the Medical College.

To put it in more detail, the Government of Pakistan requested the Government of Japan for a grant aid for the procurement of medical equipment which represents the greater part of the budget, while bearing the costs of the construction works of facilities and equipment on the Pakistani side.

The Allied Hospital not only functions as a place of clinical education of the students together with DHQ Hospital as a teaching hospital attached to the Medical College but may also be positioned as a tertiary medical institution which provides the regional inhabitants with a high degree of medical care at the top of the regional medical services i.e. as a referral hospital. Moreover, in relation to the positioning in the said national development programme, we can see that the present Project is one of the concrete operations intended to achieve the targets of the Seventh Plan in the field of health and medical care.

2-5-2. Content of the Request

The request of the present Project from the Pakistani side can be divided into a request for the facilities of hospitalization (not included in Phase I) of the object depts. of improvement of medical equipment in Phase I and a request for the diagnostic depts. to be newly established in the Project. Unlike Phase I which consisted in improving the equipment centering on Medicine Dept, Surgery Dept, Obstetrics & Gynaecology Dept. and Paediatrics Dept, which are usually called 4 basic diagnostic depts, the present Project is intended to provid the Allied Hospital with all functions of a general hospital by procuring the equipment for other specialized depts.

The object equipment of the present Project is procured to enable the Allied Hospital to achieve the diagnostic functions expected of a referral hospital as well as the teaching functions of an teaching hospital. Therefore, it is necessary to select the required and proper equipment in due consideration of both the functions of all allied hospital and the content of diagnosis of the object depts. of the plan based on the request from the Pakistani side.

The following is an outline of the object diagnostic dept facilities of the plan and the equipment:

(1) ENT Dept.

The content of the request is not much different from what it was in the beginning. The requested number of units of Stand Type Operation Lamp intended for the clinical education of students is particularly large because 40 students are divided into 10 groups. The Teaching Film of ENT for teaching purpose has been changed for a Video Cassette Recorder and a Monitor. An Electronystagmograph has been confirmed as an equipment which was omitted in the original request because of a typing error. The request includes a Laser Equipment used for enucleation of tumor of ENT as a high grade treating equipment.

(2) Ophthalmology Dept.

In the diagnostic dept, the content of the request, which is almost the same as it was in the beginning, is characterized by the equipment requiring a high degree of diagnostic technology and maintenance techniques of high accuracy. The requested items include an Ultrasonic Diagnostic System for Ophthalmology and a Laser Equipment. For both of those units, an agency is found in Pakistan and a maintenance network is secured. Other items are mainly diagnostic equipment, but two items have been eliminated from the object of the request because their purpose of use in the diagnostic dept. was not clear.

(3) Orthopaedics Dept.

The content of the requested equipment includes a wide variety of forceps for operation of Orthopaedics, equipment for Bone Operation and a Treating Bench for Plaster, etc. This content is basically the same as it was in the beginning but is very specific about each request item.

(4) Dermatology Dept.

The content of the request, which is the same as it was in the beginning, can be roughly divided into 3 categories or items for education, items for diagnosis and items for treatment. One item has been eliminated from the requested items because of ambiguity of its purpose of use, but the following 3 items have been added instead: Electrocautery Unit, Cryosurgery Unit, Woods Lamp for diagnosing favus, etc.

(5) Neurosurgery Dept.

The Neurosurgery Dept. was opened just in September last year and, therefore, the initial content of the requested equipment was only tentative. About 20 different kinds of equipment have been added, and most of the requested items are equipment for Operation of Neurosurgery and Microsurgery such as B/A, B/P Shunt Equipment used for Operation of Pituitary Gland, Operation of Spiral Marrow and Rachitomy.

(6) Plastic Surgery Dept.

The content of the requested equipment is mainly Forceps for Surgical Operations. As in the Orthopaedics Dept, the content of the equipment is very specific. 3 items have been eliminated for reason of non necessity while one item or High-Speed Grinder has been added to the request.

(7) Chest Surgery/Medicine Dept.

This dept. has the word "Medicine" in the name of the dept. since it also covers an area of internal Medicine. Although no equipment requiring a high degree of technology is included in the request, 3 items have been deleted as unnecessary and 4 items (Bronchoscope, Light Source, Nebulizer, Laryngoscope) have been supplemented to the request. The requested items are mainly those for diagnosis and treatment.

(8) Oral Surgery Dept.

Since the specifications of the requested equipment were quite ambiguous, we requested a reexamination of specifications and confirmed them by indicating the concrete equipment No. on catalogues brought from Japan according to the content of request for the equipment. The main items are Forceps and Treating Materials for Oral Surgical Operation and Treatment of Dentistry.

(9) Psychiatry Dept.

About 10 items have been deleted from the request because there were a lot of duplications with the Ward equipment to be mentioned later. There was a strong request for a Test Kit for grasping the state of mind of thepatients and a Copying Machine for using it for as many patients as possible, in addition to the equipment relating to Hypnotherapy and Shock Therapy.

(10) Drug Abuse Treatment Centre

In this medical dept. also as in the Psychiatry Dept, about 10 items have been deleted from the request because there were a lot of duplications with the equipment requested for the Ward. As a supplementary item, one unit of Thin Layer Chromatograph for detection and analysis of drugs in the addicts has been requested.

(11) Ward

The total number of beds to be improved is 569, but its has been confirmed that the requested number is 500 calculated on the basis of 24 wards.

(12) Radiotherapy/Nuclear Medicine Dept.

The content of the request was not explained well because the person who initially planned the request was not a doctor and, moreover, that person no longer remains in his original position. The room in which to install the requested large radiotherapical equipment (Cobalt-60 Teletherapy Unit, Remote After-Loading System) is almost completed though it is still under construction.

(13) CCU

The main equipment request includes Patient Monitoring System and ECG as well as Resuscitators adaptable to emergency relief of the patients. As for a Central Air Conditioning System, we decided to study the specifications on the Japanese side. There was a strong request for an Ambulance loaded with medical equipment for emergency relief of patients, but the Bedside Nurse Call has been eliminated from the request items.

(14) Physiotherapy Dept.

The requested items include medical equipment used for Beam Therapy and Physiotherapy. A supplementary request has been made for an Ultrasonic Diagnostic System and an Infrared Red treating system.

(15) Mortuary Dept.

A supplementary request has been made for 2 units of Autopsy Tables for autopsy and clinical lecture to students in addition to 2 units of 2-body Corpus Refrigerator.

(16) Workshop

The requested items include equipment and tools of simulation, calibration and trouble-shooting for the repair of medical equipment.

(17) Radiology Dept.

The requested items are a Whole-body CT Scanner and a 500 mA Radiographic Diagnostic System. The room for installing those systems is secured but requires execution of some repair works by the Pakistani side.

(18) Anaesthesiology Dept.

A request is made for a Nitrous Oxide Gas Supply System. The number of rooms to be supplied is 20 in total including 14 in the Main Operation Theatre, 2 in the Casualty Block and 4 in the Delivery Block. Other requested items include Lifesaving Equipment, Patient Monitoring System (for bedside use), Lung Function Inspecting Equipment, etc.

(19) Paediatrics Dept.

8 items have been deleted from the request for reasons of duplication, etc. with the equipment in the existing equipment and the equipment in the Obstetrics & Gynaecology Dept. The main items of the request are Ultrasonic Diagnostic System, Treating Equipment, Resuscitators, Immature Infant Monitoring System, etc.

(20) Surgery Dept.

Steel Scopes for urological inspection have been requested as supplementary items in addition to an operation instrument set for Microsurgery.

(21) OPD

The requested items are general medical equipment for examination of outpatients. Each diagnostic dept. has a plural number of rooms separately for male patients and female patients. There are 50 rooms in total for all the depts. and 50 is the basic unit of the requested quantity. The content of the request includes Stethoscope, X-Ray Film Reader, Clock, Weighing Scale, Examination Couch, Hemodynamometer, etc.

(22) Fire Extinguishing System

The requested items are Five Alarm System and Chemical Extinguishers.

(23) Transportation & others

These are Cars for transportation of staff members, Truck for transportation of materials, Pick-up and Utensils used for cleaning inside the Hospital.

(24) Lift

2 units of patients' lift and one unit of freight lift are requested for NU-2.

(25) Obstetrics & Gynaecology Dept.

This diagnostic dept. was overlooked at the time of the request was newly made on the occasion of the Field Survey of this time. The requested items include diagnostic systems (Stereo Colposcope, Immature Infant Monitoring System, Linear Scanner, etc. as expensive items) in addition to forceps used for Obstetric & Gynaecological Operations. There is a plan for establishing an Obstetrics & Gynaecology Dept. in the NU-2 and the total number of beds in the Obstetrics & Gynaecology Dept. for the entire Hospital is going to increase together with the existing Obstetrics & Gynaecology Dept. in the NU-1. As a result, the number of operations is also expected to increase and a request for increase and improvement of Forceps was made to cope with such situation.

CHAPTER 3.

CONTENTS OF THE PROJECT

Chapter 3 - Contents of the Project

3-1. Purpose of the Project

In Phase I, the Allied Hospital improved its equipment in the basic medical depts. of Internal Medicine, Surgery, Obstetrics & Gynaecology and Paediatrics and the specialized depts. of Ophthalmology and ENT as well as other depts. and blocks such as ICU, Radiology, Physiotherapy, Emergency Outpatient, Wards, Blood Bank and other depts. with general equipment. The present Project aims at opening all medical depts. necessary for a teaching hospital as originally planned by improving the equipment of the depts. and facilities which were not included in Phase I.

Therefore, through the execution of the present Project, the Allied Hospital will come to have both the functions of a teaching hospital and the functions of a referral hospital which provides the local inhabitants with tertiary medical services at the head of the regional medical facilities.

3-2. Study of the Contents of the Request

3-2-1. Examination of Appropriateness and Necessity of the Project

The Project is considered an adequate undertaking to be supported by Grant Aid from Japan from the following viewpoints:

(1) The number of doctors vis-a-vis population (approx. one doctor/1,973 inhabitants) in Pakistan is at about the average level for semi-advanced countries but is much lower than that in advanced countries (approx. one doctor/200 inhabitants). Further efforts must be made to increase the number of doctors in order to establish a better medical care system in Pakistan.

(2) In the Punjab, which represents more than one half of the national population, the level of medical care seen from the viewpoint of health & medical services available to local inhabitants is much lower than the national average as exemplified by the number of doctors vis-a-vis population (approx. one doctor/3,879 inhabitants). It is therefore important, for the improvement of health and medical care for the local people, to increase the number of doctors, improve the quality of the doctors and expand the scope of diagnosis

and treatment through efforts to promote a plan to improve the health and medical services. It can be said that it is absolutely necessary in both the areas of medical education and examination to establish specialized medical depts. such as ENT, Ophthalmology, Orthopaedics, etc., in addition to the basic medical depts. of Internal Medicine, Surgery, Obstetrics & Gynaecology, Orthopaedics, etc.

(3) According to the statistics as of June, 1988, the number of beds in the Punjab was one bed per 2,027 inhabitants which is much lower than the national average of one bed per 1,657 inhabitants. If the hospital equipment is improved through the execution of the Project, the Allied Hospital will have all depts. necessary for a teaching hospital of a medical college and there will be 1,020 beds in total with a net increase of 518 beds over the existing number. Therefore, realization of the Project is quite desirable from the viewpoint of improvement of the health and medical services available to the local inhabitants.

(4) The medical services aimed at by the Health Dept. for the Allied Hospital of the Medical College are "Treatment and Study of Cancers", "Treatment and Control of Skin Diseases" and "Improvement of Iron Deficiency in Pregnant Women". If the equipment in the targeted diagnostic depts. of the Project is improved and examinations are started, it will be one step forward for the realization of the above 3 objectives and the development plan of the Government of the Punjab will be satisfied.

3-2-2. Study on Execution & Management Plan of the Project

An increase in personnel for the execution of the Project is expected to be made only for the medical depts. and the workshop. As for the medical depts., each dept. will comprise a professor, associate professor, assistant professor, specialist, registrar, medicine officer, assistant to the chief doctor, house physician/surgeon, nurses, paramedical staff, assistants and helpers. (There may be some posts left vacant or combination of more than one post depending on the dept.)

(1) The personnel reinforcement plan through the execution of the Project in the medical depts. and the workshop is as indicated hereunder. (No reinforcement will be made in the Administrative Dept., the Office Work Dept., the Purchasing Dept. and the Service Dept.)

Name of Medical dept.	Current Number	Increased Number	Total Number
1. Medicine	127	0	127
2. Surgery	127	0	127
3. Obstetrics & Gynaecology	69	(+)34	103
4. Paediatrics	56	0	56
5. Anaesthesiology	103	0	103
6. Radiology	59	0	59
7. Casualty	61	0	61
8. Private Ward	36	(+)41	77
9. Pathology	27	0	27
10. Blood Bank	10	0	10
11. OPD	78	(-) 5	73
12. ENT	0	(+)26	26
13. Ophthalmology	0	(+)26	26
14. Neurosurgery	0	(+)14	14
15. Plastic Surgery	0	(+)11	11
16. Chest Surgery/Medicine	0	(+)15	15
17. Oral Surgery	0	(+)10	10
18. Psychiatry	0	(+)31	31
19. Radiotherapy/ Nuclear Medicine	0	(+)43	43
20. Dermatology	0	(+)19	19
21. Physiotherapy	0	(+)23	23
22. CCU	0	(+)30	30
23. Workshop	0	(+)22	22
[Sub-Total]	753	(+)340	1,093
24. Management, Administration Store, Service depts.	146	0	146
[Grand Total]	899persons	340persons	1,239persons

(2) An application for an increased budget due to an increase in personnel has already been submitted to the Dept. of Health of the Punjab. Its contents include (a) Rs. 8,642,285 for the salary of the staff, (b) Rs.1,000,000 for the maintenance cost of the equipment, and (c) Rs. 11,178,500 for the cost of material purchases.

As for the salary of the staff of the Allied Hospital, the average of the total salary amount during the period of 3 years for fiscal years 1988-89, 1989-90 and 1990-91 is Rs. 13,101,605. After the execution of the Project, the number of staff members will become

1,239 as opposed to the current number of 899 with a net increase of 38.7% over the existing number. The amount of increase of the staff salary applied for to DOH is Rs. 8,642,285 as mentioned above - and this amount corresponds to an increase of 65.9% over the average total salary amount during the 3 years of 1988-1991. Therefore, there will be no problem regarding personnel costs since the application for an increase has been accepted by DOH.

(3) The operating cost of the equipment and the consumables relating to it will probably increase to at least 3 to 4 times the current level after the execution of the Project. The Allied Hospital explains that, in case any unusually large expenses arise, it will appeal to the Government of the Punjab to be allowed a supplementary budget at the end of the year. The same is true with the purchase of spare parts and the necessary budget is always secured, as declared by the Hospital. And judging from the past records, the allocation of a supplementany budget has indeed been approved. Therefore, there seems to be no problem concerning the securing of spare parts either.

3-2-3. Relations between the Project and Similar Projects & Assistance Programmes of Other Countries

The existing equipment of the Allied Hospital was mainly procured in Phase I with Grant Aid from Japan and the main equipment items are the following:

Dept.	Name of Major Equipment
NU-1	Operating/Delivery Table, Bed, Patient Carrying System
Service Block	Laundry/Kitchen Equipment, Power Generator, Boiler
Diagnostic Block	Radiographic Diagnostic System, Operating Table, Anaesthetic Machine
Others	Ambulance, Air Conditioner, Stabilizer

As for foreign aid, a supply of equipment from Finland was received in 1989. That assistance programme was implemented as part of the plan for "Improvement and Standardization of Pathological Work" of the Government of Pakistan and consisted of supplying equipment and

materials for clinical chemistry and pathology and providing training for the hospital staff. The major equipment and materials supplied included a Chemical Analyzer, an Incubator, a Coagulation Analyzer, a Centrifuge and Reagents.

In addition, there are some equipment units which were purchased by the Allied Hospital's own budget such as a Blood Gas Analyzer and equipment for sterilizing rooms such as a Steam Sterilizer, Material Conveyor, etc.

The attached Appendix 8-5 shows the list of equipment purchased by the budget of the Allied Hospital.

According to the Allied Hospital, there is no other assistance programme being planned for promotion in the future. Therefore, it can be concluded that there is no duplication between the Project and any other assistance programme of countries other than Japan.

3-2-4. Study on Components of the Project

The request of the Pakistani side is for the medical equipment necessary for diagnosis and treatment in NU-2, the Radiotherapy Dept. Ward, Private Ward, CCU, Mortuary Unit, Workshop, OPD Block, etc., of the Allied Hospital, and these units of equipment are elements necessary for the doctors in the field of diagnosis and treatment, for the education and fostering of medical students and for the daily diagnostic and treatment activities at the Allied Hospital of the Medical College.

The contents of the diagnosis and treatment activities of the above-mentioned target medical facilities where the requested equipment is going to be installed are as follows:

(1) NU-2 --- In each medical dept., the activities of which also include surgical diagnosis and treatment, there are medical equipment and materials necessary for diagnosis and treatment in the wards and medical equipment and materials to be used in the Main Operation Theatre located in the Central Diagnostic Block. The medical depts. for which in-ward diagnosis and treatment in the NU-2 are planned include the following:

ENT Dept., Ophthalmology Dept., Orthopaedics Dept., Neurosurgery Dept., Plastic Surgery Dept., Drug Abuse Treatment Centre, Surgery-III, Obstetrics & Gynaecology Dept.-II (For the reader's reference, the NU-1 has Medicine I and II, Surgery I and II, a Paediatrics Dept., Obstetrics & Gynaecology Dept.-I and Operation Room/Labour Room of Obstetrics & Gynaecology Dept.-I.)

(2) Radiotherapy Ward --- Emphasis is put on the treatment with radiography of malignant tumors and cancers mainly in the Radiotherapy Unit using the equipment necessary for diagnosis and treatment which is located in this medical ward. Two medical depts. (Radiotherapy/Nuclear Medicine Dept. and Dermatology) are housed in this medical ward.

(3) Private Ward --- This is a ward serving those inpatients who bear private room charges.

(4) CCU --- This medical dept. ward has casualty treatment facilities for patients suffering mainly from heart diseases such as congenital heart diseases (heart deformity), valvular heart disease, cardiac infarction, cardioneurosis, heart sac inflammation, arteriosclerosis, fits of angina pectoris, etc. In this dept., intensive/coronary care is available not only for inpatients but also for outpatients.

(5) Mortuary Unit --- This is a place for storing dead bodies. Autopsies are performed for detection of the cause of a death by disease or in the case of a death due to accident, etc., and also considering the legal aspects of the matter. This unit also serves as a place for storing dead bodies to be used for clinical lectures on anatomy to medical students.

(6) Workshop --- This is a place for making repairs and inspections of the facilities and medical equipment in the Allied Hospital. The requested equipment includes electric circuit panels to be used for the study of the fundamentals of electrical engineering and electrical tools necessary for repair work.

(7) OPD Block --- Most of the medical equipment and materials requested for the treatment of outpatients are comparatively simple articles such as a hemodynamometer. The outpatient depts. forming the subject of the improvement are the 13 medical depts. and 50 diagnostic rooms of Internal Medicine, Obstetrics & Gynaecology, Surgery, Paediatrics, ENT, Ophthalmology, Chest Surgery/Medicine, Family Planning, Dermatology, Psychiatry, Oral Surgery, Orthopaedics and Neurosurgery.

(8) Medical Depts. that Expand the Content of Existing Diagnostic and Treatment Activities

The number of patients will increase in the future with the expansion of the new medical facilities such as NU-2, etc. To cope with such a situation, some of the existing medical depts. are obliged to improve their equipment again because the scope of their diagnosis

and treatment is to be expanded. There are also some other depts. such as the Radiology Dept., Anaesthesiology Dept. and Paediatrics Dept. which are planning to expand their equipment with a view to improving their diagnostic and treatment functions as depts. of the hospital attached to the Medical College and achieving the business plan of the Allied Hospital of the Medical College.

(9) Facilities and Equipment Seen from the Viewpoints of the Management System of the Hospital and Safety Control

A request is made for alarm systems and CO_2 fire extinguishers for the safety of the entire Hospital and for a lift for NU-2, as well as vehicles and cleaning equipment necessary for the management of the Hospital.

3-2-5. Plan for Improvement of Facilities by Arrangement of Equipment

The greater part of the requested equipment is going to be used in the wards, the Diagnostic Block and the OPD Block. The improvement plan of those facilities is as described hereunder.

(1) Wards

The wards to be newly provided through the execution of the Project are 4 wards with 569 beds as shown in Fig. 3-1. With this expansion, the total number of beds will become 1,020, with a net increase of 518 beds (24 wards) over the current number. Each nursing unit of NU-2 consists of 54 beds including 9 six-bed rooms and 2 isolation rooms which are not included in the number of beds. Those beds are divided into two wards of 30 beds for men and 24 beds for women, respectively, and the nursing station is also divided into 2 parts. As a result of expansion of NU-2, Surgical Unit-III which is temporarily located in the Casualty Ward of the Diagnostic Block will move to NU-2, and 20 beds for the Chest Surgery/Medicine Dept. and 20 beds for the Casualty Ward (i.e. 40 beds in total) will be newly provided on the site. On the other hand, the Private Ward consists of 6 wards, each of which constitutes one nursing unit with 16 - 17 beds.

Except for general equipment such as beds, etc., the majority of the equipment for the wards will be used in the nursing station, isolation rooms, demonstration room for the education of students, the professor's room, etc. There is no particular need to modify the facilities for the installation of equipment, except that plumbing

work is required for the installation of ice makers.

(2) Radiotherapy Ward

The Radiotherapy Ward consists of two nursing units, i.e., 30 beds for Radiotherapy Dept. and 30 beds for Dermatology Dept. respectively. Each unit has five 6-bed rooms and two isolation rooms.

(3) Radiotherapy Unit

The majar equipment items to be improved include a Cobalt-60 Teletherapy Unit, Remote After-Loading System and Simulator. The building has already been completed except for floor work and installation work of lead-shielded doors. The remaining work will be executed after the equipment models are determined and in conformity to their specifications. The Superficial X-Ray Therapy Unit will be turned into a Simulator Room which was not included in the initial plan. In those rooms, no window-type air conditioners can be installed because of the necessity to shield the heavy radiation. Therefore, it will be necessary to install a Central Air Conditioning System in each room.

(4) CCU

The CCU building, located apart from other wards, has a ten-bed nursing unit, X-Ray room and Laboratory. It will be essential to equip the rooms with a Central Air Conditioning System for both patients in serious condition and sensitive medical equipment such as ECG Monitors.

(5) OPD Block

The OPD Block consists of a North and South Block. For the arrangement of each medical dept. refer to the drawing in the Appendix. The number of examination rooms for each medical dept. is as shown hereunder.

Most of the types of equipment for the OPD Block are comparatively simple articles such as Examining Couches, B.P.Apparatus, etc., and there is no particular need of modifying the existing facilities for the installation of equipment.

Name of Medical Dept.	Rooms	Name of Medical Dept.	Rooms
Internal Medicine	6	Family Planning	4
Obstetrics & Gynaecology	4	Dermatology	2
Surgery	6	Psychology	2
Paediatrics	8	Oral Surgery	4
ENT	4	Plastic Surgery	2
Ophthalmology	5	Neurosurgery	1
Chest Surgery	2		
		Total	50

(6) Diagnostic and Treatment Block

The Diagnostic and Treatment Block consists of the Casualty Block, ICU, Laboratory Radiology Dept., Central Sterilization Dept. on the ground floor and the Main Operation Theatre on the first floor, and the equipment furnishing was already completed in Phase I. The purpose of the Phase II Project is to reinforce the diagnostic and treatment equipment such as X-Ray machines for the Radiology Dept. as well as other items which had not been procured in Phase I.

On the ground floor of the Diagnostic and Treatment Block, the following modifications of facilities are going to be made to install some of the equipment required.

1) The Pharmacy Block will be modified into a Whole-body C.T. Scanner Room, and an exclusive transformer with a capacity of 100KVA will be installed as a power supply system for it.
2) The X-Ray room of the Casualty Block (currently a Mobile X-Ray Machine is used) will be modified into a room for a new 500 mA X-Ray Machine.
3) One portion of the CSSD will be modified into a Nitrous Oxide Gas Manifold Room, and nitrous oxide gas piping will be installed from this room to 20 rooms in total, i.e., 14 rooms of the Main Operation Theatre, 2 rooms of the Casualty Block and 4 rooms of the Obstetrics & Gynaecology Dept. (2 operations rooms, 2 delivery rooms).
4) The Mechanical Gases Room (currently used as a warehouse) will be modified into a Maintenance Room for Medical Equipment.

The Workshop building is located on the north side of NU-2. This building completely lacks airtightness because it is not only separated from the main building of the Hospital but also has no door at the entrance although there is a shutter for a garage. For

that reason, it has been decided to install the maintenance room for medical equipment separately in the Diagnostic and Treatment Block which has better airtightness and where the equipment units requiring maintenance are installed in a large number. The original Workshop will be used for the maintenance of General Equipment (building facilities, equipment, beds, furniture, etc.).

Fig.3-1 Allocation of Beds for the Phase-II Project

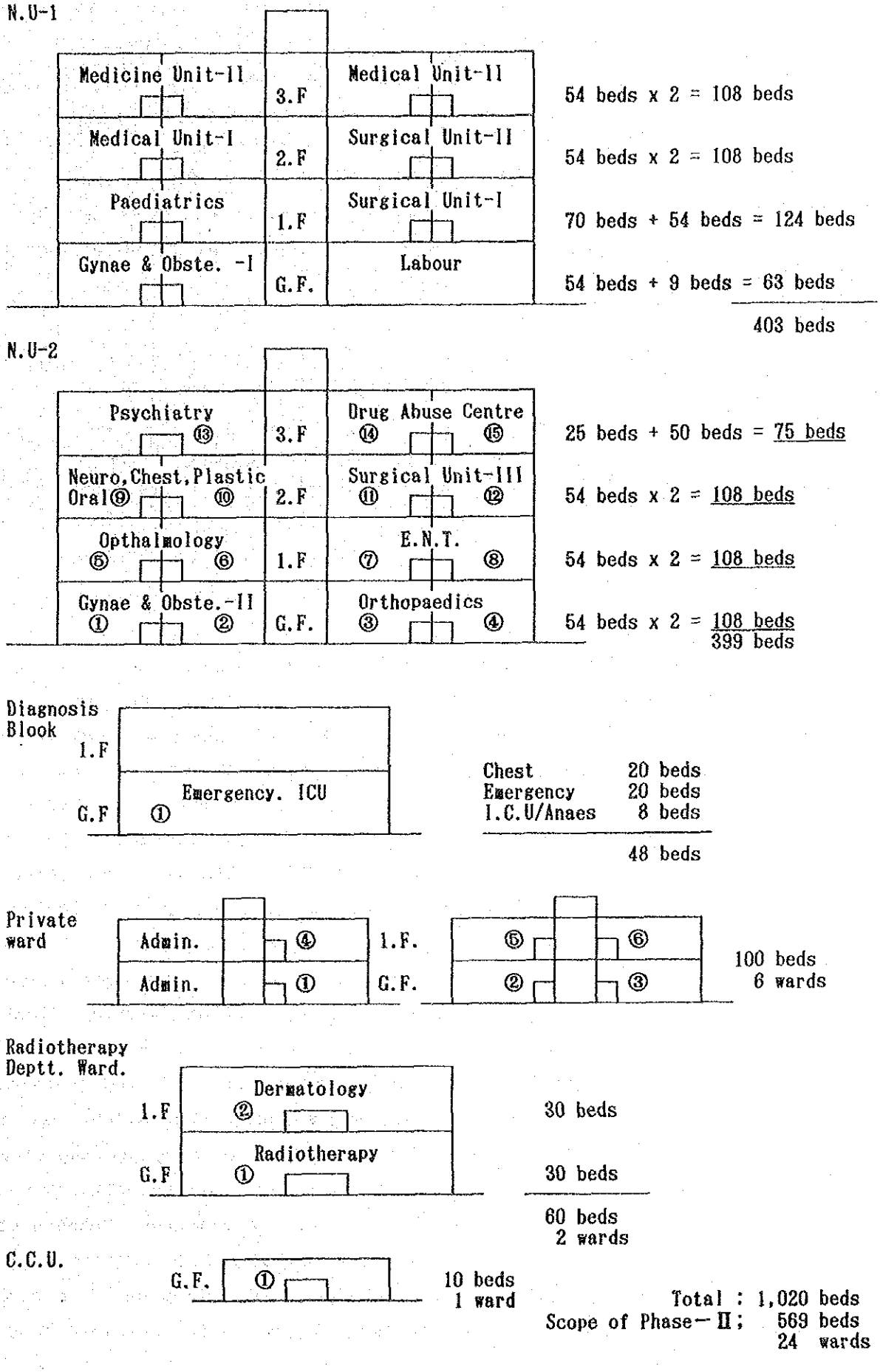
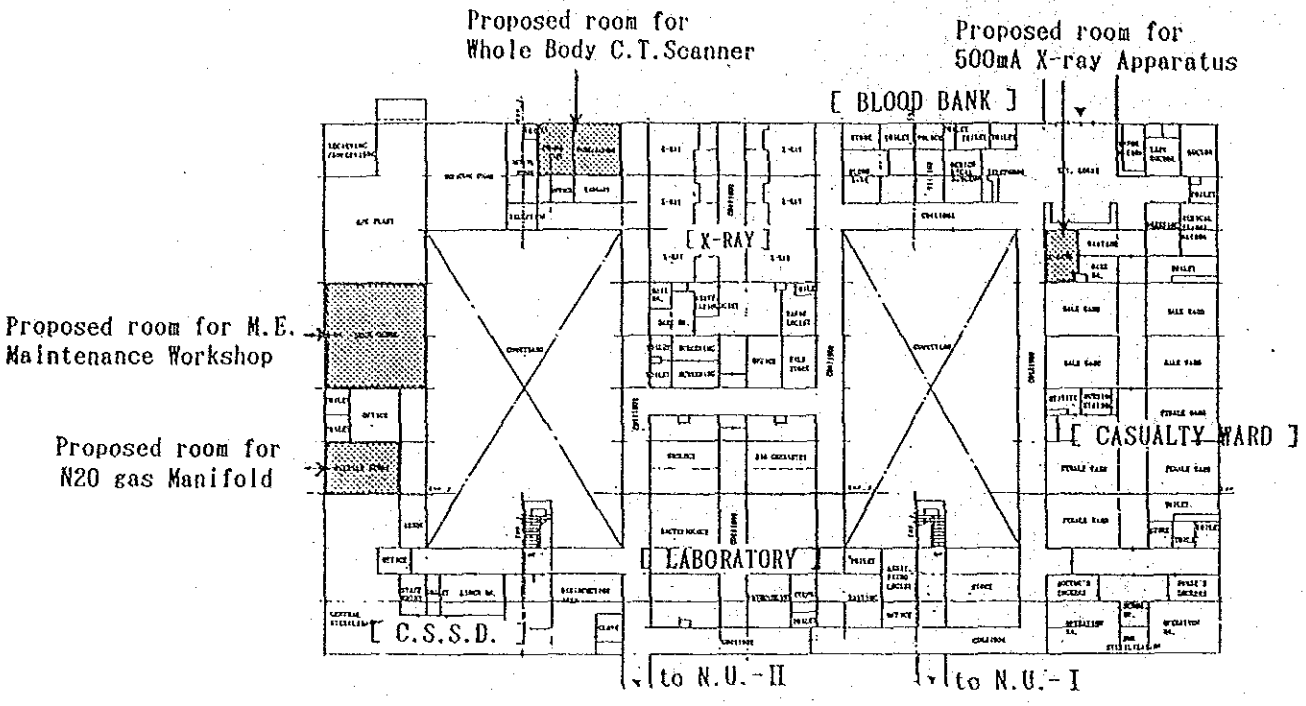


Fig. 3-2. Modification plan of ground floor of Diagnostic Block



3-2-6. Examination of the Requested Equipment

It is quite normal for the Allied Hospital to promote the fostering of personnel to engage in medical care in respect to both medical education (especially clinical education of students) and improvement of diagnostic/treatment functions and the betterment of health & medical services for the local inhabitants. In addition to the above, the health & medical services in the Allied Hospital must be implemented in line with the operating principles of (a) "Treatment and Study of Cancers", (b) "Treatment and Control of Skin Diseases", and (c) "Improvement of Iron Deficiency in Pregnant Women" which reflect the intention of the Punjab DOH.

Moreover, the supply of the requested equipment is impossible unless the current level of medical techniques (operating techniques, diagnostic techniques/capacity, maintenance & control system/capacity and budget system, ability to purchase consumables, reception setup in respect to buildings and facilities, etc.) matches the contents of the request.

Consequently, the selection of equipment will be done in accordance with the selection standards (already agreed to in the Minutes of Dis-

cussions with the Government of the Punjab) for the requested equipment of the Project. It is also necessary to examine the contents of the Project with due consideration of the situation of use of the equipment and materials supplied in Phase I.

The medical depts. and the names of the major types of equipment and materials forming the equipment plan are as follows:

(1) ENT Dept.

* Medical equipment and materials to cope with the diagnosis and treatment of diseases of the outer ear such as deformity of the outer ear, hematoma of the ear, burns of the ear, diseases of the external auditory meatus such as buildup of ear-wax, otitis externa, tumors of the external auditory meatus, diseases of the drum membrane such as rupture of the drum membrane, myringitis, diseases of middle ear otitis, other otitis media, diseases of the inner ear such as otosclerosis, Meniere's syndrome, hardness of hearing (hearing impairment), acoustic nerve tumors, labyrinthitis and other diseases of the ear such as deaf-mutism, etc.
* Medical equipment and materials to cope with the diagnosis and treatment of diseases of the nose such as deformity of the septum, rhinitis, nasal polyps, sinusitis, special inflammations of the nose such as TB, syphilis, leprosy, diphtheria, erysipelas, nasal tumors and diseases such as foreign matter in the nasal cavity frequently seen in infants.
* Educational equipment necessary for teaching the forms and conditions of diseases and diagnostic techniques, etc., of the above-mentioned diseases are also included in the equipment plan.
* The main equipment and materials requested are:
  Stand-type Lamp for Operations, Slide Projector, Human Body Model of the Ear, Nose and Throat, Video Cassette Recorder, Electric Nystamograph, Laser Treating System.
  For the above Laser Units, they need a lot of pure water for cooling the system. However, since the water supply available in the Allied Hospital contains much salinity, a heavy water treatment system is necessary to obtain pure water for the Laser Units. Therefore, the Laser Units can't be expected to be run properly without such a water treatment system.

(2) Ophthalmology Dept.

* Medical equipment and materials for ophthalmology necessary for the diagnosis and treatment of diseases of the eyelid such as hordeolum, chalizion, diseases of the conjunctiva such as conjunctivitis

trachoma, allergic conjunctivitis (spring and autumn conjunctivitis, phlyctenular conjunctivitis), pterygium, drying and softening of the conjunctiva, diseases of the cornea such as infectious diseases of the whole body (TB, syphilis, leprosy), inflammation of the eye (trachoma, etc.), corneitis leucitis and iridocyclitis produced by such causes as physico-chemical stimuli or malnutrition, diseases of the crystalline lens such as cataract, diseases of the vitreous body such as opacity, hemorrhaging of the vitreous body, other diseases or abnormality of reflection or adjustment of the retina, choroid, orbit, eyeball, eye muscles, injury of the eye, tumors, etc.

* The main equipment and materials are on Ultrasonic Diagnostic System for Ophthalmology, Laser Treating System and equipment and materials for diagnosis such as Slit Lamp, Synoptophore, etc. In this dept. also, a Laser Treatment System is requested. This system is very effective for the treatment of cataract and glaucoma and the maintenance network for these systems is secured. However, effective use of them is considered to be impossible without improvement of the hospital infrastructure, since they can be damaged because of poor quality of water containing much salinity.

(3) Orthopaedics Dept.

* The requested equipment and materials are Forceps for Orthopaedic Operations, Equipment for Operations on Bones and an Examination Couch used for applying plasters, etc. The contents of the plan are intended to cope surgically with injuries of the locomotorius such as bite wounds, fractures, gunshot wounds, contused wounds and other wounds, hemorrhaging due to damage, fractures of bones, dislocations, contracture and stiffness, inflammation, diseases of the locomotorius such as acute suppurative myositis, osteomyelitis, arthritis, osteoarthrotuberculosis, myelosis, etc.

(4) Dermatology Dept.

* Treatment is provided according to the results of inspections such as a histological inspection, bacteriological inspection, and serological inspection made in the existing Clinical Laboratory for a wide variety of diseases such as eczema, dermatitis, erythemas and teleangiectasia, purpura, physico-chemical skin diseases, hematolymphagnitis, prurigo, pruritus, drug eruption, toxic rash, impetigo bullosa, hyperkeratosis, diseases of the corium, diseases of appendages of the skin, benign tumors, malignant tumors, bacterial skin diseases, dermatomycosis, viral skin diseases, animal parasites, and diseases caused by stinging and biting of insects.

* There are medical equipment for diagnosis such as a Fluorescent Microscope, Incubator, etc., and medical equipment for treatment such as an Electric Coagulator, Cryosurgery Unit and Phototherapy Unit.
* As equipment for raising the effects of the clinical education of medical students, there are a Slide Projector, Camera with Close-up Lens and Overhead Projector.

(5) Neurosurgery Dept.

In September, 1990, the Allied Hospital opened a full-fledged Neurosurgery Dept. by inviting a doctor specializing in neurosurgery from the Mayo Hospital, King Edward Medical College in Lahore.

The contents of the initial request for equipment were of a tentative nature but opening of the Neurosurgery Dept. was already planned at the time of the request. About 20 different kinds of equipment were supplemented as a result of the Field Survey at that time.

There are various kinds of diseases of cerebral nerves, and they can be roughly classified into diseases of peripheral nerves, diseases of the spinal marrow (spinal screlosis, anterior poliomielitis, compression paralysis of spinal marrow, etc.), cerebral diseases (meningitis, cerebral hemorrhage, cerebral infarct <cerebral softening>, cerebral inflammation, cerebral tumors), diseases of the autonomic nerve, diseases of the extrapyramidal system, neurosis (migraine, hysteria), etc. No statistical data is available yet because the Neurosurgery Dept. was opened just recently in the Allied Hospital, but there are a lot of head injury and epilepsy patients to take only the Casualty Outpatient Dept. and the Surgery Dept. as examples, and there is a growing demand for diagnosis in specialized fields. To take cerebral tumors, for example, American statistics indicate that about 26 cases of cerebral tumors are produced per year per 100,000 inhabitants, of which 15 cases are said to be produced from the internal system itself and 11 cases are produced as a result of metastasis of a malignant tumor newly arising in other parts of the body. Supposing the population of the Punjab to be 62 million, there are probably 16,120 cases of cerebral tumors per year in the Punjab.

A CT scanner for the head is installed in the existing diagnostic and treatment facilities (Radiology Dept.) of the Allied Hospital and is utilized for the diagnosis of diseases in the cerebral surgery field. The number of cases of diagnosis in this field will

further increase in the future.

The requested equipment and materials are mostly those used for operations such as equipment for microsurgery, including B/A, B/P Shunt Equipment for the Treatment of Hydrocephalus in infants and equipment used for Operations of the Pituitary Gland, Operations of the Spinal Marrow and Rachitomy.

(6) Plastic Surgery Dept.

The fields of diagnosis of this dept. are somewhat similar to those of the Orthopaedics Dept. The requested equipment and materials are Forceps for Plastic Surgery, Forceps for Microsurgery and Forceps for Surgical Operations on minute blood vessels all of which are necessary for surgical techniques in this field.

(7) Chest Surgery/Internal Medicine Dept.

The requested equipment and materials are very simple ones used for performing diagnosis of diseases of the lungs and heart and examination after operations, but also include an ECG Analyzer.

(8) Oral Surgery Dept.

This dept. deals with diseases of the oral cavity (including teeth), salivary gland and chin, paradental laveolaris (pyorrhea alveolaris), decayed teeth, stomatitis such as catarrhal stomatitis, ulcelative stomatitis, etc., and blisters which is a disease of this field that appears on seriously sick infants, causing them to fall into critical condition or even die in some cases. These diseases are serious not only as diseases in themselves but also as preliminary indications of a danger to life since they appear when the body becemes weak for various reasons.

The requested equipment and materials are those necessary for the diagnosis and treatment of these diseases. At present, there is only one Diagnostic Table for Dentistry in the Allied Hospital purchased under the hospital's own budget and this is quite insufficient for the diagnostic activities in the dept.

The main content of the requested equipment and materials is Forceps for Oral Surgery Operations and Dental Treatment, a Diagnostic Table for Dentistry, X-Ray System for Dentistry, Equipment for Odontorthosis in Dentistry, etc.

(9) Psychiatry Dept.

Diseases of the mind can be roughly classified into encephalopathic mental troubles such as degeneration of the brain due to ageing, encephalic trouble, poisoning (abuse of drugs, chronic alcoholism, etc., functional mental troubles such as mania, depression, mental

illusions, delayed schizoidia, etc., and states of mental disorder such as neurosis, abnormal personality, psychosomatic disorders, etc., caused by the loss of mental stability due to living environment or unusual experiences rather than by any functional encephalopathic or functional trouble. These diseases are also frequently seen in the active younger generation in Pakistan, and the occurrence of mental disorders due to drug abuse in particular has become a big social problem. What is important for the diagnosis and treatment of these diseases is an early diagnosis, especially a differential diagnosis using simple calculation tests (addition and subtraction of 1-digit figures) or memory tests (memorizing 4 different objects).

It is important to perform diagnosis and treatment in early stages by using the requested equipment relating to shock therapy and hypnotherapy and the Test Kit for determining the state of mind of the patients.

(10) Drug Abuse Treatment Centre

As was stated before, mental trouble due to drug abuse (mainly narcotics) is conspicuous among the mental diseases in Pakistan. The Drug Abuse Treatment Centre was specially established adjacent to the Psychiatry Dept. for the treatment of such patients.

For this Centre, a request is made for Diagnostic Instruments for Psychiatry and a Chromatograph to be used for the detection and measurement of narcotics.

(11) Wards

It has been confirmed that the number of beds requested is 500 although the total number of beds subject to improvement is 518. The calculation of the quantities of different equipment and materials is based on 24 wards. The requested equipment and materials include general diagnostic equipment for wards such as Patients' Beds, an Overbed Table, Hemodynamometer, Bedside Cabinet, Medicine Cabinet, Oxygen Tent, Wheelchair, Examination Couch, Ice Maker, Weighing Scale, etc. One special item is a Blood Gas Analyzer to be used in the wards for measuring the pH of blood gas and blood fluid.

(12) Radiotherapy & Nuclear Medicine Dept.

A request is made for equipment and materials to be used for the treatment of malignant tumors and cancers. The main items include a Cobalt-60 Teletherapy Unit, Remote After-Loading System and Simulator for locating the treatment spot of the patient using those systems. These are items necessary also for the realization of

"Treatment and Study of Cancers" which is one of the planned operations of the Allied Hospital. The Cobalt-60 Teletherapy Unit is the major unit of equipment among X-Ray remote irradiation equipment. It is almost trouble-free and therefore its maintenance cost is very small. In addition, it is stable in output and easy to operate. The Remote After-Loading System is a typical treatment system used for the treatment of uterine cancer or malignant tumors of the womb. The construction work of the building for the treatment facilities in which to install these equipment and materials is almost finished, and the arrival of the equipment and materials is awaited. There is nothing to worry about regarding the technical guidance on the maintenance and control, operating techniques and planning of radioactivity doses as cooperation is going to be extended by the medical staff of the Mayo Hospital.

(13) CCU

This is a special diagnostic and treatment facility intended for controlling patients after operations for diseases of the heart such as congenital heart disease, endocarditis (acute, malignant acute, rheumatic), valvular heart disease, myocardiosis, cardiac infarction, cardioneurosis, etc., diseases of the heart sac such as inflammation of the heart sac, retention of heart fluid, concretion of the heart sac, atrophic heart sac inflammation, etc., and diseases of the artery such as arteriosclerosis, aortic aneurysm, hyperpiesia, etc. At present, the Allied Hospital has no medical facilities and technology for performing open-heart cardiac surgery but there are patients suffering from serious diseases as mentioned above. Therefore, a special diagnostic facility and medical equipment and materials for taking care of those patients are necessary. The construction work of the building for this facility has already been almost completed by the Pakistani side.

The main items of requested equipment and materials include a Centralized Patient Monitoring System, Central Air Conditioning System and Ambulance, etc.

(14) Physiotherapy Dept.

This is a diagnostic and treatment dept. intended for aiding the recovery of mobility and treatment of pain of outpatients and inpatients. The requested equipment and materials include Electrical Treating Systems/Ultrasonic Treating Systems and Physiotherapy Systems, etc., to be used for performing electrical stimulation of paralyzed muscles, preventing inactive atrophy, improving blood cir-

culation by application of electric current or killing pain to treat various neuroparalysis, neuralgia and articular neuralgia.

(15) Mortuary Dept.

A supplementary request has been made for 2 Autopsy Tables for use in clinical lectures for students in addition to Cadaver Refrigerators.

(16) Workshop

The requested items include equipment and tools for simulation, calibration and electrical safety necessary for the repair of medical equipment and facilities and equipment and materials relating to electronic training and electrical training for the education of students.

However, the Secretary of the Health Dept. of the Punjab said in the Explanation of the Draft Final Report that the equipment for the Technical Institute is to be excluded since the Technical Institute is managed by the Labour Dept. of the Punjab. Therefore, the equipment requested for the Technical Institute is to be excluded from the Basic Design.

(17) Radiology Dept.

The requested items are a Whole-body CT Scanner and a 500 mA Radiographic Diagnostic System intended to raise the level of the radiological diagnostic function of the Allied Hospital. The room for installing these systems is secured but requires some repair work by the Hospital side for the installation of the equipment.

(18) Anaesthesiology Dept.

The area of diagnosis of the Anaesthesiology Dept. will inevitably increase with the expansion of the diagnostic and treatment facilities such as NU-2, etc., and it is also natural that more items will be required in addition to the existing equipment and materials placed under the control of the Anaesthesiology Dept. The largest item requested by this dept. is a Nitrous Oxide Gas Pipe System since the absence of a centralized nitrous oxide gas supply system in each operation room of the Main Operation Theatre, Casualty Block and Delivery Block is a source of anxiety concerning the control of patients during surgical operations.

Other requested items include a Patient Monitoring System (for bedside use), Electrolyte Analyzer and Simple Resuscitators.

(19) Paediatrics Dept.

An increase of infant patients is expected in this newly established diagnostic and treatment dept. with the expansion of the diagnostic and treatment facilities such as NU-2, etc., as in the Anaesthesiology Dept. For that reason, the existing diagnostic and treatment equipment of the Paediatrics Dept. must also be improved.

The main items requested are a Phototherapy Unit used for the treatment of jaundice in immature infants or newborn babies, Newborn Resuscitators for aiding artificial breathing by applying positive and negative pressure to newborn infants in asphyxia, and on Ultrasonic Diagnostic System for heart and digestive organs, etc.

(20) Surgery Dept.

Wards of Surgery Dept.-III are going to be added in NU-2. Various Steel Scopes for Urological Inspection have been requested as supplementary items in addition to Forceps for Microsurgery, to cover a wider range of diagnosis compared with the content of the conventional General Surgery. It means that the Urology Dept. functions as one of the diagnostic fields of Surgery under the current situation.

(21) OPD

The requested items are general medical equipment for examination of outpatients. Each diagnostic dept. has a number of separate rooms for male patients and female patients. There are 50 rooms in total for all the depts. treating outpatients and 50 is the basic quantity of the requested units. The requested items include Stethoscope, X-Ray Film Reader, Clock, Weighing Scale, Examination Couch, Hemodynamometer, etc.

(22) Fire Extinguishing System

The requested items are an Alarm System and CO_2 Chemical Extinguishers to be installed throughout the Allied Hospital.

These equipment items are to be excluded from the Basic Design since they should be equipped as construction facilities and, moreover, it is easy to obtain them in Pakistan.

(23) Transportation & Others

These include staff car for the transportation of staff members of the Allied Hospital, a truck for the transportation of materials, a pick-up and items used for cleaning inside the Hospital.

Since it is considered that there is no urgent necessity for procuring a staff car and a truck, they are to be excluded.

(24) Lifts

Three Lifts for the general public are requested for installation in NU-2. At the present time, howevwe, the causes of troubles with the lifts installed in Phase I have not been determined, proper maintenance has not been provided and there is no knowing when they will be repaired. Under such circumstances the procurement of such equipment is to be avoided.

(25) Obstetrics & Gynaecology Dept.

An increase of outpatients/inpatients is also expected in this diagnostic and treatment dept. since Obstetrics & Gynaecology Dept. wards are newly secured in NU-2, etc., as in the Anaesthesiology Dept. Consequently, the number of operations will increase not only in the ward of the Obstetrics & Gynaecology Dept.-II but also in the existing Delivery Dept. and Obstetrics & Gynaecology Dept. and the content of the request reflects the plan for the increase of Forceps, etc. This diagnostic dept. was overlooked at the time of the request and a request was newly made on the occasion of the Field Survey.

The main requested items include Diagnostic Systems (Stereo Colposcope, Immature Infant Monitoring System, Linear Scanner, etc., as expensive items) as well as an Ambulance loaded with emergency relief system equipment in addition to Forceps used for Obstetric & Gynaecological Operations.

3-2-7. Study on Necessity of Technical Cooperation

Most of the medical equipment and materials supplied in the Allied Hospital of the Medical College in Phase I are Japanese made. Therefore, the staff members of the Allied Hospital engaged in medical activities are accustomed to the operation of the equipment supplied.

Several kinds of equipment in the diagnostic and treatment depts. to be improved in the Project require a high degree of operating techniques and diagnostic capacity, i.e., the Thin Layer Chromatograph in the Drug Abuse Treatment Centre, 500 mA Radiographic Diagnostic System and Whole-body CT scanner in the Radiology Dept, Ultrasonic Diagnostic System in the Paediatrics Dept, and the Ultrasonic Diagnostic System in the Obstetrics & Gynaecology Dept. are about the same as the equipment installed in the Mayo Hospital, King Edward Medical College in Lahore. The doctors working in the Allied Hospital have technical cooperation with the Mayo Hospital and, on the occasion of the visit

of the Study Team to the Mayo Hospital for the Field Survey, the people concerned of the Mayo Hospital expressed that they are ready to cooperate positively with the Allied Hospital, if so requested, to either dispatch medical engineers or conduct training. In executing the Project, procurement of equipment and materials by Grant Aid is indispensable. However, as for the technical cooperation intended to smooth or improve education and research, it seems better to rely on cooperation with other educational hospitals in Pakistan rather than technical cooperation from Japan. Therefore, it is thought that there is no particular need for technical cooperation from Japan.

3-2-8. Basic Policy for Cooperation

As a result of the stdy made, execution of the Project was judged as reasonable to be carried out with Grant Aid from Japan because its effects and feasibility, and the capacity for execution of the country concerned, etc., were confirmed, as was the fact that the effects of the Project meet the purpose of the system of Grant Aid. Therefore, we will examine the outline of the Project hereafter and proceed with the Basic Design on the condition of Grant Aid from Japan.

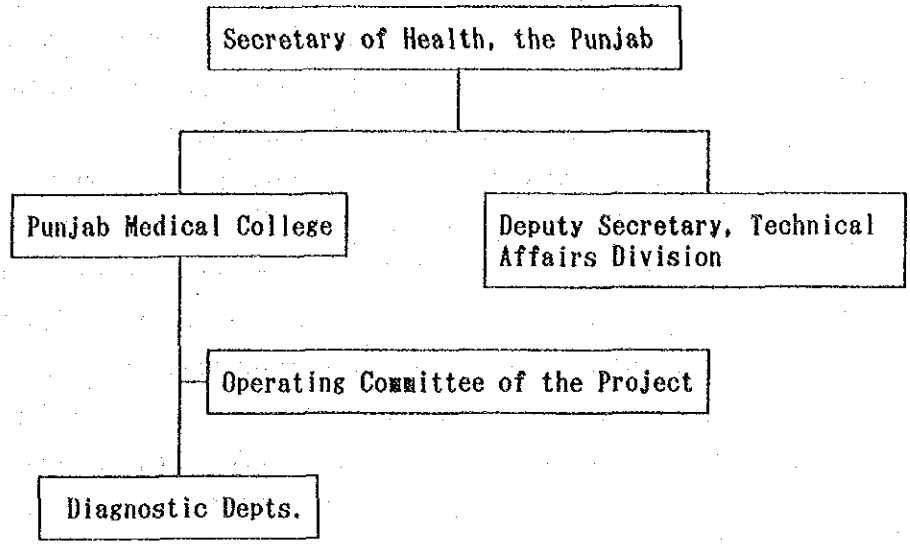
3-3. Outline of the Project

3-3-1. Executing Organization and Operating System

DOH is responsible for the operation after the execution of the Project, while the actual operation is taken charge of by the Medical College.

Compared with other medical colleges in Pakistan, the Medical College has only limited experience in diagnosis as it was opened only recently, but it is expected to make greater contributions to regional medical care and to the qualitative improvement of medical education year by year by the accumulation of achievements in education and research as well as in diagnosis. If the planned conditions are acquired with the progress of the Project, it will become possible to position this Hospital as the teaching hospital of the Medical College both in name and reality.

Table 3-1. Operation System



3-3-2. Operation Plan

It is quite natural that the Allied Hospital promote the fostering of personnel to engage in medical care and the improvement of health and medical services available to local inhabitants for the purpose of improvement of its educational function (especially clinical education of students) and improvement of diagnostic and treatment functions. However, the health and medical services in this Allied Hospital must be promoted in the future according to the operating principles of DOH, which are:

1) [Treatment and Study of Cancers] (Cancer Research).
2) [Treatment and Control of Skin Diseases] (Skin Disease Control).
3) [Rectification of Iron Deficiency in Pregnant Women] (Iron Deficiency).

For the realization of these operating principles, it seems necessary to re-examine and improve the diagnostic setup of the Allied Hospital after the execution of the Project.

In 1) [Treatment and Study of Cancers], important diseases for examination are gastric cancer, lung cancer and uterine cancer.

* For the examination of gastric cancer, radiographic inspection of the stomach is selected as the first choice screening method even today. There are methods of direct photographing and indirect photographing, but the method of indirect photographing should be promoted so that as many people as possible may receive an examina-

tion. These days, it has become possible to detect cancer in the early stage, which is hard to find with radiography, thanks to the development of the gastric fiberscope and gastrocamera. Therefore, collective examinations of the stomach should be performed regularly as one of the examinations for diseases of adults.

* The most frequent disease among malignant tumors of the lungs is lung cancer including primary lung cancer and metastatic lung cancer. At present, primary lung cancer is found most frequently and its frequency is said to be increasing every year. Its cause is believed to be the toxic gases and dust which are increasing in the atmosphere with the development of modern industries in the Faisalabad district in which the Allied Hospital is located, as in the advanced countries. Examinations performed for lung cancer are inspection of sputum, chest radiography, bronchoscopy, bronchography, etc.

* About one third of cancers in women are represented by uterine cancer. This cancer starts increasing at 30 years of age and its rate of occurrence is particularly high around 45 years of age. Early examination and thorough operations are indispensable for protection against this disease. Radiography (done by using the Remote After-Loading System requested in the Project) is also effective for the treatment of cancer in the neck.

* The largest merit of collective examinations for cancer, which is one of the primary diseases of adults, is the possibility of preventing the disease from getting serious by early diagnosis and treatment in the early stage, and this effect is clearly seen in the drop in mortality due to gastric cancer, lung cancer, uterine cancer, etc. Another advantage is that the cost of treatment can be kept low because the symptoms of the disease are slight.

Merits and Demerits of Examination:

A. Merits

1. Reducing of serious diseases and mortality by treatment in early stage.
2. Reducing of treatment costs.
3. Promoting conception and development of diagnostic and inspection methods.
4. Contributing to elucidation of conditions of disease before and after appearance of symptoms.
5. Accumulating epidemilogical information of high accuracy.
6. Facilitating planning of preventive measures.

B. Demerits

1. Increase of semi-sick and semi-healthy persons.
2. Congestion in medical facilities.
3. Increase of exposure to radioactivity.
4. Increase of burdens in time, pain and money.

It is desired to implement collective examinations by improving the diagnostic system even in the Allied Hospital as a step toward realization of the "Treatment and Study of Cancers" which is one of the operating principles.

2) [Treatment and Control of Skin Diseases] (Skin Disease Control).

As diseases of the skin and subcutaneous cell tissue, there are encephaloma, cellular inflammation, dermatomycosis and viral herpes, an infectious disease. Inflammations of the skin and subcutaneous cell tissue frequently seen are dermatitis, eczema, drug eruptions, psoriasis, herpes, blister tetter, erythemas, hydroa, pruritus, etc. As new-growths and dyschromia, geriatric pigmental spots and senile warts are generally recognized in people of advanced age. As skin cancer, there are thorny-cell carcinoma and basal-cell carcinoma, and malignant melanoma is known as a malignant new-growth of skin. In addition to these primary new-growths of skin, metastatic cancer of the skin from malignant tumors of the entrails is also recognized on some rare occasions. Other skin diseases include keratosis, nail disease, diseases of the hair and cecal pouch, trouble of the sweat glands, disease of the sebaceous gland, bedsores, nettle rash, etc.

Many of these diseases originate in the living environment and it is presumed that diagnosis and treatment of skin diseases will become more and more important with the progress of industrialization in the Faisalabad district.

3) [Rectification of Iron Deficiency in Pregnant Women]
(Iron Deficiency).

Iron deficiency originates from the general eating habits of the Pakistanis. If pregnant women's diets lack in iron content, it leads to a condition of malnutrition of the newborn baby, causing hypoplasia or even death. Rectification is done with a dose of chalybeate as a short-term remedy and with improvement of nutrition as a long-term measure.

It is necessary that guidance on the improvement of nutrition also be provided to pregnant women by the doctors and nurses in the Allied Hospital.

As in the example mentioned above, it is desirable to strive to achieve the operation plan while improving the diagnostic and treatment system at the Allied Hospital.

3-3-3. Situation of the Planned Site

In the Draft Final Report Explanation stage, NU-2 (Third Floor), the CCU and the Mortuary were still under construction. The construction work of the wards for the Psychiatry Dept. and Drug Abuse Treatment Center of NU-2 (Third Floor) is expected to be completed by November, 1991.

3-3-4. Composition of Target Medical Depts. of the Project

Target medical depts. for Phase II are as follows.

[1] NU-2

(1) ENT
(2) Ophthalmology
(3) Orthopaedics
(4) Neurosurgery
(5) Plastic Surgery
(6) Chest Surgery/Internal Medicine
(7) Oral Surgery
(8) Psychiatry
(9) Drug Abuse Treatment Centre
(10) Surgery III
(11) Obstetrics & Gynaecology II

[2] Radiotherapy Ward

(1) Radiotherapy/Nuclear Medicine
(2) Dermatology

[3] Radiotherapy Unit

[4] CCU Block

[5] Mortuary Block

[6] Outpatient Block

(1) Diagnosis Room (Refer to 3-2-5(2) OPD)
(2) Physiotherapy

[7] Existing Diagnostic Block

(1) Radiology
(2) Anaesthesiology
(3) Paediatrics

(4) Obstetrics & Gynaecology

(5) Workshop

[8] Others

(1) Transportation & Cleaning Equipment

3-3-5. Outline of the Equipment and Materials

(1) NU-2

a. ENT Dept. --- Equipment and materials for diagnosis and treatment in wards., Equipment and materials for treatment and educational equipment.

b. Ophthalmology Dept. --- Equipment and materials for diagnosis and treatment in wards., Equipment and materials for treatment and educational equipment.

c. Orthopaedics Dept. --- Forceps for Orthopaedic Surgery operations and equipment and materials for plaster treatment.

d. Neurosurgery Dept. --- Forceps for neurosurgery operations and equipment and materials for microsurgery operations.

e. Plastic Surgery --- Forceps for Plastic Surgery operations and equipment and materials for treatment.

f. Chest Surgery/Internal Medicine Dept. --- Equipment and materials for diagnosis and treatment in wards, Equipment and materials for treatment.

g. Oral Surgery Dept. --- Forceps for Oral Surgery operations and equipment and materials for Dentistry.

h. Psychiatry Dept. --- Equipment and materials for diagnosis and treatment in wards., Educational equipment.

i. Drug Abuse Treatment Centre --- Equipment and materials for diagnosis and treatment in wards., Equipment and materials for diagnosis.

j. Wards --- Equipment and materials for diagnosis and treatment in wards.

k. Surgery Dept. --- Forceps for microsurgery and equipment and materials for Urology treatment.

l. Obstetrics & Gynaecology Dept. --- Forceps for operations and equipment and materials for Obstetrics & Gynaecology treatment.

(2) Radiotherapy Ward

a. Radiology & Nuclear Medicine Dept. --- Surgical Equipment and materials for radiotherapy room.

b. Dermatology Dept. --- Equipment and materials for diagnosis and treatment in wards., Equipment and materials for treatment and educational equipment.

(3) Radiotherapy Unit --- Equipment and Materials for radiotherapy including Air Conditioning system (Cobalt 60 Teletherapy Unit, Remote After - Loading System).

(4) CCU --- Equipment and materials for diagnosis and treatment in wards, Air Conditioning System, Ambulance.

(5) Mortuary Unit --- Cadaver Refrigerators and Autopsy Table for clinical/educational uses.

(6) OPD Block

a. Equipment and materials for treatment of outpatients.

b. Physiotherapy Dept. --- Equipment and materials for diagnosis and treatment in wards, Equipment and materials for treatment.

(7) Existing Diagnostic Block

a. Radiology Dept. (expansion of existing diagnostic facilities) --- Diagnostic Equipment (Whole-body CT Scanner and a 500 mA Radiographic Diagnostic System).

b. Anaesthesiology Dept. (expansion of existing diagnostic facilities) --- Nitrous Oxide Gas Piping System, Emergency Relief Equipment, Patient Monitoring System and inspection equipment of lung functions.

c. Paediatrics Dept. (expansion of existing diagnostic facilities) --- Ultrasonic Diagnostic System, treatment equipment and Resuscitator/Immature Infant Monitoring System.

d. Obstetrics & Gynaecology Dept. (expansion of existing diagnostic facilities) --- Forceps for surgery; Equipment for treatment and Ambulance.

e. Workshop --- Equipment and materials for repair and inspection.

(8) Others --- Vehicles and Cleaning Equipment.

3-3-6. Maintenance and Control Plan

There are various problems regarding the current maintenance and control system as mentioned before, and the Allied Hospital is much interested in solving those problems. In this Project, the Allied Hospital made up a plan for establishment of a Workshop to solve such problems. The personnel and operating cost necessary for the maintenance and control system of the Project is given in the PC-I form which has already been approved by the federal government.

In addition to that, it seems appropriate to build up an effective maintenance and control system through the Project. The content (draft) of such a system is as follows:

(1) Supply System of Spare Parts and Consumables

As for spare parts, the supplier shall have a system for supplying the parts for at least 10 years after the end of the warranty period and submit an estimate of prices to the Allied Hospital which shall arrange to secure a budget for the estimated annual amount of spare parts and consumables.

(2) Formation of Maintenance and Control Staff

At the time of installation of the equipment, the supplier shall dispatch an instructor to the site to teach the correct method of operation, the method of daily inspection (to be conducted by the operator) and regular inspection and the method of handling of frequent troubles, etc., to the operators in charge and the maintenance and control staff. On that occasion, the supplier shall provide an operation manual and maintenance manual including electric circuit diagrams necessary for the equipment's operation and its maintenance and control.

(3) Elaboration of Maintenance and Control Plan

Engineers of the Workshop will make up an annual periodical inspection plan, keep records to make the operating conditions of all equipment units always clear and submit inspection & repair reports regularly to the administrative dept. of the Hospital so as to improve the control system.

(4) Technical Support System

As for the highly technical types of equipment which are difficult to maintain and control, it is desirable to conclude a periodical inspection contract with the local agency of the manufacturers. It also seems necessary to have a local agency with a specialized resident engineer so as to be able to receive technical advice and support even on normal repairs and operation, etc.

(5) Operating Budget

(a) Results of Distribution of Budget (1986-1987 -- 1990-1991)

The results of the budget distribution of the Allied Hospital are indicated in Table 3-1 (distribution and expenditures) and Table 3-2 [Payment of Wages].

In case any budget shortage arises, the director of the Allied Hospital will meet the Secretary of the Health Dept. of the Punjab to explain the justifiability of the reason for the shortage.

If the secretary judges the reason justifiable, DOH will apply for a supplementary budget to the Financial Division and the latter will make up a supplementary budget. In recent years, there was a case where Rs. 5,600,000 was given as a supplementary budget for the budget of fiscal year 1989-1990.

(b) Budget for the Execution of the Project

In the Project, an increase of personnel is planned in 15 medical depts. and the Workshop as mentioned before. The budget for the Workshop has already been approved in the PC-I form while that of the medical depts. has been applied for with DOH, in the form of an application for a budget increase for various expenses including the personnel cost. The application for a budget increase which became necessary for the Project has been made in 3 steps. An application for the Radiology/Tumor Dept. (64 beds) for fiscal year 1990-1991 was made on 2 September, 1990 and an application for fiscal year 1991-92 for the other diagnostic depts. was made on 17 September, 1990. Moreover, for the establishment of the Workshop, an increase of personnel was approved in the PC-I form and the operating budget is going to be sanctioned after the completion of installation of the equipment as well. Although the budget application has already been approved, the normal practice in Pakistan is that the actual budget is made up only after the buildings constituting the Project have been completed and the equipment has been installed completely.

Table 3-3 indicates the content of this application for a budget increase. As seen in Table 3-1, the Allied Hospital's budget was sanctioned after the completion of the installation of equipment in Phase II.

Table 3-2(1) Distribution and expenditures of the Allied Hospital

	Dist: 1986-87	Ext: 1986-87	Dist: 1987-88	Ext: 1987-88	Dist: 1988-89	Ext: 1988-89	Dist: 1989-90	Ext: 1989-90	Dist: 1990-91	Ext: 1990-91
Purchase of Machinery and equipment	-	-	200000/-	198000/-	-	-	-	-	-	-
Repair of Machinery and equipment	-	-	-	-	-	-	418930/-	473696/-	410000/-	-

FUNDS APPROPRIATED.

HEAD OF ACCOUNT
Non Development.
Commodities and Service

SUB HEAD.	Dist: 1986-87	Ext: 1986-87	Dist: 1987-88	Ext: 1987-88	Dist: 1988-89	Ext: 1988-89	Dist: 1989-90	Ext: 1989-90	Dist: 1990-91	Ext: 1990-91
T.A. of Govt Servant.	40000/-	26320.86	33000.00	38286.95	66043.00	66037.82	13400.00	131147.00	30000.00	-
Transportation.	25000/-	13815.00	20000.00	10038.00	6828.00	6628.00	12100.00	12093.00	20000.00	-
POL Charges.	300000/-	59720.62	200000.00	276799.00	438190.00	438149.32	395160.00	395160.00	390000.00	-
Postage and Telegramme.	20000/-	10000.00	1000.00	1000.00	-	-	-	-	5000.00	-
Telephone.	75000/-	16973.00	450000.00	5508346.45	304145.00	304144.65	375765.00	375054.95	260000.00	-
Gas Charges.	50000/-	24099.67	240000.00	312777.84	380206.00	380205.40	457000.00	456994.33	460000.00	-
Water Charges.	5000/-	5000.00	2000.00	2000.00	-	-	-	-	-	-
Electricity.	300000/-	265033.00	800000.00	1309217.00	2028240.00	2028240.00	2050530.00	2050529.00	2294000.00	-
Hot & Cold Weather charges.	5000/-	5000.00	1000.00	1000.00	-	-	-	-	10000.00	-
Office Stationary.	175000/-	82378.20	138000.00	137123.50	18663.50	11301.00	85540.00	84015.80	60000.00	-
Printing Charges.	100000/-	98889.85	204000.00	203080.20	132208.75	130544.19	135800.00	135304.00	100000.00	-
Newspaper.	30000/-	2028.10	2000.00	3658.50	2730.00	2718.50	3400.00	3395.50	4000.00	-
Uniforms & Liverses.	50000/-	21571.00	400000.00	93519.19	104858.96	104225.49	1080.00	1078.00	9000.00	-
Rates & Taxes.										
Fairs, Exhibitions.	5000/-	5000.00	3000.00	2400.00	-	-	-	-	-	-
Advertisement.	10000/-	3888.64	10000.00	9293.01	12780.66	12780.57	11830.00	11828.88	16000.00	-
Cost of other store/ Local Purchase.	7479000/-	9223690.75	4522000.00	6418124.33	5062015.00	5602231.28	10001045.00	1000387.35	4328735.00	-
X-Ray Films.	-	-	-	-	-	-	271010.00	271006.05	460000.00	-
Pathology Laboratory.	-	-	372000.00	371389.00	55000.00	54989.00	200000.00	197114.00	400000.00	-
Bedding & Clothing.	200000/-	168500.00	245000.00	205792.00	32739.62	31213.62	741700.00	741786.00	200000.00	-
Others.	885000/-	287751.19	1274000.00	1507618.27	376600.38	394734.35	434940.00	434940.90	450000.00	-
Diet Charges.	300000/-	95296.00	1450000.00	1678591.43	1096256.60	1096256.60	511270.00	511094.97	500000.00	-
Treatment of Govt. Servant.	-	-	-	-	-	-	298150.00	298143.54	300000.00	-
TOTAL COMMODITIES AND SERVICES.	10074000/-	10304240.38	10074000/-	12988248.95	10385300/-	10739191.44	16126910/-	16122716.78	10324735/-	

Table 3-2 Payment of Wages for the Allied Hospital

HEAD OF ACCOUNT.	1986-87	1987-88	1988-89	1989-90	1990-91
Grant No. 16 Non-Development.					
Pay of Officers	14,00,000/-	25,54,410/-	31,57,390/-	31,77,010/-	31,10,950/-
Pay of staff	30,00,000/-	66,04,620/-	68,14,120/-	57,20,840/-	73,89,585/-
Regular Allowance	16,00,000/-	25,89,400/-	32,26,010/-	29,63,410/-	31,02,890/-
Other Allowance	2,00,000/-	7,30,000/-	2,93,010/-	2,24,600/-	1,25,000/-
TOTAL SALARY	62,00,000/-	1,24,78,480/-	1,34,90,530/-	1,20,85,860/-	1,37,28,425/-

Table 3-3. Budget to be Sanctioned for Phase II

(i) Cost Statement of Radiotherapy Unit.

a) Establishment charges. Rs. 924,154/-

b) Commodities & Services. Rs.1,286,400/-

Total Rs.2,210,554/-

Break down of commodities.

Sr.No.	Sub head.	Amount.
1.	Medicine.	Rs.700,000/-
2.	X-Ray Films.	Rs. 50,000/-
3.	Bedding & clothing.	Rs.150,000/-
4.	Pathology reagents.	Rs.100,000/-
5.	Gases.	Rs. 86,400/-
6.	Others.	Rs.200,000/-
	Total Commodities & Services.	Rs.1,286,400/-

(ii) Cost Statement about the Budget Plan for Phase II

Payment of salary and other establishment.

(In rupees)

a):	Establishment charges(Salaries)	8,642,285/-
b):	Repair & Maintenance of equipment	1,000,000/-
c):	Commodities & Services	11,178,500/-
	Total	20,820,785/-

Break down of Commodities & Services Funds for Sub-head.

Sr.No.	Sub.head.	Amount.
1.	Medicine	6,000,000/-
2.	Pathology reagents	700,000/-
3.	Bedding & Clothing	600,000/-
4.	X-Ray Films	700,000/-
5.	Medical gases i.e.Nitrous oxide & Oxygen.	500,000/-
6.	P.O.L.Charges.	500,000/-
7.	Electricity	2,000,000/-
8.	Other Charges.	178,500/-
Total	Commodities & Services.	11,178,500/-

(iii) Cost Statement for Establishment of Workshop

a) Total Basic Pay of Officers.	Rs.200,025/-
b) Total Basic Pay of Other Staff.	Rs.124,310/-
c) Total allowance	Rs.275,000/-
d) Establishment Charges.	Rs.599,335/-
e) Services Charges.	Rs.100,000/-
Total	Rs.1,298,690/-

(6) Approximate Calculation of Maintenance and Control Expenses

(a) Expenses for Procurement of Consumables

The cost of procurement of consumables necessary for the operation of the equipment depends on the frequency of use of the equipment and, therefore, the proper amount of such cost must be grasped based on the experience gained during a certain period. In the Project, the ratio of the procurement cost of consumables to the purchase cost of the equipment was obtained from the statistics of expenditure for the procurement of consumables and the procurement cost of consumables for the Project was calculated based on that percentage.

* Calculation of Ratio of Procurement Cost of Consumables

Ratio of expenditure for consumables / Cost of procurement of equipment in Phase I = ¥2,952,316.31 / ¥1,500,000,000 = 1.97×10^{-3}

Cost of procurement of consumables = cost of procurement of equipment x 1.97×10^{-3} =Rs.444,838.31(¥2,758,000)

(Note) From Table 3-2, the total expenditure for consumables for fiscal year 1989-90 is Rs.468,120.05 (= ¥2,902,344.31)

(b) Expenses for Periodical Inspections and Maintenance

The equipment requested in the Project includes some highly technical items requiring periodical inspections by an engineer in addition to daily inspections. Regular inspections are effective to find troubles and take remedial measures in the initial stage, making it possible to keep the equipment always in good condition and eventually enable full utilization of the equipment's capabilities.

The expenses necessary for the periodical inspections are the technical service charges and the expenses for the replacement of spare parts. These expenses must be budgeted in the annual plan as an operating budget of the Project.

The estimated cost of periodical inspections described here is based on the supposition that the operator of each piece of equipment performs sufficient daily inspections and maintenance.

The equipment items requiring regular inspections are those of a highly technical level which are to be inspected periodically by a specialized engineer dispatched by either the manufacturer or the supplier.

* Number of equipment items subject to periodical inspections: 57items
* Daily allowance of engineer: Rs. 4,400/day
* Calculation of the cost

The approximate number of the equipment models requiring periodical inspections is 45 and 57 is the total number of items. Usually, it is supposed that one engineer can inspect 0.5 items or so each day on an average. The 0.5 number of equipment items is a figure based on a quantitative inspection made by using measuring equipment such as an oscilloscope on each piece of equipment one year after the installation of the equipment.

Therefore, the number of days required for the maintenance and inspection is 57 / 0.5 = 114

The personnel expenses calculated on the supposition that the maintenance and inspection are done twice a year are:

Rs. 4,400 x 114 x 2 = Rs. 1,003,200

For periodical inspections, the cost of spare parts for replacement must also be taken into account. This cost tends to increase with the passage of time. It will be calculated by applying the

percentage of spare parts cost against the price of the equipment according to the results of Phase I. In this calculation, the cost of spare parts for the equipment which is currently out of order because of unavailability of spare parts will also be added to the spare parts cost.

(i) Calculation of Ratio of Spare Parts Cost

Actual spare parts cost of Phase I = Rs. 9,125

Cost of unavailable parts of Phase I = Rs. 970,000

Spare Parts Cost of Phase I = Rs. 979,125

Ratio of spare parts = Cost of spare parts/Total Cost of equipment procured (phase I) = Rs.979,125 / Rs.241,935,484 = 4.05×10^{-3}

(ii) Cost of Replacement Parts.

Cost of spare parts = Cost of equipment procured x Ratio of spare parts = Approx. Rs. 567,000

Therefore, the annual cost of periodical inspections of the equipment is calculated as the sum of the technical fee and spare parts costs or Rs. 1,288,600.

(c) Increase of Personnel Expenses

The total amount of the current personnel expenses of the Allied Hospital is approx. Rs. 13,728,425 per year (1990 - 1991). An increase of 340 members is going to be made according to the personnel arrangement plan of the Project. With this increase of personnel, an increase of personnel expenses of approx. Rs. 9,241,620 is anticipated. Therefore, the Allied Hospital must cover an annual amount of Rs. 22,970,045 as personnel expenses. For this budget increase budget, an application has already been submitted by the Allied Hospital to DOH.

In Pakistan, approval of the budget for this kind of Project is made only after the completion of installation of the equipment into the building.

(d) Details of the Budget Increase Applied for

1) Electric Charge

To determine the increase in the electric charge, calculate the power consumption per unit area.

(Power consumption per unit area) = (Current power consumption) / (Total surface area used of current facilities) = 1,414,664 kwh/335,919 sq ft. = 4.21kwh/sq ft

Since the surface area of the target facilities of Phase II is 230,579 sq ft, the additional power consumption can be calculated by multiplying this figure by the power consumption per unit area.

(Additional power consumption) = (Surface area of the target facilities of Phase II) x (Power consumption per unit area) = 230,579 sq ft. x 4.21 kwh/sq ft. = 970,700 kwh

If you further multiply this value with the unit charge of power consumption of Rs. 1.4/kwh, you obtain the annual average electric power charge.

(Annual average electric power charge) = 970,700 kwh x Rs. 1.4/kwh = Rs. 1,359,000.

2) Water Charge

The water charge will also be calculated by multiplying water charge per unit area with the surface area of the target facilities of Phase II and the unit price of the water charge in the same way as in the calculation of the power charge.

(Water charge per unit area) = (Current consumption quantity of water) / (Total surface area of current facilities) = 15,500,000 cu ft. / 335,911 sq ft. = 46 cu ft/sq ft.

(Additional water consumption) = (Surface area of the target facilities of Phase II) x (Water consumption per unit area) = 230,579 sq ft. x 46 cu ft./sq ft. = 10,606,634 cu ft.

(Annual average water charge) Rs. 0.00069/cu ft. x 10,606,634 cu ft = Rs. 7,300.

3) Town Gas Charge

The charge for gases of different unit prices is collectively counted as hte gas charge. The gas charge will be calculated by determining the consumption cost per unit area from the results of the previous year and the total surface area used of the current facilities and by multiplying that value by the total surface area of the target facilities of Phase II.

(Gas charge per unit area) = (Actual charge of the previous year) / (Total surface area of current facilities) = Rs. 456,994.63/335,919 sq ft.

(Annual average gas charge) = (Gas charge per unit area) x (Surface area of the target facilities of Phase II) = Rs. 1.36/cu ft. x 230,579sq ft = Rs. 313,600

Of the lighting and energy costs estimated above, the water charge is to be borne by the Building Dept./Medical Col-

lege Construction Division. Therefore, it is only the total amount of the electric charge and the gas charge or Rs. 1,672,600 that must be borne by the Allied Hospital. This amount is planned to be added to the budget of the next fiscal year as the said operation cost of Phase II.

CHAPTER 4.

BASIC DESIGN

Chapter 4 - Basic Design

4-1. Principles of Basic Design

The Study Team had a series of discussions with the Allied Hospital side on the Basic Design of the equipment. As a result, it has been decided to select the equipment in consideration of the standards indicated hereunder under the Mutual Agreement of the parties including Health Dept. of the Punjab.

(1) The selection shall be made with special attention to the following 3 points in the matter of maintenance and control:

a. Current capacity of maintenance and control.

b. Appropriateness seen from the operating budget and the budget arrangement.

c. Ease of procurement of spare parts and consumables.

(2) The frequency of use shall be taken into account in the selection from the viewpoint of daily teaching and diagnostic functions of the Allied Hospital.

(3) The selection shall be made in view of the order of priority of diagnostic functions to be owned by the Allied Hospital of the Medical College as well as the degree of necessity seen from the number of population to be covered.

(4) The selection shall be made upon confirmation of the situation of progress of the construction works at the time of explanation of the draft (planned for early April, 1991).

(5) Ease of procurement in the Pakistani market

Equipment produced and easily obtainable in Pakistan will be excluded from the Basic Design.

(6) Equipment for building to be installed and maintained by the construction side

Building equipment fit for being procured and installed as part of the medical equipment, furniture, etc. and maintained and controlled by the construction side will be excluded from the Basic Design.

4-1-1. Natural Conditions

There is very little rainfall and the air is dry in the area. During the dry season, dust containing fine sand particles penetrates into the rooms of buildings. Therefore, types of equipment are selected which have sufficient resistance to dust and high temperatures around 40 ^{o}C.

4-1-2. Social Conditions

There are no particular restrictions vis-a-vis historical or cultural traditions. However, there is a clear distinction between men and women among the Muslims who are the majority in the area concerned and, therefore, it is best that the number of units be sufficient so that male and female patients can be separated from each other (wards, etc.).

4-1-3. Facility Conditions

The power supply in the planned site is 230V, 50 Hz. However, there are frequent voltage fluctuations and the voltage value is usually about 10 - 20% higher than the rating of single phase 230V at 240 - 250V during the daytime and 260 - 270V at night. In addition, momentary voltage fluctuations of tens of volts are produced once or twice a day and power failures occur about twice a month on an average. Therefore, the precision equipment are to be equipped with Automatic Voltage Regulators (AVR) to protect the equipment against damage due to voltage fluctuation.

4-1-4. Utilization of Local Manufacturers and Local Materials

Since cooperation with local agents is indispensable for building up a maintenance and control system and a technical support system for the equipment, it is desirable that an equipment agent be found in Pakistan with a sufficient supply capacity for spare parts and consumables and a suitable technical capacity.

4-1-5. Maintenance and Control Capabilities of the Owner

Spare parts for at least 2 years of equipment use and consumables for around 6 months of use after the delivery of the equipment will be included in the Basic Design to ensure that the equipment can be effectively used even in the future. Moreover, in addition to the installation work, at the time of delivery of the equipment, sufficient guidance on operation and maintenance and control will be provided by an English-speaking Japanese engineer to the medical staff of the Allied Hospital.

4-1-6. Scope and Level of Equipment

The principles on the scope and level of equipment are determined based on the "Principles of Basic Design" described in 4-1 and a global examination of the medical situation in Pakistan. In addition, the following points should also be taken into consideration.

1) In deciding the composition, specifications and level of the equipment, consideration should be given to the technical level of the teaching staff and keeping the equipment within the level of medical technology in Pakistan so that the procured equipment and materials may be used properly and effectively. The selection shall be made centering on models which are well utilized in the existing medical facilities as much as possible to reduce the technical burden on the Pakistani side regarding maintenance and control.
2) The selected equipment shall be of a high level of safety producing no such problems as environmental pollution, etc., after the installation and also be of an established reputation acceptable in the international market.
3) To reduce the cost of maintenance and control, a supply of necessary consumables and spare parts for facilitating maintenance and control of the equipment shall be included in the Project.
4) In implementing the Project, operation manuals and maintenance manuals for the equipment shall be prepared and a control system for those manuals shall be established on the Pakistani side. As for the spare parts and consumables, the names of the contact persons of the agencies and the manufacturers shall be clearly indicated to maintain a route of communication and enable easy procurement on the Pakistani side.

4-1-7. Construction Period

At present, the construction work of the diagnostic facilities forming the target of the improvement of equipment under the Project is almost completed. However, except for the Psychiatry Dept. and the Drug Abuse Treatment Centre (4th floor, NU-2) for which the final decision is to be made on whether or not they should be included in the scope of the Project on the occasion of the Explanation of the Draft Final Report (beginning of April, 1991), dividing the Project into two or more periods upsets the diagnostic functions and the teaching functions of the Allied Hospital, making it impossible to achieve the purpose of the Project.

In the light of the urgency of the medical situation in Pakistan, postponing the fostering of doctors may be said to be the same as destroying the very basis of the national policy (improvement of child and maternal health and fostering of medical staff). That is why the Pakistani side started the execution of the Project simultaneously for all depts. without giving priority to any specific diagnostic dept., and dividing the Project into two or more periods is not something expected by the Pakistani side. Therefore, the Project will be planned to be executed entirely in one single period.

In 1986, the construction of the Allied Hospital was completed and simultaneously 4 basic medical depts., i.e., Internal Medicine, Surgery, Obstetrics & Gynaecology and Paediatrics were established and commenced their work with installation of the medical equipment procured through Japanese Grant Aid in 1987. However, on the whole the teaching and diagnostic functions are still insufficient for a teaching hospital of a Medical College since specialized diagnostic depts. which a Medical College should possess are not established yet. Therefore the Pakistani side started the construction of NU-2 to establish 11 specialized medical depts. such as ENT, Ophthalmology, Dermatology, Radiotherapy and Nuclear Medicine and also began recruiting the medical staff necessary for such depts. It is not until establishment of the aforesaid medical depts. that the Allied Hospital can start functioning both nominally and in fact as a teaching hospital affiliated with a Medical College.

The construction period is estimated to be around 10.5 months after the conclusion of contracts with the suppliers, but the concrete implementation schedule is as shown in the process chart to be given later.

4-2. Examination of Basic Design Conditions

Most of the equipment and materials are to be procured in Japan according to the Japanese system of Grant Aid, but some of the requested items (Diagnostic System for Ophthalmology, Special Forceps for surgical operations, etc.) are not manufactured in Japan and must be procured from third countries.

Pakistan has been under the strong influence of the United Kingdom for a long time for historical reasons and much of the electrical equipment there is based on the British Standard. For that reason, the equipment and materials procured in Japan shall conform to the Japanese Industrial Standard (JIS) while those purchased in third countries (especially the United States and European countries) shall conform to the standards of the respective countries, and all of them shall be adjusted to the service conditions of the Allied Hospital at the time of their procurement and installation.

4-3. Basic Design

4-3-1. Equipment Plan

The selection of equipment has been conducted in consideration of the 8 factors indicated hereunder.

[Standards for Selection of Equipment]

(1) The selection shall be made with special attention to the following 3 points in the matter of maintenance and control.
   a. Current capacity of maintenance and control
   b. Appropriateness as seen from the operating budget and the budget arrangements
   c. Ease of procurement of spare parts and consumables

(2) The frequency of use shall be taken into account in the selection process from the viewpoint of daily teaching and diagnostic functions of the Allied Hospital.

(3) The selection shall be made in view of the order of priority of diagnostic functions of the Allied Hospital of the Medical College as well as the degree of necessity seen from the number of the population to be covered.

(4) The selection shall be made upon confirmation of the situation of progress of the construction work at the time of the Explanation of the Draft Final Report (planned for early April, 1991).

(5) Ease of procurement in the Pakistani market

Equipment produced and easily obtainable in Pakistan will be excluded from the Basic Design.

(6) Equipment for buildings that should be installed and maintained by the construction side

Building equipment suitable for being procured and installed as part of the medical equipment, furniture, etc., and maintained and controlled by the construction side will be excluded from the Basic Design.

(7) The selection shall be made from among types of equipment which have not been discontinued.

(8) The equipment for the Technical Institute shall be excluded from the Basic Design.

Selection of Equipment

The Basic Design Team has considered the contents of the request from the Pakistani side and made the following evaluation table based on the aforesaid standards for selection of equipment.

The following Codes A and E mean Adopted and Excluded respectively.

Diagnostic Dept.		Name of Equipment Requested	Selection Standards 1 2 3 4 5 6 7 8	Evaluation
ENT Dept.				
	A-1	Examination Light		A
	A-2	Laryngoscope Set		A
	A-3	Nebulizer Pump		A
	A-4	Audiometer for Adult with Sound Proof		A
	A-5	Prefabricated Room Audiometer for Infant		A
	A-6	Overhead Projector		A
	A-7	Side Projector		A
	A-8	Projector Screen		A
	A-9	Slide Cabinet		A
	A-10	ENT Teaching Model		A
	A-11	Video Cassete Recorder & Monitor (VHS) with Stand		A
	A-12 -1	Instrument Sterilizer		A
	A-12 -2	High Pressure Steam Sterilizer with Stand		A
	A-13	Electronistagmograph with Table		A
	A-14	Multipurpose Surgical Laser (Yag Type)	1 2	E
Opthalmology Dept.				
	B-1	Linear Electronic Ultrasound Scanner for Opthalmology		A
	B-2	Laser Coherant	1 2	E

	B-3	Laser Yag for Opthalmology	1	2	E
	B-4	Ocutome with Table			A
	B-5	Perimeter with Table			A
	B-6	Hand held Applanation Tonometer			A
	B-7	Portable Slit-Lamp Microscope			A
	B-8	Synaptophore with Table			A
	B-9	Ophthalmometer with Table			A
	B-10	Specular Microscope with Table & Camera			A
	B-13	Photo Slit-Lamp Microscope with Camera and Table			A
	B-14	Gonioscope with Prism			A
Orthopaedic Dept.					
	C-1	Prosthesis Operating Instrument Set		7	E
	C-2	Hip Prosthesis Operating Instrument Set, Som-Type		7	E
	C-3	Hip Compression Instrument Set			A
	C-4	Sliding Nail Plate Set			A
	C-5	Dynamic Compression Plate Set			A
	C-6	Compression plate Set K-U, M, J-O Type			A
	C-7	Orthopaedic Operating Instrument Set			A
	C-8	Operating Instrument Set for Wiring			A
	C-9	Operating Instrument Set for Neuisectomy			A
	C-10	Operating Instrument Set for External Fixator (Tubular System)			A
	C-11	Operating Instrument Set for Laminectony			A

C-12	Operating Instrument Set for Soinal Fusion	A
C-15	Spinal Cord Traction Frame	A
C-17	Operating Instrument Set for Orthopaedic	A
C-18	Operating Instrument Set for Removal of Broken Screws	A
C-19	Operating Instrument Set for Bone Fracture	A
C-20	Operating Instrument Set for Small Fragment and Mini Implant	A
C-21	Operating Instrument Set for Lengthening of Extremities	A
C-22	Electric Universal Bone Saw	A
C-23	Operating Instrument Set for Skin Graft	A
C-24	Slide Projector 35mm Slide	A
C-25	Overhead Projector	A
C-26	Projector Screen	A
C-27	Electric Torch Light Pointer for Slide Demonstration	A
C-28	Orthopaedic Plaster Room Equipment	A
C-29	Cloverleaf Kuntscher Intramedullary Nail, straight	A
C-30	Cloverleaf Kuntscher Intramedullary Nail, for Tibia	A
C-31	MR-500 Intramedullary Nail	A
C-32	Pneumatic Tourniquet	A
C-33	Pelvic Traction Belt	A

	C-34	Overhead Traction Frame		A
	C-35	Operating Instrument Set for Knee Prosthesis		A
	C-36	Orthoscope with Camera and Light Supply Unit		A
	C-37	Operating Instrument Set for Hand Surgery		A
	C-38	Operating Instrument Set for Micro Vascular Surgery		A
Dermatology Dept.				
	D-1	PUVA Therapy Unit		A
	D-2	8mm Film Movie Projector	7	E
	D-3	Slide Projector		A
	D-4	Overhead Projector		A
	D-5	35mm Camera with Micro Lense & Strobe Attachment		A
	D-6	Patch Test Kit		A
	D-8	Binocular Microscope		A
	D-9	Loupe		A
	D-10	Panjet Injector		A
	D-11	Small Operating Instrument Set		A
	D-12	Airway		A
	D-13	Tongue Depressor		A
	D-14	Ophthalmoscope		A
	D-15	Screen		A
	D-16	Reflector		A
	D-17	Fluorescence Microscope		A
	D-18	High Pressure Steam Sterilizer with Stand		A
	D-19	Centrifuge		A
	D-20	Incubator with Stand		A
	D-21	Drying Oven		A
	DA-22	Electrocautery Unit		A
	DA-23	Cryo Surgery Set		A
	DA-24	Woods Lamp		A

Neurosurgery Dept.

E-3	Trawers Self Retaining Retractor		A
E-4	Buchanan Trephine for Paediatrics	7	E
EA-6	Tube and Connector for V-A Shunt		A
EA-7	Ventricular Drainage Set		A
EA-8	Head Holder		A
EA-9	Bipolar Coagulator		A
EA-10	Operating Microscope		A
EA-11	Microsurgery Instrument Set		A
EA-12	Aneurysm clipps C Set Applicator		A
EA-13	Sugita Aneurysm Removing Forceps		A
EA-14	Aneurysm Clipps		A
EA-15	Tokyo Uni, Pattern Transspenoidal Pitutary Instruments		A
EA-16	Anterior Cervical Fusion Set		A
EA-17	Spinalcurve Frame	7	E
EA-18	Forceps Set for Intervertebral disc		A
EA-19	Rongeure Beyer Type		A
EA-20	Stryker Wedge Turning Frame	7	E
EA-21	Nerve Root Retractor		A
EA-22	Double Action Pin Cutter		A
EA-23	Weitlaner's Retractors		A
EA-24	Kerison Punches, 3 types		A
EA-25	Craniotomy Set, 6 kinds		A
EA-26	Laminectomy Set		A
EA-27	Kerison Punches, 3 types		A
EA-28	Forceps for Intervertabral disc		A

EA-29	V-A Shunt System, 4 kinds	A
EA-30	V-A Shunt Control for Infant	A
EA-31	Ventricular Drainage Set	A
EA-32	Diagnostic Set	A
EA-33	Critical Care Ventilator	A
EA-34	Cardiac Monitor	A
EA-35	Laryngoscope, 2 kinds	A
EA-36	Endotracheal Tubes Plastic with Cuff	A
EA-37	Curved Catheter Connector	A
EA-38	Straight Catheter Connector	A
EA-39	Magill Forceps	A
EA-40	Breathing Bags, 5 sizes	A
EA-41	Anaesthetic Mask, 4 sizes	A
EA-42	Anaesthetic Mask, infants	A
EA-43	Berman Airway, 3 sizes	A
EA-44	Tube Connector	A
EA-45	Corrugated Breathing Tube, 2 sizes	A
EA-46	Resuscitator	A
Plastic Surgery Dept.		
F-1	Mosquito's Forceps Straight Teeth & Curved Teeth	A
F-2	Onitsuka's Mouth Gag with 3 kinds of Tongue Plate	A
F-3	MC Inloe Dissection Forceps	A
F-4	MC Inloe Dissection Forceps	A
F-5	Adson Dissecting Forceps	A
F-6	Adson Dissecting Forceps	A
F-7	Kilner Straight Scissors	A
F-8	Kilner Skin Rectractor	A
F-9	Kilner Curved Scissors	A
F-10	Kilner Nasal Retractor	A

F-11	Bipolar Coagulator Unit	A
F-12	Straight Bipolar Forceps, 4 different sizes	A
F-13	Gilles Fines Stem Hook	A
F-14	Kilner Alae Retractor	A
F-15	Kilner Needle Holder	A
F-16	Kilner Suction Tube	A
F-17	Cobbett Modified Brailt with Stem Graft Knife with 10 steril Blades	A
F-18	Cryo Surgery Set	A
F-19	Morotomi's Mesh Graft Dermatome	A
F-20	Eckhoff Mapping Pen with Nib	A
F-21	Metal Nib	A
F-22	Suture Needle for Plastic Surgery Round Shape Type, 10 different sizes	A
F-23	Dennis Brown Cleft Palate Resparatory	A
F-24	Dennis Brown Cleft Palate Resparatory	A
F-25	Baron Palate Dissectors Set	A
F-27	Electro Surgical Unit	A
F-28	Micro Surgery Instrument Set	A
F-29	Standard Set for Harelipand Cleft Palate	A
F-30	Standard Set for Rinoplasty	A
F-31	MC Indoc Nasal Chisels	A
F-32	Silver Nasal Chisel	A
F-33	Jenkins Couges	A
F-34	Angular Scissors	A
F-35	Plastic Surgery Instrument Set	A
F-39	Knapp Scissors	A
F-40	Suction Tube	A

F-41	Mallet		A
FA-43	Super Speed Dermal Grinding Unit		A
Chest Surgery / Medicine Dept.			
G-1	Diagnostic Set		A
G-5	Trocar		A
G-6	Biopsy Needle		A
G-7	Pulmo Tester		A
G-8	Suction Unit		A
G-9	E.C.G. Analyzer		A
G-10	Manual Resuscitator		A
GA-11	Broncho Fiberscope with Endoscopic Illuminator /Stand		A
GA-12	Nebulizer Pump		A
GA-13	Endotracheal Tube Set		A
GA-14	Laryngoscope Set with Blade/Batteries		A
Oral Surgery Dept.			
H-1	Chair Mount Unit Signogrand		A
H-2	Operating Stool		A
H-3	Yag SLT Contact Laser	1 2	E
H-4	Dental Treatment Cabinet		A
H-5	Full Automatic Sterilizer		A
H-6	Dry Heat Sterilizer		A
H-7	Hand Sterilizer		A
H-8	Radio Visio Graphy		A
H-9	Direct Current System Dental Panoramic X-Ray Apparatus		A
H-10	Film Cassette for Panoramic		A
H-11	Flat Film Cassette for Cephalo		A
H-12	X-Ray Film Automatic Processor		A
H-13	Dental X-Ray Apparatus		A

H-14	Dental Fiberscope System		A
H-15	Ultrasonic Scaler		A
H-16	Ultrasonic Root Canal Apparatus		A
H-17	Induction Apparatus		A
H-18	Light Curing Apparatus		A
H-19	Multipurpose Diagnostic Apparatus		A
H-20	Root Canal Enlargement & Filling System		A
H-21	Electric Pulp Tester		A
H-22	Amalgam Mixer		A
H-23	Amalpac Set		A
H-24	Laboratory Micromotor		A
H-25	Light Curing Apparatus, Checking Unit		A
H-26	Stainless Cup		A
H-27	Magnetic Bur Stand		A
H-28	Rubber Dem Clamp Set		A
H-29	Electro Surge Operer		A
H-30	Caries Diagnostic Meter		A
H-31	Prophylaxis Cleaner		A
H-32	Mandrels		A
H-33	Diamond Discs		A
H-34	Brush Cone		A
H-35	Tooth Brushing Study Model		A
H-36	Lead Number for Intra Oral Exposures		A
H-37	Film Holder for Bite Wing Exposures		A
H-38	Micro E Drill		A
H-39	Micro E Sagitall Saw		A
H-40	Micro E Reciprocating Saw		A
H-41	Micro E Wiredriver		A
H-42	Micro E Oscillating Saw		A
H-43	Micro E Controller		A
H-44	Sterilization Container	7	E
H-45	Holding Clamp	7	E

H-46	Filter Kit		A
H-47	Cyst Curette		A
H-48	Cyst Curette		A
H-49	Long Steel Scope		A
H-50	Clouston Walker Modified Fixation Apparatus		A
H-51	Royal Berkshire Hospital Model Halo Frame		A
H-52	Dal Pont Hooks	7	E
H-53	Dal Pont Hooks	7	E
H-54	Dal Pont Hooks	7	E
H-55	Wordsley Mandibular Set		A
H-56	Bowerman and Conroy Sectional Implants		A
H-57	Rowe Screw Holding Forceps		A
H-58	Williams Automatic Screw Holding Screw Driver		A
H-59	Harrison Mandible Holding Forceps		A
H-60	Seldin Mandible Holding Forceps		A
H-61	Toller Maxillary Fracture Reduction Forceps		A
H-62	Indoe Lion Forceps		A
H-63	Rowe Disimpaction Forceps		A
H-64	Hayton Williams Forceps		A
H-65	Rowe Disimpaction Forceps		A
H-66	Hayton Williams Forceps		A
H-67	Rowe Zygomatic Elevators		A
H-68	Kilner Malar Elevators		A
H-69	Bristow Malar Elevators		A
H-70	Wire Loop Forceps		A
H-71	Osteotome		A
H-72	Tessier Maxillary Mobiliser		A

H-73	Tessier Maxillary Mobiliser		A
H-74	Maddan Maxillofacial Retractor	7	E
H-75	Rowe Zygomatic Arch Awl		A
H-76	Ward Cheek Retractor		A
H-77	Mouth Props	7	E
H-78	Mouth Props	7	E
H-79	Mouth Props	7	E
H-80	Weislander Retractor	7	E
H-81	Killian Nasal Speculum	7	E
H-82	Intra Osseous Blade Implants Set		A
H-83	Complete Instrument Set for Intra Osseous Blade Implants		A
H-84	Injection Cartridge Syringe		A
H-85	Disposable Needles		A
H-86	Disposable Needles		A
H-87	Periosteal Elevators		A
H-88	Elevators		A
H-89	Elevators		A
H-90	Elevators		A
H-91	Elevators		A
H-92	Elevators		A
H-93	Root Tip Pick		A
H-94	Tooth Forceps for Upper Incisor and Canines		A
H-95	Tooth Forceps for Upper Incisor and Canines		A
H-96	Tooth Forceps for Upper Incisor and Canines		A
H-97	Tooth Forceps for Blcuspids and Molars		A
H-98	Tooth Forceps for Blcuspids and Molars		A
H-99	Tooth Forceps for Blcuspids and Molars		A

H-100	Tooth Forceps for Bicuspids and Molars	A
H-101	Tooth Forceps for Wisdom Teeth	A
H-102	Tooth Forceps for Wisdom Teeth	A
H-103	Tooth Forceps for Wisdom Teeth	A
H-104	Tooth Forceps for Upper Roots	A
H-105	Tooth Forceps for Upper Roots	A
H-106	Tooth Forceps for Upper Roots	A
H-107	Tooth Forceps for Upper Roots	A
H-108	Tooth Forceps for Upper Roots	A
H-109	Tooth Forceps for Upper Roots	A
H-110	Tooth Forceps for Lower Incisor Caninas and Bicuspids	A
H-111	Tooth Forceps for Lower Incisor Caninas and Bicuspids	A
H-112	Tooth Forceps for Lower Incisor Caninas and Bicuspids	A
H-113	Tooth Forceps for Lower Incisor Caninas and Bicuspids	A
H-114	Tooth Forceps for Lower Incisor Caninas and Bicuspids	A
H-115	Tooth Forceps for Lower Molars	A
H-116	Tooth Forceps for Lower Molars	A

H-117	Tooth Forceps for Lower Molars	A
H-118	Tooth Forceps for Lower Molars	A
H-119	Surgical Blade Holder	A
H-120	Surgical Blades	A
H-121	Surgical Blades	A
H-122	Surgical Blades	A
H-123	Surgical Blades Remover	A
H-124	Bone Curette Schedes	A
H-125	Double End Curette Set	A
H-126	Tissue Retractors	A
H-127	Tissue Retractors	A
H-128	Retractors	A
H-129	Sugarman File	A
H-130	Bone File	A
H-131	Bone File	A
H-132	Needle Holders, straight	A
H-133	Needle Holders, curved	A
H-134	Surgery Mallets	A
H-135	Gum Scissors Set	A
H-136	Scissors	A
H-137	Needle Holders	A
H-138	Double End Explorer	A
H-139	Periodontal Probes	A
H-140	Dental Mirror	A
H-141	Dressing Pliers	A
H-142	Gum Retractor	A
H-143	Gum Retractor	A
H-144	Instrument Set for Treatment at Patient Home	A
H-145	Plastic Cheek Retractor	A
H-146	Denhalt Mouth Opener	A
H-147	Tongue Guard	A
H-148	Double End Excavators	A
H-149	Double End Cement Spatula	A

H-150	Lining Applicator			A
H-151	Proximal Filling Instrument			A
H-152	Amalgam Carrier			A
H-153	Double End Amalgam Pluggers			A
H-154	Double End Amalgam Burnisher			A
H-155	Amalgam Carver			A
H-156	Amalgam Carver			A
H-157	Matrix Retainer			A
H-158	Matrix Bands			A
H-159	Matrix Retainers			A
H-160	Matrix Bands			A
H-161	Tooth Separator			A
H-162	Tooth Separator			A
H-163	Hygienist Scaler Set			A
H-164	Pyorrhea Scaler Set			A
H-165	Pyorrhea Scaler Set			A
H-166	Perio Surgical Instrument Set			A
H-167	Root Canal Length Indicator			A
H-168	Endodontic Kit			A
H-169	Spreader			A
H-170	Gutta Percha Instrument			A
H-171	Root Cannal Pluggers			A
H-172	Root Cannal Dropper			A
H-173	Nerve Broach			A
H-174	Nerve Broach with Handle			A
H-175	Lentulo Poste Carrier			A
H-176	Flexo Reamer			A
H-177	Flexo File			A
Psychiatry Depty.				
I-1	Instrument Troll	2	3	E
	Percussor			A
I-2	Strobotest/Storobon Apparatus	2	3	E
I-8	Intubation Tubes			A

I-9	Airways, each sizes	A
I-11	Tuning Forks	A
I-12	Tongue Depressors	A
I-13	Ophthalmoscope with Hallogen Lamp	A
I-15	Manual Resuscitator	A
I-16	Laryngoscope with 3 blades	A
I-18	Anaesthesis Apparatus	A
I-19	Sponge Holding Forceps	A
I-20	Electro Convulsive Theraphy Machine	A
I-21	Couch for ECT	A
I-22	Couch for Hypnosis	A
I-23	Tape Recorder	A
I-24	Video Cassette Recorder with Movie Camera/Monitor	A
I-26	Overhead Projector	A
I-27	Slide Projector	A
I-28	High Pressure Steam Sterilizer	A
I-29	Personal Computor	A
I-30	Photocopy Machine	A
I-33	Kits & Relavent Literature	A

Drug Abuse
Treatment Centre
Dept.

J-10	Tuning Forks	A
J-11	Tongue Depressor	A
J-12	Breathing Bag	A
J-13	Sponge Holding Forceps	A
J-14	High Pressure Steam Sterilizer	A
J-16	Corch for Relaxation Exercises	A
J-17	Corch for Hypnosis	A
JA-18	Thin Layer Chromatograph	A

Ward

Dept.

K-1	Bed with Matress & Bedside Safty		A
K-2	Stool Locker		A
K-3	Overbed Table		A
K-4	Pillows (60cm x 30cm)	5	E
K-5	Bed Sheet (white color)	5	E
K-6	Pillow Cover (white color)	5	E
K-7	Transfusion Stand		A
K-8	Screen Partition		A
K-9	Urinal Set Bedpan -male- 5 pcs./set Bedpan -female- 5 pcs./set Urinal ss -male- 5 pcs./set Urinal ss -femele- 5 pcs./set		A
K-11	Enema Can Set		A
K-12	Hot Water Bottle with Grip		A
K-13	Blanket	5	E
K-14	Clinical Thermometer	5	E
K-15	Stethoscope		A
K-16	Sphygmomanometer		A
K-17	Bucket	5	E
K-18	Bedside Cabinet		A
K-19	Folding Chair for Teaching Purpose		A
K-20	Refrigerator without Freezer		A
K-21	Medicine Cabinet		A
K-22	Ultrasonic Nebulizer		A
K-23	Treatment Carriage		A
K-24	Instrument Table with Wheel		A
K-25	Laundry Cart		A

K-26	Waste Receptacle		A
K-27	Wheel Chair for Adult with Spare Tyer		A
K-28	Invalid Walker		A
K-29	Oxygen Tent		A
K-30	Instrument Tray Set		A
K-31	Patient Stool		A
K-32	Examination Table		A
K-33	Strecher with Wheel Trolly		A
K-34	Weighing Machine		A
K-35	Wall Clock	5	E
K-36	Doctor Consulting Chair with Desk	5	E
K-37	Oxygen Cylinder with Trolly		A
K-38	Film Illuminator for 3 Films		A
K-39	Double Basin Stand with Basins		A
K-41	B.P. Apparatus, wall mounted type		A
K-42	B.P. Apparatus, stand type		A
K-43	Instrument Cabinet		A
K-44	Television Monitor	5	E
K-45	Suction Unit		A
K-46	Ice Cube Machine		A
K-47	Ward Instrument Set		A
K-48	Bed for Coronary Care Unit		A
K-50	Traction Frame with Weight		A
K-52	Ophthalmoscope		A
K-53	Laryngoscope Set		A
K-54	Ambu Bag		A
K-55	Blood Gas Analyzer		A
K-56	Emergency Light		A

Radiotherapy & Nuclear Medicine Dept.							
	L-1	Survey Meter for Beta and Gamma Radiation		3	4		E
	L-2	Radio Isotope Dose Calibration		3	4		E
	L-3	Laboratory Monitor for Beta and Gamma Radiation Monitoring	1	3	4	6	E
	L-4	Pocket Dosimeter, Gamma X-Rays					A
	L-5	Charger for Pocket Dosimeter					A
	L-7	Cobalt-60 Rotational Telotherapy Unit 5000 Curing Source with TV Monitor					A
	L-8	Essential Operating Theater Equipment					A
	L-9	Simulator					A
	L-10	Dosimetric Equipment					A
	L-11	Water Phantom					A
	L-12	Remote After Loading System					A
CCU Dept.							
	M-1	Bedside Monitors with Central Monitor (Central Monitor...1, Bedside Monitor...4/Unit)					A
	M-2	E.C.G. Pressure Monitoring					A
	M-3	E.C.G. Machine, Single Channel					A
	M-5	Central Air-conditioning System					A
	M-6	Asrhymia Unit					A
	M-7	Resuscitation Unit					A
	M-8	Emergency Trolly					A

	M-9	Ambulance with Furnished Medical Equipment	A
Physiotherapy Dept.			
	N-1	Microwave Therapy Apparatus	A
	N-2	Transcutaneous Stimurator	A
	N-3	Hirschman's Galvanization	A
	N-4	Ultrasonic Apparatus	A
	N-6	Neodynator for Application of Dynamic Currents	A
	N-7	Mobile Underwater Massage Unit	A
	N-8	Metro Massage Apparatus	A
	N-10	Ergometer	A
	N-11	Traction Table	A
	N-12	Standing Bed Traction Bed for Versetile Use	A
	N-13	Shoulder Wheel	A
	N-14	Parallel Bar for Adult	A
	N-15	Parallel Bar for Children	A
	N-16	R.S.C. Pull/Armour Excerciser with Weight	A
	N-17	Variweight Boot and Weight	A
	N-18	Rowing Machine	A
	N-19	Wrist Rotator	A
	N-20	Grip Dynamometer	A
	N-21	Bicycle Exerciser	A
	N-22	Mirror for Posture Training	A
	NA-23	Portable Ultrasound Therapy Unit	A
	NA-24	Infra-red Laser Therapy Unit	A
Mortuary Dept.			
	O-1	Mortuary Refrigerator for 2 bodies	A

	OA-2	Autopsy Table, Straight Shape		A
Paramedical Institute / Workshop Dept.				
	P-1	Memory Scope		A
	P-2	Digital Voltmeter Bench Type		A
	P-3	Digital Tong Tester		A
	P-4	Frequency Tester		A
	P-5	Frequency Counter		A
	P-6	Resistance Tester (Insulation Tester)		A
	P-7	Ground Resistance Tester with Optional Accessories	8	E
	P-8	Oscilloscope		A
	P-9	Colour Pattern Generator		A
	P-10	Short Circuit Detector		A
	P-11	Multimeter Electronic		A
	P-12	I.C. Tester 40 Pins Digital		A
	P-13	Transistor Tester, Digital		A
	P-14	Tube Tester		A
	P-15	High Voltage Probe		A
	P-16	Impedance Bridge	8	E
	P-17	OP Amp Tester	8	E
	P-18	Earth Tester with Optional Accessories		A
	P-19	RPM Meter		A
	P-20	Portable Calibrator		A
	P-21	Sound Level Meter with Access		A
	P-22	Syncrono Scope 220V	8	E
	P-23	Hydrolic Press	8	E
	P-24	Lux Meter	8	E
	P-25	Galvanometer	8	E
	P-26	Potentiometer D.C.	8	E
	P-27	Decade Resistance	8	E

P-28	Pneumatic Pressure Standard	8	E
P-29	Digital Power Factor Meter	8	E
P-30	Lathe Machine	8	E
P-31	Power Press	8	E
P-32	Soldering Station	8	E
P-33	Desoldering Tools		A
P-34	KVP Meter		A
P-35	Welding Transformer	8	E
P-36	Gas Welding & Cutting Sets	8	E
P-37	Shaper	8	E
P-38	Hydraulic Press	8	E
P-39	Milling Machine	8	E
P-40	Honing Machine	8	E
P-41	Air Compressor Tank	8	E
P-42	Electric Drill Machine, Gear & Stand Type		A
P-43	Vacuum Pomp Set		A
P-44	Armature & Winding Machine	8	E
P-45	Hammer Drill Machine	8	E
P-46	Vibrator Drill	8	E
P-47	Electric Drill Machine (Hand Type)		A
P-48	Electric Drill Machine (Stand Type)	8	E
P-49	Channel Type Chain Block (3 Ton Capacity)	8	E
P-50	Grinder Hand Type	8	E
P-51	Grinder Table Type		A
P-52	Bench Vice		A
P-53	Hand Vice		A
P-54	Pipe Bender Different Size	8	E
P-55	Steel Cutter	8	E
P-56	Electric Screw Driver	8	E
P-57	Gas Leak Deducted (Electronic)	8	E

P-58	Gas Injector Adopter (Freen Gases)	8	E
P-59	Density Meter	8	E
P-60	Voltage Sterilizer (50-A)	8	E
P-61	Voltage Sterilizer (25-A)	8	E
P-62	Voltage Sterilizer (10-A)	8	E
P-63	Voltage Sterilizer (5-A)	8	E
P-64	Electric Hacksaw		A
P-65	Reamer Set		A
P-66	Threading Tools Different Sizes for Lathe		A
P-67	Threading Dye in MM and Standard Sizes		A
P-68	Micro Meter	8	E
P-69	DC Power Supplies	8	E
P-70	Hydraulic Trainer	8	E
P-71	Air Pressure Automatic Control Training	8	E
P-72	Sequence Control Trainor	8	E
P-73	Semi Conductor Trainor	8	E
P-74	Pulse Circuit Trainor	8	E
P-75	Operational Amplifire Trainor	8	E
P-76	Oscillator Circuit Trainor	8	E
P-77	Logic Circuit Trainor	8	E
P-78	Transistor Circuit Trainor	8	E
P-79	Electrical System Trainor	8	E
P-80	Multy Function Meter	8	E
P-81	Digital X-Ray Exposur Timer		A
P-82	Digital mAs Meter	8	E
P-83	Automatic Exposur Control Analyzer		A

P-84	Rad Check Tm Plus	8	E
P-85	Optional Remote Detector	8	E
P-86	Silicon X-Ray Sensor	8	E
P-87	Wisconsin KVP Test Cassette		A
P-88	Colimeter and Beam Allignment Test Tools		A
P-89	Radiographic Aluminum Stepwedge	8	E
P-90	Attenuator Sets	8	E
P-91	Highcontrast Resolution Test Tools	8	E
P-92	Low Contrast Resolution Test Tools	8	E
P-93	Grid Alignment Test Tool	8	E
P-94	Tomographic Test Tools	8	E
P-95	Film Screen Contact Test Tools	8	E
P-96	Angiography (DSA) Phantom	8	E
P-97	Angiography (DSA) Phantom	8	E
P-98	Chest Unit Qckit	8	E
P-99	Radiographic Phantom	8	E
P-100	Dental QA Phantom	8	E
P-101	Radiographic/Fluoro Kit	8	E
P-102	X-Ray Test Patterns	8	E
P-103	Beam Alignment/Arm Punch Test Tools	8	E
P-104	E.C.G. Simulator		A
P-105	Blood Pressure System Calibrator	8	E
P-106	Multiparameter Simulator with Blood Pressure	8	E
P-107	Electrical Safety Analyzer		A
P-108	E.C.G. Machine Monitor Analyzer		A
P-109	Digital Ultrasound Wattmeter	8	E
P-110	Defibrillator Analyzer		A
P-111	Digital Tachometer	8	E

	P-112	Oxygen Monitor	8	E
	P-113	Arrhythmia/E.C.G. Simulator	8	E
	P-114	Electrosurgery Analyzer	8	E
	P-115	Ventilator Tester	8	E
	P-116	Diathermy Analyzer	8	E
	P-117	Laser Power Meter	8	E
Radiology Dept.				
	R-1	Ultrasound Apparatus (Linear & Sector)		A
	R-2	Refrigerator		A
	R-3	Stretcher Trolly		A
	R-4	X-Ray Diagnostic Apparatus 500mA		A
	R-5	Slide Projector		A
	R-6	X-Ray Film Projector		A
	R-7	Camera for Clinical X-Ray Film with Flash and Stand		A
	R-8	X-Ray Film Illuminator		A
	R-9	Wheel Chair		A
	R-10	Whole-Body CT Scanner		A
Anaesthesislogy Dept.				
	S-1	Infant Ventilator		A
	S-2	Sphygmomanometer Electric		A
	S-3	Bedside Monitor		A
	S-4	Central Nitrous Oxide Supply for 20 Operation Theatres		A
	S-5	Fiberoptic Laryngoscope, Light Source		A
	S-7	Breathing Bag		A
	S-8	Electrolyte Analyser		A
	S-9	Lung Function Test Machine		A
	S-10	Ambu Bag for Adult		A

	S-11	Ambu Bag for New-born Baby	A
Paediatrics Dept.			
	T-1	Oxygen Monitor with Hi-Lo Alarms	A
	T-3	Infant Warmer	A
	T-5	Phototherapy Unit	A
	T-7	Ultrasound System for Cardiology and Abdomen	A
	T-8	Intermittent Positive Airway Pressure System	A
	T-10	Microscope	A
	T-11	Ophthalmoscope	A
	T-12	Infant Weighting and Measuring Machine	A
	T-13	HB Meter	A
	T-14	Resuscitator of Newborn & Infant	A
	T-16	Infant Incubation Set	A
	T-18	Examining Table	A
	T-19	Neonatal Monitor	A
	T-20	Neonatal Respiration and Apnea Monitor	A
	T-22	Paediatrics Resuscitation Trolly	A
Surgery Dept.			
	U-1	Instrument Set for Microsurgery	A
	U-2	Microsurgery Set for Gynaecology	A
	U-3	Binocular Roope	A
	U-4	Binocular Roope	A
	U-5	Cystourethroscope Set	A
	U-6	Irrigating Cystoscope	A
	U-7	Lithotriptoscope	A
	U-8	Examining & Double Cathetrizing Cystoscope	A

U-9	Biopsy Forceps					A
U-10	Resectoscope, Iglesias, Continuous Irrigation					A
U-11	Visual Urethrotone					A
U-12	Light Source Unit					A
U-13	Transurethral Operating Table					A
U-14	Fiber Optic Light Guide Bundle					A
U-15	Formalin Gas Sterilizer					A
U-16	Electrosurgical Unit for Resection				7	E
U-17	Bladder Evacuator					A
U-18	Bladder Retractor					A
U-19	Kidney Clamp					A
U-20	Ureteral Stone Forceps					A
U-21	Kidney Stone Forceps					A
U-22	Ureteral Stone Dislodger					A
U-23	Catheter Stylet					A
U-24	Urethral Bougie, Guyon's Set					A
U-25	Penis Clamp					A
U-26	Urethral Foreign Body Forceps					A
U-27	Infusion Pump					A
U-28	Endoscopic Examining Chair					A
U-29	Hemo Dialysis System	1	2			E
Out-Door Patient Dept.						
V-1	B.P. Apparatus					A
V-2	Examining Couches					A
V-3	Stethoscope					A
V-4	Film Illuminator					A
V-5	Screen					A
V-6	Clinical Thermometer					A
V-7	Wall Clock			5		E
V-8	Weighing Machine					A
	Cathetrizing Cystoscope					

	V-9	Revolving Stool for Patients				A
Fire Extinguishing System						
	W-1	Fire Alarming System		5	6	E
	W-2	Fire Extinguishers		5	6	E
Transportation & Other Machinary						
	X-1	Staff Car 1000cc Disel	4	5		E
	X-2	Truck 4000cc Diesel	4	5		E
	X-3	Pick Up 1600-2000cc Disel				A
	X-4	Vacuum Cleaner (Heavy Duty)				A
	X-5	Heavy Duty Blower				A
Nursing Unit II (Lift)						
	Y-1	Patient's Lift	1	5	6	E
Obstetrics & Gynaecology Dept.						
	Z-1	Yanagi's Vaginal Speculum, medium size				A
	Z-2	Kinoshita's Surgical Vaginal Retractor, medium size				A
	Z-3	Cusco's Vaginal Speculum large, medium, small				A
	Z-4	Martin Tenaculum Forceps				A
	Z-5	Muzeu's Vulsellum Forceps				A
	Z-6	Uterine Tissue Forceps				A
	Z-7	Uterine Probe				A
	Z-8	Foester's Sponge Forceps				A
	Z-9	Bozeman's Uterine Dressing Forceps				A
	Z-10	Uterine Dilators				A
	Z-11	Biopsy Punch				A
	Z-12	Uterine Biopsy Punch				A
	Z-13	Biopsy Curret				A
	Z-14	Biopsy Curret				A

Z-15	Kobak's Needle	A
Z-16	Contrast Medium Infusion Set	A
Z-18	Jomu Type Uterine Curret	A
Z-19	Uterine Currete, large, medium, small size	A
Z-20	Bumm's Uterine Curret, medium size	A
Z-21	Olshausen's Uterine Curret, medium, small size	A
Z-22	Segon's Tumor Screw	A
Z-23	Thomas Uterine Tissue Grasping Forceps	A
Z-24	Hysterectomy Forceps	A
Z-25	Alexander's Operating Retractor	A
Z-26	Ando's Abdominal Retractor, large, small size	A
Z-27	Bolfour's Abdominal Retractor	A
Z-28	Abdominal Retractor	A
Z-29	Vaginal Spatula	A
Z-30	Masson's Diamond Jaw Needle Holder	A
Z-31	Uterotubal Holding Forceps	A
Z-32	Mayo's Scissors	A
Z-33	Sim's Uterine Scissors	A
Z-34	Sim's Uterine Scissors	A
Z-35	Obstetric Stethoscope (White Resin Made)	A
Z-36	Vaginal Forceps	A
Z-37	Vaginal Prosthesis, each size	A
Z-38	Kogan's Endocervical Speculum Forceps	A

Z-39	Backhaus's Towel Forceps	A
Z-40	Kocher's Hemostatic Forceps straight 14.5cm straight 18.5cm straight 21.0cm	A
Z-41	MM Type Hysterectomy Forceps	A
Z-42	Saenger's Retractor 38mm	A
Z-43	Mosquito's Hemostatic Forceps, curved, straight	A
Z-44	Kocher's Hemostatic Forceps, curved, straight	A
Z-45	Stereoscopic Colposcope	A
Z-46	Dopplar Fetal Heart Detector	A
Z-47	Kymographic Infflation Apparatus	A
Z-49	Ballon Catheter	A
Z-52	Hysteroscope System	A
Z-58	Birth Calender	A
Z-62	Simpson's Obstetric Forceps	A
Z-63	Kielland Obstetric Forceps	A
Z-64	Braun's Decapitation Hook	A
Z-65	Smellie's Obstetric Hook	A
Z-66	Naegele's Perforator	A
Z-67	Abortion Canula Set	A
Z-70	Fetal Monitor	A
Z-71	Linear Scan	A
Z-72	Portable Vacuum Pump	A
Z-73	Breast Massaging & Milking Unit	A
Z-74	Breast Pump	A

Z-76	Obstetric/Gynae Suction Unit	A
Z-79	Infant Care System	A
Z-81	Neonatal Monitor	A
Z-82	Infant Transportation Incubator	A
Z-84	Continuous Lowpressure Aspirator	A
Z-85	Infant Resucitation Bag	A
Z-87	Infant Ventilator	A
Z-88	Baby Stethoscope	A
Z-89	Infusion Pump	A
Z-90	Miller's Laryngoscope Set	A
Z-91	Cesarean Incision Set	A
Z-92	Baby Scale	A
Z-96	Dressing Cart	A
Z-97	Nebulizer Pump	A
Z-98	Colposcope	A
Z-99	Electrosurgical Unit	A
Z-100	Endoscope Screen Viewer	A
Z-101	Foot Stool	A
Z-102	Baby Cot	A
Z-103	Baby Laryngoscope	A
Z-104	Dressing Drum	A
Z-105	Chittle Forceps	A
Z-106	Flying Squad System	A

Following the result of the above-mentioned evaluation list, Basic Design Equipment List is attached as Data 7 at the end of this report.

4-4. Execution Plan of Operations

4-4-1. Policy for Execution of Operations

The Project is to be implemented according to the framework of the system of Grant Aid of the Japanese Government. It is to be officially executed after it is approved by both the Japanese and the Pakistani Governments and an Exchange of Notes (E/N) is concluded between the two governments. After that, a Japanese Consultant will be selected by the Government of Pakistan to proceed with the design work for the implementation of the Project. After completion of the design documents for execution, a Japanese Corporation for the procurement and the installation of the equipment, or a Supplier will be decided by public tender.

The following are the basic matters and the points requiring special consideration in the execution of the operations.

(1) Executing Agency

The organization generally responsible for the Project is the Health Dept. which will be jointly responsible for the execution of the Project in cooperation with related organizations such as the Ministry of Economic Affairs of the Government of Pakistan, the Central Revenue Council, etc., also taking into consideration the opinions of the president of the Medical College.

(2) Consultant

Immediately after the conclusion of the E/N between the Governments of the two countries, the Japanese Consultant will conclude a Consultant Agreement with the Health Dept. according to the formalities of the system of Grant Aid of Japan. On the basis of this agreement, the consultant will execute the following affairs:

(a) Detailed Design Stage: Preparation of Detailed design specifications and other technical data.

(b) Tender Stage: Cooperation in selection of the equipment supplier and affairs relating to conclusion of procurement agreements.

(c) Procurement Stage: Management of affairs relating to procurement, installation and training for operation and maintenance of equipment.

(3) Equipment Supplier

The supplier of equipment selected by tender will manufacture, supply and carry in the necessary equipment and provide technical guidance on the installation and operation of the equipment concerned to be done by the Pakistani side. Even after the delivery of the equipment and materials, the supplier will make up a maintenance and control system which enables the Pakistani side to receive a continued supply of spare parts and consumables as well as technical guidance.

(4) Implementation

The implementation plan will be discussed between the Japanese Consultant and the Project staff of the Pakistani side during the design period based on the execution schedule of the present report to confirm the starting time and the method of the work belonging to the scopes of both the Japanese and the Pakistani sides and ensure smooth execution of the work. The work belonging to the scope of the Pakistani side described in 4-4-6 must be executed by the Pakistani side as scheduled before the start of installation of the equipment.

The time of execution shall preferably be planned for the best-suited period in the light of the local climatic conditions.

(5) Necessity of Dispatch of Engineers

It is very important for the local staff to master the correct operation method and the method of maintenance & control of the procured equipment as it helps to keep the equipment always in good order and normal functioning of the equipment after installation is indispensable for ensuring exact diagnosis and treatment. Therefore, it is necessary to dispatch engineers of the manufacturers to the site in order to provide guidance and training (for mastery of operation techniques, simple repair techniques, inspection methods, etc.) on the handling of machines after the installation work of the equipment.

The equipment units requiring the dispatch of engineers are as shown hereunder, and the number of days required for the training is 2 to 6 days although it varies with each type of equipment.

Category of Equipment	Number of Engineers to be Dispatched	Installation Work(days)	Guidance on Operation (days)
(1) Radiotherapy & Radiology			
a. Radiotherapy	2	22	6
b. Radiological Diagnosis	2	22	6
c. Ultrasonic Diagnosis	1	8	4
(2) Word / OPD	2	36	6
(3) Surgery	1	9	3
(4) Test Equipment	2	21	5
(5) Oral Surgery / Dentistry	1	10	3
(6) Physiotherapy & Mortuary	1	12	3
(7) Workshop & the General	2	22	4
(8) Education	1	6	3
(9) Medical Gas Supply	1	30	2
Total	16	198	45

The consultant will perform the Detailed Design and the Management of the Project for improvement of equipment based on the Agreement concluded with the Pakistani side. The Detailed Design consists of determining the detailed specifications of the equipment based on the Basic Design Study and preparing the tender documents consisting of tender instructions, draft contract for the procurement of equipment, equipment specifications, etc., including an estimation of the expenses required.

Management means verifying if the work of the supplier is carried out in conformity with the agreement to ensure proper execution of the contents of the agreement. It also means providing guidance, advice and adjustments from an impartial position, and includes the following matters:

1) Execution of formalities and the tender process necessary for the selection of the equipment supplier and attendance at the conclusion of the contract.
2) Inspection and approval of execution drawings, equipment specifications and other documents to be submitted by the equipment supplier.
3) Inspection and approval of the quality and performance of the equipment supplied.
4) Control of supply and installation work of the equipment.
5) Reporting on the progress of the work.
6) Attendance at the delivery.

In addition to the execution of these duties, the consultant will report to those concerned in the Japanese Government about the progress, payment procedures, completion and delivery, etc., of the Project.

4-4-2. Execution Management Plan

Based on the principles of Grant Aid of the Japanese Government, the consultant will organize a consistent project execution team concerning the Detailed Design Work and execute the work smoothly in conformity with the purpose of the basic design.

[1] Principles of Execution Management

(1) Keep in close contract with the staff members of the related organizations of both countries for smooth completion of the equipment supply.

(2) Give proper guidance and advice quickly and from an impartial standpoint to the parties related to the execution of the Project.

(3) Maximize the effects of the Grant Aid Project with a positive attitude toward the transfer of technology regarding guidance on installation and operating technology.

(4) Give proper guidance and advice on the control of equipment after the installation and delivery of the equipment.

(5) Inspect and approve the execution drawings, equipment specifications, etc., submitted by the equipment supplier.

(6) Inspect and approve the quality and performance of the equipment supplied.

(7) Upon confirmation of the completion of installation of the equipment and execution of the contractual conditions, the consultant will attend at the delivery of the equipment and complete its work after receiving an approval of acceptance by the Pakistani side.

The consultant will also report to the staff members concerned in the Japanese Government about the progress, payment procedures and other necessary matters in relation to the delivery of the equipment.

[2] Personnel Plan

The number of persons to be engaged in the consulting work in the Detailed Design and Execution Management Plan is as follows:

(1) Chief Consultant: 1 person

* General coordination and guidance on all consulting work.

(2) Medical Equipment Planner I : 1 person

* Analysis of planned equipment and preparation of specifications.
* Confirmation of local facilities and of matters omitted in the Basic Design Study.

(3) Medical Equipment Planner II : 1 person

* Analysis of planned equipment and preparation of specifications.
* Confirmation of local facilities and of matters omitted in the Basic Design Study.
* Explanation of and guidance on the work pertaining to the scope of supply of the Pakistani side.
* Guidance on the arrangement of planned equipment.

(4) Medical Equipment Inspector: 2 persons

* Detailed study of operation condition of equipment supplied in Phase I
* Preparation of report on above and assistance in estimation.

(5) Architectural Designer for Building & Facilities: 1 person

* Confirmation of building work by the Pakistani side.
* Guidance on connection at tie-in point between building work and equipment work.
* Guidance relating to installation work of equipment in building site.

(6) Project Cost Estimater: 1 person

* Computation of detailed Project cost.

4-4-3. Equipment Procurement Plan

[1] Method of Equipment Procurement

(1) Method of Selection of Supplier and Conclusion of Contract

The supplier to take charge of the procurement of equipment will be selected by the evaluation of the tender documents presented for a public tender to which are invited corporations having Japanese nationality as either individuals or corporate persons. The contractual system shall be a global sales contract specifying the model in the contractual document. Manufacture and supply of contractual equipment, guidance on installation, ad-

justment and test operations and technical assistance for operation and maintenance control will all be included in the supplier's duties.

(2) Supply of Equipment

The equipment of the Project will be procured in Japan in principle. However, equipment which would better be procured in third countries from the conditions of performance and maintenance control (after-sales service on the site, etc.) may be selected after a study of the following conditions and upon approval by both countries.

a. Does the equipment concerned have a level of performance apparently equal or superior to the Japanese product?

b. Is the product as convenient as Japanese products for maintenance and inspection? Is a maintenance and control system well established for it?

c. Is there an agent in Pakistan which can provide good services for any trouble with the equipment concerned?

(3) Method of Transportation

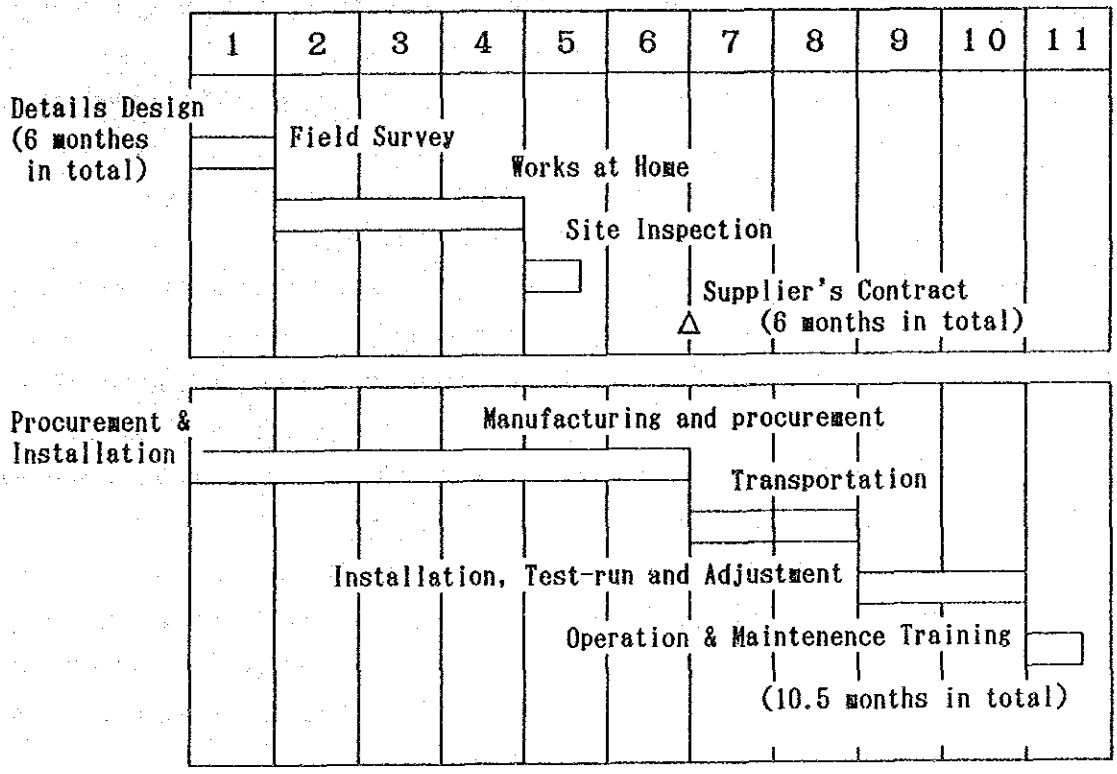
The equipment will be transported by truck in Japan but by boat from a Japanese port to the port of Karachi in Pakistan. From the port of Karachi to the site in Faisalabad, the transportation will be by truck again.

4-4-4. Execution Process

After completion of the Exchange of Notes between the two parties, the period required for each work phase by the Japanese side is shown as the following.

1) Equipment Manufacturing, Procurement	6 months
2) Transportation	2 months
3) Installation, Test-run and Adjustment	2 months
4) Operation and Maintenance Training	0.5 months

Table 4-1. Execution process



4-4-5. Approximate Operation Cost

<Scope of Operations>

The operations of the Project will be executed by mutual cooperation between Japan and Pakistan. The following are the operations to be carried out under Grant Aid from the Japanese Government and those to be executed under the budget and responsibility of the Government of Pakistan.

(1) Operations to be carried out by the Japanese Government

The Japanese side will carry out the following operations relating to consulting and procurement of equipment of the Project.

A. Consulting Work

a. Preparation of detailed design documents of the target equipment of the Project and tender instructions

b. Cooperation for selection of and conclusion of agreement with the supplier

c. Management of procurement of equipment

B. Procurement of equipment and installation work

a. Procurement of Project equipment and transportation to the specified place in the Allied Hospital

b. Guidance on installation of Project equipment and adjustment for test run

c. Explanation of and guidance on the methods of operation and maintenance control of the Project equipment

(2) Operations to be carried out by the Pakistani side

The Pakistani side will perform the following work relating to equipment installation and tax exemption, etc., of the Project equipment not included in the scope of work of the Japanese Government.

a. Preparation of the place of installation of the medical equipment and materials

b. Completion of work for improvement of facilities necessary for the installation of equipment and materials

* Installation of electric wiring up to the place of equipment installation and mounting of power outlets.
* Installation of water piping up to the place of installation and mounting of water outlets.
* Work for protection against X-Rays and floor work in Cobalt-60, Remote After-Loading System and X-Ray rooms.
* Work for new installation of Nitrous Oxide Gas Manifold room.

* Concrete foundation work for external unit of Air Conditioning System.

c. Exemption or payment of import duties, domestic taxes and other financial surcharges which are usually imposed in Pakistan on the import of the Project equipment ("Financial Surcharges" as meant here also includes indirect costs incurred in relation to foreign products adopted in Pakistan.)

d. Providing quick customs clearance and inland transportation of the materials and equipment imported from Japan.

e. Providing a storage place for the Project equipment up to the time of installation work.

f. Providing conveniences necessary for the Japanese entering and staying in Pakistan to accomplish their duties in relation to implementation of the operations.

g. Granting, under the law of the Government of Pakistan, licences, tax exemption and other permission, etc., required for the execution of the Project.

h. Bearing all necessary expenses other than those to be borne by the Japanese side.

(3) Operation Expenses to be borne by Japan

The operation cost to be borne by Japan is as follows:

1. Equipment cost
2. Design & management cost

The operation costs to be borne by the Japanese side are calculated under the conditions provided in (5) hereunder.

(4) Operation cost to be borne by the Pakistani side

Rs. 275,000 (1.7 million yen)

(5) Conditions of Calculation

(i) Time of calculation: June, 1991 (at the time of completion of the basic design)

(ii) Exchange rate: US$1 = 133.55 yen; 1R.=6.33 yen

(iii) Execution period: As indicated in the execution schedule (4-4-5).

(iv) Others: This Project will be executed according to the system of Grant Aid of the Government of Japan.

CHAPTER 5.

EFFECTS OF THE OPERATION AND CONCLUSION

Chapter 5 - Effects of the Operation and Conclusion

5-1. Effects of the Operation

The following effects can be expected from the execution of the Project:

(1) Improvement of Teaching Functions

The current Allied Hospital is providing, together with the existing DHQ Hospital, a place for the clinical education of students as a teaching hospital of the Medical College. The improvement of equipment of the Allied Hospital in Phase I was carried out for the basic medical depts. For other medical depts., clinical education is provided in the DHQ Hospital as before. The establishment of the Medical College is a part of the Provision of the Medical College and the Allied Hospital as a concrete operation of the Programme for Developing the National Health Care System of the Seventh Plan and the Allied Hospital will come to have the complete functions of a teaching hospital when the equipment of the specialized medical depts. is improved by the present Project in addition to Phase I. Moreover, there is a serious shortage of doctors and medical facilities in the area concerned and the surrounding areas because of a sharp increase in population in recent years. To improve the situation, the Government of Pakistan and the Government of the Punjab are trying to rapidly expand the medical facilities in this area. The present Project can play an extremely important role in promoting the fostering of doctors who are also badly needed for the promotion of such a programme.

(2) Contribution to Rural Health Care

The Allied Hospital was improved in Phase I and the recent expansion of beds in the DHQ Hospital has made it possible to meet the demand for medical services of the basic medical depts. such as the Internal Medicine Dept., Surgery Dept., etc. However, for other specialized medical depts. such as ENT, Ophthalmology, Orthopaedics, Dermatology, etc., it is still difficult to meet the demand. With the execution of the Project, the Allied Hospital will be come able to provide medical services of a high degree even in specialized medical areas.

5-2. Conclusion

The execution of the Project is judged as quite significant as it is expected to not only produce the effects mentioned above but also contribute to the improvement of health of Faisalabad and the sarrounding areas as a whole.

However, the execution of the Project also faces various problems as indicated hereunder and the solution of those problems seems indispensable for smooth execution of the Project.

(1) It is desired that the improvement of facilities by the Pakistani side be expedited so that the installation of the Project equipment may be performed on schedule.

(2) The operation costs necessary for the Project are supposed to reach at least 3 times the current costs of the Allied Hospital. The Allied Hospital side explains that there is no problem because it can obtain supplementary budgets by applying to the Health Dept. of the Punjab, and the Secretary of Health also promised the Study Team to secure the necessary budget. However, looking back on the current situation of the Allied Hospital, we cannot but feel that the reason why the lift and other expensive equipment are left unrepaired is probably some budget restrictions although certainly there have been budgets for covering the expenses of maintenance and control.

In the Seventh Plan, the introduction of user charges is further promoted, and the same will be true also with the Allied Hospital. The Study Team sincerely hopes that the Hospital will improve its operation by utilizing those revenues to cover its operation costs and proposes that the Allied Hospital be turned into an autonomous body. The Secretary of Health also said that an application for the autonomy of the Allied Hospital has already been submitted to the Government of Pakistan.

(3) Training on subjects including the operating method and the methods of maintenance and control of the equipment will be given to the operators and the members in charge of maintenance and control in parallel with the installation of the equipment. Since the normal employment practice in Pakistan is that the employment of personnel is approved by the Health Dept. of the Punjab only after the completion of buildings and equipment installation, it is feared that the employment of personnel to be engaged in the operation and the maintenance & control of the equipment may not be made in time for the

training.

Therefore, to avoid such a situation, it is strongly desired that the necessary personnel be arranged by the time of installation of the equipment or to have the personnel to be employed present.

[APPENDIX]

1. Members of Basic Design Study Team

1. Members of Basic Design Study Team

1-1. Basic Design Study Team (November 12th to December 16th, 1990)

Team Leader	Dr. Koichi NOBUTOMO	Chief of Health Policy, National Institute of Health Services Management, Ministry of Health & Welfare
Project Coordinator	Mr. Mitsuyoshi KAWASAKI	Staff, First Basic Design Study Division, Grant Aid Planning & Survey Dept, JICA
Chief Consultant & Equipment Planner 1	Mr. Akira SATO	Deputy General Manager of First Economic Cooperation Division, International Total Engineering Corporation
Equipment Planner 2	Mr. Ryoji HARADA	Assistant Manager of First Economic Cooperation Division, International Total Engineering Corporation
Architectural Designer	Mr. Kazumi AKITA	Manager of Design Section, Hospital Engineering Dept, International Total Engineering Corporation
Cost Estimator	Ms. Yukiko OMORI (Domestic Work)	Staff of First Economic Cooperation Division, International Total Engineering Corporation

1-2. Members of Basic Design Study Team for Explanation of Draft Final Report
(April 7th to April 21st, 1991)

Team Leader	Dr. Koichi NOBUTOMO	Chief of Health Policy, National Institute of Health Services Management, Ministry of Health & Welfare
Chief Consultant & Equipment Planner 1	Mr. Akira SATO	Deputy General Manager of First Economic Cooperation Division, International Total Engineering Corporation
Architectural Designer	Mr. Kazumi AKITA	Senior Architect General Manager Hospital Engineering Dept. International Total Engineering Corporation
Equipment Planner 2	Mr. Ryoji HARADA (Domestic Work)	Assistant Manager of First Economic Cooperation Division, International Total Engineering Corporation
Cost Estimator	Ms. Yukiko OMORI (Domestic Work)	Staff of First Economic Cooperation Division, International Total Engineering Corporation