LAO PEOPLE'S DEMOCRATIC REPUBLIC
MINISTRY OF HEALTH

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF SETTHATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL
IN
LAO PEOPLE'S DEMOCRATIC REPUBLIC

DECEMBER 2017

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

KOEI RESEARCH & CONSULTING INC.
NIPPON KOEI CO., LTD.

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey on “The Project for Improvement of Setthathirath Hospital and Champasak Provincial Hospital in The Lao People's Democratic Republic” and entrust the survey to the consortium of Koei Research & Consulting Inc. and Nippon Koei Co., Ltd.

The survey team held a series of discussions with the officials concerned of the Government of the Lao P.D.R. and conducted field investigations from February 12 to March 11, 2017. As a result of further studies in Japan and the explanation of the draft survey report in the Lao P.D.R. from August 30 to September 7, 2017, the present report is 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 Lao P.D.R. for their close cooperation extended to the survey team.

December, 2017

Mitsuko Kumagai
Director of Human Development Department
Japan International Cooperation Agency (JICA)

SUMMARY

1. Country Profile

The Lao People's Democratic Republic (hereinafter referred to as "Lao PDR") is a landlocked country bordered by Vietnam to the east, Cambodia to the south, Thailand to the west, Myanmar to the northwest and China to the north. It occupies the left bank of the middle reaches of the Mekong River. Its land is almost entirely in mountain ranges and highlands except a few small alluvial plains around Vientiane, Thakhek, Savannakhet and Pakse along the Mekong River, which demarcates most of the western border of the country. Lao PDR is an elongated mountainous country: it is 1,000 km long in the north-south direction and 150 – 500 km wide in the east-west direction. It has an area of 236,800 km^2 (approximately the same as Honshu Island of Japan). It has a tropical monsoon climate with distinctive rainy and dry seasons between May and September and between October and April, respectively. While the annual rainfall is between 1,200 mm and 2,200 mm in most of the country, some areas in mountain ranges and highlands have annual rainfall up to 4,000 mm. The annual average temperature is 26.5℃. While it is relatively cool between November and February, it is extremely humid in the rainy season with the daytime temperature reaching 35℃.

The National Census 2015 reports the total population of Lao PDR as 6,492,000 people (with 3,237,000 women and 3,255,000 men). Approx. 13 % of the people of Lao PDR live in the capital, Vientiane City. More than half of the population of Lao PDR are Lao Loum who belong to the Tai linguistic group of people. Many of them live in lowland areas along the Mekong River and they are mainly engaged in the paddy rice cultivation. Minority ethnic groups who mostly live in mountain ranges and highlands account for the rest of the population. While the official language of Lao PDR is Lao, the minority groups have their own languages. Although Buddhism lost the status of the state religion when Lao PDR became a people's democratic republic, more than half of its people are Buddhists.

The economy of Lao PDR has been growing at a high rate. The annual GDP growth rate was 7.02 % in 2016. Its GDP and nominal per capita GDP were USD 1,376.1 million and USD 1,921, respectively (IMF World Economic Outlook 2016). The service, agriculture and manufacturing industries accounted for approx. 36 % and 22 % and 33 % of GDP (Lao Statistics Bureau, 2015). Agriculture is the mainstay of the economy. Rice, sugar cane, corn, coffee, tobacco, cotton and Irish potato are major crops cultivated in Lao PDR. In this country where more than 60 % of the land is covered with forests, forestry is the second most thriving industry following agriculture. Timber, benzoin (a type of natural resin), cardamom and lacquer are among the important export goods of Lao PDR. It also has rich mineral resources. Copper, tin, gold, lead, zinc, coal and iron ore are mined in the country. The electric power generated in hydroelectric plants is amply available in the country and the power generated in the power plant of the Nam Ngum Dam, which was constructed with assistance from Japan, is exported to the neighboring Thailand. Machinery and petroleum account for the largest proportions of the imports. They are imported through Thailand. The transport in Lao PDR depends on roads and airline routes connecting major cities. The Mekong River, being an international river, is a major trade route. However, because of the existence of unnavigable sections, such as the rapids in Hemaraj and Khone Phapheng Falls, the river cannot be used as a transport route for its entire length.

The Vientiane Capital, in which a project site is located, is the center of the politics, economic activities

and cultural activities of the country. It is on the left bank (eastern bank) of the Mekong River, 1,584 km from its mouth. The city is on the border with Thailand demarcated by the river. It has complex topography consisting of areas of swampy lowland and isolated hills (whose tops are 200 m above the lowland areas). The river floods the city occasionally in the rainy reason. The city has an area of 3,920 km^2 and a population of approx. 820,000 (National Census 2015). The city has achieved rapid economic growth in recent years. The GDP growth rate of the city in 2014 was 12.7 %, which was significantly larger than the national average. The other project site is in Champasak Province, which has an area of 15,415 km^2 and a population of 694,000 people (National Census 2015). It is the core province in the southern area consisting of four provinces (with a total area of 44,091 km^2, an area larger than that of 36,750 km^2 of Kyushu Island of Japan), and is located at the southernmost point of Lao PDR having a border with Thailand and Cambodia. It is known as a production center of coffee and vegetables. Pakse, the capital city of Champasak Province, has thriving commercial activities because of the well-developed road network and navigation routes. The city also serves as a base for tourism since Champasak Province has tourist attractions such as Wat Phu, and the Khone Phapheng Falls which are both UNESCO world heritage sites, and serves as a base for tourism.

2. Background and Outline of the Project

Lao PDR is one of the least developed countries at East-south Asia in health sector; its human development index is 138th out of 188 countries (UNDP Human Development Report 2016). Especially at healthcare facilities, deterioration of equipment necessary for providing healthcare services, as well as quantitative and qualitative shortage of human resources are major issues of vulnerability for the health system.

The government of Lao PDR classed that improving of healthcare services as a prioritized area in the "8th Health Sector Development Plan 2016-2020 (8th HSDP)". In addition, the Ministry of Health promotes the implementation of "Health Sector Reform Strategies and Framework till 2025" aiming at achieving Universal Health Coverage (UHC). It also promotes efforts aiming at the expansion of capacity of the Health Science University, the sole medical school in Lao PDR, and the revision of nursing education curriculum.

Setthathirath Hospital, which is one of the five Central Hospitals in the capital, built by the Japanese grant aid project (The Project for Construction of New Setthathirath Hospital in Lao People's Democratic Republic, 1999) is one of the target hospitals of "The Project for Improvement of Setthathirath Hospital and Champasak Provincial Hospital in Lao People's Democratic Republic" (hereinafter referred to as "the Project"). In recent years, the number of its outpatients has been significantly increasing, reaching 90,000 per year. However, hospital facilities are not functioning well for the increase in outpatients and deterioration of the equipment is remarkable; thus appropriate diagnosis and treatment cannot be sufficiently provided. Setthathirath Hospital is the core educational institution and accepts a total of 600 medical and nursing students from Health Science University and Nursing College for clinical or nursing training as well as offering training opportunities for the staff of provincial or district hospitals every year. Clinical Training should be supported with adequate space and medical equipment, and should not hamper the providing medical services in the hospital. However, due to insufficiency of facilities and lack of medical equipment, the Setthathirath Hospital cannot maintain appropriate environment to provide the proper and effective training.

The other target hospital, Champasak Provincial Hospital is the top-referral hospital in the southern region, located in Pakse City where economic development has been remarkable in recent years. The southern region of the country still shows low health indicators and it is geographically difficult to transfer the patients to the Central Hospitals in the capital. Therefore, it is essential to provide the same level of medical services as the central level of Lao PDR within this region. The number of emergency referrals and the number of surgeries has increased requiring more advanced technics. However, the deterioration of the equipment is remarkable and it cannot respond to the recent medical needs of region. Moreover, Champasak Provincial Hospital accepts about 1,000 trainees a year from Champasak College of Health Science, that plays the leading role in the current in-service education in the province. Champasak Provincial Hospital is unable to provide the effective clinical training opportunities due to lack of equipment.

From this background, a request was officially submitted from Government of Lao PDR to Japan to support Setthathirath Hospital and Champasak Provincial Hospital, in order to promote the 8th HSDP by improving vulnerable service providing systems in two hospitals and by solving various issues relating to clinical training. The contents of the request is shown in the table below.

Table-1 Contents of the Request

Target Site	Contents
Setthathirath Hospital	(Facility) New Construction of the Outpatient Department (OPD)/ Emergency Room (ER) Building (2-storied, OPD, ER, Radiology Department, Endoscopic Exam Room etc.) Renovation of an Operation Theater in the Existing Building, etc. (Equipment) Computed Tomography (CT) Apparatus, Mobile Ultrasound Unit, Ventilator, Endoscope, General X-ray Unit, Fluoroscopy, OPD Diagnostic Equipment, etc.
Champasak Provincial Hospital	(Equipment) CT Apparatus, General X-ray Unit, Mobile X-ray Unit, Ventilator, Electrocardiograph (ECG), Ultrasound Unit (Cardiology), etc.

Source: Summarized by the survey team

3. Outline of the Survey Result and the Project Content

Upon the request from the Government of Lao PDR, the Government of Japan (GOJ) decided an implementation of the preparatory survey which JICA dispatched a preparatory survey team and conducted a field survey from February 12 to March 11, 2017. Through summarising and analysing results of the survey, the team developed an outline design for the construction of the new ER/OPD building, the renovation of an operation theater and the procurement of medical equipment in Setthathirath Hospital, and also developed an outline design for the procurement of medical equipment in Champasak Provincial Hospital.

Subsequently, through the additional field survey from May 28 to June 6, 2017 for discussion about contents of the draft project plan, after explanation and discussion over the draft report of the preparatory survey from August 30 to September 7, 2017 in Vientiane, the Lao PDR side has agreed with the contents described in the report submitted by the Japanese side.

The outline of the project facility and equipment component is shown in the table below.

Table-2 Outline of the Project Component

Setthathirath Hospital		
(Facility Component)		
Name of Facility	Department	Contents
New ER/OPD Building (Total floor are 3,626.3 ㎡)		
First Floor 1,866.3 ㎡	Public Space	Entrance Hall, Waiting Hall, Corridor, Toilets, Slope, etc.
	ER Department	ER Entrance, Hall, Bed Room, Reanimation Room, Minor Surgery Room, Isolation Room, Doctor/Nurse Station, Counselling Room, Staff Room, Conference Room, Exchange Room, Shower Room, Casher, Pharmacy
	Out Patient Department (OPD)	Examination Room (Internal Medicine, Paediatrics, Cardiology, Pain Clinic, Neurology)
	Radiology Department.	CT Scan Room, General X-Ray Room, Fluoroscopy Room, Mammography Room, Ultrasound Room, Reception/Office Room
	Administration / Management	Reception/Information Office, Casher, Insurance Reception, Pharmacy
Second Floor 1,723.0 ㎡	Public Space	Entrance Hall, Waiting Hall, Corridor, Toilets, Slope, etc.
	Out Patient Department (OPD)	Examination Room (Pneumology, Gastrointestinal Medicine, Allergy, Hematology & Oncology, Surgery Consultation, Dentistry, Ophthalmology, Ear, Nose and Throat (ENT)), Conference/Meeting Room, Short-Time Care Bedroom, Nurse Station, Storage, etc.
	Administration / Management	Doctor's Room, Nurse's Room, Service Staff Room, Medical Waste Stock, Storage, Kitchenette, etc.
Roof Floor 37.0 ㎡	－	Stair Case
Annex bld. 130.0 ㎡	－	Electrical Room, Generator Room, Medical Gas Room, Mechanical Room
Other External Facility	－	Water Reservoir Tank, Septic Tank, Elevated Water Tank, ER Gate, Connection Corridor
Total Floor Area 3,756.3 ㎡		
Renovation 113.5 ㎡	Surgery Operation Department	A New Operation Theater (3rd Operation Theater)

(Equipment Component)		
Location of Installation		Contents
New ER/OPD Building		
	ER Department	Ventilator, Portable Ultrasound Unit, Bedside Monitor, Nebulizer, Infusion Pump, Oxygen Saturation Monitor, Electric Scalpel, Anesthesia Unit, etc.
	Outpatient Department (OPD)	Ultrasound Unit (cardiology), Bedside Monitor, Upper Endoscope, Automatic Washer for Endoscope, Dental Chair, Dental X-ray, ENT Treatment Unit, Operation Microscope, Lens Meter, Slit Lamp Microscope, Electroencephalograph (EEG), Electromyograph (EMG), Transcranial Doppler (TCD), etc.
	Radiology	CT Apparatus, Fluoroscopy, General X-ray Unit, Manmography, etc.
Existing Main Hospital Building		
	Neonatal Intensive Care Unit (NICU) ／Pediatric Intensive Care Unit (PICU)	Bedside Monitor, Infusion Pump, Phototherapeutic Apparatus, Ventilator, Incubator, Bilirubin Skin Test, Continuous Positive Airway Pressure (CPAP), Oxygen Saturation Monitor, etc.
	Obstetrics and Gynecology (OBGY)	Infusion Pump, Operation Lamp, Delivery Table, Cardiotocograph (CTG), Ultrasound Unit (Gynecology), Ultrasound Unit (Antenatal Care), etc.
	Operation Theater	Oparating Table, Defibrillator, Electric Scalpel, Anesthesia Unit, Operation Lamp, Ethyleneoxide Gas Type Autoclave, Fiber-Optic Bronchoscope, Bedside Monitor, Autoclave, etc.
	Laundry, Morgue	Industrial Washing Machine, Industrial Dryer, Body Refrigerator, etc.
Word 2 (PPP Building)		
	Adult Intensive Care Unit (AICU)	Bedside Monitor, Nebulizer, Infusion Pump, Portable Ultrasound Unit, etc.

Champasak Provincial Hospital		
(Equipment Component)		
Location of Installation		Contents
Existing Building		
	Radiology Department	CT Apparatus, General X-ray Unit, Mobile X-ray Unit
	Surgery Operation Theater	Operation Table, Defibrillator, Electrical Scalpel, Operation Lamp, etc.
	Intensive Care Unit (ICU)	Bedside Monitor, Ventilator, Blood Gas Analyser
	Cardiovascular Intensive Care Unit (CCU)	Ultrasound Unit (Cardiology), Electrocardiograph (ECG)

Source: Survey Team

4. Implementation Schedule and Cost Estimation of the Project

For the implementation of the project, 4 months are required for the detailed design; 3 months for the works related to tendering and 15 months for the construction work and procurement/ installation of equipment. The Cost to be borne by the Lao PDR side is estimated to be 23 million yen to execute this Project.

5. Project Evaluation

(1) Relevance

The Project is relevant under the Japanese Grant Aid scheme due to reasons described below.

a. Appropriate environment for providing medical services and educational opportunities

Setthathirate Hospital cannot provide appropriate medical services and sufficient clinical trainings due to the narrow spaces in clinical area such as examination room and ER bed side etc. and deterioration and lack of medical equipment. Champasak Provincial Hospital has also similar issues because of deterioration and lack of medical equipment. By improving the two hospitals, which provide medical services and educational opportunities as a central hospital of the capital city and a top-referral hospital in southern region, in the Project, the services shall be ameliorated and appropriate clinical trainings shall be provided. It is expected that the Project would have large impact to the related health/ medical facilities and health personnel and contribute to the improvement of health system in Lao PDR. Thus relevance of implementation of the Project is high.

b. Target beneficiaries of project

Setthathirath Hospital is located in the Vientiane city whose population is approximately 820,000 (Census 2015). This project shall be beneficial to the population mentioned above. In addition, the people outside the city and residents in Vientiane Province shall also be the beneficiaries, as the hospital accepts patients with infectious diseases such as Dengue as the designated hospital for treatment of infectious disease, in case an outbreak occurs. Champasak Provincial Hospital accepts patients referred from not only the respective province but also other three neighboring provinces, which could number up to 650,000, on top of 694,000 of Champasak province. Therefore, a total of 1,344,000 people in southern region shall be beneficiaries of this project in the events of injuries, health examinations, and healthcare activities.

c. Contribution to achieving targets of the country's medium- and long-term development plan

The duration of long-term strategy for health centers in Lao PDR is fixed as 20 years. In the long-term health strategy (2000-2020), priority issues such as disease prevention and health promotion, treatment and rehabilitation, health human resource development, etc. are clearly mentioned. Strengthening these fields is also consistent with the project direction. The 8th National Socio-Economic Development Five-year Plan (2016-2020) that set the mid-term policy of health sector, clearly mentioned to improve and enhance fields such as outpatient treatment, pediatrics, obstetrics and delivery, ophthalmology, resuscitation, emergency care and medical technology. This project will contribute to achieve the goals of these fields through establishment of an ER/OPD building and the provision of equipment. Hence, the adequacy of the implementation of this project will be sufficiently secured.

d. Consistency of Japan's assistance policies and principles

In Japan's Country Assistance Policy (to Lao PDR), as assistance in health sector, it specifies to provide assistance to support medical personnel capacity development mainly in the field of maternal and child health, and health system strengthening mainly for medical facilities to improve access to health services. This project which is to support Setthathirath Hospital which is a central hospital in Vientiane and Champasak Provincial Hospital which is a top-referral hospital in southern region, with purposes of health system strengthening in Lao PDR, has enough accordance with Japan's assistance strategy and policy.

(2) Effectiveness

1) Quantitative Effects

The target values for feasible indicators of quantitative effects shall be set based on actual information in 2016 in target hospitals; Setthathirath Hospital and Champasak Provincial Hospital. The target year shall be set as 2022 which is three years after the completion of the facility construction. The expected quantitative effect and target value by implementing this project are shown in the table below.

Table-3 Quantitative Effect Indicator and Target Value

Indicator	Target Hospital	Base line (2016) (Actual value in 2016)	Target value (2022) (3 years after completion)
① Number of outpatients	Setthathirath Hospital	93,455	111,590
② Number of image diagnostics	Setthathirath Hospital	CT: 0 X-ray：12,037 Ultrasound：13,696	CT: 2,127 X-ray：14,935 Ultrasound：16,403
	Champasak Province Hospital	CT: 66 X-ray：9,105 Ultrasound：18,995	CT: 1,379 X-ray：10,081 Ultrasound: 20,003
③ Number of surgeries	Setthathirath Hospital	1,699	2,029

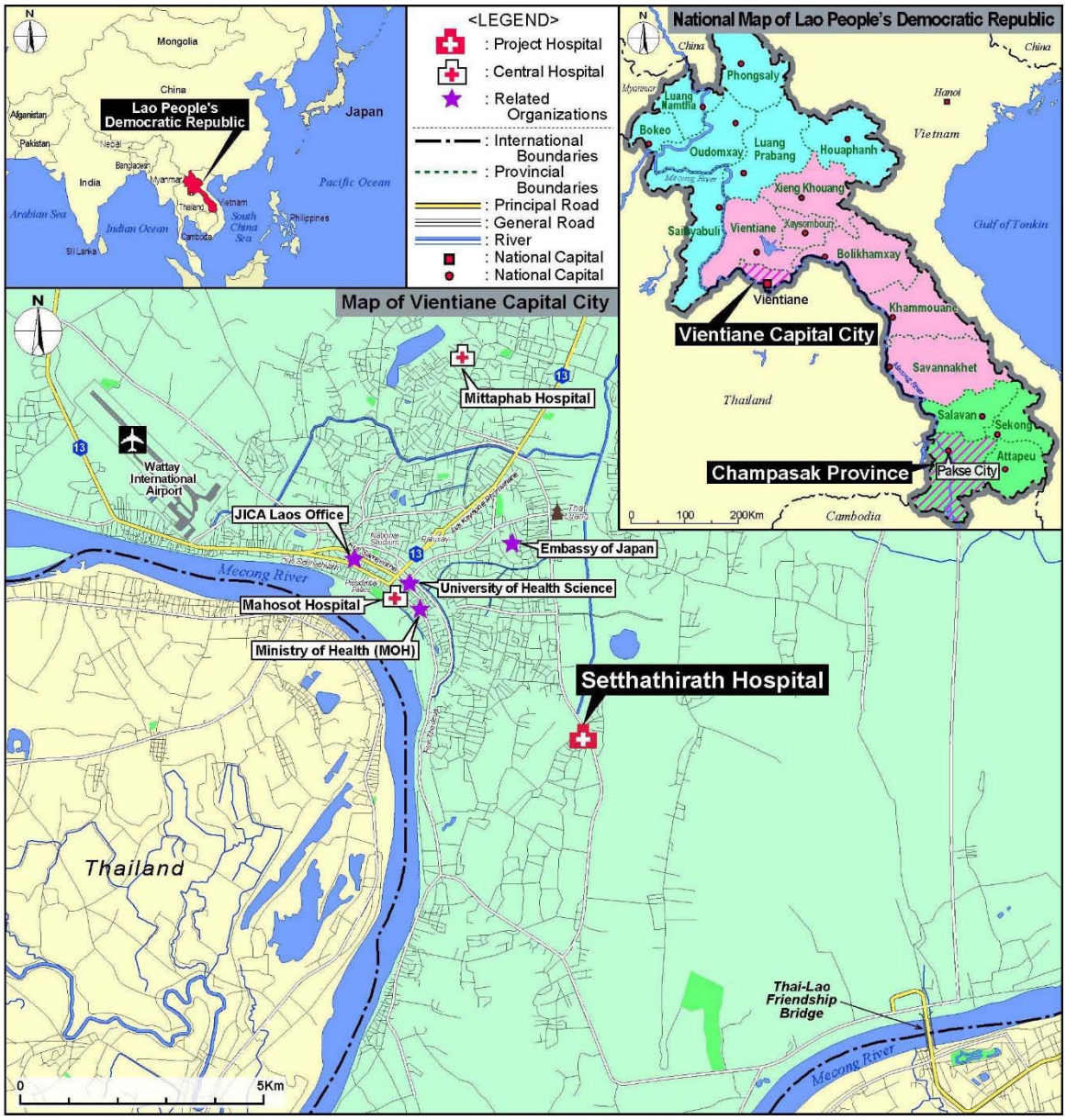
Source: Survey Team

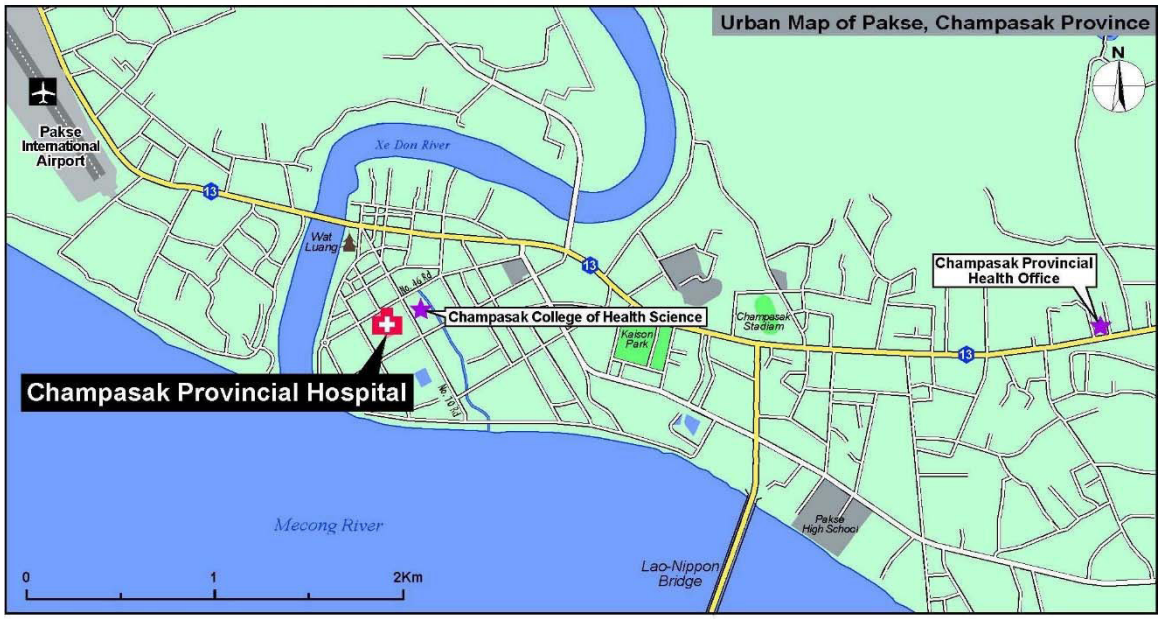
2) Qualitative Effects

Through the implementation of the project, the expected qualitative effect is assumed to be as follows.

- Environment of pre-service and in-service clinical training shall be improved for health personnel.

Contents





SITE LOCATION MAP

Perspective-1 Setthathirath Hospital New ER/OPD Building (from Eastern Side)

Perspective-2 Setthathirath Hospital New ER/OPD Building (from Northern Side)

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ABBREVIATIONS

Abbreviations	Description
AC	Air Conditioner
ACI	American Concrete Institute
AED	Automated External Defibrillator
AEP	Acrylic Emulsion Paint
AICU	Adult Intensive Care Unit
A/P	Authorization to Pay
ANC	Antenatal Care
ASTM	American Society for Testing and Materials
ATM	Automated Teller Machine
AVR	Automatic Voltage Regulator
B/A	Banking Arrangement
BH	Borehole
BOD	Biochemical Oxygen Demand
BS	British Standard
CCTV	Closed Circuit Television
CCU	Cardiovascular Intensive Care Unit
CLC	Clinical Learning Centre
COD	Chemical Oxygen Demand
CPAP	Continuous Positive Airway Pressure
CT	Computed Tomography
CTG	Cardiotocograph
DAC	Development Assistance Committee
DD	Detailed Design
DM	Diabetes Mellitus
E/N	Exchange of Note
ECG	Electrocardiograph
EDL	Electricité du Laos
EEG	Electroencephalograph
EIA	Environmental Impact Assessment
EMG	Electromyograph
ENT	Ear, Nose and Throat
EPS	Electric Pipe Shaft
ER	Emergency Room
EUR	Euro
G/A	Grant Agreement
GDP	Gross Domestic Product
GI	Gastrointestinal
GL	Ground Level
GNY	Gynecology

Abbreviations	Description
GOJ	Government of Japan
HIV	Human Immunodeficiency Virus
HSDP	Health Sector Development Plan
ICU	Intensive Care Unit
IPCU	Infection Prevention Control Unit
IPD	Inpatient Department
IV	Intravenous Drip
JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standards
JPY	Japanese Yen
KV	Kilo-Volt
KVA	Kilo-Volt-Ampere
LAN	Local Area Network
LAK	Laos Kip
LED	Light Emitting Diode
MCH	Maternal and Child Health
MDF	Main Distribution Frame
MOH	Ministry of Health
MPN	Most Probable Number
MPWT	Ministry of Public Works and Transport
MRI	Magnetic Resonance Imaging
NCDs	Non Communicable Diseases
NGO	Non-Governmental Organizations
NSEDP	National Socio Economic Development Plan
NICU	Neonatal Intensive Care Unit
O&M	Operation and Maintenance
OBGY	Obstetrics and Gynecology
OD	Outline Design
OECD	Organization for Economic Co-operation and Development
OPD	Outpatient Department
OT	Operation Theater
PC	Precast Concrete
PICU	Pediatric Intensive Care Unit
PPP	Public Private Partnership
SPT	Standard Penetration Test
TCD	Transcranial Doppler
TCVN	Tien Chuan Viet Nam
THB	Thailand Baht
TIS	Thai Industrial Standards
TR	Transformers
UHC	Universal Health Coverage

Abbreviations	Description
UN	United Nations
UNOCHA	The United Nations Office for the Coordination of Humanitarian Affairs
USD	United States Dollar
TIS	Thai Industrial Standards
VAT	Value Added Tax
VCOMS	Vientiane City Office of Management and Services
WC	Water Closet
WHO	World Health Organization

CHAPTER 1 BACKGROUND OF THE PROJECT

CHAPTER 1 BACKGROUND OF THE PROJECT

1-1 Background and Outline of the Request for Japan's Grant Aid Assistance

1-1-1 Background of the Request for Japan's Grant Aid Assistance

The Lao People's Democratic Republic (hereinafter referred to as "Lao PDR") is one of the least developed countries at East-south Asia in health sector; its human development index is 138th out of 188 countries (UNDP Human Development Report 2016). Especially at healthcare facilities, deterioration of equipment necessary for providing healthcare services, as well as quantitative and qualitative shortage of human resources are major issues of vulnerability for the health system.

The government of Lao PDR classed that improving of healthcare services as a prioritized area in the "8th Health Sector Development Plan 2016-2020 (8th HSDP)". In addition, the Ministry of Health promotes the implementation of "Health Sector Reform Strategies and Framework till 2025" aiming at achieving Universal Health Coverage (UHC). It also promotes efforts aiming at the expansion of capacity of the Health Science University, the sole medical school in Lao PDR, and the revision of nursing education curriculum.

Setthathirath Hospital, which is one of the five Central Hospitals in the capital, built by the Japan's grant aid project (The Project for Construction of New Setthathirath Hospital in Lao People's Democratic Republic, 1999) is one of the target hospitals of "The Project for Improvement of Setthathirath Hospital and Champasak Provincial Hospital in Lao People's Democratic Republic" (hereinafter referred to as "the Project"). In recent years, the number of its outpatients has been significantly increasing, reaching 90,000 per year. However, hospital facilities are not functioning well for the increase in outpatients and deterioration of the equipment is remarkable; thus appropriate diagnosis and treatment cannot be sufficiently provided. Setthathirath Hospital accepts a total of 600 medical and nursing students from Health Science University and Nursing College for clinical or nursing training as well as offering training opportunities for the staff of provincial or district hospitals every year. Clinical Training should be supported with adequate space and medical equipment, and should not hamper the providing medical services in the hospital. However, due to insufficiency of facilities and lack of medical equipment, the Setthathirath Hospital cannot maintain appropriate environment to provide the proper and effective training.

The other target hospital, Champasak Provincial Hospital is the top-referral hospital in the southern region, located in Pakse City where economic development has been remarkable in recent years. The southern region of the country still shows low health indicators and it is geographically difficult to transfer the patients to the central hospitals in the capital. Therefore, it is essential to provide the same level of medical services as the central level of Lao PDR within this region. The number of emergency referrals and the number of surgeries has increased requiring more advanced technics. However, the deterioration of the equipment is remarkable and it cannot respond to the recent medical needs of region. Moreover, Champasak Provincial Hospital accepts about 1,000 trainees a year from Champasak College of Health Science that plays the leading role in the current in-service education in the province. Champasak Provincial Hospital is unable to provide the effective clinical training opportunities due to

lack of equipment.

From this background, this project to support Setthathirath Hospital and Champasak Provincial Hospital is considered as promoting the 8th HSDP by improving vulnerable service providing systems in two hospitals and by solving various issues relating to clinical training. In addition, this project conducted a survey based on the suggestions for grant aid project in the former survey called "Data Collection Survey on Health Sector in Lao P.D.R." which was completed in March 2016. By reflecting this survey result, a request was officially submitted from Government of Lao PDR to Japan in June 2017. The content of the official request and the initial draft request are as follows.

Table 1-1 Initial Draft Request of Components of Facilities and Equipment

Target Site	Contents
Setthathirath Hospital	(Facility) New construction of an outpatient building (3-storied, outpatient department (OPD), Endoscopy Exam Room, Training Room, Lecture Hall, etc.) Renovation of the existing building (ER minor surgery room, ICU etc.) (Equipment) Computed Tomography (CT) Apparatus, Mobile Ultrasound Unit, Ventilator, Endoscope, General X-ray Unit, etc.
Champasak Provincial Hospital	(Equipment) CT apparatus, LED Operation Lamp, etc.

Source: Summarized by the survey team

Table 1-2 Components of Facilities and Equipment by Official Request as of June 2017

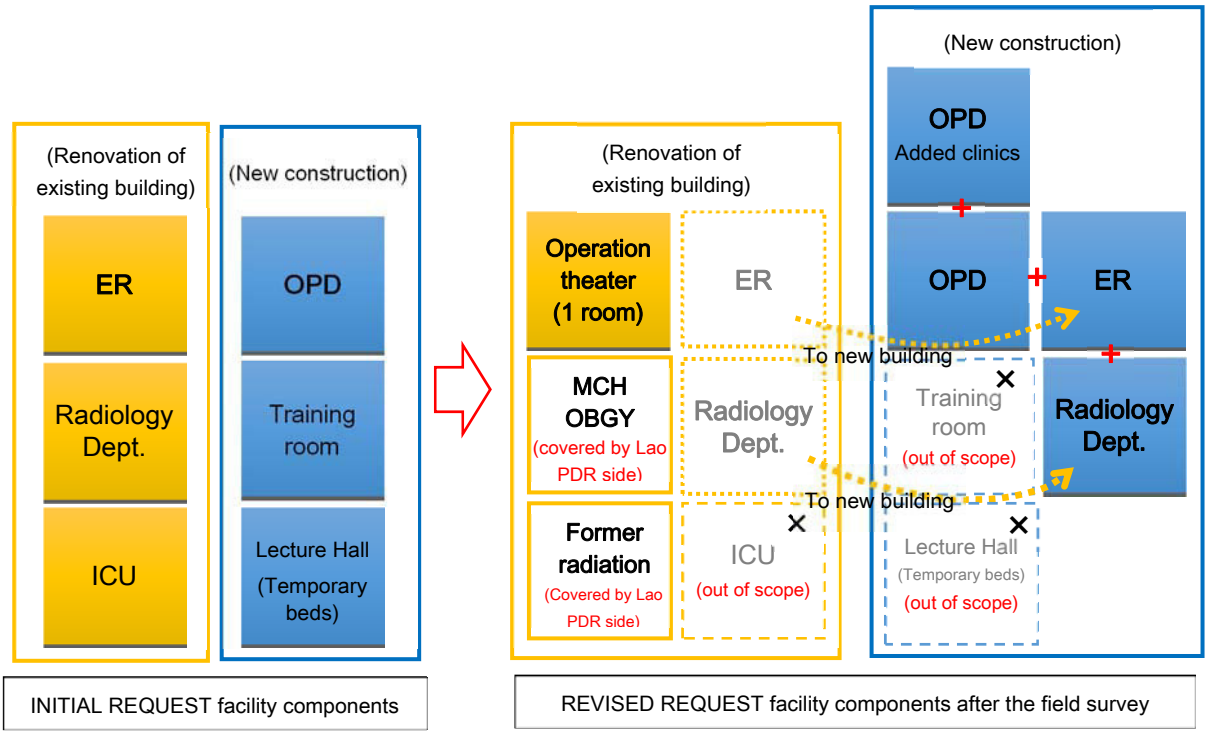
Target Site	Contents
Setthathirath Hospital	(Facility) New Construction of the Outpatient Department (OPD)/ Emergency Room (ER) Building (2-storied, OPD, ER, Radiology Department, Endoscopic Exam Room etc.) Renovation of an Operation Theater in the Existing Building, etc. (Equipment) Computed Tomography (CT) Apparatus, Mobile Ultrasound Unit, Ventilator, Endoscope, General X-ray Unit, Fluoroscopy, OPD Diagnostic Equipment, etc.
Champasak Provincial Hospital	(Equipment) CT Apparatus, General X-ray Unit, Mobile X-ray Unit, Ventilator, Electrocardiograph (ECG), Ultrasound Unit (Cardiology), etc.

Source: Summarized by the survey team

1-1-2 Change the Contents of Request from Recipient Country

Upon the request from the Government of Lao PDR, the Government of Japan decided to conduct preparatory survey, and dispatched a survey team from February to March 2017 to carry out field survey. The summary of changes in the requests confirmed by Lao PDR side during the field survey from the initial requests are as follows.

(1) Changes of targeted facility components for Settathirath Hospital and its reasons



Source: Summarized by the survey team

Fig. 1-1 Initial and Revised Facility Components Request for Settathirath Hospital

① Components excluded from the scope

a. Intensive care unit (ICU)

The existing Public-Private Partnership (PPP) ward (ward-2) has an ICU with 8 beds (including one isolated bed) and is classified as one of the wards of internal medicine based on the hospital classification.

The targets of this ward are patients requiring 24-hour continuous care due to worsened conditions such as high blood pressure or diabetes, etc. Basically, only referred patients from the internal medicine ward can be admitted this section. Post-operation patients are not transferred to this ICU as they are using the recovery room next to the operation theater, and emergency outpatients are transferred to the inpatient word of internal medicine when necessary. The management of this ICU has no relation to other clinical departments and there are no referred cases from the OPD or the ER. There are no issues in the physical distance between the existing ICU and other department locations of the hospital. Therefore, a new ICU component was excluded from the target.

b. Training room

The existing Clinical Learning Center (CLC) building which has 4 training rooms with an assumed capacity of 120 people, and the Infection Prevention Control Unit (IPCU) with an assumed capacity of 30 people in the existing main hospital building are utilized as for training space providing various educational opportunities. It was confirmed that simulation study or on-line learning for medical students is conducted daily for 1-1.5 hours before starting of the clinical practice at medical service department in the hospital. The residents who graduated from medical school and are aiming to become specialists use these rooms for case studies and simulations before starting their working time. The present condition of those places gives sufficient opportunities in terms of space and time for the lectures. Because those lectures and studies are not conducted frequently and only conducted around start/end of working hours, therefore, current facility can provide training opportunity for the future increased needs, so it is excluded from the plan. The expansion of the space at clinical examination areas will be prioritized to secure sufficient space in terms of providing practical opportunities.

c. Lecture hall (To be a temporary hospital bed room for infectious outbreak.)

There is one lecture hall where assumed accommodation size of 150 people, and so events can only be held for this limited capacity. If a larger number of people is expected, some hotels and convention centers nearby the hospital are available. The lecture hall is also considered as a temporary accommodation when patient surge occurs. Regarding the response in infectious outbreak, because requirement depends on the type of disease and patient situation, it is difficult to assume the number of rooms and the size required. But if minimum necessary space is assumed to be one partitioned room, CLC (20 patients, 4 training rooms supposed to accommodate 80 patients) and IPCU (assumed to accommodate 30 patients) could be used. Looking at the recent disease trend in Lao PDR, the outbreak of Dengue is only about once every five years. There are no critical reasons for the medical need of the new lecture hall. Because the use of existing lecture hall is not so frequent, the component of new lecture hall is excluded from the plan.

② Components added to the scope

a. Operating Theater

There are two regular operation theaters in the surgery operation department. The number of surgery cases per room is considered to be less than 500 by general standard, and therefore, 1,000 operations can be conducted by using these two rooms. However, 1,699 surgeries are conducted, and this largely exceeds the standard number. Thus, two rooms are not enough and the minor surgery room in ER is also being used as a third operation theater for surgery purpose. This means that ER cannot use the minor surgery room as initially planned and is providing services using this room. In addition to the issues of lacking operation theaters and providing negative impact to other departments, the use of a room not

designed as operation theater also has serious issues in terms of infectious control and patient safety. To sort these issues out, at least adding one regular operation theater is an urgent requirement.

b. Increased outpatient clinics

Since the hospital started its operation in 2001, various specialized OPD clinics have been added to the hospital by their own effort. As a result, unrelated medical departments are scattered randomly in the hospital, making it difficult for hospital staff and patients to use them. It is necessary to expand OPD, group relate departments, and organize the flow of outpatients to consider integrated outpatient function including the OPD clinics which have been added by the hospital.

③ Change of construction work method

Initially, the ER and the radiology department (image diagnosis department) were going to be renovated within the existing building. However, it is planned that those departments will be included in the new building components and allocated space on the ground floor to cope with increasing number of emergency patients. As for the ER, minimum time to start treatment is required, so ambulances should take the shortest approach route from the road. To respond to urgent examination by CT or X-ray unit, the radiology department will be allocated space next to ER.

In the draft request plan, it was planned to relocate all outpatient departments to the new building; however, maternal and child health (MCH) department and obstetrics and gynecology (OBGY) department will remain within the existing building. Hence, sufficient space will be secured by refurbishing the building from the Lao PDR side for the following reasons.

a. MCH and OBGY patients account for 41% of all outpatients excluding emergency outpatients Calculation Note: (23,365 MCH outpatients + 6,770 OBGY outpatients in 2016) / (total no. of outpatients excluding ER patients: 72,879). Therefore, continuous large space is required.
b. Since it is difficult to use the stairs for pregnant women, it needs to be placed on the ground floor. However, there is already a plan for ER and radiology to be allocated on the ground floor, it is difficult to secure appropriate space for MCH and OBGY in the new planned building (It is possible to allocated them enough space in the existing building).
c. OPD will be divided into MCH & OBGY department (into the existing building) and other clinics (into the new building). MCH & OBGY patients who are mainly pregnant women and other outpatients heading for clinical departments are clearly separated by attributes and gathering of clinical department for women to make it easy so that consider gender and the flow line is clearly defined both for hospital management side and female patient side, This produces better efficiency.
d. As for the renovation work of the existing building which is necessary for expanding MCH and OBGY, it is feasible with simple construction managed by Lao PDR side.

(2) Revised equipment contents

1） Request for equipment by Setthathirath Hospital and its reasons

① Review of equipment by additional operation theater

With the plan to renovate the existing building and add one operation theater, additional medical equipment for operation theater is also required.

② Review of the equipment of the new building

This survey was conducted based on information of medical equipment presented in the Data Collection Survey on Health Sector completed in 2016. Initially it was considered to continue using existing equipment in the clinical departments in the new building. However, in addition to the 13 outpatient clinical departments which were confirmed in the former survey, it turned out that there were plural outpatient clinics which were not clearly indicated, and it became necessary to consider their design planning. Regardless of official announcement of the hospital or not, all the OPD clinics that have clinical practice were surveyed. As a result of obtaining additional information, it was found that most of the equipment was deteriorated although the continuous use with risk. Therefore, it is necessary to consider the propriety of procurement of medical equipment of OPD clinics in the new building.

2） Request for equipment by Champasak Provincial Hospital and its reasons

(Addition of ICU and cardiovascular intensive care unit (CCU) equipment)

Champasak Provincial Hospital is positioned as a provincial hospital, in fact, it functions as the top referral hospital in four southern provinces including Champasak Province. Accepting severe patients from nearby provincial hospitals as the final referral hospital, not only ER but also in operation room, ICU and CCU are relatively highly used. There were 1,180 patients using ICU in 2016, 216 patients in CCU and their frequency of use in the relevant fields is considered to be high. There is also an annual increase in the number of users, leading to a request for improving the hospital by procuring medical equipment. It turned out that surgery department has been receiving continuous medical experts from Luxembourg, and specialized doctors for cardiac surgery have been trained. Out of 6,137 surgeries per year, 1,838 cases were major surgeries in terms of Lao PDR country classification (2016). However, in ICU and CCU, there were cases where appropriate treatment could not be made due to lack of medical equipment. It is decided to consider the provision of additional medical equipment because the available human resources are secured but the minimum necessary equipment is insufficient.

1-2 Natural Conditions

1-2-1 Weather Conditions

According to the past 10 years data of temperature, humidity, precipitation, wind and wind direction obtained by Meteorological Department in Vientiane, the average maximum temperature during February to November exceeds 30 ℃ in Vientiane. Only for two months from December to January, the average lowest temperature falls below 20 ℃.

The climate belongs to the tropical monsoon regions. Normally it divided into the rainy season during from May to September and the dry season during from October to April. The average maximum humidity is around 90% throughout the year, the annual average precipitation is 1,631 mm, and it is only from April to October that the monthly rainfall exceeds 200 mm.

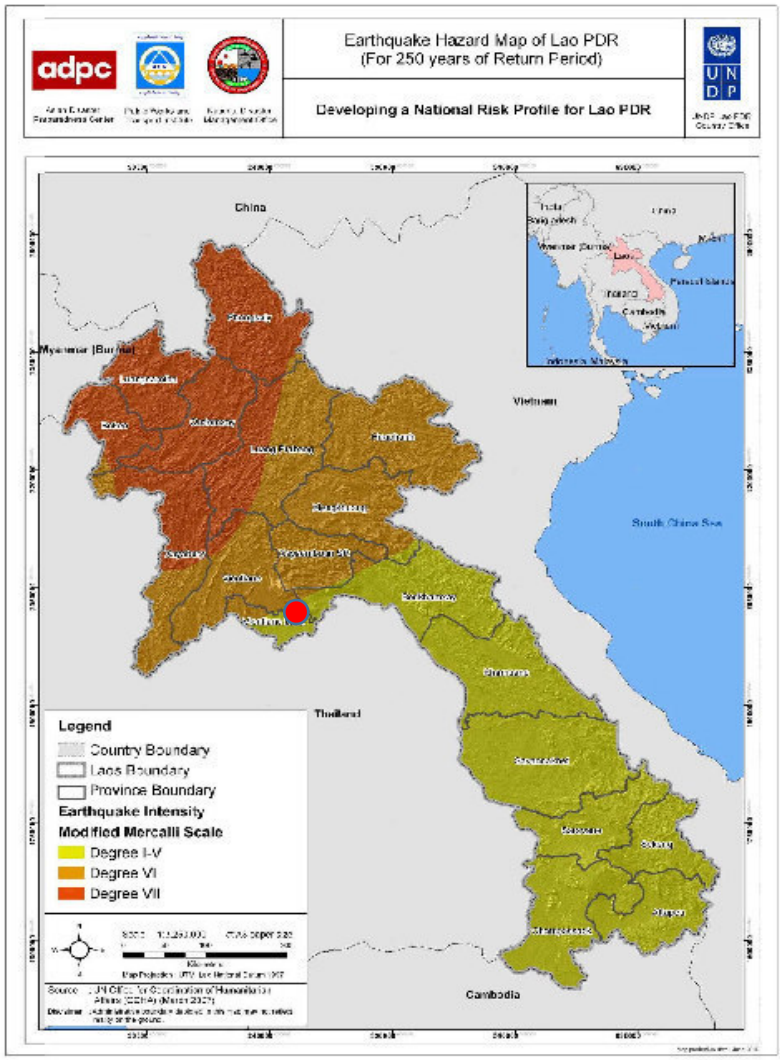
Table 1-3 Monthly Weather Information of Past 10-years in Vientiane Capital

Monthly average on past 10-year		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly average
Maximum. temperature	℃	28.3	31.1	33.3	35.1	33.9	32.8	31.9	31.7	32.0	31.9	31.1	29.0	31.8
Minimum. temperature	℃	17.4	20.1	22.6	24.7	25.2	25.5	25.2	24.9	24.8	23.9	21.5	18.5	22.9
Maximum. humidity	%	88.8	86.1	85.4	85.1	90.8	92.4	94.2	94.9	94.6	91.6	88.9	89.3	90.2
Minimum. humidity	%	50.0	46.9	47.0	48.8	58.7	63.5	66.5	68.0	66.1	59.7	52.8	50.5	57
Maximum. rainfalls	mm	15.8	9.4	45.8	70.9	213.4	230.5	318.0	327.2	262.5	95.8	36.4	5.5	1631.1
Minimum. rainfalls	mm	43.4	31.3	134.7	223.0	408.0	385.4	432.2	636.8	466.8	225.3	107.0	23.2	2202.3
Wind speed (average)	m/s	6.2	6.0	15.4	20.6	18.9	12.7	11.3	10.6	9.6	10.2	6.8	5.6	11.2
Wind speed(maximum)	m/s	10	10	28	49	25	20	15	15	15	16	10	8	20.1

Source: Meteorological Department in Vientiane

1-2-2 Earthquake

Lao PDR is a country among the lowest occurrences of earthquake with only one event exceeding Magnitude 7 in the 40 years before 2010. The rest are the ones of Magnitude 5 or less. The place of occurrence is in Myanmar, the north and the northwest parts close to China. Figure 1-2 is an earthquake hazard map of 250 years created by the UN Office for Coordination of Humanitarian Affairs (UNOCHA) using the revised Mercury seismic intensity level. Here, Lao PDR is classified into three seismic intensity levels, and Vientiane with the planned site shows the smallest seismic intensity level range, and it is regarded as a low dangerous zone for earthquake. Also, since there are no structural design regulations for earthquakes in Lao PDR, structural designers consider the seismic load with reference such as ACI or Euro Code, to construct buildings in northern part or design high-rise buildings elsewhere.



Source: UN Office for Coordination of Humanitarian Affairs (OCHA)

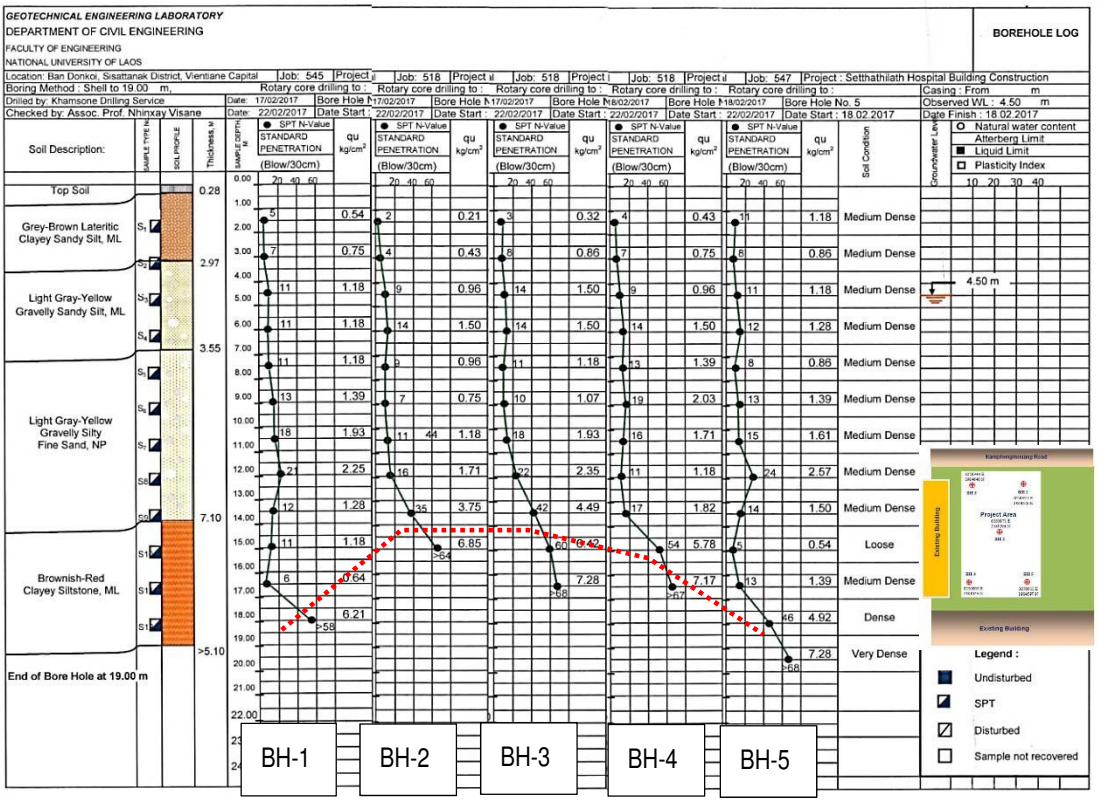
Fig. 1-2 Earthquake Hazard Map of Lao PDR

1-2-3 Results of Natural Conditions Survey

a. Soil investigation

A series of boring surveys with Standard Penetration Test (SPT) were conducted at 5 places in the proposed site for the new building construction, and Figure 1-3 shows their borehole logs. Every borehole continued to have soft soil conditions from the surface of the ground, and at around depth of 10 m, it exceeds N-value of 15. From the depths of 0.5m to 7m, it is silt mixing with cray or sands. At until the depth of 14m, it is continuously with silt mixing with gravel and layers and at around from the depths of 14-19m, it starts exceeding the N-value of 30 and becoming firm silt-stone with value of over 50. Assuming N-value of 30 as supporting layer, its depth will be 14-18 m. At holes BH-1 and BH-5, there is a more deeper supporting layer than others. The water table is at around the depth of 4.5 m, and it can be easily assumed that it will rise more in the rainy season. The existing main hospital building in

the same compound of the proposed construction site, adopts pile foundation. Pile foundation is very common in the area around Setthathirath hospital site which is not far from the Mekong river. These facts support the conclusion that the proposed site for the project holds soft soil, and hence should adopt pile foundation.



Source: An extraction from the report of soil investigation

Fig. 1-3 Result of Soil Investigation Boring Survey (Borehole Logs of 5 SPTs)

b. Water quality test

Water samples (collected from faucets) and wastewater (collected from the discharge port of the septic tank) in Setthathirath Hospital were tested at the Chinaimo Water Treatment Plant Laboratory, Vientiane City Waterworks Bureau. The test results show that there is no problem for the drinking water, and the wastewater is also adequately purified as BOD is 6.01<30 (mg/l) and COD 8.16 <120 (mg/l). Drainage is pumped from the septic tank periodically by a drain pump and discharged, and visually it is unchanged with clean water. However, 2,300 (MPN/100ml) of general bacteria and 230 (MPN/100 ml) of Escherichia coli are contained.

Table 1-4 Summary of Water Quality Test

Date of sample taking (Drinking water)	February 18, 2017
Site of sample taking (Drinking water)	Water faucets, Setthathirath Hospital
Date of sample taking (Waste water)	February 17, 2017
Site of sample taking (Waste water)	discharge port of the septic tank, Setthathirath Hospital
Testing dates	Feb 24 – March 6, 2017
Testing place	Chinaimo Water Treatment Plant Laboratory, Vientiane City Waterworks Bureau
Criteria of water quality	Drinking water standard of Lao PDR
Criteria of waste water quality	Waste water standard of Lao PDR – urban areas

Source: Summarized by the survey team

Table 1-5 Results of Water Quality Test

	Item	Unit	Drinking water		Waste water	
			Results	Standards	Results	Standards
1	Turdibity	NTU	0.8	<5	1.7	-
2	Color	CU	3.0	<5	16.0	-
3	Odor	normal	not offensive	-	-	-
4	pH (value)	-	8.51	6.5 - 8.5	8.23	6 - 9.5
5	M.Alkalinity (CaCO4)	mg/l	90	< 300	192	-
6	Ammonia ion (NH4+)	mg/l	N.D <0.07	-	1.3	-
7	Nitrite ion (NO2)	mg/l	N.D <0.05	< 3.0	N.D <0.05	-
8	Sulfate ion (SO4)	mg/l	2.5	< 250	2.7	-
9	Chloride ion	mg/l	20.6	< 250	41.83	-
10	Total Hardness (CaCO3)	mg/l	154	< 300	162	-
11	Total coliform group	MPN/100ml	0	< 2.2	>2300	-
12	E.Coli	MPN/100ml	0	0	>230	-
13	KMnO4 consumed	mg/l	4.76	<10	18.54	-
14	Dissolved Oxygen (DO)	mg/l	7.64	-	7.25	-
15	CODMn	mg/l	3.41	-	8.16	120
16	BOD5	mg/l	0.87	-	6.01	30
17	Calcium (Ca)	mg/l	47.24	< 200	44.8	-
18	Magnesium (Mg)	mg/l	8.75	< 30	12.2	-
19	Fluoride ion	mg/l	0.37	< 1.0	0.75	-
20	Total suspended Solids(TSS)	mg/l	3.0	-	7.0	30

N.D: not disolved

Source : Vientiane City, Chinaimo Water Treatment Plant Laboratory

c. Results of the buried objects survey

Drillings were conducted up to a depth of 2.0 m by using an earth drill machine at five places in the proposed construction site. A test-drilling hole was within 2m from the borehole of soil investigation. The result shows that there are no structures and buried objects in the site.

According to the interview of hospital staff, there used to be buildings surrounding the construction site, and respectively, the plan of former construction in 1999 also suggests the existence of buildings. Although, there is no buried objects found in this survey.

There is only a water supply line along the fence wall at the eastern boundary, and so the temporary road shall be constructed with caution to avoid any damage to that pipe line.

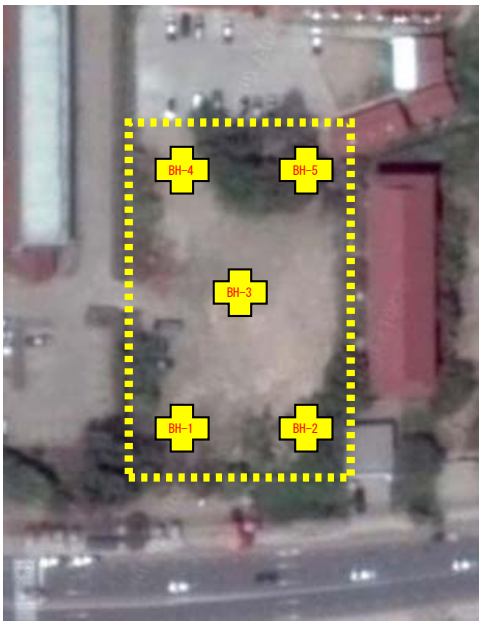


Photo 1-1 Examination Position Map of Boreholes and Test-drilling Holes

Photo 1-2 Test-drilling Hole BH-1

1-3 Environmental and Social Considerations

(1) Environmental impact assessment

In this project, there is no big earth work to change the land shape or level, no settlers, and since it is the construction of a social welfare facility which is a hospital, the direct negative influence on the surrounding residents is extremely small. However, it is necessary to pay attention to other buildings inside the hospital premises and the impact on users and patients. Therefore, this plan will not be subject to Environmental Impact Assessment (EIA). It is required to submit an environmental compliance certificate that monitors the environmental impact or an environmental impact certificate that pledges emissions rate.

(2) Considerations during the construction work

① Noise and vibration

For piling work, jacked pile or reinforced concrete pile cast in place should be adopted as construction method because of less noise and vibration. Attention will be paid to prevent vibration and noise caused by construction heavy machine and concrete mixer vehicles. Unlike urban districts, there is no regulation on running of mixer vehicles, but in the early morning and evening concrete work will experience temperature drop, so it is necessary to suppress the generation of noise and vibration.

In renovation work of the existing building, it is necessary to avoid hatching work of existing wall surfaces as much as possible. Special attention should also be paid to the vibration noise due to electric drilling of the hole-in anchors. A dry board system with right steel and plaster board will be preferable for the new partition. Chemical odor should be avoided by using emulsion type in painting work.

② Waste

Construction waste should regularly be collected by the Vientiane City Office of Management and Services (VCOMS), and in case of large quantities, it will be transported to a treatment place for waste and garbage. Chemicals such as paint, adhesives, waterproofing agents will be classified, collected and discarded as combustible hazardous materials. The biological treatment tank will be set up in the temporary toilets for workers, and discharged after treated with BOD 20 ppm.

③ Security

The construction area will be enclosed by temporary fence and moving flow of construction vehicles will be controlled with division from patients and hospital staffs to ensure safety. Construction workers and visitors will not be allowed to enter the construction area unless they wear helmets, safety vests and shoes. Work scaffolding and stairs will be appropriately provided, and worker will need to wear safety belt for work in high places.

④ Tree cutting

There are various trees which should be removed from the construction site before the commencement of the work. It is preferable to transplant them in the rainy season, but if it is difficult because of kind of tree, alternative trees should be planted at the completion of the building. Also, in line with the environmental greening of the city, 20% of the premise needs to be secured as a green area by planting trees.

(3) Consideration after completion of the facility construction

① Noise and vibration

Same as the current Setthathirath hospital, no noise or vibration will be produced, which gives a negative impact to the surroundings.

② Solid waste

Same as current Setthathirath hospital, solid waste shall be separated into general and medical wastes, and then commissioned for periodic collection to VCOMS. Currently, it is separated by black and yellow plastic bags, but as other hospitals do, it is necessary to set classified waste boxes to advertise the importance of waste management to the general public.

Especially, medical waste that is put into plastic bags may lead to injuries caused by accidents due to needles or vial bottles.

Photo 1-3 Classified Waste Boxes (Mother-Children's Hospital)

Photo 1-4 Classified Waste Boxes (Mitaphap Children's Hospital)

③ Wastewater treatment

In the current wastewater treatment facility, wastewater of 120 ㎥/day is purified with BOD 20 ppm and discharged to the drainage in the premise. In this project as well, a bio-purification tank is required that can purify water with BOD 20 ppm.

As for medical wastewater, chlorine sterilization is to be carried out for 10 ㎥/day, and after that, it is treated in the neutralization tank, then water is merged and diluted with general wastewater for discharge. For this project, chlorine sterilization treatment is required. Also, if wastewater contains heavy metals, they cannot be flushed to sewages; instead, they should be collected individually, and then request VCOMS to collect them.

④ Security

In between the project building and the main existing building of Setthathirath Hospital, there is an internal road that runs from the front gate to the backside of the premise. The walking flow of patients and hospital staff to the project building will be crossing with the moving vehicle flow. In addition, a gate for emergency will be established at the eastern front of the new building. For crossing walking flow with ambulance approach to the emergency entrance, caution sign such as zebra pattern or road hump will be necessary for getting attention of drivers.

1-4 Others

(1) Estimation of population trends

Regarding the estimation of future population growth for studying the size of each components of the project, the yearly increase rate of 3.1% specified in the “The Project for Urban Development Master Plan Study in Vientiane Capital (Final Report Summary, March 2011, The Lao People’s Democratic Republic Public Works and Transport Institute, Ministry of Public Works and Transport, JICA) is used to estimate the patients number in 2022 which is the targeted year (3 years after project completion).

CHAPTER 2 CONTENTS OF THE PROJECT

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2-1 Basic Concept of the Project

2-1-1 Project Purpose

The objective of the Project is to improve the system to deliver medical services, and the undergraduate and postgraduate training environment quantitatively and qualitatively through the development of facilities and provision of equipment for Setthathirath Hospital in Vientiane Capital and Champasak Provincial Hospital in the southern region which are top-referral hospitals (high-level medical institutes in the region) and teaching hospitals. The Project is thereby expected to contribute to the improvement of the quality healthcare services and to strengthen health systems to achieve the Universal Health Coverage (UHC).

2-1-2 Project Outline

(1) Contents of the Project for Setthathirath Hospital

Setthathirath Hospital, which was constructed and equipped under Japanese grant aid in 2001, has been changing its needs and status of medical services for more than 15 years. These changes include increase of medical sub-specialty, changes in the number of patients, changes in types of surgery, changes in disease structure, and deterioration of equipment. The medical equipment has become inadequate for the spaces and specifications in the existing facility. In addition, the role of the hospital has expanded to not only providing high quality medical services but also to provide training for pre- and post-graduate medical students.

In order to improve the current situations mentioned above, the following assistances will be provided for Setthathirath Hospital.

- Relocate the functions of OPD (except for MCH, OBGY, rehabilitation, and endocrinology departments), ER and radiology department from the existing building to the new ER/OPD building.
- Renovate an operation theater in the existing building.
- Replace deteriorated equipment and provide sufficient ones.

	Current issues	Project contents
Outpatient dept.	• Medical service and clinical practice cannot be implemented propary due to narrow space. • The department is crowded due to increase of the MCH and OBGY patients. • The number of clinics has increased, and services are provided in improper extension spaces.	**Relocation of outpatient department** Construct a new building in the hospital premises, and relocate each department that diagnostic space is extended except for the departments of MCH, OBGY, rehabilitation, and endocrinology.
Emergency dept.	• Doctors and nurses are interfered their treatments due to crowdedness by narrow space. • The department does not have a capacity for treating many patients at same time. (in case of patients surge) • Work environment is poor, e.g. no staff room.	**Expansion of emergency department** Expand the emergency first-aid spaces, bed room, staff room, etc. with sufficient space according to the flow of emergency medical treatment to a new building. Furthermore, establish temporary isolation room for infectious diseases control.
Radiology dept.	• Staff movement and information exchange are inefficient because each examination devices is separately located in the hospital. • There is a need to be adjacent to the ER, and with relocation of ER, those function to be accompanied by relocating.	**Integration of radiation dept. (image diagnosis)** Concentrate exam functions on a new building wing and place them so that they can be reached by staff passages.
Operation dept.	• Number of operation theater is in short. • Non-regular operation theater is used due to shortage of rooms.	**Expansion of the department** Renovate the recovery room next to the existing theaters as a regular theater. Rearrange former ICU as a recovery room.
Existing equipment	• Appropriate medical service cannot be provided because of the following reasons. ➢ Equipment is aging. ➢ No capacity of repairing. ➢ The numbers are in short.	**Update equipment and to provide them if necessary** Update deteriorated equipment in existing facility. Also, set up necessary equipment for the departments which will be relocated to the new building.

Source: Summarized by the survey team

Fig. 2-1 Issues and Project Plan for Setthathirath Hospital

(2) Champasak Provincial Hospital

Champasak Provincial Hospital is the top referral hospital of the four provinces in the south region. The hospital is recognized as the final destination in this region because it is located far from the central hospitals in Vientiane Capital. However, the hospital cannot provide appropriate medical services due to insufficiency and inadequacy of existing equipment. Moreover, it has not been able to provide an appropriate environment for clinical trainings for health and medical students.

Therefore, by targeting the Champasak Provincial Hospital, a support will be given, mainly by providing equipment which is in short, especially, in order to the hospital enable to play a role as a regional hospital covering south.

- Provide image diagnostic examination apparatuses including CT scanner and X-ray unit.
- Replace deteriorated equipment in operation theater.
- Replace deteriorated equipment and the ones in short baesd on the needs of patients in ICU and CCU.

Current issues	Project contents
• Appropriate medical services cannot be provided due to aging and lack of equipment. • Opportunities for appropriate clinical trainings cannot be provided. • Therefore, it cannot fulfill the role of regional top referral.	**Maintenance of medical equipment** Especially provide the equipment related to image examination, surgery, intensive care which is in needs.

Source: Summarized by the survey team

Fig. 2-2 Current Issues of Champasak Provincial Hospital and Project Contents

(3) Soft Component

In both hospitals, the same issues were raised by the hospital staff for maintenance: namely, that they cannot properly maintain or repair the equipment because there is no information of the status or location of the equipment due to no record of registration, administration or repairing history. To improve conditions regarding the above issues and utilize the planned equipment efficiently, a training will be planned with the purposes of capacity building on medical equipment maintenance with appropriateness and safety, and acquisition of the necessary knowledge on proper maintenance to maintenance staff and equipment users (doctor, nurse, and engineer).

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

(1) Basic policy for the facilities and equipment plan

This project will be planned based on the following policies including building construction and providing medical equipment for Setthathirath Hospital and providing medical equipment for Champasak Provincial Hospital, in order to achieve the project goals.

1) Basic policy for the facility design

- The building size shall follow medical needs and matched with its management.
- The plan shall ensure a highly durable facility as a part of public medical facilities by considering natural conditions.
- Universal design shall be adopted into the plan so that everyone can use it easily.
- The plan shall secure appropriate spaces for medical services and clinical trainings.
- The layout shall be considered for the relevance of each hospital functions in the building.
- The building shall be designed in sustainable size with current personnel.
- The new and existing buildings shall be interrelated.
- The plan shall put priority on sustainable components in management.
- The visibility shall be respected so that the building can be easily recognized as the Grant Aid from Japan.

2) Conditions for selecting the project target facilities

The components of the target facilities will be considered with the following conditions.

(Necessary conditions)

- The plan is related to improving the medical services currently provided.
- The medical service needs are confirmed.
- Personnel available for operation have been secured.
- New technology or personnel are not required.
- No overlapping with a feasible future plan on the Lao PDR side.
- No overlapping with other donor's assistance.

(Prioritized conditions)

- High urgency.
- Utilization as a place to provide clinical trainings.

3) Basic policy for equipment selection

Procurement of equipment in this project covers equipment that cannot fulfill its full function due to deterioration in existing medical services and equipment that is short for providing appropriate services. Major equipment users are the doctors, nurses, technicians (X-rays, clinical lab technicians etc.) at Setthathirath Hospital and Champasak Provincial Hospital. The specifications of equipment procured shall be set by taking into consideration the purpose of use, the operation and maintenance system, the users of procured equipment, the technical level in each hospital, economic efficiency, competitiveness at procurement, and the like. The selection policy of planned equipment is listed below.

- Equipment necessary for recovering the functions of the target hospitals.
- Equipment which is currently in short but in need for providing appropriate services.
- Equipment already used in the target hospitals and the hospital staff can operate with their current technical levels.
- Equipment which is easy to maintain.
- Equipment that can be repaired and maintained at local agencies.

(2) Policy for natural conditions

The facility plan focuses on comfortable and sanitary environment on the inside of the facilities, minimizing consumption of energy such as electricity, and protecting of the facilities against natural disasters. The following measures are taken particularly for soft soil and harsh natural conditions.

- Increase the indoor air volume inside the facilities to prevent the indoor temperature from rising. Also, set appropriate openings to secure natural ventilation and lighting.
- Secure comfortable indoor space by covering the building with louvers to block direct sunshine into the rooms.
- Reduce the maintenance and management burdens. For example, the elevator unit will be outside the scope of the plan for saving maintenance expense. People use the stairs and slopes to go between the floors. However, the plan will consider future installation of an elevator by Lao PDR side.
- The plan respects local life styles, religious rules, etc.

(3) Policy for Socio-economic Conditions

As the development of modern facilities has been advanced in the capital city due to the recent economic growth, the development of medical facilities has also been advanced under assistance from international organizations and development partners. Thus, the Lao people can compare and select hospitals and facilities that are will be attractive for patients, hospital employees and other users, and therefore, the facilities plan shall be made from a patient's point of view to ensure user-friendliness.

- The scale of facilities will be decided by considering accommodation of co-patients, because in Lao PDR, a few members of patients' family are usually accompany them.
- Set a layout of a new building which can be directly recognized from the site to reveal its presence to the general public, because the site faces a main road.
- Set gender-friendly bathrooms and staff lounges because many nurses and management staff in the hospital are female.

(4) Policy for construction situations / procurement condition

1) Policy for construction Condition

Vientiane City is located along the Mekong River which forms a boundary with Thailand, and has a lot in common with Thai language, culture and economy. Also in construction, Vientiane City depends on Thailand for technological capacity and procurement of materials and equipment, and there are many Thai materials and equipment suppliers and construction companies located in the city. As the city is inside the commercial zone of Thailand, it is considered that there is no problem in the procurement of high quality materials and equipment including heavy construction equipment. On the other hand, the number of master mechanics and engineers with high skill is limited.

2) Policy for procurement conditions

Three procurement options of equipment are available: namely Japanese products, local products and third country products. In Lao PDR, medical equipment such as CT devices, anesthesia apparatus and ultrasonic diagnostic equipment are not manufactured and so they are imported from Europe or Asia (Japan, China, South Korea, and other countries.).

The procurement of equipment of this project will be implemented from Japan in combination with third country products while utilizing the advantages of Japanese products for the following reasons:

- Equipment to be procured is not manufactured in Lao PDR.
- Equipment to be procured is either manufactured in Japan or can be procured in Japan.
- Among those to be procured, Japanese products are better in excellency of quality, endurance and reliability and they are also easy to use.
- If Japanese products and third country products are set as the equipment to be procured, fair competition will be ensured in bidding, transportation expenses and other appropriate costs will not be significantly high, and the aid efficacy will not be impaired.
- In order to avoid excessive specifications and poor quality and to expect long-term usability regarding the equipment to be procured, the country of origin of the equipment procured shall be a Development Assistance Committee (DAC, 30 counties) that consists of OECD member counties.

(5) Policy for recruiting local contractors

Utilization of procurement of materials and construction methods from Japan and third countries shall be considered regarding the special construction which is not common in the local areas. The reason is because higher construction accuracy and higher quality of materials and equipment in the construction of operation theater and installation work of medical gas systems, electricity and air conditioning systems is required for the hospital facilities under this project. Even in Vientiane City, the number of construction contractors with high technological capacity and order accepting capacity, and excellent

engineers and skilled workers is limited.

In order to obtain a permission of construction in Lao PDR, a domesticly registerd license of plan is required. Thus, in the process of developing a plan, a support will be sought by the local consultants who already have a license.

(6) Policy for Operation and Maintenance of the Implementation Agency

As for the maintenance and management of hospital facilities, inspections and repairs have been implemented by the electricians, mechanical piping engineers, workers and other appropriate personnel in each hospital. Due to the limitation in the budget, the normal repair works are limited to minor items. If any repair of generator, pump or air conditioning apparatus is necessary, it is being requested to a manufacturer or agent each time. In this project, maintenance and management of facilities will be implemented based on the daily operation and inspection by the engineers and staff under these terms.

Major expenses incurred by maintenance and management of facilities include repair of facilities (painting, repair of mortar walls, replacing of tiles, piping, wiring, etc.), maintenance expenses for systems and facilities (pumping out of a septic tank, cleaning of an elevated tank and a water receiver tank, replacing of air conditioning filters, etc.), cleaning for normal maintenance and management, etc. In the facility design, it is necessary to devise ways to minimize the maintenance and management expenses.

(7) Policy regarding Facility/ Equipment Grade

1) Facility

This project is the expansion of the hospital completed in 2001 through Grant Aid from Japan. Basically, the quality shall not be significantly different from existing hospital building.

2) Equipment

Grade of equipment to be procured shall be selected with following conditions:

① Equipment manageable by the users of the target hospital with their technical level.
② Equipment commonly used in the hospitals in Lao PDR.
③ Equipment that maintenance services can be provided by service agencies in Lao PDR or the neighboring countries.

(8) Policy for Construction/ Procurement Methods and Construction Period

1) Construction Method

Basically, the construction methods that can be performed by local contractors and engineers shall be adopted. However, construction methods of Japan or third countries will be adapted for special

construction works based on the necessary specifications for the hospital facilities such as finishing of theater or roof waterproofing.

2) Procurement Method

There are many experienced agents in Vientiane City and procurement including high quality products or after-sales services is available. Basically, equipment for which after-sales services are available shall be selected to ensure the procurement of products that can be used in a stable manner after providing them.

Equipment to be procured under this project shall be mainly selected from Japanese products. In case it is determined that competitiveness in bidding, capacity of local agents or other appropriate matters cannot be secured due to the limitation to Japanese products, procurement from third countries shall be taken into consideration.

3) Construction Period

Construction schedule shall be examined in consideration of avoiding the earthworks and piling in the rainy season from May to September. As for the renovation work inside of the existing hospital, it needs to be implemented in parallel to provide the medical services in the existing hospital. Therefore, work in the night and early morning shall be considered. Also, safety of user flow-lines including the ones for patients shall be carefully considered and well secured. Safety shall be prioritized over construction efficiency when setting the construction period.

2-2-2 Basic Plan (Facilities Plan / Equipment Plan)

2-2-2-1 Overall Picture of the Project

(1) Scope of the project

As a result of selection of the target facility components under this project according to “2-2-1 Design Policies (1) Basic policies for the facilities plan 2) Conditions for selecting the project target facilities”, the facilities and equipment to be provided for Setthathirath Hospital and for Champasak Provincial Hospital are listed in the table below.

Table 2-1 Scope of the Project Target Facilities and Equipment

Project target facilities	Major components
I. Setthathirath Hospital	
• Construction of the new ER / OPD building	New building (ER, OPD, Radiology Department, Administration Department), Annex building, Connecting Corridor, ER Gate
• Renovation of the existing building	Fix up a new operation theater
• Procurement of medical equipment	**(For Existing Hospital Building)** Operation Table, Operation Lamp, Electric Scalpel, Anesthesia Unit, Delivery Table, Ultrasound Unit, Syringe Pump, Bedside Monitor, Washing Machine, Body Refrigerator, etc. **(For the New Emergency/ OPD Building)** CT Apparatus, General X-ray Unit, Fluoroscooy, Mammography, Ultrasound Unit, Ventilator, Anesthesia Unit, Defibrillator, Endoscope, Electroencephalogram (EEG), Dental Chair, Lens Meter, Stretcher, Infusion Pump, Centrifuge, etc.
II. Champak Provincial Hospital	
• Procurement of medical equipment	CT Apparatus, General X-ray Unit, Operating Table, Operation Lamp, Electric Scalpel, Ventilator, Bedside Monitor, Ultrasound Unit, ECG, etc.

Source: Summarized by the survey team

(2) Contents of improvement for Setthathirath Hospital

Based on the basic plan policies, functions of each department in Setthathirath Hospital are rearranged and the review result of the necessity of improvement is as shown in the table below.

Table 2-2 Functions and Necessity of Improvement in the Setthathirath Hospital

Department		Function	Overview	Facility	Equipment	Reasons for the improvement
Health and medical services	Outpatient	Outpatient clinic	18 clinics (increased by 7 clinics from the establishment) Number of annual outpatients: 72,879 cases in 2016 (excluding emergency outpatients)	○ △	○	High urgency of improvement to install consultation rooms scattering in the hospital or service providing systems, etc. High necessity in improving the flow line of medical services in whole hospital areas. Equipment of established time in 2001 needs to be updated since they have already become deteriorated. They lack reliability of quality and accuracy of diagnostic services.
		Health check-ups / Health instruction	In addition to free MCH services, nutrition or family planning education, vaccinations, etc. are offered. Majorly MCH is charge of. (Nutrition guidance is also provided in the Endocrinology dept.).	△	○	Due to a rapid increase of patients in MCH and OBGY, renovation of north-wing of the existing building will be held to expand their spaces. This work will be conducted by Lao PDR side because of its small size and ordinary level of the work. Existing equipment becomes deteriorated and the necessity for renewal is high.

Department		Function	Overview	Facility	Equipment	Reasons for the improvement
	ER	ER	The ER patients are over 20,000/year, mainly for diseases of mid-medical level or the lower. Annual patients: 20,576 cases (in 2016)	○	○	In addition to the estimated future increase of ER and referral cases due to trauma by traffic accident or non-communicable diseases (NCD), it is estimated to be difficult to respond the future needs with the present conditions. High necessity for expansion, as the existing spaces is narrow and impedes the provision of services. Most existing equipment is deteriorated. Also, the necessary equipment in ER is in short which needs urgent improvement.
	Clinic	Examination	Two locations: Biological exam room and analysis room	×	×	Already extended as the exam room installed in the inner court.
		Image diagnosis	CT and fluoroscopic apparatus are out of order and not available.	○	○	This is indispensable in the development of diagnosis service provision systems as the top referral hospital. Also, for coordination with ER, it will be allocated based on the location of ER. CT and X-ray unit are being in an unrepairable status. They are important equipment as hospital function.
		Operation	1,699 operations (2016). Mainly mid-medical level or the lower; such as appendicitis, ureteral stone, laparoscopic gallstone removal, cesarean section, hysterectomy, or oophorectomy etc.	○	○	Roughly 500 operations per o theater are the standard. Due to excessed number of operations performed 2 thaters, at least one more theater is required. Existing equipment is deteriorated and should urgently renewed. Shadowless lamp, operation table, anesthesia machine, electric scalpel, etc. are needed for an added theater.
	In-patient	Wards	11 clinics. Bed occupancy rate: 40- 50%.	×	×	With a little patient increase, there is a room for handling of future increase based on the occupancy rate. It is low that renovation or new construction is low.
		ICU	8 beds in the PPP ward.	×	○	It is well used. It has a little connection with ER or thaters, therefore, relocation is not required. Existing equipment needs to be updated as their usage term had expired.
Training	Education and research	Clinical training	Under-graduate and in-service trainings are conducted in the hospital facilities.	×	×	The space for training has already been secured in the hospital. On the other hand, space for clinical service such as examination rooms are narrow with 3-8 trainees and staffs entering at same time. Enough space is required on design of medical service area for clinical training.

Department		Function	Overview	Facility	Equipment	Reasons for the improvement
		Research	Number of doctors of research dept. is small. Collaboration with University of Health Sciences is on-going, though not active.	×	×	No independent research function at Setthathirath Hospital and no significant relevant achievement in research area. Necessity of project's involvement is not acknowledged.
Administration and management	Administration	Management (administration, accounting)	Reception and payment counters be installed in each dept.	○	×	Due to relocation of OPD and ER to the new building, a new administration counter with minimum function is required.
		Welfare	Several cafeterias and shops, including outsourced services to a private sector. No hospital meal service for IPD patients, their family prepares or purchases foods outside for the patients.	×	×	It is not included in the hospital establishment standards of Lao PDR. As this depends on a local custom, the urgency of improvement is low.
	Services and supply	Pharmacy	Pharmacy exists in each department and drugs are provided based on the prescription.	○	×	Due to relocation of OPD and ER to the new building, new administration and pharmacy counters with minimum functions are required.
		Sterilization and laundry	The service is provided in the hospital.	×	○	As the service provision is not sufficient due to failure of equipment, replacement of equipment is required.
		Garbage and waste management	Medical wastes are collected and treated by the contractor.	×	×	This can be handled by the current service and the need of improvement is low.
		Maintenance and control	Electricians and mechanical engineers belonging to the maintenance department conduct regular maintenance and administration for the facilities and equipment. Complicated repair of equipment is outsourced to agencies.	×	×	It will consider soft component aimed at improving maintenance skill for maintenance personnel to properly and safely maintain and manage equipment.

(Legend) ○：Scope of Japan △：Scope of Lao PDR ×：Out of target scope

Source: Summarized by the survey team

1) Contents of the project and its target facilities in Setthathirath Hospital

The functions of the target hospital of this project are classified into: ①OPD; ②ER; ③Image diagnosis; ④Surgery; and ⑤Administration and Pharmacy. Major content of each function is described below.

① OPD

Most of the all existing OPD clinics will be the target of the project, except for rehabilitation department where has been already established as an annex of the hospital and it provides services under an adequate environment. Also, Endocrinology department (Diabetes Mellitus (DM) department) will not be covered because new DM center building has been under construction in a hospital premise. Also, as patients to MCH and OBGY occupy approximately 40% of the total outpatients excluding the ones of ER, and these two departments provide many associated health care services (ultrasonic diagnosis, blood sampling, urine sampling, family planning guidance, etc.), a wide space is required to provide such services. It is also difficult for pregnant women, babies, and little children to take the stairs; therefore, these two departments need to be located on the ground floor (the 1st floor) and expansion of the space shall be implemented by renovating the existing north wing (approximately 1,244 m^2).

All the OPD departments except for MCH and OBGY and Rehabilitation departments shall be relocated to the new building.

Table 2-3 Rearrangement of OPD Clinics

OPD clinics to be relocated to the new building	Internal Medicine, Pediatrics, Ophthalmology, Ear, Nose and Throat (ENT), Dental, Pneumology (Infectious Disease), Gastro and Intestinal Medicine, Hematology and Oncology, Surgery reconsultation, Pain Clinic, Cardiology, Allergy, Neurology
OPD clinics to be remained after the renovation of north wing in the existing building	MCH and OBGY
OPD clinics to be operated in annex of the hospital	Rehabilitation, Endocrinology (New building is under construction September 2017 and expecte completion in 2019).

Source: Summarized by the survey team

② ER

Based on the scope / level of current ER services, it will be relocated to a new building. “Narrow” space, which is a current problem, will be expanded to ensure smooth flow line and spacious area as a clinical fieldwork site. Additionally, as Setthathirath Hospital is positioned as a top hospital to treat infectious diseases, and so temporary isolation beds for emergency patients with infectious diseases will be installed. Furthermore, working environment for employees is taken into consideration by installing a standby area, shower, changing room, or conference room to set up the 24-hour emergency care system as well as to expand the space for providing medical services. The components to be arranged in the ER are listed below.

Table 2-4 Components of ER

Emergency triage / Emergency bed room / Resuscitation room/ Small surgery room/ Doctor and Nurse station / Temporary isolation room for infections /Pharmacy and Payment counters / Staff room / Conference room, etc.

Source: Summarized by the survey team

③ Image diagnosis

CT and X-ray fluoroscopy that are not used presently are highly required for essential functions to improve diagnostic service level of Setthathirath Hospital. These apparatuses will be arranged at a location close to the ER in the new building to provide quick exam and diagnosis.

Also, functions of the Radiology department will be collectively arranged so that the staff of the department can gather in one place to improve the efficiency in the work system such as consultation of diagnosis, operation and recording. The components included in the Radiology department are listed below.

Table 2-5 Component of Radiology Department

CT scan room / General X-ray room / Fluoroscopy room /Mammography room / Ultrasonic diagnosis room(general) / Control room / Reception and administration coutners, etc.

Source: Summarized by the survey team

④ Operation

The existing recovery room next to theater No.2 will be renovated as the 3rd theater.
Accordingly, the place currently used for temporary patient beds in Pediatrics will be reused as a recovery room. Piping such as medical gas, air conditioning ducts and electrical cables will be newly installed as separate systems from the existing ones.

⑤ Administration and Pharmacy

Accompanied by the ①OPD ②ER, and ③Radiology department (Image diagnosis) to be secured in the new building as described above, associated functions of hospital administration including triage, reception, payment, insurance counter and pharmacy will be accommodated.

2) Planned equipment of Setthathirathh Hospital

Planned equipment for Setthathirath Hospital will update deteriorated equipment and fulfill insufficient equipment for both an existing and a newly constructed building.

① Contents of planned equipment for existing hospital building

Table 2-6 Contents of Planning Equipment of Existing Building

Clinics	Needs	Major equipment
AICU (PPP)	Already passed its service life and equipment necessary for ICU are not in place. Therefore, clinical information of patients insevere conditions cannot be adequately managed and treated, and thus urgent updating s required.	Suction device, syringe pump, bedside monitor, nebulizer, infusion pump, mobile ultrasound unit, etc.
NICU & PICU	Infusion pump, pulse oximeter, resuscitation set are not in place and patient monitoring have not been done properly. Continuous monitoring and treating newborns or children are necessary function of ICU, needs to be updated urgently.	Phototherapy machine, syringe pump, ventilator, bedside monitor, incubator, infusion pump, pulse oximeter, resuscitation set for newborns etc.
Theater	Operation tables, operation lamps, and electric scalpels have been used for renewal because their service term had expired. It is necessary to renew as safe and precise surgery cannot be performed by using existing equipment. In addition, one new operation room is added, the necessary equipment for this room needs to be procured.	Operation table, defibrillator, suction device, stretcher, electric scalpel, anesthesia machine, infusion pump, operation lamp, blood warmer, instrument cargo.
Delivery	Most equipment is in use for more than 10 years or has its inconvenience donated by development partners. It is necessary to provide patient-friendly equipmen.	Suction device, suctions delivery machine, delivery table, infusion pump, delivery monitor, exam table, infant warmer etc. shadow less light.
Gynecology clinic	The equipment used since hospital opening has already become deteriorated. Since there is anxiety about breakdown, urgent updating is necessary.	Examination table, examination lamp.
OBGY	Old equipment passed its servicelife still in use. Syringe pump, infusion pump, and mammography are not in place. It is necessary to equip them because it is impossible to diagnose or treat breast cancer with such deteriorated equipment.	Ultrasound unit, syringe pump, infusion pump, mammography
MCH	Only the equipment that measures the heart sound of the fetus is functioned. It is necessary to provide necessary equipment to diagnose the condition of the fetal condition and the timing of delivery.	Ultrasound unit, delivery monitor, fetal monitor
Laundry	It is currently using that were installed in 2001. Frequent failures occur, obstructing washing work during repair.	Washing machine, dryer.
Morgue	The service terem has already expired. Due to deterioration, the cooling capacity is not sufficient and renewal is required.	Refrigerator for bodies.

Source: Summarized by the survey team

② **Contents of the planned equipment for the new building**

Table 2-7 Contents of the Planned Equipment of the New Building

Clinics	Needs	Major equipment
Internal medicine	It is using an ultrasonic diagnostic apparatus provided with support from France in 2001. Since the service term have already expired, renewal is necessary.	Ultrasound unit.
G.I.	The light-source part of endoscope has been set in 2002 and its service term has expired. Also, the endoscope is washed manually. Providing a new endoscope is necessary because the image is unclear and it has not been sufficiently washed after using it. In addition, a monitor is necessary to check the condition of the patient under examination.	Upper endoscope, auto-cleaning machine for endoscope, examination bed, bedside monitor.
ER treatment room	Equipment have been deteriorated. For surgery, it is sure that an electric scalpel and anesthesia machine are necessary.	Electric scalpel, anesthesia machine.
ER	The bedside monitor to check vital signs do not meet with number of beds, and the stretcher for emergency referral is not in use. In addition, patient condition is not monitored with any mobile ultrasound, pulse oximeter, glucose meter, etc. In addition, there is no drug refrigerator that should be placed in ER, and borrowing a refrigerator in a pharmacy a bit far from ER. Since it is absolutely necessary to monitor the patient condition in ER, early providing equipment is necessary. Drugs also supposed be available at fast hand in ER.	Bedside monitor, stretcher, infusion pump, respirator, nebulizer, mobile ultrasound unit, pulse oximeter, glucose meter, blood gas analyzer, chemical refrigerator.
Radiology	Mobile X-ray units necessary for radiology department are not in place and only one old - style X - ray imaging device is operating. Also, CT has not been in operation since 2011, and fluoroscopy has not been in operation since 2012 due to breakdown. Diagnostic imaging equipment is obsolete and cannot make a clear diagnosis and it is urgent to renew equipment.	Mobile X-ray units, general X-ray unit, CT scanner, fluoroscopy.
ENT	It still uses the equipment that moved from the old Setthathirath hospital that was located in the city. The service term has already expired and urgent update is necessary.	ENT treatment unit, audiometer, otoscope, head light, nasal mirror
Ophthalmology	Equipment is still in use that was brought from old Setthathilath hospital located in the city. It is already deteriorated and renewal is required as surgeries or diagnosis is not performed properly.	Surgical microscope, lens meter, slit lamp inspection device

Clinics	Needs	Major equipment
Neurology	Currently no equipment is available. Since it is not possible provide care, even patients of the nervous system visit there, and therefore it is necessary to provide equipment that enable to treat patients.	Electroencephalograph (EEG), electromyograph (EMG), transcranial doppler (TCD)
Laboratory (small)	Updating is necessary because equipment that has become deteriorated and its rotation speed and temperature cannot properly be set.	Desktop centrifuge, water bath, hematocrit centrifuge
Dental	Dental chair in around 2000 donated by Japanese University, a X-ray unit made in 1998 is in operation. The service term has deteriorated and needs to be renewed.	Dental chair, dental X-ray unit
Internal medicine / pediatrics	It is using deteriorated equipment that was provided through grant aid and needs renewal.	Adult weight scale, nebulizer

Source: Summarized by the survey team

(3) Contents of the target project in Champasak Provincial Hospital

1) Planned facilities of Champasak provincial hospital

The facilities are not included in the project.

2) Planned equipment of Champasak Provincial Hospital

The planned equipment for Champasak Provincial Hospital will be the ones with high urgency and necessity and will be procured in order to support the hospital's role as the top hospital in the southern area.

Table 2-8 Content of Planned Equipment for Champasak Provincial Hospital

Clinics	Needs	Major equipment
Radiology	There are X-ray unit provided in 2005 and CT scanner that has not been operated due to malfunction since 2014. Because it is a problem that image diagnosis cannot be done in case of emergency due to machine's deterioration or failure, it is necessary to update.	General X-ray unit, mobile X-ray unit, CT scanner.
Theater	Motorized operating table installed in 2004 exists, but vertical adjustment of height or overturning are not functioning. Also, the shadowless lamp is out of serviceterm, and the lamp cannot be fixed reliably. Electric scalpels are also deteriorated, resulting normal operation has not been done in some cases. With surgery using existing equipment, safe and appropriate surgeries may not be performed, thus, it is necessary to renew them.	Operating table, operation lamp, electric scalpel, defibrillator.

Clinics	Needs	Major equipment
ICU	Only 2 ventilators (made in 2008) that are needed for patients in severe conditions exist, and one has already broken. No existing equipment of bedside monitor and blood gas analyzer. Since it is necessary to observe the patient conditions and treatment in ICU, it should update equipment.	Ventilator, bedside monitor, blood gas analyzer.
CCU	There is no existing electrocardiograph (ECG) and monitoring of patient condition is not possible. Also, ultrasound diagnostic equipment which has been more than 10 years had already deteriorated. Since it is impossible to capture the condition of the cardiology patients, it is necessary to renew the equipment as soon as possible.	ECG, ultrasound unit.

Source: Summarized by the survey team

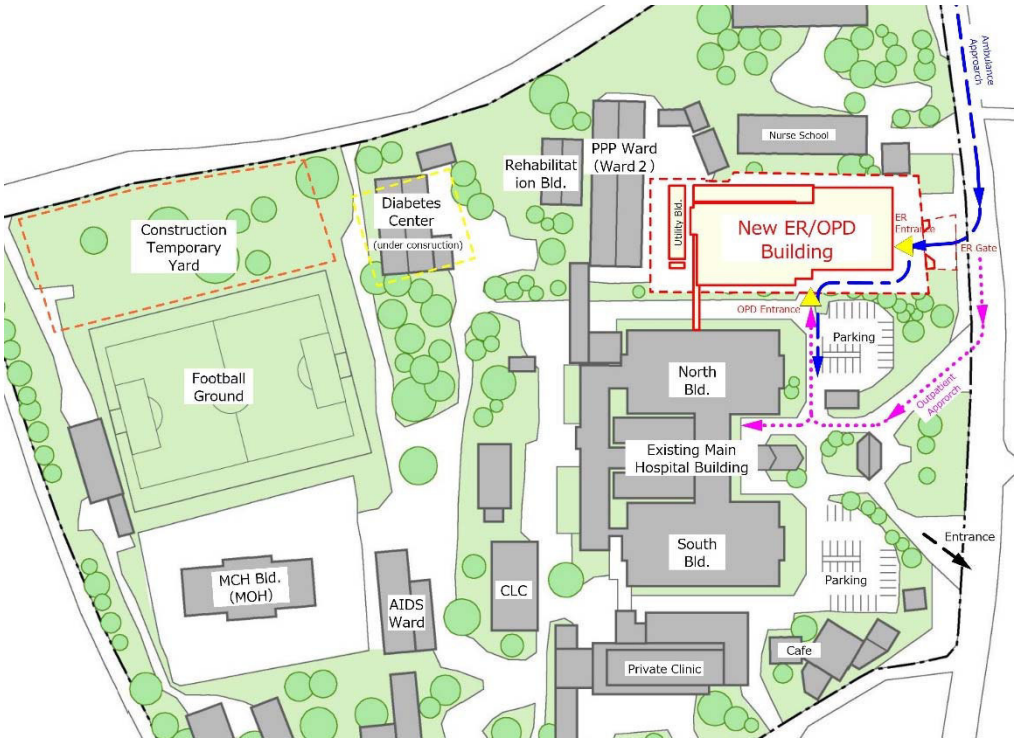
2-2-2-2 Site / Facilities Layout Plan

(1) Layout plan for the project facilities

The Setthathirath Hospital is located on a main road which is 15 km in the southeastern direction from the central part of Vientiane City. The construction site used to be empty land and it is currently used as an outdoor parking area within the hospital site. The site is flat land with an area of approximately 40m × 120m, surrounded by the nursing college on the north side, the PPP ward on the west side, an open side ditch to the south side, and by the main road on the east side.

The construction area of the project target facilities fully occupies the construction plan site, forming a rectangle with the long sides stretching from east to west. Two approaches to the facilities will be installed by separating access to the entrances respectively for ER (open for 24 hours) and for Outpatients. The entrance of ER allows direct approach from the main road on the front side, with a highly visible gate along the road to be easily seen from the road.

On the other hand, the approach to Outpatients will be available from the south side via the on-site road from the existing main hospital gate. Also, a connecting walkway will be established to connect to the existing north ward.



Source: Summarized by the survey team

Fig. 2-3 Layout Map of the New ER/OPD Building

2-2-2-3 Facilities Plan

(1) Component of the Planned Facilities

Layout of the target components in the new building is to be reviewed under the following conditions:

Table 2-9 Components of the Planned Facilities of New ER/ OPD Building

Planned component	Contents
ER / OPD building	
・Common Area	Entrance Hall, Waiting Hall, Corridor, Toilet
・ER	ER entrance, ER hall, ER Bed Room, Resuscitation room, ER Treatment room (Minor Surgery room), Isolation room, Doctor/Nurse Station, Consultation room, Conference room, Exchange room for Staff, Shower room, Casher, ER Pharmacy
・Outpatient Department	OPD Exam rooms (Intern medicine, Pediatrics, Cardiology, Pain Clinic, Neurology, Pneumonia(infections), Gastro-Intestinal Medicine, Allergy, Hematology & Oncology, Surgery Re-Consultation, Dentistry, Ophthalmology, ENT, Conference room, Day care room, Nurse station, Storage, etc.
・Radiology Department	CT exam room, General X-ray room, Fluoroscopy room, Mammographic exam room, Ultrasound exam room (General), Reception, Administration office, etc
・Administration Department	Reception/ Administration Office, Casher, Insurance counter, Pharmacy, Doctor and Nose room, Staff room, Storage, etc.

Planned component	Contents
Annex Buildings	Electrical room, Generator room, Medical-gas room, Water reservoir tank, Septic tank
Exterior Work	Connection corridor, Bridge, Pavement
Renovation of the Existing Building	Operation Theather-3, Partition wall

Source: Summarized by the survey team

(2) Layout plan

The target components for new building will be taken into consideration based on the conditions listed below.

① For quick access, ER will be allocated on the 1st floor (ground floor) and also in direct accessible location from the road in front of it. The turning space for cars will be also secured in front to the entrance of ER.

② As the Radiology department (Image diagnosis) needs to make a quick diagnosis on emergency patient's condition, the department shall be located next to ER and a flow line for direct access of a stretcher shall be secured.

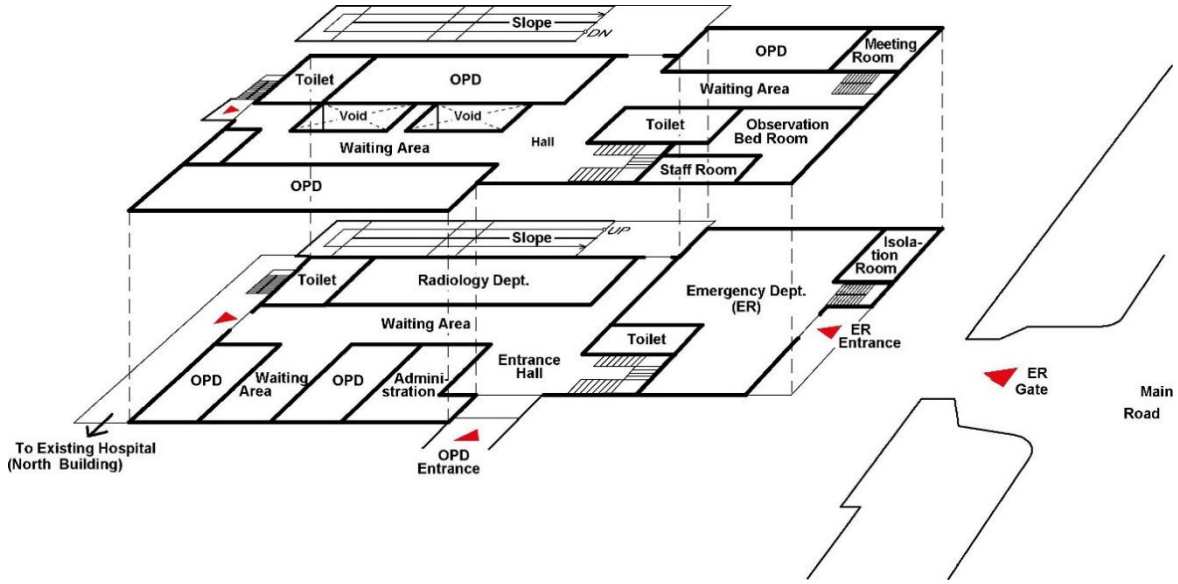
③ Among the OPD clinics, at least Pediatrics and Internal Medicine shall be located on the 1st floor so patients don't need to take the stairs.

④ The entrance of OPD shall be established by separating it from that of ER for safety and administration efficiency by dividing the flow line of vehicles and patients, and that of usual opening hours and out-of-hour-management.

⑤ A hall shall be established in the entrance of OPD, accommodating the administration functions such as triage, reception, payment, insurance counters, pharmacy, aiming to ensure the efficiency by using a one-stop line of flow for patients.

⑥ A waiting space shall be established on both the 1st and 2nd floors to provide comfortable space with good ventilation and lighting for patients. Also, enough space shall be secured so that temporary beds can be installed upon infectious disease outbreak such as Dengue or patient education and other events can be held.

⑦ As a public hospital, slopes shall be installed for elderly patients with physical difficulty, wheelchair users, malconditioned patients, so anybody is able to reduce burden in moving and to use it. As the building is only two-story and there is no urgency for movement to different levels, an elevator will not be covered by this project. In the case a need raises in the future, it shall be developed by the Lao PDR side.



Source: Summarized by the survey team

Fig. 2-4 Outline of the New ER / OPD Building

(3) Scale of the project target facilities

1) Number of consultation rooms required in OPD

Based on the prospected patient increase in the future, the necessary number or the consultation room is calculated.

The baseline is the patient in 2016 and the value of 2022 is calculated by multiplying population growth rate in Vientiane City. Then, the number of specialized doctors will be reconfirmed and the feasibility and validity of operation shall be assessed.

As the usage of consultation room varies by clinics, the rooms shall be secured according to the current usage in Dental, ENT, Ophthalmology, Gastrointestinal Departments (dual establishment of consultation and exam rooms, use of integral space for several booths, etc.).

The basic unit size of consultation room shall be set as 3.1m (from current 2.3m) in width to secure the space not too narrow for furniture and equipment installation and entry of students.

Table 2-10 Calculation of the Number of Examination Rooms in OPD

	D	CN	TN	t	Xn	Xp	
Clinics	No. of doctors	No. of outpatients in 2016	No. of target outpatients in 2022	Consultation time (min.)	No. of necessary rooms	No. of examination rooms required	Remarks
Maternal and child health department (MCH)	5	23,365	27,899	15	6	(6)	It will be renovated by Lao PDR side. There are enough doctors as gynecologists also provide support to MCH.
Pediatrics	3	2,876	3,434	20	2	2	
Internal medicine	5	6,705	8,006	15	2	2	
Dentistry	9	2,009	2,399	30	2	1	Secure a space for three dental chairs same as the current status. Dental X-ray room, dental laboratory attached.
Ophthalmology	1	2,529	3,020	15	1	2	Patients decreasing due to 2 doctors' studying abroad so value of 3,024 in 2014 was uses as maximum number in past three years. The calculation showed 2 rooms are needed. One doctor will be transferred from Ponsari province to this hospital until the doctor studying abroad returns in 3 years. Furthermore, one treatment room with simple surgery shall be attached.
ENT	4	3,661	4,371	20	2	2	One treatment room attached to simple surgery.
Rehabilitation	-	1,530	1,827	30	1	0	Not covered due to established already in a separate building.
Pneumology (infections)	3	6,732	8,038	15	2	2	
Gastro and intestinal medicine	4	5,272	6,295	15	2	2	An endoscopic exam room shall be attached in each for upper and lower unit.
Hematology & Oncology	2	1,917	2,289	20	1	2	2 rooms needed to treat blood cancer and others (gastrointestinal, lung, laryngeal cancer).
Endocrinology (Diabetes)	1	1,966	2,348	15	1	0	It is not covered because the Ministry of Health is constructing a separate building.
Surgery re-consultation	4	2,134	2,548	20	1	1	
Gynecology	10	6,770	8,084	20	3	(3)	It will be renovated in the existing building by Lao PDR side. The doctors also provide services MCH.
Cardiology	2	4,056	4,843	15	2	2	
Neurology	1	854	1,020	30	1	1	
Allergy	1	301	359	15	1	1	

	D	CN	TN	t	Xn	Xp	
Clinics	No. of doctors	No. of outpatients in 2016	No. of target outpatients in 2022	Consultation time (min.)	No. of necessary rooms	No. of examination rooms required	Remarks
Pain clinic	6	202	241	30	1	1	
ER	5	20,576	24,569	―			
Total		93,455	111,590				
Total excluding ER		72,879	87,021		31	30 (9)	9 rooms requied for MCH and OBGY will be cared by Lao PDR side. Therefor, the project will cover 21 examination rooms.

Source: Summarized by the survey team

(Conditions for calculating the number of necessary examination rooms)

・Hospital operation days per year: 260 days

Closed on Saturdays and Sundays, and opened from Monday to Friday for 5 days a week. 365 days ÷ 7 days = 52.14 weeks, 52 × 5 days = 260 days, and 260 days a year.

・ Hospital opening hours of the day: 4 hours

OPD clinics provide services only in a morning from 8:00 to 12:00. Due to local practice, most patients come in the morning and almost no patients in the afternoon in the hospital. Also, since the doctors engaged in surgery or providing care in IPD ward in the afternoon, actual OPD opening hours are only in the morning. However, only for MCH and OBGY, there are many women who come to the hospital with their husbands after the work of the husbands, and due to this circumstance, the service hours are extended in these two clinics. Therefore, for these two clinics, 1 hour is added, making it 5 hours.

・ In case, the number of exam room exceeding the number of doctors will not be considered.

・ Annual population growth rate of Vientiane Capital: 3.0%

Referred to the summary of the final report of Lao PDR "Capital Vientiane Urban Development Master Plan Formulation Plan" published in 2011.

・Target year: 2022

Planned completion (Handing over) of the project is assumed at the end of 2019. The evaluation period shall last for three years after the completion date, i.e., 2022.

・Calculation formula for required number of examination rooms

Required number of examination rooms =

Number of outpatients at target year (Xp) ÷ Annual hospital opening days (260 days) ÷ Rotation number of patients per day (R)

(Rotation number of patient per day (R) = number of service hours per day × 60 minutes ÷ average consultation time (min))

2) Short-time care bed room

The beds room will be prepared for patients requiring temporary rest and observation after cancer treatment (Hematology and Oncology), endoscopy (upper and lower), pain clinic, consultations in Pneumology, Ophthalmology, ENT, Neurology, Pediatrics, Internal Medicine or intravenous drip (IV), etc. A nurse station will be arranged next to it to observe patients.

Table 2-11 Number of Beds Required in a Short-time Care Room

	A	B	A*B／4hours
Clinics	No. of patients needs short-time care	Average time for admission	No. of necessary bed
Gastroscopy and endoscopy (upper and lower)	3	2	1.5
Chemotherapy (Hemato-Oncology)	6	3	2.25
Pain clinic treatment	1	2	0.5
Pneumology treatment	1	3	0.75
Ophthalmology a day-operation	1	3	0.75
ENT treatment	1	3	0.75
IV in Internal Medicine, Peds	2	2	1.0
Elderlies, patient in mal-conditioned, rest in between plural exams	4	1	1.0
Total(beds)			8.5

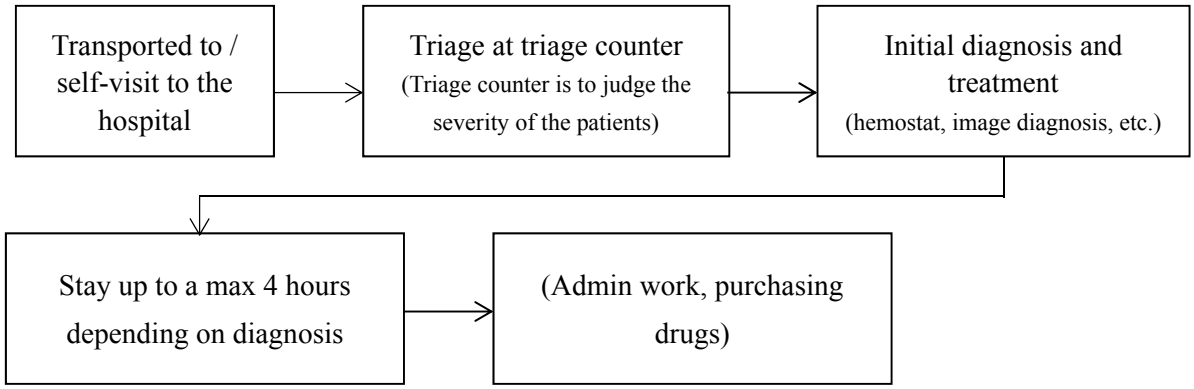
Source: Summarized by the survey team

Number of beds is calculated from daily patient number of each clinic and average time of stay. If the occupancy rate is considered as 70%, it will be 8.5 beds x 0.7 = 5.95 ≒6 (beds).

3) ER

Necessary space will be secured according to the flow of ER services to avoid inconvenience in emergency care. Sufficient space as a teaching hospital (with specialized ER physician program which is under planning by the Ministry of Health and NGO), which is not narrow for receiving residents and students, shall be secured. Also, an emergency gate separates to allow direct access by an ambulance from the front road shall be established separately from the existing hospital gate.

Flow of emergency medical service



Source: Summarized by the survey team

Fig. 2-5 Flow of ER Services in Setthathirath Hospital

① Calculation of the range of ER beds

The number of current ER beds is: 6 + emergency (resuscitation) care: 2 = 8 beds.
The average monthly ER patients in 2016 is 1,824 / month which can count as 61/day. According to a hospital guideline, patients cannot say in ER beyond 4 hours. With assumption of each stay as max time 4 hours, 10 beds will be required with rationale that 8 ER beds + 2 emergency (resuscitation) care beds = 10 beds.
(In case ER patients in Setthathirath Hospital increase, sufficient number of beds can be secured as Mahosot Hospital has 10 and Mittaphab Hospital has 8 beds in their ERs)

In the records, patients reached 125/day at peak-time. From this number, the required beds can be calculated as 21. In an event of multiple occurrences of traffic accidents and other large-scale accidents, it is possible to arrange 21 beds by placing stretchers between beds.

Table 2-12 Calculation of the Required ER Bed Number

Required ER bed number (in average)	61 (patients/day) x 4 (hours) / 24 (hours) = 10 (beds)
Required ER bed number (at peak)	125 (patients/day) x 4 (hours) / 24 (hours) = 21 (beds)

Source: Summarized by the survey team

② ER Staff Room

Staff contaminated by emergency care, staff wash and change closes by going up to a shower room of the 2nd floor. This style is not ideal in terms of sanitary aspect since ER staff may have a small contact with admin staff and patients.

Shower and changing room will be arranged for male and female separately in order to improve the work environment for staff under a 24-hour operation system.

③ **ER out-of-hour payment counter and pharmacy**

A small payment counter and pharmacy will be established near the entrance/exit at ER to handle out-of-hour service after OPD is closed at 16:00.

④ **Temporary Isolation Room for Infectious Diseases**

As Setthathirath Hospital is recognized as the top hospital for infectious diseases and designated by the Ministry of Health to be referred to for severe patients with infectious diseases, a function for providing immediate isolation shall be established. Because there is no solid evidence to calculate the bed number, a minimum of 2 beds (2 rooms) is set to isolate several patients separately. The isolation room shall have its own entrance/exit to prevent secondary infection to other patients and staff.

4) Radiology Department (Image diagnosis)

Because size of equipment is almost the same in existing and the new facilities, the size of each exam room shall be almost same to the existing and will be placed to the 1st floor. The ultrasonic exam room shall also be the same size as existing in consideration with three general ultrasonic diagnostic devices to be set in the same manner as the existing one, and layout of patient beds, ultrasonic diagnostic devices, chairs and furniture for technicians, and equipment. In addition, as a new mammography unit will be provided, and a standard exam room only for this will be arranged.

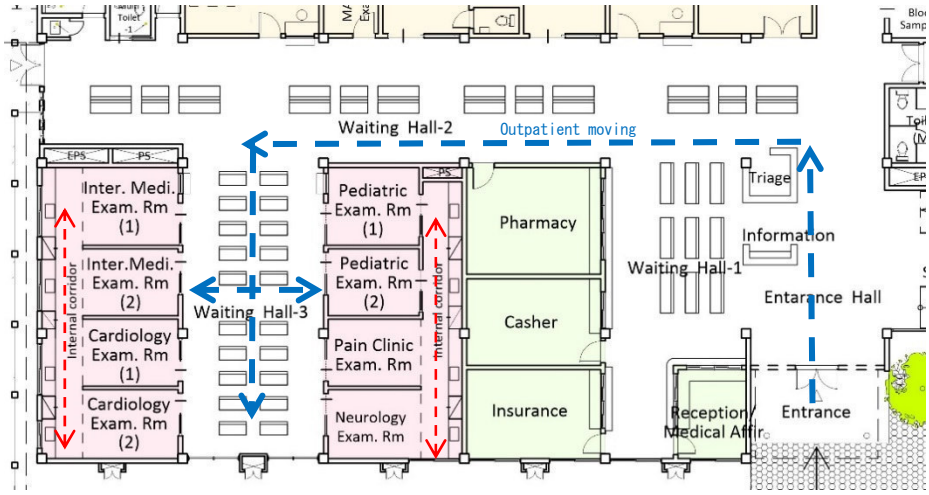
5) Administration / Pharmacy

The triage, reception, payment, and insurance counters and pharmacy corresponding to the number of staff and functions will be arranged facing the entrance hall.

(4) Floor Plan

1) Floor plan of outpatient department

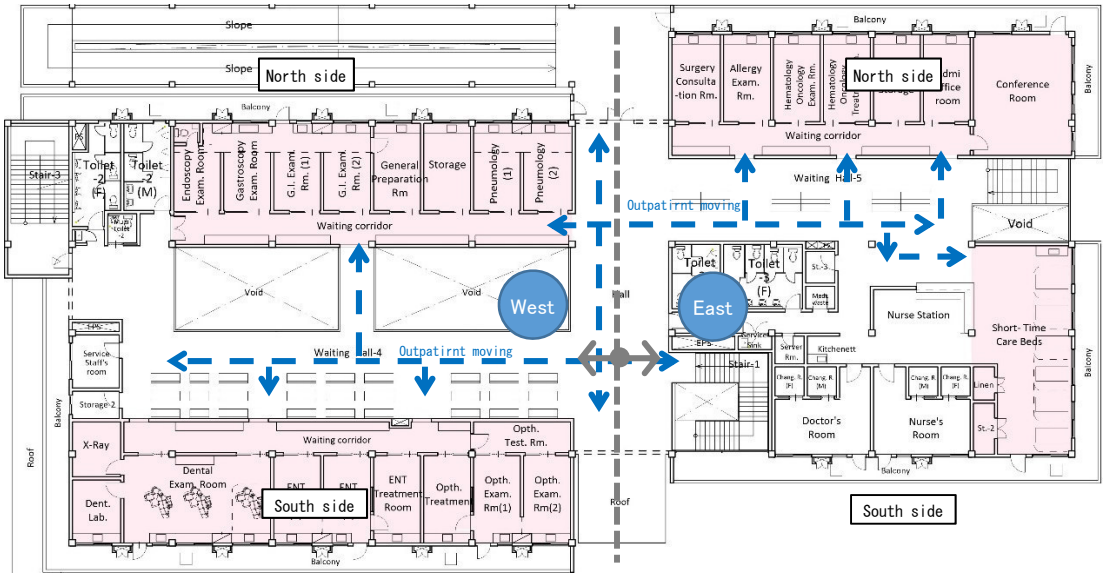
The OPD is located on the first and second floors., and on the first floor, clinics shall be arranged for patients who are have difficulty to move up and down. The consultation rooms shall be arranged side by side on both sides of a waiting hall, as well as internal waiting rooms and each examination room that can be entered directly from those internal waiting rooms. Clinics for Internal Medicine, Pediatrics, and Cardiovascular departments shall be placed whose to accommodate major patients in weak condition such as children and elderly. Also Pain Clinic (anesthesia treatment) and Neurology shall be arranged for patients with severe pain.



Source: Summarized by the survey team

Fig. 2-6 Plan of Outpatient Department at 1F

The OPD on the second floor is divided into four groups, centering around the main stairway area and dividing the western part into two, and another division of two for the east side into two north and south as well. On the southwest side, consultation rooms for dental, ophthalmology, and ENT shall be arranged, and as for the north side, a consultation room for gastrointestinal clinic, laboratory and pneumology shall be placed. On the northeast side, surgery reconsultation and chemotherapy under Hemato and oncology, storages and admin offices shall be arranged side by side. A conference room shall be arranged for exchanging opinions or having meetings for staff at the eastern end. On the southeast side, it shall be placed a day care room for patients to rest after treatment and examination along the east side wall, with a nurse station near its entrance. Furthermore, on the back side, staff room, storage and small kitchen shall be arranged in consideration so the flow lines of staff are efficient.

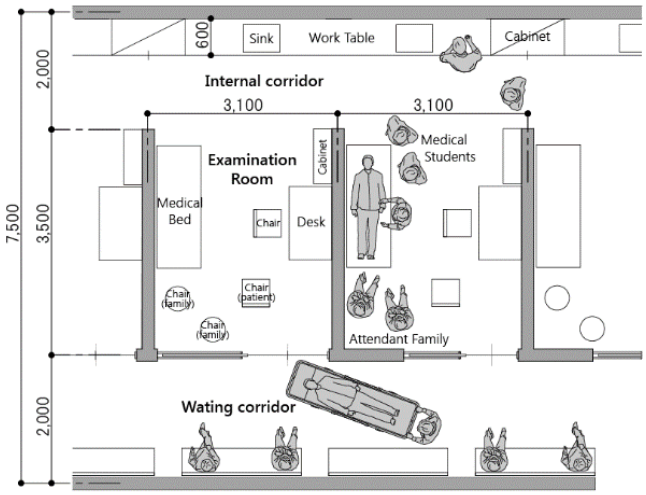


Source: Summarized by the survey team

Fig. 2-7 Plan of OPD at 2F

(Floor plan of the standard exam room)

While arranging furniture (exam desks, chair, bed, patient chairs, and cabinets) and other equipment for exam with doctors, nurses, students, patients and their families there, core walls shall be 3.1m width by 3.5 m deep since the flow line does not conflict and enable to secure the appropriate size for fieldwork to be conducted. Basically, the rooms shall be arranged side by side, connected by the staff passage to the back of them, the same arrangement as the existing ones where the sink stands along the outer wall. For the endoscopy room, the entrance shall be made large so that the patients can be transferred by stretchers.

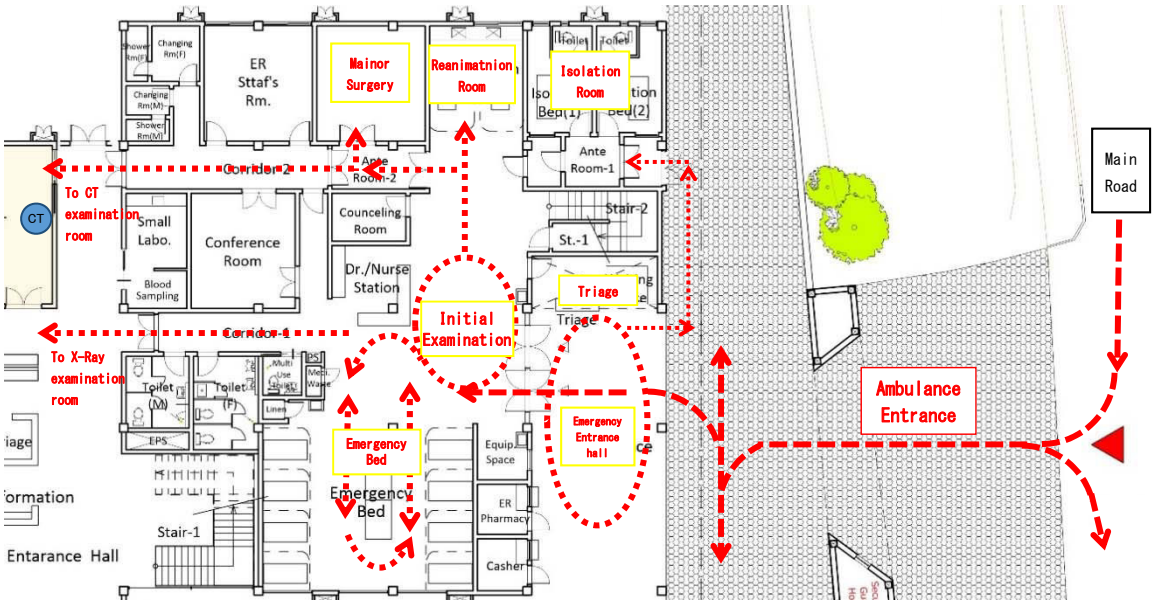


Source: Summarized by the survey team

Fig. 2-8 Plan of Examination Room

2) Floor plan of the ER

The ER should have an entrance and exit facing the east end of the facility so that it can approach directly from the main road on the east side of the hospital. The ambulance enters the ER entrance hall of Piloti and the immediate transfer by stretcher will be possible. Since the inside is full of stretchers, equipment, patients and co-patients, health staff people in and out, it is necessary to have enough space near the entrance so that complicated flow lines will not get crowded. Although initial examination and treatment is here, patients will be transferred to various places. In addition, from ER to the CT or X-ray exam rooms of the radiology, it is considered carefully that they are in a linear position so that they can be accessed quickly when necessary.

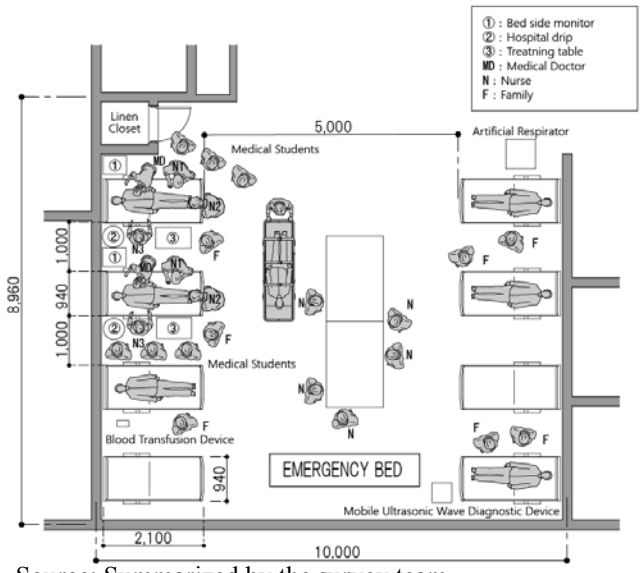


Source: Summarized by the survey team

Fig. 2-9 Plan of Emergency Department

(ER bed room)

It shall be secured with enough space so that the flow line of staff is smooth which does not hamper the practices of doctors and nurses. Total of 8 beds shall be prepared by arranging 4 beds in parallel. The spaces in between the rows shall secured a width of 5 m because transfer by stretchers and training are conducted at the same time (the same size of ER in Mahosot hospital).

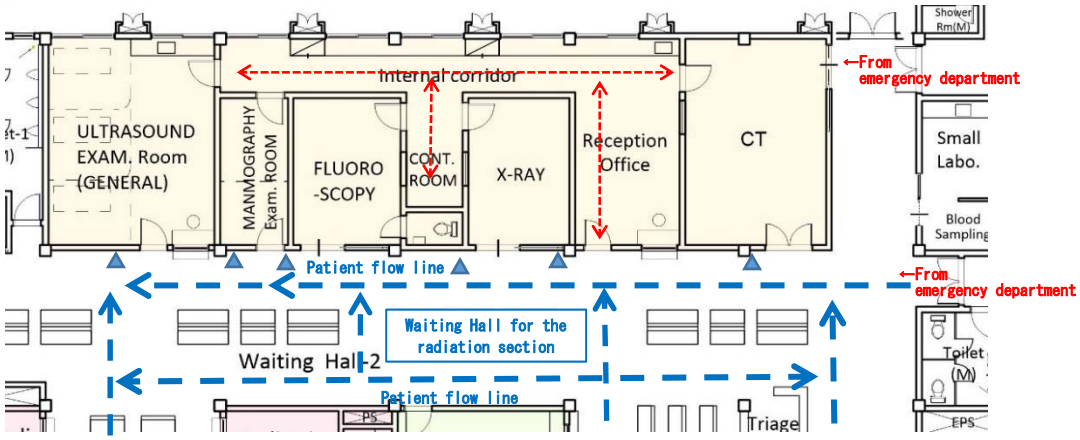


Source: Summarized by the survey team

Fig. 2-10 Plan of Emergency Bed Room

3) Floor plan of radiology department (image diagnosis)

The radiology department shall be located adjacent to ER on the north side of the first floor to respond to an urgent diagnosis of ER. In particular, the CT examination room should be located near by the emergency department. Each exam room is arranged side by side, and patient enters from the waiting hall also use as a corridor, while the back side of the laboratory, a staff passage shall be arranged for staff to allow staff to come and go as business flow line.

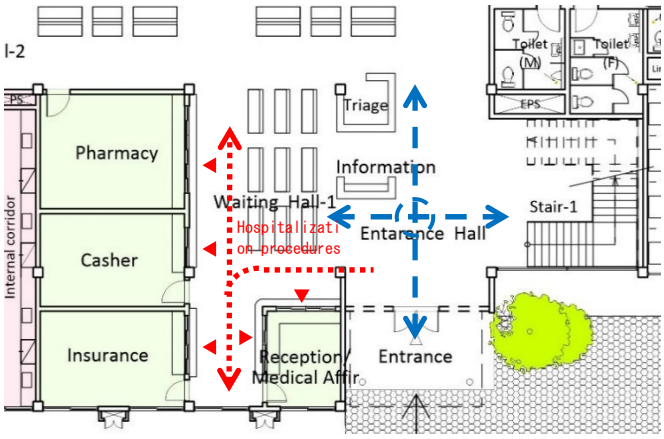


Source: Summarized by the survey team

Fig. 2-11 Plan of Radiology Department

4) Floor plan of the management department

The management section shall face the hall just outside the entrance of the OPD so that all patients visiting always face it. Patients go through the process of reception, insurance pharmacy and payment before or after the consultation, so each counter shall be placed aligned with one section facing the entrance's waiting hall to enable all procedures can be processed in one place.



Source: Summarized by the survey team

Fig. 2-12 Plan of Administration

(5) Floor Area Required

Components and area of the facilities which is ER/OPD under the project are listed below.

Table 2-13 List of Components in the New ER/OPD Building

Major Components		No. of rooms/space	Room Size (m^2)	Subtotals (m^2)
A. New ER/OPD Building				
1st Floor				
1. ER Department				
1-1	Emergency hall (Piloty)	1	80.60	80.60
1-2	Emergency triage	1	15.00	15.00
1-3	Emergency hall	1	79.78	79.78
1-4	Reanimation room	1	22.95	22.95
1-5	Emergency bed room	1	87.78	87.78
1-6	Doctor/Nurse station	1	13.32	13.32
1-7	Minor surgery room	1	28.60	28.60
1-8	Isolation room	2	16.24	32.48
1-9	Ante- room 1	1	16.00	16.00
1-10	ER Staff room	1	28.60	28.60
1-11	ER Staff changing room (F)	1	6.60	6.60
1-12	Shower room (F)	1	3.30	3.30
1-13	ER Staff changing room (M)	1	3.41	3.41
1-14	Shower room (M)	1	2.64	2.64
1-15	ER Conference room	1	27.50	27.50

Major Components			No. of rooms/space	Room Size (m^2)	Subtotals (m^2)
1-16	ER Casher		1	6.50	6.50
1-17	ER Pharmacy		1	6.25	6.25
1-18	Equipment space		1	6.25	6.25
1-19	Medical waste stock		1	1.34	1.34
1-20	Counseling room		1	8.64	8.64
1-21	ER Storage-1		1	5.76	5.76
1-22	ER Linen		1	1.32	1.32
1-23	Multi-purpose Toilet		1	4.00	4.00
1-24	Toilet (F)		1	14.40	14.40
1-25	Toilet (M)		1	10.85	10.85
1-26	Corridor& others		1	24.25	24.25
				Subtotal (㎡)	538.12
2. Radiology Department					
2-1	CT scan room		1	39.00	39.00
2-2	General X-ray room		1	20.52	20.52
2-3	Fluoroscopy room		1	24.57	24.57
2-4	Control room for X-ray		1	8.91	8.91
2-5	Mammography room		1	14.04	14.04
2-6	Ultrasound room		1	45.75	45.75
2-7	Admin for radiology		1	21.06	21.06
2-8	Internal corridor		1	34.65	34.65
				Subtotal (㎡)	208.50
3. Out-Patient Department (OPD)					
3-1	Pediatrics	Examination room	2	14.03	28.06
3-2	Internal Medicine	Examination room	2	14.41	28.82
3-3	Neurology	Examination room	1	13.40	13.40
3-4	Cardiology	Examination room	2	13.55	27.10
3-5	Pain clinic	Examination room	1	12.98	12.98
3-6	Laboratory (small)		1	10.80	10.80
3-7	Blood sampling room		1	5.70	5.70
3-8	Waiting hall	Waiting hall 2 including corridor	1	192.26	192.26
3-9		Waiting hall 3 including corridor	1	81.66	81.66
3-10	Internal corridor		1	48.34	48.34
				Subtotal (㎡)	449.12
4. Administration/Management					
4-1	Reception/Information office		1	13.12	13.12
4-2	Triage		1		—
4-3	Insurance reception		1	25.01	25.01
4-4	Pharmacy		1	29.89	29.89
4-5	Casher		1	24.40	24.40
4-6	Waiting hall-1	including corridor and triage	1	70.72	70.72
				Subtotal (㎡)	163.14

Major Components			No. of rooms/space	Room Size (m^2)	Subtotals (m^2)
5. Public Space					
5-1	Entrance hall		1	72.50	72.50
5-2	Stairs-1		1	40.95	40.95
5-3	Stairs-2		1	18.30	18.30
5-4	Stairs-3		1	30.40	30.40
5-5	Slope		1	167.04	167.04
5-6	Toilet-1 (male & female)		1	37.35	37.35
5-7	Multi- purpose toilet (1F)		1	4.00	4.00
5-8	Corridor& others				136.86
				Subtotal (㎡)	507.40
Total 1st Floor Area (㎡)					1,866.28
2nd Floor					
3. Out-Patient Department (OPD)					
3-11	Dentistry	Examination room	1	51.15	51.15
		X-ray room	1	11.52	11.52
		Dental lab.	1	13.20	13.20
3-12	Ophthalmology	Test room	1	13.00	13.00
		Examination room	2	17.05	34.10
		Treatment room (Small Surgery)	1	17.05	17.05
3-13	ENT	Examination room	2	17.05	34.10
		Treatment room	1	17.05	17.05
3-14	Pneumology (Infectious Diseases)	Examination room	2	17.36	34.72
3-15	Gastrointestinal	Examination room	2	17.36	34.72
		Gastroscopy Examination room	1	17.36	17.36
		Endoscopy Examination room	1	17.36	17.36
3-16	Hematology & Oncology	Examination room	1	17.36	17.36
		Treatment room	1	17.36	17.36
3-17	Surgery Consultation	Examination room	1	17.36	17.36
3-18	Allergy	Examination room	1	17.36	17.36
3-19	Short-time care room	Bed room	1	74.19	74.19
		Nurse station	1	17.36	17.36
		Linen	1	3.38	3.38
		Storage	1	5.03	5.03
3-20	Preparation room		1	17.36	17.36
3-21	Storage		1	17.36	17.36
3-22	Conference/meeting room		1	48.52	48.52
3-23	Waiting hall	Waiting hall 4 including corridor	1	155.34	155.34
3-24		Waiting hall 5 including corridor	1	122.63	122.63

Major Components		No. of rooms/space	Room Size (m^2)	Subtotals (m^2)
3-25	Administration office	1	17.36	17.36
3-26	Equipment storage	1	17.36	17.36
3-27	Internal waiting room	1	137.13	137.13
			Subtotal (㎡)	997.79
4. Administration/Management				
4-7	Doctor's room	1	34.10	34.10
	Changing room (M & F)	1	(8.00)	
4-8	Nurse's room	1	34.10	34.10
	Changing room (M & F)	1	(8.00)	
4-9	Storage-2	1	5.88	5.88
4-10	Storage-3	1	4.25	4.25
4-11	Storage-4(server room)	1	3.80	3.80
4-12	Medical waste stock	1	3.20	3.20
4-13	Service staff room	1	10.82	10.82
4-14	Kitchenette	1	3.80	3.80
			Subtotal (㎡)	99.95
5. Public Space				
5-9	Stairs-1	1	40.22	40.22
5-10	Stairs-2	1	17.90	17.90
5-11	Stairs-3	1	38.58	38.58
5-12	Slope	1	167.04	167.04
5-13	Toilet-2 (M & F)	1	37.35	37.35
5-14	Toilet-3 (M & F)	1	34.86	34.86
5-15	Multi- purpose toilet (2F)	1	4.00	4.00
5-16	Corridor& others			285.32
			Subtotal (㎡)	625.27
Total 2nd Floor Area (㎡)				1,723.01
Total Roof Floor Area (㎡)				37.05
Total Floor Area of ER/OPD Building (㎡)				3,626.34

Major Components	Subtotals (m^2)
B. Annex Utility Building	
1. Medical gas stock	45.00
2. Electrical room	40.00
3. Generator room	20.00
4. Mechanical room	25.00
Total Annex Utility Building Area (㎡)	130.00

Major Components	Subtotals (m^2)
C. Other Outside Facilities	
1. Water reservoir tank	—
2. Septic tank	—
3. Connecting walkway	—
4. ER gate	—
Total Outside Facilities Area (㎡)	—

Ground Total Floor Area of all facilities (㎡)	3,756.34

Major Components			No. of rooms/space	Room Size (m^2)	Subtotals (m^2)
D. Renovation work in the existing building					
1.	Additional new theater	3rd Theater	1	33.60	33.60
2.	Wall rearrangement	Renovation of the surroundings	1	79.90	79.90
				Total Floor Area (㎡)	113.50

Source: Summarized by the survey team

(6) Renovation Work Plan

1) Contents of the renovation

In order to improve the shortage of theaters in Setthathirath Hospital, a new theater shall be established by renovating existing recovery room which is located in the ground floor of the south wing.

The renovated theater shall be the same grade in basic specification as the existing ones. Major contents of renovation work are shown below.

Table 2-14 Outline of the Additional Operation Theater (OT-3)

Item	Content
Size (floor area)	5.8m x 5.8m＝33.64 ㎡
Finishing	Ceiling/Wall/Floor：Antibacterial enamel coated metal panel
Utility	AC HEPA filtered, air pressure control, medical gas piping (O^2, vacuum, compressed air)
Equipment	Operation lamp, operation table, anesthesia machine, ventilator, defibrillator, electric scalpel

Source: Summarized by the survey team

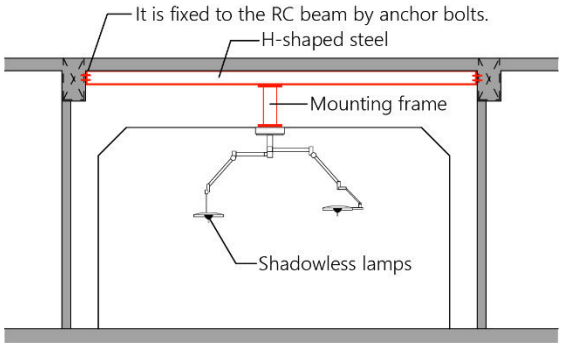
Regarding the renovation of north wing of existing building, with main purpose of expansion of MCH and OBGY, it shall be conducted by trying to minimize the range of work and expense of Lao

PDR side.

However, only as for the renovation of additional theater, it requires specifications (construction work in consideration of preventing of interference to the performing of operations) and high quality of materials (which quality equals to or exceeds to ones of existing completed in 2001) and the construction work is not only difficult but also costly; thus, it was considered not to conduct by Lao PDR side and it shall be included in the work of the Japanese side.

In construction work described above, special attention should be paid in the following points for implementation.

- Construction works shall be implemented on Saturdays, Sundays, national holidays, in night and in early morning to take into consideration the prevention of interference to existing operation services. Also, in case of emergency operation, the work shall be suspended until the operation is completed, even though construction work is conducted as previously described.
- As for installation of shadowless lamps, hanging them on an H-shaped steel, which is anchored to the existing beam with sufficient proof stress estimated for minimizing load against the existing frame, shall be considered.

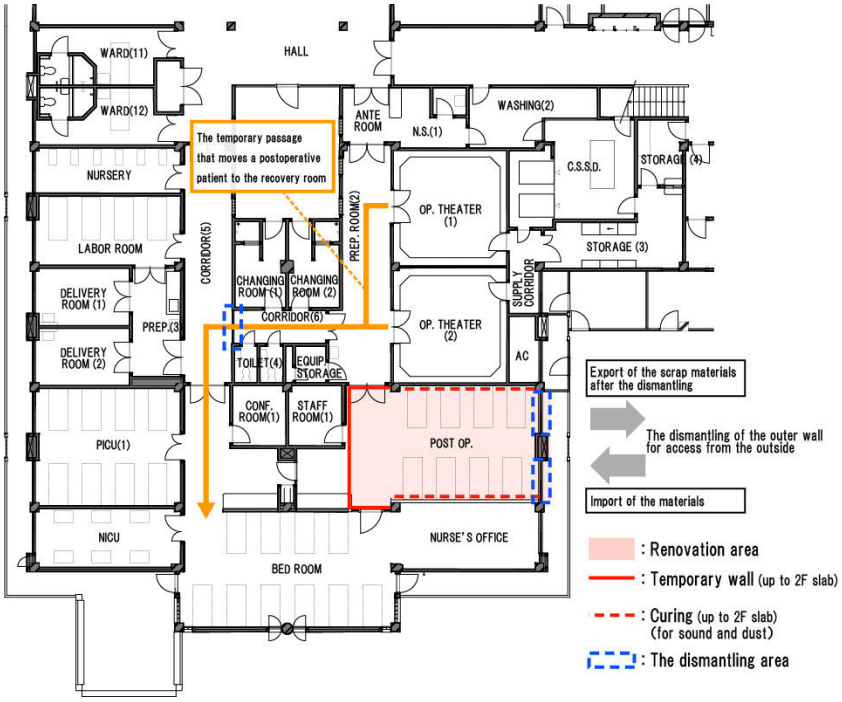


Source: Summarized by the survey team

Fig. 2-13 Method of Fixing OperationLamps at OT-3

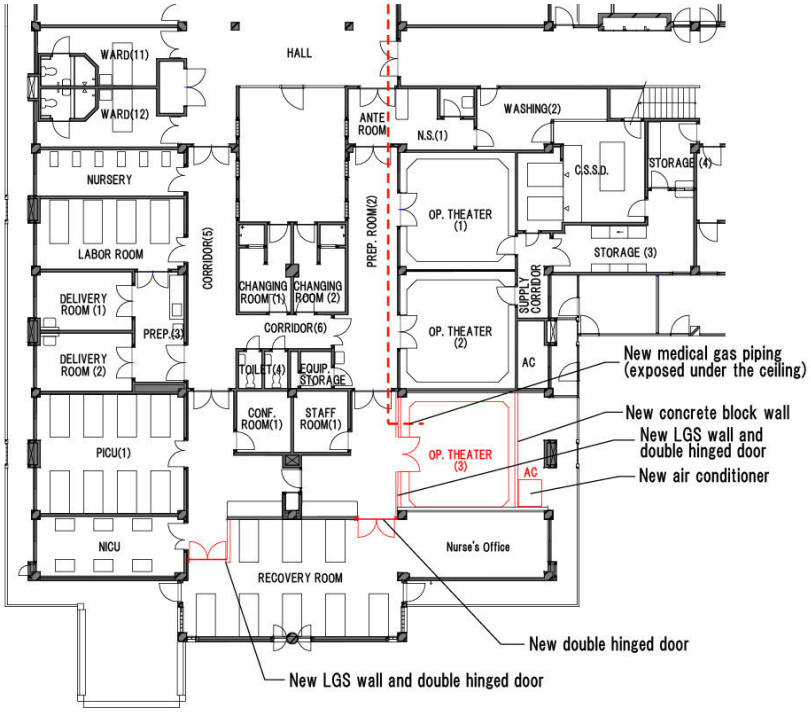
2) Minimized scope of renovation for existing facility

A theater is to be established in the current recovery room; however, construction work shall be implemented to avoid influencing the operations in theaters 1 and 2, by securing the construction flow line from the outer wall on the east side. Also, as the existing medical gas piping has gas leakage in several places due to aging, so new medical gas piping shall be connected from the manifold of gas cylinder room to theater 3. The new piping shall be constructed by exposing them under the beam to avoid interference to the existing frames and finishing.



Source: Summarized by the survey team

Fig. 2-14 Method of Renovation Work for OT-3



Source: Summarized by the survey team

Fig. 2-15 Plan of Renovation work for OT-3

Photo2-1 Inside of Existing

Photo2-2
Existing Recovery Room
(to be renovated to OT-3)

Photo2-3
Exposed Pipes of Medical-Gas
(O2, compressed air, vacuum)

(7) Section plan

The height of each floor is set to 4.5m to sufficiently secure the space for system piping including air conditioning, and the ceiling height of a room is set to 3.15m to allow the installation of ceiling fan. As for the the shared waiting hall, it will be a large space which is open to below, and by installing the louver windown at upper part of it, it will alsobe a semi-outdoor space where air convection is allowed for appropriate ventilation and lighting. The vertical louvers and balcony installed as the canopy top on the outer wall to make deep eaves block the direct sunlight and heat of the outside air. Also, any openings are not installed on the western side according to the plan.

As the 1st floor is to be constructed at the level 500mm higher than the ground surface to block the entry of sand dust and rainwater. A slope will be installed to facilitate approach for stretchers and wheelchairs. Each floor will be barrier-free which has no difference in level.

Load to the air conditioners will be reduced by insulation of styrene form or other appropriate material on the waterproof layer of the slab roof and by reducing the radiant heat inside the rooms.

(8) External element plan

Pavements of interlocking blocks are to be installed around the new facilities to discharge the rainwater drain to the open side ditches on the south side. Trees and plants will be raised in various places (at the expenses of the Lao PDR side).

As the approach to the OPD entrance and the connecting walkway to the existing building cross the side ditches, a bridge including culvert sill be installed.

2-2-2-4 Structure Plan

(1) Basic policy for the structure design

As there is no earthquake resistance design code in Lao PDR at present, according to the local engineers, designers independently set seismic force with a reference to Eurocode, etc. for construction in the earthquake-prone areas in the northern part of the country and for high-rise buildings, and no earthquake resistance design is implemented for low-rise buildings. However, as this project involves the construction of publicly important hospital, earthquake resistance design shall be implemented. Furthermore, appropriate selection shall be made for the structure shape and structure type in consideration of the local construction techniques and later maintenance and management, etc.

(2) Structure plan

The structure shall use a reinforced concrete structure which is commonly used in Lao PDR. Since the floor plan uses a uniform span and small earthquake force, a simple and clear pure Rahmen structure shall be adopted. The outer walls and partition walls use bricks that are most commonly used in the local area. The wall thickness shall be appropriately set in consideration of the climate condition and other relevant conditions in the area concerned.

(3) Foundation plan

The result of survey on the ground of the construction site shows that the ground has a sand layer containing gravels up to GL–13m, at a level deeper than that it is dark brown clay. At GL-15m, there is a bearing layer with the N value of 50 or over. Since the sand layer under the foundation is a soft and weak ground with the N value of 5 or less, pile foundation shall be adopted. As for the pile construction method, in consideration of the existing building nearby, economic efficacy and past experiences, jacking method shall be used as a rule and ready-made concrete piles shall be used.

Also, as the attached structures such as connecting walkway are lightweight, direct foundation shall also be examined.

(4) Design Load

1) Earthquake force

Earthquake force shall be calculated in accordance with the Building Standards Act of Japan. As the construction site is located in the lowest seismic intensity scale of the three scales on the earthquake hazard map and there is no major earthquake observation record in the past, 1/4 of the earthquake resistant in Janan will be set. (The Design Holizontal Seismic Coeffient, used in the calculation of earthquake resistant in Japanese design code, is 0.2. and its one-fourth which is 0.05 will be adopted for the project).

2) Wind pressure

According to the observation data recorded in Vientiane Capital for 10 years until 2016, the maximum instantaneous wind speed was 49 m/second (in 2007). The wind pressure shall be calculated in accordance with the Building Standards Act of Japan and the roughness division of the construction site is set to III and the standard wind speed, or Vo, is set to 32 m/second.

(5) Materials to use and strength

There is no national standard in Lao PDR equivalent to JIS and other appropriate Japanese standards so it is hard to say that the locally manufactured reinforcing rods have excellent performance at low cost. As it is not a special case to import reinforcement manufactured in the neighboring countries such as Thailand and Vietnam, various standards will be applied to the imported reinforcement, including JIS, TIS (Thailand), TCVN (Vietnam), BS and ASTM. The result of field survey shows that the steel price fluctuation has been significant in recent years and that there is no price gap among standards, JIS-compliant products shall be used as a rule; otherwise, the equivalent products of the same grade steel type shall be used.

The concrete compression shall be basically 25 N/mm2 to 30 N/mm2, a common strength adopted locally, and it is assumed to use cement manufactured in Thailand with stable quality.

Table 2-15 Standard of Available Reinforcement in Lao PDR

Standard	JIS G3112	TIS 24-2536	TCVN 1651-2008	BS 4449:2005	ASTM A615
Variety of steel	SD390	SD40	CB400-V	GR460B	Grade60
Yield Strength (MPa)	390-510	390	400	460	420

Source: Summarized by the survey team

(6) Structure of the existing Setthathirath Hospital

The existing building has a pure Rahmen structure of two-storied reinforced concrete construction on a pile foundation using ready-made piles of 500dia. The building takes a plane shape integrating the two wards on the south and the north that are connected by a connecting walkway including the entrance section. The central part of the 2nd floor of each ward is open to below, forming a large space for the open roof with the inclined beam and the inclined slab. As a result of the simplified strength test for the concrete on the tower pole without surface finish by using a test hammer, the strength estimated according to the coefficient of restitution was confirmed to be approximately 24 N/mm2 which is the design standard strength. Also, as a result of the visual inspection inside the hospital, no outstanding cracks and other damages have been found and there is no significant aging at present even in approximately 20 years after completion.

(7) Design standards

The following Japanese standards shall be applied to implement structure design according to the allowable stress intensity design:

- Building Standards Act and the Order for Enforcement of the same Act
- Technical Standards related to Building Structure
- Reinforced Concrete Structure Calculation Standards and the Explanation for the Technical Standards related to Building Structure

2-2-2-5 Utility Plan

(1) Applicable standards

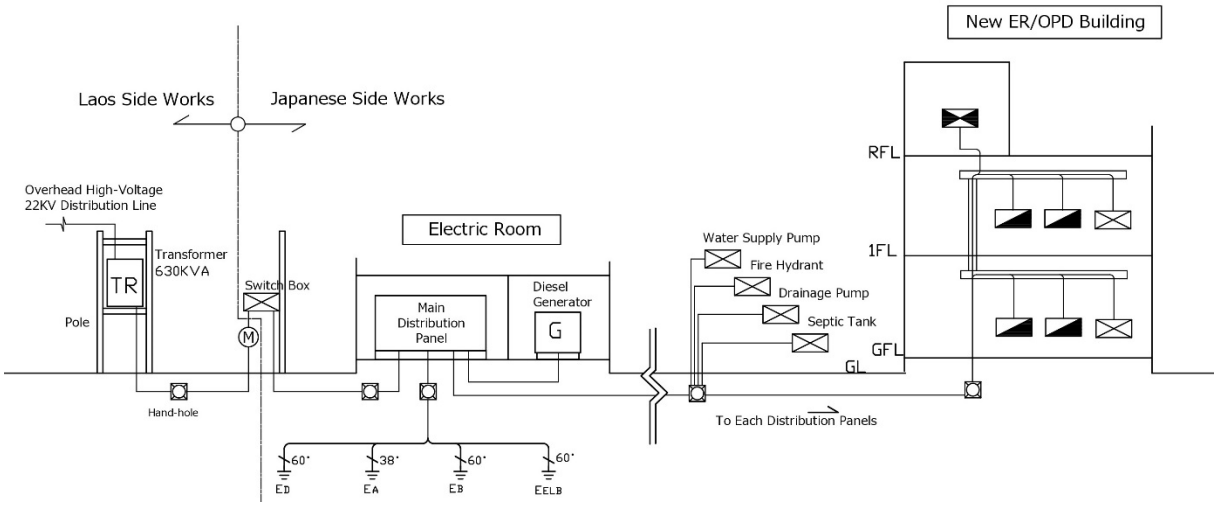
As for the items that can be generally be procured in the country according to the Lao specifications, the local standards shall apply in consideration of the maintenance and management. However, the items that cannot be procured locally, or the items for which application of Japanese standards is appropriate, shall be procured from Japan or a neighboring countries.

(2) Electric systems

① Electric power supply system

The electric power of the new building shall be led in and received from the overhead high-voltage 22KV distribution line along the border on the northwest side of hospital premise. After receiving power, the power of three-phase and four-line 380/220V will be distributed within the facilities. In consideration of the estimated performance and other features of medical equipment, the transformer capacity is assumed to adopt a 630KVA transformer and EDL (Électricité du Lao s) standard transformers with excellent compatibility shall be procured locally. Hand-hole and underground piping shall be installed from the secondary side of the transformer to install wiring to the Electric Room in the auxiliary system building. The electricity shall be provided from power receiving and supply board, and power distribution board which will be installed at electricity room, through power distribution board in each EPS of the new building to each load. In addition, a phase advancing condenser shall be established at a lower pressure side in order to improve the power factor.

To secure the functions of medical services during power blackout, a diesel generator (assuming 200KVA) shall be installed.



Source: Summarized by the survey team

Fig. 2-16 Plan of Electronic System

② Lighting and outlets system

In order to promote electric power conservation, the main lighting shall be LEDs by procuring . Also, the outlets shall be of universal model and locally procured.

③ Illumination system

The illuminance standard (general illuminance shall be set as follows in accordance with the average illuminance of the JIS and in reference to the illuminance standards adopted for the existing similar facilities.

Consultation Room / Examination Room	: 300 lx or over
Operating Room / Resuscitation Room	: 700 lx or over
Pharmacy / Administration Room / Reception	: 200 lx or over
Hall / Waiting Hall	: 150 lx or over
Patient beds	: 100 lx or over
Toilet	: 100 lx or over
Stairs / Aisle / Open ceiling	: 100 lx or over
Storage	: 50 lx or over
Changing Room / Staff Room	: 150 lx or over

Lights shall be turned on / off in each room as a rule, with a switch circuit for turning on / off installed in small division as required. Also, toilet illumination apparatus shall be turned on / off by a motion sensor switch to promote energy conservation. Power to lighting and outlet circuits shall be distributed by single-phase and two-line 220V. Evacuation guidance lamp shall be installed in the stairs and evacuation exits as needed.

④ Lightning protection system and earthing system

To protect the building from lightning, lightning rods or roof-ridge conductors if necessary shall be installed in accordance with the JIS. Earthing system for electric power system, medical equipment and telecommunication equipment shall be individually installed as needed.

⑤ Fire alarm system

Smoke detector shall be installed in each room and main controller (transmitter, indication lamp, acoustic device) shall be installed in the waiting hall. Also, receiving apparatus shall be installed in Information / Reception.

⑥ Light electrical system

a. Telecommunication system (telephone, LAN, television)

Telephone outlets and PC LAN outlets on the wall shall be installed in the administration room, consultation room, etc. External communication line is constructed at the expense ovf the recipient country, with underground piping and hand-hole installed up to the lead-in pole. Also, TV antennas shall be installed and TV terminals shall be installed in the waiting hall, Staff Room, etc.

b. Nurse call system

A receiver for nurse call shall be installed at each bed in ER, isolation room and follow-up patient to enable to communicate through a parent device set in a Nurse station.

c. Guidance support system

As for the waiting calls, a speaker shall be installed in the waiting hall and a microphone shall be installed in the consultation rooms of OPD. Also, a call button shall be installed in each toilet booth to enable to make emergency calls.

d. Broadcasting system

The amplifier beam corresponding to an emergency broadcasting and an entire building broadcasting shall be installed in the Information / Reception and a speaker shall be installed in each room.

e. Monitoring camera (CCTV) system

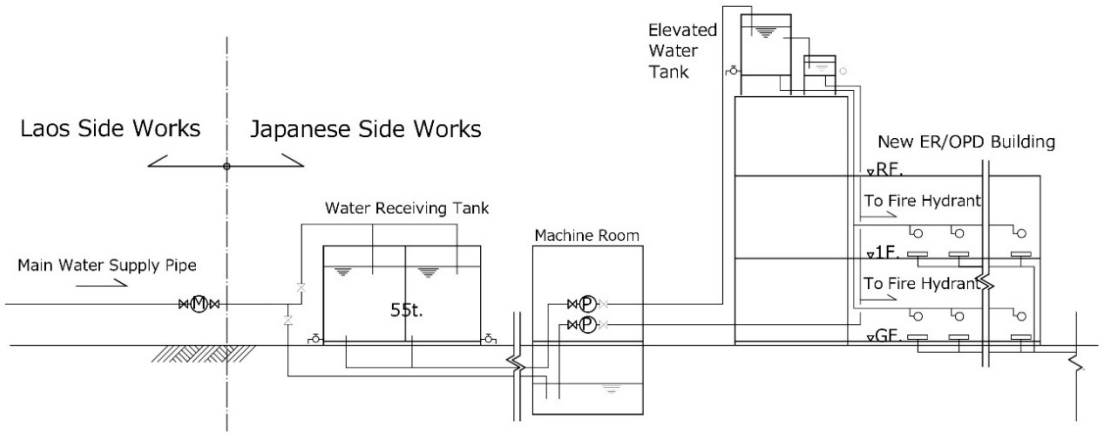
Network cameras shall be installed in major entrance and exit and a recording server shall be installed in the Information / Reception.

(3) Machine systems

① Water supply system

It shall draw a single line from the main water supply pipe from the front road on the east side (150m/m), and supply to the FRP water receiving tank (55ton) which is established on the ground. Water will be then supplied to the necessary places via the elevated water tank installed on the roof.

The water receiving tank shall be established only for the new building, and the its capacity shall be set to 50 m^3 which is assumed as the capacity for one day.



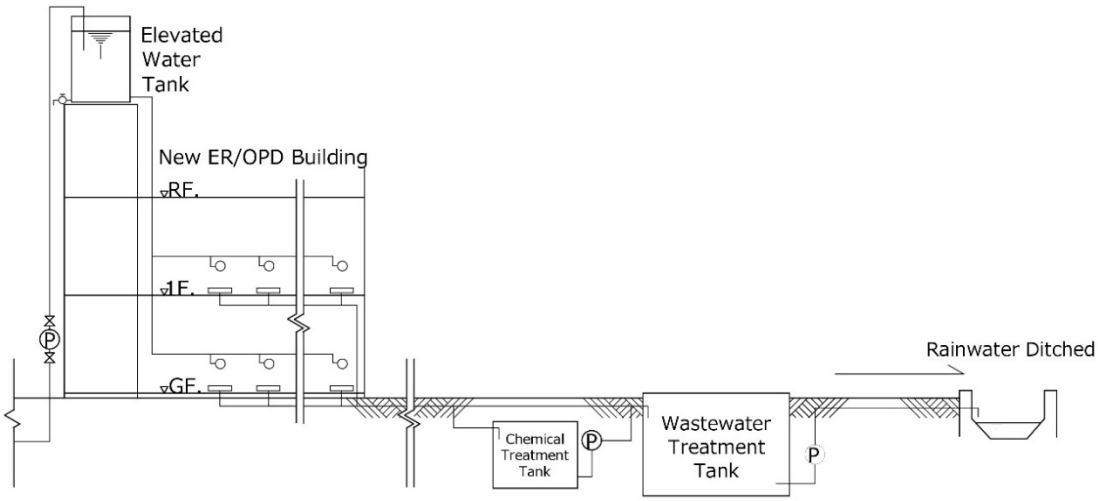
Source: Summarized by the survey team

Fig. 2-17 Plan of Water Supply System

② Drainage system

The in-hospital domestic wastewater shall be treated in a wastewater treatment tank, then discharged to the side ditch which is located at the south border of the construction site. Based on the agreement with the Water Quality Bureau of the Ministry of the Environment, BOD of the discharging water quality will be 20 ppm.

Medical and examination wastewater shall be separately treated by installing treating tank for sterilization and neutralization etc.



Source: Summarized by the survey team

Fig. 2-18 Plan of Drainage System

③ Hot water supply system

Local-type electric water boilers shall be installed only in the places requiring hot water supply.

④ Sanitary apparatus system

Western-style toilets with faucet for following water cleansing shall be installed at each booth.

⑤ Medical gas

Outlets for oxygen and suction shall be installed at every other beds in ER, resuscitation and follow-up rooms. Outlets for oxygen, suction and compressed air shall be installed in the ER treatment room. In the operating theater No.3, which shall be developed by the renovation of existing room, same as the existing adjacent operating theater, outlets for oxygen, suction and compressed air shall be installed.

⑥ Fire extinguishing system

The indoor hydrant (hose reel) and fire extinguishers shall be installed in accordance with the regulation of fire department of Lao PDR. As for the location of fire extinguishers, an alarm system shall be considered as a security measure.

⑦ Air conditioning system

Air conditioner shall be installed in every room such as consultation room. As for the ER treatment room, isolation room, and operation theater No. 3, installation of air pressure control and air purification with a filter shall be considered respectively. Sufficient mechanical ventilation shall be considered to prevent the issue of smelling in the toilets, etc.

⑧ Operation theater to be added to the existing building

Equalty to the existing operation theaters, nessesary system shall be installed such as power supplies, lighting, medical gas, air conditioning system. As for the medical gas (oxygen, compressed air, suction), maintenance and inspection of the existing piping shall be securely implemented, when extending the existing piping.

2-2-2-6 Construction Material Plan

Construction materials manufactured in Lao PDR are limited to bricks, cement, sands, gravels, reinforced rods, etc. and many of other construction materials are imported from Thailand or Vietnam. Although major construction materials are generally distributed in the country and many inferior goods are sold at low price in the market, high-quality construction materials conforming to international standards are also available. Therefore, construction materials that can be easily obtained and maintained shall be used. Also, construction materials for finishing of the project target building shall be selected to ensure the endurance and the ease of cleaning, repair and maintenance.

(1) Major structural materials

Common material in the local market and standardized material shall be adopted for the project. Many kinds of international standards for the material as like JIS, BS, ASTM and also TIS (Thai) and TCVN (Vietnam) are available in Vientiane. Also as for the selecton of the stuructual materials, it shall be selected as few kinds as possible for sufficient quality control. Major structural materials are liseted below.

- PC Concrete pile : 30cm x 30cm size will be used. 2 piles shall be combined to be 15m depth for one position.
- Concrete for foundation and upper structure : FC25-30, ready mixed concrete.
- Reinforcement : Only secured material with mill sheet.
- Structural steel: limited size and design are available. For the processing skill of steel structure is not stable, imported production will be considered that import from the neighboring countries including Japan.
- Concrete block for wall and interlocking block for pavement: Local products will be adopted.

(2) Finishing Plan

① External Finishing

High weather resist material shall be selected against strong sunshine beam and high precipitation. Major finishing plan is shown in the below table.

Table 2-16 External Finishing Plan

	Floor	Wall	Roof	Exterior
Main external finishing	Interlocking block／Cast in situ terrazzo	Mortar troweled paint／Wash gravel	Asphalt water-proofing + protective concrete ／Steel structure + roofing tile	Interlocking block

Source: Summarized by the survey team

② Internal Finishing Plan

Internal finishing of the new ER/OPD building shall be considered long-term fine quality with intention to the top level hospital in Lao PDR and also be the equial grade with the existing building constructed in 2001 by Japanese grant aid. The internal finishing plan is shown in the below table.

Tabele 2-17 Internal Finishing Plan

Room	Floor	Wall	Ceiling
Entrance hall	Granite/Marble	Stone pitching	Rock wool acoustic board
Administration/Management	Porcelain tile	Plastering + AEP coating	Ditto
Examination room	Ditto	Ditto	Ditto
Storage	Ditto	Ditto	Ditto
Waiting hall	Cast in Situ Terrazzo	Porcelain tile/ mortal steel troweled + AEP	Ditto
Waiting corridor	Porcelain tile	Ditto	Ditto
Short-time care (one day admission) room	Ditto	Mortar steel troweled + AEP coating	Ditto
Nurse station	Ditto	Ditto	Ditto
Doctor/Nurse station	Ditto	Ditto	Ditto
Toilet	Ditto	Porcelain tile	Calcium silicate board
Stairs	Porcelain tile /Marble	Porcelain tile/ mortal steel troweled + AEP	Rock wool acoustic board
ER entrance (Piloty) / triage	Marble / Cast in Situ Terrazzo	Stone	Ditto
ER bed room	Cast in Situ Terrazzo	Porcelain tile	Ditto
Reanimation room	Ditto	Antibacterial coating board	Antibacterial coating board
ER treatment room (minor surgery room)	Ditto	Ditto	Ditto
ER Conference room	Porcelain tile	Mortar steel troweled + AEP	Rock wool acoustic board
ER Staff's room	Ditto	Ditto	Ditto
Changing room	Ditto	Ditto	Ditto
Shower room	Ditto	Ditto	Ditto
Isolation room	Cast in Situ Terrazzo	Porcelain tile	Antibacterial coating board
Laboratory (small)	Porcelain tile	Ditto	Rock wool acoustic board
CT scan/X-ray/ Mammography room	Ditto	Mortar steel troweled + AEP	Ditto
Ultrasound room	Ditto	Ditto	Ditto

Source: Summarized by the survey team

③ Doors and Windows

Japanese manufactured products shall be adopted because the doors and windows installed in the existing main building have been kept in good condition without serious damage since after 15 years has past.

External Doors & Windows : Aluminum sash, Steel door

Internal Doors & Windows : Aluminum sash, Steel door

2-2-2-7 Equipment Plan

(1) Consideration of required equipment

The planned equipment will be examined in tems of its necessity and validity. In selecting equipment, the necessity will be examined by the condition and quantities of existing equipment, and the minimum necessary number shall beprovided. As for its specifications, it shall be the same as current equipment. The review results of equipment, quantity and outline specification are indicated in the attachment of "Study of planning equipment of Setthathirath Hospital and Champasak provincial Hospital".

(2) Planned Equipment List

The table below shows the equipment by each room of the departments. The rooms are classified into the existing building, grand and first floor of the new building of Setthathirathh Hospital, and the existing building of Champasak Provincial Hospital.

Table 2-18 List of Planned Equipment in Setthathirath Hospital (existing building)

Room Name	Equipment Name	Qty
AICU (ward-2)	Suction unit (Wall mount type)	1
	Syringe pump	3
	Bedside monitor	4
	Nebulizer	2
	Infusion pump	7
	Portable ultrasound unit	1
	AVR(500W)	2
NICU & PICU	Syringe pump	6
	Bedside monitor	3
	Infusion pump	6
	Phototherapeutic apparatus	2
	Ventilator	4
	Incubator	5
	Bilirubin skin test	1
	CPAP	2
	Oxygen saturation monitor (pulse oximeter)	6
	Blood pressure cuff for newborns	4
	Bag & mask, Laryngoscope (Neonatal resuscitation)	1

Room Name	Equipment Name	Qty
	AVR(500W)	10
	AVR(1000W)	7
Delivery	Suction unit	1
	Infusion pump	2
	Operation lamp	1
	Delivery suction unit	1
	Delivery table	2
	CTG	2
	Examining table	1
	Infant warmer	1
	AVR(500W)	6
	AVR(1000W)	2
GYN clinic	Examining table	2
	Stand lamp	2
	Syringe pump	2
	Infusion pump	2
	Ultrasound unit (gynecology)	1
	AVR(500W)	2
	AVR(1000W)	1
ANC (Maternity)	CTG	1
	Ultrasound unit (ANC)	1
	Fetal phonocardiograph	3
	AVR(500W)	1
	AVR(1000W)	1
Operation Theater	Suction unit	1
	Infusion pump	3
	Autoclave	1
	Operating table	2
	Defibrillator	1
	Stretcher	3
	Electric scalpel	3
	Anesthesia unit	1
	Operation lamp	3
	Ethylene oxide gas type autoclave	1
	Blood warmer	1
	Blood gas analyzer	1

Room Name	Equipment Name	Qty
	Fiber-optic bronchoscope	1
	Instrumental cart	3
	AVR(500W)	2
	AVR(1000W)	9
Recovery room	Bedside monitor	4
Laundry	Industrial washing machine	2
	Industrial dryer	1
Morgue	Body refrigerator	1

Source: Summarized by the survey team

Table 2-19 List of Planned Equipment in Setthathirath Hospital (new building) 1st Floor

Room Name	Equipment Name	Qty
Internal Medicine Examination Room (1)／(2)	Ultrasound unit (cardiology)	1
	Examination bed	2
	Consultation desk	2
	Consultation chair	2
	Round chair for patient	2
	Cabinet for examination	2
Cardiology Examination Room (1)／(2)	Examination bed	2
	Consultation desk	2
	Consultation chair	2
	Round chair for patient	2
	Cabinet for examination	2
Pediatric Examination Room (1)／(2)	Nebulizer	1
	Examination bed	2
	Weight scale (adult)	1
	Consultation desk	2
	Consultation chair	2
	Round dhair for patient	2
	Cabinet for examination	2
Pain Clinic Examination Room	Examination bed	1
	Consultation desk	1
	Consultation chair	1
	Round chair for patient	1
	Cabinet for examination	1
Surgery Consultation Room	Examination bed	1
	Consultation desk	1

Room Name		Equipment Name	Qty
		Consultation chair	1
		Round chair for patient	1
		Cabinet for examination	1
Radiography	Manmography Examination Room	Mammography equipment	1
	X-Ray	General X-ray unit	1
	CT	CT apparatus	1
	Fluoroscopy	X-ray fluoroscopy	1
	Reception Office	Consultation desk	2
		Consultation chair	2
		Round chair for patient	2
		Cabinet for examination	2
		Mobile X-ray unit	1
Ultrasound Examination Room (General)		Bed for patient	3
ER Bed		Bedside monitor	8
		Nebulizer	2
		Infusion pump	2
		Portable ultrasound unit	1
		Ventilator	1
		Oxygen saturation monitor (pulse oximeter)	3
		Stretcher	2
		Blood gas analyzer	1
		Glucometer	1
		Refrigerator for drug	1
		Bed for patient	8
ER Minor Surgery Room		Electric scalpel	1
		Anesthesia unit	1
Small Laboratory		Tabletop centrifuge	1
		Water bath	1
		Hematocrit centrifuge	1
Reanimation Room		Bed for patient	2
Isolation Bed (1)／(2)		Bed for patient	2

Source: Summarized by the survey team

Table 2-20 List of Planned Equipment in Setthathirath Hospital (new building) 2nd Floor

Room Name		Equipment Name	Qty
G.I.	G.I. Examination Room (1)／(2)	Examination bed	2
		Consultation desk	2
		Consultation chair	2
		Round chair for patient	2
		Cabinet for examination	2
	Endoscopy Examination Room	Bedside monitor	1
		Upper endoscope	1
		Automatic washer for endoscope	1
		Examination bed	1
	Gastroscopy Examination Room	Bedside monitor	1
		Examination bed	1
Dental	Dental Examination Room	Dental chair	3
		Consultation desk	1
		Consultation chair	1
		Round chair for patient	1
		Cabinet for examination	1
	Dental X-Ray	Dental X-ray	1
ENT	ENT Treatment Room	ENT treatment unit	1
		Audiometer	1
		Endoscope for ENT	1
	ENT Examination Room (1)／(2)	Examination bed	1
		Otoscope	3
		Head light	3
		Consultation desk	2
		Consultation chair	2
		Round chair for patient	2
		Cabinet for examination	2
Ophthalmology	Ophthalmology Examination Room (1)／(2)	Examination bed	1
		Consultation desk	2
		Consultation chair	2
		Round chair for patient	2
		Cabinet for examination	2
	Ophthalmology Treatment Room	Operation microscope	1
	Ophthalmology Test Room	Lens meter	1
		Slit lamp microscope	1

Room Name	Equipment Name	Qty
Neurology Examination Room	Examination bed	1
	Electroencephalograph (EEG)	1
	Electromyogram (EMG)	1
	Transcranial doppler (TCD)	1
	Consultation desk	1
	Consultation chair	1
	Round chair for patient	1
	Cabinet for examination	1
Allergy Examination Room	Examination bed	1
	Stand lamp	1
	Consultation desk	1
	Consultation chair	1
	Round chair for patient	1
	Cabinet for examination	1
Hematology and Oncology Examination Room	Examination bed	2
	Consultation desk	1
	Consultation chair	1
	Round chair for patient	1
	Cabinet for examination	1
Pneumology Examination Room	Examination bed	2
	Consultation desk	1
	Consultation chair	1
	Round chair for patient	1
	Cabinet for examination	1
Short-Time Care Beds	Bed for patient	6

Source: Summarized by the survey team

Table 2-21 List of Planned Equipment in Champasak Provincial Hospital (exixting facility)

Room Name	**Equipment Name**	**Qty**
Radiology	Mobile X-ray unit	1
	General X-ray unit	1
	CT apparatus	1
Operation Theater	Operation table	1
	Defibrillator	1
	Electric scalpel	1
	Operation lamp	1

Room Name	Equipment Name	Qty
	AVR(500W)	1
	AVR(1000W)	2
ICU	Bedside monitor	4
	Ventilator	4
	Blood gas analyzer	1
	AVR(1000W)	1
CCU	Ultrasound unit (cardiology)	1
	ECG	1

Source: Summarized by the survey team

(3) Spare parts and consumables plan

Spare parts and consumables will be generated in the operation of medical equipment which will be supported by this project. In case the existing equipment and manufacturer are different in size or structure, etc., it is difficult to share the same spare parts. Therefore, in this plan, the minimum spare parts and consumables shall be prepared which is considered as necessary for operation. Below are the spare parts prepared.

Table 2-22 List of Planned Spare Parts

Equipment name	Spare parts	Qty / unit	
Incubator	Access port caver	1	set
Autoclave	Electric heater	2	pc
Electric Scalpels	Disposal Plate	1	set

Source: Summarized by the survey team

Table 2-23 List of Planned Consumables

Equipment name	Spare parts	Qty / unit	
Syringe pump	Disposal syringe 10ml	600	pcs
	Disposal syringe 20ml	600	pcs
	Disposal syringe 30ml	300	pcs
	Disposal syringe 50ml	300	pcs
Bedside Monitor	Probe	150	unit
	Recording paper	10	roll
Portable Ultrasound Unit	Gel	12	pcs
	Recording paper	10	roll
Ultrasound Unit (GYN)	Gel	12	pcs
	Recording paper	10	roll
Ultrasound Unit (ANC)	Gel	12	pcs
	Recording paper	10	roll

Source: Summarized by the survey team

(4) Countermeasure to voltage fluctuation and power failure

In order to protect electronic medical equipment from a large voltage fluctuation, Automatic Voltage Regulator (AVR) for the whole facility is installed in the new building, and AVR is deployed individually for the equipment to be maintained in the existing facility.

(5) Maintenance contract

CT, MRI, X-ray unit, etc. are examples of equipment that has large roles in continuous operation of medical equipment. Periodic maintenance by manufacturers and the like, ensures the effectiveness of the performance and functions of the equipment and continuous use. Therefore, in this project, for expensive CT among the equipment to be maintained, the cost of maintenance for the second year and the third year which is after the expiration of the manufacturer warranty period is secured by grant aid for the effectiveness of the equipment.
The conditions of the maintenance contract are as follows.

Table 2-24 Maintenance Contract Conditions

Item	Conditions
Equipment	CT Apparatus
Contract period	the second year and the third year after the expiration of the manufacturer warranty period
Periodically maintenance	2 times/ year
Emergency response	2 times/ year
X-ray tube exchange	One time in 2-year contract period

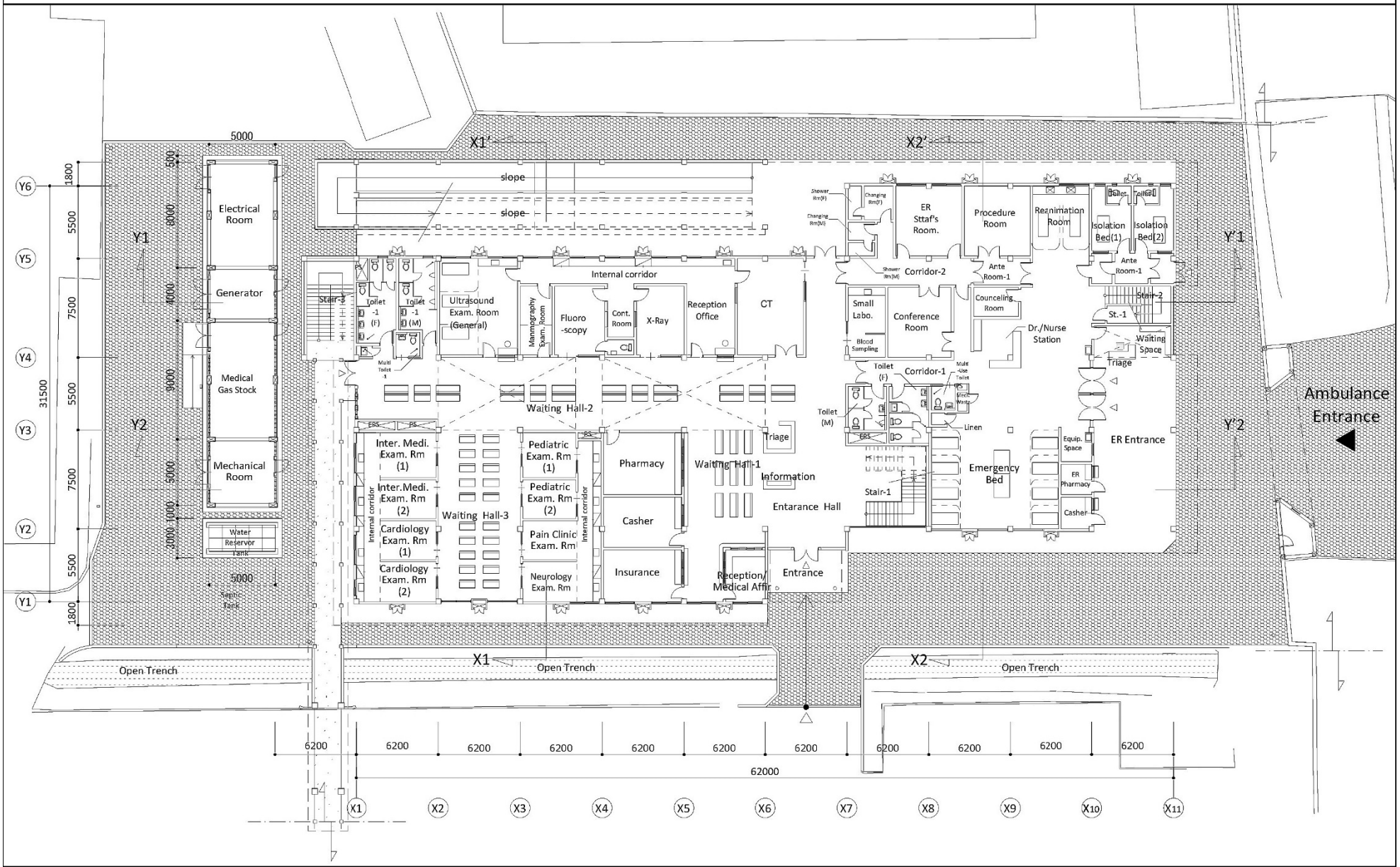
Source: Summarized by the survey team

(6) Intallation plan

Of the planned equipment, autoclave, industrial washing machine, industrial dryer, dental chair, etc. are equipment requiring adjustment of construction work, electricity, water supply connection, gas connection etc. Equipment requiring installation by manufacturer includes ventilator, anesthesia machine, ethylene oxide gas type autoclave, mammography, mobile X-ray imaging apparatus, general X-ray unit, CT apparatus, Fluoroscopy, shadowless lamp. In installing up these equipment, strict adjustment with the facility construction side is required, such as installation position, requred electricity, water supply / gas etc and timing of installation etc. Therefore, meetings will be held at the project site under construction for the purpose of mutual confirmation of the facility side and equipment side.

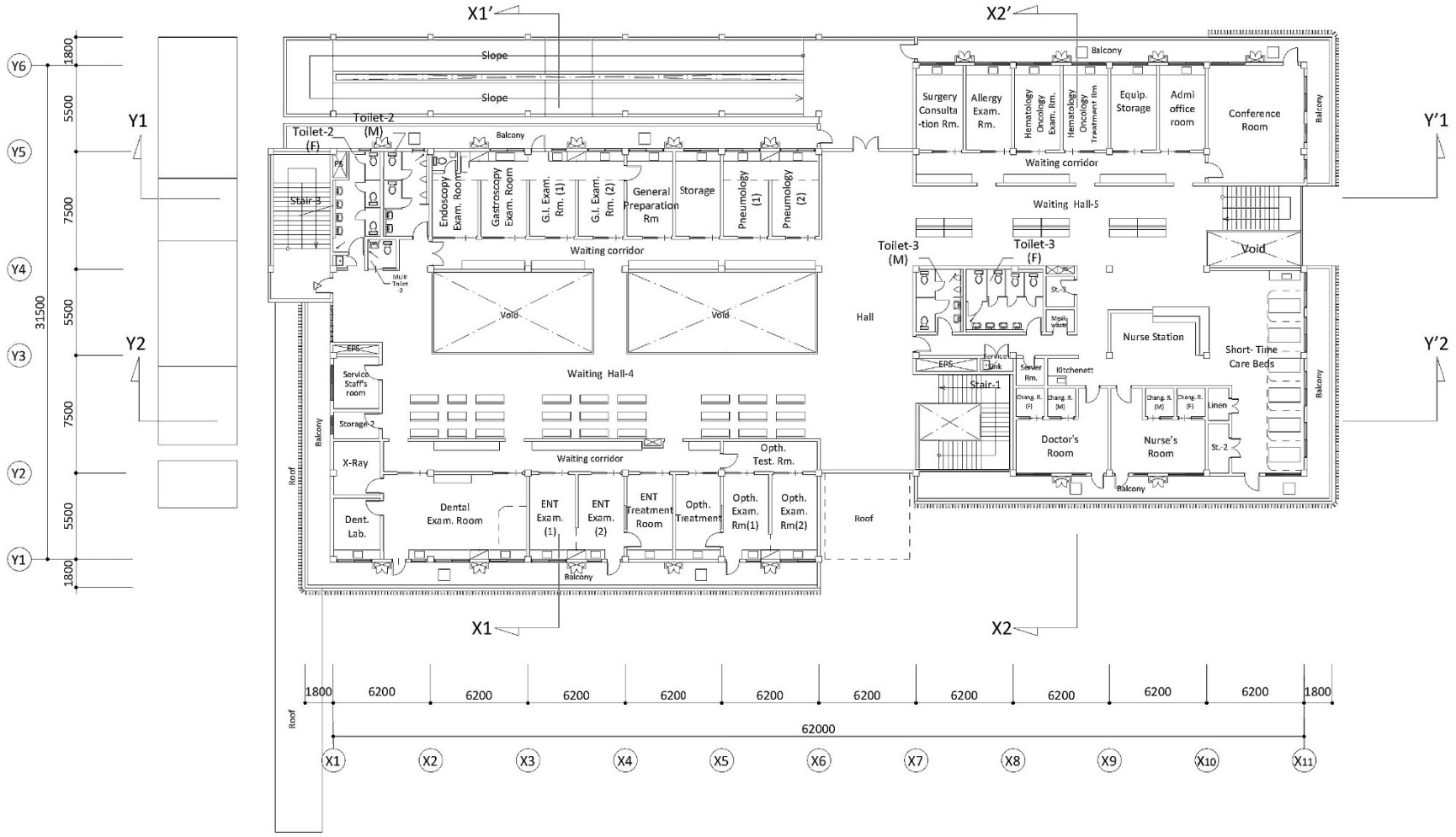
2-2-3 Oultline Design Drawings

Drawings (scale = 1/400, Plan/Elevation/Section) of the planned facilities are shown in following pages.



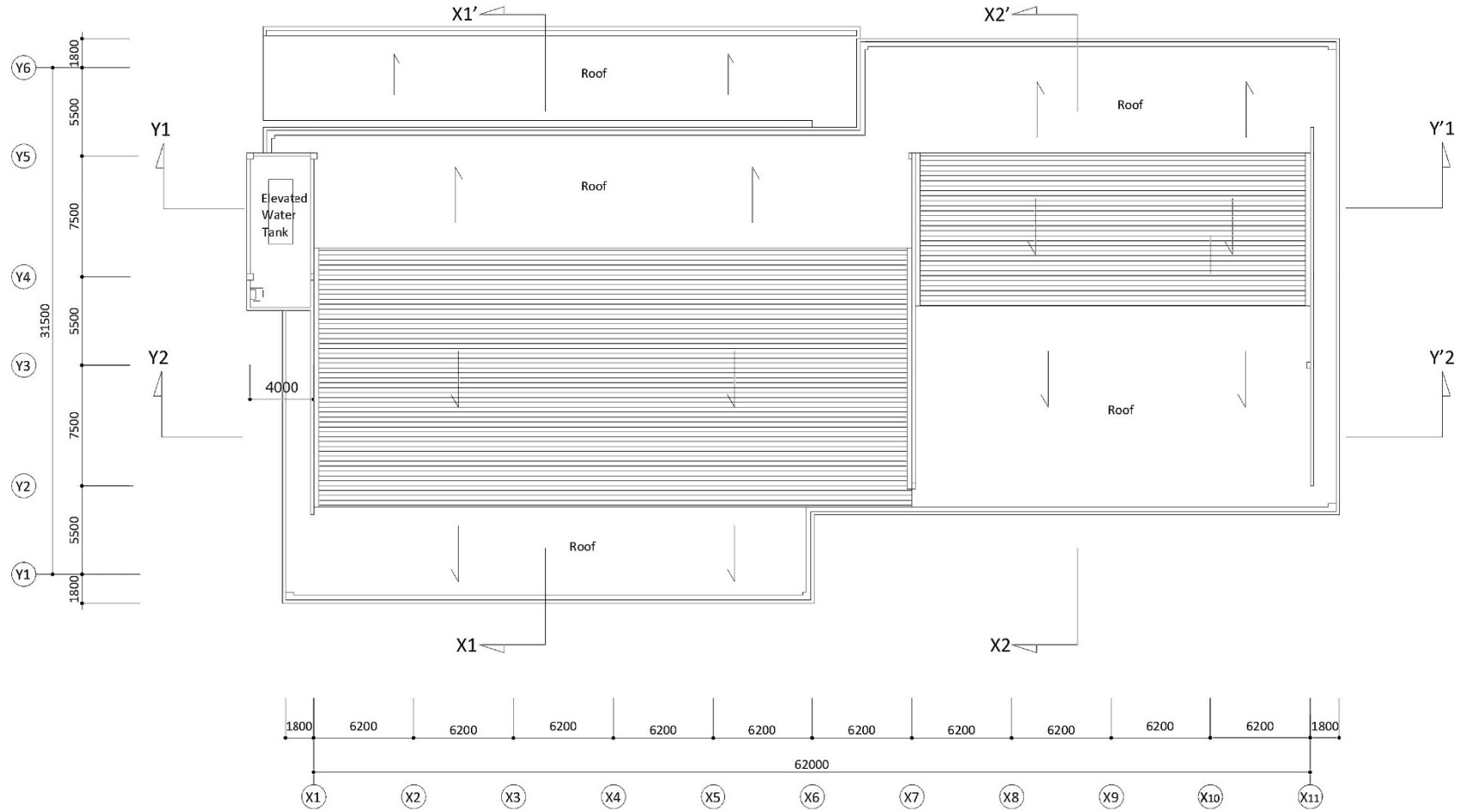
THE PROJECT FOR IMPROVEMENT OF SETTATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL

Layout / 1st Floor Plan 1/400



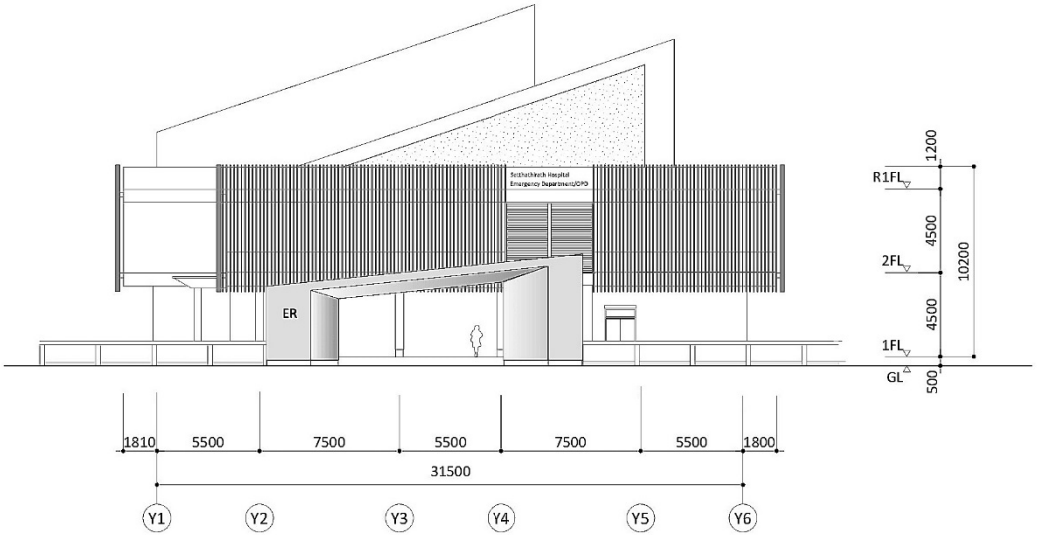
THE PROJECT FOR IMPROVEMENT OF SETTATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL

2nd Floor Plan 1/400

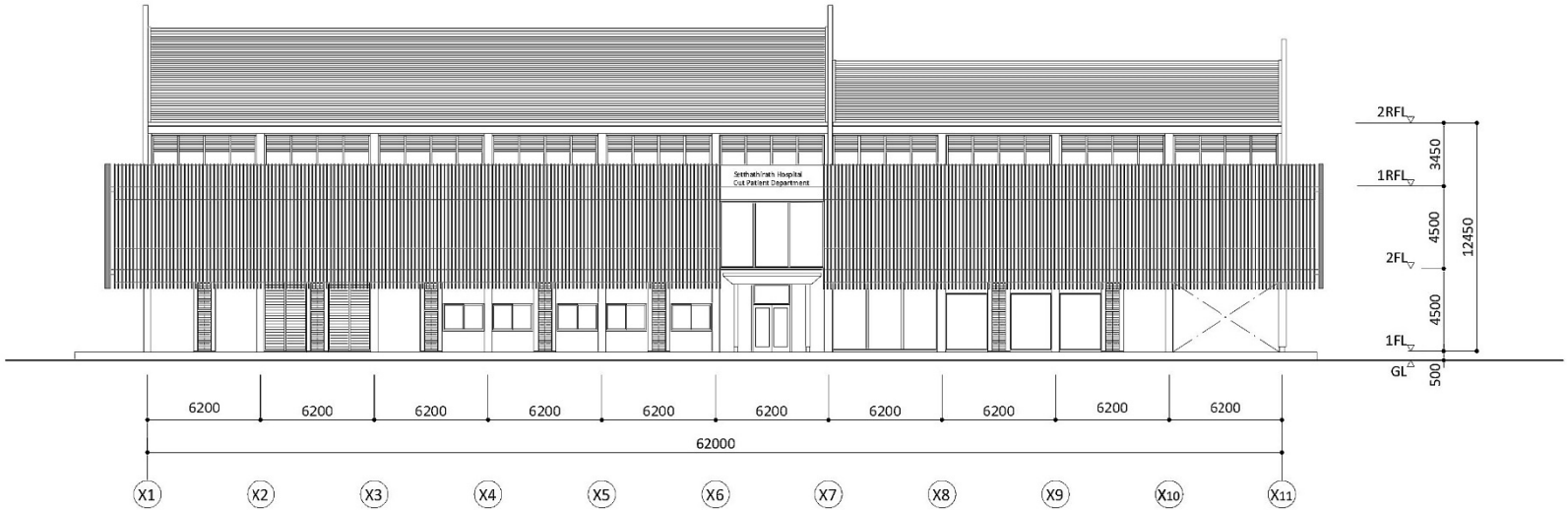


THE PROJECT FOR IMPROVEMENT OF SETTATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL

Roof Floor Plan 1/400

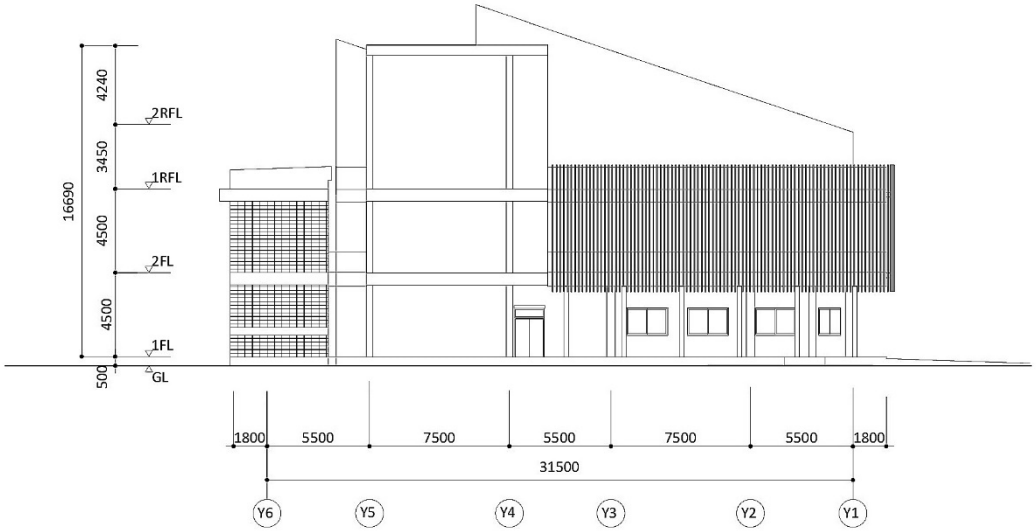


East Side

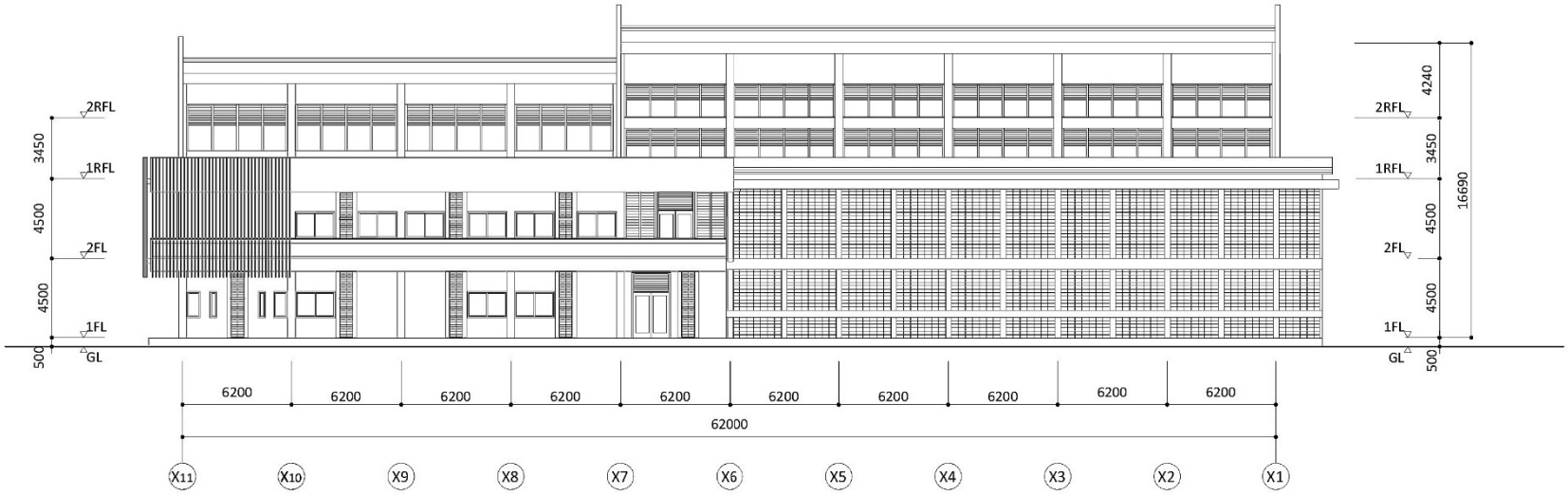


South Side

THE PROJECT FOR IMPROVEMENT OF SETTATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL	East and South Elevation 1/400

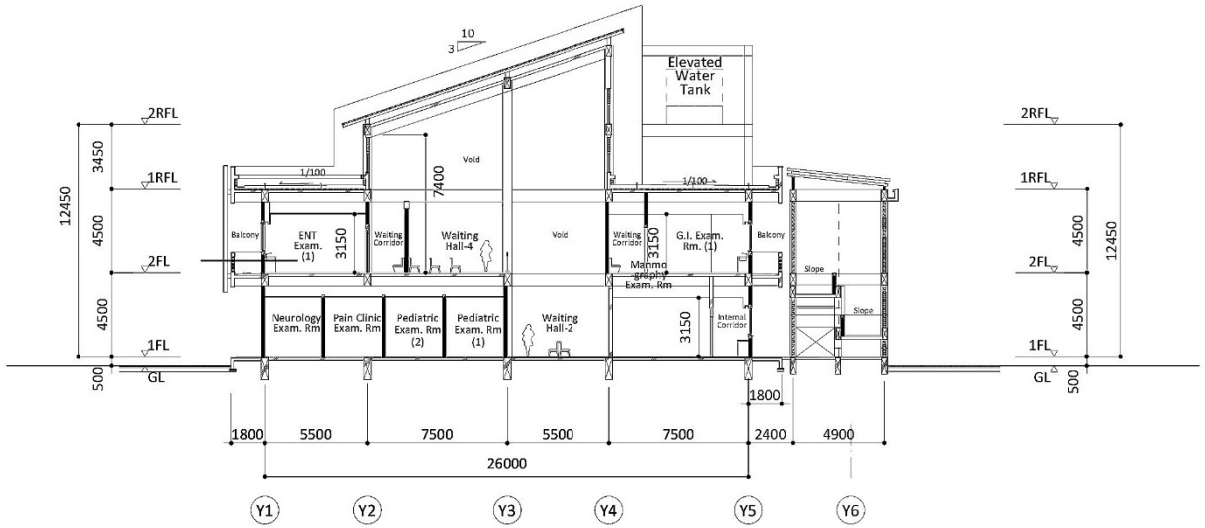


West Side

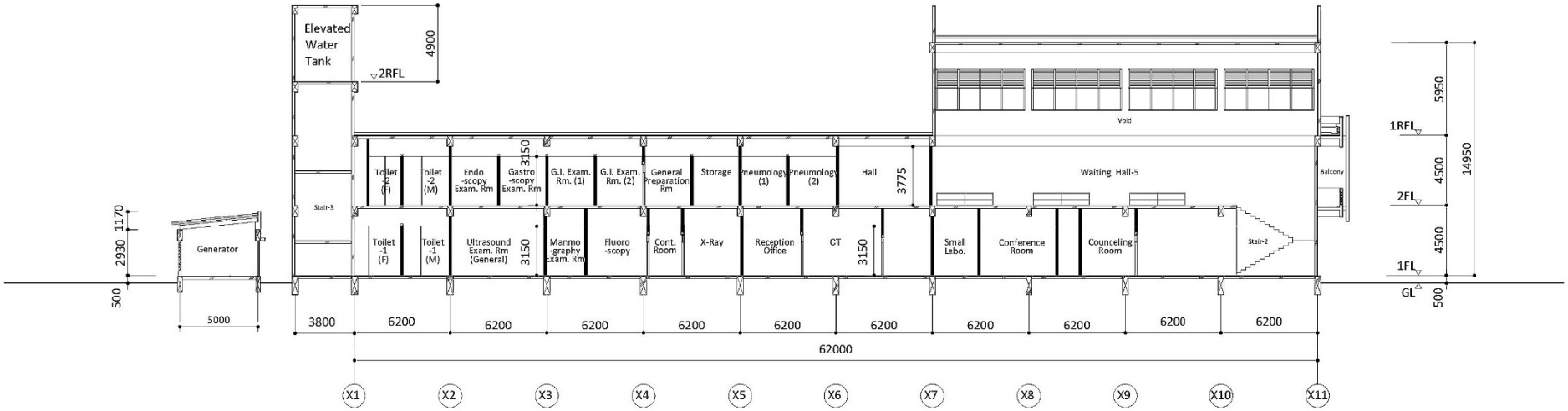


North Side

THE PROJECT FOR IMPROVEMENT OF SETTATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL	West and North Elevation 1/400

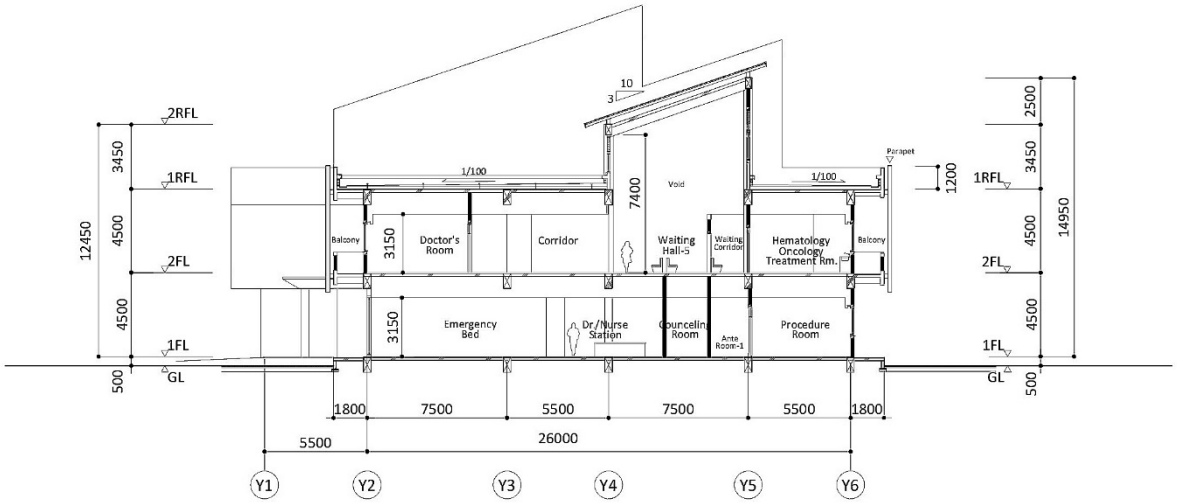


X1-X1' Section

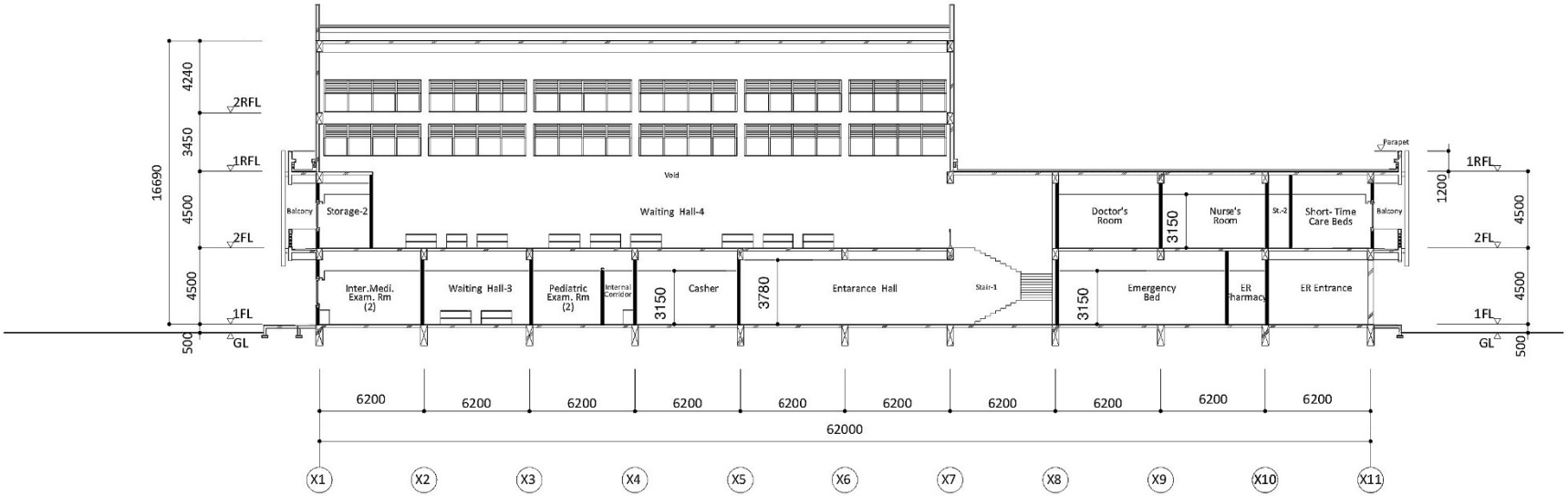


Y1-Y1' Section

THE PROJECT FOR IMPROVEMENT OF SETTATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL	X1-X1' and Y1-Y1' Section 1/400



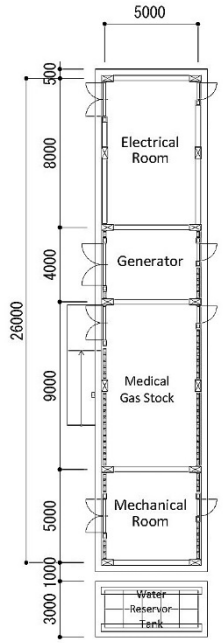
X2-X2' Section



Y2-Y2' Section

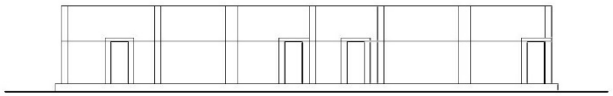
THE PROJECT FOR IMPROVEMENT OF SETTATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL	X2-X2' and Y2-Y2' Section 1/400

Settathirath Hospital : Annex Utility Building

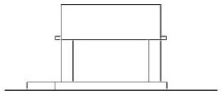


Floor Plan

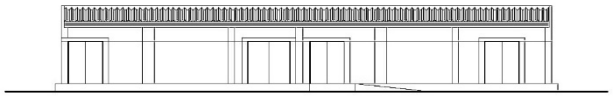
North Side



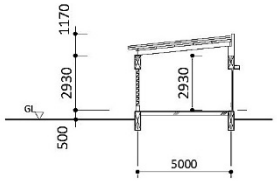
East Side



South Side

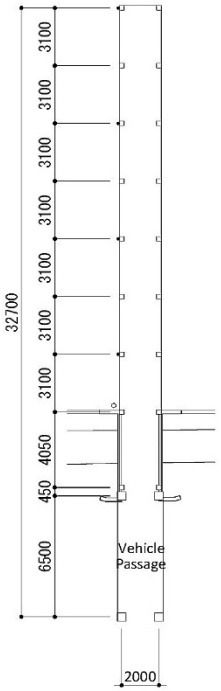


West Side

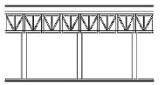


Section

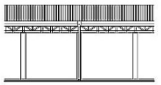
Settathirath Hospital : Connecting Walkway



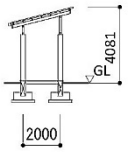
Floor Plan



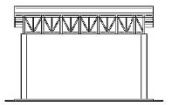
East Side



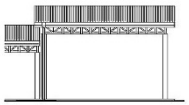
West Side



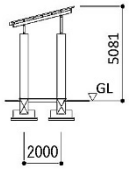
Section



East Side
(Vehicle Passage)



West Side
(Vehicle Passage)

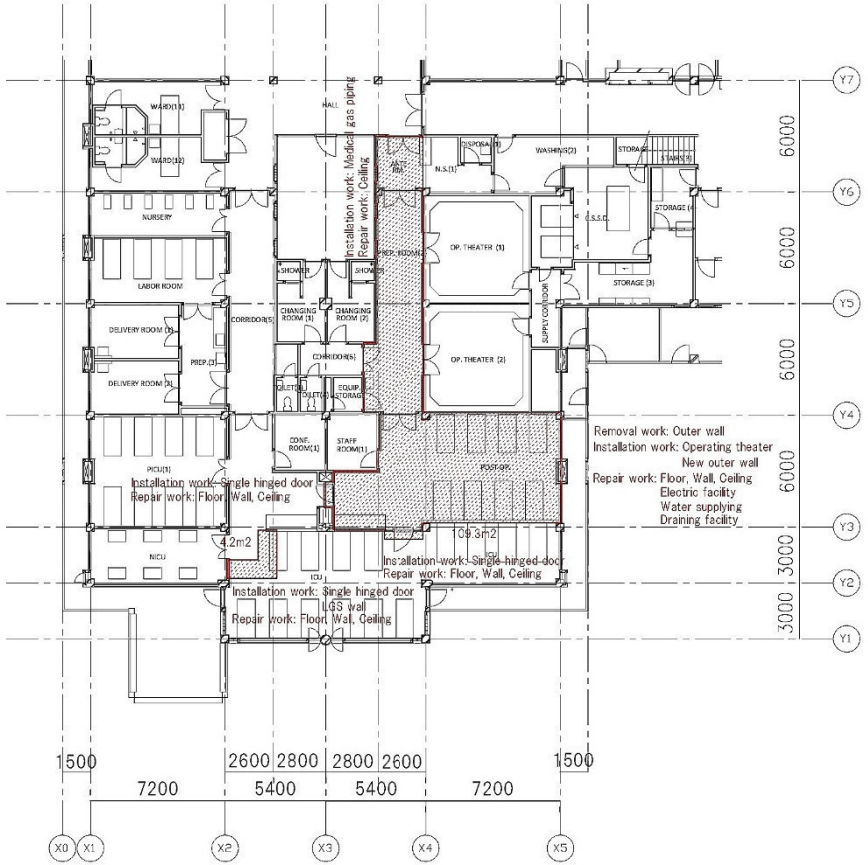


Section
(Vehicle Passage)

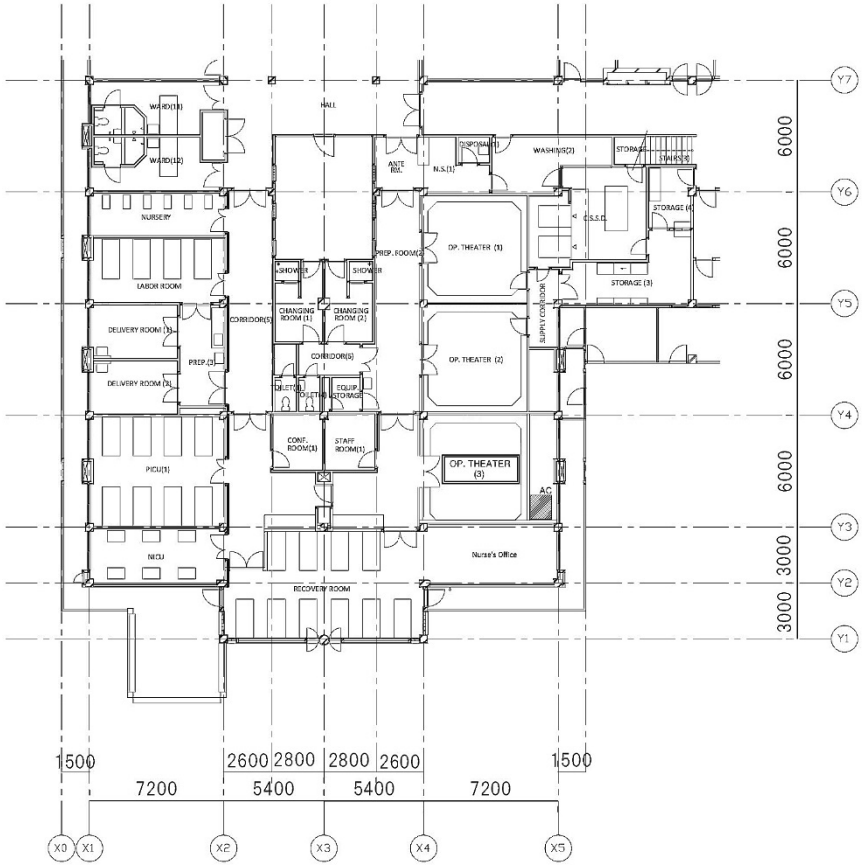
THE PROJECT FOR IMPROVEMENT OF SETTATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL

Attached Building 1/400

Settathirath Hospital Existing Building : Current Plan / Renovation Work Area



Settathirath Hospital Existing Building : Renovation Work Plan



THE PROJECT FOR IMPROVEMENT OF SETTATHIRATH HOSPITAL AND CHAMPASAK PROVINCIAL HOSPITAL

Existing Building Renovation Work Plan 1/400

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

(1) Construction Policies

1) Project implementation organization

As this project is implemented by the Grant Aid of Japan, smooth implementation of the project shall be ensured through close communication with related organizations and those concerned in partner country, consultants and construction contractors.

2) Consultant

The implementing organization of the recipient country shall conclude a service implementation agreement with a Japanese consultant to accept the consignment of bid support services and construction supervision services based on this preparatory survey report.

3) Construction company and equipment supplier

The implementing organization of the recipient country shall, under the Japanese consultant as described above, carry out general competitive bidding with prequalification for construction of facilities and general competitive bidding for equipment and material procurement, select a contractor of Japanese legal entity, and conclude a turnkey contract.

4) Utilizing local consultant and local construction company

A design license registered in the country is required to obtain a construction license in Lao PDR. Also, there are no clear legal stipulations for building standards and fire protection facilities standards. As preliminary check of design contents is necessary before submission of the application, cooperation shall be obtained in the implementation design stage from a local design consultant with the license.

As the number of Lao workers is small and there are many migrant workers from Vietnam, etc. in the construction sites in Lao PDR, it is difficult to secure workers in a certain season. Therefore, it is essential to utilize a local construction company which is familiar with the local worker custom and labor environment.

5) Dispatching professional engineer from Japan or a third country

Appropriate implementation of interior finish construction work is extremely important to provide medical services while properly operating the Operation Theaters after the implementation of this project. Accordingly, it is necessary to select engineers who are familiar with the construction method and handling of member materials as the interior construction work contractor for Operation Theaters. As the construction work contractors capable of these works are limited in Lao PDR, procuring

materials and workmanship shall be examined collectively as one set from Japan or a third country to ensure the quality.

6) Basic policies for construction

Prior to the commencement of construction, the construction work contents indicated by the consultants and the facilities construction contractors on the design specifications shall be thoroughly and carefully investigated. After that, as for the construction period, materials to use, construction methods, quality control methods, safety and health management and other appropriate matters, life styles, culture, laws and regulations, and other socioeconomic conditions in Lao PDR, natural conditions, intention of the implementing organizations, surrounding environment, location conditions, labor force and construction work characteristics shall be comprehensively reviewed to formulate the construction plan and promote efficient and economical implementation of construction works.

Also, labor and construction materials and equipment shall be locally procured as a rule; however, in the case that there is a problem in quality or inventory quantity, or in the case that procurement in Japan is advantageous from the viewpoint of the ease of maintenance and management after delivery, procurement in Japan or importing from other third country such as Thailand shall be adopted. In this case, a transportation plan shall be stipulated and delivery time, transportation routes, methods and other appropriate conditions shall be comprehensively reviewed to ensure appropriate handling without any influence on the progress of construction works.

(2) Procurement policy

1) Procurement policy of equipment

This project is aimed at improving the current state of existing equipment and restoring hospital functions, aiming to develop the necessary facilities and equipment, and equipment for this purpose is procured.

Among the equipment to be maintained under this project, since there is nothing manufactured in Lao PDR, it planned to procure equipment from Japan or third countries (North America, Europe). Also, since equipment procurement is carried out by competitive bidding, in the case where competitiveness cannot be ensured in Japan, we will consider procurement from third countries.

2) Procurement method

A procurement company will be selected by general competitive bidding by Japanese companies.

3) Transportation plan

① Transportation

For export of procured equipment, sea transport by cargo ship is common. From the place of the manufacturer, procurement equipment is shipped at Tokyo port or Yokohama port, etc.

② Sea transportation route

Since Lao PDR is an inland country without seaport, it does not have an import port. Procurement equipment that departed from Japan shall be transported by sea and unloaded at Bangkok Port in Thailand.

③ Temporary customs clearance and bonded transport at Bangkok Port

Temporary customs clearance of procured equipment that is unloaded at the Bangkok Port and is bonded to a truck to Lao PDR is carried out. Lao PDR is an inland country without a seaport; most transportation is by road. In the case of truck transport, it will use the Asian Highway AH 12 from Bangkok Port, transported to Nong Khai in the northern part of Thailand, crossing the Thai / Laos Friendship Bridge, entering the Vientiane capital.

2-2-4-2 Implementation / Procurement Conditions

(1) Points to be noted upon construction

1) Process control

Earthworks and foundation works are not performed generally in the rainy season between June and October in Lao PDR. Also, many of the construction workers are Vietnamese and there is a shortage in the number of workers on New Year's Day and in the busy farming season in Vietnam. Construction schedule shall be planned by taking into account the labor customs of workers as well as climate conditions and customs in Lao PDR.

2) Safety control

As this project is for the construction in the site of a hospital in operation and surrounded in three directions by Setthathirath Hospital (existing building), Private Ward and University of Health Sciences, sufficient attention for safety control shall be paid by installing of temporary fences along the buildings, ensuring of deployment of guides in the field, and implementing other appropriate measures.

In the plan, renovation works inside the existing building shall be performed in the night and early morning and on Saturdays and Sundays to avoid works during hospital opening hours as much as possible.

3) Temporary work plan

Material yards, field office and other appropriate zones to be installed in the site shall be surrounded by a fence to provide a clear division which prohibits the entry of general public. In the plan, it shall be specified that traveling by construction vehicles shall use the outer road along the site as much as possible.

In the case that installation of labor camp for migrant workers is required, it shall be separated from

the line of flow for general users and hospital staff and shall be installed at a place with clear division for the usage.

4) Special construction method

As the Operation Theaters are the core medical facilities with advanced systems, special materials and methods different from normal construction work are used. High-level construction work implementation in accordance with the design specifications is required to secure the functionality and safety after the provision of this project. Therefore, interior construction works for Operation Theater shall be planned as a special construction work with procurement of materials and workmanship as collective one set from Japan or a third country in order to select a contractor capable of secure implementation of the construction works.

5) Procurement of materials

Unpacking work for loading of medical equipment, cargo handling such as loading of equipment, etc. utilize the local labor, dispatching Japanese engineers and local engineers when assembling and installing equipment.

(2) Points to be considered on procurement of equipment

1) Timing to transport the equipment

The road network in Lao PDR is developed, and the road conditions from Tanaren near Vientiane, where equipment is cleared at customs, to Setthatirath Hospital and to Pakse in the south area are good. On the other hand, the climate of Lao PDR has a rainy season from June to October. Especially, at the end of the rainy season, there are many heavy rains. Since the road conditions are good, it is considered that the truck transportation in the rainy season has no problem, but it is necessary to adjust the transportation period in consideration of accidents caused by the pouring of rainy season, or traffic congestion.

2) Timing to install the equipment

This project has equipment to be installed in the existing building of Setthatirath Hospital located in the capital, equipment to be maintained in the newly built building, and equipment installed in the existing facility of Champasak Provincial Hospital located in Pakse.

It can be said to be more economically efficient to wait for completion of the new building at Setthathirath Hospital and carry in and out all the equipment at once. However, in the case of Champasak Provincial Hospital, there is no facility construction work, so considering improvement of hospital functions is the first priority, and so this project will consider supplying medical equipment at an early stage.

2-2-4-3 Scope of Works

(1) Scope or works

The Project will be implemented through mutual cooperation between Japan and Lao PDR. The works borne by each country for the smooth implementation of the project under the Grant Aid scheme of government of Japan are as follows:

1) Works borne by the Japan side

The Japan side shall bear consulting services in selection of a contractor and equipment supplier; and supervision of construction works, and the implementation responsibility as listed below:

① Construction/ renovation of facilities targeted under the project

② Procurement and installation of equipment targeted under the project

③ Test operation of the facilities and equipment; explanation/ guidance for maintenance and inspection and management methods

2) Works borne by the Lao PDR side

The Lao PDR side, shall bear the implementation responsibility regarding the land levelling of the construction site, remoral of existing facility, develop nesserary infrastructure to the site and tax exemption such as following works. In addition, the renovation work at 1st floor of existing northern main building shall be borne by Lao PDR side.

① To secure the construction and temporary construction sites.

② To level the construction site/ demolish and clear existing buildings and other unnecessary materials within the target site.

③ To develop infrastructures (electricity, city water, telephone line, etc.) into the construction site.

④ To conduct outdoor works including gates, planting, etc.

⑤ To exempt customs duties and internal taxes over materials/ equipment as well as services and their procedures.

⑥ To ensure smooth customs clearance and procedures for inland transport of materials/ equipment.

⑦ To accord Japanese nationals entry into the country and stay therein for the performance of their works.

⑧ To conduct procedures for necessary approvals and authorization for the project implementation.

⑨ To bear all necessary expenses, other than those to be borne by the Japanese side.

⑩ To conduct renovation work for the 1st floor in north ward of the existing building.

⑪ To remove existing deteriorated equipment.

Table 2-25 Major Undertakings by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure a lot of land necessary for the implementation of the project and to clear the sites		●
2	To construct/ renovate the following facilities		
	1) The building	●	
	2) The gates and fences around the site		●
	3) The parking lot (for the project building)	●	
	4) The road within the site	●	
	5) The road outside the site		●
	6) Clear existing buildings and other unnecessary materials within the target site		●
	7) Planting trees		●
	8) Renovation work of the 1st floor in north building of the existing building		●
	9) Removal of existing deteriorated equipment		●
3	To provide electricity, water supply and drainage and other incidental facilities necessary for the implementation of the project from outside the sites		
	1) Electricity		●
	2) Water Supply		●
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		●
	b. The drainage system (for toilet sewer, general waste, storm drainage and others) within the site	●	
	4) Gas		
	a. Supply from the city main gas pipe to the site		N/A
	b. The gas supply system within the site	●	
	5) Telephone and Internet		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
4	To ensure prompt customs clearance of the products and to assist internal transportation of the products in the recipient country.		
	1) Transportation of the products from Japan to Lao PDR	●	
	2) Internal transportation from the port of disembarkation to the project site	●	
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in Lao PDR.		●
6	To issue the residence permit which will be need for project implementation to Japanese and nationals from a third-country.		●
7	To ensure that the facilities and the products be maintained and used properly.		●
8	To bear all the expenses, not included in the Grant Aid, but necessary for the implementation of the project		●

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
9	To bear the following commissions paid to the Japanese bank based upon the B/A		●
	1) Advising commission of A/P		●
	2) Payment commission		●
10	Environmental and social considerations which may affect to the project implementation		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

Source: Summarized by the survey team

2-2-4-4 Consultant Supervision

(1) Construction supervision plan

Basic policies and matters to be noted for the construction supervision plan under this project are as listed below.

① To ensure smooth construction work, the consultant shall carry out close coordination with the implementing organizations. Particularly, as the infrastructure lead-in work at the expense of Lao PDR side is related to the mounting work on the Japan side and the timing of construction work is important, advance meetings shall be conducted thoroughly on the work schedule and specifications.

② By sufficiently examining the construction plans and construction drawings submitted by the contractors prior to the commencement of work, quality of the temporary work plan, process and planned materials as well as the validity of construction methods shall be evaluated.

③ Upon completion / delivery of construction work, inspection shall be carried out to see whether the finished construction work contents conform to the design specifications, and appropriate instructions shall be provided for a part to be corrected, if any.

④ Architect engineer shall be stationed in the construction site, and facility engineer shall be also dispatched as needed to conduct construction supervision.

⑤ As the existing hospital is in operation during the renovation work of Operation Theater, an engineer to coordinate with hospital operation and construcion works.

(2) Procurement supervision plan

Basic policy and points about procurement management of this project are as follows.

① For smooth equipment loading and installation work, the consultanting agency shall dispatch a

spot supervisor to coodinate construction works, inspection of equipment delivery, supervision and supervision of operation.

② As for the shipping, the pre-shipment equipment inspection by a third party organization shall be carried conducted to confirm the contracted equipment.

③ After the arrival of the equipment on site, the consultant will conduct the inspection of the equipment. The contents of the inspection will be the confirmation of the quantity, appearance, operation confirmation and accessories / spare parts for all equipment. Regarding the equipment requiring the installation, supervision on the installation process conducted by procurement company shall be provided.. It shall also supervise the contents of the initial operation guidance that the supplier will provide to Lao PDR users.

2-2-4-5 Quality Control Plan

(1) Construction

BS, ASTEM, TIS and JIS are applied to the quality control standards in Lao PDR. As there are no uniform quality control standards developed in Lao PDR, quality control under the standards of developed countries has been respected in actual situations. The quality control plan for this project shall be also made in accordance with the Japanese building standards as well as by ensuring the conformance with the local standards.

Underground pile loading test shall be performed in accordance with the Japanese Geotechnical Society Standards, etc. Concrete compression test shall be performed in a material test site in accordance with international standards such as JIS. Reinforcement tension test, etc. shall be performed in the same manner.

(2) Procurement

In order to secure and confirm the quality of the equipment procured by the contractor, investigate the pre-shipment inspection for the main equipment. Also check the temporary storage area of the equipment after arrival at the site, and decide where it does not be affected by rain or solar radiation during the storage period.

2-2-4-6 Procurement Plan for Materials and Equipment

(1) Procurement plan for construction materials and equipment

Cements, aggregates and reinforcements are manufactured in Lao PDR. Also, as the products imported from Thailand can be procured in the domestic market, adoption of materials shall be reviewed

by confirming the material quality in reference to international standards. There are ready mixed concrete plants in several places and the number of mobile concrete pump trucks, concrete mixer vehicles, etc. is sufficient in Vientiane City. As this project site is within one hour from an existing plant by car, the use of ready-mixed concrete shall be positively examined.

Many of other major construction materials and equipment are imported from Thailand and Vietnam; however, they are offered by many construction material agents in the city and can be procured in the domestic market.

Also, major construction equipment and machinery are owned by local construction contractors and they can be procured locally.

(2) Procurement plan for equipment

Maintenance is important for the purpose of permanent utilization of equipment which will be supported by this project. Therefore, equipment which can easily maintained and managed which local agents can follow-up will be considered.

2-2-4-7 Operational Guidance Plan

(1) Initial operation training plan

After the adjustment of procured equipment and performing operation test, A instruction of initial operation shall be given to the equipment users of Setthathirath Hospital and Champasak Provincial Hospital. The contents of instruction includes operation procedures and checking points for their daily maintenance.

(2) Operation training implementation plan

After the training for initial operation of equipment, another training shall be given; including maintenance methods, exchanging parts, and tracking down the cause of gliches.

2-2-4-8 Soft Component Plan

(1) Objectives and Contents of the Soft Component

Each hospital has 4 full-time staff who is in charge of maintenance and they perform simple repair works including replacement of power plugs and repair of power cables of medical equipment. At present, they are not conducting any substqantial management work for medical equipment, which supposed to be their primary task and there are issues listed below.

- Medical equipment is not managed.
- There are no registration number on each equipment.
- No service records.
- Location of medical equipment is not clear.
- Instruction manuals of medical equipment are not appropriately managed.
  No stock of consumables and exchange parts for equipment.

In order to solve the above issues, (1) support will be given to the start-up of an operation and maintenance organization; and (2) technical guidance will be given as a part of support for operation and maintenance, to improve the healthcare service which hospitals provide to patients.

(2) Expected outcomes

It is expected that the following outcomes will be produced through appropriate management of medical equipment so that the above issues will be solved.

- By attaching a Registration No. label to each item of medical equipment, current location, record of installation locations, department in charge of the equipment, etc. will become identifiable.
- The status of use of each item of medical equipment will be recorded tied to its Registration No., thus enabling effective use of equipment among different departments.
- By using the registration number, relevant information shall be kept by scoring of condition/cause and type of failure, service history and expenses. By using this information, it is possible to prevent recurrence of failures and identify failure occurrence cycles which will enable to plan and secure budget of procurement of supplies/replacement parts.

(3) Content of the Soft Component

At present, there is no equipment registration system by using the number in each hospital, and therefore the very first training will be an introduction of equipment registration, with the title such as "what is the equipment registration?", "merits of equipment registration" or "information known by the registered number". Subsequently, when equipment arrives at the project site, the 2nd training session will be held with an aim of expanding the contents learned at the 1st session.

① Target trainees

Target trainees are staff members in charge of medical equipment maintenance at Setthathirath Hospital and Champasak Provincial Hospital (8 persons in total) and doctors and nurses at clinical departments of the two hospitals (approx. 20 persons).

② Implementation period

It is planned that medical equipment will be delivered on two different occasions, the trainings will be held at firs and second delivery and instllaton which is the completion of the hand-over. The implementation process is shown below.

Table 2-26 Implementation Process of the Soft Component

Target Hospital	Contents	Time Frame													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Setthathirath Hospital	Procurement of equipment														
	Installation, conditioning,														
	Instruction on operation,														
	Soft component training														
Champasak Provincial Hospital	Procurement of equipment														
	Installation, conditioning														
	Instruction on operation,														
	Soft component training														

Source: Summarized by the survey team

③ Training programs

A training will be provided by a Japanese technical expert who will visit each of the two hospitals, by paying special attention not to disturb regular hospital operation. Details of training sessions are as follows.

Contents of 1st Training Session

Day 1	Appointment of medical equipment safety supervisor, inspection planning, and implementation of regular check-up.
Day 2	Inspection planning, explanation of the check-lists, developing the administration ledgers.
Day 3	Inspection planning by each item, developing checklists.
Day 4	Information entries in administration ledgers and explanation on management by PC.
Day 5	Developing administration ledgers and registration numbers.

Contents of 2nd Training Session

Day 1	Review of registration numbers, attaching the registration number label
Day 2	Inspection planning and implementation of daily inspection
Day 3	Updating of data in management ledgers and operation of measuring instruments
Day 4	Filing of manuals, guidance on operation
Day 5	Technical guidance on equipment for users
Day 6	Information on safety, technical guidance for equipment administration staff

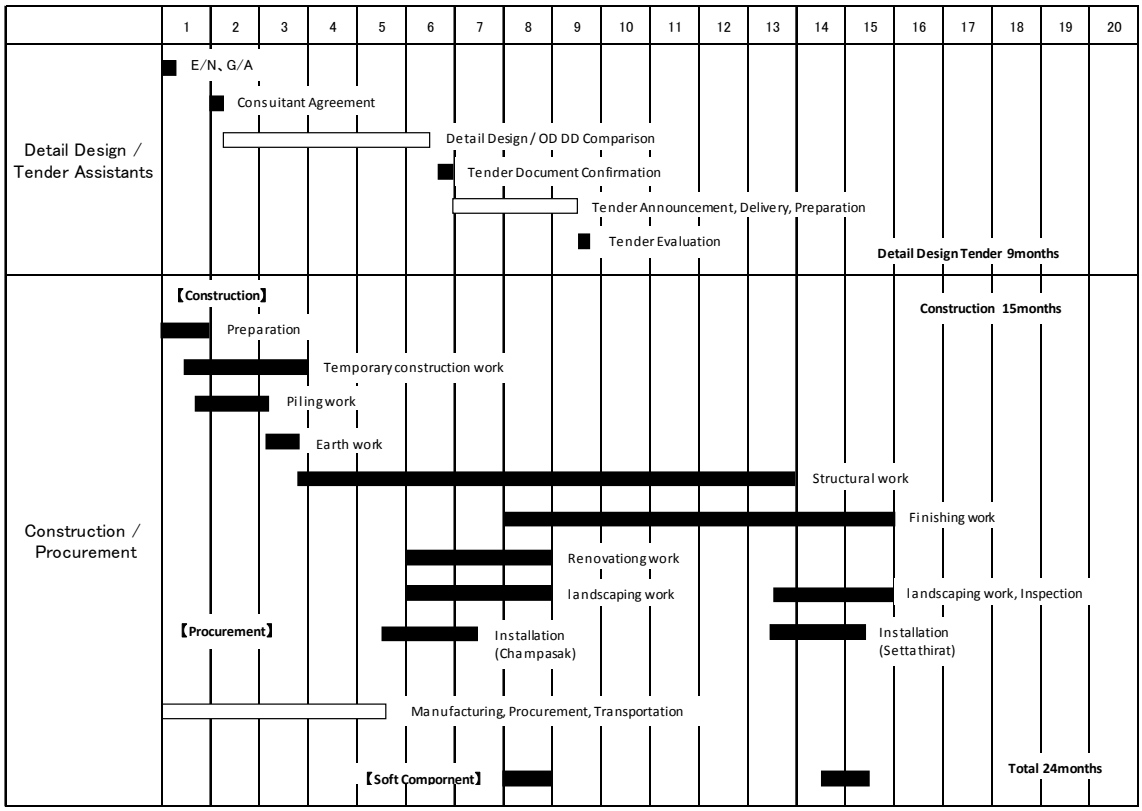
2-2-4-9 Implementation Schedule

(1) Implementation Schedule

1) Implementation Schedule of the facility

After signing of E/N and G/A between government of Japan and government of Lao PDR, the detailed design is prepared by the consultant and tendering and contract agreement on construction works and procurement of equipment will be carried out. Following by the verification of the contract with a contractor by government of Japan , the selected Japanese contractor will begin construction works and procurement/ installation of equipment. Simultaneously, the consultant will start construction supervision work. The period for detail design and tendering is estimated to be 9 months and construction works is estimated to be 15 months (including the period 1 month for the soft component). Total period for the implementation is scheduled to be 24 months.

Table 2-27 Implementation Schedule



Source: Summarized by the survey team

2-3 Obligations of Recipient Country

For the implementation of the project, the implementation agencies, Ministry of Health of Lao PDR, Setthathirath Hospital and Champasak Provincial Hospital need to complete following tasks within the restricted period:

(1) Obligations before the commencement of the construction work (only for Setthathirath Hospital)

1) To secure the construction sites

The construction site for the new ER/OPD building has already been secured within the compound of Setthathirath Hospital. To obtain the construction permit, the land certificate of the construction site shall be taken properly.

2) To conduct procedures for necessary approvals and authorization

A construction permit needs to be applied and approved without delay before the construction work for the project facility starts. The application whall be submitted from Ministry of Health or Setthathirath Hospital to the architecture bureau of Vientiane city. The responsible unit in Ministry of Public Works and Transport (MPWT) then review the application. The procedures normally take approximately 30 days. The following documents are necessary for a permit:

Application form / birth certificate / regidencial certificate / land certificate / land plan / photograph / drainage plan / drawings (plan, elevation, section, structure design, structural calculation, pile foundation plan) / environment compliance certificate

In order to obtain a permission of construction in Lao PDR, a domesticly registerd license of plan is required. Thus, a support will be sought by the local consultants who already have a license.

3) To demolishing and clearing of existing obstacles

The following obstacles including plants are to be demolished and cleared before the construction work starts:

①	Concrete pavement	: 700 ㎡
②	Concrete curve stone	: 20 no.
③	Trees	: 23 no.
④	ATM	: 3 no.
⑤	others	: Water supply pipes (to be transferred)

4) Securing of substitute parking area

As the current parking area is to be utilized for the construction site, substitute parking area shall be secured behind the existing main hospital building.

5) To secure a temporary construction site

A temporary construction site of a necessary size is required by the northwest border of the compound of the Sethathirath Hospital. The site is used for collecting materials for the construction, processing yard, and a field temporary office.

(2) Obligations during the construction/procurement work

1) To draw infrastructures into the construction site (only for Setthathirath Hospital)

Works for the following infrastructures need to be completed just before the completion of utility works and finishing works of the planned facility as well as installation of equipment.

① Electricity

A high voltage line (22KV) is drawn into the compound from the road in northern border and is down the voltage to 380KV via the planned transformer (630KVA). The transformer is purchased by the Japan side while its installation and connection shall be undertaken by the Lao PDR side.

② Water supply

The city water pipe shall be drawn into the site from the main pipe of 150mm dia. in till the FRP which is attached to the new buildings by the Lao PDR side.

③ Telephone

The Lao PDR side shall extend an existing main telephone line to be connected to the telephone switchboard inside the planned facility.

2) To remove the old equipment and machines

It is required to remove existing deteriorated equipment and machines from the place where the planned equipment will be installed for replacement. The following items shall be removed in target hospitals:

- Setthathirath Hospital : CTapparatus, General X-ray, Fluoroscopy, Operation lamp x 2, Autoclave, Washing machine x 2, Dryer, Refrigerator for body, Dental chair x 3 (Up to here, these are donated by Japanese grant aid project), General X-ray unit (equipment purchaced by the Ministry of Health, Lao PDR)

・Champasak Provincial Hospital　：CT apparatus, general X-ray unit, Operation lamp (equipment purchaced by the Ministry of Health, Lao PDR)

(3) Obligations after the construction work

1) To renovate 1st floor in the north ward of existing building

After transferring the OPD except for MCH and OBGY, ER and radiation departmens to the new building, vacant space shall be renovated by Lao PDR side aiming at expansion of service areas in MCH and OBGY.

2) To relocate existing equipment and furniture to the new building (only for Setthathirath Hospital)

Medical equipment, desks, chairs, shelves, cabinets, administrative devices or computers, cleaning tools shall be transferred to the from exsisting building to the new building for their continuous use. General furniture and office equipment shall be procured by the Lao PDR side if necessary.

3) To plant greens (only for Setthathirath Hospital)

The Lao PDR side shall plant necessary trees and flowers at exterior of the new building.

4) To engage in management, operation and maintenance (O&M)

The implementation agency shall secure necessary personnel and budget for project implementation, and it shall engage effective operation and management for constructed facility and procured equipment by the Grant Aid.

(4) Obligations to be related overall implementation

1) To exempt Taxes

To follow the E/N between two countries, a smooth procedure for disembarkation, custom clearance and internal transport of materials/ equipment procured under the Grant Aid scheme is necessary. At the same time, based on the approved contract, custom duties over materials/ equipment as well as services, VAT, and other taxes for banking transfer and transaction shall be exempted and refunded.

2) To enter into a Banking Arrangement (B/A) with a Japanese bank

Banking Arrangement (B/A) shall be made in a swift manner after the signing of E/N and G/A.

3) To execute authorization to pay (A/P) and payment commission

After the contracts of consultants and agents are made, the implementing agency shall pay an A/P notification commission and cover the commission to the bank with the registered B/A.

4) To accord with Japanese nationals for their entry into the country and stay therein

To follow the E/N between two countries, government of Lao PDR shall provide convenience for Japanese nationals for their entry into the country and stay therein for conducting their works based on the approved contract agreement.

5) Others

The Lao PDR side shall cover all nessesary expenses which is not included in the Grant Aid and shall conduct relavant administration procedures.

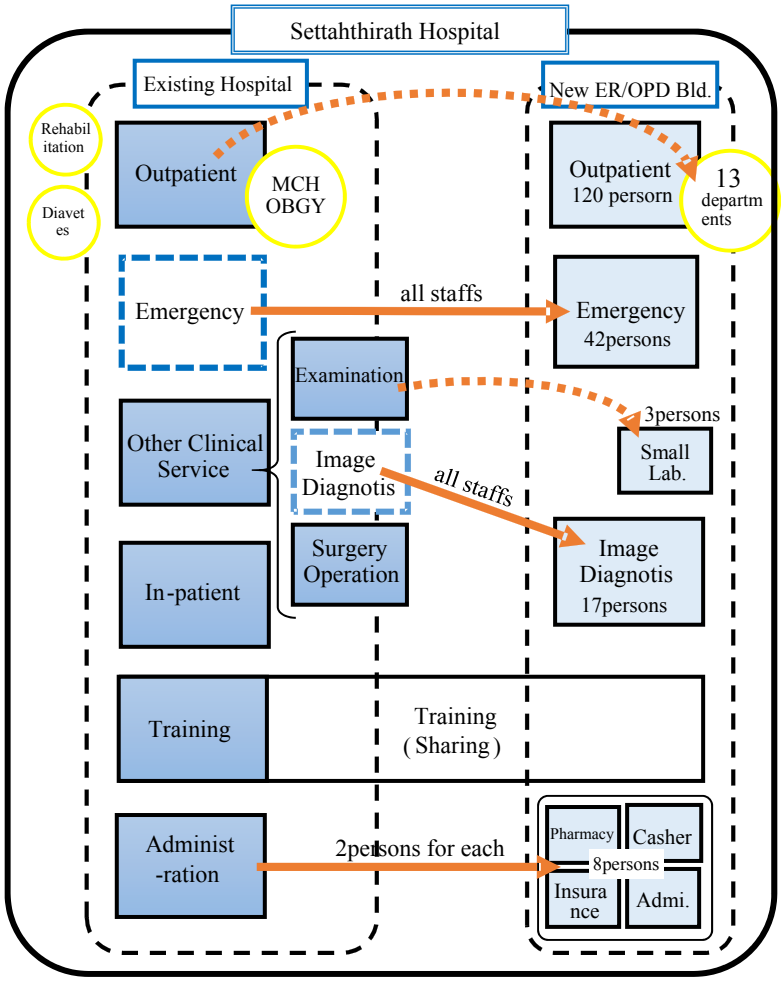
2-4 Project Operation Plan

2-4-1 Management Structure/ Personnel Plan

(1) Management Structure of Setthathirath Hospital

The basic management structure of Setthathirath Hospital after starting its operation of the new ER/OPD building will be maintained as same with current personnel. ER, OPD (13 clinics) and radiology department (image diagnostics) will be shifted to the new building, and as for the Pharmacy and Administration, personnel will be shifted partially.

190 out of 448 regular staff and 51 contract staff will be working in a new building, though nurses and doctors of Internal Medicine, Pediatrics, Pain Clinic, Surgery re-consultation, will be responsible for both buildings, existing and new.



Source: Summarized by the survey team

Fig. 2-19 Co-sharing of Staff in the Existing and the New Building

Staff arrangement to the new ER/OPD building is shown in the table below.

Table 2-28 Staffing plan for the New ER/OPD Building

Department	No. of Persons	Remarks
ER Doctors	12	Including doctors in other departments
Nurses	24	
Others	6	
Internal Medicine Doctors	2	
Pediatrics Doctors	2	
Cardiology Doctors	2	
Nurses for above 3 departments	12	
Gastro and Intestinal Doctors	5	Including a doctor who is studying abroad
Nurses	8	
Ophthalmology Doctors	2	
ENT Doctors	4	
Nurses for above 2 departments	8	
Dentistry Doctors	23	Including doctors in oral surgery that receives support from Ryukyu University
Allergy Doctors	3	
Nurses	6	
Neurology Doctors	3	Including a faculty of a University
Nurses	6	
Hematology & Oncology Doctors	2	
Nurses	4	
Pneumology(Infections) Doctors	2	
Nurses	4	
Pain Clinic Doctors	5	
Nurses	5	
Surgery (re-consultation) Doctors	4	
Nurses	8	
Radiology Doctors	6	
Nurses	11	
Small Laboratory Technician	3	
Pharmacy	2	
Casher	2	
Reception/Office	2	
Insurance	2	
Total	190	

Source: Summarized by the survey team

2-4-2 Operation and Maintenance (O&M) Plan

(1) Maintenance of facilities

Main maintenance and management items related to the new building of Setthathirath Hospital are as shown in the table below. Engineers and staff belonging to the maintenance will be in charge of, but routine cleaning of air conditioners and facilities shall be outsourced.

Table 2-29 Facility Maintenance Plan

Construction components of the facility and utilities	Interval Period			Component of Maintenance activities
	Routine	Regular	By Agent	
(Building)				
Roof waterproofing				Inspection and cleaning
Drain, Dawn Spout		6 months		Inspection and cleaning
Walls	○	1 year		Routine cleaning, painting
Floors	○	1 year		Routine cleaning, repairing clacks and floats
Doors & Windows	○			Routine inspection, locking adjustment
(Electrical Utility)				
Main distribution board	○		1 year	Routine inspection
Generator	○		1 year	Routine inspection, exchanging filters/oil
Lighting	○			Routine inspection, exchanging fluorescent lamp
Nurse call		1 month		Operation check
Emergency utilities		1 month		Operation check
(AC, Ventilation)				
AC		3 months	1 year	Cleaning fans and exchanging filters
Ventilator		3 months	1 year	Adjustment, cleaning the outlet
Ceiling fan		3 months	1 year	Cleaning, adjustment
(Water utility)				
Water reservoir tank, elevated water tank		1 year		Inspection, internal cleaning
Water supply pump	○	1 year		Routine inspection
Fire hydrant pump	○	6 months	1 year	Routine inspection and water discharging test
Sanitary unit	○			Routine inspection and cleaning
Septic tank	○		1 month	Inspection and cleaning each time, vacuuming
Aeration system	○	1 year		Routine inspection
Drainage pump	○	1 year		Routine inspection
Manhole	○	3 months		Routine inspection and cleaning
Sewage inlet	○		1 week	Routine inspection and cleaning

Source: Summarized by the survey team

(2) Maintenance of equipment

1) Equipment maintenance of Setthathirath Hospital

Regarding the maintenance staff who administrates medical equipment of Setthathirath Hospital, there are 2 electricians and 2 mechanicians assigned. Regular technicians take 24-hour-shift by taking turns to prepare for emergencies. Their work is mainly repairing such as replacing power plugs, repair the disconnection of electric cords, exchanging the light bulbs. For repairing and adjustment due to internal troubles such as breakage of the foundation of medical equipment and power supply failure, they are repaired by a local agent or manufacturer by bringing the equipment to the capital. Even after this project is implemented, these personnel and staffing plan will not be changing and secure the effective use of equipment by using the agent upon necessary. As for the CT apparatus, which is high-costed equipment, its maintenance will be supported by grant aid for the second and third year after the manufacturer's warranty termination, and therefore the hospital side needs to secure the budget before hand to prepare the phase after these periods.

In this project, only CT apparatus is the subject of the maintenance contract, and thus it is ideal that Lao PDR side shall have the maintenance contract for other equipment. Below is the list of equipment which is desirable for having maintenance contracts.

Syringe pump, Infusion pump, Bedside monitor, Ventilator, Incubator, Defibrillator, Electric scalpel, Anesthesia unit, Ultrasound unit, X-ray unit, ECG, etc.

2) Equipment Maintenance Management at Champasak Provincial Hospital

There are total of 4 maintenance staff: two technicians for maintenance and two electronic technician, working in Champasak Provincial Hospital. Of the four, one is on a 24 hours shift and others are working from 8 am to 4 pm.

The maintenance technicians described above visit each department of the hospital every Friday to maintain and administrate the equipment.

As a result of the patrol, if a problem is found in the equipment, and if the technician cannot solve the problem, they request the agent for quotation for repairing, and submit it to the hospital and wait for the budget execution. Even after this project is implemented, these personnel and staffing plan will not be changed or administration of equipment by using the agent when necessary. Similar to Setthathirathh Hospital, as for the CT apparatus, which is high-costed equipment, its maintenance will be supported by grant aid for the second and third year after the manufacturer's warranty termination, and therefore the hospital side needs to secure the budget beforehand to prepare for after these periods.

In this project, only CT apparatus is the subject of the maintenance contract, and thus it is ideal that Lao PDR side shall have the maintenance contract for other equipment. Below is the list of equipment for which it is desirable to have maintenance contracts.

Bedside monitor, Ventilator, Defibrillator, Electric scalpel, Anesthesia unit, Ultrasound unit, X-ray unit, ECG, etc.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

(1) Cost to be Borne by Lao PDR side

The Cost estimation borne by the Lao PDR side : 1,630 million LAK (23.03 million yen)

Table 2-30 Outline of Estimated Cost for the Project (borne by the Lao PDR side)

Topics	Contents	Estimated Cost (Million LAK)	JPY (million)
Facility Construction	Removal of obstacles of planned site (existing concrete pavement, trees) and leveling the site	200	2.83
	Establish electric and water lines for construction Administrative fee for construction approval	158	2.23
	Renovation of existing building (Grand floor of north wing in main building)	800	11.30
	Removal of deteriorated equipment	121	1.71
	Wiring utilities other than construction by Japan side, planting, furniture and utensils need for facility management	210	2.97
Bank commission	Banking Arrangement (B/A) establishment express and Authorization to Pay (A/P) issuance charges	141	1.99
Total		1,630	23.03

Source: Summarized by the survey team

(2) Cost Estimation Conditions

i) Time of estimation: March, 2017
ii) Exchange rate:
- 1LAK = 0.014129 Yen
- 1EUR = 123.08 Yen
- 1USD = 115.63 Yen
- 1THB = 3.31Yen

Regarding the determination of the exchange rate, an average rate from December 1, 2016 to 28 February 2017 was adopted.

(3) Construction Period

The period of detailed design, tenders and building construction work and equipmennt procurement are as shown in the project implementation schedule.

(4) Other

The project shall be implemanted in accordance with the Japanese Government's Grant Aid Scheme.

2-5-2 Operation and Maintenance Cost

2-5-2-1 Operation and Maintenance Cost for Setthathirath Hospital

(1) Operation and Maintenance Cost for Setthathirath Hospital

Estimated cost of operation and maintenance for the planned facility and equipment in the project is shown below. As a result of calculation, the yearly O&M cost is estimated as 1,939 million LAK (27,401,601 Yen * 1 LAK = 0.012129 Yen (Exchange rate as at March 2017)) (in 2022 year).

Table 2-31 Annual Operation and Maintenance Cost of Setthathirath Hospital

Items	Increased O&M Cost (LAK)	Contents/Remarks
①Office supply cost	119,056,032	Calculated by office expense of Setthathirath Hospital (2016) 244,468,239LAK, the proportion of floor area (Floor new ER/OPD Bld. 3,626.34 ㎡÷existing Bld. 7,443.39 ㎡＝0.487)
②Medicine and Consumable Cost	665,796,000	Consumable cost only. Refer to following '1) Medicine and Consumable Cost'
③Electricity bill		
Electricity	631,519,200	60,840KWh/month (electricity use per month)×865 LAK×12 months＝631,519,200 LAK
Fuel	11,539,920	Power blackout (4 times/month), 1hour/blackout. 35ℓ/h(fuel)×6,869LAK(diesel/ℓ)× 4 times ×1 hour×12 months
④City water bill	38,125,000	50 ㎥(water consumption per day)×260 days(week days) ＋25 ㎥×105 days(Sats. & Suns.)×2,440LAK／㎥
⑤Telecommunication bill	10,145,000	Internet :3,600,000LAK／year Basic fee of 3 lines :15,000LAK×3lines＋(5min×20calls ／day×250LAK／min×260days)＝6,545,000LAK The cost will be not increase from before the project as this is simply a location change.
⑥Facility O&M cost	91,059,000	Maintenance cost for AC： Because AC no. is almost the same as current ones, 24,090,000LAK ,same cost for 2016 is estimated. Cleaning service：Calculation the ratio of floor area of the new and existing, contract amount is considered as a half of 47,538,000LAK.＝23,769,000LAK Vacuum car for septic tank maintenance：twice per month is the event frequency, therefore, 1,800,000LAK×2times/month×12 months＝ 43,200,000LAK
⑦Equipment O&M cost	215,613,000	Refer to following '2) Equipment Maintenance Cost'
⑧Medical Gas bill (only O^2)	14,933,975	Estimated use of oxygen cylinders 40 ℓ type (600 ℓ capacity) is 1 per day. (for ER treatment room, ER 10 beds, 3 for day care beds). Additional theatre will be outside the scope as consumed gas volume remains the same as present due to no change of the number of operation. 1 cylinder/day (use per day) × 365days ×5USD(8,183LAK cost per cylinder)

Items	Increased O&M Cost (LAK)	Contents/Remarks
⑨Medical waste disposal cost	36,000,000	Cost for Medical waste disposal 3,000,000LAK／month×12 months
⑩Security cost (outsourcing)	105,600,000	Security 24 hours(1person in daytime, 2 persons night time), 8,800,000LAK/month×12months＝105,600,000 LAK
Total(LAK)	1,939,387,127	27,401,601 JPY(1 LAK＝0.014129 JPY)

Source: Summarized by the survey team

1) Medicine and Consumable Cost

Annual expendables of medical equipment to be maintained in the project are shown below.
As this plan has moved the existing service to the new facility as an appropriate place of providing services, it is considered that there is no increase in medical expenses related to the range of medical services.

Table 2-32 Annual Consumables Cost of Setthatithirath Hospital

Room	Equipment Name	Consumables/ Spare parts	Q'ty/ Year		LAK
AICU (PPP)	Syringe pump	Syringe(50pcs／Box)	5	Box	10,616,000
	Infusion pump	Infusion tube(30Set／Box)	5	Box	35,388,000
		Cuffs	2	Pc	708,000
	Portable Ultrasound Unit	Gel(10Pc／Box)	3	Box	4,247,000
		Recording Paper(10Roll／Box)	5	Box	3,539,000
NICU & PICU	Phototherapeutic apparatus	Light source(3Pc／Set)	1	Set	425,000
	Syringe pump	Syringe(50pcs／Box)	5	Box	10,616,000
	Ventilator	Exhalation tube(10Set／Box)	5	Box	17,694,000
		Desiccant(10Pc／Box)	2	Box	566,000
		Filter(10Pc／Set)	3	Set	1,062,000
	Bedside Monitor	Probe(50Pc／Box)	3	Box	4,247,000
		Cable(1Pc／Box)	3	Box	1,062,000
	Infusion pump	Infusion tube(30Set／Box)	5	Box	35,388,000
		Cuffs	2	Pc	708,000
	CPAP	Exhalation tube(10Set／Box)	3	Box	16,986,000
		Desiccant(10Pc／Box)	1	Box	354,000
		Filter(10Pc／Set)	2	Set	708,000
Recovery Room	Bedside Monitor	Probe(50Pc／Box)	3	Box	4,247,000
		Cable(1Pc／Box)	3	Box	1,062,000
Operation Theater	Suction unit	Suction tube	2	Set	2,831,000
		Suction bin	1	Pc	2,123,000
	Autoclave	Rubber seal	1	Set	2,123,000
		Heater	1	Pc	2,123,000
	Anesthesia Unit	Exhalation tube(10Set／Box)	5	Box	28,311,000
		Desiccant(10Pc／Box)	3	Box	1,062,000
		Filter(10Pc／Set)	3	Set	1,062,000

Room	Equipment Name	Consumables/ Spare parts	Q'ty/ Year		LAK
	Infusion pump	Infusion tube(30Set／Box)	5	Box	35,388,000
		Cuffs	2	Pc	708,000
	Ethylene oxide gas type autoclave	Rubber seal	1	Set	2,123,000
	Blood warmer	Heater	1	Pc	212,000
	Blood gas analyzer	Test plate(500Pc／Set)	3	Set	8,493,000
G.I.	Automatic washer for endoscope	Washing Chemical(5Pc／Box)	5	Box	10,616,000
	Bedside Monitor	Probe(50Pc／Box)	3	Box	4,247,000
		Cable(1Pc／Box)	3	Box	1,062,000
Delivery	Suction unit	Suction tube	2	Set	2,831,000
		Suction bin	1	Pc	2,123,000
	Infusion pump	Infusion tube(30Set／Box)	5	Box	35,388,000
		Cuffs	2	Pc	708,000
	CTG (Cardiotocogram)	Sensor probe	1	Set	1,416,000
GYN clinic	Syringe pump	Syringe(50Pc／Box)	5	Box	10,616,000
	Infusion pump	Infusion tube(30Set／Box)	5	Box	35,388,000
		Cuffs	2	Pc	708,000
ANC	Ultrasound Unit (ANC)	Gel(10Pc／Box)	3	Pc	4,247,000
		Recording Paper(10Roll／Box)	3	Box	2,123,000
	CTG	Sensor probe	1	Set	1,416,000
ER	Bedside Monitor	Probe(50Pc／Box)	3	Box	4,247,000
		Cable(1Pc／Box)	3	Box	1,062,000
	Infusion pump	Infusion tube(30Set／Box)	5	Box	35,388,000
		Cuffs	2	Pc	708,000
	Ventilator	Exhalation tube(10Set／Box)	5	Box	10,616,000
		Desiccant(10Pc／Box)	2	Box	2,831,000
		Filter(10Pc／Set)	3	Set	1,062,000
	Nebulizer	Tube(5Set／Box)	3	Box	1,062,000
	Portable Ultrasound Unit	Gel(10Pc／Box)	3	Pc	4,247,000
		Recording Paper(10Roll／Box)	3	Box	2,123,000
	Glucometer	Test plate(500Pc／Set)	3	Set	6,370,000
Radiography	Mobile X-ray Unit	X-ray bulb(1 change/3 year)	1	Pc	47,184,000
	Mammography	X-ray bulb(1 change/3 year)	1	Pc	35,388,000
	General X-ray Unit	X-ray bulb(1 change/3 year)	1	Pc	58,980,000
	X-ray fluoroscopy	X-ray bulb(1 change/3 year)	1	Pc	70,776,000
ENT	Audiometer	Probe(5Pc／Set)	1	Set	708,000
	Endoscopy for ENT	Tube(5Pc／Box)	1	Box	2,123,000
Neurology	Electroencephalograph (EEG)	Recording Paper(10Roll／Box)	5	Box	7,078,000
	Electromyogram (EMG)	Recording Paper(10Roll／Box)	5	Box	7,078,000
	Transcranial Doppler (TCD)	Recording Paper(10Roll／Box)	5	Box	7,078,000
Small Laboratory	Hematocrit centrifuge	Test tube(500Pc／Box)	5	Box	10,616,000
Total					665,796,000

Source: Summarized by the survey team

Since CT apparatus will be maintained by the Japan side until the third year after equipment delivery, there is no expense associated with replacing bulbs and tubes; however, from the fourth year, the cost of approximately 203 million LAK / year will be needed for exchanging the bulbs and tubes (assumed that changing bulbs and tubes once per three years, 609 million LAK/three years).

2) Equipment Maintenance Cost

The maintenance cost which will be provided by the project is shown as below.

Table 2-33 Annual Equipment Maintenance Cost of Setthathirath Hospital

Equipment Name	Q'ty	Inspection	LAK
Syringe pump	11	Periodic inspection	1,743,000
Bedside Monitor	21	Periodic inspection	17,835,000
Infusion pump	22	Periodic inspection	3,581,000
Ventilator	5	Periodic inspection	26,541,000
Incubator	5	Periodic inspection	3,821,000
CPAP	2	Periodic inspection	6,369,000
Electric Scalpel	4	Periodic inspection	4,133,000
Anesthesia Unit	1	Periodic inspection	6,546,000
Ultrasound Unit	3	Periodic inspection	37,423,000
Endoscope	1	Periodic inspection	9,668,000
Mammography	1	Periodic inspection	16,986,000
Mobile X-ray Unit	1	Periodic inspection	30,716,000
General X-ray Unit	1	Periodic inspection	20,525,000
X-ray fluoroscopy	1	Periodic inspection	29,726,000
Total			215,613,000

Source: Summarized by the survey team

Also, after completion of the CT maintenance contract period included in the Japan side equipment maintenance, a cost of 95,548,000 LAK / year is required for the CT periodic inspection.

(2) Staff cost

In FY 2015 / 2016, 448 staff (including contract staff) work in Setthathirath Hospital. After the completion of the new building, all clinics established in the new building start its services after the closure of services in the existing building together with the current working staff. Therefore, any increase or decrease in the number of staff is not estimated. The table below showing the breakdown of staff cost (in the past three years) in Setthathirath Hospital indicates that no new employment has been executed since 2014, and it is predicted that no rapid change in the total workforce will take place

in the future. Although a 24-hour pharmacy and an administration counter will newly open in the ER with an increase of one person to each place or two people in total, these two are transferred from existing pharmacy department for the new pharmacy and from Administration department for the counter, which does not affect the total amount of labor cost. The changes in the past labor cost do not present a significant increase or decrease and it is estimated that the total amount of labor cost in 2022 will maintain 8,819 million LAK as the total amount based on the latest information at present. Out of the total staff of 448, 190 are estimated to be transferred to the new building at the time of survey. This accounts for 42.4% of the total staff. Therefore, the labor cost in the maintenance and administration cost for new building is 3,735 million LAK.

Table 2-34 Breakdown of staff cost in Setthathirath Hospital

(unit: LAK)

Items	Fiscal Year (Sep - Oct)		
	2013-2014	2014-2015	2015-2016
Staff cost (National servant and contract staff)	8,740,000,000	9,378,664,710	8,810,936,217
Basic Salary	8,036,937,000	8,728,929,030	8,163,290,577
Staff salary (operating)	7,915,937,000	8,605,627,590	7,976,871,117
Regular staff	7,909,253,750	7,452,251,400	7,950,710,967
Staff under training	6,683,250	1,153,376,190	26,160,150
New Staff Salary	16,000,000		
Staff in national training	105,000,000	107,599,320	169,430,940
Staff in international training		15,702,120	16,988,520
Contract staff			
Monthly benefit	703,063,000	649,735,680	647,645,640
Position benefit	94,080,000	80,908,800	71,559,600
Technical benefit (Specialty)	136,000,000	140,449,680	132,935,040
Continuous working benefit	450,000,000	402,750,000	415,335,000
Security Benefit	22,983,000	25,627,200	27,816,000
Food benefit			
Social Insurance			

Note) Total staff cost equals to the total of basic salary and monthly benefits.
Source: Setthathirath Hospital

(3) Estimated revolving fund in Setthathirath Hospital

Revolving Fund for FY 2015 / 2016 in Setthathirath Hospital was 16,745 million LAK. In this project, for estimating the patients' number in 2022, 3% growth rate is adopted. Therefore by assuming the same growth rate for the revolving fund, it is estimated that the revolving fund in 2022 as 19,995 million LAK accordingly. In addition, the income by using CT scanner, X-ray fluoroscopy and mammography which will be procured by this project is expected. As the estimated number of the CT scan exam is 2,127 in

2022, the calculation by using the CT scan exam fee of 800,000 LAK of government rule, the estimated income in 2022 will be 1,701,600,000LAK. As for the mammography, abnormal findings are usually found in 10% of the total patients, and those who were found abnormal findings go into the scrutiny. In 2016, there were 106 breast biopsy cases (scrutiny) conducted and if this is considered as 10 % potion of the total, the demand number of mammography is 1,060, which also can be expected as 1,266 cases, 569,700,000LAK(exam fee 450,000LAK)of income in 2022. Also by procuring the X-ray fluoroscopy, the X-ray contrast exam became possible. In 2016, 333 cases were conducted as upper gastroscopy exam and 85 cases for the one of lower, and therefore, the demand for the X-ray contrast exam which is situated one step before the gastroscopy exam shall be at least twice as much as the number of gastroscopy (As gastro X-ray contrast exam, 836 cases). Also, not only the GI clinic, the X-ray contrast exam will be held for other departments, therefore approximately 1,000 cases demand can be assumed. By this assumption, in 2022, the number of exam cases will be 1,194 which will be 23 million LAK (with the exam fee of 200,000LAK). Moreover, another income estimation is also conducted for the 6 beds that will be installed in the day-care room in a new building by using operation rates of 70%. The assumption is that every patient will use the beds for 1 to 2 hours while having OPD services. Therefore, a bed will have two patients during with OPD opening 4 hours, and that can be considered as 12 beds. 12(beds)/day * 70% (operation rate) * 260 days (opening days per year) * 20,000 (beds fee), 43 million LAK can be expected.

[① Prospect income 2022 from current situation] 19,995,357,911 LAK (282,514,411 Yen)
[② Prospected income increase by project] 2,553,780,000 LAK (36,082,358Yen)
=1,701,600,000 (CT scanner)＋569,700,000(mammography)
＋537,300,000 (X-ray fluoroscope)＋43,680,000LAK(Use of day-care room)

Therefore, the total of expected revolving fund of Setthathirath Hospital involving the effect of this project implementation will be ① + ② = 22,549,137,911 LAK (318,596,769 Yen).

Table 2-35 Breakdown of Revolving Fund in Setthathirath Hospital (2015/2016)

No.	Description	Amount (LAK)		Description	Amount (LAK)
1	Patient Transfer by Ambulance	41,350,000	27	Overtime Health Ckeck	5,660,000
2	Eye Check (Treatment)	14,310,000	28	Emergency Treatment	322,678,000
3	MHC Card	29,575,000	29	Doctor Service Fee	135,789,000
4	Rehabilitation	11,970,000	30	Room cherge_ICU	53,330,000
5	Ear check (Treatment)	445,000	31	Neplyzer (Nose)	4,215,000
6	Health Certificate (Lao)	17,090,000	32	Cleft Lip Treatment	2,837,000
7	Health Certificate (Foreigner)	6,320,000	33	Body Model/Phantom rent	490,000
8	Bed Charge normal	332,565,000	34	Profit of Drug sale 15%	0
9	Bed Charge special	873,363,903	35	Drug sale	3,684,531,950
10	Wound Cleaning	28,364,000	36	Medical Equipment	442,306,000
11	Parking Charge	2,700,000	37	Operation consumables	1,301,443,532
12	Canteen	39,040,000	38	OB/Gyne Equipment	22,710,000
13	Specialist Check	13,630,000	39	Dental Treatment	10,285,000
14	Football Field/Bike Parking	0	40	ECG fee	102,050,000
15	Birth Certificate	8,980,000	41	CT Scanner Fee	0
16	Dead Certificate	130,000	42	Ultrasound Cardiography	33,630,000
17	Discharge Certificate	33,075,000	43	Echography Fee	231,550,000
18	Inpatient Certificate	76,980,000	44	MCH Ultrasound	102,140,000
19	Disease Certificate	3,780,000	45	Gastroglaph Fee	73,527,000
20	OPD Booklet	205,715,000	46	General chemical for test	2,195,855,242
21	Conference Room charge	10,015,000	47	X-Ray Film	341,550,000
22	Document Fee	11,030,000	48	O2	187,615,000
23	ATM-land rents	46,500,000	49	Social Insurance Fee	3,498,600,404
24	Dead Body keeping Fee	27,930,000	50	Government Insurance	1,972,633,477
25	HIV room charge	10,510,000	51	Community Insulance	174,629,949
26	Infant wormer for New Born	0	52	Bind arm or leg (wood)	373,000
				Total (2016Year)	16,745,797,457

Source: Summarized by the survey team

The examination fee specified by the Ministry of Health is as shown below (2016). As a drastic revision has been underway including the current health insurance scheme, the fee listed below which is the latest information at present may change.

Table 2-36 Examination Fee by MOH Decree (2016)

Name of Exam	Unit	Paper(LAK)	Service(LAK)	Total(LAK)
ECG	1 time	20,000	10,000	30,000
O^2 Utilization	1 hour	7,000	10,000	17,000
Ultrasound echo	1 time	20,000	30,000	50,000
X-ray(General)	1 time	20,000	30,000	50,000
Heart Ultrasound echo	1 time	65,000	100,000	165,000
Mammography	1 time			450,000
CT Scan	1 time			800,000
Fluoroscopy (X-ray contrast exam)	1 time			200,000

*As for the fluoroscope exam, the price has certain range from 180,000 LAK to 250,000 LAK, and therefore, calculation was conducted as price of 200,000 LAK.

Source: Ministry of Health, Lao PDR

(4) Income and expenditure of Setthathirath Hospital

Income and expenditure of Setthatirath Hospital consists of government subsidy and revolving fund. The total cost was 19,141 million LAK in 2016, and funding of this government subsidy that the main item will be staff cost or electricity fees considered to be continued in future. As for the revolving fund, in addition to the pharmaceutical income and service fee, the income by renting ATM machine space or foot-ball field or cafeteria sales which all are located in the hospital premise is also included. In 2016, it was 16,745 million LAK and in 2022, as specified in the section of "(3) Estimated revolving fund in Setthathirath Hospital", it will be estimated to be 19,995 million LAK.

Due to the construction of the facility and procurement of medical equipment by this project, the increased necessary cost will be estimated as 1,939 million LAK. On the other hand, the income that is considered to be increased will be 2,553 million LAK, therefore, it is assumed that income by implementing this project that is to constructing of a facility and procuring the medical equipment will exceed the cost by this project.

Also, once Japan side finishes its period of maintenance (3 years of from the handing over time), 203 million LAK /year (once a three year exchange of bulbs and exchange fee of 609 million LAK/ 3 years) and 95 million LAK of maintenance fee will be added to the expenditure of the hospital, still, it can be covered by the increase of revolving fund.

Table 2-37 Calculation of the Income and Expenditure Relating to ER/OPD Building in Setthathirath Hospital (estimation for 2022)

Income and expenditure	Item	Amount (LAK)	Amount (JPY)
Income	Expected income by the construction of the facility and procuring equipment	2,553,780,000	36,082,358
Expenditure (necessary expense)	Medicine and Consumable Cost	665,796,000	9,407,032
	Maintenance and Administration (Electricity fee etc.)	1,057,978,127	14,948,173
	Equipment Maintenance Cost	215,613,000	3,046,396
	Subtotal for expenditure	1,939,387,127	27,401,601
The balance of income and expenditure		614,392,873	8,680,757

*1 LAK = 0.014129 JPY (Rate as at March 2017)

Source: Summarized by the survey team

2-5-2-2 Operation and Maintenance Cost for Champasak Provincial Hospital

(1) Operation and Maintenance Cost for Champasak Provincial Hospital

Estimated annual cost for equipment maintenance by this project is shown below. As a result of calculation, the yearly O&M cost is estimated as 287 million LAK (4,065,502 Yen).

Table 2-38 Increased Annual O&M Cost for Champasak Provincial Hospital by the Project

Items	Increased O&M Cost (LAK)	Contents/Remarks
①Medicine and Consumable Cost	139,430,000	Consumable cost only. Refer to following '2) Medicine and Consumable Cost'
②Electricity bill		
Electricity	62,450,405	197.8Kwh/day (electricity use per month) × 865LAK×365days =62,450,405 LAK
Fuel	6,594,240	Power blackout (4 times/month) 1hour/blackout. 20ℓ/h(fuel)×6,869LAK/ℓ(diesel price/ℓ)× 4 times ×1 hour×12 months
③Equipment O&M cost	79,267,000	Refer to following '3) Equipment Maintenance Cost'
Total (LAK)	287,741,645	4,065,502 JPY(1LAK＝0.014129 JPY)

Source: Summarized by the survey team

1) Medicine and Consumable Cost

Annual expendables of medical equipment to be maintained in the project are shown below.

Table 2-39 Annual Consumables cost of Champasak Provincial Hospital

Room	Equipment Name	Consumables/ Spare parts	Q'ty/ Year		LAK
Radiology	General X-ray Unit	X-ray bulb(1 exchange/3 year)	1	Pc	58,980,000
	Mobile X-ray Unit	X-ray bulb(1 exchange/3 year)	1	Pc	47,184,000
ICU	Ventilator	Exhalation tube(10Set／Box)	5	Box	10,616,000
		Desiccant(10Pc／Box)	2	Box	2,831,000
		Filter(10Pc／Set)	3	Set	1,062,000
	Bedside Monitor	Probe(50Pc／Box)	3	Box	4,247,000
		Cable(1Pc／Box)	3	Box	1,062,000
CCU	ECG	Recording Paper(10Roll／Box)	5	Box	7,078,000
	Ultrasound Unit (cardiology)	Gel(10Pc／Box)	3	Pc	4,247,000
		Recording Paper(10Roll／Box)	3	Box	2,123,000
Total					139,430,000

Source: Summarized by the survey team

Same as Sethtathirath Hospital, since CT scanner will be maintained by Japan side until the third year after equipment delivery until the third year after delivery of equipment, there is no expense associated with the tubes and bulbs exchange, but from the fourth year it will cost approximately 203 million LAK / year for the tubes and bulbs exchange.

2) Equipment Maintenance Cost

Estimated annual equipment operation and maintenance cost which will be increased by the project is shown in the table below.

Table 2-40 Annual Maintenance management cost of Champasak Provincial Hospital

Equipment Name	Q'ty	Inspection	LAK
Bedside Monitor	4	Periodic inspection	6,794,000
Ventilator	4	Periodic inspection	21,232,000
Mobile X-ray Unit	1	Periodic inspection	30,716,000
General X-ray Unit	1	Periodic inspection	20,525,000
Total			79,267,000

Source: Summarized by the survey team

Also, after completion of the CT maintenance contract period incidental to the Japanese side equipment maintenance, a cost of 95 million LAK / year is required for the CT periodic inspection.

(2) Staff Cost

Staff cost in Champasak Provincial Hospital is as shown below. New staff was employed in FY 2014 and FY2015, and the total staff cost shows a slight increase. Details of future personnel plan have not been announced by the Ministry of Health yet; however, as an increase in the number of staff is estimated in proportion to the future increase in the number of patients, staff cost in 2022 is calculated by using the population growth rate of 1.7% which is used for the estimation of patients. Accordingly, staff cost in 2022 is estimated as 8,635 million LAK.

Table 2-41 Breakdown of staff cost in Champasak Provincial Hospital (National servant and contract staff) (unit: LAK)

Items	Fiscal Year(Sep - Oct)		
	2013-2014	2014-2015	2015-2016
Staff cost (National servant and contract staff)	6,468,487,757	7,298,146,313	7,673,955,780
Basic Salary	5,870,661,437	6,727,409,513	7,014,550,980
Staff salary (operating)			
Regular staff	5,865,188,437	6,323,635,728	6,980,839,210
Staff undertraining			
New Staff Salary	-	399,142,785	32,448,770
Staff in national training			
Staff in international training			
Contract staff	5,743,000	4,631,000	1,263,000
Monthly benefit	597,826,320	570,736,800	659,404,800
Position benefit	40,807,200	38,416,000	41,277,600
Technical benefit (Specialty)	129,971,520	129,654,000	159,818,400
Continuous working benefit	399,870,000	379,730,000	431,040,000
Security Benefit	27,177,600	22,936,800	27,268,800

Note) Total of labor cost equals to the total of basic salary and monthly benefit.
Source: Champasak provincial hospital

(2) Estimated revolving fund according to the equipment procured in Champasak Provincial Hospital

Equipment to be installed by this project is as shown below.

- Image Diagnosis Department (general X-ray unit, mobile X-ray apparatus, CT scanner)
- Operation Department (operating table, LED operation lamp, electric scalpel, defibrillator)
- ICU (ventilator, bed-side monitor, blood gas analyzer)
- CCU (ECG, ultrasonic image diagnosis for cardiology)

The effect of medical fee increases by installing of this equipment can be direct or indirect. For example, installation of LED operation lamps in a theater is beneficial to all patients who receive operation. While this can provide safer operating environment and better workplace environment for health care providers, it rarely becomes a direct influence on the increase or decrease in the number of patients. Among equipment which will be procured by this project, with the ones which income can be expected by conducting the exam, which are the CT scanner, general X-ray unit, ultrasound apparatus (cardiology) and ECG, the estimation of revolving fund is conducted.

・CT scan : 1,379 cases x 800,000 = 1,103,200,000 LAK
・X-ray : 10,081 cases x 50,000 = 504,050,000 LAK
・ECG : 4,185 cases x 30,000 = 125,550,000 LAK
(Using baseline of 3,657 cases (2013/2014) provided by the hospital as latest information)
・Ultrasound echo (cardiology): 1,849 cases x 165,000 = 305,085,000 LAK
(Estimated based on the first half year record of 2017, which is 850 cases which makes full year cases of1, 700, with the population increasing rate (1.7%))

According to the calculation above, estimated medical fee due to the equipment procured is at least 2,037 million (approx. 28,780 thousand Yen) LAK only for the portion of examination fee. Additionally, use of ventilator and defibrillator as needed, consultation fee accompanied by the examination and related exam cost can be estimated as income.

(4) Income and expenditure of Champasak Provincial Hospital

It is assumed that the income of service fee based on the procured equipment by the project will exceed the expenses, and sufficient income from this plan is expected. The main source of income is the collection of exam fees by using the introduced equipment, and the expenditure mainly consists of consumable item cost of the equipment, the maintenance and administration fee, and electricity bills.

Table 2-42 Income and expenditure in Champasak Provincial Hospital

Income and expenditure	Item	Amount (LAK)	Amount (JPY)
Income	Expected income by the project	2,037,885,000	28,793,277
NecessaryExpenditure	Medicine and Consumable Cost	139,430,000	1,970,000
	Electricity bill	69,044,645	975,532
	Equipment Maintenance Cost	79,267,000	1,119,963
	Subtotal for expenditure	287,741,645	4,065,501
The balance of income and expenditure		1,750,143,355	24,727,776

*1 LAK = 0.014129 JPY (Rate as at March 2017)

Source: Summarized by the survey team

After the maintenance period of CT scanner by Japan side (three years from hand-over), maintenance and management expenses of 203 million LAK /year (once a three year exchange of bulbs and exchange fee of 609 million LAK/ 3 years) and 95 million LAK of maintenance fee will be added to the expenditure of the hospital, still, it can be covered by the increase of revolving fund..

CHAPTER 3 PROJECT EVALUATION

CHAPTER 3 PROJECT EVALUATION

3-1 Preconditions

3-1-1 Preconditions for the Project Implementation

In order to achieve the entire plan of this project, it is necessary that the appropriate implementations and procedures to be carried out by Lao PDR side for the following matters.

① To implement the construction to be covered by Lao PDR side, for which the content is described in Chapter 2 “2-3 Obligations of Recipient Country”. Especially, it is fundamental that existing obstacles in construction planned site are removed; and procedures for tax exemption and removal of aged equipment in the existing building are completed.

② To assure the implementation of the contents described in Chapter 2 “2-4 Project Operation Plan”

③ To secure the management and maintenance cost which is needed for managing the facility and equipment, described in Chapter 2 “2-5 Project Cost Estimation”

3-1-2 External Condition for Achieving the Project

This project is to construct a necessary facility and to procure medical equipment for Setthathirath Hospital and Champasak Provincial Hospital in Lao PDR. It is expected that the facility and equipment will be utilized effectively, and thereby that the quality of providing medical service will be improved. Since much of the staff cost of both hospitals is covered by government subsidies, it is imperative that appropriate national subsidies will be secured in the future. As for the revolving fund, appropriate management and administration are requested such as securing the facility and equipment maintenance cost. Also, both hospitals are offering the places for clinical fieldwork for students to provide educational opportunities. A more appropriate educational environment shall be developed for both hospitals and schools by implementing this project. In the future, the same as the current situation, it is necessary that the institutions for health personnel capacity development manage and maintain their practical curriculum and service providing systems well.

3-2 Project Evaluation

3-2-1 Relevance

The Project is relevant under the Japanese Grant Aid scheme due to reasons described below.

(1) Appropriate environment for providing medical services and educational opportunities

Setthathirate Hospital cannot provide appropriate medical services and sufficient clinical trainings due to the narrow spaces in clinical area such as examination room and ER bed side etc. and deterioration

and lack of medical equipment. Champasak Provincial Hospital has also similar issues because of deterioration and lack of medical equipment. By improving the two hospitals, which provide medical services and educational opportunities as a central hospital of the capital city and a top-referral hospital in southern region, in the Project, the services shall be ameliorated and appropriate clinical trainings shall be provided. It is expected that the Project would have large impact to the related health/ medical facilities and health personnel and contribute to the improvement of health system in Lao PDR. Thus relevance of implementation of the Project is high.

(2) Target Beneficiaries of Project

Setthathirath Hospital is located in the Vientiane city whose population is approximately 820,000 (Census 2015). This project shall be beneficial to the population mentioned above. In addition, the people outside the city and residents in Vientiane Province shall also be the beneficiaries, as the hospital accepts patients with infectious diseases such as Dengue as the designated hospital for treatment of infectious disease, in case an outbreak occurs. Champasak Provincial Hospital accepts patients referred from not only the respective province but also other three neighboring provinces, which could number up to 650,000, on top of 694,000 of Champasak province. Therefore, a total of 1,344,000 people in southern region shall be beneficiaries of this project in the events of injuries, health examinations, and healthcare activities.

(3) Contribution to achieving targets of the country's medium- and long-term development plan

The duration of long-term strategy for health centers in Lao PDR is fixed as 20 years. In the long-term health strategy (2000-2020), priority issues such as disease prevention and health promotion, treatment and rehabilitation, health human resource development, etc. are clearly mentioned. Strengthening these fields is also consistent with the project direction. The 8th National Socio-Economic Development Five-year Plan (2016-2020) that set the mid-term policy of health sector, clearly mentioned to improve and enhance fields such as outpatient treatment, pediatrics, obstetrics and delivery, ophthalmology, resuscitation, emergency care and medical technology. This project will contribute to achieve the goals of these fields through establishment of an ER/OPD building and the provision of equipment. Hence, the adequacy of the implementation of this project will be sufficiently secured.

(4) Consistency of Japan's assistance policies and principles

In Japan's Country Assistance Policy (to Lao PDR), as assistance in health sector, it specifies to provide assistance to support medical personnel capacity development mainly in the field of maternal and child health, and health system strengthening mainly for medical facilities to improve access to health services. This project which is to support Setthathirath Hospital which is a central hospital in Vientiane and Champasak Provincial Hospital which is a top-referral hospital in southern region, with purposes of health system strengthening in Lao PDR, has enough accordance with Japan’s assistance strategy and policy.

3-2-2 Effectiveness

(1) Quantitative effects

The target values for feasible indicators of quantitative effects shall be set based on actual information in 2016 in target hospitals; Setthathirath Hospital and Champasak Provincial Hospital. The target year shall be set as 2022 which is three years after the completion of the facility construction. The expected quantitative effect and target value by implementing this project are shown in the below table.

Table 3-1 Quantitative Effect Indicator and Target Value

Indicator	Target Hospital	Base line (2016) (Actual value in 2016)	Target value (2022) (3 years after completion)
① Number of outpatients	Setthathirath Hospital	93,455	111,590
② Number of image diagnostics	Setthathirath Hospital	CT: 0 X-ray：12,037 Ultrasound：13,696	CT: 2,127 X-ray：14,935 Ultrasound：16,403
	Champasak Province Hospital	CT: 66 X-ray：9,105 Ultrasound：18,995	CT: 1,379 X-ray：10,081 Ultrasound: 20,003
③ Number of surgeries	Setthathirath Hospital	1,699	2,029

Source: Summarized by the survey team

The basis for calculating the above indicators is shown below.

① Number of outpatients

The number of outpatients at Setthathirath Hospital in the target year of 2022 was estimated by using population growth rate multiplied by patient number in 2016. As for the population growth rate, 3% was adopted by referring the outline of the final report "The Project for Urban Development Master Plan Study in Vientiane Capital (Final Report Summary, March 2011, The Lao People's Democratic Republic Public Works and Transport Institute, Ministry of Public Works and Transport, JICA) " of issued in 2011. There has been no major change in population growth rate over the past 5 years. Therefore, it is assumed that the same growth rate will continue for a while, and the estimation of number of patients up to 2022 was calculated. Diseases occur in certain proportions among populations, and on the basis of this, more patients are expected based on population increase. In Setthathirath Hospital, it is also assumed that patients will increase in the future.

② Number of image diagnoses

a. Calculation of image diagnostic cases in Setthathirath Hospital

Regarding the proportion of exam cases of outpatients, there is a possibility of change if feature of

the patients which the hospital is dealing with drastically changes due to the alteration of disease structures. However, in Setthathirath Hospital, there has been no major change in proportion of the patients by clinics over the 5 years, and it is assumed that no major change will occur in disease structure up to 2022. It is therefore assumed that the proportion of exam in outpatients also stays at the same level. Number of cases of X-ray and ultrasound in target year 2022 was calculated with shte basis of the proportion of cases in outpatients (93,455 cases) in 2016. As for the CT examination, there was cases since 2011 due to machine breakdown. Therefore, the average annual cases by using past 5-year's record till 2010, which is one year prior of breakdown year was uses as a baseline of calculation.

- Number of cases in CT in the target year：2,127cases
  ＝ based on the actual value in 2009/2010; 290 cases, it increases at yearly growth rate of 16.565%

- Number of cases in X-ray in the target year：14,395 cases = 111,590 (cases)× 12.9%
  = outpatients in 2022; 111,590 (cases)× (ultrasound cases in 2016; 12,037 cases / outpatients 93,455) 12.9%

- Number of cases in Ultrasound in the target year：16,403 cases
  = outpatients in 2022; 111,590 (cases)× (ultrasound cases in 2016; 13,696 cases / outpatients 93,455) 14.7%

b. Calculation of image diagnostic cases in Champasak Provincial Hospital

Using the same calculation methodology for Setthathirath Hospital above, the proportion of baseline cases in outpatients is calculated. Assuming that future examination rate will be almost the same ratio as present, the estimated number of examinations was calculated by using estimated outpatient in 2022 as a denominator. The estimated patients in 2022 were calculated by having outpatient of 63,276 in 2016 as baseline with population growth rate of 1.7% of overall Lao PDR.

However, regarding the CT apparatus, there was a certain period of unusable time due to machine breakdown in 2016, the value of 2016 was excluded. Instead, by using the value of 2015 which is one year before the year of breakdown; 1,036 was used for estimation.

The estimated value of outpatients (including ER) in 2022 is 70,11 and with assumption that the proportion of exams in outpatients stays at the same level, the below number of examinations was calculated.

- Number of cases in CT in the target year : 1,379

= outpatients in 2022; 70,011 (cases)× (CT cases in 2015; 1,036 cases / outpatients 52,466) 1.97%

- Number of cases in X-ray in the target year : 10,081cases
  = outpatients in 2022; 70,011 (cases)× (X-ray cases in 2016; 9,105 cases / outpatients 63,276) 14.4%

- Number of cases in Ultrasound in the target year：20,003 cases
  = outpatients in 2022; 70,011 (cases) × (ultrasound cases in 2016; 18,995 cases / outpatients 63,276) 30.0%

③ Number of operations

Regarding the number of operations, the statistics that hospital adopts was used which is all events conducted in theaters. Therefore, it includes not only surgical operations but also breast biopsy etc. There is no indication of the change in disease structure, so it is assumed that the operation case growth rate will stay at almost the same level as at present, and year average growth rate (3% / yearly) was calculated based on the actual values over the past three years; 2014-2016.

Number of cases of operations in the target year：2,029 cases
＝with the base line of actual operation cases in 2016; 1,699 cases, increased by 3 % annually.

(2) Qualitative effects:

Through the implementation of the project, the expected qualitative effect is assumed to be as follows.

- Environment of pre-service and in-service clinical training shall be improved for health personnel.

APPENDICES

APPENDICES

1. Member List of the Survey Team

1. Member List of the Survey Team

(1) The Field Survey in Laos（12nd February 2017 - 16th March 2017）

	Name	Position	Organization
1.	Taro KIKUCHI	Team Leader	Director, Health Team 4, Health Group 2, Human Development Department, JICA
2.	Nobuaki INOUE	Technical Advisor	National Center for Global Health and Medicine
3.	Eri FUJITA	Coordinator	Health Team 4, Health Group 2, Human Development Department, JICA
4.	Kentaro NISHIYAMA	Project Manager / Architectural Facilities Planning-1	Koei Research & Consulting Inc.
5.	Mutsumi GANDO	Sub-Manager / Architectural Facilities Planning-2	Koei Research & Consulting Inc.
6.	Tetsuro NISHIMURA	Building Design／Natural Conditions Survey	NIPPON KOEI CO.,LTD.
7.	Kazuhiro YAMAZAKI	Structure Design	Orimoto Structural Engineers
8.	Shuji YASUKAWA	Facilities Design	Kyodo Architects & Associates
9.	Kenta KUNIMOTO	Construction Planning / Cost	Koei Research & Consulting Inc.
10.	Toshiharu HATA	Equipment Planning / Equipment Maintenance System Planning / Equipment Procurement-2 / Cost Estimation-2	Koei Research & Consulting Inc.
11.	Kotaro MATSUNAWA	Equipment Procurement-1 / Cost Estimation-1	Japan Development Service Co., Ltd.
12.	Mai FUJI	Health Care Planning	Koei Research & Consulting Inc.

(2) Additional Field Survey（28th May 2017 – 6th June 2017）

	Name	Position	Organization
1.	Kentaro NISHIYAMA	Project Manager / Architectural Facilities Planning-1	Koei Research & Consulting Inc.
2.	Toshiharu HATA	Equipment Planning / Equipment Maintenance System Planning / Equipment Procurement-2 / Cost Estimation-2	Koei Research & Consulting Inc.

(3) DFR Explanation Survey（30th August 2017 – 7th August 2017）

	Name	Position	Organization
1.	Shunsuke SAKUDO	Team Leader	Senior Representative, JICA Laos Office
2.	Eri FUJITA	Coordinator	Health Team 4, Health Group 2, Human Development Department, JICA
3.	Kentaro NISHIYAMA	Project Manager / Architectural Facilities Planning-1	Koei Research & Consulting Inc.
4.	Mutsumi GANDO	Sub-Manager / Architectural Facilities Planning-2	Koei Research & Consulting Inc.
5.	Toshiharu HATA	Equipment Planning / Equipment Maintenance System Planning / Equipment Procurement-2 / Cost Estimation-2	Koei Research & Consulting Inc.

2. Survey Schedule

2. Survey Schedule

2-1 The Field Survey in Laos（12nd February 2017 - 16th March 2017）

No.	Day	Week	Official Members	Project Manager / Architectural Facilities Planning-1	Sub-Manager / Architectural Facilities Planning-2	Building Design / Natural Conditions Survey	Structure Design	Facilities Design	Construction Planning / Cost Estimation	Equipment Planning / Equipment Maintenance System Planning / Equipment Procurement-2 / Cost Estimation-2	Equipment Procurement-1 / Cost Estimation-1	Health Care Planning
1	12-Feb	Sun		Dep. Narita → Arv. Vientiane					Dep. Narita → Arv. Vientiane	Dep. Narita → Arv. Vientiane	Dep. Narita → Arv. Vientiane	Dep. Narita → Arv. Vientiane
2	13-Feb	Mon		Meeting with JICA Laos Office Meeting with Ministry of Health （ICR Explanation Receive the Questionnaires）		Dep. Narita → Arv. Vientiane	Dep. Narita → Arv. Vientiane	Dep. Narita → Arv. Vientiane	Meeting with JICA Laos Office Meeting with Ministry of Health	←	←	Meeting with JICA Laos Office Meeting with Ministry of Health Interview with JICA Expert
3	14-Feb	Tue		Meeting with Sethathirath Hospital (Explanation of Survey Contents, Request for cooperation)		Meeting with Sethathirath Hospital Survey of Internal Buiding	←	Survey of Sethathirath Hospital, Infrastructure, Facilities	Meeting with Sethathirath Hospital Survey of Internal Buiding	As same as Project Manager	Meeting with Sethathirath Hospital Survey of Hospital's Equipment	As same as Project Manager
4	15-Feb	Wed		Visit to Embassy of Japan Observation of Sites -Health Science University -Alliance International Medical Centre		Survey of Sethathirath Hospital, Infrastructure Interview with Local Consultant Observation of Sites -Alliance International Medical Centre	←	Survey of Sethathirath Hospital, Facilities Observation of Sites -Alliance International Medical Centre	Survey of Sethathirath Hospital, Infrastructure Interview with Local Consultant Observation of Sites -Alliance International Medical Centre	Ditto	Survey of Sethathirath Hospital's Equipment	Ditto
5	16-Feb	Thu		Survey of Sethathirath Hospital Observation of Sites -Mittaphap Hospital -Vientiane Rescue		Survey of Construction Material Interview with Local Consultant	←	Survey of Sethathirath Hospital, Facilities Survey of construction material Interview with Local Consultant	Survey of construction material Interview with Local Consultant	Ditto	Ditto	Ditto
6	17-Feb	Fri		Observation of Sites -Mahosot Hospital -Vientiane Provincial Hospital		Survey of construction material (Pile, Ready-Mixed Concrete) Start to Geological Survey	←	Survey of Sethathirath Hospital, Facilities Interview with Ministry	Survey of construction material (Pile, Ready-Mixed Concrete) Start to Geological Survey	Ditto	Ditto	Ditto
7	18-Feb	Sat		Progress of Each Survey Team Meeting		Survey of Construction Material Interview with Inspection Laboratory	←	←	Survey of Construction Material Interview with Inspection Laboratory	Progress of Each Survey Team Meeting	←	Progress of Each Survey Team Meeting
8	19-Feb	Sun		Dep. Vientiane → Arv. Pakse		Documentation Team Meeting	←	Dep. Vientiane → Arv. Pakse	Dep. Vientiane → Arv. Pakse	Dep. Vientiane → Arv. Pakse	Dep. Vientiane → Arv. Pakse	Dep. Vientiane → Arv. Pakse
9	20-Feb	Mon		Visit to Champasak Provincial Health Office (Explanation of Survey Contents) Survey of Champasak Provincial Hospital Interview with JOCV		Interview with Meteorological Office Survey of Construction Material Interview with Inspection Laboratory	←	Visit to Champasak Provincial Health Office Survey of Champasak Provincial Hospital	←	Visit to Champasak Provincial Health Office Survey of Champasak Provincial Hospital's Equipment	←	As same as Project Manager
10	21-Feb	Tue		Survey of Champasak Provincial Hospital Interview with JICA Expert		Interview with City Planning Department, Waste Department Survey of Construction Site	Survey of Sethathirath Hospital, Construction Site, Material	Survey of Champasak Provincial Hospital Interview with Local Contractor	←	Survey of Champasak Provincial Hospital's Equipment	←	Ditto
11	22-Feb	Wed		Dep. Pakse → Arv. Vientiane Meeting with Ministry of Health		Interview with Sethathirath Hospital Accounting Department, MOPWT	Confirmation of Geological Survey Progress Interview with MOPWT	Dep. Pakse → Arv. Vientiane	Dep. Pakse → Arv. Vientiane	Survey of Champasak Provincial Hospital's Request Equipment	←	Dep. Pakse → Arv. Vientiane Meeting with Ministry of Health
12	23-Feb	Thu		Survey of Sethathirath Hospital		Visit to Wattay International Airport Construction Site Interview with Local Consultant Collect Sewage	Survey of Sethathirath Hospital	Interview with Local Contractor	Interview with Electric Company Survey of Construction Material	Dep. Pakse → Arv. Vientiane	Dep. Pakse → Arv. Vientiane	As same as Project Manager
13	24-Feb	Fri		Ditto		Survey of Sethathirath Hospital Internal Buiding Consign to Water Analysis	Survey of Sethathirath Hospital Interview with Local Contractor	Interview with Local Contractor Survey of Sethathirath Hospital, Facilities	Interview with Telephone Service, Waterwork Department, EDL, Local Contractor	Survey of Sethathirath Hospital	Survey of Sethathirath Hospital's Equipment	Ditto
14	25-Feb	Sat		Progress of Each Survey Team Meeting		Survey of Construction Site	Survey of Construction Site Dep. Vientiane →Arv.	Dep. Vientiane → Arv. Bangkok	Survey of Construction Site	Progress of Each Survey Team Meeting	←	←
15	26-Feb	Sun		Documentation Team Meeting		←	Arv. Narita	Arv. Narita	Documentation Team Meeting	←	←	←
16	27-Feb	Mon		Meeting with Sethathirath Hospital Consideration of Draft Plan		Survey of Sethathirath Hospital's Site Start to Topological Survey Interview with Sethathirath Hospital Accounting Department			Interview with Local Consultant, Consctuction Association	As same as Project Manager	Survey of Equipment agency	As same as Project Manager
17	28-Feb	Tue		Ditto		Interview with EDL Visit to ASEAN Hospital Survey of B3 Hospital Ward			Interview with Tax Office, Labor Office, Local Contractor	Ditto	Ditto	Ditto
18	1-Mar	Wed		Meeting with Sethathirath Hospital Consideration of Draft Plan Meeting with JICA		Collect Sethathirath Hospital's data			Survey of Construction Material	Dep. Vientiane → Arv. Pakse	Survey of Sethathirath Hospital's Request Equipment	Ditto
19	2-Mar	Thu		Ditto	Dep. Narita → Arv. Vientiane	Interview with Ministry of Health (Tax Exemption)			Interview with Local Contractor Survey of Construction Material	Survey of Champasak Provincial Hospital's Equipment	Ditto	Ditto
20	3-Mar	Fri		Meeting with Sethathirath Hospital Consideration of Draft Plan	←	Interview with Sethathirath (CLC) Interview with Wattay International Airport Contractor (Tax Exemption)			Interview with Other Donor, Wattay International Airport Contractor	Dep. Pakse → Arv. Vientiane	Ditto	Ditto
21	4-Mar	Sat		Progress of Each Survey Team Meeting	←	Visit to Grant Aid Project Building			Progress of Each Survey Team Meeting	←	←	←
22	5-Mar	Sun	Dep. Narita → Arv. Vientiane	Documentation Team Meeting	←	←			Documentation Team Meeting	←	←	←
23	6-Mar	Mon	Meeting with JICA Official Members Visit to Sethathirath Hospital	As same as Official Members	←	Meeting with Sethathirath Hospital Interview with Ministry of Health (Tax Exemption)			Interview with Insurance Company, Wattay International Airport Contractor Visit to Pile Construction Site	As same as Official Members	Survey of Sethathirath Hospital's Request Equipment	As same as Official Members
24	7-Mar	Tue	Dep. Vientiane → Arv. Pakse Vidit to Champasak Provincial Health Office, Champasak Provincial Hospital Discussion of Minute's Content	Dep. Vientiane → Arv. Pakse (As same as Official Members)	Consideration of Draft plan Dep. Vientiane → Arv. Bangkok	Interview with Sethathirath Hospital Director, Nursing Department			Interview with Local Contractor Survey of Construction Material	Dep. Vientiane → Arv. Pakse (As same as Official Members)	Ditto	Dep. Vientiane → Arv. Pakse (As same as Official Members)
25	8-Mar	Wed	Meeting with Champasak Provincial Health Office Visit to Health Science University Junior College Dep. Pakse → Arv. Vientiane	Dep. Pakse → Arv. Vientiane (As same as Official Members)	Arv. Narita	Interview with EDL, Nursing Department Survey of Similar Hospital			Ditto	Dep. Pakse → Arv. Vientiane (As same as Official Members)	Ditto	Dep. Pakse → Arv. Vientiane (As same as Official Members)
26	9-Mar	Thu	Meeting with Ministry of Health (Confirmation of Draft Outline Plan) Visit to Embassy of Japan (Explanation of Draft Outline Plan)	As same as Official Members		Interview with Health Science University Survey of Mittaphap Hospital			Ditto	As same as Official Members	Ditto	As same as Official Members
27	10-Mar	Fri	Meeting with JICA Laos Office (Discussion of Minute's Content) Meeting with Ministry of Health (Signing of Minutes) Dep. Vientiane → Arv. Bangkok	As same as Official Members Dep. Vientiane → Arv. Bangkok		Interview with Infectious Disease Study Dep. Vientiane → Arv. Bangkok			Dep. Vientiane → Arv. Bangkok	As same as Official Members	Dep. Vientiane → Arv. Bangkok	As same as Official Members Dep. Vientiane → Arv. Bangkok
28	11-Mar	Sat	Arv. Narita	Arv. Narita		Arv. Narita			Arv. Narita	Survey of Sethathirath Hospital's Request Equipment	Arv. Narita	Arv. Kansai
29	12-Mar	Sun								Documentation		
30	13-Mar	Mon								Survey of Sethathirath Hospital's Request Equipment		
31	14-Mar	Tue								Ditto		
32	15-Mar	Wed								Ditto		
33	16-Mar	Thu								Ditto		
34	17-Mar	Fri								Ditto		
35	18-Mar	Sat								Ditto		
36	19-Mar	Sun								Documentation		
37	20-Mar	Mon								Survey of Sethathirath Hospital's Request Equipment		
38	21-Mar	Tue								Ditto		
39	22-Mar	Wed								Meeting with Sethathirath Hospital Dep. Vientiane → Arv. Bangkok		
40	23-Mar	Thu								Arv. Narita		

2-2 Additional Field Survey（28th May 2017 – 6th June 2017）

No.	Day	Week	Project Manager / Architectural Facilities Planning-1	Equipment Planning / Equipment Maintenance System Planning / Equipment Procurement-2 / Cost Estimation-2
1	28-May	Sun	Dep. Narita → Arv. Vientiane	←
2	29-May	Mon	AM : Meeting with Settathirath Hospital	←
3	30-May	Tue	AM : Meeting with Settathirath Hospital PM : Meeting with Ministry of Health	←
4	31-May	Wed	Survey of Sethathirath Hospital	←
5	1-Jun	Thu	Ditto	←
6	2-Jun	Fri	AM : Meeting with Settathirath Hospital Survey of Sethathirath Hospital	←
7	3-Jun	Sat	Additional Survey	←
8	4-Jun	Sun	Documentation	←
9	5-Jun	Mon	Reporting to JICA Office Dep. Vientiane → Arv. Bangkok	←
10	6-Jun	Tue	Arv. Narita	←

2-3 DFR Explanation Survey（30th August 2017 – 7th August 2017）

No.	Day	Week	Official Members	Project Manager / Architectural Facilities Planning-1	Sub-Manager / Architectural Facilities Planning-2	Equipment Planning / Equipment Maintenance System Planning / Equipment Procurement-2 / Cost Estimation-2
1	30-Aug	Wed		Dep. Narita → Arv. Vientiane	←	←
2	31-Aug	Thu		AM : Meeting with Settathirath Hospital	←	←
3	1-Sep	Fri		PM : Meeting with Ministry of Health	←	AM : Dep. Pakse → Arv. Vientiane PM : Meeting with Champasak Provincial Hospital Dep. Pakse → Arv. Vientiane
4	2-Sep	Sat		Documentation Team Meeting	←	←
5	3-Sep	Sun	Dep. Narita → Arv. Vientiane	Documentation Team Meeting	←	←
6	4-Sep	Mon	AM: Meeting at MPI, Department of International Cooperation, Ministry of Plan Investment PM: Meeting at DHC & DOF/MOH Meeting at MOF	←	←	←
7	5-Sep	Tue	AM : Meeting at DHC /MOH PM : Revision of MD	←	←	←
8	6-Sep	Wed	AM : Meeting at DHC /MOH PM : Signing MD Dep. Vientiane → Arv. Bangkok	←	←	←
9	7-Sep	Thu	Arv. Narita	←	←	←

3. List of Parties Concerned in the Recipient Country

3. List of Parties Concerned in the Recipient Country

(1) Ministry of Health	
Dr. Bounnack Saysansongkham	Deputy Director-General, Department of Health Care (DHC)
Dr. Lavanh Vongsavanthong	Deputy Director, Central Hospital Division
Ms. Duangphone Soulivong	Technical Officer, DHC
Dr. Bouakhan Phaknounthong	Head of Central Hospital, DHC
Dr. Thevane Thavone	Technical Officer, DHC
Mr. Thanom Insal	Director, Medical Products Supply Center
Dr. Chandavone Phoxay	Deputy Director, Department of Hygiene and Health Promotion (DHHP)
Mr Boundathien Phimmasenh	Chief of Division, Procurement Committee
(2) Ministry of Planning and Investiment	
Ms. Saymonekham Mongnomek	Duputy Director General, Department of International Cooperation
Mr. Somekhit Kaoyanouan	Asia Pacific Department
Mr. Sengthong Keoviseth	Technical Staff (Japan ODA)
(3) Ministry of Finance	
Mr. Angkhansada Muangkham	Director General, Department of External Finance and Debt Management
Ms. Viengkone Ehindavong	Deputy Director, Tax Department
Mr. Theutthoune Soukaloun	International Finance Cooperation Division
(4) Setthathirath Hospital	
Dr. Khampe Phongsavath	Director
Dr. Phayvanh Keopaseuth	Deputy Director
Dr. Vorachith Thiphakoon Pharm	Deputy Director
Dr. Khamla Choumlivong	Deputy Director
Dr. Viengxay Manivong	Cheif, Department of Medical Affairs
Mr. Mauoloiu Souvonnophousith	Deputy Director, Department of General Affairs and Planning
Mr. Kengsomkiath Thammavong	Academic Officer, Department of General Affairs and Planning
Dr. Keokethong Phongsavan	Deputy Chief, Department of Obstertics and Gynecology (OBGY)
Dr. Thavysivilay	Medical Doctor, Deparrtment of Intensive Care Unit (ICU)
Ms. Thipmalakham	Head of Nursing Departmement (ER Nurse)
Dr. Viengvansay Nabandith	Chief, Department of Laboratory
Ms. Khamla Siouedom	Head Nurse, Department of Nursing Care
Ms. Sonvuan Beng	Head of Management (MA)
Dr. Keo Phommalath	Chief, Department Anesthesia
Dr. Soulinthone	Deputy Department, Department of Pneumology
Dr. Somchanh	Head of Department, Department of Internal Medicine
Dr. Viengphathong	Chief, Department of Surgery
Dr. Chanthaoloth	Deputy of Neurology, Department of Pediatric
Dr. Simai Butphromuniharn	Chief Doctor, Eye, ear, nose and throat (EENT)
Dr. Phimseng Phitthanousone	Chief, Department of Emergency Care (ER)
Dr. Ammaly	Chief, Department of Radiology
Dr. Songkeo	Chief Doctor, Adult Intensive Care Unit (AICU)
Ms. Thanh Phommasack	Head of ER Laboratory
Dr. Thongsavamh	Dentist, Department of Dentistry
Ms. Vilaythong Soulyavong	Deputy Director, Department of Administration
Ms. Sovonaly Sisarath	Chief, Department of Financial Department
Dr. Soulinthone Phommaxay	Chief, Tropical medicine and tubeculosis (TB) ward
Dr. Sipasong Sinvongsa	Chief Doctor, Department of Surgery
Dr. Manisoru Khennavong	Medical Doctor, Department of Internal Medicine
Dr. Sinthavong	Head of Administration, Department of Administration
Mr. Phoumagphet Vongphardy	Administrator, Department of Infectious prevention control unit
Dr. Khamphonvane Phounesavath	Chief, Neonatal Intensive Care Unit (NICU) and Pediatrics Intensive Care Unit (PICU)
Dr. Vienglahone	Medical Doctor, Division of Ultrasound
Dr. Phiphob Louangsivilay	Medical Doctro, Department of Radiology

Dr. Soulaphap Hanlothxomphou	Medical Doctor, Department of Emergency Care (ER)
Dr. Vongdaen Phasinovanh	Medical Docror, Operation and Recovery Room
Dr. Khamkerth	Head of Department, Department of Gastoro and Intestional (GI)
Dr. Saleumkhouw	Medical Doctor of Gastoro and Intestional Testing Room (Endoscope)
Dr. Pathoumvanh Khamkeuth	Medical Doctor of Gastoro and Intestional Testing Room (Endoscope)
Dr. Saylor	Medical Doctor of Gastoro and Intestional Testing Room (Endoscope)
Dr. Thrsngsevanh	Head of Dentist
Dr. Sonchanb Screralay	Internal Medicine
Mr. Bounchnh Phanthalangsy	Head of Human Resource (HR)
Mr. Sukan	Technician, Maintainance
Dr. Somsana	Medical Doctor, Deparrtment of Intensive Care Unit (ICU)
Ms. Keo Duanglikone	Staff, Washing Room
Ms Vongdeuan Phasinovan	Technical Officer Department of Internal Medicine II (PPP)

(5) Champasak Provincial Health Office

Mr. Sonkiat Thone	Director,
Dr. Vanida	Vice Head of Management
Ms. Chondavone	Management Officer, Division of Managemnt
Ms. Phouangmala Phoxay	Vice Head, Division of Hospital
Ms. Soosada	Administrative Officer, Department of Administration

(6) Champasack Provincial Hospital

Dr. Khamsing Keothongkou	Director
Dr. Practith	Deputy Director
Dr. Khongmany Panyasavath	Deputy Director
Dr. Khitsaveng Sisoulath	Deputy Director
Dr. Pradith Souvanlasy	Deputy Director
Dr. Phouvanh	Radiology department (X-Ray)
Dr. Sonephet Phomma	Anesthetist, Anesthesia Department
Mr. Sintham Onsisouphanhthong	Head, Department of Finance
Dr. Soodsada Nalongsack	Deputy Head, Department of Medical Administration
Mr. Sisanong Vlonamo	Chief, Division of Maintainance
Dr. Bounyong Thepboliboun	Medical Officer, Department of Laboratory
Dr. Sayarit Khanthachack	Medical Officer, Department of Radiology
Dr. Silikhamla	Medical Officer, Department of Radiology
Mr. Khamtan Sackkalin	Deputy Head, Maintainance
Mr. Ketvixay Vongsuvanh	Techician, Divison of Maintainance
Mr. Khonesavanh Phommaketh	Techician, Division Maintainance
Dr. Bounthonh	Chief, Department of Medical administration
Dr. Bounkham Phethany	Chief, Department of Surgery

(7) University of Health Sciences

Mr. Aloungnadeth Sitthiphanh	Vice President for Planning and Student Affairs
Mr. Khamprasong	Vice Director of Cabinet Office
Ms. Amphayvieng	Mecical Doctor, Academic Affairs Division
Dr. Niranh Phoumindr	Vice Dean, Faculty of Medicine
Dr. Ketsomsouk Bouphavanh	Vice Dean, Director of EDC/HP

(8) Electricite du Laos

Mr. Phoxay Phommatham	Branch Manager for 4 Districts
Mr. Bounkheut Vilayhak	Deputy Manager

(9) Nampapa Nakhone Luang, Waterwork department, Vientian Capital

Mr. Saysongkham Bouapha	Manager, Division of ICT

(10) Ministry of Public Works and Transport

Mr. Santana Choummanivong	Department of Housing and Urban Planning

(11) Vientiane Capital Vientiane City Office Management and Service

Mr. Sisouk Thoratha	Architect

(12) Mahosot Hospital

Dr. Bounthaphany Bounxouei	Director

(13) Mitthaphab Hospital

Ms. Tavanh Manivong	Deputy Director

(14) Alliance International Medical Center; AIMC, Honda Hospital

Mr Achara Changsiri	General Manager

(15) Vientian Rescue

Mr. Sebastian

(16) Health Frontiers

Dr. Celine Jacobs
Dr. Kristina Kaufmann

(17) KOICA

Ms Jin A Hwang	Aid Effectiveness Specialist

(18) People relevant to the field of architecture

Mr. Khampanh Sengthongkham	Office Supervisor, Lao National Construction Association
Mr. Vongphai Bounmanee	Executive Director, APA Design and Consultants
Ms. Arouny Sakulku	Executive Director, Lao Consulting Group
Mr. Chan Kok Hooi	Advisor, Engineering Testing Consultant
Mr. Thepkhamphou Somsana	Director, Khamphay Sana Group
Mr. Marc O. Renault	Managing, Director, SBL Construction Solutions
Mr. Ravansith Thammarangsy	Managing Director, Delta Construction Co., Ltd
Mr. Tom Luangphet	Sales Representative, Souvanny Home center Public Company
Mr. Venus Vongphrachanh	Vice President of Bussiness Development, TK Group

(19) Sales agents for medical equipments

Ms. Keovisouk Phichith	Director, Asean Med Sole Co.,Ltd.
Mr. Sangvone Phankeo	Service Manager, CBF Pharma Co.,Ltd. - Vientian Branch
Mr. Thongkham Puthavong	Managing Director, DDP Chaleunxup Co.,Ltd.
Mr. Meckhaphim Phrachanh	Sales & Marketing Manager, Medical Device Health Care DKSH Laos Company Limited
Mr. Damdouane Phommavong	Marketing & Sales Manager, Sokody Osoth Import-Export Co.,Ltd.
Mr. Rewat Senchanthical	Deputy Managing Director, Viengthong Pharma Co.,Ltd.

(20) JICA Laos office

Mr. Shunsuke Sakudo	Senior Representative
Ms. Saeda Makimoto	Senior Representative
Mr. Masaki Aoki	Representative
Mr. Vaugxay Phouelameuang	Program Officer
Dr. Hiroimi Obara	Health policy advisor
Dr. Satoko Jimbo	MNCH Expert, Improving Quality of Health Care Services
Dr. Shiho Tobita	Project coodinator, Improving Quality of Health Care Services
Ms. Kumabe	Junior Oversea Cooperation Volunteer (JOCV)

(21) Japanese Empassy in Lao PDR	
Mr. Takeshi Hikihara	Ambassador of Japan
Mr. Hideyuki Ohnishi	Councellor
Mr. Daiki Asato	Second Secretary
Mr. Kentaro Nakajima	Second Secretary

4. Minutes of Discussion（M/D）

4. Minutes of Discussion（M/D）

4-1 Minutes of Discussion（M/D）(The Field Survey in Laos)

Minutes of Discussions
on the Preparatory Survey for the Project for
Improvement of the Teaching Hospitals of Setthathirath Hospital and Champasak Provincial Hospital

Based on the several preliminary discussions between the Government of the Lao People's Democratic Republic (hereinafter referred to as "Lao P.D.R.") and the Embassy of Japan in Lao P.D.R., Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") of Project for Improvement of the Teaching Hospitals of Setthathirath Hospital and Champasak Provincial Hospital (hereinafter referred to as "the Project") to Lao P.D.R., headed by Taro Kikuchi, Director, Health Team 4, Human Development Dept., from 12th February to 10th March, 2017. The Team held a series of discussions with the officials of the Government of Lao P.D.R. and conducted a field survey. In the course of the discussions, both sides have confirmed the main points described in the attached sheets.

Vientiane, 10th March, 2017

Mr. Taro KIKUCHI

Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Assoc. Prof. Dr. Chanphomma VONGSAMPHANH
Director General
Department of Health Care
Ministry of Health
Lao People's Democratic Republic

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the system to deliver medical services, and the training environment for the undergraduate and the postgraduate of medical and nursing institutions through the development of facilities and provision of equipment for the teaching hospitals in Lao P.D.R. The project is thereby expected to contribute to the improvement of the quality healthcare services and to strengthen health systems to achieve the Universal Health Coverage.

2. Title of the Preparatory Survey

Both sides tentatively confirmed the title of this Preparatory Survey as "the Preparatory Survey for the Project for Improvement of the Teaching Hospitals of Setthathirath Hospital and Champasak Provincial Hospital". The proposed title is brought back to Japan for the reconfirmation.

3. Project sites

Both sides confirmed that the sites of the Project are in Vientiane Capital and Champasak Province, which are shown in Annex 1.

4. Responsible authority for the Project

Both sides confirmed the authority responsible for the Project is the Ministry of Health (hereinafter referred to as "MOH"). MOH 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 structures of the main authorities are shown in Annex 2.

5. Items requested by the Government of Lao P.D.R.

5-1. As a result of discussions, both sides reconfirmed the priorities of the facilities for Settathirath Hospital and the equipment for Champasak Provincial Hospital as described in Annex 3.

5-2. The priority of the requested equipment for Setthathirath Hospital is to be

confirmed in the form of technical notes which will be signed by Lao P.D.R. side and the consultant team dispatched by JICA.

5-3. JICA will assess the feasibility of the above items through the survey and will report the findings to the Government of Japan. The final scope of the Project will be decided by the Government of Japan.

5-4. The Government of Lao P.D.R. shall submit an official request to the Government of Japan through a diplomatic channel before the end of May, 2017.

6. Procedures and Basic Principles of Japanese Grant

6-1. Lao P.D.R. side agreed that the procedures and basic principles of Japanese Grant as described in Annex 4 shall be applied to the Project.

As for the monitoring of the implementation of the Project, JICA requires Lao P.D.R. side to submit the Project Monitoring Report, the form of which is attached as Annex 5.

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

The contents of Annex 6 will be updated as the Preparatory Survey progresses, and eventually will be used as an attachment to the Grant Agreement.

7. Schedule of the Survey

7-1. The Team will proceed with further survey in Lao P.D.R. until August 2017.

7-2. JICA will prepare the Draft Preparatory Survey Report in English and dispatch a mission to Lao P.D.R. in order to explain its contents including the major undertakings on Lao P.D.R. side such as budget preparation around August, 2017.

7-3. If the contents of the Report is accepted and the undertakings for the Project are fully agreed by Lao P.D.R. side, JICA will finalize the Preparatory Survey Report and send it to Lao P.D.R. side around December, 2017.

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

8. Environmental and Social Considerations

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

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

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

9. Other Relevant Issues

9-1. Lao P.D.R. side agreed to take necessary measures for exempting customs duties, internal taxes and other fiscal levies, which may be imposed in Lao P.D.R. to the service of consultant, firms of the recipient country or other countries, the purchase of materials /and equipment, and the other related contract for the implementation of the Project.

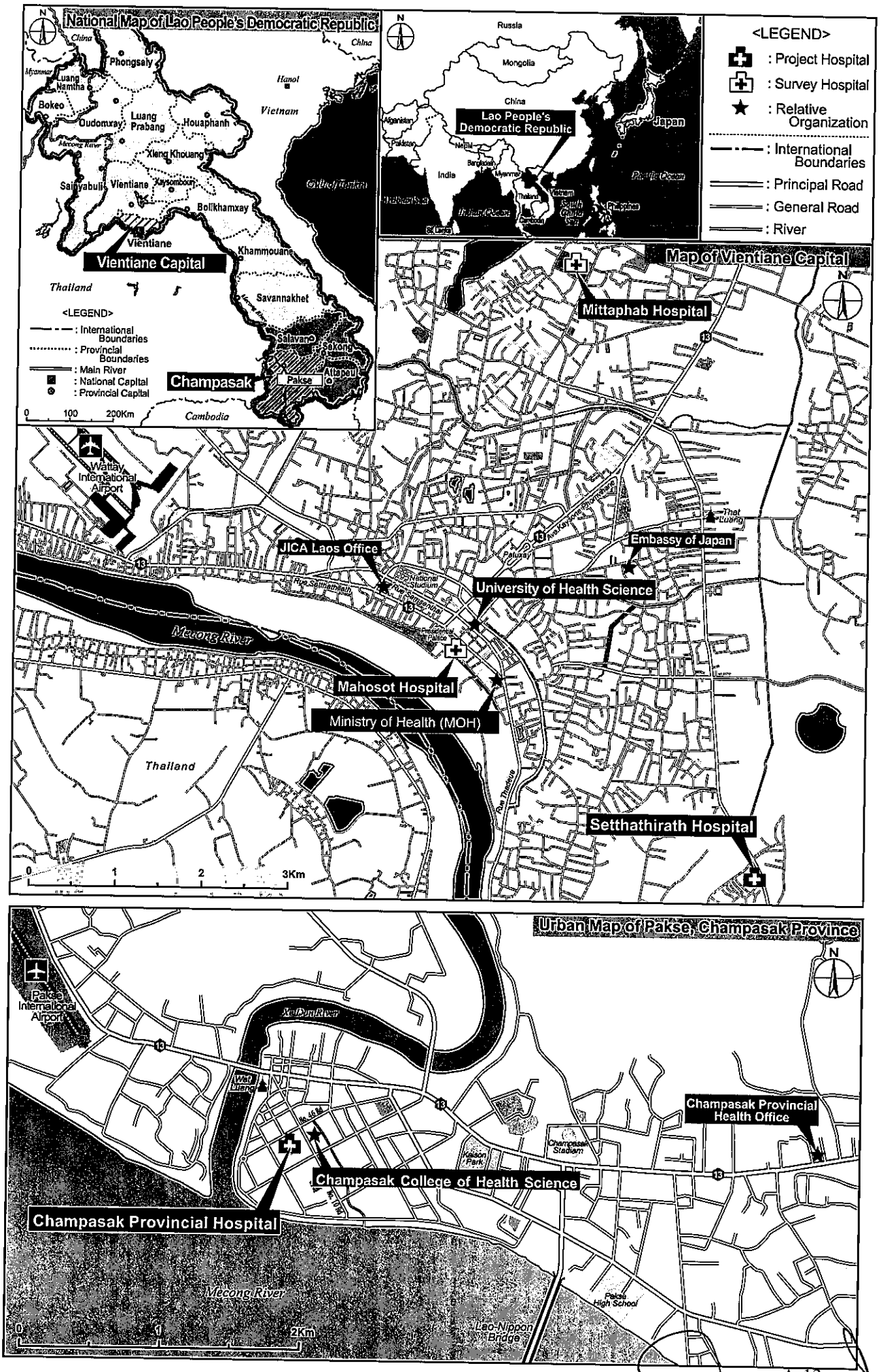
9-2. Both sides confirmed the necessity of soft component on basic skills and proper use of the equipment. The team will examine the appropriateness and make the detailed plan under the Project by August 2017.

9-3. The team insisted on the necessity to consider concluding maintenance contracts of some technological advanced equipment such as CT scanner, X-ray unit (digital) and ultrasound machine for their durable utilization.

9-4. Lao P.D.R. side promised to undertake the renovation to provide better services in MCH (Maternal and Child Health) and Gynecology in the existing building of Setthathirath Hospital, as described in Annex 6. The Team understood, in response to the request made by Lao P.D.R. side, that the consultant team would give advice in the manner to which the renovation helps the Hospital to continue providing the effective medical services.

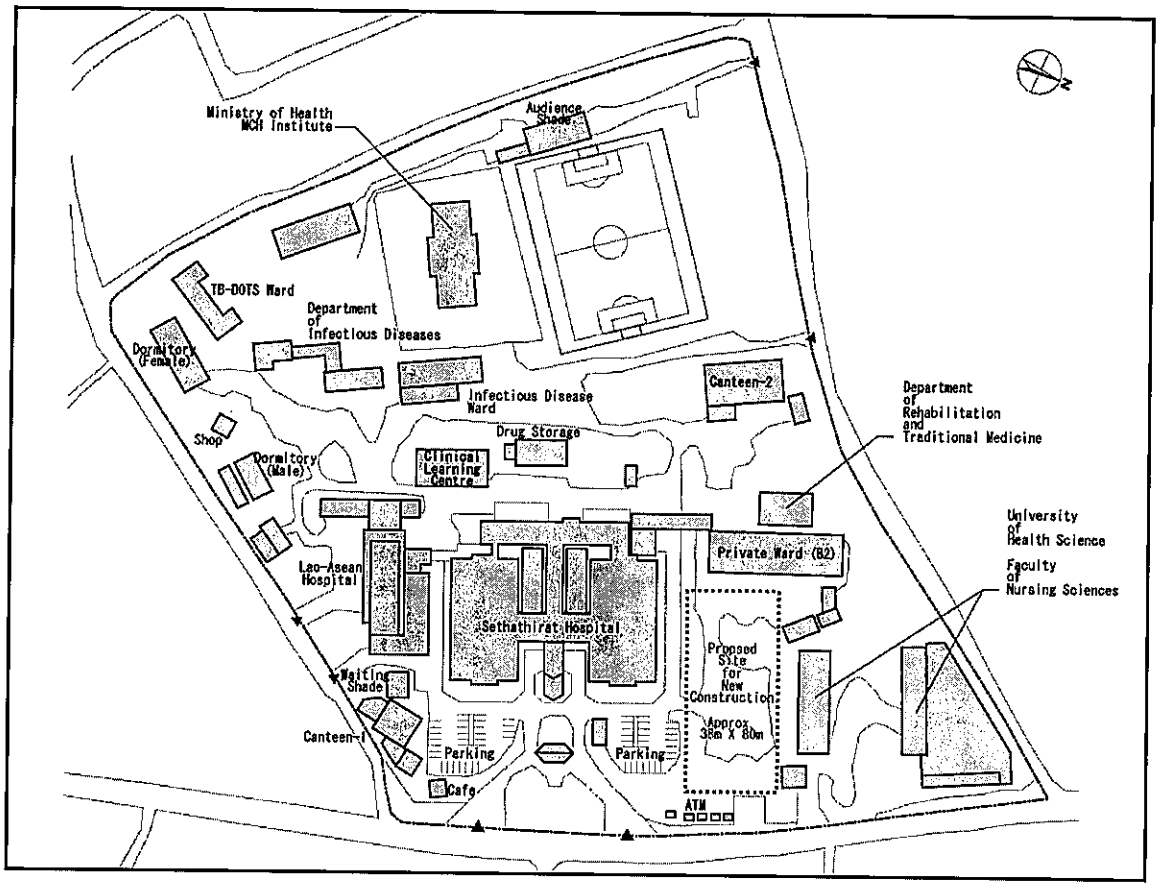
END

Annex 1 Project Sites
Annex 2 Organization Charts
Annex 3 Project Components
Annex 4 Japanese Grant
Annex 5 Project Monitoring Report (template)
Annex 6 Major Undertakings to be taken by Lao P.D.R.

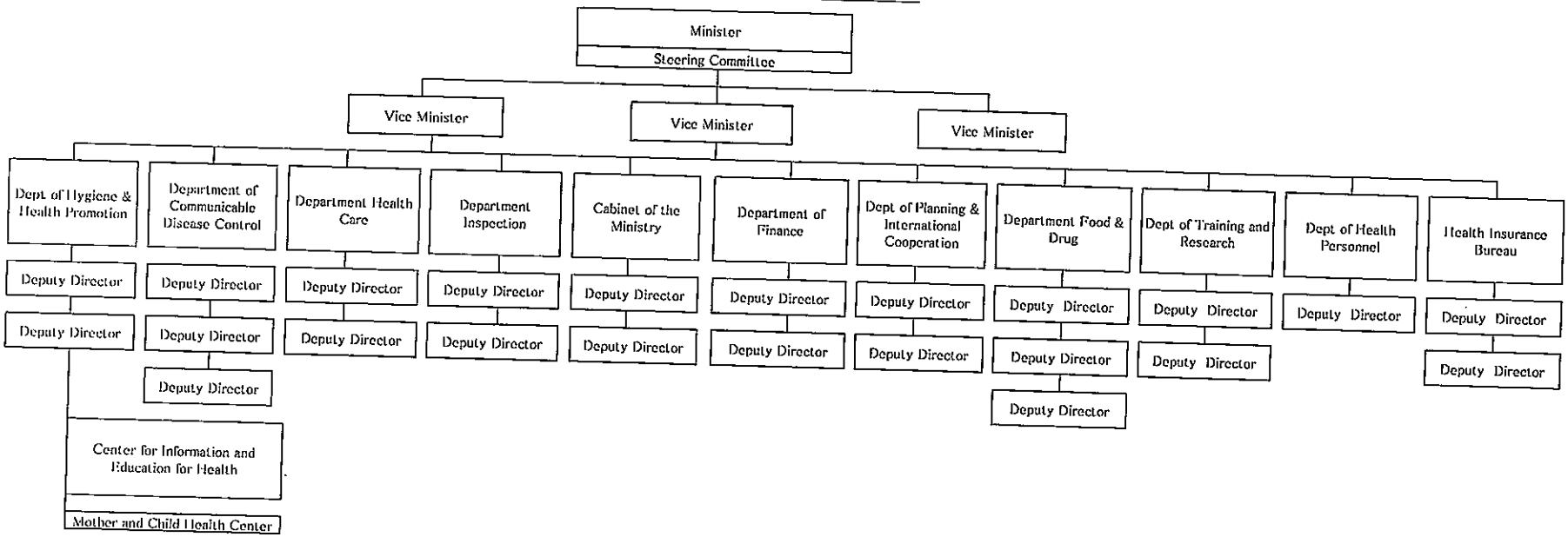

National Map of Lao People's Democratic Republic
Phongsaly
Luang Namtha
Bokeo
Oudomxay
Luang Prabang
Houaphanh
Xieng Khouang
Saiyabuli
Vientiane
Xaysomboun
Bolikhamxay
Khammouane
Savannakhet
Salavan
Sekong
Attapeu
Pakse
Champasak
Vientiane Capital
Hanoi
Vietnam
China
Thailand
Cambodia
Myanmar
Mekong River
Gulf of Tonkin
<LEGEND>
: International Boundaries
: Provincial Boundaries
: Main River
: National Capital
: Provincial Capital
0 100 200Km
Russia
Mongolia
China
Lao People's Democratic Republic
Japan
Pacific Ocean
India
Thailand
Vietnam
Cambodia
Philippines
<LEGEND>
: Project Hospital
: Survey Hospital
: Relative Organization
: International Boundaries
: Principal Road
: General Road
: River
Map of Vientiane Capital
Mittaphab Hospital
Wattay International Airport
JICA Laos Office
Embassy of Japan
University of Health Science
Mahosot Hospital
Ministry of Health (MOH)
Setthathirath Hospital
That Luang
Mekong River
Thailand
0 1 2 3Km
Urban Map of Pakse, Champasak Province
Pakse International Airport
Xe Don River
Champasak Provincial Health Office
Champasak College of Health Science
Champasak Provincial Hospital
Champasak Stadium
Kaison Park
Mekong River
Pakse High School
Lao-Nippon Bridge
0 1 2Km

Annex 1

Project site (Setthathirath)

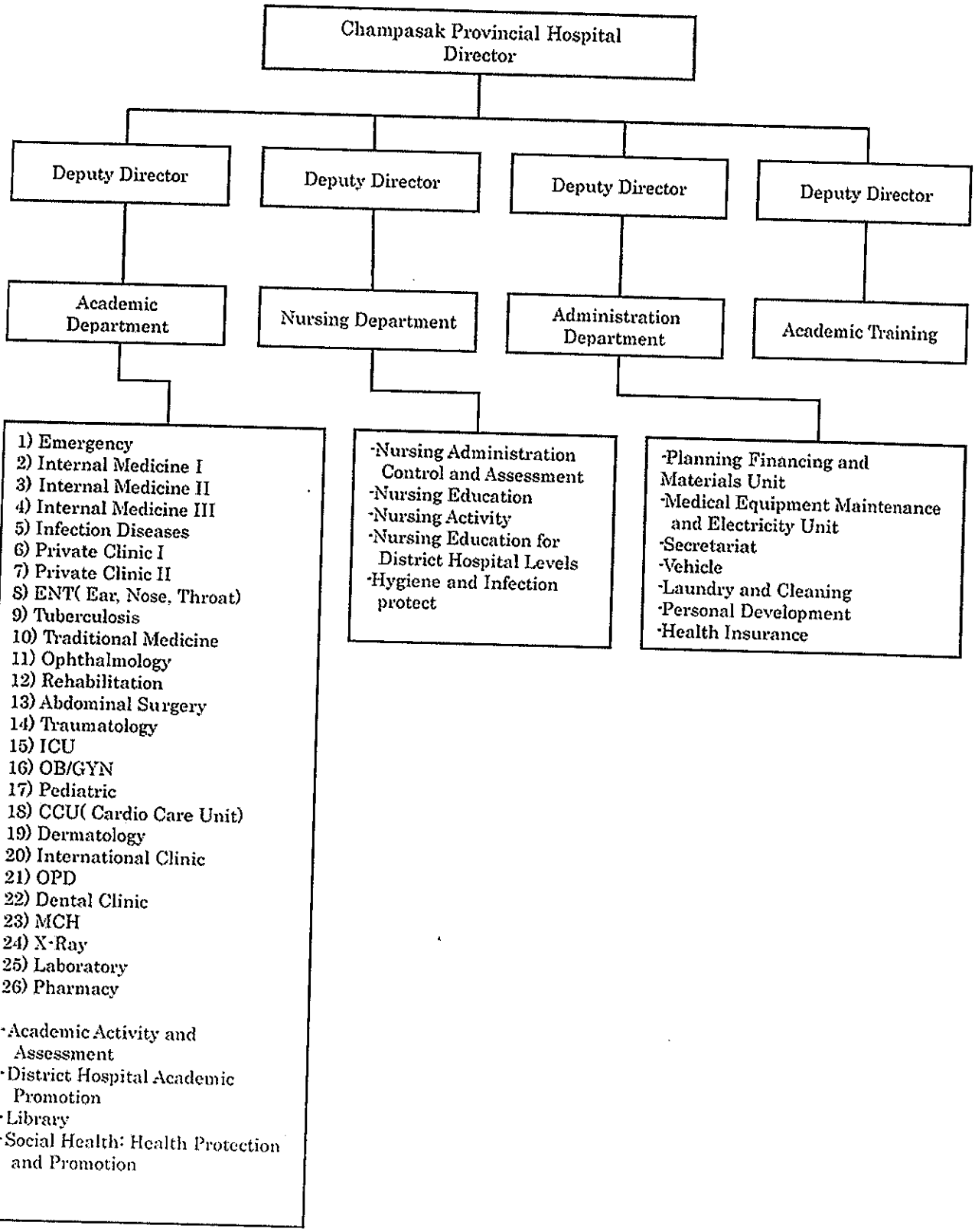


Organization Chart of Ministry of Health



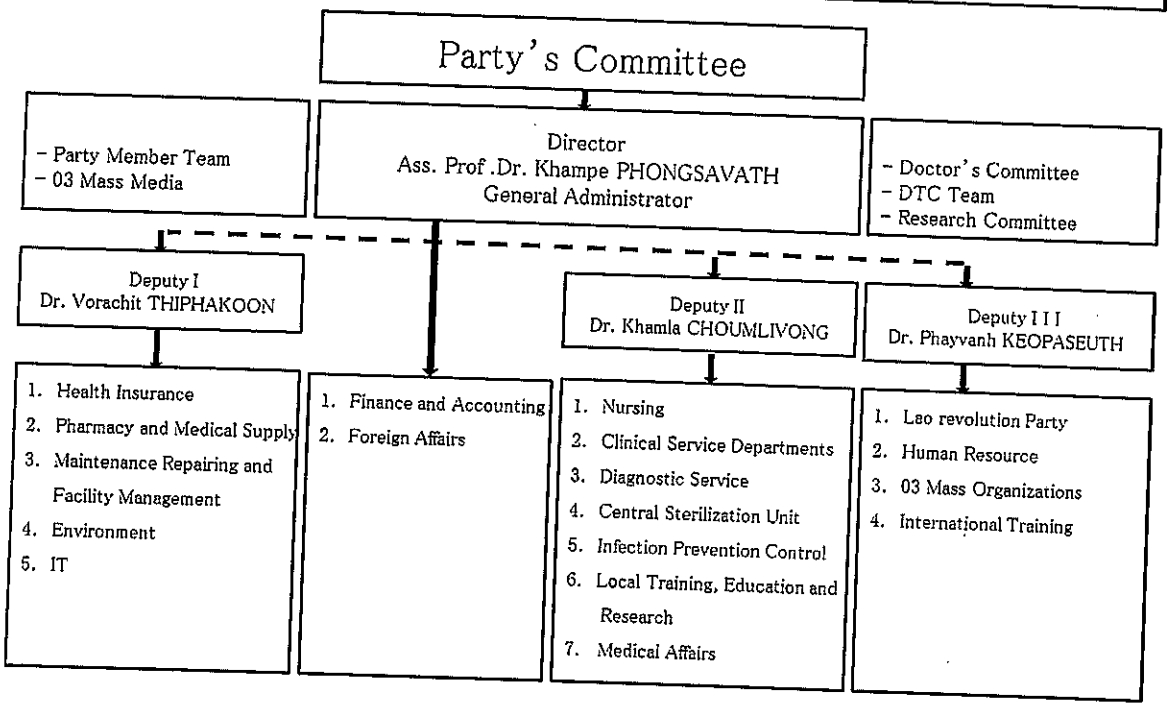
Annex 2

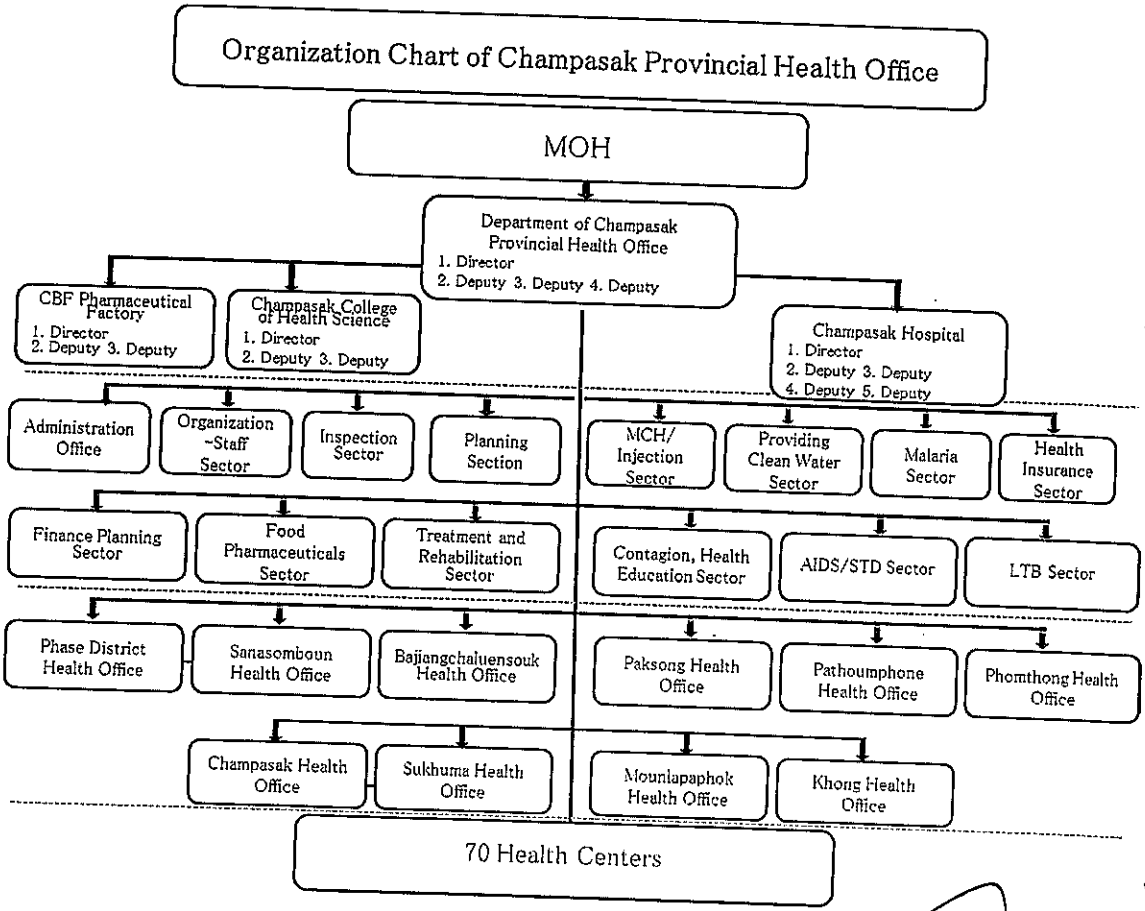
Organization Chart of Champasak Provincial Hospital



Annex 2

Organization Chart of Setthathirath Hospital





Annex 3

Project Components for the Project Improvement of Teaching Hospitals of Setthathirath Hospital and Champasak Provincial Hospital

1. Facility Components for Setthathirath Hospital

Major Components		Priority
A. New ER/OPD Building		
1. ER Department		
1) Triage area	With waiting space for patient	A
2) Emergency treatment room	2 beds with curtain	A
3) Emergency bed room		A
4) Doctor/Nurse station		A
5) Procedure room		A
6) Isolation room	With ante room, individual toilet	A
7) Laboratory	Small laboratory	A
8) Staff's room	For doctors and nurses	A
9) Conference room		A
10) Casher		A
11) Pharmacy		A
12) Medical waste stock		A
13) Waiting space	For attendant family	B
2. Radiology Department		
1) CT scan room		A
2) X-ray room		A
3) Fluoroscopy room		A
4) Mammography room		A
5) Ultrasound room		A
6) Control room		A
7) Reception		A
3. OPD		
1) Pediatrics	Consultation room	A
2) Internal Medicine	Consultation room	A
3) Ophthalmology	Consultation room, Treatment room	A

Major Components		Priority
4) Dentistry	Consultation room, X-ray, Dental lab.	A
5) ENT	Consultation room, Treatment room	A
6) Pneumology (Infectious Diseases)	Consultation room	A
7) Diabetes	Consultation room	B
8) Gastrointestinal	Consultation room	A
	Endoscopy Examination room	A
9) Cancer clinic	Consultation room	A
10) Surgery consultation	Consultation room	A
11) Pain management	Consultation room	A
12) Allergy	Consultation room	A
13) Neurology	Consultation room	A
14) Laboratory (small)		A
15) Blood sampling		A
16) Short-time care (one day admission)	With Nurse station	A
17) Conference/meeting room	Meeting room for 10-20 persons accommodation	A
18) Waiting Hall		A
4. Administration/Management		
1) Information/Reception		A
2) Triage		A
3) Medical affair	Medical record stock	A
4) Insurance reception		A
5) Pharmacy		A
6) Casher		A
7) Staff's Room	Doctor's room, Nurse's room, Changing room, Storage, Meeting room, Kitchenette	A
8) Administration Office		B
9) Storage		A
10) Elevator		B

Major Components		Priority
11) Others	Medical waste, Linen, etc.	A
B. Renovation Work (By Japan) in the existing building		
1. Additional new Operation Theater (OT)	3rd Operation Theater	A
2. Wall rearrangement in OT Department		A

2. Equipment Components

1) Equipment for the Setthathirath Hospital

The priority of the requested equipment for Setthathirath Hospital is to be confirmed in the form of technical notes which will be signed by Lao P.D.R. side and the consultant team dispatched by JICA.

2) Equipment for the Champasak Provincial Hospital

Dept.	Equipment Name	Q'ty	Priority
Radiology	General X-Ray Unit (digital)	1	B
	Mobile X-Ray Unit (digital)	1	A
	CT Scanner	1	A
Operation	Operation Table	1	A
	LED Operation Lamp	1	A
	Electric Scalpel	1	A
	Defibrillator	1	A
ICU	Ventilator	4	A
	Bed Side Monitor	4	A
	Blood Gas Analyzer	1	A
CCU	ECG	1	A
	Cardiac Ultrasound	1	A

A: High and urgent needs are reconfirmed.

B: Needs are reconfirmed, but some additional information must be collected for further examination on the Japanese side.

JAPANESE GRANT

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

1. Procedures of Project Grants

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

(1) Preparation

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

(2) Appraisal

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

(3) Implementation

Exchange of Notes

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

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

-Agreement concluded between JICA and the Recipient

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

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

Construction works/procurement

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

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the the Project

made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the Recipient necessary for the implementation of the Project.
- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

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

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

(2) Selection of Consultants

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

(3) Result of the Survey

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

3. Basic Principles of Project Grants

(1) Implementation Stage

1) The E/N and the G/A

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

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

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

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

3) Procurement Procedure

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

4) Selection of Consultants

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

5) Eligible source country

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

6) Contracts and Concurrence by JICA

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

7) Monitoring

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

8) Safety Measures

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

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

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

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

(2) Ex-post Monitoring and Evaluation Stage

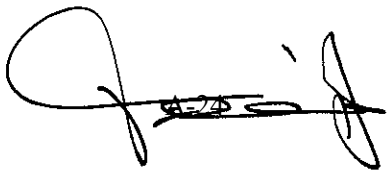
1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.

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

(3) Others

1) Environmental and Social Considerations

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



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

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

3) Proper Use

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

4) Export and Re-export

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

Attachment 1

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			

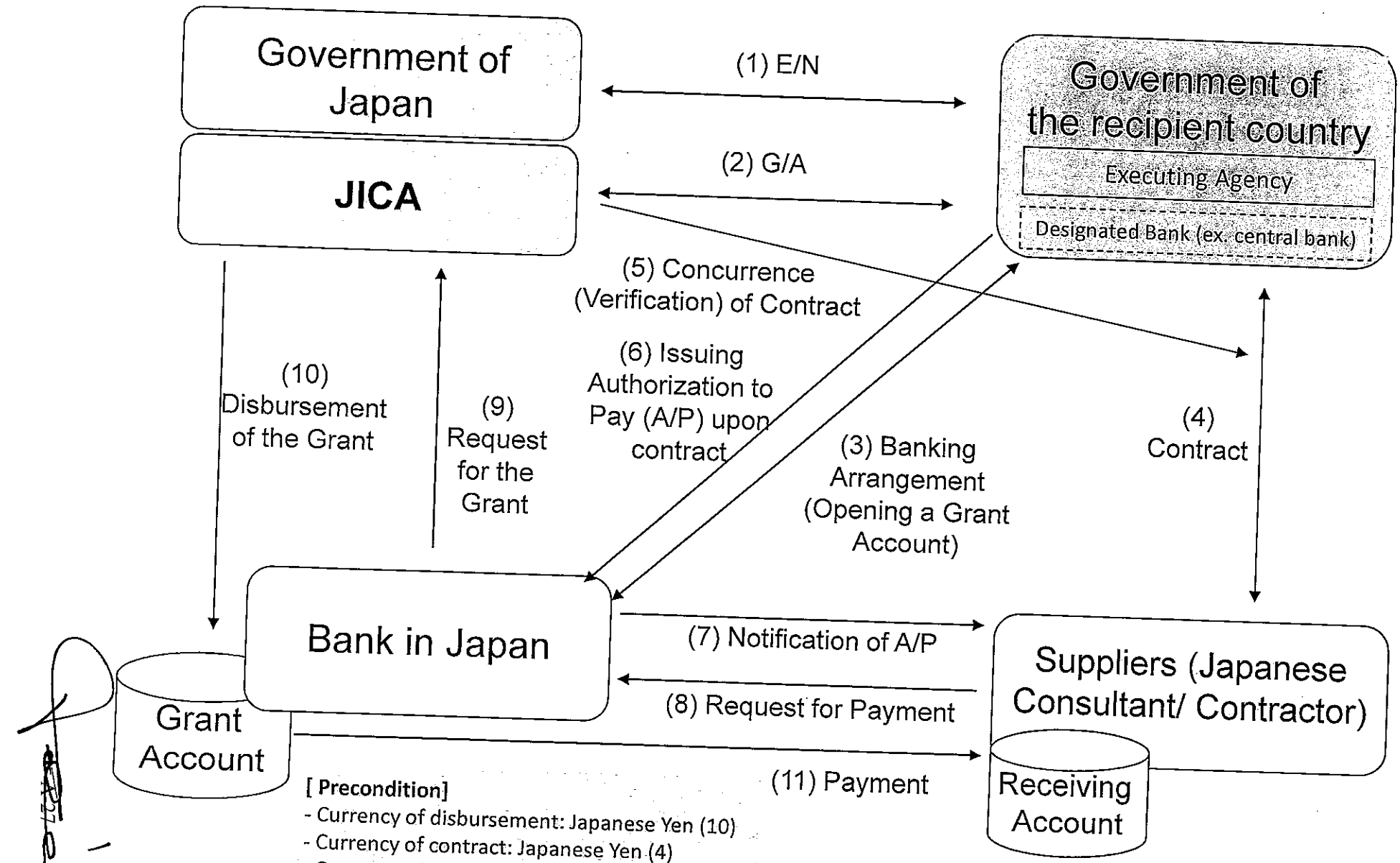
notes:

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)

Attachment 2



Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX

20XX, Month

Organizational Information

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

General Information:

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

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1: Project Description

1-1 Project Objective

1-2 Project Rationale

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

1-3 Indicators for measurement of "Effectiveness"

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

2: Details of the Project

2-1 Location

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

2-2 Scope of the work

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

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

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

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

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

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

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

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

2-5-2 Cost borne by the Recipient

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

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

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

(PMR)

2-6 Executing Agency

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

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

2-7 Environmental and Social Impacts

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

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

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

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

3-2 Budgetary Arrangement

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

Original *(at the time of outline design)*

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Actual *(PMR)*

4: Potential Risks and Mitigation Measures

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

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

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

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

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

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

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

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

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

Attachment

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

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

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

Attachment 6

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

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

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

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

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

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

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Attachment 7

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

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

Major Undertakings to be taken by the Lao P.D.R.

1. Specific obligations of the Government of Lao P.D.R. which will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost (USD)	Ref.
1	To open bank account (Banking Arrangement (B/A))	within 1 month after the signing of G/A	TBD		
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	TBD		
3	To secure and clear the land for new building in Setthathirath Hospital	before notice of the bidding document	MOH		
4	To obtain the building permits (if necessary)	before notice of the bidding document	MOH		
5	To clear the sites including removing of any obstacles for the implementation of the Project	before notice of the bidding document	MOH		
6	To submit Project Monitoring Report (with the result of Detail Design)	before notice of the bidding document	MOH		

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost (USD)	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Supplier(s)	within 1 month after the signing of the contract(s)	TBD		
2	To bear the following commissions to a bank in Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the agreement	MOH		
	2) Payment commission for A/P	every payment for consultant	TBD		
3	to ensure prompt customs clearance and to assist the Supplier(s) with internal transportation in recipient country	during the Project	MOH		
4	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	TBD		

5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted	during the Project	TBD		
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	MOH		
7	To submit Project Monitoring Report	every month	MOH		
8	To submit a report concerning completion of the Project	within six months after completion of the Project	MOH		
9	To renovate to provide better services in MCH (Maternal and Child Health) and Gynecology in the existing building of Setthathirath Hospital	TBD	MOH		
10	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities	TBD	MOH		
	1) Electricity The distributing line to the site (to be examined through the site survey)	6 months before completion of the construction	MOH		
	2) Water Supply The city water distribution main to the site (to be examined through the site survey)	6 months before completion of the construction	MOH		
	3) Drainage The storm water drainage channel to the site or the other means for storm water drainage (to be examined through the site survey)	6 months before completion of the construction	MOH		
	4) Furniture and Equipment General furniture	soon after completion of the construction	MOH		
11	Arrangement of the temporary land/space in Setthathirath hospital land for the construction works Enough space for the temporary storage of materials and machines, setting temporary office and accommodations shall be provided in the hospital land.	during the construction	MOH		
12	To Transfer medical equipment and furniture and re-setting utilities	during the construction	MOH		
13	To remove unusable medical equipment	during the construction	MOH		
14	To replace parking area	during the construction	MOH		

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost (USD)	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Project 1) Allocation of maintenance cost 2) Operation and maintenance system 3) Routine check/Periodic inspection	After completion of the construction	MOH		
2	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually (if necessary) - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between MOH and JICA.	for three years after the Project	MOH		

(A/P: Authorization to Pay,
B/A: Banking Arrangement,
the Recipient: the Government of Lao People's Democratic Republic)

2. Other obligations of the Government of Lao P.D.R. funded with the Grant

NO	Items	Deadline	Estimated Cost (Million Japanese Yen)*
1	To construct facilities and provide equipment	during the construction	
	1) To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities for Setthathirath Hospital (if necessary) a) Electricity - The drop wiring and internal wiring within the site - The main circuit breaker and transformer b) Water Supply - The supply system within the site (receiving and/or elevated tanks) c) Drainage - The drainage system (for toilet sewer, ordinary waster, storm drainage and others) within the site d) Furniture and Equipment - Project equipment 2) To provide equipment with installation and commissioning for Setthathirath Hospital and Champasak Hospital(if necessary)		
	(Detail shall be described at the time of the Preparatory Survey for the explanation of the Draft Report)	TBD	

2	To implement detailed design, tender support and construction supervision (Consulting Service)		
	Total		

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

4-2 Minutes of Discussion（M/D） （DFR Explanation Survey）

Minutes of Discussions
on the Preparatory Survey for the Project for
Improvement of the Teaching Hospitals of Setthathirath Hospital and
Champasak Provincial Hospital
（Explanation on Draft Preparatory Survey Report）

With reference to the minutes of discussions signed between Department of Health Care, Ministry of Health, Lao People's Democratic Republic and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on 10th March 2017 and in response to the request from the Government of Lao People's Democratic Republic (hereinafter referred to as "Lao P.D.R.") dated 11th May 2017, JICA dispatched the Preparatory Survey Team (hereinafter referred to as "the Team") for the explanation of Draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") for the Project for Improvement of the Teaching Hospitals of Setthathirath Hospital and Champasak Provincial Hospital (hereinafter referred to as "the Project"), headed by Shunsuke SAKUDO, Senior Representative, Laos JICA Office, from 30th August to 6th September, 2017.

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

Vientiane, 6th September, 2017

Mr. Shunsuke SAKUDO	Assoc. Prof. Dr. Bounnack SAYSANASONGKHAM
Leader Preparatory Survey Team Japan International Cooperation Agency Japan	Acting Director General Department of Health Care Ministry of Health Lao People's Democratic Republic

ATTACHEMENT

1. Objective of the Project

   The objective of the Project is to improve the system to deliver medical services, and the undergraduate and postgraduate training environment quantitatively and qualitatively through the development of facilities and provision of equipment for Setthathirath Hospital and Champasak Provincial Hospital. The Project is thereby expected to contribute to the improvement of the quality healthcare services and to strengthen health systems to achieve the Universal Health Coverage.

2. Title of the Preparatory Survey

   Both sides discussed the title of the Preparatory Survey, based on Minutes of Discussion (signed on 10th March, 2017) and application form from Lao P.D.R. As a result, both sides confirmed the title of the Survey as "the Preparatory Survey for the Project for Improvement of Setthathirath Hospital and Champasak Provincial Hospital". JICA will proceed for changing the Survey title with the Ministry of Foreign Affairs of Japan.

3. Responsible authority for the Project

   Both sides confirmed the authorities responsible for the Project are as follows:
   the Department of Health care, Ministry of Health (hereinafter referred to as "MOH") 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 taken care by relevant authorities properly and on time. The organization charts are shown in Annex 2.

4. Contents of the Draft Report

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

5. Cost estimate

   Both sides confirmed that the cost estimate including the contingency described in the Draft Report and in Annex 3 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 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 Lao 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 Lao side will be responsible for the achievement of agreed key indicators targeted in year 2022 and shall monitor the progress based on those indicators.

[Quantitative indicators]

Indicators		Baseline (2016)	Target (2022) 3 years after The Project completion
Number of outpatient visits (per year)	Setthathirath Hospital	93,455	111,590
Number of examination for image diagnosis by CT, X-ray, Ultrasound (per year)	Setthathirath Hospital	25,733	33,465
	Champasak Provincial Hospital	28,166	31,463
Number of surgery (per year)	Setthathirath Hospital	1,699	2,029

[Qualitative indicators]

Environment of clinical field work /training for health and medical staff /student are to be improved.

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 Lao 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. With regard to exemption of customs duties, internal taxes and other fiscal levies as stipulated in (2) No.5 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 MOH during the implementation stage of the Project.

The Lao side assured to take the necessary measures and coordination including allocation of the necessary budget which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage.

Both sides also confirmed that the Annex 5 will be used as an attachment of G/A.

Both sides confirmed that for smooth implementation of the Project the master list of goods and services, which are to be procured under the Project and the subject of the above-mentioned exemption of duties, tax and fiscal levies, should be prepared and submitted by MOH to the Ministry of Finance for their timely approval after Exchange of Notes on the Project is concluded and as soon as the actual prices of goods and services are available.

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 6. 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 report of the Project will be submitted 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, Sustainability). The result of the evaluation will be publicized. The Lao 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 Lao side around the end of December 2017.

15. Environmental and Social Considerations

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 likely to have minimal adverse impact on the environment, therefore the Project is categorized as C based on the Guildelines.

16. Other Relevant Issues

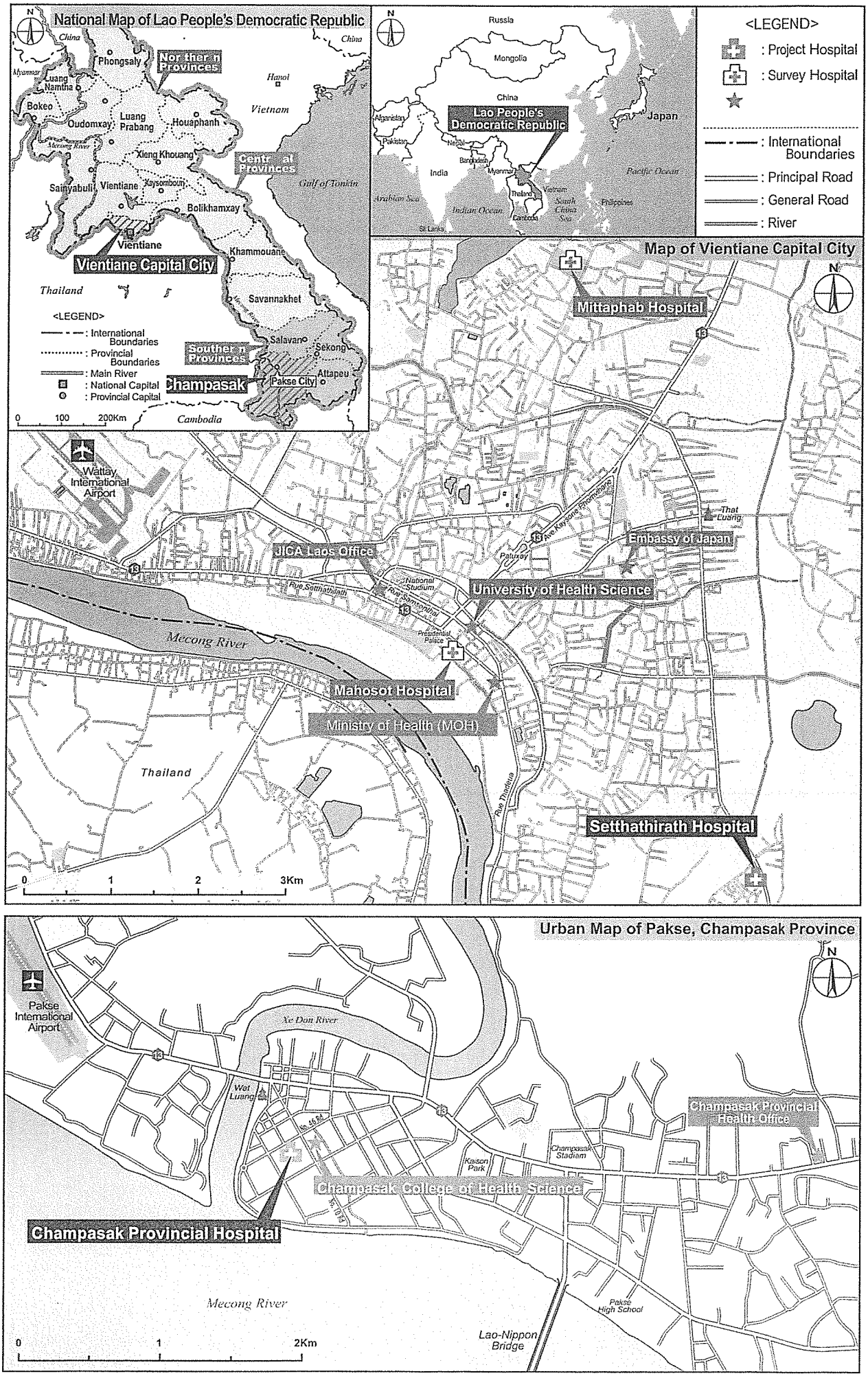
16-1. Disclosure of Information

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. Importance of the maintenance

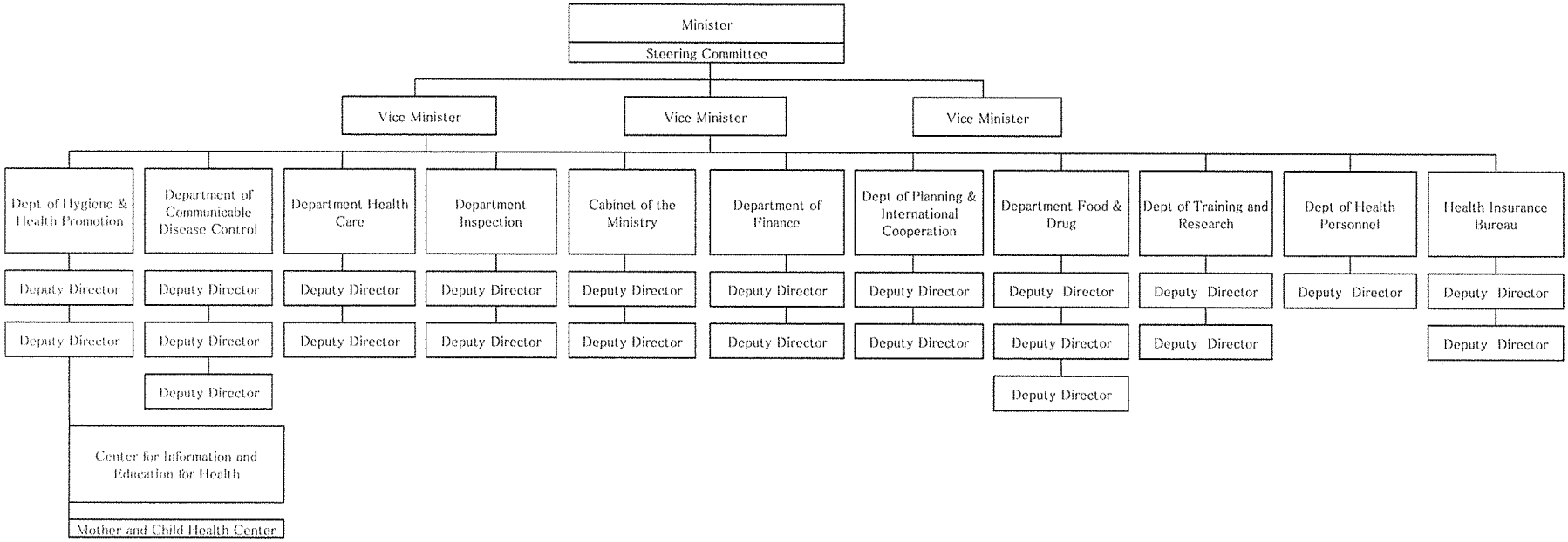
The Team explained the importance of the maintenance for the equipment and the contents of the maintenance contract by the Project, with the Draft Report.The both sides agreed the Lao side is responsible for securing the sufficient budget and human resource for the maintenance which is not covered by the maintenance contract to keep the good quality of the equipment.

Annex 1 Project Sites
Annex 2 Organization Charts
Annex 3 Tentative Project Cost Estimation
Annex 4 Implementation Schedule of the Project
Annex 5 Major Undertakings to be taken by the Government of Lao P.D.R.
Annex 6 Project Monitoring Report (template)



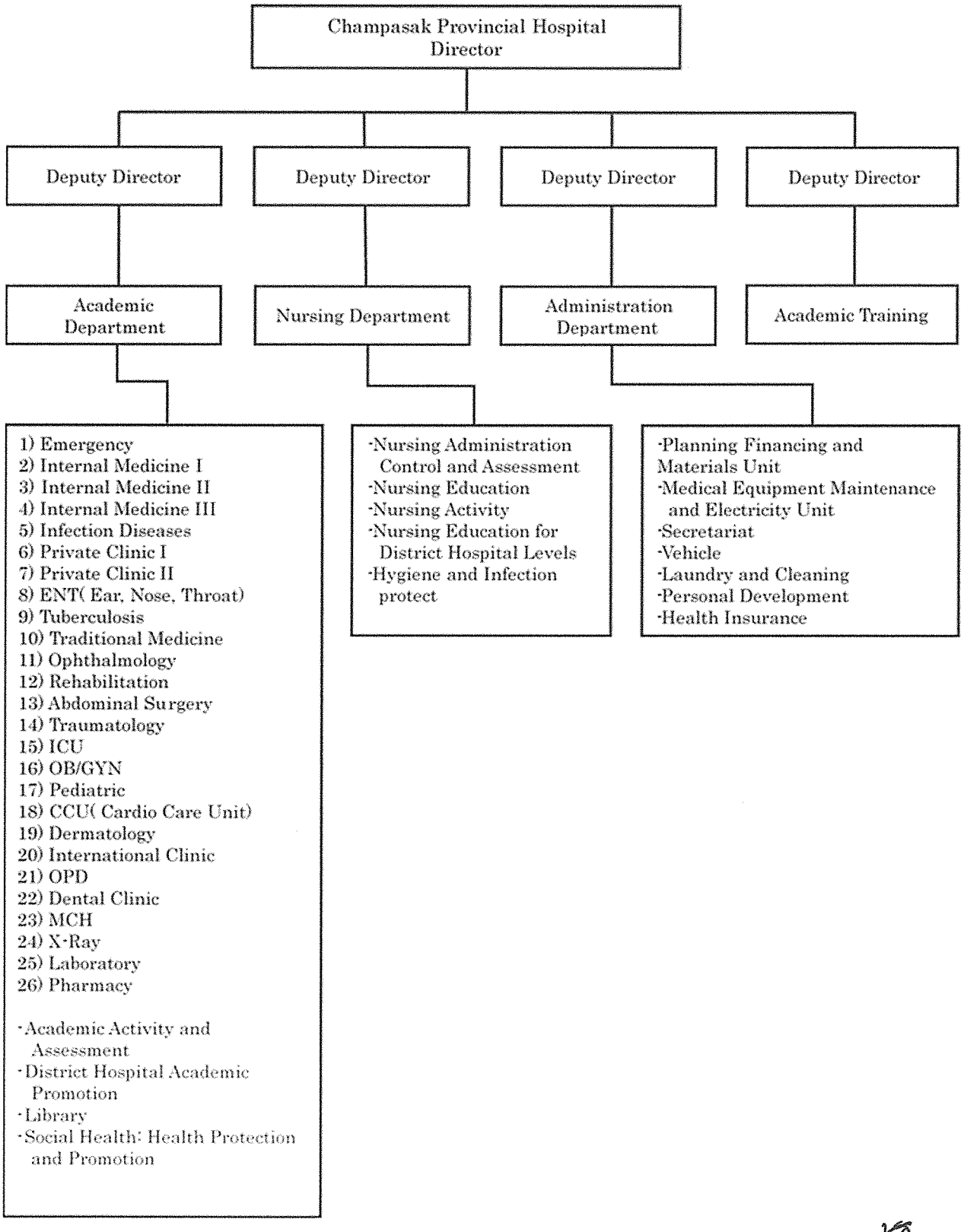
MAP OF PROJECT SITE

Organization Chart of Ministry of Health



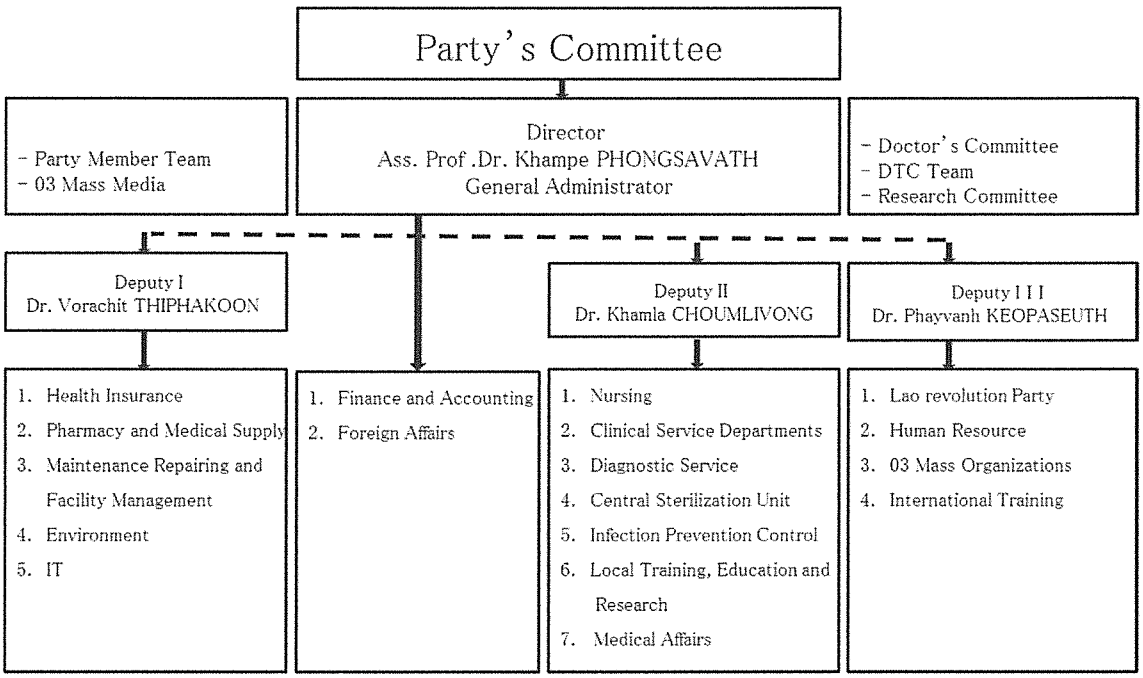
Annex 2

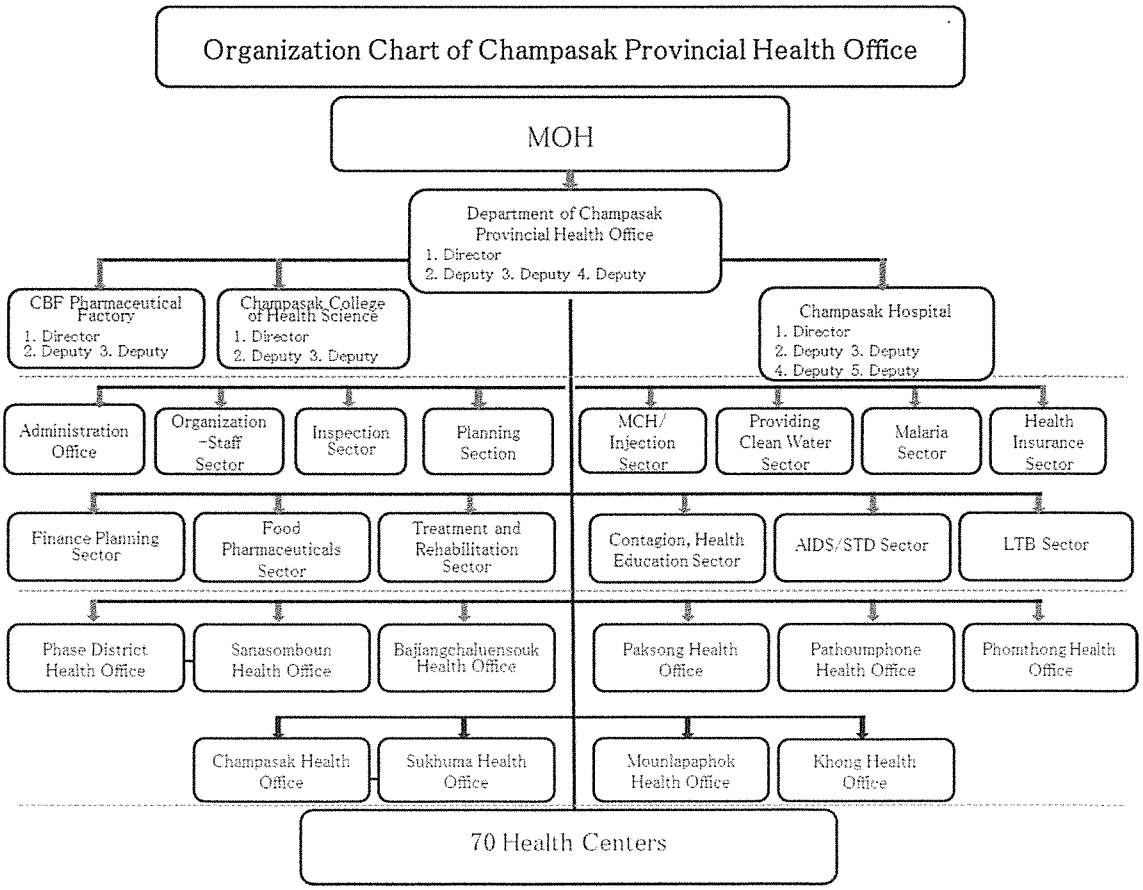
Organization Chart of Champasak Provincial Hospital



Annex 2

Organization Chart of Setthathirath Hospital





CONFIDENTIAL

Tentative Project Cost Estimation

CONFIDENTIAL

2. Cost to be Borne by the Government of LAO P.D.R.

Total Cost: Approximately 1,630 million LAK (Approximately 23Million Yen)

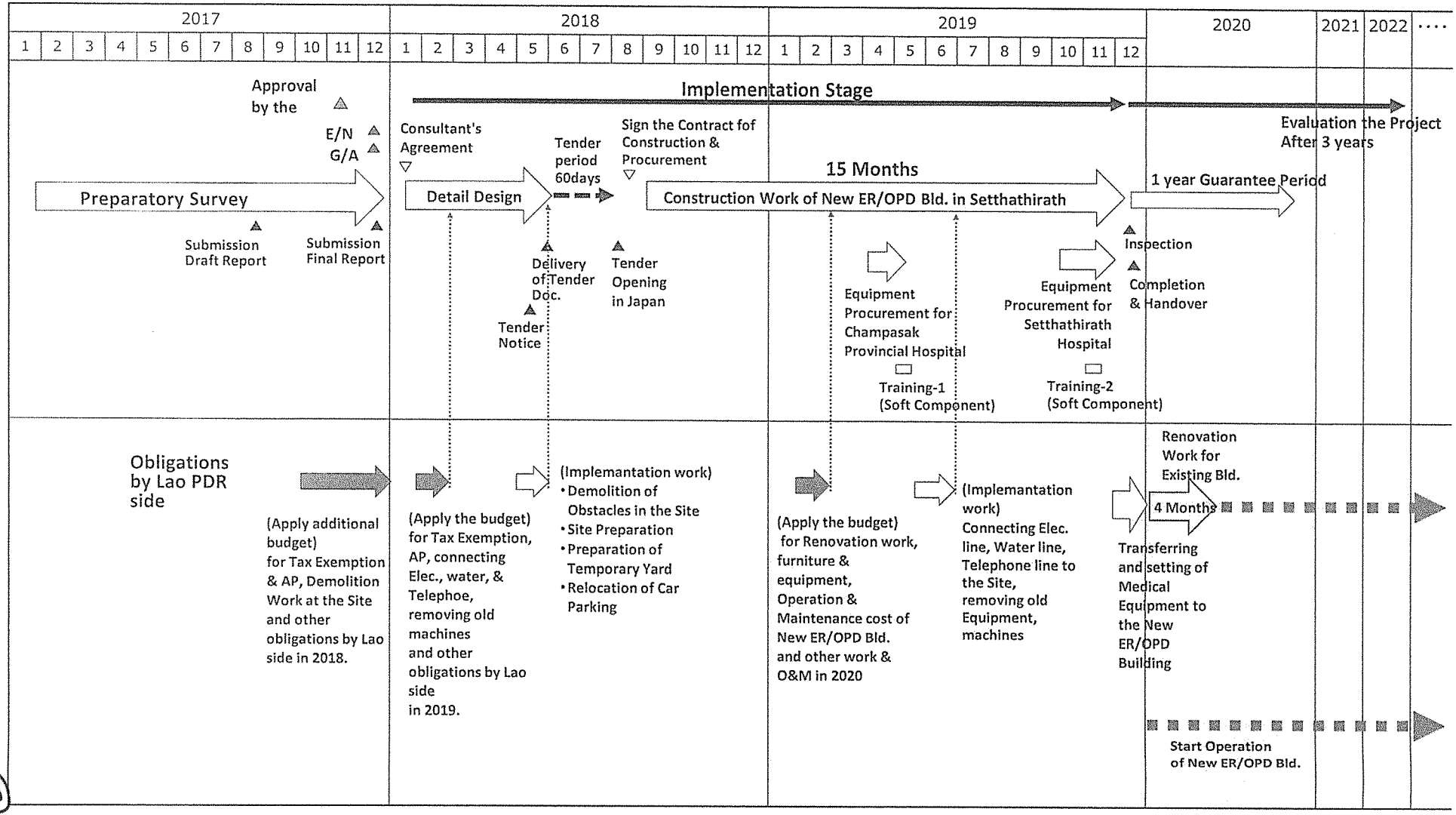
Components	Cost Estimation (Million LAK)
To bear the commissions to a bank in Japan for the banking services based upon the B/A and A/P	141
To obtain the building permits	9
To clear the site with removing any obstacles for the implementation of the Project	200
To remove unusable medical equipment and machines. To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities	106
To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities	149

To procure furniture and equipment	150
To provide planting around the new building	60
To renovate facilities and relocate exiting equipment	815

3. Condition of the Cost Estimation

- Estimated timing: March, 2017
- Exchange rates: LAK 1= 0.014129 JPYen
  USD 1= 115.63 JPYen
  EUR 1=123.0 JPYen
  THB 1=3.31 JPYen
- Others:
  The Project is implemented in accordance with the system of Japan's Grant Aid

Implemantation Schedule of the Project



ANNEX 4

Major Undertakings to be taken by the Lao P.D.R.

1. Specific obligations of the Government of Lao P.D.R. which will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost (Million LAK)	Ref.
1	To open bank account (Banking Arrangement (B/A))	within 1 month after the signing of G/A	MOH	-	
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	MOH	-	
	1) Advising commission of A/P	within 1 month after the signing of the agreement	MOH	1.5	
	2) Payment commission for A/P	every payment for the consultant	MOH	6	
3	To contract Electricity power, Water supply and Telephone for the new building	before delivery of the bidding document	MOH/ Setthathirath	5	
4	To obtain the construction permits	before delivery of the bidding document	MOH/ Setthathirath	9	
5	To clear the site with removing any obstacles (concrete pavement, trees and etc.) for the implementation of the Project	before delivery of the bidding document	MOH/ Setthathirath	200	
6	Arrangement of the temporary land/space in Setthathirath hospital compound for the construction work. Enough space for the temporary storage of materials and machines, setting temporary office and accommodations shall be provided in the hospital compound.	before delivery of the bidding document	MOH/ Setthathirath	-	
7	To replace parking area	before delivery of the bidding document	MOH/ Setthathirath	-	
8	To remove 3 no. of ATMs	before delivery of the bidding document	MOH/ Setthathirath	-	
9	To submit Project Monitoring Report (with the result of Detail Design)	before delivery of the bidding document	MOH	-	
10	To coordinate with relevant authorities, acquires necessary budget to cover VAT portion for fiscal year 2018 and 2019	before tender (February 2018)	MOH	3,892	

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost ((Million LAK)	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Contractor & the Supplier	within 1 month after the signing of the contract(s)	MOH		
2	To bear the following commissions to a bank in 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)	MOH	4	
	2) Payment commission for A/P	every payment for the consultant, the contractor and the supplier	MOH	129.5	
3	To ensure prompt customs clearance and to assist the Contractor and the Supplier with internal transportation in recipient country	during the Project	MOH	-	
4	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	-	
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted	during the Project	MOH	-	
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	MOH	-	
7	To submit Project Monitoring Report	every month	MOH	-	
8	To submit a report concerning completion of the Project	within six months after completion of the Project	MOH	-	
9	Unusable equipment and machines shall be removed for replacement with new ones. The equipment, provided by the former Grant Aid, shall be removed base on the appropriated procedure. (Champasak Provincial Hospital) : CT, general X-ray, OT light (Setthathirath Hospital) : CT, General X-ray, Fluoroscopy, OT light x 2, Autoclave, Washing machine x 2, Dry machine, Refrigerator at morgue, Dental chair x 3.	Before installation work by the Supplier	MOH/ both hospitals	106	
10	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities	-			
	1) Electricity Distribution power line from the main power line	6 months before	MOH/	106	

	22KV along the northern boundary and installation of new transformer to the site. (procurement of the transformer and inland connecting cables and wires to be responsible by Japanese side)	completion of the construction	Setthat hirath		
	2) Water Supply The city water distribution to the reservoir tank in the site from the main line at the eastern road.	6 months before completion of the construction	MOH/ Setthat hirath	35	
	3) Telephone Line Distribution telephone line to the new building from the main line at the eastern road.	2 months before completion of the construction	MOH/ Setthat hirath	3	
	4) Furniture and Equipment To procure general furniture and equipment for the new building and renovated existing building	soon after completion of the construction	MOH/ Setthat hirath	150	
	Planting around the new building	soon after completion of the construction	MOH/ Setthat hirath	60	

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost ((Million LAK)	Ref.
1	To construct facilities and provide equipment				
	1) To relocate existing medical equipment and furniture to the new building of Setthathirath Hospital	After completion the project	MOH/ Setthat hirath	15	
	2) To renovate MCH (Maternal and Child Health) and OBGY(Obstetrics & Gynecology) department in the existing building of Setthathirath Hospital for better services	After completion the project	MOH/ Setthat hirath	800	
2	To maintain and use properly and effectively the facilities constructed and equipment provided under the Project 1) Allocation of maintenance cost 2) Operation and maintenance system 3) Routine check/Periodic inspection	After completion of the construction	MOH/ both hospitals	2,227	
3	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually (if necessary) - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between MOH and JICA.	for three years after the Project	MOH/ Setthat hirath	-	

(A/P: Authorization to Pay,
B/A: Banking Arrangement,
the Recipient: the Government of Lao People's Democratic Republic)

2. Other obligations of the Government of Lao P.D.R. funded with the Grant

NO	Items	Deadline	Estimated Cost (Million Japanese Yen)*
	N.A.	N.A.	

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

2. Other obligations of the Government of Lao PDR for items funded with the Grant

Even before the Project's implementation starts, MOH, in close coordination with relevant ministries and departments shall initiate the processes to duly ensure exemption of taxes, duties and other levies involved in the Project stated below; MOH must timely prepare the master list and submit it to MOF and other relevant authorities for approval. MOH must also acquire budgetary allocations for their non-cash transaction in particular to cover VAT (Value-Added tax).

In order to ensure the Japanese Grant Aid's requirement that customs duties, internal taxes and other fiscal levies which may be imposed in Lao P.D.R. with respect to the purchase of the products and/or the services must be exempted or borne by its designated authority without using the Grant, the Team had a meeting and confirmed the following with the executing agency, i.e. MOH.

- As to the items to be imported, a master list must be prepared by the executing agency, MOH in this case, and be submitted to MOF for approval for duty-and-tax-free procurement.
- As to the items to be domestically purchased, MOH must obtain relevant budgetary allocation for non-cash transaction to cover the VAT portion in terms of counterpart fund.
- As to the items for domestic purchase where the price already includes certain taxes, contractors must purchase the item and obtain receipt with the tax amount indicated. In that case, the contractors shall only pay the amount excluding the tax amount and MOH shall cover the tax amount with the non-cash transaction budget.

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX

20XX, Month

Organizational Information

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

General Information:

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

1: Project Description

1-1 Project Objective

1-2 Project Rationale

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

1-3 Indicators for measurement of "Effectiveness"

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

2: Details of the Project

2-1 Location

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

2-2 Scope of the work

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

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

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

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

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

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

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

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

2-5-2 Cost borne by the Recipient

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

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

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

(PMR)

2-6 Executing Agency

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

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

2-7 Environmental and Social Impacts

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

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

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

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

3-2 Budgetary Arrangement

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

Original *(at the time of outline design)*

Actual *(PMR)*

4: Potential Risks and Mitigation Measures

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

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

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

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

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

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

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

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

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

Attachment

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

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

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

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

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

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

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

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

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

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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%)	

5. Technical Note

5. Technical Note

TECHNICAL NOTE
ON
THE PREPARATORY SURVEY
FOR THE PROJECT FOR IMPROVEMENT OF TEACHING HOSPITALS OF SETTHATHIRATH HOPSITAL AND CHAMPASAK PROVINCIAL HOSPITAL IN LAO PEOPLE'S DEMOCRATIC REPUBLIC

After signing of the Minute of Discussions on 10th March, 2017 regarding above titled project, Setthathirath Hospital under the Ministry of Health, Lao People's Democratic Republic and The Consultants (A consortium of System Science Consultants Inc. and Nippon Koei Co., Ltd.) of the Survey Team had a series of discussions on equipment which was one of the major components of the project for Settathirath Hospital. As the result of the discussions, both parties confirmed contents described in the attached List of Equipment.

Vientiane, 22nd March, 2017

for Settathirath Hospital

Dr. Khampe PHONGSAVATH
Director
Setthathirath Hospital
Ministry of Health, Lao P.D.R.

for the Consultant

Mr. Toshiharu HATA
Equipment Planner
The Consortium of
System Science Consultants Inc.
and Nippon Koei Co., Ltd.

Attachment: A List of Equipment for Setthathirath Hospital

Attachment: A List of Equipment for Setthathirath Hospital

Setthathirath Hospital

Dept.	Equipment name	Q'ty	Priority
AICU (PPP)	Suction Unit	1	A
	Syringe pump	3	A
	Bedside Monitor	4	A
	Nebulizer	2	A
	Infusion pump	7	A
	Portable Ultrasound Unit	1	A
NICU & PICU	Phototherapeutic apparatus	2	A
	Syringe pump	6	A
	Ventilator	6	A
	Bedside Monitor	3	A
	Incubator	5	A
	Infusion pump	6	A
	Bilirubin skin test	1	A
	CPAP	2	B
	Saturation monitor	6	A
	Blood pressure Machine for new reborn	1	B
	ECG for NB	1	B
	Bag & Mask, Laryngoscope (Neomatalie resuscitation)	1	A
Recovery room	Bedside Monitor	4	B
Operation Theater	Suction Unit	1	A
	Autoclave	1	A
	Operation Table	2	A
	Defibrillator	1	A
	Stretcher	3	A
	Electric Scalpel	3	A
	Anesthesia Unit	1	A
	Infusion pump	3	A
	Operation lamp	3	A
	Gasterisation	1	A
	Warm Blood	1	A
	Blood gas	1	A
	Instrumental cart	3	A

Dept.	Equipment name	Q'ty	Priority
Internal Medicine	Ultrasound Unit (cardiology)	1	A
G.I.	Upper Endoscope with 2 fibers	1	A
	Automatic washer for endoscope	1	A
	Bed	2	A
	Bedside Monitor	2	A
Delivery	Suction Unit	1	A
	Delivery suction Unit	1	A
	Delivery table	2	A
	Shadow less lamp	1	A
	Infusion pump	2	A
	CTG	2	A
	Examination couch	1	A
	Infant warmer	1	A
GYN clinic	Examination couch	2	A
	Stand lamp	2	A
OBGY	Ultrasound Unit (3 probe)	1	A
	Mammography Equipment	1	A
	Syringe pump	2	A
	Infusion pump	2	A
ANC (Maternity)	Ultrasound	1	A
	CTG	1	A
	Sonicad	3	A
Minor Surgery	Electric Scalpel	1	A
	Anesthesia Unit	1	A
ER	Bedside Monitor	6	B
	Stretcher	2	A
	Infusion pump	2	A
	Ventilator	1	A
	Nebulizer	2	A
	Portable Ultrasound Unit	1	A
	Saturation monitor	3	A
	Glucometer	1	A
	Blood gas	1	A
	Refrigerator	1	A

Dept.	Equipment name	Q'ty	Priority
Radiology	Mobile X-Ray Unit	1	A
	Digital X-Ray Unit	1	B
	Computed Tomography (CT) Apparatus	1	A
	X-ray fluoroscope	1	A
Laundry	Industrial Washing Machine	2	A
	Industrial Dry Machine	1	A

Dept.	Equipment name	Q'ty	Priority
ENT	ENT Treatment unit	1	A
	Audiometer	1	A
	Endoscopy for ENT	1	A
	Otoscope	3	A
	Head light	3	A
	Speculum nasal	10	A
Ophthalmology	Operation Microscope	1	B
	Lensmeter	1	A
	Slitlamp microscope	1	A
Special Consultation Room for Surgery	Stand Lamp	1	A
Neurology	Electroencephalography (EEG)	1	A
	Electromyogram (EMG)	1	A
	Transcranial Doppler (TCD)	1	A
Small Laboratory	Tabletop centrifuge	1	A
	Water bath	1	A
	Hematocrit centrifuge	1	A
Dental	Dental chair	3	B
	Dental X-ray	1	A
Operation Theater	Fiber-optic bronchoscope	1	A
Morgue	Body refrigerator	1	A
Internal Medicine/ Pediatric	Weight scale (Adult)	1	A
	Nebulizer	1	A
General furniture	Desk, table, chair, cabinet	1	B

A: High and urgent needs are reconfirmed.

B: Needs are reconfirmed, but some additional information must be collected for further examination on the Japanese side.

6. Review of planned equipment for Setthathirath Hospital and Champasak Provincial Hospital

6. Review of planned equipment for Setthathirath Hospital and Champasak Provincial Hospital

Setthathirath Hospital (Existing building)

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
AICU (PPP) (7 beds)	1	Suction unit (wall mount)	1	Exsisting bed are seven ICU beds and there are 6 existing aspirators. Add 1 unit as it should be installed in each bed.	Max. pressure: -80 kPa Min. pressure: 0Suction bottle: 1000 mL
	2	Syringe pump	3	In case the occupancy rate to 7% for 7 beds, at least 5 units are necessary. However, since there are two existing syringe pumps, 3 units are subject to provide.	Flow rate: 0.1 to 800 mL / h Accuracy: 1% Indication: 0.1 to 999.9 mL
	3	Bedside monitor	4	Since 7 monitors are required for 7 beds, and the existing 3 are sufficiently usable, it will update 4 units, exceeding the useful life.	Monitor: 10.4 inches Speed: 25, 50 mm / s Parameter: ECG, Resp, SpO 2, NIBP, Temp
	4	Nebulizer	2	Because it has passed the servicel life, it will update 2 units.	Spray: 4 mL Type: Ultrasonic Timer: 30 minutes
	5	Infusion pump	7	Maintain 7 beds as it is a necessary equipment to transport a fixed amount of liquid into the body.	Flow rate: 1 to 450 mL / h Accuracy: 10% Display: Color Alarm: Low Voltage, Pneumatic, Door Open, Complete
	6	Movable ultrasound	1	Since it is necessary for grasping the condition of seriously patients, it provide minimum quantity.	Monitor: 15 inches Scanning method: Sector, convex, linear Display modes: B, M, color Doppler
NICU (6 Beds) PICU (6 Beds)	1	Phototherapy	2	It is a necessary treatment equipment for the treatment of jaundice, about 10 people a month are necessary (one is used every 3 days). Since it will be used for a few days when used once, it will maintain at least 2 units.	Light source: Blue LED Irradiance: 30 ~ 40 μW or more Illuminance: 2,000 Lux

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
	2	Syringe pump	6	It is a necessary equipment for newborn infusion. Provide the quantity corresponding to NICU bed number 6.	Flow rate: 0.1 to 800 mL / h Accuracy: 1% Indication: 0.1 to 999.9 mL
	3	Ventilator	4	A respirator is absolutely necessary since ten newborns each month use one respirator for 2-3 weeks, one respirator is prepared for each bed. Since two CPAPs will be installed, the number of respirators shall be four.	Flow: 2 to 160 L / m Tidal: 100 to 2,000 mL Pressure: 1 to 80 cmH2O
	4	Bedside monitor	3	It is necessary equipment to observe the vital of the patient, since 6 breathing apparatuses are necessary at minimum, 3 missing ones are prepared.	Monitor: 10.4 inches Speed: 25, 50 mm / s Parameter: ECG, Resp, SpO 2, NIBP, Temp
	5	Incubator	5	5 units made in 2000 are already renewed as they have already passed their service lives.	Temperature setting: 34.0 to 37.5 ° C Air temperature: 23.0 ~ 37.0 ℃ Size: 106 x 60 x 120 cm
	6	Infusion pump	6	It is necessary for infusion of pediatric patients. Maintain 6 units of PICU beds.	Flow rate: 1 to 450 mL / h Accuracy: 10% Display: Color Alarm: Low Voltage, Pneumatic, Door Open, Complete
	7	Bilirubin meter	1	It is an instrument to measure the degree of jaundice. The existing has passed the service life and the minimum quantity is to be provided.	Measurement range: 0.0 to 25.0 mg / dL Accuracy: ± 1.5 mg / dL Power supply: Charging battery
	8	CPAP	2	For the treatment of respiratory failure of a newborn baby, it is subject to maintenance from the necessary things, and it shall be 2 units.	PEEP: 0 to 10 cm H 2O Air: Blower type Gas: 4 to 9 L / m

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
	9	Saturation monitor	6	It is necessary for evaluation of respiratory condition. The number of beds of PICU is subject to provided.	SPO 2: 1 to 100% Pulse: 25 to 250 bpm Display: Color Alarm: Low SPO 2, High SPO 2
	10	Blood pressure cuff for newborn	4	A reusable newborn cuff is provided and the same number as the bedside monitor is subject to maintenance.	Cuff size: 40 × 70 mm Measurement range: 20 ~ 300 mmHg
	12	Bag & Mask, Laryngoscope	1	Since it is necessary for cardiopulmonary resuscitation method, 1 set of the minimum quantity is provided.	Resuscitator Intubation device Airway securing Case
Recovery room (8beds)	1	Bedside monitor	4	The bedside monitor for observing the condition of the patient is a machine with high necessity that can measure vital. Since 4 units are usable, 4 units that can correspond to bed 8 are added.	Monitor: 10.4 inches Speed: 25, 50 mm / s Parameter: ECG, Resp, SpO 2, NIBP, Temp
Operation theater (Existing 2 room, additional 1 room)	1	Suction unit	1	Since the service life has not been exceeded and repair is also being carried out, maintenance for one of the operating rooms to be added is subject to maintenance.	Suction force: 0 to 80 kPa Suction bottle: 3000 mL x 2 Displacement volume: 40 mL / min
	2	Autoclave	1	It is essential for sterilization of surgical instruments, necessity is high. Since 1 is in operation, 1 is subject to perovide.	Sterilization temperature: 105 to 135 ° C Heater: built-in Chamber size: 500 × 500 × 900 mm Control panel: Color LDC Program: Automatic operation, manual operation, custom Material: Stainless steel
	3	Operation table	2	We update existing 1 because it has passed its useful life. Also, 1 of the surgical rooms to be expanded will be subject to maintenance.	Type: Electric type Table top: 49 x 190 Lift: 70 - 99 cm Roll over: 20 ° left and right Vertical rotation: 20 °

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
	4	Defibrillator	1	From the fact that it is necessary equipment for returning from fibrillation, the minimum required quantity will be subject to provided.	Display: 6.5 inch color Output: ~ 200J Measurement: HR, SpO 2, PR Power supply: Battery
	5	Stretcher	3	It has already passed its service life and needs updating. Each operating room is subject to provide.	Size: 595 × 1,900 × 540 to 925 mm Caster: 150 mm Material: Aluminum Gurtle: attached
	6	Electric scalpel	3	Grant aid unit and Korean-made products have already passed their service lives, so 2 renewals are necessary. Add 1 more for the new operating room.	Output: 50 W (bipolar) Frequency: 491.52 KHz Resection: provided Hemostasis: provided Alarm: patient alarm, overload, earth
	7	Anesthesia unit	1	Since it is already in place, It will install 1 of the additional rooms in the operating theator.	Mode: VCV, PCV Tidal: 30 to 1,300 mL PEEP: 5 ~ 25 ㎝ H2O Pressure: 280 to 500 kPa Flow: 5 to 70 L / m
	8	Infusion pump	3	The need during surgery is high. Provide each 1 unit in each operating room.	Flow rate: 1 to 450 mL / h Accuracy: 10% Display: Color Alarm: Low Voltage, Pneumatic, Door Open, Complete
	9	Operation lamp	3	The service life has already passed and needs to be renewed.	Light source: LED Number of lamps: 2 lamps Illuminance: 100,000 Lux
	10	Gasterisation	1	It is necessary for sterilization of the tube which is metamorphic when heated. Maintain 1 of the required minimum quantity.	Type: Sliding door opening and closing Capacity: 0.230 m 3 or more Number of shelves: 2 Dimensions: 1,150 to 1,600 × 1,600 to 1,800 mm
	11	Warm blood	1	Because it is necessary for blood transfusion during surgery, it will provide 1.	Type: heated water bath type heated water type Thawing temperature: 37 ℃ No. of bags: 4 bags

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
	12	Blood gas	1	Since it is necessary for grasping the state during surgery, it will install 1 minimum quantity.	Sample volume: 92 µL Measurement items: pH, pCo 2, pO 2, Can +, cK +, cCa 2 +, Hct Measurement time: 180 seconds
	13	Instrument cart	3	It is necessary for smooth surgical operation, 1 is prepared in each operating room.	Dimension: 600 × 450 × 800 mm Material: Stainless steel Caster: 4 pieces, 50 mm
Delivery (2 room)	1	Suction unit	1	Since it is necessary for proper delivery, the minimum quantity is subject to provide.	Suction force: 0 to 80 kPa Suction bottle: 3000 mL x 2 Displacement volume: 40 mL / min
	2	Delivery suction unit	1	Since it is necessary for proper delivery, the minimum quantity is subject to provide.	Suction: 0 to 93 kPa Suction bottle: 1.0 to 1.5 L, 2.0 to 3.0 L Suction cap: Provided
	3	Delivery table	2	Since existing is a large delivery table, it places a burden not suitable for the Lao people, so it will improve the delivery rooms for 2 rooms.	Dimension: 960 × 2,000 × 600 mm (height) Lifting: 600 mm Seat lifting: included Backrest lift: attached Auto return: included
	4	Shadow less lamp	1	To make the procedure at birth easier to see, 1 of the minimum quantity should be provided.	Light source: LED Number of lamps: 2 lamps Illuminance: 100,000 Lux
	5	Infusion pump	2	It prepare 2 parts of the delivery room as are necessary。	Flow rate: 1 to 450 mL / h Accuracy: 10% Display: Color Alarm: Low Voltage, Pneumatic, Door Open, Complete
	6	CTG	2	It is necessary at 3 places, 2 in the delivery room and 1 in the room waiting for labor. Since there is 1 existing, 2 are subject to provide.	Ultrasound: 1 MHz Detector: heart rate, fetal movement Detector: Strain gauge

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
	7	Examination couch	1	It is too narrow to take appropriate measures, it will provide the minimum quantity of 1 with a large size (60 to 70 cm).	Type: Bucket type Lifting: Electric hydraulic pressure Includes: upper limb bed, crotch receiving, foot plate, sewage tank
	8	Infant warmer	1	It should be in the delivery room, but 1 is subject to provide because it exceeds the service life.	Dimensions: 840 × 1, 100 × 1, 790 to 2, 190 mm Skin temperature: 35.0 to 37.9 °
GYN clinic (2 room)	9	Examination couch	2	As the service life is exceeded, it will provide maintenance for the minimum number of rooms necessary for the number of rooms.	Type: Bucket type Lifting: Electric hydraulic pressure Attachment: upper limb bed, crotch receiving, foot plate, s
	10	Stand lamp	2	Update from the fact that it has exceeded the service life.	Dimensions: 540 × 540 × 1,460 to 1,860 mm Illuminance: 30,000 lux Caster: Equipment
OBGY	1	Ultrasound unit (3 probe)	1	Update the minimum quantity as it already has a service life.	Monitor: 15 inches or more Scanning method: Sector, convex, linear Display modes: B, M, color Doppler
	2	Mammography equipment	1	Human resource development plan for use has already been done and it is expected to be used properly, so it is subject to maintenance and it shall be the minimum quantity.	X-ray: direct conversion Effective area: 232 × 296 mm X-ray tube: inverter type
	3	Syringe pump	2	To use it in chemotherapy, it will provide 2 units.	Flow rate: 0.1 to 800 mL / h Accuracy: 1% Indication: 0.1 to 999.9 mL
	4	Infusion pump	2	To use it in chemotherapy, it will provide 2 units	Flow rate: 1 to 450 mL / h Accuracy: 10% Display: Color Alarm: Low Voltage, Pneumatic, Door Open, Complete

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
ANC	1	Ultrasound unit	1	The minimum quantity will be subject to provide since it is necessary to observe the growth condition of the fetus.	Monitor: 15 inches or more Scanning method: Sector, convex, linear Display modes: B, M, color Doppler, powered,
	2	CTG	1	It is necessary for the examination of the pregnant who approached the maturity, the minimum quantity should be provided.	Ultrasound: 1 MHz Detector: heart rate, fetal movement Detector: Strain gauge
	3	Sonicad	3	To observe the fetal heart sound, it is necessary to do maintenance corresponding to the number of 3 doctors who will work in the examination room.	Ultrasound: 2.5 MHz Output: 7.4 mW or more Speaker: provided
Laundry	1	Industrial washing machine	2	Since it is judged that the service life is over both of the existing unit, update it.	Type: drum type Laundry amount: 28 kg or more Rotation speed: 20 to 35 rpm Safety device: door lock
	2	Industrial dry machine	1	Since the sevice life has already passed, update it.	Capacity: 30 ~ 40kg Heat source: propane gas
Morgue	1	Body refrigerator	1	The service life has passed and breakdowns are frequent	Number of bodies: 4 Temperature :~10 degree

Setthathirath Hospital (New building)

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
Procedure room	1	Electric scalpel	1	Since it is past its service life and needs updating, it will provide the minimum quantity.	utput: 50 W (bipolar) Frequency: 491.52 KHz Resection: provided Hemostasis: provided Alarm: patient alarm, overload, earth
	2	Anesthesia unit	1	Since it is past service life and needs updating, it will provide the minimum quantity.	Mode: VCV, PCV Tidal: 30 to 1,300 mL PEEP: 5 ~ 25 ㎝ H2O Pressure: 280 to 500 kPa Flow: 5 to 70 L / m
ER (8 beds)	1	Bedside monitor	8	Since it is a necessary equipment to measure and observe the vital of emergency patients, it will provide for 8 beds.	Monitor: 10.4 inches Speed: 25, 50 mm / s Parameter: ECG, Resp, SpO 2, NIBP, Temp
	2	Stretcher	2	When carrying a serious patient to an examination etc., smooth movement is necessary. Because ER bed can also be used for movement, it will provide 2 units.	Size: 595 × 1,900 × 540 to 925 mm Caster: 150 mm Material: Aluminum Gurtle: attached
	3	Infusion pump	2	Since there is enough number of resuscitated beds, 2 units are provided.	Flow rate: 1 to 450 mL / h Accuracy: 10% Display: Color Alarm: Low Voltage, Pneumatic, Door Open, Complete
	4	Ventilator	1	It is necessary for 2 beds that are severely responsive, 1 is subject to provide.	Flow: 2 to 160 L / m Tidal: 100 to 2,000 mL Pressure: 1 to 80 cmH2O
	5	Nebulizer	2	Because it is necessary equipment for treatment of asthma and inhalation of liquid inhaled medicine, it is subject to provide.	Spray amount: 4 mL or less Type: Ultrasonic Timer: 30 minutes

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
	6	Movable ultrasound	1	It will prepare the necessary minimum quantity from the fact that it is standard equipment for treatment and diagnosis in emergency.	Monitor: 15 inches Scanning method: Sector, convex, linear Display modes: B, M, color Doppler
	7	Saturation monitor	3	It provide the minimum quantity 3 because it is necessary for triage, inhalation treatment.	SPO 2: 1 to 100% Pulse: 25 to 250 bpm Display: Color Alarm: Low SPO 2, High SPO 2
	8	Glucometer	1	The minimum quantity will be provided from what is necessary at the time of emergency of diabetic patients.	Type: Portable Sampling: strip tape Sample: whole blood Sample amount: 0.6 μL
	9	Bood gas	1	In order to grasp the patient's condition in an emergency, it is necessary equipment and it will providep the minimum quantity.	Sample volume: 92 μL Measurement items: pH, pCo 2, pO 2, Can +, cK +, cCa 2 +, Hct Measurement time: 180 seconds
	10	Refrigerator	1	Maintain from what is necessary for chemical preservation of cold management.	Temperature: 2 to 14 ° Capacity: 322 L
Internal medicine	1	Ultrasound unit (Cardiology)	1	Since the service life has already passed and it is necessary to renew the minimum quantity.	Monitor: 17 inches or more Mode: B, M, Doppler, Color Scan: Linear Probe: Convex, linear, sector
G.I.	1	Upper endoscope with 2 fibers	1	Since the service life has already passed and it is necessary to renew the minimum quantity.	Video system: DHTV, PAL Digital / analog output: HD-SDI / DVI / VBS Xenon lamp light source Output 150 to 300 watts Contrast: Automatic Video scope Field of view: 120 ° to 140 °
	2	Automatic washer for endoscope	1	It is necessary for Fiberscope cleaning.	Type: Automatic cleaning Chamber: Stainless steel Cleaning: ultrasonic

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
	3	Bed	2	As it is necessary to properly inspect, 2 machines are subject to maintenance as well as existing numbers.	Dimension: 1,900 × 650 × 450 mm Frame: painted finish
	4	Bedside monitor	2	In order to inspect properly, it is necessary for the number of beds, so 2 units will be provided.	Monitor: 10.4 inches Speed: 25, 50 mm / s Parameter: ECG, Resp, SpO 2, NIBP, Temp
Radiology	1	Mobile X-ray unit	1	It is necessary for the radiology department, the ER and the operating room, but when the new building is completed, one will be subject to maintenance as the place will be separated.	Output: 14 kW Tube voltage: 120 kV Anode heat capacity: 140 kHU Drive system: Built-in battery
	2	Digital X-rayunit	1	Since the operating X-ray apparatus is of film type, it is thought that there is a problem in the film supply side and needs updating	Output: 45 kW or more Bucky stand: provided
	3	Computer tomography (CT) apparatus	1	Since it is essential for emergency medical care and maintenance is necessary, the minimum quantity 1 is subject to maintenance.	Number of slices: 64 Gantry: Equipment X-ray tube: 8 MHU Gantry tilt: ± 30 ° Console: provided
	4	X-ray fluoroscope	1	In order to observe the postoperative recovery and movement of the digestive system, it is necessary equipment and maintenance is necessary.	Output: 80 kW Table tilt: 0 to 89°
ENT	1	ENT treatment unit	1	Since the service life has passed, update it	Floor type Suction spray: 4 pieces Spraying device: provided Ventilation equipment: provided
	2	Audiometer	1	Since the service life has passed, update it	Standard pure tone hearing test Frequency: 250 to 8,000 Hz
	3	Otoscope	3	The existing has already failed and needs updating	Operating lighting: otoscope Light source: halogen / LED

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
	4	Head light	3	Because there is no existing, problems are seen in examination	Mirror diameter: 90 mm Focal length: 300 mm Band: 15 width × 600 length mm
Ophthal mology	1	Operation microscope	1	The service life has passed and urgent update is necessary	Type: Surgical microscope Focal length: objective 200 mm Total magnification: 5 times Light source: LED Vitreous Cutter: provided
	2	Lens meter	1	The service life has passed and urgent update is necessary	Model: Desktop type Examined lens: 32 to 80 mm
	3	Slit lamp microscope	1	The service life has passed and urgent update is necessary	Model: Galileo type internal vision binocular entity Total magnification: 6, 10, 16, 25, 40 times Slit width: 0 to 10 mm
Neurolog y	1	Electroenceph alograph (EEG)	1	There is no existing, and it is impossible to diagnose a patient	Number of channels: 32 Display: Mapping color Paper feed speed: 5 to 60 mm / sec
	2	Electromyogra ph (EMG)	1	There is no existing, and it is impossible to diagnose a patient	Number of channels: 6 Measurement accuracy: 1 μV to 10 mV
	3	Transcranial Doppler (TCD)	1	There is no existing equipment and it is impossible to judge the situation in the brain	Blood flow velocity: 2 to 80 cm / sec Measurement range: 2, 4, 8 MHz
Small laboratory	1	Tabletop centrifuge	1	The service life of the existing has passed and it is impossible to perform accurate separation	Rotation speed: 6000 RPM Timer: Up to 99 minutes
	2	Water bath	1	The service life of the existing has passed and there are many breakdowns	Tank capacity: 8 liters Temperature: ~ 100 ℃
	3	Hematocrit centrifuge	1	The service life of the existing has passed and separation is incorrect.	Rotational speed: 12,000 RPM Capillary Router: 1

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
Dental	1	Dental chair	3	The service life has already been exceeded, it can not be fixed at the proper position, and since it is burdening the patient, it is necessary to update it	Lifting and lowering method: Hydraulic motor Shadow less LED: LED High speed air motor: provided Automatic water supply equipment: provided
	2	Dental X-ray	1	The service life is over, the shooting is rough, the diagnosis is difficult	Dental X-ray imaging device Floor fixed type Tube voltage: 60 kV
Pediatric medicine	1	Weight scale (adult)	1	It is obsolete with a scale it prepared in 2000.	Weight: 150 kg Display: Digital

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
Radiology	1	Digital X-ray Unit	1	Currently, it are shooting with two units, but 1 unit will be renewed since it has exceeded its service life more than 10 years after installation.	Output: 45 kW or more Bucky stand: provided
	2	Mobile X-ray unit	1	Since equipment for radiology department is necessary, it will provide 1 unit of the minimum.	Output: 14 kW Tube voltage: 120 kV Anode heat capacity: 140 kHU Drive system: Built-in battery
	3	Computer tomography (CT) apparatus	1	Cerebral infarction, intracerebral hemorrhage and calculus can be easily diagnosed with CT images, and the necessity of maintenance is renewed high as accurate treatment can be performed.	Number of slices: 64 Gantry: Equipment X-ray tube: 8 MHU Gantry tilt: ± 30 ° Console: provided
Operation Theater	1	Operation table	1	Since existing equipment has passed its service life, it update 1 unit.	Type: Electric type Table top: 49 x 190 cm Lift: 70 - 99 cm Roll over: 20 ° left and right Vertical rotation: 20 °
	2	Operation lamp	1	If the projection surface moves unexpectedly during surgery, 1 possibility of medical accident is concerned, so 1 update is made.	Light source: LED Number of lamps: 2 lamps Illuminance: 100,000 Lux
	3	Electric scalpel	1	Since electric scalpels are indispensable for surgery, it update at least one of them.	Output: 50 W (bipolar) Frequency: 491.52 KHz Resection: provided Hemostasis: provided Alarm: patient alarm, overload, earth
	4	Defibrillator	1	Defibrillator is a device that needs servicing in the operating room, so it is subject to maintenance, and one unit of the minimum quantity should be provided.	Display: 6.5 inch color Output: ~ 200J Measurement: HR, SpO 2, PR Power supply: Battery

Room	No.	Equipment Name	Q'ty	Considerations	Outline Specification
ICU	1	Ventilator	4	Patients in need of respiratory organs are considered to need 3 to 4 days of treatment, so on the 4th day, 4 units is conducted so that the next patient can be used.	Flow: 2 to 160 L / m Tidal: 100 to 2,000 mL Pressure: 1 to 80 cmH2O
	2	Bedside monitor	4	It will do the maintenance of 4 units for use just like ventilator.	Monitor: 10.4 inches Speed: 25, 50 mm / s Parameter: ECG, Resp, SpO 2, NIBP, Temp
	3	Blood gas	1	Analyze the blood of serious patients and provide the minimum quantity for proper treatment.	Sample volume: 92 µL Measurement items: pH, pCo 2, pO 2, Can +, cK +, cCa 2 +, Hct Measurement time: 180 seconds
CCU	1	ECG	1	Because the CCU needs to observe the condition of the patient three times per day, the ECG needs to be improved and needs to develop one minimum quantity.	Display: 7 inch color Channel: 3, 6, 12 Paper speed: 5, 19, 12.5, 25, 50 mm / s Paper width: 210 mm
	2	Ultrasound unit (Cardiology)	1	Since it has already passed its service life and a failure has occurred several times, it is renewed.	Monitor: 15 inches or more Scanning method: Sector, convex, linear Display modes: B, M, color Doppler

7. Soft Component Plan

Project for Improvement of Teaching Hospitals in the Lao People's Democratic Republic

Soft Component Plan

July 2017

Koei Research & Consulting Inc.
Nippon Koei Co., Ltd.

1. Background of Development of the Soft Component Plan

(1) Summary of the Project

This Project aims at improvement of facilities and medical equipment at Setthathirath Hospital located in the capital of Lao PDR, Vientiane, and Champasak Provincial Hospital located in the southern area of Lao PDR (hereinafter referred to as "the two hospitals") and promoting improvement of hospital healthcare provision infrastructure and of pre-service and in-service training.

(2) Technicians in charge of equipment maintenance at the target hospitals

- Setthathirath Hospital: 7 technicians

Full-time technicians (4 persons) and contracted technicians (3 persons). Both specialized in electricity and machinery.

- Champasak Provincial Hospital: 4 technicians

Equipment technicians (2 persons) and electrical engineers (2 persons), both full-time workers.

(3) Issues related to equipment maintenance

As the result of the first field study, it was found that the two hospitals had the following issues.

1) Issues related to equipment maintenance capabilities

- Maintenance technicians have insufficient knowledge of and experience with the structure and maintenance of medical equipment and are unable to repair equipment in case of a failure.
- Because items of equipment and parts are not managed with Registration Nos., it is not possible to grasp the condition of equipment and parts, to promptly repair failed equipment/parts and to conduct procurement according to a predetermined plan. In addition, the location of equipment for which more than one unit is available cannot be identified in a timely manner, so substitute equipment cannot be promptly employed in case of a failure.
- No planned daily and regular inspections are conducted on equipment.
- Instruction manuals of equipment are not centrally managed and cannot easily be used when necessary.
- Measuring instruments and tools necessary for inspecting and repair of equipment are not provided.

- Service records (repair history and details) are not kept, therefore it is not possible to know whether and how the equipment have been repaired.

2) Issues related to the users of equipment (doctors, nurses, laboratory medical technologists and X-ray technologists)

- When failure occurs in any equipment, the user directly contacts the agent rather than via maintenance technicians of the hospital, which hinders the central management of equipment.

The above-mentioned issues have led to failures and insufficient maintenance of medical equipment, which is the reason of the lower level of medical services of the two hospitals. Considering this situation, it is necessary to improve the two hospitals' capability to maintain and manage medical equipment.

2. Objectives of the Soft Component

- A system to maintain and manage medical equipment appropriately and safely at the two hospitals will be established.
- Maintenance technicians of the two hospitals will improve their capabilities necessary to maintain equipment appropriately and safely.
- Maintenance technicians of the two hospitals will acquire knowledge necessary to maintain equipment appropriately and safely.

3. Outputs of the Soft Component

- An organizational structure for maintenance of equipment will be established.
- Maintenance technicians and users of medical equipment will acquire knowledge of equipment maintenance necessary for fulfilling their respective professional needs and will become able to utilize that knowledge in their work.
- The two hospitals will become able to develop an environment necessary for equipment management, for example, keeping and managing inventory ledgers and instruction manuals of medical equipment.
- Necessary procurement planning and budgeting will become possible for equipment parts, supplies, measuring instruments and tools, and maintenance of such supplies, parts and instruments will be conducted according to predetermined plans.

4. Means to Confirm the Progress in Achievement of Outcomes

How each output is being achieved will be confirmed based on the following items.

- Decrease in the number of failures caused by inappropriate use of equipment
- The number of items of equipment restored from failure through replacement of parts or supplies
- The number of existing items of equipment that are marked with a Registration No. label
- The number of existing equipment items that are registered in the management ledgers
- The number of failures and replacements of parts and supplies recorded in the management ledgers
- The number of equipment items targeted in inspection schedules
- The number of daily and regular inspections conducted in accordance with inspection schedules
- The number of regular inspection completion labels (attached to the equipment which underwent regular inspection)
- The number of instruction manuals filed
- The number of new/replaced parts and supplies in the inventory
- The number of measuring instruments and tools procured

5. Activities of the Soft Component

(1) Target trainees

- Target A: Of managers and technicians in charge of medical equipment maintenance, 4 persons of each hospital will be targeted (8 persons in total at the two hospitals).
- Target B: Of managers and users of medical equipment approx. 10 persons of each hospital will be targeted (approx. 20 persons in total at the two hospitals).

*If training is provided only to Target A, there will not be enough linkage between Target A and Target B, the latter being actual users of the equipment. This will lead to insufficient level of equipment management at the entire hospital. Therefore, training should be given to Target B as well, simultaneously with Target A,

specifically focusing on topics such as the necessity of inspection, repair procedures, and meaning and benefits of Registration Nos., so that the two hospitals will become able to perform equipment maintenance as a whole.

(2) Details of activities

Survey on present situation will be conducted and training (theory and practice) will be provided at the two hospitals. After arriving at the hospitals, the trainer will conduct a survey on the hospitals' present situation together with the hospitals' maintenance staff to identify and update issues. Later, the first training session will be provided targeting Setthathirath Hospital. After the training at Setthathirath Hospital is completed, the trainer will move to Champasak Provincial Hospital to provide training similar to that provided at Setthathirath Hospital. The 2nd training session will be conducted following a similar schedule.

Activities in detail will be as follows:

Table 1 Details of Activities

Key items		Main works	Targets	
			A	B
Survey of present situation	Survey of present situation including survey of inspection schedules	・Preparation of an inspection schedule for each item of equipment and survey of the status of its implementation	●	
		・Preparation of a daily inspection sheet for each item of equipment and survey of the status of its implementation	●	
		・Preparation of a regular inspection sheet for each item of equipment and survey of the status of its implementation	●	
		・ Preparation of a daily inspection checklist for each item of equipment and survey of the status of its implementation	●	
		・Preparation of a cleaning checklist for each item of equipment and survey of the status of its implementation	●	
	Survey of present situation related to	・Status of attachment of Registration No. labels on equipment	●	

	management ledgers	・Status of confirmation, correction and update of information recorded in the equipment ledgers (product names, manufacturers, models, installation dates, places of installation and clinical departments, personnel handling the equipment, failure/repair records, etc.)	●	
	Survey of present situation related to instruction manuals	・Provision, maintenance and utilization of instruction manuals and technical materials (specifications, service manuals, etc.) of equipment	●	
	Survey of present situation related to measuring instruments, tools, etc.	・Maintenance of measuring instruments (testers, clamp meters, insulation-resistance testers, etc.) and repair tools, as well as replacement parts and supplies (methods and places they are stored at, personnel in charge of keeping them, etc.)	●	
1st training session	Technical assistance related to operation, maintenance, etc.	・ Explanation on appointment of "personnel in charge of safety management of medical equipment" who will be responsible for safe use of medical equipment	●	○
		・ Explanation on development of inspection schedules for medical equipment and implementation of daily and regular inspections	●	○
		・Explanation on inspection schedules, and daily and regular inspection sheets	●	○
		・Explanation on the meaning, objectives, benefits of preparing management ledgers	●	○
		・ Preparation of inspection schedules, daily and regular inspection sheets for each item of equipment	●	○

		・Explanation on key procedures to prepare management ledgers (record of Registration Nos., equipment names, manufacturers' names, models, years of installation, etc.) and on how to manage and keep that information using paper documentation and computer entries	●	○
		・Preparation of management ledgers, entry of required information and creation of Registration Nos.	●	○
2nd training session	Technical assistance related to operation, maintenance, etc.	・Review of Registration Nos. created during the previous training session and examination of proposed corrections as necessary	●	○
		・Attaching Registration No. labels to equipment	●	○
		・Implementation of daily and regular inspections according to inspection schedules	●	○
		・Update of data in management ledgers (daily and regular inspection)	●	○
		・Learning how to operate measuring instruments (testers, etc.) and acquisition of appropriate ways to use them by actually using such instruments for inspecting medical equipment	●	○
		・Gathering of instruction manuals for medical equipment and practice of filing	●	○
		・Acquisition of the appropriate way to use medical equipment in accordance with instruction manuals	●	○
		・Technical guidance on the way to use equipment appropriately for users of equipment (doctors, nurses, etc.)	●	○
		・Provision of advice and instruction on how to obtain information on daily and regular inspections and safe use of medical equipment from manufacturers and on how to share such information with users of equipment	●	○

		・Provision of advice and guidance on how to strengthen direction and management capability of managers in charge of medical equipment and on how to establish a system for technicians to report, communicate and consult with their managers	●	○

(3) Implementation system

- All the training sessions will be provided by one Japanese technical expert. A Japanese technical expert who is capable of the following will be appointed.
  - The person should have full knowledge of basic principles and structures of medical equipment as well as methods of operating such equipment.
  - The person should have experience in provision of technical guidance on the ways to operate and maintain such equipment.
  - The person should have experience in preparation of management ledgers and attaching Registration No. labels.
  - The person should have experience in preparation of inspection schedules and daily and regular inspection sheets and in implementation of such inspections.
  - The person should have experience in regular inspection and be able to provide guidance on daily inspection as well.

  *Generally, Japanese technical experts with experience in regular inspections as well as other matters as mentioned above are able to provide guidance on daily inspection to users of equipment; therefore, there will be no problem when appointing a trainer.
- Consultant (1 person): To be responsible for assisting the implementation of field survey and training sessions. The consultant will need a total of 4 days to travel and perform his/her responsibility.
- Local assistant (2 persons): A person for interpretation and another person for assisting the implementation of survey and training sessions.

  *When participating in a training course, Lao people tend not to ask questions actively and they do not feel free to say that they did not understand something well enough. So, in order to enhance the results of training, a locally appointed assistant should be present at the training venue to identify how far trainees understand as well as to promote their understanding to make training as effective as possible.

6. How to Procure Resources to Implement the Soft Component

In the Soft Component, direct assistance will be provided by the contracted consultant and a person with the above-mentioned capabilities will be appointed.

7. Implementation Process of the Soft Component

(1) Time of commencement

The process of the entire Project and that of the Soft Component are shown in Table 3 below.

Table 3 Implementation Process of the Soft Component

Process	Content	Time Frame													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Setthathirath Hospital Renovation of existing facilities and construction of emergency outpatient ward (Vientiane Capital City)	Procurement of medical equipment, etc.														
	Installation and conditioning														
	Instruction on operation, etc.														
	Soft Component training														
Champasak Provincial Hospital (Pakse City)	Procurement of medical equipment, etc.														
	Installation and conditioning														
	Instruction on operation, etc.														
	Soft Component training														

*Soft Component:

*Months shown in the above table represent total time spent on each process.

(2) Period of implementation

A total of 1.2 months will be spent. Details are shown in Table 4 below.

Table 4　Implementation Period

Item	Period of personnel dispatch
1st training session (Confirmation of the present situation, training at Setthathirath Hospital → training at Champasak Provincial Hospital)	0.6 months
2nd training session (Training at Setthathirath Hospital → training at Champasak Provincial Hospital)	0.6 months
Total	1.2 months

*Training sessions will be implemented by a Japanese technical expert visiting each of the hospitals.

(3) Training schedule

Training will be provided as shown in Table 5 below.

Table 5　Training Schedule (draft)

1st Training Session

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
A.M.	Narita → Bangkok → Vientiane	Greetings of Director of Setthathirath Hospital, introduction of maintenance personnel, discussion with the personnel, confirmation of maintenance system, technical level and repair tools and confirmation of the current situation at the hospital (together with the maintenance personnel)	・Explanation on appointment of "personnel in charge of safety management of medical equipment" who will be responsible for safe use of medical equipment	・Explanation on inspection schedules, and daily and regular inspection sheets	・Preparation of inspection schedules, daily and regular inspection sheets for each item of equipment	・Explanation on key procedures to prepare management ledgers (record of Registration Nos., equipment names, manufacturers' names, models, years of installation, etc.) and on how to manage and keep that information using paper documentation and computer entries	
P.M.			・Explanation on development of inspection schedules for medical equipment and implementation of daily and regular inspections	・Explanation on the meaning, objectives, benefits of preparing management ledgers			
A.M.		・Preparation of management ledgers, entry of required information and creation of Registration Nos.	Change of location within Lao PDR Vientiane → Pakse Greetings of Director of Champasak Provincial Hospital, introduction of maintenance personnel, discussion with the personnel, confirmation of maintenance system, technical level and repair tools and confirmation of the current situation at the hospital (together with the maintenance personnel)	・Explanation on appointment of "personnel in charge of safety management of medical equipment" who will be responsible for safe use of medical equipment	・Explanation on inspection schedules, and daily and regular inspection sheets	・Preparation of inspection schedules, daily and regular inspection sheets for each item of equipment	
P.M.				・Explanation on development of inspection schedules for medical equipment and implementation of daily and regular inspections	・Explanation on the meaning, objectives, benefits of preparing management ledgers		
A.M.		・Explanation on key procedures to prepare management ledgers (record of Registration Nos., equipment names, manufacturers' names, models, years of installation, etc.) and on how to manage and keep that information using paper documentation and computer entries	・Preparation of management ledgers, entry of required information and creation of Registration Nos. Pakse → Vientiane → Bangkok →	Arrival at Narita			
P.M.							

2nd Training Session

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
A.M.	Narita → Bangkok → Vientiane	・Review of Registration Nos. created during the previous training session and examination of proposed corrections as necessary	・Implementation of daily and regular inspections according to inspection schedules	・Update of data in management ledgers (daily and regular inspection)	・Gathering of instruction manuals for medical equipment and practice of filing	・Technical guidance on the way to use equipment appropriately for users of equipment (doctors, nurses, etc.)	
P.M.		・Attaching Registration No. labels to equipment		・Learning how to operate measuring instruments (testers, etc.) and acquisition of appropriate ways to use them by actually using such instruments for inspecting medical equipment	・Acquisition of the appropriate way to use medical equipment in accordance with instruction manuals		
A.M.		・Provision of advice and instruction on how to obtain information on daily and regular inspections and safe use of medical equipment from manufacturers and on how to share such information with users of equipment	・Vientiane → Pakse Review of Registration Nos. created during the previous training session and examination of proposed corrections as necessary	・Implementation of daily and regular inspections according to inspection schedules	・Update of data in management ledgers (daily and regular inspection)	・Gathering of instruction manuals for medical equipment and practice of filing	
P.M.		・Provision of advice and guidance on how to strengthen direction and management capability of managers in charge of medical equipment and on how to establish a system for technicians to report, communicate and consult with their managers	・Attaching Registration No. labels to equipment		・Learning how to operate measuring instruments (testers, etc.) and acquisition of appropriate ways to use them by actually using such instruments for inspecting medical equipment	・Acquisition of the appropriate way to use medical equipment in accordance with instruction manuals	
A.M.		・Technical guidance on the way to use equipment appropriately for users of equipment (doctors, nurses, etc.)	・Provision of advice and instruction on how to obtain information on daily and regular inspections and safe use of medical equipment from manufacturers and on how to share such information with users of equipment	Arrival at Narita			
P.M.			・Provision of advice and guidance on how to strengthen direction and management capability of managers in charge of medical equipment and on how to establish a system for technicians to report, communicate and consult with their managers Pakse → Vientiane → Bangkok →				

8. Outputs of the Soft Component

1) Deliverables to the recipient country

- Report on the completion of the Soft Component (in English and Lao)
- Management ledgers (in English and Lao)
- Lists of equipment registered in the management ledgers (in English and Lao)
- Inspection schedules (in English and Lao)
- Daily inspection sheet (in English and Lao)
- Regular inspection sheet (in English and Lao)

2) Deliverables to JICA

- Report on the completion of the Soft Component (in Japanese) and attached documents

  *The attached documents should include the following:

  - Soft Component implementation schedule
  - List of participants

- List of outputs (names of the output documents, document authors and summaries)
- Report on the completion of the Soft Component submitted to the recipient country (in English)

- Management ledgers (in English)
- List of equipment registered in the management ledgers (in English)
- Inspection schedules (in English)
- Daily inspection sheet (in English)
- Regular inspection sheet (in English)
- Report on the Soft Component implementation status

  *The report should include the following:

  - Summary of the Soft Component (expenses, background, initially planned objectives and outcomes, objectives and outcomes achieved, initially planned inputs and activities, activities actually performed, those who engaged in the activities, participants, implementation period (time of implementation and M/M))
  - Issues and recommendations, etc. to sustain and evolve the effect and to achieve objectives
  - Comments of the recipient country
  - Attached documents: Soft Component implementation schedules, list of participants, training attendance book, list of outputs, details on output documents (document names, authors, summaries)

*A total of 2 days (0.1 months) will be set aside for works to create outputs in Japan.

9. Estimated Project Cost of the Soft Component

The estimated project cost is shown in Table 6 below. For details, refer to the detail estimate sheet as attached.

Table 6 Estimated Project Cost

Item and expenses	Japanese yen (a)	U.S. dollars	Japanese yen equivalent (b)	Remarks
1. Direct labor cost	1,301,300		―	
2. Direct expense	1,077,604	9,584	1,108,198	Conversion at 115.63 yen to one dollar
3. Indirect expense	2,706,704			
Sub-total	5,085,608	9,584	1,108,198	
Total	6,193,806			Sub-total (a) + Sub-total (b) = Total

10. Responsibilities of the Recipient Country

- Provision of facilities for training (Clinical Learning Center of Setthathirath Hospital and meeting rooms of Champasak Provincial Hospital)
- Budget necessary to utilize outputs including management ledgers, inspection schedules, daily inspection sheet and regular inspection sheet

*When the first field survey is conducted, confirmation will be made with the Ministry of Health and the two hospitals.

8. Result of Soil Investigation

8. Result of Soil Investigation

1. Introduction

The subsoil condition investigation Area is located in Setthathirath Hospital, Ban Donkoi, Sisattanak District as show in picture 1-1. This is aimed to construct 3 Floors Building.

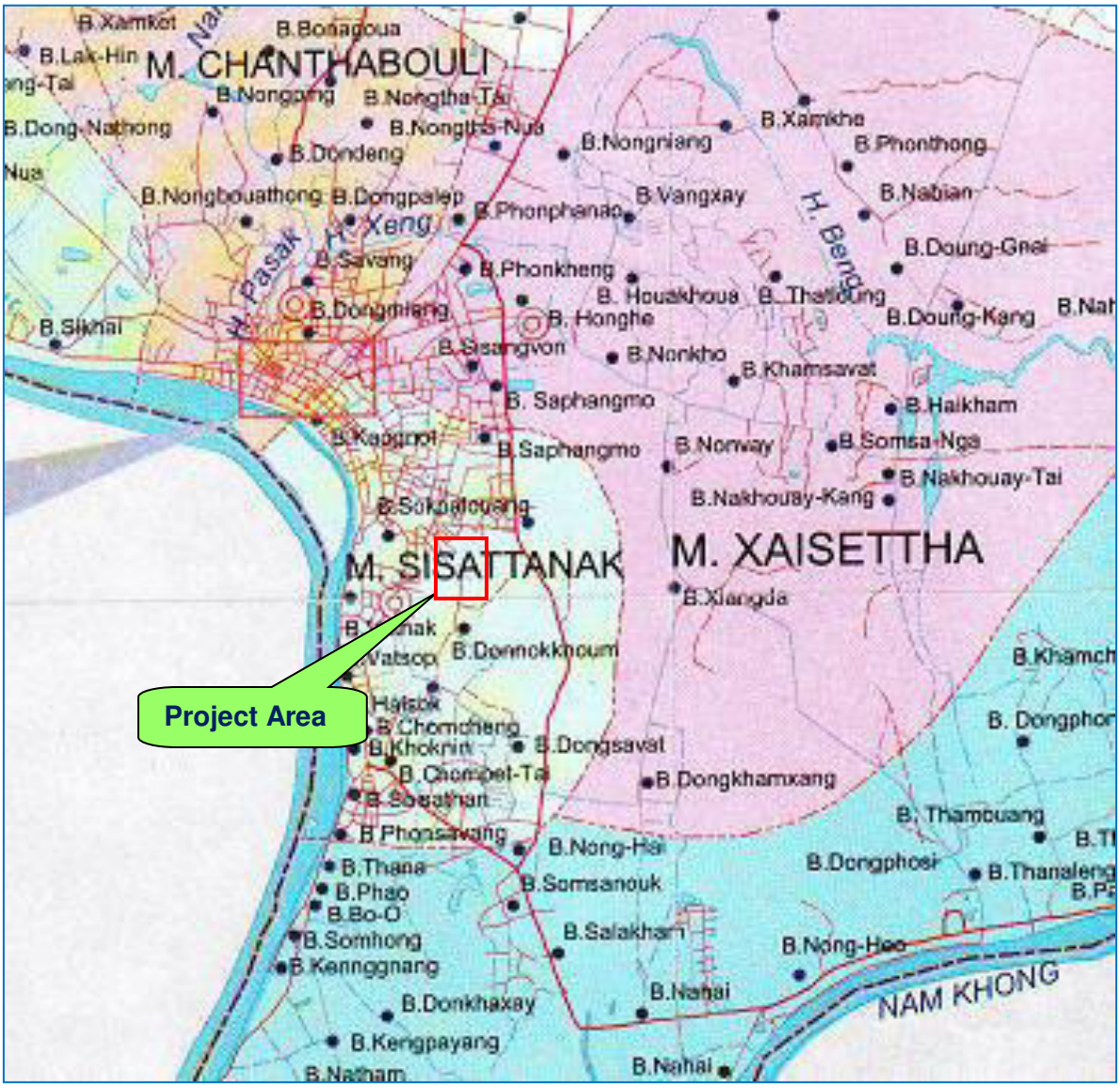

Figure 1.1 Topographic Map of Vientiane Capital, showing Location of the Project.

Subsurface investigation was held during Friday 17th and Saturday 18th February 2017 and in situ tests were carried out using as known as Standard Penetration Test (SPT), five Bore holes were drilled as indicated in Figure 1-2, collected soil samples from drilling holes for further laboratory tests, more detail of bore holes as shown pictures on page 8 to 12.

thickness of 3.70-7.10 m and Brownish-Red Clayey Siltstone with thickness greater than 8.80 m.
The above soils were formed from Geologic Time of Cenozoic Era, Period of Neo-Quaternary consisting in Vientiane formation (QII-II, QIV and N_2-Q1 ve). Geological Map of Sisattanak district, Vientiane Capital City is shown in figure 2-1.

Note : Geologic Time and Condition of the investigated area of bore hole were based on Geologic Map (Department of Geology and Minerals, Ministry of Natural Resources and Environment) and referring by field investigation data.

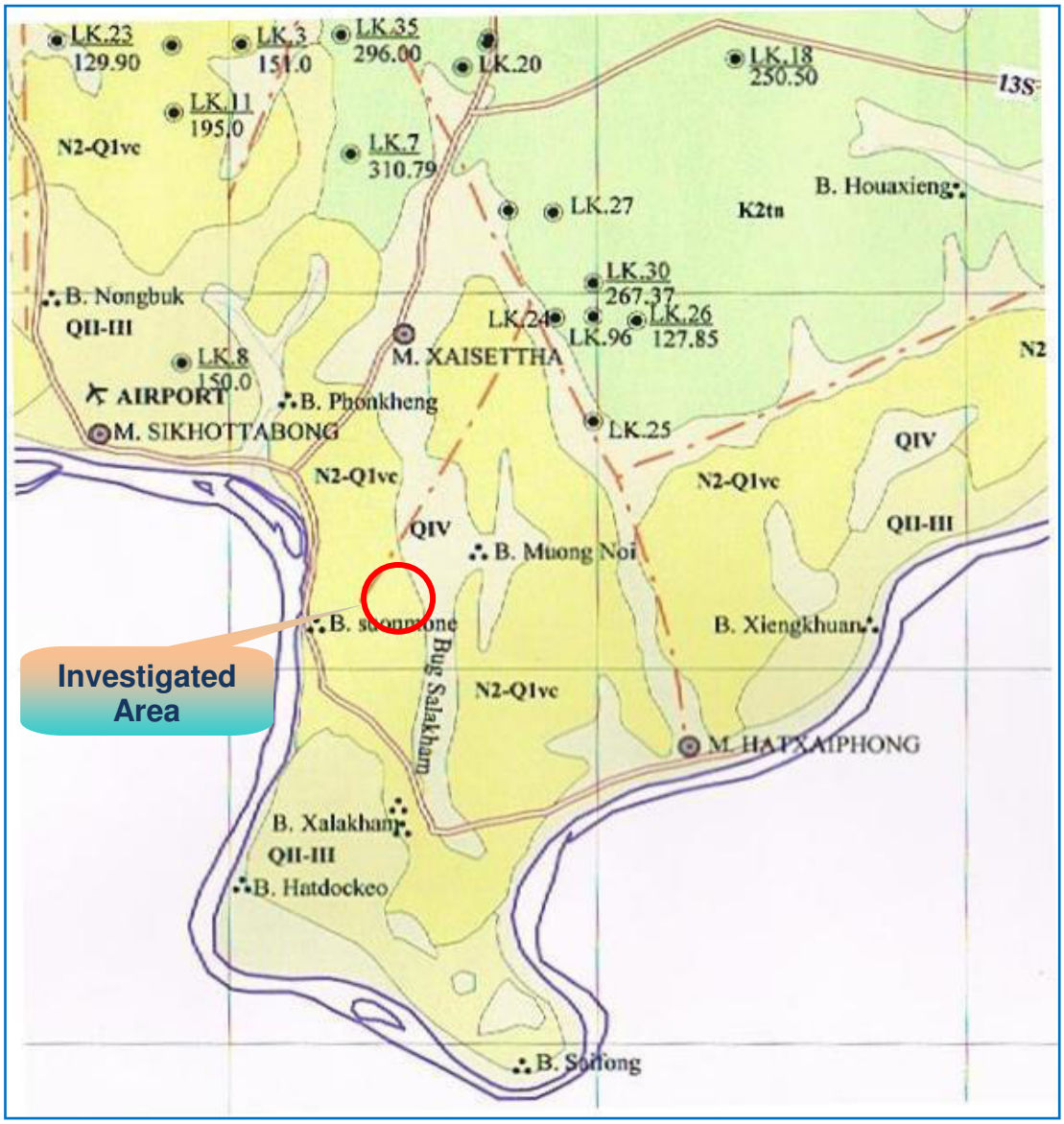

Figure 2-1 Geological Map of Sisattanak district, Vientiane Capital City showing Investigated Area.

3. Discussion of methodology used :

For the subsoil investigation for obtaining soil strength to be a foundation of proposed buildings, that necessary to be used following methodologies :

3.1 Standard Penetration Test is to :

- Determine the nature and thickness of soil strata, such as soil profile and soil description as shown in page 8 to 12,
- Obtain Soil Strength, q_u value from SPT N-Blow, as shown in page 8 to 12.
- Collect Undisturbed and Disturbed Soil Samples for further Laboratory Tests,
- Measured ground water level were encountered groundwater table at depth of 6.00 m for BH No 1, 4.50 m for BH No 2 and BH No 5, 3.00 m for BH No 3 and BH No 4.

3.2 Laboratory Tests :

All Laboratory Tests followed by **ASTM** Standard Specification and tested all of 5 samples (one sample for each Bore Hole), such as :

- Natural Moisture Content Test, **ASTM D 2216-92**
- Wet-Dry Unit Weight Determination, **ASTM D 4564-93**
- Specific Gravity of Soil Particles, **ASTM D 854-92**
- Sieve Analysis, **ASTM D 422-63**
- Atterberg's Limits Test including Soil Classification, **ASTM D 4318-95** and **ASTM D 2487-93**
- Unconfined Compression Test, **BS 1377-1975**
- Direct Shear Test**, ASTM D 3080-90** to obtain Shear Strength Parameters, such as Cohesion, C and Internal Friction Angle, φ.
- Consolidation Test to obtain settlement values, **ASTM D 2435-90**.

5. Evaluation Soil Strength from the Standard Penetration Test (SPT), Unconfined Compression Test and Direct Shear Test Results and Comments :

5.1 Evaluation

Bore Hole No	Sample, SPL, No	Depth, from to (m)	Soil strength from SPT test, kg/cm²	Unconfined Compression Test		Ground water Level, (m)	Direct Shear Test,		Available Foundation of Building
				C, kg/cm²	φ °		C, KN/m²	φ °	
BH 1	SPL 01	1.50-1.95	**0.54**			*At 6.00 m*	*15*	*41*	***12.00 m***
	SPL 02	3.00-3.45	**0.75**						
	SPL 03	4.50-4.95	**1.18**						
	SPL 04	6.00-6.45	**1.18**						
	SPL 05	7.50-7.95	**1.18**						
	SPL 06	9.00-9.45	**1.39**						
	SPL 07	10.50-10.95	**1.93**						
	SPL 08	12.00-12.45	**2.25**						
	SPL 09	13.50-13.95	**1.28**						
	SPL 10	15.00-15.45	**1.18**						
	SPL 11	16.50-16.95	**0.64**						
	SPL 12	18.00-18.45	**6.21**						
BH 2	SPL 01	1.50-1.95	**0.21**			*At 4.50 m*	*24*	*12*	***12.00 m***
	SPL 02	3.00-3.45	**0.43**						
	SPL 03	4.50-4.95	**0.96**						
	SPL 04	6.00-6.45	**1.50**						
	SPL 05	7.50-7.95	**0.96**						
	SPL 06	9.00-9.45	**0.75**						
	SPL 07	10.50-10.95	**1.18**						
	SPL 08	12.00-12.45	**1.71**						
	SPL 09	13.50-13.95	**3.75**						
	SPL 10	15.00-15.45	**6.85**						
	SPL 11	16.50-16.95							
	SPL 12	18.00-18.45							
BH 3	SPL 01	1.50-1.95	**0.32**			*At 3.20 m*	*45*	*42*	***12.00 m***
	SPL 02	3.00-3.45	**0.86**						
	SPL 03	4.50-4.95	**1.50**						
	SPL 04	6.00-6.45	**1.50**						
	SPL 05	7.50-7.95	**1.18**						
	SPL 06	9.00-9.45	**1.07**						
	SPL 07	10.50-10.95	**1.93**						
	SPL 08	12.00-12.45	**2.35**						
	SPL 09	13.50-13.95	**4.49**						
	SPL 10	15.00-15.45	**6.42**						
	SPL 11	16.50-16.95	**7.28**						
	SPL 12	18.00-18.45							
	SPL 01	1.50-1.95	**0.43**			*At 3.20 m*			
	SPL 02	3.00-3.45	**0.75**						
	SPL 03	4.50-4.95	**0.96**						
	SPL 04	6.00-6.45	**1.50**						

BH 4	SPL 05	7.50-7.95	**1.39**						
	SPL 06	9.00-9.45	**2.03**						
	SPL 07	10.50-10.95	**1.71**						
	SPL 08	12.00-12.45	**1.18**						***12.00 m***
	SPL 09	13.50-13.95	**1.82**						
	SPL 10	15.00-15.45	**5.78**						
	SPL 11	16.50-16.95	**7.17**						
	SPL 12	18.00-18.45							
BH 5	SPL 01	1.50-1.95	**1.18**			*At 4.50 m*	*35*	*42*	
	SPL 02	3.00-3.45	**0.86**						
	SPL 03	4.50-4.95	**1.18**						
	SPL 04	6.00-6.45	**1.28**						
	SPL 05	7.50-7.95	**0.86**						
	SPL 06	9.00-9.45	**1.39**						
	SPL 07	10.50-10.95	**1.61**						
	SPL 08	12.00-12.45	**2.57**						***12.00 m***
	SPL 09	13.50-13.95	**1.50**						
	SPL 10	15.00-15.45	**0.54**						
	SPL 11	16.50-16.95	**1.39**						
	SPL 12	18.00-18.45	**4.92**						
	SPL 13	19.50-19.95	**7.28**						

5.2 Comment

*According to the above evaluation the foundation of the proposed 3 floors building should be at depth of **12.00 m** downward (or depending on actual load of each footing) as Deep foundation and Drill Piles.*

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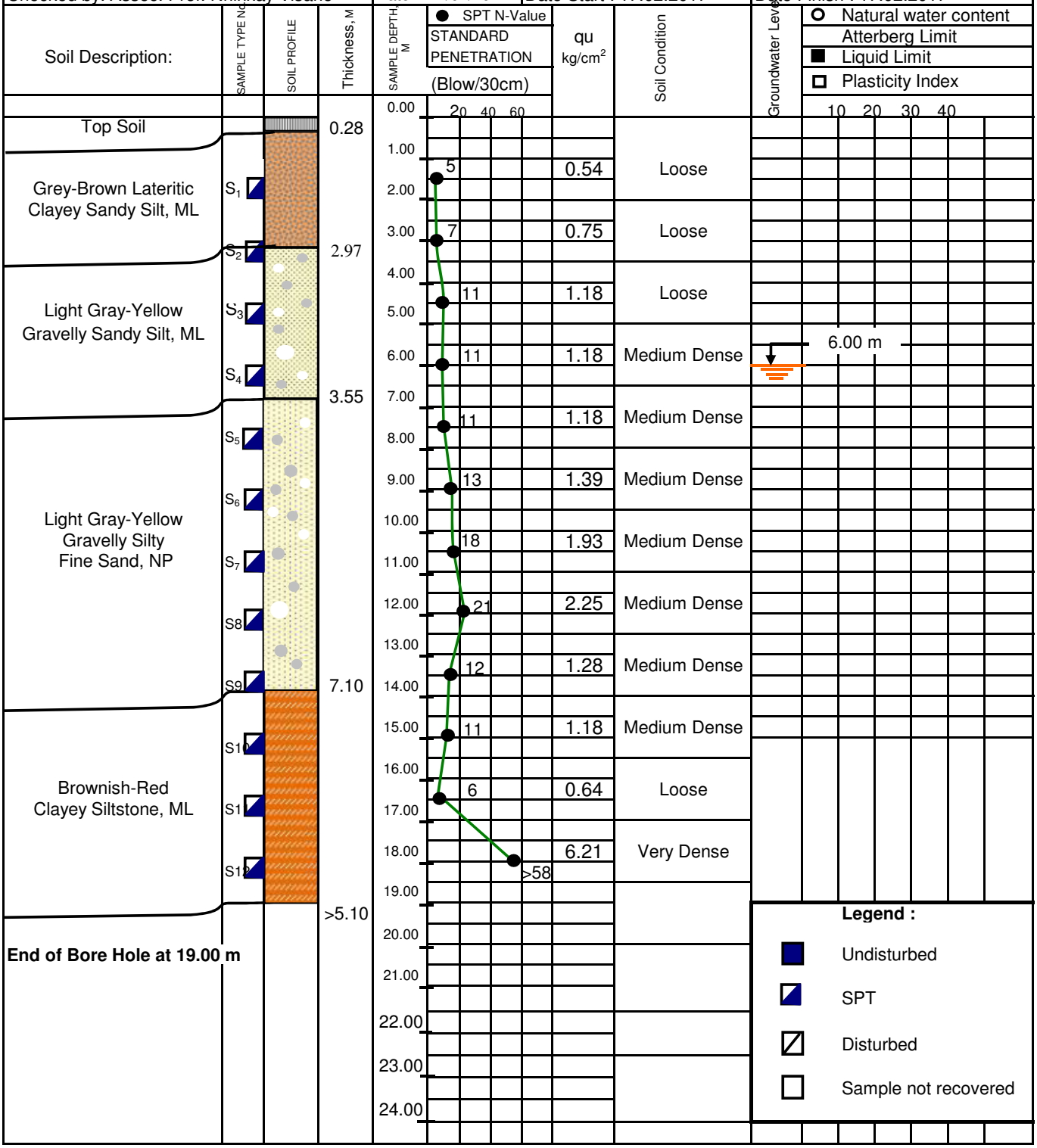
BOREHOLE LOG

Location: Ban Donkoi, Sisattanak District, Vientiane Capital	Job: 545	Project : Setthathilath Hospital Building Construction
Boring Method : Shell to 19.00 m,	Rotary core drilling to :	Casing : From m
Drilled by: Khamsone Drilling Service	Date: 17/02/2017	Bore Hole No. 1
Checked by: Assoc. Prof. Nhinxay Visane	Date: 22/02/2017	Date Start : 17.02.2017
		Observed WL : 6.00 m
		Date Finish : 17.02.2017



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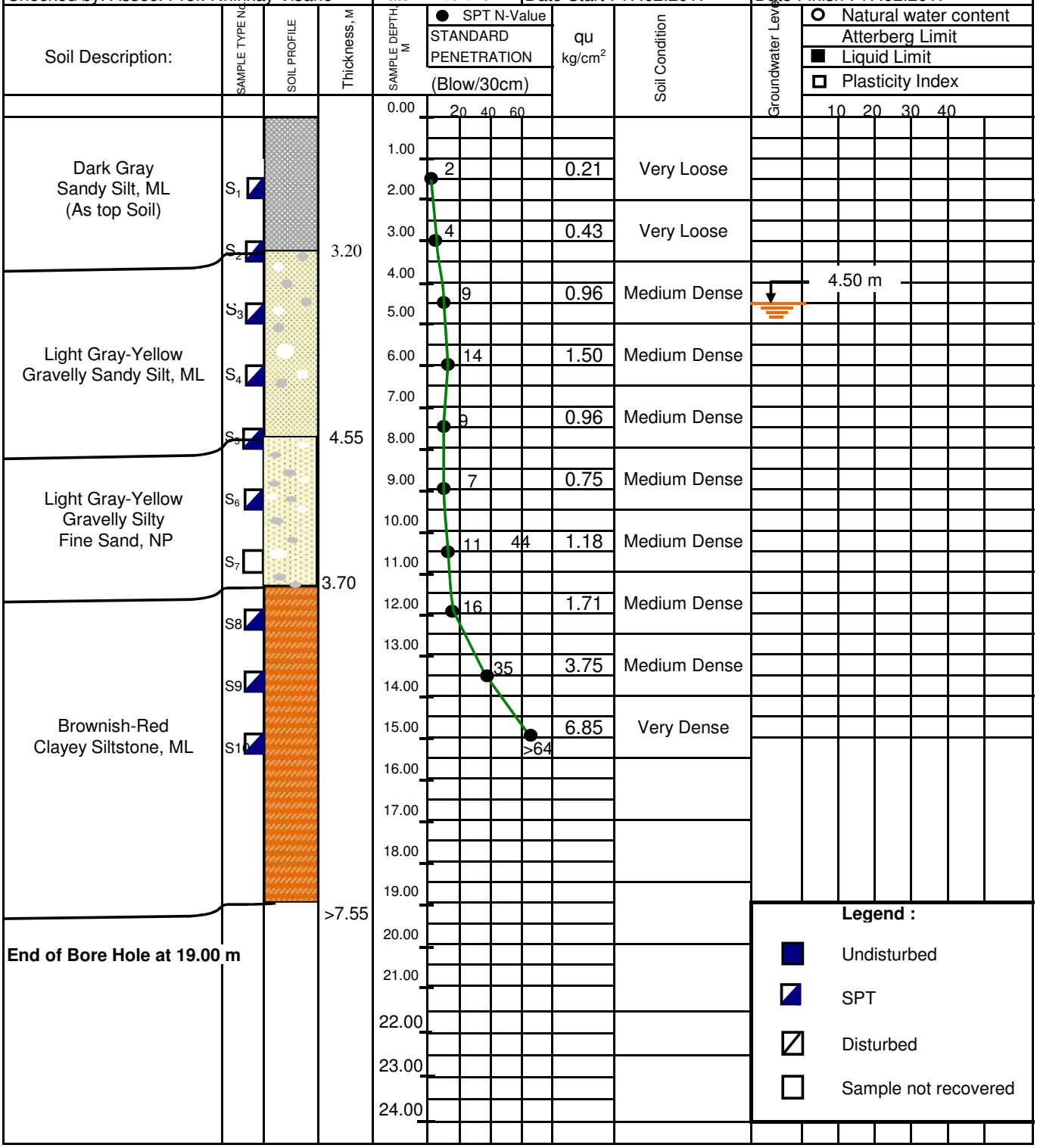
BOREHOLE LOG

Location: Ban Donkoi, Sisattanak District, Vientiane Capital	Job: 518	Project : Setthathilath Hospital Building Construction
Boring Method : Shell to 19.00 m,	Rotary core drilling to :	Casing : From m
Drilled by: Khamsone Drilling Service	Date: 17/02/2017	Bore Hole No. 2
Checked by: Assoc. Prof. Nhinxay Visane	Date: 22/02/2017	Date Start : 17.02.2017
		Observed WL : 4.50 m
		Date Finish : 17.02.2017



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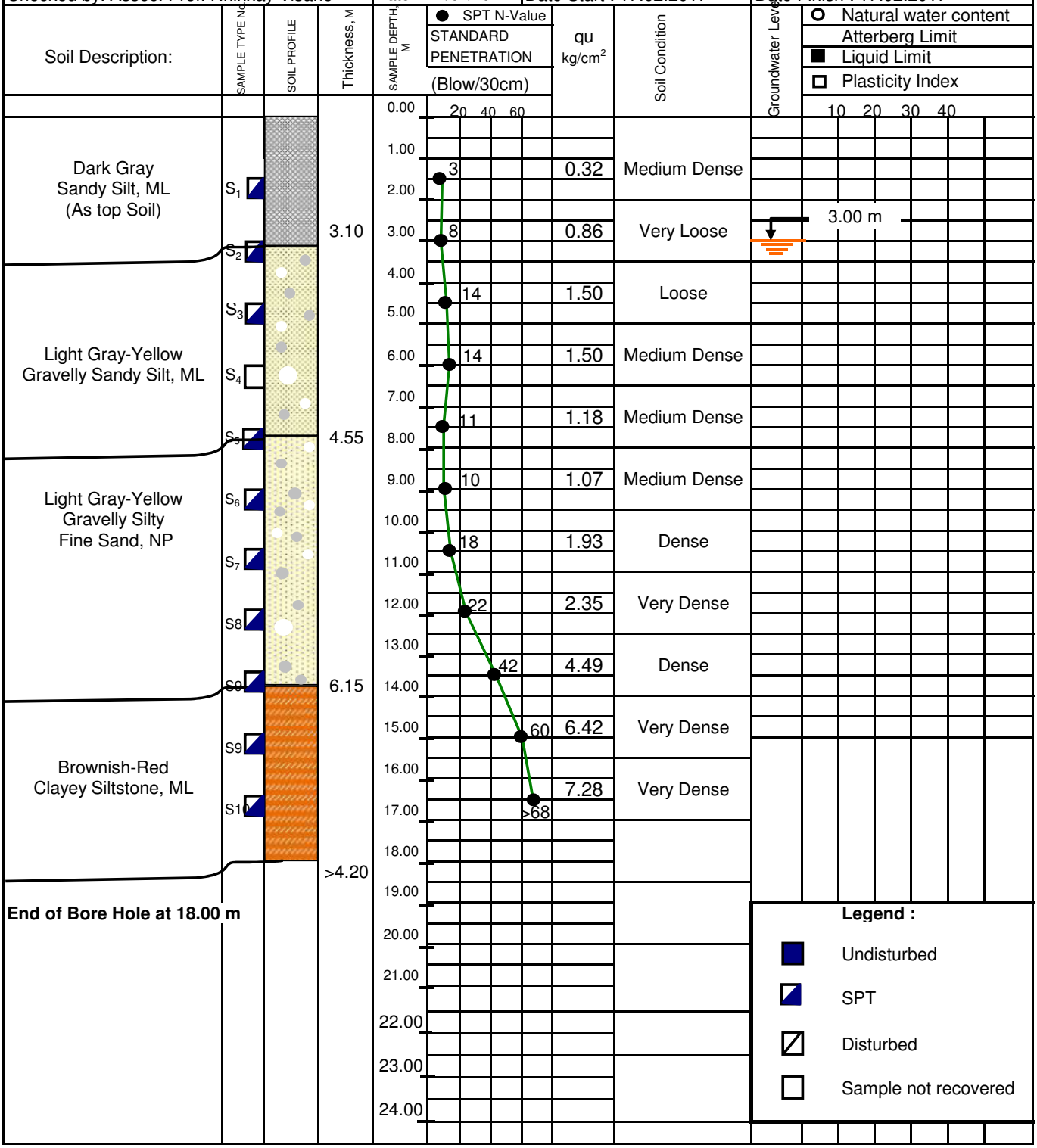
BOREHOLE LOG

Location: Ban Donkoi, Sisattanak District, Vientiane Capital	Job: 518	Project : Setthathilath Hospital Building Construction
Boring Method : Shell to 18.00 m,	Rotary core drilling to :	Casing : From m
Drilled by: Khamsone Drilling Service	Date: 17/02/2017	Bore Hole No. 3
Checked by: Assoc. Prof. Nhinxay Visane	Date: 22/02/2017	Date Start : 17.02.2017
		Observed WL : 3.00 m
		Date Finish : 17.02.2017



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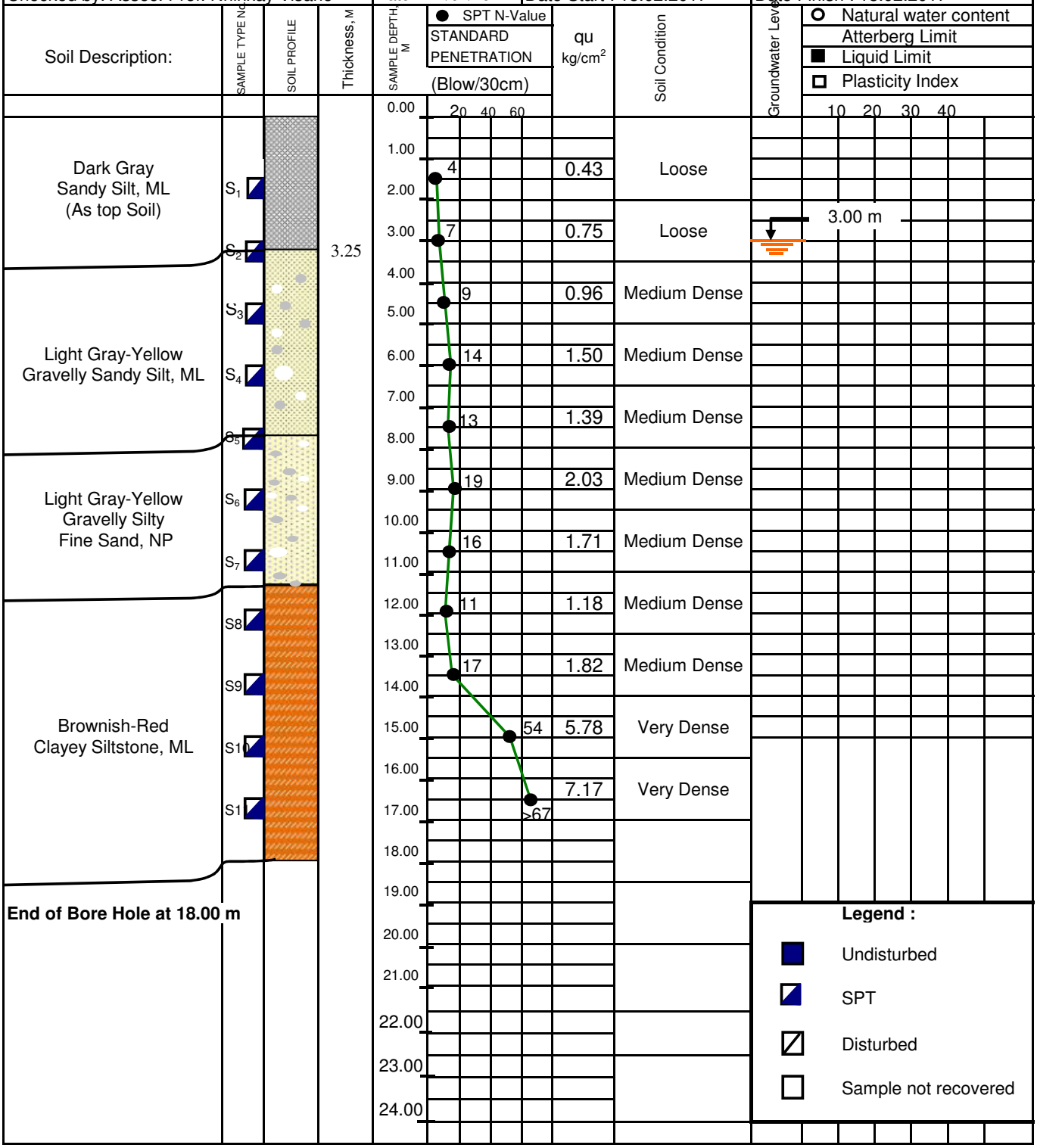
BOREHOLE LOG

Location: Ban Donkoi, Sisattanak District, Vientiane Capital	Job: 518	Project : Setthathilath Hospital Building Construction
Boring Method : Shell to 18.00 m,	Rotary core drilling to :	Casing : From m
Drilled by: Khamsone Drilling Service	Date: 18/02/2017	Bore Hole No. 4
Checked by: Assoc. Prof. Nhinxay Visane	Date: 22/02/2017	Date Start : 18.02.2017
		Observed WL : 3.00 m
		Date Finish : 18.02.2017



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BOREHOLE LOG

Location: Ban Donkoi, Sisattanak District, Vientiane Capital	Job: 547	Project : Setthathilath Hospital Building Construction
Boring Method : Shell to 21.00 m,	Rotary core drilling to :	Casing : From m
Drilled by: Khamsone Drilling Service	Date: 18/02/2017	Bore Hole No. 5
Checked by: Assoc. Prof. Nhinxay Visane	Date: 22/02/2017	Date Start : 18.02.2017
		Observed WL : 4.50 m
		Date Finish : 18.02.2017