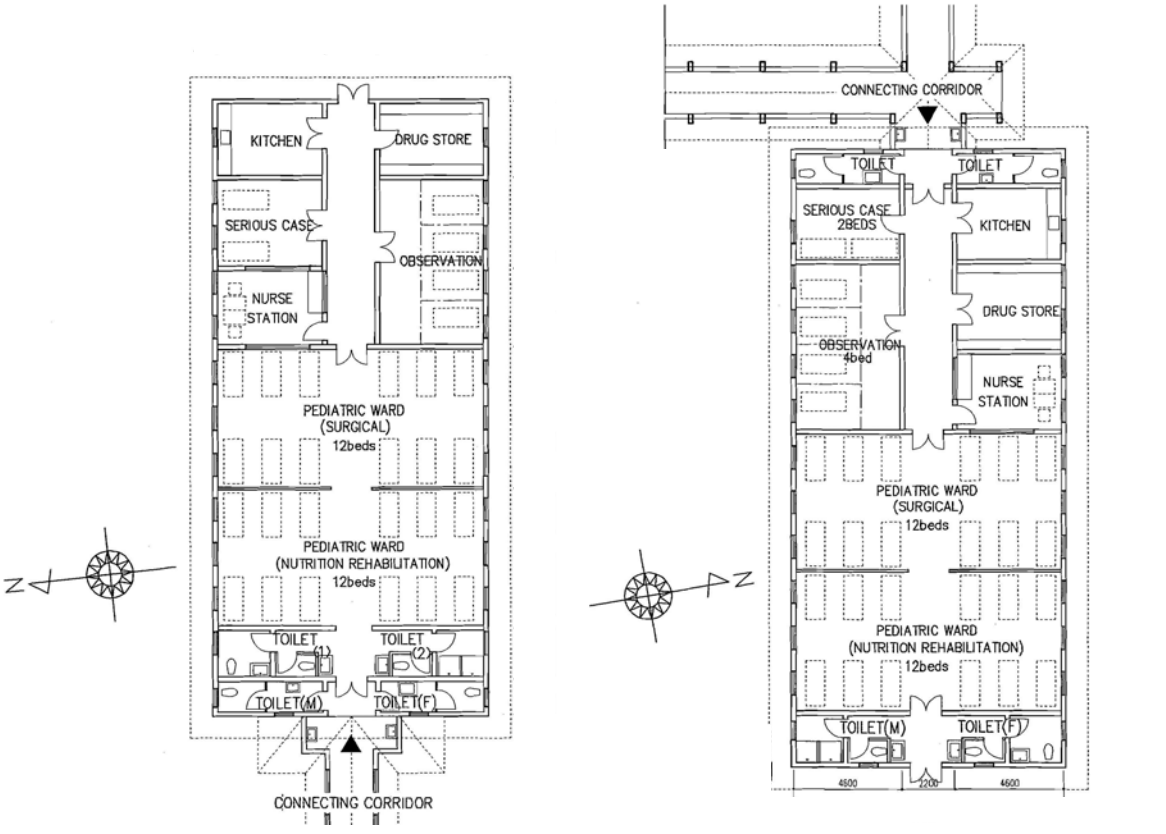
(6) Floor Plan

<District hospitals>

1) Paediatric department (298.68 m^2)

With a view to limiting the burden placed on medical and nursing staff, patients that require relatively light nursing shall be concentrated into new wards. The paediatric wards at Rumphi and Mzimba District Hospitals shall be designed as wards for non-infectious patients containing beds for children with nutritional disorders, beds for surgical patients and post-surgical observation beds, and they shall have the nurse station as the focal point. Moreover, since nutritional improvement of children with nutritional disorders and nutritional guidance for mothers of such children are a priority EHP area, kitchens shall be installed to provide cooking guidance to mothers.



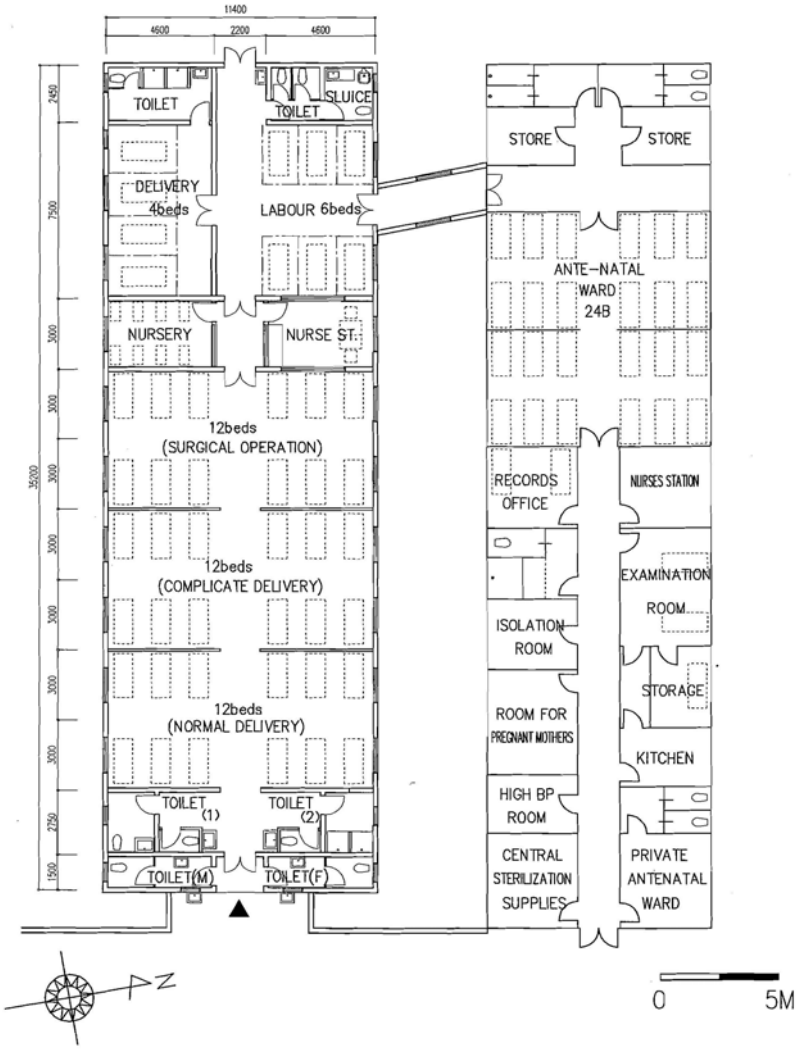
Mzimba District Hospital Paediatric Ward Rumphi District Hospital Paediatric Ward

Figure 2-7 Floor Plan of the District Hospital Paediatric Ward

2) Maternity Ward (401.28 m^2)

Concerning the maternity ward at Rumphi District Hospital, the existing ward shall be used for ante-natal pregnant women, while the new ward shall consist of a delivery room and labour

room (which had been lacking until now) as well as a room for post-natal mothers. Concerning layout, beds shall be located around the nursing station in the order of nursing necessity, i.e. beds for pregnant women undergoing obstetric procedure, beds for pregnant women having abnormal deliveries, and beds for pregnant women having normal deliveries. The nursery shall also be placed close to the nurse station to enable priority care. In addition, it is planned to install toilets and showers for pregnant women in the labour/deliver room as well as toilets and showers for general patients and for visitors and attendant family and friends. The new ward shall be connected to the existing ward with a connecting corridor in order to quickly move women in labour to the deliver room.



Extension to Rumphi District Hospital Maternity Ward

Proposed Renovation of the Existing Maternity Ward

Figure 2-8 Floor Plan of Rumphi District Hospital Maternity Ward

3) Health centres

As is shown in Table 2-3, because the contents of the medical care setup and medical service are the same at the 14 target facilities (7 Dispensaries and 7 Maternity), the Dispensaries and Maternity shall be planned on the same level.

The Ministry of Transport and Public Works Building Department approves the health centre standard drawings prepared by international aid agencies on behalf of the Ministry of Health. In the Project, out of the standard drawings that have been approved by the Ministry of Construction and Transport Building Department, the 1981 drawing for integrated outpatient dispensary and maternity ward and the 1993 drawing for detached outpatient dispensary and maternity ward shall be adopted as the floor plans for supporting EHP activities upon referring to drawings that approximate the planned scale of facilities.

The scheduled health centre construction sites are located in areas not covered by public water supply plans. Accordingly, there shall be no lying of water supply pipes and toilets shall not be installed inside the facilities. Instead, the existing outdoor toilets shall be utilized.

① Health Centre Dispensary

According to the floor plan for the health centre Dispensary, a family planning room, examination room, treatment room, and bandage and plaster room shall be installed at the top as the treatment section. Doors shall be provided to enable direct access from the examination room to the treatment room and bandage and plaster room. On the lower part of the plan, two referral waiting rooms, an office and reception area and a waiting area shall be provided. Two referral waiting rooms are planned in response to a request for greater privacy between the sexes. The entrance to the VCT consultation room and VCT waiting room shall be separate from that for general patients in order to ensure the privacy of HIV/AIDS patients. In addition, a medicine store and storeroom shall be provided. When there are no patients, it shall be possible to use the referral waiting room for EHP medical activities by part-time medical staff dispatched from district hospitals.

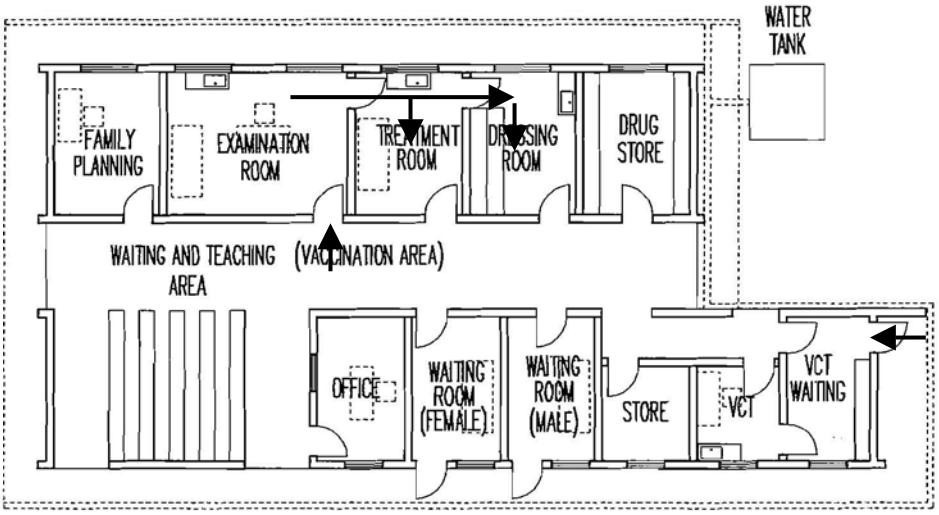


Figure 2-9 Health Centre Dispensary Floor Plans

② Health Centre Maternity

According to the floor plan for the health centre maternity ward, a post-natal room (4 beds), ante-natal room (4 beds), labour and delivery room (1 labour bed and 1 delivery table) as well as toilets and showers for patients shall be provided at the top. On the lower part of the plan, an office and reception area mainly for ante-natal examinations, examination room, registered midwife's room, referral waiting room and medicine store shall be located. The VCT consultation room and VCT waiting room shall have a separate entrance from that for general patients in order to ensure the privacy of HIV/AIDS patients. Since the target health centres do not have public water supply, there can be no piped water supply; accordingly, buckets shall be placed in the shower booths for scooping up water. The labour and delivery room require toilets, so portable toilets shall be carried to the shower booths and used as required. Concerning placenta pits, existing ones shall be used where they already exist, however, in cases where maternity wards are newly constructed under the Project, pits shall be constructed where no such facilities already exist.

In consideration of the above examination, the scale of each hospital facility shall be as follows.

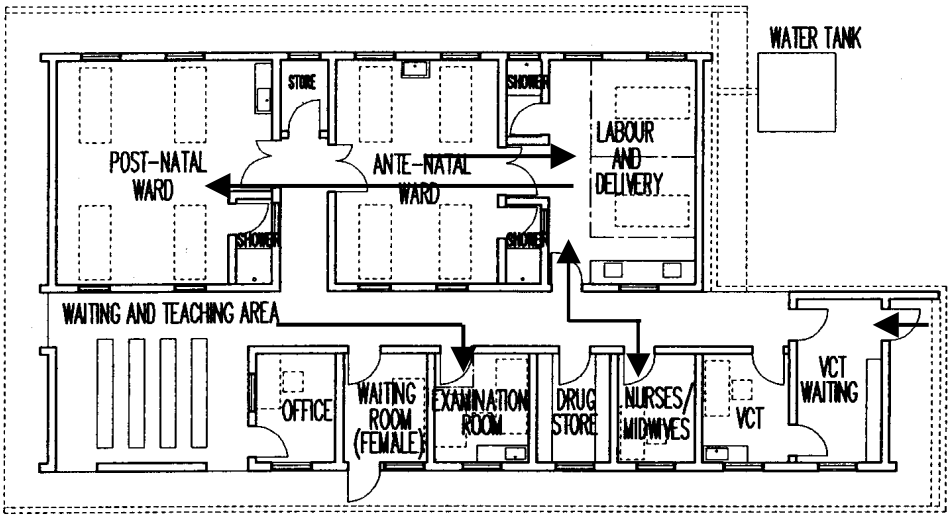


Figure 2-10 HC Maternity Ward Floor Plans

Table 2-17 summarizes the room areas contained in the above plans.

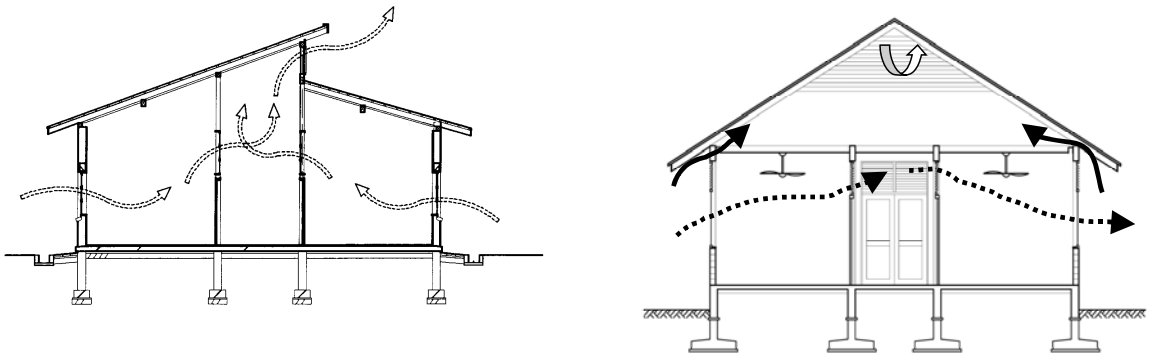
Table 2-24 Total Floor Area of Targeted Facilities (m²)

Hospital Name	Facilities	Total Floor Area (㎡)
Rumphi DH	Paediatric Ward 1 unit	298.69
	Roofed Corridor	89.36
	Maternity Ward 1 unit	401.28
	Roofed Corridor	19.67
Mzimba DH	Paediatric Ward 1 unit	298.69
	Roofed Corridor	39.22
	Sub-total	1,146.91
Health centre	Maternity (194.3 ㎡) 7 units	1,360.59
	Dispensary (197.7 ㎡) 7 units	1,383.90
	Sub-total	2,744.49
	Grand total	3,891.40

(2) Section Plan

The target areas have a rainy season, when both temperature and humidity are high, and a dry season, when winds are strong and temperatures are relatively low.

At district hospital maternity wards and paediatric wards, the local standard ceiling height of 3.1 m shall be adopted and natural ventilation combined with ceiling fan ventilation shall be adopted in general rooms.



Health centre　　District Hospital

Fig. 2-11 Section Plan

Sloped roofs are the common type in the local area, and the air volume in attics is used to prevent temperatures from increasing inside rooms. In order to ensure harmonization with the surrounding landscape and realize heat insulation, hipped roofs shall be adopted, and asphalt permeable natural fibre shall be used as the roof material.

Many of the existing health centres have ceilings, however, bats infiltrate the attic areas and the smell of their excrement pervades facilities. Accordingly, ceilings shall not be installed in the Project health centres. Asphalt permeable natural fibre, which has heat insulation performance and is used in district hospitals, shall be adopted and ply board shall be used as dressing roof sheathing board with paint finish. Perforated blocks shall be piled at the top of outer walls on the gable side in order to secure natural ventilation.

2-2-2-5 Structural Plan

(1) Design policy

Malawi has the Rule of Construction, 1990 issued by the Ministry of Transport and Public Works (MCTPC), however, there is no system of structural design criteria. Generally speaking, when facilities are constructed under assistance, either the structural design criteria of donor nations or standards used by the education agencies where designers learned their trade are followed. In the Project, British Standard (BS), which is commonly adopted locally, shall be applied to design of concrete and wind loads, while Japanese standards (JIS) shall be applied to calculation of concrete blocks, ground bearing force and timber.

- Reinforced concrete construction standard: British Standard
- Roof structure of wooden school buildings: wood structural design criteria and commentary (Architectural Institute of Japan)
- Safety factor in foundation design; Building foundations structural design criteria
- Concrete block provisions: reinforced concrete block structure design criteria and commentary (Architectural Institute of Japan)

(2) Setting of general conditions

Wind force : Strong winds blow immediately before rainfall. Standard wind velocity of 40 m/sec is adopted in local structural calculations.

Earthquake : Earthquakes hardly ever occur in Malawi and, since no accurate seismic records exist anyway, seismic force is not considered in structural calculations.

Salt damage : Salt damage countermeasures are uncommon and there are no reports of such damage occurring. Accordingly, countermeasures shall be limited to measurements during the works.

(3) Examination of seismic force

A local contractor was consigned to implement boring surveys and standard penetration tests at Rumphi and Mzimba District Hospitals as well as Atterberg testing, triaxial compression testing and consolidation settlement testing in the laboratory. At the health centre scheduled construction sites, trial boring (GL -.10m) was carried out and soil samples taken from the excavation bottom were analysed in triaxial compression testing. The following results were obtained.

Table 2-25 Results of Soil Survey and Test

Source	Depth (m)	Atterberg Limits		Classification	Test Triaxial/Box Shear			Shrinkage	NMC (%)
					Bulk Density	M/C	C		
		L.L.	P.I.		Kg/m^3	%	kN/m^2		
Rumphi District									
Katowo Rural Hospital	1.00	42	21	A-7-6 (9)	1900	20.0	26.0	7.3	20.1
Mwazisi H. Centre	1.00	45	22	A-7-6 (11)	1756	18.4	41.0	7.2	20.5
Mzimba District									
Kafukule H. Centre	1.00	48	23	A-7-6 (11)	2017	13.9	122.0	6.7	13.6
Euthini Rural Hospital	1.00	44	21	A-7-6 (10)	1945	19.4	47.0	6.8	21.9
Endindeni H. Centre	1.00	39	18	A-6 (4)	1981	14.0	56.0	6.6	13.4
Emfeni H. Centre	1.00	46	22	A-7-6 (4)	1951	16.7	14.0	9.2	15.9
Kasungu District									
Simlemba H. Centre	1.00	37	18	A-6 (6)	1897	10.0	78.0	9.3	21.6
Chamwabvi Dispensary	1.00	56	27	A-7-6 (11)	Not sampled due to pebbles			6.0	10.3
Kapelula H. Centre	1.00	63	38	A-7-5 (16)	1880	25.9	88.0	7.3	27.5
Khola H. Centre	1.00	44	20	A-7-6 (10)	1933	20.9	54.0	8.6	23.0
Chulu H. Centre	1.00	31	13	A-6 (2)	1952	14.5	13.0	6.9	14.2
Lilongwe District									
Chiwamba H. Centre	1.00	42	19	A-7-6 (3)	1906	20.3	52.0	6.7	15.6
Mtenthela H. Centre	1.00	43	19	A-7-6 (5)	1844	22.8	18.0	8.0	23.6
M'bang'ombe H. Centre	1.00	49	23	A-7-6 (3)	1874	18.9	70.0	7.4	19.7

Source: Bearing Test Report

Based on these survey findings, spread foundations (continuous footing) shall be adopted in the Project facilities and the size of foundations shall be calculated from the weight supported by walls. The following table shows bearing force values (kN/m^2) obtained from the standard penetration testing and triaxial compression testing of soil samples obtained in the excavation survey.

Table 2-26 Results of Soil Bearing Test

Site		Bearing Ground Level	Mature of Bearing Ground	Design Bearing Capacity (kN/m^2)
1.	Rumphi DH	GL-1.81m	Sandy Silt Clay	80
2.	Katowo Rural Hospital	GL-1.21m	Sandy Silt Clay	50
3.	Mwazisi H. Centre	GL-1.21m	Sandy Silt Clay	50
4.	Mzimba District	GL-2.31m	Sandy Silt Clay	50
5.	Kafukule H. Centre	GL-1.21m	Sandy Silt Clay	100
6.	Euthini Rural Hospital	GL-1.21m	Sandy Silt Clay	50
7.	Endindeni H. Centre	GL-1.21m	Sandy Clay	100
8.	Emfeni H. Centre	GL-1.21m	Sandy Clay	100
9.	Simlemba H. Centre	GL-1.21m	Sandy Clay	100
10.	Chamwabvi Dispensary	GL-1.21m	Sandy Silt Clay	50
11.	Kapelula H. Centre	GL-1.21m	Sandy Silt Clay	100
12.	Khola H. Centre	GL-1.21m	Sandy Silt Clay	50
13.	Chulu H. Centre	GL-1.21m	Sandy Silt Clay	100
14.	Chiwamba H. Centre	GL-1.21m	Sandy Silt Clay	50
15.	Mtethela H. Centre	GL-1.21m	Sandy Silt Clay	100
16.	M'bang'ombe H. Centre	GL-1.21m	Sandy Silt Clay	100

Notes: GL: Ground Level

These findings show that bearing force of between 50~100 kN/m2 is obtained and, judging from the scale of the facilities, spread foundations are appropriate in all cases. Continuous footing shall be adopted as a precaution against uneven subsidence, and concrete slabs on earth floors shall be used to directly translate floor load to the ground.

(4) Frame plan and design load

Concerning the frame plan, reinforced concrete bock structures shall be adopted from the viewpoint of protecting the natural environment. Concrete blocks shall also be used for partition walls. In the Project, structural modules shall be prepared as much as possible with a view to realizing stable and economic structural plans. The following fixed load and live load values shall be adopted and standard wind load shall be set at 40 m/s.

Table 2-27 Design Load (N/m2)

	Fixed Load	Live Load	Sub-total
Common Rooms	4,200	2,000	6,200
Corridor	4,200	2,000	6,200
Waiting Hall	4,200	2,000	6,200
Roof	300	1,000	1,300

Structural materials shall be selected with priority given to locally procurable items.

Table 2-28 Specification of Structural Materials

Member	Specifications
Standard Design Strength	25 N/mm^2
Cement	Ordinary Portland Cement
Ad-mixture	Not using for site mixture
Course Aggregate	Crushed Stones
Fine Aggregate	Liver Sand, Pit Sand
Steel Bars（Decorative）	D-10～D-16
Steel	BS4360: Grade-43 (equivalent)
Bolts & Nuts	BS4604: Grade 8.8 General Grade (equivalent)
Wood	Glued Laminated Wood: BS1204/WBP(equivalent)
Concrete Block	JISA5406 (equivalent)

2-2-2-6 Mechanical & Electrical Plan

(1) Basic policy

The equipment plan shall be compiled according to the following policy.

<District Hospitals>

① In addition to power supply to lighting fixtures and ceiling fans, install sockets for supplying power to medical equipment in the maternity wards and paediatric wards.

② Since the sites will be integrated with existing facilities, take the capacity of equipment in existing parts into account in the design.

③ Adopt equipment and instruments with simple specifications to make maintenance work easier, and select local standard instruments for which it is easy to obtain replacement parts.

④ Concerning equipment design, since Malawi has no national standards, the British Standard shall be adopted regarding calculation of sewage tank capacity, piping and fixtures, etc.

⑤ In order to mitigate operating expenses and lighting and heating costs, plan for the minimum required equipment capacity.

⑥ Construct sewage tanks for each building so that independent treatment can be conducted for each.

⑦ Lightning conductors shall not be installed because buildings are single story and there is no legal requirement.

<Health Centres>

① Because none of the target health centres have power supply, do not install any electric equipment operated on mains power. In labour and delivery rooms, install solar power-generated lights in the equipment works.

② None of the target health centres receive public water supply. Accordingly, troughs and water tanks shall be installed on building roofs in order to collect and utilize rainwater.

③ The site surveys found that flush toilets couldn't be used even if they were installed due to the lack of water supply. Accordingly, existing outside toilets shall be used and toilet facilities shall not be included in the Project.

④ Washbasins and sinks shall be installed in the necessary rooms, and used water shall be drained to outdoor rainwater pits through pipes.

⑤ Lightning conductors shall not be installed because buildings are single story and there is no legal requirement.

(2) Plumbing equipment

① Water supply equipment

<District Hospitals>

Rumphi District Hospital is able to receive water via the public water supply throughout the year. Since adequate water pressure can be obtained from the water source, water is directly stored in an elevated water tank and supplied to each facility via a gravity system. Following the completion of extension works, it is scheduled for the existing maternity ward to be renovated into an ante-natal ward, but there will no change in the water supply flow.

It is planned to increase the number of beds in the new maternity ward (36 beds) and paediatric ward (24 beds) by 60. The necessary water supply is calculated as 33,000 litres/day (around 30% of the Japanese standard) as shown below, and it is planned for the wards to receive water supply from the existing elevated water tank.

Increase in water supply: 60 beds x 550 l/bed/day = 33,000 l/day

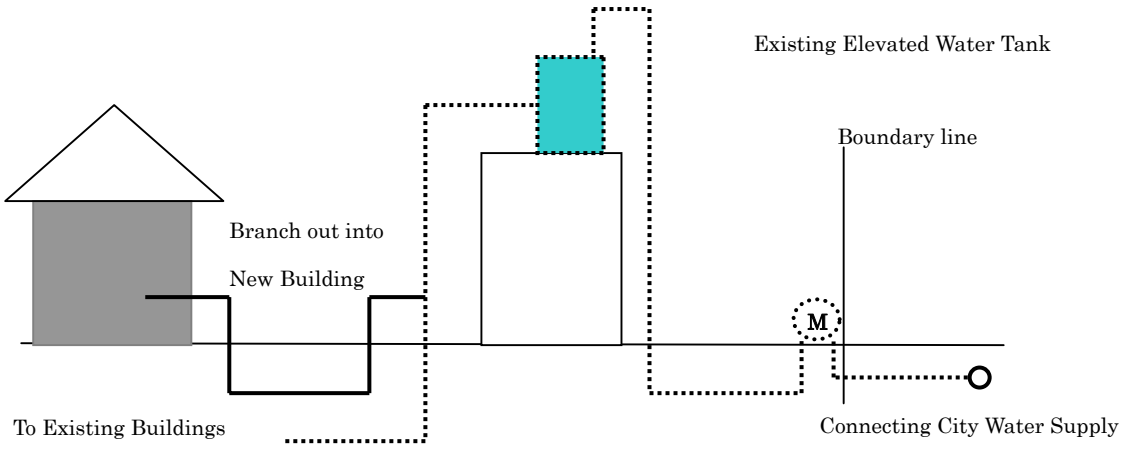


Figure 2-12 Water Supply System

Mzimba District Hospital also receives water from the public water supply, however, the supply flow drops in the dry season, while during drought times, the hospital purchases water from a water tank truck and holds it in an elevated water tank. It is planned to add 24 beds to the paediatric ward and the necessary water supply is calculated as 13,200 l/day (around 30% of the Japanese standard), and it is planned for the wards to receive water supply from the existing elevated water tank.

Increase in water supply: 24 beds x 550 l/bed/day = 13,200 l/day

<Health Centres>

Only one of the target health centres is connected to the public water supply, while all the others obtain water by bucket from their own wells or community wells. Upon surveying rainfall data for the past six years from the Meteorological Agency, it was found that mean rainfall over the past six years has been 635 mm in Rumphi, 902 mm in Mzimba, 800 mm in Kasungu and 842 mm in Lilongwe, and rainfall is concentrated into the rainy season that lasts for six months from October to April. Accordingly, in order to mitigate the water drawing effort, rain that falls on the 228 m2 outpatient dispensary roof and the 225 m^2 maternity ward building roof shall be collected in troughs and held in receiving tanks for use inside the facilities.

Table 2-29 Existing Water Resources of Planned Facilities

	No.	Planned Facilities	Existing Sources	
			Existing Well	District Water Supply
①	R DH	Rumphi DH	N/A	Yes
②	RHC-1	Katowo Rural Hospital	Yes	N/A
③	RHC-3	Mwazisi H. Centre	Yes	N/A
④	MDH	Mzimba District		Yes* (Non water at dry season)
⑤	MHC-4	Kafukule H. Centre	Yes	Yes
⑥	MHC-6	Euthini H. Centre	Yes	N/A
⑦	MHC-9	Endindeni H. Centre	Yes	N/A
⑧	MHC-12	Emfeni H. Centre	Yes	Yes
⑨	KHC-1	Simlemba H. Centre	Yes	N/A
⑩	KHC-3	Chamwabvi Dispensary	Yes	N/A
⑪	KHC-8	Kapelula H. Centre	Yes	N/A
⑫	KHC-10	Khola H. Centre	Yes	N/A
⑬	KHC-11	Chulu H. Centre	Yes	N/A
⑭	LHC-1	Chiwamba H. Centre	Yes	N/A
⑮	LHC-2	Mtethela H. Centre	Yes	N/A
⑯	LHC-3	M'bang'ombe H. Centre	Yes	N/A

Source: Survey Result

② Drainage equipment

<District Hospitals>

Since there are no public sewerage facilities on the district hospital level, sanitary sewage and miscellaneous wastewater are jointly treated in digestion tanks and treated effluent is percolated into the ground via infiltration storm water inlets. In the Project too, the combination of (septic tank + treatment tank) and (infiltration inlet) shall be

adopted according to design standard drawings of the Malawi Ministry of Public Works (the present Ministry of Transport and Public Works). The calculation method given in the BS (CP 302 100) shall be adopted regarding the number of people served by the system.

Digestion tank capacity : C = 135 x N + 1800 [L]
Maternity ward : 36 beds x 2.5 = 90 → 105 (Employees + safety factor)
C = 15,975 L
Paediatric ward : 24 beds x 2 = 40 → 65 (Employees + safety factor)
C = 10,575 L

Table 2-30 Treatment Capacity of Septic Tank

Capacity	Treatment Tank 1 (m^3)	Treatment Tank 2 (m^3)
Rumphi District Hospital		
Maternity Ward: 105 persons	10.5	5.325
Paediatric Ward: 65 persons	7.05	3.525
Mzimba District Hospital		
Paediatric Ward: 65 persons	7.05	3.525

<Health Centres>

Many of the existing health centres targeted in the Project have water supply pipes and flush toilets installed inside and digestion tanks outside, however, in the site surveys it was found that toilets are not used throughout the year because there is no public water supply. Moreover, since there are no plans to supply water to surrounding areas, existing outside toilets shall be utilized and there shall be no construction of toilets in the Project. The waterworks authority of Malawi stipulates that toilets must not be constructed within 150 m of wells because of risk of water pollution. For this reason, particularly at the health centres located in densely populated urban areas, it is not possible to build pit-type toilets.

③ Sanitary fixtures

<District Hospitals>

Existing facilities adopt Asian type (squat type) sanitary fixtures for toilets; accordingly, the same type shall be adopted in the Project for convenience. Meanwhile, Western style toilets shall be installed in one toilet for disabled people and the toilet for pregnant women attached to the delivery room at each hospital.

Concerning toilet flushing, water drawn from a tank by bucket shall be adopted in accordance with the local custom, and hand showers shall be installed in each booth for

cleaning purposes. All sanitary fixtures can be procured locally and maintenance work including procurement of faucets and other parts is also possible.

<Health Centres>

Since there will be no construction of toilets in the Project, there will be no need to install toilet equipment. Washbasins and sinks can be procured locally and maintenance work including procurement of faucets and other parts is also possible.

④ Solid waste treatment

<District Hospitals>

Current treatment methods for solid waste shall be adopted at the district hospitals, so this shall not be included in the Project.

<Health Centres>

The Ministry of Health circulates boxes for recovering medical waste products. The ministry periodically collects these boxes, and the same method shall be adopted in the Project.

⑤ Fire extinguishing equipment

<District Hospitals>

Local fire departments provide guidance for the installation of fire extinguishing equipment in district hospitals. Generally speaking, it is compulsory to install fire hydrants and fire extinguishers. Hand bells shall be utilized as fire alarms, and locally common powder type fire extinguishers shall be planned.

<Health Centres>

Since fire departments require that around two fire extinguishers be installed in health centres, these shall be procured at each target facility in the Project.

(3) Air conditioning equipment

In both the paediatric wards and maternity wards, natural ventilation shall be adopted in the hospital rooms and ceiling fans shall be installed to circulate air. Ventilation fans shall be installed in the cooking guidance kitchens, where heat and odour is generated, as well as toilets that have no access to outside air.

<Health Centres>

In the maternity wards, it is planned to install solar generators for storing electric energy in batteries and supplying it to lighting fixtures in the labour and delivery rooms. Since there will no surplus electricity for supplying to other equipment, ventilation fans shall not be installed.

(4) Electric equipment

<District Hospitals>

① Electricity leading-in

Since the district hospitals have power receiving equipment, electricity shall be lead in along low voltage branches from there. Two generator circuit lines shall be connected to general power sources in each facility.

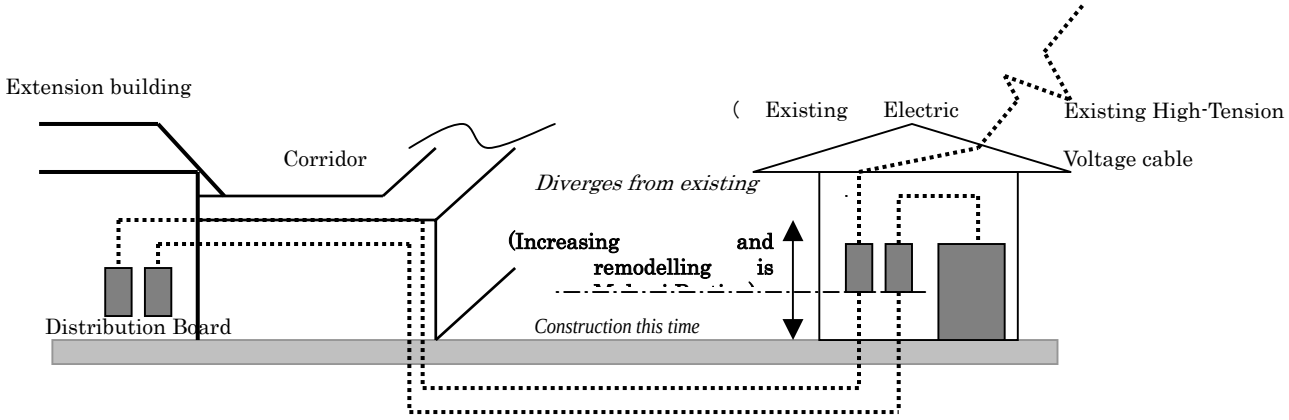


Figure 2-13 Electricity Connection System

② Continuous power generator equipment

Since the district hospitals already have emergency power generator equipment, electric energy from this shall be used to power the minimum required lighting fixtures that will be installed in the labour and delivery rooms, hospital rooms and nurse stations of maternity wards and the hospital rooms and nurse stations of paediatric wards.

③ Lights and sockets

General circuit distribution panels and generator circuit distribution panels shall be installed in each facility. Sockets shall be provided in those areas where power sources are required according to the medical equipment plan. Moreover, ceiling fans shall be

installed in hospital rooms in order to circulate air and enhance the indoor environment.

④ Lighting equipment

Lighting fixtures mainly comprising fluorescent lamps, which are relatively cheap to maintain, shall be planned. Brightness levels shall be set corresponding to the standard design prescribed by the Ministry of Health (around 50% of the JIS standard in Japan) in consideration of local conditions.

⑤ Lightning conductors

Lightning conductors shall not be installed because buildings are single story.

⑥ Telephone equipment

Telephone outlets and telephone sets shall be installed in nurse stations and connected to the PBX of existing wards.

<Health Centres>

Lighting fixtures powered by solar generators shall be installed in the maternity ward labour and delivery rooms of the target health centres.

Table 2-31 Summary of Mechanical and Electrical Facilities

No.	Rm. Name	Bed	Zircon/Vent.			Plumbing							Electricity					Medical Equipment
			Air Con/Vent.	C.Fan	Vent.	City Water	Rain	Hot Water	Drain	Hydrant	Fire Extinguisher	Med.G.	Light	Outlet	G Circuit	C.FAN	telephone	Name of Medical Equipment (Capacity)
	Rumphi District Hospital (Paediatric)																	
1	Connecting Corridor		-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	
2	Toilet-1		-	-	-	○	-	-	○	-	-	-	○	○	-	-	-	
3	Toilet-2		-	-	-	○	-	-	○	-	-	-	○	○	-	-	-	
4	Serious Case	2	-	-	-	-	-	-	-	-	-	-	○	○	○	-	-	Suction Apparatus(300VA)、Nebulizer(70VA)
5	Serious Case	4	-	-	-	-	-	-	-	-	-	-	○	○	○	○	-	Suction Apparatus(300VA)、Nebulizer(70VA)
6	Corridor		-	-	-	-	-	-	-	○	○	-	○	○	-	-	-	
7	Kitchen		-	-	○	○	-	-	○	-	-	-	○	-	○	-	-	
8	Drug Store		-	-	-	-	-	-	-	-	-	-	○	○	○	-	-	
9	Hospital Attendant		-	-	-	-	-	-	-	-	-	-	○	○	○	-	○	Pressure Cooker(1,500VA)
10	Nutrition Rehabilitation	12	-	-	-	-	-	-	-	-	○	-	○	○	-	○	-	Suction Apparatus(300VA)、Nebulizer(70VA)
11	Paediatric Ward	12	-	-	-	-	-	-	-	-	○	-	○	○	-	○	-	Suction Apparatus(300VA)、Nebulizer(70VA)
12	Toilet-3		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
13	Toilet-4		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
14	Shower Rm.		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
15	Exterior		-	-	-	-	-	-	-	○	-	-	○	-	-	-	-	
	Rumphi District Hospital (Maternity)																	

No.	Rm. Name	Bed	Zircon/Vent.			Plumbing							Electricity					Medical Equipment
			Air Con/Vent.	C.Fan	Vent.	City Water	Rain	Hot Water	Drain	Hydrant	Fire Extinguisher	Med.G.	Light	Outlet	G Circuit	C.FAN	telephone	Name of Medical Equipment (Capacity)
16	Shower Rm. And toilet		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
17	Toilet-1		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
18	Sluice		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
19	Delivery	4	-	-	-	-	-	-	-	-	-	-	○	○	○	-	-	Light (200VA), Heater (1,100VA), Sterilizer (1,000VA), Vacuum Extractor (300VA)
20	Corridor		-	-	-	-	-	-	-	-	○	-	○	-	-	-	-	
21	Labour	6	-	-	-	-	-	-	-	-	-	-	○	○	○	-	-	Fetal Heart Detector (50VA)
22	Nursery		-	-	-	-	-	-	-	-	-	-	○	○	○	-	-	Incubator (400VA)、Heater (1,100VA), Oxygen Concentrator (230VA)、Phototherapy Unit (300VA)
23	Nurse St.		-	-	-	-	-	-	-	-	-	-	○	○	○	-	○	Pressure Cooker (1,500VA)
24	Surgical Delivery	12	-	-	-	-	-	-	-	-	○	-	○	○	-	○	-	Vacuum Extractor (300VA)
25	Complicate Delivery	12	-	-	-	-	-	-	-	-	○	-	○	○	-	○	-	Vacuum Extractor (300VA)
26	Normal Delivery	12	-	-	-	-	-	-	-	-	○	-	○	○	-	○	-	Vacuum Extractor (300VA)
27	Toilet-2,3		-	○	-	○	-	-	○	-	-	-	○	-	-	-	-	
28	Toilet-4,5,6		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
29	Shower Rm.		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
30	Exterior		-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	
	Mzimba District Hospital (Paediatric)																	
31	Kitchen		-	-	○	-	-	-	-	-	-	-	○	-	○	-	-	
32	Serious Case	2	-	-	-	-	-	-	-	-	-	-	○	○	○	-	-	Suction Apparatus(300VA)、Nebulizer(70VA)
33	Nurse St.		-	-	-	-	-	-	-	-	-	-	○	○	○	-	○	Pressure Cooker(1,500VA)
34	Corridor		-	-	-	-	-	-	-	-	○	-	○	-	-	-	-	
36	Drug Store			-	-	-	-	-	-	-	-	-	○	○	○	-	-	
36	Infectious	4	-	-	-	-	-	-	-	-	-	-	○	○	○	○	-	Suction Apparatus(300VA)、Nebulizer(70VA)
37	Nutrition Rehabilitation	12	-	-	-	-	-	-	-	-	○	-	○	○	-	○	-	Suction Apparatus(300VA)、Nebulizer(70VA)
38	Paediatric Ward	12	-	-	-	-	-	-	-	-	○	-	○	○	-	○	-	Suction Apparatus(300VA)、Nebulizer(70VA)
39	Shower Rm.		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
40	Toilet-1,2		-	○	-	○	-	-	○	-	-	-	○	-	-	-	-	
41	Toilet-3,4,5		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
42	Connecting Corridor		-	-	-	○	-	-	○	-	-	-	○	-	-	-	-	
	Health centre Dispensary																	
43	Family Planning		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
44	Examination Rm.	1	-	-	-	-	○	-	○	-	-	-	-	-	-	-	-	
45	Treatment Rm.		-	-	-	-	○	-	○	-	-	-	-	-	-	-	-	
46	Dressing Rm.		-	-	-	-	○	-	○	-	-	-	-	-	-	-	-	
47	Store		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
48	Waiting and Teaching Area		-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	
49	Corridor		-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	
50	Waiting Rm. (Female)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
51	Waiting Rm. (Male)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
52	Drug Store		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
53	Office		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
54	VCT		-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	
55	VCT Waiting		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
56	Exterior		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Rain Water Reserve Tank
	Maternity																	
57	Post-Natal Ward	4	-	-	-	-	○	-	○	-	-	-	-	-	-	-	-	
58	Shower Rm.		-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	
59	Store		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	Anti-Natal Ward	4	-	-	-	-	○	-	○	-	-	-	-	-	-	-	-	
61	Shower Rm.		-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	
62	Labour and Delivery	2	-	-	-	-	○	-	○	-	-	-	○	-	-	-	-	Solar Power System
63	Shower Rm.		-	-	-	-	○	-	○	-	-	-	-	-	-	-	-	
64	Waiting and Teaching Area		-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	
65	Corridor		-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	

No.	Rm. Name	Bed	Zircon/Vent.			Plumbing							Electricity					Medical Equipment
			Air Con/Vent.	C.Fan	Vent.	City Water	Rain	Hot Water	Drain	Hydrant	Fire Extinguisher	Med.G.	Light	Outlet	G Circuit	C.FAN	telephone	Name of Medical Equipment (Capacity)
66	Examination Rm.	1	-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	
67	Waiting Rm. (Female)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
68	Drug Store			-	-	-	-	-	-	-	-	-	-	-	-	-	-	
69	Office		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70	Nurses/Midwives		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
71	VCT		-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	
72	VCT Waiting		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
73	Exterior		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Rain Water Reserve Tank

2-2-2-7 Building Materials Plan

(1) Basic Policy

The following basic policy shall be adopted for selecting construction materials:

- Select materials and finishing methods that is suited to the local climate and customs.
- In order to reduce maintenance costs, adopt materials and methods that afford easy maintenance.
- By locally procuring construction materials as much as possible, adopt a plan that affords easy repair and maintenance locally and enables construction cost to be reduced.
- Use materials in accordance with standard designs of the Ministry of Health, World Bank and other donors.

(2) Examination of Major Materials

The policy regarding the main materials shall be as follows:

① Roof materials

- Galvanized corrugated iron plate is the generally adopted roof material, and Mzimba District Hospital and other facilities have cooling tiles added to this in order to raise heat insulation performance. However, because cooling tiles tend to drop off over time, more collar plates and improved type tiles are being adopted in recent years.

- In elementary and secondary school buildings constructed under assistance from the Dfid, Perry tiles (80 cm square corrugated tiles made from mortar) are used in consideration of reflected heat and the sound of rain on roofs, however, this approach entails strength problems in that people cannot mount the roof after it is installed. In the project, asphalt permeable natural fibre roofing, which has heat insulation performance and weather

resistance, shall be placed over sheathing roof boards and rear faces shall be paint finished. By doing this, attic spaces that provide a chance for bats and small rodents to make nests shall be removed.

- In the Project, asphalt permeable natural fibre roofing shall be adopted because this has heat insulation performance, can be mounted by people following installation, can be installed quite easily and is cheaper that metal roof materials.

② Exterior walls

- Since reinforced concrete blocks shall be used for walls, trowel-applied mortar shall be placed over them and paint finished.

③ Fittings (windows and doors)

- Steel jalousie windows, which are common in the local area, shall be adopted, and security iron grille shall be placed on windows in the medicine stores. Windows shall have enough open area to secure appropriate light, and care shall be taken to ensure that low direct sunlight does not enter rooms and cause temperatures to rise too much in the morning and evening.

- For indoor doors, steel fames and locally common wood frames shall be adopted.

④ Interior finishing materials

- Floors shall comprise reinforced concrete slabs and trowel-applied mortar finish in consideration of durability. Only in the labour and delivery rooms shall epoxy resin coating be applied over the mortar finish.
- Interior walls shall comprise reinforced concrete blocks with mortar paint finish.
- As for ceilings, Ch = 3,100 ceilings shall be installed in district hospitals only. As a rule, soft board painting, which is commonly used in local school facilities, shall be used.
- Health centres shall not have attics in order to prevent bats from nesting. Accordingly, sheathing roof boards shall be given paint finish.

The following table gives a comparison of the Project facilities with similar existing facilities.

Table 2-32 Comparison of Local Method and Selected Construction Method

	Local Construction	Selected Construction	Reason
Exterior: Roof	G.I. Roofing Sheets with Clay Tile	Asphalt Penetrated Natural fibre Roof Sheets	It is superior on heat insulation and weatherproof to G.I. sheets also cost saving in long life.
Wall	Faced Brick Wall. Mortar trowelled brick wall with paint finish	Mortar trowelled on Reinforced CB with paint finish	In order to environment protection (fire wood conservation). Uniformed quality is available.
Doors & Windows	Steel made. Wooden made.	Exterior: Glass louver windows & Steel doors. Interior: Wooden doors with Steel frame	Commonly used in local. It is stronger and inexpensive compare to aluminium materials.
Interior: Floor	Mortar trowel led.	Mortar trowel led	Mortal trowel led floor is commonly used in local because inexpensive.
Wall	Mortar trowel led with paint finish	Mortar trowel led with paint finish	Commonly used in local.
Ceiling	Non-ceiling. Soft board with paint finish	DH：Soft board with paint finish HC：Non-ceiling	Soft board act for heat insulation. Commonly used in local.

Notes: G.I.sheet: galvanized iron sheet, CB: Concrete Block.

(3) Major finishing materials by facility

As a rule, materials (including imported items) that are easily procurable locally and afford easy maintenance shall be adopted in all the Project facilities.

Table 2-33 Finishing Material Plan: District Hospitals & Health Centres

	Finishing Material
Roof:	Asphalt Penetrated Natural fibre Roof Sheets
Eave soffit:	Calcium Silicate Board t-6mm with AEP
Windows:	Steel Frame Glass Louver Windows
Structure:	Frame ：Reinforce Concrete Wall ：Reinforced Concrete Block Finish ：Mortal trowelled with paint finish

＜Interior Finishing Materials＞

	Floor	Skirting Board	Wall	Ceiling	Doors & Windows
Common Rooms	Mortar	Mortar with AEP finish	Mortar t-20 mm with AEP finish	Soft Board t -6 mm with AEP finish	Wooden Door t-40 mm with steel frame
Labour Room Delivery Room	Mortar trowelled with Epoxy-resin Finish	Same as above	Same as above	Same as above	Same as above

Notes: AEP: Acrylic Emulsion Paint, t: thickness

2-2-2-8 Equipment Plan

(1) Overall plan

1) Transition of Requested Contents of the Project

As the original request form did not include an equipment list, the preliminary study team conceived and proposed to the government of Malawi, the equipment plan for health centres during discussion between the both sides in the preliminary study of this project. They were selected, as basic and essential items in performing medical services, from the standard medical equipment list, which EHP recommends, and from such indispensable items as radio communication devices, and solar battery system for the radio device and lighting in carrying out everyday activities. Moreover, office furniture, extremely low-cost items, and items related to EPI, which are well equipped as a whole, and consumable items were excluded beforehand under the consensus of the Malawi side in a course of discussions even though it is listed in the EHP list. The equipment plan for health centres, which the preliminary study team confirmed to the Malawi side, is shown as Table 2-29.

For the items for district hospitals, the preliminary study team recommended that they be planned in the basic design study, based upon the above-mentioned equipment selection policy. According to the preliminary study report, the medical equipment procurement of district hospitals and central hospitals was going on in the whole country. The tender notice was announced in October, 2005, and the successful bidder would be determined in June 2006, and the equipment delivery and the installation were scheduled to be completed in the latter half of 2006. Therefore, the medical equipment for district hospitals should not be included in this project. However, it is considered as appropriate to include the equipment used in wards concerned such as the beds (for adults and for infant) , bed side lockers and screens provided that construction of new wards are included in the content of this project. Therefore, it is decided that the each health centre be surveyed to inspect the items listed in Table 2-6 as a study target, and the necessity of procurement be judged from the situation of existing equipment, in this field survey. To be concrete, necessity was examined to replace worn-out items and to supplement items which fall short in numbers and the examination result was compiled into the final request equipment list (Refer to Table 2-29) ,which MOH agreed with.

Table 2-34 Contents of Requested Equipment for Health Centres

No.	Equipment name	Qtty
1.OPD		
1-1 Examination room		
1	Weighing machine, adult	1
2	Diagnostic instruments set	1
3	Sphygmomanometer	1
4	Examination couch	1
5	Screen with castors	1
6	Water tank, 20ℓs, with faucet and stands	1
7	Stools	2
1-2 Treatment room		
8	Instruments set, for treatment	2
9	Instruments set, for foreign body removal	2
10	Instruments set, drainage incision	2
11	Instruments set, stitch removal	2
12	Instruments set, suturing	2
13	Examination couch	1
14	Screen, with castors	1
15	Stretcher	1
16	Instruments cart, castors	1
17	Kick bucket, stand, castors	1
18	Water tank, 20ℓ、faucet, stand	1
19	Chair	1
20	Stove, kerosene/paraffin	1
21	Autoclave, high pressure	1
1-3 Dressing room		
22	Instrument sets, treatment	2
23	Instruments cart, with castors	1
24	Water tanks, 20ℓ, with faucet and stands	1
25	Stools	2

No.	Equipment Name	Qtty
2. Maternity ward		
2-1 Delivery room		
26	Delivery tables	2
27	Basinets	1
28	Screen with castors	1
29	Suction units, manual	1
30	Resuscitation bags, infant, adult	1
31	Instruments set, delivery and suturing	3
32	Instruments set, episiotomy and tear	1
33	Sphygmomanometers	1
34	Weighing scale, children	1
35	Instruments cart, with castors	1
36	Examination lights, with battery back-up	1
37	Autoclaves, high pressure cooker type	1
38	Stove, kerosene/paraffin	1
39	Stool	1
40	Water tanks, 20ℓ, with faucet and stands	1
2-2 Labour room		
41	Beds, with mattress, adult	8
42	Bedside lockers	8
43	Basinets	8
44	Screen with castors	6
45	Water tanks, 20ℓ, with faucet and stands	1
3.Holding room		
46	Beds, adult	2
47	Beds, children, with side rails	2
48	Drip stands	1
4.Radio communication device etc.		
49	Radio device	1
50	Solar battery, for radio/lighting	1
51	Kerosene lamp	1

2) District Hospitals

The targeting facilities are two district hospitals and 55 health centres as mentioned before. The targeting area extends from central region of the country including the capital over the northern region and is located in the mountainous hill zone. As for the district hospitals, it is established in district headquarter, is in order of basic infrastructures such as electricity and the city water, and electrically driven equipment is operated. Mobile phones are used in the vicinity of district headquarters, but not so prevailed in the remote villages. Most of health facilities communicate with district hospitals by radio. Under such circumstances, even equipment which needs installation can be set up in the district hospitals. According to the above-mentioned details assistance by this project procures the ward equipment (bed side lockers and beds) among equipment necessary for

extending the maternity ward and the paediatrics ward in the district hospitals. As a result, it is the one to enhance the patient accommodation ability of the wards, and to attempt the improvement of care services to the infant and pregnant women and nursing mothers.

3） Health centres

To make easier the local residents' access, the health centres are almost set up in the village in the whole area of district. The access is in the place where it takes one to two hours on the average to reach a facility from the trunk road as most of roads are unpaved and have a lot of ups and downs in the mountainous hill zone, too as long as it is not along the trunk road. Vehicles might not proceed so smooth in the rainy season by muddy road according to region. Water supply is not prevailed widespread in most health centres and the well water is used drawing up with hand pump. Even though the place where electricity is available it is in the situation that power failure occurs quite often. The assistance provided in this project is procurement of minor surgical instrument sets, and instruments for medical examination and delivery, and attempting to improve the diagnosis and treatment service such as minor surgery and medical examination, and of the maternal and child health care such as perinatal care and delivery.

(2) Basic design

The requested items of equipment are examined in the light of conformation to functions of each section. The examination result is described hereunder:

<District hospitals>

Table 2-35 Functions of District Hospitals and Content of Equipment Plan

Building	Departments	Activities	Items to be considered
Maternity ward	Prenatal ward	Waiting for delivery	Beds, and bedside lockers
	Delivery room	Care for delivery	—
	Nursery	Care for infants and treatment	—
	Serious case room	Care for serious cases	Beds, and bedside lockers
	Postnatal ward	Postnatal care including Caesarean cases	Beds, and bedside lockers
Paediatrics ward	Ward	Care for children and accommodating guardians, e.g. mothers	Beds, and bedside lockers
	Isolation room	Care for septic cases	Beds, and bedside lockers
	Nutrition room	Dietary care and nourishment guidance, etc. for children under 5	—

Note: It is Malawi side that will undertake equipping delivery room, nursery, and malnutrition room with medical and other equipment.

1) Medical equipment for the maternity ward

The content of request consists of beds and bedside lockers for the maternity ward to be newly built. They are indispensable items to accommodate pregnant women who come to a hospital from remote places though these are simple items. Moreover, it is assumed that purchase of a lot of equipment will become a big burden in consideration of the financial situation in Malawi. Since an existing bed is a fixed and high legs type, it is difficult for pregnant women to lay themselves on beds and to move to and from a stretcher. Therefore, it is recommended to adopt the height-adjustable model to reduce the physical loads of those prenatal and post natal. The bedside locker is necessary for keeping necessaries for the inpatients to live in a hospital. For specifications of the bedside lockers should not be of wood-made but be of steel product with rust prevention processed, taking into a consideration considerably high humidity in Malawi. The quantity should conform to the numbers of beds, which are planned for the prenatal ward, the serious case room, and the postnatal ward according to the number of beds in the building plan.

2) Medical equipment for the paediatrics ward

The beds for the paediatrics ward to be newly built and the bedside lockers are planned to procure in the general room and isolation room. The quantity is planned according to the number of beds, which are specified in the building plans. The beds for adults are planned instead of child beds for this ward considering the situation of which the guardian, usually

mothers lie together with their children for nursing. In addition, the floor level about 300mm is considered as well as an existing bed, to make easy patients lay themselves on the beds in planning the specifications.

<Health Centres>

Table 2-36 Functions of Health Centres and Contents of the Equipment

Blocks	Sections	Functions	Major equipment
Dispensary	Examination room	Consultation for out-patients	Weighing scale, diagnostics set, sphygmomanometers etc.
	Treatment room	Minor surgeries such as abscess incision, suturing of injuries etc.	Examination tables, minor surgical sets
	Dressing room	Treatment such as suturing, dressing, stitch removal	Suturing sets
	EPI room	Storing vaccine and vaccination	-
Maternity ward	Prenatal ward	Prenatal care	Beds, bedside lockers etc.
	Delivery room	-MCH, i.e. check-up of pregnant women, growth monitoring of infants, family planning -Normal deliveries	Examination tables, weighing scales, sphygmomanometers, delivery tables, suction units, resuscitation bags, delivery forceps, lighting at night time etc.
	Postnatal ward	Postnatal care	Beds, bedside lockers etc.
Holding room		Holding emergency cases	Beds, bedside lockers etc.

1) Dispensary

① Examination room

The room is planned for an examination, an interview, and registration of outpatients. Planned are to procure such basic diagnosis as weighing scales, diagnostic sets, and medical examination stands.

② Treatment room

Planned are to procure minor surgical sets and examination tables, which are necessary for minor surgeries such as abscess incision and suturing of injuries.

③ Dressing room

Planned is to procure a suturing set necessary for suturing and dressing etc. Autoclaves and kerosene stoves are excluded from the plan since it is not used in most facilities and most of the personnel are not well trained for the operation method.

2) Maternity ward

① Antenatal/Postnatal ward

To accommodate pregnant women and nursing mothers who come to a hospital from remote places, the beds and the bedside lockers are planned to procure. The kerosene lamp is for lighting of the ward and it is excluded because it doesn't relate to the medical services directly.

② Delivery room

This room is planned to equip with diagnosis equipment such as sphygmomanometers and weighing scales for antenatal check-up, delivery tables and suction units the lighting for the delivery at night time and delivery forceps set, etc. for normal deliveries. Since episiotomy is not done subject to the guidance of MOH, this incision set is excluded from the plan. The basinet is also excluded from the plan because MOH guides not to use it. MOH is encouraging mothers to sleep together with their newborns to encourage breast feeding, but this item hinders their sleeping together.

③ The holding room

Planned are to procure the beds for emergency cases to wait until an ambulance comes. The child beds are substituted for adult beds and thus, not targeted in the plan.

The necessity and the validity of the equipment procurement of each item were inspected based upon the examination result of the above-mentioned request equipment according to the equipment selection criteria. The equipment selection criteria are shown as the following Table.

Table 2-37 Equipment Selection Criteria

	Criteria
1. Maintenance ability	passed :items that Malawi side can maintain satisfactorily in light of technical and financial aspects failed: items that Malawian side cannot maintain properly
2. Status of existing equipment	passed: items that be replaced due to obsoleteness or is in shortage in numbers Failed: items that existing ones satisfy the function of target facilities, or other donors or MOH has planned to procure the same items in the future.
3. Man power disposition	Passed: items which medical personnel are already posted to run properly. Failed: items which medical personnel are not posted to run properly.
4. Function and activities	Passed: items that meet the function or activities of the target facilities. Failed: items that do not satisfy the above.
5. Principles of Japan's Grant Aid system	Passed: items that are not consumables and that contribute directly to improvement of medical services of the target facilities. Failed: items that do not contribute directly to improvement of medical services, or are considered to be consumables.

Examination result is compiled into the following table:

Table 2-38 Inspection of Request Equipment

① District hospitals

No.	Equipment name	Criteria					judgment	quantity	Particulars
		①	②	③	④	⑤			
1	Beds, with mattress, adult	○	○	○	○	○	○	36	Rumphi district hospital maternity ward
2	Bedside lockers	○	○	○	○	○	○	36	-do-
3	Beds, with mattress, adult	○	○	○	○	○	○	24	Rumphi district hospital paediatrics ward
4	Bedside lockers	○	○	○	○	○	○	24	-do-
5	Beds, with mattress, adult	○	○	○	○	○	○	24	Mzimba district hospital paediatrics ward
6	Bedside lockers	○	○	○	○	○	○	24	-do-

② Health Centres

No.	Equipment name	Criteria					Judgment	Quantity	Location/particulars
		①	②	③	④	⑤			
1	Weighing scale, adult	○	○	○	○	○	○	25	OPD examination room
2	Diagnostic sets	○	○	○	○	○	○	49	-do-
3	Sphygmomanometers	○	○	○	○	○	○	31	-do-
4	Examination tables	○	○	○	○	○	○	22	-do-
5	Screen with castors	○	×	○	○	×	×	38	
6	Water tanks	○	○	○	○	×	×	33	
7	Stools	○	×	○	○	×	×	35	
8	Minor surgical instrument sets	○	○	○	○	○	×	157	OPD treatment room
9	Examination tables	○	○	○	○	○	×	45	OPD treatment room
10	Screen with castors	○	×	○	○	×	×	49	
11	Stretchers	○	×	○	○	○	×	31	
12	Instruments carts	○	×	○	○	○	×	38	
13	Kick buckets	○	×	○	○	×	×	37	
14	Water tanks	○	○	○	○	×	×	40	
15	Stools	○	×	○	○	×	×	26	
16	Stoves, kerosene/paraffin	○	○	×	○	○	×	37	Used with 17.
17	Autoclave, high pressure steam	○	○	×	○	○	×	39	
18	Minor surgical instrument set	○	○	○	○	○	○	108	Examination room at OPD
19	Instruments carts	○	×	○	○	○	×	47	
20	Water tanks	○	○	○	○	×	×	43	
21	Stools	○	×	○	○	×	×	53	
22	Delivery tables	○	○	○	○	○	○	52	Delivery room in maternity block
23	Basinets	○	○	○	×	○	×	43	
24	Screen with castors	○	×	○	○	×	×	39	
25	Suction units, manual	○	○	○	○	○	○	29	Delivery room in maternity block
26	Resuscitation bags	○	○	○	○	○	○	47	Delivery room in maternity block
27	Instrument sets, delivery and suturing	○	○	○	○	○	○	130	Delivery room in maternity block
28	Instruments sets, episiotomy, suturing	○	○	○	○	×	×	47	

No.	Equipment name	Criteria					Judgment	Quantity	Location/particulars
		①	②	③	④	⑤			
29	Sphygmomanometers	○	○	○	○	○	○	29	Delivery room in maternity block
30	Weighing scale, infants	○	○	○	○	○	○	5	Delivery room in maternity block
31	Instrument cart with castors	○	×	○	○	○	×	16	
32	Examination lights with battery back-up	○	○	○	○	○	○	52	Delivery room in maternity block
33	Autoclaves, high pressure, steam	○	○	×	○	○	×	36	
34	Stove, kerosene/paraffin	○	○	×	○	○	×	25	
35	Stools	○	○	○	○	×	×	24	
36	Water tanks	○	○	○	○	×	×	29	
37	Beds with mattress, adult	○	○	○	○	○	○	98	Maternity ward
38	Bedside lockers	○	○	○	○	○	○	249	Maternity ward
39	Basinets	○	○	○	×	○	×	405	
40	Screen with castors	○	×	○	○	×	×	299	
41	Water tanks	○	○	○	○	×	×	42	
42	Beds, adult	○	○	○	○	○	○	50	Holding room
43	Beds, children, with side rails	○	○	○	×	○	×	98	
44	Drip stands	○	○	○	○	○	○	31	Holding room
45	Radio communication devices	×	○	○	○	○	×	14	Used with 46.
46	Solar battery, radio/lighting	×	○	○	○	○	×	18	
47	Kerosene lamp	○	○	○	○	×	×	22	

Note: Quantity of health centre equipment is shown as the total numbers of all the 55 health centres.、As for the equipment quantity of each facility, basically it is decided to conform to the standard quantity shown in the EHP equipment list. Since some items are in working conditions, such numbers of working items confirmed during the field survey is subtracted from the standard quantity. In addition, the space of the targeted facilities to equip with is examined, and the quantity of equipment for each facility is determined.

The specifications and use of major equipment are shown as follows:

Table 2-39 Specifications and use of major equipment

No.	Equipment name	Specifications	Use
A-2	Hospital beds, adult	Material: -frame: steel -mattress: poly-urethane foam -castors: with corner stoppers -back rest: adjustable -height: adjustable	To be used as a bed for prenatal and post natal care for pregnant women. As a lot of pregnant women of high risk birth are hospitalized in a district hospital, the bed model that can adjust height to reduce the pregnant women's load (A low position: decreasing of the load when the patient lies in the bed, and a high position: The load decreases when a doctor and a nurse, etc. diagnose and treat them and transfers them to a stretcher in transferring to a delivery room (The height of the stretcher : from the floor by about 80cm)
B-2	Diagnostic equipment sets	-light source for an ophthalmoscope: halogen -power source: battery cell Composition:	To be used as a basic diagnostic set for ENT, and internal medicine in Dispensary.

No.	Equipment name	Specifications	Use
		-ophthalmoscope, laryngoscope, otoscope, handle, and tongue depressor	
B-5	Instrument sets, minor surgery	Material: stainless Composition: Pincers, haemostat, razor holder, razor Stainless case	To be used as instruments for foreign body removal and drainage incision for out-patients.
B-7	Instrument sets, suturing	Material: stainless steel Composition: Scissors, needle holder, haemostat, Petri dish, needle, thread, scissors Stainless case Stainless steel case	To be used as instrument to make a surgical treatment of out-patients, mainly for suturing and stitch removal.
B-8	Delivery beds	Type:2 section type Foot rest: detachable or fordable Material: steel Composition: Foot rest, delivery material, funnel , soil can, mattress, step	To be used as an item for pregnant women to deliver on it.
B-10	Resuscitators, manual,	Type: manual Size: for infant, and adult Material: silicone rubber Possible to sterilize Composition: Resuscitation bag, mask, airway Reservoir bag	Items to restore spontaneous breathing of wound patients, who fall dyspnea.
B-11	Instrument sets, Delivery and suturing	Material: stainless steel Composition: Pincers, haemostat, scissors, cord Scissors, needle holder, kidney basin, razor holder, razor, Stainless case, needle, and thread	Essential instruments for treatment of normal deliveries
B-14-1	Solar system	Solar panel, Battery cell, Charging controller, and Inverter	This item is used as lighting source for an examination light which is used for night time delivery.
B-15 B-17	Hospital beds, adult	Material: steel Mattress: polyurethane foam Castors: corner stoppers	B-15 : it is used as beds for pre- and post-natal care for pregnant women in HCs. B-17 : It is used as beds to hold an emergency case waiting for an ambulance transporting the case from an HC to district hospitals etc.
B-16	Bedside lockers	Material: steel With drawer and locker With castors	To be used as lockers to keep patients' baggage.

Table 2-40 Basic Design 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	A-3	Bedside lockers	24
	A-4	Beds	24
2.Mzimba district hospital			
2-1. Paediatrics unit	A-5	Bedside lockers	24
	A-6	Beds	24

Health centres (55sites)

Target institutions	Item no.	Equipment name	Quantity
1. OPD unit			
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 unit			
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

The breakdown of health centre equipment quantity is attached to the appendix at the end of this report.