

#### 4.3.2 Plan for the Distribution of Main Equipment

Details of the main equipment under this project are shown in Table 4-1. It is considered that certain items must be procured from third-party countries because of the ease and reliability of maintenance and the availability of spare parts. The method of procurement is indicated in the "Remark" column as shown below:

A: Procurement from a third-party country should be necessary or advantageous.

B: The item can be procured from Japan.

Table 4-1 List of Main Equipment

Division / Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
1) Radiation Therapy			
Cobalt-60 irradiation unit	Rotary, pendulum, and intermittent irradiation. With counter plate. Max. charge: 9000 ci or more.	As the unit is used for the treatment of various diseases in a general hospital, it must be capable of multi-position irradiation.	A
Intracavity machine remote after loading	Remote control. Radiation source: Cesium-137	The treatment of cancer of the uterus, which is prevailing among Kenyan women, require a remote-controlled irradiator that can introduce concentrated radioactive substance into the body cavity.	A
Superficial X-ray machine	Water or air-cooling system. Capacity: 20-250 kVA (variable)	As the unit is used against both deep and superficial malignant neoplasms, the dose of irradiation must be variable over a wide range. A type having an X-ray tube cooling apparatus is desirable if the unit is operated for a long time.	A
Aquaplast machine (water phantom)	Medium-sized water tank. With separate measurement unit.	Simple standard product.	B
Anesthesia machine	Close circuit type. With Fluothane vaporizer and sphygmomanometer.	Closed circuit type establishes anesthesia economically in a short time.	B

Division / Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
X-ray simulator	With fluoroscopic camera. Capacity: 150 kV, 500 mA or more. 360° rotation of X-ray tube holder.	Because the unit is used for various parts of the body, it must be a high-class model capable of high-power output and fluoroscopic radiography.	A
Treatment planning system	Micro computer-controlled. With software for cobalt-60 irradiation unit and internal radiotherapy unit.	The equipment must be a general purpose unit which can be used with various types of therapeutic equipment.	A
2) Laboratory			
Clinical chemistry analyzer, automatic	Full automatic. Processing speed: 100/hr or more. Number of analysis items: 12 or more.	A full automatic model is preferable, as it can handle many specimens from the general hospital and other medical institutions.	A
Refrigerated centrifuge	Max. revolution: 5,000 r.p.m. Max. capacity: 6,000 ml.	A large capacity is required because a large quantity of blood is treated.	B
Spectrophotometer	Visible light and UV. Micro computer-controlled.	The unit must be a double beam type capable of various types of tests. Calculation capability is essential for high precision results.	B
Tissue embedding system	Paraffin tank: 2 l. With foot switch. Hot plate: 50-70°C.	A high capacity model capable of series processing of melting, cooling, and embedding.	B
Automatic knife sharpener	Automatic (programmable) Accepts both bevel-ground and V-ground knives.	Must be able to sharpen knives for all types of microtomes: rotary, sliding, freezing, etc.	B
CO <sub>2</sub> incubator	Capacity: 100 l or more (x 2 chambers). Automatic control of CO <sub>2</sub> concentration.	A double chamber type, which can handle two different culture conditions, is useful in various examinations. Accurate control of CO <sub>2</sub> concentration is necessary.	B
Double head microscope	Magnification: 1,000 x or more. Plane objective lens.	As it is used chiefly for educational purpose, the optical system must have a high resolution.	B

Division / Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
Blood gas analyzer	Full automatic electrode analysis. Number of analysis items: 4 or more. Number of calculation items: 5 or more.	A model that can derive sufficient data for clinicopathologic examination and respiration management from small samples.	A
Semi-auto clinical chemistry analyzer	Semi-automatic type. Processing speed: 50/hr or more. Number of analysis items: 6 or more.	A semi-automatic model suitable to urgent or spot examination. The number of analysis items can be small.	A
3) Operating Theaters			
Cardiac monitor	Waveform display of ECG, non-invasive blood pressure, and respiration curve. Numerical display of heart rate, blood pressure, temperature, and respiration rate. With protection against electric knife noise.	A model used for general management of intra-operative patients.	A
Respirator	Volume control type. With integrated compressor. Compatible with IMV, CPAP, and PEEP.	A model suitable to the assistance of patients showing spontaneous respiration and those requiring forced ventilation.	A
Artificial heart-lung machine	Non-pulsative roller pump type. Air bubble type or membrane type artificial lung.	A model that is simple in structure and convenient in use.	A
Operating table	With hydraulic elevator. Table-top gear type. Capable of longitudinal and side rotation and lifting the abdominal part.	Standard multi-purpose operating table with foot-controlled elevator. It should be basically maintenance-free.	B
Resuscitation trolley	For doctor's round of visits. With respirator and defibrillator.	Life-saving equipment must be integrated, as it can be used for emergency care of postoperative patients.	B
Broncho fiberscope	Fiberscope type with biopsy forceps and curette.	A fiberscope type that causes little pain of the patient and can be used in peripheral bronchi.	B
Rectoscope	Proximal illumination type. With biopsy forceps.	Economy type which is convenient in use.	B

Division / Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
Cystoscope/urethroscope set	Liner. For direct sight, full oblique sight, and lateral sight. With optical visual tube.	Economy type used in general examination of urinary diseases.	B
Bone surgery instrument set	Porous plate, fix screw, etc.	Standard products.	B
Orthopedic surgery instrument set	With longitudinal and transverse retractor for hip joint.	Standard product that can be used in orthopedic treatment of the hip.	B
Gastric endoscope	Water tank type. With separate measurement instrument.	Simple standard type.	B
4) T. S. S. U.			
Ultrasonic instrument washer	Manual type. Consisting of clensing, rinsing, and drying chambers.	In view of durability, a type requiring manual transfer of instruments between chambers is preferable, although the capacity of treatment is somewhat low.	B
Surgical glove drying and powdering machine	2-chamber type (drying and powdering chambers).	An economy type having 2 chambers completes treatment in a short time.	B
Hot air oven	Electric heater type.	Economy type.	B
5) C. S. S. D.			
Hot air oven	Electric heater type.	Economy type.	B
Ultrasonic instrument washer	Manual type. Consisting of clensing, rinsing, and drying chambers.	In view of durability, a type requiring manual transfer of instruments between chambers is preferable, although the capacity of treatment is somewhat low.	B
Surgical glove drying and powdering machine	2-chamber type (drying and powdering chambers).	An economy type having 2 chambers completes treatment in a short time.	B
6) I. C. U.			
Nurse station central monitoring system (for 8 patients)	Central monitor system Waveform display: ECG, invasive blood pressure, respiration curve. Numerical display: heart rate, blood pressure, temperature, respiration rate.	Standard equipment that can centrally monitor up to 8 patients.	B
Autoclave	Heat source: electricity. Steam replacement type.	Steam sterilization is preferable, as quick and reliable starilization is achieved in a short time.	B

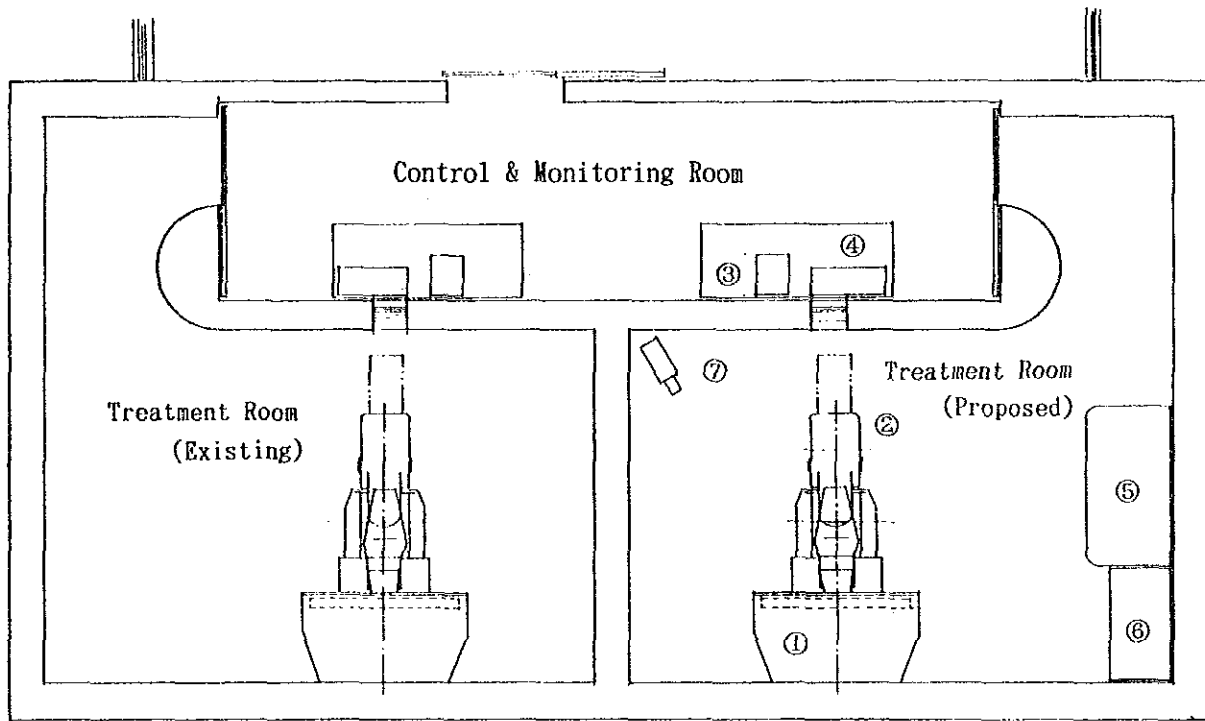
Division / Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
Emergency trolley with defibrillator	For doctor's round of visits. With respirator and defibrillator.	Life-saving equipment must be integrated, as it can be used for emergency care of postoperative patients.	B
7) E. C. G. /Cardiology			
Angio-cardiography system	Single plane type. Polygraph for angiography. Automatic injector for contrast medium. Table hung from the ceiling.	As the system is intended to replace the existing system and is installed in a limited space, I-type X-ray tube is used and the table is hung from the ceiling. The equipment must allow sufficient room for activities.	A
Ultrasound scanner	Sector method. Color doppler type.	Color image display is desirable as it can be used for various cases (intravascular regurgitation, disturbance, occlusion, etc.)	B
8) Renal Unit			
Hemodialysis machine	Individual dialysis. With monitoring apparatus. Single pulse method.	Individual dialysis unit that can be used for the emergency treatment of chronic renal insufficiency, acute renal insufficiency, drug intoxication, etc.	A
Peritoneal dialysis cyclers	With monitoring apparatus.	Standard type used for the treatment of chronic renal insufficiency.	A
Defibrillator	With ECG monitor. Rechargeable battery type.	A portable type with a monitor that can treat a patient in cardiac arrest.	B
9) Biomedical Engineering			
Oscilloscope	80-100 MHz, with memories. Transportable type.	Capable of examining the output functions of image processing unit, etc.	B
Frequency counter	Portable type. 0-10 MHz.	Capable of examining pulses from ECG and other electronic equipment.	B
10) Casualty			
Defibrillator	With ECG monitor. Rechargeable battery type.	A portable type with a monitor that can treat a patient in cardiac arrest.	B

Division / Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
Bedside monitor	Wired ECG monitor. Display: non-fade digital memory type.	A model with memories that permits the observation of continuous changes in the patient's condition.	B
Operating table	With hydraulic elevator. Table-top gear type. Capable of longitudinal and side rotation and lifting the abdominal part.	Standard multi-purpose operating table with foot-controlled elevator. It should be basically maintenance-free.	B
Anesthesia machine	Close circuit type. With Fluothane vaporizer and sphygmomanometer.	Closed circuit type establishes anesthesia economically in a short time.	
Operating room lamp	Multiple lamp type (7-10 lamps). Hung from the ceiling.	Standard type that is convenient in use.	B

### 4.3.3 Layout of the Equipment

The plans in the following pages show the layout of the equipment which is procured under this project and requires installation works.

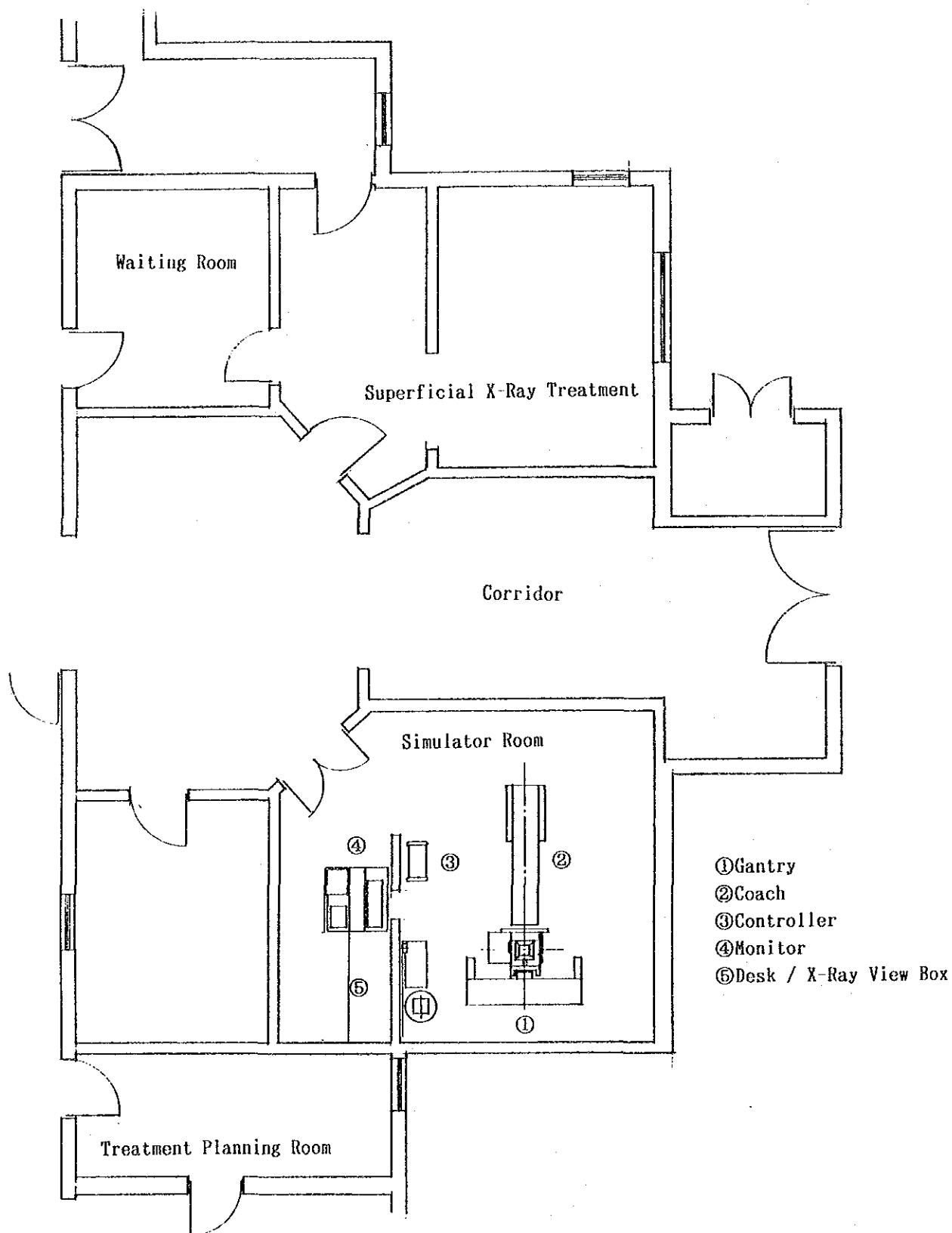
#### RADIOTHERAPY 1



- ① Gantry
- ② Coach
- ③ Monitor
- ④ Controller
- ⑤ Preparation Table
- ⑥ Cabinet
- ⑦ TV Camera

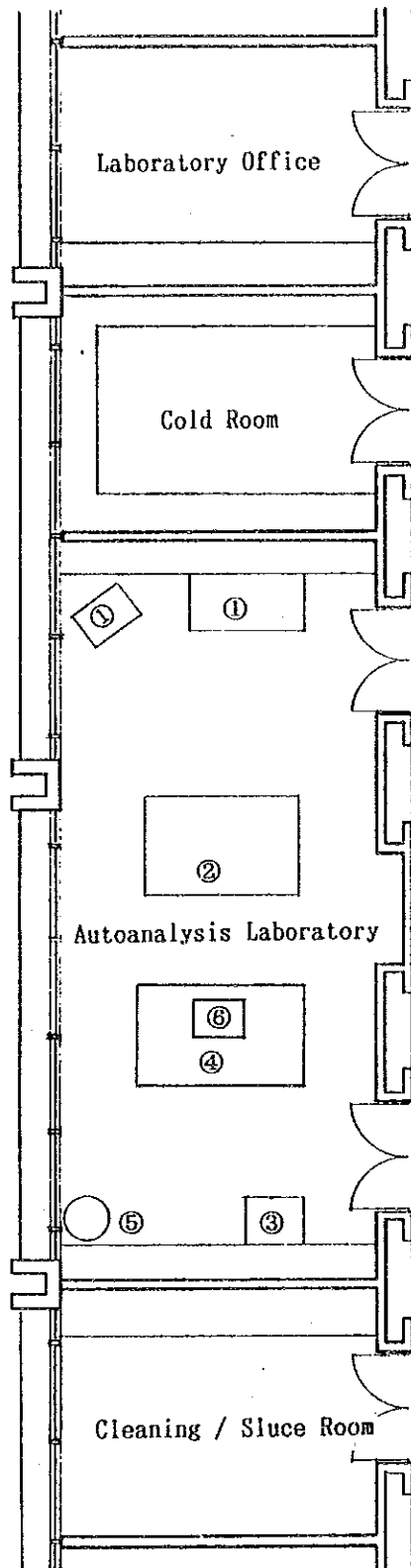
SCALE 0 1 2 3 4 5<sup>m</sup>

RADIOTHERAPY 2

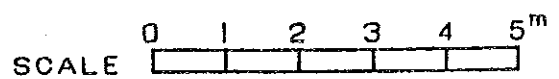




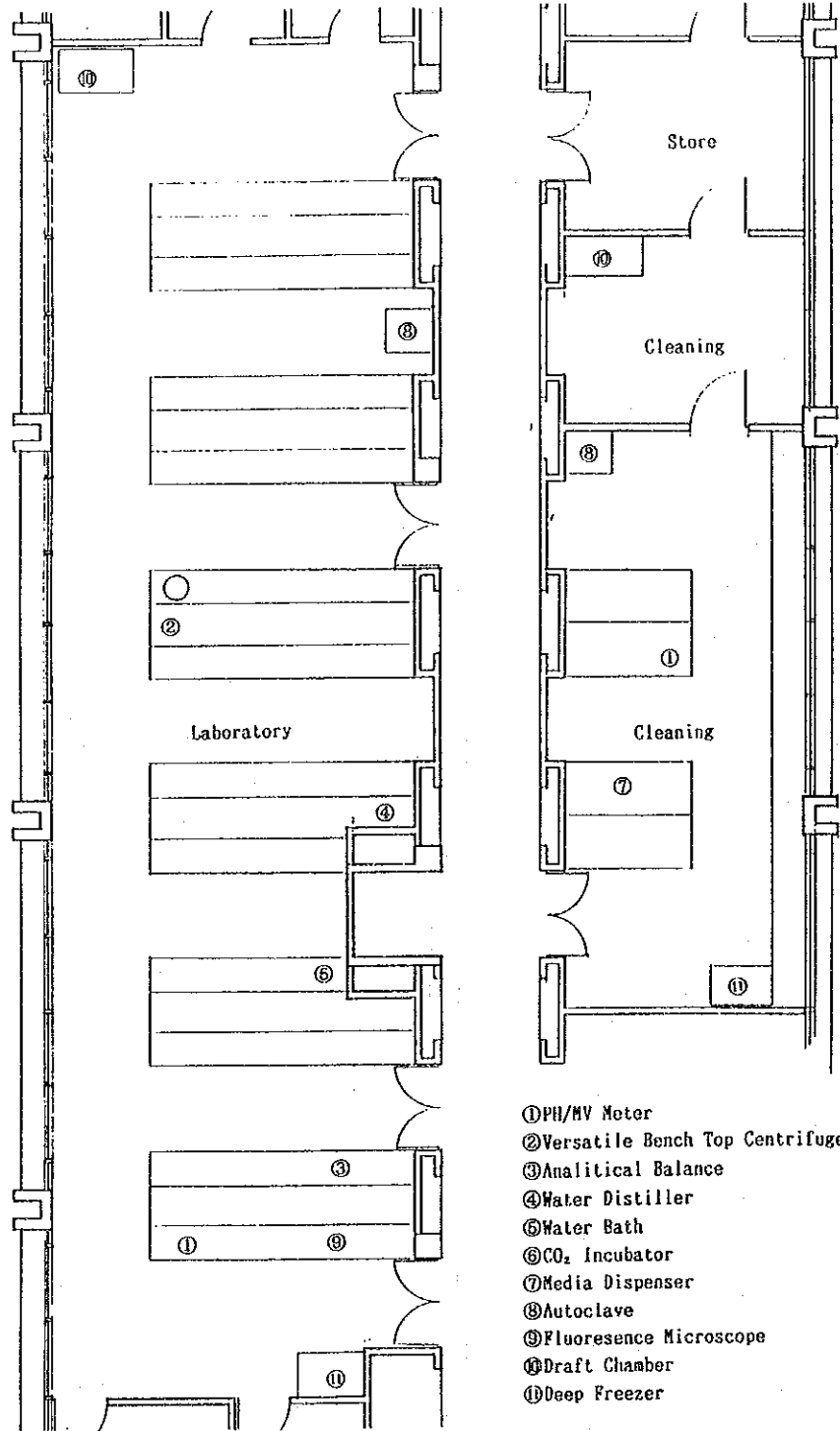
CHEMICAL PATHOLOGY



- ① Clinical Chemistry Analyzer
- ② Clinical Chemistry Analyzer
- ③ Refrigerated Centrifuge
- ④ Analytical Balance
- ⑤ Water Distiller
- ⑥ Electrophoresis

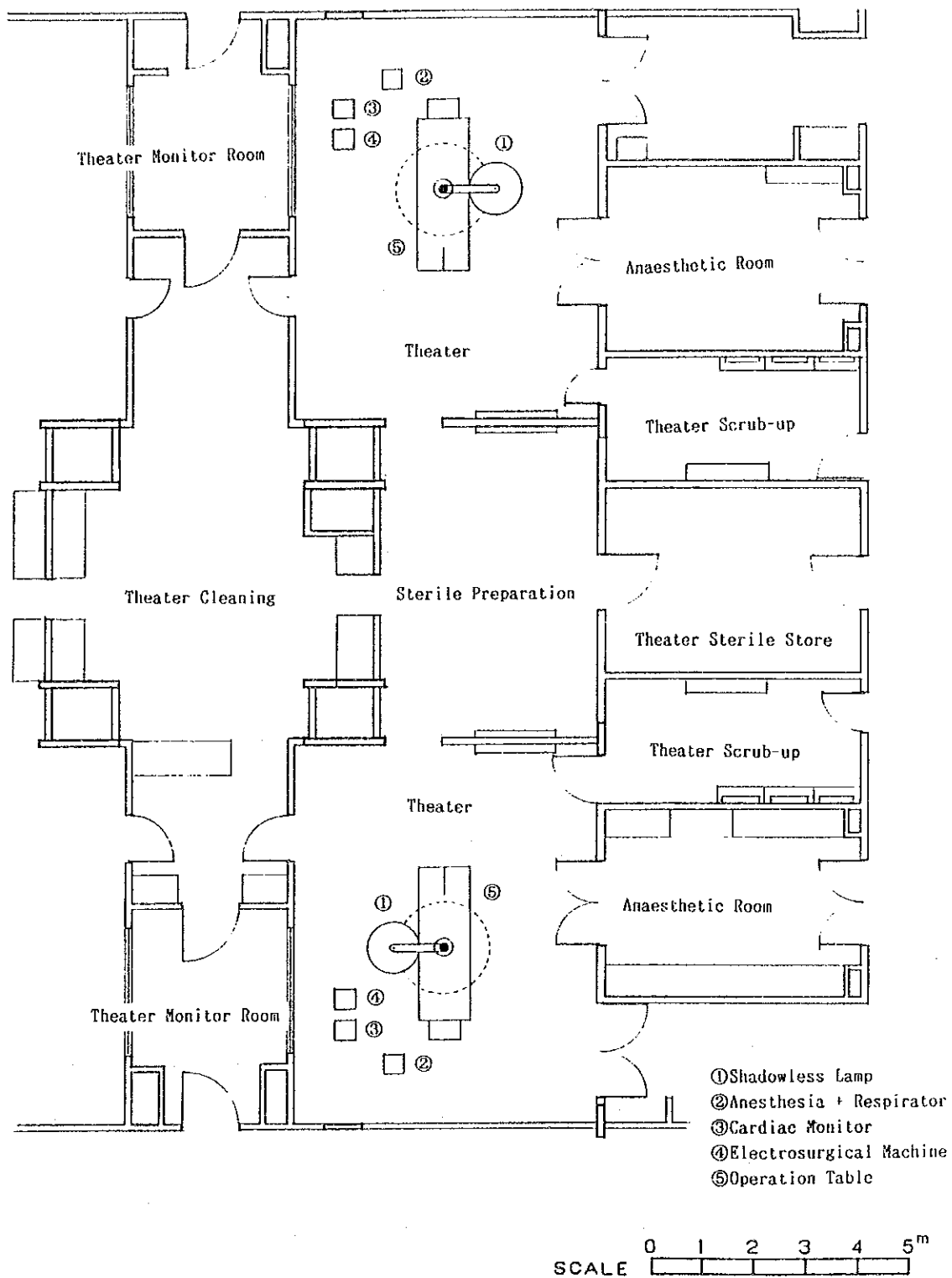


MICROBIOLOGY AND PARASITOLOGY

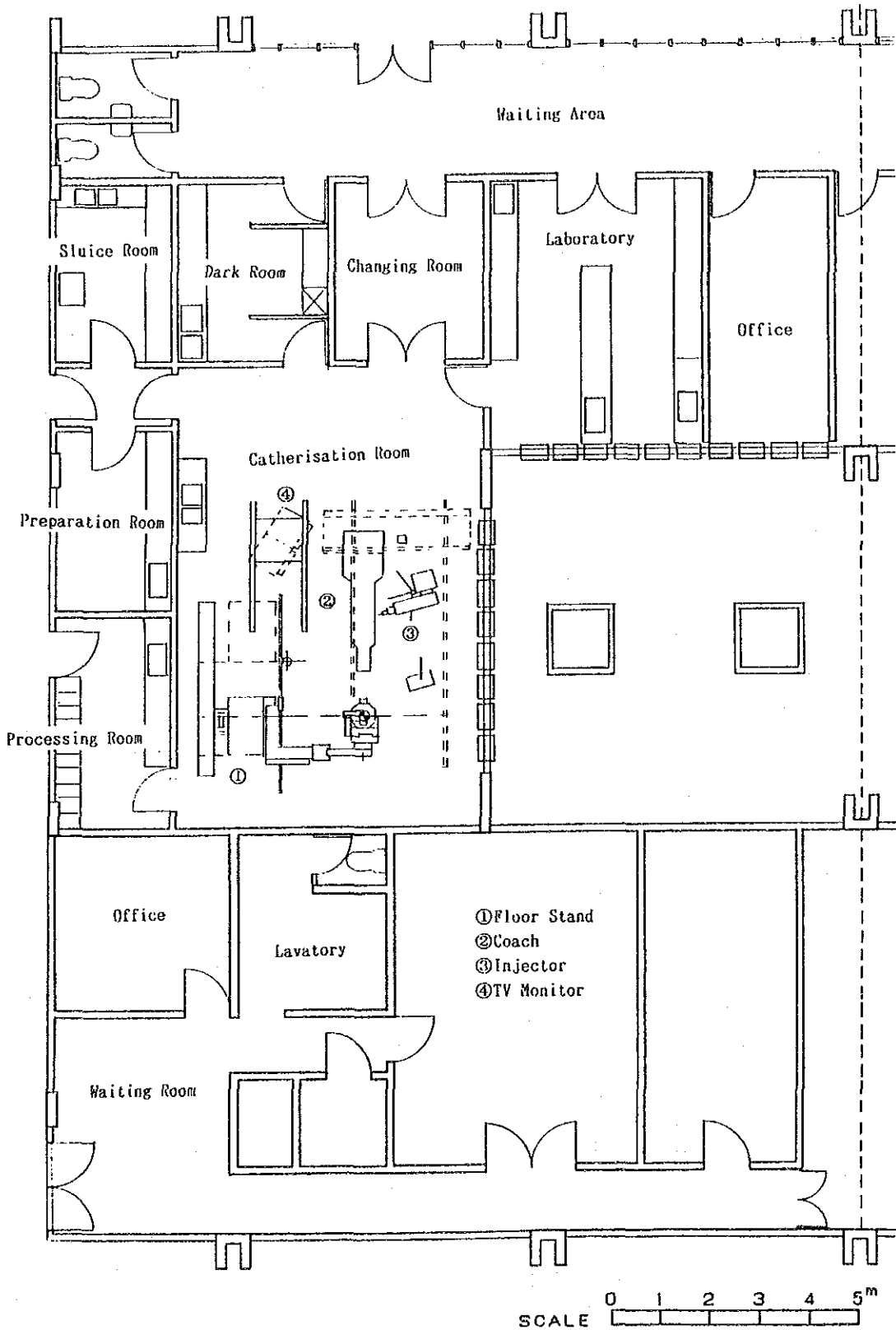


SCALE 0 1 2 3 4 5<sup>m</sup>

THEATERS

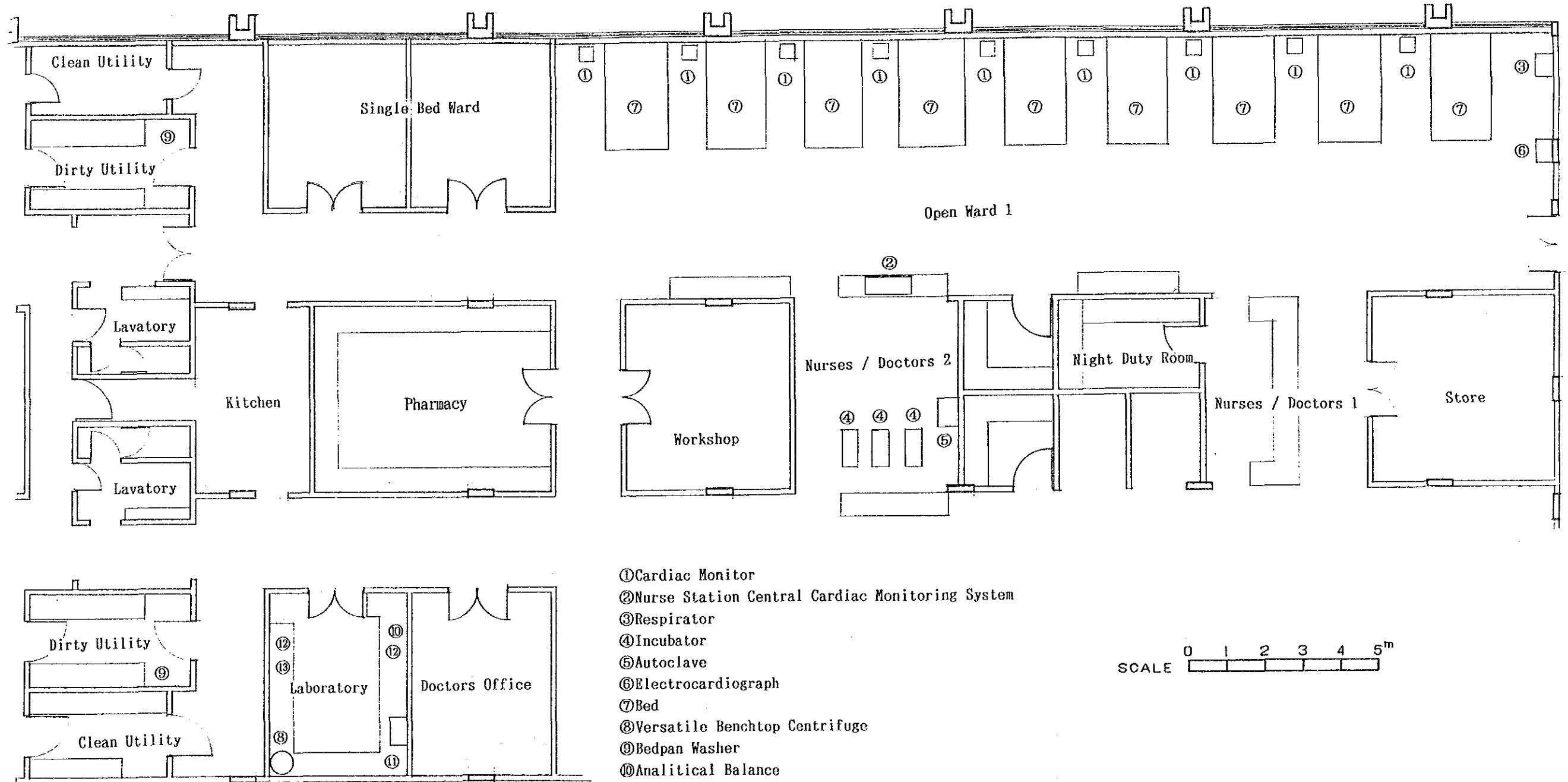


# CARDIO PULMONARY LABORATORY

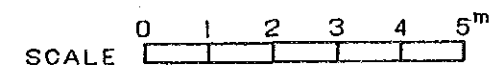




ICU

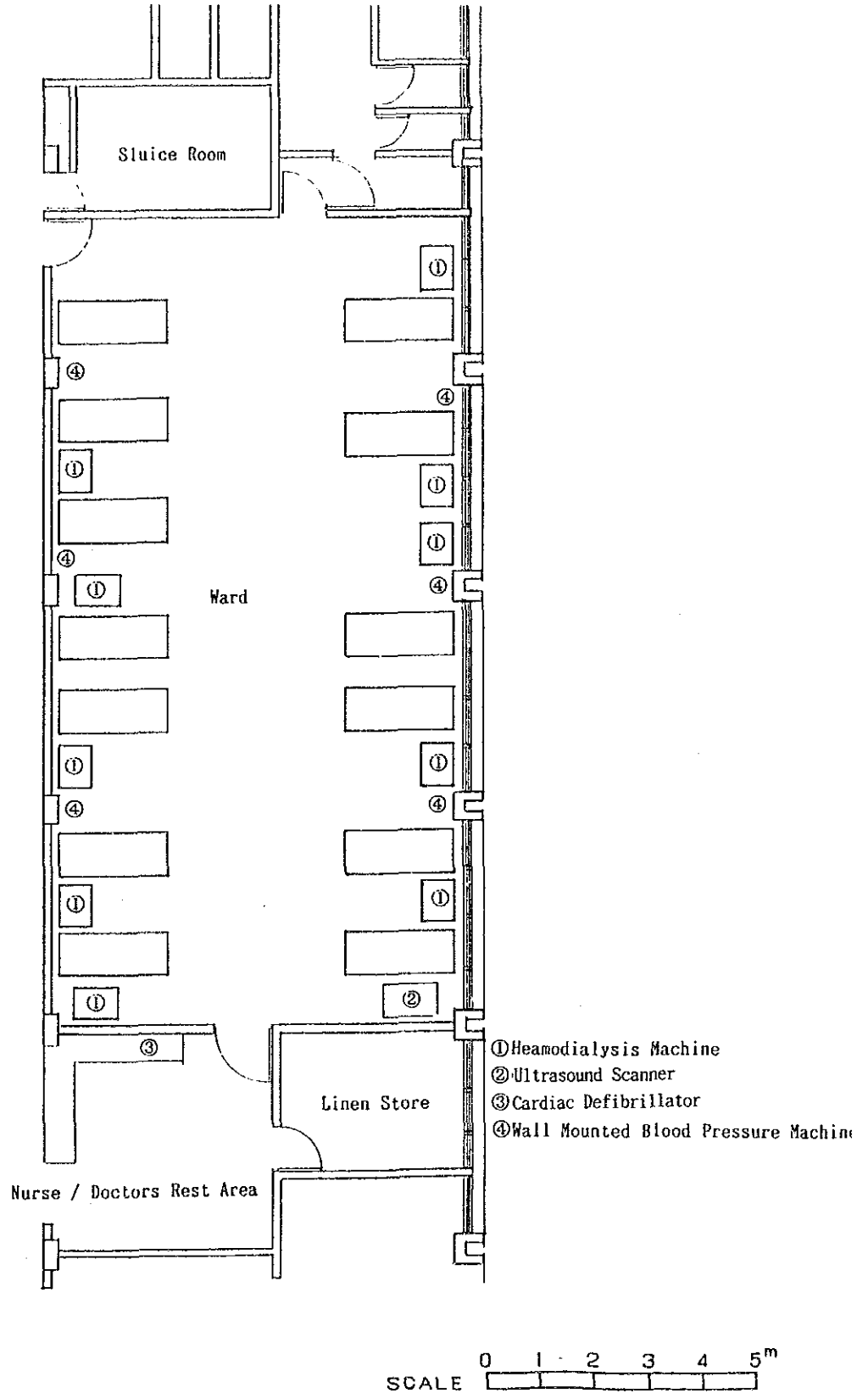


- ① Cardiac Monitor
- ② Nurse Station Central Cardiac Monitoring System
- ③ Respirator
- ④ Incubator
- ⑤ Autoclave
- ⑥ Electrocardiograph
- ⑦ Bed
- ⑧ Versatile Benchtop Centrifuge
- ⑨ Bedpan Washer
- ⑩ Analytical Balance
- ⑪ Hot Air Oven
- ⑫ Automatic Pipette Washer
- ⑬ Electrolyte Analyzer





RENAL





#### 4.4 Project Execution and Management

##### 4.4.1 Project Execution System

###### (1) Implementation Body

Implementation body of this Project is the Ministry of Health, Government of the Kenya. Permanent Secretary of the Ministry who was the representative of the Kenyan side for this project at the time of basic design study, will act as main official in charge and Director of Kenyatta National Hospital will carry out implementation works.

In executing the project, the Ministry of Health shall undertake the following procedures:-

- Conclusion of Consultancy Agreement with a Japanese Consulting Firm which is to undertake detailed design, tendering procedures, supervision of the works for implementation of the project.
- Carrying out tendering by public notice through news paper in Japan according to the tender document, decision of a Japanese firm which supplies and installs the equipment and the conclusion of a Supply Contract with the Japanese Firm.
- Acquisition of the verification from Japanese Government for Consultancy Agreement and Supply Contract.
- Preparation of spaces for the equipment to be installed in proposed hospital.
- Banking arrangement under the Exchange of Notes, payment through the bank according to the agreement and the contract.
- Issuance of various certificates in compliance with the agreement and the contract.

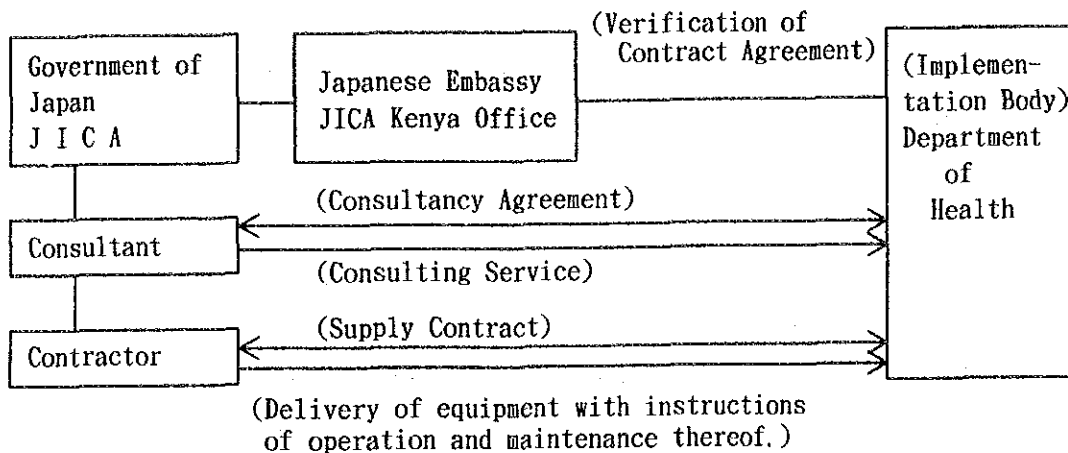
(2) Consultant

In case of implementation of the Project under the Japanese Government's Grant Aid assistance, the Japanese Consultant, in conformity with the consultancy agreement to be concluded on the basis of the procedures of the Japanese Government's Grant Aid System between the implementation body of the Kenyan Government and the Consultant, will render the following consulting services:

- Detailed Design - To execute a detailed design study and to prepare specifications of equipment and other technical documents.
- Tendering - To assist the selection of a Contractor and to cooperate in concluding contract.
- Procurement - To supervise procurement of the equipment and to inspect the equipment prior to shipment thereof.
- Installation - To inspect the equipment delivered to the hospital concerned and to supervise installation works thereof.

(3) Contractor

Contractor shall be responsible for the delivery and installation of the equipment and for the training of personnel concerned on the operation of the equipment. Since some of equipment shall be procured from third countries and also some others installed in place where renovated with Rehabilitation Project cooperated by World Bank. It is necessary for the Contractor, therefore, to ensure smooth implementation of the Project under close coordinations with the Implementation Body. The implementation mechanism is shown in the following chart:



The supply of equipment is performed by a Japanese contractor in conformity with the procedures of the Japanese Government Grant Aid System.

#### 4.4.2 Undertakings of Both Governments

Undertakings of Governments of Japan and Kenya are defined as follows:

##### (1) Undertakings of the Government of Japan

To deliver equipment to Kenyatta National Hospital, install thereof and train the Kenyan personnel concerned which are summarized as follows:

- (a) The equipment to be supplied by the Government of Japan is indicated in 4.3.1 and the proposed sites are indicated in 3.3.2 above.
- (b) All the costs of sea and land transportation of the equipment to the destinations.
- (c) Costs for installation of the equipment.
- (d) Costs for training of the Kenyan personnel concerned on initial test, operation and maintenance of the equipment at the site.

(2) Undertakings of the Government of Kenya

- (a) Provision of space and facilities for the installation of the equipment.
- (b) Provision of utilities such as electricity, gas, water, drainage etc. which are required for the installation of the equipment.
- (c) Provision of storage yard so that the equipment can be safely stored until the installation works be undertaken.
- (d) Assurance of smooth proceedings of unloading and customs clearances in Kenya as well as prompt land transportation to the sites of the equipment.
- (e) Exemption Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Kenya with respect to the supply of the products and services under the Japanese Grant Aid.
- (f) Bearing of charges for the Banking Arrangement (B/A) and Authorization to Pay (A/P).
- (g) Provision of licenses, approval and other authorizations required for the execution of the Japanese Grant Aid.
- (h) Bearing of charges for tax exemption procedures.
- (i) Bearing of costs other than the undertakings of Japanese and Kenyan Government which are necessary for the procurement of equipment under the Project.
- (j) Bearing of the costs for proper and effective operation and maintenance of the equipment to be procured under the Project.

4.4.3 Executing Program

The executing works for this project shall be undertaken with the following implementation policy.

- 1) To undertake sufficient consultations among the pertinent authorities of both Governments of Kenya and Japan as well as the Contractor at the various stages such as the conclusion of the Exchange of Notes, Tendering, selection of the Contractor,

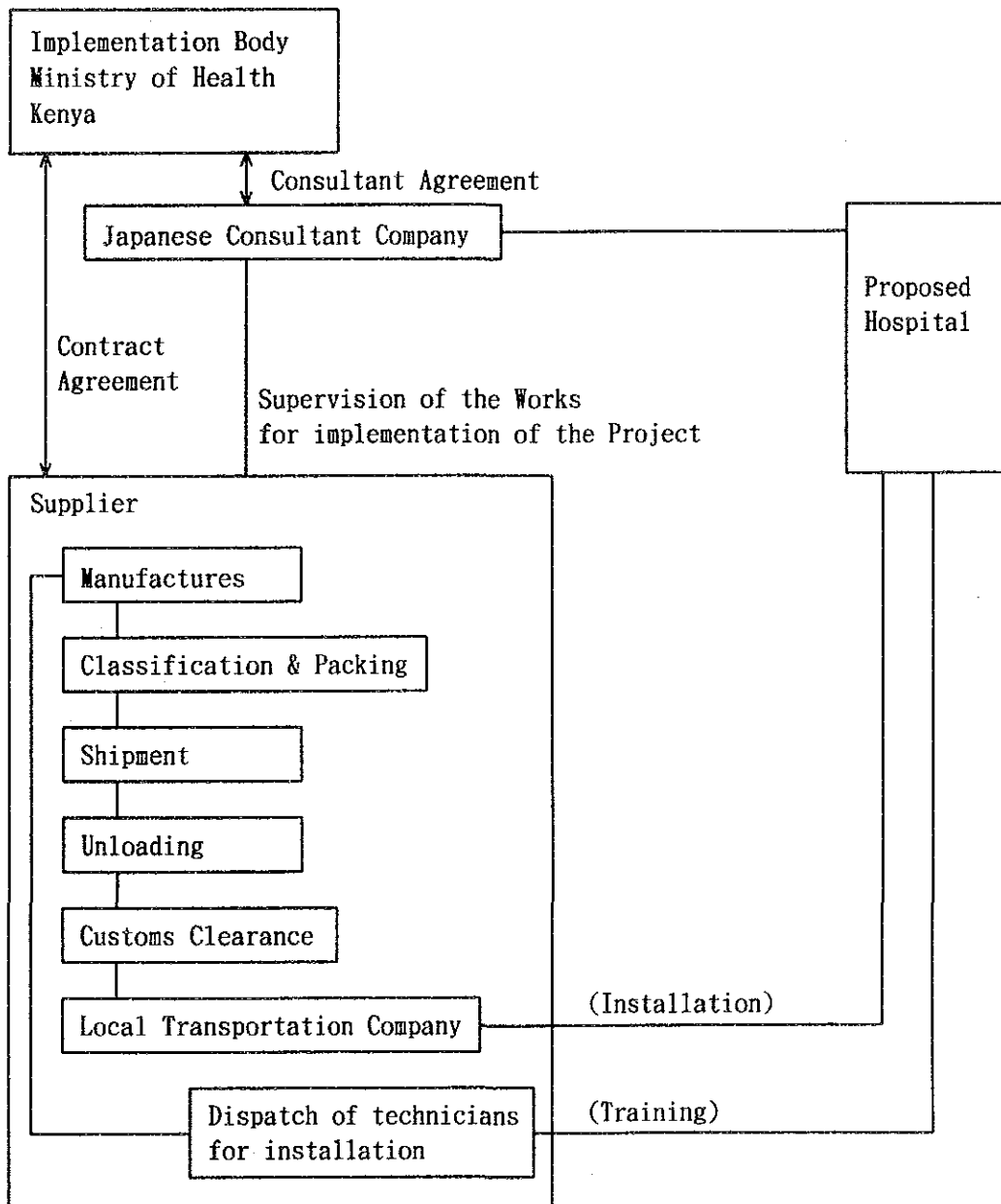
manufacturing schedule of the equipment, inspection at the time of shipment as well as delivery and the payment of the contracted amount so that the Project shall be implemented smoothly. These consultations include formalities to be taken.

- 2) In view of the fact that the proposed facilities are hospital, it is difficult to suspend their routine works for the delivery and installation of the equipment. In order to avoid such a difficult situation, close consultations among personnel concerned on the work schedule etc. shall be undertaken beforehand at the stage of detailed design.
- 3) As for the equipment to be procured in Japan, careful quality control and inspections on the equipment at the times of production and shipment thereof shall be undertaken beforehand in Japan under the direction of the consultant. As for the equipment to be procured from the third countries, the consultant shall advise the contractor that inspection and provisional installation test may be held in the third country if necessary so that the time required for the installation at site shall be observed.
- 4) Regarding the equipment which require installation work, the consultant shall advise the contractor to send manufacturer's technicians for giving guidance in their installations.  
As for the equipment for which the dispatch of the technicians is difficult, the technicians of local agent shall undertake the guidance on behalf of the manufacturer.
- 5) In taking over the equipment, it is necessary for the consultant to undertake final inspection for making sure of the proper implementation of the Project.
- 6) Training course shall be held at the hospital by the contractor in order to give them full knowledge on the operation and

maintenance of the equipment supplied, further orientation for training may be held by the consultant with some equipment to strengthen such courses.

Flow-Chart of the Implementation System is as follows:

Flow-Chart of the Implementation System



#### 4.4.4 Procurement of the Equipment

Procurement of the equipment shall be made in accordance with the following policies:

- (1) In view of the fact that obtaining of Japanese medical equipment with exception of some equipment is comparatively difficult, and also Maintenance System by the manufacturer is not well being established in the Kenya, certain sorts of the equipment shall be procured from third countries. The equipment shall be the products of the manufacturers having their branch offices or agents in Kenya which can render proper after care in addition to installation thereof.
- (2) Such equipment available in Kenya shall be procured locally as much as possible taking the consideration for the specifications, costs and maintenance capabilities of the equipment.
- (3) Local manpower shall be used for the delivery of the equipment to, and installation at the proposed hospital.
- (4) As for the equipment to be procured in Japan and from third countries, since it is estimated to take approximately nine to ten weeks in total, namely four weeks respectively for sea transportation and two weeks for customs clearance, and another three to four weeks for inland transportation of the equipment to the site, the procurement schedule of the equipment should be planned with taking full considerations of the time factor mentioned above.

#### 4.4.5 Execution Schedule

Execution schedule of this Project is prepared based on the procedure of the Japanese Government's Grant Aid and on condition that both related agencies of Japan and the Kenya shall proceed respectively without delay to the necessary works for documentary

procedures as well as equipment procurement.

Implementation schedule of the Project shall be carried out in accordance with the following three steps starting from the date of conclusion of the Exchange of Notes between the both Governments concerned:

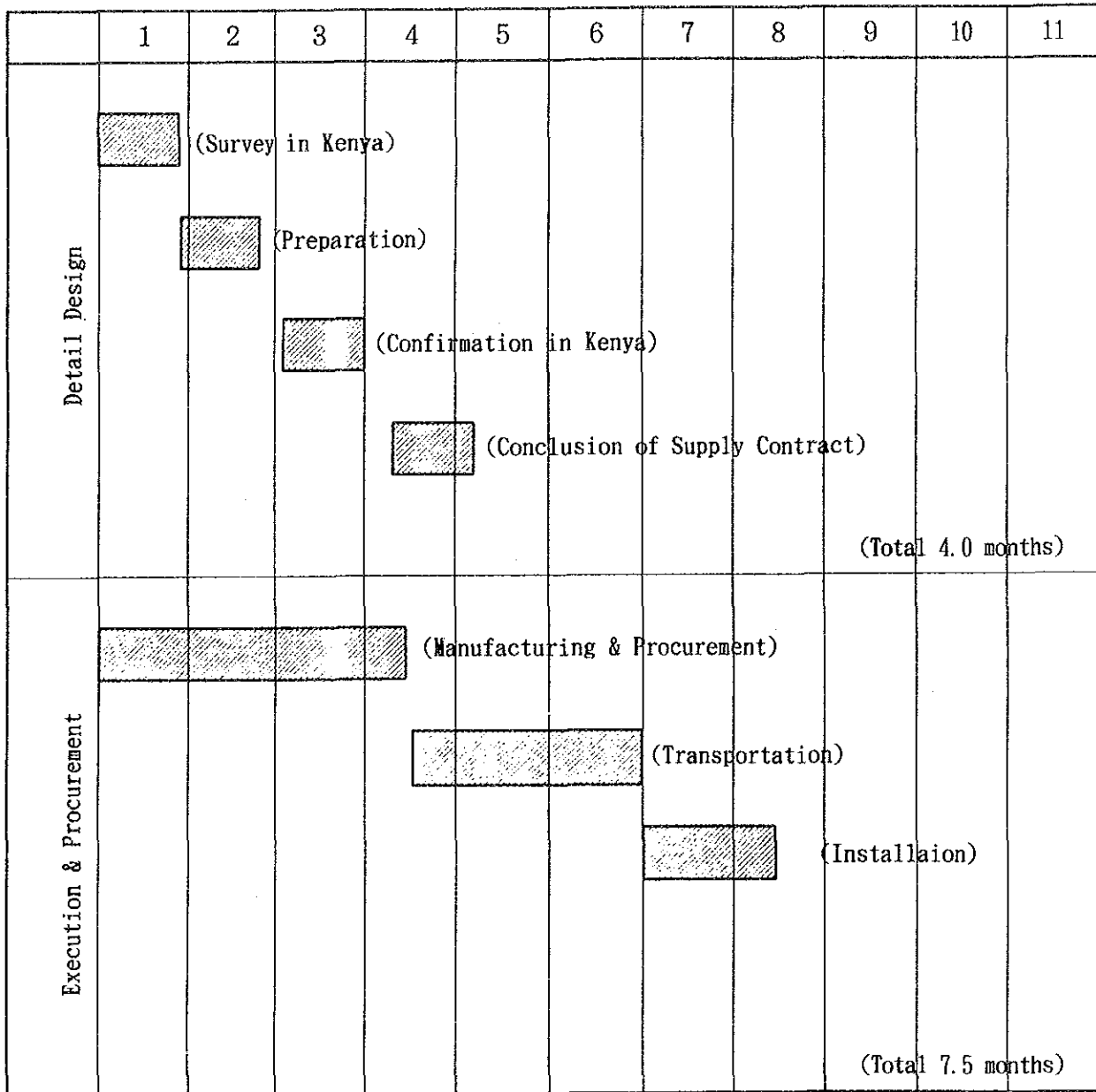
- ① Detailed Design and Tendering : Required for 4.0 months
  - Detailed design after verification of consultancy agreement: 1.7 months
  - Preparation of the Tender Documents and verification thereof: 0.8 months
  - From public notice to tender opening: 1.0 months
  - For evaluation: 0.5 months
  
- ② Implementation of works: Required for 7.5 months
  - Manufacturing of the equipment after conclusion of the Contract Agreement: 3.3 months
  - Customs clearance, sea and inland transportation of the equipment: 2.7 months
  - Installation and orientation by the Contractor and inspection by the Consultant: 1.5 months

Accordingly, this Project shall be completed in about 7.5 months after the conclusion of supply contract. Work Program is shown in Figure 4-1 in the next page.



THE PROJECT FOR IMPROVEMENT OF THE EQUIPMENT OF  
THE KENYATTA NATIONAL HOSPITAL.

Figure 4-1 Executing Works Schedule



**Chapter 5. Effectiveness of the Project  
and Conclusion**



## Chapter 5. Effectiveness of the Project and Conclusion

### 5.1 Project Evaluation

#### (1) Effectiveness of the Project

The following results can be anticipated with the implementation of this project.

##### 1) Direct Effectiveness

Actual state and problem	Measures to be taken in the Project	Effectiveness of the project
<p>1. Although the hospital is ranked the highest among Kenyan medical institutions, renewal and replenishment of equipment have been impeded by long-standing tight economic situation. The hospital in the present condition cannot perform the role as a general hospital. In particular, almost no renewal of advanced equipment has been conducted, and they are showing a considerable loss of performance.</p>	<p>Superannuated and irreparable equipment should be replaced. Equipment having deteriorated functions should be replaced with most up-to-date equipment to improve the efficiency of medical care.</p>	<p>The renewal and replenishment of equipment will re-establish the original capability of the hospital to provide medical care. The function of the hospital as a regional hospital and a general hospital to provide medical care from primary to tertiary care will be restored.</p>
<p>2. Although the hospital has a role of the only institution for the training of medical staff, the equipment is obsolete and not satisfactory for the purpose of medical training.</p>	<p>Equipment suitable to most up-to-date therapeutic and diagnostic techniques should be procured.</p>	<p>The function of hospital as the educational hospital for Nairobi University School of Medicine Medical Training School will be rehabilitated.</p>
<p>3. Recent growth of population and concentration to urban areas have caused serious shortage of medical equipment and the delivery of adequate medical services has become difficult. For this reason, reason, impediment has occurred in the accommodation of patients referred from lower medical institutions.</p>	<p>The equipment which is insufficient in number should be procured to meet the actual size of demand, so that routine medical care activities can be conducted smoothly.</p>	<p>When necessary quantities of equipment has been installed, the hospital will be able to accept referred patients not only from Nairobi area but also rural areas. The hospital will recover the role of the top referral hospital.</p>

This project is intended to assist the important and highest ranked public medical institution where low-income people representing a large part of the Kenyan population can receive the most advanced medical care. The execution of this project will improve the level of advanced medicine in the country, and expand the volume and extent of medical services delivered to the people in Kenya. The population in the service area of this hospital is about 1,427,000 which is as many as about 6% of the total population of Kenya. Thus the hospital has an exceptionally large scale of medical activities. In view of the fact that the hospital is at the top of the referral system, it can be said that the whole population of Kenya (about 23,000,000) is the recipients of the service of this hospital. Therefore, this project is considered to have extremely significant effectiveness.

## 2) Indirect Effectiveness

If the equipment provided under this project is used for the training of medical staff, it will promote the training of doctors, nurses, and paramedical staff, and these specialists will be practicing in all parts of Kenya in the future. Thus this project will improve indirectly the opportunity for the people in Kenya to receive better medical services.

On the other hand, the procurement of new and advanced equipment will improve the efficiency of medical care and increase the capacity of the hospital to accept paid patients. As the result, it is expected that the revenue will be increased and the financial status of the hospital will be improved.

## (2) Appropriateness of the Project

As mentioned above, this project has the direct and indirect effectivenesses and judging from the relationship with the objective and direction of the medical care policy in general it is considered as appropriate that this project will be implemented under Japan's grant aid as described in the followings.

- ① This project is consistent with the objective and direction of health care policy pursued by the Republic of Kenya.
- ② The facility assisted in this project is the largest public hospital in Kenya which has to be responsible from primary health care to tertiary care. However, most of the equipment in this hospital has been superannuated or become obsolete to an unserviceable degree because of the tight financial situation and other reasons. Almost no replacement or replenishment has been conducted for a long time. In this situation, the hospital is suffering from serious impediment in the delivery of daily medical services, and the need for the procurement of equipment is very urgent.
- ③ The equipment planned to be procured under this project is primarily intended to renew and replenish of existing equipment at the hospital. Thus, the maintenance and operation of the procured equipment can be continued by the Kenyan side using the budget, manpower, and technical skills in Kenya.
- ④ This project can be executed in the framework of Japan's grant aid without any difficulty.

## 5.2 Conclusion

As described above, this project is expected to have great effectiveness. At the same time, it is expected to foster medical personnel at large, eventually contributing to the improvement of health care of the people.

In the formulation of this basic design, it has been attempted to generate maximal effectiveness from minimal assistance, based on the examination on the actual conditions and situation of the country. It is possible that this project is executed under the Japan's grant aid, and the project is considered to be consistent with "B.H.N.", which is the aim of such assistance. Because of these reasons, it is concluded that the execution of this project is appropriate.

### 5.3 Recommendations

In order to enhance the effectiveness of this project, it is desirable that the Kenyan side and the Japanese side take the following actions:

#### (1) Recommendations to the Kenyan side

- 1) The reform of the maintenance system should be executed according to the re-organization of operating and maintenance system promoted by the World Bank and the recommendations in Section 3.3.5 of this report.
- 2) A part of the equipment planned to be procured under this project includes equipment for highly advanced therapies. Most of the consumables for such equipment must be imported from overseas countries. A stable system ensuring the availability of these consumables should be established taking consideration for regulations concerned, processes and procedures to obtain these items.
- 3) A part of the equipment procured under this project requires maintenance by the manufacturer and its agent. The maintenance of such equipment is guaranteed for the first one year. Since the maintenance must be continued after the expiration of this period under a maintenance contract with the supplier, the fund to cover the cost of such contract should be prepared by Kenyan side with some budgetary arrangement.
- 4) In order to clarify the effectiveness and problems of this project, it is recommended that the activities information of the divisions involved in this project may be submitted to the Japanese side at intervals of 6 months.

#### (2) Recommendations to the Japanese side

- 1) In order to enable more effective use of the equipment procured under this project, it is recommended that Japanese expert in

charge of maintenance may be sent to the project site. The expert need not be specialist in a particular area of technology, but should have full and wide knowledge and expertise in medical equipment.

- 2) In order to induce the self-help effort of the Kenyan side concerning the maintenance of equipment, it is recommended that the personnel of Kenyatta National Hospital in charge of the maintenance of medical equipment (biomedical engineer) may be invited to Japan to promote technology transfer in the maintenance and repair of medical equipment.





## APPENDIX



## Appendix 1 Member List of Survey Team

### 1-1 Basic design study team

Dr. Katsuhiro YOSHITAKE	Team Leader Department of International Cooperation, National Medical Center Hospital Ministry of Health and Welfare
Ms. Noriko SUZUKI	Grant Aid Planner First Basic Design Study Division, Grant Aid Study & Design Department Japan International Cooperation Agency (JICA)
Mr. Shin-ichi KIMURA	Medical Equipment Planner I Senior Consultant Medical and Laboratory Equipment Binko Ltd.
Mr. Taturō NAKAJIMA	Medical Equipment Planner II Senior Consultant Medical and Laboratory Equipment Binko Ltd.
Mr. Yasuaki KAWABE	Facilities Planner Utilities and Facilities Consultant Binko Ltd.
Mr. Kenji IWASAKI	Operation and Maintenance Planner Technical Advisor Binko Ltd.
Mr. Hiroaki NARITA	Cost Estimator Consultant Division Binko Ltd.

### 1-2 Draft final report explanation team

Dr. Katsuhiro YOSHITAKE	Team Leader Department of International Cooperation, National Medical Center Hospital Ministry of Health and Welfare
Mr. Tatsuzo KATO	Grant Aid Planner General Affairs Division, Tokyo International Center Japan International Cooperation Agency (JICA)
Mr. Shin-ichi KIMURA	Medical Equipment Planner I Senior Consultant Medical and Laboratory Equipment Binko Ltd.
Mr. Kenji IWASAKI	Operation and Maintenance Planner Technical Advisor Binko Ltd.

Appendix 2. Survey Schedule

The Project for the improvement of the equipment for KNH

Survey schedule Apr. 3, 1992 - May 2, 1992

	Month/Day	Time	Contents of Survey		
1	Apr. 3 (Fri)	11:00 15:50	Narita Dep. (BA-006) — London Arr.		
2	4 (Sat)	10:45	London Dep. (BA-069) — Nairobi Arr.		
3	5 (Sun)		Collection of Related Data		
4	6 (Mon)		(Ramadan-holiday) Internal meeting		
5	7 (Tue)	9:00 10:00 11:30 14:30 16:30	Courtesy call on JICA office: orientation regard as project Courtesy call on MOH: Meeting with Permanent Secretary Courtesy call on Ministry of Finance: Meeting with Duputy secretary Courtesy call on KNH Meeting with Director Internal Meeting		
6	8 (Wed)	10:00	Courtesy call on Embassy of Japan		
		11:00	Visit World Bank: Meeting about rehabilitation plan		
		14:30	Team A(government member + consultant A)	Time	
		14:30	Meeting with KNH Director	14:30	Survey of casualty
				15:00	Syrvy of Laboratory
7	9 (Thu)	9:00	Meeting with KNH		
		10:00	Survey of Jerico health center		
		11:30	Survey of Langada health center		
		14:30	Survey of Machacos provincial hospital		
		8:15	Survey of KNH •Radiation therapy •C. S. S. D.		
8	10 (Fri)	9:00 10:30 14:30	Meeting with KNH Visit USAID: Meeting about rehabilitation plan Survey of KNH: Pediatrics, Radiation therapy		
9	11 (Sat)		Collection of related data		
10	12 (Sun)		Collection of related data		
11	13 (Mon)	8:15	Meeting with KNH Director		
		16:00	Signature of Minutes (In MOH)		
			Government member	Time	Consultant member
12	14 (Tue)	11:00	Government member departure Nairobi dep. (LH-581) — Frankfurt Arr.		
		8:15	Survey of KNH •Cytology •Systology •Loutine Lab.		
13	15 (Wed)	17:30	Frankfurt dep. —		
		8:15	Survey of KNH •Microbiology •Immunology •Hitopathology		
14	16 (Thu)	11:45	Narita arr.		
		8:15	Survey of KNH •Clinical chemistry •Pathology •Survey of local agent		

	Month/Day	Time	Contents of Survey
15	Apr. 17 (Fri)	8:00 10:00 14:30 15:00	Survey of Operation theater, KNH •Survey of I. C. U. •Survey of Loutine Lab. •Survey of Radiation therapy
16	18 (Sat)		Collection of related data
17	19 (Sun)		Collection of related data •Internal meeting
18	20 (Mon)	8:00 14:00	Survey of ECG/Cardiology Survey of Infection ward
19	21 (Tue)	8:00 8:30 14:00 17:00	Some consultant member leave for Japan, Nairobi dep. (LH-581) } Frankfurt Survey of Dialysis in KNH Meeting with KNH representatives Intermediate call on JICA office
20	20 (Wed)	8:00 10:00 11:00 12:00 14:30	Survey of C. S. S. D., KNH Survey of T. S. S. U., KNH Survey of local Agent Meeting with consultant of World Bank Meeting about contents of KNH equipment (operation theater)
21	23 (Thu)	8:30 9:30 14:30	Meeting with KNH representatives Meeting with World Bank consultant about implementation schedule Meeting about contents of KNH equipment (Laboratory)
22	24 (Fri)	8:30 11:00 14:30 16:00	Meeting about contents of KNH equipment (Laboratory) Survey of Agakarn Hospital Meeting about contents of KNH equipment (Casualty) Meeting with World Bank consultants and hospital maintenance dep. representatives
23	25 (Sat)		Collection of related data
24	26 (Sun)		Collection of related data
25	27 (Mon)	8:30 14:00	Meeting with KNH representatives Survey of Jomo Kenyatta University
26	28 (Tue)	8:20 9:30 11:00 14:00 15:00 16:30	Meeting with KNH representatives Meeting with World Bank consultant Meeting with local Agent Survey of Nairobi Hospital Survey of M. P. Shar Hospital Meeting with hospital maintenance dep., KNH
27	29 (Wed)	8:30 11:00 14:00 15:30	Survey of Radiation therapy, KNH Meeting with representatives, KNH Report of survey to KNH Deputy Director Report of survey to JICA Office
28	30 (Thu)	11:15 19:50	Nairobi dep. (SR-293) ———— Zurich arr.
29	May 1 (Fri)	12:45	Zurich dep. (SR-166) ————
30	2 (Sat)	7:45	————— Narita arr.

The project for the improvement of the equipment for the KNH

Draft final report explanation survey schedule : Aug. 4, 1992~Aug. 10, 1992

	Month/Day	Time	Contents of survey	
1	8 / 4(Tue.)	12:00 18:10	Narita dep. (AF-257)	Paris arr.
2	5(Wed.)	20:30	Paris dep. (AF-452)	Nairobi arr.
3	6(Thu.)	7:15 9:30 11:00 14:00 15:00 17:30	Courtesy call on JICA office: Orientation regarding the project. Courtesy call on Embassy of Japan. Courtesy call on Ministry of Finance: Meeting with Deputy secretary. Courtesy call on MOH: Meeting with Permanent secretary. Internal meeting	
4	7(Fri.)	8:30 14:00	Courtesy call on KNH: Meeting with Director. Visit World Bank: Meeting about rehabilitation plan.	
5	8(Sat.)	9:00	Meeting with KNH.	
6	9(Sun.)		Collection of related data.	
7	10(Mon.)	8:15	Meeting with KNH Director.	
8	11(Tue.)	10:00	Signature of Minutes. Meeting with World Bank.	
9	12(Wed.)	00:55	Nairobi dep. (SR-293)	Consultant: 1 person 11:00 Amsterdam dep. → Frankfurt → Nurnberg
10	13(Thu.)	12:45	Zurich dep. (SR-166)	15:00 Survey of Medical Equip. Mfg. 7:00 Nurnberg dep. → Toronto 18:00 Toronto → Ottawa arr.
11	14(Fri.)	7:45	Narita arr.	10:00 Survey of Medical Equip. Mfg.
12	15(Sat.)	15:30 20:18	Ottawa dep.	Washington arr.
13	16(Sun.)	15:05	Washington dep. (NH-001)	Narita arr.
14	17(Mon.)	18:00		Narita arr.

### Appendix 3 Interviewed Person List

#### EMBASSY OF JAPAN

Mrs Ginko Sato	Ambassador Extraordinary and Plenipotentiary
Mr. Shigeru Takahara	First Secretary
Mr. Makoto Yoshitani	Second Secretary and Medical Attache'

#### JICA KENYA OFFICE

Mr. Masaru Morimoto	Resident Representative
Mr. Tsuneo Takahata	Deputy Resident Representative
Mr. Yoshiyuki Takahashi	Staff Member
Mr. Kouji Makino	Staff Member

#### MINISTRY OF HEALTH

Mr. Daniel Mbiti	Permanent Secretary MOH
Mr. George K. Githae	Deputy Secretary, MOH
Mr. Benard Kirult	Personal Assistant

#### MINISTRY OF FINANCE

Mr. B.J.O. Makosewe	Deputy Director External Resources Dept.
Mr. C.I. Shakaba	Desk Officer ERD
Mrs D. Musau	Asst D. Officer ERD

#### KENYATTA NATIONAL HOSPITAL

Dr. Naftali Agata	Hospital Director
Dr. J. Meme	New Hospital Director
Dr. Augustine K. Multa	Deputy Director/Physician & Cardiologist
Dr. Cleopa Mailu	Casualty Manger
Dr. Barasa Otsyula	Chairman Division of Surgery
Dr. Frank Mwongera	Chairman Renal Services
Dr. C.J.N. Omondi	Chairman Division of Anaesthetist/ICU
Dr. Allan Kisia	Chief Anaesthetist
Dr. Heywood Aseso	Chief Cardiologist
Prof. Francis Orinda	Chairman Laboratory Services
Dr. Julius Onyango	Chairman Division of Radiology



Mr. P.J. Ngugi	Hospital Engineer
Mr. Danus Walume	Bio-medical Engineer
Mr. Joseph O. K'kwaka	Public Relations Officer
Mr. Ole Ursin	Consultant Engineer of World Bank
Mr. Wilson G. Noreh	Planning Manager/Projects Coordinator
Mrs Rachel Gesami	Deputy Planning Manager
Mrs Susan I Kui	Medical Records Officer
Mrs Lucia Wangome	Chief Nurse
Mrs Theodora Aseto	Casualty Matron
Mrs Perpetua Kisebu	Theatre Matron
Mrs Winnie Musumba	Renal Matron

WORLD BANK

Mr. Macgregor	Project Coordinator
Mr. Ole Ursin	Consultant Engineer

USAID

Dr. Danel Kraushaar	Chief of Party
Mr. David Collins	Coordinator

WHO

Mr. Mike Asante	Administration Officer
-----------------	------------------------

JOMO KENYATTA UNIVERSITY COLLEGE OF AGRICULTURE AND TECHNOLOGY

Mr. Noicu Boro	Chief of Scientific Engineer Division
Mr. Takahiko Sugiyama	Project Team Leader
Mr. Takeaki Sato	Assistant Team Leader

THE AGA KHAN HOSPITAL

Mr. Naphtaley N. Mugo	Assistant Director
-----------------------	--------------------

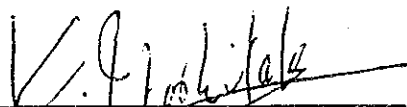
MINUTES OF DISCUSSIONS  
ON  
THE BASIC DESIGN STUDY ON THE PROJECT FOR  
THE IMPROVEMENT OF THE EQUIPMENT FOR  
THE KENYATTA NATIONAL HOSPITAL  
IN  
THE REPUBLIC OF KENYA

Based on the results of the Preliminary Study, the Japan International Cooperation Agency (JICA) decided to conduct a Basic Design Study on the Project for the Improvement of the Equipment for the Kenyatta National Hospital (hereinafter referred to as "the Project").

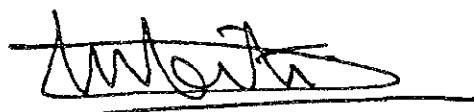
JICA sent to the Republic of Kenya a study team, which is headed by MD. Katsuhiko Yoshitake, Department of International Cooperation, National Medical Center Hospital, Ministry of Health and Welfare from April 4 to 30, 1992. The team had a series of discussions with the officials concerned of the Government of Kenya and conducted a field survey at the study area.

As a result of discussions and field survey, both sides have confirmed the main items described in the attached sheets. The team will proceed to further works and prepare the Basic Design Study Report.

Nairobi, April 13, 1992



MD. Katsuhiko Yoshitake  
Leader  
Basic Design Study Team  
JICA



Mr. Daniel M. Mbiti  
Permanent Secretary  
Ministry of Health  
The Republic of Kenya

ATTACHMENT

1. Objective

The objective of the Project is to improve the medical services at the Kenyatta National Hospital by procurement of the necessary equipment for the following activities.

- 1.1 Clinical services as a national referral hospital
- 1.2 Educational and Training services for medical and health personnels

2. Project Site

The Project site is in the Kenyatta National Hospital.

3. Executing agency

Kenyatta National Hospital is responsible for the administration and execution of the Project under the jurisdiction of the Ministry of Health.

4. Items requested by the Kenya side

The following items were finally requested by the Kenya side in order of priority.

- 4.1 Procurement of Equipment for Diagnostic Laboratories
- 4.2 Procurement of Equipment for Operating Theater
- 4.3 Procurement of Equipment for T.S.S.U.
- 4.4 Procurement of Equipment for C.S.S.D.
- 4.5 Procurement of Equipment for Bio-medical Engineering  
/Maintenance
- 4.6 Procurement of Equipment for Intensive Care Unit
- 4.7 Procurement of Equipment for Radiotherapy Department
- 4.8 Procurement of Equipment for Cardiology Department
- 4.9 Procurement of Equipment for Renal Unit
- 4.10 Procurement of Equipment for Casualty
- 4.11 Procurement of Spares for the equipment mentioned above

*K. G. J.*

*Amn*

5. Comments by the Japanese side on the requested items mentioned in 4. above

5.1 The Japanese side will review the necessary equipment for the Project according to the priority order proposed by the Kenya side with due consideration to the implementation schedule of the Project for Rehabilitation of the Kenyatta National Hospital financed by the World Bank.

5.2 The final components of the Project may differ, when considered necessary after further studies in Japan.

6. Japan's Grant Aid system

6.1 The Kenya side understands the system of Japan's Grant Aid as explained by the team.

6.2 The Kenya side will take necessary measures, as described in Annex for the smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

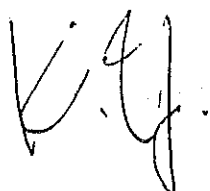
7. Maintenance and Operation of the Equipment

The Kenyatta National Hospital will establish and implement the maintenance and operation system for the equipment at levels satisfactory to Japan.

In this connection, the Kenyatta National Hospital will assure the adequate provision of funds for maintenance and operation in the recurrent budget.

8. Other relevant issues

On condition that Japan's Grant Aid is extended to the Project, the Kenyatta National Hospital will maintain adequate performance and utilization data on the major items of the equipment included in the Project. And these data will be submitted annually to the Japanese side.



9. Schedule of the Study

- 9.1 The consultants will proceed to further studies in Kenya until April 30, 1992.
- 9.2 Based on the Minutes of Discussions and the results of the study, JICA will compile a draft report and dispatch a mission in order to explain its contents in August 1992.
- 9.3 Upon approval of the said draft report by the Kenya side, JICA will complete the final report and submit it to the Government of Kenya and the Government of Japan around September 1992.

10. Technical Cooperation

The Kenya side requested the dispatch of Japanese experts and the acceptance of trainees in Japan in the field of Bio-medical Engineering.


*K. J.*

*Imm*

Annex

Necessary measures to be taken by the Government of Kenya on condition that Japan's Grant Aid is extended:

1. To provide the land for temporary site office, warehouse and stock yard during the implementation period
2. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in Kenya, and prompt internal transportation of imported materials and equipment for the Project
3. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Kenya with respect to the supply of the products and services under the verified contracts
4. To accord Japanese Nationals, whose services may be required in connection with the supply of products and the services under the verified contracts, such facilities as may be necessary for their entry into Kenya and stay therein for the duration of their work
5. To use and maintain properly and effectively all the equipment purchased under the Grant
6. To bear all the expenses other than those to be borne by the Grant, necessary for the procurement of the equipment as well as for the transportation and the installation of the equipment



MINUTES OF DISCUSSIONS  
ON  
THE BASIC DESIGN STUDY ON THE PROJECT FOR  
THE IMPROVEMENT OF THE EQUIPMENT FOR  
THE KENYATTA NATIONAL HOSPITAL  
IN  
THE REPUBLIC OF KENYA  
(CONSULTATION ON DRAFT REPORT)

In April 1992, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the Project for Improvement of the Equipment for the Kenyatta National Hospital (hereinafter referred to as "the Project") to the Republic of Kenya, and based on the discussions with the Kenya side and the examination of the results of the field survey, JICA has prepared the draft report of the study.

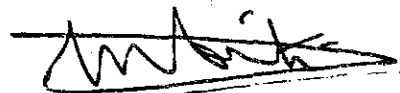
In order to explain and discuss the contents of the draft report, JICA sent to Kenya a study team, which is headed by M.D. Katsuhiko Yoshitake, Department of International Cooperation, National Medical Center Hospital, Ministry of Health and Welfare from August 6 to 11, 1992.

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

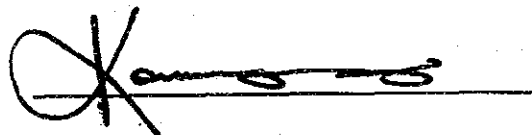
Nairobi, August 11, 1992



M.D. Katsuhiko Yoshitake  
Leader  
Draft Report Consultation Team  
JICA



Mr. Daniel M. Mbiti  
Permanent Secretary  
Ministry of Health  
The Republic of Kenya



Permanent Secretary/  
Finance Secretary  
Office of The Vice  
President and  
Ministry of Finance  
The Republic of Kenya

## ATTACHMENT

### 1. Contents of the Draft Report

The Kenya side has agreed and accepted in principle the contents of the Draft Report proposed by the team.

### 2. Japan's Grant Aid system

2.1 The Kenya side understands the system of Japan's Grant Aid as explained by the team.

2.2 The Kenya side will take necessary measures described in the Annex I for the smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

### 3. Maintenance and Operation of the Equipment

3.1 The Kenyatta National Hospital (KNH) will establish and implement the maintenance and operation system for the equipment at levels satisfactory to Japan, as is proposed in the Draft Report.

In this connection, the KNH will assure the adequate provision of funds for maintenance and operation in the recurrent budget in accordance with Annex III .

3.2 On condition that the Grant Aid by the Government of Japan is extended to the Project, the Kenya side will conclude maintenance contracts with the manufacturers on the equipment described in the Annex II after the one year guaranty by the manufacturers.

### 4. Other relevant issues

On condition that Japan's Grant Aid is extended to the Project, the KNH will maintain adequate performance and utilization data on the major items of the equipment included in the Project. And these data will be submitted annually to the Japanese side.

K. G. J.



5. Schedule of the Study

JICA will complete the final report with the confirmed items, and submit it to the Government of Kenya and the Government of Japan around September 1992.

6. Technical Cooperation

The Kenya side requested the dispatch of Japanese experts and the acceptance of trainees in Japan in the field of Bio-medical Engineering.

K-fj

Annex I

Necessary measures to be taken by the Government of Kenya on condition that Japan's Grant Aid is extended:

1. To provide the land for temporary site office, warehouse and stock yard during the implementation period
2. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in Kenya, and prompt internal transportation of imported materials and equipment for the Project
3. To ensure exemption of customs, internal taxes, value added taxes and other fiscal levies for unloading, customs clearance, inland transportation of imported equipment for the Project
4. To conclude a Banking Arrangement (B/A) with an authorized Japanese foreign exchange bank and bearing the necessary commissions to the Japanese foreign exchange bank for the banking services based upon the B/A
5. To issue necessary Authorization(s) to Pay (A/P) and bearing the necessary payment commissions for A/P based upon the B/A
6. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Kenya with respect to the supply of the products and services under the verified contracts
7. To accord Japanese Nationals whose services may be required in connection with the supply of products and the services under the verified contracts such facilities as may be necessary for their entry into Kenya and stay therein for the performance of their work



8. To use and maintain properly and effectively all the equipment purchased under the Grant
9. To bear all the expenses other than those to be borne by the Grant, necessary for the procurement of the equipment as well as for the transportation and the installation of the equipment

K.G.

*[Handwritten signature]*

Annex II

The Kenya side will conclude the maintenance contracts with the manufacturers on the following equipment.

1. Cobalt 60 Radiation Unit
2. X-ray Simulator
3. Intracrability Machine
4. Superficial X-ray Machine
5. Hemodialysis Machine
6. Peritoneal Dialysis Cyclers
7. Central Monitoring System
8. Angiocardiography System
9. Auto Clinical Chemistry Analyzer
10. Blood Gas Analyzer
11. Clinical Chemistry Analyzer
12. Sodium & Potassium Analyzer

K.H.

MINISTRY OF HEALTH

Telegrams: "MINHEALTH, Nairobi

Telephone: Nairobi 718870

When replying please quote

Ref. No. ....

and date



AFYA HOUSE  
CATHEDRAL ROAD  
P.O. Box 30016  
NAIROBI

....., 19.....

ANNEX III

**THE IMPROVEMENT OF THE EQUIPMENT  
FOR KENYATTA NATIONAL HOSPITAL**

**THE ESTABLISHMENT OF A REVOLVING FUND FOR THE MAINTENANCE  
OF THE EQUIPMENT**

**1. OVERVIEW**

The Ministry Of Health, through the Kenyatta National Hospital Management Board, has established a "REVOLVING FUND" to provide a reliable source of revenue to meet local and external financial obligations for the maintenance, technical support services, procurement of spare parts, energy requirements and consumable purchase costs, of its equipment.

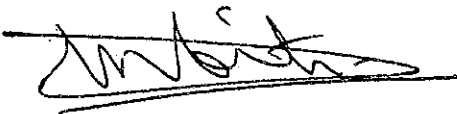
**2. THE CAPITAL BASE OF THE FUND**

- 2.1 The fund shall be operated under a special account opened in National Bank Of Kenya, where the fund will be deposited.
- 2.2 The capital of the fund will be made out of the revenue earned from the National Hospital Insurance Fund's monthly remittances to the hospital from 1st July, 1992 in retrospect.
- 2.3 All revenue realised from the user charges of medical equipment shall also be deposited directly to this account.
- 2.4 The revolving fund shall be at Ksh.20 Million per year (subject to revision upwards) from National Health Insurance Fund, and other necessary revenue should be secured from grants voted by parliament for this purpose.
- 2.5 No direct withdrawal shall be permitted except when remitting payment to suppliers and servicing of the maintenance contracts. Proper accounting procedures will be established to provide the intentions to commit the available funds.

*K.Y.*

*Amman*

- 2.6 The revolving fund shall consist of a guaranteed level of 30% of foreign exchange held in convertible currencies to sustain and guarantee the procurement of spare parts, consumables and payment of the maintenance contracts of the foreign manufacturers and suppliers.
- 2.7 All the receipts, earnings, interests and the balance of the fund at the close of each financial year shall be retained, for the purpose of which the fund is established, in the reserve account of the fund.
- 2.8 Quarterly statements of accounts of the fund and breakdown of the Balance Sheet will be made available to JICA and other donor agencies funding the rehabilitation programme of the physical facilities, plants and equipment of the Kenyatta National Hospital, during the project period.
- 2.9 The Kenyatta National Hospital Board will develop further its administration and technical structure for proper and efficient operation and utilisation of this fund.



**D.M. MBITI**  
**PERMANENT SECRETARY**

TUESDAY 11TH AUGUST, 1992.



Functioning

A...Good  
 B...Partial out of order but operational  
 C...Out of order under requesting repair  
 D...Out of order and unrepairable

Frequency in use

1...Very busy  
 2...Occasional in needs  
 3...Sometimes for stand-by  
 4...Seldom use  
 5...No use

Maintenance structure by equipments-wise

I...Maintained by the biomedical engineering services  
 II...Maintained by the hospital engineering (electrical dep.)  
 III...Maintained by the hospital engineering (mechanical dep.)  
 IV...Maintained under service contract of manufacturer or agent  
 V...Others

## Present condition of main medical equipments

## 1. Radiation therapy

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Cobalt 60 radiation unit	A	1	IV	Canada	AECL, 20Mev
X-ray simulator	D	5	V	Canada	Theratron 750, not in use for 3 years.
Isotope scanner	A	1	V	Italy	
Intracavity machine remote after loading	A	1	V	Italy	Gambrow
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made
Suction unit	A	1	I	U. K.	Airzole Products-made
Operating room lamp	B	1	II	-	
Defibrillator	B	1	I	U. K.	
Bedside monitor	A	1	I	Japan	Nichiden San-ei-made

## 2. Laboratory

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Routine laboratory					
Blood bank ref.	A	1	II	U. K.	Foster-made, rigid structure
Blood cell counter	A	2	I	-	
Hot air oven	B	1	I	-	
Microscope	B	2	I	-	
Centrifuge	B	2	I	Germany	replaced ten years ago
Clinical chemistry analyzer	C	5	I	Germany	
Flame photometer	A	2	I	-	
Temperature water bath	A	2	I	-	
(Pathology)					
Auto clinical analyzer	B	2	IV	U. S. A.	Technicon-made, out of order

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Refrigerator	D	5	II	U. K.	
Temperature water bath	A	2	I	U. K.	
Centrifuge	B	3	I	--	Large: U. K., Medium: Germany, Small: U. K.
Flame photometer	C	5	I	U. K.	Corning-made
Spectro photometer	B·D	2·5	I	U. K.	One unit out of order. Coulter
(Microbiology)					
Incubator	A	1	I	Germany	
Centrifuge	B·D	2·5	I	Germany	One of two units out of order
CO <sub>2</sub> Incubator	A	1	I	Germany	
Freezer	A	1	II	Netherlands	
Temperature water bath	A	1	I	--	
Clean bench	A	2	I	--	
Balance	B	2	I	--	
Autoclave, portable	D	5	I	--	
Refrigerator, small	D	5	II	U. K.	
" , medium	A	1	II	U. K.	
Autoclave, large	D	5	I	--	It will be disposed soon.
Cleanbox	D	5	I	--	Ten years old, now used as storage box.
Microscope (1 unit)	A	2	I	--	
" (6 units)	D	5	I	--	
Boiling sterilizer	B	2	I	U. K.	British Sterilizer-made. Bad condition but being used.
(Histology)					
Refrigerator	A	1	II	U. K.	
Automatic tissue processor (2 units)	A	5	I	--	Not use Brand new, not in use.
" (1 unit)	B	2	I	--	Using, partly malfunction.
" (1 unit)	D	5	I	--	
Knife sharpener	B	2	I	U. S. A.	American Optics Co., Ltd.
Balance (1 unit)	B	1	I	--	
" (1 unit)	D	5	I	--	
Incubator (2 units)	B	1	I	Germany	Meters partly out of order
" (2 units)	D	5	I	Germany	
Microtome (4 units)	B	2	I	--	
" (4 units)	D	5	I	--	
Freezer, small	B	1	II	Germany	More than ten years old
Microscope (4 units)	B	1	I	Japan	Olympus



Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
(Cytology)					
Microscope (5 units)	B	1	I	Germany	
Centrifuge	B	2	I	Germany	
(Hematology)					
Blood cell counter	A	1	IV	U. K.	Coulter Ltd.
Microscope (2 units)	B	1		Japan	Nikkon
" (2 units)	D	5		Germany	Lizte
Hemoglobin meter	B	3	I	U. K.	As stand-by, more than ten years old
Diluter	A	1	I	U. K.	Good condition although more than ten years old
Centrifuge	C	5	I	Germany	
Spectrophotometer	C	5	I	—	Under repair
Refrigerator (2 units)	B·C	1·5	II	U. K.	Freezing Machinery-made.
Freezer	C	5	II	U. K.	
Incubator			II	Germany	
Blood cell counter			I	—	
Temperature water bath			I	—	
Ultra low temperature freezer			II	—	
Electrophoresis	B	1	I	U. S. A.	
Balance	B·D	1·5	I	Germany	
Dry cabinet	D	5	I	U. S. A.	Heater not working
Ultrasonic cleaner	D	5	I	U. K.	
(Immunology)					
Ultra low temperature freezer, (horizontal)	B	1	II	New Zealand	
" , (vertical)	A	1	II	U. S. A.	
Clean box	D	5	II	—	More than ten years old being used as storage box
Temperature water bath (2 units)	D	5	I	—	
" (3 units)	A·B	1·2	I	—	Two units are in good condition
Incubator (2 units)	A·B	2·2	II	—	
Centrifuge (2 units)	B	2	I	Germany	
" (2 units)	D	5	I	Germany	
" (2 units)	C	5	I	U. S. A.	Backman-made, L5-65
" (3 units)	A	1	I	Germany	
Ultracentrifuge	A	5	I	—	Not being used
Bottle washer	D	5	II	—	Donation from Germany
Microtome knife sharpener	C	5	I	—	
Drying cabinet	D	5	II	—	Heating system out of order

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
pH meter	A·D	2·5	I	U. K.	1 unit out of order Procured by WHO
Spectrophotometer	C	5	I	U. K.	Bulb is not being replaced
Balance (2 units)	A	2	I	—	
" (2 units)	C	5	I	—	
Microscope (4 units)	A	1	I	—	
" (1 unit)	C	5	I	—	No light bulb
Refrigerator (1 unit)	D	D	II	U. S. A.	Short of freezing gas
" (2 units)	A	1	II	U. S. A.	Westinghouse-made

### 3. Operation theater

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Vacuum pump	A	1	I	—	
Ice machine	D	5	II	U. K.	
Magnetic stirrer	A	1	I	U. S. A.	
Gamma counter	C	5	I	U. S. A.	Beckman-made: no isotope
(No. 1 theater)					
Operating table	B	2	III	U. K.	No vertical, horizontal movement
Operating room lamp	B	2	II	U. K.	Only one bulb out of eight is working
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made. Repaired by service contract.
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made
Film viewer	D	5	I	—	
Electrosurgical unit	C	5	I	—	
Sterilizer, (vertical)	D	5	II	U. K.	British Sterilizer-made
Drop pole	B	2	III	—	
Stretchers	B	2	III	—	
Mechanical chair	B	2	III	—	
(No. 2 theater)					
Operating table	B	2	III	U. K.	No vertical, horizontal movement
Operating room lamp	B	2	II	U. K.	Only large bulb is working
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made
Film viewer	D	5	II	—	Wall type, half of them working
Drop pole	B	2	III	—	
Electrosurgical unit	C	5	I	—	Wall type, short of electrode and fit switch
Stretchers	B	2	III	—	
Infant incubator	A	2	I	—	
Mechanical chair	B	2	III	—	

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
(No. 3 theater)					
Operating table	B	2	III	U. K.	No vertical, horizontal movement
Operating room lamp	B	2	II	U. K.	Technical Light & Equipment-made
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made
Film viewer	B	2	I	—	
Drop pole	B	2	III	—	
Electrosurgical unit	C	5	I	—	Wall type, short of electrode and fit switch
Strechers	B	2	III	—	
Mechanical chair	B	2	III	—	
(No. 4 theater)					
Operating table	B	2	III	U. K.	No vertical, horizontal movement
Operating room lamp	B	2	II	U. K.	Technical Light & Equipment-made
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made Repaired by service contract.
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made
Film viewer	B	2	I	—	Half of them usable
Electrosurgical unit	C	5	I	—	Short of electrode and fit switch
Sterilizer, (vertical)	D	5	II	U. K.	British Sterilizer-made
Drop pole	B	2	III	—	
Strecher	B	2	III	—	
Mechanical chair	B	2	III	—	
(No. 5 theater)					
Operating table	B	2	III	U. K.	Echman
Operating room lamp	B	2	II	U. K.	Technical Light & Equipment-made
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made
Electrosurgical unit	C	5	I	—	
Operation microscope	B	4	I	—	
Film viewer	A	2	I	—	All in good condition
Drop pole	B	2	III	—	
Strechers	B	2	III	—	
Mechanical chair	B	2	III	—	
(No. 6 theater)					
Operating table	B	2	III	U. K.	
Operating room lamp	B	2	III	U. K.	Technical Light & Equipment-made
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made
Film viewer	B	2	I	—	Half of them usable
Electrosurgical unit	C	5	I	—	
Drop pole	B	2	III	—	
Strechers	B	2	III	—	
Mechanical chair	B	2	III	—	

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
(No. 7 theater)					
Operating table	B	2	III	U. K.	
Operating room lamp	B	2	II	U. K.	Technical Light & Equipment-made eight small bulbs are not working
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made Repaired by service contract.
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made
Film viewer	C	5	I	—	
Electrosurgical unit	C	5	I	U. K.	No electrode and fit switch
Sterilizer, (vertical)	D	5	II	U. K.	British Sterilizer-made
Drop pole	B	2	III	—	
Stretchers	B	2	III	—	
Mechanical chair	B	2	III	—	
Boiling sterilizer	B	2	I	—	
(No. 8 theater)					
Operating table	B	2	III	U. K.	No vertical, horizontal movement
Operating room lamp	B	2	II	U. K.	Technical Light & Equipment-made large bulb and two small bulb are working
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made Repaired by service contract.
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made
Film viewer	C	5	I	—	Unit: type
Electrosurgical unit	C	5	I	—	No electrode and fit switch
Cabinet	B	1	II	—	
Drop pole	B	2	III	—	
Stretchers	B	2	III	—	
Mechanical chair	B	2	III	—	
(No. 9 theater)					
Operating table	B	2	III	U. K.	Echman
Operating room lamp	B	2	II	U. K.	6 bulbs are working
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made Repaired by service contract.
Electrosurgical unit	B	1	I	U. K.	Serviceable although old
Film viewer	B	2	I	—	3 units are working
Drop pole	B	2	III	—	
Stretchers	B	2	III	—	
Mechanical chair	B	2	III	—	
(No. 10 theater)					
Operating table	B	2	III	U. K.	Echman
Operating room lamp	B	2	II	U. K.	

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made Repaired by service contract.
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made heater is out of order
Film viewer	B	2	I	—	
Electrosurgical unit	B	2	I	U. K.	Short of accessories
Sterilizer, (vertical)	C	5	II	U. K.	Surgical Equipment Supplies-made
Cabinet, (small)	B	1	III	—	
Drop pole	B	2	III	—	
Strechers	B	2	III	—	
Mechanical chair	B	2	III	—	
(No. 11 theater)					
Operating table	B	2	III	U. K.	
Operating room lamp	B	2	II	U. K.	
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made Repaired by service contract.
Hot air oven	B	2	II	U. K.	Laboratory Thermal Equipment-made
Film viewer	B	2	I	—	
Electrosurgical unit	D	5	I	—	
Drop pole	B	2	III	—	
Strechers	B	2	III	—	
(No. 12 theater)					
Operating table	B	2	III	U. K.	Echman
Operating room lamp	B	2	II	U. K.	Stopper of arm is out of order
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made Repaired by service contract.
Hot air oven	D	5	II	U. K.	Laboratory Thermal Equipment-made
Film viewer	B·C	2·5	I	—	1 unit is serviceable
Sterilizer, (vertical)	B	2	II	U. K.	British Sterilizer-made
Boiling Sterilizer	B	2	II	—	
Drop pole	B	2	III	—	
Strechers	B	2	III	—	
Mechanical chair	B	2	III	—	

## 4. T. S. S. U.

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Dry cabinet	D	5	II	U. K.	Heater out of order, being used as a mere cabinet
Ultrasonic cleaner	C	5	I	U. K.	
Surgical glove checker	D	5	II	U. K.	
Sterilizer, large	B	1	II	U. K.	British Sterilizer-made
" , "	D	5	II	U. K.	British Sterilizer-made
Hot air oven	D	5	II	U. K.	Out of repair, old type, no spare parts

## 5. C. S. S. D.

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Surgical glove cleaner	D	5	II	-	
Surgical glove checker	C	5	II	-	
Dry cabinet	D	5	II	U. K.	Heater out of order
Hot air oven	B	1	II	U. K.	Workable although old
"	A	1	II	U. K.	Good condition although old
Sterilizer, medium	D	5	II	Germany	Donation, new
" , large	B	1	II	U. K.	British Sterilizer-made
" , "	D	5	II	U. K.	British Sterilizer-made
Ultrasonic cleaner	C	5	I	Germany	Not workable

## 6. I. C. U.

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Respirator, A(4 units)	C	5	I	U. K.	Bennet maintenance difficult because of no manual
" , B(1 unit)	A	1	I	-	
" , C(2 units)	A	1	I	Switzerland	Ameda-made
Bed-side monitor					
Type: A (4 units)	A	1	I	-	S & W -made
B (1 unit)	A	1	I	U. S. A.	Honey Well-made
C (2 units)	D	5	I	-	
ECC monitor					
Type: A (6 units)	D	5	I	Japan	NEC San-ei-made. Difficult to obtain spare parts
B (2 units)	C	5	I	Japan	NEC San-ei-made.
Shock monitor (2 units)	D	5	I	Netherlands	Philipps-made. No repairable because no spare parts

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Polygraph	A	1	I	Japan	NEC San-ei-made
Anesthesia machine	A	1	IV	U. K.	British Oxygen-made Repaired by service contract.
Defibrillator Type: A (2 units)	A	1	I	Netherlands	Philipps-made
B (3 units)	A·D	1·5	I	—	2 of 3 out of order
Infant incubator Type: A (2 units)	D	5	I	—	Air Seald-made
B (1 unit)	B	4	I	Japan	Atom-made

#### 7. E. C. G. /Cardiology

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Angio cardiography	B	2	V	Netherlands	Philipps-made, service contract desirable
Anesthesia machine	A	2	IV	U. K.	British Oxygen-made Repaired by service contract.
Operating room lamp	B	2	II	U. K.	
Respirator	B	2	I	U. S. A.	
Suction unit	B	2	I	U. K.	
Contrast injector	B	2	I	—	
Defibrillator, Type: A	B	2	I	U. K.	Model: SD-400
" " B	B	2	I	U. K.	
Spot light	B	2	II	—	
Oxygen analyzer	B	2	I	Israel	
Ultrasound scanner	A	1	I	Japan	Aloka-made. Service contract desirable
Stress test system	A	2	I	U. S. A.	
E. C. G.	A	1	I	Japan	Nippon Koden, ECG-6353
Pacemaker	A	2	I	Netherlands	Philips, DP-200
Poly graph	B	4	I	—	
Peritoneal dialysis cyclers	C	3	II	Sweden	Gambrow

## 8. Renal

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Hemodialysis machine, (8 units)	B	1	I	Sweden	Gambrow, not satisfactorily, but workable
(7 units)	D	5	I	Sweden	Gambrow, difficult to obtain spare parts
Patients beds	B	1	II	—	Can be used somehow
Water purifier	A	1	I	Germany	Crist-made. 1 unit is out of order
Refrigerator	B	1	II	—	

## 9. Biomedical Engineering

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Soldering iron	A	1		—	
Vise, Type: A	A	1		—	
B	B	1		—	No handle
Grinder	B	1		Japan	Hitachi-made. Partial defective
Tester, Type: A	A	1		China	Procured in 1991
B	B	1		China	"
Tool set	B	1		—	Not in good condition
Generator	A	2		—	Inside the ICU work station
Oscilloscope	A	B		U. K.	Inside the ICU work station
Synchroscope	C	5		Japan	Iwasaki Tsushinki-made. No probe.
Worksono oscilloscope	C	5		—	Tele Equipment-made. No probe.
Multimeter	A	1		Japan	



10. Casualty

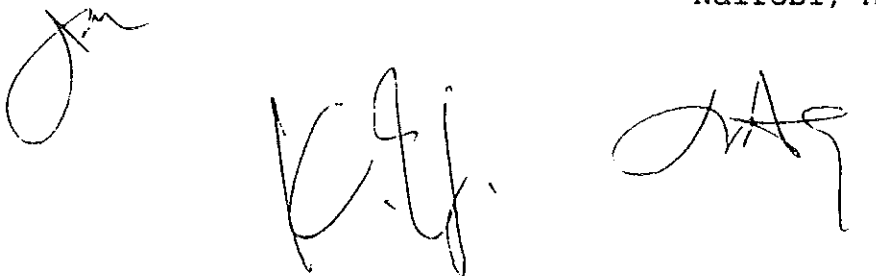
Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Suction unit	B	1	I	U.K.	1 out of 13 units is serviceable
Sphygmomanometer	B	1	I	—	More than 10 years old being used
Strechers	B	1	III	—	" "
Drop pole	B	1	III	—	" "
Examination table	B	1	III	—	" "
Cabinet (made of wood)	B	1	III	—	" "
Mechanical chair	B	1	III	—	" "
(Casualty : minor operation)					
Operating table	B	2	III	U.K.	More than 10 years old
Operating room lamp	B	2	II	U.K.	Technical Light & Equipment-made ceiling type
Electrosurgical unit	B	2	I	U.K.	More than 15 years old
Suction unit	B	2	I	U.K.	
Anesthesia machine	A	2	IV	U.K.	British Oxygen-made Repaired by service contract.
Strechers	B	2	III	—	More than 10 years old
Sphygmomanometer	B	2	I	—	" "
Film viewer	B	2	II	—	" "
Drop pole	B	2	III	—	" "
Mechanical chair	B	2	III	—	" "

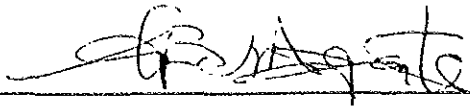
Project; Improvement of the Equipment for  
the Kenyatta National Hospital

On condition that Japan's Grant Aid is extended to the Project for Improvement of the Equipment for the Kenyatta National Hospital (hereinafter referred to as "the Project"), the following items are agreed by the undersigned.

- 1) The Government of Kenya will take necessary measures as described in the Minutes of Discussion to be signed by the Kenya side and the Japanese side.
- 2) The Japanese side will extend its Grant Aid to the Project for the purpose of improving the medical services at the Kenyatta National Hospital through procurement of the necessary equipment for the Project.
- 3) The World Bank/the International Development Association will monitor and supervise the establishment and implementation of the maintenance and operation system for the equipment at the Kenyatta National Hospital under the "Health Rehabilitation Project" financed by the World Bank.

Nairobi, April 13, 1992

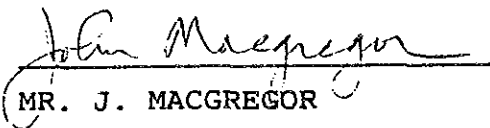




DR. N.N AGATA

Director

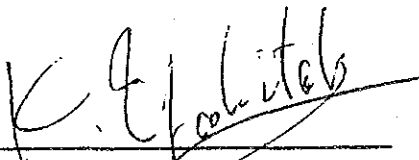
Kenyatta National Hospital  
Government of Kenya



MR. J. MACGREGOR

Senior Operation Officer

Regional Mission in Eastern Africa  
The World Bank



DR. KATSUHIRO YOSHITAKE

Leader

Basic Design Study Team

on the Project for Improvement of the Equipment  
for the Kenyatta National Hospital  
Japan International Cooperation Agency



JICA