Ministry of Health & Medical Services
Solomon Islands

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR IMPROVEMENT
OF
KILU'UFI HOSPITAL
IN
SOLOMON ISLANDS

May 2023

Japan International Cooperation Agency (JICA)

Fukunaga Architects - Engineers Co., Ltd.
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Preface

Japan International Cooperation Agency (JICA) decided to conduct a preparatory survey and to entrust the survey to the consortium of Fukunaga Architects-Engineers Co., Ltd. Yachiyo Engineering Co., Ltd. and Binko International Limited.

The survey team held a series of discussions with the officials concerned from the Government of Solomon Islands and conducted field investigations in April 2022. The present report was finalized based on their findings, together with the results of several further studies conducted in Japan.

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 from the Government of Solomon Islands for cooperating closely with the survey team.

May 2023

KAMEI Haruko

Director General,
Human Development Department
Japan International Cooperation Agency

Summary

Summary

1. Outline of the Country

Solomon Islands has a population of 707,000 and a gross national income per capita of USD 2,680 (World Bank, 2021, WB). The country has a land area of 28,900 km^2. It is an island state consisting of approximately 1,000 islands, which makes economic development difficult owing to geographical factors. Malaita, the project's target province, covers an area of 4,225 km^2 and has a population of 173,000, which is 24% of the total national population, making it the most populous province in the Solomon Islands (2019 demographic statistics).

The World Health Organization (WHO) has set a threshold of 4.45 persons per 1,000 people to estimate the number of health personnel, including doctors, nurses, and midwives, required to achieve the Sustainable Development Goals (SDGs) (WHO, 2018). Against this threshold, the country has only 2.36 persons.

2. Background and Outline of the Project

In the National Development Strategy (NDS) (2016–2035), the Solomon Islands National Government (SIG) has stated NDS Objective Three as "All Solomon Islanders have access to quality health and education." In the foundations for the future strategy, it states "Rehabilitate regional and provincial – secondary and specialty (mental health) hospitals including tertiary infrastructure and equipment. The Ministry of Health and Medical Services (MHMS) has developed the National Health Strategic Plan (NHSP) 2016–2020. Malaita is a priority province in the NHSP, and it has decided to rehabilitate Kilu'ufi Hospital (KH), a regional general hospital (Level 3) located in the provincial capital Auki. Since its establishment in 1967, KH has undergone a series of small alterations and additions with support from the SIG, WHO, and other donor funds. KH has become the second-largest hospital in the country but is unable to provide adequate medical services owing to lack of facilities, inadequate sanitation, aging facilities, and lack of medical equipment. Due to a shortage of resources, some patients are transferred to the NRH.

Under these circumstances, in 2016, the SIG prepared the "Kilu'ufi Hospital Master Plan Design Report, June 2016 (hereafter referred to as MP2016)," which was a comprehensive plan for the reconstruction of KH. However, the SIG faced financial difficulties in achieving this plan. The SIG requested a grant aid from the Government of Japan (GOJ to rebuild the entire KH. In response to this request, JICA conducted a preparatory study to study the possibility and extent of assistance.

3. Outline of the Survey / Contents of the Project

The government of Japan (GOJ) decided to conduct a preliminary survey (hereinafter "the Survey") in response to the request from the SIG, and the Japan International Cooperation Agency (JICA) started remote survey from January 2022, and dispatched a survey team (hereinafter "the JICA Survey Team") twice, in April and June 2022. When they returned to Japan, the JICA Survey Team further analyzed the field survey results and elaborated a project plan for facility construction and equipment procurement. The JICA Survey Team then presented the SIG with an outline of the survey results in January 2023 and compiled the final Survey Report.

Although MP 2016 recommended a completely new construction of the entire hospital on a new site, a new consecutive step-by-step development plan was agreed upon with the hospital to enable implementation with a limited budget.

This project by the Japanese Grant Aid project aims to be the first stage of this new development plan. The project aims to first rehabilitate the existing hospital infrastructure (water and power supply) and to build facilities for the priority services of the hospital, namely the Emergency Medicine & General Outpatient Services, the operating theatre suite with a central sterilization service department, medical imaging, and the delivery unit with a special care nursery. The medical equipment for these services will also be procured.

This implementation of the first stage will promote the successive phases of the redevelopment plan funded by the SIG with other donor funds. This project aims to improve the quality of medical services at KH.

Table. 1 Outline of the Project

Phase 1	Scope of the Project by the Japanese grant aid funds:		
Size & Functions	Infrastructure facilities (electricity and water): Total floor area: 75.00 m^2 Central clinical building and delivery building: Total floor area: 2,137.26 m^2		
Infrastructure	1) Electricity	Relocation of existing transformer and generator Installation of new power supply system	
	2) Water	Installation of a new borehole pump (deep well), elevated water tank, Provision of new water supply system from the stream Rainwater harvesting system for the new building	
Facilities	1) Emergency Medicine & General Outpatient Services	Consultation rooms	2 General OPD consultation rooms & 1 Medicine consultation room
		Treatment rooms	(Resuscitation, Minor procedure, blood collection, etc.)
		Observation beds	Male 6 beds Female 6 beds Children 3 beds Isolation 1 bed
		Pharmacy	
	2) Medical Imaging	General X-Ray room	
		Ultrasound room	
	3) Operating Theatre Suite	2 Operating rooms	
		OT hall with Scrub	Observation 2 beds Minor Treatment 1 bed
	4) CSSD	Central Sterilization Service rooms	
	5) Delivery Room & Special Care Nursery (SCN)	Delivery room	3 beds
		Labour room (Ante-natal beds)	4 beds
		Post-natal day beds	4 beds with baby cots
		Isolation bed	1 bed
		Neonatal Bay / Milk room	2 incubators
Others	1) Electricity	Power outlets, Generator, Lightings, Telephone & LAN, Fire safety lightings, lightening protectors	
	2) Mechanical	A/C, ventilation, etc.	
	3) Plumbing	Sanitary, Water & hot water supply, drain & sewage (septic tank), Firefighting (hose reel) etc.	
Medical equipment	All medical equipment for above medical services including patient monitors, X-Ray machine, Ultrasound machine, OT table, OT lights, Anesthetic machine, Electrical surgical machine, Delivery table, Infant incubator, and others. Total 63 types, 293 items.		
Furniture	General furniture, office supply and IT system is to be provided by SIG		
	Consecutive phase for the comprehensive development funded by SIG and other donor funds		
Phase 2	Facility and equipment for the 4 new wards, maternity, surgical, medical and children wards.		
Future phase	Laboratory, specialty clinics (ophthalmology, dentistry, physiotherapy), administration department, service department (kitchen, laundry, mortuary). Community sports area and facilities.		

4. Project period

The project implementation schedule is 9 months for the detailed design and tender period, and 21 months for the construction of facilities and procurement of equipment. This includes the infrastructure works that must be completed before the building construction works.

Equipment procurement will take approximately 14 months from the review and approval of shop drawings. The procurement of equipment will be completed simultaneously with facility construction.

5. Evaluation of the Project

(1) Relevance

This project is deemed appropriate as a cooperative project funded by Japanese Grant Aid from the following perspectives.

1) Beneficiary population and target area

KH is a core regional hospital (level 3) on Malaita Island, the country's largest and most populous island. The hospital's direct catchment area is Malaita Island, with a population of 170,000.

Furthermore, in the event that the country's central hospital, the NRH, becomes dysfunctional because of a disaster or other factors, KH has been receiving patients as an alternative facility. Therefore, 700,000 people throughout the Solomon Islands are beneficiaries. The population is growing in Solomon (2.4% in 2021), with a total fertility rate of 4.36 (2019) and is expected to continue to grow.

2) Human Security

KH targets patients of all ages from newborns to the elderly. As the only general hospital on the island, it is expected to treat all cases, symptoms, and illnesses, including those related to maternal and child health, infectious diseases, NCDs, accidents, and emergency treatment.

The project corresponds with SDG Goal 3: “Ensure healthy lives and promote the well-being of people of all ages,”’ worthy of assistance by Japanese grant aid.

The facilities to be developed through this grant assistance are the central clinical and delivery facilities, which are the highest-priority sectors of the hospital. The development of these core departments will contribute to peace and stability in the region, as it will facilitate the improvement of the hospital's medical care and enable residents to receive secure medical services, thereby contributing to the human security of the people in the region.

3) Consistency with SIG National Development Strategy

Under its National Development Strategy 2016–2035, the SIG aimed for economic growth through the sustainable improvement of people's living standards and industrial development. The long-term goals are (i) economic growth, (ii) poverty alleviation and food security, (iii) quality health and education, (iv) resilient, environmentally sustainable development, and (v) a unified nation. Maintaining a sustainable and stable society is listed as a key item. Therefore, the health

sector aims to achieve universal health coverage (UHC) based on the 2018 MHMS Role Delineation Policy. It aims to provide adequate health services to all, including the most vulnerable groups (e.g., persons with disabilities and women suffering from domestic violence), as priority targets. The project is consistent with the SIG Development Strategy as it will develop the highest-priority sectors of rural core hospitals.

4) Consistency with the international cooperation strategy of Japan

The Ministry of Foreign Affairs of Japan in "Solomon Islands Country Development Cooperation Policy with Japan (April 2019)" states that "Japan has a fisheries agreement with Solomon Islands and has close relations in the fisheries sector, as Japanese fishing vessels operate in the country's Exclusive Economic Zone (EEZ). In addition, since its independence, Japan has built good bilateral relations with Australia, including support for Japan's position in the international arena. It is important to continue to support the independent and sustainable development of Solomon Islands in cooperation with Australia and other countries with which Solomon Islands has close relations, and to strengthen bilateral relations between Japan and Solomon Islands and realize a 'free and open Indo-Pacific'. In addition, Japanese companies are considering energy development and other projects in Solomon Islands, and it is expected that in the future, economic relations between the two countries will become even closer, including through the promotion of industry by private capital."

The basic policy of Official Development Assistance (ODA) is to achieve self-sustaining and sustainable economic growth and improve the living standards of the people through strengthening social and economic infrastructure as the main goal, and to overcome vulnerability, the medium goal is to "provide assistance in improving the quality of local health services, including improving health and sanitation facilities, training health professionals in infectious diseases and NCDs, and public health awareness raising activities. Support for improving the quality of community health services" as a mid-term objective. One of the points to note is that "the support will be provided in light of the country's severe geographical conditions (diffuse, narrow, remote, isolated, etc.), which make the country a development challenge in many aspects," which is consistent with the fact that the project will support Malaita Island, which is not the capital.

This project is positioned within the JICA Global Health Initiative and is consistent with these policies.

(2) Effectiveness

1) Quantitative effects

The following quantitative effects are envisioned by the project.

Table. 2 Quantitative effectiveness indicators and target values

index-name	standard value (Actual values in 2019)	target value (3 years after completion, in 2028)
Number of outpatients (cases/year)	13,397	16,000
Number of imaging diagnoses with X-Ray (cases/year)	2,399	4,100
Number of imaging diagnoses with Ultrasound (cases/year)	2,505	4,100

*Reference values will not be used in 2020 and 2021 to avoid the impact of the coronavirus.

2) Qualitative effects

The following quantitative effects are envisioned by the project.

◆ Improvements in facilities and medical equipment will promote better medical service flow lines, which will improve the quality and efficiency of the medical services provided at the hospital.

- The new medical flow line of the new facility will enhance the efficiency of medical services.
- The improvement of operating theatre facilities and equipment will improve the operating environment, leading to more efficient operation theatre unit management and better operations.
- The improvement of facilities and equipment for maternal and child healthcare, particularly in delivery rooms, will improve the hospital environment and healthcare services provided to mothers and babies.
- The new mobile and portable diagnostic imaging equipment will enable bedside diagnoses of the patients and ease the burden of moving the patients around.

◆ The new facility will improve the quality and efficiency of clinical services by providing appropriate ventilation, handwashing facilities, and better clarification of clean and dirty areas.

- Infection management will be strengthened by the new facilities.
- KH experiences some difficulties in implementing basic infection control measures (standard precautions) for healthcare workers in the existing buildings. They also face issues with the maintenance of old buildings. This project will improve facilities and equipment, thereby enabling effective physical infection control measures. The new facility, together with the soft component (technical assistance) provided by the

project, should encourage proactive implementation of standard precautions by healthcare workers.

- The confidence of patients and their satisfaction with the medical staff will improve.
  - Comfortable and clean facilities will increase patients' confidence.
  - Patients' satisfaction and the motivation of medical staff will be improved.
  - KH's influence and recognition as a top referral hospital in Malaita province will be enhanced.

Based on the above analysis, the preparatory survey concluded that the project is highly relevant and effective.

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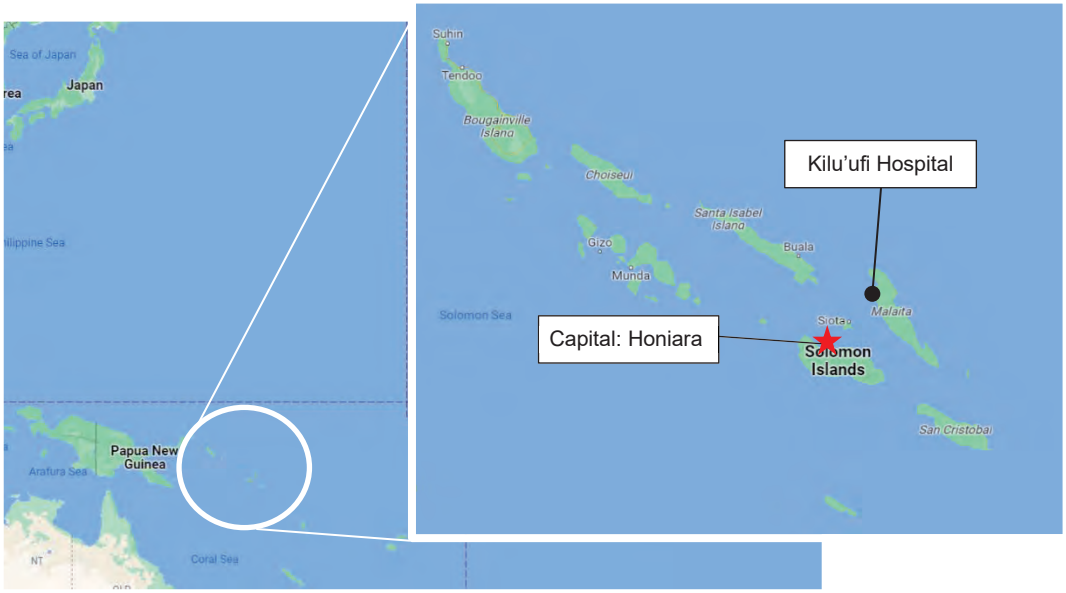
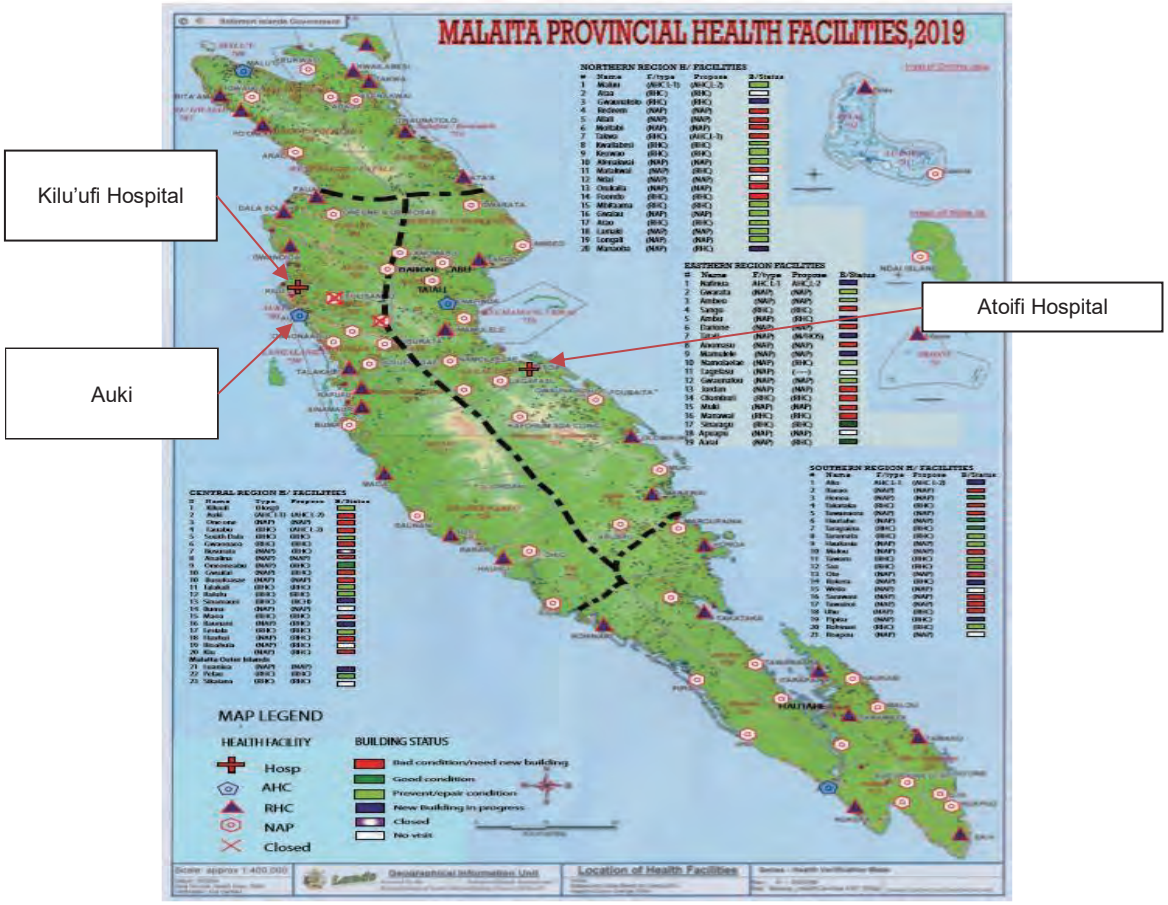
Location Map



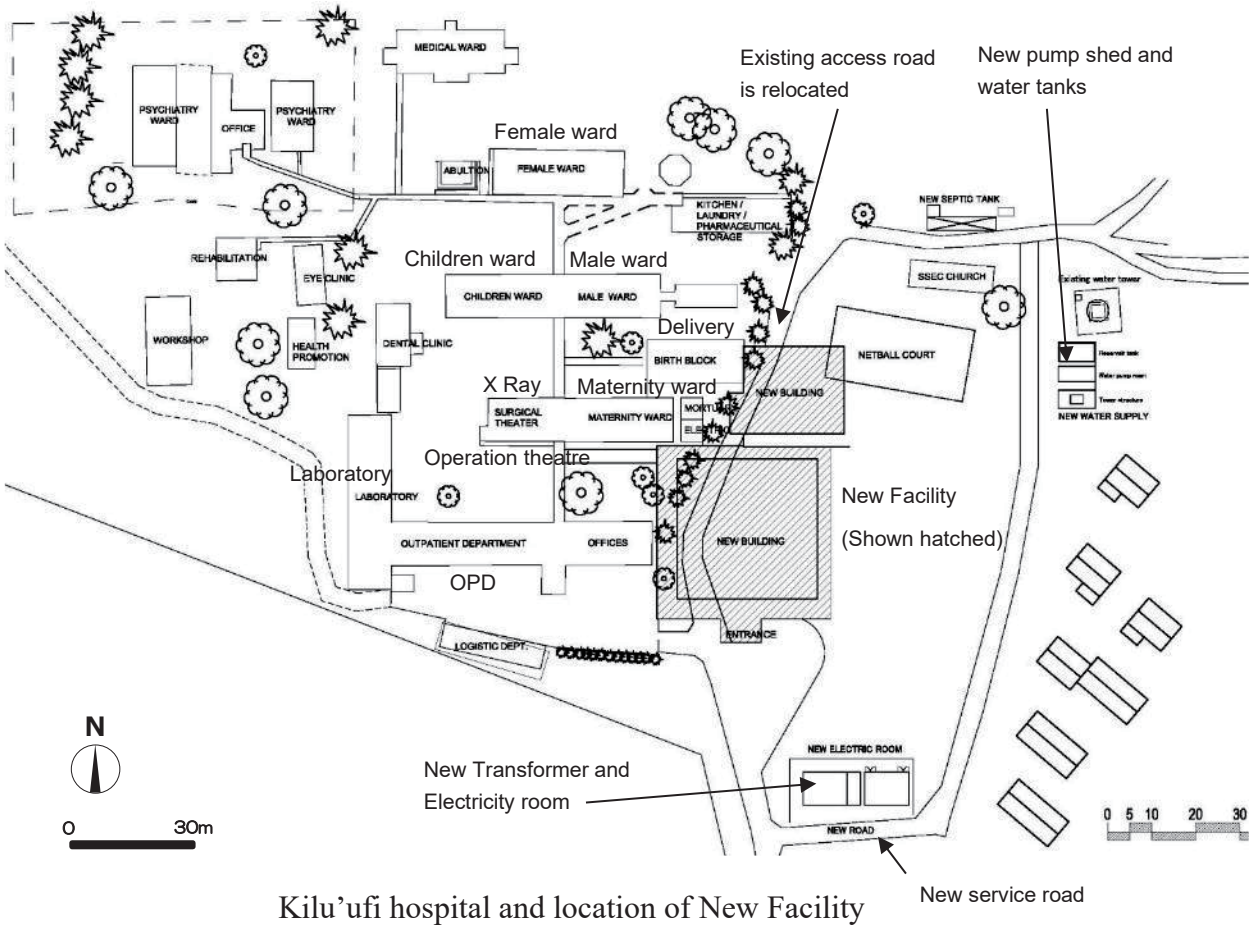
Map of Solomon Islands[1]



Project site: Location of Kilu'ufi Hospital[2]

[1] Google Maps
[2] Excerpts from the handout "Solomon Islands Government Response

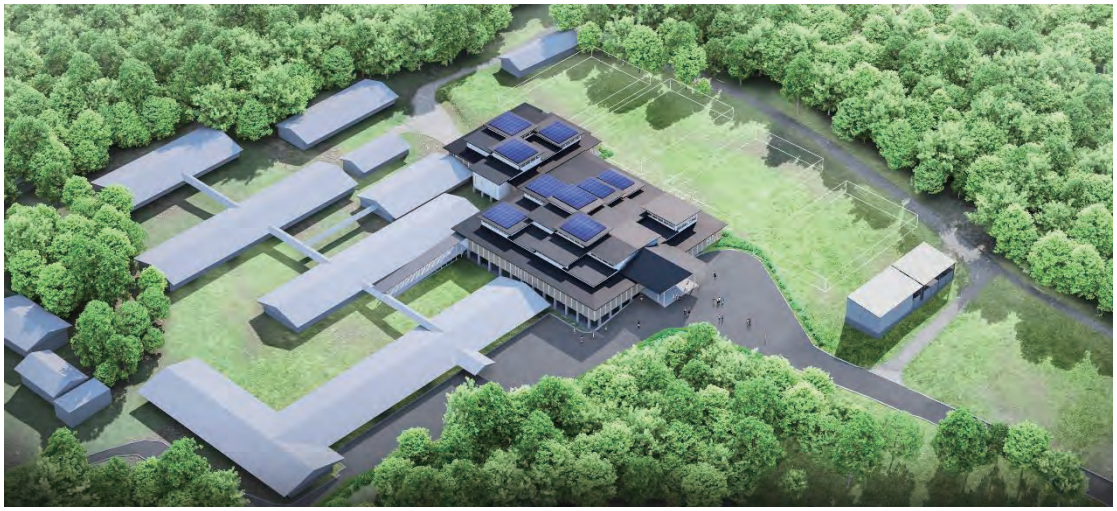
Project Site



Kilu'ufi hospital and location of New Facility

Perspectives

Aerial perspective



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Abbreviations

Abbreviation	
AHC	Area Health Centre
ARI	Acute Respiratory Infection
AVR	Automatic Voltage Regulator
BME	Biomedical Engineering
CBR	Community Based Rehabilitation
CHC	Community Health Centre
COVID	COVID-19 (Coronavirus disease)
CTG	Cardiotocography
DWE	Direct Wage Employees
ECG	Electrocardiogram
GDP	Gross Domestic Product
HDU	High Dependency Unit
IPC	Infection Prevention Control
KH	Kilu'ufi Hospital
MHMS	Ministry of Health & Medical Services
MPDB	Malaita Planning and Development Board
MOU	memorandum of understanding
MP2016	Kilu'ufi Hospital Master Plan Design report 2016
NCD	Non Communicable Diseases
NGO	Non-governmental Organization
NRH	National Referral Hospital
NHSP	National Health Strategic Plan
OPD	Outpatient Department
PNG	Papua New Guinea
PDO	Provincial Disaster Office
RHC	Rural Health Centre
SBD	Solomon Islands Dollar
SIEA	Solomon Islands Electrical Authority
SIG	Solomon Islands Government
SpO2	Oxygen saturation
TB	Tuberculosis
UHC	Universal Health Coverage
UXO	Unexploded Ordnance
WHO	World Health Organization
YTD	Year to Date

Chapter 1 Background of the Project

Chapter 1. Background of the Project

1.1 Background of the Project

In the National Development Strategy (NDS) (2016–2035), the Solomon Islands National Government (SIG) has stated NDS Objective Three as "All Solomon Islanders have access to quality health and education." In the foundations for the future strategy, it states "Rehabilitate regional and provincial – secondary and specialty (mental health) hospitals including tertiary infrastructure and equipment. The Ministry of Health and Medical Services (MHMS) has developed the National Health Strategic Plan (NHSP) 2016–2020. Malaita is a priority province in the NHSP, and it has decided to rehabilitate Kilu'ufi Hospital (KH), a regional general hospital (Level 3) located in the provincial capital Auki. Since its establishment in 1967, KH has undergone a series of small alterations and additions with support from the SIG, WHO, and other donor funds. KH has become the second-largest hospital in the country but is unable to provide adequate medical services owing to lack of facilities, inadequate sanitation, aging facilities, and lack of medical equipment. Due to a shortage of resources, some patients are transferred to the NRH.

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1.2 Request from the Recipient Country

Original request

Hospital buildings (approximately 4,500 m^2): administration offices, outpatient departments, pharmacy, physiotherapy rooms, medical imaging rooms, examination rooms, an operating theatre suite, a central sterilization room, hospital wards (150 beds), training rooms, etc. Equipment: medical equipment required for the new facilities.

Minutes of Discussion (M/D) dated on 28 April 2022

After a series of discussions in April 2022, an M/D was signed regarding the priority of required facilities in the project between the JICA survey team and the Ministry of Health and Medical Services (MHMS) to enhance core medical services by strengthening the hospital's handling of urgent patients at the out-of-hours outpatient department, enhancing maternal and child healthcare services at the obstetrics and family planning departments, and strengthening the surgical departments.

Table 1-1 LIST of Required Functions according to Master Plan 2016(*1)
(M/D attachment 2)

	Project components.	Priority of the Project
Outpatient	EMERGENCY MEDICINE & GENERAL OUTPATIENT SERVICES	x
Outpatient	REFERRALS & SPECIALIST OUTPATIENT SERVICES	x
Outpatient	DENTAL CLINIC	
Outpatient	REHABILITATION & PHYSIOTHERAPY	
Outpatient	FAMILY PLANNING & REPRODUCTIVE HEALTH	x
Outpatient	PHARMACY	x
Central Diagnosis	MEDICAL IMAGING	x
Central Diagnosis	OPERATING THEATRE SUITE	x
Central Diagnosis	DELIVERY ROOM & SPECIAL CARE NURSERY (SCN)	x
Central Diagnosis	MEDICAL LABORATORY	
Wards	MATERNITY WARD	X（＊2）
Wards	SURGICAL WARD	X（＊2）
Wards	PAEDIATRIC WARD	
Wards	Medical WARD	
Wards	ISOLATION WARD	
Administration	MAIN ENTRY / CENTRAL RECEPTION, ADMISSIONS & REVENUE	
Administration	HOSPITAL ADMINISTRATION	
Administration	PROVINCIAL HEALTH ADMINISTRATION	
Administration	BULK MEDICAL / PHARMACEUTICAL STORAGE	
Services	CENTRAL STERILIZATION SERVICESSS DEPARTMENT (CSSD)	x
Services	MORTUARY	
Services	KITCHEN	
Services	LAUNDRY	
Services	ENGINEERING (BIOMEDICAL)	
Services	ENGINEERING (MAINTENANCE), GARAGE & PLANT	
Services	WASTE MANAGEMENT	

(*1) Kilu'ufi Hospital Master Plan Design Report, June 2016
(*2) It was decided that these are not included in the Project, after the M/D discussion.
Source: JICA survey team

Although priority was given to the outpatient departments, the SIG stated that the new construction of obstetrics and gynecology wards and the surgical ward are urgently required and should be included in the project if the Grant Aid fund is sufficient. After the feasibility survey, they were excluded from the project and the SIG agreed to the extent of the project.

Most existing hospital buildings are more than 50 years old, and the core facilities were built in 1967. In the M/D, the rebuilding of the entire hospital was discussed as being essential. A consecutive staged development was presented. This development plan utilized existing facilities and newly built buildings at each stage. This consecutive step-by-step development was agreed upon, and Grant Aid from the GOJ will be appropriate for the first stage of development.

The current hospital lacks a reliable source of water, which is essential for providing medical services. Water is obtained from a nearby creek using a single pump and the supply is

shut off during monthly maintenance. Additionally, the existing electricity-receiving facilities are located on a vacant lot selected for the proposed construction site and must be relocated. As the electricity supply cannot be interrupted, the plan is to install new power-receiving facilities at the new location and switch them over from the current facility. The current power-receiving facilities include an emergency generator, but a new one must be built and switched over. Therefore, the grant aid will be allocated first to establish dependable water and electricity supplies, which are crucial for medical services. The hospital's highest-priority medical service sectors will then be developed, specifically central medical functions, including outpatients, diagnostic imaging, surgery, and deliveries.

The following is an overview of the project requested as eligible for grant aid and an overview of the consecutive development.

The outline of the project as a Grant Aid project is shown below.

Table 1-2 Outline of the Project & Consecutive Development

	Grant Aid Project by GOJ
Facilities	(1) Hospital infrastructure (Electricity & water) ・Renewal of electricity power supply with backup generator, ・Renewal of water supply (2) New Facilities A new Central Clinical Building ・Emergency Medicine & General Outpatient Services, Pharmacy ・Medical Imaging ・Delivery unit ・Operating theatres suites with Central Sterilization Department (CSSD) MEP works in the new facilities ・Electricity: lightings, power outlets, lightning protection, etc. ・Mechanical: Air-conditionings & ventilations, sanitary equipment, water & hot water supply, drainage & sewage treatment, firefighting equipment, etc.
Medical equipment	Medical equipment & fixtures required for the above facilities.
	Consecutive development by the SIG and other donors
Second Stage	New facilities and equipment in four hospital wards: Obstetrics & Gynaecology ward, Surgical ward, Paediatric ward, and Internal medicine ward.
Future development	New facilities and equipment in laboratories, specialist outpatient departments (ophthalmology, dentistry, rehabilitation, etc.), administration offices and service departments (kitchen, laundry, mortuary, etc.)

1.3 Site conditions

1.3.1 Natural conditions

1.3.1.1 Project site

KH is located on the northwest coast of Malaita Island, on a 158,000 ha plot 20 m above sea level. A village access road connects the Auki town center to the hospital building complex.

The topography is relatively flat with gentle slope going down northward and westward.

The 2016 Master Plan analyzed the topography and recommended the northwest area of the site for building a new hospital complex. After discussions with KH, it was agreed that the eastern area, which is currently used as a community area, would be the construction site for the project.

The hospital site was registered as a Perpetual Estate by the Commissioner of Lands on behalf of the SIG.

The allocated project site is in the center of the hospital plot and is not close to the boundary lines. During the survey, the boundaries with corner marks were checked by the relevant person, and it was confirmed that there was no dispute regarding the usage of the project construction site.

1.3.1.2 Climate

(1) Temperature

Malaita is located in the Intertropical Convergence Zone. The sun is at the zenith over Malaita, and the hottest season is from November to February.

The climate in Auki is humid and high throughout the year, with an average temperature of 31.4 °C. The monthly average high temperature is 33.0 °C (2000–2012) and monthly average low temperature is 20.9 °C (1962–2021). The monthly average humidity is high as 86%–94%.

From April to August, trade winds blow steadily from the southeast.

(2) Precipitation in Auki

The annual average rainfall in Auki is 3,343 mm (2001–2020; climatic data mentioned in this paragraph were provided by the Solomon Islands Meteorological Service), with more precipitation in the southern hemisphere during the summer (December to March). The highest recorded annual rainfall was 3,935 mm (2015) and the lowest was 2,634 mm (2019). The recorded monthly rainfall was 941 mm (March 2013) and the maximum daily rainfall was 149 mm (December 28, 2018).

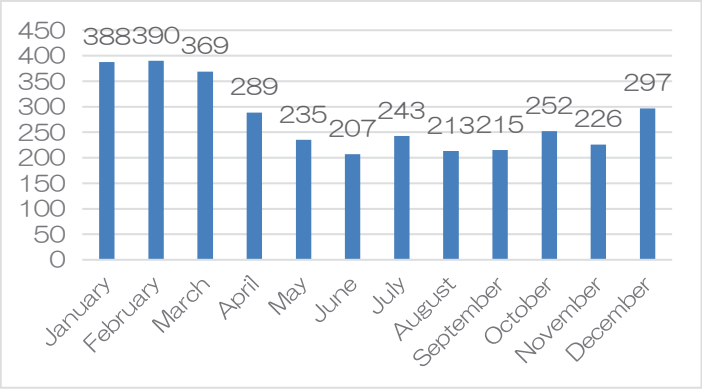


Figure 1-1 Precipitation records in Auki (Average 2001-2020)

Source: Solomon Islands Meteorological Service

During the field survey, it was confirmed with the Malaita Provincial Disaster Office (PDO) that Auki City has no record of major damages caused by cyclones and/or earthquakes in the past. However, it has been reported that the Solomon Islands are particularly vulnerable to natural disasters, such as torrential rain associated with cyclones, tsunamis, and earthquakes.[3]

1.3.2 Existing Infrastructure on the Project site

1.3.2.1 Traffic and Access Roads

Roads on the island of Malaita are not fully paved. The roads to the center of Auki and KH are paved, but they have some potholes. The transportation of the project material may be difficult owing to these conditions.

Table 1-3 Road conditions to the Project site

	
Unpaved access road from Auki to Kilifi Hospital	Potholes in the paved roads.

[3] Internal Displacement Monitoring Centre (IDMC)

1.3.2.2 Power Supply

1) Transmission lines under the Auki Power Station

Three diesel engine generators (see Photograph No. 1) were allocated to the Auki Power Station during a survey in June 2022. A 500 kV generator will be replaced by a new 700 kV and the 500 kV generator will be used as standby. The Auki power station has two 1000 kV transformers (see Photograph No. 1). A 11 kV transmission line (feeder 1) under transformer No. 1 transmits electricity to the river near Auki airport, and there are six transformers (step down to 415/240 kV) along this line. The 4th transformer (200 kVA) from Auki Station is for KH. Another 11 kV transmission line (feeder 2) under transformer No. 2 transmits electricity to Auki town.

Table 1-4 Photographs of Auki Power Station

No.1 Diesel Engine Generators in the Auki Power Station	No.2 Transformers in the Auki Power Station
	

In 2021, the records show that the maximum power loads were 414 kVA (maximum) and 361 kVA (minimum), and the minimum power loads were 305 kVA (maximum) and 247 kVA (minimum). The fluctuation in the power load in 2021 is as follows:

	2021												Minimum	Maximum	Average
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Maximum Load (KVA)	377	361	385	375	380	377	384	393	391	380	414	390	361	414	384
Minimum Load (KVA)	258	250	247	251	263	250	254	278	276	265	305	267	247	305	264

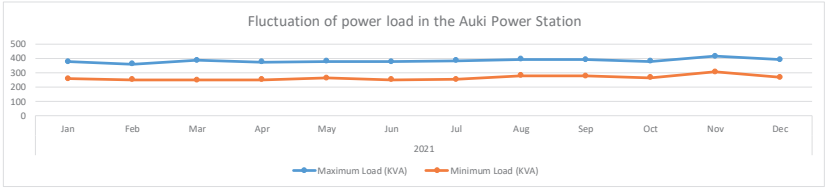


Figure 1-2 Power load in 2021

Source: Auki Power Station of Solomon Power

2) Distribution Line for Kilu'ufi Hospital

There are three distribution lines from the 200 kVA transformer to KH;

a) Distribution line for staff houses (Distribution: D)

b) Distribution line for pump house of stream water (Distribution 1: D1)

c) Distribution line for northside hospital's existing facilities (Distribution 2: D2）

Line a) is under Solomon Power and lines b) and c) are under KH. The electricity bill for staff housing is prepaid using prepaid cash power (wattmeter), and the electricity bill for KH is paid using post-paid cash power to Solomon Power. The voltage is stable at approximately 240 V, as shown in the following table

Table 1-5 Stable voltage observed in the survey

Time	Day of the week	Location	Voltage
0421-0422 0830-0830	Thursday to Friday	Office	242.3 -237.5
0425-0426 1600-1600	Monday to Tuesday	Surgical Room	235.0-232.1

At the existing KH, the average power consumption is 28,800 kWh/month, and the monthly electricity rate is approximately SBD 170,000. The power rate fluctuates between SBD 5.23 (June 2021) to SBD 7.08/kWh (May 2022). The latest rate is approximately 1.36 times higher compared with the previous year.

	2021							2022					Minimim	Maximum	Anerage
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May			
Consumption (kWh)	29,360.00	29,880.00	27,880.00	24,440.00	27,240.00	33,920.00	25,480.00	29,120.00	34,960.00	25,400.00	30,560.00	27,360.00	24,440.00	34,960.00	28,800.00
Rate (SBD)	153,451.47	157,467.60	153,061.20	136,619.60	159,081.60	188,595.20	150,332.00	181,708.80	217,451.20	156,972.00	195,584.00	193,708.80	136,619.60	217,451.20	170,336.12
(Convert to YEN)												3,124,329			2,747,351
Unit price (SBD/kWh)	5.23	5.27	5.49	5.59	5.84	5.56	5.90	6.24	6.22	6.18	6.40	7.08	5.23	7.08	5.92
(Convert to YEN)												114			

Exchange rate: \16.1290/SBD ※OANDA rate (Average in May 2022)

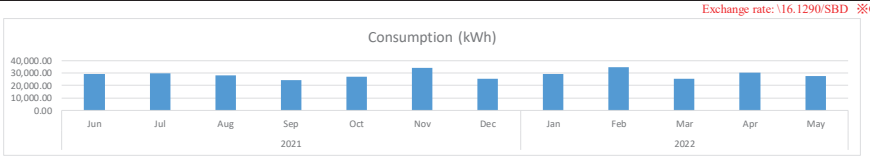


Figure 1-3 Power bills in 2021

Source: Kilu'ufi Hospital (Invoices from Solomon Power)

A schematic diagram of the status of the power supply facilities and equipment at KH is shown below.

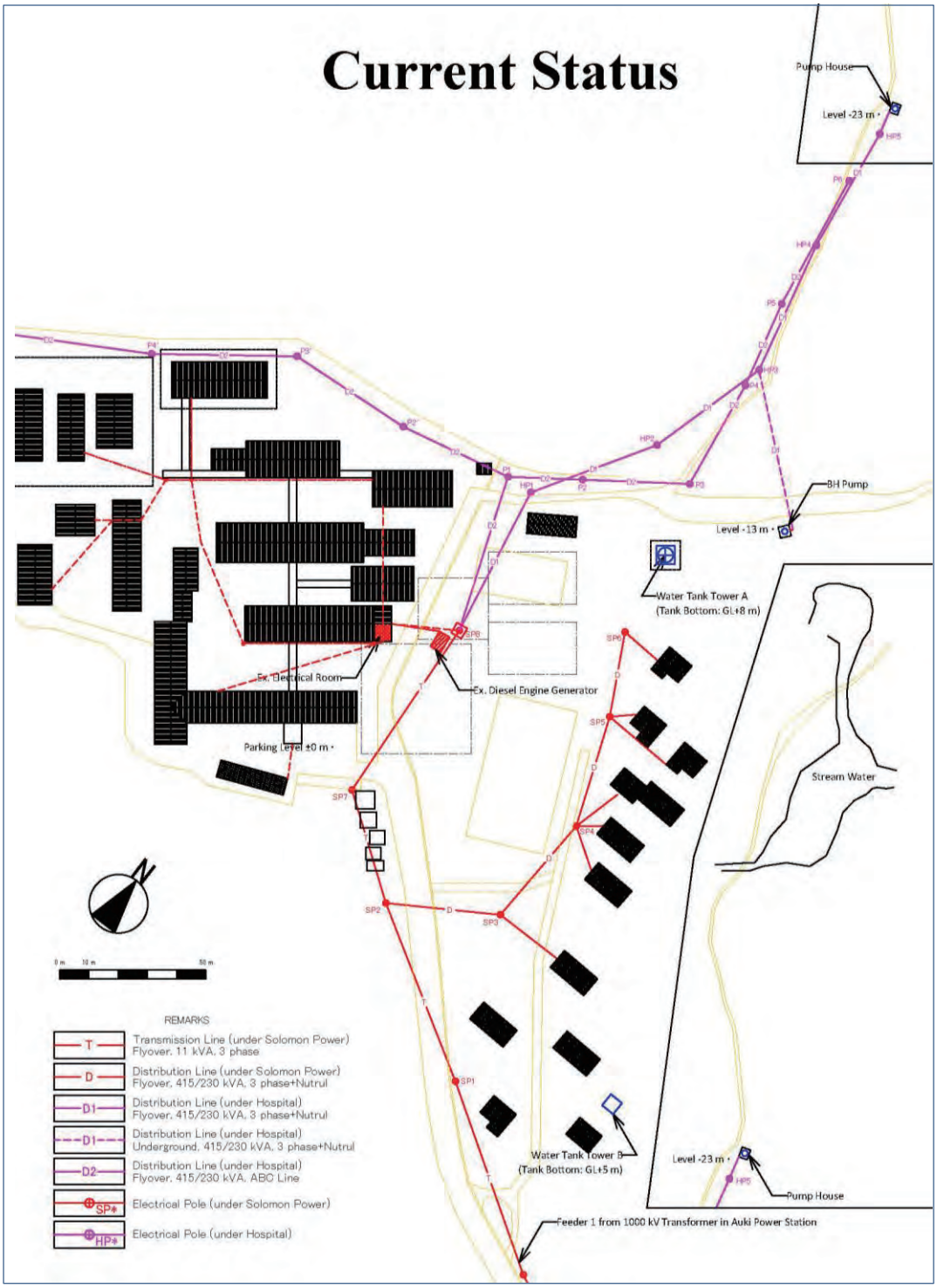


Figure 1-4 Current power supply system in Kilu'ufi Hospital

Source: Prepared by JICA Study Team

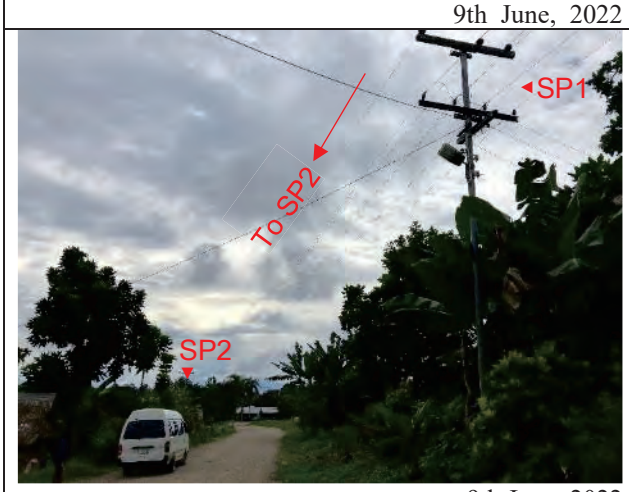
Table 1-6 Current Status 1

9th June, 2022

No. 1: Existing stand-by diesel engine generator (275 kVA) and existing transformer (200 kVA)

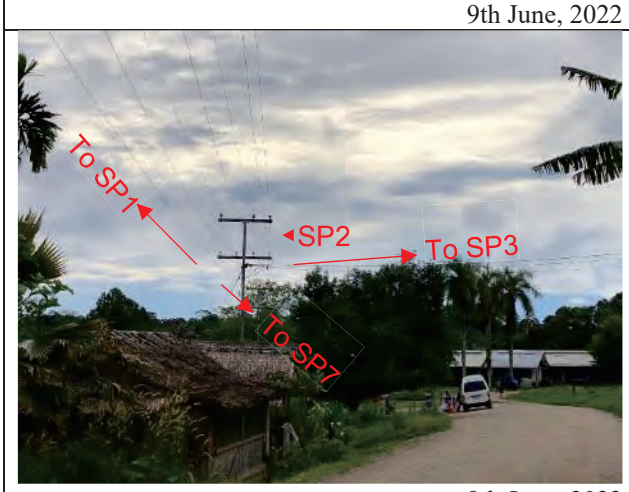
Generator was installed in 2019 and supported by Taiwan. Power is distributed to each building on the site by overhead and underground wiring (3-phase wires). The voltage was stable at almost the rated 240 V as shown in the following table.

Time	Date of week	Location	Voltage
04:21-04:22 08:30-08:30	Thu to Fri	Office	242.3- 237.5
04:25-04:26 16:00-16:00	Mon to Tue	Surgical Room	235.0- 232.1



9th June, 2022

No. 2: Existing electrical poles under Solomon Power (SP1 and SP2)

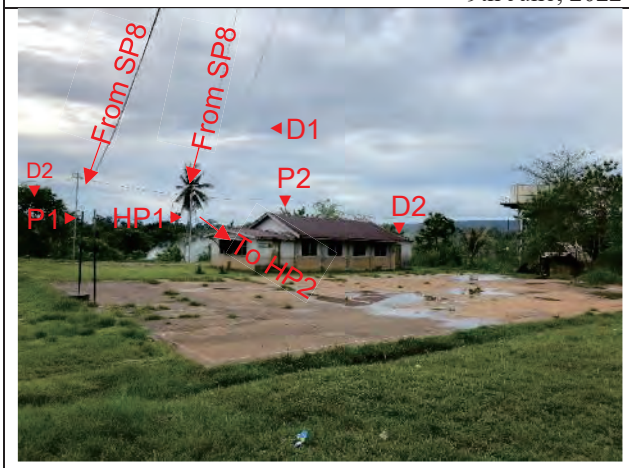


9th June, 2022

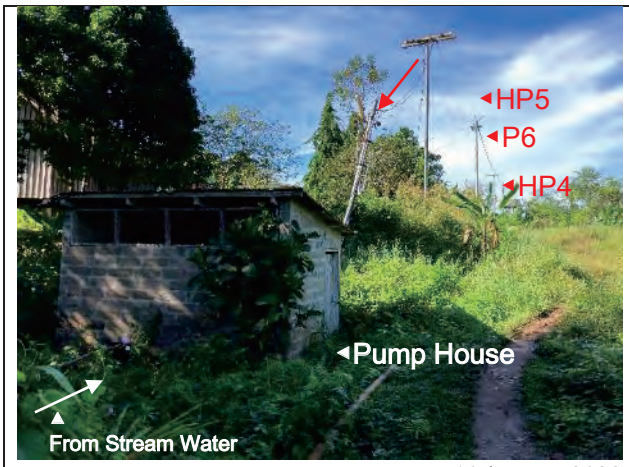
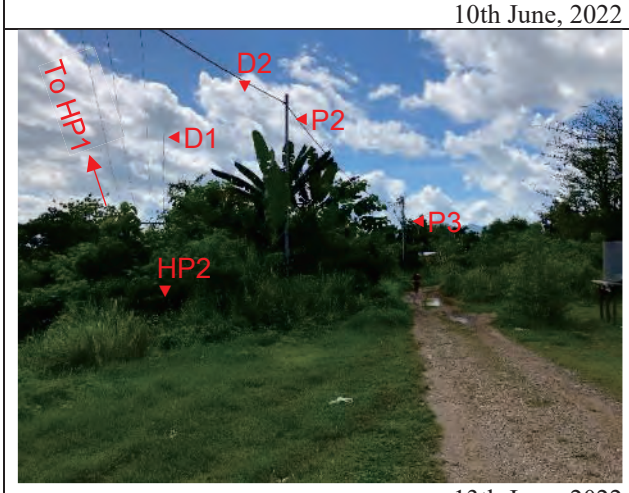
No. 3: Existing electrical pole under Solomon Power (SP2)

Junctions point from existing electrical pole under Solomon Power (SP2) to existing electrical pole for staff houses (SP3) and for hospital (SP7).

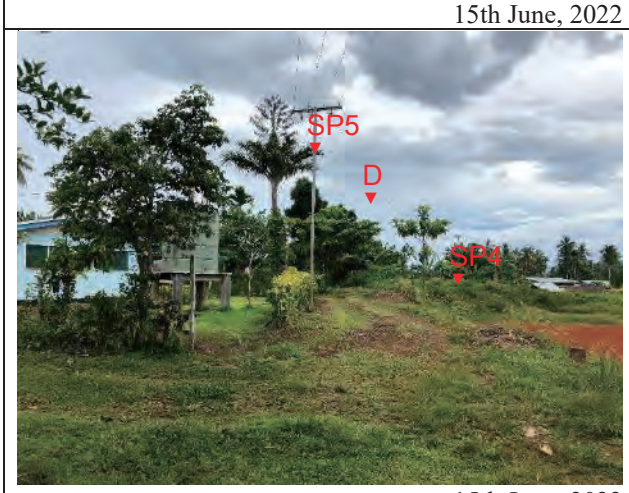
SP: Solomon Power Electrical Pole D: Distribution Line

 9th June, 2022	**No. 4: Existing electrical pole under Solomon Power (SP7)**
 9th June, 2022	**No. 5: Existing electrical pole under Solomon Power (SP8)** The electricity is transmitted from a transformer under the electrical pole (SP8) to the main board (MB, power receiving panel) in the electrical room of the hospital by underground cable. The backup electricity will be supplied from the generator and the line to the MB is overhead cable.
 9th June, 2022	**No. 6: Existing electrical pole under Hospital (HP1)** Distribution line (D1) from the electrical pole (SP8) to the pump house for stream water Distribution line (D2) is not in use. The Hospital is planning to dismantle the line

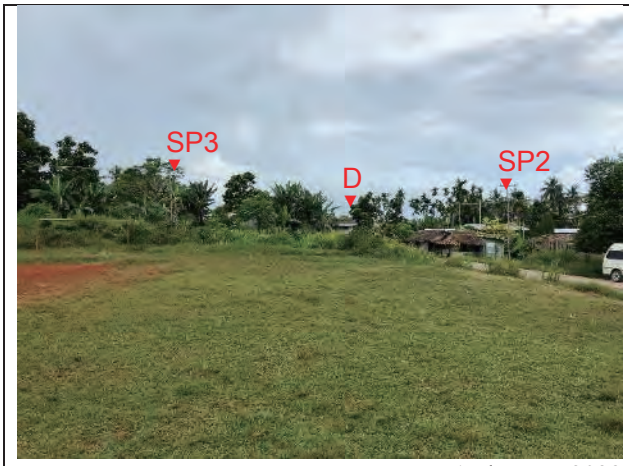
SP: Solomon Power Electrical Pole D: Distribution Line HP: Hospital Electrical Pole

 10th June, 2022	**No. 7: Existing electrical poles under Hospital (HP4,5 and 6)** Electrical pole (P6) will be dismantled by the hospital.
 13th June, 2022	**No. 8: Existing electrical pole under Hospital (HP2)** Electrical poles (P2 and P3) and distribution line (D2) will be dismantled by the hospital.
 10th June, 2022	**No. 9: Existing power box for water well** The electricity is supplied from the electrical pole (HP3) to the power box by the underground cable (orange color line). The electricity is supplied from the power box to the water well pump by the cable (blue color line) .

SP: Solomon Power Electrical Pole D: Distribution Line HP: Hospital Electrical Pole

 15th June, 2022	**No. 10: Existing electrical poles under Solomon Power (SP5 and SP6)**
 15th June, 2022	**No. 11: Existing electrical poles under Solomon Power (SP4 and SP5)**
 15th June, 2022	**No. 12: Existing electrical poles under Solomon Power (SP3 and SP4)**

SP: Solomon Power Electrical Pole D: Distribution Line

 15th June, 2022	**No. 13: Existing electrical poles under Solomon Power (SP2 and SP3)**
 15th June, 2022	**No. 14: Existing electrical poles under Solomon Power (SP2 and SP7)** Proposed new transformer will be installed around the area of the soccer goal, after removing of existing transformer. Behind the soccer goal is the proposed area for a new detour route to the north of the hospital.

SP: Solomon Power Electrical Pole D: Distribution Line

1.3.2.3 Water Supply System

Figure 1-5 Location of water sources and pumps

A schematic of the current status of the water supply facilities and equipment at KH is shown below.

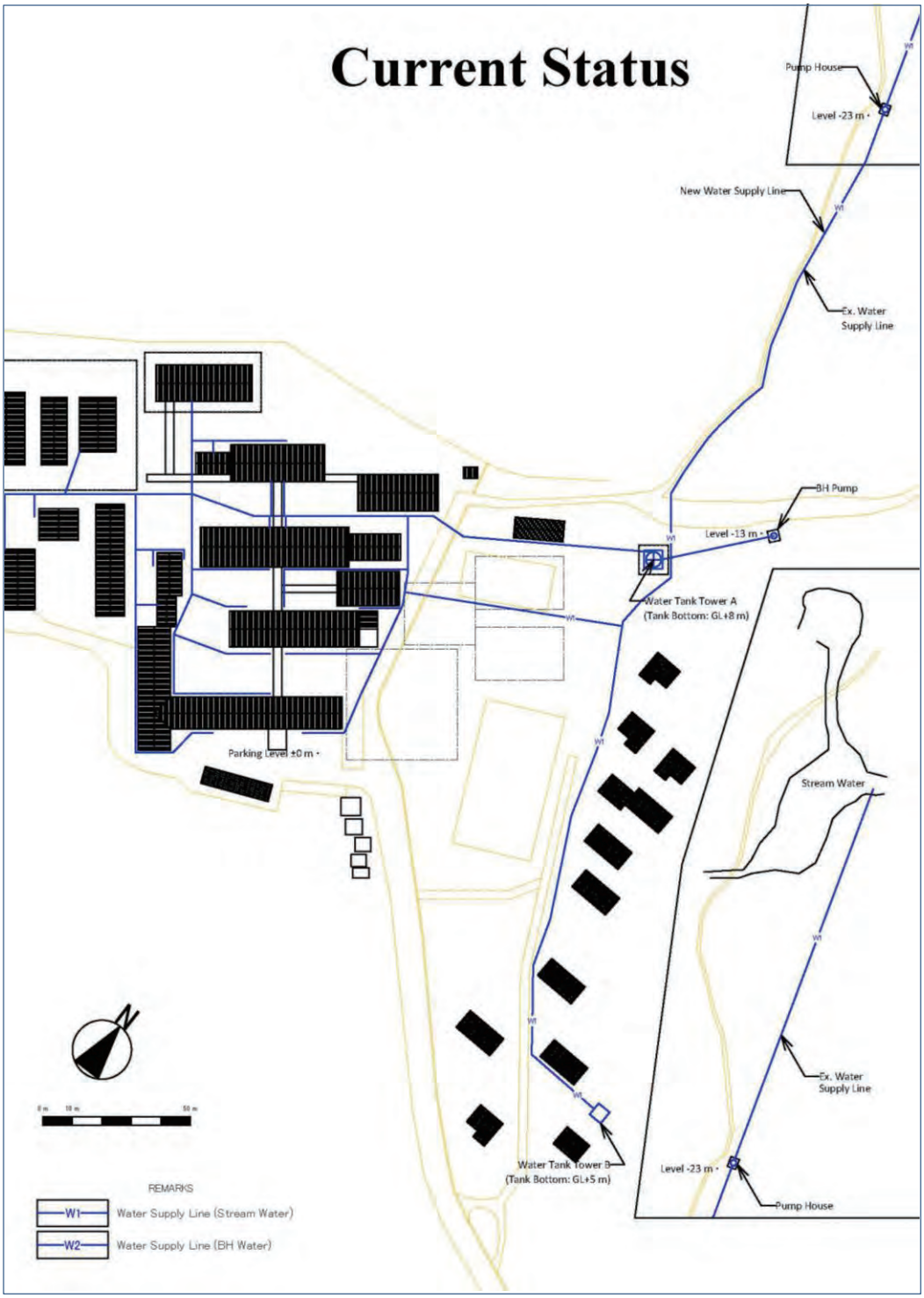


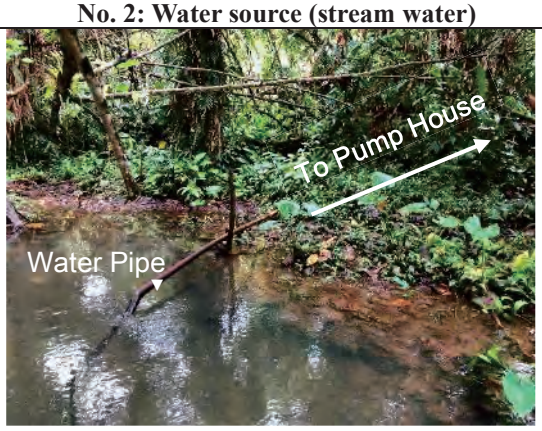
Figure 1-6 Current water supply system in Kilu'ufi Hospital

Source: Prepared by JICA Study Team

1) Water supply from the stream

Water is supplied from a stream at the bottom of a hill north of KH and pumped to the hospital using an impeller pump in a shed. There was no alternative pump in the event of a breakdown. The hospital had requested before an upgrade of the pump system, but the budget was not approved. The intake point is approximately 400 m from the hospital and the water pipe was laid along the service road located east of the hospital.

Table 1-7 Water from the stream

No. 1: Stream (water source)	No. 2: Water source (stream water)
 9th June, 2022	 9th June, 2022

Stream water is pressurized from a pump shed, which is approximately 260 m from the hospital.

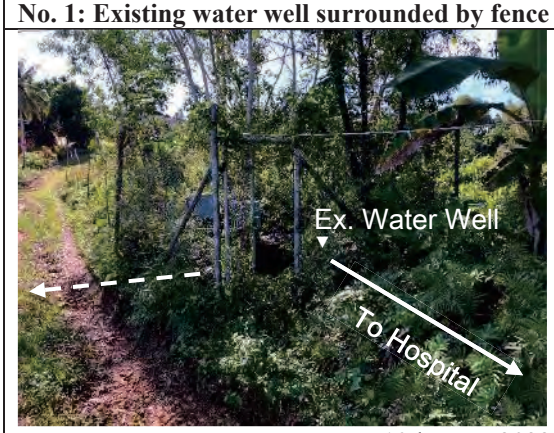
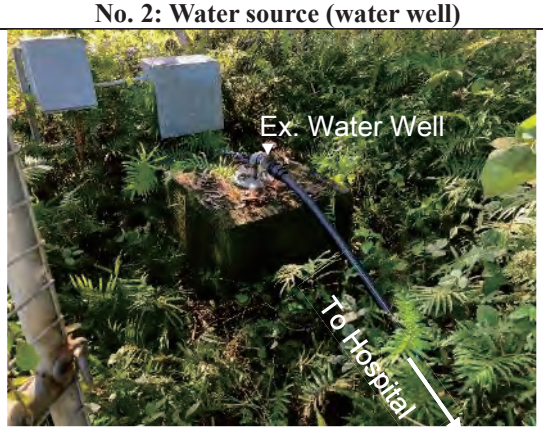
Table 1-8 Current water supply system to Kilu'ufi Hospital

 9th June, 2022	**No. 3: Pump for stream water** The silver pump is operating 24 hours a day, 365 days a year. Every Friday morning at 9:00 a.m., the maintenance staff stops the pump for an hour, and clean the pipe by backflow water from the hospital side due to the difference in elevation. Another pump (blue) was installed as a backup pump originally, but it is not used due to lack of pressure.
 11th June, 2022	**No. 4: Water tank tower for staff houses** Stream water is supplied directly to the hospital with the water pressure of the impeller pumps, while as the water for staff houses is supplied by gravity from the water tank tower (5 m height from the ground level to the bottom of tank: 4.8 x 4.8 m and 3.6 m height). The tank is still in use at the time of survey, but the structure is badly rusted.

2) Water supply from borehole

The existing borehole is located approximately 120 m from the water pipe along the service road to the east of the hospital. The borehole was used until 2019 but is no longer in use because the pump broke down.

Table 1-9 Water from the borehole

No. 1: Existing water well surrounded by fence	No. 2: Water source (water well)
 10th June, 2022	 10th June, 2022

The water well is approximately 25 m deep and the water surface level is approximately–11 m from the ground level (measured 11 AM on 14th June, 2022) based on the measurement during the survey.

Table 1-10 Borehole pump

 9th June, 2022	**No. 3: Pump for water well** Pump was pulled out from the water well (Manufactured by Maro, 0.55 kW、1.0 ℓ/sec, Source: RWASH PROGRAM report provide from the hospital). Top casing pipe is PV (100 mm diam）.
 11th June, 2022	**No. 4: Measurement of depth and water level of water well** The well is approximately 25 m deep which was measured by dropping bolt with a string, and water surface level is approximately minus 11 m from the ground level which was measured by dropping bolt with pet bottle. Source: Design Report for Kilu'ufi Hospital Water Supply Rehabilitation (RWASH PROGRAM report, 24th May, 2020)

The existing water tank tower is located approximately 80 m from the hospital. It was not in use at the time of the survey because of the failure of the borehole pump. The rust on the tower structure and tank was evident, as mentioned in the RWASH PROGRAM report.

Table 1-11 Elevated water tank

11th June, 2022

No. 5: Water tank tower for water well

Water tank tower was constructed by USAID in 2005. The height is approximately 8 m from the ground level to bottom of the tank. Diameter of tank is approximately 5.2 m and height is approximately 3.6 m (approximately 50,000 liters).

Item	Specification
Supply volume	1.0 ℓ/sec (3,600 ℓ/hour)
Peak volume	2.0 ℓ/sec (7,200 ℓ/hour)
Daily demand	38,000 ℓ (0.4 ℓ/sec)
Pump operating hour	11hours
Requirement hour to fill up	13.9 hours

Source: RWASH PROGRAM report

3) Collecting Rainwater

Existing hospital buildings are equipped with water tanks to collect rainwater, which is used by patients and others. The rainwater tank materials were FERRO-cement, corrugated iron, wrapped steel plates, and polyethylene. Their capacities are approximately 5,000–10,000 l. About 20 tanks were located in the hospital area. Rainwater tanks will also be installed during this project.

Table 1-12 Rainwater tanks at Kilu'ufi Hospital

No. 1: Ferro-Cement	No. 2: Polyethylene	No. 3: Galvanized Steel
		
11th June, 2022	11th June, 2022	11th June, 2022

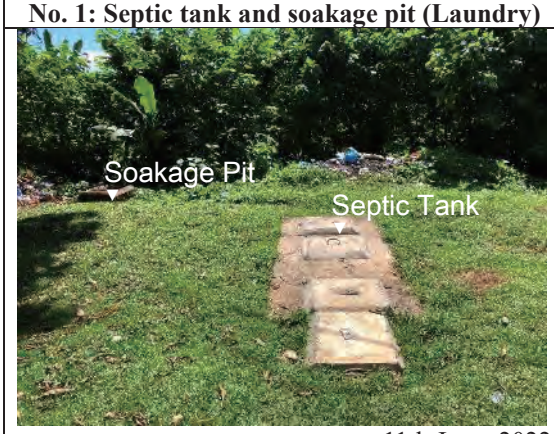
4) Other water supply system

With the support of the Swiss government, an individual Swiss installed a reverse osmosis (RO) water-purification system in 2017. Solar panels were added in 2019 to run the system; however, the pipes and wiring are currently disconnected and no longer in use. The pump attached to the RO is too powerful, leaving only a small amount of water in the existing plumbing system, and resulting in no water coming out from the other faucets. The situation was reported to the relevant person and the Swiss embassy.

1.3.2.4 Drainage and sewage

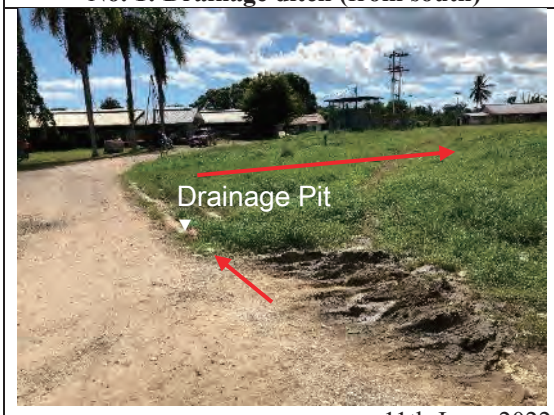
Septic tanks and soakage pits were installed at the hospital and the wastewater is treated using a method generally used for domestic wastewater and sewage. The water purification tank is a two-tank sedimentation system, and approximately once every three years, the sludge is cleaned and dumped into a pit near the septic tank and covered with excavated soil.

Table 1-13 Drainage map and photographs of soakage pits

No. 1: Septic tank and soakage pit (Laundry)	No. 2: Septic tank and soakage pit (Shower)
	
11th June, 2022	11th June, 2022

Surface water is drained into an open ditch located along the north–south road between the hospital and an existing football field. Water flows from south to north and seeped into the slope north of the hospital.

Table 1-14 Open ditch in the field

No. 1: Drainage ditch (from south)	No. 2: Drainage ditch (to north)
	
11th June, 2022	11th June, 2022

1.3.2.5 Telephone and telecommunications facilities

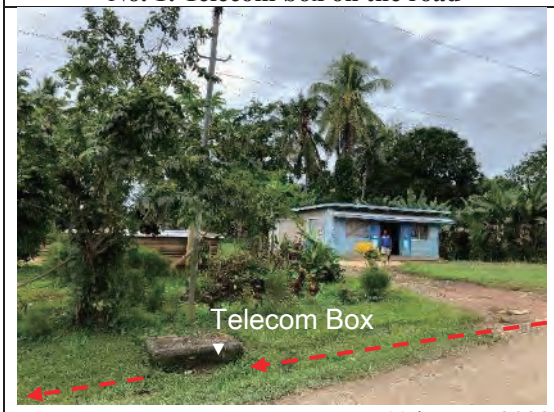
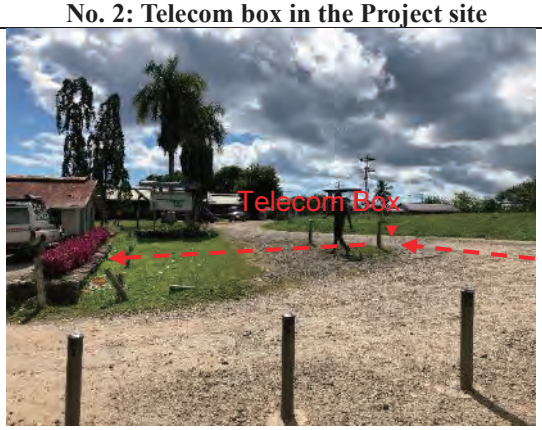
A schematic diagram of the status of the telecommunications facilities and equipment in Kilu'ufi Hospital is shown below.

Figure 1-7 Current telecommunication system at Kilu'ufi Hospital

Source: Prepared by JICA Study Team

Solomon Telecom (ST) telephone lines (copper line, 50 pairs × 1 set) and Internet data lines (fiber data, 12-core) were connected to the existing hospital building.

Table 1-15 Telecom box on Kilu'ufi Hospital site

No. 1: Telecom box on the road	No. 2: Telecom box in the Project site
	
11th June, 2022	11th June, 2022

1.4 Environmental and Social Considerations

(1) Category based on JICA Guidelines for Environmental and Social Considerations

The project is the extension of the existing hospital and constructing new wings on a sports field in the existing hospital, and the land is registered on behalf of the SIG. The project is classified as "C" according to the JICA Guidelines for Environmental and Social Considerations (April 2010) because its potential adverse impacts on the environment are not likely to be significant.

(2) Environmental Policies and Procedures required for the Project in Solomon Islands

Environmental Impact Assessment (EIA) is defined in The Environmental Act 1998 and The Environmental Regulations 2008 (Solomon Islands Subsidiary Legislation). The project is not a development act as defined in the second schedule of the Act. During the preparatory survey, JICA's environmental screening sheet was presented as a questionnaire to the MHMS, and the answers showed that the project will have no significant environmental or social concerns based on the regulations of the Solomon Islands. The Survey team suggested that the MHMS consult the Environmental Conservation Department (ECD) of the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM). The MHMS of the SIG confirmed that it would provide environmental and social considerations before and during the implementation.

(3) Waste Management

After the project will be completed, the SIG will be responsible for treating the medical waste. At KH, Infection Prevention Control (IPC) is implemented within the capacity of the hospital according to the MHMS guidelines. Currently, medical waste is incinerated in temporary

incinerators, and the hospital plans to install permanent incinerators using concrete and bricks. A budget for this was submitted to the state government in June.

Chapter 2 Contents of the Project

Chapter 2. Contents of the Project

2.1 Basic Concept of the Project

This project by the Japanese Grant Aid project aims to be the first stage of this new development plan. The project aims to first rehabilitate the existing hospital infrastructure (water and power supply) and to build facilities for the top priority services of the hospital, namely the Emergency Medicine & General Outpatient Services, the operating theatre suite with a central sterilization service department, medical imaging, and the delivery unit with a special care nursery. The medical equipment for these services will also be procured.

This implementation of the first stage will promote the successive phases of the redevelopment plan funded by the SIG with other donor funds. This project aims to improve the quality of medical services at KH.

2.2 Outline Design of Japanese Assistance

2.2.1 Design Policy

2.2.1.1 Design principles

(1) Comprehensive development plan and scope of Japanese grant aid project

As stated in the 2016 Master Plan, KH requires complete redevelopment. The existing basic layout of rooms and departments is insufficient to accommodate modern medical practices. A comprehensive development plan that considers the available funds and integrity of medical services must be designed.

Although a visual inspection of the site survey indicated that the main structure of the existing facility was not severely deteriorated, it was designed over 50 years ago and is therefore inadequate as a hospital facility to provide modern medical care, as recommended in MP 2016. However, owing to the scale of cooperation, it is not possible to completely rebuild the hospital in this project. Therefore, the project should be positioned as the first stage of overall improvement and the necessary functions should be identified for cooperation. Additionally, if existing facilities are to be rebuilt in the same location, the cost of developing a temporary relocation site and the burden on the hospital because of multiple functional relocations will increase. Therefore, it is preferable to construct a new facility at a different location and relocate the functions. Furthermore, as the development plan after this grant assistance cannot be finalized, the functions to be developed must be linked to the functions that will remain in the existing facility.

Based on these constraints, the following four proposals were presented to the hospital, and the construction site was selected after consultation.

	Options
N	Northern part of the site Adjacent to existing isolation ward and women's ward
W	Western part of the site Vacant land beyond existing psychiatric hospital
S	Southern part of the site Adjacent to existing laboratory department
E	Eastern part of the site: adopted option Existing community square, In front of hospital

Option N: The site was not suitable because of steep cliffs with a height difference of more than 6 m, which would have resulted in high construction costs for the facility foundations.

Option W: The site is gently undulating, and land development work would be required if the facility were to be built. Land development work would require approximately two years, and the cost was estimated by the Solomon side to be between S$2–4 million. In addition, it would be located more than 150 m from the existing facility, making it difficult to link existing facilities and services.

Option S: The site was not suitable because of the steep slope of the land with a difference in elevation of more than 3 m and the high cost of the construction of facility foundations.

Option E: This is the entrance area to the existing facility and would ensure the most efficient medical flow lines in terms of patient access and linkages with the existing facility. Although there is a site elevation difference of approximately 2 m, the site has a large amount of vacant land, and continuous development of the site is possible. However, it is an important community space used for sports and other activities. An open space for the community can be secured by creating one on the northwest side of the site. These advantages were discussed with the community, who agreed that this site was the most appropriate for hospital development.

As a result of discussions with the hospital regarding the functions of the first phase to be developed through grant aid, it was agreed to strengthen the outpatient department, including the emergency, delivery, and surgery departments.

The hospital agreed that surgical, delivery, pediatric, and medical wards were also urgently necessary. The new wards would be grouped by service and not sex, as in the current facility. If facilities, including all wards, can be developed, the four basic departments of the regional core hospital can be developed, and the objectives identified as priorities in the NHSP can be achieved. The following table summarizes the medical services and facilities to be developed for each phase

of the Comprehensive Development Plan. Consecutive development of the project (Phases 2 and 3) will be planned by the SIG using internal funds and other donor funds.

Table 2-1 Comprehensive development plan
Scope of the Project by Japanese grant aid funds and consecutive development)

category	services	Building	Approx total area of the rooms (m2)	Approx total floor area of the building (m2)	Current project Phase 1 (Japanese funds)	Phase 2	Phase 3 (future plan)
outpatient department	Emergency medicine & general outpatient services		750		x		
outpatient department	Referrals & specialist outpatient services				x		
Central clinical department	Medical imaging	central	70		x		
Central clinical department	Operating theatre suite	clinical	260		x		
service sector	Central sterilization services department (CSSD)	building	70	1410	x		
Central clinical department	Delivery room & special care nursery (SCN)	Delivery building	300	570	x		
ward	Maternity ward	maternity ward	330	550	These functions and services will utilize the existing buildings. The existing buildings are to be renovated to accommo-date these functions and services for the time being.	x	
ward	Surgical ward	surgical ward	330	550		x	
ward	Paediatric ward	paediatric ward	330	550		x	
ward	Medical ward	Medical ward	330	550		x	
ward	Isolation ward	isolation ward	350	550			
outpatient department	family planning & reproductive health		90				x
administrative department	Central reception, admissions & Revenue						x
administrative department	Hospital Administration		170				x
administrative department	Provincial health administration		190				x
service sector	Mortuary	Administration building	70	750			x
Central clinical department	Medical laboratory	laboratory block	160	220			x
outpatient department	Dental clinic	Dental building	80	120			x
outpatient department	Rehabilitation & physiotherapy	Rehabilitation building	80	120			x
outpatient department	Bulk medical	Pharmaceutical	70				x
administrative department	Pharmaceutical storage	building	170	320			
service sector	kitchen		90				x
service sector	laundry		60				x
service sector	Engineering (maintenance) garage & Plant		40				x
service sector	Engineering (biomedical)	service wing	130	460			x
service sector	Waste management	wasteplant	50	80			x
		total		6800			x

Source: prepared by JICA Study Team

The hospital site is large, and it has an unbuilt vacant lot in the northwest. This survey confirmed that the site is state-owned land and boundary stakes are present. To the south of the hospital site, the land is subdivided into smaller lots, and residential development in Auki extends to this hospital site. The hospital must keep the site clear, as hospital improvements such as this will still be necessary in the future. It was explained to the hospital and Provincial Governor that if vacant land to the northwest was developed into residential land in the future, future development of the hospital would not be possible. Therefore, the existing community space to be used as a construction site in this plan must be developed and relocated to this vacant site to utilize the available land. This vacant land is sufficiently large for use for sports medicine, for example. It is important to maintain a master plan for this vacant land in the northwest, which is not covered by the first stage of this improvement project.

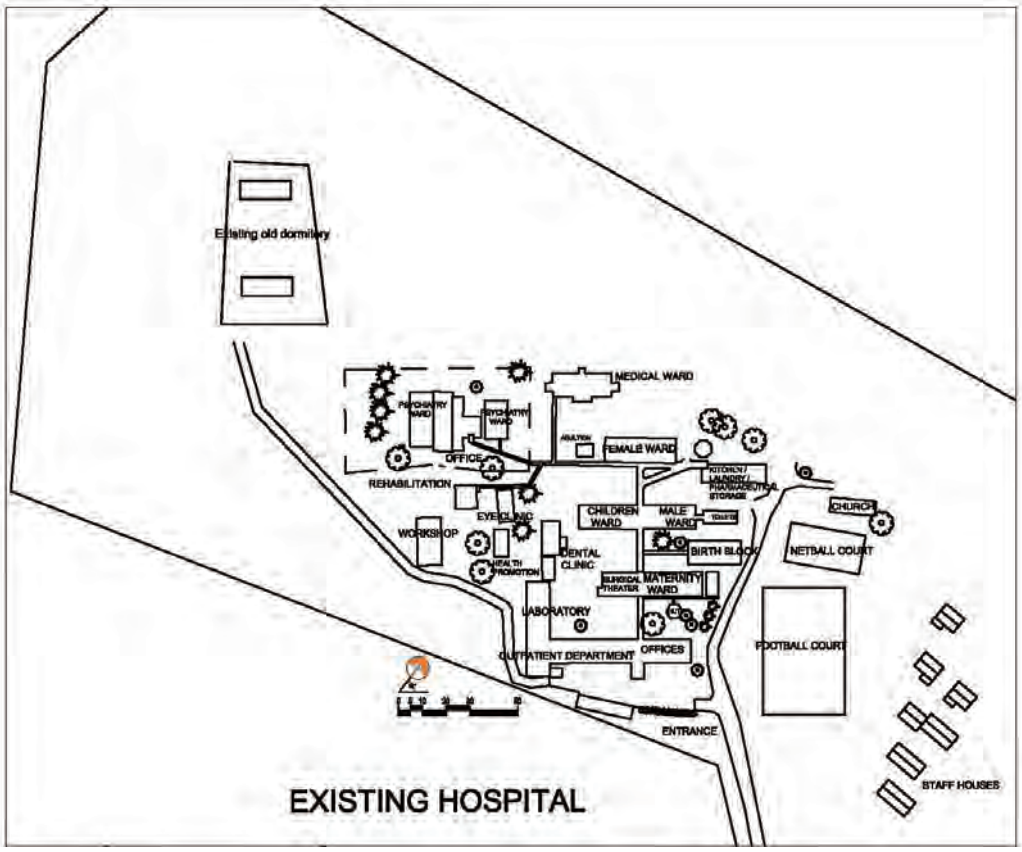


Figure 2-1 Existing Hospital

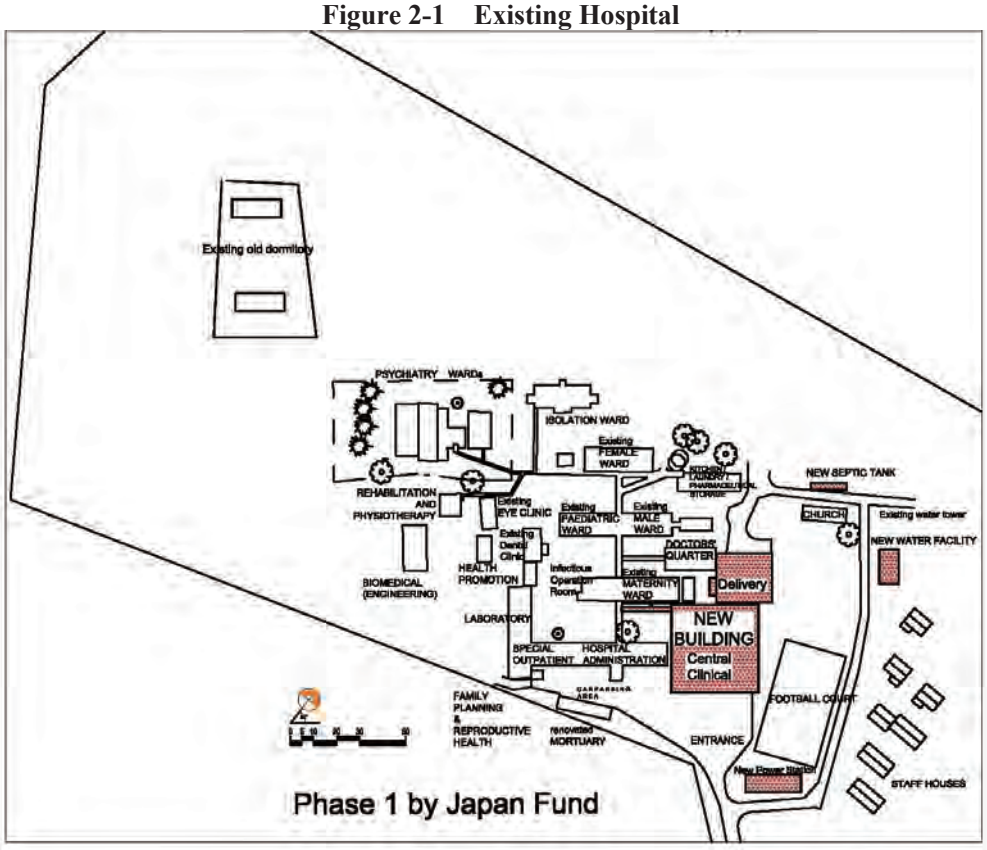


Figure 2-2 JICA Building

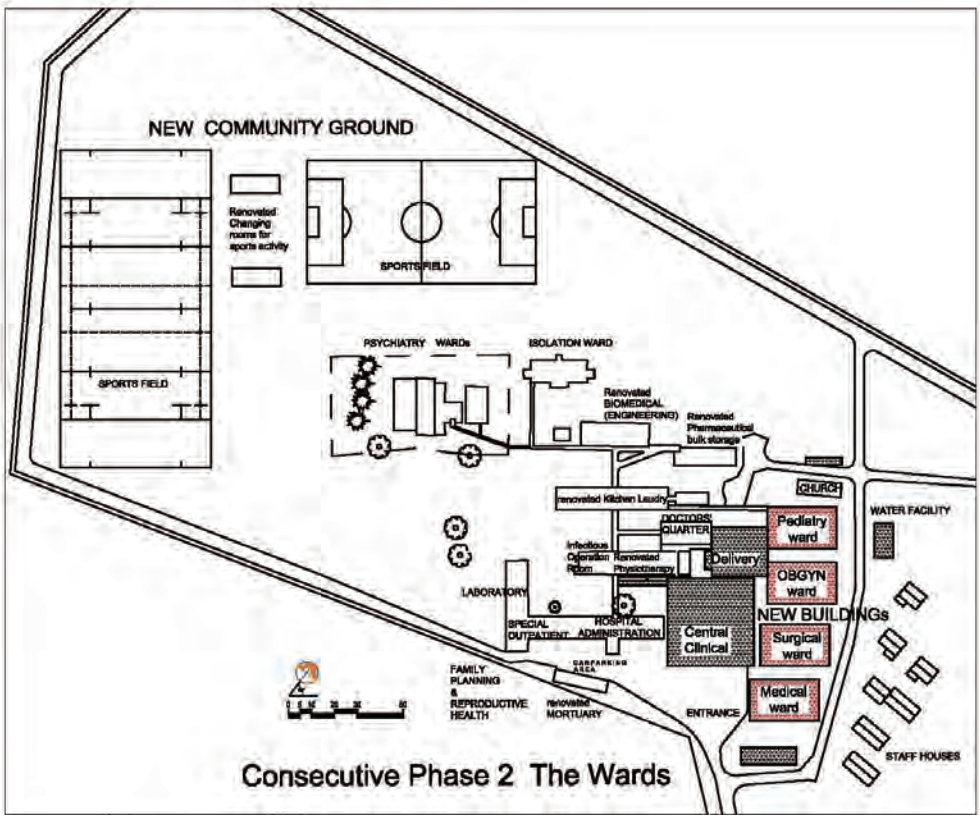


Figure 2-3 Phase 2

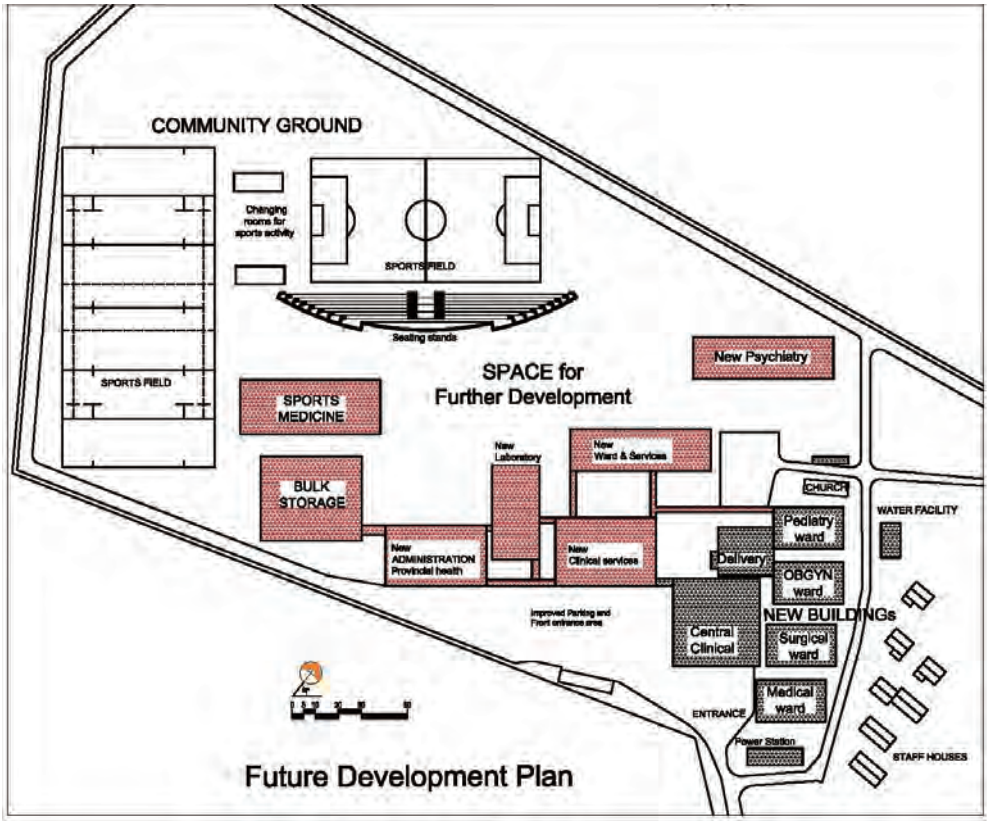


Figure 2-4 Far Future

(2) Basic policy for facility planning.

The stability of water and power systems is essential for hospital medical services. The first objective of the project is to rehabilitate the hospital's water and power supplies. The building environment will be improved for the Emergency Medicine & General Outpatient Department, operating theatre suite with CSSD, medical imaging unit, delivery, and special care nursery services by constructing new facilities and procuring medical equipment for these services. After the new facilities will be handed over, a soft component, a technical assistance program, will be provided for the maintenance of medical equipment.

Table 2-2 Outline of the Project

Size & Functions	Infrastructure facilities (electricity and water): Total floor area: 75.00 m2 Central clinical building and delivery building: Total floor area: 2,137.26 m2		
Infrastructure	1) Electricity	Relocation of existing transformer and generator and installation of new power supply system	
	2) Water	Installation of a new borehole pump, and provision of new water supply system from the stream & rainwater harvesting.	
Facilities	1) Emergency Medicine & General Outpatient Services	Consultation rooms	2 General OPD consultation rooms & 1 Medicine consultation room
		Treatment rooms	(Resuscitation, Minor procedure, blood collection, etc.)
		Observation beds	Male 6 beds Female 6 beds Children 3 beds
		Isolation room	1 bed for patients with doubt of infections
		Pharmacy	
	2) Medical Imaging	General X-Ray room	
		Ultrasound room	
	3) Operating Theatre Suite	2 Operating rooms	
		OT hall with Scrub	Observation 2 beds Minor OT (Treatment bed)
	4) CSSD	Central Sterilization Services Department rooms	
	5) Delivery Room & Special Care Nursery (SCN)	Delivery room	3 beds
		Labour room (Ante-natal beds)	4 beds
		Post-natal day beds	4 beds
		Isolation bed	1 bed
		Neonatal Bay (Isolation) / Milk room	2 incubators
Others	1) Electricity	Power outlets, Generator, Lightings, Telephone & LAN, Fire safety lightings, lightening protectors	
	2) Mechanical	A/C, ventilation, etc	
	3) Plumbing	Sanitary, Water & hot water supply, drain & sewage (septic tank), Firefighting (hose reel) etc.	
	4) Medical gases	(BY SIG)	
Medical equipment	All medical equipment for above medical services		
Furniture	General furniture, office supply and IT system is to be provided by SIG		

The design policy of the facility is described as follows.

- Universal access shall be adopted in facility designs to ensure equitable access across communities.
- Considering smooth medical flow lines, the building shall be single-story.
- Most building materials, including concrete aggregates, are transported from outside the island. Owing to the limited construction materials that can be procured and the fact that most buildings of the same size on the island are steel-framed, the new facility shall also have a steel frame for the upper structure and concrete for the foundation and floors. Owing to the limited transport dimensions, a lightweight steel truss or unit system, which can be assembled with small members, will be used instead of a heavy steel frame. A simple bolting system shall be adopted to enable non-skilled workers on the island to participate in the construction. The roof will consist of modular roof panels.
- Adopting a perimeter corridor system.
  - It is easier to connect each building because we are adopting a step-by-step development of the hospital.
  - This would protect interior rooms from strong sunlight.
  - The external wall heat load would be reduced because there is no direct sun exposure on the external walls of the room.
- The roof is to be multi-layered, allowing soft light and air to reach the internal areas of the building. Natural ventilation throughout the building would be effective in controlling infection. Each roof layer will have a sufficient height difference to enable proper waterproofing measures. The roof panels will be strongly fixed against winds. These details shall be further developed in the detailed design stage.
- All rooms will be air-conditioned. Ceiling fans will also be installed in these air-conditioned rooms to keep them comfortable without air conditioning during the morning, evening, and night hours. Ceiling heights of at least 3.5 m shall be designed to make rooms comfortable without air conditioning.
- Windows shall be jalousie-based and natural ventilation-oriented. Insect nets shall be installed in all openings. Insect nets shall be attached to lattices to facilitate easy partial repairs. These lattices are effective security measures during typhoons and other strong winds.
- The traditional shapes of Malaita Island will be adopted as much as possible in terms of structure and design.

2.2.1.2 Design Principles on natural conditions

(1) Climate

Malaita Province is hot and humid throughout the year with an average annual temperature of 31.4 ℃. The annual rainfall in Auki is 3,343 mm (average from 2001 to 2020), with the largest daily rainfall of 149 mm recorded in December 2018, and a maximum wind speed of 46 m/s recorded in February 2016. The highest recorded monthly temperature is 33.0 ℃ (from 2000 to 2012), and the lowest monthly average temperature is 20.9 ℃ (from 1962 to 2021). The average relative humidity is extremely high, ranging from 86% to 94%.

The following measures are taken to reduce the environmental impact: (1) installation of solar panels for power generation, (2) adoption of LED lighting, (3) rainwater harvesting, and use of passive energy (natural wind and solar adjustment). To utilize these methods, roofs are insulated and designed with a multi-layer structure that actively ventilates the attic. The water supply for the existing hospital is primarily sourced from rivers and rainwater, and rainwater storage tanks are installed on the roofs to serve as water sources. The table below shows the standard values for roof drainage standards according to NBCSI-2022 (draft), which are based on the numerical standards shown in the table below, compared with the commonly used 100 mm/h (SHASE-S206) in Japan.

Table 2-3　Criteria and design policy for roof drainage (to be developed in detailed design)

NBCS-2022（draft）	SHASE-S206 Technical Standards for Water Supply and Drainage (*1)	Design Policy
NF7 Roof drainage a) Eaves gutter: 80 mm/h (20 years) b) Valley gutter: 100 mm/h (100 years) d) Temporary building gutter: 63 mm/h (5 years)	Allowable maximum, based on rainfall of 100 mm/h Set the rainwater pipe diameter. based on the maximum permissible roof area and pipe slope. For rainfalls other than 100 mm/h, the maximum rainfall for the area in question is used to compensate for this. Normally, one pipe size larger is usually adopted	As there is no record of 10-minute rainfall intensity in the Solomon Islands, similar Japanese example is used as a reference for the daily rainfall intensity record. in areas where rainfall is around 150 mm. Maximum 10-minute rainfall record 25-30 mm/10 minutes, i.e. 150-180 mm/h. The planning should be done on the safe side, based on these figures.

*1 Ministry of Land, Infrastructure, Transport and Tourism. Architectural Guidance Division, Housing Bureau

No standards or guidelines exist for the environmental performance of buildings in the Solomon Islands, including roof insulation. Therefore, the following values are used as standards with reference to Okinawa, a similar region in Japan:

Average solar heat gain during cooling season ηAC =3.2

The standard value for Okinawa was changed from 3.2 to 6.7 in the 2020 revision. The main reason for this is that the values tend to be higher for reinforced concrete construction, which

is common in Okinawa. The new building for the project shall be a steel-framed structure. Therefore, this value is based on a stricter old standard.

(2) Geotechnical

According to the analysis of the soil survey conducted by a local subcontractor, the results of a Standard Penetration Test (SPT) suggest that the allowable bearing capacity of the clay layer with a depth of 1–2 m is 85.1 kN/m^2 (8.7 t/m^2). The classification of the soil was based on the Australian Standard Residential slabs and footings, Australian Standard (AS)2870-2011. It is "Class M" (moderately reactive clay or silt sites, which may experience moderate ground movement due to moisture changes). The footing shall be placed over the engineered fill material at a thickness of 500 mm to prevent uneven soil settlement and improve the bearing capacity of the underlying soil.

(3) Earthquake

In Solomon Islands, the new National Building Code for Solomon Islands (NBCSI-2022) was drafted and currently under public hearing since April 2022. The schedule for implementing the new standards is unknown. Commonly in the country, the structural design for public buildings tends to be designed according to the Australian and New Zealand Standards (AS/NZS), and for the earthquake stability analysis, NZS 4203-Part 4 is used. The same reference was used for NBCSI-2022. In this project, these circumstances will be referred to in detail during the design stage.

According to the Provincial Deserter Office (PDO) of Malaita, Auki has not suffered major damage from cyclones or earthquakes in the past, but the facilities in the project will be designed as a hospital that will be utilized for disaster responses.

(4) Lightning

In the existing hospital, catenary wires were installed above the vehicle depot. For the new facilities, lightning rods (air terminations) will be installed on the new elevated water tank, and conductors will be installed around the roof of the perimeter corridors in the buildings and released into the underground grounding loop. For internal lightning protection, surge-protective devices (SPDs) will be installed on the main board to prevent overvoltage and overcurrent (lightning surges).

(5) Stabilizing the electricity and water supply (Infrastructure plan)

1) Power supply plan

The proposed electricity supply diagram is shown below.

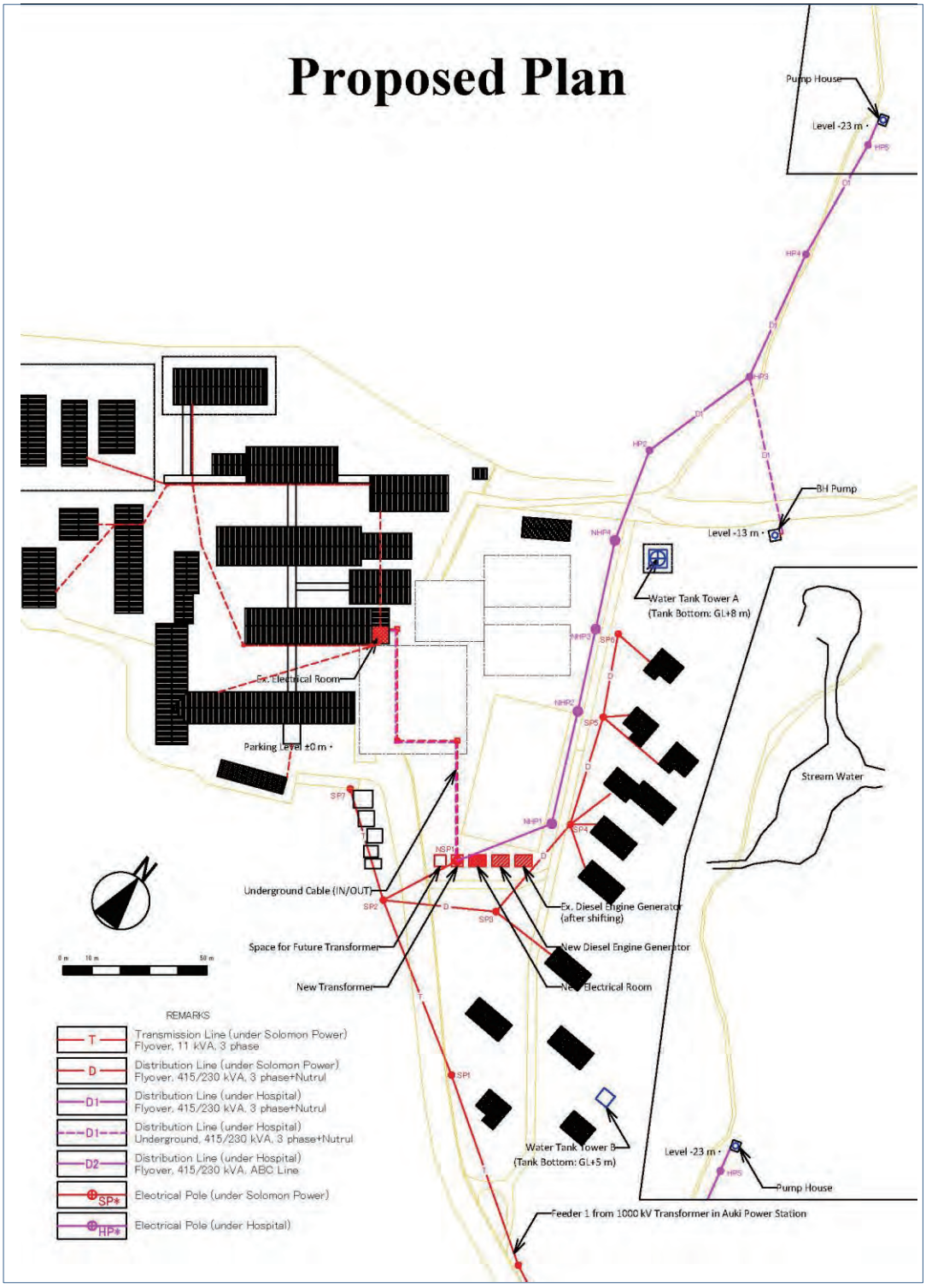


Figure 2-5 Proposed power supply plan

Source: Prepared by JICA Study Team

【Outline of the plan】

Based on a request from KH, a draft plan was presented, and the details below were agreed upon:

i. Installation of new transformers that supply electricity to both existing and new hospital facilities.
ii. Removal of existing transformers after installation of new ones.
iii. Securing a transformer yard for increased voltage for future planning
iv. A new standby generator to supply electricity under power failure only for the new facilities.
v. Relocation of existing standby generators after installation of new standby generators.
vi. A new electrical room (south side of proposed construction site) will be constructed.
vii. Removal of overlapping distribution lines and construction a new distribution line detour route to the pump house
viii. Installation of new solar power generation system for hospital operations.

Solomon Power, formerly the Solomon Islands Electrical Authority (SIEA) under the Ministry of Minerals and Energy, became a corporation (state enterprise)under the new name Solomon Power. The removal and relocation of existing transformers and transmission/distribution lines in the project will be performed by Solomon Power.

2) Water supply plan

The water supply for the project is shown below.

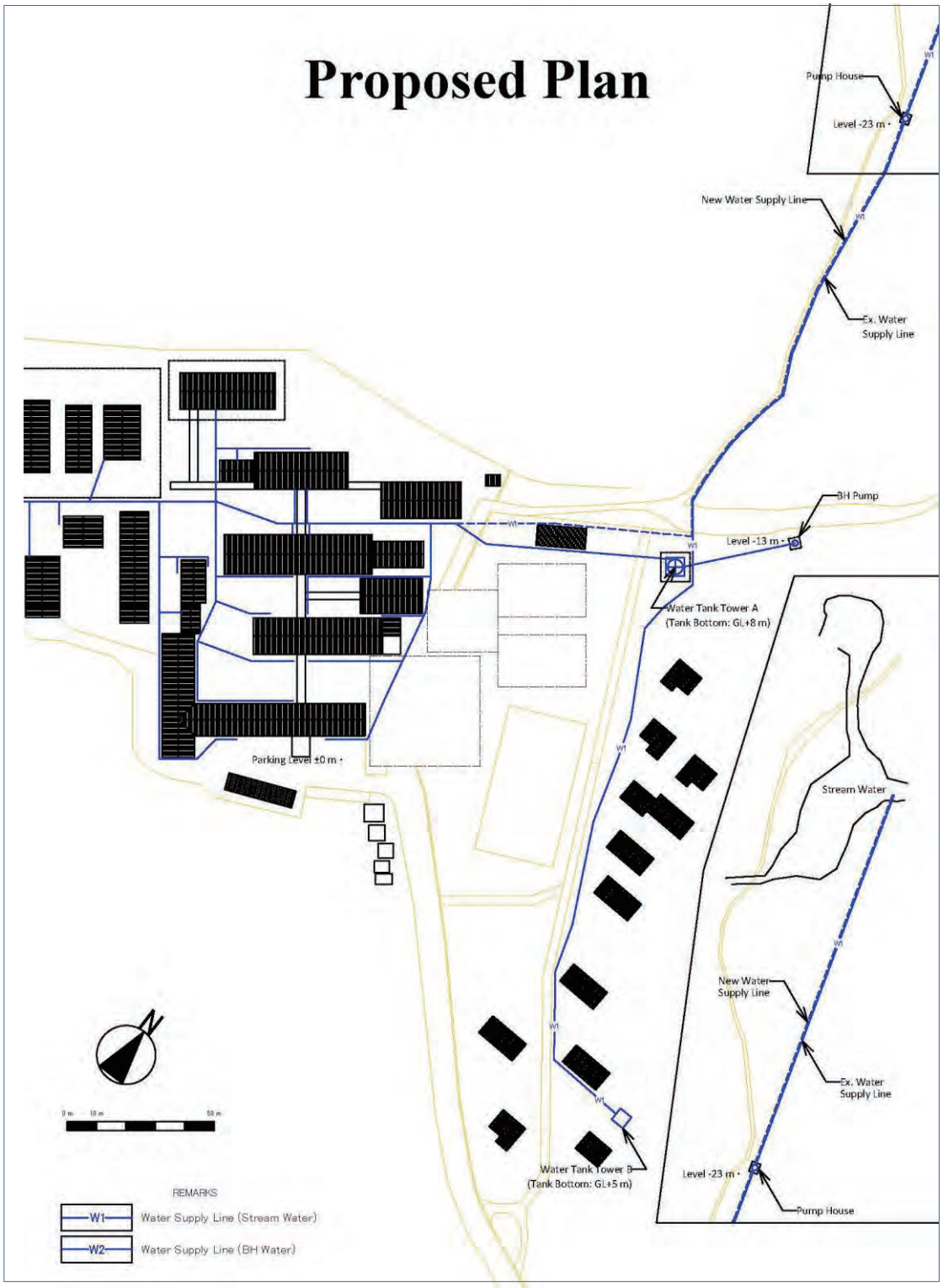


Figure 2-6 Water supply plan

Source: Prepared by JICA Study Team

【Outline of Plan】

Based on a request from KH, a draft plan was presented, and the details below were agreed upon:

i. Replacement of one existing pump in a pump house. Two new pumps will be installed in the new pump shed to improve the water supply to existing and new facilities.
ii. Installation of new water pipes to accommodate the increase in water pressure from the stream.
iii. Replacement of the broken pump in the existing borehole. If the pumping capacity of the existing well cannot be confirmed during the detailed design stage, a new well shall be installed.
iv. Installation of new water pipes to accommodate the increase in water pressure from the borehole.
v. Construction of a new tank tower and installation of an elevated water tank.
vi. Construction of new reservoir tank with a filtering system.
vii. Installation of new rainwater tanks to collect rainwater from the roofs of the new facilities.

2-1) Groundwater supply

At KH, water is not supplied by Solomon Water. Groundwater from a borehole well supplied water to the hospital, but the pump broke down in 2019. Currently, water is supplied only from a stream. However, stream water is occasionally unsuitable for use. Quality may be compromised by Escherichia coli, and the water becomes muddy after heavy rains. During this project, a new borehole pump will be installed.

For this new borehole, the work will be supervised by a Japanese engineer to ensure the quality of the borehole shaft and to prevent groundwater contamination or reduction in water volume. To obtain sufficient water volume prior to construction, the location of the new borehole will be determined, and a test drill will be conducted during the detailed design period.

2-2) Hydrogeologic conditions and groundwater development potential of the Project site

Malaita Island, where KH is located, has mountainous terrain, with small alluvial plains developing near the coast. The geology of the mountains is based on Mesozoic igneous rocks overlain by Neogene sedimentary rocks. KH is located on a flat alluvial layer outside Auki town, underlain by Pleistocene to Recent age coralline alite limestone common to most of the coast of Malaita Island. In addition, the removal of topsoil and vegetation revealed a reddish-brown clay layer, which may be related to the lake southeast of the hospital site. This type of soil is more evident on the soccer field next to the hospital, in the areas surrounding the hospital, and on the sidewalks outside the building. The alluvium deposited by flood, river, and storm water runoff, is

primarily silt, sand, and gravel-washed sediments overlaid by allistic limestone and clay deposits found throughout the hospital site.

The main aquifer around the project site is limestone, and the results of an electrical survey conducted in Auki under another project 3 km away revealed that the aquifer is distributed at depths ranging from 20 to 100 m. Auki town uses two water wells as water supply sources. The water wells in Auki town have a daily pumping rate of 200 m^3, and the groundwater quality is sufficient for domestic use. The groundwater development potential of the project site, which will be determined through hydrogeological and electrical surveys, is estimated to be similar to that of Auki town.

2-3) Groundwater salinization measures

Groundwater quality is good; however, because water is drawn from an aquifer near the coast, inadequate management of the groundwater table can cause salinization due to seawater intrusion.

The relationship between the desalination lens and seawater is called the "Ghyben–Herzberg relation"; the thickness of the freshwater lens can be estimated from the groundwater level from the sea level (L1:L2= 1:40). The natural water level of the existing well at the hospital in June 2022 was approximately 11.6 m. Because the elevation of the water well is approximately 19 m, the groundwater table was estimated to be approximately 7.4 m above sea level (0 m).

According to the Ghyben–Herzberg relation, the thickness of the freshwater lens is approximately 300 m and sufficient groundwater is present.

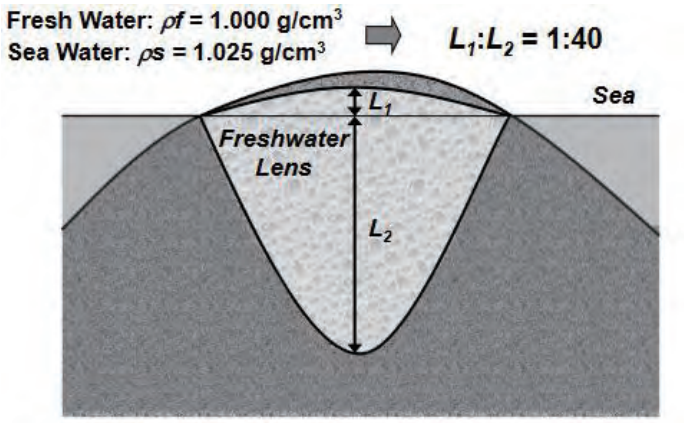


Figure 2-7 Ghyben–Herzberg relation

However, as the groundwater level decreases owing to pumping, the freshwater lens becomes thinner, and saltwater salinization of groundwater by seawater occurs.

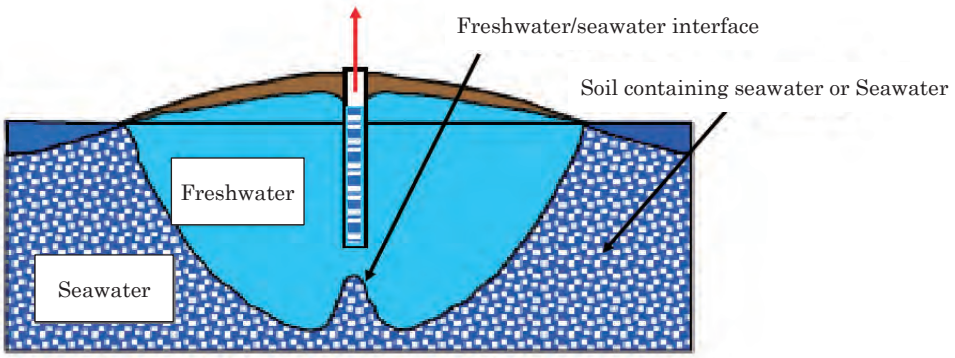


Figure 2-8 Saltwater intrusion due to low groundwater table

Although the results of the electrical survey conducted in Auki under the other project did not indicate seawater intrusion into the freshwater lens, there is a need to measure the amount of water level drop due to pumping during well operation and to ensure that the dynamic water level is not below sea level. Groundwater management through the proper operation of submersible pumps is necessary at the time of the handover of water supply facilities to the hospital. Electrical conductivity, which is an indicator of salinization, should be measured, and care should be taken to ensure that the salinity is not high to affect water for domestic use.

2-4) Estimation of planned water volume and stable pumping rate

Based on the results of the field survey, the water requirement of the facility is approximately 70 m^3 per day. If the new water well can achieve the same capacity as the pumping capacity of the water wells in Auki town(200 m^3/day), it will be possible to satisfy the planned water volume with a pump operation of approximately 9 h per day.

The main source of water is good quality groundwater; however, there are many uncertainties, such as the porosity of the strata and the hydraulic conductivity coefficient, which cannot be determined until excavation is performed. Because domestic water is essential for hospital operations, redundancy in water sources is necessary, and the two existing water sources (the water well and stream) will be restored.

- To supply water from the existing stream, one aging existing pump will be replaced and two new pumps will be installed.
- The daily water consumption of the entire hospital is assumed to be 70 m^3/day, and 70 m^3 for the receiving water tank and 14 m^3 for the water tank tower are planned.
- Rainwater is also used as a water source.

2-5) Work schedule (25 days) on the detail design stage for new water well

Table 2-4 Schedule of borehole construction supervision

		Work outline	Day for work
1	Groundwater exploration and analysis Freshwater lens distribution survey Existing well investigation	✓ Vertical electrical exploration and hydrogeological investigation will be conducted in the planned area to select about three well drilling sites with high groundwater development potential. ✓ Analyze the resistivity depth distribution to determine the distribution of freshwater lenses in the proposed site. ✓ Check to see if existing water well can be utilized as a backup water source.	7 days (Including analysis)
2	Water well drilling and finishing	The rotary-type water well drilling method takes into account the geology, and the upper layer of sedimentary rock is excavated by mud drilling with a Tricombit, followed by the insertion of the opening of pipe to prevent collapse. After inserting the opening of pipe, drill the well with an air hammer. After confirming the aquifer, insert casing & screen and finish the well. After inserting the opening of pipe, drill the water well with an air hammer. After confirming the aquifer, insert casing & screen and finish the water well.	14 days (as follows) ➢ 3 days for drilling machine setup (transport from port and installation of scaffold, preparation), drilling and casing insertion ➢ 8 days for drilling (100m), depending on geological conditions (number of days considering measures to prevent water loss in limestone areas) ➢ 3 days for installation of casing & screen, gravel packing, and finishing of water well
3	Pumping test (stable pumping rate, depth of pump installation)	To determine the amount of water level drop and stable pumping rate for the water well, execute following tests; 1) Step pumping test, 2) Continuous pumping test, and 3) Recovery test The test results will be analyzed to determine the installation depth of the submersible pumps to be installed in the water supply facility construction.	4 days (Including analysis)

2.2.1.3 Policy on socio-economic conditions

In the Solomon Islands, the price of goods, particularly fuel and imported goods, is rising as of June 2022. A meeting of the Central Bank on September 22, 2022, concluded the following policy:

'The Board of the Central Bank of Solomon Islands has decided to adopt an accommodative monetary policy stance to contain inflation over the next six months, based on the need to continue to support the economic recovery.

Economic activity in the first half of 2022 was even weaker than in the latter half of 2021, as

COVID-19 and the effects of the war in Ukraine continue to delay economic recovery. With the exception of communications and investment, which showed signs of recovery, activity in all sectors remains weak.

Inflation increased from 2.5% in December 2021 to 3.9% in June 2022. Core inflation increased to 4.1% from 1.2% in December 2021, mainly due to sharp price increases in fresh food from the market. The outlook for aggregate inflation was revised upwards, reaching 6.9% by the end of the year, higher than the 3.2% forecast in the March Monetary Policy Statement. This is due to a significant increase in import price inflation, in particular fuel and food prices. Core inflation is estimated to remain in the range of 5% to 6% by the end of the year.'

These inflationary trends during the detailed design shall be closely monitored and discussed with the project agencies concerned for appropriate measures.

2.2.1.4 Policy on Facility Construction and Equipment Procurement

(1) Building Permits

The project requires a building permit, the authority of which is the Ministry of Infrastructure Development (MID). To obtain a permit for the project, the MHMS will first submit an application to the Malaita Planning and Development Board (MPDB) of the Malaita Provincial Government Headquarters (MPGHQ) in Auki. The application will then be submitted to the Malaita Planning and Development Board (MPDB) of the MPGHQ for a review. After the Committee's approval, the project will be submitted to the MID for final approval, and the review will be completed. The review fee is SBD 1,500, and a construction license fee of SBD 1,500/year must be paid to the committee during the construction period.

(2) Construction Materials

In the Solomon Islands, construction materials are procured from third countries, except for concrete aggregates. Materials from Australia, New Zealand, and PNG are available in Honiara.

The study team confirmed through several interviews that aggregates are available in Auki but their size and quality vary. In Auki, locals use aggregates from the coast, but this is not a recommended practice because it destroys the coastal ecosystem and deteriorates the quality of concrete with high salt content. In addition, the construction materials available in Auki are procured for small-scale constructions. Therefore, when a larger supply is required, contractors use materials transported from Honiara. Therefore, for the project, construction materials and equipment will be procured in Honiara and transported from Honiara Port to Auki Port.

Local construction companies can hire heavy construction equipment, such as backhoes with drivers, but the number and types of equipment are limited. As with construction materials, the company is seeking to transport from Honiara. There is no machinery leasing industry in

Honiara or Auki, and local companies own their own machinery.

To procure the concrete aggregate, raw stone obtained by excavating the riverbed is transported to a crushing facility, crushed, and prepared in assorted sizes. According to previous reports, crushed stone is obtained in the same manner as in previous grant assistance projects. Negotiations with landowners are required for the extraction of raw stones, and the MHMS will need to consult and contract with the relevant parties. Note that these negotiations can be time consuming. Moreover, the crushing facility is not located in Auki, and considering the cost of transporting and constructing a complete set of crushing equipment to Auki, it would be reasonable to select a site in Honiara for the raw-stone extraction and transport it to Auki.

Therefore, concrete construction it on Malaita Island is commonly used only for foundations and other substructures, and steel construction is used for superstructures; the same method will be used in this project.

Table 2-5 Construction materials in Honiara

	
Construction materials store in Honiara Most building materials are available in Honiara, including rebar, cement, paint, plumbing materials, and sanitary fixtures.	Local steel dealer in Honiara They supply steel structural materials, steel plates (exterior walls and roofs), nails, and much more.

(3) Policy on procurement of construction materials and medical equipment

Most of the construction materials and medical equipment for the project will be procured from Japan and the third countries such as Australia, New Zealand, and Southeast Asia, and will be unloaded at the Port of Honiara, cleared through customs, and then transported by ship to the Auki Port on Malaita Island. In addition, the materials, equipment, and construction vehicles to be procured in Honiara will also be transported by sea from Honiara Port to Auki Port. The cost of transportation is included in this project.

Auki Port has no container lift; cargo sent through containers will be unpacked at Honiara Port and transported to Malaita Island using either small boats or trucks. Travel from Honiara Port to Auki Port takes approximately one day. The distance by road from Auki Port to KH is approximately 4 km. The road has a width equivalent to two lanes going either way, but the speed

of travel decreases owing to poor road conditions, making the travel time by truck approximately 30 min. Table below shows the situation at the ports of Honiara and Auki.

Table 2-6 Honiara port and Auki port for material procurement

	
The Port of Honiara: the boat on the right of the pier is for Auki. With the support of the Japanese Grant Aid, the port was improved in 2016, and handling capacity is considered to be fine.	The Port of Auki It is small in scale and has no container lifts in place.

2.2.1.5 Policy on local contractors

(1) Facilities

A skilled local contractor for the construction of hospital is not readily available on the island, and the survey team learned that construction management for a small facilities is sometimes performed in Honiara. During the field survey, one Honiara-based contractor with experience in construction in Auki was identified. In Auki, some construction companies own heavy construction equipment; however, the numbers and types of equipment are limited. Under the grant scheme, a Japanese contractor will be employed and they will subcontract local contractors for the project. To secure local labor for the project, good laborers from Malaita Island will be included in our policy on procurement, with the expectation of effective and quality construction by considering the establishment of a good relationship with the local community.

It will be necessary to dispatch skilled workers from Japan and third countries under a prime contractor who will provide appropriate guidance to local laborers.

（2） Equipment

At KH, the management, maintenance, and replacement of parts and consumables for medical equipment are the responsibility of the MHMS. No local agents can undertake the maintenance of medical equipment.

The Solomon Islands is an island country; it is expected that the procurement of equipment and dispatch of engineers from neighboring countries will be expensive. Therefore, the survey team attempted to find a local medical company, a medical equipment manufacturer established in the Solomon Islands, or an agent of medical equipment manufacturers in third

countries, but this cannot be confirmed. In this project, some medical equipment will require longer maintenance contracts after the first defect liability period has expired. These equipment maintenance services will be provided by neighboring countries, such as Australia and Papua New Guinea.

2.2.1.6 Japanese contractor

(1) Facilities

According to the framework of Japan's Grant Aid, a Japanese contractor will be selected through an open tender process to construct facilities for the project.

The contractor must have a record of construction equivalent to the scale of the project, technical abilities, and appropriateness for the plan of delivery of materials. In addition, the contractor must be capable of implementing sufficient safety measures to protect visitors, hospital patients, and nearby residents during the construction period, and must be able to manage the construction schedule, transport procedures, and good coordination with the hospital.

The Japanese contractor will subcontract local contractors and will be responsible for the work by the subcontractors.

（2） Equipment

Regarding the medical equipment to be procured in this project, our policy is to confirm the possibility of introducing equipment in which Japanese companies have advantages and to assume that Japanese companies will be procured in principle; however, if it becomes necessary to procure equipment from a third country, we will consult with the client about the candidate countries in advance.

For equipment procurement management, we will carefully analyze the capabilities of the Japanese company selected as the contractor and consider support from consultants as necessary, paying attention to ensuring the quality of equipment procurement and process compliance.

2.2.1.7 Policy on Operation and Maintenance (O&M)

(1) Facilities

For daily operation and maintenance (O&M) at KH with regard to infrastructure, water, drainage, and electricity, two staff members perform routine cleaning and maintenance. Special repairs and maintenance requiring electrical knowledge are outsourced. The facilities and MEP of the project will be designed to conduct daily inspections and maintenance available to the existing staff. The new water supply system will require chlorine injection drips, which should be inspected, and chlorine should be adequately supplied. For the supply of medical cylinders, the MHMS will be responsible for the existing and new facilities. The existing hospital's pharmacy department manages the medical gas cylinders, which are supplied by the MHMS in Honiara once every two weeks, and it is assumed that this will continue.

(2) Equipment

Medical equipment O&M is conducted multiple times per year by MHMS biomedical engineers who visit and inspect each facility. Following the provision of medical equipment to the target facility, biomedical engineers and other O&M managers responsible for the medical equipment will be employed within the hospital and will require to take action regarding the medical equipment in the hospital that is not currently undergoing O&M.

The number of employed medical practitioners and technical level are sufficient for the selected equipment, and the supply of replacement parts/consumables is relatively easy. The equipment plan is suited to the capacity of the new hospital, assuming that O&M costs can be continuously included in the budget of the MHMS and the target hospital.

Delivery company technicians will provide operational training (initial operation guidance/usage guidance) regarding device operation when delivering equipment. In addition, O&M training for medical equipment will be conducted on soft components. In this project, following the one-year warranty period for particularly complex equipment, such as X-ray apparatus and ultrasound diagnostic machinery, a two-year maintenance contract will be executed with the manufacturer, after which we propose that the recipient country must renew a maintenance contract with an agent.

2.2.1.8 Design Policy for the selection of materials

(1) Facilities

The materials and finishes required for regional hospitals are stipulated in MP2016 and the project will adopt them. The survey team confirmed that the materials and finishes were used in a similar facility during the visit to the NRH and concluded that they are appropriate for a Grant Aid project.

(2) Equipment

By supplying medical equipment with performance levels/specifications that are almost the same as those of other domestic medical institutions such as the NRH, the medical equipment will select equipment for which replacement parts/consumables can be supplied by NMS, a domestic supply agency, so that O&M does not place an excessive burden on the target facility. Voltage fluctuations were observed in Auki city, Malaita Province. Therefore, an automatic voltage regulator (AVR) and an uninterruptible power supply (UPS) will be included in medical equipment that might be damaged by blackouts or voltage fluctuations.

2.2.1.9 Policy on Construction Schedule

(1) Facility

The construction schedule shall be planned with due consideration for safety as the site is adjacent to the existing hospital that is in operation. Transportation time should also be considered

because most materials and equipment will be transported from outside the islands. The duration of tax exemption procedures and delays due to severe weather during the rainy season will also be considered. In addition, the contractor should develop a critical path, including the relocation and removal of existing infrastructure facilities in cooperation with local ministries, installation of new poles, and the removal of existing poles. The construction schedule should reflect the appropriate allocation of labor and construction machinery.

(2) Equipment

It was assumed that the equipment to be maintained in this project will be transported from outside the island. A process will be developed that considers the time required for equipment preparation and transportation, including tax exemption procedures.

2.2.1.10 Policy on security issues

The security and safety of the people engaged in the project will be prioritized.

In November 2021, there was unrest in Honiara, followed by protests. Since then, the city has not experienced any riots or protests.

In preparation for emergencies and with due diligence, communication between the counterpart, contractors, consultants, JICA headquarters, JICA Solomon offices, and the Japanese Embassy in the Solomon Islands will be established, and a safety plan will be developed and implemented according to JICA's safety guidelines.

2.2.2 Basic Plan (Facility Plan / Equipment Plan)

2.2.2.1 Site Layout

The ground level of the new facilities will be approximately 2 m higher than that of the existing ward, sloping westward. The floor level of the new building will be decided by minimizing the amount of soil cut and fill s for the foundation.

During the first stage of hospital development, some existing facilities will remain and be in use, including special outpatient departments, administration offices, laboratories, pediatric wards, and male and female wards. To connect the existing hospital to the new facilities, a roofed ramp will be built between the existing hospital and new buildings.

The access road to the new Central Clinical Building will be tarmac and will be raised to the entrance porch, allowing vehicles to drive and drop patients. Currently, a microbus runs from Auki to the hospital, and the area in front of the Central Clinical Building will be a bus depot.

The existing road along the staff housing near the east boundary will be made suitable for service vehicles, compensating for the demolition of existing service roads running south–north, as new buildings will be built on it. A new route will be used to access existing service buildings (medical gas storage, kitchens, etc.) at the north end. An annex - electrical building will be built

at the south end of the ground, and delivery vehicles for generator oil will be accessed via the new road.

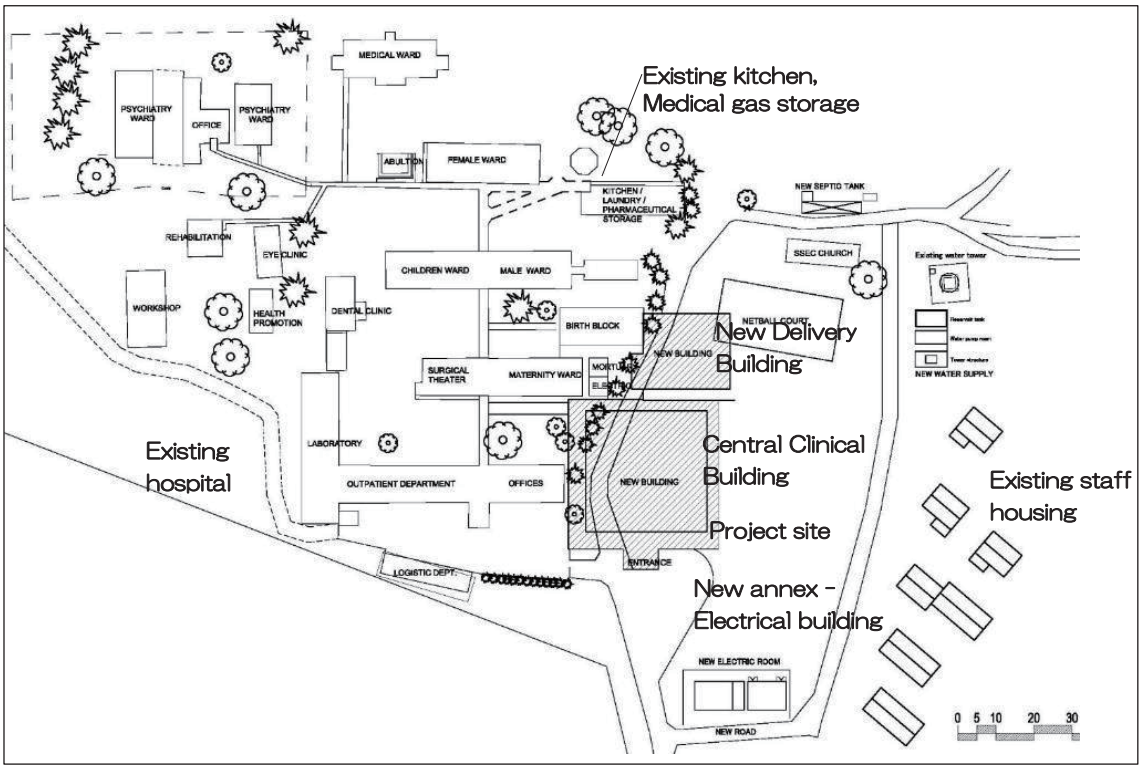


Figure 2-9 Site Layout

2.2.2.2 Architectural plan

(1) Facility Components

The project includes rebuilding medical service departments that require urgent attention, such as emergency medicine and general outpatient departments, with the expectation of enhancing out-of-hour ambulatory care, obstetrics departments, and surgical operation theatres. The total floor area of the Central Clinical Building, the Delivery Building, and machine rooms (electrical building and pump rooms) will be approximately 2300 m^2.

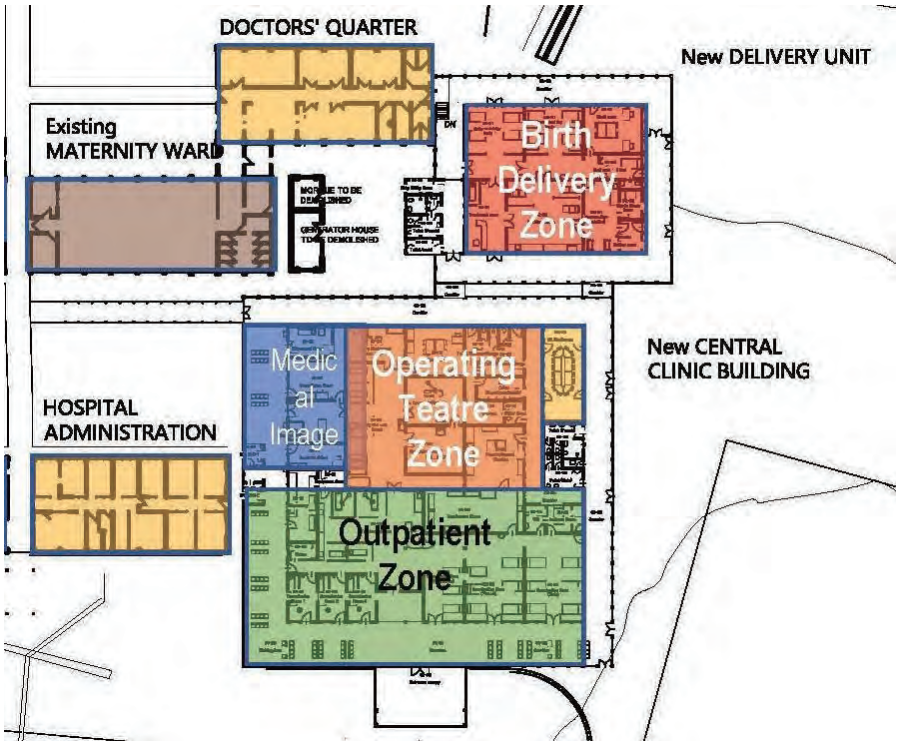


Figure 2-10 Facility Components

The construction of a hospital ward, which was initially requested by the recipient, is also an urgent task after the completion of the grant aid program. The construction of the wards has an extremely high priority, and it is desirable to start construction at the same time as the completion of this project (end of 2025). It is desirable that the four wards be constructed at the same time, but it is also effective to construct the wards one by one to send a message to the residents that the hospital is being continuously maintained.

Figure 2-11 Phase 2 The Wards

1) Medicine & General outpatient department

Following discussions with KH and the MHMS, and with reference to the MP 2016, the survey team concluded that both parties agreed with the various functions of the emergency medicine and general outpatient department, staff/triage station, patient waiting area, treatment room, examination bays (observation beds), and consultation rooms. Two general outpatient consultation rooms and an emergency consultation room will be provided. The special outpatient department will continue to use existing facilities. Treatment rooms will have sufficient space for various treatments by nurses, enabling a large number of patients to be admitted simultaneously, such as in the event of major traffic accidents. Observation beds will be procured in each examination bay with the division of male (six beds), female (six beds), and pediatric (three beds) by increasing the number of beds from the current six beds in the existing OPD. It will have 15 observation beds. The survey confirmed that this is consistent with the actual medical situation at KH. As a flow line for emergency patients, two entrances for emergency patients separate from

those for general patients will be established in the perimeter corridor area. Handwashing facilities will be installed near emergency patient entrances.

2) Medical Imaging

At the request of the SIG, a general X-ray room and an ultrasound room will be provided.

3) Operating Theatre Suite

In MP 2016, it was suggested that the new operation theatre suite would have one operating theatre and one procedure room. At the current hospital, minor operations are performed in the entrance-changing area of the operating theatre, which is also used as a storage room. In addition, surgeons are occasionally dispatched from overseas, making it challenging to secure rooms to perform multiple surgeries simultaneously. Therefore, in the new operating theatre suite, it is appropriate to have at least two operating theatres. KH is expected to serve the country when the NRH cannot function. This is another rationale to have two operation rooms.

4) Central sterilization services department (CSSD)

A new CSSD will be provided with functions to cover new operating theatres and existing wards.

5) Delivery room & Special care nursery (SCN)

In MP 2016, two LDR rooms (a system in which one patient can stay in the same room during labor, delivery, and recovery) were suggested. KH and the MHMS mentioned that no LDR rooms will be required yet at the hospital but prefer to have separate rooms for each stage of delivery: the delivery building will be equipped with a delivery room, labor room (ante-natal room with four beds), and a recovery room (post-natal with four beds). The number of new delivery beds will be three, as the hospital has two aged delivery beds that are not sufficient, with previous events of deliveries on the floor. The neonatal room (nursery) will be equipped with two incubators, as stipulated in MP 2016.

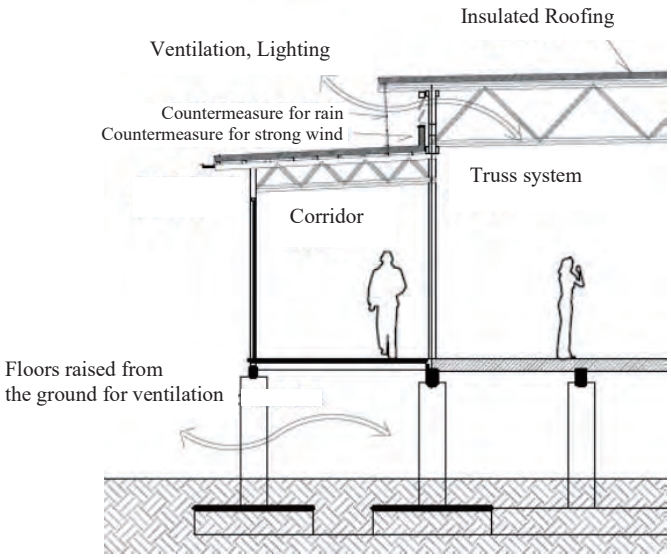
(2) Room Areas

The buildings will be single-story buildings. The rooms and areas for each department were planned based on MP 2016.

Table 2-7 Room Areas

			area	m2
1	Central Clinical Building	Emergency medicine & General outpatient department	300	
		Medical imaging department	70	
		Operation theatre suite	260	
		CSSD	90	
		Total of various rooms	800	
		Waiting area, Corridors and other common spaces	600	
		Total floor area		1,410
2	Delivery Building	Delivery room & Special care nursery (SCN)	300	
		Corridors and other common spaces	270	
		Total floor area		570
		Others (connecting corridors, etc)		157
		Total		2,137
3	Machine rooms	Water supply facilities, electricity room, etc.		75

(3) Cross-sectional plan



As mentioned earlier, the roof will be steel framed with a multi-tiered roof. The roof will be stepped to allow natural lighting and ventilation. The steps will be high enough to prevent rain. The roof will be made of thermal insulation panels, which are effective against strong solar radiation. The roof joists will be dense, and strong anchoring methods using these steps will provide sufficient protection against strong winds.

To adapt to the extreme climate of high temperature and humidity, floors will be raised from the ground, and cross-ventilation will be used to control the internal temperature, with windows on perimeter walls and ventilation windows at the top of the building. The ceiling height will be 3.5 m.

(4) Structure

1) Foundation

The foundations will be isolated pads with girders, and after soil improvement, the bottom level of the pad foundation of the Central Clinical Building will be approximately 3 m below the floor level. It was observed that the groundwater level is 4.36–5.00 m, which is lower than the planned foundation level. The reinforced concrete for the foundation work shall conform to JASS 5 of the Architectural Institute of Japan, and the design standard strength shall be 21 N/mm^2.

2) Superstructure

Superstructures other than foundations and floors shall be based on steel structures. The port of Auki does not have a facility for unloading 40-foot containers. To minimize the transport capacity, a steel structure will be composed of small members, and lattice trusses may be employed for the roof structure.

3) Structural design conditions

i. Live loads

In the draft of NBC-2022, the design live loads for hospitals (class 9b) were not mentioned. The following values are to be adopted based on the design guidelines of the Japanese Ministry of Education:

- Corridors, waiting areas: 1,800 N/m^2
- Operating theatre, examination rooms: 3,900 N/m^2

ii. Seismic load

In the draft of NBC-2022, NZS 1170 Part 5 refers to the seismic load. To analyze the earthquake resistance of a structure, its maximum strength must be calculated. Part and whole structural elasticity and strength will be examined. This corresponds to route 3 of the Japanese structural calculations. In the detailed design, structural calculations will be performed according to NZS 1170 Part 5, and the size of the structural member will be determined.

iii. Wind load

The draft of NBC-2022 referred to AS/NZS 1170 Structural Design Actions Part 2 to resist a minimum wind velocity of not less than 248 km/h (approximately 69 m/s). In Auki, the maximum recorded wind speed was 46 m/s (February 2016). In the Japanese building code, the wind velocity (Vo) in Okinawa is 46 m/s, and the design velocity is defined as 60 m/s. In this project, the design wind speed will be set to 248 km/h (approximately 69 m/s).

(5) Electrical works

After the removal of the existing 200 kVA transformer at KH, the required electrical work will be conducted, such as installing a new transformer in the vicinity of the new electrical room.

Table 2-8 Electric work in the Project

No	Works	Draft scope	Remarks
E-1.	Electricity	Relocation of power supply lines Required amount of power: approx. 500 kVA 415V/240V Generator (approx. 270 kVA) Solar power generator: Approx. 50 kVA (disconnected when generator is used)	
E-2	Lighting	Energy savings with LED lighting. Emergency lightings to be battery-integrated.	Architecture plans for natural lighting
E-3	LAN	Servers and wiring are to be borne by SIG	Piping for LAN to be borne by the Japanese side.
E-4.	Nurse call	Pushbutton + indicator light system	Nurse calls at ward rooms. Nurse call to be installed at each toilet
E-5.	Fire equipment	Automatic fire alarms (smoke detectors + call buttons)	
E-6.	Lightning protection	Lightning rods (for facilities and solar panels).	Medical grounding is also included
E-7.	Phone.	Relocate existing telephone switchboards	
		Following are not included 1. Public address (broadcasting) system 2. Security cameras and systems 3. Television 4. LAN servers, wiring 5. Hospital IT systems (HIS)	

(6) Mechanical works

Table 2-9 Mechanical & Plumbing works in the Project

No	Works	Draft scope	Remarks
M-1	Water supply	Repair of the existing water supply system to ensure redundancy and restore water supply from two sources (stream and the borehole). Installation of pumps in a new pump shed. Installation of new submersible pump in the existing borehole. Installation of a new 70 m^3 reservoir tank and a 14 m^3 elevated water tank. Rainwater harvesting with rainwater tank	Daily water consumption for the hospital is designed as 70 m^3/day.
M-2	Hot-water supply	Installation of solar water heaters. Installation of electric geysers to important rooms.	Hot water supply to operating theatres, sterilization rooms, etc.
M-3.	Sanitary	Western style only. No Asian style.	
M-4.	Wastewater treatment	Installation of new septic tanks for the new facilities	
M-5.	Medical gas	No central piping. Cylinders to be supplied by SIG	Medical cylinders will be used where necessary
M-7.	Air conditioning	Wall-mounted air conditioners and ceiling fans	
M-8	Ventilation	Operating theatre systems and delivery room systems shall be mechanically ventilated with appropriate filters. Ceiling fans are installed in both air-conditioned and non-air-conditioned rooms to reduce air-conditioning operating time.	Plan natural ventilation.
M-9.	Fire fighting	Installation of hose reels, fire extinguishers.	

(7) Special equipment for M/E

- Solar power generator

  Solar panels will be installed on the roofs of buildings, and electricity will be generated and converted to AC using a power conditioner. The system will be connected to the grid system using a new transformer. The power of the solar panel and power conditioner will be approximately 50 kW.

- Backup Generator

The existing 275 KVA generator will be relocated to the new electrical room. The new 270 KVA generator will be an outdoor type and will be equipped with a 2,000 L oil tank to withstand

a two-day (50-h) power failure. The old and new generators will cover the electricity generated by the existing and new hospital buildings.

(8) Required MEP in each room

Table 2-10 Required MEP in each room

Various Room Specifications	A - Australasian P - PNG															
Name Of A Room	Guideline: HFG Code	LAN Data	Nurse Call	General Lightings	Emergency Lightings	Generator Power	Generator	Fire detection	Water	Hot Water	Grey Water	Air Conditioning	Mechanical Ventilation	Ceiling Fan	Room Pressure (+ -)	Remarks.
EMERGENCY MEDICINE & GENERAL OUTPATIENT SERVICES																
Ambulance Entry / Trolley Bay	-			X				X	X							
Staff / Triage Station	SSTN-14-P	X		X	X	X		X	X			X		X		
Waiting Area	WAIT-30-A.	X		X	X	X		X	X					X		
Resuscitation Bay	PBTR-R-P	X		X	X	X	X	X	X	X		X		X		
Minor procedure bay	PROC-16-P.	X		X	X	X	X	X	X	X		X		X		
Isolation Room	1BR-IS-N-P	X	X	X	X	X	X	X				X	X	X	-	
Treatment Room (Nurse)		X		X	X	X		X	X	X		X	X	X		
Examination Bays (Male)		X		X	X	X		X				X	X	X		Observation beds x 6
Examination Bays (Paediatrics)		X		X	X	X		X				X	X	X		Observation beds x 3
Examination Bays (Female)		X		X	X	X		X				X	X	X		Observation beds x 6
Consultation Room 1	CONS-P.	X		X	X	X		X	X	X		X	X	X		General
Consultation Room 2		X		X	X	X		X	X	X		X	X	X		General
Consultation Room 3		X		X	X	X		X	X	X		X	X	X		Emergency
Clean Utility Room	CLUR-12-P.	X		X	X	X		X	X	X		X	X			
Dirty Utility Room	DTUR-P.	X		X	X	X		X	X		X		X			
Equipment Store		X		X		X		X						X		
ER Staff room	SRM-15-A.	X		X	X	X		X	X			X		X		
Toilet (Female & Male separated)			X	X		X		X	X		X		X			
Doctor's Office	OFF-S9-P.	X		X		X		X				X		X		for OPD Doctor
Pharmacy		X		X		X		X	X	X		X		X		
MEDICAL IMAGING																
Patient Change Room	CHPT-P.			X	X	X		X				X		X		
General X-Ray Room	SCRN-P.	X		X	X	X		X				X	X			
Ultrasound Room	ULTR-A	X		X	X	X		X				X	X			
Store – Records	STFS-8-P	X		X		X		X								Combined with the imaging office
Imaging Office		X		X	X	X		X	X			X	X	X		Radiographer / technical

Various Room Specifications	A - Australasian P - PNG															
Name Of A Room	Guideline: HFG Code	LAN Data	Nurse Call	General Lightings	Emergency Lightings	Generator Power	Generator	Fire detection	Water	Hot Water	Grey Water	Air Conditioning	Mechanical Ventilation	Ceiling Fan	Room Pressure (+ -)	Remarks.
																workspace / with storage
OPERATING THEATRE SUITE																
Entry (Anteroom)	ANRM-6-A.	X		X		X		X						X		
Office (Anesthesiologist's room)	OFF-S9-P.	X		X		X		X				X		X		Anesthesiologist's room with secure drug storage
Holding / Recovery Bays	PBTR-RS1-P	X		X	X	X	X	X				X		X		Combined within OT hall
OT Hall with Scrub		X		X	X	X		X	X			X		X		
Operating Room 1	ORMS-P.	X		X	X	X	X	X				X	X		＋A Little More Than Usual	
Operating Room 2	ORMS-P.	X		X	X	X	X	X				X	X		＋A Little More Than Usual	
Minor OT (Treatment Bay)	PBTR-A-10-P	X		X	X	X	X	X				X	X			Combined within OT hall
Sterile Stock Store/Set up Room	STSS-12-P.	X		X	X	X		X	X			X	X		＋A Little More Than Usual	
Equipment Store	STEQ-14-P.	X		X	X	X		X				X				
Staff Room	SRM-.	X		X	X	X		X	X			X		X		Reception / Staff Meeting / Handover
Staff Toilet/Shower/Change	CHST-10-P.			X		X		X	X	X	X	X	X			
Staff Toilet/Shower/Change				X		X		X	X	X	X	X	X			
Storage	STGN-9-P.	X		X		X		X					X			
CENTRAL STERILIZATION SERVICES DEPARTMENT (CSSD)																
Dirty Receipt	-	X		X		X		X	X	X		X	X	X	-	
Preparation and Washing	-	X		X		X		X	X	X		X	X	X	-	
Sterilization Room	-	X		X		X		X	X			X	X	X	＋A Little More Than Usual	
Autoclave Service Room	STSS-20-P.	X		X		X		X	X	X		X	X	X	＋A Little	Reception and Distribution Desk

Various Room Specifications	A - Australasian P - PNG															
Name Of A Room	Guideline: HFG Code	LAN Data	Nurse Call	General Lightings	Emergency Lightings	Generator Power	Generator	Fire detection	Water	Hot Water	Grey Water	Air Conditioning	Mechanical Ventilation	Ceiling Fan	Room Pressure (+ -)	Remarks.
															More Than Usual	
DELIVERY ROOM & SPECIAL CARE NURSERY (SCN)																
Birthing Rooms	BIRM-P.	X		X	X	X		X	X	X		X		X		3 beds in one room
Ante-natal day beds		X		X	X	X		X	X					X		4 Beds
Post-natal day beds		X		X	X	X		X	X					X		4 Beds + 4 Cots
Bedroom – 1 Bed	1BR-ST-B-P	X		X	X	X		X	X			X		X		High dependency – no ensuite
Treatment room	PROC-16-P.	X		X	X	X		X	X	X		X	X	X		
Neonate Bay (Isolation)	NBSC-P	X		X	X	X	X	X	X	X		X	X	X		Nursery 2 cots
Mother room		X		X	X	X		X	X	X		X		X		
Clean Utility Rooms	CLUR-12-P.	X		X	X	X		X	X	X		X		X		Includes Anaesthetic/Drug Store
Dirty Utility Room	DTUR-P.	X		X	X	X		X	X		X		X	X		
Sterile Stock Store	STSS-12-P.	X		X	X	X		X				X		X	＋A Little More Than Usual	
Staff Room	SRM-15-A.	X		X	X	X		X				X		X		Staff Meeting / Handover / Beverage Bay
Toilet (Female)	ENS-BR-B-P		X	X		X		X	X	X	X		X			Shower
Toilet (Male)			X	X		X		X	X		X		X			

(9) Construction materials

The materials used in the project are readily available locally, and general building materials and finishes shall be those used in the local area, to facilitate easy maintenance and repair after completion. The following is a list of the finishes.

Table 2-11 Finish materials

External finish		
Place	Finish	Remarks
Roof	Insulated metal roof panel 100mm	
External wall	Insulated metal wall panel	
Windows & doors	Steel doors, Aluminum windows	

Internal finish				
Place	Finish			
	Floor	Skirting board	Wall	Ceiling
External waiting area	Granite water-polished 300x300x20 mm	Granite water-polished h50 x 300 x 10 mm	30 mm metallic external wall insulation panels	None (eaves)
Treatment rooms	Terrazzo tiles 300x300x30 mm	Terrazzo tiles h50 x 300 x 10 mm	30 mm metallic external wall insulation panels	Plasterboard 9.5 mm + sound-absorbing plasterboard 9.5 mm Painted finish
Operating rooms	Terrazzo tiles 300x300x30 mm	stainless steel	Plasterboard 9.5+12 mm Painted Finish	Plasterboard 9.5+12 mm Painted finish
Toilets	Tiled 100 mm square	Tiled 100 mm square	Water-resistant gypsum board 9.5 + calcium silicate board 6 mm mosaic tiling	Calcium silicate board 6 mm Painted finish

Exterior works	
Place	Finish
Access road	Asphalt (for passenger vehicle)
East service road	gravel
Around machine room	gravel

2.2.2.3 Equipment plan

(1) Equipment plan

1) Equipment selection policy

Based on the survey results, MHMS equipment managers, KH medical practitioners, and others were interviewed and consulted when making decisions regarding the necessity and validity of the requested equipment. The selection standards were arranged according to the five points given below. Based on these selection standards, the MHMS and KH were consulted again, and the equipment was classified into three stages (A, B, and C), in order of priority, from the perspective of coordination with the overall project direction and scale.

Based on the equipment selection policy, a review was conducted based on the analysis of the April field survey results, adjustments to the construction plan details, and a field survey conducted in May. An equipment plan (planned equipment list) was then produced.

(Equipment selection standards) ・Equipment that is required in order to manage the facility that will be newly constructed in this project ・Equipment that can be operated and maintained by Kilu'ufi Hospital in terms of the supply of reagents/consumables, etc. ・Equipment that can be operated and maintained by Kilu'ufi Hospital in terms of personnel/budget ・Equipment that is numerically insufficient even after investigating the usage of existing equipment through relocation and the adjustment of patient flow lines ・Equipment used for diagnosis that contributes to the functional improvement of Kilu'ufi Hospital as a whole and to referral systems
(Order of priority) A: Equipment that is essential to treatment activities at the hospital B: Equipment that is highly necessary for treatment activities at the hospital C: Equipment that is highly necessary for activities other than treatment at the hospital, and equipment that can be investigated as being the responsibility of the recipient country

2) Planned equipment

i. Overall plan

The equipment plan formulated for this project includes the provision of equipment that is essential for the facility provided by Japan to operate as the top referral hospital in the Solomon Islands. The construction plan includes the provision of an outpatient department, medical imaging department, surgical department, obstetrics department, and a pharmacy at KH. From the perspective of project coordination and scale settings, the equipment plan narrows down the equipment for these departments. The details of the final equipment plan enable operations corresponding with the technical level of its counterpart. Regarding voltage fluctuations, as countermeasures to excess currents and temporary power outages, a UPS and AVR are included in the plan for medical-use electronic devices. The draft equipment plan list shown below includes the number of items, equipment name, equipment quantity, order of priority, and whether UPS/AVR will be used.

Table 2-12 Planned equipment list

No	Name of Equipment	Qty	Priority	UPS	AVR
1	3-person waiting bench	20	C		
2	Wheelchair	4	B		
3	Stretcher	6	B		
4	Patient bed	68	B		
5	Examination light	14	A		
6	Suction machine	7	A		
7	Oxygen concentrator	13	A		
8	Instrument trolley	20	B		
9	Resuscitation set for adults	1	A		
10	Patient monitor	3	A		○
11	IV stand	45	B		
12	Oxygen regulator set	12	B		
13	Diagnostic set	6	A		
14	Treatment instrument set	6	A		
15	EM cart	2	B		
16	Nebulizer	1	A		
17	Bedside cabinet	53	B		
18	Overbed table	53	B		
19	Treatment table with caster (high/low type)	6	B		
20	Desk and chair	20	C		
21	Shelf	16	C		
22	Patient stool	4	C		
23	Examination table	4	B		
24	Height/Weight scale for adults	1	A		
25	Glucometer	1	A		
26	Meeting table and 4 chairs	8	C		
27	Whiteboard	7	C		
28	General X-Ray machine	1	A		○
29	Mobile X-Ray machine	1	B		
30	Imager	1	A		○
31	Ultrasound machine	1	A	○	○
32	Portable ultrasound machine	1	B		
33	Scrub for 2 persons	1	A		
34	OT table	2	A		
35	OT lights	2	A		
36	Anesthetic machine	2	A		○
37	Electrical surgical machine	2	A		○
38	Surgical instrument set	2	A		
39	Cesarean section surgical instrument set	2	A		
40	D & C instrument set	2	A		
41	Laryngoscope set	2	A		
42	Locker for 9 persons	5	C		

No	Name of Equipment	Qty	Priority	UPS	AVR
43	High-pressure steam sterilizer 80-100L	1	A		
44	High-pressure steam sterilizer 50-100L	1	A		○
45	Sterile stock shelf	7	C		○
46	Delivery table	3	B		
47	Delivery instrument set	3	B		
48	Baby cot	10	B		
49	CTG	1	A		○
50	Vacuum extractor	1	A		○
51	Infant incubator	2	A		○
52	Infant warmer	2	A		○
53	Weight/Height scale for newborns	1	A		
54	Phototherapy	1	A		○
55	Resuscitation set for newborns	3	A		
56	Linen cart	4	C		
57	Pharmacy shelf	12	C		
58	Pharmacy cabinet	4	C		
59	Medical Refrigerator for storage/dispensary	2	A		○
60	Electrical balance	2	A		

(2) Planned equipment list

Based on the planned equipment list (draft), the final planned equipment list was produced, following an analysis in Japan. The change from the planned equipment list (draft) is that hospital ward equipment is no longer included in the plan with the policy of removing the hospital ward from the construction plan. The planned equipment list, showing the name, quantity, and quantity of equipment by department, is given below.

1) Planned equipment list

Table 2-13 Planned equipment list

No	Name of Equipment	Qty	①*	②	③	④	⑤
1	3-person waiting bench	20	20	-			
2	Wheelchair	2	2	-			
3	Stretcher	4	2	2	-		
4	Patient bed	20	9	2	-	9	-
5	Examination light	12	7	1	-	4	-
6	Suction machine	5	1	2	-	2	-
7	Oxygen concentrator	11	5	3	-	3	-
8	Instrument trolley	18	9	5	-	4	-
9	Resuscitation set for adults	1	1	-			
10	Patient monitor	3	1	2	-		
11	IV stand	21	13	5	-	3	-
12	Oxygen regulator set	10	2	4	-	4	-
13	Diagnostic set	4	4	-			

No	Name of Equipment	Qty	①*	②	③	④	⑤
14	Treatment instrument set	4	2	1	-	1	-
15	EM cart	2	2	-			
16	Nebulizer	1	1	-			
17	Bedside cabinet	5	1	-		4	-
18	Overbed table	5	1	-		4	-
19	Treatment table with caster (high/low type)	6	4	1	-	1	-
20	Desk and chair	14	6	2	3	3	-
21	Shelf	8	2	4	-	2	-
22	Patient stool	4	3	-	1	-	
23	Examination table	4	3	-	1	-	
24	Height/Weight scale for adults	1	1	-			
25	Glucometer	1	1	-			
26	Meeting table and 4 chairs	6	4	1	-	1	-
27	Whiteboard	5	3	1	-	1	-
28	General X-Ray machine	1	-		1	-	
29	Mobile X-Ray machine	1	-		1	-	
30	Imager	1	-		1	-	
31	Ultrasound machine	1	-		1	-	
32	Portable ultrasound machine	1	-		1	-	
33	Scrub for 2 persons	1	-	1	-		
34	OT table	2	-	2	-		
35	OT lights	2	-	2	-		
36	Anesthetic machine	2	-	2	-		
37	Electrical surgical machine	2	-	2	-		
38	Surgical instrument set	2	-	2	-		
39	Cesarean section surgical instrument set	2	-	2	-		
40	D & C instrument set	2	-	2	-		
41	Laryngoscope set	2	-	2	-		
42	Locker for 9 persons	3	-	2	-	1	-
43	High-pressure steam sterilizer 80-100L	1	-	1	-		
44	High-pressure steam sterilizer 50-100L	1	-	1	-		
45	Sterile stock shelf	7	-	4	-	3	-
46	Delivery table	3	-			3	-
47	Delivery instrument set	3	-			3	-
48	Baby cot	10	-			10	-
49	CTG	1	-			1	-
50	Vacuum extractor	1	-			1	-
51	Infant incubator	2	-			2	-
52	Infant warmer	2	-			2	-
53	Weight/Height scale for newborns	1	-			1	-

No	Name of Equipment	Qty	①*	②	③	④	⑤
54	Phototherapy	1	-			1	-
5	Resuscitation set for newborns	3	1	-		2	-
56	Pharmacy shelf	14	-				14
57	Pharmacy cabinet	4	-				4
58	Medical refrigerator for storage/dispensary	2	-				2
59	Electrical balance	2	-				2
60	AVR 0.5 k VA	5	1	4	-		
61	AVR 1.5 k VA	7	-		1	4	2
62	AVR 5.0 k VA	2	-	2	-		
63	UPS1.5 k VA	1	-		1	-	

* ①Emergency Medicine & General Outpatient Services, ②Operating Theatre Suite (including Autoclave Service Room), ③Medical Imaging, ④Delivery room & Nursery Care, ⑤Pharmacy

2) By department

i. Emergency Medicine & General Outpatient Services

The outpatient department comprises a treatment area, reception room, examination room, etc. Outpatients undergo triage at the outpatient reception from medical staff, and depending on the treatment situation and patient symptoms, those with wounds, such as trauma, and those who require urgent assistance are sent to the treatment room, resuscitation room, or initial examination bay in the treatment area; patients who require some time for treatment are monitored and placed on standby at the reception; and internal medicine patients are sent to the examination room. The planned equipment is required for treatment in the outpatient department.

Table 2-14 The equipment required for treatment in the outpatient department

Area/Room	Name of equipment
Entrance, Staff triage station, Waiting area	Desk and chair, Whiteboard, 3-person waiting bench
Treatment Room, Minor procedure bay	Treatment table with caster (high/low type), Treatment instrument set, Instrument trolley, IV stand, Examination light, Oxygen concentrator, Oxygen regulator set, EM cart, Nebulizer, Wheelchair, Stretcher, Suction machine, Resuscitation set for adults, Resuscitation set for newborns, Patient monitor, Diagnostic set
Consultation room, Examination bays, Isolation room	Desk and chair, Shelf, Patient stool, Examination table, Instrument trolley, Examination light, Diagnostic set, Glucometer, Height/Weight scale for adults, Patient bed, IV stand, Bedside cabinet, Overbed table
ER staff room	Meeting table and 4 chairs, Whiteboard

ii. Operating Theatre Suite (including Autoclave Service Room)

The surgical department comprises a reception, ante-room, operating rooms 1 and 2, OT hall with a treatment area, recovery room, anesthesiologist's room, staff room, changing rooms (male and female), equipment storage area, and sterilization room. After reception, patients are transferred to stretchers in the ante-room to the operating room. Depending on the patients' symptoms, they are transferred to the operating room or treatment area in a certain part of the OT hall where they are treated. The patients are then transferred to the post-op recovery room.

In the sterilization room, equipment that has been used in surgery and any other hospital equipment that requires sterilization undergoes sterilization and washing. The sterilization of some equipment for which the Auki clinic has insufficient sterilization equipment will be outsourced. The equipment required for treatment in the surgery department is planned as follows:

Table 2-15 The equipment required for treatment in the surgery department

Area/Room	Name of equipment
Ante-room	Stretcher
Operating rooms 1 and 2	OT table, OT lights, Instrument trolley, IV stand, Oxygen concentrator, Oxygen regulator set, Anesthetic machine, Electrical surgical machine, Suction machine, Patient Monitor, Surgical instrument set, Cesarean section surgical instrument set, D&C instrument set, Laryngoscope set
OT hall with treatment area	Treatment table with caster (high/low type), Treatment instrument set, Instrument trolley, IV stand, Examination light, Oxygen concentrator, Oxygen regulator set, Scrub for 2 persons
Minor OT Treatment bay	Patient bed
Office Anesthesiologist's room Staff room, Changing room	Desk and Chair, Shelf, Meeting table and 4 chairs, Whiteboard, Locker for 9 persons
Autoclave Service Room	High-pressure steam sterilizer 80-100L, High-pressure steam sterilizer 50-100L, Sterile stock shelf

iii. Medical Imaging

The diagnostic imaging department comprises a patient waiting point (external), general X-ray room, operations office (preparation room), and ultrasound diagnosis room. Patients wait at the waiting point and, following instructions from medical staff, undergo inspections, including imaging and diagnosis. Patients with abnormal chest or abdominal conditions and those with bone fractures, bruising, or sprains undergo inspection using general X-ray imaging devices. Expectant mothers undergoing prenatal check-ups and patients with abdominal pain and soft tissue injuries around the wounds undergo inspection using ultrasound diagnostic equipment. The equipment required for treatment in the diagnostic imaging department is planned as follows:

Table 2-16 The equipment required for treatment in the diagnostic imaging department

Area/Room	Name of equipment
General X-Ray room	General X-Ray machine, Mobile X-Ray machine
Imaging office	Desk and chair, Imager
Ultrasound room	Ultrasound machine, Portable ultrasound machine, Examination table, Patient stool

iv. Delivery room & Nursery Care

The obstetrics department includes delivery rooms, a labor room, a postpartum room, a treatment room, a staff station, a nursery care area, and a staff room. When a pregnant woman begins to experience labor pain, she is moved to the labor room for the period prior to delivery, after which she is moved to the delivery room for delivery, depending on the situation of the fetus. After delivery, the mother and child are transferred to the postpartum room. Newborns who require temperature management or other treatments are treated in new-born baby care area. The equipment required for treatment in the obstetrics department is planned as follows:

Table 2-17 The equipment required for treatment, etc. in the obstetrics department

Area/Room	Name of equipment
Delivery rooms	Delivery table, Instrument trolley, Examination light, Delivery instrument set, Baby cot, CTG, Vacuum extractor
Ante-natal day beds	Patient bed
Post-natal day beds	Patient bed, IV stand, Bedside cabinet, Overbed table, Baby cot
Treatment room	Treatment table with caster (high/low type), Treatment instrument set, Instrument trolley, IV stand, Examination light, Oxygen concentrator, Oxygen regulator, Suction machine, Desk and chair
Nursery area	Infant incubator, Infant warmer, IV stand, Oxygen concentrator, Oxygen regulator set, Suction machine, Resuscitation set for newborns, Weight/Height scale for newborns, Phototherapy
Staff room	Meeting table and 4 chairs, Whiteboard, Desk and chair, Shelf, Meeting table and 4 chairs, Locker for 9 persons

v. Pharmacy

The pharmacy includes a counter for use by patients and wards, a workroom, and a drug storage area. The existing KH pharmacy is an outpatient pharmacy, whereas Second Level Medical Supply (SLMS) manages pharmaceuticals for use by hospital wards and supplies pharmaceuticals throughout Malaita province. The equipment required for the operation of the pharmacy is planned as follows:

Table 2-18 The equipment required for the operation of the pharmacy

Area/Room	Name of equipment
Pharmacy	Pharmacy shelf, Pharmacy cabinet, Medical refrigerator for storage/dispensary, Electrical balance

(3) Basic specification of the equipment

Table 2-19 Basic specification of the equipment

No	Name of equipment	Qty	Main specifications and components
10	Patient Monitor	3	Used to monitor patient condition and to display patient vital signs on the screen. Measured parameters: ECG, NIBP, Temperature, SPO2, Respiration, CO2, etc.
28	General X-Ray machine	1	Used for human body image information for medical treatment. Composition: Digital radiography device, X-Ray generator, X-Ray tube with support, Bucky table, Bucky stand, etc.
29	Mobile X-Ray machine	1	Used for human body image information for medical treatment. Composition: Main cart, Digital radiography device, X-ray generator, X-Ray tube unit, etc.
31	Ultrasound machine	1	Used to visualize subcutaneous body structures and dynamics, providing image information for diagnosis. Composition: Colour monitor, Convex transducer, Linear transducer, B/W Printer, etc.
32	Portable ultrasound machine	1	Used to visualize subcutaneous body structures and dynamics, providing image information for diagnosis. Composition: Colour monitor, Convex transducer, Linear transducer
36	Anesthetic machine	2	Used for continuous inhalation anaesthesia for adults and children in surgery by supplying a mixture of oxygen, laughing gas, air, and anaesthetic. Composition: Main unit, Vaporizer, Anaesthesia ventilator
37	Electrical surgical machine	2	Used in surgical procedures to coagulate living tissue using high-frequency currents. Composition: Hand switch-operated pencils, Blade electrode, Foot switch
49	CTG	1	Used for foetal heart monitoring and to monitor maternal contractions. Composition: Main unit, Transducer, Printer, Mobile cart
51	Infant incubator	2	Used to accommodate and maintain an optimal environment for new-borns. Composition: Main unit, Hood (with Access Port), Servo control system, Mattress, Temperature probe, Oxygen sensor

52	Infant warmer	2	Used to care for premature and new-born babies and to provide them with an optimal environment. Composition: Main unit, Mattress, Humidification control function
54	Phototherapy	1	Used to treat jaundice in new-borns. Composition: Main unit, Light source, Mobile stand

(4) Spare parts and consumables

At the time of the study, there was no O&M manager for medical equipment at the target facility, and the maintenance and repair of medical equipment was conducted by the MHMS biomedical department. The spare parts and consumables required by each facility were stored in the MHMS warehouse.

After supplying the equipment in this project, the necessary consumables and replacement parts will immediately be ordered from the MHMS, which will presumably take time to process and deliver. Therefore, during that time, the number of consumables for equipment O&M have been included in the plan for a period of three months.

Table 2-20 Spare parts and consumables

No	Name of equipment	Consumables	Qty
7	Oxygen concentrator	Nasal cannula, Oxygen tube, Humidifier bottle	11
10	Patient monitor	Disposable ECG electrodes for adults, Disposable ECG electrode for paediatrics, Recording paper	3
25	Glucometer	Strips, Puncture needle	1
29	Mobile X-Ray machine	Dry film 14" x 17"	1
30	Imager	Dry film 14" x 17" Dry film 10" x 12" Dry film 8" x 10"	1
31	Ultrasound machine	Gel, Printer paper	1
32	Portable ultrasound machine	Gel	1
33	Scrub for 2 persons	Brush, UV lamp	1
36	Anaesthetic machine	CO2 canister, Reusable patient circuit, Reusable face mask (5 kinds)	2
37	Electrical surgical machine	Reusable plate electrode	2
49	CTG	Belts for doppler transducer, Gel, Recording paper	1
50	Vacuum extractor	Suction bottle with cap, Disposable suction catheter, Fr.10, Fr.14	1
51	Infant incubator	Access port cover, Filter, Skin Temperature probe	2
52	Infant warmer	Skin temperature probe, Probe fixation pad	2
54	Phototherapy	Eye mask (3 kinds)	1

(5) Equipment subject to maintenance contract and its contents

In the Solomon Islands, where resources are limited, considerable importance is placed on the continuous use of medical equipment. Although no medical equipment O&M guidelines are available, the Medical Equipment Committee has medium-to-long-term targets to confirm the continuing operation status of supplied medical equipment and O&M status, establish systems for the effective and appropriate usage of medical equipment in medical sites, and implement monitoring and surveillance of preventive maintenance plans for diagnostic imaging devices.

The survey results indicated that there is a need to execute maintenance contracts for the planned equipment in this project and for medical equipment that would presumably have a significant impact on treatment services if they were to become non-operational. The standards for establishing a maintenance contract are arranged into the following three categories, based on the above policies and consultations.

(Maintenance contract establishment standards)

・ Equipment of such importance that, when non-operational, no appropriate diagnosis/treatment can be made when patients are received

・ Equipment that cannot be maintained remotely and requires on-site inspection and repair, etc., by a manufacturer engineer

・ Equipment that can be covered in O&M expenditure after the completion of the maintenance contract, although doing so would be different at the time of completion of the facility

In addition to the one-year warranty for the general X-ray imaging apparatus and the ultrasound diagnostic apparatus supplied in this project, a two-year maintenance contract shall be executed. From the fourth year following equipment supply, the Government of the Solomon Islands shall investigate the continuation of the maintenance contract and plan O&M within the budget of the target facility for the purpose of the O&M of the equipment. The supplied equipment for which maintenance contracts are to be executed and the details of the maintenance services are shown in the table below.

Table 2-21 The supplied equipment for which maintenance contracts are to be executed and the details of maintenance services

No	Name of equipment	Details of maintenance service contract
28	General X-Ray machine	Period (2 years after warranty period), Periodic inspection (once per year), On-call service (4 times per year), Replacement parts (if necessary and at cost)
31	Ultrasound machine	

2.2.3 Outline Design Drawing

- Site plan
- Ground floor layout (Central Clinical Building)
- Ground floor Layout (Delivery Building)
- Elevations
- Sections

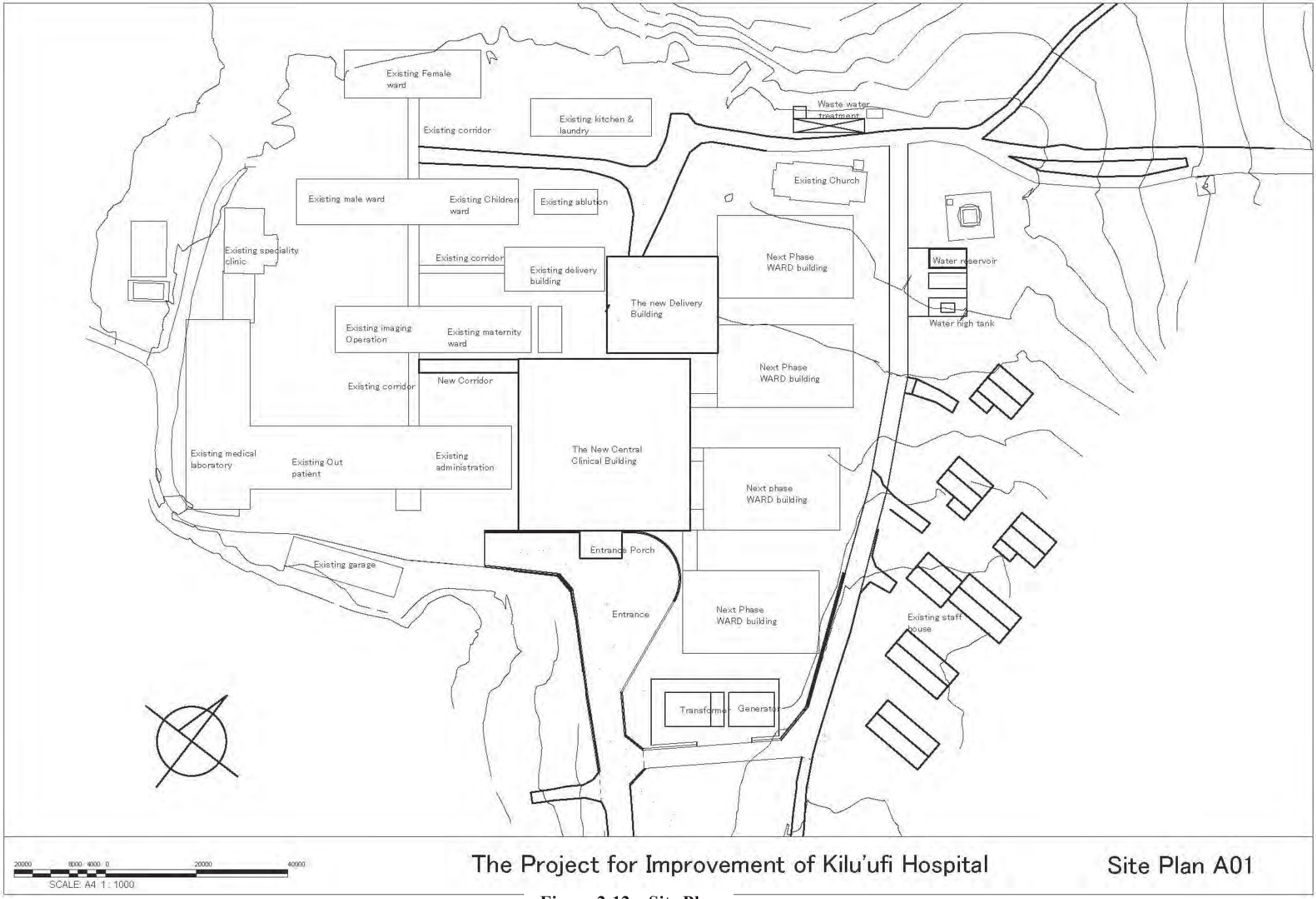


Figure 2-12 Site Plan

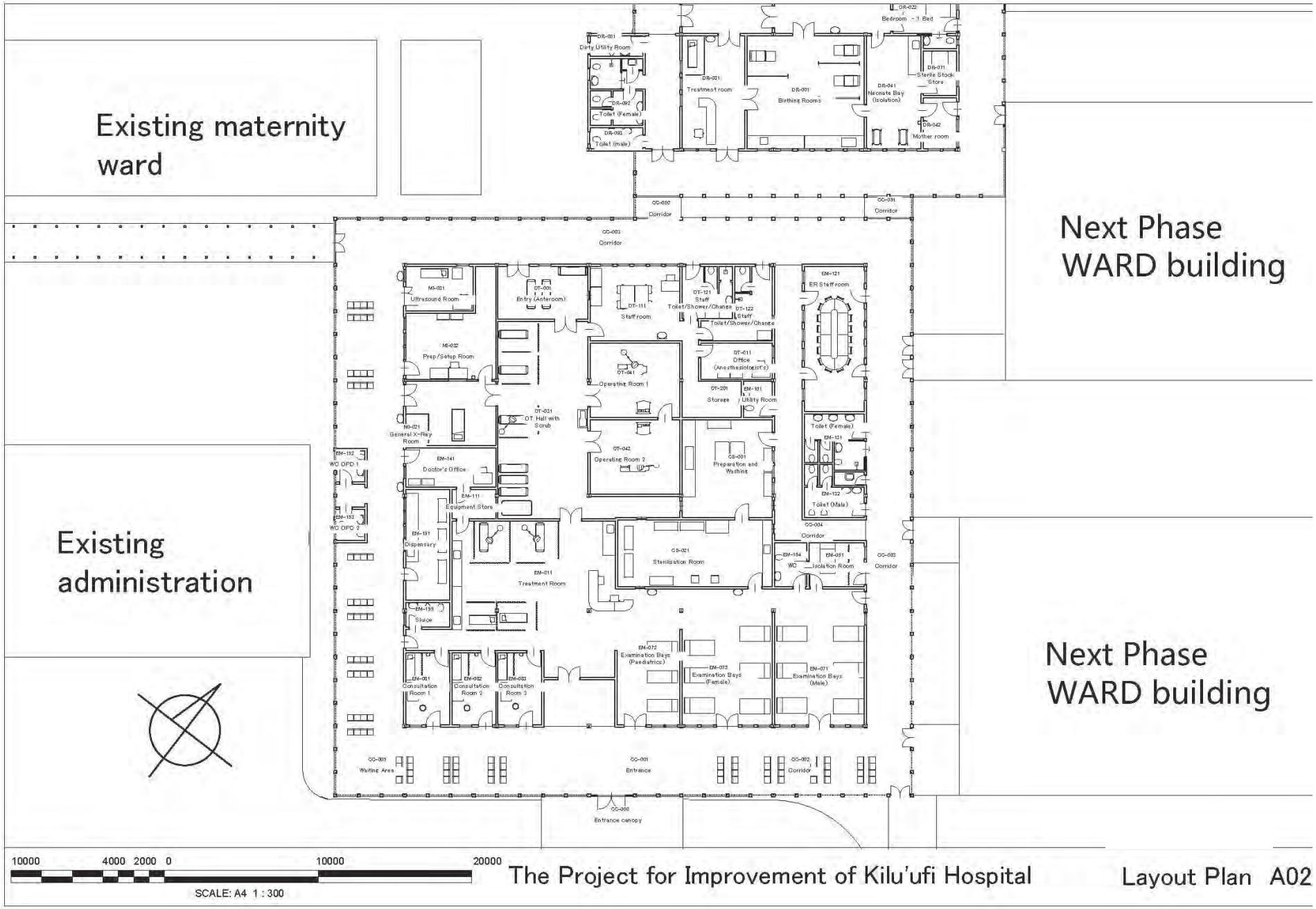


Figure 2-13 Ground floor layout (Central Clinical Building)

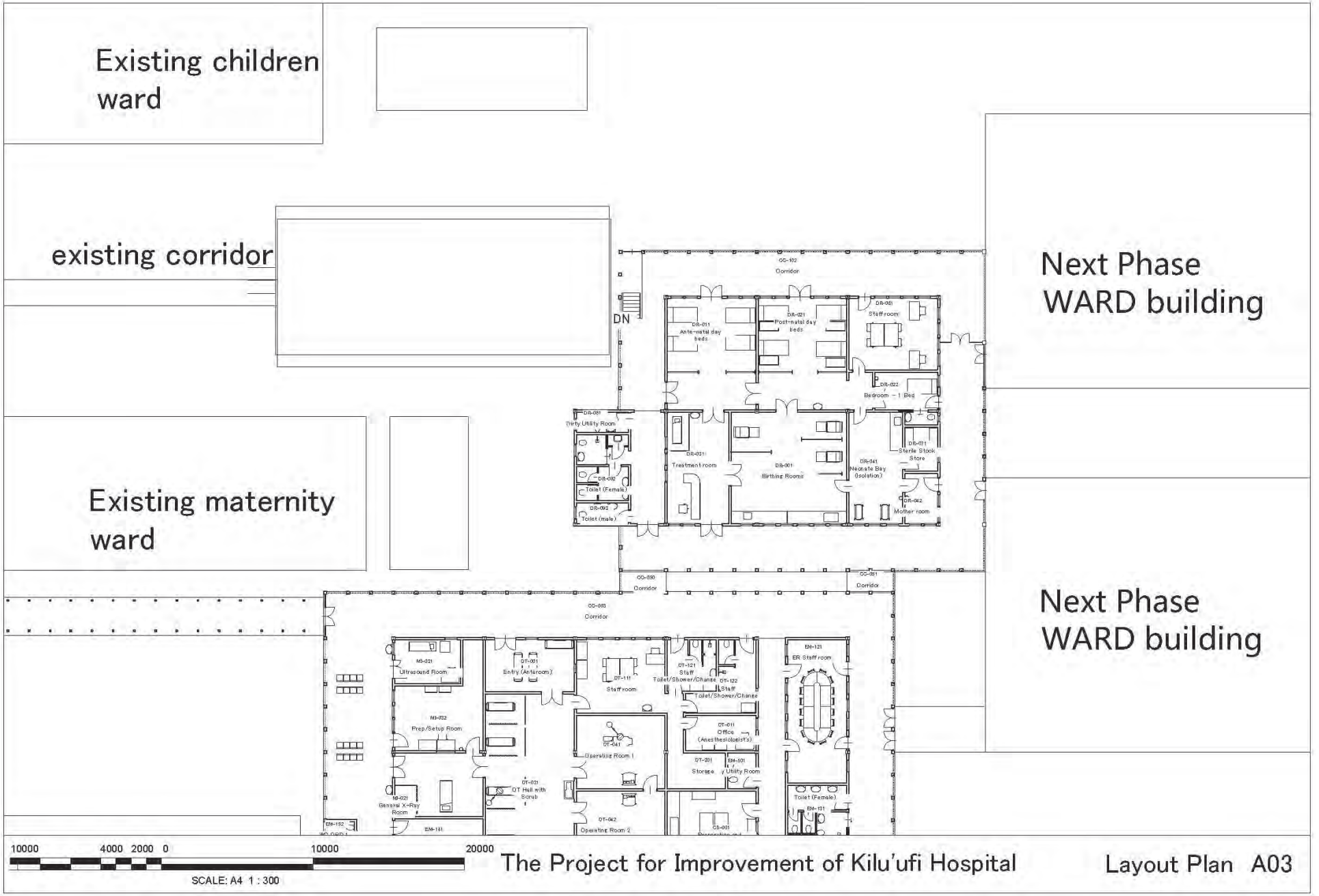


Figure 2-14 Ground floor Layout (Delivery Building)

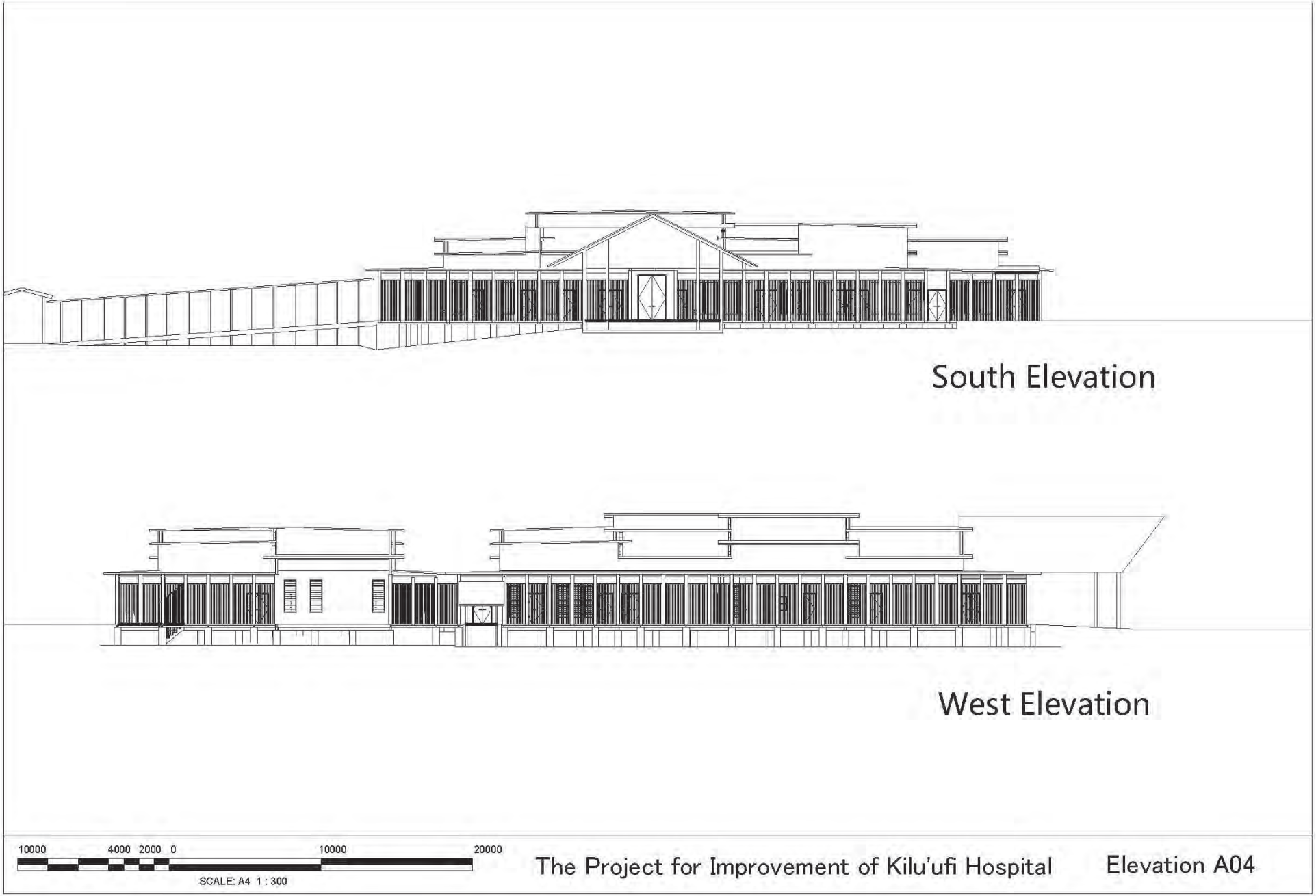
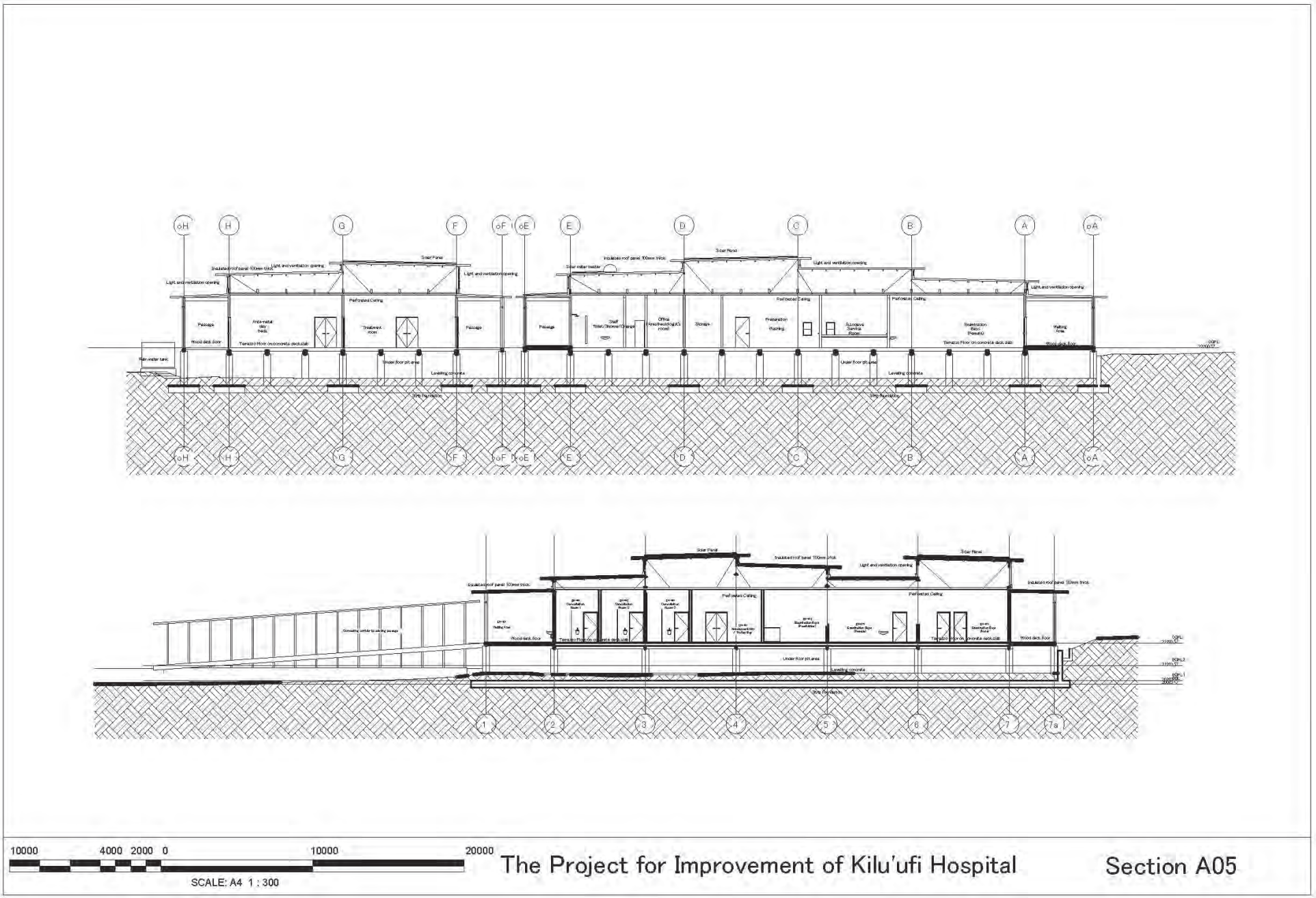


Figure 2-15 Elevations



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The Project for Improvement of Kilu'ufi Hospital

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Figure 2-16 Sections

2.2.4 Implementation Plan

2.2.4.1 Implementation Policy

(1) Grant Aid scheme of the GOJ

The project will be conducted within the framework of the GOJ Grant Aid scheme. When the project is approved by the Cabinet of Japan, the GOJ and SIG sign an Exchange of Notes (E/N), which will be followed by the conclusion of the Grant Aid Agreement (G/A) between JICA and the SIG.

(2) Agent agreement

When the G/A agreement is signed, the SIG will conclude an Agent Agreement (hereinafter "A/A") with a Japanese consulting firm (hereinafter "the Consultant"). JICA will acknowledge the A/A. The Consultant will develop a detailed design of the facilities based on the preparatory survey and prepare tender documents for facility construction and equipment procurement. Tender documents will be presented to JICA for verification. In Japan, the project will be tendered, and the winning Japanese contractors will be awarded contracts for the construction of the facilities, equipment procurement, and installation. JICA verification will be required for contractual matters in the implementation of the Japanese Grant Aid.

Upon the commencement of construction work, a supervising committee will be formed by the stakeholders. The Consultant's main scope of works in the A/A are as follows:

1) Design Development

The Consultant will develop a detailed design and review the equipment plan. In preparation for building permissions, the Consultant will develop the required technical documentation, including architectural design, structure, and fire prevention planning, with support from a local architectural office according to the regulations of the Solomon Islands.

When design development is complete, tender documents and budget estimations will be prepared. Tender documents for construction will consist of drawings, technical specifications, instructions to bidders, and conditions of contract. Tender documents for equipment procurement will consist of an equipment list, technical specifications, instructions to bidders, and conditions of contract.

2) Administration of tender

The Consultant will administer the tender call and evaluate bidder qualifications and bidding documents, subject to approval from the MHMS/SIG. A two-stage tender will be called in Japan. The first stage will evaluate the bidders' qualifications (pre-qualification (P/Q)), and the second stage will evaluate the bidding prices. The Consultant will also administer the exchange of contracts for facility construction and procurement of the equipment and evaluate the contract documents to be submitted to JICA for approval.

3) Contract administration

The Consultant will administer contracts to an engineer to supervise the work of the Contractor and equipment suppliers. The Consultant will be in a neutral position in the contracts to evaluate the work but will also supervise technical matters by giving instructions to the Contractor. To facilitate the implementation of the project and coordinate the related parties, a Japanese supervisor-in-residence will be on site during the project.

4) Defect liability checks

When the defect liability period elapses after one year of completion of the building, and when the guarantee period of equipment elapses, the facilities will be checked for defects, and subsequently, the Contractor and supplier will remedy the defects.

(3) Organization for Project Implementation

The stakeholders of the project under the Japanese Grant are as follows.

1) The MHMS/SIG

The administrative authority and implementation organization of the project on the Solomon Island is the MHMS. The MHMS will oversee the project based on the G/A and perform items within the SIG scope. The MHMS will conclude an A/A with a Japanese consultant firm as well as contracts for facility construction and equipment supply and installation and will perform contractual obligations as the Client.

2) Japan International Cooperation Agency (JICA)

Under the Grant Aid Scheme, JICA will administer the monitoring and proceedings necessary for project implementation as the project-implementing agency of the GOJ.

3) The Consultant

Based on A/A, the Consultant will conduct design development, tender documentation and evaluation, and contract administration as an architectural consultant.

4) Contractors

The project comprises facility construction and equipment procurement. The building contractors and equipment suppliers will be selected through open national tenders in Japan. The MHMS will award contracts to the selected contractors based on tender evaluations. Contractors will construct the facilities and procure equipment according to the contracts. Japanese contractors may subcontract local contractors for their work.

Upon project completion, the contractors will provide information on the equipment and conduct initial training on its operation of the required equipment. After the handover, the equipment suppliers are expected to provide any necessary assistance to the MHMS, including introduction to the manufacturers and local agencies so that the MHMS can continue purchasing

the required equipment parts and consumables. The figure below shows the relationship between the stakeholders of the project under the Japanese Grant.

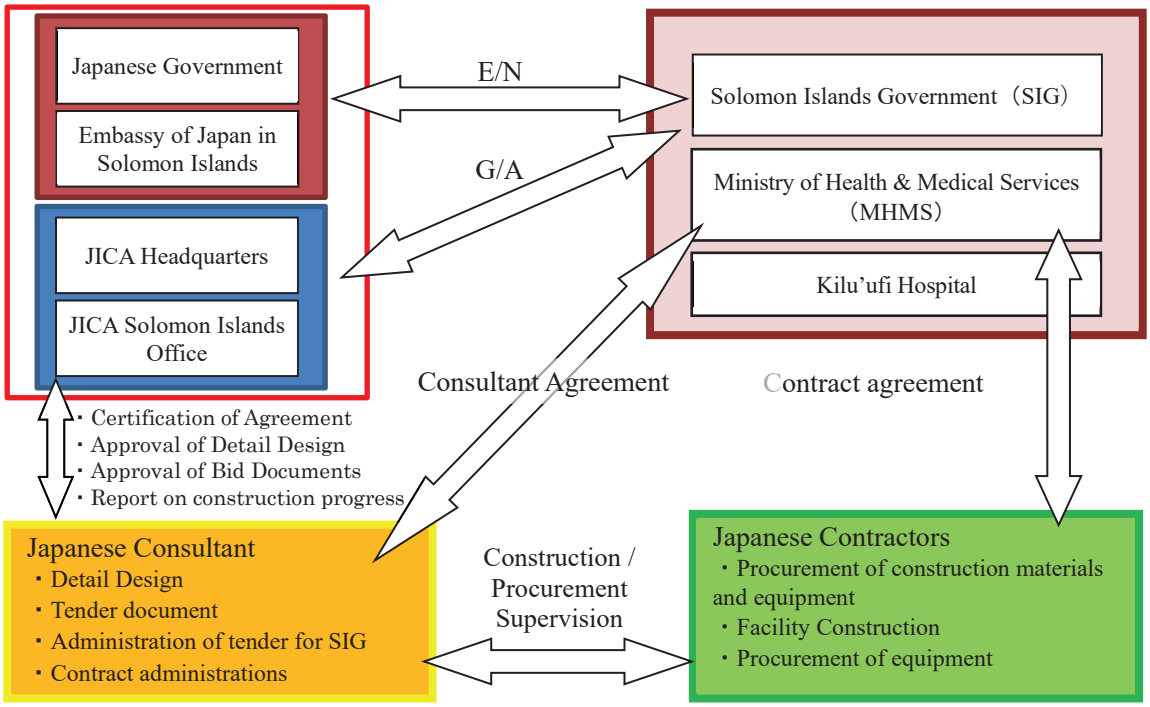

Figure 2-17　The Stakeholders in the Project Implementation

2.2.4.2 Implementation Conditions

(1) Construction works

1) Progress of the construction work

To ensure that the construction work will be completed within the period indicated in the contract, the Consultant will check the weekly and monthly progress based on the Contractor's work schedule. If delays are anticipated, the Consultant will order the Contractor to submit a countermeasures plan. The items to be overseeded include the following:

i. Review and certify the completed work
ii. Review of report of delivered materials and equipment when required
iii. Checking of the appropriateness of temporary work and construction equipment
iv. Review and instructing when required regarding the number of engineers, skilled workers, laborers, etc. on site.

2) Safety at construction site

To ensure thorough safety at the construction site, the Consultant will review the safety management plan prepared by the Contractor, inspect the site, and issue orders when required to improve the safety plan.

(2) Considerations for equipment procurement

1) Transportation routes and methods of equipment

To procure medical equipment, boats from Japan may need to refuel at Kiribati or Papua New Guinea on their way to Honiara in the Solomon Islands. Large containers are impossible to handle at Auki Port; therefore, after the customs at Honiara, containers will be dismantled, and the equipment will be loaded onto trucks or directly onto boats. The boats make a one-day journey to Auki Port on Malaita Island. The equipment will be delivered to the project site approximately 4 km from the port.

2) MEP required for the equipment

A three-phase power supply will be required for the high-pressure steam sterilizer, water supply and drainage (including high-temperature drainage), and exhaust ventilation. The installation of operating lights will be included in the procurement of equipment.

These items to be prepared at the facility are indicated as conditions of bid and require the submission of the documents necessary for construction immediately after the equipment contract is signed.

(3) Tax exemption

Goods and equipment in the project shall be tax-exempted. According to information from the MHMS, the Goods Tax Act (December 31, 2003) of the Solomon Islands is an applicable law for tax exemptions. An application for tax exemption, known as the GT22, must be submitted to the Inland Revenue Division of the Solomon Islands by the MHMS for approval. The BA fee for grant assistance is borne by the Ministry of Finance.

2.2.4.3 Scope of Works

The demarcation of works between the Solomon Islands and Japanese sides for the construction of facilities and procurement of medical equipment is shown below.

In the M/D discussion, it was agreed that the SIG would take the necessary budgetary measures to ensure that the project would be implemented at an appropriate time.

Table 2-22 Demarcation of works

Item	Works by Japan	Works by Solomon Islands
Site preparation		Securing construction area and construction yard
Construction permit	(Support of preparation of application documents)	Application will be by the SIG (the MHMS) The application will be assessed by the MPDB and final approval by the MID
EIA		Preparation of report, application and the approval of EIA
Removal of UXO		Survey result shows there were no UXO. However if it appears, removal of UXO shall be by SIG.
Removal of obstruction, Relocation of objects	Shifting Electrical poles & cables, transformers	Removal of trees in the new roads
Facility Construction	-Relocation and removal of existing infrastructure facilities -Building & MEP	Installation of telephone and communication lines. Procurement of general furniture Relocation of the services from the Existing to the new facility. Relocation of the services in the existing Buildings.
Medical Equipment	Medical equipment in the new facility	Procurement of medical consumables
Others		Assignment of Project management personnel

2.2.4.4 Consultant Supervision

The Japanese Consultant will implement the project based on the consultant contract with SIG. The Consultant will maintain close communication between both countries and endeavor to deliver construction and procurement work within the schedule.

In accordance with Japan's grant aid system, the Consultant shall organize an integrated project team for detailed design and construction supervision based on the purpose of the schematic design and shall ensure smooth implementation of the work. Under construction supervision, the Consultant shall be fully aware of the various circumstances at the project site and in the Solomon Islands and shall plan to maintain consistency in process, quality, workmanship, and safety controls.

(1) Policy for Construction Supervision

The Consultant shall supervise the progress of construction and the procurement of construction materials and equipment to ensure that the work is completed within the specified

construction period, ensure the quality and performance of the work as indicated in the contract documents and the delivery of materials and equipment, and supervise and guide the construction contractor to ensure the safe execution of the work at the site.

1) Project Management

To ensure that the project is completed within the construction period indicated in the contract documents, each week and month, the Consultant shall check the status of the construction process and the actual progress as planned by the contractor at the time the contract was executed. If delays are anticipated, the Consultant shall alert the Contractor, request that the Contractor submit and implement a countermeasure plan, and instruct the Contractor to complete the construction and delivery of construction materials and equipment within the contracted construction period.

Comparison of planned and progress processes is primarily based on the following items:

i. Confirmation of construction completion (status of procurement of construction materials and equipment, and construction progress)
ii. Confirmation of delivery of materials and equipment (construction materials and equipment)
iii. Confirmation of temporary work and preparation of construction equipment
iv. Confirmation of the number of engineers, technicians, laborers, etc., and the actual number of workers.

2) Security Control

As described in 2-2-4-2 Construction/Procurement Considerations, to establish and operate a thorough safety management system, the company will consult and cooperate with the safety manager of the construction contractor and manage the site during the construction period to prevent industrial accidents and injuries and accidents to third parties (KH staff, patients, etc.). The following points should be considered for safety management at the construction site:

i. Establishment of safety management regulations and appoint a manager
ii. Prevention of accidents by conducting periodic inspections of construction machinery
iii. Establishment of operational routes for construction vehicles, transport equipment, etc., and thorough implementation of safe driving
iv. Installation and periodic inspection of safety facilities
v. Establishment of a welfare system for workers and encouraging them to take holidays

(2) Organizations for Construction Supervision

The proposed construction site, Auki, is located in the center of Malaita Island, and the client will stay in Auki during the construction period. There will be no obstacles to the dispatch of Japanese engineers or the assignment of local supervisors. Because the project will include the

removal and relocation of existing infrastructure facilities, as well as various types of finishing work and specialized medical facility work, the project plans to assign specialized engineers (design, structure, and facilities) in addition to a Japanese engineer in residence, and will establish an appropriate construction and supervision system based on the detailed design.

During the construction period, the site office shall be located at a temporary site, including existing ground surrounding the construction site. The concrete plant, material storage area, and other facilities shall also be located within the temporary site, and the site shall be accessible to the Consultant's resident engineer, construction company's work manager, and construction engineer at all times.

(3) Procurement supervision services for the equipment

Procurement supervision services for the equipment works are as follows:

1) Coordination with the supplier and confirmation of equipment production drawings (work in Japan)
2) Inspection at manufacturer factories (work in Japan)
3) Pre-shipment inspection (work in Japan or other countries)
4) Procurement supervision (on the project site)
5) Inspection at the end of the defect notification period (on the project site)

2.2.4.5 Quality Control Plan

(1) Building works

The tender document will be prepared with reference to the Japanese Standard Specification for Public Works Construction (published by the Public Building Association), JASS (Architectural Institute of Japan), and NBC-2022 draft (if the draft will be finalized). AS/NZS standards are commonly used in the Solomon Islands. The project design will also refer to AS/NZS standards where applicable.

The quality standard strength of reinforced concrete for foundation work shall be set according to JASS 5 of the Architectural Institute of Japan. Test mixing will be conducted based on the concrete formulation control plan during the construction preparation period, and the strength of the formulation control strength will be controlled by conducting compressive strength tests on the specimens as hot weather concrete during the construction period, as the daytime temperature at the site often exceeds 30 °C during the month.

Rebars will be deformed according to JIS G3112 SD345. Rebar products that follow Australian and New Zealand standards (AS/NZS) may be imported into the project. In such cases, the strength of the rebar will be verified using tensile and bending tests during the construction preparation period and will be matched with the mill sheets and tags of the procured rebar.

1) Reviewing and giving approval, consent, or comment as appropriate to the following documents:

- construction schedule and revised construction schedule,
- construction plan (method statement),
- quality assurance and quality control documents,
- health safety and environment management documents,
- shop drawings, samples and catalogues,
- other relevant document submitted by the Contractor

2) Carrying out of inspections and testing of the works, materials and equipment on and off the site including manufacturer's inspections,

Table 2-23 Major Quality Control Plan

Type	Control Items	Test (Inspection)Method	Test Frequency
Earth Work	Bearing Capacity	Flat plate loading test or simple support measurement	Includes corridors and septic tank locations
	Degree of compaction	Visual inspection	All locations at bottom of foundation
	Root cutting slope angle Bedding accuracy	Measurement (slope over 1:0.8) Measurement	
	Inspection of incoming soil (as needed)	Grain size test	Per soil pickup site
Formwork	Shape and form	Dimensional inspection and photos	All materials
	Material Testing	Thickness, Material and Deformation	All materials
	Assembly Inspection	Visual (gaps, strengtheners, spacers)	All materials
Rebar work	Tensile strength	Tensile strength test or mill sheet (JIS, AS/NZS or other standards or higher)	Once per size and steel grade
	General Quality	Mil Sheet	Once per size and steel grade
	Inspection of arrangements of reinforcements	Number of bars, diameter, rebar spacing, joint length, anchorage length, and thickness of cover	Before concrete casting, all locations
Concrete work	Aggregate grading	Sieving test	Per sampling site
	Trial mix	Mixing, water-cement ratio, compressive strength, slump, and Cantab test	1 time (per design strength)
	Compressive strength	Compression strength test	Once for each part
	Slump	Slump Test	each part
	Shape and form (after dismantling the formwork)	Measurement	All members
Steel work	Steel material	Material Testing	Mil Sheet
Door and Window Works	Quality of door and window	Visual and measurement	At time of delivery
Electrical work	Electrical wire	Insulation, current-carrying tests, etc. by AS/NZS	
Water supply and Drainage work	water pipe	Water-pressure test	When piping is completed per system
	Drainpipe	Water fill test, treated water inspection	When piping is completed per system
Furniture and Fixtures	Furniture and fixture quality	Visual and measurement	At time of delivery

(2) Equipment

The quality of all the equipment to be supplied in this project, including medical equipment and furniture, must be ensured. Safety and performance standards, which determine quality, should be based on widely recognized international standards and guidelines, including design, development, manufacturing, sales, performance, safety requirements, operation, maintenance, and disposal. Therefore, a requirement is to obtain IEC, SIO, GMP, and country-based manufacturing and import licenses for medical equipment, in particular.

2.2.4.6 Procurement Plan

(1) Building materials

Materials satisfying the quality levels necessary for secondary hospitals will be selected, and materials not available locally will be procured from Japan or other countries. Locally available materials and equipment generally conform to Australian Standards (AS); however, materials that do not comply with AS shall conform to the Japan Industry Standard (JIS).

1) Local procurement

Construction materials and equipment for the Solomon Islands are mostly imported. To repair and maintain the facilities, availability in the market will be considered when selecting the materials; quantity and quality should not be compromised, but caution is required regarding the shortage of local materials to avoid delays in the construction schedule.

For the procurement of aggregates for concrete work, considerable time will be required to identify, negotiate with owners, obtain approval, and install a crushing plant, and the implementation process should be considered as a preparation period.

2) Import Procurement

Most construction materials and equipment are imported from Japan or other countries (e.g., Australia, New Zealand, Southeast Asia). The Contractor should be cautious regarding procurement and transportation schedules.

3) Procurement Plan

Table 2-24 Construction Materials lists

Material	Suppliers	Producing Area			Remarks
	Local	Local Production	Imports	Japan	
Architectural Work					
Portland cement	○		○		PNG, AU, NZ
Fine Aggregates	◎	◎			Procurement from quarry where quality can be ensured
Coarse Aggregates	◎	◎			Procurement from quarry where quality can be ensured
Rebar			○		AU, NZ, BK
Wooden form	○		○		PNG, AU, NZ
Steel frame			○	○	Japan, PNG, AU, NZ, BK
Tile	○		○		AU, NZ
Plywood	○		○		PNG, AU, NZ
Timber	○		○		PNG, AU, NZ
Folded plate (aluminum-zinc alloy-plated steel sheet)			○		AU, NZ
Insulating material			○		AU, NZ
Painting material	○		○		AU, NZ
Steel doors and windows			○		AU, NZ
Wooden doors and windows			○		AU, NZ
Aluminum doors and windows			○		AU, NZ
Wooden furniture			○		PNG, AU, NZ
Mechanical and electrical work					
Electric wires and codes	○		○		AU, NZ
Outlets and switches	○		○		AU, NZ
Lighting fixtures	○		○		AU, NZ
Air conditioning	○		○		AU, NZ
Exhaust fan	○		○		AU, NZ
Sanitary equipment	○		○		AU, NZ
Water supply and drainage pipes	○		○		AU, NZ
Power generator	○		○		AU, NZ

◎: Construction materials and equipment that can be locally procured and produced

○: Construction materials and equipment that can be locally procured and produced in third countries

PNG: Papua New Guinea, AU: Australia, NZ: New Zealand, BK: Bangkok

(2) Equipment

In principle, the medical equipment for this project will be procured from Japan. Because some medical equipment comes with a maintenance contract, it is necessary to have a distributor in a neighboring country.

In addition, if the number of manufacturers in Japan is limited, there is a risk that competition in the bidding will be hindered and fair bidding will not be possible, considering

procuring third-country products instead of limiting some of the equipment to be procured to Japanese products.

2.2.4.7 Initial operation guidance / operational guidance plan

Engineers dispatched by the company providing the equipment will provide guidance to KH medical practitioners regarding basic equipment operation methods and O&M at the time of delivery and installation of the supplied equipment. The guidance will center on medical equipment and will include cautions regarding equipment O&M, explanations of daily inspection methods, and simple troubleshooting.

2.2.4.8 Soft Component (Technical Assistance) Plan

The project will provide medical equipment for the new outpatient department, medical imaging department, operation theatre suite, delivery unit, and pharmacy at KH.

The quality of medical services depends on the quality of the maintenance of the medical equipment. The efficiency and effectiveness of medical services will be improved through preventive maintenance, swift repair of broken devices, and securing uninterrupted medical services.

It is essential that personnel from various departments, including those from the management department, medical practitioners, account managers, and engineers, are proactively involved in medical equipment O&M. However, in the Solomon Islands and the hospital, effective O&M is difficult because of the lack of personnel. There are many cases in which medical equipment is either not sufficiently used or non-operational owing to malfunctions or is left unused.

The deployment of the required personnel is essential when providing effective O&M. At the time of the survey, no person was assigned as responsible for medical equipment. Therefore, prior to the implementation of the soft component, it will be necessary for the MHMS to appoint a medical equipment O&M technician with sufficient engineering background.

The role of this project's soft component is to provide the necessary technical training for the promotion of safe usage of medical equipment and O&M implementation to managers and equipment end-users at the hospital. The objective is cooperation, which leads to the establishment of O&M systems for medical equipment at the hospital.

2.2.4.9 Procurement Procedure

The project implementation schedule is shown below: nine months for the detailed design and tender period, and 21 months for the construction of facilities and procurement of equipment.

The project requires the relocation and removal of existing infrastructure; ordering, manufacturing, and installation of new transformers and backup generator will be included in "Preparation for Works."

A detailed design will be developed and tender documentation will be prepared by the consultant in nine months.

The construction period of the facilities will be 21 months, with considerations such as the inclusion of labor of Solomon Islanders, material and equipment imports, construction management capability of local subcontractors, installation of plants at aggregate quarry, ground improvement, rainy seasons, preparation work, provision of new roads, and external work on-site.

Equipment procurement will take approximately 14 months from the review and approval of shop drawings. The procurement of equipment will be completed simultaneously with facility construction.

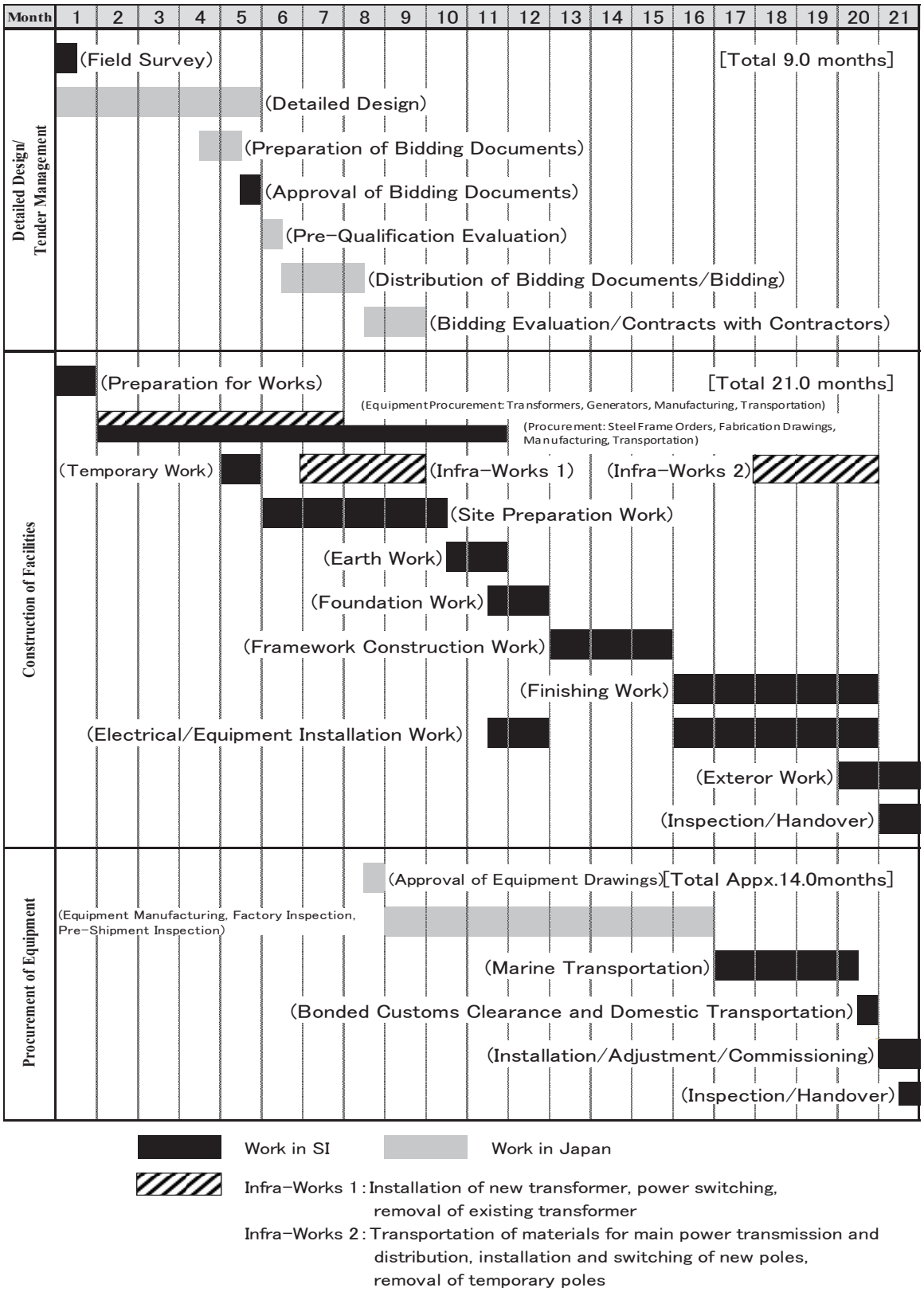

Figure 2-18 Project Implementation Schedule

2.3 Security

(1) Political Risks and Security Measures

The Contractor and Consultants will refer to the Travel Advisory and Warnings issued by the Ministry of Foreign Affairs of Japan during the implementation of the project. JICA Solomon Islands will provide local security information when necessary.

(2) General Crime Risks and Safety Measures

Crime risks are relatively low in Honiara and Malaita Island; however, the Contractors and the Consultant will pay diligence, including transport and accommodation.

(3) Safety Management on construction site

Construction vehicles must pay attention to pedestrians even though the project site is located away from Auki town and the number of pedestrians along the road is small. It is necessary to ensure the safety of the morning and evening commuting traffic of employees and buses transporting patients to and from the hospital.

For public safety during construction, the construction site will be clearly demarcated by temporary fencing.

There is one access road to the hospital, and construction vehicles share it with other vehicles, such as hospital buses. Construction workers should pay attention when driving.

Security guards will watch the entrance to the construction site to guide construction vehicles.

Because there is no ready-mix concrete plant on Malaita Island, a concrete plant must be installed within the proposed construction site. This may cause noise, and the plant should be located as far away as possible from the existing hospital wards. Before the start of construction, it is necessary to fully explain to the hospital the noise and the time of day it will be generated and to obtain their understanding.

2.4 Obligations of the recipient country

The following works are to be borne by the Solomon Islands side.

2.4.1 Items related to the Construction of Facilities

The MHMS of the Solomon Islands has an annual budget of SBD 174 million (2021: JPY 2.61 billion; SBD = JPY 15), which is below the donor funding of SBD 218 million. Given this financial situation, the project items borne by the recipient country should be minimal.

Therefore, typical items to be borne by the recipient country in Grant Aid Projects, such as infrastructure development will be included in the Japanese scope. This is to avoid project delays caused by insufficient funds by the recipient side at the beginning of the project.

The following items will be borne by the recipient country:

a. Electricity tariffs for the new facility: The base fee may increase following an increase in electricity-receiving capacity. However, the cost of relocating electricity will be borne by Japan.
b. Right of Water: the cost of using the water source if it may arise in the future. (Currently, the landlord where the water source exists agrees with the use of water by the hospital free of charge).
c. Cost associated with the alternative community activity area. The project site is in the existing hospital and is owned by the state government (perpetual estate register); as far as the survey team knows, no cost is incurred and the project has the right to use it for the construction. However, because the existing community area will be fully used for the project, the costs for developing an area for community activities in alternative areas will be borne by the counterpart.
d. Obtaining all necessary permits and certificates for the construction before commencement of the project.
e. Hospital IT-related costs (Internet servers, LAN wiring, software, and equipment)
f. Office equipment (e.g., photocopiers, printers, computers) and stationery
g. Moving cost of the existing equipment and furniture to the new facility
h. Administrative costs.
   Project monitoring costs, establishment and maintenance of grant accounts (e.g., bank commission fees), and recruitment of new medical personnel
i. Cost of renovation of existing facilities after completion of the new buildings:
   renovation of existing facilities where the departments will be moved to the new facility, such as the outpatient, surgical, medical imaging, and delivery departments.
   The existing mortuary will no longer have direct access to the road when the new facility is constructed, and the mortuary room should be prepared by the SIG.

Other existing facilities can be renovated into various office administration rooms and special outpatient departments as desired.

j. Additional staff costs after the opening of the new facility

2.4.2 Items related to the Procurement of Equipment

- Procurement of medical equipment not covered by Japanese grant aid funds
- Procurement of general furniture and fixtures and fittings not covered by Japanese grant aid funds.

2.4.3 Operation & Maintenance (O&M)

- Employment, training, and payment of salaries and allowances for staff required for hospital operations.
- Procurement of consumables and replacement parts required for the operation and maintenance of facilities and equipment.
- Appropriate and effective use and maintenance of constructed facilities and equipment procured through grant aid.

2.5 Project Operation Plan

2.5.1 Organization and Staffing for Operations & Repairs / Maintenance

2.5.1.1 Operational Structure and number of staff required for the new facility

In 2022, KH employed 109 medical staff and 40 non-medical staff, including 7 doctors and 83 nursing staff. The new staff required in the new facility will include four specialist doctors, three general doctors, five nursing staff, one laboratory technician, one BME, and two medical clerks (see Table 2-25 below for figures).

The composition of the additional staff was discussed at length with the hospital. The conclusion was that increasing the number of specialists was the highest priority, and as a regional core hospital, five specialists in four basic departments (surgeons, internists, obstetricians and gynecologists, pediatricians, and anesthetists) is– essential. Currently, only one specialist surgeon is available; therefore, four additional surgeons would be required. Without specialist doctors, it would not be possible to train young doctors. Some have stated that young doctors must be trained in rural areas rather than in central Honiara because doctors in regional hospitals are required to see patients in all cases. In addition, without a specialist doctor, the number of patients will not increase. In the absence of a specialist doctor, the number of outpatients would increase or decrease from year to year but would not tend to increase. In the Solomon Islands, specialists are concentrated at the NRH in the capital city Honiara and are not well assigned to rural areas. The highest priority is to transfer specialists from the NRH. The completion of the new facility for this project is a good opportunity for this. However, it is not financially feasible to significantly increase staffing at KH because of the limitations of the state health budget. In Solomon Islands, services are provided by a small number of medical staff; thus, administrative tasks that can be performed without qualifications should be allocated to medical clerks to enable the medical staff

to focus on the medical services. Medical clerks can handle various record-keeping tasks, such as those that form the basis of medical statistics. Although the original plan was to assign new medical clerks to each of the four basic departments, priority was given to the assignment of medical specialists to each department. Therefore, only two additional medical clerks were included. This increase in staffing was specified in the minutes of discussion signed during the preparatory survey.

Although the number of nurses has increased in recent years, there has been a significant shortage of doctors. Increasing the number of medical personnel is essential to ensure the quality of healthcare services, and in particular, to ensure a minimum number of doctors to make appropriate diagnostic and treatment decisions.

Table 2-25 Required additional staff for the new facilities

		Emergency medicine & General outpatient department	Operation theatre suite	Anesthesiology	Medical imaging department	Delivery room	Special care nursery (SCN)	BME	Medical administration work	TOTAL
Doctor	Specialist	1		1		1	1			4
	General	1				1	1			3
Nurse	Senior nurse									0
	Nurse	2				3				5
	Assistant nurse									0
Professionals	Anaesthetic technician									0
	Medical imaging engineer				1					1
	Biomedical Engineer (BME)							1		1
	Medical clerk								2	2
	TOTAL	4	0	1	1	5	2	1	2	16

Source: JICA Survey Team

Table 2-26 Staff required for the new facilities

		Emergency medicine & General outpatient department	Operation theatre suite	Anesthesiology	Medical imaging department	Delivery room	Special care nursery (SCN)	BME	Medical administration work	TOTAL
Doctor	Specialist	1	1	1		1	1			5
	General	2	1			2	1			6
Nurse	Senior nurse	1	1			1	1			4
	Nurse	7	3			8	3			21
	Assistant nurse	5	1			3	3			12
Professionals	Anaesthetic technician			1						1
	Medical imaging engineer				6					6
	Biomedical Engineer (BME)							1		1
	Medical clerk								2	2
	TOTAL	16	7	2	6	15	9	1	2	58

Source: JICA Survey Team

2.5.1.2 Requirement of establishing the O&M system of medical equipment

Daily maintenance and preventive checks of medical equipment will be required to use the products throughout their lives to provide medical services. Although rules, procedures, and systems regarding the O&M of medical equipment have not yet been fully developed in the Solomon Islands, it is desirable to have a system at KH.

The table above shows the need for employment of BME personnel, and the O&M department of the new facility should work in collaboration with the Biomedical Department of the MHMS.

2.5.2 Operation & Maintenance Plan

2.5.2.1 Operation and Maintenance of new facility

For the O&M of the infrastructure at the existing hospital, two staff members are responsible for daily maintenance, primarily regarding the water supply system.

The maintenance staffing for the new facilities' O&M will be similar to the previous one; however, at the completion of the facilities, the Contractor will provide technical instructions to the hospital's relevant departments.

The project will introduce a new system, including water disinfection with chlorine and wastewater treatment with a septic tank. O&M manuals will be prepared for the system, and instructions will be provided.

In addition to daily cleaning, periodic maintenance is required, as indicated in table below.

Table 2-27 Facility maintenance and management items]

item	frequency
Building structure	
・Floor cleaning	Every day
・Wall & Ceiling cleaning	Every week Upper walls and ceilings are prone to dust accumulation due to ceiling fans and air-conditioning
・Operation room. Floor wall and ceiling	Sterilization of floor wall and ceiling after each operation.
every 6 months	Every 6 months
・Regular cleaning of gutters and drains	Every 2-3 months, and before rainy season
・Interior paint finish	Re-paint every 5 to 7 years
・Exterior paint finish	Re-paint very 7 to 10 years
・Water proofing membranes	Re-paint in 10 to 12 years.
・Paint for metal roof	Re-paint in 10 to 12 years.
・Replacement of metal roof	Replace steel roof in 30 to 40 years
Equipment related	
Air conditioning filters	Regular weekly cleaning
Generator	Regular monthly trial runs
Solar power	Regular monthly cleaning
Water supply system	Weekly chlorine input
Elevated water tanks	Regular annual cleaning.
Septic tanks	Regular monthly cleaning

2.5.2.2 Maintenance management of the equipment

After the handover of the equipment supplied in this project, the most important step toward using medical equipment effectively will be the continuous implementation of O&M by the Solomon Islands and the target facility. To continuously implement medical equipment O&M, including existing systems, the following are required:

・The Solomon Islands and target facility must ensure the necessary funding for hospital management and medical equipment management/O&M and determine systematic budgetary measures, the scale of personnel to be employed, and a plan that is suited to the technical level.

・A medical equipment O&M manager should be employed to strengthen cooperation with medical equipment O&M departments in the MHMS and at NRH, use tools to supplement O&M activities with a view toward preventive maintenance, and provide an annual budget and O&M plan. Technical training was provided for soft components.

・The functions required at the medical level of the target facility and an O&M plan on that basis should be fully investigated alongside the capacity for medical equipment O&M in the Solomon Islands and target facility, and consideration should be given to the optimal equipment and specifications.

・The minimum required level of fundamental medical equipment should be planned for the level of the hospital established at the target facility. Equipment O&M should be easy and incurs low operational costs.

2.6 Project Cost Estimation

2.6.1 Initial Cost Estimation

(1) Estimated project cost to be borne by the Government of Japan

This information is confidential and will not be disclosed here.

(2) Estimated project cost to be borne by the Government of Solomon Islands

SBD 1,180 million (JPY 18.5 million)

The estimated project costs to be borne by the SIG are shown in the following table. These costs are expected to fluctuate in the future.

Table 2-28 Expenses borne by the Solomon Islands State]

NO.	Item	Content	JPY (thousands)	SBD (thousands)
1	Bank commission	Banking Arrangements B/A commission fees (the account for Grant Aids Project), authorization to pay A/P commissions.	2,037	130.0
2	Administration costs	Costs for local consultants for the project implementation, including environmental impact assessment reports	1,567	100.0
3	Building permission fees	Application fee for the development permit to relevant authority (Malaita State Government)	23	1.5
4	Site preparation	Cost for the preparation of the Project site, such as cutting the trees within the proposed construction area.	783	50.0
5	Construction permission fees	Application fee for the building permit to relevant authority	71	4.5
6	Administration costs	Staff costs. Preparation of project monitoring reports required according to JICA guidelines	3,761	240.0
3	Medical equipment	Medical equipment not included in the scope of the Grant Aid project (carts, consumables)	4,700	300.0
5	Furniture and fixtures	Office furniture and other general furniture, office stationery, etc.	4,700	300.0
		subtotal	17,644	1,126
6		contingency (for price inflation)	846	54
		total amount	18,500	1,180

1 SBD=15.67 JPY

The above estimates do not include the following items.

a. Human resource costs: costs of recruiting new doctors and staff required for new facilities, including training and education.
b. Hospital Information Technology (IT): Costs for the development of various types of IT (e.g., electronic medical records, online reservations), software, and servers to

support hospital medical services and administrative management.

c. Consecutive development project cost: The construction of new ward buildings is urgently required. The construction of a new community field in the northwest area of the site is also required.

（3） Conditions for Estimation

1) Cost estimation date: June 2022
2) Exchange rate: 1 USD ＝125.17 JPY 1 SBD=15.67 JPY
   (average rate from April to June 2022).
3) Inflation rate: According to the IMF forecast, prices will increase by 6.30% (1.063)
4) The project implementation schedule for project activities such as the tender document preparation, the tender, and construction is as described earlier.

2.6.2 Operation and Maintenance Costs

The O&M costs for the new facility are summarized table below.

Table 2-29 Operation and maintenance costs after completion of construction

	Item	Required annual expenditure
1.	Staff salaries	SBD 1,905,480
2.	Consumables for medical examinations, medicine & drugs, maintenance of equipment	SBD 192,728
3.	Medical gas	SBD 121,023
4.	Electricity & fuels	SBD 1,247,100
5.	Maintenance expenses	SBD 215,000
	Total	SBD 3,681,331

2.6.3 Operation and Maintenance Cost evaluation

（1） Staff salaries

Approximately 58 doctors, nurses, and other medical staff will be required to operate the new facilities. The required salaries for the additional staff were calculated SBD 1,905,480.00 per year.

Table 2-30 Additional staff salary required for the new facilities

		Required	Annual salary	New facility Total	Existing	Existing total
Doctor	Specialist	5	240,000	1,200,000	1	240,000
	General	6	151,140	906,840	3	453,420
		11		2,106,840	4	693,420
Nurse	Senior nurse	4	63,840	255,360	4	255,360
	Nurse	21	54,150	1,137,150	16	866,400
	Assistant nurse	12	39,000	468,000	12	468,000
		37		1,860,510	32	1,589,760
Professionals	Anaesthetic technician	1	90,000	90,000	1	90,000
	Medical imaging engineer	6	78,000	468,000	5	390,000
	Biomedical Engineer (BME)	1	72,510	72,510	0	0
	Medical clerk	2	35,400	70,800	0	0
		10		701,310	6	480,000
	Total	58		4,668,660	42	2,763,180

4,668,660-2,763,180=SBD **1,905,480.00**

*The additional cost for 16 new staff at the new facilities is estimated at **SBD 1,905,480.00 per year.**

（2） Diagnosis equipment consumables costs, drug purchase costs, and equipment maintenance costs

Table 2-31 Diagnosis equipment consumables costs, drug purchase costs, equipment maintenance costs

	Items	Detail of items	Amount （SBD）
1	Spare parts and consumables	Nasal cannula, ECG electrodes, X-ray Dry film, Gel, Printer paper, Reusable patient circuit, Reusable face mask etc.	181,478.00
2	Local engineer dispatch	Dispatch of MHMS engineers, 3 times a year	11,250.00
		Total amount	192,728.00

（3） Medical gas (Oxygen)

Table 2-32 Medical gas (Oxygen) cost

	Items	Detail of items	Amount （SBD）
1	Medical gas	Oxygen bottles (180 bottles) , replaced 6 times a year	121,023.00
		Total amount	121,023.00

(4) Electricity, fuels, and others

Table 2-33 Electricity, fuels, and others

	item	Amount	Amount
1	disinfectant	600 kg/year x SBD 20 =.	SBD 12,000.00
2	Electricity bill	See below	SBD 1,203,900.00
3	Generator fuel costs	See below	SBD 31,200.00
		total amount	SBD 1,247,100.00

1) Water:

Sodium hypochlorite solution (chlorine) will be used to disinfect water from boreholes, river, and rainwater. For a 12% solution of sodium hypochlorite with an injection rate of 1.5 mg/L, the annual consumption will be approximately 300 kg. It is assumed that the same amount will be used for wastewater treatment. The total annual consumption of sodium hypochlorite will be approximately 600 kg.

2) Electricity:.

Electricity consumption per month (for two new buildings):

Contract 95 kW (electricity power 190 kVA for two new buildings) × 50% = 95 kW Load factor: 30

Electricity consumption : 720 h mobile/month

Electricity load: 95 kW × 720 h × 30% load factor = 20,520 kWh/month.

● Electricity bill per month

Average electricity tariff/month 121,410 (SBD)

1,902,500 (JPY equivalent

● Annual electricity charges (for two new buildings)

12 months × 121,410 = 1,456,920 (SBD)

12 months × 1,902,500 = 22,830,000 (JPY equivalent) ...(i)

● Annual solar power generation (reference case)

Photovoltaic output 1 MW (840 kW) ⇒ 855 MWh

Photovoltaic output 50 kW (42 kW) ⇒ 42.75 MWh

(Reference) Approximately 49 MWh/year for Kyocera product used in Tokyo.

Solar power annual electricity saving charge (solar 50 kW)

42.75 MWh × 5.92 (SBD/kWh) = 252,938 (SBD)

4,079,629 (JPY equivalent) ... (ii)

● Annual electricity costs (including photovoltaic electricity saving costs)

(i)–(ii) = 1,203,900 (SBD)

19,417,703 (JPY equivalent)

3) Generator fuel costs:

Fuel costs were calculated based on the assumption that the frequency of power outages at the site is approximately once a week, for one hour per outage.

Fuel unit price 12.00/L (SBD)

Annual fuel consumption charge SBD 12/L x 50 L/h × 1.0 h/day × 52 weeks/year = 31,200/year (SBD)

489,000 JPY equivalent

（5） Other (building maintenance costs)

Facility maintenance and management costs for interior and exterior finishes, electrical and mechanical equipment, etc., are ¥1,680/m^2/year* (SBD100) for a 3,000 m^2 public building of similar size in Japan.

*Price in Japan. Required unit price for maintenance and management costs of government buildings in FY2023 (National Health Insurance No. 6, 18 May 2022).

SBD 100 × 2,000 m^2 = 200,000 (SBD)

3,150,000 JPY equivalent)

Filters for air-conditioning machines, such as operating theatres, are pre-filters and medium-grade filters that can be washed with water. The maintenance cost was estimated as the cost of replacing medium-grade filters once per year.

SBD 2,500 × 6 locations = 15,000 (SBD)

235,000 (JPY equivalent)

Above Total 200,000 + 15,000 = 215,000 (SBD)

3,370,000 (JPY equivalent)

2.6.4 Projected income and expenditure after implementation of the Plan.

The budget and expenditure of the Ministry of Health and Medical Services of the Solomon Islands are shown above. While expenditure does not significantly exceed the budget, there is a limited health budget by the SIG, and the MHMS relies on foreign donors for approximately half to more than half of its budget. In 2020, a separate budget was allocated to the new coronavirus pandemic. The projected total of SBD 3,681,331 for the O&M of the new facility is approximately 0.85% of the Solomon Islands' MHMS budget (SBD 432 million in 2021). This projection includes the additional personnel costs required at KH after project completion. The MHMS explained that the specialist doctors were already employed at the NRH and they only need be transferred to KH. If the annual salary of SBD 960,000 for the four additional specialists is reduced, the total would be SBD 2,721,331. A 10% contingency should be added to this estimate; therefore, the total additional budget required after project completion is approximately SBD 3

million. This is approximately 0.7% of the current budget of the MHMS. Therefore, the project can be considered feasible.

The expenditure of the Malaita Provincial Health Department in 2021 was SBD 21 million, and the non-personnel maintenance and management cost of SBD 1.8 million is equivalent to 8% of this amount. Owing to the coronavirus pandemic in 2019, the health-related budget has fluctuated significantly, and it has been difficult to predict future budget trends. The financial status of the SIG should be closely monitored during the project.

Chapter 3 Project Evaluation

Chapter 3. Project Evaluation

3.1 Preconditions

The following issues and items for the project are to be implemented on schedule by the Solomon side.

(1) Before Tender

- The construction site is currently used as a community area. The basic policy for utilizing this location was discussed with the hospital community during the preparatory survey and has been approved. All stakeholders in this community area should be notified of this basic development policy, and the Solomon side should ensure that there will be no objection when the construction starts.
- To open a bank account (Banking Arrangement (B/A)), secure authorization to pay (A/P) to a bank in Japan (Agent Bank) for payments to the Consultant, and bear bank commissions for the payments.
- To obtain an IEE/EIA approval and/or No Objection Certificate (NOC), if applicable (to be performed by SIG)
- To obtain building permits / NOCs or any other relevant documents required.
- To identify the personnel or department to manage the monitoring of the project on the SIG side.

(2) During the Implementation of the Project

- To issue an Authorization to Pay (A/P) to a bank in Japan (Agent Bank) for payments to the Contractor and supplier(s); to bear the commissions to the bank in Japan for banking services based on the B/A, including the A/P and payment commissions.
- To assist and facilitate procedures to obtain tax/duty exemptions from SIG.
- To provide all necessary furniture and medical equipment that are not provided by the Japanese side as necessary for the operation of the new facility.
- To provide necessary IT software and equipment for the operation of the new facility.
- To allocate the required number of trained staff for the operation and maintenance of the new facility and equipment provided by the Grant Aid.

(3) After the Project

- To properly maintain the facility and equipment supplied under the Grant Aid.
- To renovate the existing building after the transfer of functions to the new facility.

3.2 Necessary Inputs by the Recipient Country

It is recommended that the SIG implements the following items to sustain the outcome and effectiveness of the project:

- Early implementation of the next phase of the Comprehensive Development Plan.

The facilities at KH urgently require complete renovation. Only the central clinical building and delivery building can be built with Japanese grant aid, and renovation and reconstruction of the wards are not possible owing to budgetary constraints. As many patients come from far away, the environment of in-patient facilities require urgent improvement; therefore, the four wards (maternity, surgical, medical, and pediatrics) of the next phase of the project are urgently required. When these wards are rebuilt, the hospital can provide comprehensive medical care as a core hospital in the region.

- Ensure the necessary budget for the operation of the hospital, including newly built facilities.

3.3 Important Assumptions

The following are the important external assumptions for the success of the project

- Political and security conditions do not deteriorate.
  The Solomon Islands experienced riots in the capital Honiara in 2021. One of the reasons for this has been identified as a delay in the development of Malaita Island compared with the capital Honiara. The development policy on Malaita Island and security stability should continue.
- The national health-related budget is maintained and donor support is not substantially reduced.
  As services expand, the current hospital management structure should be maintained, staffing should be increased, and budgets for maintenance and administration should increase. In addition, donors play a significant role in the health of Solomon Island. If donor support is substantially reduced, it will be difficult to maintain the country's health policy.

3.4 Project Evaluations

3.4.1 Relevance

This project is deemed appropriate as a cooperative project funded by Japanese Grant Aid from the following perspectives.

(1) Relevance

1) Beneficiary population and target area

KH is a core regional hospital (level 3) on Malaita Island, the country's largest and most populous island. The hospital's direct catchment area is Malaita Island, with a population of 170,000.

Furthermore, in the event that the country's central hospital, the NRH, becomes dysfunctional because of a disaster or other factors, KH has been receiving patients as an alternative facility. Therefore, 700,000 people throughout the Solomon Islands are beneficiaries.

The population is growing in Solomon (2.4% in 2021), with a total fertility rate of 4.36 (2019) and is expected to continue to grow. The number of beneficiaries will also continue to grow.

(2) Human Security

KH targets patients of all ages from newborns to the elderly. As the only general hospital on the island, it is expected to treat all cases, symptoms, and illnesses, including those related to maternal and child health, infectious diseases, NCDs, accidents, and emergency treatment.

The project corresponds with SDG Goal 3: “Ensure healthy lives and promote the well-being of people of all ages,”’ worthy of assistance by Japanese grant aid.

The facilities to be developed through this grant assistance are the central clinical and delivery facilities, which are the highest-priority sectors of the hospital. The development of these core departments will contribute to peace and stability in the region, as it will facilitate the improvement of the hospital's medical care and enable residents to receive secure medical services, thereby contributing to the human security of the people in the region.

(3) Consistency with SIG National Development Strategy

Under its National Development Strategy 2016–2035, the SIG aimed for economic growth through the sustainable improvement of people's living standards and industrial development. The long-term goals are (i) economic growth, (ii) poverty alleviation and food security, (iii) quality health and education, (iv) resilient, environmentally sustainable development, and (v) a unified nation. Maintaining a sustainable and stable society is listed as a key item. Therefore, the health sector aims to achieve universal health coverage (UHC) based on the 2018 MHMS Role Delineation Policy. It aims to provide adequate health services to all, including the most vulnerable groups (e.g., persons with disabilities and women suffering from domestic violence), as priority targets. The project is consistent with the SIG Development Strategy as it will develop the highest-priority sectors of rural core hospitals.

(4) Consistency with the international cooperation strategy of Japan

The Ministry of Foreign Affairs of Japan in "Solomon Islands Country Development Cooperation Policy with Japan (April 2019)" states that "Japan has a fisheries agreement with Solomon Islands and has close relations in the fisheries sector, as Japanese fishing vessels operate in the country's Exclusive Economic Zone (EEZ). In addition, since its independence, Japan has built good bilateral relations with Australia, including support for Japan's position in the international arena. It is important to continue to support the independent and sustainable development of Solomon Islands in cooperation with Australia and other countries with which Solomon Islands has close relations, and to strengthen bilateral relations between Japan and Solomon Islands and realize a 'free and open Indo-Pacific'. In addition, Japanese companies are considering energy development and other projects in Solomon Islands, and it is expected that in the future, economic relations between the two countries will become even closer, including through the promotion of industry by private capital."

The basic policy of ODA is to achieve self-sustaining and sustainable economic growth and improve the living standards of the people through strengthening social and economic infrastructure as the main goal, and to overcome vulnerability, the medium goal is to "provide assistance in improving the quality of local health services, including improving health and sanitation facilities, training health professionals in infectious diseases and NCDs, and public health awareness raising activities. Support for improving the quality of community health services" as a mid-term objective. One of the points to note is that "the support will be provided in light of the country's severe geographical conditions (diffuse, narrow, remote, isolated, etc.), which make the country a development challenge in many aspects," which is consistent with the fact that the project will support Malaita Island, which is not the capital.

This project is positioned within the JICA Global Health Initiative and is consistent with these policies.

3.4.2 Effectiveness

(1) Quantitative effects

The following quantitative effects are envisioned by the project.

Table 3-1 Quantitative effectiveness indicators and target values

index-name	standard value (Actual values in 2019)	target value (3 years after completion, in 2028)
Number of outpatients (cases/year)	13,397	16,000
Number of imaging diagnoses with X-Ray (cases/year)	2,399	4,100
Number of imaging diagnoses with Ultrasound (cases/year)	2,505	4,100

*Reference values will not be used in 2020 and 2021 to avoid the impact of the coronavirus.

Targets are to be set for approximately three years after completion of the project.

<Number of outpatients>

The outpatient care system at KH is generally served by one general physician, nurses, and other paramedical staff, and is not divided into specialty departments. In addition, KH is a “level 3” regional general hospital, and according to the Role Delineation Policy 2018, it must serve the province's residents (more than 20,000 people) with sufficient medical services (more than 400 cases/week). Currently, although there is a need for outpatient care, more than 400 cases/week have not been achieved owing to staff shortages. The current rate is 200–250 cases/week.

In addition to the general outpatient consultation rooms (two rooms), there will be an after-hours consultation room (one room), and the number of permissible outpatients is expected to increase with the increase in consultation rooms (= increase in the number of outpatients); it is essential to secure additional doctors to serve the increase in patients (see 3.4.1.1 Operational

Structure). The number of doctors required for the new facility was set at eight, two of whom should provide outpatient services.

The number of outpatients is expected to increase progressively as the number of doctors increases, reaching more than 400 cases/week in approximately 10 years after the completion of the facility.

Based on this, after three years of handover, the project achievement target for 2028 is set at 16,000 people, an increase of 1.2 times from the current situation (based on the current number of outpatients, to expect roughly double the number of outpatients in 10 years, the project achievement target for three years is set at 1.2 times).

<Number of diagnostic imaging cases>

The role of diagnostic imaging in the public healthcare system in Malaita is served by KH, and the existing diagnostic imaging situation is such that although there is a high need for diagnostics with a maximum number of 30 diagnoses/day, the equipment is becoming obsolete. Even when many patients visit for examination, tests are frequently cancelled or delayed owing to equipment problems. Thus, the average number is approximately 18.8. This number of cases/day is insufficient to satisfy the needs of the patients.

The implementation of the project will result in updated equipment, which will reduce the number of cancelled and postponed tests and satisfy the current diagnostic requirement of 30 cases/day. The target value is 30 tests/day, the maximum number of tests per day in the baseline year, plus 2 tests/day, the increase in patients in the target year, for a total of 32 tests/day, or 8,200 diagnostic imaging tests/year at KH.

Table 3-2 Breakdown of diagnostic imaging cases

Breakdown of diagnostic imaging cases (2019) Number of diagnostic imaging cases (cases) 4,904 cases/year, approx. 18.8 cases/day*, maximum number of cases 30 cases/day - Number of X-ray examinations (cases) 2,399/year, approx. 9.2 cases/day, max. 15 cases/day - Number of ultrasound examinations (cases) 2,505/year, approx. 9.6 cases/day, max. 15 cases/day *1 year = 260 days (5 weekdays x 52 weeks per year)
Breakdown of diagnostic imaging cases (2028) Number of diagnostic imaging procedures (cases) 8,200 cases/year, 32 cases/day*. - Number of X-ray examinations (cases) 4,100/year, 16/day - Number of ultrasound examinations (cases) 4,100/year, 16/day *1 year = 260 days (5 weekdays x 52 weeks per year)

Table 3-3 Project evaluation indicators

validity	• Aligned with SIG health policy. • As a regional core hospital, the beneficiaries are the entire state and, furthermore, the entire country as an emergency replacement facility of the NRH. • The facilities have not been updated since their design in the 1960s, making it difficult to adapt them to modern healthcare. • There is a shortage of medical personnel, but the current medical staff are fully motivated, and are coping with available resources to serve the community.	
effectiveness	• Quantitative Effects	• qualitative effect
	• Number of outpatients (annual) • Number of diagnostic imaging procedures (annual)	• Improvements in facilities and medical equipment will promote better medical service flow lines, which will improve the quality and efficiency of the medical services provided at the hospital. • The new facility will improve the quality and efficiency of clinical services by providing appropriate ventilation, handwashing facilities, and better clarification of clean and dirty areas. • The confidence of patients and their satisfaction with the medical staff will improve

(2) Qualitative effect

The following quantitative effects are envisioned by the project.

◆ Improvements in facilities and medical equipment will promote better medical service flow lines, which will improve the quality and efficiency of the medical services provided at the hospital.

・The new medical flow line of the new facility will enhance the efficiency of medical services.

・The improvement of operating theatre facilities and equipment will improve the operating environment, leading to more efficient operation theatre unit management and better operations.

・The improvement of facilities and equipment for maternal and child healthcare, particularly in delivery rooms, will improve the hospital environment and healthcare services provided to mothers and babies.

・The new mobile and portable diagnostic imaging equipment will enable bedside diagnoses of the patients and ease the burden of moving the patients around.

◆ The new facility will improve the quality and efficiency of clinical services by providing appropriate ventilation, handwashing facilities, and better clarification of clean and dirty areas.

Infection management will be strengthened by the new facilities.

KH experiences some difficulties in implementing basic infection control measures (standard precautions) for healthcare workers in the existing buildings. They also face

issues with the maintenance of old buildings. This project will improve facilities and equipment, thereby enabling effective physical infection control measures. The new facility, together with the soft component (technical assistance) provided by the project, should encourage proactive implementation of standard precautions by healthcare workers.

◆ The confidence of patients and their satisfaction with the medical staff will improve.

- Comfortable and clean facilities will increase patients' confidence.
- Patients' satisfaction and the motivation of medical staff will be improved.
- KH's influence and recognition as a top referral hospital in Malaita province will be enhanced.

3.4.3 Conclusion.

Based on the above analysis, the preparatory survey concluded that the project is highly relevant and effective.

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1. Member List of the Study Team

1. Member List of the Study Team

(1) Basic Design 1st Field Survey (From 7th April to 12th May 2022)

Name	Assignment	Tile
Mr. Hisakazu HIRAOKA	JICA / Team Leader	Office for COVID-19 Response Human Development Department, JICA
Mr. Masaru FUJINUMA	Chief Consultant/ Architecture Planning	Fukunaga Architects-Engineers
Mr. Yuya FUKADA	Deputy Chief Consultant／ Architecture Planning2	Fukunaga Architects-Engineers
Ms. Shoko SEYAMA	Architectural Design / Site condition survey	Fukunaga Architects-Engineers
Mr. Kenji SAWAI	Equipment Plan / Maintenance	BINKO INTERNATIONAL LTD.
Ms. Yuika TAKAYAMA	Health Care Plan / Gender Consideration	BINKO INTERNATIONAL LTD.
ONLINE		
Ms. Akiko ITO	JICA / Planning Arrangement	Office for COVID-19 Response Human Development Department, JICA
Mr. Mitsuo ISONO	JICA / Medical Technical Planning	Senior Advisor, JICA
Ms. Rei KANSAKU	JICA / Medical Technical Planning	Senior Advisor, JICA
Mr. Hironori KOMATSU	Infrastructure Plan	Yachiyo Engineering Co., Ltd.
Mr. Daichi KANAZASHI	Construction Execution Plan / Cost Estimation (~28th February 2022)	Yachiyo Engineering Co., Ltd.
Mr. Ichiro MASUDA	Construction Execution Plan / Cost Estimation (1st March 2022~)	Yachiyo Engineering Co., Ltd.
Mr. Hirotaka HIROOKA	Equipment Planning	Fukunaga Architects-Engineers
Ms. Tomomi TEZUKA	Procurement Planning/ Cost Estimation	BINKO INTERNATIONAL LTD.
Ms. Kumiko NISHIJIMA	Architectural Design / Site condition survey 2	Fukunaga Architects-Engineers

(2) Basic Design 2nd Field Survey (From 26th May to 18th June 2022)

Name	Assignment	Tile
Mr. Hironori KOMATSU	Infrastructure Plan	Yachiyo Engineering Co., Ltd.
Mr. Ichiro MASUDA	Construction Execution Plan / Cost Estimation	Yachiyo Engineering Co., Ltd.

(3) Explanation of Draft Report (From 8th to 14th January 2023)

Name	Assignment	Tile
Ms. Akiko ITO	JICA / Team Leader	Office for COVID-19 Response Human Development Department, JICA
Ms. Rei KANSAKU	JICA / Medical Technical Planning	Senior Advisor, JICA
Mr. Masaru FUJINUMA	Chief Consultant/ Architecture Planning	Fukunaga Architects-Engineers
Mr. Kenji SAWAI	Equipment Plan / Maintenance	BINKO INTERNATIONAL LTD.
Ms. Shoko SEYAMA	Architectural Design / Site condition survey	Fukunaga Architects-Engineers

2. Study Schedule

2. Study Schedule

(1) Basic Design 1st Field Survey

No.	Date		JICA	Consultant				
			Team Leader	Chief Consultant／Architecture Planning	Deputy Chief Consultant／Architecture Planning2	Architectural Design / Site condition survey	Equipment Plan / Maintenance	Health Care Plan / Gender Consideration
			Mr. Hiraoka	Fujinuma	Fukada	Seyama	Sawai	Takayama
1	7-Apr	Thu		NRT 11:10 → 17:20 SGP 21:30 →				
2	8-Apr	**Fri**		→ 06:55 Brisbane 10:00 → 14:15 Honiara				
3	9-Apr	Sat		*Day 1 of Mandatory Quarantine Stay*	*・Meeting w/Local consutant (Monday, 9:00am) ・Contact to NRH, KH hosipital, MHMS, SIWA, SPA, Remote survey on EIA, Infrastructure, Relevant permit, onstruction safety regulation etc. ・Meeting with Donors ・TAX Exemption survey*			
4	10-Apr	Sun		*Day 2*				
5	11-Apr	Mon		*Day 3*				
6	12-Apr	Tue		*Day 4*				
7	13-Apr	Wed		*Day 5 11:30(Solomon)nternal meeting with JICA)*				
8	14-Apr	Thu	NRT 11:10 → 17:20 SGP 21:30 →	*Day 6*				
9	15-Apr	**Fri**	→ 06:55 Brisbane 10:00 → 14:15 Honiara	*Day 7*				
10	16-Apr	Sat	*Day 1 of Mandatory Quarantine Stay*	*Day 8*				
11	17-Apr	Sun	*Day 2*	*Day 9*				
12	18-Apr	Mon	*Day 3*	*Day 10*				
13	19-Apr	Tue	*Day 4 Online Meeting*	9:00 Visit to JICA Office 14:00-Courtesy call and discussion w/ Ministry of Health and Medical Services		9:00- Visit NRH 14:00-Courtesy call and discussion w/ Ministry of Health and Medical Services		
14	20-Apr	Wed	*Day 5 Online Meeting*	Honiara 11:10 → 12:100 Auki Courtesy call Malaita Province Office, Visit Kilu'ufi Hospita: Confirmation of Schedule, Meeting with Hospital Directors, etc.				
15	21-Apr	Thu	*Day 6 Online Meeting*	Survey at Kilu'ufi Hospital Kick-off meeting: Explanation of Inception Report, Site survey				
16	22-Apr	Fri	*Day 7 Online Meeting*	Survey at Kilu'ufi Hospital Discussion on M/D	Site Survey		Maintenance Section Survey Discussion w/ facility manager	Visit to Planning and Policy Department, Health Statistics Division
17	23-Apr	Sat	*Day 8 Remote participation to the survey*	Discussions with doctors of each department about the scope of the facility and equipment				
18	24-Apr	Sun	*Day 9 Remote participation to the survey*	Internal Meeting, Documentation				
19	25-Apr	Mon	*Day 10 Remote participation to the survey*	Survey at Kilu'ufi Hospital 18:00- Discussion on M/D				
20	26-Apr	Tue	Discussion w/ MHMS	Survey at Kilu'ufi Hospital Auki 15:45 → 16:25 Honiara	Site survey	Gender survey	Equipment survey	Hospital Survey
21	27-Apr	Wed	Discussion w/ MHMS		Auki 12:40 → 13:10 Honiara			
22	28-Apr	Thu	10:00 PCR Test (Honiara) Signing on M/D 16:00 Report to the Embassy of Japan		Facility Survey		*Positive for the coronavirus Quarantine*	Same as Deputy Chief Consultant
23	29-Apr	**Fri**	AM: Receive the result of PCR test 16:15 Honiara → 18:30 Brisbane 23:50 →			*Positive for the coronavirus Quarantine*		ditto
24	30-Apr	Sat	→ 05:45 Singapore 09:25→17:30 Narita					ditto
25	1-May	Sun			*Positive for the coronavirus Quarantine*			
26	2-May	Mon						
27	3-May	Tue						
28	4-May	Wed						
29	5-May	Thu						
30	6-May	Fri						
31	7-May	Sat						
32	8-May	Sun						
33	9-May	Mon					NRH (Maintenance department of Medical equipment)	
34	10-May	Tue				PCR Test (Honiara) NRH Survey	NRH Survey	
35	11-May	Wed				AM: Receive the result of PCR test 16:15 Honiara → 18:30 Brisbane 23:50 →		
36	12-May	Thu				→ 05:45 Singapore 09:25→17:30 Narita		

(2) Basic Design 2nd Field Survey

			Consultant	
			Infrastructure Plan	Construction Execution Plan / Cost Estimation
No.	Date		Komatsu	Masuda
1	26-May	Thu	NRT 11:10 → 17:20 SGP 21:30 →	
2	27-May	Fri	→ 06:55 Brisbane 10:00 → 14:15 Honiara	
3	28-May	Sat	*Day 1 of Mandatory Quarantine Stay*	
4	29-May	Sun	*Day 2*	
5	30-May	Mon	*Day 3*	
6	31-May	Tue	*Day 4*	
7	1-Jun	Wed	*Day 5*	
8	2-Jun	Thu	*Day 6*	
9	3-Jun	Fri	*Day 7*	
10	4-Jun	Sat	*Day 8*	
11	5-Jun	Sun	*Day 9*	
12	6-Jun	Mon	*Day 10*	
13	7-Jun	Tue	Meeting with SIEA :Survey of infrastructure bureaus (Electricity and Waterworks) Meeitng with MHMS	Visit to JICA Office Distribution of questionnaires for construction companies. Explanation of local surveyors
14	8-Jun	Wed	AM: Additional surey in Honiara Honiara 14:25 → 15:05 Auki Survey at Kilu'ufi Hospital	
15	9-Jun	Thu	Survey of project site and infrastructure status, Meeting on Soil investigaton and Topo survey to start	
16	10-Jun	Fri	Survey with SIEA (Auki) at the Hospital Meeting with the Hospital (Infrastructure Plan) Visit of SIEA (Auki)	Topo survey Soil Survey Construction Programming Survey
17	11-Jun	Sat	Meeting with the Hospital (Infrastructure Plan)	Topo survey Construction material survey in Auki
18	12-Jun	Sun	Internal Meeting, Documentation	
19	13-Jun	Mon	T/N meeting	
20	14-Jun	Tue	Malaita Island Power and Water Authority Survey	Auki 14:30 → 15:00 Honiara Construction planning, procurement situation, market research, collection of estimates
21	15-Jun	Wed	Auki 15:25 → 16:40 Honiara	Construction material survey in Honiara
22	16-Jun	Thu	10:00 PCR Test (Honiara) Meeting with SIEA Meeting with MHMS	Visit to JICA Office
23	17-Jun	Fri	AM: Receive the result of PCR test 16:15 Honiara → 18:30 Brisbane 23:50 →	
24	18-Jun	Sat	→ 05:45 Singapore 09:25→17:30 Narita	

(3) Explanation of Draft Report

			JICA		Consultant		
			Planning Arrangement	Medical Technical Planning	Chief Consultant／Architecture Planning	Architectural Design / Site condition survey	Equipment Plan / Maintenance
No.	Date		Ms. Ito	Dr. Kansaku	Fujinuma	Seyama	Sawai
1	8-Jan	S	NRT → SGP →				
2	9-Jan	M	→Brisbane → Honiara				
			15:00-Report to the Embassy of Japan	15:45-NRH	Same as	15:45-NRH	
3	10-Jan	T	Discussion at MHMS about the result of Japan assistance analysis (Draft Report) Flight Honiara 16:30→17:00Auki Kilu'ufi Hospital Visit and Discussion with Hospital Director				
4	11-Jan	W	8:30 Visit to Malaita Province Office 9:30 MD Discussion at the Hospital Flight Auki→14:35 Honiara 15:00-MD Discussion at MHMS				
5	12-Jan	T	10:00 MD Discussion at MHMS Team meeting at JICA Solomon Office 15:00-MD Sign				
6	13-Jan	F	10:30 NRH Survey Honiara 14:20 → 16:30 Brisbane 23:25 →				
7	14-Jan	S	→ Singapore → Narita				

3. List of Parties Concerned in the Recipient Country

3. List of Parties Concerned in the Recipient Country

Department	Position	Name
Ministry of Health and Medical Seruvices (MHMS)		
	Permanent Secretary	Ms. Pauline Mcneil
	Deputy Secretary Health Care (DSHC)	Dr. Gregory Jilini
	Deputy Secretary Corporate	Dr Lazarus De Neko
	Chief Planning Officer	Mr. Brian Idufausa
	Director Policy & Planning	Mr. Ivan Ghemu
	Infrastructure Manager	Mr. Collin George
	Manager for Procurement Unit	Mr.Layten Jacob
	Director of the NMS	Mr.Timmy Manea
	WHO RDP officer	Mr.Ronney Kenitahani
	Principal HR Office	Ms. Velisia Lehe
	Director HR Office	Mr. Gari Joseph
	Finance Office/ Control	Ms. Esther Tekulu
	Finance Office	Ms. Beverlyn Sanga
	National Director of Nursing	Mr. Michael Larui
	Senior Admin PCU	Mr. Paul Kunua
Kilu'ufi Hospital		
	Director (Until February 2023)	Dr. Rex Maukera
	Director (From February 2023)	Dr David Danitofea
	Hospital Secretary	Mr. Jack Adoma
	Acting Hospital Secretarait / Assistant Director of Nursing (ADON) / Logistics	Ms. Ethel Kaota
	Director of Nursing (DON)	Mr. Richard Maegerea
	Assistant Director of Nursing (ADON), Community Health Service	Ms. Julie Hitu Hitai
OT	General Surgery	Dr. Micky Olangi
Medicine	Medical Officer, Medicine	Dr. Nathan Tahuniara
Pediatric	Medical Officer, Aeasthetia	Dr. David Danitofea
Obstetrics & Gyneacology	Obstetrics / Gynaecology	Dr. Adriang Galokepoto
ER	Medical Officer, Emergency/OPD	Dr. Patrick Gwao
IPC	Nursing officer, Infection Prevention Control (IPC)	Mr. Nixon Olofisau
Pharmacy	Pharmacy Department	Mr. Jory Joseph
	Pharmacy Department	M.Reuben Kona
OT	Clinical nurse,OT	M. George Misitee
Radiology	Radiologist	M.Clement Jfal
	Principal Radiologist, Avocator of gender issue	Mr. Joun Mark Hou
Laboratory	Malaria lab technician	M. Makita Wate
	General lab technician	M. Sam Faluaburu
Obstetrics & Gyneacology	Delivery,Midwives	Ms.Rachel Ofai
	Nursary	Ms.Sarah akoasi
	Registered nurse, Gynae, Medical & Surgucal ward	Ms. Jane Wanefiolo

Department	Position	Name
Administration	Accountant	Ms. Ellen Matangani
Infrastructure	Infrastructural officer	Mr. Jack Koraai
	Insrastructural / plumbing	Mr. Frank Koke
Malaita Province Government (MPG)		
	Premier (Provincial Secretary, PS)(until February 2023)	Mr. Daniel Suidani
	Deputy Provincial Securetary (DPS)	Mr. David Tuita
	Chief Health Inspector	Ms. Gloria Siwainao
	Chief Planning	Mr. Pete Herelura
	Assistant engineer	Mr. Rex Ugulimate Jr.
National Referral Hospital		
	Medical Superintendent	Dr. Janella Solomon
	General Surgeon	Dr. Rooney Jagilly
	Department of Radiology	Dr.Aaron Oritaimae
	Department of Radiology	Ms.Susan soma
	Department of the Maintenance	Mr.Douglas Nelson Reres
Desaster & Solomon Islands Meteorological Service		
Auki, Malaita	Provincial Desaster Office (PDO)	Mr. Pearson Simi
Honiara	Principal Met Officer-Climate	Mr. Max Sitai
Solomon Power		
	Project Manager, Honiara	Mr. Kellyson Kwakwala
	Station Manager, Auki	Mr. Josha
	Linemen, Auki	Mr. David Riki
Solomon Telecom		
	Technician, Auki	Mr. Lawrence Lani
Donors		
WB		Ms. Louisa Fakaia
ADB		Mr. Ki Fung Kelvin Lam
ADB		Mr. Elmar Elbling
New Zealand High Commission to the Solomon Isl		Ms. Olivia Benton-Guy
UK Emergency Medical Team (UK-EMT / UK-MED)		
		Dr.Emery
		Dr.Emilio Hornsey
		Dr.Kim Beentjes
		Dr. Fliad Said
Architect Office		
Kramer Ausenco	Solomon Islands Office Office Manager	Mr. Daniel Tucker

4.Minutes of Discussions（M/D）

4-1. Basic Design 1st Field Survey M/D

4-2. Explanation of Draft Report M/D

4-1. Basic Design 1st Field Survey M/D

Minutes of Discussions
on the Preparatory Survey for
The Project for Construction of Kilu'ufi Hospital

In response to the request from the Government of Solomon Islands, Japan International Cooperation Agency (hereinafter referred to as "JICA") organized the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") of the Project for The Project for Construction of Kilu'ufi Hospital (hereinafter referred to as "the Project") to Solomon Islands. The Team held a series of discussions with the officials of the Government of Solomon Islands and conducted a field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Honiara, 28 April, 2022

Mr. HIRAOKA Hisakazu
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Ms. Pauline McNeil
Permanent Secretary
Ministry of Health and Medical Services
Solomon Islands Government

Witness

Dr. Rex Maukera
Malaita Province Health Director (acting)
Kilu'ufi Hospital

ATTACHMENT

1. Objective of the Project

   The objective of the Project is to improve the function of Kilu'ufi Hospital by building new facilities to relocate some functions, thereby contributing to improvement of health services provided in Malaita Province.

2. Title of the Project

   Both sides discussed the title of the Project and agreed that following revised title is appropriate, and both sides confirmed that the final title will be decided based on the coordination with the Government of Japan.

   "The Project for Improvement of Kilu'ufi Hospital"

3. Project site

   Both sides confirmed that the site of the Project is shown in Annex 1.

4. Responsible authority for the Project

   Both sides confirmed the authorities responsible for the Project are as follows:
   The Ministry of Health and Medical Services will be an executing agency for the Project (hereinafter referred to as "the Executing Agency"). The Executing Agency shall coordinate with all the relevant authorities to ensure smooth implementation of the Project and ensure that the undertakings for the Project shall be managed by relevant authorities properly and on time. The organization charts are shown in Annex 2.

5. Items requested by the Government of Solomon Islands

   5-1. As a result of discussions, both sides confirmed that the items requested by the Government of Solomon Islands are described in Annex 1:
   Construction of facilities: components are listed as Project component
   Procurement of Equipment: plan is described as Medical equipment plan

   5-2. JICA will assess the feasibility of the above requested items through the survey and will report the findings to the Government of Japan. The final scope of the Project will be decided by the Government of Japan.

6. Procedures and Basic Principles of Japanese Grant

6-1. The Solomon Islands side agreed that the procedures and basic principles and basic principles of Japanese Grant (hereinafter referred to as "the Grant") as described in Annex 3 shall be applied to the Project.

As for the monitoring of the implementation of the Project, JICA requires Solomon Islands side to submit the Project Monitoring Report, the form of which is attached as Annex 4.

6-2. The Solomon Islands side agreed to take the necessary measures, as described in Annex 5, for smooth implementation of the Project. The contents of the Annex 5 will be elaborated and refined during the Preparatory Survey and be agreed in the mission dispatched for explanation of the Draft Preparatory Survey Report.

The contents of Annex 5 will be updated as the Preparatory Survey progresses, and eventually, will be used as an attachment to the Grant Agreement.

7. Schedule of the Survey

7-1. The Team will proceed with further survey in Solomon Islands until June 2022.

7-2. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Solomon Islands in order to explain its contents around November 2022.

7-3. If the contents of the draft Preparatory Survey Report is accepted and the undertakings for the Project are fully agreed by the Solomon Islands side, JICA will finalize the Preparatory Survey Report and send it to Solomon Islands around April, 2023.

7-4. The above schedule is tentative and subject to change.

8. Environmental and Social Considerations

8-1. The Solomon Islands side confirmed to give due environmental and social considerations before and during implementation, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April 2010).

8-2. The Project is categorized as "C" from the following considerations:

Not located in a sensitive area, nor has it sensitive characteristics, nor falls it into sensitive sectors under the Guidelines, and its potential adverse impacts on the environment are not likely to be significant.

Both sides will confirm the necessity of the procedures concerning environmental assessment. If necessary, the Solomon Islands side will conduct the necessary procedures concerning the environmental assessment (including stakeholder

meetings, Environmental Impact Assessment (EIA) / Initial Environmental Examination (IEE) and information disclosure, etc.) and make EIA/IEE report of the Project. The EIA/IEE approval shall be received from the responsible authorities and submitted to JICA by the date to be notified later.

9. Other Relevant Issues

9-1. Needs for continuous enhancement of the hospital function

Both sides have confirmed that the Project is a part of improvement of the hospital focusing on some functions with urgent needs to enhance. The Solomon Islands side will seek for continuous improvement of the hospital stepwise in consideration of the medical needs and community needs including recreational facility with available resources.

9-2. Exemption of customs duties, internal taxes and other fiscal levies

The Japanese side explained that customs duties, internal taxes and other fiscal levies which may be imposed in Solomon Islands with respect to the purchase of the products and/or the services be exempted or be borne by its designated authority without using the Grant and its accrued interest. The detailed procedure for tax exemption shall be provided by the Solomon Islands side to the Team by before the next survey scheduled in end of May 2022.

9-3. Land ownership

The Solomon Islands side agreed to submit a land title of the proposed construction site before the end of May 2022. Land title means that there is no customary land ownership.

9-4. Clearance of Unexploded Ordnance (UXO)

The Solomon Islands side agreed to conduct detection survey and discrimination of UXO in the Project site and to provide the Team with site clearance report of UXO by the end of May 2022. If the needs of further detection survey of the UXO in the Project site arose at the later stage of the preliminary survey of the Project, the Project may cover the survey cost and the Solomon Islands side will be responsible for clearance of UXO found by the survey.

9-5. Well water survey

The hospital had two sources of water, one from the stream, and the other from a borehole. The pump of the borehole broke down in 2019. It has not been used hence. The Solomon Islands side agreed to conduct survey of the borehole to assess whether it can be used again with new pumping facilities. The survey will include water capacity and quality test of the existing borehole and alternative water source information. This survey shall be completed and reported to the Team by the end of May 2022.

9-6. Technical Assistance ("Soft Component")

Both sides confirmed necessity of technical assistance for the maintenance of the equipment. Currently there is no bio-medical engineer assigned to the hospital. The Solomon Islands side agreed to plan and to create a post for a bio-medical engineer in the hospital. Training of this bio-medical engineer for proper maintenance of the equipment including but not limited to inventory making and record keeping shall be provided as "Soft Component" of the Project.

9-7. Maintenance service contract

Both sides agreed the importance of maintenance service contract for major equipment to be procured. The maintenance service contract is the responsibility of the executing agency. The variation of maintenance services covered by the contract will be decided depending on the risk and necessary cost of repair for each of the equipment. Both sides also agreed to consider maintenance service contracts for some of the major medical equipment that need professional maintenance to be included in the grant.

9-8. Budget for the undertaking of the Solomon Islands side

Both sides agreed to cooperate to secure appropriate budget for the undertaking of the Solomon Islands side for the Project. The budget plan shall be submitted to the Ministry in charge of the budget approval by September 2022 at latest, so that budget will be properly allocated for the fiscal year 2023 starting from January 2023.

9-9. Exchange of information regarding related projects

The Solomon Islands side agreed to inform the Japanese side all projects related to the Project, including current and future ones, by Solomon Islands Government's

funds and other donors' funds, during the course of the Project, including this preparatory survey.

These related projects include but not limited to;

- Health projects related to Kilu'ufi Hospital
- Infrastructure projects (power, water, drainage, roads) related to Kilu'ufi Hospital.
- Area development projects surrounding the Kilu'ufi Hospital.

9-10. Gender Mainstreaming

Both sides confirmed that following gender elements shall be duly reflected in the scope of Preparatory Survey.

(a) Collection of information and gender disaggregated data for assessment of gender needs.

(b) Examination of gender-responsive measures based on the assessment, such as:

- ✓ Facility design that reflects gender-specific needs.
- ✓ Selection of equipment that reflects gender-specific needs and ensure usability by women.
- ✓ Implementation of soft-component activities that promote women's empowerment.
- ✓ Collection of gender-disaggregated data for monitoring and evaluation (in case gender-related data is included in the indicators for project objective).

Annex 1 Project Site and Project Component

Annex 2 Organization Chart

Annex 3 Japanese Grant

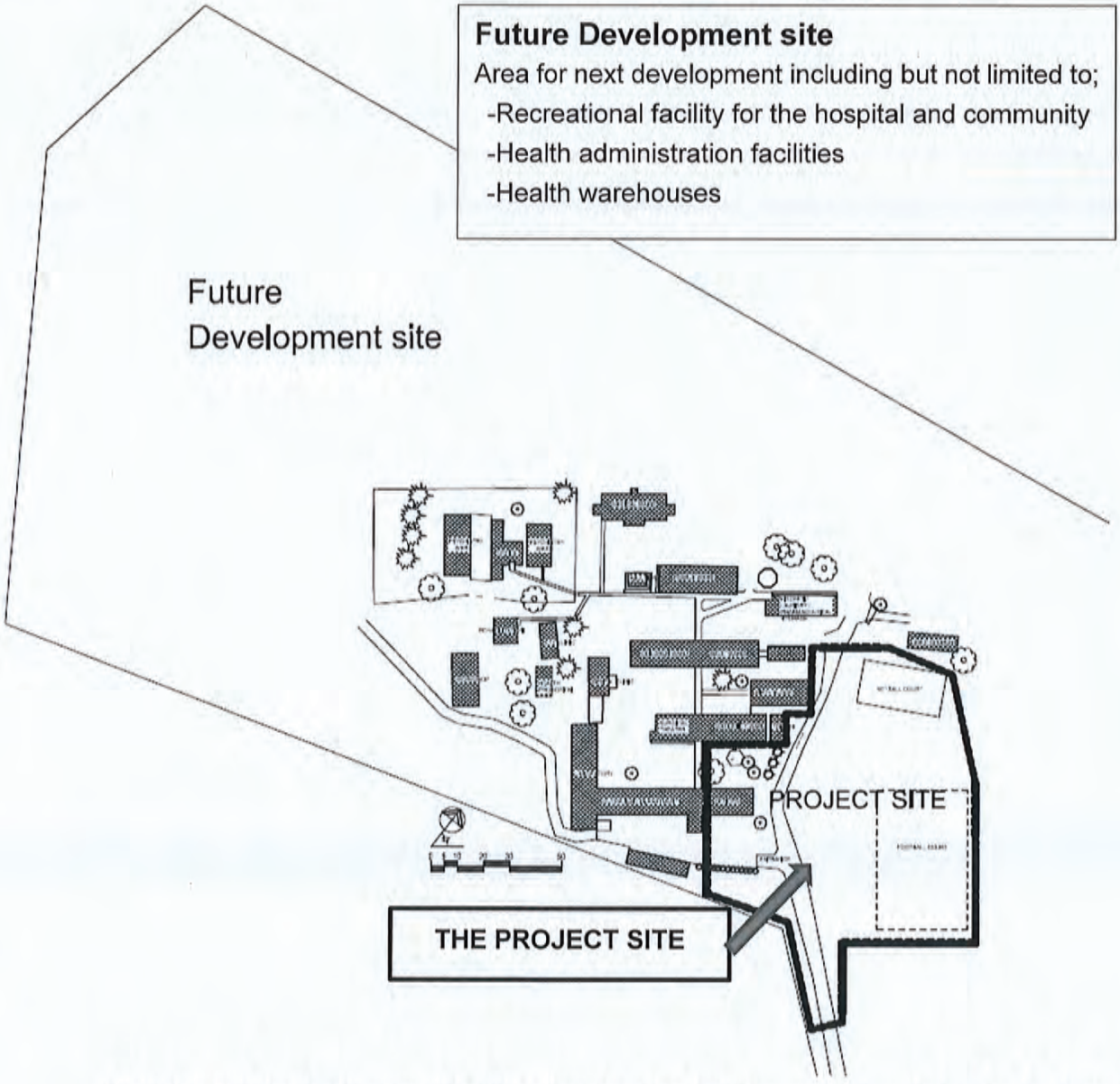
Annex 4 Project Monitoring Report (template)

Annex 5 Major Undertakings to be taken by the Government of Solomon Islands

Annex 1.

Project Site and Project Component

A. Project site



The Solomon Islands side agreed that the administration building can be demolished for the Project if necessary. Japanese side shall draft layout of the new building by the end of May, and discuss further the final extent of the Project site.

B. Project component

LIST of Required Functions according to Master Plan 2016		Priority of the Project
Outpatient	EMERGENCY MEDICINE & GENERAL OUTPATIENT SERVICES	x
Outpatient	REFERRALS & SPECIALIST OUTPATIENT SERVICES	x
Outpatient	DENTAL CLINIC	
Outpatient	REHABILITATION & PHYSIOTHERAPY	
Outpatient	FAMILY PLANNING & REPRODUCTIVE HEALTH	x
Outpatient	PHARMACY	x
Central Diagnosis	MEDICAL IMAGING	x
Central Diagnosis	OPERATING THEATRE SUITE	x
Central Diagnosis	DELIVERY ROOM & SPECIAL CARE NURSERY (SCN)	x
Central Diagnosis	MEDICAL LABORATORY	
Wards	MATERNITY WARD	x
Wards	SURGICAL WARD	x
Wards	PAEDIATRIC WARD	
Wards	Medical WARD	
Wards	ISOLATION WARD	
Administration	MAIN ENTRY / CENTRAL RECEPTION, ADMISSIONS & REVENUE	
Administration	HOSPITAL ADMINISTRATION	
Administration	PROVINCIAL HEALTH ADMINISTRATION	
Administration	BULK MEDICAL / PHARMACEUTICAL STORAGE	
Services	CENTRAL STERILISATION SERVICESSS DEPARTMENT (CSSD)	x
Services	MORTUARY	
Services	KITCHEN	
Services	LAUNDRY	
Services	ENGINEERING (BIOMEDICAL)	
Services	ENGINEERING (MAINTENANCE), GARAGE & PLANT	
Services	WASTE MANAGEMENT	

Above departments marked as "x" shall be the first priority for the buildings to be built using the grant. The maternity ward and surgical ward shall also be included in the first priority of the Project. All these departments may be moved to futhre development in consideration with the total development plan and amount of the grant.

2. Medical equipment plan

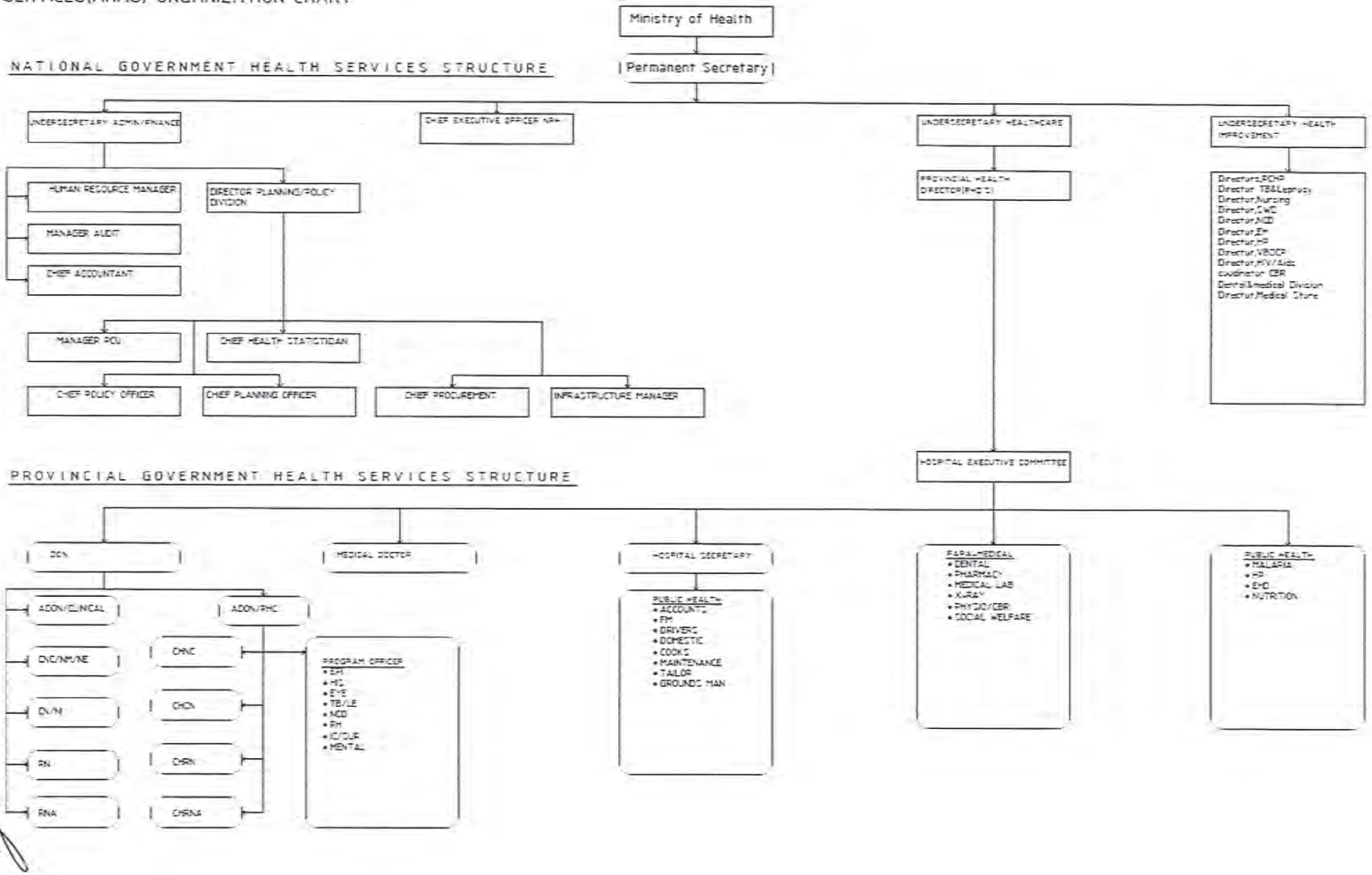
1) Medical equipment for the departments included as the components of the facility shall be basically supplied using the grant. Detail list and quantity shall be studied further.

2) General furniture such as office tables and chairs, wooden beds for duty doctor, etc. and health information system (computers, networks and software) shall be basically supplied by Solomon Islands side.

Annex 2.

Organization chart

MINISTRY OF HEALTH & MEDICAL SERVICES(MHMS) ORGANIZATION CHART



Annex 3

JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as "the Recipient") to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as "Project Grants").

1. Procedures of Project Grants

Project Grants are conducted through following procedures (See "PROCEDURES OF JAPANESE GRANT" for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as "the Survey") conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as "GOJ") and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as "the G/A")

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as "the B/A")

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as "the Bank") to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as "the Project") on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of

relevant agencies of the Recipient necessary for the implementation of the Project.

- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

3. Basic Principles of Project Grants

(1) Implementation Stage

1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."

2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the

Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.

b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.

2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

PROCEDURES OF JAPANESE GRANT

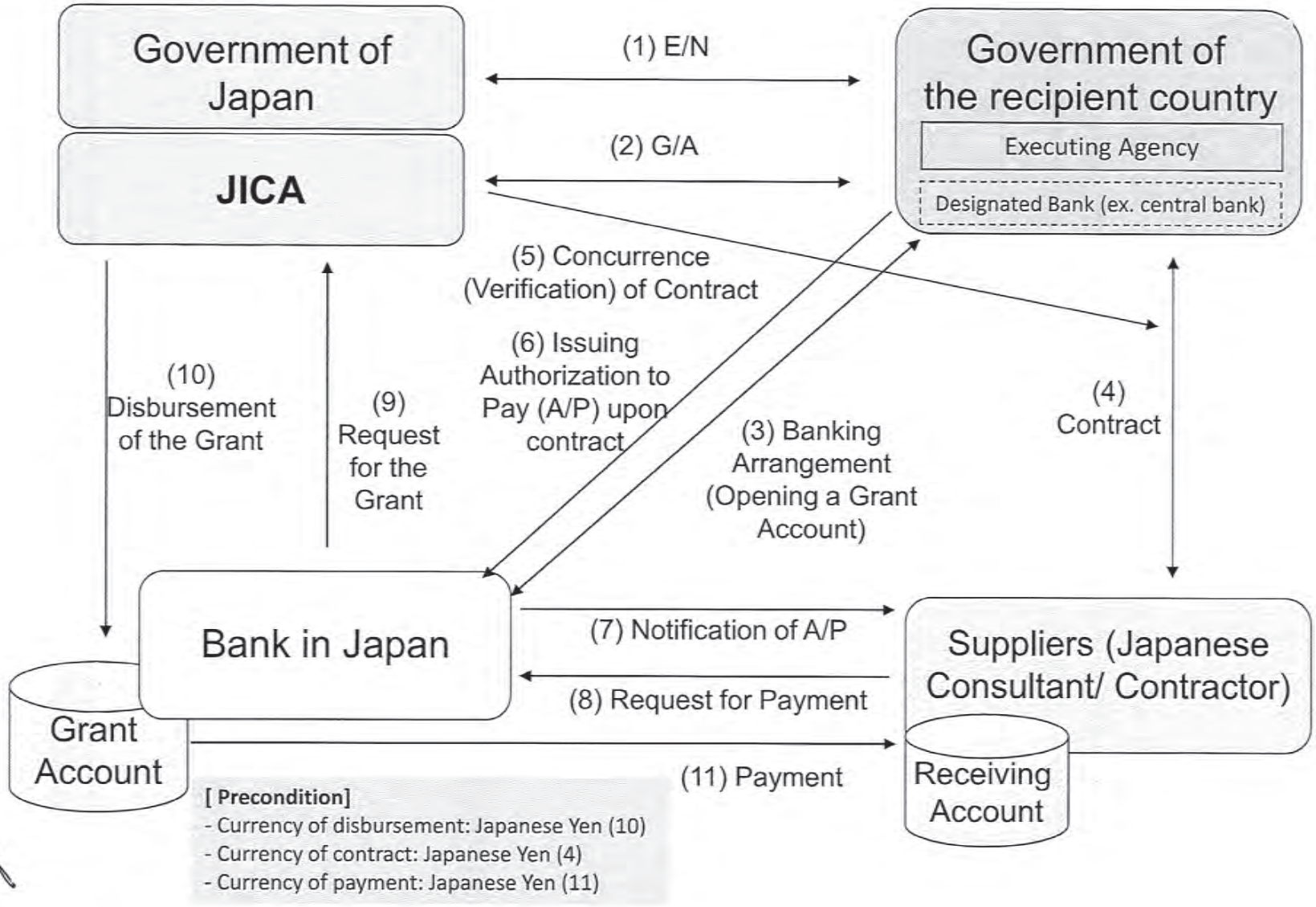
Stage	Procedures	Remarks	Recipient Government	Japanese Government	JICA	Consultants	Contractors	Agent Bank
Official Request	Request for grants through diplomatic channel	Request shall be submitted before appraisal stage.	x	x				
1. Preparation	(1) Preparatory Survey Preparation of outline design and cost estimate		x		x	x		
2. Appraisal	(2)Preparatory Survey Explanation of draft outline design, including cost estimate, undertakings, etc.		x		x	x		
	(3)Agreement on conditions for implementation	Conditions will be explained with the draft notes (E/N) and Grant Agreement (G/A) which will be signed before approval by Japanese government.	x	x (E/N)	x (G/A)			
	(4) Approval by the Japanese cabinet			x				
3. Implementation	(5) Exchange of Notes (E/N)		x	x				
	(6) Signing of Grant Agreement (G/A)		x		x			
	(7) Banking Arrangement (B/A)	Need to be informed to JICA	x					x
	(8) Contracting with consultant and issuance of Authorization to Pay (A/P)	Concurrence by JICA is required	x			x		x
	(9) Detail design (D/D)		x			x		
	(10) Preparation of bidding documents	Concurrence by JICA is required	x			x		
	(11) Bidding	Concurrence by JICA is required	x			x	x	
	(12) Contracting with contractor/supplier and issuance of A/P	Concurrence by JICA is required	x				x	x
	(13) Construction works/procurement	Concurrence by JICA is required for major modification of design and amendment of contracts.	x			x	x	
	(14) Completion certificate		x			x	x	
4. Ex-post monitoring & evaluation	(15) Ex-post monitoring	To be implemented generally after 1, 3, 10 years of completion, subject to change	x		x			
	(16) Ex-post evaluation	To be implemented basically after 3 years of completion	x		x			

notes:

1. Project Monitoring Report and Report for Project Completion shall be submitted to JICA as agreed in the G/A.

2. Concurrence by JICA is required for allocation of grant for remaining amount and/or contingencies as agreed in the G/A.

Financial Flow of Japanese Grant (A/P Type)



Annex 4
G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX

20XX, Month

Organizational Information

Signer of the G/A (Recipient)	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:
Executing Agency	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:
Line Ministry	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:

General Information:

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

1: Project Description

1-1 Project Objective

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitative indicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location

Components	Original *(proposed in the outline design)*	Actual
1.		

2-2 Scope of the work

Components	Original* *(proposed in the outline design)*	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	(proposed in the outline design)	*(at the time of signing the Grant Agreement)*	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (1,000 Taka)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original *(at the time of outline design)* name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
Actual *(PMR)*

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original *(at the time of outline design)*
Actual *(PMR)*

3-2 Budgetary Arrangement

- Required O&M cost and actual budget allocation for O&M

Original *(at the time of outline design)*

Actual *(PMR)*

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks *(at the time of outline design)*

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:

	Contingency Plan (if applicable):
Actual Situation and Countermeasures	
(PMR)	

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant

Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
- Contractor's Main Staff List

4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final)only)
8. Pictures (by JPEG style by CD-R) (PMR (final)only)
9. Equipment List (PMR (final)only)
10. Drawing (PMR (final)only)
11. Report on RD (After project)

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
						Price (Decreased) E=C−D	Price (Increased) F=C+D
1	Item 1	●●t	●	●	●	●	●
2	Item 2	●●t	●	●	●		
3	Item 3						
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st ●month, 2015	2nd ●month, 2015	3rd ●month, 2015	4th	5th	6th
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

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Attachment 7

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

Annex 5

Major Undertakings to be taken by the Government of Solomon Islands

Specific obligations of the Government of Solomon Islands which will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To sign the banking arrangement (B/A) with a bank in Japan (the Agent Bank) to open bank account for the Grant	within 1 month after the signing of the G/A	MOF		
2	To issue A/P to the Agent Bank for the payment to the consultant	within 1 month after the signing of the contract(s)	MOF		
3	To bear the following commissions to the Agent Bank for the banking services based upon B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	MHMS		
	2) Payment commission for A/P	every payment	MHMS		
4	To approve IEE/EIA (Conditions of approval should be fulfilled, if any) and secure the necessary budget for implementation for EMP and EMoP (and fulfilling conditions of approval, if any).	within 1 month after the signing of the G/A	MHMS		
5	To secure the following lands 1) the Project site for the new building 2) temporary construction yard and stock yard near the Project site 3) borrow pit and disposal site near the Project site	1 month before notice of the bidding documents	MHMS		
6	To obtain the planning, zoning, building permit	1 month before notice of the bidding documents	MHMS		
7	To clear, level and reclaim the Project site by taking measures as follows 1) Relocation of power, water, city gas, sewage and storm water line, and any other on-site infrastructure which are in the new building area, if applicable 2) Removal of trees 3) Removal or relocation of building/shed and/or any things which may be obstacleon the Project site 4) Clear the existing rooms and their surroundings by relocation/ removal of existing equipment where the work to be held as a part of the Project	1 month before notice of the bidding documents	MHMS		
8	To submit Project Monitoring Report (with the result of Detailed Design)	before preparation of the bidding documents	MHMS		

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To issue A/P to the Agent Bank for the payment to the supplier and the contractor	within 1 month after the signing of the contract(s)	MHMS		
2	To bear the following commissions to the Agent Bank for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	MHMS		
	2) Payment commission for A/P	every payment	MHMS		
3	to ensure prompt unloading and customs clearance at ports of disembarkation in the country of the Recipient and to assist the Supplier(s) with internal transportation therein	during the Project	MHMS		
4	To accord Japanese physical persons and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the country of the Recipient and stay therein for the performance of their work	during the Project	MHMS		
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and/or the services be exempted	during the Project	MHMS		
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	MHMS		
7	To notify JICA promptly of any incident or accident, which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers.	during the construction	MHMS		
8	1) To submit Project Monitoring Report	every month	MHMS		
	2) To submit Project Monitoring Report (final) (including as-built drawings, equipment list, photographs, etc.)	within 1 month after issuance of Certificate of Completion for the works under the contract(s)	MHMS		
9	To submit a report concerning completion of the Project	within 6 months after completion of the Project	MHMS		
10	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the site(s)				
	1) Electricity The distributing line to the site	before start of the construction	MHMS		
	2) Water Supply To secure second source of water which may be the existing borehole or a new borehole. A proper survey including water capacity and water quality shall be completed for these boreholes.	before start of the construction	MHMS		
	3) Drainage The city drainage main (for storm, sewer and others) to the site	6 months before completion of the construction	MHMS		
11	To provide equipment, furniture, facilities necessary for the implementation of the Project in the site(s) General furniture for TBD	before start of the construction	MHMS		
	Equipment for TBD	before start of the construction	MHMS		

12	To ensure the safety of persons engaged in the implementation of the Project	during the Project	MHMS		
13	To take necessary measures for security and safety of the Project site (measures for security) 1) Security facilities (security fence, security gate, lighting system, CCTV camera, security guard accommodation etc) 2) Deployment of security guard at the Project site 3) Proper gate control of the Project site 4) Deployment of police/armed guard at the Project site 5) Security escort for the persons related to the Project when commuting to the Project site (measures for safety) 6) maintaining the safety of workers and the general public by thorough implementation of safety measures and immediate action in the case of accident 7) traffic control around the site(s) and on transportation routes of construction materials 8) installation of fences around the site(s)	during the construction	MHMS		
14	To assign and train necessary staff to operate and maintain the improved hospital. 1) Assign additional medical, administrative and service personel to operate and maintain the improved facility. 2) Provide necessary training to the all the staff. 3) If there are any technical assistance program for the Project, assign appropriate counterpart or trainee for the program.				

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection 4) Conduct maintenance service contract for some equipments	After completion of the construction	MHMS		

(A/P: Authorization to Pay, B/A: Banking Arrangement, EIA: Environmental Impact Assessment, G/A: Grant Agreement, IEE: Initial Environmental Examination, MOF: Ministry of Finance, MHMS: Ministry of Health and Medical Services)

4-2. Explanation of Draft Report M/D

Minutes of Discussions
on the Preparatory Survey for the Project for
Improvement of Kilu'ufi Hospital
(Explanation on Draft Preparatory Survey Report)

With reference to the minutes of discussions signed between the Ministry of Health and Medical Services and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on 28 April, 2022 and in response to the request from the Government of Solomon Islands dated 6 April, 2020, JICA dispatched the Preparatory Survey Team (hereinafter referred to as "the Team") for the explanation of Draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") for the Project for Improvement of Kilu'ufi Hospital (hereinafter referred to as "the Project").

As a result of the discussions, both sides agreed on the main items described in the attached sheets.

Honiara, 12 January, 2023

Ms. ITO Akiko
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Ms. Pauline McNeil
Permanent Secretary
Ministry of Health and Medical Services
Solomon Islands Government

Witness

Dr. Rex Maukera
Malaita Province Health Director (acting)
Kilu'ufi Hospital

ATTACHMENT

1. Objective of the Project

   The objective of the Project is to strengthen the function of Kilu'ufi Hospital by establishing the new central clinical building and delivery building and updating its medical equipment, thereby contributing to improvement of health services provided in Malaita Province.

2. Title of the Preparatory Survey

   Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for Improvement of Kilu'ufi Hospital".

3. Project site

   Both sides confirmed that the site of the Project is shown in Annex 1.

4. Responsible authority for the Project

   Both sides confirmed the authorities responsible for the Project are as follows:
   The Ministry of Health and Medical Services will be an executing agency for the Project (hereinafter referred to as "the Executing Agency"). The Executing Agency shall coordinate with all the relevant authorities to ensure smooth implementation of the Project and ensure that the undertakings for the Project shall be managed by relevant authorities properly and on time. The organization charts are shown in Annex 2.

5. Contents of the Draft Report

   After the explanation of the contents of the Draft Report by the Team, the Solomon Islands side agreed to its contents. JICA will finalize the Preparatory Survey Report based on the confirmed items. The report will be sent to the Solomon Islands side around June 2023.

6. Cost estimate

   Both sides confirmed that the cost estimate including the contingency explained by the Team is provisional and will be examined further by the Government of Japan for its approval. The contingency would cover the additional cost against natural disaster, unexpected natural conditions, etc.

7. Confidentiality of the cost estimate and technical specifications
Both sides confirmed that the cost estimate and technical specifications of the Project should never be disclosed to any third parties until all the contracts under the Project are concluded.

8. Procedures and Basic Principles of Japanese Grant
The Solomon Islands side agreed that the procedures and basic principles of Japanese Grant (hereinafter referred to as "the Grant") as described in Annex 3 shall be applied to the Project. In addition, the Solomon Islands side agreed to take necessary measures according to the procedures.

9. Timeline for the project implementation
The Team explained to the Solomon Islands side that the expected timeline for the project implementation is as attached in Annex 4.

10. Expected outcomes and indicators
Both sides agreed that key indicators for expected outcomes are as follows. The Solomon Islands side will be responsible for the achievement of agreed key indicators targeted in year 2028 and shall monitor the progress for Ex-Post Evaluation based on those indicators.

[Quantitative indicators]

Indicator	Baseline (2019)	Target (2028) (3 years after the Project completion)
The number of outpatients (cases/year)	13,397	16,000
The number of X-ray examination (cases/year)	2,399	4,100
The number of ultrasound examination (cases/year)	2,505	4,100

[Qualitative indicators]
(1) The improvement and optimization in medical services by better medical service flow and well maintained, equipped facilities.
(2) The improvement of healthcare-associated infection control by appropriate facility air circulation, hand-washing and hygienic zoning.
(3) The increased satisfaction and confidence of patients and healthcare workers in

medical services.

11. Ex-Post Evaluation

JICA will conduct ex-post evaluation after three (3) years from the project completion, in principle, with respect to six evaluation criteria (Relevance, Coherence, Effectiveness, Efficiency, Impact, Sustainability). The result of the evaluation will be publicized. The Solomon Islands side is required to provide necessary support for the data collection.

12. Technical assistance ("Soft Component" of the Project)

Considering the sustainable operation and maintenance of the products and services granted through the Project, following technical assistance is planned under the Project: Technical training on operation and maintenance, and safe usage of provided medical equipment for hospital staff. The Solomon Islands side confirmed to deploy necessary number of counterparts who are appropriate and competent in terms of its purpose of the technical assistance as described in the Draft Report.

13. Undertakings of the Project

Both sides confirmed the undertakings of the Project as described in Annex 5. The Solomon Islands side assured to take the necessary measures and coordination including allocation of the necessary budget which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage. Both sides also confirmed that Annex 5 will be used as an attachment of G/A.

13-1. Tax exemption

With regard to exemption of customs duties, internal taxes and other fiscal levies as stipulated in (2) 5 of Annex 5, both sides confirmed that such customs duties, internal taxes and other fiscal levies, which shall be clarified in the bid documents by Ministry of Health and Medical Services during the implementation stage of the Project.

13-2. Necessary staffing and budget allocation for hospital operation

In order to properly operate the hospital with newly established facilities, it is estimated to require to be staffed with additional four (4) specialists, three (3) general doctors, five (5) nurses, one (1) medical imaging engineer, one (1) biomedical engineer and two (2) medical clerks. The cost necessary for the additional 16 staff

members is estimated at SBD1,905,480.00. The Solomon Islands side assured to ensure the staffing plan to be fulfilled by the year 2026.

14. Monitoring during the implementation

The Project will be monitored by the Executing Agency and reported to JICA by using the form of Project Monitoring Report (PMR) attached as Annex 6. The timing of submission of the PMR is described in Annex 5.

15. Project completion

Both sides confirmed that the project completes when all the facilities constructed and equipment procured by the Grant are in operation. The completion of the Project will be reported to JICA promptly by the Executing Agency, but in any event not later than six months after completion of the Project.

16. Environmental and Social Considerations

16-1. General Issues

16-1-1. Environmental Guidelines and Environmental Category

The Team explained that 'JICA Guidelines for Environmental and Social Considerations (April 2010)' (hereinafter referred to as "the Guidelines") is applicable for the Project. The Project is categorized as C because the Project is likely to have minimal adverse impact on the environment under the Guidelines.

17. Other Relevant Issues

17-1. Disclosure of Information

Both sides confirmed that the Preparatory Survey Report from which project cost is excluded will be disclosed to the public after completion of the Preparatory Survey. The comprehensive report including the project cost will be disclosed to the public after all the contracts under the Project are concluded.

17-2. Gender Mainstreaming

Both sides confirmed that gender mainstreaming should be duly practiced for the Project. In particular, both sides agreed on the following gender elements to be integrated into the Project.

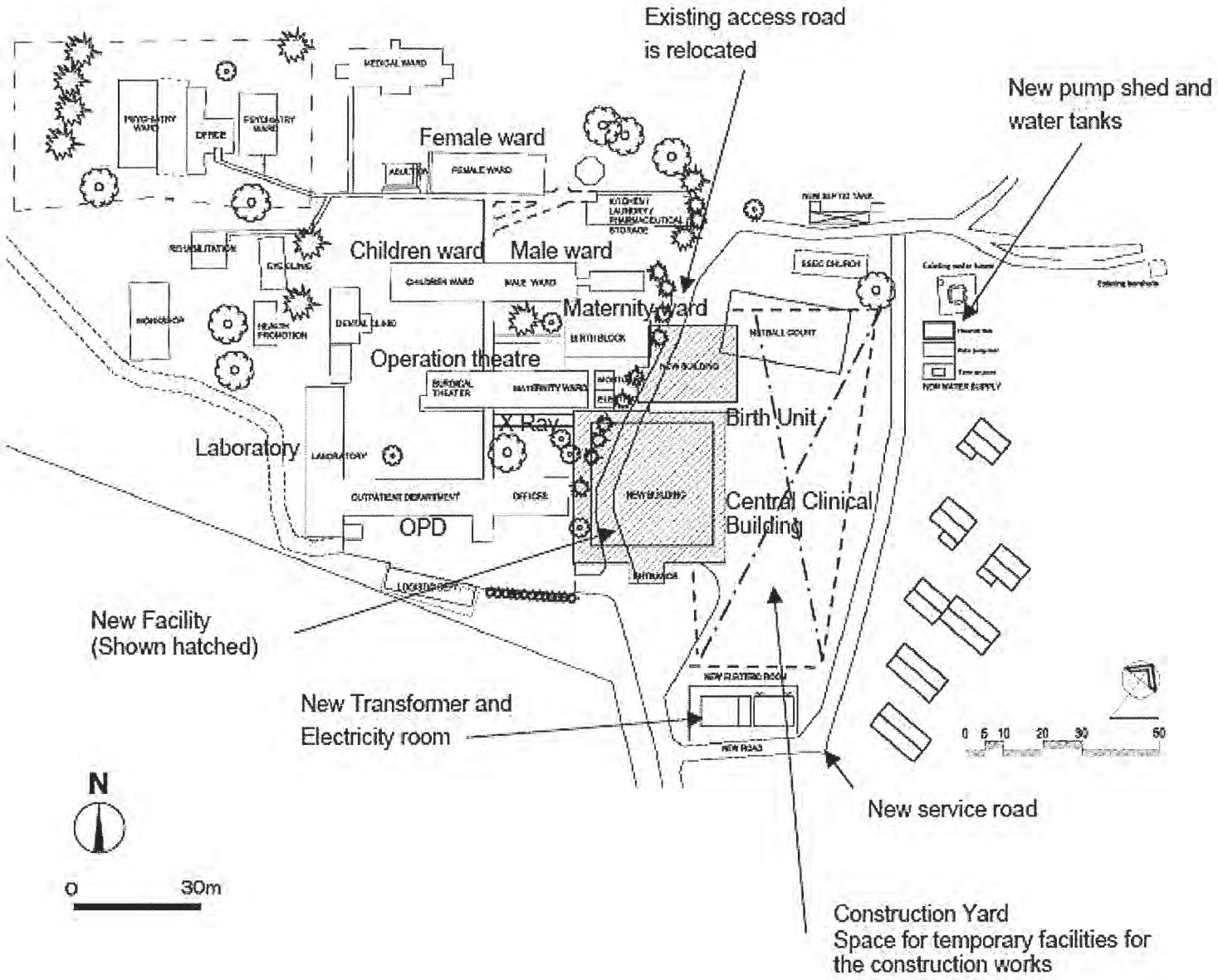
- Facility design that reflects gender-specific needs.

17-3. Equitable Access

Both sides confirmed that universal access should be in consideration of the facility design to ensure equitable access across the community.

Annex 1 Project Site
Annex 2 Organization Chart
Annex 3 Japanese Grant
Annex 4 Project Implementation Schedule
Annex 5 Major Undertakings to be taken by the Government of Solomon Islands
Annex 6 Project Monitoring Report (template)

Annex 1

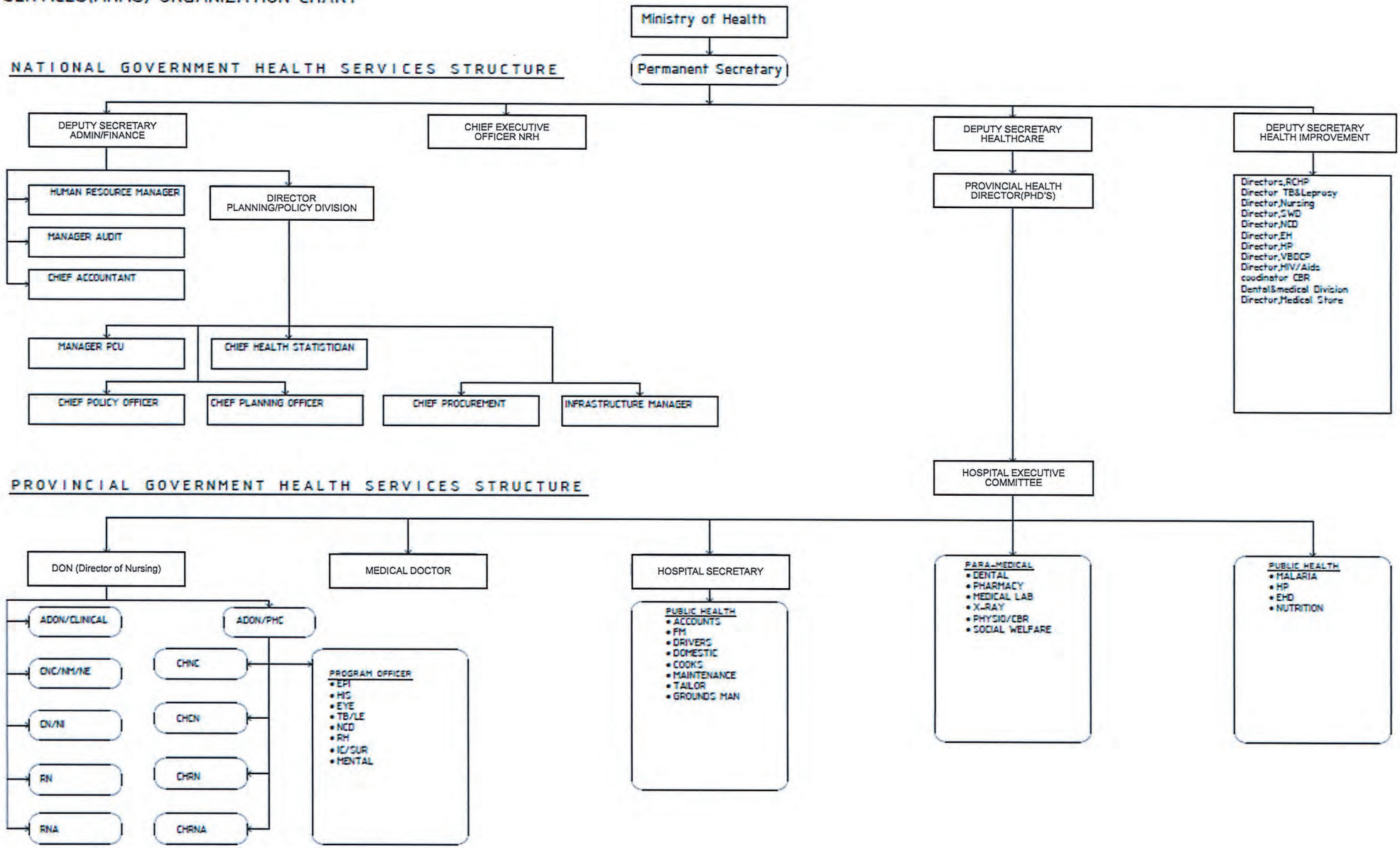


Kilu'ufi Hospital and location of New Facility

Annex 2

Organization chart

MINISTRY OF HEALTH & MEDICAL SERVICES(MHMS) ORGANIZATION CHART



JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as "the Recipient") to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as "Project Grants").

1. Procedures of Project Grants

Project Grants are conducted through following procedures (See "PROCEDURES OF JAPANESE GRANT" for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as "the Survey") conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as "GOJ") and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as "the G/A")

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as "the B/A")

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as "the Bank") to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as "the Project") on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of

relevant agencies of the Recipient necessary for the implementation of the Project.

- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

3. Basic Principles of Project Grants

(1) Implementation Stage

1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."

2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the

Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.

b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.

2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

PROCEDURES OF JAPANESE GRANT

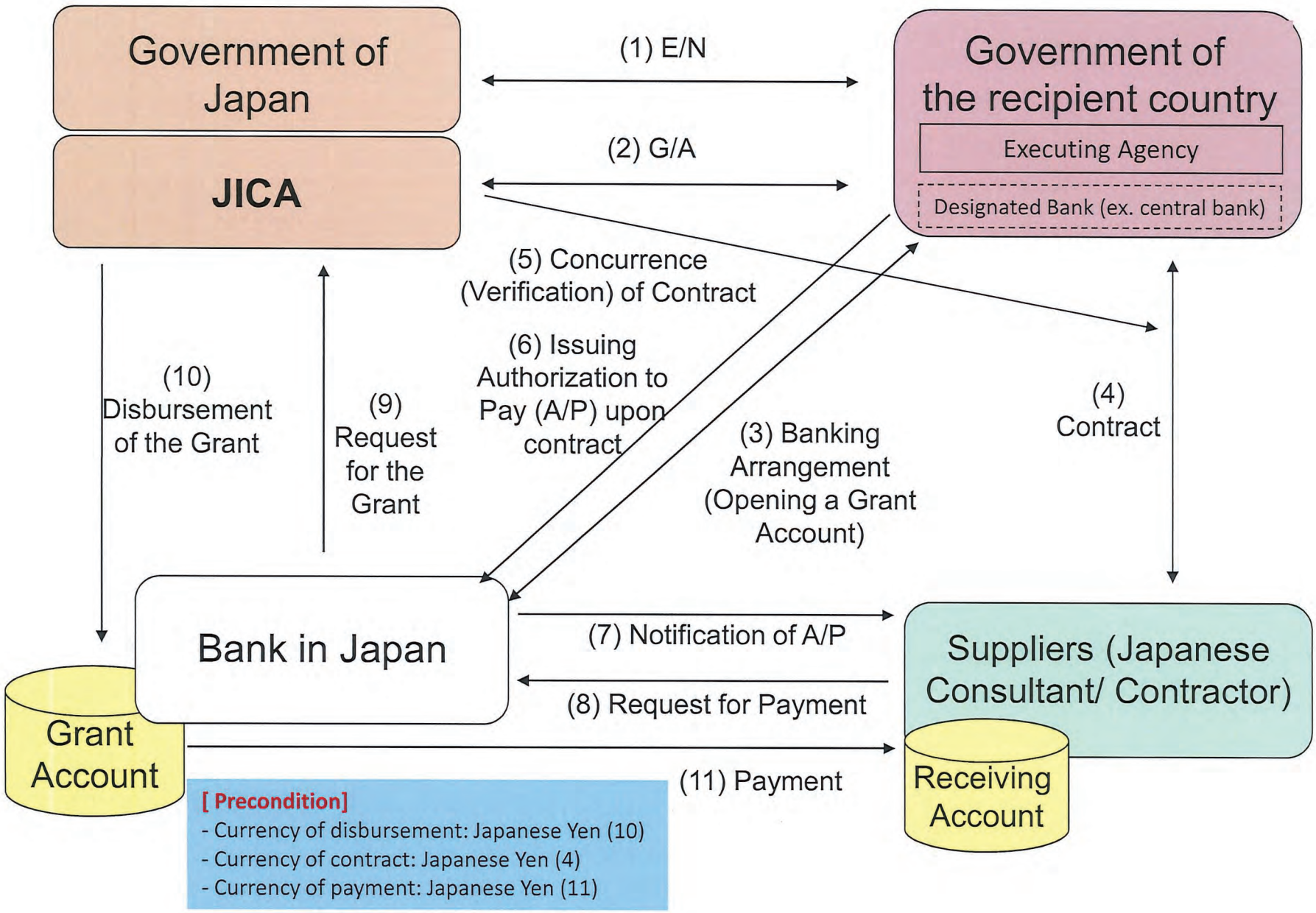
Stage	Procedures	Remarks	Recipient Government	Japanese Government	JICA	Consultants	Contractors	Agent Bank
Official Request	Request for grants through diplomatic channel	Request shall be submitted before appraisal stage.	x	x				
1. Preparation	(1) Preparatory Survey Preparation of outline design and cost estimate		x		x	x		
2. Appraisal	(2)Preparatory Survey Explanation of draft outline design, including cost estimate, undertakings, etc.		x		x	x		
	(3)Agreement on conditions for implementation	Conditions will be explained with the draft notes (E/N) and Grant Agreement (G/A) which will be signed before approval by Japanese government.	x	x (E/N)	x (G/A)			
	(4) Approval by the Japanese cabinet			x				
3. Implementation	(5) Exchange of Notes (E/N)		x	x				
	(6) Signing of Grant Agreement (G/A)		x		x			
	(7) Banking Arrangement (B/A)	Need to be informed to JICA	x					x
	(8) Contracting with consultant and issuance of Authorization to Pay (A/P)	Concurrence by JICA is required	x			x		x
	(9) Detail design (D/D)		x			x		
	(10) Preparation of bidding documents	Concurrence by JICA is required	x			x		
	(11) Bidding	Concurrence by JICA is required	x			x	x	
	(12) Contracting with contractor/supplier and issuance of A/P	Concurrence by JICA is required	x				x	x
	(13) Construction works/procurement	Concurrence by JICA is required for major modification of design and amendment of contracts.	x			x	x	
	(14) Completion certificate		x			x	x	
4. Ex-post monitoring & evaluation	(15) Ex-post monitoring	To be implemented generally after 1, 3, 10 years of completion, subject to change	x		x			
	(16) Ex-post evaluation	To be implemented basically after 3 years of completion	x		x			

notes:

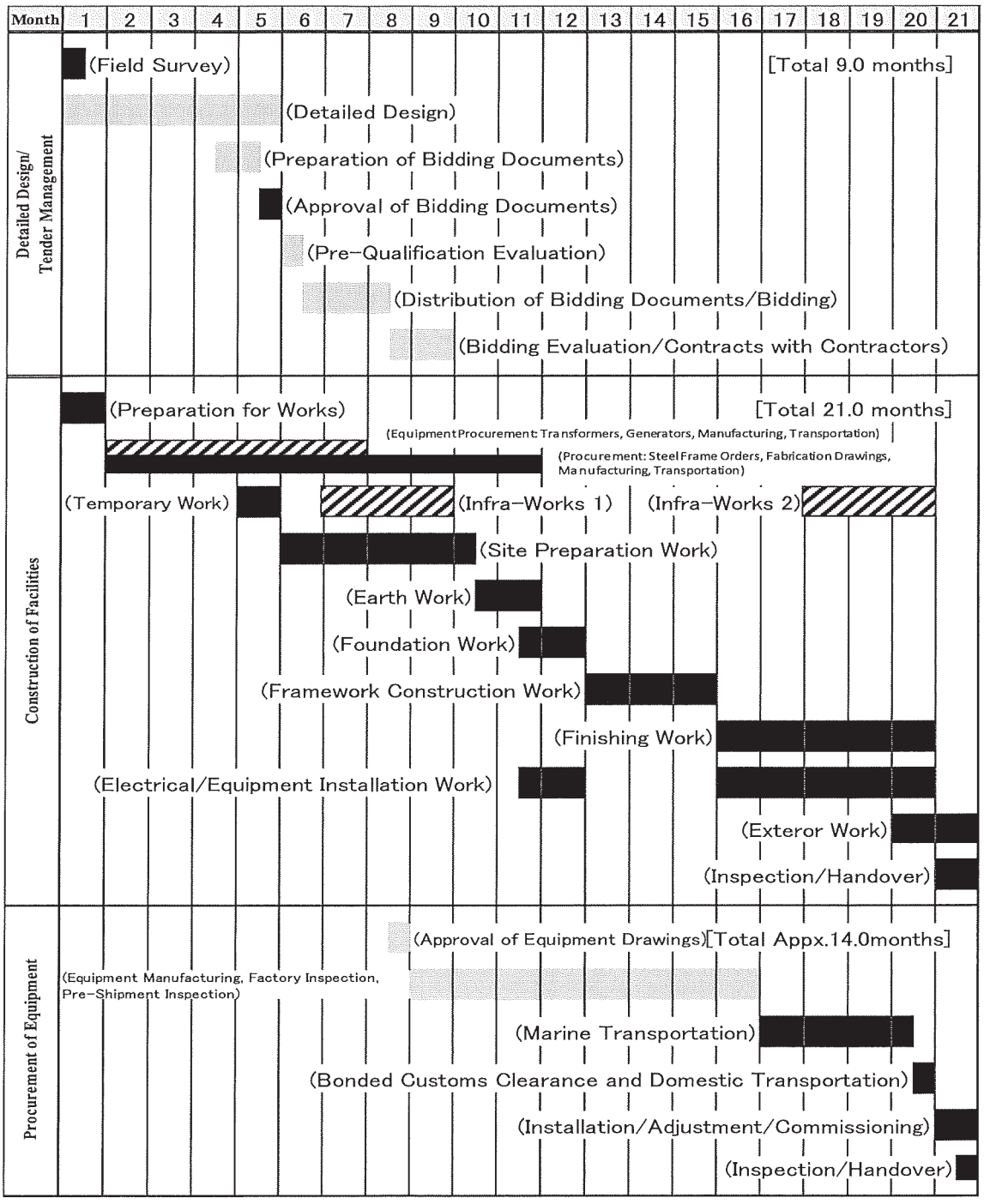
1. Project Monitoring Report and Report for Project Completion shall be submitted to JICA as agreed in the G/A.

2. Concurrence by JICA is required for allocation of grant for remaining amount and/or contingencies as agreed in the G/A.

Financial Flow of Japanese Grant (A/P Type)



Project Implementation Schedule



Work in SI

Work in Japan

Infra-Works 1 : Installation of new transformer, power switching, removal of existing transformer

Infra-Works 2 : Transportation of materials for main power transmission and distribution, installation and switching of new poles, removal of temporary poles

Annex 5

Major Undertakings to be taken by the Government of Solomon Islands

1. Specific obligations of the Government of Solomon Islands which will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost (SBD)	Ref.
1	To sign the banking arrangement (B/A) with a bank in Japan (the Agent Bank) to open bank account for the Grant	within 1 month after the signing of the G/A	MOF	130,000	
2	To issue A/P to the Agent Bank for the payment to the consultant	within 1 month after the signing of the contract(s)			
3	Bank commission To bear the following commissions to the Agent Bank for the banking services based upon B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)			
	2) Payment commission for A/P	every payment			
4	Administration costs Costs for local consultants for the project implementation, including environmental impact assessment reports as following. To approve IEE/EIA (Conditions of approval should be fulfilled, if any) and secure the necessary budget for implementation for EMP and EMoP (and fulfilling conditions of approval, if any).	within 1 month after the signing of the G/A	MHMS	100,000	
5	To secure the following lands 1) the Project site for the new building 2) temporary construction yard and stock yard near the Project site 3) borrow pit and disposal site near the Project site	1 month before notice of the bidding documents	MHMS		
6-1	Building permission fees Application fee for the development permit to relevant authority (Malaita Provincial Government)	1 month before notice of the bidding documents	MHMS	1,500	
6-2	Construction permission fees Application fee for the building permit to relevant authority	Upon commencement of construction	MHMS	4,500	
7	Site Preparation Cost for the preparation of the Project site, such as cutting trees within the proposed construction area. Following items may apply if it is not included in the scope of work of the Japanese side. 1) Relocation of power, water, city gas, sewage and storm water line, and any other on-site infrastructure which are in the new building area, if applicable 2) Removal or relocation of building/shed and/or any things which may be obstacle on the Project site	1 month before notice of the bidding documents	MHMS	50,000	
8	To submit Project Monitoring Report (with the result of Detailed Design)	before preparation of the bidding documents	MHMS		

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost (SBD)	Ref.
1	To issue A/P to the Agent Bank for the payment to the supplier and the contractor	within 1 month after the signing of the contract(s)	MOF	Included in (1) 1 to 3, total SBD 130,000	
2	To bear the following commissions to the Agent Bank for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)			
	2) Payment commission for A/P	every payment			
3	To ensure prompt unloading and customs clearance at ports of disembarkation in the country of the Recipient and to assist the Supplier(s) with internal transportation therein	during the Project	MHMS		
4	To accord Japanese physical persons and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the country of the Recipient and stay therein for the performance of their work	during the Project	MHMS		
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and/or the services be exempted	during the Project	MHMS		
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	MHMS		
7	To notify JICA promptly of any incident or accident, which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers.	during the construction	MHMS		
8	Administration costs Staff costs. Preparation of project monitoring reports required according to JICA guidelines 1) To submit Project Monitoring Report	every month	MHMS	Administration staff cost 240,000	
	2) To submit Project Monitoring Report (final) (including as-built drawings, equipment list, photographs, etc.)	within 1 month after issuance of Certificate of Completion for the works under the contract(s)			
9	To submit a report concerning completion of the Project	within 6 months after completion of the Project			
10	Medical equipment To provide medical equipment not included in the scope of the Grant Aid project (carts, consumables, etc) for the implementation of the Project	before start of the construction	MHMS	300,000	
11	Furniture and fixtures To provide office furniture and other general furniture, office stationery, etc. for the implementation of the Project	before start of the construction	MHMS	300,000	

12	To ensure the safety of persons engaged in the implementation of the Project	during the Project	MHMS		
13	To take necessary measures for security and safety of the Project site	during the construction	MHMS		
14	To assign and train necessary staff to operate and maintain the improved hospital. 1) Assign additional medical, administrative and service personel to operate and maintain the improved facility. 2) Provide necessary training to the all the staff. 3) If there are any technical assistance program for the Project, assign appropriate counterpart or trainee for the program.	by the year 2026	MHMS	1,905,480	

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost (SBD)	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection 4) Conduct maintenance service contract for some equipments	after completion of the construction	MHMS	3,000,000	

(A/P: Authorization to Pay, B/A: Banking Arrangement, EIA: Environmental Impact Assessment, G/A: Grant Agreement, IEE: Initial Environmental Examination, MOF: Ministry of Finance, MHMS: Ministry of Health and Medical Services)

*Contingency shall be added to the above estimated cost by the Government of Solomon Islands. The above estimates do not include the following items.

a. Hospital Information Technology (IT): Costs for the development of various types of IT (e.g. electronic medical record, online reservations, etc.), software, servers, etc. to support hospital medical services and the administrative management.
b. The consecutive development project cost: Construction of new ward buildings is urgently required. Construction of the new community field in the northwest area of the site is also required.

2. Other obligations of the Government of the Government of Solomon Islands funded with the Grant

NO	Items	Deadline	Amount (Million Japanese Yen)*
1	To construct the facility and to procure equipment - Construction of the central clinical building 1) To conduct the following transportation a) Marine and /or Air transportation of the products from Japan to the country of the Recipient b) Internal transportation from the port of disembarkation to the project site		
	2) To construct access roads a) Within the site		
	3) To construct the temporary building		
	5) To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities a) Electricity - The drop wiring and internal wiring within the site - The main circuit breaker and transformer b) Water Supply - The supply system within the site (receiving and/or elevated tanks) c) Drainage - The drainage system (for toilet sewer, ordinary waster, storm drainage and others) within the site d) Furniture and Equipment - Project equipment		
2	To implement detailed design, bidding support and construction supervision (Consulting Service)		
3	Contingencies		

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX

20XX, Month

Organizational Information

Signer of the G/A (Recipient)	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:
Executing Agency	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:
Line Ministry	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:

General Information:

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

1: Project Description

1-1 Project Objective

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitative indicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location

Components	Original *(proposed in the outline design)*	Actual
1.		

2-2 Scope of the work

Components	Original* *(proposed in the outline design)*	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	(proposed in the outline design)	*(at the time of signing the Grant Agreement)*	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (1,000 Taka)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original *(at the time of outline design)* name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
Actual *(PMR)*

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original *(at the time of outline design)*
Actual *(PMR)*

3-2 Budgetary Arrangement

- Required O&M cost and actual budget allocation for O&M

Original *(at the time of outline design)*

Actual *(PMR)*

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks *(at the time of outline design)*

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:

	Contingency Plan (if applicable):
Actual Situation and Countermeasures	
(PMR)	

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant

Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
- Contractor's Main Staff List

4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final)only)
8. Pictures (by JPEG style by CD-R) (PMR (final)only)
9. Equipment List (PMR (final)only)
10. Drawing (PMR (final)only)
11. Report on RD (After project)
12. Report on the Management of Safety for Construction Works

Attachment 6

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
						Price (Decreased) E=C−D	Price (Increased) F=C+D
1	Item 1	●●t	●	●	●	●	●
2	Item 2	●●t	●	●	●		
3	Item 3						
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st ●month, 2015	2nd ●month, 2015	3rd ●month, 2015	4th	5th	6th
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

-
-
-

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

Report on the Management of Safety for Construction Works

Month/Year 2022 年×月	Cumulative number of labor 労働延人数	Cumulative number of public accident 公衆災害件数	Cumulative hours worked 延べ実労働時間数	Number of deaths and injuries due to industrial accidents 労働災害による死傷者				Frequency rate 度数率	Severity rate 強度率
					Death and injuries 死傷者数	Aggregated number of calendar days absent 延べ休業日数	Aggregated number of work-days lost 延べ労働損失日数		
This Month 当月				Death 死者					
				More than 4 calendar days absent 休業 4 日以上					
				1 to 3 calendar days absent 休業 1～3 日					
				Total 計					
Total including this month 当月迄累計				Death 死者					
				More than 4 calendar days absent 休業 4 日以上					
				1 to 3 calendar days absent 休業 1～3 日					
				Total 計					

Note 注)

1. Frequency rate is the frequency of occurrence of industrial accidents.
   Frequency rate = (Number of deaths and injuries due to industrial accidents ÷ Cumulative hours worked) × 1,000,000
   度数率＝（労働災害による死傷者数÷延べ実労働時間数）×100 万時間
2. Severity rate is degree of seriousness of the industrial accident.
   Severity rate = (Aggregated number of work-days lost ÷ Cumulative hours worked) × 1,000
   強度率＝（延べ労働損失日数÷延べ実労働時間数）1000 時間
3. Aggregated number of work-days lost = Aggregated number of calendar days absent ×(300÷365)
   Death（7,500 days）: death as a result of an industrial accident includes not only instantaneous death but also death as a result of occupational injury or disease.
   延べ労働損失日数＝延べ休業日数×（300÷365）・・・死亡 7500 日（即死のほか負傷が原因で死亡したものを含む）
4. Frequency rate and severity rate are rounding off the third decimal place.
   度数率・強度率は小数点第 3 位以下四捨五入

5. Technical Notes

5. Technical Notes

Technical Notes of Discussions
on the Preparatory Survey for
The Project for Construction of Kilu'ufi Hospital

In response to the request from the Government of Solomon Islands, Japan International Cooperation Agency (hereinafter referred to as "JICA") organized the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") of the Project for The Project for Construction of Kilu'ufi Hospital (hereinafter referred to as "the Project") to Solomon Islands. The Team held a series of discussions with the officials of the Government of Solomon Islands and conducted a second field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Honiara, June 16th, 2022

Mr. Hironori Komatsu
Infrastructure Plan
Preparatory Survey Team
Yachiyo Engineering Co., Ltd.

Ms. Pauline McNeil
Permanent Secretary
Ministry of Health and Medical Services
Solomon Islands Government

Auki, June 14th, 2022

Dr. Rex Maukera
Director
Kilu'ufi Hospital

ATTACHMENT

1. Technical items requested by the Government of Solomon Islands

1-1. As a result of technical discussions, both sides confirmed that the technical items requested by the Government of Solomon Islands are as in the following annexes.

1-2. Team will assess the feasibility of the above requested technical items through the survey and will report the findings to JICA and the Government of Japan. The final scope of the Project will be decided by the Government of Japan.

2. Outline of the facility is shown in Annex 1.

3. Construction area and temporary road are shown in Annex 2

4. Infrastructure Plan

Request for the improvement of the infrastructure including following items is shown in Annex 3.

a. water supply plan

Objective: Stabilize the water supply to the hospital for 24/365 continuous water supply.

Renovate the water supply back to double water source, one is water from slow flowing stream and the other is the borehole.

1) Slow flowing stream:
   - Renovate the pumping system to 24/365 continuous water system.
2) Borehole
   - Repair the broken pump system to 24/365 continuous water system.

The Hospital submitted the "Design Report for Kilu'ufi Hospital Water Supply Rehabilitation dated 24th May, 2020 (RWASH PROGRAM report)" as progress of obligations (survey of the borehole to assess, water capacity and quality test, alternative water source information) by the Solomon Islands side as noted in the minutes of the discussion concluded on 28th April, 2022.

This RWASH PROGRAM report does not include data for the water capacity and water quality which is necessary to assess whether the borehole can be used again with new pumping facilities.

The Solomon Islands side agreed to conduct survey of the borehole including these data. This survey shall be completed and reported to the Team **by the middle of July 2022**.

b. power supply plan

The existing power supply system for the Kilu'ufi Hospital and draft plan for the Project is shown in Annex 3. This includes relocation works of some existing facilities necessary for the Project implementation.

The Solomon Islands side requests that this re-location of the power supply line, together with the transformers to be covered by the Japan side according to the discussion with the 1st Team on April 2022.

The Solomon Islands side agreed to discuss with SIEA (trading as Solomon Power), and get cost estimation for the relocation **by the end of July 2022**.

c. drainage and sewage plans

The Solomon Islands side requests new septic tank for the new building.

5. Equipment list is shown in Annex 4

END

Annex 1 Outline of the facility

Annex 2 Construction area and temporary road

Annex 3 Infrastructure plan

Annex 4 Equipment plan

Annex 1

Building floor area summary

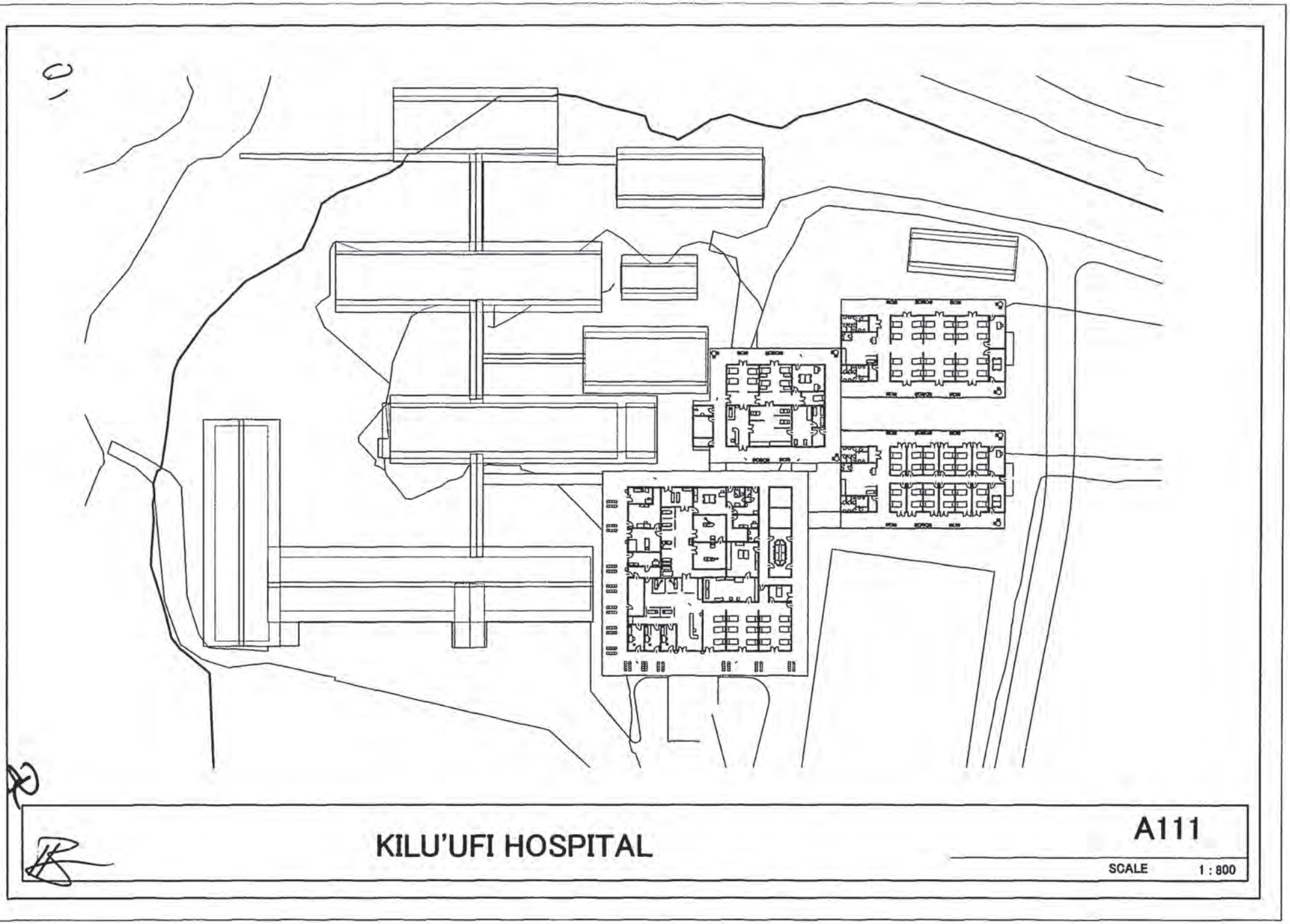
			Floor area	m2
1	Central Building	EMERGENCY MEDICINE & GENERAL OUTPATIENT SERVICES	750	
		MEDICAL IMAGING	70	
		OPERATING THEATRE SUITE	260	
		CENTRAL STERILISATION SERVICESSS DEPARTMENT (CSSD)	70	
		Room area total	1,150	
		Circulation area	260	
		Total floor area		1,410
2	Maternity Building	DELIVERY ROOM & SPECIAL CARE NURSERY (SCN)	300	
		Circulation area	270	
		Total floor area		570
3	Maternity ward	MATERNITY WARD	330	
		Circulation area	220	
		Total floor area		550
4	Surgical ward	SURGICAL WARD	330	
		Circulation area	220	
		Total floor area		550
5	Mechanical plant	Water tanks, generator plant, electrical power, waste water		300

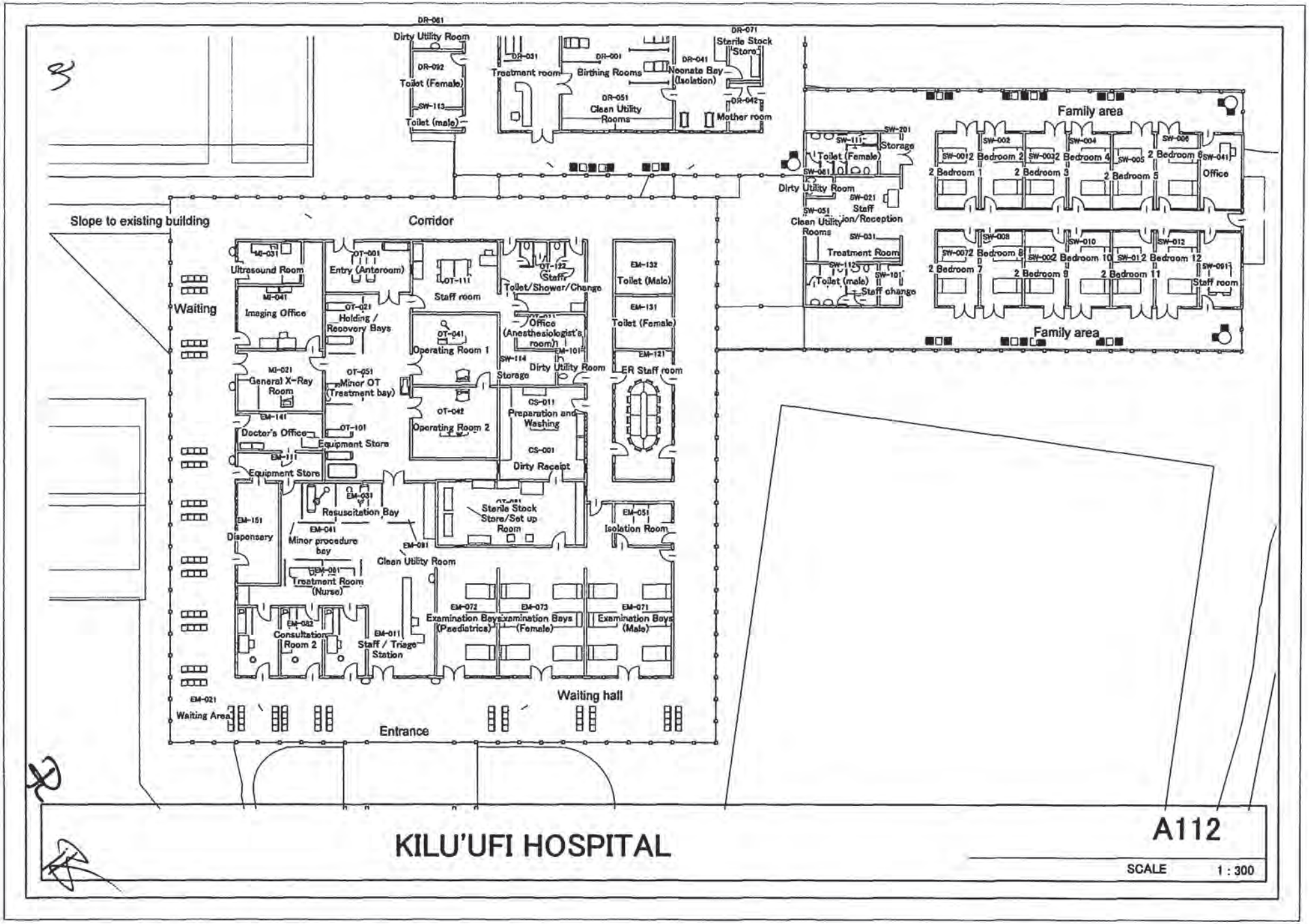
No.	Facilities Required (English)	LAN Data	Nurse Call / Duress Call	General Lighting	Emergency Lighting	General Power	Emergency Power	Fire Detection	Cold Water	Hot Water	Grey Water	Air Conditioning	Mechanical Ventilation	Ceiling fan	+/- Pressure	Special Provisions / Comments
EM	**EMERGENCY MEDICINE & GENERAL OUTPATIENT SERVICES**															
EM- 00 1	Ambulance Entry / Trolley Bay			x				x	x							
EM- 01 1	Staff / Triage Station	x		x	x	x		x	x			x		x		
EM- 02 1	Waiting Area	x		x	x	x		x	x					x		
EM- 03 1	Resuscitation Bay	x		x	x	x	x	x	x	x		x		x		
EM- 04 1	Minor procedure bay	x		x	x	x	x	x	x	x		x		x		
EM- 05 1	Isolation Room	x	x	x	x	x	x	x				x	x	x	-	
EM- 06 1	Treatment Room (Nurse)	x		x	x	x		x	x	x		x	x	x		
EM- 07 1	Examination Bays (Male)	x		x	x	x		x				x	x	x		Observation beds x 6
EM- 07 2	Examination Bays (Paediatrics)	x		x	x	x		x				x	x	x		Observation beds x 3
EM- 07 3	Examination Bays (Female)	x		x	x	x		x				x	x	x		Observation beds x 6
EM- 08 1	Consultation Room 1	x		x	x	x		x	x	x		x	x	x		General
EM- 08 2	Consultation Room 2	x		x	x	x		x	x	x		x	x	x		General
EM- 08 3	Consultation Room 3	x		x	x	x		x	x	x		x	x	x		emergency
EM- 09 1	Clean Utility Room	x		x	x	x		x	x	x		x	x			
EM- 10 1	Dirty Utility Room	x		x	x	x		x	x		x		x			
EM- 11 1	Equipment Store	x		x		x		x						x		
EM- 12 1	ER Staff room	x		x	x	x		x	x			x		x		
EM- 13 1	Toilet (Female)		x	x		x		x	x		x		x			
EM- 13 2	Toilet (Male)		x	x		x		x	x		x		x			
EM- 14 1	Doctor's Office	x		x		x		x				x		x		for OPD Doctor
EM- 15 1	Dispensary	x		x		x		x	x	x		x		x		
MI	**MEDICAL IMAGING**															
MI- 01 1	Patient Change Room			x	x	x		x				x		x		
MI- 02 1	General X-Ray Room	x		x	x	x		x				x	x			
MI- 03 1	Ultrasound Room	x		x	x	x		x				x	x			
	Store – Records	x		x		x		x								Combined with the Imaging office
MI- 04 1	Imaging Office	x		x	x	x		x	x			x	x	x		Radiographer / technical workspace / with storage
OT	**OPERATING THEATRE SUITE**															
OT- 00 1	Entry (Anteroom)	x		x		x		x						x		
OT- 01 1	Office (Anesthesiologist's room)	x		x		x		x				x		x		Anesthesiologist's room with secure drug storage
OT- 02 1	Holding / Recovery Bays	x		x	x	x	x	x				x		x		Combined within OT hall
OT- 03 1	OT Hall with Scrub	x		x	x	x		x	x			x		x		
OT- 04 1	Operating Room 1	x		x	x	x	x	x				x	x		+	
OT- 04 2	Operating Room 2	x		x	x	x	x	x				x	x		+	
OT- 05 1	Minor OT (Treatment bay)	x		x	x	x	x	x				x	x			Combined within OT hall
OT- 08 1	Sterile Stock Store/Set up Room	x		x	x	x		x	x			x	x		+	
OT- 10 1	Equipment Store	x		x	x	x		x				x				
OT- 11 1	Staff room	x		x	x	x		x	x			x		x		Reception / Staff Meeting / Handover
OT- 12 1	Staff Toilet/Shower/Change			x		x		x	x	x	x	x	x			
OT- 12 2	Staff Toilet/Shower/Change			x		x		x	x	x	x	x	x			
OT- 20 1	Storage	x		x		x		x					x			
CS	**CENTRAL STERILISATION SERVICESSS DEPARTMENT (CSSD)**															
CS- 00 1	Dirty Receipt	x		x		x		x	x	x		x	x	x	–	Good access from Wards
CS- 01 1	Preparation and Washing	x		x		x		x	x	x		x	x	x	–	
CS- 02 1	Sterilisation Room	x		x		x		x	x			x	x	x	+	
CS- 03 1	Autoclave Service Room	x		x		x		x	x	x		x	x	x	+	Distribution Counter, sterile stock area included
DR	**DELIVERY ROOM & SPECIAL CARE NURSERY (SCN)**															
DR- 00 1	Birthing Rooms	x		x	x	x		x	x	x		x		x		3 beds in one room
DR- 01 1	Ante-natal day beds	x		x	x	x		x	x					x		4 beds
DR- 02 1	Post-natal day beds	x		x	x	x		x	x					x		4 beds +4 cots
DR 02 2	Bedroom – 1 Bed	x		x	x	x		x	x			x		x		High dependency
DR- 03 1	Treatment room	x		x	x	x		x	x	x		x	x	x		For minor treatment
DR- 04 1	Neonate Bay (Isolation)	x		x	x	x	x	x	x	x		x	x	x		Nursery 2 cots
DR- 04 2	Mother room	x		x	x	x		x	x	x		x		x		
DR- 05 1	Clean Utility Rooms	x		x	x	x		x	x	x		x		x		Includes Anaesthetic/Drug Store
DR- 06 1	Dirty Utility Room	x		x	x	x		x	x		x		x	x		
DR- 07 1	Sterile Stock Store	x		x	x	x		x				x		x	+	
DR- 08 1	Staff room	x		x	x	x		x				x		x		Staff Meeting / Handover / Beverage Bay
DR- 09 2	Toilet (Female)		x	x		x		x	x	x	x		x			shower also
DR- 09 3	Toilet (Male)		x	x		x		x	x		x		x			

FUNCTIONAL PROGRAMMING FOR KILI'UFI Hospital

No.	Facilities Required (English)	LAN Data	Nurse Call / Duress Call	General Lighting	Emergency Lighting	General Power	Emergency Power	Fire Detection	Cold Water	Hot Water	Grey Water	Air Conditioning	Mechanical Ventilation	Ceiling fan	+/- Pressure	Special Provisions / Comments
MW	**MATERNITY WARD**															
MW- 00 1	Bedroom 1 – 4 Beds	x	x	x	x	x		x						x		
MW- 00 2	Bedroom 2 – 4 Beds	x	x	x	x	x		x						x		
MW- 00 3	Bedroom 3 – 4 Beds	x	x	x	x	x		x						x		
MW- 00 4	Bedroom 4 – 4 Beds	x	x	x	x	x		x						x		
MW- 00 5	Bedroom 5 – 4 Beds	x	x	x	x	x		x						x		
MW- 00 6	Bedroom 6 – 4 Beds	x	x	x	x	x		x						x		
MW- 01 1	Staff Station/Reception	x	x	x	x	x		x	x			x		x		
MW- 02 1	Treatment Room	x		x	x	x		x	x	x		x		x		
MW- 03 1	Office	x		x	x	x		x				x		x		
MW- 04 1	Clean Utility Rooms	x		x	x	x		x	x	x		x		x	+	
MW- 05 1	Dirty Utility Room			x	x	x		x	x		x			x		
MW- 08 1	Staff room	x		x	x	x		x				x		x		Staff Meeting / Handover / Beverage Bay
MW- 09 1	Staff Change	x		x	x	x		x								
MW- 10 1	Toilet (Female)		x	x	x	x		x	x	x	x					with shower
MW- 10 2	Toilet (male)		x	x	x	x		x	x	x	x					with shower
MW- 20 1	Storage			x	x	x		x								
SW	**SURGICAL WARD**															
SW- 00 1	2 Bedroom 1	x	x	x	x	x		x						x		
SW- 00 2	2 Bedroom 2	x	x	x	x	x		x						x		
SW- 00 3	2 Bedroom 3	x	x	x	x	x		x						x		
SW- 00 4	2 Bedroom 4	x	x	x	x	x		x						x		
SW- 00 5	2 Bedroom 5	x	x	x	x	x		x						x		
SW- 00 6	2 Bedroom 6	x	x	x	x	x		x						x		
SW- 00 7	2 Bedroom 7	x	x	x	x	x		x						x		
SW- 00 8	2 Bedroom 8	x	x	x	x	x		x						x		
SW- 00 9	2 Bedroom 9	x	x	x	x	x		x						x		
SW- 01 0	2 Bedroom 10	x	x	x	x	x		x						x		
SW- 01 1	2 Bedroom 11	x	x	x	x	x		x						x		
SW- 01 2	2 Bedroom 12	x	x	x	x	x		x						x		
SW- 02 1	Staff Station/Reception	x	x	x	x	x		x	x			x	x	x		
SW- 03 1	Treatment Room	x		x	x	x		x	x	x		x	x	x		
SW- 04 1	Office	x		x	x	x		x				x	x	x		
SW- 05 1	Clean Utility Rooms	x		x		x		x	x	x		x		x	+	
SW- 06 1	Dirty Utility Room	x		x		x		x	x		x		x	x		
SW- 09 1	Staff room	x		x	x	x		x				x	x	x		Staff Meeting / Handover / Beverage Bay
SW- 10 1	Staff Change	x		x		x		x								
SW- 11 1	Toilet (Female)		x	x		x		x	x		x		x			with shower
SW- 11 2	Toilet (male)		x	x		x		x	x		x		x			with shower
SW- 07 1	Storage			x		x		x						x		

PH	PHARMACY To be included in the existing administration area															
PH- 00 1	Goods Receipt – Pharmacy	x		x	x	x	x	x								
PH- 01 1	Pharmacy Counter	x		x	x	x	x	x								Public access point Includes office space for pharmacist
PH- 02 1	Room dearing with Wards medicine	x		x	x	x	x	x								maybe one room with pharmacy counter
PH- 03 1	Secondy level Storage room (vaccine, etc)			x	x	x	x	x								
PH- 04 1	Assembly/Preparation Room	x		x	x	x	x	x	x			x	x		+	
PH- 05 1	Drug Store			x		x		x								1 x storage area with refrigerated storage.
PH- 05 2	Drug Store			x		x		x								1 x storage area with refrigerated storage.
PH- 06 1	Store – Accountable Drugs			x		x		x								Lockable store / area for each kind of medicine
	Office	x		x		x		x	x			x	x			Pharmacist Office included in counter area

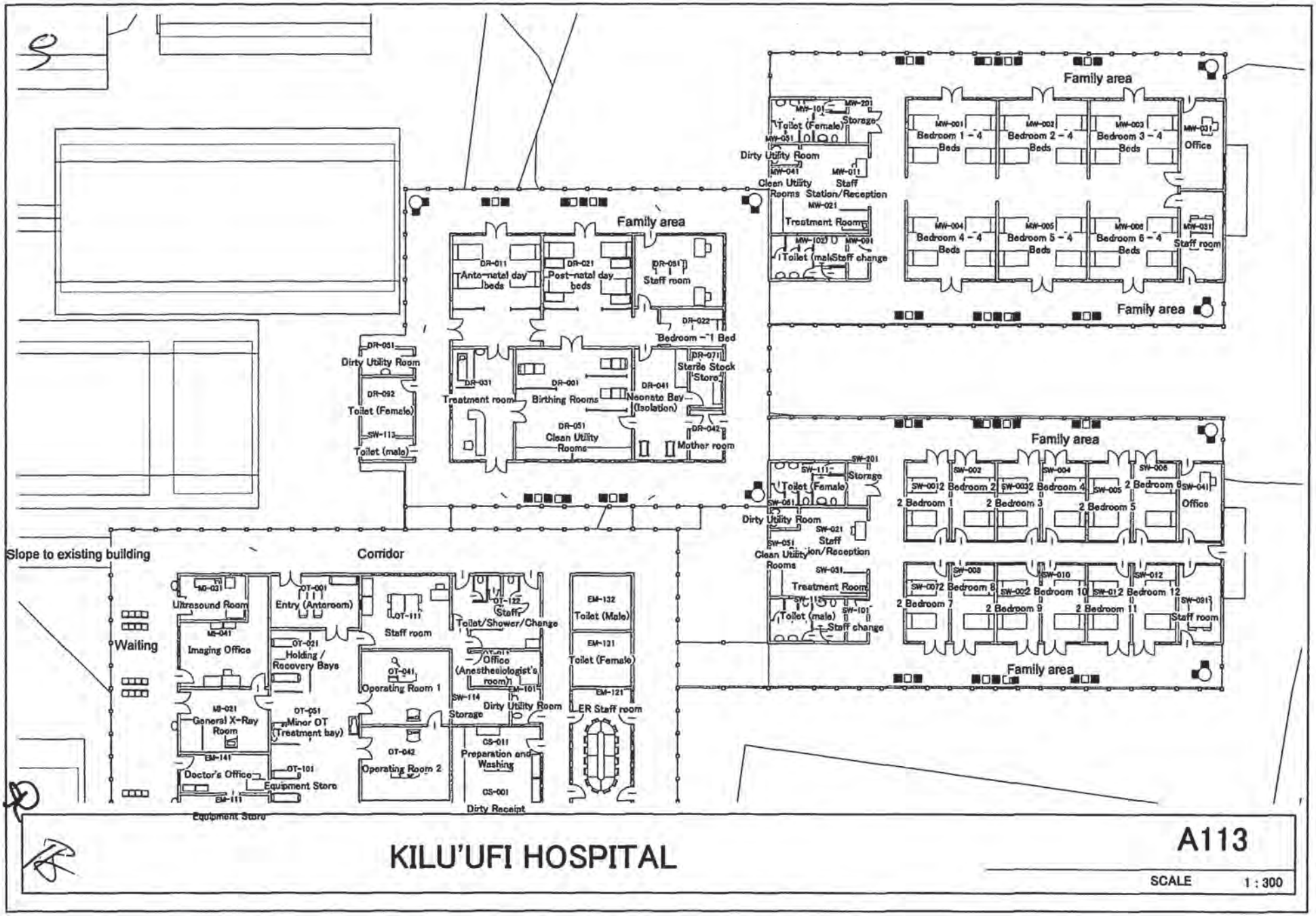

KILU'UFI HOSPITAL
A111
SCALE 1 : 800



KILU'UFI HOSPITAL

A112

SCALE 1 : 300



KILU'UFI HOSPITAL

A113

SCALE 1 : 300

Outline of Building System

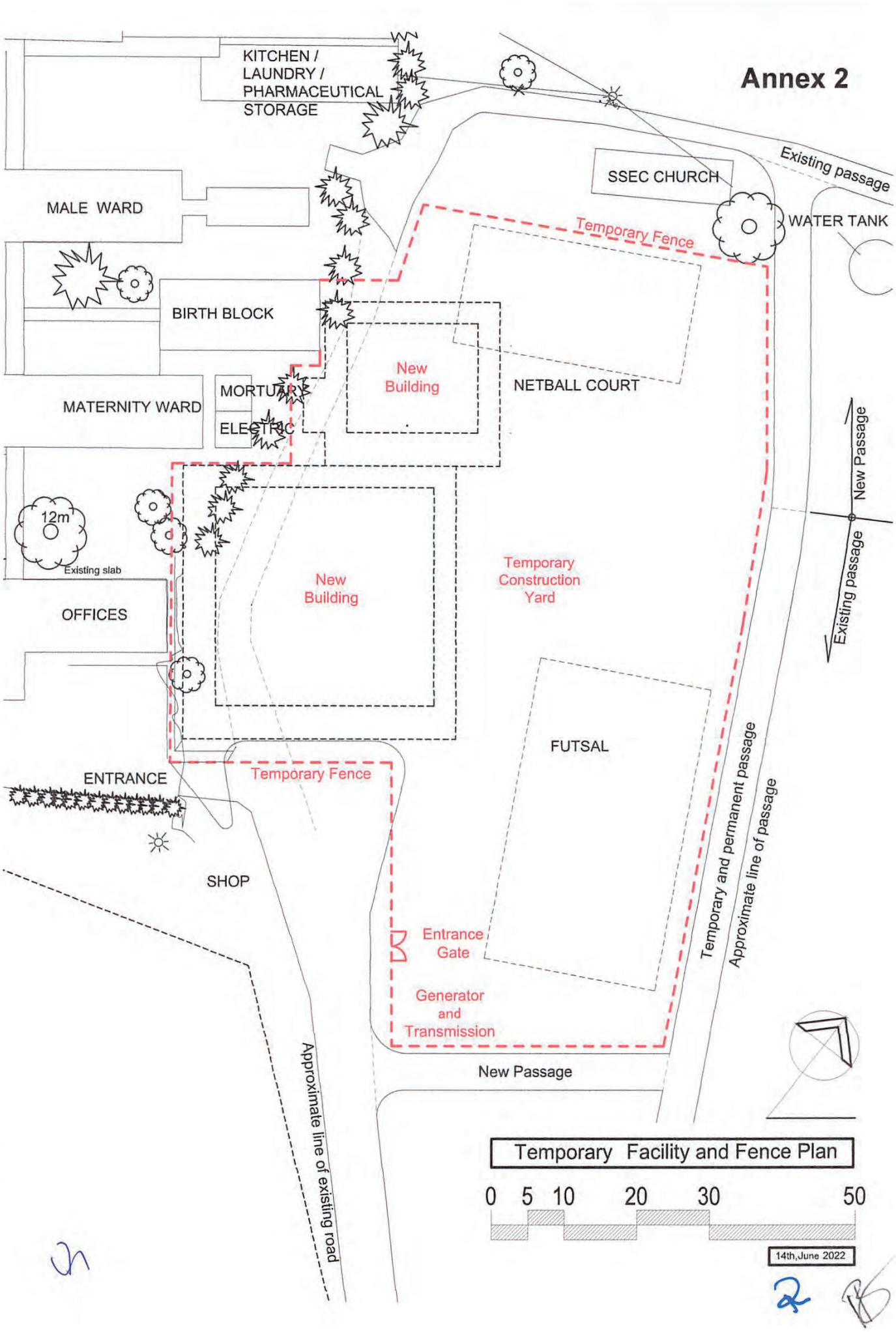
Electrical System

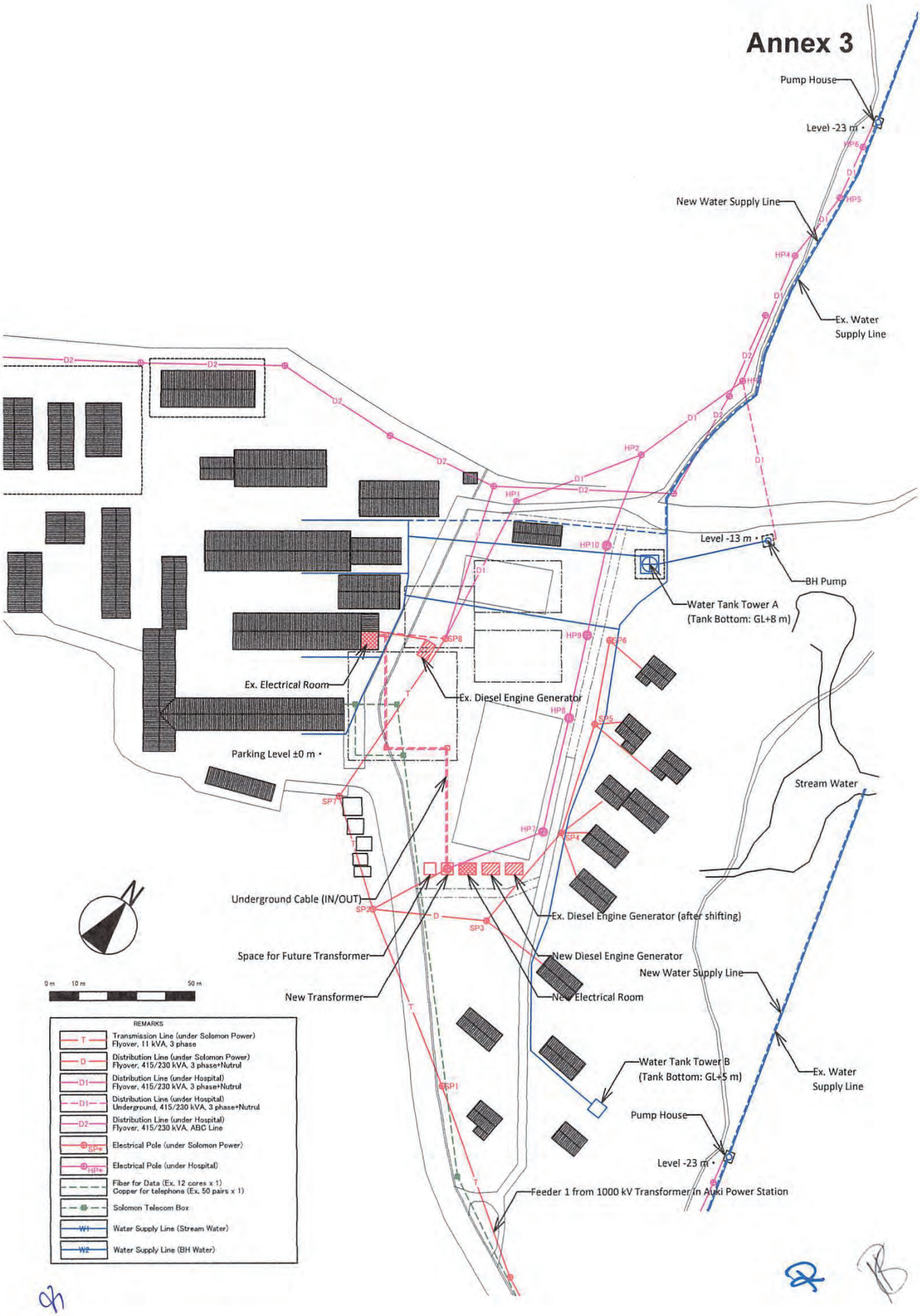
No	Item	Proposed plan	Remarks
E-1	Electric Power system	Relocation of the electrical power line crossing over the Project site. Assume approximate 200kVA of power receiving capacity for the new facility Low voltage 415V/240V Emergency Generator (approx 200kVA) backup Solar power generation approx. 50kVA, on grid type. Approx 25kVA of solar power may be used with the generator.	
E-2	Lighting fixtures	Energy-saving and long life with LED lighting Emergency lighting is battery built-in	Architectural design shall incorporate natural lighting system with appropriate high side windows and top lights.
E-3	LAN system	Piping for LAN shall be included in the facility. Actual wiring and server system shall not be included in the Project.	
E-4	Nurse Call/Duress call	Push button + indicator light system	Nurse call for wards. Duress call for toilets.
E-5	Fire protection	Automatic fire alarm system (smoke detector + push button)	
E-6	Lightning protection	The lightning rod	Medical earthing system with isolation transformers shall be included in the facility.
E-7	Telephone system	Existing system to be relocated to new room in the new facility	
		Following system is not included in the Project. 1. Public address system 2. Security system with camera 3. Television antenna system 4. LAN servers and wiring 5. Hospital IT system (HIS)	

Mechanical System

M-1	Water supply	Repair and upgrade existing system. Add one pump to existing stream water source. Replace the borehole pump. Total 2 system with 2 pumps each will be the new water system for redundancy. The amount of water required for this project is assumed to be approx. 50 m3/day. Rain water tank, approx.100m3) + elevated water tank (10m3) shall be provided.	Capacity of pumps and tanks shall be calculated in detail according to the new facility design.
M-2	Water heater	Solar water heaters to be provided. Electric water heaters to be provided for critical rooms.	Supply to operating room, delivery room, etc.
M-3	Sanitary fixtures	All western style toilet. No squat type.	
M-4	Wastewater treatment	Septic Tank for the new facility only.	
M-5	Medical Gas	A central system shall not be provided in the new facility.	To be supplied individually from manifolds
M-7	Air conditioning	Air conditioning room is individual separate air conditioning system (wall-mounted type) + ceiling circulator	
M-8	Ventilation	Operating rooms shall have mechanical ventilation with appropriate filter. Non-air-conditioning parts such as corridors and waiting rooms shall be equipped with ceiling fans.	Architectural design shall incorporate natural ventilation system.
M-9	Firefighting system	Fire hydrant system and fire extinguishers shall be included.	

MEP


Annex 2
KITCHEN / LAUNDRY / PHARMACEUTICAL STORAGE
MALE WARD
BIRTH BLOCK
MATERNITY WARD
MORTUARY
ELECTRIC
OFFICES
Existing slab
12m
ENTRANCE
SHOP
SSEC CHURCH
WATER TANK
Existing passage
Temporary Fence
New Building
NETBALL COURT
New Passage
Existing passage
New Building
Temporary Construction Yard
FUTSAL
Temporary Fence
Entrance Gate
Generator and Transmission
Temporary and permanent passage
Approximate line of passage
New Passage
Approximate line of existing road
Temporary Facility and Fence Plan
0 5 10 20 30 50
14th,June 2022
2


Annex 3
Pump House
Level -23 m
New Water Supply Line
Ex. Water Supply Line
Level -13 m
BH Pump
Water Tank Tower A (Tank Bottom: GL+8 m)
Ex. Electrical Room
Ex. Diesel Engine Generator
Parking Level ±0 m
Stream Water
Underground Cable (IN/OUT)
Ex. Diesel Engine Generator (after shifting)
Space for Future Transformer
New Diesel Engine Generator
New Transformer
New Electrical Room
New Water Supply Line
Water Tank Tower B (Tank Bottom: GL+5 m)
Ex. Water Supply Line
Pump House
Level -23 m
Feeder 1 from 1000 kV Transformer in Aluki Power Station
0 m 10 m 50 m
REMARKS
Transmission Line (under Solomon Power) Flyover, 11 kVA, 3 phase
Distribution Line (under Solomon Power) Flyover, 415/230 kVA, 3 phase+Nutrul
Distribution Line (under Hospital) Flyover, 415/230 kVA, 3 phase+Nutrul
Distribution Line (under Hospital) Underground, 415/230 kVA, 3 phase+Nutrul
Distribution Line (under Hospital) Flyover, 415/230 kVA, ABC Line
Electrical Pole (under Solomon Power)
Electrical Pole (under Hospital)
Fiber for Data (Ex. 12 cores x 1) Copper for telephone (Ex. 50 pairs x 1)
Solomon Telecom Box
Water Supply Line (Stream Water)
Water Supply Line (BH Water)

Annex 4

The Project for the Improvement of Kilu'ufi Hospital in Solomon Islands
Equipment List 0614, 2022

Clinical Services	No	Area/Room Name	Equipment	Priority	Planned Qty
EM	001	Ambulance Entry / Trolley Bay	-	-	-
EM	011	Staff / Triage Station	Desk and Chair	C	2
EM			Whiteboard	C	1
EM	021	Waiting Area	Waiting bench for 3 persons	C	20
EM	061	Treatment room (Nurse)	Treatment table with caster, high/low type	B	2
EM			Treatment instrument set	A	2
EM			Instrument trolley*	B	2
EM			IV stand	B	2
EM			Examination light	A	2
EM			Wheelchair	B	2
EM			Stretcher**	B	2
EM	031	Resuscitation Bay	Treatment table with caster, high/low type	B	1
EM			Treatment instrument set	A	1
EM			Instrument trolley	B	1
EM			IV stand	B	1
EM			Examination light	A	1
EM			Oxygen concentrator	A	1
EM			Oxygen regulator set	B	1
EM			Suction machine	A	1
EM			EM cart	B	1
EM			Resuscitation set for adult	A	1
EM			Resuscitation set for newborns	A	1
EM			Patient monitor	A	1
EM			Diagnostic set	A	1
EM	041	Minor Procedure Room	Treatment table with caster, high/low type	A	1
EM			Treatment instrument set	A	1
EM			Instrument trolley	B	1
EM			IV stand	B	1
EM			Examination light	A	1
EM			Oxygen concentrator	A	1
EM			Oxygen regulator set	B	1
EM			EM cart	B	1
EM			Nebulizer	A	1
EM	051	Isolation Room	Patient bed	B	1
EM			Bedside cabinet	B	1
EM			Overbed table	B	1
EM			IV stand	B	1
EM	071	Examination Bays (Male)	Patient bed	B	3
EM			IV stand	B	3
EM			Oxygen concentrator	A	1
EM	072	Examination Bays(Pediatrics)	Patient bed	B	2
EM			IV stand	B	2
EM			Oxygen concentrator	A	1
EM	073	Examination Bays (Female)	Patient bed	B	3

Clinical Services	No	Area/Room Name	Equipment	Priority	Planned Qty
EM			IV stand	B	3
EM			Oxygen concentrator	A	1
EM	081	Consultation Room1	Desk and Chair	C	1
EM			Patient stool	C	1
EM			Examination table	B	1
EM			Instrument trolley	B	1
EM			Examination light	A	1
EM			Diagnostic set	A	1
EM			Glucometer	A	1
EM			Weight/Height scale for adult	B	1
EM	082	Consultation Room 2	Desk and Chair	C	1
EM			Patient stool	C	1
EM			Examination table	B	1
EM			Instrument trolley	B	1
EM			Examination light	A	1
EM			Diagnostic set	A	1
EM	083	Consultation Room 3	Desk and Chair	C	1
EM			Patient stool	C	1
EM			Examination table	B	1
EM			Instrument trolley	B	1
EM			Examination light	A	1
EM			Diagnostic set	A	1
EM	091	Clean Utility Room	-	-	-
EM	101	Dirty Utility Room	-	-	-
EM	111	Equipment Store	-	-	-
EM	121	ER Staff Room	Meeting table with 4 chairs	C	4
EM			Whiteboard	C	2
EM	131,132	Staff Toilets (Male/Female)	-	-	-
EM	141	Doctor's Office	Desk and Chair	C	1
EM			Shelf	C	2
MI	011,021	Patient Change Room, General X-Ray Room	General X ray machine	A	1
MI	041,032	Prep/Setup Room, Imaging Office	Desk and Chair	C	2
MI			Imager	A	1
MI	031	Ultrasound Room	Desk and Chair	C	1
MI			Examination table	B	1
MI			Patient stool	C	1
MI			Ultrasound machine	A	1
OT	001	Entry Anteroom	Stretcher	B	2
OT	011	Office (Anesthesiologist's Room)	Desk and Chair	C	1
OT			Shelf	C	2
OT	021	Holding / Recovery Bays	Patient bed	B	2
OT	031	OT Hall with Scrub	Scrub for 2 person	A	1
OT	041	Operating Room 1	OT table	A	1
OT			OT lights	A	1
OT			Instrument trolley	B	2
OT			IV stand	B	2
OT			Oxygen concentrator	A	1
OT			Oxygen regulator set	B	1
OT			Suction machine	A	1
OT			Anesthetic machine	A	1
OT			Electrical surgical machine	A	1
OT			Patient monitor	A	1

Clinical Services	No	Area/Room Name	Equipment	Priority	Planned Qty
OT			Surgical instrument set	A	1
OT			Caesarean section surgical instrument set	A	1
OT			D &C instrument set	A	1
OT			Laryngoscope	A	1
OT	042	Operating Room 2	OT table	A	1
OT			OT lights	A	1
OT			Instrument trolley	A	2
OT			IV stand	B	2
OT			Oxygen concentrator	B	1
OT			Oxygen regulator set	A	1
OT			Suction machine	B	1
OT			Anesthetic machine	A	1
OT			Electrical surgical machine	A	1
OT			Patient monitor	A	1
OT			Surgical instrument set	A	1
OT			Caesarean section surgical instrument set	A	1
OT			D &C instrument set	A	1
OT			Laryngoscope	A	1
OT	051	Minor OT (Treatment bay)	Treatment table with caster, high/low type	A	1
OT			Treatment instrument set	A	1
OT			Instrument trolley	B	1
OT			IV stand	B	1
OT			Examination light	A	1
OT			Oxygen concentrator	A	1
OT			Oxygen regulator set	A	1
OT	081	Sterile Stock Store/Set up Room	-	-	-
OT	101	Equipment Store	-	-	-
OT	111	Staff room	Meeting table with 4 chairs	C	1
OT			Desk and Chair	C	1
OT			Shelf	C	2
OT			Whiteboard	C	1
OT	121,122	Staff Toilet/Shower/Change	Locker for 9 person	C	2
CS	001	Dirty Receipt	-	-	-
CS	011	Preparation and Washing	-	-	-
CS	021	Sterilization Room	-	-	-
CS			-	-	-
CS	031	Autoclave Service Room	High pressure steam sterilizer M size A	A	1
CS			High pressure steam sterilizer M size B	A	1
CS			Sterile stock shelf	C	4
DR	001	Birthing Rooms (3 beds)	Delivery table	A	3
DR			Instrument trolley	B	3
DR			Examination light	A	3
DR			Delivery instrument set	A	3
DR			Baby cot	B	6
DR			CTG	A	1
DR			Vacuum extractor	A	1
DR	022	Bed room- 1 Bed	Patient bed	B	1
DR	011	Ante-natal day beds	Patient bed	B	4

Clinical Services	No	Area/Room Name	Equipment	Priority	Planned Qty
DR	021	Post-natal day beds	Patient bed	B	4
DR			Bedside cabinet	B	4
DR			Overbed table	B	4
DR			Baby cot	B	4
DR	031	Treatment Room	Treatment table with caster, high/low type	A	1
DR			Treatment instrument set	A	1
DR			Instrument trolley	B	1
DR			IV stand	B	1
DR			Examination light	A	1
DR			Oxygen concentrator	A	1
DR			Oxygen regulator set	B	1
DR			Suction machine	A	1
DR			Desk and Chair	C	2
DR	041	Neonate Bay (Isolation)	Infant incubator	A	2
DR			Infant warmer	A	2
DR			IV stand	B	2
DR			Oxygen concentrator	A	2
DR			Oxygen regulator set	B	2
DR			Suction machine	A	1
DR			Resuscitation set for newborns	A	2
DR			Weight/Height scale for newborns	A	1
DR			Phototherapy	A	1
DR	042	Mother room	-	-	-
DR	051	Clean Utility Room	-	-	-
DR	061	Dirty Utility Room	-	-	-
DR	071	Sterile Stock Store	Sterile stock shelf	C	3
DR	081	Staff room	Meeting table with 4 chairs	C	1
DR			Desk and Chair	C	1
DR			Shelf	C	2
DR			Whiteboard	C	1
DR			Locker for 9 person	C	1
DR	092	Toilets (Female)	-	-	-
MW	001-006	4 Bedroom 1-4, Beds x6, 24 beds	Patient bed	B	24
MW			Bedside cabinet	B	24
MW			Overbed table	B	24
MW	011	Staff Station/Reception	Desk and Chair	C	1
MW			Instrument trolley	B	1
MW			IV Stand	B	12
MW			Oxygen concentrator	A	1
MW			Oxygen regulator set	B	1
MW			Diagnostic set	A	1
MW			Suction machine	A	1
MW	021	Treatment Room	Treatment instrument set	B	1
MW			Instrument trolley	B	1
MW			Examination light	A	1
MW			Wheelchair	B	1
MW			Stretcher	B	1
MW	031	Office	Desk and Chair	C	1
MW			Shelf	C	2
MW	041	Clean Utility Room	-	-	-
MW	051	Dirty Utility Room	-	-	-

Clinical Services	No	Area/Room Name	Equipment	Priority	Planned Qty
MW	081	Staff room	Meeting table with 4 chairs	C	1
MW			Desk and Chair	C	1
MW			Shelf	C	2
MW			Whiteboard	C	1
MW	091	Staff change room	Locker for 9 person	C	1
MW	101,102	Toilets (Female/Male)	-	-	-
MW	201	Storage	-	-	-
SW	001-012	2 Bedroom 1-12, Beds x12, 24 beds	Patient bed	B	24
SW			Bedside cabinet	B	24
SW			Overbed table	B	24
SW	021	Staff Station/Reception	Desk and Chair	C	1
SW			Instrument trolley	B	1
SW			IV Stand	B	12
SW			Oxygen concentrator	A	1
SW			Oxygen regulator set	B	1
SW			Diagnostic set	A	1
SW			Suction machine	A	1
SW	031	Treatment Room	Treatment instrument set	B	1
SW			Instrument trolley	B	1
SW			Examination light	A	1
SW			Wheelchair	B	1
SW			Stretcher	B	1
SW	041	Office	Desk and Chair	C	1
SW			Shelf	C	2
SW	051	Clean Utility Room	-	-	-
SW	061	Dirty Utility Room	-	-	-
SW	091	Staff room	Meeting table with 4 chairs	C	1
SW			Desk and Chair	C	1
SW			Shelf	C	2
SW			Whiteboard	C	1
SW	101	Staff change room	Locker for 9 person	C	1
SW	111,112	Toilets (Female/Male)	-	-	-
SW	071	Storage	-	-	-
PH		Goods Receipt – Pharmacy	-	-	-
PH		Pharmacy Counter	-	-	-
PH		Drug Store	Pharmacy shelf	C	6
PH			Pharmacy cabinet	C	2
PH			Medical Refrigerator for storge/dispensary	A	2
PH		Preparation room	Pharmacy shelf	C	6
PH			Pharmacy cabinet	C	2
PH			Pharmacy Electronic Balance	A	2
PH		Store – Accountable Drugs	Pharmacy shelf	C	2

*Instrument trolley requires the function of the Drug trolley function.
** Stretchers are available in patient type and operating room type, details are given in the technical specifications.
+ Cart for Linen, Planed Qty is 4 - 6. To change depending on project resources and hospital operational conditions, Building plan. Priority B or C.

A is Equipment required for hospital operation.
B is Equipment required for hospital operation, continue to consider.
C is General furniture, hospital side, continue to consider.
To change depending on project resources and hospital operational conditions.

6. Soft Component Plan

Ministry of Health & Medical Services
Solomon Islands

PREPARATORY SURVEY REPORT
ON
THE PROJECT
FOR
IMPROVEMENT OF KILU'UFI HOSPITAL

SOFT COMPONENT PLAN

December 2022

Japan International Cooperation Agency (JICA)

Fukunaga Architects-Engineers Co., Ltd.

Yachiyo Engineering Co., Ltd.

Binko International Limited

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8. **Recipient Country Obligations** 12

1. Background of Planning Soft Component

The incidence of diseases in the Solomon Islands includes an increase in noncommunicable diseases (NCDs). A similar trend has been observed worldwide. Infectious diseases and NCDs are among the leading causes of mortality. The medical services system is in a period of transition, as it provides countermeasures to the increase in NCDs and the spread of infectious diseases, which is an essential and serious matter.

The National Health Strategy Plan (NHSP, 2016–2020, 2022–2031) promotes reforms such as assigning medical services to each of the provinces in order to achieve universal health coverage (UHC). The NHSP states four main outcomes and six material issues and describes an improvement in medical services and quality in four provinces, including Malaita Province, where medical services are lagging in comparison with other provinces.

The objective of this project is to construct facilities and provide equipment for Kilu'ufi Hospital, which is the top referral hospital in Malaita Province, to improve medical services in the province and strengthen local and national referral systems.

The equipment will be supplied to the Kilu'ufi Hospital Outpatient Department, Diagnostic Imaging Department, Surgical Department, Obstetrics Department, and Pharmacy. In the field survey, studies and consultations will be conducted based on the requested master plan, usage of existing equipment, construction plans, etc., to produce equipment selection standards and plan details. The final equipment plan includes equipment that can be operated according to the technical level of its counterpart.

As an area that has a major impact on the provision and quality of medical services in the Solomon Islands and the target facility, medical device O&M will be ensured, and the efficiency and effectiveness of medical services will be improved through preventive maintenance and swift repair of non-operational devices to ensure the provision of essential medical equipment and uninterrupted medical services.

Medical equipment O&M includes all planned activities for the safe use of the equipment, maintaining its functionality, and preventing malfunctions and breakdowns. The complexity of O&M depends on the facility's scale, type, location, and necessary resources. However, regardless of the scale of the medical facility, medical equipment O&M is a necessity.

It is also essential that personnel from various departments, including those from the management department, medical practitioners, account managers, and engineers, are proactively involved in medical equipment O&M. However, in the Solomon Islands and target facility, there is no prospect of O&M expanding to the appropriate operation of medical equipment, safe usage, and other areas, because there are no systems or personnel for that purpose. Therefore, there are many cases in which medical equipment is either not sufficiently used, is non-operational owing to malfunctions, or is left unused.

The role of the soft component in medical equipment O&M is to promote local medical service initiatives through the appropriate operation of medical equipment in the target facility, safe usage of the equipment, and implementation of O&M based on the acquisition of knowledge and provision of technical support through training, and to construct O&M systems that will lead to improved medical services and quality.

The soft component has been planned on this basis.

・Soft Component Objectives

Appropriate operation and safe usage of medical equipment at the target hospital and awareness among medical practitioners regarding the importance of O&M.

Provision of O&M systems for medical equipment at the target hospital, and the appropriate implementation of medical equipment O&M, including a reduction in downtime due to equipment malfunction and an increase in the period of operation without accident.

・Soft Component Outcomes

The following table shows the outcomes (direct effects) achieved through the implementation of the soft component.

Soft component inputs	Direct Effect
1. Introduction to How to Organize the Maintenance system of the Kilu'ufi hospital	・ Determines the roles of the Medical Equipment O&M Department and O&M Manager in the hospital ・ Appropriate reporting of medical equipment O&M status to the Medical Equipment O&M Department of the Ministry of Health & Medical Services ("MHMS")
2. Creation and Control of the Medical equipment maintenance management plan	・ Appropriate performance of daily inspections and periodic inspections ・ Appropriate use, maintenance, and upkeep of medical equipment
3. Establishment of the Medical Equipment Inventory system of the Kilu'ufi hospital	・ Provision of comprehensive and reliable information about medical equipment in a timely manner ・ Implementation of general management based on the medical equipment management ledger (inventory) including the history of inspections and repairs

4. Establishment of the Maintenance record system of the medical equipment (Report system)	・ Usage of a medical equipment maintenance records system (report system) and ensuring that maintenance records are up-to-date ・ Immediate production of reports to report problems in the case of malfunctioning medical equipment
5. How to ensure the medical equipment is utilized effectively	・ Appropriate linkage and effective usage between medical equipment and patient services ・ Efficient use of medical equipment consumables without waste
6. How to ensure correct operation for the medical equipment	・ Usage of medical equipment with the correct operational methods with reference to information in the operations manual ・ Regular upkeep and cleaning of used medical equipment according to the correct method
7. Establishment of the Monitoring of the progress system	・ Establishment of an update cycle for the annual medical equipment O&M plan ・ Able to review the implementation of medical equipment O&M, surveillance, issues, and needs ・ Specification of medical equipment O&M issues and establishment of specific targets

2. Verification of Outcome Achievement

The following table lists the indicators used to verify the achievement of the outcomes through the implementation of the soft component.

Soft component inputs	Verification Method
1. Introduction to How to Organize the Maintenance system of the Kilu'ufi hospital	・ Confirmation of organization chart and system chart ・ Confirmation of the duties of the Medical Equipment O&M Department and the job description of a person in charge of medical equipment
2. Creation and Control of the Medical equipment maintenance management plan	・ Confirmation of daily maintenance and periodic maintenance annual plan (calendar) ・ Confirmation of daily checklist (sheet) and periodic checklist (sheet) ・ Confirmation of safety and calibration testing sheet
3. Establishment of the Medical Equipment Inventory system of the Kilu'ufi hospital	・ Confirmation of updated information in the medical equipment management ledger (inventory) ・ Confirmation of medical equipment system number and inspection tag (sticker)

4.	Establishment of the Maintenance record system of the medical equipment (Report system)	・ Confirmation of maintenance record system reports and report storage files
5.	How to ensure the medical equipment is utilized effectively	・ Confirmation of daily checklist (sheet) ・ Confirmation of inventory checklist for accessories and consumables
6.	How to ensure the correct operation for the medical equipment	・ Confirmation of operations manual (simple operations manual) ・ Confirmation of care and cleaning checklist (sheet)
7.	Establishment of the Monitoring of the progress system	・ Confirmation of record of activities of Medical Equipment O&M department and O&M manager ・ Confirmation of annual activities plan

3. Soft Component Activities (Input Plan)

To increase the potential for independence, the details of the input plan will involve participatory techniques, including lectures and workshops. For the medical equipment management ledger (inventory) and maintenance record system of the medical equipment (report system), after thorough confirmation of the existing status of public medical facilities in the Solomon Islands, the results will be provided to avoid any inconsistencies with the methods used by other facilities in the country. In addition, for smooth cooperation in the future, a request will be made through the MHMS for engineers from the Biomedical Departments of public medical facilities in the Solomon Islands to be used as (local) medical equipment O&M training instructors.

Regarding monitoring after the completion of the soft component, follow-ups will be performed by inspection technicians dispatched from Japan who will confirm the operational status at the time of inspection at the end of the equipment manufacturer's guarantee period and inspections at the end of the second and third years of the maintenance contracts that commence when the equipment is supplied.

・Consultants

An engineer for medical equipment maintenance management training (Japanese Consultant)

A lector for medical equipment maintenance management training (Local Consultant)

The following table shows the necessary competencies and Scope of Work for the Consultants.

Title	Engineer for medical equipment maintenance management training (Japanese Consultant), 1 Person	Lector for medical equipment maintenance management training (Local Consultant), 1 Person
Necessary competencies	・A person who has the qualification of Medical Engineer (2nd class ME engineer) or has experience in implementing maintenance management training for medical equipment ・Engineer's classification: 3rd class	A technician working in the biomedical department of a public health facility in the Solomon Islands
Scope of Work	< Work Schedule in Japan > ・Development of the training plan ・Report preparation < Work Schedule in the Solomon Islands > ・Assist with the Study of documents and teaching materials for the training and assist in the preparation of those documents ・Lecture assistance ・Preparation of assessment materials, etc.	< Work Schedule in the Solomon Islands> ・Study of documents and teaching materials for the training and preparation of those documents ・Lecture ・Creating and evaluating assessments, etc.

・Major target medical equipment

Ultrasound machine, CTG, infant incubator, patient monitor, oxygen concentrator, suction unit, etc.

・Activities (Input Plan)

The following table shows Soft Component Activities (Input Plan)

Soft component inputs	Training content	Affected Person	Soft Component Output
1. Introduction to How to Organize the Maintenance system of the Kilu'ufi hospital	・ Quality Health Services ・ Organizing Maintenance	Director General General Secretary Coordinator of the department Maintenance department staff Department staff	・ List of regulations and standards for medical equipment ・ Organization chart, system chart Job description for each organization
2. Creation and Control of the Medical equipment maintenance management plan	・ Priorities when creating a maintenance plan ・ Maintenance of the Medical equipment, Repairs, Safety Testing ・ External resource (Maintenance contract etc.)		・ Daily maintenance and Periodical maintenance annual plan (Wall Calendar) ・ Daily checklist(sheet) and Periodic checklist(sheet) ・ Safety and Calibration testing sheet

3. Establishment of the Medical Equipment Inventory system of the Kilu'ufi hospital	· Creation of an inventory of the medical equipment · Operating management of the medical equipment		· Inventory of the medical equipment · Medical equipment Inspection tags (stickers)
4. Establishment of the Maintenance record system of the medical equipment (Report system)	· Report system when the medical equipment faults etc · Monitor Progress and Record Work · Service Histories of the Medical equipment		· Reports used for the maintenance record system and files for storing reports · Wall-mounted rack for storing reports
5. How to ensure the medical equipment is utilized effectively	· How to use effective medical equipment · Training & skills Development	Maintenance department staff Department staff	· Inventory checklist of accessories and consumables
6. How to ensure the correct operation for the medical equipment	· How to operate the medical equipment with applied the procedure properly · Application Training · Care and Cleaning Instructions after the Medical equipment using		· Operation manual (Simple operation manual) · Care and Cleaning checklist(sheet)
7. Establishment of the Monitoring of the progress system	· Setting Goals · Monitoring progress	Director General General Secretary Coordinator of the department Maintenance department staff	· Annual Action Plan · Working group meeting note format

・Soft component, List of the training participants

Soft component inputs	Training content / (Number of participants)	Director General	Secretary General	Coordinator of the department*	Maintenance department staff*	Department staff*
1. Introduction to How to Organize the Maintenance system of the Kilu'ufi hospital	・ Quality Health Services (7 people)	○	○	○	○	-
	・ Organizing Maintenance (7 people)	○	○	○	○	-
2. Creation and Control of the Medical equipment maintenance management plan	・ Priorities when creating a maintenance plan (7 people)	○	○	○	○	-
	・ Maintenance of the Medical equipment, Repairs, Safety Testing ・ External resource (Maintenance contract etc.) (5 people)	-	-	○	○	-
3. Establishment of the Medical Equipment Inventory system of the Kilu'ufi hospital	・ Creation of an inventory of the medical equipment (5 people)	-	-	○	○	-
	・ Operating management of the medical equipment (5 people)	-	-	○	○	-
4. Establishment of the Maintenance record system of the medical equipment (Report system)	・ Report system when the medical equipment faults etc (6 people)	○	-	○	○	-
	・ Monitor Progress and Record Work ・ Service Histories of the Medical equipment (6 people)	-	○	○	○	-

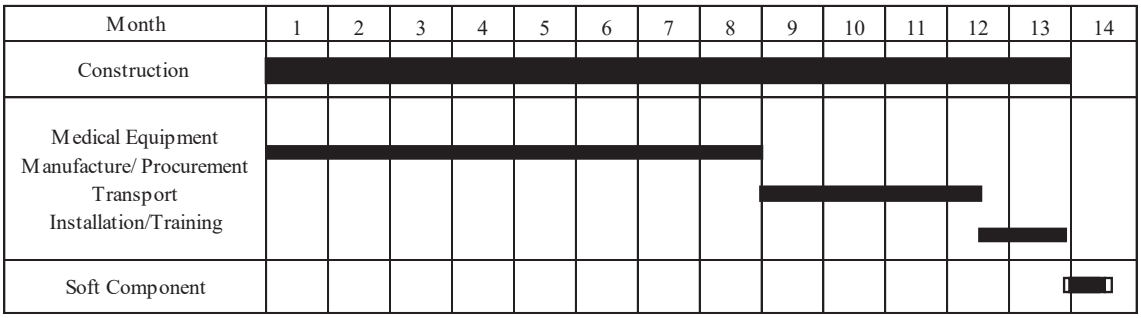
5.	How to ensure the medical equipment is utilized effectively	・ How to use effective medical equipment (11 people)	-	-	-	○	○
		・ Training & skills ・ Development (11 people)	-	-	-	○	○
6.	How to ensure correct operation for the medical equipment	・ How to operate the medical equipment with applied the procedure properly (11 people)	-	-	-	○	○
		・ Application Training ・ Care and Cleaning Instructions after the Medical equipment using (11 people)	-	-	-	○	○
7.	Establishment of the monitoring of the progress system	・ Setting Goals (7 people)	○	○	○	○	-
		・ Monitoring Progress (7 people)	○	○	○	○	-

*Coordinator of the department (4 people, from Department of the surgery, internal medicine, paediatrics, and obstetrics)
Maintenance department staff (1 person, in charge of medical equipment)
Department staff (10 people, from Department of the surgery, internal medicine, paediatrics, and obstetrics)

4. Methods for Procuring Implementation Resources for Soft Component

The soft component offers direct support through the commissioned consultants. To construct medical equipment O&M systems at the target facility, meticulous coordination with networks in the Solomon Islands and the effective use of domestic resources are required. However, because of limited private resources in the Solomon Islands, such as the absence of local consultants and organizations specializing in medical equipment O&M, engineers working in the Biomedical Departments of public medical facilities in the Solomon Islands will be commissioned as lecturers after being introduced by the MHMS. The details of the training in the soft component will include onboard matters indicated by the MHMS that have resulted from past experiences of medical equipment O&M in public medical facilities and advice about adaptation.

5. Soft Component Implementation Process



- Work Schedule in Japan (Preparation, 2 days) 0.10MM

Materials and various sheets and report formats will be produced for use in lectures on the O&M of medical equipment to be used in the training. An overall flowchart of the tasks to be performed will also be prepared in Japan. It will be confirmed in advance whether the target facility has established an acceptance system.

Day	Schedule
1	Schedule adjustments, Meetings, etc.
2	Preparation of teaching materials for the training

- Work Schedule in the Solomon Islands (17 days) 0.57MM

To introduce the O&M system for medical equipment to the target facilities, create a maintenance management plan and inventory of the medical equipment, and establish the maintenance record system of the medical equipment (Report system), a monitoring system will be established using the annual activities plan, and guidance will be provided to help trainees understand the use of medical equipment effectively and operating it correctly.

Day	Schedule	Timetable	Training content	Vehicle	Lecturer	Accommodation (Lecturer)
1	Narita → Singapore, Singapore → Brisbane	-	-	-	-	-
2	Brisbane→Honiara	-	-	-	-	
3	Visit MHMS, explain training content Honiara → Auki	-	-	1	1	1
4	Soft component works 1. Introduction to How to Organize the Maintenance system of the Kilu'ufi hospital	10:00-12:00 13:00-15:00	・Quality Health Service ・Organizing Maintenance *	2	2	2
5	Soft component works	10:00-12:00	・Priorities when creating	3	3	3

	2. Creation and Control of the Medical equipment maintenance management plan		a maintenance plan			
		13:00-15:00	・Maintenance of the Medical equipment, Repairs, and Safety Testing* ・External resource (Maintenance contract etc.)			
6	Soft component works 3. Establishment of the Medical Equipment Inventory system of the Kilu'ufi hospital	10:00-12:00	・Creation of an inventory of the medical equipment	4	4	4
		13:00-15:00	・Operating management of the medical equipment*			
7	The meeting, Organizing materials	-	-	-	5	5
8	The meeting, Organizing materials	-	-	-	6	6
9	Soft component works 4. Establishment of the Maintenance record system of the medical equipment (Report system)	10:00-12:00	・Report system when the medical equipment faults etc.	5	7	7
		13:00-15:00	・Monitor Progress and Record Work* ・Service Histories of the Medical equipment *			
10	Soft component works 5. How to ensure the medical equipment is utilized effectively	10:00-12:00	・How to use effective medical equipment*	6	8	8
		13:00-15:00	・Training & skills Development			
11	Soft component works 6. How to ensure correct operation for the medical equipment	10:00-12:00	・How to operate the medical equipment with applied the procedure properly	7	9	9
		13:00-15:00	・Application Training* ・Care and Cleaning			

			Instructions after the Medical equipment using*			
12	Soft component works 7. Establishment of the Monitoring of the progress system	10:00-12:00 13:00-15:00	・Setting Goals* ・Monitoring Progress	8	10	10
13	Auki → Honiara	-	-	9	11	-
14	The meeting, Organizing materials	-	-	-	-	-
15	The meeting, Organizing materials	-	-	-	-	-
16	Visit MHMS, explain the result of Activities Honiara → Brisbane	-	-	10	-	-
17	Brisbane → Singapore, Singapore → Narita	-	-	-	-	-

* A combination of lectures and workshops

- Work Schedule in Japan (After Training, 3 days) 0.15MM

Summarize the results of technical guidance and prepare a final report.

Day	Schedule
1	Report preparation
2	Report preparation
3	Report preparation

6. Soft Component Output

Soft Component Output	・ Annual Action Plan ・ Daily maintenance and Periodical maintenance annual plan (Wall Calendar) ・ Daily checklist(sheet) and Periodic checklist(sheet), Safety and Calibration testing sheet ・ Inventory of the medical equipment ・ Reports used for the maintenance record system and files for storing reports ・ Inventory checklist of accessories and consumables

7. Soft Component Initial Cost Estimation

The total estimated cost of the soft component is approximately 3,896,000 yen.

8. Recipient Country Obligations

To ensure the potential for the independence of the Solomon Islands as far as possible, the training in the soft component must use techniques that promote autonomous activities by the Solomon Islands. Therefore, a full understanding of and cooperation in this soft component from the implementing organization in the Solomon Islands is required.

First, it will be necessary for managers at the MHMS and Kilu'ufi Hospital to understand and consider the targets and details of the plan. The most important aspect is the employment of appropriate personnel to perform the soft component. At the time of the survey, no one had been employed to be in charge of medical equipment. Therefore, prior to implementing the soft component, it will be necessary for MHMS to appoint a medical equipment O&M technician who has a high technical level. Japan will provide these technicians with technical training and cooperation through the soft component.