Provincial Government of Aurora
Republic of the Philippines

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF AURORA MEMORIAL HOSPITAL
IN
REPUBLIC OF THE PHILIPPINES

February, 2010

JAPAN INTERNATIONAL COOPERATION AGENCY

AZUSA SEKKEI CO., LTD.

INTEM CONSULTING, INC.

PREFACE

Japan International Cooperation Agency (JICA) conducted the preparatory survey on the Project for Improvement of Aurora Memorial Hospital in the Republic of the Philippines.

JICA sent to the Philippines a survey team from 31st May to 27th June, 2009.

The team held discussions with the officials concerned of the Government of the Philippines, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to the Philippines in order to discuss a draft outline design, and as this result, the present report was finalized.

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

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of the Philippines for their close cooperation extended to the teams.

February, 2010

Nobuko Kayashima
Director of Human Development Department
Japan International Cooperation Agency

February, 2010

LETTER OF TRANSMITTAL

We are pleased to submit to you the preparatory survey report on the Project for Improvement of Aurora Memorial Hospital in the Republic of the Philippines.

This survey was conducted by the Consortium of Azusa Sekkei Co., Ltd. and Intem Consulting, Inc., under a contract to JICA, during the period from May 2009 to February, 2010. In conducting the survey, we have examined the feasibility and rationale of the project with due consideration to the present situation of the Philippines and formulated the most appropriate outline design for the project under Japan's Grant Aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

Hozumi OGAWA

Project manager,
Preparatory Survey team on the Project for Improvement of Aurora Memorial Hospital
The Consortium of Azusa Sekkei Co., Ltd. and Intem Consulting, Inc.

Summary

Summary

① Outline of the Recipient Country

1) Geography

The Republic of the Philippines (hereinafter called "the Philippines") is a country in Southeast Asia comprising about 7,000 various-sized islands with a total land area of approximately 300,000 km^2 (about 80% the size of Japan) and a population of around 90 million (as of 2008). The climate of the Philippines is tropical monsoon with high temperature and humidity throughout a year. The winter monsoon brings a dry season from December to May, and the summer monsoon brings a rainy season from June to November. However, the climate varies from region to region depending on where it is located within a country that spans across 15 degrees of latitude and has many steep mountains. Situated in the circum-pacific seismic zone, this island country experiences frequent earthquakes.

Aurora is one of the eight provinces of the Central Luzon (Region III) with a population of about 210,000 (as of 2008). It is located at the far eastern end of the region, facing the Pacific Ocean and isolated by the Sierra Madre Mountain Range from the neighboring provinces. A partially-unpaved mountain road leading to Cabanatuan City, Nueva Ecija Province, which borders Aurora to the west, provides virtually the only accessible link to Aurora.

Baler City, where the proposed project site is located, is situated in the central part of Aurora Province. It rains heavily throughout the year, having an annual rainfall of over 3,000mm, without a clear distinction between the dry and rainy seasons. Typhoons move directly across Baler at a frequency of two to three every year. The average temperature is around 27˚C, and the temperature does not fluctuate very much throughout the year.

2) Socio-Economic Conditions

The current Philippine President Arroyo focused on measures against poverty and anti-terrorism and security issues after her inauguration in 2001. However, since the issuance of the "10 Point Development Agenda" after the presidential election in May 2004, her focus has shifted to the political and fiscal reforms including the reduction of fiscal deficit, peace process with anti-government forces, and reconciliation to promote unity among Filipinos beyond social classes and political parties. In the past few years, her remarks often touched upon subjects related to the business environment of the Philippines, including the "Super Region" concept that aims to improve the country's investment environment and infrastructure. In her State of the Nation speech in July 2008, she stated that she would place priority on measures to control the price hikes of food and crude oil that were directly affecting Philippine households. In October the same year, in the face of the global financial crisis triggered by the subprime loan problems in the United States, she announced an economic stimulus package to allocate a total of 100 billion pesos for the government and private sectors and is implementing other programs to strengthen the country's economy.

The Philippines recorded a nominal GDP of 168.5 billion dollars and GNP per capita of 1,902 dollars in 2008 (according to 2008 data of Central Bank, National Statistics Office, etc.). Its 2007 GDP was the fifth largest among the ASEAN nations, with GDP per capita being the 6th largest. The political and fiscal reforms implemented by the current administration have produced some result, achieving the highest GDP growth rate in the preceding 31 years of 7.3% and an extremely low inflation rate of 2.8% in 2007. However, the country's economy experienced a downturn affected by high crude oil and commodity prices and the

ensuing financial crisis in 2008, during which the inflation rate stayed at a high level of 9.3% and GDP growth rate considerably declined to 4.6%.

The primary, secondary, and tertiary industries of the Philippines account for 18.2%, 29.6%, and 52.2% respectively of the country's GDP (2008 Central Bank). The Philippines' external trade is mostly made up of intermediate trade, in which the country imports semi-finished electronic devices and processes them into finished semiconductors, etc. for export. Electronic devices accounted for 58.1% of the country's total export in 2008 (49 billion dollars, down 2.8% from the previous year), and semiconductors accounted for 47% of the total export. Electronic devices also accounted for 35.5% of the total import (56.7 billion dollars, up 2.2% from the previous year), and the mineral resources occupied 21.8%. The Philippines' trade deficit in 2008 was 7.6 billion dollars, a 51.9% jump from the previous year.

② Background and Outline of the Request for Japan's Grant Aid Assistance

To restructure and improve respective health systems, provinces in the Philippines have taken initiative in formulating the Province-wide Investment Plan for Health (hereinafter called "PIPH") in accordance with FOURmula One for Health, which has been implemented by the Department of Health (hereinafter called "DOH") since 2005. However, due to the shortages of funds and health professionals, those provinces that have formulated PIPH so far are facing significant challenges in executing their plans. The lack of manpower is largely attributable to the massive emigration of doctors and nurses to other countries, as well as their disproportionate concentration in urban districts within the country. Thus, rural provinces are more negatively affected by the shortages.

Due to the geographical condition of Aurora Province, the only link conneting to other provinces is a road leading to Cabanatuan City, Neuva Ecija Province that borders Aurora to the west. It takes around four hours to travel this road, which is unpaved in many sections and often blocked due to landslides in typhoon seasons. Partially because of its remote location, the province's health and medical service conditions are poor. Its population per doctor is 11,800 (as compared to 1,100 for the whole country) and population per hospital bed is 2,800 (1,000 for the whole country). Shortages of medical facilities and human resources in Aurora Province are more serious than the rest of the Philippines, and, as a result, its infant and maternal mortality rates in 2002 were the highest in Region III, lagging considerably behind the national averages.

Aurora Province has four small hospitals run by the Provincial Government of Aurora (hereinafter called "PGA") and eight Rural Health Units (RHUs) and 66 Barangay Health Stations (BHSs) managed by eight municipalities, plus one private Level-2 hospital. As for manpower, shortages of doctors in hospitals and shortages of nurses and midwives in Health Centers are particularly serious. Two of the four provincial hospitals have had their hospital certifications cancelled by the public health insurance corporation due to lack of doctors. For this reason, severely ill patients are forced to go to the national hospital outside of the province after hours of drive across the mountain range. Also, home deliveries attended by traditional midwives (called "hilots") still account for nearly 80% of the total. Therefore, fostering and deployment of a sufficient number of community-based health workers, as well as upgrading of facilities and equipment, are becoming urgent issues.

The Aurora Memorial Hospital (hereinafter called "AMH"), a targeted institution of this Project, is a public general hospital situated in the provincial capital Baler. Installed with 25 sick beds and staffed by 1 specialist doctor and 4 general physicians, AMH directly covers four municipalities in the central Aurora. AMH's hospital license was downgraded from Level 2 to Level 1, as it became unable to perform proper

surgical procedures at the time when DOH decided to put restrictions on operations in hospitals without a surgeon and an anesthesiologist around 2000. Although officially recognized as the top referral hospital of the province, AMH, in reality, is functioning only as a small hospital, covering the central part of Aurora Province.

In order to mitigate shortages of health workers in remote communities, DOH has been extending a variety of assistance programs to local governments for many years, including assistance for the establishment of an extension campus of the School of Health Sciences (UPM-SHS) of University of the Philippines Manila (UPM) in Baler, Aurora in July 2008. The purpose of opening this extension campus is to disseminate in the northern Philippines a unique educational system to foster community-based health workers, which UPM-SHS has been practicing in Eastern Visayas in the central Philippines for many years. Successful operation of UPM-SHS Baler, which offers doctor, nursing and midwifery courses, will ensure a stable, continuous supply of health professionals working in and around Aurora Province. To actualize this, UPM-SHS needs to meet the two challenges of constructing a permanent campus and establishing a teaching hospital. Under these circumstances, PGA decided to relocate the existing AMH and upgrade it to a Level 4 hospital with 100 beds, and requested Japan's Grant Aid Assistance for the establishment of new AMH. As a result of a preparatory survey conducted in response to the request from January to March 2009, it was concluded and agreed upon by both Japanese and Philippine sides that it would be more appropriate to downscale the initial plan to a Level 2 hospital with 50 beds.

③ Outline of the Survey Result and Contents of the Project

Based on the request mentioned above, the Japan International Cooperation Agency (JICA) decided to conduct a preparatory survey (basic design) and dispatched a study team to the proposed project site from 31st May to 27th June, 2009. The team held discussions with the officials concerned of the Government of the Philippines and conduct a field survey at the proposed site. After further studies in Japan and returning to the Philippines from 10th to 26th January, 2010 to discuss a draft outline design, the study team compiled this Preparatory Survey Report.

This Grant Aid Project aims to contribute to the achievement of PIPH goals of Aurora Province, one of which is to improve medical services in the province, by constructing and equipping a Level-2 hospital in Baler City, the capital of Aurora Province. Taking into account the requests made by the Aurora Provincial Government, as well as the findings obtained from the field surveys and discussions, the policies and contents of the Project were decided as described below.

1) Design Policy

a) Functional Capability and Capacity

- As for medical service functionality, the new AMH should be able to provide Level-2 medical services by specialist doctors in each of the Internal Medicine, Surgery, Obstetrics and Gynecology, Pediatrics, and EENT Departments.
- Based on the current demand of outpatients and inpatients, the capacity of the new AMH is set at 50 beds with an extra capacity to expand to 100 beds.
- Since AMH is the only hospital in Aurora Province that can perform surgical procedures, the surgical department will be especially fortified and upgraded in order to reduce the number of patients transferred to other provinces.

b) Facility Plan

- Since AMH is the top referral hospital of Aurora Province and may serve as the rehabilitation base in case of disasters, the buildings will have sturdy structures.
- For easy operation and maintenance by the local staff, the buildings will be constructed based on the specifications and construction methods commonly used in the local area in appropriate grade and scale. Construction materials will also be procured from local sources as much as possible.
- Multi-storied structures that require elevators and slopes will be avoided. All buildings, except for part of the administration building, will be one storied.
- Natural ventilation and lighting will be utilized as much as possible. Rooms requiring air conditioning will use insulators and other energy-conserving measures.
- All buildings will adopt basically the same central-corridor-type general-cross-section style so that standardized structure and construction/installation methods can be applied to all of them to achieve uniform, high quality and reduce construction cost.
- The buildings will be designed in accordance with the building code, structural codes, fire law, environmental law, and other laws and regulations applicable in the Philippines. If certain design elements are considered critical in terms of safety, but no local standards are available, they will be determined by referring to Japanese standards while taking precautions not to be excessive.

c) Equipment Plan

- The content and scale of the equipment should be appropriate for the functionality, level, manpower, and scale of activity of the new hospital.
- The equipment should be operated and maintained by local staff without difficulties after the completion of the Project.
- The equipment should be appropriate for the buildings and facilities.
- The quantity of each equipment item will be determined based on the activities, number of patients, and the frequency of equipment use at each clinical department as confirmed in the outline design. Existing equipment should be utilized as much as possible to keep the quantities of new equipment to a minimum.

2) Scale and Contents

a) Facilities

The facility plan consists of five buildings of Administration, ER & OPD Building, Operation & Delivery Building, two Ward Buildings, and Service Building, plus ancillary buildings. The facilities, structure, and scale of each building are shown in Table-i below.

Table-i Buildings to be Constructed under the Project

Building Name	Structure	Contents of the Building	Floor Area
Administration, ER & OPD Building	RC structure 1 Story (Partially 2 stories)	Administration Dept., ER, OPD, Laboratory, X-ray Room, Pharmacy, etc.	1,503.0 ㎡
Operation & Delivery Building	RC structure 1 Story	Operation Theater, Delivery Room, Central Sterilizing & Supply Room, etc.	765.0 ㎡
Ward Buildings (2 blocks)	RC structure 1 Story	4 beds room, 2 beds room, 1 bed room, HCU, Shower room, etc.	Per block 432.0 ㎡ Total 864.0 ㎡
Service Building	RC structure 1 Story	Kitchen, Laundry, Maintenance Room, Pump Room, Watertank Storage, etc.	432.0 ㎡
Ancillary Buildings	RC structure	Morgue, Guardhouse, Driver's Waiting Room, Elevated Watertank, Septic Tank, etc.	405.6 ㎡
Total			3,969.6 ㎡

b) Equipment

The amount and the use of the major equipment to be procured under the Project is as follows:

Table-ii Amount and Use of Major Equipment to be Procured under the Project

Fields	Equipment Name	Usage	Amount
Dental Equipment	Dental X-ray Unit And Film Processor	For dental X-ray diagnostic	1
Physical Therapy Equipment	Traction Unit	Cervical and lumbar traction treatment	1
Radiology Equipment	General X-ray System	For X-ray medical diagnostic	1
	Automatic X-ray Film Processor	To develop X-ray film	1
	Ultrasound Machine for General Examination	For diagnostic imaging	1
Laboratory Equipment	Hematology Analyzer	For patient's hematology analyzing	1
	Autopsy Table	Table for autopsy	1
CSSR Equipment	Autoclave	For sterilization of instrument at hospital	2
Equipment for Ward	Infant Warmer	Treatment warmer table for neonatal	1
	Mechanical Ventilator	Respiratory assistance for patient in difficulty in breathing	1
Emergency Room /Operation Theater Equipment	Defibrillator	Countershock for cardioplegia patient /defibrillation	4
	Electro-Surgical Unit	For coagulation, cutting at operation or treatment	2
	Bedside Monitor	Biomedical monitoring for patient of ICU/OP theater	6
	Anesthesia Apparatus w/Vaporizer	Anesthesia Apparatus for operation	1
	Operating Tables	Patient table for operation	2
	Operating Lights	Illumination at an operation	2
	Surgical Scrub Station	For operator's hand-wash before operating	1
Obs. /Gyn. Equipment	Delivery Table	Patient bed for delivery	2
	Fetal Monitor	Fetal monitor at the prenatal diagnostic or the delivery	1
	Ultrasound Machine for OB/GY	For obstetric and gynecologic diagnostic imaging	1
EENT Equipment	E.N.T Treatment Unit	Treatment Unit for E.N.T diagnostic	1

④ Project Schedule and Estimated Project Cost

The cost to be borne by Phillipine side for implementing this Project under Japan's Grant Aid System is estimated at 80 million Pesos (170 million yen). The Project is scheduled to be implemented in a single fiscal year, taking 6 months for detailed design and 14 months for construction and procurement. However,

this cost estimate is provisional and would be further examinated by the Government ot Japan for the approval of the Grant.

⑤ Validity of the Project

Implementation of this Project is expected to bring about direct and indirect effects as summarized below:

(1) Direct Effects

a) Upgraded medical service function and expanded capacity will enable the hospital to diagnose and treat a wider range of diseases and increase the total person-day of acceptable inpatients from the current 7,700 person-day to 13,000 person-day.

b) Upgraded facilities and equipment, plus deployment of specialist doctors in all clinical departments, will enhance the hospital's examination and medical care capacities especially in the Surgery and Obstetrics and Gynecology Departments.

c) Because of the enhanced hospital capacities, AMH will be able to accept about 800 more patients per year without needing to transfer them to other provinces. This will lessen the physical and financial burden on patients.

d) Improved facilities (new installation of emergency-patient observation room, expanded nursing space, provision of better privacy for patients, etc.) will enhance the quality of medical services and lessen the workload of hospital staff.

(2) Indirect Effects

a) Upgrading of AMH's hospital license from Level 1 to Level 2, as well as the enhancement of its medical service quality, will increase the hospital's income from PhilHealth and strengthen its financial foundation.

b) Upgrading of the hospital will also enhance its capacity as a teaching hospital, thereby helping to improve the quality of health workers and fortify the health service systems in the entire province of Aurora.

c) Increased number of patients visiting AMH will lessen the loss of medical service income to other provinces, thereby mitigating the economic loss on the provincial level.

In addition to the above, it is deemed appropriate to implement this Project under Japan's Grant Aid Assistance for reasons 1) to 7) described below.

1) Direct beneficiaries of this Project include residents living in and around Baler City, as well as those using hospitals outside Aurora Province. Indirect beneficiaries are the entire population of Aurora Province of 210,000 people, which represents a significantly large number.
2) The objective of this Project is the quantitative and qualitative improvement of AMH's medical services. This Project is desired for meeting the BHN and improving the living conditions of the local residents.
3) The facilities to be constructed under this Project will be built based on the construction methods and specifications commonly used in the Philippines. Also, equipment to be procured under this Project will be selected from products whose manufacturers have local agents in Manila. Therefore, the facilities and equipment can be operated and maintained without requiring overly advanced skills and techniques.
4) One of the PIPH goals of Aurora Province, which is also the overall goal of this Project, is to guarantee quality hospital care and services for all residents of Aurora Province. This Project will contribute to the

achievement of this long-term goal.

5) By practicing the recommendations made in Table-iii, AMH will likely be able to increase income, and will cover a part of the operation and maintenance cost of its facilities and equipment.
6) This Project hardly poses any negative social or environmental impact.
7) This Project can be implemented within the framework of Japan's Grant Aid System without particular difficulties.

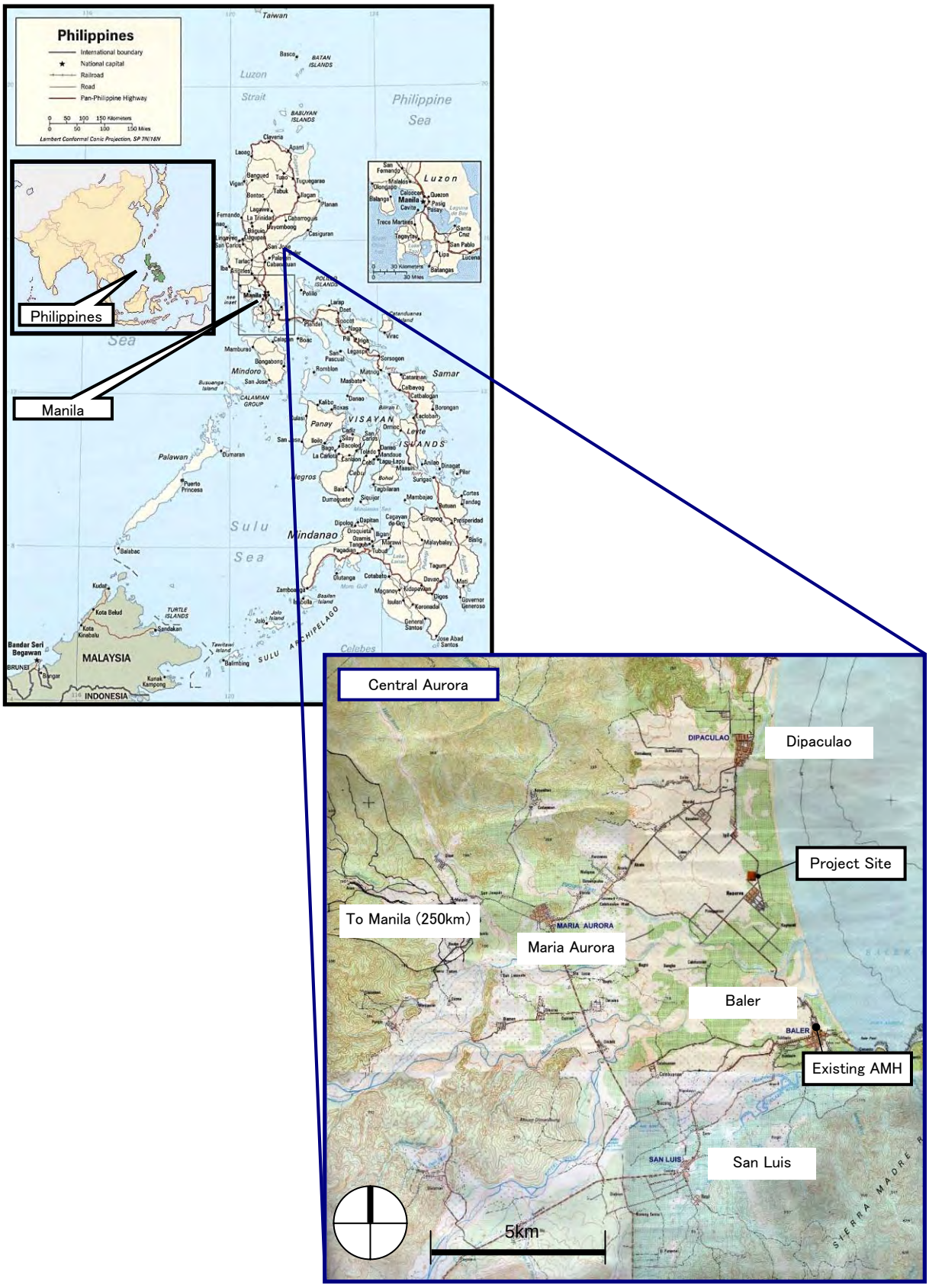
The goal of the Project is to improve new AMH's medical services both in terms of quality and quantity, for which it is necessary for the parties involved – AMH, PGA and the Provincial Health Office (PHO) – to engage responsibly in a series of activities. The development of infrastructure and equipment under the Project is part of such activities: however each party still has much more to do to achieve the goal. Of these activities, Table-iii summarizes particularly important ones in the form of recommendations. The shaded area in Table-iii concerns the activities in which AMH will engage. This table shows a logical frame of the process towards the goal that starts from the bottom to the top: that is, each hospital will engage in its own activities based on the activities of PGA & PHO, which will increase the medical services in terms of quality and quantity, and finally the goal of PIPH will be attained.

Table-iii: Framework of Recommendations

<table>
<tr><td colspan="2">Goal of PIPH</td><td colspan="2">To ensure that every Auroran receives quality hospital care and services.</td></tr>
<tr><td colspan="2">Project Objective</td><td>To improve the AMH care and services both in quality and in quantity.</td><td>To improve Casigran District Hospital (CDH), Maria Aurora Community Hospital (MACH), Dingalan Community Hospital (DCH) care and services respectively both in quality and in quantity</td></tr>
<tr><td rowspan="2">Activities</td><td>AMH & 3 public hospitals</td><td>[AMH]
1) To operate AMH in a self-sustaining way through raising its cost recovering capacity.
2) To put in systemic efforts to address the improvement of service quality continuously
3) To keep investing to develop staff's capacities suitable enough to meet the requirements for their tasks.</td><td>[CDH, MACH, DCH]
1) To operate the hospital with efforts to raise cost recovery ratio.
2) To put in systemic efforts to address the improvement of service quality continuously
3) To keep investing to develop staff's capacities suitable enough to meet the requirements for their tasks.</td></tr>
<tr><td>PGA & PHO</td><td colspan="2">1) To recruit and allocate appropriate staff with competencies to the hospital.
2) To allocate budget among hospitals in proportion to their performance of services.
3) To allow hospitals to operate in a self-sustained manner through revising financial regulations and systems.
4) To invest to capital assets in order to improve infrastructure, equipment and vehicles.
5) To plan and promote the coordinating mechanism among provincial hospitals to share common resources such as health staff, facilities and equipment.</td></tr>
</table>

Contents

Location Map



Perspective

List of Figures and Tables

Abbreviations

ADB	Asian Development Bank
AIDS	Acquired Immune Deficiency Syndrome
ALOS	Average Length of Stay
AMH	Aurora Memorial Hospital
ARI	Acute Respiratory Infection Disease
ASCOT	Aurora State Collage of Technology
BHN	Basic Human Needs
BHS	Barangay Health Station
BOR	Bed Occupancy Rate
CAR	Cordillera Administrative Region
CBC	Complete Blood cell Count
CHDs	Centers for Health Development
CHED	Commission on Higher Education
CHW	Community Health Worker
CMO	CHED Memorandum Order
C/S	Caesarean Section
CVA	Cerebral Vascular Accident
DENR	Department of Environment and Natural Resources
DOH	Department of Health
ECC	Environmental Compliance Certificate
EENT	Eye, Norse, Nose and Throat
EMB	Environmental Management Bureau
E/N	Exchange of Notes
EoJ	Embassy of Japan
EP	Emulsion Paint
ER	Emergency Department
F1	FOURmula One (F1) for Health
FHSIS	Field Health Statistics Information System
FRP	Fiber Reinforced Plastic
G/A	Grant Agreement
GDP	Gross Domestic Product
GL	Ground Level
HCU	High Care Unit
HIV	Human Immunodeficiency Virus
HSRA	Health Sector Reform Agenda
ICC	Investment Coordination Committee
ICU	Intensive Care Unit
ILHZ	Inter-Local Health Zone

JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standard
JOCV	Japan Overseas Cooperation Volunteers
KOICA	Korea International Cooperation Agency
LGUs	Local Government Units
MDG s	Millennium Development Goals
MOA	Memorandum of Agreement
MOOEs	Maintenance & Other Operation Expenses
NEDA	National Economic and Development Agency
NICU	Neonatal Intensive Care Unit
NGO	Non-Governmental Organization
NSCP	National Structural Code of Philippines
ODA	Official Development Assistant
OPD	Outpatient Department
PCAB	Philippine Contractors Accreditation Board
PGA	Provincial Government of Aurora
PHC	Primary Health Care
PHO	Provincial Health Office (Officer)
PIPH	Province-wide Investment Plan for Health
RHU	Rural Health Unit
RC	Reinforced Concrete
SS	Sentrong Sigla
TOT	Training of Trainers
TSWs	Total Service Workloads
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Foundation
UPM	University of the Philippines, Manila
UPM-SHS	UPM School of Health Science
USAID	U.S.Agency for International Development
VAT	Value Added Tax
WHO	World Health Organization

Chapter 1 Background of the Project

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

To restructure and improve respective health systems, provinces in the Philippines have taken initiative in formulating the Province-wide Investment Plan for Health (hereinafter called "PIPH") in accordance with FOURmula One for Health, which has been implemented by the Department of Health (hereinafter called "DOH") since 2005. However, due to the shortages of funds and health professionals, those provinces that have formulated PIPH so far are facing significant challenges in executing their plans. The lack of manpower is largely attributable to the massive emigration of doctors and nurses to other countries, as well as their disproportionate concentration in urban districts within the country. Thus, rural provinces are more negatively affected by the shortages.

Aurora Province with a population of 210,000 is one of eight provinces in Central Luzon (Region III). Geographically, it is located at the farthest eastern part of the region facing the Pacific Ocean and isolated by the Sierra Madre Mountain Range from other provinces. The only link that connects Aurora Province with other regions is a road leading to Cabanatuan City, Neuva Ecija Province that borders Aurora to the west. It takes around four hours to travel this road, which is unpaved in many sections and often blocked due to landslides in typhoon seasons. Partially because of its remote location, the province' health and medical service conditions are poor. Its population per doctor is 11,800 (as compared to 1,100 for the whole country) and population per hospital bed is 2,800 (1,000 for the whole country). Shortages of medical facilities and human resources in Aurora Province are more serious than the rest of the Philippines, and, as a result, its infant and maternal mortality rates in 2002 were the highest in Region III, lagging considerably behind the national averages.

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The Aurora Memorial Hospital (hereinafter called "AMH"), a targeted institution of this Project, is a public general hospital situated in the provincial capital Baler. Installed with 25 sick beds and staffed by 1 specialist doctor and 4 general physicians, AMH directly covers four municipalities in the central Aurora. AMH's hospital license was downgraded from Level 2 to Level 1, as it became unable to perform proper surgical procedures at the time when DOH decided to put restrictions on operations in hospitals without a surgeon and an anesthesiologist around 2000. Although officially recognized as the top referral hospital of the province, AMH, in reality, is functioning only as a small hospital, covering the central part of Aurora Province.

In order to mitigate shortages of health workers in remote communities, DOH has been extending a variety of assistance programs to local governments for many years, including assistance for the establishment of an extension campus[1] of the School of Health Sciences (UPM-SHS) of University of the

[1] Its main campus is located in Palo, Eastern Visayas, Leyte Island.

Philippines Manila (UPM) in Baler, Aurora in July 2008. The purpose of opening this extension campus is to disseminate in the northern Philippines a unique educational system to foster community-based health workers, which UPM-SHS has been practicing in Eastern Visayas in the central Philippines for many years. Successful operation of UPM-SHS Baler, which offers doctor, nursing and midwifery courses, will ensure a stable, continuous supply of health professionals working in and around Aurora Province. To actualize this, UPM-SHS needs to meet the two challenges of constructing a permanent campus and establishing a teaching hospital. Under these circumstances, PGA decided to relocate the existing AMH and upgrade it to a Level 4 hospital with 100 beds, and requested Japan's Grant Aid Assistance for the establishment of new AMH. As a result of a preparatory survey conducted in response to the request from January to March 2009, it was concluded and agreed upon by both Japanese and Philippine sides that it would be more appropriate to downscale the initial plan to a Level 2 hospital with 50 beds.

Upgrading of AMH will directly and significantly contribute to the fortification of the medical referral system and the qualitative improvement of medical services in Aurora Province. Also, its enhancement will enable AMH to serve as a training hospital of UPM-SHS, thereby indirectly contributing to the fostering of medical professionals in six provinces, including Aurora. Therefore, the necessity and appropriateness of this Project is deemed high.

1-2 Natural Conditions

(1) Climatic Conditions

The table and figure below show the weather data of Baler City. Unlike the weather data of the Philippine capital Manila, Baler has constant rainfalls throughout a year without a clear distinction between the rainy and dry seasons. Precipitation is especially heavy during the typhoon season from October to December, and Aurora Province is directly hit by two to three typhoons every year. In formulating the implementation plan, it is important to avoid the October – December period as much as possible to do excavation work, main-frame construction, and other works that could be adversely affected by heavy rain, and adopt the construction methods and scheduling that incorporate measures against rainfall.

Table 1.1 Weather Data of Baler City (1994 – 2008 average)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Average rainfall (mm)	192.5	164.3	197.1	215.6	306.8	288.5	261.3	194.3	320.5	498.8	420.3	279.0	3,339.1
Average max. temp. (℃)	28.7	29.3	30.5	32.0	33.1	33.3	33.0	33.0	32.7	31.5	30.5	29.0	31.4
Average min. temp. (℃)	20.2	20.6	21.3	22.6	23.4	23.6	23.5	23.6	23.2	22.5	21.9	20.9	22.3
Average temp. (℃)	24.5	25.0	25.9	27.3	28.3	28.4	28.3	28.3	27.9	27.0	26.2	24.9	26.8
Relative humidity (%)	83	83	82	81	80	80	80	78	80	81	82	82	81
Dominant wind direction	E	E	E	E	E	E	E	W	E	E	E	E	E

Source: Response to the Letter of Inquiries

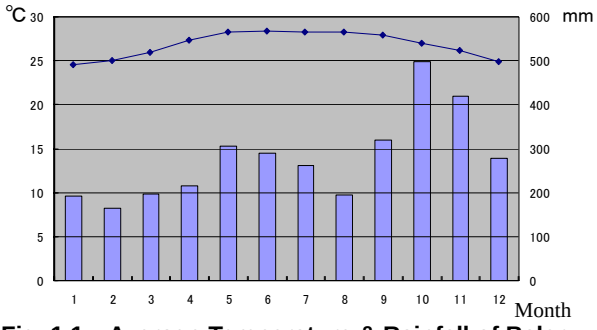


Fig. 1.1 Average Temperature & Rainfall of Baler

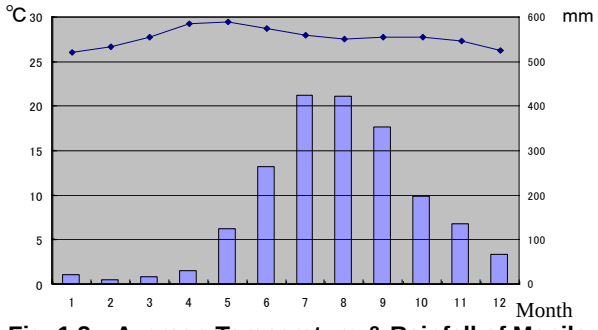


Fig. 1.2 Average Temperature & Rainfall of Manila

(2) Geographic Conditions

The North Luzon Expressway (NLEx) connects Manila to Angeles, and the Subic-Clark-Tarlac Expressway (SCTEx), which was constructed under Japan's assistance and opened in 2008, extends from Angeles to Tarlac, both of which are well-paved 2- to 4-lane roads. A flat 1-lane paved road extends from Tarlac to San Jose.

The route from San Jose to Maria Aurora is a mountain road, which is about 80% paved. Since the pavement work was continuing during the field survey, it is likely that most of the road will have been paved by the time the construction work for this Project commences. However, a part of the road runs across a dam and becomes a 1-lane alternate traffic road with tall curbs, which avoids trailers and other large vehicles with a large gap in cornering tracks between front and back inner wheels to path through.

It takes around six hours from Manila to the project site by a 4WD car and a whole day by a large truck. All construction materials, except for sand and gravel, will be procured in Manila, and medical equipment will be procured in Japan and shipped to Manila by ocean, and then transported from Manila to the project site by land. Therefore, the above-mentioned poor accessibility needs to be taken into account when drafting an implementation plan including a schedule.

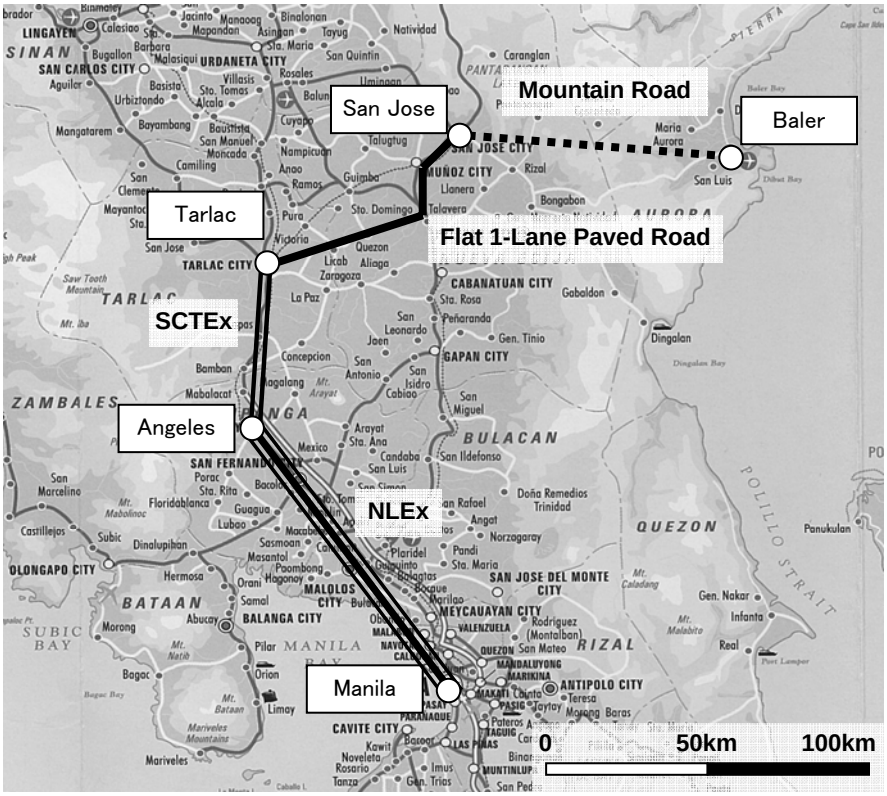


Figure 1.3 Land Transportation Route from Manila to Project Site

(3) Natural Environment Surveys

Topographical, boring, and water-quality surveys were conducted by subcontractors in and around the project site.

1) Topographical Survey

The proposed construction site is located in Barangay Reserva in Baler City. This land consists of two registered plots, Lot Nos. 2608 and 2609. At present, PGA has the ownership of the land. Lot No. 2608 on the north side would be dedicated to constructing the UPM-SHS Baler campus, and Lot. No. 2609 on the

south side would be used exclusively for building new AMH under this Project. On the southern plot (Lot No. 2609) where new AMH will be constructed, there remain a coconut plantation office, agricultural development facilities, and other buildings. According to PGA, notices have already been issued to the occupants with regard to the removal and vacation of these buildings, and it has been decided to relocate the Coconut Authority Office to Dinalungan in the northern Aurora and agricultural development facilities to the former site of the Provincial Equipment Office in Baler City. The timing of vacation/ relocation will be decided according to the hospital construction schedule to be finalized in the near future.

The plot is an almost flat area of 38,384m2, the eastern half of which, however, is 60 to 80cm lower than the frontal road and the rest of the plot. It was agreed that the Philippine side would fill this part to make it level to other parts of the plot.

2) Boring Survey

A boring survey on four points within the proposed construction site revealed that the surface layer at all four points consisted of around 1.0 meter-deep sandy clay or clayey sand (with an N-value of around 10). Beneath the surface soil is an around 5-meter-deep layer of fine sand or silt mixed with fine sand, below which is a hard silt/ sand layer with an N-value of over 50.

The buildings to be constructed under this Project will consist of RC flat structures (partially 2-story buildings). Since the N-value of the surface layer to around GL-1.0m (or 1.6 – 1.7m after earth fill) is 10, the structural plan will be drafted using the more stable fine-sand/ clay layer beneath it as the support layer.

The Philippines is situated on the circum-pacific seismic zone, and Luzon Island, where Baler is located, belongs to Zone 4 with a seismic coefficient of 0.4 according to the earthquake zone map of the National Structural Code of Building (NSCB). However, no earthquake damage has been reported in Baler in recent years.

3) Water Quality Survey

The existing buildings in the proposed construction site are using deep wells as water sources because there is no municipal water supply system in or around the area. These are spouting wells at about 250 feet below the ground surface. It is common to store water sprung up to above ground level in a water tank on the ground and pump it up to an elevated water tank. However, 1-story buildings are mostly using the natural pressure of spouting water to send water to the faucets.

In this water quality survey, water samples were taken from five points: two are from the outlets of well water in the former agricultural development facilities and one each from the wells of the Coconut Plantation Office, the Rice Processing Complex, which was constructed with financial aid from Korea International Cooperation Agency (KOICA), and the Department of Public Works and Highway (DPWH). All of them are spouting wells. The water quality of four points, excluding the well water of the Rice Processing Complex, complied with the Philippine National Standards for Drinking Water (PNSDW) 2007 and were proven to be suitable for drinking. The water sample from the Rice Processing Complex, however, was found to be unsuitable for drinking, as coliform bacilli were detected in the water. The exact cause of contamination is unknown. It could be that bacteria were generated in the concrete water receiving tank, or bacteria from septic tank effluent seepage got mixed in the water vain.

In this Project, the water supply plan will be formulated based on spouting wells that are commonly used in this area.

1-3 Environmental and Social Considerations

This is a hospital-construction project, and its environmental and social impact on the areas around the construction site is considered minor. Therefore, it is classified as a Category C project under the JICA Guidelines for Environmental and Social Considerations.

Also, there is no need to apply for the Environmental Compliance Certificate (ECC), as this Project is not categorized as a project or a area of environmentally critical under the environmental impact assessment governed by the Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR).

Table 1.2 Environmentally Critical Projects/ Areas

A Environmentally Critical Projects		B Environmentally Critical Areas
I Heavy Industries	a. Non-ferrous metal industries b. Iron and steel mills c. Petroleum and petro-chemical industries including oil and gas d. Smelting plants	1. National parks, watershed reserves, wildlife preserves and sanctuaries 2. Aesthetic potential tourist spots 3. Habitat for any endangered or threatened species of indigenous Philippine Wildlife 4. Areas of unique historic, archaeological, or scientific interests 5. Areas which are traditionally occupied by cultural communities or tribes 6. Areas frequently visited and/or hard-hit by natural calamities 7. Areas with critical slopes 8. Areas classified as prime agricultural lands 9. Recharged areas of aquifers 10. Water bodies characterized by certain conditions 11. Mangrove areas characterized by certain conditions 12. Coral reefs characterized by certain conditions
II Resouce Extractive Industries	a. Major mining and quarrying projects b. Forestry projects (logging, major wood processing projects, etc.) c. Fishery projects	
III Infrastructure Projects	a. Major dams b. Major power plants c. Major reclamation projects d. Major roads and bridges	

Source: Proclamation No.2146 under Presidential Decree No.1586

Chapter 2　Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Purpose

In PIPH (2009-2013) of Aurora Province, currently under formulation, PGA has laid out a goal to upgrade AMH to a Level 3 hospital with a 100-bed capacity by 2013. For this long-term goal, PGA plans to improve AMH in several phases, and the Project is positioned within PIPH as a mid-term project in the process of fulfilling the long-term goal. In accordance with the hospital classification by DOH (Table 2.1), AMH will receive a Level 2 license from DOH within 2009, and further enhance itself toward a Level 3 hospital by 2011, the year of the project completion. In terms of improvement as a teaching hospital for UPM-SHS, AMH also aims to meet various material/ human/ organizational requirements that support regular midwifery/ basic nursing courses.

Table 2.1 Position of AMH Project in the Time Frame of the Aurora PIPH

DOH Classification	**Level 1**	**Level 2**	**Planned AMH**	**Level 3**
Target Year	**Current**	**In 2009**	**In 2011 (Mid-term Goal)**	**In 2013 (Long-term Goal)**
Service Capability	Emergency hospital to provide initial clinical care & primary care	Non-departmentalized hospital to provide general clinical care	Same as Level 2, but provide specialty clinical care in some areas	Departmentalized hospital to provide general and specialty clinical care
Bed Strength	25	25	50	100
Nursing Service	Minimal category of care for 24 hours or longer	Intermediate & moderate care for 24 hours or longer	Moderate & partial category of highly supervised care	Total 6 intensive skilled care in addition to Level 2 care
Teaching Hospital Function	Midwifery (Temporary*)	Midwifery (Temporary*)	Midwifery (Regular) & BS Nursing (Basic courses only)	Midwifery (Regular) & BS Nursing (Regular)

Note: * CHED Memorandum Order (CMO) No.54 in 1997 stipulates that the midwifery school should be affiliated with a general hospital with 50-bed capacity which provides maternal, pediatrics and medical surgical care.

In light of the above, the long-term goal (Overall Goal) and current mid-term goal (Project Purpose) of the Project can be summarized as shown below (Table 2.2), concerning two basic roles which AMH should serve – that is, provision of medical services and serving as a teaching hospital for UPM-SHS.

Table 2.2 Summary of Overall Goal and Project Purpose

	Medical Service	**Teaching Hospital Function**
Overall Goal	Every Auroran receives quality hospital care and services.	AMH functions as the teaching hospital eligible to the BS Nursing and the Midwifery education of UPM-SHS Baler.
Project Purpose	Service capability of AMH is upgraded to Level 2 and is appropriately improved in quality and quantity.	AMH functions as the teaching hospital eligible to the Midwifery education and the basic courses of BS Nursing education of UPM-SHS Baler.

2-1-2 Outline of the Project

To achieve the above goals, the Project plans to relocate AMH to a site adjacent to the construction site of UPM-SHS Baler, transform AMH into a hospital capable of providing medical services of Level 2 or above, and implement sound hospital management by appropriately revising its financial planning. Through these activities, the new AMH is expected to provide medical services as a top referral hospital for the province and to permanently function as a teaching hospital for UPM-SHS Baler. In this process, the Project aims to build a new AMH of Level 2 with a 50-bed capacity and to procure equipment necessary for the facilities so as it to achieve the mid-term goal.

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

This grant aid aims directly to contribute to a great extent to enhancement of the medical referral system and improvement of the medical services in Aurora, and, indirectly to the training of medical professionals in six neighboring provinces including Aurora Province as a teaching hospital for UPM-SHS. In order to contribute to these purposes, the design of facilities and equipment has been drawn up in accordance with the following policies.

(1) Basic Policy

1) Defining Scope and Size of the Assistance

Scope and size of the assistance were defined in accordance with the following basic policies:

① As for medical service functionality, the new AMH should be able to provide Level-2 medical services by specialist doctors in each of the Internal Medicine, Surgery, Obstetrics and Gynecology, Pediatrics, and EENT Departments.

② Based on the current demand of outpatients and inpatients, the capacity of the new AMH is set at 50 beds with an extra capacity to expand to 100 beds.

③ Since AMH is the only hospital in Aurora Province that can perform surgical procedures, the surgical department will be especially fortified and upgraded in order to reduce the number of patients transferred to other provinces.

④ In general, multistoried hospitals have to be equipped with elevators to transfer patients and materials to different floors. In this plan, however, it is considered inappropriate to install elevators on the grounds that the hospital is located far from the capital and thus it is difficult to take emergency actions if any trouble arises to elevators, and that the maintenance is costly. A slope, which creates excess space and additional burden on medical staff, is also considered inappropriate. Hence, the hospital will be basically one-storied in this plan, while parts of the building for administrative purposes alone will be two-storied.

⑤ For operational and maintenance purposes, facilities of appropriate grade and size shall be selected.

⑥ Since AMH is the top referral hospital of Aurora Province and may serve as the rehabilitation base in case of disasters, the buildings will have sturdy structures.

2) Basic policy for Equipment Selection

Basic policies for equipment planning are as follows;

① Consistency with functions, hospital level and staff/ activity size of the new hospital

In selecting equipment, consistency will be ensured with the medical care services and the expected level which the new hospital will offer. Also, optimal quantity of the equipment will be determined based on the prospect for new staff employment and the estimated capacity of medical care.

② Operation and management without problems after implementation

Since the current provincial and hospital budgets for the hospital operation are not necessarily sufficient, it is necessary to avoid procuring equipment that requires high operation/ maintenance costs.

Also, since there are no medical device agents around Aurora Province, procurement of consumable supplies and repair in the event of failure will be dependent on the support by the agents all the way from the capital Manila. Hence, equipment must be selected from items that do not require high operation/ maintenance costs and whose local agents are located in Manila.

③ Consistency with hospital facilities

Since planned equipment will be installed in the new facilities to be built under the Project, equipment planning will require sufficient information shared with building planners and ensure the consistency with the facility plan. In addition, given that requested equipment includes general X-ray systems and operating lights, both of which necessitate installation works, planning of such equipment requires thorough discussion and confirmation between facility planners to make plans without discrepancies.

④ Effective utilization of existing equipment

Although the large portion of existing equipment in the hospital concerned is decrepit and thus needs to be replaced with new one, it is appropriate to transfer to the new hospital and continue to use some of the equipment recently procured. Planning of equipment shall incorporate analysis of the current status of the existing equipment to offer a reflective and efficient plan.

(2) Policy on Natural and Environmental Conditions

Table 1.1 shows the climate of the Baler City, Aurora, where the construction site is situated. As compared with the capital Manila, the region has substantial rainfall of more than 3,000 millimeters per year with little climatic difference between the rainy season and the dry season. To protect from high temperature and humidity, any rooms without air conditioners require careful layout of the buildings, structural specifications and finish materials that address sunlight and ventilation.

① Prioritize important properties such as waterproof and durability to select materials that allow for easy maintenance and that can maintain material grade

② Eaves will be placed for protection of the buildings from sunlight and rainwater, and effectively utilize natural ventilation for rooms without air-conditioners. The eave protrusion length will be made long enough to protect the exterior walls from soiling by rain and from water leakage.

③ With the average highest temperature of over 30 degrees Celsius, roofs and exterior walls will require heat insulation measures.

(3) Policy on Social and Economic Conditions

Building construction methods common in the Philippines include concrete block masonry and RC rigid frames, apart from wooden frames. The project will, based on such common methods, apply RC rigid frames and concrete blocks for exterior wall with mortar plastering. For air-conditioned rooms, the exterior walls will be a double-wall structure to create air space for heat insulation. As for the roofs, insulating materials will be laid down underneath and slopes will be secured enough to ensure adequate air volume inside the roofs for heat insulation.

(4) Policy on Construction and Procurement Conditions

1) ICC

In the Philippines, if a total project cost exceeds 500 million pesos (approx. 1 billion yen), it is necessary to obtain approval from the Investment Coordination Committee (hereinafter called "ICC"). 'A total project cost' refers to the amount of costs borne by the Japanese side (the amount indicated in the Exchange of Notes) and the Philippine side (Value Added Tax, VAT) and custom fee, land development cost, application fee for Building Permit, relocation cost, etc.) combined.

2) VAT Exemption

Upon commencement of the Project, PGA will wire transfer the amount of VAT claimed by the Japanese contractors to their designated bank accounts. PGA recognizes the necessity of securing the amount of VAT in its budget for the next fiscal year, and has already started to make arrangements to secure the amount in addition to the regular accounting. It is also necessary to notify PGA of the approximate amount of VAT at an early stage.

3) Standards to Apply and Building Permit

The design will refer to local laws/ regulations and guidelines including building codes, structural codes, fire laws and environment laws. Any safety-related matters that are important but not mentioned in local codes will refer to Japanese guidelines and avoid excessiveness.

Any validation or advice concerning compliance with various laws/ regulations and guidelines can be obtained from PGA engineers. Since these engineers are also in charge of applications for Building Permit and other various permits, no particular local license architects will be hired.

4) Local Building Construction

As for construction materials, only sand and gravel can be procured in the Baler area, while all of the other materials need to be brought from the capital Manila. For selection of materials, it is essential that the Project comprehensively address usage purpose, durability, efficiency, etc., and conduct detail planning with full consideration for maintenance of not only primary structures but also finishing and facility equipment. For this reason, the project should procure as many materials capable of local maintenance as possible.

During this study, buildings under construction were seen across the Baler City. According to construction engineers and on-site construction managers, these buildings were handled by contractors from Manila, which is fairly common. Under this plan, the Project will also hire contractors in Manila, but as a subcontractor under Japanese primary contrator. In addition, the labor standards law stipulates that, a project must hire 35% or above of the total workforce from local residents if such resources are locally available. Hence, the Project will be scheduled in consideration with the relatively low construction efficiency resulting from the employment of non-skilled labors and basic skilled labors from Baler. In addition, although instructions from Japanese resident supervisors are necessary, the Project should avoid complicated design with low feasibility, and should adopt a simple plan that ensures

rigidity and workability.

(5) Policy on Utilization of Local Contractors

1) Facility Planning

There are many local contractors in the Philippines and branch offices of several Japanese contractors in Manila. Based on their performance, contractors are categorized by the Philippine Contractors Accreditation Board (PCAB) into six grades in terms of their size ranging from large (AAA) to small firms (Trade). Among local contractors, those classified as large have experiences of the construction project under Japan's grant aid. As in general, the awareness for quality control and safety control in the Philippines are lower than those in Japan, it is necessary to conduct these firms about Japanese-style management practices. In particular, under the circumstances in which Baler, where the construction site is located, is far from Manila with few skilled labors in the area, the Project should dispatch Japanese staff for on-site construction supervision, but make full use of local contractors where necessary.

2) Equipment Planning

Since there are many medical device agents in the Philippines and, in particular, those established by major Japanese and Western manufacturers in Manila, many of the equipment items needed for the Project are locally available. However, local prices of these imported goods are not always lower than prices of those directly purchased from manufacturers. Furthermore, local procurement, of which the purchase price includes VAT, has many potential problems such as long-term financial strains on suppliers until the tax refund, despite the fact that the refund is guaranteed after purchase, as well as necessity for prior budget allocation by the VAT implementation entity for refund. Therefore, in the process of equipment procurement, both prices will be compared for selection of appropriate suppliers. However, it is also important to consider support system of local agents for equipment installation, maintenance and procurement of consumable supplies after delivery. Therefore, the Project will formulate a procurement plan that enables the hospital to receive appropriate support from the agents.

(6) Policy on Operation and Maintenance

1) Facility Planning

Although AMH has one facility maintenance engineer, maintenance is limited due to lack of the engineer's skills. Yet, engineers with expertise are sent by PGA to maintain the facilities when needed.

The Project will formulate a facility plan for operation and maintenance within the scope of technical capacity of the current maintenance personnel, and select facility equipment of low maintenance costs. Also, the plan will address cost saving for operation.

2) Equipment Planning

As mentioned above, many distributors handling overseas products (including Japanese products) are based in the Philippines. Hence, for equipment that requires constant replenishment of supplies or special repair expertise in the event of failure, the Project will employ a plan that thoroughly takes into account procurement of products from the manufacturers which have distributors in the Philippines. Also, in

consideration of the operational budget of the hospital concerned, the Project will select equipment that does not require high operational costs.

(7) Policy on Grade Setting for Facilities and Equipment

1) Facility Planning

Facility grade will be appropriately determined in accordance with the existing hospital to avoid excessive technical and financial strains on future operation and maintenance of AMH. Given that AMH will be the only public hospital capable of performing operations in Aurora and that in time of disaster AMH will become a main restoration site as a top referral hospital for the province, the hospital buildings will adopt a rigid structure.

Regarding the maintenance of the building, the Project will adopt easily repairable, renewable and exchangeable construction materials that are locally available. Likewise, construction methods should avoid applying particular kind of methods but apply ones that are common in local. Electrical and mechanical facilities will also address simplicity and durability in maintenance and operation.

2) Equipment Planning

Given that the target hospital will offer basic medical care as a Level 2 institution, equipment with basic specifications will be selected in accordance with activities of the hospital.

(8) Policy on Construction/ Procurement Methods and Schedule

Because of the heavy rainfall throughout the year, the construction schedule will allocate enough curing time for the base materials when the finishing stage approaches. Since most of the construction materials are transferred from Manila, procurement of materials/ equipment will significantly affect the work schedule. Hence, the Project will check scheduled quantity of materials/ equipment and the stock of remaining items at any given time to avoid delays caused by material shortages.

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

(1) Hospital Functional Plan

1) Direction of the Functional Enhancement for the Hospital

① Medical care function

Under the provincial referral system, the new AMH will provide, as a general hospital, Level 2 medical care by specialist doctors in all fields, and serve as a connection point between Level 1 medical care (provided by provincial RHU and other provincial hospitals) and Level 3 medical care (provided by the national medical center in the neighboring provinces). To this end, the hospital will give priority to the following three medical care functions in its reinforcement process.

- Diagnostic function such as image diagnosis and laboratory clinical examination
- Cardiopulmonary resuscitation for patients with moderate to severe illness in all medical departments: Management of moderate to severe cerebral vascular/ heart/ respiratory/ pediatric

diseases, neonatal care and management of obstetrical and gynecological diseases

- High-demand and urgent basic surgical function: safe implementation of moderate abdominal operations (acute appendicitis, exploratory surgery, caesarean section, hysterectomy, etc.) and pre- and post-operative patient management

② Teaching hospital function

SHS will provide clinical lecturers and materials/ equipment for lectures. AMH will provide clinical cases and facilities (space and equipment) needed for clinical training in Midwifery and Nursing courses.

③ Hospital capacity

The number of beds will increase from the current 25 to 50 in order to accept moderate to severe patients otherwise traveling outside the province and to meet increasing demands for facility delivery.

④ Hospital operation

For efficient hospital operation, the following measures will be taken to address effective resource utilization;

- Active utilization of hospital facilities by private specialist doctors: concluding visiting doctor contracts with private specialist doctors to make up for the doctor shortage and to increase, through specialist doctors, the number of inpatients and checkups/ medical cares.
- Securing of independent funds: establishing a revolving fund independent of the general hospital budget to allow AMH to purchase the necessary amount of supplies and equipment/ materials when necessary. Extending this method, currently implemented only for drugs to purchasing of supplies, for the laboratory and X-ray examination.
- Improvement of a workplace environment: Implementing 5S[1] campaign, which is currently in progress in the provincial government building, also in the hospital to form a safe and sanitary work environment as well as a clean curing environment.

(2) Site/ Facility Layout

1) Site Overview

Situated in Barangay Reserva in the Baler City, the planned construction site consists of two addresses, Lot No. 2608 and 2609, and it has been confirmed that the land currently belongs to PGA. The north of the site, No.2608, will be occupied by UPM-SHS Baler, and the south of the site, Lot No. 2609, will be occupied by the new AMH buildings constructed under the Project without interference in each other's land. The southern site (Lot 2609), where the hospital construction is planned, is currently occupied by facilities of the Philippine Coconut Authority and agricultural development facilities. The facility owners have already been informed of removal of their facilities and relocation of the facility users. It has been determined that the Coconut Authority will move to Dinalungan in the north and the agricultural development facilities to the site formerly used by the Provincial Equipment Office in Baler. The

[1] 5 –S is a term created with an initial letter S of five words: 1) Sort, 2) Straighten, 3) Scrub, 4) Standardize and 5) Sustain. It is used as a management tool to improve a work environment through systematic and continuous execution of these activities within the daily rutine.

relocation schedule will be determined in accordance with the hospital construction schedule to be determined in future.

The site is a 38,384 sqm. flat or nearly flat land with depressions of the eastern part of the building construction site by 60 to 80 centimeters from the front road and the periphery within the site. The Philippine side will fill this lowered area to increase the height up to the level of the surrounding areas.

2) Zoning

The new AMH buildings will be largely divided into four zones; 1) Administration, Emergency & Outpatient Department Zone, 2) Central Medical Care Zone, 3) Ward Zone and 4) Service Zone. With many external accesses, 1) Admin. ER & OPD Zone will be located closest to the front road in the east of the site along with the hospital entrance in the front and easy access to the Emergency Department. On the other hand, for privacy, 3) Ward Zone will be located farthest to avoid intersection between the traffic paths of outpatients and inpatients. 2) Central Medical Care Zone that has Operation rooms and Delivery rooms will be located between the above buildings for easy access from both sides. 4) Service Zone for Maintenance room, Kitchen and Laundry room will be close to the southeastern road instead of the front road for easy access.

3) Uniformity with the UPM-SHS Baler Plan

Since the new AMH will serve as a teaching hospital for UPM-SHS Baler which is to be constructed adjacent to the AMH, the Philippine side expects the unity among the buildings. Hence, the hospital layout will be designed in accordance with the master layout of UPM-SHS's plan to offer uniformity in layout and direction of the buildings. Specifically, as with UPM-SHS, the new hospital allows for a 40 meter setback from the eastern front road (National Road), and faces the front road.

4) Building Direction for Energy Saving

Wards that have rooms without air-conditioners will be located in the east-west direction to avoid direct exposure to sunlight.

5) Layout Allowing for Future Expansion

In accordance with the UPM-SHS's plan to include a doctoral course in its future curriculum, the Philippine side plans to extend the new AMH to a Level 3 hospital with a 100-bed capacity as a teaching hospital available for the course. Hence, the layout for wards, operation rooms and the Emergency Room (ER) and Outpatient Department (OPD) will be designed to allow for future hospital extension.

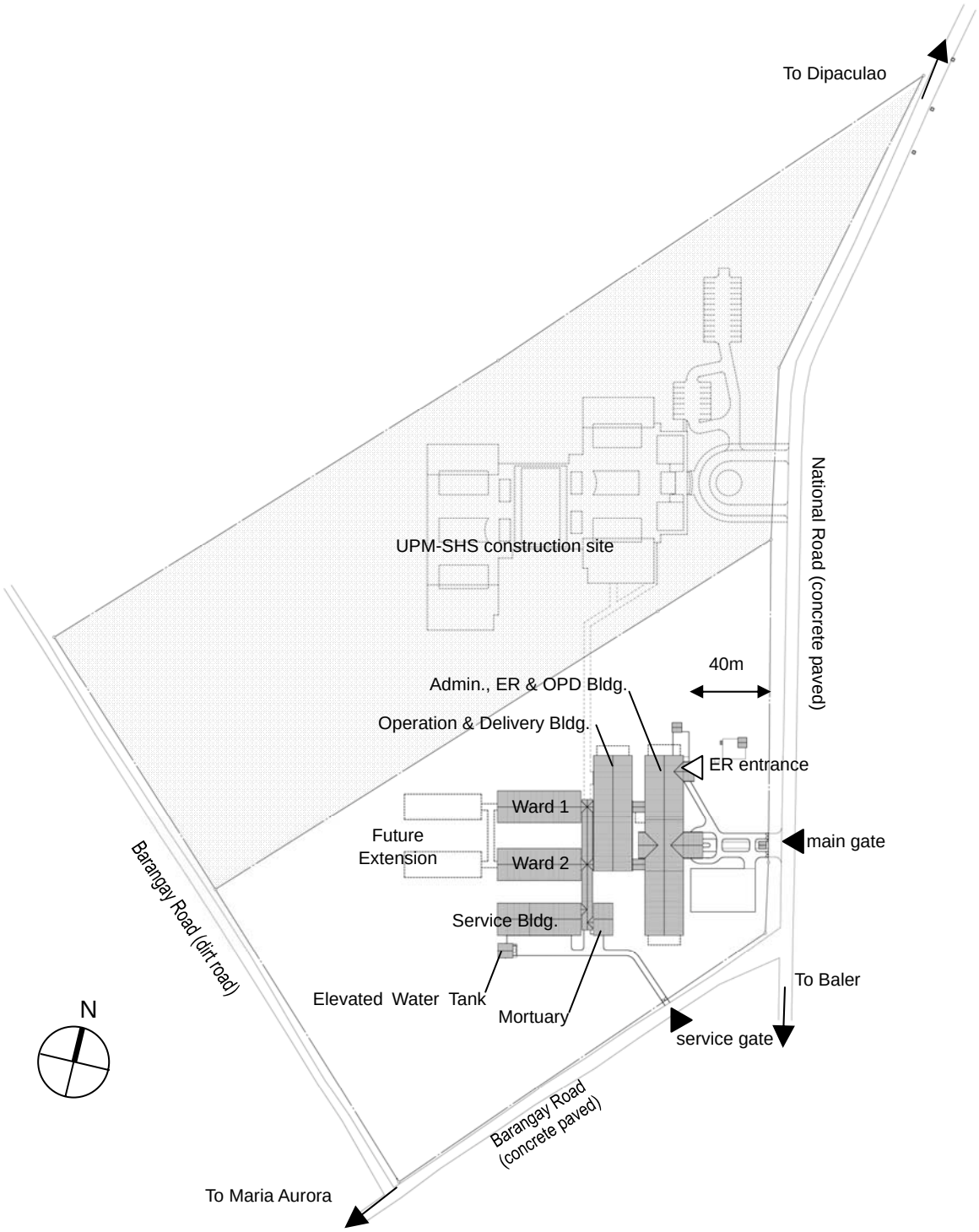


Fig. 2.1 Site Plan of New AMH

(3) Building Plan

1) Floor Plan

① Facility planning by department

As a result of discussion with the Philippine side during the field study, the new AMH will include the following rooms:

a. Administration, ER & OPD Building

[Administration Department]

Lobby (including Information, and Toilet), Social Services Room, Billing Office, Inpatient's Medical Records Storage, Administrative Office, Chief Nurse's Office, Hospital Chief's Office, Conference Room, Storage and Staff Toilet

[Outpatient Department]

OPD Reception, Vital-Check Area, Waiting Area, Equipment Storage, OPD Medical Records Storage, Consultation Room, Medical Care Room, Medical Clinic (Medicine, Pediatrics, Obstetrics and Gynecology, Surgery, and EENT), Dental Clinic and Physical Therapy Room

[Emergency Department]

Family Waiting Room, Nurse Station, Examination and Medical Care Room (3+1 beds, including shower room), Observation Room (2 beds), Stretcher Storage, ER Doctor's Duty Room, Linen Storage and Utility

[Radiology Department]

Reception, Waiting Room, X-ray Room, Control Booth, Dark Room, Film Storage, Ultrasound Room, ECG Room and Radiologist's Duty Room

[Pathology Department]

Reception, Waiting Room, Clinical Laboratory, Specimen Collection Room, and Pathologist's Duty Room

[Pharmacy]

Pharmacy (including drug storage) and Pharmacist's Duty Room

b. Operation & Delivery Building

[Operation Department]

Operation Room (2 rooms), Recovery Room, Receiving Area, Sterilizing Area, Equipment Storage, Operation Hall, Men's/ Women's Locker Room, Nurse Station, Stretcher Storage, Doctor & Nurse's Anteroom, Janitor's Closet, Linen Storage, Utility, Manifold, and Air-Conditioning Machine Room

[Delivery Department]

Delivery Room (two rooms, one of them is a large room), Labor Room (2 beds, including toilet), NICU, Nurse Station (including toilet and bloom closet), Anteroom, and Obs./ Gyn. Doctor's Duty Room

[Central Sterilizing & Supply Department]

Receiving and Delivery Area, Assembly Area, Sterilizing Area, and Storage Area

c. Ward Building

50 beds in total (25 beds/ nursing unit), Nurse Station (2 rooms), Two-bed Room (2 high-care unit (HCU) rooms adjacent to the nursing stations), Four-bed Rooms (8 rooms), Two-bed Rooms (including a toilet, 4 rooms, charged), One-bed Room (including a toilet, 6 rooms, charged), Toilet, Shower Room, Linen Storage, and Utility

d. Service Building

Men's/ Women's Locker Room (including toilets), Staff Dining Room, Kitchen, Nutritionist's Office, Laundry, Food Storage, Maintenance Room, Generator Room, Water Receiving Tank Room, Pump Room, and Central Supply Storage

e. Others

Morgue, Autopsy Room (including dressing room, toilet and shower), Ambulance Driver's Waiting Room, Guard House, and Elevated Water Tank

② Facility capacity estimation

②-1. Estimation of AMH hospitalization needs

【Hospitalization needs in Aurora Province】

a. Estimation method

To assess the hospital capacity of 50 requested beds, it is necessary to grasp hospitalization needs in Aurora Province quantitatively. For hospitalization, residents of Aurora Province choose from public/ private and inner/ outer province hospitals. In other words, any chosen hospital belongs to one of four segments, public/ private and inner/ outer province (Fig. 2.2). The PGM Medical Center in Cabanatuan City, AMH and Premier Hospital in Baler are in Segments A, B and C, respectively. Segment D is comprised of private hospitals outside Aurora. The provincial hospital statistics track the number of patients hospitalized in Segment B, but do not reveal the number of patients hospitalized in private and outer province hospitals. For this reason, other available information, in this case, inpatient data given by PhilHealth will be used to estimate the number of inpatients in Segments A, C and D.

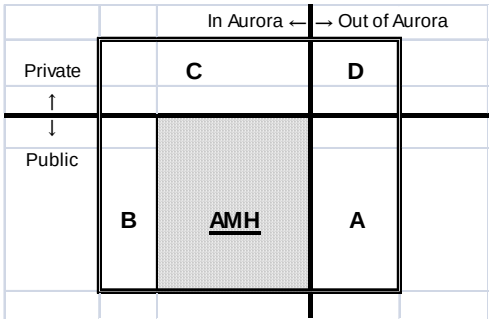


Fig. 2.2 Spatial Segments of AMH Needs

b. Inpatient analysis under the PhilHealth Indigent Family Program.

Based on PhilHealth Aurora's inpatient statistics of 190 members of its Indigent Family Insurance Program, these 190 member patients can be classified by the above four segments as shown in Table 2.3. A total of 123 inpatients in public hospitals in Aurora Province account for 64.7% of the total, and 41 inpatients in public hospitals outside Aurora Province account for 21.6%. A total of 26 inpatients in private inner/ outer province hospitals combined account for 13.7%. Estimation of the total inpatient needs will be based on the component ratio indicated in the right column of the table.

Table 2.3 Hospital Confinement of PhilHealth Sponsored Members

Segment	No. of member patients		Component Ratio（%）	
	In Aurora	Out of Aurora	In Aurora	Out of Aurora
Public Hospitals	123[1)]	41[2)]	64.7%	21.6%
Private Hospitals	19	7	10.0%	3.7%
Total	190		100%	

Note: 1) AMH shares 111 patients among 123. 2) PGM Medical Center shares 26 patients among 41.
Source: Answer to the Questionnaire (original information comes from PhilHealth Aurora)

c. Estimation of the total inpatient needs

According to the statistics provided by Aurora Province, the number of patients hospitalized in public hospitals in Aurora Province in 2008 is 6,337. Since both Maria Aurora and Dingalan are not granted hospital certification by PhilHealth at the moment, it is necessary to exclude them when estimating the number of patients, which uses the component ratio of the PhilHealth patients (Table 2.4).

Table 2.4 Discharged Number from 4 Public Hospitals in Aurora, 2008

Hospital	No. of discharged
AMH	3,960
Maria Aurora (MA) Hospital	1,141
Casiguran (C) Hospital	1,046
Dingalan (D) Hospital	190
Total of 4 hospitals (Of which, total of 2 hospitals except for MA & D)	6,337 (5,006)

Source: Hospital Statistical Report, 2008 of individual hospital

In this case, the number of inpatients in AMH and Casiguran combined is 5,006, which corresponds to Segment B of “Public Hospital-In Aurora” in Fig. 2.2 and accounts for 64.7% of the total as indicated in the right column of Table 2.3. Based on this percentage, the number of patients in the province is estimated at 7,737 (calculated from 5,006 patients/ 0.647, hereafter, a round number 7,740 is used). As a next step, the total 7,737 patients are allocated to Segments A, C and D except Segment B in accordance with their ratio to estimate the number of patients in respective segments (Table 2.5).

It is important to note that the number of 6,337 actual patients in Segment B shown in the statistics (Table 2.5) is different from the number of 5,006 estimated patients by 1,331. To fill this gap, the number 1,331 is added to both Segment B and the total, which become 6,337 patients and 9,071 patients, respectively.

Table 2.5 Estimation of Hospitalization Made with Component Ratio of PhilHealth Members

Segment	Component Ratio（%）		Estimated No. of Hospitalization	
	In Aurora	Out of Aurora	In Aurora	Out of Aurora
Public Hospitals	B: 64.7%	A: 21.6%	B: 5,006 (6,337=5,006+1,331)	A: 1,670
Private Hospitals	C: 10.0%	D: 3.7%	C: 770	D: 360
Total	100.0%		7,740 (9,071=7,740+1,331)	

Note: Figures in ( ) show the total of its segment patients and 1,331 patients of Maria Aurora & Dingalan Hospital.

In summary, Aurora Province had a total of about 9,071 patients as of 2008, with 8,007 patients (88%) in public hospitals and 1,100 patients (12%) in private hospitals. In terms of regional distribution, the overall picture shows that 7,107 patients (78%) remained in the province while 2,030 patients (22%) traveled outside of the province.

【Hospitalization needs in Aurora Province】

a. Estimation method

Hospitalization needs under the AMH services can be categorized into the following three patient groups;

(a) Number of patients hospitalized in AMH

(b) Part of patients currently go to public and private hospitals outside Aurora

(c) Part of obstetrics patients shifting from home delivery practices in Aurora to facility ones

While the above (a) which represents current AMH patients is understood as evident needs, (b) and (c) can be regarded as potential needs. The shift from home delivery practices to facility ones as represented in (c) is promoted by PHO around the country as an administrative measure under DOH, and in recent years the facility delivery rate has increased even in rural areas. Hence, it is essential in terms of health measures that AMH assumes the role of a receiving body for the increasing facility delivery practices to address mid-term medical needs for AMH. For the estimation, the numbers of patients in these three categories will be first estimated, and aggregated to obtain the total.

b. Number of patients hospitalized in AMH (a)

As of 2008, AMH had a total of 3,960 patients.

c. The number of potential patients for AMH out of those hospitalized in public outer province hospitals (b)

Of public hospitals in other provinces, PGM Medical Center in Cabanatuan City has accepted the highest number of patients from Aurora, totaled 828 such inpatients in 2008. Under this study, medical care information, including patient address, age, disease name, and progress, was obtained from the institution's records of 504 inpatients coming from Aurora. Analyzing this information, PHO in Aurora sorted these patients into those treatable under AMH services and those who are difficult to treat. As a result, 90% of the patients were classified as those treatable with the AMH services while only 10% of them were considered difficult to treat (Table 2.6).

Table 2.6 Analysis of Referred Patients to PGM Medical Center from Aurora Province, 2008

Specialty	Total cases (a)	No. of cases judged difficult to treat (b)	Percentage (b/a) (%)
Internal Medicine	133	12	9.0
Surgery	180	38	21.1
Pediatrics	62	2	3.2
Obs./ Gyn.	122	0	0.0
Ophthalmology	7	0	0.0
Total	**504**	**52**	**10.3**

Source: Information from Aurora PHO on the result of analysis of data originated from PGM Medical Center

Since information in the record doesn't provide good understanding of severity of patient symptoms, approximately 20% of treatable cases should be viewed as those that include gray area cases (potentially classified as difficult to treat if more information is available). Hence, with patients of difficulty (10%) and the gray area (20%) excluded, 70% of the patients hospitalized in other hospitals will be estimated as treatable with the AMH services.

d. The number of inpatients increased under the shift from home delivery to facility delivery (c)

Aurora Province had a total of 4,773 births in 2008, and, within three health zones in Aurora, the central zone, where Baler is situated, had 3,099 births, or 65% of the total. Facility delivery using hospitals and RHUs accounts for 24%, or 766 cases of the total 3,099 cases, while home delivery accounts for 76% or 2,333 cases (Table 2.7). PHO aims to increase facility delivery up to 50% as its mid-term goal and 80% as its long-term goal. The estimation uses the mid-term goal of 50%, and suggested that, as shown in "Projection" of Table 2.7, facility delivery practices in the central zone will increase by 814 cases from the current number to a half (50%) of the current 3,099 cases or 1,580 cases. This increase will be allocated to 2 hospitals and 4 RHUs in the central zone with 400 cases or a half of the cases handled by AMH, 200 cases by Maria Aurora Hospital and 50 cases[2] by each RHU. As a result, the number of deliveries in AMH is expected to almost double from the current 371 to 771.

Table 2.7 Mid-Term Projection of Deliveries by Place in Central Aurora

Place	In 2007		Projection		Increase & Decrease	Distribution of increases among facilities	
	No.	%	No.	%		Facility	No.
Health Facility (Hospital・RHU)	766	24%	1,580	50%	+814	AMH Maria Aurora 4 RHUs	400 200 214
Home	2,333	76%	1,570	50%	-763	-	-

Source: Figures in 2007 come from Aurora HIS (FHSIS) Annual Report for the Year 2007, and projections are done based on Aurora PHO suggestions.

e. Accumulation of patient increases and the result

Table 2.8 shows the estimation of the numbers of patients in the above (a), (b) and (c) and the total. As a result, the number of current AMH inpatients as represented in (a) is 3,960, the number of estimated patients for the new AMH out of those who travel to private and outer province hospitals as represented in (b) is 1,100 and the expected increase of obstetrics inpatients (c) is 400, totaling 5,460 current and potential inpatients for the new AMH.

[2] The allocation is projected by PHO.

Table 2.8 Estimation of Total In-patients Needs for AMH

Segmentation of needs	Description	Estimation
(1) No. of discharged patients from AMH (a)	In 2008	**3,960**
(2) No. of Aurorans hospitalized in PGM Medical Center	In 2008	828
(3) No. of Aurorans in (2) except for those from Dingalan	No. of inpatients from Dingaran-130	700
(4) No. of Aurorans hospitalized in public ones other than PGM	Segment-A in Table 2.5: 1,670 – 828	842
(5) No. of Aurorans in (4) except for those from Dingalan	842 – 132 =approx.710	710
(6) Total no. of Aurorans hospitalized in public ones outside Aurora	(3)+(5): 700 ＋710	1,410
(7) No. of potential patients who may go to new AMH among (6)	Assumed to be 70% of (6) from PGM stat.	**990**
(8) No. of Aurorans hospitalized in private ones in and outside Aurora	From Table 2.5, C: 770 + D: 360	1,130
(9) No. of potential patients who may go to new AMH among (8)	Assumed to be about 10%, 110 of (8)	**110**
(10) No. of potential patients for the new AMH (b)	(7) + (9): 990 + 110	1,100
(11) No. of expected increases of deliveries at facilities from home (c)	Estimated from the current number of deliveries at 4 cities of central Aurora	400
(12) Total inpatients needs (Actual and Potential)	(1) + (10) + (11): 3,960+ 1,100 + 400	**5,460**

Note: 1) Number of inpatients for PGM Medical Center in (2) & (3) above comes from the Statistics in 2008, not estimation.
2) Estimated number in (3) & (4) is rounded one with truncating the first digit.
3) Number of patients from Dingalan in (5) is calculated based on the assumption that it accounts for 15.7% (132 inpatients) of the total-842.

②-2. Projection of the number of AMH patients/ medical cares

With a total of 50 beds requested for the new AMH, the number of inpatients under this capacity is 4,760, based on 80% bed utilization and the average 3.1 days[3] of hospitalization (Table 2.9). This covers 87% of the above hospitalization needs or 5,460 patients (5,060 patients for general, 400 patients for obstetrics). Provided that almost the same number of patients will be added to the outpatient and emergency patient figures, the number of these patients combined will increase by 5% from the 2008 level to 16,700 patients (13,500 outpatients and 3,200 emergency patients).

[3] The average length of hospitalization in AMH,1.95days, is approximately 1 day shorter than 2.93 days of Maria Aurora and 2-3 days shorter than the length of 3 hospitals in other provinces.

Table 2.9 Projection of Number of Patients and Medical Cares at New AMH

Clinical Service	Beds Distribution	BOR (%)	Bed Days	ALOS(day)	Admission
Medicine	24	80	7,008	3.6	1,947
Surgery	6	80	1,752	3.5	500
Obs./ Gyn.	8	80	2,336	2.2	1,062
Pediatrics	12	80	3,504	2.8	1,251
Total	**50**	**80**	14,600	**3.1**	4,760

Indicator	Target	Remarks	Actual in 2008
1. Admissions	4,760	Expected to increase 801 (by 20.2%) from 2008	3,959
1.1 ALOS	3.1	See upper part of the table.	1.95
1.2 Bed Days	14,600	See upper part of the table.	7,689
1.3 BOR	80.0%	80% is regarded as a satisfactory level of utilization.	84.3%
2. Total OPD Visits	13,500*	Expected to increase by 5% from 2008	12,845
3. ER Visits	3,200	Expected to increase by 5% from 2008	3,074

Note: PHIC patients are assumed to account for 26% of the total, which is as same as the current share. 2,000 dental visits is assumed to be included in13,500 of the total OPD visits in consideration of its stable trends around 2,000 visits in these years.

Major Items of Exams & Treatments	In-patient	Out & ER patient	Total
1. Admission	4,760		-
Of which, Surgery	501	-	-
Of which Obstetrics (90%) [1)]	960	-	-
2. Bed days or Out- & ER patients	14,600	16,700	
3. X-ray examination	1,140	1,420	**2,560**
4. Surgical Operation			
4.1 Major（excluding C/S cases） [2)]	Planned-100	Emergency-50	**150**
4.2 C/S cases	120	-	**120**
4.3 Minor	220	100	**320**
5. Delivery	780 [3)]	-	**780**
6. Ultra Sound examination	310	770	**1,080**
7. Laboratory tests	16,020	6,850	**22,870**
8. ECG examination	400	320	**720**
9. Blood Bank（bags used for transfusion）	125	30	**155**
10. Physiotherapy cases	150	870	**1,020**
11. Pharmacy（Prescription）	8,440	3,420	**11,860**

Note: 1) Assumed that Obstetric patients account for 90% and Gynecology 10% of total Obs./ Gyn. patients in reference to statistics of the hospital.
2) 2 plannned surgeries and 1 emergency surgery in a week are assumed in consideration of surgeons work schedule.
3) Number of delivery at AMH is assumed to increase by 400 due to expectation of total increase of facility deliveries in Aurora province. Base of this expectation is explained in Table 2.7.

②-3. Study on the facility capacity

a. Ward (study on the number of beds)

Covering 87% of the estimated hospitalization needs in the central zone of Aurora as stated above, the capacity of 50 beds considered valid. Hence, under the Project, the hospital will meet the requested capacity of 50 beds.

b. Outpatient Department (Study on the number of consultation rooms)

・General outpatient consultation and medical care rooms (Currently 3 consultation cubicles, 1 medical care room and 1 room for dental clinic room)

Table 2.10 Estimation of OPD Consultation/ Medical Care Rooms

Estimated outpatients	A	From Table 2.9 (excluding 2,000 dental patients)	11,500 patients
Consultation hours	B	Weekdays: 8:00~12:00, 13:00~16:00（7hours） Saturday: 8:00~12:00（4 hours） Sunday/ holiday (12 days): Closed	
Annual consultation hours	C	7 hours x(365-52.12) days +4 hours x52days=	1,951 hours
No. of patients per hour	D	A÷C=	5.89 patients/ hour
No. of medical care cases	E	Average length of consultation 25 minutes (including preparation and cleaning)	2.4 patients/ hour and room
No. of rooms needed	F	D÷E=	2.5→3 rooms

4 rooms that consist of 3 consultation rooms and 1 medical care room, as well as 1 dental consultation room will be planned.

・Consultation rooms for visiting doctors (Currently: none)

Since visiting doctors will run their services independently, a consultation room must be planned for each of their specialties. Hence, a total of 5 rooms will be planned for Internal medicine, Surgery, Obstetrics and Gynecology, Pediatrics and EENT. For Obstetrics and Gynecology, the room will have space for two rooms to offer inquiry and examination.

c. Emergency Department (Study on the number of examination beds and observation rooms)

・Examination/ medical care rooms (Currently: 3 examination beds)

Table 2.11 The Number of Emergency Patients per Day

Emergency patients delivered	A	In 2008	3,074 patients
Estimated emergency patients	B	From Table 2.9	3,200 patients
Estimated minor emergency operations	C	From Table 2.9	100 operations
No. of emergency patients/ day	D	B÷365=	8.8 patients/ day

Currently, only 3 examination beds are placed in the emergency room. Under the plan, 1 treatment bed will be added to allow for minor emergency operations.

・Observation room (Currently: none)

Patients needed for temporary hospitalization in the observation room are those with respiratory diseases, diarrhea diseases and injured from accidents including traffic accidents. Hospitalized patients are likely to be brought in the hospital at night and discharged on the following day, or brought in the morning and discharged on the same day. Given that the current AMH does not have an observation room and uses examination beds for temporary hospitalization after examination/ medical care, the

new AMH will have a dedicated observation room.

d. Operation Department (Study on operation rooms, stretchers in Recovery Room)

・Operation room (Currently 2 rooms, used for emergency operations only)

Table 2.12 Estimation of Operation Rooms

Major operations	A	From Table 2.9	150 cases
Cesarean Section	B	From Table 2.9	120 cases
Estimated minor operations	C	From Table 2.9	220 cases
Total operations	D	A+B+C=	490 cases
Estimated no. of days for operation/ year	E	Performed by visiting doctors 2 days/ week 52x2=	104 days
No. of operations/ day	F	D÷E=	4.8 operations/ day
Average operation length	G	Including preparation and cleaning	120 minutes
No. of operations/ room	H	6 hour room usage ÷G=	3 operations/ day and room
Rooms needed	I	F÷H=	1.6→2 rooms

Although only one room is needed from 4 day-per-week operations by visiting doctors, given the necessity of sterilization and cleaning after operations of infected patients, performing 3 operations in 1 room is considered difficult. Hence, 2 rooms will be provided.

・Recovery room (Currently: 2 stretchers)

A recovery room is used by patients who need to stay after their operations until they awake from anesthesia. Provided that only major operations require postoperative care and that the number of operations will take place 1.44 operations/ day from the above estimation A÷E, the recovery room will have the same number of stretchers as the current number.

e. Obstetrics Department (Study on the number of obstetrics rooms)

・Obstetrics rooms (Currently: 2 rooms)

Table 2.13 No. of Deliveries per Day

Estimated deliveries	A	From Table 2.9	780 deliveries
No. of deliveries/ day	B	A÷365=	2.14 deliveries/ day

To address delivery characteristics (many of them take place at dawn and highly duplicative), the new AMH will have the same number of delivery rooms as the current number. Large space will be allocated to one of the rooms for delivery training of UPM-SHS.

③ Floor plan

[Administration, ER & OPD Building]

a. Emergency Department

- In addition to examination beds, a treatment bed will be placed with an operating light attached to the ceiling to be used for minor emergency operations in order to enhance the hospital's emergency function.
- ER Examination & Medical Care Room, Nurse Station and Observation Room will be designed to be an integrated space to improve efficiency of medical activities.
- Shower Room and Stretcher Storage will be created near the stretcher entrance to prevent contamination in the ER.
- The layout should allow for easy access to the Operation Department, Pathology Department and Radiology Department.
- Doctor's Duty Room will be created for around-the-clock operation.
- The layout should allow for future extension in the north direction.

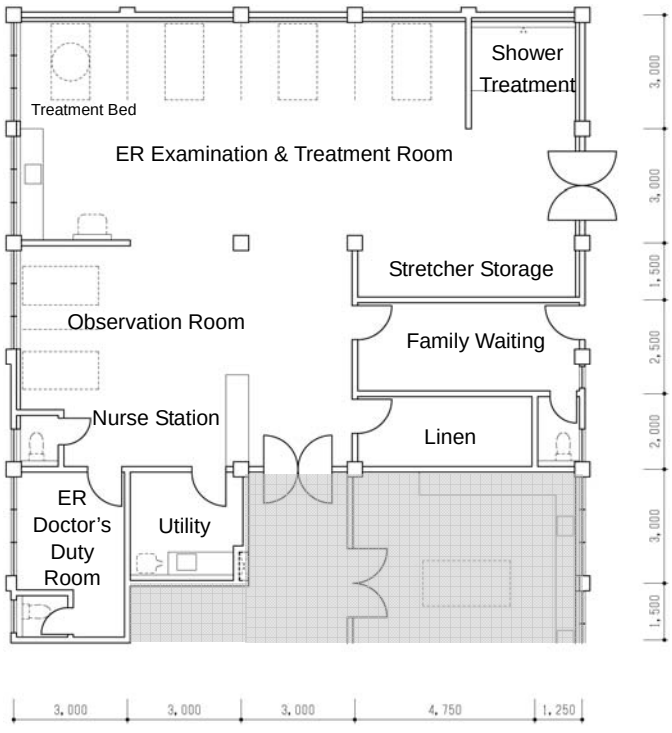


Fig. 2.3 Emergency Department Plan 1/200

b. Pathology Department/ Radiology Department

- Pathology Department and Radiology Department will secure a wide corridor for waiting space.
- X-ray room shall have a 4.5 m x 6.0 m space with Control Booth and Dark Room next to the room.
- Laboratory and Sample Collection Room will be created next to each other.
- Laboratory will have work tables and sinks against the wall and an island table in the center.
- Inside Sample Collection Room, a toilet along with pass box will be created to allow patients to directly submit a sample to Laboratory.

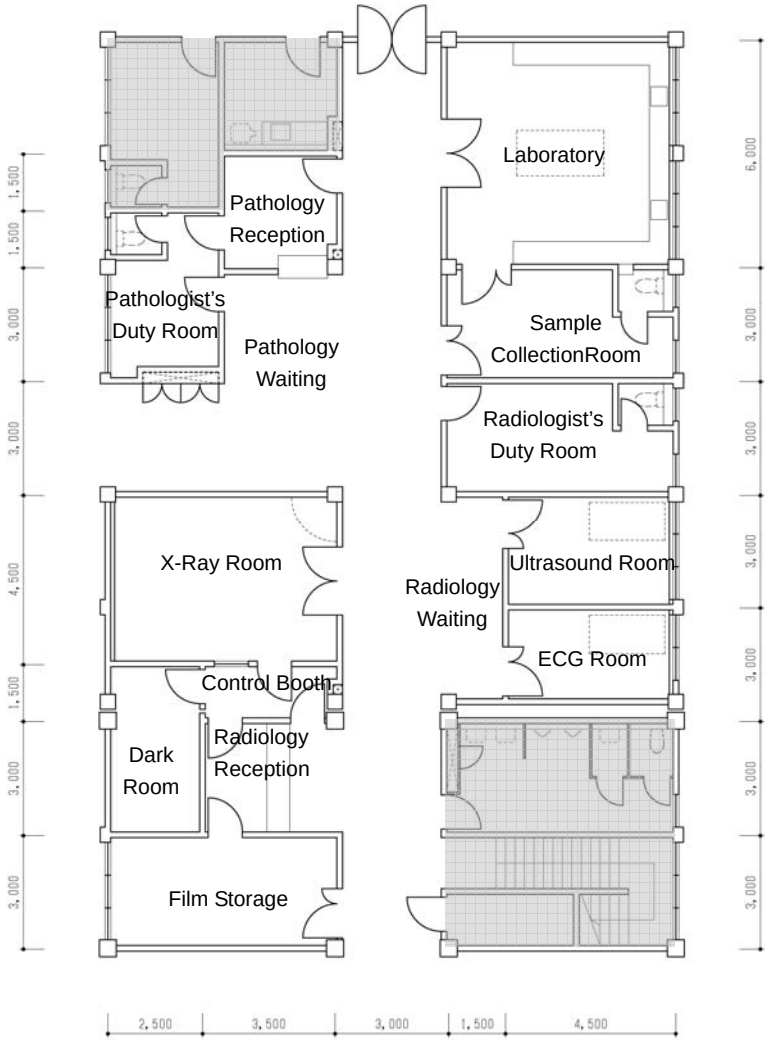


Fig. 2.4 Pathology & Radiology Department Plan 1/200

c. Outpatient Department

- Apart from General Consultation Rooms, consultation rooms for visiting doctors will be created for each specialty.
- OPD Reception will have an area dedicated to patients' vital check, which measures temperature, blood pressure, weight, etc.
- The Pathology Department, Radiology Department and Pharmacy will be created in one building to realize complete outpatient care within the same building.
- Each of Consultation Rooms will have work space at the back, and will allow for direct access to Equipment Storage.
- Inside the work space, a work table and a sink will be installed against the wall.
- To maintain operational independence, a full private room will be allocated to each of the consultation rooms of different specialties.
- A dark room will be created inside EENT Clinic for examination with a slit lamp.
- Obstetrics and Gynecology Clinic will secure twice the space of other clinics to have separate areas for inquiry and examination.
- In front of the consultation rooms, a wide corridor will be created for waiting space.
- The layout should allow for future extension in the south direction.

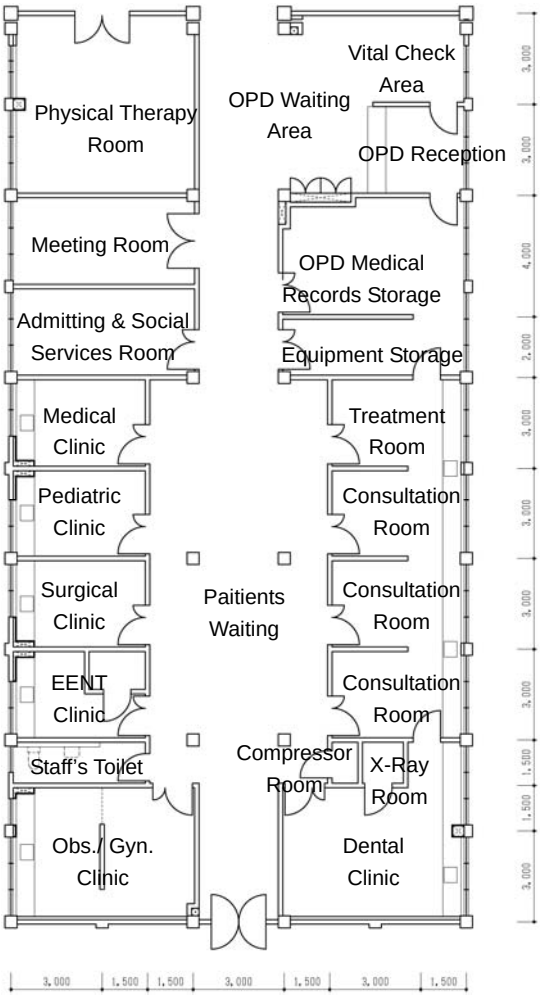


Fig. 2.5 Outpatient Department Plan 1/250

【Operation & Delivery Building】

d. Operation Department

- In consideration of events where a planned operation and an emergency operation may take place at the same time, and where an operation room needs to be shut down for 24-hour sterilization after an operation of an infected patient, the new AMH will have two operation rooms. Also, finishing of these rooms will be dust-proofed and designed for easy cleaning.
- The Operation Department will be divided into Clean Area and Sub-Clean Area to allow for outside access to the department through the staff locker rooms.
- Sub-Sterilizing Area will be created inside Clean Area to prevent intersection between the traffic paths of equipment and general patients and families.
- Recovery Room and Nurse Station will be created in Sub-Clean Area to enhance the hospital's operation function including postoperative care.

Fig. 2.6 Operation Department Plan 1/200

e. Delivery Department

- The department will have 2 Delivery Rooms with Anteroom in between.
- Labor Room will be created next to Delivery Room with a door placed in between to allow for direct access to Delivery Room.
- Delivery Room will basically have a 3.0 m x 6.0 m space. One of the two rooms will secure a bigger 6.0 m x 6.0 m space for midwifery training.
- Delivery Room will have a work table, a sink and a waste disposal against the wall.
- Anteroom will have a work table against the wall and a baby bath, as well as a hand wash, near the door.
- NICU and Nurse Station will be created next to each other with a glass observation window in between.

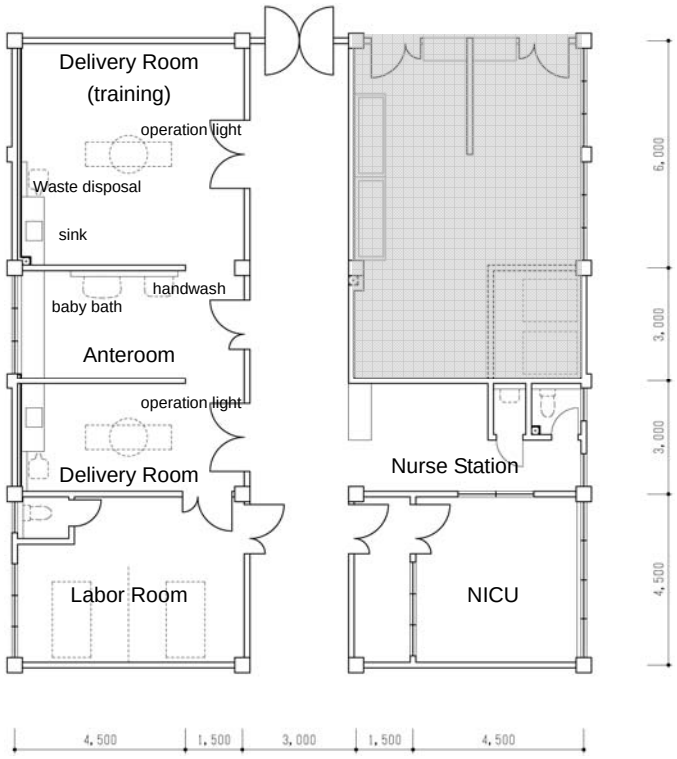


Fig. 2.7 Delivery Department Plan 1/200

【Ward Building】

f. Ward Building

- 25 beds will be grouped under one nursing unit, and 2 twenty five-bed buildings will stand in parallel.
- Based on estimation using examples of other hospitals, 1) 24 beds will be allocated to Internal Medicine, 2) 6 beds to Surgery, 3) 8 beds to Obstetrics & Gynecology and 4) 12 beds to Pediatrics (See Table 2.9).
- According to the Philippine standards, a patient room will have a maximum of 4 beds.
- A general patient room is a four-bed room separated by curtains for minimum privacy.
- Chargeable patient rooms equipped with a toilet will be created at the maximum (35%) specified by the Philippine standards to allocate this revenue to part of the hospital operation. Room rates will vary by room type: one/ two-bed room and with/ without air-conditioning.
- Two High Care Units with a glass observation window will be created next to Nurse Station. Also, oxygen medical gas outlets will be installed.
- Nurse Station will be located near the building entrance to manage visitors.
- Day Room will be created to serve as meeting space between patients and their families as well as to secure space for stretcher/ wheelchair storage.

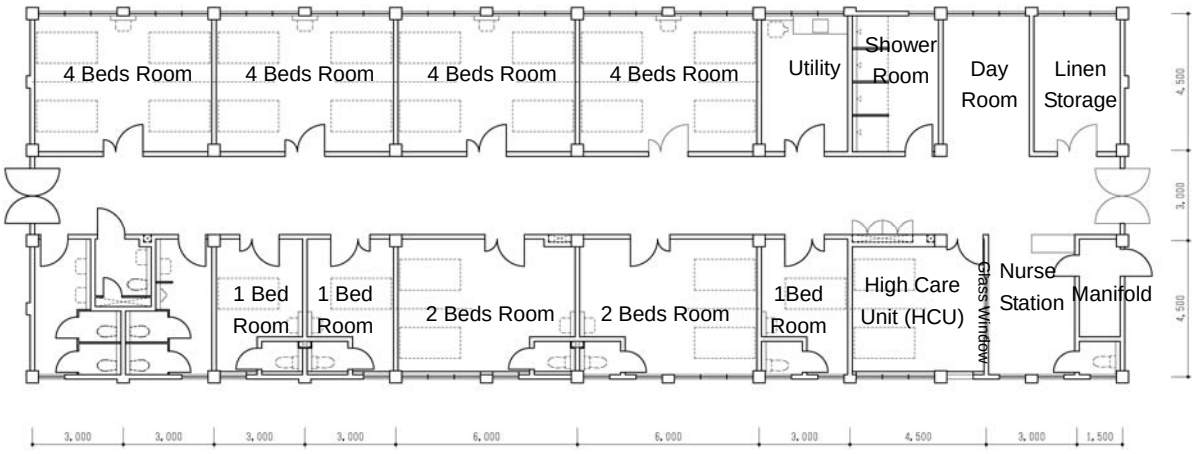


Fig. 2.8 Ward Department Plan 1/250

④ Floor size table

Table 2.14 Floor Area of Each Building

Building	Department	Room	No. of Rooms	Area per Room (m^2)	Total Area (m^2)
Administration, ER & OPD Building	Administrative Department	Entrance Hall	1	94.50	94.50
		Information Counter	1	4.00	4.00
		Storage (1st Floor)	1	4.00	4.00
		Billing/ Cashier	1	33.75	33.75
		Administrative Office	1	33.75	33.75
		Inpatient's Medical Records Storage	1	33.75	33.75
		Hospital Chief's Office	1	20.25	20.25
		Chief Nurse's Office	1	19.50	19.50
		Conference Room	1	33.75	33.75
		Storage (2nd Floor)	1	18.00	18.00
	Emergency Department	Family Waiting Room	1	15.00	15.00
		Nurse Station/ Observation Room	1	54.00	54.00
		ER Examination & Treatment Room	1	84.00	84.00
		Shower Treatment Area	1	6.00	6.00
		Stretcher Storage	1	9.00	9.00
		ER Doctor's Duty Room	1	13.50	13.50
		Utility	1	9.00	9.00
		Linen Storage	1	9.50	9.50
	Outpatient Department	OPD Waiting/ Vital Check Area	1	27.00	27.00
		OPD Reception	1	9.00	9.00
		OPD Medical Records Storage	1	24.00	24.00
		Meeting Room	1	18.00	18.00
		Admitting & Social Services Room	1	18.00	18.00
		Physical Therapy Room	1	36.00	36.00
		Patient's Waiting Area	1	72.00	72.00
		Consultation Room	3	13.50	40.50
		Treatment Room	1	13.50	13.50
		Dental Clinic	1	31.50	31.50
		Medical Clinic	1	13.50	13.50
		Pediatric Clinic	1	13.50	13.50
		Obstetrics/ Gynecology Clinic	1	27.00	27.00
		Surgical Clinic	1	13.50	13.50
		EENT Clinic	1	13.50	13.50
		Equipment Storage	1	12.00	12.00
	Pathology Department	Laboratory	1	36.00	36.00
		Sample Collection Room	1	18.00	18.00
		Pathologist's Duty Room	1	13.50	13.50
		Pathology Reception	1	9.00	9.00
	Radiology Department	X-Ray Room	1	27.00	27.00
		Control Booth	1	5.25	5.25
		Dark Room	1	11.25	11.25
		Film Storage	1	18.00	18.00
		Ultrasound Room	1	13.50	13.50
		ECG Room	1	13.50	13.50
		Radiologist's Duty Room	1	18.00	18.00
		Radiology Reception	1	7.50	7.50
	Pharmacy	Pharmacy	1	33.75	33.75
		Pharmacist's Duty Room	1	18.00	18.00
	Others	Toilets, Corridors, etc.			383.00
				Total	1,503.00

Building	Department	Room	No. of Rooms	Area per Room (m^2)	Total Area (m^2)
Operation & Delivery Building	Operation Department	Operation Theater	2	36.00	72.00
		Recovery Room	1	16.00	16.00
		Equipment Storage	1	9.00	9.00
		Sub-Sterilizing Area	1	9.00	9.00
		Clean-up Area	1	9.00	9.00
		Operation Hall	1	48.00	48.00
		Locker Room	2	15.00	30.00
		Nurse Station	1	15.00	15.00
		Doctor & Nurse's Anteroom	1	15.00	15.00
		Stretcher Storage	1	7.50	7.50
		Utility	1	8.00	8.00
		Linen Storage	1	7.50	7.50
	Delivery Department	Delivery Room (with training area)	1	36.00	36.00
		Delivery Room	1	18.00	18.00
		Anteroom	1	18.00	18.00
		Labor Room	1	27.00	27.00
		Nurse Station	1	18.00	18.00
		NICU	1	20.25	20.25
		Obs./ Gyn. Doctor's Duty Room	1	13.50	13.50
	CSSR	Central Sterilizing & Supply Room	1	54.00	54.00
	Others	Men's Locker Room	1	30.00	30.00
		Women's Locker Room	1	45.00	45.00
		Machine Room	1	18.00	18.00
		Manifold	1	15.00	15.00
		Toilet, Corridors, etc.			206.25
				Total	765.00
Ward Building	Ward Department	4 Beds Room	8	27.00	216.00
		2 Beds Room	4	27.00	108.00
		1 Bed Room	6	13.50	81.00
		High Care Unit (HCU)	2	20.25	40.50
		Nurse Station	2	13.50	27.00
		Utility	2	13.50	27.00
		Linen Storage	2	13.50	27.00
		Day Room	2	13.50	27.00
	Others	Shower Room	2	13.50	27.00
		Manifold	2	5.25	10.50
		Toilets, Corridors, etc.			273.00
				Total	864.00
Service Building	Service Department	Laundry	1	24.00	24.00
		Maintenance Room	1	36.00	36.00
		Staff Dining Room	1	40.50	40.50
		Kitchen	1	33.75	33.75
		Nutritionist's Office	1	9.00	9.00
		Central Supply Storage	1	30.00	30.00
		Food Storage	1	18.00	18.00
	Others	Men's Locker	1	8.80	8.80
		Women's Locker	1	8.80	8.80
		Generator Room	1	18.00	18.00
		Electricity Room	1	30.00	30.00
		Water Receiving Tank Room	1	72.00	72.00
		Pump Room	1	18.00	18.00
		Toilets, Corridors, etc.			85.15
				Total	432.00

Building	Department	Room	No. of Rooms	Area per Room (m^2)	Total Area (m^2)
Mortuary Building	Mortuary Department	Morgue	1	18.00	18.00
		Locker Room	1	18.00	18.00
		Autopsy Room	1	21.00	21.00
	Others	Toilet, Corridor, etc.			15.00
				Total	72.00
Ancillary	Common	Corridor (indoor)			54.00
		Corridor (outdoor)			233.25
	Ancillary Buildings	Guard House	1	4.00	4.00
		Ambulance Driver's Waiting Room	1	9.00	9.00
		Septic Tank Machine Room	1	8.35	8.35
		Elevated Water Tank	1	25.00	25.00
				Total	333.60
				Grand Total	**3,969.60**

2) Sectional Plan

- All of the departments utilized by patients will be created on the first floor to address (barrier-free) universal design. Hospital Chief's Office, Conference Room, Administrative Office and some of the offices used by medical staff will be created on the second floor to avoid intersection between the traffic paths of patients and the hospital staff.
- To prevent flood during a heavy rain, the floor of the first floor will be elevated 300 millimeters above the ground surface. Hence, the hospital entrance will have a slope, instead of steps, to allow for access by wheelchairs, stretchers and goods to deliver.
- Large eaves will be placed for indoor protection from direct sunlight and for wall protection from rainwater
- For rooms without air-conditioners, louvers will be attached above the windows to secure ventilation.
- As a locally conventional and standard method, Corrugated Galvanized Iron (CGI) Sheet slope roofing will be adopted. In addition, in order not to create unnecessarily large air volume in the roof space, 1) the front direction will be made short and 2) gable wall roofing will be adopted. At the same time, the pitch of the roof will be made at 3/10 to improve water shut out performance.
- Heat insulation materials will be attached to the back of the folded plate, and louvers will be placed on the gable walls to prevent temperature increase in the roof space, realizing a stable room temperature throughout the year.
- An open corridor will be used for each of the connections between the buildings to secure natural ventilation and sunlight. However, two corridors connecting the Administration, ER & OPD Building and the Operation and Delivery Building will have walls to protect a patient transferred on a stretcher from wind and rain.
- Ceiling heights of rooms will be designed at 3.0 meters in height for installation of operating lights and at 2.8 meters for installation of ceiling fans.
- Efforts will be made to secure the quality of construction and to minimize the costs by applying general central corridor section to each building, and by making thorough use of standard models of building structures, construction methods and practices.

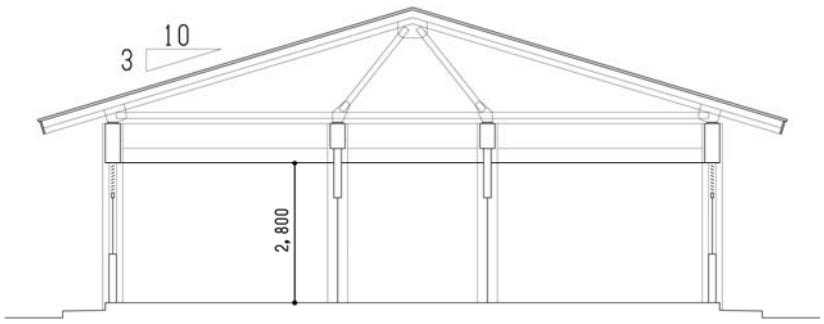


Fig. 2.9 General Section 1/150

3) Structural Plan

① Structural plan requirements

- Earthquake: the Philippines is located in the circum-pacific seismic zone. According to the National Structural Code for Building (NSCB), the Luzon Islands including Baler is in Zone IV with a seismic coefficient of 0.4. Yet there has been no report on earthquake damage in Baler in recent years.
- Typhoon: every year, several typhoons occurring off the eastern Pacific coast of Aurora Province come on shore. They bring more rain damage than wind damage, occasionally flooding the Saklayin River, which runs through Baler. In 2004, the city was affected by above-floor flooding. There has been no flood damage in the construction area situated approximately six kilometers from the Baler City. According to the NSCB wind pressure map, Baler, which faces the Pacific Ocean, is in Zone I with a basic wind speed of 200KPH and a wind pressure of 2,000Pa.

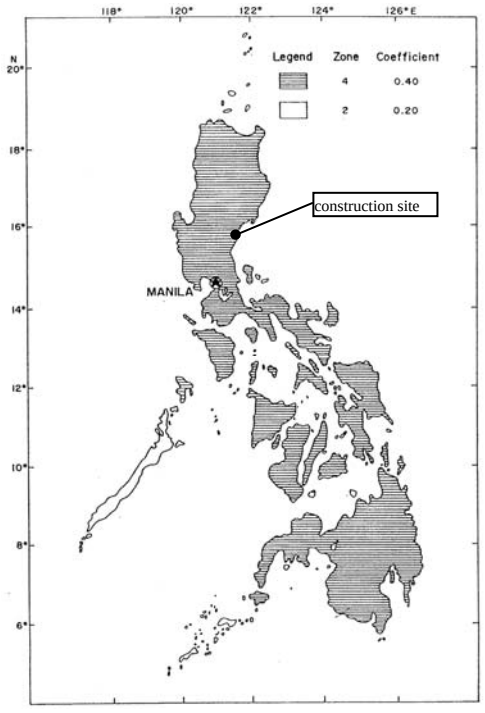


Fig. 2.10 Seismic Zone Map

Zone	I	II	III
Basic Wind Speed (km/h)	200	175	150
Wind Pressure (Pa)	2,000	1,500	1,000

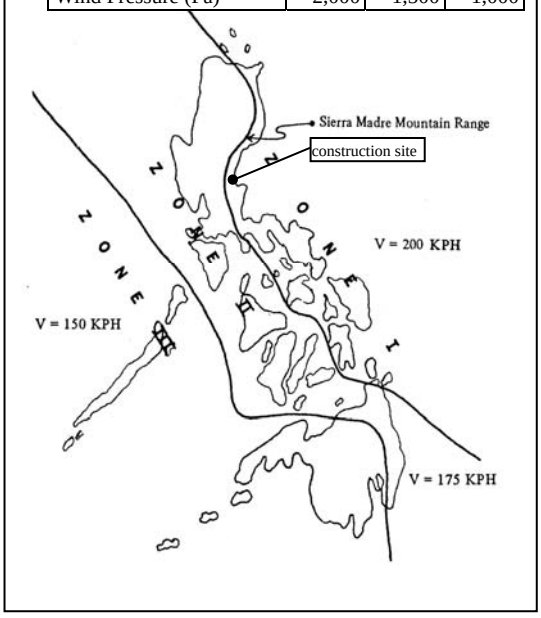


Fig. 2.11 Wind Pressure Zone Map

- Tsunami: there is one report of significant damage caused by tsunami in the Baler City in 1735, but, no damage has been reported since then.
- Ground condition: as a result of a boring survey conducted at four locations in the area, soil at every location is covered with a 1.0 meter thickness of sandy clay or clayey sand (in any case, the N value is around 10), under which a silt layer with fine sand or a fine sand layer runs five meters deep. Under these layers, a rigid silt sand layer with an N value of 50 is formed.
- Since the construction site is 70 centimeters lower in elevation than the neighboring roads, soil will be filled to close the gap.

② Structural Plan

- The structural plan will apply NSCB, and will also take into account guidelines specified by the Architectural Institution of Japan.
- Building structures will employ reinforced concrete, a standard structural type in the Philippines. RC rigid frames will be primarily used for columns and beams, and concrete blocks will be used for walls.
- The roof structure will employ steel members with metal sheeting, which is a standard roof structure locally.
- Expansion joints will be used because the Administration, ER & OPD Building takes a long structure and because of a considerably different rigidity of the building which is comprised of a flat and a two-story structures.

③ Foundation Plan

- The planned buildings consist of RC flat structures (partially two-storied). Under the ground condition, which the area near GL-1.0 meter (1.6 to 1.7 meters after filling) from the soil surface has an N value of 10, a stable clay soil with fine sand under the surface will be used as a support layer for the buildings. Also, in consideration of structural size and type of the buildings, spread footing will be employed for groundwork.
- The foundation will be designed based on the soil bearing capacity assessed by the result of soil property tests, such as a columnar section, embedded depth, etc., and further safety confirmation will take place after commencement of the building construction.

④ Loading Capacity

- The building construction will follow the movable loads listed in the table below:

Table 2.15 Loading Capacity

Usage	Load (Pa)
Hospital Wards and Rooms	2000
Consultation Room, Operation Theater, etc.	3000
Offices	2400
Storage	6000

Source: National Structural Code for Building (NSCB)

⑤ Materials to be used

- Concrete: since there is no ready-mixed concrete plant in Baler, a batcher plant will be set up on site for concrete production. The plant will utilize cement made in the Philippines (brought from Manila) and aggregates extracted near Baler. Its mixture proportioning and tests will be conducted on site to ensure concrete design intensity.
- Reinforcing steel: reinforced steels manufactured in the Philippines will be used. Intensity of the steels will be confirmed with tension tests in Manila prior to the delivery to the construction site.
- Steel frames: Steel frames manufactured in the Philippines will be used for base of roof structuring. On the assumption that the roofs will be kept without maintenance for a long time, basically heavy steel frames (PL of 6 millimeters thick) or materials with higher durability will be used.

4) Mechanical and Electrical Facility Plan

4)-1 Mechanical Facility Plan

① Water supply

- Wells will be built inside the construction site. Based on the standard specifications of wells in the local region, each well is 65A in diameter and 75 meters in depth. For failures and maintenance, two wells will be created.
- Since water is self-flowing, the wells will directly supply water to the receiving tank, in which the accumulated water will be transferred to the elevated water tank through a lifting pump to serve each building by using the gravity.

Table 2.16 Overview of Water Supply

Equipment name	Specifications	Basis of Capacity
Water receiving tank	FRP panels tank Capacity: 42m^3	The amount used per day
Elevated water tank	Stainless integrated tank Capacity: 4m^3	Estimated maximum water supply per hour x 0.5 hours

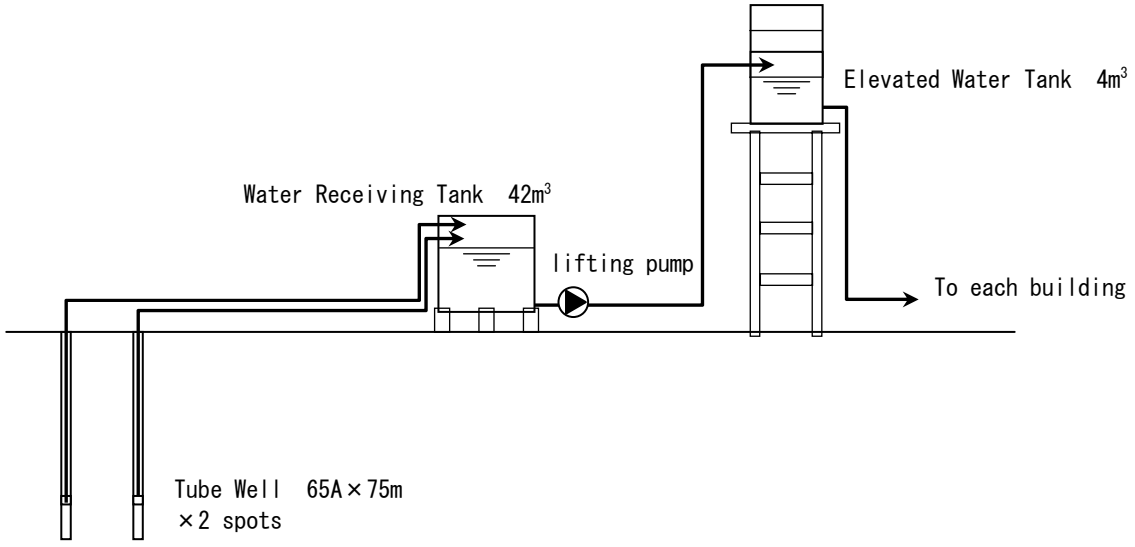


Fig. 2.12 Flow Diagram of Water Supply

② Hot water supply

- For local hot-water supply, electric instant water heaters (about 3.0 kW) will be installed at locations in need.

Table 2.17 Locations for Hot-water supply

Building name	Dept.	Room name	Usage
Admin., ER & OPD Building	Emergency Dept.	Shower Treatment Area	For body shower
Operation & Delivery Building	Delivery Dept.	Delivery Room	For delivery
		Anteroom	For baby bathing
	CSSR Dept.	Cleaning up/ Sterilizing/ Assembly Area	For cleaning of operation instruments
Ward Building	Ward Dept.	Nurse Station	For cleaning of instruments

③ Drainage facility

- Drainage inside the buildings will employ a separate sewage/ miscellaneous drainage system. Sewage water and miscellaneous drainage will meet at the first outdoor drainage collection, and naturally flow down to the septic tank. Drainage in the water receiving tank and the elevated water tank will be discharged into public sewage inside the site through isolated systems. Rainwater will be discharged with spontaneous penetration, and no drainage facility will be established.

④ Sanitary fixture facility

- The common toilet area will have basins, urinals and sinks. The basins shall employ a western-style flush type. In consideration of the local custom, a faucet (wall faucet) will be installed in each cubicle. A toilet for disabled persons will have a basin and a sink for wheelchair access.
- Waste disposals, showers, bath tubs, large wash basins for operations, etc. will be installed where necessary.

Table 2.18 Sanitary Fixture Facility

Room name	Fixture name	Specifications	Attachments
Toilet (common)	Basin	Western-style basin	Flush valve, toilet paper roller, wall faucet
	Urinal	Wall-mount type	Flush valve
Toilet (single rooms)	Basin	Western-style basin	Low tank, toilet paper roller, wall faucet
Toilet	Sink	Wall-mount type, Hand faucet	Toilet mirror
Toilet for the disabled	Basin	Basin for wheelchair access	Flush valve, toilet paper roller, wall faucet
	Sink	Wall-mount type, Manual faucet (lever-type)	Toilet mirror
Shower	Shower faucet	Shower faucet with hose	
Delivery room	Bath tub	Wall-mount type	Wall faucet
Operation Hall	Hand-wash basin	Large hand-wash basin	The faucet is subject to installation of medical equipment.

⑤ Fire-fighting facilities

- In reference to the Japanese laws/ regulations, fire–fighting facilities will include indoor fire hydrants and extinguishers. Also, hydrant outlets will be attached to the water supply systems in accordance with the local fire guidance.

Table 2.19 Fire-fighting Facilities

Equipment name	Specifications	Legal grounds
Indoor fire hydrant	Fire hydrant pump 300L/min Fire water tank 6.5m^3 Indoor fire hydrant Warning range 25m	According to the guidelines of the Japanese Fire Defense Law
Fire water supply	A 65A hydrant outlet attached to a water supply pipe of the elevated water tank.	According to the local fire guidance
Fire extinguisher	Installed every 20 meters of walking distance	According to the guidelines of the Japanese Fire Defense Law

⑥ Gas facility

- A room equipped with propane gas cylinders will be created next to Kitchen Room to supply gas to the kitchen instrument. The cylinders and kitchen instrument will be installed separately.

⑦ Medical gas facility

- For medical gas, only oxygen through a manifold will be supplied to Operation Room as well as Examination and Medical Care Room at the Emergency Department. While High Care Unit of the Ward Building will also have oxygen supply, given the distance between the above manifold and the building, a separate manifold will be installed in the Ward Building.
- Compressed air will be supplied to dental examination tables inside Dental Clinic of the Outpatient Department. The compressor along with a pipe connected to the examination tables will be installed in Machine Room adjacent to the clinic.

Table 2.20 Locations for Medical Gas Supply

Dept.	Room name	Gas type	Outlet type	Quantity
Operation/ Delivery	Operation Room (2 rooms)	Oxygen	1-outlet wall mount	2/ room
	Recovery Room	Oxygen	1-outlet wall mount	2
	Delivery Room (2 rooms)	Oxygen	1-outlet wall mount	1/ room
ER	Examination & Treatment Room	Oxygen	1-outlet wall mount	4
	Nurse Station/ Observation Room	Oxygen	1-outlet wall mount	2
Ward	High Care Unit (2 rooms)	Oxygen	1-outlet wall mount	2/ room
OPD	Dental clinic	Compressed air	Floor mount valve	2

⑧ Septic tank

- Based on the Philippine environmental guidelines, the hospital will have a septic tank. The tank will employ a simple structure with extended aeration system which requires relatively low maintenance. Made of concrete, the tank will employ a semi-underground type to prevent floating and to reduce the construction costs.

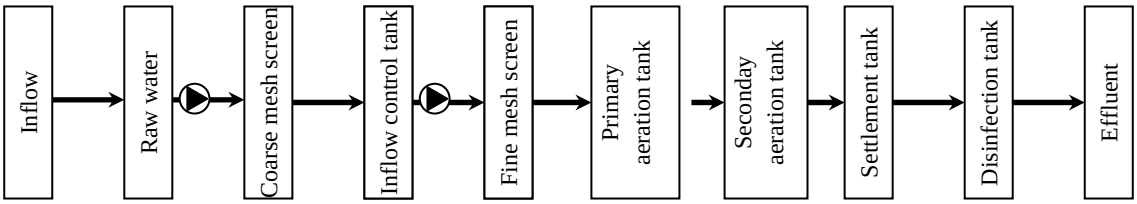


Fig. 2.13 Septic Tank Treatment Process

Table 2.21 Septic Tank Specificications

Category	Specifications
Type	Packaged, Extended aeration
Structure	Concrete, Sub-underground
Capacity	100m3/ day
Effluent quality	BOD 50mg/ L、COD 100mg/ L、SS 70mg/ L

⑨ Air-conditioning facility

- Air-conditioners will be installed in the following rooms. Rooms apart from Operation Room will employ either ceiling cassette or single package wall-mount air-conditioners
- To ensure cleanliness of the room, Operation room will secure positive pressure, and employ a floor-mounted duct air-conditioner for easy maintenance. In consideration of local filter replenishment, the only renewable coarse filters will be used.

Table 2.22 Locations for Air Conditioning Facility Installation

Building name	Dept.	Room name	Air conditioning type
Admin., ER & OPD Building	Admin. Dept.	Billing/ Cashier, Hospital Chief's Office, Chief Nurse's Office, Administrative Office, Conference Room	Ceiling cassette type
	Emergency Dept.	ER Examination & Medical Care Room, Nurse Station, Observation Room	
	OPD Dept.	Conference Room, Medical Clinic, Surgical Clinic, Pediatric Clinic, Obstetrics and Gynecology Clinic, EENT Clinic, Medical Care Room, Dental Clinic, Physical Therapy Room	
	Pharmacy	Pharmacy	
	Pathologist Dept.	Laboratory	
	Radiology Dept.	X-ray Room	
		Control Booth, ECG Room, Ultrasound Room	Wall-mount type
Operation & Delivery Building	Operation Dept.	Operation Room	Floor-mount duct type
		Operation Hall, Recovery Room, Nurse Station	Ceiling cassette type
	Delivery Dept.	Delivery Room, Anteroom	
Ward Building	Ward Dept.	1-bed room	Wall-mount type
		2-bed room, High Care Unit	Ceiling cassette type

⑩ Ventilation facility

- Rooms that are not facing exterior walls, toilets, shower rooms and windowless rooms will have a mechanical ventilation facility. In principle, the facility will be used for Type 3 ventilation, and will be supplemented with ceiling fans for low air volume and blowers for high air volume. Operation Room and Delivery Room will adopt Type 2 ventilation to supply air into the package units, and Central Sterilizing & Supply Room will adopt Type 1 ventilation for the large amount of ventilation. In addition, Kitchen will be equipped with a ventilation hood.
- Rooms without air-conditioners will be equipped with ceiling fans, electric ceiling fans and wall fans.

Table 2.23 Locations for Mechanical Ventilation Facility Installation

Room name	Ventilation type	Remarks
General patient room, Toilet, Waste Disposal Room, Locker Room, Shower Room, Storage, Dark room, Generator room and Compressor room	Type 3 ventilation	Frequency of ventilation depends on the usage of the room.
Operation Room, Delivery Room	Type 2 ventilation	Frequency of ventilation depends on the usage of the room.
Central Sterilizing & Supply Room	Type 1 ventilation	

**Type 1: Mechanical Ventilation for both Supply and Exhaust Air*
**Type 2: Mechanical Ventilation for Supply Air*
**Type 3: Mechanical Ventilation for Exhaust Air*

4)-2 Electrical Facility

① Electric wiring

- A High-voltage 3φ3W13.2kV electric line connected to the distribution line of AURELCO (a power distributor in Aurora) will be installed from the southeastern road to the inside of the building site through aerial wiring. A transformer will be installed inside the site to reduce the voltage of the incoming electricity to 3φ4W 400V-230V, and the line connected to the distribution panel at Electricity Room will be buried underground.

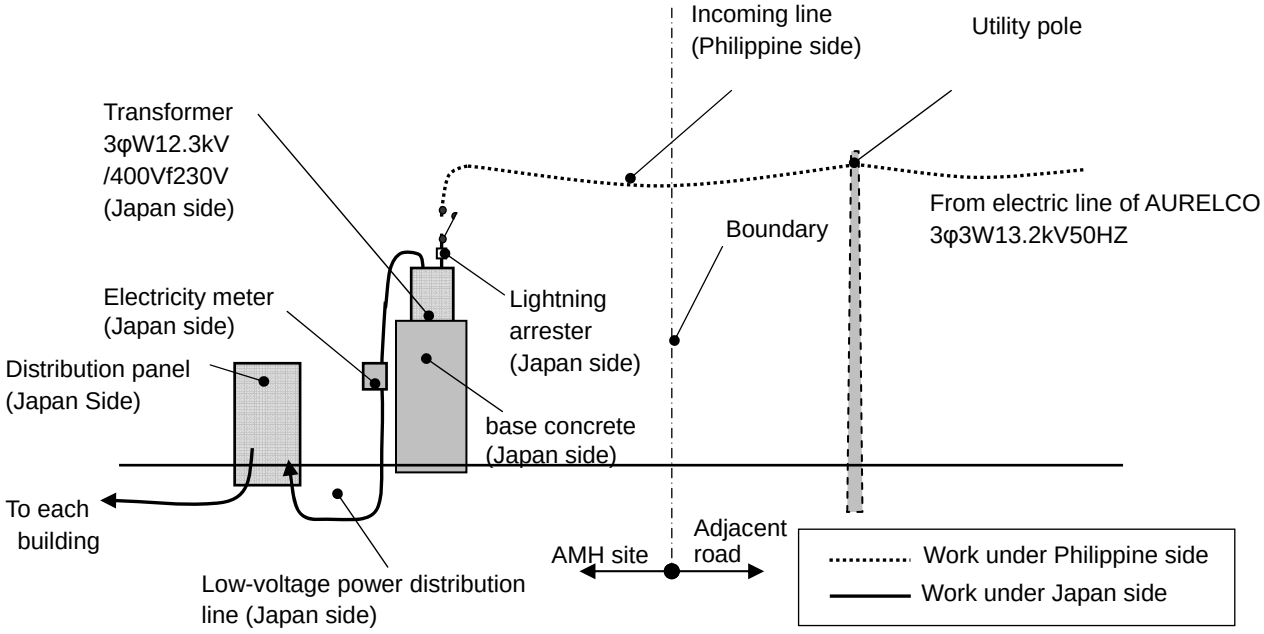


Fig. 2.14 Itemization of Electric Line Installation

② Power receiving/ transforming facility

- An outdoor oil-immersed transformer with around 300KVA will be used as a transformer of the power receiving facility.
- A low-voltage power distribution facility will employ an indoor stand-alone system (installed in Electricity Room) with distribution voltage of 3φ4W 400V-230V and a molded case circuit breaker (MCCB) as a branch circuit breaker.

③ Stand-by generator

- A low-voltage stand-by generator will be placed in Generator Room located next to Electricity Room. The generator will have a capacity of 3φ4W 400V-230V, 100KVA (estimated).
- An auxiliary fuel tank with an operational capacity of two hours or above will be selected.
- The generator will supply power loads as listed in the table below:

Table 2.24 Emergency Power Load

Load Differentiation	Supply Range
Lighting Fixture	ER examination & Treatment Room, Operation Theater, Delivery Room, HCU
Air Conditioning Load	Air Conditioning Machine of ER examination & Treatment Room, Operation Theater
Sanitation Load	Water Supply Pump, Drainage Pump
Medical Equipment	Power outlet of ER Examination & Treatment Room, Operation Theater

④ Main power facility

- A low-voltage main will employ a XLPE/ PVC cable, which will be protected with a PVC pipe for underground and indoor installation. The cable size will be designed to satisfy the load current with a voltage drop of 3% or less at the main. (The size of the neutral will correspond to 100% of the line.)
- Power branch wiring will employ either vinyl lines and PVC pipes or cables for installation.
- Branch circuits for outdoor devices and ones near water will be equipped with an earth leakage circuit breaker (ELCB) (30mA 0.1 second).

⑤ Lighting fixture/ outlet facility

- In principle, branch circuits for lighting fixtures and general outlets will employ a single-phase two-wire 200V-20A, and apply protection at the wiring circuit breaker of the distribution panel. Also, any circuits connected to devices near water will be equipped with an ELCB. Wiring will employ cables, lines and pipes for installation.
- Of outlet circuits, outlets used for medical devices will employ a medical outlet and a medical earth terminal to ensure patient safety.
- Lighting fixtures will mainly use fluorescent lamps (FL40W）.
- For efficient usage, a lighting intensity of each room will be determined by the current facility usage and the period of lighting. The table below summarizes different lighting intensities and lighting fixtures for the major rooms.

Table 2.25 Lighting Plan by Room

Room	Lighting Intensity	Lighting Fixture
Administrative Office	500lx	Surface-mounted fluorescent lamp
Nurse Station	500 lx	Surface-mounted fluorescent lamp
Bed Rooms	200lx	Surface-mounted fluorescent lamp
Delivery Room	500 lx	Surface-mounted fluorescent lamp
Operation Theater	500 lx	Surface-mounted fluorescent lamp with cover
Entrance Hall	150 lx	Surface-mounted fluorescent lamp
Corridor	150 lx	Surface-mounted fluorescent lamp
Storage	150 lx	Surface-mounted fluorescent lamp

⑥ Emergency lighting/ guidance lighting fixture

- To secure minimum lighting during power outage, emergency lighting fixtures with storage batteries will be installed at the corridors and in Operation Room, Delivery Room, etc. In addition, guidance lights used to display an emergency exit sign will be installed at the corridors.

⑦ Communication facility

- Interphones will be installed for communication among different rooms.
- Interphone installation locations: Nurse Station, Operation Room, Delivery Room, Central Sterilizing & Supply Room, Laboratory, X-ray Room, Administrative Office, Hospital Chief's Office, etc.
- LAN cables will be installed for PC network connections.
- LAN cable installation locations: Laboratory, Nurse Station, X-ray Room, OPD Reception, OPD Medical Records Storage, Pharmacy, Administrative Office, Hospital Chief's Office, etc.
- TV common viewing facility will be installed in OPD Waiting Area, Men's/ Women's Locker Room, Staff Room, etc.
- A sound reinforcement system for call-out will be installed in OPD Waiting Area at the Outpatient Department.

⑧ Alarm facility

- For swift response, an alarm panel will be installed in Administrative Office to display system failures, etc. Alarms, including full/ low water alarms for the water tanks, generator failures, ground fault alarms for the distribution panel and abnormalities, will be displayed with a buzzer.

⑨ Emergency warning facility

- An emergency warning facility will be installed for early fire announcement within the hospital in the event of fire. Emergency buzzers, emergency buttons and red indicating lamps will be installed at designated locations of the corridors.

⑩ Lightning protection facility

- Lightning rods will be mounted on the second-floor roof of the Admin., ER & OPD Building and

the roof of the elevated water tank.

5) Construction Material Plan

For major construction materials, only those that are commonly used in the Philippines and that allow for future self-maintenance will be selected. Also, given that the construction site is located near the shore, finish will apply protection against salt damage. The following tables show finish materials mainly used for the building exterior and interior.

Table 2.26 Exterior Finish

Parts	Finish
Roof	Colored Galvalium Roofing Sheet on Steel Frame Truss, light-gauge steel purlin & Grasswool Insulation
Exterior Wall	Spray Painting on Mortar Trowel
Doors & Windows	Colored Aluminum Sash

Table 2.27 Interior Finish

Rooms	Finish			
	Floor	Base board	Wall	Ceiling
Entrance Hall	Non-slip Ceramic Tile	Ceramic Tile	EP	Acoustic Board
Offices, Staff Anterooms, etc.	Plastic Tile	Vinyl Base Board	Ditto	Ditto
Examination & Treatment Rooms, Nurse Stations, etc.	Ditto	Ditto	Ditto	Ditto
Laboratory	Ditto	Ditto	Ditto	Ditto
Wards	Ditto	Ditto	Ditto	Ditto
ER Examination & Treatment Room, Delivery Room	Vinyl Flooring Sheet	Vinyl Flooring Sheet	EP	Acoustic Board
Operation Theater	Ditto	Ditto	Ceramic Tile	Ditto
Linen, Storage, etc.	Dust Preventive Resin	EP	EP	EP
Utility, Toilet, Shower Room, Kitchen, etc.	Non-slip Ceramic Tile	Ceramic Tile	Ceramic Tile	Ditto
Machine Room, etc.	Dust Preventive Resin	EP	Mortar Trowel	Exposed Ceiling

(4) Equipment Plan

1) Study on Requested Equipment

The Final Requested Equipment List which was confirmed at the time of the field study (refer to Appendix 4-1 Minutes of Discussion, Annex-3 Requested Equipment List) is a list of items carefully selected in line with the said basic policy and discussions, and thus basically contains fair selections. Even so, for confirmation, in Japan, the following criteria for selection were set forth, and individual items of the equipment were reviewed for their appropriateness.

[Equipment selection criteria]

① Whether the equipment is consistent with activities of the hospital concerned.

② Whether it is easy to operate and maintain the equipment after the delivery.

③ Whether the equipment is not a duplicate of the existing equipment.

④ Whether the equipment does not create a hindrance (e.g. brand specification) to tendering.

As a result of the review, each of the requested equipment was basically found to be appropriate. However, the following are descriptions of items requiring careful considerations and those that were modified/ removed from the list.

a) Electrolyte Analyzer/ Blood Gas Analyzer

The equipment is used to measure biological information, which is useful for management of emergency patients and severely ill patients, and is considered extremely important for the hospital concerned. However, the equipment with the given requested specifications requires daily maintenance; it seems extremely difficult to manage and maintain it under the current governance of the hospital that does not possess any similar equipment. Although use of alternative equipment with cartridges was studied, given the significant costs of the supplies, inclusion of the alternative equipment in the plan was considered unrealistic in terms of cost efficiency despite its easy maintenance and deployment without technical problems.

Still, when the usage is limited to analysis of electrolytes, a single-function device with relatively easy maintenance and relatively reasonable supplies presents a good solution. Given that, with specifications of this function alone, operation and maintenance of this device at the hospital is presumably feasible, blood gas analysis will be removed from the available functions, and the equipment will be used only for electrolyte analysis.

b) Ventilator

Given that the hospital is a Level 2 institution, transferring severely ill patients to upper-level hospitals is considered a general practice, and the necessity of the equipment concerned is relatively low. However, as evident from the past cases, there will be many cases of treating severe patients at the hospital for several reasons, including the hospital's status as a top referral institution for Aurora Province and more than three hour drive on bad roads for transfer from the hospital to upper referral hospitals in other provinces. Given that the hospital is going to secure a physician who specialize in internal medicine and has experience in handling a ventilator, the requested specifications of the equipment will be changed from those that address infant care to basic ones that target adult and pediatrics.

c) General digital X-ray unit

During the field study, the hospital requested a general-use X-ray unit with specifications that generate digital data for remote diagnosis (e.g. DR, CR). According to this, the field study confirmed the usage of digital X-ray units and the operation status in the Philippines. As a result, it became clear that the equipment is not widely used and that its support governance for maintenance has not been sufficiently developed. Therefore, the plan will include standard analog equipment.

d) Electrocoagulation unit

The equipment will be used at the Emergency Department as a treatment tool, and, with a low necessity for incisions at the hospital, the equipment only with an electrocoagulation function was

selected. Since no manufacturers in the country have been identified to currently produce the equipment with the given specifications, this item will be integrated with an electro-surgical unit that also possesses an incision function requested as a separate item.

e) X-ray Film Dryer

The equipment is used as a drier for X-ray films manually developed in the event of failure of the automatic processor. However, in conjunction with digitalization of X-ray equipment and changes in the environment, manufacturers have pulled out from making the equipment, and the procurement seems difficult. Hence, given that natural drying of X-ray films is also acceptable during emergency, despite its high necessity, the equipment will be removed from the list.

f) Desktop safety cabinet

Since the equipment was requested in terms of infection prevention for pathologists when they handle samples during tuberculosis tests, its necessity can be justified. However, validity of the equipment is not necessarily high in terms of operation/ maintenance and cost efficiency concerning: significant costs of HEPA filter supplies, the limited number of manufacturers producing the requested desktop cabinets that are no longer considered standard, current implementation of tuberculosis tests without use of the equipment, and moderate effectiveness of masks, etc. for infection prevention. Hence, the equipment will be removed from the plan.

g) Pass Box

The equipment is used to transfer X-ray film cassettes between Dark Room and X-ray Room, and is considered highly effective in terms of work efficiency. However, as with the above film dryer, manufacturers have pulled out from making the equipment in response to the decrease in demand, and procurement therefore seems difficult. Also, since cassettes can be delivered by a radiologist after each filming, this equipment will be removed from the plan.

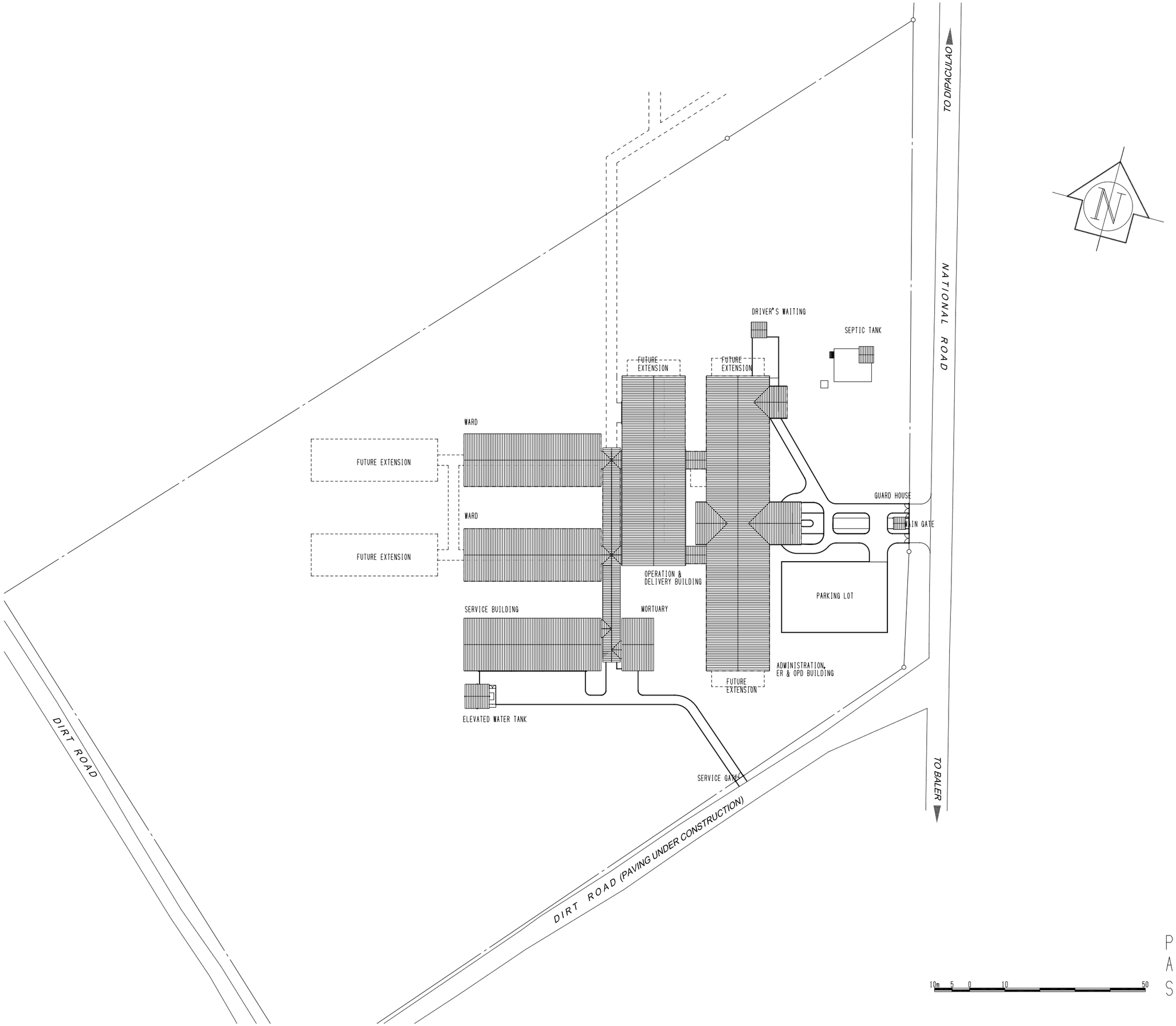
2) Planned Equipment

As a result of the above study, planned equipment now consists of the following 151 items. (See 2-2-3 “Medical Equipment Layout Plan” and Table 2.28 for layout and the list of the equipment.)

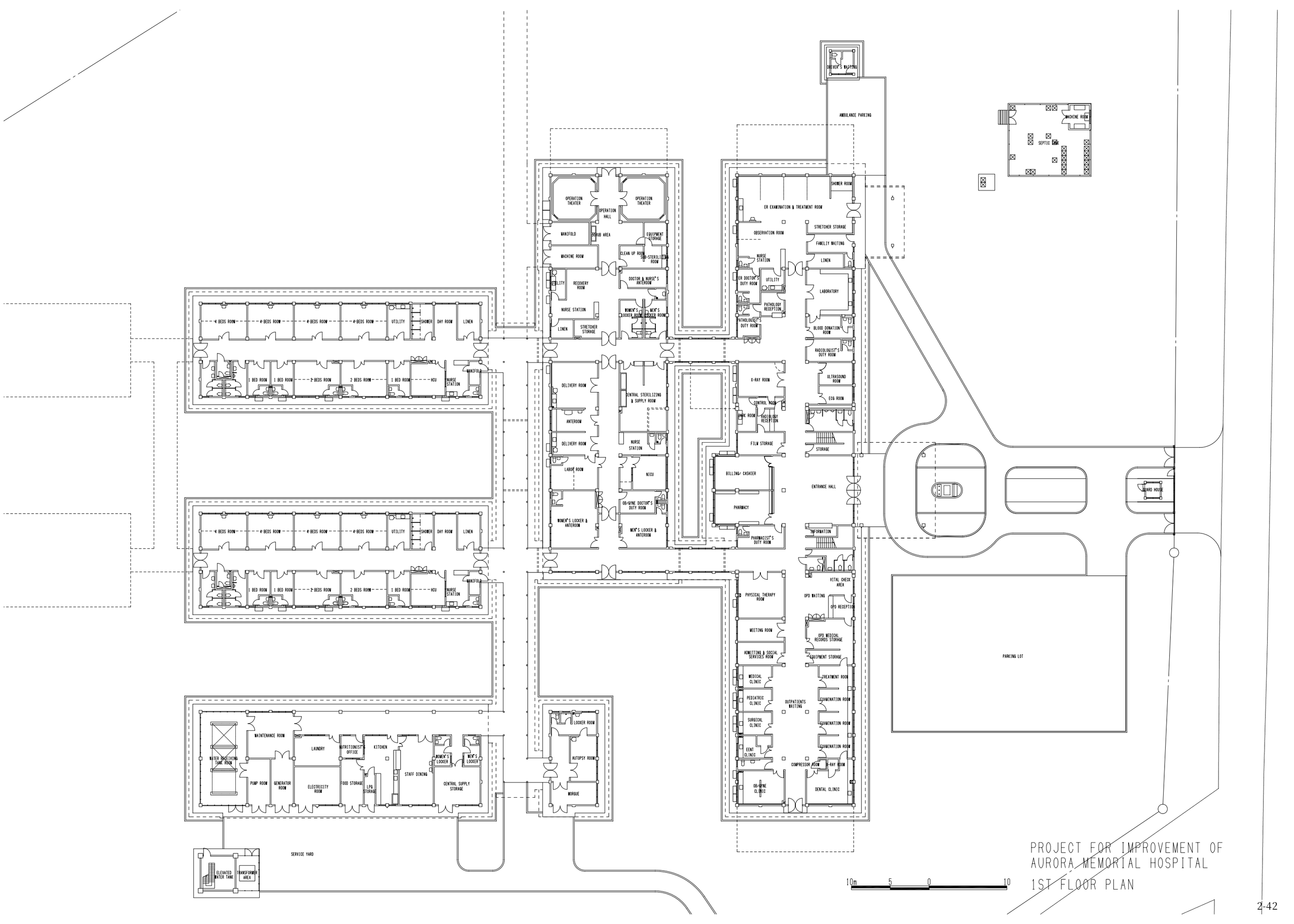
1) General OPD: 16 items including Examination couch and X-ray film illuminator
2) Dental: 1 item, Dental X-ray unit
3) Physical Therapy: 15 items including Hot pack unit and Parallel bars
4) X-ray: 10 items including General X-ray unit and X-ray film processor (automatic)
5) Laboratory: 24 items including Hematology analyzer and Spectrophotometer
6) Ward: 25 items including Medical refrigerator for medicines and Syringe infusion pump
7) CSSR: 5 items including Autoclave and Hot Air sterilizer
8) Kitchen: 2 items, Freezer and Serving trolley
9) ER/ Operation: 34 items including Electro-surgical unit, Operating table and Operating light
10) Obs./ Gyn.: 12 items including Examination table for Obs./ Gyn. and Fetal monitor
11) EENT: 7 items including E.N.T treatment chair and Slit lamp

2-2-3 Outline Design Drawing

01	Site Plan		1/1,000
02	1st Floor Plan		1/400
03	2nd Floor Plan		1/400
04	Elevation, & Section	Administration, ER & OPD Building	1/200
05	Elevation, & Section	Operation & Delivery Building	1/200
06	Elevation, & Section	Ward Buildings	1/200
07	Elevation, & Section	Service Building	1/200
08	Plan, Elevation, & Section	Ancillary Buildings	1/200
09	Medical Equipment Layout Plan		1/400

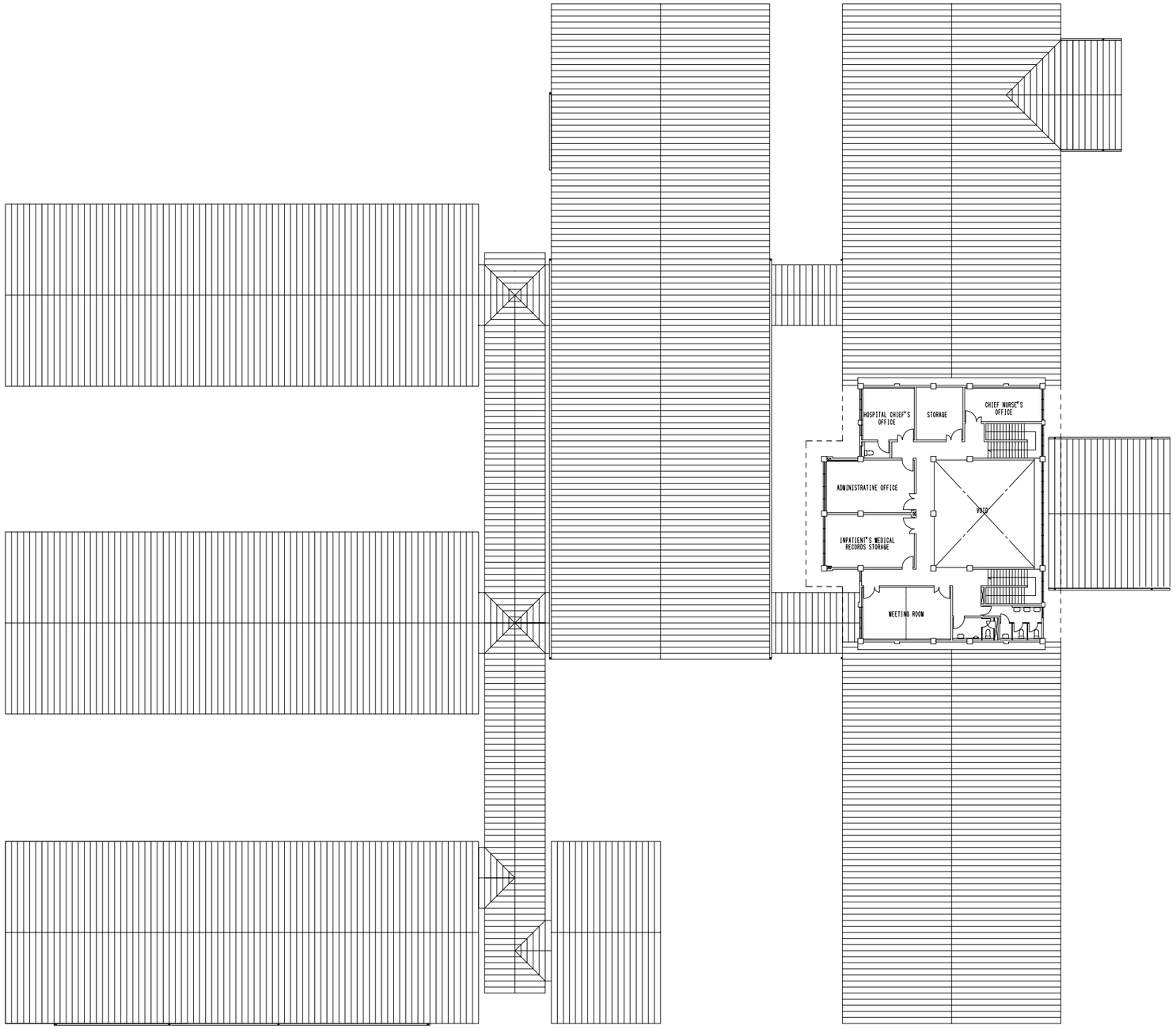


PROJECT FOR IMPROVEMENT OF AURORA MEMORIAL HOSPITAL
SITE PLAN



PROJECT FOR IMPROVEMENT OF
AURORA MEMORIAL HOSPITAL

1ST FLOOR PLAN



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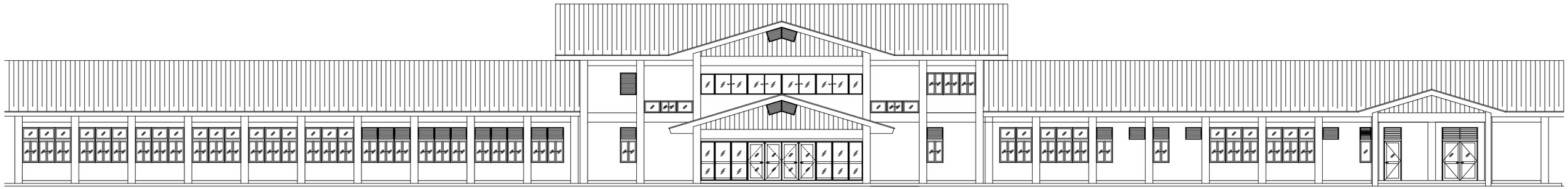
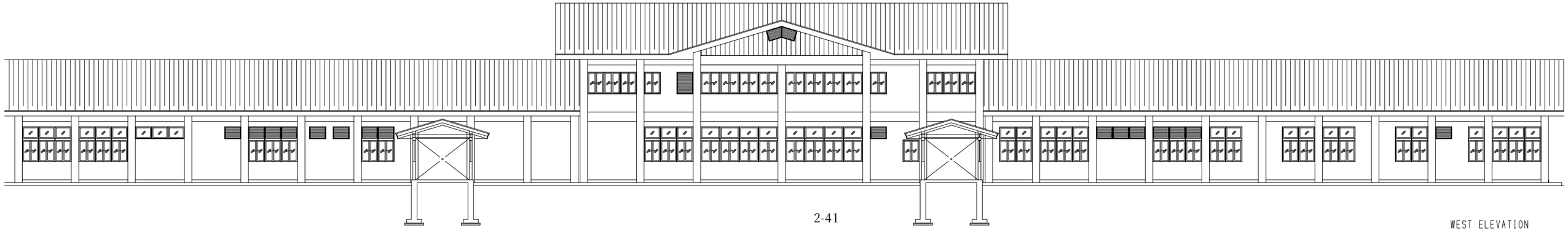
PROJECT FOR IMPROVEMENT OF
AURORA MEMORIAL HOSPITAL

2ND FLOOR PLAN



EAST ELEVATION



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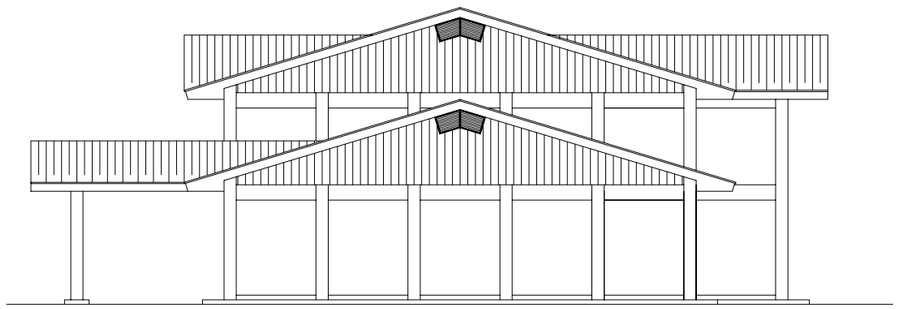

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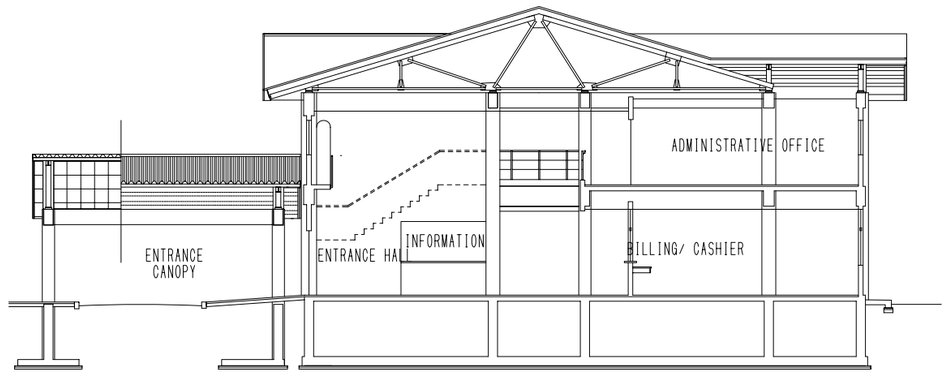

SECTION

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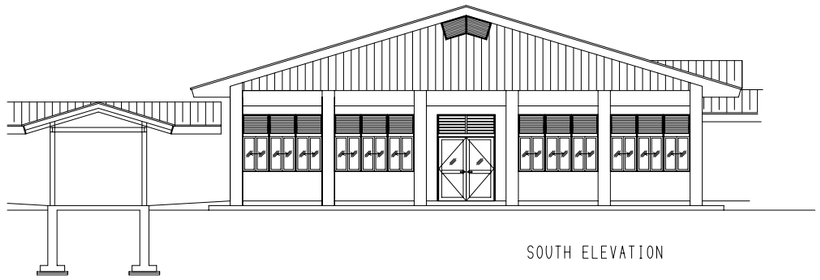
PROJECT FOR IMPROVEMENT OF
AURORA MEMORIAL HOSPITAL

ADMINISTRATION, ER & OPD BUILDING
SECTION & ELEVATION



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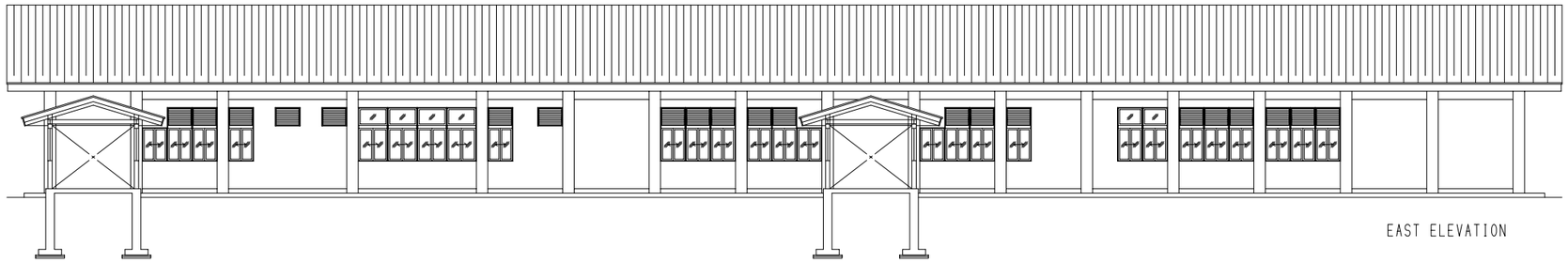

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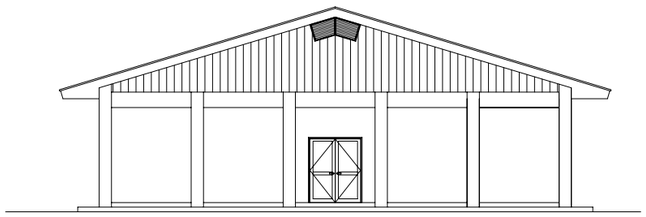

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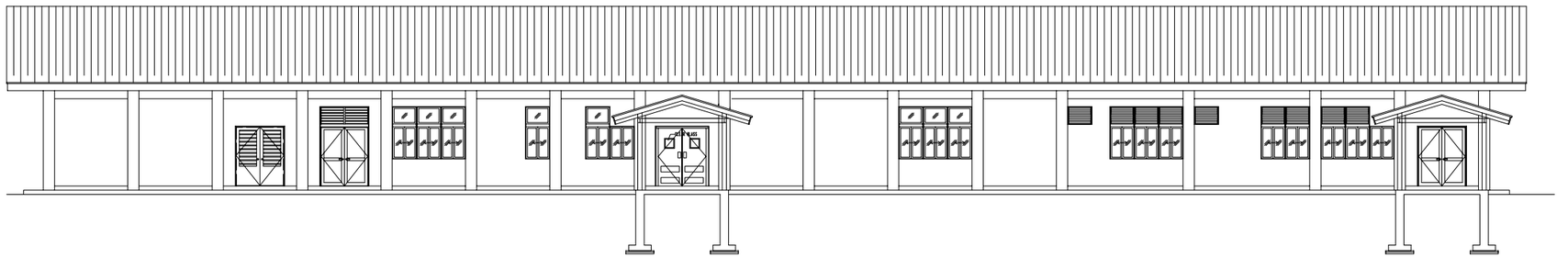

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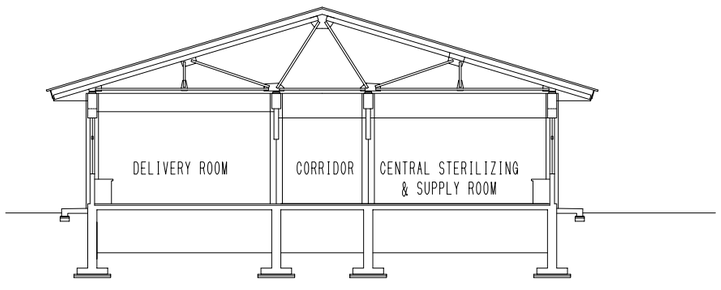
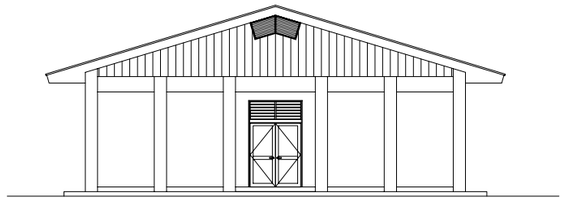


SECTION

10m 5 0 10

PROJECT FOR IMPROVEMENT OF
AURORA MEMORIAL HOSPITAL
OPERATION & DELIVERY BUILDING
SECTION & ELEVATION



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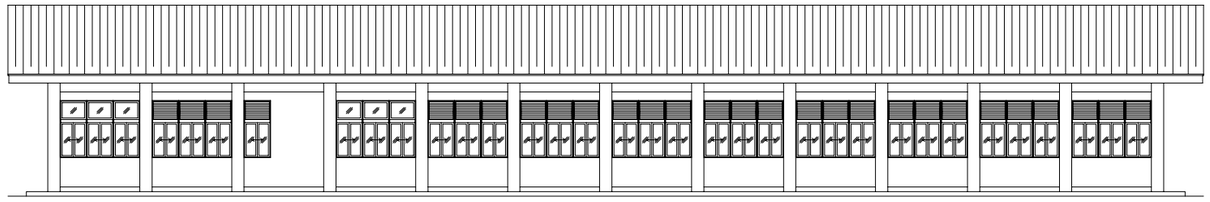

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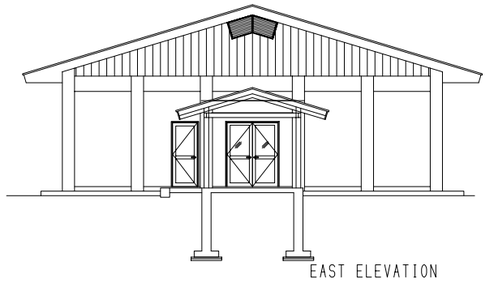

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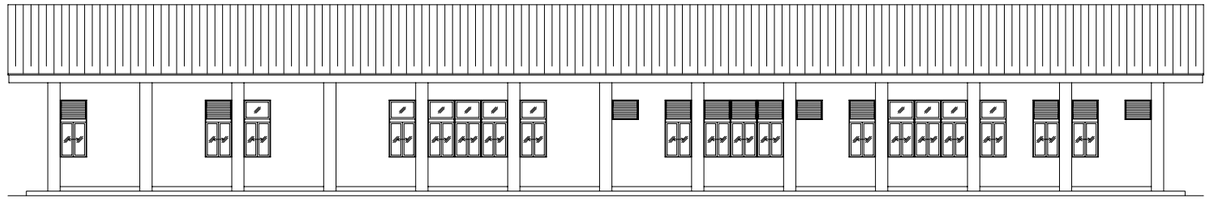

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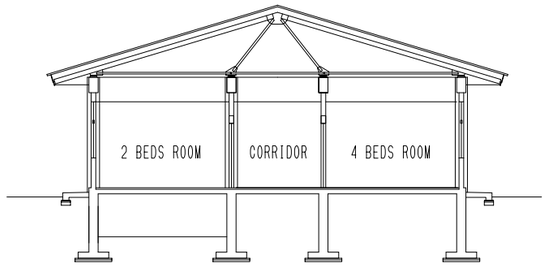

SECTION

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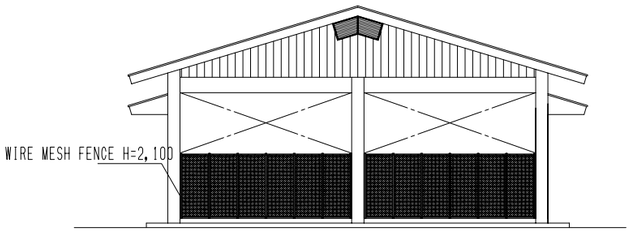
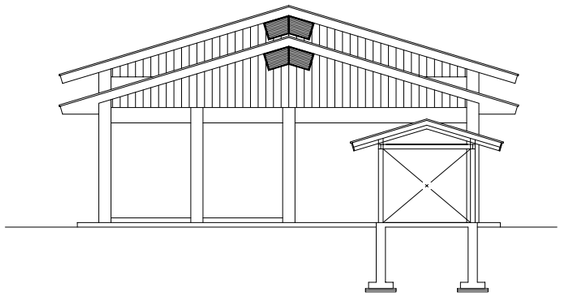
PROJECT FOR IMPROVEMENT OF
AURORA MEMORIAL HOSPITAL
WARD BUILDING SECTION & ELEVATION



WEST ELEVATION

SOUTH ELEVATION



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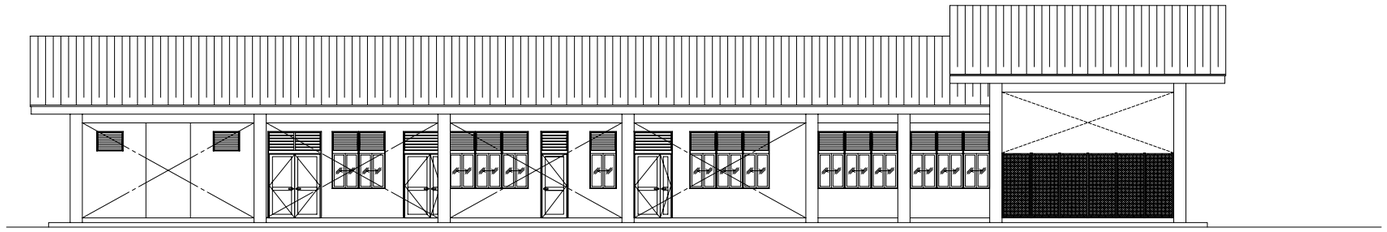

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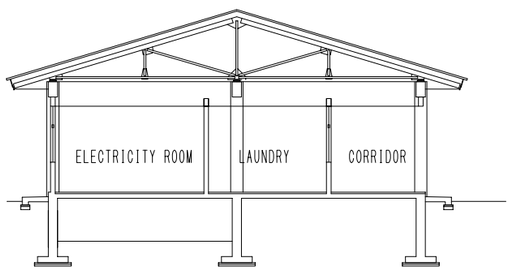

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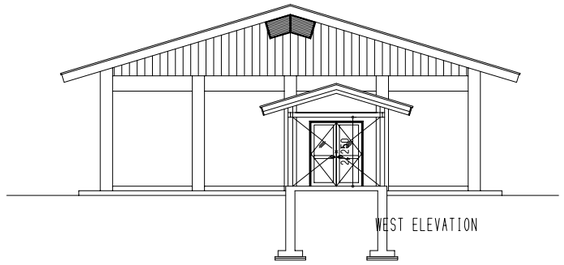
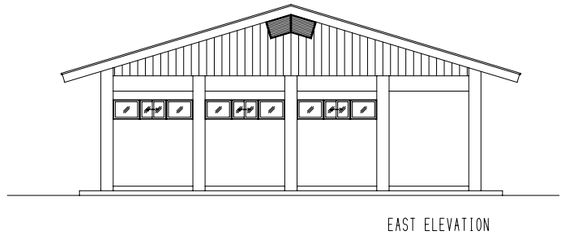
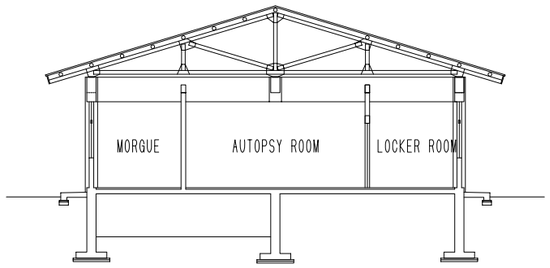
PROJECT FOR IMPROVEMENT OF
AURORA MEMORIAL HOSPITAL

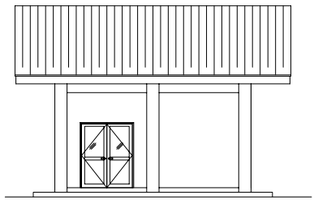
SERVICE BUILDING
SECTION & ELEVATION

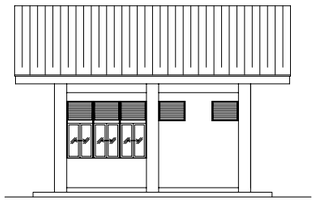
MORTUARY BUILDING



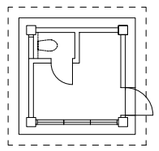


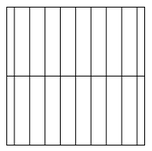




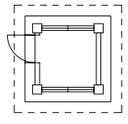


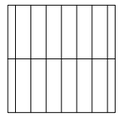
DRIVER'S ANTE ROOM

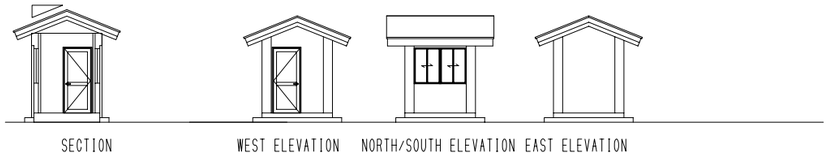




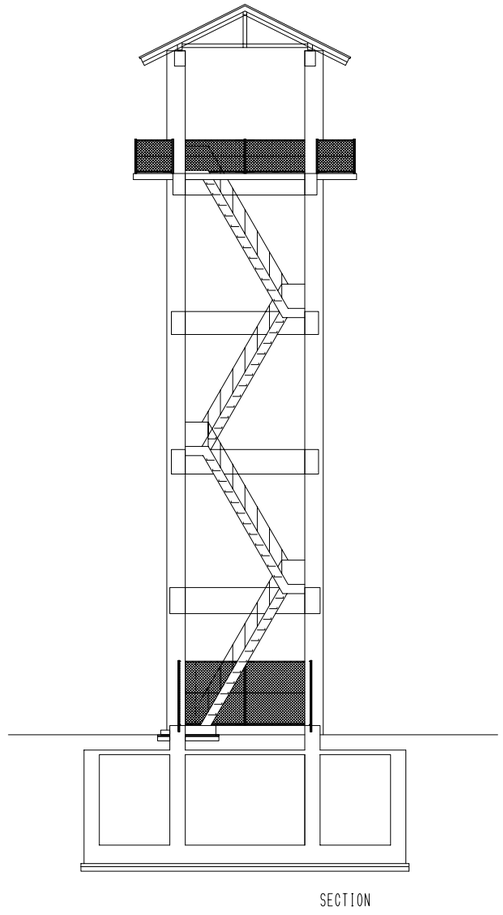
GUARD HOUSE

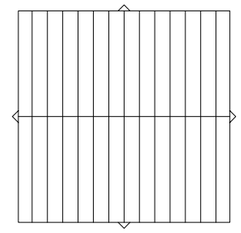


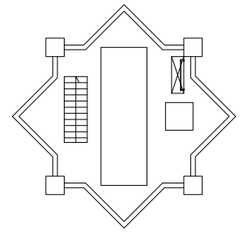


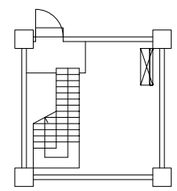


ELEVATED WATER TANK



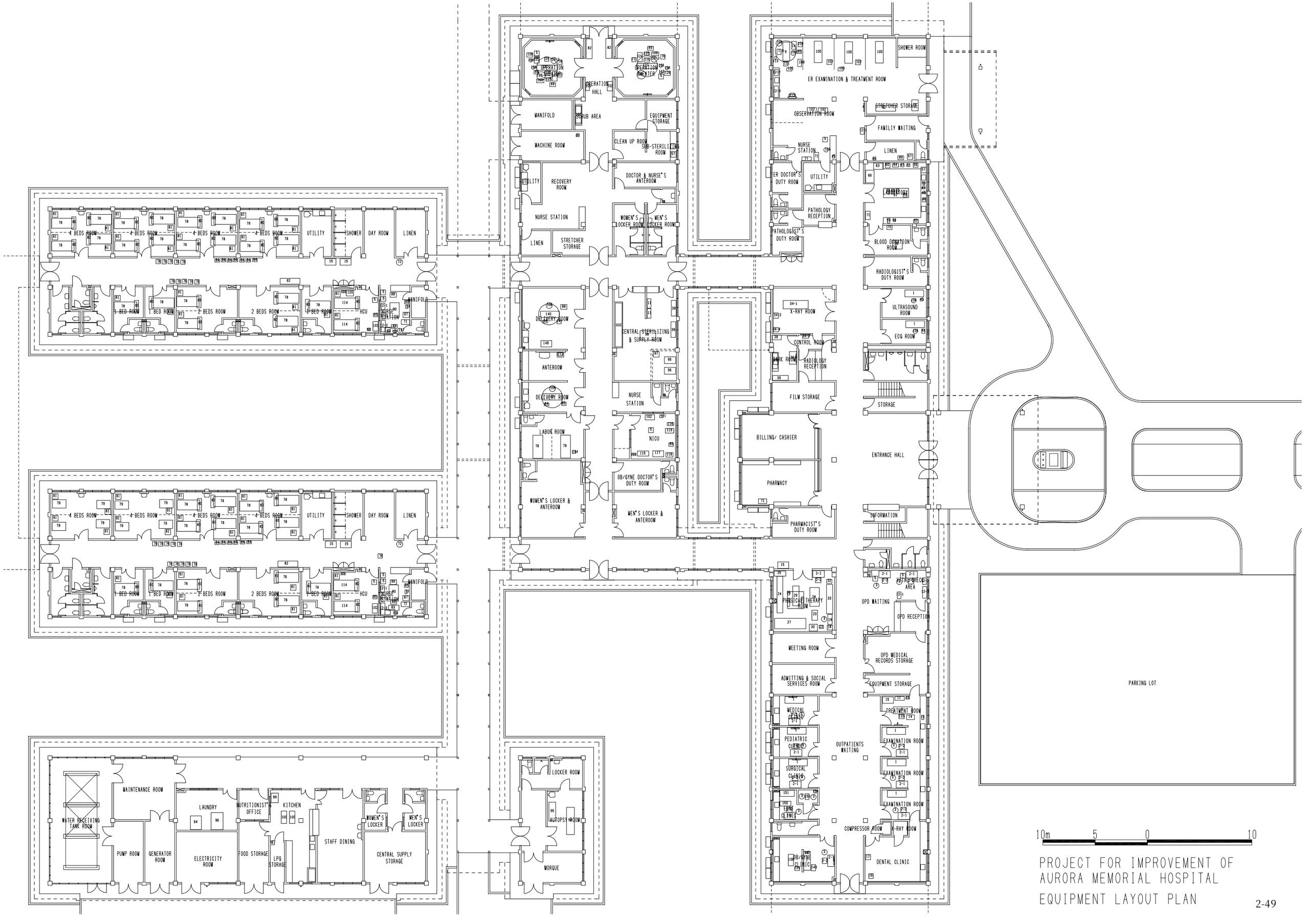






PROJECT FOR IMPROVEMENT OF
AURORA MEMORIAL HOSPITAL

ANCILLARY BUILDINGS
PLAN, SECTION & ELEVATION



PROJECT FOR IMPROVEMENT OF AURORA MEMORIAL HOSPITAL

EQUIPMENT LAYOUT PLAN

Table 2.28 Equipment List

No.	Code	Description	Qty.	No.	Code	Description	Qty.
1	1	Examination Couch	9	42	45	Electrocardiograph Machine	2
2	2	Doctor Desk & Chair	11	43	46	Hematology Analyzer	1
3	3	Patient Stool	13	44	47	Blood Coagulation Analyzer	1
4	4	X-ray Film Illuminator	9	45	48	Electrolyte Analyzer	1
5	5	Sphygmomanometer	12	46	49	Spectrophotometer	1
6	6	Stethoscope	12	47	50	Blood Sedimentation Stand	1
7	7	Hammer	3	48	51	Shaker	1
8	8	Diagnostic Set	2	49	52	Microscope	3
9	9	Treatment Table	2	50	53	Autopsy Instrument	1
10	10	Instrument Sterilizer	3	51	54	Autopsy Table	1
11	11	Instrument Cabinets	4	52	55	Morgue Cart	1
12	12	Weighing Scales	4	53	56	Hot Air Sterilizer for Laboratory	1
13	13	Ultrasonic Nebulizer	3	54	57	Autoclave (Table Top Type)	3
14	14	Instrument Table	2	55	58	pH Meter	1
15	15	Wheelchair	7	56	59	Electronic Analytical Balance	1
16	16	Treatment Cabinet	1	57	60	Centrifuge	1
17	17	Dental X-ray Unit And Film Processor	1	58	61	Laboratory Center Table	1
18	18	Hot Pack Unit	1	59	63	Storage Cabinets for Laboratory	1
19	19	Paraffin Bath	1	60	64	Water Bath	1
20	20	Shoulder Wheel	1	61	65	Mixer	1
21	21	Shoulder Ladder	1	62	66	Distiller	1
22	22	Exerciser for Finger	1	63	67	Ultrasonic Cleaner	1
23	23	Exercise (Bicycle)	1	64	68	Digital Micro Pipette	1
24	24	Parallel Bars	1	65	69	Bed for Blood Collecting	1
25	25	Posture Training Mirror	1	66	70	Blood Bank Refrigerator	1
26	26	Chest Pulley	1	67	71	Medical Refrigerator for Medicines	5
27	27	Exercise Stairs	1	68	72	Laundry Bag Carrier/Cart	2
28	28	Training Mat	1	69	73	Syringe Infusion Pump w/Stand	2
29	29	Training Bed	1	70	74	Infusion Pump w/Stand	5
30	30	Dumbbells	1	71	75	Blood Infusion Warmer	1
31	32	Infrared Lamp	1	72	76	I.V. Hanger Stand	22
32	33	Traction Unit	1	73	77	Needle Destroyer	5
33	34	General X-ray System	1	74	78	Gatch Bed With Side Railings	40
34	35	Protective Instrument Set for X-ray	1	75	79	Bed for Pediatric	8
35	36	Film Loading Desk	1	76	80	Over bed Table	42
36	38	Cassette Keeping Shelf	1	77	81	Bedside Cabinet	50
37	39	Film Cabinet for X-ray Room	3	78	82	Stretcher Trolley	5
38	40	Automatic X-ray Film Processor	1	79	83	Oxygen Tent for Pediatric	1
39	42	Darkroom instrument Set	1	80	84	Oxygen Regulator w/Trolley & Tank	15
40	43	Film Marker	1	81	85	Suction Unit	8
41	44	Ultrasound Machine for General Examination	1	82	86	Resuscitation Bag	3

No.	Code	Description	Qty.	No.	Code	Description	Qty.
83	87	Emergency Cart	2	120	125	Instrument Stand (Mayo's)	4
84	88	Dressing Cart	3	121	126	Anesthesia Table	2
85	89	Dressing Case w/Drum Stand	5	122	127	Operating Tables	2
86	90	Utility Work Table for Nurse Station	2	123	128	Operating Lights	2
87	91	Laryngoscope Set	2	124	129	Operating Instrument Set for Cholecystectomy	1
88	92	Pulse Oximeter	2	125	130	Operating Instrument Set for Thyroidectomy	1
89	93	Defibrillator	4	126	131	Operating Instrument Set for Appendectomy	2
90	94	Washing Machine	1	127	132	Operating Instrument Set for Emergency Tracheotomy	2
91	95	Dryer	1	128	133	Operating Instrument Set for Section Cesarean Section	2
92	96	Autoclave	2	129	134	Operating Instrument Set for Explore Laparotomy	1
93	97	Hot Air Sterilizer	1	130	135	Operating Instrument Set for Hernioplasty	1
94	98	Working Table for CSSR	1	131	136	Endotracheal Set	1
95	99	Freezer	1	132	137	Surgical Scrub Station	1
96	100	Food Serving Trolley	2	133	138	Examination Table for Obs./Gyne	1
97	101	Operating Instrument Set For Minor Surgery	6	134	139	Examination Unit for Obs./Gyne	1
98	102	Medicine Cabinets	6	135	140	Delivery Table	2
99	104	Electro-Surgical Unit	2	136	141	Vacuum Extractor	1
100	105	Bed for Emergency Room	3	137	142	Speculum (Vaginal)	2
101	106	Operating Light (Small)	3	138	143	Doppler Fetus Detector	1
102	107	Examination Light (Goose Neck Type)	2	139	144	Fetal Monitor	1
103	108	Revolving Stool	8	140	145	Instrument Set For Dilatation And Curettage	2
104	109	Basin Stand	3	141	146	Instrument Set For Delivery	2
105	110	Foot Stool	4	142	147	Comfort Stool	1
106	111	Kick Bucket	3	143	148	Examination Couch for Pediatric	1
107	112	Water Sterilizing Unit	2	144	149	Ultrasound Machine for Obs./Gyne	1
108	113	Bedside Monitor	6	145	150	E.N.T Treatment Chair	1
109	114	Bed for I.C.U.	4	146	151	E.N.T Treatment Unit	1
110	115	Infant Incubator	1	147	152	Head Mirror	1
111	116	Infant Incubator (Transport type)	1	148	153	Speculum (Nasal)	1
112	117	Infant Warmer	1	149	154	Audiometer	1
113	118	Phototherapy Unit	1	150	155	Slit Lamp w/Table	1
114	119	Infant Bassinet	1	151	156	Foreign Body Forceps	1
115	120	Mechanical Ventilator	1				
116	121	Bilirubin Meter	1				
117	122	Anesthesia Apparatus w/Vaporizer	1				
118	123	Instrument Cabinets for Operation Room	1				
119	124	Instrument Tray Stand	2				

** Number in the Medical Equipment Layout Plan corresponds to the code number of the above table.*

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The elements of this project include facility construction work, supply and installation of equipment, and the scope of cooperation regarding to the project undertaken by the Japanese side will be implemented according to the framework of Japanese grant aid. Implementation of this plan shall be initiated officially only after it is approved by the Governments of both countries and the exchange of notes (E/N) and the Grant Agreement (G/A) is signed. Immediately after signing of the E/N and the G/A, the Philippine organization that is responsible for implementation of this project and the Japanese consultant firm shall enter a contract and initiate the detail design work of the project. When the design is completed, the Japanese construction companies and equipment supply and installation companies participate in the tender for their works. The successful tenderers for construction of facilities and supply and installation of the equipment proceed to their work. The basic principles and items to be proposed for implementation of this project are described below.

1) Executing organization

The implementing entity in the project is the Provincial Government of Aurora (PGA), and the Aurora Memorial Hospital (AMH) will be responsible for operation and maintenance of the facilities and the equipment provided by Japan.

2) Consultant

After signing of the E/N and the G/A, the Japanese consultant firm and the Government of Philippines enter a consultant contract according to the formal procedure for the Grant Aid System of the Government of Japan. This consultant firm executes the following activities under this Contract.

① Detail design of the project: To prepare the design documents (specifications and technical reference materials on the facilities and equipment included in the project).

② Tender: To cooperate in selection of the contractor(s) and supplier(s) through the tender and in transaction of procedures required under the contract.

③ Construction supervision: To supervise so that instructions for construction of facilities, delivery and installation of the equipment, operation and maintenance are given properly.

In the detail design stage, the consultant determines the construction plan and the equipment supply plan in detail based on the basic design investigation of the project, reviews the equipment, and prepares the tender documents consisting of specifications of the project plan, tender terms and conditions, draft of the contracts required for the construction work and procurement of equipment.

Cooperation to the tender procedure means to observe selection of the contractor(s) and the supplier(s) through the tender and to help them transact the formal procedures required for execution of their contracts and preparation of the reports to be submitted to the Government of Japan.

Construction supervision means to check whether or not each work item done by the contractor and the supplier as specified in each contract and to confirm that the contents of their contracts are executed appropriately. In addition, to promote smooth implementation of the project, the consultant shall, in the neutral position, provide related parties with advice and guidance and serve as a coordinator among them.

Listed below are major items in the scope of the construction supervision work.

① Procedures required for verification and approval of the work implementation plan, implementation drawings, equipment specifications and other documents submitted by the contractor(s) and supplier(s).

② Inspection and approval prior to shipment of the construction materials, supply, installation and handling of the equipment.

③ Confirmation of instructions for the construction machines and materials, supply, installation and handling of the equipment.

④ Checking and reporting the progress of the construction.

⑤ Observation of handing over the completed facilities and equipment.

The consultant shall execute above items and report to the related authorities of the Government of Japan about the progress of this project, the payment procedure and handing over of the completed facilities.

3) Contractor(s) and Supplier(s)

The contractor(s) and the supplier(s) shall be selected through the open tender for the Japanese corporations that are qualified to the specific requirements. In principal, contracts will be made through the negotiation between PGA and the contractor(s) and the supplier(s) that proposed the lowest price and succeed in the subsequent negotiations.

The contractors) and the supplier(s) shall construct the facilities, supply, deliver and install necessary construction materials and equipment according to the terms and provisions of contracts, and provide technical guidance for operation, maintenance and management of the procured equipment to the Philippine side. Furthermore, besides providing guidance for securing a system of supply by suppliers, manufacturers and agencies of spare parts and supplies needed for the different equipment for continuous use of it after it is procured, providing of support to make it possible to receive services such as gratis repair during the period of guarantee, paid repair after the period of guarantee, technical guidance, etc.

4) Japan International Cooperation Agency

The Japan International Cooperation Agency shall give due advice to the consultant so that the project is implemented in conformity with the Grant Aid System. Also, it shall hold consultations with the executing organizations of this project as necessary for untroubled implementation of the project.

5) Preparation for Implementation Plan

The representatives of the executing organization on the Philippine side and the consultant shall review the implementation plan during the detail design period. They shall make clear the scopes of the construction work Japan and Philippines take charge, confirm through consultations the starting time and the method of each work and discuss so that all the works carried out smoothly according to the implementation schedule in this report. In particular, the Philippine side has to be sure to carry out, at its own expense before commencement of the facility construction work, such as to secure and prepare the land, to demolish the existing buildings, etc.

2-2-4-2 Implementation Conditions

Described below are those items to be noted for implementation of the project. They should be fully taken into consideration when making the implementation plan.

1) Schedule Management

Since the planned construction site is in a region where it rains frequently throughout the year, sufficient time should be allocated to excavation and groundwork. Also, allocating enough curing time for each finishing task will ensure finish quality of the buildings. Therefore, the project will fully take the construction schedule into consideration.

2) Sending of Technicians for Equipment Installation

It is extremely important to impart knowledge and skills regarding appropriate operation and maintenance of the equipment so as to contribute to Medical services through continuous proper operation of the supplied equipment after implementation of the project. That being the case, technicians who are thoroughly familiar with the operation of the different equipment will be selected as the equipment installation technicians, and sufficient time will be allotted for them to explain operation thereof (operation techniques, simple repair techniques, inspection methods, etc.) and to make sure that those concerned on the receiving side acquire sufficient understanding concerning its operation and maintenance.

3) Safety Control

Construction of UPM-SHS Baler is planned on the northern site of the Project. The construction will have already begun at the commencement of the Project construction, and will be complete during the Project construction. Subsequently, the school will accommodate midwifery students. For this reason, the Project construction will fully address safety control with installation of temporary fences at the boundary with the northern construction site and stationing of on-site guide personnel.

2-2-4-3 Scope of Works

It is mutual cooperation between Japan and Philippines that makes implementation of this project successful. When this project is implemented under the Japan's Grand Aid, it is advisable that the Governments of Japan and Philippines undertake the scopes of works as described below respectively.

1) Undertakings Borne by the Government of Japan

The Government of Japan undertakes consultation of this project and the works related to construction of the facilities, procurement and installation of equipment as described below.

① Consultation

i To prepare implementation design documents for the facilities and equipment subject for this project and their tender terms documents.

ii To cooperate in selecting the contractor(s), and supplier(s) and executing contracts for the project.

iii To supervise the instructions for the construction of the facilities and delivery, installation, operation and maintenance of the equipment.

② Construction of facilities, supply and installation of equipment

i To construct facilities subject to this project.

ii To procure construction materials and equipment subject to this plan, transport and deliver them to the site.

iii To instruct installation of the equipment subject to this project, conduct a trial run and make adjustments.

iv To explain and instruct operation and maintenance methods for the equipment subject to this project.

2) Undertakings Borne by the Government of the Philippines

The government of the Philippines will bear and implement the following tasks concerning land development of the construction site, clearance of the existing facilities, wiring and equipment installation needed for power supply into the construction site, procedures for tax exemption, etc.

① Preparation of the Construction Site

i To secure and prepare the land for the construction and the temporal works

ii To clear the existing buildings including trees and plants

iii Backfilling of the soil up to road level

iv To transfer overhead electric wire and utility poles

② Exterior Works

i Construction of the Boundary Fence

ii Landscape Planting

③ To purchase or to transfer medical equipment, furniture and equipment to be procured by the Philippine side

④ PGA is to refund the amount of VAT to requesting Japanese contractors for their purchase of materials and provision of services under the approved contracts.

⑤ To provide measures to facilitate speedy custom clearance and surface transportation procedure for the equipment and materials to be exported from Japan and other foreign countries according to the approved contracts

⑥ To provide measures to facilitate procedures for those Japanese who enter Philippines and stay here to carry out their roles for the project

⑦ To issue approvals and permissions required for implementation of this project

⑧ To pay all the necessary expenses other than those borne by the Government of Japan

2-2-4-4 Consultant Supervision

1) Implementation Supervision Policy

Under the policy of the Grant Aid System of the Government of Japan, the consultant forms, based on the concept of the basic design, a team that is responsible to execute the project including preparation of the implementation design to achieve smooth and successful implementation. The implementation supervision policy for this project is outlined below.

① To keep close contact with those who are in charge of the project representing related organizations of both countries so that construction of the facilities and installation of equipment will be completed without delay.

② To provide quick and appropriate advice and suggestions from the neutral standpoint to the contractor(s), supllier(s) and others concerned.

③ To provide appropriate guidance and suggestions regarding suitable equipment layout and adjustment of tie-in with facilities as well as operation and management after handing over. And to confirm that implementation has been completed and terms of each contract are fulfilled, to observe handing over the facilities and equipment and obtain an approval of receipt from the Philippine side.

2) Construction Supervision Plan

As the types of construction works involved in this project are versatile, a resident supervisor (in charge of construction) is appointed and the following engineers are dispatched from time to time, keeping step with the progress of the construction works.

① Manager of general affairs (Overall coordination, process control)

② Engineer in charge of construction (Confirmation of construction methods, design concept, construction drawings, specifications of materials, etc.)

③ Engineer in charge of structure (Confirmation of the ground conditions, foundation work, framework)

④ Engineer in charge of electrical installation (Power supply & distribution system, electric service and substation, etc.)

⑤ Engineer in charge of mechanical installation (Utility supply and processing system, air conditioning, water supply, drainage and hygiene system, etc.)

⑥ Engineer in charge of equipment (Instruction for equipment installation, adjustment with the facility, confirmation of operation instructions, etc.)

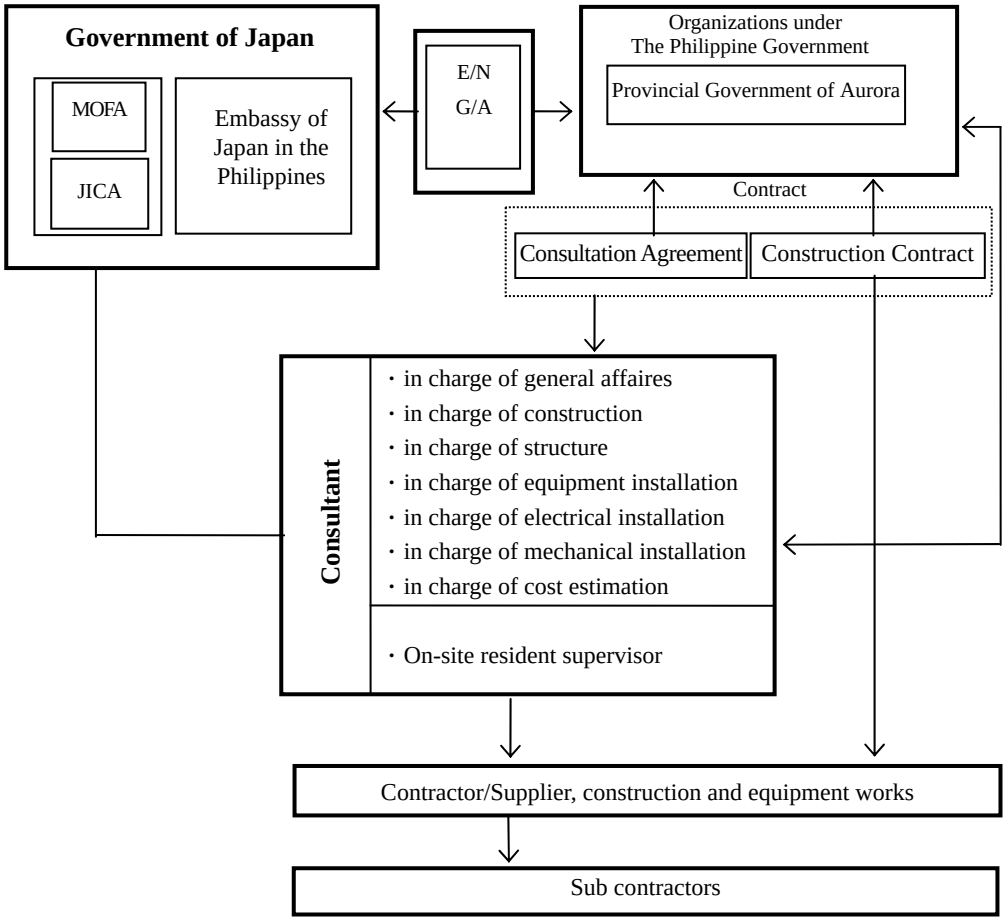


Fig. 2.15 Construction Administration System

2-2-4-5 Quality Control Plan

1) Quality Control of the Facility

The Cotractor(s) will submit the documents of construction plans in advance to the consultant according to the construction contract (drawings, specifications, etc.). The consultant will verify the adequacy prior to the commencement of construction listing the specific inspection items and indicating the frequency to work for securing high level of quality control.

Major controlling items are listed below.

① Material

On-site resident supervisor will implement the inspection of receiving construction materials.

i Reinforcing mill sheets, results of tension strength tests and manufacturers names

ii Analysis tables of cement material identification, tables of test results and manufacturers names

iii Analysis of salt components in aggregate, size distributions, densities and percentages of absorption

iv Reinforced concrete

iv-1 Checking Mixing Plans

Confirmation and determination of the aggregate quantity, slump, cement-water ratio, air quantity and salt components through test mixings

iv-2 Compression Tests

Determination of the standard control values from analysis of result tables

iv-3 Control of material quantity measures and complete control of material storage

iv-4 Prior submittals of concrete casting plans

② Standards of Control

The consultant will carry out the construction supervision with certain standards of control based on the approved construction schedule plans. The standards of control will be basically governed by the standards of Japan.

③ Soil Bearing Capacity

Confirmation of the soil bearing capacity will be carried out with the presence of on-site resident supervisor on the site by implementing plane table loading tests.

④ Quality Control of Equipment

Ready-made medical equipment to be procured for this project will be selected from the equipment that complies with JIS, UL, IEC, ISO and other international standards. The consistencies between the equipment to be procured and the contents of the contract will be confirmed at the inspections carried out before shipment together with the inspections carried out by the third agencies for the components of shipment and containers.

2-2-4-6 Procurement Plan

1) Construction Materials

Among construction materials, only sand and gravel can be procured around the construction site, while all of the other materials need to be brought from the capital Manila. For selection of materials, it is essential that the Project comprehensively address, in particular, usage purpose, durability, efficiency, etc., and conduct detail planning with full consideration for maintenance of not only major structures but also finish and facility equipment. For this reason, the Project should procure as many materials capable of local maintenance as possible. Given that Aurora Province has only few Filipino engineers, and that training of skilled workers has not been adequately provided even in the provincial capital Baler because of the limited number of construction projects, the local labor situation affected by this acute shortage of skilled workers doesn’t seem to provide favorable conditions. It is therefore essential the Project dispatch Japanese staff as resident supervisors in accordance with the progress of the Project.

Table 2.29 Procurement of Construction Materials

Materials	Procurement from				Remarks
	Manila	Cabanatuan	Nearby the site	Japan	
Cement	○	○			
Sands/ Gravels			○		
Plywood form	○	○	○		
Concrete block	○	○			
Reinforcement bar	○				
Steel frame	○				
Lumber	○				
Roofing materials	○				
Ceramic Tiles	○				
Paintings	○				
Heat insulation materials	○				
Aluminum D&W frames	○				
Steel D&W frames	○				
Glass	○				
D&W hardware	○				
Wooden furniture	○	○			
Distribution panel	○				
Lighting equipment	○				
Electricity wirings	○				
Wiring accessories	○				
Incoming panel	○				
Transformer	○				
Light electrical equipment	○				
PVC pipe	○				
Plumbing fixture	○				
Pump	○				
Water receiving tank	○				

2) Equipment

To address procurement prices and availability of equipment with appropriate specifications, the planned equipment will be basically procured from Japan or locally.

2-2-4-7 Operational Guidance Plan

Given that the planned equipment is basically consistent with the activities of the hospital concerned, and that the hospital personnel have enough operational experience, initial usage and operational guidance will be specific to procured equipment. Also, since equipment will be procured, in principle, from manufacturers that have distributors in the Philippines, technicians of these distributors will provide installation/ initial usage/ operational guidance.

2-2-4-8 Implementation Schedule

1) Project Implementation Schedule

Following the tendering and contract signing concerning construction and equipment procurement after the Exchange of Notes (E/N) and the Grant Agreement (G/A), which were signed between the two countries for implementation of the Project under the Grant Aid System of the Government of Japan,

facility construction, equipment procurement and installation will be implemented within a single fiscal year. The following shows approximate time needed for design, tendering and construction/ procurement:

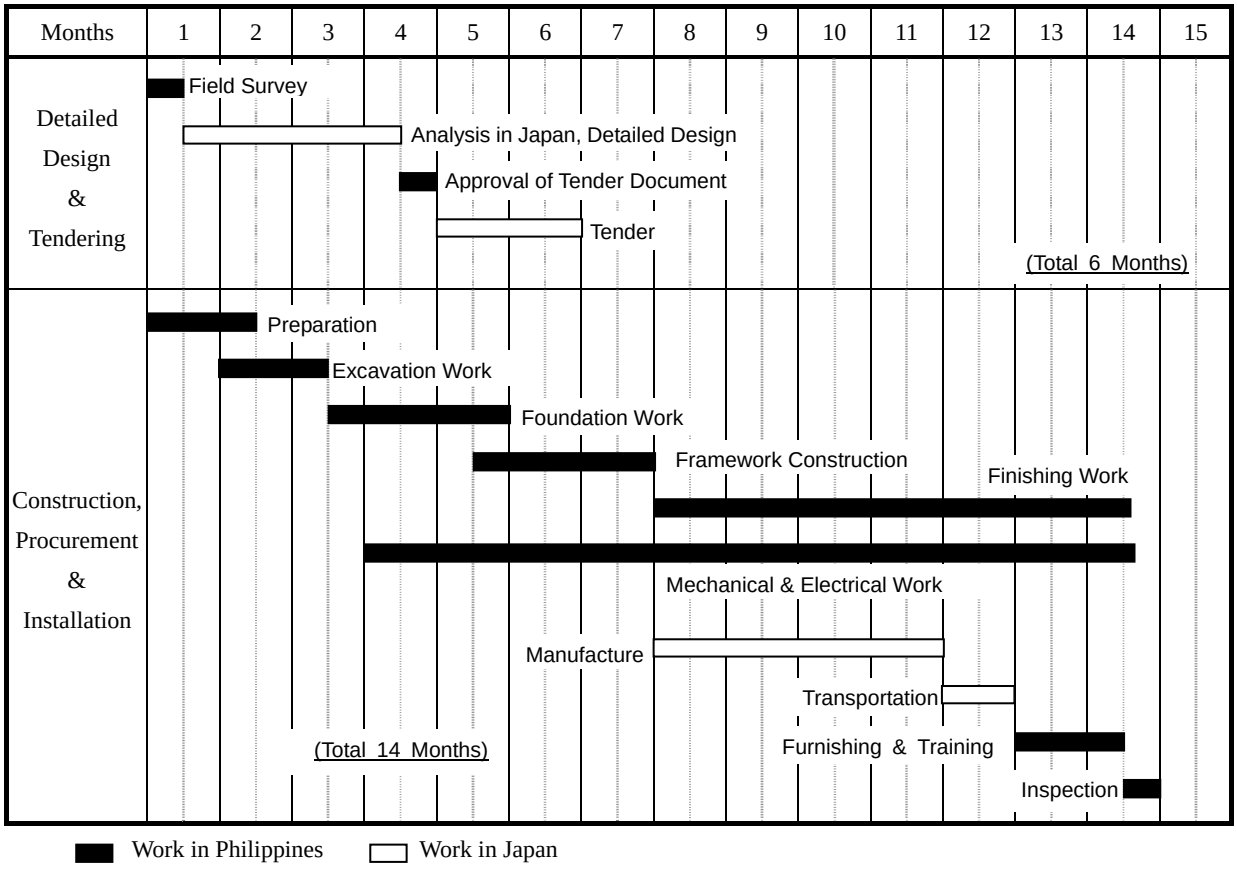
Table 2.30 Project Implementation Schedule

	Time Period
Detail Design Stage (Including field survey)	4.0 months
Tender Stage	2.0 months
Construction/ Procurement & Installation Stage	14.0 months

2) Implementation Schedule

The following table shows the implementation schedule of this Project.

Table 2.31 Implementation Schedule



2-3 Obligations of Recipient Country

The scope of work under the plan is described in "2-2-4-3 Scope of Work." The following describes overview of work borne by the Philippines.

(1) Process-Related

1) Land acquisition

The construction site is under the property of PGA of the Philippines.

2) Value-added tax (VAT)

It is necessary for PGA to make an arrangement to refund VAT to Japanese firm(s), construction firm(s) and equipment procurement firm(s) engaged in the Project, which pay the VAT when procuring construction materials and equipment in the Philippines for project implementation during the construction period. PGA needs to secure a budget for VAT refunds to be requested by Japanese firm(s), construction firm(s) and equipment procurement firm(s).

3) Arrangements for equipment/ materials imported from Japan or third countries

PGA shall make arrangements, including that for tax exemption, which will be needed for swift unloading, clearance and inland transportation procedures for materials and equipment imported from Japan or third countries.

4) Acquisition of Building Permit

Application for and acquisition of Building Permit concerning the Project need to be completed without delays prior to the commencement of actual work. Application for and acquisition of other permits needed for commencement of the construction should proceed in the same manner.

5) Banking Arrangement and issuance of Authorization to Pay

PGA will become a contact institution for this plan to promptly handle Banking Arrangement and issue Authorization to Pay based on the consultant agreement and contractor/ suppliers' contracts.

(2) Work Borne by the Philippine Side

The following is an overview of the Philippines' scope of work, which is essential for smooth implementation of the plan.

1) Clearance of existing facilities and trees, and land development at the planned construction site

The construction site is currently occupied by the facilities of the Provincial Farmers and Fisherfolks Information and Technology Service Center and the Philippine Coconut Authority. It has been confirmed that the Provincial Farmers and Fisherfolks Information and Technology Service Center will relocate within the Baler City and the Coconut Authority will relocate to Dinalungan in the north. Since the construction site is 60 to 70 centimeters lower in elevation than the ground level of the front road and the periphery, it requires land development including land filling and leveling to increase up to the same level.

Prior to the construction, PGA needs to clear the existing buildings, installations and trees, and to fill this lowered area to complete land development in line with the ground conditions designed for the construction

site.

2) Fence installation and tree planting

Fences will be installed in the east, south and western areas that face the roads. Given that AMH will become a teaching hospital for midwives as well as for nurses and doctors in the future, fence installation at the boundary with the UPN-SHS Baler will be left to the decision of PGA. Also, trees and plants will be planted if necessary.

3) Infrastructure improvement

PGA will install electric wires up to designated locations within the construction sites. Also, after completion of the construction, the facilities will require constant supply of medical gas and propane gas. Given that water will be supplied from the self-flowing water within the site and that there is no fixed-line telephone in Aurora, PGA will not bear the fees involved.

4) Bank payment commission

For applications for the Grant Aid System, PGA needs to prepare bank commissions that include an Authorization to Pay advising commission and a payment commission.

5) Relocation of existing equipment and furniture

PGA will be in charge of relocation of the existing equipment and furniture in the existing facilities as well as purchasing of the equipment and furniture which Philippine Side consider it necessary. Since relocation of the existing equipment and furniture can be done by the hospital staff without professional moving services, PGA will not bear any costs.

Timing of the relocation will be determined in accordance with the progress of the construction, but it will take place soon after the construction is complete.

2-4 Project Operation Plan

2-4-1 Organizational Set-up and Staffing

The current organization shown in Fig. 2.16 will be maintained. Within this organization, Clinical will be organized under the Clinical Department once permanent specialist doctors are secured and appointed as chiefs of the relevant specialties.

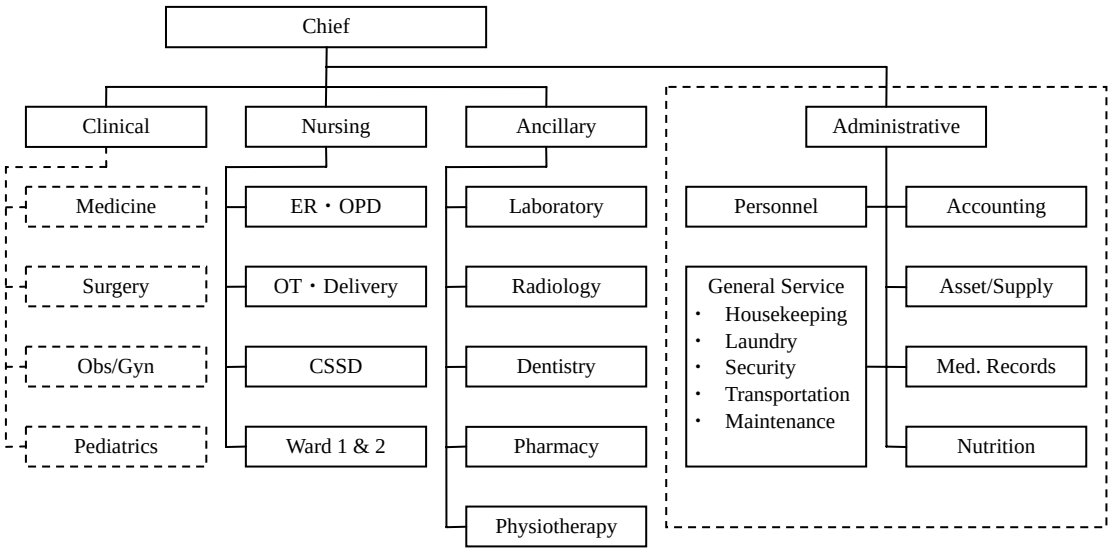


Fig. 2.16 Organigram of AMH

Given that the current manpower is enough to handle the workload of the new hospital, new hiring at the time when hospital opens will be minimized. Hence, the new hospital will hire a total of 4 new staff members: 1 permanent physician each for Surgery and Obstetrics/ Gynecology and 1 maintenance technician each for facility equipment and medical equipment at the Administrative Department. With this increase, the number of permanent and casual staff combined will become 91 as shown in Table 2.32, and, with the current 43 job orders, will total 134 staff members.

Table 2.32 HR Allocation Plan of AMH

Service	Function	Current	Addition	Total	Job Order
Administrative		41	2	**43**	14
Clinical	Chief	1	-	**1**	
	Specialist	4	2	**6**	
	General Practitioner	3	-	**3**	
Nursing		25	-	**25**	23
Ancillary	Dentistry	1	-	**1**	1
	Nutrition	3	-	**3**	
	Pharmacy	1	-	**1**	1
	Laboratory	3	-	**3**	3
	Radiology	4	-	**4**	
	Physiotherapy	1	-	**1**	1
Total		**87**	**4**	**91**	**43**

Note: Current number includes those of Permanent and Casual (Contractual in case of medical doctors) employees in 2009.

While it is difficult to hire new personnel under the financial situation of PGA, finding appropriate personnel

from the current technical staff at other departments of PGA to transfer them to AMH as maintenance technicians for building facilities and medical equipment is considered plausible. However, the workload for the maintenance technician for medical equipment may be too small if a person is fully dedicated to AMH. It is therefore important to study alternatives including one that extends the responsibility to management of medical equipment in other hospitals while keeping the technician's workplace in AMH and the name in PHO.

2-4-2 Maintenance Plan

(1) Facilities

For maintenance of the buildings, activities of the following items are needed:

Table 2.33 Facility Maintenance Items

Item	Frequency	Details
Power receiving and transforming equipment	Daily	Visual inspection
	Annually	Inspection and maintenance by a technician
Generator	Daily	Visual inspection
	Annually	Inspection and maintenance by a technician
Lighting fixture	When needed	Bulb replacement
Guidance lighting/ emergency lighting equipment	Weekly	Lighting test
Air-conditioner	Weekly	Visual inspection
	Quarterly	Filter cleaning/ replacement
	Annually	Air vent cleaning
Ventilation equipment	Monthly	Visual inspection, Fan belt adjustment
	Annually	Air vent cleaning
Water receiving tank	Weekly	Visual inspection
	Annually	Inner tank cleaning
Elevated water tank	Weekly	Visual inspection
	Annually	Inner tank cleaning
Feed-water pump	Daily	Visual inspection of the equipment
Chlorine sterilization	Weekly	Inspection of the amount of the remaining solution.
Drainage equipment	Daily	Visual inspection of the drainage equipment
Sanitary equipment	Weekly	Water flow inspection
Fire hydrant pump	Daily	Visual inspection of the equipment
	Bimonthly	Hydrant flow testing
Septic tank	Daily	Visual inspection inside the tank, garbage cleaning, disinfectant replenishment
	Every four months	Sludge extraction
Oxygen supply equipment	Daily	Manifold, visual inspection of the alarm system
	When needed	Oxygen cylinder replacement
	Annually	Inspection and maintenance by a technician
Air compressor	Daily	Visual inspection of the compressor
	Annually	Inspection and maintenance by a technician

(2) Equipment

The medical equipment requires the following maintenance activities:

1) Start-up inspection

Currently, equipment is inspected by the staff responsible for each of the items at any given time, and

minor failures are also handled by the responsible staff. However, given that inspection is expected to be done on a daily basis, it is now recommended that the staff inspect the equipment at the beginning of work every day.

2) After-work cleaning/ inspection

Although the hospital staff does not currently conduct regular cleaning and inspection for the medical equipment, it is important to clean each of the equipment at the end of work and to inspect failures to keep it in a good condition. Hence, if this activity is implemented, it will be recommended that a technician for installation of the equipment provide the staff with cleaning/ inspection instructions at the time of the delivery.

3) Calibration

For measurement accuracy, measurement devices need to be calibrated at a certain interval, but no such activity is currently conducted. Therefore, a technician for installation of the equipment requiring regular calibration will provide the staff with instructions for calibration at the time of the delivery.

4) Repair in the event of failure

Since neither the hospital nor PHO currently has a unit or technician with skills to repair medical equipment, repair of malfunctioning equipment is basically outsourced to its distributor in Manila. PHO is planning to employ a skilled technician and establish a repair unit in future, in line with which a recommendation will be given to establish a system which can swiftly deal with any breakdown of equipment.

5) Inventory management of supplies

Implemented on an as-needed basis, current procurement of supplies cannot effectively respond to urgent shortages. Hence, it will be recommended that, after the above maintenance department is established, the department carry a certain stock of supplies to ensure adequate inventory management.

2-4-3 Financial Planning

(1) Policy

With improvement of the capacity and services of AMH, its operational costs are expected to increase significantly. In order to cover this increase, all AMH can do is either to expect PGA to increase budget allocations or to increase the income of its own medical services. Given that PGA's funding is extremely rigid as costs of personnel services account for approximately 55% of the total, and that its allocation to the health sector remains at as low as 15% of the total, it is difficult for AMH to have optimistic view for such an increase. Hence, as policies for financial planning, AMH will make efforts to increase income from its services, and manage the income-expenditure balance to at least cover Maintenance & Other Operating Expenses (hereinafter called "MOOEs").

(2) Income Projection

① Methods

For projection of income from the hospital services, its financial data for a period of 5 months from January to May of 2009 are used. The estimated income was calculated as a product between the estimated number of medical cares and "income per care" obtained after dividing the amount of income by the number of medical care cases it actually provided. Some items used "Total Service Workloads[4](TSWs)", an indicator obtained by converting the number of patients by type, including IPD, OPD and ER, into the number of inpatients. Table 2.35 (1) & (2) shows the projection process and its result.

② Results

Table 2.34 compares the amounts in major income items between the current hospital and the new hospital. As a result of comparison of the total figures, the income of 3,364,000 pesos in fiscal 2009 year is estimated to increase by 5,222,000 pesos or 2.6 times to 8,586,000 pesos.

Table 2.34 Projection of Annual Service Income of New AMH

(Unit: thousand pesos)

Item	Current (2009)	Projection	Expected Increase
I. Service Income	2,437	7,187	4,750
Major items:			
1. Laboratory tests fees	940	2,192	1,250
2. Hospitalization fees (room & board)	872	2,168	1,296
3. Delivery fees	361	708	347
4. X-ray exam. Fees	185	207	19
5. Operation room fees (only for CSs)	56	1,200	1,144
6. Ultrasound exam. Fees	10	378	368
II. Certificate Issuing Fees	83	155	72
III. Hospital Account Total (I) + (II)	2,520	7,343	4,823
IV Income for Drug Revolving Fund	844	1,242	398
Grand Total (III)+(IV)	3,364	8,586	5,222

Note: Current (2009) Income is computed by converting 5 months' income from Jan. to May to 12 months', that is, by enlarging 5-month income 2.4 times.

The income increase exceeding the patient increase is due to an overall increase in the number of various examination and medical care cases that primarily include those in laboratory test fees, hospitalization fees and operation room fees. Of these items, laboratory tests will significantly contribute to the income increase with not only its increased test cases but also the change in the scope of tests it can perform; tests that are currently conducted in private institutions will be conducted by AMH with installation of new clinical test equipment.

[4] Income/ expenditure of a hospital come from all medical care of inpatients and OPD/ ER patients. "Total Service Workloads (TSWs)" is an indicator created to efficiently indicate the number of inpatients, OPD/ ER patients, instead of separating them by category to help overall understanding of management efficiency and work efficiency of the hospital as one business entity. This converts the number of all patients into the number of inpatients as it uses a formula of "total inpatients + (total OPD patients + ER patients)/ 3" on the assumption that 3 OPD/ ER patients are equivalent to 1 inpatient. The figure of TSWs will be 14,600 + (13,500 + 3,200) /3 = 20,167, using the figures stated in Table 3.9.

Table 2.35 (1) Projection of Annual Income of New AMH

(unit: pesos)

	Item	Determinant	Actual Income in 2009 Jan. to May(a)	Performed Cases in 2009 Jan to May(b)	Income per case (c)= (a)/(b)	Projected Number of cases (d)	**Projected Income** (c)x(d)
Service Income	1. Laboratory fee	Total test cases	391,777	6,084	64	22,870	1,472,705
		Biochem. Cases			450	1,600	720,000
	2. Hospitalization (Room &Board) fee	Total bed-days	363,788	Charity-1,327, PHIC/Pay-464	C- 60/day, P-400/day	C-10,800, P-3,800	2,168,000
	3. Delivery fee	Delivery cases	150,778	166	908	780	708,475
	4. X-ray exam. Fee	X-ray test cases	76,901	947	81	2,560	207,884
	5. Oxygen fee	Total bed-days	40,049	1,791	22	4,760	106,440
	6. ECG test fee	ECG test cases	4,980	46	110	720	79,200
	7. Supplies	TSWs	10,513	10,614	1.0	20,167	20,167
	8. Doctors fee	Neglectable	5,700				0
	9. OR/ ER fee	C/S cases	23,421	2	10,000	120	1,200,000
	10. Anethesiology fee	Neglectable	0				0
	11. Other Services fee	TSWs	23,114	10,614	2.2	20,167	43,917
	12. Ultrasound test fee	Ultrasound cases	3,990	12	350	1,080	378,000
	13. Circumcision fee	Same as 2009's	42,400	132			42,500
	14. Physiotherapy fee	Rehabili. cases	1,980	50	40	1,020	40,800
	Sub Total (A)		**1,015,508**	-			**7,187,897**
Certificate Issuing	1. Birth Certificate	Delivery cases	35,382	371	100	780	78,000
	2. Medical Certificate	TSWs	33,310	10,614	3.1	20,167	63,290
	3. Driver's License	Same as 2008's	14,600	n.a.			14,600
	Sub Total (B)		**83,292**				**155,890**
Hospital Accounting Total		**(A)+(B)**					**7,343,787**
Revolving Med. Program Income(C)		See Table 2.35(2)	352,016				1,242,287
Grand Total		**(A)+(B)+ (C)**					**8,586,074**

Note: 1) "C" and "P" in "2. Hospitalization fee" indicate those from Charity and PhilHealth/Pay patients respectively.
2) Figures in Certificate Issuing show the result in 2008 instead of those in 2009, since the result in 2009 is not prepared yet.

Table 2.35 (2) Assumption and Procedures to Compute Each Item

Service Income	1.Laboratory fee	Total test cases	P.64/case * 22,870 cases
		Clinical test. Cases	Introduction of an automatic analyzer will contribute to add incomes. Computation formula: P.450/case * 1,600 cases, is based on following assumptions. 1) Clinical tests account for 7% of total laboratory tests 22,870 cases, which is the same share of FBS/ RBS tests in2008. 2) Unit fee P.450/case covers 3 item analysis such as total cholesterol levels and each analysis costs P.150.
	2.Hospitalization (Room &Board) fee	Total bed-days	Increasing private and 2-beds semi private rooms with air-conditioning for PhilHealth patients will allow AMH to charge P.400/day closest to the PhilHealth ceiling price, while P.60/day will be charged to self-payment and charity patients. Computation formula: P.400/day * 3,800 bed-days =P.1,520,000 for PhilHealth, P.60/day * 10,800bed-days =P.648,000 for Self/ Charity. Computation is based on the assumption that PhilHealth patients account for 26% of estimated 14,600 total bed-days, which is same share as the present.
	3.Delivery fee	Delivery cases	P.908/case * 780 cases
	4.Xray exam. Fee	Xray test cases	P.81/case * 2,560 cases
	5.Oxygen fee	Total bed-days	Oxygen is used mainly to inpatients in intermediate and serious conditions. P.22/inpatient * 4,760 inpatients
	6.ECG test fee	ECG test cases	P.110/case * 720 cases
	7.Supplies	TSWs	P.1/bed-day * 20,167 TSWs
	8.Doctors fee	Neglectable	Assumed 0 because current amount of income is vanishingly small.
	9.OR/ ER fee	C/S cases	Current regulation allows AMH to charge the fee only in case of Caesarean section P.10,000/case * 120 C/S cases
	10.Anethesiology fee	Neglectable	Assumed 0 because it is not charged even currently.
	11.Other Services fee	TBDs converted	P.2.2/bed-day * 20,167 TSWs
	12.Ultrasound test fee	Ultrasound cases	P.350/case * 1,080 cases
	13. Circumcision fee	Same as 2009's	Assumed same amount as that in 2009
	14. Physiotherapy fee	Rehabili. cases	P.40/case * 1,020 cases
Certificate Issuing	1.Birth Cert.	Delivery cases	P.100/case * 780 cases
	2.Medical Cert.	TBDs converted	Number of cases is not available: P.3.1/bed-day * 20,167 TSWs
	3.Driver's License	Same as 2008's	Assumed same amount as that in 2009 since number of cases is not available.
Revolving Med. Program Income		Expenses x 110%	Add 10% to the purchase costs of drugs as handling charges, which is presented in Table 2.42 (1) as "Revolving Medicine Program": P.1,129,352 * 110%

Note: The amount of the unit fee in each item is computed from "Income per case" of Table 2.35 (1).

(3) Expenditure Projection

① Methods

According to the accounting system, the expenditure of AMH can be largely classified into four categories, two of which, personnel services and MOOEs, are indicated in the hospital accounting. Drugs and medicines in the revolving the medicine program accounting and electricity charges in PGA accounting are separated from the hospital accounting. However, hospitals in other provinces that do not employ the revolving medicine program accounting include expenditures of their drugs and medicines in the hospital accounting, in this estimation, drugs and medicines were included in the hospital accounting. See "2-5-2 Operation and Maintenance Expenditure" for estimation of each item and specific estimation methods.

Table 2.36 Method of Expenditure Projection by Type of Accounting System

Type of Accounting System	Major Title of Expenses	Method of Expenditure Projection
Hospital Accounting	Personnel Services	Refer to "2-5-2 (2)"
	MOOEs	Refer to "2-5-2 (3)"
Revolving Medicine Program Accounting	Drugs and Medicines	Refer to "2-5-2 (3)"
PGA Accounting	Electricity Charges	Refer to "2-5-2 (4)"

② Results

Table 2.37 shows comparison of current and estimated expenditures of the hospital and major items. The total amount excluding electricity charges is expected to increase by 4,387,000 pesos or 17.5% from the current 25,085,000 pesos in fiscal 2009 to 29,472,000 pesos under the new hospital, and electricity charges are expected to nearly triple from the current figure to 1,231,000 pesos.

Table 2.37 Comparison of Current & Estimated Operating Expenditures of AMH (unit: thousand pesos)

Item	Current (2009)	Projection	Expected Increase
I. Personnel Services	19,417	20,999	1,581
II. MOOEs (including amount of III.)	5,667	8,473	2,806
Major items:			
1. Medical, Dental & Laboratory Supplies	1,683	2,409	726
2. Oxygen Gas	0	585	585
3. Consultancy Expenses (Contract specialist)	492	852	360
4. Repairs & Maint. – Building.	0	225	226
5. Repairs & Maint. – Equipment	30	60	30
III. Revolving Medicines Program Expenses	585	1,129	543
IV. Hospital Total (I) + (II)	25,085	29,472	4,387
V. Electricity Charges	442	1,231	789

Note: Current expenses (in 2009) are quoted from the Budget Plan of AMH in 2009.

While the numbers of inpatients and OPD/ ER patients are expected to increase by 20% and 5%, respectively, the cost increase remains at 17.5%. This is due to the minimum staff increase, which resulted in a slight increase in the expenditures of personnel services by 1,581,000 pesos or 8.1%. As a result, the percentage of the expenditures of personnel services in the total lowered from 77.4% to 71.2%, slightly reducing the rigidity of the budget. On the other hand, MOOEs were estimated to increase by 49.5%, along with an increase of its percentage in the total hospital costs, to 28.7%. Apart from electricity charges, individual expense items with large increases include medical cares/ dental materials, laboratory supplies, purchase of oxygen gas, and expenditures of drugs and medicines.

(4) Prospects for Financial Improvement and Required Measures

The degree of improvement in AMH's financial conditions with investment in hospital buildings and equipment was assessed by means of the above income and expenditure projections. Table 2.38 shows comparison of financial conditions among the new/ old AMH and reference hospitals.

Table 2.38 Comparison of Cost Recovery Ratio among Hospitals

(Unit: thousand pesos)

Item	Projection	Comparison		
	New AMH	AMH	Biliran	Benguet
		Jan-May, 2009	2008	2008
DOH Licensing level	2	1	2	3
Service Income (A)	8,586	1,535	9,908	55,702
Total Expenditure (B)	29,472	12,898	48,293	87,408
Of which, MOOEs (C)	8,473	1,295	16,361	27,457
Cost Recovery Ratio (A/B)	**29.1%**	**11.9%**	**20.5%**	**63.7%**
Income-MOOEs Ratio (A/C)	**101.3%**	**118.5%**	**60.5%**	**202.8%**

Note: Electricity expense is excluded from the expenditures in the table.
Source: Financial information from each hospital except for "Projection of new AMH"

As a result of computation, the cost recovery ratio of the new AMH is 29.1%, more than double of 11.9% in 2009. Compared with the recovery ratio of reference hospitals, the ratio of the new AMH is still far from that of Benguet Hospital, 63.7%, but significantly exceeds that of Biliran Hospital, 20.5%. The income to MOOEs ratio is projected 101%, slightly lower than 118% in 2009, but it means that the income will still be enough to cover MOOEs excluding the expenditures of personnel services.

This presents prospects for achievement of the new AMH's financial goal, which aims to improve the cost recovery ratio while maintaining the current income to MOOEs ratio above 100%. Even in that situation, PGA will bear a total of 2,453,000 pesos of additional expenditures, which consist of a labor cost increase of 1,581,000 pesos and an electricity expenditure increase of 872,000 pesos.

If AMH is able to maintain its income to MOOEs ratio above 100% with systematic support by PGA to grant a certain degree of freedom of the hospital management, this Project will potentially contribute to the financial management of PGA in terms of:

① Clarifying the division of responsibilities for the hospital management between PGA and AMH. Specifically, PGA will bear the expenditures of personnel services, and AMH will bear MOOEs from its income.

② Preventing the operation of AMH from creating significant additional strains on the financial management of PGA. Regardless of the operation of AMH, PHO will be able to secure operational budgets for other hospitals.

On the other hand, it is important to note that shifting the obligation of the electricity payment from PGA to AMH will lower the income-MOOE ratio to 87.8%. This is fundamentally due to AMH's limited income, and to improve the situation requires not only PGA's support such as revision of the hospital accounting system but also AMH's own effort to increase its income. For example, many of the items estimated in Table 2.35 are services calculated based on the current low fees, and some of the items, including Anesthesiology, were not

calculated because of lack of rules concerning their fees. AMH will have more chances of increasing its income with improvement of the following accounting practices along with the above items.

① Whether there are chargeable services that are not charged to patients and insurers in practice.

② Whether the hospital services are charged to all patients, and the fees are collected.

③ Whether services are adequately priced to recover the unit expenditures.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

The cost to be borne by Phillipine side for implementing this Project under Japan's Grant Aid System is estimated at 80 million Pesos (170 million yen). With the conditions of cost estimation in (2) below, breakdown of the cost to be borne by the Philippines under the said classification can be estimated as follows:

(1) Cost Estimation to be Borne by Philippine Side

Table 2.39 Projection of Expenditures to be Borne by Philippine Side

Items	Expenditure Projection	
	(in Thousand P)	(in Thousand JPY)
1) Demolition of Existing Buildings	4,288	9,176
2) Removal of Existing Trees & Bushes	3,710	7,939
3) Backfilling Up to Road Level	5,522	11,817
4) Land Preparation	12,858	27,516
5) Construction of Boundary Fence	5,488	11,744
6) Electricity Incoming Line to the Site	100	214
7) Procurement of Furniture and Blinds	4,900	10,486
8) Planting Works (trees, lawns, etc.)	1,165	2,493
9) VAT assumption	41,151	88,063
10) Banking Commissions	524	1,122
Total	79,706	170,570

(2) Conditions of Cost Estimation

1) Period of Cost Estimation: June 2009

2) Exchange Rate: US$ 1 = 95.69 JPY、P 1 = 2.14 JPY
(6 months average from December 2008 to May 2009)

3) Construction Period: It is estimated that the project would be implemented in a single fiscal year, and the period of detailed design, construction and procurement of equipment is identified in the implementation schedule.

4) Others: This cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant.

2-5-2 Operation and Maintenance Cost

(1) Policy for Cost Estimation

Expenditures of personnel services and MOOEs of the new AMH were estimated based on the following policies:

① Income and expenditure shall be estimated based on the assumption that the new hospital starts at the present period. This avoids uncertainty over assessment of the future hospital management based on estimates calculated from appreciation of past prices and salaries.

② The estimates shown in "1. Project Overview" shall be used as the numbers of AMH patients and treatment/ test cases that are the key to the income and expenditure projections. However, some expense items will use "total service workloads," an indicator that converts the numbers of patients separated by inpatients, and OPD/ ER patients into the number of inpatients combined, instead of using the separate numbers.

(2) Expenditures of Personnel Services

Expenditures of personnel services for a total of 5 new staff members: expenditures of 3 new specialist doctors (Internal Medicine, Surgery, and Obstetrics & Gynecology) and 2 maintenance technicians (facility/ medical equipment) will be added to the costs of personnel services in fiscal 2009. This increase in the annual expenditures of personnel services will be calculated by the following formula:

(395,350 pesos/ year x 3 specialist doctors) + (197,675 pesos/ year x 2 technicians) = 1,581,400 pesos

(3) MOOEs

① Projection methods

MOOEs consist of expense items including medical supplies, drugs/ medicines, food supplies and telephone charges, but excluding expenditures of personnel services. Given that the service level of AMH is to improve, estimation of MOOEs will to refer to expenses of more costly Level 2 or 3 hospitals. In this case, it used unit expenditures and the amounts in total under the following three groups categorized in accordance with the amounts and characteristics of the expenditure items. For example, per-patient expenditures (unit expenditures) of medical supplies and drugs/ medicines of four hospitals (the current AMH, Biliran Hospital, Ed. Joson Memorial Hospital and Benguet Hospital) were computed and compared to adopt an intermediate unit expenditures, which was multiplied by the number of patients for projection of MOOEs. On the other hand, items, including domestic travelling, that are currently expended little but are not likely to increase in the future used the current expenses without any changes while other items, including oxygen gas, were estimated differently, based on the separately calculated usage estimates.

Table 2.40 Three Types of Projection Method

	Projection Method	Major Items Corresponded to
1	Adopt appropriate per capita expenses from 4 hospitals	Medical, Dental- Lab. Supplies, Food supplies, Drugs & Medicines
2	Adopt amount of current AMH expenses	Small expenses item such as Travelling – Local, Training, etc.
3	Adopt amount of expenses projected in "5.2 (4)"	Oxygen Gas, Repairs & Maint. – Hospital Building.

Table 2.41 shows results of the projection using the method that "1. Adopt appropriate per capita expenses from 4 hospitals" of the above three methods. "(C) Expenses per patient (=A / B)" in this table shows that the expenses of medical, dental & laboratory supplies of Ed. Joson Memorial Hospital are the highest, whereas those of Benguet Hospital are the lowest, and that the expenditures of food supplies of AMH are the highest, whereas those of Benguet Hospital are the lowest. However, no particular trend was observed as expected that the unit expenditure was likely to be higher for hospitals of higher levels. For this reason, a median of the highest and lowest figures was obtained for each of the items, and, as a result, the estimation used many of the unit expenditures of Biliran Hospital, which has regional characteristics similar to those of Aurora Province in terms of regional remoteness.

Table 2.41 Comparison of Amount and Unit Expenditures of Major Items of MOOEs of 4 Public Hospitals

(unit: peso)

(A) Expenditure of major items	Code	AMH	Biliran	Ed. Joson	Benguet
MOOEs Total		6,558,000	16,361,855	16,190,000	27,457,735
Office Supplies	755	206,000	294,972	350,000	1,697,313
Medical, Dental & Laboratory Supplies	757	1,541,000	5,554,022	4,400,000	8,598,700
Food Supplies	758	1,188,000	3,119,244		2,947,615
Drugs and Medicines	759	101,676	2,617,130	4,700,000	6,232,254
Payments to contracted consultants	793	420,000	-	240,000	500
Repairs & Maint. – Hospital equipment	832	8,000	46,000	100,000	486,107
Repairs & Maint. – Motor Vehicle	841	41,000	-	100,000	137,890
Repairs & Maint. – Total	811-850	11,000	119,755	n.a.	643,184
Revolving Medicines Program	-		-		4,000,000
(B) No. of patients	**Code**	**AMH**	**Biliran**	**Ed. Joson**	**Benguet**
Admission (a)		3,959	7,738	6,058	6,058
Total Bed Days (b)		7,689	36,102	20,739	45,341
OPD Patients (c)		12,845	18,336	25,488	78,900
Emergency Visits (d)		3,074	12,836		21,630
OPD + Emergency Patients (e)		15,919	31,172	25,488	100,530
OPD & ER patients Converted to Bed-Days	(f) = (e) / 3	5,306	10,391	8,496	33,510
Total Bed-Days Converted	(g) =(b) + (f)	**12,995**	**46,493**	**29,235**	**78,851**
Expenses per patient (=A / B)	**Code**	**AMH**	**Biliran**	**Ed. Joson**	**Benguet**
Office Supplies	755	15.9	**6.3**	12.0	21.5
Medical, Dental & Laboratory Supplies	757	118.6	**119.5**	150.5	109.0
Food Supplies	758	154.5	86.4	n.a.	**65.0**
Drugs and Medicines	759	8	**56**	161	79
Repairs & Maint. – Hospital equipment	832	0.62	0.99	3.42	6.16
Repairs & Maint. – Motor Vehicle	841	3.15	n.a.	3.42	1.75
Repairs & Maint. – Total	811-850	0.85	2.58	n.a.	8.16
Revolving Medicines Program	-				50.7

Note: Values of AMH represent the accumulating total of 5 months from Jan. to May in 2009, while others show the annual total in 2008.

② Results

Table 2.42 (1) & (2) shows processes and results of the projection. “Determinant” in this table refers to the most crucial factor among those determining the amount of each expense item. For example, as for the expenses of medical, dental and lab. supplies, total service workloads (TSWs) is regarded as a determinant to estimate the amount by multiplying the unit expenditure of 119.5 pesos by 20,167 TSWs. In addition, the costs for hospital equipment and motor vehicles in “Repairs and Maintenance” used the actual expenditures of the current AMH for estimation, instead of using the comparison unit expenditures in Table 2.41 for several reasons including: for medical supplies, the difficulty of obtaining an average unit expenditure of medical supplies from the varying unit expenditures of the four hospitals, and, for vehicles, the absence of plans to purchase new vehicles. Also, the repair and maintenance expenses of the hospital building and equipment and the electricity charges used the figures estimated in “(4) Estimation of facility/ equipment maintenance expenses.”

As a result of the above projection, MOOEs and electricity charges of the new hospital were estimated to be 8,475,000 pesos and 1,232,000 pesos, respectively. The estimated MOOEs have an increase of 2,807,000 pesos from its budget of 5,667,000 pesos in 2009. This is largely due to increases in the expenses of medical, dental and lab. supplies, drugs and medicines, consultancy expenses for visiting doctors and electricity charges.

Since, as clearly shown in Table 2.41, the unit expenditures of some expense items of the other hospitals significantly vary from one another, those figures together do not indicate a certain tendency as predicted earlier. This could be due to the facts that the projection used samples from only four hospitals, each of which has unit expenditures that reflect circumstances that are specific to the hospital, and that the guidelines that specify the scope of each expense item vary from one another. Hence, PHO needs to continue to collect information of other hospitals concerning expenditures to improve accuracy of its predictions.

Table 2.42 (1) Projection of Annual MOOEs of New AMH (Unit: Pesos)

MOOE Expense Item	Code	Unit Expenditure (a)	Determinant	Quantity (b)	Estimation (a) x (b)	Budget In 2009
Travelling – Local	751	-	Same as 2009[1)]		125,200	125,200
Training	753	-	Same as 2009		25,000	25,000
Office Supplies	755	6.3	TSWs	20,167	127,050	110,300
Accountable Forms	756	2.46	TSWs	20,167	49,660	32,000
Food Supplies	758	65.0	Total bed-days[2)]	14,600	949,000	960,000
Medical, Dental & Laboratory Supplies	757	119.5	TSWs	20,167	2,409,917	1,683,800
Drugs and Medicines	759	-	[3)]			-
Oxygen Gas	-		See 2-5-2(4)		585,518	
Gas, Oil and Lubricants	761		Current + Addition		204,543	95,000
Other Supplies	765	6.54	TSWs	20,167	131,910	85,000
Cooking Gas	768	6.50	See 2-5-2(4)	14,600	151,807	50,000
Telephone –Mobile	773	-	Same as 2009		0	0
Advertising and Others	780	-	Same as 2009		3,500	3,500
Consultancy Expenses (Contract specialist)	793	-	No. of specialists	Add 360,000	852,000	492,000
General Services	795	1.92	TSWs	20,167	38,797	25,000
Janitorial Services	796	-	Same as 2009		30,000	30,000
Repairs & Maint. – Hospital Building.	813	-	See 2-5-2(4)		225,429	0
Repairs & Maint. – Office Equipment	821	-	Same as 2009		15,000	15,000
Repairs & Maint. – Hospital equipment	832	-	Twice of 2009		60,000	30,000
Repairs & Maint. – Motor Vehicle	841	-	Same as 2009		50,000	50,000
Repairs & Maint. -Furniture, IT equip, etc.		-	Twice of 2009		44,000	22,000
Taxes, Duties and Licenses	891	-	Same as 2009		0	0
Fidelity Bond Premiums	892	-	Same as 2009		15,000	15,000
Other Maint. & Operation	969	2.54	TSWs	20,167	51,212	33,000
Health Services Program (Job Order staff)	-	-	Same as 2009		1,200,000	1,200,000
Revolving Medicines Program	-	56	TSWs	20,167	1,129,352	585,604
MOOEs				**Total**	**8,475,106**	**5,667,404**
Electricity Charges			See 2-5-2(4)		1,231,802	442,000

Note: 1) "Same as 2009" in the columns of Determinant indicates that the same amount as that in 2009 budget plan is applied.
2) "Total bed-days" is applied as a determinant since "Food Supplies" is valid only for inpatients.
3) Expenditure of "Drugs and Medicines" is computed in "Revolving Medicine Program".

Table 2.42 (2) Assumption and Procedures to Compute Each Item

Travelling – Local	Set as much as the current amount because of no occasion to expect major increases
Training	Set as much as the current amount because of no occasion to expect major increases
Office Supplies	Adopt Biliran's unit cost because AMH's current cost is judged higher than others
Accountable Forms	Adopt AMH's current unit cost without comparison because the amount is negligibly small
Food Supplies	Adopt Benguet's unit cost because AMH's current cost is judged higher than others. Total bed-days is adopted as determinant since this cost arises only from inpatients' care.
Medical, Dental & Laboratory Supplies	Adopt Biliran's unit cost because AMH's current cost is judged higher than others
Drugs and Medicines	Result of computation is presented in "Drug Medicine Program"
Oxygen Gas	Adopt a figure estimated at "2-5-2 (4) Operation & Maintenance Cost of Building and Equipment"
Gas, Oil and Lubricants	Add P.109,543 as diesel oil expenses computed at "2-5-2 (4)" to planned expense in 2009's budget.
Other Supplies	Adopt AMH's current unit cost without comparison because the amount is negligibly small
Cooking Gas	Adopt a figure estimated at "2-5-2 (4) Operation & Maintenance Cost of Building and Equipment"
Telephone –Mobile	Set as much as the current amount because of no occasion to expect major increases
Advertising and Others	Set as much as the current amount because of no occasion to expect major increases
Consultancy Expenses (Contract specialist)	Add P.360,000 (=P.30,000 x 12 months) as rewards for a surgeon to current P.492,000 rewards for 3 specialists.
General Services	Adopt AMH's current unit cost without comparison because the amount is negligibly small
Janitorial Services	Set as much as the current amount because of finding no occasion to increase
Repairs & Maint. – Hospital Building.	Adopt a figure estimated at "2-5-2 (4) Operation & Maintenance Cost of Building and Equipment"
Repairs & Maint. – Office Equipment	Set as much as the current amount because of no occasion to expect major increases
Repairs & Maint. – Hospital equipment	Double planned expense in 2009 with taking account of introduction of many new equipment
Repairs & Maint. – Motor Vehicle	Set as much as the current amount because of no occasion to expect major increases
Repairs & Maint. -Furniture, IT equip, etc.	Double planned expense in 2009 with taking account of introduction of IT equipment system.
Taxes, Duties and Licenses	Set as much as the current amount because of no occasion to expect major increases
Fidelity Bond Premiums	Set as much as the current amount because of no occasion to expect major increases
Other Maint. & Operation	Adopt AMH's current unit cost without comparison because the amount is negligibly small
Health Services Program (Job Order staff)	Set as much as the current amount because of no plan to employ Job Order staff.
Revolving Medicines Program	Adopt Biliran's unit cost because AMH's current cost is judged too lower than others
Electricity Charges	Adopt a figure estimated at "2-5-2 (4) Operation & Maintenance Cost of Building and Equipment"

(4) Estimation of Facility/ Equipment Maintenance Costs

1) Facilities

Building operation and maintenance will require approximately 2,079,000 pesos/ year (approx. 4,448,000 yen) for utility expenditures and a total of 225,000 pesos/ year (approx. 486,000 yen) for supply expenses of some 100,000 pesos/ year (approx. 216,000 yen) and maintenance expenses of some 125,000 pesos/ year (approx. 270,000 yen) combined.

Daily inspection of the equipment will be conducted by the hospital staff, and the expenses of personnel services of the staff are not included in the above figures.

Table 2.43 Estimated Annual Expenses of Facility Maintenance

Category	Item	Work/ projection method	Frequency	Amount (pesos)	
Utility	Electricity	Estimated from the lighting and air-conditioning usage.		1,231,802	P/yr
	Gas	Estimated from the usage at the kitchen.		151,807	P/yr
	Oxygen	Estimated from the usage.		585,518	P/yr
	Light oil	Estimated from the number of hours of generator operation.		109,543	P/yr
	Sub-total			2,078,670	P/yr
Supplies	Lighting fixtures	Replacing 20% of fluorescent lights each year	At any given time	40,000	P/yr
	Chlorine solution	Estimated form replenishment and supply of chlorine solution	Quarterly	10,185	P/yr
	Filter	Estimated from filter replacement and its quantity	Annually	50,000	P/yr
	Sub-total			100,185	P/yr
Maintenance	Power receiving and transforming equipment	Inspection by the hospital facility technician	Monthly		P/yr
	Private generator	Only including inspection and parts replacement by the hospital facility technician	Monthly	55,800	P/yr
	Tank cleaning -Water receiving tank	Cleaning by the hospital facility technician	Annually		P/yr
	Tank cleaning -Elevated water tank	Cleaning by the hospital facility technician	Annually		P/yr
	Maintenance -Septic tank	Inspection by the hospital facility technician	Every four months		P/yr
	Sludge extraction - Septic tank	Work done by the professional services	Every four months	69,444	P/yr
	Medical gas inspection	Inspection by the hospital facility technician	Semi-annually		P/yr
	Sub-total			125,244	P/yr
Total				2,304,100	P/yr

2) Equipment

Of equipment operation and maintenance expenses that are estimated to increase after implementation of the plan, expenses of supplies and replacement parts are estimated to be 1,624,917 pesos (approx. 3,477,000 yen) annually, as shown in the table below:

Table 2.44 Estimated Annual Expenses of Supplies and Spare Parts of Medical Equipment

Code	Description	Q'ty	Consumable/ Spare parts	Annual Consumption	Unit Price (P)	Total Price (P)
4	X-ray Film Illuminator	9	Fluorescent Lamp	1	83	747
17	Dental X-ray Unit	1	Film (100 sheets)	12	1,850	22,200
	Film Processor	1	Developing Fluid/ Fixing Solution	3	780	2,340
34	General X-ray System	1	Film (100 sheets)	46	3,700	170,200
40	Automatic X-ray Film Processor	1	Developing Fluid/ Fixing Solution	3	14,950	44,850
44	Ultrasound Machine for General Examination	1	U/S Gel	46	280	12,880
			Recording Paper	6	550	3,300
45	Electrocardiograph Machine	2	ECG Cream (250mg Tube)	12	120	2,880
			Recording Paper (10 pcs)	2	600	2,400
46	Hematology Analyzer	1	Reagent (for 900 tests)	1	39,280	39,280
			Recording Paper (20Pcs)	3	1,920	5,760
47	Blood Coagulation Analyzer	1	Reagent for approx. 120 tests	0.5	63,970	31,985
			Recording Paper	6	930	5,580
48	Electrolyte Analyzer	1	Reagent	6	21,400	128,400
			Recording Paper	6	3,740	22,440
49	Spectrophotometer	1	Reagent (5 Parameter/ Person、300 Test)	24	7,010	168,240
			Recording Paper (25 m x 5 pcs)	6	700	4,200
58	pH Meter	1	Electrode	2	13,550	27,100
73	Syringe Infusion Pump w/ Stand	2	Syring	320	12	7,680
74	Infusion Pump w/ Stand	5	Infusion Set	320	38	60,800
83	Oxygen Tent for Pediatric	1	Oxyge (60lbs)	100	650	65,000
84	Oxygen Regulator w/ Trolley & Tank	15	Oxyge (60lbs)	25	650	243,750
93	Defibrillator	4	ECG Cream (250mg Tube)	0.5	120	240
			Recording Paper(50 x 30mm)	0.5	60	120
94	Washing Machine	1	Detergent	12	470	5,640
106	Operating Light (Small)	3	Spare Bulb	0.5	1,800	2,700
107	Examination Light (Goose Neck Type)	2	Spare Bulb (100w)	1	38	76
112	Water Sterilizing Unit	2	Filter	1	28,030	56,060
			Ultraviolet Lamp	1	30,460	60,920
113	Bedside Monitor	6	ECG Cream (250mg Tube)	46	120	33,120
			Recording Paper (50 x 30mm)	6	60	2,160
118	Phototherapy Unit	1	Fluorescent Lamp	1	83	83
121	Bilirubin Meter	1	Capillary Tube (100 pcs.)	12	373	4,476
			Sealing Pate (10 pcs.)	1	5,140	5,140
122	Anesthesia Apparatus w/ Vaporizer	1	Anesthetic	46	4,670	214,820
			Soda Lime	24	3,600	86,400
128	Operating Lights	2	Spare Bulb	2	1,800	7,200
137	Surgical Scrub Station	1	Filter	1	28,040	28,040
			Ultraviolet Lamp	1	30,500	30,500
144	Fetal Monitor	1	U/S Gel	6	120	720
			Recording Paper	6	1,590	9,540
149	Ultrasound Machine for Obs./ Gyn.	1	U/S Gel	3	550	1,650
			Recording Paper (1 roll= 1,000 shots))	6	550	3,300
					Total	1,624,917

2-6. Other Relevant Issues

The following items shall be noted for the Project to be implemented smoothly.

- It is necessary to obtain approval from ICC before the cabinet approval in Japan as the total cost of the Project exceeds 500 million pesos. The Philippine side had applied for approval with the help from the study team during the visit for the Explanation of the Draft Report. The Project has already obtained the ICC approval on 28th January, 2010.
- Before the construction under Japanese side starts, Philippine side shall complete the land preparation works, which includes demolision of the existing buildings, removal of trees & bushes, backfilling of the soil up to the road level, and installation of the electricity incoming line to the site.
- After the completion of the construction under Japanese side, Philippine side shall relocate the existing equipment and furniture from the existing AMH in the way not to interfere the operation of the hospital.

Additionally, after the completion of the Project, the followings shall be paid special attention so that the new AMH will consolidate stable and sustainable operation.

- To secure adequate human resources, including specialist doctors, chief administrative officer, and maintenance engineers.
- To make every effort to increase the medical services income.
- To secure adequate budget allocation to AMH continuously.
- To improve maintenance capability and capacity, with enough budget for maintenance expenses.

Chapter 3 Project Evaluation and Recommendations

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effect

The present AMH is a Level 1 general hospital, as classified by DOH, with 25 beds staffed by one specialist doctor and four general physicians. Although it is officially positioned as the top referral hospital of the province, it is not functioning properly as such due to the absence of specialist doctor at present and insufficient and aged facilities and equipment, nor is it officially satisfying the criteria for serving as the teaching hospital of UPM-SHS. This Project was proposed for the purpose of achieving the two objectives of improving AMH's medical services and upgrading it to the status of a teaching hospital of UPM-SHS Baler. It intends to achieve the objectives by relocating AMH to the plot adjacent to the construction site of the UPM-SHS Baler campus and newly constructing and equipping its facilities so that it can provide Level-2 or higher-level medical services, as well as by streamlining hospital administration by optimizing its financing plan. As a result, the new AMH will be able to deliver medical services as the top referral hospital of Aurora Province and function as the teaching hospital of UPM-SHS Baler on a permanent basis. This Project consists of the construction of the new AMH as a Level-2 hospital with 50 beds and the procurement of equipment necessary for the facilities.

The direct and indirect effects to be brought about by the implementation of this Project are summarized below.

Table 3.1 Effects and Improvements to be Brought by this Project

Present conditions and problems	Countermeasures provided by this Project	Direct effects, degrees of improvement	Indirect effects, degrees of improvement
The present AMH cannot function as the top referral hospital of the province due to absence of specialist doctors, nor can it provide adequate medical services in terms of quality and quantity due to insufficient and aged facilities and equipment.	・ Construction of a new hospital ・ Upgrading of medical equipment	① The cumulative number of inpatients acceptable by AMH will increase from current 7,000 per day to 13,000 per day. ② Examination and medical care capabilities especially of the Surgery, Obstetrics and Gynecology, Departments will improve. ③ The number of patients that can receive medical care at AMH without the need to be transferred to other hospitals outside the province will increase by around 800 patients a year. ④ Upgraded facilities will improve the quality of medical services and lessen the workload of medical staff.	① Qualitative improvement of medical services will increase income from PhilHealth, thereby enhancing the financial conditions of AMH. ② AMH's capacity as a practical training hospital will be expanded, leading to the development of quality health workers and the strengthening of medical service systems of the entire province. ③ Economic loss on the provincial level in the form of lost medical service income to other provinces will be lessened.

The outcome indicators to measure the effects of the Project are summarized below. The appropriate timing for evaluation would be one year after the commencement of full-scale operation following the handover of the facilities and equipment to the Philippine side, which will be in or after 2013.

Table 3.2 Outcome Indicators and Sources of Data

Outcome indicators	2008 (current)	2013 and thereafter	Data source
No. of inpatients at AMH	3,960 persons	Larger than 2008 figure	Hospital Annual Report
No. of major surgeries including C-section.	0 case	270 cases	Hospital Annual Report
No. of deliveries	371 cases	780 cases	Hospital Annual Report
No. of Aurora residents that can receive medical care at AMH without needing to go to other hospitals outside the province.	No. of inpatients in hospitals in other provinces: 2,000 persons	No. of patients out of the 2,000 that can receive medical care at AMH: 800 persons	Hospital Annual Report Medical Statistics of Aurora Province

3-2 Recommendations

3-2-1 Recommendations to the Recipient Country

(1) Outline of the Recommendations

AMH is a public institution exceptionally allowed to receive income from its users. Hence, AMH can recover some of its expenditures with service income. Through this Project, which modernizes its infrastructure all at once with allocating some specialist doctors, AMH will be in a far better position than other provincial hospitals. This implies that implementation of this Project will provide a set of conditions that enable AMH to take responsibility for certain part of its management.

According to the financial projections for the new AMH, the income of 3,364,000 pesos in 2009 is expected to increase by 2.6 times or 5,222,000 pesos to 8,586,000 pesos (Table 2.34). This is attributable to an overall increase in income, which mainly comes from the laboratory test fees and the hospitalization/ operating room fees. On the other hand, expenditure is expected to increase by 4,387,000 pesos or 17.5% from 25,085,000 pesos in FY 2009 to 29,472,000 pesos (Table 2.37). Electricity charges are expected to increase almost threefold to 1,231,000 pesos. As a result, income is estimated to exceed expenditure with significant improvement of the cost recovery ratio (which is defined as a ratio of "service income/ total expenditure") from the current 11.9% to 29.1% along with a higher Service Income-Maintenance & Other Operation Expenses (MOOEs) ratio of 101.3% (Table 2.38).

Accordingly, one of the responsibilities AMH should assume is to reduce the degree of dependence on the budget of PGA. It is practical to put forth a suggestion that AMH take advantage of the budget of PGA to cover personnel expenses, but finance MOOEs with its own revenues from medical care services on its own account. When this is achieved, PGA will receive a great deal of benefit, be able to reduce additional burden to run AMH, and, at the same time, reallocate the budget to improvement of other hospitals.

(2) Recommendations to Strengthen the AMH Management Capacity

1) To assign a head of administration as the right-hand of the chief of hospital

Although the new AMH is a small hospital with a 50-bed capacity, it is not easy for the Hospital Chief alone to manage both Level 2 medical services and the administrative work. Generally, modern hospitals today have a Head of Administration who assists the Hospital Chief who routinely engages in finance, accounting and personnel affairs. AMH should also create such a post and recruit an appropriate officer even from different parts of PGA organization.

2) To develop capacity to collect and make effective use of hospital information

① To keep track of information necessary to manage hospital effectively

The current information system of AMH remains at a rudimentary level. There is a serious doubt about the accuracy of statistics and the utilization of them for managing the hospital. To change this situation, AMH should as a whole build capacity to collect, keep track of and make effective use of accurate information which includes:

a) Medical care information: accuracy of the existing statistics, indicators that are not included in the existing statistics but prove the quality of medical care services (such as information regarding patients transferred from other institutions), and monthly reports featuring year-on-year comparisons.

b) Financial information: monthly financial reports of income/ expenditure compiled by source of Out-Patient Department (OPD)/ Emergency Room (ER) and In-Patient Department (IPD); and monthly reports on income/ expenditure of major departments (such as Ward, Operation Room, Laboratory, and X-ray Room)

② To give priority to development of the accounting reporting system

The hospital shall examine if the bills for patients are correctly issued and paid. As a tool for this examination, an information system that connects different sections shall be put in place to enable the supervisors to easily check up payment records.

③ To develop more accurate financial estimation of the new hospital with collecting information further in detail

The projections of income/ expenditure shown in Table 2.35 and Table 2.38 are summaries of the projections of each individual items. However, no financial analysis or budget planning based on the unit costs such as income/ expenditure per patient or per medical care case is done for those individual items. Therefore, it is impossible to assess validity of these estimates in comparison with data of other hospitals. Financial estimation of the new hospital is an essential task to draw up a budget: AMH shall at first calculate the unit cost, make financial analysis and budget planning, so as to grasp necessary information as shown in ① above.

3) To focus financial concerns on increasing service incomes

① To review the current tariff and charging system

If the electricity bill is charged to AMH instead of PGA, who currently bears the cost, the income-MOOEs ratio will fall to 87.8% from 101.4% in Table 2.39. This is fundamentally attributable to AMH's limited income, and in order to increase the income, AMH itself will be required to take certain actions. For example, of the incomes estimated in Table 2.36, there are quite a few services whose fees charged to the patients are based on the current very low rates, and some of the incomes such as anesthesiology fee were not calculated because of lack of rules concerning their fees. It is considered that AMH will have more chances to increase income if it rectifies problems of the charging system including:

a. Whether there are chargeable services that are not charged to patients and insurers in practice.
b. Whether the hospital services are charged to all patients, and the fees are collected.
c. Whether services are adequately priced to recover the costs.

② To take measures to maximize reimbursement (payment) from PhilHealth.

PGA is promoting, under PIPH, to increase the number of PhilHealth beneficiaries. An increasing number of PhilHealth beneficiaries who visit AMH for care will be a significantly effective and realistic approach to increase in income.

Also, PhilHealth has the benefit schedule in reimbursement with upper limits under three case types from A to C shown in Table 3.3. Hence, it is necessary for AMH to develop its facilities, personnel and services in line with PhilHealth requirements so as to obtain maximum rewards within the range of the benefits.

Table 3.3 PhilHealth Benefit Schedule at Level 2 Hospitals

Benefit Item	Case Type		
	A	B	C
Room & Board, not to exceed 45 days per year	400	400	600
Drugs & Medicine, per single confinement	3,360	11,200	22,400
X-ray, Laboratory and Others, per single confinement	2,240	7,350	14,700
Operating Room	Minimum= 2,200 ～ maximum=7,500		

③ To learn advanced hospital management knowledge and methods from model hospitals

AMH will select hospitals that have a high cost recovery ratio and serves as model hospitals such as Benguet Provincial Hospital, study the financial standing and management methods, and leverage the knowledge obtained for its own operation.

4) To mobilize all the hospital staff to improve service quality continuously

① To undertaking 5S practice as a first step toward quality improvement

In Philippines quality assurance system of health services, such as licensing by Department of Health (DOH) and accreditation by PhilHealth, is in place. Hence, it is reasonable to assume that it is time for individual hospitals to start out introducing Total Quality Management (TQM) on their own accord. In this case, AMH is recommended to start 5S practice (Sort, Straighten, Scrub, Standardize and Sustain) as a first step, which aims to improve a work environment. Through continuous engagement in 5S practice to improve its work environment, AMH will be able to create the condition whereby the right things with right amount are set in right time at a right place. Since this practice has been already implemented at the provincial government office, it seems far more easily feasible to extend it to AMH, rather than tacking something completely new. It is important to note that 5S practice includes not only cleaning but also good practices of inventory management and maintenance of facilities/ equipment as described below:

a) Inventory management of drugs and medicines as well as supplies is to sort and straighten these goods. The hospital will secure proper inventory level by, for example, making a purchase request for an important supply when its predefined minimum inventory level is reached (instead of making a request when the inventory is nearly depleted.)
b) Where routine checks on facility/ equipment is concerned, the hospital will be able to prevent any interruption or at least minimize the downtime even if an interruption occurs by keeping the equipment clean and regularly filling in its check list for early detection of a failure.

② To conducting a periodic patient satisfaction survey and complaint analysis

A patient satisfaction survey, conducted in June 2009 and addressed to 20 inpatients and 30

outpatients revealed that many of the patient complaints concerned sufficiency of equipment; atmosphere, cleanliness and comfort of the facilities; and the staff's thoughtfulness towards patients. Conducting this type of survey once every several years on an ad-hoc basis would little help improve the quality of the services. As a means of gauging the quality of services, any survey will be able to be reflected to and improve the work procedures, attitudes of staff members and methods of maintaining and managing facilities only if it is conducted continuously to set forth steps against aspects where many feel unsatisfactory and to monitor the trends in remarks of such patients: for example, to all inpatients at the time when they discharge from hospital, and to outpatients for once or twice a year. This exactly is the continuous activities to improve the quality, and requires the following matters:

a) At the time when 5S practice has brought certain results, transform the 5S Committee will be upgraded to, say, a "Committee for Service Quality Improvement," which will be in charge of drawing up activity plans, and monitoring and assessing the practice.
b) Establishing a system within the hospital, whereby action to take is determined immediately after any complaint is brought against the hospital.
c) Regular – for example, monthly or bimonthly - visits made by PHO Chief to the hospital will make the staff conscious of being watched, and thus build a sense of tension in their everyday work: it will have a considerably positive effect on their attitude and consciousness concerning cleanliness of facilities.

5) To invest continuously to develop capacity of not only the clinical but the management staff

Upgrading of the medical services in Surgery, Obstetrics and all other clinical departments requires enhancement of the hospital's financial and accounting function as well as maintenance system of buildings and equipment. It also requires the improvement of the skills of the current staff in nursing, clinical and administrative department, in consideration of the policy to minimize the number of new staff employment at the opening of the new hospital. It is therefore necessary to formulate a plan to send staff to teaching hospitals and training institutions for acquisition of necessary knowledge and skills before the opening of the new hospital, secure necessary budgets and put the plan into practice. At the same time, it is also important to remember that staff members of the administrative departments should be given opportunities to receive training programs for capacity building or visit other advanced hospitals for reference. And it is recommended that, after the opening, the new hospital implement "1% rule," under which the hospital invests 1% of its annual expenditures in skill improvement for the staff.

(6) To make best efforts to retain specialist doctors who have been employed or contracted with

Resignations of already employed or contracted specialist will immediately result in revocation of the Level 2 license. Hence, it is necessary for PGA and AMH to keep good communications with these doctors, and make arrangements as much as possible to respond to their requests.

(7) To maintain the facility and equipment efficiently and sustainably

At present, only one plumber is assigned as a maintenance engineer for the whole AMH. Howerver, as stated in "2-5-2, Operation and Maintenance Plan", there are a lot of daily checkings for routine maintenance activity. Therefore, it is recommended to assign additional two full-time maintenance engineer, one for facility maintenance and the other for medical equipment maintenance.

They shall at least have the skills for daily checkings and minor repairs as stated in 2-5-2, in order to realize the efficient and sustainable maintenance.

(3) Recommendations to PGA and PHO

1) To modify the provincial codes to allow AMH to expand current revolving fund system

① To allow AMH to establish revolving funds for purchase laboratory and X-ray supplies

Any interruption of providing services due to the lack of medicines and supplies not only leads to a loss of confidence in the hospital among patients, but also directly results in a loss of an income opportunity or financial damage. To avoid this, it is strongly recommended to establish a Revolving Fund (hereinafter called "RF") for purchase of reagents and supplies used for laboratory and X-ray as in the case of drugs and medicines that are currently purchased under a RF. The fund size should be large enough to cover annual costs of purchasing supplies and maintenance, a certain amount of fund operation costs, including commission fees, regular maintenance costs and repair reserves used in the event of failure.

At the same time, to promptly operate the RF and secure transparency of the operation, PGA/ PHO shall set up the AMH Committee consisting of the Governor, the Provincial Committee, the Hospital Chief and local NGO representatives.

② To establish a comprehensive RF which covers all the MOOEs through integrating individual RFs established for medicine, laboratory and X-ray

It will be necessary in future to integrate individual RFs for each item, including medical supplies for surgical operations and high care, into a "MOOEs Revolving Fund," a fund that comprehensively manages MOOEs. In order to give AMH personnel incentives to save costs and increase income, it is essential for AMH to assume the responsibility to operate the MOOEs Fund in black and to have discretion in making use of its profits within the scope of certain rules. Achieving this will satisfy a prerequisite for allowing AMH to run self-sustaining operation.

2) To develop the effective provincial health management

① To introduce performance base criteria to reasonably allocate PHO budget among hospitals

Given that budgets of four hospitals account for 85% of the budget of PHO as a whole, hospital management is critical for the financial management of PHO. The bar chart at the bottom of Fig. 3-1 shows the allocation of the provincial budget for FY 2009 among the four hospitals. Almost half of the budget was directed to AMH, followed by Casiguran District Hospital (CDH), Maria Aurora Community Hospital (MACH) and Dingalan Community Hospital (DCH) in this order. However, these allocations are significantly different from the ratios of the numbers of inpatients and outpatients among the hospitals, so that the allocation by PHO is not necessarily consistent with the performance of the hospitals. In particular, the budget allocation to MACH hardly reflects its performance. PHO should make its budget allocation at least for MOOEs, if not for labor expenses, in consistency with the performance of the hospitals, and clarify the criteria for budget allocations to the parties concerned. It is also important to avoid excessive investment in future in AMH for the sake of the Project; it is desirable to set up guidelines which have an arrangement to allocate as large a portion of the budget as possible to other three hospitals, which face the risk of revocation of their licenses because of the doctor shortages.

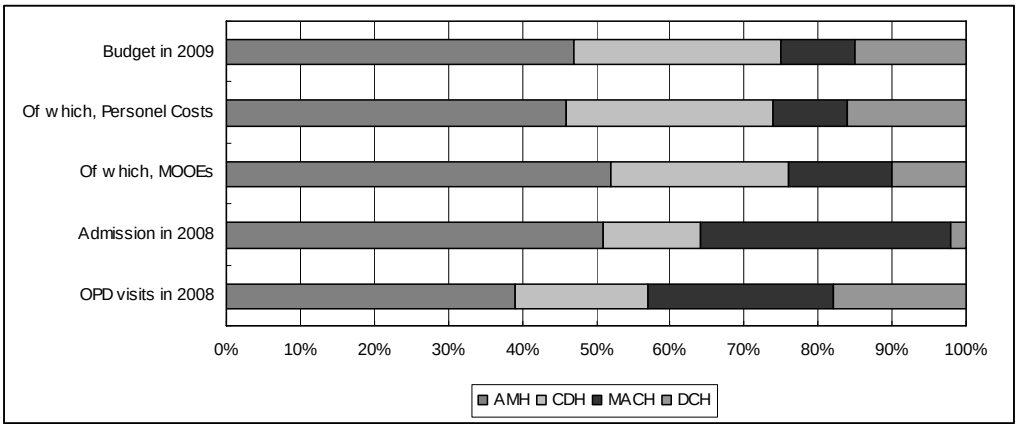
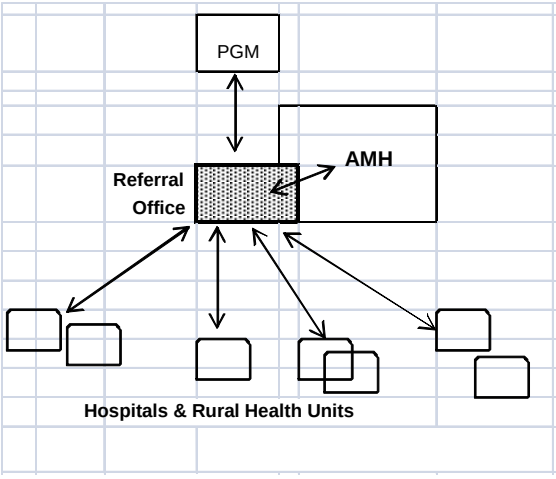


Figure 3.1 Comparison of Budget Allocation and Performance among Four Hospitals

② To work out the referral office in AMH as the center of provincial health referral system

PGA aims, in "Hospital Service" in its PIPH for Aurora Province, to realize Internet-based interactive communication among medical institutions. AMH, positioned in the core of the provincial medical referral system, will, in essence, serve as a hub for the interactive communication. To this end, PGA needs to set up an office or to allocate a staff member in charge of running the system so that other medical institutions and patients will feel real benefits from the referral system. The office or the person in charge of this system will have the following two main functions:

Table 3.4 Functions of Referral Office and its Conceptual Diagram

a) Referral Intermediary 1) To monitor and assess the flow of patients across the provincial boarder based on the information collected. 2) To operate a front office of AMH both between local institutions and between PGM Medical Center (advance booking of consultation and diagnosis, guidance/ coordination) 3) To manage referral and counter-referral documents, and to maintain referral database. 5) To disseminate hospital information to local health institutions and to collect from them.	
b) Referral Coordination 1) To pool a batch of medical officers at AMH and to dispatch them to other 3 hospitals regularly. 2) To hold training workshops for health personnel periodically. 3) To coordinate meetings of health personnel on operation of the local referral system.	**Conceptual Diagram of the proposed Referral Office**

3-2-2 Coordination with Technical Assistance and Other Donors

To achieve the Project objective, which is to improve the healthcare service of AMH both qualitatively and quantitatively, it is necessary for AMH and PGA/ PHO to implement various kinds of activities as said in the above recommendation, other than to improve the facilities and equipments under the assistance of Japan's Grant Aid. Technical Assistance or the dispatch of Volunteers for the improvement of hospital management program may accellerate those activities.

At the same time, it is expected that the improvement of healthcare services and strengthening of the management capacity will be achieved not only in AMH but in other hospitals in Aurora, by requesting and accepting widely the assistance to and from the international donors and NGOs.