No.

Department of Health

The Republic of the Philippines

BASIC DESIGN STUDY REPORT

ON

THE PROJECT FOR CONSTRUCTION AND EQUIPPING

OF

THE DAVAO MEDICAL CENTER

IN

THE REPUBLIC OF THE PHILIPPINES

JANUARY, 2000

JAPAN INTERNATIONAL COOPERATION AGENCY

YAMASHITA SEKKEI INC.

INTERNATIONAL CONSULTANTS CORPORATION

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PREFACE

In response to a request from the Government of the Republic of the Philippines, the Government of Japan decided to conduct a basic design study on the Project for Construction and Equipping of the Davao Medical Center and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Philippines a study team from July 5 to August 8, 1999.

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, 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 team.

January, 2000

Kimio Fujita
President
Japan International Cooperation Agency

January, 2000

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Construction and Equipping of the Davao Medical Center in the Republic of the Philippines.

This study was conducted by Yamashita Sekkei Inc., under a contract to JICA, during the period from June 30, 1999 to February 14, 2000. In conducting the study, 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 basic 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,

Ken Majima
Project manager,
Basic Design Study team on
the Project for Construction and Equipping of the Davao Medical Center
Consortium
Yamashita Sekkei Inc.
International Consultants Corporation

ABBREVIATIONS

ADL	Activities of Daily Living
Ave.	Avenue
AVR	Automatic Voltage Regulator
CT	Computed Temography
Dist.	District
DLPC	Davao Light & Power Co., Inc.
DMC	Davao Medical Center
DOH	Department of Health
ECG	Electrocardiograph
EEG	Echoencephalograph
EMG	Electromyography
E/N	Echange of Notes
ENT-HNS	Ear, Nose and Throat – Head and Neck Surgery
EV	Elevator]
FP	Family Planning
GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit Gmbh
HMS	Hospital Maintenance Service
ICC	Investment Coordination Committee
IUD	Intrauterine Device
kVA	Kilo Voltage Ampere
Lab.	Laboratory
lx	Lux
Med.	Medical
NEDA	National Economic and Development Authority
OB	Obstetric
OPD	Outpatient Department
OR	Operating Room
OT	Occupational Therapy
PUVA	Psolaren Ultraviolet Assay
TB	Tuberculosis
VOL.	Volunteer

Chapter 1 Background of Project

Chapter 1 Background of the Project

In the Philippines the death rates of infants and pregnant women are 49/thousand and 18/10thousand respectively (according to Philippines National Statistics of 1995) and improvement and strengthening of the health and medical care system is an issue the Philippines must cope with.

Mindanao is located in the south of Republic of the Philippines. It is the second largest island, next to Luzon in terms of the area. The population of Davao City in Mindanao is over one million and is in the fourth place in the country. Zamboanga City in the 6th place (approximately 500,000 population) and Cagayan de Oro City in the 9th place (approximately 430,000 population) are also located in Mindanao. However, the income average level and health condition level of Mindanao are lower than the national average level as shown in the table below.

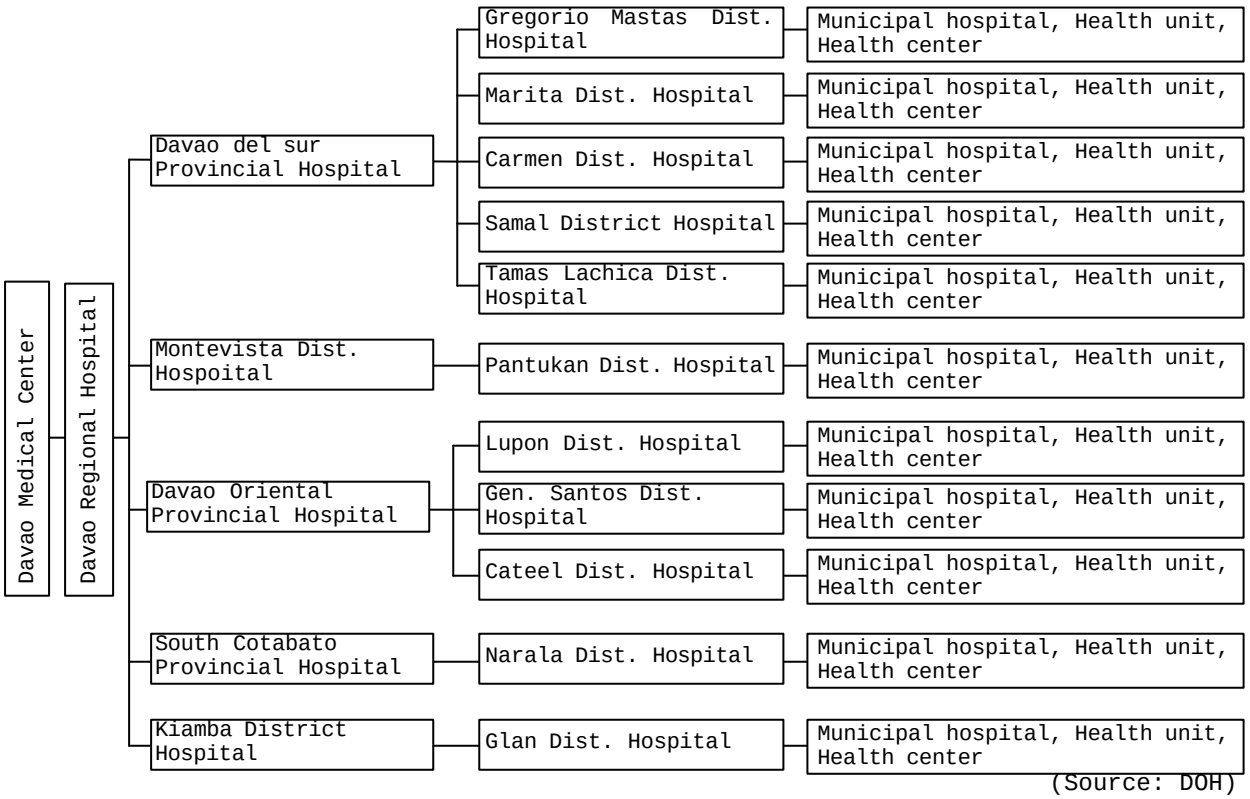
Table 1-1 Income average and health index of Mindanao

	Family income average *1 (peso)	Health index *2		
		Infant (<1 year old) Mortality Rate (per thousand)	Child (1-4 year old) Mortality Rate (per thousand)	Maternal Mortality Rate (per 100,000 mothers)
Philippines	123,881	49	19	180
Western Mindanao	89,370	59	26	200
Northern Mindanao	99,473	54	22	225
Southern Mindanao	94,356	52	21	160
Central Mindanao	81,364	54	22	187
ARMM	74,729	63	30	320

(Source: Philippine Statistics Almanac (*1: 1997, *2: 1995)

The government of the Philippines states that the health is the basic human rights and sets the target of the health and medical field as "Health to all Philippine people" in its National Development Plan (1995 ~ 2020). In particular, for Mindanao where the income level and health condition level are both lower than the national average level, Mindanao Health Development Plan (2000 ~ 2004) is instituted aiming to improve the health conditions by strengthening the local health system and establishing an effective and efficient network, referral scheme.

Davao Medical Center with 400 general beds and 200 psychiatrics beds is one of the largest national tertiary medical institutions in the Philippines. At present, there are fifteen (15) hospitals and medical centers of the tertiary medical services under the control of Department of Health. In the southern Mindanao, Davao Medical Center, positioned at the top of the referral system in that area as shown in the following figure, plays important roles to lead promotion of the health development plan and to improve the medical standard level in the area.



(Source: DOH)

Fig. 1-1 Referral scheme in the XI district topped by Davao Medical Center

Demands for diagnosis/treatment at Davao Medical Center has a trend to increase every year. In 1998 214,544 outpatients and 43,989 inpatients were accepted. However, the current situation is such that the old and small outpatients' building, which was diverted from the psychiatrics ward building, fails to meet the increasing demands and is forced to limit the number of outpatients being received every day to 900.

Furthermore, in the inpatients' building which also fails to meet the demands, beds are placed in corridors and multi-purpose hall and the bed occupancy

ratio in 1998 was as high as 128% while its authorised capacity is 400. As described above, Davao Medical Center is confronted by various problems in facilities, which then makes it difficult to fulfil the leading role as the top refferral hospital in that area. Under such circumstances, theGovernment of the Philippines requested the Government of Japan for the grant aid for construction of the new Outpatient Department building and procurement of medical equipment for Davao medical Center which cannot be implemented by itself for the reason of financial difficulties it faces.

CHAPTER 2 CONTENTS OF THE PROJECT

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2-1 Objectives of the Project

The ongoing "National Development Plan (1995 - 2020)" envisages health as one of fundamental human rights and defines it as the goal as well as the means of development. However, in the Republic of the Philippines, where there are wide earnings differentials, the ratio of the poor and needy who have difficulty in bearing their own medical expenses is high and therefore it is of urgent necessity to establish a full-fledged health system by strengthening public hospitals where the poor and needy may be exempted from medical expenses.

The Davao Medical Center (DMC) was founded in 1917 in Davao, the central city in Mindanao, where the residents' income level is below the national average. "Mindanao Health Development Plan (2000 - 2004)," which is Mindanao's major health policy measure, is aimed at establishing an effective and efficient health care network based on a viable referral system. The Davao Medical Center, the tertiary level top referral national hospital, is placed as a flagship hospital in the region to take the lead in promoting the health development plan and in fact is playing an important role in enhancing the technical level of health care in the region.

The number of patients to DMC is increasing from year to year in keeping with the steady increase of the population in the region. Though the authorized bed capacity DMC is 400, in actuality however, bed occupancy rate in 1998 reached as high as 128 percent under the condition that gymnasium and even corridors were used to accommodate inpatients. The number of outpatients has also been increasing at an annual rate of about five percent. Due to the limited resources, DMC limits the number of outpatients to be accepted a day to 900.

DMC's existing outpatient (OPD) building was formerly a psychiatric patients ward. As such, the building does not meet necessary functions and spaces

required for its medical services. The facilities of the ENT Dept. and the Ophthalmology Dept. are placed in another building due to shortage of floor area in the OPD building. These outpatient facilities are located across the public road from the main building, where the medical examination facilities are placed. As a result, outpatients have to move between buildings across the public road for medical examination and consultation/ treatment. As described above, due to facilities and equipment, DMC has had difficulty to fulfill its functions as the region's top level referral hospital.

As stated above, the "Mindanao Health Development Plan" is aimed at establishing an effective and efficient health care network based on a viable referral system as well as strengthening the region's health care system. The objective of this project is therefore to strengthen DMC's facilities and equipment to enable it to play a pivotal role in improving the quality of public health care services in South Mindanao as the region's top referral tertiary level hospital.

2-2 Basic Concept of the Project

2-2-1 Overall Plan

(1) Catchment Area

The table below shows a breakdown of inpatients at DMC according to thieir home town. As is clear from the table, the inpatients are mainly from South Mindanao (Region XI), and also from Central Mindanao (Region XII) and the Caraga Region, the northwestern part of Mindanao. The number of inpatients from those area occupies 99 percent of total patients and the rest of the inpatients are from North Mindanao (Region X), West Mindanao (Region IX), the Autonomous Region of Mindanao Mosuresu (ARMM) and outside Mindanao island. Inpatients from Davao City and South Davao Province, where Davao City is located, account for 82 percent of the total

number of inpatients. Adding inpatients from North Davao Province and East Davao Province to the above, number of inpatients make up 95 percent of the total. Therefore, it is judged that South Mindanao is DMC's catchment area.

Table 2-1 No. of Impatients According to Their Home

Region	Residence located	Nos. of Inpatients	Rank	%
Region XI	Davao City	34,797	1	79%
	Davao del Norte	4,738	2	11%
	Davao del Sur	1,439	3	3%
	Davao Oriental	908	4	2%
	South Cotabato	185	8	
	Gen. Santos City	88	9	
	Sarangani	70	11	
Caraga	Agusan del Sur	342	7	1%
	Surigao del Sur	343	6	1%
	Butuan City	12	-	
	Surigao der Norte	8	-	
	Agusan der Norte	1	-	
Region XII	Cotabato City	58	12	
	Cotabato	833	5	2%
	Sultan Kudarat	72	10	
	Iligan City	1	-	
Region X	Bukidnon	33	13	
	Cagayan de Oro City	6	-	
Region IX	Zamboanga City	4	-	
	Zamboanga del Sur	4	-	
ARMM	Maguindanao	24	-	
OTHERS	Iloilo, Ilocos Norte Others	23	-	
	Total	43,989	-	100%

Source:DMC

(2)Population of the Catchment Area

The latest data on the population of the DMC's catchment area is the 1995 Census. Therefore, figures for 1998, 2000 and 2005 are estimated as below.

Table 2-2 Population of the Catchment Area

		Actual				Estimation	
year		1970	1980	1990	1995	2000	2005
Davao del Norte	Population	442,543	725,153	1,056,301	1,191,443	1,392,000	1,460,000
	Increase rate / year	5.35	5.06	3.83	2.28	2.26	2.01
Davao del sur	Population	392925	523,224	632,798	677,069	719,000	757,000
	Increase rate / year	3.75	2.91	1.92	1.28	1.27	1.13
Davao City	Population	392,473	610,375	849,947	1,006,840	1,175,000	1,344,000
	Increase rate / year	5.69	4.52	3.37	3.22	3.19	2.84
Davao Oriental	Population	247,995	339,931	394,697	413,472	427,000	443,000
	Increase rate / year	6.46	3.20	1.50	0.87	0.86	0.85
Sarangani	Population	127,637	219,372	283,141	367,006	465,000	574,000
	Increase rate / year	5.72	5.57	2.58	4.98	4.93	4.39
South Catabato	Population	252,612	401,705	539,458	621,155	706,000	785,000
	Increase rate / year	6.34	9.08	5.68	2.68	2.65	2.36
Gen. Santos City	Population	85,861	149,396	250,389	327,173	418,000	520,000
	Increase rate / year	0.10	5.69	5.30	5.14	5.09	4.53
South Mindanao	Population	1,942,046	2,969,156	4,006,731	4,604,158	5,239,000	5,883,000
	Increase rate / year	5.04	4.34	3.04	2.64	2.62	2.34

Estimation: Based on population projection by Region 1995 to 2005 table 1.7, 1998 Philippine Statistical Yearbook

Source: CENSUS FACTS AND FIGURES November 1998、National Statistics Office

(3) Number of Patients Used in the Calculation of the Scale of DMC's Health Care Services for Outpatients

The number of outpatients at DMC varies from year to year, but it has been steadily increasing in keeping the population increase in South Davao. As shown in the table below, its yearly increase rate is about five percent. The average annual number of outpatients for the past three years is 220,220, which is about 1.42 times larger than the annual total for 1990. The population of South Mindanao is expected to increase at an annual rate of more than two percent over the next 10 years. It is expected, therefore, that the number of outpatients at DMC will increase at a similar annual rate over the same period. For these reasons, it is concluded that the year 2005 is the target year for calculating the scale of DMC's health care services.

Table 2-3 Nos of Outpatients 1990-1998

Year	Nos of Outpatients	Index based on 1990	Increase/Decrease ratio
1990	154,947	100	-
1991	149,086	96	▼3.8%
1992	162,672	105	+9.1%
1993	183,403	118	+18.4%
1994	203,283	131	+10.8%
1995	205,315	133	+1.0%
1996	219,621	142	+7.0%
1997	226,496	146	+3.1%
1998	214,544	138	▼5.3%

As the existing outpatient buildings do not meet the increasing health care needs due to shortage of the facilities, the daily number of outpatients for each clinical department is limited to 100, or 900 in total for the nine clinical departments. Since the annual total consultation days is about 250 excluding Saturdays and Sundays (104 days/year) as well as national holidays (15 days/year), the maximum annual capacity of accepting outpatients is calculated to be 225,000 if the above-mentioned limit to the daily number of outpatients continues. In other words, it appears that since 1996 DMC has been operating with its maximum capabilities.

It was thus judged appropriate to choose 1995 as the base year for the estimation of DMC's future health care workload. The workload for the target year is calculated to multiply the population increase rate in each province from 1995 to 2005 and the ratio of inpatients for each province (patient ratio).

Table 2-4 Calculation of Outpatient Increase Ratio

	A Population in 1995	B Population in 2005	C Population Increase Ratio	D Outpatient Ratio	E Patient Increase Ratio
Davao del Norte	1,191,443	1,460,000	1.225	0.110	0.135
Davao del Sur	677,069	757,000	1.118	0.030	0.034
Davao City	1,006,840	1,334,000	1.325	0.790	1.047
Davao oriental	394,472	443,000	1.123	0.020	0.022
Others	5,919,492	7,762,000	1.311	0.050	0.066
Total				1.000	1.304

Thus, the estimated annual total number of outpatients for 2005 is about 267,730 [the annual total number of outpatients for 1995 (205,315) x 1.304 = 267,730 (1,070/day)]

(4)Staffing

The following table shows a staffing plan for each outpatient department.

Table 2-5 Outpatient Service Proposed Staffing Plan

		Surgery	Anesthesia	Internal Med. / Endoscopy	Pedia/ under five	OB-Gyn/FP	Dermatology	ENT	EYE	Family Med.	Orthopedics	Rehabilitation	Dental	Total
Medical staff	Med. Staff	14	4	15	10	9	3	4	4	5	5	1		74
	M.S.VOL	4	2	14	5	4	2	5	7		2	1		46
	Residents	18	11	16	14	17	2	7	6	14	7			112
Dentist	Dentist												3	3
	Dentist(VOL)												3	3
	Dent. Aide												3	3
Nurses		2		2	1	1		2	2	1	1			12
Midwife						1								1
U.W./Aides		1		1	1	1					1			5
Physical Therapist												1		1
Occupational Therapist												1		1
Art. Limb/brace Maker												1		1
Clerk						1								1
Total		39	17	48	31	34	7	18	19	20	16	5	9	263

Source：DMC

2-2-2 Facility Plan

(1)Repair and Extension of the Existing Facilities

The initial request submitted in 1993 included the repair of the existing facilities of the emergency department. But it was excluded from this project because the work had been completed by the Philippine side by the time of this basic design study. The initial request also included the conversion of the existing facilities of the Laboratory department

into the facilities of the Critical care complex after the Laboratory department move to the new OPD building. However, it was excluded from this project from the view point that the priority should be given to the construction of the new outpatient building.

(2) New Outpatient Department (OPD) Building

1) Necessary functions and Floor Area

The objective of the facility plan of this project is basically to transfer DMC's existing medical functions to the new OPD building. However, it was also examined whether or not to include the rooms necessary for equipment to be provided by the other donor organizations or procured by DMC, or to be transferred from the existing facilities.

The following requested facilities are examined as a basic for floor planning.

Table 2-6 Requested Facilities

Rooms	Floor area	Priority	Remarks
Outpatient	2,291 m^2	A	
Information, waiting area	190 m^2	A	
Connecting corridor	466 m^2	A	
X-ray rooms	1,128 m^2	A	MRI is C
Ultra sound rooms	149 m^2	A	
Laboratory	806 m^2	A	
Teletherapy rooms	283 m^2	B	
Pharmacy	88 m^2	A	
Lecture rooms	1,171 m^2	A	Office is B
Library	311 m^2	B	
Canteen & Kitchen	799 m^2	B	
Security office	20 m^2	A	
Housekeeping	18 m^2	A	
Conference room	34 m^2	A	
Toilet	167 m^2	A	
EV shaft	266 m^2	A	
Medical room	55 m^2	A	
Power house	36 m^2	A	
Waiting hall and waiting area	1,746 m^2	A	
Hallway and staircase	1,048 m^2	A	
Total	11,072 m^2	A	

As a result of examination, it is concluded that Library, Canteen & Kitchen and Conference room are excluded from this project since those facilities are not directly connected medical services. Teletherapy rooms are also excluded from being transferred to the new OPD building since existing facility is still usable.

2) Structure

The structural design for this project will be worked out in accordance with the provisions of the National Structural Code of the Philippines and the National Building Code of the Philippines. The foundation structural design will be worked out on the basis of the results of the soil investigation carried out by the Philippine side. Structural materials and construction methods used widely employed in the country to ensure an economical and safe structure.

3) Utility

The utility plan will be worked out on the basis of the present conditions of the infrastructure in and around the construction site. Special attention shall be paid not to make the operation of the system be a burden on DMC in terms of running cost and maintenance. The important points to note in this respect are as follows.

Reliance of the existing transformer facilities (within the main building) is unknown. In addition, if the new OPD building is to share the existing transformer with the existing buildings, its secondary wiring will become complicated. Therefore, a new transformer shall be installed by the Philippine side for the new outpatient building. It is possible to intake an additional powerline to the premises besides the existing one. As power failure occures in and around the project site about twice a month on average, a generator is to be installed to ensure power supply during power failure.

City water is to be supplied to the new OPD building. However,

capacity of the existing service pipe is unable to meet additional water demand. The pressure of the present water supply decreases in the morning, while demand is high, causing water shortages. Therefore, water need to be first stored in the ground water tank and then pumped up to the elevated water tank installed on the roof for supply with gravity to each of the facilities in the new OPD building where water is used. Direct water supply from the well will result in trouble to the existing facilities, so that well water is also to be first stored in the ground water tank and then pumped up to the elevated water tank installed on the roof in the same way as city water.

4) Building Materials

In principle, building materials shall be the ones which minimize maintenance cost. For this reason, materials shall be durable and be the ones widely used in the country.

2-2-3 Equipment Plan

Each item of requested equipment was given apriority through the discussion with the Philippine side in accordance with the criteria shown below. After appropriateness of each item was examined in consideration of the priority, equipment plan was settled on.

[General Principles for Selecting Medical Equipment in Japan's Grant Aid Scheme]

(A) Type of Medical Equipment Receiving High Priorities

① Equipment that is needed to replace decrepit one.

② Equipment that is needed to be added to currently operating ones in order to meet unsatisfied demands.

③ Equipment that is necessary to conduct basic medical practices as a hospital.

④ Equipment that is easy to operate and maintain.

⑤ Equipment that benefits a large number of people.

⑥ Equipment that is highly cost-effective.

⑦ Equipment whose effectiveness in medical practices has been proven.

(B) Types of Medical Equipment Receiving Low Priorities

① Equipment that requires high operating costs.

② Equipment that benefits a limited number of people.

③ Equiment that is low cost-effective.

④ Equipment that is used for academic research purposes and not for patient treatments.

⑤ Equipment that can be substituted by less sophisticated one.

⑥ Equipment that may cause environmental problems (e.g. by its medical wastes).

⑦ Equipment whose effectiveness in medical practices has not been proven.

⑧ Equipment that could be used for personal purposes by hospital staff.

⑨ Equipment that are more than minimum necessary quantity [duplicate]

[Principles for Selecting Medical Equipment in Regard to Conditions of an Individual Hospital]

(C) Type of Medical Equipment Receiving High Priorities

① Equipment that can be operated by currently available technical level in a hospital

② Equipment that can be operated by hospital's current personnel.

③ Equipment that matches hospital's functions under a current local referral system and also meet local medical needs.

④ Equipment that is expected to be provided by other donars.

(D) Types of Medical Equipment Receiving Low Priorities

① Equipment whose spare parts and consumables are difficult to obtain in a local market.

② Equipment that can not be operated by currently available technical level in a hospital.

③ Equipment that can not be operated by hospital's current personnel

nor outside agents.

④ Equipment that does not match hospital's functions under a current local referral system nor meet local medical needs.

⑤ Equipment that requires major renovations on hospital's infrastructure, such as water supply, electricsupply, a drain system, and so on.

⑥ Equipment whose functions could be covered by currently available equipment in a hospital.

The quantity of selected item of equipment is to be determined taking into account the annual total target number of patients, the quantity of existing usable items of equipment and the scale of the new OPD building. Due consideration is also to be given to the following so that maintenance and management will not be a burden to the Philippine side.

① Equipment that are of easy operation and that consume a relatively small amount of electric power should be selected.

② Quantity of spare parts for maintenance is to be necessary amount for running of about one year.

③ Equipment to be procured locally as much as possible for lower equipment costs and easier maintenance.

2-3 Basic Design

2-3-1 Design Concept

(1) Natural Conditions

Davao, where the project site is located, has a tropical oceanic climate. The average monthly temperature in Davao city exceeds 30°C, and the wind direction is mostly south/north throughout the year. Controlling indoor temperatures is therefore the important point to be noted in working out the floor plan. As the use of air conditioners will lead to increase of maintenance and management costs, indoor environment shall be maintained comfortable by means of running free methods such as roof insulation and natural ventilation. There is no distinct difference in rainfall between the rainy season and the dry season and average monthly rainfall ranges from 150 mm to 200 mm. In addition, the city is scarecely affected by typhoons. Therefore, attention in the facility design to rainfall is not critical. On the other hand, the groundwater level in the project site is high and the lower part of the project site is poorly drained. This factor should be taken into consideration in setting the ground floor level. Compared to the northern part of the country, Davao is less affected by earthquakes. However, there is still a possibility and therefore seismic design shall be employed in accordance with the National Structural Code of the Philippines.

(2) Social Conditions

Though the majority of people in the Philippines are Christians, different custom of living is also considered in the design of buildings such as providing faucet in toilet booth. Therefore, same consideration is to be given in the design of this project as well.

(3) Local Construction Situation

As DMC is a national medical center operating under the jurisdiction of the Department of Health (DOH), it is necessary to obtain an approval

on the design of the building from Department of Health.

The procedure for obtaining approval from DOH is divided into two stages, namely, the stage of basic design and the stage of detail design, as shown below. After the approval is given by DOH, application for building permit shall be made to the City of Davao.

A. Stage of Schematic Design

Flow of the Procedure

Inspection of the project site by DOH
↓
Coordination between DOH
(Health Infrastructure Service) and the hospital
↓
Preparation of Schematic Plan
(Hospital)
↓
Presentation and evaluation of the schematic plan
(the hospital and the Health Infrastructure Service)
↓
Initial approval of Schematic Plan
(Health Infrastructure Service)
↓
Review of the Schematic Plan
(Committee on review of Schematic Plan)
↓
Final approval of the Schematic Plan
(Recommending approval by Health Infrastructure Service)
↓
Final approval
(Undersecretary)
↓
Approval for construct
(Bureau of Licensing and Regulation)

The above-mentioned procedures are applied to buildings constructed by the Department of Health. In the case of this project, the stage of basic design corresponds to "Preparation of the Schematic Plan by the Hospital," and the stage of explanation about the outline of the project to "Presentation and Evaluation of the Schematic Plan."

B. Stage of Detail Design

Flow of the Procedure

Working drawing
(All the drawings and specifications must be signed by an architect, a structural engineer, an electrical engineer and a sanitary engineer, registered in the Philippines.)
↓
Approval of the Department of Health
↓
Approval of the Chief of the hospital and the director of the DOH Regional Office
↓
Approval of the Undersecretary of Health
(or the director of the Health Infrastructure Service)
↓
Review by the City Engineer of Davao City
↓
Review by the Fire Department of Davao City
↓
Filing of the application documents with Davao City Planning Office
↓
Building permit

All the above procedures are to be cleared by the Philippine side. Though the application documents will be prepared by Japanese consultant, they must be signed by qualified local architect and engineers. The construction work cannot be started unless all the above-mentioned procedures have been completed. The facility plan shall be prepared in accordance with the local code and regulations as well as the standard of the Department of Health.

(4) Local Contractors

Compared to Manila, number of high-rise buildings in Davao is much less and the construction market is much smaller. Contractors active inDavao are therefore smaller in scale than those active in Manila. In the case of large-scale high-rise building construction works, contractors from Manila generally act as prime contractors, and local contractors as subcontractors. Basic building materials such as cement and aggregate

are produced in Davao, but industrial products such as aluminum windows and electrical equipment are transported from Manila. The execution plan and the procurement plan shall be worked out in consideration of above situation of the local construction industry.

(5) Maintenance and Management Capability of the Implementing Organization

The maintenance and management costs of DMC are covered by the Department of Health's budget, donations from different organizations and its own incomes from medical care services. DMC has sufficient number of staff for maintenance of building facilities and equipment. Those items of equipment which cannot be repaired within DMC are transferred to the Hospital Maintenance Services (HMS) under the Department of Health, which is located on the premises of DMC. However, there are cases where even HMS cannot repair due to the unavailability of spare parts. Therefore, in working out the facility plan for this project, due consideration should be given to the past problems as well as DMC's maintenance and management capabilities.

(6) Range and Grades of Facilities and Equipment

DMC has continuously been improving its facilities and equipment for providing proper health care services to patients whose number is increasing from year to year. For those improvement projects, source is not only from the Department of Health but assistance of Davao City and other international agencies are utilized such as donation of CT scanner from Davao City and the sewage treatment plant from Austrian Government. In such context some items of equipment are confirmed to be procured by other donors and be installed in the new OPD building. Therefore, in determining the scope of this project, due consideration should be given to the positioning of this project within the framework of the DMC's master plan to improve its facilities and equipment. And, priority is given to facilities more than equipment in consideration of future improvement of equipment. The grade of facilities and equipment

shall not be set high in order to prevent excessive increases in the maintenance and management costs.

(7) Period of Construction Work

In the Philippines, the signing of the Exchange of Notes (E/N) concerning foreign grant aid is based on the approval of the National Economic Development Agency's (NEDA) Investment Coordination Committee (ICC). This project was approved by the ICC in 1993 when the Government of the Republic of the Philippines made a formal request to the Government of Japan for grant aid. However, six years had passed before this study was conducted, it has become necessary to review the details of the request, and therefore it is necessary to obtain the ICC's approval for this project anew. It will take at least three months for obtaining the ICC's approval. As regards the local nature condition, on the other hand, there is no significant difference between the rainy season and the dry season in Davao, so that the construction schedule will not be affected by weather conditions during the rainy season. Therefore, there is no notable hindrance on the construction work to be completed as scheduled if started poperly. It is important, therefore, to cooperate with the Philippine side so that the E/N be signed smoothly and that the construction work be started without delay.

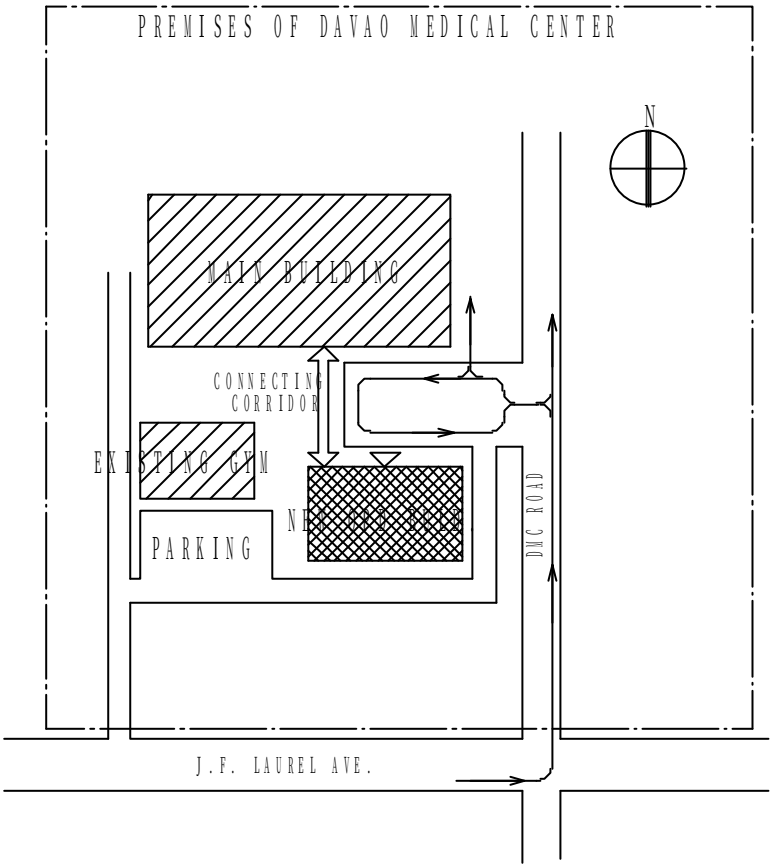
2-3-2 Basic Design

(1) Site Plan

The project site is located at the corner of J.F. Laurel Avenue, on which the site of the Davao Medical Center borders on the north, and DMC road running from north to south in the center of the premises of DMC. The access to the DMC’s existing Main building, which is located on the northern side of the project site, faces DMC road. If a new access to the new ODP building is made besides the existing entrance, it will cause confusion in control going in and out of people. It will also be difficult

to adjust the entrance level of the new OPD building to the existing road level of DMC raod. Therefore, the new OPD building is to share the existing access of the Main building. As the new OPD building will be provided with centralized hospital functions such as X-ray department and the Laboratory department which will have frequent access from the Main building, the new OPD building shall be connected to the existing Main building by a corridor to secure a pedestrian traffic line between the two buildings. Furthermore, a service road necessary for fire fighting is to be provided around the new OPD building.

Fig.2-1 Site Layout Plan



(2)Architectural Area

1) Floor Plan

① Orthopedic Dept.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
TX room		8.8		
Casting room	10.5	10.5	15.6	
Consultation corner	30.3 (3 booths)	7.0×2=14.0	20.8	for 2 desks
Nurse's station	6.0	6.0	8.9	
Doctor's office		7.5	9.0	Office
Operation room		17.3	—	
Recovery room		8.7	—	
Dressing & Lockers		4.5	—	
Toilet		1.8	3.1	
Hallway		23.9	—	
Total	46.8	103.0	57.4	facilities are planned in OR Dept.

Calculation of the Consultation Room

The size of each consultation room is to be determined on the basis of the number of outpatients to the department.

Nos of outpatient (1998)	8,217
Nos of patients per day	32.9
Target No. of daily outpatients in 2005	43
No. of Consultation room	43cases×20min.÷8hours=1.8 One room to accommodate two consultation desks to be provided

Staffing Plan

The Philippine side plans the number of physicians to be assigned in Orthopedic Dept. of the new OPD building as follows.

Medical staff			Nurses	Nursing aides	Total
Med. specialist	M.S. VOL	Residents	1	1	16
5	2	7			

② Rehabilitation Dept.

The medical services given at the Rehabilitation Dept. are as shown below.

Ⓐ Diagnosis of Functional Disorders

Diagnosis of functional disorders is conducted by analyzing the results of static and dynamic measurements of the patient's physical conditions.

Necessary items of equipment:

video cameras, tensile strength/joint angle measuring equipment, dynamometer, telemeter electrocardiograph, heartbeat memory, treadmill/ergometer, etc.

Ⓑ Exercise Therapy

Exercise therapy conducted by the physiotherapist includes recovery from paralysis and muscular buildup.

Necessary items of equipment:

treatment table, inclined table, parallel bars, supporting bar, platform, mat, mirror, dumbbells, wheelchair, walker, etc.

Ⓒ Physical Therapy

In physiotherapy, light, water and heat are used to produce physical stimuli.

Necessary items of equipment: bathtub for hydrotherapy (whole body, parts of body, whirlpool), hot pack/heater, infrared lamp, ultrasonic treatment equipment, laser beam treatment equipment, functional neuromuscular stimulator, etc.

Ⓓ Prosthesis Therapy

Therapy by the use of prostheses.

Necessary items of equipment:

video camera, tensile strength/joint angle measuring equipment, dynamometer, telemeter electrocardiograph, heartbeat memory, treadmill/ergometer, etc.

Ⓔ Occupational Therapy

Therapy for recovery from disorders by engaging in occupational work. This therapy includes production of handicrafts, functional work with elements of games and sports, training in the use of prostheses, training in activities in daily life, preliminary occupational training and psychological training.

Necessary items of equipment:

woodworking tool, metalworking tool, handicraft work tool, therapy games, devices for use in training in vita functions, worktable, chair, etc.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Gym		42.3	175.7	Including Ot, wheel chair parking, waiting area and other treatment space
OT area		19.5	—	
Hydrotherapy room		8.0	9.6	
Treatment cubicle		24.3	27.9	9.3㎡×3rooms
ADL room		6.0	8.1	Including occopational therapy
Store		4.0	—	
Toilet (staff)		3.8	3.2	
Toilet (patient)		2.3	4.2	w/shower
Doctor’s office		16.0	15.5	
Wheelchair & stretcher parking		12.0	—	
Reception		7.5	—	
Treatment room		5.2	9.8	For therapy needing privacy
Other treatment spaces		119.6	—	
Total	68.8	270.0	254.0	

Number of Patients

The number of patients to undergo each of the above-mentioned therapies at the department of the new OPD building is estimated on the basis of the number of patients during the period from January to June, 1999.

	Physical therapy	Occupational therapy	Total
Inpatient	1,374	779	2,153
Outpatient	2,829	1,353	4,182
No. of patients (first half of 1999)	4,203	2,132	6,335
No. of patients per day in 2005	34	18	52
Target No. of daily outpatients (2005)	44	23	67

③ OB/Gyn/FP Dept.

Room	Existing	Requested floor area	Planned floor area	Remarks
Operation room		23.4	—	Transferred to Outpatient OR Dept.
Toilet		2.7	3.1	
Treatment room		12.0	—	
Conference room		13.5	—	
Nurses' station		11.3	8.9	Reception
Gyn consultation rooms	8.5	8.9×3=26.7	28.8	9.6㎡×3rooms
Internal Exam. room			19.2	9.6㎡×2rooms
OB consultation room	57.0	7.9×6=47.4	40.0	8.0㎡×5rooms
Ultrasound room		12.2	6.0	
Counseling room		10.5	15.6	
Hallway		73.3	54.7	Including waiting area
Office			9.0	Office
Waiting area	13.5		—	
FP (IUD) room	14.2		9.6	
Urine collection			5.3	
Lab.			9.1	
Total	93.2	233.0	209.3	

Calculation of the Consultation Rooms

The necessary number of consultation rooms is to be determined on the basis of the number of patients to the department.

	OB/FP	GYN
No. of outpatients in 1998	16,580(OB)+4,559(FP)	9,999
No. of daily outpatients	84.6	40.0
Target No. of daily outpatients in 2005	110	52
No. of consultation rooms	110patients×20Min.÷ 8hours = 4.6→5rooms	52patients×20min.÷ 8hours = 2.2→3rooms
Remarks	Common ultrasound room to be added	2 internal examination rooms for 3 consultation rooms to be provided

Staffing Plan

The Philippine side plans the number of physicians to be assigned in OB/GYN/FP Dept. of the new OPD building as follows.

Medical staff			Nurse	Midwife	Nursing aides	Clerk	Total
Med. Specialists	M.S. VOL	Residents	1	1	1	1	34
9	4	17					

④ Family Medicine Dept.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Doctor's room		22.5	9.0	Office
Family Health Care Clinic		13.5	13.5	
Counseling room		11.3	15.6	
Consultation room	45.7	10.5×4=42.0	36.0	9.0㎡×4 booths
Nurses' station		11.3	8.9	Reception
Treatment room		8.0	18.0	2 booths
Personnel Health Services room		11.2	13.5	
Conference room		35.1		
TB/Asthma clinic	29.2	27.0	48.9	Including reception and waiting
TB med. store	4.0			
Hallway		48.1	48.5	Including waiting area
Toilet			3.1	
Total	74.9	230.0	215.0	

Note: Family Health Care Clinic will be used for health activities of community level nursing which is based on Family Health Care Program. Presently 50 families are registed to DMC but there is no permanent place for the activity.

Calculation of the Consultation Rooms

The necessary number of consultation rooms is to be determined on the basis of the number of patients to the department.

No. of outpatients (first half of 1999)	12,106
No. of daily outpatients	97
Target Nos of dailyoutpatients in 2005	126
No. of consultation booths	126patients×15min.÷8hours=3.9 → 4booths

Staffing Plan

The Philippine side plans the number of physicians to be assigned in Family Medicine Dept. of the new OPD building as follows.

Medical staff		Nurses	Total
Medical specialists	Residents	1	20
5	14		

⑤ Pediatrics Dept.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Well child*	19.1	39.0	27.0	3 booths
Sick child	19.1	43.9	40.5	4 booths
Counseling room			15.6	
Conference room		13.5	—	
Staff room		24.0	—	
Nurse station		7.9	8.9	Reception
Office		11.2	9.0	
Hallway		25.7	62.4	Including waiting area
Toilet		7.0	3.1	
Infectious consultation room		10.8	15.6	
Adolescent			13.5	
Lactation			13.5	
Outdoor medical care			64.8	
Total	38.3	183.0	273.9	

Note: *Health check up for babies delivered at DMC will be done in Well Child room.

Calculation of the Consultation Rooms

The necessary size of consultation rooms is to be determined on the basis of the number of patients to the department.

	Sick child	Well child
No. of outpatient (1998)	22,385	13,812
No. of daily outpatients	89.5	55.2
Target No. of daily outpatients in 2005	116.4	71.8
No. of consultation room	116.4patients × 15min. ÷ 8hours＝3.6 →1room (4desks)	71.8patients × 20min. ÷ 8hours＝2.99 →1room (3desks)

In addition to the above-mentioned consultation rooms, one for examining and treating patients with infectious diseases is to be provided.

Staffing Plan

The Philippine side plans the number of physicians to be assigned in Pediatrics Dept. of the new OPD building as follows.

Medical staff			Nurses	Nursing aides	Total
Medical specialists	M.S. VOL	Residents	1	1	31
10	5	14			

⑥ Dermatology Dept.

Dermatology department was established on April 1, 1999. A total of four physicians, including one to serve as department chief, have been assigned to this department. (Hospital Administrative Order No. 038 S. 1999)

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Lab.		8.4	15.6	
Office		4.5	9.0	
PUVA room		9.6	15.6	
Consultants office		9.6	—	
Consulting room		12.3	15.6	
Treatment room	17.8 (Including Laser treatment)	9.5	15.6	
Consultation room		9.5	15.6	
Reception	5.8	5.3	8.9	
Toilet	4.5	3.4	3.1	
Hallway		38.9	24.0	
Total	28.1	111.0	123.0	

Main Tests and Therapies Conducted at the Dermatology Department

Test and Treatment	Contents	Equipment
1. Strap test, photesthesis	To identify cause of dermatitis. Judgement to be conducted twice, first in 24 hours and second in 48 hours	
2. Miscoscopic examination	Crinis, parasite, fungus	Bed, microscopy
3. External treatment	Drag spread, strapping	Observation under natural sun light
4. Electrosurgery Electrocoagulation /electrolysis	Treatment of Lentigo, hirsutism, tragomaschalia. Pathological examination of tissue.	Bed, electrotome for anaplasty
5. PUVA	UVA irradiation	Bed, UVA eradication equipment
6. Cryotherapy	Dry ice, liquid nitrogen	

Calculation of the Necessary Number of Consultation Rooms

The necessary number of consultation rooms is to be determined on the basis of the number of patients to the department.

No. of outpatients (April-June, 1999)	2760 (for 3 months from April to June)
No. of daily outpatients	44
Target Nos of daily outpatients in 2005	57
No. of consulting room	57patients×10min.÷8hours=1.2 → 1room

Staffing Plan

The Philippine side plans the number of patients to to be assigned in Dermatology Dept. of the new OPD building as follows.

Medical specialist	M.S. VOL	Residents	Total
3	2	2	7

⑦ Internal Medicine Dept.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Oncology clinic		19.5	14.4	
Cardiac clinic		19.5	14.4	
Nurses' station		19.5	8.9	Reception
Consultation room			15.6	
Waiting area		19.5		
Consulting room	20.5	12.0×6 =72.0	57.6	9.6㎡×6booths
Other specialty clinic		19.5	14.4	
Doctors' office		10.5	9.0	Office
Toilet		2.4	3.1	
Hallway		52.6	63.3	Including waiting area
Injection room	20.5		14.4	Treatment room
Total	41.0	235.0	215.0	

Calculation of the Consultation Rooms

The necessary number of consultation rooms is to be determined on the basis of the number of outpatients to the department.

No. of outpatients (1998)	31,965 (patients to oncology, cardiology, hematology, nephro, rheumatology and diabetes clinics excluded)
No. of daily outpatients	128
Target No. of outpatients in 2005	166
No. of consulting room	166×15min.÷8hours=5.2→6booths

In addition, three consultation rooms for oncology, cardiology, hematology, nephro, and reheumatology are to be provided. The present situation of the above special clinics is as shown in the following table.

	Oncology	Cardiology	Hematology	Nephro	Reheumatology
Consulta-tion hours	Tue・Thurs 1:00～5:00	Mon・Fri 1:00～5:00	Wed 1:00～5:00	Thurs 1:00～3:00	Once a month
Present facility	variable	variable	variable	Conference room	Conference room
No. of specialists	Regular 1 VOL 1	Regular 2 VOL 1	Regular 1 VOL 1	Regular 2	Regular 1

Staffing Plan

The Philippine side plans the number of physicians to be assigned in Internal Medicine Dept. of the new OPD building as follows.

Medical staff			Nurses	Nursing aides	Total
Medical specialist	M.S. VOL	Residents	2	1	48
15	14	16			

⑧ Diabetes clinic

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Consultation room	34.0	11.0	31.2	
Waiting area		11.0		
Mass counceling room	49.6		55.2	waiting
Patent’s toilet			4.3	
Foot care room			17.2	
Total	83.6	22.0	107.9	

Facilities required for this clinic are those necessary for activities of Diabetes Educational Clinic (DEC) and Sugar Club which have been held for diabetes patients since 1993 at DMC. Dance lesson and exercise are conducted from 8:00 to 8:30 everyday by Sugar club and Diabetes Educational Clinic is held before starting consultation on Tuesdays and Fridays. Therefore, a consultation room for two consultation desks and a mass counseling room, where 50 patients will take dance and exercise lesson are planned. The mass counselling room will be used as a waiting room after the execise. In addition to those rooms, foot care room is planned for treatment of trivial vessel disorder mass counseling room will be used as waiting room after theexercise.

Medical staff for this clinic belong to the Internal Medicine department.

⑨ Dental Dept.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Reception		4.9	6.0	
Office		8.8	7.2	
Treatment booth	43.0	8.8×6=52.8	63.0	10.5㎡×6booths
Waiting lobby		11.0	60.6	Including hallway
Hallway		9.5		
Store		3.0		
X-ray room			9.0	
Prep. room			7.2	Film developing equipment
Toilet			3.6	
Recovery room			5.4	
Total	43.0	90.0	162.0	

Calculation of the Treatment Booths

The necessary number of treatment booths is to be determined on the basis of the number of patients to the department.

Infant examination and maternal examination will be conducted at the new OPD building.

	Dental outpatient	Infant examination	Maternal examination
No. of outpatient (1998)	8,768	13,812	9,999
No. of outpatients per day	35	55	40
Target No. of daily outpatient in 2005	45.5	71.5	52
Time for treatment/ exam.	30 minutes per patient	10 minutes per patient	10 minutes per patient
No. of treatment	45.5patients × 30min. ÷8hours＝2.8→3rooms	(71.5patients＋52patients) × 10min.÷8hours＝2.6→3rooms	

Staffing Plan

The Philippine side plans the number of physicians to be assigned in Dental Dept. of the new outpatient building as follows.

Dentist	Dent. VOL	Dent. Aide	Total
3	3	3	9

⑩ ENT-HNS Dept.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Nurses station		10.5	8.1	Receiption
Store		6.3	7.2	Office
Waiting	53.4 (Roof only)	12.6	32.4	including reception
Infected cases		33.1	43.2	3 booths
Lab.	6.1	8.3		
Treatment room	57.1 (8 booths)	11.3	43.2	3 booths
Consultant room		18.4	9.0	
Diagnostic room		27.6	13.5	
Operation room	20.0	36.0		Transferred to outpatient OR Dept.
Sterilizing area		11.7		
Hallway	7.3	36.2		
Soundproof booth	0.8			
Locker room	6.5			
Toilet	10.5		3.6	
Cashier/Reception	11.4			
Total	173.1	212.0	162.0	OR facilities are planned in OR Dept.

Calculation of the Necessary Number of Treatment Booths

The necessary number of treatment booths is to be determined on the basis of the number of patients to the department.

No. of outpatients (1998)	13,225
No. of outpatients per day	52.9
Target No. of daily outpatients in 2005	68.8
No. of treatment booths	68.8patients×30min.÷8hours=4.3 → 5booths

The ratio between the number of cases of infectious diseases and that of cases of non-infectious diseases varies. Therefore, three consultation booths are planned for each of non-infectious cases and infectious cases, totaling 6 booths.

Staffing Plan

The Philippine side plans the number of physicians to be assigned in Ent-HNS Dept. of the new outpatient building as follows.

Medical staff			Nurses	Total
Medical specialists	M.S. VOL	Resident	2	18
4	5	7		

⑪ Surgery Dept.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Operation room		63.9	—	
Sterilizing area		7.0	—	
Recovery room		25.2	—	
Nurse station		10.5	8.9	Reception
Waiting lobby		24.0		
Pain clinic/ Anesthesia		9.4	13.5	
Consultation room	17.1	12.0×4	50.4	12.6×4rooms
Treatment room	17.1×2=34.2 (17.1×2=34.2 (one is dressing room)	33.3	44.1	15.3×2rooms (Treatment room) 13.5×1rooms (dressing room)
Supply room		7.0	—	
Patients dressing room		8.1	—	
Dr. dressing room		5.3	—	
Hallway		66.3	70.5	Including waiting area
Surgery office			9.0	office
Toilet			3.1	
Consultation room			15.6	
Total	51.3	308.0	215.0	OR facilities are planned in OR Dept.

Calculation of the Necessary Number of Consultation Rooms

The necessary number of consultation rooms is to be determined on the basis of the number of outpatients to the department

No. of outpatients (1998)	25,091
No. of outpatients per day	100.4
Target No. of daily outpatients in 2005	130.5
No. of consultation room	130.5patients×15min.÷8hours=4.1 →4rooms

In addition to the consultation rooms calculated as above, one pain clinic

and two treatment rooms, each of which shared by two consultation rooms, are to be provided.

Staffing Plan

The Philippine side plans the number of physicians to be assigned in Surgery Dept. of the new OPD building as follows.

Medical staff			Nurses	Nursing aides	Total
Medical specialist	M.S. VOL	Residents	2	1	39
14	4	18			

⑫ Ophthalmology Dept.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Nurse station		7.9	8.9	Reception
Waiting lobby	65.9	12.3	25.2	
Eye examination rooms	40.0 (5boths)	7.5×6=45.0	50.4	for six examination tables (including corridor)
Refraction room		30.0	18.0	
Laser room		10.5	18.0	
Nurses lounge		11.3	—	
Residents lounge	11.7	14.1	9.0	Office
Conference area		14.0	—	
Recovery room		21.0	—	
Dressing room	8.1 (corridor to OR)	3.2	—	
Operation room	26.5 (2 Operation tables)	24.5	—	
Minor Operation room		10.5×2=21.0	18.0	
Hallway		79.2	—	
Office	2.9		3.1	
Toilet			15.6	
Total	155.1	294.0	166.1	Operation room facilities are planned in OR Dept.

Main Tests and Treatments Conducted at the Ophthalmology Department

	Contents	Main equipment
1. Optometry	5m distance with 300～500lx illuminance	Optotype
2. General examination	Examination of cornea, lens etc.	Slit lamp microscope
3. Opthalmotonometry (Darkroom)	Diagnosis, prevention and treatment of glaucomatous	
4. Funduscopy (Darkroom)	Examination of optomeninx	Funduscope
5. Visual field test (Darkroom)	Diagnosis of eyeground and brain affection	Campimeter
6. Eyeground imaging	Examination of deseases at optomeninx, eyeground, vessel etc.	
7. Eye wash	To remove foreign matter	Bed, washing basin
8. Application of eyewash	Diagnosis, anesthesia, treatment	Washing basin
9. Application of salve		Washing basin
10. Cold pack	Cold water, ice used	
11. Hot pack	Hot water, liquid medicine (approx. 50℃) 10 minutes per time, 2～3 times a day	
12. Infrared, pack	irradiation of 5～10 minutes	Infrared ray lump
13. Bougie Depuration of dacryagogue	Collyer 1 to 2 times every 3 minutes, Bougie removal after 15 minutes	Bed
14. Injection under conjunctiva	Anesthesia collyer, injection by physician	Bed, washing basin treatment light
15. Operation of hordeoplum	Pyorrhea incision	Treatment bed, treatment light
16. Removal of foreign matter from cornea	To wear a patch on the day	Treatment bed, slit lamp microscope
17. Operation of chalazion	Infiltrate anesthesia, evidement	Treatment bed, slit lamp microscope
18. Ciliectomy	Infiltrate	Treatment bed, slit lamp microscope
19. Operation of blepharelosis	Infiltrate anesthesia, patch fill dressing	Treatment bed, slit lamp microscope

Calculation of consultation booths

No. of outpatients (1998)	18,588
No. of daily outpatients	74.4
Target No. of daily outpatients in 2005	96.7
No. of examination tables	96.7patients×30min.÷8hours=6.04 → 6

Staffing Plan

The Philippine side plans the number of physicians to be assigned in Ophthalmology Dept. of the new outpatient building as follows.

Medical staff			Nurses	Total
Medical specialist	M.S. VOL	Residents	2	19
4	7	6		

⑬ Outpatient OR Dept.

Flow of patients for operation at OPD.

At present, day surgery on outpatients are performed in the operation room of the ENT and ophthalmology outpatient departments and in the central OR Department.

Day surgery is performed on outpatients who are able to walk both before operation and after operation and have no other health problems than the affected part. Inguinal hernia, hemorrhoids or the like, equivalent to the category of ASA-1 in the U.S. Society of Anesthesiology are treated.

The flow of operation process is as shown in the diagram below. The same process is to apply in the new OPD building.

Determination of Eligible Outpatients

Prior to the surgical operation, the patient is to undergo the necessary examination. The test results are sent to the outpatient office within two hours after the tests.
Examinations are:
- CBC
- Urine test
- X-ray examination
- ECG

If there is a problem to be examined by the anesthetist, such problem is to be referred to the medicine department or the pediatrics department at least one day prior to the surgical operation.

The outpatient to undergo a surgical operation is to pay a fixed fee of 1,200 pesos. Outpatients who have health insurance are not required to pay the fee.
The outpatient who has paid the fee is required to submit the receipt to the outpatient office.

The outpatient to undergo a surgical operation is required to arrive at the hospital by 6:00 a.m.

After the operation, the outpatient wait in the recovery room in case of ordinary anesthesia, or in the emergency room in case of spinal anesthesia.
The problem(s) likely to occur when the patient recovers and can walk on his or her own is explained to the patient and relevant instructions are given in writing to the patient.

The patient who has undergone a surgical operation does not recover by 6:00 p.m., is hospitalized.
A follow-up medical examination is conducted one to seven days after the surgical operation

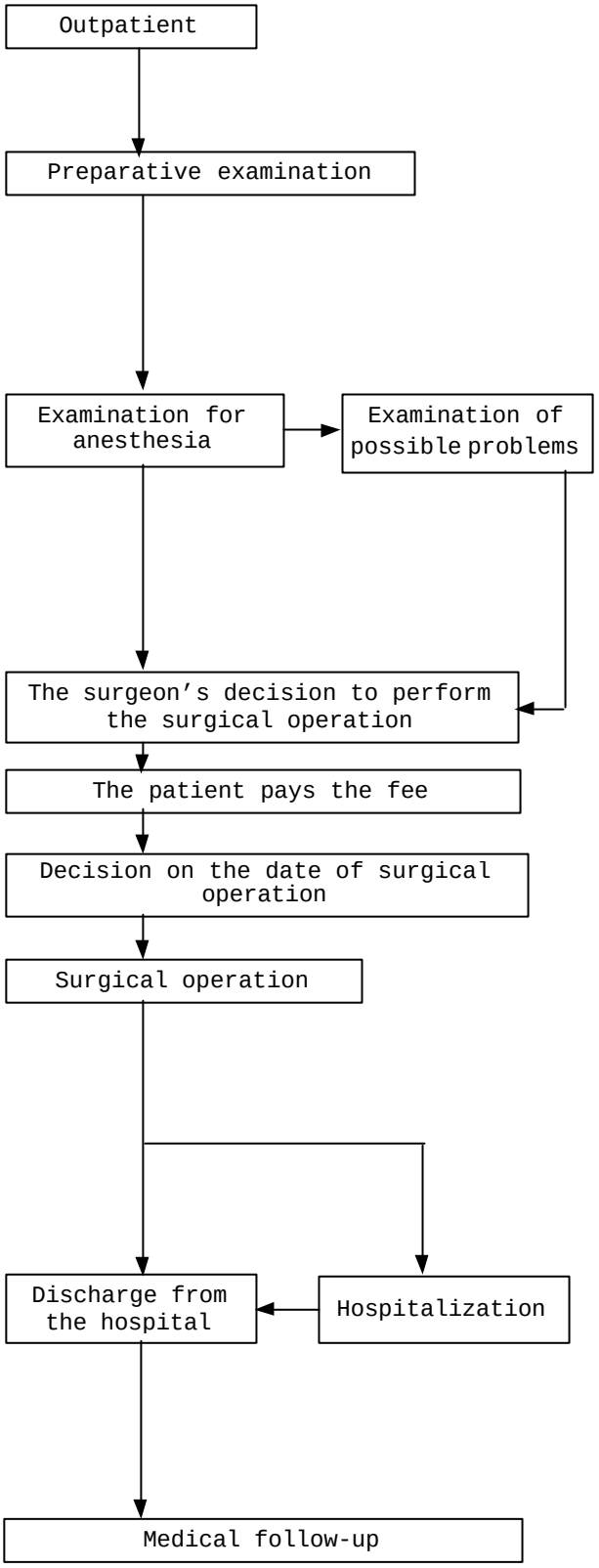


Fig.2-2 Flow of Operation Process

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Reception			21.6	
Nurse station			6.2	
Patients locker room			28.4	14.2×2 rooms (Including toilets)
Recovery room			43.2	
Operation room hall			72.7	scrub
Waiting			64.8	Post-operation instruction, pre-operation treatment
Operation room			64.8	21.6㎡×3rooms (Orthopedics, OB/Gyn, ENT)
Operation room			28.8	Opthalmology
Operation room			49.1	Surgery (2 operation tables)
Disposal room			5.4	
Resting room 1			23.4	
Staff locker room			64.8	32.4㎡×2rooms (shower, toilet included)
Wash/assembling room			34.2	
Toilet			3.4	
Store 2			6.6	
Sterilizing room			11.6	
Clean store			18.5	
Resting room 2			9.0	
Manifold room			25.2	
A/C room			17.1	
Hallway			18.8	
Total		0	617.7	

The request submitted by the Philippine side included an operating room for each of the ENT, Ophthalmology, Orthopedics, OB/GYN and Surgical departments. However, the provision of an operating room to each of these departments will necessitate the provision of incidental facilities, such as sterilizing room and preparatory room in each department, which will likely lead to waste of facilities, equipment and staff members' time and labor. Therefore, it was concluded to establish an outpatient OR department to centralize operating rooms for easier maintenance and management.

ENT-HNS and Ophthalmology departments in OPD are presently provided with operating rooms for minor surgical operations. However, at the other departments, monor surgeries are performed using spaces closed off with partitions in the treatment rooms or the consultation rooms.

As shown in the following table, a total of about 4,600 minor surgeries were performed at the five outpatient departments in 1998. Since June 1998 relatively large-scale surgical operations have been performed as one-day surgery at Surgery Dept.

Minor surgeries performed at the outpatient department in 1998.

Dept.	Nos of operation	Contents	Required time for a case	Expected No. of cases a day
ENT-HNS	935	Incision & Drainage, Closed reduction of nasal bone fracture, Interdental wiring, Electrocautery, Sature fistulomy of ranula etc.	1.5	1216 (4.9)
Ophthalmology	555	Pterygium excision, Anterior vitrectomy, Cataract, Glancoma etc.	2.5	722 (2.9)
Orthopedic	674	Removal of implants, Suturing of wound, Thenar flap, Disarticulation/Amputation etc.	0.75	876 (3.5)
OB/GYN	1,170	Polypectomy, Cervical punch biopsy with ECC, Practional curettage, Polypectomy etc.	0.75	1521 (6.1)
Surgery	1,492	Excision of breast mass, Excision of sebaceous cyst, Excision of tendon/ganglion cyst, Rectal biopsy etc.	1.5	1940 (7.8)
	111 (from June to December 1998)	Herniorrhaphy, Herniotomy, Hemorrhoidectomy, Hydrocelectomy, Fistulotomy etc.	2.5	288 (1.2)
Total	4,937			6,563

Note: The average operating time includes the preoperative and postoperative time to make preparations and clear up the operating room.

Determination of the Necessary Number of Operating Rooms

For the following reasons, it was decided to provide an operating room to each of the five outpatient departments (five operating rooms in total). Also shown below is the estimated daily occupancy hours of each operating room in the target year.

Ⓐ ENT

Since microscope is often used at the operation, the operating room for this department need to be vibration free so that the surgeon's viewing field may not move.

Daily occupancy hours: (5.2 operations/day) x (1.5 hours/operation) = 7.4 hours

Ⓑ Ophthalmology

For prevention of infectious diseases, operation room for this department must be kept cleaner than those for the other departments.

Daily occupancy hours: (2.9 operation/day) x (2.5 hours/operation)
= 5.8 hours

Ⓒ OB/GYN

Privacy must be protected due to nature of the activities in the department.

Daily occupancy hours: (6.1 operations/day) x (0.75 hours/operation)
= 4.6 hours

Ⓓ Orthopedics

Since the operating table for this department are different from those used for the other departments, it is desirable to provide an exclusive operation room for this department.

Daily occupancy hours: (3.5 operations/day) x (0.75 hours/operation)
=2.6 hours

Ⓔ Surgery

Since the operating table for this department is different from those used for the other departments, it is desirable to provide an exclusive operation room for this department.

Daily occupancy hours: (7.8 operations/day) x (1.5 hours/operation)
+ (1.2 operations/day) x (2.5 hours/operation)
= 14.7 hours

Due to the situation of OR of each department as stated above, one operating room is to be provided to each of the Surgery, ENT, Ophthalmology, OB/GYN, and Orthopedics departments. And the operating room for Surgery Dept. will be larger than others to accommodate two operating table since the daily operating room occupancy is large.

⑭ Laboratory Dept.

Flow of patients at Laboratory Department

The procedure for undergoing clinical testing, physiological testing and image diagnosis is as shown below.

A prescription prepared and signed by a physician in charge to be given to the patient or his/her attendant.

Patient who is unable to pay the medical fee consult social welfare officer.

The form is submitted to the billing office for confirmation of the amount of the payment.

The confirmed amount to be paid at the cashier. In the case of a patient who is on the health insurance list, only the differential is paid.

The patient submits the receipt and relevant documents to the respective counter by 3:00 p.m. to undergo the tests.

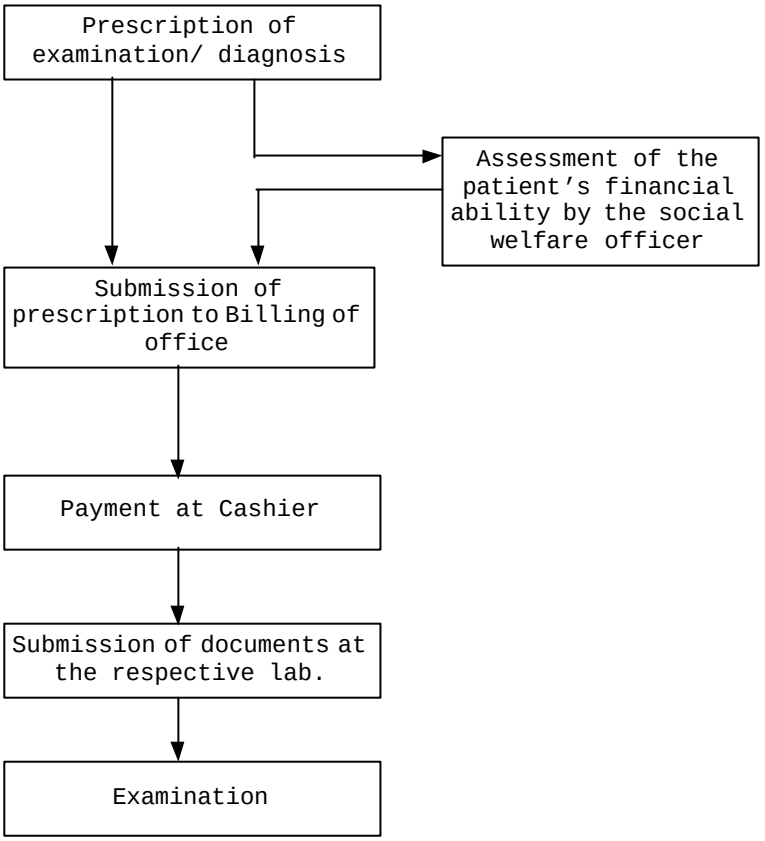


Fig. 2-3 Flow of Examination Process

When it is necessary to conduct tests and/or diagnosis for an inpatient on a holiday, or in an emergency after working hours, a resident on 24 hour duty is to present.

Functions of Laboratory Dept.

General tests:

Qualitative tests of urine, excrement and body fluid, and cytological test.

Necessary items of equipment:

microscope, colorimeter, refractometer, centrifuge, incubator,

testing table, etc.

Blood tests:

Blood form, blood specific gravity, number of blood cells, bleeding, blood coagulation tests to be utilized in diagnosis of hemophilia, leukemia and other blood diseases. Blood count, blood cell form test, coagulation factor test.

Necessary items of equipment:
blood counter, microscope, fibrometer, centrifuge, differential white blood cell counter, testing table, etc.

Biochemical tests:

Qualitative and quantitative tests of chemical elements of blood, urine and body fluid.

Necessary items of equipment:
spectrophotometer, flame photometer, protein refractometer, electrophoresis equipment, hydrogen ion concentration measuring equipment, constant temperature tank, centrifuge, testing table, incubator, chemical scale, pure water generator, pipet washer, draft, balance stand, etc.

Serum tests:

The serum test results are utilized in diagnosis of virus infections (AIDS, chickenpox, rubella, influenza) and autoimmune diseases. Antigen/antibody test, virus test

Necessary items of equipment:
constant temperature tank, incubator, centrifuge, pipette washer, testing table, etc.

Necessary facility:
antigen test booth

Bacteriological examination:
Types of bacteria are identified by culturing and dyeing.
Viral culture, identification, tolerance/sensitivity test of

sputa, urine, blood, secretions and body fluid

Necessary items of equipment:

constant temperature tank, incubator, microscope, centrifuge, dry heat sterilizer, autoclave, testing table, etc.

Necessary facilities:

gas burner, medium room, anteroom, sterilization room

Pathological examination:

Identification of diseases through examination of tissues. Morphological examination of physiological changes caused by diseases, Microscopic examination of cells

Necessary items of equipment:

microtome, paraffin melting equipment, dyeing equipment, frozen section generator, incubator, testing table, etc.

Ⓐ **General Lab., Bacteriology Lab., Pathology Lab.**

Rooms	Existing	Requested floor area	Planned floor area	Remarks
General Lab.				
Collection area		12.3	49.8	Blood collection, waiting
Clerical room		15.8	21.6	Including record
CMT office		14.7	9.6	Person in charge
Uri-PARA		13.4	29.0	General examination
Drug assay room	116.5	16.9	—	Including in chemical lab.
Drying/Distilling room		19.8	—	
Staff lounge		17.7	—	
Storage		20.0	—	
Storage lab.		31.5	41.4	
Chemistry lab.		39.0	52.4	
Hematology lab.		33.8	28.4	
Hallway		51.9		
Urine collection			15.0	7.5㎡×2rooms
Total	144.0	286.8	247.2	

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Bacteriology Lab.				
Washing area	27.5	21.0	19.2	
Bacteriology lab.		32.4	43.2	
Ante room		8.8	4.5	
Media preparation room		12.6	6.6	
Isolation room		15.2	10.5	
Total	27.5	90.0	84.0	
Pathology Lab.				
Reception	42.5	21.0	—	
Pathology lab.		44.6	15.6	
Histopath area		25.9	36.6	
Patho working area		30.4	36.6	No A/C
Toilet		4.3		
Hallway		10.1	6.0	Ante room
Store			13.2	
Total	42.5	130.8	108.0	
Common				
Locker room			19.2	9.6㎡×2rooms
Resting room			12.8	
Hallway			90.4	
Total	214.0	507.6	561.6	

Ⓑ **Physiological Lab.**

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Physiological examination section				
Waiting area		27.0	47.7	
Office			10.8	
Nurse station		10.5	10.8	Reception
File storage		5.3	—	
Treadmill station		25.0	21.6	
ECG station		10.0×2 =20.0	14.4	7.2×2rooms
EMG station		10.0	7.2	
Pulmonary lab.	45.5	27.0	13.8	
EEG (soundproof)		27.0	13.8	
Locker room		6.0		
Sterilizing room		18.6		
Hallway		62.5	28.8	
Consultation room	45.5	238.9	13.8	
Total			182.7	
Endoscopy examination section				
Endscopy unit		18.0×3 =54.0	42.8	21.4×2 rooms (Including toilet)
Eqipment working area		21.2	22.0	
Recovery room			9.0	
Locker room		7.7	4.3	
Toilet			4.3	
Total			82.4	
Grand Total			265.1	

⑮ Training facilities

At Davao Medical Center many training are actively conducted whole year round for residents, interns and paramedics within the hospital as well as those from outside the hospital.

DMC has accepted annually 5,800 trainees in average as shown in the following table. As DMC is one of the top referral hospitals in Mindanao, it is required to accept more trainees for accomplishing objectives of "Mindanao Health Development Plan"

Table 2-7 Number of Trainees trained at DMC anually in the past 5 years

Field	1994	1995	1996	1997	1998	Total
Nursing	4,012	3,981	3,851	3,503	3,110	18,457
Mental care	1,023	1,145	1,035	945	1,013	5,161
Midwifery	198	204	186	194	213	995
Nursing assistance	10	11	8	13	11	53
Nutrition	56	48	39	42	43	228
Physical therapy	149	146	154	158	192	799
Occupational therapy	—	—	—	92	98	190
Medical technology	278	293	257	272	280	1,380
Psychiatrics	32	29	31	36	43	171
Medical student	245	268	254	248	250	1,265
Total	**6,003**	**6,125**	**5,911**	**5,503**	**5,253**	**28,795**

Since there are a few training rooms in DMC, it is needed to rent rooms at outside facilities such as hotels in case of lectures for large number of trainees. This has been burden for DMC to rent places, so that training rooms and lecture hall are planned on the third floor of the building to solve the situation.

Number and size of training rooms are determined based on the past training achievement at DMC during six months from July 1998 to December 1998, which is almost same as first six months of the same year.
In the period 34 training courses were held for totaling of 1,709 days and 2,026 trainees participated in the courses. Total number of trainees participated in training at DMC in 1998 is as many as 5,253. Courses are

categorized in three groups in terms of duration, namely short course from 1 to 5days, intermediate course of approximately a month and long term course of 3 to 6 months. Some courses are being held simultaneously and intermediate courses and long term courses for residents, intern, medical students and nurses/midwives, totaling 10 courses, are always held all year round. Past results of training courses held at DMC from July 1998 to December 1998 is shown below.

Program/Activity	Nature of participants	July	Aug.	Sept.	Oct.	Nov.	Dec.	No. of participants	Training term
Residency training program	Resident physicians	▬	▬	▬	▬	▬	▬	122(total) (5-19/dept.)	Long term (6 months)
Residency disporsal program	Resident physicians	▬	▬	▬	▬	▬	▬	5	Long term (6 months)
Internship training program	Medical interns	▬	▬	▬	▬	▬	▬	25	Long term (6 months)
Prevention and primary care of diabetic nephropathy	Nurses/ Midwives	●						100	Short term (1 day)
Nursing care	Nurses	●						47	Short term (1 day)
Life threatening dermatoses	Nurses		●					120	Short term (1 day)
Dynamics of aging	Nurses/ Physiologist		●					39	Short term (1 day)
Ethical delimma in nursing	Nurses	●						95	Short term (1 day)
Biofeedback	Nurses				●			173	Short term (1 day)
Role clarification for senior nurse	Nurses							14	Short term (1 day)
Ranger in nurses	Nurses					●		118	Short term (1 day)
Qualitative research	Nurses					●		126	Short term (1 day)
Effects and management of genital tract infections	Nurses						●	117	Short term (1 day)
Violence against women	Physicians/ Nurses							66(total)	Short term (1 day)
Mental health and stress in the workplace	Physicians/ Nurses				●			37	Short term(1 day)
Basic life support	Physicians Nurses						●●	69(total)	Short term(1 day)
Volunteer training	Nurses	▬	▬	▬	▬	▬	▬	7	Long term (6 months)
Volunteer training	Nurses/ Midwives	▬	▬	▬	▬	▬	▬	14	Long term (6 months)
Coordination meeting	Nurses/ Midwives			●				42	Short term (1 day)
Orientation of clinical instructors	Nurses/ Midwives					■		9	Short term (5 days)
Interrupted residency training program	Resident physicians from other hospitals	▬	▬	▬	▬	▬	▬	7	Long term (6 months)
Basic training course on AIDs	Physicians	●						15	Short term (1 day)
Hospital infection control program	Nurses/ Midwives	●		●	●			99(total)	Short term (1 day)
Effective management	Nurses/ Technicians	■						64	Short term (2 days)
Lactation management seminor	Nurses/ Midwives		●					34	Short term (1 day)
Waste management update	Physicians/ Nurses			●				24	Short term (1 day)
Coronary care nursing	Nurses	▬	▬	▬				3	Long term (3 months)
Renal dialysis unit	Nurses	▬	▬	▬				3	Long term (3 months)
Coronary care nursing	Nurses				▬	▬	▬	11	Long term (3 months)
Renal dialysis unit	Nurses/ Technicians				▬	▬	▬	4	Long term (3 months)
Medical clerkship	Graduating medical students	▬ (76)	▬ (18)	▬ (33) ▬ (18)	▬ (7) ▬ (24)	▬ (8) ▬ (16)	▬ (44) ▬ (16)(43)	303(total) ( ): No. of participants /session	Middle term (1 month～ 2 months)
Volunteer training program/Ovservership	Graduates of paramedical courses	▬	▬	▬	▬	▬	▬	6	Long term (6 months)
Orientation of students	Nursing students				(115)	(31) (28) ●●●●● (36)	(15)	225(total) ( ): No. of participants /session	Short term (1 day)
Frequency of training conducted within a month		17	14	14	14	16	13	2,026 (total number of participants)	

Fig. 2-4 Past Results of Training Courses Held at DMC (July to December 1998)

Examination of size of rooms and their number

① Lecture room

All medical departments, totaling 12 departments, hold section meetings in the mornings and training courses are held from 13:00 to 17:00. Each of long term courses have to have a classroom once everyday, so that necessary number of rooms is determined based on requirement of these long term training courses.

- Number of courses a day held in the afternoon：
  12(resident training of 12 medical departments)+8(other training courses) = 20 times
- Average duration of each course ： 1.0 hour

Necessary number of rooms

20 times×1 hour÷4.0 hours = 5.0 rooms

Utilization ratio of lecture rooms in mornings

12 Medical departments×1 hour÷(4 hours×5rooms)×100=60%

Therefor, 40 % of utilization hours will be applied for short term training courses when section meetings are not held.

Size and number of rooms

Seating capacity of each lecture rooms is planned to be 24 in consideration of size of past training courses. Size of each room is 31.2 m^2 to accommodate 24 tablet arm chairs (12 in case separate chairs and tables used)

② Large lecture room

A large lecture room is planned for plenary lectures of resident training courses and one day seminar with participants of more than 100 trainees. Seating capacity of the room is planned to be 180 in consideration of the maximum number of participants at past courses (173 participants,

presently outside facilities such as hotel are used since no such facility is available within DMC), and area is 229.2 m^2. The room will be separated into two medium size rooms by means of sliding wall for holding medical clerkship courses with participants of 24 to 70 trainees, which is held everyday in July, September and December as well as for one day irregular courses which are held 1 to 4 times monthly.

The table shown below illustrates how the large lecture room will be utilized on an assumption of the past results.

		Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Used as 1 room (180/room)	1 hour use	1/week	1/week	1/week	1/week	1/week	1/week
	Whole day use	2/week	2/week	-	2/week	2/week	1/week
Used as 2 rooms (70/room)	1 hour use	-	Every day	Every day	-	-	Every day
	Whole day use	4/week	1/week	3/week	1/week	2/week	-

Note: When irregular whole day course is held, daily courses do not use the room.

As a result of above examination, 5 lecture rooms with a seating capacity of 24 and one large lecture room with a seating capacity of 180, which can be separated into two medium size lecture room (each room will have a seating capacity of 70), are planned in this project.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
Auditorium		675.0	-	
Large lecture room (180 capacity)			229.2	When used as two rooms, 70 capacity
A/V room		237.0	-	
Pantry		27.0	14.4	
Conference room		72.0	-	
Board room		27.0	-	
Training room (24 capacity)			156.0	31.2 ㎡×5 rooms =156 ㎡
Training office		45.3	15.6	
Office of C.T.O		14.0	-	
Storage		6.0	16.1	Furniture
storage		13.1	33.4	
A/C mech. room		18.6	14.4	
Locker room		248	-	
Total		1,213.4	479.1	

⑯ X-ray Dept.

Rooms	Existing	Requested floor area	Planned floor area	Remarks
CT room		33.6	32.4	
Control room		10.8	14.4	
AVR/Mechanical room		14.7	—	
X-ray room 1～3	30.3 22.0 30.3 17.5	33.4×3 =100.2	129.6	32.4㎡×4 rooms(1～4)
X-ray room 4,7		26.2×2 =52.4	36.1	
X-ray room 5,6		29.9×2 =59.8		
Darkroom	7.5+5.3	6.5×3=19.5	23.8	Including ante-room
X-ray record room	31.3	118.9	97.2	
Staff office		36.3	—	
Conference room	13.8	18.0	—	
Charman's office		15.0	15.6	doctor's room
Doctors lockers/Lounge		25.5	34.2	17.1㎡×2rooms
Reading room	20.0	25.0	24.0	
Radiation Technologist locker room		25.0	—	
MRI room		32.5	—	
MRI control room		9.0	—	
MRI mech. room		6.0	—	
Chief Radiation Technologist office		17.2	—	
Mannography/ Dental		25.2	—	
Waiting area 1		90.5	45.0	
Hallway		347.5	201.1	Including stretcher parking
Reception			55.8	
Waiting area 2		45.4	—	
Total	178.0	1128.0	709.2	
Ultrasound				
Nursestation		10.8	4.0	Reception
Ultrasound room		7.2×6=43.2	28.8	7.2㎡×4rooms
Doctors' room		15.8	14.4	
Store		12.3		
Toilet		2.4×2=4.8	2.9	
Hallway/waiting		40.5	21.9	
Total		149.0	72.0	
Grand Total		470.8	781.2	

Ⓐ CT Rooms

As it has been confirmed in writing that the Office of the President of

the Republic of the Philippines will donate a full-length CT scanner through Davao City Office, a CT room and a control room is to be provided under this project.

Ⓑ X-Ray Rooms

Five x-ray rooms are planned for six X-ray equipment, which were calculated to be necessary in the year of 2005 since, one is mobile type out of 6 equipment.

The existing C-arm X-ray machines for use in surgery is to remain in the operating room in the main building, and the panoramic dental X-ray machine is to be placed in the Dental Dept. of the new OPD building.

Ⓒ X-ray record room

X-ray films are required by law to be kept for five years. The existing X-ray record room has a capacity of storing X-ray films of the three years due to its limited space.

X-ray films in envelops of 350mm by 430 mm are kept in cabinets (300cm wide) with six shelves each.

The floor area of the X-ray record room is to be determined on the basis of the necessary number of cabinets to keep X-ray films for the five years.

- Annual total number of X-ray examinations in the year of implementation of the project: 40,000 (for both inpatients and outpatients)
- Average envelope thickness: 0.3 cm (8 films in an envelop on average)

  Necessary number of cabinets

  (40,000 x 0.3 cm x 5 years)/300 cm x 6 shelves = 33.3 → 34

Ⓓ Ultrasound diagnosis rooms

Based on the examination on necessary ultrasound diagnosis equipment, five equipment will be necessary. Therefore, four rooms are planned for four equipment since one will be placed in OB/GYN/FP department.

⑰ OPD Reception

Rooms	Existing	Requested floor area	Planned floor area	Remarks
HCWP office		13.2	86.4	Including councelling room and nurse office
Nurse office		9.9	—	
OPD director's office	17.5	17.1	10.8	
Cashier	10.2	16.2	10.8	
Billing office	29.0	18.0	10.8	
Social welfare room	13.5	8.6×2 =17.2	46.8	Including store
OPD adminitrator's office		20.0	10.8	
Information		14.5	13.5	
Registration			18.0	
Registration triage		8.0	18.0	
Medical records room	20.5 (for 9 years)	55.9	86.4	
Councelling room	7.7		—	
Waiting area	88.8	1746.0	363.6	
Total	187.2	1936.0	675.9	

Flow of patients for registration at OPD is as follows;

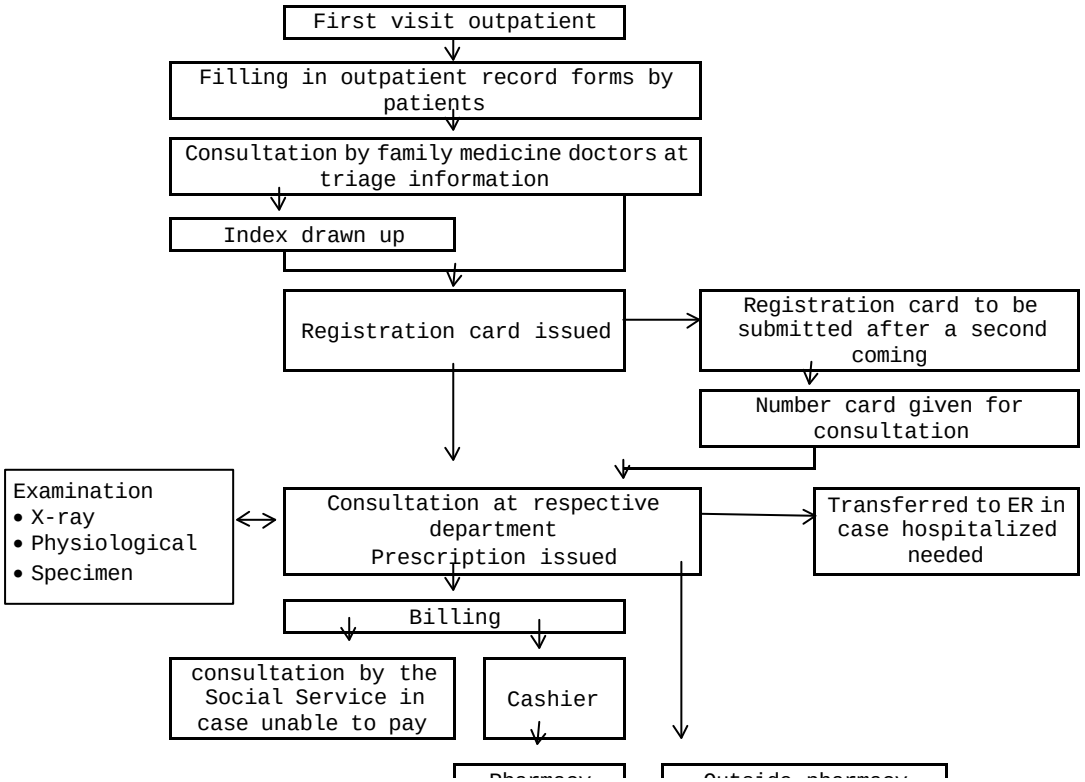


Fig. 2-5 Flow of Patients

⑱ Others

Rooms	Requested floor area	Planned floor area	Remarks
Security office	20.0	46.4	Including control panel observation
Housekeeping	18.0	43.2	Including store
Conference room	34.0	—	
Public toilet	167.0	203.0	43.2㎡×4, 108㎡×2, 4.3㎡×2
EV machine room	266.0	43.2	
Manifold room	55.0		Including in outpatient OR
Power house	36.0		Installed in the dry area
Staircase/Hallway	1048.0	2,246.6	
Disabled toilet		41.4	9.0㎡×3+7.2㎡×2

Calculation of the Toilets in the Basement, the First Floor and the Second Floor

The estimated total number of outpatients in 2005 is 1070.
A patient is accompanied by 2.5 attendants on average, so that the daily total number of visitors to new OPD building is estimated to be 2,675 (1070 x 2.5).
On an assumption that the daily total number of visitors to the new OPD building are distributed 535 on the Basement, 1070 on the first floor and 1070 on the second floor (the ratio between men and women: 50:50) and that the toilet use rate will be 60 percent of the total number of visitors during peak hours, the necessary numbers of toilets in the basement, the first floor and the second floor are calculated as follows in accordance with the Architectural Design Data.

Basement

	Required number	
	Men	Women
Urinal	3	—
WC	3	4
Washing basin	3	3

1st FL, 2nd FL

	Required number	
	Men	Women
Urinal	5	—
WC	2	6
Washing basin	3	4

Table of Breakdown Floor Area by Facility Function

Section	Requested floor area	Priority	Planned floor area	Remarks
Clinical Depts.	2,291 ㎡	A	2,160.6	
Outpatient OR	0	A	617.7	5 ORs
Entrance misc.	190 ㎡ (Excluding waiting)	A	675.9	
Connecting corridor	466 ㎡	A	1,150.6	
X-ray Dept.	1,128 ㎡	A	781.2	5 X-ray rooms, CT room and ultrasound
Physiology Lab.	149 ㎡	A	265.1	ECG, EMG, EEG, endoscopy
Lab.	806 ㎡	A	561.6	General, Bacterilogy, Pathology
Pharmacy	88 ㎡	A	—	To be in the existing main building
Teletherapy	283 ㎡	B	—	Existing equipment not to be shifted
Training Dept.	1,171 ㎡	A	479.1	
Library	311 ㎡	B	—	
Canteen & Kitchen	799 ㎡	B	—	
Security	20 ㎡	A	46.4	
Housekeeping	18 ㎡	A	43.2	
Conference room	34 ㎡	A	—	
Waiting Lobby	1,746 ㎡	A	363.6	
Public toilet	167 ㎡	A	244.4	Including disabled toilets and part of staff toilet
EV mech. room	266 ㎡	A	43.2	
Manifold room	55 ㎡	A		Included in OPD OR Dept.
Power house	36 ㎡	A	—	
Stair/hallway	1,048 ㎡	A	2,246.6	
Total	11,072 ㎡	A	8,528.6	

Floor area of each medical department is as shown below.。

	Requested floor area	Planned floor area
Orthopedics Dept.	103	57.4
Rehabilitation Dept.	270	254.0
OB/GYN/FP Dept.	233	209.3
Family medicine Dept.	230	215.0
Pediatrics Dept.	183	273.9
Dermatology Dept.	111	123.0
Medicine Dept.	235	215.0
Diabetes clinic	22	107.9
Dental Dept.	90	162.0
ENT-HNS Dept.	212	162.0
Surgery Dept.	308	215.0
Ophthalmology Dept.	294	166.1
Total	2,291	2,160.6

2) Floor planning

Entrance lobby and triage are planned on the Ground floor to receive outpatients. Patients proceed to the respective clinical department after assigned at the triage on the Ground floor. The new OPD building is to be connected to the existing Main building by a connecting corridor at the Ground floor level. Inpatients from the existing Main building will have an access to X-ray rooms and laboratories via the entrance lobby on the Ground floor. Clinical departments located on the Ground floor are Orthopedics Dept., Rehabilitation Dept., OB/GYN/FP Dept. Pediatrics Dept. to which short walking distance is desirable for the patients. OR, X-ray rooms are placed on the Lower Ground floor because they need to be closed up from outside. It is advantageous to locate X-ray rooms on the basement as it is not necessary to consider protection for downward leakage of radiation.

Facilities for Dermatology Dept., Dental Dept., ENT-HNS Dept. surgery Dept., Medical Dept. and Ophthalmology Dept. are placed on the 2nd floor as walking distance is not very important criteria for those departments.

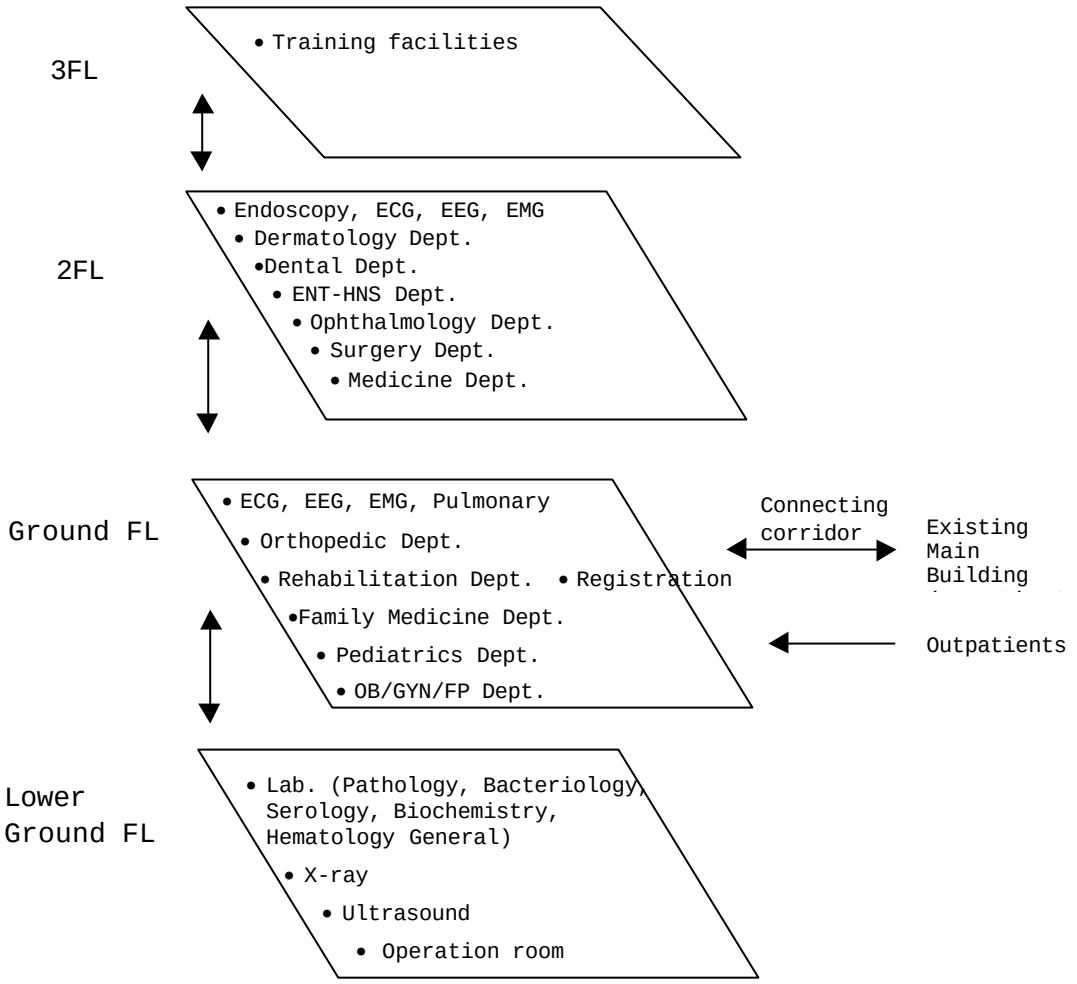


Fig. 2-6 Functional Layout Plan

3) Section Plan

To reduce the maintenance and management costs as much as possible, mechanical air-conditioning should be minimized. Indoor environment should be maintained comfortable by means of sectional arrangements of the building such as natural ventilation and protection from direct sunlight. Provision of eaves with a sufficient depth to prevent direct sunlight and keeping sufficient air volume in each room to lower room temperature are considered to be effective measures.

As the project site inclines down from north to south, lower ground floor is above ground at the south side whereas it is underground at the north side. Humidity will be high underground part of the building. Therefore, a dry area is planned around the underground part so that the exterior walls of the lower ground floor will not touch earth directly.

(3) Structural Plan

- Outline of the Structure

  The outline of the structure of the new OPD building is as follows.

  Number of stories : one below ground and three above ground

  Story heights : lower ground floor, ground floor and second floor: 4.2 m, third floor: 4.05m

  Basic span : 6.0 m x 7.2 m

  Type of structure : Reinforced concrete rigid frame structure

  Foundation : Direct foundation

- Foundation system

  According to the geological survey report of the project site, which was provided by the Philippine side, the geological soil condition of the project site is almost even. The rigid clayey silt layer (N value: 8-10) that lies at a depth of 1.5 meters can be the supporting layer. The foundation system should be direct foundation with the value of allowable bearing capacity of 14.5 t/m^2.

- Superstructure system

  In consideration of construction method, cost effectiveness, natural conditions and the size of the building, it is appropriate to employ reinforced concrete rigid frame structure with reinforced concrete seismic wall. In consideration of the present situation of the local construction industry and cost efficiency, non-structural walls should be of brick or concrete hollow block.

- Load and external Force

  – Live load:

  The values of live load are to be in accordance with the National Structural Code of the Philippines as shown below.

Offices	240kg/m^2
X-ray rooms	300kg/m^2

Consultation rooms	240kg/m^2
Ordinary training rooms	200kg/m^2
X-ray film store	800kg/m^2
Machine room	600kg/m^2

- Seismic load:

  To be calculated in accordance with the National Structural Code of the Philippines.

- Main materials

  - Concrete : 210kg/m^2
  - Reinforcing bars : Grade 60, (Fy=60,000psi)

(4) Electrical Facility Plan

1) Power intake facility

Power will be received from the 13.8 KV high voltage overhead power line of Davao Light & Power Co., Inc. (DLPC) running along Laurel Street on the southern side of the project site. It is the Philippine side work to intake power from the line including provision of an electrical pole near the boundary line as well as installation of transformer. DLPC will take chare of those works on a charge basis. Low tension electricity (3φ3W220V) is to be supplied to the electrical room from the transformer in the scope of this project.

2) Generator facility

Power failure occurs twice a month on average and there is voltage fluctuation in and around the project site. For these reasons, an automatic voltage regulator (AVR) and a power generator are to be provided for stable power supply.

- Power receiving equipment

  Low voltage power is to be led to a low tension switchboard after stabilized by AVR. Switchboard and AVR are planned to be installed

in the dry area provided at north side of the new OPD building.

Since the capacity of the transformer to be installed by the electric power company is calculated to be 750kVA as shown in the table below, the capacity of the automatic voltage regulator is to be 750 kVA.

Table 2-8 Calculation of Transformer Capacity

Items	Assumed	Assumed consumption	Max. power capacity	Remarks
Medical equipment	750kVA	15%	76.5kVA	X-ray75kVA×6 CT 60kVA×1
	240kVA	40%	96kVA	
A/C, Ventilation	450kVA	80%	360kVA	
Pump	90kVA	20%	18kVA	
Lighting	150kVA	80%	120kVA	
General outlets	90kVA	20%	18kVA	
EV	45kVA	20%	9kVA	
Others	50kVA	20%	10kVA	
Total	1795kVA		707.5kVA → 750kVA	

- Generator facility

  An electric power generator will be installed for continuos power supply at the time of power stoppage. The X-ray machines and the CT equipment require relatively high electric load, so that 4 of X-ray machines are excluded from the generator circuit. In order to reduce the running costs as much as possible, the circuits for the lighting fixtures and socket outlets for general use are planned to be disconnected from the generator circuit when the fire pump (capacity estimated at 75 kW) needs generator power supply.

  Generator circuits will cover the following

  – part of medical equipment (CT and two X-ray machines)

  – air conditioners for operation room and Lab.

  – water supply/drainage pumps

  – elevators, 50% of lighting fixtures and 50% of wall socket outlets

(General circuite)

- 50% of air conditioners, 50% of lightings/wall socket outlets for general use

In light of the above-mentioned considerations, a radiator-type diesel generator (625 kVA, 500 kW) is to be installed as the power source at the time of power failure.

3) Main Feeder

Electric power will be supplied to the electric light panel board and the power control panel from the low tension panel board installed in the electric room. An alarm panel for to the generator and control panel for pump etc. will be installed in the security office. The voltages of main feeder should be as follows.

Equipment needing power	:	3φ 220V
Lights, socket outlets	:	1φ 220V

4) Lighting Fixtures, Socket outlets

- Lighting fixtures

  Fluorescent lights (mainly FL40W x 2) will be mainly used. The generator circuits and the other circuits shall be categorized separately. Three-way switches will also be installed where necessary.

  Areas such as the waiting rooms where many people gather will be provided with emergency lighting fixtures with built-in batteries as the means of evacuation guidance at the time of power failure.

  Values of illuminance for the main rooms are shown in the table below.

Table 2-9 Illuminance of Major rooms

Target illuminance	Rooms
300 lx	Consultation room, Treatment room, Lab., Offices
200 lx	X-ray records room, Hallway, Waiting area
150 lx	Toilet, Locker room, Pantry etc.
100 lx	Store, Electrical room

- Socket outlets

  Voltage of socket outlets shall be 220V. Location and height of socket outlets for specific item of equipment will follow the requirement of the equipment including its shape. Outlets will be differentiated whether they are connected to the general circuits or the generator circuits so that they may easily be identified. In case of equipment requiring a UPS, a UPS will be procured under the equipment work.

5) Telephone System

- Switchboard

  Since internal telephone communication system shall cover the entire DMC, including the existing facilities and the new OPD building. Therefore, existing switchboard in the Main building needs to be replaced (or expanded) by the Philippine side to have more capacity to provide telephone lines to the new OPD building. It is expected that the new OPD building will require 10 telephone lines and 80 extension lines. Therefore, the existing switchboard (14 telephone lines and 64 extension lines) should be upgraded to have a capacity of 24 city lines and 144 extension lines.

- Terminal boards

  The Philippine side shall take charge of increasing city lines for the new OPD building and replacing the primary terminal board in the Main building. A new terminal board for the new OPD building will be installed near the existing switchboard so that the scope

of the work under this project, which is after the secondary terminal board, shall be clear. Telephone sets will be installed at the relevant rooms in the new OPD building.

6) Intercommunication System

An intercom (with speaker) will be installed for the communication between control room and respective CT room or X-ray room.

7) Public Address System

- Main public address system

  A public address system will be installed to be used for guiding patients in an emergency and for paging. The amplifier and other units will be installed in the security office.

- Individual public address systems

  A microphone will be installed at reception counter of each clinical department, and a speaker will be installed in each waiting area, for calling patients.

8) Automatic Fire Alarm System

In accordance with the Fire Code of the Philippines, an automatic fire alarm system will be planned. The control panel for the system will be installed in the security office.

9) Lightning Arresting System

A lightning arresting system will be installed to protect the building against lightning. The system will be installed in accordance with the Electrical Code of the Philippines.

(5) Plumbing System

1) Water Supply System

At the existing facilities, drinking water is supplied from the city water main of Davao City and well water is utilized for other uses. In the case of the new OPD building, city water and well water are used in the same way as the existing facilities.

Since the existing service pipe of city water has no extra capacity, a 50 mmφ service pipe will be connected to the 150 mmφ city water main running along San Nicolas Street on the eastern side of the project site. It is a part of the Philippine side work to lay the new service pipe, including the work to install a water meter on the service pipe.

City water will be first stored in the water reservoir installed on the ground and then pumped up to the elevated water tank to be supplied to the sanitary facilities in the new OPD building. According to the data on city water, it is sometimes contaminated with bacteria. For this reason, city water is to be sterilized with a UV sterilizer when it is pumped up to the elevated water tank.

A 100 mmφ water pipe will be laid by the Philippine side up to the construction site to store well water in the underground water reservoir. Well water is then pumped up to the elevated water tank to be supplied to the sanitary facilities in the new OPD building.

In principle, PVC (polyvinyl chloride) water pipes will be used except for the portion where water will be pumped up. Galvanized steel pipe will be used for the portion.

- Estimated quantity of water supply

  The quantity of water to be supplied to the new OPD building is estimated as follows.

  – Number of users

    Staff members : 290 (110ℓ/day・person)

    Outpatients (including attendants): 1,800 (10ℓ/day・person

– Daily quantity of water supply
=290 persons x 110 ℓ /day・person + 1,800 users x 10 ℓ /day・person
50,000 ℓ /day (50m^3/day)

Two types of water, namely, city water and well water, will be supplied separately to the new OPD building. Therefore, necessary quantity of each type of water need to be determined separately. According to the Air Conditioning/Sanitary Engineering Handbook (12th Edition), a Japanese standard, the standard ratio between drinking water and water for other uses is 60～66 (%):40～44 (%). The new OPD building is a hospital mainly for outpatients and no kitchen is included, it is concluded that the ratio should be 50:50.

Drinking water	50 m^3/day x 0.5	25 m^3/day
Water for other uses	50 m^3/day x 0.5	25 m^3/day

- Capacity of water reservoir

Capacity of the reservoir to store city water is generally 50 percent of the daily total quantity in Japan. In the case of this project, however, the supply pressure of city water is not high enough. Therefore, storage capacity of the water tank to store city water is concluded to be equal to the total quantity supplied daily. Capacity of the reservoir to store well water should also be equal to the total quantity supplied daily.

– Water tank to store city water (ground panel assembly-type)
25 m^3 (net capacity)
Dimensions: 5 m x 3 m x 25 m h (with an inside partition)
– Water tank to store well water (underground building pit)
25 m^3

- Capacity of Elevated water tanks

Storage capacity of the elevated water tanks should be about 15 percent of the total quantity of water supplied daily.

– Elevated water tank to store city water (panel assembly-type water tank) 4 m^3 (net capacity)

25 m^3/day x 0.15 4 m^3;

dimensions: 2 m x 2 m x 1.5 m h

- Elevated water tank to store well water (panel assembly-type water tank) 4 m^3 (net capacity)

  25 m^3/day x 0.15 4 m^3;

  dimensions: 2 m x 2 m x 1.5 m h

2) Hot Water Supply System

Electric water heaters will be provided in laboratories to supply hot water.

3) Drainage System

Drainage from the new OPD building will be treated first in outdoor septic tank and then discharged to the wastewater treatment facility for final treatment.

The work up to connection of the drainage pipe to the wastewater treatment facility will be carried out under this project. Chemical wastewater from the testing lab. and other facilities will be neutralized. The circuit ventilation system and the stack ventilation system are to be employed. PVC pipes will be used for piping.

Rainwater will be discharged into the existing side ditch running along San Nicolas Street.

4) Sanitary Fixture

Sanitary fixtures will be selected according to the architectural plan in consideration of local custom.

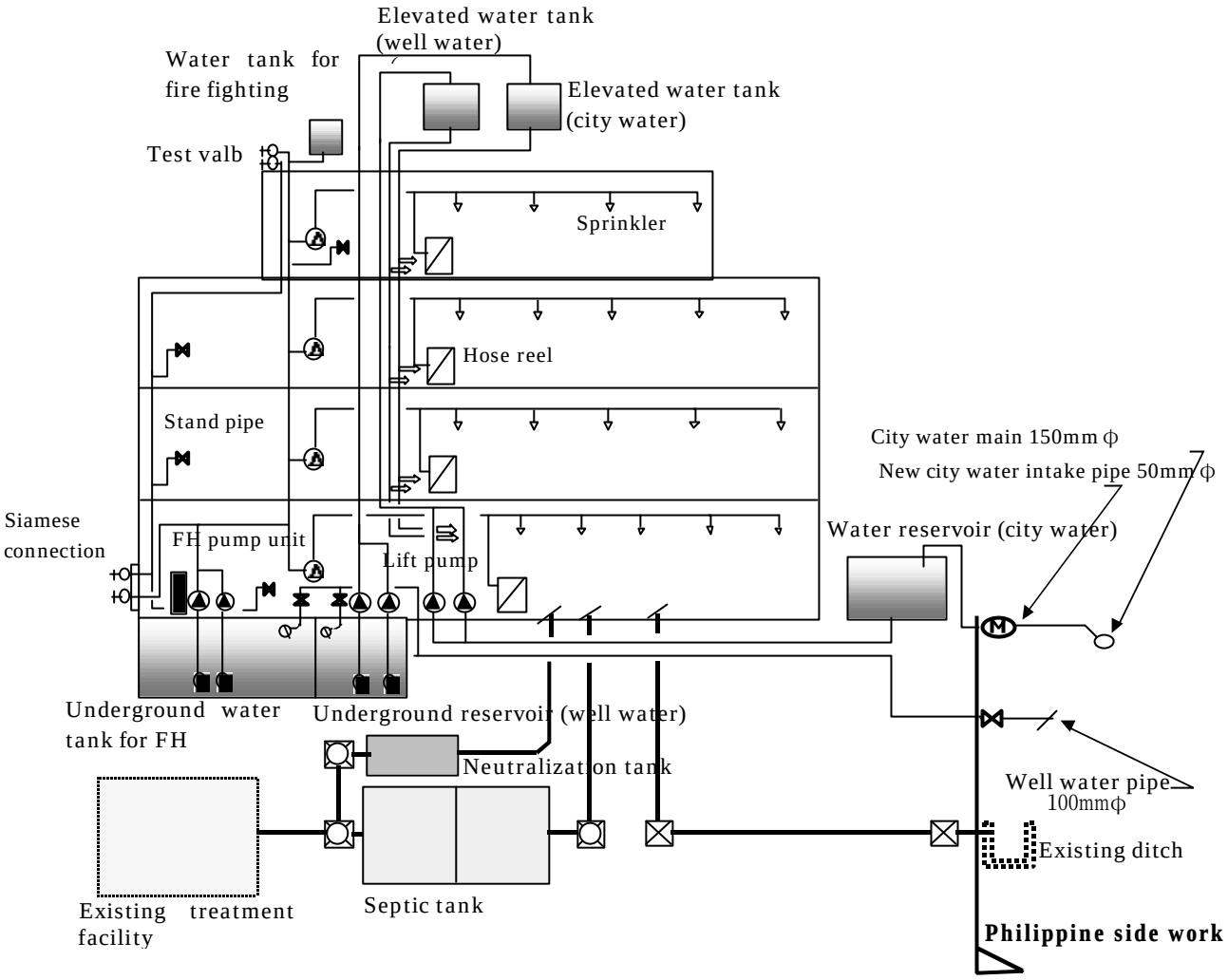


Fig. 2-7 Diagram of Water Supply and Fire Hydrant

5) Fire Extinguishment Equipment Plan

The new OPD building is categorized in the "Class 4." of the Fire Code of the Philippines, so that sprinklers, horse reels, dry stand pipes and fire extinguishers are required.

At the consultation with the Davao City Fire Department, it was instructed that sprincler system would not be necessarily installed in the rooms, where expensive equipment such as CT and X-ray machine would be installed, provided that other substituting fire fighting system is installed.

6) Medical Gas Equipment

A centralized oxygen gas supply system , by means of gas cylinder,

and a centralized vacuum system will be provided in the operation rooms, recovery rooms, part of X-ray rooms and treatment rooms.

(6) Air-conditioning/Ventilation Systems

From the standpoint of ease of maintenance and troubleshooting, air-conditioning systems which do not require a complex, advanced control system are to be employed.

Rooms to be air-conditioned should be minimized in order to reduce the maintenance and maintenance costs as much as possible.

1) Design condition

① Design Temperature/Humidity Conditions

Dry-bulb: temperature 33℃ D.B.

Wet-bulb: temperature 27℃ W.B.

(Source: Local data collected for D.B.; ASHARE/U.S. Air Conditioning Society Handbook for W.B.)

② Indoor Temperature/Humidity Conditions

Dry-bulb: temperature 26℃ D.B.

Wet-bulb: -

2) Air-Conditioning System

Air-conditioning systems shall be as simple and effective as possible for simple maintenance. The air-conditioning systems to be employed for different zones are as described below.

- Operation room on the basement

  Air-conditioning system will be installed in the machine room adjacent to each of the rooms and a package type air-conditioner will be installed in each operation room.

  In light of the required degree of cleanliness of the air, a circulatory-type clean unit will be installed in the operation room for ophthalmology.

- Other Rooms

  Separate type air-conditioners will be provided in consultation rooms, treatment rooms, doctors' rooms and lecture rooms. Duct system with a package type air-condtioner will be employed for the large lecture room.

3) Ventilation Equipment System

Ventilation system shall be consistent with the conditions as set forth in the architectural plan to utilize natural ventilation.

Mechanical ventilation is provided to discharge odors and heat in the toilets, the electric room, the machine room and the pump room. In order to maintain indoor environment clean, ventilation system is installed in the consultation rooms, the treatment rooms, the offices, etc. as well as the operation rooms, the X-ray rooms and the laboratories.

Ceiling fans are to be installed in the waiting zones.

(7) Building Material Plan

Main Structural Materials

Part	Material	Remarks
Foundation, Foundation girder, slab, Girder, Bean	Reinforced concrete	Materials are commonly available
Exterior wall	Concrete hollow block, Reinforced concrete	Widely employed locally

Exterior Finishing Materials

Part	Material	Remarks
Roof	Pitched metal sheet roof, partially asphalt waterproofing Concrete hollow block protection layer	Widely employed locally.
Exterior wall	Fair face brick Texture paint	Hard to show dirt on brick. Concrete part to be finished with durable paint.
Doors & Windows	Aluminum sash	Good in air-tightness and durability. Produced locally
	Steel doors	Locally made products satisfy standard

Interior finishing material

Rooms	Floor	Wall	Ceiling	Remarks
Consultation room, Waiting area	Ceramic tile	Paint cement mortar	Mineral accoustic tile	Durability
Operation room	Terrazzo tile	Paint cement mortar	Paint on calcium	Easy cleaning
Lab.	Terrazzo tile	Ceramic tile	Silicate board	Chemical resisting and easy cleaning

(8) Equipment Plan

Since it is necessary that the equipment plan be of the smallest possible scale required to attain the objective of this project. Of the items which are not included in the request of the Government of the Philippines, those which are considered necessary as a result of discussion are included in this project and their technical levels and quantities were examined. Shown below are the results of the examination of the main items of equipment for the clinical departments.

1) Orthopedic Dept.

- Gypsum cutter, plaster bandage table, X-ray film illuminator
  One unit for each of above items is planned since they are judged indispensable for diagnosis and treatment.

2) Rehabilitation Dept.

- Ultrasonic therapy equipment
  This equipment is indispensable for the treatment of neuralgia and chronic arthritis. In addition, the number of existing equipment is not enough for the number of patients. For these reasons, one unit of this equipment is planned to make up for the shortfall.

- Low frequency therapy unit
  This equipment is effective against muscular atrophy and improving the circulation of the blood and it is easy to operate. For the purpose of widening the scope of treatment by the use of this

equipment, one unit is planned.

- Exercise therapy equipment

  One unit for each of the following items is planned to be included since they are effective in restoring muscle.

3) OB/Gyn/FP Dept.

- Clinical examination table, Gynecological examination unit

  Four units for each of these items were requested, by the Philippine side. However, it was concluded that two units of them are reasonable in light of the three number of consultation rooms, which was set up in consideration of patient number.

- Doppler fetal heart detector

  This equipment is used to detect movements of the circulatory system of the fetus in order to determine whether the fetus is alive, to estimate the presentation and to conduct labor monitoring. It is thus indispensable for the obstetric diagnoses. As requested by the Philippine side, two units of this equipment are planned to be installed in the obstetrical consultation rooms.

- Colposcope with a camera

  This apparatus is used for the examination of the uterovaginal canal. It is provided with a light source and a camera so that it enables observation with enlarged images of the affected parts, ensuring early discovery of physical changes caused by diseases and accurate analysis of diseases. Therefore, one unit is planned to be installed in the gynecological consultation room.

4) Family Medicine Dept.

- X-ray film illuminator

  Three wall-mounted X-ray film illuminators for observation of two 14” x 17” films are planned and installed in the three of consultation

rooms.

5) Pediatrics Dept.

- Ultrasonic nebulizer

  As this equipment is indispensable for the treatment of asthma and bronchitis of infants, one unit is planned.

6) Dermatology Dept.

- PUVA apparatus

  PUVA therapy, in which long-wavelength ultraviolet light is applied, is effective in treating psoriasis, vitiligo and alopecia and is therefore widely used nowadays. The ultraviolet light for use in PUVA therapy is of simple structure and is therefore easy to operate. Therefore, one unit of this apparatus is planned to be installed.

- Wood's lamp

  One Wood's lamp unit is planned for the treatment of local skin diseases.

7) Internal Medicine Dept.

- ECG machine

  As this equipment is indispensable for early diagnosis of arrhythmia, cardiac hypertrophy and ischemic heart diseases, one unit of this equipment is to be planned.

8) Dental Dept.

- Dental chair unit with compressor and vacuum

  Existing four dental chair units are judged to be continuously usable at the new OPD facility. Therefore two additional dental chair unit with compressor and vacuum are planned in this project to be installed in each of the six treatment booths.

- Dental X-ray machine (Intraoral)

  The outpatient dental department owns a panoramic X-ray machine presently. This type of X-ray machine is used to take panoramic photographs of teeth, the jaw and the fact. Teeth and tissues around teeth, including the upper jaw cavity, the nasal cavity, the diaphsys of the upper and lower jaws and the gnathic joints can be photographed in a single film. In dental examinations, however, it is often necessary to photograph maximum of two teeth together with tissues around. Therefore, one unit of intraoral type X-ray machine is planned to be installed, which meets this requirement.

9) ENT-HNS Dept.

- ENT treatment unit, chair

  Three sets of ENT treatment units for internal examination and chair are planned to be installed in each treatment booth.

10) Surgery Dept./Ophthalmology Dept.

Equipment for consultation and treatment are excluded from this project.

11) Outpatient OR Dept.

The following basic items are planned for each of the operation rooms of orthopedic, OB/Gyn, ENT-HNS, surgery and ophthalmology.

- Operating table

  Types of operating tables to be installed in each OR shall vary depending upon their respective requirements. The number of units is determined on a basis of the annual number of operations conducted in the past: As a result of calculation, it is concluded to provide two units for the surgery OR and one unit for each of the other departments.

- Operating light

  An operating light (Ceiling type, bulb diameter: 750 mm, 8 bulbs, 140,000 Lux) is planned to be installed in each OR.

- X-ray film illuminator

  A wall-mounted X-ray film illuminator is planned to be installed in each OR.

- Instrument trolley/Stand, Mayo table

  Mayo-type instrument stands are provided in the orthopedics OR and ophthalmology departments and general wagon-type instrument trolley are to be provided in the ORs.

- Operating binocular microscope

  One unit of operating binocular microscope is planned for ENT-HNS OR for intratympanic operations.

- Autoclave

  A autoclave with a built-in boiler (inner volume: 150 liters) is planned to be installed in the autoclave room.

- Scrub unit

  Two scrub units, two perso type, are to be installed in the OR hallway.

12) Laboratory Dept.

- Side table, Center table, Sink unit

  appropriate number of such tables and sink units are planned to be installed in each laboratory.

- Fume hood

  One unit of fume hood, which front opening is approximately 1,000mm wide, is planned for biochemical laboratory to exhaust harmful gas comes out when quantitative analysis of body fluid or blood is conducted.

- Clean bench

  This item is quite indispensable to make clean atmosphere for preparation of culture medium. Therefore, one unit with built-in HEPA filter is planned for bacteriology laboratory.

- Freezing microtome, Paraffin oven, Automatic tissue processor

  As those items are necessary for preparation of human organic tissues for microscopic observation, one unit each of them is included in the plan.

- High pressure steam sterilizer

  One unit of high pressure sterilizer (inner volume is approximately 150 liters) in which a steam generator is built is planned for sterilizing room.

- Water distilling apparatus

  One unit of water distilling apparatus which capacity is approximately 2.5 liters/min. is planned for sterilizing room to replace existing superannuated equipment.

13) Physiological Lab.

- Spirometer

  One unit of spirometer with printer is planned to replace an existing one which is already superannuated, thus, not in working condition. This appratus is to be installed in the pulmonary lab.

- Endscopy

  Endscopy is nowadays indispensable in carying out medical examinations. Different types of endscopes for examination of different organs – digestive tracts, respiratory organs, urinary organs, ears, noses, and female genital organs – are used widely. At Davao Medical Center, examinations of digestive tracts are conducted by the use of stomach and colon fiberscopes. However, the quantity of the fiberscopes is short for the number ofpatients.

In order to replenish the present situation, two sets for each of stomach, colon fiberscopes are to be provided. And two sets of duodenum fiberscopes, are to be provided for expanding scope of examination. Besides those fiberscopes, it is planned to provide a set of video monitor system, washer and a suction pump.

- Ultrasound machine

  Ultrasound diagnosis is said to be almost harmless to human body and has been improved as accurate as X-ray diagnosis. Ultrasound diagnosis is widely suited for diseases of various parts such as lung, digestive organs and bones, especially popularly used at internal medicine, surgery, pediatrics and OB/Gyn. Since maintenance cost for ultrasound diagnosis equipment is inexpensive compared to other image diagnosis methods, number of cases have been increasing in the Philippines.

  Shortage of equipment makes it difficult to meet the demand of ultrasound diagnosis at DMC. Under the condition, priority of diagnosis is given to inpatients and many of outpatients are introduced to the private clinics nearby the medical center, where ultrasound equipment is available. The number of patients introduced to those private clinics reaches approximately daily 20. The table shown below indicates number of cases of ultrasound diagnosis at DMC.

Table 2-10 Number of Cases of Ultrasound Diagnosis at DMC

	No of In-patients	No. of Out-patients	Cases of Ultrasound Diagnosis		Ratio of Ultrasound diagnosis for inpatients	Ratio of Ultrasound diagnosis for outpatients	Ratio of Ultrasound diagnosis for entire patients
			Inpatient	Out-patient			
DMC (1998)	37,751	214,544	2,388	4,199 (5,000)*1	6.3%	2.0% (4.3%)*2	2.6% (4.6%)*2

Note *1 : Number of patients introduced to private clinic for ultrasound diagnosis
*2 : Ratio including number of patients introduced to private clinic

Presently 17 diagnosis cases (4199÷250 days) for outpatients and 7 diagnosis cases (2,388÷365) for inpatients are implemented daily

by using 2 ultrasound equipment at DMC. On the other hand, approximately 20 patients are introduced to private clinics for diagnosis daily. This means that a demand of ultrasound diagnosis at DMC is 44(17+7+20), and which is estimated to increase to 58 (44×1.304) in the year 2005.

Presently 24 cases are handled with two equipment daily, so that 4 ultrasound equipment (58cases÷24cases×2=4.8→4 equipment) will be necessary to cope with the estimated demand in the year 2005.

Presently DMC owns two ultrasound diagnosis equipment(one is for OB/GYN) and one equipment donated by France Government will be in use soon. Therefore, one equipment is planned to be procured in this project to fill up shortage

14) X-ray Dept.

- X-ray machine

  At present, DMC owns a total of nine X-ray machines as shown in the following table.

Tabel 2-11 Existing X-ray Machines Owned by DMC

	No.	Type	Manufacturer	Q'ty	Condition	Shift plan to the Project
Stationary Type	1	General type, 500mA	Shimadzu (Japan)	1	Not used because of superannuation	Not to be shifted
	2	General type, 800mA	Trophy (France)	1	Good	To be shifted
	3	Fluoroscopic type, 500mA	Shimadzu (Japan)	1	Can be repaird	To be shifted
	4	Fluoroscopic type, 800mA	Trophy (France)	1	Good	To be shifted
Mobile type	5	Mobile type	Shimadzu (Japan)	1	Not used because of superannuation	Not to be shifted
	6	Mobile type	Trophy (France)	1	Good	shifted
	7	Mobile type	Siemens (Germany)	1	Not used because of superannuation	Not to be shifted
	8	C-arm type for surfical operation	Trophy (France)	1	Good	Not to be shifted
	9	Panoramic type,for dental diagnosis	Trophy (France)	1	Good	Shifted to dental dept.

To determine appropriate number of X-ray machines for this project, past records of X-ray diagnosis at Jose Reyes Memorial Hospital, which is positioned as a same national medical center as DMC, are as shown below.

Table 2-12 Performance of X-ray Examination at Jose Reyes Memorial Hospital

Annual inpatient number		33,771 (except new-born babies)
Annual outpatient number		360,699
Annual total number of patient		394,470
Annual number of X-ray examinations	Inpatient	7,377
	Outpatient	35,150
	Total	42,527
Ratio of the number of X-ray examination to the number of patient	Inpatient	21.8%
	Outpatient	9.7%
	Total	10.8%

Due to a shortage of X-ray machines, DMC is unable to meet the demand for X-ray examinations. On an assumption that when the requested X-ray machines are installed, the ratio of the number of X-ray examinations to the number of patients will be about the same as that at Jose Reyes Hospital, the necessary number of X-ray examinations is calculated as follows.

Table 2-13 Calculation of Target Number of X-ray Examination

		Outpatient		**Inpatient**		**Number of examinations per day**
The number of patient in 2005		267,730		49,076		
Ratio of the number of X-ray examinations to the number of patient		9.7%		21.8%		
The number of X-ray examinations		25,970		10,699		
X-ray operation days/year		250days		365days		
The number of examinations/day		104		29		
Ratio between general and fluoroscopic is 76% and 24% respectively	General	79		22		101
	Fluoroscopic		25		7	32

As the average time required to a general photograph examination

is 15 minutes, and the average time required to a fluorescopic photograph examination is 30 minutes, the necessary number of X-ray machines is calculated as follows.

General type: 101 x 15 minutes ÷ 8 hours = 3.16 → 4 (units)

Fluoroscopic type: 32 x 30 minutes ÷ 8 hours = 2.0 → 2 (units)

Thus the necessary number of general type X-ray machines is four, and type X-ray machines photographs is two. As DMC owns two general type X-ray machines and two fluoroscopic type X-ray machines, two general type X-ray machines are to be planned under this project.

The specifications for and the uses of the main items of equipment which must be procured under this project are as shown in the following table.

Table 2-14 Specification of Major equipment

Equipment	Specifications	Use
Ultrasound therapy unit	Applicable frequency Deep part : 1MHz Shallow part : 3MHz	To be used for minute massage treatment by means of vibration generated by high frequency
Electric traction	Max. traction force : 99kg Holding time : 0-99 sec. or continuous Time set : 1-99 min. With safety apparatus	To be used for maxillomandibular traction and cervical traction
Ultrasound machine	Scanning method : Linear, Sector, Convex B.M. BM mode, Doppler mode	To be used for examination of affection with various flaps, ischemia cardiopathy and syntrophus cardiopathy as well as assessment of cardiac function and hemokinesis measurement by means of scanning ultrasound beam
Colposcope with camera	Operating distance : 250-600mm Amplification : 3 steps (8x, 12.6x, 20x) With 35mm camera	To be used for diagnosis of metra and vagina in Gynecology
Dental chair unit with compressor and vacuum	Component Chair for patient, light, air turbine, suction unit, gargling unit, air compressor	A set of basic appliance and apparatus used at dentistry for consultation and treatment
Cryosurgery system for Gnye-cology	Coolant: Liquid nitrogen Min. temperature: -190 deg.C	To be used for cryogenic treatment to break local tissues

Equipment	Specifications	Use
Operating binocular microscope	Stand type Microscope Type : Inclined binocular microscope Working distance: 200mm Total magnification: 4x, 6x, 10x, 16x, 25x Illuminator Light source: 15V, 150W halogen lamp Field of illumination : 73mm dia.	To be used subtle operation and deep operation in ENT, etc.
High pressure steam sterilizing machine	With built-in boiler Chamber size: 500Wx650Dx500mmH	To be used for sterilizing appliance and apparatus for operation and examination
Biological microscope	Illumination: 6V, 20W halogen lamp Stage: 160x200mm Total magnification: 10-1500 x for observation 2-500 x for photomicrography	To be used for observation of bacteria and human tissues, etc.
Spirometer	Test item VC, FVC, MVV	To be used for examination of ventilation
Gastroscope	Distal end diameter : 9.8mm Channel diameter : 2.8mm Effective length : 1,025mm Field of view : 120 deg.	To be used for examination of gaiter affection
Colonoscope	Distal end diameter : 13.8mm Channel diameter : 3.2mm Effective length : 1,325mm Field of view : 140 deg.	To be used for examination of colon
Light source	Lamp: Halogen lamp With air feeding function Connectable with endoscope	To be used as a light source for endoscope to enable observation and photographing
Endoscopic video monitoring system	TV system Pickup element: Interline method Sensitivity: 1,400Lux	To be used for video recording and playback of images captured by endoscope, which will improve accuracy of examination enabling observation of some doctors at a time
	Video system Video system : PAL Pickup element : 3CCD White balance : Automatic compensation Black balance : Automatic compensation	
X-ray machine, stationary type (500mA)	Table Buckey, Tabletop, Sliding type Stand A set of buckey stand High voltage generator (40-90)-(125-150)kV (20-320)-(500-630)mA X-ray bulb 140-170KHU X-ray bulb support Slides on the floor	To be used for examination of fracture, pneumonopathy, cardiology and cerebropathy
Automatic X-ray film processor	Automatic feeding Film size : 4x5-14x17 inches Capacity : 220 films/h Developing speed : 90 sec.	To be used for automatic developing, including fixing, washing and drying of X-ray film and other images for diagnosis

The items and quantities of the equipment to be planned for this project are given in the following list.

Table 2-15 Equipment list

No.	Equipment	Q'ty
A	**Orthopedics Dept.**	
	(Casting room/Consultation room/Treatment room)	
A-1	Gypsum cutter	1 unit
A-2	Plaster bandage table	1 unit
A-3	X-ray film illuminator	2 units
B	**Rehabilitation Dept.**	
	(Treatment room/Gym.)	
B-1	Ultrasound theraphy unit	1 unit
B-2	Electric traction	1 unit
B-3	Hotpack unit	2 units
B-4	Low frequency therapy unit	1 unit
B-5	X-ray film illuminator	2 units
B-6	Rotary wrist	1 unit
B-7	Wrist roll	1 unit
B-8	Chest pulley	1 unit
B-9	Hotpack (large)	2 pcs.
B-10	Hotpack (medium)	8 pcs.
B-11	Hotpack (for neck)	4 pcs.
B-12	Hotpack (for shoulder)	6 pcs.
C	**OB/Gyn/FP Dept.**	
	(Consultation room/Internal exam. room)	
C-1	Clinical examination table	2 units
C-2	Gynecological examining unit	2 units
C-3	X-ray film illuminator	2 units
C-4	Doppler fetal heart detector	2 units
C-5	Colposcope with camera	1 unit
D	**Family Medicine Dept.**	
	(Councelling room/Treatment room/Consultation room)	
D-1	X-ray film illuminator	3 units
E	**Pediatrics Dept.**	
	(Consultation room)	
E-1	Ultrasonic neblizer	2 units
E-2	X-ray film illuminator	2 units
F	**Dermatology Dept.**	
	(Treatment room/Lab.)	
F-1	PUVA apparatus	1 unit
F-2	Wooods lamp	1 unit
F-3	Trinocular microscope with camera	1 unit

No.	Equipment	Q'ty
G	**Medicine Dept.**	
	(Consultation room)	
G-1	ECG machine	1 unit
G-2	Ultrasonic nebulizer	3 units
G-3	X-ray film illuminator	3 units
H	**Dental Dept.**	
	(Treatment booth/X-ray room/Prep. room)	
H-1	Dental chair unit with compressor and vacuum	2 units
H-2	Dental X-ray (Intraoral)	1 unit
H-3	X-ray film processor	1 unit
H-4	X-ray film illuminator	1 unit
H-5	Ultrasonic scaler	4 units
I	**ENT-HNS Dept.**	
	(Treatment room / Diagnostic room)	
I-1	ENT treatment unit	3 units
I-2	ENT chair unit	3 units
I-3	X-ray film illuminator	1 unit
J	**Outpatient OR Dept.**	
	(Orthopedics)	
J-1	Operating table	1 unit
J-2	X-ray film illuminator	1 unit
J-3	Operating light (Ceiling suspended type)	1 unit
J-4	Stand, Mayo table	1 unit
	(OB/Gyn)	
J-5	Operating table	1 unit
J-6	Operating light (Ceiling suspended type)	1 unit
J-7	X-ray film illuminator	1 unit
J-8	Instrument trolley	1 unit
J-9	Cryosurgery system for Gynecology	1 unit
	(ENT)	
J-10	Operating binocular microscope	1 unit
J-11	Operating table	1 unit
J-12	X-ray film illuminator	1 unit
J-13	Operating light (Ceiling suspended type)	1 unit
	(Surgery)	
J-14	Operating table	2 units
J-15	Operating light (Ceiling suspended type)	2 units
J-16	X-ray film illuminator	2 units
J-17	Instrument trolley	2 units
	(Opthalmology)	
J-18	Operating table	1 unit
J-19	Operating light (Ceiling suspended type)	1 unit

No.	Equipment	Q'ty
J-20	Stand, Mayo table	1 unit
J-21	X-ray film illuminator	1 unit
	(Sterilizing room)	
J-22	High pressure steam sterilizer	1 unit
	(OR hall)	
J-23	Scrub unit (for 2 persons)	2 units
K	**Laboratory Dept.**	
	(Uri para lab.)	
K-1	Side/Corner table	6 units
K-2	Sink unit	1 unit
	(Hematology lab.)	
K-3	Side/Corner table	5 units
K-4	Sink unit	1 unit
	(Serology lab.)	
K-5	Side/Corner table	5 units
K-6	Sink unit	1 unit
K-7	Center table	1 unit
K-8	Medical cabinet	1 unit
	(Biochemistry lab.)	
K-9	Side/Corner table	6 units
K-10	Sink unit	1 unit
K-11	Center table	1 unit
K-12	Fume hood	1 unit
K-13	Medical cabinet	1 unit
	(Bacteriological examination)	
K-14	Side/Corner table	5 units
K-15	Sink unit	1 unit
K-16	Center table	1 unit
K-17	Clean bench	1 unit
	(Isolation room/Preparation room)	
K-18	Side table	2 units
	(Pathology lab.)	
K-19	Automatic tissue processor	1 unit
K-20	Paraffin oven	1 unit
K-21	Freezing microtome	1 unit
K-22	Biological microscope	2 units
K-23	Multiviewing attachment for microscope	1 unit
K-24	Side/Corner table	5 units
K-25	Sink unit	2 units
K-26	Corner table	2 units

No.	Equipment	Q'ty
	(Histpathology lab.)	
K-27	Side/Corner table	5 unit
K-28	Sink unit	2 unit
K-29	Center table	1 unit
	(Sterilizing room)	
K-30	Side table	2 units
K-31	Sink unit	1 unit
K-32	High pressure steam sterilizer	1 unit
K-33	Water distilling apparatus	1 unit
L	**Phisiological Lab.**	
	(Pulmonary lab.)	
L-1	Spirometer	1 unit
M	**Special lab.**	
M-1	Endoscopic table	1 unit
M-2	Gastroscope	2 units
M-3	Colonoscope	2 units
M-4	Light source	1 unit
M-5	Endoscopic washer	1 unit
M-6	Endoscopic video monitoring system	1 set
M-7	Duodenoscope	2 units
M-8	Endoscopic suction pump	1 unit
M-9	X-ray film illuminator	2 units
M-10	Electro surgical unit for endoscope	1 unit
M-11	Endoscopic trolley	1 unit
M-12	Endoscopic cabinet	1 unit
N	**Ultrasound Examination Section**	
N-1	Ultrasound machine, B/W (B, M, B/M)	1 unit
O	**X-ray Dept.**	
	(X-ray room)	
O-1	X-ray machine, stationary type (500mA)	2 units
	(X-ray accessories)	
O-2	Automatic X-ray film processor	1 unit
O-3	Film loading desk	1 unit
O-4	Cassette pass box	1 unit
O-5	X-ray film illuminator	3 units
O-6	X-ray film processing tank	1 unit
O-7	Dark room lamp	1 unit
O-8	X-ray film dryer	1 unit
O-9	Sink unit	1 unit

(9)Basic Design Drawings

① Site Plan 1:600

② Lower Ground Floor Plan 1:400

③ Ground Floor Plan 1:400

④ 2nd Floor Plan 1:400

⑤ 3rd Floor Plan 1:400

⑥ Roof/Penthouse Floor Plan 1:400

⑦ North Elevation, South Elevation 1:400

⑧ East Elevation, West Elevation 1:400

⑨ Section 1:400

Floor area schedule

	Main Facility(㎡)	Ramp(㎡)	Connecting Corridor(㎡)
Penthouse	127.2		
3rd Floor	986.6		
2nd Floor	2,253.1	126.4	
Ground Floor	2,618.5	126.4	1,150.6
Lower Ground Floor	2,543.2	126.4	
Total	8,528.6	379.2	
Grand Total			10,058.4

CHAPTER 3 IMPLEMENTATION PLAN

CHAPTER 3 IMPLEMENTATION PLAN

3-1 Implementation Plan

3-1-1 Implementation Concept

This project shall be implemented under the Government of Japan's grant aid cooperation after the signing of an Exchange of Notes by the governments of both countries, subject to the Government of Japan's approval for it at a Cabinet meeting. Basic matters in implementation of the Project are described as below.

(1) Construction Period

The Project includes the construction work of a building with a floor area of approximately 10,000m^2 and the equipment work, which is to procure and install equipment. Necessary period for both construction work and equipment work is concluded to be 18 months in consideration of contents and scale of each work, condition of the project site, local construction situation, required construction technology.

(2) Contracting System

Judging from the size of both construction work and equipment work as well as the relations between those works, it is appropriate to contract the two works separately. Contractors for each work shall be selected among Japanese companies through pre-qualification evaluation and open tender.

(3) Implementation System of the Philippine Government

The Project is to be implemented under the jurisdiction of Department of Health of the Republic of the Philippines. The Davao Medical Center (DMC) under the Department will be the party to be responsible for implementing the Project. DMC will also take necessary measures for importing construction materials and equipment such as customs clearance as well as allocation of budget for customs duties. Implementing party will be in charge

of necessary procedures such as consultant contract, construction contract and banking arrangement of the Project. Davao Medical Center, to which the Project will be extended, will be in charge of providing necessary information and technical advice and will execute the Philippine side work.

National Economic and Development Authority (NEDA) is the agency representing the Philippine side to be in charge of implementing grant aid projects.

Building permit, which is required for building construction in Davao, must be obtained from Davao city after Department of Health approves the building plan.

(4) Execution system

1) Consultant

Immediately after signing of the Exchange of Notes between both governments, the Department of Health will conclude a design and supervision contract with a selected Japanese consultant and have the agreement verified by the Government of Japan. The consultant will prepare detail design drawings based on the contents of this study report and then carry out tenders as well as construction and procurement supervision.

2) Contractors

Contractors for both the construction work and the equipment work are to be selected from among qualified Japanese companies through public tender. The Department of Health is to conclude both construction contract and equipment contract with the successful tenderers respectively and have the contracts verified by the Government of Japan. It is possible for Japanese contractors to utilize local subcontractors in recruiting labors, procurement of local materials, customs clearance etc.

3-1-2 Implementation Condition

In implementing this project, special attention should be paid to the following matters.

(1) Legal procedure for building construction

It is necessary for the Philippine side to obtain building permit from the City engineer's office, Fire Marshall and City planning office of Davao City for the construction of this project. After completion of the construction work, the completed building have to be inspected by the officials of the above-mentioned offices so that the completion certificate will be issued. As stated above, legal procedure must be cleared at relevant times till actual use of the new OPD building. Therefore, it is important for the Philippine side not to cause inconvenience which may delay the implementation of the project.

(2) Procurement of Building Materials

Basic building materials, such as aggregate, cement and reinforcing bars are procured without problems in Davao City. But not a few items of electrical equipment and mechanical equipment are to be transported from Manila. It is therefore important to give due consideration to the marine transport schedule, thefts and damage during transportation which may cause hidrance to the progress of the construction work.

(3) Import of Building Materials/Equipment

Building materials and equipment imported from outside the country shall be exempted from custom duty. For the tax exemption procedures, Department of Health has to pay amounts of money equivalent to those of customs duties to the Bureau of Customs. Therefore, it may be simpler to get custom clearance in Manila than in Davao. On the other hand, when such building materials and equipment are cleared at the customs in Manila, they must be transshipped there and transported domestically to Davao. This will increase the risk

of theft and damage to equipment. When procuring building materials and equipment in foreign countries for this project, above-mentioned circumstances should be considered to avoid theft and damage.

3-1-3 Scope of Works

(1) Scope of Works

The Project is to be implemented through close cooperation between the Government of Japan and the Government of the Philippines within the framework of grant aid extended by the Government of Japan. It is reasonable for the Governments of the two countries to undertake scope of works as shown below.

1) The Work to be done under Japan's Grant Aid

1. Facilities
   - Construction of the buildings described in this study report
   - Electrical, mechanical and sanitary installations

2. Equipment
   - Equipment procurement work
   - Equipment installation work

3. Infrastructure
   - Water supply and drainage work within the premises

4. Exterior works
   - Roads and parking lots within the premises

5. Other works related to the above work
   - Transportation of equipment and materials from Japan and third countries to the Philippines
   - Necessary procedure for transportation

2) The Work to be done by the Government of the Philippines

1. Site and exterior works

- Securing the site for the project
- Removing existing structures, trees and so on from the project site
- Construction of access roads to the project site
- Construction of exterior structures including fence
- Planting and gardening

2. Infrastructure
   - Supply of electricity up to the site
   - Installation of telephone lines up to the Main Distribution Frame
   - Water supply up to the reservoir and connection of the drainage line

3. Preparatory work
   - Provision of sites for temporary construction site office, workshops and material storage places
   - Installation of temporary electricity supply and telephone lines

4. Fixtures and furniture
   - Fixtures, curtains, furniture, etc. other than those supplied under the grant aid of the Government of Japan

5. Procedural work and its expenses borne by the Philippine side
   - Banking arrangement expenses
   - Tax exemption procedure expenses
   - Prompt action related to customs clearance and inland transportation
   - Necessary measures for exempting the Japanese nationals engaged in the implementation of the Project from customs duties, domestic taxes and other fiscal levies in accordance with the verified agreement
   - Arrangement to expedite acquisition of visas, customs clearance, and any other formalities that may be necessary for the entry of Japanese nationals engaged in the implementation of the project

- Maintenance and management expenses for ensuring that the facilities constructed and the equipment installed are operated properly and effectively
- Expenses for obtaining formal permits necessary for construction

Cost estimation borne by the Philippine side is attached in the appendices.

3-1-4 Consultant Supervision

In accordance with Japan's grant aid system, the Japanese consultant firm will conclude a consultant agreement with the implementing organization of the Government of the Philippines. After concluding the agreement, the consultant will work out detail design documents and supervise the construction work in compliance with the provisions of the consultant agreement. Construction supervision is aimed at ensuring that the construction work will be carried out in accordance with the design documents, and at providing direction, technical advice and coordination throughout the term of services from a fair point of view for the proper implementation and quality control of the construction work. The construction supervision service includes the followings.

1. Assistance in tendering

   The consultant shall prepare the documents necessary for tendering the construction work and the equipment procurement/installation work, and assist the client in carrying out tasks such as the public announcement of invitation to tender, acceptance of applications, prequalification, distribution of documents to the tenderers, acceptance of tender, evaluation of the tender results. And the consultant also advise the client on concluding the contract.

2. Instruction, advice and coordination to the contractor

   The consultant shall examine the construction schedule, construction plan,

the building materials procurement plan and the equipment procurement/ installation plan, and shall give the instruction, advice and coordination to the contractors.

3. Examination and approval of shop drawings and manufacturing drawings

The consultant shall examine and approve the shop drawings, manufacturing drawings and other relevant documents submitted by the contractors.

4. Confirmation and approval of building materials and equipment

The consultant shall confirm the consistency with the contract documents of the building materials and equipment which the contractors propose to procure, and shall approve their adoption.

5. Plant inspection

The consultant shall inspect the building materials and equipment at the manufacturers' factories to ensure their quality and performance.

6. Reporting on progress of the construction work

The consultant shall grasp the actual conditions of the construction site and progress, and report them to both Governments.

7. Completion inspection and test operations

The consultant shall inspect the completed facilities and the installed equipment, and make a test run of each piece of equipment, in order to ascertain that all the works of facilities and equipment are completed in compliance with the provisions of the contract documents, and shall submit the Inspection Certificate to the Philippine side.

8. Training in operation of the equipment

Some equipment installed under the Project will require considerable operating skills as well as good knowledge of their maintenance. For

this reason, it will be necessary to have the engineers of the Philippine side receive on-site training in proper equipment operation and troubleshooting techniques during the installation/adjustment/test-run period. The consultant shall give instruction and advice concerning the training programme.

Judging from the scale of the Project, it is advisable that, in carrying out the aforementioned tasks, the consultant shall station one architect/ engineer to the Philippines throughout the term of works. The consultant shall also dispatch necessary engineers to the site at relevant occasions for inspection, instruction and coordination, and at the same time assign necessary engineers in Japan to establish a communication and backup system. The consultant shall report the progress of the works, payment procedures, completion of the construction of the facilities and installation of the equipment, and any other relevant matters to the competent agencies of the Japanese Government.

3-1-5 Procurement Plan

(1) Guidelines for Procurement of Building Materials

Materials and equipment for use in this project are to be procured in accordance with the following guidelines.

1. Local procurement

   In principle, building materials for this project should be procured in the Philippines so that they can be easily repaired, managed and maintained by the Philippine side after the completion of the facilities. Especially, heavy building materials such as cement, gravel and concrete blocks, which are to be used in large quantity, should be procured in the country from the standpoint of advantage in transportation. In case of equipment, which require periodical maintenance services by the local distributors such as X-ray machine, imported one should be procured from local distributor.

2. Import

Those materials and items of equipment which are not available in the Philippines, which can be procured locally but are judged to be defective in terms of quality or which are in short supply and expensive in the Philippines, should be procured in Japan or other third countries.

(2) Materials/Equipment Procurement Plan

Materials and equipment to be used in the project are planned to be procured as listed in the following table.

1) Materials Procurement Plan

Table 3-1 Procurement Plan of Building Materials

Work	Material/Equipment	Countries			Remarks
		Philippine	Japan	Third country	
Building Work	Cement	○			Procurable locally
	Sand	○			Ditto
	Gravel	○			Ditto
	Re-bar	○	○		Ditto
	Form	○			Ditto
	Brick	○			Ditto
	Waterproofing	○			Ditto
	Terrazzo tile	○			Commonly used locally
	Ceramic tile	○			Procurable locally
	Glass	○			Ditto
	Timber	○			Ditto
	Aluminum windows	○			Ditto
	OR, X-ray room door				Quality be secured
	Wooden doors	○			Procurable locally
	Hardware				Ditto
	Paint	○			Ditto
Mechanical & Sanitary Work	Pump	○			Procurable locally
	Fan	○			Ditto
	Sanitary fittings	○			Ditto
	PVC pipe	○			Ditto
	Galvanized steel pipe	○			Ditto
	Water tank		○		Reliable and less expensive
	Hose reel	○			Procurable locally
	Fire extinguisher	○			Ditto
	Electric water heater		○		Reliable and less expensive
	Clean unit		○		Ditto
Electrical Work	Distribution panel	○			Procurable locally
	Generator	○			Ditto
	Lighting fixture	○			Ditto
	Fire alarm system		○		Reliable and less expensive
	Wiring conduit	○			Procurable locally
	Medical power supply system		○		Reliable and less expensive

2) Equipment Procurement Plan

Table 3-2 Procurement Plan of Equipment

Equipment	Countries			Remarks
	Philippines	Japan	Third country	
Gypsum cutter		○		Reliable product can be available.
X-ray film illuminator		○		Ditto
Ultrasound therapy unit		○		Ditto
Electric traction		○		Ditto
Rotary wrist		○		Ditto
Clinical examination table		○		Ditto
Doppler fetal heart detector		○		Ditto
Colposcope with camera		○		Ditto
Ultrasonic nebulizer		○		Imported product from Japan is available locally.
PUVA apparatus		○		Reliable product can be available.
Woods lamp		○		Ditto
ECG machine		○		Imported product from Japan is available locally.
Dental chair unit		○		Reliable product can be available.
Dental X-ray machine (interoral)		○		Ditto
Operating table		○		Ditto
Operating light (Ceiling)		○		Reliable product can be available.
Operating binocular microscope		○		Ditto
High pressure steam sterilizer		○		Ditto
Side table/Center table		○		Ditto
Fume hood		○		Reliable product can be available.
Clean bench		○		Ditto
Automatic tissue processor		○		Ditto
Freezing microtome		○		Ditto
Biological microscope		○		Ditto
Water distilling apparatus		○		Ditto
Endoscopic video monitor system		○		Ditto
Fiberscopes		○		Ditto
Ultrasound machine		○		Ditto
X-ray machine, stationary type		○		Ditto
Automatic X-ray film processor		○		Ditto

3-1-6 Implementation Schedule

When the Exchange of Notes concerning the implementation of the Project is concluded between the Government of Japan and the Government of the Philippines, the construction and equipment works will be implemented with the following procedures.

1. Detail design

   The consultant shall prepare the design documents such as detailed design drawings, specifications and tender documents based on the contents of the study report after the conclusion of the consultant agreement. The consultant shall also obtain approval on the above-mentioned documents from the Philippine side after consultation with them. The estimated period required for completing the procedure is approximately four months.

2. Tendering

   The contractors to take charge of the construction work and the equipment works will be selected separately by tender. The tender work includes tender announcement, prequalification, acceptance of tenders, evaluation of the tenders, designation of the contractors and conclusion of the contracts. The estimated period required for completing this procedure is approximately three months.

3. Construction work and equipment work

   Judging from the contents and scale of the work and the actual situation of the local construction industry, it will take 18 months to complete the entire project, including the equipment work, provided the procurement of building materials and the customs clearance of imported articles proceed smoothly.

The overall implementation schedule from the conclusion of the Exchange of Notes to the completion of the project which includes above-mentioned factors

will be as shown below.

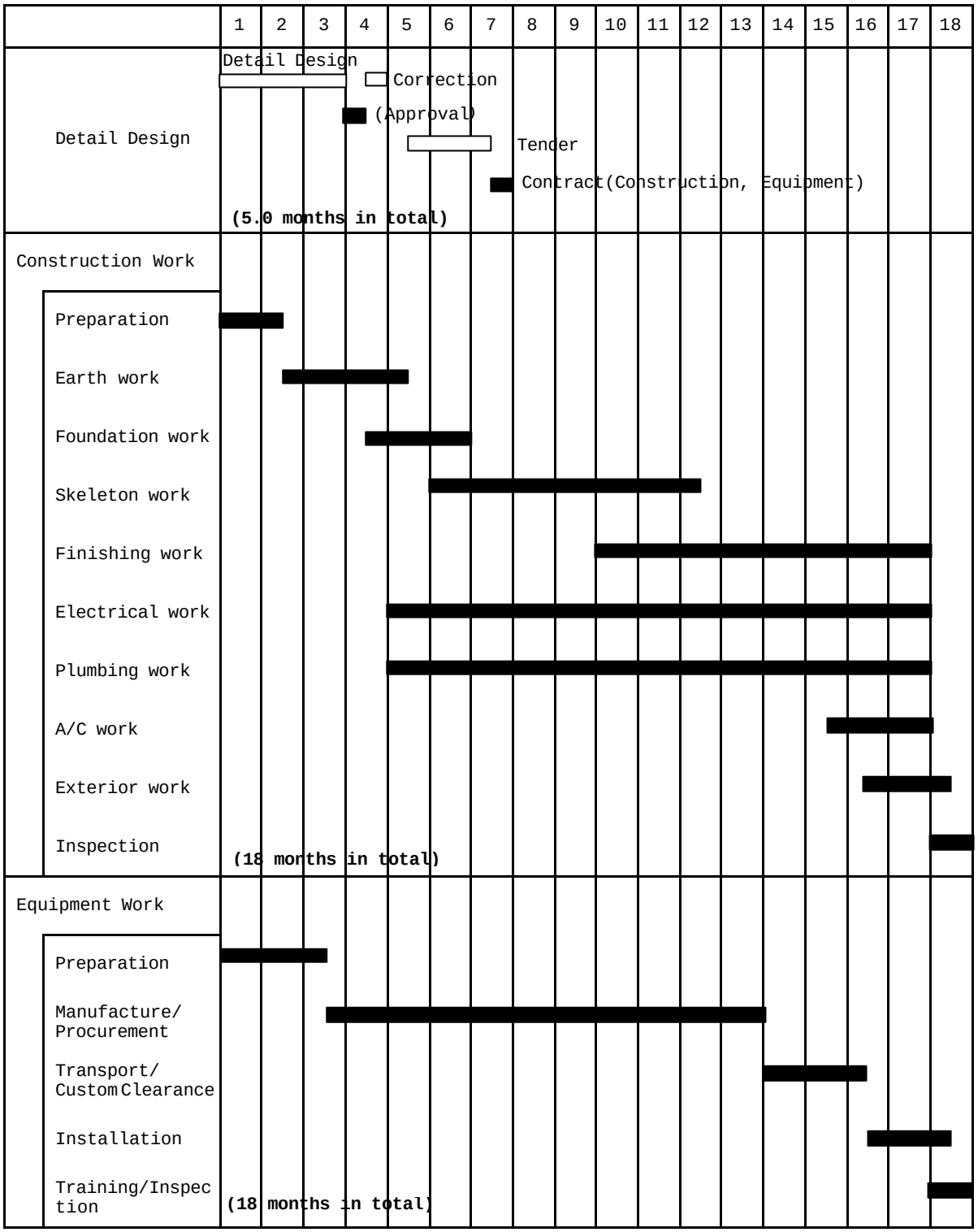


Fig. 3-1 Implementation Schedule

3-1-7 Obligations of Recipient Country

Following necessary measures shall be taken by the Government of the Philippines on the condition that the Grant Aid by the Government of Japan is extended to the Project.

1. To secure lots of land necessary for the Project including temporary stockyard;
2. To clear and level the site for the Project prior to the commencement of the construction;
3. To provide a proper access road to the Project site;
4. To provide facilities for distribution of electricity, water supply, telephone trunk line and drainage and other incidental facilities outside the site;
5. To undertake incidental outdoor works, such as gardening, fencing, exterior lighting, and other incidental facilities in and around the Project site, if necessary;
6. To ensure prompt unloading and customs clearance of the products purchased under the Japan's Grant Aid at ports of disembarkation in the Philippines;
7. To exempt Japanese nationals from customs duties, internal taxes and fiscal levies which may be imposed in the Philippines with respect to the supply of the products and services under the verified contracts;
8. To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such facilities as may be necessary for their entry into the Philippines and stay therein for the performance of their work;
9. To bear commissions, namely advising commissions of an Authorization to Pay (A/P) and payment commissions, to a Japanese bank for the banking services based upon the Banking Arrangement (B/A);

10. To provide necessary permissions, licenses, and other authorization for implementing the Project, if necessary;

11. To ensure that the facilities constructed and equipment purchased under the Japan's Grant Aid be maintained and used properly and effectively for the Project; and

12. To bear all the expenses, other than those covered by the Japan's Grant Aid, necessary for the Project.

3-2 Operation and Maintenance plan

The costs of operation and maintenance of the new OPD building, when number of outpatients a day become 1070 in the target year of 2005, are estimated as below.

Item	Estimated cost
Consumables and maintenance expenses	2,301,000 PHP/year
Consumables cost	(1,621,000 PHP/year)
Maintenance cost	(680,000 PHP/year)
General expenses	4,272,000 PHP/year
Electricity charge	(2,500,000 PHP/year)
Telephone charges	(380,000 PHP/year)
Fuel for generator	(200,000 PHP/year)
Water charges	(98,000 PHP/year)
Medical gas charges	(792,000 PHP/year)
EV maintenance	(252,000 PHP/year)
Total	6,573,000 PHP/year

1) Personnel Expenses

There will be no increase in the number of medical doctors. However, 15 numbers of nurses and administrative personnel is planned to be increased. Personnel expense for increase of personnel is estimated to be PHP 1,657,503.

2) Consumables and maintenance cost

① Consumables expenses

- Gel for ultrasound machine, filter cartridge for water distilling apparatus, freezing microtome 240,000 PHP/year
- General X-ray film
  6000cases/year×21.1PHP/sheet×2=1,012,800PHP→1,013,000PHP/year
- Dental X-ray film
  32,579cases/year × 0.5 × 1/case × 10.3PHP/sheet=167,782PHP → 168,000PHP/year
- X-ray Developing liquid 200,000PHP/year

② Maintenance expenses

- Periodical maintenance contract cost
  Maintenance contract costs for X-ray machines, ultrasound machines, endoscope video monitor system etc. 3% of equipment cost 430,000PHP/year
- Spare parts
  Sterilizing lump, fuse, switch, operating light lump, ultra violet lump etc.

  250,000PHP/year

3) General Expenses

① Electricity Costs

Electricity consumption is estimated as follows.
Contract electricity: 400 kW
Monthly electricity consumption: 400 kW x (0.5 x 9 h x 22 days + 0.2 x 24h x 30 days) = 97,200 kWh

A. Basic charge

400 kW x 181.12 PHP = 72,448.00 PHP ••••••••••••••••••••••Ⓐ

B. Generation charge

97,200 kWh x 1,5669 PHP/kWh = 152,300 PHP ••••••••••••••••Ⓑ

C. Energy charge

1st-100 h → 100 h x 400 kW → 40,000 kWh x 0.766 = 30,600.00 PHP

excess → (97,200-40,000) kWh x 0.735 = 42,042 PHP

Total: 72,642.00 PHP ••••••••••••••••••••••••••••••••••Ⓒ

The amount of Ⓐ +Ⓑ+ Ⓒ is the monthly amount of electricity charges. In the case of the amount of Ⓒ, a 20 percent hospital discount and a 10 percent prompt payment discount are applicable.

Ⓐ + Ⓑ + Ⓒ x 0.7 = 208,173 PHP/month

Therefore, the annual total amount of electricity charges is 2,500,000 PHP (208,173 pesos/month x 12 months).

② Telephone Charges

The amount of telephone charges is calculated on the following assumptions.

Number of outbound calls for the existing building:
about 400 times/day

Number of subscription line circuits for the existing building:
14 Lines

Monthly telephone charges for the existing building:
44,592.27 pesos
(including the basic charge in the amount of 13,720 pesos)

Estimated number of telephone lines for the new OPD building:
10 Lines

A Basic charge

980 pesos/subscription line x 10 circuits = 9.800PHP/month•• Ⓐ

B Usage-based charge

(44,592.27 pesos-13,720) x 10/14 = 22,051.62 PHP/day•••••••• Ⓑ

Ⓐ + Ⓑ = 31,851.62 PHP/month

Therefore, the annual total amount of telephone charges is 380,000 pesos (31,851.62 pesos/month x 12 months).

③ Cost of Fuel for the Private Electric Power Generator

It is assumed that the generator (500 kW) will be used for about one hour a month.

1.36 kg/kW•h ÷ 0.83 kg/ℓ x 500 kW x 1 h x 12 months = 9,831 ℓ/year

Therefore, the annual total amount is 200,000 pesos (9,831 ℓ x 20 pesos).

④ Water Charges

The amount of water charges is calculated on the assumption that the maximum daily consumption of city water will be 25 m^3 and that a month comprises 30 days and the annual city water demand rate is 70 percent.

The amount of water charges is calculated by adding the amount of water meter rent to the amount of consumption-based charge.

- Water meter rent (water meter caliber: 50 mmΦ) 200 Php/month

  Annual water meter rent

  200 Php/month x 12 months = 2,400 Php •••••••••••••••• Ⓐ

- Estimated amount of consumption-based charge

  The estimated amount of consumption-based charge is calculated on the basis of the caliber of the water meter and the level of city

water consumption.

Monthly city water consumption is 526 m^3 (25 m^3/day x 30 day/month x 0.7).

The amount per cubic meter of consumption-based charge is 15.11 Php. So the monthly amount of consumption-based charge is

15.11 Php/m^3 x 525 m^3/month x 12 months x 12 months/year
= 95,193 Php ･･ Ⓑ

Therefore, the annual total amount of water charges is 97,593 Php (Ⓐ+Ⓑ).

⑤ Medical Gas Charges

The average monthly O_2 consumption at the DMC is 24,000 kg.

It is assumed here that O_2 consumption will increase by 10 percent.

- 2,400 kg/month x 0.1 = 240 kg/month
- The amount per kilogram of gas charges is 27.5 Php/kg.

Therefore, the annual total amount of O_2 charges is 792,000 (240 kg/month x 27.5 Php/k･cylinder x 12 months/year).

⑥ Cost of Elevator Maintenance (monthly inspection/maintenance contract)

7,000 pesos/month x 12 months/year = 252,000 pesos/year

Chapter 4 PROJECT EVALUATION AND RECOMMENDATION

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATION

4-1 Project Effect

(1) Expected Positive Effects of the Project

When this Project is implemented and appropriate management and operation are executed by the side of Philippines, improvement to the current state and benefit effect as described below can be obtained.

1) Direct effects

① It will be possible to deal with increase of number of outpatients.
The number of outpatients accepted per day is currently limited to 900 persons because of limited facilities. However, it will become possible to accept all of outpatients when the new OPD building is completed, and number of outpatients increases up to 1,070 in 2005.

② The flow of patients will be simplified.
The diagnosis/treatment function and the examination function, which are currently scattered to the OPD building, and the main building, will be centralized to the new OPD building. Thus, the burden to patients, who have to make round trips between separate buildings by crossing a public road in the premises of the hospital to receive examination and diagnosis/treatment, will be reduced as a result. Also, the burden will be reduced from those who have to visit different departments, such as diabetics who visit Internal medicine department and Ophthalmology department, because examination and diagnosis/treatment can be done within the same building.

③ One day surgery can be effectively performed.
Priority is given to convenience at the central operation department located in the main building. Therefore, at the

Ophthalmology department and the ENT department, day surgeries have been conducted at their own ORs which were diverted from existing rooms of the ENT/Opthalmology building since several years ago. This system has resulted effective diagnosis/ treatment at these department. When the Outpatient Operation Room department is established in the new OPD building, it will become possible to perform one-day surgery also at the Surgery Department, Orthopedics Department and OB/GYN Department, and effective diagnosis/treatment will be achieved at all these departments as well.

④ Contribution will be made to implementation of the master plan of the hospital

The authorized bed capacity of Davao Medical Center is 400. In reality, however, beds are placed in the corridors and multi purpose hall as well, and the percentage of occupancy in 1998 was as high as 128%. In such situation, implementation of the master plan to increase of number of beds to 600 in the future is an urgent necessity. According to the master plan, the Radiology Department, Rehabilitation Department, Outpatients' Orthopedics Department and Laboratory Department, which are currently located in the existing main building, will be moved to the new OPD building and the spaces after movement of these departments will be diverted to sickrooms. Therefore, implementation of this Project will eventually help the master plan make progress in terms of its implementation.

⑤ The medical income will increase.

As the number of accepted outpatients will increase and various hospital functions will be improved, the number of examinations as well as number of diagnoses using X- ray and ultrasound will increase. As a result, proceeds of pharmaceuticals and diagnosis/treatment service revenue such as income from pay

examinations and consultation will increase.

⑥ Training can be effectively conducted.

Provision of training is a principal role of Davao Medical Center. However, since the facilities for this purpose are insufficient with the DMC, DMC has to rent places outside the hospital such as hotels. When training facilities are set up in the new OPD building, the shortage problem of training rooms will be solved, and it will become possible to effectively conduct the training related to the clinical field. This also means no more expenses for leasing halls and less expenses for operation of the hospital.

2) Indirect effect

It is possible to make contribution to promotion of the national development plan.

When the direct effect stated above is produced, the Davao Medical Center will be strengthened to play the role of a top referral hospital in the South Mindanao. "National Development Plan (1995-2020)" seizes health as basic human rights and states that heath is a means of development as well as an objective. In Mindanao where the poverty layer occupies about 50% of the population, establishment of a network and referral system of the public hospitals is promoted to accomplish the objective of the National Plan by "Mindanao Health Development Plan (2000 - 2004)". Execution of this Project will make contribution to promotion of a national program. Furthermore, the training function of Davao Medical Center, which is playing an important role in the medical care education in the region, will be improved and it will be possible to provide effect in the improvement of the regional medical care level.

(2) Verification of the Appropriateness of the Project

1) Positioning of this Project in the National Development Plan

As the ratio of the poor people who are unable to bear medical expenses is high in the Philippines, consolidation of a health system by strengthening public hospitals is an urgent necessity. Therefore, "Mindanao Health Development Plan (2000 - 2004)", which is the health policy of Mindanao, envisages strengthening the regional health system by means of establishing an effective and efficient network and referral system as an objective together with strengthening of a regional health system. Davao Medical Center is positioned as the top referral hospital of District XI. Therefore, implementation of this Project consisting of construction of a new OPD building and procurement of equipment, which is necessary for a top referral hospital, will make direct contribution to "Mindanao Health Development Plan (2000 - 2004)". In view of the above, implementation of this Project is judged fully appropriate and justifiable.

2) Practicability of facilities operation

① Personnel

Davao Medical Center is currently conducted by 257 doctors in total. These doctors are working in rotation in inpatients' departments and outpatients' departments. As far as doctors are concerned, enough number of them are already secured and there is no need of increasing them for the new OPD building. However, it is necessary to newly employ two nurses, three nursing attendants, an administrative officer, a clerk, five guardsmen and three utility workers. The Davao Medical Center estimates the increase of personnel expenses after completion of this Project will be PHP1,657,503.

② Maintenance and management expenses

The maintenance and management expenses including those of fuel and light, equipment and consumables, etc. of the new OPD building

are estimated to be PHP6,573,000 in total. Furthermore, increase of personnel expenses caused by increase of nurses and general staff (present number of doctors is sufficient to deal with the new OPD building) is calculated (on a trial basis) as PHP1,657,503. On the other hand, new income generated on completion of the new OPD building are estimated as described below.

- Income of consultation fee

  It is planned to collect PHP20 from each person as consultation fee, which is not charged currently.

  Number of patients from whom consultation fee can be collected:

  The number of outpatients who are not subject to the social service is 71.1% of all the outpatients from the data of 1998.

  (214,544 – 61,985)÷214,544×100＝71.1%

  Number of outpatients in 2005, which is the project target year: 268,000 persons

  Therefore, 268,000 persons x 0.711 x PHP20 = P3,810,960 → P3,800,000

- Increase of income of diagnosis/treatment accompanying increase of number of X-ray diagnoses

  Increase of number of X-ray diagnoses

  = Number of X-ray diagnoses when new outpatients' building is completed - Current number of X-ray diagnoses = (104 cases x 250 days + 29 cases x 365 days) - 30,585 cases = 6,000 cases

  Therefore, 6,000 cases x PHP200 per case (average of current fees for X-ray diagnosis) = PHP1,200,000

- Increase of income of diagnosis/treatment accompanying increase of number of ultrasonic diagnoses

  Current number of ultrasonic diagnoses introduced outside:

5,000 cases/year

5,000 cases x P375 per case (current typical fees for ultrasonic diagnosis) = PHP1,875,000

- Outpatients' operations
  Forecasted number of one-day surgeries in 2005, which is the project target year: 6,563
  Current number of one-day surgeries in 1998: 4,613 cases

  Therefore, (6,563 cases - 4,613 cases) x PHP1,200 (current operation fee) = P2,340,000

Based on the above, increase of income generated after completion of the new OPD building is estimated as PHP9,215,000, which is larger than the estimated expenditure. Consequently, it is judged that there is no problem with respect to the maintenance and management expenses.

4-2 Recommendation

This Project will make contribution to the Mindanao Health Development Plan as described earlier, and it is expected that it will provide a large effect in securing health, which is basic human rights of people. However, equipment procured under this project is minimum, so that not a small number of medical equipment need to be purchased by the Philippines side. In order that the new OPD building is appropriately operated and the expected effect is achieved, it is important that the Philippine side shall appropriate necessary budget at the relevant time for procurement of necessary item of equipment for the new OPD building so that expected effects of this project will be attained.

APPENDICES

1. Member List of the Survey Team

(1)Basic Design Study (July 5~August 8, 1999)

Dr. Toshiyasu Shimizu	Team Leader	Bureau of International Cooperation International Medical Center of Japan Ministry of Health and Welfare
Mr. Fumio Banjyo	Technical Advisor	Advisor of Architecture, Managemental Guidance Division, Department of National Hospital, Health Service Bureau Ministry of Health and Welfare
Mr. Masakatsu Komori	Coordinator	Second Project Management Division, Grant Aid Management Department, Japan International Cooperation Agency
Mr. Ken Majima	Project Manager	Yamashita Sekkei Inc.
Mr. Kunihiko Inadome	Construction Planner	Ditto
Mr. Minoru Tanaka	Structural Planner	Ditto
Mr. Yasunori Nomura	Facilities and Utilities Planner	Ditto
Mr. Masayoshi Masuzawa	Facilities and Utilities Planner	Ditto
Mr. Akira Sato	Equipment Planner	International Consultants Corporation
Mr. Koji Sato	Equipment Planner	Yamashita Sekkei Inc.
Mr. Osamu Suzuki	Cost and Procurement Planner	Ditto

(2)Explanation of Draft Basic Design (October 25~November 13, 1999)

Dr. Kaname Kanai	Team Leader	Director, Planning Division, Bureau of International Cooperation, International Medical Center of Japan, Ministry of Health and Welfare
Mr. Masakatsu Komori	Coordinator	Second Project Management Division, Grant Aid Management Department, Japan International Cooperation Agency
Mr. Ken Majima	Project Manager	Yamashita Sekkei Inc.
Mr. Kunihiko Inadome	Construction Planner	Ditto
Mr. Akira Sato	Equipment Planner	International Consultants Corporation
Mr. Osamu Suzuki	Cost and Procurement Planner	Ditto

2. Survey Schedule

(1)Basic Design Study

No.	Date	Place	Schedule		
			Officials	Consultants	
1	7/5 (Mon)			• Lv. Tokyo Arr. Manila	
2	7/6 (Tue)	Manila Davao		• Courtesy call to JICA office • Lv. Manila Arr. Davao	
3	7/7 (Wed)	Davao		• courtesy call to DMC	
4	7/8 (Thu)	Davao		• Meeting with concerned officials of DMC	
5	7/9 (Fri)	Davao		• Survey of infrastructure	
6	7/10 (Sat)	Davao			
7	7/11 (Sun)	Davao		• Analysis of collected data • Meeting within the team	
8	7/12 (Mon)	Manila Davao	• Lv. Tokyo Arr. Manila • Courtesy call to DOH	• Lv. Davao Arr. Manila (Majima, Inadome)	• Site survey at DMC (existing equipment)
9	7/13 (Tue)	Manila Davao	• Courtesy call to NEDA • Courtesy call to the Secretary of Health • Courtesy call to the JICA office		
10	7/14 (Wed)	Manila Davao	• Survey of DOPS-PGH • Lv. Manila Arr. Davao		
11	7/15 (Thu)	Davao	• Courtesy call to the Japanese Consulate • Courtesy call to the Regional office of DOH • Courtesy call to DMC • Courtesy call to Davao Doctors Hospital		
12	7/16 (Fri)	Davao	• Site survey and Meeting with DMC • Courtesy call to the City Mayor		
13	7/17 (Sat)	Davao	• Meeting within the team		
14	7/18 (Sun)	Davao	• Meeting within the team		
15	7/19 (Mon)	Davao	• Meeting at DMC regarding Minutes of Meeting		
16	7/20 (Tue)	Davao	• Report to the Regional office of DOH • Lv. Davao Arr. Manila		• Research of local market • site survey of the existing facilities in DMC
17	7/21 (Wed)	Manila Davao	• Meeting at DOH		
18	7/22 (Thu)	Manila Davao	• Signing of M/M • Survey of Jose Reyes Medical Center • Report to the JICA office		
19	7/23 (Fri)	Manila Davao Cebu	• Report to the Embassy of Japan • Lv. Manila Arr. Tokyo	• Lv. Manila Arr. Cebu (Majima, Inadome, Sato) • Survey of Vicente Sotto Memorial Medical Center	

No.	Date	Place	Schedule		
			Officials	Consultants	
20	7/24(Sat)	Cebu Davao		• Analysis of collected data	• Analysis of collected data
21	7/25(Sun)	Davao		• Lv. Cebu Arr. Davao (Majima, Inadome, Sato)	
8	7/26(Mon)	Davao		• Site survey of the existing facilities in DMC	
9	7/27(Tue)	Davao		• Survey at City engineer's office and Fire Dept. • Research of the local market	
10	7/28(Wed)	Davao		• Survey of the Davao Regional Hospital	
11	7/29(Thu)	Davao		• Survey of Davao Del Sur Provincial Hospital	
12	7/30(Fri)	Davao		• Meeting at DMC	
13	7/31(Sat)	Davao		• Analysis of collected data • Meeting within the team	
14	8/1 (Sun)	Davao		• Lv. Davao Arr. Manila	
15	8/2 (Mon)	Manila		• Survey at DOH • Survey of the local Market	
16	8/3 (Tue)	Manila		• Survey of local market	
17	8/4 (Wed)	Manila Baguio		• Lv. Manila Arr. Baguio (Majima, Inadome) • Survey of Benguet General Hospital	• Survey of procurement
18	8/5 (Thu)	Manila		• Lv. Baguio Arr. Manila	
19	8/6 (Fri)	Manila		• Report to the JICA office • Report to the Embassy of Japan	
20	8/7 (Sat)	Manila		• Analysis of collected data • Meeting within the team	
21	8/8 (Sun)			• Lv. Manila Arr. Tokyo	

(2) Explanation of Draft Basic Design

No.	Date	Place	Schedule		
			Officials	Consultants	
1	10/25 (Mon)			• Lv. Tokyo Arr. Manila • Courtesy call to JICA office	
2	10/26 (Tue)	Manila		• Courtesy call to DOH	
3	10/27 (Wed)	Manila Davao	• Lv. Tokyo Arr. Manila • Meeting at NEDA • Courtesy call to theJICA office	• Lv. Manila Arr. Davao • Meeting at DMC	
4	10/28 (Thu)	Davao	• Lv. Manila Arr. Davao • Courtesy call to the Regional office of DOH • Meeting at DMC		
5	10/29 (Fri)	Davao	• Meeting at DMC		
6	10/30 (Sat)	Davao	• Site survey of the project site • Meeting within the team		
7	10/31 (Sun)	Davao	• Analysis of collected data • Meeting within the team		
8	11/1 (Mon)				
9	11/2 (Tue)	Davao	• Meeting at DMC		
10	11/3 (Wed)	Davao Manila	• Lv. Davao Arr. Manila • Meeting at DOH	• Lv. Manila Arr. Davao (Majima)	• Inventry survey at DMC
11	11/4 (Thu)	Davao Manila	• Signing of Minutes of Meeting at DOH • Report to the JICA office		
12	11/5 (Fri)	Davao Manila	• Report to the Embassy of Japan • Lv. Manila Arr. Tokyo	• Lv. Manila Arr. Davao (Majima)	
13	11/6 (Sat)	Davao		• Site survey at DMC	
14	11/7 (Sun)	Davao		• Meeting within the team	
15	11/8 (Mon)	Davao		• Site survey at DMC • Survey at City Engineer's office and Fire Dept.	
16	11/9 (Tue)				
17	11/10 (Wed)	Davao		• Lv. Davao Arr. Manila	
18	11/11 (Thu)	Manila		• Meeting at DOH	
19	11/12 (Fri)	Manila		• Report to JICA office • Report to the Embassy of Japan	
20	11/13 (Sat)			• Lv. Manila Arr. Tokyo	

3. List of Party Concerned in the Recipient Country

National Economic and Development Authority

Mr. Laurence Nelson Guevara	
Ms. Leni A. Magalit	Senior economic development specialist
Ms. Judith U. Gondra	

Department of Health

Dr. Alberto G. Romualdez, Jr.	Secretary
Dr. Shirley Domingo	Executive Assistant, Office of Secretary

Office for Health Facilities Services

Dr. Antonio Lopez	Undersecretary
Dr. Margarita M. Galon	Undersecretary

Hospital Operations and Maintenance Services

Dr. Colserda Abesamis	Director
Ms. Stephanie Condero	Senior Health Program Officer
Dr. Rodery S. Enrique	Med. Specialist
Dr. Mario C. Panay	Division Chief
Dr. Criselda Abesamis	

Health Infrastructure Services

Arch. Rebecca Penafiel	Director, Health Infrastructure
Arch. Remedios Paulino	Architect
Arch. Tomas P. Gahol	Architect

Foreign Assisted Coordinating Service

Ms. Remedios S. Paulino	Director III

Regional office of DOH (Region XI)

Dr. Avelino Grospe	Director IV
Dr. Salvador Estrera	Director III
Dr. Rhodora B. Lalson	Medical specialist III
Dr. Rene Elias C. Lopez	LMHMS Coordinator
Ofelin S. Poliquit	

Davao Medical Center (DMC)

Dr. Gerardo D. Cunanan	Chief of Hospital
Dr. Marilyn U. Lim	Medical Specialist III
Dr. Jean S. Tay	Chief, Professional Medical Staff Division

Dept. of Anesthesia

Dr. John F. Gomez (Chair)	M.S.IV
Dr. Ceasar U. Sy	M.S.III
Dr. Esa G. villagomeza-Amaguin	M.S.II

Dept. of Ear Nose Throat

Dr. Mnuel C. Tan, Jr. (Chair)	M.S.III
Dr. Jose Godofredo G. Diaz	M.S.II

Dr. Ramil C. Gaña	M.O.IV
Dr. Jeffrey S. Morales	M.O.III

Dept. of Ophthalmology

Dr. Andrew S. Selga (Chair)	M.S.III
Dr. Josephine I. Cadayona	M.S.II
Dr. Perfecto S. Domingo, Jr	M.S.II
Dr. Grego K. Pineda	M.O.IV

Dept. of Family Medicine

Dr. Carlos Jesus P. Bangoy (Cair)	M.S.III
Dr. Evelyn Abasolo-Lao	M.S.II
Dr. Nancy Therese S. Pasigado	M.O.III
Dr. Pearlie Jean Basañes-Miras	M.O.III, Chief Resident

Dept. of Internal Medicine

Dr. Josefino A. Ramos (Chair)	M.S.III
Dr. Daniel C. Cistobal	M.S.II
Dr. Roy B. Ferrer	M.O.IV (Diabetes Program Coordinator)
Dr, Beverly Rose L. Diaz	M.S.IV

Dept. of Dermatology

Dr. Carlos R. Pacheco (Chair)	M.S.III
Dr. Lalaine Rabe-Visitacion	M.S.II
Dr. Pacita Santos-Belisario	M.S.II
Dr. Ma. Assumpta Cecilia Realubit-Serrano	Volunteer Consultant
Dr. Leo E. Lagda	Resident Physician
Dr. Lani Ramirez	Resident Physician

Dept. of Obstetrics-gynecology

Dr. Carolina O. Joyo (Chair)	M.S.III
Dr. Emilia Afable-Cruz	M.S.III
Dr. Ligaya V. Freires	M.S.III
Dr. Joyce S. Custodio	M.S.II
Dr. Roverto V. Alcantara	M.S.II
Dr. Concepcion D. Rayel	M.S.II
Dr. Regina Dela Paz-Ingente	M.S.II
Dr. Ruby E. Robiso	M.O.IV
Dr. Paula Cynthis Criz-Limlengco	M.O.III

Dept. of Orthopedics

Dr. Samson A. Peli (Chair)	M.S.II
Dr. Anthony Alberto C. Angala	M.O.IV

Dept. of Pathology

Dr. Oscar P. Grageda (Chair)	M.S.III
Dr. Arthur C. Benignos II	M.O.IV

Dept. of Pediatrics

Dr. Liberation M. Abarico (Chair)	M.S.III
Dr. Virginia Hernandez-Tanueco	M.S.II
Dr. Merlin R. Fernandez	M.O.III

Dept. of Psychiatry

Dr. Willie N. Figueroa (Chair)	M.S.II

Dept. of Radiology

Dr. Ma. Lourdes B. Lacanilao (Chair)	M.S.III
Mr. Ricardo N. Batu	Deputy District Collector
Dr. Samuel B. Bangoy	M.O.III
Dr. Michael M. Mañago	Resident Physician

Dept. of Surgery

Dr. Rizal D. Aportadera (Chair)	M.S.III
Dr. Joselito Rosauro J. Cembrano	M.S.II
Dr. Thomas S. Marquez-Lim	M.S.II
Dr. Rolley Rey P. Lobo	M.S.II
Dr. Mark Edward Anthony M. Maruya	M.O.IV
Dr. Louie A. Metran	M.O.III

Ms. Belen Q. Aspera	Med. Tech. III
Dr. Florence P. Prantilla	Volunteer Anesthesiologist
Dr. Ma. Luisa Aportadera	M.S.III, Head, Section of Rehabilitation Medicine
Mr. Orval Tiño	Physical Therapist
Dr. Evelyn L. Siasu	M.S.II, Pediatric Intensive Care Unit
Ms. Maria Victoria G. Prenda	Pharmacist
Ms. Vilma L. Comoda	Chief Nurse
Ms. Ofelia B. Ompoy	Assistant Chief Nurse
Ms. Elizabeth Barriga	Nurse III, Training Office
Ms. Corazon Colendres	Nurse III, Supervising Nurse, OPD
Ms. Norita A. De Guzman	Nurse III, Health Education Promotion Officer
Ms. Nancy T. Arenas	Nurse II, Head Nurse, Central ICU
Engr. Genaro R. Nono	Engineer III
Engr. Aniceto U. Malabanan	Engineer III
Engr. Henry Tancio	Bldg. Maintenance Foreman
Mr. Romeo G. Pandapatan	Supply Officer III
Ms. Luisita C. Maliwat	Record Officer III
Mr. Rally Pronteras	Equipment Coordinator
Mr. Ricardo S.D. Justol	Administrative Officer V
Ms. Fely Ulangkaya	Medical Social Worker II, OPD Administrator

Ms. Ana Joy P. Mendez	Administrative Officer II
Ms. Marlyn L. Arado	Librarian
Ms. Jannette S. Cabada	Nurse I, Diabetes Nurse Educator

Davao City

Hon. Benjamin C. De Guzman	City Mayor

City Engineers Office

Engr. Joaquin B. Cui, Jr.	City engineer
Engr. Antonio B. Fuliga	Engineer IV

Office of the City Fire Marshall

Mr. Joselito A. Quibin	City Fire Marshall
Mr. Ricardo N. Batu	Deputy District Collector
Mr. Elipidio B. Jumalon	Chief Flammable/Combustible Section
Mr. Allan D. Capiña	Building Safety Inspector

Bureau of Customs, Department of Finance, Collection District XII

Mr. Datuminan M. Dianalan	District Collector, Port of Davao
Mr. Ricardo N. Batu	Deputy District Collector

Environment Impact Assessment Division, Department of Environment and Natural Resources

Engr. Metodio Y. Turbella	Officer in Charge

Philippine General Hospital

Dr. Roberto L. Ruiz	Chairman

Jose Reyes Memorial Medical Center

Dr. Maria Pem Perez	Asst. Director
Dr. Emmanuel F.	Asst. Coordinator for Medical Training
Dr. Higinio T. Mappala	Asst. Chief , OPD

San Lazaro Hospital

Dr. Benito F. Arca	

Vicente Sotto Memorial Medical Center

Dr. Eusebio M. Alquitalas	Chief of Hospital
Dr. Filomeha G. De Los Santos	Chief of Clinics
Dr. Joy Fea Lim	Head, OPD

Davao Regional Hospital

Dr. Romulo A. Busuego	Chief of Hospital
Dr. Dainah S. Casintahan	Medical Officer IV

Davao Del Sur Provincial Hospital

Dr. Mahelinde B. Zambarrano	Provincial Health Officer II
Dr. Jesus B. Catro Jr.	Medical Officer II
Lucilyn B. Salera	Nurse III
Estrellita C. Mellina	Nurse III

Benguet General Hospital

Dr. Esteban T. Piok	Provincial Health Officer II

Dr. Corazon Cabansag	Provincial Health Officer I
Dr. Norma C. Pacalso	Training Officer
Engr. Manuel Palasi	Provincial Sanitary Engineer

Davao Doctors Hospital

Dr. Herminio Villano	President

Embassy of Japan

Mr. Hikaru Fukuda	First Secretary

Consular Office of Japan in Davao

Mr. Hiroyuki Higuchi	Consul-Counselor

JICA Philippines Office

Mr. Hideo Ono	Resident Representative
Mr. Toshiyuki Kuroyanagi	Deputy Resident Representative
Mr. Kazuo Sudo	Deputy Resident Representative
Mr. Masatoshi Takahashi	
Ms. Maki Nagai	
Ms. Yuko Arimoto	
Ms. Tomoya Yoshida	
Ms. Yojiro Miyashita	

5. Cost Estimation Borne by the Recipient Country

Estimated Project costs to be borne by the Government of the Philippines

- Site preparation
  - Relocation of the existing trees, flag poles and the chapel extension ····· 220,000PHP
- Temporary infrastructure supply for the construction work
  - Temporary power supply ····· 30,000PHP
  - Temporary telephone ····· 30,000PHP
  - Temporary water supply ····· 80,000PHP
- Permanent infrastructure supply
  - Power supply ····· 700,000PHP
  - Renewal of switchboard ····· 400,000PHP
  - Telephone line ····· 41,000PHP
  - City water supply ····· 42,500PHP
  - Well water supply ····· 300,000PHP
- Exterior
  - Planting ····· 30,000PHP
- Furniture, Curtain, Consumables etc. ····· 5,000,000PHP
- Relocation of the existing equipment ····· 440,000PHP

Total	7,313,500PHP

Other than the items listed above, following expenses shall also be borne by the Philippine side as required for the domestic procedures and the procedure of the grant aid cooperation system.

- Formalities of obtaining the building permit
- Customs duties on imported materials and equipment for the Japanese side work (estimated to be 8,500,000PHP)
- Internal taxes, value added tax and other fiscal levies. (VAT 10%, Creditable with hold tax 1%, Municipal tax 0.75%)
- Banking arrangement and other related charge.