BASIC DESIGN STUDY
FOR
THE ESTABLISHMENT OF
THE COLLEGE OF NURSING AND PARAMEDICAL INSTITUTE
IN
THE ISLAMIC REPUBLIC OF PAKISTAN

DECEMBER 1984

JAPAN INTERNATIONAL COOPERATION AGENCY

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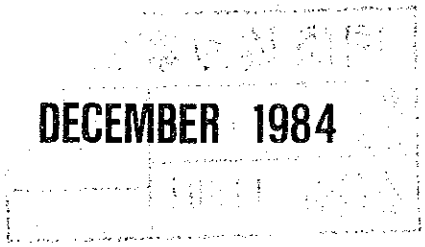

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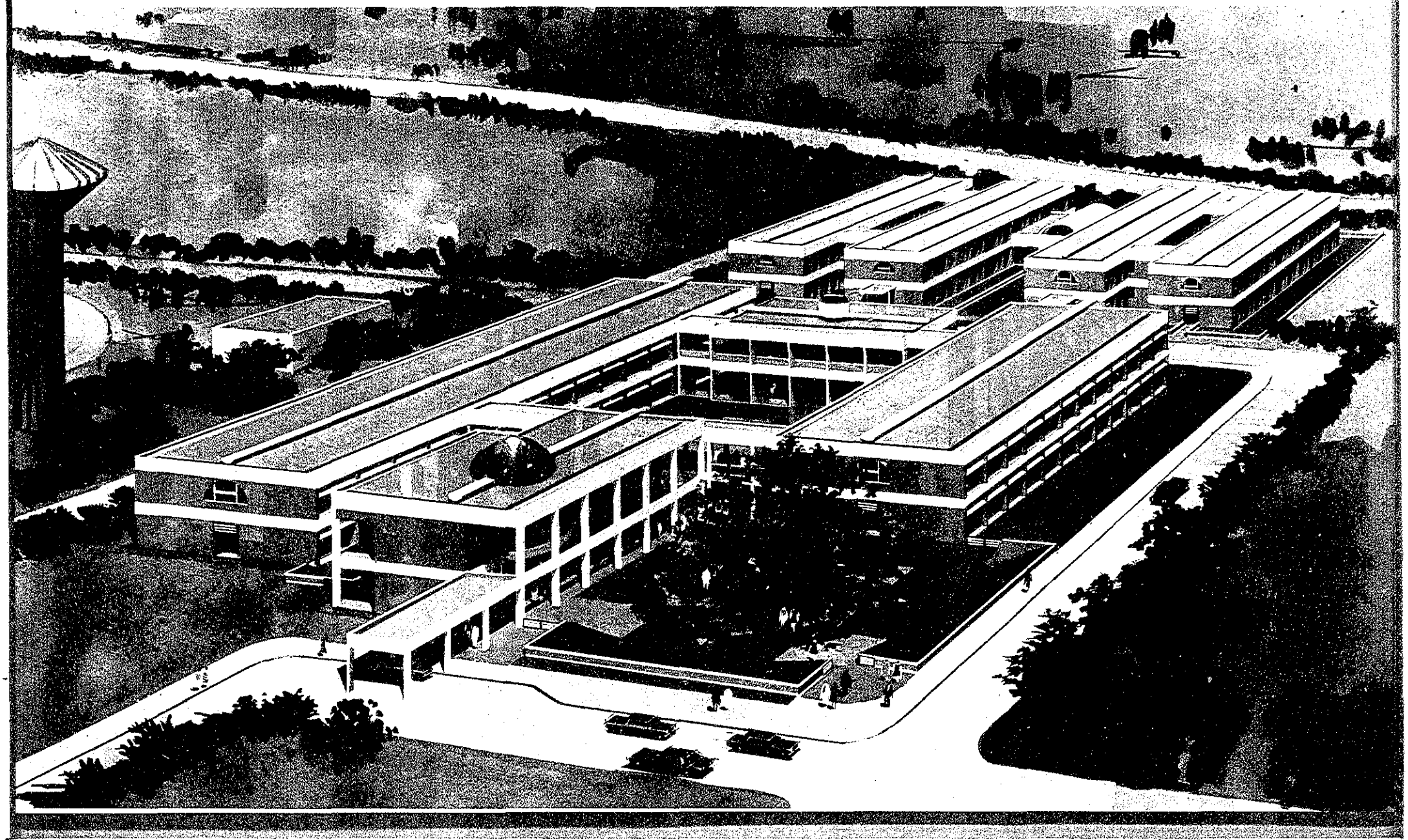

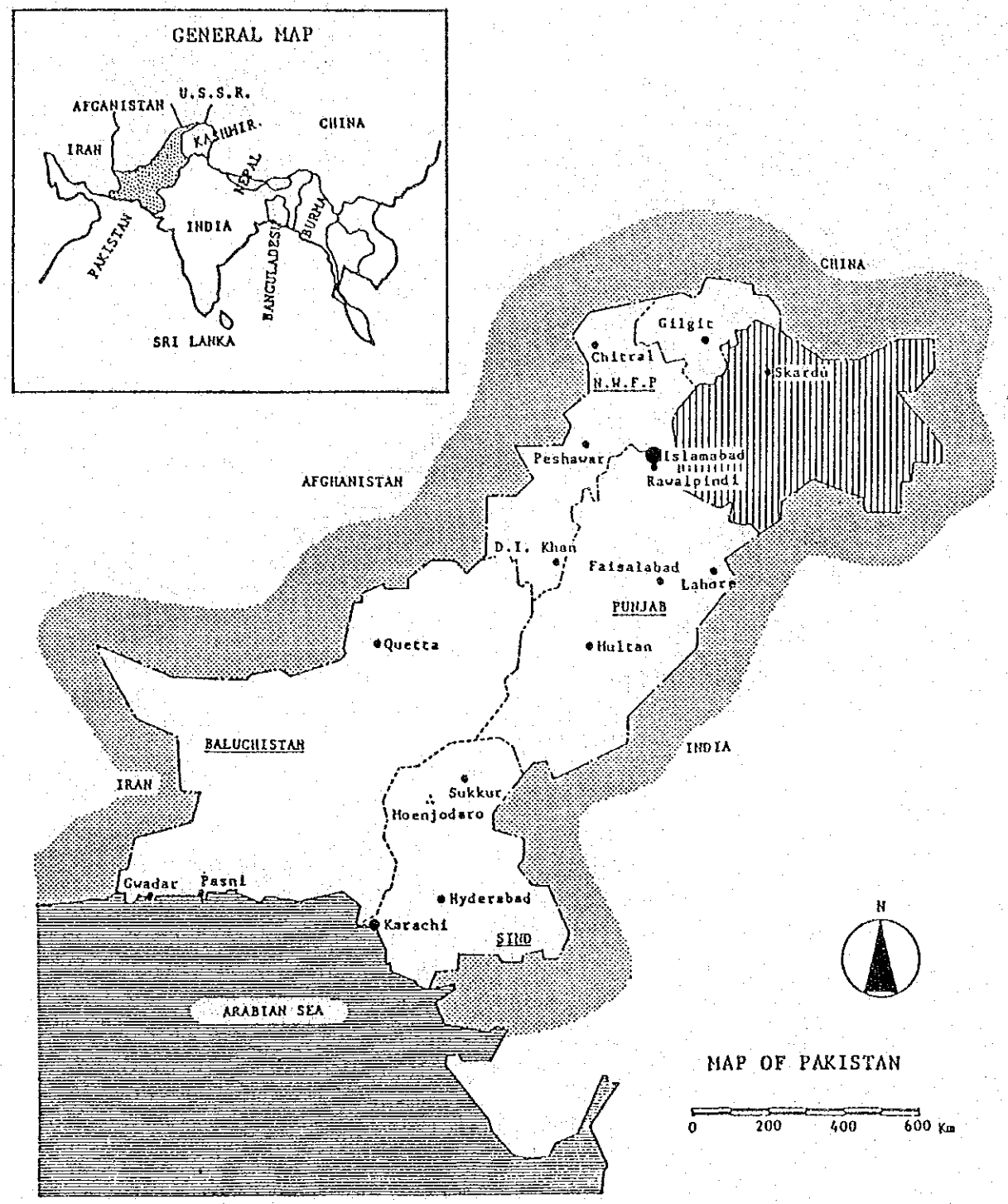
GENERAL MAP
AFGHANISTAN
U.S.S.R.
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CHINA
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PAKISTAN
BANGLADESH
BURMA
SRI LANKA
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N.W.F.P
Skardu
Peshawar
Islamabad
Rawalpindi
AFGHANISTAN
D.I. Khan
Faisalabad
Lahore
PUNJAB
Quetta
Multan
BALUCHISTAN
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IRAN
Sukkur
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MAP OF PAKISTAN
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PREFACE

In response to the request of the Government of the Islamic Republic of Pakistan, the Government of Japan decided to conduct a basic design study on the Project for the Establishment of a Nurses and Para-Medics Training College and entrusted the study to the Japan International Cooperation Agency (JICA). The JICA sent to Pakistan a study team headed by Mr. Yutaka HOSONO, Deputy Director, Grant Aid Department, JICA from August 2 to 21, 1984.

The team had discussions on the Project with the officials concerned of the Government of Pakistan and conducted a field survey in Islamabad city. After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of firendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Islamic Republic of Pakistan for their close cooperation extended to the team.

December 1984

Keisuke Arita

Keisuke ARITA
President
Japan International Cooperation Agency

SUMMARY

The Government of the Islamic Republic of Pakistan is keen to improve the education and health care facilities in the country to provide health and welfare of its people in accordance with provisions contained in the Sixth 5-year plan (July 1983 - June 1988).

At present, the total number of medical doctors, nurses and paramedicals available in the country is insufficient to provide effective health care. Also there are no arrangements to train specialist nurses in various specialities such as paediatrics, neuropsychiatry, anaesthesia, intensive care etc. Yet the arrangements regarding training of paramedics are not satisfactory.

For this reason, the Government of the Islamic Republic of Pakistan planned to establish a "College of Nursing and Para Medical Institute" (hereafter the College and Institute) to impart the postgraduate education and training of nurses, training of paramedics professionals in various specialities, and to train nursing teachers for basic schools in the country and requested the Government of Japan for Grant Aid. The Government of Japan dispatched the Basic Design Study Team headed by Mr. Y. Hosono, Deputy Director of Grant Aid Department, JICA to Pakistan in the period from August 2 to August 21, 1984, through Japan International Cooperation Agency (JICA).

The purpose of this project is to construct adequate facilities and to supply the equipment to train the teachers for basic nursing schools, to train various specialist nurses to lead the health care activities, and to train paramedics to provide them with adequate medical knowledge and technique to assist in diagnosis and treatment performed by doctors, so as to correct the imbalance of the personnel in charge of the health care activities both in quality and quantity. This project will increase the number of the specialized personnel in the medical field and improve health care services in Pakistan through

training and education of the nurses and paramedicals in these facilities.

The proposed site for the above mentioned facilities is situated in the Islamabad Hospital Complex (IHC) which is now under construction in the capital, Islamabad. It is the flat land of about 20,000m^2 in area. The infrastructure is almost complete and satisfactory.

The project consists of Administration Block, Education Block-1 (for postgraduate nurse training), Education Block-2 (for para medical training), Library Block and Dormitory each for nurses and paramedics. The details are as follows:

Administration Block (1,252m^2)	Registration and curriculum office, board of examination office, large lecture room, etc.
Education Block-1 (1,935m^2)	Principal's room, vice principal's room, administration office, instructors' room, meeting room, lecture room, practice room, audio-visual room, preparation room, etc.
Education Block-2 (2,580m^2)	Principal's room, vice principal's room, administration office, instructors' room, meeting room, lecture room, practice room, audio-visual room, preparation room, etc.
Library Block (750m^2)	Library, cafeteria, pantry, machine room, etc.

(The subtotal of the area of the education facilities: 6,517m^2)

Dormitory (4,963m^2)	Bed room, administration office, study room, dining room, kitchen, etc.

(Total area: 11,480m^2)

The Government of Japan will be responsible for the construction of the facilities and the supply of the related equipment. The Government of the Islamic Republic of Pakistan will be responsible for the cost of site reclamation, construction of an access road and provision of utilities and services for construction.
The project implementation period is estimated to be 5 months for the detailed design and tender procedure, 20 months for the construction. The principal execution organization of the Government of the Islamic Republic of Pakistan is the Ministry of Health, Special Education and Social Welfare (MOH). The general supervisor is the Secretary of MOH, and the execution manager is the Project Director of IHC.

Proper utilization of the College and Institute will be dependant on the early completion and full functioning of IHC.

It is both significant and effective for the construction of the College and Institute to be on the same site as the construction of the Children's Hospital in IHC under the Japanese Grant Aid.

CONTENTS

ABBREVIATIONS

BHU	Basic Health Unit
BS	British Standard
CCU	Coronary Care Unit
CDA	Capital Development Authority
EAD	Economic Affairs Division Ministry of Finance and Economic Affairs
E/N	Exchange of Notes
GOJ	Government of Japan
GOP	Government of the Islamic Republic of Pakistan
IHC	Islamabad Hospital Complex
ICU	Intensive Care Unit
JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standard
JPMC	Jinnah Postgraduate Medical School
LHV	Lady Health Visitor
MCH	Mothers and Childrens Centre
MOH	Ministry of Health, Special Education and Social Welfare
NIH	National Institute of Health
NWFP	North Western Frontier Province
PNC	Punjab Nursing Counsil
PHN	Public Health Nurse
RHC	Rural Health Centre
T & T	Telephones and Telgraph Department
WAPDA	Water and Power Development Authority

CHAPTER 1. INTRODUCTION

In Pakistan, five 5-year plans have been carried out to develop the society. In the previous fifth 5-year plan already carried out, almost satisfactory results were obtained in spite of the world-wide stagnant economy and trade situation. However, long-term investment in the basic structure and human development is not sufficient and the level of the health services and education remain unsatisfactory. Therefore, in the Sixth 5-year plan under practice, an emphasis is put on the fields of the education, culture, and health care.

Of the above mentioned fields, the establishment of facilities for training specialized nurses and qualified paramedicals is an urgent task for the reasons given below.

At present, 840 nurses are trained annually in Pakistan. The number of registered nurses is 11,000, approximately a half of them working. That is, the number of actually working nurses is less than one third the number of doctors. In addition, there is practically no adequate facilities for specialized nurses in fields such as paediatrics, anaesthesia, ICU, etc. and there is only one facility for the training teaching staff in basic nursing schools.

The paramedical staff to assist the medical doctors and the nurses such as the general laboratory technicians and the X-ray technicians, is very insufficient both in quality and quantity. In addition, there is no adequate training facilities for them, so such training facilities are required to be established urgently.

In the above mentioned situation, the Government of the Islamic Republic of Pakistan planned the establishment of "the College of Nursing and Paramedical Institute" (hereafter the College and Institute) in March 1984 and requested the Government of Japan for the Grant Aid.

At present, the Islamabad Hospital Complex (IHC) is under construction in the capital, Islamabad, as the central medical care facilities in Pakistan.
The Children's Hospital is being constructed as a part of IHC under the Japanese Grant Aid. The College and Institute will be also a part of IHC for training of health personnel by using the facilities of IHC, which are comprehensive health care facilities covering the public health, diagnosis and treatment as well as education and research.

The Government of Japan dispatched a Basic Design Study Team for the Grant Aid through the JICA in August 1984 and started the investigation.
The Basic Design Study was conducted for 20 days from August 2 to August 21, 1984 principally to confirm the contents of the request and the execution body, to investigate the health care situation, to survey the similar facilities, and to investigate and discuss the various basic conditions of the plan. Mr. F. I. Malik, Joint-Secretary of EAD and Mr. Y. Hosono, the leader of the Team signed the minutes of discussion. (See Appendix)

According to the original request of the Government of the Islamic Republic of Pakistan, the Japanese Grant Aid is to be used for the construction of the College and Institute only. However, during the Team's discussion with the Pakistani authorities concerned, the Government of the Islamic Republic of Pakistan proposed an additional request to construct the Dormitory for students also under the Japanese Grant Aid in order to make the residential accomodation in conformity with the completion of the College and Institute.

This report is the results of the Basic Study of the "College of Nursing and Paramedical Institute".

CHAPTER 2. BACKGROUND OF THE PROJECT

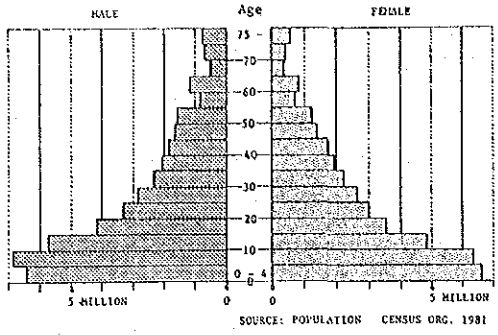
2-1 Medical Care Situation

1) Diseases and death factors

It was reported that at the beginning of the 20th century, the crude death rate in Pakistan was about 40. It has decreased gradually, about 30 in 1950, about 16 in middle of the 1930's, and about 12 at present. At present, the maternal mortality (the number of death per 1,000 live birth) is 6 - 8 and the infant mortality is about 100 per 1,000. The average life expectancy of male and female in 1965 is 47 and 45 respectively. In 1983, it increased to 55 and 54 respectively. However, compared with the average of other countries, these values are low. The most important causes of this is high infant mortality rate and death rate at birth.

As described above, features of health conditions in Pakistan are the high birth rate, the high death rate of the infants and children, the high death rate at birth, and the high attack rate of the contagious and infectious diseases. In the past and even at present, contagious and infectious diseases were and are the principal cause of illness and death. The most serious cause is diarrhoea in children. Under these circumstances the supply of safe water in view of health and sanitation is very important. The Pakistan Government is now taking the effective measure for this purpose through the organizations concerned in each province. However, at present, potable water is supplied only to 38% of the total population (77% in cities and 22% in rural areas). Sewage systems are only available in a few cities. In most cases, waste water is treated in septic tanks and penetration tanks or discharged directly to the waterways and rivers. It is said that the rural areas have no practical sewage system and sanitary facilities.

POPULATION



SOURCE: POPULATION CENSUS ORG. 1981

REGISTERED PARAMEDICAL PERSONNEL

	(MOH)
Health visitors	2,562
Midwives	5,275
B.Sc. Medical technologists	115
Medical technicians	389
Sister tutors	290
Ward administrators	535
Physiotherapists	191
Dispensers	17,370
Sanitary inspectors	1,974
Malaria inspectors	1,601
Malaria pharmacist	72
Rural health inspesctors	296
Medical assistants	339
Doctors	33,584
Nurses	11,070

(6th 5-year Plan)

Facility	1983	Population per facility
Infrastructure :		
(i) Hospital beds.. ..	51,400	1,790
(ii) Rural Health Centres ..	374	172,241
(iii) BHUs/Sub-Centres/Dispensaries/MCH Centres.	6,490	12,943
Manpower :		
(i) Doctors	20,000	4,600
(ii) Dentists	1,100	83,000
(iii) Nurses	5,530	1/6.4 beds
(iv) Paramedics	37,000	2,486
(v) TBAs	15,000	1/3 villages

Health Related Statistics

		Pakistan		
		1965	1978	1983
Life expectancy at birth (years)	M	47	54	55
	F	45	53	54
Infant mortality rate (aged 0 - 1)	(per 1,000 live births)	140	105	100
Child death rate (aged 1 - 4)	(per 1,000)	12		10
Crude death rate	(per 1,000)	16	14	12

2) Manpower

Insufficiency of personnel is a large problem in the health and medical care services. In paticular the number of nurses is seriously inadequate and hampers the health and medical care service. It is said that the medical doctors are relatively excessive, so the countermeasure against their unemployment is required. To the contrary, the number of the nurses is less than 1/3 of that of the medical doctors. The number of the registered nurses is 10,554 (in 1982), but the number of the actually working nurses is about 1/2 (5,550 in 1983). The reasons of the insufficiency of the nurses are as 1) low wage, 2) lack of carreer development in the present medical system, 3) social pressure against women advancements, 4) drop out from work because of marriage and transfer, 5) insufficient nurse training facilities, and 6) increases in dropouts from school. Especially, the above mentioned social and cultural factors are the most serious causes of the low numbers of nurses. These factors have the adverse influences not only on the medical care but also the education of the whole society, thus the problem is deeply rooted.

Generally speaking, according to the statistics of the female education in Pakistan, only 16% of females can read and write (47% in cities and 7% in rural areas in 1984). The percentage of the primary school enrollment of the female is 32% (20% in the rural regions), but percentage of women enrolled in secondary school is 12% in cities and 3% in rural areas. The percentage of women in the entire workforce is very low.

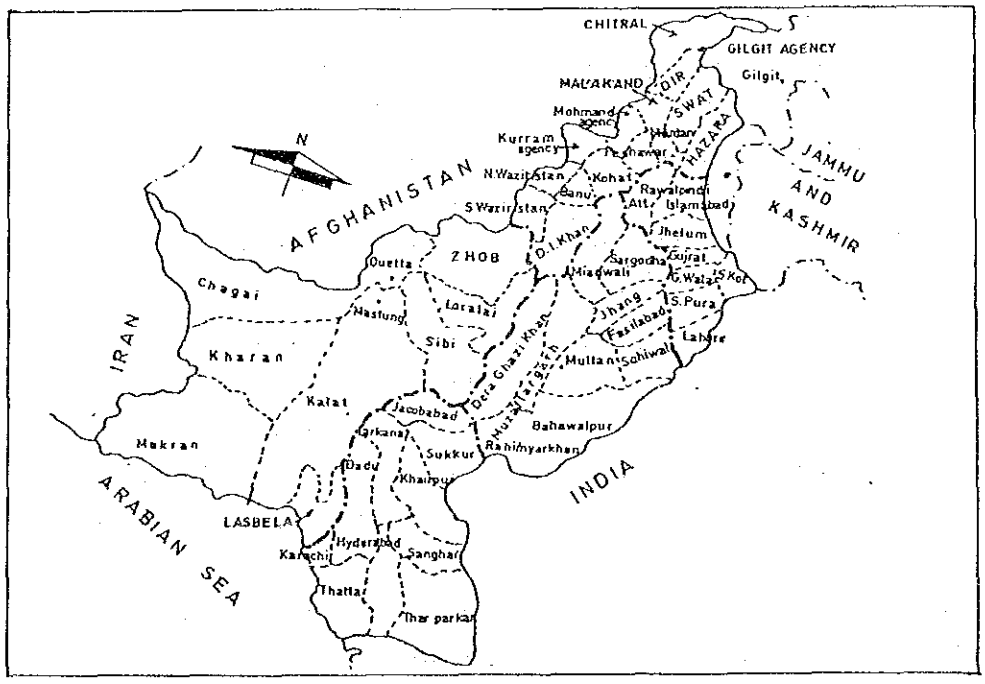
ADMINISTRATION STRUCTURE

	Pakistan*	Punjab	Sind	NWFP	Baluchistan
Province	4	1	1	1	1
Divisions	15	5	3	3	4
Districts	64	21	15	12	16
Tehsils/Talukas	298	75	68	61	94
Mouzas/Villages	41,569	24,996	5,910	3,275	7,388

* Excludes Federally Administered Tribal Areas.

Source: Health & Health Related Statistics of Pakistan; Planning Commission March 1975 and September 1978.

PAKISTAN : PROVINCES AND DISTRICTS



About 38,000 paramedics are now engaged in the medical care all over Pakistan (source; Sixth 5-year plan, according to the data of MOH, the number of the paramedics including the health visitors, midwives, sister tutors and ward administrators is about 31,000, and about 22,000 excluding them). The paramedics work in the ward, out patient department, laboratory and treatment areas (the operation, ICU, CCU, rehabilitation, dental service, ophthalmology, X-ray examination, and nutrition guidance). They are regarded as the assistant to the medical doctors and the nurses. Since the number of the qualified specialists working in the laboratory department is small, about 17,000 dispensers work instead of them. These dispensers are those who passed the qualification examination after the on-the-job training for one year, so they understand the primary and practical prescription, treatment and examination methods. However, their understanding of basic medical theory is insufficient. The chief of the laboratory department is a medical doctor, and most of the paramedics are male.

3) Medical care policy

Pakistan is divided into four provinces; Punjab, Sind, NWFP and Baluchistan, and there are Federal and the Federally administrated tribal areas. Each province consists of divisions, and each division consists of the districts. Districts consist of 3-5 Tehsil/Taluka, and the Tehsil/Taluka consists of towns and villages stepwise. The Federal Government is principally in charge of the planning of the national plan and the medical care investigation of the health administration and the administrative adjustment. On the other hand, the Provincial Government is in charge of hospital operation and education. The focus of health services is at the district level.

The health mechanism basically consists of the levels from the low to the high systematically, as shown in the table below.

Level	Population	Function
Village	1,000	2 community health workers
BHU	10,000	4-6 assistant health workers
RHC	100,000	2 medical doctors and 8 assistants
Tehsil Hospital	380,000	10-20 beds, surgery and internal medicine laboratories, and X-ray device
District Hospital	1,160,000	Principle medical specialities
Teaching Hospital	Province	All the modern equipment

According to the levels shown in the above table, basically, the medical care facilities are systematized as follows:

1 BHU (Basic Health Unit)
2 RHC (Rural Health Unit)
3 Provincial General Teaching Hospital/District Hospital
4 Federal General Hospital

The following federal governmental hospitals are operated as central hospitals throughout the nation:

- o IHC, Islamabad (now under construction)
- o Jinnah Postgraduate Medical Center, Karachi
- o Central Government Poly Clinic, Islamabad

However, there is no close operational cooperation between these hospitals. Patient can go to any hospital freely for the medical treatment.

The facilities is not sufficient in BHUs and RHCs. In Punjab province, electricity is not supplied to 64% of the BHUs and 25% of the RHCs, and no water is supplied to 6% of the BHUs and 2% of the RHCs. Generally, in other Province the standards is the same as that in Punjab province (Source: Rural Health Institution in the Public Sector, 1982).

4) Sixth 5-year development plan

The Sixth 5-year plan started in July, 1983 to promote the results of the economic development in 35 years after the independence and to realize the independent economic development. In the Sixth 5-year plan, an emphasis is placed on the promotion of the private development investment to use its energy, on the diffusion of the benefit of the development among the social and economically weak such as the provincial farmers who had been not blessed in the past, and on the completion of the public services to improve the national life. The special emphasis is placed on the doubling of the literacy rate, the diffusion of the water supply and drainage, as well as the relief and the independence of the weak, for example, the improvement of the social position of the female, aid to the orphans, and education of mentally and physically handicapped persons.
The principal goals of this plan are as follows:

1 Improvement of the social services such as the primary education, potable water, basic medical care, etc.
2 Completion of the facilities such as the roads, communication equipment and power transmission equipment, etc. to equalize the cultural differences the regions.
3 The enforecement of the adequate development plan of the poor regions.
4 Enforcement of the poverty relief policy and the income increase policy
5 Promotion of nutritional improvement
6 Promotion of employment and improvement of the productivity.

In the field of the health and medical care service, four policies are established to enforce them concretely; the extension of the regional health and medical care services, the completion of the basic medical care facilities, the training of the health and medical care man power, and the establishment of the contagious and infectious disease preventive measure program.

1. The extension of the regional health and medical care services

In this policy, an emphasis is placed on the disease prevention services such as vaccination and sanitation guidance, to prevent childhood diseases, principally, those of newborn babies and infants, and the positive medical guidance to pregnant women before and after childbirth. On the other hand, the BHU with one medical doctor and 2-3 paramedics is used as the front line of the above mentioned activities. In addition, to equalize the difference between cities and rural areas, 3 doctors (including one woman doctor) and 25 beds are allocated to the RHC to use it as the medical base in the region.

2. Completion of the basic medical care facilities

The Provincial General Teaching Hospital/District Hospital is used as a facility to accept patients from the above mentioned BHU/RHC, and is planned to complete the principal medical care service. The completion of the Central Hospitals is urged to act as the final referral facilities.

3. The training of the health and medical care man power

In the past 10 years, the number of medical colleges increased from 7 to 16, and about 4,260 doctors graduate from these medical colleges anually. In many medical colleges, students receive the medical education under overcrowded conditions because of sudden increase of the number of the student over authorized capacity. As a result, the decline of the education level was pointed out. To improve this situation, renovation of facilities is now planned. Improvements to employment conditions of the medical doctors such as the increase of the remote place allowances, and the obligatory engagement in the regional health and medical care services are now under examination for their adequate regional appointment.

At present, the number of the actually working nurses throughout the country is only 5,500. If one nurse is required for 5 beds, about 10,000 nurses are required for clinical service at the completion of the Sixth 5-year plan. Thus, the insufficiency of the nurses is serious. In addition, the number of the LHV and the PHN in charge of the regional health is extremely insufficient, and there is no regular training facilities for them.

The total number of the paramedics in Pakistan is 22,000 or 35,000. According to this plan, about 38,000 paramedics are required which, and candidates are being trained in the Provincial General Hospitals/ District Hospitals. Paramedics are classified into various functions, and their specialities differ according to each field. With the progress of medical technology in the recent years, the high specialities are required, so the special training courses are necessary.

4. Contagious and infectious disease preventive measure program

The following health and medical care programs are continued. It can be said that the key to success in these programs are in the hands of the persons who carry them out, of the nurses and the paramedics.

- o Preventive program
- o Diarrhoea control program
- o Malaria control program

The Pakistan Government increased the budget for health from 646 million rupees in 1978 to 1,299 million rupees in 1982, namely, by 15% annually in the Fifth 5-year plan. The Pakistan Government is now planning to increase the budget by 20% annually in the Sixth 5-year plan.

2-2 Actual Situation of Medical Care Education

1) General education

The problem of the general education in Pakistan is the imbalance in the low literacy rate and the education level. At present, the literacy rate is less than 25%, the enrollment ratio among the school age children is less than 50%, and many students leave school in the mid-course because of the insufficience of the facilities. The Government is now vigorously endeavoring to increase the number of the schools by using mosques as the schools. On the other hand, by opening of new universities, only a limited number of students have an advanced school career. That is, the pyramid of the school career is top heavy. Therefore, the Government announced the improvement policy of the basic education through the extension of the primary and the secondary schools without increasing the universities in the future.

2) Training of Basic Nursing

After graduating from high school (at the age of 15), nurse students receive nursing education for 3 years and education in midwifery for 1 year, or 4 years in total. Graduates who passed the examination are registered by PNC as registered nurses. The graduates then take tests in English and Islamic ethics in the universities. If they pass this test, they can obtain the qualification of B.Sc. Nursing Degree. There are 44 basic nursing training schools throughout Pakistan. 840 students graduate from these schools anually. PNC recognize the hospitals for practical training of nursing. These recognized hospitals must have 100 beds in total in the internal medicine, surgery, pediatrics, ophthalmology, ENT, gynaechology and obstetrics, and must also have outpatient and emergency departments. In addition, the recognized hospitals must have personnel including the teaching staff and the specified class rooms. One teacher is appointed for every 25 students.

On the other hand, the lady health visitor (LHV) is trained to offer the primary health service in the region. There are 10 LHV training schools and 600 students graduate from these schools anually (in 1983). The LHV receives the general education for 10 years and the PHN education for 2 years (1 year for the PHN education and 1 year for the obstetrics education). The LHV works principally in the Mothers and Children's Center. As of 1983, 2,562 health visitors and 5,275 midwives were registered. However, it is necessary to train the PHN to supervise the LHVs to complete the regional medical care and health service in the future. Therefore, the Government is planning to establish the PHN course which gives the postgraduate education course for 1 year and to train 80 senior public health nurses.

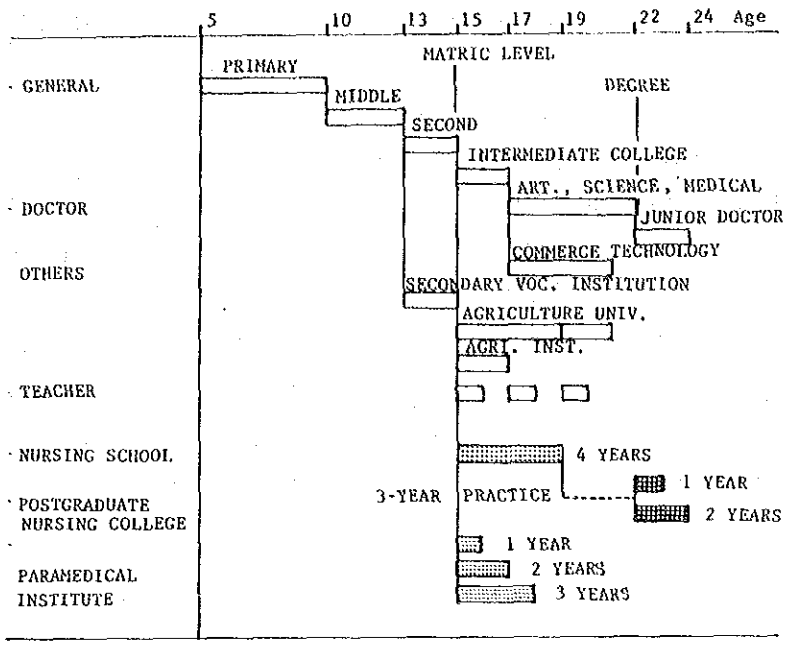
3) Postgraduate nurse education

As the facilities for the special education of the postgraduate nurses, there is only one postgraduate nurse education center, the College of Nursing at JPMC in Karachi. However, postgraduate nurses are trained only for the ward administration and teachers in the basic nursing school.

The nurses graduated from the basic nursing school of 4 years and with the practical experience after 3 years can enter the College of Nursing. They receive the education of the ward administration for 1 year and the education of the nursing instructor for nursing school for 1 year in this college. At present, 44 students receive the former education and 24 students receive the latter education. The students are from every province, principally, from the Punjab and the Sind province. The students are classified into the schorlarship students who receive the pay while receiving the education, and the private students who pay 250 rupees as school fees as well as boarding expenses. The building of this college is independent, and the ground floor is used as the school room and the first, second and third floors are the hostel consisting of 48 rooms.

10 teachers were planned to staff this college, however, at present, only 4 teachers are teaching 66 students. The total number of personnel is 42.

EDUCATION SYSTEM IN PAKISTAN



TRAINING SCHOOL FOR NURSES

	Punjab	Sind	NWFP	Baluchistan	Total
Federal	1	1	-	-	2
Govt.	10	4	5	1	20
Semi-Govt.	-	-	-	1	1
Army	6	1	-	1	8
Mission	4	3	-	1	8
Social	-	1	-	-	1
Security K.M.C.	-	1	-	-	1
Private	-	3	-	-	3
Total	22	15	5	4	44

TRAINING OF HEALTH MANPOWER

S. No.	Category	1978 No.	1978 Yearly output	1983 No.	1983 Yearly output
(i)	Medical Colleges	15	4,000	16	4,260
(ii)	Dental Schools	4	117	4	120
(iii)	Nurse Training Schools ..	28	750	44	840
(iv)	LHV Training Schools ..	8	389	10	600
(v)	Medical Technician Training Schools	—	—	26	650

There is no specialized nursing education facilities for the postgraduate nurse in Pakistan, such as pediatric nursing, psychiatric nursing, operation theatres, ICU, public health nursing, ophthalmologic nursing, etc.

4) Paramedic training

The paramedic training plan is very insufficient. At present, paramedics receive on-the-job training in the Provincial General Hospitals/ District Hospitals in each region, and most of these become dispensers. The training is assistance for the preparation and dispensing of medicine, fundamental knowledge of disinfection, vaccine, serum, primary medical care and first aid care and the simple examinations of the blood, phlelgm and urine. They understand the practical procedure of the clinical examination, however, they know little of the basic theory, so their examination work is simple and extremely limited. The same is applied to laboratory technicians and laboratory assistants.

In the school of Physiotherapist, JPMC, the electrotherapy, physiotherapy and hydrotherapy are taught by using the hospital facilities. A room for occupational therapy in the hospital is used as the playroom for children because an instructor is not available. The education is of 3-year course, 61 students in total attend this school.

There is the also a School of Medical Technology, NIH in Islamabad as the school for the general clinical technicians. This school was first established in Karachi, then transferred to Islamabad. High school graduates enter this school and receive 2-year training. At present, there are 45 males and 5 females, 50 in total, and is operated by 18 teachers and 13 personnel. Until now, 510 laboratory technologists have graduated from this school. Applicants for this school are about 10 times the authorized number. There is also a similar school, the College of Community Medicine, at Lahore.
In addition, to meet the needs for the advanced technologists, this school is going to establish B.Sc. course in Medical Technology for 2 years. It is expected that the graduates from this senior course

would assist to the laboratory diagnosis in hospitals. 20 students attend the senior course. A similar course was established at the JPMC, but this course was discontinued due to financial reasons.

There are some schools which are training the physiotherapists and the general clinical technicians. However, the facilities to train various paramedics such as the X-ray technicians, speech therapists, and dieticians are hardly available. Most of the paramedics receive on-the-job training for 1 or 2 years.

After they finish this training course, they can undergo the examination which is given twice a year by the State Medical Faculty. When they pass this examination, the diploma is given to them. It is said that the ratio of the successful applicants is as low as 10 - 30%.

CONTENTS OF TRAINING OF NURSES AND PARAMEDICS

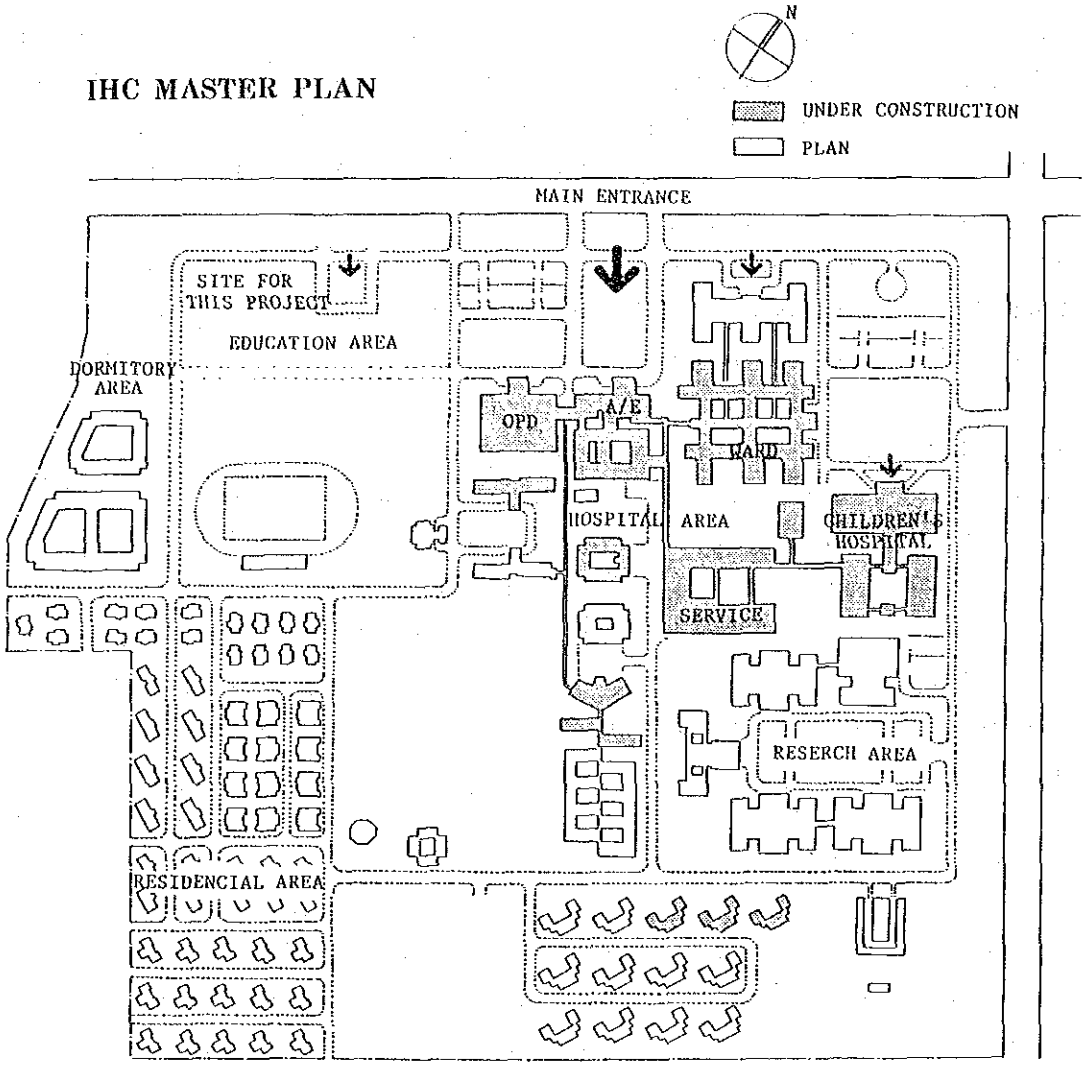
Job	Entrance qualification	Age limit	Education period	Qualification obtained	(Remarks)
Nurses	High school graduate (Qualification for university entrance examination)	15 - 25 (40 in some cases)	3 years (+1 year for midwife education)	NURSE(B.SC.)	
Midwives	Same as above	Same as above	1 year	MIDWIFE	
Health nurse	Same as above	Same as above	2 years	HEALTH VISTITOR	
Assistant nurse	Middle school graduate	17 - 40	1 year	NAIDS	
Assistant midwives (Tuberculosis preventer)	Healthy and sound	None	1 year	DAIDS (TBA)	
Postgraduate nursing	3 years as the nurse	(21 -)	(1 year)		(JPMC)
Phyio-therapist	Junior college graduate	(17 -)	3 years	PHYSIOTHERAPIST	(JPMC)
General clinical technician	High school graduate	(15 -)	2 years	LABO. TECHNOLOGIST	(NIH)
General senior clinical technician	LABO. TEC.		2 years	B.Sc.MED.TEC.	(NIH)

2-3 Present Situation of IHC

The Capital Committee made the recommendation regarding the construction of Islamabad in 1958. It was determined to establish the Federal Government in the present situation, and Dioxides, the urban planner, made the master plan next year. The work of the Capital Committee was handed over to the Capital Development Authority (CDA), and the construction of the capital started in 1961. Afterwards, the principal trunks, governmental offices, dwellings and markets, have been constructed one after another. Islamabad is the twin city of Rawalpindi. The population of the latter is overwhelmingly greater than that of the former. The residential area of Islamabad is occupied by the high-class residences of the government officials and the foreigners.

The IHC was planned to meet the demand the medical care in the Islamabad and Rawalpindi area (with the total population of 1,080,000 in 1981). According to the plan, the IHC consists of four zones; hospital, research, education and residential zone, with a 625-bed General Hospital, a 200-bed Childrens' Hospital, a 200-bed Department of Obstetrics and Gynaecology, a Medical Institute such as the Brain Research Center, a Postgraduate Medical Collage, and a staff residence.
When this plan is realized, the IHC will be able to accept 4, 000 outpatients a day and support comprehensive medical facilities with the medical research organization under the control of the Federal Government. The General Hospital and residential accommodation are almost completed. The 200-bed Childrens' Hospital is now under construction under the Japanese Grant Aid. Thus, the development of the first stage of the IHC is almost complete.

The site of IHC is in the shape of the square with side of about 800 meters. The site is on the slope with the slight inclination downwards towards the southwest. To align the high of the buildings, two-story buildings will be situated on the north side of the complex, and four-story buildings on the south side.


IHC MASTER PLAN
N
UNDER CONSTRUCTION
PLAN
MAIN ENTRANCE
SITE FOR THIS PROJECT
EDUCATION AREA
DORMITORY AREA
OPD
A/E
WARD
HOSPITAL AREA
CHILDREN'S HOSPITAL
SERVICE
RESERCH AREA
RESIDENCIAL AREA

The IHC is scheduled to open the Outpatient Department and the Accident and Emergency Department at the end of 1984, and to open the main facilities by June, 1985, at the end of this fiscal year.
The progress of the remaining utility work is as follows:

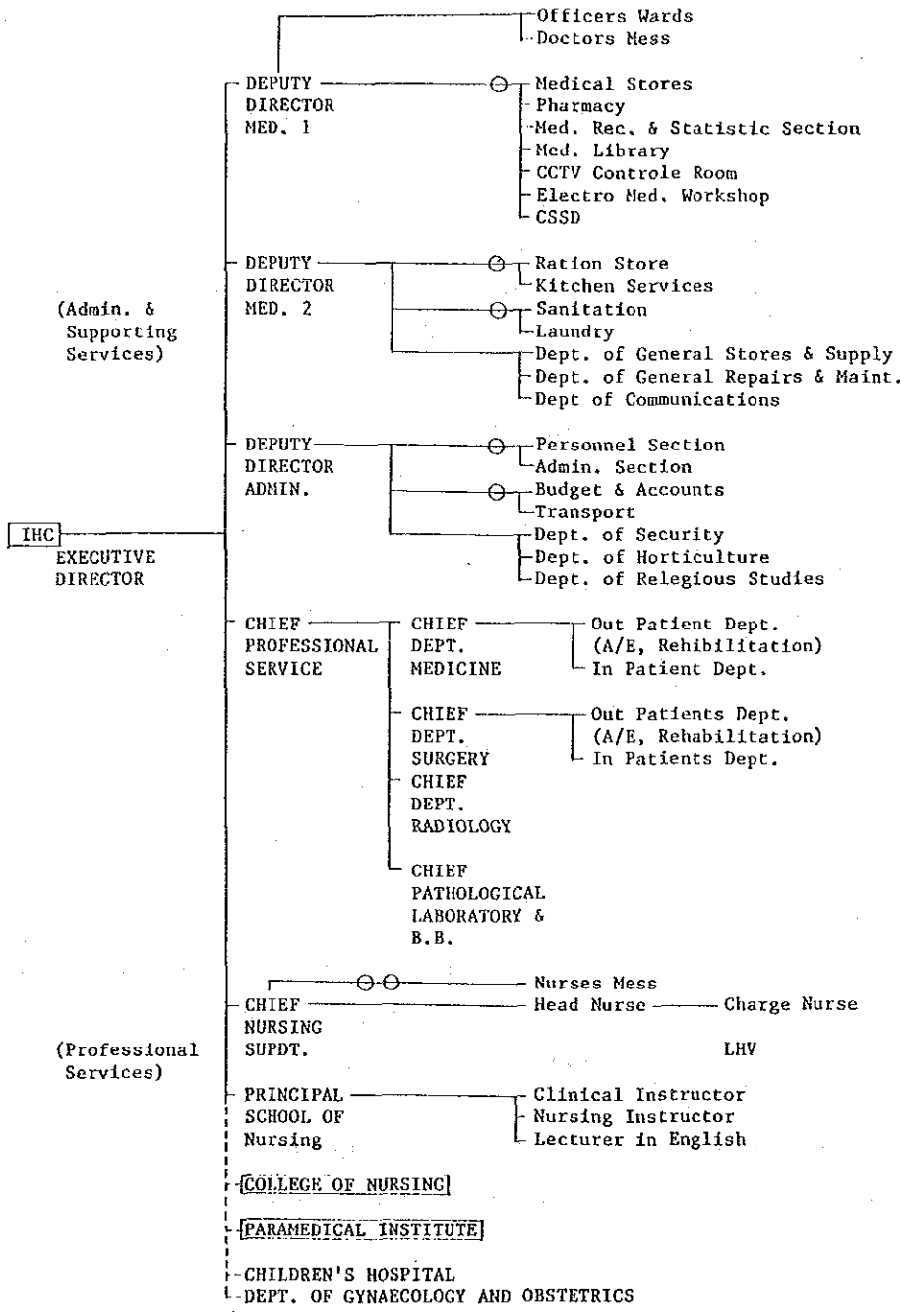
1	Electrical work	The external work was completed, and the internal work is almost completed.
2	Sanitary work	The internal work is almost completed, and the external work completed by 80%. The order for kitchen equipment has already been placed. The laundry equipment has already been installed and is waiting for final calibration (without connection).
3	Air conditioning	Airconditioning work is almost completwork ed in Outpatient Department and the Accident and Emergency Department. The Operating Department is now being modified. It will be completed by June, 1985.
4	Elevator	The elevators were already ordered. (The machine room is not yet completed.)
5	Hostels	Connection of each utilities will be completed at the end of this November. However, the some modification are required.
6	Boiler building	The building is now under construction. Building construction and the equipment installation will be completed at the end of 1984.

The construction of the Childrens' Hospital is now progressing favourably. It will be completed in March, 1985. Organization of the

IHC and the Children's Hospital has been determined, but only a part of the persons in charge has been appointed until now.

First, Nursing school in IHC was planned to start with 100 students. However, it is not independent, but in a part on the second floor of OPD with limited space, so the school will start education with a half of the scheduled number of the students.

ORGANIZATION OF IHC



CHAPTER 3. CONTENTS OF THE PROJECT

3-1 Project Objectives

The shortage of nurses and paramedics is said to be a major drawback in the progress of management of health and medical services in Pakistan.

At present, 840 nurses are educated annually at 44 nurses' training schools, but this is insufficient to meet the future requirement of nurses in view of increase in the number of hospitals and medical facilities. In Pakistan, the nurses are educated mainly through the practical work in the hospitals rather than through basic studies.

As far as the education of paramedics is concerned, there is no proper system so far, though only a limited number of paramedics has been educated at the specialized paramedical schools or at the local hospitals situated in different parts of the country, but the training is inadequate to meet the increasing demands made by paramedics.

Therefor, the Government has decided to establish a post-graduate school for nurses and training facilities for paramedics in IHC, one of the leading medical facilities in Pakistan. The proposed College and Institute is intended for postgraduate education and refresher training for the nurses and paramedics in the country. When the construction of the proposed postgraduate school for the nurses and the training facilities for paramedicals is completed, Pakistan will have a systematized nursing and paramedical education and training system, and this system is expected to play an important role in Pakistan.

3-2 Project Contents

The courses of study Pakistan first intended to provide at the proposed postgraduate school for the nurses and the institution for the paramedics seem to be too many under the present circumstances. For example, not only have educational facilities for the paramedical specialists not yet been established well but also the postgraduate education system for the nurses has not functioned well in Pakistan. Thus, in consideration of the present conditions of the medical service system and the medical education system in Pakistan, the following courses of study and numbers of students are proposed.

College of Nursing	Number of students	Period of education (year)
1. Nursing in Paediatrics	20	1
2. Nursing in Operation Theatre	10	1
3. Nursing in Anesthesia	10	1
4. Nursing in Intensive/Coronary Care Unit	10	1
5. Public Health Nursing	20	1
6. Nursing in Neuro-Psychiatry	10	1
7. Teachers for Basic Training Schools	25	2
	105 (130 in total)	

Paramedical Institute	Number of students	Period of education (year)
1. Broad Based Technician	40	1
2. Operation Theatre Technician	10	1
3. X-Ray Technician	20	2
4. Physiotherapist	20	3
5. Orthoptist	10	1
6. Dental Hygienist	10	1
7. Dietry Technician	10	1
8. Medical Electronics and Engineers	5	1
	125 (185 in total)	

1) *College of Nursing*

Postgraduate education for the nurses has already been carried out at JPMC though educational subjects are limited. Under the system taken at JPMC, the registered nurses who have been in service for at least three years are qualified for admission to the College of Nursing. This system will be applied to the proposed new postgraduate school in IHC.

o Nursing in Paediatrics
(Number of students: 20, Period: 1 year)

The specialized education of nursing in Paediatrics is important in view of that infants and their mothers' infection rate and mortality rates are high in Pakistan.

The Children's Hospital is to be opened in March, 1985, and is expected to contribute to the training for the Paediatric nurses.

o Nursing in Operation Theater
(Number of students: 10, Period: 1 year)

It is a common knowledge that the elementary education in nursing is not good enough for the nurses to assist in surgical operations, and specialized and continuous education in the operation theater is essential, since not only the techniques of surgical operation advance rapidly but also the patients who have undergone the surgical operations require quick and proper nursing.

The number of students is fixed to 10 due to the reasons that the field training capacity is limited, and that the demand for specialized nurses is not so large.

This course is recommended to be called "Nursing in Operation Theater" to indicate that the nature of the nursing service under this category is more comprehensive than mere technical aspects.

o Nursing in Anaesthesia
(Number of student: 10, Period: 1 year)

Anaesthesiology advanced and become more complex together with progress in the surgical operation techniques, and this has resulted in a demand for anaesthesiologist. In Pakistan, a training program exists for doctor anaesthetists, but number of the candidates is not

so large. As a result, the demand the nurses who can be substituted for the anaesthetists is increasing. Under the present circumstances, the study of Anaesthesiology needs to be included in this course, though nurses should primarily be assistants to doctors.

o Nursing in Intensive/Coronary Care Unit
(Number of students: 10, Period: 1 year)

The numbers of students were originally proposed to be 10 for the study of ICU and another 10 for the study of CCU, but these two subjects of study have been combined into one as they include common areas of study and the demand for these categories is relatively small. So, 1-year study is shared between these two subjects by 6 months for each, and this programme is recommended to begin with.

o Public Health Nursing
(Number of students: 20, Period: 1 year)

In Pakistan, public health nurses are expected to play leading role on the LHV who facilitates the primary health care, and thus this course is considered to play a vital role for the spread of the local health and medical service in Pakistan. The number of students was decided to be 20.

o Nursing in Neuro-Psychiatry
(Number of students: 10, Period: 1 year)

In the beginning, the Basic Design Study Team on this subject has concluded that the time is too early for the provision of this course of study as adequate statistics concerning psychiatric patients are not available and that one year is not long enough for training of nurses in psychiatric nursing, but Pakistan has stressed the necessity of this course. This course is combined with the study of Neurology.

o Teachers of Basic Training School
(Number of students: 25, Period: 2 years)

A training program which ensures a stable supply of qualified nurses is urgently needed in Pakistan. A training period of two years has been decided upon, including the period required for the systematic study of the theories of the sciences of nursing and paedagogy. As for number of students, it was concluded that at least 25 students

needed to be educated at a time in addition to those educated at the school in Karachi, as the average period of continuous service of the nurses is generally short, that the number of trained tutors is already short by 170 even at present, and that the number of clinical instructors for practical training in the hospitals is also short.

2) Education of Paramedics

Those qualified for entrance include graduates of secondary school (or those qualified for matriculation). There is no restriction by sex, but most of the applicants for paramedics will be males.

o Broad-based Technician
(Number of students: 40, Period: 1 year)

Education of capable clinical laboratory specialists is essential for the progress of clinical laboratory technology. The broad-based technicians in clinical laboratory have the spheres of their activities in various diagnosis in hospitals, the clinical laboratory department of hospitals and the BHU, where they work for health care and the prevention of disease among local people. In most of the clinical laboratory, examinations are conducted by the dispensers at present. For the education of clinical laboratory specialists, there are only two schools providing 2-year courses.

In general, 1 year is not long enough for the education of broad-based technicians in clinical laboratories to allow them to play the leading role among the staff of the clinical laboratory department, but it was decided to start the training programme from 1-year course in view of urgent need of broad-based technicians in clinical laboratory. The period of education would be extended in the near future. In consideration of the possible future extention of the education period, the number of students has been decided to be 40, although 50 was proposed in the beginning.

o Operation Theater Technician
(Number of students: 10, Period: 1 year)

The primary function of operation theater technicians is to assist surgeons and nurses in the operation theater. Provision of this course of study is reasonable in order to cover the shortage of the

nurses. The number of students was originally proposed to be 20, but it has been reduced to 10 in consideration of that the function of this occupation is auxiliary to the nurses and that the time of field training for this occupation will be restricted by the field training of the nurses.

o X-ray Technician
(Number of students: 20, Period: 1 year)

In Japan, qualified X-ray technicians are supposed to have finished a 3-year course of study in the diagnosis and treatment radiology science, although the course was the 2-year course previously. In Pakistan, at least two years will be required for the education of the X-ray technicians, since the candidates for the X-ray technicians will be required to pursure basic studies (physics, electric engineering, electronic engineering, cyberhetics, etc.). A reasonable number of students is considered to be 20 due to the efficiency of the education and the utility of the expensive equipment. However, the period of schooling will have to be extended to 3 years in the future, since longer period of schooling will be necessary for the students when field training for radiography and the uses of radioisotopes are added to the present course of study. IHC is provided with a complete set of radiography equipment. It is expected that this equipment will be used effectively for the training of these X-ray technicians.

o Physiotherapist (PT)
(Number of students: 20, Period: 3 years)

In Pakistan, physiotherapists provides their services to those who have been injured, or suffering from the chronic diseases, polio, Parkinson disease, cerebnalvascular accidents, congenital deformity, etc. At present, the education of physiotherapists is carried out at JPMC in parallel with the diagnosis and treatment by the physiotherapists. The course of study provided at JPMC has already been extended to 3 years from 2 years, and the education system at JPMC has already been established. Primarily, the physiotherapists are supposed to decide the contents of the treatment and the training programs for the patients based on the diagnosis of the doctors, and thus a 3-year course of study is recommended for the education of the physiotherapists from the beginning.

o Orthopists
(Number of students: 10, Period: 1 year)

The most common eye disease in Pakistan are conjunctivitis and trachoma. Provision of an education system for the orthoptists is necessary not only from its primary purpose but also to cover the shortage of the nurses when carrying out examinations of eyes or the orthoptical training for the patients. This course of study will be started as the 1-year course.

o Dental Hygienists
(Number of students: 10, Period: 1 year)

The dental department at IHC consists of 5 sections, and so the dental department can be considered to be able to provide ample opportunities for field training of the dental hygienists. A 1-year course is recommended for the education of the dental hygienists.

o Dietary Technicians
(Number of students: 10, Period: 1 year)

For education of dietary technicians, 2-year course and 4-year course (for senior dietary technicians) are provided in Japan, however, special course for the dietary technicians for the hospitals is not provided. Based on present practice in Japan the necessity of providing the dietary technician education course in the paramedical school may arise, but the necessity of the special dietary technicians for the hospitals is being recognized in Japan also. The necessity of the dietary technician education course can be justified not only from the fact that hospitals are short of the dietary technicians but also because considerable number of children are undernourished, and also considerable number of adults are suffering from diabetes and atherosclerosis in Pakistan.

o Medical Electronics and Engineerings (ME) Technicians
(Number of students: 5, Period: 1 year)

In developing countries, the medical equipments are not necessarily used efficiently due to inadequate maintenance and servicing. In Pakistan, there is the necessity for the education of the medical electronic and engineering specialists, since there is demand for such specialists familiar with the constructions and functions of various medical equipments, capable of providing the repair services, and can

be converted to the specialists for the CCU and dialysis when necessary. The number of students is limited to 5.

The provision of the following four courses of study at the proposed College and Institute are suspended:

o Speech Therapists

The course of education for speech therapists is provided as a 4-year course in Japanese universities. In order to be qualified as a speech therapist, the student is required to complete the basic courses in linguistics, phonetics, psychology, kinesiology and neurology. In consideration of the objective of the proposed College and Institute, we have concluded that the provision of the course for the speech therapists is beyond the capacity of the school at this stage.

o Coronary Care Technicians

The primary function of this occupation is to perform the clinical physiological examination in CCU, and to assist doctors and nurses. The function of this occupation can be replaced with that of the Broad-based Technician. Pakistan is said to have 20 ICU/CCU with 430 beds in total, but we concluded that provision of the course for the coronary care technician is too early.

o Audiometricians

The function of this occupation is not only too specialized (the clinical examination of the hearing sense) but also can be replaced with that of the broad-based technician. If the scope of the service is expanded to include nystagmography, this requires the candidate for the audiometrician to complete the basic courses of electric engineering, electronic engineering, physiology and neurology, and these courses of study cannot be completed in 1 year.

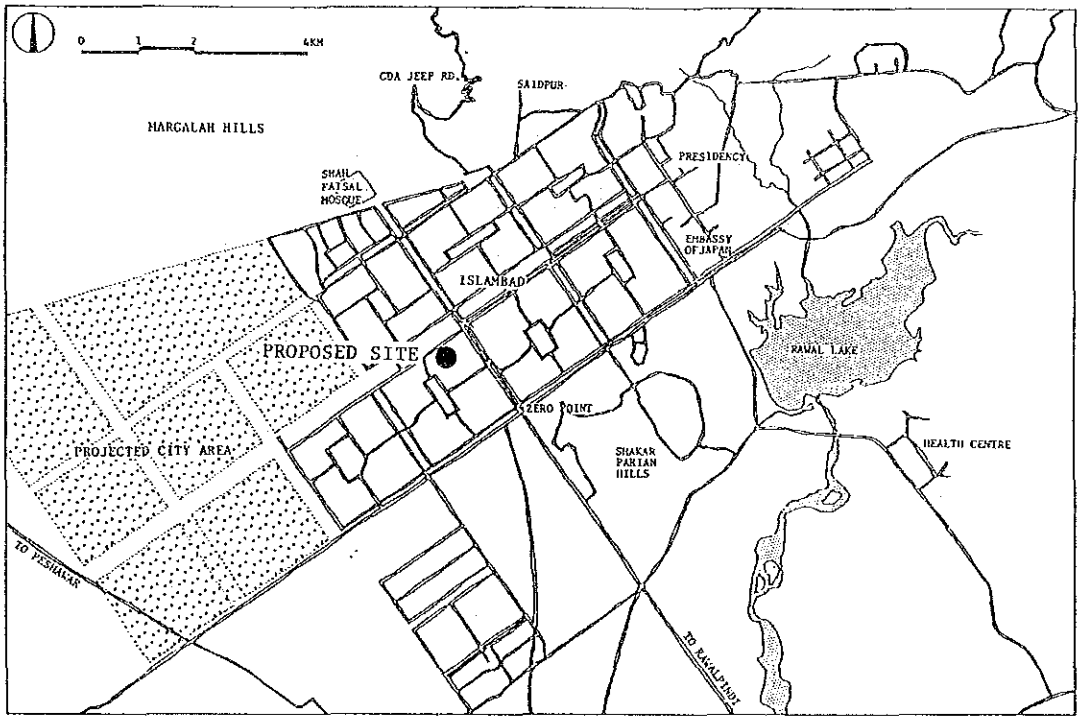
o Dialysis Assistants

In Pakistan, there are 7 kidney disease treatment centers with 186 beds in total. A considerable number of people seem to be suffering from kidney disease. At present, haemodialyisis is not conducted for the patients with chronic renal failure. Thus, the priority of the education should be given to that of the specialists in other paramedical fields.

3) Curriculum

Consideration of details of the curriculum is currently in progress. As the method of teaching, the time will be shared equally between the lecture and the practical training, and model rooms for the practical training will be provided in the College and Institute so that the students can experience the field training in the model room as far as possible in order to enable the concentrated training that is sometimes difficult in the actual practical training in the hospital, since some of the courses of study are concerned with the treatment of the serious cases requiring careful service. The qualification examination after graduation will be given by the Pakistan Nursing Council (PNC) and Punjab State Medical Faculty.

PROPOSED SITE



CHAPTER 4. OUTLINE OF THE PROJECT SITE

4-1 Proposed Construction Site

The proposed site for the College and Institute is located within IHC, G8/3, at the center of the urban planning area of Islamabad, and occupies the marginal northwestern part, the educational area of IHC. The site is adjacent to the postgraduate medical college which is also expected to be constructed.

4-2 Site Condition

The proposed site consists of a rectangular lot about 120m long from east to west and about 90m long from north to south, which is slightly inclined towards west and south. The proposed site faces three 7m wide roads, along its south, north and west sides. There is a huge old tree which is 30m in diameter, 20m in hight, and this tree is to be retained.

The land is possessed by MOH, and the complex is surrounded by the fence, and it is accessible only through the main entrance and the east entrance. The security in the city of Islamabad is quite good, and thus no gatekeepers are posted at the IHC site.

As for the IHC site, soil surveys have already been completed, the results of these survey indicate that the northeastern part of the IHC site has a satisfactory bearing capacity.

4-3 Existing Infrastructure

1) Roads within premise

Of the three roads of 7m adjacent to the proposed site, and the roads along north and west sides have been paved provisionally. The final paving will be made when this construction work is completed, since there is the possibility of damage due to the traffic of the construction equipments and vehicles.

2) Supply and drainage of water

According to the master plan, the city water will be introduced into the four elevated water tanks in IHC and supplied to various users. Installation work for the city water pipes has already started.
The drainage system will be divided into the rainwater, sewage and waste water. The drainage system of the College and Institute can be connected to these drainage systems.

3) City gas

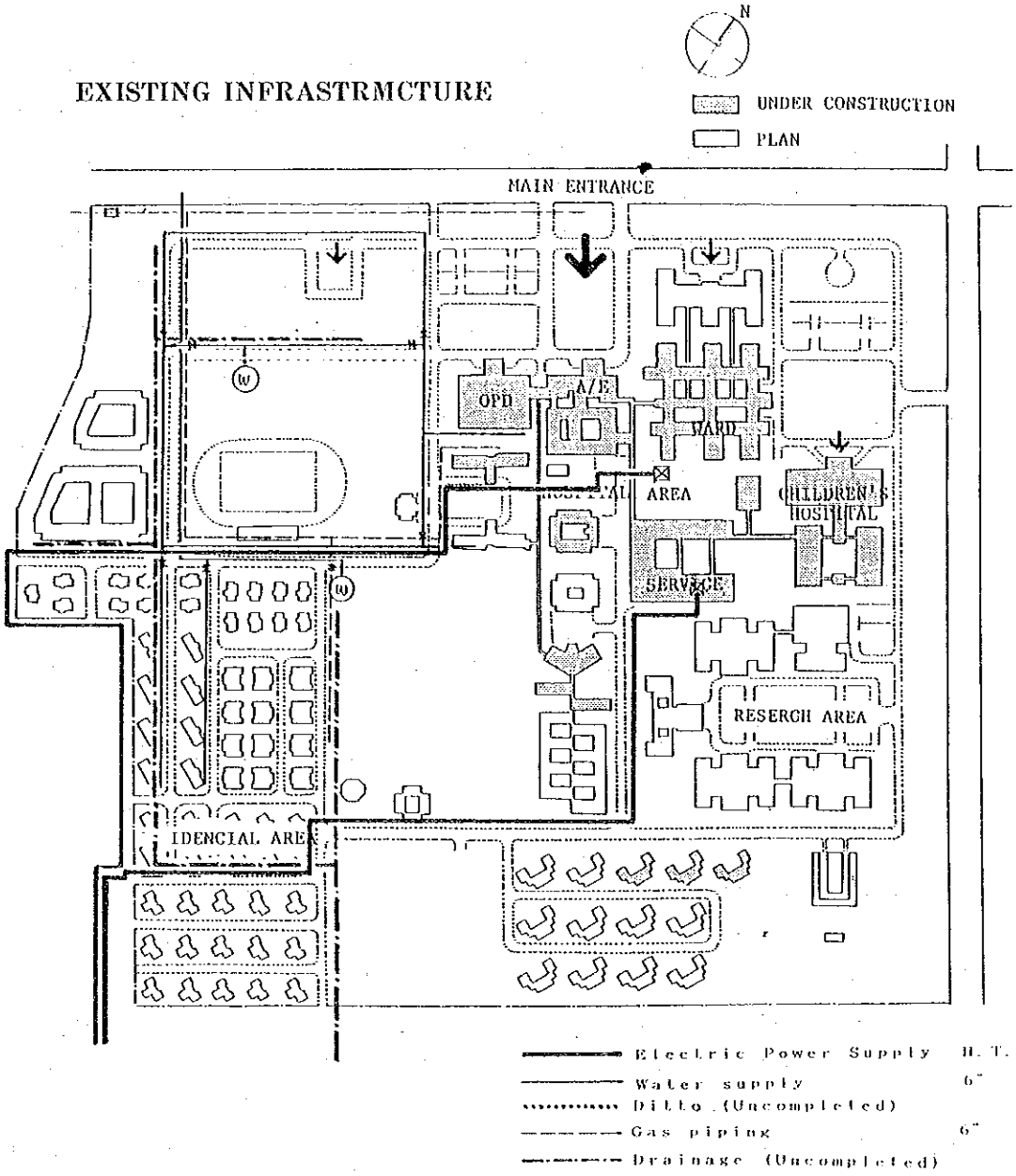
Natural gas is one of the most inexpensive sources of energy in Pakistan, and it is important as the source of energy for heating in Islamabad, where the temperature frequently falls below 0°C in the wintertime. According to the proposed plan, the city gas supply pipe will be laid along the western road in IHC.

4) Power supply system

Five substations will be provided within IHC, and 3-phase 400V and single-phase 230V power will be supplied from the substation at the southern end of the proposed site. Short power failures occur frequently in Islamabad, but the emergency power source is not required judging from the nature of the facilities. As for the voltage fluctuation, proper protective device should be provided for the educational equipments.

5) Telephone system

It is necessary to decide whether the telephone line should be taken from the main building of IHC or should be installed an independent telephone line. For the provisional telephone system, the line can be taken from the line installed along the main road of the north side of IHC.

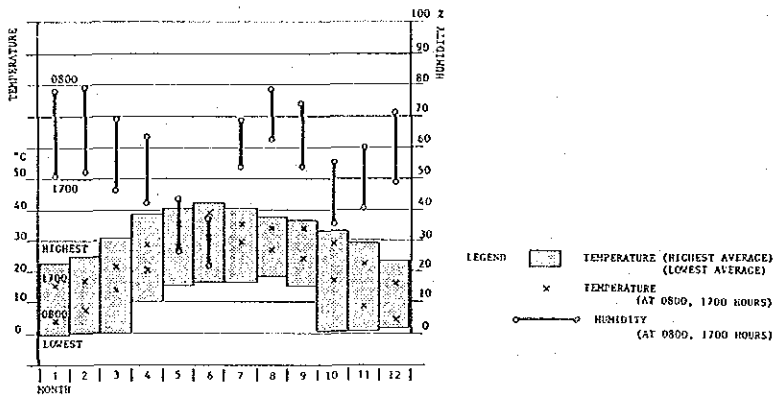


4-4 Climate condition

In Islamabad, the temperature in the summertime (May to July) rises up to 42°C. In July, sandstorms attack the city. The rainy season (July to August) starts after the sandstorms. In September, the fine weather continues. During the wintertime (December to February), weather during the daytime is comfortable, but the temperature during the nighttime frequently falls to - 2°C, and heating devices are needed.

Under these conditions, in designing the buildings, adequate consideration should be given to make the interior comfortable throughout all seasons. For example, the rise of temperature during the summertime may be reduced by providing high ceilings and efficient ventilation devices, while the fall of the temperature in the building may be reduced by providing the effective heat-insulating measures. Furthermore, measures to prevent airborne sand from entering into the building should be taken. Wind blows constantly from the northeast or the southwest.

CLIMATE CONDITION IN ISLAMABAD



4-5 Building Code

The proposed site is located in the capital planning area, so that MOH, as the owner of the buildings, is required to submit an application for the approval of the construction to Capital Development Authority (CDA). Furthermore, it is required to have the designs approved by CDA, since the building standards for construction other than residences and commercial facilities are not fully established.

CHAPTER 5. BASIC DESIGN

5-1 Basic Design Criteria

The College and Institute functionally consists of a postgraduate school for the nurses and a training school for paramedics, and inbetween, the administrative and the welfare department.

The College of Nursing, has highly specialized characteristics at it is expected not only to provide intensive courses of study to students enrolled in the school but also to conduct seminors and lectures for others, and so intended by the Government. These two schools differ in that the former is for the nurses who are mostly women, and the latter is for paramedics who are mostly men. Besides, the two schools differ as to the level of education and the range of the age of the students. Thus, basically it is desirable to separate the facilities of the two schools because of the above mentioned differences. Nevertheless, some of the facilities such as the physical and chemical laboratories and the model rooms can be used in common, and thus these facilities are recommended to be located where common use is possible.

1) Lighting, ventilation and related devices

The building will be constructed so that its longitudinal side extends from east to west to enable the natural lighting and natural wind ventilation from south and north directions. Natural lighting will be utilized as much as possible, though, the sunlight will be adjusted by the louvers and eaves to keep the interior comfortable.
The electrical lighting and mechanical ventilation systems of the building will be simplified as far as possible. Ceiling fans will be provided for auxiliary ventilation in the summertime, and the clean gas-heating devices and hot water heating devices are recommended in the wintertime, since the heating by the natural gas is advantageous for economy, safety and ease of operation.

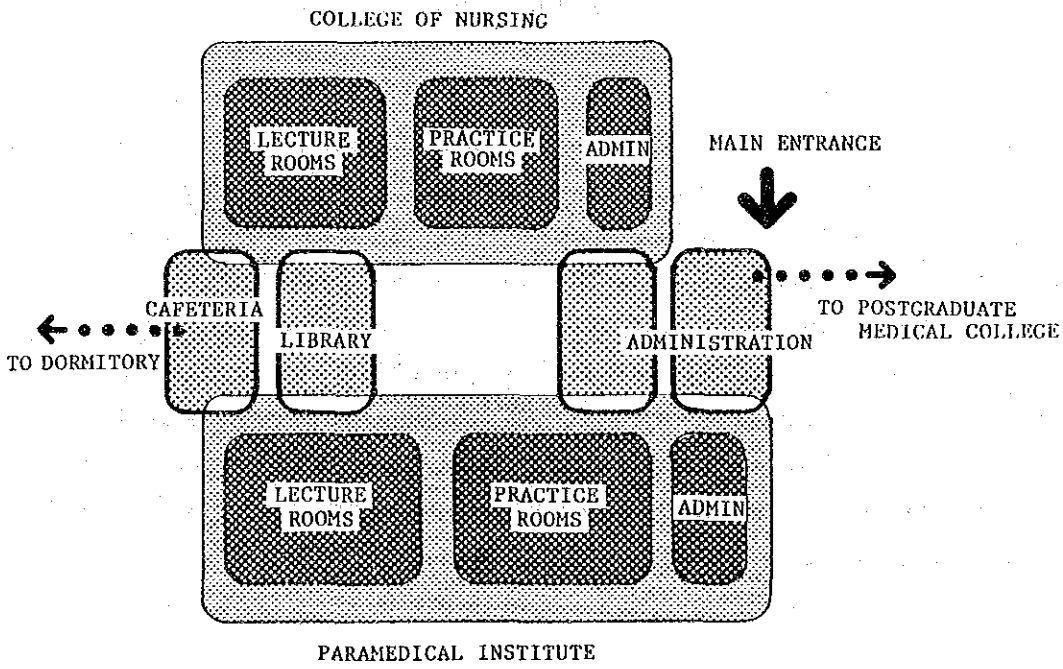
2) Design

The College and Institute and the future Postgraduate Medical College constitute the major part of the educational area in IHC, and stand facing the main gate of IHC. In designing the College and Institute, considerations must be given so that the new building will match other buildings composing the educational area as well as the buildings of the hospital complex.
The College and Institute will be a two-storied building according to the basic guideline of the master plan. The building is desired to be designed partly in Islamic style.

3) Selection of building materials

The local building materials will be used as far as possible in order to realize acceptable construction costs and ease of maintenance, but the purchasing schedule for the local materials matching with the execution schedule of the construction work should be done prior to the start of the construction work, since there is the possibility that the smooth supply of local materials is not necessarily assured.

FUNCTIONAL RELATIONSHIPS



5-2 Required Functional Elements and Facilities

The proposed College and Institute consists of three major functions; the administrative, the educational and the welfare. Of these functions, educational functions are divided into those related to lectures and those related to practical training.

Administrative functions will be required for both the College of Nursing and Paramedical Institute, and the administration department is supposed to facilitate communication between the two schools and to administrate their activities. The administrative department will comprise the principal's room, vice principal's room, instructors' room, office room, meeting room, board of examination room (to be located in the central area), office for administration, library, reference room and large lecture hall which will be used for the entrance ceremony, graduation ceremony, large-scale lecture and short-term training course, and the administrative function is expected to facilitate the smooth and efficient activities of the system as a whole.

The educational function and system is required to have flexibility for the use of the facilities so that it will be able to adapt to the various forms of education and to cope with increases or changes in the curriculum which may occur in the future. In post-graduate education of the nurses, the education frequently will take the form of the seminar by a small number of students instead of the ordinary lecture form. The demand for classrooms with the overhead projectors and audio-visual equipment including video-tape recorders is increasing.
When the practical training is carried out in the hospital, there is the possibility that the normal practice in the operation theatres, ICU and CCU in the hospital will be disturbed by the training students. Aimulation facilities will be necessary depending on the content of the practical training. Also, as the form of the practical training varies depending on the courses of study, the separate training rooms will be provided for different courses of study in addition to the lecture rooms.
IHC has already reached the comissioning stage, and is expected to function as a training hospital. Training of the students is largely

dependent on IHC's activity, so that the early start and the smooth operation of the whole organization of the hospital are urgently desired.

The College and Institute expect to enroll students from various parts of the country, and the construction of the dormitory for the students will be necessary since appropriate accommodations are not available on the Hospital campus. Also, it would be appropriate to have the residencial accomodation for students simultanuously ready for all type of courses to be conducted in College and Institute. It is desirable to open the part of dormitory to the attendents of short-term courses and seminars for efficient utilization of school facilities.

5-3 Layout Plan

According to the master plan of IHC, the educational area consists of the proposed College and Institute and the Postgraduate Medical College. The entrance to the educational zone faces in same direction as the main entrance to the hospital, and large number of the outpatients will be accepted daily as a comprehensive hospitalis. Thus, the entrance to the educational zone should be provided separately from the hospital entrance so that the educational zone can be free from heavy traffic of the people and the noise, and a quiet educational environment can be created.
The auditorium to be constructed as a facilities to be affiliated to the Postgraduate Medical College is intended for the common use with the College and Institute, so that a connecting corridor will be provided in the future between the College and Institute and the auditorium, and traffic of the students between the two schools will be possible.
The on-the-job training of the nurses and paramedics is expected in IHC, the connection between the College and Institute and the Hospital is essential.

The College and Institute will be constructed so that the natural lighting will be taken from north and south directions. Various

measures for sunlight control and the measures for prevention against noise by outsiders will be provided. Natural ventilation and natural lighting will be utilized as far as possible so that the facilities can be used functionaly and effectively. The existing old tree will be used as a landmark. The court yard surrounded by the buildings shall create an independent desirable environment for the education.

The dormitory for the students is recommended to be located at the western end of IHC. The dormitory for the nurses is recommended to be separated from the dormitory for the paramedics, as the nurses and paramedics differ as to the sex and the age. The dining rooms for the nurses and the paramedics will be provided separately and the meals will be prepared in separate kitchens.

5-4 Facilities Planning

The plans for the principal facilities are as follows:

1) Administration Block

The board of examination office and the common office will be located adjacent to the lobby. A large lecture room which can accommodate 200 people will be located on the first floor. This lecture room is intended for the multi-purpose use such as those for the short-term courses provided to the outsiders, entrance ceremony, graduation ceremony and common use by both schools.

2) Education Blocks

Education Block-1 will be used for the postgraduate education of the nurses, and Education Block-2 will be used for education of the paramedics. The administration office, director's office, office of vice director and meeting rooms will be located adjacent to the entrance of the ground floor of each block. Practice rooms which require water supplies and drainage systems will be located collectively on the ground floor in order to ease maintenance and to prevent the spread

of noise and odor. Lecture rooms will be located collectively on the upper floor, so that they can be used for various purposes such as the joint conference and the seminars as well as for common use by different courses. The audio-visual rooms, product and preparation rooms and instructors' rooms are also located on the upper floor.

3) Library Block

The machine room and the cafeteria will be located on the ground floor. The dormitories are accessible through the central passage of the building. The library will be located on the upper floor, and will opened for nurse students and students learning paramedical courses.

4) Dormitory

According to the master plan of IHC, the dormitories are supposed to be built as two-storey buildings. In principle, the dormitory for the nurse students will be provided with the two-bed rooms with showers which is the same size and facilities as existing nurses' hostel in IHC, and the dormitory for the paramedics will be provided with four-bed rooms and the public showers and toilets.
As for the number of the rooms, almost all the nurse students will be given a bed in the dormitory. About 70% of the paramedical students will be given a bed in the dormitory because the number of paramedical students from Islamabad and Rawalpindi will be large.

5-5 Scale of Facilities

The content of the floor area of each department is as follows:
This floor area is subject to alterations resulting from the detailed examination.

1) Administration Block

Room name	Room area (m^2)	Capacity (person)	Remarks (m^2/person)
Office (for general registration and curriculum)	81	7	11.6
Office (for board of examination)	35	5	7.0
Large lecture room	300	200	1.5
Lavatory	23		
Pantry	12		
Corridor, hall, etc.	801		
Subtotal	1,252		

2) Library Block

Room name	Room area (m^2)	Capacity (peron)	Remarks (m^2/persons)
Library	226	67	4.0
Cafeteria	96	95	1.0
Pantry	23		
Machine room	92		
Corridor, hall, etc.	313		
Subtotal	750		

3) College of Nursing

Room name	Room area (m^2)	Capacity (person)	Remarks (m^2/person)
Lecture room for 25 people	69 x 2	25	2.7
Lecture room for 20 people	52 x 2	20	2.6
Lecture room for 10 people	35 x 4	10	3.5
Practice room Ward	69		
ICU	69		
Museum	52		
Preparation room	35 x 2		
Meeting room	35 x 2	10	3.5
Principal's room	35	2	
Vice Principal's room	35	2	
Administration office	121	17	7.1
Pantry	17		
Audio-visual room	69	20	3.5
Product and preparation room	35		
Instructers' room	138	20	6.9
Store	35		
Lavatory	138		
Corridors, staircases etc.	600		31%
Subtotal	1,935		

4) Paramedical Institute

Room name	Room area (m^2)	Capacity (persons)	Remarks (m^2/person)
Lecture room for 40 people	86	40	2.3
Lecture room for 20 people	52 x 5	20	2.5
Lecture room for 10 people	35 x 5	10	3.5
Practice room			
Clinical Laboratory	69	20	3.5
Physiology	69	20	3.5
Physics, chemistry	69	20	3.5
X-ray	104	20	5.2
Physiotherapy	104	20	5.2
Orthoptist	52	10	5.2
Dental Hygienist	52	10	5.2
Dietry Technician	69	10	6.9
Workshop	52	5	10.4
Preparation room	35 x 2 + 18		
Audio-visual room	69	20	3.5
Product and preparation room	35		
Administration office	121	17	7.1
Pantry	17		
Meeting room	35 x 2	10	3.5
Principal's room	35	2	
Vice Principal's room	35	2	
Instructors' room	138	10	7.0
Lavatory	138		
Corridors, staircases etc.	673		26%
Subtotal	2,580		

5) Dormitory

Room name	Room area (m^2)	Capacity (person)	Remarks (m^2/person)
Collage of Nursing			
Private room (2-bed)	13 x 63	2 x 63	9.6
Shower room	7 x 63		
Meeting room	13 x 2	2 x 2	6.5
Office	40	7	5.7
Lounge and play room	81	32	2.5
Study room	40	32	1.3
Dining Room	108	63	1.7
Lavatory	19		
Store	13 x 2		
Kitchen/Office	49		
Store	13		
Housekeepers' room	20		
Corridors, staircases, etc.	846		
Sub total	2,528		
Paramedical Institute			
Private room (4-bed)	27 x 28	4 x 28	6.8
Private room (2-bed)	13 x 8		
Shower room	7 x 8	2 x 8	9.6
Meeting room	13 x 2	2 x 2	6.5
Office	40	7	5.7
Lounge and play room	81	32	2.5
Study room	40	32	1.3
Dining room	109	63	1.7
Lavatory/Shower	157		
Store	52		
Kitchen/Office	49		
Store	13		
Houskeeper' room	26		
Machine room	72		
Corridors, staircases, etc.	854		
Subtotal	2,435		
Subtotal	4,963		

5-6 Element Planning

The determining factors for the building element planning, include selection of the building materials which suit the local weather and natural conditions and the ease of maintenance after completion of the building.

1) Roof

The rise of the temperature of the roof surface causes the rise of interior temperature and adversely affects the waterproof layer. The use of the air-permeable heat-insulating cover for the waterproof layer is recommended. To keep the interior temperature low, high ceiling and the natural and or mechanical ventilation are recommended.

2) External walls

The external walls facing east and west should be provided with small openings so that the direct sunlight in mornings and evenings can be prevented, and these walls should be dual wall to increase their heat-insulating effects. The external walls facing the north and the south will be provided with windows for the natural ventilation, and will be provided with the louvers and eaves to prevent direct sunlight.

Paint on the external wall may discolor due to the high temperature and ultraviolet rays, so that the type of paint should be selected carefully.

The foot of the building is apt to be smudged by the splash of the rainwater, and such problem will have to be solved either by covering the foot area with mortar or by laying the pebbles on the berm around the foot of the building.

3) Interior wall and ceiling

The interior wall should be finished using the hard-to-smudge material or easy-to-clean paint. For ceiling materials, sound-absorbing materials should be used for the lecture rooms. The water-resisting qualities and easy access for inspection are required for the ceiling materials in the lavatory and kitchen.

4) Flooring

For the open corridor, waterproof measures shall be provided to prevent the rainwater from entering the interior corridor. Chemical-proof and washable materials should be used for flooring in the laboratories. Use of sound-absorbing materials such as carpeting is desirable for flooring of the library, but the material should be selected in consideration of cost and ease of cleaning.

5-7 Material Planning

The College and Institute is an educational facilities to be used by numbers of people, so that the building materials should be of high durability. Local materials should be used as far as possible for the reduction of the construction cost and the ease of maintenance unless the quality and quantity of the materials are below the required standards.

1) Structural materials (Main structural materials)

Column, beams, floor slab, staircases:	Reinforced concrete
Walls:	Brick laying

2) Exterior finishing materials

Roofing:	Double-structure roof using heat-insulating materials
Exterior:	Mortar with paint finishing, Exposed concrete, Washed terrazzo
Fittings:	Aluminum and steel fittings
Eaves:	Reinforced concrete

3) Interior finishing materials (Main rooms)

COLLEGE AND INSTITUTE

Section	Flooring	Wall	Celling
Lecture room	Plastic tiles	Mortar VP	PB EP
Training room	Vinyl sheet	Mortar VP	Exposes concrete putty-finished EP
Administration office and Instructors' room	Plastic tiles	Mortar VP	PB EP
Large lecture room (200 seats)	Plastic tiles	Sound-absorbing brick wall	Rock wool acoustic tile
Audio-visual room	Plastic tiles	Same as above	Same as above
Lavatory	Round mosaic tiles/Vinyl sheet	Pocelain tiles	Flex. B EP
Library	Vinyl sheet	Mortar VP	Rock wool acoustic tile
Corridor	Vinyl sheet	Mortar VP, partially Washed Terrazzo	Exposed concrete putty-finished EP, partially PB EP
Hall	Terrazzo blocks	Mortar VP, Washed Terrazzo	Exposed concrete putty-finished EP, Rock wool acoustic tile

DORMITORY

Section	Flooring	Wall	Celling
Private room	Plastic tiles	Mortar VP	Exposed concrete putty-finished EP PB EP
Lavatory	Round mosaic tiles	Porcelain tiles	Flex. B EP
Corridor	Plastic tiles	Mortar VP	PB EP
Lounge	Plastic tiles	Mortar VP	Rock wool acoustic tile

Remarks: PB Plaster Board
VP Vinyl Emergeon Paint
EP Acrylic Emergeon Paint
Flex. B Flexible Board

FIG.1 GEODYNAMICS OF PAKISTAN

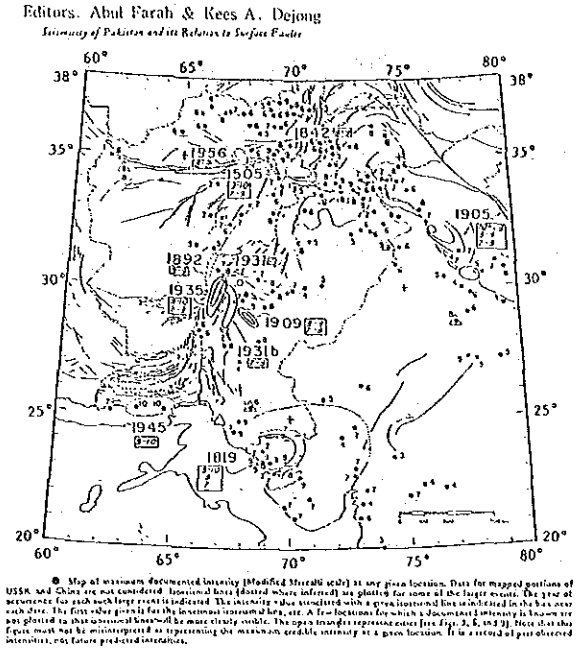


FIG.2 A-MAX FOR RETURN PERIOD TR=50 YEARS

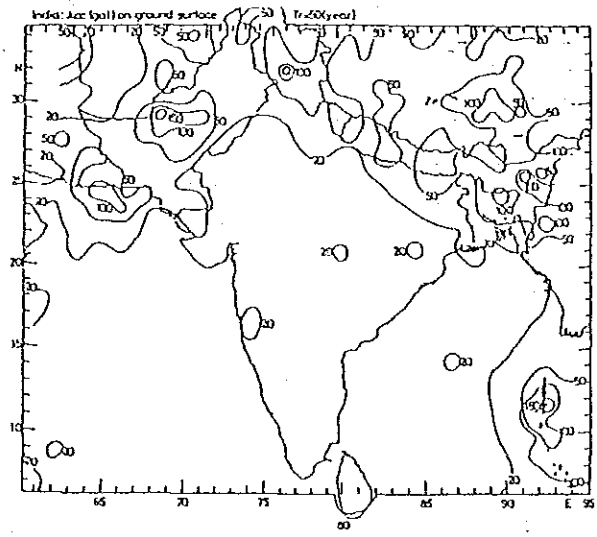
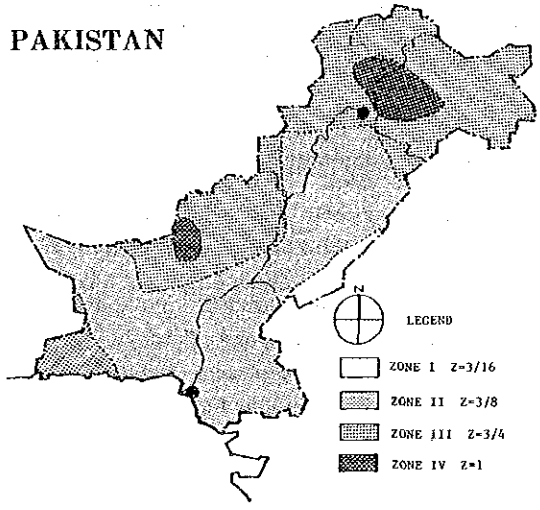


FIG.3 SEISMIC ZONE IN PAKISTAN



5-8 Structural Planning

The Islamabad Building Regulations, established in 1963, are based on the former BS. construction design standards, and recently, US standards have been partially adopted as construction standards. In this project, US Building Code Requirements for Reinforced Concrete (ACI-318-82) will be used as the construction design standard.

1) Loads

The live load to be adopted is as follows:

Class room	300kg/m^2
Office	250kg/m^2
Meeting room and hall	400kg/m^2
Machine room and corridor	500kg/m^2
Dormitory rooms	200kg/m^2

In case of two-storey reinforced concrete building, it is not necessary to take wind loads into consideration.

2) Seismic force

In Pakistan, establishment of the seismic design standards is now being examined. At present, the disigner uses an adequate seismic design according to his engineering judgement.
In this project, the following seismic forces were obtained with reference to the earthquake activities in the surrounding countries:

- The seismic intensity distribution diagram recorded in various regions in this country indicates, the maximum modification merical scale intensity as 6-7, and the maximum acceleration on the ground is 20-100 gal. (See Fig.)

- The seismic risk map prepared by Dr. Hattori indicates, the maximum acceleration on the ground expected near this site for the return period of 50 years as 20-50 gal. (See Fig.)

o From the above estimations, the basic share coefficient on the ground is estimated as follows:

$$Cb = \frac{20 - 100}{980} \times 2.5 = 0.051 - 0.250$$

o Another seismic risk map indicats the Cb value near this site to be as follows: (See Fig.3)

$$Cb = \frac{3}{4} \times 0.1 = 0.075$$

In this project, the Cb value is regarded as 0.1 according to the above mentioned various values.

3) Soil Bearing Capacity

According to the results of the soil survey made over the IHC site, the surface of the ground is covered with a clay silt layer containing coarse sand, and the N value by the standard penetration test is about 30. It is reasoned from these values that the design soil bearing capacity is 5-10 t/m^2. A direct foundation is adopted with the assumption that the design soil bearing capacity is 10 t/m^2.

4) Materials and Construction Method

The principal structure of this project will be reinforced-concrete in view of construction costs. The following policies are adopted for the structural materials.

o Concrete aggregate

Fine aggregate and river sand in Punjab and Sind province can be used. For coarse aggregate, the supply cannot meet the demand, and crushed stone may be obtained instead.

o Cement

Cement is produced by the State Cement Cooperation. In recent years, production ability for cement has improved. Cement is being produced according to the British Standards with good quality, so cement will be procured in Pakistan.

o Reinforcement

Both deformed bars and round steel reinforcements are produced in Pakistan. However, the supply is insufficient and the quality is not uniform. In addition, in this project, the construction period is limited, therefore imported steel bar will be used. The type is hot rolled bar steel, SD30.

5-9 Mechanical Planning

1) Air-conditioning System

To cope with the rise of temperature in the summertime, the natural ventilation will be planned as far as possible to conform with the building plan. if air-conditioning is required, adequate consideration should be given to cost factors and ease of maintenance. Most rooms should provided with the heaters, as there is snowfall in the winter.

In the College and Institute, the rooms for the Principal and Vice principal, part of the Administration office in administration building, Large lecture hall, Audio-visual room and Library will be provided with air-conditioning systems, while other Offices, Lecture rooms and Laboratories will be provided only with the central hot-water heating system. In the Dormitory, the air-conditioning system will be provided to only the Study room and the Dining room, while the Bed-rooms and the Office will be provided with ceiling fans and individual gas heating using clean' heaters.

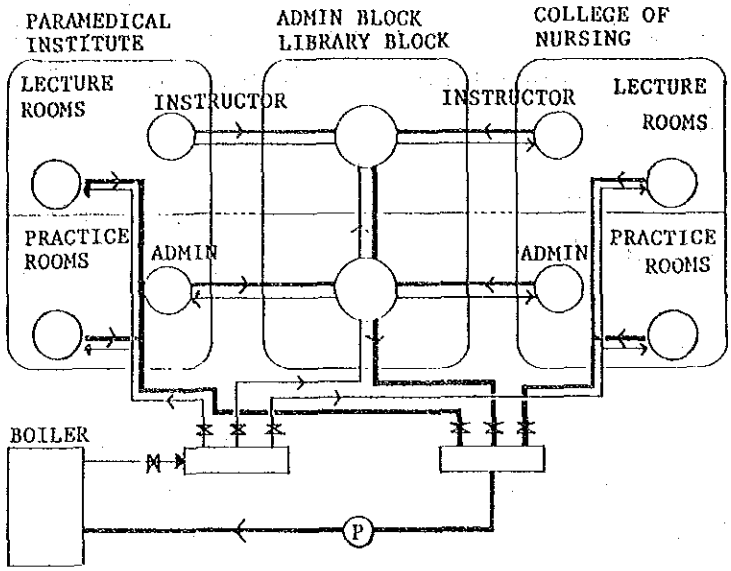
The design criteria for the air-conditioning system is as follows:

	Summertime	Wintertime
Outdoor conditions	43°C, 30%	-2°C
Indoor conditions	26°C, about 50%	20°C

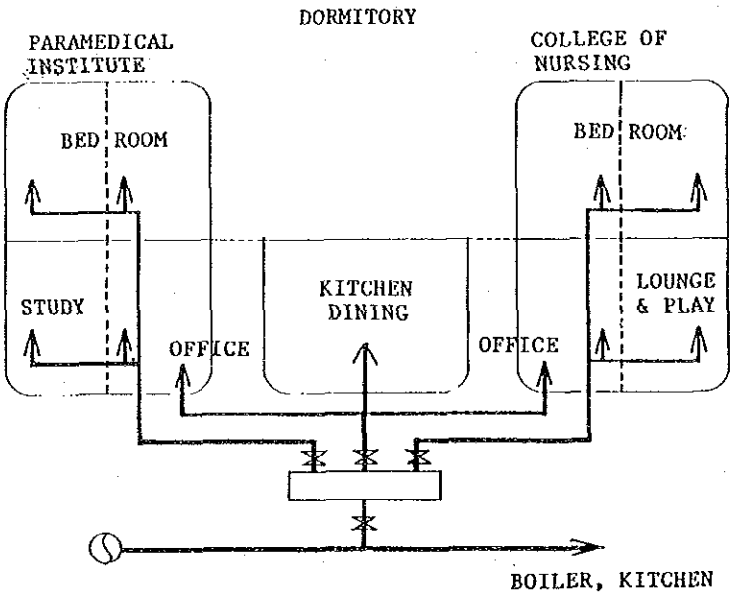
Ventilation of the buildings will be made by natural ventilation in principle. Mechanical ventilators will be provided for the Kitchens and Laboratories.

Installation of ceiling fans in rooms without air-conditioners will be considered.

HOT WOTER HEATING PIPING LINE



GAS PIPING LINE



2) Water supply

Water will be directly supplied made from the water main in IHC. The water consumption is estimated on the following bases:

College and Institute	
Students and school personnel	489
Visitors and others	111
Total	600 persons
600 persons x 250 ℓ/day.person =	150,000 ℓ/day
Sprinkling, etc.	50,000 ℓ/day
Total	200 m^3/day (8 hrs) = 420 ℓ/min

Dormitory	Consumption (ℓ)
Students and school personnel:	300 persons
300 persons x 250 ℓ/day. person =	75,000 ℓ/day
Sprinkling, etc.	22,000 ℓ/day
Total	97 m^3/day (8 hrs) = 202 ℓ/min

3) Miscellaneous systems

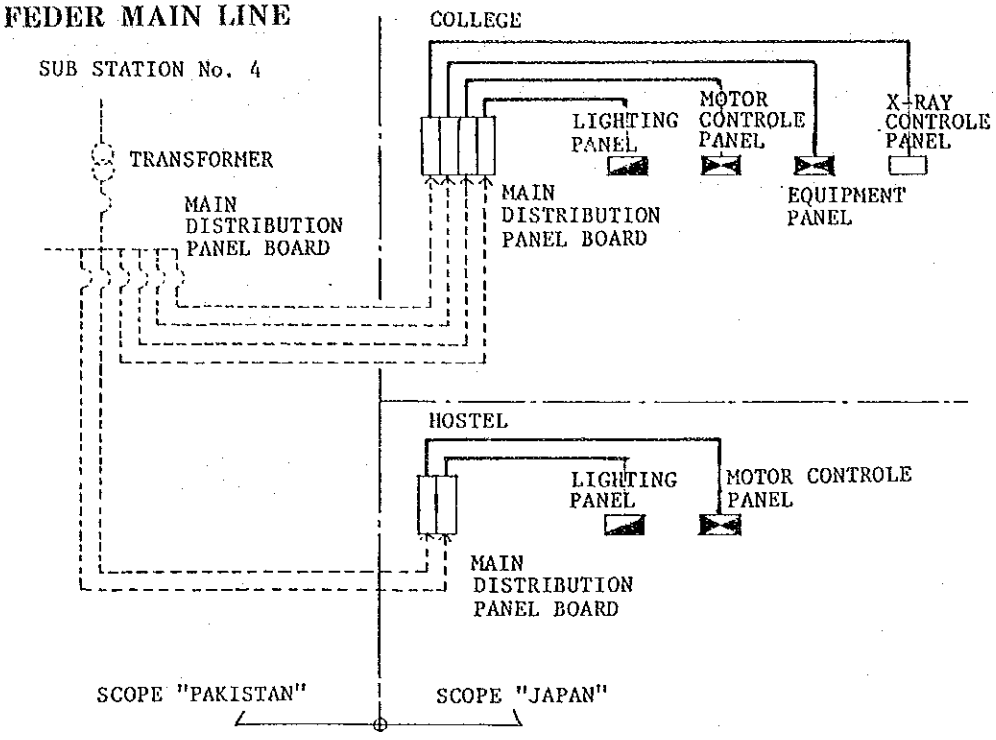
In College and Institute, hot water from the gas boiler will be supplied to the Pantry adjacent to the Cafeteria. In the dormitory, the hot water from the gas boiler will be supplied to the showers and kitchens.

The drainage system will be divided into two for waste water and rainwater.

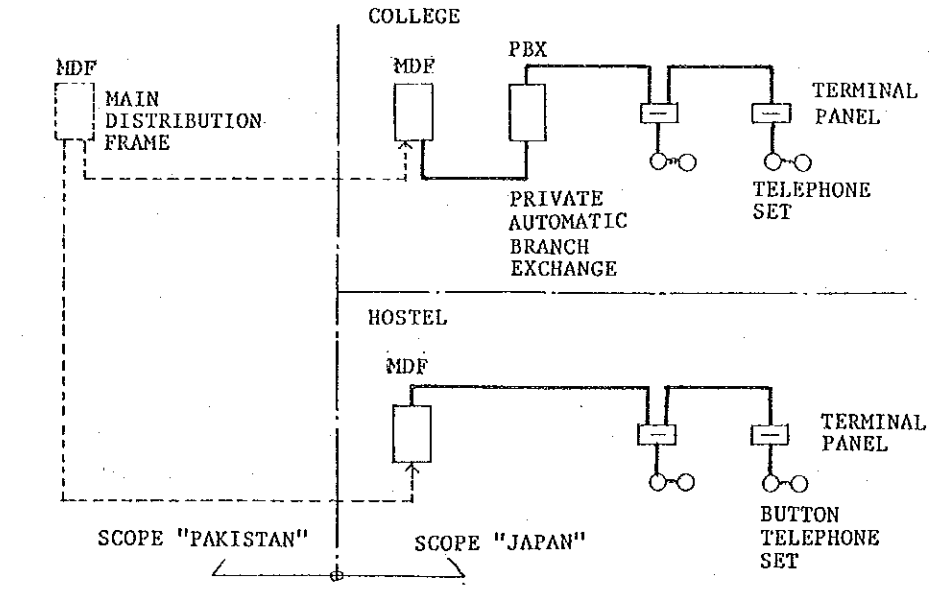
The indoor hydrants will be installed in the sections of the building so that the primary fire-fighting action can be taken at the time of the fire.

The city gas is mainly for boilers for the hot-water supply, the gas heaters in private dormitory rooms, and the kitchen equipment.

FEDER MAIN LINE



TELEPONE MAIN LINE



5-10 Electrical System

1) Basic Equipment

The low voltage power is led from the substation No. 4 which will be constructed by Pakistan adjacent to this building. Pakistan will arrange the cables and wires from the substation No. 4 to the low voltage power-board installed in the electric room in this building. Pakistan should lay the following trunk cables from the substation No. 4 to this building:

College and Institue	2 systems
Dormitory	2 systems

	College and Institution	Dormitory	Total
a) Lighting and receptacles	150kVA	100kVA	250kVA
b) Air conditioning and ventilation	80kVA	20kVA	100kVA
c) Sanitary equipment	20kVA	10kVA	30kVA
d) Practice device (General)	150KVA	--	150KVA
e) Practice device (X-ray)	50kVA	--	50kVA
Total	450kVA	130kVA	580kVA

It is planned that Pakistan will lay 3 telephone circuits from the MFD (COT100/EXT200) in the existing building to the College and Institute, and 2 circuits from the above mentioned MFD to the MFD of each building of the Dormitory.
It is also planned that about 30 extension telephones will be installed in the College and Institute and about 6 extension telephones will be installed in the Dormitory. An exchange system will be used for the College and Institute and the pushbutton telephone system for the Dormitory.

2) General electrical equipment

The distribution voltage is as follows:

a) Lighting and receptacles Load 3-phase, 4-wire, 400/230V

b)	General power Loads	3-phase, 3-wire, 400V
c)	Practical device (General) Loads	3-phase, 4-wire, 400/230V
d)	Practical device (X-ray) Loads	3-phase, 4-wire, 400/230V

To operate the equipment efficiently and to decrease the operation expenses, the direct-mount-type fluorescent lamps will be principally used. The light sources in the principal rooms are as follows:
The lamps can be turned on and off independently.

	College and Institute	Dormitory
Fluorescent lamp	Office, Study room, Lecture room, Training room and Corridor	Bed room, Office, and Dining room
Incandescent lamp	Cafeteria and Audio-visual room	Lounge, Corridor and Entrance hall
Mercury lamp	Outdoor lamp	Outdoor lamp

o Design illumination

College and Institute	
Office, Practice room and Lecture room	350 - 450 lx.
Corridor and Lavatory	100 lx.
Cafeteria	200 lx.
Audio-visual room	300 lx.
Dormitory	
Office	350 - 400 lx.
Bed room	100 - 150 lx.
Dining room	300 lx.
Lounge, and Entrance hall	100 - 150 lx.
Corridor	50 - 100 lx.

Amplifiers will be installed in the College and Institute and the Dormitory respectively to announce the start and the end of the lesson and for communication throughout the buildings. 4 systems are planned. In the meantime, an independent public-address system will be installed in the large lecture room.
A TV antenna will be placed on the roof and a plug socket is installed in the Cafeteria, Lounge, and Audio-visual room respectively.

Emergency bells, pushbuttons and display lamps are installed to indicate emergencies such as fires. The pushbuttons will interlock with the hydrant pumps. The independent panel is installed in the offices of the School and Dormitory to indicate the section where the fire breaks out.
To protect the buildings and the facilities from thunderbolts, a lightening arrester will be installed on the roof.
Outdoor lamps will be installed around the building for security.

5-11 Equipment Planning

In selecting the educational equipments for the College and Institute, consideration was given to the selection of the types which are convenient and easy for the students to understand the basic functions, operation and care in handling, and the mere insistence on the latest models was avoided.

Since this College and Institute are located in IHC, and the students are expected to undergo the field training in this hospital complex, only the equipments which are considered to be essential for the school education will be installed.
The equipments required for the College and Institute are listed in the Annex. The basic criteria for selection are as follows:

- Systematic equipments so that the basic understanding by the students can be facilitated.

- Equipments suited for the local condition and applicable to the actual jobs of the nurses after graduation from the college.

- Equipments which features easy operation, easy maintenance and easy after care.

- Equipment to be well designed in order to meet the needs of students, in case practical training would disturb the daily activity of the hospital.

BASIC DESINGN DRAWINGS

1. Layout Plan

College and Institute

2. Ground floor plan
3. First floor plan
4. Roof Plan
5. Elevation
6. Sectional view

Dormitory

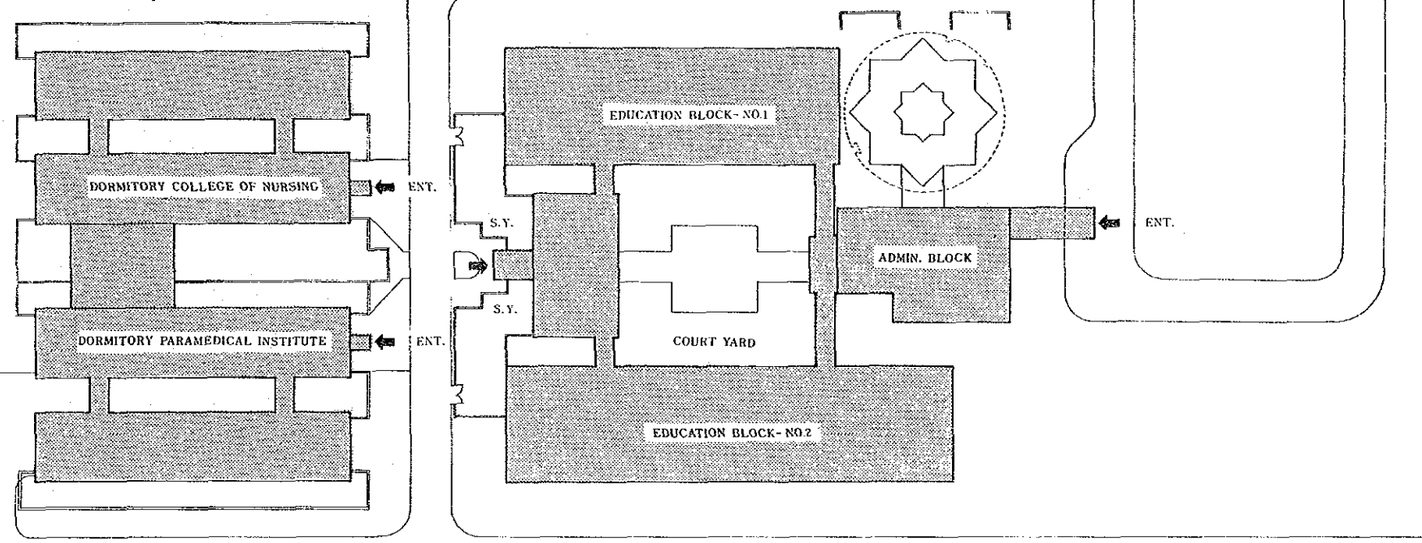
7. Ground floor plan/ First floor plan
8. Elevation/ Sectional view

KHYABAN-E-QUAID-E-AZEN STREET

N

DORMITORY

THE COLLEGE OF NURSING AND PARAMEDICAL INSTITUTE



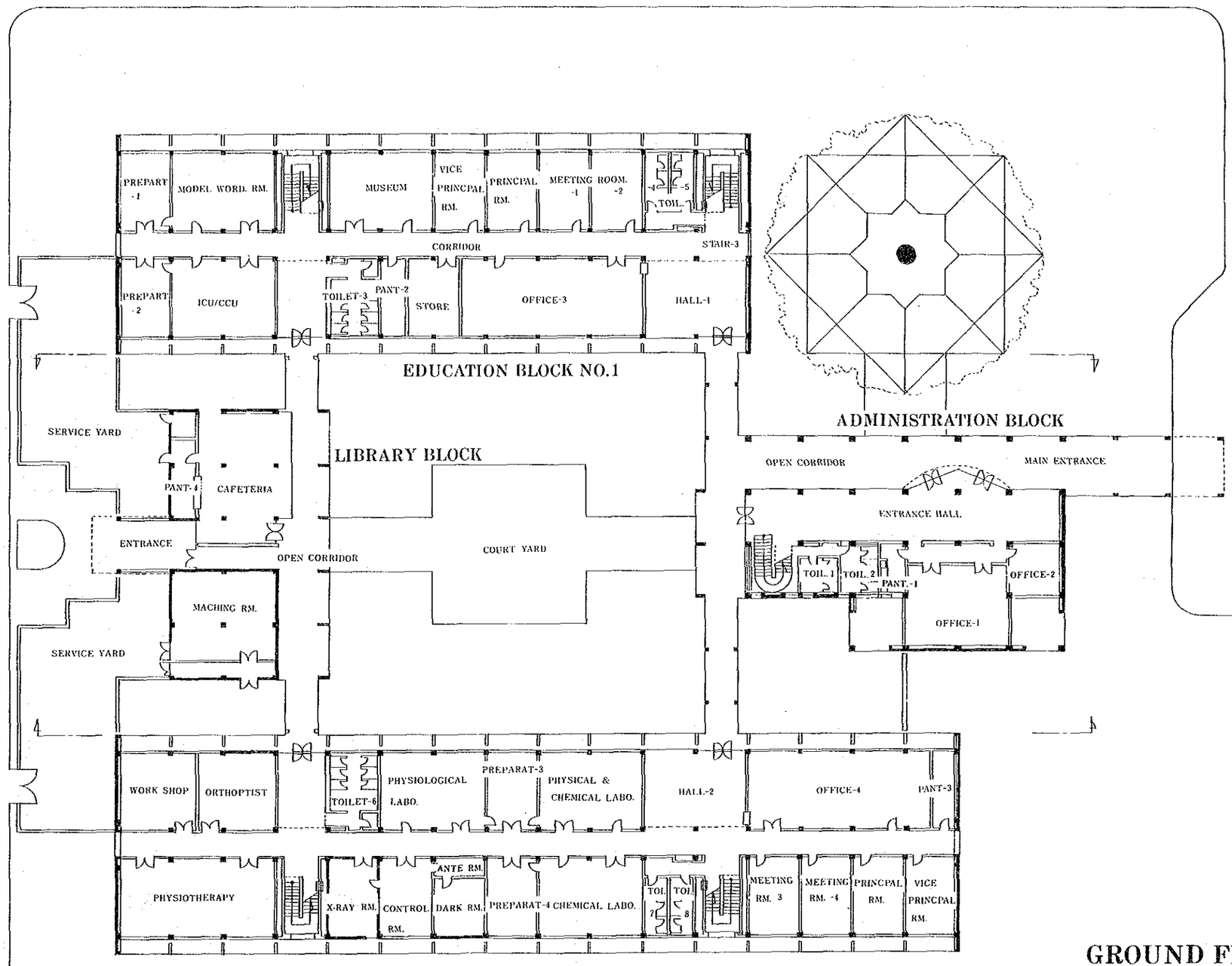
SUB STATION

WATER TANK

LAYOUT PLAN

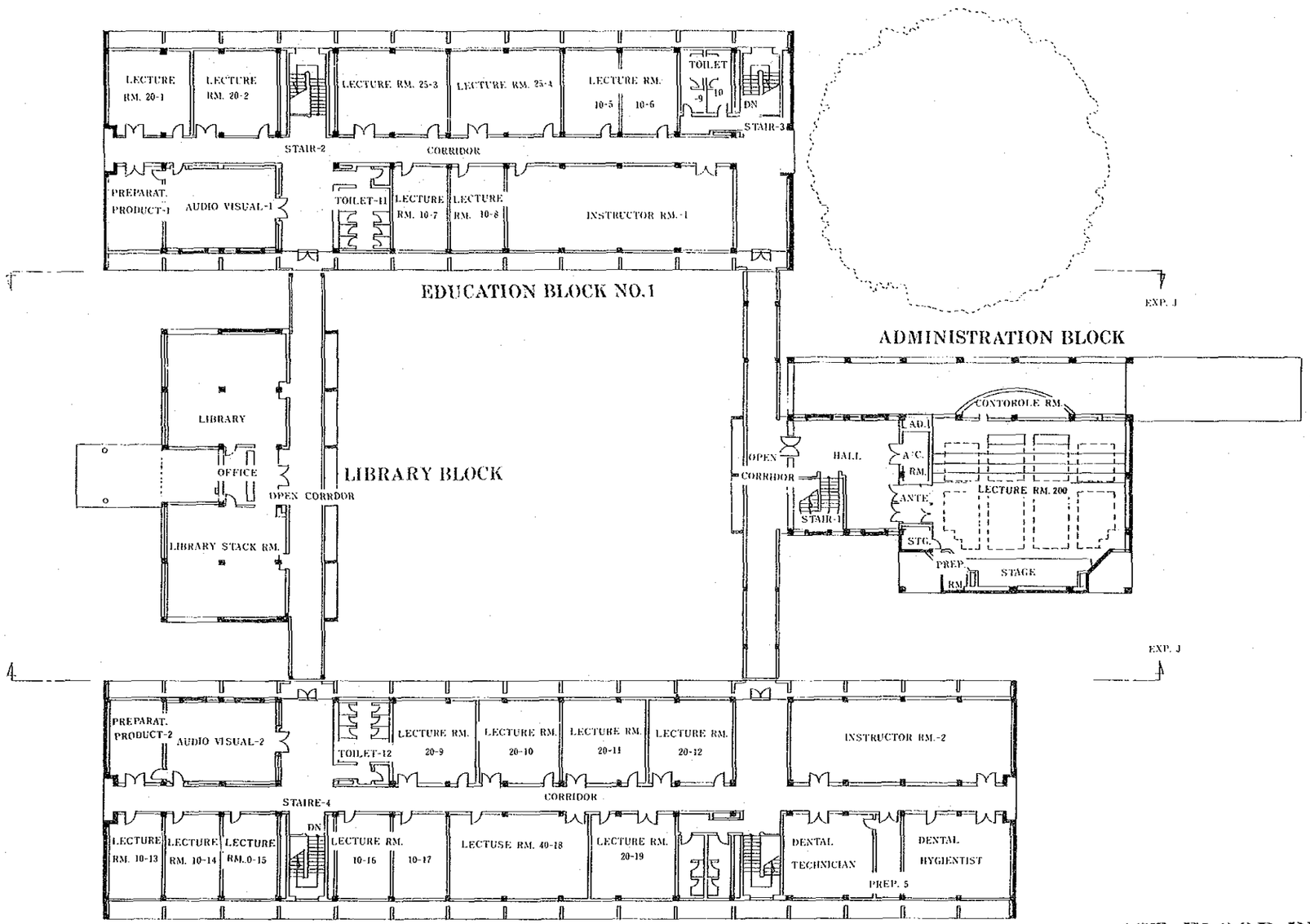
0 10 20 50 100 m

01



GROUND FLOOR PLAN

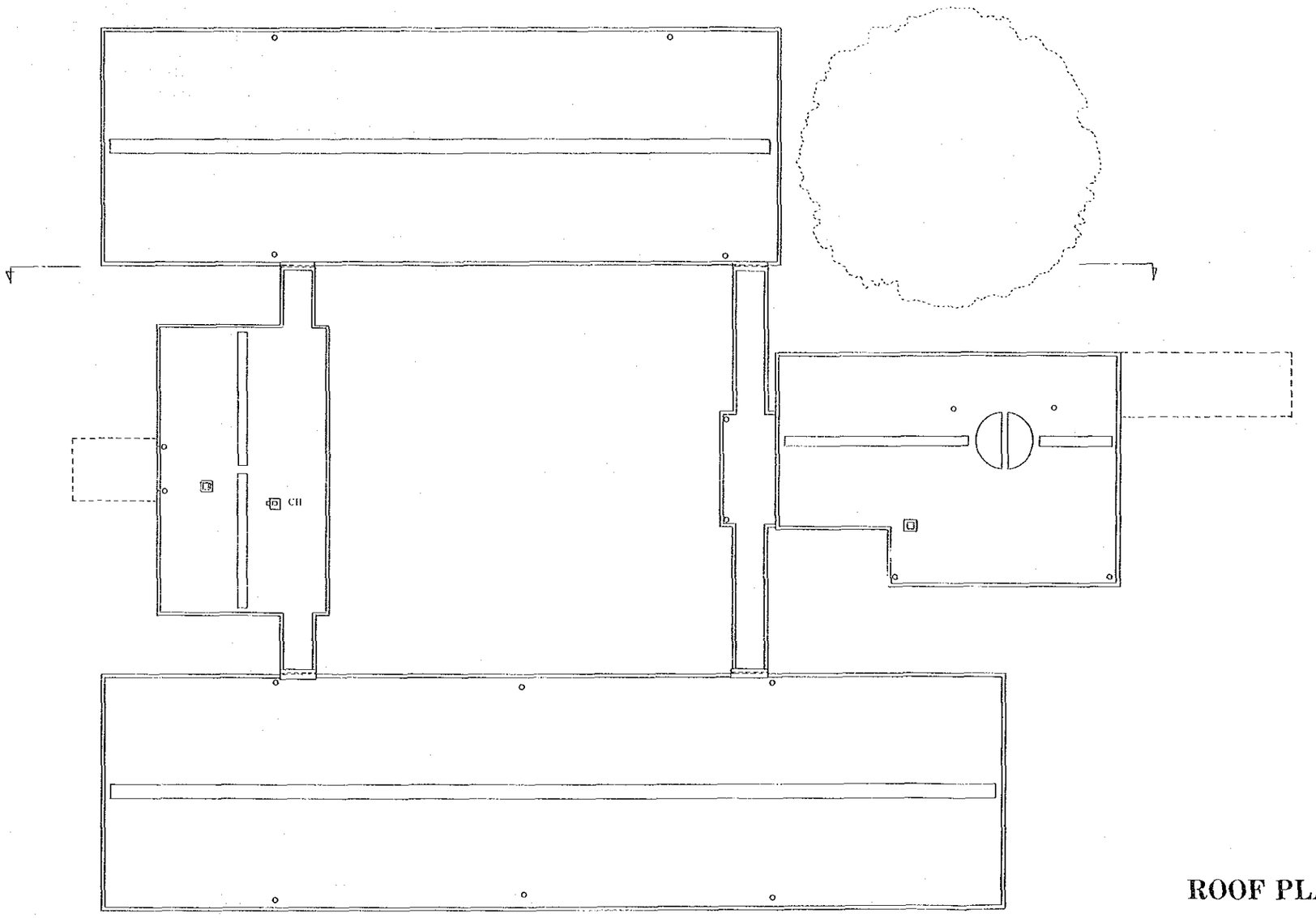
02



1ST. FLOOR PLAN

0 5 10 20 50m

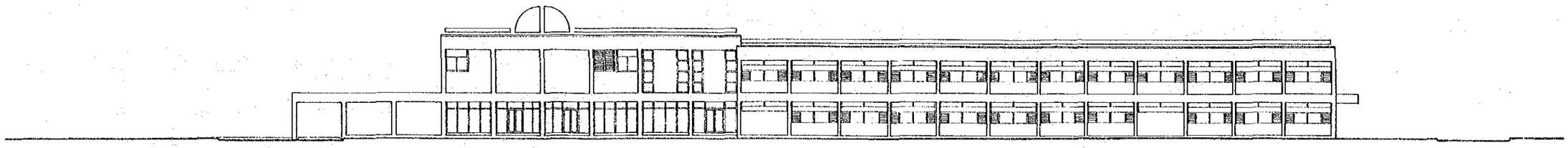
03



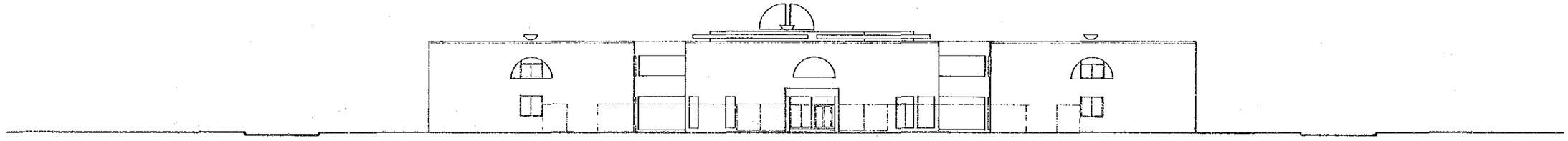
ROOF PLAN

0 5 10 20 50m

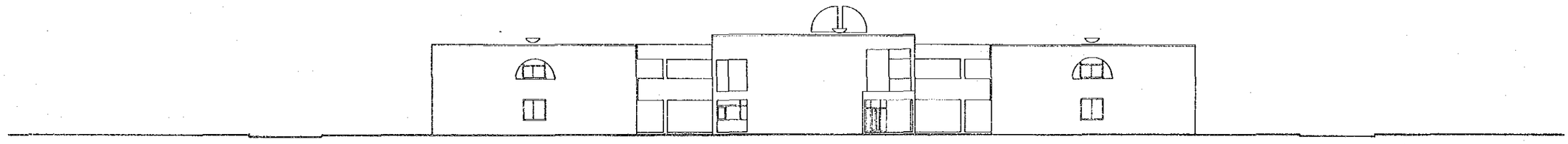
04



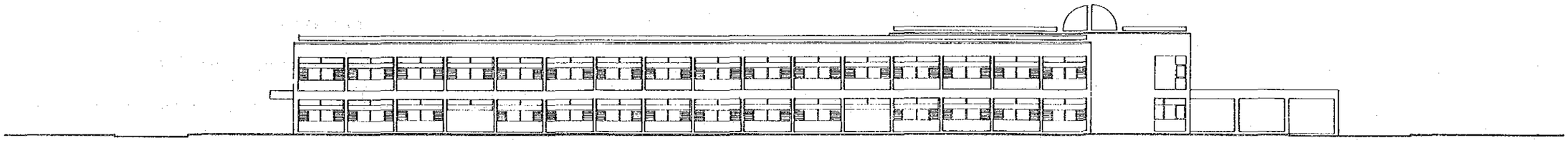
NORTH ELEVATION



WEST ELEVATION



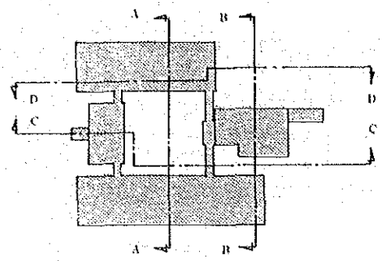
EAST ELEVATION



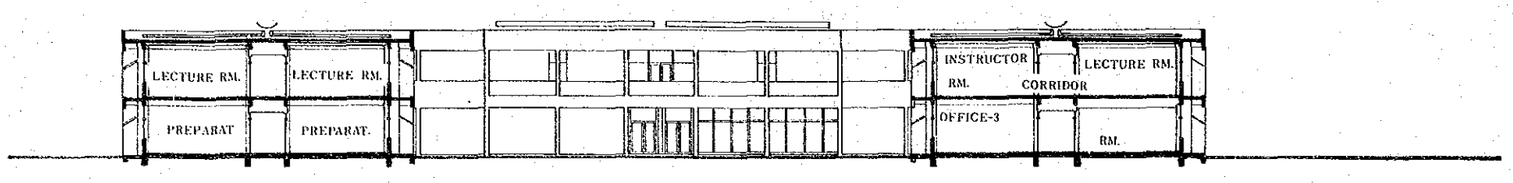
SOUTH ELEVATION

0 5 10 20 50m

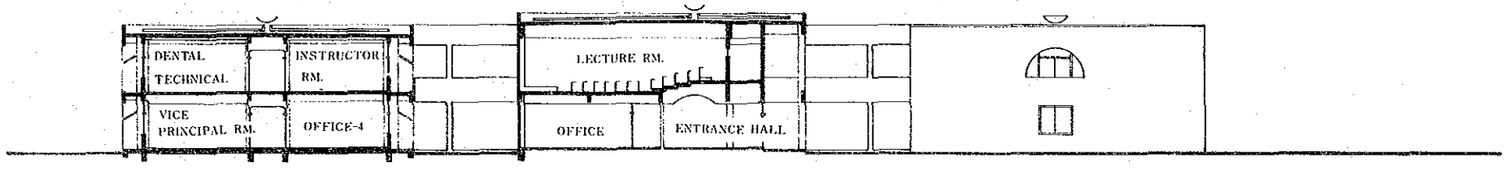
05



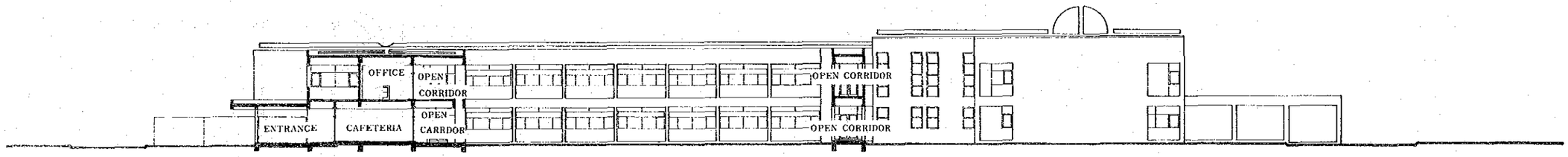
KEY PLAN



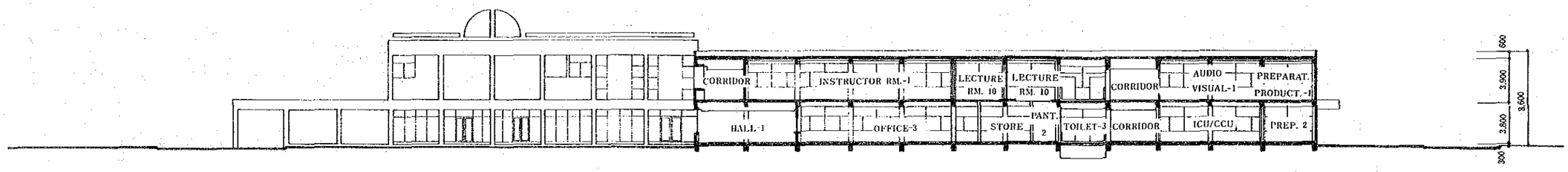
A-A SECTION



B-B SECTION



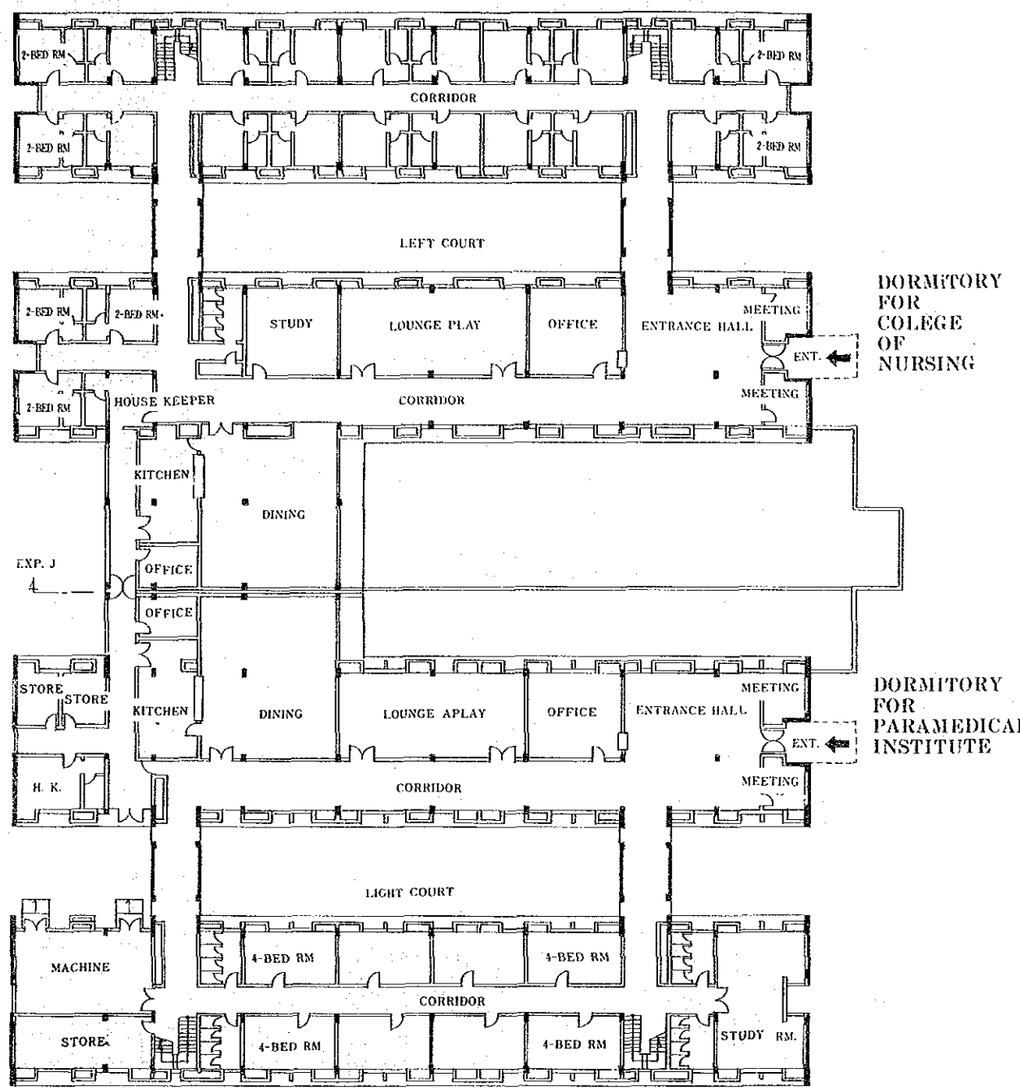
C-C SECTION



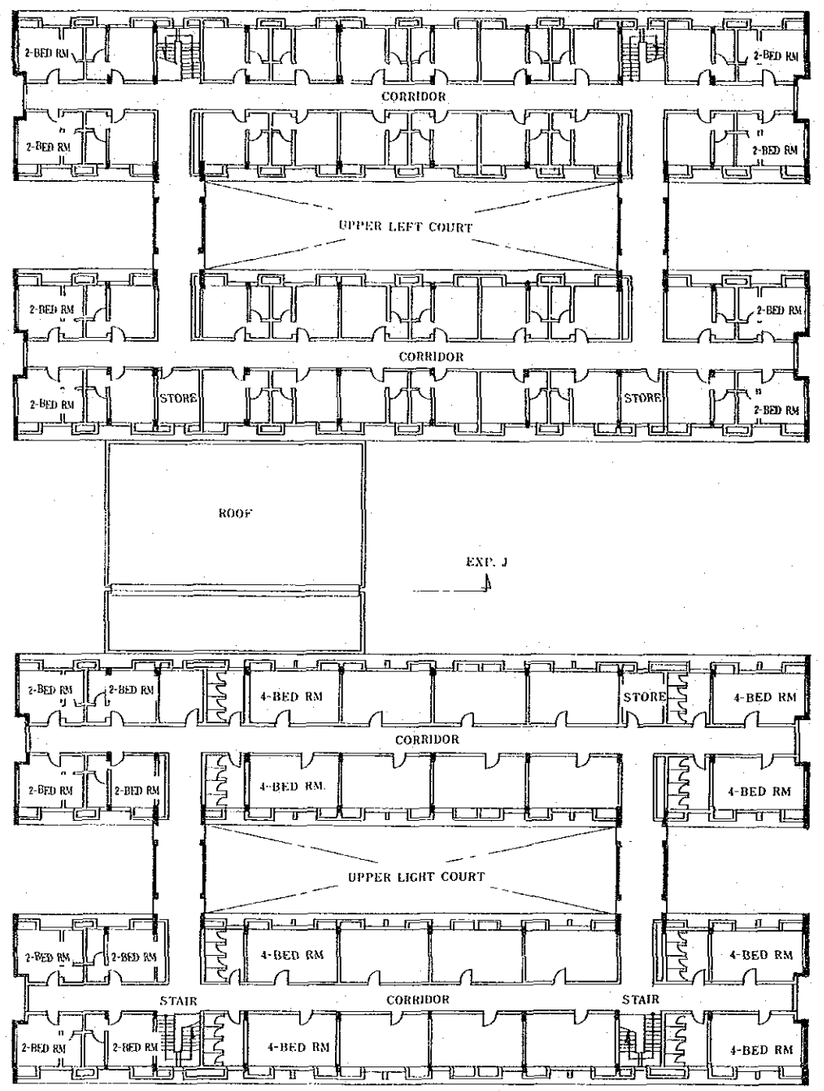
D-D SECTION

0 5 10 20 50m

06



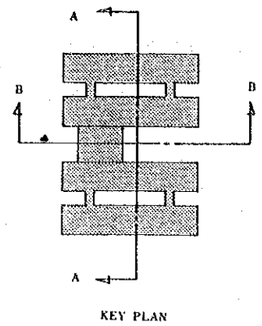
DORMITORY GROUND FLOOR PLAN



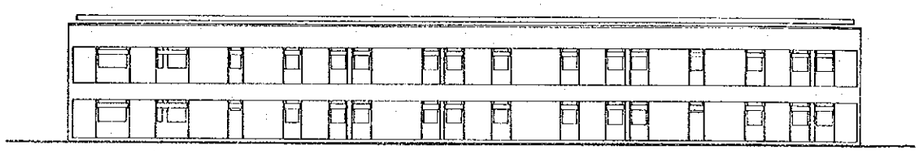
DORMITORY 1ST. FLOOR PLAN

0 5 10 20 50m

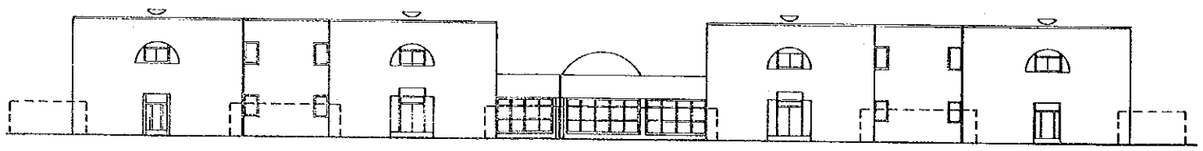
07



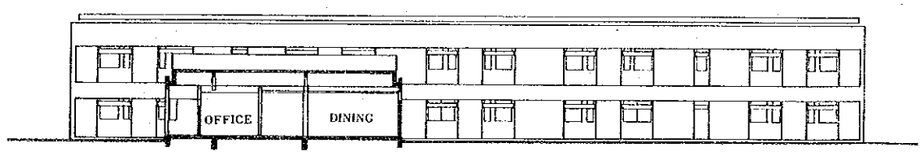
KEY PLAN



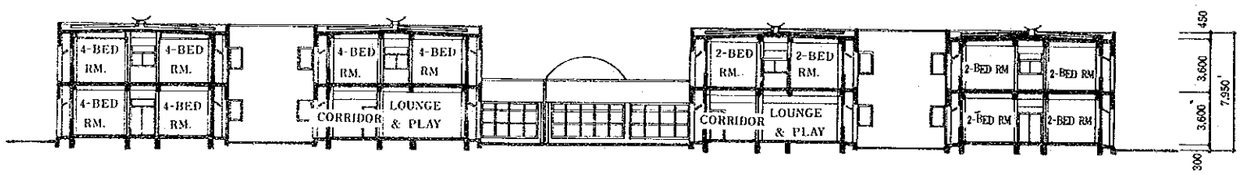
SOUTH ELEVATION



EAST ELEVATION



B-B SECTION



A-A SECTION

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