

MINISTRY OF HEALTH AND SPORTS
THE REPUBLIC OF THE UNION OF MYANMAR

**PREPARATORY SURVEY REPORT ON
THE PROJECT FOR THE CONSTRUCTION
OF
NEW YANGON SPECIALIST HOSPITAL IN
THE REPUBLIC OF THE UNION OF
MYANMAR**

APRIL 2018

JAPAN INTERNATIONAL COOPERATION
AGENCY (JICA)
YAMASHITA SEKKEI INC.
AZUSA SEKKEI CO. LTD.
BINKO INTERNATIONAL LTD.

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JR
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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to the consortium of Yamashita Sekkei Inc., Azusa Sekkei Co. Ltd. and Binko International Ltd.

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

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

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

April, 2018

Ms. Mitsuko Kumagai
Director General
Human Development Department
Japan International Cooperation Agency

SUMMARY

1. Outline of the Recipient Country

The Republic of the Union of Myanmar (hereinafter referred to as “Myanmar”) is located along the western side of the Indochina Peninsula, and is bordered by the People’s Republic of China to the north east, by Laos to the east, Thailand to the southeast, Bangladesh to the west and India to the northwest. The land area is approximately 680,000 square kilometers (about 1.8 times of Japan) and the population is about 51.41 million (as of 2014). The capital is Naypyidaw. Most of the land of Myanmar is in the tropical or subtropical zone, but there are large differences in climate and rainfall depending on the location.

Since 1962, the economic distress had been increased because of the socialist regime and the closed economic policy, and on December, 1987, Myanmar was recognized as the Least Developed Country (LDC) by the United Nations. In 1988, Myanmar government announced that they would change the economic system to the liberal economic system, then the economy began to grow well in 1992. But, the economic growth had remained sluggish because of the Asian currency crisis of 1997 and the global recession from 2008. After the general election of 2010, Ms. Aung San Suu Kyi under house arrest was released and on March, 2011, the military regime finished, then Mr. Thein Sein had been inaugurated and the transition to civilian government was implemented. At the general election of 8th November, 2015 which was first time in four years, “National League for Democracy” (NLD) which is headed by Ms. Aung San Suu Kyi got a great victory and NLD government has been inaugurated.

The democratization, the transition to open economy and the trade environmental improvement have been rapidly implemented in Myanmar and the managed floating exchange rate system to unite the foreign exchange market was introduced in April, 2012. As a result of the growth of service and manufacturing industries, the economic growth has accelerated and the nominal GDP in 2015 was 67 billion USD and the nominal GDP per capita in 2015 was 1,292 USD. The actual growth rate of GDP was 7.03 % and the rate of increase in consumer price index was 11.48 %. Stable annual economic growth of 7 % is assumed in a medium and long term with plenty natural resources, fertile land, relatively inexpensive labor force, and geopolitical advantage as a node of the member countries of ASEAN (The Association of Southeast Asian Nations), India and China. Moreover, the Kuala Lumpur Declaration regarding the establishment of ASEAN Economic Community (AEC) which consists of 10 countries of ASEAN was signed by ASEAN countries leaders on 31st, December, 2015. The customs of 90 % of items have already been zero and it is expected that they will accelerate economic integration among all member countries as a result of the achievement of the high standard liberalization of trade.

As a recent movement, Myanmar Investment Committee (MIC) presented the 10 categories in which the investment is preferentially authorized on 28th, June, 2017. It is suggested that Myanmar government tries to accelerate the investment to companies whether they are local or not under the Myanmar Investment Law which was fully come into effect in April, 2017.

On the other hand, the government expenditure to the healthcare services have been surely increased every year, especially after 2012, the budget has been drastically increased. The budget of Ministry of Health and Sports (MoHS) in the year 2015/16 was 8.6 times of that in the year 2011/12. Nevertheless, according to Human Development Index of UNDP, Myanmar was 150th rank among 173 countries at the year 2014 and was still one of “Low Human Development” countries.

2. Background and Outline of the Project

In the health sector of Myanmar, the mortality rates have been on the rise, not only due to communicable diseases but also due to non-communicable diseases. The mortality rate due to non-communicable diseases including cardiovascular diseases is 59 % of total number of deaths (441,000 / year) in Myanmar. In addition, the mortality rate due to cardiovascular diseases (ischemic heart diseases and stroke etc.) is 25 % of total number of deaths, and it accounts for a largest portion among non-communicable diseases. Moreover, in the ranking of the cause of premature deaths in Myanmar, stroke remains the first from 2005 to 2015 and ischemic heart diseases went up from the fourth in 2005 to the second in 2015 respectively.

However, the hospitals that can provide diagnosis and medical care for these diseases are still limited. Yangon General Hospital (YGH) (established in 1899) is one of the highest referral hospital in the country and serves as a teaching hospital. But, the number of acceptable patients is insufficient relative to the patients who need treatment and YGH is incapable of providing sufficient medical services because of the following reasons:

- Out of date facilities and shortage of medical equipment
- Inconvenient circulation flow of staff and patients due to frequent repeated extensions and renovations
- The shortage of beds, and
- The excessive concentration of patients.

On the basis of above situation, “The Project for the Construction of New Yangon Specialist Hospital” was requested to improve the quality and quantity of medical services through the relocation of clinical functions from YGH to a proposed specialist hospital.

In Myanmar, the health sector has been implementing “National Health Policy” and “National Health Plan 2017-2021” and challenges programs, such as “The

improvement of hospital care”, “The enhancement of healthcare system” and so on. This Project is expected to contribute to realization of such health policies and plans in Myanmar.

The content of the request by Myanmar is as the below table.

Table I: The Content of the Request by Myanmar

Content	Component	Cost
Facility	Outpatient Department, Emergency Department, Operation Theater, Ward, Diagnostic Imaging Department, Administration Department, Others (Pharmacy storage, Electrical facilities, Water supply/discharge facilities, Laundry, Engineer Department, Library, Lecture rooms)	Five story Approximately 9,290 m ² (100,000sq feet) Cost : USD 2,606,178- *Unit price/sq feet : 27,000MMK (Unit price/m ² : 290,625.6MMK = 264.2USD * 1 USD = 1,100MMK)
Equipment	Equipment for Cardiac, Neuro medicine and Oncology	Cost : USD 21,226,229- * Cardiac Department USD 1,904,048 Neuro medicine Department USD 4,698,556 Oncology Department USD 4,623,625
Soft Component	Maintenance and Management for Cardiac equipment, Neuro medicine equipment and Oncology equipment	Cost : USD 1,061,311 * 5% of Equipment cost
Supervision		Cost : USD 260,618- * 10% of Construction cost
Total		USD:25,154,336-

The above request components were prepared in March, 2015 and the oncology department was excluded from the scope of the Project after discussions. Considering the facility function and grade, the size of the facility and the project cost is considered not appropriate.

3. Summary of the Survey Results and Components of the Project

In consideration of the above background, JICA dispatched a preparatory survey team to Myanmar for the Project from 5th, July to 1st, August, 2015 as Survey I and from 6th, September, 2015 to 10th, October, 2015 as Survey II. But, this preparatory survey was suspended due to the change of government administration. After confirmation of the request from the present government, JICA dispatched a preparatory survey team to Myanmar from 2nd, July, 2017 to 22nd, July, 2017 as Survey III. The survey team prepared the outline design and an explanation of draft report was given in Myanmar from 26th, November, 2017 to 2nd, December, 2017, then, Myanmar side agreed with the Project on the basis of the draft report of the preparatory survey.

The scope of the Project agreed together with Myanmar side is to relocate the four targeted departments including cardiology, cardiac surgery, neuro medicine and neurosurgery from YGH to a proposed specialist hospital, and to construct a facility and procure a part of equipment required for operating as a cardiovascular medical center (refer to Table II and Table III). The medical equipment and furniture (for administration and staff rooms) required for the specialist hospital are planned to be timely procured by Myanmar side.

Table II: Facility

Japanese side	
(1) Building outline	
Item	Floor Area(m ²)
Seven story	27,187 m ²
①Outpatient Department (Cardiology / Cardiac surgery / Neuro medicine / Neurosurgery), Diagnostic Imaging Department, Emergency Unit, Laboratory Unit, Operation Theater, ICU (20beds), Angiography Unit, Pharmacy, Central Sterile and Supply Department (CSSD), Medical Engineering Department, Rehabilitation Department, Education, Medical Record storage, Supply Processing Distribution (SPD), Administration, Kitchen, Laundry, Morgue	
②Ward (296beds)	
(2) Building service outline	
<ul style="list-style-type: none">• Electric facilities : Power-supply equipment (incoming / substation / power distribution), emergency power generation system, lights, outlets, communication equipment, fire alarm system, lightening protector• Mechanical facilities : Air conditioning and ventilation system• Water supply / discharge facilities : Sanitary fixtures, water and hot water supply system, wastewater discharge system, fire-fighting equipment• Special facilities : Medical gas equipment, elevator system	
Myanmar side	
(3) Accessory building	
<ul style="list-style-type: none">• Guard house• Ambulance Garage	

Table III: Main Equipment

Department	Main Equipment
Cardiology Neuro medicine Neurosurgery	Angiography system Bi-plane
Cardiology	Angiography system Single plane
Diagnostic Imaging	CT scanner, Digital X-ray machine
Soft Component	The training will be for the four targeted departments and maintenance department. The training will instruct how to conduct daily check, how to deal with equipment malfunction and how to manage inventory lists in order to organize maintenance structure of medical equipment.

4. Implementation Schedule and Estimated Cost of the Project

The Project will take approximately 37 months for its implementation including 10.5 months for detailed design and bidding, 24 months for construction works, two months for installation and handover of medical equipment. Soft component will take approximately 11.5 months from start to finish. The project cost borne by the Government of Myanmar is estimated to be 3.496 billion Japanese yen.

5. Evaluation of the project

(1) Relevance

Implementation of this project is highly relevant as a Japanese grant aid scheme from the following point of views.

- 1) Target departments of this project are four departments in Yangon General Hospital (YGH) which is a top referral hospital located in Yangon city. Therefore, direct beneficiaries of this project will be the population residing in Yangon region and also population residing in the reachable areas to refer patients, while indirect beneficiaries are all nationals in Myanmar.
- 2) The objective of this Project is to improve quality and quantity of medical and healthcare services for cerebral and cardiovascular diseases in Yangon region by establishing a new specialist hospital and improving medical equipment where cerebral and cardiovascular diseases can be treated, through relocation of the selected clinical departments from YGH as a tertiary medical facility. Thus, it is expected that the poor or the elderly people could improve their access to tertiary medical services. As a result, it is expected to contribute to contentment of Basic Human Needs and stabilizing the people's livelihood which is one of the objectives of Japanese grant.
- 3) This project would contribute to achieve objectives articulated in the Myanmar Health vision 2030 and these objectives are to improve the people's health, to develop health system responding to the changes of situation surrounding people's health, to provide medical services to all nation and to develop human resources. In addition, it would contribute to reduce mortality, mobility and disabilities from aftereffects of NCDs targeted in the "National Strategic Plan for Prevention and Control of NCDs 2017-2021" formulated in 2017.
- 4) The Government of Myanmar has set National health policy and National Health plan 2017-2021, and tries to achieve "improvement of hospital care", and "health system strengthening". Especially, National Health Plan 2017-2021 has pointed out that mortality rate stemming from NCDs are on an increasing trend in addition to persistently high mortality due to some of infectious diseases.

(2) Effectiveness

Expected effects of the Project are as follows;

1) Quantitative Effects

A) BASIC INDICATORS

Following basic indicators would increase based on the data in 2016.

Table IV Quantitative Indicators and Target Values: Basic Indicators

Name of Department	Indicators	Original (Yr 2016)	Target (Yr 2024)
Cardiology	No. of inpatients	4,436	5,221
	No. of outpatients	19,762	23,260
Cardiac surgery	No. of inpatients	947	1,115
	No. of outpatients	4,826	5,680
Neurosurgery	No. of inpatients (except trauma)	2,920	3,437
	No. of outpatients	1,180	1,389
Neuro medicine	No. of inpatients	1,020	1,201
	No. of outpatients	7,115	8,374

B) QUANTITATIVE EFFECTS OF EACH DEPARTMENT

Table V Quantitative Indicators and Target Values: each department

Name of Department	Indicators	Original (Yr 2016)	Target (Yr 2024)
Cardiology	No. of angiography and angioplasty	1,761	2,113
	Time duration from receiving patients until starting catheter treatment(min.)	N/A	30
Cardiac surgery	No. of major surgeries	374	56
Neurosurgery	No. of months in which patients are waiting for surgery (month)	3	1
	No. of surgical cases used intraoperative CT scanning	0	89
Neuro medicine	No. of thrombolytic therapy cases	45	90
	No of cerebral infarction patients evaluated by MRI	0	304

2) Qualitative Effects

Table VI Qualitative Effects

- | |
|---|
| <ol style="list-style-type: none">1. The hospital environment will be improved to enable hospital staff to provide effective medical services by clear separation of medical staff flow and patients flow. Especially, by streamlining emergency flow, the duration from arrival to starting treatment of a patient will be shortened.2. Advanced surgical operations (e.g. Stent-graft or TAVI) will be performed in the hybrid operation theater for cardiac surgery.3. Catheter treatments for strokes, aneurysm and Arteriovenous Malformation (AVM) will be performed.4. Patient friendly accessible facility design will enhance the satisfaction of patients under rehabilitation and wheelchair users. |
|---|

Contents

Preface

Summary

Contents

Location Map

Perspective

List of Figures & Tables

Abbreviations

Chapter 1	Background of the Project.....	1-1
1.1	Background of the Project	1-1
1.2	Natural Conditions	1-1
1.3	Environmental and Social Considerations	1-3
Chapter 2	Contents of the Project.....	2-1
2.1	Basic Concept of the Project	2-1
2.2	Outline Design of the Japanese Assistance	2-1
2.2.1	Design Policy	2-1
2.2.1.1	Basic Policy	2-1
2.2.1.2	Policy for Natural Conditions	2-5
2.2.1.3	Policy for Socioeconomic Conditions	2-5
2.2.1.4	Policy on Construction Conditions.....	2-6
2.2.1.5	Policy on Procurement Conditions.....	2-6
2.2.1.6	Policy on Use of Local Contractors	2-6
2.2.1.7	Policy on Operation and Maintenance.....	2-6
2.2.1.8	Policy on Grade Setting for Facilities and Equipment	2-7
2.2.1.9	Policy on Construction Schedule.....	2-7
2.2.2	Basic Plan (Construction Plan/Equipment Plan).....	2-8
2.2.2.1	Site and Facility Plan.....	2-8
2.2.2.2	Construction Plan.....	2-14
2.2.2.3	Equipment Plan.....	2-27
2.2.3	Outline Design Drawing	2-52
2.2.4	Implementation Plan.....	2-53
2.2.4.1	Implementation Policy	2-53
2.2.4.2	Implementation Conditions	2-56
2.2.4.3	Scope of Works	2-57
2.2.4.4	Consultant Supervision.....	2-59

2.2.4.5	Quality Control Plan	2-62
2.2.4.6	Procurement Plan.....	2-63
2.2.4.7	Initial operation training and operation training	2-64
2.2.4.8	Soft Component (Technical Assistance) Plan	2-65
2.2.4.9	Implementation Schedule	2-65
2.3	Obligations of Recipient Country.....	2-67
2.4	Project Operation Plan	2-69
2.4.1	Operation and Maintenance Plan.....	2-69
2.4.2	Maintenance Plan	2-70
2.5	Project Cost Estimation.....	2-73
2.5.1	Initial Cost Estimation.....	2-73
2.5.2	Operation and Maintenance Cost.....	2-74
Chapter 3	Project Evaluation.....	3-1
3.1	Preconditions	3-1
3.2	Necessary Input by Recipient Country	3-1
3.3	Important Assumptions	3-1
3.4	Project Evaluation	3-2
3.4.1	Relevance	3-2
3.4.2	Effectiveness	3-2

[Appendices]

1. Member List of the Survey Team
2. Survey Schedule
3. List of Parties Concerned in the Recipient Country
4. Minutes of Discussions
5. Soft Component (Technical Assistance) Plan
6. Other Relevant Data
7. References

Location Map



Figure I: Map of Myanmar

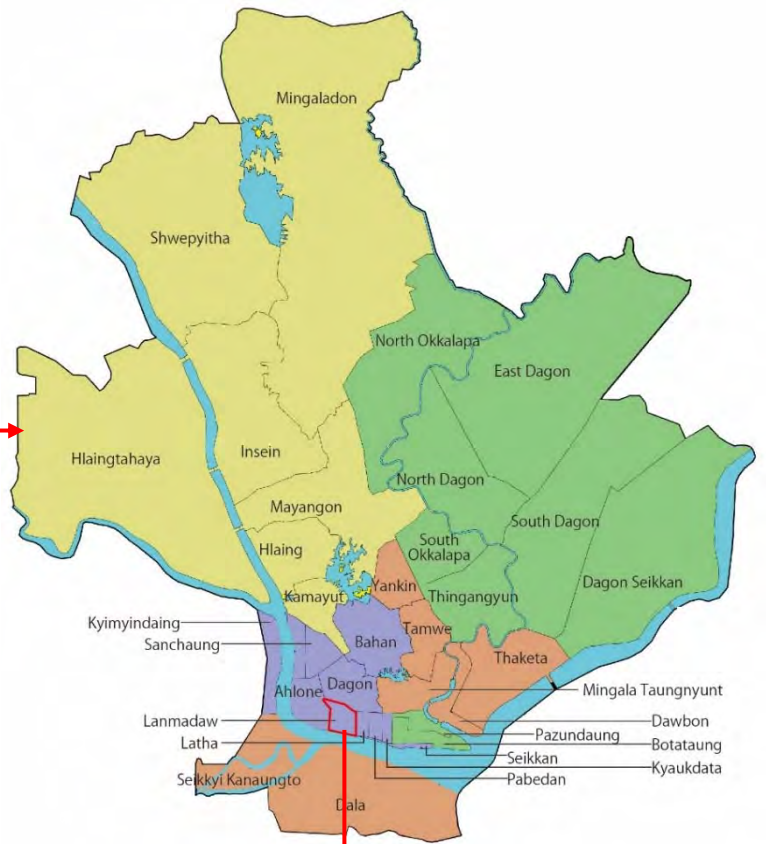


Figure II: Map of Yangon

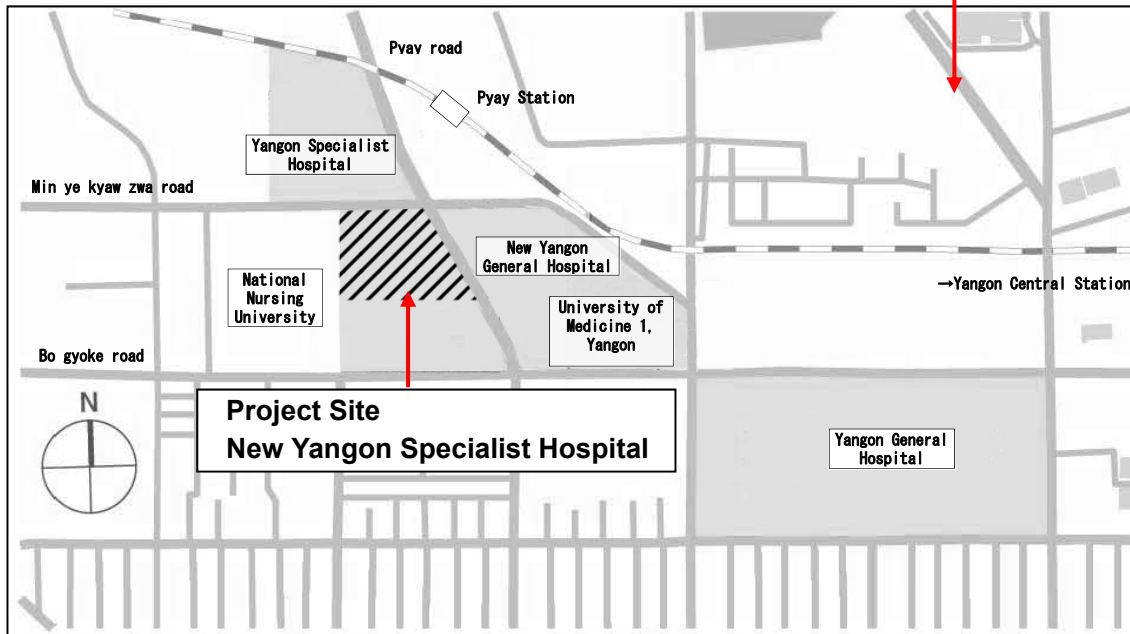


Figure III: Location of the Project Site

Abbreviations

ACT	Activated Clotting Time
AV	Audio Visual
CCU	Coronary Care Unit
CMSD	Central Medical Store Depot
CPU	Central processing unit
CSSD	Central Sterile Services Department
CT	Computed Tomography
DR	Digital Radiography
EEG	Electroencephalogram
EIA	Environmental Impact Assessment
EMG	Electromyogram
E/N	Exchange of Notes
G/A	Grand Agreement
GL	Ground Level
HCU	High Care Unit
HDU	High Dependency Unit
HEPA	High Efficiency Particulate Air
HWC	Handicapped Water Closet
ICU	Intensive Care Unit
IEE	Initial Environmental Examination
IMF	International Monetary Fund
JICA	Japan International Cooperation Agency
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emission Diode
MOECAP	Ministry of Environmental Conservation and Forestry
MPT	Myanmar Posts and Telecommunications
MRI	Magnetic Resonance Imaging
NCU	Neurosurgical Care Unit
NYGH	New Yangon General Hospital
PACS	Picture Archiving and Communication System
PBX	Private Branch exchange
PCI	Percutaneous Coronary Intervention
PTCA	Percutaneous Transluminal Coronary Angiography
RIS	Radiology Information System
RO	Reverse Osmosis
SCU	Stroke Care Unit
SWC	Staff Water Closet
UPS	Uninterruptable Power Supply
USD	United States Dollar
YCDC	Yangon City Development Council
YESC	Yangon Electricity Supply Corporation
YGH	Yangon General Hospital
YSH	Yangon Specialist Hospital

Perspectives



Figure IV: Bird's eye view



Figure V: Facade image

LIST OF FIGURES & TABLES

Table I The Content of the Request by Myanmar

Table II Facility

Table III Main Equipment

Table IV Quantitative Indicators and Target Values: Basic Indicators

Table V Quantitative Indicators and Target Values: Each department

Table VI Qualitative Effects

Table 1-1 Monthly rainfall of Yangon

Table 1-2 Average monthly maximum temperature of Yangon

Table 1-3 Average monthly minimum temperature of Yangon

Table 1-4 Average monthly wind direction of Yangon

Table 2-1 Components of the Project

Table 2-2 The activity and main equipment of main departments

Table 2-3 Demarcation of clinical services for targeted departments between NYSH and YGH

Table 2-4 Ground Floor / Floor Areas of Major Rooms

Table 2-5 First Floor / Floor Areas of Major Rooms

Table 2-6 Second Floor / Floor Areas of Major Rooms

Table 2-7 Ward Floors (3~6 Floor) / Floor Areas of Major Rooms

Table 2-8 Design Concept of Floor Zoning

Table 2-9 Major Exterior Finishing Materials

Table 2-10 Major Interior Finishing Materials

Table 2-11 Approximate Water Supply Quantity

Table 2-12 Equipment plan for Outpatient Department

Table 2-13 Equipment plan for Physiology Laboratory

Table 2-14 Equipment plan for Rehabilitation Department

Table 2-15 Equipment plan for Diagnostic Imaging

Table 2-16 Equipment plan for Angiography Unit

Table 2-17 Equipment plan for Emergency Unit

Table 2-18 Main equipment plan for High Care Unit

Table 2-19 Main equipment plan for ICU

Table 2-20 Main equipment plan for Surgical Unit (Cardiac surgery)

Table 2-21 Main equipment plan for Hybrid Operation Theater (Cardiac)

Table 2-22 Main equipment plan for Operation Theater (Neuro Surgery)

Table 2-23 Main equipment plan for Hybrid Operation Theater (Neuro)

Table 2-24 Main equipment plan for Laboratory Unit

Table 2-25 Main equipment plan for Pharmacy

Table 2-26 Main equipment plan for Ward

Table 2-27 Main equipment plan for Central Sterile and Supply Department (CSSD)

Table 2-28 Main equipment plan and specification procured by Japanese side
Table 2-29 Main equipment plan and specification procured by Myanmar side
Table 2-30 Undertakings by the Government of Myanmar
Table 2-31 The List of Procurement Plan for Major Construction Materials
Table 2-32 Project Implementation Schedule
Table 2-33 Required Workforce in the NYSH
Table 2-34 Summary of regular inspection points of facilities
Table 2-35 Service Life of Mechanical and Electrical Equipment
Table 2-36 Proposed Maintenance Structure
Table 2-37 Estimated Cost to be borne by the Government of Myanmar
Table 2-38 Estimated operation and maintenance cost (thousand MMK per year)
Table 2-39 Annual maintenance budget of equipment consumables
Table 2-40 MoHS Expenditures by Department (2015/16)
Table 3-1 Quantitative Indicators and Target Values: Basic Indicators
Table 3-2 Quantitative Indicators and Target Values: each department
Table 3-3 Qualitative Effects

Figure I Map of Myanmar
Figure II Map of Yangon
Figure III Location of the Project Site
Figure IV Bird's eye view
Figure V Facade image

Figure 1-1 Location of Borehole
Figure 2-1 Photomap of Site Surroundings
Figure 2-2 Project Site Condition
Figure 2-3 Design Concept of Site Plan
Figure 2-4 Design Concept of Department Layout
Figure 2-5 Design Concept of Bed rooms
Figure 2-6 Water System Diagram
Figure 2-7 Wastewater Flow Diagram
Figure 2-8 Air Conditioning Flow
Figure 2-9 Project Implementation Organization Diagram

Chapter 1 Background of the Project

Chapter 1 Background of the Project

1.1 Background of the Project

In Myanmar, the health sector has been implementing “National Health Policy” and “National Health Plan 2017-2021” and challenges programs, such as “The improvement of hospital care”, “The enhancement of healthcare system” and so on. This Project is expected to contribute to realization of such health policies and plans in Myanmar. In the health sector of Myanmar, the mortality rates have been on the rise, not only due to communicable diseases but also due to non-communicable diseases. The mortality rate due to communicable diseases including cardiovascular diseases is 59 % of total number of deaths (441,000 / year) in Myanmar. In addition, the mortality rate due to cardiovascular diseases (ischemic heart diseases and stroke etc.) is 25 % of total number of deaths, and it accounts for a largest portion among non-communicable diseases. Moreover, in the ranking of the premature cause of deaths in Myanmar, stroke remains the first from 2005 and ischemic heart diseases went up from the fourth in 2005 to the second respectively.

However, the hospitals that can provide diagnosis and medical care for these diseases are still limited. Yangon General Hospital (YGH) (established in 1899) is the highest referral hospital in the country and serves as a teaching hospital. But, the number of acceptable patients is insufficient relative to the patients who need treatment and YGH is incapable of providing sufficient medical services because of the following reasons:

- Out of date facilities and shortage of medical equipment
- Inconvenient circulation flow of staff and patients due to frequent repeated extensions and renovation
- The shortage of beds, and
- The excessive concentration of patients.

On the basis of above situation, “The Project for the Construction of New Yangon Specialist Hospital” was requested to improve the quality of medical services through the relocation of clinical functions from YGH to a proposed specialist hospital.

1.2 Natural Conditions

(1) Topography

The Project site is located in Yangon city where is surrounded by the Line river to the west, by the Yangon river to the south, by the Bago river to the east. North-South distance is approximately 32km and East-West distance is approximately 24km. The area is located in the east part of the delta of the Ayeyarwady river and the center of Yangon city is located in 34km upstream from the mouth of the Yangon river. The slightly elevated hill stretches from north to south in the center of Yangon city and it

downs gently towards the south. On the other hand, the east and west part of Yangon city is plain area.

(2) Geology

The ground of Yangon is generally weak. According to the geotechnical survey, the sandy clayey soil layer with N-value of approximately 10 and the allowable bearing capacity of 30 to 50 kN/m² was found from the ground surface to 8m deep. Then, the silty sand layer with N-value of less than 20 continues up to a depth of GL-25m and deeper than this, bearing capacity is gradually increasing, then N-value reach 50 at the depth of 45m from ground.

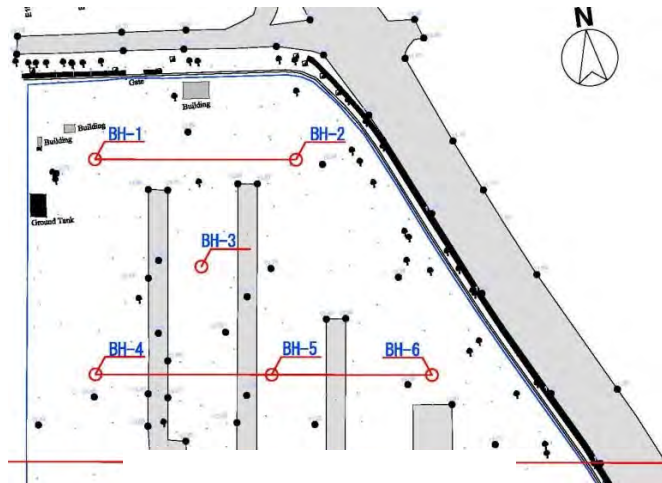


Figure 1-1 Location of borehole

(3) Groundwater

According to the groundwater survey, the water of the well of YGH, test well of the project site and the existing south well contains considerable amount of iron.

(4) Climate

1) Temperature and Humidity

The climate of Yangon is the tropical monsoon, the average temperature is about 27.5 degree Celsius throughout the year and the temperature is highest in March and April, the end of dry season. The amount of annual rainfall is very high, more than 2,700mm, and it often rains intensively in a short time. It is also confirmed that cyclones hit the area.

Figure 1-1: Monthly rainfall of Yangon

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	48	0	127	5	412	567	574	615	538	178	0	0	3,064
2012	0	0	0	8	167	450	717	864	379	59	115	0	2,759
2013	6	0	0	0	125	556	630	464	612	371	13	3	2,780

Yangon city Kabaie meteorological observatory

Figure 1-2: Average monthly maximum temperature of Yangon

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	32.3	34.8	33.7	36.5	33.0	31.7	31.2	30.5	31.2	33.0	34.2	33.3
2012	33.5	36.0	36.9	37.9	34.8	31.7	31.1	30.2	32.1	33.8	33.9	32.6
2013	32.7	36.6	37.1	38.6	35.5	31.4	30.4	30.9	31.2	32.1	34.1	30.9

Yangon city Kabaie meteorological observatory

Figure 1-3 Average monthly minimum temperature of Yangon

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	18.2	19.5	21.6	24.4	24.7	24.7	24.0	23.7	23.6	23.5	21.4	19.7
2012	17.1	18.8	21.9	24.4	24.5	23.6	22.8	22.4	22.6	22.7	22.1	17.3
2013	15.8	19.2	20.0	21.9	22.4	22.1	24.0	24.2	23.9	23.7	22.9	17.6

Yangon city Kabaie meteorological observatory

2) Wind Direction

The wind direction is sometimes north or west on November to January, but it is mainly south at the other seasons. The wind velocity is not so strong throughout the year, which is about 2~8m/s.

Figure 1-4: Average monthly wind direction of Yangon (2015)

Time	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AM 9:30	NE	SE	SE	SW	SE	SW	SW	SW	SW	SW	NE	NE
PM 6:30	W	SW	SW	SW	SW	SW	SW	SW	SW	SW	NW	NE

Yangon city Kabaie meteorological observatory

3) Natural Disasters

Six cyclones from the Indian Ocean hit Myanmar after 2001. Three of those are category four, corresponding to the strongest category of Japanese Typhoon strength classification.

(5) Earthquake

According to the earthquake zone map of Myanmar, the possible peak ground acceleration is estimated at 0.15 to 0.2 gal.

1.3 Environmental and Social Considerations

(1) Regulation of Myanmar regarding Environmental and Social Considerations

In Myanmar, the Environmental Conservation Law came into effect on March 2012, and the procedure of Environmental Impact Assessment (EIA) has already been approved by the parliament. The Ministry of Environmental Conservation and Forestry (MOECF) issued the document regarding the procedure of EIA, and the evaluation has started on the basis of the environmental quality guideline MOECF drew. The department in charge of EIA which is Environmental Conservation Department (ECD) is now belonging to the Ministry of Natural Resource and Environmental Conservation (MONREC) because of the reorganization of the government in 2016. According to the guideline of the document, report types, flow of procedure and penalties are regulated, and the project proposal shall be submitted to ECD by the organization for Project implementation before reporting. The guideline of the evaluation refers to the guideline of Environmental, Health and Safety (EHS) guideline of International Finance Corporation (IFC).

(2) The Procedure of EIA for this Project

According to the above guideline, in case of hospitals, Initial Environmental Examination (IEE) shall be submitted regardless of the scale. IEE shall be reported by the third party registered to ECD, and it is expected that it takes approximately six months to report in the reference to a similar case. ECD examines the submitted report in accordance of the guideline and determines whether EIA is required or not. In case EIA is required, the Ministry of Health and Sports (MoHS) shall ask the third party to

monitor whether the Project is managed on the basis of the recommended program of EIA report or not during the Project implementation stage.

According to the guideline of the Environmental Conservation Law, in case of hospital construction, IEE shall be submitted regardless of their scale.

(3) Attention Points of Environmental and Social Consideration for this Project

Attention points of Environmental and Social Consideration for this Project is as follows;

(Hospital Construction)

- Treatment of waste water and garbage, especially for medical waste and special waste water
- Impact to surroundings traffic (Impact of access of ambulance, patients and staffs)

(Site Condition)

- Demolition of trees (Demolition of old trees is required)
- Impact to neighborhood

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2.1 Basic Concept of the Project

The confirmed principal concept of new specialist hospital is as follows:

- National institute for cerebral and cardiovascular diseases with teaching and research capacity
- Universal design to provide patient-centered medical services

The outline of medical service and requested facilities of new specialist hospital confirmed with Myanmar side during the field survey is as shown in Table 2-1.

Table 2-1. Components of the Project

1. Clinical department	Cardiology, Cardiac surgery, Neuro medicine, Neurosurgery
2. Major target diseases	Cardio vascular disease including stroke , brain tumor, other neurological diseases such as degenerative disease
3. Facility	<p>Seven story, Total area: 27,187 m², 316 beds</p> <p>Examination room of Outpatient Department</p> <p>Emergency Unit</p> <p>ICU 20 beds (Cardiology, Neuro medicine, Neurosurgery)</p> <p>Ward 296 beds (less than 4 beds per room)</p> <p>Operation theater (Cardiology, Neurosurgery) including Hybrid operation theater</p> <p>Diagnostic Imaging Department</p> <p>Angiography Unit</p> <p>Laboratory</p> <p>Pharmacy</p> <p>Rehabilitation room</p> <p>Central Sterile Services Department</p> <p>Lecture room</p> <p>Others: Administration Department, Storage, Morgue, Electrical room etc.</p>
4. Major large equipment	<p>CT scanner</p> <p>Angiography system</p> <p>X-ray apparatus</p> <p>Autoclave</p> <p>Laboratory table</p>

2.2 Outline Design of the Japanese Assistance

2.2.1 Design Policy

2.2.1.1 Basic Policy

(1) Basic Concept of New Yangon Specialist Hospital

Targeting to provide international level medical services as a highest referral hospital of the country, outline design of NYSH have been developed based on the following policy:

1. Advanced hospital function
 - Able to provide services incorporating the latest medical technology
 - 24hours non-stop service
 - Reliable design against disaster risk
 - Introduction of hybrid operation theater for cardiac surgery and neurosurgery

- Operation theater equipped with ceiling pendant to maintain cleanliness
 - Introduction of sophisticated diagnostic imaging equipment together with PACS system
2. Creation of patient-centered environment
 - Comfortable clinical environment with spacious common area under hot and long rainy season climate
 - Secure sufficient ward amenities for family attendants
 - Universal design such as disabled toilets and handrails of corridors
 - Respect local culture such as nursing care methods or meal service
 3. Promotion of team-based medical care and improvement of efficiency
 - Staff station for coordination among different professional staff
 - Efficient and undisturbed medical environment by management oriented ward planning and separation of patient flow and staff/delivery flow
 4. Appropriate facility grading and ensuring of operation and maintenance
 - Corresponding to local budget, maintenance, operation, and medical technology, reasonable scope and size should be planned with consideration of availability of consumables and spare parts.
 - Easy maintenance and cost deduction will be considered corresponding to utilities supply and maintenance situation of the existing facilities. Energy saving methods to reduce air-conditioning and lighting cost will be studied.

(2) Facility of Japanese Assistance

□ Summary of NYSH

As a result of discussion with concerned parties including heads of the four targeted clinical departments of YGH, the function and capacity of clinical service are confirmed as shown in Table 2-2.

Table 2-2. The activity and main equipment of main departments

Department	Activities and equipment
Ward (296 beds) General 58 beds x four floors =232 beds HCU 16 beds x four floors =64 beds	The patients requiring tertiary level care in neuro medicine, neuro surgery, cardiology and cardiac surgery will be accommodated. Admitting diagnosis will be conducted for the postoperative recovery period patients and for internal medicine patients. Each room in the Ward has 4 beds or less. Some of the private rooms are designed as negative pressure rooms to accommodate patients with infectious diseases. In addition, Total 64-beds of HCU is planned for less seriously ill patients than ICU.
Operation Theater Three cardiac surgery rooms (one of the rooms is a hybrid OT with angiography equipment.) Three neurosurgical rooms (one of the rooms is a hybrid OT with CT)	Two operation theaters for cardiac surgery and one hybrid operation theater equipped with angiography machine are planned. Hybrid operation theater enables to operate safely surgical treatment such as bypass operation in addition to less invasive procedure such as stent-grafting and stent placement under angiography system. Although it will be the first Hybrid operation theater in Myanmar, they can operate without any problem since procedures are not different from current one. Two neurosurgery rooms and one hybrid operation room with a CT scanner are planned in order to determine an affected area by using navigation system. Hybrid operation theater for neurosurgery has an advantage in enhancement of patients' safety by confirming affected part accurately. In particular, combination of CT scanner and Navigation system enable to remove brain

Department	Activities and equipment
	tumor by obtaining real time image during operation. Since there were only fourteen cases of intracranial catheter treatments as of 2016, it is planned to secure only the space for a biplane angiography system for future plans.
Central Sterile and Supply Department (CSSD)	The role of this department is to sterilize such as surgical gowns, operation instrument sets, and bed sheets, etc. by using high pressure steam and supply to the operating theaters, ICUs, etc.
Outpatient Department (Eight consultation rooms)	This department will treat revisiting outpatients and accept new outpatients referred from other hospitals for specialized consultation. NYSH plans to open outpatient department with four specialties - neuro medicine, neuro surgery, cardiology and cardiac surgery. Doctors of each specialty conduct consultation with outpatients two or three days a week. The schedule coordination among the departments will be needed to avoid rush of outpatients.
Rehabilitation department (physical therapy room)	Inpatients of neurology and cardiology diseases will have rehabilitation training for six weeks. The facility with equipment for kinesiology, occupational therapy and physiotherapy is planned for acute rehabilitation in the four planned specialties and physiotherapists will conduct the training
Emergency Unit Two examination rooms Two beds for treatment Six beds in recovery and observation room	The number of emergency patients with neurosurgery trauma is the largest among the four planned specialties. Since it is necessary to cooperate with other departments for trauma patients, their functions are supposed to remain in the existing YGH. Neurological patients with stroke will be accepted at new hospital. In NYSH, Blood Gas Analyzers (including electrolyte), ECG and mobile X-ray unit will be equipped for quick diagnosis and treatment for received patients.
Diagnostic Imaging Department Two CT rooms One MRI room Two DR rooms	Since the diagnostic imaging analysis is vital for the four targeted specialties, a 64-slice CT scanner for emergency patients and a 128-slice CT scanner for cardiovascular examination and other in/outpatients are planned. A 1.5T MRI with cardiac application will be installed since it is important to diagnose and evaluate by MRI for cardiovascular patients. Furthermore, PACS System is planned in order to compare and manage patient's image data easily.
Angiography Unit	One single-plane Angiography System and two bi-plane Angiography Systems are planned for coronary angiography, PCI (percutaneous coronary intervention) ¹ , pacemaker implantation, catheter ablation for atrial fibrillation, peripheral vessels intervention ² treatment, and intracerebral treatment. In total, three units will be included in the scope of the Project.
ICU (20 beds)	20-bedded ICU is planned for management and intensive care of serious post-operative patients. Each unit places necessary equipment such as ventilator, central monitor, patient monitor, infusion pump and syringe pump.
Laboratory Unit Laboratory test Microbiology test Pathological test	<Laboratory department> This department will conduct biochemistry test, hematology test, immunochemical test such as hormone, myocardial markers and tumor markers, pathological test and microbial/bacterial test, which are necessary for clinical examination of the four targeted specialties. Since YSH has enough equipment for immunochemical test and pathological test and the number of pathological tests is small, sharing of test function with YSH can be considered. Thus, only space for laboratory is secured under the Project. <Blood transfusion department> In blood transfusion, it is confirmed that national blood center has an appropriate system to provide blood. Thus, the equipment only for cross-match test for blood transfusion and for preservation are planned.
Pharmacy Outpatient dispensary: not to outsource and no preparation function.	At this moment, there is no pharmacy to provide medicine for outpatients in YGH. All medicine for inpatients is pre-packaged and they do not compound medicine at the pharmacy of YGH. An in-house pharmacy to provide medicine for inpatients is planned.
Education Six lecture rooms for 50 persons, meeting room for 20 persons	Since this hospital is required to function as an educational hospital, six lecture rooms accommodating 50 people are planned with AV equipment including projectors and microphones for clinical meeting or lectures by visiting outside lecturers.
Others	A room for medical engineering department, kitchen, laundry, administration department, medical record storage, mortuary etc. are also planned.

¹ Percutaneous coronary intervention is a procedure that uses a balloon catheter and a stent to open up blood vessels in the heart that have been narrowed by plaque buildup so as to increase the flow of blood.

² Peripheral vessels intervention is a procedure that uses a balloon catheter and stent to compress the plaque against the wall of the artery leading to the legs and an artery that have been narrowed.

□ Functional demarcation between NYSH and YGH

The four targeted clinical departments, namely, cardiology, cardiac surgery, neuro medicine and neurosurgery, are planned to be relocated from YGH though some services mainly for emergency cases will remain as shown in the table below.

Table 2-3. Demarcation of clinical services for targeted departments between NYSH and YGH

Clinical dept.	Services to remain in YGH	Services to be relocated to NYSH	Notes
cardiology	Clinical services for emergency cases for some time after the opening of NYSH	Clinical services for out/inpatients and referred patients	All emergency patients will be transported to YGH for some time after NYSH opening, and this function will be transferred gradually to the new specialty hospital
cardiac surgery	Clinical services for emergency cases for some time after the opening of NYSH	Clinical services for out/inpatients and referred patients	Ditto
neuro medicine	Clinical services for patients with Guillain-Barre syndrome and epilepsy who do not require emergency care	Stroke Patients	Patients with Guillain-Barre syndrome and epilepsy who do not require emergency care will remain at YGH.
neurosurgery	Clinical services for trauma cases, and radiology treatment for brain tumor	All clinical services except those listed in the left column	Clinical services for trauma cases need to collaborate with other departments within YGH In YGH, there are two linear accelerators for radiotherapy treatment. Thus, radiotherapy treatment will be conducted in YGH.

Since the provision of all clinical services under the targeted departments, including cardiovascular emergency cases in NYSH are functionally desirable under enhanced emergency patients transport system in future, building and equipment plans will be planned with flexibilities to accommodate such functions.

(3) Project Site

The project site is the northern half of the premises facing Pyay road, Bo Gyoke road, Min Ye Kyaw Zwa road and National University of Nursing constructed under Japanese Grant Aid. The project site is located at the end of the downtown, and within the medical facility district with Yangon Specialist Hospital (hereafter “YSH”) on the north side, and New Yangon General Hospital (hereafter “NYGH”) and YGH along the southern road.



Figure 2-1: Photomap of Site Surroundings

Myanmar side requested intensive use of land without using all the given area for effective site utilization since the project site is located in high land value area within Yangon.

Consequently, feasibility for an underground parking was studied. As the result, only on-ground parking system was selected because northern area is big enough to accommodate parking requirements as described in the draft National Building Code of Myanmar, and it is necessary to plan a flexible medical space for expected increase of hospital wards under limited financial resources.

The project site is confirmed as large enough to accommodate the requested facilities and for future expansion in case of intensive use of the site by planning one integrated mid-story hospital. The project site has good accessibility to public transportation, existing national hospitals, medical university and nursing university and good visibility from the surrounding main streets. Utilities to the site are available, for example, the main power distribution line is nearby. Furthermore, it is confirmed that the site has enough space to accommodate the temporary work area for building work during construction period.

2.2.1.2 Policy for Natural Conditions

(1) Consideration for High Temperature and Solar Radiation

In Yangon region, the average temperature is about 27.5 degree Celsius throughout the year and the temperature is highest in March and April, the end of dry season. Therefore, the new building to be constructed should be designed to control the external heat load by enhancing the thermal insulation performance of the roof and the wall. In addition, installation balconies and eaves is planned to control strong sunlight.

(2) Consideration for Rainfall and High Humidity

The amount of annual rainfall is very high, more than 2,700mm, and it often rains intensively in a short time. In order to prevent flooding in the project site, the surrounding area of the new building should be elevated and appropriate drainage gutters should be constructed.

The deterioration of the exterior walls and the eaves are commonly founded in Yangon because of mold growth caused by rainfall and high humidity. Therefore, the exterior finish material should be selected considering mold prevention, and the openings and air conditioning system should be designed to prevent the dust from entering.

2.2.1.3 Policy for Socioeconomic Conditions

The project site is highly valuable in the center of Yangon where the land price is rising. In order to ensure enough space for future development, the intensive land use shall be planned as much as possible.

In Myanmar, many informal patient attendants, most of whom are family members of inpatients, stay overnight in hospital hallways and provide all life supports of patient, such as changing sheets and preparing meals except for medical services. In accordance with such local practice, the areas for these patient attendants are planned under the Project.

2.2.1.4 Policy on Construction Conditions

Because official building standards and relevant regulations are being developed and not yet enforced in Myanmar, the new Project building will be designed in compliance with the draft version of these standards and regulations or in reference to relevant laws and regulations of Japan. Moreover, since construction works requires a building permit in advance from the Yangon City Development Committee (YCDC), the procedure should be implemented timely by the Myanmar side.

2.2.1.5 Policy on Procurement Conditions

Most of the major construction materials are available on the local market including locally produced items and imported items from China and/or ASEAN countries. It is possible to obtain locally construction materials that meet the quality requirements of the construction works for the Project. Therefore, in principle, construction materials for the construction works of the Project will be procured from the local market.

The medical equipment is procured in Myanmar or from Japan based on the principles of Japanese Grant Aid. However, it is acceptable to procure part of medical equipment from third country such as EU and/or the United States considering cost advantage, user-friendliness and accessibility of maintenance service by local agent in Yangon. On the other hand, some medical furniture is acceptable to procure from China and ASEAN whose headquarters is located in developed country considering cost advantage and of less transportation cost.

2.2.1.6 Policy on Use of Local Contractors

Most public and private construction works are undertaken by local contractors. They also participate in many projects funded by international donors and agencies including the Government of Japan. Therefore, it is possible to find local construction firms that can meet the quality requirements of construction works of the Project. For effective use of local construction firms in the construction works, the new building should be designed with locally common structural practices as well as locally used finishing materials and building machineries.

2.2.1.7 Policy on Operation and Maintenance

For the facility management, the new building of the Project should not include building equipment or systems which are not commonly used in Myanmar and require advanced maintenance techniques. Moreover, building machineries requiring daily

maintenance should be carefully selected according to the availability of consumables and spare parts so that it will not cause undue financial burden to NYSH.

Medical equipment will be selected based on the availability of maintenance services, such as periodical check and corrective maintenance services by the engineers from local agents in Yangon. In addition, it is imperative that the consumables and spare parts necessary for medical equipment operation should be provided through local agents.

The soft component program for effective usage of procured equipment will be conducted to strengthen medical equipment maintenance management system. The soft component program includes the following contents: Daily and periodical check mainly for the equipment which YGH does not have experience to use before, training for maintenance contract management based on the frequency of use and preparation of equipment inventory list.

2.2.1.8 Policy on Grade Setting for Facilities and Equipment

In principle, the grade of facilities will be determined considering mainly the ease of maintenance and the durability of medical facilities. This decision will be made by referring to similar cases as well as other hospitals and public facilities constructed in Myanmar in cooperation with Japan. Construction materials will be selected considering mainly the latest local construction methods, the usability, the ease of maintenance and the durability. However, to provide the latest medical services, the Project will select construction materials that meet the required level considering the ease of maintenance even if they are not common in Myanmar.

Concerning the grade of medical equipment, the plan is to provide the equipment of prevailing grade and specifications in similar tertiary level medical facilities in Myanmar or in neighboring countries. Since the medical staff may not have sufficient skills to operate a part of the equipment after only the initial operation training conducted by Equipment Supplier, it is necessary to have additional inputs such as soft component program and/or training in Japan for effective usage.

2.2.1.9 Policy on Construction Schedule

The plan for the construction schedule takes into consideration the local conditions, such as the possible delays in construction works during the rainy season and the extreme hot season. Furthermore, the construction period will be estimated accommodating the necessary conditions earth works and piling, such as big site development area or soft subsoil layers.

2.2.2 Basic Plan (Construction Plan/Equipment Plan)

2.2.2.1 Site and Facility Plan

(1) Site Plan

Since the use of the neighboring area southern side of the project site is not decided, planned buildings will have enough distance from the southern side boundary to reduce the future land usage influence. Main hospital building will be located a good distance away from Pyay road in the east side to avoid noise and vibration due to heavy traffic, while public canteen and utility building will be located along the main road. This creates a clear opening for the hospital façade with good distance from the main road. On the other hand, substantial negative impact is not expected for building arrangement near the boundary with the national nursing university in the west side since neighboring areas are undeveloped.

Hospital wards are to be built above clinical service department since reduction of building footprint is preferred to satisfy required parking lots in addition to meeting the request of intensive use of the site.

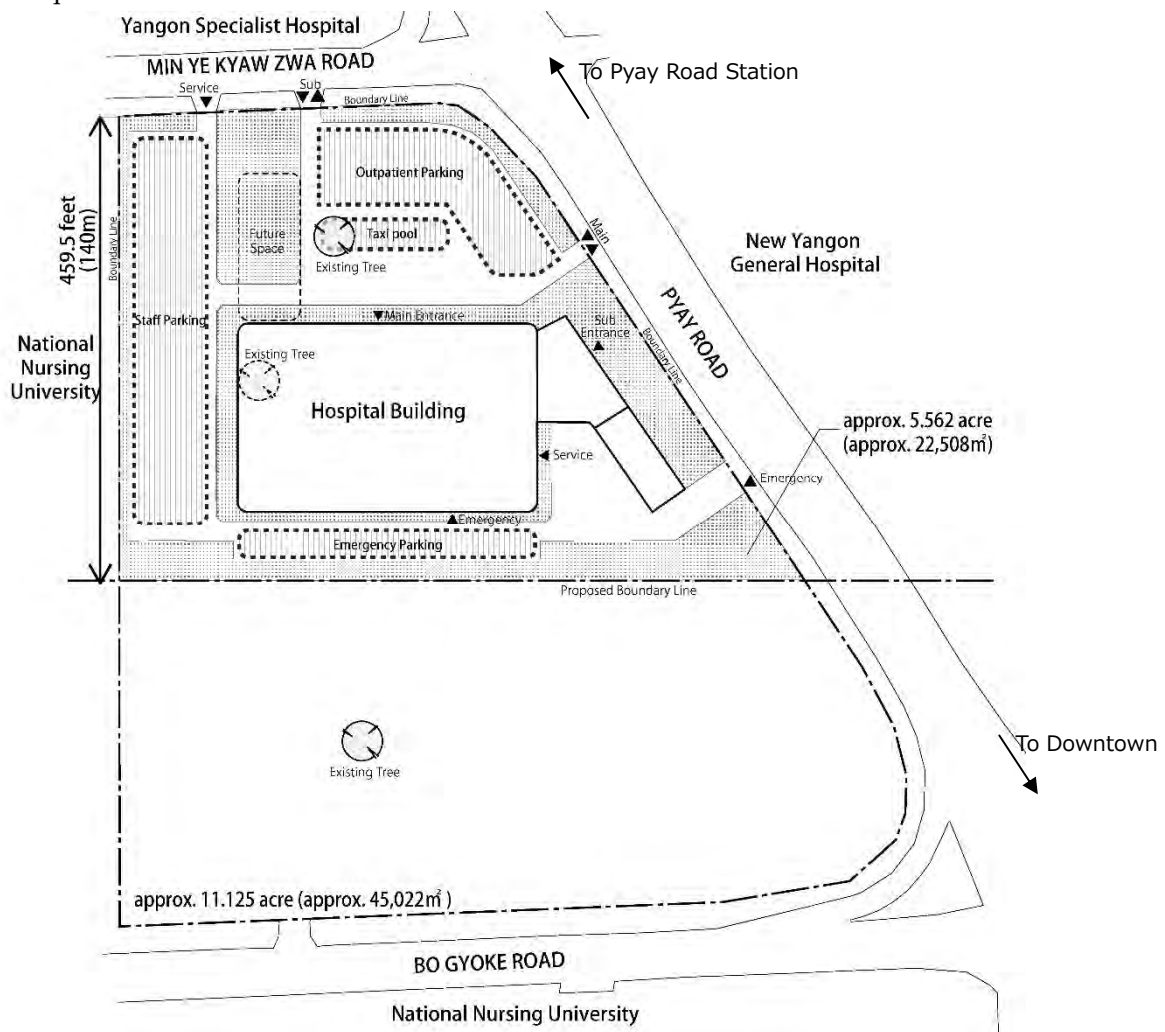


Figure2-2: Project Site Condition

Project site is close to a railway station and bus stops and is a walking distance from downtown. It is expected that majority of patients will use public and commercial transportation, such as taxi, bus or railway.

Main entrance will face Pyay road, major arterial road in Yangon. Because of high frequency of traffic jam, vehicle-waiting bay is planned by opening pedestrian way. Covered walkway to the hospital is planned considering the pedestrians during rainfall.

The other entrances are provided at the north side for quick access to YSH and railway station. Visitor flow is planned to avoid crossing ambulance and service flow. Landscape is designed retaining the big existing trees within the site where possible. Drive way is separated from side walk to secure safety. The gates for removal of the bodies and delivery are placed at locations to avoid general visitor flow and sight from the front gate.

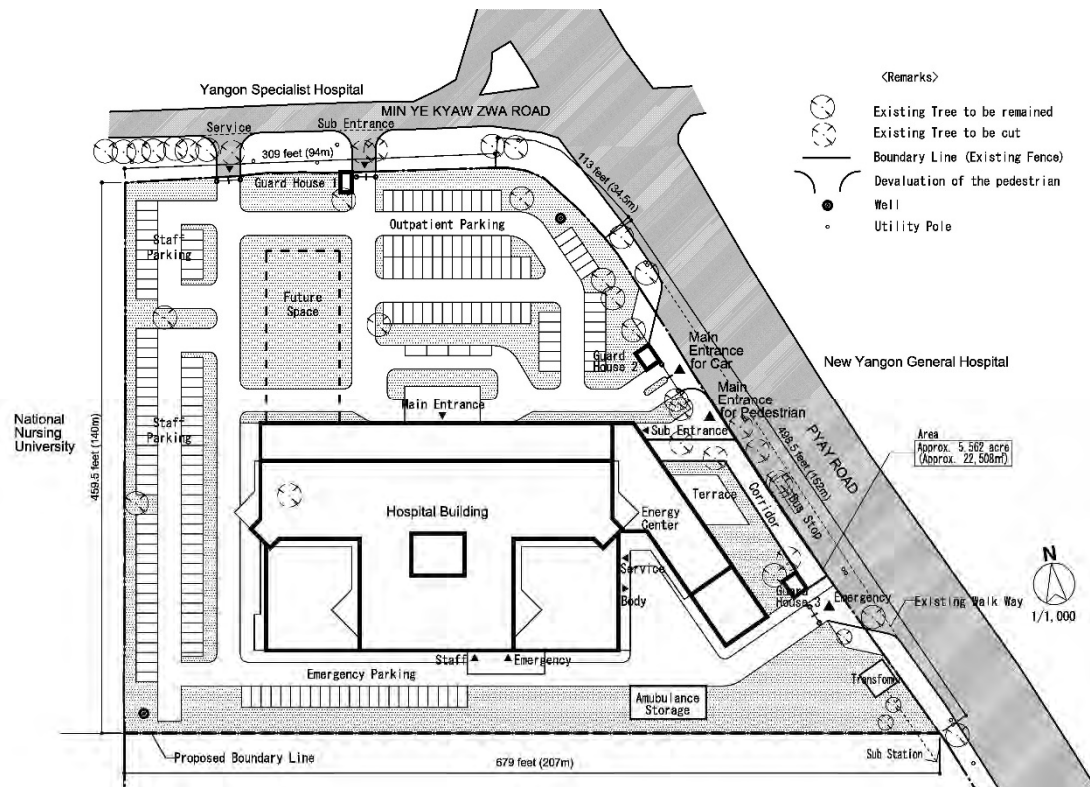


Figure2-3: Design Concept of Site Plan

(2) Department Allocation Plan

Providing all the essential functions, such as outpatient department, emergency unit and diagnostic imaging department, on the ground floor will minimize outpatients flow. The quick access from emergency unit will enable prompt CT and MRI scans for emergency patients at the diagnostic imaging department.

On the first floor, staff working areas, such as laboratory, medical engineering administration, education and supply processing department are to be located.

For conducive working conditions, accessible areas for patients should be limited.

Departments of intensive treatment, such as surgical unit, angiography unit, CSSD and ICU etc., are all located on the second floor to complete all the advanced medical care on the same floor.

The third to sixth floors will be wards. Five lifts will ensure prompt vertical transports, two for general use, two for hospital beds and one for service.

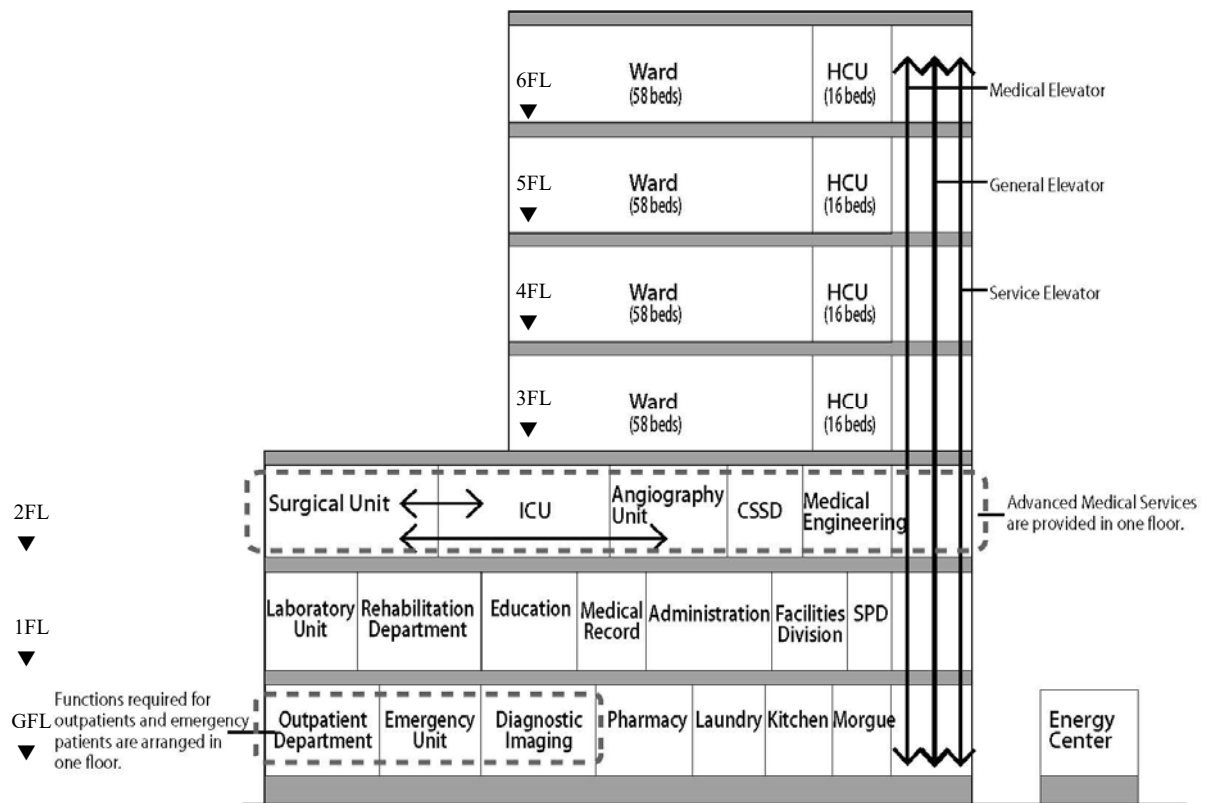


Figure 2-4: Design Concept of Department Layout

(3) Basic Policy of Facility

Because of the discussions during the field survey, main design concepts for the new facility are as follows:

- 1) International level hospital
 - Evidence-based design
 - Emphasis on the patients' safety (the prevention of nosocomial infection and accidents)
- 2) Patient-centered hospital
 - Universal design building with clean and comfortable environment
 - Attentive to the needs of patients: to minimize the patients' movement, to provide patients and their families comfortable spaces, to reduce the distance between patients and medical staff and to minimize patients' waiting time etc.

3) Sustainable of facility

- Emphasis on the ability to extend and renew the facilities: to secure the space for future extension on the site which is adjacent to the new facility, modularized structural design, mechanical design Considering renewal and future extension etc.)

(4) Function and Required rooms for New Facility

As the result of the discussions during the field survey and the domestic analysis, main components of the new facility corresponding to the activities of NYSH are planned as shown in Table 2-4, 2-5, 2-6 and 2-7.

Table 2-4. Ground Floor / Floor Areas of Major Rooms

Room	No.	Area per room(m ²)	Room	No.	Area per room(m ²)	Room	No.	Area per room(m ²)
Outpatient Department			CPU (CT)	2	8	Body store	1	10
Consulting1~6	6	14	X-RAY	2	28	Air lock	1	13
Consulting7~8	2	16	Change(X-RAY)	2	3	Change & Shower	1	8
Treatment	1	108	MRI	1	61	Staff Toilet (SWC)	1	3
Resident	1	17	Air lock(MRI)	1	13	Family Waiting	1	13
Waiting1	1	178	Change(MRI)	1	3	Body Wash	1	16
Reception	1	63	Toilet(MRI)	1	3	Morgue	1	16
Accounting	1							
OPD Admin	1	85	CPU(MRI)	1	19	Pharmacy		
Medical Consultant	1	75	Control	1	183	Dispensing	1	45
Interview	3	7	Radiologic Interpretation	1	40	Pharmacist	1	13
Physiology Laboratory			File Store	1	38	Duty Staff	1	12
ECG	1	17	Conference	1	38	Drug Information	1	14
Stress ECG	1	27	PACS	1	15	Drug Storage	1	40
Echo	2	13	Emergency Unit			Laundry		
EEG	2	14	Emergency Hall	1	220	Laundry	1	47
			Staff Station					
Control	1	11	Emergency Entrance	1	18	Dirty Linen	1	13
EMG	1	30	Wash	1	8	Clean Linen	1	27
Waiting2	1	17	Consulting	2	14	Linen Office	1	13
Staff Area of Outpatient Department			Waiting	1	14	Kitchen		
Staff Corridor Input	1	253	Recovery	1	53	Kitchen	1	130
Staff Lounge	1	61	Equipment	1	12	Office	1	15
Conference1	1	24	Pharmacy	1	9	Food Storage	1	14
Conference2	1	14	Staff room	1	16	Canteen	1	312
Conference3	1	17	Dirty Utility	1	9	Common Areas		
Pantry	1	11	Conference	1	29	Shop	1	55
Staff Toilet (SWC)	2	7	Toilet	2	3	Shop Storage	1	11
Diagnostic Imaging			Disabled Toilet(HWC)	1	6	Toilet(Male)	1	31
CT	2	51	Staff Toilet (SWC)	2	3	Toilet(Female)	1	29
Air lock (CT)	2	6	Morgue			Disabled Toilet(HWC)	1	5
Change (CT)	2	4	Autopsy	1	32			

Table 2-5. First Floor / Floor Areas of Major Rooms

Room	No.	Area per room(m ²)	Room	No.	Area per room(m ²)	Room	No.	Area per room(m ²)
Rehabilitation Department			Library (Closed Shelves)	1	78	Admin Office	1	97
Rehabilitation	1	126	Library (Open Shelves)	1	42	Consulting	2	6
Staff room	1	12	Pantry	1	12	Doctor Office	1	310
Store	1	12	Supply Processing Distribution			Meeting	2	64
Laboratory Unit			SPD Store	1	101	Male Staff Main Locker	1	200
Biochemistry Blood Issue	1	187	Medical Record			Female Staff Main Locker	1	278
Micro Biology	1	22	Medical Record	1	127	Staff Main Lounge	1	187
Air lock	1	6	Administration			Facilities Division		
Histopathology	1	40	MS Office	1	36	House keeping	1	64
Cut Pathology	1	9	Deputy MS Office	2	20	Common Areas		
Office	1	15	Assistant MS Office	2	20	Toilet(Male)	1	40
Duty Staff	1	10	Department Head Office	4	20	Toilet(Female)	1	40
Education			Financial Manager Office	1	20			
Lecture Room 1 ~3	3	75	Matron Office	1	16			
Lecture Room 4 ~6	3	64	Pantry	1	6			

Table 2-6. Second Floor / Floor Areas of Major Rooms

Room	No.	Area per room(m ²)	Room	No.	Area per room(m ²)	Room	No	Area per room(m ²)
Surgical Unit			Male Doctor Change	1	46	Equipment	4	15
Operation Theater1 (Cardiac)	1	81(54)	Female Doctor Change	1	37	Air Lock	3	9
Operation Theater2 (Cardiac)	1	78(49)	Staff Toilet (SWC)	2	3	Change	3	7
Hybrid Operation Theater (Cardiac)	1	155 (114)	Visitor Doctor	1	33	Wash	1	13
Control (Cardiac)	1	15	ICU			Staff Lounge	1	24
CPU (Cardiac)	1	15	ICU 20beds Staff Station	1	1,058	Staff Change	2	10
Operation Theater1 (Neuro)	1	78(49)	Clean Utility	1	12	Staff Toilet (SWC)	1	3
Operation Theater2 (Neuro)	1	81(54)	Equipment	1	12	Central Sterile and Supply Department		
Hybrid Operation Theater (Neuro)	1	161 (119)	Pharmacy	1	12	Receive	1	31
Control (Neuro)	1	15	Doctor	1	10	Decontamination	1	62
CPU (Neuro)	1	15	Head Nurse	1	8	Packing	1	132
Surgical Corridor	1	340	Dirty Utility	1	17	Sterilizing	1	38
Air Lock	1	25	Store	2	15	Delivery	1	31
Staff Station	1	110	Air Lock	2	12	Clean Stock	1	59
Recovery	1	43	Staff Toilet (SWC)	2	3	Medical Engineering		
Anaesthetist	1	35	Conference	1	35	ME Stock / Maintenance /Staff Room	1	104
Equipment	1	35	Duty Staff	5	9	Common Areas		

Room	No.	Area per room(m ²)	Room	No.	Area per room(m ²)	Room	No	Area per room(m ²)
(Cardiac)								
Equipment(Neuro)	1	25	Angiography Unit			Family Waiting	1	25
Dirty Utility	1	18	Angiography	2	76	Toilet(Male)	1	12
Conference	1	66	Angiography (Future Extension)	1	74	Toilet(Female)	1	12
Staff Lounge	2	66	Control	1	127			

※The figure of () of operation room means effective area

Table 2-7. Ward Floors (3~6 Floor) / Floor Areas of Major Rooms

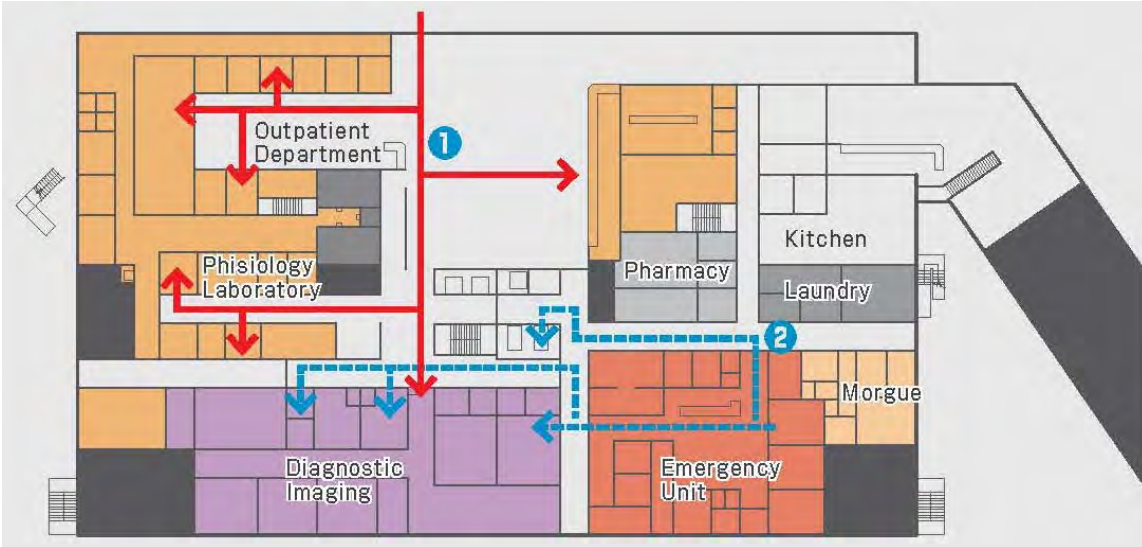
Room	No.	Area per room(m ²)	Room	No.	Area per room(m ²)	Room	No.	Area per room(m ²)
Ward			Utility	2	10	Staff Area		
4bedroom	12	49~51	Equipment	2	22~25	Doctor Office	1	51
1bedroom	10	17~20	Shower	2	15	Duty Staff	2	7
Staff Station	1	86	Disabled Toilet(HWC)	8	5	Conference	1	51
Clean Utility	1	13	Family Lounge	2	31	Staff Lounge	1	46
Dirty Utility	1	13	HCU (High Care Unit)			Staff Toilet(SWC)	2	3
Examination	1	11	HCU 16beds Staff Station	1	452	Common Areas		
Procedure	1	11	Clean Utility	1	13	Family Lounge	1	120
Pharmacy	1	13	Dirty Utility	1	13	Pantry	1	10
Head Nurse	1	13	Dirty Utility	1	10	Toilet(Male)	1	10
Counselling	2	9	Equipment Store	1	36	Toilet(Female)	1	11
Dirty Utility	2	6	Disabled Toilet(HWC)	1	4			

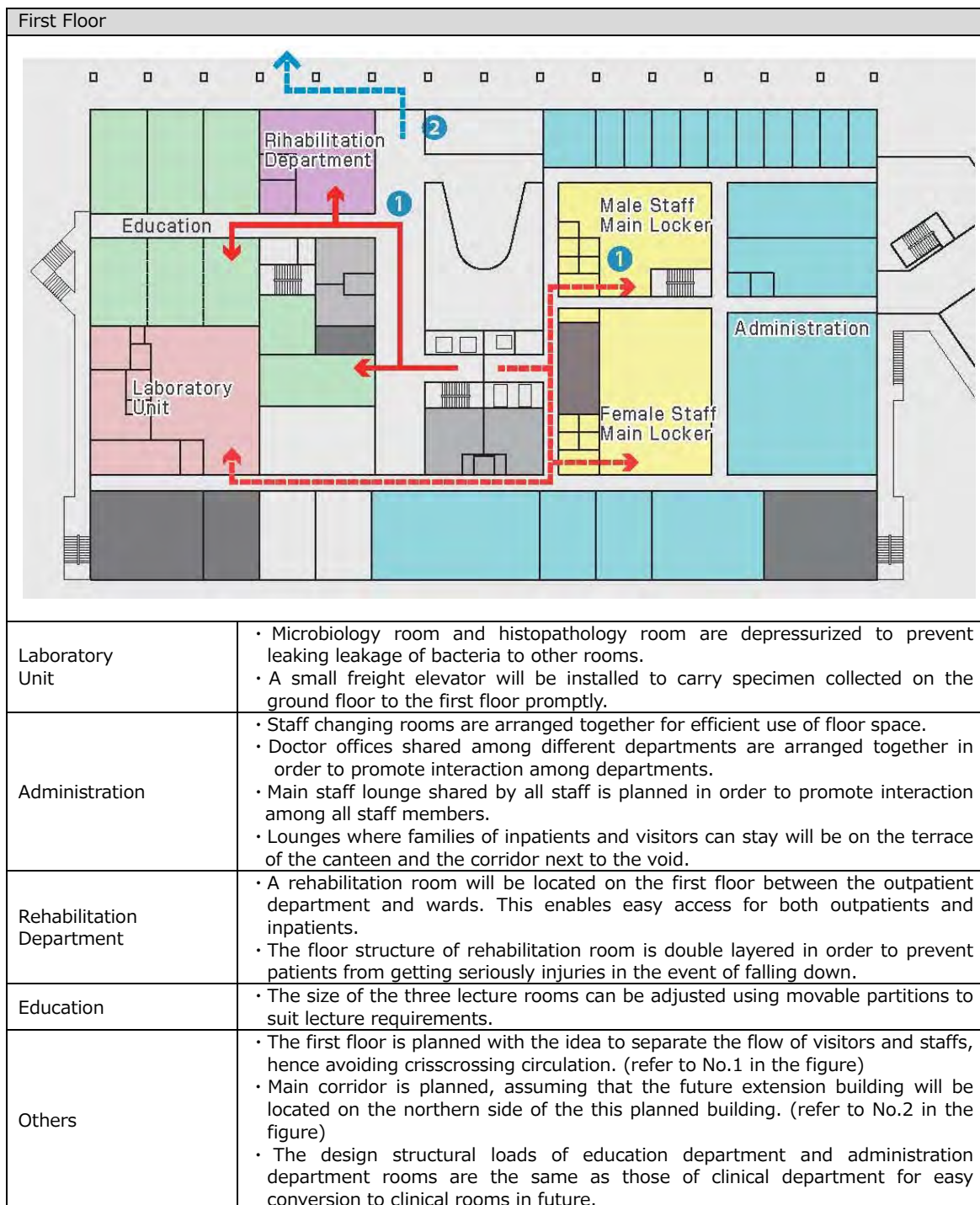
2.2.2.2 Construction Plan

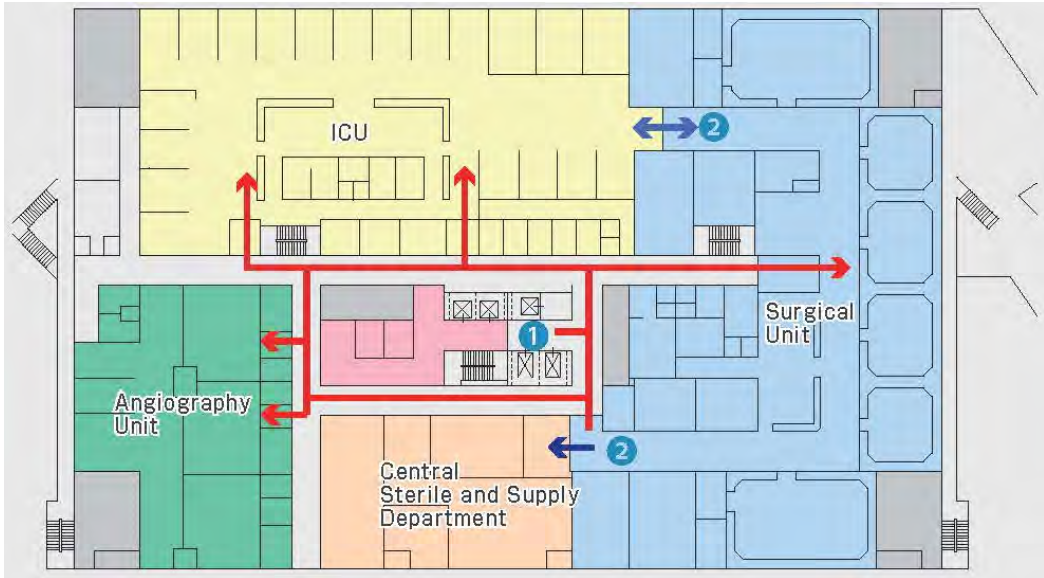
(1) Floor Plan

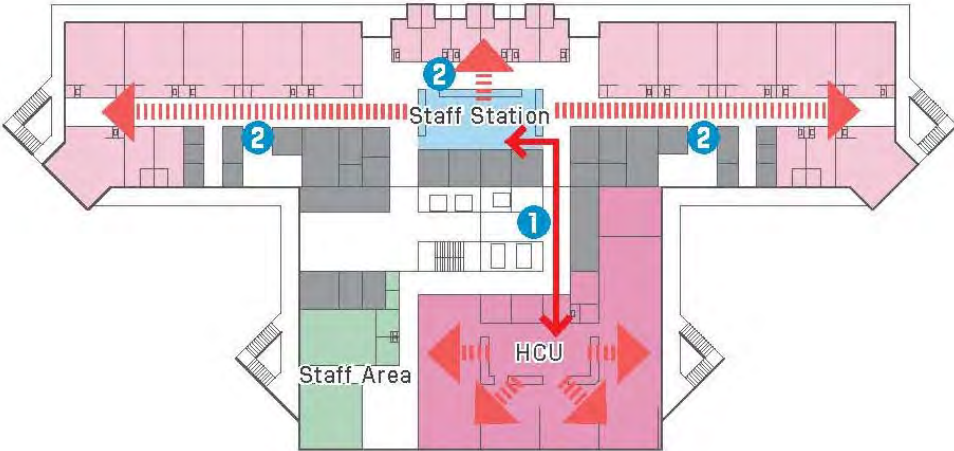
Floor layouts have been developed based on the design concept of floor zoning and circulation is shown in Table 2-8.

Table 2-8. Design Concept of Floor Zoning

Ground Floor	
	
Outpatient Department / Emergency Unit	<ul style="list-style-type: none"> • The walking distance for patients (reception⇒ examination⇒ inspection and diagnostic imaging⇒ accounting) is reduced by arranging all functions of outpatient department on the same floor. (refer to No.1 in the figure) • The staff corridor connecting to each examination room and inspection room on the back side is planned. This enables staff to work effectively by preventing the patient and staffs' circulation from crossing each other. • Rooms for blood collection and rooms for intravenous drip are arranged in the same room in order to be managed by a few staff. • Medical consultant room and medical information corner are planned where patients can consult with staff about medical services after inpatient treatment. • Emergency unit is planned near the medical elevators, enabling prompt transport of patients to the Surgical unit in case of emergency operation. (refer to No.2 in the figure)
Diagnostic Imaging Department	<ul style="list-style-type: none"> • The control room connecting to each imaging room on the back side are planned. This enables staff to work effectively with short walking distance. • In addition to a general main entrance, an entrance only for emergency patients will be located near the CT and emergency rooms for immediate transportation of emergency patients. This enables prompt transportation of emergency patients from emergency unit to imaging rooms. (refer to No.2 in the figure)
Service Department	<ul style="list-style-type: none"> • There will be service corridor connecting to each service room on the back side. This prevents flow of patients crossing staff circulation enabling staff to provide efficient service. • The canteen will be outside the hospital security zone so that not only hospital visitors but also the general public can use the canteen.



Second Floor	
	
Surgical Unit	<ul style="list-style-type: none"> The operation theaters (three for cardiac surgery and three for neurosurgery) are found around the centrally located staff station to ensure minimum staff circulation. The operation theaters area is spacious for easy management of the many medical equipment used during operation. The planned operation-hall layout is space saving and ensures easy separation of the clean and dirty areas. There are staff lounges for each department for comfortable workplace. Operation hall and ICU are directly connected, dividing the area into clean area and dirty area. Equipment stores are provided exclusively for each department in order to manage equipment effectively and hygienically (refer to No.2 in the figure).
ICU	<ul style="list-style-type: none"> In order to improve the rate of operation and manage effectively, 20 bedded ICU (three beds of those are in private booths) is shared among departments of cardiac surgery and neurosurgery. Furthermore, two of three private booths are equipped with personal dialyzers for inpatients who require dialysis treatment. Beds are located around the centrally positioned staff station for easy access to patients by staff. Duty staff rooms are arranged sufficiently for comfortable workplace.
CSSD	<ul style="list-style-type: none"> CSSD for washing, sterilization and management of medical and surgical equipment is located next to the surgical unit. The procedure is strictly set to manage clean equipment carefully, i.e., equipment collection→ equipment washing→ equipment sterilization→ equipment issuing.
Medical Engineering	<ul style="list-style-type: none"> ME (Medical Engineering) room is located next to CSSD for effective maintenance and inspection of equipment.
Angiography Unit	<ul style="list-style-type: none"> Three catheter rooms will be installed (one of those is for future extension) to cope with cardio-vascular disease treatments expected to rise in future. The rooms are arranged in together in order to work effectively in the area.
Others	<ul style="list-style-type: none"> Family waiting space will be located in the general elevator hall; this will minimize the intersecting of staff circulation and public circulation. The entire second floor is air-conditioned to ensure a clean environment. To improve the efficient use of mechanical facilities, machine rooms are located at the southern corners on 1st and 2nd floor and all the four corners of the 3rd floor. All Departments related to surgical unit (operation theaters, ICU, CSSD, and Angiography unit) are found on the second floor, enabling a small team of medical staff to work quickly and effectively (refer to No.1 in the figure).

Ward Floor	
	
Bedroom	<ul style="list-style-type: none"> • The upper part of the walls between bedrooms and ward corridors are glasses for easy observation of inpatients from the staff station (refer to No.2 in the figure). • The bedside space is spacious enough for inpatients and their families to sit comfortably. • Balconies outside of the bedrooms connects to exterior escape stairs enabling safe evacuation in case of an emergency such as fires and earthquakes.
Day room	<ul style="list-style-type: none"> • Comfortable day rooms with natural daylight and nice views are planned. (Day rooms in wards are refreshing spaces for inpatients' family attendants. Day rooms in front of elevator hall are waiting spaces for families who are not supposed to enter wards.
Toilet	<ul style="list-style-type: none"> • All toilets for inpatients are accessible and provided at a rate of one per six beds. • Toilets are grouped together on the east and west side facing the outside in order to discharge odors promptly from the toilets to the outside.
Staff Lounge	<ul style="list-style-type: none"> • Lounges where staffs can refresh are planned for comfortable working environment. • Staffs corridor are planned for quick movement between the staff station and HCU. (refer to No.1 in the figure) • The access route from general elevator hall to ward is planned to go through the staff station in order to manage the ward access easily by limited number of staffs.
Others	<ul style="list-style-type: none"> • The plan of ward floors are principally uniform consisting of general ward and HCU (High Care Unit). The staff stations for the general ward and HCU are centrally positioned for easy and effective observation of patients by limited number of staffs. It also shorten staffs' circulation.

□The Layout of Bed room

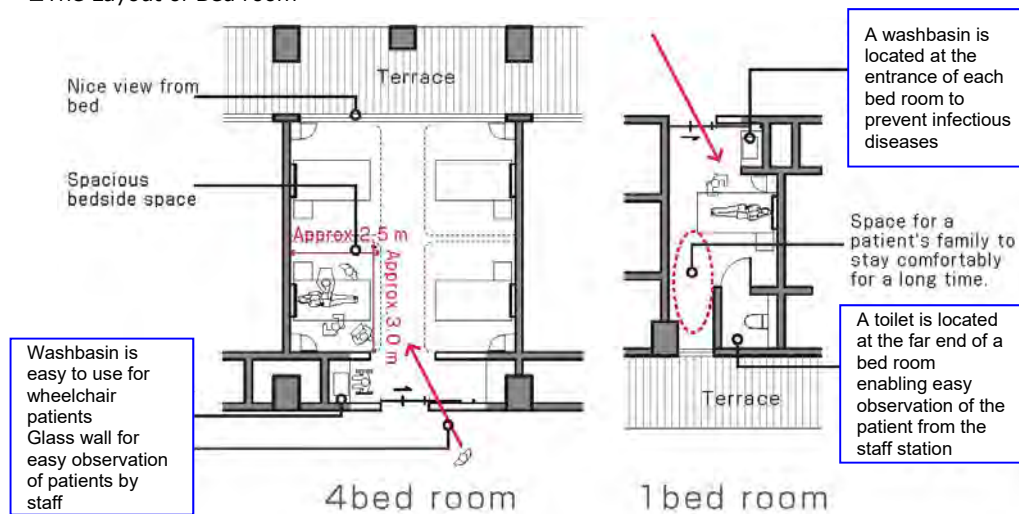


Figure 2-5: Design Concept of Bed rooms

(2) Cross-sectional and Elevation Plan

The ward floors are located above the clinical floor in order to reduce the travel distance for inpatients. The level of ground floor will be higher than the frontal road level in order to prevent flooding.

The floor heights of the ground floor, the first floor and the second floor are determined in consideration of air conditioning ducts and mechanical pipes above the ceiling. On the other hand, the floor height of ward floors is determined based on the ceiling height suitable for natural ventilation.

The building orientation of new building in the project site is decided taking advantage of the east-west axis to prevent the strong sunshine. Therefore, the upper ward floors have the balconies with deep eaves all around and the lower clinical floors are fitted with louvers around the perimeter in order to control sunlight.

(3) Interior and Exterior Finishing

1) Basic Policy

- A) Maximum use of local market materials to reduce the construction period and cost, and
- B) Select materials that can be maintained locally.

2) Finishing Material

Major exterior finishing materials are listed in Table 2-9 below.

Table 2-9. Major Exterior Finish Materials

Part	Finishing materials	Notes
Exterior wall	Concrete block + Mortar + Paint	Locally common practice
Roof	Protective concrete layer on asphalt water proofing with thermal insulation	Prioritize waterproof performance
Doors and windows	Aluminum fitting	Prioritize durability and water shielding performance

Major interior finishing materials are listed in Table 2-10 below.

Table 2-10. Major Interior Finish Materials

Story	Room	Floor	Wall	Ceiling	Notes/Priority issues
Ground floor	Entrance hall	Natural stone	Paint + Wainscot stone	Mineral fiber board	Durability and cleaning
	Outpatient department Examination/ Treatment	Vinyl sheeting	Paint + Wainscot stone	Mineral fiber board	Durability and cleaning
	Outpatient department Waiting	Ceramic tile	Paint + Wainscot panel	Mineral fiber board	Durability and maintenance
	Outpatient department OPD Office	Ceramic tile	Paint	Mineral fiber board	Durability and maintenance
	Emergency hall	Vinyl sheeting	Paint + Wainscot panel	Cement board + Paint	Durability and cleaning
	Emergency Recovery	Vinyl sheeting	Paint + Wainscot panel	Cement board + Paint	Durability and cleaning
	Autopsy	Epoxy resin floor	Paint	Cement board + Paint	Waterproofing and cleaning
	Diagnostic imaging CT · X-ray	Vinyl sheeting	Paint	Cement board + Paint	Radiation protection
	Diagnostic imaging MRI	Vinyl sheeting	Paint	Cement board + Paint	Electromagnetic shield
	Diagnostic imaging Control	Ceramic tile	Paint	Cement board + Paint	Durability and maintenance
	Canteen	Ceramic tile	Paint + Wainscot panel	Mineral fiber board	Durability and maintenance
First floor	Administration Office	Ceramic tile	Paint	Mineral fiber board	Durability and maintenance
	Administration Staff lounge	Wooden flooring	Paint + Wainscot panel	Mineral fiber board	Maintenance and comfortability
	Laboratory	Vinyl sheeting	Paint	Cement board + Paint	Durability and chemical proofing
	Education Lecture room	Ceramic tile	Paint + Wainscot panel	Mineral fiber board	Durability and maintenance
Second floor	Surgical Unit Operation theater	Vinyl sheeting	Metallic panel	Cement board + Paint	Durability and radiation protection
	ICU	Vinyl sheeting	Paint + Wainscot panel	Cement board + Paint	Durability, cleanliness and cleaning
	Central sterile services department (CSSD)	Vinyl sheeting	Paint	Cement board + Paint	Durability, cleanliness and cleaning

Story	Room	Floor	Wall	Ceiling	Notes/Priority issues
	Angiography Unit	Vinyl sheeting	Paint	Cement board + Paint	Durability, cleanliness and cleaning
Ward	Bed room (4bed,1bed)	Ceramic tile	Paint + Wainscot panel	Cement board + Paint	Durability and maintenance
	Ward corridor	Ceramic tile	Paint + Wainscot panel	Cement board + Paint	Durability and cleaning
Common	Stairs	Ceramic tile	Paint	Cement board + Paint	Durability and maintenance
	Corridor	Ceramic tile	Paint + Wainscot panel	Cement board + Paint	Durability and maintenance
	Mechanical room	Dust proofing	Glasswool board	Glasswool board	Cleaning
	Toilet, Shower room	Ceramic tile with waterproof	Paint + Wainscot tile	Cement board + Paint	Waterproofing and cleaning

(6) Structural Design

1) Ground Conditions of the Project Site and Foundation Structure Design

The subsoil of the project site consists of silty sand with N-value of less than 20 that continues up to a depth of 25m, then up to a depth of 45m, N-value is not stable ranging between 20 to 40, and deeper than this, the clayey soil has N-value of 50–60. Therefore, pile foundation supported by this clayey soil layer is selected for the new building. Since precast concrete piles for this depth requires many number of piles with long pile driving period, 45m deep bored piles is planned.

2) Superstructure Design

Reinforced concrete frame and concrete block walls for non-anti-seismic elements will be adopted, which are common in Myanmar.

3) Design Load

The external forces and loads are assumed as follows, considering the local climate and geographical conditions. The buildings will have necessary structural resistance against natural disasters assumed in the region such as earthquakes.

a) Dead Load

The dead load is calculated as the sum of the weight of all structural components and non-structural building components designed for the new building.

b) Wind Load

The wind load is calculated by referring to local conditions and the building codes of Japan or the United States.

c) Live Load

The live load is calculated by referring to local conditions and the building codes of Japan or the United States.

d) Seismic Load

The seismic load is estimated in reference to the earthquake zone map in Myanmar. According to the map, the project site is located in Earthquake Zone III (Strong Zone), where the possible peak ground acceleration is estimated at 150-200gal and shakings with intensity scale VII in the Modified Mercalli Intensity Scale can happen.

(7) Electrical Facility Plan

1) Power Receiving and Transforming Equipment

33kV underground power lines connected from a newly constructed power distribution station at the southeast corner of the site and the Myanmar side shall be installed the main transformer near the property boundary. However, through discussion with the Yangon Electricity Supply Corporation (YESC), the transformer (33KV/11KV) will be installed in the energy center by YESC for this project. The transformer room shall be rented to YESC for its management.

The transformer will step down the voltage to 6.6 kV and the line connected to the substation installed on the first floor of the energy center building. The room will have substation equipment, power generators, battery storage systems (for power receiving and distributing operations), etc. The electricity room will be located on the first floor for risk management purposes (against flood damage, etc.).

2) Emergency Power Generation Equipment

Emergency power generator, a safeguard against frequent power failures, will be installed for uninterrupted operation of medical equipment. Since power source stability is especially important for medical equipment, the medical power load system should be separated from the general load system. The capacity for the medical system is estimated as 50-60% of the total power capacity, which is the average level for hospital facilities.

Fuel storage capacity for generators should be enough for 72 hours (three days) of continuous operation. However, there is a danger of rainwater intrusion due to the fuel tank with such capacity normally buried type. Therefore, the exposed fuel

tank with the capacity enough for 1.5 days will be located in the generator room. The fuel tank shall be covered with blindfold panel in view of crime prevention.

3) Power Distribution System

A secondary substation will be installed on the ground floor and the rooftop floor of NYSH. On each floor, general power supply and important medical power supply are separated. The power is distributed through the main distribution board on each floor to sub distribution boards. Wiring accessories for the trunk line route will be metal ducts (racks) for future changes and modifications. A 410/220V three-phase four-wire distribution voltage system will mainly be used.

4) Lighting and Outlets

Illuminance will be set at approximately 200 Lx for general public space and 500 – 1,000 Lx for consultation rooms, and others. Most of the lighting fittings will be fluorescent lights. Use of long-life LED will be considered for energy conservation subject to their availability on the local market.

Outlets will be grounded and power sources for medical equipment shall be constructed according to the arrangement and capacity.

5) Telephone System

Approximately ten trunk lines from MPT (telephone public corporation) are planned for NYSH. Direct dial-in system will be introduced so that each internal phone can automatically receive direct calls via digital PBX (private branch exchange) system. Trunk line equipment for staff mobile phone reception (Wi-Fi antennas and trunk cables) will be installed for each floor.

6) Nurse Call System

Nurse call equipment will be installed for communication between the staff station and bed rooms, and toilets.

7) Intercommunication System

Intercommunication systems will be installed for efficient administrative work and medical services at the hospital.

8) LAN Equipment

Empty ducts for internal LAN will be installed on each floor.

9) Television Reception Equipment

Antenna terminals will be installed in waiting rooms, staff rooms, etc.

10) CCTV System

CCTV cameras are to be installed for access management and safety in the hospital and will be monitored from the central monitoring room.

11) Fire Prevention Equipment

The installation of all essential fire prevention equipment follows the guidelines of the local authorities. This include exit guidance lights and emergency lights with built-in batteries provided to assist progression towards the emergency exit. Public address system for internal operation and emergency installation will also be included. The fire detection system will have receivers in the central monitoring room.

12) Lightning Protection Equipment

The building will be equipped with a lightning protection system, rod-type lightning arresters on the roof,

(8) Mechanical Equipment Plan

1) Water Supply Equipment

The main water pipes with a diameter of approx. 230 mm under the front road (Min Ye Kyaw Zwa Road) on the north side of the site constructed during the period of the British administration are very old. City water supply outage is frequent especially during the dry season and water quality is not good, hence wells were installed to supply water to the existing facilities, YGH, NYGH and YSH. The Project will install four wells to secure water sources during shortages. However, a new water supply network of YCDC is planned before the completion of the Project, and if public water supply can be used, the water supply pipe from the network shall be connected to the reservoir by Myanmar side. Water pumped from the wells will be stored in a receiving tank, and then conveyed to an elevated tank using a lift pump prior to supplying the water use places by gravity. For the top floors where water pressure by gravity is low, booster pumps will pressurize water for smooth supply. Since the well water contains a large amount of iron according to the water quality test, iron removal equipment is planned for the Project.

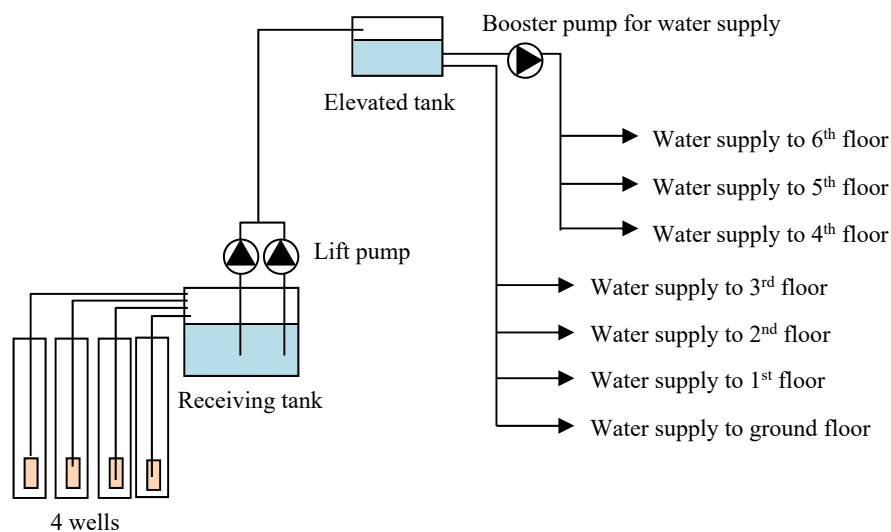


Figure 2-6: Water System Diagram

☐ Approximate Water Supply Quantity

Table 2-11. Approximate Water Supply Quantity

Target	Estimated No. of people	Unit Water Supply Quantity (L/person/day)	Daily Water Supply (m ³ /day)
No. of Beds	320	2000 L/person	640 m ³
Total			→ 640 m ³

Note: Unit water supply quantity is based on current usage

☐ Approximate Device Capacity

Receiving tank: 560 m³

Elevated tank: 50m³

Well pump: Capacity 260 liter/min. x 4 locations (hourly average water supply)

2) Drainage Facilities

A septic tank will be installed for the treatment of wastewater from the building and the treated water will be discharged into a ditch at the east side of the site. According to Committee for Quality Control of High Rise Building (CQHB), the required wastewater standards are; Biochemical Oxygen Demand (BOD) : 20mg/l, Chemical Oxygen Demand (COD):30mg/l, and Suspended Solids (SS):30mg/l. Pathological and dialysis wastewater will be treated separately and shall be detoxified first with a wastewater treatment system before being discharged.

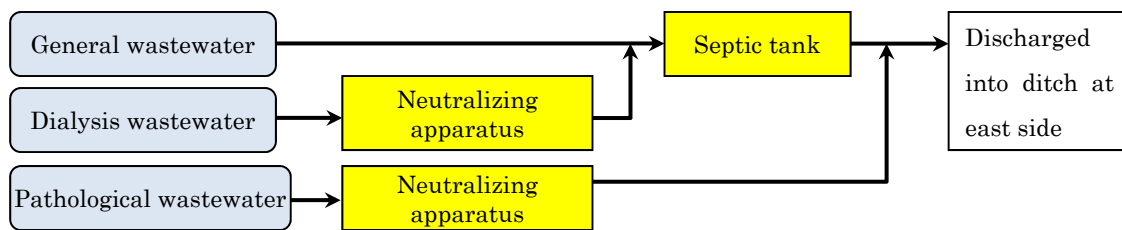


Figure 2-7: Wastewater Flow Diagram

3) Hot Water System

Since hot water systems are not very common on the local market, electric hot water geysers with tank will be installed in limited locations including some shower rooms and the central sterile and supply department.

4) Sanitary Installations

Considering the local maintenance capacity, devices with a complex mechanism such as automatic faucets and sensor flush bulbs (flush valves) will not be provided. Simple devices, such as lever faucets and manual flush valves will be selected.

5) Gas equipment

In accordance with local practice, LPG gas cylinders will be used for cooking in the kitchen. The Myanmar side shall install gas equipment as well as cooking facilities.

6) Fire-fighting facilities

Fire extinguishers, indoor fire hydrants and sprinklers are planned by referring to the building code of Singapore and Japan.

7) Medical Gas Equipment

Medical gas system under the Project will accommodate oxygen, compressed air and suction system. Oxygen and suction equipment will be installed for each hospital bed, and oxygen, compressed air and suction equipment will be installed in operation theaters, ICUs, etc.

For other gases such as nitrous oxide, nitrogen gas and carbon dioxide, it is planned to use individual cylinders instead of a central piping system.

The design of the oxygen supply system in NYSH is based on the cylinder-based supply. Cylinders will be supplied with gas. Since oxygen-generating machines have been installed in existing YGH by the Myanmar side, spare space for such machines will be reserved at NYSH.

8) Air Conditioning Facilities

For air conditioning, chilled water will be supplied using air-cooled chilling units. For the rooms that need reheating for humidity control, hot water will be supplied using air-cooled heat pump chillers.

Common areas, such as the entrance hall and corridors are designed as open air spaces with maximum use of natural ventilation to save energy. Rooms that require cleanliness, such as operation theaters and ICUs will be air conditioned by single duct system. With a HEPA filter, the targeted of the cleanliness of operation theaters and ICUs is class 10,000 along with humidity control. Consultation rooms, laboratories, meeting rooms, etc., will be air conditioned with fan coils and outdoor air handling unit. Natural ventilations are planned for wards and other rooms facing the exterior walls. However, private bed rooms of relatively serious patients will have individual package air conditioning units.

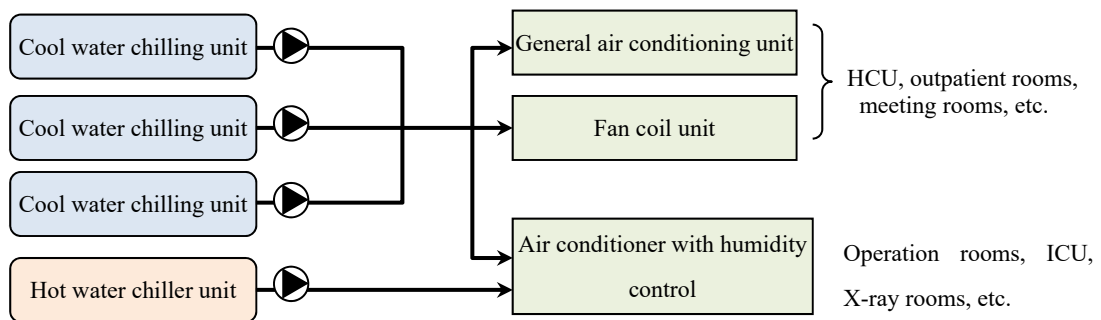


Figure 2-8: Air Conditioning Flow

9) Ventilation Facilities

Class one ventilation facilities (supply and exhaust fan) will be installed for the machine room, electric room, kitchen, etc., and Class three ventilation facilities (exhaust fan) will be installed for toilets, storage, etc. For operation theaters, ICUs and other rooms that necessitate cleanliness, positive pressure ventilation system will be applied to prevent external air and dust from entering rooms.

10) Automatic Control Equipment

Major building facilities will have automatic control equipment. To simplify daily maintenance by hospital staff, maximum application of automation is planned. Because it is a large-scale building, major facilities will be controlled from the monitoring room.

2.2.2.3 Equipment Plan

(1) Equipment Selection Policy

The equipment is planned to improve medical services in the four target departments (cardiology, cardiac surgery, neuro medicine and neurosurgery), and common departments such as diagnostic imaging. Equipment selection has been made on the basis of the current and the near future medical care activities in these departments. The equipment procured from Japan side was drastically narrowed down in the process for reconsideration of the Project scale. Myanmar side will procure equipment other than Japan's procurement in the plan. Equipment plan for each department is as follows.

1) The cardiology department is equipped with two single plane angiography systems installed in two catheter laboratories in 2014 and 2016. In 2016, this department handled a total of 1,761 cases, including 339 coronary angiographic examination cases, 590 cardiac catheterization treatment cases such as PCI (Percutaneous Coronary Intervention), 272 pacemaker implantation cases (both permanent and temporary), 382 ablation treatment cases for atrial fibrillation, and other 178 cases. Under the Project, replacement and supplementation of equipment is planned for contribution to decrease of waiting patients and improvement of medical services for cardiac cases.

2) The cardiac surgery department has three modular-type operation theaters. In 2016, 374 major surgeries, namely in decreasing order, congenital heart diseases, coronary vessel cardiac diseases and valvular diseases, were performed. And 245 minor surgeries such as vascular surgery and construction of shunt for dialysis patients were performed. In recent years, medical equipment such as IABP (Intra-Aortic Balloon Pumping)³ and operation lamp were procured. However patients still wait their operation for a maximum of eighteen months due to limited number of operation theaters. Since medical equipment is mixture of old and new, some of medical equipment needs to be replaced and/or supplemented.

It is expected that the elder patients with cardiac disease will increase. Therefore, it is necessary to provide safe and prompt diagnosis and treatment for diseases which require prompt treatment of ischemic heart disease such as angina, and myocardial infarction. Under the Project, there will be three major operation theaters including a hybrid operation theater. Single-plane angiography system is planned for the hybrid operation theater; here both advanced internal medicine treatment such as stent-graft and surgical procedure such as bypass surgery and valve replacement can be performed safely under angiography. The advantage of the room is that it can shift promptly into surgical treatment in case internal medicine treatment is not effective.

³ IABP (Intra-aortic Balloon Pumping) is a procedure that inserts a balloon catheter to patients of acute myocardial infarction or cardiac insufficiency heart failure so as to reduce cardiac work by inflating or deflating the balloon in accordance with the blood beat.

It enables safe treatment for the patient with risk of emergency operation since catheter treatment can be done in a clean environment equivalent to operation theater, and valve disease can be treated by TAVI (Transcatheter Aortic Valve Implantation) at hybrid operation theater. Under the Project, necessary medical equipment is planned for three operation theaters, cardiac surgery ICU (care of post-operative patients) and general wards.

3) 49.65% of patients in the neuro medicine department are stroke patients. Therefore, establishment of SCU (Stroke Care Unit) was planned, the procurement was done and it is in operation as of July 2017 as the first Stroke Care Center in Myanmar. Patients such as Guillain-Barre syndrome and epilepsy are visiting other than stroke patients.

Craniotomy procedure by neurosurgeon is required for patients with cerebral hemorrhage. The necessary equipment for diagnosis and treatment, which is currently insufficient, is planned for the department under the Project.

4) Neurosurgery department has two operation theaters, one major and one minor. In 2016, 2,000 cases of trauma surgery had been performed in the YGH, where the function of trauma surgery will remain. Also performed were 1,919 other cases such as ventriculoperitoneal shunt, shunt replacement, burr hole evacuation of hematoma, spinal decompression surgery, removal of spinal cord tumors, stereotactic biopsy for brain tumors, craniotomy & removal of tumor, craniotomy & biopsy for tumors, clipping for cerebral aneurysm, and cranial osteogenesis. Waiting period of operation for patients as of July 2017 is from six to twelve months due to obsolescence of essential medical equipment such as bipolar electrosurgical units and microsurgical instrument set for neurosurgery. Therefore, it is necessary to improve medical equipment and appropriate environment for the operation theaters. Under the Project, three major operation theaters including one hybrid operation theater is planned.

The neurosurgery hybrid operation theater will be equipped with a CT scanner to capture real time image during operation and enable pinpointing of the affected part. In addition, combination of CT scanner and Navigation system enable accurate removal of brain tumor. Equipment for the three operation theaters, Neurosurgical ICU (NICU) (for care of post-operative patients), and for general ward is planned under the Project.

5) There are common departments such as outpatients, Physiology Laboratory, Rehabilitation Department, Diagnostic Imaging, Emergency Unit, Laboratory Unit, and Pharmacy. Necessary medical equipment for diagnosis and treatment of cardiac disease patients is planned under the Project. The criteria of selection for medical equipment is based on current and future clinical activities and availability of maintenance system by Myanmar side.

(2) Contents of Equipment Planning

1) Procurement of medical equipment and furniture by the Recipient Country

Equipment necessary for functioning of new facility procured by Japanese side was drastically narrowed down and shown in each table below putting priority A or B. Myanmar side agreed to procure medical equipment which is not procured by Japan side, transferrable equipment, medical furniture such as hospital bed and supplementary one, and general furniture. The Myanmar side's procurement, distribution and relocation schedule will be adjusted to match handover of the equipment procured by Japan side. Major procurement and transferrable equipment and furniture for individual department is listed either ● or ▲ mentioned in following equipment list. The difference between ● or ▲ is that ● is mandatory to procure while ▲ is either transfer or newly procured.

Furthermore, it is planned to assist the part of Myanmar side's procurement work by Japanese consultants so as to materialize project effects on time.

2) Equipment plan for each department

Equipment plan for each department considering current and future clinical activities at the handover is as follows.

Outpatient Department

Outpatient department is divided into consulting rooms and procedure rooms. In consulting rooms, examination table, instrument cabinet and LCD monitors for image viewing, a general diagnostic set such as height/weight scales, stethoscope and sphygmomanometer are planned under the Project. The purpose of LCD monitor is to help interpret images and explain to a patient in the consulting room. The equipment planned for outpatient department is as shown in below table.

Table 2-12 Equipment plan for Outpatient Department

Item No.	Equipment	Qty.	Priority
OP-1	Examination table	10	●
OP-2	LCD monitor for outpatient department	10	●
OP-4	Diagnostic set	10	●
OP-8	Instrument cabinet	8	●

● indicates new medical equipment procured by the Myanmar side

Physiology Laboratory

Three units of Holter ECG including recorders and analyzers to confirm conditions of cardiac patients are planned. ECG with treadmill for observing cardiac functional change in stress test, and ECG with 12 channels with application software for arrhythmia are planned. In addition, tilt table for examining the autonomic function is planned under the Project. The main equipment planned for Physiology Laboratory is as shown in below table.

Table 2-13 Equipment plan for Physiology Laboratory

Item No.	Equipment	Qty.	Priority
P-1	Tilt table	1	●
P-3	ECG 12ch	1	●
P-4	Holter ECG with 3 recorders	1	●
P-5	ECG with treadmill for stress test	1	●
P-6	Spirometer	1	●
P-7	EEG	1	▲
P-8	EMG	1	▲

● indicates new medical equipment procured by the Myanmar side

▲ indicates transfer from YGH or new medical equipment procured by the Myanmar side

Rehabilitation Department

The equipment for the rehabilitation in the acute phase of cardiology, cardiac surgery, neurosurgery, and neuro medicine is planned under the Project. It is important to start rehabilitation training just after the surgery in order to return to society early and to prevent recurrence of cardiovascular and brain disease.

For the heart surgery patients, a treadmill and an ergometer, which are suitable for training the cardiac function through gradual heart load charging are planned. For the stroke patients, stairs and parallel bars are planned since their rehabilitation requires walking whilst maintaining balance. The main equipment planned for rehabilitation department is as shown in below table.

Table2-14 Equipment plan for Rehabilitation Department

Item No.	Equipment	Qty.	Priority
RH-1	Stairs	1	●
RH-2	Parallel bars with mirror	2	●
RH-4	Balance ball and other exercise therapy set	1	●
RH-6	Treadmill	2	●
RH-7	Ergometer	1	●
RH-8	Electrical stimulation	2	●
RH-9	Functional electrical stimulation	3	●
RH-12	Ultrasound therapy machine	3	●
RH-13	Laser therapy machine	3	●
RH-14	Interferential therapy machine	3	●
RH-15	Paraffin wax bath	2	●
RH-16	ECG 6ch	1	●
RH-18	Movement therapy machine	1	●
RH-19	Equipment for occupational therapy	1	●
RH-21	Spirometer	3	●
RH-22	Wheel chair	1	●

● indicates new medical equipment procured by the Myanmar side

Diagnostic Imaging

Two types of CT scanners, namely CT scanner 64 slice for emergency patients and CT scanner 128 slice for outpatients and inpatients are planned under the Project. CT scanner 64 slice is used for immediate diagnosis for patients such as stroke and trauma.

CT scanner 128 slice will be used for 3D image angiography of especially ischemic heart disease diagnosis since it minimizes examination time and enable minimize the influence from body movement by fast-computed tomography. In addition, generally

used 1.5 tesla type MRI with the cardiovascular application software is planned under the Project. While CT angiography needs contrast agent, MR angiography can make 3D image with minimum or no use of contrast agent.

MRI has an advantage of no exposure to radiation during examination since it does not use X-ray. In addition, it can make special image and supplementary analysis with application software resulting in detailed diagnostics.

Applications such as load perfusion MRI, delayed enhancement MRI, cine MRI, and diffusion-weighted imaging will be installed as main MRI options. The applications with these options enable evaluation of cerebral infarction at early stage, detection of myocardial ischemia and the wall movement and wall pressure, resulting in accurate diagnosis.

Two digital X-ray machines necessary for the chest X-ray photography for outpatients and inpatients, and a mobile X-ray unit for immobilized patients of ICU/HCU is planned. Picture Archiving and Communication System (image storage communication systems: PACS) is planned to store, browse and manage the image data received from each diagnostic imaging device, such as CT, MRI. The advantage of PACS system is the reduction of the cost of dry film and printing, and easy searching and choosing necessary images. The main equipment planned for diagnostic imaging is as shown in below table.

Table2-15 Equipment plan for Diagnostic Imaging

Item No.	Equipment	Qty.	Priority
R-1	CT scanner 128 slice	1	A
R-2	CT scanner 64 slice	1	●
R-3	MRI	1	●
R-4	PACS system (including RIS)	1	●
R-8	Digital X-ray machine	2	A(1)
R-9	Mobile X-ray unit	1	●
R-10	Ultrasound scanner for outpatient department	2	●
R-12	MR compatible stretcher	1	●

● indicates new medical equipment procured by the Myanmar side

() indicates Q'ty of procurement by the Japan side

Angiography Unit

In the Angiography Unit, it is possible to detect and treated vascular diseases and tumors using X-ray fluoroscopy with the aid of catheter implanted in the vessel in the affected area, or the injection of a contrast agent so as to exclusively read the vessel. This procedure helps to reduce the burden of patients compared with surgical procedure since the affected area can be treated from vessel.

The clinical activities of this unit are categorized into three. The first activity is angiographic examination and catheter treatment for cardiac blood vessel and coronary artery. The second activity is electrophysiological examination and treatment. This includes examination to diagnose mechanism of arrhythmia by reaction of heart electrical stimulation, and radio-frequency ablation treatment which destroy heart tissue causing arrhythmias. The third activity is cerebral angiography and

neuroendovascular treatment which include examination and treatment of coarctation causing cerebral infarction.

Three angiography systems are planned for this department under the Project. Japan side will procure one angiography system bi-plane, and one angiography system single plane. On the other hand, Myanmar side will procure one angiography system bi-plane for coronary and neurology. Angiography system single plane is for examination and treatment of coronary artery in the cardiology department. Since it is possible to perform dual-direction fluoroscopy, angiography system bi-plane for coronary and neurology is utilized for stroke patients, cerebral tumor patients and brain vascular IVR (Interventional Radiology) in addition to catheter ablation and pacemaker implantation. 3D mapping system, ablation generator and irrigation pump for ablation on the request list is planned to be procured by the Myanmar side. The main equipment planned for Angiography Unit is as shown in below table.

Table2-16 Equipment plan for Angiography Unit

Item No.	Equipment	Qty.	Priority
CL-1	Angiography system bi-plane	1	A
CL-2	Angiography system single plane	1	A
CL-3	Angiography system bi-plane for coronary and neurology	1	●
CL-7	Irrigation pump for ablation	1	●
CL-8	Anesthesia machine with ventilator	1	●
CL-9	Defibrillator with transcutaneous pacing	2	●
CL-13	3D mapping system	1	▲
CL-14	Ablation generator	1	▲
CL-15	Monitor for ablation/3D	1	▲
CL-16	Infusion pump	2	●

● indicates new medical equipment procured by the Myanmar side

▲ indicates transfer from YGH or new procurement by the Myanmar side

Emergency Unit

Since emergency patients need immediate procedures, diagnostic equipment, such as ECG, portable ultrasound scanner, and mobile X-ray unit will be included under the Project. Blood gas analyzer is planned in the unit since it is important for emergency patients with, e.g., heart diseases and stroke to measure SpO₂, CO₂ and pH. In case patients need biochemical examination, their specimens will be transferred to clinical laboratory for testing. The main equipment planned for emergency unit is as shown in below table.

Table2-17 Equipment plan for Emergency Unit

Item No.	Equipment	Qty.	Priority
ER-3	Emergency bed	8	●
ER-4	Emergency cart	2	●
ER-5	Blood gas analyzer with ISE	1	●
ER-6	ECG 6ch	1	●
ER-7	Mobile X-ray unit	1	●
ER-8	Ultrasound scanner for emergency department	1	●
ER-9	Defibrillator	1	●
ER-13	Infusion pump	2	●

● indicates new medical equipment procured by the Myanmar side

High Care Unit (HCU: SCU, CCU, NCU, SICU)

Each floor will have sixteen bedded high care units, in 64 beds, which will play the intermediate role between the ICU and general ward. In cardiac surgery and neurosurgery, patients with stable vital signs will be transferred from ICU to HCU for continuous and intensive nursing care. HCU are categorized into SCU (Stroke Care Unit) for neuro medicine, CCU (Coronary Disease Care Unit) for cardiology, NCU (Neurosurgical Care Unit) for neurosurgery, and SICU (Surgical Intensive Care Unit) for cardiac surgery. These HCUs will be care for patients with relatively serious condition requiring assisted respiration and monitoring of total body condition such as blood pressure or cardiovascular condition, etc.

Therefore, the necessary equipment for the unit, such as ventilator, central monitor, patient monitor, infusion pump, syringe pump, oxygen regulator and humidifier for central piping, suction bottle, and medicine cabinet are planned under the Project. A ventilator will be not included in the two surgical HCUs (NCU & SICU) since these surgical departments can manage respiratory control for patients by ventilator in ten-bedded ICU. On the other hand, four ventilators are planned in the two internal medicine HCUs (SCU & CCU) in total eight units since these departments do not have ICU. One infusion pump and one syringe pump are provided to each bed for surgical HCUs, in total 32 units. In case of internal medicine HCUs, if half of the beds are occupied by patients with serious conditions, three infusion pumps and four syringe pumps are planned per bed in total 64 units and 80 units respectively. For the rest of the beds, one syringe pump and one infusion pump are planned per bed. The main equipment planned for HCU is as shown in below table.

Table2-18 Main equipment plan for High Care Unit

Item No.	Equipment	Qty.	Priority
CCU-1	Ventilator	4	●
CCU-2	Central monitor	2	●
CCU-3	Patient monitor for ward	16	●
CCU-4	Patient bed electric	16	●
CCU-8	Infusion pump	32	●
CCU-9	Syringe pump	40	●
CCU-10	Suction bottle for central piping	16	●
CCU-11	Oxygen regulator and humidifier	16	●
CCU-12	Defibrillator	2	●
CCU-13	Oxygen concentrator	2	●
CCU-16	Medicine cabinet	2	●
CCU-17	Instrument cabinet	2	●
SCU-1	Ventilator	3	●
SCU-2	Ventilator	1	▲
SCU-3	Central monitor	2	●
SCU-4	Patient monitor for ward	12	●
SCU-5	Patient monitor for ward	4	▲
SCU-6	Patient bed electric	12	●
SCU-7	Patient bed electric	4	▲
SCU-11	Infusion pump	30	●
SCU-12	Infusion pump	2	▲
SCU-13	Syringe pump	40	●

SCU-14	Suction bottle for central piping	16	●
SCU-15	Oxygen regulator and humidifier	16	●
SCU-16	Defibrillator	1	●
SCU-17	Oxygen concentrator	2	●
NCU-3	Central monitor	2	●
NCU-4	Patient monitor for ICU	16	●
NCU-5	Patient bed electric	16	●
NCU-9	Infusion pump	16	●
NCU-10	Syringe pump	16	●
NCU-11	Suction bottle for central piping	16	●
NCU-12	Oxygen regulator and humidifier	16	●
NCU-13	Defibrillator	1	●
NCU-14	Oxygen concentrator	5	●
SICU-3	Central monitor	1	●
SICU-4	Patient monitor for ICU	16	●
SICU-5	Patient bed electric	16	●
SICU-9	Infusion pump	16	●
SICU-10	Syringe pump	16	●
SICU-11	Suction bottle for central piping	16	●
SICU-12	Oxygen regulator and humidifier	16	●
SICU-13	Defibrillator	1	●
SICU-14	Oxygen concentrator	1	●

● indicates new medical equipment procured by the Myanmar side

▲ indicates transfer from YGH or new medical equipment procured by the Myanmar side

Intensive Care Unit(Cardiac surgery ICU:10 beds, Neurosurgical ICU:10 beds)

This unit is for postoperative observation and intensive care of patients, such as thoracotomy, and craniotomy. The unit is mainly for surgical patients, however, the patients with serious condition from cardiology and neurology can be cared in the ICU.

The purpose of ICU is to provide nursing care of postoperative patients who require respiratory management. Therefore, one ventilator is planned to each bed in the ICU. Necessary equipment such as central monitor, patient monitor, infusion pump, syringe pump, oxygen regulator and humidifier, suction bottle, medicine cabinet and patient bed electric are planned under the Project.

For patients after open heart surgery at cardiac surgery department, it is important to manage water amount, electrolytes, and acid-base balance because heart lung machine is used. For craniotomy procedure at neurosurgery department, postoperative management is also important because of invasive interventions such as long hours under anesthesia. Therefore, three units of infusion pump per bed, in total 30 units at each department, and four units of syringe pump per bed, in total 40 units at each department are planned.

In addition, hemodialysis machine is also planned for postoperative cardiac surgery patients with impaired renal function. The main equipment planned for ICU is as shown in below table.

Table2-19 Main equipment plan for ICU

Item No.	Equipment	Qty.	Priority
Cardiac surgery ICU-1	Ventilator	10	●
Cardiac surgery ICU-3	Central monitor	1	●
Cardiac surgery ICU-4	Patient monitor for ICU	10	●
Cardiac surgery ICU-5	Patient bed electric	10	●
Cardiac surgery ICU-9	Infusion pump	30	●
Cardiac surgery ICU-10	Syringe pump	40	●
Cardiac surgery ICU-11	Suction bottle for central piping	10	●
Cardiac surgery ICU-12	Oxygen regulator and humidifier	10	●
Cardiac surgery ICU-13	Defibrillator	1	●
Cardiac surgery ICU-14	Oxygen concentrator	1	●
Cardiac surgery ICU-17	Medicine cabinet	1	●
Cardiac surgery ICU-20	Hemodialysis machine	2	●
Cardiac surgery ICU-21	RO unit	1	●
Cardiac surgery ICU-27	Blood gas analyzer with ISE	1	●
Neurosurgical ICU-1	Ventilator	10	●
Neurosurgical ICU-3	Central monitor	2	●
Neurosurgical ICU-4	Patient monitor for ICU	10	●
Neurosurgical ICU-5	Patient bed electric	10	●
Neurosurgical ICU-9	Infusion pump	30	●
Neurosurgical ICU-10	Syringe pump	40	●
Neurosurgical ICU-11	Suction bottle for central piping	10	●
Neurosurgical ICU-12	Oxygen regulator and humidifier	10	●
Neurosurgical ICU-13	Defibrillator	1	●
Neurosurgical ICU-14	Oxygen concentrator	5	●

● indicates new medical equipment procured by the Myanmar side

Operation Theater (Cardiac surgery)

The equipment for surgery such as bypass surgery, valvular surgery and aortic surgery is planned under the Project. One cell saver to perform autologous blood transfusion for the patients who require autotransfusion is planned to each major operation theater, in total two units. The cell saver helps to avoid the risks of transfused blood related infectious diseases such as side effects of transfusion-associated graft versus host disease, hepatitis and HIV/AIDS, etc.

The necessary analyzers for blood coagulation time (ACT: Activated clotting time), and blood gas observation and evaluation will be also included. Ultrasound scanner is planned as intraoperative ultrasonography; a transesophageal ultrasound scanner for monitoring cardiac imaging from esophagus and an intraoperative ultrasound scanner for monitoring coronary artery blood flow and volume during operation. Transesophageal ultrasound scanner enables evaluation of heart function and wall exercises in bypass surgery. In regard to valvular heart disease, it helps to confirm the location of lesion and evaluate valve replacement.

Ceiling pendant for anesthetic gas, ceiling pendant for surgery and hot cabinet /cold cabinet in the major operation theaters will be included under the Project. Ceiling pendant for surgery minimizes the number of electrical plugs on the floor and creates safer environment in the operation theater. Ceiling pendant for anesthetic gas enables provision of medical gas such as oxygen and vacuum through the outlets of the central medical gas piping. Hot cabinet keeps replacement liquid and saline warm at body

temperature. Cold cabinet keeps medicine which require low temperature control cold. Operation Theater light with camera and monitor is planned so that medical students in clinical practice can learn surgical approaches by observing the operation on the monitor. The main equipment planned for surgical unit is as shown in below table.

Table2-20 Main equipment plan for Surgical Unit (Cardiac surgery)

Item No.	Equipment	Qty.	Priority
OTC-1	Operation table	2	●
OTC-4	Operation theatre light for OT	2	●
OTC-5	Electrosurgical unit	2	●
OTC-6	Anesthesia machine with ventilator	2	●
OTC-7	Ceiling pendant for anesthetic gas	2	●
OTC-8	Ceiling pendant for surgery	2	●
OTC-12	Hot cabinet /cold cabinet	2	●
OTC-13	Ultrasonic aspirator with accessories	1	●
OTC-14	Anticoagulation monitor(ACT) machine	2	●
OTC-16	Intraoperative ultrasound scanner for cardiovascular	1	●
OTC-17	Heart lung machine with cooler/heater unit	2	●
OTC-18	Intra aortic balloon pump (IABP)	2	●
OTC-19	Cell saver	2	●
OTC-20	Surgical C-arm X-ray unit	1	●
OTC-21	Low continuous suction machine	2	●
OTC-22	Blood gas analyzer with ISE	1	●
OTC-23	Biochemistry analyzer, semi-automated	1	●
OTC-24	Thoracoscope system	1	●
OTC-28	PCPS (ECMO)	1	●
S-8	Hand scrub station	1	B

● indicates new medical equipment procured by the Myanmar side

Hybrid Operation Theater (Cardiac surgery)

One single plane angiography system for hybrid OT (detector size: 12 inches) is planned for the cardiac surgery hybrid operation theater. In case internal medicine treatment such as stent-graft catheter is not effective, it is possible to change to a surgical procedure such as bypass without patient's physical burden for transferring to the other rooms. A ceiling suspended single plane angiography system will be installed since one direction angiography is sufficient enough for cardiac area examination and procedure and the room can be used for general operation theater by pushing the arm aside when angiography is not necessary.

The main equipment planned for hybrid operation theater is as shown in below table.

Table2-21 Main equipment plan for Hybrid Operation Theater (Cardiac surgery)

Item No.	Equipment	Qty.	Priority
HOTC-1	Angiography system for hybrid OT	1	●
HOTC-5	Anesthesia machine with ventilator	1	●
HOTC-8	Operation theatre light for hybrid OT	1	●
HOTC-9	Ceiling pendant for anesthetic gas	1	●
HOTC-12	LCD Monitor for OT	3	●
HOTC-13	Heart lung machine with cooler/heater unit	1	●
HOTC-15	Defibrillator	1	●
HOTC-16	Intra aortic balloon pump (IABP)	1	●

● indicates new medical equipment procured by the Myanmar side

Operation Theater (Neurosurgery)

In neurosurgery, an electric high speed drill for each major operation theater will be included in the scope of the Project since it is necessary for the craniotomy operation. One ultrasonic aspirator is planned per two major operation theaters. It is beneficial for brain tumor and reduces the amount of bleeding and surgical time. In addition, operating microscope is planned to magnify operative field since there are many operations on tiny areas of the brain in the neurosurgery. Only one new operating microscope will be procured and the other one will be transferred from YGH.

Surgical C-arm X-ray unit is planned since X-ray image would be required during surgery on the spine area. Ceiling pendants for anesthetic gas, ceiling pendants for surgery and hot cabinet /cold cabinet are planned for the major operation theaters.

To minimize permanent damage after surgery, the project provides per two rooms one set of equipment consisting of one C2 nerve monitor to record nerve function using EMG by stimulating nerve. One anesthesia machine with ventilator is planned per room. Operation lamp with camera is planned so that medical students in clinical practice can learn operation approaches by observing the surgery and watching images taken by camera mounted on operation lamp ceiling type and can see views of operation area by large monitor or by view of operating microscope. The main equipment planned for operation theater (neurosurgery) is as shown in below table.

Table2-22 Main equipment plan for Operation Theater (Neurosurgery)

Item No.	Equipment	Qty.	Priority
OTN-4	Operation theatre light for OT	2	●
OTN-5	Electrosurgical unit	1	●
OTN-6	Anesthesia machine with ventilator	2	●
OTN-7	Ceiling pendant for anesthetic gas	2	●
OTN-8	Ceiling pendant for surgery	2	●
OTN-12	Hot cabinet /cold cabinet	2	●
OTN-13	Ultrasonic aspirator with accessories	1	▲
OTN-14	Intraoperative ultrasound scanner for neurosurgery	1	▲
OTN-15	Stereo taxi system	1	▲
OTN-16	Navigation system	1	●
OTN-17	High speed drill, electric	1	●
OTN-18	High speed drill, electric	1	▲
OTN-19	ICP monitor, EVD	1	▲
OTN-20	C2 Nerve monitor	1	▲
OTN-21	Neuroendoscope	1	▲
OTN-26	Mobile Operating microscope	1	●
OTN-27	Mobile Operating microscope	1	▲
OTN-28	Ceiling Operating microscope	1	●
OTN-29	Surgical C-arm X-ray unit	1	●
OTN-30	Head clamp & retractor system	1	●
OTN-31	Head clamp & retractor system	1	▲
S-8	Hand scrub station	1	B

● indicates new medical equipment procured by the Myanmar side

▲ indicates transfer from YGH or new medical equipment procured by the Myanmar side

Hybrid Operation Theater (Neurosurgery)

Hybrid operation theater equipped with CT scanner is planned for removal of tumor

with safety and precisely by confirming the location of operation area from intracranial views taken by CT scanner interlocked with operation table and navigation system. Ceiling pendant for anesthetic gas and ceiling pendant for surgical are planned in the hybrid operation theater.

Same as other operation theater, operating lamp with camera and monitor is planned for educational purpose. The main equipment planned for the room is as shown in below table.

Table2-23 Main equipment plan for Hybrid Operation Theater (Neuro)

Item No.	Equipment	Qty.	Priority
HOTN-2	CT scanner 20 slice	1	●
HOTN-5	Anesthesia machine with ventilator	1	●
HOTN-7	Operation theatre light for hybrid OT	1	●
HOTN-8	Ceiling pendant for anesthetic gas	1	●
HOTN-10	Camera for operation room	1	●
HOTN-11	LCD Monitor for OT	3	●
HOTN-13	Defibrillator	1	●

● indicates new medical equipment procured by the Myanmar side

Laboratory Unit

The equipment necessary for target four departments is planned to perform clinical examinations such as biochemical tests, hematology, immunology hormone test (myocardial marker, tumor marker), pathology test and microbial/bacterial test.

Fully automated blood culture system is also planned in order to specify the bacteria of infectious endocarditis for the postoperative patients of cardiac surgery or catheter intervention. The equipment enables to identify the bacteria quickly by culturing the bacteria automatically, which is effective for early diagnosis. As to blood transfusion, the equipment for cross-match test which is necessary for blood transfusion and for blood storage are planned since blood supply system has established and can be supplied from National Blood Center adjacent to the YGH. The main equipment planned for laboratory unit is as shown in below table.

Table2-24 Main equipment plan for Laboratory Unit

Item No.	Equipment	Qty.	Priority
L-1	Fully automated chemistry analyzer	1	●
L-2	Urine analyzer	1	●
L-3	Blood cell counter 5 part differential	1	●
L-4	Automated coagulation analyzer	1	●
L-5	Immuno hormone analyzer	1	●
L-6	Distillation plant	1	●
L-7	Laboratory central table with stool	1	B
L-8	Laboratory side table with stool	5	B
L-9	Fully automated blood culture system	1	●
L-10	Automatic sliding strainer	1	●
L-12	Binocular microscope	4	●
L-15	Safety cabinet	1	●
L-16	Tissue processor	1	●
L-20	Blood bank refrigerator	1	●
L-23	Microscope	1	●
L-24	Centrifuge for serofuge	2	●

L-27	Centrifuge for specimen separation	2	●
L-30	Cryostat	1	●
L-31	Bone marrow aspiration trephine set	1	●

● indicates new medical equipment procured by the Myanmar side

() indicates Q'ty of procurement by the Japan side

Pharmacy

In-house pharmacy will be installed to supply medicine to the outpatients and inpatients. The equipment plan for pharmacy is as shown in below table.

Table2-25 Main equipment plan for Pharmacy

Item No.	Equipment	Qty.	Priority
PH-1	Pharmaceutical refrigerator	4	●
PH-2	Medicine cabinet	5	●
PH-3	Desk and chair	1	●
PH-4	Storage Rack	5	●

● indicates new medical equipment procured by the Myanmar side

Ward

Each floor from 3rd to 6th, fifty-eight beds equipped with oxygen and suction outlets per bed will be installed on each floor. In this general ward, infusion pump and syringe pump are not planned since patients who require controlled infusions are not to be accommodated in the Ward. Patient monitors are also not planned since patients who require continuous monitoring of the vital signs such as ECG, SpO₂ are not to be accommodated likewise.

Long-term continuous tests of brain waves help to determine that operation can be effective or not for the epilepsy patients who are refractory to medicine therapy and other diseases. Therefore, EEG equipped with long-time recording analysis software is planned. Ultrasound scanner with transesophageal probe (W-16 in table 2-26) helps to observe the blood flow condition of the heart of patients after catheter intervention and to check for a blockage. The main equipment planned for the ward is as shown in below table.

Table2-26 Main equipment plan for Ward

Item No.	Equipment	Qty.	Priority
W-1	Examination table	2	●
W-4	Hospital bed	232	●
W-5	Bedside cabinet	232	●
W-15	ECG 6ch	2	●
W-16	Echo machine(transesophageal probe)	3	●
W-19	EEG	1	▲
W-20	EEG	1	●
W-21	EMG	1	▲
W-23	Ultrasound scanner for neuro medicine	1	●
W-25	Infusion pump	40	●
W-26	Syringe pump	40	●

● indicates new medical equipment procured by the Myanmar side

▲ indicates transfer from YGH or new medical equipment procured by the Myanmar side

Central Sterile and Supply Department (CSSD)

It is planned to install the equipment necessary for washing, sterilization and storage of the instruments and other items. Two washer disinfectors are planned for prewashing of steel accessories used in surgery. High pressure steam sterilizer is used for drape, steel instruments used in surgery and bed sheets from the ward. Two kinds of high pressure sterilizers are planned including one large high-pressure steam sterilizer, capacity of more than 400L and a small one, capacity of approximately 150L. The equipment plan for central sterile and supply department is as shown in below table.

Table2-27 Main equipment plan for Central Sterile and Supply Department (CSSD)

Item No.	Equipment	Qty.	Priority
S-1	High pressure steam sterilizer S size	1	B
S-2	High pressure steam sterilizer M size	1	B
S-3	Hydrogen peroxide gas sterilizer	1	●
S-4	Ultrasonic washer	2	●
S-5	Sterilization cart	1	●
S-6	Linen cart	3	●
S-7	Sterilization cabinet	3	●
S-9	Washer disinfectant	2	●

● indicates new medical equipment procured by the Myanmar side

3) Detailed equipment plan

Table 2-28 shows equipment plan with components and distribution to medical departments.

Table 2-28 Main Equipment plan and specification procured by Japanese side

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
Angiography system bi-plane	It is used for intracranial treatment, and peripheral arterial plasty by bi-plane angiography with dual-direction fluoroscopy. The main procedures will be coil embolization for cerebral aneurysm, stent-graft treatment and vasodilation for normalization of blood flow. It is standard equipment in the hospital for cardiac patients.					1	1
Angiography system single plane	It is used for coronary angiography and emergency PCI to a patient with ischemic heart diseases. It is intermediate equipment in the hospital performing cardiac catheter treatment and cardiac surgery. Ceiling suspended type generally installed in catheter laboratory is planned.					1	1
CT scanner 128 slice	To capture tomographic image of cardiac patients with cardiac optional software. 128 slice is standard specification in the hospital for cardiac patients.					1	1
Digital X-ray machine	To capture general chest X-ray image of cardiac patients.					1	1
Hand scrub station	To reduce the number of bacteria on hands and fingers as much as possible before procedure.					2	2
High pressure steam sterilizer S size	To sterile surgical instruments and linens in a short time by high-pressure steam.					1	1
High pressure steam sterilizer M size						1	1
Laboratory central table with stool	It is used for preparation of specimen, microscopic observation, placement of testing equipment in laboratory unit.					1	1
Laboratory side table with stool						5	5

Table2-29 Main Equipment plan and specification procured by Myanmar side

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
Anesthesia machine with ventilator	Equipment for full body anesthetist by inhalation of anesthetic gas from vaporizer. It is versatile equipment in the operation theater of tertiary level medical facilities and applicable for all cases.		3		3	1	7
Aneurysm surgery set	A set of steel surgical instruments used clipping for cerebral aneurysm.				2		2
Angiography system for hybrid OT	It is used for TAVI to the patients with serious aortic stenosis which is not suitable for surgery. In addition, used for the stent-graft treatment to the thoracic aortic aneurysm or the abdominal aortic aneurysm, and for the simultaneous procedure of bypass and balloon dilatation to the arteriosclerosis obliterans. It is intermediate equipment in the hospital performing cardiac catheter treatment and cardiac surgery. Ceiling suspended type is planned since it can put the arm aside in case of no use.		1				1
Angiography system bi-plane for coronary and neuro medicine	It is used for implantation of pacemaker, ablation treatment of atrial fibrillation, peripheral-vascular intervention, and neuroendovascular treatment. Bi-plane angiography is planned since it enables these procedure by dual-direction fluoroscopy. It is intermediate equipment in the hospital performing cardiac catheter treatment. Ceiling suspended type generally installed in catheter laboratory is planned.					1	1
Anticoagulation monitor(ACT) machine	To measure the clotting time (activated all clotting time) during using heparin with heart-lung machine.		2				2
Automated coagulation analyzer	To measure PT(Prothrombin Time), APTT(Activated Partial Thromboplastin Time), fibrinogen, thrombotest, coagulation factors and coagulation time.					1	1
Balance ball and other exercise therapy set	It is a set of equipment such as balance ball for the exercise therapy in Rehabilitation Department. Various sizes are planned in order to select the appropriate size depending on physical status.					1	1
Basic neurosurgical set	A set of steel surgical instruments consisting of general set of instruments for neurosurgery and instruments for spine surgery. It is standard equipment for neurosurgery in tertiary level medical facilities.				2		2
Bedside cabinet	To accommodate personal belongings of patients.	16	26	16	26	232	316
Binocular microscope	To observe a pathological specimen, cytological specimen and stained specimen.					4	4
Blood bank refrigerator	To store transfusion blood at low temperature categorizing each blood type					1	1

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
Blood cell counter 5 part differential	To calculate complete blood counts such as red blood cell, white blood cell, and platelet. It is standard equipment for blood test.					1	1
Blood gas analyzer with ISE	Equipment to analyze oxygen saturation and electrolyte in the blood.		2		1	2	5
C2 Nerve monitor	To measure EMG during surgery of the spine or its surrounding neurological area by stimulating nerve close to operative area so as to avoid permanent damage. It is standard equipment for neurosurgery and orthopedics in tertiary level medical facilities			1			1
Ceiling pendant for anesthetic gas	To use the space of operation theater effectively by hanging a pendant equipped with the outlet of the anesthesia machine. It is standard equipment for modular type operation theater.		3		3		6
Ceiling pendant for surgery	To use the space of operation theater effectively by putting the equipment for the operation such as a patient monitor mounted the pendant. It is standard equipment for modular type operation theater.		3		3		6
Cell saver	To return safe autologous blood to the body for patients during open-heart surgery using a heart-lung machine in order to avoid infection and GVHD (graft-versus-host disease). The autologous blood transfusion has dilution method, recovery method and septic method. This device has recovery method and can be used for retrieving and returning patients' blood for early recovery during and after operation. It is standard equipment in the hospital performing cardiac surgery.		2				2
Central monitor	To monitor vital signs of multi patients simultaneously in operation theater and ICU.	2	2	2	4		10
Centrifuge for serofuge	To centrifuge blood for determination of blood type, cross-matching test, genotype and Rh positive and negative.					2	2
Centrifuge for specimen separation	To separate blood ingredients.					2	2
Consultation desk and chair	To diagnose patients in the consultation room.					10	10
CT scanner 64 slice	To obtain tomographic image for emergency patients. 64 slice is standard function for emergency including cardiac patients.					1	1
CT scanner 20 slice	To obtain intraoperative image for confirming location of cerebral tumor by the combination of navigation system. It is intermediate equipment for the hybrid operation theater in tertiary level medical facilities.				1		1

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
Cryostat	To cut frozen tissue taken from the body. It enables to make pathological specimen in shorter time than normal procedure. As a result, rapid diagnosis becomes possible. It is standard equipment for pathology in tertiary level medical facilities.					1	1
Deep Freezer	To store blood products such as plasma at -20 degrees in blood transfusion unit.					1	1
Defibrillator	To deliver electric shocks percutaneously to a patient having ventricular fibrillation or atrial fibrillation and normalize systolic performance.	2	3	1	3	1	10
Defibrillator with transcutaneous pacing	Equipped with function of namely transcutaneous pacing or body surface electrode pacing, which recover heart pulse in a way of stimulating electrically with electrode on the chest. To deliver pacing with body surface electrode until other intravenous temporary pacing or medicine therapy start to the emergency bradycardia and cardiac arrest during cardiac catheter treatment. It is standard equipment in the hospital for cardiac patients.					2	2
Defibrillator with internal paddle	To deliver electric shocks percutaneously to a patient having ventricular fibrillation or atrial fibrillation and normalize systolic performance and circulatory dynamics. A type with internal paddle is planned to deliver electric shocks during surgery. It is standard equipment in the hospital for cardiac patients.		2				2
Diagnostic set	To diagnose patients. A set consists of thermometers, stethoscopes, percussion hammers, otoscopes, ophthalmoscope, sphygmomanometer, height and weight scales for adult.					18	18
Digital X-ray machine	To capture general chest X-ray image for cardiac patients. DR system has an advantage in prompt diagnosis by getting image without film.					1	1
ECG with treadmill for stress test	To perform ECG examination stressing body constantly by running on the treadmill. 12-channel type is planned for diagnosis in cardiology department. It is standard equipment for physiological function test in the hospitals for cardiology.					1	1
ECG 12ch	To diagnose cardiac diseases such as arrhythmia by graphical recording of electrical activity of the heart. Signal-Averaged ECG software will be installed for outpatients with arrhythmia. It is standard equipment in the hospitals receiving many cardiac patients.					1	1
ECG 6ch	To diagnose cardiac diseases such as arrhythmia by graphical recording of electrical activity of the heart. 6-channel type for outpatients is planned.	1	1			4	6

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
EEG	To diagnose disturbance of consciousness or epilepsy. It helps to develop a treatment plan for epilepsy patients by long recording of brain waves and video simultaneously, which enable to record brain wave, facial expressions and the body movement at the moment of epilepsy seizure.					3	3
Electrosurgical unit	It is used for cutting body tissue, hemostasis and coagulation during operation is planned, especially suitable for tiny blood vessels. Electrosurgical knife tips suitable for microsurgery are planned for neurosurgery department.		2		1	1	4
Electrosurgical unit for neurosurgery	For neurosurgical procedure, it is necessary to arrest of hemorrhage or cutting for micro parts. Thus, it is required to have bipolar coagulation in order to flow low electrical current at points of forceps. It is commonly used for neurosurgical surgery in tertiary level medical facilities				1		1
Emergency bed	To lay a patient for emergency treatment.					8	8
Emergency cart	To store and classify cannula, catheter, bandage, medicines etc. necessary for emergency treatment. It is standard equipment.	1	1			2	4
Ergometer	To recover body movement function of post-operative patients of cardiac surgery and neurosurgery by using bicycle exercise.					1	1
Examination table	To lay a patient on the table for diagnosis.					12	12
Fully automated blood culture system	Culturing of the blood of patients with fever or suspected of infectious endocarditis after a cardiac catheterization or open-heart surgery, which helps quick identification of bacteria and treatment. It is standard equipment in tertiary level medical facilities.					1	1
Head clamp & retractor system	To fix the head unidirectionally during craniotomy. It is standard equipment for neurosurgery.				2		2
Heart lung machine with cooler/heater unit	Used as a temporary substitute of patient's heart and lung during open-heart surgery. Water (0 to 42 degrees Celsius) is sent to the heat exchanger of the machine in order to cool down or warm up (rewarming) the blood. It is standard equipment as supplementary extracorporeal circulation device for open-heart surgery.		3				3
Hemodialysis machine	To discharge the wastes and toxins in the blood of a patient with weak kidney function after cardiac surgery.		2				2
High speed drill, electric	To incise head bone quickly and safely by high-speed electric drill. It is standard equipment for surgical machine in neurosurgery.				2		2
Holter ECG with 3 recorders	To detect arrhythmia and ischemic changes by long-time recording of electrocardiogram under normal circumstances by carrying the recorder unit around for 24-hour continuous recording of electrocardiography (cardiac activity). It is standard equipment in the hospitals for					1	1

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
	cardiac patients.						
ICP monitor, EVD	To measure the intracranial pressure continuously for the suspected patients with increasing intracranial pressure. It is standard equipment as a monitoring device after neurosurgery.				1		1
Incubator	To culture microorganisms.					1	1
Infusion pump	To control drip of the infusion.	32	46	32	46	44	200
Instrument cabinet	To store small items, necessary for diagnosis and treatment, at nurse station in the Ward.	2	3		1	34	40
Intra aortic balloon pump (IABP)	To expand a balloon inserted and placed into the descending aorta in diastole (diastolic augmentation) and to shrink the balloon in systole (systolic unloading). It enables to decrease the myocardial oxygen consumption by decreasing afterload of ventricular in systole and to increase coronary blood flow by increasing diastolic pressure in diastole. Used in the operation theater or ICU. It is standard equipment in the hospitals performing cardiac surgery.		3				3
Intraoperative ultrasound scanner for cardiovascular	To confirm whether a blood flow failure occurs or not in the graft after coronary artery bypass surgery with the ultrasound doppler. It is standard equipment in the hospital performing cardiovascular bypass surgery.		1				1
Intraoperative ultrasound scanner for neurosurgery	To diagnose the affected area during surgery. To observe images in the brain, and the position of the respiratory and suction tube during a tumor removal surgery. It is standard equipment for neurosurgical operation theater.				1		1
IV pole	To hang infusion set.	16	26	16	26	58	142
LCD monitor for outpatient department	To view images from PACS in the examination room for outpatient consultation room.					10	10
LCD monitor for OT	To view images from PACS in the operation theater. A large monitor is planned in order to view multiple images from each modality.		3		3		6
LCD monitor for education	To view images in the meeting room for educational and medical conference purpose.					2	2
Medicine cabinet	To store medicine required in the Ward.	2	1			31	34
Medicine trolley	To deliver medicine to patient's bedside in the Ward.	2	1				3
Micro neurosurgical set	A set of steel surgical instruments for tiny parts such as brain or spinal cord.				2		2

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
Micro pipette set	To dispense blood for crossmatch test in blood transfusion unit.					1	1
Mobile X-ray unit	To capture X-ray picture on the bedside for a patient who is difficult to move to X-ray rooms. DR system is planned so that patient data can be stored without carrying multiple IP cassettes.					2	2
MRI	To capture an image of internal information of human body using nuclear magnetic resonance technology. It enables to analyze high-precision 3D image and to confirm affected areas of the soft tissue. The cardiovascular application will be installed as an optional software in order to apply for cardiovascular diagnosis. It intermediate equipment in tertiary level medical facilities.					1	1
Navigation system	To form an image and navigate for the surgery based on CT image data of patients. It is intermediate equipment in the hospital performing neurosurgery.				1		1
Operation theatre light for OT	To provide adequate illumination with no shadow in operative fields for safe and accurate surgery. The operating lamp will have a built-in camera so that medical students can observe the operation live on a large screen as a function of educational hospital.		2		2		4
Operation theatre light for hybrid OT	To provide adequate illumination with no shadow in operative fields for safe and accurate surgery. The length of arm depends on the width and length of traveling rail of the angiography system or the CT scanner and the operation table motion. The operating lamp will have a built-in camera so that medical students can observe the operation live on a large screen as a function of educational hospital.		1		1		2
Ceiling Operating microscope	To magnify the operative field by microscope and to enable microsurgery during craniotomy. It is able to use the space of operation theater effectively by hanging. It is standard equipment in the hospital performing neurosurgery.				1		1
Mobile Operating microscope	To magnify the operative field by microscope and to enable microsurgery during craniotomy. It is standard equipment in the hospital performing neurosurgery.				2		2
Operation table	To lay a patient and manage the position up-and-down or side-to-side depending on the operative method or area during surgery. It is essential equipment in the operation theater. Electronic hydraulic driven type is planned for the operation requiring fine positioning such as microsurgery or organ transplantation.		2		2		4
Oven	To sterilize clinical laboratory instruments.					1	1

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
Overbed table	To put food tray when eating on the bed.	16	26	16	26	232	316
Oxygen concentrator	To supply highly concentrated oxygen to a patient requiring oxygen inhalation.	2	2	2	15		21
Oxygen regulator and humidifier	To display flow rate and to provide humidification connecting to the oxygen central pipe outlets.	16	26	16	26		84
PACS system (including RIS)	To store, browse and manage image data received from the image diagnostic equipment (modality) such as CT and MRI. It enables to compare previous image and latest image of the same patient. It is also possible to register electronic data of patient information with RIS (radiology information system) resulting in faster and easier search of the previous images of patients. MRI, two CT scanners, two digital X-ray machines and two angiography systems procured under the Project will be corresponded to PACS system as a connecting modality.					1	1
Parallel bars with mirror	To train and recover movement function for stroke patients in the rehabilitation room.					2	2
Patient bed electric	To lay a post-operative patient and take an appropriate position using the crank.	16	26	16	26		84
Patient monitor for ICU	To monitor the status of respiratory and circulatory system of patients with serious condition and notify doctors or nurses by alarm. It will connect to the central monitor for remote monitoring.		26		26		52
Patient monitor for ward	To monitor the status of respiratory and circulatory system of patients and notify doctors or nurses by alarm.	16		16		27	59
Patient monitor for OT	To measure heart rate, few of invasive blood pressure, cardiac output and anesthetic gas concentration of a patient during surgery and observe the status of a patient continuously and to take necessary measures in case a patient's condition becomes critical. It is intermediate equipment as intraoperative monitoring device for cardiac surgery and neurosurgery.		2		2	4	4
Pharmaceutical refrigerator	To store medicines requiring refrigerated temperature in the Ward and the pharmacy.					12	12
Platelet incubator with agitator	To thaw platelet in blood transfusion unit.					1	1
Hemodialysis machine	To measure and record the vital sign, the volumes/waves of physiological phenomenon of patients such as breathing, pulse, and blood pressure during catheterization. It is standard equipment for cardiac catheter laboratory.					2	2
Radiology accessories set	To protect doctors and nurses from radiation in the catheter laboratory and hybrid operation theater.		1		1		2
Recovery bed	To lay a patient in the recovery room.		4		4		8

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
RO unit	To purify dialysis water. It is standard equipment as RO device for dialysis. A small type of unit covering two dialysis machines is planned.		1				1
Spirometer	To measure respiratory function such as breathing capacity.					5	5
Stairs	To train and recover movement function for a stroke patient or post-operative patient in the rehabilitation room.					1	1
Sterilization cabinet	To store a sterile drum with sterilized items inside.					3	3
Sterilization cart	To carry medical instruments after sterilization.					1	1
Stretcher	To transport a patient.	1	1	1	3	5	11
Suction bottle for central piping	Connected to the central vacuum piping and used to receive the aspirate.	16	26	16	26		84
Surgical C-arm X-ray unit	To perform fluoroscopy for confirming place of spine and implanted device during operation.		1		1		2
Surgical instrument set for open heart surgery	Used during open-heart surgery in cardiac surgery. It is standard equipment for cardiac surgery in tertiary level medical facilities.		2				2
Syringe pump	To control an accurate drip.	40	56	40	56	40	232
Temporary pacemaker	To deliver electrical stimulation to myocardial and cause the necessary systole resulting in recovering heartbeat. It is standard equipment in the hospitals with cardiology.					1	1
Thawing water bath	To thaw blood products.					1	1
Tilt table	To move a patient from a flat state up to 90 degrees during tilt table test.					1	1
Treadmill	Used for rehabilitation for patients after cardiac surgery and stroke patients in order to recover movement function.					2	2
Ultrasonic aspirator with accessories	Used for the disruption, emulsification and suction of tissues during surgery.		1		1		2
Ultrasound scanner with TEE probe	Transesophageal probe and sector probe is planned as a composition of the unit. The transesophageal probe observes heart by inserting a gastro camera emitting ultrasound from the mouth to the stomach, through esophagus. The sector probe observes heart movement.		1				1
Ultrasound scanner for outpatient department	Ultrasound scanner with sector probe for adult is planned to diagnose cardiac patients in the outpatient department. It enables to examine the cardiac blood flow of patient with arrhythmia or follow-up patients after surgery.					2	2
Ultrasound scanner for emergency unit	For rapid diagnosis of patients in the Emergency Unit. Linear, convex and sector probes is planned in order to examine many parts of body such as heart, abdomen, and chest.					1	1

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
Ultrasound scanner for neuro medicine	To measure and evaluate the degree of stenosis by observing brain blood vessels and carotid blood flow using ultrasound. Mainly used for stroke patients.					1	1
Ventilator	To support patients with spontaneous respiration and to control the breathing of a patient necessary for forced respiration.	4	13	4	10		31
Weighing scale bed for stretcher/wheel chair	To weigh a patient on the stretcher or wheel chair.					1	1
Weight measurable bed	To weigh a patient of pre/post hemodialysis treatment. It is standard equipment in the hospitals performing hemodialysis treatment.		1		1		2
Wheel chair	To transport a patient who is serious condition.	1	1	1	3	14	20
Oxygen analyzer	To measure blood oxygen saturation level and total hemoglobin value of a patient during cardiovascular catheterization.					2	2
Amputation set	To incise chest in cardiac surgery.		2				2
Electrical stimulation	To evaluate nerve or muscle function by stimulating nerve electrically to a patient of neurosurgery and neuro medicine.					2	2
Functional electrical stimulation	To provoke artificially physical exertion to a patient with paralysis by central nervous system damage resulting in trigger muscle contraction of paralyzed limb using low-energy electrical pulse, Functional electrical stimulation (FES), which lead to grasp, walking, bladder action, and upright position.					3	3
Transcutaneous electrical nerve stimulation	For pain relief by putting surface electrode on the peripheral nerve of the neurosurgical and neurology patients using low-frequency wave. Namely TENS.					3	3
Pneumatic compression device	To improve blood flow of the legs for a patient with chronic venous insufficiency under pressure on the legs.					2	2
Ultrasound therapy machine	To irradiate affected area with strong ultrasound for treatment.					3	3
Laser therapy machine	To irradiate affected area with a laser for treatment.					3	3
Interferential therapy machine	To irradiate affected area with interferential low-frequency wave for treatment.					3	3
Paraffin wax bath	To recover fractured segments rapidly or functional disorder by soaking affected area in the paraffin wax bath.					2	2
Movement therapy machine	To perform exercise therapy for improvement of balance sense, muscle and liveness, muscle tension and coordination, elasticity of joint, cardiovascular regulation, movement function, circulatory stimulation, rheumatic disease, neurogenic disease, spinal disease, stress disease					1	1

Description	Function/Component of the equipment	Cardiology	Cardiac surgery	Neuro medicine	Neurosurgery	Other	Q'ty
	and respiratory disease.						
Equipment for occupational therapy	A set of occupational therapy such as peg board to recover movement function of hands and legs necessary for daily life.					1	1
Medicine ball(Various size)	To improve muscle strength using various size of medicine balls.					3	3

2.2.3 Outline Design Drawing

This section presents the following outline design drawings.

Site plan

Ground floor plan

First floor plan

Second floor plan

Third floor plan

Fourth floor – Sixth floor plan

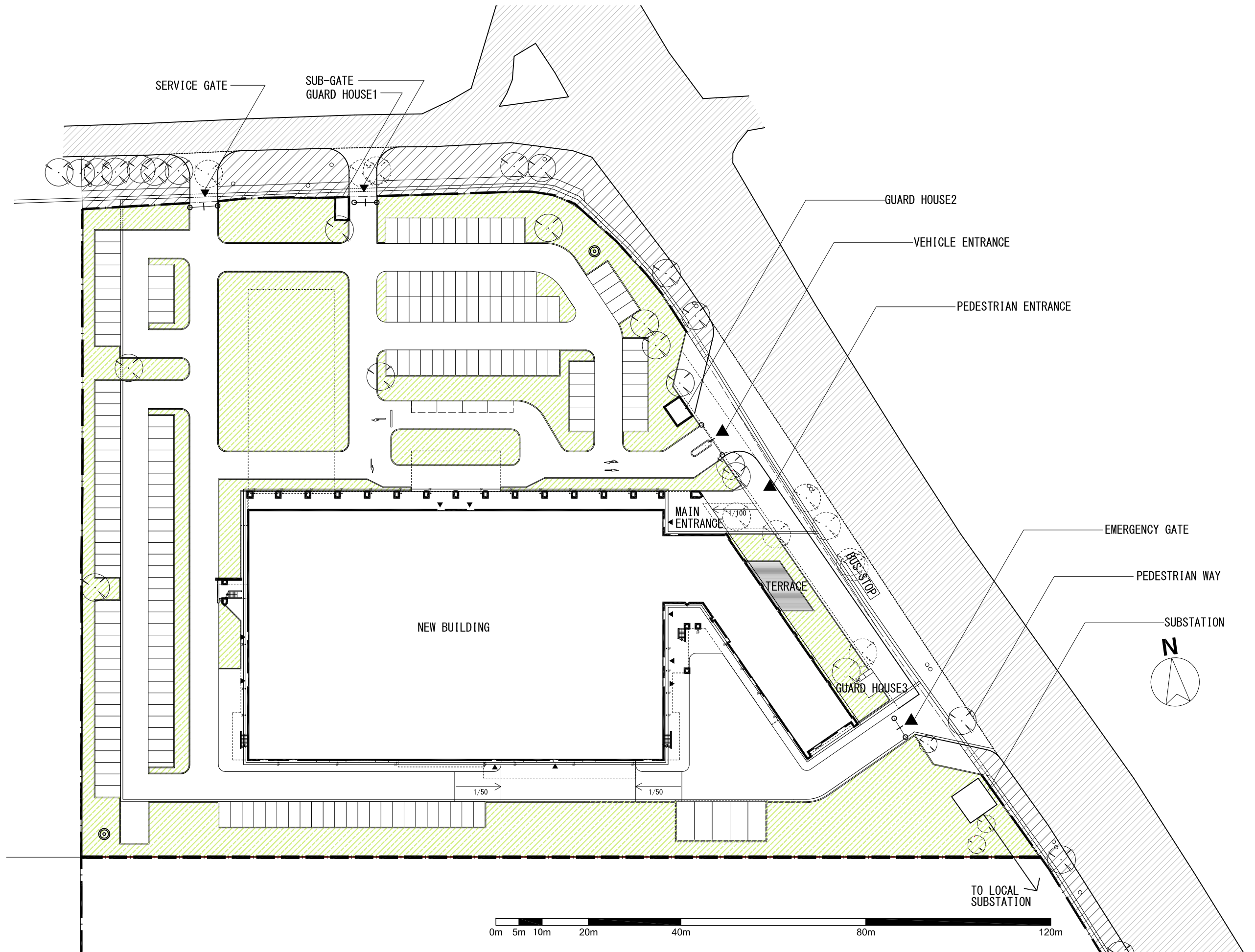
Roof floor plan

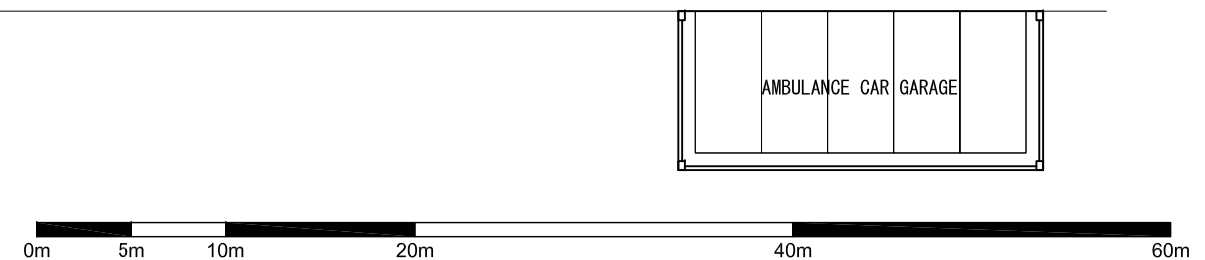
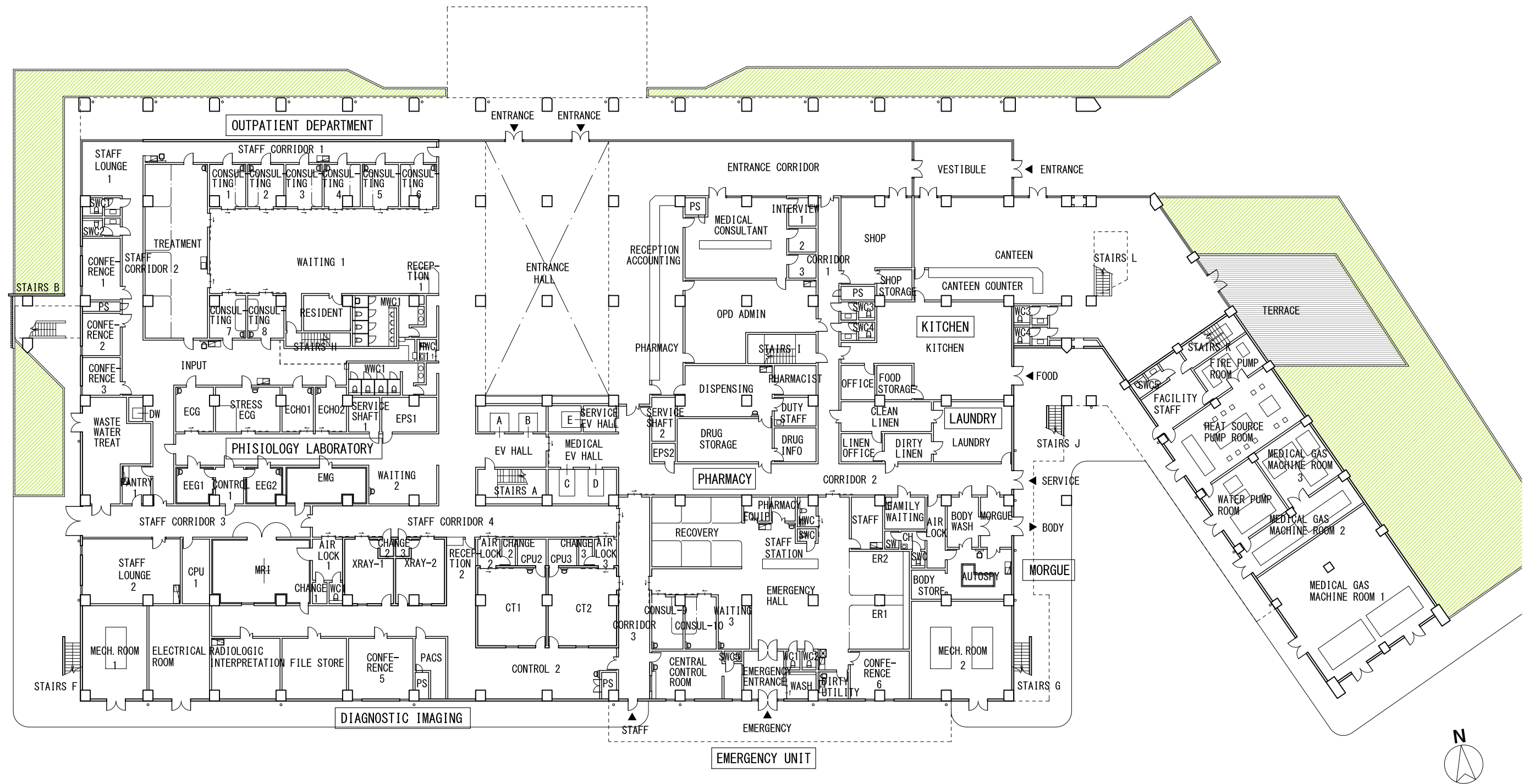
North elevation

South, East and West elevation

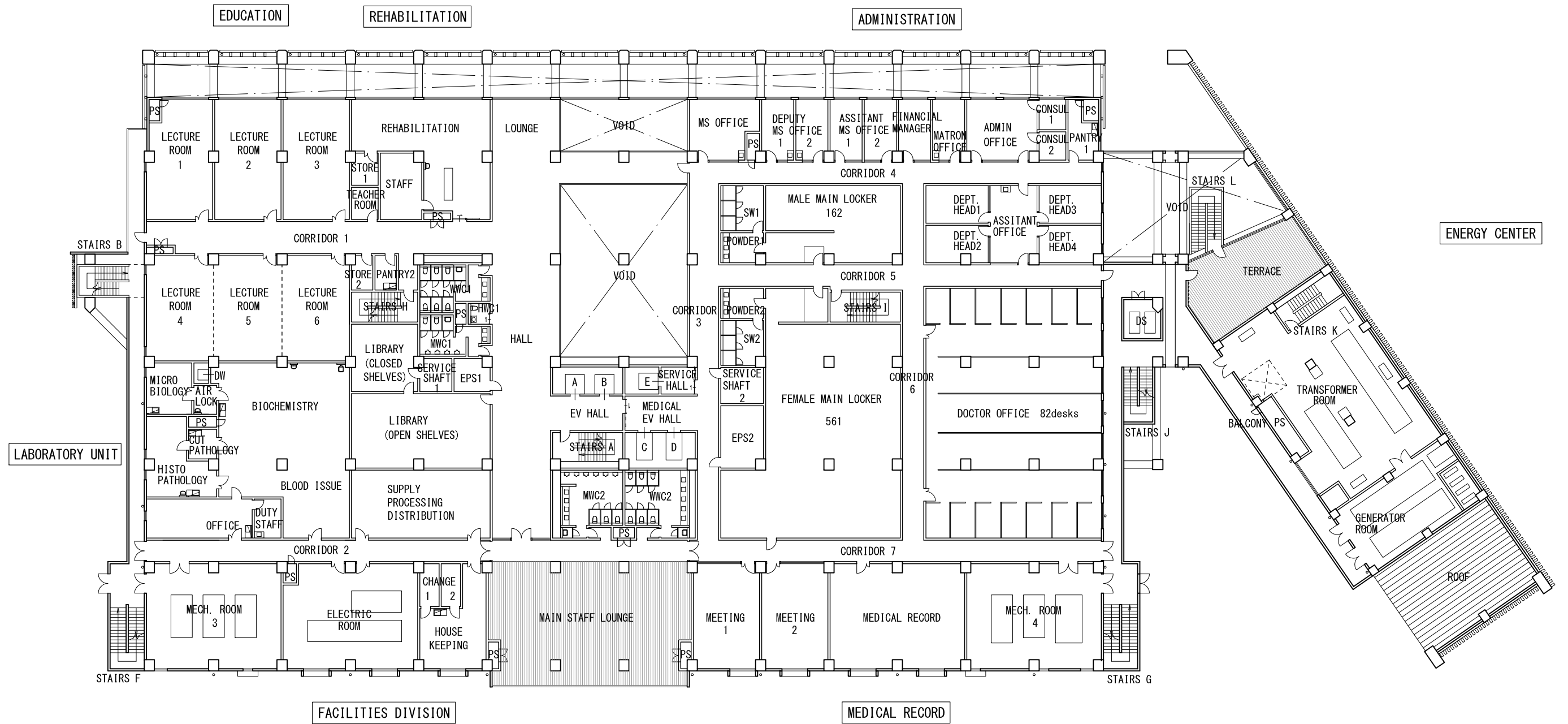
Section

Elevation and section of Energy center

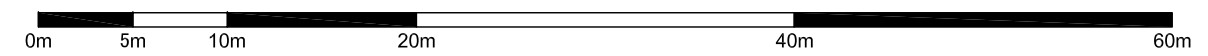
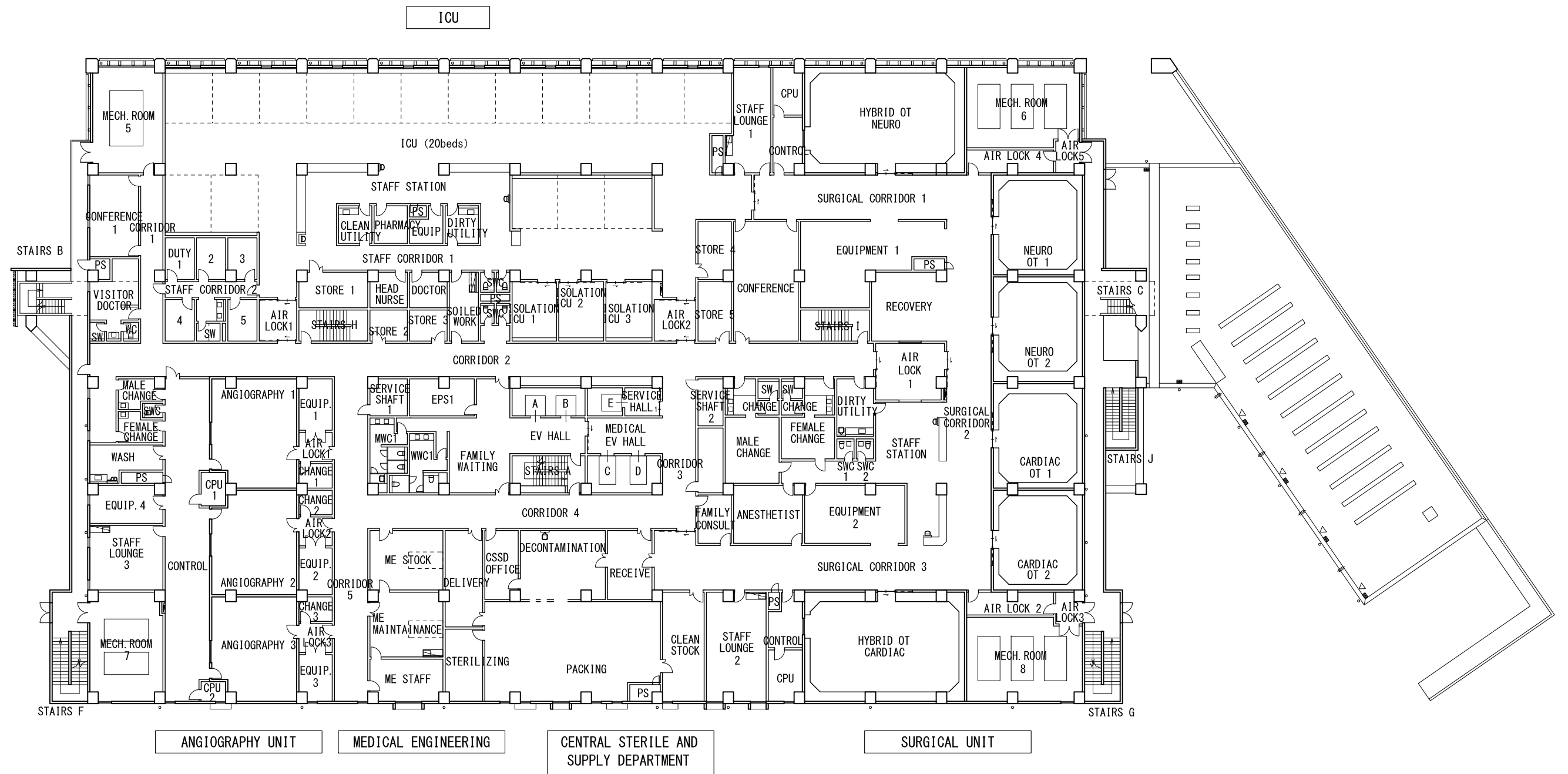




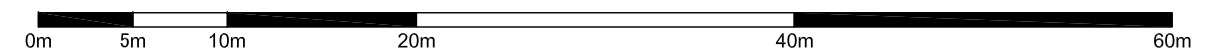
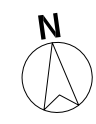
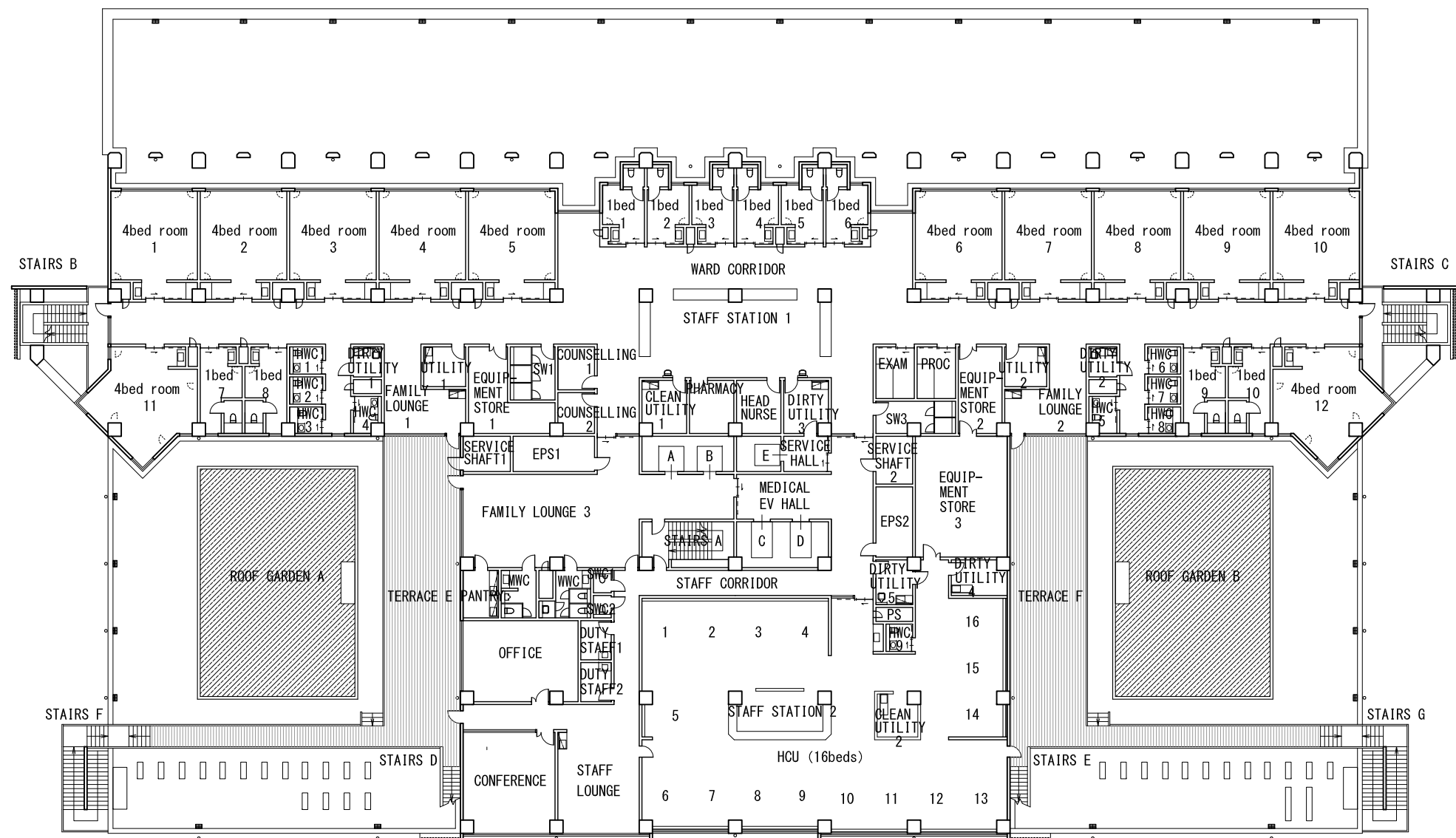
- ※ REMARK
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 - HWC : DISABLED TOILET
 - MWC : MALE TOILET
 - WWC : FEMALE TOILET
 - SWC : STAFF TOILET



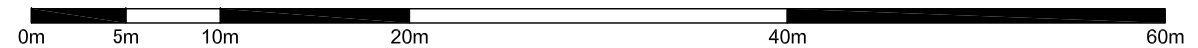
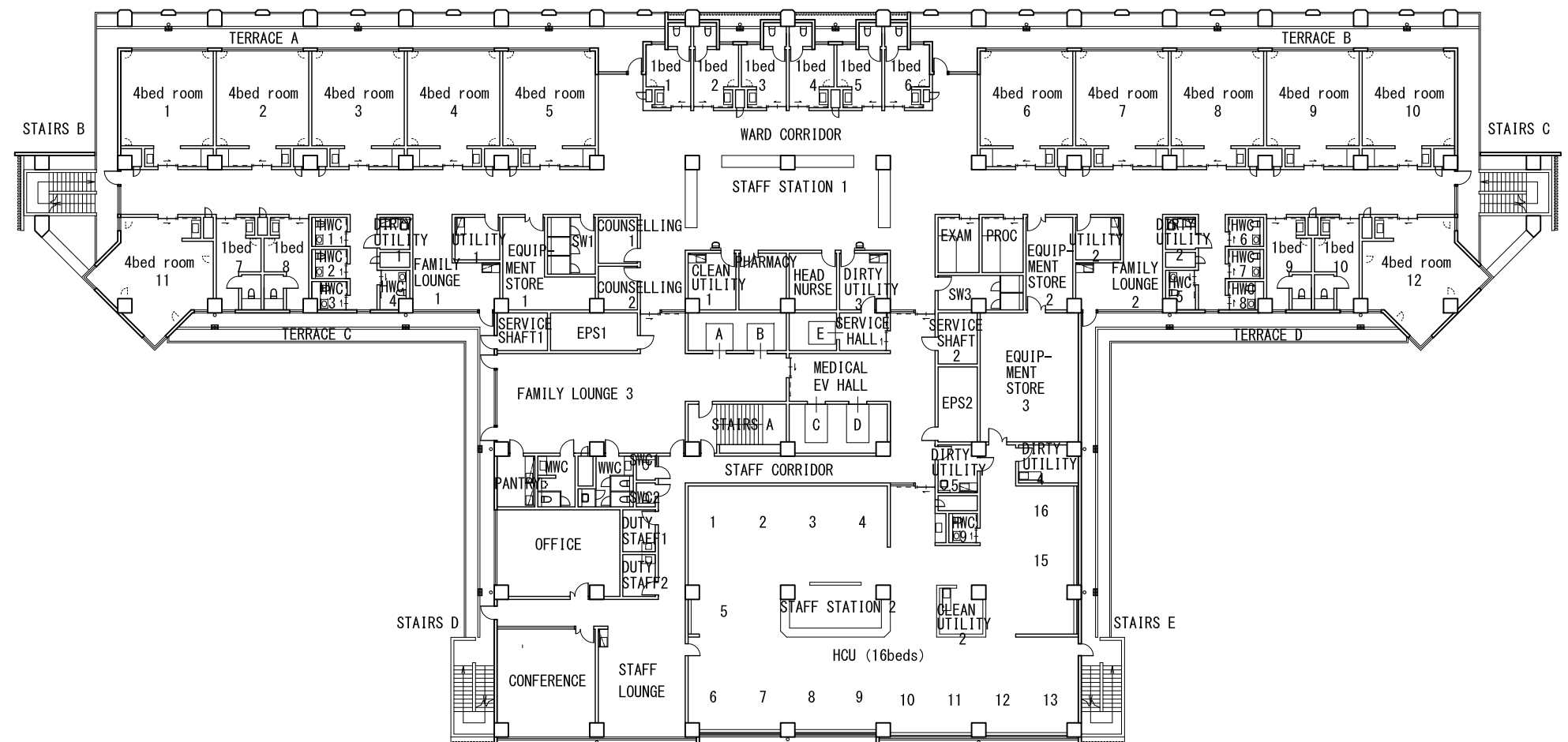
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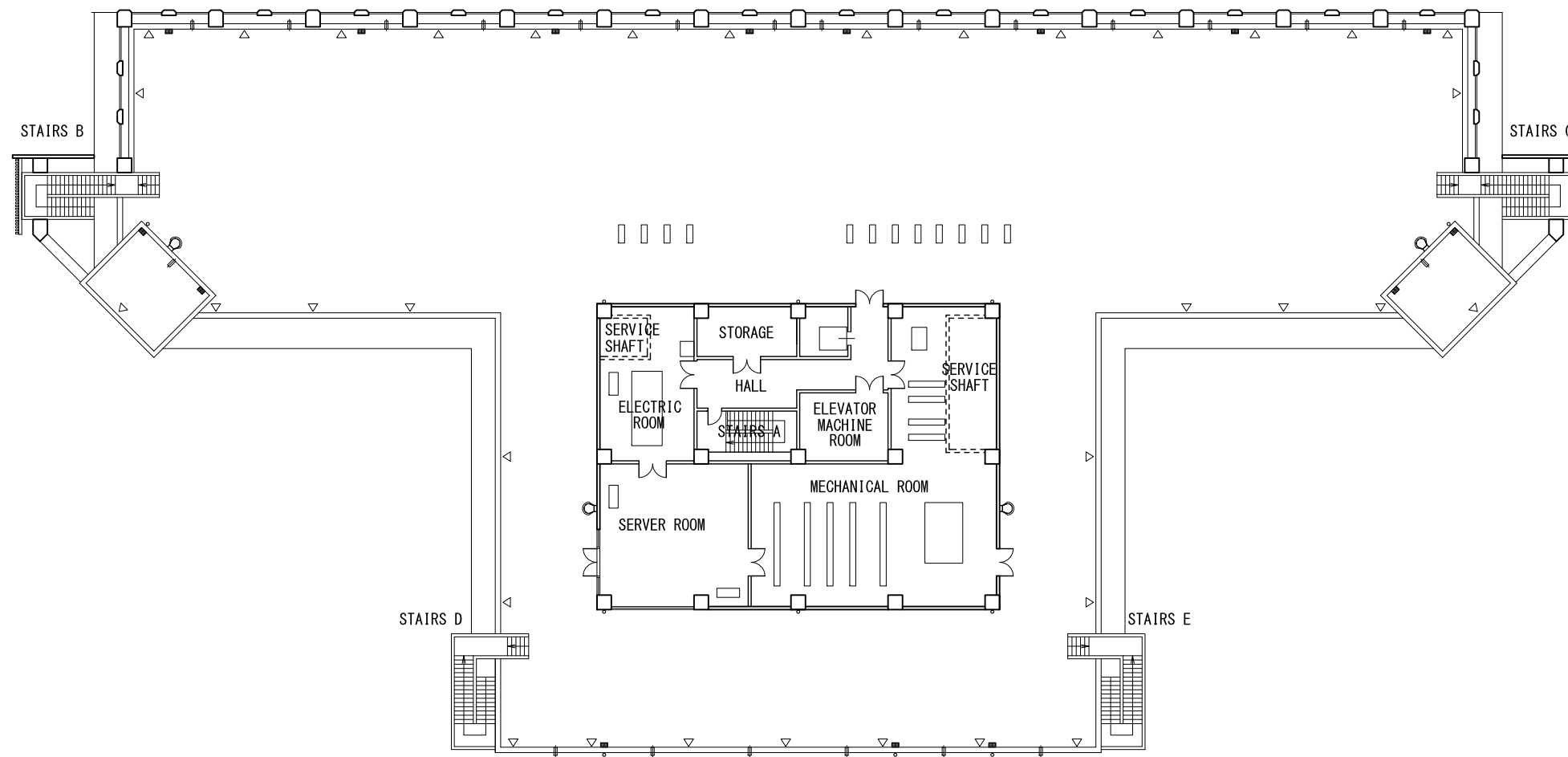
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






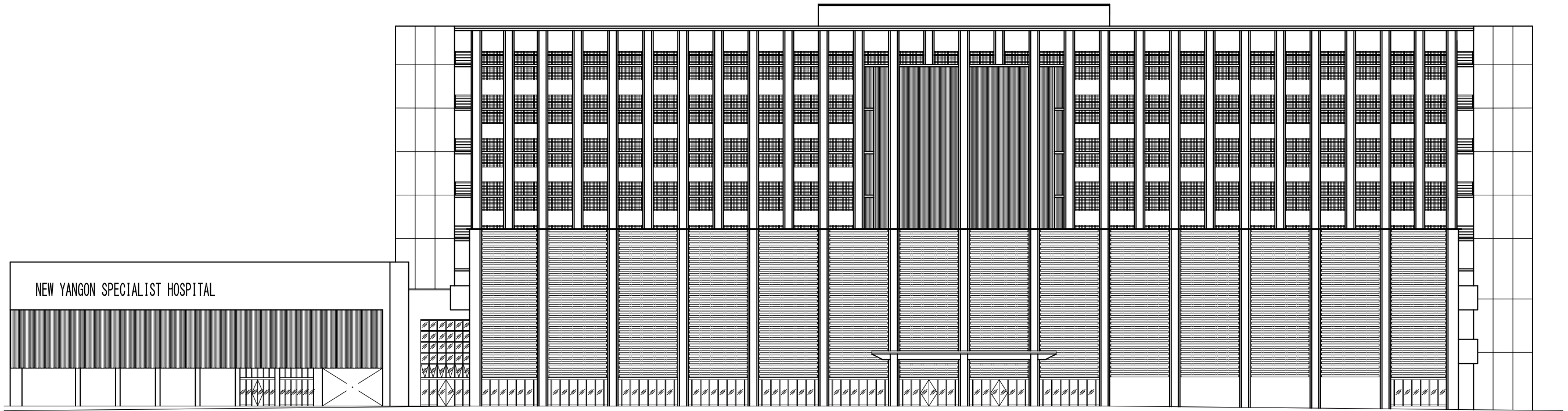
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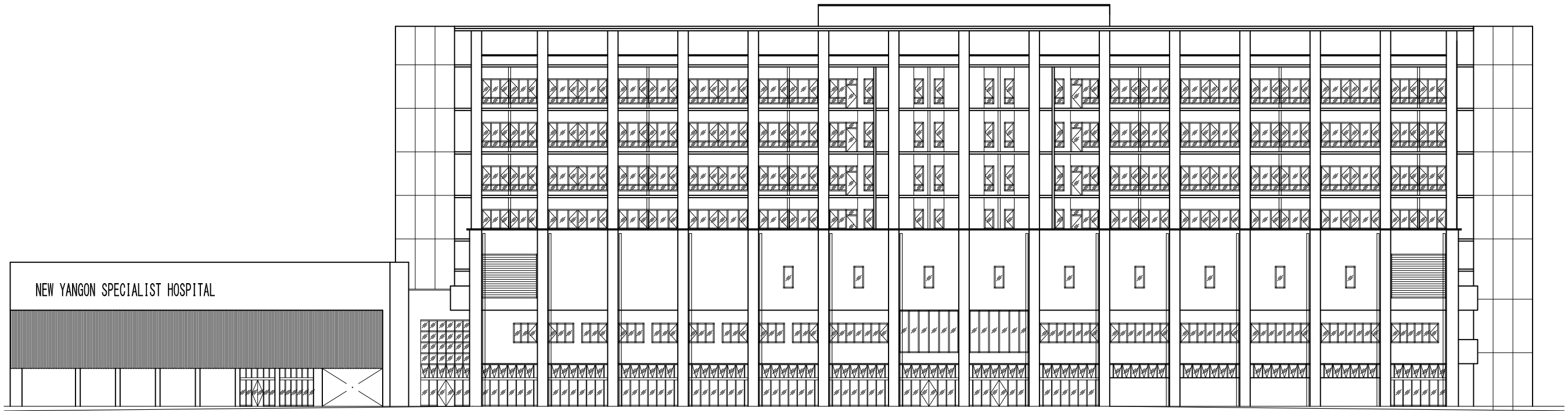
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 - SWC : STAFF TOILET



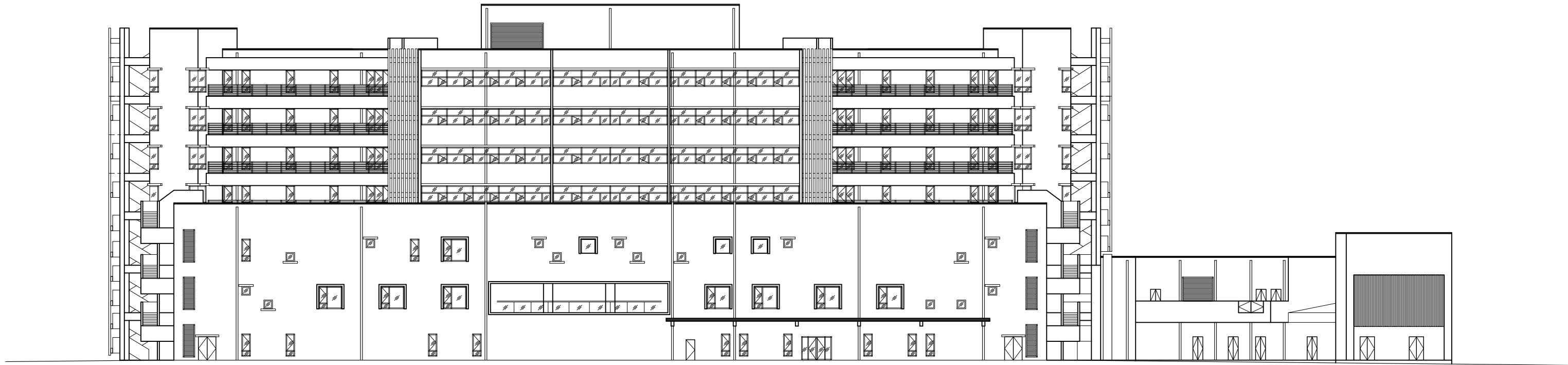
REMARK		
⌵	WEEP HOLE	* DETAILS  SEE.
△	DAVIT (HORIZONTAL JOINT)	* DETAILS  SEE.
■ RD	ROOF DRAIN φ150	* DETAILS  SEE.
○ DP	DRAIN PIPE φ200	
	LADDER	* DETAILS  SEE.



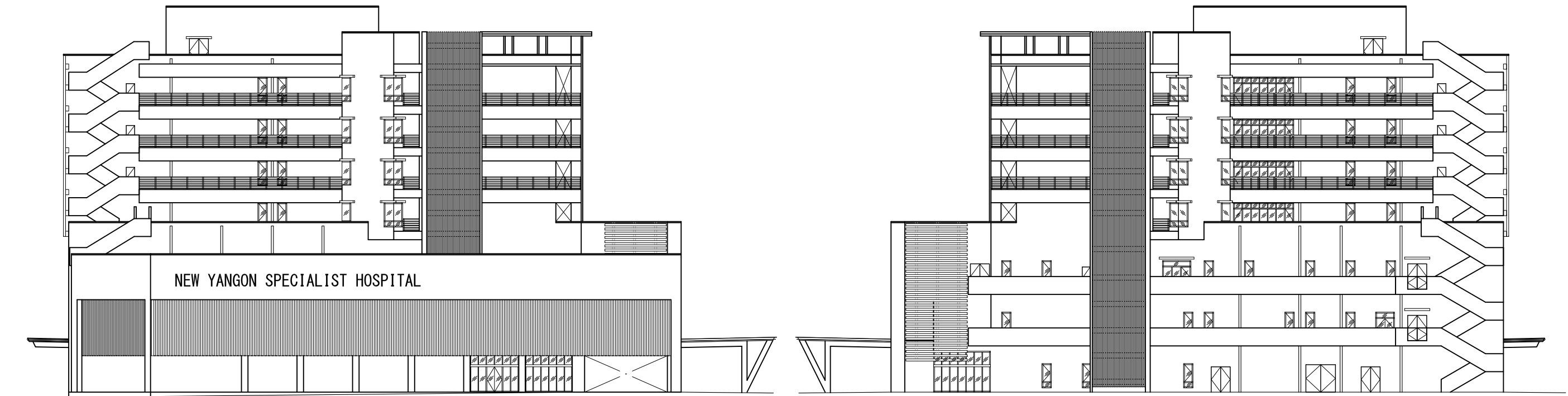
NORTH ELEVATION 1



NORTH ELEVATION 2

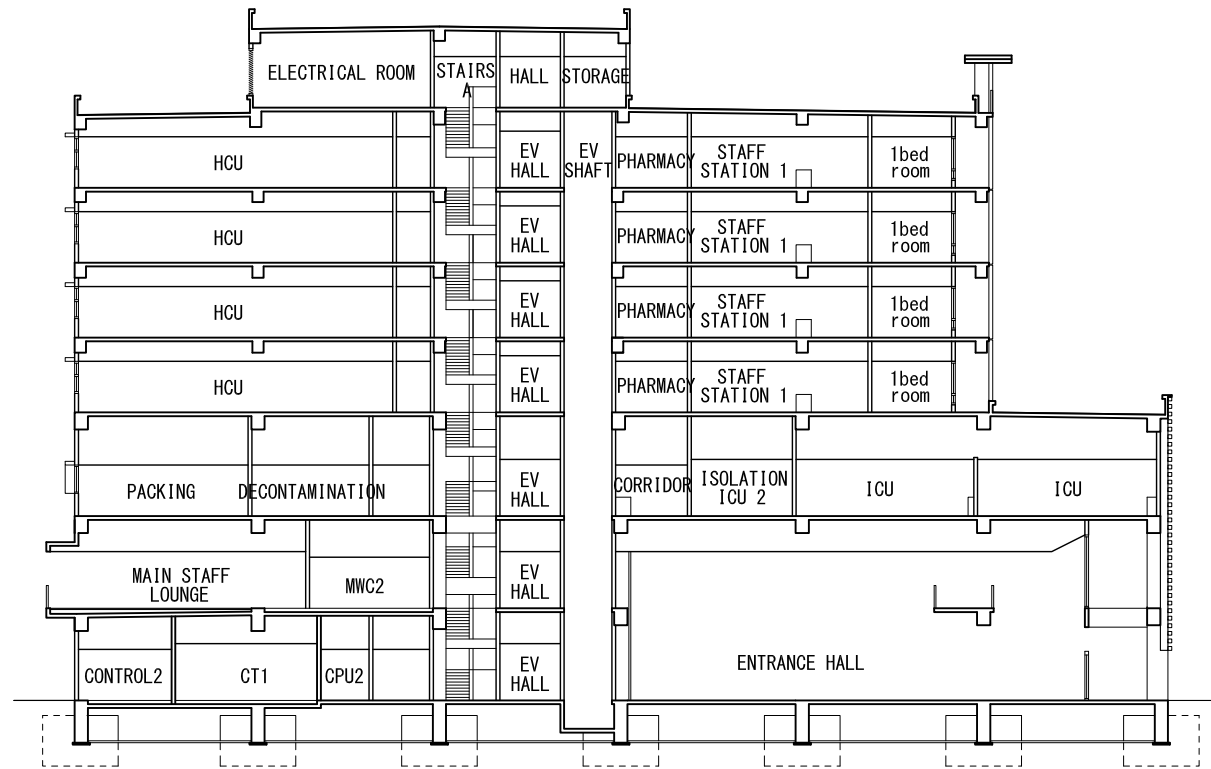


SOUTH ELEVATION

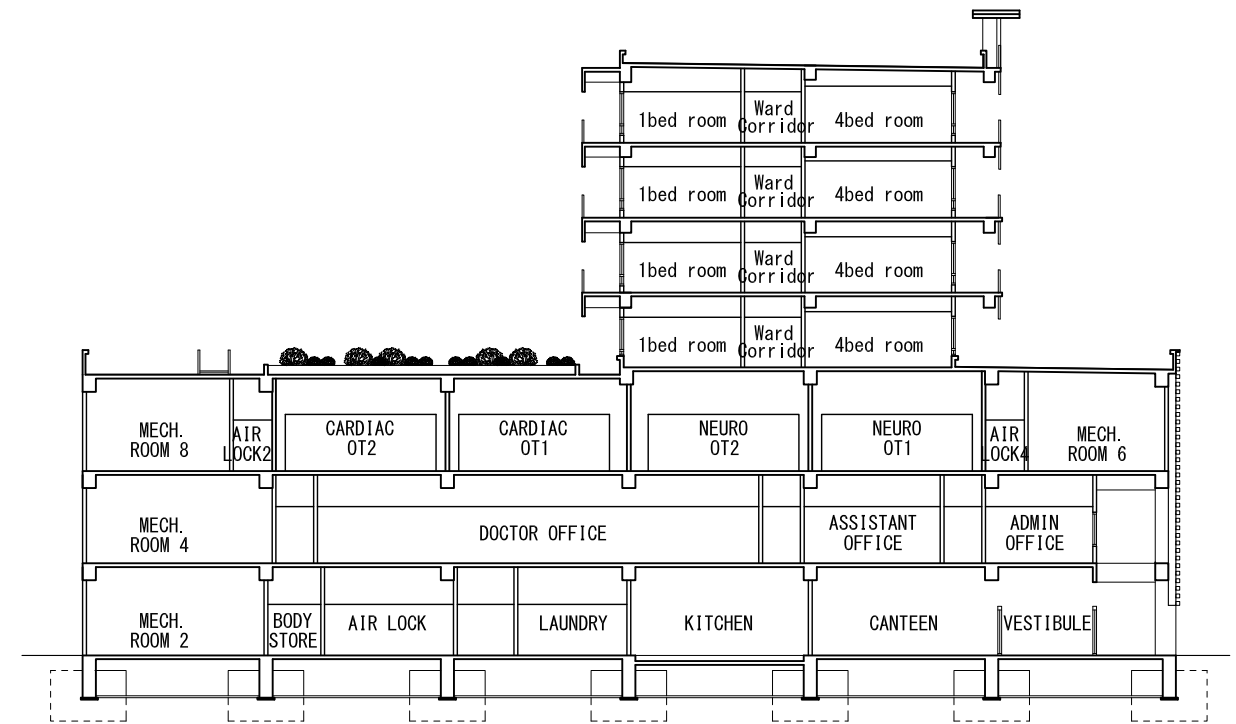


EAST ELEVATION

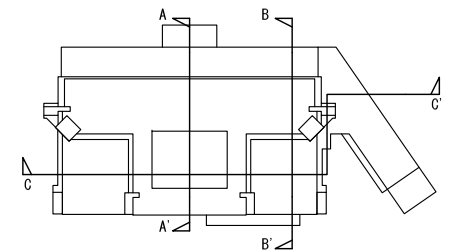
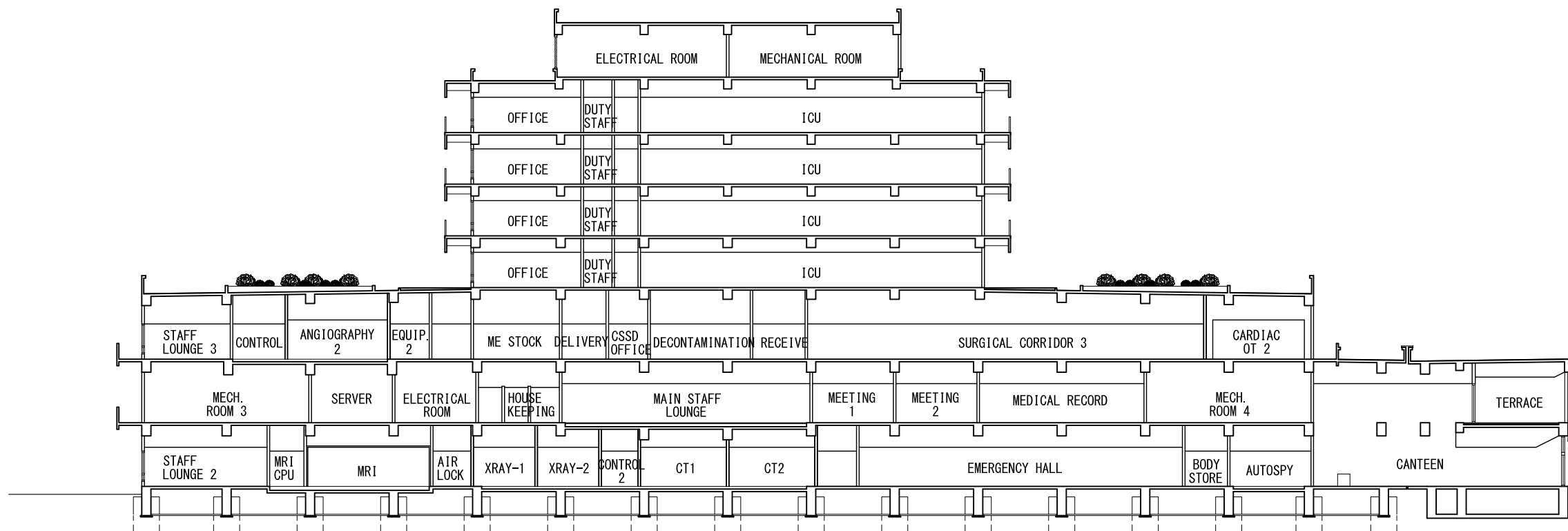
WEST ELEVATION



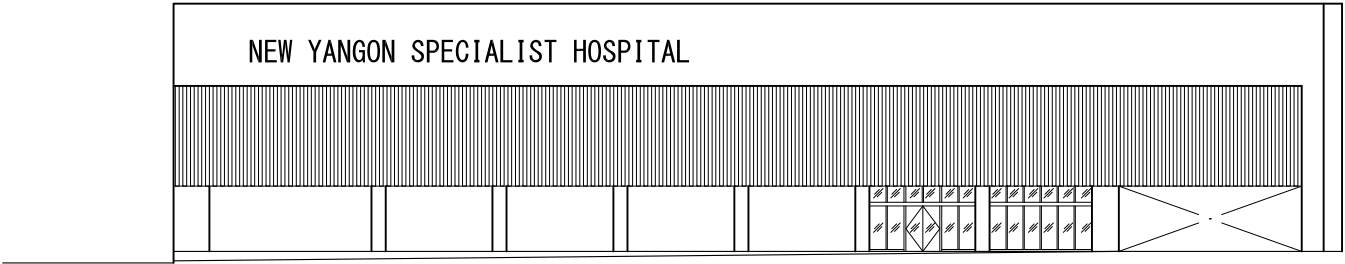
A-A' SECTION



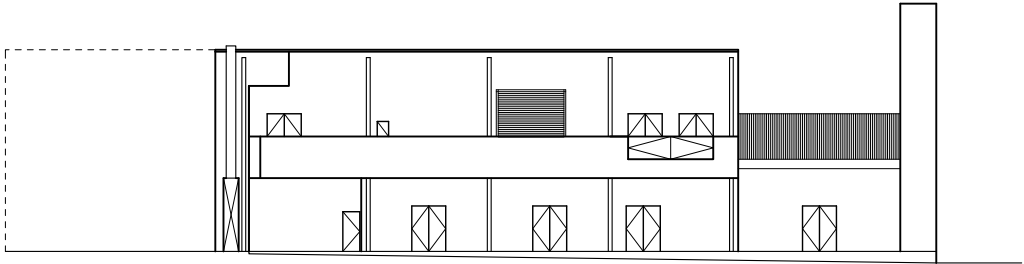
B-B' SECTION



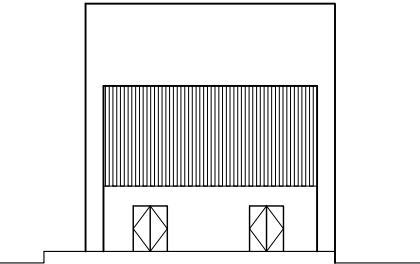
C-C' SECTION



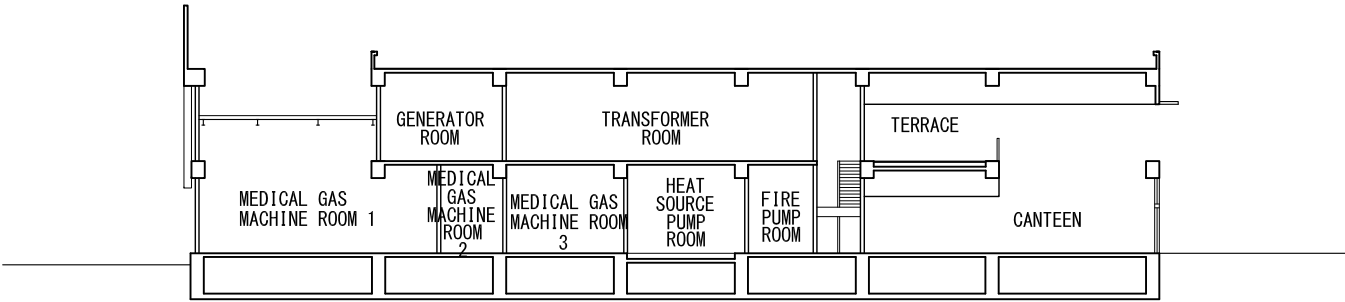
EAST ELEVATION



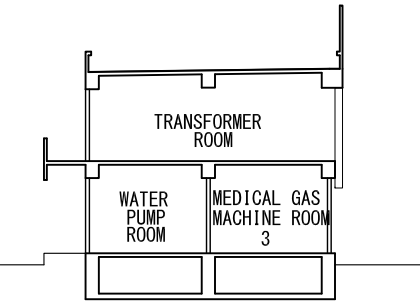
WEST ELEVATION



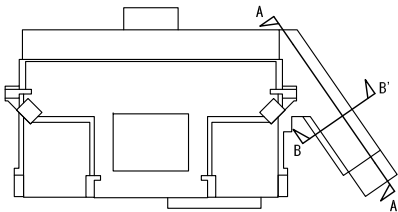
SOUTH ELEVATION



A-A' SECTION



B-B' SECTION



2.2.4 Implementation Plan

2.2.4.1 Implementation Policy

The Project will be implemented in accordance with Japanese Grant Aid Scheme. After the Project is approved by Japanese Cabinet, the Government of Japan and Myanmar will sign an Exchange of Notes (E/N), which will be followed by the conclusion of a Grant Agreement (G/A) between JICA and the Government of Myanmar. Subsequently, the Government of Myanmar will enter into the consulting services agreement with a Japanese consulting firm, which will conduct a detailed design for the facilities and equipment. After preparation of detailed design drawings and bidding documents, Japanese contractors awarded through bids will construct facilities, and procure and install equipment for the Project.

The verification of JICA shall be required to validate those agreement and contracts to implement Japanese Grant.

Upon the commencement of the construction work, the supervising committee will be formed consisting of the Myanmar side implementing agency, the Japanese consultant, and contractors.

(1) Project Implementation Organization

The Project line agency and the executing agency for the Government of Myanmar is the Department of Medical Services (hereinafter “DoMS”) under MoHS, which will be the authorized signatory contracts. The staff of DoMS in charge of the Project will play the role of coordinator during the implementation of the Project.

(2) Consultant

After the E/N and G/A are signed, DoMS, MoHS will conclude a consulting services agreement for the Project with a Japanese consulting firm and obtain verification from JICA in accordance with the Grant Aid Guidelines. The Consultant will develop detailed design and prepare bidding documents based on the preparatory survey report. The final bidding documents will be submitted to DoMS for review and approval.

For the construction work, the Consultant will assist the executing agency with the management of the bidding process and supervision of the construction works based on the bidding documents including detailed design drawings. For the equipment procurement and installation, the Consultant will also assist with management of bidding processes and supervision of delivery, installation, commissioning, and initial equipment operation training. For the equipment and furniture for the Project procured by Myanmar side, Central Medical Store Depot (CMSD) under MoHS shall conduct preparation of specification, bidding procedure, and installation supervision. However, it is essential to coordinate Myanmar side equipment and detail design of building, and to coordinate awarded Myanmar side equipment and construction work

by the Japanese contractor. Therefore, the Consultant supports such service conducted by CMSD.

The detailed tasks and responsibilities of the Consultant for the construction and equipment work under the Japanese Grant are as follows:

1) Detailed Design

Based on the preparatory survey report, the Consultant will develop detailed design, review the equipment plan, and prepare bidding documents consisting of drawings, technical specifications, instructions to bidders, conditions of contracts for construction and equipment works. The Consultant will also estimate the costs of the construction and equipment works.

2) Assistance in Bidding

The Consultant will assist the executing agency in bidding processes to select contractors. The Consultant will also report the results of the bidding processes to JICA.

3) Construction and Equipment Procurement Supervision

The Consultant will confirm the proper implementation of works by the contractor and the equipment suppliers in accordance with the contracts documents. In order to facilitate the smooth implementation of the Project, the Consultant will dispatch a Japanese resident supervisor to give advice and instructions to the Contractors as well as coordinating all parties concerned from an impartial stance. The major tasks of the Consultant are described below;

- Examine and confirm the construction plans, shop drawings, equipment specifications, and other relevant documents submitted by the contractors of the construction and equipment works,
- Examine and confirm the quality and performance of the construction materials, furniture, and conduct pre-shipment inspection of the imported equipment,
- Confirm the condition of delivery, installations and initial operation training for building machineries and equipment,
- Monitor and report the progress of the construction and equipment works, and
- Attend the commissioning of the completed facilities and equipment.

The Consultant will also report the progress of the works, the process of payment, the commissioning of completed facilities and equipment, and other relevant matters to the concerned authorities in Japan, such as JICA.

(3) Contractors

The selection of the building contractors and equipment suppliers will be through open bidding processes in which only qualified Japanese corporations are eligible to

participate. In principle, DoMS will award contracts to the lowest bidders of construction and equipment works. In accordance with the contracts, the Contractors will implement construction of facilities, and procurement, delivery, and installation of equipment as well as initial operation training for the each equipment to the Myanmar side. Additionally, the Equipment Suppliers are expected to provide logistic support and to coordinate the manufacturers and local agencies so that NYSH can continue to procure spare parts and consumable supplies as well as receive professional equipment training even after the handover of the equipment.

(4) Japan International Cooperation Agency (JICA)

Under the Grant Aid Scheme, Japan International Cooperation Agency (JICA) will conduct necessary administration for monitoring and promoting the Project implementation as the Project implementing agency of the Government of Japan.

(5) Local Consultants and Contractors

Considering various tasks for a Japanese resident supervisor, it is advisable to employ local consultants as assistants for construction supervision.

Reliable local contractors with considerable resource and engineering competence can be considered as subcontractors of the Japanese contractor.

(6) Organization for Project Implementation

Figure 2-9 shows the relationship of the concerned parties during the implementation of the Project under the Japanese Grant including the construction stage.

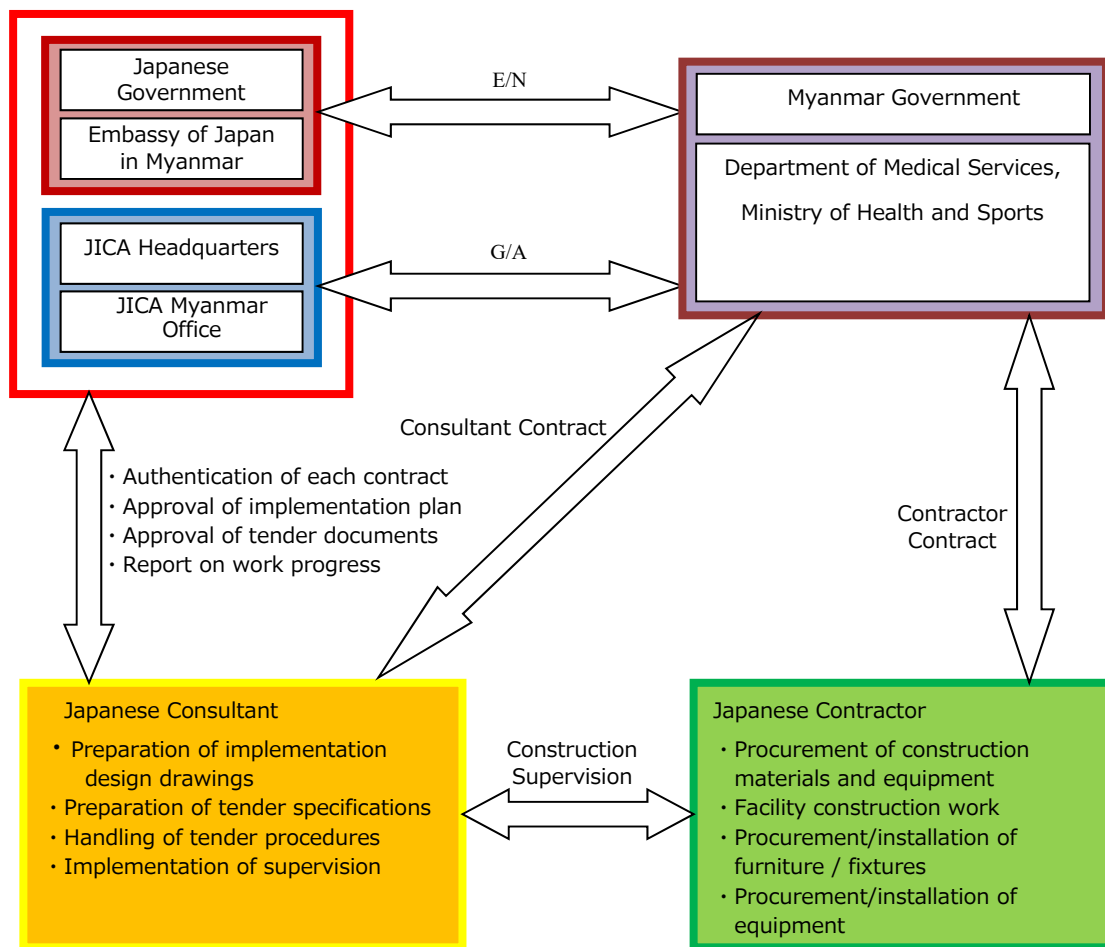


Figure 2-9: Project Implementation Organization Diagram

2.2.4.2 Implementation Conditions

(1) Points to be considered for Construction Works

1) Schedule Management

One of the most important points in terms of the schedule management will be works during the rainy season from May to October. The construction plan should be prepared in consideration of the need to avoid flooding over temporary works area including service road, foundation and external works, etc.

2) Safety Management

The project site should be temporarily fenced with few gates for safety of the neighborhood and circulation control of construction equipment, materials and workers.

3) Security Measures of Materials

To prevent materials from theft, there will be a 24-hour security at the project site.

(2) Points to be considered for Equipment Works

Most of the local agents of medical equipment are based in Yangon and establish the maintenance system to respond to a problem in case malfunction of medical equipment occurs. Each local agent has engineers trained by manufacturer's headquarter or neighboring countries such as Singapore or Thailand so that most malfunctions can be repaired by themselves.

The medical equipment procured under the Project is conditioned to have its local agent in Yangon so as to enjoy above-mentioned maintenance system. Therefore, continuous maintenance and technical support will be viable so that equipment will keep good condition for long-lasting use.

1) Implementation management

Under the Project, the Myanmar side need to procure most of equipment. Therefore, it is important to adjust procurement schedule with Myanmar side so that the items from Myanmar side can be delivered in accordance with the delivery of items procured from Japan, which leads to smooth opening of new hospital. In addition, it is important to arrange the schedule with Myanmar side for installation, initial operation training and operation training. It is important to coordinate the scope of work of the equipment suppliers and the building contractor to avoid troubles in installation of major equipment, such as CT scanner and angiography system in imaging diagnostic department, and high pressure steam sterilizer in operation unit. In addition, it is important to manage safety by sharing installation schedule with hospital side.

2) Implementation of operation training

Training of proper use and maintenance of equipment is very important for clinical services for sustainable and efficient utilization of the provided equipment after completion of the Project.

Thus, the conditions of tender documents should stipulate the assignment of experienced and knowledgeable installation engineers. For proper use of major diagnostic imaging equipment, such as CT scanner and angiography system, special training on the medical application software of the equipment should be included as part of the operation training by the equipment suppliers under the contracts.

2.2.4.3 Scope of Works

The Project implementation will be by cooperation between the Governments of Japan and Myanmar. The demarcation of responsibilities between the Governments of Japan and Myanmar in the implementation of the Grant Aid Scheme of the Government of Japan is as follows:

(1) Undertakings by the Government of Japan

The Government of Japan will provide the following Project undertakings on consulting services, construction of facilities, procurement and installation of equipment.

1) Consulting Services

- Preparation of detailed design documents of facilities and equipment as well as bidding documents
- Administrative support for bidding procedure to select Contractors
- Supervision of construction works and delivery, installation, commissioning, and initial operation training of equipment
- Support regarding procurement management of medical equipment procured by Myanmar

2) Facility Construction and Procurement and Installation of Equipment

- Demolition of existing structures at the project site
- Construction of the facilities under the Project
- Procurement of construction materials and equipment for the facilities under the Project and transportation and delivery to the project site
- Installation, commissioning, and adjustment of the equipment procured in the Project
- Initial training on the operation of equipment procured in the Project

(2) Undertakings by the Government of Myanmar

Table 2-30. Undertakings by the Government of Myanmar

Items related to the equipment procurement
Procure and install general furniture other than those provided by the Government of Japan
Personal computers/ Office appliances
White coats / Towels / Bed sheets
Mannequins / Models
Medicine / Medical consumables
Relocate existing equipment to the new building
Items related to the construction works
Secure the lot of land necessary for the Project
Level the ground of the Project site including demolition of existing structures and removal of trees
Embankment of the Project site and installation of an ambulance garage and guard houses
Planting and gardening works around the new building
Install high voltage lines, telephone lines and Internet lines for the new building
Obtain building permit and environmental license
Items related to operation and maintenance
Procure consumables and spare parts required to maintain the facilities and equipment
Utilize and maintain the facilities and equipment properly and effectively
Items related to administration procedures
Bear commissions for the Banking Arrangement (B/A), payment to a consultant and contractors, Authorization to Pay (A/P) and amended A/P

Obtain permissions, licenses and other authorizations necessary for the Project
 Ensure prompt unloading, customs clearance and tax exemption of the construction material and equipment imported for the Project
 A permission and approval for supporting procurement management of medical equipment procured by Myanmar side under the Project
 Exempt the Japanese nationals and corporate entities and parties concerned from third countries engaged in the Project from customs duties, taxes, and any other levies and charges in Myanmar
 Make necessary arrangement for the above-mentioned Japanese nationals and parties concerned from third countries to enter into and stay in Myanmar to engage in the Project
 Bear all expenses, other than those covered by Japanese Grant budget, necessary for the completion of the Project

2.2.4.4 Consultant Supervision

(1) Consultant Supervision

Based on the result of the preparatory survey, the Consultant will form the Project team to be involved in the whole process of the Project from the detail design stage to the supervision stage in order to ensure the smooth implementation, in accordance with the guidelines of the Japanese Grant.

1) Consultant Supervision Policy

The policies for the supervision of the construction and equipment works in the Project are as follows:

- Keep close contact with the responsible persons of the relevant agencies of Myanmar and Japan to ensure that the construction of facilities and the installation of equipment is completed immediately.
- Give prompt and appropriate advice and instructions to the Contractors of construction and equipment works from an impartial stance.
- Provide proper advice and instructions on the operation and maintenance of the facilities and equipment after handover.

2) Consultant Supervision Plan

In addition to the resident supervisor and local engineers stationed at the project site, throughout the construction period including defects notification period, engineers listed below will be dispatched to Myanmar according to the progress of the construction.

Project manager/Vice project manager	Overall coordination and supervision of process and quality control
Architect	Explanation of design intent and confirmation of materials
Structural engineer	Confirmation of bearing capacity of piling and structural materials

Mechanical engineer	Explanation of design intent and interim and final inspection of plumbing and air-conditioning works
Electrical engineer	Explanation of design intent and interim and final inspection of electrical works
Engineer for final inspection	Inspection before the expiry of defect notification period, i.e., one year after completion of the construction works

The following engineers will be dispatched at the stages of installation and operation training of equipment under Japanese Grant and at the stages of procurement of equipment by Myanmar side:

Procurement supervisor	Supervision of installation, Coordination with building contractor, Supervision of quantity check, Supervision of initial operation training
Inspector for final inspection	Inspection before the expiration of defect notification period (one year after completion of the equipment works)
Soft Component supervisor	Guidance of maintenance
Supervisor for supporting procurement of Myanmar side	Support of preparing bidding documents, evaluation of bid, interval inspection, supervision of installation and check of medical equipment procured by Myanmar side

3) Procurement Supervision

Major supervision services for the equipment works are as follows:

A) Coordination with the Suppliers and confirmation of equipment production drawings (service in Japan)

Coordination meetings will be held in Japan to confirm:

- Documents required in tender documents (drawings for manufacturing, layout drawings, utility list, etc.),
- Equipment procurement processes (including ordering, inspection, shipping, transportation, and installation), and
- Equipment suppliers' teams (including human resources, reporting procedure, etc.).

B) Pre-shipment Inspections (service in Japan)

A part of equipment can be fully set up at the manufacturer's plant, packaged for export and transferred to an appointed warehouse. Therefore, pre-shipment inspection will be conducted at the manufacturer's plant before shipment.

C) Pre-shipment Inspections (service in Japan or third countries)

The Consultant shall select third-party inspection agencies for pre-shipment inspection; prepare necessary documents, such as specifications for inspection and confirm inspection certificates. The Consultant shall submit inspection reports to MoHS.

D) Procurement supervision (on the Project site)

The Consultant shall supervise the inventory and inspection of the equipment, installation, adjustment, test run/commissioning and initial operation training conducted by the Suppliers.

The Consultant to verify the equipment's manufacturer, their model number and their specification in accordance with the contract. The consultant will confirm the initial operation training attendee lists with name, department, and position of attendees and the completion certificates with instructors' signature. Upon the completion, the Consultant will report the completion of handover of the equipment to MoHS taking necessary procedures. A resident supervisor dispatched for the duration of the project will undertake these services and supervise installation, inspection and handover.

E) Inspection just before the expiration of warranty (on the Project site)

The Consultant shall conduct an inspection before an expiration of the manufacturer's warranty and produces an inspection report.

(2) Procurement Management by the Supplier

Major equipment procurement management works done by Supplier are as follows:

1) Confirmation of equipment production drawings (work in Japan)

The Supplier shall clarify procedures for procurement of equipment (ordering, inspection, loading, transportation and installation) and submit documents required in the bidding documents (drawing for manufacturing, layout drawing, utility list, etc.) to Consultants for approval.

2) Pre-shipment inspection (work in Japan)

Imaging diagnostic equipment will be fully set up at the manufacturer's plant, packaged for export and transferred to designated warehouses. For this reason, the Supplier conducts pre-shipment inspection at the manufacturer's plant. Pre-shipment inspections for the other equipment will be conducted at warehouses designated by the manufacturer or by their forwarder.

3) Pre-shipment Inspection (work in Japan or third countries)

The Suppliers will have a pre-shipment meeting with each manufacturer and participate in pre-shipment inspection with a third-party inspection agency. After shipments, the Supplier submits photocopies of loading documents (Bill of Lading,

insurance policy, invoice and packing list, etc.) to the inspection agencies. Inspection should be conducted at seaport in each procurement country.

4) Procurement supervision on the Project site (on the Project site)

The Suppliers shall conduct an inventory check and inspection, commissioning and initial operation training and operation training for all equipment. Staffs in charge from DoMS and the Consultant will supervise these processes.

2.2.4.5 Quality Control Plan

To ensure high quality construction works, Japanese standard specification of public construction work and JASS 5, with reference to Myanmar standards and international standards as necessary, shall guide construction supervision.

(1) Reinforcement work

Prior to every concrete casting, the construction supervisor shall inspect re-bar arrangement work by the Contractor, criteria of which include shape tolerance by gauge and visual inspection. The construction supervisor will instruct additional inspection points.

In addition, three test pieces of each type of steel bar shall have tensile tests done for every 200 ton in the project site or at the time of deliveries.

(2) Concrete work

1) Mixing strength

Compression strength tests will be done on three or more test pieces per casting and every 50 cubic meter of fresh concrete to confirm concrete mixing.

2) Slump value, Chloride content, Air content

Inspection of slump value, chloride content and air content shall be implemented following general methods used in Japan, at a frequency of per casting and every 50 cubic meter of fresh concrete.

(3) Form work

Prior to concrete casting, the construction supervisor conduct the inspection including the dimensions between formwork and rebar. Additional inspection criteria will be instructed by the construction supervisor.

(4) Mechanical work and Electrical work

Water pressure test, insulation test and conductivity test shall be implemented for every system. The construction supervisor will check leakage and confirms the test according to designated criteria.

(5) Others

In case of failures of works, such as off-shutter concrete quality or shortage of concrete coverage over rebar, etc., the Contractor shall follow the instructions from the construction supervisor.

Regarding pile works, the designated bearing capacity shall be confirmed through the loading test of several piles of main piles.

2.2.4.6 Procurement Plan

(1) Construction

1) Procurement Policy

Since most major construction materials and equipment for the Project are available in Myanmar, principally those items will be procured locally. Some of materials, which are not available on the local market will be procured from Japan or third countries.

2) Procurement Plan

A) Structural Work

Sands and aggregates for structural concrete and concrete blocks for partition walls will be procured locally. The Contractor can procure imported deformed bars, structural steels, and cements on the local market, or import those items directly from the third countries, such as Thailand and/or China etc.

B) Finishing Work

Timbers are available locally. The Contractor can procure imported aluminum fittings, tiles, metal roof sheets, paint, and glass or import those items directly from the third countries, such as Thailand and/or China etc. Special materials, such as panels for operation theaters and electromagnetic shield materials will be procured from Japan or third country since they are not available on the local market.

C) Plumbing Work

The Contractor can procure imported pumps, tanks, sanitary appliance, and pipes etc. on the local market or import those items directly from the third countries, such as Thailand and/or China etc.

D) Air Conditioning Work

The Contractor can procure imported chiller units, pumps, air conditioners, fans, and conduits etc. on the local market, or import those items directly from the third countries, such as Thailand and/or China etc.

E) Electrical Work

The Contractor can procure imported lighting fixtures, power panels, cables/wires, and conduits etc. on the local market, or import those items directly from the third countries, such as Thailand and/or China etc.

Table 2-31. The List of Procurement Plan for Major Construction Materials

	Procurement location			Note
	Myanmar	Japan	Third countries	
[Temporary works]				
Scaffolding	○			Steel prefabricated scaffolding
Temporary fence	○			Corrugated steel sheet or Plywood board with paint
Temporary office, storage, Shed	○			Timber Brick, Timber
[Material]				
Portland cement	○		○	ASEAN countries
Aggregate	○			
Deforming bar	○		○	ASEAN countries or China
Formwork plywood	○		○	ASEAN countries or China
Concrete block	○			
Structural Steel	○		○	ASEAN countries
Waterproofing material	○		○	ASEAN countries
Light gauge steel	○		○	ASEAN countries or China
Color metal corrugated sheet	○		○	ASEAN countries
Aluminum fitting	○		○	ASEAN countries
Wooden door and windows	○		○	ASEAN countries
Glass	○		○	ASEAN countries or China
Tile	○		○	ASEAN countries or China
Acoustic board	○		○	ASEAN countries
Fiber cement board	○		○	ASEAN countries
Paint	○		○	ASEAN countries
Panel of Operation theater	○	○	○	OECD member countries
Radiation protection / Electromagnetic shield	○	○	○	Japan, ASEAN countries
[Mechanical ・ Electrical material]				
Tank	○		○	ASEAN countries or Korea
Pump	○		○	Japan or ASEAN countries
Pipe	○		○	ASEAN countries
Sanitary appliance	○		○	ASEAN countries
Chiller unit	○		○	USA or ASEAN countries
Air conditioner	○		○	ASEAN countries or China
Blower	○		○	ASEAN countries or China
Duct	○		○	ASEAN countries
Transformer	○		○	ASEAN countries
Power panel	○		○	ASEAN countries or China
Cable, wire and conduit	○		○	ASEAN countries
Lighting fixture	○		○	ASEAN countries
Lightning rod	○		○	OECD member countries

2.2.4.7 Initial operation training and operation training

Subsequent to the delivery, installation, adjustment and commissioning of the equipment, the Suppliers will conduct initial operation training. The Consultant will supervise proper implementation of such trainings. The three parties, the representative from DoMS, the Consultants and the Supplier confirm the training contents and certificate at the time of handover.

2.2.4.8 Soft Component (Technical Assistance) Plan

In order to ensure long-term use of the equipment under the Project and in good condition, the Project will conduct a training on the improvement of maintenance management system of medical equipment. The course will be for medical personnel, doctors, nurses and engineers (radiographer and laboratory engineers etc.) from the four targeted departments, diagnostic imaging department and clinical laboratory departments. A person in charge of medical equipment department and the department staff selected by the medical superintendent should also join this training. The training will instruct how to conduct daily check, how to deal with equipment malfunction.

2.2.4.9 Implementation Schedule

The Project will take the following steps before commencement of the construction works in accordance with the Grant Aid Scheme of the Government of Japan:

- The Government of Japan and Myanmar will sign E/N and JICA and the Government of Myanmar will conclude G/A.
- JICA will recommend a Japanese consulting firm to conduct preparatory survey of the Project, in principle, to the Government of Myanmar.
- DoMS, as a representative of the Government of Myanmar will enter into consulting services agreement with the consulting firm.
- The detailed design development and biddings will be conducted. After the signing of the contracts, construction and equipment works will commence.

(1) Detailed Design

Based on the preparatory survey, the Consultant will develop detail design and prepare bidding documents consisting of drawings, specifications, instructions to bidders, etc. The Consultant will hold consultations with DoMS during the detailed design stage and submit the complete bidding documents for review and approval.

(2) Bidding

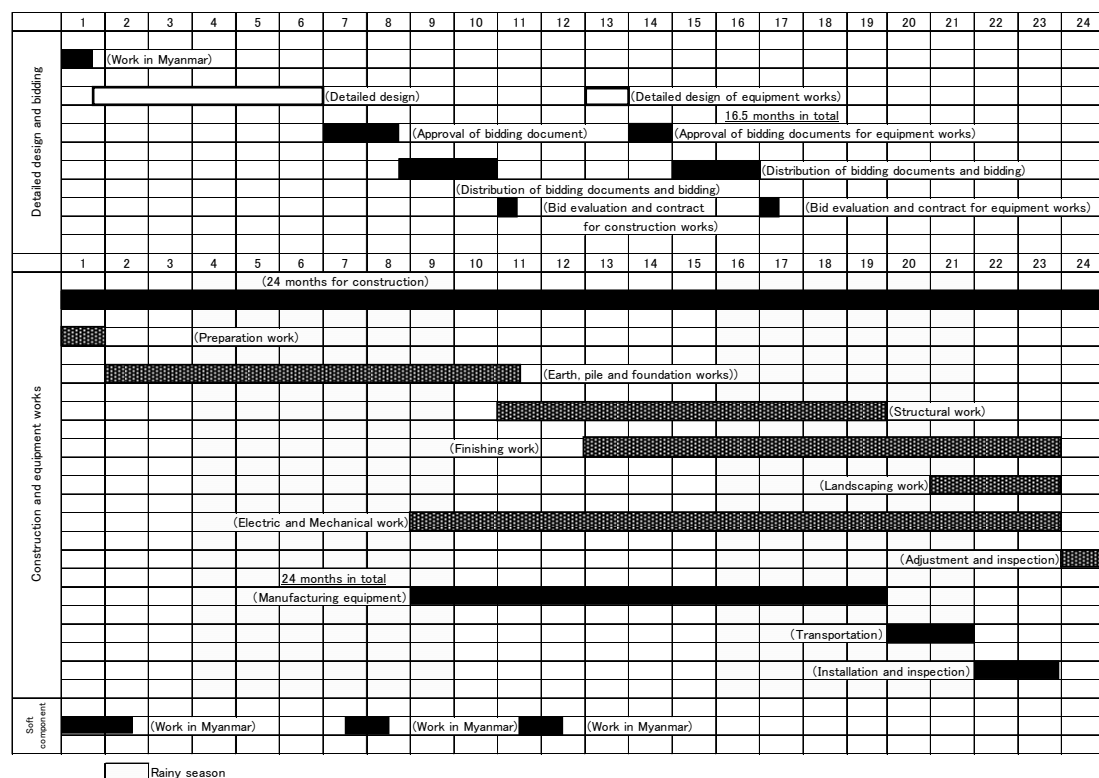
After the completion of detailed design, the prequalification (P/Q) of the bidding for the construction works will be announced and conducted in Japan. After P/Q screening, DoMS will invite the qualified construction companies to the bidding. DoMS will invite equipment supply companies to the other biddings. The biddings are conducted in the presence of all parties concerned. After that, the lowest bidders, whose bids meet all set conditions, will be awarded the contracts with DoMS for construction and equipment works.

(3) Construction and Equipment Works

After the signing of the contracts, the Contractors will obtain verification from JICA to commence construction and equipment works. Based on the scale of the proposed facilities and local construction practices, approximately 24 months will be required for construction works, procurement and installation of equipment including initial operation training. This prospect presupposes smooth procurement of materials and equipment and prompt actions by relevant the Myanmar side organizations, and smooth implementation of undertakings by the Myanmar side.

Table 2-32 shows implementation schedule of the Project.

Table 2-32. Project Implementation Schedule



2.3 Obligations of Recipient Country

The Project will be implemented under the Grant Aid Scheme of the Government of Japan. The Government of Myanmar will be responsible for the following tasks.

(1) Items Related to the Construction Works

- Level the ground of the project site including demolition of existing structures and removal of trees
- Embankment of the project site and construction of an ambulance garage and guard houses
- Planting and gardening works around the new building
- Acquire building permission and environmental license
- Install high voltage lines, telephone lines and internet lines for the new building

(2) Items Related to the Equipment Procurement

- Procure and install other medical equipment and general furniture not provided by the Government of Japan
- Relocate existing equipment from YGH to the new building
- Acceptance of Japanese consultant for supporting CMSD in charge of procurement work for equipment procured by Myanmar side

(3) Items Related to Operation and Maintenance

- Procure consumables and spare parts required to maintain the facilities and equipment
- Proper and effective utilization and maintenance of the facilities and equipment
- Per diem, accommodation and transportation expense for Soft Component (Technical Assistance) Program attendees

(4) Items Related to Administration Procedures

- Bear commissions for the Banking Arrangement (B/A), payment of the Consultant and Contractors, Authorization to Pay (A/P) and amended A/P
- Obtain construction permits and provide the relevant information and arrangements with the building authorities
- Obtain permissions, licenses and other authorizations necessary for the Project
- Ensure prompt unloading, customs clearance and tax exemption of the construction material and equipment imported for the Project
- Exemption from payment of customs duties, commercial taxes, and any other levies and charges in Myanmar by the Japanese nationals and corporate entities, and parties concerned from third countries engaged in the Project.
- Make necessary arrangements for the above-mentioned Japanese nationals and parties concerned from third countries to enter and stay in Myanmar and to engage in the Project activities

- Bear all expenses, other than those covered by Japanese Grant, necessary for the completion of the Project
- Prepare and submit Project Monitoring Report(PMR) until completion of the Project

2.4 Project Operation Plan

2.4.1 Operation and Maintenance Plan

(1) Operation Structure

To ensure proper utilization of the new facilities and medical equipment provided under the Project and delivery of medical services, deployment of medical personnel in NYSH shall be as shown in the Table 2-33. The number of nurses is estimated based on a three shifts system taking in consideration the increased number of beds in HCU and ICU. Since NYSH will provide medical services 24 hours a day, radiographers in the diagnostic imaging department and laboratory technicians in the laboratory unit also need to work round the clock.

Hospital Management Manual issued by MoHS in 2011 stipulates that it is mandatory to organize a medical equipment maintenance unit as a part of hospital administration.

Table 2-33. Required Workforce in the NYSH

Category	Pharmacy, Administration *	Image Diagnosis *	Medical Lab. *	Cardiac Surgery	Cardio- logy	Neuro- Surgery	Neuro- Medicine	Total
Professor				1	1	1	1	4
Senior Consultant/Associate Professor		1	1	6	6	6	6	26
Junior Consultant/ Lecturer		1	2	5	5	5	5	23
Junior Doctors		5	8	13	13	13	13	65
Radiologist		4						4
Anesthesiologist				8		7		15
Total Doctors		11	11	33	25	32	25	137
Sister				3	3	3	3	12
Staff Nurse				18	18	18	18	72
Trained Nurse				29	29	29	29	116
Total Nurse				50	50	50	50	200
Physical Therapist				2	2	2	2	8
EEG/EMG Technician							3	3
Radiographer		10			3			13
Laboratory Technician			8					8
Pharmacist	10							10
Total Co-medical	10	10	8	2	5	2	5	42
Nurse Aid				10	10	10	10	40
Clerk	45			1	1	1	1	49
Other staff (incl. worker)	50			10	10	10	10	90
Total other staff	95			21	21	21	21	179
Grand total	105	21	19	106	101	105	101	558

Source: Study Team *calculated based on the number of workers by category per 100 beds from "The Summary of Study of Hospital Operation and Management Situation Analysis"

(2) Maintenance system

The new facility is designed with minimum use of advanced and complicated systems and local technicians should find it easy to maintain. To keep the facility in good condition for long term, it is important that daily maintenance and inspections of facilities and machineries be performed in accordance with instruction manuals and by

knowledgeable technicians. Accordingly, it is necessary to secure and train technicians so that they are equipped with knowledge of the constructed facilities and machineries. In addition, it is required to implement the periodic maintenance based upon the annual maintenance plan and keeping the maintenance records.

A security guard will operate the central monitoring room 24 hours a day to ensure prompt management of facility failures and emergencies, such as fires promptly.

<Maintenance system for the equipment>

It has been confirmed that a facility maintenance unit and medical engineering unit will be housed in administrative department of NYSH.

The responsibilities of the medical engineering unit is expected to manage inventory of medical equipment in the hospital, to ensure the implementation of daily maintenance plans, to arrange agents for repair, to conduct periodic inspection, to manage the annual maintenance contracts with agents, etc. In case of major failure requiring high repair costs, before repairing, the medical engineers need to obtain approval from DoMS thorough the medical superintendent.

2.4.2 Maintenance Plan

(1) Facilities

There are two categories for maintenance of facilities: (i) daily cleaning and (ii) repair of parts from wear and tear, damage, and deterioration. The daily cleaning will encourage people to use facilities carefully as well as ensure early detection of damages and/or malfunctions. The repair of facilities mainly consists of the restorations and rectifications of deterioration on the interior and exterior finish covering the superstructure. Facilities should be refurbished every decade to retain their functionality. Items for regular inspection and maintenance, which affect the lifespan of facilities, will be in the maintenance manuals provided by the Contractor at the commissioning of the facilities. Detailed inspection and cleaning methods will be also explained during the commissioning. Regular inspection points are summarized in Table 2-34 below.

Table 2-34. Summary of regular inspection points of facilities

	Inspection and maintenance points	Frequency
Exterior	• Repair and repaint exterior walls	Repaint every 5 years
		Repair every 3 years
	• Inspect and repair roofs	Inspect every 3 years
		Repair every 10 years
	• Clean gutters and drainage surroundings regularly	Every month
Interior	• Inspect and repair exterior door and window sealants	Every year
	• Inspect and clean ditches, manholes, etc.	Every year
	• Renovate the interior	As necessary
	• Restore and repaint partitions walls	As necessary
	• Replace ceiling materials	As necessary
	• Adjust doors and windows to fit the openings	Every year
	• Replace door handles, hinges, etc.	As necessary
	• Periodical inspection for elevators	Every year

(2) Building Equipment

For building equipment, it is important to conduct daily “preventive maintenance” not just repair or parts replacement. The length of running time is not the only determinant of the life of equipment; normal operation, daily inspection, lubrication, adjustment, cleaning, maintenance, etc. can extend life of equipment. Daily maintenance can prevent problems, accidents and the further deterioration.

Building machineries, such as power generators and pumps need periodic maintenance and it is vital to conduct regular major inspections once a year. Table 2-35 shows average service life of major equipment. For lighting, use of LED lamp will be considered to reduce maintenance costs.

Table 2-35. Service Life of Mechanical and Electrical Equipment

	Type of Equipment	Service Life
Electric	Switchboard	20 – 30 years
	LED light	20,000 – 40,000 hours
	Florescent light (lamp)	5,000 – 10,000 hours
	Incandescent light (lamp)	1,000 – 1,500 hours
	Generator	30 years
Plumbing	Pump, pipe, valve	15 years
	Tank	20 years
	Sanitary ware	25 – 30 years
Air conditioning	Pipe	15 years
	Exhaust fan	20 years
	Air conditioner	10 years

Maintenance of filters is important for maintenance of cleanliness and prevention of infection.

Air conditioners in operation theaters and ICUs will use a set of three of filters – prefilters, middle efficiency filters and HEPA filters. Prefilters need to be washed with water every two months and all filters need to be replaced every year.

(3) Equipment

The advisable maintenance plan is shown in the Table 2-36. The plan will be constructed by DoMS, MoHS and NYSH based on the requirements for medical equipment maintenance stipulated in “Hospital Management Manual” issued by MoHS in 2011.

Table 2-36. Proposed Maintenance Structure

Department of Medical Services in Ministry of Health and Sports	administrative department at the new Yangon specialty hospital	maintenance unit at the new Yangon specialty hospital
Policy making for maintenance and operation	Collecting expected operational budget from each clinical department and applying to MoHS	Clarification of the role and demarcation of duties among a hospital director, a PIC of maintenance and end users
Allocation of operational budget	Applying for a distribution of human resources to MoHS	Management of inventory lists of each clinical department
Planning and distribution of human resources	Management of inventory lists	Instruction of how to use the equipment for the end users including daily and periodic maintenance
Planning a human resource development	Collecting information from each clinical department	Confirmation of stock of parts and consumables
	Information sharing with a hospital directors and hospital executives (such as periodic reports)	Dealing with serious defects (report and applying for outsourced repair to administrative department)
	Planning and implementation for technical training for medical staff and technicians	Adjustments or repairs of simple defect, etc.
	Repair of equipment by outsourcing to manufacturers' agents	Dealing with serious defects (identifying the cause of failure)
		Acceptance and inspection after completion of repair

2.5 Project Cost Estimation

2.5.1 Initial Cost Estimation

(1) Estimated Cost to Be Borne by the Government of Myanmar

The estimated costs to be borne by the Government of Myanmar during implementation of the Project are as shown in Table 2-37 below.

Table 2-37. Estimated Cost to be borne by the Government of Myanmar

NO.	Item	Content	Estimated cost (MMK)	Note
1	Level the ground of the Project site	Demolition of the existing obstacles such as pavement and ground levelling	80,419,000	
2	Removal of trees	Removal of trees obstructing the construction site	605,000	
3	Planting and Gardening works	Planting and gardening works around the new building	44,146,000	
4	Landscaping works	Embankment of the project site and installation of an ambulance garage and guard houses	787,387,000	
5	Utilities connection	Install high voltage lines, telephone lines and internet lines	25,206,000	
6	Procure general furniture	Procurement and installation of general furniture other than those provided under Japanese Grant	1,223,937,000	
7	Procure medical equipment 1	Procurement and installation of medical equipment other than those provided under Japanese Grant (Diagnostic Imaging equipment)	16,701,432,000	
	Procure medical equipment 2	Medical furniture, Portable medical equipment	23,169,091,000	
8	Banking commissions	Commissions for Authorization to Pay, payments to the Consultant and the Contractors	21,265,000	
9	Taxes	Customs duties of the construction material and equipment imported for the Project	181,161,000	5% of the estimated price
10	Kitchen equipment	Instruments for cooking provided in the canteen of the new facility	47,552,000	
11	IEE/EIA	Application fee of IEE/EIA	146,904,000	
Total			42,425,105,000	

(2) Conditions for Estimation

- Estimation time: July 2017
- Exchange rate: 1USD=112.09JPY
1USD=1,360.21MMK
1JPY=12.13MMK
1MMK=0.082JPY
(Average rate of April – June, 2017)
- Construction and procurement period: See the Project implementation schedule for the detail design, the bidding and the construction and equipment works
- Other: The cost shall be estimated in accordance with Japanese Grant Aid Scheme

2.5.2 Operation and Maintenance Cost

(1) Operation and Maintenance Cost

Estimated annual operation and maintenance costs for the facilities and equipment are as shown in Table 2-38.

Table 2-38. Estimated operation and maintenance cost (thousand MMK per year)

Item	Estimated expenditures after completion of the Project
①Electricity	343,424
②Fuel	41,785
③Communication	25,811
④Medical gas	192,954
⑤Filter	23,400
⑥Facility maintenance	77,244
⑦Medicine	353,100
⑧Medical materials	1,706,650
⑨Medical equipment maintenance	2,258,747
Total	5,023,115

【Basis of Calculation】

① Electricity cost

- Electricity cost

Electricity cost estimation is based on total floor area. Power consumption per square meter for cost calculation is at 70 watt for daytime (9 AM to 7 PM) and 10watt (7 PM to 9 AM) for nighttime.

As the current unit cost of electric power is 35 MMK/kilowatt and the three-year inflation rate is 17.7%, the unit power cost in three years will be $35 \text{ MMK/kilowatt} \times 1.177 = 41.2 \text{ MMK/kilowatt}$.

For the whole building, the cost will be as below.

$(27,187 \text{ m}^2 \times 70\text{watt/square meter} \times 10 \text{ hours} + 27,187 \text{ square meter} \times 10 \text{ watt/square meter} \times 14 \text{ hours}) \times 1 \text{ kW}/1000\text{W} \times 41.2 \text{ MMK/kW} \times 365 \text{ days/year} = 343,424,009 \text{ MMK/year}$

② Fuel cost

- Fuel cost for emergency power generators

Two new 750kVA diesel power generators will be installed and fuel costs will be incurred. Fuel cost is calculated on the assumption that there will be a two-hour outage once every three days.

As the unit cost of light oil is 550MMK/L and three-year inflation rate is 17.7%, the unit cost of light oil will be $550 \text{ MMK/L} \times 1.177 = 647 \text{ MMK/L}$.

As a generator uses 120L of light oil per hour, the cost will be as below.

$120 \text{ L/hour/unit} \times 2 \text{ units} \times 2 \text{ hours/day} \times 365 \text{ days/year} \times 1/3 \text{ day} \times 647 \text{ MMK/L} = 37,784,800 \text{ MMK/year}$ -----(a)

- Ambulance fuel cost
Five ambulances are planned to the facilities of the Project by MoHS and fuel costs will be incurred.
 $800,000 \text{ MMK/year/unit} \times 5 \text{ units} = 4,000,000 \text{ MMK/year} \text{ -----(b)}$
- Total fuel cost
 $(a) + (b) = 41,785 \text{ thousand MMK/year}$

③ Communication cost

- Internet
Internet connection at 8 Mbps (ready for videoconferencing) is planned.
As the annual connection fee is 67.0 USD, and the monthly basic rate is 778.0 USD, estimated annual cost is as follows:
 $67.0 \text{ USD} + 778.0 \text{ USD} \times 12 \text{ months} = 9,403 \text{ USD/year}$
As the three-year inflation rate is 17.7%, estimated annual cost is as follows:
 $9,403 \text{ USD/year} \times 1.177 = 11,067 \text{ USD/year} \text{ ----- (c)}$
- Telephone
The assumption is that 10 telephone trunk lines will be constructed.
As the monthly basic fee per line is 56\$, estimated annual cost is as follows:
 $56 \text{ USD} \times 10 \text{ lines} \times 12 \text{ months} = 6,720 \text{ USD/year}$
As the three-year inflation rate is 17.7%, estimated annual cost is as follows:
 $6,720 \text{ USD/year} \times 1.177 = 7,909 \text{ USD/year} \text{ ----- (d)}$
- Total communication cost
 $(c) + (d) = 18,976 \text{ USD/year} = 25,811 \text{ thousand MMK/year}$

④ Medical gas cost

- Oxygen
Daily oxygen consumption at the new hospital is assumed to be 70% of the oxygen consumption (400 L/bed) at a typical hospital in Japan.
As the unit cost of oxygen is estimated at 5 MMK/L and the three-year inflation rate is 17.7%, the unit cost of oxygen will be $5 \text{ MMK/L} \times 1.177 = 5.9 \text{ MMK/L}$ in three years.
Yearly oxygen consumption at the hospital will be $320 \text{ beds} \times 400 \text{ L/bed} \times 0.7 \times 365 \text{ days} = 32,704,000 \text{ L/year}$.
Yearly oxygen cost will be $32,704,000 \text{ L/year} \times 5.9 \text{ MMK/L} = 192,953,600 \text{ MMK/year}$.

⑤ Filter replacement cost

- Prefilter

Prefilters will be replaced once a year. The average price of a prefilter is 3,000 JPY and about 400 prefilters will be used at the hospital.

$$3,000 \text{ JPY/filter} \times 400 \text{ filters} \times 1/\text{year} = 1,200,000 \text{ JPY/year}$$

- Middle efficiency filter

Middle efficiency filters will also be replaced once a year. The average price of a middle efficiency filter is 8,000 JPY and the hospital will use about 30 middle filters.

$$8,000 \text{ JPY/filter} \times 30 \text{ filters} \times 1/\text{year} = 240,000 \text{ JPY}$$

- HEPA filter

HEPA filters should be replaced once a year. The average price of a HEPA filter is 30,000 JPY and the hospital will have approximately 30 HEPA filters installed.

$$30,000 \text{ JPY/filter} \times 30 \text{ filters} \times 1/\text{year} = 900,000 \text{ JPY/year}$$

- Total filter cost

$$1,200,000 \text{ JPY/year} + 240,000 \text{ JPY/year} + 900,000 \text{ JPY/year} = 2,340,000 \text{ JPY/year} \\ = 23,400 \text{ thousand MMK/year}$$

⑥ Facility Maintenance

- Building Repair Cost

Although the building repair cost varies each year, the annual average cost for the first 10 years from the completion of the facilities is assumed to be about 0.1% of the construction cost of finishing works.

$$1,892,000,000 \text{ JPY} \times 0.1\% \times 12.13 \text{ MMK/JPY} = 22,949,960 \text{ MMK per year} \text{ ----- (e)}$$

- Mechanical and Electrical Facilities Maintenance

Although the maintenance cost of machineries is rarely incurred for the first five years from the completion of the facilities, the frequency of replacement of spare and defective parts will increase after that. The annual average mechanical and electrical facilities maintenance cost for the first 10 years is assumed to be about 0.2% of the building equipment that needs to be replaced.

$$2,238,000,000 \text{ JPY} \times 0.2\% \times 12.13 \text{ MMK/JPY} = 54,293,880 \text{ MMK per year} \text{ ----- (f)}$$

Thus, estimated facility maintenance costs in total are:

$$(e) + (f) = 77,244 \text{ thousand MMK per year}$$

⑦ Medicine

In 2017, the cost for the medicine used in the four target departments was approximately 29 million JPY. The medicine cost for NYSH is estimated as

353,100,000 MMK per year based on increasing number of patients and increasing cases of high cost medicine treatment, such as thrombotic strokes treatment in neuro medicine.

⑧ Cost for Medical Materials

In 2017, the cost of the consumables used in the four target departments was about 125 million JPY. The ratio of consumables has been increasing for cardiology where noninvasive treatment, such as catheterization is performed and for cardiac surgery where expensive materials, such as artificial valves are used. The estimated annual cost for medical materials in NYSH is 1,706,650,000 MMK⁴ per year due to increase in noninvasive treatments using high value materials, such as stents or coils in neurosurgery department.

⑨ Operation and Maintenance cost of Equipment

The medical equipment in NYSH consists of new ones procured by Japan and the ones transferred from existing facility. The estimated annual cost for operation and maintenance is as shown in Table 2-39.

Table 2-39. Annual maintenance budget of equipment consumables

Consumable materials of medical equipment procured under Japanese Grant	29,636,000MMK ⁵
Consumable materials of medical equipment procured by Myanmar	111,487,000MMK ⁶
Consumable materials of transferred existing medical equipment from YGH	28,224,000MMK ⁷
Operation and maintenance cost with agency	2,089,400,000MMK ⁸
Total	2,258,747,000MMK

Future inflation rate forecasted by IMF is not considered in the above estimates since technology and manufacturing advances will likely keep the price trends of highly advanced medical equipment stagnant.

(2) Operational Budget of the NYSH

According to the above estimations the total budget for annual operation, management and maintenance of NYSH is estimated as 5,023,115,000 MMK (approximately 411 million JPY) as shown in the Table 2-40.

⁴ Average medical material cost as of 2016 per patient = 853,325Kyat x expected No. of catheter treatment 2,000 cases=1,706,650,000 Kyat (Number of angiography and angioplasty is 1,761 in 2016, then after the handover, it will increase to 2,113 until 2024.)

⁵ Based on equipment operational rate, it is estimated that 0.29% of equipment procurement cost is required for consumables cost.

⁶ Based on equipment operational rate, it is estimated that 0.29% of equipment procurement cost is required for consumables cost.

⁷ Based on equipment operational rate, it is estimated that 0.29% of equipment procurement cost is required for consumables cost.

⁸ Maintenance cost for diagnostic imaging equipment and PACS system etc. is estimated around 11~12% of equipment procurement cost.

Since DoMS derived from Department of Health in April 2015, the information of the former budget records for DoMS was not available at the time of field survey in 2015. The allocation of budget of DoMS in the year 2015/16 was 503,754 million MMK, which is 67% (approximately 41.3 billion JPY) of the total budget of MoHS. The estimated ratio of the annual operation, management and maintenance budget of NYSH (411 million JPY shown in estimation above) to the DoMS budget is 0.99%. Accordingly, continuous funds allocation by DoMS is considered enough to operate, manage, and maintain NYSH.

Table 2-40. MoHS Expenditures by Department (2015/16)

(Unit : Million MMK)							
	Name of Department	Current Expenditure	%	Capital Expenditure	%	Total(Million MMK)	%
1	Minister's Office	1,331.920	0.33	19.541	0.0	1,351.461	0.18
2	Department of Public Health	137,837.053	34.24	50,197.680	14.35	188,034.733	24.97
3	Department of Medical Services	233,913.99	56.0	269,839.789	77.11	503,753.774	66.90
4	Department of Health Professional Resource Development and Management	20,523.025	5.1	13,568.198	3.88	34,091.223	4.53
5	Department of Medical Research	2,981.336	0.7	1,649.722	0.5	4,631.058	0.62
6	Department of Traditional Medicine	4,772.721	1.2	9,568.597	2.73	14,341.318	1.90
7	Department of Food and Drug Administration	1,721.037	0.43	5,076.774	1.45	6,797.811	0.90
	Total	403,081.077	100	349,920.301	100	753,001.378	100

Source: Mirror (Myanmar version) newspaper, May 1st, 2015

Chapter 3 Project Evaluation

Chapter 3 Project Evaluation

3.1 Preconditions

It is preconditioned that Myanmar side would take necessary procedures such as land acquisition, construction approval, obtaining Environmental Impact Assessment (EIA), custom duty, tax exemption, Banking Arrangement (B/A), issuance of Authorization to Pay (A/P) and removal of any obstacles from construction planning site, improvement of infrastructure, procurement of general furniture, medical equipment and other items.

3.2 Necessary Input by Recipient Country

Following measures shall be taken by Myanmar side in order to keep effectiveness of the Project.

- Assignment of medical personnel such as consultants and co-medicals who would provide high quality advanced medical services at New Yangon Specialist Hospital (NYSH)
- Procurement of consumables, spare parts, medicine and medical materials which are essential to operate medical equipment procured under the Project
- Assignment of personnel who would conduct maintenance activities for proper and effective use of buildings and equipment constructed and procured under the Project
- Implementation of continuous and stable maintenance activities by concluding maintenance contract with local agents for the procured medical equipment under the Project after finishing warranty period

3.3 Important Assumptions

Following external conditions need to be satisfied in order to keep effectiveness of the Project.

- Ministry of Health and Sports(MoHS) would continue the implementation of “Out of pocket reduction policy”
- National health policy and strategic plan such as “Myanmar Health Vision 2030” and “National Strategic Plan for Prevention and Control of NCDs 2017-2021” would continue, and there would be no big policy change which would affect project implementation.
- It would be secured to provide proper supply of medical materials, medicine and consumables which are essential for proper clinical activities.

3.4 Project Evaluation

3.4.1 Relevance

Implementation of this project is highly relevant as a Japanese grant aid scheme from the following point of views.

- (1) Target departments of this project are four departments in YGH which is a top referral hospital located in Yangon city. Therefore, direct beneficiaries of this project will be the population residing in Yangon region and also population residing in the reachable areas to refer patients, while indirect beneficiaries are all nationals in Myanmar.
- (2) The objective of this Project is to improve quality and quantity of medical and healthcare services for cerebral and cardiovascular diseases in Yangon region by establishing a new specialist hospital and improving medical equipment where cerebral and cardiovascular diseases can be treated, through relocation of the selected clinical departments from YGH as a tertiary medical facility. Thus, it is expected that the poor or the elderly people could improve their access to tertiary medical services. As a result, it is expected to contribute to contentment of Basic Human Needs and stabilizing the people's livelihood which is one of the objectives of Japan's grant aid.
- (3) This project would contribute to achievement of objectives articulated in the Myanmar Health vision 2030 and these objectives are to improve the people's health, to develop health system responding to the changes of situation surrounding people's health, to provide medical services to all nation and to develop human resources. In addition, it would contribute to reducing mortality, mobility and disabilities from aftereffects of NCDs targeted in the "National Strategic Plan for Prevention and Control of NCDs 2017-2021" formulated in 2017.
- (4) Government of Myanmar has set National health policy and National Health plan 2017-2021, and tries to achieve "improvement of hospital care", and "health system strengthening". Especially, recently, National Health Plan 2017-2021 has pointed out that mortality rate stemming from NCDs are on an increasing trend in addition to persistently high mortality due to some of infectious diseases.

3.4.2 Effectiveness

Expected effects of the Project are as follows;

(1) QUANTITATIVE EFFECTS

A) BASIC INDICATORS

Table 3-1 Quantitative Indicators and Target Values: Basic Indicators

Name of Department	Indicators	Original (Yr 2016)	Target (Yr 2024)
Cardiology	No. of inpatients	4,436	5,221
	No. of outpatients	19,762	23,260
Cardiac surgery	No. of inpatients	947	1,115
	No. of outpatients	4,826	5,680
Neurosurgery	No. of inpatients (except trauma)	2,920	3,437
	No. of outpatients	1,180	1,389
Neuro medicine	No. of inpatients	1,020	1,201
	No. of outpatients	7,115	8,374

【Calculation method for target indicators such as number of Inpatients and Outpatients of each department】: According to the Myanmar Population and Housing Census conducted in 2014, population of Yangon Metropolitan area in 2024 would be approximately 120% compared with that of 2014. Since original data is 2016, number of inpatients and outpatients is assumed as 117.7%.

B) QUANTITATIVE EFFECTS OF EACH DEPARTMENT

The quantitative indicators expected by new facility and improvement of medical equipment have been set to confirm the project objective, which is “to improve quality and quantity of medical and healthcare services for cerebral and cardiovascular diseases”. The indicators to measure quantitative effects for each target department are set as follows;

Table 3-2 Quantitative Indicators and Target Values: each department

Department	Indicators	Original (Yr 2016)	Target (Yr 2024)
Cardiology	No. of angiography and angioplasty	1,761	2,113
	Time duration from receiving patients until starting catheter treatment(min.)	N/A	30
Cardiac surgery	No. of major surgeries	374	561
Neurosurgery	No. of months in which patients are waiting for surgery (month)	3	1
	No. of surgical cases used intraoperative CT scanning	0	89
Neuro medicine	No. of thrombolytic therapy cases	45	90
	No of cerebral infarction patients evaluated by MRI	0	304

Indicator 1: Number of angiography and angioplasty

◆ The rational of setting this indicator: Through provision of new angiography system for new facility with effective patient flow, it is expected to measure improvement of amount of medical services by number of treatment done as a result of strengthening of functions of angiography and angioplasty.

At the time of field survey in 2017, the cardiology department in YGH has two angiography systems with single-plane, and those equipment are operating 365 days a year and tested 1,761 cases per machine in 2016 (four to five cases per day). It is expected to take 1.2 times more cases than the cases in 2017 which is equivalent to five to six cases per day because the patient flow from the emergency room to the catheter room will be designed as more effective flow, the duration of examination would be shorter due to a better patient management, and it can deal with more complicated cases such as persistent atrial fibrillation and atrial arrhythmia. The equation is as follows:

(The number of angiography and angioplasty in 2016) $1,761 \times 1.2 = 2,113$

Indicator 2: Time duration from receiving patients until starting catheter treatment (min.)

◆ The rational of setting this indicator: It is important to measure the time from a patient arrival to the time of starting the catheter treatment for confirming improvement of patient flow to deal with emergency cases such as acute myocardial infarction in the cardiac surgery specialized hospital which will be separated from YGH. At the time of field survey in 2017, in the emergency department of YGH, first, patients are triaged at the general reception, and emergency physicians examine patients accordingly and if a patient is judged as serious enough to be seen by a consultant, a specialist rushes to the emergency department. As the consequence of this process, some urgent cases like acute myocardial infarction is resulted in delaying in treatment. In the new hospital, the emergency patients are cardiology disorder patients only, therefore, patients are seen by cardiology physicians and are transferred immediately to the catheter laboratory for the treatment. It is, therefore, expected to be around 30 minutes from receiving patients until starting catheter treatment.

Indicator 3: Number of major surgeries

◆ The rational of setting this indicator: The number of major surgeries in the cardiac surgery department in YGH has been limited due to the limited capacity of major operation theater. However, the capacity of such operation theater will be increased due to increased number of theaters. Therefore, it is expected to measure improvement of treatment functions by this indicator.

At present, one of major operation theaters for cardiac surgery department locates in the department and the other one locates in the new building. The total number of

operation theater for the department is two. There are two cardiac surgery specialists in the department at present time, however, the head of department will retire before the inauguration of the new hospital due to the public servant regulation. On the other hand, the next generation are going to be ready soon. It is expected to have two consultants within three years of hospital inauguration. In Myanmar, in an operation, a specialist only proceeds the main and difficult part of the operation such as connecting part in coronary bypassing surgery and assistants do the rest of surgery. Therefore, it is possible to have more than two operations simultaneously by this Myanmar way of operations. Since the number of operation theater will increase from two to three, it is expected to conduct operation 1.5 times more than present numbers. (The number of major surgeries in 2016) $374 \times 1.5 = 561$

Indicator 4: Number of months in which patients are waiting for surgery (month)

◆ The rational of setting this indicator: After increase of number of operation at new specialized hospital separated from existing YGH, it is expected to improve the amount of medical services to be provided resulting in shortening of operation waiting time.

The number of patients on the waiting list in neurosurgery department is the number of patients who are waiting for major surgeries. These operations are going to be taken place in the new facility. Along with the number of operation theater will increase from one to three, the duration of waiting for operations will decrease to one third of present waiting duration of three months, therefore, it will be one month.

Indicator 5: Number of surgical cases used intraoperative CT scanning

◆ The rational of setting this indicator: When CT scanner and navigation system are used at the same time, it become possible to perform less invasive operation method and more precise operation. Thus, it can measure to judge whether new hospital is reached to international standard hospital.

In 2016, the number of operations excluding injuries was 1,919. Out of 1,919 cases, craniotomy/brain tumor removable surgery was 149 cases. It is assumed that the rates of surgical operations which need to make sure the position of tumor by CT during the operation is around 60% to total brain tumor removable surgery operations, even though CT was taken before the operation. Therefore, 89 operations annually are expected to use CT during the operations.

(The number of craniotomy/brain tumor removable operations) $149 \times 60\% = 89$

Indicator 6: Number of thrombolytic therapy cases

◆ The rational of setting this indicator: Thrombolytic therapy to stroke patients is most effective and indispensable treatment method. Through provision of diagnostic imaging equipment such as CT and MRI in order to identify for patients who is

effective for thrombolytic therapy, it is possible to measure how treatment function is improved.

In 2016, the number of thrombolytic therapy was 45 cases in neuro medicine department. As it is expected to increase more medial facilities where can proceed thrombolytic therapy in Yangon, the number of patients who need treatment is expected to be an uptrend accordingly. The determining factor for giving thrombolytic therapy is the duration of time from onset of stroke to the arrival of hospital (should be within few hours). The number of patients who reach the new hospital will increase because they will be transferred directly by ambulances, it is expected that the number of thrombolytic therapy in 2024 will be 90 cases which is two time more than the number in 2016.

(The number of thrombolytic therapy cases in 2016): $45 \times 2 = 90$

Indicator 7: Number of cerebral infarction patients evaluated by MRI

◆The rational of setting this indicator: It is important to examine stroke patients by MRI for cases like bleedings are not recognized by CT but is still suspected as early stroke stage or for reducing the risk of bleeding of patients after operations. ⁹In strokes, cerebral infarction occupies around 60% of total strokes, therefore, it is expected to have 304 cases annually.

(The number of inpatients at neuro medicine department) 1020 cases x (the rate of stroke patients) 49.65% x 60%=304 cases

(2) QUALITATIVE EFFECTS

The project aims to provide international level medical services as a highest referral hospital of the country. Therefore, measurable qualitative effects have been set in consideration of the advantage of facility design of the hospital such as “improved patient flow and barrier-free design” and “operation theater for advanced procedures”, whether it is reached to international standard hospital.

Table 3-3 Qualitative Effects

- | |
|---|
| <ol style="list-style-type: none">1. The hospital environment will be improved to enable hospital staff to provide effective medical services by clear separation of medical staff flow and patients flow. Especially, by streamlining emergency flow, the duration from arrival to starting treatment of a patient will be shortened.2. Advanced surgical operations (e.g. Stent-graft or TAVI) will be performed in the hybrid operation theater for cardiac surgery.3. Catheter treatments for strokes, aneurysm and Arteriovenous Malformation (AVM) will be performed.4. Patient friendly accessible facility design will enhance the satisfaction of patients under rehabilitation and wheelchair users. |
|---|

⁹ Stroke can be categorized into 1) Intracerebral Hemorrhage, 2) Cerebral Infarction and 3) Subarachnoid Hemorrhage. Cerebral infarction will require MRI examination, although hemorrhage can be diagnosed by CT scanner.

Appendices

1. Member List of the Survey Team
2. Survey Schedule
3. List of Parties Concerned in the Recipient Country
4. Minutes of Discussions
5. Soft Component (Technical Assistance) Plan
6. Other Relevant Data
7. References

1. Member List of the Survey Team

Member List of the Study Team

(1) Field Survey I (Jul.5~Aug.1, 2015)

Name	Post	Period of Stay	Organization
Ms. ONO Hiroe	Team Leader	Jul.5~Jul.18	Director, Health Team 4 Human Development Department JICA
Ms. ONO Tomoko	Cooperation Planning	Jul.5~Jul.18	Assistant Director, Health Team 4 Human Development Department JICA
Mr. ISONO Mitsuo	Advisor for Medical Services	Jul.5~Jul.18	Special Advisor JICA
Ms. HOSHIAI Chiharu	Cooperation Planning	Jul.11~Jul.17	Southeast Asia Division 4 Southeast Asia and Pacific Department JICA
Mr. KAKEHI Atsuo	Advisor for Architectural Planning	Jul.26~Jul.29	Professor Department of Architectural Design Kogakuin University
Mr. TSUMOTO Tadayoshi	Chief Consultant / Architectural Planning	Jul.8~Jul.29	Yamashita Sekkei Inc.
Mr. OHTA Yosuke	Architectural Design 1	Jul.12~Aug.1	Azusa Sekkei Co., Ltd
Mr. NISHIKAWA Kohei	Architectural Design 2	Jul.14~Jul.20	Yamashita Sekkei Inc.
Mr. YAMAMOTO Eisuke	Structural Design	Jul.8~Jul.28	Yamashita Sekkei Inc.
Mr. SUKEGAWA Somei	Electrical Design	Jul.12~Aug.1	Azusa Sekkei Co., Ltd
Mr. SHIMOSE Tetsuro	Mechanical Design	Jul.12~Aug.1	Azusa Sekkei Co., Ltd
Mr. MATSUMOTO Yasuhiro	Deputy Chief Consultant / Construction Planning	Jul.8~Jul.28	Azusa Sekkei Co., Ltd
Ms. ASANUMA Yasuko	Equipment Planning	Jul.8~Jul.28	Binko International Ltd.
Mr. KAYANO Naoki	Equipment Procurement / Cost Estimate	Jul.12~Jul.25	Binko International Ltd.
Ms. OKITSU Akiko	Health Planning	Jul.8~Jul.28	TAC International Inc.

(2) Field Survey II (Sep.6~Oct.10, 2015)

Name	Post	Period of Stay	Organization
Ms. ONO Hiroe	Team Leader	Sep.6~Sep.12	Director, Health Team 4 Human Development Department JICA
Ms. ONO Tomoko	Cooperation Planning	Sep.6~Sep.12	Assistant Director, Health Team 4 Human Development Department JICA
Mr. ISONO Mitsuo	Advisor for Medical Services	Sep.6~Sep.12	Senior Advisor JICA
Mr. YAMADA Osamu	Advisor for Construction	Sep.6~Sep.12	Senior Advisor JICA
Mr. KAKEHI Atsuo	Advisor for Architectural Planning	Sep.6~Sep.10	Professor Department of Architectural Design Kogakuin University
Mr. TSUMOTO Tadayoshi	Chief Consultant / Architectural Planning	Sep.6~Sep.26	Yamashita Sekkei Inc.
Mr. OHTA Yosuke	Architectural Design 1	Sep.6~Oct.10	Azusa Sekkei Co., Ltd
Mr. NISHIKAWA Kohei	Architectural Design 2	Sep.6~Sep.26	Yamashita Sekkei Inc.
Ms. KOBAYASHI Yuka	Structural Design	Sep.13~Oct.3	Yamashita Sekkei Inc.
Mr. SUKEGAWA Somei	Electrical Design	Sep.13~Oct.3	Azusa Sekkei Co., Ltd
Mr. TANADA Ryo	Mechanical Design	Sep.13~Sep.26	Azusa Sekkei Co., Ltd
Mr. MATSUMOTO Yasuhiro	Deputy Chief Consultant / Construction Planning	Sep.6~Oct.10	Azusa Sekkei Co., Ltd
Ms. ASANUMA Yasuko	Equipment Planning	Sep.6~Oct.7	Binko International Ltd.
Mr. KAYANO Naoki	Equipment Procurement / Cost Estimate	Sep.13~Oct.10	Binko International Ltd.
Ms. OKITSU Akiko	Health Planning	Sep.6~Sep.19	TAC International Inc.

(3) Field Survey III (Jul.2~Jul.22, 2017)

Name	Post	Period of Stay	Company name
Mr. KIKUCHI Taro	Team Leader	Jul.2~Jul.8	Director, Health Team 4 Human Development Department JICA
Ms. IBI Tomomi	Cooperation Planning	Jul.2~Jul.8	Deputy Director, Health Team 4 Human Development Department JICA
Mr. ISONO Mitsuo	Advisor for Medical Services	Jul.10~Jul.15	Senior Advisor JICA
Mr. KAKEHI Atsuo	Advisor for Architectural Planning	Jul.2~Jul.4	Professor Department of Architectural Design Kogakuin University
Mr. TSUMOTO Tadayoshi	Chief Consultant / Architectural Planning	Jul.2~Jul.22	Yamashita Sekkei Inc.
Mr. SHIBATA Hiroshi	Architectural Design 1	Jul.2~Jul.12	Yamashita Sekkei Inc.
Mr. NISHIKAWA Kohei	Architectural Design 2	Jul.2~Jul.22	Yamashita Sekkei Inc.
Mr. YAMAMOTO Eisuke	Structural Design	Jul.2~Jul.15	Yamashita Sekkei Inc.
Mr. SUKEGAWA Somei	Electrical Design	Jul.9~Jul.18	Azusa Sekkei Co., Ltd
Mr. CHIBA Akira	Mechanical Design	Jul.11~Jul.16	Azusa Sekkei Co., Ltd
Mr. MATSUMOTO Yasuhiro	Deputy Chief Consultant / Construction Planning	Jul.2~Jul.22	Azusa Sekkei Co., Ltd
Ms. ASANUMA Yasuko	Equipment Planning	Jul.2~Jul.15 Jul.20~Jul.22	Binko International Ltd.
Mr. KAYANO Naoki	Equipment Procurement / Cost Estimate	Jul.2~Jul.22	Binko International Ltd.
Ms. OKITSU Akiko	Health Planning	Jul.2~Jul.8	TAC International Inc.

(4) Field Survey IV (Nov.26~Dec.2, 2017)

Name	Post	Period of Stay	Company name
Ms. IBI Tomomi	Team Leader	Nov.26~Dec.2	Senior Deputy Director, Health Team 4 Human Development Department JICA
Mr. TSUMOTO Tadayoshi	Chief Consultant / Architectural Planning	Nov.26~Dec.2	Yamashita Sekkei Inc.
Mr. MATSUMOTO Yasuhiro	Deputy Chief Consultant / Construction Planning	Nov.26~Dec.2	Azusa Sekkei Co., Ltd
Ms. ASANUMA Yasuko	Equipment Planning	Nov.26~Dec.2	Binko International Ltd.

2. Survey Schedule

Field Survey I (Jul.5~Aug.1, 2015)

	Date		JICA Officials				Advisor	1	2	3	4	5	6	7	8	9	10													
			Team Leader	Cooperation Planning	Cooperation Planning	Advisor Medical services	Advisor Architectural Planning	Chief Consultant / Architectural Planning	Architectural Design	Architectural Design	Structural Design	Electrical Design	Mechanical Design	Deputy Chief Consultant / Construction Planning	Equipment Planning	Equipment Procurement / Cost Estimate	Health Planning													
			Ms. ONO Hiroe	Ms. ONO Tomoko	Ms. HOSHIAI Chiharu	Mr. ISONO Mitsuo	Mr. KAKEHI Atsuo	Mr. TSUMOTO Tadayoshi	Mr. OHTA Yosuke	Mr. NISHIKAWA Kohei	Ms. YAMAMOTO Eisuke	Mr. SUKEGAWA Somei	Mr. SHIMOSE Tetsuro	Mr. MATSUMOTO Yasuhiko	Ms. ASANUMA Yasuko	Mr. KAYANO Naoki	Ms. OKITSU Akiko													
1	Jul.5	Sun	NRT→YGN																											
2	Jul.6	Mon	JICA Office																NRT→YGN	Survey of similar facilities	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team	Meeting with team	NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team
3	Jul.7	Tue	YGN→NPT																											
4	Jul.8	Wed	Greeting with MOH								NRT→YGN				Survey of similar facilities	Discussion with YGH		Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team						
5	Jul.9	Thu	Meeting with team																						NRT→YGN	Survey of similar facilities	Discussion with YGH	Meeting with team	NRT→YGN	Meeting with team
6	Jul.10	Fri	Discussion with MOH								NRT→YGN				Survey of similar facilities	Discussion with YGH		Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team						
7	Jul.11	Sat	NPT→YGN Meeting with team			NRT→YGN											Survey of similar facilities								Discussion with YGH	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey
8	Jul.12	Sun	Meeting with team						NRT→YGN		Meeting with team	NRT→YGN		Meeting with team	Discussion with YGH	Equipment market survey		YGN→NPT Discussion with MOH	NPT→YGN Meeting with team											
9	Jul.13	Mon	Discussion with YGH																	NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team			
10	Jul.14	Tue	Discussion with YGH						NRT→YGN	Meeting with team	NRT→YGN	Meeting with team		Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH		NPT→YGN Meeting with team												
11	Jul.15	Wed	Discussion with YGH																NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team				
12	Jul.16	Thu	YGN→NPT Report to MOH, Sign of Minute		YGN→	Discussion with YGH			NRT→YGN	Meeting with team	NRT→YGN	Meeting with team		Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH		NPT→YGN Meeting with team												
13	Jul.17	Fri	NPT→YGN Report to EOJ and JICA office		→NRT	YGN→													NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team				
14	Jul.18	Sat	→NRT		→NRT				NRT→YGN	Meeting with team	NRT→YGN	Meeting with team		Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH		NPT→YGN Meeting with team												
15	Jul.19	Sun																	NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team				
16	Jul.20	Mon							NRT→YGN	Meeting with team	NRT→YGN	Meeting with team		Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH		NPT→YGN Meeting with team												
17	Jul.21	Tue																	NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team				
18	Jul.22	Wed							NRT→YGN	Meeting with team	NRT→YGN	Meeting with team		Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH		NPT→YGN Meeting with team												
19	Jul.23	Thu																	NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team				
20	Jul.24	Fri							NRT→YGN	Meeting with team	NRT→YGN	Meeting with team		Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH		NPT→YGN Meeting with team												
21	Jul.25	Sat																	NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team				
22	Jul.26	Sun							NRT→YGN	Meeting with team	NRT→YGN	Meeting with team		Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH		NPT→YGN Meeting with team												
23	Jul.27	Mon																	NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team				
24	Jul.28	Tue							NRT→YGN	Meeting with team	NRT→YGN	Meeting with team		Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH		NPT→YGN Meeting with team												
25	Jul.29	Wed																	NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team				
26	Jul.30	Thu							NRT→YGN	Meeting with team	NRT→YGN	Meeting with team		Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH		NPT→YGN Meeting with team												
27	Aug.1	Fri																	NRT→YGN	Meeting with team	NRT→YGN	Meeting with team	Discussion with YGH	Equipment market survey	YGN→NPT Discussion with MOH	NPT→YGN Meeting with team				

Field Survey II (Sep.6~Oct.10, 2015)

			JICA Officials				Advisor	1	2	3	4	5	6	7	8	9	10						
			Team Leader	Cooperation Planning	Advisor Medical Services	Advisor Construction	Advisor Architectural Planning	Chief Consultant / Architectural Planning	Architectural Design	Architectural Design	Structural Design	Electrical Design	Mechanical Design	Deputy Chief Consultant / Construction Planning	Equipment Planning	Equipment Procurement / Cost Estimate	Health Planning						
			Ms. ONO Hiroe	Ms. ONO Tomoko	Mr. ISONO Mitsuo	Mr. YAMADA Osamu	Mr. KAKEHI Atsuo	Mr. TSUMOTO Tadayoshi	Mr. OHTA Yosuke	Mr. NISHIKAWA Kohei	Ms. KOBAYASHI Yuka	Mr. SUKEGAWA Somei	Mr. TANADA Ryo	Mr. MATSUMOTO Yasuhiro	Ms. ASANUMA Yasuko	Mr. KAYANO Naoki	Ms. OKITSU Akiko						
1	Sep.5	Sat																					
2	Sep.6	Sun	NRT→YGN			NRT→YGN	NRT→YGN	Foreign country→YGN	NRT→YGN	NRT→YGN				NRT→YGN	NRT→YGN		FUK→YGN						
3	Sep.7	Mon	Meeting with team						Site survey	Architectural Planning				Meeting with team			Meeting with team						
4	Sep.8	Tue	Discussion with YGH/PMU												Discussion with YGH/PMU			Discussion with YGH/PMU					
5	Sep.9	Wed	YGN→NPT Presentation to MOH/ Sign of Minute		YGN→NPT Presentation to MOH/ Sign of Minute NPT→YGN		YGN→NPT Presentation to MOH NPT→YGN→	YGN→NPT Presentation to MOH/Sign of Minute	Survey of natural conditions	Architectural Planning				YGN→NPT Presentation to MOH/ Sign of Minute			YGN→NPT Presentation to MOH/Sign of Minute						
6	Sep.10	Thu	Meeting with team		Meeting with team		→NRT	Meeting with team	Discussion with YGH	Architectural Planning				Meeting with team			Meeting with team						
7	Sep.11	Fri	NPT→YGN Report to EOJ, JICA (YGN→)			NPT→YGN Report to EOJ, JICA (YGN→)			NPT→YGN Report to EOJ,JICA	Survey of building regulation	Survey of NYGH, YGH and Site			NPT→YGN Report to EOJ,JICA			NPT→YGN Report to JICA						
8	Sep.12	Sat	→NRT		Bangkok→ Foreign country	→NRT		Meeting with team	Architectural Planning	Architectural Planning				Meeting with team			Meeting with team						
9	Sep.13	Sun						Meeting with team			NRT→YGN	NRT→YGN	NRT→YGN	Meeting with team	YGN→ Foreign country	NRT→YGN	Meeting with team						
10	Sep.14	Mon						Architectural Planning	Discussion with YGH	Architectural Planning		Survey of infrastructure		Discussion with YGH	Foreign country	Discussion with CMSD	Survey of hospital organization						
11	Sep.15	Tue						Architectural Planning	Discussion with YGH	Architectural Planning		Survey of building information		Discussion with YGH	Foreign country	Survey of local agencies	Survey of hospital organization						
12	Sep.16	Wed						Presentation to YGH											Foreign country→YGN	Presentation to YGH			
13	Sep.17	Thu						Architectural Planning				Survey of YGH				Discussion with YGH	Survey of YGH Survey of local agencies			Survey of budget			
14	Sep.18	Fri						Discussion with YGH				Survey of YGH				Meeting with YGH			Preparation for report YGN→				
15	Sep.19	Sat						Architectural Planning				Survey of YGH				Preparation for report	Survey of local agencies			→FUK			
16	Sep.20	Sun						Meeting with team															
17	Sep.21	Mon						Architectural Planning				Survey of national conditions		Survey of YGH		Suevey of construction market		Survey of YGH Survey of local agencies					
18	Sep.22	Tue						YGN→NPT Report to MOH	Preparation for report	Architectural Planning	Survey of national conditions		YGH調査	Survey of national conditions		YGN→NPT Report to MOH		Survey of local agencies					
19	Sep.23	Wed						NPT→YGN		Discussion with fire department							NPT→YGN		NPT→YGN	Survey of local agencies			
20	Sep.24	Thu						Architectural Planning				Survey of YGH				Survey of construction market		Survey of YGH Survey of local agencies					
21	Sep.25	Fri						Survey of underground object YGN→		Survey of underground objects										Survey of local agencies			
22	Sep.26	Sat						→NRT		Survey of construction material		→NRT		Survey of construction material	Architectural Planning	→NRT		Survey of construction material	Survey of local agencies				
23	Sep.27	Sun																	Meeting with team				
24	9月28日	月																	Meeting with team Report to JICA Discussion with YCDC Preparation for report Survey of YGH	Report to JICA		Survey of CMSD Survey of local agencies	
25	9月29日	火																		Discussion with YCDC		Survey of local agencies	
26	9月30日	水																		Preparation for report		Survey of unit price Survey of local agencies	
27	10月1日	木																		Survey of YGH		Survey of YGH Survey of local agencies	
28	10月2日	金																	Survey of local material	Site survey	Preparation for report	Survey of local material Survey of local agencies	
29	10月3日	土	Preparation for report	→NRT	→NRT	Preparation for report																	
30	10月4日	日	Meeting with team	Meeting with team																			
31	10月5日	月	Preparation for report	Survey of unit price	Survey of similar facilities Survey of local agencies																		
32	10月6日	火	Survey of YGH Survey of local materials	Survey of unit price	Survey of local agencies																		
33	10月7日	水	Survey of YGH Survey of local materials	Survey of unit price	→NRT		Survey of local agencies																
34	10月8日	木	Survey of YGH	Survey of unit price	Survey of local agencies																		
35	10月9日	金	Survey of local companies YGN→	Survey of local companies YGN→	Survey of local agencies YGN→																		
36	10月10日	土	→NRT	→NRT	→NRT																		
37	10月11日	日																					

Field Survey III (Jul.2~Jul.22, 2017)

	Date		JICA Officials			Advisor	1	2	3	4	5	6	7	8	9	10		
			Team Leader	Cooperation Planning	Advisor Medical Services	Advisor Architectural Planning	Chief Consultant / Architectural Planning	Architectural Design	Architectural Design	Structural Design	Electrical Design	Mechanical Design	Deputy Chief Consultant / Construction Planning	Equipment Planning	Equipment Procurement/ Cost Estimate	Health Planning		
			Mr. KIKUCHI Taro	Ms. IBI Tomomi	Mr. ISONO Mitsuo	Mr. KAKEHI Atsuo	Mr. TSUMOTO Tadayoshi	Mr. SHIBATA Hiroshi	Mr. NISHIKAWA Kohel	Mr. YAMAMOTO Eisuke	Mr. SUKEGAWA Somei	Mr. CHIBA Akira	Mr. Matsumoto Yasuhiro	Ms. ASANUMA Yasuko	Mr. KAYANO Naoki	Ms. OKITSU Akiko		
1	Jul.2	Sun	NRT→YGN	NRT→YGN		NRT→YGN	NRT→YGN	NRT→YGN	NRT→YGN			NRT→YGN	NRT→YGN	NRT→YGN	NRT→YGN	FUK→YGN		
2	Jul.3	Mon	YGN→NPT Discussion with MOHS NPT→YGN			Discussion with YGH Architectural Planning YGN→	YGN→NPT Discussion with MOHS NPT→YGN	Discussion with YGH Architectural Planning				Discussion with YGH Architectural Planning	Discussion with YGH					
3	Jul.4	Tue	Discussion with YGH/UM1				→NRT	Discussion with YGH/UM1					Discussion with YGH/UM1					
4	Jul.5	Wed	Preparation for Minute of Meeting			Preparation for Minute of Meeting	Architectural Planning Discussion with YCDC			Survey of construction market Discussion with YCDC		Discussion with YGH						
5	Jul.6	Thu	Preparation for Minute of Meeting				YGN→NPT Presentation to MOH/Sign of Minute of Meeting NPT→YGN Discussion with YGH/UM1	Architectural Planning Discussion with YGH/UM1				Preparation for Minute of Meeting	Visit to National Blood Bank Center Preparation for Minute of Meeting	Visit to Parkway Hospital, Banrangrad Hospital, Bangkok Hospital				
6	Jul.7	Fri	YGN→NPT Presentation to MOH / Sign of Minute of Meeting NPT→YGN→					Architectural Planning Discussion with YGH/UM1					YGN→NPT Presentation to MOH/Sign of Minute of Meeting NPT→YGN Discussion with YGH/UM1	Visit to YGH, North Okalap Hospital Discussion with YGH/UM1	Visit to YGH, North Okalap Hospital Discussion with YGH/UM1 YGN→			
7	Jul.8	Sat	→NRT			Meeting with team			NRT→YGN	Meeting with team				→FUK				
8	Jul.9	Sun				NRT→YGN	Meeting with team			Electrical Design		Meeting with team			Survey of construction market	Discussion with YGH Survey of health information		
9	Jul.10	Mon			Architectural Planning			Electrical Design	Architectural Planning			NRT→YGN						
10	Jul.11	Tue			Architectural Planning		Architectural Planning YGN→		Architectural Planning		Electrical Design		NRT→YGN	Discussion with YGH				Discussion with YGH Discussion with YSH
11	7月12日	水			Discussion with YGH		Discussion with fire department Discussion with Power supply company	→NRT	Discussion with fire department Visit to YSH	Discussion with fire department Discussion with Power supply company			Discussion with fire department Visit to YSH	Visit to North Okalap Hospital				
12	7月13日	木			Discussion with YGH		Discussion with YGH Discussion with YCDC	Discussion with YGH/UM1	Architectural Planning Discussion with YCDC	Survey of Infrastructure Discussion with YCDC			Discussion with YGH Discussion with YCDC	Discussion with CMSD Survey of local agencies				
13	7月14日	金			Discussion with YGH/UM1 YGN→		Discussion with YGH/UM1		Discussion with YGH/UM1 YGN→	Discussion with YGH/UM1								
14	7月15日	土			→NRT		Survey of Construction market		Survey of Construction market	→NRT	Meeting with team	Meeting with team YGN→	Survey of Construction market	Meeting with team				
15	7月16日	日							Meeting with team	Meeting with team		Meeting with team	→NRT	Survey of Construction market				DGH Project
16	7月17日	月	Architectural Planning	Architectural Planning		Electrical Design YGN→			Survey of Construction market			DGH Project	Discussion with YGH					
17	7月18日	火	Preparation for Technical Note	Preparation for Technical Note		→NRT			Survey of Construction market			DGH Project	Discussion with YGH Survey of local agencies					
18	7月19日	水	YGN→NPT	Architectural Planning					YGN→NPT	DGH Project	Survey of equipment price							
19	7月20日	木	Discussion with MOHS Sign of Technical Note NPT→YGN	Architectural Planning					Discussion with MOHS Sign of Technical Note NPT→YGN	Discussion with MOHS Sign of Technical Note	Survey of local agencies							
20	7月21日	金	Report to JICA YGN→	Report to JICA YGN→					Report to JICA YGN→	NPT→YGN Report to JICA YGN→	Report to JICA YGN→							
21	7月22日	土	→NRT	→NRT		→NRT												

Field Survey IV (Nov.26~Dec.2, 2017)

	Date		JICA Official	1	2	3
			Cooperation Planning	Chief Consultant/ Architectural Planning	Deputy Chief Consultant/ Construction Planning	Equipment Planning
			Ms. IBI Tomomi	Mr. TSUMOTO Tadayoshi	Mr. MATSUMOTO Yasuhiro	Ms. ASANUMA Yasuko
1	Nov.26	Sun	NRT→ YGN			
2	Nov.27	Mon	Discussion with YGH/UM1 Survey of Targeted four department of YGH			
3	Nov.28	Tue	YGN⇒NPT Discussion with MOH			
4	Nov.29	Wed	Discussion about Minute of Meeting			
5	Nov.30	Thu	Sign of Minute of Meeting NPT⇒YGN			
6	Dec.1	Fri	Report to JICA YGN⇒NRT			
7	Dec.2	Sat	⇒NRT			

3. List of Parties Concerned in the Recipient Country

List of Parties Concerned in the Recipient Country

Organization	Name	Position
Ministry of Health and Sports		
Yangon Cluster	Dr. Hla Myint	General Manager of Hospital Division
Department of Medical Services	Prof. Dr. Myint Han	Director General
	Dr. Moe Khaing	Director
	Dr. Kyi Soe	Director
	Dr. Than Naing Htut	Assistant Director
	U Min Oo	Assistant Director
	Dr. Ywel Nu Nu Khin	Deputy Chief of Medical Department
Department of Medical Research	Dr. Kyaw Zin Thant	Director General
	Dr. Hlaing Myat Thu	Deputy Director General
	Dr. Khin Phyu Phyu	Chief
	Dr. Win Maw Tun	Staff of Development Department
	Dr. Moh Moh Ktun	Chief of Biomedical Department
Department of Human Resource of Health	New New Khin	Head Nurse
Department of Human Resource and	Prof. Dr. Tin Tun	Chief
Yangon General Hospital		
	Dr. Aye Ko Ko	Medical Superintendent (2015~2016)
	Dr. Khin Theingi Myint	Medical Superintendent (2017~)
	Dr. Myint Myint Aye	Chief of Second Senior Medical Department
		Deputy Medical Superintendent
Neuro medicine	Prof. Win Min Thit	Professor, Chief
	Dr. Seinn Mya Mya Aye	Associate Professor, Consultant
	Dr. Saw Oo	Associate Professor, Consultant
	Dr. Ohnmar	Consultant
		Consultant
Neurosurgery	Dr. Myat Thu	Professor of University of Medicine 1, Yangon
	Prof. Win Myaing	Professor of University of Medicine 2, Yangon
	Dr. Sein Mya Mya Aye	Consultant
Cardiology	Prof. Nwe New	Professor, Chief
Cardiac surgery	Prof. Khin Mgleoin	Professor, Chief
	Dr. Soe Paring	Senior Consultant
Diagnostic Imaging Department	Prof. Than Than Sint	Professor, Chief
	Dr. Pho Wai Win	Assistant of Medical Superintendent
	Dr. Myat Thu	Professor
	Dr. Win Myaing	Professor
	Dr. Kyawya Aung	Associate Professor
	Dr. Kyi Hlaing	Associate Professor
	Dr. Mg Mg Aung	Consultant
	Dr. Myo Myint Maw	Associate Professor
	Dr. Aung Cho Tun	Associate Professor
	Prof. Khin Lay Su	Professor
	Dr. Wai Wai Htun	Consultant
	Dr. Nam Bwar Bwar	Consultant
Rheumatology	Dr. Sandar Oo	Senior Consultant
Emergency	Dr. Khin Than Mon	Deputy Chief
Anesthesiology	Dr. Aung Htet	Associate Professor
Outpatient Department	Dr. Yan Myo Kyaw	Assistant of Medical Superintendent
Pathology	Dr. Khwar Nyo Zin	Senior Consultant of Microbiology
	Dr. Min Zaw Thw	Consultant
	Prof. Cho Cho Nyunt	Professor
Pharmacy	Dr. Myat Than Htike	Pharmacist
	Dr. Myo Myo Aye	Pharmacist
	Dr. Thin Khwarnyo Oo	Pharmacist
	Dr. Ei Phyu Phyu Ag	Pharmacist
	Dr. Htoo Htoo Lwin	Pharmacist

Rehabilitation	Dr. Khin Myo Hla	Professor
	Dr. Myo Thuzar Lehin	Consultant
Forensic	Prof. Dr. Myo Thaik Oo	Chief
Administration	Dr. Khin Theingi Myint	Assistant
	Dr. Kyaw Htike Oo	Assistant
Yangon Specialist Hospital		
	Dr.Than Htut	Chief of Medical Department
	Dr. Kyaw Swar Lwin	Deputy Chief of Medical Department
	Dr. Myo Thet Tin	Senior Consultant of Pathology
Nephrology	Dr. Khin Khin Win	Senior Consultant
	Dr. Win Win Hlaing	Senior Consultant
Pathology	Dr. Myo Thet Tin	Senior Consultant
New Yangon General Hospital		
	Dr. Khin Phyu win	Chief of Medical Department
	Dr. AyeThwin	Deputy Chief of Medical Department
	Dr.Tint Khine	Deputy Chief of Medical Department
University of Medicine 1, Yangon		
	Prof. Zaw Wai Soe	Rector
Yangon Nursing University		
	Prof.Myat Thandar	Rector
Yangon Pediatric Hospital		
	Dr. Aung Tun Oo	Deputy Medical Superintendent
	Dr. Khin	Chief of Medical Management
	Theingi Myint	
Yankin Pediatric Hospital		
	Ms. Aye Aye Aye	Anesthesiologist
Yangon Central Woman Hospital		
	Dr. Aye Aye Kwin	Senior Consultant
	Prof. Yin Yin Soe	Professor
	Dr. Papa	Chief of Medical Department
	Mr. Myo Chit	Electrical Engineer
North Okkalapa Hospital		
	Dr. Than Htut Oo	Medical Superintendent
Asia Royal Hospital		
	Ms. TOE TOE	Radiologist
	Mr. Khin Mang Tin	Radiologist
Parami General Hospital		
	Dr. Olivier Cattin M.D.	Consultant
Victoria Hospital		
	Dr. Kyaw MinThu	
National Blood Center		
	Dr. Thida Aung	Associate Professor
Ministry of Home Affair		
Myanmar Fire Department	U Kyaw Thura	Chief
	U Kyi Win	Chief
	U Aung Swe Win	Deputy Chief
	U Myint Soe	Deputy Chief
	Ye Min Thway, Myient Tum	Deputy Chief
	Fhwe Ba	Deputy Chief
	U Win Win	Assistant Director
	U Myint Oo	Assistant Director
	Daw Thein Kyi	Assistant Director
	Awg Myint Sure	Assistant Director
	Sai Ohn Kyau	Electrical and Mechanical Engineer
	Hla su Myant	Architectural Consultant
	Nay Win Thein	Civil Consultant
	Zon Pan Lwin	Engineer
	Tin Yu Yu Hlang	Engineer
	San Thaw Tae Wai	Engineer

	Thinzar Yheinf	Engineer
	The Su Laf Win (Engineer)	Engineer
Yangon Fire Station	Tnaw Dar	Deputy Chief
Yangon City Development Committee		
	Kyaw Thar Sein	Deputy Chief of Examination Department
	Zaw Win	Deputy Chief of Construction Department
Engineer Department (Architecture)	Nay Win	Deputy Chief of Permission Department
Engineer Department (Architecture)	Tin Tin Kyi	Assistant Chief Engineer
	Maw Maw Kyi	Assistant Chief Engineer
	Than Than Hlay	Executive Engineer
	Mar Mar Cho	Executive Engineer
Environmental Public Cleaning Bureau	U Saw Win Maung	Deputy Chief
Environmental Public Cleaning Bureau	Aung Myint Maw	Assistant Chief Engineer
Engineer Department (Supply)	Mr. Kyaw Naing Soe	Assistant Engineer
Engineer Department (Architecture)	Mr. Nay Win	Deputy Chief Engineer
	Ms. Win Yu New	Management Engineer
Engineer Department (Supply)	Ms. Si Si Win	Township Engineer
Pollution Management Department	Mr. Aung Myint Maw	Assistant Chief Engineer
Cooperation Department	Dr. Yu Yu Win Maung	Assistant Engineer
Yangon Electric Supply Corporation		
	Mr. Aye Aye Mon	Electrical Engineer
	Mr. Than Win Aung	Electrical Engineer
Central Medicine Management		
	Dr. Aung Gyi Maung	Chief (Management of Medicine)
National Health Network		
	Dr. Tin Myo Win	Surgeon
Referral Office		
	Dr. Khaing Pann Wut Yee,	Country Manager, Parkway Hospital,

4. Minutes of Discussions

(1) Field Survey I

Minutes of Discussions
on the First Preparatory Survey for the Project for
Construction of New Yangon Specialist Hospital

Based on the several preliminary discussions between the Government of The Republic of the Union of Myanmar (hereinafter referred to as “Myanmar”) and Embassy of Japan and JICA, the Government of Japan decided to conduct Preparatory Survey for the Project for Construction of New Yangon Specialist Hospital (hereinafter referred to as “the Project”), and entrusted the Preparatory Survey to Japan International Cooperation Agency (hereinafter referred to as “JICA”).

JICA sent the First Preparatory Survey Team for the Outline Design (hereinafter referred to as “the Team”) to Myanmar, headed by Ms. Hiroe Ono, Director of Health Division 4, Human Development Department, JICA, and scheduled to stay in the country from 5th July to 31st July, 2015.

The Team held a series of discussions with the officials concerned from Government of The Republic of the Union of Myanmar and conducted a field survey in the Project site. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Nay Pyi Taw, 16th July, 2015



Ms. Hiroe Ono

Leader

Preparatory Survey Team

Japan International Cooperation Agency

Japan



Prof. Myint Han

Director General

Department of Medical Services

Ministry of Health

The Republic of the Union of Myanmar

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve patient-centered medical services for cerebral and cardiovascular diseases by establishing a new specialist hospital with teaching and research functions, through relocation of the selected medical functions from the Yangon General Hospital.

2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as “the Preparatory Survey for the Project for Construction of New Yangon Specialist Hospital”.

3. Project Site

3-1 The Myanmar side shall provide the documents of property of the proposed Project site in Lanmataw Township with indication of site boundaries as soon as possible.

3-2 The team has proposed that the site of the Project to be the northern part of the allotted land in Lanmataw Township. The location of the site is shown in Annex 1. This site is proposed for the following reasons:

- Ease of patient transfer/coordinated care with 500 bedded Yangon Specialist Hospital for patients with complications
- Residents living in the southern part of the allotted land

3-3 The Myanmar side proposed that the project site will be half of the space between the University of Nursing and New Yangon General Hospital and the proposed location of New Yangon Specialist Hospital by JICA team will be considered and decided by Ministry of Health. Department of Medical Services will inform JICA about the location of the project site by 24th July, 2015, and shall clear the Project site by demolishing all existing buildings, pavements, trees and underground objects, if any, by the implementation of the Project.

4. Line Agency and the Project Management Unit

Both sides confirmed the line agency and the Project Management Unit (PMU) as follows:

4-1. The line agency is Department of Medical Services, Ministry of Health, which would be the agency to supervise the PMU.

4-2. The PMU is headed by the Hospitals Chief Executive, Yangon Cluster, and its members include Medical Superintendents of Yangon General Hospital, New Yangon General Hospital, and 500 bedded Yangon Specialist Hospital, and Professors of cardiology, cardiac surgery, neuro medicine and neurosurgery of Yangon General Hospital. The PMU is established within Yangon General Hospital and shall coordinate with all the relevant agencies to ensure smooth

implementation of the preparatory survey and the Project, and ensure that the undertakings are taken by relevant agencies properly and on time.

4-3. Additional members of PMU in charge of construction and designing New Yangon Specialist Hospital will be nominated by Department of Medical Services.

5. Items requested by the Government of Myanmar

5-1. As a result of discussions, both sides confirmed the Project concept (described in Annex 2) and the items requested by the Government of Myanmar are as follows:

- Medical services to be provided in New Yangon Specialist Hospital are as follows:
 - Cardiology and Cardiac surgery: New Yangon Specialist Hospital would be responsible for chronic and referral cases and scheduled treatment/surgery, as major function for emergency cases would remain in Yangon General Hospital.
 - Neuro Medicine: all functions to be moved to New Yangon Specialist Hospital, due to limited number of specialist
 - Neurosurgery: all functions, including tumor cases will be moved to New Yangon Specialist Hospital. However, major functions for injury cases will remain in Yangon General Hospital.
- Major equipment to be included in the Project will be proposed by Myanmar side by 31st July, 2015.

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

6. Japanese Grant Scheme

The Myanmar side understands the Japanese Grant Scheme and its procedures as described Annex 3, 4 and 5 and necessary measures to be taken by the Government of Myanmar for smooth implementation of the Project, as a condition for the Japanese Grant to be implemented. The detailed contents of the Annex 6 will be worked out during the survey and shall be agreed at the time of the explanation of the draft Preparatory Survey Report.

The contents of Annex 6 will be used to determine the following:

- (1) The scope of the Project.
- (2) The timing of the Project implementation.

Contents of Annex 6 will be updated as the Preparatory Survey progresses, and will finally be the Attachment to the Grant Agreement.

7. Schedule of the Survey

7-1. The Team will proceed with preparatory survey in Myanmar until 31st July, 2015 and return to

Myanmar to continue the survey from September to October, 2015.

- 7-2. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Myanmar in order to explain its contents around February, 2016.
- 7-3. If the contents of the draft Preparatory Survey Report is accepted in principle and the undertakings are fully agreed by the Myanmar side, JICA will complete the final report in English and send it to Myanmar around May, 2016.
- 7-4. The above schedule is tentative and subject to change.

8. Environmental and Social Considerations

- 8-1. The Myanmar side confirmed to give due environmental and social considerations during implementation of the Project and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).
- 8-2. The Myanmar side shall confirm the necessary procedures concerning the environmental assessment based on draft guidelines of Initial Environmental Examination (IEE) and Environment Impact Assessment (EIA) under Environment Conservation Law. If applicable, the Myanmar side shall take necessary measures to obtain environmental license before the implementation of the Project and report to JICA Myanmar office.

9. Other Relevant Issues

- 9-1 The Myanmar side agreed to obtain that development/planning permit for construction of New Yangon Specialist Hospital from Yangon City Development Committee (YCDC) by the end of 2015.

9-2 Human Resource

Ministry of Health agreed to provide staff recruitment plan with time schedule by February 2016. The Japanese side will provide the estimated number of necessary medical/paramedical staff for New Yangon Specialist Hospital in September, 2015.

9-3. Questionnaire

The Myanmar side agreed that the following information shall be provided to the Team by 31st July, 2015.

- National policy for Non-Communicable Diseases control and strategies for cerebral and cardiovascular diseases, if any
- Morbidity and mortality rate for cerebral and cardiovascular diseases in Myanmar for the last 10 years
- Current number of health workforce and human resource development plan: physicians (especially for consultants for the cardiology, cardiac surgery, neuro medicine and neurosurgery departments), nurses, other co-medicals and technicians.
- Revenue and expenditure in total and breakdowns of Yangon General Hospital in the last 5 years.

- List of hospitals with specialized services for cardiology, cardiac surgery, neuro medicine and neurosurgery
- Master plan of Yangon General Hospital when it is available



Annex 1 Project Site

Annex 2 Project Concept

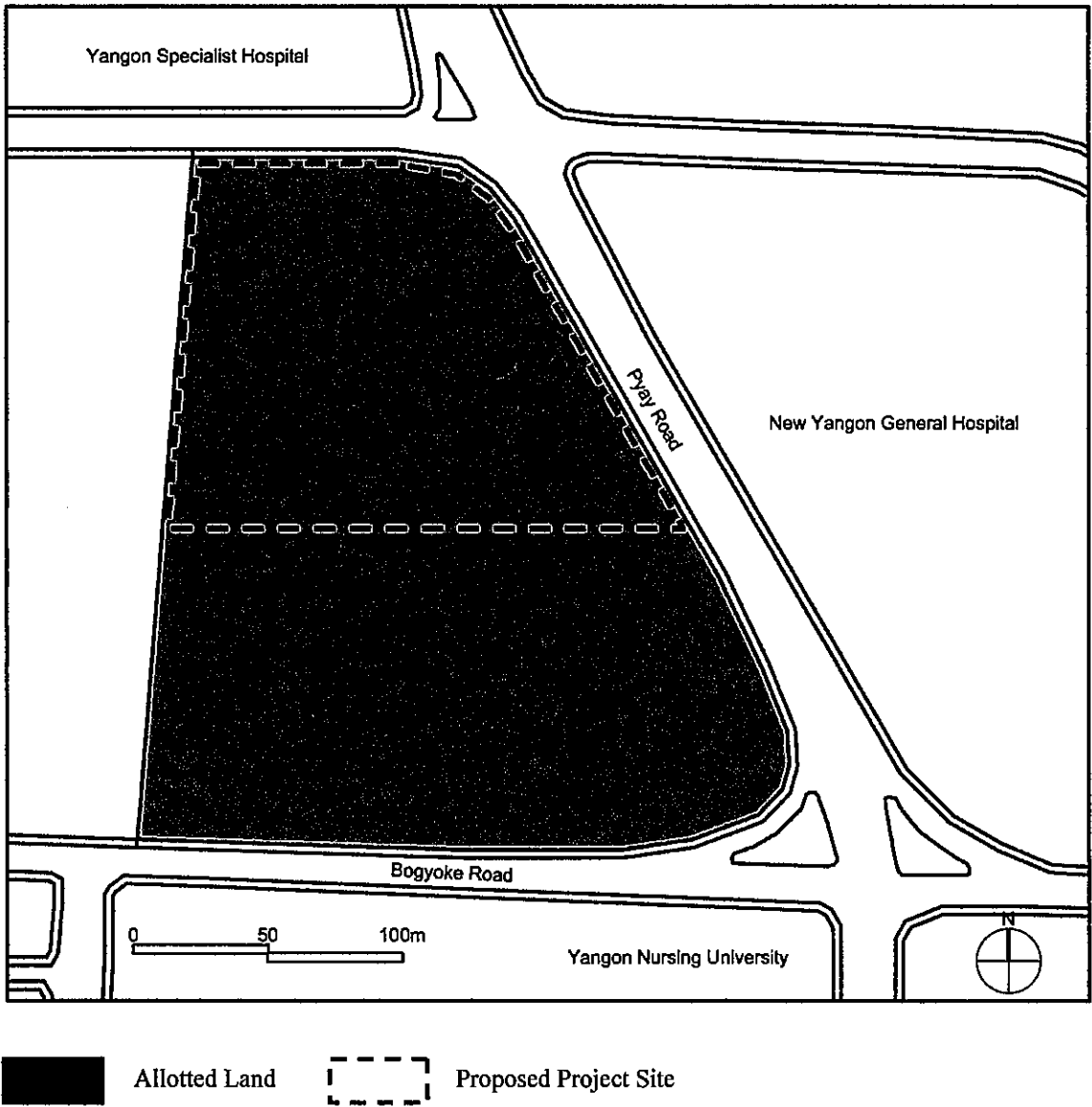
Annex 3 Japan's Grant Aid

Annex 4 Flow Chart of Japan's Grant Aid Procedures

Annex 5 Financial Flow of Japan's Grant Aid

Annex 6 Major Undertakings to be taken by the Government of Myanmar

Annex 1: Project Site



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Proposed Outline of New Yangon Specialist Hospital

【Basic Concept】

- ✓ National Institute for Cerebral and Cardiovascular Diseases with teaching and research capacity
- ✓ Universal Design with International Standard to provide patient-centered medical services

1. Clinical Departments : cardiology, cardiac surgery, neuro medicine, neurosurgery
2. Target diseases : cardiovascular diseases including cerebral stroke and other cerebrospinal diseases
3. Main facilities :
 - ① OPD
 - ② Fully equipped emergency department
 - ③ Intensive care units: Cardiac-ICU, Neuro-ICU, Stroke care unit
 - ④ General wards: numbers of beds per a room shall be less than 4.
 - ⑤ Operation room: cardiac surgery, neurosurgery
 - including Hybrid operation room
 - ⑥ Radiological imaging unit
 - ⑦ Clinical laboratory
 - ⑧ Pharmacy
 - ⑨ Physiotherapy rooms
 - ⑩ Central sterilization and service room
 - ⑪ Lecture rooms
 - ⑫ Others: administrative unit, storages, mechanical rooms, morgue etc.

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Annex 3: Japan's Grant Aid

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and 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. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures:

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of 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 country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme 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 a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever 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 organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is

confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered 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 appropriateness of the Project.

3. Japan's Grant Aid Scheme

(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 signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) 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 country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex 6.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

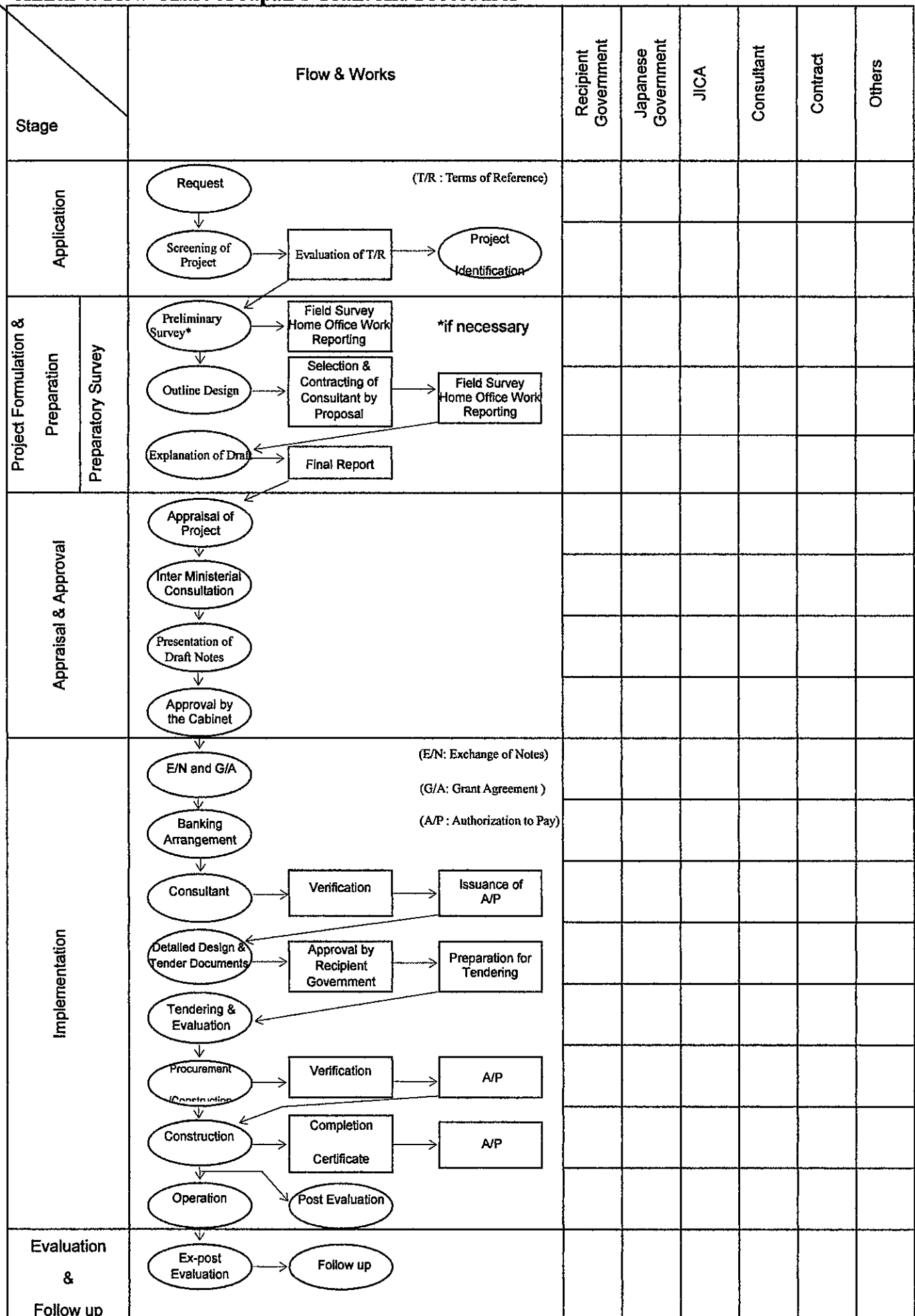
(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

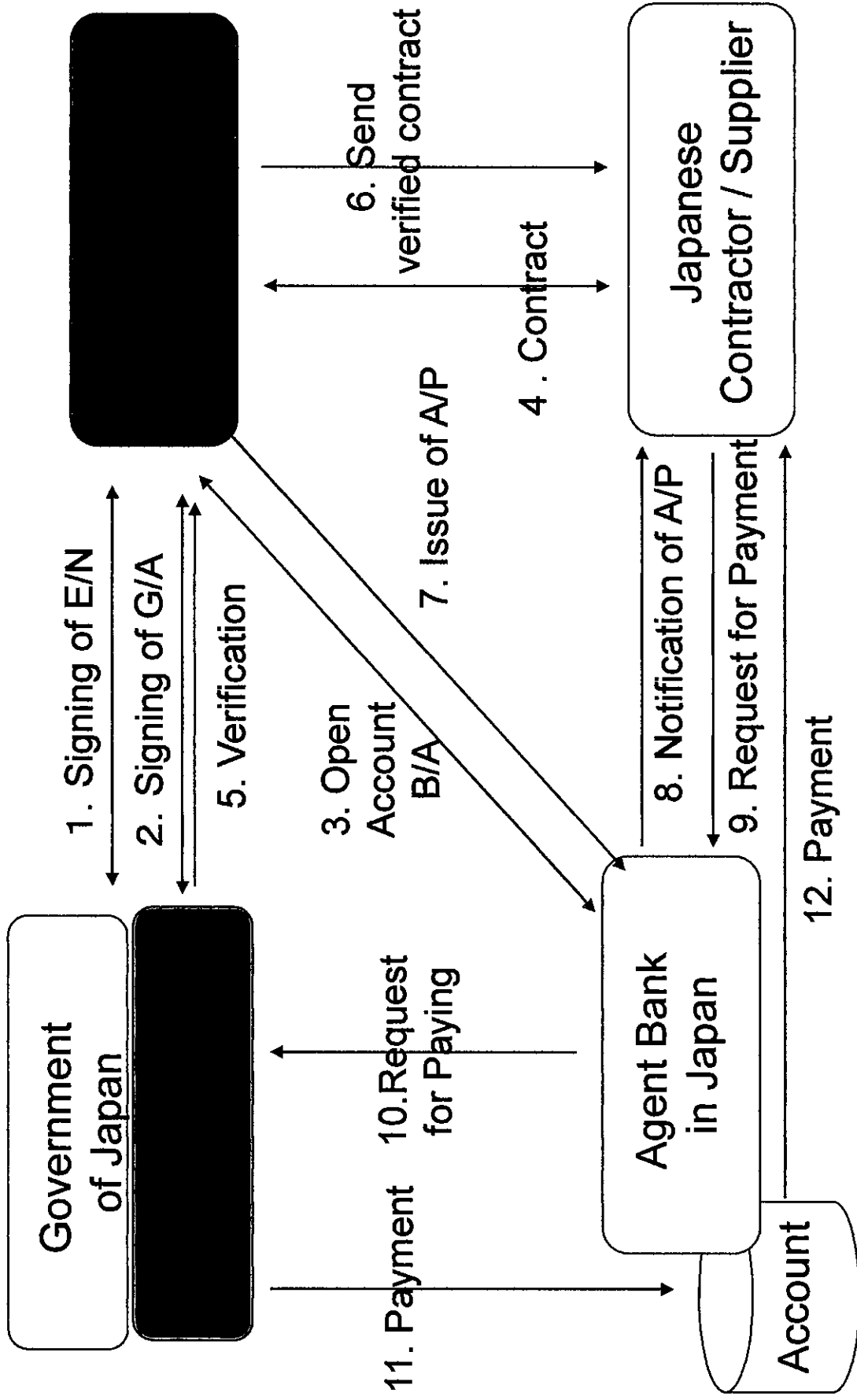
Annex 4: Flow Chart of Japan's Grant Aid Procedures



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Annex 5

Financial Flow of Japan's Grant Aid



Annex 6: Major Undertakings to be taken by Government of Myanmar

1. Before the Tender

NO	Items
1	To open Bank Account (Banking Arrangement (B/A))
2	To take necessary measures to obtain environmental license, if confirmed necessary, and report to JICA Myanmar office.
3	To secure the Project site including building area and temporary construction yard and stock yard within the Project area
4	To obtain the planning and/or building permit
	1) To obtain the development and/or planning permit if applicable
	2) To obtain construction permit and the other applicable building permits
5	To clear, level and reclaim the Project site including removal of the existing buildings, the existing pavement, underground obstacles and trees if necessary

2. During the Project Implementation

NO	Items
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A
	1) Advising commission of A/P
	2) Payment commission for A/P
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country
	1) Tax exemption and customs clearance of the products at the port of disembarkation
3	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work
4	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; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract
5	To bear all the expenses, other than those to be borne by the Grant Aid
6	To construct the following facility
	1) The fences in and around the site
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities
	1) Electricity The distributing power line to the site. If required, relocation of electrical poles at around the site.
	2) Water Supply The city water distribution main to the site, if available
	3) Drainage The city drainage main (for storm water, sewer and others) to the site

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	4) Telecommunications Telephone line and Internet line to the MDF and server room in new building.
	5) Furniture and Equipment General furniture and equipment for administration
8	To submit environmental monitoring report to JICA Myanmar Office, if Applicable
9	To recruit sufficient staff with appropriate skills and experiences for operation and maintenance of new facilities and equipment provided under the Grant Aid

3. After the Project

NO	Items
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid by: 1) Allocation of sufficient budget for operation and maintenance 2) Training of staff on the specialized medical services 3) Contracting with agents for maintenance of specialized medical equipment and lift 4) Regular collection and proper disposals of medical waste and waste water
2	To appoint and retain sufficient staff with appropriate skills and experiences for operation and maintenance of new facilities and equipment provided under the Grant Aid

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

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(2) Field Survey II

**Minutes of Discussions
on the Second Preparatory Survey for the Project for
Construction of New Yangon Specialist Hospital**

Based on the several preliminary discussions between the Government of The Republic of the Union of Myanmar (hereinafter referred to as “Myanmar”) and Embassy of Japan and Japan International Cooperation Agency (hereinafter referred to as “JICA”), the Government of Japan decided to conduct Preparatory Survey for the Project for Construction of New Yangon Specialist Hospital (hereinafter referred to as “the Project”), and entrusted the Preparatory Survey to JICA.

JICA sent the Second Preparatory Survey Team for the Outline Design (hereinafter referred to as “the Team”) to Myanmar, headed by Ms. Hiroe Ono, Director of Health Division 4, Human Development Department, JICA, and scheduled to stay in the country from 6th September to 9th October, 2015.

The Team held a series of discussions with the officials concerned from Government of The Republic of the Union of Myanmar and conducted a field survey in the Project site. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Nay Pyi Taw, 9th September, 2015



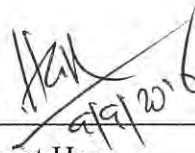
Ms. Hiroe Ono

Leader

Preparatory Survey Team

Japan International Cooperation Agency

Japan



Prof. Myint Han

Director General

Department of Medical Services

Ministry of Health

The Republic of the Union of Myanmar

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve patient-centered medical services for cerebral and cardiovascular diseases by establishing a new specialist hospital with teaching and research functions, through relocation of the selected medical functions from the Yangon General Hospital.

2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as “the Preparatory Survey for the Project for Construction of New Yangon Specialist Hospital”.

3. Project Site

- 3-1 The Myanmar side will coordinate with the Yangon City Development Committee (YCDC) to confirm the site boundary and provide the site boundary map, by 9th October, 2015.
- 3-2 The Myanmar side shall transfer the property ownership of the Project site to the Ministry of Health and shall provide the documents of property to the Japanese side by 31st January, 2016.
- 3-3 The both sides generally agreed on the boundary line between the site of the Project and the Southern part of the allotted land in Lanmataw Township, as shown in Annex 1.
- 3-4 The Myanmar side has agreed to clear the Project site by demolishing all existing buildings, pavements, trees and underground objects, if any, by the implementation of the Project.

4. Line Agency and the Project Management Unit

Both sides confirmed the line agency and the Project Management Unit (PMU) as follows:

- 4-1 The line agency is Department of Medical Services, Ministry of Health, which would be the agency to supervise the PMU.
- 4-2 The PMU is headed by the Hospitals Chief Executive, Yangon Cluster, and its members include Medical Superintendents of Yangon General Hospital, New Yangon General Hospital, and 500 bedded Yangon Specialist Hospital, and professors of cardiology, cardiac surgery, neuro medicine and neurosurgery of Yangon General Hospital. The PMU is established within Yangon General Hospital and shall coordinate with all the relevant agencies to ensure smooth implementation of the preparatory survey and the Project, and ensure that the undertakings are taken by relevant agencies properly and on time.
- 4-3 Additional members of the PMU in charge of construction and designing of New Yangon Specialist Hospital will be nominated by Department of Medical Services.

5. Items requested by the Government of Myanmar

5-1. Both sides confirmed the Project concept (described in Annex 2) and the items requested by the Government of Myanmar are as follows:

- Medical services to be provided in New Yangon Specialist Hospital are as follows:
 - Cardiology and Cardiac surgery: New Yangon Specialist Hospital would be responsible for chronic and referral cases and scheduled treatment/surgery, as major function for emergency cases would remain in Yangon General Hospital.
 - Neuro Medicine: all functions to be moved to New Yangon Specialist Hospital, due to limited number of specialists
 - Neurosurgery: all functions, including tumor cases, will be moved to New Yangon Specialist Hospital. However, major functions for injury cases will remain in Yangon General Hospital.

5-2 JICA has proposed that the draft schematic diagram of new hospital (Annex 3), the draft components of facility (Annex 4) and the draft list of medical equipment with priority category (Annex 5). Consultant team will continue to discuss with Myanmar side on the details of these drafts during the survey.

5-3 JICA will assess the appropriateness of the components of the Project and will report findings to the Government of Japan. The final components of the Project would be decided by the Government of Japan.

6. Japanese Grant Scheme

The Myanmar side understands the Japanese Grant Scheme and its procedures as described Annex 6, 7 and 8 and necessary measures to be taken by the Government of Myanmar for smooth implementation of the Project, as a condition for the Japanese Grant to be implemented. The detailed contents of the Annex 9 will be discussed internally on Myanmar side and provide the feedback to the Japanese side for further discussion.

The contents of Annex 9 will be used to determine the following:

- (1) The scope of the Project.
- (2) The timing of the Project implementation.

Contents of Annex 9 will be updated as the Preparatory Survey progresses, shall be agreed at the time of the explanation of the draft Preparatory Survey Report, and will finally be the Attachment to the Grant Agreement.

7. Monitoring during the Implementation

Both side agreed to continue to discuss on the monitoring methods during the Implementation, including the use of Project Monitoring Report (PMR) as shown in Annex 10.

8. Schedule of the Survey

- 8-1 The Team will proceed with the second preparatory survey in Myanmar until 9th October, 2015.
- 8-2 JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Myanmar in order to explain its contents between April and May, 2016.
- 8-3 If the contents of the draft Preparatory Survey Report is accepted in principle and the undertakings are fully agreed by the Myanmar side, JICA will complete the final report in English and send it to Myanmar around July, 2016.
- 8-4 The above schedule is tentative and subject to change.

9. Environmental and Social Considerations

- 9-1 The Myanmar side confirmed to give due environmental and social considerations during implementation of the Project and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).
- 9-2 The Myanmar side shall confirm the necessary procedures concerning the environmental assessment based on draft guidelines of Initial Environmental Examination (IEE) and Environment Impact Assessment (EIA) under Environment Conservation Law by 23 September, 2015. If applicable, the Myanmar side shall take necessary measures to obtain environmental license before the implementation of the Project and report to JICA Myanmar office.

10. Other Relevant Issues

- 10-1 The Myanmar side agreed to obtain that development/planning permit for construction of New Yangon Specialist Hospital from YCDC by the end of 2015.

10-2 Human Resource

The Japanese side has provided the estimated number of necessary medical/paramedical staff for New Yangon Specialist Hospital, as described in Annex 11. Ministry of Health agreed to provide staff recruitment plan with time schedule by February, 2016.

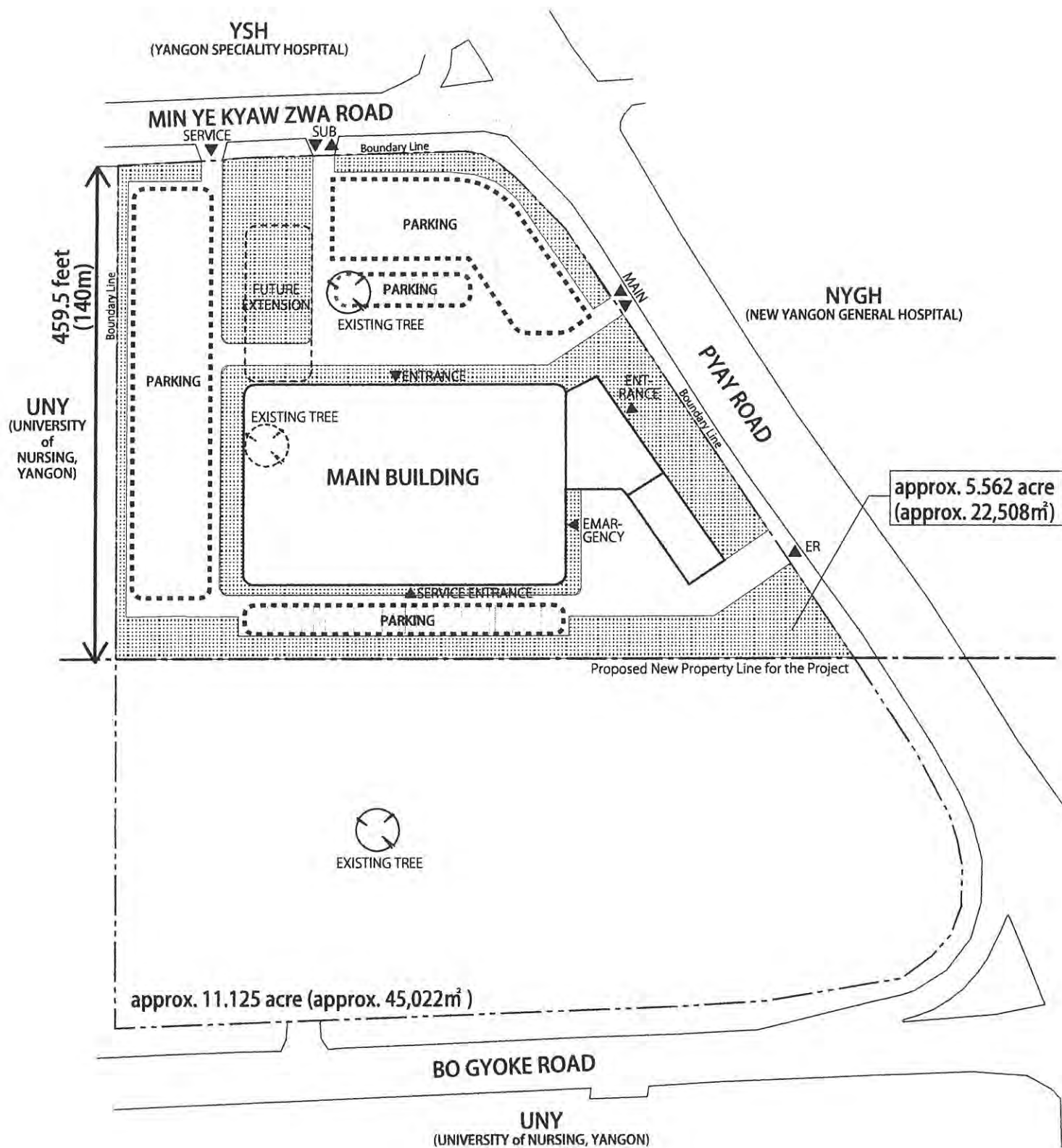
10-3 Maintenance of the Building and the Equipment

Both sides agreed on the importance of the maintenance, including preventative maintenance, of the building and the equipment to avoid interruption of the services and to reduce cost for repair. The Myanmar side agreed to establish teams for medical equipment maintenance and for facilities under hospital management committee. The Japanese side strongly recommended maintenance contract with manufactures after initial warranty period for advanced medical equipment such as CT, MRI and angiography.

10-4 Tax Exemption for Commercial Tax

The Myanmar side has agreed to take necessary measures for commercial tax exemption for the Project and to continue discussion on this matter.

- Annex 1 Proposed Project Site
- Annex 2 Proposed Outline of New Yangon Specialist Hospital
- Annex 3 Schematic Diagram of New Hospital (Draft)
- Annex 4 Components of Facility (Draft)
- Annex 5 List of Medical Equipment (Draft)
- Annex 6 Japanese Grant
- Annex 7 Flow Chart of Japanese Grant Procedure
- Annex 8 Financial Flow of Japanese Grant
- Annex 9 Major Undertakings to be taken by the Government of Myanmar and by Japanese Grant (Draft)
- Annex 10 Project Monitoring Sheet Form
- Annex 11 Estimated Number of Manpower Needed for New Yangon Specialist Hospital



Proposed Outline of New Yangon Specialist Hospital**【Basic Concept】**

- ✓ National Institute for Cerebral and Cardiovascular Diseases with teaching and research capacity
- ✓ Universal Design with International Standard to provide patient-centered medical services

1. Clinical Departments : cardiology, cardiac surgery, neuro medicine, neurosurgery
2. Target diseases : cardiovascular diseases including cerebral stroke and other cerebrospinal diseases
3. Main facilities:
 - ① Outpatient Department (OPD)
 - ② Emergency department
 - ③ Intensive care units
 - ④ General wards: numbers of beds per a room shall be less than or equal to 4.
 - ⑤ Operation room: cardiac surgery, neurosurgery including hybrid operation room
 - ⑥ Diagnostic imaging unit
 - ⑦ Clinical laboratory
 - ⑧ Pharmacy
 - ⑨ Rehabilitation room
 - ⑩ Central sterilization and service room
 - ⑪ Lecture rooms
 - ⑫ Others: administrative unit, storages, mechanical rooms, morgue etc.
4. Key concepts
 - ① International standard
 - Able to provide services incorporating the latest medical technology
 - Evidenced-based facility design
 - Comprehensive service through team-based medical care
 - 24-hour non-stop services
 - Patient safety – reduction/prevention of infection and accidents in the hospitals

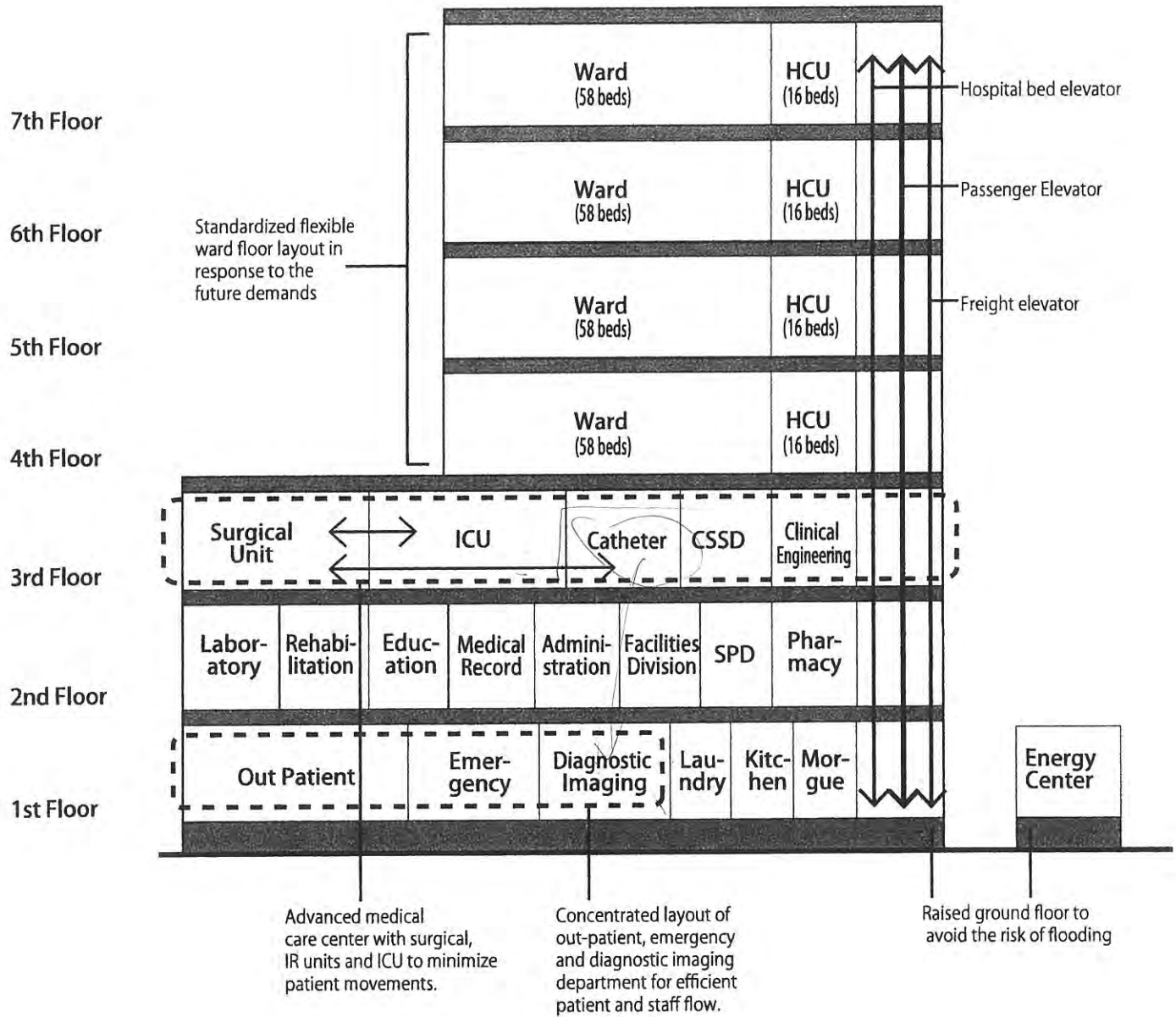
② Best Patient Experience

- Medical care of high quality
- Welcoming and clean facility with Universal Design
- Facility design to
 - Minimize patient movement
 - Ensure close attention from medical staffs
 - Secure sufficient spaces for patients and their families
- Reduce waiting time with good management

③ Well-prepared for the Future

- Flexible design for the future needs - allowing layout changes and expansion
- Reliable design for the disaster risks – floods, fire, earthquake
- Consideration for long-term costs and environment impacts – lower energy consumption and maintenance cost
- Good management of operation and maintenance





Departments	Major rooms
Outpatient	Lobby & reception counter
	Office
	Inpatient regisitation
	Consultation room
	Treatment room
	Physiological laboratory
	Cashier/ account
	Shop
Rehabilitation	Rehabilitation room
Diagnostic Imaging	General Xray room
	CT Scan room
	MRI
	Angiography room
	Radiologic interpretation room
	Staff room
	PACS Server
Emergency Unit	Reception
	Waiting area
	Consultation room
	Treatment room
	Recovery hall
	Staff Station
	Staff room
ICU	Intensive Care Unit 20 beds
	Staff station
	Staff room
	Equipment store
Surgical Unit	Family waiting
	Reception /control station
	Operation theater 4 rooms
	Hybrid Operation theater 2 rooms
	Recovery area
	Staff station
	Anesthetist
	Staff lounge
	Conference
	Equipment store
Laboratory	Clinical Laboratory
	Transfusion service

Departments	Major rooms
Clinical Engineering	Storage
	Staff room
Pharmacy	Drug Store
	Pharmacy
	Staff room
Inpatient Wards	4 bed room
	Single-bed room
	High care unit
	Staff station
	Exam / Treatment room
	Counseling room
	Conference room
	Day room
Central sterile and supply department	Staff room
	Soiled equipment storage
	Decontamination room
	Packing room
	Sterilizing room
Kitchen	Clean equipment storage
	Staff room
	Dining room
	Kitchen
Laundry	Linen Storage
	Laundry
Administration	Office
	meeting room
	Locker room
	Storage, etc.
Education	Conference room
	meeting room
	Library
Medical Record	Medical record storage
SPD	Supply Processing Distribution Storage
Morgue	Morgue
Facilities Division	Housekeeping
	Central control room
	Security room
Energy Center	Electrical room
	Medical gas room
	Mechanical room

Annex 5 Equipment List for New Yangon Speciality Hospital

Department	Item No.	Description	Q'ty	Priority 0908
Outpatient	OP-1	Examination table	10	A
Outpatient	OP-2	PACS terminal (LCD Monitor)	10	A
Outpatient	OP-3	Consultation desk and chair	10	A
Outpatient	OP-4	Diagnostic set	10	A
Outpatient	OP-5	Waiting chair for 3 persons	35	A
Outpatient	OP-6	Storage cabinet for medical records	8	●
Outpatient	OP-7	X-ray film storage cabinet	5	●
Outpatient	OP-8	Instrument cabinet	8	A
Outpatient (Physiology laboratory)	P-1	Tilt table	1	A
Outpatient (Physiology laboratory)	P-2	Patient monitor (ECG, BP) for tilt table test	1	A
Outpatient (Physiology laboratory)	P-3	ECG machine 12ch.with high signal averaging ECG software	1	A
Outpatient (Physiology laboratory)	P-4	Holter ECG with 3 recorders	1	A
Outpatient (Physiology laboratory)	P-5	ECG with Treadmill for stress test	1	A
Outpatient (Physiology laboratory)	P-6	Spirometer	1	A
Outpatient (Physiology laboratory)	P-7	EEG	1	A
Outpatient (Physiology laboratory)	P-8	EMG	1	A
Outpatient (Restraunt)	P-9	Dining table with stool	1	●
Rehabilitation	RH-1	Stairs	1	A
Rehabilitation	RH-2	Parallel bars with mirror	2	A
Rehabilitation	RH-3	Exercise mat	1	A
Rehabilitation	RH-4	Balance ball and other exercise therapy set	1	A
Rehabilitation	RH-5	Whirlpool bath	1	●
Rehabilitation	RH-6	Treadmill	1	A
Rehabilitation	RH-7	Ergometer	1	A
Diagnostic Imaging	R-1	CT scanner 128 slices	1	A
Diagnostic Imaging	R-2	CT scanner 64 slices	1	●
Diagnostic Imaging	R-3	MRI 1.5 tesla	1	A
Diagnostic Imaging	R-4	PACS system (including RIS)	1	A
Diagnostic Imaging	R-5	Image printer	1	A
Diagnostic Imaging	R-6	Injector for MRI	1	A
Diagnostic Imaging	R-7	Injector for CT	1	A
Diagnostic Imaging	R-8	Digital X-ray machine	2	A
Diagnostic Imaging	R-9	Mobile X-ray unit	1	A
Diagnostic Imaging	R-10	Ultrasound scanner	2	●
Diagnostic Imaging	R-11	Workstation for radiology equipment	3	●
Diagnostic Imaging (Cath. Labo.)	CL-1	Angio system(Cath Lab) single plane	1	A
Diagnostic Imaging (Cath. Labo.)	CL-2	Angio system(Cath Lab) bi plane	1	A
Diagnostic Imaging (Cath. Labo.)	CL-3	Injector for angio system	2	A
Diagnostic Imaging (Cath. Labo.)	CL-4	Radiofrequency ablation generator (with stimulation)	1	A
Diagnostic Imaging (Cath. Labo.)	CL-5	3D mapping system	1	B
Diagnostic Imaging (Cath. Labo.)	CL-6	Irrigation pump for ablation	1	A
Diagnostic Imaging (Cath. Labo.)	CL-7	Polysonmograph (hemodinamics)	1	A
Diagnostic Imaging (Cath. Labo.)	CL-8	Anesthesia machine with ventilator	1	A
Diagnostic Imaging (Cath. Labo.)	CL-9	Defibrillator with internal paddle	2	A
Diagnostic Imaging (Cath. Labo.)	CL-10	Oxygen Anayzer	2	●
Emergency unit	ER-1	Stretcher	5	A
Emergency unit	ER-2	Wheel chair	5	A
Emergency unit	ER-3	Emergency bed	8	A
Emergency unit	ER-4	Emergency cart	2	A
Emergency unit	ER-5	Blood gas analyzer with ISE	1	A
Emergency unit	ER-6	ECG machine , 6ch.	1	A
Emergency unit	ER-7	Mobile X-ray unit	1	A
Emergency unit	ER-8	Ultrasound scanner, portable	1	A
Emergency unit	ER-9	Defibrillator with internal paddle	1	A
Emergency unit	ER-10	Diagnostic set	8	A

Equipment List for New Yangon Speciality Hospital

Department	Item No.	Description	Q'ty	Priority 0908
Emergency unit	ER-11	Mobile OT lamp	4	●
Emergency unit	ER-12	Patient monitor	2	●
Emergency unit	ER-13	Infusion pump	2	A
Coronary Care Unit (CCU)	CCU-1	Ventilator for adult	2	A
Coronary Care Unit (CCU)	CCU-2	Central monitor	2	A
Coronary Care Unit (CCU)	CCU-3	Patient monitor	16	A
Coronary Care Unit (CCU)	CCU-4	Patient bed electric	16	A
Coronary Care Unit (CCU)	CCU-5	Bedside cabinet	16	A
Coronary Care Unit (CCU)	CCU-6	Overbed table	16	A
Coronary Care Unit (CCU)	CCU-7	IV pole	16	A
Coronary Care Unit (CCU)	CCU-8	Infusion pump	15	A
Coronary Care Unit (CCU)	CCU-9	Syringe pump	20	A
Coronary Care Unit (CCU)	CCU-10	Suction bottle for central piping	16	A
Coronary Care Unit (CCU)	CCU-11	Oxygen regulator and humidifier	16	A
Coronary Care Unit (CCU)	CCU-12	Defibrillator	2	A
Coronary Care Unit (CCU)	CCU-13	Oxygen concentrator	2	A
Coronary Care Unit (CCU)	CCU-14	ECG machine	1	A
Coronary Care Unit (CCU)	CCU-15	Emergency trolley	1	A
Coronary Care Unit (CCU)	CCU-16	Medicine cabinet	2	A
Coronary Care Unit (CCU)	CCU-17	Instrument cabinet	2	A
Coronary Care Unit (CCU)	CCU-18	Medicine trolley	2	A
Coronary Care Unit (CCU)	CCU-19	Hand dryer	1	●
Coronary Care Unit (CCU)	CCU-20	Blood gas analyzer with ISE	1	A
Intensive Care Unit (ICU)	ICU-1	Ventilator for adult and pediatrics	10	A
Intensive Care Unit (ICU)	ICU-2	Central monitor	2	A
Intensive Care Unit (ICU)	ICU-3	Patient monitor	10	A
Intensive Care Unit (ICU)	ICU-4	Patient bed electric	10	A
Intensive Care Unit (ICU)	ICU-5	Bedside cabinet	10	A
Intensive Care Unit (ICU)	ICU-6	Overbed table	10	A
Intensive Care Unit (ICU)	ICU-7	IV pole	10	A
Intensive Care Unit (ICU)	ICU-8	Infusion pump	40	A
Intensive Care Unit (ICU)	ICU-9	Syringe pump	40	A
Intensive Care Unit (ICU)	ICU-10	Suction bottle for central piping	10	A
Intensive Care Unit (ICU)	ICU-11	Oxygen regulator and humidifier	10	A
Intensive Care Unit (ICU)	ICU-12	Defibrillator	1	A
Intensive Care Unit (ICU)	ICU-13	Oxygen concentrator	2	A
Intensive Care Unit (ICU)	ICU-14	ECG machine	1	A
Intensive Care Unit (ICU)	ICU-15	Emergency trolley	1	A
Intensive Care Unit (ICU)	ICU-16	Medicine cabinet	1	A
Intensive Care Unit (ICU)	ICU-17	Instrument cabinet	1	A
Intensive Care Unit (ICU)	ICU-18	Medicine trolley	1	A
Intensive Care Unit (ICU)	ICU-19	Hemodialysis machine	2	A
Intensive Care Unit (ICU)	ICU-20	RO unit	1	A
Intensive Care Unit (ICU)	ICU-21	Weight measurable bed	2	A
Intensive Care Unit (ICU)	ICU-22	Pressure mattress for avoiding bed sore	2	●
Intensive Care Unit (ICU)	ICU-23	Fiberoptic bronchoscope	1	●
Intensive Care Unit (ICU)	ICU-24	Pacemaker machine	1	●
Intensive Care Unit (ICU)	ICU-25	Body warmer	1	●
Intensive Care Unit (ICU)	ICU-26	Blood gas analyzer with ISE	1	A
Stroke Care Unit(SCU)	SCU-1	Ventilator for adult	2	A
Stroke Care Unit(SCU)	SCU-2	Central monitor	1	A
Stroke Care Unit(SCU)	SCU-3	Patient monitor	6	A
Stroke Care Unit(SCU)	SCU-4	Patient bed electric	6	A
Stroke Care Unit(SCU)	SCU-5	Bedside cabinet	6	A
Stroke Care Unit(SCU)	SCU-6	Overbed table	6	A
Stroke Care Unit(SCU)	SCU-7	IV pole	6	A

1/14

Equipment List for New Yangon Speciality Hospital

Department	Item No.	Description	Q'ty	Priority 0908
Stroke Care Unit(SCU)	SCU-8	Infusion pump	3	A
Stroke Care Unit(SCU)	SCU-9	Syringe pump	6	A
Stroke Care Unit(SCU)	SCU-10	Suction bottle for central piping	6	A
Stroke Care Unit(SCU)	SCU-11	Oxygen regulator and humidifier	6	A
Stroke Care Unit(SCU)	SCU-12	Defibrillator	1	A
Stroke Care Unit(SCU)	SCU-13	Oxygen concentrator	2	A
Neuro ICU(NCU)	NCU-1	Ventilator for adult and pediatrics	10	A
Neuro ICU(NCU)	NCU-2	Ventilator for neonates	1	B
Neuro ICU(NCU)	NCU-3	Central monitor	3	A
Neuro ICU(NCU)	NCU-4	Patient monitor	20	A
Neuro ICU(NCU)	NCU-5	Patient bed electric	18	A
Neuro ICU(NCU)	NCU-6	Bedside cabinet	20	A
Neuro ICU(NCU)	NCU-7	Overbed table	20	A
Neuro ICU(NCU)	NCU-8	IV pole	20	A
Neuro ICU(NCU)	NCU-9	Infusion pump	20	A
Neuro ICU(NCU)	NCU-10	Syringe pump	20	A
Neuro ICU(NCU)	NCU-11	Suction bottle for central piping	20	A
Neuro ICU(NCU)	NCU-12	Oxygen regulator and humidifier	20	A
Neuro ICU(NCU)	NCU-13	Defibrillator	1	A
Neuro ICU(NCU)	NCU-14	Oxygen concentrator	10	A
Neuro ICU(NCU)	NCU-15	Infant warmer	1	B
Neuro ICU(NCU)	NCU-16	Plasma exchange machine	1	●
Surgical unit	OTC-1	Operation table	2	A
Surgical unit	OTC-2	Defibrillator with internal paddle	1	A
Surgical unit	OTC-3	Patient monitor	2	A
Surgical unit	OTC-4	Operation theatre light with monitor	2	A
Surgical unit	OTC-5	Electrosurgical unit	2	A
Surgical unit	OTC-6	Anesthesia machine for cardiac surgery	2	A
Surgical unit	OTC-7	Ceiling pendant for anesthetic gas	2	A
Surgical unit	OTC-8	Ceiling pendant for surgery	2	●
Surgical unit	OTC-9	Ceiling pendant for endoscope	2	●
Surgical unit	OTC-10	Ceiling pendant for medical gas	2	●
Surgical unit	OTC-11	Ceiling pendant for electric power connector	2	A
Surgical unit	OTC-12	Hot/cold cabinet	2	A
Surgical unit	OTC-13	Ultrasonic aspirator (CUSA)	1	●
Surgical unit	OTC-14	Anticoagulation monitor(ACT) machine	2	A
Surgical unit	OTC-15	Echo machine (transesophageal probe)	1	A
Surgical unit	OTC-16	Intraoperative ultrasound scanner for blood flow measurement	1	A
Surgical unit	OTC-17	Heart lung machine with cooler/heater unit	2	A
Surgical unit	OTC-18	Intra aortic balloon pump (IABP)	2	A
Surgical unit	OTC-19	Cell saver	2	A
Surgical unit	OTC-20	Surgical C-arm x-ray unit	1	●
Surgical unit	OTC-21	Low continuous suction machine	2	●
Surgical unit	OTC-22	Blood gas analyzer with ISE	2	A
Surgical unit	OTC-23	Biochemistry analyzer,semi-automated	1	●
Surgical unit	OTC-24	Thoracoscope system	1	●
Surgical unit	OTC-25	Surgical instrument set for open heart surgery	2	A
Surgical unit	OTC-26	Surgical instrument set for thoracic operation	2	A
Surgical unit	OTC-27	Surgical instrument set for pediatrics	2	A
Surgical unit	OTC-28	PCPS (ECMO)	1	B
Surgical unit	HOTC-1	Single plane angiography system	1	A
Surgical unit	HOTC-2	Injector	1	A
Surgical unit	HOTC-3	Operation table for angiography system	1	A
Surgical unit	HOTC-4	Polysonmograph (hemodynamics)	1	A
Surgical unit	HOTC-5	Anesthesia machine with ventilator	1	A

Equipment List for New Yangon Speciality Hospital.

Department	Item No.	Description	Q'ty	Priority 0908
Surgical unit	HOTC-6	Ultrasound scanner with TEE probe	1	●
Surgical unit	HOTC-7	Radiology accessorie set (apron etc.)	1	A
Surgical unit	HOTC-8	Operating lamp with camera	1	A
Surgical unit	HOTC-9	Ceiling pendant for anesthetic gas	1	A
Surgical unit	HOTC-10	Ceiling pendant for electric power connector	1	A
Surgical unit	HOTC-11	Camera for operation room	1	A
Surgical unit	HOTC-12	LCD Monitor for PACS	1	A
Surgical unit	HOTC-13	Heart lung machine with cooler/heater unit	1	●
Surgical unit	HOTC-14	Instrument cabinet	2	A
Surgical unit	HOTC-15	Defibrillator	1	A
Surgical unit	HOTC-16	Intra aortic balloon pump (IABP)	1	●
Surgical unit	OTN-1	Operation table	2	A
Surgical unit	OTN-2	Defibrillator with internal paddle	1	A
Surgical unit	OTN-3	Patient monitor	2	A
Surgical unit	OTN-4	Operation theatre light with monitor	2	A
Surgical unit	OTN-5	Electrosurgical unit	2	A
Surgical unit	OTN-6	Anesthesia machine with ventilator	2	A
Surgical unit	OTN-7	Ceiling pendant for anesthetic gas	2	A
Surgical unit	OTN-8	Ceiling pendant for surgery	2	●
Surgical unit	OTN-9	Ceiling pendant for endoscope	2	●
Surgical unit	OTN-10	Ceiling pendant for medical gas	2	●
Surgical unit	OTN-11	Ceiling pendant for electric power connector	2	A
Surgical unit	OTN-12	Cold cabinet	2	A
Surgical unit	OTN-13	Ultrasonic aspirator with accessories	1	A
Surgical unit	OTN-14	Intraoperative ultrasound scanner for neuro surgery	1	A
Surgical unit	OTN-15	Navigation system	1	A
Surgical unit	OTN-16	High speed drill , electric	1	A
Surgical unit	OTN-17	ICP monitor, EVD	1	A
Surgical unit	OTN-18	C2 Nerve monitor	1	A
Surgical unit	OTN-19	Neuroendoscope	1	●
Surgical unit	OTN-20	Spine set	2	A
Surgical unit	OTN-21	Basic neurosurgical set	2	A
Surgical unit	OTN-22	Micro neurosurgical set	2	A
Surgical unit	OTN-23	Aneurysm surgery set	2	A
Surgical unit	OTN-24	Operating microscope mobile	2	●
Surgical unit	OTN-25	Operating microscope ceiling	1	A
Surgical unit	OTN-26	Surgical C-arm x-ray unit	1	A
Surgical unit	OTN-27	Head clamp & retractor system	2	A
Surgical unit	OTN-28	Clip and instruments	1	●
Surgical unit	HOTN-1	Angio system bi plane	1	●
Surgical unit	HOTN-2	CT scanner 32slices	1	A
Surgical unit	HOTN-3	Injector for CT	1	A
Surgical unit	HOTN-4	Operation table for angiography system	1	A
Surgical unit	HOTN-5	Anesthesia machine with ventilator	1	A
Surgical unit	HOTN-6	Radiology accessorie set (Apron etc.)	1	A
Surgical unit	HOTN-7	Operating lamp with camera	1	A
Surgical unit	HOTN-8	Ceiling pendant for anesthetic gas	1	A
Surgical unit	HOTN-9	Ceiling pendant for electric power connector	1	A
Surgical unit	HOTN-10	Camera for operation room	1	A
Surgical unit	HOTN-11	LCD Monitor for PACS	1	A
Surgical unit	HOTN-12	Instrument cabinet	2	A
Surgical unit	HOTN-13	Defibrillator	1	A
Surgical unit	HOTN-14	Waiting chair for 3 persons	30	A
Laboratory unit	L-1	Fully automated chemistry analyzer	1	●
Laboratory unit	L-2	Urine analyzer	1	●
Laboratory unit	L-3	Blood cell counter 5 part differential	1	A

Equipment List for New Yangon Speciality Hospital

Department	Item No.	Description	Q'ty	Priority 0908
Laboratory unit	L-4	Automated coagulation analyzer	1	A
Laboratory unit	L-5	Immuno hormone analyzer	1	●
Laboratory unit	L-6	Distillation plant	1	A
Laboratory unit	L-7	Laboratory central table with stool	1	A
Laboratory unit	L-8	Laboratory side table with stool	2	A
Laboratory unit	L-9	Full automated blood culture system	1	B
Laboratory unit	L-10	Automatic sliding stainer	1	●
Laboratory unit	L-11	Microtome	1	●
Laboratory unit	L-12	Binocular microscope	4	A
Laboratory unit	L-13	Incubator	1	●
Laboratory unit	L-14	Paraffin bath (embedding machine)	1	●
Laboratory unit	L-15	Safety cabinet	1	●
Laboratory unit	L-16	Tissue processor	1	●
Laboratory unit	L-17	Cooling plate	1	●
Laboratory unit	L-18	Hematocrit centrifuge	1	●
Laboratory unit	L-19	Storage rack	5	A
Laboratory unit	L-20	Blood bank refrigerator	1	A
Laboratory unit	L-21	Thawing water bath	1	A
Laboratory unit	L-22	Micro pipette set	1	A
Laboratory unit	L-23	Microscope	1	A
Laboratory unit	L-24	Centrifuge for serofuge	2	A
Laboratory unit	L-25	Platelet incubator with agitator	1	A
Laboratory unit	L-26	Deep Freezer	1	A
Laboratory unit	L-27	Centrifuge for specimen separation	2	A
Laboratory unit	L-28	Oven	1	A
Laboratory unit	L-29	Pharmaceutical refrigerator	3	A
Laboratory unit	L-30	Cryostat	1	B
Laboratory unit	L-31	Bone marrow aspiration trephine set	1	●
Clinical Engineering	CE-1	Working table with chair	1	●
Clinical Engineering	CE-2	Maintenance tool kit	1	●
Pharmacy	PH-1	Pharmaceutical refrigerator	4	A
Pharmacy	PH-2	Medicine cabinet	5	A
Pharmacy	PH-3	Desk and chair	1	●
Pharmacy	PH-4	Storage Rack	5	●
Inpatient Ward	W-1	Examination table	2	●
Inpatient Ward	W-2	Suction bottle for central piping	66	●
Inpatient Ward	W-3	Oxygen regulator and humidifier	66	B
Inpatient Ward	W-4	Hospital bed	264	●
Inpatient Ward	W-5	Bedside cabinet	264	●
Inpatient Ward	W-6	Overbed table	264	●
Inpatient Ward	W-7	IV pole	66	●
Inpatient Ward	W-8	Patient monitor	10	●
Inpatient Ward	W-9	Low continuous suction unit	33	●
Inpatient Ward	W-10	Instrument cabinet	33	●
Inpatient Ward	W-11	Medicine cabinet	33	●
Inpatient Ward	W-12	Instrument trolley	33	●
Inpatient Ward	W-13	Bedpan washer	4	●
Inpatient Ward	W-14	Wheel chair	8	●
Inpatient Ward	W-15	ECG machine	2	A
Inpatient Ward	W-16	Echo machine (transesophageal probe)	3	A
Inpatient Ward	W-17	Chair for case discussion	80	●
Inpatient Ward	W-18	White board	4	●
Inpatient Ward	W-19	EEG	1	A
Inpatient Ward	W-20	EEG for 24 hrs. monitoring with monitor	1	A
Inpatient Ward	W-21	EMG	1	A
Inpatient Ward	W-22	Weighing scale for stretcher/wheel chair	1	A

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Equipment List for New Yangon Speciality Hospital

Department	Item No.	Description	Q'ty	Priority 0908
Inpatient Ward	W-23	Ultrasound scanner carotid dopper +transcranial	1	B
CSSD	S-1	High pressure steam sterilizer 440L	2	A
CSSD	S-2	High pressure steam sterilizer 160L	1	A
CSSD	S-3	Hydrogen peroxide gas sterilizer	1	A
CSSD	S-4	Ultrasonic washer	2	A
CSSD	S-5	Sterilization cart	1	A
CSSD	S-6	Linen cart	3	A
CSSD	S-7	Sterilization cabinet	3	A
CSSD	S-8	Hand scrub station for 3 persons	2	A
Kitchen	K-1	Cooking oven	1	●
Kitchen	K-2	Desk and chair	1	●
Kitchen	K-3	Refrigerator for food	1	●
Kitchen	K-4	Freezer for food	1	●
Laundry	LA-1	Washing machine with dehydration function	3	B
Laundry	LA-2	Drying machine	3	B
Laundry	LA-3	Linen cabinet	3	B
Laundry	LA-4	Press machine	2	B
Administration Department	A-1	Desk	80	●
Administration Department	A-2	Chair	80	●
Administration Department	A-3	Book shelf	30	●
Administration Department	A-4	File cabinet	30	●
Education (conference room)	LE-1	Projector	2	●
Education (conference room)	LE-2	Screen	2	●
Education (conference room)	LE-3	AV set	2	●
Education (conference room)	LE-4	Lap top computer	1	●
Education (conference room)	LE-5	LCD for meeting room & research	2	●
Education (conference room)	LE-5	Desk with chair for listner	100	●
Education (conference room)	LE-6	Stand for speaker	2	●
Education (medical library)	LE-7	Book shelf for reference book	1	●
Medical Record	MR-1	Book shelf	5	●
Medical Record	MR-2	File Cabinet	3	●
Supply Processing Distribution	S-1	Pharmaceutical refrigerator	5	B
Supply Processing Distribution	S-2	Storage Rack	5	B
Morgue	M-1	Refrigerator for dead body for 4	1	●

A High Priority

B Medium Priority , and need to be justified at domestic analysis

● Will be procured from Myanmar side

*Q'ty Subject to be changed at domestic analysis

2

11/4

JAPANESE GRANT

The Japanese Grant (hereinafter referred to as the “Grant”) is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and 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. The Grant is not supplied through the donation of materials as such.

Based on a JICA law which was entered into effect on October 1, 2008 and the decision of the GOJ, JICA has become the executing agency of the Japanese Grant for Projects for construction of facilities, purchase of equipment, etc.

1. Grant Procedures

The Grant is supplied through following procedures:

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as “the G/A”)
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of 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 country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Scheme 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.

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

JICA requests the Government of the recipient country to take whatever 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 organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (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 appropriateness of the Project.

3. Japanese Grant Scheme

(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 signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles, in accordance with the E/N, to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) 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 country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. The Grant may be used for the purchase of the products or services of a third country, if necessary, taking into account the quality, competitiveness and economic rationality of products and services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals", in principle.

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals, in principle. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Project, the recipient country is required to undertake such necessary measures as Annex. The Japanese Government requests the Government of the recipient country to exempt all customs duties, internal taxes and other fiscal levies such as VAT, commercial tax, income tax, corporate tax, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract, since the Grant fund comes from the Japanese taxpayers.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant.

(7) "Export and Re-export"

The products purchased under the Grant should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"), in principle. JICA will execute the Grant by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Environmental and Social Considerations

The Government of the recipient country must carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the recipient country and JICA Guidelines for Environmental and Social Consideration (April, 2010) .

(11) Monitoring

The Government of the recipient country must 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 must regularly report to JICA about its status by using the Project Monitoring Report (PMR).

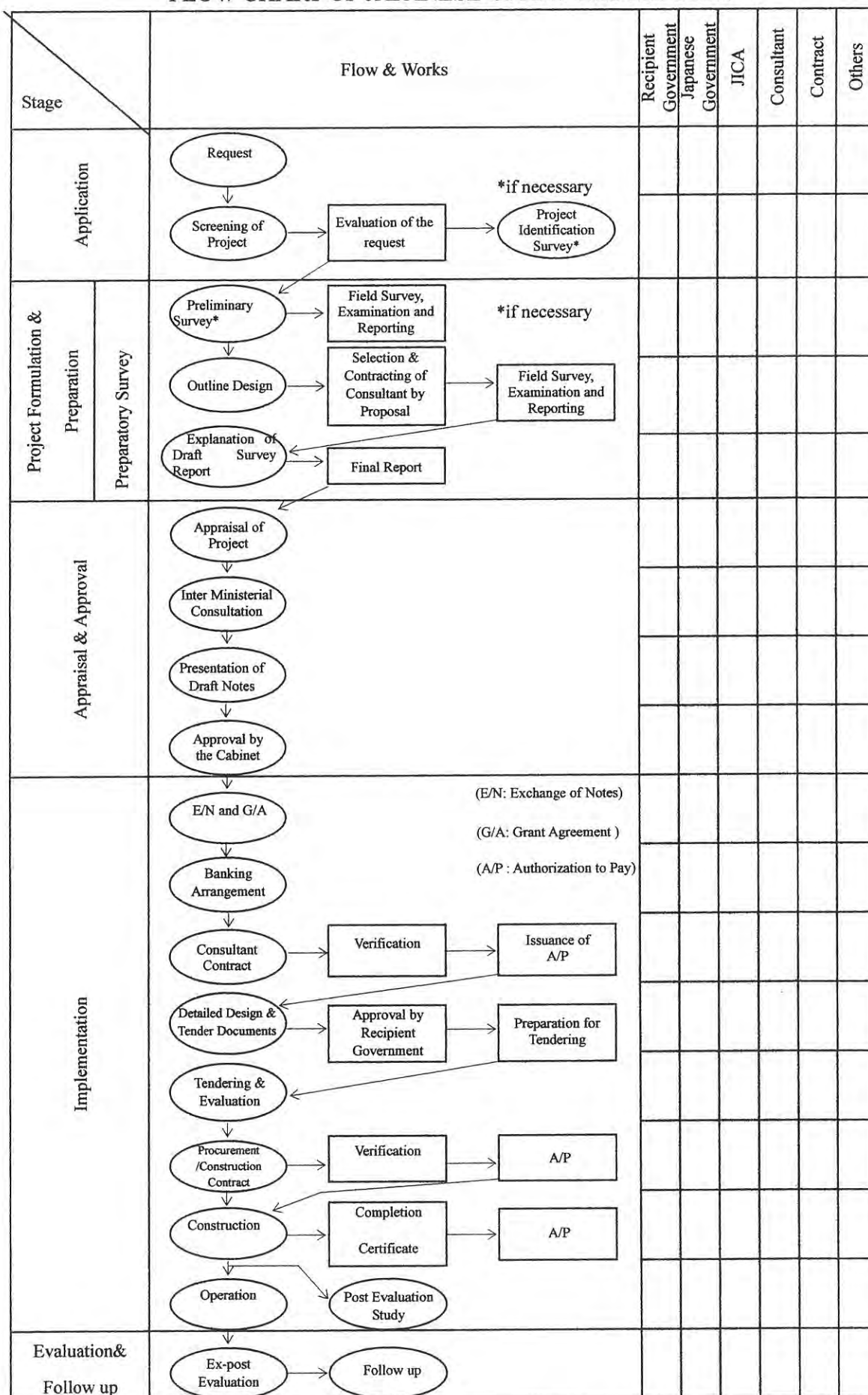
(12) Safety Measures

The Government of the recipient country must ensure that the safety is highly observed during the implementation of the Project.

2

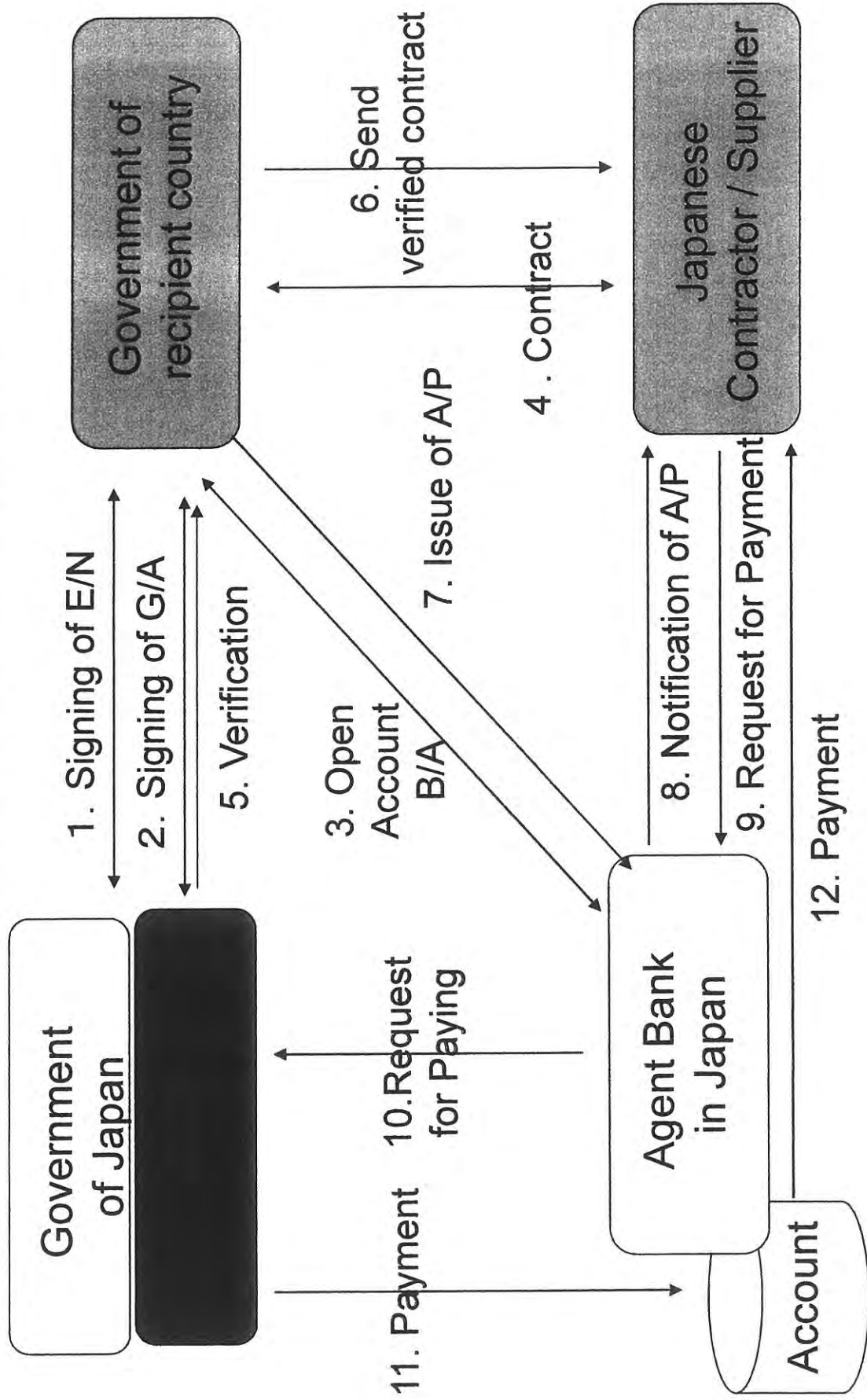
16

FLOW CHART OF JAPANESE GRANT PROCEDURES



Annex 8

Financial Flow of Japan's Grant Aid



Annex 9: Major Undertakings to be taken by Government of Myanmar and by Japanese Grant (Draft)

Major Undertakings to be taken by Government of Myanmar

1. Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A	MOH/MOF/MFTB		
2	To take necessary measures to obtain environmental license, if confirmed necessary, and report to JICA Myanmar office.	within 1 month after G/A	MOH		
3	To secure the Project site including building area and temporary construction yard and stock yard within the Project area	before notice of the tender document	MOH		
4	To obtain the planning and/or building permit				
	1) To obtain the development and/or planning permit if applicable	By the end of 2015	MOH/YCDC?		
	2) To obtain construction permit and the other applicable building permits	before notice of the tender document	MOH/YCDC?		
5	To clear, level and reclaim the Project site including removal of the existing buildings, the existing pavement, underground obstacles and trees if necessary	before notice of the tender document	MOH/MOF		

2. During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract	MOH/MOF/MFTB		
	2) Payment commission for A/P	every payment	MOH/MOF/MFTB		
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax exemption and customs clearance of the products at the port of disembarkation	during the Project	MOH/MOF		
3	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project	MOH		
4	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; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	MOH/MOF		
5	To bear all the expenses, other than those to be borne by the Grant Aid	during the Project	MOH/MOF		
6	To construct the following facility				
	1) The fences in and around the site	before the completion of the construction	MOH		
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities				
	1) Electricity The distributing power line to the site. If required, relocation of electrical poles at around the site.	6 months before completion of the construction	MOH/Electrical Authority		
	2) Water Supply The city water distribution main to the site, if available	6 months before completion of the construction	MOH/YCDC		
	3) Drainage				

	The city drainage main (for storm water, sewer and others) to the site	6 months before completion of the construction	MOH/ YCDC		
4)	Telecommunications				
	Telephone line and Internet line to the MDF and server room in new building.		MOH/ MPT?		
5)	Furniture and Equipment				
	General furniture and equipment for administration	1 month before completion of the construction	MOH		
8	To submit environmental monitoring report to JICA Myanmar Office, if Applicable	during the Project	MOH		
9	To recruit sufficient staff with appropriate skills and experiences for operation and maintenance of new facilities and equipment provided under the Grant Aid	6 months before completion of the construction	MOH		

3. After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid by: 1) Allocation of sufficient budget for operation and maintenance 2) Training of staff on the specialized medical services 3) Contracting with agents for maintenance of specialized medical equipment and lift 4) Regular collection and proper disposals of medical waste and waste water	After completion of the construction	MOH/ MOF/ YCDC?		
2	To appoint and retain sufficient staff with appropriate skills and experiences for operation and maintenance of new facilities and equipment provided under the Grant Aid	After completion of the construction	MOH		

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

2

11/4

Major Undertakings to be Covered by the Japanese Grant

No	Items	Deadline	Cost Estimated (Million Japanese Yen)*	
1	To construct hospital and to procure equipment		XX.XX	
1)	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country			
a)	Marine(Air) transportation of the products from Japan to the recipient country			
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			
4)	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 waste, storm drainage and others) within the site			
d)	Furniture and Equipment			
-	Project equipment			
2	To implement detailed design, tender support and construction supervision (Consultant)		YY.YY	
	Total		ZZ.ZZ	

*; The cost estimates are provisional. This is subject to the approval of the Government of Japan.

A

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Project Monitoring Report
on
The Construction of New Yangon Specialist Hospital
Grant Agreement No. XXXXXXXX
 20XX, Month

Organization Information

Authority (Signer of the G/A)	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	<u>Project Management Unit of New Yangon Specialist Hospital</u> Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Line Agency	<u>Ministry of Health</u> Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____

Outline of Grant Agreement:

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

1: Project Description

1-1 Project Objective

--

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

--

1-3 Effectiveness and the indicators

- Effectiveness by the project

2: Project Implementation

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	Original: (M/D) UNTL Hera campus Attachment: Map	Actual: (PMR) Attachment(s):Map
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Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
1.		
2.		(PMR)

2-1-2 Reason(s) for the modification if there have been any.

(PMR)

2-2 Implementation Schedule

2-2-1 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
Cabinet Approval E/N G/A Detailed Design Tender Notice Tender Construction Period Installation of Equipment Project Completion Date* Defect Liability Period			

*Project Completion was defined as _____ at the time of G/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

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2-3 Undertakings by each Government

2-3-1 Major Undertakings

See Attachment 2.

2-3-2 Activities

See Attachment 3.

2-3-3 Report on RD

See Attachment 4.

2-4 Project Cost

2-4-1 Project Cost

Table 2-4-1a Comparison of Original and Actual Cost by the Government of Japan
(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Construction Facilities	Building Construction			Please state not only the most updated schedule but also other past revisions chronologically.
Equipment	Equipment			
Consulting Services	- Detailed design - Procurement Management - Construction			

	Supervision			
Total				

Note: 1) Date of estimation: March 2015
2) Exchange rate: 1 US Dollar =119.79Yen

Table 2-4-1b Comparison of Original and Actual Cost by the Government of Myanmar

Items			Cost (Million USD)	
	Original	Actual	Original	Actual
1) Leveling of the Site	Demolition of existing pavement, and Grading			
2) Tree felling and stumping	Cutting obstacle trees, and roots			
3) Tree planting and landscape gardening	Tree planting and landscape gardening of the site			
4) Procurement of soil	Procurement of soil for embankment in the site			
5) Infrastructure	Wiring work and leading telephone line to the Site			
6) Procurement of furniture	Procurement of general furniture which are not included in the work by the Grant Aid from the Government of Japan			
7) Commissions	Commissions of A/P and B/A			
8) Tax	Import Duty and Sales Tax applied to imported equipments and materials			
Total				

Note: 1) Date of estimation: March, 2015
2) Exchange rate: 1 US Dollar = 119.79JPY

2-4-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

(PMR)

2-5 Organizations for Implementation

2-5-1 Executing Agency: Project Management Unit of New Yangon Specialist Hospital
- Organization's role, financial position, capacity, cost recovery etc,

- Organization Chart including the unit in charge of the implementation and number of employees.

Original:
Actual, if changed: (PMR)

2-6 Environmental and Social Impacts

3: Operation and Maintenance (O&M)

3-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original:
Actual: (PMR)

3-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original:
Actual: (PMR)

4: Precautions (Risk Management)

- Risks and issues, if any, which may affect the project implementation, outcome,

sustainability and planned countermeasures to be adapted are below.

Original Issues and Countermeasure(s): (M/D)	
Potential Project Risks	Assessment
1.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
2.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
3.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(PMR)	

5: Evaluation at Project Completion and Monitoring Plan

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 for 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. Undertakings to be taken by each Government
3. Monthly Report
4. Report on RD
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)
(Final Report Only)

Annex 11 Estimated Number of Manpower Needed for New Yangon Specialist Hospital

	Estimated Number of Manpower Needed	Estimated Number of Manpower Needed
Doctor	61	137
Professor	(5)	(4)
Sr. Consultant	(10)	(26)
Jr. Consultant	(11)	(23)
Jr. Doctor	(28)	(65)
Radiologist	(7)	(4)
Anesthesiologist	—	(15)
Nurse	63	200
Physical therapist	—	8
EEG/EMG Technician	1	3
Radiological Technician	1	13
Lab. Technician	1	8
Pharmacist	—	10

28

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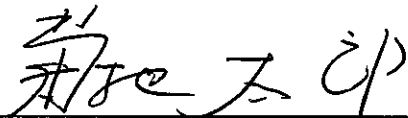
(3) Field Survey III

Minutes of Discussions
on the Third Mission of Preparatory Survey for the Project
for
Construction of New Yangon Specialist Hospital

Based on the several preliminary discussions between the Government of the Republic of the Union of Myanmar (hereinafter referred to as "Myanmar"), the Embassy of Japan and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA dispatched the third Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") of the Project for Construction of New Yangon Specialist Hospital (hereinafter referred to as "the Project"), to Myanmar, headed by Mr. Taro Kikuchi, Director of Health Team 4, Human Development Department, JICA from 3rd July to 21st July, 2017.

The Team held a series of discussions with the officials of the Government of Myanmar and conducted a field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Nay Pyi Taw, 7th July, 2017



Mr. Taro Kikuchi
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan



Prof. Myint Han
Director General
Department of Medical Services
Ministry of Health and Sports
The Republic of the Union of Myanmar

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve patient-centered medical and healthcare services for cerebral and cardiovascular diseases by establishing a new specialist hospital with teaching function, through relocation of the selected clinical departments for cardiology, cardiac surgery, neuro medicine and neurosurgery from Yangon General Hospital, thereby contributing to improvement of the people's health.

2. Project Design

Both sides discussed two separate project designs, including components such as building construction and equipment provision, as described in Plan A and Plan B individually. The basic concept of the construction of New Yangon Specialist Hospital under the Project is outlined in Annex 1.

Plan A is the design where a seven-story building is constructed which contains inpatient wards and High Care Unit (HCU) on the higher rise as well as clinical facilities on the lower one including Outpatient Department (OPD), emergency unit, surgical unit, diagnostic imaging unit, laboratory and Intensive Care Unit (ICU) while only a few portion of advanced medical equipment is procured by the Japanese side. Under Plan A, the rest of medical equipment is procured by the Myanmar side.

Plan B is the other where a three-story building is constructed which contains clinical facilities and more medical equipment essential to run the departments is procured by the Japanese side. Under Plan B, construction of inpatient ward building as well as procurement of the rest of medical equipment are responsible of the Myanmar side.

Information on Plan A and Plan B are presented in Annex 2 to Annex 4 respectively.

The Team will report findings from the discussions on both Plan A and Plan B to the Government of Japan for her final choice. It is noted that the Myanmar side clearly gave the mission the preference in Plan A.

3. Project Site

As for Plan A, the Myanmar side confirmed that the Project site and the boundary line are as shown in Annex 2-A.

The Team emphasized on the necessity to secure more space within the area where the Project site is accommodated on the purpose to realize Plan B. The Myanmar side agreed that the Ministry of Health and Sports would take measures of extending its original boundary line laid for the Project by 25 (twenty-five) meters to the south as shown in Annex 2-B, if Plan B was adopted.

The Myanmar side agreed that the Ministry of Health and Sports would obtain “the land ownership certificate” of the area.

The Myanmar side also agreed to remove the existing fence dividing the area.

4. Responsible Authority for the Project

Both sides confirmed the authority responsible for the Project is as follows:

Department of Medical Services, the Ministry of Health and Sports will be the 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 Executing Agency will take necessary procedures to officially establish an organization of New Yangon Specialist Hospital. The organization chart is proposed as shown in Annex 5.

5. Procedures and Basic Principles of Japanese Grant

The Myanmar side agreed that the procedures and basic principles of Japanese Grant as described in Annex 6, 7 and 8 shall be applied to the Project. The Myanmar side agreed to take the necessary measures, as described in Annex 9, for smooth implementation of the Project. The contents of Annex 9 will be elaborated and refined during the Preparatory Survey and then will be agreed in the mission dispatched for explanation of the Draft Preparatory Survey Report. The contents of Annex 9 will be updated as the Preparatory Survey progresses, and eventually will be used as an attachment to the Grant Agreement.

As for the monitoring of the implementation of the Project, JICA will require the Myanmar side to submit the Project Monitoring Report, the form of which is attached as Annex 10.

6. Human Resource

The Team provided the estimated number of necessary medical/co-medical staff for New Yangon Specialist Hospital, as described in Annex 11. The Myanmar side agreed to provide staff recruitment plan based on the estimation.

7. Budget Estimation

The Team explained that, according to Annex 9, all the expenses other than those to be borne by the Japanese side must be responsibly budgeted by the Myanmar side. The Myanmar side agreed to submit a budget proposal of the Project. The Team will make estimation for FY 2018 and fill the format as per Annex 12, and submit it to the Myanmar side before the Team leaves.

8. Environmental and Social Considerations

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

The Myanmar side confirmed to conduct the necessary procedures concerning the environmental assessment based on the guidelines of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) under Environment Conservation Law. If applicable, the Myanmar side agreed to take necessary measures to obtain environmental license before the implementation of the Project and report to JICA Myanmar office.

9. Schedule of the Survey

The Team will proceed with further survey in Myanmar until 21st July, 2017. Upon the final choice of the plan by the Government of Japan, as mentioned above in the article 2, JICA will start preparing the Draft Preparatory Survey Report in English and dispatch a mission to Myanmar in order to explain its contents including the determinate components. The schedule of the mission will be informed according to the final choice.

10. Maintenance

Both sides agreed on the importance of the maintenance, including preventive maintenance, of the building and the equipment to avoid interruption of the services and to reduce cost for repair. The Myanmar side agreed to establish the units for building and medical equipment maintenance. The Team strongly recommended maintenance contracts to be concluded with manufactures' local agents for advanced medical equipment such as CT scanner, angiography unit, MRI and PACS system before its warranty period terminates.

11. Other Relevant Issue

The Myanmar side agreed to share with the Team some information on the administrative procedures about public works related to the construction of public hospital.

Annex 1	Outline of New Yangon Specialist Hospital
Annex 2-A	Proposed Project Site (Plan A)
Annex 2-B	Proposed Project Site (Plan B)
Annex 3-A	Schematic Diagram of New Hospital (Plan A)
Annex 3-B	Schematic Diagram of New Hospital (Plan B)
Annex 4-A	List of Medical Equipment (Plan A)
Annex 4-B	List of Medical Equipment (Plan B)
Annex 5	Organization Chart of New Yangon Specialist Hospital
Annex 6	Japanese Grant
Annex 7	Procedures of Japanese Grant
Annex 8	Financial Flow of Japanese Grant (A/P Type)
Annex 9	Major Undertakings to be taken by the Government of Myanmar
Annex 10	Project Monitoring Report
Annex 11	Estimated Number of Manpower Needed for New Yangon Specialist Hospital
Annex 12	Total Estimated Costs to be Included in the Budget Proposal for Parliament's Budget

Outline of New Yangon Specialist Hospital

【Basic Concept】

- ✓ National Institute for Cerebral and Cardiovascular Diseases with teaching capacity
- ✓ Universal Design with International Standard to provide patient-centered medical and healthcare services

1. Clinical Departments : cardiology, cardiac surgery, neuro medicine, neurosurgery
2. Target diseases : cardiovascular diseases including cerebral stroke and other cerebrospinal diseases
3. Main facilities :
 - ① Outpatient Department (OPD)
 - ② Emergency department
 - ③ Intensive care units
 - ④ General wards: numbers of beds per a room shall be less than or equal to 4.
 - ⑤ Operation room: cardiac surgery, neurosurgery including hybrid operation room
 - ⑥ Diagnostic imaging unit
 - ⑦ Clinical laboratory
 - ⑧ Pharmacy
 - ⑨ Rehabilitation room
 - ⑩ Central sterilization and service room
 - ⑪ Lecture rooms
 - ⑫ Others: administrative unit, storages, mechanical rooms, morgue etc.
4. Key Concepts
 - ① International Standard
 - Medical and healthcare incorporating advanced medical technology
 - Team-based medical care
 - 24-hour non-stop services
 - Patient safety – reduction/prevention of nosocomial infection and medical malpractices
 - ② Best Environment for Patients
 - High quality medical and healthcare
 - Hospitable facilities with Universal Design

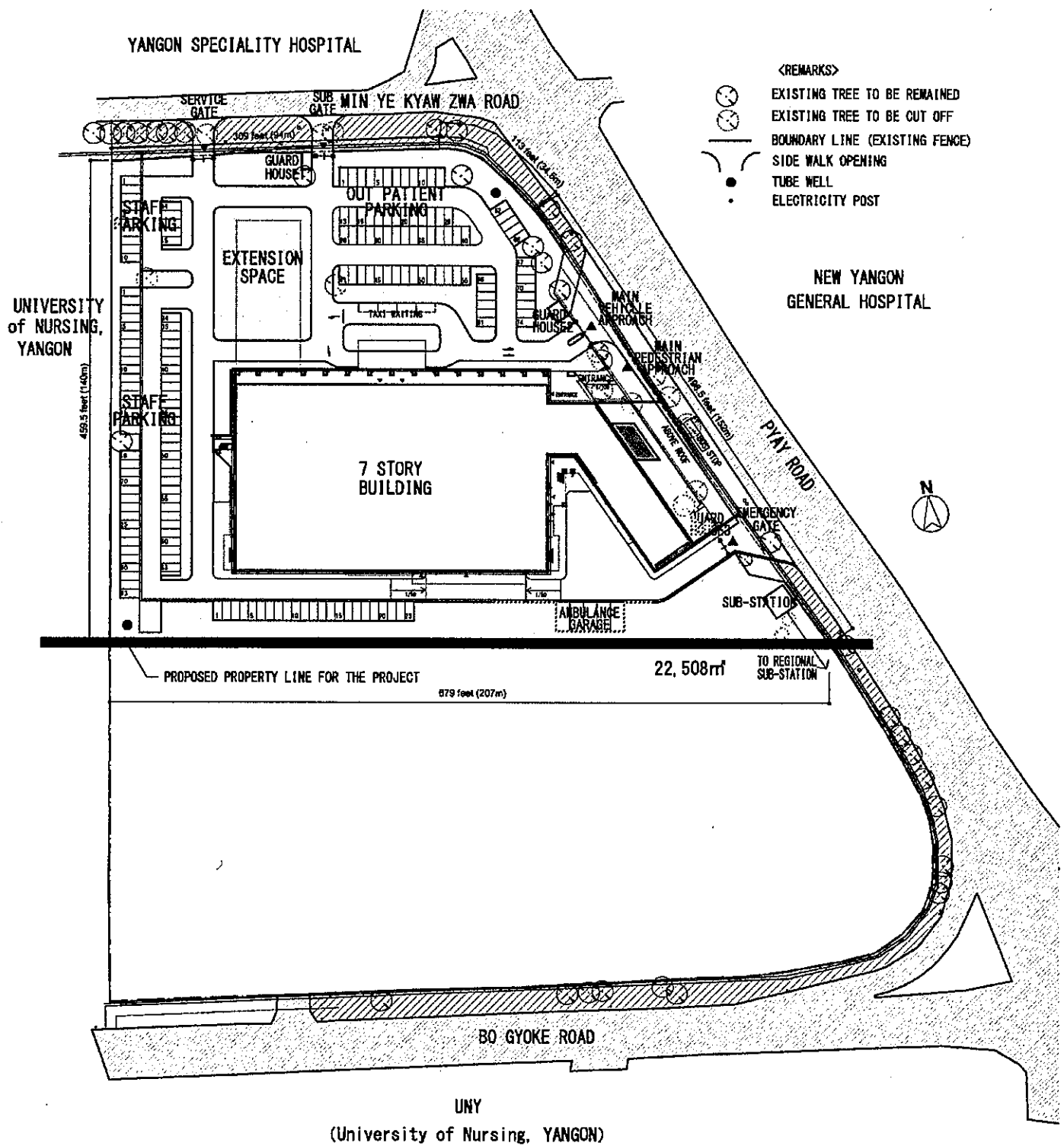
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- Facility designed to
 - Minimize patient movement
 - Ensure close attention from medical staffs
 - Secure sufficient space for patients and their families
 - Reduce waiting time
- ③ Designed for Future Demands and Needs
 - Flexibility allowing layout changes and expansion
 - Resilience against the disaster risks – floods, fire, earthquake
 - Consideration for financial sustainability and environmental impacts – lower energy consumption and maintenance cost
 - Sound maintenance management of facilities and equipment

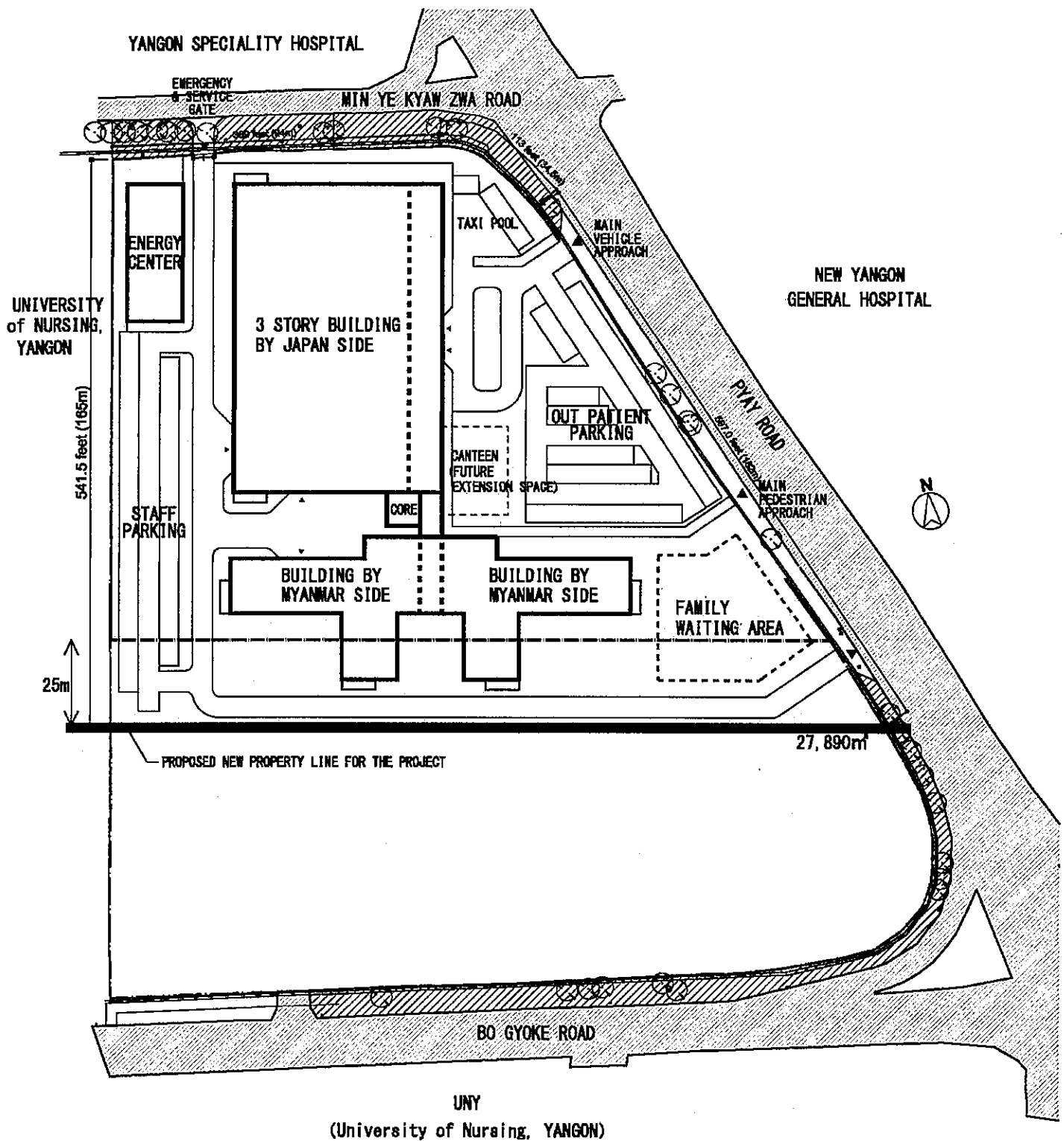
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Proposed Project Site (PLAN B)

Annex-2-B

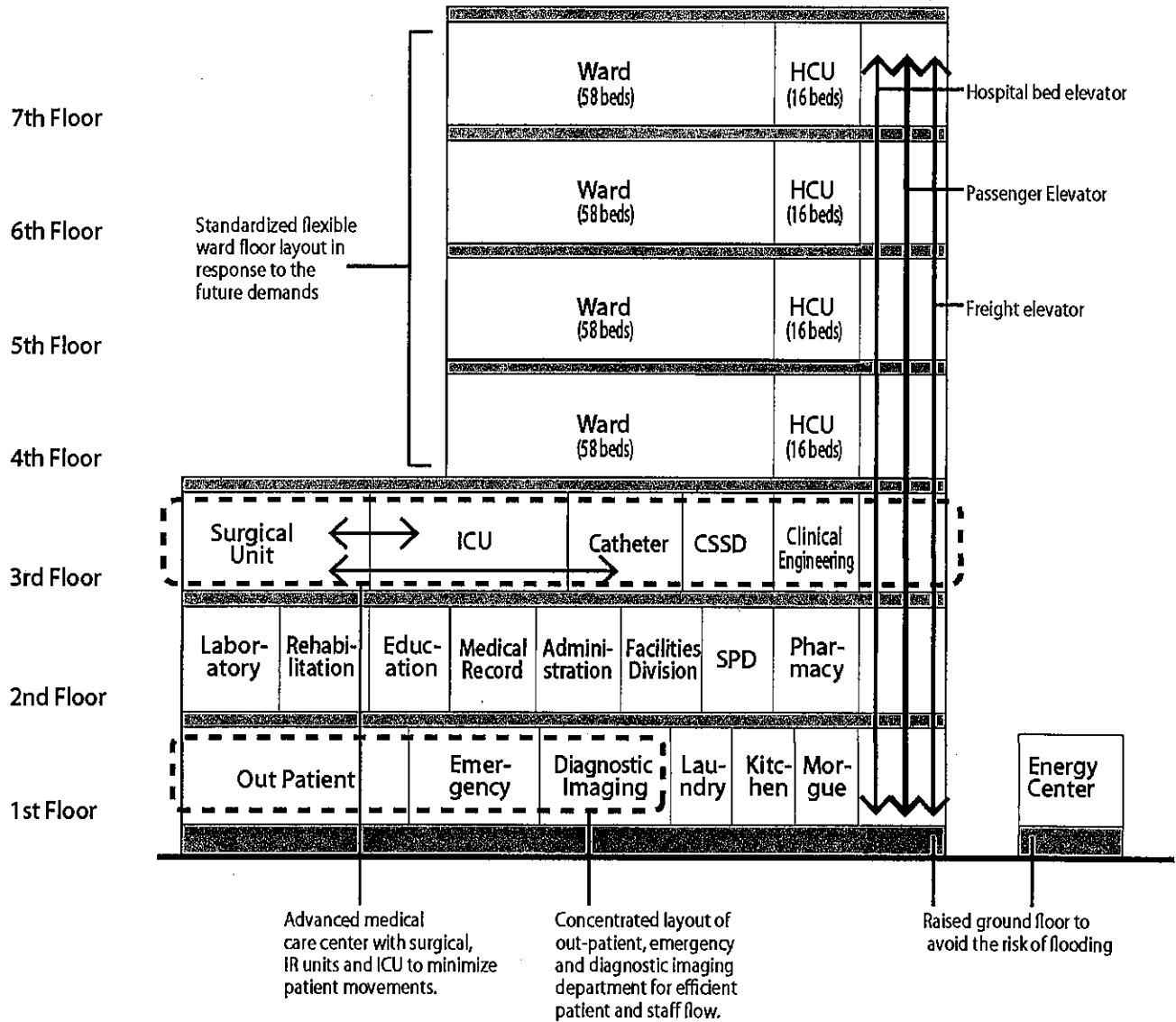


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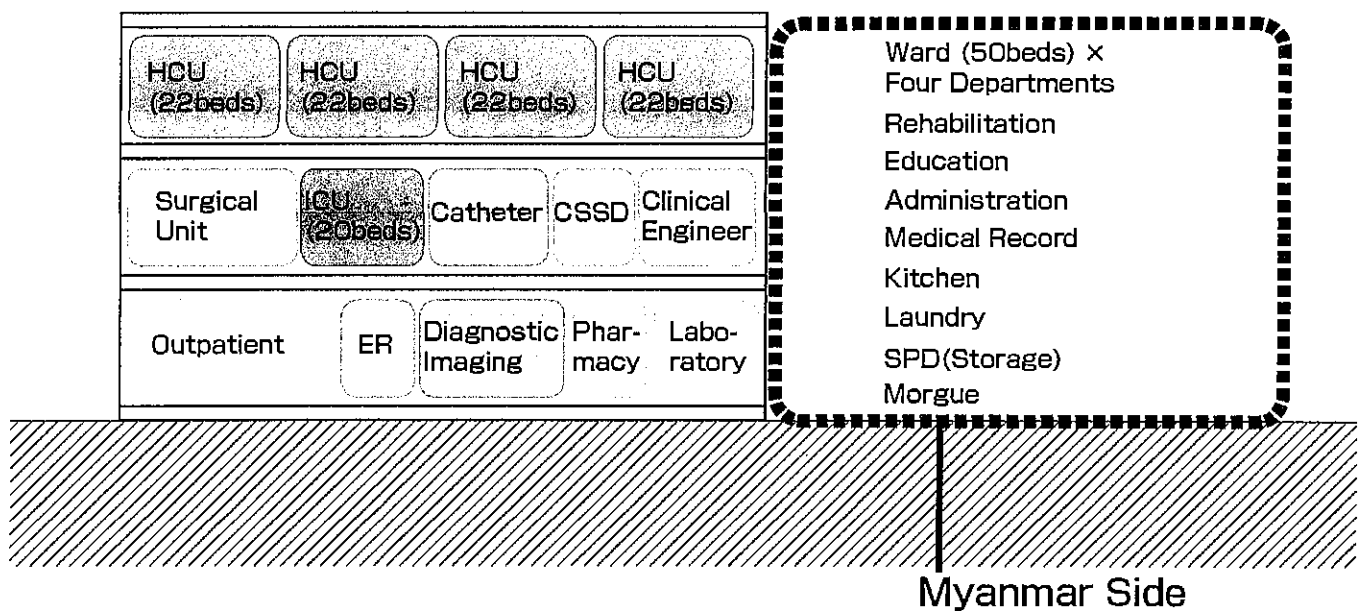
Schematic Diagram of New Hospital (PLAN A)

Annex-3-A



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39

12/1

List of Medical Equipment (Plan A)

Department	Item No.	Description	Q'ty	Priority
Outpatient	OP-1	Examination table	10	●
Outpatient	OP-2	PACS terminal (LCD Monitor)	10	●
Outpatient	OP-3	Consultation desk and chair	10	●
Outpatient	OP-4	Diagnostic set	10	●
Outpatient	OP-5	Waiting chair for 3 persons	35	●
Outpatient	OP-6	Storage cabinet for medical records	8	●
Outpatient	OP-7	X-ray film storage cabinet	5	●
Outpatient	OP-8	Instrument cabinet	8	●
Outpatient (Physiology laboratory)	P-1	Tilt table	1	●
Outpatient (Physiology laboratory)	P-2	Patient monitor (ECG, BP) for tilt table test	1	●
Outpatient (Physiology laboratory)	P-3	ECG machine 12ch. with high signal averaging ECG software	1	●
Outpatient (Physiology laboratory)	P-4	Holter ECG with 3 recorders	1	●
Outpatient (Physiology laboratory)	P-5	ECG with treadmill for stress test	1	●
Outpatient (Physiology laboratory)	P-6	Spirometer	1	●
Outpatient (Physiology laboratory)		EEG	1	transfer
Outpatient (Physiology laboratory)		EMG	1	transfer
Outpatient (Restaurant)	P-7	Dining table with stool	1	●
Rehabilitation	RH-1	Stairs	1	●
Rehabilitation	RH-2	Parallel bars with mirror	2	●
Rehabilitation	RH-3	Exercise mat	1	●
Rehabilitation	RH-4	Balance ball and other exercise therapy set	1	●
Rehabilitation	RH-5	Whirlpool bath	1	●
Rehabilitation	RH-6	Treadmill	1	●
Rehabilitation	RH-7	Ergometer	1	●
Diagnostic Imaging	R-1	CT scanner 128 slices	1	A
Diagnostic Imaging	R-2	CT scanner 64 slices	1	●
Diagnostic Imaging	R-3	MRI 1.5 tesla	1	●
Diagnostic Imaging	R-4	PACS system (including RIS)	1	●
Diagnostic Imaging	R-5	Image printer	1	●
Diagnostic Imaging	R-6	Injector for MRI	1	●
Diagnostic Imaging	R-7	Injector for CT	1	●
Diagnostic Imaging	R-8	Digital X-ray machine	2	A(1)
Diagnostic Imaging	R-9	Mobile X-ray unit	1	●
Diagnostic Imaging	R-10	Ultrasound scanner	2	●
Diagnostic Imaging	R-11	Workstation for radiology equipment	3	●
Diagnostic Imaging (Cath. Labo.)	CL-1	Angiography unit(Cath Lab) single plane	1	A
Diagnostic Imaging (Cath. Labo.)	CL-2	Angiography unit(Cath Lab) bi plane	1	A
Diagnostic Imaging (Cath. Labo.)	CL-3	Injector for Angiography unit	2	●
Diagnostic Imaging (Cath. Labo.)	CL-4	Radiofrequency ablation generator (with stimulation)	1	●
Diagnostic Imaging (Cath. Labo.)	CL-5	3D mapping system	1	●
Diagnostic Imaging (Cath. Labo.)	CL-6	Irrigation pump for ablation	1	●
Diagnostic Imaging (Cath. Labo.)	CL-7	Anesthesia machine with ventilator	1	●
Diagnostic Imaging (Cath. Labo.)	CL-8	Defibrillator with pacing	2	●
Diagnostic Imaging (Cath. Labo.)	CL-9	Oxygen Analyzer	2	●
Diagnostic Imaging (Cath. Labo.)	CL-10	Temporary pacemaker	1	●
Diagnostic Imaging (Cath. Labo.)		Cardiac stimulator	1	transfer
Diagnostic Imaging (Cath. Labo.)		3D mapping system	1	transfer
Diagnostic Imaging (Cath. Labo.)		Ablation generator	1	transfer
Diagnostic Imaging (Cath. Labo.)		Monitor for ablation/3D	1	transfer
Emergency unit	ER-1	Stretcher	5	●
Emergency unit	ER-2	Wheel chair	5	●
Emergency unit	ER-3	Emergency bed	8	●
Emergency unit	ER-4	Emergency cart	2	●
Emergency unit	ER-5	Blood gas analyzer with ISE	1	●
Emergency unit	ER-6	ECG machine, 6ch.	1	●
Emergency unit	ER-7	Mobile X-ray unit	1	●
Emergency unit	ER-8	Ultrasound scanner, portable	1	●

1/24

List of Medical Equipment (Plan A)

Department	Item No.	Description	Q'ty	Priority
Emergency unit	ER-9	Defibrillator with internal paddle	1	●
Emergency unit	ER-10	Diagnostic set	8	●
Emergency unit	ER-11	Mobile OT lamp	4	●
Emergency unit	ER-12	Patient monitor	2	●
Emergency unit	ER-13	Infusion pump	2	●
Coronary Care Unit (CCU)	CCU-1	Ventilator for adult	2	●
Coronary Care Unit (CCU)	CCU-2	Central monitor	2	●
Coronary Care Unit (CCU)	CCU-3	Patient monitor	22	●
Coronary Care Unit (CCU)	CCU-4	Patient bed electric	22	●
Coronary Care Unit (CCU)	CCU-5	Bedside cabinet	22	●
Coronary Care Unit (CCU)	CCU-6	Overbed table	16	●
Coronary Care Unit (CCU)	CCU-7	IV pole	16	●
Coronary Care Unit (CCU)	CCU-8	Infusion pump	15	●
Coronary Care Unit (CCU)	CCU-9	Syringe pump	20	●
Coronary Care Unit (CCU)	CCU-10	Suction bottle for central piping	16	●
Coronary Care Unit (CCU)	CCU-11	Oxygen regulator and humidifier	16	●
Coronary Care Unit (CCU)	CCU-12	Defibrillator	2	●
Coronary Care Unit (CCU)	CCU-13	Oxygen concentrator	2	●
Coronary Care Unit (CCU)	CCU-14	ECG machine	1	●
Coronary Care Unit (CCU)	CCU-15	Emergency trolley	1	●
Coronary Care Unit (CCU)	CCU-16	Medicine cabinet	2	●
Coronary Care Unit (CCU)	CCU-17	Instrument cabinet	2	●
Coronary Care Unit (CCU)	CCU-18	Medicine trolley	2	●
Coronary Care Unit (CCU)	CCU-19	Hand dryer	1	●
Coronary Care Unit (CCU)	CCU-20	Blood gas analyzer with ISE	1	●
Intensive Care Unit (ICU)	ICU-1	Ventilator for adult and pediatrics	10	●
Intensive Care Unit (ICU)		Ventilator for adult (Cardiovascular surgery)	3	transfer
Intensive Care Unit (ICU)	ICU-2	Central monitor	2	●
Intensive Care Unit (ICU)	ICU-3	Patient monitor	32	●
Intensive Care Unit (ICU)	ICU-4	Patient bed electric	32	●
Intensive Care Unit (ICU)	ICU-5	Bedside cabinet	32	●
Intensive Care Unit (ICU)	ICU-6	Overbed table	10	●
Intensive Care Unit (ICU)	ICU-7	IV pole	10	●
Intensive Care Unit (ICU)	ICU-8	Infusion pump	40	●
Intensive Care Unit (ICU)	ICU-9	Syringe pump	40	●
Intensive Care Unit (ICU)	ICU-10	Suction bottle for central piping	10	●
Intensive Care Unit (ICU)	ICU-11	Oxygen regulator and humidifier	10	●
Intensive Care Unit (ICU)	ICU-12	Defibrillator	1	●
Intensive Care Unit (ICU)	ICU-13	Oxygen concentrator	2	●
Intensive Care Unit (ICU)	ICU-14	ECG machine	1	●
Intensive Care Unit (ICU)	ICU-15	Emergency trolley	1	●
Intensive Care Unit (ICU)	ICU-16	Medicine cabinet	1	●
Intensive Care Unit (ICU)	ICU-17	Instrument cabinet	1	●
Intensive Care Unit (ICU)	ICU-18	Medicine trolley	1	●
Intensive Care Unit (ICU)	ICU-19	Hemodialysis machine	2	●
Intensive Care Unit (ICU)	ICU-20	RO unit	1	●
Intensive Care Unit (ICU)	ICU-21	Weight measurable bed	2	●
Intensive Care Unit (ICU)	ICU-22	Pressure mattress for avoiding bedsore	2	●
Intensive Care Unit (ICU)	ICU-23	Fiberoptic bronchoscope	1	●
Intensive Care Unit (ICU)	ICU-24	Pacemaker machine	1	●
Intensive Care Unit (ICU)	ICU-25	Body warmer	1	●
Intensive Care Unit (ICU)	ICU-26	Blood gas analyzer with ISE	1	●
Stroke Care Unit(SCU)	SCU-1	Ventilator for adult	1	●
Stroke Care Unit(SCU)		Ventilator for adult	1	transfer
Stroke Care Unit(SCU)	SCU-2	Central monitor	1	●
Stroke Care Unit(SCU)	SCU-3	Patient monitor	18	●
Stroke Care Unit(SCU)		Patient monitor	4	transfer
Stroke Care Unit(SCU)	SCU-4	Patient bed electric	18	●
Stroke Care Unit(SCU)		Patient bed electric	4	transfer

List of Medical Equipment (Plan A)

Department	Item No.	Description	Q'ty	Priority
Stroke Care Unit(SCU)	SCU-5	Bedside cabinet	22	●
Stroke Care Unit(SCU)	SCU-6	Overbed table	6	●
Stroke Care Unit(SCU)	SCU-7	IV pole	6	●
Stroke Care Unit(SCU)	SCU-8	Infusion pump	1	●
Stroke Care Unit(SCU)		Infusion pump	2	transfer
Stroke Care Unit(SCU)	SCU-9	Syringe pump	6	●
Stroke Care Unit(SCU)	SCU-10	Suction bottle for central piping	6	●
Stroke Care Unit(SCU)	SCU-11	Oxygen regulator and humidifier	6	●
Stroke Care Unit(SCU)		Defibrillator	transfer	●
Stroke Care Unit(SCU)	SCU-12	Oxygen concentrator	2	●
Neuro ICU(NCU)	NCU-1	Ventilator for adult and pediatrics	10	●
Neuro ICU(NCU)	NCU-2	Ventilator for neonates	1	●
Neuro ICU(NCU)	NCU-3	Central monitor	3	●
Neuro ICU(NCU)	NCU-4	Patient monitor	32	●
Neuro ICU(NCU)	NCU-5	Patient bed electric	32	●
Neuro ICU(NCU)	NCU-6	Bedside cabinet	32	●
Neuro ICU(NCU)	NCU-7	Overbed table	20	●
Neuro ICU(NCU)	NCU-8	IV pole	20	●
Neuro ICU(NCU)	NCU-9	Infusion pump	20	●
Neuro ICU(NCU)	NCU-10	Syringe pump	20	●
Neuro ICU(NCU)	NCU-11	Suction bottle for central piping	20	●
Neuro ICU(NCU)	NCU-12	Oxygen regulator and humidifier	20	●
Neuro ICU(NCU)	NCU-13	Defibrillator	1	●
Neuro ICU(NCU)	NCU-14	Oxygen concentrator	10	●
Neuro ICU(NCU)	NCU-15	Infant warmer	1	●
Neuro ICU(NCU)	NCU-16	Plasma exchange machine	1	●
Surgical unit	OTC-1	Operation table	2	●
Surgical unit	OTC-2	Defibrillator with internal paddle	1	●
Surgical unit	OTC-3	Patient monitor	2	●
Surgical unit	OTC-4	Operation theatre light with monitor	2	●
Surgical unit	OTC-5	Electrosurgical unit	2	●
Surgical unit	OTC-6	Anesthesia machine for cardiac surgery	2	●
Surgical unit	OTC-7	Ceiling pendant for anesthetic gas	2	●
Surgical unit	OTC-8	Ceiling pendant for surgery	2	●
Surgical unit	OTC-9	Ceiling pendant for endoscope	2	●
Surgical unit	OTC-10	Ceiling pendant for medical gas	2	●
Surgical unit	OTC-11	Ceiling pendant for electric power connector	2	●
Surgical unit	OTC-12	Hot/cold cabinet	2	●
Surgical unit	OTC-13	Ultrasonic aspirator (CUSA)	1	●
Surgical unit	OTC-14	Anticoagulation monitor(ACT) machine	2	●
Surgical unit	OTC-15	Echo machine (transesophageal probe)	1	●
Surgical unit	OTC-16	Intraoperative ultrasound scanner for blood flow measurement	1	●
Surgical unit	OTC-17	Heart lung machine with cooler/heater unit	2	●
Surgical unit	OTC-18	Intra aortic balloon pump (IABP)	2	●
Surgical unit	OTC-19	Cell saver	2	●
Surgical unit	OTC-20	Surgical C-arm X-ray unit	1	●
Surgical unit	OTC-21	Low continuous suction machine	2	●
Surgical unit	OTC-22	Blood gas analyzer with ISE	2	●
Surgical unit	OTC-23	Biochemistry analyzer, semi-automated	1	●
Surgical unit	OTC-24	Thoracoscope system	1	●
Surgical unit	OTC-25	Surgical instrument set for open heart surgery	2	●
Surgical unit	OTC-26	Surgical instrument set for thoracic operation	2	●
Surgical unit	OTC-27	Surgical instrument set for pediatrics	2	●
Surgical unit	OTC-28	PCPS (ECMO)	1	●
Surgical unit		PCPS (Cardiovascular surgery)	1	transfer
Surgical unit	OTC-29	Recovery bed	4	●

List of Medical Equipment (Plan A)

Department	Item No.	Description	Q'ty	Priority
Surgical unit	HOTC-1	Single plane Angiography unit	1	●
Surgical unit	HOTC-2	Injector	1	●
Surgical unit	HOTC-3	Operation table for Angiography unit	1	●
Surgical unit	HOTC-4	Polysomnography (hemodynamics)	1	●
Surgical unit	HOTC-5	Anesthesia machine with ventilator	1	●
Surgical unit	HOTC-6	Ultrasound scanner with TEE probe	1	●
Surgical unit	HOTC-7	Radiology accessories set (apron etc.)	1	●
Surgical unit	HOTC-8	Operating lamp with camera	1	●
Surgical unit	HOTC-9	Ceiling pendant for anesthetic gas	1	●
Surgical unit	HOTC-10	Ceiling pendant for electric power connector	1	●
Surgical unit	HOTC-11	Camera for operation room	1	●
Surgical unit	HOTC-12	LCD Monitor for PACS	3	●
Surgical unit	HOTC-13	Heart lung machine with cooler/heater unit	1	●
Surgical unit	HOTC-14	Instrument cabinet	2	●
Surgical unit	HOTC-15	Defibrillator	1	●
Surgical unit	HOTC-16	Intra aortic balloon pump (IABP)	1	●
Surgical unit	OTN-1	Operation table	2	●
Surgical unit	OTN-2	Defibrillator with internal paddle	1	●
Surgical unit	OTN-3	Patient monitor	2	●
Surgical unit	OTN-4	Operation theatre light with monitor	2	●
Surgical unit	OTN-5	Electrosurgical unit	2	●
Surgical unit	OTN-6	Anesthesia machine with ventilator	2	●
Surgical unit	OTN-7	Ceiling pendant for anesthetic gas	2	●
Surgical unit	OTN-8	Ceiling pendant for surgery	2	●
Surgical unit	OTN-9	Ceiling pendant for endoscope	2	●
Surgical unit	OTN-10	Ceiling pendant for medical gas	2	●
Surgical unit	OTN-11	Ceiling pendant for electric power connector	2	●
Surgical unit	OTN-12	Cold cabinet	2	●
Surgical unit		Ultrasonic aspirator with accessories	1	transfer
Surgical unit		Intraoperative ultrasound scanner for neuro surgery	1	transfer
Surgical unit		Stereo taxi system	1	transfer
Surgical unit	OTN-13	Navigation system	1	●
Surgical unit	OTN-14	High speed drill , electric	1	●
Surgical unit		High speed drill , electric	1	transfer
Surgical unit		ICP monitor, EVD	1	transfer
Surgical unit		C2 Nerve monitor	1	transfer
Surgical unit		Neuroendoscope	1	transfer
Surgical unit	OTN-15	Spine set	2	●
Surgical unit	OTN-16	Basic neurosurgical set	2	●
Surgical unit	OTN-17	Micro neurosurgical set	2	●
Surgical unit	OTN-18	Aneurysm surgery set	2	●
Surgical unit	OTN-19	Operating microscope mobile	1	●
Surgical unit		Operating microscope mobile	1	transfer
Surgical unit	OTN-20	Operating microscope ceiling	1	●
Surgical unit	OTN-21	Surgical C-arm X-ray unit	1	●
Surgical unit	OTN-22	Head clamp & retractor system	1	●
Surgical unit		Head clamp & retractor system	1	transfer
Surgical unit	OTN-23	Clip and instruments	1	●
Surgical unit	OTN-24	Recovery bed	4	●

11/24

List of Medical Equipment (Plan A)

Department	Item No.	Description	Q'ty	Priority
Surgical unit	HOTN-1	Angiography unit bi plane	1	●
Surgical unit	HOTN-2	CT scanner 32slices	1	●
Surgical unit	HOTN-3	Injector for CT	1	●
Surgical unit	HOTN-4	Operation table for Angiography unit	1	●
Surgical unit	HOTN-5	Anesthesia machine with ventilator	1	●
Surgical unit	HOTN-6	Radiology accessories set (Apron etc.)	1	●
Surgical unit	HOTN-7	Operating lamp with camera	1	●
Surgical unit	HOTN-8	Ceiling pendant for anesthetic gas	1	●
Surgical unit	HOTN-9	Ceiling pendant for electric power connector	1	●
Surgical unit	HOTN-10	Camera for operation room	1	●
Surgical unit	HOTN-11	LCD Monitor for PACS	3	●
Surgical unit	HOTN-12	Instrument cabinet	1	●
Surgical unit	HOTN-13	Defibrillator	1	●
Surgical unit	HOTN-14	Waiting chair for 3 persons	30	●
Laboratory unit	L-1	Fully automated chemistry analyzer	1	●
Laboratory unit	L-2	Urine analyzer	1	●
Laboratory unit	L-3	Blood cell counter 5 part differential	1	●
Laboratory unit	L-4	Automated coagulation analyzer	1	●
Laboratory unit	L-5	Immuno hormone analyzer	1	●
Laboratory unit	L-6	Distillation plant	1	●
Laboratory unit	L-7	Laboratory central table with stool	1	B
Laboratory unit	L-8	Laboratory side table with stool	5	B(1)
Laboratory unit	L-9	Fully automated blood culture system	1	●
Laboratory unit	L-10	Automatic sliding strainer	1	●
Laboratory unit	L-11	Microtome	1	●
Laboratory unit	L-12	Binocular microscope	4	●
Laboratory unit	L-13	Incubator	1	●
Laboratory unit	L-14	Paraffin bath (embedding machine)	1	●
Laboratory unit	L-15	Safety cabinet	1	●
Laboratory unit	L-16	Tissue processor	1	●
Laboratory unit	L-17	Cooling plate	1	●
Laboratory unit	L-18	Hematocrit centrifuge	1	●
Laboratory unit	L-19	Storage rack	5	●
Laboratory unit	L-20	Blood bank refrigerator	1	●
Laboratory unit	L-21	Thawing water bath	1	●
Laboratory unit	L-22	Micro pipette set	1	●
Laboratory unit	L-23	Microscope	1	●
Laboratory unit	L-24	Centrifuge for serofuge	2	●
Laboratory unit	L-25	Platelet incubator with agitator	1	●
Laboratory unit	L-26	Deep Freezer	1	●
Laboratory unit	L-27	Centrifuge for specimen separation	2	●
Laboratory unit	L-28	Oven	1	●
Laboratory unit	L-29	Pharmaceutical refrigerator	3	●
Laboratory unit	L-30	Cryostat	1	●
Laboratory unit	L-31	Bone marrow aspiration trephine set	1	●
Clinical Engineering	CE-1	Working table with chair	1	●
Clinical Engineering	CE-2	Maintenance tool kit	1	●
Pharmacy	PH-1	Pharmaceutical refrigerator	4	●
Pharmacy	PH-2	Medicine cabinet	5	●
Pharmacy	PH-3	Desk and chair	1	●
Pharmacy	PH-4	Storage Rack	5	●
Inpatient Ward	W-1	Examination table	2	●
Inpatient Ward	W-2	Suction bottle for central piping	66	●
Inpatient Ward	W-3	Oxygen regulator and humidifier	66	●
Inpatient Ward	W-4	Hospital bed	264	●
Inpatient Ward	W-5	Bedside cabinet	264	●
Inpatient Ward	W-6	Overbed table	264	●
Inpatient Ward	W-7	IV pole	66	●
Inpatient Ward	W-8	Patient monitor	10	●

List of Medical Equipment (Plan A)

Department	Item No.	Description	Q'ty	Priority
Inpatient Ward	W-9	Low continuous suction unit	33	●
Inpatient Ward	W-10	Instrument cabinet	33	●
Inpatient Ward	W-11	Medicine cabinet	33	●
Inpatient Ward	W-12	Instrument trolley	33	●
Inpatient Ward	W-13	Bedpan washer	4	●
Inpatient Ward	W-14	Wheel chair	8	●
Inpatient Ward	W-15	ECG machine	2	●
Inpatient Ward	W-16	Echo machine (transesophageal probe)	3	●
Inpatient Ward	W-17	Chair for case discussion	80	●
Inpatient Ward	W-18	White board	4	●
Inpatient Ward		EEG	1	transfer
Inpatient Ward	W-19	EEG for 24 hrs. monitoring with monitor	1	●
Inpatient Ward		EMG	1	transfer
Inpatient Ward	W-20	Weighing scale bed for stretcher/wheel chair	1	●
Inpatient Ward	W-21	Ultrasound scanner carotid doppler +transcranial	1	●
CSSD	S-1	High pressure steam sterilizer 440L	1	B (1)
CSSD	S-2	High pressure steam sterilizer 160L	1	B
CSSD	S-3	Hydrogen peroxide gas sterilizer	1	●
CSSD	S-4	Ultrasonic washer	2	●
CSSD	S-5	Sterilization cart	1	●
CSSD	S-6	Linen cart	3	●
CSSD	S-7	Sterilization cabinet	3	●
CSSD	S-8	Hand scrub station for 3 persons	2	B
Kitchen	K-1	Cooking oven	1	●
Kitchen	K-2	Desk and chair	1	●
Kitchen	K-3	Refrigerator for food	1	●
Kitchen	K-4	Freezer for food	1	●
Laundry	LA-1	Washing machine with dehydration function	3	●
Laundry	LA-2	Drying machine	3	●
Laundry	LA-3	Linen cabinet	3	●
Laundry	LA-4	Press machine	2	●
Administration Department	A-1	Desk	80	●
Administration Department	A-2	Chair	80	●
Administration Department	A-3	Book shelf	30	●
Administration Department	A-4	File cabinet	30	●
Education (conference room)	LE-1	Projector	2	●
Education (conference room)	LE-2	Screen	2	●
Education (conference room)	LE-3	AV set	2	●
Education (conference room)	LE-4	Lap top computer	1	●
Education (conference room)	LE-5	LCD for meeting room & research	2	●
Education (conference room)	LE-6	Desk with chair for listener	100	●
Education (conference room)	LE-7	Stand for speaker	2	●
Education (medical library)	LE-8	Book shelf for reference book	1	●
Medical Record	MR-1	Book shelf	5	●
Medical Record	MR-2	File cabinet	3	●
Supply Processing Distribution	S-1	Pharmaceutical refrigerator	5	●
Supply Processing Distribution	S-2	Storage Rack	5	●
Morgue	M-1	Refrigerator for dead body	1	●

A Procured by the Japan side

B Subject to further analysis in Japan

● Procured by the Myanmar Side

*Q'ty Subject to change after further analysis in Japan

Transfer Existing equipment will be transferred by Myanmar side to new facility.

List of Medical Equipment (Plan B)

Department	Item No.	Description	Q'ty	Priority
Outpatient	OP-1	Examination table	10	●
Outpatient	OP-2	PACS terminal (LCD Monitor)	10	B(8)
Outpatient	OP-3	Consultation desk and chair	10	●
Outpatient	OP-4	Diagnostic set	10	●
Outpatient	OP-5	Waiting chair for 3 persons	35	●
Outpatient	OP-6	Storage cabinet for medical records	8	●
Outpatient	OP-7	X-ray film storage cabinet	5	●
Outpatient	OP-8	Instrument cabinet	8	●
Outpatient (Physiology laboratory)	P-1	Tilt table	1	●
Outpatient (Physiology laboratory)	P-2	Patient monitor (ECG, BP) for tilt table test	1	●
Outpatient (Physiology laboratory)	P-3	ECG machine 12ch.with high signal averaging ECG software	1	A
Outpatient (Physiology laboratory)	P-4	Holter ECG with 3 recorders	1	A
Outpatient (Physiology laboratory)	P-5	ECG with treadmill for stress test	1	A
Outpatient (Physiology laboratory)	P-6	Spirometer	1	●
Outpatient (Physiology laboratory)		EEG	1	transfer
Outpatient (Physiology laboratory)		EMG	1	transfer
Outpatient (Restraint)	P-7	Dining table with stool	1	●
Rehabilitation	RH-1	Stairs	1	●
Rehabilitation	RH-2	Parallel bars with mirror	2	●
Rehabilitation	RH-3	Exercise mat	1	●
Rehabilitation	RH-4	Balance ball and other exercise therapy set	1	●
Rehabilitation	RH-5	Whirlpool bath	1	●
Rehabilitation	RH-6	Treadmill	1	●
Rehabilitation	RH-7	Ergometer	1	●
Diagnostic Imaging	R-1	CT scanner 128 slices	1	A
Diagnostic Imaging	R-2	CT scanner 64 slices	1	●
Diagnostic Imaging	R-3	MRI 1.5 tesla	1	A
Diagnostic Imaging	R-4	PACS system (including RIS)	1	B
Diagnostic Imaging	R-5	Image printer	1	●
Diagnostic Imaging	R-6	Injector for MRI	1	●
Diagnostic Imaging	R-7	Injector for CT	1	●
Diagnostic Imaging	R-8	Digital X-ray machine	2	A(1)
Diagnostic Imaging	R-9	Mobile X-ray unit	1	●
Diagnostic Imaging	R-10	Ultrasound scanner	2	A(1)
Diagnostic Imaging	R-11	Workstation for radiology equipment	3	●
Diagnostic Imaging (Cath. Labo.)	CL-1	Angiography unit(Cath Lab) single plane	1	A
Diagnostic Imaging (Cath. Labo.)	CL-2	Angiography unit(Cath Lab) bi plane	1	A
Diagnostic Imaging (Cath. Labo.)	CL-3	Injector for Angiography unit	2	●
Diagnostic Imaging (Cath. Labo.)	CL-4	Radiofrequency ablation generator (with stimulation)	1	●
Diagnostic Imaging (Cath. Labo.)	CL-5	3D mapping system	1	●
Diagnostic Imaging (Cath. Labo.)	CL-6	Irrigation pump for ablation	1	●
Diagnostic Imaging (Cath. Labo.)	CL-7	Anesthesia machine with ventilator	1	●
Diagnostic Imaging (Cath. Labo.)	CL-8	Defibrillator with pacing	2	A
Diagnostic Imaging (Cath. Labo.)	CL-9	Oxygen Analyzer	2	●
Diagnostic Imaging (Cath. Labo.)	CL-10	Temporary pacemaker	1	A
Diagnostic Imaging (Cath. Labo.)		Cardiac stimulator	1	transfer
Diagnostic Imaging (Cath. Labo.)		3D mapping system	1	transfer
Diagnostic Imaging (Cath. Labo.)		Ablation generator	1	transfer
Diagnostic Imaging (Cath. Labo.)		Monitor for ablation/3D	1	transfer
Emergency unit	ER-1	Stretcher	5	●
Emergency unit	ER-2	Wheel chair	5	●
Emergency unit	ER-3	Emergency bed	8	●
Emergency unit	ER-4	Emergency cart	2	●
Emergency unit	ER-5	Blood gas analyzer with ISE	1	●
Emergency unit	ER-6	ECG machine, 6ch.	1	●
Emergency unit	ER-7	Mobile X-ray unit	1	●
Emergency unit	ER-8	Ultrasound scanner, portable	1	●

List of Medical Equipment (Plan B)

Department	Item No.	Description	Qty	Priority
Emergency unit	ER-9	Defibrillator with internal paddle	1	●
Emergency unit	ER-10	Diagnostic set	8	●
Emergency unit	ER-11	Mobile OT lamp	4	●
Emergency unit	ER-12	Patient monitor	2	●
Emergency unit	ER-13	Infusion pump	2	●
Coronary Care Unit (CCU)	CCU-1	Ventilator for adult	2	A
Coronary Care Unit (CCU)	CCU-2	Central monitor	2	●
Coronary Care Unit (CCU)	CCU-3	Patient monitor	22	A
Coronary Care Unit (CCU)	CCU-4	Patient bed electric	22	A
Coronary Care Unit (CCU)	CCU-5	Bedside cabinet	22	B
Coronary Care Unit (CCU)	CCU-6	Overbed table	16	●
Coronary Care Unit (CCU)	CCU-7	IV pole	16	●
Coronary Care Unit (CCU)	CCU-8	Infusion pump	15	A(13)
Coronary Care Unit (CCU)	CCU-9	Syringe pump	20	A
Coronary Care Unit (CCU)	CCU-10	Suction bottle for central piping	16	●
Coronary Care Unit (CCU)	CCU-11	Oxygen regulator and humidifier	16	●
Coronary Care Unit (CCU)	CCU-12	Defibrillator	2	●
Coronary Care Unit (CCU)	CCU-13	Oxygen concentrator	2	●
Coronary Care Unit (CCU)	CCU-14	ECG machine	1	A
Coronary Care Unit (CCU)	CCU-15	Emergency trolley	1	●
Coronary Care Unit (CCU)	CCU-16	Medicine cabinet	2	●
Coronary Care Unit (CCU)	CCU-17	Instrument cabinet	2	●
Coronary Care Unit (CCU)	CCU-18	Medicine trolley	2	●
Coronary Care Unit (CCU)	CCU-19	Hand dryer	1	●
Coronary Care Unit (CCU)	CCU-20	Blood gas analyzer with ISE	1	A
Intensive Care Unit (ICU)	ICU-1	Ventilator for adult and pediatrics	10	A(7)
Intensive Care Unit (ICU)		Ventilator for adult (Cardiovascular surgery)	3	transfer
Intensive Care Unit (ICU)	ICU-2	Central monitor	2	A
Intensive Care Unit (ICU)	ICU-3	Patient monitor	32	A
Intensive Care Unit (ICU)	ICU-4	Patient bed electric	32	A
Intensive Care Unit (ICU)	ICU-5	Bedside cabinet	32	B
Intensive Care Unit (ICU)	ICU-6	Overbed table	10	●
Intensive Care Unit (ICU)	ICU-7	IV pole	10	●
Intensive Care Unit (ICU)	ICU-8	Infusion pump	40	A
Intensive Care Unit (ICU)	ICU-9	Syringe pump	40	A
Intensive Care Unit (ICU)	ICU-10	Suction bottle for central piping	10	A
Intensive Care Unit (ICU)	ICU-11	Oxygen regulator and humidifier	10	A
Intensive Care Unit (ICU)	ICU-12	Defibrillator	1	●
Intensive Care Unit (ICU)	ICU-13	Oxygen concentrator	2	●
Intensive Care Unit (ICU)	ICU-14	ECG machine	1	●
Intensive Care Unit (ICU)	ICU-15	Emergency trolley	1	●
Intensive Care Unit (ICU)	ICU-16	Medicine cabinet	1	●
Intensive Care Unit (ICU)	ICU-17	Instrument cabinet	1	●
Intensive Care Unit (ICU)	ICU-18	Medicine trolley	1	●
Intensive Care Unit (ICU)	ICU-19	Hemodialysis machine	2	A
Intensive Care Unit (ICU)	ICU-20	RO unit	1	A
Intensive Care Unit (ICU)	ICU-21	Weight measurable bed	2	●
Intensive Care Unit (ICU)	ICU-22	Pressure mattress for avoiding bed sore	2	●
Intensive Care Unit (ICU)	ICU-23	Fiberoptic bronchoscope	1	●
Intensive Care Unit (ICU)	ICU-24	Pacemaker machine	1	●
Intensive Care Unit (ICU)	ICU-25	Body warmer	1	●
Intensive Care Unit (ICU)	ICU-26	Blood gas analyzer with ISE	1	A
Stroke Care Unit(SCU)	SCU-1	Ventilator for adult	1	●
Stroke Care Unit(SCU)		Ventilator for adult	1	transfer
Stroke Care Unit(SCU)	SCU-2	Central monitor	1	●
Stroke Care Unit(SCU)	SCU-3	Patient monitor	18	A
Stroke Care Unit(SCU)		Patient monitor	4	transfer
Stroke Care Unit(SCU)	SCU-4	Patient bed electric	18	A
Stroke Care Unit(SCU)		Patient bed electric	4	transfer

List of Medical Equipment (Plan B)

Department	Item No.	Description	Qty	Priority
Stroke Care Unit(SCU)	SCU-5	Bedside cabinet	22	B
Stroke Care Unit(SCU)	SCU-6	Overbed table	6	●
Stroke Care Unit(SCU)	SCU-7	IV pole	6	●
Stroke Care Unit(SCU)	SCU-8	Infusion pump	1	●
Stroke Care Unit(SCU)		Infusion pump	2	transfer
Stroke Care Unit(SCU)	SCU-9	Syringe pump	6	A
Stroke Care Unit(SCU)	SCU-10	Suction bottle for central piping	6	●
Stroke Care Unit(SCU)	SCU-11	Oxygen regulator and humidifier	6	●
Stroke Care Unit(SCU)		Defibrillator	transfer	●
Stroke Care Unit(SCU)	SCU-12	Oxygen concentrator	2	●
Neuro ICU(NCU)	NCU-1	Ventilator for adult and pediatrics	10	A
Neuro ICU(NCU)	NCU-2	Ventilator for neonates	1	●
Neuro ICU(NCU)	NCU-3	Central monitor	3	●
Neuro ICU(NCU)	NCU-4	Patient monitor	32	A
Neuro ICU(NCU)	NCU-5	Patient bed electric	32	A
Neuro ICU(NCU)	NCU-6	Bedside cabinet	32	B
Neuro ICU(NCU)	NCU-7	Overbed table	20	●
Neuro ICU(NCU)	NCU-8	IV pole	20	●
Neuro ICU(NCU)	NCU-9	Infusion pump	20	●
Neuro ICU(NCU)	NCU-10	Syringe pump	20	A
Neuro ICU(NCU)	NCU-11	Suction bottle for central piping	20	A(10)
Neuro ICU(NCU)	NCU-12	Oxygen regulator and humidifier	20	A(10)
Neuro ICU(NCU)	NCU-13	Defibrillator	1	●
Neuro ICU(NCU)	NCU-14	Oxygen concentrator	10	●
Neuro ICU(NCU)	NCU-15	Infant warmer	1	●
Neuro ICU(NCU)	NCU-16	Plasma exchange machine	1	●
Surgical unit	OTC-1	Operation table	2	A
Surgical unit	OTC-2	Defibrillator with internal paddle	1	A
Surgical unit	OTC-3	Patient monitor	2	A
Surgical unit	OTC-4	Operation theatre light with monitor	2	A
Surgical unit	OTC-5	Electrosurgical unit	2	●
Surgical unit	OTC-6	Anesthesia machine with ventilator	2	A
Surgical unit	OTC-7	Ceiling pendant for anesthetic gas	2	A
Surgical unit	OTC-8	Ceiling pendant for surgery	2	A
Surgical unit	OTC-9	Ceiling pendant for endoscope	2	●
Surgical unit	OTC-10	Ceiling pendant for medical gas	2	●
Surgical unit	OTC-11	Ceiling pendant for electric power connector	2	●
Surgical unit	OTC-12	Hot/cold cabinet	2	●
Surgical unit	OTC-13	Ultrasonic aspirator (CUSA)	1	●
Surgical unit	OTC-14	Anticoagulation monitor(ACT) machine	2	A(1)
Surgical unit	OTC-15	Echo machine (transesophageal probe)	1	●
Surgical unit	OTC-16	Intraoperative ultrasound scanner for blood flow measurement	1	●
Surgical unit	OTC-17	Heart lung machine with cooler/heater unit	2	A(1)
Surgical unit	OTC-18	Intra aortic balloon pump(IABP)	2	A(1)
Surgical unit	OTC-19	Cell saver	2	●
Surgical unit	OTC-20	Surgical C-arm X-ray unit	1	●
Surgical unit	OTC-21	Low continuous suction machine	2	●
Surgical unit	OTC-22	Blood gas analyzer with ISE	2	●
Surgical unit	OTC-23	Biochemistry analyzer, semi-automated	1	●
Surgical unit	OTC-24	Thoracoscope system	1	●
Surgical unit	OTC-25	Surgical instrument set for open heart surgery	2	●
Surgical unit	OTC-26	Surgical instrument set for thoracic operation	2	●
Surgical unit	OTC-27	Surgical instrument set for pediatrics	2	●
Surgical unit	OTC-28	PCPS (ECMO)	1	●
Surgical unit		PCPS (Cardiovascular surgery)	1	transfer
Surgical unit	OTC-29	Recovery bed	4	A

1124

List of Medical Equipment (Plan B)

Department	Item No.	Description	Q'ty	Priority
Surgical unit	HOTC-1	Single plane Angiography unit	1	●
Surgical unit	HOTC-2	Injector	1	●
Surgical unit	HOTC-3	Operation table for Angiography unit	1	●
Surgical unit	HOTC-4	Polysomnography (hemodynamics)	1	●
Surgical unit	HOTC-5	Anesthesia machine with ventilator	1	●
Surgical unit	HOTC-6	Ultrasound scanner with TEE probe	1	A
Surgical unit	HOTC-7	Radiology accessories set (apron etc.)	1	●
Surgical unit	HOTC-8	Operating lamp with camera	1	●
Surgical unit	HOTC-9	Ceiling pendant for anesthetic gas	1	●
Surgical unit	HOTC-10	Ceiling pendant for electric power connector	1	●
Surgical unit	HOTC-11	Camera for operation room	1	●
Surgical unit	HOTC-12	LCD Monitor for PACS	3	B(2)
Surgical unit	HOTC-13	Heart lung machine with cooler/heater unit	1	●
Surgical unit	HOTC-14	Instrument cabinet	2	●
Surgical unit	HOTC-15	Defibrillator	1	●
Surgical unit	HOTC-16	Intra aortic balloon pump(IABP)	1	●
Surgical unit	OTN-1	Operation table	2	A
Surgical unit	OTN-2	Defibrillator with internal paddle	1	●
Surgical unit	OTN-3	Patient monitor	2	A
Surgical unit	OTN-4	Operation theatre light with monitor	2	A
Surgical unit	OTN-5	Electrosurgical unit	2	●
Surgical unit	OTN-6	Anesthesia machine with ventilator	2	A
Surgical unit	OTN-7	Ceiling pendant for anesthetic gas	2	A
Surgical unit	OTN-8	Ceiling pendant for surgery	2	A
Surgical unit	OTN-9	Ceiling pendant for endoscope	2	●
Surgical unit	OTN-10	Ceiling pendant for medical gas	2	●
Surgical unit	OTN-11	Ceiling pendant for electric power connector	2	●
Surgical unit	OTN-12	Cold cabinet	2	●
Surgical unit		Ultrasonic aspirator with accessories	1	transfer
Surgical unit		Intraoperative ultrasound scanner for neuro surgery	1	transfer
Surgical unit		Stereo taxi system	1	transfer
Surgical unit	OTN-13	Navigation system	1	A
Surgical unit	OTN-14	High speed drill , electric	1	A
Surgical unit		High speed drill , electric	1	transfer
Surgical unit		ICP monitor, EVD	1	transfer
Surgical unit		C2 Nerve monitor	1	transfer
Surgical unit		Neuroendoscope	1	transfer
Surgical unit	OTN-15	Spine set	2	●
Surgical unit	OTN-16	Basic neurosurgical set	2	●
Surgical unit	OTN-17	Micro neurosurgical set	2	●
Surgical unit	OTN-18	Aneurysm surgery set	2	●
Surgical unit	OTN-19	Operating microscope mobile	1	A
Surgical unit		Operating microscope mobile	1	transfer
Surgical unit	OTN-20	Operating microscope ceiling	1	●
Surgical unit	OTN-21	Surgical C-arm X-ray unit	1	●
Surgical unit	OTN-22	Head clamp & retractor system	1	●
Surgical unit		Head clamp & retractor system	1	transfer
Surgical unit	OTN-23	Clip and instruments	1	●
Surgical unit	OTN-24	Recovery bed	4	A

List of Medical Equipment (Plan B)

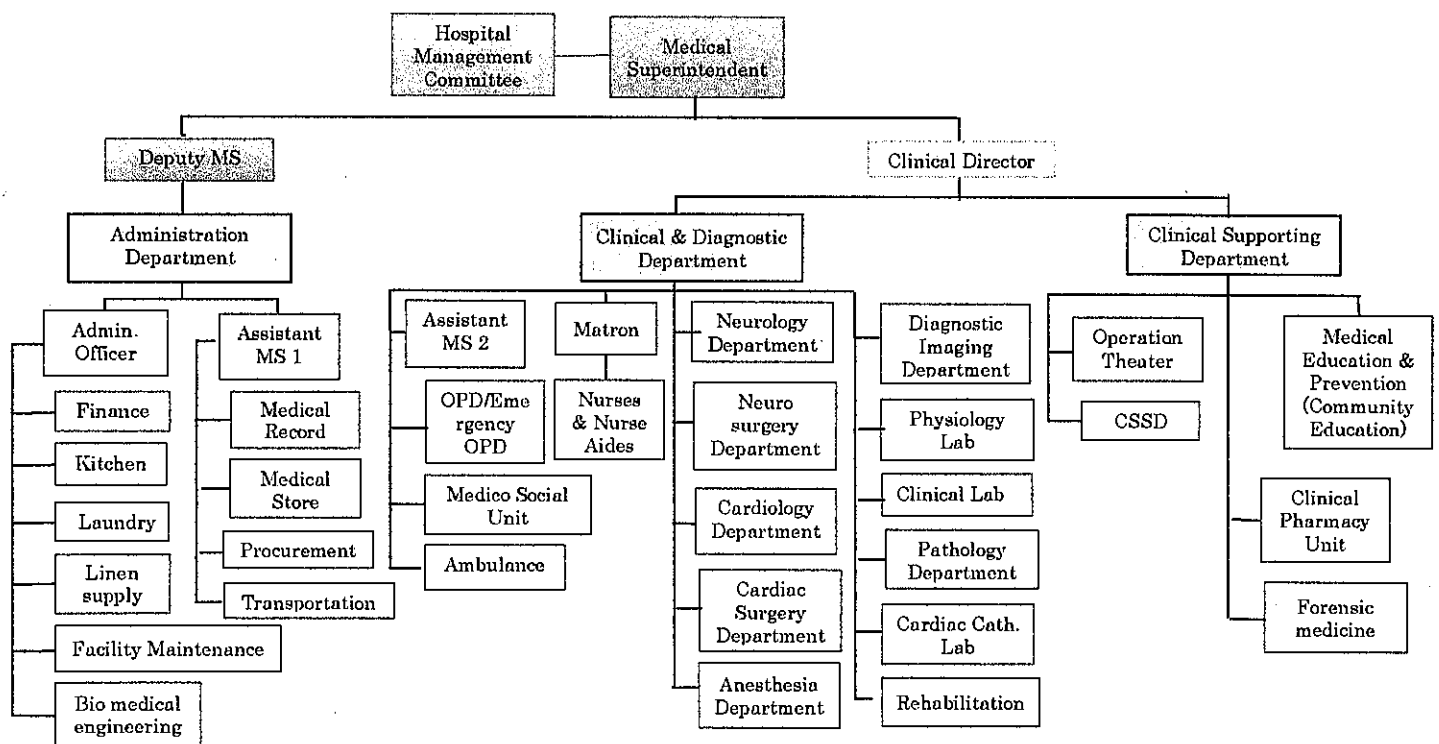
Department	Item No.	Description	Q'ty	Priority
Surgical unit	HOTN-1	Angiography unit bi plane	1	●
Surgical unit	HOTN-2	CT scanner 32slices	1	●
Surgical unit	HOTN-3	Injector for CT	1	●
Surgical unit	HOTN-4	Operation table for Angiography unit	1	●
Surgical unit	HOTN-5	Anesthesia machine with ventilator	1	●
Surgical unit	HOTN-6	Radiology accessories set (Apron etc.)	1	●
Surgical unit	HOTN-7	Operating lamp with camera	1	●
Surgical unit	HOTN-8	Ceiling pendant for anesthetic gas	1	●
Surgical unit	HOTN-9	Ceiling pendant for electric power connector	1	●
Surgical unit	HOTN-10	Camera for operation room	1	●
Surgical unit	HOTN-11	LCD Monitor for PACS	3	B(2)
Surgical unit	HOTN-12	Instrument cabinet	1	●
Surgical unit	HOTN-13	Defibrillator	1	A
Surgical unit	HOTN-14	Waiting chair for 3 persons	30	●
Laboratory unit	L-1	Fully automated chemistry analyzer	1	●
Laboratory unit	L-2	Urine analyzer	1	●
Laboratory unit	L-3	Blood cell counter 5 part differential	1	A
Laboratory unit	L-4	Automated coagulation analyzer	1	A
Laboratory unit	L-5	Immuno hormone analyzer	1	●
Laboratory unit	L-6	Distillation plant	1	●
Laboratory unit	L-7	Laboratory central table with stool	1	B
Laboratory unit	L-8	Laboratory side table with stool	5	B(1)
Laboratory unit	L-9	Fully automated blood culture system	1	●
Laboratory unit	L-10	Automatic sliding strainer	1	●
Laboratory unit	L-11	Microtome	1	●
Laboratory unit	L-12	Binocular microscope	4	●
Laboratory unit	L-13	Incubator	1	●
Laboratory unit	L-14	Paraffin bath (embedding machine)	1	●
Laboratory unit	L-15	Safety cabinet	1	●
Laboratory unit	L-16	Tissue processor	1	●
Laboratory unit	L-17	Cooling plate	1	●
Laboratory unit	L-18	Hematocrit centrifuge	1	●
Laboratory unit	L-19	Storage rack	5	●
Laboratory unit	L-20	Blood bank refrigerator	1	A
Laboratory unit	L-21	Thawing water bath	1	A
Laboratory unit	L-22	Micro pipette set	1	●
Laboratory unit	L-23	Microscope	1	●
Laboratory unit	L-24	Centrifuge for serofuge	2	●
Laboratory unit	L-25	Platelet incubator with agitator	1	A
Laboratory unit	L-26	Deep Freezer	1	●
Laboratory unit	L-27	Centrifuge for specimen separation	2	●
Laboratory unit	L-28	Oven	1	●
Laboratory unit	L-29	Pharmaceutical refrigerator	3	●
Laboratory unit	L-30	Cryostat	1	A
Laboratory unit	L-31	Bone marrow aspiration trephine set	1	●
Clinical Engineering	CE-1	Working table with chair	1	●
Clinical Engineering	CE-2	Maintenance tool kit	1	●
Pharmacy	PH-1	Pharmaceutical refrigerator	4	A(2)
Pharmacy	PH-2	Medicine cabinet	5	●
Pharmacy	PH-3	Desk and chair	1	●
Pharmacy	PH-4	Storage Rack	5	●
Inpatient Ward	W-1	Examination table	2	●
Inpatient Ward	W-2	Suction bottle for central piping	66	●
Inpatient Ward	W-3	Oxygen regulator and humidifier	66	●
Inpatient Ward	W-4	Hospital bed	264	●
Inpatient Ward	W-5	Bedside cabinet	264	●
Inpatient Ward	W-6	Overbed table	264	●
Inpatient Ward	W-7	IV pole	66	●
Inpatient Ward	W-8	Patient monitor	10	●

List of Medical Equipment (Plan B)

Department	Item No.	Description	Q'ty	Priority
Inpatient Ward	W-9	Low continuous suction unit	33	●
Inpatient Ward	W-10	Instrument cabinet	33	●
Inpatient Ward	W-11	Medicine cabinet	33	●
Inpatient Ward	W-12	Instrument trolley	33	●
Inpatient Ward	W-13	Bedpan washer	4	●
Inpatient Ward	W-14	Wheel chair	8	●
Inpatient Ward	W-15	ECG machine	2	●
Inpatient Ward	W-16	Echo machine (transesophageal probe)	3	●
Inpatient Ward	W-17	Chair for case discussion	80	●
Inpatient Ward	W-18	White board	4	●
Inpatient Ward		EEG	1	transfer
Inpatient Ward	W-19	EEG for 24 hrs. monitoring with monitor	1	●
Inpatient Ward		EMG	1	transfer
Inpatient Ward	W-20	Weighing scale bed for stretcher/wheel chair	1	●
Inpatient Ward	W-21	Ultrasound scanner carotid doppler +transcranial	1	●
CSSD	S-1	High pressure steam sterilizer 440L	1	B(1)
CSSD	S-2	High pressure steam sterilizer 160L	1	B
CSSD	S-3	Hydrogen peroxide gas sterilizer	1	●
CSSD	S-4	Ultrasonic washer	2	●
CSSD	S-5	Sterilization cart	1	●
CSSD	S-6	Linen cart	3	●
CSSD	S-7	Sterilization cabinet	3	●
CSSD	S-8	Hand scrub station for 3 persons	2	B
Kitchen	K-1	Cooking oven	1	●
Kitchen	K-2	Desk and chair	1	●
Kitchen	K-3	Refrigerator for food	1	●
Kitchen	K-4	Freezer for food	1	●
Laundry	LA-1	Washing machine with dehydration function	3	●
Laundry	LA-2	Drying machine	3	●
Laundry	LA-3	Linen cabinet	3	●
Laundry	LA-4	Press machine	2	●
Administration Department	A-1	Desk	80	●
Administration Department	A-2	Chair	80	●
Administration Department	A-3	Book shelf	30	●
Administration Department	A-4	File cabinet	30	●
Education (conference room)	LE-1	Projector	2	●
Education (conference room)	LE-2	Screen	2	●
Education (conference room)	LE-3	AV set	2	●
Education (conference room)	LE-4	Lap top computer	1	●
Education (conference room)	LE-5	LCD for meeting room & research	2	●
Education (conference room)	LE-6	Desk with chair for listener	100	●
Education (conference room)	LE-7	Stand for speaker	2	●
Education (medical library)	LE-8	Book shelf for reference book	1	●
Medical Record	MR-1	Book shelf	5	●
Medical Record	MR-2	File Cabinet	3	●
Supply Processing Distribution	S-1	Pharmaceutical refrigerator	5	●
Supply Processing Distribution	S-2	Storage Rack	5	●
Morgue	M-1	Refrigerator for dead body	1	●

- A Procured by the Japan side
 B Subject to further analysis in Japan
 ● Procured by the Myanmar Side
 *Q'ty Subject to change after further analysis in Japan
 Transfer Existing equipment will be transferred by Myanmar side to new facility.

ANNEX-5 Organization chart of New Yangon Specialist Hospital



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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 signed 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)."

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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.

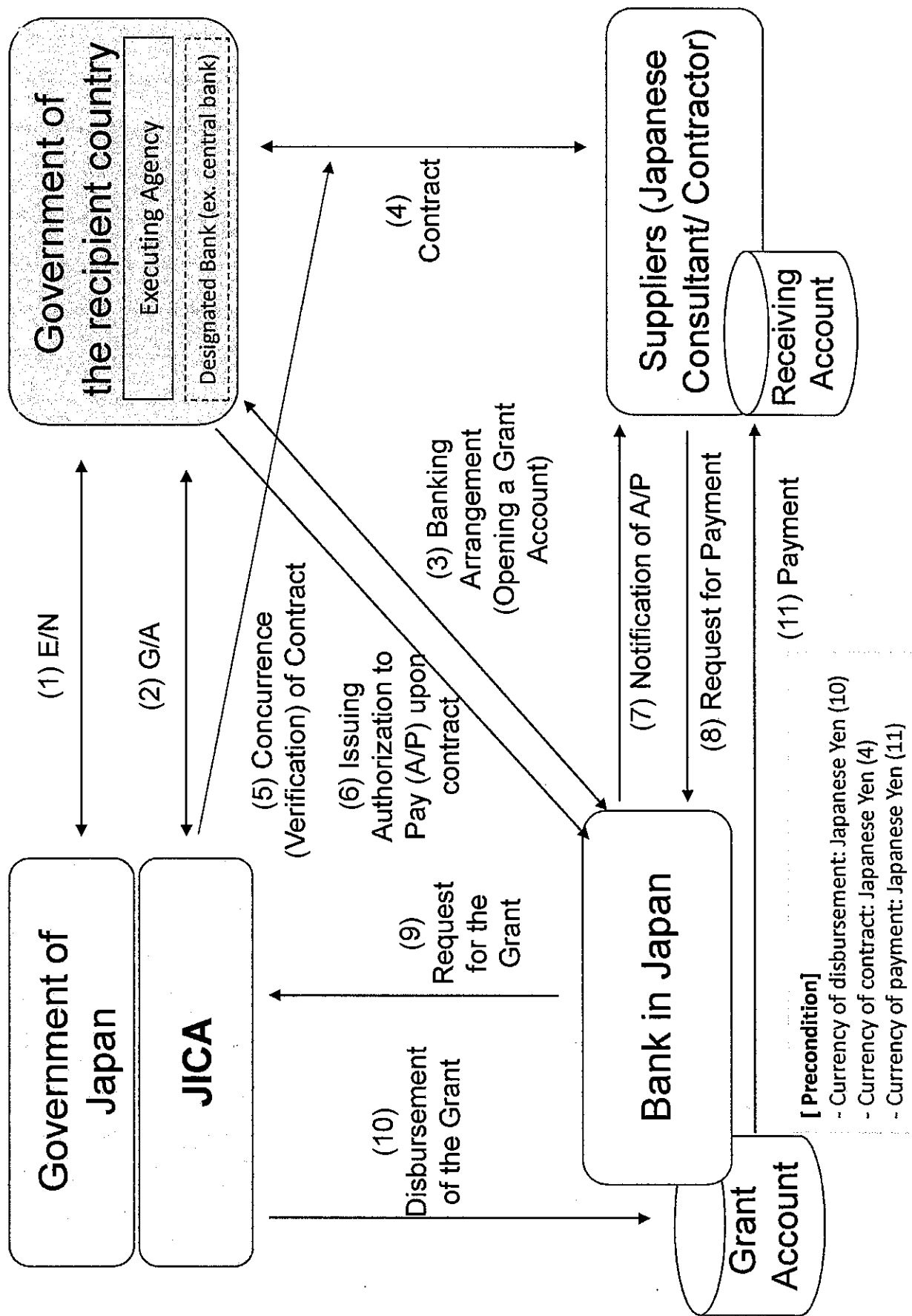
PROCEDURES OF JAPANESE GRANT

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 9 Major Undertakings to be taken by the Government of Myanmar

(1) Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A	MOPF		
2	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the contract	MOHS		
3	To obtain approval of IEE/EIA if applicable	within 1 month after G/A	MOHS		
4	To secure and clean the following lands 1) the Project site including building area 2) temporary construction yard and stock yard within the Project area	before notice of the bidding document	MOHS		
5	To obtain construction permit and the other applicable building permits	within 6 months after G/A	MOHS/ YCDC		
6	To clear, level and reclaim the Project site including removal of the existing buildings, the existing fence, the existing pavement, underground obstacles and trees if necessary	before notice of the bidding document	MOHS		
7	To submit Project Monitoring Report (with the result of Detail Design)	before preparation of bidding documents	MOHS		

(2) During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Contractor and Supplier(s)	within 1 month after the signing of the contract(s)	MOHS		
2	To bear the following commissions to a bank of Japan for the banking services based upon the B/A 1) Advising commission of A/P 2) Payment commission for A/P	 within 1 month after the signing of the contract every payment	 MOHS MOPF		
3	To accord Japanese nationals 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	MOHS		
4	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; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	MOHS MOPF		
5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for the implementation of the Project	during the Project	MOHS		
6	1) To submit Project Monitoring Report 2) To submit Project Monitoring Report (final)	 every month within one month after signing of Certificate of Completion for the works under the contract(s)	 MOHS MOHS		

3/4

1/4

7	To submit a report concerning completion of the Project	within six months after completion of the Project	MOHS		
8	To construct the following facility				
	1) The fences in and around the site	before the completion of the construction	MOHS		
	2) Incidental facilities for the site, such as ambulance garage, guard house and substation, etc.	before the completion of the construction	MOHS		
	3) Parking lot and storm water drainage	before the completion of the construction	MOHS		
9	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 power line to the site. If required, relocation of electrical poles at around the site.	6 months before completion of the construction	MOHS		
	2) Water Supply The city water distribution main to the site, if available	6 months before completion of the construction	MOHS/ YCDC		
	3) Drainage The city drainage main (for storm water, sewer and others) to the site	6 months before completion of the construction	MOHS/ YCDC		
	4) Telecommunications Telephone line and Internet line to the main distribution frame (MDF) and server room in new building	1 month before completion of the construction	MOHS		
	5) Furniture and Equipment General furniture and equipment for administration	1 month before completion of the construction	MOHS		
10	To provide medical furniture and medical equipment				
	1) To procure and install medical furniture and medical equipment	1 month before completion of the construction	MOHS		
	2) To transfer existing medical furniture and medical equipment	1 month before completion of the construction	MOHS		
11	To submit environmental monitoring report to JICA Myanmar Office, if applicable	during the Project	MOHS		
12	To recruit sufficient staff with appropriate skills and experiences for operation and maintenance of new facilities and equipment provided under the Grant Aid	6 months before completion of the construction	MOHS		

(3) After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid by: 1) Allocation of sufficient budget for operation and maintenance 2) Training of staff on the specialized medical services 3) Contracting with agents for maintenance of advanced medical equipment and lift 4) Regular collection and proper disposals of medical waste and waste water	After completion of the construction	MOHS		
2	To appoint and retain sufficient staff with appropriate skills and experiences for operation and maintenance of new facilities and equipment provided under the Grant Aid	After completion of the construction	MOHS		

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

(MOHS: Ministry of Health and Sports, MOPF: Ministry of Planning and Finance, YCDC: Yangon City Development Committee)

3

1/24

<p><u>Project Monitoring Report</u></p> <p>on</p> <p><u>Project Name</u></p> <p><u>Grant Agreement No. XXXXXXXX</u></p> <p>20XX, Month</p>
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Organizational Information

Signer of the G/A (Recipient)	<div style="border-bottom: 1px solid black; margin-bottom: 5px;">Person in Charge (Designation)</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Contacts</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Address:</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Phone/FAX:</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Email:</div>
Executing Agency	<div style="border-bottom: 1px solid black; margin-bottom: 5px;">Person in Charge (Designation)</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Contacts</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Address:</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Phone/FAX:</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Email:</div>
Line Ministry	<div style="border-bottom: 1px solid black; margin-bottom: 5px;">Person in Charge (Designation)</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Contacts</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Address:</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Phone/FAX:</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Email:</div>

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.			

Handwritten signature

Handwritten signature

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:
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:
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.

--

Estimated Number of Manpower Needed for New Yangon Specialist Hospital

Category	Pharmacy /Admin. *	Diagnostic Imaging *	Clinical Lab. *	Cardiac Surgery	Cardio- logy	Neuro- Surgery	Neuro medicine	Total
Head of Department				1	1	1	1	4
Senior Consultant.		1	1	6	6	6	6	26
Junior consultant		1	2	5	5	5	5	23
SAS and AS ¹		5	8	13	13	13	13	65
Radiologist		4						4
Anaesthesiologist				8		7		15
Total No. of Doctors		11	11	33	25	32	25	137
Sister				3	3	3	3	12
Staff Nurse				18	18	18	18	72
Trained Nurse				29	29	29	29	116
Total No. of Nurses				50	50	50	50	200
Physiotherapist				2	2	2	2	8
EEG/EMG Technologist ²							3	3
Radiographer		10			3			13
Laboratory Technician			8					8
Pharmacist	10							10
Total No. of Co-medicals	10	10	8	2	5	2	5	42
Nurse Aid				10	10	10	10	40
Clark	45			1	1	1	1	49
Others (including workers)	50			10	10	10	10	90
Total No. of Other staff	95			21	21	21	21	179
Grand Total	105	21	19	106	101	105	101	558

Source : Preparatory Survey Team

*The calculation is based on the sanction number of manpower per 100 beds referred from "Summary of Hospital Management Situation Analysis Report, 2012"

¹ SAS: Specialist Assistant Surgeon, AS: Assistant Surgeon² EEG: Electroencephalogram, EMG: Electromyogram

Total estimated costs to be included in the budget proposal for parliament's approval

An implementing agency of the Government of Myanmar is responsible for submitting a budget proposal to be approved for the next fiscal year's (FY) budget or the current year's supplementary budget. The budget proposal shall include both estimated costs borne by the Government of Myanmar and the grant provided by the Government of Japan. If the proposed budget spans multiple years, it must be appropriated and approved for each fiscal year.

*Expenses to be borne by the Government of Myanmar are subject to change depending on the progress of project implementation. The actual amount to be requested each FY shall be amended accordingly.

New Yangon Specialist Hospital

	FY2018	FY2019	FY2020	FY2021	FY2022
Expenses to be borne by the Government of Myanmar	Thousand MMK	Thousand MMK	Thousand MMK	Thousand MMK	Thousand MMK
Grant to be provided by the Government of Japan	Thousand MMK	Thousand MMK	Thousand MMK	Thousand MMK	Thousand MMK
Amount to be requested each FY for budget approval	Thousand MMK	Thousand MMK	Thousand MMK	Thousand MMK	Thousand MMK
Total project expenses	Thousand MMK				

Budget preparation/approval process in Myanmar

Budget proposal for next fiscal year	Budget proposal for supplementary budget of current year	Process
August - October	August	Line ministries and departments prepare and submit budget proposal to the Ministry of Planning and Finance (MOPF)
September - December	September - October	The Budget Department scrutinizes and compiles budget proposals, which are to be vetted by a Vice-President and submitted to the Financial Commission
December - January	October - November	The Financial Commission discusses the budget proposals and submits them to the Cabinet with recommendations
December to January	October - November	Union Budget Bill is discussed and approved by the Cabinet
January - March	November	Union Budget Bill is discussed and approved by Pyidaungsu Hluttaw
March	December	Union Budget Law is enacted by Pyidaungsu Hluttaw and approved by the President
April -	December	MOPF allocates budget to each ministry for execution

*The schedule is subject to change every year.

**If the budget proposal cannot be processed and approved at the above-mentioned timings, the implementation agency shall seek alternative ways to secure the necessary budget.

(4) Explanation of Draft Final Report

Minutes of Discussions
on the Preparatory Survey for the Project for
Construction of New Yangon Specialist Hospital
(Explanation on Draft Preparatory Survey Report)

With reference to the minutes of discussions signed between Department of Medical Services, Ministry of Health and Sports (hereinafter referred to as “DoMS”) and the Japan International Cooperation Agency (hereinafter referred to as “JICA”) on 7th July, 2017 and in response to the request from the Government of the Republic of the Union of Myanmar (hereinafter referred to as “Myanmar”) dated 20th May, 2015, 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 Construction of New Yangon Specialist Hospital (hereinafter referred to as “the Project”), headed by Ms. Tomomi IBI, Senior Deputy Director of Health Team 4, Human Development Department, JICA from 27th November to 1st December, 2017.

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

Nay Pyi Taw, 30th November, 2017

衣 斐 友 美

Ms. Tomomi Ibi

Leader

Preparatory Survey Team

Japan International Cooperation Agency

Japan

Thar Tun Kyaw

Dr. Thar Tun Kyaw

Director General

Department of Medical Services

Ministry of Health and Sports

The Republic of the Union of Myanmar

ATTACHEMENT

1. Objective of the Project

The objective of the Project is to improve patient-centered medical and healthcare services for cerebral and cardiovascular diseases by establishing a new specialist hospital with teaching function, through relocation of the selected clinical departments for cardiology, cardiac surgery, neuro medicine and neurosurgery from Yangon General Hospital (hereinafter referred to as "YGH"), thereby contributing to improvement of the people's health.

2. Project Design

Both sides confirmed that the Project will be implemented according to the Plan A which was proposed in the third mission of Preparatory Survey in July, 2017.

Both sides confirmed that the site of the Project is as shown in Annex 1 and the equipment to be procured in the Project in Annex 2.

3. Responsible authority for the Project

Both sides confirmed the authorities responsible for the Project and establishment of the Project Management Unit (hereinafter referred to as "PMU") are as follows:

3-1. DoMS will be the 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, supervise the PMU and ensure that the undertakings for the Project shall be managed by relevant authorities properly and on time.

The Executing Agency will take necessary procedures to officially establish an organization of New Yangon Specialist Hospital (hereinafter referred to as "NYSH"). The organization chart is proposed as shown in Annex 3. The Executing Agency will also make efforts to appoint the candidate of the Medical Superintendent (hereinafter referred to as "MS") of NYSH.

3-2. The PMU is headed by Deputy Director General of DoMS, and consists of officers concerned with procurement of DoMS, MS and Deputy MS of YGH, professors of cardiology, cardiac surgery, neuro medicine and neurosurgery of YGH, and the officers concerned of Yangon Regional Medical Services. The PMU is

established within the Ministry of Health and Sports / YGH and shall coordinate with all the relevant agencies to ensure smooth implementation of the Project, and ensure that the undertakings are taken by relevant agencies properly and on time.

4. Contents of the Draft Report

After the explanation of the contents of the Draft Report by the Team, the Myanmar side agreed to its contents.

5. Cost estimate

Both sides confirmed that the cost estimate including the contingency described in Annex 5 and the Draft Report 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.

6. Confidentiality of the cost estimate and technical specifications

Both sides confirmed that the cost estimate and technical specifications in Annex 5 and the Draft Report should never be duplicated or disclosed to any third parties until all the contracts under the Project are concluded.

7. Timeline for the project implementation

The Team explained to the Myanmar side that the expected timeline for the project implementation is as attached in Annex 4.

8. Expected outcomes and indicators

Both sides agreed that key indicators for expected outcomes are as follows. The Myanmar side will be responsible for the achievement of agreed key indicators targeted in year 2024 and shall monitor the progress based on those indicators.

[Quantitative indicators]

Department	Indicators	Original (Yr. 2016)	Target (Yr. 2024)
Basic indicators			
Cardiology	No. of inpatients	4,436	5,221
	No. of outpatients	19,762	23,260
Cardiac surgery	No. of inpatients	947	1,115
	No. of outpatients	4,826	5,680

Neurosurgery	No. of inpatients (except trauma)	2,920	3,437
	No. of outpatients	1,180	1,389
Neuro medicine	No. of inpatients	1,020	1,201
	No. of outpatients	7,115	8,374
Indicators for each department			
Cardiology	No. of angiography and angioplasty	1,761	2,113
	Time duration from receiving patients until starting catheter treatment (min.)	N/A	Within 30 min. after arrival
Cardiac surgery	No. of major surgeries	374	561
Neurosurgery	No. of months in which patients are waiting for surgery (month)	3	1
	No. of surgical cases used intraoperative CT scanning	0	89
Neuro medicine	No. of thrombolytic therapy cases	45	90
	No of cerebral infarction patients evaluated by MRI	0	304

[Qualitative indicators]

- (1) The hospital facility is improved its design and work environment which enables hospital staff to provide medical services to patients effectively by dividing the line of flows between hospital staff and patients. Especially, by shortening the line of emergency patients, the time duration between time of arrival and time of starting treatment of a patient will be shortened.
- (2) High level surgical operation (e.g. Stent-graft or TAVI) will be performed in the hybrid operation theater for cardiac surgery.
- (3) Catheter treatments for strokes, aneurysm and Arteriovenous Malformation(AVM) will be performed.
- (4) The degree of satisfaction among patients who are under rehabilitation or using wheelchair will increase because the facility is designed as barrier free, so that patients can move around easily.

9. 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. The Myanmar 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.

10. Undertakings of the Project

Both sides confirmed the undertakings of the Project as described in Annex 5.

10-1. Tax exemption

With regard to exemption of customs duties, internal taxes and other fiscal levies as stipulated in No (2) 4 of Annex 5, both sides confirmed that such customs duties, internal taxes and other fiscal levies include VAT, commercial tax, income tax and corporate tax, which shall be clarified in the bid documents by DoMS during the implementation stage of the Project. The Myanmar side confirmed that necessary procedure for the above-mentioned tax exemption would be taken promptly in order to avoid delay in implementing the Project. In particular, both sides agreed that the Myanmar side would bear the commercial tax if it is not exempted.

10-2. Budget allocation

The Myanmar side assured to take the necessary measures and coordination including allocation of the necessary budget which is preconditions of implementation of the Project. The amount to be budgeted up to FY2020-2021 by the Myanmar side is estimated in Annex 6. The Team requested that the Myanmar side prepare the budget based on the estimation in each fiscal year.

10-3. Measures to keep the schedule

In order to avoid the delay in the schedule of the Project, both sides confirmed that the Myanmar side would take necessary procedures described in Annex 5 as scheduled, specifically paying attention to construction permit, approval of IEE/EIA and issue of Authorization to Pay (A/P).

10-4. Others

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 the Annex 5 will be used as an attachment of G/A.

11. 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 7. The timing of submission of the PMR is described in Annex 5.

12. 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, but in any event not later than six months after completion of the Project.

13. Ex-Post Evaluation

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

14. Schedule of the Study

JICA will finalize the Preparatory Survey Report based on the confirmed items. The report will be sent to the Myanmar side around March, 2018.

15. Environmental and Social Considerations

15-1 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.

15-2 Initial Environmental Examination (IEE) / Environmental Impact Assessment (EIA)

The Myanmar side confirmed that the Project would be subjected to the recommendation to be made by the Environmental Conservation Department, Ministry of Natural Resource and Environmental Conservation on the Initial Environmental Examination and/or the Environmental Impact Assessment, if applicable in compliance with the Environmental Conservation Law.

16. Other relevant issues

16-1. 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.

16-2. Technical assistance service for equipment procurement work by Myanmar side

Both sides confirmed that the the Myanmar side would take the necessary measures for procurement of the equipment to be covered by the Myanmar side without delay based on the schedule as shown in Annex 4.

The Myanmar side agreed and accepted that the Japanese consultants would provide technical assistance service for equipment procurement work as shown in Annex 8. The Myanmar side assured that the Japanese consultants could participate in the tender evaluation committee.

In order to proceed with the procurement process on schedule, the Myanmar side agreed that the procurement procedure (i.e. planning, bidding, place of order, delivery and installation) for the equipment for the Project would be separated from the routine procedures of other equipment. The Myanmar side also confirmed that they would control and monitor the schedule of installation.

16-3. Sharing of medical equipment

The Team explained and the Myanmar side agreed that sharing of test function with Yangon Specialist Hospital (hereinafter referred to as "YSH") would be considered since YSH has already basic immune hormone and pathological test equipment and the number of pathological tests is small in NYSH.

16-4. Maintenance

Both sides agreed on the importance of the maintenance, including preventive maintenance, of the building and the equipment to avoid interruption of the services and to reduce cost for repair. The Myanmar side agreed to establish the units for building and medical equipment maintenance and to allocate capable medical engineers who will be trained with the support of another JICA's technical cooperation. The Team strongly recommended that maintenance contracts be concluded with manufactures' local agents for advanced medical equipment such as CT scanner, angiography unit, MRI and PACS system before its warranty period terminates, and that the budget for maintenance be secured accordingly.

16-5. Human resource

The Team provided the estimated number of necessary medical/co-medical staff for NYSH, as described in Annex 9. The Myanmar side agreed to provide staff recruitment plan based on the estimation.

16-6. Roof-laying ceremony

Both sides confirmed that it would be considered to organize a roof-laying

ceremony by the Myanmar side around October, 2020 to commemorate the progress of the construction to the public.

Annex 1 Project Site

Annex 2 Equipment List

Annex 3 Organization Chart of New Yangon Specialist Hospital

Annex 4 Project Implementation Schedule

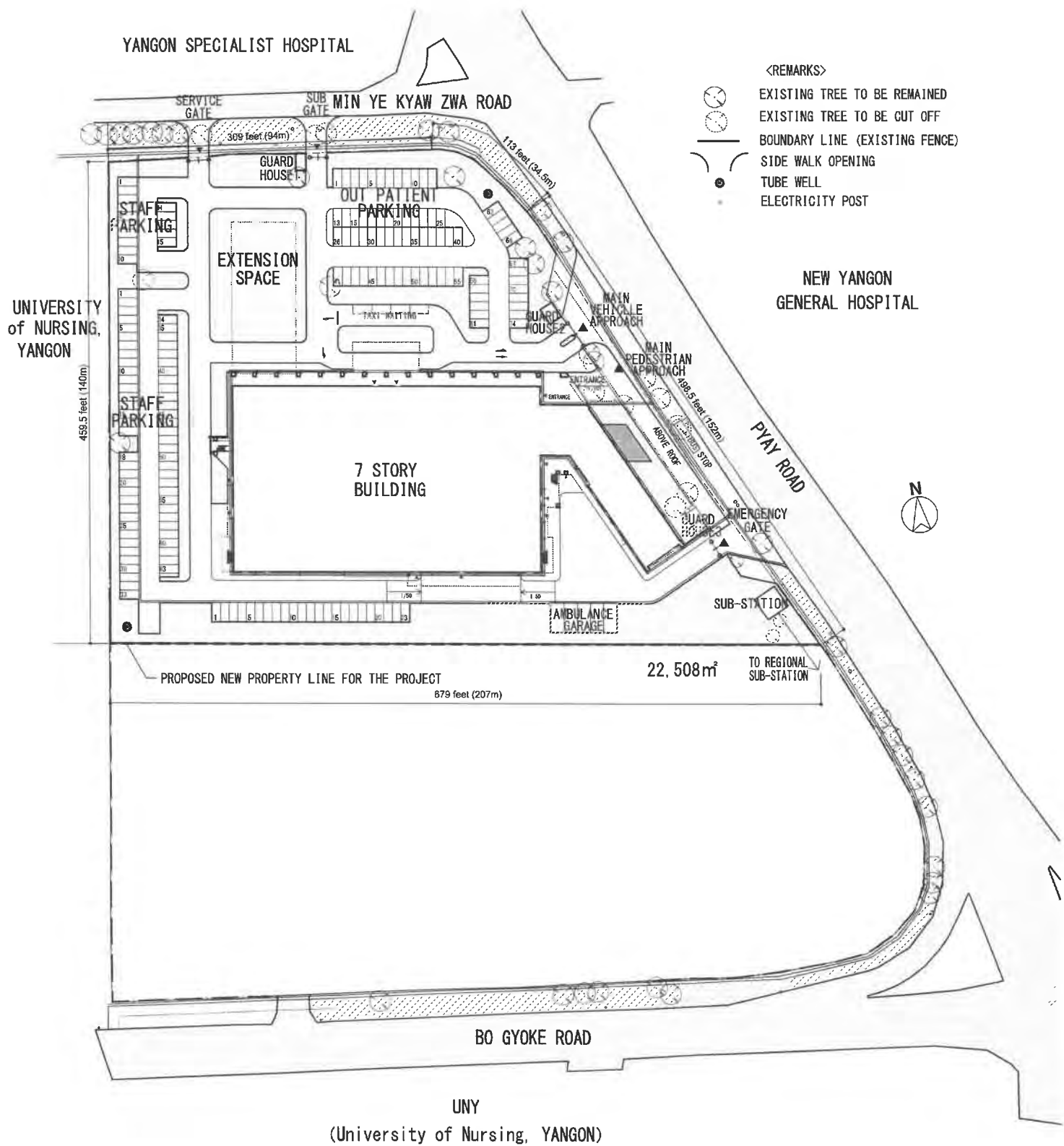
Annex 5 Major Undertakings to be taken by the Government of Myanmar / the Japanese Grant

Annex 6 Total estimated costs to be included in the budget proposal for parliament's approval

Annex 7 Project Monitoring Report

Annex 8 Technical Assistance Service for Equipment Procurement Work by Myanmar side

Annex 9 Estimated Number of Manpower Needed for New Yangon Specialist Hospital



List of Medical Equipment

Department	Item No.	Description	Qty	Plan-A	Procurement year
Outpatient	OP-1	Examination table	10	●	2020
Outpatient	OP-2	LCD Monitor A	10	●	2019
Outpatient	OP-3	Consultation desk and chair	10	●	2020
Outpatient	OP-4	Diagnostic set	10	●	2020
Outpatient	OP-5	Waiting chair for 3 persons	35	●	2020
Outpatient	OP-6	Storage cabinet for medical records	8	●	2020
Outpatient	OP-7	X-ray film storage cabinet	5	●	2020
Outpatient	OP-8	Instrument cabinet	8	●	2020
Outpatient (Physiology laboratory)	P-1	Tilt table	1	●	2020
Outpatient (Physiology laboratory)	P-2	Patient monitor B	1	●	2020
Outpatient (Physiology laboratory)	P-3	ECG A	1	●	2020
Outpatient (Physiology laboratory)	P-4	Holter ECG with 3 recorders	1	●	2020
Outpatient (Physiology laboratory)	P-5	ECG with treadmill for stress test	1	●	2020
Outpatient (Physiology laboratory)	P-6	Spirometer	1	●	2020
Outpatient (Physiology laboratory)	P-7	EEG	1	▲	2020
Outpatient (Physiology laboratory)	P-8	EMG	1	▲	2020
Outpatient (Restaurant)	P-9	Dining table with stool	1	●	2020
Rehabilitation	RH-1	Stairs	1	●	2020
Rehabilitation	RH-2	Parallel bars with mirror	2	●	2020
Rehabilitation	RH-3	Exercise mat	1	●	2020
Rehabilitation	RH-4	Balance ball and other exercise therapy set	1	●	2020
Rehabilitation	RH-5	Whirlpool bath	1	●	2020
Rehabilitation	RH-6	Treadmill	2	●	2020
Rehabilitation	RH-7	Ergometer	1	●	2020
Rehabilitation	RH-8	Electrical stimulation	2	●	2020
Rehabilitation	RH-9	Functional electrical stimulation	3	●	2020
Rehabilitation	RH-10	Transcutaneous electrical nerve stimulation	3	●	2020
Rehabilitation	RH-11	Pneumatic compression device	2	●	2020
Rehabilitation	RH-12	Ultrasound therapy machine	3	●	2020
Rehabilitation	RH-13	Laser therapy machine	3	●	2020
Rehabilitation	RH-14	Interferential therapy machine	3	●	2020
Rehabilitation	RH-15	Paraffin wax bath	2	●	2020
Rehabilitation	RH-16	ECG B	1	●	2020
Rehabilitation	RH-18	Movement therapy machine	1	●	2020
Rehabilitation	RH-19	Equipment for occupational therapy	1	●	2020
Rehabilitation	RH-20	Medicine ball (Various size)	3	●	2020
Rehabilitation	RH-21	Spirometer	3	●	2020
Rehabilitation	RH-22	Wheel chair	1	●	2020
Diagnostic Imaging	R-2	CT scanner B	1	●	2019
Diagnostic Imaging	R-3	MRI	1	●	2019
Diagnostic Imaging	R-4	PACS system (including RIS)	1	●	2019
Diagnostic Imaging	R-5	Image printer	1	●	2020
Diagnostic Imaging	R-6	Injector for MRI	1	●	2020
Diagnostic Imaging	R-7	Injector for CT	1	●	2020
Diagnostic Imaging	R-9	Mobile X-ray unit	1	●	2020
Diagnostic Imaging	R-10	Ultrasound scanner B	2	●	2020
Diagnostic Imaging	R-11	Workstation for radiology equipment	3	●	2020
Diagnostic Imaging	R-12	MR compatible stretcher	1	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-3	Angiography system D	1	●	2019
Diagnostic Imaging (Cath. Labo.)	CL-4	Injector for Angiography unit	2	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-5	Radiofrequency ablation generator (with stimulation)	1	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-6	3D mapping system	1	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-7	Irrigation pump for ablation	1	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-8	Anesthesia machine with ventilator	1	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-9	Defibrillator B	2	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-10	Pulse oximeter	2	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-11	Temporary pacemaker	1	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-12	Cardiac stimulator	1	▲	2020
Diagnostic Imaging (Cath. Labo.)	CL-13	3D mapping system	1	▲	2020
Diagnostic Imaging (Cath. Labo.)	CL-14	Ablation generator	1	▲	2020
Diagnostic Imaging (Cath. Labo.)	CL-15	Monitor for ablation/3D	1	▲	2020
Diagnostic Imaging (Cath. Labo.)	CL-16	Infusion pump	2	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-17	Electrosurgical unit A	1	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-18	Hemodynamics	2	●	2020
Diagnostic Imaging (Cath. Labo.)	CL-19	Blood gas analyzer with ISE	1	●	2020
Emergency unit	ER-1	Stretcher	5	●	2020
Emergency unit	ER-2	Wheel chair	5	●	2020
Emergency unit	ER-3	Emergency bed	8	●	2020
Emergency unit	ER-4	Emergency cart	2	●	2020
Emergency unit	ER-5	Blood gas analyzer with ISE	1	●	2020
Emergency unit	ER-6	ECG B	1	●	2020
Emergency unit	ER-7	Mobile X-ray unit	1	●	2020
Emergency unit	ER-8	Ultrasound scanner C	1	●	2020
Emergency unit	ER-9	Defibrillator A	1	●	2020
Emergency unit	ER-10	Diagnostic set	8	●	2020
Emergency unit	ER-11	Mobile OT lamp	4	●	2020
Emergency unit	ER-12	Patient monitor B	2	●	2020
Emergency unit	ER-13	Infusion pump	2	●	2020

List of Medical Equipment

Department	Item No.	Description	Qty	Plan-A	Procurement year
Coronary Care Unit (CCU) HCU16	CCU-1	Ventilator	4	●	2020
Coronary Care Unit (CCU) HCU16	CCU-2	Central monitor	2	●	2020
Coronary Care Unit (CCU) HCU16	CCU-3	Patient monitor B	16	●	2020
Coronary Care Unit (CCU) HCU16	CCU-4	Patient bed electric	16	●	2020
Coronary Care Unit (CCU) HCU16	CCU-5	Bedside cabinet	16	●	2020
Coronary Care Unit (CCU) HCU16	CCU-6	Overbed table	16	●	2020
Coronary Care Unit (CCU) HCU16	CCU-7	IV pole	16	●	2020
Coronary Care Unit (CCU) HCU16	CCU-8	Infusion pump	32	●	2020
Coronary Care Unit (CCU) HCU16	CCU-9	Syringe pump	40	●	2020
Coronary Care Unit (CCU) HCU16	CCU-10	Suction bottle for central piping	16	●	2020
Coronary Care Unit (CCU) HCU16	CCU-11	Oxygen regulator and humidifier	16	●	2020
Coronary Care Unit (CCU) HCU16	CCU-12	Defibrillator A	2	●	2020
Coronary Care Unit (CCU) HCU16	CCU-13	Oxygen concentrator	2	●	2020
Coronary Care Unit (CCU) HCU16	CCU-14	ECG B	1	●	2020
Coronary Care Unit (CCU) HCU16	CCU-15	Emergency trolley	1	●	2020
Coronary Care Unit (CCU) HCU16	CCU-16	Medicine cabinet	2	●	2020
Coronary Care Unit (CCU) HCU16	CCU-17	Instrument cabinet	2	●	2020
Coronary Care Unit (CCU) HCU16	CCU-18	Medicine trolley	2	●	2020
Coronary Care Unit (CCU) HCU16	CCU-19	Hand dryer	1	●	2020
Coronary Care Unit (CCU) HCU16	CCU-20	Emergency cart	1	●	2020
Coronary Care Unit (CCU) HCU16	CCU-21	Stretcher	1	●	2020
Coronary Care Unit (CCU) HCU16	CCU-22	Wheel chair	1	●	2020
Stroke Care Unit(SCU) HCU16	SCU-1	Ventilator	3	●	2020
Stroke Care Unit(SCU) HCU16	SCU-2	Ventilator	1	▲	2020
Stroke Care Unit(SCU) HCU16	SCU-3	Central monitor	2	●	2020
Stroke Care Unit(SCU) HCU16	SCU-4	Patient monitor B	12	●	2020
Stroke Care Unit(SCU) HCU16	SCU-5	Patient monitor B	4	▲	2020
Stroke Care Unit(SCU) HCU16	SCU-6	Patient bed electric	12	●	2020
Stroke Care Unit(SCU) HCU16	SCU-7	Patient bed electric	4	▲	2020
Stroke Care Unit(SCU) HCU16	SCU-8	Bedside cabinet	16	●	2020
Stroke Care Unit(SCU) HCU16	SCU-9	Overbed table	16	●	2020
Stroke Care Unit(SCU) HCU16	SCU-10	IV pole	16	●	2020
Stroke Care Unit(SCU) HCU16	SCU-11	Infusion pump	30	●	2020
Stroke Care Unit(SCU) HCU16	SCU-12	Infusion pump	2	▲	2020
Stroke Care Unit(SCU) HCU16	SCU-13	Syringe pump	40	●	2020
Stroke Care Unit(SCU) HCU16	SCU-14	Suction bottle for central piping	16	●	2020
Stroke Care Unit(SCU) HCU16	SCU-15	Oxygen regulator and humidifier	16	●	2020
Stroke Care Unit(SCU) HCU16	SCU-16	Defibrillator A	1	●	2020
Stroke Care Unit(SCU) HCU16	SCU-17	Oxygen concentrator	2	●	2020
Stroke Care Unit(SCU) HCU16	SCU-18	Stretcher	1	●	2020
Stroke Care Unit(SCU) HCU16	SCU-19	Wheel chair	1	●	2020
Neurosurgery HCU16	NCU-3	Central monitor	2	●	2020
Neurosurgery HCU16	NCU-4	Patient monitor A	16	●	2020
Neurosurgery HCU16	NCU-5	Patient bed electric	16	●	2020
Neurosurgery HCU16	NCU-6	Bedside cabinet	16	●	2020
Neurosurgery HCU16	NCU-7	Overbed table	16	●	2020
Neurosurgery HCU16	NCU-8	IV pole	16	●	2020
Neurosurgery HCU16	NCU-9	Infusion pump	16	●	2020
Neurosurgery HCU16	NCU-10	Syringe pump	16	●	2020
Neurosurgery HCU16	NCU-11	Suction bottle for central piping	16	●	2020
Neurosurgery HCU16	NCU-12	Oxygen regulator and humidifier	16	●	2020
Neurosurgery HCU16	NCU-13	Defibrillator A	1	●	2020
Neurosurgery HCU16	NCU-14	Oxygen concentrator	5	●	2020
Neurosurgery HCU16	NCU-15	Infant warmer	1	●	2020
Neurosurgery HCU16	NCU-16	Infant incubator	2	●	2020
Neurosurgery HCU16	NCU-17	Plasma exchange machine	1	●	2020
Neurosurgery HCU16	NCU-18	Stretcher	2	●	2020
Neurosurgery HCU16	NCU-19	Wheel chair	2	●	2020
Cardiovascular surgery HCU16	SICU-10	Syringe pump	16	●	2020
Cardiovascular surgery HCU16	SICU-11	Suction bottle for central piping	16	●	2020
Cardiovascular surgery HCU16	SICU-12	Oxygen regulator and humidifier	16	●	2020
Cardiovascular surgery HCU16	SICU-13	Defibrillator A	1	●	2020
Cardiovascular surgery HCU16	SICU-14	Oxygen concentrator	1	●	2020
Cardiovascular surgery HCU16	SICU-15	Emergency cart	1	●	2020
Cardiovascular surgery HCU16	SICU-3	Central monitor	1	●	2020
Cardiovascular surgery HCU16	SICU-4	Patient monitor A	16	●	2020
Cardiovascular surgery HCU16	SICU-5	Patient bed electric	16	●	2020
Cardiovascular surgery HCU16	SICU-6	Bedside cabinet	16	●	2020
Cardiovascular surgery HCU16	SICU-7	Overbed table	16	●	2020
Cardiovascular surgery HCU16	SICU-8	IV pole	16	●	2020
Cardiovascular surgery HCU16	SICU-9	Infusion pump	16	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-1	Ventilator	10	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-2	Ventilator	3	▲	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-3	Central monitor	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-4	Patient monitor A	10	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-5	Patient bed electric	10	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-6	Bedside cabinet	10	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-7	Overbed table	10	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-8	IV pole	10	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-9	Infusion pump	30	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-10	Syringe pump	40	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-11	Suction bottle for central piping	10	●	2020

List of Medical Equipment

Department	Item No.	Description	Q'ty	Plan-A	Procurement year
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-12	Oxygen regulator and humidifier	10	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-13	Defibrillator A	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-14	Oxygen concentrator	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-15	ECG B	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-16	Emergency trolley	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-17	Medicine cabinet	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-18	Instrument cabinet	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-19	Medicine trolley	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-20	Hemodialysis machine	2	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-21	RO unit	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-22	Weight measurable bed	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-23	Pressure mattress for avoiding bedsore	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-24	Fiberoptic bronchoscope	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-25	Pacemaker machine	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-26	Body warmer	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-27	Blood gas analyzer with ISE	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-28	Stretcher	1	●	2020
Intensive Care Unit (ICU)Cardiovascular surgery10	CS ICU-29	Wheel chair	1	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-1	Ventilator	10	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-2	Bedside cabinet	10	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-3	Central monitor	2	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-4	Patient monitor A	10	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-5	Patient bed electric	10	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-6	Oxygen concentrator	5	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-7	Overbed table	10	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-8	IV pole	10	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-9	Infusion pump	30	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-10	Syringe pump	40	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-11	Suction bottle for central piping	10	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-12	Oxygen regulator and humidifier	10	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-13	Defibrillator A	1	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-14	Oxygen concentrator	5	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-15	Pressure mattress for avoiding bedsore	1	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-16	Stretcher	1	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-17	Wheel chair	1	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-18	Weight measurable bed	1	●	2020
Intensive Care Unit (ICU) Neurosurgery10	NS ICU-19	Blood gas analyzer with ISE	1	●	2020
Surgical unit	OTC-1	Operation table	2	●	2020
Surgical unit	OTC-2	Defibrillator C	2	●	2020
Surgical unit	OTC-3	Patient monitor C	2	●	2020
Surgical unit	OTC-4	Operation theatre light A	2	●	2019
Surgical unit	OTC-5	Electrosurgical unit A	2	●	2020
Surgical unit	OTC-6	Anesthesia machine with ventilator	2	●	2020
Surgical unit	OTC-7	Ceiling pendant for anesthetic gas	2	●	2019
Surgical unit	OTC-8	Ceiling pendant for surgery	2	●	2019
Surgical unit	OTC-12	Hot/cold cabinet	2	●	2020
Surgical unit	OTC-13	Ultrasonic aspirator with accessories	1	●	2020
Surgical unit	OTC-14	Anticoagulation monitor(ACT) machine	2	●	2020
Surgical unit	OTC-15	Echo machine (transesophageal probe)	1	●	2020
Surgical unit	OTC-16	Intraoperative ultrasound scanner A	1	●	2020
Surgical unit	OTC-17	Heart lung machine with cooler/heater unit	2	●	2020
Surgical unit	OTC-18	Intra aortic balloon pump (IABP)	2	●	2020
Surgical unit	OTC-19	Cell saver	2	●	2020
Surgical unit	OTC-20	Surgical C-arm X-ray unit	1	●	2020
Surgical unit	OTC-21	Low continuous suction machine	2	●	2020
Surgical unit	OTC-22	Blood gas analyzer with ISE	1	●	2020
Surgical unit	OTC-23	Biochemistry analyzer, semi-automated	1	●	2020
Surgical unit	OTC-24	Thoracoscope system	1	●	2020
Surgical unit	OTC-25	Surgical instrument set for open heart surgery	2	●	2020
Surgical unit	OTC-26	Surgical instrument set for thoracic operation	2	●	2020
Surgical unit	OTC-27	Surgical instrument set for pediatrics	2	●	2020
Surgical unit	OTC-28	PCPS (ECMO)	1	●	2020
Surgical unit	OTC-29	PCPS (Cardiovascular surgery)	1	▲	2020
Surgical unit	OTC-30	Recovery bed	4	●	2020
Surgical unit	OTC-31	Amputation set	1	●	2020
Surgical unit	OTN-1	Operation table	2	●	2020
Surgical unit	OTN-3	Patient monitor C	2	●	2020
Surgical unit	OTN-4	Operation theatre light A	2	●	2019
Surgical unit	OTN-5	Electrosurgical unit A	1	●	2020
Surgical unit	OTN-6	Anesthesia machine with ventilator	2	●	2020
Surgical unit	OTN-7	Ceiling pendant for anesthetic gas	2	●	2019
Surgical unit	OTN-8	Ceiling pendant for surgery	2	●	2019
Surgical unit	OTN-12	Hot/cold cabinet	2	●	2020
Surgical unit	OTN-13	Ultrasonic aspirator with accessories	1	▲	2020
Surgical unit	OTN-14	Intraoperative ultrasound scanner B	1	▲	2020
Surgical unit	OTN-15	Stereo taxi system	1	▲	2020
Surgical unit	OTN-16	Navigation system	1	●	2019
Surgical unit	OTN-17	High speed drill, electric	1	●	2020
Surgical unit	OTN-18	High speed drill, electric	1	▲	2020
Surgical unit	OTN-19	ICP monitor, EVD	1	▲	2020
Surgical unit	OTN-20	C2 Nerve monitor	1	▲	2020
Surgical unit	OTN-21	Neuroendoscope	1	▲	2020

List of Medical Equipment

Department	Item No.	Description	Q'ty	Plan-A	Procurement year
Surgical unit	OTN-22	Spine set	2	●	2020
Surgical unit	OTN-23	Basic neurosurgical set	2	●	2020
Surgical unit	OTN-24	Micro neurosurgical set	2	●	2020
Surgical unit	OTN-25	Aneurysm surgery set	2	●	2020
Surgical unit	OTN-26	Operating microscope mobile	1	●	2019
Surgical unit	OTN-27	Operating microscope mobile	1	▲	2019
Surgical unit	OTN-28	Operating microscope ceiling	1	●	2019
Surgical unit	OTN-29	Surgical C-arm X-ray unit	1	●	2020
Surgical unit	OTN-30	Head clamp & retractor system	1	●	2020
Surgical unit	OTN-31	Head clamp & retractor system	1	▲	2020
Surgical unit	OTN-32	Clip and instruments	1	●	2020
Surgical unit	OTN-33	Recovery bed	4	●	2020
Surgical unit	OTN-34	Electrosurgical unit B	1	●	2020
Surgical unit	HOTN-2	CT scanner C	1	●	2019
Surgical unit	HOTN-3	Injector for CT	1	●	2020
Surgical unit	HOTN-5	Anesthesia machine with ventilator	1	●	2020
Surgical unit	HOTN-6	Radiology accessories set	1	●	2020
Surgical unit	HOTN-7	Operation theatre light B	1	●	2019
Surgical unit	HOTN-8	Ceiling pendant for anesthetic gas	1	●	2019
Surgical unit	HOTN-10	Camera for operation room	1	●	2020
Surgical unit	HOTN-11	LCD Monitor B	3	●	2019
Surgical unit	HOTN-12	Instrument cabinet	1	●	2020
Surgical unit	HOTN-13	Defibrillator A	1	●	2020
Surgical unit	HOTN-14	Waiting chair for 3 persons	30	●	2020
Surgical unit	HOTN-15	Ceiling pendant for surgery	1	●	2019
Surgical unit	HOTC-1	Angiography system C	1	●	2019
Surgical unit	HOTC-2	Injector	1	●	2020
Surgical unit	HOTC-3	Operation table for Angiography unit	1	●	2020
Surgical unit	HOTC-5	Anesthesia machine with ventilator	1	●	2020
Surgical unit	HOTC-6	Ultrasound scanner A	1	●	2020
Surgical unit	HOTC-7	Radiology accessories set	1	●	2020
Surgical unit	HOTC-8	Operation theatre light B	1	●	2019
Surgical unit	HOTC-9	Ceiling pendant for anesthetic gas	1	●	2019
Surgical unit	HOTC-11	Camera for operation room	1	●	2020
Surgical unit	HOTC-12	LCD Monitor B	3	●	2019
Surgical unit	HOTC-13	Heart lung machine with cooler/heater unit	1	●	2020
Surgical unit	HOTC-14	Instrument cabinet	2	●	2020
Surgical unit	HOTC-15	Defibrillator A	1	●	2020
Surgical unit	HOTC-16	Intra aortic balloon pump (IABP)	1	●	2020
Surgical unit	HOTC-17	Ceiling pendant for surgery	1	●	2019
Surgical unit	HOTC-18	Amputation set	1	●	2020
Laboratory unit	L-1	Fully automated chemistry analyzer	1	●	2020
Laboratory unit	L-2	Urine analyzer	1	●	2020
Laboratory unit	L-3	Blood cell counter 5 part differential	1	●	2020
Laboratory unit	L-4	Automated coagulation analyzer	1	●	2020
Laboratory unit	L-5	Immuno hormone analyzer	1	●	2020
Laboratory unit	L-6	Distillation plant	1	●	2020
Laboratory unit	L-9	Fully automated blood culture system	1	●	2020
Laboratory unit	L-10	Automatic sliding strainer	1	●	2020
Laboratory unit	L-11	Microtome	1	●	2020
Laboratory unit	L-12	Binocular microscope	4	●	2020
Laboratory unit	L-13	Incubator	1	●	2020
Laboratory unit	L-14	Paraffin bath (embedding machine)	1	●	2020
Laboratory unit	L-15	Safety cabinet	1	●	2020
Laboratory unit	L-16	Tissue processor	1	●	2020
Laboratory unit	L-17	Cooling plate	1	●	2020
Laboratory unit	L-18	Hematocrit centrifuge	1	●	2020
Laboratory unit	L-19	Storage Rack	5	●	2020
Laboratory unit	L-20	Blood bank refrigerator	1	●	2020
Laboratory unit	L-21	Thawing water bath	1	●	2020
Laboratory unit	L-22	Micro pipette set	1	●	2020
Laboratory unit	L-23	Microscope	1	●	2020
Laboratory unit	L-24	Centrifuge for serofuge	2	●	2020
Laboratory unit	L-25	Platelet incubator with agitator	1	●	2020
Laboratory unit	L-26	Deep Freezer	1	●	2020
Laboratory unit	L-27	Centrifuge for specimen separation	2	●	2020
Laboratory unit	L-28	Oven	1	●	2020
Laboratory unit	L-29	Pharmaceutical refrigerator	3	●	2020
Laboratory unit	L-30	Cryostat	1	●	2020
Laboratory unit	L-31	Bone marrow aspiration trephine set	1	●	2020
Clinical Engineering	CE-1	Working table with chair	1	●	2020
Clinical Engineering	CE-2	Maintenance tool kit	1	●	2020
Pharmacy	PH-1	Pharmaceutical refrigerator	4	●	2020
Pharmacy	PH-2	Medicine cabinet	5	●	2020
Pharmacy	PH-3	Desk and chair	1	●	2020
Pharmacy	PH-4	Storage Rack	5	●	2020
Inpatient Ward	W-1	Examination table	2	●	2020
Inpatient Ward	W-4	Hospital bed	232	●	2020
Inpatient Ward	W-5	Bedsheet cabinet	232	●	2020
Inpatient Ward	W-6	Overbed table	232	●	2020
Inpatient Ward	W-7	IV pole	58	●	2020
Inpatient Ward	W-8	Patient monitor B	24	●	2020

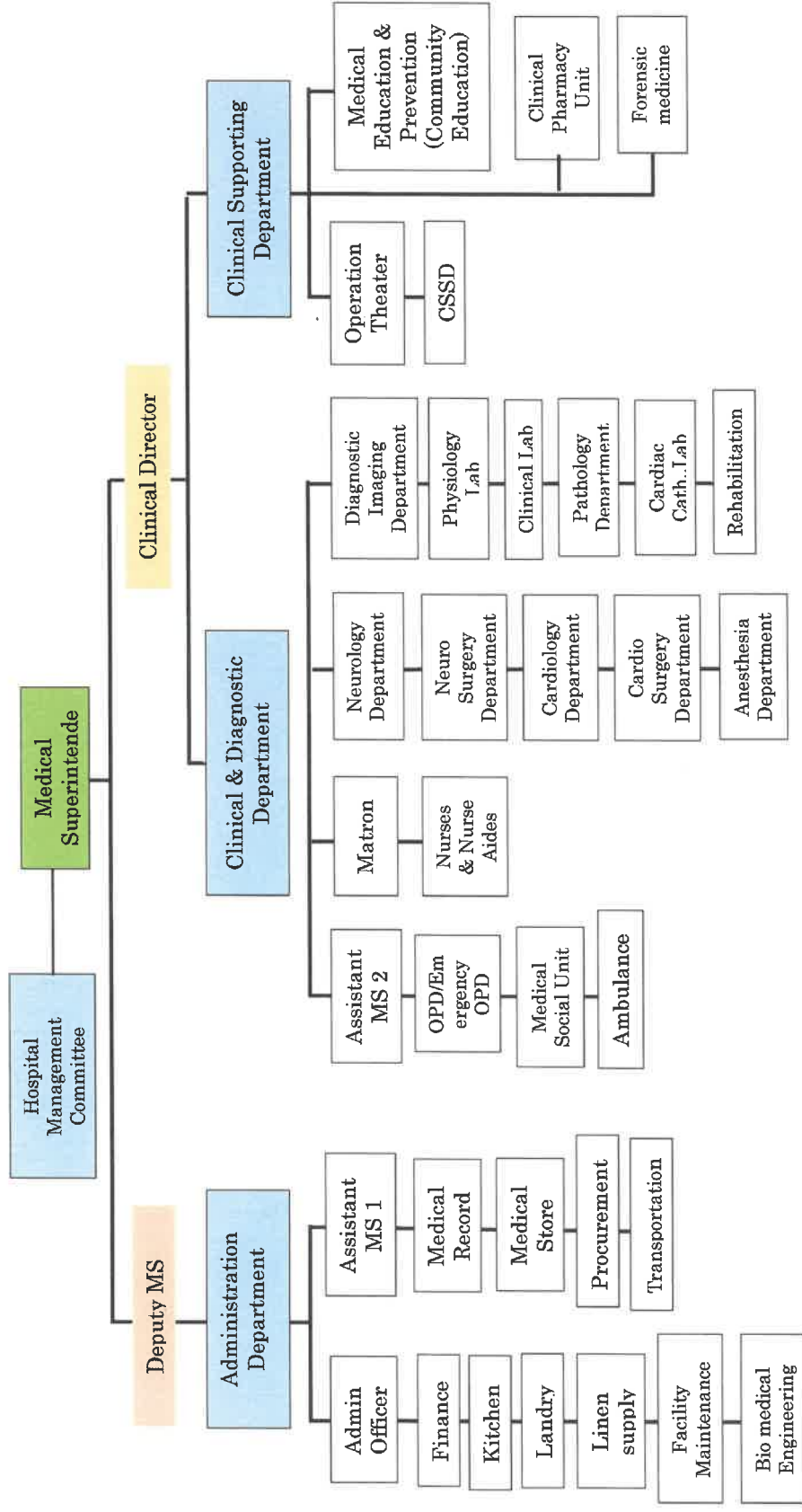
List of Medical Equipment

Department	Item No.	Description	Q'ty	Plan-A	Procurement year
Inpatient Ward	W-9	Low continuous suction machine	26	●	2020
Inpatient Ward	W-10	Instrument cabinet	26	●	2020
Inpatient Ward	W-11	Medicine cabinet	26	●	2020
Inpatient Ward	W-12	Instrument trolley	26	●	2020
Inpatient Ward	W-13	Bedpan washer	4	●	2020
Inpatient Ward	W-14	Wheel chair	8	●	2020
Inpatient Ward	W-15	ECG B	2	●	2020
Inpatient Ward	W-16	Echo machine (transesophageal probe)	3	●	2020
Inpatient Ward	W-17	Chair for case discussion	80	●	2020
Inpatient Ward	W-18	White board	4	●	2020
Inpatient Ward	W-19	EEG	1	▲	2020
Inpatient Ward	W-20	EEG	1	●	2020
Inpatient Ward	W-21	EMG	1	▲	2020
Inpatient Ward	W-22	Weighing scale bed for stretcher/wheel chair	1	●	2020
Inpatient Ward	W-23	Ultrasound scanner D	1	●	2020
Inpatient Ward	W-24	Spirometer	1	●	2020
Inpatient Ward	W-25	Infusion pump	40	●	2020
Inpatient Ward	W-26	Syringe pump	40	●	2020
CSSD	S-3	Hydrogen peroxide gas sterilizer	1	●	2020
CSSD	S-4	Ultrasonic washer	2	●	2020
CSSD	S-5	Sterilization cart	1	●	2020
CSSD	S-6	Linen cart	3	●	2020
CSSD	S-7	Sterilization cabinet	3	●	2020
CSSD	S-9	Washer disinfectant	2	●	2020
Kitchen	K-1	Cooking oven	1	●	2020
Kitchen	K-2	Desk and chair	1	●	2020
Kitchen	K-3	Refrigerator for food	1	●	2020
Kitchen	K-4	Freezer for food	1	●	2020
Laundry	LA-1	Washing machine with dehydration function	3	●	2020
Laundry	LA-2	Drying machine	3	●	2020
Laundry	LA-3	Linen cabinet	3	●	2020
Laundry	LA-4	Press machine	2	●	2020
Administration Department	A-1	Desk	80	●	2020
Administration Department	A-2	Chair	80	●	2020
Administration Department	A-3	Book shelf	30	●	2020
Administration Department	A-4	File cabinet	30	●	2020
Education (conference room)	LE-1	Projector	2	●	2020
Education (conference room)	LE-2	Screen	2	●	2020
Education (conference room)	LE-3	AV set	2	●	2020
Education (conference room)	LE-4	Lap top computer	1	●	2020
Education (conference room)	LE-5	LCD Monitor C	2	●	2020
Education (conference room)	LE-6	Desk with chair for listener	100	●	2020
Education (conference room)	LE-7	Stand for speaker	2	●	2020
Education (medical library)	LE-8	Book shelf for reference book	1	●	2020
Medical Record	MR-1	Book shelf	5	●	2020
Medical Record	MR-2	File cabinet	3	●	2020
Supply Processing Distribution	SPD-1	Pharmaceutical refrigerator	5	●	2020
Supply Processing Distribution	SPD-2	Storage Rack	5	●	2020
Morgue	M-1	Refrigerator for dead body	1	●	2020

* Q'ty written in left is for Plan A and right is for Plan B.

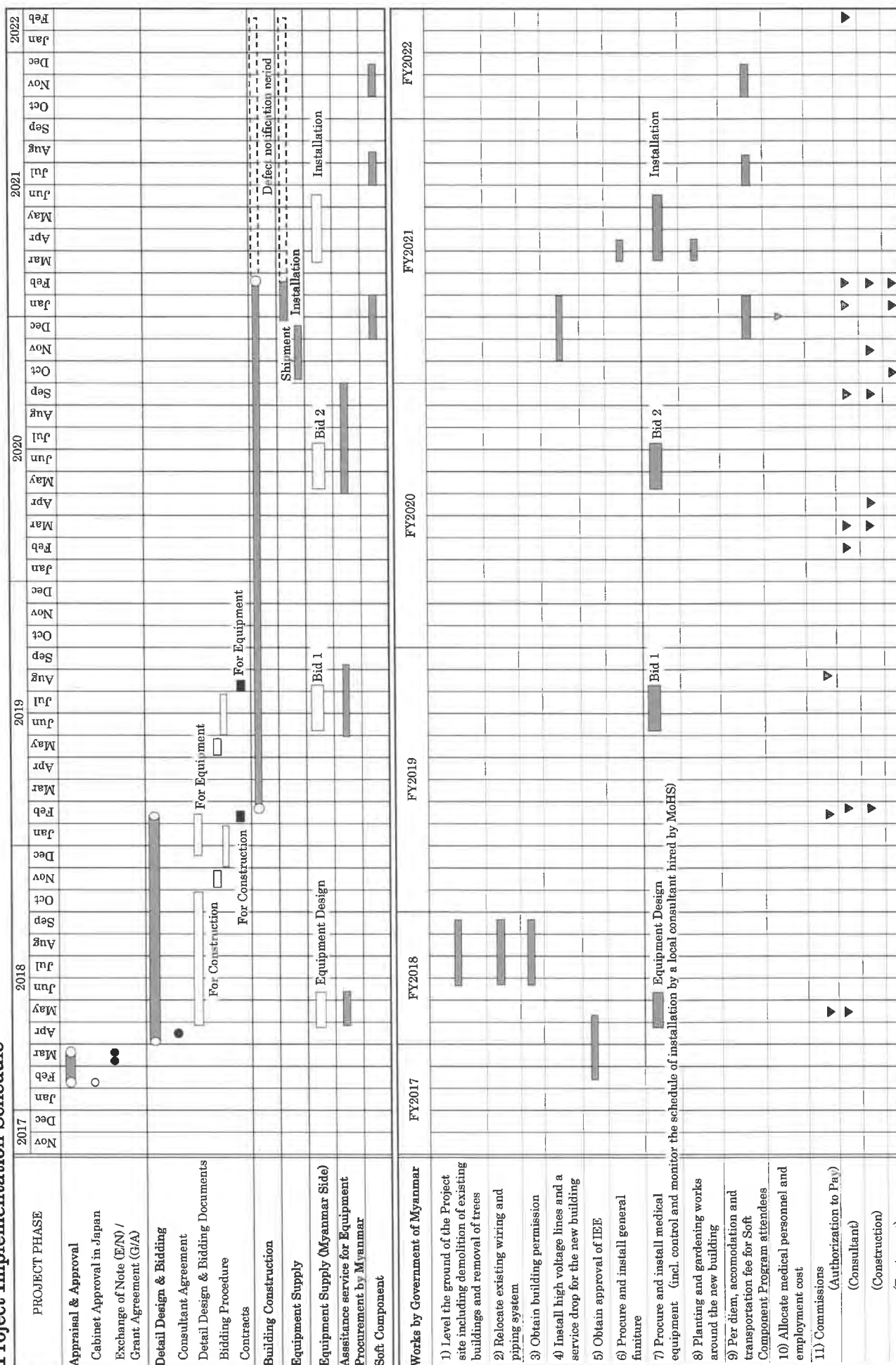
- A Procured by the Japan side
 B Subject to further analysis in Japan
 ● Procured by the Myanmar Side
 ▲ Transferred to new facility or procured by the Myanmar side
 *Q'ty Subject to change after further analysis in Japan

ANNEX 3 Organization Chart of New Yangon Specialist Hospital



ANNEX-4 Project Implementation Schedule

Project Implementation Schedule



※ The above schedule is subject to change.

Major Undertakings to be taken by the Government of Myanmar

(1) Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	To open Bank Account (Banking Arrangement (B/A))	within 1 month after the signing of the G/A	MoPF		
2	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the agreement	MoHS		
3	To obtain approval of IEE/EIA if applicable	within 1 month after the signing of the G/A	MoHS	146,904	
4	To secure and clean the following lands 1) the Project site including building area 2) temporary construction yard and stock yard within the Project area	before notice of the bidding document	MoHS		
5	To obtain construction permit and the other applicable building permits	within 6 months after G/A	MoHS/ YCDC		
6	To clear, level and reclaim the Project site including removal of the existing buildings, the existing fence, the existing pavement, underground obstacles and trees if necessary	before notice of the bidding document	MoHS	81,024	
7	To submit Project Monitoring Report (with the result of Detail Design)	before preparation of bidding documents	MoHS		

(2) During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Contractor and Supplier(s)	within 1 month after the signing of the contract(s)	MoHS		
2	To bear the following commissions to a bank of Japan 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)	MoHS	382	
	2) Payment commission for A/P	every payment	MoPF	20,883	
3	To ensure prompt unloading and customs clearance at ports of disembarkation in recipient country and to assist the Supplier(s) with internal transportation therein	during the Project	MoHS		
	1) Tax exemption and customs clearance of the products at the port of disembarkation	during the Project	MoHS		
	2) Internal transportation from the port of disembarkation to the project site	during the Project	MoHS		
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	MoHS		
4	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; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project	MoHS MoPF	181,161	
5	To bear all the expenses, other than those covered by the Grant Aid, necessary for the implementation of the Project	during the Project	MoHS		
6	1) To submit Project Monitoring Report	every month	MoHS		
	2) To submit Project Monitoring Report (final)	within 1 month after signing of Certificate of Completion for the works under the contract(s)	MoHS		

7	To submit a report concerning completion of the Project	within 6 months after completion of the Project	MoHS		
8	To construct the following facility				
	1) The fences in and around the site	before the completion of the construction	MoHS		
	2) Embankment of the project site and construction of Incidental facilities for the site, such as ambulance garage, guard house and substation, etc.	before the completion of the construction	MoHS	783,387	
	3) Parking lot and storm water drainage	before the completion of the construction	MoHS		
9	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 power line to the site. If required, relocation of electrical poles at around the site.	6 months before completion of the construction	MoHS	14,746	
	2) Water Supply The city water distribution main to the site, if available	6 months before completion of the construction	MoHS/ YCDC		
	3) Drainage The city drainage main (for storm water, sewer and others) to the site	6 months before completion of the construction	MoHS/ YCDC	—	
	4) Telecommunications Telephone line and Internet line to the main distribution frame (MDF) and server room in new building	1 month before completion of the construction	MoHS	10,460	
	5) Furniture and Equipment General furniture and equipment for administration	1 month before completion of the construction	MoHS	1,223,937	
10	To procure medical furniture and medical equipment	during the Project	MoHS		
11	To submit environmental monitoring report to JICA Myanmar Office, if applicable	during the Project	MoHS		
12	To recruit sufficient staff with appropriate skills and experiences for operation and maintenance of new facilities and equipment provided under the Grant Aid	6 months before completion of the construction	MoHS	—	

(3) After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To install medical furniture, general furniture and medical equipment				
	1) To install medical furniture, general furniture and medical equipment, and transfer existing equipment	4 months after completion of the construction	MoHS	39,870,523	
	2) To control and monitor the schedule of installation by a local consultant hired by MoHS				
2	To appoint and retain sufficient staff with appropriate skills and experiences for operation and maintenance of new facilities and equipment provided under the Grant Aid	After completion of the construction	MoHS		
3	To procure and install kitchen equipment	After completion of the construction	MoHS	47,522	
4	To plant trees and flowers within the site	After completion of the construction	MoHS	44,146	
5	To maintain and use properly and effectively the facilities constructed and equipment procured under the Japanese Grant	After completion of the construction	MoHS	5,023,115	
	1) Allocation of maintenance cost				
	2) Operation and maintenance structure				
	3) Routine check/Periodic inspection				

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

(MoHS: Ministry of Health and Sports, MoPF: Ministry of Planning and Finance, YCDC: Yangon City Development Committee)

Cost: Thousand Myanmar Kyat

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Major Undertakings to be covered by the Japanese Grant Aid

NO	Items	Deadline	Amount (Million Japanese Yen)*
1	<p>To construct building and procure equipment</p> <p>1) To conduct the following transportation</p> <p>a) Marine(Air) transportation of the products from Japan to the recipient country</p> <p>b) Internal transportation from the port of disembarkation to the project site</p> <p>2) To construct access roads</p> <p>a) Within the site</p> <p>3) To construct the temporary building</p> <p>4) To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities</p> <p>a) Electricity</p> <p>The drop wiring and internal wiring within the site</p> <p>The main circuit breaker and transformer</p> <p>b) Water Supply</p> <p>The supply system within the site (receiving and/or elevated tanks)</p> <p>c) Drainage</p> <p>The drainage system (for toilet sewer, ordinary waster, storm drainage and others) within the site</p> <p>d) Furniture and Equipment</p> <p>Project equipment</p>	Feb/2021	
2	To implement detailed design, bidding support and construction supervision (Consulting Service)		
	Total		8,607

*The Amount is provisional. This is subject to the approval of the Government of Japan.

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Total estimated costs to be included in the budget proposal for parliament's approval

An implementing agency of the Government of Myanmar is responsible for submitting a budget proposal to be approved for the next fiscal year's (FY) budget or the current year's supplementary budget. The budget proposal shall include both estimated costs borne by the Government of Myanmar and the grant provided by the Government of Japan. If the proposed budget spans multiple years, it must be appropriated and approved for each fiscal year.

*Expenses to be borne by the Government of Myanmar are subject to change depending on the progress of project implementation. The actual amount to be requested each FY shall be amended accordingly.

	Items	Apr-Sep 2018	Oct 2018-Sep 2019	FY2019 -2020	FY2020 -2021	Total
Expenses to be borne by the Government of Myanmar	Demolition of existing obstacles and ground levelling		80,419			80,419
	Removal of trees obstructing the construction site		605			605
	Planting and gardening				44,146	44,146
	Landscaping works including ambulance garage and guard houses				783,387	783,387
	Install high voltage lines, telephone lines and internet lines			25,206		25,206
	Procurement of general furniture				1,223,937	1,223,937
	Procurement of medical equipment 1			16,701,432		16,701,432
	Procurement of medical equipment 2				23,169,091	23,169,091
	Banking commissions for A/P	217	486	5,162	15,400	21,265
	Custom duties for construction material and equipment imported for the Project			181,161		181,161
	Kitchen equipment in the canteen				47,552	47,552
	Application fee of IEE/EIA	73,452	73,452			146,904
	Total amount to be borne by Myanmar – (a)	73,669	154,962	16,912,961	25,283,513	42,425,105
Grant to be provided by the Government of Japan	Building Construction		461,000	22,212,000	61,861,000	84,534,000
	Equipment Procurement				10,378,000	10,378,000
	Consultation Fee	429,200	643,800	2,490,000	1,459,000	5,022,000
Total amount to be borne by Japan – (b)		429,200	1,104,800	24,702,000	73,698,000	99,934,000
Amount to be requested each FY for budget approval - (a+b)		502,869	1,259,762	41,614,961	98,981,513	142,359,105
Total project expenses		142,359,105				

Unit: Thousand MMK

Budget preparation/approval process in Myanmar

Budget proposal for next fiscal year	Budget proposal for supplementary budget of current year	Process
March - May	March	Line ministries and departments prepare and submit budget proposal to the Ministry of Planning and Finance (MOPF)
April - July	April - May	The Budget Department scrutinizes and compiles budget proposals, which are to be vetted by a Vice-President and submitted to the Financial Commission
July - August	May - June	The Financial Commission discusses the budget proposals and submits them to the Cabinet with recommendations
July - August	May - June	Union Budget Bill is discussed and approved by the Cabinet
August - September	June	Union Budget Bill is discussed and approved by Pyidaungsu Hluttaw
September	July	Union Budget Law is enacted by Pyidaungsu Hluttaw and approved by the President
October -	July	MOPF allocates budget to each ministry for execution

*The schedule is subject to change every year.

**If the budget proposal cannot be processed and approved at the above-mentioned timings, the implementation agency shall seek alternative ways to secure the necessary budget.

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<p><u>Project Monitoring Report</u> on <u>The Project for Improvement of New Yangon Specialist Hospital</u> <u>Grant Agreement No. XXXXXXXX</u> 20XX, Month</p>

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	The Project for Construction of New Yangon Specialist Hospital
E/N	Signed date: _____ Duration: _____
G/A	Signed date: _____ Duration: _____
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of Iran: _____

1: Project Description

1-1 Project Objective

The objective of the Project is to improve patient-centered medical and healthcare services for cerebral and cardiovascular diseases by establishing a new specialist hospital with teaching function, through relocation of the selected clinical departments for cardiology, cardiac surgery, neuro medicine and neurosurgery from Yangon General Hospital, thereby contributing to improvement of the people's health.

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

In the Republic of Myanmar (Myanmar), the health sector has been implementing "National Health Plan" and "National Health Plan 2017-2021" and challenges programs such as "the improvement of hospital care", "the enhancement of healthcare system" and so on. It is designated on "National Health Plan 2017-2021" that in the recent years, the mortality rate of non-communicable diseases have been on the rise, while communicable diseases still remain as a challenge. In the ranking of the premature cause of deaths in Myanmar, stroke remains the first from 2005 to 2015 and ischemic heart disease went up from the fourth in 2005 to the second in 2015.

However, the hospitals that can provide diagnosis and medical care for these diseases are still limited. Yangon General Hospital (YGH) (established in 1899) is the highest referral hospital in the country and serves as a teaching hospital for the University of Medicine 1, Yangon. While it provides a variety of specialized services, YGH is incapable of providing sufficient medical services because of the following reasons:

- Aged facilities and shortage of medical equipment,
- Inconvenient circulation flow of staff and patients due to frequent extensions and renovations,
- The shortage of beds, and
- The excessive concentration of patients.

In the cerebral and cardiovascular related departments (cardiology, cardiac surgery, neuro medicine and neurosurgery), the long waiting time to receive necessary treatment is notable. For the 619 cases of surgery (emergency surgery 245 cases and elective surgery 374 cases) performed in 2016, the waiting time was a maximum of 18 months for cardiac surgery. For the 1,716 cases related to cardiovascular medicine performed in 2016, the waiting time was two months before beginning the examination and treatment with catheter. Furthermore, the 3,919 cases of neurosurgery (trauma 2,000 cases and non-trauma 1,919 cases) performed in 2016; the waiting time was from six to twelve months.

The clinical departments are scattered since there was not a long-term master plan during the development of facilities. Thus, it is difficult to provide a patient-friendly service with the current facilities. Patients visit each department by themselves, and some of them need to receive the specialized treatments in different blocks located on opposite sides of an arterial road. Such a situation makes infection control difficult in addition to inconvenient patient flow. To improve the quality of medical services, increase efficiency of referral system and promote health of local people in Yangon area, the Myanmar government requested a Japanese grant aid project. The project will relocate/separate some medical functions from the Yangon General Hospital to a proposed specialist hospital.

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives			
Name of Department	Indicators	Original (Yr 2016)	Target (Yr 2024)
Cardiology	No. of inpatients	4,436	5,221
	No. of outpatients	19,762	23,260
Cardiac surgery	No. of inpatients	947	1,115
	No. of outpatients	4,826	5,680
Neurosurgery	No. of inpatients (except trauma)	2,920	3,437
	No. of outpatients	1,180	1,389
Neuro medicine	No. of inpatients	1,020	1,201
	No. of outpatients	7,115	8,374
Cardiology	No. of angiography and angioplasty	1,761	2,113
	Time duration from receiving patients until starting catheter treatment(min.)	N/A	Within 30 min. after arrival
Cardiac surgery	No. of major surgeries	374	561
Neurosurgery	No. of months in which patients are waiting for surgery (month)	3	1
	No. of surgical cases used intraoperative CT scanning	0	89
Neuro medicine	No. of thrombolytic therapy cases	45	90
	No. of cerebral infarction patients evaluated by MRI	0	304
Qualitative indicators to measure the attainment of project objectives			
<ol style="list-style-type: none"> 1. The hospital facility is improved its design and work environment which enables hospital staff to provide medical services to patients effectively by dividing the line of flows between hospital staff and patients. Especially, by shortening the line of emergency patients, the time duration between time of arrival and time of starting treatment of a patient will be shortened. 2. High level surgical operation (e.g. Stent-graft or TAVI) will be performed in the hybrid operation theater for cardiac surgery. 3. Catheter treatments for strokes, aneurysm and Arteriovenous Malformation (AVM) will be performed. 4. The degree of satisfaction among patients who are under rehabilitation or using wheelchair will increase because the facility is designed as barrier free, so that patients can move around easily. 			

2: Details of the Project

2-1 Location

Location	Original: (M/D) Corner of Pyay road and Myn Ye Khaw Zha Road, Yangon	Actual: (PMR)
	Attachment(s):Map	Attachment(s):Map

2-2 Scope of the work

Components	Original* (proposed in the outline design)	Actual*
1. Construction	7 story hospital building	
2. Equipment	9 items of medical equipment	
3. Maintenance Contract		

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)	
Cabinet Approval	2/2018		
E/N	3/2018		
G/A	3/2018		
Detailed Design	4-10/2018		
Bid Notice for Construction	11/2018		
Bidding for Construction	2/2019		
Bid Notice for Equipment	5/2019		
Bidding for Equipment	8/2019		
Procurement of the Equipment	8/2019-9/2020		
Installation of the Equipment	11/2020		
Handover	2/2021		
Manufacturer's Warranty Period	2/2022		

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.

2-5 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
Construction	Hospital building		6,969	
Equipment	Medical equipment		856	
Consulting Services	- Detailed design - Tender Support - Supervision - Soft Component		414	
Total			8,239	

Note: 1) Date of estimation: July 2017
2) Exchange rate: 1 US Dollar = 112.09 Yen

2-5-2 Cost borne by the Recipient

Components			Cost (thousand MMK)	
	Original (proposed in the outline design)	Actual (in case of any modification)	Original ^{1),2)} (proposed in the outline design)	Actual
Level the ground of the Project site	Demolition of the existing obstacles such as pavement and ground levelling		80,419	
Removal of trees	Removal of trees obstructing the construction site		605	
Planting and Gardening works	Planting and gardening works around the new building		44,146	
Landscaping works	Embankment of the project site and installation of an ambulance garage and guard houses		783,387	
Utilities connection	Install high voltage lines, telephone lines and internet lines		25,206	
Procure general furniture	Procurement and installation of general furniture other than those provided under Japanese Grant		1,223,937	
Procure medical equipment 1	Procurement and installation of medical equipment other than those provided under		16,701,432	

	Japanese Grant (Diagnostic Imaging equipment)			
Procure medical equipment 2	Medical furniture, portable medical equipment		23,169,091	
Banking commissions	Commissions for Authorization to Pay, payments to the Consultant and the Contractors		21,265	
Taxes	Customs duties of the construction material and equipment imported for the Project		181,161	
Kitchen equipment	Instruments for cooking provided in the canteen of the new facility		47,552	
IEE/EIA	Application fee of IEE/EIA		146,904	
Total			42,425,103	

Note: 1) Date of estimation: July 2017
2) Exchange rate: 1 US Dollar = 112.09 Yen

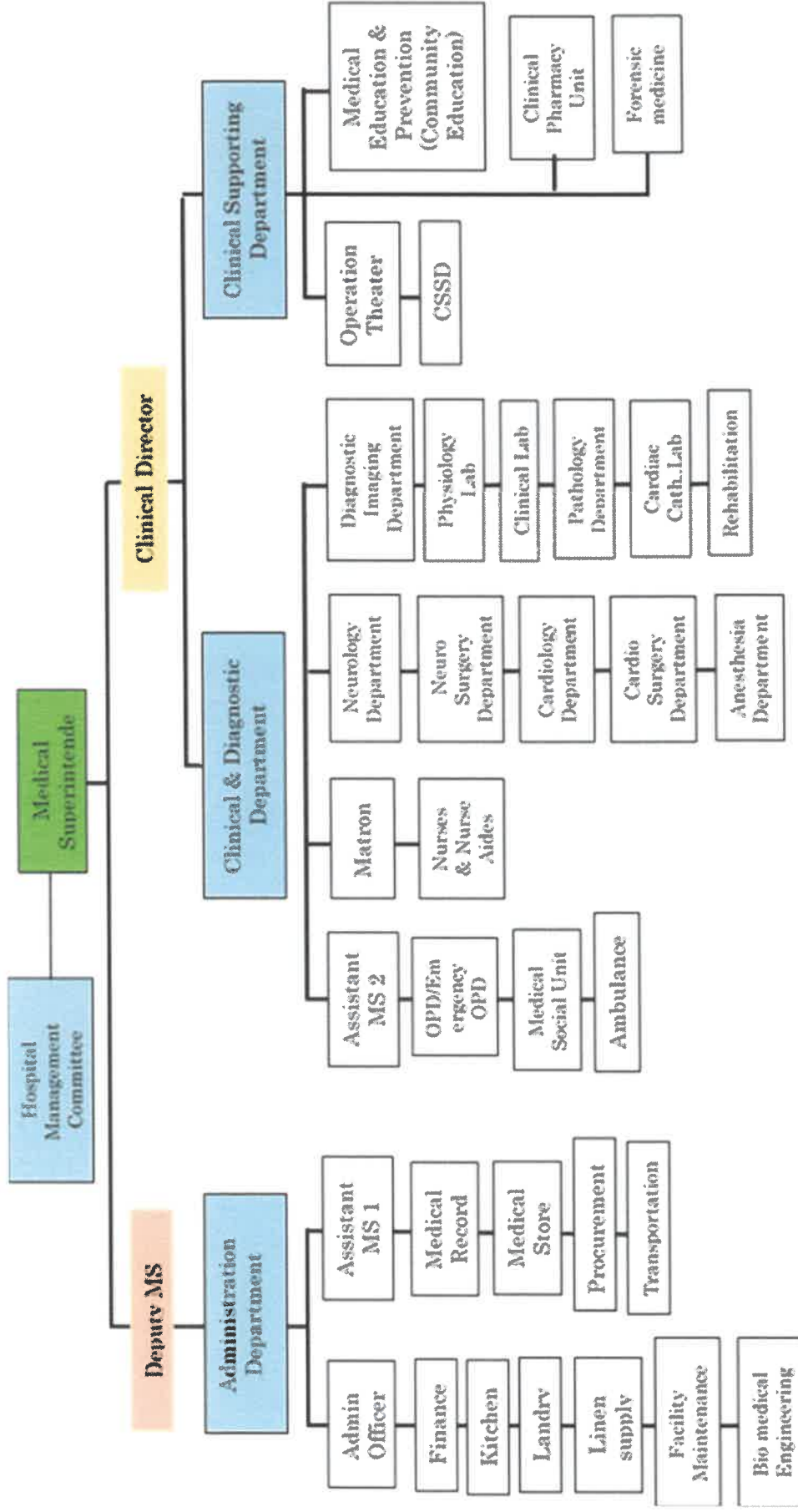
Reasons for the remarkable gaps between the original and actual cost, and the countermeasures
(if any)

(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)



Actual (PMR)

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 spare parts, etc.)

Original (at the time of outline design)

(1) Facilities

There are two categories for maintenance of facilities: (i) daily cleaning and (ii) repair of parts from wear and tear, damage, and deterioration. The daily cleaning will encourage people to use facilities carefully as well as ensure early detection of damages and/or malfunctions. The repair of facilities mainly consists of the restorations and rectifications of deterioration on the interior and exterior finish covering the superstructure. Facilities should be refurbished every decade to retain their functionality. Items for regular inspection and maintenance, which affect the lifespan of facilities, will be in the maintenance manuals provided by the Contractor at the commissioning of the facilities. Detailed inspection and cleaning methods will be also explained during the commissioning. Regular inspection points are summarized in Table below.

Summary of Regular Inspection Points of Facilities		
	Inspection and maintenance points	Frequency
Exterior	• Repair and repaint exterior walls	Repaint every 5 years
	• Inspect and repair roofs	Repair every 3 years
	• Clean gutters and drainage surroundings regularly	Inspect every 3 years
	• Inspect and repair exterior door and window sealants	Repair every 10 years
	• Inspect and clean ditches, manholes, etc.	Every month
Interior	• Renovate the interior	Every year
	• Restore and repaint partitions walls	Every year
	• Replace ceiling materials	As necessary
	• Adjust doors and windows to fit the openings	As necessary
	• Replace door handles, hinges, etc.	Every year
	• Periodical inspection for elevators	Every year

(2) Building Equipment

For building equipment, it is important to conduct daily “preventive maintenance” not just repair or parts replacement. The length of running time is not the only determinant of the life of equipment; normal operation, daily inspection, lubrication, adjustment, cleaning, maintenance, etc. can extend life of equipment. Daily maintenance can prevent problems, accidents and the further deterioration.

Building machineries, such as power generators and pumps need periodic maintenance and it is vital to conduct regular major inspections once a year. Below table shows average service life of major equipment. For lighting, use of LED lamp will be considered to reduce maintenance costs.

Service Life of Mechanical and Electrical Equipment		
	Type of Equipment	Service Life
Electric	Switchboard	20 - 30 years
	LED light	20,000 - 40,000 hours
	Florescent light (lamp)	5,000 - 10,000 hours
	Incandescent light (lamp)	1,000 - 1,500 hours
	Generator	30 years
Plumbing	Pump, pipe, valve	15 years
	Tank	20 years
	Sanitary ware	25 - 30 years
Air conditioning	Pipe	15 years
	Exhaust fan	20 years
	Air conditioner	10 ears

(3) Equipment

The advisable maintenance plan is shown in the below Table. The plan will be constructed by DoMS, MOHS and New Yangon Specialist Hospital based on the requirements for medical equipment maintenance stipulated in "Hospital Management Manual" issued by MOHS in 2011.

Proposed Maintenance Structure		
Department of Medical Services in Ministry of Health and Sports	administrative department at the New Yangon Specialist Hospital	maintenance unit at the New Yangon Specialist Hospital
Policy making for maintenance and operation	Collecting expected operational budget from each clinical department and applying to MOHS	Clarification of the role and demarcation of duties among a hospital director, a PIC of maintenance and end users
Allocation of operational budget	Applying for a distribution of human resources to MOHS	Management of inventory lists of each clinical department
Planning and distribution of human resources	Management of inventory lists	Instruction of how to use the equipment for the end users including daily and periodic maintenance
Planning a human resource development	Collecting information from each clinical department	Confirmation of stock of parts and consumables
	Information sharing with a hospital directors and hospital executives (such as periodic reports)	Dealing with serious defects (report and applying for outsourced repair to administrative department)
	Planning and implementation for technical training for medical staff and technicians	Adjustments or repairs of simple defect, etc.
	Repair of equipment by outsourcing to manufacturers' agents	Dealing with serious defects (identifying the cause of failure)
		Acceptance and inspection after completion of repair

Required Workforce in the NYSH								
Category	Pharmacy, Administration *	Image Diagnosis *	Medical Lab. *	Cardiac Surgery	Cardiology	Neuro- Surgery	Neuro- Medicine	Total
Professor				1	1	1	1	4
Senior Consultant/ Associate Professor		1	1	6	6	6	6	26
Junior Consultant/ Lecturer		1	2	5	5	5	5	23
Junior Doctors		5	8	13	13	13	13	65
Radiographer		4						4
Anesthesiologist				8		7		15
Total Doctors		11	11	33	25	32	25	137
Sister				3	3	3	3	12
Staff Nurse				18	18	18	18	72
Trained Nurse				29	29	29	29	116
Total Nurse				50	50	50	50	200
Physical Therapist				2	2	2	2	8
EEG/EMG Technician							3	3
Image Diagnosis Technician		10			3			13
Medical Technician			8					8
Pharmacist	10							10
Total Co-medical	10	10	8	2	5	2	5	42
Nurse Aid				10	10	10	10	40
Clark	45			1	1	1	1	49
Other staff (incl. worker)	50			10	10	10	10	90
Total other staff	95			21	21	21	21	179
Grand total	105	21	19	106	101	105	101	558

Actual (PMR)

3-2 Budgetary Arrangement

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

Original (at the time of outline design)

The estimated costs to be borne by the Government of Myanmar during implementation of the Project are as shown below.

Estimated operation and maintenance cost (thousand MMK per year)

Item	Estimated expenditures after completion of the Project
①Electricity	343,424
②Fuel	41,785
③Communication	25,811
④Medical gas	192,954
⑤Filter	23,400
⑥Facility maintenance	77,244
⑦Medicine	353,100
⑧Consumables for the equipment	1,706,650
⑨Medical equipment maintenance	2,258,747
Total	5,023,115

Exchange rate: 1USD=112.09JPY
1USD=1,360.21MMK
1JPY=12.13MMK
1MMK=0.082JPY

MOHS Expenditures by Department (2015/16)

(Unit : Million MMK)

	Name of Department	Current Expenditure	%	Capital Expenditure	%	Total (Million MMK)	%
1	Ministry Office	1,331.920	0.33	19.541	0.0	1,351.461	0.18
2	Department of Public Health	137,837.053	34.24	50,197.680	14.35	188,034.733	24.97
3	Department of Medical Services	233,913.99	56.0	269,839.789	77.11	503,753.774	66.90
4	Department of Health Professional Resource Development and Management	20,523.025	5.1	13,568.198	3.88	34,091.223	4.53
5	Department of Medical Research	2,981.336	0.7	1,649.722	0.5	4,631.058	0.62
6	Department of Traditional Medicine	4,772.721	1.2	9,568.597	2.73	14,341.318	1.90
7	Department of Food and Drug Administration	1,721.037	0.43	5,076.774	1.45	6,797.811	0.90
	Total	403,081.077	100	349,920.301	100	753,001.378	100

Source: Mirror (Myanmar version) newspaper, May 1st, 2015

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. Delay or lack of coordination in the procurement/installation schedule for the equipment to be procured by Myanmar side	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Assistance service by Japanese consultant for equipment procurement work by Myanmar side
	Contingency Plan (if applicable):
	NIL
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
Appendix - Progress Control Report with photographs
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. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(PMR (final) only)
7. Pictures (by JPEG style by CD-R) (PMR (final) only)
8. Equipment List (PMR (final) only)
10. Drawing (PMR (final) only)
11. Report on RD (After project)

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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%)	

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Technical Assistance Service for
Equipment Procurement Work by Myanmar side

Stage	Item	Assistance Service
1. Detailed Design Stage	Procurement planning	<ul style="list-style-type: none"> • Assist to prepare procurement plan based on the number of prospective tenderers among manufacturer's local agents and Myanmar government requirements
	Utility Information	<ul style="list-style-type: none"> • Assist to collect utility information of planned equipment (size, electricity and other installation conditions) necessary for design hospital building
	Equipment Design	<ul style="list-style-type: none"> • Assist to layout planned equipment on the drawing provided from construction side • Review and advise for technical specifications and tentatively fix the procurement schedule by Myanmar side
	Preparation of Specification	<ul style="list-style-type: none"> • Assist to prepare equipment specification.
2. Bidding Stage	Tender Documents	<ul style="list-style-type: none"> • Assist to confirm specifications of final bidding documents
	Evaluation of Bid	<ul style="list-style-type: none"> • Assist to evaluate technical bids
3. Intermediate Inspection		<ul style="list-style-type: none"> • Assist to conduct intermediate inspection in order to confirm whether or not planned installation place meets with requirement of equipment. • Assist to confirm utility such as power consumption and number of plugs etc. • Assist to be fixed delivery route, installation plan and overall schedule up to handover

Estimated Number of Manpower Needed for New Yangon Specialist Hospital

Category	Pharmacy /Admin. *	Diagnostic Imaging *	Clinical Lab. *	Cardiac Surgery	Cardio- logy	Neuro- Surgery	Neuro medicine	Total
Head of Department				1	1	1	1	4
Senior Consultant.		1	1	6	6	6	6	26
Junior consultant		1	2	5	5	5	5	23
SAS and AS ¹		5	8	13	13	13	13	65
Radiologist		4						4
Anaesthesiologist				8		7		15
Total No. of Doctors		11	11	33	25	32	25	137
Sister				3	3	3	3	12
Staff Nurse				18	18	18	18	72
Trained Nurse				29	29	29	29	116
Total No. of Nurses				50	50	50	50	200
Physiotherapist				2	2	2	2	8
EEG/EMG Technologist ²							3	3
Radiographer		10			3			13
Laboratory Technician			8					8
Pharmacist	10							10
Total No. of Co-medicals	10	10	8	2	5	2	5	42
Nurse Aid				10	10	10	10	40
Clark	45			1	1	1	1	49
Others (including workers)	50			10	10	10	10	90
Total No. of Other staff	95			21	21	21	21	179
Grand Total	105	21	19	106	101	105	101	558

Source : Preparatory Survey Team

* The calculation is based on the sanction number of manpower per 100 beds referred from "Summary of Hospital Management Situation Analysis Report, 2012"

¹ SAS: Specialist Assistant Surgeon, AS: Assistant Surgeon² EEG: Electroencephalogram, EMG: Electromyogram

5. Soft Component (Technical Assistance) Plan

The Project for Construction of New Yangon Specialist Hospital Soft Component Plan

1. Background of Planning Soft Component

1-1 Background and Objective of the Project

In the health sector in the Republic of the Union of Myanmar (hereinafter referred to as “Myanmar”), the “National Health Policy” and the “National Health Plan 2017-2021” have been set out to guide such efforts as improving hospital care and strengthening the health system. Notably, apart from infectious diseases that are a persisting challenge in the country, deaths caused by non-infectious diseases are increasing in recent years, as being pointed out in the National Health Plan 2017-2021. Stroke remains the leading cause of deaths in Myanmar from 2005 to 2015, followed by ischemic heart disease (one of the heart diseases) which is now more acute than before, leaping from the fourth-ranked cause.¹ According to the 2017 profile of Yangon General Hospital (hereinafter referred to as “YGH”), the largest tertiary level medical facility in Myanmar where the Project’s four target clinical departments are located, the top 10 diseases that caused in-hospital deaths in 2016 include 179 cases of acute myocardial infarction (2.83% of the total deaths) and 200 cases of strokes (3.16%). This indicates that cardiovascular diseases are more likely to cause deaths, against which the country needs to take relevant measures. The top 10 diseases leading to hospitalization, according to said profile, are trauma, hemorrhage of unknown reasons, stroke, and ischemic heart disease in order of the most common causes. The third- and fourth-ranked diseases are related to the cerebral and cardiovascular diseases.

Treatments of these cerebral and cardiovascular diseases are time-critical tasks that affect the survival of patients, that is, how much the time can be reduced from the onset of the diseases to medical intervention. Because this also affects the degree of their aftereffects, it is essential to have a hospital specialized in diagnoses and treatments of cerebral and cardiovascular diseases to which patients are accessible immediately. In Myanmar’s current situation, however, only a few existing hospitals are available to make diagnoses and treatments of these cardiovascular diseases. Only YGH has four operating clinical departments of cardiology, cardiac surgery, neuro medicine, and neurosurgery. Even YGH, however, is compelled to have a long list of patients waiting for admissions, due to a shortage of beds and excessive concentration of patients. Moreover, clinical departments in the hospital facility are situated in a quite complicated configuration, while also isolated from one another over the site. This has undermined accessibility for patients. They must receive their treatments in the medical blocks spread out across the site, and occasionally in an annex on the other side of the road. The circulation flow of patients is therefore severely interrupted, which also makes infectious disease control difficult.

The Government of Myanmar requested this grant aid project to construct a hospital specialized in

¹ Institute Health Metrics and Evaluation, Country Profile-Myanmar, 2015

treatments of cardiovascular diseases, together with the provision of equipment, and to relocate some of the medical care functions in the relevant four clinical departments in YGH, the country's only and top referral hospital. To respond to this request, the Project intends to assist in constructing a specialist hospital of these four clinical departments on a new site and in providing equipment.

1-2 Current conditions and issues of equipment utilization

At present, the Biomedical Engineering Department (BME) in YGH carries out maintenance of medical equipment used in the four target clinical departments situated therein. Since the spring of 2016, BME has appointed newly graduated electrical civil engineers. However, it has not assigned an engineer specialized in medical electronics, and therefore the management ability and maintenance skills remain modest. Therefore, when the medical equipment in the four target clinical departments does not function properly, BME needs to commission a maintenance service to a local agent in the private sector. Nonetheless, because YGH and the local agent have not entered into a maintenance contract, requested repairs are not made on a timely basis. Although medical staff in the target clinical departments checks medical equipment regularly, check items vary among the staff members, and the efforts are far away from fulfilling the requirements of preventive maintenance work. Furthermore, necessary parts and components are not traced or administered, and medical supplies and consumables are not supplied on a scheduled basis, making it difficult to deliver unceasing medical services. With training included as a soft component, the Project will exert on developing a coherent mechanism to maintain medical equipment through mitigation of problems inhibiting preventive maintenance, operation and maintenance, and proper inventory control of medical consumables and supplies.

(1) Current conditions of maintenance work in the hospital

At present, YGH has Biomedical Engineer (BME) where a total of five staff members are allocated, including a technician (diploma in electrical engineering), another technician (specialized in electrical engineering) transferred from the Central Medical Stores Depot (CMSD), and two newly graduated engineers (civil and electrical engineering) appointed from July 2016 and onwards. However, these engineers and technicians are not so called biomedical engineers who specifically studied medical electronics, just as clinical engineers trained in Japan. Therefore, BME is currently only capable of repairing basic medical equipment such as adjusting sphygmomanometers and suction units. Moreover, its management of medical equipment does not keep an inventory record of the available equipment owned by each clinical department or involve updating and tracking of repair records on different kinds of equipment. BME is simply serving as a liaison office to contact with a local agent. Practically, it relies on a local agent of the manufacturer for repairs. Furthermore, catheters, stents, and other medical materials, and consumables such as ultrasonic scalpels and dialyzers are not purchased on a regular basis, which has hindered prompt medical service provision.

Maintenance of medical equipment in the four target clinical departments is tasked on the

physicians, nurses, and co-medicals who actually use it. They check and maintain the equipment regularly, including testing before use to ensure safe operations. In addition, they manage spare parts and consumables such as breathing circuits for ventilator in the Intensive Care Unit (ICU) or catheters and infusion sets used in the catheter laboratory. When the medical equipment does not function properly, a clinical department requests a repair service directly or via BME in the hospital to a local agent, because the trouble-shooting skills of said section only covers basic equipment, as mentioned above. The hospital has installed some medical equipment and systems requiring advanced maintenance, including a 32-slice CT scanner in the brain surgery and a cardiac angiography system in the cardiology. While the staff members understand that such advanced medical equipment needs a maintenance contract, they are still at the stage of acquiring their knowledge or experience of how to determine the scope of such service and requirements. Thus, the budget necessary for concluding said contract has not been appropriated, and therefore medical staff continue to use equipment without the agreement being made. Furthermore, in most cases manufacturers of such advanced medical equipment allow engineers to be trained in their country of origin (hereinafter referred to “qualified engineers”) to provide maintenance services such as periodic check or repairs to abide by the Product Liability Law (PL Law).²

The New Yangon Specialist Hospital (NYSH) to be constructed in the Project will be installed with medical equipment needed to provide advanced medical services that should be available in a tertiary level medical facility. For the sake of reliable delivery of quality medical services, it is critical that the medical staff check such equipment daily and that a local agent inspect them periodically and provide timely maintenance services in case a malfunction occurs. In particular, equipment operated in ICU such as heart lung machine and extracorporeal circulation machine and ventilator directly affect survival chances of patients. It is of utmost importance to ensure that the equipment is inspected regularly by a local agent so as to minimize the downtime.

(2) Current conditions of maintenance services obtained from manufacturers’ local agents

Maintenance services in YGH are provided by Yangon-based local agents on an on-call basis with which the manufacturers have agency contracts. Engineers in these agents have relevant qualifications, trained in the manufacturers’ headquarters or local agents in neighboring countries including Singapore and Thailand. They are therefore capable of correcting moderate malfunctions in the equipment.

At present, as described in (1), a maintenance contract has not been made between the hospital and a local agent regarding large-sized diagnostic imaging machines such as a CT scanner and MRI used in the radiology department, heart lung machine in the cardiac surgery department, and life-support systems, including ventilators, owned commonly by the four target clinical departments.

² Myanmar does not have its PL Law at present. FDA Myanmar has just started to impose import license for medical equipment. Those medical equipment products manufactured in Japan or a third country, regardless of their destinations, require check and repairs by trained engineers.

Consequently, essential periodical check and maintenance services upon malfunction remain unavailable. Behind this is the facts that; (1) the local agent made an on-call maintenance service upon malfunction before without an agency contract, (2) no budget is appropriated for concluding a maintenance contract, and (3) YGH is not familiar with how to negotiate such contract as it has never done that before. These are the primary reasons for why said contract has not been concluded as of yet. As a result, when the hospital requests a local agent for repairs without a valid maintenance contract, the engineer's arrival takes time. This has been disrupting medical service provision.

(3) Current conditions of utilization of procured medical equipment

Although depending on individuals, medical staff in YGH's four target clinical departments is reasonably knowledgeable of handling the existing equipment, and they are carrying out clinical practices with different kinds of equipment. While capable of handling the equipment, they are not well trained in terms of preventive maintenance which involves daily check to detect potential mechanical failure and take relevant precautions. Currently, medical staff in the wards of clinical departments, the operation theater complex, and ICU visually checks their equipment on a regular basis. However, they do not practice record keeping. Consequently, check items and procedures vary one staff member after another, and no standardized check procedure has been adopted. Moreover, the staff members orally report to nurses who work in the following shift about the conditions of equipment, making it inaccurate to circulate the information at times. Again, as mentioned above, because of absence of a maintenance service agreement with a local agent, the hospital is unable to obtain periodic check and implement proper preventive maintenance work including parts replacement under the presence of the agent.

For a suite of medical equipment procured under the Japanese grant aid project, a supplier or manufacturer will provide initial operational training. However, such training sessions offered by the supplier before handover take only a short period of time for each of equipment procured. Mostly instructed on how to handle the equipment, not all end-users are able to master detailed procedures of daily check and trouble shooting. For long-term use of the procured equipment in good conditions, it is critical for the hospital to foster preventive maintenance work such as daily check, trouble shooting, and periodic check that are not included in the scope of the supplier's initial operational training.

(4) Analysis of the issues related to equipment utilization

Considering the circumstances described in (1) through (3) above, the following three issues are identified. The soft component is deemed requisite to address these issues, which is conducive to the Project's smooth launch and sustainable use of the procured equipment.

① Preventive maintenance (Budget management, maintenance contract, and daily checks)

- ①-1 **【Budget management】** As the hospital is unfamiliar with benefits of the preventive maintenance, budget is not earmarked to meet supply of consumables and spare parts

required for mechanical operations as well as cost incurred for a maintenance contract.

- ①-2 **【Maintenance contract】** No periodic check or spare parts replacement has been carried out as needed, due to absence of a maintenance contact between the local agent and YGH. When a mechanical malfunction occurs, therefore, it takes time to restore proper operations, leading to disruption of medical service provision.
- ①-3 **【Daily check】** Although medical staff in the target clinical departments practice simple visual check of the equipment regularly, their check items have variance. No standardized check procedure is adopted.
- ①-4 **【Periodic check】** Semi-annual or quarterly check must be scheduled so that engineers qualified by the manufacturers can make professional check. Such occasion, however, has not been made available.
- ①-5 **【Management of equipment use】** YGH has not yet developed a database customized for medical equipment management, and thus BME is unable to collect and integrate information on the conditions of operating equipment belonging to clinical departments.

② Maintenance system

- ②-1 YGH's medical equipment is maintained by its BME, which conducts minor trouble-shooting of simple equipment such as sphygmomanometer and suction unit. While civil and electrical engineers have been appointed to change such situation, a biomedical engineer specialized in medical equipment has not yet been assigned. When the medical equipment malfunctions, BME needs to call on a local agent in the private sector.
- ②-2 With respect to maintenance of medical equipment, responsibilities are not well defined among the hospital administrator, consultants, physicians, nurses, co-medicals, and BME. The coherent maintenance system has been underdeveloped to serve for the entire institution.

③ Proper inventory of medical consumables and materials

- ③-1 Although expending large quantities of medical materials and consumables, the four target clinical departments are unable to place orders based on the quantification of the actual amount consumed annually, including catheters, stents, and coils guided in the bodies of patients under angiography. Once these consumables supplied in the beginning of the year are used, the lead time takes longer. The shortage of consumables and materials required for the medical equipment has often restricted clinical practices.
- ③-2 The understock of medical materials has forced patients to purchase their stents or artificial valves by themselves for the sake of treatments.
- ③-3 Medical staff are unable to use equipment, although properly functioning, because the medical consumables are out of stock.

2. Objective of the soft component

The current situation of equipment maintenance in YGH's four target clinical departments falls chiefly into three kinds of problems: (1) insufficiency in preventive maintenance, (2) underdeveloped operation and maintenance system, and (3) inconsistent inventory control for consumables and materials essential to use the medical equipment. In particular, NYSH providing advanced medical care, will face serious problems that may threaten patient safety due to periodic check of key equipment is not being thoroughly conducted, especially for ventilators and an angiography system used for treatments with intratracheal intubation and catheterization.

To address these issues, the soft component intends to support developing a maintenance system for medical equipment procured under the Project, mainly involving medical staff in the four target clinical departments and the inter-departmental facilities including the radiology department, the hospital director, the deputy director, the chief administrative officer, and BME. The ultimate objective is that the equipment procured in the Project will be operated and maintained in good conditions.

3. Result of the Soft Component (Technical Assistance) Program

Table 1 Outcome of Soft Component

Item	No.	Outcome of soft component	Final goal
Maintenance management structure	3-1	<ul style="list-style-type: none"> • Role of each division such as hospital administrator, consultant, physician, nurse, co-medicals and BME department would be clearly defined. 	To implement maintenance management based on the established repair correspondence flow.
Daily check / Periodic check	3-2	<ul style="list-style-type: none"> • Depending on the defected condition, it becomes possible for end-user to distinguish between repair inside of the hospital and repair outside of the hospital. • Contents of daily check / periodic check for medical equipment listed on table 5 would be standardized for check items and its method. 	To ensure that daily check is performed on the decided check items for staff at each shift.
Centralized management of equipment	3-3	<ul style="list-style-type: none"> • To establish equipment inventory list (data base) for existing equipment including working condition of each equipment. 	To update periodically the maintained equipment control database.
Budget management	3-4	<ul style="list-style-type: none"> • To manage quantity of consumables/spare parts which are necessary for equipment operation. (recording paper, gel, filter and syringe etc.) • To formulate A budget plan (draft) for purchasing consumables and spare parts based on managed usage records • To implement periodic check at appropriate times and to manage the operational status of each equipment 	<p>To secure the budget required for purchasing expendable items and spare parts described in the management record and have sufficient stock</p> <p>To formulate a replacement plan for equipment.</p> <p>To execute maintenance and management budget from the Ministry of Health and Sports, to strengthen maintenance system of medical.</p>

Maintenance contract	3-5	End users increase knowledge of maintenance contracts.	To decrease downtime (equipment inactivity hours) of individual equipment.
Medical consumables / materials	3-6	To apply for purchasing medical materials necessary for examination and treatment such as catheter, stent, etc. based on the previous year activity record for each procedure.	To decrease the number of cases where patients purchase medical materials necessary for examination and treatment.

4. The method of achievement confirmation of soft component

Soft component support is limited in duration, so the results are shown in Table 1. After that, the self-help efforts of Myanmar side are expected to achieve the final goal of Table 2. (Regarding whether the final goal has been achieved or not, self-check on Myanmar side will be expected.)

Also, the achievement of the program is confirmed in the following way:

Table 2 Confirmation method of Achievement Degree

Item			The method of achievement confirmation
Operation and maintenance system	Operation and maintenance system	3-1	Flow chart for repair correspondence in case trouble occur stated personnel and role clearly
Results for preventive maintenance	Daily check / Periodic check	3-2	Daily check sheet used by end users, confirmed by the head of department or BME department Daily check sheet which is stated check items
	Centralized management of equipment	3-3	Equipment management database
	Budget control	3-4	Consumables / spare parts management record Equipment management database Planning budget plan (draft)
	Maintenance contract	3-5	Priority list which should be concluded of equipment for maintenance contracts in each target department
Proper inventory of medical consumables / materials	Medical consumables / materials	3-6	Management table for medical material usage record

5. Implementation Plan of Soft Component (Technical Assistance) Program

5-1 The Soft Component Program

The Soft Component Program is shown in Table 3.

Table 3 Implementation Plan of Soft Component (Technical Assistance) Program

	Outcome	Contents of input	Target personnel
The First Session	3-2	<ul style="list-style-type: none">• Integrated equipment management data base• Management of maintenance form, such as daily check sheet• Maintenance of daily check and periodic check sheet	Medical staff / maintenance team of all target department (Regarding 3.2, hospital administrator: MS or Deputy MS)
	3-3	Guidance on how to fill in maintenance form	
	3-6		
		Management record for Medical material usage and consumables / spare parts	
	3-5	Guidance on how to engage proper maintenance contract	
	3-1	Clarification of the scope of work for each party with regard of maintenance Guidance on creation for flow chart for repair in case malfunction occurs Guidance on repair requests in case malfunction occurs for medical equipment	
	3-6	Instruction for the procurement plan of periodical spare parts and consumables for each of equipment according to medical material usage	
The Second Session	3-1~3-6	Practical Training by using each maintenance check sheet created in the first session (simulation), Identification of issues and problems and instruction for the improvement.	Medical staff / maintenance team of all target department
The Third Session	3-4	Practice of planning budget plan (draft) based on management record	
	3-1~3-6	Review of the maintenance method using maintenance check sheet, Identification of issues and problems, instruction for improvement. Instruction using management record for creation of the procurement plan of spare parts and consumables.	Medical staff / maintenance team of all target department (Regarding 3.2, hospital administrator MS or Deputy MS)
		Advice for repair during warranty period and conclusion of maintenance contract.	
	3-4 3-6	Update for long term plan of equipment budget according to current clinical activities (based on content of preparatory survey report)	

The Soft Component Program will be conducted in three sessions. The objective of the first session is review the content of operation guidance, daily check method and troubleshooting by conducting right after the initial operation guidance done by the equipment Supplier. The second session will be implemented after about half a year has passed since medical equipment is used for actual patients so that attendees will be able to understand the specific adaptation case and usage method to a certain extent. The third session of the final one will be implemented right before the warranty period for the equipment will expire so that attendees will be able to handle repair of equipment within the warranty

period in case there are operational uncertain points and equipment malfunction, and be able to deal with promotion of maintenance management contract. Also, when formulating the budget plan, it will be able to reflect in the budget for the next fiscal year through conducting guidance shortly before the budget plan formulation time based on the new budget year of Myanmar.

The Soft Component Program will be conducted in three sessions. The reason for it is as follows:

- ① Medical staff can understand what is unclear about the maintenance of the equipment only after they started to use the equipment in the actual clinical activity.
- ② Medical staff can understand problems and what is unclear about the use of preventive maintenance check sheet only after they started to use it in the actual clinical activity. In case they cannot understand them, it will not be possible to actually operate.
- ③ The negotiation for conclusion of maintenance contract will be done just before the warrant expires, so Soft Component Program should be held at appropriate timing. Also maintenance contract should be confirmed according to the frequency of the use.

5.2 Expected attendees

Expected attendees are hospital administrators (MS or Deputy MS), end-users of supplied equipment (physicians, nurses, co-medicals) at target department and common clinical departments such as laboratory and radiology, and biomedical engineering department (BME). Medical staff have shift work, thus we should arrange the training so that medical staff from each shift can join it. The program will be held in NYGH. The photos and movies of the practical training of the program will be taken and shot so that they can be checked repeatedly. And it should be considered to establish certain knowledge and skills.

Table4 Expected attendees of Soft Component (Technical Assistance) Program

	Position	Number of people	Activity content
New Yangon Specialty Hospital	Hospital administrator (MS, DMS)	1 each	<ul style="list-style-type: none"> • Explanation on medical equipment management plan • Presentation of supplied equipment • Explanation of importance of Equipment Maintenance
	BME	3	<ul style="list-style-type: none"> • Creation and utilization of equipment management data base • Daily check and periodic check • Plan of procurement of consumables • Management of periodic check(every half year) • Maintenance of equipment and its replacement • Long term procurement of consumables • Update of integrated equipment management data base • In case malfunction occurs, how to take action.

	Position	Number of people	Activity content
	End users (Physicians, nurses, co-medicals)	5-10 from target / common department	<ul style="list-style-type: none"> • The effectiveness, quality and safety of medical equipment • Necessity of medical equipment check before/after use • Presentation of supplied equipment • Maintenance method for PCPS (Percutaneous Cardiopulmonary Support)

5.3 Target Equipment

Target Equipment for individualized instruction of daily / periodic check is shown in Table 5..

Table5 Target Equipment List for Soft Component
(Daily check, Periodic check Individual Guidance)

Category	Name
Cardiovascular Surgery	Cell saver, Intra aortic balloon pump (IABP)
Neurology	EEG(Electroencephalogram), Ultrasound scanner carotid doppler + transcranial
Common Department (CSSD)	Hydrogen peroxide gas sterilizer, Washer disinfectant
Common Department (Operation theater/Anesthesia)	Platelet incubator with agitator, PCPS (ECMO)
Common Department(others)	Thawing water bath, Mortuary refrigerator
Total	10 items

Through the guidance of this soft component, the objective is that preventive maintenance should be ensured to implement such as daily / periodic check. Specifically, problems of equipment operation and maintenance are extracted for each of equipment for each job category as shown in Table 5. And, it is necessary to clarify the scope of work of each party (check person, user, respondent in case malfunction occurs, etc.) in charge of each of equipment and to create a situation where equipment is properly managed.

In this soft component program, it should be proceeded along with confirming direction and proficiency whether the content of the guidance matches the final objective, whether the guidance content is based on the participant's level, etc. Also, training supervision staff will take photos and videos of the practical training of the program so that expected attendees will be able to review. And, in case similar equipment is introduced in other facilities, records will be able to keep checking. In addition, in case the end user is not sure how to operate equipment and conduct daily check, the operation / check method will be established after the completion of this soft component program through watching the photos and movies over and over.

Table 6 Achievement Objective of Equipment maintenance and Management for each job

Equipment	Consultant Dr. / Physician	Nurse, Co-medical	BME department
Cell saver	Cardiac surgeon ◎	Nurse ○	●
Intra aortic balloon pump (IABP)	Cardiac surgeon, Cardiologist ◎	Nurse ○	●
EEG (Electroencephalogram)	Neuro medicine physician ◎	Nurse ○	●
Ultrasound scanner carotid doppler + transcranial	Neuro medicine physician ◎		●
Hydrogen peroxide gas sterilizer	Cardiologist ○	Nurse ○ Sterilizer operator ◎	●
Washer disinfectant		Nurse ○ Sterilizer operator ◎	●
Thawing water bath		Medical Technician ◎	●
PCPS (ECMO)	Cardiologist ◎	Nurse (Per fusionist) ○	●
Platelet incubator with agitator		Medical Technician ◎	●
Refrigerator for dead body		User at Mortua ◎	●

* ◎ ⇒ Main operator ○ ⇒ Operation assistance

● ⇒ Maintenance (daily check abnormality, dealing with defects and malfunction)

Regarding maintenance of the equipment management database and expendable supplies / spare parts management record, the following is target equipment as follows in addition to the equipment listed in Table 5 and the 9 items procured by the Japanese side.

Table 7 Equipment Management Database, Target Equipment of Consumable parts / Spare parts Management Record

Product group	Description
Equipment necessary for precise adjustment (plotting to overall drawing)	PACS system, Intraoperative CT for Hybrid OT, Angiography system, 3D mapping system, Central monitor, Ceiling pendant, Neurosurgery Hybrid OT (operation microscope, navigation system), Hemodialysis machine
Portable equipment	Tilt table, Central monitor, ECG, EEG, EMG, Treadmill, Rehabilitation physical therapy equipment such as Ultrasonic aspirator with accessories, Mobile X-ray unit, Infusion pump, Syringe pump, Blood gas analyzer with ISE, Ventilator, Defibrillator, etc.
Equipment necessary for installation (plotting to overall drawing)	Digital X-ray machine, Hemodialysis machine, Plasma exchange machine, High pressure steam sterilizer, Hand scrub station, Washing machine, Dryer, etc.

6. Procurement method of soft component implementation resources

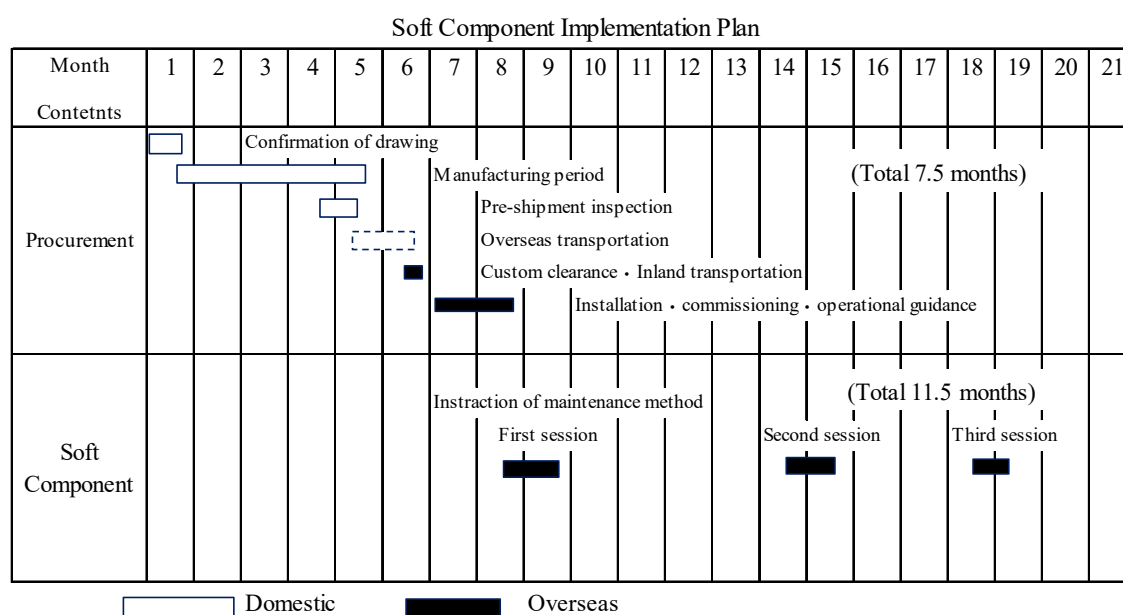
In Myanmar, there is no domestic educational system to create biomedical engineers until now and it is difficult to utilize local resources. Personnel with comprehensive knowledge, practical experience and management experience should be dispatched from Japan for safe use of medical equipment and maintenance and management method so that it is important to communicate the method of medical practice in Japan. Regarding dispatched members, it will be planned as follows.

- Soft component trainer (Clinical engineer or Medical engineering experts*)
- Soft component supervisor for training guidance

*Qualified Engineer who has passed examination to measure Medical Equipment technical capability / knowledge

7. Implementation Schedule of Soft Component (Technical Assistance) Program

The first session is held right after the installation work starts and it takes about 1.17 month (35 days). The second session is held 6 months after the installation and it takes about 0.93 month (28 days). The third session takes place 11 months after the installation and it takes 0.70 month (21 days). Totally it takes 11.5 months to complete whole Soft Component Program including preparation.



8. The outcome of Soft Component (Technical Assistance) Program

The following document will be submitted as outcome of Soft Component Program

Table 8 List of the outcome of Soft Component (Technical Assistance) Program

Outcome of Soft Component Program	
1	List of attendees of soft component program
2	PP education slides used at soft component
3	Daily check sheet
4	Equipment priority list requiring periodic check
5	Periodic check sheet
6	Equipment management database
7	Management list for consumables/spare parts
8	Management table of medical equipment materials based on the usage
9	Repair action flow chart
10	Priority list for engagement of maintenance contract

9. Soft Component (Technical Assistance) Program Cost Estimation

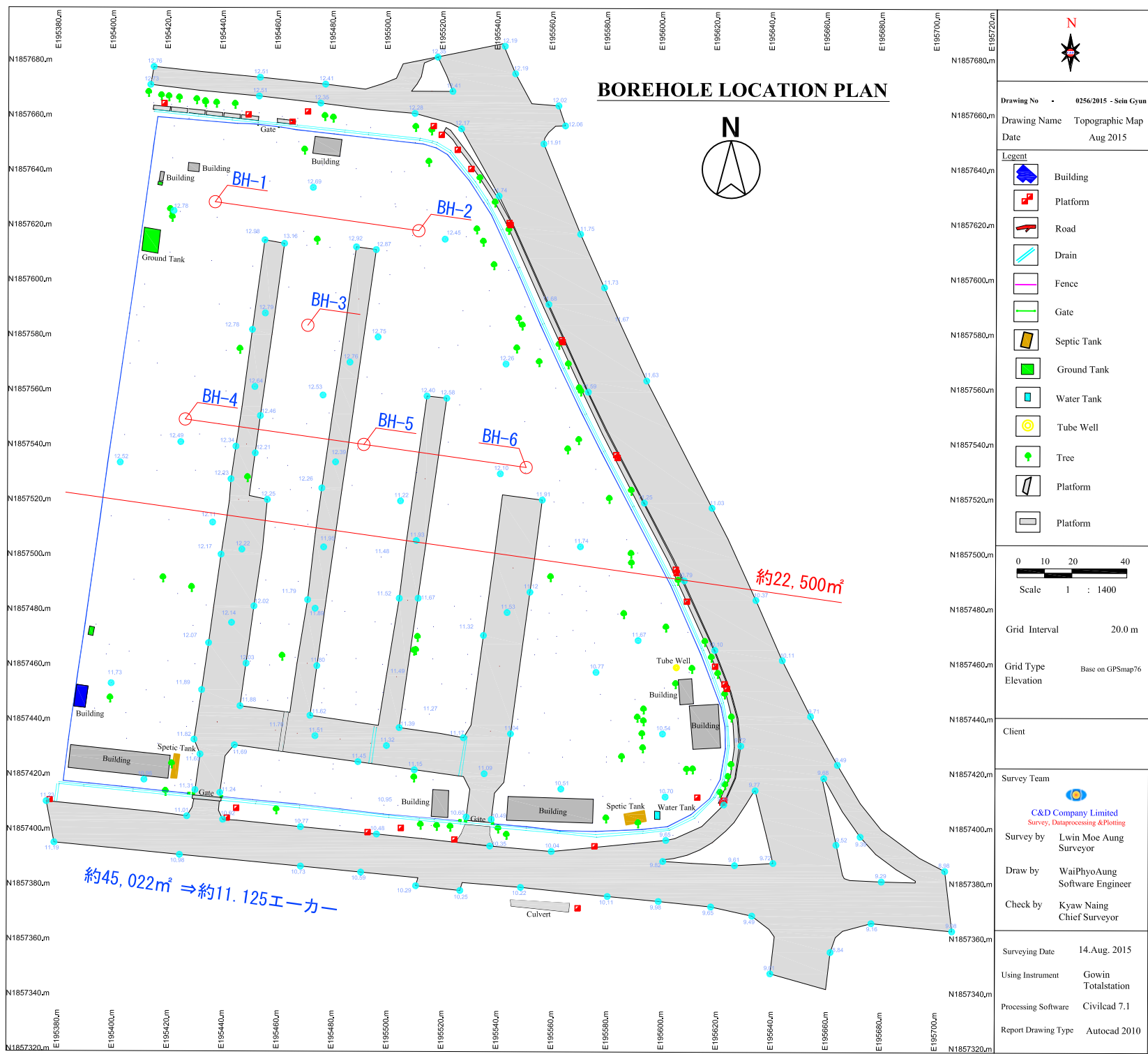
Total Estimated project cost : 16,297 thousand JPY

10. Obligations of Recipient Country

In addition to these personnel, it is indispensable to secure and allocate the necessary number of consultant, nurses, etc., for the operation of the facility. As a prerequisite for the implementation of soft components, it is necessary to organize biomedical engineering units under the management department of NYSH and to arrange multiple engineers and technicians according to the agreement at Outline Design by the Myanmar side. During the guidance of Soft Component, the hospital administrator should adjust staff's shift and get cooperation so that medical staff can participate as many as possible.

Furthermore, it is necessary to ensure the budget for maintenance and running cost such as the Annual Maintenance Contract fee and consumable and spare parts fee so that NYSH can practice what was instructed and trained during Soft Component Program. In order to measure the outcome of the soft component listed in 3 properly and to submit the outcome listed in 8, it is necessary to get cooperation for submission of statistical data on quantitative indicators such as the number of treated patients.

6. Other Relevant Data



BORE HOLE No. **BH - 1**

BORING LOG (FOR DESIGN PARAMETERS CONSIDERATION)

Sheet No. 2 OF 2

PROJECT NAME : Geological Survey on the project for New Yangon Specialist Hospital in the Republic of the Union of Myanmar

LOCATION : Corner of Pyay Road and Bogyoke Aung San Road, Lanmadaw Tsp

GROUND LEVEL : Existing Ground Level

COORDINATE : N : 16° 46' 55.4", E : 96° 08' 34.3" DEPTH : 49.95 m

BORING EQUIPMENT : TOHO (CD-5)

BORING METHOD : Rotary Drilling Method

ORIENTATION : Vertical

GROUND WATER LEVEL : 13.1 m

DATE : 28/8/15 ~ 2/9/15

LOGGED BY : Saw Nay Htoo

CLIENT

Yamashita Sekkei Inc.

SCALE (m)	ELEVATION (m)	DEPTH GL - (m)	THICKNESS (m)	DIAGRAM	COLOUR	RELATIVE DENSITY (or) CONSISTENCY	SOIL NAME	SOIL DESCRIPTION	DATE & DEPTH (m)	CASING (DEPTH (m) & DIAMETER (mm))	WATER DEPTH (m)	STANDARD PENETRATION TEST TEST METHOD (ASTM D 1586-99)					SAMPLING					SCALE (m)
												DEPTH GL - (m)	N-Value (Blows / 30cm)	CURVE OF BLOW	SAMPLE (Type & No)	DEPTH GL - (m)	TCR (%)	SCR (%)	RQD (%)			
31	-31.50	31.50	1.50		Yellowish brown	Very dense	Silty SAND-II	Very dense, Yellowish brown, Fine to coarse grained sand, Silty SAND-II.				31.0									31	
32												32.0	45/30		SPT-22	31.0					32	
33												33.0	36/30		SPT-23	31.45					33	
34												34.0									34	
35												35.0	43/30		SPT-24	33.0					35	
36												36.0									36	
37												37.0	43/30		SPT-25	34.45					37	
38												38.0									38	
39												39.0	46/30		SPT-26	37.0					39	
40												40.0									40	
41												41.0	39/30		SPT-27	34.45					41	
42												42.0									42	
43												43.0	40/30		SPT-28	38.0					43	
44												44.0									44	
45												45.0	46/30		SPT-29	38.45					45	
46												46.0									46	
47												47.0	65/12		SPT-30	39.0					47	
48												48.0									48	
49												49.0	62/20		SPT-31	40.0					49	
50												50.0									50	
51												51.0	63/22		SPT-32	40.45					51	
52												52.0									52	
53												53.0	53/10		SPT-33	41.45					53	
54												54.0									54	
55												55.0	55/10		SPT-34	42.0					55	
56												56.0									56	
57												57.0									57	
58												58.0									58	
59												59.0									59	
60												60.0									60	

NOTE: Soil classification is based on visual classification at some depths where the physical tests were not carried out.

Sample key

Rock core sample (Core lost)

Water sample

RQD (%)

Term

Planner structure

Term

Spacing (mm)

Term

Spacing (mm)

Remarks

Geo-friends Engineering & construction Co.,Ltd.

Tel : 951-561431, 959-420107757

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Revision No. : Rev-0

Revision Date : 09/10/15

Site Geologist : Saw Nay Htoo

Operator : Thein Zaw

Checked by : May Thu

BORE HOLE No. **BH - 2**

BORING LOG (FOR DESIGN PARAMETERS CONSIDERATION)

Sheet No. 2 OF 2

PROJECT NAME : Geological Survey on the project for New Yangon Specialist Hospital in the Republic of the Union of Myanmar

LOCATION : Corner of Pyay Road and Bogyoke Aung San Road, Lanmadaw Tsp

GROUND LEVEL : Existing Ground Level

COORDINATE : N : 16° 46' 55.2", E : 96° 08' 36.9" DEPTH : 49.95 m

BORING EQUIPMENT : TOHO (CD-6)

BORING METHOD : Rotary Drilling Method

ORIENTATION : Vertical

GROUND WATER LEVEL : 12.66 m

DATE : 29/8/15 ~ 2/9/15

LOGGED BY : Aung Ngwe Phyo

CLIENT
Yamashita Sekkei Inc.

SCALE (m)	ELEVATION (m)	DEPTH GL - (m)	THICKNESS (m)	DIAGRAM	COLOUR	RELATIVE DENSITY (op) CONSISTENCY	SOIL NAME	SOIL DESCRIPTION	DATE & DEPTH (m)	CASING (DEPTH (m) & DIAMETER (mm))	WATER DEPTH (m)	STANDARD PENETRATION TEST TEST METHOD (ASTM D 1586-99)					SAMPLING				SCALE (m)
												DEPTH GL - (m)	N-Value (Blows / 30cm)	CURVE OF BLOW	SAMPLE (Type & No.)	DEPTH GL - (m)	TCR (%)	SCR (%)	RQD (%)		

31

32

33

34

35

36

37

38

39

40

41

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44

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47

48

49

50

51

52

53

54

55

56

57

58

59

60

-34.50

-36.00

-37.50

-40.50

-43.50

-45.00

-46.50

-49.95

34.50

36.00

37.50

40.50

43.50

45.00

46.50

49.95

27.00

1.50

1.50

3.00

3.00

1.50

1.50

3.45

Yellowish brown

Yellowish brown

Yellowish brown

Brownish gray

Yellowish brown

Yellowish brown

Bluish gray

Bluish gray

Medium dense to dense

Very dense

Dense

Hard

Dense

Very dense

Hard

Very dense

Silty SAND-I

Silty SAND-II

Silty SAND-I

Sandy Silty CLAY

Silty SAND-I

Silty SAND-II

SILT

Silty SAND-II

Medium dense to dense, Reddish brown mottled light gray and yellowish brown, Fine to coarse grained sand, Sub-rounded to sub-angular, Silty SAND-I with a trace of gravel.

Very dense, Yellowish brown, Fine to coarse grained sand, Sub-rounded to sub-angular, Silty SAND-II with a trace of gravel.

Dense, Yellowish brown, Fine to coarse grained sand, Silty SAND-I.

Hard, Brownish gray, Low plasticity, Sandy Silty CLAY.

Dense, Yellowish brown, Fine to coarse grained sand, Silty SAND-I.

Very dense, Yellowish brown, Fine to medium grained sand, Silty SAND-II.

Hard, Bluish gray, Low plasticity, SILT.

Very dense, Bluish gray, Fine to medium grained sand, Silty SAND-II.

42.45

1/9/15

49.95

2/9/15

28/30

30/30

61/30

44/30

41/30

44/30

42/30

48/30

62/15

57/15

59/15

60/21

61/24

31.0

32.0

33.0

34.0

35.0

36.0

37.0

38.0

39.0

40.0

41.0

42.0

43.0

44.0

45.0

46.0

47.0

48.0

49.0

50.0

51.0

52.0

53.0

54.0

55.0

56.0

57.0

58.0

59.0

60.0

SPT-21

SPT-22

SPT-23

SPT-24

SPT-25

SPT-26

SPT-27

SPT-28

SPT-29

SPT-30

SPT-31

SPT-32

SPT-33

30.45

31.0

31.45

32.0

32.45

33.0

33.45

34.0

34.45

35.0

35.45

36.0

36.45

37.0

37.45

38.0

38.45

39.0

39.45

40.0

40.45

41.0

41.45

42.0

42.45

43.0

43.45

44.0

44.45

45.0

45.45

46.0

46.45

47.0

47.45

48.0

48.45

49.0

49.45

50.0

50.45

51.0

51.45

52.0

52.45

53.0

53.45

54.0

54.45

55.0

55.45

56.0

56.45

57.0

57.45

58.0

58.45

59.0

59.45

60.0

60.45

Remark : Soil classification is based on visual classification at some depths where the physical tests were not carried out.

NOTES

Relative density description		Consistency description	
Relative density	SPT N-Value (approx)	Consistency	SPT N-Value (approx)
Very loose	0 - 4	Very soft	under 2
Loose	4 - 10	Soft	2 - 4
Medium dense	10 - 30	Firm	5 - 8
Dense	30 - 50	Stiff	9 - 15
Very dense	over 50	Very stiff	16 - 30
		Hard	over 30

Sample key

Disturbed sample (SPT sample)

Undisturbed Sample (Piston sampler)

Undisturbed Sample (Denison sampler)

Rock core sample (Single core tube)

Rock core sample (Double core tube)

Rock core sample (Core lost)

Water sample

RQD (%)	Term
0 - 25	Very poor
25 - 50	Poor
50 - 75	Fair
75 - 90	Good
90 - 100	Excellent

Planner structure

Term	Spacing (mm)
Very thick	> 2000
Thick	600 - 2000
Medium	200 - 600
Thin	60 - 200
Very thin	20 - 60
Thickly laminated	6 - 20
Thinly laminated	< 6

Discontinuities

Term	Spacing (mm)
Very widely spaced	> 2000
Widely spaced	600 - 2000
Medium spaced	200 - 600
Closely spaced	60 - 200
Very closely spaced	20 - 60
Extremely closely spaced	< 20

Remarks

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Revision No.	Rev-0
Revision Date	09/10/15
Site Geologist	Aung Ngwe Phyo
Operator	Hla Min Htut
Checked by	May Thu

BORE HOLE No. **BH - 3**

BORING LOG (FOR DESIGN PARAMETERS CONSIDERATION)

Sheet No. 1 OF 2

PROJECT NAME : Geological Survey on the project for New Yangon Specialist Hospital in the Republic of the Union of Myanmar

LOCATION : Corner of Pyay Road and Bogvoke Aung San Road, Lanmadaw Tsp

GROUND LEVEL : Existing Ground Level

COORDINATE : N : 16° 46' 53.8", E : 96° 08' 35.6" DEPTH : 49.95 m

BORING EQUIPMENT : TOHO (CD-11)

BORING METHOD : Rotary Drilling Method

ORIENTATION : Vertical

GROUND WATER LEVEL : 12.61 m

DATE : 29/8/15 ~ 2/9/15

LOGGED BY : Pyae Pyae Soe

CLIENT : Yamashita Sekkei Inc.

SCALE (m)	ELEVATION (m)	DEPTH GL - (m)	THICKNESS (m)	DIAGRAM	COLOUR	RELATIVE DENSITY (no) CONSISTENCY	SOIL NAME	SOIL DESCRIPTION	DATE & DEPTH (m)	CASING (DEPTH (m) & DIAMETER (mm))	WATER DEPTH (m)	STANDARD PENETRATION TEST TEST METHOD (ASTM D 1586-99)					SAMPLING					SCALE (m)		
												DEPTH GL - (m)	N-Value (Blows / 30cm)	CURVE OF BLOW	SAMPLE (Type & No.)	DEPTH GL - (m)	TCR (%)	SCR (%)	ROD (%)					
1	-1.00	1.00	1.00		Reddish brown			Top soil layer, Reddish brown, Sandy CLAY.				0	20	40	60	80	100							
2					Reddish brown	Firm	Sandy Lean CLAY	Firm, Reddish brown, Low plasticity, Sandy Lean CLAY.				5/30							SPT-1	1.0				1
3	-3.00	3.00	2.00									8/30							SPT-2	2.0				2
4												9/30							SPT-3	3.0				3
5												40/90							UD-1	4.0				4
6												16/30							SPT-4	5.0				5
7												50/90							UD-2	6.0				6
8	-7.50	7.50	4.50									10/30							SPT-5	7.45				7
9												13/30							SPT-6	8.0				8
10												13/30							SPT-7	8.45				9
11												13/30							SPT-8	9.0				10
12												14/30							SPT-9	9.45				11
13												16/30							SPT-10	10.0				12
14												13/30							SPT-11	10.45				13
15												14/30							SPT-12	11.0				14
16												16/30							SPT-13	11.45				15
17												17/30							SPT-14	12.0				16
18												13/30							SPT-15	12.45				17
19												14/30							SPT-16	13.0				18
20												15/30							SPT-17	13.45				19
21												14/30							SPT-18	14.0				20
22												16/30							SPT-19	14.45				21
23												17/30							SPT-20	15.0				22
24												14/30								15.45				23
25												15/30								16.0				24
26												14/30								16.45				25
27												14/30								17.0				26
28												24/30								17.45				27
29												26/30								18.0				28
30												27/30								18.45				29
												27/30								19.0				30
												27/30								19.45				
												27/30								20.0				
												27/30								20.45				
												27/30								21.0				
												27/30								21.45				
												27/30								22.0				
												27/30								22.45				
												27/30								23.0				
												27/30								23.45				
												27/30								24.0				
												27/30								24.45				
												27/30								25.0				
												27/30								25.45				
												27/30								26.0				
												27/30								26.45				
												27/30								27.0				
												27/30								27.45				
												27/30								28.0				
												27/30								28.45				
												27/30								29.0				
												27/30								29.45				
												27/30								30.0				
												27/30								30.45				

NOTES

Sample key

Planner structure

Discontinuities

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Revision No

Revision Date

Site Geologist : Pyae Pyae Soe

Operator : Kyaw Swar

Checked by : May Thu

BORE HOLE No. **BH - 4**

BORING LOG (FOR DESIGN PARAMETERS CONSIDERATION)

Sheet No. 1 OF 2

PROJECT NAME : Geological Survey on the project for New Yangon Specialist Hospital in the Republic of the Union of Myanmar

BORING EQUIPMENT : TOHO (CD-5)

DATE : 3/9/15 ~ 7/9/15

LOCATION : Corner of Pyaw Road and Bogvoke Aung San Road, Lanmadaw Tsp

BORING METHOD : Rotary Drilling Method

LOGGED BY : Saw Nay Htoo

GROUND LEVEL : Existing Ground Level

ORIENTATION : Vertical

CLIENT

COORDINATE : N : 16° 46' 52.6", E : 96° 08' 34.0" DEPTH : 49.95 m

GROUND WATER LEVEL : 12.42 m

Yamashita Sekkei Inc.

SCALE (m)	ELEVATION (m)	DEPTH CL. (m)	THICKNESS (m)	DIAGRAM	COLOUR	RELATIVE DENSITY (or) CONSISTENCY	SOIL NAME	SOIL DESCRIPTION	DATE & DEPTH (m)	CASING (DEPTH (m) & DIAMETER (mm))	WATER DEPTH (m)	STANDARD PENETRATION TEST TEST METHOD (ASTM D 1586-99)					SAMPLING					SCALE (m)	
												DEPTH CL. (m)	N-Value (Blows / 30cm)	CURVE OF BLOW	SAMPLE (Type & No.)	DEPTH CL. (m)	TCR (%)	SCR (%)	ROD (%)				
1	-1.00	1.00	1.00					Top soil layer, (Back filled soil).															
2					Reddish brown	Very loose to loose	Clayey SAND	Very loose to loose, Reddish brown, Low plasticity, Clayey SAND.															
3	-3.00	3.00	2.00																				
4					Reddish brown	Firm	Sandy Lean CLAY	Firm, Reddish brown, Low plasticity, Sandy Lean CLAY.															
5	-5.00	5.00	2.00																				
6																							
7					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown, Low plasticity, Fine to medium grained sand, Clayey SAND.															
8																							
9	-9.00	9.00	4.00																				
10					Reddish brown																		
11																							
12																							
13																							
14					Yellowish brown																		
15																							
16																							
17																							
18																							
19																							
20					Reddish brown	Medium dense to dense	Silty SAND-I	Medium dense to dense, Reddish brown and yellowish brown, Fine to coarse grained sand, Sub-rounded to angular, Silty SAND-I with a trace of gravel.															
21																							
22																							
23																							
24																							
25																							
26																							
27																							
28					Yellowish brown																		
29																							
30																							

NOTES

Relative density description

Consistency description

Relative density

SPT N-Value (max)

Consistency

SPT N-Value (max)

Very loose

0 - 4

Very soft

under 2

Loose

4 - 10

Soft

2 - 4

Medium dense

10 - 30

Firm

5 - 8

Dense

30 - 50

Stiff

9 - 15

Very dense

over 50

Very stiff

16 - 30

Hard

over 30

Sample key

Disturbed sample (SPT sample)

Undisturbed Sample (Piston sampler)

Undisturbed Sample (Denison sampler)

Rock core sample (Single core tube)

Rock core sample (Double core tube)

Rock core sample (Core lost)

Water sample

RQD (%)

Term

0 - 25

Very poor

25 - 50

Poor

50 - 75

Fair

75 - 90

Good

90 - 100

Excellent

Planner structure

Term

Spacing (mm)

Very thick

> 2000

Thick

600 - 2000

Medium

200 - 600

Thin

60 - 200

Very thin

20 - 60

Thickly laminated

6 - 20

Thinly laminated

< 6

Discontinuities

Term

Spacing (mm)

Very widely spaced

> 2000

Widely spaced

600 - 2000

Medium spaced

200 - 600

Closely spaced

60 - 200

Very closely spaced

20 - 60

Extremely closely spaced

< 20

Remarks

Geo-friends Engineering & construction Co.,Ltd.

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Revision No

Rev-0

Revision Date

09/10/15

Site Geologist : Saw Nay Htoo

Operator : Thein Zaw

Checked by : May Thu

BORE HOLE No. **BH - 4**

BORING LOG (FOR DESIGN PARAMETERS CONSIDERATION)

Sheet No. 2 OF 2

PROJECT NAME : Geological Survey on the project for New Yangon Specialist Hospital in the Republic of the Union of Myanmar

LOCATION : Corner of Pyaw Road and Bogyoke Aung San Road, Lanmadaw Tsp

GROUND LEVEL : Existing Ground Level

COORDINATE : N : 16° 46' 52.6", E : 96° 08' 34.0" DEPTH : 49.95 m

BORING EQUIPMENT : TOHO (CD-6)

BORING METHOD : Rotary Drilling Method

ORIENTATION : Vertical

GROUND WATER LEVEL : 12.42 m

DATE : 3/9/15 ~ 7/9/15

LOGGED BY : Saw Nay Htoo

CLIENT

Yamashita Sekkei Inc.

SCALE (m)	ELEVATION (m)	DEPTH GL - (m)	THICKNESS (m)	DIAGRAM	COLOUR	RELATIVE DENSITY (or) CONSISTENCY	SOIL NAME	SOIL DESCRIPTION	DATE & DEPTH (m)	CASING / DEPTH (m) & DIAMETER (mm)	WATER DEPTH (m)	STANDARD PENETRATION TEST TEST METHOD (ASTM D 1586-99)					SAMPLING					SCALE (m)
												DEPTH GL - (m)	N-Value (Blows / 30cm)	SAMPLE (Type & No.)	DEPTH GL - (m)	TCR (%)	SCR (%)	RQD (%)				
																			CURVE OF BLOW			
																			0	20	40	

31

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31.0

32.0

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52.0

53.0

54.0

55.0

56.0

57.0

58.0

59.0

60.0

22/30

29/30

28/30

34/30

44/30

33/30

34/30

40/30

43/30

43/30

55/11

55/10

55/15

58/15

SPT-21

SPT-22

SPT-23

SPT-24

SPT-25

SPT-26

SPT-27

SPT-28

SPT-29

SPT-30

SPT-31

SPT-32

SPT-33

30.45

31.0

31.45

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60

NOTES

Relative density description		Consistency description	
Relative density	SPT N-Value (mc/s)	Consistency	SPT N-Value (mc/s)
Very loose	0 - 4	Very soft	under 2
Loose	4 - 10	Soft	2 - 4
Medium dense	10 - 30	Firm	5 - 8
Dense	30 - 50	Stiff	9 - 15
Very dense	over 50	Very stiff	16 - 30
		Hard	over 30

Sample key

Disturbed sample (SPT sample)

Undisturbed Sample (Piston sampler)

Undisturbed Sample (Denison sampler)

Rock core sample (Single core tube)

Rock core sample (Double core tube)

Rock core sample (Core lost)

Water sample

RQD (%)	Term
0 - 25	Very poor
25 - 50	Poor
50 - 75	Fair
75 - 90	Good
90 - 100	Excellent

Planner structure

Term	Spacing (mm)
Very thick	> 2000
Thick	600 - 2000
Medium	200 - 600
Thin	60 - 200
Very thin	20 - 60
Thickly laminated	6 - 20
Thinly laminated	< 6

Discontinuities

Term	Spacing (mm)
Very widely spaced	> 2000
Widely spaced	600 - 2000
Medium spaced	200 - 600
Closely spaced	60 - 200
Very closely spaced	20 - 60
Extremely closely spaced	< 20

Remarks

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Revision No.

Rev-0

Revision Date

09/10/15

Site Geologist : Saw Nay Htoo

Operator : Thein Zaw

Checked by : May Thu

PROJECT NAME : Geological Survey on the project for New Yangon Specialist Hospital in the Republic of the Union of Myanmar

BORING EQUIPMENT : TOHO (CD-11)

DATE : 3/9/15 ~ 7/9/15

LOCATION : Corner of Pyay Road and Bogvoke Aung San Road, Lanmadaw Tsp

BORING METHOD : Rotary Drilling Method

LOGGED BY : Pyae Pyae Soe

GROUND LEVEL : Existing Ground Level

ORIENTATION : Vertical

CLIENT

COORDINATE : N : 16° 46' 52.5", E : 96° 08' 36.5" DEPTH : 49.95 m

GROUND WATER LEVEL : 12.50 m

Yamashita Sekkei Inc.

SCALE (m)	ELEVATION (m)	DEPTH GL - (m)	THICKNESS (m)	DIAGRAM	COLOUR	RELATIVE DENSITY (or) CONSISTENCY	SOIL NAME	SOIL DESCRIPTION	DATE & DEPTH (m)	CASING (DEPTH (m) & DIAMETER (mm))	WATER DEPTH (m)	STANDARD PENETRATION TEST TEST METHOD (ASTM D 1586-99)										SAMPLING					SCALE (m)				
												DEPTH GL - (m)	CURVE OF BLOW ●										SAMPLE (Type & No.)	DEPTH GL - (m)	TCR (%)	SCR (%)		ROD (%)			
													N-Value (Blows / 30cm)																		
													N-Value (Blows / 30cm)	0	20	40	60	80	100												
1	-1.00	1.00	1.00					Top soil layer, Reddish brown.																							
2					Reddish brown	Soft	Sandy Lean CLAY	Soft, Reddish brown, Low plasticity, Sandy Lean CLAY.					2/30								SPT-1	1.0					1				
3														3/30									1.45					2			
4											3.0			75/90								UD-1	3.0					3			
5	-5.00	5.00	4.00								φ110			4/30									4.0					4			
6					Reddish brown	Loose	Clayey SAND	Loose, Reddish brown, Low plasticity, Clayey SAND.																							
7																	45/90								UD-2	5.0					5
8																	7/30									5.45					6
9	-9.00	9.00	4.00																							6.0					7
10																															
11																										6.45					8
12																										7.0					7
13																											7.45				8
14																															
15																										8.0					9
16																										8.45					8
17																											9.0				9
18																															
19																										9.45					10
20																										10.0					10
21																										10.45					11
22																															
23																										11.0					11
24																										11.45					12
25																											12.0				12
26																															
27																										12.45					13
28																											13.0				13
29																											13.45				14
30																															
31																										14.0					14
32																										14.45					15
33																											15.0				15
34																															
35																										15.45					16
36																										16.0					16
37																											16.45				17
38																															
39																										17.0					17
40																										17.45					18
41																											18.0				18
42																															
43																										18.45					19
44																										19.0					19
45																											19.45				20
46																															
47																										20.0					20
48																										20.45					21
49																											21.0				21
50																															
51																										21.45					22
52																										22.0					22
53																											22.45				23
54																															
55																										23.0					23
56																											23.45				24
57																															

NOTES

Relative density description		Consistency description	
Relative density	SPT N-Value (approx)	Consistency	SPT N-Value (approx)
Very loose	0 - 4	Very soft	under 2
Loose	4 - 10	Soft	2 - 4
Medium dense	10 - 30	Firm	5 - 8
Dense	30 - 50	Stiff	9 - 15
Very dense	over 50	Very stiff	16 - 30
		Hard	over 30

Sample key

● P-1

○ U-1

○ D-1

■ R

■ W

Disturbed sample (SPT sample)

Undisturbed Sample (Piston sampler)

Undisturbed Sample (Denison sampler)

Rock core sample (Single core tube)

Rock core sample (Double core tube)

Rock core sample (Core lost)

Water sample

Planner structure

Term	Spacing (mm)
Very thick	> 2000
Thick	600 - 2000
Medium	200 - 600
Thin	60 - 200
Very thin	20 - 60
Thickly laminated	6 - 20
Thinly laminated	< 6

Discontinuities

Term	Spacing (mm)
Very widely spaced	> 2000
Widely spaced	600 - 2000
Medium spaced	200 - 600
Closely spaced	60 - 200
Very closely spaced	20 - 60
Extremely closely spaced	< 20

Geo-friends Engineering & construction Co.,Ltd.

Tel : 951-561431, 959-420107757

www.geo-friends.com

service@geo-friends.com

Revision No. : Rev-0

Revision Date : 09/10/15

Site Geologist : Pyae Pyae Soe

Operator : Kyaw Swar

Checked by : May Thu

PROJECT NAME : Geological Survey on the project for New Yangon Specialist Hospital in the Republic of the Union of Myanmar

BORING EQUIPMENT : TOHO (CD-11)

DATE : 8/9/15 ~ 12/9/15

LOCATION : Corner of Pyay Road and Bogvoke Aung San Road, Lanmadaw Tsp

BORING METHOD : Rotary Drilling Method

LOGGED BY : Pyae Pyae Soe

GROUND LEVEL : Existing Ground Level

ORIENTATION : Vertical

CLIENT

COORDINATE : N : 16° 46' 52.3", E : 96° 08' 38.4" DEPTH : 49.95 m

GROUND WATER LEVEL : 12.1 m

Yamashita Sekkei Inc.

SCALE (m)	ELEVATION (m)	DEPTH GL - (m)	THICKNESS (m)	DIAGRAM	COLOUR	RELATIVE DENSITY (or) CONSISTENCY	SOIL NAME	SOIL DESCRIPTION	DATE & DEPTH (m)	CASING (DEPTH (m) & DIAMETER (mm))	WATER DEPTH (m)	STANDARD PENETRATION TEST TEST METHOD (ASTM D 1586-99)										SAMPLING					SCALE (m)	
												DEPTH GL - (m)	CURVE OF BLOW ●										SAMPLE (Type & No.)	DEPTH GL - (m)	TCR (%)	SCR (%)		ROD (%)
													N-Value (Blows / 30cm)	N-Value (Blows / 30cm)														
													0	20	40	60	80	100										
1	-1.00	1.00	1.00		Reddish brown			Top soil layer, Reddish brown, Sandy CLAY.				1.0	4/30							SPT-1	1.0				1			
2					Reddish brown	Soft to stiff	Sandy Lean CLAY	Soft to stiff, Reddish brown mottled yellowish brown, Low plasticity, Sandy Lean CLAY.		3.0		2.0	4/30							SPT-2	2.0				2			
3					Reddish brown	Soft to stiff	Sandy Lean CLAY	Soft to stiff, Reddish brown mottled yellowish brown, Low plasticity, Sandy Lean CLAY.		φ110		3.0	65/90							UD-1	3.0				3			
4					Reddish brown	Soft to stiff	Sandy Lean CLAY	Soft to stiff, Reddish brown mottled yellowish brown, Low plasticity, Sandy Lean CLAY.				4.0	9/30							SPT-3	4.0				4			
5	-5.00	5.00	4.00		Reddish brown	Soft to stiff	Sandy Lean CLAY	Soft to stiff, Reddish brown mottled yellowish brown, Low plasticity, Sandy Lean CLAY.				5.0	60/90							UD-2	5.0				5			
6					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				6.0	9/30							SPT-4	6.0				6			
7					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				7.0													7			
8					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				8.0	11/30							SPT-5	7.45				8			
9	-9.00	9.00	4.00		Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				9.0	12/30							SPT-6	9.0				9			
10					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				10.0													10			
11					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				11.0	13/30							SPT-7	10.45				11			
12					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				12.0	12/30							SPT-8	12.0				12			
13					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				13.0													13			
14					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				14.0	9/30							SPT-9	13.45				14			
15					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				15.0	10/30							SPT-10	15.0				15			
16					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				16.0													16			
17					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				17.0	11/30							SPT-11	16.45				17			
18					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				18.0	12/30							SPT-12	18.0				18			
19					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				19.0													19			
20					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				20.0	14/30							SPT-13	19.45				20			
21					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				21.0	14/30							SPT-14	21.0				21			
22					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				22.0													22			
23					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				23.0	14/30							SPT-15	22.45				23			
24					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				24.0	16/30							SPT-16	24.0				24			
25					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				25.0													25			
26					Reddish brown	Loose to medium dense	Clayey SAND	Loose to medium dense, Reddish brown mottled yellowish brown, Low plasticity, Clayey SAND.				26.0	18/30							SPT-17	25.45				26			
27					Yellowish brown	Loose to medium dense	Silty SAND-I	Medium dense to dense, Reddish brown and yellowish brown, Fine to coarse grained sand, Silty SAND-I with a trace of gravel.		27.00		27.0	20/30							SPT-18	27.0				27			
28					Yellowish brown	Loose to medium dense	Silty SAND-I	Medium dense to dense, Reddish brown and yellowish brown, Fine to coarse grained sand, Silty SAND-I with a trace of gravel.		9/9/15		28.0													28			
29					Yellowish brown	Loose to medium dense	Silty SAND-I	Medium dense to dense, Reddish brown and yellowish brown, Fine to coarse grained sand, Silty SAND-I with a trace of gravel.				29.0	29/30							SPT-19	28.45				29			
30					Yellowish brown	Loose to medium dense	Silty SAND-I	Medium dense to dense, Reddish brown and yellowish brown, Fine to coarse grained sand, Silty SAND-I with a trace of gravel.				30.0	32/30							SPT-20	30.0				30			

NOTES

Relative density description		Consistency description	
Relative density	SPT N-Value (approx)	Consistency	SPT N-Value (approx)
Very loose	0 - 4	Very soft	under 2
Loose	4 - 10	Soft	2 - 4
Medium dense	10 - 30	Firm	5 - 8
Dense	30 - 50	Stiff	9 - 15
Very dense	over 50	Very stiff	16 - 30
		Hard	over 30

Sample key

Disturbed sample (SPT sample)

Undisturbed Sample (Piston sampler)

Undisturbed Sample (Denison sampler)

Rock core sample (Single core tube)

Rock core sample (Double core tube)

Rock core sample (Core lost)

Water sample

RQD (%)	Term
0 - 25	Very poor
25 - 50	Poor
50 - 75	Fair
75 - 90	Good
90 - 100	Excellent

Planner structure

Term	Spacing (mm)
Very thick	> 2000
Thick	600 - 2000
Medium	200 - 600
Thin	60 - 200
Very thin	20 - 60
Thickly laminated	6 - 20
Thinly laminated	< 6

Discontinuities

Term	Spacing (mm)
Very widely spaced	> 2000
Widely spaced	600 - 2000
Medium spaced	200 - 600
Closely spaced	60 - 200
Very closely spaced	20 - 60
Extremely closely spaced	< 20

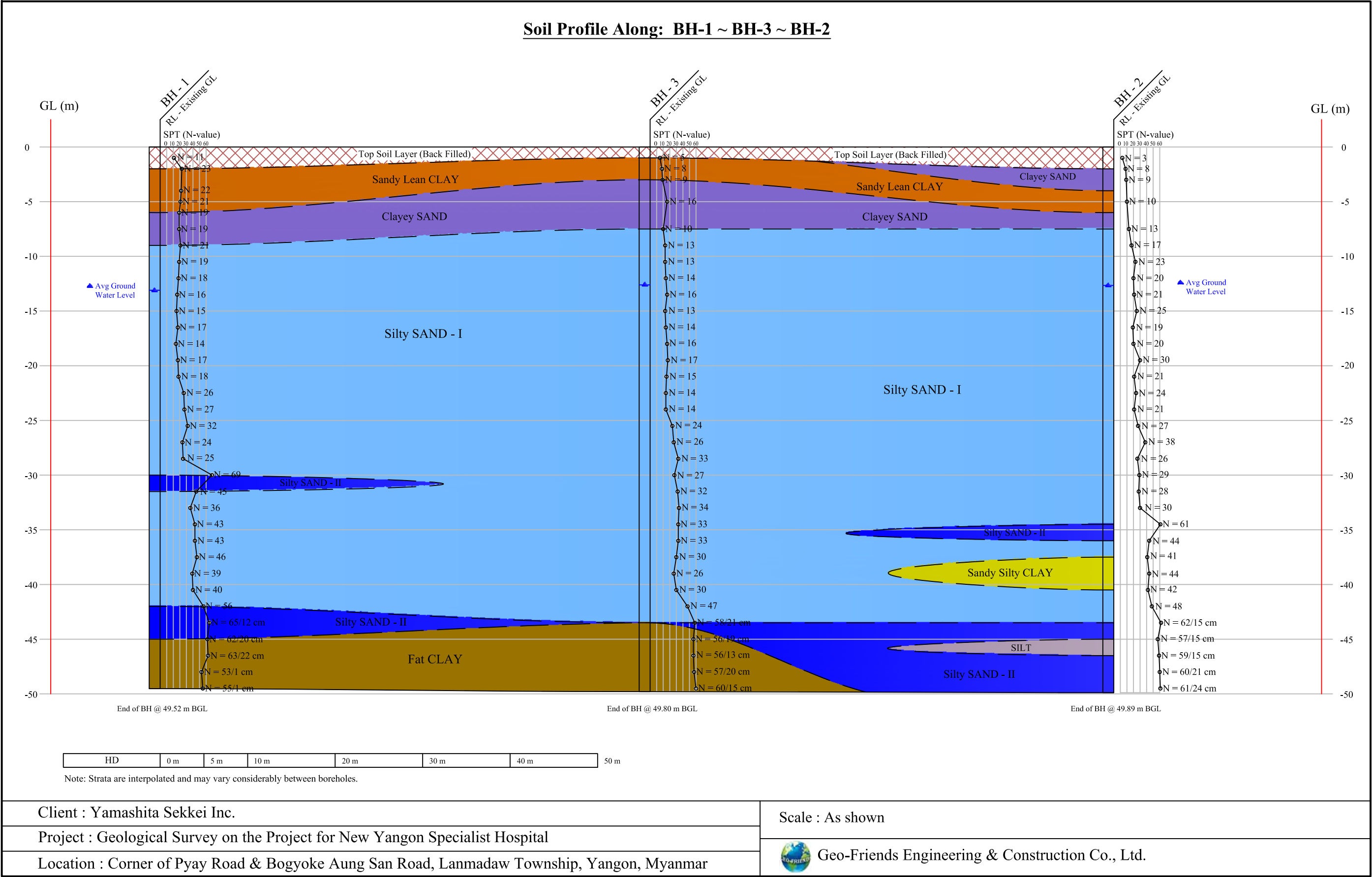
Remarks

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www.geo-friends.com
service@geo-friends.com

Revision No.	Rev-0
Revision Date	09/10/15
Site Geologist	Pyae Pyae Soe
Operator	Kyaw Swar
Checked by	May Thu

Soil Profile Along: BH-1 ~ BH-3 ~ BH-2



Client : Yamashita Sekkei Inc.

Project : Geological Survey on the Project for New Yangon Specialist Hospital

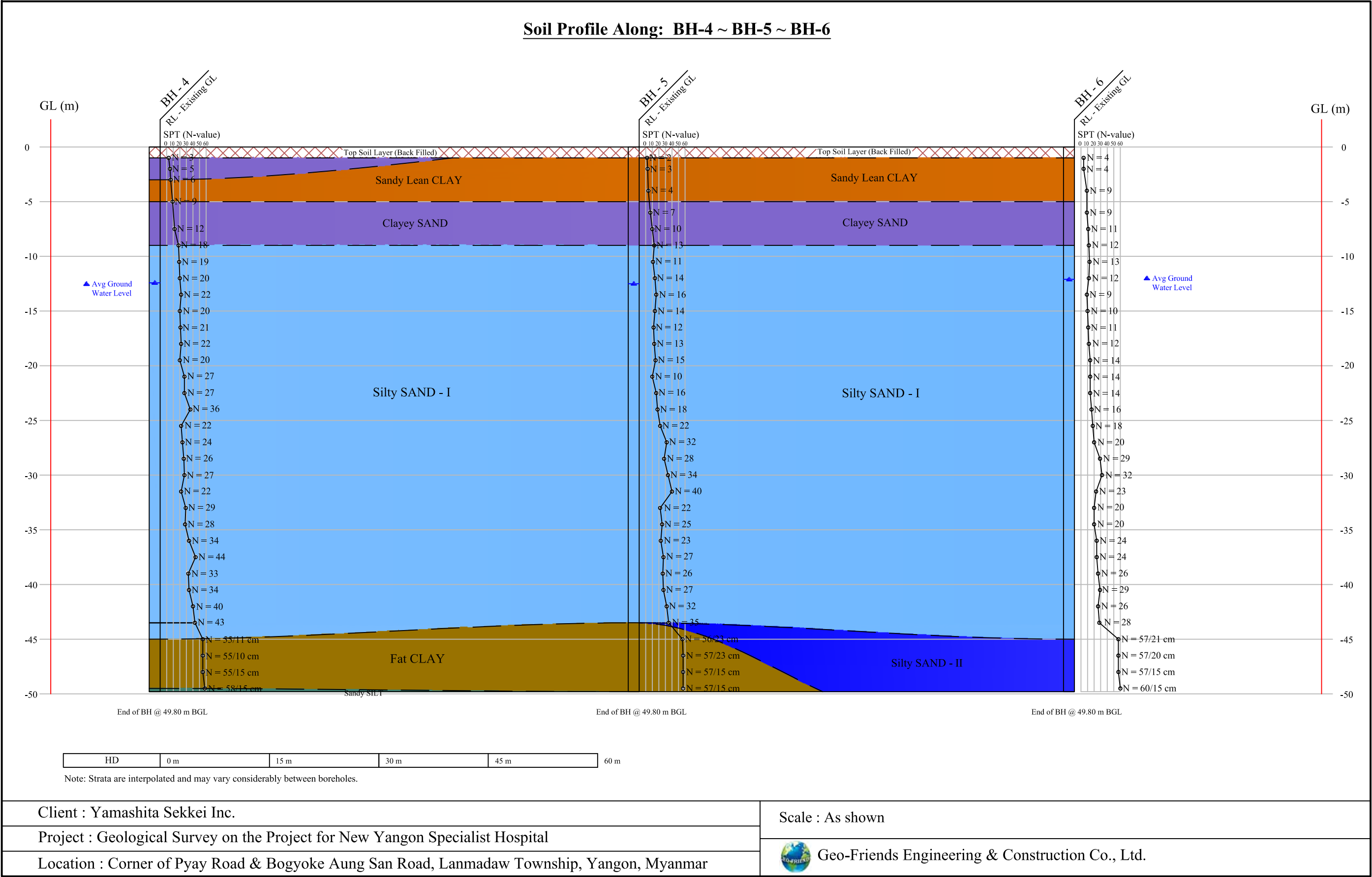
Location : Corner of Pyay Road & Bogyoke Aung San Road, Lanmadaw Township, Yangon, Myanmar

Scale : As shown



Geo-Friends Engineering & Construction Co., Ltd.

Soil Profile Along: BH-4 ~ BH-5 ~ BH-6



Client : Yamashita Sekkei Inc.

Project : Geological Survey on the Project for New Yangon Specialist Hospital

Location : Corner of Pyay Road & Bogyoke Aung San Road, Lanmadaw Township, Yangon, Myanmar

Scale : As shown



Geo-Friends Engineering & Construction Co., Ltd.



LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
 B.Sc Engg: (Civil), Dip S.E (Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001.
 Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)



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Issue Date - 01-12-2012

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Issue No - 1.0/Page 1 of 1

W1015 365

WATER QUALITY TEST RESULTS FORM

Client Geo-Friends Co.,Ltd.
 Nature of Water Tube Well Water (A)
 Location Lanmadaw Township, YSA Project
 Date and Time of collection 21.10.2015
 Date and Time of arrival at Laboratory 23.10.2015
 Date and Time of commencing examination 24.10.2015
 Date and Time of completing 26.10.2015

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH	5.7		6.5 - 8.5
Colour (True)	5	TCU	15 TCU
Turbidity	22	NTU	5 NTU
Conductivity	179	micro S/cm	
Total Hardness	40	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	26	mg/l as CaCO ₃	
Magnesium Hardness	14	mg/l as CaCO ₃	
Total Alkalinity	32	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	Nil	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	Nil	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	32	mg/l as CaCO ₃	
Iron	0.62	mg/l	0.3 mg/l
Chloride (as CL)	27	mg/l	250 mg/l
Sodium chloride (as NaCL)	45	mg/l	
Sulphate (as SO ₄)	Nil	mg/l	200 mg/l
Total Solids	114	mg/l	1500 mg/l
Suspended Solids	24	mg/l	
Dissolved Solids	90	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate	Nil	mg/l	
Phenolphthalein Acidity	6	mg/l	
Methyl Orange Acidity	Nil	mg/l	
Salinity	0.1	ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature: Hein

Name: Zaw Hein Oo

B.Sc (Chemistry)
 Chemist

(a division of WEG Co.,Ltd.)

ISO TECH Laboratory

Approved by

Signature: Soc Thin

Name: Soc Thin

Soc Thin
Soc Thin
 Technical Officer
 ISO TECH Laboratory

No. 18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.

Ph: 01-640955, 09-73225175, 09-73242162, Fax: 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

WATER QUALITY TEST RESULTS FORM

Client GEO - FRIENDS
Nature of Water Tube Well Water (A)
Location Yangon New Specialist, Lanmadaw Township.
Date and Time of collection 7.10.2015
Date and Time of arrival at Laboratory 7.10.2015
Date and Time of commencing examination 8.10.2015
Date and Time of completing 10.10.2015

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH	6.3		6.5 - 8.5
Colour (True)	5	TCU	15 TCU
Turbidity	29	NTU	5 NTU
Conductivity	218	micro S/cm	
Total Hardness	60	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	38	mg/l as CaCO ₃	
Magnesium Hardness	22	mg/l as CaCO ₃	
Total Alkalinity	56	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	Nil	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	Nil	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	56	mg/l as CaCO ₃	
Iron	0.48	mg/l	0.3 mg/l
Chloride (as CL)	26	mg/l	250 mg/l
Sodium chloride (as NaCL)	43	mg/l	
Sulphate (as SO ₄)	12	mg/l	200 mg/l
Total Solids	140	mg/l	1500 mg/l
Suspended Solids	31	mg/l	
Dissolved Solids	109	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate	Nil	mg/l	
Phenolphthalein Acidity	4	mg/l	
Methyl Orange Acidity	Nil	mg/l	
Salinity	0.1	ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature:

Name:

Hein
Zaw Hein Oo
B.Sc (Chemistry)

Chemist

(a division of WEG Co.,Ltd.) ISO TECH Laboratory

Approved by

Signature:

Name:

Soe Tun
Soe Tun
B.E (Civil) 1980
Technical Officer,
ISO TECH Laboratory



LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
 B.Sc Engg: (Civil), Dip S.E (Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001.
 Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)



WTL-RE-001

Issue Date - 01-12-2012

Effective Date - 01-12-2012

Issue No - 1.0/Page 1 of 1

W1015 366

WATER QUALITY TEST RESULTS FORM

Client Geo-Friends Co.,Ltd.
 Nature of Water Tube Well Water (B)
 Location Lanmadaw Township
 Date and Time of collection 21.10.2015
 Date and Time of arrival at Laboratory 23.10.2015
 Date and Time of commencing examination 24.10.2015
 Date and Time of completing 26.10.2015

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH	5.4		6.5 - 8.5
Colour (True)	20	TCU	15 TCU
Turbidity	36	NTU	5 NTU
Conductivity	193	micro S/cm	
Total Hardness	46	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	32	mg/l as CaCO ₃	
Magnesium Hardness	14	mg/l as CaCO ₃	
Total Alkalinity	30	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	Nil	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	Nil	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	30	mg/l as CaCO ₃	
Iron	1.52	mg/l	0.3 mg/l
Chloride (as CL)	28	mg/l	250 mg/l
Sodium chloride (as NaCL)	46	mg/l	
Sulphate (as SO ₄)	Nil	mg/l	200 mg/l
Total Solids	138	mg/l	1500 mg/l
Suspended Solids	42	mg/l	
Dissolved Solids	96	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate	Nil	mg/l	
Phenolphthalein Acidity	6	mg/l	
Methyl Orange Acidity	Nil	mg/l	
Salinity	0.1	ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature: Hein

Name: Zaw Hein Oo

B.Sc (Chemistry)
 Chemist

(a division of WEG Co.,Ltd.)

ISO TECH Laboratory

Approved by

Signature: Soe Thi

Name: Soe Thi

B.E (Civil) 1980
 Technical Officer

ISO TECH Laboratory

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.

Ph: 01-640955, 09-73225175, 09-73242162, Fax: 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com



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Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)



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Issue Date - 01-12-2012

Effective Date - 01-12-2012

Issue No - 1.0/Page 1 of 1

W1015 103

WATER QUALITY TEST RESULTS FORM

Client GEO - FRIENDS

Nature of Water Tube Well Water (B)

Location Yangon New Specialist, Lanmadaw Township.

Date and Time of collection 7.10.2015

Date and Time of arrival at Laboratory 7.10.2015

Date and Time of commencing examination 8.10.2015

Date and Time of completing 10.10.2015

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH	6.1		6.5 - 8.5
Colour (True)	30	TCU	15 TCU
Turbidity	58	NTU	5 NTU
Conductivity	212	micro S/cm	
Total Hardness	60	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	42	mg/l as CaCO ₃	
Magnesium Hardness	18	mg/l as CaCO ₃	
Total Alkalinity	36	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	Nil	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	Nil	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	36	mg/l as CaCO ₃	
Iron	2.33	mg/l	0.3 mg/l
Chloride (as CL)	31	mg/l	250 mg/l
Sodium chloride (as NaCL)	51	mg/l	
Sulphate (as SO ₄)	10	mg/l	200 mg/l
Total Solids	161	mg/l	1500 mg/l
Suspended Solids	55	mg/l	
Dissolved Solids	106	mg/l	1000 mg/l
Manganese	1.0	mg/l	0.05 mg/l
Phosphate	Nil	mg/l	
Phenolphthalein Acidity	4	mg/l	
Methyl Orange Acidity	Nil	mg/l	
Salinity	0.1	ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature: Hein

Name: Zaw Hein Oo

B.Sc (Chemistry)

Chemist

ISO TECH Laboratory

(a division of WEG Co.,Ltd.)

Approved by

Signature: Soe Hui

Name: Soe Hui

B.Sc (Civil) 1980

Technical Officer

ISO TECH Laboratory

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LABORATORY

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Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)



WTL-RE-001

Issue Date - 01-12-2012

Effective Date - 01-12-2012

Issue No - 1.0/Page 1 of 1

W1015 104

WATER QUALITY TEST RESULTS FORM

Client GEO - FRIENDS
Nature of Water Tube Well Water (C)
Location Yangon New Specialist, Lanmadaw Township.
Date and Time of collection 7.10.2015
Date and Time of arrival at Laboratory 7.10.2015
Date and Time of commencing examination 8.10.2015
Date and Time of completing 10.10.2015

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH	6.2		6.5 - 8.5
Colour (True)	Nil	TCU	15 TCU
Turbidity	4	NTU	5 NTU
Conductivity	219	micro S/cm	
Total Hardness	48	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	34	mg/l as CaCO ₃	
Magnesium Hardness	14	mg/l as CaCO ₃	
Total Alkalinity	24	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	Nil	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	Nil	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	24	mg/l as CaCO ₃	
Iron	0.25	mg/l	0.3 mg/l
Chloride (as CL)	27	mg/l	250 mg/l
Sodium chloride (as NaCL)	45	mg/l	
Sulphate (as SO ₄)	22	mg/l	200 mg/l
Total Solids	117	mg/l	1500 mg/l
Suspended Solids	7	mg/l	
Dissolved Solids	110	mg/l	1000 mg/l
Manganese	Nil	mg/l	0.05 mg/l
Phosphate	Nil	mg/l	
Phenolphthalein Acidity	4	mg/l	
Methyl Orange Acidity	Nil	mg/l	
Salinity	0.1	ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature: Hein

Name: Zaw Hein Oo

B.Sc (Chemistry)

Chemist

(a division of WEG Co., Ltd.)

ISO TECH Laboratory

Approved by

Signature: Soe Thi

Name: Soe Thi

B.E (Civil) 1980

Technical Officer

ISO TECH Laboratory

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.

Ph: 01-640955, 09-73225175, 09-73242162, Fax: 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

WATER QUALITY TEST RESULTS FORM

Client GEO - FRIENDS
 Nature of Water Tap Water
 Location Yangon Specialist Hospital, Lanmadaw Township. (500 Beds)
 Date and Time of collection 7.10.2015
 Date and Time of arrival at Laboratory 7.10.2015
 Date and Time of commencing examination 8.10.2015
 Date and Time of completing 10.10.2015

Results of Water Analysis

WHO Drinking Water Guideline (Geneva - 1993)

pH	4.6		6.5 - 8.5
Colour (True)	Nil	TCU	15 TCU
Turbidity	2	NTU	5 NTU
Conductivity	116	micro S/cm	
Total Hardness	16	mg/l as CaCO ₃	500 mg/l as CaCO ₃
Calcium Hardness	12	mg/l as CaCO ₃	
Magnesium Hardness	4	mg/l as CaCO ₃	
Total Alkalinity	12	mg/l as CaCO ₃	
Phenolphthalein Alkalinity	Nil	mg/l as CaCO ₃	
Carbonate (CaCO ₃)	Nil	mg/l as CaCO ₃	
Bicarbonate (HCO ₃)	12	mg/l as CaCO ₃	
Iron	0.13	mg/l	0.3 mg/l
Chloride (as CL)	18	mg/l	250 mg/l
Sodium chloride (as NaCL)	30	mg/l	
Sulphate (as SO ₄)	6	mg/l	200 mg/l
Total Solids	61	mg/l	1500 mg/l
Suspended Solids	3	mg/l	
Dissolved Solids	58	mg/l	1000 mg/l
Manganese	0.3	mg/l	0.05 mg/l
Phosphate	Nil	mg/l	
Phenolphthalein Acidity	8	mg/l	
Methyl Orange Acidity	Nil	mg/l	
Salinity	0.1	ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature:

Name:

Hein

Zaw Hein Oo

B.Sc (Chemistry)

Chemist

(a division of WEG Co.,Ltd.)

ISO TECH Laboratory

Approved by

Signature:

Name:

Saesh

See Fun

B.E (Civil) 1988

Technical Officer

ISO TECH Laboratory

7. References

List of Existing Medical Equipment in YGH
(Target Departments and Related Departments)

Department	Name of Equipment	Q'ty	Working condition, etc.
Cardiovascular Surgery			
ICU	Ventilator (adult & pediatric)	1	procured in 2016, good
	Patient Monitor	12	Half-good, half aging but working
	Infusion Pump	10	procured in 2016, good
	Syringe Pump	18	6 Nos. procured in 2016, good
	Electric Bed	4	working condition
	Central Monitor	1	working condition
	Defibrillator	3	aging but possible to work
Sterilization	High Pressure Steam Sterilizer 80L	2	working condition
	Boiling Sterilizer	1	working condition
	Hand Scrub Station	1	working condition
	Instrument Cabinet	1	working condition
Minor Operation Theater	Operation Table	1	working condition
	Shadowless Lamp Mobile	1	working condition
	Instrument Set	3	2 Nos. are aged, but possible to use
	Electrosurgical Unit	2	working condition
Major Operation Theater	Operation Table	1	working condition
	Shadowless Lamp	1	working condition
	Anesthesia Machine with ventilator	2	made in UK, good
	Heart Lung Machine	2	made in Germany, good, 1 is procured in 2016
	Ultrasonic Knife	1	working condition
	Electrosurgical Unit	3	1 is in good condition
	Blood Gas Analyzer	4	1 is procured in 2016, good
	Cell Saver	1	working condition
	Blood Flow Measuring Device	1	working condition
	Intra Aortic Balloon Pump (IABP)	2	procured in 2015 & 2016, good
	Echo Machine (with TEE probe)	1	good
	PCPS (Percutaneous Cardio-Pulmonary S	1	procured in 2015, good
	Intraoperative Ultrasound Scanner	1	procured in 2016, good
Cardiac Medicine			
CCU	Ventilator	1	working condition
	Defibrillator	1	working condition
	Central Monitor	1	working condition
	Patient Monitor	3	working condition
	Electric Bed	9	working condition
Cath. Labo	Angiography System single plane	1	procured in 2016, good
	Angiography System single plane	1	procured in 2014, good
	LCD Monitor	2	working condition
	Defibrillator	2	working condition
	Shadowless Lamp	2	One is procured in 2016 good, another is in working condition
	Instrument Cabinet	2	working condition
	Polygraph	2	procured in 2016 good, procured in 2014 working
	High Frequency Generator & Pump	1	procured in 2015, good
	3D Mapping System	1	procured in 2015, good
Physiological Function Test	Echo Machine (with TEE probe)	4	1 is good, 2 are working
	Treadmill	1	working condition
	ECG 12 Ch.	2	working condition
	Holter ECG (recorder 3 units)	1	working condition
	Defibrillator	1	working condition
Neuro Surgery			
ICU	Ventilator	4	2 are in good condition
	Patient Monitor	4	working condition
	Infusion Pump	4	working condition
	Syringe Pump	8	working condition
	Electric Bed	4	working condition
	Defibrillator	1	working condition

Department	Name of Equipment	Q'ty	Working condition, etc.
Sterilization	Steam Sterilizer	1	aged but possible to use
Minor Operation Theater	Shadowless Lamp	1	good condition
	Anesthesia Machine	1	good condition
	Electrosurgical Unit	1	good condition
	Patient Monitor	1	good condition
Major Operation Theater	Operating Microscope	1	procured in 2013, good condition
	Shadowless Lamp, Ceiling	1	procured in 2014, good condition
	Anesthesia Machine	1	good condition
	Defibrillator	1	good condition
	Patient Monitor	1	good condition
	Electrosurgical Unit	1	good condition
	Stereotaxy + Navigation System	1	procured recently, good
Neuro Medicine			
SCU	Ventilator	1	working condition
	Defibrillator	1	working condition
	Patient Monitor	4	working condition
	Electric Bed	4	working condition
	Ultrasound Scanner	1	working condition
	CPAP Unit	2	working condition
Rehabilitaion Room	Upper Limb Moving Machine	1	working condition
	Building Block for Occupational Theory	1	working condition
	Lower Limb Massage Machine	1	working condition
Physical function Room	EEG	2	working condition
	EMG	3	working condition
Rehabilitation (YGH Main Building)			
Physical therapy	Ultrasound Therapy Device	2	working condition
	Shortwave Therapy Device	1	working condition
	Microwave Therapy Device	1	working condition
	Ultraviolet Therapy Device	1	working condition
Exercise therapy	Pallarel Bar	2	working condition
	Mirror	1	working condition
	Staris	1	working condition
	Head Flame	1	working condition
	Foot Rowing Boat	1	working condition
	Ergometer	1	working condition
	Tilt Table	1	working condition
	Balance Ball	1	working condition
Hidro therapy	Whirlpool Bath for Upper & Lower Limb	1	working condition
Occupational therapy	Peg Board	3	working condition
	Building Block for Occupational Theory	2	working condition
Image Diagnostic Department			
X-ray	Angiography Unit	1	recently procured, good
	MRI 1.5T	1	procured in 2012, good
	CT 128 Slice	2	1 is malfunction, 1 is working
	CT 32 Slice	1	working condition
	Digital X-ray Machine	2	working condition
	Fluoroscopy X-ray Machine	1	malfunction, used as general X-ray
Ultrasound scanning	Ultrasound Scanner Ordinary Type	3	working condition
Nuclear medicine	Linear Accelerator	2	working condition
	SPECT-CT	1	working condition
	Gamma Camera	2	working condition, 1 is aging
	PET-CT	1	working condition
Laboratory			
Biochemistry	Biochemistry Analyzer	3	working condition
	Electrolyte Analyzer	4	working condition
	Biochemistry analyzer, semi-automated	1	working condition
Immunology	Immuno Hormonn Analyzer	2	working condition
	Biochemistry Analyzer	3	working condition
Hematorogy	Blood Cell Counter	3	working condition
Microbiology	Blood Culture Machine	2	working condition
	Safety Cabinet	1	working condition
	AntiBody Test Machine	1	working condition

Department	Name of Equipment	Q'ty	Working condition, etc.
	Incubator	1	working condition
	Urine Acid Analyzer	1	working condition
Pathlogy	Tissue Processor	1	working condition
	Paraffin Bath	1	working condition
	Automatic Stainer	1	working condition
	Microtome	1	working condition
	Cryostat	1	working condition
Emergency Laboratory	Centrifuge	2	working condition
	Blood Cell Counter	3	working condition
	Biochemistry Analyzer	2	Rental from Manufacturer's Local Agent
Central Sterile Supply Department			
Emergency Department	High Pressure Steam Strilizer 440L	2	working condition
New Building 5F	High Pressure Steam Strilizer 400L	4	working condition
	Ultrasonic Cleaner	1	working condition
Main Building GF	High Pressure Steam Strilizer 400L	2	working condition
Pharmacy			
Central Pharmacy Storage	Medicine Cabinet	5	working condition
	Pharmaceutical Refrigerator 300L	10	working condition
Emergency Dispatch Department			
Parking	Ambulance	6	4 are procured in 2015, good, others are working
Mortury Department			
Mortury	Mortury Refrigerator	7	1 is malfunction, no way to repair

