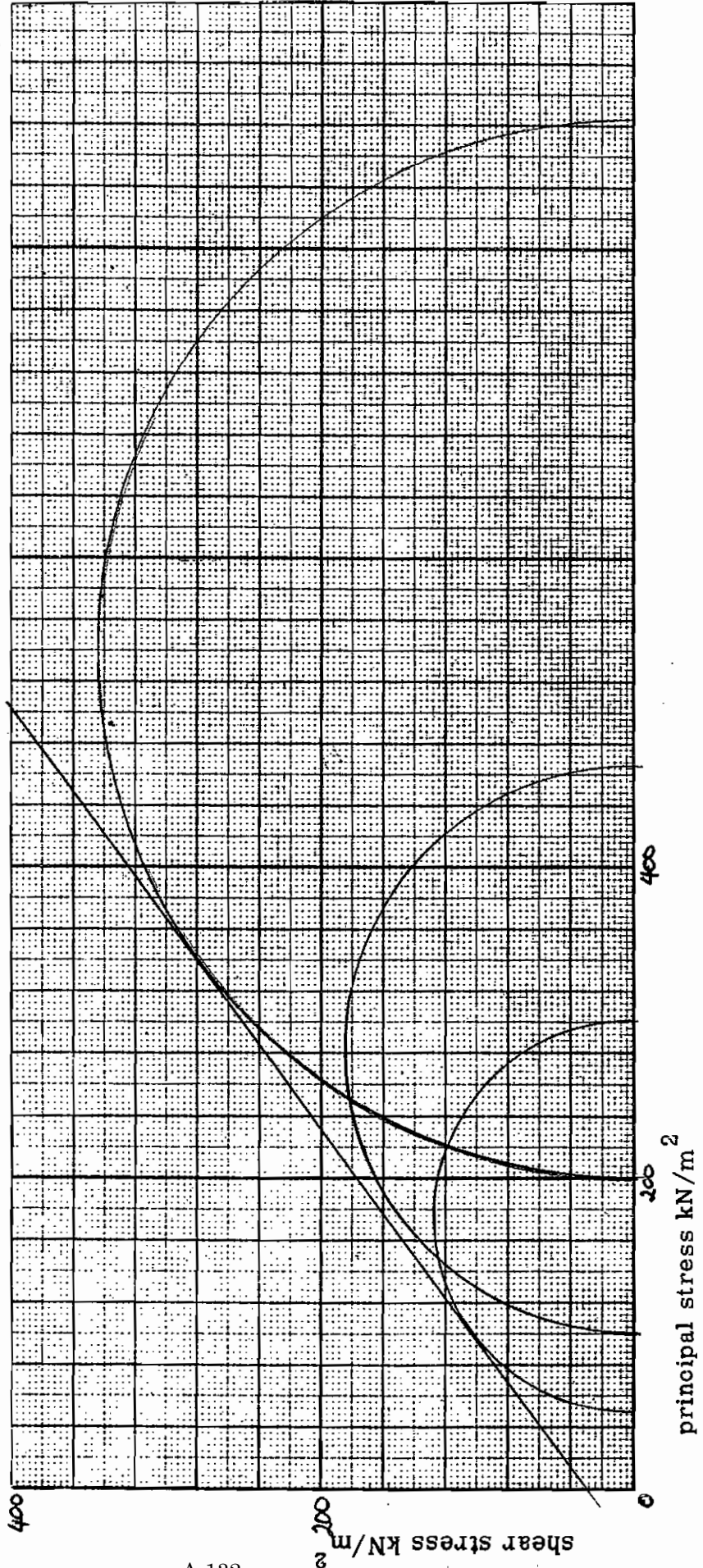
Form K18M

spec ident.	cell/p kN/m^2	stress kN/m^2	$q - q_3$ kN/m^2	σ_3 kN/m^2	σ_1 kN/m^2
1	50	250.7	250.7	50	300.7
2	100	367.3	367.3	100	467.3
3	200	680.9	680.9	200	880.9

sample no.
Location no. BH 1: 3.50 - 3.75m
date: 18/04/06

Hard reddish brown cemented lateritic gravel

$C = 30 \text{ kN/m}^2$
 $\phi = 36.4^\circ$
 $M/C = 15.0\%$
 $B/D = 1893 \text{ kg/m}^3$





Triaxial Test Mohr Circles

Form K18M

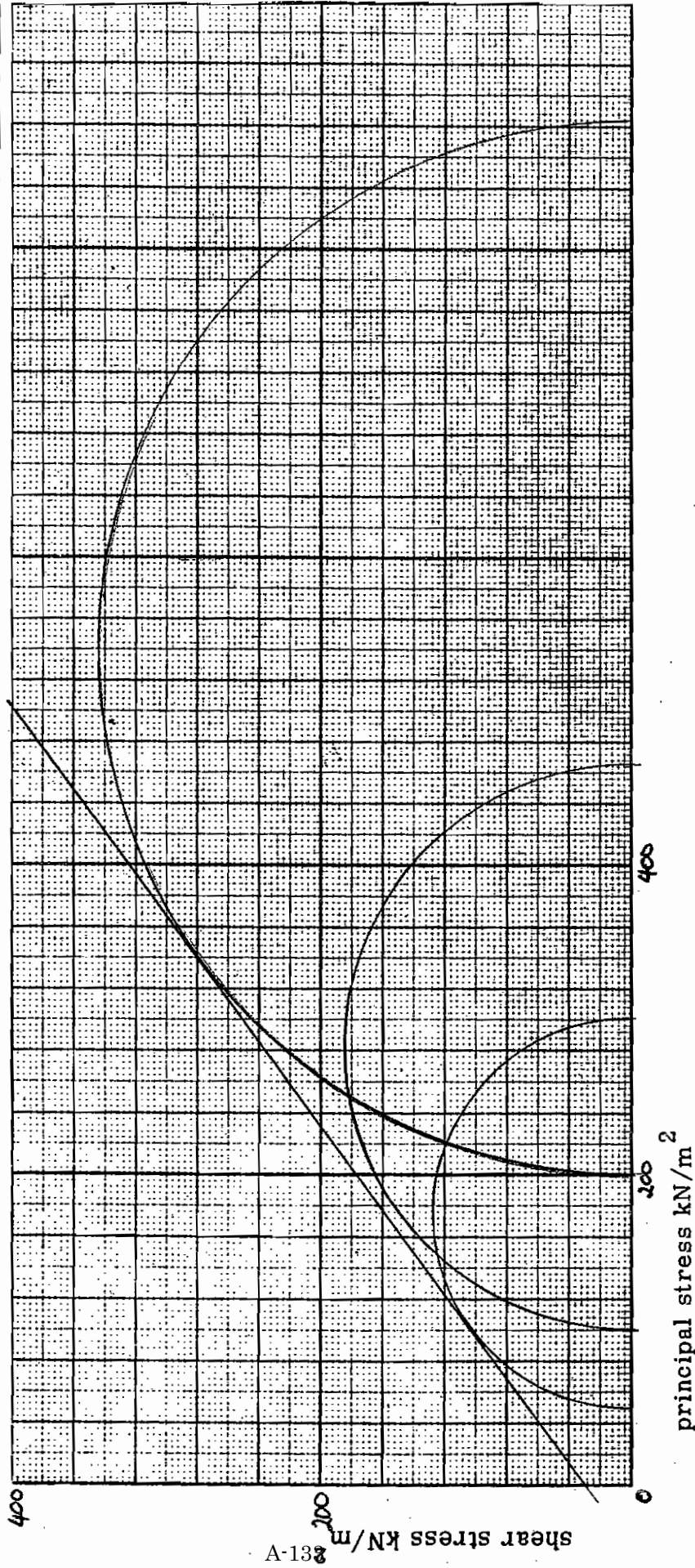
RUMPHI DISTRICT HOSPITAL

sample no.	
Location no. BH 1:	3.50 - 3.75m
date:	18/04/06

Hard reddish brown cemented
lateritic gravel

$C = 30 \text{ kN/m}^2$
 $\phi = 36.4^\circ$
 $M/C = 15.0\%$
 $B/D = 1893 \text{ kg/m}^3$

spec ident.	cell/p kN/m^2	stress kN/m^2	$q - q_p$ kN/m^2	σ_3 kN/m^2	σ_1 kN/m^2
1	50	250.7	250.7	50	300.7
2	100	367.3	367.3	100	467.3
3	200	680.9	680.9	200	880.9





Triaxial Test Mohr Circles

Form K18M

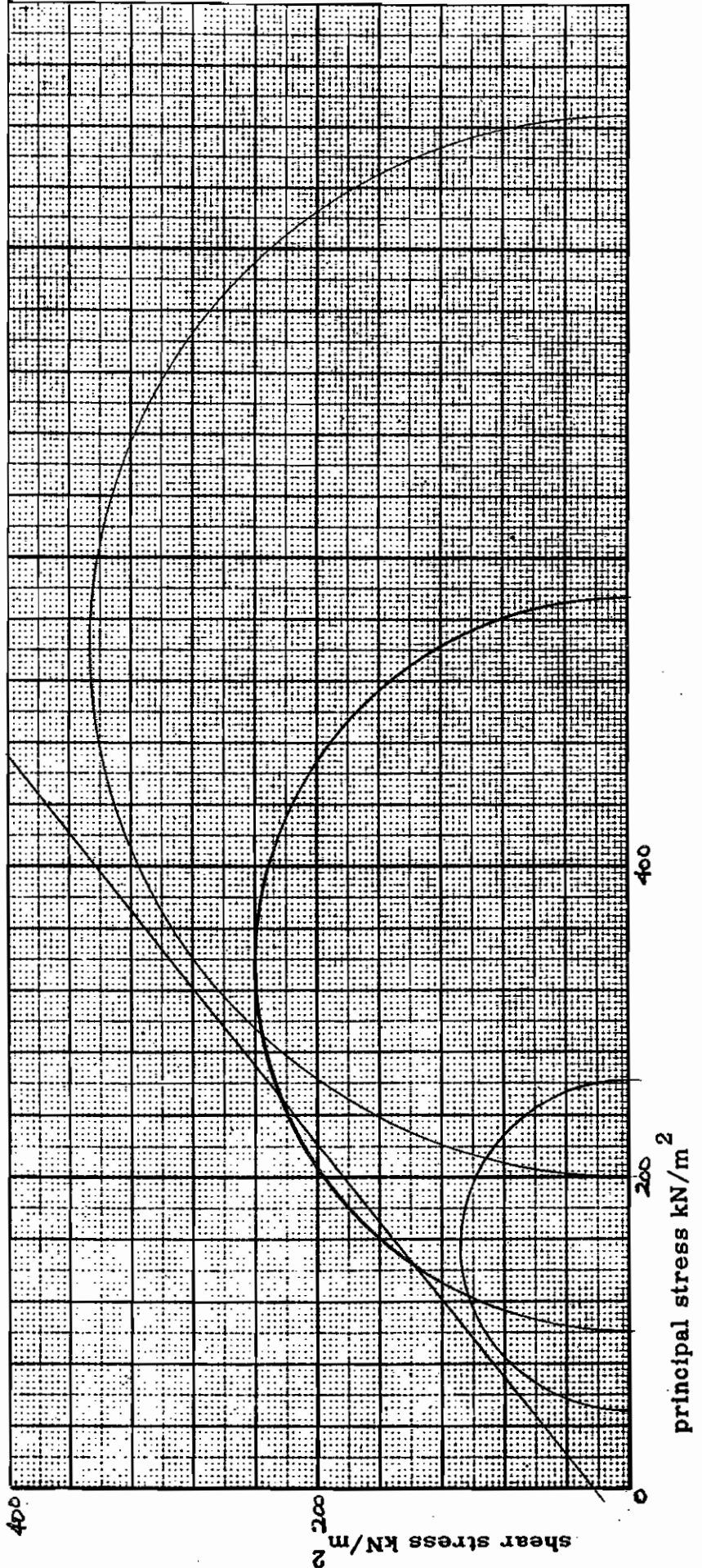
MEIMBA DISTRICT HOSPITAL

sample no.	
Location no. BH 1: 2.10-2.55	
date: 17/04/06	

Reddish brown decomposed Rock

$c = 23 \text{ kN/m}^2$
 $\phi = 38.7^\circ$
 $M/c = 10.7\%$
 $B/D = 1897 \text{ kg/m}^3$

spec ident.	cell/p ₂ kN/m ²	stress kN/m ²	$q - \sigma_3$ kN/m ²	σ_3 kN/m ²	σ_1 kN/m ²
1	50	212.0	212.0	50	262.0
2	100	473.3	473.3	100	573.3
3	200	685.1	685.1	200	885.1



BEARING CAPACITIES ACCORDING TO SPT-N VALUES

Rumphi District Hospital

<u>Depth</u>	<u>N Value</u>	<u>Continous Foundation</u> <u>(KN/m²)</u>	<u>Square Foundation</u> <u>(KN/m²)</u>
1.0m	2	2.860	1.2
2.0m	7	8.801	3.7
3.0m	8	14.3	6.0
4.0m	52	345.1	149.7
5.0m	90++	1232.8++	528.0++

Mzimba District Hospital

<u>Depth</u>	<u>N Value</u>	<u>Continous Foundation</u> <u>(KN/m²)</u>	<u>Square Foundation</u> <u>(KN/m²)</u>
1.0m	2	2.860	1.16
2.0m	3	6.005	2.441
3.0m	7	12.806	5.333
4.0m	9	20.769	8.656
5.0m	14	42.946	18.022
6.0m	23	109.984	46.269
7.0m	43	396.570	166.581
8.0m	58	799.204	334.151
9.0m	65	1114.516	463.978
10.0m	77	1716.328	712.032

Kasungu District Hospital

<u>Depth</u>	<u>N Value</u>	<u>Continous Foundation</u> <u>(KN/m²)</u>	<u>Square Foundation</u> <u>(KN/m²)</u>
1.0m	2	2.860	1.16
2.0m	5	7.124	2.957
3.0m	8	14.258	5.978
4.0m	63	501.543	217.688
5.0m	74	837.785	358.667
6.0m	102	1862.000	789.548
6.75	101++	2033.665	857.341

**MINISTRY OF TRANSPORT AND PUBLIC WORKS
LABORATORY TEST RESULTS**

CLIENT : KUME SEKKEI CO. LTD.
PROJECT : Rural Health Facilities Improvement

LOCATION: Trial Pit

SOURCE	SAMPLE DEPTH NO. (m)	PARTICLE SIZE DISTRIBUTION % PASSING SIEVE SIZE (mm)										ATTERBERG LIMITS L.L.P.I.	CLASSIFI CATION	TEST			SHRINKAGE	% NMC	REMARKS		
		19.0	13.2	9.5	4.75	2.36	.600	.425	.300	.150	.075			BULK DENS. Kg/m ³	M/C %	BOX C				SHEAR o	
																					Kg/m ³
Rumphi District																					
Katowo H. Centre	1.00			100	100	93	87	75	58	52	42	21	A-7-6(9)	1900	20.0	26.0	5.8	7.3	20.1		
Mwazisi H. Centre	1.00			100	100	96	93	83	66	61	45	22	A-7-6(11)	1756	18.4	41.0	12.5	7.2	20.5		
Mzimba District																					
Kafukule H. Centre	1.00			100	88	83	76	65	61	48	23	A-7-6(11)	2017	13.9	122.0	30.8	6.7	13.6			
Euthini H. Centre	1.00		100	99	98	86	83	77	63	44	21	A-7-6(10)	1945	19.4	47.0	25.2	6.8	21.9			
Endindeni H. Centre	1.00			100	83	76	66	51	45	39	18	A-6(4)	1981	14.0	56.0	16.2	6.6	13.4			
Emfeni H. Centre	1.00	100	100	98	83	59	56	52	41	38	46	22	A-7-6(4)	1951	16.7	14.0	28.1	9.2	15.9		
Kasungu District																					
Simlemba H. Centre	1.00			100	93	87	75	58	52	37	18	A-6(6)	1897	10.0	78.0	49.9	9.3	21.6			
Chamwabvi H. Centre	1.00	100	97	93	84	64	59	54	45	40	56	27	A-7-6(11)	Not sampled due to pebbles			6.0	10.3			
Kapelula H. Centre	1.00			100	88	83	77	69	67	63	38	A-7-5(16)	1880	25.9	88.0	3.2	7.3	27.5			
Khola H. Centre	1.00			100	98	86	83	77	67	63	44	20	A-7-6(10)	1933	20.9	54.0	18.2	8.6	23.0		
Chulu H. Centre	1.00			99	95	74	68	62	44	31	13	A-6(2)	1952	14.5	13.0	20.3	6.9	14.2			
Lilongwe District																					
Chiwamba H. Centre	1.00			100	93	84	64	59	54	45	40	19	A-7-6(3)	1906	20.3	52.0	13.7	6.7	15.6		
Mtshela H. Centre	1.00	100	100	95	91	88	79	73	65	50	45	19	A-7-6(5)	1844	22.8	18.0	26.3	8.0	23.6		
M'bang'ombe H. Centre	1.00			100	97	90	61	56	50	41	36	23	A-7-6(3)	1874	18.9	70.0	7.5	7.4	19.7		

IN = 9.3 kg/m³



Triaxial Test Mohr Circles

Form K18M

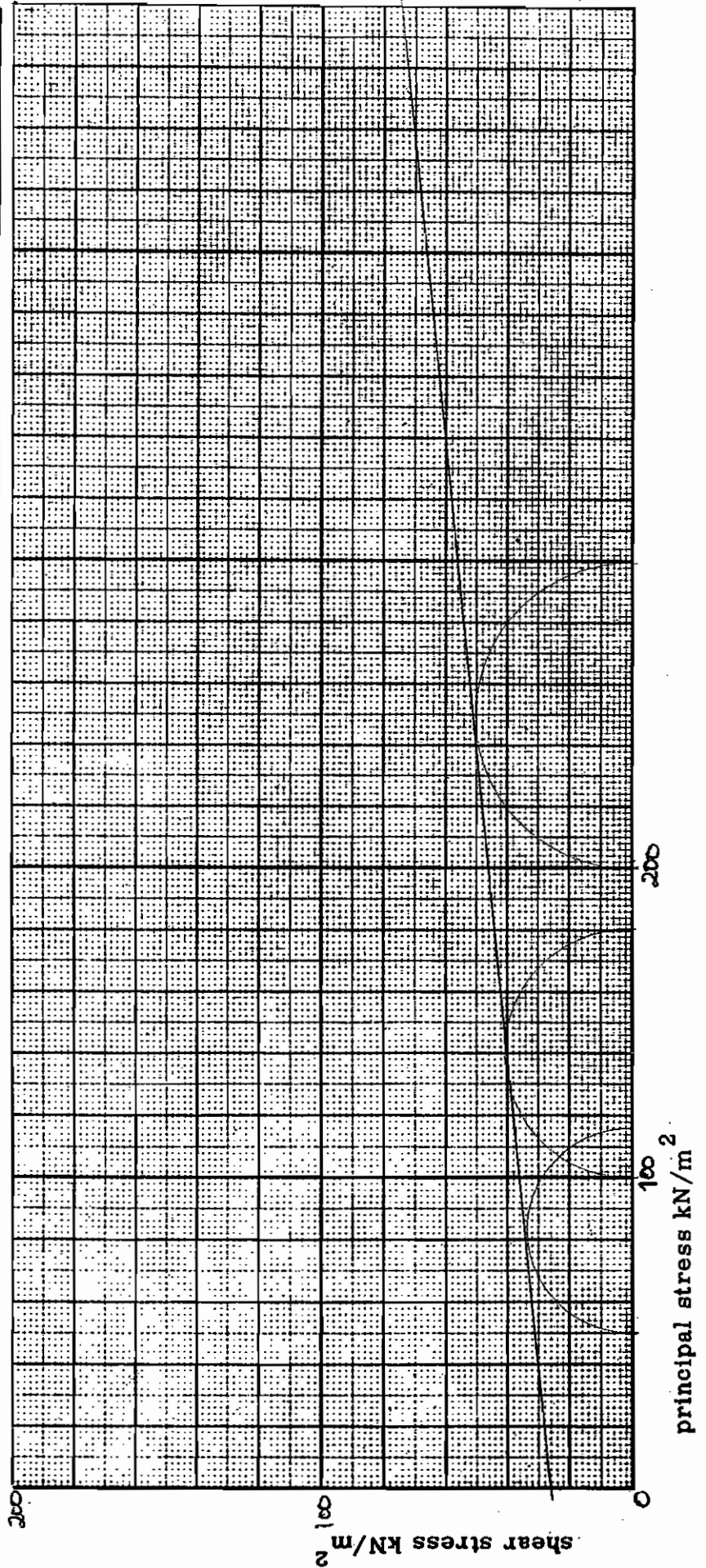
KATOWO HEALTH CENTRE

sample no.	6
Location no.	TP 1: 1.00m
date:	12/04/06

Soft yellowish grey brown sandy silty CLAY

$c = 26 \text{ kN/m}^2$
 $\phi = 6^\circ (5.8^\circ)$
 $w/c = 20.0\%$
 $B/D = 1900 \text{ kg/m}^3$

spec ident.	cell/ p_2 kN/m^2	stress kN/m^2	$q - \sigma_3$ kN/m^2	σ_3 kN/m^2	σ_1 kN/m^2
1	50	65.4	65.4	50	115.4
2	100	80.0	80.0	100	180.0
3	200	98.8	98.8	200	298.8





Triaxial Test Mohr Circles

Form K18M

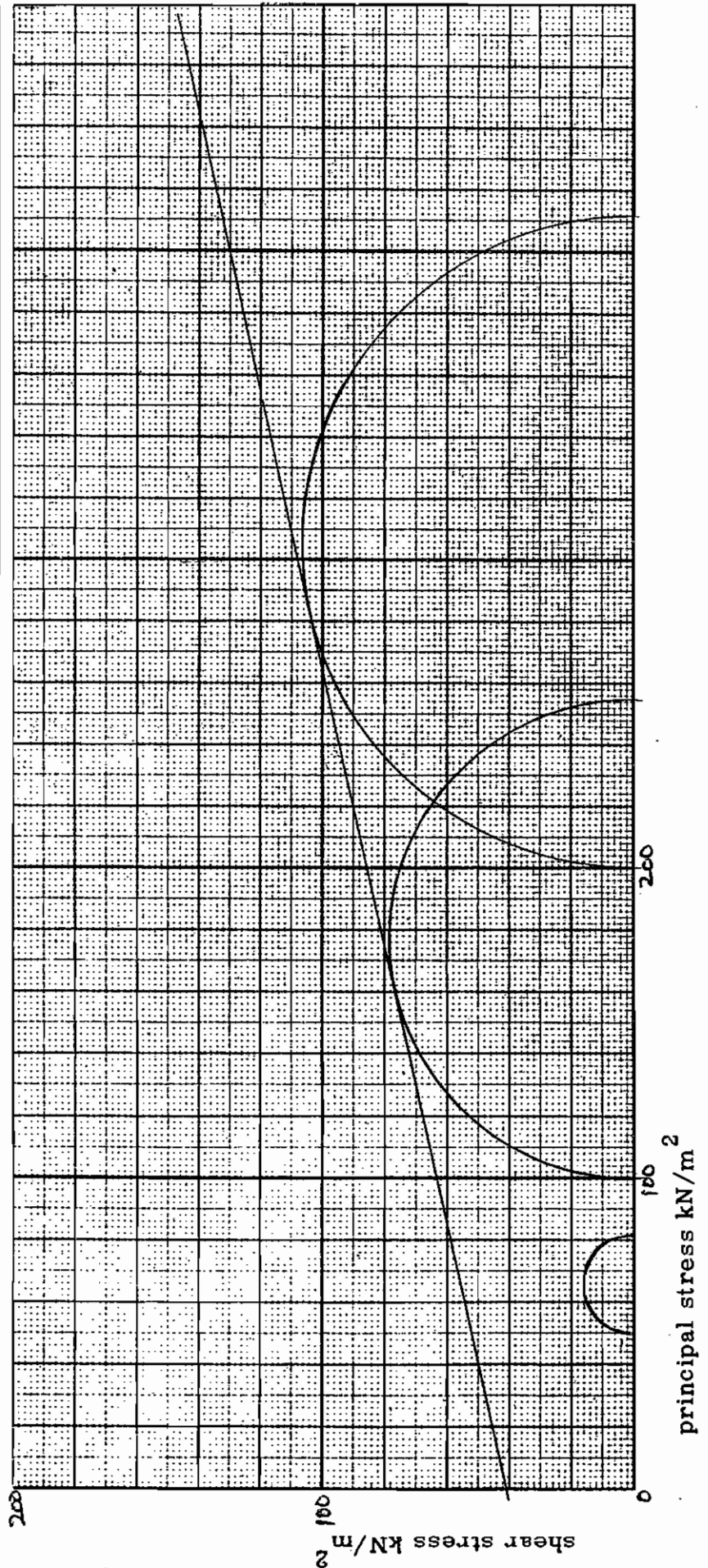
MWAZISI HEALTH CENTRE

sample no.	
Location no. TR 1 : 1.0m	
date:	12/04/06

Reddish brown Sandy Silty CLAY

$c = 41 \text{ kN/m}^2$
 $\phi = 12.5^\circ$
 $M/C = 18.8\%$
 $B/S = 1756 \text{ kg/m}^3$

spec ident.	cell/p ₂ kN/m ²	stress kN/m ²	$q - \sigma_3$ kN/m ²	σ_3 kN/m ²	σ_1 kN/m ²
1	50	30.4	30.4	50	80.4
2	100	154.7	154.7	100	254.7
3	200	212.1	212.1	200	412.1





Triaxial Test Mohr Circles

Form K18M

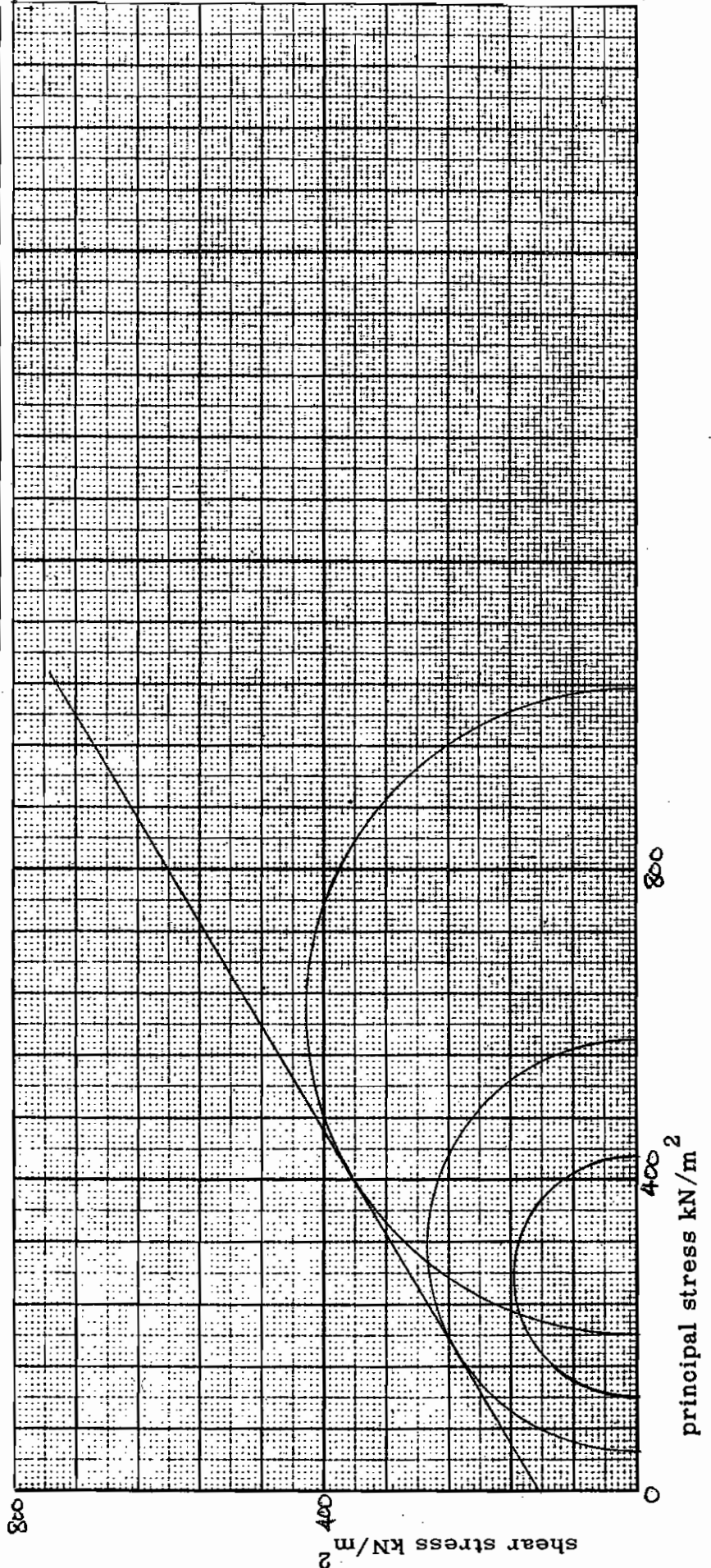
KAFUKULE HEALTH CENTRE

sample no.	
Location no.	TP 1: 1.00 m
date:	15/04/06

Yellowish brown silty sandy CLAY

$c = 122 \text{ kN/m}^2$
 $\phi = 30.8^\circ$
 $M/C = 13.9\%$
 $B/D = 2017 \text{ kg/m}^3$

spec ident.	cell/p ₂ kN/m ²	stress kN/m ²	q - q ₃ kN/m ²	σ_3 k _v /m ²	σ_1 kN/m ²
1	50	533.2	533.2	50	583.2
2	100	349.0	349.0	100	449.0
3	200	837.1	837.1	200	1037.1





Triaxial Test Mohr Circles

Form K18M

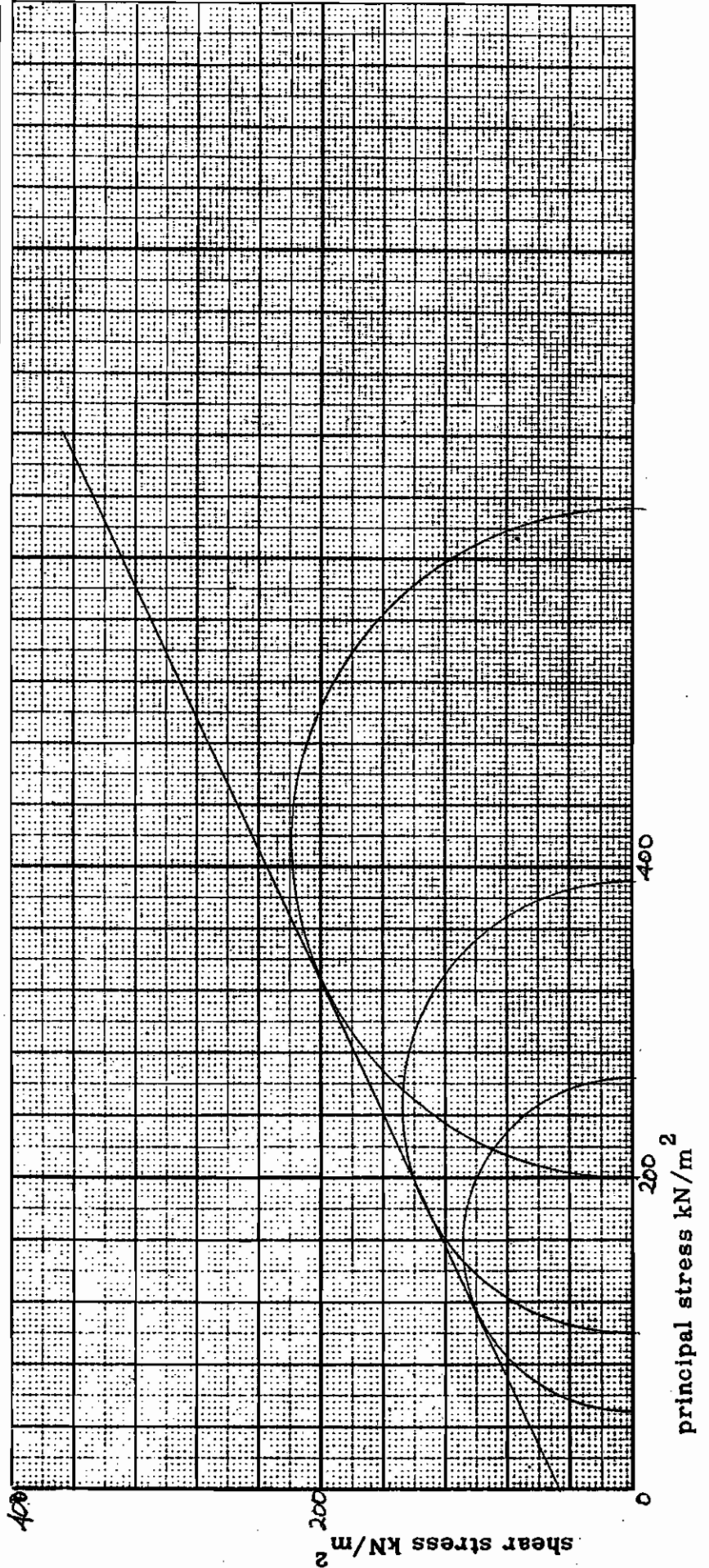
EUTHINT HEALTH CENTRE

sample no.	
Location no.	T.P. 1 : 1.0m
date:	19/04/06

stiff dark reddish brown
Sandy silty CLAY

$c = 47 \text{ kN/m}^2$
 $\phi = 25.2^\circ$
 $M/c = 19.4\%$
 $B/D = 1945 \text{ kg/m}^3$

spec ident.	cell/p kN/m^2	stress kN/m^2	$q - q_3$ kN/m^2	σ_3 kN/m^2	σ_1 kN/m^2
1	50	213.4	213.4	50	263.4
2	100	289.8	289.8	100	389.8
3	200	431.9	431.9	200	631.9





Triaxial Test Mohr Circles

Form K18M

ENDINDENI HEALTH CENTRE

sample no.	
Location no.	
date:	

Yellowish brown sandy
silty CLAY

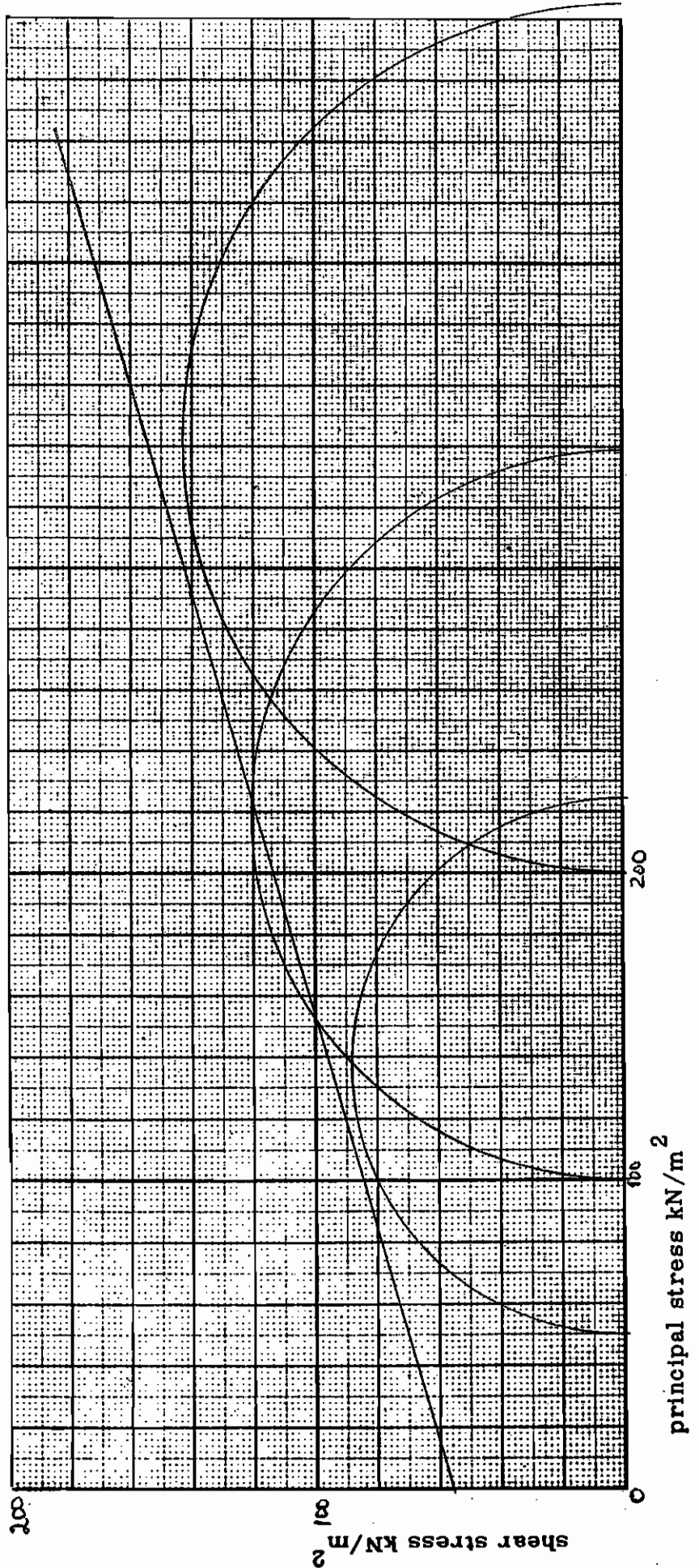
$$c = 56 \text{ kN/m}^2$$

$$\phi = 16.2^\circ$$

$$Mc = 14.0\%$$

$$B/D = 1981 \text{ kg/m}^3$$

spec ident.	cell/p ₂ kN/m ²	stress kN/m ²	q - q _s kN/m ²	σ ₃ kN/m ²	σ ₁ kN/m ²
1	50	174.7	174.7	50	224.7
2	100	238.6	238.6	100	338.6
3	200	284.8	284.8	200	484.8





Triaxial Test Mohr Circles

Form K18M

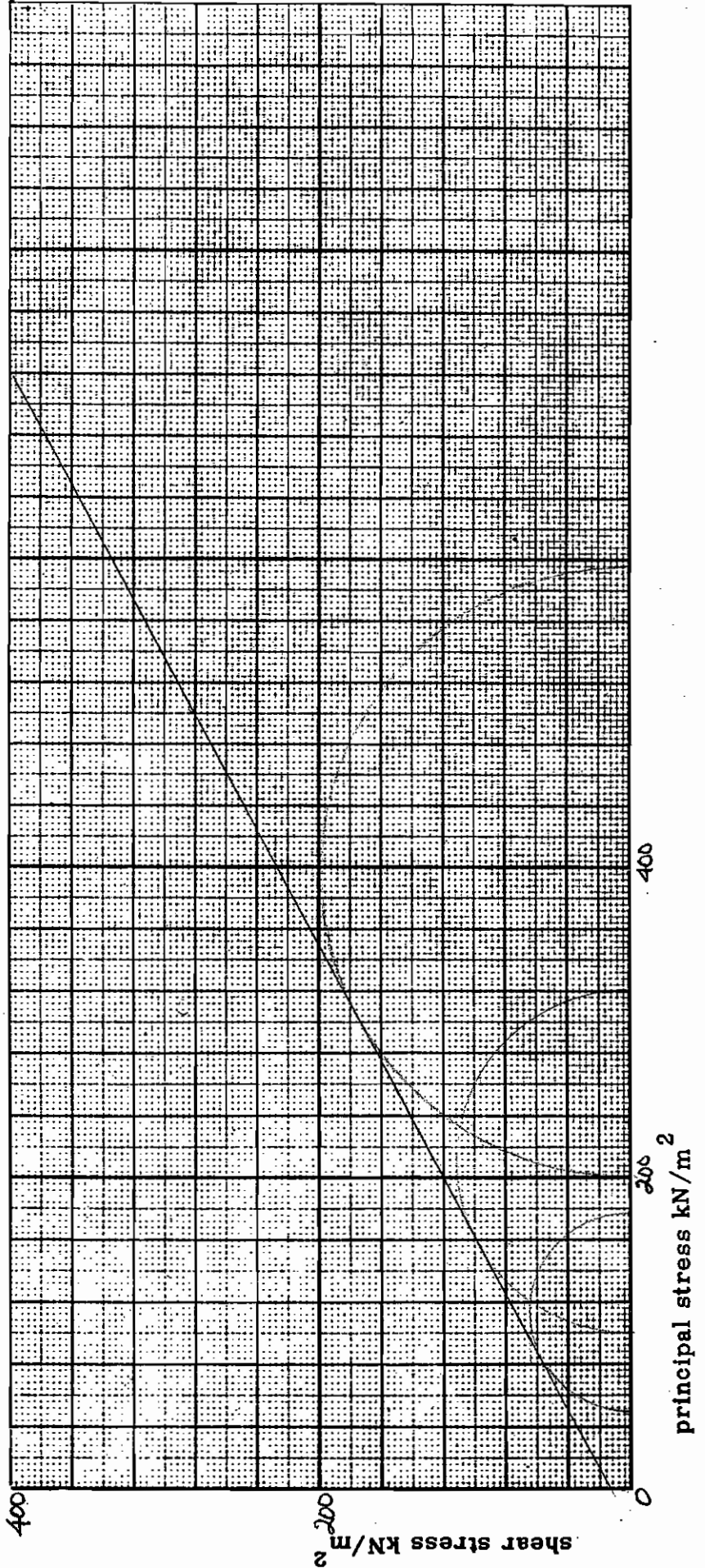
EMFENI HEALTH CENTRE

sample no.	
Location no.	TP 1: 1.0m
date:	19/04/06

Dark yellowish brown gravelly &
sandy CLAY

$C = 14 \text{ kN/m}^2$
 $\phi = 28.1^\circ$
 $M/C = 16.7\%$
 $B/D = 1951 \text{ kg/m}^3$

spec ident.	cell/p kN/m ²	stress kN/m ²	$q - q_3$ kN/m ²	σ_3 kN/m ²	σ_1 kN/m ²
1	50	126.0	126.0	50	176.0
2	100	220.1	220.1	100	320.1
3	200	394.6	394.6	200	594.6





Triaxial Test Mohr Circles

Form K18M

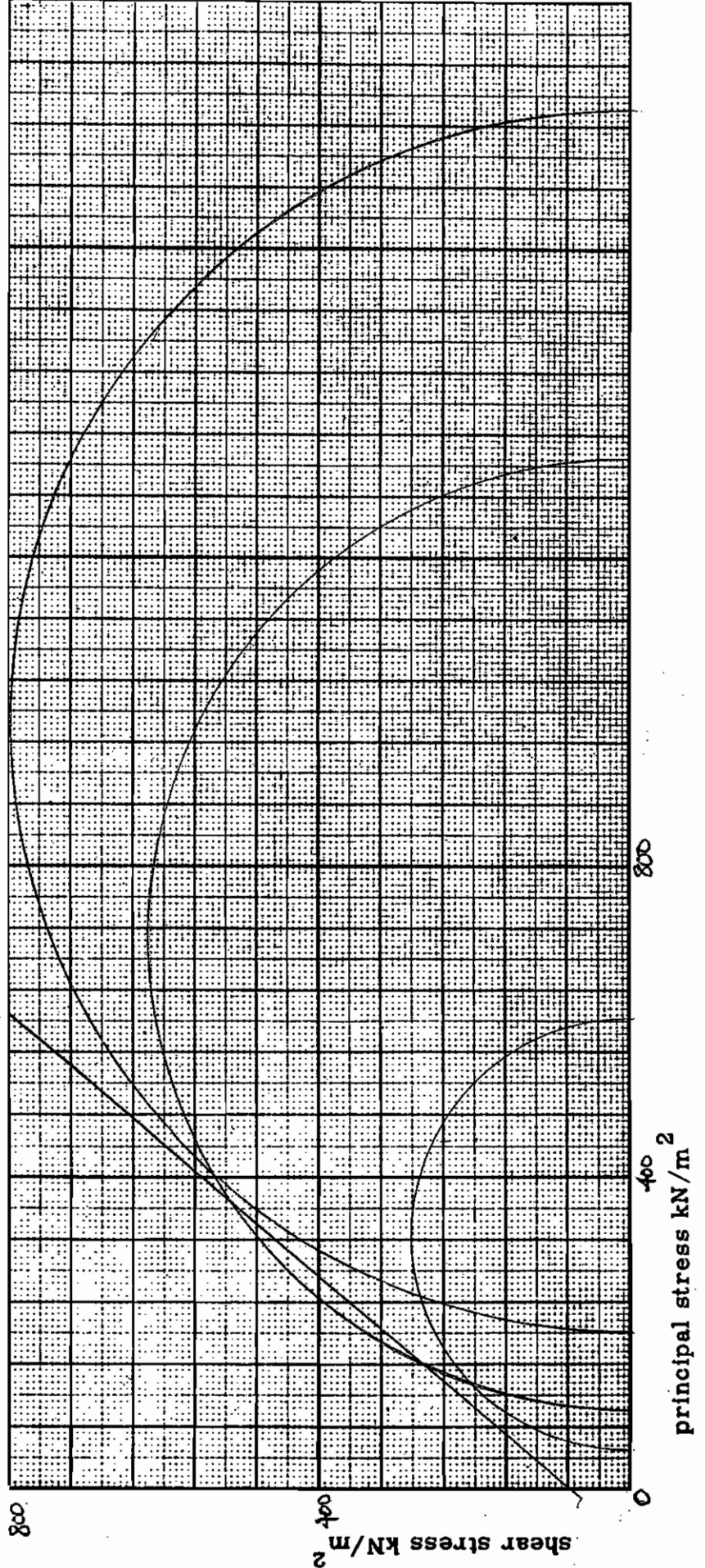
SIMLEBA HEALTH CENTRE

sample no.	
Location no. T.P.	1: 1.0m
date:	12/04/06

Stiff brown sandy CLAY with
Quartz gravel

$C = 78 \text{ kN/m}^2$
 $\phi = 49.9^\circ$
 $M/C = 10.4\%$
 $B/D = 1897 \text{ kg/m}^3$

spec ident.	cell/p kN/m^2	stress kN/m^2	$q - q_3$ kN/m^2	σ_3 kN/m^2	σ_1 kN/m^2
1	50	553.4	553.4	50	603.4
2	100	1227.0	1227.0	100	1327.0
3	200	1581.0	1581.0	200	1781.0





Triaxial Test Mohr Circles

Form K18M

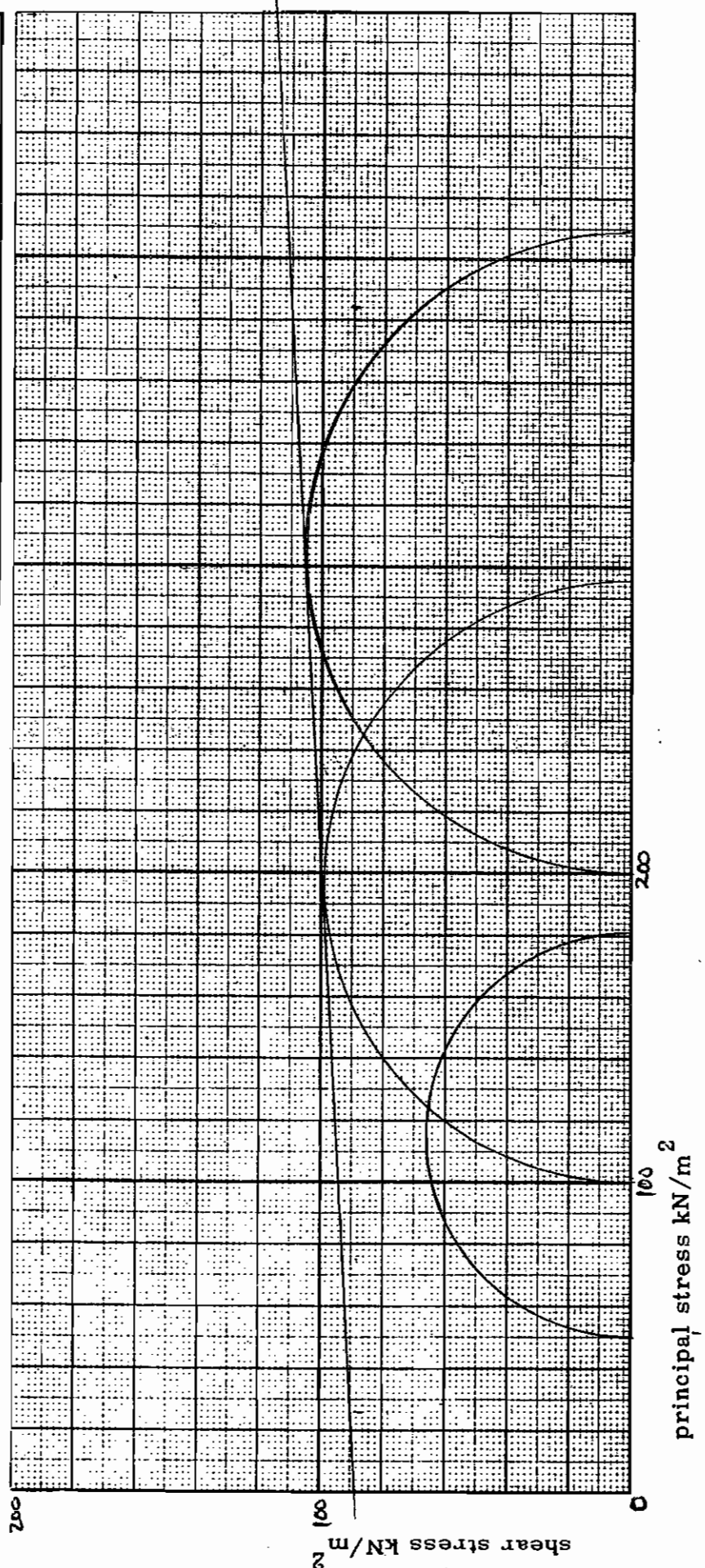
KAPELYLA HEALTH CENTRE

sample no.	
Location no. T.R. 1: 1.0m	
date: 17/04/06	

Reddish brown sandy silty CLAY

$c = 88 \text{ kN/m}^2$
 $\phi = 3.2^\circ$
 $M/C = 25.9\%$
 $B/D = 1880 \text{ kg/m}^3$

spec ident.	cell/p kN/m^2	stress kN/m^2	$q - q_0$ kN/m^2	σ_3 kN/m^2	σ_1 kN/m^2
1	50	131.5	131.5	50	181.5
2	100	195.6	195.6	100	295.6
3	200	208.6	208.6	200	408.6





Triaxial Test Mohr Circles

Form K18M

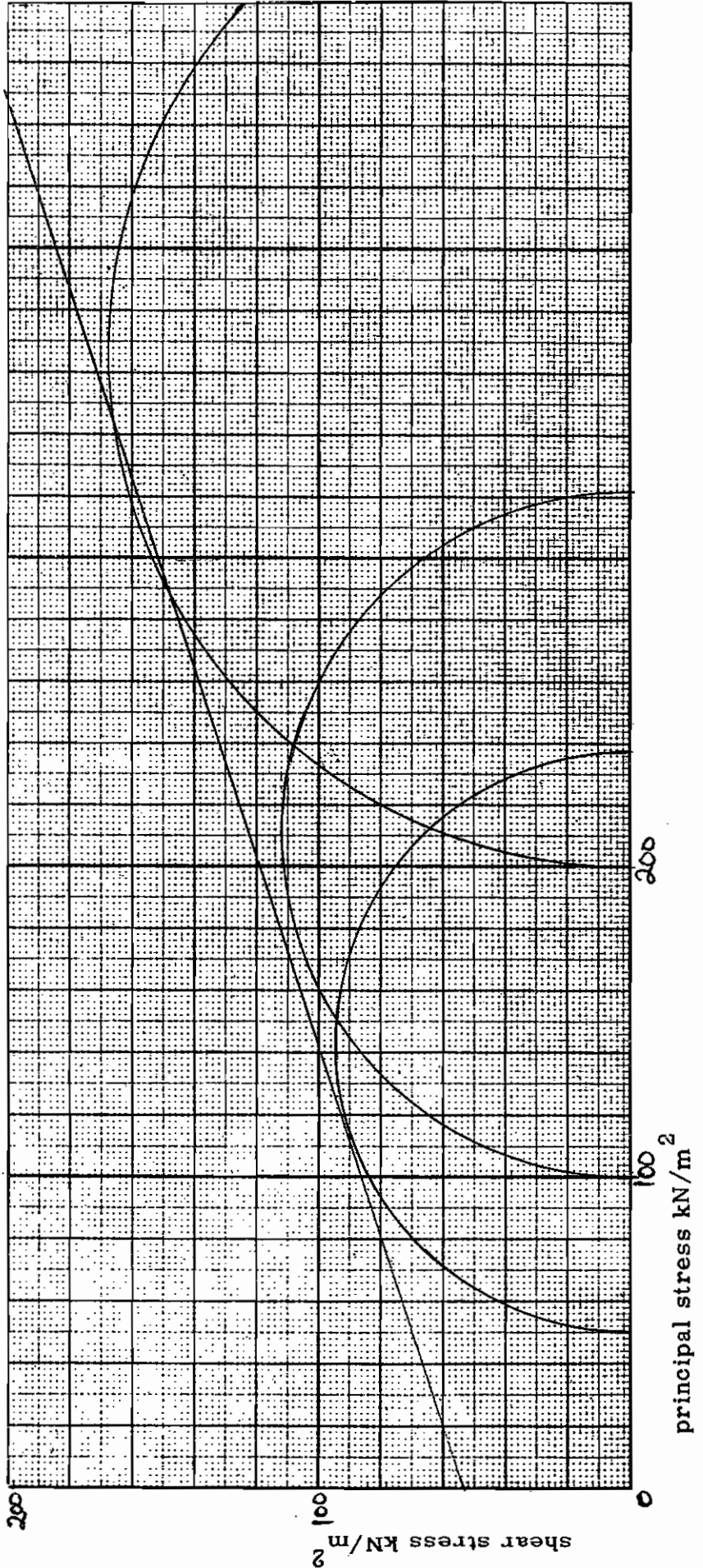
KHOLA HEALTH CENTRE

sample no.	
Location no. TP. 1 : 1.0m	
date: 13/04/06	

Dark brown sandy silty CLAY

$c = 54 \text{ kN/m}^2$
 $\phi = 18.2^\circ$
 $M/C = 20.9\%$
 $B/D = 1933 \text{ kg/m}^3$

spec ident.	cell/p ₂ kN/m ²	stress kN/m ²	$\sigma_1 - \sigma_3$ kN/m ²	σ_3 kN/m ²	σ_1 kN/m ²
1	50	187.7	187.7	50	237.7
2	100	220.6	220.6	100	320.6
3	200	333.4	333.4	200	533.4





Triaxial Test Mohr Circles

Form K18M

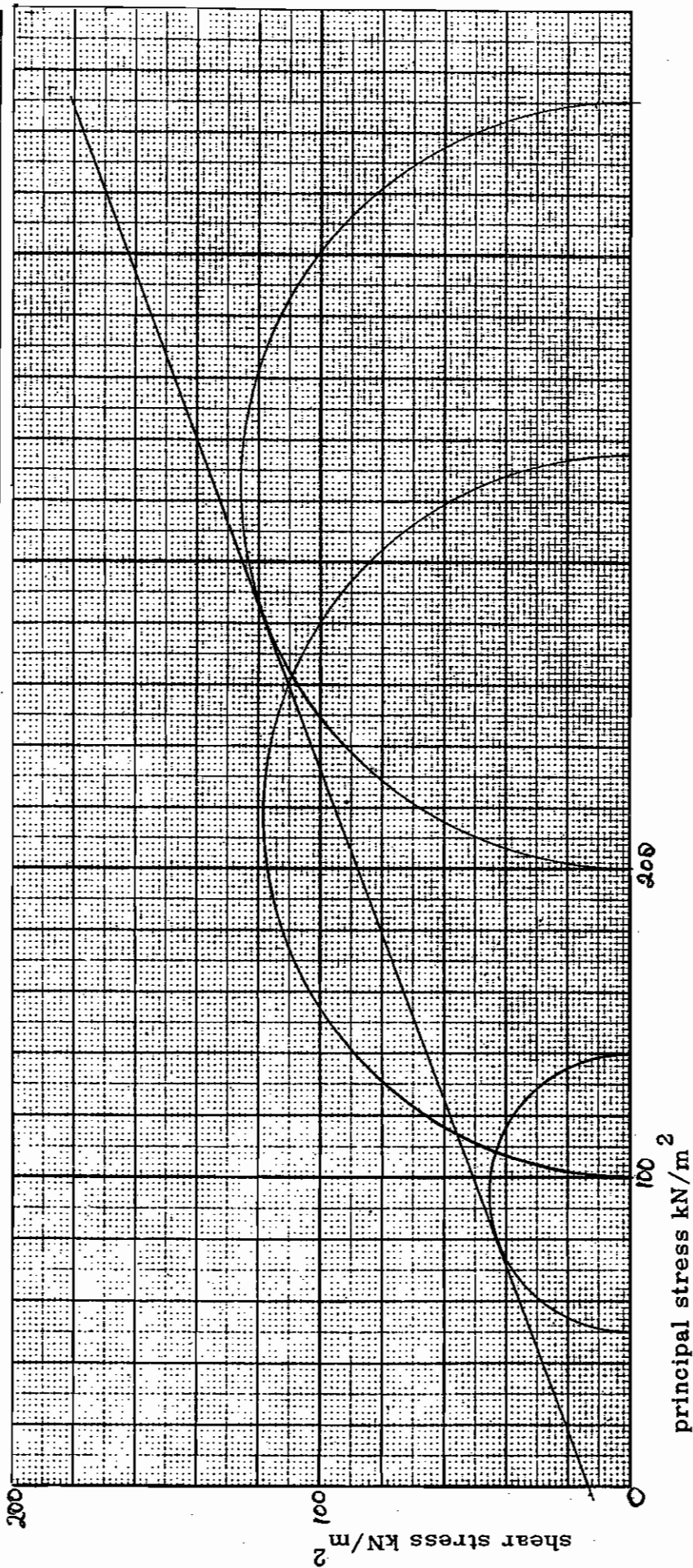
CHULY HEALTH CENTRE

sample no.	
Location no.	TP 1: 1.0m
date:	15/04/06

Dark brown Sandy silty CLAY

$c = 13 \text{ kN/m}^2$
 $\phi = 20.3^\circ$
 $M/C = 14.5\%$
 $B/D = 1952 \text{ kg/m}^3$

spec ident.	cell/ p_2 kN/m ²	stress kN/m ²	$q - q_2$ kN/m ²	σ_3 kN/m ²	σ_1 kN/m ²
1	50	90.1	90.1	50	140.1
2	100	235.6	235.6	100	335.6
3	200	250.4	250.4	200	450.4





Triaxial Test Mohr Circles

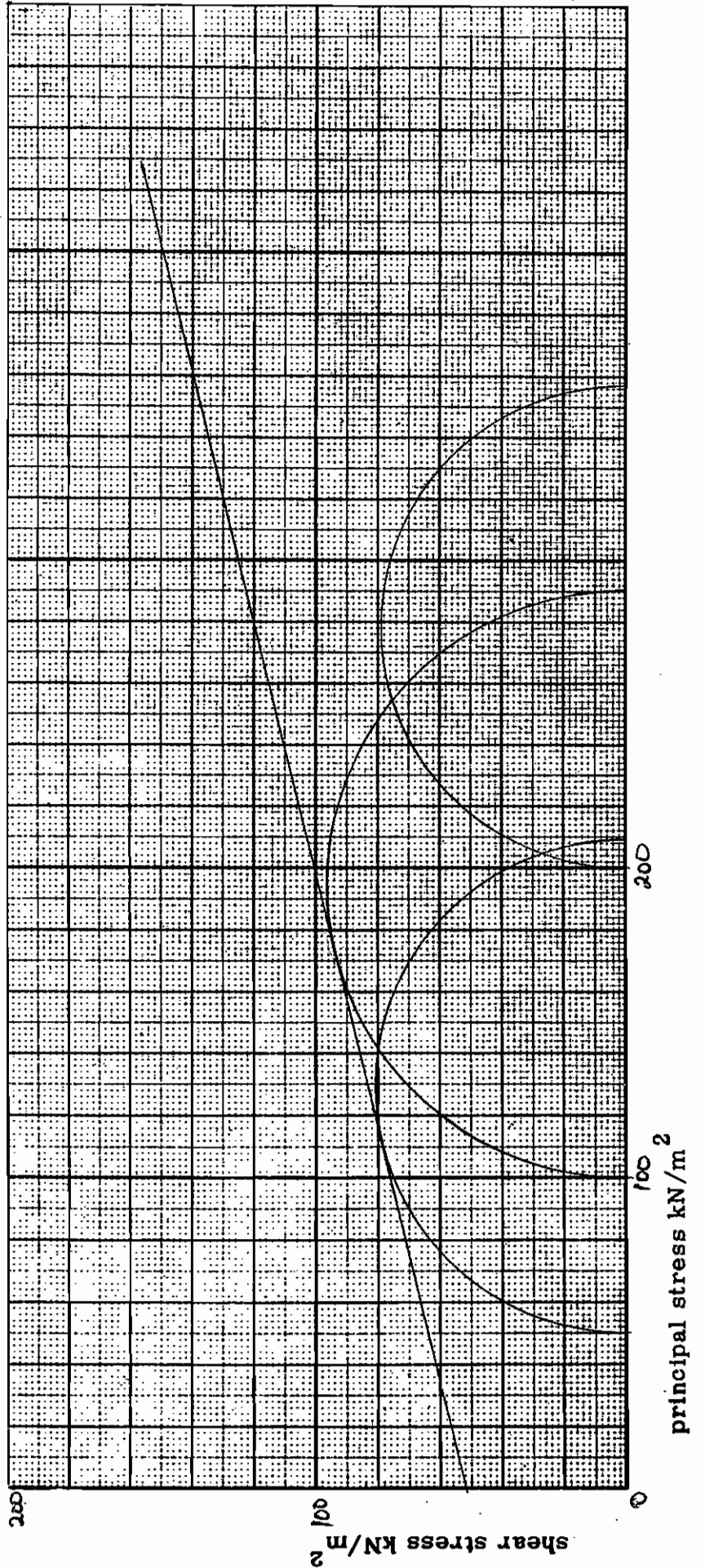
Form K18M

CHIWAMBA HEALTH CENTRE

sample no.	
Location no. TP 1: 1.0m	
date: 17/04/06	

$C = 52 \text{ kN/m}^2$
 $\phi = 13.7^\circ$
 $M/c = 20.3\%$
 $B/D = 1906 \text{ kg/m}^3$

spec ident.	cell/p kN/m^2	stress kN/m^2	$q - \sigma_3$ kN/m^2	σ_3 kN/m^2	σ_1 kN/m^2
1	50	159.5	159.5	50	209.5
2	100	189.5	189.5	100	289.5
3	200	156.5	156.5	200	356.5 356.5





Triaxial Test Mohr Circles

Form K18M

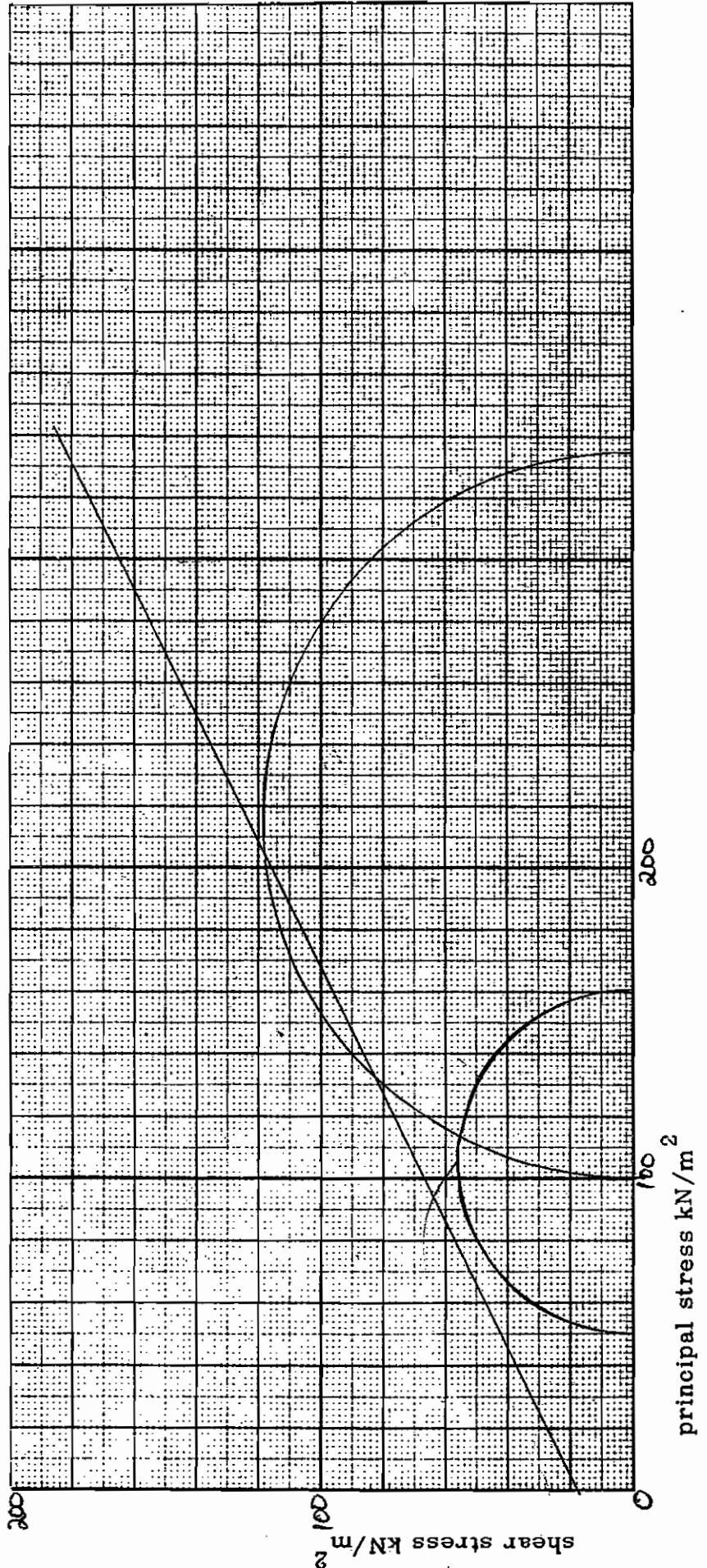
MTENTHELA HEALTH CENTRE

sample no.	
Location no.	TP 1: 1.0m
date:	19/04/06

Yellowish brown sandy silty CLAY
with lenticular gravel

$C = 18 \text{ kN/m}^2$
 $\phi = 26.3^\circ$
 $M/C = 22.8\%$
 $B/D = 1844 \text{ kg/m}^3$

spec ident.	cell/p kN/m^2	stress kN/m^2	$q - \sigma_3$ kN/m^2	σ_3 kN/m^2	σ_1 kN/m^2
1	50	110.8	110.8	50	160.8
2	100	233.9	233.9	100	333.9
3	200				





Triaxial Test Mohr Circles

Form K18M

M'BANG'DOMBE HEALTH CENTRE

sample no.	
Location no. TP 1: 1.00m	
date: 19/04/06	

Reddish brown sandy silty CLAY

$c = 70 \text{ kN/m}^2$
 $\phi = 7^\circ (7.5^\circ)$
 $w/c = 18.9\%$
 $B/D = 1874 \text{ kg/m}^3$

spec ident.	cell/ p_2 kN/m^2	stress kN/m^2	$q - q_3$ kN/m^2	σ_3 kN/m^2	σ_1 kN/m^2
1	50	169.9	169.9	50	219.9
2	100	184.6	184.6	100	284.6
3	200	213.7	213.7	200	413.7

