Ministry of Health
Republic of Uganda

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA
IN
THE REPUBLIC OF UGANDA

AUGUST 2012

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

YOKOGAWA ARCHITECTS & ENGINEERS, INC.
INTEM CONSULTING, INC.

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to the consortium of Yokogawa Architects & Engineers, Inc. and INTEM Consulting, Inc.

The survey team held a series of discussions with the officials concerned of the Government of Uganda, and conducted field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Uganda for their close cooperation extended to the survey team.

August, 2012

Nobuko Kayashima
Director General
Human Development Department
Japan International Cooperation Agency

SUMMARY

SUMMARY

1. Overview of the Country

The Republic of Uganda (hereinafter referred to as "Uganda") is an inland country in eastern Africa, surrounded by Kenya, Tanzania, Rwanda, the Democratic Republic of Congo and Sudan. It covers approx. 241,000 km^2 (about 2/3 of the area of Japan), and has a population of approx. 32.7 million (World Bank, 2009). The country's per capita GNI (Gross National Income) is US$370 (2008).

2. Background, History and Outline of the Requested Japanese Assistance

In Uganda, infant mortality rate is 76 per 1000 live births (2006), under 5 mortality rate is 137 per 1000 live births (2006) and maternal mortality ratio is 430 per 100,000 live births (2008), still displaying very high rates. These issues are attributable to the limited access to health services of the impoverished people particularly the socially vulnerable such as women and children in rural areas. It is the pressing issue of the health sector to improve this situation and ensure treatment and prevention of diseases that can be treated and prevented.

The Government of Uganda formulated the National Health Policy (hereinafter referred to as "NHP") (1999/2000-2009/10) in 1999. Under this policy the Government of Uganda programmed the Health Sector Strategic Plan (hereinafter referred to as "HSSP"), in which the government made efforts to improve the present situation, such as, to establish a free medical care system throughout the country, to improve the rate of accessibility to medical facilities by increasing their numbers, and to strengthen the medical delivery services all the way from the community level to the district level. These efforts have produced certain tangible outcomes, such as an increase in the ratio of the population having access to a medical facility within a distance of 5 km from 49% (1999) to 72% (2004). Nevertheless, there were still a lot of medical facilities that are in need of rehabilitation and improvement of facilities and equipment, and it is quite difficult to allocate sufficient budget. Thus, the improvement of medical infrastructures has been continuously emphasised in NHP II (2010/11-2019/20) and the Health Sector Strategic and Investment Plan (hereinafter referred to as "HSSIP") (2010/11-2014/15), the succeeding programmes to NHP and HSSP.

Along the policy of the Government of Uganda that would take a gradual approach to promote facility improvements divided by regions, "The Project for the Rehabilitation of Health Facilities and Supply of Medical Equipment in Mbale, Tororo, Bugiri and Busia Districts" was conducted between 2005 and 2006 and "The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment in the Central Region in Uganda" was conducted between 2009 and 2010 with grant aid of Japan.

Under such circumstances, the Government of Uganda requested grant aid for "The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment in the Western Region in Uganda" (hereinafter referred to as "the Project") in 2008, following these grant aid projects. This request aimed to enhance the function of medical service in four hospitals at Hoima, Kabale, Fort Portal and Masindi that play important roles in the western region through the construction of facilities and the

procurement of medical equipment, and consequently to upgrade the quality of medical service delivery and to establish a more efficient and effective regional referral system in the western region in Uganda.

3. Outline of the Survey Results and Description of the Project

In response to the request, the Government of Japan decided upon the implementation of a preparatory survey of the Project, and the Japan International Cooperation Agency (hereinafter referred to as "JICA") conducted a preparatory survey (field survey I) in May 2011. The survey team surveyed the requested four hospitals and cooperation projects financed by other donors, complied an "Observations by the Survey Team" which is a comparative prioritisation list of the four hospitals, discussed with the Ugandan authorities concerned, and narrowed down to three target hospitals. After the analysis I in Japan of the results of the field survey I, JICA conducted the preparatory survey (field survey II) in August 2011, in which the survey team surveyed the target three hospitals and discussed with the Ugandan authorities in more detail, conducted field surveys of relevant governmental and private institutions, and collected referential data and information. Following the further analysis II in Japan and the draft report explanation mission in June 2012, the present preparatory survey report has been complied.

The assistance components of the Project are to construct the Outpatient Department Block (hereinafter referred to as "OPD Block") and the Operation Theatre/Maternity Ward (hereinafter referred to as "OT/Maternity Ward") at Hoima Regional Referral Hospital (hereinafter referred to as "RRH") and the OPD/Casualty Block and the OT/Maternity Ward at Kabale RRH, and procure medical equipment at Hoima, Kabale and Fort Portal RRHs, and implement technical assistance for appropriate operations and maintenance of equipment (Soft Component assistance). It is expected that the Soft Component assistance will enable the effective use of equipment and conduction of medical activities.

Outline of the Project for Hoima RRH

Project Component			Description
OPD Block (including outpatient toilet)	GF	760.00 m^2	Reception, Laboratory, Pharmacy, Staff room, Consultation rooms (paediatric, gynaecology, obstetrics.), ENT clinic, patient toilet, etc.
	1F	778.00 m^2	General OPD, Specialised OPD, Dental unit, HIV consultation room, Patient toilet, etc.
Subtotal		1,538.00 m^2	
OT/Maternity Ward	GF	810.00 m^2	OT: OT(2), HDU, Recovery room, Staff locker room, OT hall, CSSD Casualty: Ambulance, Triage/Clinic, Resuscitation room, Office, Sluice/sterilisation, Staff room, etc.
	1F	699.75 m^2	Maternity: Ward (42 beds), Newborn baby room, Maternity treatment room, Nurse station, Sluice/sterilisation, Patient toilet, etc.
Subtotal		1,509.75 m^2	
Power Receiving House	1F	36.0 m^2	Power receiving room, Generator room
Total		3,083.75 m^2	
Equipment for Main OT/Casualty/HDU : 19 items Equipment for CSSD: 3 items Equipment for OPD : 10 items Equipment for Ward : 2 items Equipment for Common use : 9 items Total : 43 items			Anaesthesia Machine, Operating Table, Operating Light, Ventilators, Operating Instrument Set, etc. Autoclave, Sterilizing Container Set, etc. Diagnostic Set, Examination Couch, etc. Bed for Ward, Infant Incubator X-ray Film Viewer, Nebulizer, etc.

Outline of the Project for Kabale RRH

Project Component			Description
OPD/Casualty Block (including outpatient toilet and connecting corridor)	GF	833.20 m^2	OPD: Reception, Laboratory, Pharmacy, Staff room, Patient toilet, etc. Casualty: Ambulance, Triage/clinic, Resuscitation room, Minor OT, Sluice/sterilisation, Office, Staff room, etc.
	1F	790.00 m^2	Consultation rooms (paediatric, gynaecology, general OPD, specialised OPD), Dental unit, Patient toilet, etc.
Subtotal		1,623.20 m^2	
OT/Maternity Ward	GF	744.00 m^2	OT(3), HDU, CSSD, Recovery room, Staff locker room, OT hall, etc.
	1F	765.75 m^2	Maternity: ward (42 beds), Delivery room (5), Newborn baby room, Nurse station, Sluice/sterilisation, Patient toilet, etc.
Subtotal		1,509.75 m^2	
Total		3,132.95m^2	
Equipment for Main OT/Casualty/HDU : 24 items Equipment for CSSD: 3 items Equipment for Delivery room : 3 items Equipment for OPD : 9 items Equipment for Ward : 2 items Equipment for Common use : 11 items Total : 52 items			Anaesthesia Machine, Operating Table, Operating Light, Ventilators, Operating Instrument Set, etc. Autoclave, Sterilizing Container Set, etc. Delivery bed, Doppler, etc. Diagnostic Set, Examination Couch, etc. Bed for Ward, Infant Incubator, etc. X-ray Film Viewer, Nebulizer, etc.

Outline of the Project for Fort Portal RRH

Project Component	Description
Equipment for Main OT/Casualty/HDU: 17 items	Anaesthesia Machine, Operating Table, Operating Light, Ventilators, Operating Instrument Set, etc.
Equipment for CSSD : 2 items	Autoclave, Sterilizing Container Set
Equipment for Delivery room : 2 items	Delivery bed, Doppler
Equipment for OPD : 5 items	Diagnostic set, Examination couch, etc.
Equipment for Ward : 1 item	Infant Incubator
Equipment for common use : 8 items	X-ray Film Viewer, Nebulizer, etc.
Total : 35 items	

4. Project Schedule and Cost Estimate

When the Project is implemented, the detailed design will take about 4.0 months, the tender procedures about 3.0 months, the construction work including procurement and installation of the equipment 13.0 months and the technical assistance on the operation and management of equipment (soft component) about 1.5 months. The total cost to be borne by the Ugandan side is estimated at approximately 17 million yen.

5. Project Evaluation

(1) Relevance

The Project will be beneficial to about 6 million people, contribute to the achievement of the target goals of NHP II and HSSIP, and contribute to the improvement of the basic human needs (BHN) of the residents in the western region in Uganda as well as the safety and stability of their livelihood through the upgrading of medical services. In this regard, the significance and necessity of the Project will be high.

(2) Effectiveness

The following (1) Quantitative Effects and (2) Qualitative Effects are expected by the implementation of the grant aid project.

1) Quantitative Effects

Quantitative Effects expected by the Project are as follows.

Post-implementation project effects shall be confirmed for each target hospital based on the current situation in the fiscal year 2010/11 (from July 2010 to June 2011 according to the Ugandan fiscal year) and evaluated quantitatively with the planned value set for three years after the completion of the Project (fiscal year 2018/19)

a) Hoima RRH (targeted building components: OPD, operation theatre, casualty[*1])
   - By improving OPD, the number of outpatients per year will increase from 94,955[*2] to 122,492
   - By improving the operation theatre, the number of operations per year[*3] will increase from 1,870 to 2,412.
   - By improving the casualty, the number of emergency patients per year will increase from 2,615 to 3,373.

*1 Maternity ward is included in the targeted building components but the delivery room is not included, therefore the area will not be incorporated as one of the target sections.
*2 Outpatients: general outpatient, paediatric, surgery, orthopaedic, ophthalmology, ENT, dental, Obs/Gyn, psychiatry department
*3 Dental operation is not included.

b) Kabale RRH (targeted building components: OPD, operation theatre, casualty, maternity ward)
   - By improving the OPD, the number of outpatients per year will increase from 92,947[*4] to 119,902.
   - By improving the operation theatre, the number of operations[*5] per year will increase from 3,114 to 4,017.
   - By improving the casualty, the number of emergency patients per year will increase from 448 to 578.
   - By improving the maternity ward, the number of deliveries per year will increase from 5,754 to 7,423.

*4 Outpatients: paediatrics, internal medicine, surgery, orthopaedics, ophthalmology, ENT, dental, Obs/Gyn, psychiatry department
*5 Dental operation is not included.

c) Fort Portal RRH

Equipment procurement for the OPD, operation theatre, casualty and Obstetrics/Gynaecology (hereinafter referred to as "Obs/Gyn.") Department is planned. However, the construction of facilities are not planned for this hospital so, it would be difficult to set a specified increasing number for the each department. Therefore, only the number of OPD shall be set as the indicator.

   - By improving the OPD, the number of outpatients per year will increase from 138,437[*6] to 178,584.

*6 Outpatients: general outpatients, paediatric, internal medicine, surgery, orthopaedics, ophthalmology, ENT, dental, Obs/Gyn, psychiatry department

2) Qualitative Effects

a) By improving access and quality of healthcare services in rural areas, the targeted hospitals will become more accessible for the local residents so that hospitals become possible to accept the patients that used to be difficult.

b) By improving the targeted hospitals, they will function effectively as the top referral hospitals in the regions.

In conclusion, the validity of the Project to be implemented by grant aid of our country carried as well as the anticipated effectiveness of the Project will be high.

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APPENDICES

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Map No. 3862 Rev. 4 UNITED NATIONS
May 2003

Department of Public Information
Cartographic Section

- Facility Construction and Equipment Supply/Installation
- Equipment Supply/Installation

PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA

HOIMA
REGIONAL REFERRAL HOSPITAL

PERSPECTIVE

PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA

KABALE
REGIONAL REFERRAL HOSPITAL

PERSPECTIVE

LIST OF FIGURES AND TABLES

ABBREVIATOINS

Abbreviation	English
AfDB	African Development Bank
AIJ	Architectural Institute of Japan
A/P	Authorisation to Pay
B/A	Banking Arrangement
BHN	Basic Human Needs
BS	British Standards
CDF	Capital Development Fund
CPD	Continuous Professional Development
CSSD	Central Supply and Sterilisation Department
CSU	Central Sterilisation Unit
DAC	Development Assistance Committee
E/N	Exchange of Notes
ENT	Eye Nose Throat
EU	European Union
5S	Seiri, Seiton, Seiketsu, Shitsuke (Sort, Set, Shine, Standardize, Sustain)
G/A	Grant Agreement
GDP	Gross Domestic Product
GF	Ground Floor
GH	General Hospital
HC	Health Centre
HDU	High Dependency Unit
HSSIP	Health Sector Strategic and Investment Plan
HSSP	Health Sector Strategic Plan
JCRC	Joint Clinical Research Centre
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
MDF	Main Distribution Frame
MOFPED	Ministry of Finance, Planning and Economic Development

MOH	Ministry of Health
NGO	Non-Governmental Organisations
NHP	National Health Policy
NRH	National Referral Hospital
NWSC	National Water Service Company
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OPD	Outpatient Department
OT	Operation Theatre
PBX	Private Automatic Branch Exchanger
QS	Quantity Survey
RRH	Regional Referral Hospital
SHSSPP	Support to Health Sector Strategic Plan Project
UK	United Kingdom
UNABCEC	Uganda National Association of Building and Civil Engineering Contractors
UNBS	Uganda National Bureau of Standards
URA	Uganda Revenue Authority
USAID	United States Agency for International Development
UShs	Uganda Shilling
VAT	Value Added Tax
WB	World Bank
WHO	World Health Organisation

CHAPTER 1 BACKGROUND OF THE PROJECT

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1-1 Background, History and Outline of the Requested Japanese Assistance

In the Republic of Uganda (hereinafter referred to as "Uganda"), infant mortality rate is 76 per 1000 live births (2006), under 5 mortality rate is 137 per 1000 live births (2006) and maternal mortality ratio is 430 per 100,000 live births (2008), still displaying very high rates. In order to achieve the Millennium Development Goals (hereinafter referred to as "MDGs") by 2015, improvement of under 5 mortality rates, maternal mortality rates, infant measles immunisation coverage and delivery rates at health facilities are critical. These issues are attributable to the distribution delay and lack of medicinal products and lack of healthcare professionals, in addition to the limited access to health services of the impoverished people particularly the socially vulnerable such as women and children in rural areas. It is the pressing issue of the health sector to improve this situation and ensure treatment and prevention of diseases that can be treated and prevented.

The Government of Uganda formulated the National Health Policy (hereinafter referred to as "NHP") (1999/2000-2009/10) in 1999. Under this policy the Government of Uganda programmed the Health Sector Strategic Plan (hereinafter referred to as "HSSP"), in which the government made efforts to improve the present situation, such as, to establish a free medical care system throughout the country, to improve the rate of accessibility to medical facilities by increasing their numbers, and to strengthen the medical delivery services all the way from the community level to the district level. These efforts have produced certain tangible outcomes, such as an increase in the ratio of the population having access to a medical facility within a distance of 5 km from 49% (1999) to 72% (2004). Nevertheless, there were still a lot of medical facilities that are in need of rehabilitation and improvement of facilities and equipment, and it is quite difficult to allocate sufficient budget. Thus, the improvement of medical infrastructures has been continuously emphasised in NHP II (2010/11-2019/20) and the Health Sector Strategic and Investment Plan (hereinafter referred to as "HSSIP") (2010/11-2014/15), the succeeding programmes to NHP and HSSP. HSSIP has set its midterm target as "to attain a good standard of health for all people in Uganda in order to promote a healthy and productive life", and has set up "to improve the levels, and equity in access and demand to defined services needed for health" as one of the policies to achieve this target.

Along the policy of the Government of Uganda that would take a gradual approach to promote facility improvements divided by regions, "The Project for the Rehabilitation of Health Facilities and Supply of Medical Equipment in Mbale, Tororo, Bugiri and Busia Districts" was conducted between 2005 and 2006 and "The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment in the Central Region in Uganda" was conducted between 2009 and 2010 with grant aid of Japan.

Under such circumstances, the Government of Uganda requested grant aid for "The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment in the Western Region in Uganda" (hereinafter referred to as "the Project") in 2008, following these grant aid projects. This request

aimed to enhance the function of medical service in four hospitals at Hoima, Kabale, Fort Portal and Masindi that play important roles in the western region through the construction of facilities and the procurement of medical equipment, and consequently to upgrade the quality of medical service delivery and to establish a more efficient and effective regional referral system in the western region in Uganda.

The overall request from the Government of Uganda is summarised in the following table.

Table－1　Request Components from the Republic of Uganda

Target hospital	Hoima RRH*[1]	Kabale RRH	Fort Portal RRH	Masindi GH*[2]
Components	1.Operation theatre (OT) 2.OPD*[3] w/ casualty unit 3.Male/female ward 4.Incinerator 5.Generator room 6.Accommodation for 30 interns 7.Medical equipment (including ambulance & multipurpose vehicles)	1.OPD w/ casualty unit 2.Operation theatre 3.Maternity ward (50 beds) w/ obstetric OT 4.Incinerator 5.Generator room 6.Accommodation for 30 interns 7.Medical equipment (including ambulance & multipurpose vehicles)	1.Main laboratory 2.Casualty unit (OPD extension) 3.Accommodation for 30 interns 4.Medical equipment (including ambulance & multipurpose vehicles)	1.Operation theatre 2.OPD w/ casualty unit 3.Delivery unit for Maternity Dept 4.Generator room 5.Medical equipment (including ambulance & multipurpose vehicles)

*1: RRH: Regional Referral Hospital
*2: GH: General Hospital
*3: OPD: Outpatient Department

In response to the request, the Government of Japan decided upon the implementation of a preparatory survey of the Project, and the Japan International Cooperation Agency (hereinafter referred to as "JICA") conducted a preparatory survey (field survey I) in May 2011. The survey team surveyed the requested four hospitals and cooperation projects financed by other donors, complied an "Observations by the Survey Team" which is a comparative prioritisation list of the four hospitals, discussed with the Ugandan authorities concerned, and narrowed down to three target hospitals. After the analysis I in Japan of the results of the field survey I, JICA conducted the preparatory survey (field survey II) in August 2011, in which the survey team surveyed the target three hospitals and discussed with the Ugandan authorities in more detail, conducted field surveys of relevant governmental and private institutions, and collected referential data and information. Following the further analysis II in Japan and the draft report explanation mission in June 2012, the present preparatory survey report has been complied.

1-2　Natural Conditions

(1) Topographic Survey

The survey team and the Ugandan authorities concerned conducted site surveys at Hoima RRH and Kabale RRH to come to consent on the precise location of the new facilities to be constructed. Then a local survey consultant was called and started topographic surveys at the both sites, however, the location of the new OPD Block was changed and an additional survey

was conducted in the premises of Hoima RRH. Copies of the topographic maps at Hoima and Kabale sites are attached to Appendix 7-1 of this report. The plot plans for Hoima RRH and Kabale RRH were drawn based on the topographic maps compiled by the local consultant.

(2) Geotechnical Investigations

Geotechnical investigations were conducted at the Hoima and Kabale sites simultaneously with the topographic surveys. As the location of the OPD Block at Hoima RRH was changed during the field survey, the additional geotechnical investigations were also conducted.

At the both sites, the design soil bearing capacity (long-term) was 150 kPa/m^2 at GL-1.5m depth. Partial copies of the geotechnical investigation report at the Hoima and Kabale sites are attached to Appendix 7-2 of this report.

1-3 Environmental and Social Considerations

The Project is to construct new buildings in the current hospital premises as well as to supply and install medical equipment at Hoima RRH and Kabale RRH, and to supply and install medical equipment at Fort Portal RRH. The Project will be classified as Category C specified in JICA "Guidelines for Environmental and Social Considerations", which are likely to have minimal or little adverse impact on the environment and society. Specifically the environmental and social considerations are kept in mind in the following matters in the Project.

(1) Sewage

1) Hoima RRH

As the area around Hoima RRH is not provided with a public sewerage system, wastewater from the OPD Block and the Operation Theatre/Maternity Ward (hereinafter referred to as the OT/Maternity Ward) will be treated in a septic tank, which is a popular treatment method locally. Then the treated wastewater will be seeped underground within the site ground via a percolation pipe.

2) Kabale RRH

The area around Kabale RRH is equipped with a public sewerage system, and the wastewater from the OPD/Casualty Block and OT/Maternity Ward will be connected to the hospital's sewerage pipe and discharged into the city main sewer.

(2) Location of the Construction Site for the Outpatient Block at Hoima RRH

At the time of site surveys during the field survey I from mid May to early June, 2011, Hoima RRH expressed the Japanese survey team that they would newly obtain a park land on the opposite side of the Government Road which was owned by the Hoima District Government, and promised that the procedures for land acquisition was progressing and the Title Deed

would be issued in August 2011. (It was stated in the Minutes of Discussions for the Field Survey I.) Hoima RRH had developed a facility master plan indicated this new plot as a part of the hospital premises. In this master plan, the new OPD Block was planned in this new plot. Based on these survey results, the survey team developed four plot plans of the OPD Block during the analysis I in Japan, all of which assumed the OPD Block to be constructed in the new plot.

The Japanese survey team visited Hoima RRH again in August 2011 during the field survey II, conducted site surveys and discussed with Hoima RRH. The minutes of discussions was signed by the both parties on August 6 that the OPD Block was to be constructed in the new plot in the presence of the officers of the Health Infrastructure Division, MOH.

At a later date, however, when the local residents knew that the park was to be used for the rehabilitation of Hoima RRH, they started to react against the acquisition of the park land by Hoima RRH. Following such opposition from the local residents, Hoima RRH, MOH and the Japanese survey team discussed and agreed to place the new OPD Block within the hospital premises, at a court yard adjacent to the existing Medical Ward.

Thus the objection of the local residents to the Japanese Grant Aid for Hoima RRH has ceased, however, consideration should be given enough to the local community for the implementation of the Project.

(3) Solar Heater System

During the explanatory mission on the draft report, the Government of Uganda requested to consider a solar heater system for the hot water supply system. In the Project, hot water is planned to be supplied for the newborn baby bath in the delivery room and newborn room, as well as the scrub unit in the operation theatre in both Hoima and Kabale RRHs. It means the solar heater system, if considered, should be installed in the OT/Maternity Ward of both hospitals.

As the both hospitals are located in the equator, where abundant solar thermal is available, consumption of electric power is expected to be suppressed by introducing the solar heater system. If the Project is decided to be implemented, the solar heater system will be considered for the hot water supply facilities during the detailed design stage.

CHAPTER 2 CONTENTS OF THE PROJECT

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Superior Objectives and Project Objectives

In Uganda, accessibility for socially vulnerable people to medical services still remains limited, and the improvement of this situation is an urgent issue in the health sector.

The Government of Uganda programmed HSSP, in which the government made efforts to improve the present situation, such as, to establish a free medical care system throughout the country, to improve the rate of accessibility to medical facilities by increasing their numbers, and to strengthen the medical delivery services all the way from the community level to the district level. These efforts have produced certain tangible outcomes, such as an increase in the ratio of the population having access to a medical facility within a distance of 5 km from 49% (1999) to 72% (2004). Nevertheless, there were still a lot of medical facilities that are in need of rehabilitation and improvement of facilities and equipment, and it is quite difficult to allocate sufficient budget. Thus, the improvement of medical infrastructures has been continuously emphasised in NHP II (2010/11-2019/20) and HSSIP (2010/11-2014/15), the succeeding programmes to NHP and HSSP.

Especially, deterioration and shortage of facilities and equipment were significant at RRHs that serve as the core of regional medical services. The government founded the Capital Development Fund (hereinafter referred to as "CDF"), a system to allocate national budget directly to the RRHs, which has been applied to the construction and rehabilitation of buildings as well as the procurement and repairs of medical equipment. The CDF budget, however, is not enough to deal with large projects of facility construction and/or equipment procurement.

The superior objectives of the Project are to upgrade the quality of regional medical services, improve the accessibility to the medical facilities, establish a more efficient and effective regional referral system, which, on the whole, will contribute to the improvement of regional health. In order to realise these objectives, the Project aims to enhance the function of medical service in the target RRHs that will play important roles in the medical service delivery in the western region in Uganda through the construction of facilities and the procurement of equipment.

2-1-2 Outline of the Project

The original request from the Government of Uganda was composed of the improvement facilities and provision of equipment for Hoima RRH, Kabale RRH, Fort Portal RRH and Masindi GH. Responding to the request, JICA dispatched a preparatory survey (Outline Design) team to confirm the situation, study the appropriateness of the Project and promotion of its implementation.

When the survey team visited the WB Uganda Office during the field survey I, it was revealed that Masindi GH was highly prioritised as one of the target hospitals of the WB's Uganda Health

Systems Strengthening Project. Accordingly, the Ministry of Health (hereinafter referred to as "MOH) of Uganda and the survey team agreed to exclude Masindi GH from the Project. Also it was found through the field surveys that Fort Portal RRH had the facilities renovated in recent years and the necessity and urgency for the rehabilitation of facilities was not very high compared to Hoima and Kabale RRHs. On the other hand, deterioration and shortage of medical equipment was as remarkable as these two RRHs; thus, it was agreed that medical equipment would be provided for Hoima, Kabale and Fort Portal RRHs.

The assistance components of the Project are to construct the Outpatient Department Block (hereinafter referred to as "OPD Block") and the Operation Theatre/Maternity Ward (hereinafter referred to as "OT/Maternity Ward) at Hoima RRH and the OPD/Casualty Block and the OT/Maternity Ward at Kabale RRH, and procure the equipment at Hoima, Kabale and Fort Portal RRHs, and implement the Soft Component assistance for appropriate operations and maintenance of equipment. It is expected that the Soft Component assistance will enable the effective use of equipment and conduction of medical activities.

Table-1 Outline of the Project for Hoima RRH

Project Component		Description
OPD Block (including outpatient toilet)	GF 760.00 m^2	Reception, Laboratory, Pharmacy, Staff room, Consultation rooms (paediatric, gynaecology, obstetrics.), ENT clinic, patient toilet, etc.
	1F 778.00 m^2	General OPD, Specialised OPD, Dental unit, HIV consultation room, Patient toilet, etc.
Subtotal	1,538.00 m^2	
OT/Maternity Ward	GF 810.00 m^2	OT: OT(2), HDU, Recovery room, Staff locker room, OT hall, CSSD Casualty: Ambulance, Triage/Clinic, Resuscitation room, Office, Sluice/sterilisation, Staff room, etc.
	1F 699.75 m^2	Maternity: Ward (42 beds), Newborn baby room, Maternity treatment room, Nurse station, Sluice/sterilisation, Patient toilet, etc.
Subtotal	1,509.75 m^2	
Power Receiving House	1F 36.0 m^2	Power receiving room, Generator room
Total	3,083.75 m^2	
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Table-2 Outline of the Project for Kabale RRH

Project Component		Description
OPD/Casualty Block (including outpatient toilet and connecting corridor)	GF 833.20 m^2	OPD: Reception, Laboratory, Pharmacy, Staff room, Patient toilet, etc. Casualty: Ambulance, Triage/clinic, Resuscitation room, Minor OT, Sluice/sterilisation, Office, Staff room, etc.
	1F 790.00 m^2	Consultation rooms (paediatric, gynaecology, general OPD, specialised OPD), Dental unit, Patient toilet, etc.
Subtotal	1,623.20 m^2	
OT/Maternity Ward	GF 744.00 m^2	OT(3), HDU, CSSD, Recovery room, Staff locker room, OT hall, etc.
	1F 765.75 m^2	Maternity: ward (42 beds), Delivery room (5), Newborn baby room, Nurse station, Sluice/sterilisation, Patient toilet, etc.
Subtotal	1,509.75 m^2	
Total	3,132.95m^2	
Equipment for Main OT/Casualty/HDU : 24 items Equipment for CSSD: 3 items Equipment for Delivery room : 3 items Equipment for OPD : 9 items Equipment for Ward : 2 items Equipment for Common use : 11 items Total : 52 items		Anaesthesia Machine, Operating Table, Operating Light, Ventilators, Operating Instrument Set, etc. Autoclave, Sterilizing Container Set, etc. Delivery bed, Doppler, etc. Diagnostic Set, Examination Couch, etc. Bed for Ward, Infant Incubator, etc. X-ray Film Viewer, Nebulizer, etc.

Table-3 Outline of the Project for Fort Portal RRH

Project Component	Description
Equipment for Main OT/Casualty/HDU: 17 items Equipment for CSSD : 2 items Equipment for Delivery room : 2 items Equipment for OPD : 5 items Equipment for Ward : 1 item Equipment for common use : 8 items Total : 35 items	Anaesthesia Machine, Operating Table, Operating Light, Ventilators, Operating Instrument Set, etc. Autoclave, Sterilizing Container Set Delivery bed, Doppler Diagnostic set, Examination couch, etc. Infant Incubator X-ray Film Viewer, Nebulizer, etc.

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

(1) Basic Policies

1) Strengthening of the hospital function

The objective of the Project is to strengthen the hospital functions of the three target hospitals to the essential levels required of secondary medical facilities in order to promote the improvement of the medical services and referral system in the western region in Uganda.

2) Consideration for the facility master plan

Following the establishment of CDF in 2008/09, each RRH commissioned the programming of a master plan to architectural and engineering consultant offices in and around Kampala with the support of the Health Infrastructure Division of MOH., and a provisional master plan was developed for each RRH in 2009/10. Provisional facility master plans have been developed for Hoima RRH and Kabale RRH, however, they have not been officially approved by the Health Infrastructure Division of MOH, and the requirements and conditions on which the master plans are based on seem obscure. The facility master plans may be reviewed in future, however, the facilities to be rehabilitated in the Project should be planned in consideration that they will continuously take the central role of medical service at delivery in the future.

3) Determination of the size of the planned facilities

The scale or size of the planned facilities of the target hospitals will be determined based on performance data on diagnosis and treatment during the past three years, and also consider forecast population increases in the areas to be covered by these hospitals.

4) Height of the buildings

In principle, the buildings will be two stories in height to effectively utilise the limited available site area of the hospitals with the minimum adverse effects on the medical services. Staircases and ramps will be used as the means of access in the vertical direction instead of elevators or similar facilities that may require considerable maintenance costs.

5) Structural design

The Project will adopt Ugandan standards for earthquake resistance and wind force resistance. The structure of the target hospital facilities will be designed to allow the facilities to provide continuous medical activities without disruption in case of natural disasters (particularly rainy seasons and earthquakes) taking into consideration of Uganda’s natural conditions.

6) Technical and fiscal sustainability

The facility plan and equipment plan will be formed in consideration of the technical and

fiscal sustainability of the hospitals, based on their managerial capabilities (number of medical and healthcare professionals, their technical levels, financial affordability, state of procurement of consumables and replacement parts, etc.) and the staff reinforcement plan of the medical staff. The construction materials are to be selected with preference to those meeting the criteria for sturdiness, low maintenance requirements, availability in the local markets, and ease of replacement or repairs.

7) Plot plan and construction plan to enable the provision of sustainable medical service delivery
Candidate lots for the construction site have been proposed by Hoima RRH and Kabale RRH. These candidate sites will be respected and the plot plans as well as the construction plans will be developed that will least interfere with medical services of each hospital during the construction work periods.

8) Equipment plan
Basic polities for equipment planning are as follows:
① Consistency with functions, hospital level and staff/ activity size of the targeted hospitals
② Operation and management without problems after implementation of the Project
③ Consistency with hospital facilities
④ Effective utilization of existing equipment

In addition, the equipment requested during the field survey was numerous and covering all the departments, so targeting all the equipment seemed to be unfeasible in terms of scale and budget for the Project. Therefore it was decided to take such the procedures; the equipment suitable for the Project was selected first by the established criteria, along with the policies above, then, the adequate equipment suitable for each hospital situation is planned with confirming the relevancy.

9) Soft components (Technical Assistance)
For promoting effective utilisation of the procured equipment, Ugandan side requested for technical assistance to improve the skill of equipment maintenance. Each hospital's condition, technical level and the cooperation with on-going technical cooperation project, "The Project on Improvement of Health Service through Health Infrastructure Management" should be considered for planning this technical assistance.

10) Coordination with supports by other donors
The project will be fully informed of the support programs of other donors, and will be careful that assistance provided by the Project will not duplicate the activities of other donors.

(2) Policies to Natural Conditions

1) Temperature and humidity

The monthly mean maximum temperatures at Hoima and Kabale range from 25˚C to 28˚C, and the temperature does not exceed 30˚C. Air conditioners will not be installed in general. The facilities will be designed to allow ample natural airflow to realise sufficient ventilation. However, air conditioners will be installed in such rooms that require a high degree of cleanliness such as operation theatres and High Dependence Unit (hereinafter referred to as "HDU").

2) Precipitation

Both Hoima and Kabale have rainfall throughout the year. The annual precipitation is less than that of Japan.

Data on hourly maximum precipitation are not available, but daily maximum does not exceed 100 mm. Determination of the amount of rainwater runoff from the roof and exterior drainage capacity will follow more rigorous Japanese standards for the selection of standpipes for rainwater drainage to allow a good margin of safety.

(3) Policies to Socio-economic Customs

According to the documents issued by the Uganda Bureau of Statistics, construction costs rose about 11% during the past several years. In especial, significant increases are observed in the prices of fuel, such as petrol and diesel. The three target hospitals at Kabale and Hoima and Fort Portal are situated in the western region, at a distance of 200 ~ 400km from Kampala. Therefore, transportation costs of construction materials and medical equipment share a large percentage of the project cost. In developing the facility construction and equipment procurement plans, these requirements should be taken into consideration.

(4) Policies to Construction and Procurement Situations

A number of buildings including high-rise hotel and office buildings and large commercial buildings are constructed, and elevators are seen in Kampala. On the other hand, in Kabale and Hoima, even large commercial buildings are 4 or 5 stories high in which elevators are not installed.

The buildings to be constructed in the Project will be 2 stories high in principle. Staircases and ramps will be planned instead of the elevators.

The labour situation has an excess in total working population exceeding demand, and most of the workers are simple unskilled labourers. Skilled workers are in significantly short supply in terms of both quality and number. Their skill levels are not as high as equivalent workers in advanced countries. The locally prevalent construction methods should be adopted as much as possible.

(5) Policies to Employing Local Contractors

Currently, about 70 companies are registered with the Uganda National Association of Building and Civil Engineering Contractors (hereinafter referred to as "UNABCEC"). Member companies are not categorised by trade such and architecture or civil, but classified by sales amount in five ranks, A*, A, B, C and D. Companies of A* rank are the largest companies. Bulletins published by UNABCEC do not indicate data on capital, assets, number of employees, past performance, or yearly contract amounts of member companies.

There are some local construction companies that have experiences in construction works associated with Japanese ODA projects. These companies are all classified as A* or A rank companies by UNABCEC.

It is said that there are three large local construction companies in Uganda, one with European capital and the other two with Indian capital. The construction costs of the company with European capital are said to be higher than the other two. There is no company with Japanese capital, but some Japanese companies have local business offices or liaison offices in Uganda. They mainly receive contracts for ODA works. The technical levels of Ugandan construction companies are still lower than advanced countries. Therefore, the direct management of Japanese engineers is essential if local companies are employed as subcontractors of Japanese enterprises. These Japanese engineers will conduct detailed examinations of construction processes, quality management, and safety management as well as providing technical instruction. The labour pool of construction workers is relatively abundant. However, skilled workers may be in short supply depending upon the trade. The project will consider as necessary the use of skilled expatriate workers from third countries.

The Project is to construct hospital facilities and the degree of difficulty of construction works is relatively high. Under the Japanese Grant Aid scheme, a Japanese construction contractor will employ local contractors as the subcontractors to carry out construction works. The subcontractors will be large-scale local companies with higher construction capabilities falling under rank A* or A.

(6) Policies concerning Capability of the Implementing Agency for Proper Management and Maintenance

1) Facility plan

Hoima RRH and Kabale RRH have both been in service for about eighty years since they were commissioned. During this long period, hospital facilities have been added and modified one after another. Both Hoima RRH and Kabale RRH have about twenty buildings. Many of them were built between 1930 and 1950. Some of these structures are seriously deteriorated.

At present, several persons are in charge of maintenance of facilities and equipment in Hoima RRH and Kabale RRH. The work on the equipment maintenance in principle and only one technician is in charge of facility maintenance.

In planning the Project, the most important issue is ease of maintenance and reduction of running costs. Facilities and equipment of the proper quality will be selected, and they should

be locally procurable to the extent possible.

2) Equipment plan

Some equipment needs specific consumables. Basically the failure of medical equipment is inevitable in the long term, and some equipment requires specific parts for repairs. Therefore, the following points need to be fully considered for the equipment planning.

① Agency handling the equipment should exist in Uganda or neighbour countries.
② Equipment requiring high operation cost should be eliminated.
③ Specifications of equipment should correspond to the technical level of the targeted hospitals.

(7) Policies for setting Grade of Facilities and Equipment

1) Facility plan

The designs of the hospital buildings will comply with the provisions of the following standards in use in Uganda applicable to hospital facilities, etc. The facility plan will incorporate environmental consideration, prevention of nosocomial infection, caring for those with disabilities, and ability to cope with disaster.

- Public Health Act
- Structural Design Guide Line (Draft 2004)
- Seismic Code Practice for Structural Designs – U319

The hospital components (departments and sections, etc.) and functions of similar medical facilities in Uganda will also be referred to in setting the grade for each department and each room commensurate with their performance requirements in order to develop a facility plan that will maximise cost-effectiveness.

2) Equipment

In Uganda, there is a "Standard List of Medical Equipment and Furniture (hereinafter referred to as the "Standard List")" guiding the suitable equipment for each level of the health facilities and this Standard List also includes the general specifications. In planning the grade and specification of the equipment, this Standard List should be referred to.

However, it often contains higher specifications than the actual necessity. Therefore, the standard list should be used as a reference and the grade of equipment should be planned corresponding to the services delivered by the targeted hospitals and technical level of staff with referring the similar level of hospitals.

(8) Policies to Methods and Period of Construction and Procurement

1) Policy to the method of construction

Locally common construction methods in Uganda will be preferentially adopted to try to ease

the acquisition, maintenance and control. Also, materials will be selected taking into account of the availability of materials in the Ugandan market.

2) Policy to the method of procurement

Uganda is basically an agricultural country, with coffee, tea and fishery products as its main products. Uganda depends almost entire on import for the supply of construction materials mainly from Kenya, South Africa, India, etc. except for a few materials such as cement, bricks and reinforcement steel, etc. In order to facilitate maintenance after the completion of the Project, the construction materials will be procured locally to the extent possible. In such cases, the quality and quantity of material supply should be carefully investigated so that the construction schedule may not be adversely affected.

Materials, products and equipment to be imported from Japan and third countries will be shipped to the Port of Mombasa, Kenya. The goods will then be transported by truck to each site. The goods will undergo the customs clearance at the country border city Malaba.

The Project includes procurement of medical equipment that is expected to be shipped by air. The medical equipment will be airfreighted from Japan or third countries to Entebbe Airport in Uganda, and then transported to each site by road.

3) Policy to the construction period

The Project is construction of about 3,000 m^2 size at both Hoima RRH and Kabale RRH. In consideration that the entire construction period is expected to be 13.0 months, and that the two sites are away from each other, it is regarded appropriate to conduct the Project in a single year by commencing the construction works at the two sites simultaneously.

The both construction sites are situated in the hospital premises. Improvement of various infrastructures such as rerouting of soil sewerage, as well as demolishing of the existing facilities will be implemented under the responsibility of Uganda. Therefore, it is important that all the concerned persons thoroughly understand and confirm with each other the construction implementation schedule so that the progress in the construction of the project buildings may not be hindered. It is also important that the construction works will be well planned so as not to hinder the medical services and routing hospital operations.

2-2-2 Basic Plan

2-2-2-1 Overall Project Description

(1) Transition of the Request

Initial Request (Request Proposal) (August 2008)	Preparatory Survey: Final Request at Field Survey I (June 2011)	Preparatory Survey: Final Request at Field Survey II (August 2011)	Final Scope for Cooperation
Target hospital & component	Target hospital & component	Target hospital & component	Target hospital & component
Hoima RRH	Hoima RRH	Hoima RRH	Hoima RRH
1.Operation theatre 2.OPD w/ casualty unit 3.Male/female ward 4.Incinerator 5.Generator room 6.Accommodation for 30 interns 7.Medical equipment (including ambulance & multipurpose vehicles)	1.OPD w/ casualty unit 2.Operation theatre (3 OT w/ CSU) 3.Maternity ward (50 beds) 4.Medical equipment (including ambulance & multipurpose vehicles)	1.OPD (2 stories) 2.OT/Maternity ward (w/ casualty unit, 2 OT, CSU & HDU, 50 beds for maternity ward) 3.Medical equipment (including ambulance vehicles)	1.OPD (2 stories) 2.OT/Maternity ward (casualty unit, 2 operation rooms, CSSD & HDU, 42 beds for maternity ward) 3.Medical equipment
Kabale RRH	Kabale RRH	Kabale RRH	Kabale RRH
1.OPD w/ casualty unit 2.Operation theatre 3.Maternity ward (50 beds) w/ obstetric OT 4.Incinerator 5.Generator room 6.Accommodation for 30 interns 7.Medical equipment (including ambulance & multipurpose vehicles)	1.OPD w/ casualty unit 2.Operation theatre (3 OT w/ CSU & ICU) 3. Maternity ward (80 beds) w/ obstetric OT 4.Medical equipment (including ambulance & multipurpose vehicles)	1.OPD (2 stories, w/ casualty unit) 2.OT/Maternity ward (3 OT w/ CSU & HDU, 5 delivery rooms, 58 beds for maternity ward) 3.Medical equipment (including ambulance vehicles)	1.OPD/Casualty Bldg. (2 stories, w/ casualty unit) 2.OT/Maternity ward (3 OT w/ CSSD & HDU, 5 delivery rooms, 34 beds for maternity ward) 3.Medical equipment
Fort Portal RRH	Fort Portal RRH	Fort Portal RRH	Fort Portal RRH
1.Main laboratory 2.Casualty unit (OPD extension) 3.Accommodation for 30 interns 4.Medical equipment (including ambulance & multipurpose vehicles)	Medical equipment (including ambulance & multipurpose vehicles)	Medical equipment (including ambulance vehicles)	Medical equipment
Masindi GH	Masindi GH		
1.Operation theatre 2.OPD w/ casualty unit 3.Delivery unit for Maternity Dept 4.Generator room 5.Medical equipment (including ambulance & multipurpose vehicles)	To be renovated under the rehabilitation project by the World Bank. Excluded from Japanese Grant Aid.		

Inception Report
- Examination of the criteria for selecting the target hospitals

Analysis I in Japan & Interim Report
- Facilities
Analysis and review of the request components of Hoima RRH and Kabale RRH

- Equipment
Examination of the criteria for selection of the medical equipment and analysis / review of the request components for Hoima, Kabale and Fort Portal RRHs

Analysis II in Japan
- Facility planning for Hoima and Kabale RRHs
- Equipment planning for Hoima, Kabale and Fort Portal RRHs

Figure-1 Transition of the Request

(2) Selection of the Target Hospitals

Through the analysis of the results of the field survey I, the survey team has compiled the findings into the "Observations by the Survey Team".

Table-4 Observations by the Survey Team (June 1st, 2011)

Criteria	Hoima RRH	Kabale RRH	Fort Portal RRH	Masindi GH
Improvement and support plans by other donors during last 10 years	Constructed and now functioning ・Eye department (NGO, UK) ・Mental ward (AfDB) ・Paediatric ward (Renovated by the Government of Italy)	Constructed and now functioning ・Mental ward (AfDB) ・Eye department (Lions Aid, Norway)	Constructed and now functioning ・Mental ward (AfDB) To be constructed ・Main laboratory (USAID)	Loan amount of investment for GH and HC4 was agreed with WB and Masindi was highly prioritized as 4th rank for systematic rehabilitation
Improvement and support plans by national budget	・Lab extension (CDF) Under Construction ・Paying ward (CDF) ・Drug store (CDF) ・Staff housing (CDF) ・Getting land for the expansion (CDF)	Under Construction ・Private wing (CDF) ・Nurses' hostel (CDF) Constructed, but waiting for a specialist and equipment supply ・ENT department (MOH)	Main facilities were invested recently by MOH and now functioning Under Construction ・Private wing (CDF) ・Staff housing and Interns' hostel (CDF)	
Status and needs of facilities	・Established in 1938 ・Old buildings but look not so bad ・OPD & maternity ward so much crowded ・Many buildings were built by other donors ・New OPD is planned to build across the public road & land title is under preparation ・Status of power supply is very bad ・Staff housing under construction **・Need of new facilities seems very high**	・Established in 1944 ・Old buildings but look not so bad ・Building space is insufficient ・OPD, surgical ward & maternity ward so much crowded ・Beautiful garden court to be conserved ・Frequent power failure ・Private wing & nurses' hostel under construction **・Need of new facilities seems very high**	・Established in 1930 ・Many buildings newly built & rehabilitated ・New laboratory building will be built by other donor's fund ・Buildings are well maintained & kept clean ・Private wing & staff housing under construction **・Need of new facilities seems not imminent**	・Established in 1922 ・Old buildings **・WB financial support is expected**
Status and needs of equipments	Shortage of essential medical equipment ・Operation theatre ・CSU ・Laboratory etc.	Shortage of essential medical equipment ・Operation theatre ・CSU ・Laboratory etc.	Laboratory equipment will be procured by USAID Shortage of essential medical equipment ・Operation theatre ・CSU etc.	Medical equipment will be procured by WB

Hospital function	**Treatment Department**	･OPD･Gyn/Obs･Internal medicine･Surgical/Orthopaedic･Paediatric･Psychiatry･Eye･Dental･TB	･OPD･Gyn/Obs･Internal medicine･Surgical/Orthopaedic･Paediatric･Psychiatry･Eye･Dental･TB	･OPD･Gyn/Obs･Internal medicine･Surgical/Orthopaedic･Paediatric･Psychiatry･Eye･Dental･TB	
	Human resource (Doctors and other staffs)	MDs with specialty ･Physician 1 ･Obs/Gyn. 1 ･Paediatric 1 ･Ophthalmology 2 ･Anaesthetic 1 ･Public health 1 General MDs 5 Clinical Officers 10 Anaesthetic Officers 4 Orthopaedic staffs 4 Radiographers 1 Laboratory staffs 5	MDs with specialty ･Physician 1 ･Obs/Gyn. 3 ･Ophthalmology 1 General MDs 2 Clinical Officers 6 Anaesthetic Officers 3 Orthopaedic staffs 5 Radiographers 3 Laboratory staffs 10	MDs with specialty ･Physician 1 ･Surgeons 2 ･Obs/Gyn 1 ･Paediatric 1 ･Ophthalmology 1 ･Radiology 1 General MDs 9 Clinical Officers 15 Anaesthetic Officers 3 Orthopaedic staffs 8 Radiographers 3 Laboratory staffs 4	MDs 3 Clinical Officers 6
Referral system	**Referral cases**	･Surgery/Orthopaedic surgery, needing specialists ･Further investigation by specialists (Neurological, Heart, etc.) ･Evaluation with CT, Endoscopy, Biopsy etc. ･Special care (palliative, chemotherapy)	･Surgery/Orthopaedic surgery, needing specialists ･Further investigation by specialists (Neurological, Heart, Eye etc.) ･Evaluation with CT, Endoscopy, Biopsy etc. ･Special care (palliative, chemotherapy) ･Mental	･Further investigation by specialists (Neurological, Heart, ENT etc.) ･Evaluation with CT, Endoscopy, Biopsy etc. ･Complicated orthopaedic surgery ･Special care (palliative, chemotherapy) ･Mental	
	Referred hospital	Mainly Mulago	Mainly Mulago or Mbarara, Otherwise Private hospitals in the same area	Mainly Mulago, Otherwise Butabika (for mental health)	Mulago, Hoima, Gulu
Others		･Requesting a surgeon to MOH	･Requesting a surgeon to MOH	･Comparatively hospital management are well organized	
Suggestion by the Survey Team		･Facilities rehabilitation, and standard equipment supply ･Fulfilment of doctors (especially surgeon)	･Facilities rehabilitation, and standard equipment supply ･Fulfilment of doctors (especially surgeon)	･Equipment supply to upgrade the medical services ･ENT/Eye & Casualty Unit are needed but those are small buildings and could be improved by the hospital	WB financial support is expected.

(3) Request Components from the Recipient Country at the Field Survey I

1) Facilities

The request components presented by MOH in response to the results of the field surveys at the four candidate hospitals are summarised in the following table.

Hospital	Request Components
Hoima RRH	- Construction of OPD with Casualty Unit - Construction of an Operation Theatre (3 operation rooms) complete with CSU - Construction of a Maternity Ward (50 beds) - Procurement of medical equipment including ambulance vehicle and multipurpose vehicle
Kabale RRH	- Construction of OPD with Casualty Unit - Construction of an Operation Theatre (3 operation rooms) complete with a central sterilising unit (CSU) and ICU - Construction of a Maternity Ward (80 beds) with an obstetrics theatre - Procurement of medical equipment including ambulance vehicle and multipurpose vehicle
Fort Portal RRH	- Procurement of medical equipment including ambulance vehicle and multipurpose vehicle
Masindi GH	- To be excluded from the Project because the WB's financial support is expected.

2) Equipment

The equipment study on the request from Masindi GH was not conducted, for the reason that rehabilitation of the hospital infrastructure was to be carried out by the Uganda Health Systems Strengthening Project by WB and decided not to be covered by the scope of the Project. The rehabilitation of the facilities at Fort Portal RRH was also excluded from the Project because the facilities seemed sufficient and in good conditions. However, the situation of existing equipment in this hospital was confirmed to be deficient and decrepit, so the equipment rehabilitation was decided to be included to the scope of the Project. The survey team confirmed if the equipment list shown on the application form was the final request or not. However, the target hospitals did not recognise the contents of the request, so the survey team requested each target hospital to prepare the list of the final requested equipment and received it by the end of field survey.

(4) Request Components from the Recipient Country at the Field Survey II

1) Facilities

As a result of the discussions with MOH, Hoima RRH and Kabale RRH based on the analysis I in Japan, the request components were narrowed down as follows:

Hospital	Request Components at Field Survey I	Request Components at Field Survey II
Hoima RRH	1 Construction of OPD with Casualty Unit 2 Construction of an Operation Theatre (3 operation rooms) complete with CSU 3 Construction of a Maternity Ward (50 beds)	1. OPD (2 stories) GF: reception, laboratory, pharmacy, clinic (6 rooms), others 1F: clinic (5 rooms), dental clinic, others 2. OT/Maternity Ward (2 stories) GF: operation theatre (2 rooms) with ancillary rooms, HDU, CSU, casualty unit 1F: maternity ward (50 beds)

Hospital	Request Components at Field Survey I		Request Components at Field Survey II
Kabale RRH	1 Construction of OPD with Casualty Unit 2 Construction of an Operation Theatre (3 operation rooms) complete with CSU and ICU 3 Construction of a Maternity Ward (80 beds) with an obstetrics theatre	⇒	1. OPD/Casualty Block (2 stories) GF: OPD: reception, laboratory, pharmacy, casualty unit, others 1F: OPD: clinic (7 rooms), dental clinic, others 2. OT/Maternity Ward (2 stories) GF: operation theatre (3 rooms, one for obstetric operation) with ancillary rooms, HDU, CSU 1F: maternity ward (58 beds), 5 delivery rooms, new born room, other ancillary rooms

Major differences in the two request components are as follows:

① Hoima RRH

a) Because the OPD Block and OT/Maternity Ward are designed at separate locations in the hospital premises, the casualty unit is planned in the OT/Maternity Ward. The OPD Block accommodates rooms for the outpatient department only.

b) Three operation rooms were requested at first, but there was one operation room exclusively for obstetric operation in the existing maternity ward. The survey team calculated two operation rooms would be sufficient to cater for the demand even taking into account the past records and assumed population increase in future (five years after the completion of the Project), and recommended two operation, which the Ugandan side agreed upon. (See '2-2-2-3 I (2) 2)③Operation theatre' for details.)

② Kabale RRH

a) The original request for two single-story buildings; one for the operation theatre and the other for the maternity ward was changed to a two-story building composed of the operation theatre on the ground floor and the maternity ward on the first floor.

b) Relevant to the above change, three operation rooms were designed in the operation theatre, including one for obstetric operation.

c) Twenty two beds were planned to remain at the existing Maternity Ward, and 10 beds were planned for ophthalmology and ENT respectively. Consequently, 58 beds were requested for the new Maternity Ward, so that Kabale RRH would have 92 beds in the Maternity Ward in total. (See '2-2-2-3 I (3) 2)④Maternity Ward' for details.)

2) Equipment

During the field survey II, the Survey Team had discussions with the concerned parties of MOH and the target hospitals on the tentative version of selection criteria which was drafted based on the results of field survey I. The final list of requested equipment was established out of the requested equipment collected during the field survey I, through the evaluation of the validity of equipment based on these criteria.

3) Soft component

According to MOH, there were the cases that the procured equipment was not utilised effectively in the past projects, which caused by the reasons that the instruction on the equipment operation and maintenance and information on the procurement of consumables and spare parts was not sufficient and that the system of maintenance and management was still immature. Under these circumstances, the Ugandan side requested for the technical assistance on improving the maintenance skills and clinical skills for operation of the procured equipment under the Project.

"Project on Improving of Health Service through Health Infrastructure Management", the technical cooperation by JICA is presently implemented to enforce the management system of medical equipment in the health facilities in Uganda. This technical cooperation is planned to be countrywide activities and it could be difficult to expect the cooperation specialised on the improvement of skill of the planned equipment by this grant aid project. Therefore, the technical assistance for the specified equipment was planned as Soft Component under the cooperation with the technical cooperation project.

2-2-2-2 Site Planning

(1) Hoima RRH

As it was described in '1-3 Environmental and Social Considerations', following opposition from local residents during the field survey I about the candidate site that Hoima RRH intended to obtain for the construction of a new OPD Block, both the Ugandan and Japanese sides agreed to place the new OPD Block within the hospital premises.

There is a courtyard in the hospital premises to be large enough by removing the existing container office between MCH and the Administration Bldg. facing the front street. The new OPD Block is planned in this space.

The new OPD Block and the OT/Maternity Ward will be located at places separated by the hospital road. The casualty unit is usually situated in the OPD building, however, there is a need to strengthen cooperation of the casualty unit and the operation theatre; therefore the casualty unit will be combined in the operation theatre. The OT/Maternity Ward will be placed in the space to be created by dismantling the decrepit existing OT and kitchen, because it is desirable to construct the OT/Maternity Ward adjacent to the existing Maternity Ward.

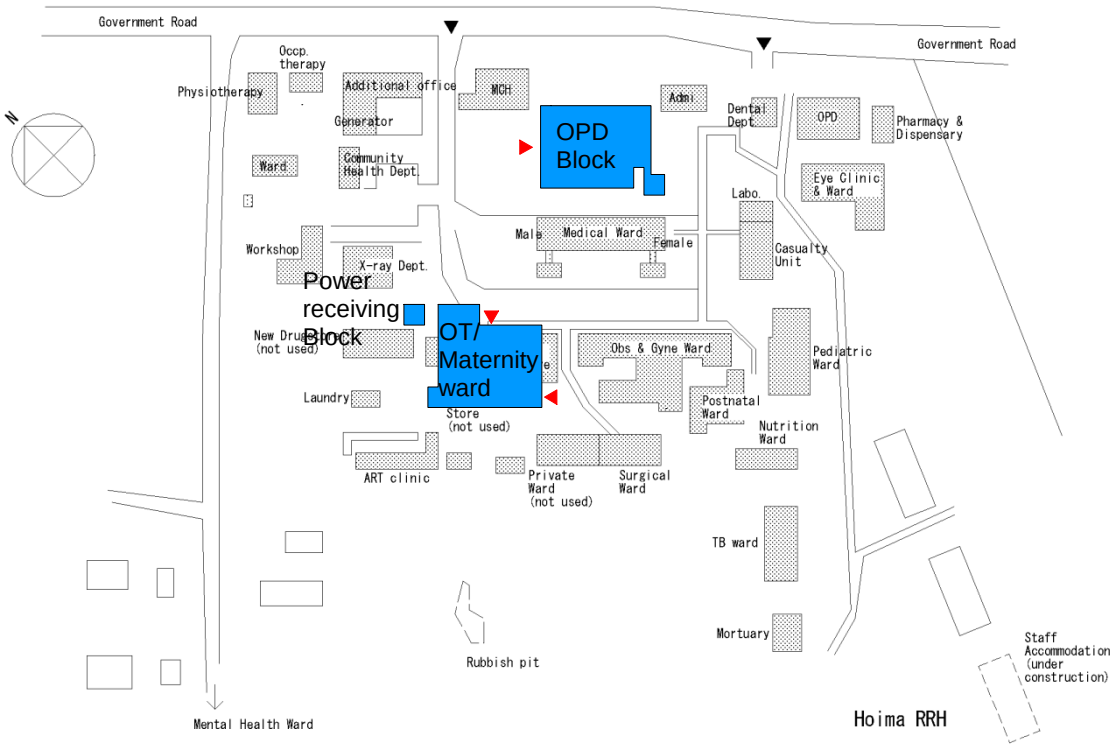


Figure-2 Hoima RRH: Layout Planning

(2) Kabale RRH

The candidate site that Kabale RRH wished during the field survey I for the construction of a new OPD/Casualty Block is owned by Kabale RRH, but because of concerns about taking time to negotiate for evacuation of the residents who currently occupy there, both the Uganda and Japanese sides agreed to situate the OPD/Casualty Block at the adjacent space on the south of the existing OPD building.

The OT/Maternity Ward will be planned at the space to be created by demolishing the existing operation theatre, and the two buildings will be connected by a connection corridor.

The decrepit existing OPD building will be demolished after the completion of the OPD/Casualty Block, and its space will be used for the parking lot and front yard.

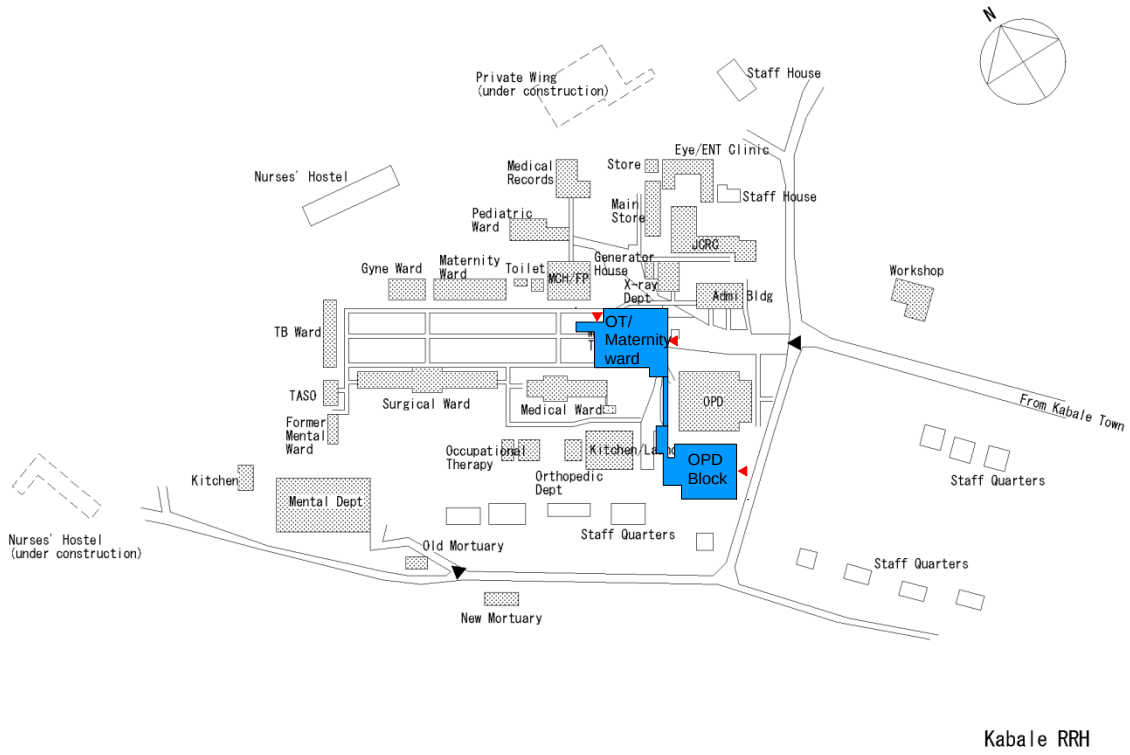


Figure-3 Kabale RRH: Layout Planning

2-2-2-3 Facility Planning

I Architectural Planning

(1) Design Conditions for planning the capacity of facilities

The number and size of main rooms of each department is determined using the assumption explained below based on the number of patients forecast for the year 2018/2019, or five years after completion and commissioning of the Project. The number of patients in 2018/2019 is forecast based on the past data (number of patients or number of operations, for example) of both hospitals and on the rate of population increase in Uganda.

1) Assumed population increase

The number of patients may be assumed to increase in proportion to the population. As a first step, the population of the western region in Uganda for 2018/2019 is forecast and the rate of population increase is calculated. The newest data of population, the year 2009/2010 is set as 1, and the population in 2018/2019 is estimated.

The annual population increase is 3.2% according to the MOH's "The State of Uganda Population Report". Then, the population in the year 2018/2019 is expected as 1.29. This figure is used for the estimation of the number of patients.

2010/11		1		
2011/12	x1.032	1.032		
2012/13	x1.032	1.065		
2013/14	x1.032	1.099		
2014/15	x1.032	1.134		
2015/16	x1.032	1.171		
2016/17	x1.032	1.208		
2017/18	x1.032	1.247		
2018/19	x1.032	1.287	→	**1.29**

2) Conditions of hospital operation

The working days and operation hours of each department of the target hospitals are set as follows according to the workload analysis of RRHs in the western region in Uganda.

Department	Conditions of Hospital Operation	
OPD	300 days/year	8 hours/day
Casualty	365 days/year	24 hours/day
Delivery	365 days/year	
Operation cases	365 days/year	6 cases/room･day
Average admission days in the Maternity Ward	5 days (following the past records at Kabale RRH and Hoima RRH)	
Bed occupancy	90%	
Consultation time	Medicine, Paediatrics	8 minutes/person/room
	Other departments	20 minutes/person/room

(2) Hoima RRH

1) Number of Patients

Following table shows the number of patients at each department of Hoima RRH in the past three years.

Patients/visitors at each department		2008/09	2009/10	2010/11	Average	Remark
A.	Outpatients	106,992	110,067	104,603	107,221	
	(Breakdown)					
	General OPD (Medical)	36,879	55,369	37,928	43,392	
	Casualty	123	118	272	171	
	Paediatrics	10,014	11,291	14,455	11,920	
	Gynaecology	928	725	864	839	
	Surgery	487	39	0	175	
	Orthopaedics	1,526	1,078	1,972	1,525	
	Ophthalmology	5,556	6,752	7,959	6,756	Existing
	Dental	9,686	10,050	11,461	10,399	
	Private	0	0	0	0	
	ENT	2,865	2,561	2,471	2,632	
	Physiotherapy	921	618	1,184	908	Existing
	Occupational therapy	0	0	0	0	Existing
	Hypertension	1,622	1,257	1,411	1,430	
	Diabetes	943	783	1,248	991	
	HIV/AIDS	3,805	1,406	3,098	2,770	
	Psychiatry	5,605	6,739	7,504	6,616	Existing
	Antenatal	24,400	9,484	10,341	14,742	
	Family Planning	1,632	1,797	2,435	1,955	
	Total	106,992	110,067	104,603	107,221	
		(93,278)	(94,161)	(85,521)	**(90,986)**	Excluding ophthalmology, physiotherapy, occupational therapy, psychiatry and family planning
B.	No. of emergency patients	1,971	2,374	2,615	2,320	
	(Breakdown)					
	Injuries - Road Accidents	335	337	448	373	
	Injuries (Trauma due to other causes)	1,470	1,846	1,958	1,758	
	Animal / Snake bites	166	191	209	189	
	Total	1,971	2,374	2,615	**2,320**	
C.	Operations	13,320	13,822	13,331	13,491	
	Dental operation	-9,686	-10,050	-11,461	-10,399	
	Operations except for dental operation	3,634	3,772	1,870	**3,092**	
	(Caesarean)	(894)	(996)	(1,178)	(1,023)	
D.	Inpatients in the Maternity Ward	4,122	4,193	4,164	4,160	
	Annual total admission days (person・day)	16,212	18,224	18,616	17,684	
	Average admission days (day)	3.93	4.35	4.47	4.25	
	Bed occupancy rate (%)	153.16%	172.17%	175.87%	**167.07%**	
E.	Total No. of deliveries	3,544	3,685	3,687	**3,639**	

2) Study by department

① OPD

<Preconditions>

1. Consultation rooms for ophthalmology, physiotherapy, occupational therapy, psychiatry and family planning are not considered, because they already have the rooms.
2. Among other departments, consultation rooms for medical (general OPD), paediatric, dental and ENT departments that have many patients, as well as for antenatal, gynaecology and HIV/AIDS that require special considerations are estimated separately.
3. Surgical, orthopaedic, hypertension and diabetes are integrated in the specialised OPD (special clinic) to estimate the required number of consultation rooms.
4. Working days of OPD are 300 days/year.
5 OPD is opened for 8 hours/day (480 minutes/day).
6. On the average one patient spends 8 minutes for consultation at medical and paediatric OPD, and 20 minutes at dental and other departments.

<Based on the average annual number of patients in three years>

	Annual No. of outpatients (p/year)	Annual working day (day/year)	Opening hour (min/day)	Average No. of daily patients (p/day)	Rate of population increase	Expected No. of daily patients in 2018/19 (p/day)	Consultation room				
							Average of consultation time (min/p/room)	Max. No. of daily patients per room (p/room/day)	Required No. of consultation rooms (room)	Calculated No. of rooms (room)	**Required No. of rooms after examination (room)**
	A	B	C	D=A/B	E	F=D*E	G	H=C/G	I=F/H		
1. Medical (General OPD)	43,392	300	480	144.64	1.29	186.59	8	60	3.11	4	**5**
2. Paediatric	11,920	300	480	39.73	1.29	51.26	8	60	0.85	1	**1**
3. Dental	10,399	300	480	34.66	1.29	44.72	20	24	1.86	2	**2**
4. ENT	2,632	300	480	8.77	1.29	11.32	20	24	0.47	1	**1**
5. HIV/AIDS	2,770	300	480	9.23	1.29	11.91	20	24	0.50	1	**1**
6. Gynaecology	839	300	480	2.80	1.29	3.61	20	24	0.15	1	**1**
7. Antenatal	14,742	300	480	49.14	1.29	63.39	8	60	1.06	2	**1**
8. Specialised OPD	4,121	300	480	13.74	1.29	17.72	20	24	0.74	1	**1**
Total	90,815	--	--	302.72	--	390.50	--	--	--	13	**13**

<Examination of the calculated number of rooms required>

Four rooms will be necessary for the general OPD when the number of rooms are estimated based on the average number of patients in three years. In fact, however, the OPD patients in the year 2009/10 counted 55,369, which showed about 46% increase from 36,879 patients in 2008/09 and 37,928 patients in 2010/11. The required number of rooms becomes 5 rooms when it is calculated based on the 55,369 patients in 2009/10. The number of patients is assumed to continuously increase owing to the construction of the new OPD. In consideration of these factors, five rooms should be planned in the Project.

The calculation indicates that gynaecology and antenatal will need three rooms in total,

however, their examinations are similar and they can share the consultation rooms commonly. Thus, two consultation rooms will be planned for gynaecology and antenatal clinics.

② Casualty unit

<Preconditions>

1. Triage is incorporated in the clinic.
2. Casualty Unit is operated 365 days/year and 24 hours/day (1,440 minutes/day).
3. On the average one patient spends 120 minutes/room for diagnosis and/or treatment, and 480 minutes/bed for recovery.

<Based on the average number of patients in three years>

Annual No. of casualty-patients (p/year)	Annual working day (day/year)	Opening hour (min/day)	Average No. of daily patients (p/day)	Rate of population increase	Expected No. of daily patients in 2018/19 (p/day)	Clinic / Triage			
						Average of filtering time (min/p/room)	Max. No. of daily patients per room (p/room/day)	Required No. of clinic (room)	**Required No. of rooms (room)**
A	B	C	D=A/B	E	F=D*E	G	H=C/G	I=F/H	
2,320	365	1,440	6.36	1.29	8.20	120	12	0.68	**1**
						Resuscitation room			
						Average of recovery time (min/p/bed)	Max. No. of daily patients per bed (p/bed/day)	Required No. of beds (bed)	**Required No. of beds (bed)**
						J	K=C/J	L=F/K	
						480	3	2.73	**3**

③ Operation theatre

<Preconditions>

1. Working days of the operating theatre are 365 days/year.
2. Dental operation theatre is excluded.
3. According to the past records, the average number of operations per room is 6 cases/ room/day.
4. On the average one person spends 0.5 day/bed in the recovery room for recovery.

<Based on the average number of operations in three years>

Annual No. of operations / patients (p/year)	Annual working day (day/year)	Average No. of daily operations / patients (p/year)	Rate of population increase	Expected No. of daily operations /patients in 2018/19 (p/day)	Caesarean			Operation		
					Average No. of operations/patients per room (p/room/day)	Required No. of rooms (room)	**Planned No. of rooms (room)**	Average No. of operations/patients per room (p/room/day)	Required No. of rooms (room)	**Planned No. of rooms (room)**
A	B	C=A/B	D	E=C*D	F	G=E/F		F	G=E/F	
a) 1,023	365	2.80	1.29	3.62	6	0.60	**1**			
b) 2,069	365	5.67	1.29	7.31				6	1.22	**2**
c)3,092	(Total)									

Note: a) Caesarean operation; b) Operation except for caesarean; c) Total

There is one obstetric operation room in the existing maternity ward. Consequently, two operation rooms will be planned in the new OT/Maternity Ward.

④ Maternity ward

<Preconditions>

1. Working days of the maternity ward are 365 days/year.
2. On the average one inpatient stays for 5 days in the hospital.
3. Usual bed occupancy rate is 90%.

<Based on the average number of patients in three years>

Annual No. of inpatients (p/year)	Annual working day (day/year)	Average admission days (day/p)	Total admission days per year (day/year)	Rate of population increase	Expected total admission days in 2018/19 (day/year)	Bed occupancy rate (%)	Expected total admission days (day/year)	Required No. of beds (bed)	Planning	
									No. of beds (bed)	Bed occupancy rate (%)
A	B	C	D=A*C	E	F=D*E	G	H=F/G	I=H/B	**J**	K=F/B/J
4,160	365	5	20,800	1.29	26,832	90%	29,813	81.68	**82**	89.65%

(Number of beds planned)

1. 20 beds in the existing maternity ward	→	**20 beds** (existing)
2. 16 beds in the postnatal ward adjacent to the existing maternity ward	→	**16 beds** (existing)
3. 4 beds in the space remodelled from the new born baby room and storage in the postnatal ward*	→	**4 beds** (after renovation)
4. 42 beds in the new maternity ward	→	**42 beds** (new)
	Total	**82 beds**

* The requested number of beds at the time of field survey II was 50. The planned number of beds is 82 as calculated above, while the existing maternity ward has 20 beds, postnatal ward 16 beds, and 4 beds will be installed after remodelling. Consequently, the new maternity ward will have 42 beds.

⑤ Delivery unit

<Preconditions>

1. The average number of deliveries per bed is 3 persons/room/day.

<Based on the average number of deliveries in three years>

Annual No. of deliveries (p/year)	Annual working day (day/year)	Average No. of daily deliveries (p/day)	Rate of population increase	Expected average No. of daily deliveries in 2018/19 (p/day)	Delivery Room		
					Average No. of daily deliveries per bed (p/day/bed)	Required No. of delivery beds (bed)	**Planned No. of delivery beds (bed)**
A	B	C=A/B	D	E=C*D	F	G=E/F	
3,639	365	9.97	1.29	12.86	3	4.29	**5**

The existing Maternity Ward has delivery rooms. Consequently, new delivery rooms will not be planned in the Project.

3) Required floor areas

Based on the number of rooms needed for each department as calculated above, the required total floor areas on building plans are estimated. The floor area of each room of the target hospitals is assumed in consideration of the current status of existing facilities, and with reference to the standard for medical facilities in Uganda and the standard for medical facilities in Japan (AIJ Architectural Design Data Corpus and others).

In addition, medical equipment layout expected in each room, the number of patients and the number of medical staff are comprehensively considered to calculate the required floor area of each room.

Table-5 Floor Areas of Hoima RRH

OPD Block GF			
Dept	Room	Floor areas(m2)	Size (m)
OPD	Entrance hall	32.0	4.0x8.0
	Reception, Office (med. record storage)	30.0	6.0x5.0
	Laboratory	36.0	6.0x6.0
	Pharmacy	36.0	6.0x6.0
	Staff room (M & W) (w/ toilet, shower)	36.0	6.0x6.0
	Paediatric consultation	18.0	6.0x3.0
	Paediatric treatment	18.0	6.0x3.0
	Obstet. consultation	18.0	6.0x3.0
	Obs/Gyn. treatment	18.0	6.0x3.0
	Gynaec. consultation	18.0	6.0x3.0
	ENT clinic	36.0	6.0x6.0
	Med. supply storage-1	18.0	6.0x3.0
	Fire hydrant pump room	10.0	2.0x5.0
	Waiting space	104.0	2.0x52.0
	Corridor	144.0	2.0x72.0
	Staircase	44.0	4.0x6.0+4.0x5.0
	Ramp	104.0	4.0x26.0
	Connection corridor	4.0	2.0x2.0
	Toilet	36.0	6.0x6.0
GF Total		760.0 m2	
OPD Block 1F			
OPD	General OPD consul-1	18.0	6.0x3.0
	General OPD consul-2	18.0	6.0x3.0
	General OPD consul-3	18.0	6.0x3.0
	General OPD treatment	36.0	6.0x6.0
	General OPD consul-4	18.0	6.0x3.0
	General OPD consul-5	18.0	6.0x3.0
	Special OPD consul.	18.0	6.0x3.0
	Special OPD treat.	18.0	6.0x3.0
	Med. supply storage-2	6.0	1.5x4.0
	Dental clinic	54.0	6.0x9.0
	Dental X-ray	9.0	3.0x3.0
	Dental storage	9.0	3.0x3.0
	HIV counselling	18.0	6.0x3.0
	HIV consultation	18.0	6.0x3.0
	Staff toilet	6.0	1.5x4.0
	Waiting space	100.0	2.0x50
	Corridor	186.0	(2.0x70.0)+(4.0x10.0) +(1.5x4.0)
	Staircase	66.0	6.0x6.0+6.0x5.0
	Ramp	104.0	4.0x26.0
	Connection corridor	4.0	2.0x2.0
	Toilet	36.0	6.5x6.0
1F Total		778.0 m2	
Total		1538.0 m2	

Casualty	Ambulance	36.0	6.0x6.0
	Triage / Clinic	18.0	6.0x3.0
	Resuscitation room	42.0	6.0x7.0
	Sluice/sterilisation	6.0	3.0x2.0
	Anteroom (Ambu-OT)	12.0	2.0x6.0
	Office	12.0	3.0x4.0
	Nurse station-2	18.0	6.0x3.0
	Staff room (w/ toilet, shower)	27.0	3.0x9.0
	Duty room	9.0	3.0x3.0
	Corridor	72.0	3.0x24.0
	Subtotal	252.0 m2	
Common	Ward entrance	24.0	6.0x4.0
	Corridor	47.25	1.5x31.5
	Staircase	12.0	6.0x2.0
	Ramp	105.75	4.5x23.5
	Fire hydrant pump room	9.0	4.5x2.0
	Subtotal	198.0 m2	
GF Total		810.0 m2	
OT / Maternity Ward 1F			
Maternity ward	8-bed room-1	45.0	6.0x7.5
	8-bed room-2	45.0	6.0x7.5
	8-bed room-3	45.0	6.0x7.5
	8-bed room-4	45.0	6.0x7.5
	8-bed room-5	45.0	6.0x7.5
	2-bed room	22.5	3.0x7.5
	Attendant room (w/ toilet)	28.50	3.0x9.5
	Linen store	5.25	1.5x3.5
	Maternity treatment	22.5	3.0x7.5
	Nurse station	22.5	3.0x7.5
	Newborn baby room	22.5	3.0x7.5
	Sluice/sterilisation	12.0	3.0x4.0
	Patient toilet	45.0	6.0x7.5
	Staff room	9.0	3.0x3.0
	Staff toilet	6.75	1.5x4.5
	Corridor	124.5	3x(30+7.5)+1.5x(4.5+ 3.5)
	Subtotal	546.0 m2	
Common	Corridor	15.0	3.0x2.0+1.5x6.0
	Staircase	24.0	6.0x4.0
	Ramp	114.75	4.5x25.5
	Subtotal	153.75 m2	
1F Total		699.75 m2	
Total		1509.75 m2	

OT/Maternity Ward GF			
Dept	Room	Floor areas(m2)	Size (m)
Operation theatre	Operation theatre-1	36.0	6.0x6.0
	Operation theatre-2	36.0	6.0x6.0
	Anaesthesia room	9.0	3.0x3.0
	Recovery room	18.0	6.0x6.0
	Nurse station, operation gowning room	13.5	3.0x4.5
	OT hall	85.5	6.0x6.0+3.0x4.5+3.0 x12.0
	Anteroom	24.0	6.0x4.0
	Staff locker room & ancilary room	36.0	6.0x6.0
	CSSD	48.0	6.0x8.0
	HDU	36.0	6.0x6.0
	Nurse station-1	18.0	6.0x3.0
	Subtotal	360.0 m2	

Power Receiving Block			
Dept	Room	Floor areas(m2)	Size (m)
Common	Power receiving room	18.0	3.0x6.0
	Generator room	18.0	3.0x6.0
	Total	36.0 m2	

4) Components of each building

Based on the discussions with MOH and Hoima RRH and the site surveys facilities construction at Hoima RRH is planned to consist of three buildings; the OPD Block, the OT/Maternity Ward and the power receiving block. The power receiving block requires only small space; nevertheless, it is planned as a separate one to avoid the emission of noise and vibrations during the operation of the generator system.

Building	Floor	Room
OPD Block	GF	Entrance hall, Reception, Laboratory (including blood sampling room), Pharmacy, Staff room (including toilet and shower, separate rooms for male and female staff), Obstetrics consultation room, Obstetrics/gynaecology treatment room, Gynaecology consultation room, Paediatric consultation room, Paediatric treatment room, ENT clinic, Waiting space, Corridor, Staircase, Ramp, Medical supply storage-1, etc.
	1F	General OPD consultation room (5 rooms), General OPD treatment room, Specialised OPD consultation room, Specialised OPD treatment room, HIV consultation room, HIV counselling room, Dental clinic, Medical supply storage-2, Staff toilet, Waiting space, Corridor, Staircase, Ramp, etc.
	G, 1F	Outpatient toilets (men, women and handicapped) on each floor in a separate building
OT/Maternity Ward	GF	Operation Theatre: OT (2 rooms), Recovery room (2 beds), Anaesthesia room, Nurse station with operation meeting room, Staff locker room (men/women), Anteroom, Operation hall, HDU (4 beds), Nurse station-1, CSSD, etc. Casualty Unit: Ambulance, Triage/Clinic, Resuscitation room (3 beds), Sluice/sterilisation room, Nurse station-2, Office (also serving as guard post), Staff locker room (men/women), Duty room, Anteroom (Ambu-OPT), Corridor, etc. Maternity Ward: Ward entrance, corridor, staircase, ramp, etc.
	1F	Maternity Ward: 8-bed rooms (5), 2-bed room (1), Nurse station, Maternity treatment room, Newborn baby room, Sluice/sterilisation room, Staff room, Staff toilet, Attendant room, Linen store, Patient toilet, Corridor, Staircase, Ramp, etc.
	G, 1F	Inpatient toilets in a separate building
Power Receiving Block	GF	Power receiving room, Generator room

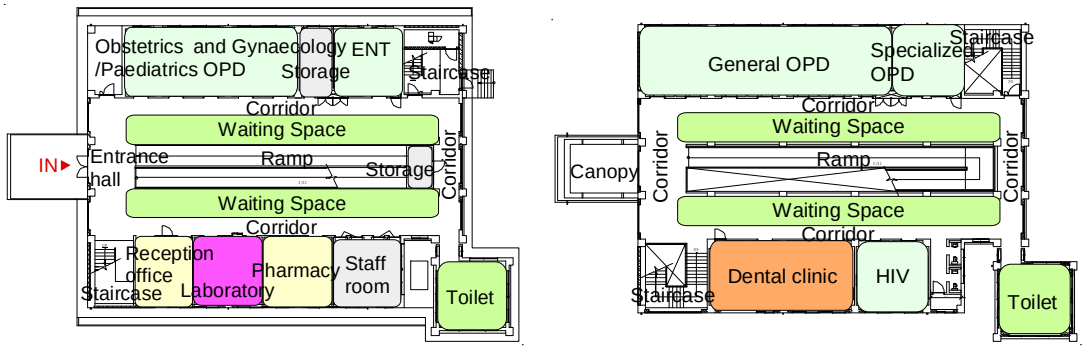
5) Floor planning (zoning plan)

① OPD Block

The site is located in the hospital premises. A two-story building will be planned for the better use of land. Elevators are not common in the Hoima area, and their maintenance costs will be considerably high; engineers will have to be called from Kampala for maintenance and repairs, for example. Instead, ramps and stairways will be planned for the vertical migration.

Consultation rooms are the main components in the OPD Block. They will be lined along the north and south peripheral walls in order to ensure sufficient natural light and breeze in the rooms,

In the Project, the ramps are designed at the centre in the building with airy space above, and patients waiting space will be provided around the ramps. Staff corridors will be provided along the window side of the consultation and treatment rooms so that the movement of doctors, nurses and other medical staff will not intersect with the circulation of patients. Toilets will be installed at a separate corner, to minimise the offensive odours into the hospital buildings.



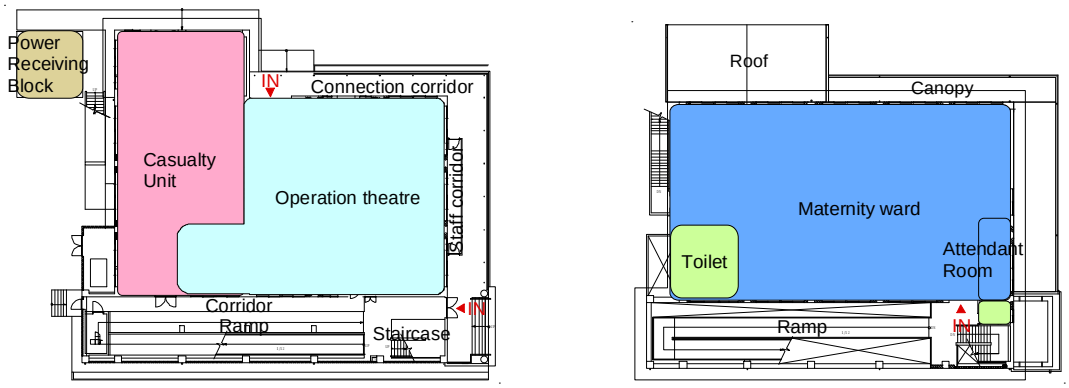
Ground Floor First Floor

Figure-4 Hoima RRH: Zoning of OPD Block

② OT/Maternity Ward

Similar to the OPD Block, the OT/Maternity Ward will be also planned as a two story building. The operation theatre and casualty departments will be on the ground floor, and the maternity ward on the first floor.

Ramps will be designed on the rear side of the building near the stairways for the purpose of transfer of patients by a stretcher or wheelchair. The space above the ramps will be designed as an atrium to serve as if the roofed outdoor space so that ample sun lights and outdoor air will be taken into the building.



Ground Floor First Floor

Figure-5 Hoima RRH: Zoning of OT/Maternity Ward

6) Elevation planning (shape, exterior finishing material)

The buildings will be of a rigid-frame concrete structure, which is commonly used locally, with masonry exterior walls. Columns and beams and a part of masonry walls will be finished with painting on the cement mortar substrate. The exterior walls will be fair-faced brick masonry walls or mortar with paint finish.

Sloped roofs (15˚) of corrugated galvanised steel sheets will be adopted for economy and ease of construction.

The elevation design will be based on the fenestration plan to create about 5-meter wide window opening spaces between the 6-meter pitch columns. High side lights will be installed for the rooms like the recovery room that may not require so much light. Glass blocks will be used to admit daylight to the patient movement spaces like the staircases and corridors.

7) Sectional planning

The height of the ground floor is set at 3.85 meters and the first floor at 3.80 meters, in consideration of the required ceiling height of various rooms (3.00 m) and spaces for pipes for water supply and sewage above the ceiling. In the Project, the sectional planning shall be made in consideration of sufficient natural air flow, because the rooms other than the operation theatres and HDU will not be equipped with air conditioners.

In the OPD Block, vent grilles will be provided above the ramps so that air flowing into the building through the openings on the exterior walls will flow out through the vent grilles under the roof. In the space above the ceiling, air intakes will be provided on the soffit of the eaves so that air flows inside the above-ceiling space and flows out through the vent grilles on top of the atrium. Polycarbonate roofings will be used part of the atrium ceilings, which will serve as roof lights.

In the OT/Maternity Ward, the operation rooms and HDU will be equipped with air conditioners and the other rooms on the ground floor will not be exposed to radiation heat from the roof. Natural light and air flow will be ensured by opening/closing of the high side windows. In the maternity ward on the first floor sun light and natural air flow will be provided through the openings in the north and south exterior walls.

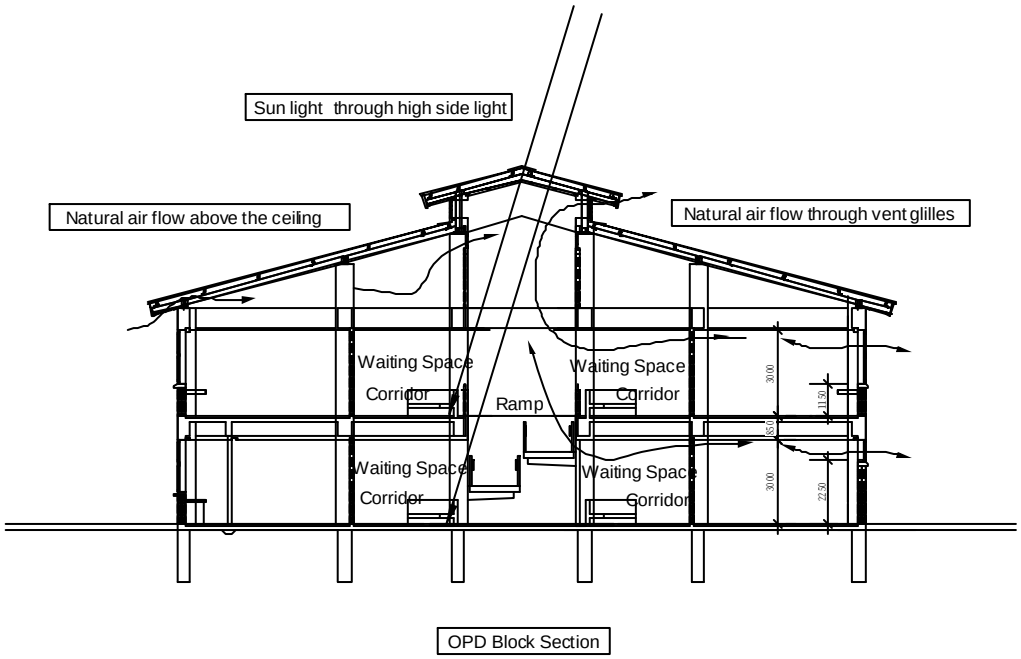


Figure-6 Hoima RRH: Section of OPD Block

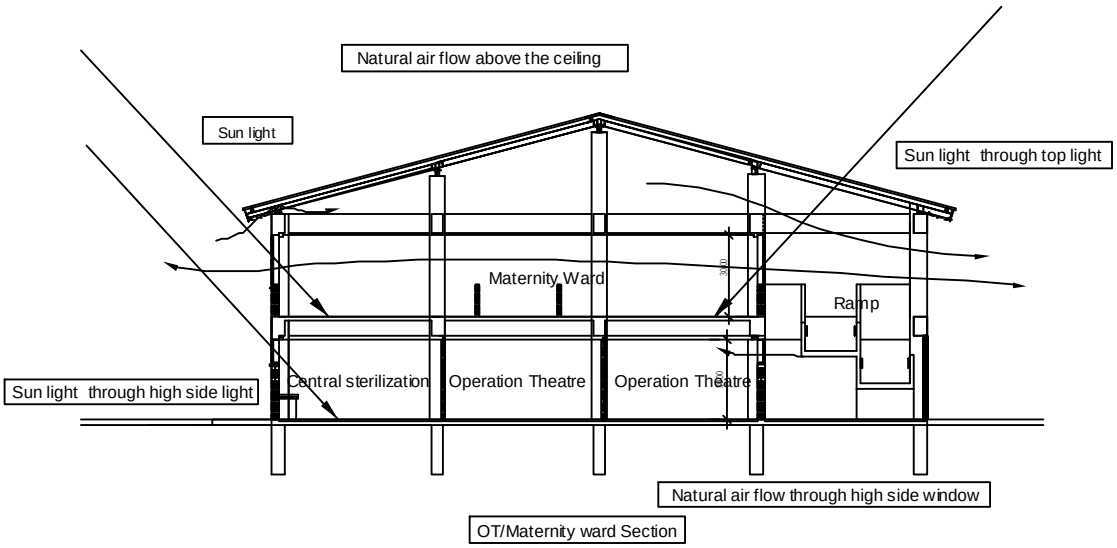


Figure-7 Hoima RRH: Section of OT/Maternity Ward

(3) Kabale RRH

1) Number of Patients

Following table shows the number of patients at each department of Kabale RRH in the past three years.

Patients/visitors at each department		2008/09	2009/10	2010/11	Average	Remark
A.	Outpatients	64,004	86,017	121,567	90,529	
	(Breakdown)					
	Paediatrics	6,545	7,459	9,906	7,970	
	Medical	29,838	47,707	73,287	50,277	
	Surgery	503	215	0	239	
	Private	1,773	1,732	1,870	1,792	Existing
	Orthopaedics	1,616	2,221	2,260	2,032	
	Ophthalmology	2,248	2,363	2,420	2,344	Existing
	ENT	1,119	1,394	1,851	1,455	Existing
	Dental	4,718	4,490	6,897	5,368	
	Physiotherapy	2,951	1,399	1,653	2,001	Existing
	Occupational therapy	0	364	299	221	Existing
	Gynaecology	222	367	597	395	
	Psychiatry	998	521	511	677	Existing
	Antenatal	8,110	8,918	10,206	9,078	Existing
	Family Planning	3,363	6,867	9,810	6,680	Existing
	Total	64,004	86,017	121,567	90,529	
	Total	(43,442)	(62,459)	(92,947)	**(66,281)**	Excluding private ward (Grade A), ophthalmology, ENT, physiotherapy, occupational therapy, psychiatry, antenatal and FP
B.	No. of emergency patients	1,099	1,857	448	1,135	
	(Breakdown)					
	Injuries - Road Accidents	348	392	341	360	
	Injuries (Trauma due to other causes)	717	1,399	67	728	
	Animal / Snake bites	34	66	40	47	
	Total	1,099	1,857	448	**1,135**	
C.	Operations	3,219	5,305	4,034	4,186	
	Dental operation	-1,172	-2,556	-920	-1,549	
	Operations except for dental operation	2,047	2,485	3,114	**2,549**	
	(Caesarean)	(642)	(604)	(853)	(700)	
D.	Inpatients in the Maternity Ward	3,514	3,552	6,986	4,684	**No. of beds: 30**
	Annual total number of admission days (p･day)	19,255	15,768	16,452	17,158	
	Average admission days (day)	5.48	4.44	2.35	4.09	
	Bed occupancy rate (%)	178.29	159.27	164.68	167.41	
		(360days)	(330days)	(333days)		
	Modified bed occupancy rate (%)	**175.84**	**144.00**	**150.25**	**163.05**	(calculated based on 365days)
E.	Total No. of deliveries	3,208	3,312	5,754	**4,091**	

2) Study by department

① OPD

<Preconditions>

1.Consultation rooms for the private ward (Grade A), ophthalmology, ENT, physiotherapy, occupational therapy, psychiatry, antenatal and family planning are not considered, because they already have ones.

2. Among other departments, consultation rooms for medical, paediatric, gynaecology and dental are estimated separately.

3. Surgical and orthopaedic departments are integrated in the specialised OPD (special clinic) to estimate the required number of consultation rooms.

4. Working days of OPD are 300 days/year.

5. OPD is operated for 8 hours/day (480 minutes/day).

6. On the average one patient spends 8 minutes for consultation at medical and paediatric OPD, and 20 minutes at dental and other departments.

<Based on the average number of patients in three years>

	Annual No. of outpatients (p/year)	Annual working day (day/year)	Opening hour (min/day)	Average No. of daily patients (p/day)	Rate of population increase	Expected No. of daily patients in 2018/19 (p/day)	Consultation room			
							Average of consultation time (min/p/room)	Max. No. of daily patients per room (p/room/day)	Required No. of consultation rooms (room)	**Required No. of rooms (room)**
	A	B	C	D=A/B	E	F=D*E	G	H=C/G	I=F/H	
1. Medical	50,277	300	480	167.59	1.29	216.19	8	60	3.60	**4**
2. Paediatric	7,970	300	480	26.57	1.29	34.27	8	60	0.57	**1**
3. Dental	5,368	300	480	17.89	1.29	23.08	20	24	0.96	**1**
4. Gynaecology	395	300	480	1.32	1.29	1.70	20	24	0.07	**1**
5. Specialised OPD	2,271	300	480	7.57	1.29	9.77	20	24	0.41	**1**
Total	66,281	300	480	220.94	1.29	285.01	--	--	--	**8**

② Casualty unit

<Preconditions>

1. Triage is incorporated in the clinic.

2. Casualty Unit is operated 365 days/year and 24 hours/day (1,440 minutes/day).

3. On the average one patient spends 120 minutes/room for diagnosis and/or treatment, and 480 minutes/bed for recovery.

<Based on the average number of patients in three years>

Annual No. of casualty-patients (p/year)	Annual working day (day/year)	Opening hour (min/day)	Average No. of daily patients (p/day)	Rate of population increase	Expected No. of daily patients in 2018/19 (p/day)	Clinic / Triage			
						Average of filtering time (min/p/room)	Max. No. of daily patients per room (p/room/day)	Required No. of clinic (room)	**Required No. of rooms (room)**
A	B	C	D=A/B	E	F=D*E	G	H=C/G	I=F/H	
1,135	365	1,440	3.11	1.29	4.01	120	12	0.33	**1**
						Resuscitation room			
						Average of recovery time (min/p/bed)	Max. No. of daily patients per bed (p/bed/day)	Required No. of beds (bed)	**Required No. of beds (bed)**
						J	K=C/J	L=F/K	
						480	3	1.34	**2**

③ Operation theatre

<Preconditions>

1. Working days of the operating theatre are 365 days/year.
2. Dental operation theatre is excluded.
3. According to the past records, the average number of operations per room is 6 cases/ room/day.
4. On the average one person spends 0.5 day/bed in the recovery room for recovery.

<Based on the average number of operations in three years>

Annual No. of operations / patients (p/year)	Annual working day (day/year)	Average No. of daily operations / patients (p/year)	Rate of population increase	Expected No. of daily operations /patients in 2018/19 (p/day)	Caesarean			Operation		
					Average No. of operations/patients per room (p/room/day)	Required No. of rooms (room)	**Planned No. of rooms (room)**	Average No. of operations/patients per room (p/room/day)	Required No. of rooms (room)	**Planned No. of rooms (room)**
A	B	C=A/B	D	E=C*D	F	G=E/F		F	G=E/F	
a) 700	365	1.92	1.29	2.47	6	0.41	**1**			
b) 1,849	365	5.07	1.29	6.53				6	1.09	**2**
c) 2,549	(Total)									

Note: a) Caesarean operation; b) Operation except for caesarean; c) Total

④ Maternity ward

<Preconditions>

1. Working days of the maternity ward are 365 days/year.
2. On the average one inpatient stays for 5 days in the hospital.
3. Usual bed occupancy rate is 90%.

<Based on the average number of patients in three years>

Annual No. of inpatients (p/year)	Annual working day (day/year)	Average admission days (day/p)	Total admission days per year (day/year)	Rate of population increase	Expected total admission days in 2018/19 (day/year)	Bed occupancy rate (%)	Expected total admission days (day/year)	Required No. of beds (bed)	Planning	
									No. of beds (bed)	Bed occupancy rate (%)
A	B	C	D=A*C	E	F=D*E	G	H=F/G	I=H/B	**J**	K=F/B/J
4,684	365	5	23,420	1.29	30,212	90%	33,569	91.97	**92**	89.97%

(Number of beds planned)

1. The existing maternity ward has 22 obstetric beds and 9 pay-beds. The pay beds will be moved into the private ward which is under construction now when it is completed. Four delivery rooms and ancillary rooms in the existing maternity ward are dilapidated and have low functionality. The delivery rooms shall be newly planned in the new OT/Maternity Ward in the Project. Then, by remodelling the delivery rooms in the existing maternity ward into the bed rooms, 16 obstetric beds can be ensured. Consequently, the number of obstetric beds will be 47 after the renovation: (22 existing beds + 9 pay-beds to be moved + 16 beds to be created through the remodelling of the existing delivery rooms). → **47 beds** (after the renovation of the existing ward)
2. The new maternity ward is planned to have 34 beds.* → **34 beds** (new)
3. The total of 1.+2. above (81 beds) is 11 beds insufficient for the required 92 beds. This shortfall of 11 beds is planned to be covered by Kabale RRH at the time of remodelling of the existing maternity ward. → **11 beds**

Total **92 beds**

* The requested number of beds at the time of field survey II was 58, and 47 beds will be ensured after the renovation of the existing maternity ward. It is necessary to provide 45 beds in the new OT/Maternity ward to reach the required 92 beds (92-47). In consideration of the appropriate size of the Project, it has been agreed that the Japanese side will provide 34 beds while the Ugandan side will cover the remaining 11 beds.

(Recommendation)

In the course of discussions between Kabale RRH and the Survey Team during the Field Survey II, Kabale RRH requested that the ophthalmology and ENT wards should be secured each having 10 beds after the renovation of the existing maternity ward.

However, clinics and operation theatres of ophthalmology and ENT are apart from the existing maternity ward. Besides, it is not preferable that the 10 beds each for ophthalmology and ENT share a part of the maternity ward among. Consequently it is proposed that the ophthalmology and ENT wards will be constructed by the Ugandan side near the existing clinics and operation theatres of ophthalmology and ENT.

⑤ Delivery unit

<Preconditions>

The average number of deliveries per bed is 3 persons/room/day.

<Based on the average number of deliveries in three years>

Annual No. of deliveries (p/year)	Annual working day (day/year)	Average No. of daily deliveries (p/day)	Rate of population increase	Expected average No. of daily deliveries in 2018/19 (p/day)	Delivery Room		
					Average No. of daily deliveries per bed (p/day/bed)	Required No. of delivery beds (bed)	**Planned No. of delivery beds (bed)**
A	B	C=A/B	D	E=C*D	F	G=E/F	
4,091	365	11.21	1.29	14.46	3	4.82	**5**

3) Required floor areas

Based on the number of rooms needed for each department as calculated above, the required total floor areas on building plans are estimated. The floor area of each room of the target hospitals is assumed in consideration of the current status of existing facilities, and with reference to the standard for medical facilities in Uganda and the standard for medical facilities in Japan (AIJ: Architectural Design Data Corpus and others).

In addition, medical equipment layout expected in each room, the number of patients and the number of medical staff are comprehensively considered to calculate the required floor area of each room.

Table--6 Floor Areas of Kabale RRH

OPD/Casualty Block GF			
Dept	Room	Floor areas(m2)	Size (m)
OPD	Entrance hall	50.0	4.0x6.0+3.0x6.0+4.0 x2.0
	Reception, Office (med. record storage)	30.0	6.0x5.0
	Laboratory	36.0	6.0x6.0
	Pharmacy	36.0	6.0x6.0
	Med supply storage-1	36.0	6.0x6.0
	Staff room (M) (w/ toilet, shower)	36.0	6.0x6.0
	Waiting space	48.0	2.0x24.0
	Corridor	84.0	2.0x42.0
	Staircase	48.0	(4.0x6.0)x2
	Ramp	40.0	2.0x20.0
	Subtotal	444.0 m2	
Casualty	Ambulance	36.0	6.0x6.0
	Triage/Clinic	18.0	6.0x3.0
	Resuscitation room	45.0	6.0x7.5
	Sluice/sterilisation	18.0	6.0x3.0
	Minor operation theatre	27.0	6.0x4.5
	Office	10.5	3.0x3..5
	Nurse station	18.0	6.0x3.0
	Staff room (M, W) (w/ toilet, shower)	27.0	3.0x9.0
	Duty room (M)	9.0	3.0x3.0
	Corridor	61.5	3.0x20.5
	Subtotal	270.0 m2	
Common	Fire hydrant pump room	12.0	2.0x6.0
	Connection corridor	4.0	2.0x2.0
	Toilet	60.0	5.0x12.0
	Subtotal	76.0 m2	
Connection corridor (OPD-OT)		43.2	2.0x21.6
GF Total		833.2 m2	
OPD/Casualty Block 1F			
OPD	Dental clinic	54.0	6.0x9.0
	Dental X-ray	9.0	3.0x3.0
	Dental storage	9.0	3.0x3.0
	Gynaecology treatment	18.0	6.0x3.0
	Gynaecology consul.	18.0	6.0x3.0
	Staff toilet	6.75	1.5x4.5
	Med. supply storage-2	4.5	1.5x3.0
	Special OPD consul.	18.0	6.0x3.0
	General OPD consul-1	18.0	6.0x3.0
	General OPD consul-2	18.0	6.0x3.0
	Common treatment room	36.0	6.0x6.0
	General OPD consul-3	18.0	6.0x3.0
	General OPD consul-4	18.0	6.0x3.0
	Paediatric consultation	18.0	6.0x3.0
	Waiting space	100.0	2.0x50
	Corridor	186.75	2.0x62.0+4.0x14.0+ 1.5x4.5
	Staircase	72.0	6.0x6.0x2
	Ramp	104.0	4.0x26.0
	Subtotal	726.0 m2	
Common	Connection corridor	4.0	2.0x2.0
	Toilet	60.0	5.0x12.0
	Subtotal	64.0 m2	
1F Total		790.0 m2	
Total		1623.2 m2	

OT/Maternity Ward GF			
Dept	Room	Floor areas(m2)	Size (m)
Operation theatre	Operation theatre-1	36.0	6.0x6.0
	Operation theatre-2	36.0	6.0x6.0
	Operation theatre-3	36.0	6.0x6.0
	Anaesthesia room	9.0	3.0x3.0
	Recovery room	18.0	6.0x7.0
	Nurse station, operation meeting room	15.0	3.0x5.0
	Nurse station-2	18.0	6.0x3.0
	HDU	36.0	6.0x6.0
	OT hall	93.0	6.0x6.0+3.0x19.0
	Anteroom	16.0	4.0x4.0
	Locker room corridor	12.0	6.0x2.0
	Staff room (M) (w/ toilet, shower)	16.0	4.0x4.0
	Staff room (W) (w/ toilet, shower)	16.0	4.0x4.0
	CSSD	51.0	6.0x7.0+3.0x3.0
	Subtotal	408.0 m2	
Common	Electric room	8.0	2.0x4.0
	Fire hydrant pump room	8.0	2.0x4.0
	Corridor	80.0	2.0x40.0
	Subtotal	96.0 m2	
Maternity wa	Corridor	53.25	1.5x35.5
	Staircase	48.0	6.0x4.0x2
	Ramp	114.75	4.5x25.5
	Ward entrance	24.0	6.0x4.0
	Subtotal	240.0 m2	
GF Total		744.0 m2	
OT/Maternity Ward 1F			
Maternity Ward	8-bed room-1	45.0	6.0x7.5
	8-bed room-2	45.0	6.0x7.5
	8-bed room-3	45.0	6.0x7.5
	8-bed room-4	45.0	6.0x7.5
	2-bed room	22.5	3.0x7.5
	Attendant room	15.0	2.0x7.5
	Nurse station	22.5	3.0x7.5
	Newborn baby room	22.5	3.0x7.5
	Delivery room-1	15.0	3.0x5.0
	Delivery room-2	15.0	3.0x5.0
	Delivery room-3	15.0	3.0x5.0
	Delivery room-4	15.0	3.0x5.0
	Delivery room-5	20.0	4.0x5.0
	Sluice/sterilisation	12.0	3.0x4.0
	Staff toilet, shower	10.5	3.0x3.5
	Corridor	193.0	3.0x39.0+2.0x30.5+ 2.5x6.0
	Staircase	48.0	6.0x4.0x2
	Ramp	114.75	4.5x25.5
	Patient toilet	45.0	6.0x7.5
1F Total		765.75 m2	
Total		1509.75 m2	

4) Components of each building

Based on the discussions with MOH and Kabale RRH and the site survey, facilities construction at Kabale RRH is planned to consist of two buildings; the OPD/Casualty Block and the OT/Maternity Ward.

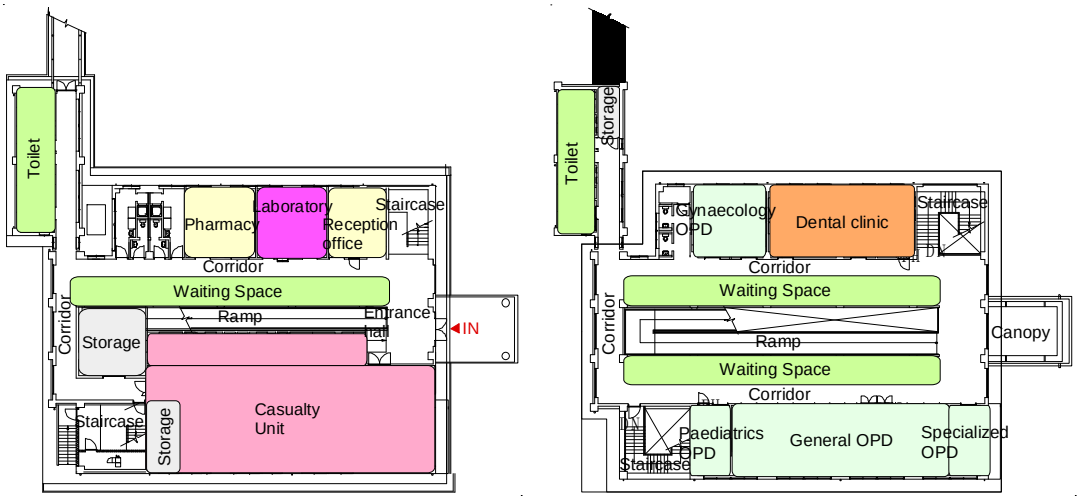
Building	Floor	Room
OPD / Casualty Block	GF	Casualty Unit: Ambulance, Triage/Clinic, Resuscitation room (2 beds), Minor OT, Sluice/sterilisation room, Nurse station, Office (also serving as a guard post), Staff room (Men/Women), Duty room, Corridor, etc. Outpatient Department: Entrance hall, Reception/Office (including medical record storage), Laboratory, Pharmacy, Staff room (Men/Women), Waiting space, Staircase, Ramp, Medical supply storage-1, etc.
	1F	General OPD consultation room (4 rooms), Paediatric consultation room, Special OPD consultation room, Common treatment room, Gynaecological consultation room, Gynaecological treatment room, Dental clinic, Medical supply storage-2, Staff toilet, Waiting space, Corridor, Ramp, etc.
	G, 1F	Outpatient toilets in a separate building
OT/Maternity Ward	GF	Operation Theatre: OT (3 rooms; 1 for obstetric operation), Recovery room, Anaesthesia room, Nurse station/operation meeting room, Staff locker room (men/women), Anteroom, Operation hall, HDU (4 beds), Nurse station, CSSD, etc. Maternity Ward: Ward entrance, Corridor, Staircase, Ramp Common space: Electric room, Receiving tank pump room, Fire hydrant pump room, Storage, etc.
	1F	Maternity Ward: Patient room (8-bed: 4 rooms, 2-bed: 1 room), Nurse station, Delivery room (5 rooms), Newborn baby room, Sluice/sterilisation room, Staff toilet, Patient toilet, Attendant room, Corridor, Staircase, Ramp, etc.

5) Floor planning (zoning plan)

A two-story building will be planned similar to Hoima RRH. Staircases and ramps will be provided for the vertical migration instead of elevators.

① OPD/Casualty Block

In the Project, the slopes are designed at the centre in the building. Rooms for the OPD will be located in the north half and the rooms for the Casualty Unit will be in the south half of the ground floor. On the first floor, clinics for the OPD will be lined along the north and south peripheral walls. Patients waiting space and corridors will be located in the inner areas around the ramps in the centre. Patient toilets for the OPD will be installed in an independent house along the walkway to the OT/Maternity Ward, to minimise the offensive odours into the hospital buildings.



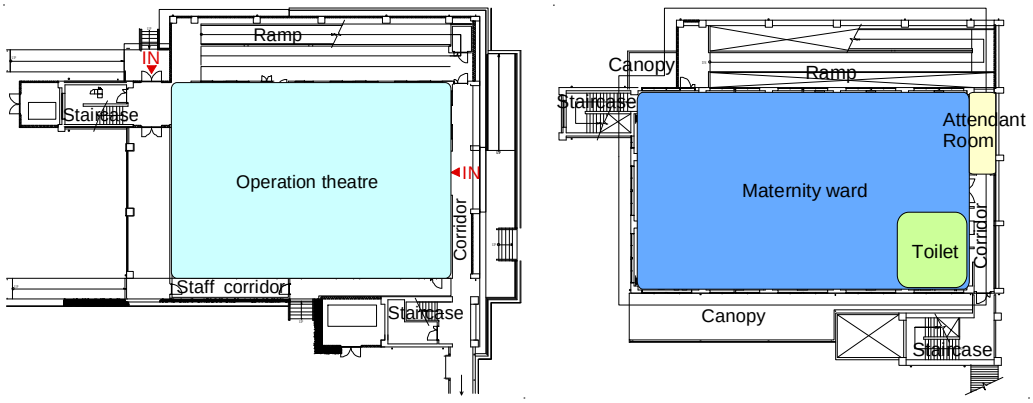
Ground Floor First Floor

Figure-8 Kabale RRH: Zoning of OPD/Casualty Block

② OT/Maternity Ward

The OT/Maternity Ward will be also planned as a two story building. The operation theatre will be on the ground floor, and the maternity ward on the first floor.

Ramps will be designed on the north side of the building for the purpose of transfer of stretchers and wheelchairs to the Maternity Ward. The space above the ramps will be designed as an atrium to serve as if the roofed outdoor space so that ample sun lights and outdoor air will be introduced into the building.



Ground Floor First Floor

Figure-9 Kabale RRH: Zoning of OT/Maternity Ward

6) Elevation planning (shape, exterior finishing material)

The elevation plan will be the same as that for Hoima RRH.

7) Sectional planning

The elevation plan will be the same as that for Hoima RRH.

II Structural Planning

(1) Structural Design Standards

The Japanese survey team and the officers in charge of architectural planning of the Health Infrastructure Division, Department of Clinical Services of MOH discussed and agreed that the Ugandan structural design standards would be applicable to the load requirements, and that the structural analysis and design method would comply with the structural standards of the Architectural Institute of Japan.

(2) Design Loads

1) Dead load

All the weights of building structures, finishes, and utility appliances will be considered.

2) Live load

The live load criteria stated in the Public Health (Building) Rules and the Structural Design Guide Lines (Draft 2004) will be applied. The design live load requirements of the principal rooms are as follows:

Roof	: 1.50 KN/m^2 (flat roof, slope roof 0°≦ and ≦10°)
	: 0.50 KN/m^2 (slope roof 10°< and ≦30°, limited access)
Ward, toilet	: 2.40 KN/m^2
Clinic, treatment room	: 3.00 KN/m^2
Operation theatre	: 4.80 KN/m^2
Office	: 3.50 KN/m^2
Data room	: 7.50 KN/m^2
Corridor, stairs	: 4.80 KN/m^2

3) Wind load

The following formula, which is stated in the Structural Design Guide Lines (Draft 2004), will be applied to calculate the design wind load.

$F = Cf \cdot q \cdot As$

$q = K \cdot V^2$

where:

F	: Wind force (N)
Cf	: Wind force coefficient
As	: Effective frontal areas of buildings
q	: Design stream velocity pressure (765N/m^2)
K	: Constant dependent on site altitude (0.53)
V	: Standard velocity (38m/sec.)

4) Seismic load

The following formula, which is stated in the Seismic Code of Practices for Structural

Designs-US319 (2003), will be applied to calculate the design seismic load.

Cd = C・Z・I・K

where:

Cd : Design horizontal seismic coefficient at the ground level

C : Basic seismic coefficient for the fundamental translational period ($C \leqq 0.8$)

Z : Seismic zone factor (at both Hoima and Kabale, Z=1.0)

I : Structure importance factor (Hospitals, I=1.5)

K : Structural performance factor (Ductile moment-resisting frame, K=1.0; Ductile moment-resisting frame with masonry infill, K=2.0)

(3) Framing Planning

The project buildings will be constructed of reinforced concrete with rigid frames that consists of steel girders supporting the folded roof system and supportive reinforced concrete slabs, which is a simple and practical frame system predominant in Uganda, using materials available in local markets. Interior and exterior walls will be of masonry construction, and the ground floor slab will be reinforced concrete subfloor.

(4) Foundation Planning

Four holes were bored in the site grounds at Hoima RRH and Kabale RRH respectively in order to check the geotechnical conditions of the sites. The design long-term bearing capacity of soils based on the geotechnical investigation reports are summarised as follows:

Site	Embedded length below GL (m)	Type of soil	Long-term bearing capacity (KPa/m^2)
Hoima RRH	1.50	Clayey silt	150
Kabale RRH	1.50	Silty clay	150

Accordingly, isolated footing system will be adopted both for Hoima RRH and Kabale RRH.

(5) Structural Materials and Construction Methods

1) Concrete

Concrete needs to be manufactured with concrete mixer trucks at each site, because there are no concrete mills that are capable of manufacturing ready mixed concrete.

The design strength of concrete (Fc) will be set at $25N/mm^2$ (by 28th-day compressive strength test with 150 square specimens.)

2) Reinforcing steel

Standard deformed bars, which are produced in Uganda, of Grade 460 conforming to BS 4449 will be used. The size of bars ranges from 8, 10, 12, 16, 20 to 25mm. All the bars should be connected with lap joints.

III Utility Systems Planning

(1) Electrical Planning

1) Power incoming installations

The main cable for electric power supply to the planned facilities at Hoima RRH and Kabale RRH will be tapped from Umeme's 11-kV transmission lines to the 100kVA pole transformer. The received electric power is stepped down to 415-240V and distributed by 3-phase 4-line cables to each consumption point.

The electric power required at the project facilities is estimated to be from 100 to 200kVA at both Hoima and Kabale. Renewal of the pole transformer from the existing 100kVA type to a 315kVA one will be the responsibility of the Ugandan side for the expected increase of electric consumption (the required power supply based on the transformer capacity 45VA/m^2, and power consumption 15W/m^2).*

The Japanese side will install trunk cables, switchboards, etc for receiving and distribution after the pole transformer.

2) Generator system

The requirement for backup power for the operation theatres, refrigerators, some outlets and water pump, etc. is assumed to be about 50kVA. Based on this assumption, a package type kerosene-fuel 50kVA diesel generator will be installed in the electric room at Hoima RRH. The diesel engine should be manually switched on at the time of power failure. At Kabale RRH, the existing 200kVA generator will also serve for the project facilities.

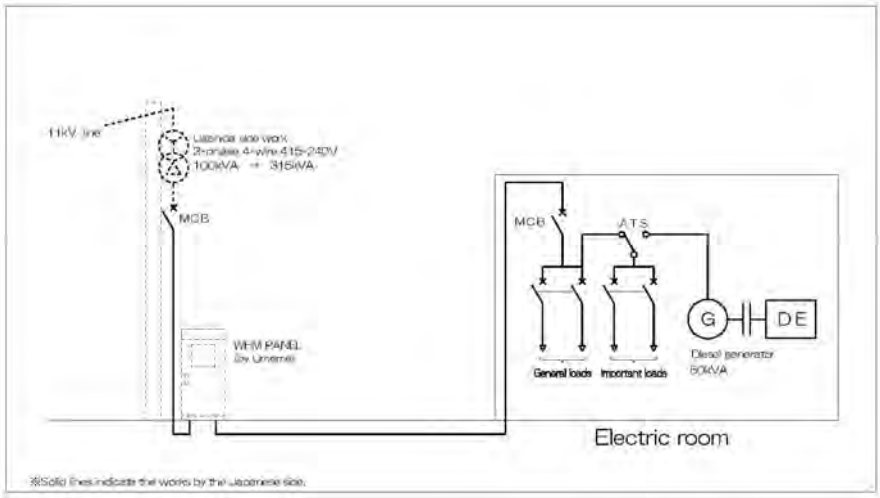


Figure-10 Hoima RRH: Schematic Diagram of Receiving and Transforming Systems

* The Ugandan side and the Japanese survey team discussed this issue and agreed that the renewal of transformer would belong to the Japanese scope. The details will be examined later.

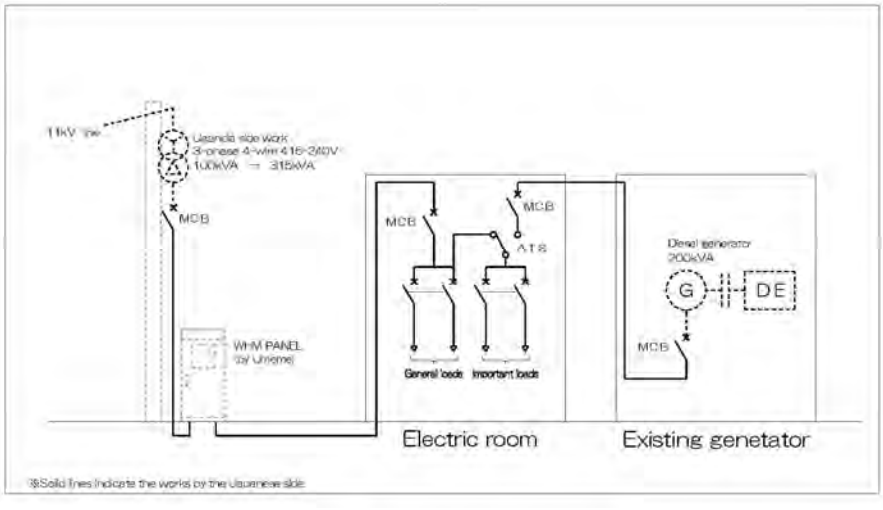


Figure-11 Kabale RRH: Schematic Diagram of Receiving and Transforming Systems

3) Receptacles and lights

The design illuminance is set at about 70% of the JIS standards. As light sources, energy efficient type shaded fluorescent lamps which are commonly used locally are planned. In the operation theatres embedded lights with acryl covers d lights will be planned to avoid dust falling down the lights. Emergency lights and emergency exit sign lights with built-in batteries will be planned in the corridors.

Exterior pole lights will be planned between the OPD Block and the OT/Maternity Ward at Hoima RRH for the convenience of pedestrians at night.

Receptacles for a single-phase 240V cable with 2P15A grounding will be installed for common use.

4) Lightening arrester and grounding device

The existing buildings are equipped with the lightning system. Similarly a lightening rod will be installed on the roof of the project buildings. The grounding electrodes will be embedded in the ground for the general power supply and for the operation theatres respectively.

5) Telephone system

The telephone wiring up to the MDF will be the responsibility of the Ugandan side. Two lines will be drawn to both Hoima and Kabale sites.

A PBX will be installed at the reception of the OPD Block, to establish a system which enables the extension-to-extension call. Telephone sets will be installed at each room except for the patient rooms. Extension numbers will be allotted to each telephone set. Installation of a primary side cable of MDF is the responsibility of the Ugandan side.

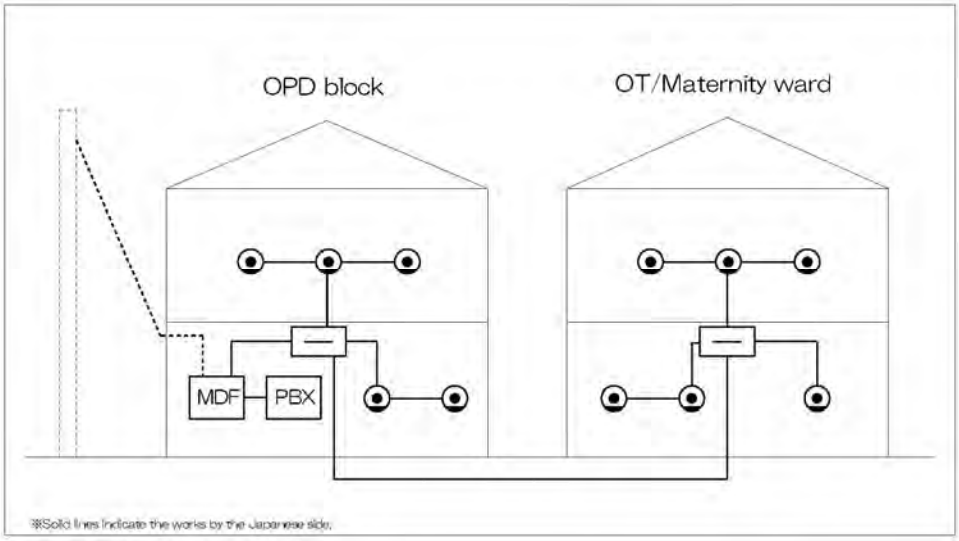


Figure-12 Schematic Diagram of Telephone Infrastructures

6) Cable piping for information network

Empty pipes will be installed from the terminal panel to each room (except for the patient rooms) so that cables can be laid to establish the information network system in the future.

7) TV common antenna system

A TV antenna will be installed near the elevated water tank from which TV cable/wires will be laid to the offices, waiting spaces and attendant rooms.

8) Public address system

A main panel for the public address system will be installed at the reception in the OPD Block with speakers in the common space, to enable broadcasting in the entire building as well as paging in each ward and/or floor.

9) Automatic fire alarm system

Smoke and thermal detectors will be installed where necessary. They will transmit alarms to the central receiver at the reception in the OPD Block.

(2) Mechanical Planning

1) Water supply system

Both Hoima RRH and Kabale RRH are supplied with city water by the National Water Service Company (hereinafter referred to as "NWSC"). A branch pipe will be drawn from the existing water supply pipe in the hospital premises. According to NWSC, the city water main for Hoima RRH has sufficient water pressure. Water will be directly led to the elevated water tanks on top of the OPD Block and OT/Maternity Ward, and then supplied to each point of consumption with the use of pressure pump in order to cover the pressure drop at the shower

head. In Kabale RRH, the water pressure of the city water main is not very high according to NWSC. Water will be led to a water receiving tank on the ground level after which water will be pumped up to the elevated tanks on top of the OPD/Casualty Block and OT/Maternity Ward, and then supplied to each point of consumption with the use of pressure pump in order to cover the pressure drop at the shower head.

Based on the following consumption data, the elevated water tanks planned to have sufficient capacity for the two-day consumption. The size of the water receiving tank at Kabale RRH is planned to cover for the half-day consumption:

Table-7 Water Consumption at Hoima RRH (OT/Maternity Ward)

	Calculation Conditions			Water Consumption	
	person/day	%	person	L/day•person	m^3/day
Doctor and nurse	22	80%	18	80	1.44
Inpatient	50	100%	42	150	6.30
Attendant for inpatient	50	50%	21	20	0.42
Total					8.16

Table-8 Water Consumption at Hoima RRH (OPD Blok)

	Calculation Conditions			Water Consumption	
	person/day	%	person	L/day•person	m^3/day
Doctor and nurse	36	80%	29	80	2.32
Outpatient	390	100%	390	20	7.80
Attendant for outpatient	390	50%	195	20	3.90
Total					14.02

Table-9 Water Consumption at Kabale RRH (OT/Maternity Ward)

	Calculation Conditions			Water Consumption	
	person/day	%	person	L/day•person	m^3/day
Doctor and nurse	40	80%	32	80	2.56
Inpatient	34	100%	34	150	5.10
Attendant for inpatient	34	50%	17	20	0.34
Total					8.00

Table-10 Water Consumption at Kabale RRH (OPD/Casualty Block)

	Calculation Conditions			Water Consumption	
	person/day	%	person	L/day•person	m^3/day
Doctor and nurse	34	80%	28	80	2.24
Outpatient	285	100%	285	20	5.70
Attendant for outpatient	285	50%	143	20	2.86
Total					10.80

Accordingly, the capacity of each elevated water tank is estimated as follows:

For Hoima RRH OT/Maternity Ward: $8.16m^3/day \cdot 2\ days = 16.32m^3 \rightarrow 17m^3$

For Hoima RRH OPD Block: $14.02m^3/day \cdot 2\ days = 28.04m^3 \rightarrow 29m^3$

For Kabale RRH OT/Maternity Ward: $8.00m^3/day \cdot 2\ days = 16.00m^3 \rightarrow 16m^3$

For Kabale RRH OPD/Casualty Block: $10.80m^3/day \cdot 2\ days = 21.60m^3 \rightarrow 22m^3$

The elevated tanks are planned to be panel tanks, and the compartment will be provided for the ease of cleaning and maintenance.

The water receiving tank at Kabale RRH will be a round tank whose capacity is calculated as follows:

For Kabale RRH: $(8.00m^3/day + 10.80m^3/day) \cdot 0.5day = 9.40m^3 \rightarrow 10m^3$

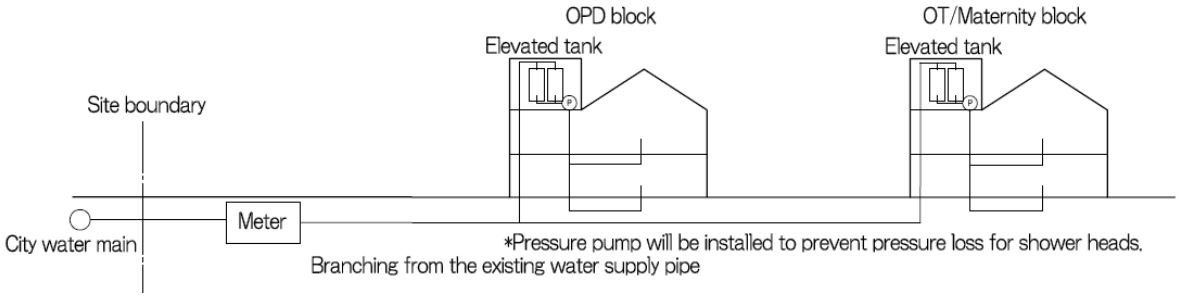


Figure-13 Hoima RRH: Schematic Diagram of Water Supply System

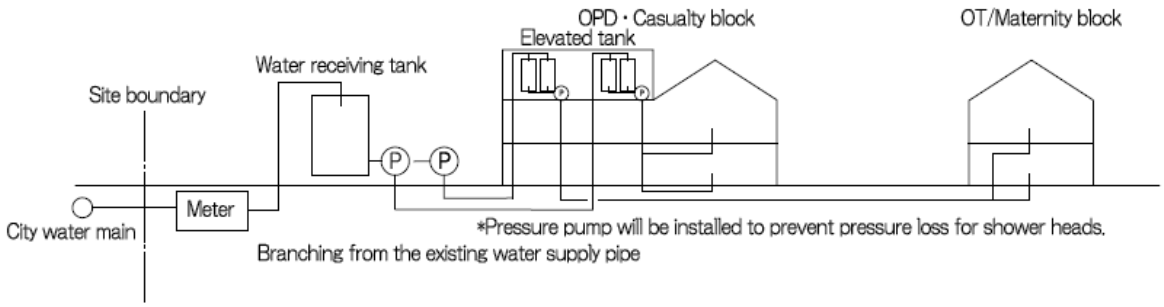


Figure-14 Kabale RRH: Schematic Diagram of Water Supply System

2) Wastewater sewerage system

As the area around Hoima RRH is not provided with a public sewerage system, wastewater will be treated in a septic tank and then seeped underground via a percolation pipe.

The area around Kabale RRH is equipped with a public sewerage system, and the soil wastewater and domestic wastewater will be connected to the hospital's sewerage pipe and discharged into the city main sewer.

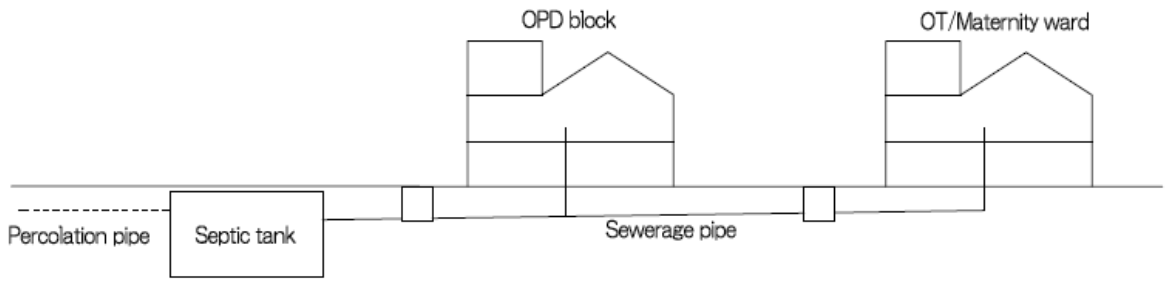


Figure-15 Hoima RRH: Schematic Diagram of Wastewater Sewerage System

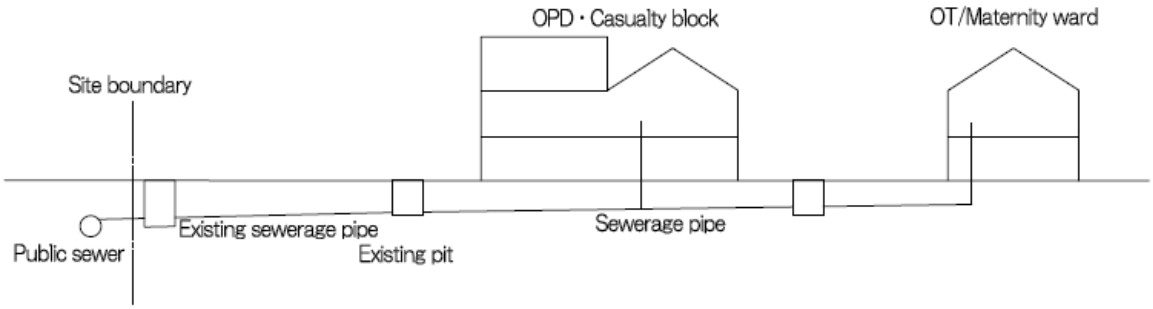


Figure-16 Kabale RRH: Schematic Diagram of Wastewater Sewerage System

3) Hot water supply system

Hot water will be supplied by independent electric hot water supply units at individual places where hot water is needed, such as hand-washing sink at the operation theatre, newborn baby bath, etc.

4) Sanitary fixtures

Patients, family attendants of the patients and hospital visitors will use squat toilets (Eastern-style toilet) equipped with high-tank flushing units. Patients in the Maternity Ward and hospital staff will use Western-style water closets. Water closets will also be adopted in the handicap toilets.

5) Fire fighting facilities

Fire water tanks using rain water as the main water source will be installed, to be equipped with a fire hydrant and a pump. Fire extinguisher will be also installed at necessary places.

6) Waste treatment system

Both hospitals conduct sorted collection of solid waste and medical waste, incinerate them at different places within the hospital premises, and bury the ashes. At the time of field survey, the standards for incinerators of Uganda were still in the process of formulation, and the incinerator was dropped from the list of requested items.

7) Air-conditioning system

In principle, rooms will be designed to allow ample natural draft to realise sufficient ventilation. Forced ventilation system will be installed in all the operation theatres as well as toilets and shower rooms that do not face outside.

Air-conditioning facilities will be designed for the operation theatres and HDU.

IV Construction Materials Planning

(1) Exterior Finishing Materials

1) Roof

Locally available galvanised precoated steel sheets will be used for roofing to facilitate maintenance. The roofs will be sloped roofs, with a gradient of 15 degrees or more, to prevent rainwater seepage into the inside.

2) Exterior wall

For the facility of maintenance, the exterior walls of the buildings will be fair-faced brickwork or paint finish over cement mortar substrate.

(2) Interior Finishing Materials

1) Floor

Floors will be finished with easy to clean and durable terrazzo polished in situ.

2) Interior wall

Interior walls in general will be masonry walls finished with paint on cement mortar substrate. Walls of operations theatres and delivery rooms, etc. that are liable to be contaminated with hazardous substances will be brickwork walls finished with tiles on cement mortar substrate. The walls of hallways and rooms and the projecting corners of columns that stretchers or carts can hit will be equipped with stretcher guards or corner guards, for the purpose of protection and also serving as a handrail.

3) Ceiling

① Ceilings of the rooms that require a high degree of cleanliness, such as the operation theatres and delivery rooms, will be finished with antimicrobial paint on calcium silicate boards for ease of cleaning and maintenance.

② The ceilings of general rooms, corridors and waiting halls will be finished with paint on gypsum boards.

③ The ceilings of toilets, shower rooms, etc. will be finished with paint on calcium silicate boards.

4) Doors and window sashes

External doors and windows will be equipped with aluminium sashes for their weather durability.

Internal doors for general rooms will be plywood doors and frames. The operation theatres and delivery rooms which require durable and easy-to-clean fittings will be provided with stainless steel doors and frames.

The following tables show the finishing schedule under consideration at present.

Table-11 Finishing Schedule

Building Element	Local Method (including the existing buildings)	Adopted Method	Reason for adopting the method
Roof	Sloped roof (Corrugated galvanised steel sheets)	Sloped roof (Corrugated galvanised precoated steel sheets)	Commonly used locally. Easy for maintenance
Exterior wall	Fair-faced brickwork, or fair-faced brickwork finished with paint on cement mortar substrate	Fair-faced brickwork, or fair-faced brickwork finished with paint on cement mortar substrate	Commonly used locally. Easy for maintenance
Floor	Terrazzo in situ	Terrazzo in situ	Durable and easy cleaning
		Tile	Easy for cleaning
Interior wall	Paint on mortar substrate	Paint on mortar substrate	Commonly used locally, easy for maintenance
		Tile	Commonly used locally, easy for maintenance
Ceiling	Paint finish on gypsum board substrate Mineral fibre decorative acoustic panel	Paint on gypsum board substrate	Commonly used locally, relatively easy for maintenance
		Calcium silicate board	Waterproof, relatively easy for maintenance
Doors & Windows	Steel windows Aluminium windows	Aluminium doors & windows	Commonly used locally, good weather durability
	Wooden doors Steel doors	Aluminium doors & windows	Good soundproofing and operability, easy for maintenance
		Steel doors & windows Wooden doors & windows	Good weather durability and soundproofing
		Stainless steel doors & windows	Good soundproofing, easy for cleaning

5) Equipment for utility systems

The usable lives of equipment for building utility systems range from 10 to 15 years, considerably shorter than construction materials. Such equipment should be selected to facilitate maintenance, including renewals, by the Ugandan side after these equipment will be handed over to the Ugandan side. Therefore, to the extent possible, they will be procured locally or from third countries including Kenya with demonstrated performance, while ensuring acceptable levels of quality.

2-2-2-4 Equipment Planning

The team confirmed final requested equipment narrowed down through the discussion with MOH and concerned persons with the targeted hospitals during the field survey II. However, the equipment requested was still numerous and covering all the departments. Therefore, to sustain the consistency with the facility planning, it was decided to take such the procedures; “First step: the equipment suitable for the Project was selected by the established criteria” and “Second step: the adequate equipment suitable for each hospital situation is planned with confirming the relevancy”.

[First step: the equipment suitable for the Project was selected by the established criteria]

Selection Criteria 1

① The equipment that is used for clinical purpose and corresponds to the services and clinical level of the targeted hospitals should be selected.

② The equipment should be limited to the one for the departments targeted for facility rehabilitation under the Project. This criterion is also applicable to Fort Portal RRH and the same departments with Hoima RRH and Kabale RRH are targeted, though the facility rehabilitation is not planned at Fort Portal RRH in the Project.

③ The Equipment considered to be low cost effective due to low frequency of use should be excluded.

④ In principle, the equipment that can be easily procured by the Ugandan side will be excluded.

⑤ The equipment whose purpose can be substituted by other clinical ways or by the use of other equipment will be excluded.

⑥ The equipment presumed not to conform to the scheme of Japanese Grant Aid project for the reasons that it is consumables itself or can be utilised in another purpose should be excluded.

The result of examination based on the above criteria is as follows.

Note:

"×" indicates the items do not conform to the criteria. If there is any one of unconformable criteria, the items were left out of selection. The items fulfilling all the criteria with "○" in the Overall Result were selected by these criteria.

Table-12 Equipment List Studied with the Criteria

No.	Equipment	Criteria						Overall Result
		①	②	③	④	⑤	⑥	
1	ABR System			×				×
2	Air Mattress (for Bedsore Prevention)			×				×
3	Amalgamator					×		×
4	Ambulance						×	×
5	Anaesthesia Machine							○
6	Audiometer (Clinical)			×				×
7	Audiometer (for Paediatric)			×				×
8	Audiometer (Screening)							○
9	Auto Refractor			×				×
10	Autoclave (Large)							○
11	Autoclave (Medium)					×		×
12	Autoclave (Table Top Type)					×		×
13	Automatic Film Processor					×		×
14	Baby Cot				×			×
15	Balance (Analytical)		×					×
16	Balance (Electric)		×					×
17	Balkan Beam			×				×
18	Band Saw		×					×
19	Bed (for Emergency)							○
20	Bed (for HDU)							○
21	Bed (for Orthopedic)					×		×
22	Bed (for Patient)							○
23	Bed Side Locker				×			×
24	Belt Sander		×					×
25	Bobarth Ball Set		×					×
26	Bohlers Stirrups		×					×
27	Bone Drilling Machine (Manual)		×					×
28	Bone Saw		×					×
29	Bronchoscope							○
30	Bull Head Lamp				×			×
31	Cabinet (for Drug)				×			×
32	Cabinet (for Drying)					×		×
33	Cabinet (for Instrument)				×			×
34	C-arm X-ray Unit							○
35	Cassette Set					×		×
36	Cassette Set (Gridded Type)					×		×
37	CD4 Counter		×					×
38	Centrifuge (HCT)		×					×
39	Centrifuge (Table Top Type)							○
40	Chemistry Analyzer		×					×
41	Colorimeter		×					×
42	Crutches				×			×
43	Deep Freezer		×					×
44	Defibrillator							○
45	Delivery Bed							○
46	Dental Unit							○
47	Dental X-ray Machine							○
48	Desk & Chair Set (for Doctor)				×			×
49	Diagnostic Set							○
50	Diagnostic Set (for MCH)					×		×
51	Distillator		×					×
52	Doppler							○
53	Dryer		×					×
54	Dynamometer (Hand, Finger)		×					×
55	ECG (12 lead)							○
56	ECT		×					×
57	Electric Cautery Apparatus		×					×
58	Electric Saw		×					×
59	Electric Surgical Unit							○
60	Electrical Nerve Stimulators (TENS)		×					×
61	Electroencephalogram (EEG)		×					×
62	Electrophoresis Apparatus		×					×
63	EMG		×					×
64	EMS		×					×
65	Endoscope Set							○
66	ENT Unit							○
67	Esophagoscope					×		×
68	Examination Couch							○
69	Examination Lamp (Mobile Type)							○
70	Examination Table (for Ob&Gy w/Examination Unit)							○

No.	Equipment	Criteria						Overall Result
		①	②	③	④	⑤	⑥	
71	Exercise Ball Set		×					×
72	Exercise Equipment Set (for Hand therapy)		×					×
73	Exerciser (for Arm Muscle)		×					×
74	Exerciser (for Finger)		×					×
75	External Fixation Set						×	×
76	Extraction Forceps Set				×			×
77	Glucometer		×					×
78	Goniometer		×					×
79	Grinder		×					×
80	Haematology Analyzer		×					×
81	Hand Circular Saw		×					×
82	Hand Wash Trolley				×			×
83	Hawley Table			×				×
84	Hearing Aid Analyzer		×					×
85	Hot Air Oven		×					×
86	Hot Plate		×					×
87	Incubator (Anaerobic)		×					×
88	Infant Incubator							○
89	Infant Incubators (for Transport)			×				×
90	Infant Warmer			×				×
91	Infrared Therapy Machine		×					×
92	Infusion Pump				×			○
93	Instrument Set (for Adenoidectomy)				×			×
94	Instrument Set (for Antrum Wash Out)				×			×
95	Instrument Set (for Bilateral Tubal Ligation)				×			×
96	Instrument Set (for Burr Hole)			×				×
97	Instrument Set (for Caesarean Section)							○
98	Instrument Set (for Cataract)			×				×
99	Instrument Set (for Delivery)							○
100	Instrument Set (for Dental)							○
101	Instrument Set (for Dental extraction/Examination)					×		×
102	Instrument Set (for Dental Filling)					×		×
103	Instrument Set (for Dental Surgery)			×				×
104	Instrument Set (for Dilatation)							○
105	Instrument Set (for Dressing)				×			×
106	Instrument Set (for ENT Casualty)			×				×
107	Instrument Set (for ENT Clinic)							○
108	Instrument Set (for Extra Ocular)			×				×
109	Instrument Set (for General Surgery Large)							○
110	Instrument Set (for Gynecology)							○
111	Instrument Set (for Hernia/Hydrocoelectomy)				×			×
112	Instrument Set (for Hysterectomy)				×			×
113	Instrument Set (for Intra Ocular)			×				×
114	Instrument Set (for Intubation)					×		○
115	Instrument Set (for IUCD)				×			×
116	Instrument Set (for IV Cut Down)				×			×
117	Instrument Set (for Laparotomy)							○
118	Instrument Set (for Laparotomy, Paediatric)			×				×
119	Instrument Set (for Lumbar Puncture, Adult)				×			×
120	Instrument Set (for Lumbar Puncture, Paediatric)				×			×
121	Instrument Set (for Mastoidectomy)			×				×
122	Instrument Set (for Myringotomy)				×			×
123	Instrument Set (for Obstetric Laparotomy)					×		×
124	Instrument Set (for Orthopedic Accessories)						×	×
125	Instrument Set (for Orthopedic)							○
126	Instrument Set (for Pathology)		×					×
127	Instrument Set (for Polypectomy)				×			×
128	Instrument Set (for Post Mortem)		×					×
129	Instrument Set (for Proof Puncture)				×			×
130	Instrument Set (for Sinus Operation)			×				×
131	Instrument Set (for Skin Grafting)			×				×
132	Instrument Set (for Stech Removing)				×			×
133	Instrument Set (for Stripping)			×				×
134	Instrument Set (for Surgical Toilet and Suture)				×			×
135	Instrument Set (for Suture)				×			×
136	Instrument Set (for Tonsillectomy)				×			×
137	Instrument Set (for Tracheostomy)							○
138	Instrument Set (for Tubal Ligation)				×			×
139	Instrument Set (for Turbinectomy)			×				×
140	Instrument Set (for Urology)		×					×

No.	Equipment	Criteria						Overall Result
		①	②	③	④	⑤	⑥	
141	Instrument Set (for Vasectomy)		×					×
142	Instrument Set (for VVF)					×		×
143	Instrument Shelf				×			×
144	Instrument Tray w/Stand				×			×
145	Instrument Tray				×			×
146	Irrigation Stand				×			×
147	IV Production Unit		×					×
148	Jigsaw		×					×
149	Laryngoscope Set					×		×
150	Lens Set (Trial)				×			×
151	Lens (+20D for Indirect Ophthalmoscope)				×			×
152	Light Cure Machine					×		×
153	Magnifier (Head Worn Type)				×			×
154	Mattress (for Exercising)		×					×
155	Microscope (Binocular)							○
156	Mirror		×					×
157	Mobile X-ray Unit			×				×
158	Multipurpose Tent		×					×
159	Muscle Stimulator		×					×
160	Nebulizer							○
161	Needle Aspiration Biopsy Set						×	×
162	OAE Machine			×				×
163	Operating Light (Ceiling Type)							○
164	Operating Light (Mobile Type)							○
165	Operating Microscope (for ENT)							○
166	Operating Microscope (Portable)			×				×
167	Operating Table							○
168	Ophthalmoscope (Direct)			×				×
169	Ophthalmoscope (Indirect, Head Worn Type)			×				×
170	Otoscope				×			×
171	Over Bed Table				×			×
172	Oxygen Concentrator					×		×
173	Paraffin Bath		×					×
174	Parallel Bar (for Children and Adults)		×					×
175	Patient Monitor					×		×
176	Patient Transfer Suitcase			×				×
177	Patient Trolley							○
178	pH Meter		×					×
179	Phototherapy Unit			×				×
180	Pinch Gauge (Hydraulic)		×		×			×
181	Plaster Bender					×		×
182	Plaster Saw (Electrical)			×				×
183	Plaster Shear (Manual)							×
184	Plaster Table				×			×
185	Portable Monitor							○
186	Pulse Oxymeter					×		×
187	Quadriceps Chair		×					×
188	Refrigerator (for Mortuary)		×					×
189	Refrigerator (for Specimen)		×					×
190	Refrigerator (for Blood Bank)		×					×
191	Refrigerator (for Ice Pack)		×					×
192	Refrigerator (for Kitchen)		×					×
193	Refrigerator (for Laboratory)							○
194	Refrigerator (for Medicine)							○
195	Refrigerator (w/ Freezer)		×					×
196	Resuscitation Bag (for Adult)							○
197	Resuscitation Bag (for Paediatric)							○
198	Retinoscope			×				×
199	Sewing Machine (Electric)		×					×
200	Shaker		×					×
201	Shaker (for VDRL)		×					×
202	Short Wave Diathermy Machine		×					×
203	Shoulder Wheel		×					×
204	Sign Nails						×	×
205	Skull Caliper (w/ Key)				×			×
206	Slit Lamp (w/ Applanation Tonometer)				×			×
207	Slit Lamp (w/ Teaching Provision)				×			×
208	Slitlamp			×				×
209	Soundproofing Booth			×				×

No.	Equipment	Criteria						Overall Result
		①	②	③	④	⑤	⑥	
210	Spectrophotometer		×					×
211	Spirometer			×				×
212	Stair		×					×
213	Standing Frame		×					×
214	Stationary Bike		×					×
215	Steam Sterilizer					×		×
216	Stool (for Surgeon)				×			○
217	Stool (for Patient)				×			×
218	Sterilizing Container Set (Drum & Carrier)							○
219	Stretcher				×			×
220	Stretcher (for Mortuary)		×					×
221	Suction Machine (Electric)							○
222	Suction Machine (for Vacuum Molding)		×					×
223	Suction Machine (Manual)				×			×
224	Surgical Light (Head Worn Type)					×		×
225	Syringe Pump							○
226	Tilting Table		×					×
227	Tonometer (Digital)			×				×
228	Tonometer (Non Contact Type)			×				×
229	Touch Mixer		×					×
230	Traction Machine (for Neck & Back)		×					×
231	Treadmill		×					×
232	Trolley (for Dressing)				×			×
233	Trolley (for Drug & Instrument)				×			×
234	Trolley (for Drug)				×			×
235	Trolley (for Emergency)				×			×
236	Trolley (for Instrument)				×			×
237	Trolley (for Mortuary)		×					×
238	Trolley (Mayo Type)				×			×
239	Tympanometer			×				×
240	Tympanometer (Handheld)			×				×
241	Ultrasonic Dental Scalar					×		×
242	Ultrasound Keratometer Machine			×				×
243	Ultrasound Scanner (Portable)							○
244	Ultrasound Scanner (for Clinical)					×		×
245	Ultrasound Therapy Machine		×					×
246	Under Water Seal Drainage Set						×	×
247	Vacuum Extractor (Electric)					×		×
248	Vacuum Extractor (Manual)					×		×
249	Ventilators (Adult)							○
250	Ventilator (Paediatric)			×				×
251	Universal Polishing Machine		×					×
252	Visual Field Machine (Automated)			×				×
253	Vitrectomy Machine			×				×
254	Walking Frame		×					×
255	Washing Basin w/Stand				×			×
256	Washing Machine		×					×
257	Water Bath		×					×
258	Weighing Scale (for Specimen)		×					×
259	Weighing Scale (Infant)				×			×
260	Weight Set		×					×
261	Weight/Height Measuring Scale				×			×
262	Wheel Chair				×			×
263	Working Table (Large)							○
264	X-ray Film Viewer							○
265	X-ray Processing Unit (for Dental Film)					×		×
266	YAG Laser Machine			×				×

[Second step: the adequate equipment suitable for each hospital situation is planned with confirming the relevancy]

The equipment approved relevancy for the Project was selected at the first step. At the second step, each item was evaluated in terms of validity, based on conditions of the departments of each hospital through the following criteria.
Meanwhile, through the discussion during the draft report explanation mission, each RRH pointed the different understanding against the result of evaluation drafted by the consultant after analysis II in Japan, and requested to restore or add some equipment. For these reasons, some modifications were added to the result of evaluation through the reexamination of requests after the draft report explanation mission.

Selection Criteria 2

(a) The equipment should be targeted for facility rehabilitation under the Project.
(In case of Fort Portal RRH, the same department planned facility rehabilitation in the other two RRHs under the Project should be targeted.)
(b) Certain staffs are/will be appointed who can properly operate and maintain the equipment.
(c) The equipment whose purpose will overlap the existing ones that are in good conditions and in sufficient quantity will be excluded or reduced the planned number.
(d) The equipment usage purpose that can be substituted by other clinical ways will be excluded.
(e) The equipment presumed to be of less frequent usage will be eliminated or the planned number will be reduced.

The result of evaluation based on the above criteria is as follows.

Note:
"○" indicates the items conforming to the criteria; on the other hand, "×" indicates conformability to the criteria. If there is any one of unconformable criteria, the items were left out of selection and showed "×" in the overall result. "△" in the criteria indicates that the number of equipment was regarded as overmuch. The items fulfilling all the criteria with "○" in the Overall Result were selected as the final planned equipment.

Table-13 Hoima RRH

Code No.	Equipment	Request			Evaluation/the number of equipment							
		Department	Q'ty	Total	(a)	(b)	(c)	(d)	(e)	Overall Result		
										Evaluation	Q'ty	Total
5	Anaesthesia Machine	Main OT	2	3	○	○	○	○	○	○	2	2
		Ophthalmology OT	1		×	○	○	○	○	×	-	
8	Audiometer (Screening)	ENTclinic	1	1	○	○	○	○	○	○	1	1
10	Autoclave (Large)	CSSD	2	2	○	○	○	○	○	○	2	2
19	Bed (for Emergency)	Casualty department	3	3	○	○	○	○	○	○	3	3
20	Bed (for HDU)	HDU	4	7	○	○	○	○	○	○	4	4
		Medical ward	3		×	○	○	○	○	×	-	
22	Bed (for Patient)	Maternity ward	50	50	○	○	○	○	△	△	42	42
34	C-arm X-ray Unit	Main OT	1	1	○	○	○	○	○	○	1	1
39	Centrifuge (Table Top Type)	OPD Laboratory	1	2	○	○	○	○	○	○	1	1
		Main OT	1		×	○	○	○	○	×	-	
44	Defibrillator	Casualty department	1	2	○	○	○	○	○	○	1	1
		HDU	1		○	○	○	×	○	×	-	
45	Delivery Bed	Delivery room	8	8	×	○	○	○	○	×	-	-
46	Dental Unit	Dental clinic	3	3	○	○	△	○	○	△	2	2
49	Diagnostic Set	Paediatric consultation room	1	8	○	○	○	○	○	○	1	3
		Specialised OPD consultation	1		○	○	○	○	○	○	1	
		HIV consultation room	1		○	○	○	○	×	×	-	
		General OPD consultation room	2		○	○	○	△	○	△	1	
		Medical ward	3		×	○	○	○	○	×	-	
55	ECG (12 lead)	HDU	1	3	○	○	○	○	○	○	1	1
		Medical ward	2		×	○	○	○	○	×	-	
59	Electric Surgical Unit	Main OT	2	2	○	○	○	△	○	△	1	1
65	Endoscope Set	Main OT	1	1	○	○	○	○	○	○	1	1
66	ENT Unit	ENTclinic	1	1	○	○	○	○	○	○	1	1
68	Examination Couch	Obstet. Consultation room	1	20	○	○	○	○	○	○	1	15
		Gynaec. Consultation room	1		○	○	○	○	○	○	1	
		ENTclinic	1		○	○	○	○	○	○	1	
		Paediatric consultation room	1		○	○	○	○	○	○	1	
		Paediatric treatment room	1		○	○	○	○	○	○	1	
		Specialised OPD consultation room	1		○	○	○	○	○	○	1	
		Specialised OPD treatment room	1		○	○	○	○	○	○	1	
		HIV treatment room	1		○	○	○	○	○	○	1	
		HIV consultation room	1		○	○	○	○	×	×	-	
		General OPD consultation room	5		○	○	○	○	○	○	5	
		General OPD treatment room	2		○	○	○	○	○	○	2	
		Casualty department	1		○	○	×	○	×	×	-	
		HDU	1		○	○	○	○	×	×	-	
		Maternity treatment room	2		○	○	×	○	×	×	-	
69	Examination Lamp (Mobile Type)	Paediatric consultation room	1	14	○	○	○	○	○	○	1	4
		General OPD consultation room	2		○	○	○	○	△	△	1	
		Specialised OPD consultation room	1		○	○	○	○	○	○	1	
		HIV consultation room	1		○	○	○	○	×	×	-	
		Casualty department	2		○	○	○	○	△	△	1	
		Obs/Gyn. OT	1		○	○	○	○	×	×	-	
		Obs/Gyn. OPD consultation room	2		○	○	○	○	×	×	-	
		Obs/Gyn. ward	4		○	○	○	○	×	×	-	
70	Examination Table (for Ob&Gy w/	Obs/Gyn. OPD Treatment room	2	4	○	○	○	△	○	△	1	2
		Maternity treatment room	1		○	○	○	○	×	×	-	
		Maternity Ward	1		○	○	○	○	○	○	1	
88	Infant Incubator	Newborn baby room	5	5	○	○	○	△	○	△	3	3
92	Infusion Pump	Resuscitation room	2	6	○	○	○	△	○	△	1	2
		HDU	4		○	○	○	△	○	△	1	
97	Instrument Set (for Caesarean S	Main OT	5	5	○	○	○	△	○	○	1	1
104	Instrument Set (for Dilatation)	Main OT	5	5	○	○	○	△	○	○	1	1
110	Instrument Set (for Gynecology)	Obs/Gyn. OPD Treatment room	6	6	○	○	○	△	○	△	2	2
125	Instrument Set (for Orthopedic)	Main OT	1	1	○	○	○	○	○	○	1	1
137	Instrument Set (for Tracheostom	OT	1	2	○	○	○	○	○	○	1	2
		Resuscitation room	1		○	○	○	○	○	○	1	
155	Microscope (Binocular)	OPD Laboratory	1	3	○	○	○	○	○	○	1	1
		Main OT	2		×	○	○	○	○	×	-	

Code No.	Equipment	Request			Evaluation/the number of equipment							
		Department	Q'ty	Total	(a)	(b)	(c)	(d)	(e)	Overall Result		
										Evaluation	Q'ty	Total
160	Nebulizer	Paediatric consultation room	1	4	○	○	○	○	○	○	1	3
		General OPD treatment room	1		○	○	○	○	○	○	1	
		Specialized OPD	1		○	○	○	○	○	○	1	
		Resuscitation room	1		○	○	○	○	×	×	-	
163	Operating Light (Ceiling Type)	Main OT	2	2	○	○	○	○	○	○	2	2
164	Operating Light (Mobile Type)	Obs/Gyn. OT	1	1	×	○	○	○	○	×	-	-
165	Operating Microscope (for ENT)	Main OT	1	1	○	○	○	○	○	○	1	1
167	Operating Table	Main OT	2	3	○	○	○	○	○	○	2	2
		Obs/Gyn. OT	1		×	○	○	○	○	×	-	
177	Patient Trolley	Recovery room	5	17	○	○	○	△	○	△	2	2
		Resuscitation room	2		○	○	○	×	○	×	-	
		Maternity Ward	1		○	○	×	○	○	×	-	
		Obs/Gyn. OT	2		×	○	○	○	○	×	-	
		Ophthalmology ward	1		×	○	○	○	○	×	-	
		OT of ophthalmology	1		×	○	○	○	○	×	-	
		Medical ward	5		×	○	○	○	○	×	-	
185	Patient Monitor	Main OT	3	11	○	○	△	△	○	△	2	4
		HDU	4		○	○	○	△	○	△	1	
		Resuscitation room	3		○	○	○	△	○	△	1	
		Obs/Gyn. OT	1		×	○	○	○	○	×	-	
193	Refrigerator (for Laboratory)	OPD Laboratory	1	1	○	○	○	○	○	○	1	1
194	Refrigerator (for Medicine)	OPD Laboratory	1	3	○	○	○	×	○	×	-	1
		Med. Supply storage	1		○	○	○	○	○	○	1	
		Obs/Gyn. OT	1		×	○	○	○	○	×	-	
196	Resuscitation Bag (for Adult)	Delivery room	2	2	×	○	○	○	○	×	-	-
216	Stool (for Surgeon)	Main OT	4	4	○	○	○	△	○	△	2	2
218	Sterilizing Container Set (Drum &	CSSD	1	1	○	○	○	○	○	○	1	1
221	Suction Machine (Electric)	Central OT	3	11	○	○	○	△	○	○	2	4
		Resuscitation room	2		○	○	○	△	○	△	1	
		HDU	2		○	○	○	△	○	△	1	
		Obs/Gyn. OT	2		×	○	○	○	○	×	-	
		Paediatric ward	2		×	○	○	○	○	×	-	
225	Syringe Pump	Resuscitation room	2	6	○	○	○	△	○	△	1	3
		HDU	4		○	○	○	△	○	△	2	
249	Ventilators (Adult)	HDU	2	2	○	○	○	△	○	△	1	1
263	Working Table (Large)	CSSD	1	1	○	○	○	○	○	○	1	1
264	X-ray Film Viewer	Obstet. consultation room	1	13	○	○	○	○	○	○	1	8
		Gynaec. consultation room	1		○	○	○	○	○	○	1	
		ENTclinic	1		○	○	○	○	○	○	1	
		Paediatric consultation room	1		○	○	○	○	○	○	1	
		Specialised OPD consultation room	1		○	○	○	○	○	○	1	
		HIV consultation room	1		○	○	○	○	×	×	-	
		General OPD consul	5		○	○	○	△	○	△	2	
		Resuscitation room	1		○	○	○	○	×	×	-	
		Operation theatre	1		○	○	○	○	○	○	1	

Table-14 Kabale RRH

Code No.	Equipment	Request			Evaluation/the number of equipment							
		Department	Q'ty	Total	(a)	(b)	(c)	(d)	(e)	Overall Result		
										Evaluation	Q'ty	Total
5	Anaesthesia Machine	Main OT	3	4	○	○	○	○	○	○	3	3
		ENT OT	1		×	○	○	○	○	×	-	
10	Autoclave (Large)	CSSD	2	2	○	○	○	○	○	○	2	2
19	Bed (for Emergency)	Casualty department	3	3	○	○	○	○	○	○	3	3
20	Bed (for HDU)	HDU	4	4	○	○	○	○	○	○	4	4
22	Bed (for Patient)	Maternity ward	66	66	○	○	○	○	△	△	34	34
29	Bronchoscope	Main OT	1	1	○	○	○	○	○	○	1	1
34	C-arm X-ray Unit	Main OT	1	1	○	○	○	○	○	○	1	1
39	Centrifuge (Table Top Type)	OPD laboratory	1	3	○	○	○	○	○	○	1	1
		Main laboratory	2		×	○	○	○	○	×	-	
44	Defibrillator	Casualty department	1	3	○	○	○	×	○	×	-	2
		Main OT	1		○	○	○	○	○	○	1	
		HDU	1		○	○	○	○	○	○	1	
45	Delivery Bed	Delivery room	5	5	○	○	○	○	○	○	5	5
46	Dental Unit	Dental clinic	3	3	○	○	○	△	○	△	2	2
47	Dental X-ray Machine	Dental clinic	1	1	○	○	○	○	○	○	1	1
49	Diagnostic Set	Paediatric OPD consultation room	1	3	○	○	○	○	○	○	1	3
		General OPD consultation room	1		○	○	○	○	○	○	1	
		Specialised OPD consultation	1		○	○	○	○	○	○	1	
52	Doppler	Obs/Gyn. Ward	3	3	○	○	○	△	○	△	1	1
55	ECG (12 lead)	Casualty department	1	3	○	○	○	○	○	○	1	2
		HDU	1		○	○	○	○	○	○	1	
		Medical ward	1		×	○	○	○	○	×	-	
59	Electric Surgical Unit	Main OT	2	2	○	○	○	△	○	△	1	1
65	Endoscope Set	Main OT	1	1	○	○	○	○	○	○	1	1
66	ENT Unit	ENTclinic	1	1	○	○	○	○	○	○	1	1
68	Examination Couch	Specialised OPD consultation room	1	15	○	○	○	○	○	○	1	9
		Specialised OPD treatment room	1		○	○	○	○	○	○	1	
		Gynaec. OPD Consultation room	1		○	○	○	○	○	○	1	
		Paediatric OPD consultation room	1		○	○	○	○	○	○	1	
		Paediatric OPD treatment room	1		○	○	×	○	○	×	-	
		General OPD consultation room	4		○	○	○	○	○	○	4	
		General OPD treatment room	2		○	○	○	△	○	△	1	
		Medical ward	1		×	○	○	○	○	×	-	
		Surgery ward	1		×	○	○	○	○	×	-	
		Paediatric ward	1		×	○	○	○	○	×	-	
		TB ward	1		×	○	○	○	○	×	-	
69	Examination Lamp (Mobile Type)	General/Specialised OPD treatment room	3	11	○	○	○	○	△	△	1	4
		Paediatric OPD treatment room	1		○	○	○	○	○	○	1	
		Obs/Gyn. Ward	3		○	○	○	○	△	△	2	
		Medical ward	1		×	○	○	○	○	×	-	
		Paediatric ward	1		×	○	○	○	○	×	-	
		Surgery ward	1		×	○	○	○	○	×	-	
		TB ward	1		×	○	○	○	○	×	-	
70	Examination Table (for Ob&Gy w/Examination Unit)	Gynaec. consultation room	1	3	○	○	○	○	○	○	1	1
		Obstet. OPD treatment room	1		○	○	○	×	○	×	-	
		MCH Consutlation room	1		×	○	○	○	○	×	-	
88	Infant Incubator	Maternity ward	3	3	○	○	○	△	○	△	2	2
92	Infusion Pump	HDU	2	2	○	○	○	○	○	○	2	2
97	Instrument Set (for Caesarean Section)	Main OT	5	5	○	○	○	△	○	△	1	1
99	Instrument Set (for Delivery)	Delivery room	10	10	○	○	○	△	○	△	3	3
100	Instrument Set (for Dental examination)	Dental clinic	12	12	○	○	○	△	○	△	1	1
104	Instrument Set (for Dilatation)	Main OT	3	3	○	○	○	△	○	△	1	1
109	Instrument Set (for General Surgery Large)	Minor OT	3	9	○	○	○	○	×	×	-	2
		Main OT	6		○	○	○	△	○	△	2	
114	Instrument Set (for Intubation)	HDU	1	1	○	○	○	○	○	○	1	1
117	Instrument Set (for Laparotomy)	Main OT	4	4	○	○	○	△	○	△	1	1
125	Instrument Set (for Orthopedic)	Main OT	5	5	○	○	○	△	○	△	1	1
137	Instrument Set (for Tracheostomy)	Casualty department	1	1	○	○	○	○	○	○	1	1
155	Microscope (Binocular)	OPD laboratory	1	2	○	○	○	○	○	○	1	1
		Central OT	1		×	○	×	○	○	×	-	

Code No.	Equipment	Request			Evaluation/the number of equipment							
		Department	Q'ty	Total	(a)	(b)	(c)	(d)	(e)	Overall Result		
										Evaluation	Q'ty	Total
160	Nebulizer	Casualty department	2	12	○	○	○	○	×	×	-	3
		Paediatric OPD treatment room	1		○	○	○	○	○	○	1	
		General OPD treatment room	2		○	○	○	△	○	△	1	
		HDU	1		○	○	○	○	○	○	1	
		Medical ward	2		×	○	○	○	○	×	-	
		Paediatric ward	2		×	○	○	○	○	×	-	
		Surgery ward	1		×	○	○	○	○	×	-	
		TB ward	1		×	○	○	○	○	×	-	
163	Operating Light (Ceiling Type)	Main OT	3	3	○	○	○	○	○	○	3	3
164	Operating Light (Mobile Type)	Casualty department	3	6	○	○	×	○	○	×	-	1
		Minor OT	1		○	○	○	○	○	○	1	
		Central OT	1		○	○	×	○	○	×	-	
		ENTOT	1		×	○	○	○	○	×	-	
165	Operating Microscope (for ENT)	Main OT	1	1	○	○	○	○	○	○	1	1
167	Operating Table	Minor OT	1	5	○	○	×	○	○	×	-	3
		Main OT	3		○	○	○	○	○	○	3	
		ENTOT	1		×	○	○	○	○	×	-	
177	Patient Trolley	Casualty department	4	19	○	○	×	○	○	×	-	2
		Recovery room	5		○	○	○	△	○	△	2	
		Obs/Gyn. ward	1		○	○	×	○	○	×	-	
		ENTOT	1		○	○	×	○	○	×	-	
		Orthopaedic OT	1		×	○	○	○	○	×	-	
		Medical ward	2		×	○	○	○	○	×	-	
		Paediatric ward	2		×	○	○	○	○	×	-	
		Surgery ward	2		×	○	○	○	○	×	-	
		TB ward	1		×	○	○	○	○	×	-	
185	Patient Monitor	Casualty department	3	11	○	○	○	△	○	△	1	4
		Main OT	3		○	○	○	△	○	△	2	
		HDU	4		○	○	○	△	○	△	1	
		Obs/Gyn. ward	1		×	○	○	○	○	×	-	
193	Refrigerator (for Laboratory)	OPD laboratory	1	1	○	○	○	○	○	○	1	1
194	Refrigerator (for Medicine)	Med. supply storage	1	1	○	○	○	○	○	○	1	1
196	Resuscitation Bag (for Adult)	Casualty department	2	7	○	○	○	△	○	△	1	2
		HDU	1		○	○	○	○	○	○	1	
		Medical ward	1		×	○	○	○	○	×	-	
		Paediatric ward	1		×	○	○	○	○	×	-	
		Surgery ward	1		×	○	○	○	○	×	-	
		TB ward	1		×	○	○	○	○	×	-	
197	Resuscitation Bag (for Paediatric)	Casualty department	2	3	○	○	○	△	○	△	1	1
		Paediatric ward	1		×	○	○	○	○	×	-	
216	Stool (for Surgeon)	Minor OT	2	5	○	○	○	○	×	×	-	3
		Main OT	3		○	○	○	○	○	○	3	
218	Sterilizing Container Set (Drum & Carrier)	CSSD	1	1	○	○	○	○	○	○	1	1
221	Suction Machine (Electric)	Main OT	2	15	○	○	○	○	○	○	2	4
		HDU	2		○	○	○	○	○	○	2	
		Delivery room	3		○	○	×	○	○	×	-	
		Medical ward	2		×	○	○	○	○	×	-	
		Paediatric ward	2		×	○	○	○	○	×	-	
		Surgery ward	2		×	○	○	○	○	×	-	
		TB ward	2		×	○	○	○	○	×	-	
225	Syringe Pump	HDU	2	2	○	○	○	○	○	○	2	2
243	Ultrasound Scanner (Portable)	Casualty department	1	3	○	○	○	○	×	×	-	-
		Gynae. treatment room	1		○	○	○	○	×	×	-	
		Maternity ward treatment room	1		○	○	○	○	×	×	-	
249	Ventilators (Adult)	HDU	2	2	○	○	○	△	○	△	1	1
263	Working Table (Large)	CSSD	1	1	○	○	○	○	○	○	1	1
264	X-ray Film Viewer	Specialised OPD consultation room	1	7	○	○	○	○	○	○	1	4
		Gynae. OPD consultatio	1		○	○	○	○	○	○	1	
		Paediatric OPD consulta	1		○	○	○	○	○	○	1	
		General OPD consultatic	4		○	○	○	△	○	△	1	

Table-15 Fort Portal RRH

Code No.	Equipment	Request			Evaluation/Q'ty							
		Department	Q'ty	Total	(a)	(b)	(c)	(d)	(e)	Overall Result		
										valuatio	Q'ty	Total
5	Anaesthesia Machine	Main OT	3	5	○	○	○	○	○	○	3	3
		Obs/Gyn. OT	1		×	○	○	○	○	×	-	
		Ophthalmology OT	1		×	○	○	○	○	×	-	
8	Audiometer (Screening)	ENTclinic	1	1	○	○	○	○	○	○	1	1
10	Autoclave (Large)	CSSD	2	2	○	○	○	○	○	○	2	2
19	Bed (for Emergency)	Casualty department	3	3	○	○	○	○	○	○	3	3
20	Bed (for HDU)	Medical ward (HDU)	4	4	×	○	○	○	○	×	-	-
29	Bronchoscope	ENTclinic	1	1	○	○	○	○	○	○	1	1
34	C-arm X-ray Unit	Main OT	1	1	○	○	○	○	○	○	1	1
39	Centrifuge (Table Top Type)	Main laboratory	1	1	×	○	○	○	○	×	-	-
44	Defibrillator	Casualty department	1	3	○	○	○	○	○	○	1	2
		OT	-		○	○	○	○	○	○	1	
		Medical ward (HDU)	1		×	○	○	○	○	○	-	
		Paediatric ward	1		×	○	○	○	○	×	-	
45	Delivery Bed	Delivery room	5	5	○	○	△	○	○	△	2	2
46	Dental Unit Set	Dental clinic	1	1	○	○	×	○	○	×	-	-
52	Doppler	Obs/Gyn. OPD consultation roon	2	3	○	○	○	△	○	△	1	1
		Obs/Gyn. OT	1		○	○	○	○	×	×	-	
55	ECG (12 lead)	Casualty department	2	2	○	○	○	△	○	△	1	1
59	Electric Surgical Unit	Main OT	2	3	○	○	○	△	○	△	1	1
		Minor OT	1		○	○	○	○	×	×	-	
65	Endoscope Set	Main OT	1	1	○	○	○	○	○	○	1	1
66	ENT Unit	ENTclinic	2	2	○	○	○	△	○	△	1	1
68	Examination Couch	Casualty department	1	2	○	○	○	○	×	×	-	-
		Surgery OPD consultation room	1		×	○	○	○	○	×	-	
69	Examination Lamp (Mobile Type)	General OPD	9	19	○	○	○	△	×	×	-	3
		Obs/Gyn. OPD	4		○	○	○	△	○	△	1	
		Paediatric OPD	2		○	○	○	△	○	△	1	
		Surgery OPD	1		○	○	○	○	○	○	1	
		Medical ward	3		×	○	○	○	○	×	-	
70	Examination Table (for Ob&Gyw/Exam	Obs/Gyn. Consultation room	6	6	○	○	×	○	○	×	-	-
88	Infant Incubator	Maternity ward	4	4	○	○	○	△	○	△	2	2
92	Infusion Pump	Casualty department	3	23	○	○	○	△	○	△	1	1
		Medical ward (HDU)	10		×	○	○	○	○	×	-	
		Paediatric ward	10		×	○	○	○	○	×	-	
97	Instrument Set (for Caesarean Sectio	Obs/Gyn. OT	3	3	○	○	○	△	○	○	1	1
99	Instrument Set (for Delivery)	Obs/Gyn. department	10	10	○	○	×	○	○	×	-	-
100	Instrument Set (for Dental examinatio	Dental clinic	3	3	○	○	×	○	○	×	-	-
104	Instrument Set (for Dilatation)	Main OT	3	3	○	○	×	○	○	×	-	-
107	Instrument Set (for ENT Clinic)	ENTclinic	1	1	○	○	○	△	○	△	1	1
109	Instrument Set (for General Surgery I	Main OT	3	3	○	○	○	△	○	△	1	1
110	Instrument Set (for Gynecology)	Obs/Gyn. Consultation room	3	6	○	○	△	○	○	△	1	2
		Delivery room	3		○	○	△	○	○	△	1	
114	Instrument Set (for Intubation)	Main OT	2	3	○	○	△	○	○	△	1	1
		Minor OT	1		○	○	×	○	○	×	-	
		Obs/Gyn. OT	1		○	○	×	○	○	×	-	
117	Instrument Set (for Laparotomy)	Main OT	5	7	○	○	○	△	○	△	1	1
		Obs/Gyn. OT	2		○	○	×	○	○	×	-	
125	Instrument Set (for Orthopedic)	Main OT	1	1	○	○	△	○	○	△	1	1
137	Instrument Set (for Tracheostomy)	Main OT	2	2	○	○	△	○	○	△	1	1
155	Microscope (Binocular)	Main OT	2	2	×	○	×	○	○	×	-	-
160	Nebulizer	Casualty department	1	9	○	○	○	○	○	○	1	1
		Surgery department	2		×	○	○	○	○	×	-	
		Medical ward (HDU)	3		×	○	○	○	○	×	-	
		Paediatric ward	3		×	○	○	○	○	×	-	
164	Operating Light (Mobile Type)	Main OT	2	4	○	○	○	○	○	○	2	4
		Minor OT	1		○	○	○	○	○	○	1	
		Obs/Gyn. OT	1		○	○	○	○	○	○	1	

Code No.	Equipment	Request			Evaluation/Q'ty							
		Department	Q'ty	Total	(a)	(b)	(c)	(d)	(e)	Overall Result		
										valuatic	Q'ty	Total
165	Operating Microscope (for ENT)	Main OT	1	1	○	○	○	○	○	○	1	1
167	Operating Table	Main OT	2	3	○	○	○	○	○	○	2	2
		Minor OT	1		○	○	○	○	×	×	-	
177	Patient Trolley	OPD	4	14	○	○	○	○	×	×	-	2
		Main OT	3		○	○	○	△	○	△	2	
		Obs/Gyn. OT	1		×	○	○	○	○	×	-	
		Surgery ward	2		×	○	○	○	○	×	-	
		Medical ward (HDU)	4		×	○	○	○	○	×	-	
185	Portable Monitor	Casualty department	3	19	○	○	○	△	○	△	1	3
		Main OT	3		○	○	○	△	○	△	2	
		Minor OT	1		×	○	○	○	○	×	-	
		Obs/Gyn. OT	1		×	○	○	○	○	×	-	
		Surgery ward	4		×	○	○	○	○	×	-	
		Medical ward (HDU)	4		×	○	○	○	○	×	-	
		Paediatric ward	3		×	○	○	○	○	×	-	
194	Refrigerator (for Laboratory)	Main OT	1	3	○	○	○	○	×	×	-	-
		Obs/Gyn. OT	1		○	○	○	○	×	×	-	
		Medical ward (HDU)	1		○	○	○	○	×	×	-	
196	Resuscitation Bag (for Adult)	Main OT	2	7	○	○	×	○	○	×	-	-
		Obs/Gyn. department	4		○	○	×	○	○	×	-	
		Obs/Gyn. OT	1		○	○	×	○	○	×	-	
197	Resuscitation Bag (for Paediatric)	Main OT	1	5	○	○	×	○	○	×	-	-
		Delivery room	1		○	○	×	○	○	×	-	
		Obs/Gyn. OT	2		×	○	×	○	○	×	-	
		Paediatric ward	1		×	○	×	○	○	×	-	
216	Stool (for Surgeon)	Main OT	6	10	○	○	△	○	○	△	2	2
			2		×	○	○	○	○	×	-	
		Ophthalmology OT	2		○	○	×	○	○	×	-	
218	Sterilizing Container Set (Drum & Carr	CSSD	1	1	○	○	○	○	○	○	1	1
221	Suction Machine (Electric)	Casualty department	2	14	○	○	△	○	○	△	1	4
		Main OT	3		○	○	○	○	○	○	3	
		Minor OT	1		○	○	×	○	○	×	-	
		Obs/Gyn. OT	1		×	○	○	○	○	×	-	
		Surgery ward	2		×	○	○	○	○	×	-	
		Medical ward (HDU)	5		×	○	○	○	○	×	-	
243	Ultrasound Scanner (Portable)	Casualty department	1	2	○	○	○	×	○	×	-	1
		Obs/Gyn. department	1		○	○	○	○	○	○	1	
249	Ventilators (Adult)	Casualty department	2	2	○	○	○	△	○	○	1	1

The list of planned equipment is as follows.

Table-16 List of Planned Equipment

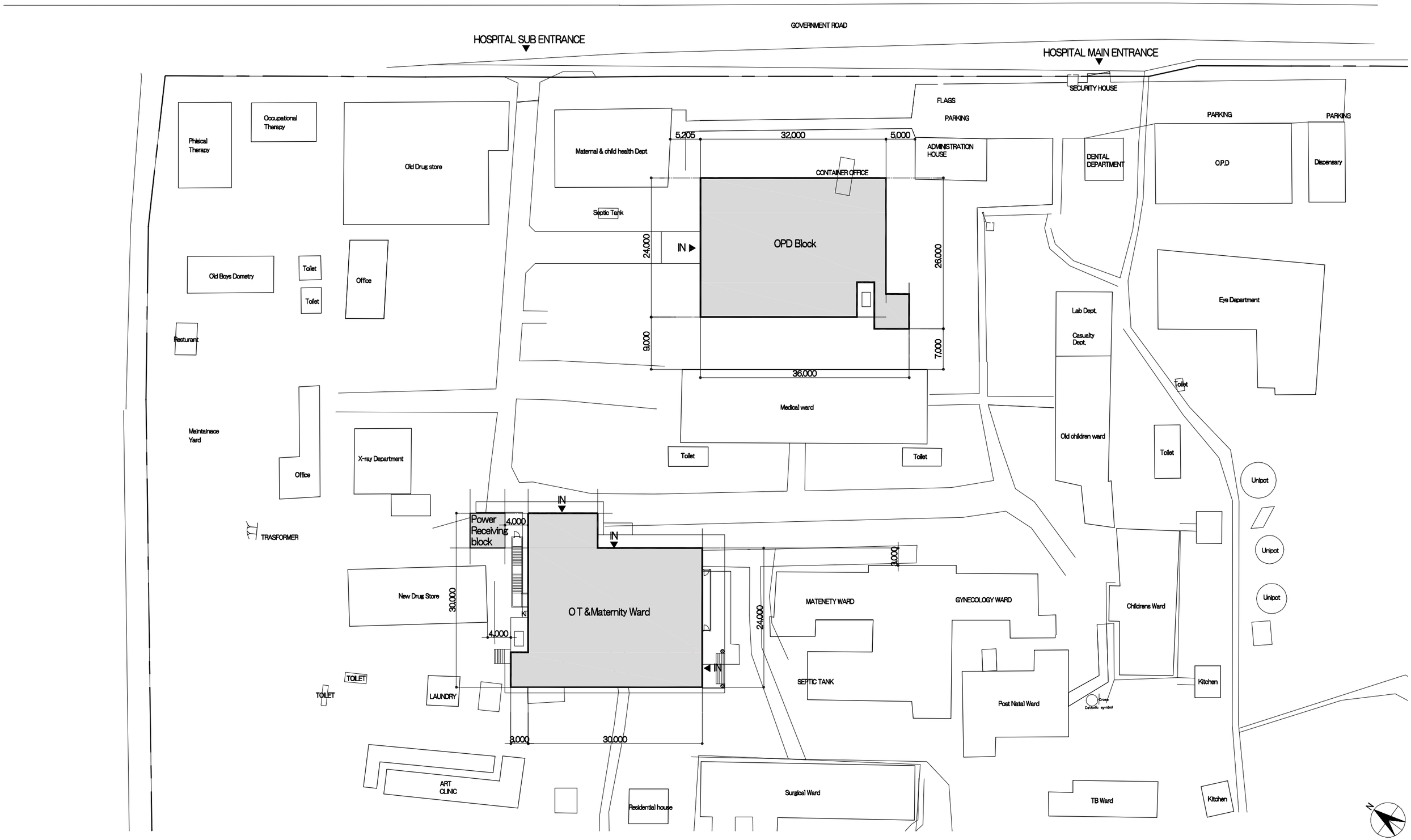
No.	Code No.	Equipment	Q'ty	Hoima RRH																Kabale RRH																Fort Portal RRH								
				OPD								OT/Maternity Ward					Subtotal	OPD							OT/Maternity Ward					Subtotal	OPD	Casualty	OP Theater	CSSD	Dental	ENT	Obs/Gyn.	Subtotal
				Laboratory	Obs/Gyn.	ENT	Paediatric	HIV	General/Special OPD	Dental		OP Theater	CSSD	Casualty	HDU	Maternity Ward		Laboratory	Obs/Gyn.	ENT	Paediatric	General/Special OPD	Med supply storage	Dental	OP Theater	CSSD	Casualty	HDU	Maternity Ward														
1	5	Anaesthesia Machine Set	8								2					2								3					3			3					3
2	8	Audiometer (Screening)	2			1										1																		1		1
3	10	Autoclave (Large)	3									1				1									1				1			1					1
4	19	Bed (for Emergency)	9										3			3										3			3		3						3
5	20	Bed (for HDU)	8											4		4											4		4								
6	22	Bed (for Patient)	76												42	42												34	34								
7	29	Bronchoscope	2																					1					1					1		1
8	34	C-arm X-ray Unit	3								1					1								1					1			1				1
9	39	Centrifuge	2	1												1	1												1							
10	44	Defibrillator	5										1			1								1			1		2		1	1				2
11	45	Delivery Bed	7																									5	5						2	2
12	46	Dental Unit Set	2							1						1							1						1								
13	49	Diagnostic Set	6				1		2							3				1	2								3								
14	52	Doppler	2																									1	1						1	1
15	55	ECG (12 lead)	4											1		1										1	1		2		1						1
16	59	Electric Surgical Unit	3								1					1								1					1			1					1
17	65	Endoscope Set	2								1					1								1					1								
18	66	ENT Unit	3			1										1				1									1						1		1
19	68	Examination Couch	24		2	1	2	1	9							15		1		1	7								9								
20	69	Examination Lamp (Mobile Type)	11				1		2		1					4				1	1							2	4	3							3
21	70	Examination Table (forObs/Gyn.)	3		1										1	2		1											1								
22	88	Infant Incubator	7												3	3												2	2						2	2
23	92	Infusion Pump	5										1	1		2											2		2		1					1
24	97	Instrument Set (for Caesarean Section)	3								1					1								1					1			1					1
25	99	Instrument Set (for Delivery)	3																									3	3							
26	100	Instrument Set (for Dental examination)	1																				1						1								
27	104	Instrument Set (for Dilatation)	2								1					1								1					1								

No.	Code No.	Equipment	Q'ty	Hoima RRH																Kabale RRH																Fort Portal RRH								
				OPD								OT/Maternity Ward						Subtotal	OPD							OT/Maternity Ward					Subtotal	OPD							Subtotal
				Laboratory	Obs/Gyn.	ENT	Paediatric	HIV	General/Special OPD	Dental	OP Theater	CSSD	Casualty	HDU	Maternity Ward		Laboratory	Obs/Gyn.	ENT	Paediatric	General/Special OPD	Med supply storage	Dental	OP Theater	CSSD	Casualty	HDU	Maternity Ward		OPD	Casualty	OP Theater	CSSD	Dental	ENT	Obs/Gyn.	
28	107	Instrument Set (for ENT Clinic)	1																																	1		1
29	109	Instrument Set (for General Surgery Large)	3																					2					2			1					1
30	110	Instrument Set (for Gynecology)	4		2										2																					2	2
31	114	Instrument Set (for Intubation)	2																								1		1			1					1
32	117	Instrument Set (for Laparotomy)	2																					1					1			1					1
33	125	Instrument Set (for Orthopedic)	2								1				1									1					1								
34	137	Instrument Set (for Tracheostomy)	4								1		1			2											1		1			1					1
35	155	Microscope (Binocular)	2	1												1	1												1								
36	160	Nebulizer	7				1		2							3				1	1						1		3		1						1
37	163	Operating Light (Ceiling Type)	5								2					2								3					3								
38	164	Operating Light (Mobile Type)	5																								1		1		1	2				1	4
39	165	Operating Microscope (for ENT)	3								1					1								1					1			1					1
40	167	Operating Table	7								2					2								3					3			2					2
41	177	Patient Trolley	6								2					2								2					2			2					2
42	185	Portable Monitor	11								2		1	1		4								2		1	1		4		1	2					3
43	193	Refrigerator (for Laboratory)	2	1												1	1												1								
44	194	Refrigerator (for Medicine)	2						1							1						1							1								
45	196	Resuscitation Bag (for Adult)	2																							1	1		2								
46	197	Resuscitation Bag (for Paediatric)	1																							1			1								
47	216	Stool (for Surgeon)	7								2					2								3					3			2					2
48	218	Sterilizing Container Set (Drum & Carrier)	3									1				1									1				1				1				1
49	221	Suction Machine (Electric)	12								2		1	1		4								1		1	2		4		1	3					4
50	225	Syringe Pump	5										1	2		3											2		2								
51	243	Ultrasound Scanner (Portable)	1																																	1	1
52	249	Ventilators (Adult)	3											1		1											1		1		1						1
53	263	Working Table (Large)	2									1				1									1				1								
54	264	X-ray Film Viewer	12		2	1	1		3		1					8		1		1	2								4								
55	268	Oxygen Cylinder w/Regulator & Trolley	11								2			1		3								3			1		4		1	3					4
56	269	Endoscope Set w/Coagulation	1																													1					1
57	270	Examination Unit (forObs/Gyn)	3		1										1	2		1											1								

2-2-3 Outline Design Drawings

Hoima RRH:
- Plot Plan
- OPD Block Plan
- OPD Block Elevation
- OT/Maternity Ward Plan
- OT/Maternity Ward Elevation
- Section

Kabale RRH:
- Plot Plan
- OPD/Casualty Block Plan
- OPD/Casualty Block Elevation
- OT/Maternity Ward Plan
- OT/Maternity Ward Elevation
- Section



PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA

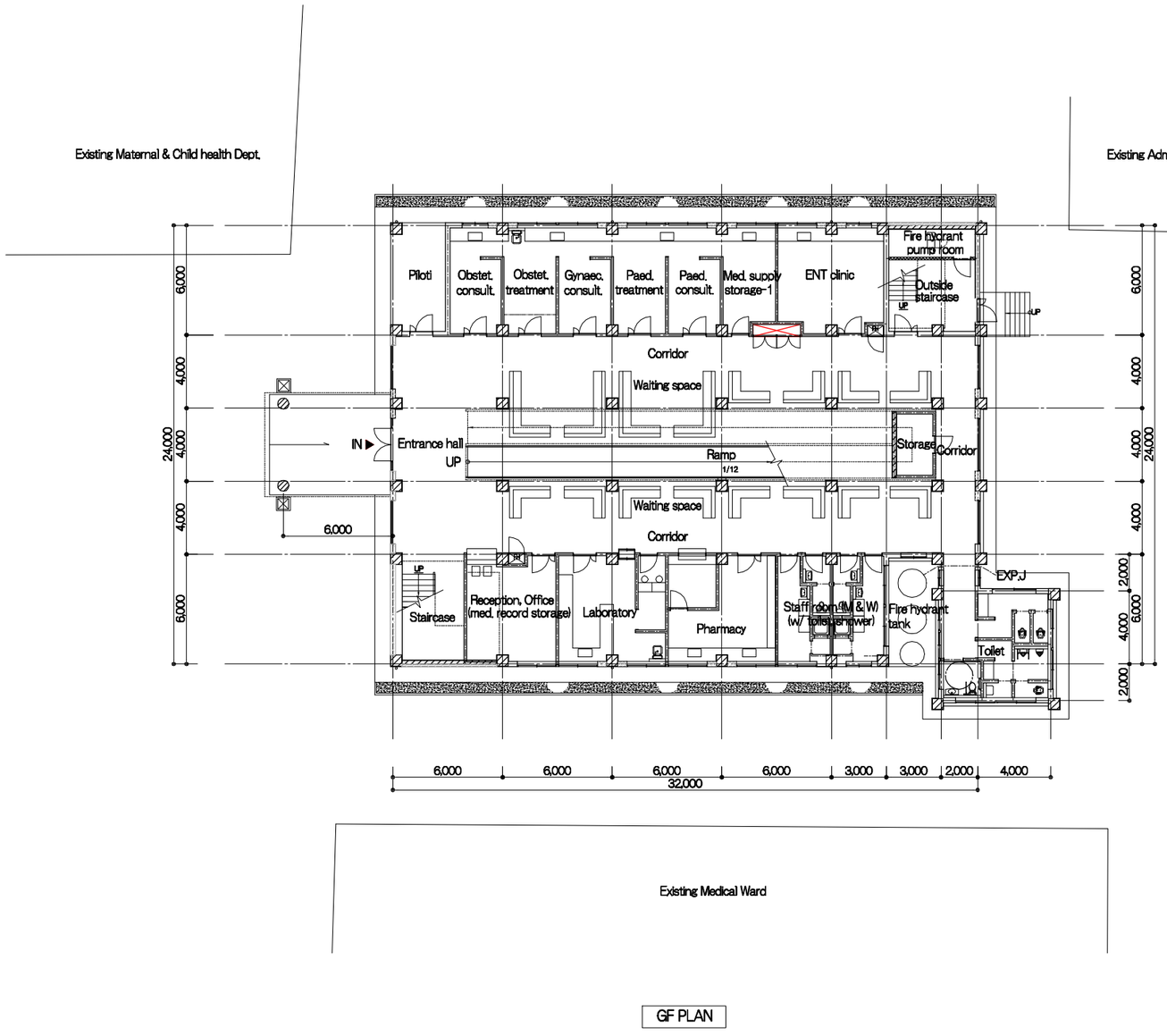
HOIMA

REGIONAL REFERRAL HOSPITAL

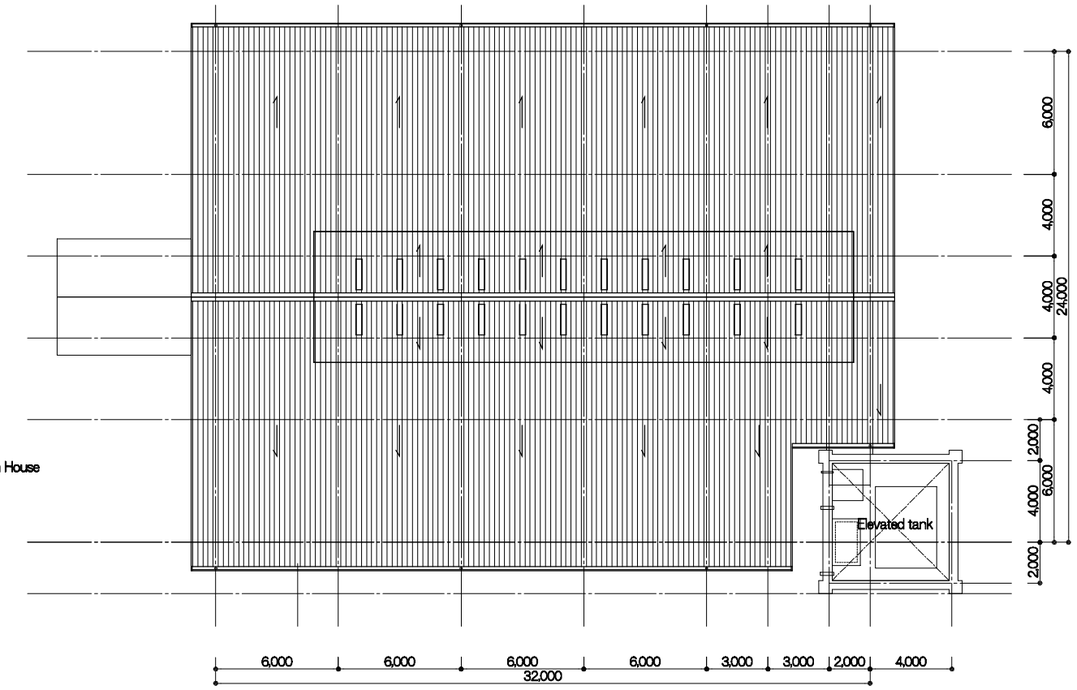
Name of drawing: PLOT PLAN

Scale of drawing: 1:600

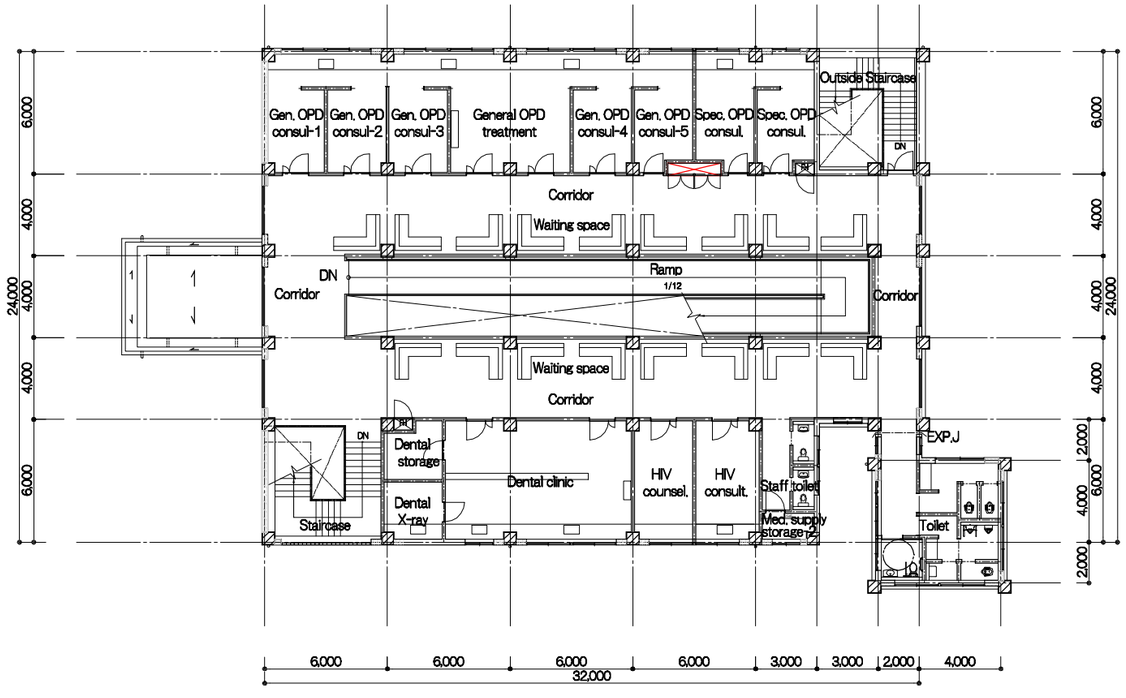
Number of drawing: H-01



GF PLAN



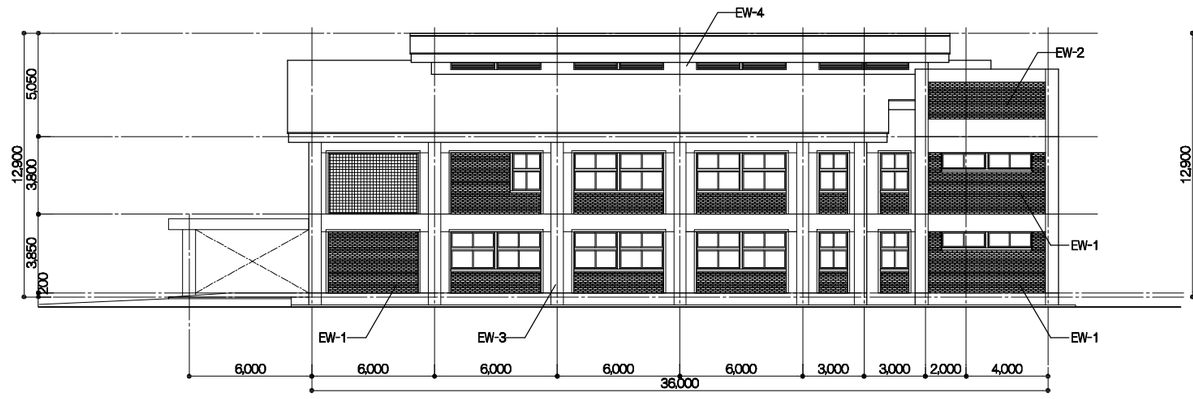
RF PLAN



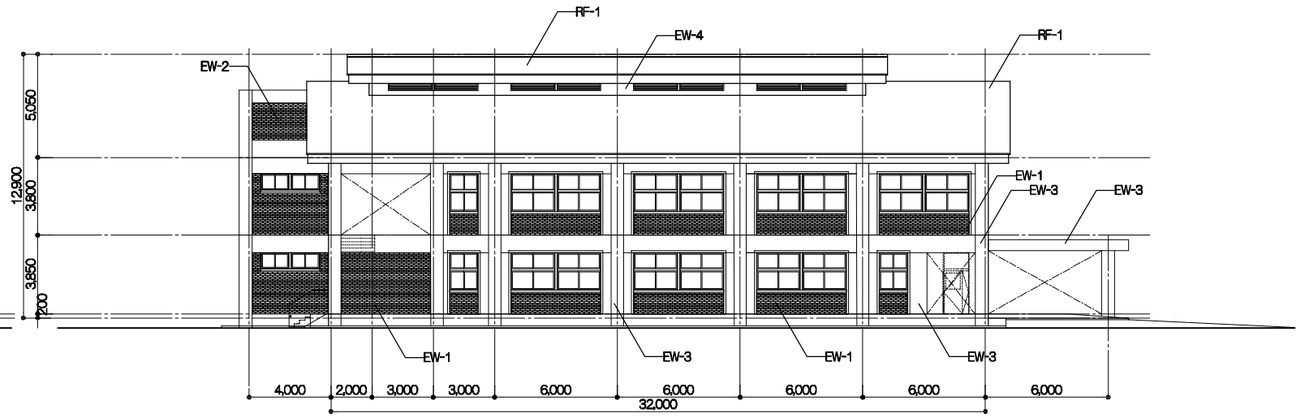
1F PLAN

OPD block

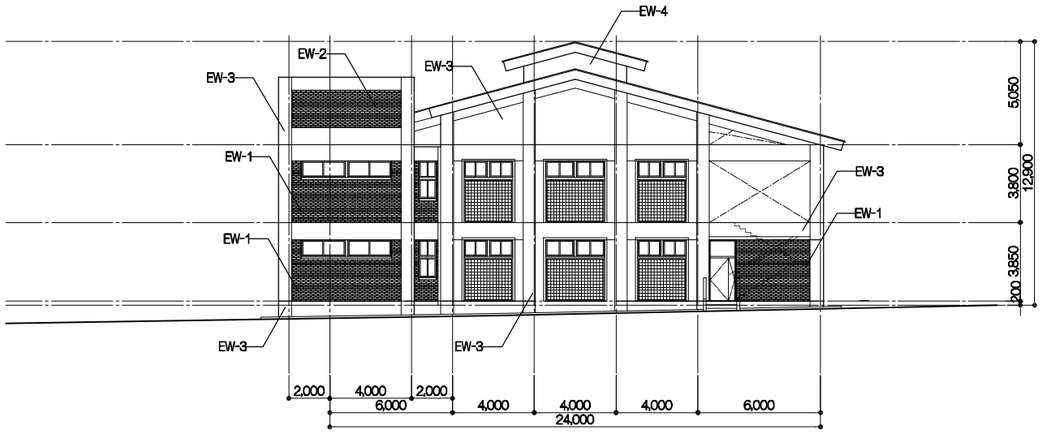
PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA	HOIMA REGIONAL REFERRAL HOSPITAL	Name of Drawing: OPD Block PLAN Scale of Drawing: 1:300	Number of Drawing: H-02



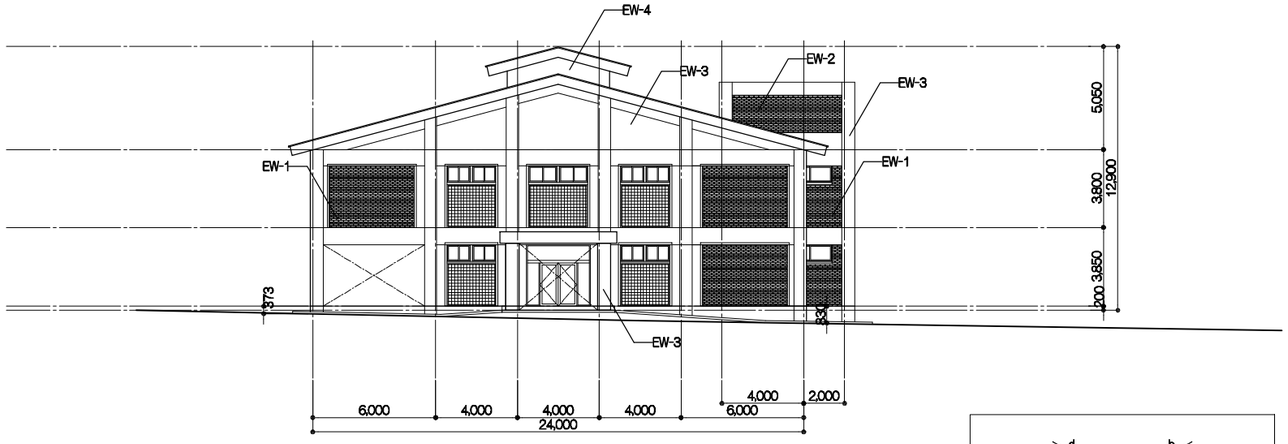
Elevation a-a



Elevation c-c



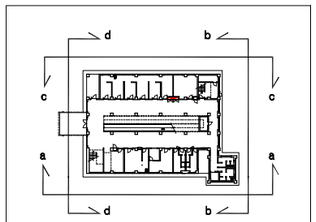
Elevation b-b



Elevation d-d

Legend

RF-1	CORRUGATED GALVANIZED STEEL SHEETROOFING t=0.5
RF-2	CONCRETE FLAT ROOF W/ TROWELING , ASPHALT WATER PROOFING ,CONCRETE W/TROWEL FINISH
EW-1	FAIR FACE BRICK
EW-2	FAIR FACE POROUS BRICK
EW-3	MORTAR W/ ELASTIC PAINTING FINISH
EW-4	CARRUGATED GALVANIZED STEEL SHEET ROOFING t=0.5



OPD block

PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA

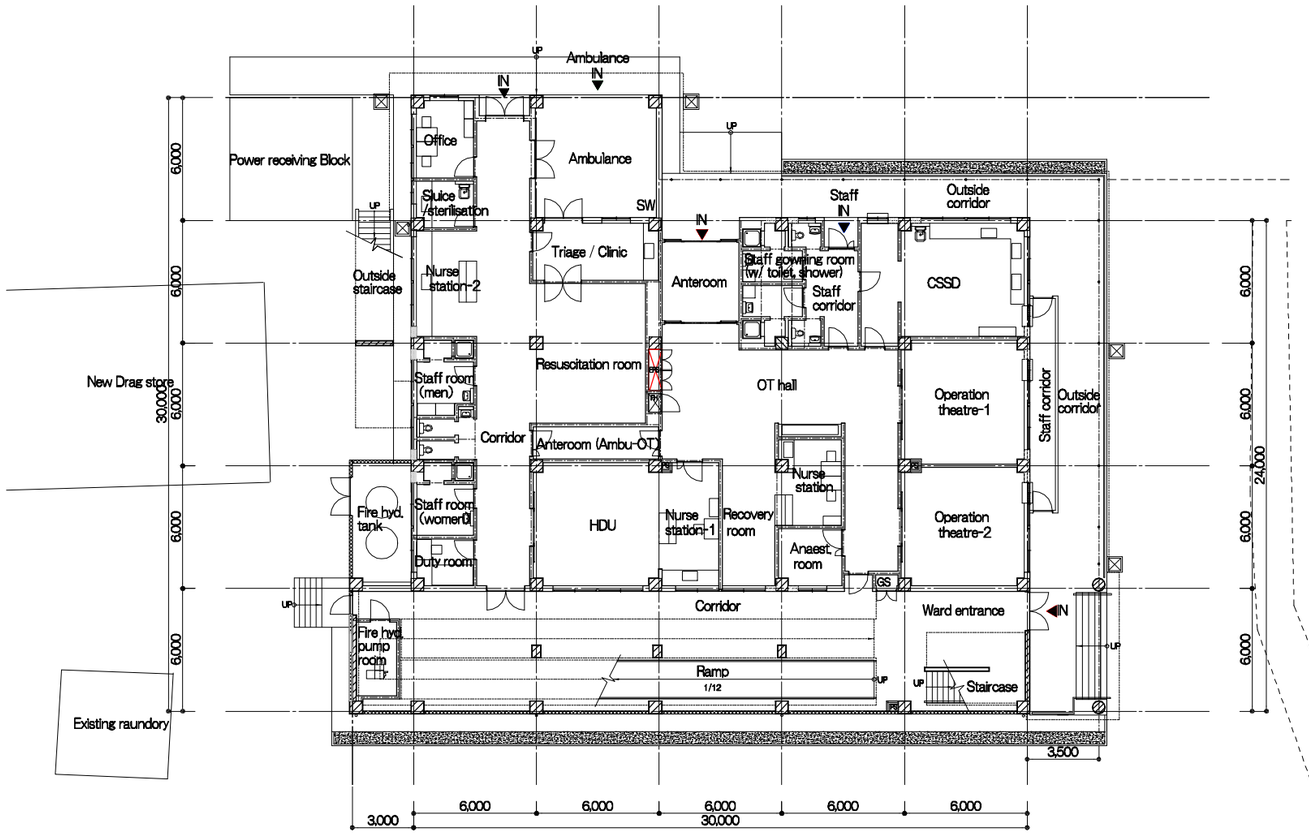
HOIMA

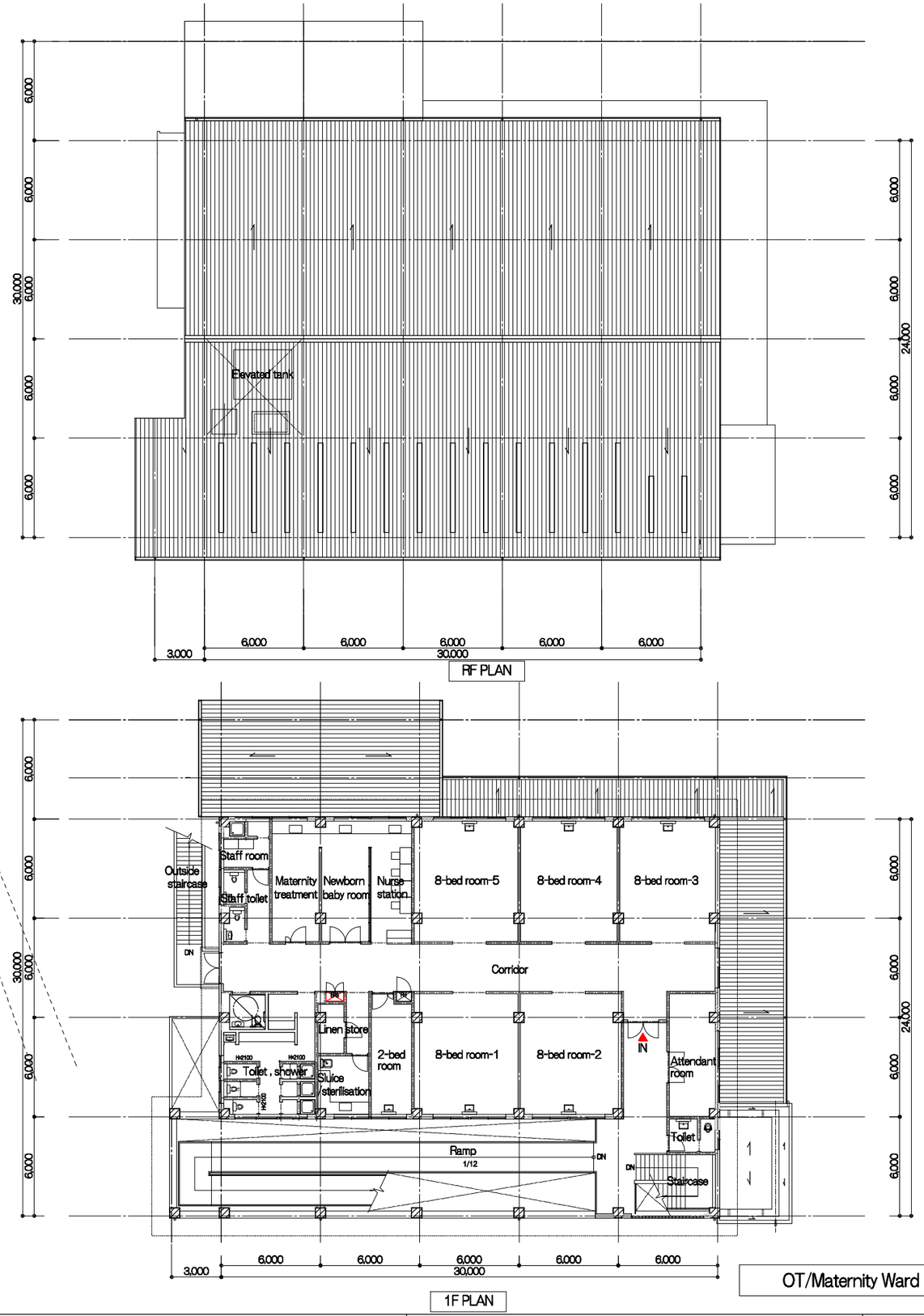
REGIONAL REFERRAL HOSPITAL

Name of Drawing: OPD Block Elevation

Scale of Drawing: 1:300

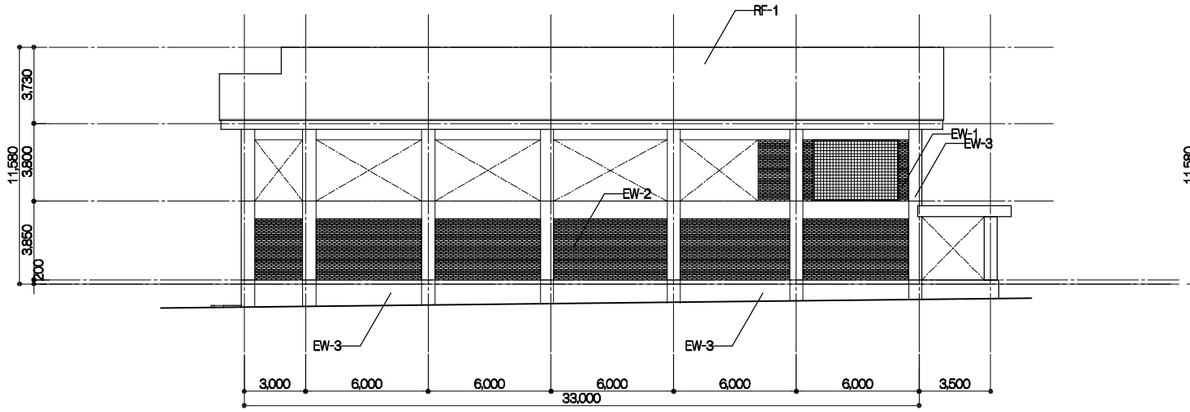
Number of Drawing: H-03



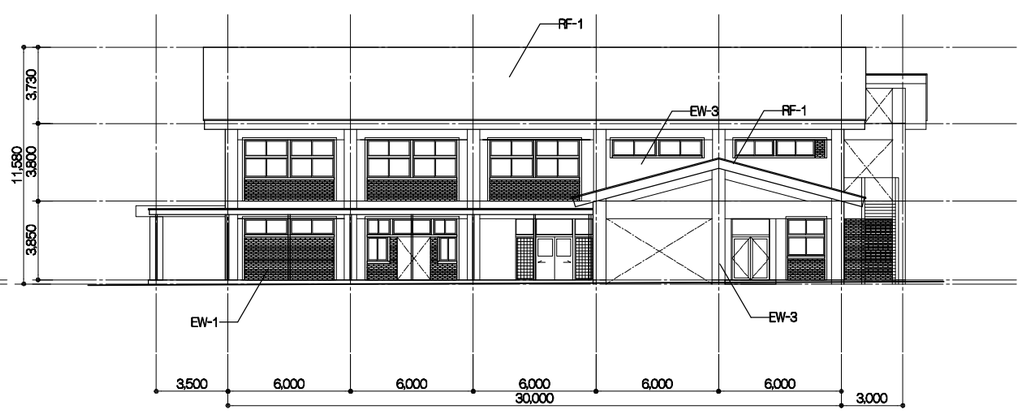


OT/Maternity Ward

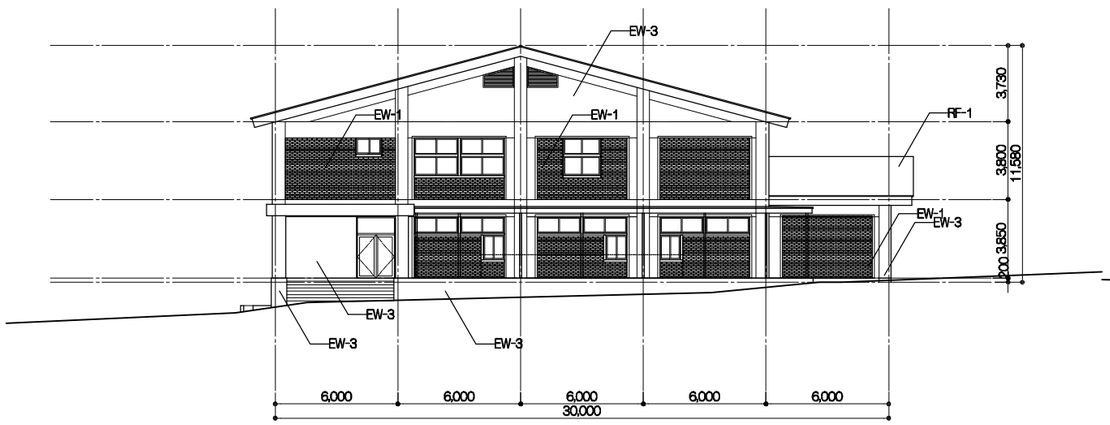
PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA	HOIMA REGIONAL REFERRAL HOSPITAL	Name of Drawing: OT/Maternity Ward PLAN Scale of Drawing: 1:300	Number of Drawing: H-04



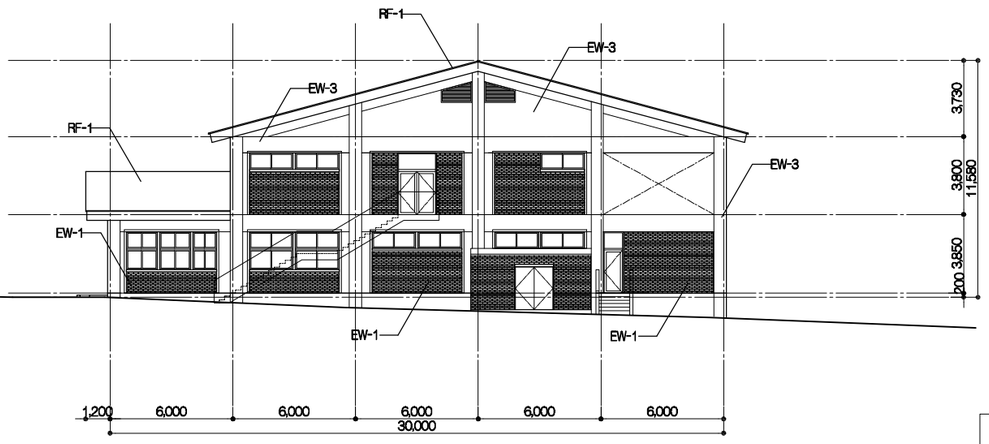
Elevation a-a



Elevation c-c



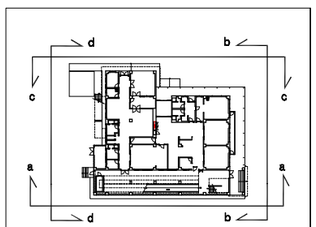
Elevation b-b



Elevation d-d

Legend

RF-1	CORRUGATED GALVANIZED STEEL SHEETROOFING t=0.5
RF-2	CONCRETE FLAT ROOF W/ TROWELING , ASPHALT WATER PROOFING ,CONCRETE W/TROWEL FINISH
EW-1	FAIR FACE BRICK
EW-2	FAIR FACE PORUS BRICK
EW-3	MORTAR W/ ELASTIC PAINTING FINISH
EW-4	CARRUGATED GALVANIZED STEEL SHEET ROOFING t=0.5



OT/Maternity Ward

PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA

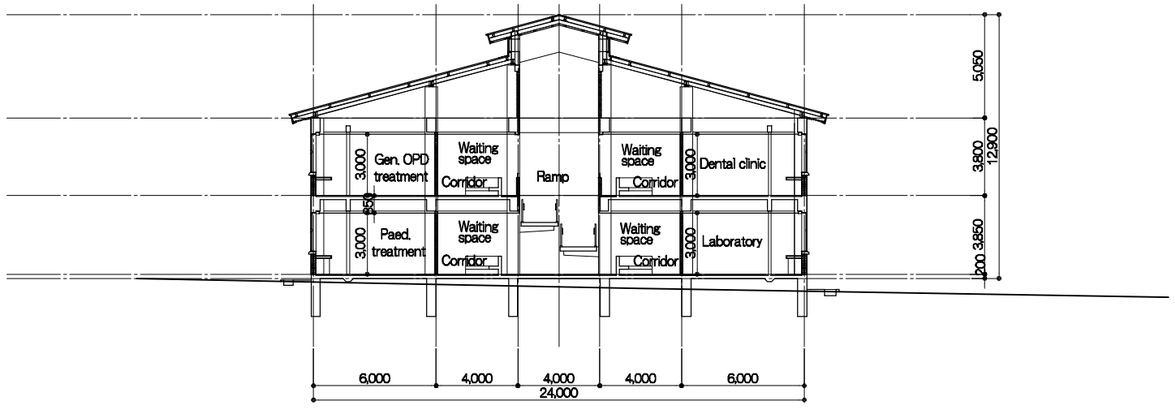
HOIMA

REGIONAL REFERRAL HOSPITAL

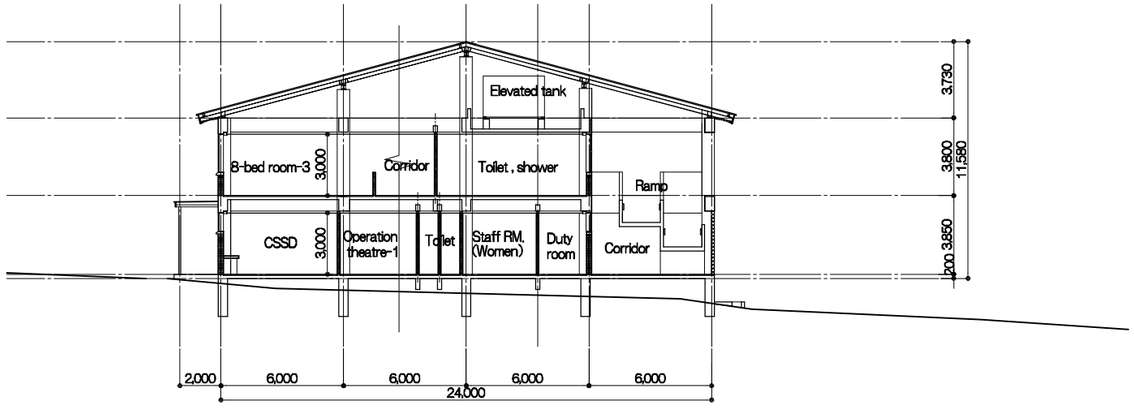
Name of Drawing: OT/Maternity Ward Elevation

Scale of Drawing: 1:300

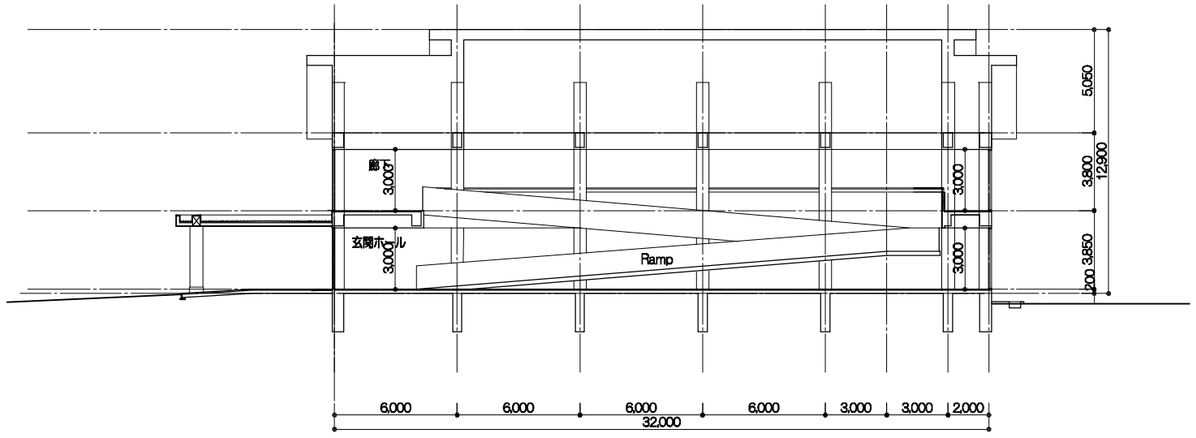
Number of Drawing: H-05



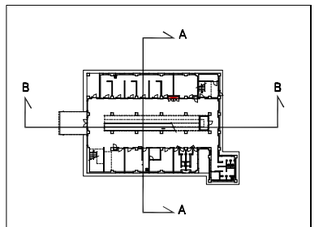
Section A-A



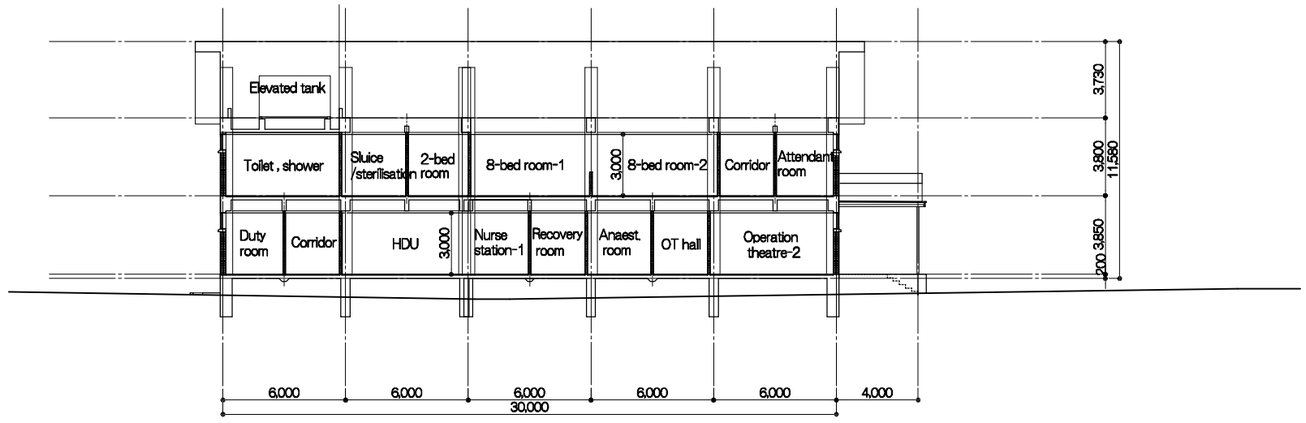
Section A'-A'



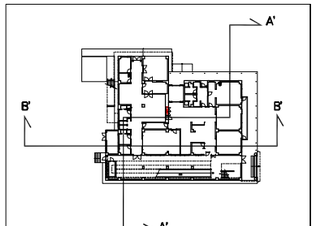
Section B-B



OPD block



Section B'-B'



OT/Maternity Ward

PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA

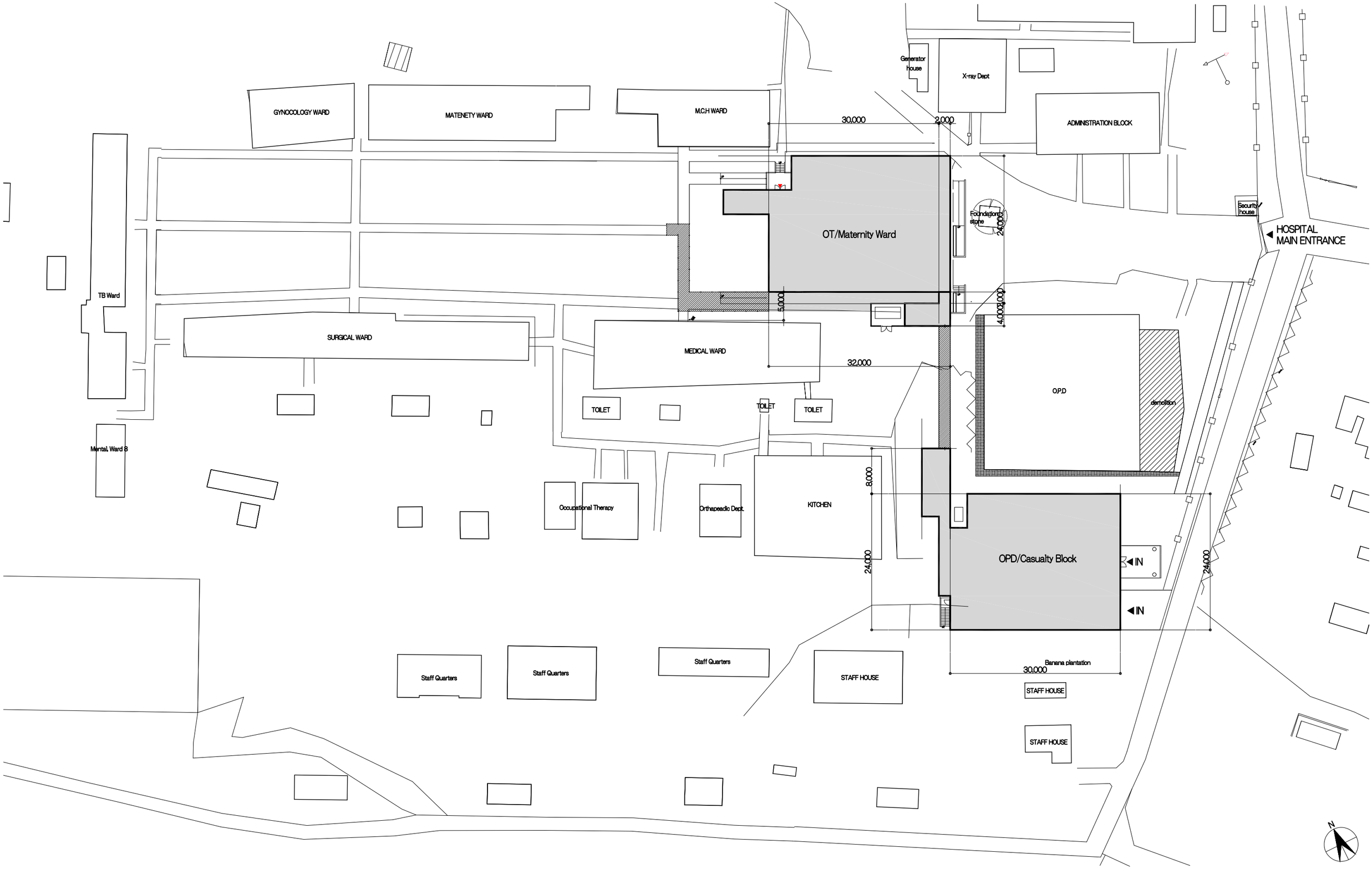
HOIMA

REGIONAL REFERRAL HOSPITAL

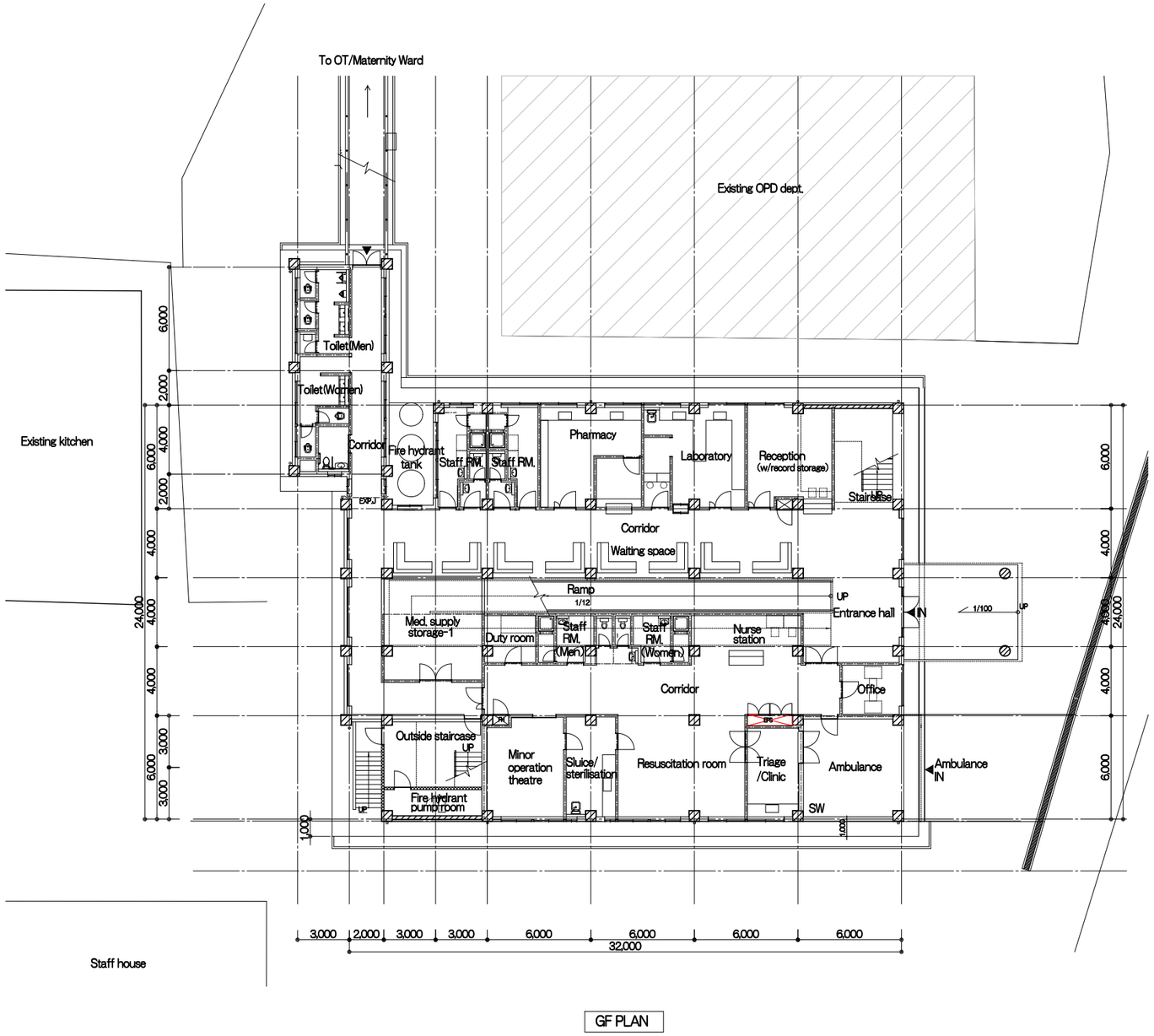
Name of Drawing: Section

Scale of Drawing: 1:300

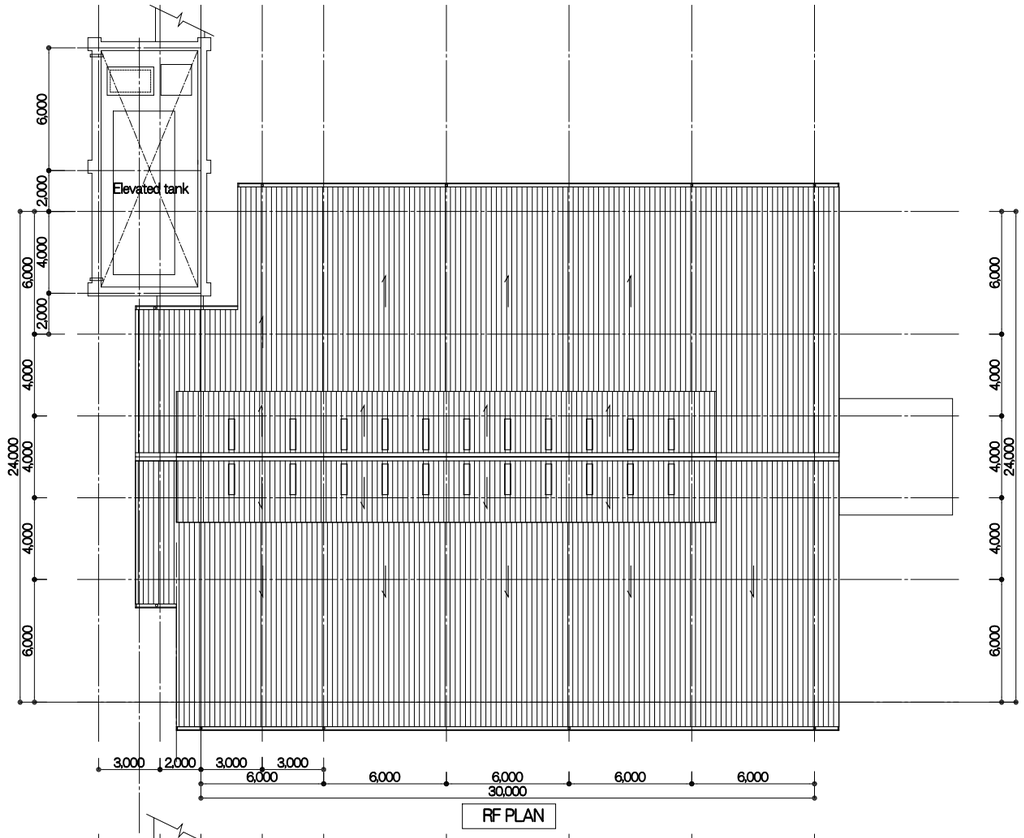
Number of Drawing: H-06



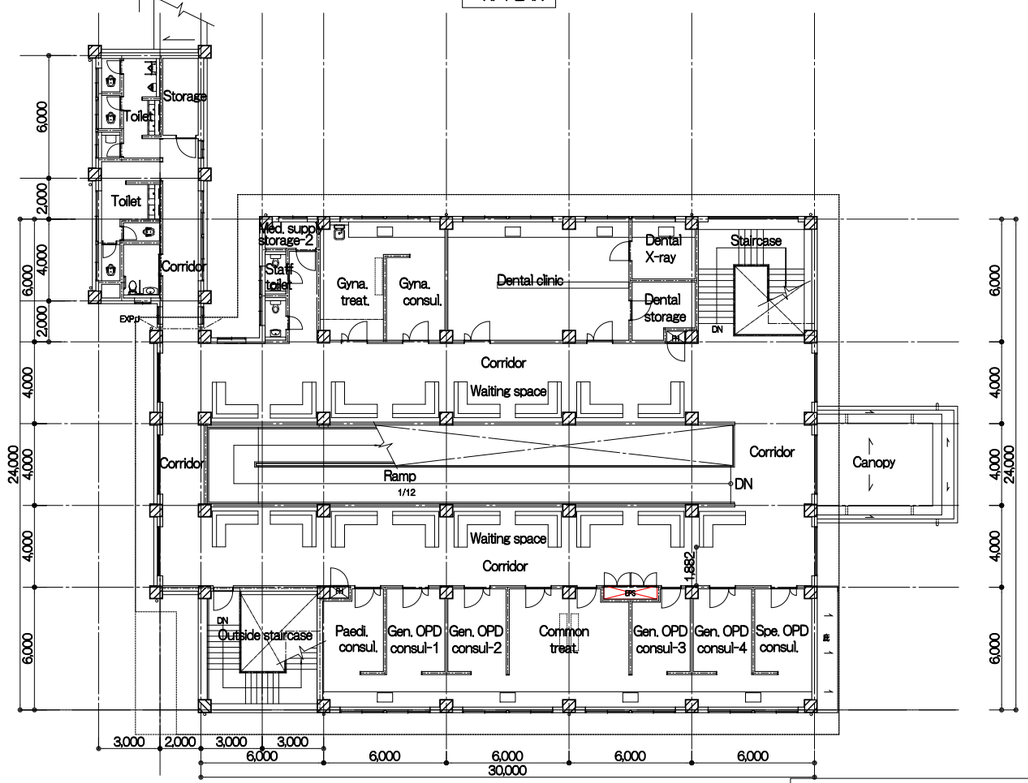
PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA	KABALE REGIONAL REFERRAL HOSPITAL	Name of drawing: PLOT PLAN Scale of drawing: 1:600	Number of drawing: K-01



GF PLAN



RF PLAN



1F PLAN

OPD block

PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA

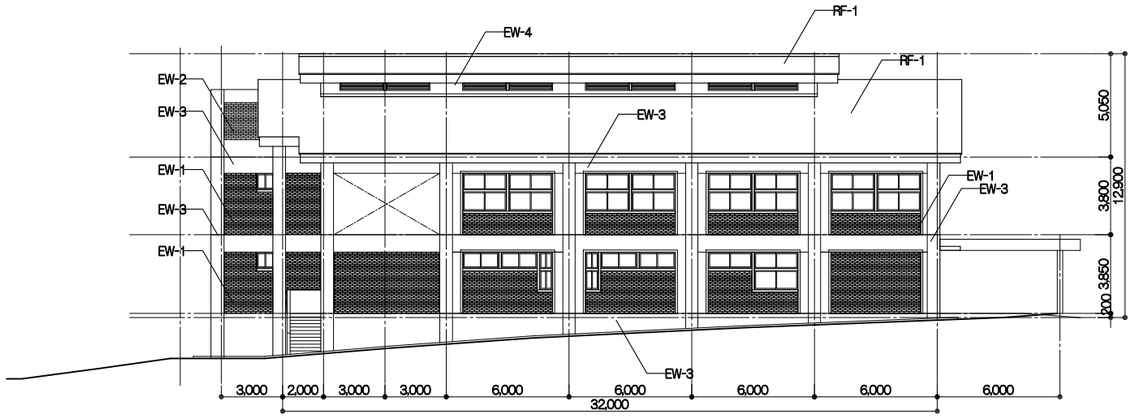
KABALE

REGIONAL REFERRAL HOSPITAL

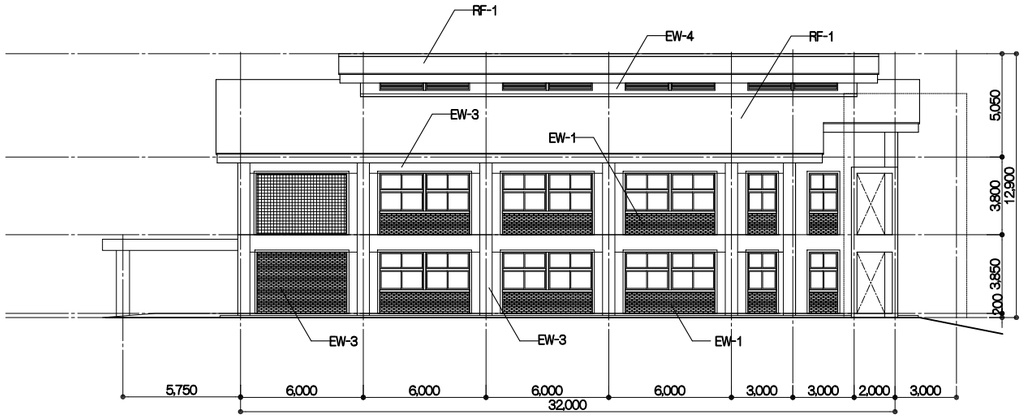
Name of Drawing: OPD/Casualty Block PLAN

Scale of Drawing: 1:300

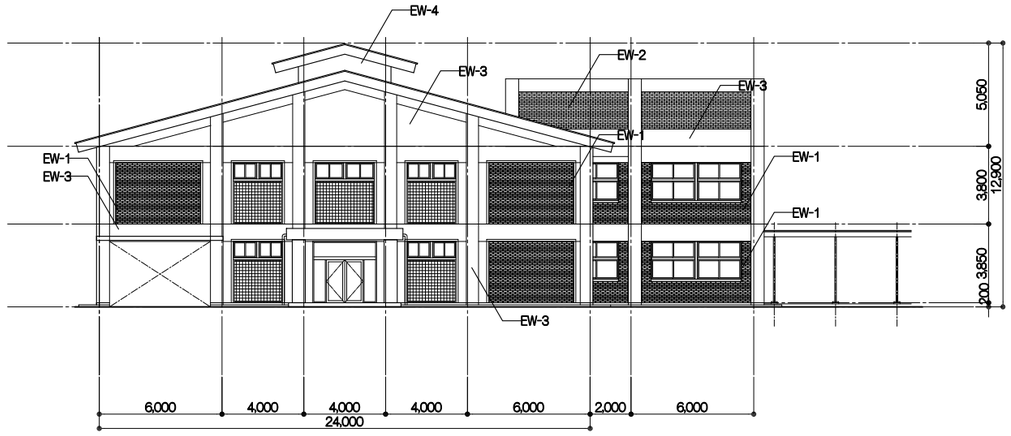
Number of Drawing: K-02



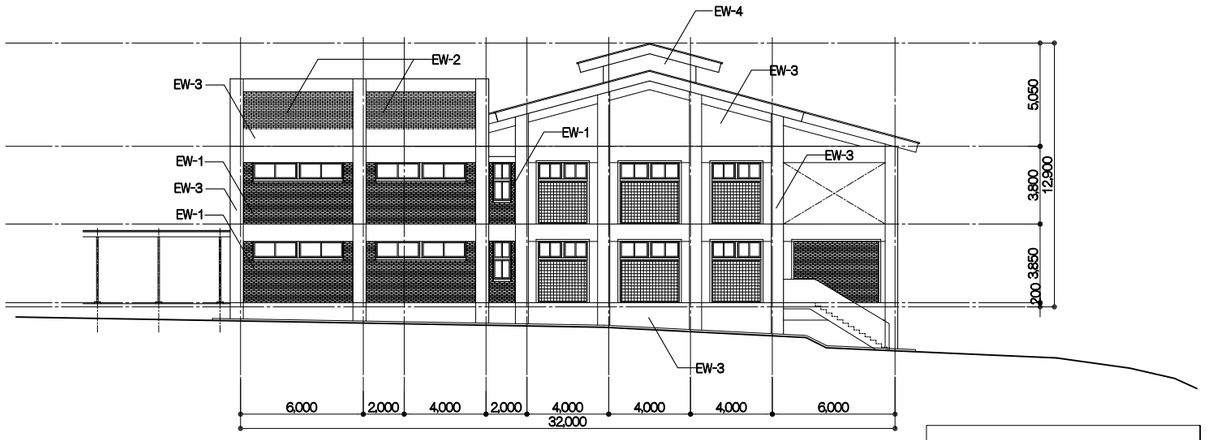
Elevation a-a



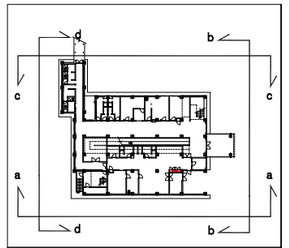
Elevation c-c



Elevation b-b



Elevation d-d



OPD block

Legend

RF-1	CORRUGATED CALVANIZED STEEL SHEETROOFING t=0.5
RF-2	CONCRETE FLAT ROOF W/ TROWELING , ASPHALT WATER PROOFING ,CONCRETE W/TROWEL FINISH
EW-1	FAIR FACE BRICK
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EW-3	MORTAR W/ ELASTIC PAINTING FINISH
EW-4	CARRUGATED GALVANIZED STEEL SHEET ROOFING t=0.5

PREPARATORY SURVEY ON THE PROJECT FOR THE REHABILITATION OF HOSPITALS AND SUPPLY OF MEDICAL EQUIPMENT IN THE WESTERN REGION IN UGANDA

KABALE

REGIONAL REFERRAL HOSPITAL

Name of Drawing: OPD/Casualty Block Elevation

Scale of Drawing: 1:300

Number of Drawing: K-03