No.

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR RECONSTRUCTION OF
THE NEW AMSTERDAM HOSPITAL
IN
THE CO-OPERATIVE REPUBLIC OF GUYANA

JULY 2002

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

JOINT VENTURE
BETWEEN
YAMASHITA SEKKEI INC.
AND
BINKO LTD.

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PREFACE

In response to a request from the Government of the Co-operative Republic of Guyana, the Government of Japan decided to conduct a basic design study on the Project for Reconstruction of the New Amsterdam Hospital in the Co-operative Republic of Guyana and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Guyana study teams from October 2 to October 30 2001, and from January 27 to February 6, 2002.

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

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

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

July, 2002

Takao Kawakami
President
Japan International Cooperation Agency

July, 2002

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Reconstruction of the New Amsterdam Hospital in the Co-operative Republic of Guyana.

This study was conducted by the joint venture between Yamashita Sekkei inc., and Binko Ltd., under a contract to JICA, during the period from September, 2001 to July, 2002. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Guyana 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,

Kunihiko Inadome
Project manager,
Basic design study team on
The Project for Reconstruction of
The New Amsterdam Hospital
in the Co-operative Republic of Guyana

The Joint Venture between
Yamashita Sekkei inc. and
Binko Ltd.

LOCATION MAP

PERSPECTIVE

LIST OF FIGURES & TABLES

ABBREVIATIONS

ASTM	American Society Testing and Materials
BS	British Standard
CIDA	Canadian International Development Agency
Dept.	Department
ECG	Electrocardiograph
EU	European Union
E/N	Exchange of Notes
Fc	Compressive Force
Ft	Tensile Force
GPL	Guyana Power and Light Co.
GT&T	Guyana Telephone &Telegraph Company
GUYSUCO	Guyana Sugar Company
G$	Guyana Dollar
HIV	Human Immunodeficiency Virus
HT	High Tension
Hz	Hertz
IDB	Inter-American Development Bank
ksi	kilo pound per square inch
KVA	Kilo Voltage Ampere
LPG	Liquefied Petroleum Gas
LX	Lux
MDEX	Medical Development Strategy
N/A	New Amsterdam
OB/GYNE	Obstetric/Gynecology
ODA	Official Development Assistance
OT	Operating Theater
PAHO	Pan-American Health Organization
PVC	Polyvinyl Chloride
REO	Regional Executive Officer
RHAs	Regional Health Authorities
RHO	Regional Health Officer
RM	room
STD	Sexually Transmitted Disease
TB	Tuberculosis
UNDP	United Nations Development program
USAID	U.S. Agency for International Development

SUMMARY

The infant mortality rate and the mortality under 5 years of age of the Co-operative Republic of Guyana are 56 and 76 per 1000 live births (UNICEF data*Note, 1999) respectively, and life expectancy at birth is 65 (UNICEF data*Note, 1999). As indicated by the basic health indicators stated above, the health condition of the country is as bad as worst countries in the Central and South America, following to Haiti and Bolivia. Main reason to cause this situation is thought of as development of the medical services in local regions is behind compared to its national capital region in Guyana. As much as 34 % of the recurrent health budget in the year 2000 was disbursed for the Georgetown hospital in the capital, which is the only one tertiary level medical institution of the country. On the other hand, in the same year total recurrent health budget disbursed for medical institutions at secondary level or low in all the regions is merely 30 %. These facts indicate that there is a considerable gap in medical services between the national capital and the other local regions. (Note: UNICEF data: The State of the World's Children 2000)

With the background stated above, particular emphasis is placed on the improvement of the health services in the local regions in “National Development Strategy 2001～2010”, which is the development plan of Guyana, giving prominence to improvement of referral system alongside improvements in local health care facilities.

Guyana has a population of about 856,000(PAHO estimation, 1998) and as much as 97% of the population live on the Coastal Plain, which is a narrow strip area facing the Atlantic Ocean. And approximately 200,000, which accounts for a quarter of the country’s entire population, concentrate in Georgetown, the capital of the country located in Region 4. Health service in this area is well provided with having the Georgetown Hospital as the top referral hospital. On the other hand, though Region 6 has second largest population in the country, the New Amsterdam Hospital, its core referral hospital, is not able to provide necessary medical services due to its superannuated facilities, which was built about 120 years ago, as well as its superannuated equipment. It is urgently needed to be reconstructed but the Government can not afford to disburse necessary budget.

Though the New Amsterdam Hospital is positioned as the core referral hospital in Region 6 to provide secondary level medical services, it is not able to accept referral patients from lower level medical institutions. As evidenced by its low bed occupancy ratio, which is 35% in 1999, the referral system in Region 6 is not practically functioning. Under the condition, the Government of Guyana made a request to the Government of Japan for a grant aid cooperation to reconstruct the supersaturated facilities and replace superannuated equipment of the New Amsterdam Hospital.

In response to the request made by the Government of Guyana, the Government of Japan conducted a preparatory study on the Project in July 2000. As a result of the survey, the Preparatory Study Team suggested to the Guyana side that the proposed project site was not well suited for the Project due to its inconvenient location. The Team recommended that the other site offered by the New Amsterdam Mayor was more suitable for the Project than the proposed site. After this, the Government of Guyana informed to the Government of Japan formally that the site offered by the Mayor was concluded to be the Project site. In response to this information on the alternative site, the Government of Japan conducted the Basic Design Study from September 29 to November 5, 2001. However, as a result of the study, it was found that there were occupants on a part of the site and remaining part was not enough for implementation of the Project.

The Guyana side proposed the second alternative site for the Project to the Government of Japan by December 2001 and the Japanese side conducted the Basic Design Study-2 from January 26 to February 9, 2002 in response to the request.
After the analysis in Japan and explanation of the Draft Final Report from April 8 through April 27, 2002, the Basic Design Study Team prepared this Basic Design Report.

In the Basic Design it was concluded that improvement of the existing facilities of the New Amsterdam Hospital by means of expansion or renovation would be difficult and that reconstruction of the facilities at the present premise is not rational since the hospital is not allowed to suspend its medical services during construction. Therefore, the Project requested by the Guyana side to reconstruct a new hospital facility on the different site was adopted. Though the site near the existing hospital was not adopted due to the occupants staying there, the alternative site presented by the Guyana side is not far from the center of the city and both sides confirmed to determine it as the Project site.

Based on the detailed survey of the existing facilities during the Basic Design Study, the basic design for the Project was formulated with the minimum rooms and floor areas necessary to provide secondary level medical services in Region 6. The number of ward beds was determined to be 114 as the result of examination on the record of accepted patients in consideration of the future increase of population. The actual total number of ward beds, 199 at present, was concluded excessive for the Project. Facilities and equipment were designed to accommodate the same formation of specialty clinics as the present one and to maintain their present grade necessary for the secondary level medical services.

Layout of buildings is planned on the east-west axis so as to utilize natural ventilation. The Outpatient

Dept. building is placed most closely to the Public Road to facilitate access of outpatients and ward buildings are placed deepest inside the site to avoid noise from the Public Road. The Central Clinical Dept. building is placed between the Outpatient Dept. building and the Ward buildings for easy access from both departments. Buildings related to medical care activities are planned as single story to facilitate mobility of patients.

As a result of examination of structural calculation and cost analysis, strip foundation system was adopted since most buildings are single story and the building load is not large.

Outline of the facility plan is as shown below;

Building	Rooms	Structure/Story	
Outpatient Dept. Bldg	Consultation rooms and treatment rooms for the general OPD, Ophthalmology clinic, ENT clinic, Surgery clinic, Orthopedic clinic, Medicine clinic, Pediatric clinic, OB/GYN clinic, Dermatology clinic and Dental clinic, Reception office, Pharmacy	Reinforced concrete structure (columns, beams, floors) , Steel truss roof frame Single storey	746.3 ㎡
Central Clinical Dept. Bldg.	Delivery/Labour section, Operating theaters, Emergency section, X-ray section, Laboratory	Reinforced concrete structure (columns, beams, floors) , Steel truss roof frame Single storey	1,485.0 ㎡
Administration Dept. Bldg.	Administration office, Telephone exchange room, Medical superintendent room, Matron's room, Administrator's room, Library, Classroom and training room for nursing school	Reinforced concrete structure (columns, beams, floors) , Steel truss roof frame Two stories	523.6 ㎡
Service Dept. Bldg.	Laundry, Sewing room, Kitchen, Scullery, Canteen, Electrical room	Reinforced concrete structure (columns, beams, floors) , Steel truss roof frame Single storey	544.8 ㎡
Wards	Medicine (Male), Medicine (Female), Pediatric, Gynecology, Ophthalmic, Surgery (Male), Surgery (Female), Maternity totaling 114 beds	Reinforced concrete structure (columns, beams, floors) , Steel truss roof frame Single storey	1,911.6 ㎡
Others	Central corridor, Pump room, Guardhouse, Drivers' room	Reinforced concrete structure (columns, beams, floors) , Steel truss roof frame Single storey	405.0 ㎡
		Total floor area	5,616.3 ㎡

Most of the equipment requested by the Guyana side is for replacement of the superannuated ones. Equipment plan is worked out based on the "Basic Criteria for Selecting the Equipment".

Major equipment planned to be procured under the Project is as shown below.

Description	Purpose of use, Level	Q'ty
X-Ray Unit	General-purpose X-ray used for X-ray photos of the skeletal structures, the chest and the abdomen	1
Mobile X-Ray Unit	Used with serious cases, patients unable to move, those who are undergoing surgical operation and those who have just gone through surgical operation	1
Automatic X-Ray Film Processor	It is capable of automatic development from developing to drying and helps speed up the developing process.	1
Ultrasound Scanner	Used for indirect ultrasonic diagnosis of abdominal disease.	1
Operating Table	Used for general surgical operations. A sturdy and easy-to-use hydraulically-powered elevating table is to be procured.	2
Operating Light	Electric lights used for general surgical operations. Ceiling lights (main and auxiliary) which can be used for abdominal section should be procured.	3
Anesthesia Apparatus	Used for performing surgical operations under general anesthesia. Carburetors that meet basic technical requirements should be procured.	2
Ventilator	Used for supporting the patient's life during surgical operation under general anesthesia.	2
Patient Monitor	Used for monitoring anesthetized patients' condition.	2
Electro Surgical Unit	Used for incising and coagulating tissues during surgery to minimize bleeding.	1
Gynecological Examining Table	To be used for routine medical examination and treatment.	1
Fetal Monitor	Used for monitoring fetuses before and after delivery. Topography is used to avoid danger of suspended animation and the like.	1
Infant Incubator	Used for incubating premature babies, low-weight premature babies, and abnormal newborn babies under appropriate conditions in terms of room temperature, quantity of oxygen and humidity.	2
Pediatric Treatment Table	Device used for incubating and monitoring newborn babies who have undergone a surgical operation.	1
Auto Refractometer	Used for measuring objective refractivity, degree of astigmatism and astigmatic axis.	1
Examination Chair for Ophthalmology	Basic item of equipment used for ophthalmic examination.	1
Electric Tonometer	In ophthalmic care, tonometry is performed frequently. In addition, it must be carried out safely and accurately. The tonometer operates fast and d durable. It plays an important role in ophthalmic care.	1
Operating Table for Ophthalmology	Use for ophthalmic surgery. A sturdy and easy-to-use hydraulically-powered elevating table is to be procured.	1
Operating Microscope for Ophthalmology	Essential equipment used for ophthalmic surgery like cataract, pterygium and so on. A sturdy and easy-to-use type is to be procured.	1
High Pressure Steam Sterilizer	Basic item of equipment to be installed in Central Material Room. Used for sterilizing operating gowns and surgical appliances with high-pressure steam.	2
Automatic Washer	Used for washing linens as bed sheets and pillow cover in a Hospital.	1
Incinerator	It burns medical waste that has a high moisture content by burner. It burns incombustible gas in the second chamber to hold dioxin to a minimum.	1

In case it is decided to implement the Project with the grant aid cooperation of the Government of Japan, it is appropriate that the construction work should be executed in two phases in view of the sizes of the Project, local construction situation, local weather condition and the budget system of both countries. In Phase 1, the ward buildings and the Service Dept. building should be constructed and necessary equipment

for those buildings will be procured and installed. In Phase 2, the Central Clinical Dept. building and other facilities will be constructed and necessary medical equipment will be procured and installed. The period of each phase will respectively take 19 months including the period for detail design and tender. However, by means of overlapping part of periods of both Phases, the entire project will be 25 months. The project costs to be borne by the Guyana side are estimated as G$40 million for the Phase 1 and G$16 million for the Phase 2 respectively.

When the Project will have been implemented, hygiene for medical care will be secured, mobility of inpatients in the hospital will be facilitated and inpatients' surrounding in wards will be improved, consequently medical surrounding at the New Amsterdam Hospital will be improved. In addition, examination and laboratory testing, which are presently suspended due to shortage of equipment, will be back in business. Then the New Amsterdam Hospital will be able to provide necessary medical services required as the core referral hospital in the region and to accept referral patients from the lower level medical institutions. The improvements listed above will contribute to improvement of the referral system of the region, which is aimed in the national health plan, and bring about benefits to the 170,000 population of Region 6.

Further, the burden to the Georgetown hospital will be lightened since patients in Region 6, who used to go to Georgetown Hospital, will be treated locally instead of going over to Georgetown.

The maintenance and management budget for the New Amsterdam Hospital after completion of the Project is estimated to increase by approximate G$ 6 million. When compared to the increase of the health budget disbursed to Region 6 in recent years, the increase of maintenance and management budget at the New Amsterdam Hospital is not considerable amount for the Guyana side to appropriate. However, present number of maintenance personnel is not enough and it is necessary to recruit additional staff for the maintenance of the electrical, sanitary and mechanical system of the facilities. The facility systems designed in this Project are not complex as requiring high technology for maintenance, and therefore, recruitment of maintenance staff will not be difficult.

The important issue for maintenance of facilities and equipment is to prevent breakdown of the systems by means of establishing rational maintenance organization for periodical inspection and trouble shooting etc. For this purpose technical assistance by the consultants is planned under this Project to assist the Guyana side to establish the maintenance and management system for both facilities and equipment.

Since open incineration of medical disposal is presently a critical issue at the existing hospital, an

incinerator for disposing medical wastes is planned to be procured in this Project and technical assistance on the Waste Management is planned for establishing the waste management system/organization in the new hospital. Therefore, it is indispensable for the Guyana side to recruit necessary personnel for maintenance/management and to assign personnel responsible for waste management for effective implementation and fruitful result of the Project.

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[Appendices]

CAHPTER 1. BACKGROUND OF THE PROJECT

The New Amsterdam Hospital is positioned as the core hospital in Region 6 to provide the secondary level medical services and to accept referral patients from the lower level medical institutions. However, it is not able to fulfil its given task due to its superannuated three storey wooden facility, which was built approximate 120 years ago, as well as shortage of medical equipment. With the condition of the hospital stated above, the Government of the Co-operative Republic of Guyana made a request to the Government of Japan for the grant aid cooperation for the Project for Reconstruction of the New Amsterdam Hospital, which is the primary necessity to improve the referral system of Region 6.

In response to the request, the Government of Japan sent the Preparatory Study Team to Guyana in July 2000. As a result of the study, the Team made a suggestion to the Guyana side that the site offered by the Mayor of New Amsterdam was more appropriate than the proposed project site in consideration of access for patients and the hospital personnel. As the Guyana side approved the site offered by the Mayor as the Project site, the Government of Japan conducted the Basic Design Study in October 2001. However, as the result of the Basic Design Study, it was found that the area of the site was not enough for reconstruction of the New Amsterdam Hospital since two occupants were staying in a part of the site. The Basic Design Study Team suggested to the Guyana side that there were two alternatives. One was to secure an enough space for the Project in the same site and the other was to find an alternative site meeting requirements of the Project. The Guyana side informed of the alternative site to the Government of Japan formally by the end of November 2001, so that the Government of Japan conducted the Basic Design Study-2 in February 2002 and confirmed that the site satisfied the requirements for the Project in terms of access, ground condition, water supply, power supply etc. Then the both sides agreed to determine it as the Project site.

On the other hand, an issue was brought up at the existing hospital regarding open incineration. Then the Guyana side concluded that Waste Management is the critical issue for the reconstruction of the new hospital and requested the Government of Japan to include an incinerator for medical disposal in the scope of the Project as well as for a technical assistance by the consultant for establishing Waste Management system in the hospital. In addition, the Guyana side requested technical assistance for establishing maintenance and management system within the hospital as well, since it is important to maintain the facilities and equipment in good condition for the sustainable medical services provided at the hospital.

Outline of the request made by the Guyana side is as shown below;

Facilities

- Outpatient Department
  General outpatient, Dental clinic, Ophthalmology clinic, ENT clinic, Surgery clinic, Orthopedic clinic, Medical clinic, Paediatrics clinic, OB/GYNE clinic, Dermatology clinic, Physical therapy room
- Central Clinical Department
  Laboratory, X-ray, Operating theatre (general, ophthalmology), Labor/Delivery, Emergency, Central Sterile Supply Department
- Administration Department
  Medical Superintendent's office, Matron's office, Administrator's office, Supervisors' office, Library, PABX, Security, Mortuary, etc.
- Ward
  Paediatric, Medical (male, female), Surgical/Orthopaedic(Male, Female), Ophthalmology, Gynecology, Maternity, Scullery
- Service
  Kitchen, Canteen, Laundry, Sewing, Generator, Pump, Boiler room, Central Store
- Training facilities for the New Amsterdam Nursing School
- New Amsterdam Health Center

(2) Equipment

- Ophthalmology clinic
  Examination Chair for Ophthalmology, Electric Tonometer
- Dental clinic
  Autoclave for Dental
- Examination lab
  Ultrasound Scanner
  Electrocardiograph
- Pathology Lab
  Centrifuge, Binocular Microscope, Incubator, Medicine Refrigerator for Laboratory,
  Laboratory Sterilizer
- X-ray room
  X-Ray Unit, Mobile X-Ray Unit
- X-ray dark room
  Automatic X-Ray Film Processor
- Operating theatre
  Anesthesia Apparatus, Ventilator, Electro Surgical Unit, Operating Light, Operating Table,

Operating Microscope for Ophthalmology, Operating Table for Ophthalmology

- Operating theatre, Recovery room
  Patient Monitor, Defibrillator
- Delivery room
  Fetal Monitor, Delivery Table
- Incubator room
  Infant Incubator
- CSS Room
  High Pressure Steam Sterilizer
- Mortuary
  Autopsy Table
- Ward
  Patient Bed, Treatment Instrument Set, Electric Boiling Sterilizer, Suction Unit, Wheel Chair, Instrument & Dressings Cabinet
- Laundry
  Automatic Washer, Dryer, Electric Ironing Machine
- General
  Incinerator

(3) Technical Assistance

- Waste Management of medical wastes
- Maintenance and management of facilities
- Maintenance and management of equipment

Chapter 2. CONTENTS OF THE PROJECT

2-1 Basic Concept of the Project

(1) Overall goal and the Project purpose

In Guyana over concentration to the capital of the country is considerable and development of the health service system in local regions is behind. Under such situation, emphasis is placed on the improvements of medical services in local regions by means of improving referral system and health care facilities etc. in "National Development Strategy 2001～2010", the development plan of the country.

Region 6 has the second largest population next to Region 4, where the capital city is located. The health policy of the country stresses that it is necessary to improve the referral system for improvement of the health condition of Region 6 by means of improving medical facilities as well as staffing necessary personnel to the medical facilities of the primary level and the secondary level.

The New Amsterdam Hospital, which is the core hospital in Region 6, is not able to provide necessary medical services at the secondary level and is not able to accept referral patients from the lower level medical institutions due to its superannuated facilities as well as shortage of medical equipment. As the result of this situation, the referral system in Region 6 does not function and patients bypass the New Amsterdam Hospital and travel to Georgetown Hospital, which is the only one tertiary level hospital in the country and is located about 110km away from New Amsterdam. This situation burdens not only patients but also the Georgetown hospital for wasting time and money.

With the background as stated above, this Project is aimed at improvement of medical services provided at the New Amsterdam Hospital as a part of the measures to be taken for improvement of the medical services in Region 6.

(2) The outline of the Project

This Project is aimed at improvement of the medical services provided at the New Amsterdam Hospital, which is not able to meet the medical needs in the region, due to its superannuated facilities and equipment. The grant aid cooperation planned to be extended by the Japanese Government for this Project includes reconstruction of facilities consisting of an Outpatient Dept. building, a Central Clinical Dept. building, Wards etc. on the parcel of land, which is different from the existing premise, and procurement of medical equipment mainly to replace superannuated ones.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Plan

There are not enough corridors in the existing building of the New Amsterdam Hospital even though it is long and narrow building, and consequently, wardrooms are used as the general corridor, which condition hamper cure of patients. The building was built nearly hundred and twenty years ago and its wooden structure is superannuated and even dangerous. Therefore, it was judged difficult to improve the existing facility by means of renovation or expansion and concluded that reconstruction was the most reasonable choice for improvement of the New Amsterdam Hospital. On the other hand, it is not rationale for the hospital to reconstruct the facilities in the same premise because the hospital is not allowed to suspend its business during the construction. In consideration of the conditions as stated above, the Project to reconstruct the hospital building in the project site proposed by the Guyana side was adopted.

(2) Natural Conditions

The coastal plain where New Amsterdam is situated is characterized by high temperature and high humidity. The daily highest temperature exceeds 30℃ throughout the year. On the other hand, temperature control by air conditioning will result in increase of facility operation and management costs. Therefore, air-conditioning should be limited to major rooms in the Central Clinical Dept. such as the operating theaters. It is rather comfortable in the wards of the existing hospital even without air-conditioning since natural ventilation is well working. This kind of good reference with the existing hospital shall be employed effectively for this project and maintenance/running cost shall be minimized.

The coastal plain is covered with a silty clay soil layer and ground condition is disadvantageous for building construction. It is unavoidable that buildings subside in a long span. Under such condition due consideration should be given to the building design not to cause uneven subsidence which causes damage to the building.

(3) Socio-economic Conditions

The proposed Project site is adjacent to the St. Aloysius Primary School. The school people are concerned with the possibilities that the noise of the construction works and patients' screaming at delivery may affect the school activities. Besides the school's concern, the possibility of environmental negative impacts of the medical wastes generated at the hospital needs to be reminded.

In order to avoid negative impacts to the school, well communication shall be maintained between the contractor and the school with the coordination of the consultant so that the construction activities might not interrupt school activities and accidents can be avoided during construction. Also, facility design shall incorporate the requirements given by the school as well as envisioned possibility such as the location of the waste collection and the incinerator to be far from the school.

There are the Berbice High School, the New Amsterdam Technical Institute and the St. Aloysius Primary School around the project site, so that it is busy during daytime but it gets deserted at night after school hours. Therefore, due consideration shall be given in the facility design for crime-prevention especially at night since the hospital will be open twenty four hours.

(4) Local Construction Industry

The construction industry of the country, which has a population of approximately 800,000, is small in scale. Therefore, locally made materials are limited and most building materials are imported. The number of skilled construction workers is also limited. Therefore, building design shall not be complex in order not to cause delay in construction progress and to secure certain grade of quality under the given conditions.

In Guyana building law is under preparation for enforcement. Therefore, building design can be done in accordance with foreign regulations. In this Project detail design will be done in accordance with either the standards of British or US since they are in English language and will not cause confusion to the Guyana side.

(5) Local Contractors

The coastal plain is covered with a sedimentary layer and is disadvantageous for building construction. Though the stiff layer generally lies at a depth of about 15 meters in the coastal plain, piles are seldom used even for the cases of two or three stories and not many troubles have been generated since past experiences in building construction are well utilized. Therefore, it is important that the local contractors to participate in the construction work of this Project should have sufficient experience in construction of buildings similar to this Project and ample knowledge of buildings' ageing such as settlement. On the other hand, there are not many local contractors who can handle large-scale building construction projects, and consequently the number of local contractors eligible for this project is limited. The construction execution plan for this project, therefore, should be made up on the understanding of the above situation so that the construction work may be carried out smoothly.

(6) Project Implementing Organization of the Guyana side

The New Amsterdam Hospital is run by the health budget disbursed to Region 6. The health budget disbursed to Region 6 has increased steadily and therefore, the Guyana side will not have difficulty in bearing budget increase in operation of the New Amsterdam Hospital after implementation of the Project. However, present maintenance personnel are not enough for maintenance of the proposed facilities. Therefore, recruiting additional manpower is needed for the Guyana side for maintenance and management of the new facilities of this Project.

In case facility equipment or medical equipment breakdown, it may need to be sent to Georgetown, which is approximate 110km away from New Amsterdam, or to call engineers from Georgetown, which condition will require considerable time and result in interruption of medical services. Therefore, building plan and equipment plan shall be made up in consideration of easy maintenance. In addition, implementation of technical assistance for establishing the maintenance system within the hospital shall be planned.

(7) Grading of the Facilities and Equipment of the Project

1) Facilities

The New Amsterdam Hospital is positioned as the core hospital of Region 6 to provide the secondary level medical services. Therefore, grade of the facilities shall be minimal to provide the secondary level medical services.

2) Equipment

This project is aimed at improving the quality of basic medical services in Guyana. Therefore, following criteria will be applied as the design policies for equipment plan of this project.

- Demand for Medical Services

① The planned items of equipment shall be mainly for use in basic medical services.

② The planned items of equipment shall not be for use in research work but for diagnosis and treatment of diseases.

③ The items of equipment to be procured under this project shall be replacement of the existing items, which have become superannuated, or to make up the shortfall in supply.

④ Basically, the planned items of equipment are to replace the existing ones or to offset the

shortfall in supply.

⑤ The technical level of the specifications of the items of equipment to be procured under this project should not exceed that of the existing items of equipment in Georgetown Hospital, the country's top referral hospital located in the capital of the country.

- Financial Condition

① The items of equipment to be procured under this project shall be the ones operable at low cost and financially maintainable for the Guyana side.

② The scale of this project should be consistent with the range which the Guyana side can cope with and also develop their technical potential. (Those items of equipment, which require costly expendables, are not to be included in this project.)

- Technical Requirements

① The planned items of equipment should be those, which do not require special training of medical professionals. They should be operated satisfactorily by the present medical staff.

- Natural Conditions and Infrastructure

① The planned items of equipment should be proof against the natural conditions in a tropical climate.

- Procurement and Installation

① Expendables for one year will be included in the plan in consideration of the estimated period of time from the opening of the new hospital to the time when its operations get going, and the period of time from placing of orders for expendables and their delivery.

② In consideration of transportation costs and maintenance requirements, drier and autoclave should be procured from the third country.

③ Those existing items of equipment, which can be used in the new hospital, should be relocated by the Guyana side. The details of these items are shown in the “List of Equipment”.

- Maintenance and Management

① The items of equipment shall be ones which can be maintained and managed satisfactorily by local distributors or the Guyana side.

② A training course in operation and routine inspection of equipment should be given to the

staff members in charge of operation at the time of installation in the new hospital.

(8) Construction Method, Procurement of Materials and Construction period

The construction industry is small in scale in Guyana. Building materials are mostly imported. In addition, the number of skilled construction workers is limited. If the building design requires too high degree of precision, it will be difficult to progress the construction work as scheduled under such condition. Therefore, the building design shall be made in consideration that the construction work can be done with local construction method and materials which local contractors are familiar to for smooth progress of the work.

2-2-2 Basic Plan

2-2-2-1 Construction Plan

(1) Site Planning

The northern end of the project site borders on the Public Road to the direction of Skeldon, and its eastern end borders on the Garrison Road. The Public Road is an asphalt-paved trunk road and has a busy traffic. On the other hand, the Garrison Road serves as an access to the residential area and the pavement is left not repaired. In light of such condition of the roads surrounding the project site, main access to the site is planned to be from the Public Road and a service sub-access to the project site is planned at the Garrison Road side.

The Project site is adjacent to the St. Aloysius Primary School. Therefore, consideration is given to the location of the mortuary and delivery room. These facilities are planned to be placed in the Central Clinical Department building which is located behind the Service Department building and does not face the school directly. The incinerator for medical wastes will be placed as far as possible from the primary school so that smoke may not affect the school.

In light of the soft ground condition of the project site and the mobility of patients, the proposed building is planned basically as one-storied. In order to receive benefits of natural ventilation inside the building, all buildings are laid out in parallel on the east-west axis. The Outpatient Dept. building is placed at the nearest position to the Public Road for easy access of outpatients. On the other hand, Ward buildings are placed deep inside the site to avoid noise at the Public Road. The Central Clinical Dept. building is placed between the Outpatient Department building and Ward buildings to facilitate access from both of the departments. A central corridor is placed running from north to south which connects Outpatient department, the Central Clinical department, the Administration department and wards. The Service department, consisting of the

kitchen, the laundry, the electrical room and other service facilities are planned to be located near the service entrance and to be connected with a service corridor branched off from the central corridor. Parking lots are provided near the main entrance and the service entrance.

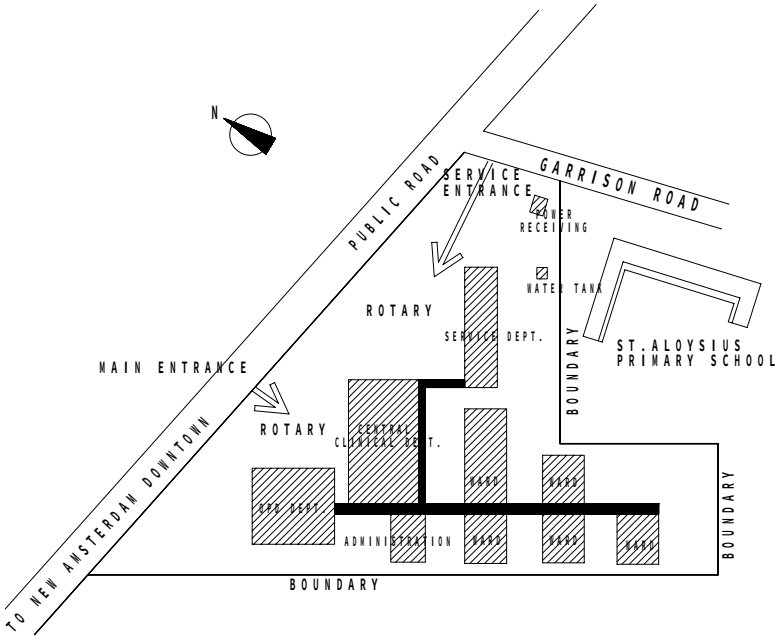


Fig. 2-1 Site Planning and Facility Arrangement

(2) Architectural Planning

1) Floor Plan

The necessary number of rooms and the floor area of each room are determined as the result of the following examinations on the basis of the survey result of the existing facilities as well as the request of the Guyana side.

① Outpatient Department

The Outpatient Department consists of a general outpatient clinic, a medicine clinic, an ENT clinic, a dental clinic, an ophthalmic clinic, a surgical clinic, an orthopedic clinic, a pediatric clinic etc. Present consultation hours at each of these clinics are as shown in Table 2-1.

Since some of the clinics are not open every weekday, consultation/treatment rooms are planned to be shared by different clinics.

Table 2-1 Consultation Hours of Clinics at the New Amsterdam Hospital

Clinic	Consultation days	Consultation hours	Remarks
Medicine	Wednesday and Thursday	8:00～12:00	One (1) full time specialist in charge
Dental	Monday through Friday	8:00～16:00	One (1) full time dentist in charge
Ophthalmic	Tuesday, Friday and Saturday	8:00～	Patients' waiting time varies since one ophthalmologist conducts both surgeries and consultation.
Surgical	Wednesday and Friday	12:00～	One (1) full time specialist in charge
Orthopedic	Monday and Thursday	12:00～	One (1) full time specialist in charge
Pediatric	Monday	8:00～12:00	One (1) full time specialist in charge
Gynecologic	Tuesday	8:00～12:00	One (1) specialist conducts consultations for both clinic on different weekdays.
Obstetric	Friday	8:00～12:00	
ENT	Monday through Saturday	8:00～15:00	A specialist comes to the hospital from Georgetown once a month. On other days the nurse in charge conducts consultation.
Dermatologic			A dermatologist comes to the hospital from Georgetown once a month. On other days the nurse in charge conducts consultation.
T.B.	Monday through Friday	8:00～16:00	A specialist comes to the hospital from Georgetown once a month. On other days the nurse in charge administers medicines to patients.
S.T.D.	Monday through Friday	8:00～16:00	A specialist comes to the hospital from Georgetown Hospital once a month. On other weekdays the nurse in charge administers medicines to patients.

At ENT Clinic, Dermatologic clinic, TB Clinic and S.T.D. Clinic, priority is given to the convenience of the specialist from Georgetown in deciding consultation hours. But at other clinics doctors are full time and their consultation hours are adjustable.

The clinics are grouped in terms of consultation days, types of consultaton/treatment and equipment used.

Table 2-2 Grouping of the Clinics for Faciity Use

Group		Monday	Tuesday	Wednesday	Thurthday	Friday	Saturday
General Outpatient		○	○	○	○	○	
Group 1	Medicine			○	○		
	Gynecology		○				
	Obstetric				○		
	ENT	○	○	○	○	○	
	Pediatric	○					
	Dematology	○	○	○	○	○	
Group 2	Dental	○	○	○	○	○	
Group 3	Ophthalmic					○	○
Group 4	Surgical			○		○	
	Orthopedic	○			○		

As a result of the examination stated as above, the Outpatient Department building is planned as shown below.

Table 2-3 Planned Facilities of the Outpatient Dept. Building

Room	Planned floor area	Existing floor area	Remarks
General Outpatient	54.0	79.2	At present, two MEDEXes are responsible for conducting medical examinations. When patients are judged to need diagnosis by specialist, they are introduced to relevant clinics. Since this system will maintain after this project is implemented, two medical consultation rooms and a treatment room are planned, which is the same as present condition.
Medicine OB/GYNE ENT Pediatrics Dermatology	54.0	26.4	Consultation days of Medicine are Wednesday and Thursday. At ENT Clinic and Dermatologic Clinic, both of which are managed part-time physicians from Georgetown, experienced nurses conduct consultation. Since consultations by nurses are flexible, two medical examination rooms and a treatment room are planned to be shared by four clinics.
Dental	27.0	24.2	A full-time dentist conducts dental treatment every weekday. So a medical treatment room for the exclusive use of the dental section is planned. The existing furniture and equipment shall be transferred to the new facility by the Guyana side.
Ophthalmic	36.0	94.5	A full-time ophthalmologist conducts medical consultation. A darkroom with special medical equipment is needed for this clinic, so that a facility for the exclusive use is planned consisting of a examination room (18 square meters) and a treatment room (18 square meters) .
Surgical/Orthopedic	54.0	72.1	Surgical Clinic's consultation days are Wednesday and Friday, and Orthopedic Clinic's consultation days are Monday and Thursday. A medical consultation room (18 square meters) for common use, a plaster cast room (18 square meters) and a treatment room (18 square meters) are planned to be shared by these two clinics.
Reception/Medical Record room	45.0	61.9	At the existing hospital the clinics are scattered in the building and therefore medical record control and reception business are conducted separately at each clinic. In light of the resultant waste of time and labour, reception and medical record control shall be centralized.
Pharmacy	54.0	93.2	The outpatient pharmacy and the ward pharmacy are organized separately at the existing hospital. These pharmacies are to be integrated into a single pharmacy for efficiency in this project. A dispensing room and a medicine stockroom are planned.
Toilets	36.0		Toilets for the exclusive use of outpatients are planned. Necessary number of toilets for men and women totalling of 120 outpatients are planned.
Waiting Room/Corridors	386.3	250.7	Corridor is minimum at the existing hospital since most of clinics are placed on the 1st floor and access to the rooms is directly from outside the building.
Subtotal	746.3	702.2	

② Central Clinical Department

The OT section, consisting of two general operating theaters and one ophthalmic operating theater, the delivery section, the CSS section, the laboratory section, the X-ray section and the Emergency section are concentrated in one building. Layout of those sections in the building is planned to facilitate correlations between different but close related sections such as "Delivery section and OT section", "Emergency section and Operation section" etc.

Table 2-4 Planned Facilities of the Central Clinical Dept. Building

Room	Planned floor area	Present floor area	Remarks
Labour room	54.0	-	A prenatal room and a postnatal room are provided in the existing hospital, but not labour room. As the postnatal room is located between the prenatal room did the delivery room, expectant mothers move to the delivery room from the prenatal room passing through the postnatal room when delivery sign appears. They have to wait at the corridor in front of the delivery room if they are not yet ready to deliver. In this project a labour room for three beds is planned to avoid such inconvenience at the existing hospital.
Delivery room	36.0	40.2	In the year 2000, the max daily delivery cases were 18 and the average was 10. These numbers are handled with two delivery beds. In case a labour room is provided, occupancy of the delivery rooms will be reduced. Therefore, number of delivery beds is maintained in this project.
Nurses' station	18.0	28.6	The nurses' station is planned to be located in a place where both the labour room and the delivery rooms can be monitored simultaneously.
Incubator room	9.0	6.1	In principle, newborn babies stay with their mothers in the same beds after delivery. Only premature and abnormal babies stay in incubators. At present there is no inconvenience caused with three incubators, so that a newborn baby room with a space for three incubators is planned to be close to the delivery room.
Preparation room	14.0	13.4	Preparation in relation to delivery room to be conducted.
Toilet	5.3		Toilet for the staff members. A shower facility attached.
Central sterilizing supply room	72.4	29.7	To sterilize medial appliances used in the operating rooms, the delivery room, the emergency room and other rooms. A clean store for storing sterilized appliances is attached.
O.T. 1	39. 0	32.2	There are two operating theatres in the existing hospital. Same number of OTs are planned since one of the rooms become unusable after operation of an infectious case.
O.T. 2	39.0	32.2	
O.T. (Ophthalmic)	36.0	34.1	For ophthalmic surgeries a microscope and other special medical appliances are needed, so that an exclusive OT is planned.
Ante room	18.0	-	Preparatory work such as anasthesia will be carried out.
Toilet	3.0		Toilet for patients.
Recovery	36.0	-	Patients are kept in this room after operation for recovery from anasthesia or observation.
Nurses' station	15.0	-	To control handing over patients to the O.T. section from Wards.
Locker room for men	27.0	27.1	For nurses and doctors to change clothing before and after operations.
Locker room for women	27.0	27.1	
Emergency room	105.0	194.4	Since the existing emergency building is also used for medical service at night, the size of the building is rather large. Therefore, emergency room planned in this project is smaller in scale than the existing emergency. Two treatment beds and two observation beds can be placed in the room.

Room	Planned floor area	Present floor area	Remarks
X-ray	36.0	65.4	General X-ray will be installed.
Reading room	18.0	30.1	To be used as a machine control room as well.
Darkroom/store	18.0	36.3	The automatic X-ray film processor will be installed. A sink will be provided for manual development.
Pathology laboratory	72.0	96.4	
Specimen collection room	45.0	27.1	Blood collection, urine collection, ECG, and ultrasonography are to be conducted.
Waiting room	36.0	-	Waiting room for patients.
Mortuary	85.5	106.3	
STD/T.B. clinic	54.0	-	Included in OPD Dept. at present
Manifold room	15.8	-	For central control of oxgen and vacuum
Toilet	15.8	-	
Corridor	535.0	171.9	
Subtotal	1,485.0	998.6	

③ Administration Department

An administration office, an administrator's office, a medical superintendent's room, a matron's room, a supervisors' room, doctor's rooms are laid out on the first floor. A library and teaching facilities for the New Amsterdam Nursing School are placed on the second floor.

Table 2-5 Planned Facilities of the Administration Dept. Building

Room	Planned floor area	Present floor area	Remarks
Administration office	48.0	80.8	Present floor area includes the central store for the use of a total of 10 staff members (4.8 square meters/person). Central store is planned in the Service dept.
Administratorl's office	14.4	12.5	Existing desk, a sofa for visitors, bookshelves, etc. shall be transferred.
Telephone exchange room	9.6	11.7	A telephone switchboard will be installed. Two telephone operators to work in.
Store	12.0	42.2	
Supervisors' office	24.0	27.1	Office for supervisors.
Medical Superintendent's office	24.0	10.8	Office of the medical superintendent. Necessary space for members is planned.
Head nurse's office	24.0	27.1	Office for the matron.
Doctor's room	12.0x2	-	For the physicians on duty.
Training room	48.0	61.4	Facility to be used for trainings of the New Amsterdam Nursing School Students. Room area for a class of 15 trainees.
Preparation room	12.0		For storing medical appliances for trainings.
Instructors' room	12.0	9.2	For two instructors stationed by the nursing school.
Classroom	36.0	72.8	For lectures to the students of the nursesing school. (Floor area for a class of 15 students: 2.4 square meters/student)
Library	60.0	64.8	Similar size to the existing one. (Three desks for a total of 18 seating)
Toilet	48.0	5.2	For the common use of the staff members of Administration Department and the students of the nursesing school.
Staircase/corridor	127.6	-	
Subtotal	523.6	425.6	

④ Service Department

The Service Department building consists of the kitchen, the laundry, the sewing room, the central warehouse and the electrical room.

Meals for inpatients are prepared in the kitchen, and then collected by the respective ward maids in the scullery next to the kitchen. After being carried to their respective wards, a meal for each inpatient will be set at scullery in the respective wards. Ward linen is changed on two designated days of the week. Dirty linen is collected and taken to the laundry. Generally, cleaning is done manually. Washing is dried outdoors on fine days. During the rainy season washing is dried within the laundry. Dried washing is pressed and stored in the ironing room. In the sewing room, staff uniforms are sewn and repaired, and ward linen is repaired as well. It is planned to locate the laundry and the sewing room adjacent to each other and share the ironing room.

Table 2-6 Planned Facilities of the Service Dept. Building

Room	Planned floor area	Present floor area	Remarks
Kitchen	51.1	71.5	Meals for inpatients and the staff are prepared.
Scullery	15.1	18.6	The existing scullery is narrow and deep and causes jam. A sufficient width is secured to avoid congestion.
Canteen	57.6	130.0	On the assumption that maximum of 95 staff take meals on a three-shift basis, a floor area for 36 seating (1.6 square meters/person).
Dumbwaiter	—	1.8	No dumbwaiter is needed in the planned facility since all wards are single story.
Locker room	13.0	11.3	Two locker rooms, one for men and the other for women, are planned for a total of 24 staff who work in the kitchen, the laundry and the sewing room.
Food store	12.6	10.8	Existing refrigerator shall be transferred by the Guyana side.
Refrigerator/freeze room	—	13.9	A refrigerator and a freezer are to be installed in the kitchen.
Kitchen office	12.6	7.2	The resting room for the kitchen's staff members.
Laundry	100.8	261.7	For washing, drying (on rainy days) and pressing linen and other clothes. At present there are two laundries--one for the staff members and the other for the wards. It is planned to combine these two laundries.
Sewing room	28.8	29.6	The ironing room is to be shared with the laundry.
Electrical room	72.0	50.4	A switchboard and a generator are installed.
Toilet	24.0	14.5	For the use of the staff members of Service Department and dining room users.
Central warehouse	57.6	144.2	Storage for consumables and spare parts of the entire hospital.
Corridor	99.6	21.4	
Subtotal	544.8	786.9	

⑤ Wards

The number of beds for each Ward is to be determined on the basis of the average daily numbers of inpatients per month in the past. The following table shows the average numbers of daily inpatients for the past four years, from 1997 to 2000.

Table 2-7 Average Daily Number of Inpatients per Month for the Past Four Years

Period		Pediatric /internal	Internal (women)	Surgical/ orthopedic (men)	Infectious surgical (men)	Gynecologic	Surgical/ orthopedic (women)	Ophthalmic	Internal (men)	Pediatric surgical	Maternity	Newborn baby
Month	Year	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average
1997	1	3.7	10.3	7.0	6.0	7.6	5.7	4.1	5.4	3.8	19.7	11.4
	2	7.6	11.6	8.1	4.8	12.5	5.4	9.2	4.9	7.2	17.6	11.2
	3	6.5	6.0	9.3	3.7	9.8	4.8	5.8	6.2	4.6	17.6	9.5
	4	7.9	9.6	2.5	4.0	10.5	4.3	8.9	7.4	3.0	24.8	12.5
	5	9.8	7.1	9.6	6.3	8.1	4.4	7.4	10.6	1.5	25.8	12.7
	6	10.0	9.1	13.7	5.7	16.8	5.6	5.5	7.1	3.2	23.3	12.0
	7	5.5	13.3	12.1	6.4	10.9	4.6	3.4	9.8	3.1	23.9	12.3
	8	8.3	11.2	11.5	3.9	10.7	7.8	1.0	7.8	4.2	31.5	17.2
	9	3.8	9.5	12.9	4.8	9.2	3.5	5.4	5.0	2.6	26.7	15.3
	10	4.7	10.2	9.2	4.5	8.5	5.8	8.3	7.7	3.3	32.2	18.4
	11	5.7	10.9	9.5	3.8	9.9	3.7	7.8	4.0	2.8	31.9	17.1
	12	4.3	8.9	14.5	1.7	5.8	3.6	4.4	5.5	1.5	23.5	15.2
Maximum mean		10.0	13.3	14.5	6.4	16.8	7.8	9.2	10.6	7.2	32.2	
1998	1	3.5	13.5	8.2	4.5	5.6	3.8	3.2	10.8	3.2	20.5	12.8
	2	5.5	15.1	13.0	5.2	9.5	5.1	5.0	7.4	2.9	21.2	12.4
	3	5.3	12.0	11.8	4.2	9.6	6.3	3.7	7.5	3.9	20.7	12.0
	4	3.1	15.9	8.2	3.7	8.7	5.4	5.0	5.4	3.4	19.9	11.9
	5	5.8	13.5	13.4	7.3	7.4	6.7	3.1	10.9	3.7	24.5	13.8
	6	6.7	13.8	12.2	6.3	5.6	7.9	4.6	13.5	4.2	20.7	17.2
	7	4.1	11.5	11.7	4.2	8.8	6.0	4.3	10.1	3.9	19.2	10.2
	8	4.2	16.2	17.6	5.4	7.4	5.6	4.9	6.8	3.3	17.9	10.2
	9	4.3	14.8	12.8	6.3	5.5	7.1	5.5	7.3	6.0	21.3	9.8
	10	4.4	15.6	11.8	5.7	8.9	6.7	1.0	8.0	3.8	16.9	10.3
	11	5.7	14.0	17.5	5.9	9.5	5.6	0.0	6.8	4.1	17.7	10.2
	12	5.0	11.2	14.3	4.5	5.3	3.5	0.0	5.0	5.4	14.1	7.8
Maximum mean		6.7	16.2	17.6	7.3	9.6	7.9	5.5	13.5	6.0	24.5	17.2
1999	1	5.0	11.7	12.7	4.5	6.4	3.9	0.0	6.5	2.8	16.4	10.4
	2	2.7	6.3	9.9	6.4	8.4	3.1	8.5	7.4	3.2	15.7	7.7
	3	5.9	7.4	9.8	6.2	6.7	3.7	2.6	6.2	6.0	14.1	8.6
	4	8.8	9.8	8.9	8.2	7.5	4.0	14.3	5.8	4.5	13.3	8.9
	5	3.4	4.0	6.5	3.4	4.5	1.4	0.0	4.5	5.2	12.0	7.7
	6	2.8	5.7	6.7	5.1	3.8	2.6	0.0	3.4	5.1	12.5	7.5
	7	4.0	8.4	9.9	2.0	9.2	6.8	0.0	7.4	4.2	15.8	8.5
	8	4.3	8.4	9.8	4.7	6.4	5.3	0.0	8.7	3.7	17.0	9.1
	9	3.1	9.5	15.1	6.6	6.8	4.9	0.0	6.7	4.1	21.2	12.0
	10	3.7	9.4	10.5	6.1	9.2	4.3	0.0	7.6	3.5	18.0	8.8
	11	4.7	9.3	11.5	6.3	8.6	6.5	0.0	6.6	2.7	20.1	10.6
	12	5.1	11.7	9.3	2.4	6.8	7.1	0.0	6.6	2.8	16.1	10.0
Maximum mean		8.8	11.7	15.1	8.2	9.2	7.1	14.3	8.7	6.0	21.2	12.0
2000	1											
	2											
	3											
	4	2.0	10.0	12.9	4.2	7.8	5.9	0.0	7.3	3.6	11.2	7.0
	5	4.2	11.3	11.6	6.0	8.1	8.7	0.0	5.2	2.6	14.2	7.6
	6	7.9	12.7	10.6	4.6	11.4	6.8	0.0	6.3	2.2	12.9	9.7
	7	5.3	11.4	12.5	2.0	8.7	4.8	0.0	5.9	3.3	15.0	9.9
	8	1.9	12.7	12.9	4.3	11.3	8.6	0.0	6.7	6.5	14.9	9.6
	9	4.8	9.8	11.8	5.5	9.9	7.2	3.4	6.8	5.1	13.7	8.3
	10	1.6	10.9	15.5	7.8	7.6	7.4	5.6	9.6	6.3	14.5	9.1
	11											
	12											
Maximum mean		7.9	12.7	15.5	7.8	11.4	8.7	5.6	9.6	6.5	15.0	9.9

The existing wards are classified as shown above being adjusted to the facility plan. In this project classification of wards is rearranged to facilitate convenience of cure and nursing as show below. The number of beds for each ward is determined in consideration of the maximum mean of the past records. Wards are designed as large open rooms in the same manner as typical wards in Guyana. Spacing of beds in wards is secured rather large to accommodate unexpected increase of inpatients, which have occasionally occured in the past.

Year	Pediatric	Surgical/ orthopedic (men)	Surgical/ orthopedic (women)	Internal (men)	Internal (women)	Gynecologic	Obstetric	Ophthalmic
1997	17.2	20.9	7.8	10.6	13.3	16.8	32.2	9.2
1998	12.7	24.9	7.9	13.5	16.2	9.6	24.5	5.5
1999	14.8	23.3	7.1	8.7	11.7	9.2	21.2	14.3
2000	14.4	23.3	8.7	9.6	12.7	11.4	14.9	5.6
Planned number of beds	16	20	10	10	16	10	20	10
Remarks	Pediatric internal clinic and pediatric surgical clinic are to be integrated into a single clinic.	Surgical clinic (men), orthopedic clinic and infectious surgical clinic are to be integrated into a single clinic.		Including two infectious beds	Including two infectious beds			

Total number of male patients at the surgical/orthopedic and infectious surgical wards shown in" Table 2-7 Average Daily Number of male Inpatients per Month" are mostly around 17, though the table above indicates more than 20 exceptionally, so that 16 beds is judged reasonable.

Premature and abnormal newborn babies are accommodated in the incubator room. Generally all newborn babies first stay with their mothers in the same bed as the policy of the hospital, therefore, no newborn baby room is planned.

Table 2-8 Planned Facilities of the Wards

Room	Planned floor area	Present floor area	Remarks
Internal (men)	151.2	359.5	Two isolation bed rooms (in consideration of possible occurrence of infectious diseases) attached
Internal (women)	302.4	322.1	Two isolation bed rooms (in consideration of possible occurrence of infectious diseases) attached
Pediatric	302.4	281.5	Two isolation bed rooms (in consideration of possible occurrence of infectious diseases) attached
Gynecologic	151.2	212.2	
Ophthalmic	151.2	195.3	
Surgical (men)	286.2	359.5	
Surgical (women)	151.2	201.4	
Obstetric	286.2	375.0	
Corridor	129.6		
Subtotal	1911.6	2,306.5	

⑥ Common Area

Table 2-9 Planned Facilities of the Common Area

Room	Planned floor are	Present floor area	Remarks
Common corridor	378.8	191.7	
Subtotal		191.7	

⑦ Others

Table 2-10 Other Incidental Facilities

Room	Planned floor area	Present floor area	Remarks
Pump room	10.0	17.3	
Guardhouse	16.2	27.0	
Subtotal	26.2	44.3	

At present, the New Amsterdam Health Center is located within the existing New Amsterdam Hospital building. It provides MCH services such as pre-natal and postnatal examination as well as immunization in and around New Amsterdam City. The Guyana side requested to include relocation of the health center together with the hospital since it partially depends on the hospital in terms of facility such as sterilization. However, the proposed site for this project is situated in the outskirts of New Amsterdam, and it will be inconvenient for visitors to the health center in case it is relocated together with the hospital. Such condition may lower the immunization rate. The New Amsterdam Hospital presently has an emergency annex building within the premises, which was built in 1996 with reinforced concrete structure. Since it was confirmed with the Guyana side that this annex building can be utilized as the Health Center and equipment for the Center can be arranged by the Guyana side after the hospital is transferred, it was concluded not to include the Center in the Project.

The floor areas of the planned facilities are summarized as shown in the following table.

Table 2-11 Floor Area of the Planned Facilities

Facility	Floor area	Number of stories
Outpatient Department	746.3 ㎡	Single story
Central Clinical Department	1,485.0 ㎡	Single story
Administration Department	523.6 ㎡	Two stories
Service Department	544.8 ㎡	Single story
Ward	1,911.6 ㎡	Single story
Pump room	26.2 ㎡	Single story
Common corridor	378.8 ㎡	Single story
Total floor space	5,616.3 ㎡	

2) Sectional Planning

In order to minimize maintenance and management costs, air-conditioning is limited to those rooms in the Central clinical Dept. building where artificial environment is indispensable. In the other rooms without air-conditioning, ceiling shall be kept high to secure large air volume and natural ventilation. The ground level in the coastal plain is generally low and flood is common in New Amsterdam. Therefore, it is necessary to consider the possibility of flood in the proposed site. However, there has not been flood experienced at the primary school adjacent to the Project site since it was built. In consideration of the fact, the first floor is set to be the same as that of the primary school.

There are two rainy seasons a year in the coastal plain and precipitation is high. Therefore, utmost attention shall be paid on countermeasure to leakage. Metal sheet roofing will be used in consideration of its high waterproof property and durability. In consideration of heat radiation and noise generated by rainfalls, insulation sandwiched steel panel shall be selected.

(3) Structural Plan

1) Outline of the structure

Outline of the structure of the buildings are as follows;

Number of story	:	Single story/two stories above ground
Story height	:	4.5m
Basic spans	:	6.0m×6.0m、6.0m×9.0m、6.0m×7.2m
Type of structure	:	Reinforced concrete rigid frame structure with steel roof frame
Foundation	:	Direct foundation (Strip foundation)

2) Foundation system

Soil condition in New Amsterdam is soft as is typical in the coastal plain of Guyana with approximate 15.0 meter thick soft silty clayey layer covering the surface. Due to such condition, tallest building in New Amsterdam made of reinforced concrete rigid frame structure is three storied. Generally foundation system employed locally is strip footing. The footing system of the three storied tallest building is also strip foundation and no troubles were caused due to ground settlement. Based on the survey results of the existing buildings in New Amsterdam, strip foundation system is judged reasonable and will be employed for this project as well. In case of strip foundation, land may settle down across the ages. But it will not cause serious problems as long as the entire buildings sink together with the ground and uneven subsidence is avoided. Following points are made up as

criteria for planning the building facilities in consideration of local practice as a reference.

- In principle, the building shall be one-storied. In case of two-storied, second floor shall be of wooden to minimize vertical loading.
- Loading condition shall be even so that differential settlement may be avoided. (The results of a geotechnical survey show that a stiff layer exists at approximately same depth. If loading condition of a building is even, differential settlement can be avoided.)
- The roof structure shall be of steel, instead of reinforced concrete, so that the loading to the strip foundation is minimized.
- The first floor slab shall sit on the ground, instead of being supported by the foundation, so that the load of the floor will not be burden to the foundation.
- The bottom of the footing shall be higher than the ground water level.
- Humic soil consisting of organic substances, which covers the surface of the ground, shall be removed.
- The site shall be banked to secure drainage of surface water to the ditch surrounding the site. (Design ground level shall be set 300mm lower from the 1st floor level)
- Berm and gutter shall be properly provided all around the buildings so as to prevent storm water from invading under the buildings.
- Expansion joints should be properly employed in order to avoid the impact of differential settlement and thereby secure well-balanced building structure.

Then the foundation system is planned in accordance with the following criteria.

The bearing capacity of the ground should be 3.0t/m^2. (The safety factor is 3.0 on the basis of the geotechnical survey results.) In order to remove humic soil, top soil should be scraped off to a depth of approximately 30 cm at the portion of the building area. The spaces under the foundation and the concrete slab shall be backfilled with sand. Backfilling with sand should be compacted at depths of 20 cm or less with the dry density more than 95 percent.

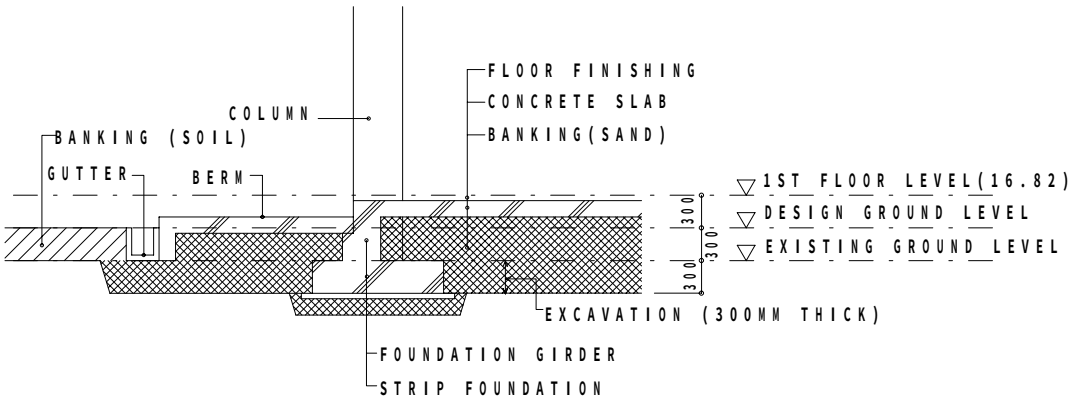


Fig. 2-2 Relation between the Foundation and the Ground Level

3) Superstructure system

In consideration of local construction practice, cost effectiveness, natural conditions and the size of buildings, reinforced concrete rigid frame structure is appropriate for this project, which is common locally. First floor concrete slab shall be placed to sit on the ground to transmit loading directly to the ground. The second floor of the Administration Dept. building, which is the only one multi story, shall be made of wood to lighten the building weight. Walls shall be made of concrete hollow blocks except for the wall of the X-ray room, which shall be reinforced concrete to prevent radiation.

4) Load

– Live load：	Office	300kg/㎡ (for slab design),	180kg/m^2 (for frame design)
	X-ray room	360kg/㎡ (for slab design),	330kg/m^2 (for frame design)
	Consultation room	230kg/㎡ (for slab design),	180kg/m^2 (for frame design)
	Classroom	200kg/㎡ (for slab design),	210kg/m^2 (for frame design)
	Mechanical room	600kg/㎡ (for slab design),	500kg/m^2 (for frame design)

- Main materials
  - Concrete ： Fc=210kg/cm^2 (4 week compression)
  - Re-bar ： Fy=50ksi (3,500kg/cm^2)
  - Steel structure ： Fy=36ksi (2,500kg/cm^2)

(4) Electrical Plan

1) Power receiving

Along the Public Road, which the project site borders on at the northern side, and the Garrison Road, which borders on the eastern end of the project site, there are 13,800-volt high tension-overhead power lines of Guyana Power and Light Co. (GPL). GPL has assured that the power line along the Garrison Road can afford the load of the new buildings of the Project. Therefore, power will be received to the site from the 13,800-volt high tension overhead power line along the Garrison road.

2) Power Receiving Equipment

- High-Voltage Power Receiving Equipment

  An outdoor weatherproof type substation is planned to be installed on the ground. The feeder

between the transformer and the electrical room should be laid underground. The maximum power demand of the planned facilities is estimated at about 350 KVA. According to GPL, it will be possible to install three 167 KVA transformers (501 KVA in total). The following works need to be undertaken by the Guyana side.

a. Power receiving to the site from the high tension overhead power line.
b. Installation of a H-shape stand made of wooden masts together with circuit-breaker and electric meter.

The maximum power demand of the facilities are estimated as shown in the following table.

Table 2-12 Power Demand of the Planned Facilities

Equipment	Estimated capacity	Estimated demand factor	Maximum power demand	Remarks
Medical equipment	30 KVA	15 %	4.5 KVA	X-ray equipment 30KVA
	170 KVA	40 %	68 KVA	
Air conditioner/ventilator	200 KVA	80 %	160 KVA	
Plumbing equipment	50 KVA	20 %	10 KVA	
Lighting fixture	70 KVA	80 %	56 KVA	
Socket outlet	40 KVA	20 %	8 KVA	
Others	50 KVA	20 %	10 KVA	
Total	610 KVA		316.5 KVA	

- Generator system

  Scheduled power outages are implemented in New Amsterdam due to the superannuation of the power plant and the fuel shortage. For this reason, local generators are used at major public facilities such as New Amsterdam Relay Station of Guyana Telephone & Telegraph Company, New Amsterdam Hospital. Therefore, a generator system is planned for this project as well.

- Automatic Voltage Regulator (AVR)

  In New Amsterdam, the voltage fluctuates widely due to the insufficient size and load imbalance of the high tension power lines of Guyana Power and Light Co. As a result of the field survey, it has been observed that the voltage fluctuation rate is up to 16 percent. Low-voltage power supplied during the British time was 3φ4W 260/440V 60Hz. But after the independence in 1966, 1φ3W 120/250V 60Hz power has been becoming popular due to the influence of the United States. Now these two different system co-exist in the country. Under such situation both transformers for single phase two lines and for three lines are used, and therefore the load balance of these transformers is questionable. As the voltage fluctuation rate

of 10 percent or more is likely to cause breakdowns with medical equipment, an AVR is planned to the circuit for medical equipment. AVR system will be designed to be central system as a part of the electrical plan.

3) Main Feeder

The standard power voltage in Guyana is 13,800/120・240V 60Hz, which coexist in one building. The voltages of low-voltage power to be supplied in this project is planned to be 3φ4W 120/208V 60Hz, which is applied in the USA and neighbouring countries.

Electric power is supplied to the distribution boards for lightings etc. in each building from the low-voltage control panel installed in the electrical room. An alarm device, which displays alarms for the high/low water levels of the water reservoir tank and the elevated water tank, pumps, and a generator, should be installed in the administration office.

The main power voltages are as shown below.

Power equipment	:	3φ208 V
Lighting fixture/socket outlet	:	1φ120 V
Power supply device for medical equipment	:	1φ120 V and 208 V

4) Lighting Fixtures, Socket outlets

- Lighting fixture

  Mainly fluorescent lights (mainly Fl40W x 2) will be selected. On/off circuits should be designed to cover rather small areas so that power savings means can be maximized.

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

Table 2-13 Design Luminance for the Main Facilities

Room	Design illuminance
Operating theater	750 LX
Consultation room, treatment room, laboratory	500 LX
Office, corridor	300 LX
X-ray room, ward, waiting room	200 LX
Toilet, locker room, scullery, store	150 LX

- Socket Outlets

  Socket outlets should be installed giving due consideration to the equipment arrangement and the height of equipment. Distinction of outlets belonging to general circuits or generator circuits will be indicated properly.

5) Telephone System

There is an overhead telephone line along Garrison road which borders on the east side of the project site. But the telephone line has no spare circuits according to New Amsterdam Business Office of Guyana Telephone & Telegraph Company (GT&T). It is necessary, therefore, that the Guyana side provide extra lines for this project. The telephone lines needed for the proposed building is estimated 12 circuits (of which 6 are for extension lines, 4 are direct lines for the kitchen, public telephone, etc., and 2 for telecommunication). A total of about 40 extensions are planned.

6) Intercommunication System

Communication within the proposed buildings will be done by means of extension telephones. An intercommunication system with speakers is planned in the X-ray room for communication between patients and the operator.

7) Public Address System

A public address system for paging patients is planned in the waiting room of OPD. An amplifier will be placed in the reception office. And remote microphones will be placed in the reception office and the pharmacy. Speakers will be placed in the waiting area.

8) Automatic Fire Alarm System

No fire low is yet enforced in Guyana. Therefore, an automatic fire alarm system which complies with Japan's fire laws is planned. Control panel is planned to be installed in the administration office.

9) Lightning Arresting System

In order to protect the buildings against lightning, down conductor is bonded to the metal roof. British Standard Code of Practice for Protection of Structures Against Lightning is applied to the design.

10) Protective Grounding

Protective grounding system is planned in the operating theaters and the X-ray room to protect

medical equipment.

(5) Sanitary/Mechanical Planning

1) Water Supply System

A PVC 75 mmφ water main of New Amsterdam Waterworks Bureau of the Ministry of Housing and Water is buried along Garrison Road on which the project site borders at the east side. A 50 mmφ service pipe is planned to be connected to this water main for the proposed building.

City water is first to be stored in a water receiving tank on the ground and then is to be pumped up into the elevated water tank for distribution to each part of the facilities.

From the standpoint of effective use of natural resources, rainwater is also to be utilized. Rainwater is to be stored as wash down water for the lavatories in the wards. Rainwater on the roofs of the wards will be collected then stored in a rainwater storage tank. It is then pumped up to the rain water elevated water tank. The elevated water tank used to store rainwater will be located near the wards.

There are not many items of medical equipment, which require strict water conditions in terms of allowable water quality and allowable water pressure, in particular. From the standpoint of cost reduction, necessary measures will be taken with individual items of equipment necessary.

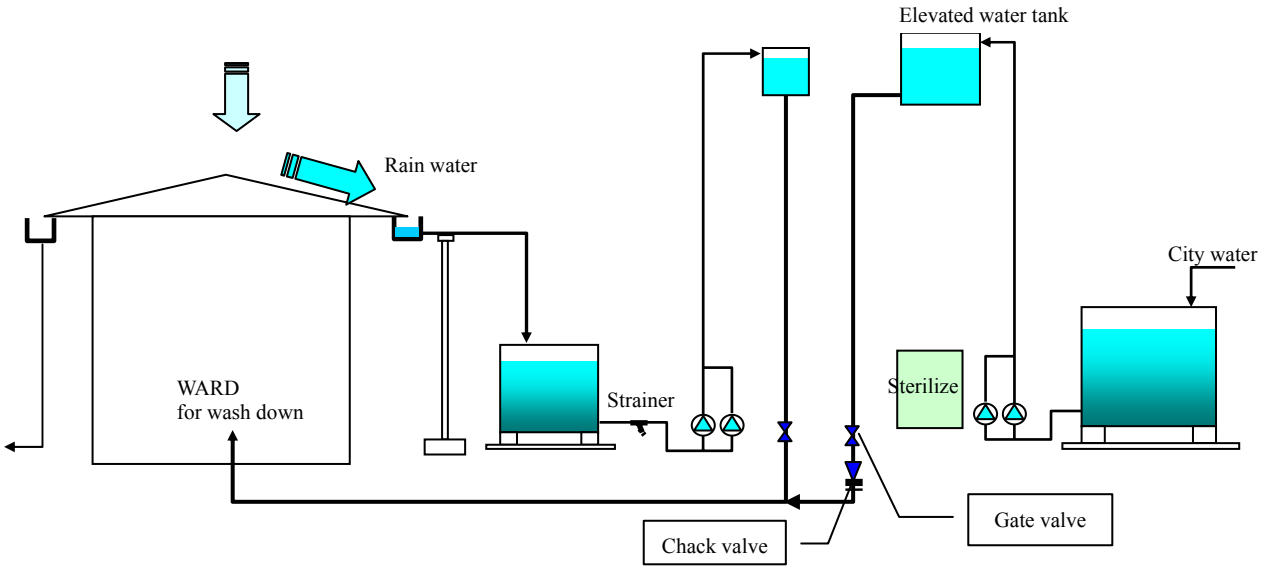


Fig. 2-3 Conceptual Scheme of the Water Supply System

Calculation of the quantity of water to be supplied:

The quantity of water to be supplied to the proposed facilities is calculated as follow;

Number of staff members	：	144×100 /person・day	＝	14,400	/day
Number of inpatients	：	110×250 /person・day	＝	27,500	/day
Number of outpatients	：	200×10 /person・day	＝	2,000	/day
		Daily total quantity of water to be supplied		43,900	/day

Storage capacity of the water reservoir ： 43,900 /day×60%＝26,340 →25m^3

Storage capacity of the elevated water tank ： 43,900 /day×10%＝ 4,390 → 5m^3

2) Hot Water Supply system

Instantaneous hot-water heaters will be provided where hot water is required. In the kitchen, where a considerable quantity of hot water is consumed, an LPG instantaneous water heater is planned.

3) Sanitary Fitting

Type of sanitary fittings shall be selected in consideration of easy maintainance and local customs.

4) Drainage System

Indoor wastewater is separated into sewage and other wastewater. Indoor sewage will be discharged into septic tanks installed outdoors. Other wastewater will be combined to the treated sewage before discharged to the pipeline leading to the cleek near the site. The Guyana side need to provide the pipeline from the site to the cleek.

Medical wastewater, which must be treated before discharged, shall be neutralized separately.

5) Fire Extinguishing system

Since no fire fighting code is yet enforced in Guyana, Japan's fire fighting code is applied as the result of the consultation with New Amsterdam Fire Station.

Fire hydrants and fire extinguishers are planned for the fire extinguishing system.

6) LPG System

The existing LPG storage tank shall be relocated by the Guyana side to the project site to be used mainly in the kitchen, where gas is used in large quantities.

7) Kitchen Equipment Plan

Kitchen equipment is planned for cooking meals for inpatients and staff.

8) Medical Gas System

Central Oxygen supply system and Vacuum system are planned mainly in the Central clinical Dept.

building and part of wards. As a building work, manifold and piping will be provided. Inlets and outlets will be included in the scope of equipment work.

Laughing gas (nitrous oxide) shall be stored in mobile cylinders, which will not be included in the scope of this project. The Guyana side shall be responsible for the relocation of the existing air compressor for the dental system to the new facility.

9) Septic Tank

Household type domestic wastewater treatment tanks are planned near the lavatories. Due to the ground condition of the project site, tanks shall not be set deep underground. Therefore, sewer pipes shall not be long to minimize gap generated by inclination.

As the septic tanks are planned to be installed close to the buildings, special attention should be paid to the locations of deodorization funnels.

10) Air Conditioning Equipment

In principle, the air conditioning system is designed to be the combination of a split-type packaged air conditioner and a ventilator for supply exhaust air. Air-conditioning is limited to those rooms in the Central Clinical Dept. where artificial environment control is necessary for clinical activities. Since Central Clinical Department includes facilities requiring delicate atmosphere such as operating theatre, a medium-spec filter is planned to be adopted at the air intake. In the other rooms without air-conditioning ceiling fans are planned.

(6) Building Material Plan

Main Structures

Part	Material	Remarks
Foundation, foundation girder slab, beam	Reinforced concrete	No ready mixed concrete is available in the country. Concrete mixing to be done on the site.
Roof truss	Steel truss	Truss structure requires less meticulous precision than rigid frame.

Exterior Finishing Materials

Part	Material	Remarks
Roof	Steel sheet insulations and witch panel	Highly reliable in terms of water resistance. Procurable from neighbouring countries
Exterior wall	Concrete hollow block	Manufactured within the country.
Windows and doors	Aluminium sash	Local dealers import materials and assemble.
	Steel doors	High strength against invasion from outside.

Interior Finishing Materials

Department	Room	Floor	Wall	Ceiling
OPD	Consultation room	Ceramic tile	Paint finish on mortar	Mineral acoustic board
Clinical Dept.	Operation Theater room	Synthetic regin poured flooring	Paint finish on mortar	Calcium silicate board (paint finish)
	Emergency room	Ceramic tile	Paint finish on mortar	Mineral acoustic board
Administration Dept.	Office	Ceramic tile	Paint finish on mortar	Mineral acoustic board
Service Dept.	Kitchen	Ceramic tile	Ceramic tile	Calcium silicate board (paint finish)
	Electrical room	Mortar finish	Glass wool	-
Ward	Wards	Ceramic tile	Paint finish on mortar	Calcium silicate board (paint finish)

2-2-2-2 Equipment Plan

- Selection of Appropriate Items of Equipment

Items of equipment requested by the Guyana side are basically replacement of superannuated existing equipment. Based on the criteria of the design policy, minimum equipment is selected necessary for the secondary level medical institution. As a result of the survey of the existing equipment, the dental unit, the spectrophotometer, mortuary refregerator and electrolyte analyser were found still usable. Therefore, it was concluded that they should be transferred to the new facilities and those items should not be included in this project. Number of medicine refrigerators in the wards are planned to be minimum on the premise that they can be shared by neighboring wards.

In selection of each item of equipment, "Basic Criteria for Selecting the Equipment" as well as "Additional Criteria for Selecting the Equipment" shown below are applied. Results of the examinations in terms of appropriateness and necessity as well as number of equpment are summed up in the "Examination of Requested Equiment"in Appendices. In case of the equipment selected, a cercle is put in the culumn of "Evaluation" Number of equipment is shown in the column of "Quantity Planned".

(1) Basic Criteria for Selecting the Equipment

1) Criteria for Giving High Priority

① Equipment that is to be replaced for existing old/decrepit equipment
② Equipment that is to be a supplement for the equipment lacking distinctly in its quantity
③ Equipment that is required for basic hospital treatment/diagnosis
④ Equipment that is easy to operate and maintain
⑤ Equipment that may give much benefit/effect to hospital
⑥ Equipment that is highly cost-effective
⑦ Equipment that is proven for its medical usefulness (necessity)

2) Criteria for Giving Low Priority

① Equipment that requires high operation and maintenance cost
② Equipment that has limited benefit/effect to hospital
③ Equipment that is lowly cost-effective
④ Equipment that is not for treatment/diagnosis use, but for academic research purposes

⑤ Equipment that can be substituted with a simple one

⑥ Equipment that may cause environmental pollution by its medical waste, etc.

⑦ Equipment that is not proven for its medical usefulness (necessity)

⑧ Equipment that is for personal usage by hospital staff (not medical use)

⑨ Equipment that has than minimum required quantity (inefficient, repetitive equipment)

(2) Additional Criteria for Selecting the Equipment

(After field survey and considering Recipients condition)

1) Additional Criteria for Giving High Priority

① Equipment that can be operated by hospital's current technical capabilities

② Equipment that can be operated/maintained by hospital staff

③ Equipment that matches with hospital's social position/function (referral system, local needs)

④ Equipment that can be expected to cooperate with another donors.

2) Additional Criteria for Giving Low Priority

① Equipment that is difficult to locally procure its spare parts and consumable

② Equipment that cannot be operated by hospital's current technical capability

③ Equipment that seems to be difficult of its operation/maintenance by present hospital's staff

④ Equipment that does not match with hospital's social position/function (referral system, local needs)

⑤ Equipment that requires large scope of infrastructure work (water, electricity supply, drain, etc.) for its installation

⑥ Equipment that can be substituted by efficient usage of existing equipment

Main equipment to be procured under this project is shown in the table below.

Table 2-14 List of Main Equipment

Item no.	Name of equipment	Specifications	Quantity	Purpose of use
A-21	Electrocardiograph	・Main Unit: 1) 12leads, 2) Analyser, 3)Monitor ・Accessory: 4) Printer, 5) Cart	1	Used for diagnosis of arrhythmia and auxilliary diagnosis of ischemic heart disease, hypercardia, and electrolyte abnormality.
E-01	X-Ray Unit	・X-ray tube voltage: 150KV ・X-ray tube electric current: 500 mA ・Composition: X-ray generator, X-ray tube, bucky table, bucky stand	1	General-purpose X-ray used for X-ray photos of the skeletal structures, the chest and the abdomen.
M-03	Electric Ironing Machine	・Heater: electric heater ・Press size: 1,500 (W) x 700 (L) ・Material: Stainless steel	1	Used for pressing to linens as bed sheets in a Hospital.
E-02	Mobile X-Ray Unit	・X-ray tube voltage: 125 KV ・X-ray tube electric current: 100 mA ・Arm length: 1,000 mm	1	Used with serious cases, patients unable to move, those who are undergoing surgical operation and those who have just gone through surgical operation.
H-18-1	Laparotomy Instrument Set	・Foster sponge holding forceps ・Backhaus towel forceps ・Surgical knife handle etc.	2	Used for general and emergency operations in the abdomen in general surgery, hepatobiliary surgery etc.
N-02	Autopsy Table	・Material: stainless steel ・Size:2,600(L) x 700(D) x 850(H)	2	Used for doing postmortems. Provided with a sink.
B-16	Electric Tonometer	・Measuring range: 0-60 mmHg ・Migration length: more than 10 mm ・Display: CRT or liquid crystal display ・Recorder	1	In ophthalmic care, tonometry is performed frequently. In addition, it must be carried out safely and accurately. The tonometer, which is indispensable for quick and safe tonometry, plays an important role in ophthalmic care.
B-15	Examination Chair for Opthalmology	・Sight tester ・Refraction unit	1	Basic item of equipment used for ophthalmic examination.
H-06	Operating Microscope for Opthalmology	・Objective lens: F=300 mm, F=175 MM ・Magnification: 3 - 15 X ・Visual field: 68-14 mm ・Working distance: 290 mm ・Illuminance: 68,000 lux	1	Essential equipment used for ophthalmic surgery like cataract, pterygium and so on. A sturdy and easy-to-use type is to be procured.
B-10	Auto Refractometer	・Measuring range: Spherical degrees, -20 to +20 and up ・Measuring time: 0.15 sec. ・Measuring mode: standard, continuous, high-speed ・CRT display: black and white, more than 5 inches ・Printer	1	Used for measuring objective refractivity, degree of astigmatism and astigmatic axis
H-22	Patient Monitor	・Measurement items: 1) ECG, 2) blood pressure, 3) respiration, 4) SPO2, 5) pulse, 6) CO2, 7) body temperature ・Printer, Cart	2	Used for monitoring a patient's vital sign in anesthetisation.
A-16	Plaster Instrument Set	・Plaster table ・Gypsum cart ・Plaster cutter and knife	1	A set contains a plaster table and a plaster cutter and a knife etc. to put on and take off a plaster cast to a person who has a fracture. This set is essencial to surgery.
J-01-1	High Pressure Steam Sterilizer (Medium)	・Capacity: approx. 220 L ・Sterilizing temperature: 132 C ・Provided with steam generator ・Attachments: recorder, cart	1	Basic item of equipment to be installed in Central Material Room. Used for sterilizing operating gowns and surgical appliances with high-pressure steam.
J-01-2	High Pressure Steam Sterilizer (Small)	・Capacity: approx. 160 L ・Sterilizing temperature: 132 C ・Provided with steam generator ・Attachments: recorder, cart	1	Used for high-pressure steam sterilization of surgical instruments in a short time for emergency surgical operation and needles for waste management.
E-05	Automatic X-Ray Film Processor	・Type: roller type ・Film size: 14" x 17" or more ・Developing capacity: 50 photos/hour ・Developing speed: 180 sec/sheet	1	It is capable of automatic development from developing to drying and helps speed up the developing process.
H-01	Operating Table	・Type: general-purpose hand-powered operating table ・Table top size: 1,900 mm x 450 mm ・Range of vertical motion: 700-1000 mm ・Trendelenburg angle: +/-25 degrees ・Lateral tilt angle: +/-20 degrees	2	Used for general surgical operations. A sturdy and easy-to-use hydraulic -powered elevating table is to be procured.
H-21	Defibrillator	・Output energy : 2 - 360J or more ・Charging time : 10 sec. or less ・Display : Provided ・Recorder: Provided	1	Used for life-saving in severe patients with cardiac arrest, ventricular fibrillation, ventricular tachycardia, etc.
H-15	Ventilator	・For use with both child and Adult ・Ventilation volume: 60-900 ml ・Respiration rate: approx. 5-40 times/min.	2	Used for supporting the patient's life during surgical operation under general anesthesia.

Item no.	Name of equipment	Specifications	Quantity	Purpose of use
		・Respiratory quotient: 1:0.5-1.5		
H-18-4	Orthopedic Surgery Instrument Set	・Hand drill set ・Bone cutter ・Kirlshner wire etc.	2	A set of basic surgical instruments used widely in orthopedic operations.
M-01-1	Automatic Washer	・Capacity: 30kg or more ・Cylinder material: Stainless steel	1	Used for washing linens as bed sheets and pillow cover in a Hospital.
M-01-2	Automatic Extractor	・Capacity: 30kg or more ・Cylinder rotation: 1400r.p.m. or more	1	Used for dehydration linens as bed sheets and pillow cover in a Hospital.
A-22	Ultrasound Scanner	・Display: black and white, more than 12 inches ・Probe: frequency conversion-type convex, linear, end vaginal	1	Used for indirect ultrasonic diagnosis of abdominal disease.
H-05	Electro Surgical Unit	・Type: monopolar, bipolar ・Functions: cutting, coagulation, mixture, bipolar ・Output: cutting: more than 250 W; coagulation: more than 100 W; mixture: more than 200 W; bipolar: more than 15 W ・Safety device: to be grounded; to be provided with counter electrode board and foot switch	2	Used for incising and coagulating tissues during surgery to minimize bleeding.
H-18-3	Urological Surgery Instrument Set	・Kidney clamp forceps ・Peritoneal forceps ・Holding forceps etc.	2	A set of basic surgical instruments used widely in urological operations.
A-17	Gynecological Examining Table	・Body: steel, hydraulically-operated ・Parts: steel and stainless steel ・Reclining range: 10 degrees downward to 80 degrees upward	1	To be used for routine medical examination and treatment.
I-13	Infant Incubator	・Method of control: servo control ・Present temperature range: 35-37 C ・Alarm: warming, fan, present temperature, system, power failure	2	Used for incubating premature babies, low-weight premature babies, and abnormal newborn babies under appropriate conditions in terms of room temperature, quantity of oxygen and humidity.
I-08-2	Phototherapy Unit	・Lamp: 20W, 5pcs. or more ・Light shading plate, Hour meter, Cooling fan ・Mobile stand: Column height adjustable from 110cm to 150cm or wider, provided with casters	1	Used for treatment of jaundice to a newborn baby. Stand type should be procured for easy to move.
H-03-1	Anesthesia Apparatus	・Vaporiser, 2 (Halothane, Isoflurane) ・Flowmeter (N2 and O2)	3	Used for performing surgical operations under general anesthesia. Carburaters that meet basic technical requirements should be procured.
H-02	Operating Light	・Type: satellite-type ceiling light ・Construction: 8 main lights and 5 auxiliary lights ・Light bulb: halogen, 24 V, 40 W ・Illuminance: main lights: 135,000; auxiliary lights: 100,000 or more	3	Electric lights used for general surgical operations. Ceiling lights (main and auxiliary) that can be used for abdominal section should be procured.
H-10	Medicine Refrigerator for Operating Room	・Dimension: (W)550mm x (H)1,000mm x (D)450mm ・Material: Stainless steel ・Capacity: 80L or more	3	Used for cooling drugs that have to keep in low temperature in an operating theater.
F-10-9	Laboratory Safety Cabinet	・Dimension: (W)1,000mm x (H)1,500mm x (D)800mm ・Inner Width: 800mm ・Exhaust Amount: 5.5-6.5m3/min. ・Air blower: 1	1	This is an essencial equipment to protect a laboratory worker from a bacteria during an examination of atuberculosis, etc. and to prevent a leaking a bacteria, etc. to the outside.
H-18-5	Burr Hole Instrument Set	・Foster sponge holding forceps ・Backhaus towel forceps ・Surgical knife handle etc.	1	A set for removing a coagulated blood in a cephalon when it sustains damage by accident.
O-01	Incinerator	・Type: For medical waste ・Capacity: 30kg/h or more ・Combustion Chamber: Primary and secondary ・Burner: Primary burner 1, Secondary burner 1	1	It burns medical waste that has high moisture content by burner. It burns incombustible gas in the second chamber to hold dioxin to a minimum.

Table 2-15 List of Equipment

Item No.	Description	Quantity Planned		Quantity, will be moved	Total Quantity
		Phase I	Phase II		
CSS ROOM (CENTRAL CLINICAL DEPT.)					
J-01-1	High Pressure Steam Sterilizer （Medium)	0	1	0	1
J-01-2	High Pressure Steam Sterilizer (Small)	0	1	0	1
J-03	Working Table, Chair	0	1	0	1
J-04	Sterilizer Container	0	1	0	1
J-06	Dressing Drum Cabinet	0	1	0	1
X-RAY ROOM (CENTRAL CLINICAL DEPT.)					
E-01	X-Ray Unit	0	1	0	1
E-02	Mobile X-Ray Unit	0	1	0	1
E-10-1	X-Ray Protective Accessories, Darkroom Accessories	0	1	0	1
X-RAY DARK ROOM (CENTRAL CLINICAL DEPT.)					
E-05	Automatic X-Ray Film Processor	0	1	0	1
E-09	Cassette Pass Box	0	1	0	1
X-RAY READING ROOM (CENTRAL CLINICAL DEPT.)					
E-03	Reception Desk and Chair for X-ray Department	0	1	0	1
E-07	X-Ray Film Illuminator	0	1	0	1
X-Ray Film store (Central Clinical Dept.)					
E-08	Film Loading Table	0	1	0	1
E-10-2	X-Ray Film Cassette, Screen	0	1	0	1
E-11	X-Ray Film Keeping Shelf	0	1	0	1
OPHTHALMOLOGY CLINIC (OUTPATIENT DEPT.)					
B-01	Doctor's Consulting Desk	0	0	1	1
B-02	Doctor's Chair	0	0	1	1
B-08	Instrument Storage Container	0	1	0	1
B-09	Instrument & Dressings Cabinet	0	1	0	1
B-10	Auto Refractometer	0	1	0	1
B-11	Keratometer	0	1	0	1
B-12	Chart Projector	0	1	0	1
B-13	Slit Lamp	0	1	0	1
B-14	Trial Lens Set	0	1	0	1
B-15	Examination Chair for Opthalmology	0	1	0	1
B-16	Electric Tonometer	0	1	0	1
B-17	Opthalmoscope, Indirect Type	0	1	0	1
B-18	Opthalmoscope, Direct Type	0	1	0	1
EMERGENCY ROOM (CENTRAL CLINICAL DEPT.)					
G-01	Doctor's Consulting Desk	0	0	1	1
G-02	Doctor's Chair	0	0	1	1
G-03	Patient Stool	0	0	1	1
G-04	Examining Cart	0	2	0	2
G-05	Emergency Light	0	2	0	2
G-06	X-Ray Film Illuminator (Stand Type)	0	2	0	2
G-07	Diagnostic Instrument Set for Emergency	0	2	0	2
G-08	Treatment Instrument Set for Emergency	0	2	0	2
G-09	Medicine Cabinet	0	1	0	1
G-10	Resuscitation Trolley	0	1	0	1
G-11	Suction Unit (Hanging Type)	0	2	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	0	2	0	2
G-13	Emergency Resuscitation Kit	0	2	0	2
G-14	Instrument & Dressings Cabinet	0	1	0	1
G-15	Stretcher Trolley for Emergency	0	2	0	2
G-18	Nebulizer	0	1	0	1
G-19	Sphygmomanometer for Adult and Child	0	2	0	2
EMERGENCY (OBSERVATION) ROOM (CENTRAL CLINICAL DEPT.)					
G-16	2-Crank Bed for Adult	0	2	0	2
G-17	Bedside Cabinet	0	2	0	2
GENERAL OPD, OB/GYN CLINIC (OUTPATIENT DEPT.)					
A-01	Doctor's Consulting Desk	0	0	1	1
A-02	Doctor's Chair	0	0	1	1
A-03	Patient Stool	0	0	1	1
A-04	Examining Couch	0	1	0	1

Item No.	Description	Quantity Planned		Quantity, will be moved	Total Quantity
		Phase I	Phase II		
A-05	Examining Light	0	1	0	1
A-06	X-Ray Film Illuminator	0	1	0	1
A-07-2	Diagnostic Instrument Set for General and Gynecology	0	1	0	1
A-08	Instrument & Dressings Cabinet	0	1	0	1
A-09	Medicine Cabinet	0	1	0	1
A-10-1	Weighing Scale for Adult	0	1	0	1
A-11-1	Sphygmomanometer for Adult	0	1	0	1
A-13	Clothes Basket	0	1	0	1
A-15	Treatment Instrument Set	0	1	0	1
A-17	Gynecological Examining Table	0	1	0	1
A-18	Gynecological Examining Unit	0	1	0	1
A-20	Fetal Heart Detector	0	1	0	1
A-23	Electric Boiling Sterilizer	0	1	0	1
GENERAL OPD, PEDIATRIC CLINIC (OUTPATIENT DEPT.)					
A-01	Doctor's Consulting Desk	0	0	1	1
A-02	Doctor's Chair	0	0	1	1
A-03	Patient Stool	0	0	1	1
A-04	Examining Couch	0	1	0	1
A-05	Examining Light	0	1	0	1
A-06	X-Ray Film Illuminator	0	1	0	1
A-07-3	Diagnostic Instrument Set for General, Pediatric, ENT	0	1	0	1
A-10-2	Weighing Scale for Adult and Child	0	1	0	1
A-11-2	Sphygmomanometer for Adult and Child	0	1	0	1
A-12	Two Basin Stand	0	1	0	1
A-13	Clothes Basket	0	1	0	1
A-19	Baby Scale	0	1	0	1
GENERAL OPD (OUTPATIENT DEPT.)					
A-01	Doctor's Consulting Desk	0	0	1	1
A-02	Doctor's Chair	0	0	1	1
A-03	Patient Stool	0	0	1	1
A-04	Examining Couch	0	2	0	2
A-05	Examining Light	0	2	0	2
A-06	X-Ray Film Illuminator	0	2	0	2
A-07-1	Diagnostic Instrument Set for General	0	2	0	2
A-08	Instrument & Dressings Cabinet	0	1	0	1
A-09	Medicine Cabinet	0	1	0	1
A-10-1	Weighing Scale for Adult	0	2	0	2
A-11-1	Sphygmomanometer for Adult	0	2	0	2
A-12	Two Basin Stand	0	1	0	1
A-13	Clothes Basket	0	2	0	2
A-14	Oxygen Inhaler Apparatus	0	1	0	1
A-15	Treatment Instrument Set	0	1	0	1
A-23	Electric Boiling Sterilizer	0	1	0	1
OPHTHALMIC CLINIC (OUTPATIENT DEPT.)					
A-09	Medicine Cabinet	0	1	0	1
A-12	Two Basin Stand	0	1	0	1
A-23	Electric Boiling Sterilizer	0	1	0	1
SURGERY, ORTHOPEDIC CLINIC (OUTPATIENT DEPT.)					
A-01	Doctor's Consulting Desk	0	0	1	1
A-02	Doctor's Chair	0	0	1	1
A-03	Patient Stool	0	0	1	1
A-04	Examining Couch	0	1	0	1
A-05	Examining Light	0	1	0	1
A-06	X-Ray Film Illuminator	0	1	0	1
A-07-4	Diagnostic Instrument Set for Surgery and Orthopedics	0	1	0	1
A-08	Instrument & Dressings Cabinet	0	1	0	1
A-09	Medicine Cabinet	0	1	0	1
A-10-1	Weighing Scale for Adult	0	1	0	1
A-11-1	Sphygmomanometer for Adult	0	1	0	1
A-12	Two Basin Stand	0	1	0	1
A-13	Clothes Basket	0	1	0	1
A-15	Treatment Instrument Set	0	1	0	1

Item No.	Description	Quantity Planned		Quantity, will be moved	Total Quantity
		Phase I	Phase II		
A-16	Plaster Instrument Set	0	1	0	1
A-23	Electric Boiling Sterilizer	0	1	0	1
	DENTAL CLINIC (OUTPATIENT DEPT.)				
A-08	Instrument & Dressings Cabinet	0	1	0	1
A-09	Medicine Cabinet	0	1	0	1
A-12	Two Basin Stand	0	1	0	1
C-01	Doctor's Consulting Desk	0	0	1	1
C-02	Doctor's Chair	0	0	1	1
C-03-1	Dental Unit	0	0	1	1
C-03-2	Compressor for Dental Unit	0	0	1	1
C-04	Dental X-ray Unit	0	0	1	1
C-05	Diagnostic Instrument Set	0	1	0	1
C-06	Autoclave for Dental	0	1	0	1
	OT (CENTRAL CLINICAL DEPT.)				
B-05	Microsurgery Instrument set	0	1	0	1
B-06	Ophthalmic Surgeon Stool	0	1	0	1
B-19	Operating Table for Ophthalmology	0	1	0	1
H-01	Operating Table	0	2	0	2
H-02	Operating Light	0	3	0	3
H-03-1	Anesthesia Apparatus	0	3	0	3
H-03-2	Pump Set for Eliminate Surplus Gas	0	3	0	3
H-04	Anesthesia Instrument Set	0	3	0	3
H-05	Electro Surgical Unit	0	2	0	2
H-06	Operating Microscope for Ophthalmology	0	1	0	1
H-07	Suction Unit (with Casters)	0	3	0	3
H-08	X-Ray Film Illuminator for Operating Room	0	3	0	3
H-09	Instrument & Dressings Cabinet for Operating Room	0	3	0	3
H-10	Medicine Refrigerator for Operating Room	0	3	0	3
H-11	Warming Cabinet for Operating Room	0	3	0	3
H-12	Water Sterilizer (with Brush Dispenser &Soap Dispenser)	0	2	0	2
H-15	Ventilator	0	2	0	2
H-17-2	Suction Unit (Hanging Type)	0	3	0	3
H-18-1	Laparotomy Instrument Set	0	2	0	2
H-18-2	Thoracotomy Instrument Set	0	2	0	2
H-18-3	Urological Surgery Instrument Set	0	2	0	2
H-18-4	Orthopedic Surgery Instrument Set	0	2	0	2
H-18-5	Burr Hole Instrument Set	0	1	0	1
H-18-6	Skull Traction Instrument Set	0	2	0	2
H-18-7	Skin Harvesting and Grating Instrument Set	0	1	0	1
H-18-8	Caesarean Section Instrument Set	0	2	0	2
H-23	Local Anethesia Set	0	2	0	2
H-24	Kick Bucket	0	3	0	3
H-25	Instrument tray stand	0	3	0	3
	OT ANTE ROOM (CENTRAL CLINICAL DEPT.)				
H-03-2	Pump Set for Eliminate Surplus Gas	0	1	0	1
H-17-2	Suction Unit (Hanging Type)	0	1	0	1
	OT, RECOVERY ROOM (CENTRAL CLINICAL DEPT.)				
G-12	Oxygen Inhaler Apparatus (Floating Type)	0	3	0	3
H-14	2-Crank Bed for Adult	0	3	0	3
H-16	Resuscitation Trolley	0	2	0	2
H-17-1	Low Pressure Continuous Suction Unit	0	1	0	1
H-17-2	Suction Unit (Hanging Type)	0	3	0	3
H-19	Infusion Pump	0	4	0	4
H-20	Feeding Syringe Pump	0	2	0	2
H-21	Defibrillator	0	1	0	1
H-22	Patient Monitor	0	2	0	2
K-22	Drug Safe	0	1	0	1
	INCUBATOR ROOM (CENTRAL CLINICAL DEPT.)				
G-11	Suction Unit (Hanging Type)	0	3	0	3
G-12	Oxygen Inhaler Apparatus (Floating Type)	0	3	0	3
I-08-1	Pediatric Treatment Table	0	1	0	1
I-08-2	Phototherapy Unit	0	1	0	1

Item No.	Description	Quantity Planned		Quantity, will be moved	Total Quantity
		Phase I	Phase II		
I-13	Infant Incubator	0	2	1	3
	EXAMINATION LAB (CENNTRAL CLINICAL DEPT.)				
A-04	Examining Couch	0	2	0	2
A-13	Clothes Basket	0	3	0	3
A-21	Electrocordiograph	0	1	0	1
A-22	Ultrasound Scanner	0	1	0	1
F-23	Balance for Blood Bank	0	1	0	1
F-30	Blood Bank Refridgerator	0	1	0	1
F-31	Donner's Bed	0	1	0	1
F-32	Height & Weighing Scale	0	1	0	1
	OPHTHALMIC WARD				
G-11	Suction Unit (Hanging Type)	2	0	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	2	0	0	2
K-01	Patient Bed	8	0	0	8
K-02-1	2-Crank Bed for Adult	2	0	0	2
K-04	I.V.Hanger Rod	4	0	0	4
K-05	Overbed Table	2	0	0	2
K-06	Bedside Cabinet	10	0	0	10
K-07	Working Chair	0	0	4	4
K-08	X-Ray Film Illuminator	1	0	0	1
K-09	Medicine Cabinet	1	0	0	1
K-10	Instrument & Dressings Cabinet	1	0	0	1
K-11-1	Weighing Scale for Adult	1	0	0	1
K-12-1	Diagnostic Instrument Set for Ophthalmology	1	0	0	1
K-13	Treatment Instrument Set	1	0	0	1
K-15	Nebulizer	1	0	0	1
K-16	Examining Light	1	0	0	1
K-17	Wheel Chair	1	0	0	1
K-18	Stretcher Trolley	1	0	0	1
K-19	Oxygen Inhaler Apparatus	1	0	0	1
K-20	Suction Unit (Medium Size)	1	0	0	1
K-23	Electric Boiling Sterilizer	1	0	0	1
K-26	Urinal & Bed Pan Rack	2	0	0	2
	SURGICAL WARD (FEMALE)				
G-11	Suction Unit (Hanging Type)	2	0	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	2	0	0	2
K-01	Patient Bed	6	0	0	6
K-02-1	2-Crank Bed for Adult	2	0	0	2
K-04	I.V.Hanger Rod	4	0	0	4
K-05	Overbed Table	2	0	0	2
K-06	Bedside Cabinet	10	0	0	10
K-07	Working Chair	0	0	4	4
K-08	X-Ray Film Illuminator	1	0	0	1
K-09	Medicine Cabinet	1	0	0	1
K-10	Instrument & Dressings Cabinet	1	0	0	1
K-11-1	Weighing Scale for Adult	1	0	0	1
K-12-2	Diagnostic Instrument Set for Surgery, Orthopedics	1	0	0	1
K-13	Treatment Instrument Set	1	0	0	1
K-14	Medicine Refrigerator for Ward	1	0	0	1
K-15	Nebulizer	1	0	0	1
K-16	Examining Light	1	0	0	1
K-17	Wheel Chair	1	0	0	1
K-18	Stretcher Trolley	1	0	0	1
K-19	Oxygen Inhaler Apparatus	1	0	0	1
K-20	Suction Unit (Medium Size)	1	0	0	1
K-23	Electric Boiling Sterilizer	1	0	0	1
K-26	Urinal & Bed Pan Rack	2	0	0	2
L-03	Orthopedic Bed	2	0	0	2
L-04	Traction Apparatus	2	0	0	2
	SURGICAL WARD (MALE)				
G-11	Suction Unit (Hanging Type)	2	0	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	2	0	0	2

Item No.	Description	Quantity Planned		Quantity, will be moved	Total Quantity
		Phase I	Phase II		
K-01	Patient Bed	12	0	0	12
K-02-1	2-Crank Bed for Adult	2	0	0	2
K-04	I.V.Hanger Rod	6	0	0	6
K-05	Overbed Table	2	0	0	2
K-06	Bedside Cabinet	16	0	0	16
K-07	Working Chair	0	0	4	4
K-08	X-Ray Film Illuminator	1	0	0	1
K-09	Medicine Cabinet	1	0	0	1
K-10	Instrument & Dressings Cabinet	1	0	0	1
K-11	Weighing Scale for Adult	1	0	0	1
K-12-2	Diagnostic Instrument Set for Surgery, Orthopedics	1	0	0	1
K-13	Treatment Instrument Set	1	0	0	1
K-14	Medicine Refrigerator for Ward	1	0	0	1
K-15	Nebulizer	1	0	0	1
K-16	Examining Light	1	0	0	1
K-17	Wheel Chair	1	0	0	1
K-18	Stretcher Trolley	1	0	0	1
K-19	Oxygen Inhaler Apparatus	1	0	0	1
K-20	Suction Unit (Medium Size)	1	0	0	1
K-21	Resuscitation Trolley	1	0	0	1
K-22	Drug Safe	1	0	0	1
K-23	Electric Boiling Sterilizer	1	0	0	1
K-24	Ice Making Machine	1	0	0	1
K-26	Urinal & Bed Pan Rack	2	0	0	2
L-03	Orthopedic Bed	2	0	0	2
L-04	Traction Apparatus	2	0	0	2
	OBSTETRIC WARD				
G-11	Suction Unit (Hanging Type)	2	0	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	2	0	0	2
K-01	Patient Bed	14	0	0	14
K-02-1	2-Crank Bed for Adult	2	0	0	2
K-04	I.V.Hanger Rod	6	0	0	6
K-05	Overbed Table	2	0	0	2
K-06	Bedside Cabinet	16	0	0	16
K-07	Working Chair	0	0	4	4
K-08	X-Ray Film Illuminator	1	0	0	1
K-09	Medicine Cabinet	1	0	0	1
K-10	Instrument & Dressings Cabinet	1	0	0	1
K-11-1	Weighing Scale for Adult	1	0	0	1
K-12	Diagnostic Instrument Set for Delivery	1	0	0	1
K-13	Treatment Instrument Set	1	0	0	1
K-15	Nebulizer	1	0	0	1
K-16	Examining Light	1	0	0	1
K-17	Wheel Chair	1	0	0	1
K-18	Stretcher Trolley	1	0	0	1
K-19	Oxygen Inhaler Apparatus	1	0	0	1
K-20	Suction Unit (Medium Size)	1	0	0	1
K-23	Electric Boiling Sterilizer	1	0	0	1
K-24	Ice Making Machine	1	0	0	1
K-26	Urinal & Bed Pan Rack	2	0	0	2
K-27	Baby Scale	1	0	0	1
K-28	Baby Bassinet	16	0	0	16
	PEDIATRIC WARD				
G-11	Suction Unit (Hanging Type)	2	0	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	2	0	0	2
K-02-2	Crank Bed for Pediatrics	2	0	0	2
K-03	Patient Bed for Pediatrics	0	0	14	14
K-04	I.V.Hanger Rod	4	0	0	4
K-05	Overbed Table	2	0	0	2
K-07	Working Chair	0	0	4	4
K-08	X-Ray Film Illuminator	1	0	0	1
K-09	Medicine Cabinet	1	0	0	1
K-10	Instrument & Dressings Cabinet	1	0	0	1

Item No.	Description	Quantity Planned		Quantity, will be moved	Total Quantity
		Phase I	Phase II		
K-11-2	Weighing Scale for Pediatrics	1	0	0	1
K-12	Diagnostic Instrument Set for Pediatrics	1	0	0	1
K-13	Treatment Instrument Set	1	0	0	1
K-14	Medicine Refrigerator for Ward	1	0	0	1
K-15	Nebulizer	1	0	0	1
K-16	Examining Light	1	0	0	1
K-17	Wheel Chair	1	0	0	1
K-18	Stretcher Trolley	1	0	0	1
K-19	Oxygen Inhaler Apparatus	1	0	0	1
K-20	Suction Unit (Medium Size)	1	0	0	1
K-21	Resuscitation Trolley	1	0	0	1
K-23	Electric Boiling Sterilizer	1	0	0	1
K-24	Ice Making Machine	1	0	0	1
K-26	Urinal & Bed Pan Rack	2	0	0	2
	MEDICINE WARD (FEMALE)				
G-11	Suction Unit (Hanging Type)	2	0	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	2	0	0	2
K-01	Patient Bed	8	0	0	8
K-02-1	2-Crank Bed for Adult	2	0	0	2
K-04	I.V.Hanger Rod	4	0	0	4
K-05	Overbed Table	2	0	0	2
K-06	Bedside Cabinet	10	0	0	10
K-07	Working Chair	0	0	4	4
K-08	X-Ray Film Illuminator	1	0	0	1
K-09	Medicine Cabinet	1	0	0	1
K-10	Instrument & Dressings Cabinet	1	0	0	1
K-11-1	Weighing Scale for Adult	1	0	0	1
K-12	Diagnostic Instrument Set for General	1	0	0	1
K-13	Treatment Instrument Set	1	0	0	1
K-14	Medicine Refrigerator for Ward	1	0	0	1
K-15	Nebulizer	1	0	0	1
K-16	Examining Light	1	0	0	1
K-17	Wheel Chair	1	0	0	1
K-18	Stretcher Trolley	1	0	0	1
K-19	Oxygen Inhaler Apparatus	1	0	0	1
K-20	Suction Unit (Medium Size)	1	0	0	1
K-23	Electric Boiling Sterilizer	1	0	0	1
K-24	Ice Making Machine	1	0	0	1
K-26	Urinal & Bed Pan Rack	2	0	0	2
	MEDICINE WARD (MALE)				
G-11	Suction Unit (Hanging Type)	2	0	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	2	0	0	2
K-01	Patient Bed	14	0	0	14
K-02-1	2-Crank Bed for Adult	2	0	0	2
K-04	I.V.Hanger Rod	6	0	0	6
K-05	Overbed Table	2	0	0	2
K-06	Bedside Cabinet	16	0	0	16
K-07	Working Chair	0	0	4	4
K-08	X-Ray Film Illuminator	1	0	0	1
K-09	Medicine Cabinet	1	0	0	1
K-10	Instrument & Dressings Cabinet	1	0	0	1
K-11-1	Weighing Scale for Adult	1	0	0	1
K-12	Diagnostic Instrument Set for General	1	0	0	1
K-13	Treatment Instrument Set	1	0	0	1
K-14	Medicine Refrigerator for Ward	1	0	0	1
K-15	Nebulizer	1	0	0	1
K-16	Examining Light	1	0	0	1
K-17	Wheel Chair	1	0	0	1
K-18	Stretcher Trolley	1	0	0	1
K-19	Oxygen Inhaler Apparatus	1	0	0	1
K-20	Suction Unit (Medium Size)	1	0	0	1
K-21	Resuscitation Trolley	1	0	0	1
K-22	Drug Safe	1	0	0	1

Item No.	Description	Quantity Planned		Quantity, will be moved	Total Quantity
		Phase I	Phase II		
K-23	Electric Boiling Sterilizer	1	0	0	1
K-24	Ice Making Machine	1	0	0	1
K-26	Urinal & Bed Pan Rack	2	0	0	2
	GYNECOLOGY WARD				
G-11	Suction Unit (Hanging Type)	2	0	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	2	0	0	2
K-01	Patient Bed	8	0	0	8
K-02-1	2-Crank Bed for Adult	2	0	0	2
K-04	I.V.Hanger Rod	4	0	0	4
K-05	Overbed Table	2	0	0	2
K-06	Bedside Cabinet	10	0	0	10
K-07	Working Chair	0	0	4	4
K-08	X-Ray Film Illuminator	1	0	0	1
K-09	Medicine Cabinet	1	0	0	1
K-10	Instrument & Dressings Cabinet	1	0	0	1
K-11-1	Weighing Scale for Adult	1	0	0	1
K-12	Diagnostic Instrument Set for General and Gynecology	1	0	0	1
K-13	Treatment Instrument Set	1	0	0	1
K-15	Nebulizer	1	0	0	1
K-16	Examining Light	1	0	0	1
K-17	Wheel Chair	1	0	0	1
K-18	Stretcher Trolley	1	0	0	1
K-19	Oxygen Inhaler Apparatus	1	0	0	1
K-20	Suction Unit (Medium Size)	1	0	0	1
K-22	Drug Safe	1	0	0	1
K-23	Electric Boiling Sterilizer	1	0	0	1
K-26	Urinal & Bed Pan Rack	2	0	0	2
	DELIVERY ROOM (CENTRAL CLINICAL DEPT.)				
G-11	Suction Unit (Hanging Type)	0	2	0	2
G-12	Oxygen Inhaler Apparatus (Floating Type)	0	2	0	2
H-12	Water Sterilizer (with Brush Dispenser & Soap Dispenser)	0	2	0	2
I-01	Labour Table	0	3	0	3
I-02	Bedside Cabinet	0	3	0	3
I-03	Delivery Table	0	2	0	2
I-04	Delivery Light	0	2	0	2
I-05	Resusciator	0	1	0	1
I-06	Instrument & Dressings Cabinet	0	1	0	1
I-07	Obstetric Instrument Set	0	4	0	4
I-09	Baby Scale	0	1	0	1
I-11	Suction Unit (Large Size)	0	2	0	2
I-12	Electric Boiling Sterilizer (Foot Pedal Type)	0	1	0	1
I-14	Fetal Monitor	0	1	0	1
	PHARMACY (OUTPATIENT DEPT.)				
D-01	Prescription Counter	0	1	0	1
D-03	Water Still	0	1	0	1
D-04	Working Table, Chair	0	1	0	1
D-05	Hot Plate	0	1	0	1
D-06	Medicine Balance	0	1	0	1
D-07	Weighing Balance	0	1	0	1
D-08	Medicine Refrigerator for Pharmacy	0	1	0	1
D-09	Drug Safe, Medicine Cabinet	0	1	0	1
	LAUNDRY (SERVICE DEPT.)				
M-01-1	Automatic Washer	1	0	0	1
M-01-2	Automatic Extractor	1	0	0	1
M-02	Dryer	1	0	0	1
M-03	Electric Ironing Machine	1	0	0	1
	PATHOLOGY LAB (CENTRAL CLINICAL DEPT.)				
D-10	Hot Air Sterilizer	0	1	0	1
F-01	Medicine Refrigerator for Laboratory	0	1	0	1
F-02	Binocular Microscope	0	2	0	2
F-03	Hematocrit Centrifuge	0	1	0	1
F-04	Blood Glucose Meter	0	1	0	1
F-05	Blood Cell Counter, Manual Type	0	3	0	3

Item No.	Description	Quantity Planned		Quantity, will be moved	Total Quantity
		Phase I	Phase II		
F-06	Hemoglobinmeter	0	1	0	1
F-07	Coaguro Meter	0	1	0	1
F-08	Bilirubin Meter	0	1	0	1
F-09	Blood Mixer (Test tube type)	0	2	0	2
F-10-1	Laboratory Center Table	0	1	0	1
F-10-2	Laboratory Sink Unit for Center Table	0	1	0	1
F-10-3	Laboratory Side Bench A	0	1	0	1
F-10-4	Laboratory Side Bench B	0	1	0	1
F-10-5	Laboratory Side Bench C	0	1	0	1
F-10-6	Laboratory Side Bench D	0	1	0	1
F-10-7	Laboratory Cart Unit	0	1	0	1
F-10-8	Laboratory Sink Unit	0	1	0	1
F-10-9	Laboratory Safety Cabinet	0	1	0	1
F-10-10	Laboratory Storage Cabinet	0	1	0	1
F-10-11	Laboratory Chair	0	1	0	1
F-12	Microscope	0	1	0	1
F-13	Hot Plate	0	2	0	2
F-14	Colony Counter	0	1	0	1
F-15	Water Bath	0	1	0	1
F-16	Incubator	0	1	0	1
F-17	Drying Cabinet	0	1	0	1
F-18	Spectrophotometer	0	0	1	1
F-19	pH Meter	0	1	0	1
F-20	Electrolyte Analyzer	0	0	1	1
F-21	Centrifuge	0	1	0	1
F-22	Plate Mixer	0	1	0	1
F-25	Laboratory Sterilizer	0	1	0	1
F-26	Water Still	0	0	1	1
F-28	Laboratory Instruments Set	0	1	0	1
F-33	RH view box	0	1	0	1
	MORTUARY (CENTRAL CLINICAL DEPT.)				
N-01	Mortuary Refrigerator	0	0	1	1
N-02	Autopsy Table	0	2	0	2
N-03	Autopsy Instrument Set	0	1	0	1
	GENERAL				
O-01	Incinerator	0	1	0	1

2-2-3 Basic Design Drawings

(1) SITE PLAN

(2) OUTPATIENT DEPT. BUILDING FLOOR PLAN

(3) ADMINISTRATION DEPT. BUILDING FLOOR PLAN

(4) OUTPATIENT DEPT./BUILDING and ADMINISTRATION DEPT. BUILDING ELEVATION, SECTION

(5) CENTRAL CLINICAL DEPT. BUILDING FLOOR PLAN

(6) CENTRAL CLINICAL DEPT. BUILDING ELEVATION, SECTION

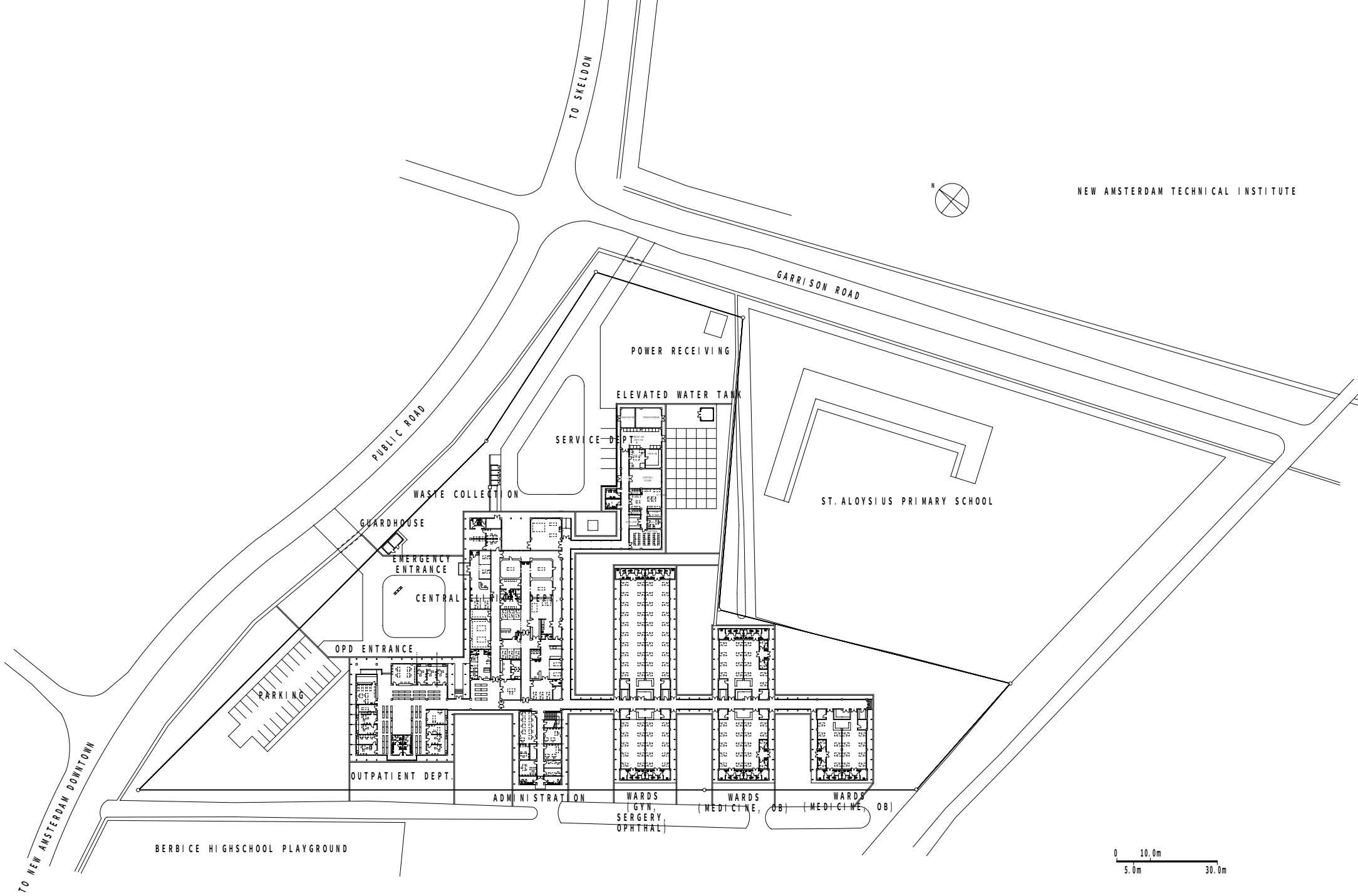
(7) SERVICE DEPT. BUILDING FLOOR PLAN

(8) SERVICE DEPT. BUILDING ELEVATION, SECTION

(9) WARD BUILDING-1 FLOOR PLAN

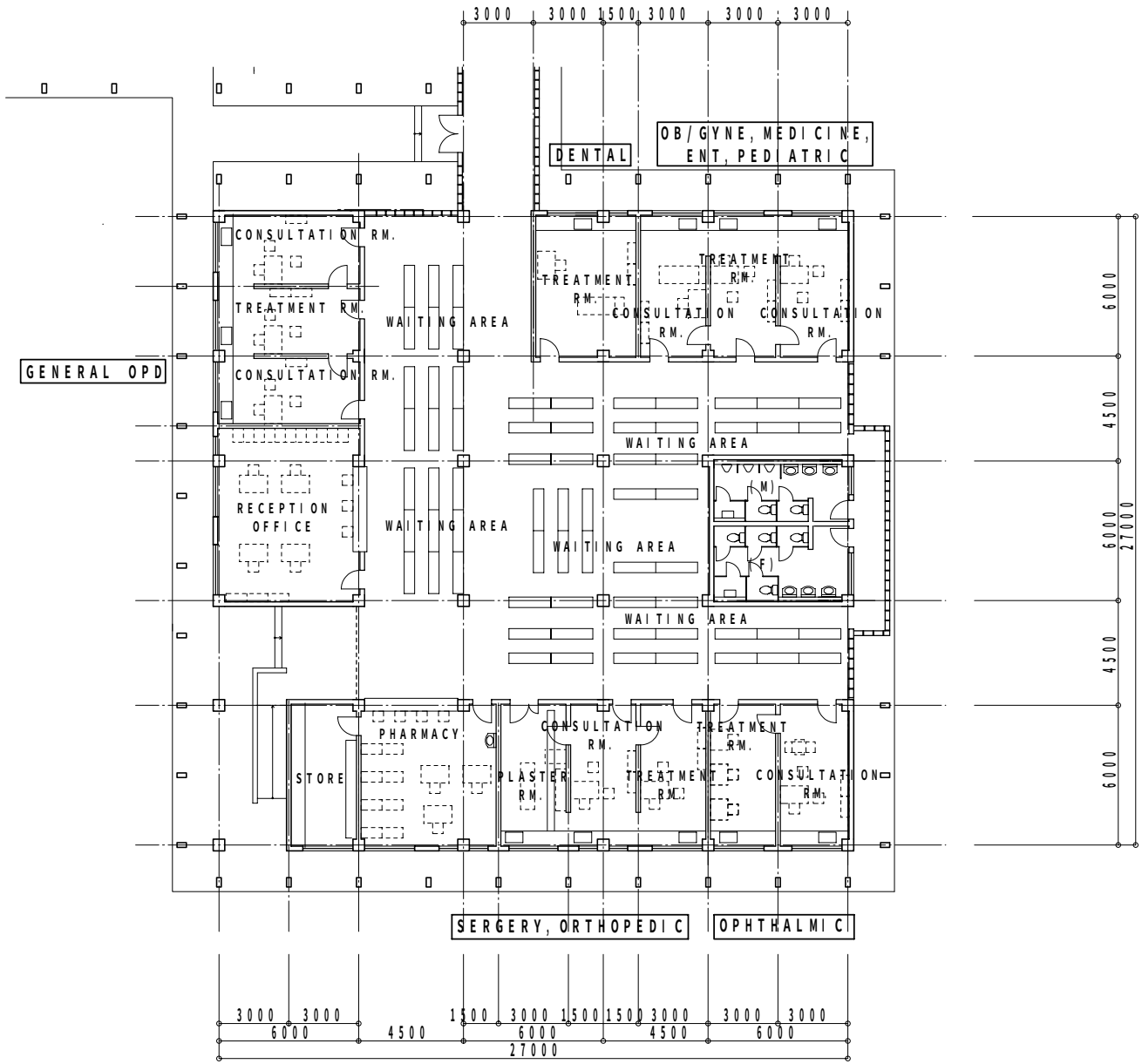
(10) WARD BUILDING-2 FLOOR PLAN

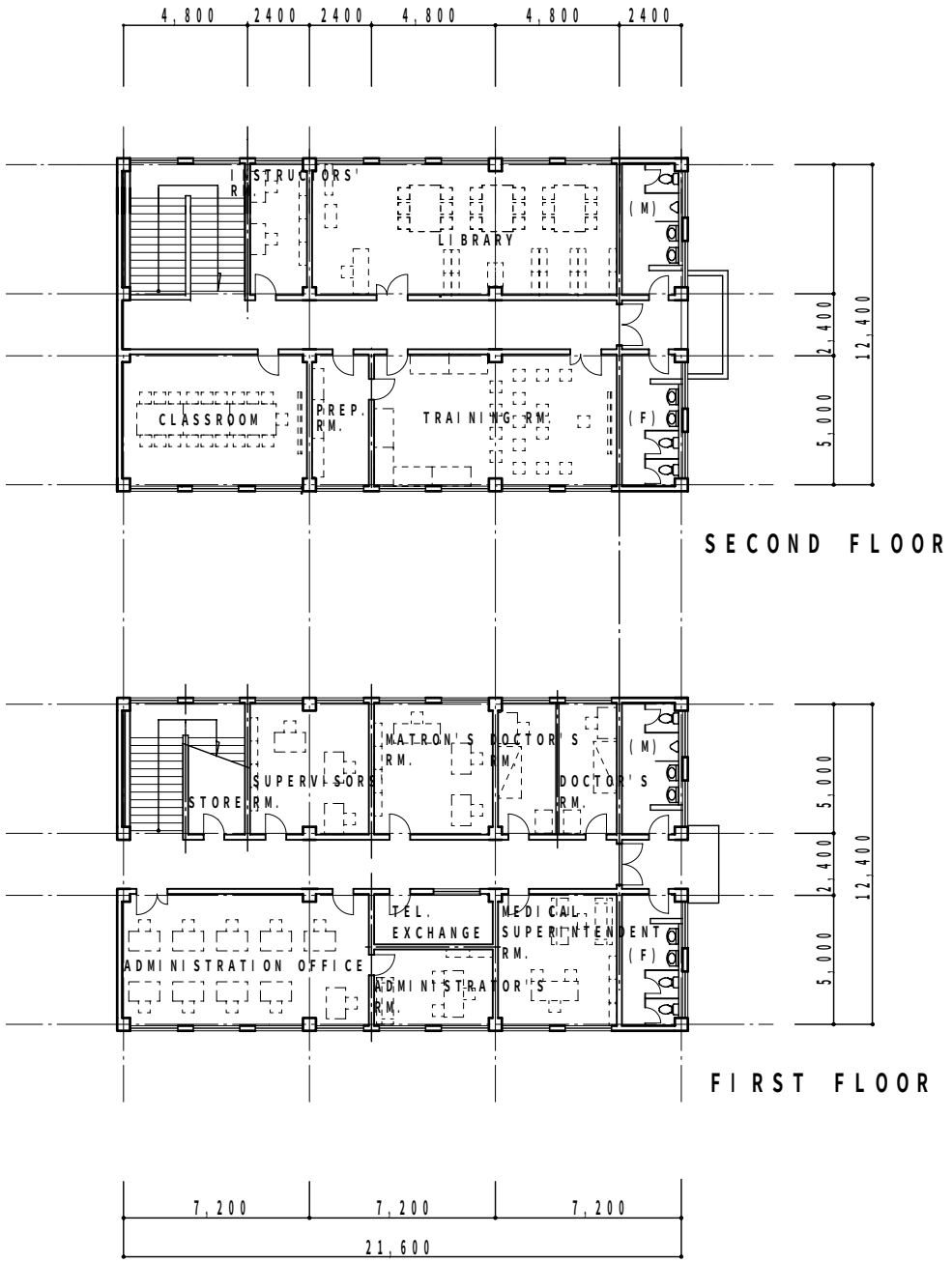
(11) WARD BUILDING ELEVATION, SECTION

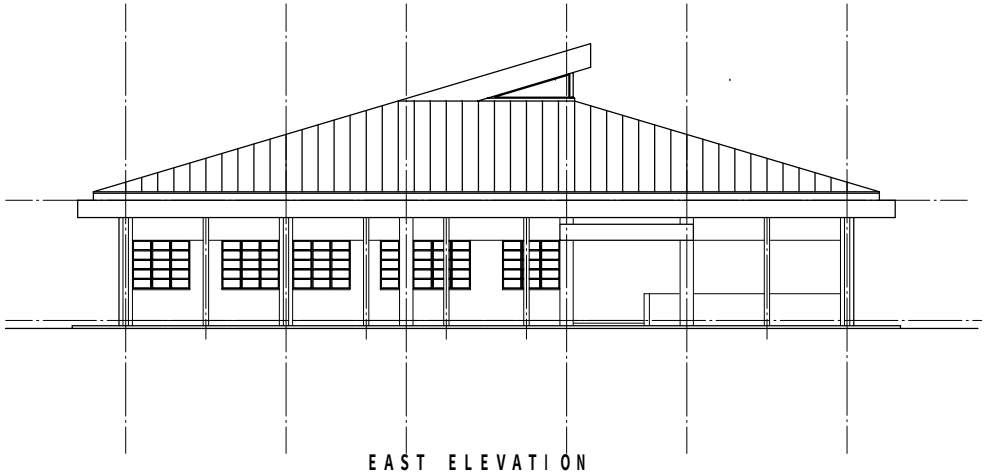


THE PROJECT FOR RECONSTRUCTION OF THE NEW AMSTERDAM HOSPITAL
IN THE REPUBLIC OF GUYANA

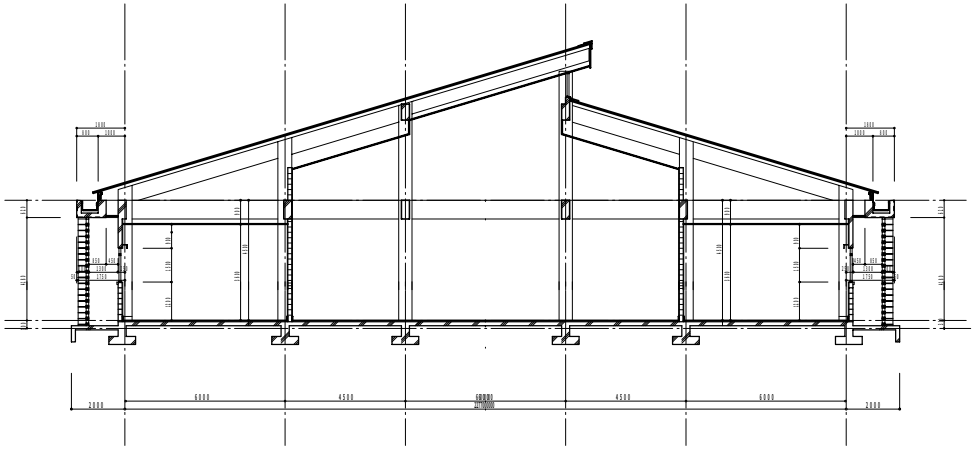
SITE LAYOUT PLAN 1


3000 3000 1500 3000 3000 3000
DENTAL
OB/GYNE, MEDICINE, ENT, PEDIATRIC
CONSULTATION RM.
TREATMENT RM.
WAITING AREA
TREATMENT RM.
TREATMENT RM.
CONSULTATION RM.
CONSULTATION RM.
GENERAL OPD
CONSULTATION RM.
WAITING AREA
(M)
RECEPTION OFFICE
WAITING AREA
WAITING AREA
(F)
WAITING AREA
6000
4500
6000
6000
27000
PHARMACY
CONSULTATION RM.
TREATMENT RM.
STORE
PLASTER RM.
TREATMENT RM.
CONSULTATION RM.
SERGERY, ORTHOPEDIC
OPHTHALMIC
3000 3000 1500 3000 1500 1500 3000 3000 3000
6000 4500 6000 4500 6000
27000
N


4,800
2400
2400
4,800
4,800
2400
INSTRUCTORS' RM.
LIBRARY
(M)
CLASSROOM
PREP. RM.
TRAINING RM.
(F)
2,400
5,000
12,400
SECOND FLOOR
STORE RM.
SUPERVISOR
MATRON'S RM.
DOCTOR'S RM.
DOCTOR'S RM.
(M)
TEL. EXCHANGE
MEDICAL SUPERINTENDENT RM.
ADMINISTRATION OFFICE
ADMINISTRATOR'S RM.
(F)
5,000
2,400
5,000
12,400
FIRST FLOOR
N
7,200
7,200
7,200
21,600

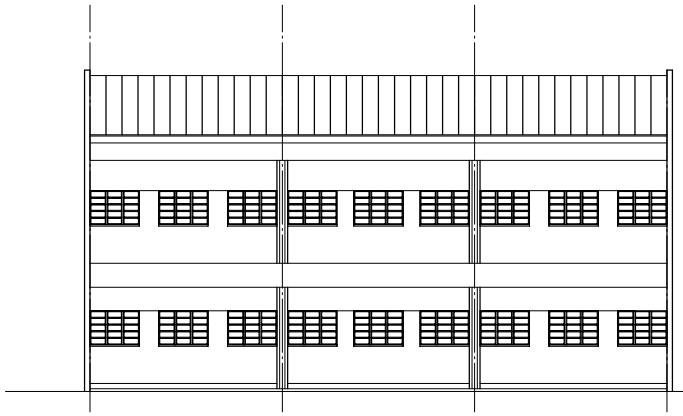


EAST ELEVATION

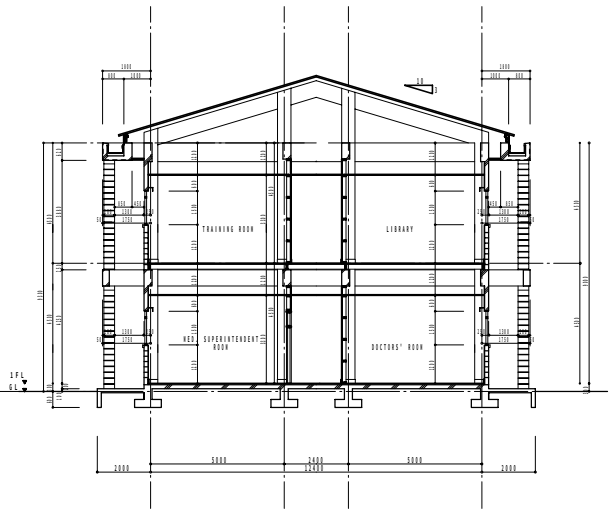


SECTION

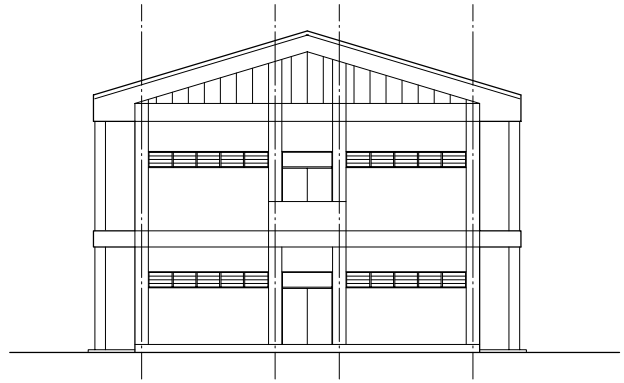
OPD DEPT. BUILDING



SOUTH ELEVATION

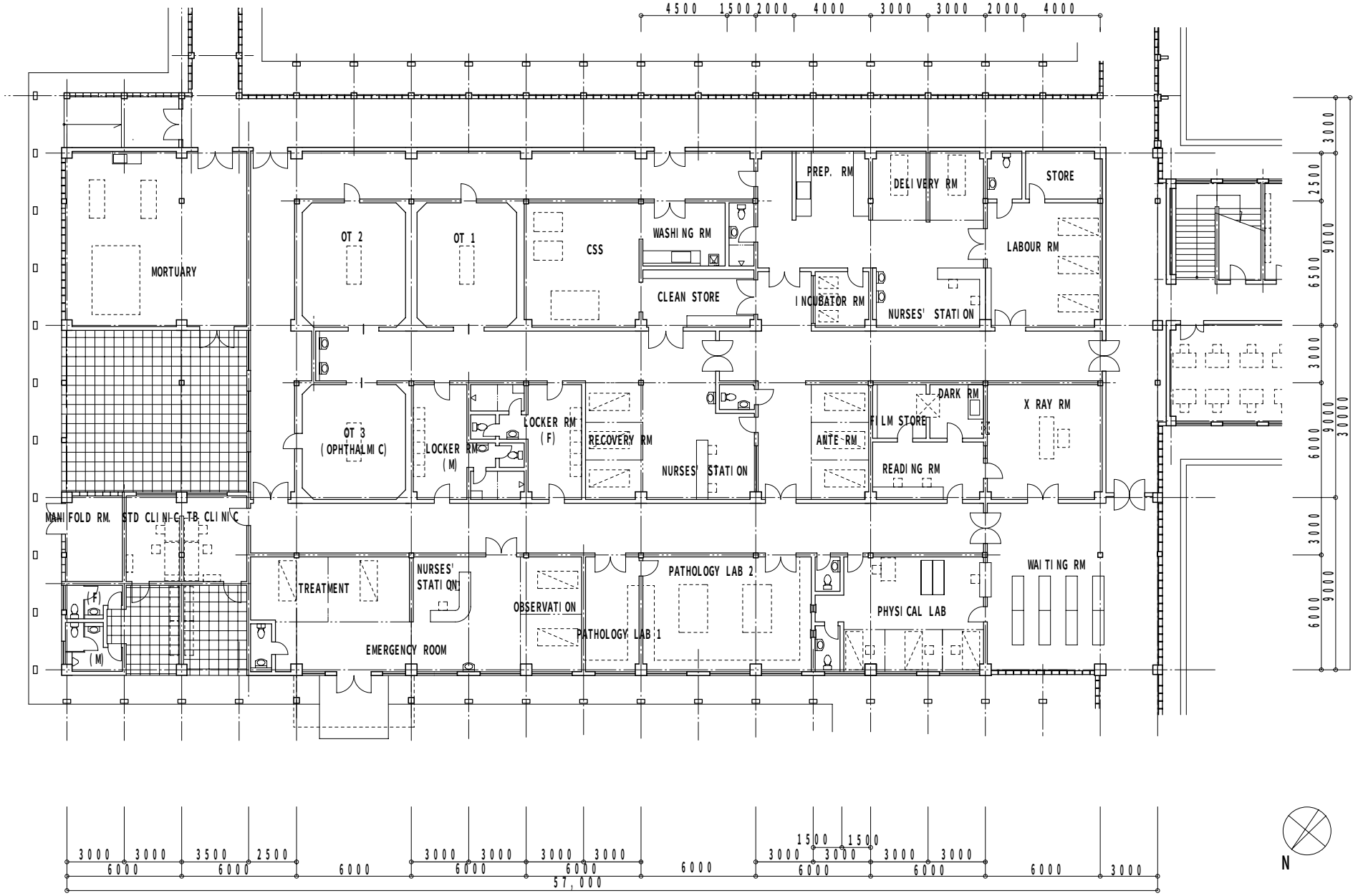


SECTION



WEST ELEVATION

ADMINISTRATION BUILDING


4500 1500 2000 4000 3000 3000 2000 4000
MORTUARY
OT 2
OT 1
CSS
WASHING RM
CLEAN STORE
PREP. RM
DELIVERY RM
STORE
LABOUR RM
INCUBATOR RM
NURSES' STATION
OT 3
(OPHTHALMIC)
LOCKER RM
(M)
LOCKER RM
(F)
RECOVERY RM
NURSES' STATION
ANTE RM
DARK RM
FILM STORE
X RAY RM
READING RM
MANIFOLD RM.
STD CLINIC
TB CLINIC
(F)
(M)
TREATMENT
NURSES'
STATION
OBSERVATION
EMERGENCY ROOM
PATHOLOGY LAB 2
PATHOLOGY LAB 1
PHYSICAL LAB
WAITING RM
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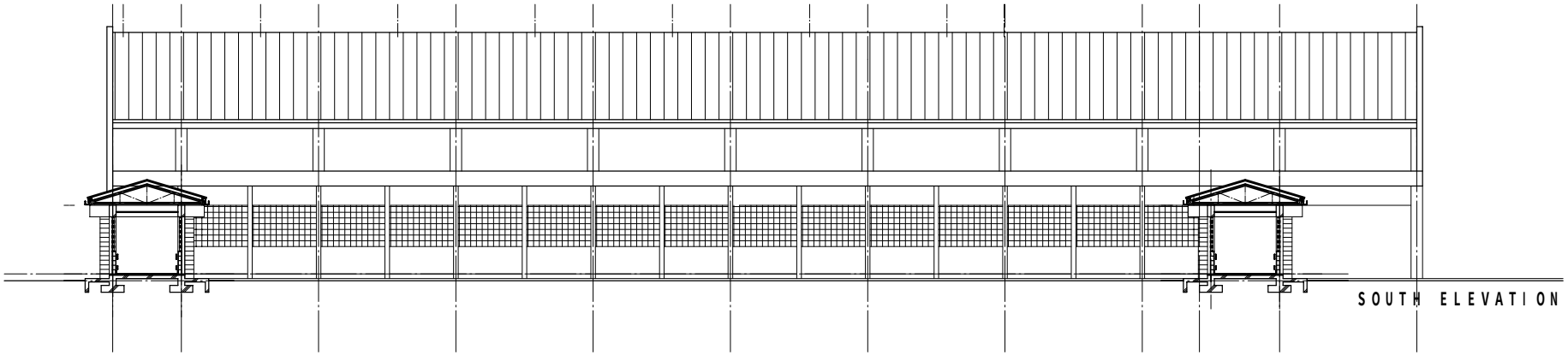
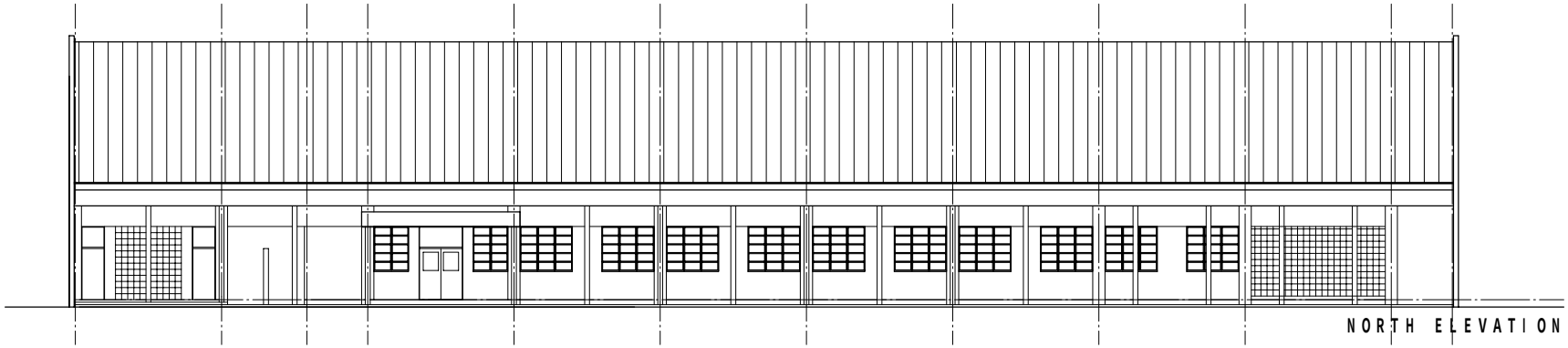
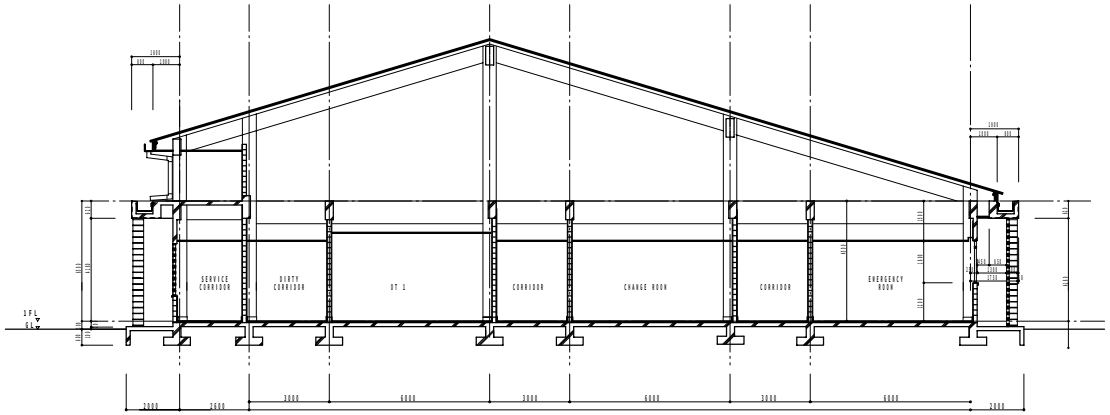
6000 6000 6000
3000 3000 3000 3000
6000 6000 6000
1500 1500
3000 3000 3000 3000
6000 6000 6000
3000
57,000
N



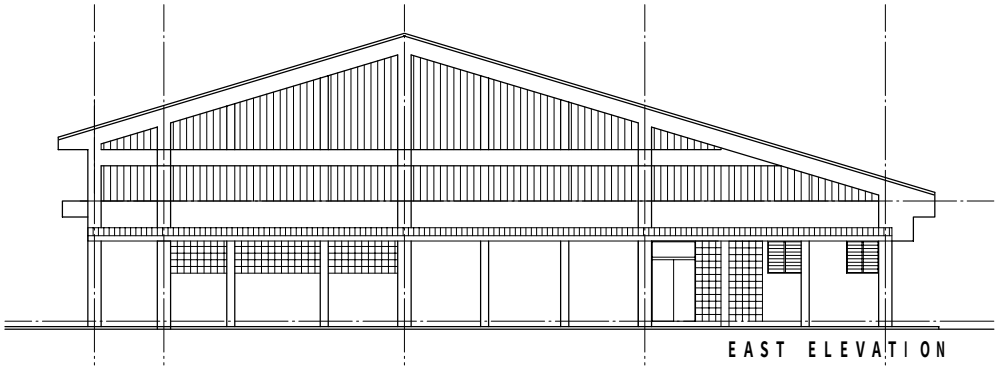
SOUTH ELEVATION



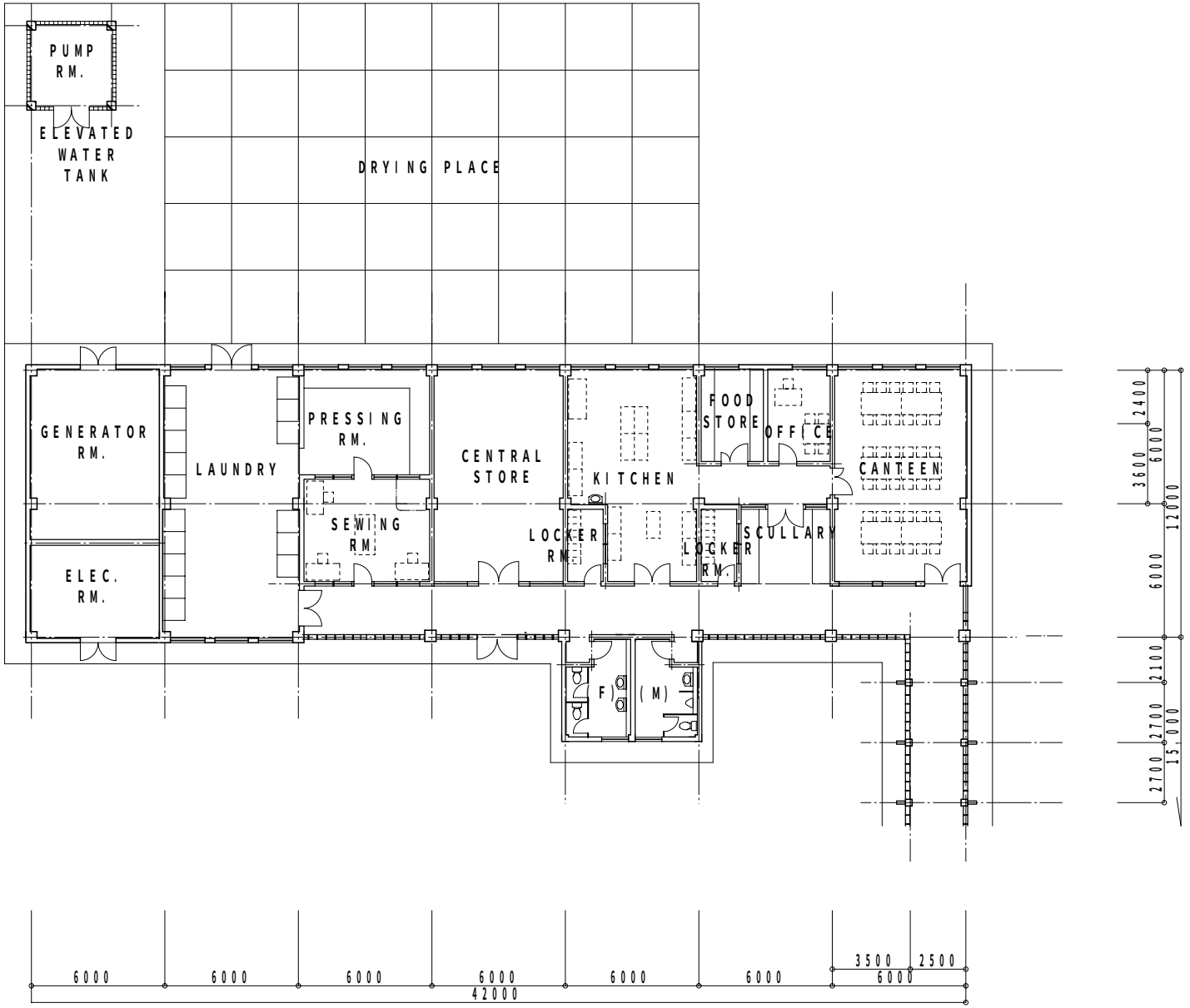
NORTH ELEVATION



SECTION

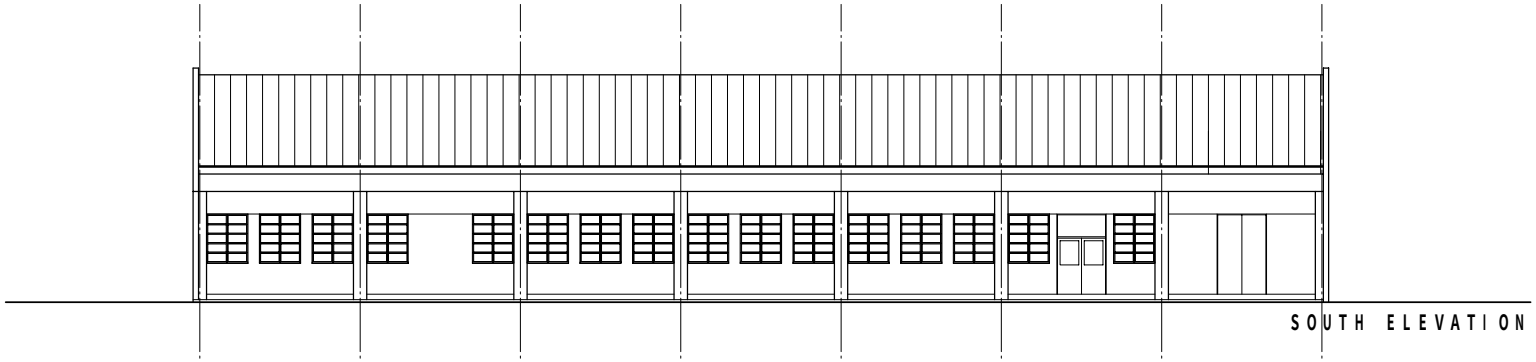


EAST ELEVATION

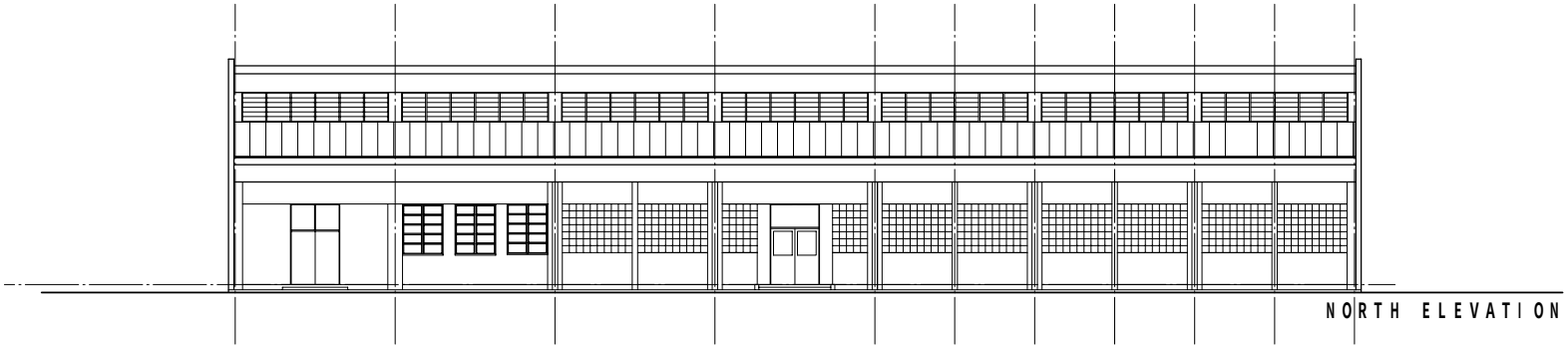


PROJECT FOR RECONSTRUCTION OF THE NEW AMSTERDAM HOSPITAL
IN THE REPUBLIC OF GUYANA

SERVICE DEPT. BUILDING
FLOOR PLAN 7



SOUTH ELEVATION



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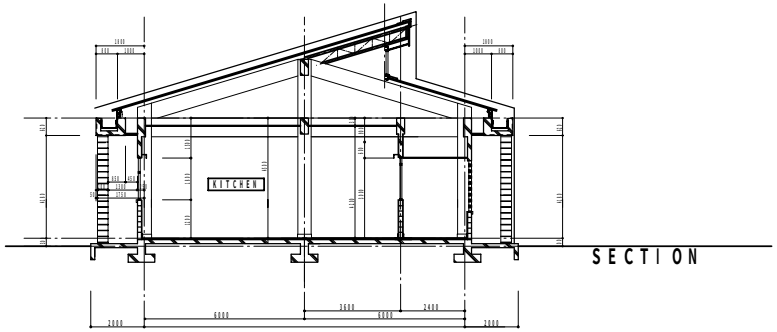
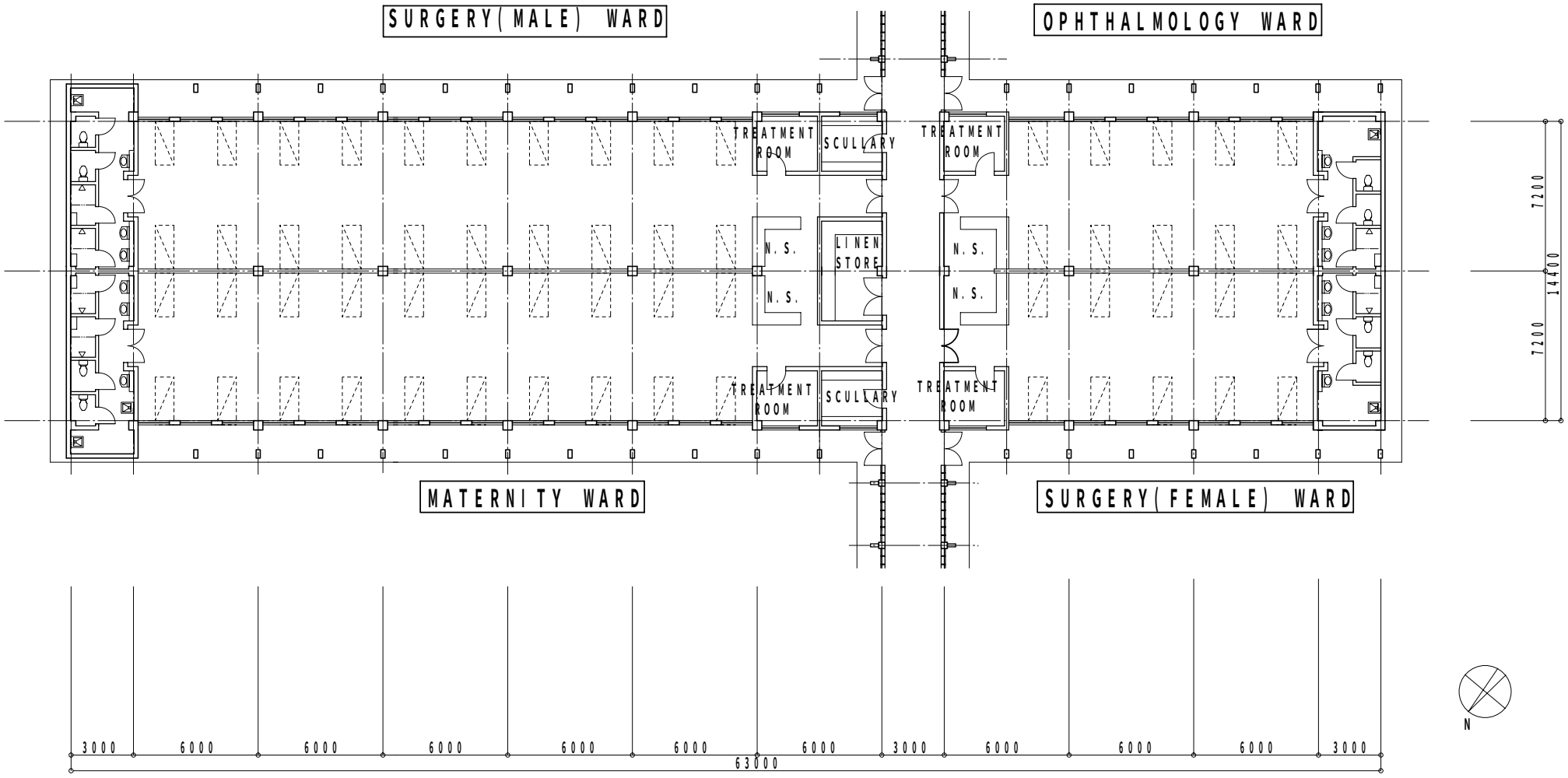


SECTION


SURGERY(MALE) WARD
OPHTHALMOLOGY WARD
TREATMENT ROOM
SCULLARY
TREATMENT ROOM
N. S.
N. S.
LINEN STORE
N. S.
N. S.
TREATMENT ROOM
SCULLARY
TREATMENT ROOM
MATERNITY WARD
SURGERY(FEMALE) WARD
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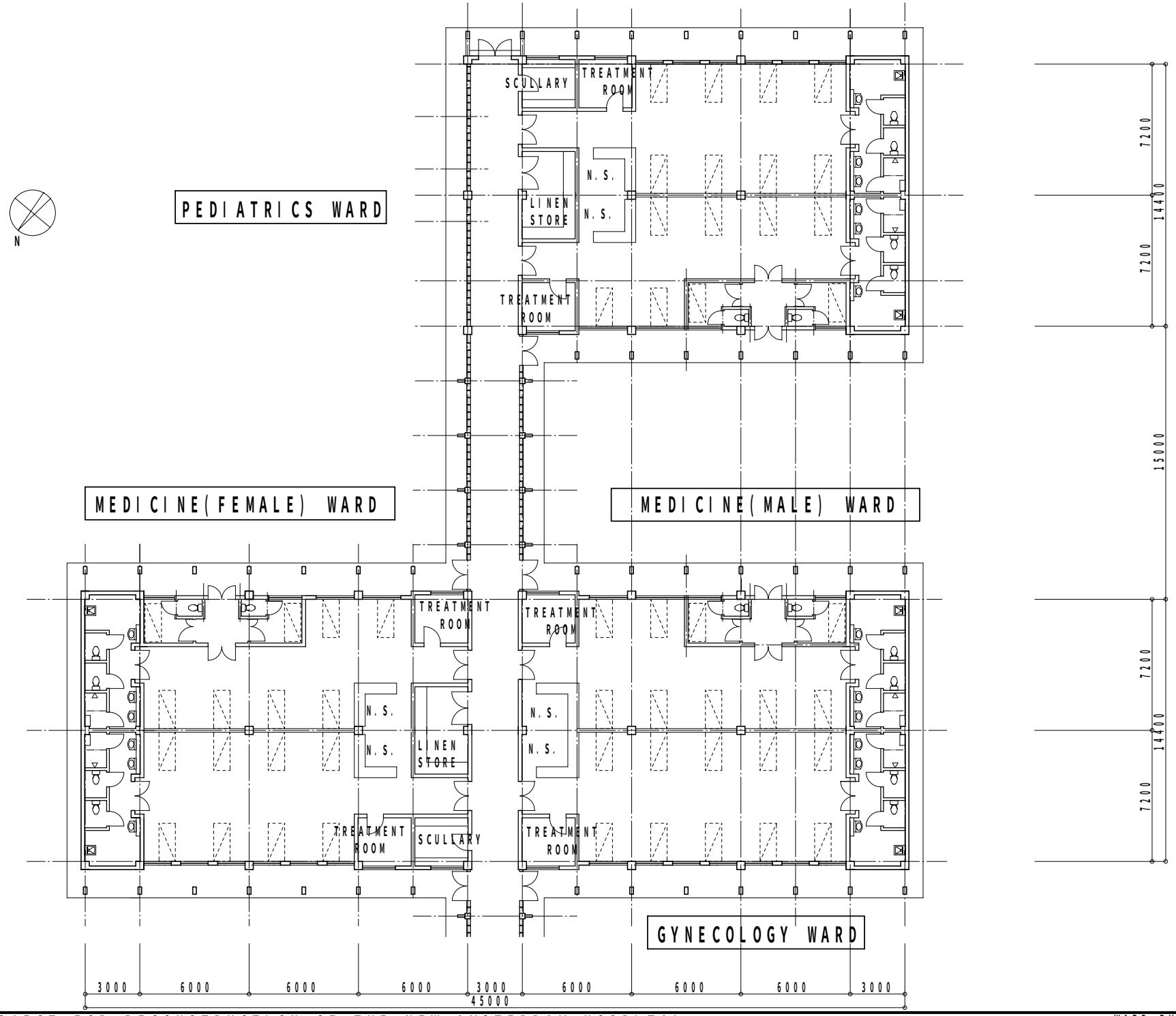
14400
7200
N
3000
6000
6000
6000
6000
6000
6000
3000
6000
6000
6000
3000
63000


N
PEDIATRICS WARD
SCULLARY
TREATMENT ROOM
N.S.
N.S.
LINEN STORE
TREATMENT ROOM
MEDICINE(FEMALE) WARD
MEDICINE(MALE) WARD
TREATMENT ROOM
TREATMENT ROOM
N.S.
N.S.
N.S.
N.S.
LINEN STORE
TREATMENT ROOM
SCULLARY
TREATMENT ROOM
GYNECOLOGY WARD
7200
14400
7200
15000
7200
14400
7200
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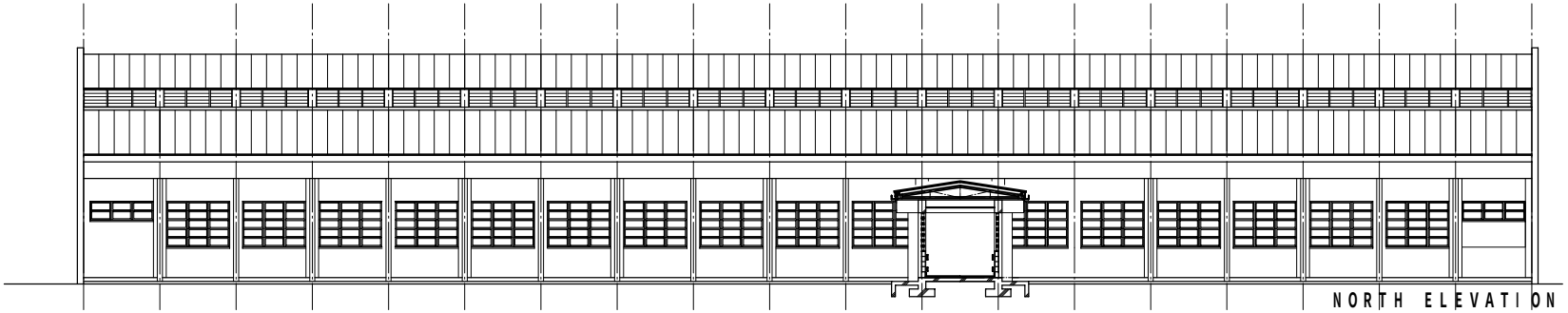
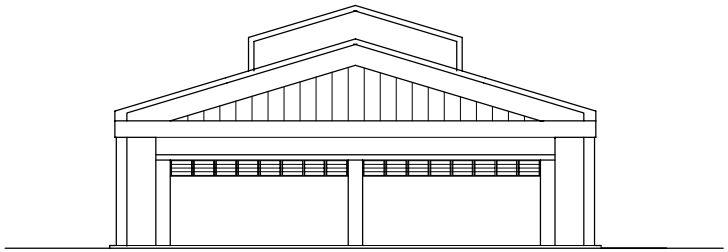
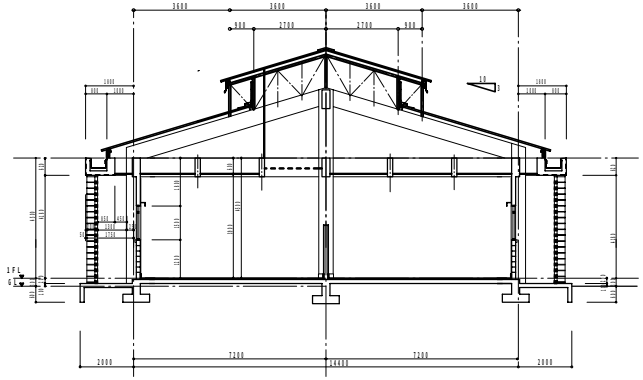
6000
6000
6000
3000
6000
6000
6000
3000
45000



NORTH ELEVATION



WEST ELEVATION



SECTION

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

This project shall be implemented under the Government of Japan's grant aid cooperation after the Exchange of Notes between 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 buildings with a total floor area of approximately 5,600m^2 and the equipment work of procurement and installation of equipment. The entire project period will be separated into two phases. The Phase1 includes construction of the Ward building, the Service Dept. building, and the Central corridor as well as procurement and installation of equipment for those facilities. The Phase 2 includes construction of the Outpatient Dept. building, the Administration Dept. building, and the Central Clinical Dept. building and other incidental buildings as well as procurement and installation of equipment for the facilities.

(2) Contracting System

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

(3) Implementation Organization of the Guyana Government

The Ministry of Health of Guyana is the implementing agency for the Project and the Ministry of Foreign Trade and International Cooperation is the Coordinating Agency. Project management will be implemented by the Ministry of Health (Region VI)/Regional Democratic Council-6. Ministry of Health will take necessary measures for importing construction materials and equipment such as customs clearance as well as allocation of budget for customs duties

Building permit, which is required for building construction in Guyana, must be obtained by the Ministry of Health from the Ministry of Housing and Water.

(4) Execution system

1) Consultant

Immediately after the Exchange of Notes between both Governments, the Ministry of Health will conclude a design and supervision agreement 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 Basic Design 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 shall to be selected among qualified Japanese companies through public tender. The Ministry of Health shall 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.

2-2-4-2 Implementation Conditions

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

(1) Legal procedure for building construction

It is necessary for the Guyana side to obtain building permit from the Ministry of Housing and Water for the construction of buildings of this project. Since building regulation is under preparation for enforcement in Guyana, regulations of foreign countries can be applied provided they are in English language. In case the Japanese Building Act is applied, translation must be submitted together with application documents. Application documents need to be signed by licensed architect/engineers. However, licenses are not necessarily to be of Guyana.

(2) Procurement of Building Materials

The construction market in New Amsterdam is not large enough for implementation of this project. Therefore, it will be needed to procure materials from Georgetown. The important point noted for transport of materials from Georgetown to New Amsterdam is the size of load to cross the Barbice River. A load shall not exceed maximum loading size/weight of ferryboat.

(3) Import of Building Materials/Equipment

Building materials and equipment imported from outside the country shall be exempted from custom duty. The Government of Guyana has enough experience in handling grant projects from foreign countries/ international organizations, so that the tax exemption procedure will not be problem for them. On the other hand, in case such building materials and equipment are cleared at the customs in Georgetown, they must be transshipped and transported domestically to New Amsterdam. This will increase the risk of theft and damage to equipment. Therefore, at most attention shall be paid to the transport of materials/ equipment to avoid theft and damage.

(4) Rainy Season

Dry sand has to be used for back filling and the time for this work is limited due to the rainy season. In Guyana there are two rainy seasons in a year and it has been becoming irregular due to the "El niño" effect. Therefore, construction progress schedule has to be prepared carefully in consideration of unanticipated situation.

2-2-4-3 Scope of Works

(1) Scope of Works

The Project will be implemented through close cooperation between the Government of Japan and the Government of Guyana 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 Guyana
   - Necessary procedure for transportation

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

1. Site and exterior works
   - Securing the site for the project
   - Removing existing structures, trees and so on from the project site and drain water in the site properly
   - Pre-loading with 1.0m thick soil at least 6 months in advance of the construction work
   - 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
   - Provision of telephone lines for the Project and connect them to the Main Distribution Frame
   - Water supply up to the reservoir and connection of the drainage line
   - Installation of pipeline for discharge of sewage from the site to the creek nearby

3. Preparatory work
   - Provision of sites for temporary construction site office, workshops and material storage places
   - Installation of temporary electricity supply, water 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
   - 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 Guyana side is attached in the appendices.

2-2-4-4 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 Guyana. 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 advises the client on concluding the contracts.

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 Guyana side.

8. Training in operation of the equipment

   Some equipment installed under the Project will require operating skills as well as good knowledge of their maintenance. For this reason, it will be necessary to have the engineers of the Guyana 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 program.

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 Guyana 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.

2-2-4-5 Procurement Plan

(1) Guidelines for Procurement of Building Materials

Materials and equipment to be used in this Project will be procured in accordance with the following guidelines.

1. Local procurement

   Building materials for this Project to be produced within Guyana are limited to principle items such as gravel, wood and concrete hollow blocks, which quality is satisfactory for use. Machines or equipment, which requires periodical maintenance services or consumables, shall preferably be imported ones available in the country.

2. Import

   Those materials and items of products which are not available locally will be imported from Japan or the third countries. Machines or equipment, which require consumables or spare parts, shall preferably be imported from the neighboring countries such as Venezuela, Trinidad and Tobacco.

(2) Materials/Equipment Procurement Plan

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

1) Materials Procurement Plan

Table 2-16 Procurement Plan of Building Materials

Work	Material/Equipment	Countries			Remarks
		Guyana	Japan	Third country	
Building Work	Cement	○			Imported products procurable locally
	Sand	○			Procurable locally
	Gravel	○			Ditto
	Re-bar	○			Imported products procurable locally
	Roof material			○	To be imported
	Ceramic tile	○	○		Imported products procurable locally
	Glass	○			Ditto
	Timber	○			Procurable locally
	Aluminum windows	○			Imported products procured locally
	OR, X-ray room door		○		High quality is advantageous
	Wooden doors	○			Procurable locally
	Hardware	○			Imported products procurable locally

Work	Material/Equipment	Countries			Remarks
		Guyana	Japan	Third country	
Mechanical & Sanitary Work	Pump		○		To be imported
	Fan		○		Ditto
	Sanitary fittings			○	Ditto
	PVC pipe		○		Ditto
	Galvanized steel pipe			○	Ditto
	Water tank		○	○	Ditto
	Hose reel			○	Ditto
	Fire extinguisher			○	Ditto
	Electric water heater			○	Ditto
Electrical Work	Distribution board		○		To be imported
	Generator		○		Ditto
	Lighting fixture		○		Ditto (Bulves shall be available locally)
	Fire alarm system			○	Ditto
	Wiring conduit		○		Ditto
	Medical power supply system		○		Ditto

2) Equipment Procurement Plan

Basically equipment to be procured for this project will be selected from products made in Japan or locally. However, following equipment will be selected from products made in the third countries in consideration of maintenance. In Guyana most of the equipment used are products of USA or EU countries and maintenance service agencies are available for those products in Guyana or neighboring countries such as Venezuela.

Table 2-17 Procurement Plan of Equipment

Equipment		Procurement country			Note
		Local	Japan	Third Country	
A-21	Electrocordiograph			○	USA
A-22	Ultrasound Scanner			○	USA, EU
E-01	X-Ray Unit			○	USA, EU
E-02	Mobile X-Ray Unit			○	USA, EU
E-05	Automatic X-Ray Film Processor			○	USA, EU
G-05	Emergency Light			○	USA
H-02	Operating Light			○	USA
H-03-1	Anesthesia Apparatus			○	USA, EU
H-06	Operating Microscope for Opthalmology			○	EU
H-15	Ventilator			○	USA, EU
H-21	Defibrillator			○	USA
H-22	Patient Monitor			○	USA, EU
I-04	Delivery Light			○	USA
I-08-1	Pediatric Treatment Table			○	USA, EU
I-13	Infant Incubator			○	USA, EU
I-14	Fetal Monitor			○	USA
M-01-1	Automatic Washer			○	USA, EU
M-01-2	Automatic Extractor			○	USA, EU
M-03	Electric Ironing Machine			○	USA, EU
M-02	Dryer			○	USA, EU
J-01-1	High Pressure Steam Sterilizer （Medium）			○	EU
J-01-2	High Pressure Steam Sterilizer （Small）			○	EU
O-01	Incinerator			○	USA

2-2-4-6 Quality Control Plan

Quality control of the construction work shall be in accordance with the following standards.

Table 2-18 Quality Control Standard

Item	Standard	Inspection
Backfilling (Under foundation and concrete slab)	95% maximum dry density	ASTM
Concrete	Slump: Less than 15cm 4 week compression strength: 210kg/cm^2 (cylinder) Type of cement; Normal Portland cement	Slump test, Compression test
Rebar	ASTM-Gr50, fy=50ksi	Tensile test or mill sheet
Steel structure	ASTM-A36, fy=36ksi	

2-2-4-7 Implementation Schedule

When the Notes concerning the implementation of the Project is exchanged between the Government of Japan and the Government of Guyana, the construction and equipment works will be implemented in accordance 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 Basic Design Study report after the conclusion of the consultant agreement. The consultant shall also obtain approval on the above-mentioned documents from the Guyana side after explanation to them. The estimated period required for completing the procedure is approximately three months.

2. Tendering

   The contractors to take charge of the construction work and the equipment work 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 two 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, Phase 1 will take 12 months and Phase 2 will take 12 months respectively, 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 Exchange of Notes to the completion of the project which includes above-mentioned factors will be as shown below.

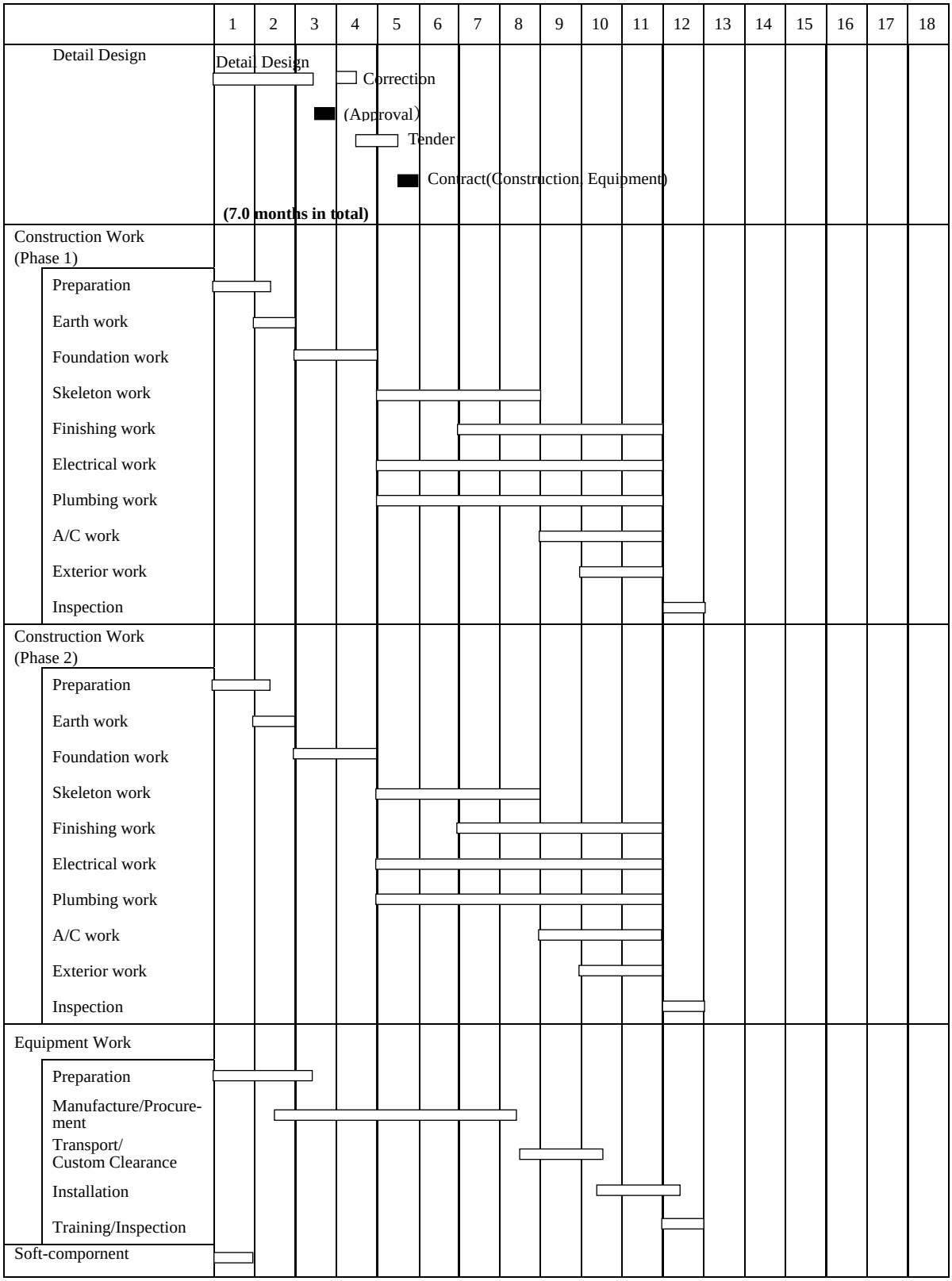


Fig. 2-4 Implementation Schedule

2-3 Obligations of Recipient Country

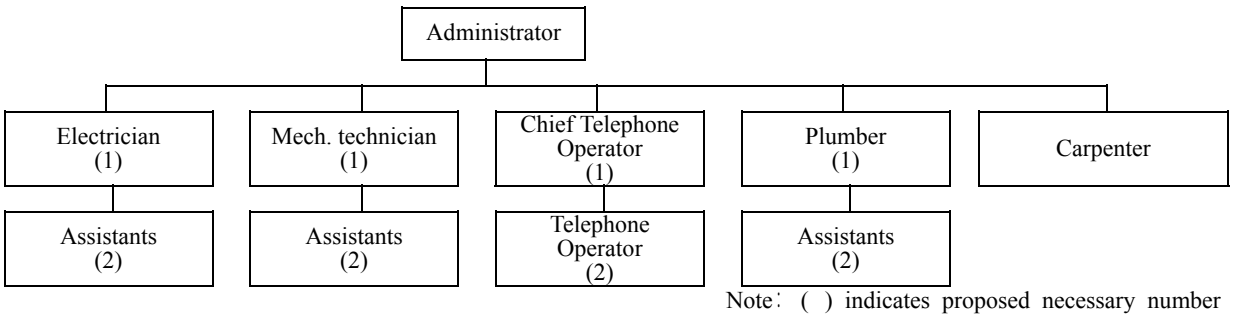
Following necessary measures shall be taken by the Government of Guyana on the condition that the Grant Aid by the Government of Japan is extended to the Project. Cost estimation borne by the recipient country is attached in Appendices.

1. To secure lots of land necessary for the Project including temporary stockyard;
2. To place pre-loading on the site for securing settlement of the proposed site prior to the commencement of the construction (Pre-loading shall be approx. 1.0m thick soil on the specified area and be completed at least 6 months in advance of the construction work);
3. To provide a proper access road to the Project site;
4. To provide facilities for distribution of electricity, water supply, telephone trunk line, drainage, sewerage pipeline 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, as well as installation of the pipe line from the site to the creek nearby, which was instructed by the Guyana side;
6. To ensure prompt unloading and customs clearance of the products purchased under the Japan's Grant Aid at ports of disembarkation in Guyana;
7. To exempt Japanese nationals from customs duties, internal taxes and fiscal levies which may be imposed in Guyana 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 Guyana and stay therein for the performance of their work;
9. To bear commissions, namely advising commissions of 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.

2-4 Project Operation Plan

The facilities of the Project are designed to be simple not to require highly advanced maintenance technology, focusing on solving present issues with the existing building. However, present organization of the hospital is not enough for maintenance of the proposed facilities, since the existing facilities do not require much maintenance. Therefore, it is necessary for the Guyana side to recruit additional maintenance personnel for the hospital before completion of Project.

Major items of facilities needing maintenance are air conditioning system in the central clinical department building, sanitary system and electrical systems including generator system. Once these systems broke down seriously, it will be needed to call repairmen from Georgetown, which is about 110km away from New Amsterdam, or to send broken down equipment to Georgetown. It will take considerable time to get them repaired and such situation will cause inconvenience to the medical services at the hospital. In order for prevention of occurrence of the troubles, it is important that the systems are properly operated and daily inspection is properly implemented. For the purpose, it is necessary to establish maintenance and management organization, to set up the work responsibility schedule, to set up check up system, and to establish the risk management system. The organization shown below is proposed as the maintenance and management of the proposed facilities of the Project. To set up the organization the Guyana side needs to recruit one electrician, one plumber and five assistants as suggested below. It is judged no problem for the Guyana side to recruit these additional personnel since necessary budget is already scheduled.



Note: ( ) indicates proposed necessary number

A technical assistance by the consultant is planned under the Project for establishing maintenance and management system to the organization shown above. Therefore, the Guyana side is required to assign necessary number of personnel as stated above at least 6 month prior to the completion of the construction work.

The Minstry of Health adopts the system to contract out repair of broken medical equipment to the private

dealers in Georgetown when medical equipment is broke down at the public hospitals. This system will be maintained still after the completion of the Project. This system will release each medical institution from the burden of repair for themselves but it takes considerable time to get back the equipment repaird and returned. While the equipment is sent for repair, medical services needing the equipment are suspended. Therefore, it is important for the hospitals to prevent occurrence of breakdown by means of establishing maintenance and management system within the hospital. A technical assistance by the consultant is planned under the Project to set up maintenance and management organization for establishing a system of daily maintenance, troubleshooting not to cause serious troubles with equiopment.

The increase of operation costs are estimated as shown bellow.

(thousand Guyana $)

Item	After construction (G$/year)	Present (G$/year)	difference (G$/year)	Notes
Consumables and maintenance cost	5,841	6,038	-197	Data of Present is of year 1999
Electricity charges	7,330	1,825	+5,505	Consumption of planed facilities 22,000kwh/month Consumption of existing facilities 5,500kwh/month Planed consumption would be 4 times
Telephone charges	1,200	800	+400	Planed telephone line 12lines, 40extentions Existing telephone line 9lines, 21extentions
Fuel for emergency power plant	313	140	+173	Capacity for planed facilities 75kVA Capacity for existing facilities 24kVA Consumption of planed facilities would be 2 times although the capacity is 3 times
Water charges	154	152	+2	Consumption of planed facilities 1,300m^3 Consumption of existing facilities 810m^3 The difference is not significant, because mayor part of water charges is basic charge (G$150,000/year)
Medical gas	941.5	800	141.5	The number of operation would not increase so much due to limited number of doctor
Sub-total	15,779.5	6,270.5	+6,024.5	

(Other than “Consumables and maintenance cost”, present budgets are of the year 2000.)

The increase in operation cost of 6,024.5 thousand Guyana dollars as calculated above occupies 0.14% of the recurrent budget of the Ministry of Health and 1.5% of the recurrent budget disbursed to Region 6. In consideration of the increase of the health budget disbursed to Region 6 in these years, the Ministry of Health will not have difficulty to bear the increase of the operation costs for the New Amsterdam Hospital.

Estimation of the operational cost of the New Amsterdam Hospital is as shown below;

1) Personnel expenses

No increase is planned in the number of doctors under the Project. Therefore, no additional budget of personnel expenses is required for this project.

2) Consumable expenses and maintenance expenses G$ 5,841,000

No.	Item	Estimated cost/unit/year	Quantity	Total estimated cost / year
A-05,K-16	Examining Light	G$ 12,000	13	G$ 156,000
A-20	Fetal Heart Detector	G$ 8,000	1	G$ 8,000
A-21	Electrocordiograph	G$ 21,000	1	G$ 21,000
A-22	Ultrasound Scanner	G$ 159,000	1	G$ 159,000
E-01	X-Ray Unit	G$ 923,000	1	G$ 923,000
E-02	Mobile X-Ray Unit	G$ 923,000	1	G$ 923,000
E-05	Automatic X-Ray Film Processor	G$ 140,000	1	G$ 140,000
F-02,F-12	Binocular Microscope	G$ 13,000	3	G$ 39,000
F-03	Hematocrit Centrifuge	G$ 114,000	1	G$ 114,000
F-04	Blood Glucose Meter	G$ 27,000	1	G$ 27,000
F-06	Hemoglobinmeter	G$ 73,000	1	G$ 73,000
F-08	Bilirubin Meter	G$ 3,000	1	G$ 3,000
F-14	Colony Counter	G$ 4,000	1	G$ 4,000
F-21	Centrifuge	G$ 15,000	1	G$ 15,000
F-30	Blood Bank Refridgerator	G$ 13,000	1	G$ 13,000
G-05	Emergency Light	G$ 25,000	2	G$ 50,000
G-11,H-17-2	Suction Unit (Hanging Type)	G$ 3,000	30	G$ 90,000
G-18,K-15	Nebulizer	G$ 3,000	9	G$ 27,000
H-02	Operating Light	G$ 111,000	3	G$ 333,000
H-03-1	Anesthesia Apparatus	G$ 183,000	3	G$ 549,000
H-05	Electro Surgical Unit	G$ 58,000	2	G$ 116,000
H-06	Operating Microscope for Opthalmology	G$ 29,000	1	G$ 29,000
H-15	Ventilator	G$ 9,000	2	G$ 18,000
H-17-1	Low Pressure Continuous Suction Unit	G$ 2,000	1	G$ 2,000
H-19	Infusion Pump	G$ 113,000	4	G$ 452,000
H-20	Feeding Syringe Pump	G$ 49,000	2	G$ 98,000
H-21	Defibrillator	G$ 117,000	1	G$ 117,000
H-22	Patient Monitor	G$ 15,000	2	G$ 30,000
I-04	Delivery Light	G$ 111,000	2	G$ 222,000
I-05	Resusciator	G$ 13,000	1	G$ 13,000
I-08	Pediatric Treatment Table	G$ 13,000	1	G$ 13,000
I-11	Suction Unit (Large Size)	G$ 4,000	2	G$ 8,000
I-13	Infant Incubator	G$ 80,000	1	G$ 80,000
I-14	Fetal Monitor	G$ 101,000	1	G$ 101,000
J-01	High Pressure Steam Sterilizer	G$ 246,000	2	G$ 492,000
K-20	Suction Unit (Medium Size)	G$ 4,000	8	G$ 32,000
O-01	Incinerator	G$ 271,000	1	G$ 271,000
	Total			G$ 5,841,000

3) General expenses

① Electricity costs | G$ 7,330,000/year

Electricity consumption is estimated as follows:

Max. electricity demand : 316.5kVA

Contract electricity : 160kW

Monthly electricity consumption :

160kW×(0.3×10hr×22day+0.1×24hr×30day)=22,080Kwh/month

22,080Kwh/month×G$27.66/Kwh =G$ 610,732/month

G$610,732/month×12months =G$ 7,328,784/year

G$ 7,330,000/year

② Telephone charges | G$ 1,200,000/year

Telephone charges are estimated as follow:

Estimated number of line for planed facilities： 12 lines

Estimated number of call made by each line ： 20 times/line/day

Total number of call made by each lines in the facilities： 12×20=240 times/ day

Basic charges for commercial use： 12 lines×G$1,000/line/month=G$12,000/month

Total charges		Rate	Mean charges		
Local call	240 time/day	×0.5	×G$0.2/time	= G$	24.0/day
National call	240 time/day	×0.45	×G$6.6/ time	= G$	712.8/day
Overseas call	240 time/day	×0.05	×G$180.0/ time	= G$	2160.0/day
	(G$24.0+712.8+2160)×30			= G$	86,904/day

(G$12,000+G$86,904)×12 months=G$1,186,848 G$1,200,000

③ Fuel for emergency generator | G$ 313,000/year

An emergency generator with capacity of 75[kVA] is planned. 100% of load, Consumption rate per hour : Approx. [18]

One hour a day of blackout is assumed:

1hr×18 /hr×22 days×12 month×*G$65.87/liter=G$313,014.24/year

④ Water charges | G$ 154,000/year

Supply line 50mm dia., G$ 12,500/month as fixed charge for Institute/hospital, G$0.25/$m^3$ as Unit Rate,

43900 liter/day as demand and 5% as increase rate are estimated.

43.9m^3/day×1.05×365 days×G$0.25/m^3＝G$4,206/year

Basic charge: G$12,500/month×12+*G$4,206/year

＝G$154,206/year→G$154,000/year

⑤ Medical gas charges

G$ 941,500/year

[Oxygen]

Place of use	Consumption volume per each outlet	Mean time of daily use	Simulta-neous use rate	No. Of outlet	Total
OT	2 liters/min.	120 min.	100%	3	720 liters
Recovery rm.	3 liters/min.	300 min.	25%	3	675 liters
Ward	3 liters/min.	300 min.	10%	30	2700 liters
Total					4095 liters →4000 liters

4000 liters×260 day＝1000 kilo-liters

1000 kilo-liters /year(Estimated volume of annual use)×G$71.5/ =G$71,500/year

[Nitrous oxide]

Place of use	Consumption volume per each outlet	Mean time of daily use	Simulta-neous use rate	No. Of outlet	Total
OT	4 liters/min.	120 min.	100%	3	1440 liters

1,440 liters×260 day＝375 kilo-liters

375 kilo-liters/year (Estimated volume of annual use)×G$2,123/ =G$796,125/year

G$71,500/year＋G$796,125/year＝G$867,625→G$870,000

2-5 Technical Assistance by Consultant

(1) Necessity and present Issues

In Guyana Waste Management has just been introduced and will be launched at the Georgetown Hospital in a short time. In other medical institutions no systematic activities are taken yet.

At the New Amsterdam Hospital the existing incinerator is superannuated and unusable, so that medical wastes are presently disposed by open incineration at the empty lot adjacent to the hospital. This situation arouses disquietude among neighbors.

Wastes generated at hospitals include various matters such as general wastes, infectious wastes, sharps, parts of human bodies etc. Therefore, it is quite important to segrigate wastes in accordance with the proper classification and to dispose them in relevant method suitable for each category of wasts to avoid pollution or accidents. Especially for the New Amsterdam Hospital, it is important to establish its own Waste Management system since the local authority does not have an incinerator for disposing hazardous wastes. For this purpose, it is planned to procure a special type of an incinerator for disposing medical hazardous wastes as well as autocraves in this Project. However, the organization of the hospital is not prepared to cope with setting up a proper system for Waste Management nor handling these equipment. Therefore, technical assistance by the consultant was requested to assist establishing the Waste Management system in the hospital.

New Amsterdam is located about 110km away from Georgetown, the capital of the country, and there are no maintenance agencies available for serious breakdown of machineries and equipment. Therefore, once machineries or equipment got seriously broke down at the New Amsterdam Hospital, it may be needed to call repairman from Georgetown or send machineries or equipment to Georgetown. It will take considerable time to get them repaired under this situation and cause serious inconvenience to the medical service of the hospital. In order to avoid such state of affairs, it is important to establish a maintenance organization for proper operation of facility/equipment and periodical inspection/troubleshooting. Therefore, technical assistance by the consultant was requested to assist establishing the proper maintenance and management organization within the hospital.

(2) Policy for the Technical Assistance for Maintenance and Management of Facilities and Equipment

Operation manual of facilities and equipment provided under this Project will be prepared by the contractors and training will be conducted at the time of turn over. However, training by the contractors will be focused on operation of each item of facility/equipment and is not aimed at establishing maintenance and management system. The objective of the technical assistance is to establish the maintenance and management organization as well as proper check-up system to prevent facilities/equipment from breaking down, which will lead to the establishment of the risk management.

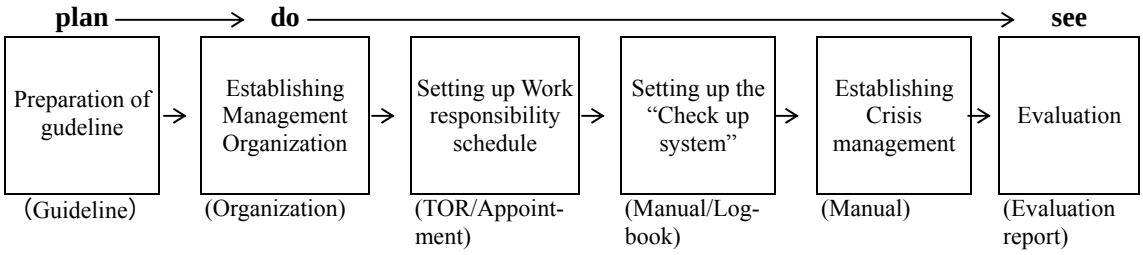


Fig. 2-5 Flow of Establishment of Maintenance Management

(3) Effects (Direct effects)

① Waste Management for Medical Wastes

- Implementing framework will be established with responsible person assigned and implementing organization formed
- Workshops will be held
- Poster will be made for segregation of wastes and method of disposal
- Guideline will be made based on the Safe Management of WHO
- Medical hazardous wastes will be segregated in the hospital
- Accidents caused by sharps will decrease
- Infectious wastes and sharps will not be discharged to outside the hospital
- In-hospital infection will be prevented
- Bad effects to the surrounding environment will be minimized due to relevant incineration. Running cost of incinerator will be saved with reasonable operation.
- Notification or act for medical waste management will be proposed.

② Facilities/Equipment

- Maintenance and management organization will be established.
- Work responsibility schedule for maintenance will be clearly defined.
- Maintenance manual will be developed.
- Troubleshooting method will be standardized and troubles will be found at early stage.
- Maintenance log book will be kept.
- Troubles will not be caused by irresponsible usage.

(4) Implementing mode： Management assistance

① Assistance will be extended to set up the organization for medical waste management including preparation of the guideline and its enforcement.

② Assistance will be extended to set up the maintenance and management organization of facilities and equipment including preparation of management manual and implementation.

(5) Activity (Inputs)

1) Medical waste management

- Dispatch of an expert： Either medical personnel familiar to medical waste management or an engineer having comprehensive knowledge about medical waste management shall be dispatched for the following period.
  In Japan…… 1 × 0.4months
  In Guyana …… 1 × 1.0months

- Methodology ： In Japan…… To work with the trainees invited to the C/P training held in Japan, to prepare a guideline on a basis of the Safe Management of WHO
  In Guyana …… To lead preparation of setting up guideline, holding workshops, making posters, training and proposal for notification/act regarding medical waste management
  Counterparts… Medical superintendent, administrator, matron, chiefs of sections

- Outputs ： Medical waste management guideline, organization chart for waste management, posters for waste management

- C/P training ： Since there are no practical accomplishments in waste management in Guyana, it is important to invite counterparts for training about waste management in Japan in advance of the technical assistance. Following contents are considered reasonable for the training in Japan.

  Counterparts ： Administrator of the New Amsterdam Hospital
  Planning Director of Ministry of Health
  Period ： Approx. 3 weeks right before completion of

the construction work in August 2004

Contents : − Practical segregation of medical wastes
− Management organization of waste management
− Handling of hazardous medical wastes
− Disposal methods of hazardous wastes

2) Maintenance and management of facilities

- Dispatch of an expert : An engineer with experience related to construction work shall be dispatched for the following period.
  In Japan····· 1 × 0.1months
  In Guyana ····· 1 × 0.7months

- Methodology : In Japan····· Preparation
  In Guyana ····· To establish management organization and to set up work responsibility schedule for maintenance, check up system and risk management, management manual.

＜applicable facilities＞

Category	Items
Electrical	Generator, transformer, lighting and socket outlets, fire alarm system
Sanitary	Pump, plumbing, septic tanks, reservoir, water tank, elevated water tank, sanitary fittings, rain water tank, fire fighting system
Mechanical	Air conditioning, ventilation system, medical gas/vacuum system

- Counterpart : Administrator, Maintenance engineer (electrical, plumbing, mechanical)
- Outputs : Management manual (including work responsibility schedule, work contents schedule and check up manual), Management organization, Maintenance log book

3) Maintenance management of equipment

- Dispatch of an expert : An engineer having practical experience in planning and/or installation of medical equipment shall be dispatched for the following period.
  In Japan ····· 1 × 0.1months
  In Guyana····· 1 × 0.7months

- Methodology : In Japan ····· Preparation

In Guyana ····· To establish management organization and to set up work responsibility schedule for maintenance, check up system and risk management, management manual.

- Counterparts : Administrator, chief of sections where equipment shown below are used

＜Applicable equipment＞

Equipment	Daily maintenance	Contents of daily maintenance（reference）
Ultrasound scanner	○	Daily inspection
Water still	○	Cleaning, replacement of filter
X-ray unit	○	Daily inspection
Mobile X-ray unit	○	Daily inspection
Automatic X-ray film processor	○	Periodical replacement of filter
pH meter	○	Replacement of liquid
Anesthesia apparatus	○	Daily inspection of tube and connector
Water sterilizer	○	Periodical replacement of filter
Ventilator	○	Daily inspection of tube and connector
Patient monitor	○	Daily inspection
Pediatric treatment table	○	Daily inspection
Infant incubator	○	Daily inspection
High pressure steam sterilizer	○	Daily inspection
Automatic washer	○	Daily inspection
Dryer	○	Daily inspection
Incinerator	○	Daily inspection

- Outputs : Management manual (including work responsibility schedule, work contents schedule and check up manual), Management organization, Maintenance log book

Chapter 3 PROJECT EVALUATION AND RECOMMENDATIONS

3-1 Project Effect

The health policy of the Government of Guyana is aimed at improvement of the medical services in local regions by means of improving medical facilities and the referral system. The New Amsterdam Hospital is positioned as the core referral hospital to provide secondary level medical services in Region 6. Therefore, implementation of the Project will result in bringing about benefits to the 170,000(Note) population of Region 6. In addition, in case the Regional Health Authority (RHAs) is established with the jurisdiction over Region 6 and Region 5, the benefit will be brought to 230,000 of both regions since the New Amsterdam Hospital is only one regional hospital in both regions.

(Note): according to the estimation of PAHO, 1996

The outputs expected as a result of implementation of the Project is summarized as below.

Table 3-1 Expected Effects and Improvements by the Project

Present condition and issues	Inputs of the Project	Expected outputs and improvements
The facility of the New Amsterdam Hospital, which is wooden three storied and was built more than 100 years ago, is superannuated and structurally dangerous. Its floor plan is old fashioned and does not meet requirements as the modern hospital. Water supply system in the building is not functioning. In addition, medical equipment is short and therefore, the hospital is not able to provide medical services as the core referral hospital, consequently it hardly gain trust of local residents.	To reconstruct new hospital facilities, consisting of OPD, OT, delivery, service etc., of the New Amsterdam Hospital on the site different from the existing premise to meet the health needs with necessary functions as the core referral hospital of Region 6.	• Clean environment is secured for operation, delivery and medical care by means of air-tightness, clear zoning, and provision of water supply system as well as replacement of superannuated equipment. • Medical examination and treatment can be implemented effectively owing to the functional facility layout and provision of equipment. • Clear flow of movements in the hospital will bring about functional service and improvement in inpatients' environment. • With the direct effects listed above, medical services provided at the New Amsterdam Hospital will be improved.

(1) Selection of verifiable indicators

In selection of verifiable indicators, "Project purpose", "Overall goal for the Project" and "expected outputs" are classified as shown in the table below.

Table 3-2 Objectively Verifiable Indicators

Narrative Summary	Objectively Verifiable Indicators	Means of Verification
Overall Goal Heath condition of the residents in Region 6 will be improved.	• Maternal mortality rates • Infant mortality rates of Region 6	Monitoring report
Project Purpose Medical services provided at the New Amsterdam Hospital will be improved.	• Bed occupancy ratio • Number of outpatients to the clinics • Number of laboratory tests	Monitoring report
Outputs Facilities and equipment will be improved.	• Common space will be increased • Water supply can be secured in the buildings • Vertical movements of patients will not be needed. • Quality and quantity of Medical equipment will be improved.	Monitoring report
Other outputs Medical waste management will be improved.	• Medical wastes will not be disposed by open incineration and will be properly disposed by the incinerator.	Monitoring report

Survey results and expected "objective verifiable indicators" of each item shown above are discussed as below.

① Overall goal： Health condition of residents in Region 6 will be improved.

Though it is hardly to say that the referral system in Region 6 is functioning at present, the lower level medical institutions send patients to the New Amsterdam Hospital from time to time in case they are not able to cope with, such as cases of complicated expectants and immature babies. It is a fact that district hospitals and health centres rely on the New Amsterdam Hospital for higher medical care. In case this Project is implemented and the New Amsterdam Hospital is prepared to accept patients referred from the lower level medical institution, the referral system in Region 6 is expected to work. Maternal mortality rate and infant mortality rate are selected as the indicators of "Health condition of residents in Region 6 will be improved."

- Maternal mortality rate in Region 6 will decrease.
- Infant mortality rate in Region 6 will decrease.

② Project purpose： The medical services provided by the New Amsterdam Hospital will be improved.

The New Amsterdam Hospital is positioned as the core referral hospital in Region 6 to provide secondary level medical services and it is important assignment for the hospital to accept

patients, who the lower level medical institutions are not able to cope with. Therefore, bed occupancy rate, number of outpatients to the clinics and number of delivery and laboratory testing as indicators to evaluate outputs of the Project.

- Bed occupancy rate at the New Amsterdam Hospital will rise.
- Number of outpatients to clinics will increase.
- Number of laboratory examination will increase.

It was confirmed on the Minutes of Discussion that the Guyana side will report monitoring records of above indicators to the Japanese side for five years after completion of the Project. In view of the period of monitoring, five years is judged appropriate in consideration of the time for the Hospital to get on truck.

These statistics of the indicators listed above have been taken at the hospital and therefore, evaluation of the Project is possible to compare them to the indicators to be reported in the monitoring report as described aforementioned.

Present statistical data at the New Amsterdam Hospital are shown below.

Table 3-3 Present Condition of Indicators

Indicator	Present
Bed occupancy rate	35%
No. of outpatients to clinics	18,752
No. of laboratory examination	26,453

③ Expected outputs： Facilities and equipment will be improved.

Outputs of the Project under the Japan's grant aid assistance are improvements of facilities to be reconstructed and equipment to be procured. Following items are the expected outputs.

- Necessary common space will be secured and unit floor area per ward bed will increase. (Existing:30.15 ㎡/bed, Plan:49.26 ㎡/bed)
- Number of places where water will be supplied will increase. (Existing:3, Plan:30)
- Movements of patients and equipment across different storeys will no longer necessary. (Existing:3storeys, Plan: single story)
- Medical equipment will increase and examination and medical care, which are not conducted presently due to shortage of equipment, will be conducted, such as X-ray photography, treatment of infants with neonatal jaundice, cataract operation etc.

④ Other outputs： Waste management will be implemented in the hospital

At present in the existing hospital, medical wastes are disposed by open incineration and criticized by neighbours. By means of implementing this Project, medical wastes will be properly segregated and proper disposal will be done. Further, danger of infection caused by sharps, which are presently left after open incineration, will be avoided.

3-2 Recommendations

(1) Sustainable appropriation of operating budget and personnel

The operating budget of the New Amsterdam Hospital is estimated to increase by G$6 million in case this Project is implemented and the hospital is reconstructed. This increase consists of mostly utility budget, such as electricity, fuel for the generator and the incinerator. It will cause considerable inconvenience to the medical services of the hospital if the necessary budget is not appropriated properly. Therefore, appropriation of operating budget is indispensable for sound management of the hospital.

Shortage of medical doctors is serious issue in Guyana and the Government of Guyana made agreements with governments of Cuba and China for dispatch of medical doctors to cover the shortage. In the New Amsterdam Hospital two Cuban doctors are currently working, who are playing significant roles in the hospital. Therefore, the Government of Guyana is required to continue the agreement to secure necessary doctors not to cause discontinuance of medical services.

(2) In case the Project is implemented with the grant aid cooperation, the New Amsterdam Hospital will be able to accept patients of difficult cases from the lower level medical institutions, which is the goal of the Project purpose. Therefore, it is important that the Guyana side steadily improve the referral system of Region 6, such as improving other medical institutions in order to acquire expected outputs of the Project.

(3) Since open incineration of medical disposal is at the existing hospital is criticized by neighbours. Though this Project will be implemented at the different project site, some people are concerned with implementation of the Project since there is a primary school adjacent to the site. This Project includes technical assistance for establishing the waste management system/organization in the hospital composing segregation of wastes, disposal method of infectious wastes etc. However, the effort of the

hospital is not enough to protect the environment from negative impacts of medical wastes. For the purpose, the regional democratic council and the town hall are required to have proper understanding toward waste management to be implemented in the hospital and to cooperate with the hospital. The regional democratic council needs to appropriate enough budgets necessary for implementation of the waste management and the town hall needs to take necessary measures for collection of disinfected wastes defused at the hospital.