of activities from primary to tertiary medical care and provides a medical service designed to meet the demands of the area as was stated previously. Furthermore, the bus ride from the suburb of Varanasi to Lucknow takes over six hours and is thus inaccessible for most patients. Therefore the type of illnesses and patients dealt with by the two institutions differs completely and hardly overlap in any manner whatsoever.

3.2.6. Examination of Requested Equipment

This project aims to restore the functions of the institution as a general hospital. Therefore, in examining the contents of the request, the main guideline will be the renewal and supplementation of existing medical equipment. The results of the examination are stated below.

(1) Surgical Departments

The renewal of existing equipment mainly consisting of shadowless lighting, operating tables and electric diathermy plus other specialist instruments for the operating theatres of each surgical department is planned. Of the 24 operating theatres in the Hospital, installation is scheduled for the 15 situated in the central block. As for surgical microscopes and X-ray equipment, only one of each will be installed on the third floor of the block containing the orthopedic department and their use will be shared with the general surgery and urology departments. As for the artificial heart and lung apparatus which the heart and thoracic surgery department requested, it is considered not to make it an object for procurement due to the fact that the surrounding equipment conditions are not of a degree high enough to carry out open heart surgery.

(2) Central Sterilization Supply, Laundry (CSSD)

Due to the level of obsolescence of such basic equipment as high pressure sterilizing devices, drying machines and washing machines, there is a continuous shortage in capacity. A renewal of equipment equal in number and capacity to the present equipment will be carried out.

(3) Clinical Laboratory (Clinical Pathology Laboratory)

Equipment such as automatic hemodialysis apparatus, spectrophotometers, blood gas apparatus, high speed centrifugal separators and incubators is vital for clinical examination and ailment diagnosis. All the equipment requested is currently in place and operating to a certain extent, however drastic functional deterioration means that it takes long time to obtain results and occasional breakdowns are hindering the department's work very much. This department is composed of the clinical, pathological and microbiological examination sections, and due to the different nature work they do, there is a need to install individual, equipment that can not commonly be used.

(4) Maintenance Workshop

Lathes, multi testers, oscilloscopes, resistance meters and so on are used in the repair and testing of medical equipment. Present apparatus and tools are insufficient in both variety and numbers, and as well as the fact that a number of engineers must share them, the degree of precision is poor due to the fact they are old models. The supply of the apparatus and tools requested is necessary for the purpose of carrying out fast action in response to requests for repairs. From one or two of main apparatus will be provided for shared use depending on their frequency of use, and a considerable number of tools and instruments for daily use will be provided.

(5) Department of Ophthalmology

Slit lamps, surgical microscopes and cornea meters are equipment necessary for basic ophthalmic diagnosis and therapy, but the present such equipment is badly obsolete and in need of renewal. The necessity of argon laser eye treatment unit seems to be high since there are many cases of vitreo-retinal disorders such as diabetic retinopathy hypertensive retinopathy and retinal detachments. However, judging from the state of current activity, such high level medical equipment as ophthalmic ultrasonic diagnosis apparatus is deemed to be not necessary.

(6) Department of ENT

There is an urgent need to renew the outpatient ENT treatment unit and surgical instruments in view of the state of obsolescence of existing equipment and the large number of patients. There seems to be little need for a CO_2 laser unit judging from the state of current activity and the surrounding equipment.

(7) Department of Dental Surgery

The present dental chair units and instruments are completely inadequate and six new sets should be installed. A total of four high speed sterilizers, one for each dentistry room, is thought of as necessary.

(8) Department of Obstetric & Gynecology

It is necessary to renew the obsolete delivery tables and spot lamps installed in all four delivery rooms. It is necessary to install an ultrasonic diagnosis apparatus for which the demand is high and until now the diagnosis is conducted by using the equipment in the radiology department.

(9) Department of Pediatrics

It is viewed as necessary to install four incubators and two phototherapy units judging from the rate of birth of immature infant and the state of current incubators. As for the laminar flow for air cleaning, it is thought that the India side should prepare because it is a part of building facility.

(10) Nursing School

At least one 30 seat minibus seems to be necessary in order that two classes may carry out outside training activity. Moreover, it is deemed necessary to provide educational sets and so on for the furthering of nurse training.

(11) Department of Radiology

Despite the fact that CT scanners are high level medical equipment, they are a basic and practically useful equipment necessary for diagnosis in the internal, pediatrics, gynecology, neurology, orthopedics, urology and cardiocirculatory departments. Moreover, current equipment is designed solely for head diagnosis only, and judging from the trends in ailments in recent years is functionally insufficient. It is therefore seen as appropriate to supplement a whole body CT scanner.

Along with the CT scanner, ultrasonic diagnostic apparatus is seen as an effectual item of equipment, and the currently used old models will find it difficult to cope with the rising numbers of patients. Supplement of this equipment is also seen as necessary.

The Cobalt 60 irradiation therapy equipment is an indispensable item in the treatment of progressive cancer, and due to the length of service of the equipment existing in the hospital, its functions have declined and there is a need to supplement its quantative shortcomings in view of the increase in patients. It is therefore desired to install one set in the current therapy room prepared.

(12) Section of Gastroenterology

The installation of escophagal endoscope, GI endoscope, colonic endoscope and gall bladder endoscope plus the related equipment is seen as necessary for renewal and supplementation of present endoscopes.

(13) Section of Nephrology

Hemodialysis machines contribute to the therapy for serious renal disease patients. Because the number of such machines is constantly insufficient due to irreparable breakdown, the supply of this machine is seen as appropriate. Judging from the numbers of patients and the operating state of current equipment, there is an urgent need for the installation of three hemodialysis machines and one reverse osmosis water plant. As for blood plasm circulatory machines, there seems to be no urgent need judging from the demand side.

(14) Section of Cardiology

Heart lung machine, X-ray equipment for cardioangiography and catheter examination polygraphs are mainly used for open heart surgery. Judging from the morbidity of the patients and the state of surrounding equipment, the level of priority for the installation of such equipment is seen as low. Color doppler ultrasonic diagnostic equipment is installed in the Department of Radiology and is used in share with this section.

3.2.7. Necessity of Technical Cooperation

Almost all of the equipment scheduled for procurement under this project is for the renewal or supplementation of existing equipment, and the present institute staff should in technical terms be fully able to handle it. As for the maintenance, the laboratory and hospital workshops will be in charge and should be able to cope with their existing organization and staff. Consequently, no special technical cooperation is necessary under this project. However, concerning renewed equipment where operation procedure is different, technical quidance by the manufacturers will be held in India at time of the procurement.

3.2.8. Basic Policy of Implementation of Cooperation.

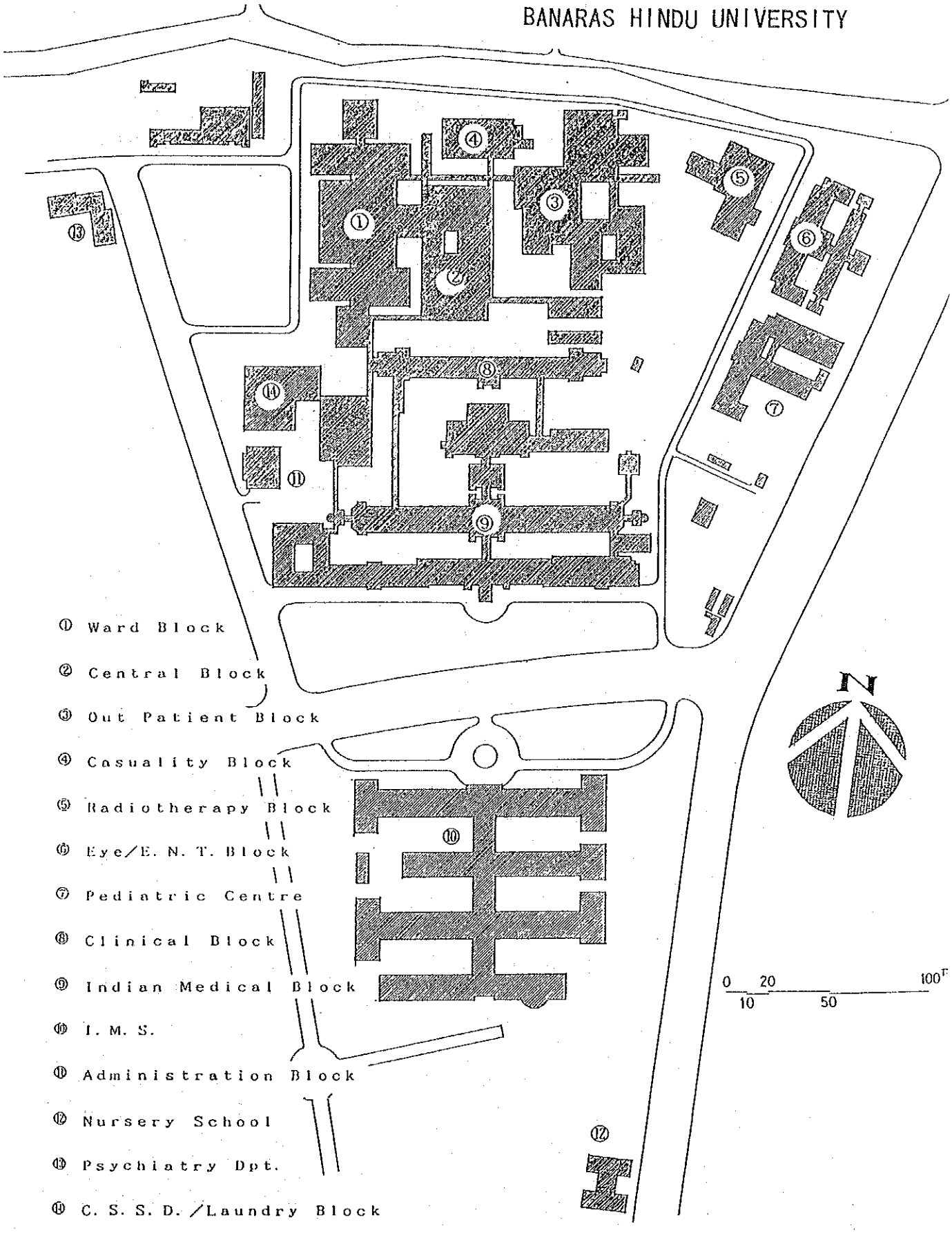
This project stands at the peak of the medical structure in the Varanasi area, and through the upgrading of the Institute of Medical Sciences, SS Hospital which is at the heart of the supply of medical services in the area, aims to support indirectly the 8th Five Year Health Development plan being promoted by the country and to provide a higher quality medical service to the residents of the region. The equipment currently installed at the institution is beyond its limits of use and poor efficiency due to obsolescence and quantitative insufficiency due to breakdown and damage is a major problem.

This project is viewed as appropriate for grant aid programme of Japan in that it aims to augment medical service equipment in line with the population increase of the area through mainly improving equipment necessary for the recovery of the Institute's original medical service functions; and that it aims to achieve a substantiation of its health activities as a top referral hospital. Moreover, the Institute is currently in operation and will not need to employ new staff in the execution of this project; and from an execution viewpoint, on studying the previously mentioned items, the effectiveness, practicality of the project plus state of preparation and capacity for the work in India have been confirmed, and as well as this, the scale of the project also is consistent with the system of grant aid of Japan. Therefore, with Japanese grant aid as a premise, the following project outline will be studied and basic design will be carried out. However, partial revision of the requests is appropriate and this is stated in the examination of contents of the request.

3.3 Outline of the Project

The Drawing 3-1 shows the site plans for the improvement of equipment of this project.

THE INSTITUTE OF MEDICAL SCIENCES, BANARAS HINDU UNIVERSITY



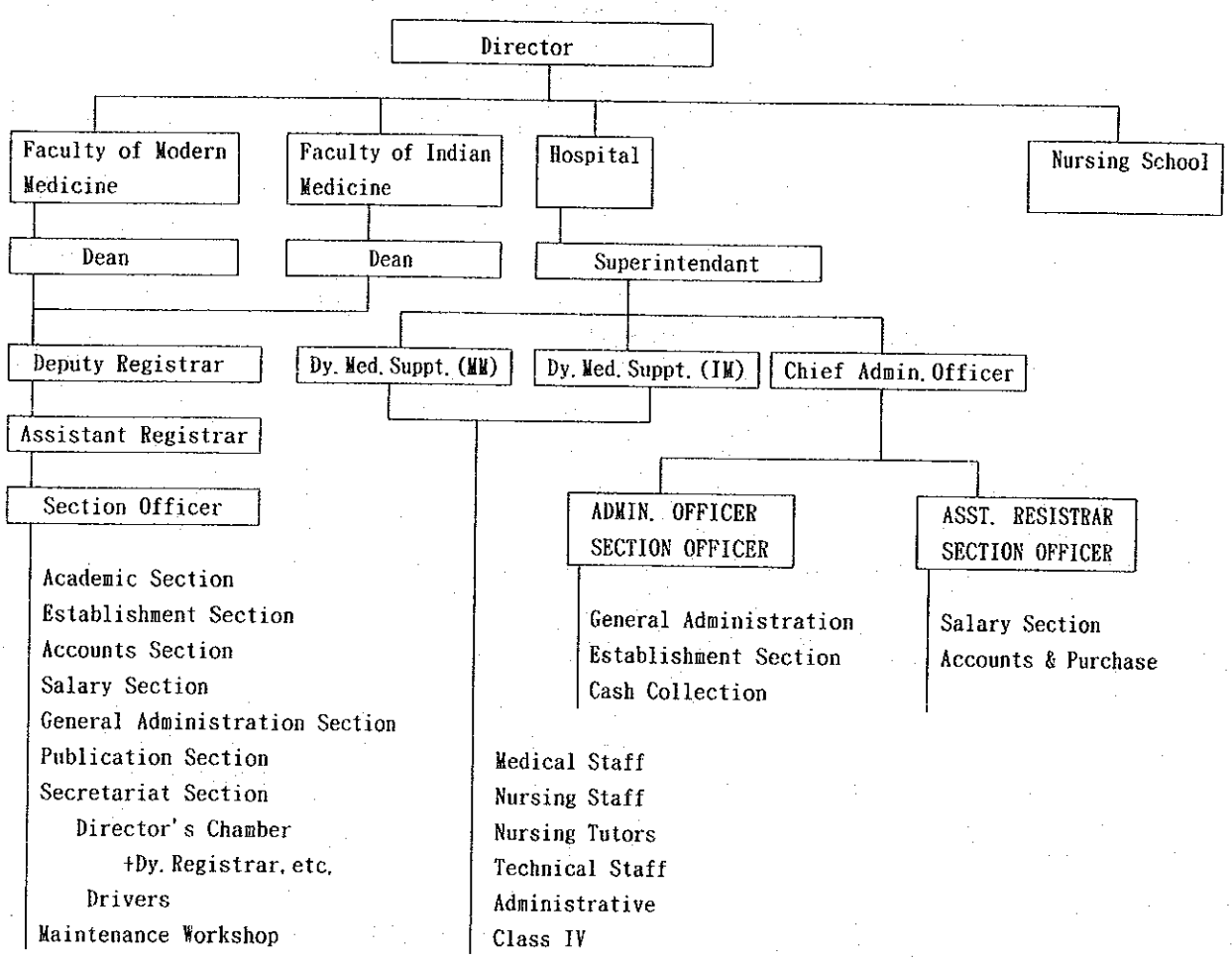
3.3.1 Executing Agency and its Management Organization.

(1) Organization Diagram of the Institute

The following illustrates the organization diagram of the Institute which shall be the executing agency of this project. The Institute of Medical Sciences is an independent department of the University and under the leadership of the Institute Director.

In executing the project, discussion and coordination of requests shall be done mainly by a group led by the University Chancellor and including the Institute Director, the Medical Department Manager and Hospital Manager.

Figure 3-2 Organization Chart of IMS-BHU



(2) Operating Set Up

1) Medical Staff

The project will be executed with the Institute of Medical Sciences, SS Hospital taking the lead and working in harmony with the related examination departments. The staff working directly in connection with the project shall include all medical staff at the hospital excluding the staff of the Indian Medical Department, and number is 1,606 (see Table 2-18).

3.3.2 Plan of Operation

This project shall be placed as part of the improvement project of the Institute of Medical Sciences, SS Hospital being promoted under the Indian Government sponsored 8th Five Year Development Plan. This project aims to procure the equipment for which funding is difficult and that is necessary to carry out the upgrading, renewal and supplementation of obsolete equipment in line with the aforementioned Five Year Plan. Execution of this project aims to improve activities in the following departments.

Table 3-45 Plan of Operation by Department

Department	Content of operation plan
Dep't Surgery	Among 24 operating theatres, improve 15 in central block and bulid a structure for carrying out various operations and promote integration of functions.
CSSD	Upgrade in and out routes of sterilized and unsterilized materials; reduce risk of in-hospital infection and raise sterilizing capacity to meet current demand.
Central clinical Pathology · Laboratory	Raise examination capacity of specimens to meet demand of each dep't and accept requests from other hospitals.
Institute Workshop	Enable to upgrade tools & instruments and to maintain medical equipment containing electronic circuitry.
Dep't of Ophthalmic	Improve equipment to deal with infectious ailments, cataracts & corneal transplant and meet current demand.

Department	Content of operation plan
Dep't of ENT	Improve outpatient sections to strengthen capacity for dealing with patients.
Dep't of Dental Surgery	Improvement of equipment for amalgam filling, capping & denture diagnosis & therapy for high quality service.
Dep't of Obstetric & Gynecology	Upgrade delivery rooms to establish set up to deal with rising number of cases.
Dep't of Pediatrics	Improve equipment necessary for treating unmmatured infant and raise survival rate of such cases.
Nursing School	Upgrade vehicles for training to promote outdoor activity
Dep't of Radiology	Upgrade & renew existing equipment to raise capacity of patient admittance.
Section of Gastroenterology	Improve endoscopes etc for G.I. ailment diagnosis to enable fast diagnosis & early therapy.
Section of Nephrology	Improve hemodialysis equipment to cope with acute renal failures.
Section of Cardiology	Arrange to deal with open heart surgery thru. improvement of artificial heart & lung, color doppler & cardioangiography equipment etc.

3.3.3. Outline of Equipment

The project reasoning and purpose of use etc of the main items of equipment judged to be necessary based on the results of the examination of requests stated in 3.2.

① Equipment in need of urgent renewal due to sharp fall in functions and obsolescence.

② Equipment in need of renewal because of breakdown and impossibility of obtaining parts because the manufacturers warranty has expired.

③ Equipment in need of replacement or supplementation due to major deterioration in efficiency because of old model or fall in functions because of supperannuation.

④ Equipment in need of quantitative supplementation due to increase in number of patients.

⑤ Equipment in need of supplementation because usable equipment are extremely few due to breakage and passing of life limit.

⑥ Equipment necessary for the maintenance of advanced medical equipment.

Table 3-46 Object of Use of Project Equipment

Department name Equipment name	Reason	Purpose of use , effect etc
Department of Surgery		
Operating theater shadowless lamp	①②	For smooth operation, clearly irradiates operation area & provides ideal lighting, correct color temperature & no heat. Choose multi lamp type main lamp with additional lamps to enable various operations.
Operating theater table	①	Operable by hydraulic or gears type enabling movement & transfer of table top to cope with many body positions and so help in executing of specialist type operation.
Operating theater diathermy	①	Used in body tissue & hemostatic incision and coagulation operations. Good for operating on extremely fine vessel areas
Anesthesic apparatus	①②	For general inhaled anasthetic. Also combines functions of artificial respirator enabling use for intravenous, vertebral & subdural anasthetic. Also, during operation, can switch from local or intravenous to inhaled anasthetic enabling longer operations to be performend.
Patient monitor	③④	Observes cardiac functions during & after operation. Alarm system warns medical staff of patients abnormality when indication figure for the function becomes out of the standard.
Defbrillator	⑤	Used to treat fibrillation due to heart failure etc. Recovers normal pulse by applying high voltage pulse to chest. Useful for heart attack cases during surgery.

Department name Equipment name	Reason	Purpose of use , effect etc
Video endoscope set	⑤	Used to display sick areas invisible to eye by using high resolution video camera. Numerous doctors can discuss diagnosis over TV screen
Surgical image intensifier C-arm X-ray equipment	①	Used to take X-rays during surgery or in bone setting or emergency cases when patient cannot move. X-ray vision operations become possible.
Bronchoscope	②⑤	Used for diagnosis & therapy of lung diseases, pneumonia and for discovery & extraction of foreign material in bronchus.
Surgical scrub station	③	To mainly supply sterile water for pre-surgery washing. Water treatment methods include filter, reverse osmotic pressure, UV, compound, heating & distillation types. Treated water can be used to wash hands before operation, wash instruments, dilute disinfectants, wash patient injuries and as hygroscope for oxygen inhalation.
Ventilator	③④	Used to assist patient breathing during & after surgery. Also aids survival of patients unable to breath or whose respiration has stopped.
Blood gas analizer	③④	Used to measure pressure of oxygen or carbon gases in blood. Used for diagnosis in clinical pathological investigation and respiration control during operations and for patients receiving intensive therapy. Clearly grasps patients condition and allows effective therapy to be given.
CSSD		
High pressure steam sterilizer	①④	To sterilise metal, magnetic, glass, paper, cloth & rubber instruments and medicines that can withstand 120 ℃ steam. Directly exposes item to saturated steam to destroy micro organisms. Is vital to steam saturate the whole item so a high function apparatus is needed. Standard conditions are: 115°C for 3 mins, 121°C for 20 mins. 126°C for 15 mins. Quick sterilisation of 130-135°C for 10-5 mins can be applied for highly heat resistant items.
Ultrasonic instrument washer	⑤	Apparatus to remove dirt attached to steel and glass instuments by ultrasonic wave and rinse with pure water. Ultrasonic cleaning is vital for reducing bacterial count on items needing sterilisation.

Department name Equipment name	Reason	Purpose of use , effect etc
Drying cabinet	②	For sterilisation of metal & glass instruments. Designed to sterilise dry & sterilise glass ampoules and biles.
Surgical glove powdering machine	⑤	To powder gloves after washing and drying to enable their re-use.
Washing machine	①④	To wash linen and surgical wear to enable a more hygiene operation.
Press machine	①④	To iron bed sheets and linen and also have heat sterilising effect.
Central Clinical Pathology Laboratoy		
Automatic haemato-logy analyzer	⑤	Type of hemacytometer vital for diagnosis and therapy fo blood disorder patients. Can do screening of white & red corpuscles, hemoglobin hematcrit and screening of blood platelet and coagulation capability.
Full automatic chemistry analyser	①	Used in biochemical investigation of protein, fat, starch, enzymes (for angina diagnosis) in blood and for urine analysis. Automatic analysis enables stable results and precise diagnosis.
Double head, binocular microscope	⑤	Biological microscope wiht double or more heads to enable observation by more than one doctor at a time and essential for magnified confirmation in urinary sediment, worm egg inspection, morphological blood investigations, and bacteriology, cytology, histopathology etc. investigations.
Trinocular phase microscope	⑤	Vital for observing non-chromasonal organisms & cells. Can oserve and photograph living cell & micro organism movements.
UV-VIS spectro-photometer	⑤	For anlysis of protein and nucleic acid in blood. For diagnosis and determination of deseases.
NA, K, CL analyzer	⑤	Measures important electrolytes such as Na+, K+, and CI- ion concentration in blood and urine. Blood & urine concentration is regulated by kidney and hormones. Hormone changes, internal secretion failure and diarrhea etc will upset electrolyte balance.
Deep freeze	⑤	To preserve at -80°C; (1) bacteria & viruses for long period of time; (2) blood, red & white corpuscles, thrombocytes etc.; (3) easily destroyed macromolecules and organs; (4) living cells & culture cells; (5) living material used in clinical investigations for long time.

Department name Equipment name	Reason	Purpose of use , effect etc
Automatic embed-ding center	⑤	Appropriate for block ordering by paraffin blocking & embedding tissue dehydrated, degreased & penetrated in sample making process. Enables equal paraffin block to be obtained.
Institution Workshop		
Oscilloscope	⑤	Used to inspect circuitry & functions of electric equipment. Effectual in maintenance of X-ray and ultrasonic equipment containing electronic circuit.
Lathe machine	①③	For lathe working steel equipment and processing medical equipment repair parts.
Department of Opthalmology		
Argon lazer eye treatment unit		Useful for therapy by cauterlization of retinal wall by blue-green laser light. Accurate therapy can be obtained for retinal detachment, diabetic retinopathy and glaucoma etc.
Fundus camera	⑤	For photographing through pupil opened by mydriatics to record changes in state of eyeground ailments. Also used at time of fluorescent fundus photography by fluorescein intravenous injection to detect retina & choroid blood vesel abnormality and retinitis pigmentosa.
Department of ENT		
ENT treatment table	⑤	Bult in with medicines, instruments and sprays needed for examination and therapy of outpatients.
Department of Dental Surgery		
Dental unit	①⑤	For treatment of outpatients. Patient seat angle can be adjusted enabling more comfortable treatment for patient and dental surgeon.
Department of Obstetric Gynecology		
Ultrasound scanner	⑤	For diagnosing uterus myomatosus, ovarian tumor and pelvic organ tumors in the obstetric section. Can also diagnose early pregnancy, placental attachment area, fetal position, fetal head circumference, molar death, multiple gestation, polyhydramnios, and abnormalities such as extrauterine gestation. Harmless to patients and exact.
Nursing School		
Vehicles (mini-bus)	⑤	To aid transport for health and hygiene activity in rural area which is included in education carriculum for nurses.

Department name Equipment name	Reason	Purpose of use , effect etc
Department of Radiology		
Whole body CT scanner	②	Through an X-ray beam detection unit, can find out body areas X-ray absorption values and through a computer give a body section image. Excellent contrast gives clear view of normal and abnormal tissue. Extremely effectual in diagnosis on head, thorax, limbs, stomach and spinal chord.
Ultrasonography scanner	⑤	Can investigate inner body fat, organs and bone through ultrasonic doppler effect. In GI area, can diagnose gallbladder, bile duct stones and tumors in both, cholecystitis, cholangitis, hepatitis, cirrhosis of the liver, hepatic abscess,hepatic tumor, chronic pancreatitis, pancreatic tumor, pancreatic cyst, lymph node enlargement, mesentery tumor, peritoneum tumor, aortic aneurism and GI tumor. It can also investigate the heart through the sternum by transforming its probes into narrow echo window fan shaped beam probes.
Cobalt 60 tele-therapy apparatus	①⑤	Used in radiological therapy of malignant biologic ailments. Can also be used inunison with surgical therapy to treat third stage cancer patients.
Esophagas fiber-scope	⑤	Used in observation of the escophagus and cardia. Useful for diagnosis of escophagal cancer.
GI fiberscope	①⑤	Used for investigation and diagnosis of GI and escophagus. Especially essential for emergency endoscopy at times of upper GI bleeding. Able to confirm area of bleeding from escophagus to GI to duodenum by frontal direct and slant viewing with one insertion. Can also perform foreign matter extraction or pigment spread etc. together with various attachments.
Colono fiberscope	⑤	Used for therapy on sigmoid colon and rectum within 25cm of anus.
Hemodialysis apparatus	③④	Used for hemodialysis of narcotic poisoning or acute and chronic kidney failure patients. Removes ureal wastes from patients blood and is essential for life support of serious kidney failure cases.
Reverse osmosis water plant		By using a reverse osmotic membrane, it can supply very high purity level water necessary for hemodialysis.

3.3.4. Costs of Operation and Maintenance

The following states the costs involved in the operation of the equipment procured under this project. The following standard prices (as of August, 1993) were used in the cost calculations.

(1) Therapy and Diagnosis Costs.

1) Costs involving Diagnosis and Therapy

In order to support the daily medical service, medical expendable costs, nursing expendable costs, reagent and pharmaceutical purchase costs are necessary. Among these cost, direct costs of endoscopy and general clinical examination, and operation costs, plus indirect necessary costs arising from the hospitalization of patients are included however in case that the same level of services is carried out in the Institution, no new measures in terms of the financial plan will be necessary. Moreover, even assuming that through the procurement of new equipment, the Hospital's medical efficiency rises by between 10 and 20% (judging by comparison of present equipment with new equipment), this would only be a minute amount and account for 1 or 2% of the Hospital's total budget. Consequently, such costs are not dealt with except for some particular items of equipment (see later section).

(2) Equipment Operating Costs

The trial calculation for the operating and maintenance costs of the equipment procured under this project is stated below. However, because much of the equipment being procured is for the replacement of obsolete items or the supplementing of recently broken and irreparable items, the maintenance costs are not seen as necessary enough to devise a new budget measure.

Electricity charges	Impossible to calculate
Medical gas	681,000 rupees
Consumables etc	about 4,309,000 rupees
	about 4,990,000 rupees
	(about 17,465,000 yen)

The basis for this trial calculation of costs is stated below.

Public Rates			
Electricity	Unknown details due to BHU pays all electricity costs in a lump.		
Water	Electrically-pumping up well water system costs electricity rate only.		
Sewerage	Discharging into city sewage disposal facilities unknown accurate charge (IMS pays the costs with BHU)		
Fuel			
Gasoline	Rupee30/Liter		
Diesel	Rupee20/Liter		
Medical Gas			
Oxygen	6.8m³ Cylinder(L)	Rupee	300.00
	1.36m³ 〃 (S)	〃	90.00
Nitrous Oxide	16,560 Liter	〃	5,000.50
Medical Air	6.2m³	〃	150.30
Consummables			
X-ray film	14"x17" 100 pieces	Rupee	2,500
Film developing solution for auto	40 Liter	Rupee	1,300
for manual	60 Liter	〃	500
Fixing solution for auto	35 Liter	〃	900
for manual	5 Liter	〃	900
Dialyzer	1 pack	Rupee	800
Peritoneal Dialysis,Solution	10 Liter	Rupee	800

1) Electricity Charges

The Institute does not allocate a separate electricity charge budget, and the University pays in a lump sum. Therefore the Institute does not have to pay for any of the electricity charges concommitant with equipment procured under this project. Incidentally, the charges for 1992 amounted to 650,000 rupees (2,275,000 Japanese yen).

2) Medical Gas

Fifteen items of anasthetic apparatus are scheduled for procurement under this project. Assuming that each is used 2.5 hours a day and 22 days a month, the annual consumption costs will be as follows.

① Oxygen 2 liters/min. x 150 min. =300 liters x 22 days x 12 month=79,200 liter/year 79,200 liter ÷ 1,360 liter/cylinder = 60 cylinders approx. Gas charge cost : 90 rupees x 60 cylinder = 5,400 rupees 5,400 rupees x 15 cylinders = 81,000 rupees	
② Nitrous Oxide 4 liter/min. x 120 min. ⇒480 liter x 22 days x 12 months=126,720 liter/year 126,720 liter ÷ 16,560 liter/cylinder = 8 cylinders approx. Gas charge cost: 5,000 rupees/cylinder x 8 cylinder = 40,000 rupees 40,000 rupees x 15 cylinders = 600,000 rupees	
Total cost for medical gases	681,000 rupees

3) Consumables

① Radiology CT Scanner : 1 set X-ray Film 10 films/day 10 films/day x 240 day/year = 2,400 films/year x 25 rupees/film =60,000 rupees
Film Developing Cost 1,400 rupees (Developing solution : 500 rupees +fixing solution:900 rupees)/600 films -------- 2.33 rupees/film 2,400 film/year X 2.33 rupees ⇒ 5,592 rupees
TOTAL 65,592 rupees
② Cardiology E.C.G. unit : 5 sets E.C.G. Paper 2 rolls/month=24 rolls/year 24 rolls X 60 rupees/1 roll=1,440 rupees X 5 inch sets ⇒7,200 rupees
③ Laboratory Autochemistry Analyzer: 1 set Reagent 2,500 tests/1 set 300 test/day X 286 day⇒85,800 tests÷2,500 tests/1 set⇒34 sets Reagent : 2,000 rupees/set X 34 sets= 68,000 rupees
Blood Gas Analyzer : 2 sets 1,000 tests/1 set+CO_2 gas - 1 cylinder 20 test/day X 286 days⇒5,712 tests÷1,000 test/set⇒6 sets Reagent : 3,200 rupees + CO_2Gas : 1,000 rupees = 50,400 rupees X 6 sets X 2 units= 50,400 rupees
TOTAL 118,400 rupees
④ Nephrology Hemodialyzer : 3 sets Dialyzer, Tube, Solution : Rupee 2,400/set 2 patients/day/unit X average 5 units/day⇒ 6 patient X 286 days ⇒1,716 patient/day X 2,400 rupees = 4,309,592 rupees *Hemodialysis is basically chargeable on the patient. Reuse of Dialyzer makes costs rather cheap.
Medical Consumables Total 4,309,592 rupees

3.3.5. Cooperation from Private Agents

(1) Current State of Private Sector Maintenance Activities

In India, simple function medical equipment is being mass produced, but that is only one part of all medical equipment and basically, high level medical equipment is hardly manufactured at all, and thus is imported from abroad. As for the equipment procured through local agent, contracts are made with the agent for spot repair visits at times of breakdown and the comprehensive periodic checking of equipment which is set according to the frequency of use, grade and urgency of the repair. Financially affluent private medical institutions conclude maintenance contracts for high level equipment and receive complete support. The maintenance of such high level equipment in these private medical institutions is of a high standard and broken or unusable equipment is hardly ever seen. Moreover, procurement of spare parts and consumables is smooth. As for the high level CT scanners, local agents provide a maintenance service and to a certain extent can be trusted in their technology.

(2) Local Agents List

The main agents dealing in the most commonly used medical equipment in India are shown in Table 3-46. These firms are all stationed in Delhi, Calcutta and Bombay and through their branches have equipment supply records to the Institute of Medical Sciences, SS Hospital.

Table 3-46 Local Agent for Main Medical Equipment

Company name	Address	Main Equipment
Blue Star Limited	Delhi	X-ray Equipment, Ultrasound Scanner, Electro Medical Equipment, Clinical Laboratory Equipment, Others
Thoshinwal Brothers Pvt. Ltd.	Bombay	X-ray Equipment, Ultrasound Scanner, Electro Medical Equipment, Clinical Laboratory Equipment, Others
Bombay Medical Coordinators Pvt.	Bombay	X-ray Equipment, Ultrasound Scanner, Electro Medical Equipment, Others
Rasahmi Diagnostic Pvt.	Bangalore	Electro-surgical Unit, Suction Apparatus, O.T. Table, Others
J. Mltra & Brother Pvt. Ltd.	Delhi	Clinical Laboratory Equipment, Optical Apparatus, Others
Snow White	Bombay	Laundry Machines
Thermax India Ltd.	Bombay	Laundry Machines
National Steel India	Bombay	C.S.S.D. Equipment

Chapter 4 Basic Design

Chapter 4 Basic Design

4.1 Design Policy

The formulation of the project should adhere to the following design conditions.

(1) Design Conditions on the Demand Side

1) The project should be designed so that it is appropriate for the trend of diseases in Varanasi district, India, the number of beneficiaries, and the level of medical technology, taking in consideration the fact that the projected site is the top referral hospital in the district.

2) The projected site is a general hospital in charge of medical care ranging from the primary to the tertiary. However, the design of this project is to be centered on basic equipment used for primary and secondary medical care in the treatment of common diseases.

3) An attempt should be made to rehabilitate the medical functions of the Hospital, which have been declining, as well as to ensure the capability to deliver high quality health care as the only nationally operated general hospital and the top referral hospital in the country, through the provision of necessary equipment.

4) However, this project does not aim to completely improve the whole institution, but is compiled based on the concepts of centralization and rationalization.

5) The departments targeted for improvement are the Surgery Department, the Clinical Pathology Laboratory, the Central Sterilization and Supply Department, the Maintenance Workshops and other related departments which form the basis of the Hospital's whole medical service. It is thus planned that many medical departments will be able to recieve as many wide ranging benefits as possible.

6) The equipment procured does not aim to support tertiary medical

services or the treatment of special types of diseases, but is to be for the diagnosis and therapy of common type diseases which have the highest occurrence rates in the target area.

Moreover, based on the above viewpoints, this project will not include high cost equipment for the providing of a special medical service such as a magnetic resonance imaging system, an ultrasound lithotripter, a linear accelerator, an artificial heart and lung machine, and angiocardiography apparatus.

(2) Design Condition on the Technical Side

1) The items of the equipment planned under this project should be urgently needed items which, although already installed in the Hospital, do not funciton satisfactorily at present because of supeannuation or other reasons or which are insufficient in number.

2) The technical level of the equipment procured under this project should be comparable with that of the existing equipment, and the procured equipment shold be suitable to the level of technical skills of the existing medical personnel of the hospital.

3) The equipment procured under this project should be relatively simple in structure, durable, basically trouble-free, and can be serviced to a certain degree under the existng equipment maintenance system.

4) The costs of the operation and maintenance of the procured equipment should be affordable within the current health care budget of India.

(3) Design Conditions in Terms of Installation Works

1) In implementing the project, the works for the installation of the equipment should be planned to be conducted efficiently in a short period so that the works should not interfere with the routine operation of the Hospital.

2) Some of heavy duty and advanced medical equipment requiring installation works should be subjected ot test installation and preshipment inspection at the manufacturer's factory, so that the term of installation works in the site can be shortened.

(4) Policies Concerning the Utilzation of Local Products and Procurement of Equipment from Third-party Countries

1) In view of the ease and reliability of maintenance after procurement, as well as the relationship with the existing equipment, it should be taken into consideration that a part of the equipment may be procured from third-party countries.

2) Items that can be procured in India should be procured locally, so long as no problem is expected in maintenance.

3) Spare parts, periodically replaced parts, expendable supplies, and maintenance services for the procured equipment must be available in India or neighbouring countries.

(5) Basic Conditions Related to Natural Environment

1) The equipment should have sufficient resistance to heat, humidity, and dust so that it can withstand the tropical climate in Varanasi, India.

2) Precision machines should be planned to have air conditioners, ventilation fans, and other means ot prevent dust hazard.

4.2 Examination of Design Conditions

4.2.1 Examination of Projected Departments

The following departments are selected as project targets based on the aforementioned basic guidelines.

1) Of a total 22 operating theatres, the fifteen located in the central operating theatre block are to be improved. The post operative

recovery rooms will also be included as a project target.

2) Operation related equipment in the department of orthopedics, plastic surgery, urology, cardiothoracic surgery, neurosurgery and vascularsurgery departments is to be improved from the viewpoint of strengthening the surgical departments.

3) The blood bank is to be targeted as one part of the clinical pathology laboratory.

In concrete terms, basic design is planned for the following range of departments.

○ Operating Theatres Block	4
General Surgery Operating Theatres	1
Plastic Surgery Operating Theatres	1
Gynecological Surgery Operating Theatres	2
Emergency OB/GYN Operating Theatres	1
Cystoscopy Surgery	1
Urological Surgery Operating Theatres	1
Cardiothoracic Surgery Operating Theatres	1
Neuro Surgery Operating Theatres	1
Emergency Surgery Operating Theatres	2
Post Operative Recovery Room, etc.	3
○ Central Sterilization and Supply Department	
Central Sterilization and Supply Room	1
Laundry Section	1
Incinerator Section	1
○ Central Clinical Laboratory	
Pathology Laboratory	1
Microbiology Laboratory	1
Immunology Laboratory	1

Pathology Laboratory	1
Haematology Laboratory	1
Blood Bank	1

○ Maintenance Workshop

SS Hospital Workshop	1
IMS Workshop	1

○ Department of Ophthalmology	OPD ETC
○ Department of ENT	〃
○ Department of Dental Surgery	〃
○ Department of Obstetrics and Gynecology	4 Labour Rooms
○ Department of Pediatrics	Newborn Baby and Pediatric O.T.
○ Nursing School	Vehicles
○ Department of Radiology	Diagnosis and Treatment
○ Department of Endoscopy	Gastroscopes
○ Section of Nephrology	Acute Renal Fault
○ Department of Cardiology	Thoracic Surgery Instrument

4.2.2 Selection of Equipment

The equipment planned to be supplied in each division is selected based on the following conditions:

(1) Operating Theatre Block

One each of the following general surgical equipment is planned for each of the fifteen operating theatres: shadowless ceiling lamp, operating table, anaesthesia apparatus and electric diathermy. However, installation of shadowless lamp in cystoscopy surgery operating theatre is exluded from this project. For equipment such as defibrillators, electrocardiographs and syringe pumps which are not used so frequently, one of each will be provided for shared use between three operating theatres. The equipment selection criteria for each speciality operating theatre are as follows.

1) Genaral Surgery Operating Theatres

Together with operating theatre equipment, installation of surgical equipment for dealing with general head, stomach and chest surgery is planned.

2) Orthopedic Surgery Operating Teatres

Together with operating theatre equipment, installation of equipment such as surgical X-ray apparatus, bone fracture sets, electric bone drill units and other such osteopathic and orthopedic equipment is planned.

3) Plastic Srugery Operating Theatres

Together with operating theatre equipment, installation of equipment centered on that for head plastic surgery such as plastic surgical instrument sets and Stryker sets with micro, oesteome is planned.

4) Gynecological Surgery Operating Theatres & Emergency OB/GYN OT

Together with operating theatre equipment, installation of equipment such as labarofiberscopes, hystoscopes, surgical instruments for Ceasarian section and so on for the diagnosis and therapy of gynecological diseases is planned.

5) Cystoscopy Surgery and Urological Surgery Operating Theatres

Together with operating theatre equipment, improvement of equipment for endoscopic surgery such as cycto-urethroscopes and cystourethroscopes is planned.

6) Cardiothoracic Surgery Operating Theatres

Together with operating theatre equipment, installation of thoracotomy and laporotomy equipment such as bronchoscopes, thoracotomy surgical instrument sets and surgical microscopes is planned. Equipment such as open heart aortic surgery sets and artificial heart and lung machines for use in open heart surgery is not included in the project.

7) Neuro Surgery Operating Theatres

Together with operating theatre equipment, installation of cavieron surgical equipment such as leksel stereotactic apparatus, craniotomy surgical instrument sets and so on is planned.

8) Emergency Surgery Operating Theatres

Installation of surgical equipment for two operating theatres and general surgical instruments used in emergency surgery plus other related equipment is planned.

9) Post Operative Recovery Room, etc.

Installation of equipment such as ventilators, patient monitors, blood gas analyzers and so on for post surgical intensive control is planned.

(2) Central Sterilization and Supply Department

1) Central Sterilization and Supply Room

In order to enable the total separated handling of treated and untreated materials, installation of three large scale sterilizers for each sterilized materials entry and exit door is planned. As the following figure illustrates, the sterilization room will be divided into two with a central area, and spaces between material and ceiling, floor and walls partitioned off. Also, in order to prevent degradation due to supply of hard water, the installation of a water softening plant is also planned.

2) Laundry Section

Renewal of existing washing machines water extractor, pressing machine and drying machines is planned.

3) Incinerator Section

Installation of small incinerator for medical waste products (exclusive use) is planned.

(3) Cenatral Clinical Laboratory

1) Pathology Laboratory

Installation of a full automatic chemistry analyzer, automatic haemotology analyzer, U.V. sepctrophotometer and related equipment for blood, urine and fluid investigation is planned.

2) Microgiology Laboratory

Installation of microscopes, deep freezes and incubators etc. for the investigative culture and preservation of microorganisms is planned.

3) Immunology Laboratory

Installation of a turbidimeter and ELISA platelet reader for use in antibody immune reactions is planned.

4) Pathology Laboratory, Histopathology and Cytlogy Laboratory

Installation of an automatic tissue processor, automatic staining machine, embedding microtome and such related equipment for compiling materials on microscopic examinations is planned.

5) Haematology Laboratory · Blood Bank

Installation of a haemotological analyzer, whole blood platelet aggregometer, blood storage refrigerator, croyobath and such related equipment for use in blood transfusion examination and storage is planned.

(4) Maintenance Workshop

Equipment necessary for maintenance and repair of medical equipment, such as electronic measurement devices, electronic repair tools and power tools is planned.

(5) Department of Ophthalmology

Installation of equipment used for treatment of outpatients glasses examination and argon laser eye treatment unit used for the therapy of various vitreo-retinal disorders from which many patients are suffered

is planned.

(6) Department of ENT

Installation of equipment used for treatment of outpatients and hearing examination is planned.

(7) Department of Dental Surgery

Installation based around dental units, dental laboratory modules and so on for treatment of dental outpatients is planned.

(8) Department of Obstetrics & Gynecology

Installation of ultrasound scanners for perinatal diagnosis, and delivery tables, observation apparatus and so on for use in delivery is planned.

(9) Department of Pediatrics

Installation of four incubators to deal with the relatively high rate of unmmatured infant, and neonate therapy equipment such as tables for paediatric minor surgery and so on is planned.

(10) Nursing School

Installation of one mini-bus for transport in outdoor training activity and nursing educational equipment is planned.

(11) Department of Radiology

Installation of one whole body CT scanner and one ultrasonography scanner which will prove extremely effective in diagnosing a wide range of diseases, and one cobalt 60 teletherapy machine for therapy in increasingly common malignant tumors is planned.

(12) Department of Endoscopy

Installation of a fiber endoscope and related equipment for diagnosis of upper GI and lower GI is planned.

(13) Section of Nephrology

Procurement of equipment such as hemodialysis machines and pure water making units for hemodialysis of renal disease patients is planned.

(14) Department of Cardiology

Installation of surgical equipment only for use in the thoracotomy department is planned to be included among equipment for the cardiotomy and thoracotomy.

4.2.3. Examination of the Maintenance System

It is thought that the current budget and personnel plans of the maintenance workshops will have major difficulty in dealing with all the equipment scheduled for procurement under this project. Some of the high level medical equipment to be procured will need maintenance to be done by specialist. The manufacturers warranty on the procured equipment lasts for one year, so during this period, it is thought to be necessary to reserve funds for maintenance from the revolving fund etc, and conclude maintenance contracts with manufacturers and local agents in order to ensure the long term operation of the procured equipment.

4.2.4. Procurement of the Equipment

As described before, in view of the ease and certainty of maintenance after procurement and the availability of periodically replaced parts, repair parts, and consumable suplies, it should be taken into consideration that the following items may be procured form third-party countries. Some items must be procured from third-party countries, because they are not produced in Japan nor India.

Equipment	Manufacturing Countries
Cobalt 60 radio-therapy unit	Canada, France, U.S.A., Japan
Clinical chemistry analyzer	Switzerland, Germany, U.S.A., Japan
Blood gas analyzer	Switzerland, Netherlands, Germay, U.S.A., Japan
Ultrasound scanner	Nertherlands, France, U.S.A., Japan
Hemodialysis machine	Sweden, U.S.A., Germany, Japan
Respirator	U.S.A., Germany, France, Japan
Vehicle	India, Japan, others

4.3 Basic Plan

4.3.1 Equipment Distribution Plan

Based on the basic design policies and conditions described above, it is considered appropriate that about 290 different types of items should be procured under this project, as detailed in the following:

・Operating Theatre Block

General Surgery Operating Theatres	Quat.
Operating Theatre Shadowless Ceiling Lamp	4
Operating Theatre Table for General Surgery	4
Operating Theatre Diathermy (Electro-Surgical Unit)	4
Anaesthesia Apparatus with Ventilator	4
Defibrillator, portable	1
Patient Monitor with P.O. Temp. ECG, Nerve Stimulator	4
Electrocardiograph, 1-channel	1
Glucometer, Pocket Type	1
Infusion Pump	1
Syringe Pump	1
X-ray Film viewer, Wall Mounted Type	4
Emergency Operating Theatre lamp, with Battery Back-Up	1
Blood Flow Detector, Ultrasound Doppler	1
Laparo-fiberscope	1
Surgical Instrument set, for General Surgery	8
Surgical Instrument set, for Tnyroidectomy	2
Surgical Instrument set, for Cholecystectomy	4

Surgical Instrument set, for Gastrectomy	(8-22695)	2
Surgical Instrument set, for Nephrectomy	(8-22697)	2
Surgical Instrument set, for Appendicctonomy	(8-22702)	2
G.I. Suturing Instrument set	(8-22609)	2
Peripheral Vascular Clamp	(8-22744~5)	2
Octopus/Thompson Abdominal Wall Self Retaining Retractor		1
Electric Dermatome set	(8-22971)	1
Surgical Scrub Station	(8-29820)	2
Autoclave, Table-Top type		2
Maiyo Type Instrument Table		4
Instrument Table, Fan-Shaped		4
Ambu Bag set		4

Orthopedic Surgery Operating Theatres

Operating Theatre Shadowless Ceiling Lamp	1
Operating Theatre Table for Orthopedic Surgery	1
Operating Theatre Diathermy (Electro-Surgical Unit)	1
Anaesthesia Apparatus with Ventilator	1
Defibrillator, portable	1
Electrocardiograph, 1-channel	1
Glucometer, Pocket Type	1
Patient Monitor with P.O. Temp. ECG, Nerve Stimulator	1
Infusion Pump	1
Syringe Pump	1
Surgical Image Intensifier C-Arm X-ray Equipment	1
X-ray Film viewer, Wall Mounted Type	1
Emergency Operating Theatre Lamp, with Battery Back-Up	1
Maiyo Type Instrument Table	1
Instrument Table, Fan-Shaped	1
Surgical Instrument set, for Orthopedic Sergery	2
Steel Wire Traction Instrument Set	1
Kirschner Wire Instrument Set	1
Kunscher Intramedullary Pin Set	1
Bone Fracture Set	1
Arthroplastic set	1
Arthroscopic Equipment set	1
Anterior Spinal Instrument Set	1
Electric Bone Drill Unit	2

Electric Bone Saw	1
Surgical Scrub Station	1
Microwave Theraphy Apparatus	1
Ultrasonic Teraphy Apparatus	1
Ambu Bag set	1

Plastic Surgery Operating Theaters

Operating Theatre Shadowless Ceiling Lamp	1
Operating Theatre Table for Plastic Surgery	1
Operating Theatre Diathermy (Electro-Surgical Unit)	1
Anaesthesia Apparatus with Ventilator	1
Patient Monitor with P.O. Temp. ECG, Nerve Stimulator	1
Operating Microscope for Micro-Surgery, Dual Head	1
X-ray Film viewer, Wall Mounted Type	1
Emergency Operating Theatre lamp, with Battery Back-Up	1
Electric bone drill with dermatome & blades	1
Microsurgery Instrument set	1
Standard plastic surgery instruments	1
Fibre-optic cold light	1
Correcting rhinoplasty set	1
Stryker Set,w/ Micro, Oesteome. Drill Deramabraider	1
Special Maillofacial Surgery Instruments	1
Rhinoplast set	1
Skin Grafting Knife (Breathaist)	1
Magnifying Loupe, 4X	2
Ultrasonography doppler	1
Nerve stimulator	1
Maiyo Type Instrument Table	1
Instrument Table, Fan-Shaped	1
Ambu Bag set	1

Gynecological Surgery Operating Theatres

Operating Theatre Shadowless Ceiling Lamp	3
Operating Theatre Table for Gynecological Surgery	3
Operating Theatre Diathermy (Electro-Surgical Unit)	2

Anaesthesia Apparatus	3
Defibrillator, portable	1
Electrocardiograph, 1-channel	1
Glucometer, Pocket Type	1
Patient Monitor with P.O. Temp. ECG, Nerve Stimulator	2
Infusion Pump	1
X-ray Film Viewer	4
Syringe Pump	1
Emergency Operating Theatre lamp, with Battery Back-Up	3
Maiyo Type Instrument Table	3
Instrument Table, Fan-Shaped	3
Colposcope with camera	1
Hystoscope with Photography unit	1
Laparofiberscope with teaching attachment	1
Surgical Instruments set for Ceasarian section	2
Surgical Instruments set for Hysterectomy set	2
Surgical Instruments set for Radial wertheins Hyst. set	2
Surgical Scrub Station	2
Autoclave, Table- Top type	1
Ambu Bag set	3

Cystoscopy Surgery Operating Theatres

Operating Theatre Table for Cysto Surgery	1
Anaesthesia Apparatus with Ventilator	1
Patient Monitor with P.O. Temp. ECG, Co2 Nerve Stimulator	1
X-ray Film viewer, Wall Mounted Type	1
Emergency Operating Theatre Lamp, with Battery Back-Up	1
Cycto-Urethroscopy endoscopic photoprepratory system	1
Cystourethroscope, adoult Liglesia 0 and 30° & 12 lenses	1
Cystourethroscope, children	1
Cystourethroscope, infant	1
Biopsy and Grasping forceps	1
Urethrotome set	1
Resectoscope, Adult	1
Resectoscope, children	1
Cystoscope with diathermy unit	1

Uretherorenoscope for Adult and children	1
Maiyo Type Instrument Table	1
Instrument Table, Fan-Shaped	1
Endoscopic Sterilizer	1
Ambu Bag set	1

Urological Surgery Operating Theatres

Operating Theatre Shadowless Ceiling Lamp	1
Operating Theatre Table for Urolo Surgery	1
Operating Theatre Diathermy (Electro-Surgical Unit)	1
Anaesthesia Apparatus with Ventilator	1
Operating Microscope for Urological-Surgery	1
X-ray Film viewer, Wall Mounted Type	1
Emergency Operating Theatre lamp, with Battery Back-Up	1
Surgical Instrument for Nephrectomy	1
Maiyo Type Instrument Table	1
Instrument Table, Fan-Shaped	1
Autoclave, Table top type	1
Surgical Scrub Station	1
Ambu Bag set	1

Cardiothoracic Surgery Operating Theatres

Operating Theatre Shadowless Ceiling Lamp	1
Operating Theatre Table for Cardiothoracic Surgery	1
Operating Theatre Diathermy (Electro-Surgical Unit)	1
Anaesthesia Apparatus with Ventilator	1
Defibrillator, portable	1
Electrocardiograph, 1-channel	1
Glucometer, Pocket Type	1
Patient Monitor with P.O. Temp. ECG, Nerve Stimulator	1
Infusion Pump	1
Syringe Pump	1
X-ray Film viewer, Wall Mounted Type	1
Emergency Operating Theatre lamp, with Battery Back-Up	1
Maiyo Type Instrument Table	1

Instrument Table, Fan-Shaped	1
Instruments for cardiothoracic surgery	1
Bronchoscope, rigid type	1
Fiberoptic bronchoscope fiberoptics, for adult & Pediatric	1
Fiberoptic Intubation	1
Biopsy gun	1
Thorocoscope	1
Oesophegeal therapeuticscope set	1
Thoracotomy surgical instrument set	1
Emergemcy Mediastinal surgical instrument set	1
Thoracoscopy set	1
Laparotome set, rigid type	1
First rib recection set	1
Fiber head spot light	2
Ambu Bag set	1

Neuro Surgery Operating Theatres

Operating Theatre Shadowless Ceiling Lamp	1
Operating Theatre Table for Neuro Surgery	1
Operating Theatre Diathermy	1
Anaesthesia Apparatus with Ventilator	1
Patient Monitor with P.O. Temp. ECG, Co2 Nerve Stimulator	1
Maiyo Type Instrument Table	1
Instrument Table, Fan-Shaped	1
High speed drill	1
Surgical Instrument set, for craniotomy	1
Spinal surgery set	2
Autoclave, Table-Top type	1
Ambu Bag set	1

Emergency Surgery Operating Theatres

Operating Theatre Shadowless Ceiling Lamp	2
Operating Theatre Table for Emergency Surgery	2
Operating Theatre Diathermy	2
Anaesthesia Apparatus with Ventilator	1
Defibrillator, portable	1
Electrocardiograph, 1-channel	1

Glucometer, Pocket Type	1
Patient Monitor with P.O. Temp. ECG, Nerve Stimulator	2
Infusion Pump	1
Syringe Pump	1
X-ray Film viewer, Wall Mounted Type	2
Emergency Operating Theatre Lamp, with Battery Back-Up	2
Surgical Instrument set, for General Surgery	4
Autoclave, Table-Top type	1
Surgical Scrub Station	1
Instrument Sterilizer, Table Top Type	1
Maiyo Type Instrument Table	2
Instrument Trolley	2
Ambu Bag set	2

Post Operative Recovery Room, etc.

Ventilator, volume preset, PEEP, SEEP	3
Patient Monitor with P.O. Temp. ECG, Nerve Stimulator	6
Infusion Pump, with IV stand	5
Syringe pump	5
Defibrillator, portable	2
Blood Gas Analyzer	1
Na, K. Analyzer	1
Gath Bed	4
Glucometer	3
Ambu Bag set	6
Fiberoptic Laryngoscope, adult and pediatric	1
Bronchofiberscope	1

・Central Sterilization and Supply Department	Qu't

Central Sterilization and Supply Room

High Pressure Sterilizer, two doors Type, 400L.	3
Ultrasonic Instrument Washer	1
Drying Cabinet	1

Surgical Glove Washer & Dryer	1
Surgical Glove Powdering Machine	1
Water Distilling Machine	1
Water Softening Plant (Non Chemical Type)	1
Sewing Machine (Non Electrical Type)	1
Instrument Supply Trolley	6
Fluoroscent Lamp, Ceiling Type	20
Air Conditioner, Window Type for Clean Linen Room	4
Partition Assemb. for Separation of Dirty and Clean Linens	1

Laundry Section

Washing Machine, 100Kgs.	2
Breaching Machine	1
Automatic Hydric Washer Extractor	2
Drying Tumber	2
Electric Press Machine	1
Linen Supply Trolley	6
Laundry Cart	6
Sewing Machine, (Non Electrical Type)	2

Incinerate Section, etc.

Incinerator, Electric Type	1

• Central Clinical Laboratory	Qu't

Pathology Laboratory

For Clinical Pathology Laboratory

Automatic Haematology analyser	1
Full Automatic Chemistry analyser, with Electolyte Tests	1
Semi-Automatic Fibrometer (coagulator)	1
Binocular Laboratory Microscope, 1500X	4

Dual Headed Binocular Microscope, 1500X	1
Trinocular Microscope, with Fluorescent, Phase Contrast and Micro-Photographic facilities	1
Whole Blood Platetet Aggregometer	1
Automatic Hand Pipettes, 10ul-100ul	4
Automatic Hand Pipettes, 20ul-200ul	12
Automatic Pipettes for Bottled Reagents	18
U.V. Spectrophotometer with Micro-cuvettes System	1
Elisa Platlet Reader	1
Deep freezer for -20°～-30°C	1
Na,K,Cl Analyzer	1
Laminar Air Flow	2
Centrifuge for test tubes and capilily tubes	1
Autoclave, Vertical Type, 45 Litters	1
Air Conditioner, Window Type	4
Fluoresent Lamp, 80 Watts X two tubes	18

Microbiology Laboratory (Including Parasitology Laboratory)

Deep freeze, -35℃ Vertical Type	2
Deep freeze, -80℃ Horizontal Type	1
Binocular research microscope, 1000X	8
Dark field microscope	1
Inverted microscope, with Photography system	1
Trinocular microscope with Phase Cont, Fluor. Photo	1
Centrifugal lyophiliser Freez Drier, small volume	1
High Seed Cold Centrifuge, 1 Angle, 2 Swing rotor	1
B.O.D. incubator, low Tem. 20~25℃	2
UV-VIS Spectorophotometer	1
ELISZ Platelet Reader	1
Micropipette set, 5-50,10-100,20-200ml and 1-5μ l	3
Electric Vaccum Cleaner	3

Immunology Laboratory

Turbidimeter	1
ELISA Platlet Reader	1

Pathology Laboratory

Histopathology and Cytrogy Laboratory

Automatic tissue processor	3
Automatic staining machine for histology	2
Automatic Embedding Centre	1
Sledge microtome, Heavy Duty	1
Rotary Microtome, Precision type	2
Freezing microtome (0~35°C)	1
Cytocentrifuge, Cyto-Spin	1
Demonstration Microscope, 5-10 Heads	1
Binocular Research Microscope, 1000X	6

Haematology Laboratory

Haematological analyzer	1
Research Fluoroscent microscope, with Phase Contrast/Photo.	1
Video System for Microscopy	1
Multi Type Coagulomenter	1
Whole Blood Platelet aggregometer	1
Micropipettes, 5-50, 10-100, 20-200 1000 ~ above, each	3
Elisa Platelet Reader	1

Blood Bank, etc.

Blood storage refrigerators, for 200 units	1
Refrigerated centrifuge (-4°C), 500mL X 4	2
Deep freezers, -80°C, Vertical Type	2
Platelet incubator with shaker, 22~23℃ for 30mlX40 Bags	1

Croyobath, circulating (Plasma thawing bath) for 4℃	1
Freeze dryer (for preparation for freeze dried plasma)	1

· Maintenance Workshop — Qu't

SS Hospital Work Shop

Light Duty Lathe Machine, 3 Feets Bed	1
Radial Drillig Machine	1
Power Hacksaw Machine	1
Double Ended Grinding Machine	1
Brazing Machine (Braze/Weld)	1

IMS Main workshop

Oscilloscope 50～100 MHz (Storage)	1
I.C. Tester	1
L.C.R. Bridge (for Impudance, Capacitance, Registance)	1
Digital Multimeters	1
Digital Clamp Tester	1
Digital Thermometer	1
Function Generator (Signal Generator)	1
Pulse Generator	1
Pattern Generator for TV. Monitor Adjustment	1
Vacuum Cleaner,7 Liters	2
Tool Cabinet Containing Tools for Repair Works	1
Tool set for Mechanical Works	4
ME Repair Tool set, for Electronic items	2
ME Repair Tool set, for Electric Machinary	1
Heavy Duty Lathe Machine, 3～4 Feets Bed	1
Light Dduty Lathe Machine, 2 Feets Bed	1
Precision Works Lathe Machine	1
Universal milling machine	1
Radial drilling machine	1
Power hacksaw machine	1
Double Ended grinding machine	1

Measuring boring precision Instrument	1
Wood working lathe Machine	1
Perspex (Plastic Sheet) cutting machine	1
Electrocardiograph with pattern signal unit	1
Digital pH meter Standard Adjustment	1
Amateur Balancing Machine	1
Drying Varnish Machine, Cabinet Type	1
Automatic Coil Winding Machine	2
Glass Blowing Lathe Machine	1
Electronics Parts Component sets	1
AC Power Drill with Drill Blade	2

Group B

· Department of Ophthalmology	Qu't
Argon Laser Eye Treatment Unit	1
Slit Lamp with Tonometer applanation with Photo attachment	1
Operating microscope, Dual Head	1
Operating Table for Eye Treatment	1
Operating Lamp, Mobile type with battery buck-up	1
Fundus camera	1
Eye Surgery Instrument for Radial Keratotemy & Keratoplasty	1

· Department of ENT	
ENT Treatmement Table	1
Mobile Shadowless Lamp, with battery back-up	1
Fibre optic light source	2
Operating Microscope, Dual Head	1
Endoscopic sinus surgery, with Antroscope	1
Microsurgery Instrument set for Ear and Lalyng	1
Audiometer, Dual channel for adult	1
Audiometer, for infant	1
ENT treatment unit	4

- Department of Dental Surgery

Dental Unit, with Compresser	6
Dental Instrument Set with Cabinet	6
Dental Laboratory Module	1
High Speed Sterilizer, Vertical Cyrinder Type	4
Dental X-ray Unit	1

- Department of Obstetrics & Gynecology

Delivery Table	4
Spot Examining Lamp for Labour Room	4
Ultrasound scanner with linear, sector and vaginal probe	1
Cardio-tocograph / Fetal Monitor	2
Fetal Heart Detector (Doppler type)	4
Vaccum Extractor	2
Air Condition for Ultrasound Scanner Room	1

- Department of Pediatrics

Block A

Operating Theatre light-twin system from ceiling	1
Treatment Table for Paediatric minor Surgery	1
Bronchofiberscope for pediatric	1
Gastrointestinal-Duodeno Fiberscope for Pediatric	1
Laparoscope for Pediatric	1
Cysto-Rectoscope for infant and pediatric	1
Jackson Lee Resuscitator	1
Video System for fiberscope	1

Block B

Incubators	4
Ventilators, for infant and chaild	2
Infusion pumps	2
Syringe pump	2
Phototherapy unit	2
Infant Warmer	1
Blood Gas Analyser	1

Patient Monitor for Infant with Pulse Oximeter	1
Apnea monitor	1
Electronic weighing scale for new-born babies	1
Emergency cart with resuscitators	1

· Nursing School

Vehicle, Mini-Bus, 30 persons	1
Chase doll of adult size (Female)	1
Obstetrical training kit - dummy with doll	1
Delivery kit (EMERGENCY CART)	1
Teaching models	1
Teaching charts	1
Human skeleton	1
VTR and color TV	1

· Department of Radiology

Wole Body Computer Tomography X-Ray Equipment	1
Ultrasonography Scanner, for Chast and abdomen	1
Cobalt 60 Teletherapy Machine	1

· Department of Endoscopy

Esophago Fiberscope	1
Gastorintestinal Fiberscope	2
Colono Fiberscope	1
Choledoco Fiberscope	1
Video Endoscopy set with Camera, VTR, Monitor	2
Endoscopic Illuminator	2
Electro Surgical Unit for Endoscope	2
Suction Unit	2
Endoscopic and Proctoscopic Table	1
Endoscopic Cabinet, with UV lamps	1
Fiberscope Cleaning Machine, Manual Type	1
Endoscopic Trolley	1

· Section of Nephrology

Hemodialysis Machine, for acute dialysis	3
Revers Osmosis water plant for the hemodialysis	1

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 such as European countries, U.S.A. etc. that certain items must be procured from third-party countries because of the ease and reliablility 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 considered.

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
Department of Surgery			
Operating Theater Shadowless Lamp	Combination type (7~10 tubes) Ceiling mount	To be standard model for easy handling.	B
Operating Theater Table	Oil-hydraulic elevation Section:hant-end control Lateral-tilt	General level normal operating tables with foot controlled elevation, and easy to maintain.	B
Operating Diathermy	Coagulation:100w up Cutting:80 up Blend cutting 160w up Mix:180w up Bipor	Multi-function models that can be used in general, urology and micro surgery for shared uses are thought valid. High hemostatic function solid state type is planned.	B
Anesthesia Apparatus	Close circuit, Halothane vaporizer with BP machine	Closed circuit type machine for short term, economical anesthetic is preferred.	B
Patient Monitor	Wired System Display:non feld digital memory Wave form:ECG Non-intensive BP Heart rate Beats Resp,Temp, etc.	To be standard type for independent use in each operating theatre, and equipped with memory for continued observation of the changes in the state of patient's condition.	B

Division/Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
Defibrillator	Output:300 Jour up Synchronus/ Asynchronus with ECG Monitor, DC operation	A normal type simultaneous /non-simultaneous conductive model with monitor for dealing with emergency heart stoppage patients.	B
Surgical Image Intensifier C-Arm X-ray Equipment	1,000 KVA 6' I.I tube with CRT monitor	To be equipped with memory for recording pictures during operations, to be used mainly in orthopedic surgery field.	B
Bronchoscope	Apical part dia: 5.0 mm, 6.2 m Working length: 550 mm Field view:70°~90°	To be a fiber type item for use in therapy of expungent bronchus and not painful for the patient. To be forceps or diametric for curet insertion in biopsy and histeopathy, and suction for bronchus cleaning.	B
Surgical Scrub Station	Tab:2 Made of stainless steel with mirror	To be connectable to existing water pipes and cheap in terms of installation operating costs.	B
Ventilator	Volume control Compressor built-in IMV, Peep, CPAP available	A model able to support self respiratory patients and cope with adjestable respiration for patients under coerced respiration.	A
Blood Gas Analyzer	Full automatic electlyte analysis Parameters:4 kinds up Test:5 up	To be a model to which necessary data for clinical pathological investigation samples respiration control can be inputted.	A
Central Materials Department			
High Pressure Steam Sterilizer	System:electric boiler Capacity:400 litter Automatic heading system, 2 door type, American type square shaped, Stainless steel	To be equipment capable of sterilizing all the linen, and surgical instruments and materials of the 24 operating theaters. To be front, rear open and close model capable of separating the handling of treated and untreated materials.	B
Ultrasonic Instrument Washer	Manual type, Washing, rinsing and drying chamber	To be a model of slightly low throughput but possible to manually transfer between the three tanks.	B

Division/Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
Drying Cabinet	Electric heating	Popular model.	B
Surgical Materials Department			
Surgical Glove Washer & Dryer	Twin-chamber (drying and conditioning)	A twin tank short time disposal popular model is valid.	B
Wasing Machine	Capacity:for 100 kg Automatic type	A model capable of integrated washing, bleaching and drying is preferred.	B
Press Machine	Electric type	To be a high temperature, high pressure model capable of heat disinfecting sheets and covers.	B
Central Clinical Laboratory			
Automatic Hematology Analyzer	Semi automatic, End-point: 480 tests/H up Rate mode: 240 tests/H up	To be a model for use in routine blood and urine investigations of patients in the clinical laboratory.	A
Full Automatic Chemistry Analyzer	Full automatic Test:100 samples/H Parameters:over 12	A total automatic model for quick treatment of large quantities of samples sent from the general hospital and medical facilities.	A
Double Head, Binocular Microscope	Max:1,500 x With illuminator	To be a two tube head, facing model for microscope simultaneous investigation and discussion of two people.	B
Trinocular Phase Microscope	Max:1,500 x With photo system	To be able ato provide stable photographic results with automatic exposure device equipped.	B
UV-VIS Spectrophotometer	VIS-UV ray system Micro-computor controlled	A double beam type for dealing with various investigations is necessary. A device that has operation functions through micro-computer for gaining high accuracy investigation results is required.	B
Deep freeze	Cap.:380 liter up Term:-70°C up Upright model	A model that can preserve reagents and vaccines, and is easy in terms of entry and removal.	B

Division/Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
Automatic Embedding Center	Heater:0~60°C Parafine Chamber: 15x15 cm Cooling -10°C	A medium size model capable of treating from 500 to 700 samples daily.	B
Maintenance and Construction Department			
Osciloscope	Mobile type 80~100 MHZ With freeze function	To be capable of output function investigations such as picture treatment equipment.	B
Lathe Machine	Work station : 2~3 feets	Items capable of dealing with repair of medical equipment and facilities.	B
Opthalmic Department			
Argon Laser Eye Treatment Unit	Out-put 50~1200W (green) 〃 50~1200W (blue) Variable control closed water cool type	There is necessity for the equipment for the therapy of vitreo-retinal disorders caused by hypertension and diabetes	B
Fundus Camera	Stereo scopic photography Photo:50° Auto focusing	To be able to carry out fluorescent fundus photography through fluorescein intrvenous injection for the detection of blood vessel count abnormalities in the retina and chropid, and retinal pigmentary obstructions.	B
ENT Department			
ENT Treatment Table	Suction/air blow With 4 spray Spot light:1 bulb	To be used for examination and therapy of outpatients.	B
Dental Surgery Department			
Dental Therapy Unit	Patient chair Operating unit With light Micro-motor	To be a model capable of horizontal therapy with separate, easy to maintain, oil pressure driven seat and unit.	B
Obstetrics Department			
Ultrasound Scanner	Scanning:linear, convex Frequency:3.5 MH, Display:CRT 5" up, With VTR system	A model equipped with micron convex probe for trans-vcaginal scans and fan shaped probe for deep detection is desirable.	B

Division/Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
Nursing School			
Vehicles (Mini-Bus)	CAB-over type, 3,000~3,500 cc. Water cooling Desel engine 4 cylinders, 30 persons	A semi offload wheeled vehicle for use in remote ouatdoor training activities.	A
Radiology Department			
Whole Body CT Scanner	Ganatry size: 550 mm up Pulse rate: 100/sec. Scan time:CT scan: 2 sec or less Scanography: 12 sed or less Tube current:120 KV Spatail resolution: 0.5 mm or better Slice thickness: 2, 5, 10 mm Image reconstruction: 512x512 Dynamic scan system: required	To be a high resolution model capable of use in thoracic and abdominal photography and in the diagnosis of small foci. A model capable of not only cancer but also non-infectious disease diagnosis is desirable.	A
Ultrasonography Scanner	Linear and sector system With themal printer Multi format camera	A color screen display model capable of dealing with diagnosis of various cases (blood vessel backflow, wild flow and obstruction) is desirable.	A
Cobalt 60 Teleterapy Apparatus	Rotary, pendulum, and intermittent irradiation, With counter plate, Max. charge: 10,000 ci or more.	A device that can irradiate in multi-positions is essential for use on various cases of therapy in the general hospital.	A
Gastroenterology Department			
GI Fiberscope	Working length: 1,345 mmm Field view: 80° up Field distance: 10~100 mm With illuminator	Used in stomach ailment diagnosis. To be a model capable of photography and biopsy.	B

Division/Equipment	Main Specifications	Appropriateness of the Level of Equipment	Remark
Colono Fiberscope	Working length: 1,680 mm Field view: 120° (approx.) Field distance: 5~100 mm Angle up-down: each 180°	To be a model capable of dealing with biopsies of colitic polyp and cancer. Easy to handle fiber is valid.	B
Nephrotic Department			
Hemo Dialysis Apparatus	For each patient With alarm system Single pass type	Dialysis apparatus capable of personal use for treatment of acute and chronic kidney failure and medicinal poisoning patients is valid.	A
Reverse Osmosis Water Plant	R.O. water system Cap. :150L/H	To be a model capable of handling the water supply to four dialysis machines including the one already existing hemodialysis machine	A

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.

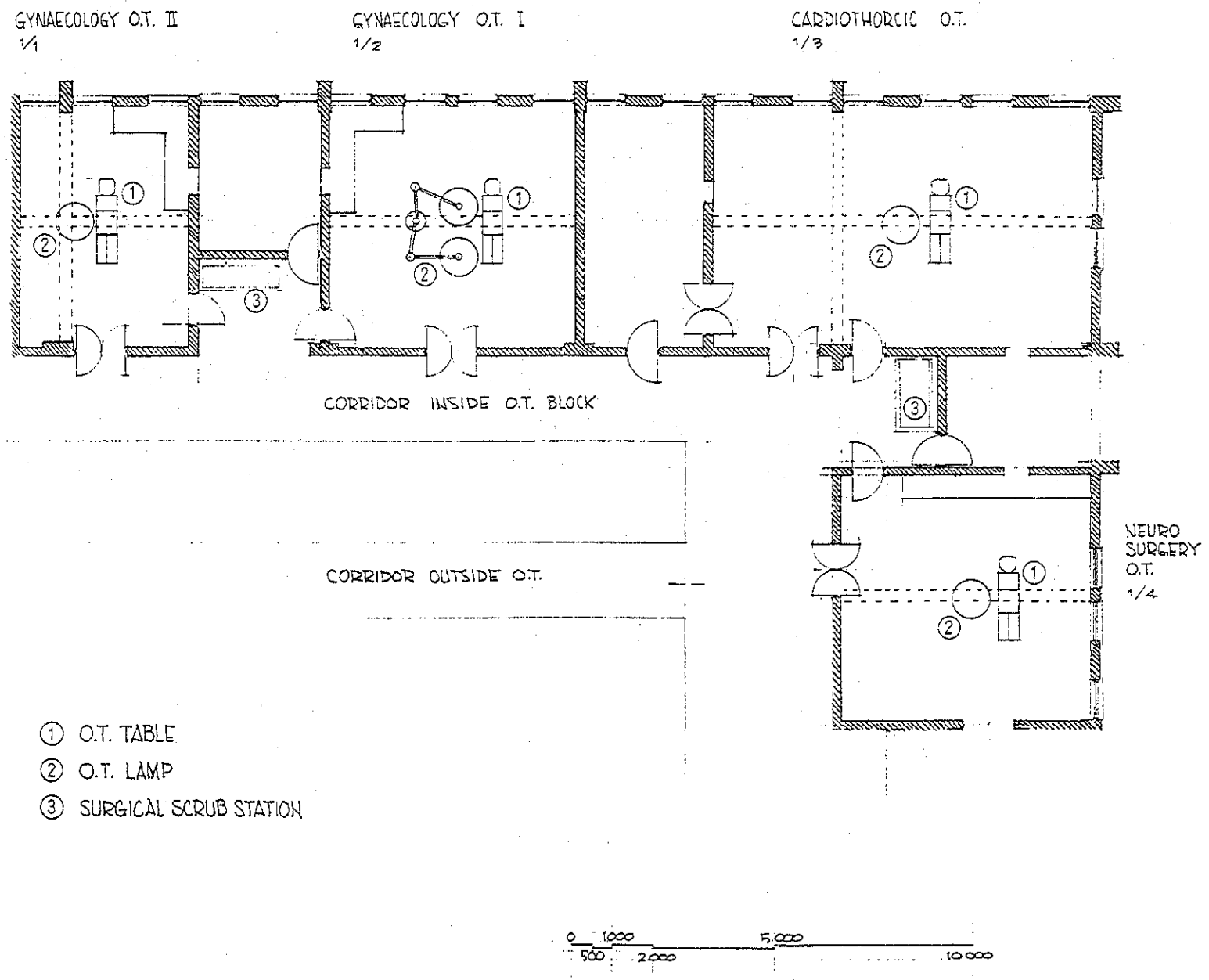


Fig. 4-1 OPERATION THEATRES ON THE FIRST FLOOR

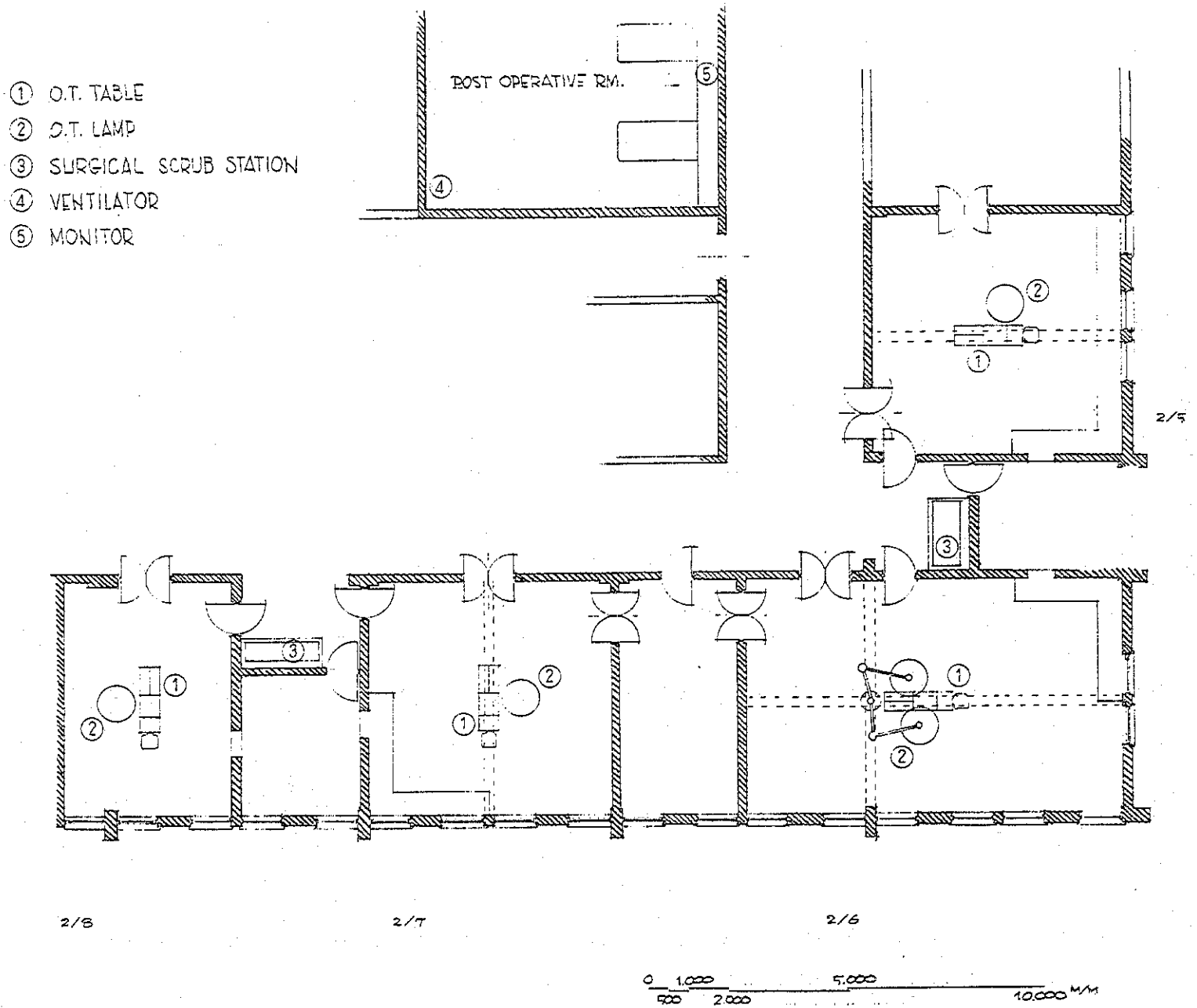


Fig. 4-2 OPERATION THEATRES ON THE SECOND FLOOR

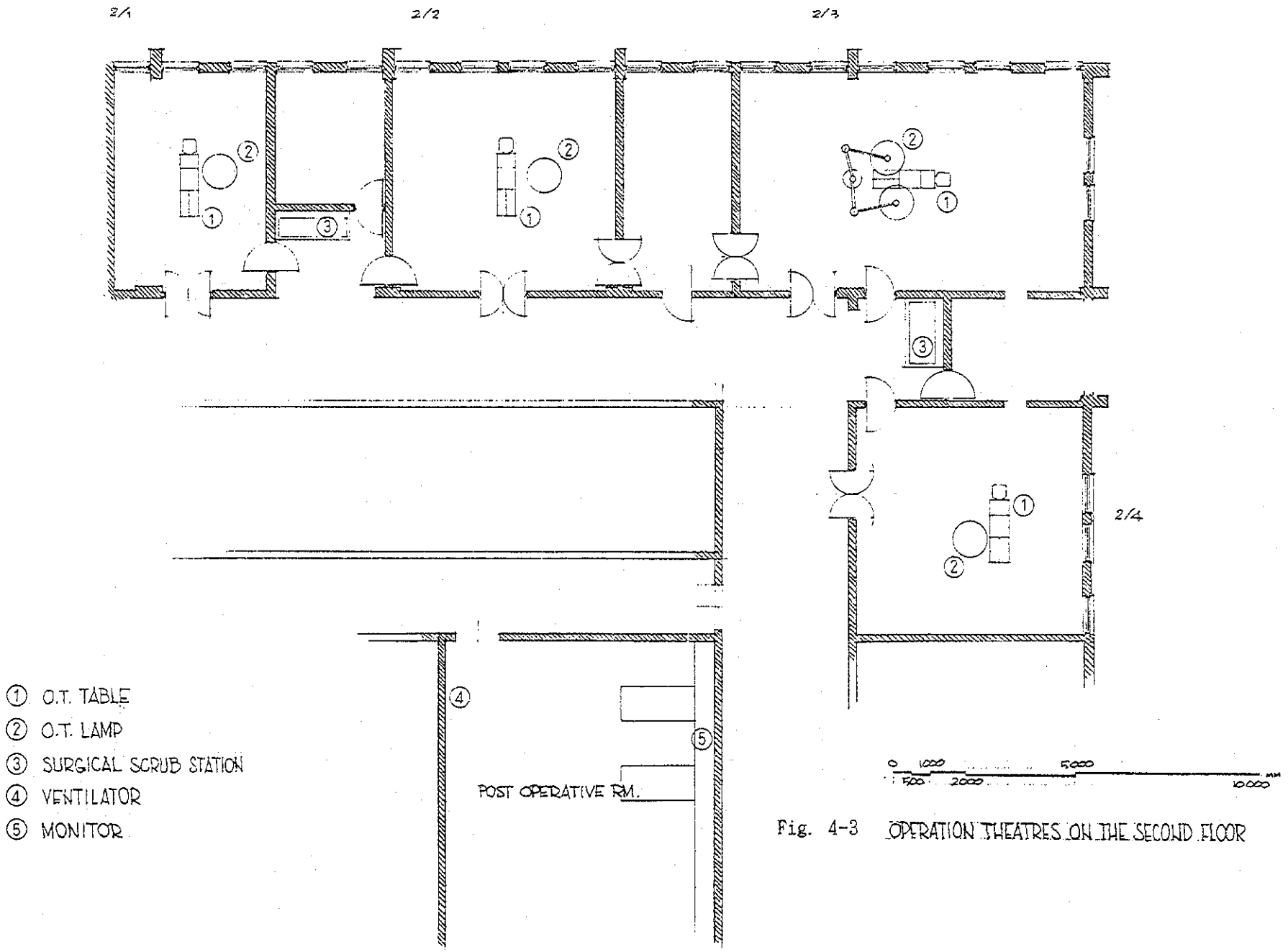
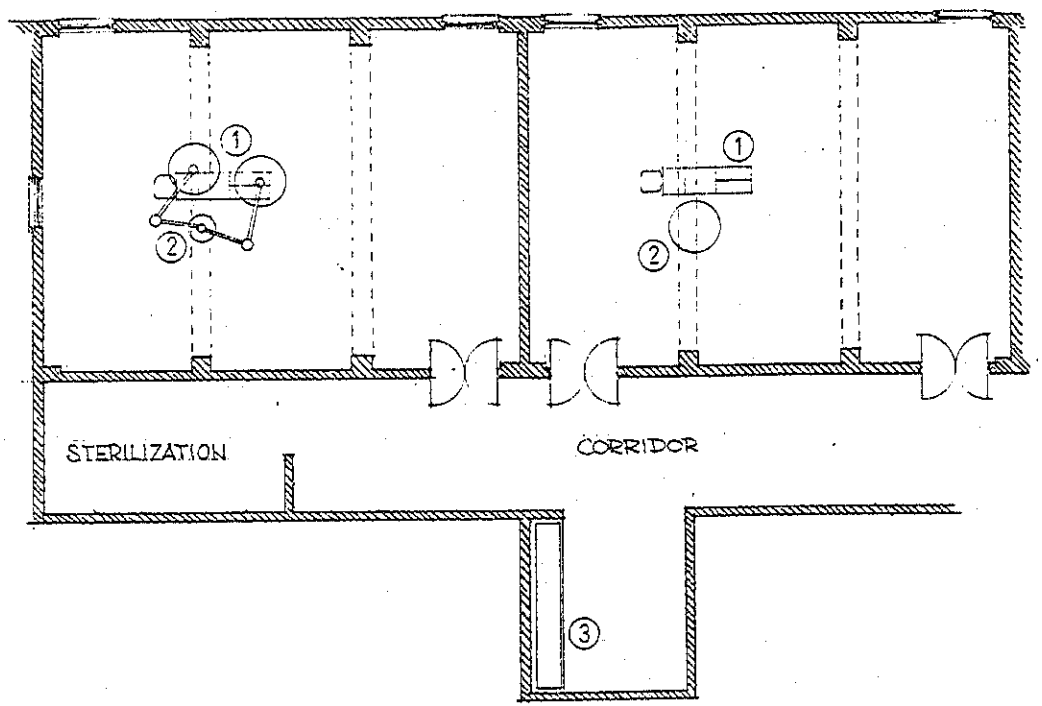


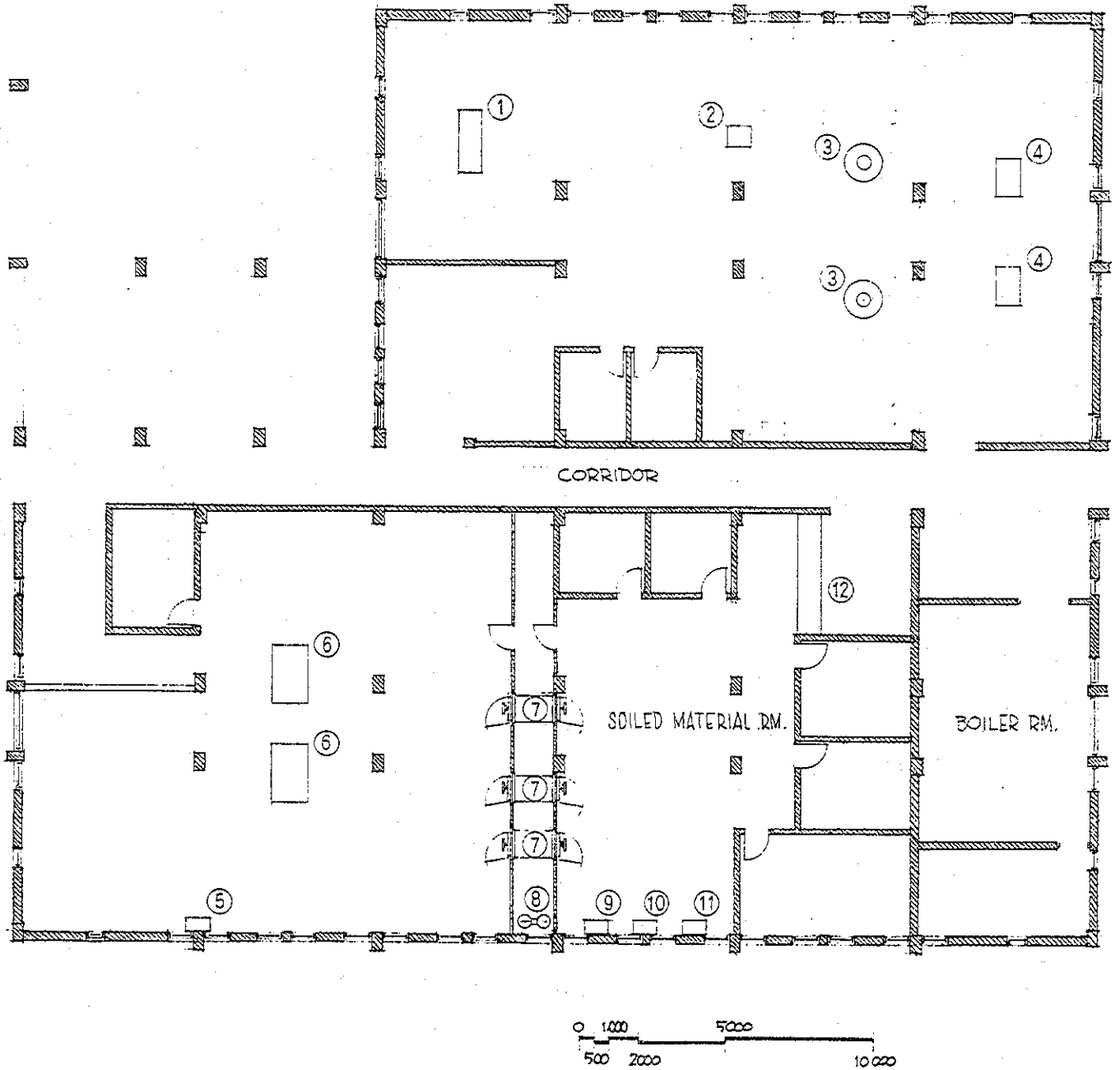
Fig. 4-3 OPERATION THEATRES ON THE SECOND FLOOR



① O.T. TABLE
② O.T. LAMP
③ SURGICAL SCRUB STATION

0 1000 5000
500 2000 10,000 mm

Fig. 4-4 EMERGENCY O.T. BLOCK



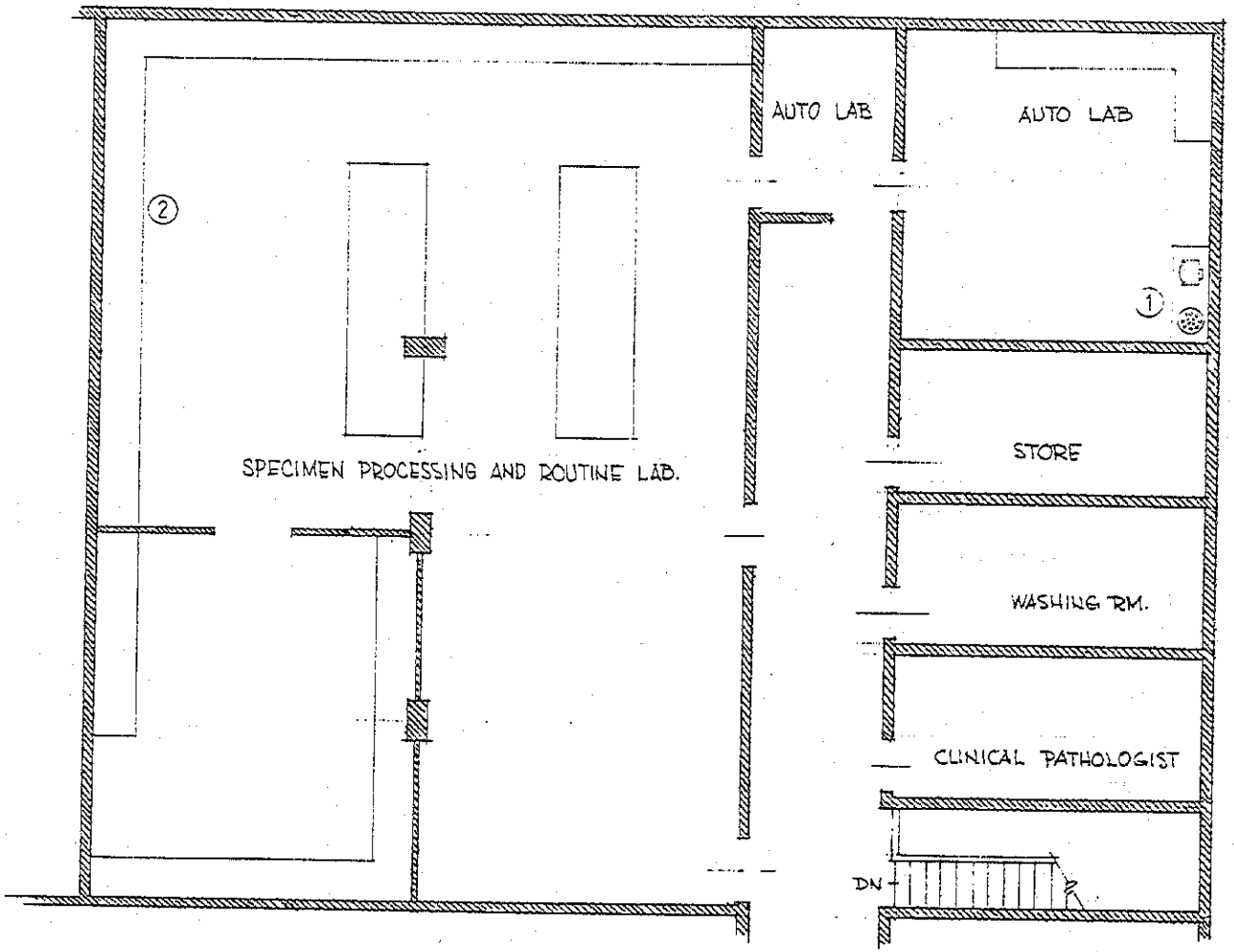
LAUNDRY

① PRESS MACHINE
② DRYING TUMBLER
③ HYDRIC EXTRACTOR
④ WASHING MACHINE

CSSD

⑤ SURGICAL GLOVE POWERING MACHINE
⑥ WORK TABLE
⑦ HIGH PRESSURE STELILIZER
⑧ WATE SOFTENER
⑨ DRYER
⑩ SURGICAL GLOVE WASHER
⑪ ULTRASONIC INSTRUMENT WASHER
⑫ DELIVERY COUNTER

Fig. 4-5 CSSD/LAUNDRY BLOCK



① AUTO CHEMISTRY ANALYSER

② AUTOMATIC HAEMATOLOGY ANALYSER

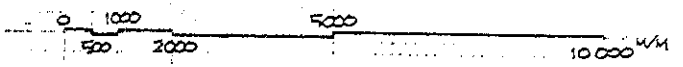
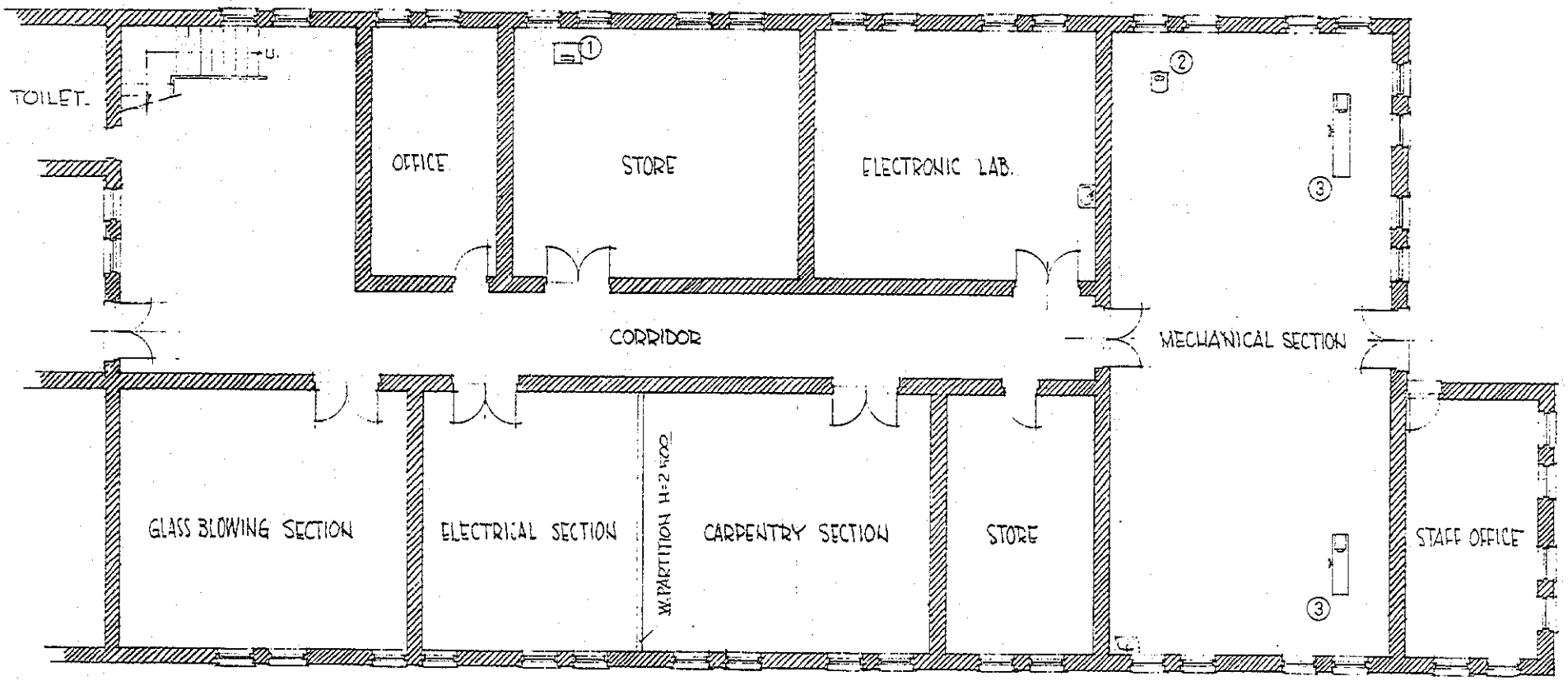


Fig. 4-6 CLINICAL INVESTIGATION CENTRE



① OSCILLOSCOPE
② RADIAL DRILLING MACHINE
③ LATHE MACHINE

Fig. 4-7 INSTITUTE WORKSHOP

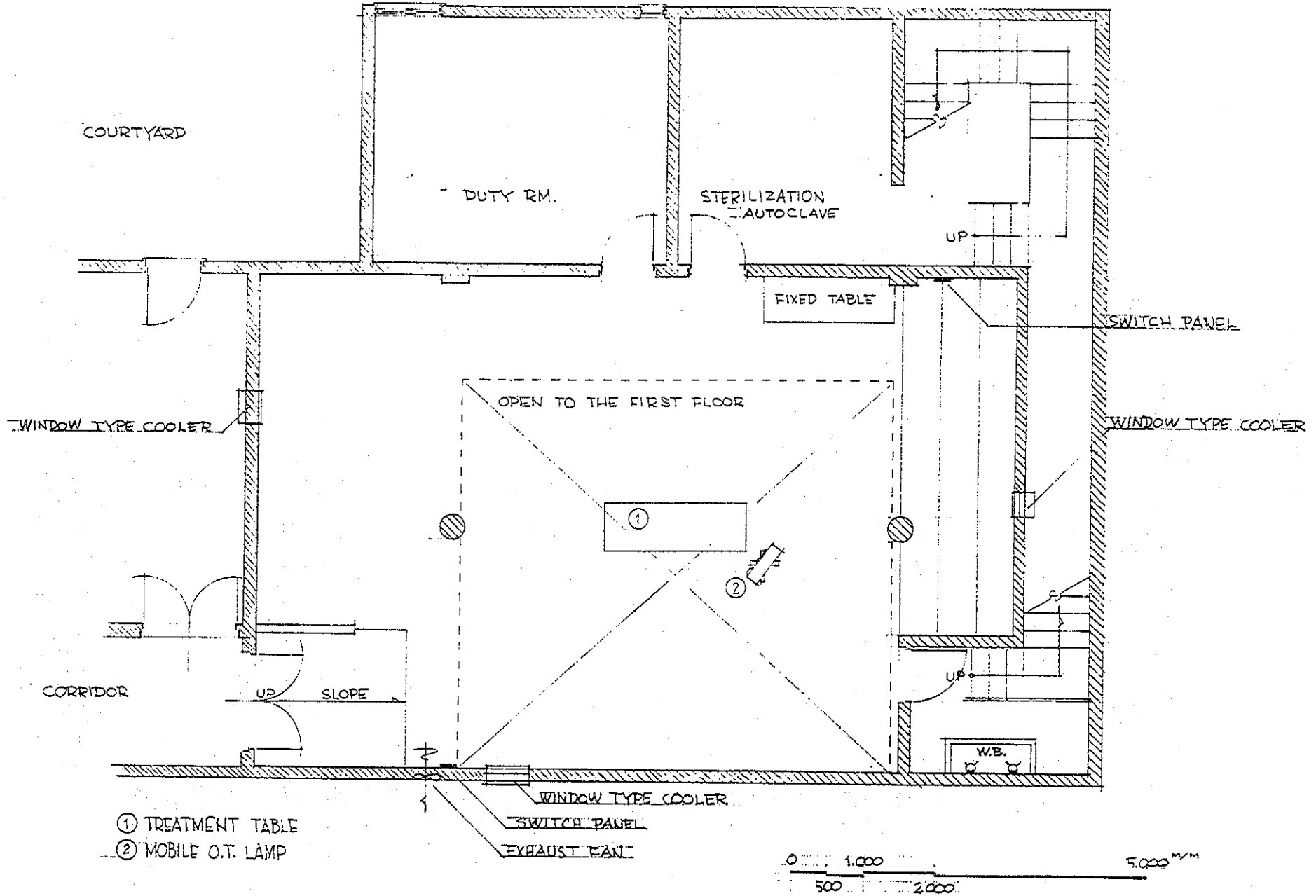


Fig. 4-8 OPTHALMOLOGY OPERATION THEATRE

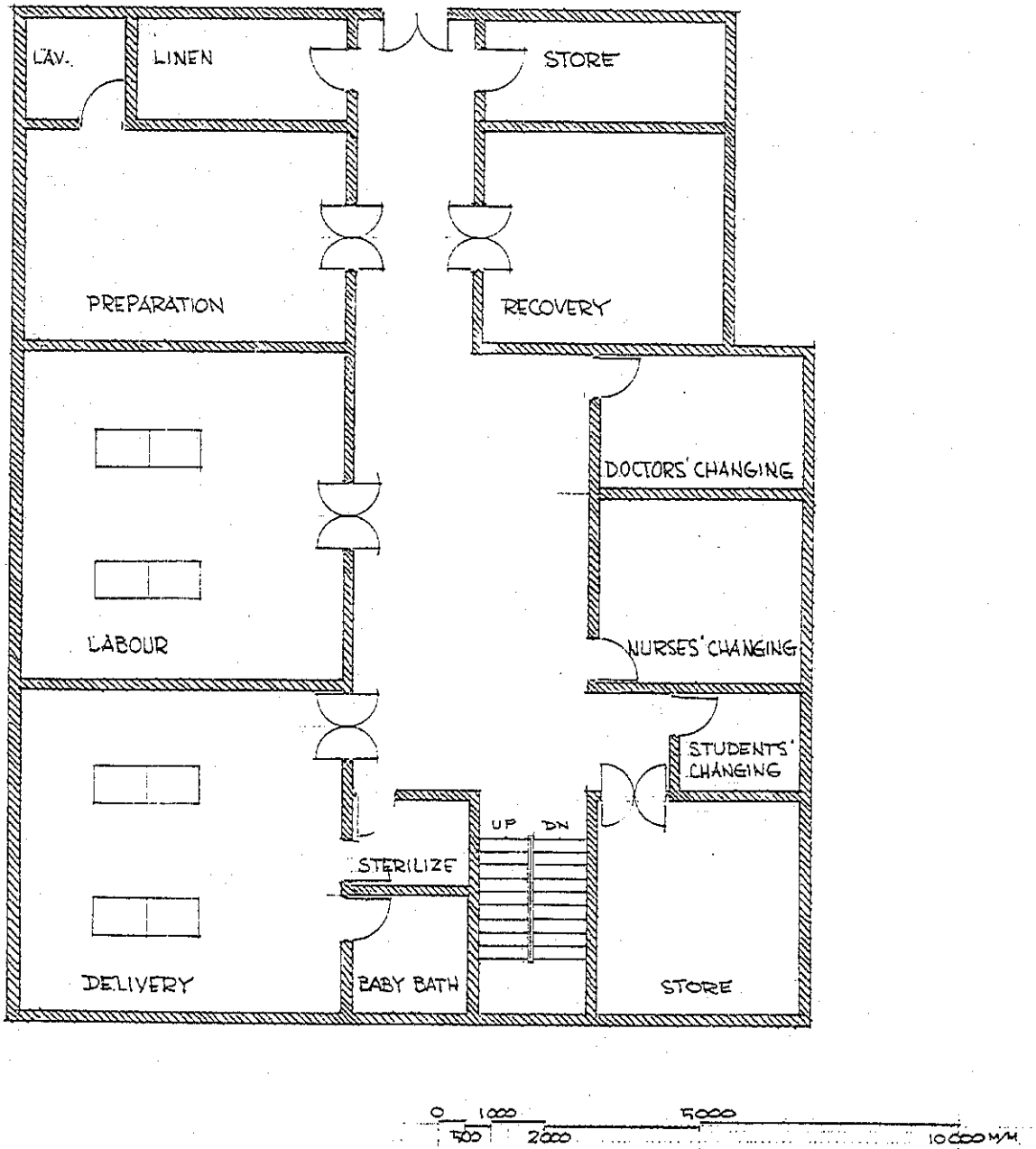


Fig. 4-9 LABOUR ROOM BLOCK

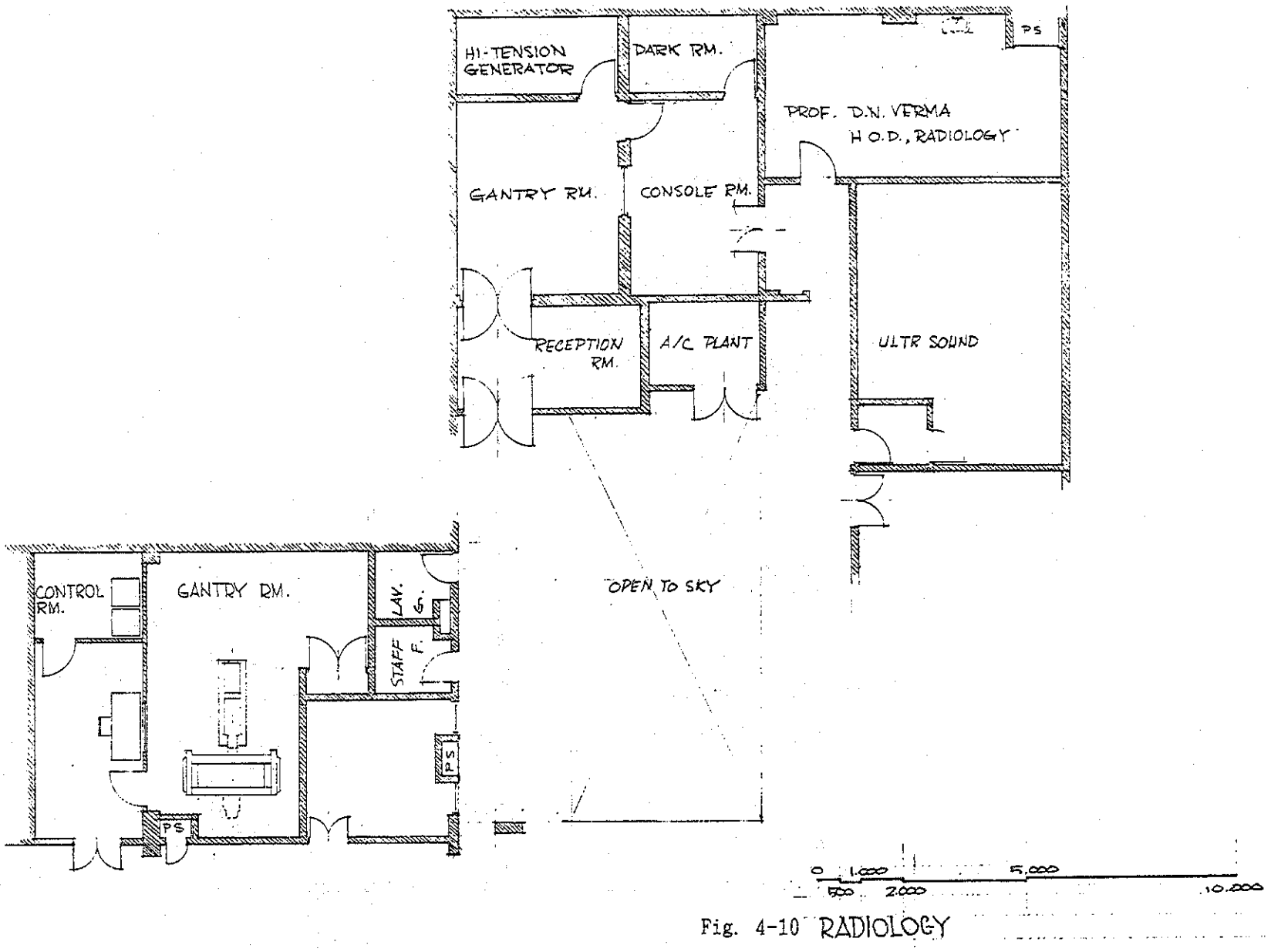


Fig. 4-10 RADIOLOGY

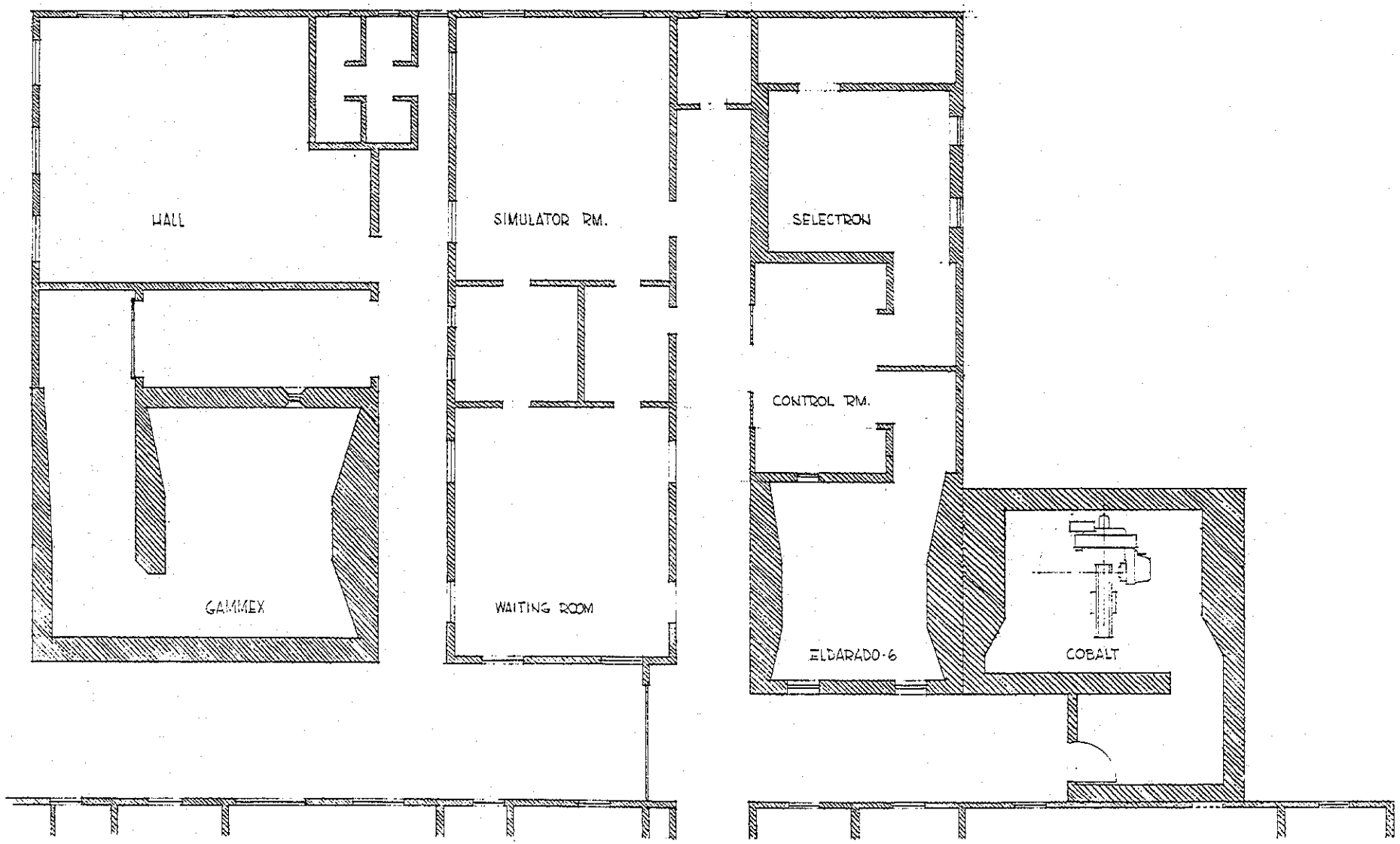


Fig. 4-11 RADIOLOGY

4.4 Project Implementation Programme

4.4.1 Project Implementation System

This project is carried out by the following three bodies. The implementation mechanism is shown in the following chart.

(1) Implementation Body

Implementation body of this project is the Institute of Medical Sciences, Banaras Hindu University and the proposed facility is the attached hospital (Sir Sunderlal Hospital) of the Institue of Medical Sciences.

The Superintendent of the Sir Sunderlal Hospital will carry out implementation works under the responsibility of the director of the Instiute of Medical Sciences.

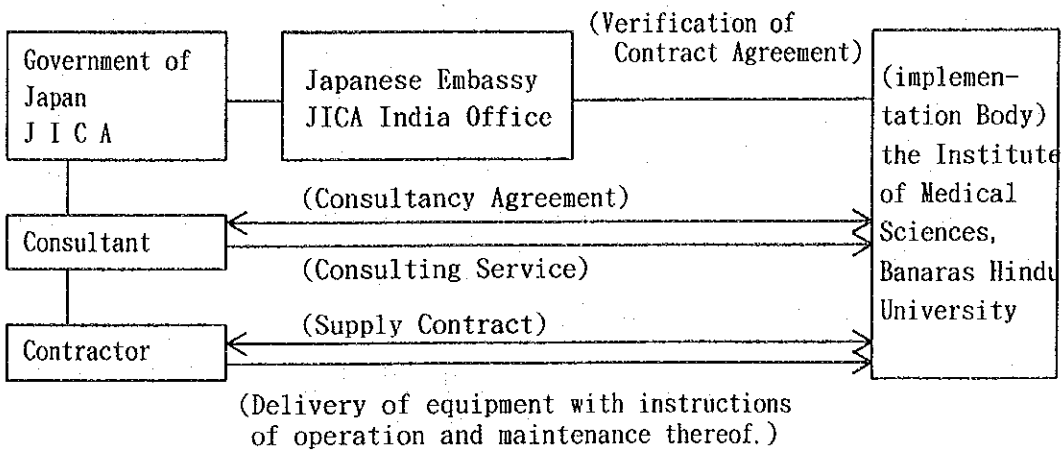
(2) Consultant

In case that this project is implemented under the Japanese Government's Grant Aid Assistance, a Japanese Consultant in conformity with a consultancy agreement to be concluded between the Implementation Body of India 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

A Japanese contractor (trading firm) who has been selected by the tendering is responsible for the manufacture, delivery and installation of the equipment in conformity with a contract. The Contractor conducts guidance on the operation of the equipment and its maintenance.



4.4.2 Undertaking of Both Governments

Undertaking of the Governments of Japan and India are defined as follows:

(1) Undertaking of the Government of Japan

To supply the equipment to the S.S. Hospital (Sir Sunderlal Hospital) of the Institute of Medical Sciences, Banaras Hindu University, install thereof and train the Indian personnel concerned in conformity with the procedures of the Japanese Government Grant Aid System which are summarized as follows:

1) The equipment to be supplied by the Government of Japan is shown in Table 4-2 and the proposed facility is the S.S. Hospital of the Institue of Medical Sciences, Banaras Hindu University.
2) All the costs of sea and land transportation of the equipment to the proposed facility site.
3) Costs for installation of the equipment including dispatch of engineers, hiring indian labor, tool and measuring instrument etc.
4) Costs for guidance on initial test, operation and maintenance of the equipment at the site.

(2) Undertaking of the Government of India

1) Provision of space and facilities for the installation of the equipment.
2) Provision of utilities such as electricity, gas, water, drainage etc. which are required for the installation of the equipment.
3) Provision of storage yard so that the equipment can be safely stored until the installation work be undertaken.
4) Assurance of smooth proceedings of unloading and customs clearance in India as well as prompt land transportation of the equipment to the site.
5) Exemption of Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in India with respect to the supply of the products and services under the Japanese Grant Aid.
6) Bearing of charges for the Banking Arrangement (B/A) and Authorization to Pay (A/P).
7) Provision of licenses, approval and other authorizations required for the execution of the Japanese Grant Aid.
8) Bearing of charges for tax exemption procedures.
9) Bearing of costs other than the undertakings of Japanese and Indian Government which are necessary for the procurement of equipment under the Project.
10) Bearing of the costs for proper and effective operation and maintenance of the equipment to be procured under the Project.
11) Report of operational conditions of the equipment after the installation thereof.

4.4.3 Detail Design and Supervision

The consultant undertakes the detail design and the supervision of the project in conformity with the agreement to be concluded between the Indian side and the consultant.

The detail design is defined as the determination of detail design based on the Basic Design Study, and the preparation of tender documents which consists of specifications of equipment, instruction to bidders and forms of contract etc..

The supervision is to ascertain whether the work of a contractor is executed in compliance with a supply contract and to secure the adequate implementation of the contract and furthermore to render guidance, advice and coordination based on a fair standpoint.

The supervision consists of the following works.

1) Administrative procedures necessary for the selection of a contractor. The exection of a tender, witness of a supply contract.
2) Examination of the specifications of equipment and other documents to be submitted by the contractor.
3) Examination of the quality and performance of the equipment to be supplied.
4) Supervision of supply schedule of the equipment and installation thereof.
5) Report of the progress of the project.
6) Witnessing of the handing-over the equipment.

In addition to the above-mentioned work, the consultant reports the progress of the project, the payment procedures and handing-over of the equipment etc. to the Japanese Government.

4.4.4 Equipment Procurement Plan

(1) The Selection of a contractor and the Method of Selection

A Contractor to procure the equipment will be selected from Japanese trading firms by means of competitive tendering. The type of a contract will be a blanket purchasing contract specifying the kind of equipment in the contract. The contract will include manufacture, delivery, installation, initial tests of the equipment and technical guidance of operation and maintenance thereof.

(2) The procurement of Equipment

The equipment for this project will be procured from Japan or third party countries(European countries etc.).

(3) Method of Transportation

Land transportation is made within Japan and sea transportation is undertaken from Japan to Calcutta Port in India. From Calcutta Port, inland transportation is made to Varanasi.

4.4.5 The schedule fo Implementation of the Project

(1) The Schedule of Implementation

On condition that this Project is approved by the Cabinet Meeting of the Government of Japan, and the Exchange of Notes is signed for the Project between the both Governments, the implementation works for the Project shall be undertaken with the following procedures.

1) Signing of the Exchange of Notes between the both Governments.
2) Banking Arrangement for the payment by Japan Grant Aid Fund for the Project between the Implementation Body and an authorized foreign exchange bank.
3) Conclusion of the consultancy agreement between the Implementation Body and the Japanese Consultant.
4) Verification of the consultancy agreement and the approval of payment by the Government of Japan.
5) Preparation of detail design and tender documents by the consultant.
6) Approval of tender documents by the Implementation Body and the preparation of tender by the consultant.
7) Execution of tendering and bids evaluation.
8) Conclusion of the contranct for procurement of the equipment between the Implementation Body and a Japanese trading firm
9) Verification of the above contract and the approval of payment by the Government of Japan.
10) Procurement works and supervision.
11) Handing-over

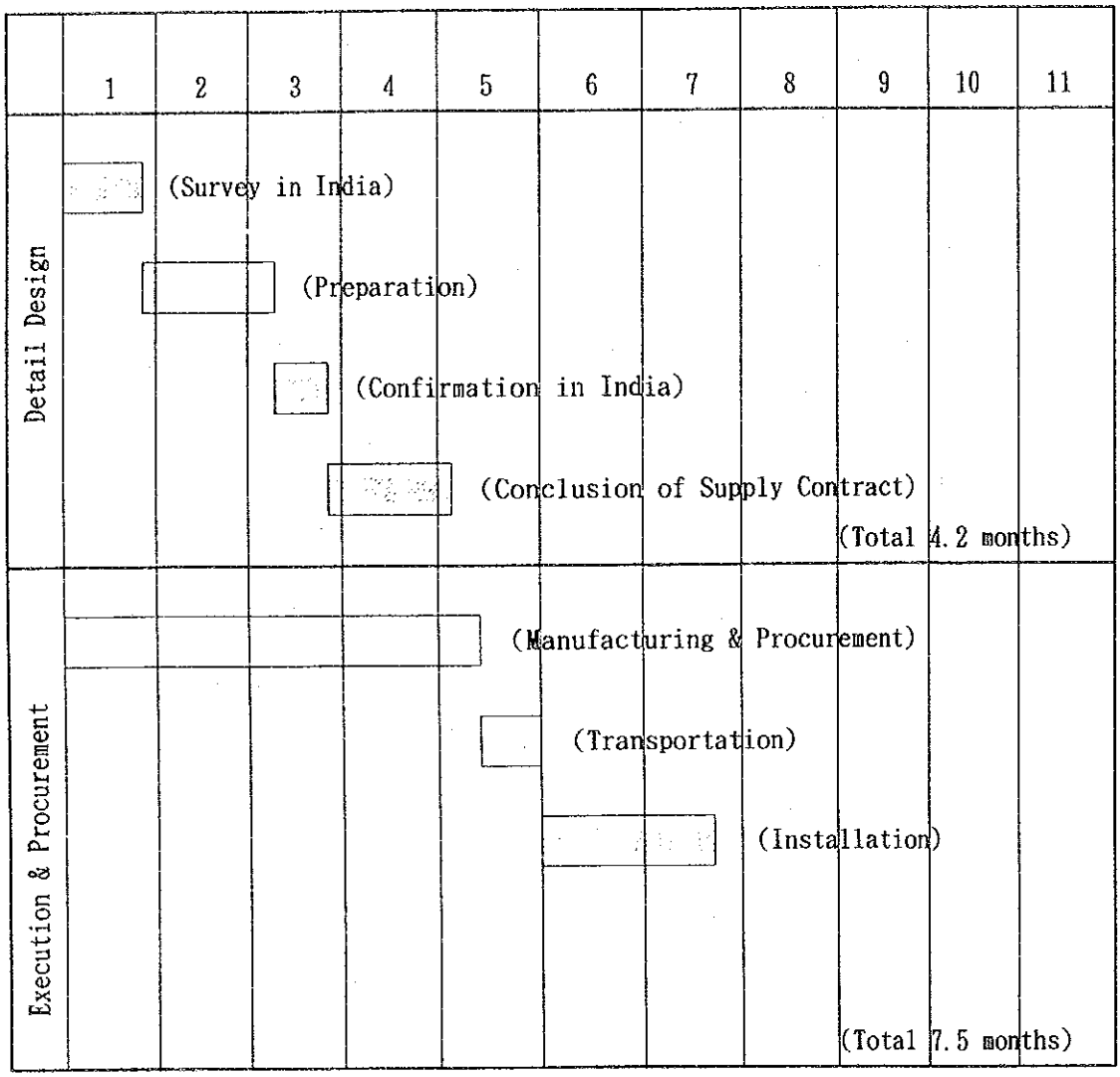
(2) Period of Implementation

The period required for respective work after the conclusion of the exchange of Notes is as follows.

1) Conclusion of consultancy agreement and discussion of detail design	approx.	0.8 month
2) Preparation of detail design and of tender documents	〃	1.5 〃
3) Approval of tender documetns	〃	0.6 〃
4) Tendering, conclusion of contranct and approval	〃	1.3 〃
5) Manufacture of equipment	〃	5.5 〃
6) Transportation	〃	0.5 〃
7) Installation (include initial test, adjustment, operation guidance, training, maintenance instruction and confirmation of handing-over)	〃	1.5 〃
Total	approx.	11.7 months

Work Programme is shown in the figure 4-1.

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
1. Although S.S. Hospital is one of the highest hospital among Varanasi area, 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 re-renewal of fundamental medical equipment like operating table and high pressure sterilizer besides advanced ones have been conducted, and they are showing a considerable loss of performance	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.	The renewal and replenishment equipment will re-establish strenghten its primary and secondary medical care, at least the function of S.S. Hospital as a regional and general hospital will restore.
2. Although the hospital has a role of an institute of BHU and a training school for medical staffs, the equipment is is obsolete and not satisfactory for the purpose of research activities and medical training.	Equipment which is mainly in extremely short stock, suitable to current therapeutic and diagnostic techniques should be procured.	The function of the hospital as medical research center of BHU, IMS and teaching hospital.
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.	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.	When necessary quantities of equipment has been installed, hospital will be able to accept referred patients not only from Baranas area but also rural areas. The hospital will recover the role of the top referral hospital.

This project is intended to assist the important and highest ranked public medical institution where low-income people representing a large part of the Varanasi area residents 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 India. The number of people in and around Varanasi who can receive the services of this hospital is about 30,000,000 which is as many as about 3.5% of the total population of India. 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 Eastern U.P., Bihar and Eastern Madhya Pradesh (about 100,000,000) 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 etc., and these specialists will be practicing in all parts of whole India in the future. Thus this project will improve indirectly the opportunity for the people in India 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 India.

② The facility assisted in this project is the largest public hospital in Varanasi area 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 obsolute 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 Indian side using the budget, manpower, and technical skills in India.

④ From the standpoint of the scale or project and execution period, 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 by offering better medical services. 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 whole India and

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 Indian side side take the following actions:

(1) 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 oversea countries. A stable, effective budget system ensuring the availability of these consumables should be established taking consideration for regulations concerned, processes and procedures to obtain these items.

(2) 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 years. 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 Indian side with some budgetary arrangement.

(3) 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 the interval of every 6 months.

(4) This project aims to, as its objective, renew and supplement the equipment and at the time of the installation of equipment, appropriate training for the maintenance personnel will be conducted. Therefore, technological transfer to the maintenance personnel of the proposed hospital is not necessary. However, it is recommended for indian side to consider that the maintenance personnel from the proposed hospital are sent to Japan in the future to carry out more effective and efficient operation of the equipment.

Appendix

APPENDIX 1 LIST OF MEMBERS OF SURVEY TEAM

Members of the field survey team

1 .	Dr. Minoru TANABE Department of International cooperation, National Medical Center Hospital Ministry of Health and Welfare	Team Leader
2 .	Mr. Toshiyuki NAKAMURA First Basic Design Study Division, Grant Aid Study & Design Department, Japan International Cooperation Agency (JICA)	Grant Aid Planner
3 .	Mr. Shinichi KIMURA Senior Consultant Medical and Laboratory Equipment Binko Ltd.	Project Manager
4 .	Mr. Zenichi ANDO Senior Consultant Medical and Laboratory Equipment Binko Ltd.	Medical Equipment Planner
5 .	Mr. Masayuki ASABUKI Utilities and Facilities Consultant Binko Ltd.	Facilities Planner

Members of draft final report explanation team

1 .	M. D. Seiki TATENO Bureau of International Cooperation, International Medical Center of Japan	Leader
2 .	Mr. Toshiyuki NAKAMURA First Basic Design Study Division, Grant Aid Study & Design Department, Japan International Cooperation Agency (JICA)	Grant Aid Planner
3 .	Mr. Shinichi KIMURA Senior Consultant Medical and Laboratory Equipment Binko Ltd.	Project Manager
4 .	Mr. Hiroshi MURAKAMI Senior Consultant Medical and Laboratory Equipment Binko Ltd.	Medical Equipment Planner

APPENDIX 2

MINUTES OF DISCUSSIONS
ON
BASIC DESIGN STUDY ON THE PROJECT FOR
AUGMENTATION OF THE MEDICAL SERVICES
IN
THE INSTITUTE OF MEDICAL SCIENCES, BANARAS HINDU UNIVERSITY
IN
INDIA

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 Augmentation of the Medical Services in the Institute of Medical Sciences, Banaras Hindu University (hereinafter referred to as "the Project").

JICA has sent to India the Basic Design Study Team headed by Dr. Minoru Tanabe, M.D., Ph.D., Department of International Cooperation, National Medical Center Hospital, Ministry of Health and Welfare, from August 15 to September 12, 1993.

The team had a series of discussions with the officials concerned of India 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.

New Delhi, August 24 1993

Dr.Minoru Tanabe M.D., Ph.D.,
Leader
Basic Design Study Team
JICA

Dr.N.N. Khanna, MS, FAMS,
Director
Institute of Medical Sciences
Banaras Hindu University
Varanasi

Mrs. P.V. Valsala G. Kutty
Deputy Secretary
Ministry of Human Resource
Development

ATTACHMENT

1.Objective

The objective of the Project is to improve the medical services in the Institute of Medical Sciences, Banaras Hindu University (hereinafter referred to as "the Institute") by procurement of the necessary equipment for the Institute.

2.Project Site

The Project site is in the Institute of Medical Sciences, Banaras Hindu University, Varanasi.

3.Responsible Ministry and Executing Agency

Responsible MInistry : Ministry of Human Resource Development
Executing Agency : Banaras Hindu University

4.Items requested by the Indian side

After discussions with the Basic Design Study Team, items described in Annex I were finally requested by the Indian side categorizing into two groups. However, the final items of the Project will be decided after further studies.

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

1) The Japanese side will emphasize on the importance of rationalization (establishment of adequate operational flow, demarcation of clean and dirty zone, centralization of some departments, etc.) executed by the Indian side.
2) The Japanese side will analyze the requested items based on the following criteria:
   a) Equipment which is required for treatment of common diseases and benefitable for majority of people
   b) Equipment which is in urgent necessity
   c) Equipment which can be utilized and maintained under the present operational capability of the Institute.

6.Japan's Grant Aid system

1) The Indian side understands the system of Japan's Grant Aid as explained by the team.
2) The Indian side will take necessary measures, as described in Annex II for the smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

7.Schedule of the Study

(1) The consultants will proceed to further studies in India until September 12, 1993.

(2) JICA will prepare the draft report in English and dispatch a mission in order to explain its contents around December 1993.

(3) In case that the contents of the report is accepted in principle by the Indian side, JICA will complete the final report and send it to the Government of India by March 1994.

8.Other relevant issues

1) The Japanese side emphasized that the betterment of environmental hygiene in the Institute was utmost important to improve the medical services in the Institute. The Indian side agreed its importance and in that connection the Indian side would take necessary measures.

2) On condition that Japan's Grant Aid is extended to the Project;

a) The Indian side will assure the adequate provision of the recurring budget to the Institute through the University Grants Commission, and the Institute will also establish necessary revolving funds for securing sustainable and proper operation and maintenance of the equipment included in the Project.

b) The Ministry of Human Resource Development will allocate the necessary personnel for the Institute for securing proper operation and maintenance of the Project.

c) The Institute will provide necessary electricity supply for the Project for securing proper operation of the equipment included in the Project.

d) The Institute will make an inventory list on the equipment included in the Project. And the list will be renewed in accordance with the condition of the equipment.

e) The Institute will maintain the adequate performance data on the equipment included in the project, and the data will be submitted to the Japanese side annually.

3) The Indian side requested both Linear Accelerator and Computer Tomograhy (CT) X-ray Image Scanner to be provided for the Project. The Japanese side replied that Linear Accelerator could not be included as far as the Project is concerned. The Indian side agreed to exclude Linear Accelerator for the Project.

Annex I

Provision of equipment for the following departments/sections in each group

Group :A

- Operation Theatre Block
  - General Surgery Operation Theatres
  - Orthopedic Surgery Operation Theatres
  - Gynecological Surgery Operation Theatres
  - Plastic Surgery Operation Theatres
  - Cystoscopy Surgery Operation Theatres
  - Urological Surgery Operation Theatres
  - Cardiothoracic Surgery Operation Theatres
  - Neuro Surgery Operation Theatres
  - Emergency Surgery Operation Theatres
  - Post Operative Recovery Room for above, etc.

- Central Sterilization and Supply Department
  - Central Sterilization and Supply Room
  - Laundry Section
  - Incinearate Section, etc.

- Central Clinical Laboratory
  - Pathology Laboratory
  - Microbiology Laboratory
  - Parasitology Laboratory
  - Immunology Laboratory
  - Histopathology Laboratory
  - Biochemistry Laboratory
  - Haematology Laboratory
  - Blood Bank, etc.

- Maintenance Workshop

Group :B

- Department of Ophthalmology
- Department of E.N.T.
- Department of Dental
- Nursing School
- Department of Obstetrics & Gynecology
- Department of Paediatrics
- Department of Radiology (Diagnosis)
- Department of Endoscopy
- Section of Nephrology
- Department of Cardiology

Annex II

Necessary Measures to be taken by the Indian side 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 exempt taxes and to take the necessary measures for customs clearance of the equipment brought for the Project at the port of disembarkation

3. To exempt Japanese Nationals from customs duties, internal taxes and other fiscal levies which may be imposed in India 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 India 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

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY ON THE PROJECT FOR
AUGMENTATION OF THE MEDICAL SERVICES
IN
THE INSTITUTE OF MEDICAL SCIENCES, BANARAS HINDU UNIVERSITY
IN
INDIA
(CONSULTATION ON DRAFT REPORT)

In August 1993, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the Project for Augmentation of the Medical Services in the Institute of Medical Sciences, Banaras Hindu University (hereinafter referred to as "the Project") to India, and through discussions, field survey, and technical examination of the results in Japan, has prepared the draft report of the study.

In order to explain and consult the Indian side on the components of the draft report, JICA sent to India a study team, which is headed by Dr. Seiki Tateno, M.D., Bureau of International Cooperation, International Medical Center of Japan, Ministry of Health and Welfare from January 13 to 22, 1994.

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

New Delhi, January 21, 1994

Dr. Seiki Tateno
Leader
Draft Report Explanation Team
JICA

Dr. K.N. Agarwal
Director
Institute of Medical Sciences
Banaras Hindu University

Durgadas Gupta
Director(Universities)
Ministry of Human Resource
Development

ATTACHMENT

1. Components of the Draft Report

The Government of India has agreed and accepted in principle the components of the Draft Report proposed by the team.

2. Japan's Grant Aid System

1) The Government of India has understood the system of Japan's Grant Aid as explained by the team.

2) The Government of India will take the necessary measures, as 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. Other relevant issues

1) The Japanese side emphasized that the betterment of environmental hygiene in the Institute was utmost important to improve the medical services in the Institute. The Indian side agreed its importance and in that connection the Indian side would take necessary measures.

2) On condition that Japan's Grant Aid is extended to the Project:

a) The Indian side will assure the adequate provision of the recurring budget to the Institute through the University Grants Commission, and the Institute will also establish necessary revolving funds for securingsustainable and proper operation and maintenance of the equipment included in the Project.

b) The Institute will provide necessary electricity supply for the Project for securing proper operation of the equipment included in the Project.

c) The Institute will make an inventory list on the equipment included in the Project. And the list will be renewed in accordance with the condition of the equipment.

d) The Institute will maintain the adequate performance data on the equipment included in the project, and the data will be submitted to the Japanese side annually.

4. Further Study

JICA will complete the final report with the confirmed items, and send it to the Government of India around April 1994.

Annex I

Necessary Measures to be taken by the Indian side 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 exempt taxes and to take the necessary measures for customs clearance of the equipment brought for the Project at the port of disembarkation

3. To exempt Japanese Nationals from customs duties, internal taxes and other fiscal levies which may be imposed in India 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 India 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

APPENDIX 3 LIST OF PRINCIPAL PERSONS CONCERNED

BASIC DESIGN STUDY

MINISTRY OF HUMAN RESOURCES DEVELOPMENT

Mr. D. S. Mukaopaohyay	Joint Secretary
Mrs. Kutty	Deputy Secretary
Mr. Uday Kumar Varma	Director, Universities.
Mr. S. D. Banga	Desk Officer, Universities.
Mr. S. S. Mahlaviat	Desk Officer, Universities.

MINISTRY OF FINANCE

Mr. G. S. Grewel	Under Secretary
Mrs. Sumati Mehta	Deputy Secretary
Mr. P. V. Valsala	Deputy Secretary

INSTITUTE OF MEDICAL SCIENCES, BANARAS HINDU UNIVERSITY

Prof. G. C. Pant	Rector
Prof. N. N. Khanna	Director, IMS-BHU
Prof. B. Dube	Dean, & Professor of Pathology
Dr. G. Trivedi	Medical Superintendant, IMS-BHU
	Deputy Medical Superintendant, IMS-BHU
Dr. U. K. Dixit	Chief Adminisrative Officer, IMS-BHU
Mr. C. S. Prasad	University Engineer, BHU
Prof. C. B. Tripathi	Head, Department of Forensic Medicine
Prof. P. K. Dey	Head, Department of Physiology
Prof. B. M. Sharma	Head, Department of Microbiology
Prof. C. B. Gulati	Head, Department of Microbiology
Dr. S. V. Sharma	Head, Department of Orthopedics
Dr. S. C. Goel	Department of Orthopedics
Dr. S. K. Saraf	Department of Orthopedics
Prof. P. K. Shukla	Head, Department of Pathology
Prof.(Mrs.)D. Sharma	Head, Department of Obstetrics & Gynecology
Prof. P. Tiwari	Department of Obstetrics & Gynecology
Prof. L. K. Pandey	Department of Obstetrics & Gynecology
Prof. D. N. Varma	Head, Department of Radiology
Dr. M. S. Agrawal	Department of Radiology
Prof. R. P. S. Bhatia	Head, Department of Opthalmokogy
Prof. Akram Lal	Head, Department of Anesthesiology
Prof. (Mrs)D. Sharma	Department of Anesthesiology
Prof. G. P. Katiyar	Head, Department of Pediatrics
Prof. V. Bhargave	Department of Pediatrics
Dr. R. K. Jain	Head, Department of Otorinolaryngology
Prof. S. Mishra	Head, Department of Medicine
Dr. S. S. Pandey	Head, Department of Skin & V. D.
Dr. S. C. Matah	Head, Department of T. B. & Chest Diseases

Prof. T. K. Lahiri	Head, Section of Cardiothoracic Surgery
Prof. V. N. P. Tripathi	Head, Section of Urology
Dr. P. B. Swsh	Section of Urology
Prof. S. Mohanty	Head, Section of Neuro-Surgery
Prof. (Mrs.)S. C. Gopal	Head, Section of Pediatric Surgery
Dr. B. V. Agrawal	Head, Section of Cardiology
Prof. S. Mishar	Head, Section of Neurology
Dr. Jai Prakagh	Head, Section of Nephrology
Prof. J. K. Agrawal	Head, Section of Endocrinology
Prof. J. P. Gupta	Head, Section of Gastroenteology
Prof. (Mrs.)M.Chakravorty	Head, Section of Molecular Biology
Mrs. S. G. Mishra	Superintendent, Nursing School
Prof. B. C. Rastogi	Division of Pathology, Histopathology
Dr. V. Bhatlacharya	Section of Plastic Surgery
Dr. P. Jain	Section of Plastic Surgery
Dr. J. K. Sinha	Section of Plastic Surgery
Prof. F. M. Tripathi	Section of Microvascular Surgery
Dr. S. Gupta	Department of General Surgery
Prof. V. P. Singh	Head, Chemical Haemotology

SANJAI GANDHI GRADUATE INSTITUTE OF MEDICAL SCIENCES

Prof. S. S. Agarwal	Acting Director, SGPGI
Prof. A. Ayyagari	Head of Microbiology

KING GEORGE'S MEDICAL COLLEGE

Prof. G. N. Agrawal	Head, Department of Radiotherapy

EMBASSY OF JAPAN

Mr. Ryuichi Ishii	Minister, Embassy of Japan in India
Mr. Katsutoshi Hama	First Secretary, Embassy of Japan In India

JICA

Mr. Minoru Sasago	Resident Representative, JICA India Office
Mr. Toshifumi Sakai	Deputy Resident Representative, JICA India Office
M.D. Kiyohide Kojima	Leader, JICA Lucknow Office (Emeritus Professor, Nagoya University)
Mr. S. Kobayashi	JICA Lucknow Office

DRAFT FINAL REPORT EXPLANATION

MINISTRY OF HUMAN RESOURCES DEVELOPMENT

Mr. Uday Kumar Varma	Director, Universities.
Mr. Durgadas Gupta	Director

MINISTRY OF FINANCE

Mrs. Sumati Mehta	Director, Deputy Secretary

INSTITUTE OF MEDICAL SCIENCES, BANARAS HINDU UNIVERSITY

Prof. K. N. Agarwal	Director, Inst.. of Med. Scs.
Prof. G. C. Pant	Ex-Rector, BHU & Head, Dept. of RT & RM.
Prof. P. K. Dey	Department of Physiology
Prof. P. C. Sen	Medical Superintendent, S.S. Hospital
Prof. B. Dube, Dean	Faculty of Medicine

JICA

Mr. Minoru Sasago	Resident Representative, JICA India Office
Mr. Masahiro Nomura	Deputy Resident Representative, JICA India Office
Mr. Toshifumi Sakai	Deputy Resident Representative, JICA India Office

APPENDIX 4 SURVEY SCHEDULE

(Basic Design Study Team)

date	Activities	Accommodation
15 Aug. (Sun)	Narita 12:20 →(AI301)→ 17:25 Delh	Delhi
16 Aug. (Mon)	Meeting at JICA office Courtesy call on the Embassy of Japan, Ministry of Finance, Ministry of Human Resources Development (MHRD) Explanation of Inception Report	Delhi
17 Aug. (Tue)	Transfer to Varanasi (IC407) Coutersy call on IMS, BHU Explanation of Inception Report and tentative schedule	Vanarasi
18 Aug. (Wed)	Site survey of B.B. Hospital, IMS, BHU	Vanarasi
19 Aug. (Thu)	Site survey of B.B. Hospital, IMS, BHU	Vanarasi
20 Aug. (Fri)	Site survey of B.B. Hospital, IMS, BHU	Vanarasi
21 Aug. (Sat)	Team A & Kimura: Transfer to Delhi (Arrival on 16:30 by IC401) Team B: Survey and internal meeting	Team A & Kimura: Delhi Team B: Vanarasi
22 Aug. (Sun)	Analysis of information	Team B: Vanarasi
23 Aug. (Mon)	Team A & Kimura: Meeting with MHRD Team B: Site survey	Team A & Kimura: Delhi Team B: Vanarasi
24 Aug. (Tue)	Team A & Kimura: Meeting with MHRD, including signing Minutes Team B: Site survey	Team A & Kimura: Delhi Team B: Vanarasi
25 Aug. (Wed)	Team A: Return to Japan via Bangkok (Delhi 00:55→(TG915/772)→ 15:55 Narita) Kimura: Delhi→Lucknow Team B: Varanashi → Lucknow (by car)	Team B & Kimura: Lucknow
26 Aug. (Thu)	Survey of Sanjai Gandhi Graduate Institue of Medical Sciences and King Gorge Institute of Medical Sciences	Lucknow
27 Aug. (Fri)	Lucknow → (by car) → Varanasi	Varanasi
28 Aug. (Sat)	Survey of IMS, BHU	Varanasi
29 Aug. (Sun)	Analysis of information	Varanasi

date	Acttivities	Accommodation
30 Aug. (Mon)	Site Survey	Varanasi
31 Aug. (Tue)	Survey of first priority facilities, central ope. block, CSSD and laundry. Meeting with personnel concerned of the hospital.	Varanasi
1 Sep. (Wed)	Survey of first priority facilities, Central laboratory, Maintenance Workshop. Meeting with personnel concerned of the hospital.	Varanasi
2 Sep. (Thu)	Survey of second priority facilities, Opthalmology, E.N.T.,Ob & Gy. Meeting with personnel concerned.	Varanasi
3 Sep. (Fri)	Survey of second priority facilities, Radiology, Endoscope, Wards. Meeting with personnel concerned.	*1) Varanasi
4 Sep. (Sat)	Survey of transportation method and local procurement	*2) Varanasi
5 Sep. (Sun)	Analysis of information	Varanasi
6 Sep. (Mon)	Meeting with IMS,BHU Survey of third priority facilities of the hospital. Meeting with personnel.	Varanasi
7 Sep. (Tue)	Meeting with IMS, BHU Discussion about problem pending	Varanasi
8 Sep. (Wed)	Last meeting with IMS, BHU	Varanasi
9 Sep. (Thu)	Varanasi → (IC408) → Delhi	Delhi
10 Sep. (Fri)	Report to JICA office & the Embassy of Japan Survey of transporation method and local procurement.	Delhi
11 Sep. (Sat)	Alanysis of information	Delhi
12 Sep. (Sun)	Delhi 00:50 → (TG915/772) → 15:55 Narita via Bangkok	

*1) Members in charge of facility survey : transfer to Delhi
*2) Members in charge of facility survey : Return to Japan

(Draft Final Report Explanation Team)

date	Acttivities	Accommodation
13 Jan. (Thur)	Narita 12:30 → (AI307) → Delhi 18:40	Delhi
14 Jan. (Fri)	Meeting with JICA office and the Embassy of Japan. Meeting with Ministry of Finance, Ministry of Human Resources Development	Delhi
15 Jan. (Sat)	Delhi → Varanasi (IC-407)	Varanasi
16 Jan. (Sun)	Meeting inside the team	Varanasi
17 Jan. (Mon)	Meeting with Institute of Medical Sciences (I.M.S.)	Varanasi
18 Jan. (Tue)	〃 〃	〃
19 Jan. (Wed)	〃 〃	〃
20 Jan. (Thur)	Varanasi → Delhi (IC-408)	Delhi
21 Jan. (Fri)	Meeting with Ministry of Human Resources Development including signing the minutes of discussions. Report the result to JICA office and Embassy of Japan.	Delhi
22 Jan. (Sat)	Delhi 02:00 (TG-915) → Bangkok (07:05) Bangkok 11:15 (TG-640) → Narita (19:00)	

APPENDIX 5

Present Condition of Main Medical Equipments

Functiong
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··· Occassional in needs
3··· Sometimes for stand-by
4··· Seldom use
5··· No use

Maintenance structure by equipment-wise
I ··· maintained by the hospital maintenance department
II ··· maintained by agents
III ··· maintenance under service contract of manufacturer
IV··· others

Pathology

Equipment name	Function-ing	Frequency in use	Maintenance structure	Product country	Remarks
Refrigerator 12 units	(Remarks)	1	I	India	A-1 unit, B-2 units, C-2 units D-7 units, Kelvinator-made
Refrigerator 2 units	〃	1	I	India Kelvinator-made	A-1 unit, D-1 unit,
Refrigerated centrifuge	B	2	II	Germany	Janetzki-made
Haematocrit centrifuge	B	2	I	India	
Spectronic 20	C	2	II	U.S.A.	B & L-made
Ultra microtome	C	5	II	Sweden	LKB-made
Rotary microtome	C	2	II	Japan	ERMA-made, under repair
Platelet aggregomater	C	5	I	-	need repair
Binocular microscope 12 units	C	5	II	Japan	Olympus-made, need repair
Double head microscope 2 units	B	2	II	Japan	Nikkon-made
Incubator	B	2	I	India	

Microbiology

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Deep freeze -85°C	D	5	I	U. S. A.	Revco-made
〃 -70°C	D	5	I	India	Crisp Cold-made
〃 -20°C	D	5	I	Indis	Gem-made
〃 -20°C	A	1	I	Inida	Kelvinator-made
Ultra centrifuge	D	5	I	U. S. A.	Beckman-made
Cold centriguge	D	5	I	U. S. A.	IEC-made
〃	D	5	I	India	KLB-made
〃	C	5	I	U. S. A.	Beckman-made
〃	B	2	I	India	SICO-made
Cold chamber -4°C	A	1	I	-	Herysun-made
Laminor flow horizontal	A	1	I	India	Klenzaid-made
Laminor flow vertical 2 units	A	1	I	India	Widson scientific-made Kartos International-made
Transilluminator	A	2	III	France	
CO_2 incubator 2 units	A	1	III	U. S. A.	Napco-made, Hereus-made(Germany)
Inverted microscope 2 units	A	2	II	U. S. A.	Reichert-made, Olympus-made(Function-c)
Fluorescent microscope	A	〃	II	Germany	Leitz-made Olympus-made(Function-c)
Stereo microscope	A	2	II	U. S. A.	
Dark ground microscope	C	4	II	Japan	Olympus-made, need repair

Nephrology

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Haemodialysis	A	1	II	U. S. A.	Cobe Centry-made
〃	D	5	II	U. S. A.	〃
〃	C	4	II	Japan	Nikkiso-made
Incubator	A	2	I	India	Yorko-made
Freeze	A	1	I	India	
Defibrillator	D	5	I	-	
Osmometer	C	4	I	U. S. A.	Fiske-made
Flame photometer	A	2	I	U. S. A.	Corning-made
Binocular Microscope	A	2	I	India	

Cardiology

Equipment name	Func-tion-ing	Fre-quency in use	Mainte-nance structure	Product country	Remarks
ECG m/c 13 units	A	2	I	India	BPL-made, new and some repaired before
ICCU with monitor	A	1	II	India	Indichem-made, new
Defibrillator	A	2	I	India	BPL-made
Echocardiograph	A	1	III	Japan	Aroka-made
Tread mill	A	1	III	U.S.A.	Marquette-made
Holter recorder	A	1	III	U.S.A.	〃

Plastic Surgery

Equipment name	Func-tion-ing	Fre-quency in use	Mainte-nance structure	Product country	Remarks
Operating microscope	A	2	II	-	
Operating table	B	2	I	India	Cognette-made
Operating light	B	2	I	India	〃
Mobile operating light	A	2	I	Holland	Philips-made

Neuro Surgery

Equipment name	Func-tion-ing	Fre-quency in use	Mainte-nance structure	Product country	Remarks
Operating table	B	2	I	-	
Operating light	B	2	I	-	
Anesthesia machine	B	2	I	-	

Cardiothoracic Surgery

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Cardiovascular monitor	B	2	III	U. S. A.	Eform-made
〃	D	5	III	U. S. A.	〃
〃	B	2	III	-	Data medix-made
Blood gas analyser	D	5	I	Germany	Eishweiler-made
Defibrillator	B	2	I	U. S. A.	
Heart lung machine	B	2	III	U. S. A.	
Ventilator	A	2	III	U. K.	Manley-made
Operating table	B	2	I	-	
Operating light	B	2	I	-	
Spirometer 2 units	A	2	I	India	Plumax-made, D-flow-made

Urology

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Cystoscope	B	2	I	Germany	Storz-made
Recectoscope(adult)	B	2	I	Germany	〃
Recectoscope(pediatrics)	B	2	I	Germany	〃
Lithotrite	B	2	I	Germany	
Operating table	B	2	I	-	Routine operating table
Operating light	B	2	I	-	
Telescope 0°30°70°120°	B	2	I	-	
Spectrophotometer	C	5	I	-	
Uroflow meter	C	5	I	-	
Mircroscope	C	5	I	-	

Pediatric Surgery

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Multi channel Recorder	A	2	III	U.S.A.	Physio control-made
Pluse oxymeter	A	2	III	Japan	Omeda-made
Infant ventilator	A	2	III	U.S.A.	Sechrist-made
Pediatric cysto-resectoscope	A	2	III	Germany	Storz-made
Diathermy	A	2	I	U.S.A.	Velley Lab.-made
Operating table	A	2	I	-	
Operating light	A	2	I	-	
Defibrillator	A	2	I	India	BPL-made
Pediatric surgical Instrument set	B	2	I	India	
Transcutaneous po_2 and po_2 monitor	A	2	III	Denmark	Radiometer-made
Anesthesia machine	A	2	III	-	

Emergency operation theatre

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Operating table	B	2	I	India	Esler-made
Operating light	B	2	I	India	ARKO-made
Anesthesia machine	A	2	I	India	Ultradent-made
Diathermy	B	2	I	Holland	Philips-made
Suction unit	A	2	I	India	Medispec-made
Mobile operating light	A	2	I	-	

Obstetric & gynecology

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Laparoscope	C	4	I	U.S.A.	KLI-made, 20 years old
Colposcope	C	4	I	Germany	Carl zeiss-made, 22 years old
Cardiotocograph	B	2	I	U.S.A.	Hewllet packard-made
Foetal heart detector	C	4	I	India	Electronic corp.-made 15 years old
Suction machine	B	2	I	U.S.A.	Berkley-made
Dathermy	B	2	I	U.S.A.	Valey lab-made
Cryo Surgery	C	4	I	India	Prince-made

Radiology

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
X-ray unit(500mA)	B	2	III	India	IGE-made
X-ray unit(300mA)	B	2	III	India	IGE-made
X-ray unit(300mA)(skull)	A	2	III	U.S.A.	GE-made
X-ray unit(200mA)	B	2	III	India	IGE-made
X-ray unit(725/300mA)	A	2	III	India	IGE-made, repaired in 1922
X-ray unit(100mA)	A	2	III	India	IGE-made, under regular check
Mobile X-ray unit(60mA)	A	2	III	-	
Ultrasonography	A	1	III	Germany	Siemens-made, guarantee period
CT scanner(head)	A	2	III	Japan	Hitachi-made

Ophtalmology

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Operating microscope	A	2	IV	-	with T.V. monitor
Fundas camera	B	2	IV	Japan	Kowa-made, repaired before
Ultrasonography	B	2	IV	-	repaired before
Slit lamp	B	2	IV	India	Jaggi-made
Keratometer	D	5	IV	India	Jaggi-made
Operating table	B	2	I	-	
Operating lamp	A	2	I	-	
Anesthesia machine	A	2	I	-	
Mobile operating light	A	2	I	-	

Pediatrics

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Spectrophotometer	B	2	I	Germay	Carl zeiss-made, needs overhaul
Refrigerate centrifuge	A	2	I	India	Remi-made
Gamma counter	C	4	I	Holland	
Flame photometer	B	2	I	India	Mediflame-made
Colorimeter 3 units	C	4	I	-	2 out of 3 units are unrepairable
Deionizer	D	5	I	-	
BOD incubator	D	5	I	-	
Distillation apparatus	D	5	I	-	Scientric instrument-made
Refrigerator 3 units	D	5	I	-	
Deep freeze 3 units	D	5	I	-	
Binocular microscope	B	2	I	-	
Incubator	D	5	I	-	Thermostat does not work
Phototherapy unit	D	5	I	-	donated by WHO (3 units)

Orthopaedics

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Diagnostic anthoroscope	B	2	I	Germany	
Fluorecent Microscope	B	2	II	-	
Shortwave Diathermy	B	2	II	Holland	Philips-made
Image Intensifier	D	5	I	-	
Orthopaedic operation table	B	1	I	-	
Operating light	B	1	I	-	
Anesthesia machine	B	1	I	-	

E. N. T.

Equipment name	Function-ing	Frequency in use	Maintenance structure	Product country	Remarks
Operating microscope	B	2	I	Poland	2 units
Operating microscope	D	4	I	India	
Audiometer	B	1	I	Italy	Amplaid-made
Fiberoptic bronchoscope	B	2	I	Germany	MLW-made
Fiberoptic Laryngoscope	A	2	I	India	
Cryosurgical unit	A	2	I	India	Ascon-made
Operating table	A	2	I	India	Esler-made
Anesthesia machine	B	2	III	India	IOL-made
Operating light	B	2	I	India	UPL-made

Radiotherapy

Equipment name	Function-ing	Frequency in use	Maintenance structure	Product country	Remarks
Cobalt 60	A	1	III	Canada	AECL-made
Rotational cobalt	B	2	III	Canada	Gammerx-made
Manual brachy therapy	A	2	III	India	Elpro international-made
Branchy therapy	A	2	III	Holland	Selectron nucletron-made
Dosimeter	A	2	I	-	
Portable X-ray unit	A	2	III	-	
Treatment pllanning system	A	2	III	India	DSG-made

Dental surgery

Equipment name	Function-ing	Frequency in use	Maintenance structure	Product country	Remarks
Dental module	B	1	I	India	Confident-made
Dental X-ray unit	B	2	III	Czecho-slovakia	There are other 2 units (philips) which are not serviceable
Casting machine 3 units	B	2	I	Italy	Gallny-made
Furnace	B	2	I	Italy	Gallny-made
Acrylizer	B	2	I	India	Unident-made
Lathe	D	5	I	Japan	Osada-made
Autoclave	D	5	I	-	
Suction machine	D	5	I	-	

Maintenance workshop

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Oscilloscope 2 units	B	2	I	India	
Winding machine 2 units	A	2	I	India	
Digital multimeter	B	2	I	India	
DC power supply 3 units	B	2	I	India	
Lathe	B	2	I	India	Mysore Kirloskar-made
Radial drilling machine	B	2	I	India	Universal engineering-made
Grinding mahcine	B	2	I	India	
Electric saw	B	2	I	India	Baroda-made
Glass grinding machine	B	2	I	India	
Glass slivering machine	B	2	I	India	
Compressor	B	2	I	India	
Weighing machine	A	2	I	India	

Blood Bank

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Deep freez	A	1	III	India	Krispcold-made
Freeze 3 units	A	1	I	India	Krispcold-made, Allwyn-made
Centrifuge	A	2	I	India	Remi-made
Water bath	A	2	I	India	Scientronic-made

C. S. S. D.

Equipment name	Functioning	Frequency in use	Maintenance structure	Product country	Remarks
Autoclave 4 units	B	1	I	India	2 units working NSE-made 2 units under repair
Glove washing machine	A	1	I	India	NSE-made
Glove drying machine	A	1	I	India	NSE-made
Distilling appratus	C	4	I	India	NSE-mad
Sewing mahcine	B	2	I	India	Usha-made

Laundry

Equipment name	Func-tion-ing	Fre-quency in use	Mainte-nance structure	Product country	Remarks
Calender machine	C	5	II	-	
Hydro water extractor 3 units	A	1	II	India	Snow white-made, one of the units is out of order
Washing machine 3 units	A	1	II	India	Snow white-made, one of the units is out of order
Steam press 4 units	C	5	II	India	Snow white-made, 4 units are our of order
Dry tumbler 2 units	A	1	II	India	Snow white-made, one of the units is out of order
Breaching machine	C	5	II	India	Snow white-made
Sewing machine	B	2	II	India	Usha-made
Automatic package boiler 2 units	B	1	II	India	Wanson Vaporax-made, one of the units needs repair

Central Clinica Laboratry

Equipment name	Func-tion-ing	Fre-quency in use	Mainte-nance structure	Product country	Remarks
Platelet counter	B	2	III	Japan	Erma-made
Cell counter 2 units	B	2	III	Japan	Erma-made
Haematocrite machine	A	2	III	India	Remi-made
Incubator	A	2	II	India	Yorko-made
Microscope 3 units	A	2	II	India	
Colorimeter	A	2	II	India	
Auto chemistry analyzer	A	2	III	Italy	Polimax-made
Computor for auto chemistry analyzer	A	2	III	Italy	Polimax-made
Potassium analyzer	A	2	III	Denmark	
Refrigerator for reagent	A	2	III	India	GEM-made
Spectro colorimeter	C	2	III	India	Systronic-made
Chloride meter	A	2	III	India	Elico-made

Nursing School

Equipment name	Func-tion-ing	Fre-quency in use	Mainte-nance structure	Product country	Remarks
Human skelton	B	1	I	-	
Chase doll of adult size (Female)	B	1	I	-	
Incubator	B	1	I	-	
Obstetric training kit	B	1	I	-