

MINISTRY OF HEALTH AND FAMILY WELFARE
INDIA

IMPLEMENTATION REVIEW STUDY REPORT
ON
THE PROJECT FOR THE IMPROVEMENT
OF
KALAWATI SARAN CHILDREN'S HOSPITAL
IN
INDIA

JANUARY, 1998

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JAPAN INTERNATIONAL COOPERATION AGENCY
YAMASHITA SEKKEI INC.

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1143000 (6)

PREFACE

In response to a request from the Government of India the Government of Japan decided to conduct a study for the implementation review on the Project for the Improvement of Kalawati Saran Children's Hospital and entrusted the study to the Japan International Cooperation Agency (JICA).

The team reviewed and analyzed the related materials in Japan, and as this result, the present report was finalized.

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

I wish to express my sincere appreciation to the officials concerned of the Government of India for their close cooperation extended to the team.

January, 1998



Kimio Fujita

President

Japan International Cooperation Agency

January, 1998

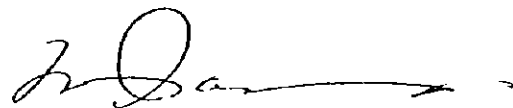
Letter of Transmittal

We are pleased to submit to you the study report for the implementation review on the Project for the Improvement of Kalawati Saran Children's Hospital in India.

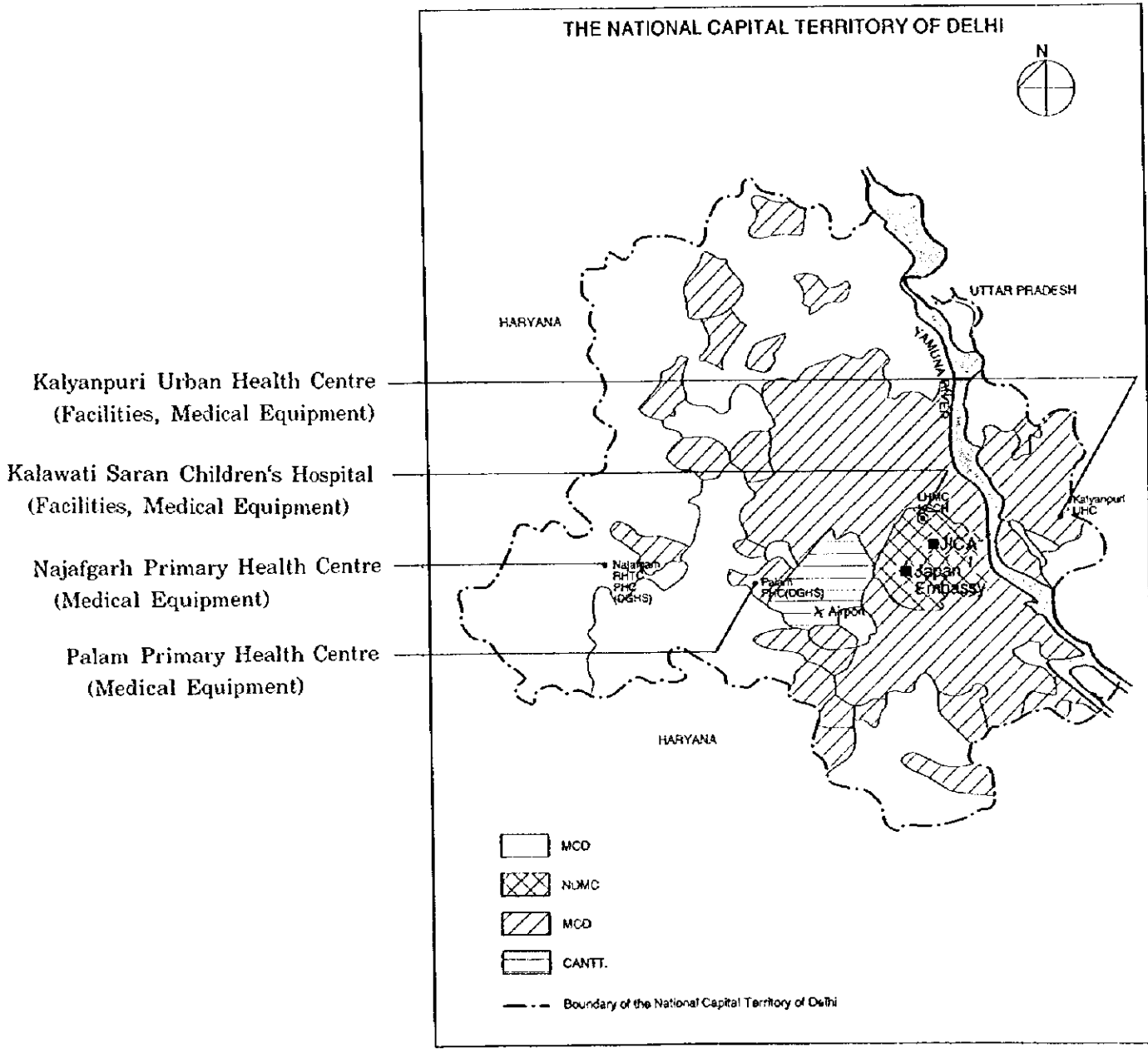
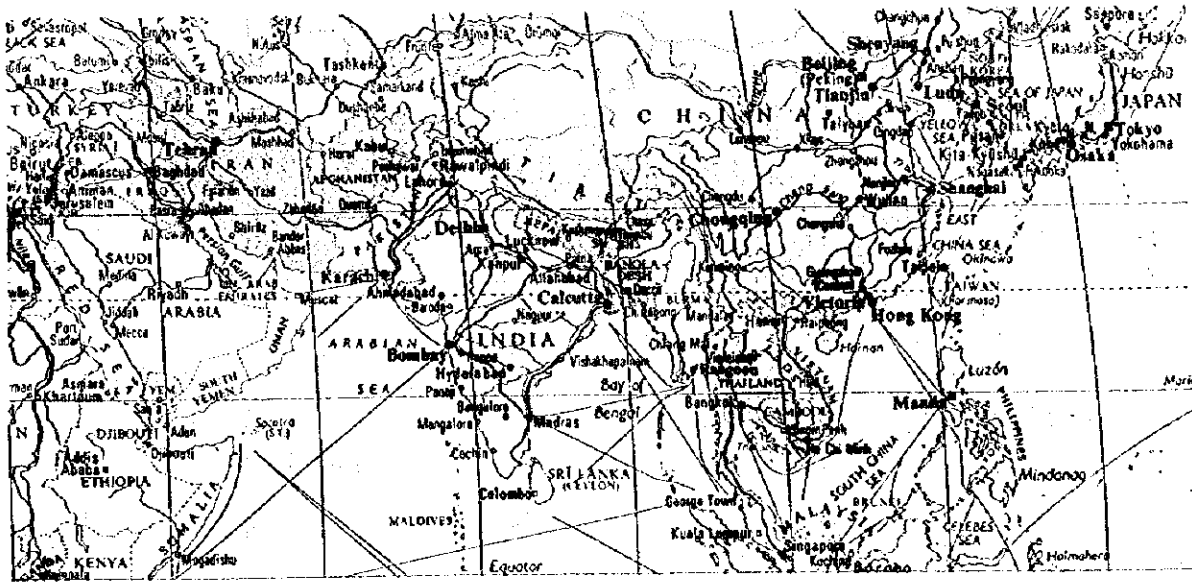
This study was conducted by Yamashita Sekkei Inc. under a contract to JICA, during the period from November 6, 1997 to February 23, 1998. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of India and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



Minoru Tanaka
Project manager,
Study team for
the implementation review on
the Project for the Improvement of
Kalawati Saran Children's Hospital
Yamashita Sekkei Inc.



SITE LOCATION MAP

CONTENTS

Preface

Letter of Transmittal

Location Map and Perspective

| | | |
|------------------|--|------------|
| Chapter 1 | Background of the Project..... | 1 |
| 1-1 | Background of the Request | 1 |
| 1-1-1 | Health Care Situation in India..... | 1 |
| 1-1-2 | Health Care Service System..... | 5 |
| 1-2 | Contents of the Request | 10 |
| 1-2-1 | Background of the Request..... | 10 |
| 1-2-2 | Outline of the Request..... | 11 |
| | | |
| Chapter 2 | Contents of the Project..... | 15 |
| 2-1 | Objectives of the Project | 15 |
| 2-2 | Basic Concept of the Project | 16 |
| 2-2-1 | Cooperation concepts..... | 16 |
| 2-2-2 | Examination of the Request..... | 17 |
| 2-3 | Basic Design | 44 |
| 2-3-1 | Design Concept..... | 44 |
| 2-3-2 | Examination of the Design Condition..... | 47 |
| 2-3-3 | Basic Design..... | 50 |
| | | |
| Chapter 3 | Implementation Plan..... | 100 |
| 3-1 | Implementation Plan | 100 |
| 3-1-1 | Implementation Concept..... | 100 |
| 3-1-2 | Implementation Condition..... | 104 |
| 3-1-3 | Scope of Works..... | 107 |
| 3-1-4 | Construction Supervision..... | 109 |
| 3-1-5 | Material/Equipment Procurement Plan..... | 112 |
| 3-1-6 | Implement Schedule..... | 113 |
| 3-1-7 | Obligations of Recipient Country..... | 115 |
| 3-2 | Operation and Maintenance Plan | 116 |

| | | |
|-----------|--|-----|
| Chapter 4 | Project Evaluation and Recommendations | 122 |
| 4-1 | Expected Results of the Project | 122 |
| 4-2 | Recommendations | 125 |

ANNEX

1. MEMBERS LIST OF THE SURVEY
2. SURVEY SCHEDULE
3. LIST OF PARTY CONCERNED IN THE RECIPIENT COUNTRY
4. MINUTES OF DISCUSSIONS
5. COST ESTIMATION BORNE BY THE RECIPIENT COUNTRY
6. SOIL INVESTIGATION RESULT

CHAPTER 1 BACKGROUND OF THE PROJECT

CHAPTER 1 BACKGROUND OF THE PROJECT

1-1 Background of the Request

1-1-1 Health Care Situation in India

India has a population of about 916 million (as of 1995), of which children under the age of 15 accounted for about 40 percent. On the other hand, the national average infant mortality rate was 80/1,000 and the mortality rate for children under the age of 5 was 33.3/1,000. It is clear from these figures that children's health condition remains very bad in the country. The improvement of the quality of health care for children is thus one of the top priorities in the Government of India's health policy.

(1) Health Care Services

India's population increased by 23.56 percent in the decade from 1981 to 1991. Particularly noteworthy was the population concentration in urban areas. Over the said decade, the urban population increased by 36.2 percent. Of the country's three major metropolitan areas, the Delhi metropolitan area has the highest rate of population growth. Over the decade its population increased by 47.0 percent.

Table 1-1 Population Increase Rates of 3 Major Cities

| City | Population in 1991 (in thousands) | Population increase rate for 1981-91 (%) | | | | | | | | | |
|----------------|-----------------------------------|--|----|----|----|----|----|----|----|----|-----|
| | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | (%) |
| Delhi | 8,419 | [Bar chart showing 47.0% increase] | | | | | | | | | |
| Greater Bombay | 12,596 | [Bar chart showing 36.2% increase] | | | | | | | | | |
| Calcutta | 11,022 | [Bar chart showing 23.56% increase] | | | | | | | | | |

Table 1-2 Population Indicators of the Seventh Five Year Plan and Its Achievements

| | Target of the 7th 5 year Plan | Achievements at the year of 1990 |
|----------------------------------|----------------------------------|-------------------------------------|
| Crude Birth Rate (per 1000) | 29.1 | 29.9 |
| Crude Death Rate (per 1000) | 10.4 | 9.6 |
| Infant Mortality Rate (per 1000) | 90 | 80 |
| Contraceptive Prevalence Rate | 42.0% | 44.1% (Results of Census 1991) |

The Delhi metropolitan area is faced with various social problems in consequence of such a rapid increase in its population. In the field of health care, in particular, the increase and improvement of primary health care facilities in the suburbs is a problem of great urgency because of the rapid increase in the number of suburban residents. While in this metropolitan area children under the age of 15 account for 35.5 percent of its total population, it had only 1,647 hospital beds available for children, which made up only 9 percent of the total number of hospital beds in the area. In other words, there was only one hospital bed available for every 2,000 children in the area, which fell far below six hospital beds for each 1,000 children recommended by WHO. It is therefore urgently necessary to increase and improve health care facilities in the area.

Table 1-3 Area and Population of Delhi

| Designation | | Area (km ²) | Population | | Growth Rate (%) 1981~1991 | Density (per km ²) | |
|-------------|---------|----------------------------|------------|-----------|---------------------------------|--------------------------------|--------|
| | | | 1981 | 1991 | | 1981 | 1991 |
| MCD | (Urban) | 614.52 | 5,409,998 | 8,038,608 | 48.59 | 13,547 | 16,643 |
| | (Rural) | 782.77 | 452,206 | 943,392 | 108.62 | 578 | 1,183 |
| NEMC | | 42.74 | 273,036 | 294,149 | 7.73 | 6,388 | 6,882 |
| CANTT | | 42.97 | 85,166 | 94,326 | 10.76 | 1,982 | 2,195 |
| Total | | 1,483.00 | 6,220,406 | 9,370,475 | 50.64 | 4,194 | 6,319 |

(Source: BUREAU OF ECONOMICS AND STATISTICS, DELHI ADMINISTRATION AND CIBIL GUIDE, MCD)

Table 1-4 Health Index of Delhi

| Index | | Note |
|-----------------------------|------------------|---|
| Population | 9,370,475 person | 89.93% are living in Urban area Urban 8,427,000 Rural 943,475 |
| Child (under 15) population | 3,326,000 person | 35.5% of total population |
| Crude Birth Rate (CBR) | 29.5 ‰ | |
| Crude Death Rate (CDR) | 6.4 ‰ | |
| Infant Mortality Rate (IMR) | 32.6 ‰ | |
| Number of Hospital | * 82 (1992) | Exclude private hospital |
| Total Bed Number | *18,770 (1992) | Exclude private hospital |
| Number of Pediatric Bed | * 1,647 (1992) | 9% of total Nos. of bed |
| N.s of Bed/1,000 | 2.2 | |
| Nos. of Pediatric Bed/1,000 | 0.5 | |

Note: Unless otherwise noted, figures are as of 1991

Source: DELHI VOLUNTARY HEALTH ASSOCIATION, MEDICAL DIRECTORY 1992

(2) Disease Patterns in India and Delhi

The national disease pattern in India is characterized by many cases of diarrheal and respiratory diseases. On the other hand, diseases with high fatality rates include tuberculosis, acute diarrheal diseases and pneumonia.

Table 1-5 Main Diseases, Morbidity and Fatality Rate in India (1990)

| Diseases | Nos. of Disease (thousand) | Morbidity Rate (per 100,000) | Fatality Rate (%) |
|---------------------|----------------------------|------------------------------|-------------------|
| Diarrheal Disease | 9,579 | 1,164.19 | 8.63 |
| Respiratory Disease | 8,929 | 1,085.19 | 2.98 |
| Leper | 2,546 | 309.43 | |
| Malaria | 1,777 | 215.96 | 0.22 |
| Tuberculose | 1,131 | 132.45 | 9.31 |
| Black water fever | 577 | 70.12 | |
| Pneumonia | 434 | | 3.05 |
| Typhoid | 370 | | 0.64 |

According to the 1992 statistics of Delhi, the numbers of deaths from main diseases are as shown in the following table.

Table 1-6 Number of Deaths by Cause in Delhi

| | Nos. of Deaths (per 1,000) | No. of Deaths under age of 15 | Death Rate of Children (%) | Remarks |
|-----------------------------------|----------------------------|-------------------------------|----------------------------|--|
| 1. Infectious & parasitic disease | 6,155 | 2,501 | 40.6 | Tuberculosis 2,869, Bacterial disease 1,602, Infectious diarrheal disease 801, Virus disease 732 |
| 2. Infant abnormalities | 5,127 | 5,127 | 100 | |
| 3. Circulatory disease | 2,919 | 112 | 3.8 | |
| 4. Respiratory disease | 1,776 | 1,043 | 58.7 | |
| 5. Nervous disorder | 1,149 | 652 | 56.7 | |
| 6. Others | 20,418 | 3,775 | 18.4 | |
| Total | 37,544 | 13,210 | 64.6 | |

(Source: Annual Report Delhi)

According to the statistics on medically provided deaths by cause, there were 13,210 deaths of children under the age of 15, which accounted for 64.6 percent of the total. There were also 8,597 deaths of infants under the age of one, which represented 65 percent of the total number of deaths of children.

Diseases with high morbidity and fatality rates at Kalawati Saran Children's Hospital are as shown in the table below.

Table 1-7 Main Diseases in Kalawati Saran children's Hospital

| Disease | No. of diseases (per 1,000) | Fatality rate (%) |
|---|-----------------------------|---------------------------------------|
| Respiratory disease | 3,724 | Measles, other infectious disease: 15 |
| Sepsis, deficiency disease, jaundice, tetanus | 3,180 | Tetanus : 28 Hepatitis : 8 |
| Diarrheal disease | 3,007 | Typhoid: 4 |
| Nervous disorder | 1,797 | |
| Malnutrition, anemia | 1,683 | |
| | 791 | |
| Tuberculosis | 545 | 19 |
| Polio | 492 | 16 |
| Digestive disease | 467 | |
| Uninary disease | 283 | |

(Source: Kalawati Saran Children's Hospital)

The above-mentioned data suggest that respiratory and diarrheal diseases, both of which are contracted due mainly to malnutrition, are the main causes

of the high infant mortality rate in India.

(3) Improvement of the Quality of Health Care Services

The primary, secondary and tertiary health care services in India are greatly affected by the differences in health care facilities, the technical level and deployment of medical professionals and socio-economic situation among the states. The total number of primary health centres in the country has increased to some extent, but the problem of improvement of facilities and shortage of medical professionals is yet to be resolved.

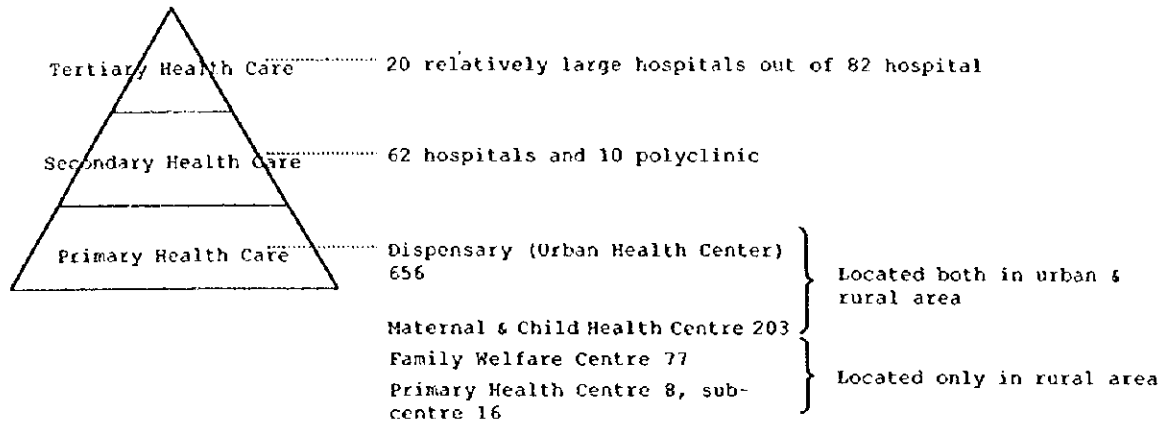
1-1-2 Health Care Service System

(1) Health Care Service System in Delhi

The health care service system in Delhi comprises tertiary health care service, which is provided by 20 large hospitals, secondary health care service, which is provided by 62 hospitals and 10 polytechnics, and primary health care service, which is provided by dispensaries, maternal and child health centres, family welfare centres and primary health centres. Though the referral system among them are not established well. As reported by the WHO and UNICEF, new patient directly goes to the tertiary health care service which has an advanced medical technology and well-equipped facilities. It is urgently necessary to improve the quality of medical care service in the area by improving the quality of primary and secondary medical care service and by establishing a full-blown referral system. In Delhi, hospitals are operated and managed by a wide variety of organizations, as shown in Table 1-8.

In 1977, the government of Delhi announced a health care system for public hospitals as follows. In actuality, however, the health care system is being operated without a full-fledged referral system in which patients are free

to choose hospitals where they want to have their diseases treated.



In Delhi, hospitals are concentrated in the centre, with the result that there are only a limited number of hospitals in the suburban districts, including the district on the eastern side of the Yamuna River.

Primary health centres are mainly responsible for medical care in the suburb of Delhi.

Given below is the outline of health care institutions other than hospitals in India.

Polytechnics:

Polytechnics are health care institutions founded for the purpose of providing health care services to patients referred from dispensaries. They have only outpatient divisions, which are usually grouped into general outpatient, gynecological, ophthalmological and ENT departments.

Dispensaries:

Dispensaries are responsible for primary health care under the national health programme, such as prevention and treatment of tuberculosis and malaria, maternal and child health care and immunizations. A typical dispensary has a staff of five to six. Dispensaries' staff members include

physicians, pharmacists, ANMs and laboratory technicians. The government of Delhi plans to increase the staff of dispensaries in about twofold and named as Urban Health Centre.

Maternal and child health centres:

Maternal and child health centres are responsible for examining and giving guidance to expectant mothers as well as deliveries. There is a total of 25 maternal and child health centres with inpatients' wards.

Family welfare centres:

Family welfare centres are provided with functions and facilities required to promote the spread of, and give guidance on family planning. They have contraceptive operation facilities. In the rural area, it is situated within primary health centres.

Primary health centres:

Primary health centres are responsible for primary health care in rural districts. They have sub-centres as their lower branches.

Table 1-8 Medical Institutions in Delhi (1991)

| Facilities Organization | Hospital | No. of Beds | No. of Ped. Beds | PHC (PHC/ FWC) | PHC (No. of Beds) | SC | MCH /SC | MCH No. of Beds | Poly Clinic | Special Clinic No. of Beds | Special Clinic No. of Beds | Private Clinic No. of Beds | FWC | Dis- pensary (UHC) |
|--|-------------------|-------------------------|------------------------|----------------------|-------------------------|--------------------|---------------------|-----------------------|----------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------|--------------------------|
| 1. MCD | 17 (2) | 3,435 (102) | 245 | 5 (5) | 47 (47) | | 180 (50) | 268 (10) | | 16 | | | 35 (5) | 157 (56) |
| 2. NDVC | 2 | 201 | 35 | | | | 13 | 53 | 1 | 1 | | | 2 | 32 |
| 3. Cantt. Board | 1 | 30 | 0 | | | | 1 | | | | | | | |
| 4. Delhi Admin. | 15 (2) | 4,046 (100) | 339 | | | | | | 7 | 6 | | | 3 | 178 (38) |
| 5. Ministry of Health & Family Welfare (DGHS) | 9 | 4,621 | 513 | 3 (3) | 20 (20) | 16 (16) | 2 | 12 | | 7 | | | 4 (3) | 118 |
| 6. Ministry of Railway | 2 | 476 | 60 | | | | | | 2 | | | | 14 | 12 |
| 7. Voluntary Orga. | 21 | 3,195 | 116 | | | | 7 | | | 11 | | | 18 | 23 (1) |
| 8. Statutory Bodies | 6 | 1,845 | 339 | | | | | | | 4 | | | 1 | 126 |
| 9. Others | | | | | | | | | | | | | | (6) |
| Total | 82 (3) | 18,770 (202) | 1,647 | 8 (8) | 67 (67) | 16 (16) | 203 (50) | 333 (10) | 20 | 45 | 150 | 105 | 77 (8) | 556 (101) |

PHC : Primary Health Centre DGHS : Directorate General of Health Services
 SC : Sub-center UHC : Urban Health Centre
 MCH : Maternal & Child Health Centre

Special Clinic : Tuberculosis, STD, Leper Hospital
 FWC : Family Welfare Centre

() indicates number of facilities in Rural area

(2) Health Care Service System in the Rural Districts of Delhi

The rural districts of Delhi account for about 10 percent of the total population of Delhi while they represent about 50 percent of the total area of Delhi. It is for this reason that these districts are still not provided with a sufficient number of medical institutions. At present, there are eight primary health centres and 16 sub-centres in these rural districts.

Of the eight primary health centres, three are managed by the Ministry of Health and Family Welfare. These three primary health centres (Najafgarh, Palam, Ujawa) and the 16 sub-centres are operating under the control of the regional Health Training Centre (RHTC) in Najafgarh.

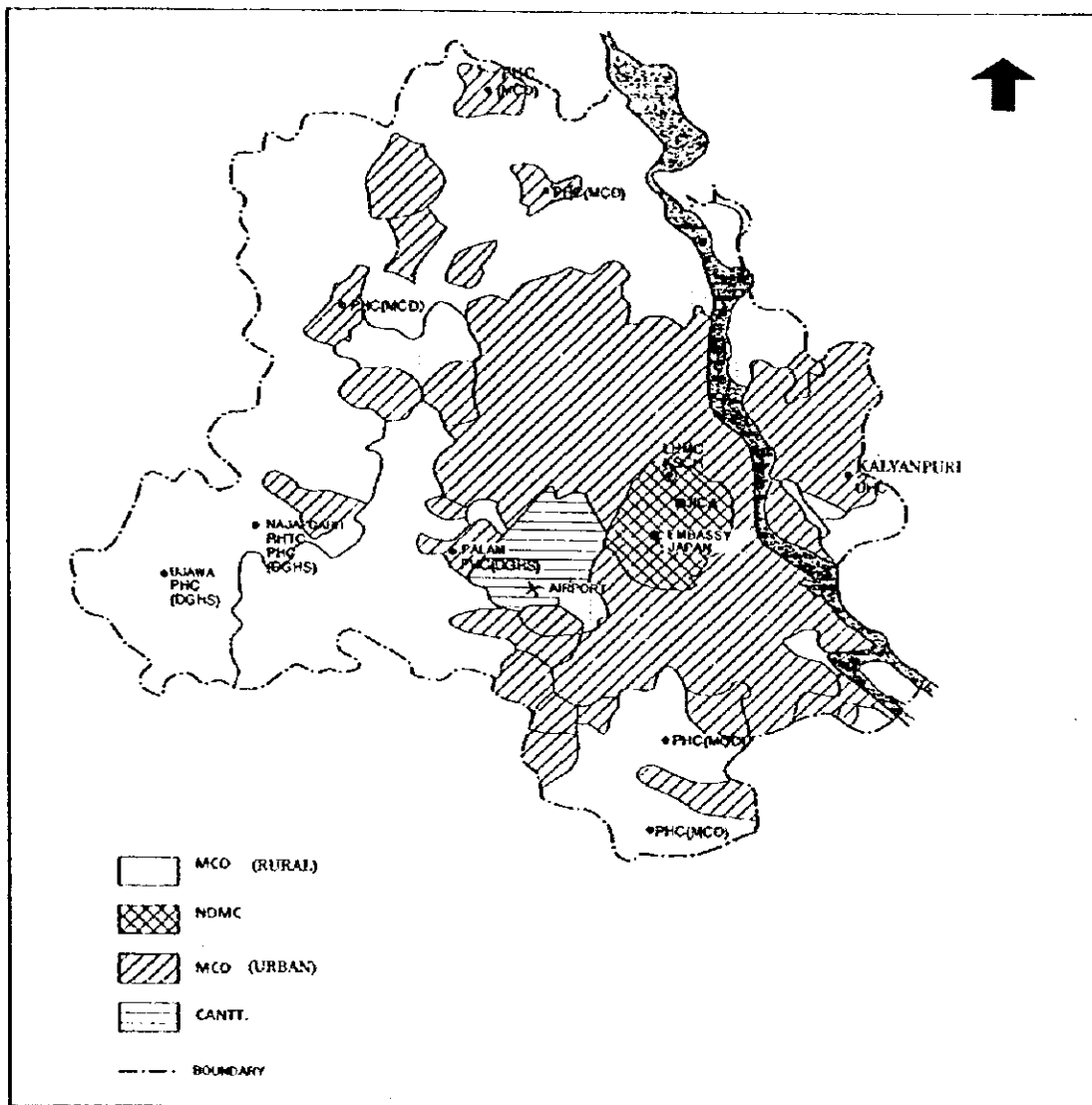


Fig. 1-1 Administrative District of Delhi and Location of PHC

1-2 Contents of the Request

1-2-1 Background of the Project

Against such a background, the Government of India made a request to the Government of Japan for grant aid cooperation for the improvement of the facilities and procurement of medical equipment of Kalawati Saran Children's Hospital, which is playing an important role in primary and secondary health care in Delhi and the surrounding neighborhood. They also made a request for the improvement of the facilities and procurement of medical equipment of the three health centres which are controlled under the Ministry of Health and Family Welfare.

In response to the request made by the Government of India, the Government of Japan sent to India a preliminary study team in July 1994 and a basic design study team in November 1994, to make the feasibility study of the request. Based on the results of these studies, the team has made a basic design for the project.

The Exchange of Notes concerning the construction of the central building and the workshop/substation building of Kalawati Saran Children's Hospital and the procurement of part of the items of equipment to be installed in these buildings was signed in December 1995 as the first phase of the project, and were completed in March 1997. The second phase of the project was planned as below.

Construction work : Laundry building, incinerator building, Kalyanpuri UHC building and installation of deep tube well at Palam PHC

Equipment procurement work:

Equipment for Phase 1 buildings, laundry building, incinerator building, Palam PHC and Najafgarh PHC.

However, the preparation work which is to be carried out by Indian side, such as clearance of the site, obtaining the building permit, etc. is being delayed. As a result, it become difficult to carry out all the work at the second phase as planned.

On this situation, the government of Jaspán sent to India a project expediting team in September 1997 and it was agreed by both parties that this project should be implemented with modified conditions. As a result, this study for implementation review was conducted with the aim of making a review on the works which it was planned as the second phase at the time of the basic design study.

1-2-2 Outline of the Request

(1) Objective of the Request

The Project is aimed at enhancing the primary and secondary health care functions of Kalawati Saran Children' s Hospital, which is operated with the cooperation of Lady Hardinge Medical College, while improving health care activities carried out at the three regional health centres which work closely with the Medical College. This will promote the health of community residents, particularly children, and improve such health indicators as the infant mortality rate.

(2) Project Implementing Organization

Lady Hardinge Medical College is the Indian organization to implement the Project, and the Ministry of Health and Family Welfare of India is responsible for coordinating all Project efforts.

(3) Contents of the Project

① Kalawati Saran Children' s Hospital

This hospital is India's only national children's hospital. It is located on the premises of Lady Hardinge Medical College in the centre of Delhi. Its three major functions are:

- Primary and secondary health care for newborn babies and infants in the centre of and around Delhi
- Preventive/community health care under the National Health and Family Welfare Programme (family planning, immunization for children, control of diarrhea, cholera and malaria)
- Function as a teaching hospital where, undergraduate and postgraduate students, and interns of Lady Hardinge Medical College are trained in pediatrics, obstetrics & gynecology and preventive social medicine

The hospital has a total of 350 beds. According to the 1993 statistics, the annual total number of outpatients who visited the hospital was 263,753 and the average annual bed occupancy rate was 86.7 percent.

② Kalyanpuri Urban Health Centre

This Health Centre located in a densely populated district on the eastern side of the Yamuna River running through Delhi is operated by Lady Hardinge Medical College. Due to heavy migration, it is difficult to estimate the number of community residents to benefit from the health care services provided by the Health Centre. The total population of this district is estimated at about 80,000. This Health Centre's three main functions are:

- Community health care (medical examination and treatment of outpatients, mother and child health, family planning, etc.)
- Training (for undergraduate and postgraduate students, and interns of Lady Hardinge Medical College)

- Research (on community health activities)

35,000 outpatients visit this Health Centre annually.

③ Najafgarh Primary Health Centre

This Health Centre located in a western suburb of Delhi is one of the eight primary health centres in the rural districts of Delhi. The technical aspects of this Health Centre's operations are managed by Lady Hardinge Medical College, but this Health Centre itself operates under the supervision of Directorate General of Health Services (DGHS), Ministry of Health and Family Welfare. This district has a population of 78,000. 80,000 outpatients are examined and treated at this Health Centre annually.

④ Palam Primary Health Centre

This Health Centre located near Delhi International Airport provides primary health care services similar to those offered by Najafgarh Primary Health Centre. The technical aspects of the operations of this Health Centre are managed by Lady Hardinge Medical College, but the Health Centre itself operates under the control of the Directorate General of Health Services, Ministry of Health and Family Welfare. This district has a population of 107,000. 46,000 outpatients are examined and treated at this Health Centre annually.

(4) Outline of the Requested Facilities and Equipment

1) Contents of Phase 1 (Already completed)

① Kalawati Saran Children's Hospital Central & Workshop/substation Building

- Construction of facilities of Outpatient Dept., Radiology Dept.,

Clinical Examination, Physiological Examination, Operation Theatre, Recovery/ICU, Preventive & Social Medicine Dept. etc.

- Procurement and installation of medical equipment necessary for primary and secondary health care services in Radiology Dept., Operation Theatre and Central Supply & Sterilizing Dept.

2) Contents of Phase 2

① Kalawati Saran Children' s Hospital Laundry and Incinerator Building

- Construction of facilities of Wash/Extract Rm, Drying Rm, Press Rm, Reception/distribution etc.
- Construction of Incinerator Building
- Procurement and installation of necessary equipment for Laundry and Incinerator Building

② Kalyanpuri Urban Health Centre

- Construction of facilities to replace the existing facility
- Procurement and installation of medical equipment necessary for primary health care services

③ Najafgarh Primary Health Centre

- Procurement and installation of medical equipment necessary for primary health care services

④ Palam Primary Health Centre

- Installation of tube well
- Procurement and installation of medical equipment necessary for primary health care services

CHAPTER 2 CONTENTS OF THE PROJECT

CHAPTER 2 CONTENTS OF THE PROJECT

2-1 Objectives of the Project

This project is aimed at enhancing the primary and secondary functions of Kalawati Saran Children' s Hospital located on the premises of Lady Hardinge Medical College and operated with the cooperation of the Medical College. Also, facilities will be constructed and medical equipment procured to improve the quality of regional health activities conducted at the three Health Centres which are working closely with the Medical College. Thereby, the Project will contribute to the improvement in India of such health indicators as the infant mortality rate.

In the Project, for extensive and effective attainment of objectives, first, facilities and equipment for central & workshop building consist of outpatient, radiology, laboratory, operation theatre and other departments of Kalawati Saran Children' s Hospital, which is operated with the cooperation of Lady Hardinge Medical College, will be procured.

Second, facilities and equipment will be procured for Kalyanpuri Urban Health Centre, which is operated and managed by Lady Hardinge Medical College, and a tube well will be installed on its premises.

Third, equipment will be procured for Najafgarh Primary Health Centre and Palam Primary Health Centre. A tube well will also be installed on the latter' s premises.

Construction of central & workshop building of Kalawati Saran Children' s Hospital and procurement of medical equipment for radiology dept. operation theatre and central supply & sterilization dept. was completed as Phase 1 in March, 1997.

2-2 Basic Concept of the Project

2-2-1 Cooperation Concept

The result from the examination of contents of the request, cooperation will be made for the project with following concept.

- Concept-1 Improvement of primary health care level

Cooperation will be made, on where the necessity of improvement is thought to be high in the health centre facilities related to Kalawati Saran Children's Hospital, to enhance the primary health care of urban and rural area of Delhi.

- Concept-2 Improvement of secondary health care level on pediatric medical care

Cooperation will be made on the improvement of facilities of Kalawati Saran Children's Hospital to enhance the secondary health care mainly around Delhi.

- Concept-3 Support for preventive social medicine activities

Cooperation will be made on the improvement of facilities of Kalawati Saran Children's Hospital to enhance the ability of implementation of national programme in the field of preventive social medicine such as immunization, diarrheal and cholera control etc. for mother and child.

- Concept-4 Support for enhancement of educational effect

Cooperation will be made on the improvement of facilities of Kalawati Saran Children's Hospital which have the function as teaching hospital of Lady Hardinge Medical College and related health centre to enhance the training of interns and graduates.

- **Concept-5 Realistic plan**

Cooperation on the improvement of Kalawati Saran Children's Hospital will be made within the scope of their operation and maintenance ability considering present staff and budget of the hospital.

- **Concept-6 Easy maintenance**

On planning of facilities and on selection of equipment, easy and economical maintenance should be considered.

- **Concept-7 Reasonable implementation schedule**

Implementation schedule should be cope with the works of both Japanese and Indian side, and rational and feasible phasing of the project should be set up.

2-2-2 Examination of the Request

Kalawati Saran Children's Hospital, which is India's only national children's hospital, is located on the premises of Lady Hardinge Medical College in Delhi, adjacent to Suchita Kripalani General Hospital attached to the Medical College. Its three main functions are as follows.

- Medical examination and treatment of infants and children in primary and secondary health care in and around Delhi
- Preventive/community health care, including family planning, infant immunization and control of diarrhea, cholera and malaria, under the National Health and Family Welfare Programme
- A teaching hospital (paediatrics, obstetrics and gynecology and preventive social medicine) for undergraduate and postgraduate students, and interns of Lady Hardinge Medical College

○ Present Conditions of Medical Services Provided by Kalawati Saran Children's Hospital

① Medical Examination and Treatment of Outpatients

Given below is the outline of the statistical data on the medical examination and treatment of outpatients at Kalawati Saran Children's Hospital.

Table 2 -1 Annual Number of Outpatients to Kalawati Saran Children's Hospital (1993)

| Classification | Annual no. of first visit outpatients | Annual no. of revisit outpatients | Total (annual) |
|--|---------------------------------------|-----------------------------------|----------------|
| General outpatients | 59,358 | 26,213 | 85,571 |
| Emergency outpatients | 30,630 | | 30,630 |
| Outpatients to Physical Medicine & Rehabilitation Department | 4,854 | 68,100 | 72,954 |
| Outpatients to Special Clinics | 6,953 | 37,671 | 44,624 |
| Total | 1,01,795 | 1,31,984 | 2,33,779 |

(Source: Kalawati Saran Children's Hospital)

In 1993, a total of 233,779 outpatients visited the hospital. Since the total number of the hospital's working days was 293 in 1993, an average of 797 outpatients visited the hospital every working day in that year. The following table shows a breakdown by department of the annual total of outpatients to the hospital.

Table 2-2 Annual Total Number of General Outpatients to Kalawati Saran Children's Hospital and the Hospital's Working Days/Consulting Hours

| Clinical Department | Annual no. of Patient | Working Days | Working Hours |
|--------------------------|-----------------------|--------------|---------------|
| (Medicine departments) | | | |
| Paediatric Medicine | 69,393 | Mon.~Sat. | 9:00~13:00 |
| Paediatric Dermatology | 5,448 | ditto | ditto |
| (Surgical departments) | | | |
| Paediatric surgery | 7,152 | ditto | ditto |
| Paediatric orthopedics | 1,191 | Twice a week | ditto |
| Paediatrics E. N. T. | 1,500 | Mon.~Sat. | ditto |
| Paediatric ophthalmology | 887 | ditto | ditto |
| Total | 85,571 | | |

(Source: Kalawati Saran Children's Hospital)

The Physical Medicine & Rehabilitation Department's weekly working days are Monday through Saturday from 9:00 to 16:00. The department accepted adult and infant outpatients. The ratio between the former and the latter is 6:4.

② Use of the Ward

The hospital's ward has a total of 350 beds, of which 30 are for use of newborn babies in the Suchita Kripalani General Hospital. The bed occupancy rate, which is usually less than 100 percent, exceeds 100 percent during August and September, which is the monsoon season when general sanitary conditions deteriorate because of high temperature and humidity.

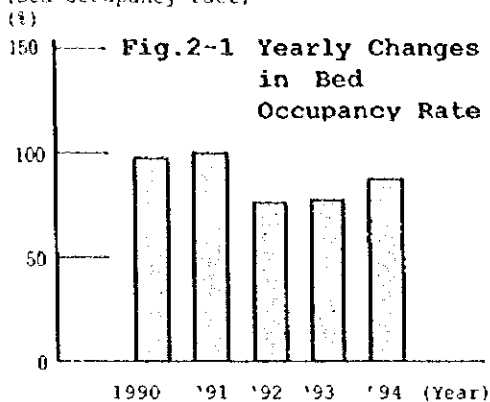
Table 2-3 Monthly Bed Occupancy Rates

(Unit: percent)

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sept. | Oct. | Nov. | Dec. | Annual |
|------|------|------|------|------|------|------|------|-------|-------|------|------|------|--------|
| 1993 | 59.3 | 62.2 | 59.0 | 66.2 | 60.4 | 83.0 | 83.4 | 109.2 | 104.0 | 92.1 | 66.3 | 62.3 | 77.4 |
| 1994 | 70.2 | 60.8 | 76.7 | 83.7 | 89.0 | 99.8 | 86.9 | 103.7 | 106.4 | 89.4 | 61.3 | 84.1 | 87.1 |

(Source: Kalawati Saran Children's Hospital)

(Bed occupancy rate)



At Kalawati Saran Children's Hospital, the annual bed occupancy rate exceeded 100 percent in 1991. As a result, its total number of beds increased by 36 to 350. Since 1992, the bed occupancy rate has stayed below 100 percent.

Since occupancy exceeds 100 percent in summer, however, it has been decided to further increase the total number of beds.

○ Preventive/Community Health Care Services Provided by Kalawati Saran Children's Hospital

Since its founding in 1956, Kalawati Saran Children's Hospital has been providing preventive/community health care services to mothers and children in and around Delhi. The hospital is providing these services at its Special Clinics.

Table 2-4 Preventive/Community Health Services Provided by KSHCH

| Names and Working Days of Special Clinics | Outline of Services Provided | Annual no. of outpatients received |
|---|---|------------------------------------|
| Child Health Promotion Clinic (Mon.~Sat.: 9:00~16:00) | Immunization service for mothers and children, tuberculin tests under the national tuberculosis control programme, and distribution of vitamin A tablets for prevention of blindness | 23,292 |
| Child Guidance Clinic (Mon.~Sat.: 9:00~16:00) | Guidance to retarded and mentally disabled children for their psychological development | 3,109 |
| Malaria Clinic (Mon.~Sat.: 9:00~16:00) | Malaria screening tests as part of the national malaria control programme | 3,299 |
| Family Welfare Clinic (Mon.~Sat.: 9:00~16:00) | Promotion of the spread of the national family planning programme under the national population policy | 4,576 |
| Diarrhea Training & Treatment Unit (Mon.~Sat.: 9:00~16:00, (24 hours in summer)) | Treatment of diarrhea patients through the provision of O.R.S. under the national diarrhea/cholera control programme, training in treatment of diarrhea patients and compilation of statistics. | 11,373 |

As is clear from the above descriptions, the hospital is engaged mainly in promoting national preventive/community health care programmes for children.

○ Activities of Kalawati Saran Children's Hospital as a Teaching Hospital

① Outline of Education Provided by Lady Hardinge Medical College and the Relationship with Kalawati Saran Children's Hospital

In India, medical colleges provide four and a half years of undergraduate education, one year of internship and two to three years of postgraduate education. Below is the outline of medical education in the country.

Table 2-5 Education in Medical College

| Course | Year | | | | | | | | | Qualifications after graduation | No. of students enrolled at Lady Hardinge Medical College | |
|----------------------------------|--------------------------|---|---|---|-----------------------|--------------------------|---|---|---|---------------------------------|---|---------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | |
| Undergraduate course | [Bar spanning years 1-4] | | | | | | | | | | MB, BS | 130 per grade |
| Internship | | | | | [Bar spanning year 5] | | | | | | | |
| Graduate course (degree course) | | | | | | [Bar spanning years 6-8] | | | | | MD, MS | 54 per grade |
| Graduate course (diploma course) | | | | | | [Bar spanning years 6-7] | | | | | | 16 per grade |

(Note) MB : Bachelor of Surgery MD : Doctor of Medicine
 BS : Bachelor of Medicine MS : Master of Surgery

Kalawati Saran Children's Hospital functions as a paediatric teaching hospital attached to Lady Hardinge Medical College, and is therefore equipped with offices of professors of paediatrics of the college and paediatric seminar rooms. The college's professors of paediatrics examine hospital patients while giving classes.

○ Relationship between Lady Hardinge Medical College and the 3 Health Centres

In 1977 the Government of India announced its new medical education plan (the Rome Plan) whose goals were to promote medical colleges' active

involvement in local community health problems and to provide direct health care services to residents of rural areas. The following measures were thereby proposed.

- To send medical students to rural areas
- To send medical college instructors to rural areas
- To enhance quality of health care in rural and urban areas through medical examination and treatment by providing facilities and equipment for tests and X-ray examinations
- To promote transfer in stages of comprehensive health care (preventive medicine, health promotion and medical treatment) to the area covered by each medical college

In this Plan, it is proposed that each medical college take charge of community health care through at least three area health centres. In the case of Lady Hardinge Medical College, it was decided that the College should be responsible for enhancing the quality of community health care through Najafgarh Primary Health Centre, Palam Primary Health Centre and Kalyanpuri Urban Health Centre. At present, the Medical College is training its undergraduate and postgraduate students, and interns by sending them to these three Health Centres and while providing local community health care services to the entire area.

○ Outline of Activities of the 3 Health Centres

Given below is the outline of the activities of the three Health Centres related to the Project.

Activities of Kalyanpuri Urban Health Centre

Medical Treatment

1. Outpatients (internal medicine, surgery, paediatric, obstetrics and gynecology)
2. Immunization
3. Health of mothers and children
4. Family planning
5. Special clinics (ophthalmology)
6. School children' s health
7. General medical tests
8. Emergency medical treatment

Training

1. Medical doctors (training of undergraduate and postgraduate students, and interns of Lady Hardinge Medical College)
2. Nurses (including public health nurses), paramedical, medical and social workers (training of the students of the nursing school attached to Lady Hardinge Medical College)

Research

1. Research on schoolchildren' s health
2. Research on community health care

Outline of Activities of Najafgarh and Palam Primary Health Centres

Medical Treatment

1. Outpatients (internal medicine, surgery, paediatrics and obstetrics and gynecology)
2. 24-hour emergency medical treatment (only at Najafgarh Primary Health Centre)
3. Health of mothers and children (immunization, guidance of childbirth at home)

4. Normal delivery (delivery and hospitalization)
5. Family planning (abortion, sterilization, guidance on family planning)
6. Tests (pregnancy test, blood test, urine test, saliva test)

Training

1. Medical doctors (training of undergraduate and postgraduate students, and interns of Lady Hardinge Medical College)
2. Nurses (training of nursing school students attached to Lady Hardinge Medical College)

○ Present Activities of the 3 Health Centres

Lady Hardinge Medical College is responsible for all operations carried out at Kalyanpuri Urban Health Centre, but its responsibility for Najafgarh Primary Health Centre and Palam Primary Health Centre is limited to management of medical technologies at these Health Centres. The latter two Health Centres operate under the control of the Directorate General of Health Services, Ministry of Health and Family Welfare. Present activities of these three Health Centres are summarized as follows.

Table 2-6 Present Activities of the 3 Health Centres

| | Kalyanpuri Urban Health Centre | Majafgarh Primary Health Centre | Palan Primary Health Centre |
|---|--------------------------------|---------------------------------|-----------------------------|
| No. of residents to benefit from the project | 80,000 | 78,455 | 1,07,000 |
| ● Curative Services | | | |
| Annual no. of outpatients | 35,000 | 60,000 | 46,000 |
| Annual no. of inpatients | -- | 10,500 | 441 |
| Annual no. of laboratory tests conducted | 1,800 | 13,000 | 2,000 |
| Annual no. of referrals | 350 | 8,000 | 415 |
| ● Family Welfare Services | | | |
| Annual no. of operations for sterilization | 9 | 420 | 101 |
| ● Immunization Services | | | |
| Annual no. of vaccinations | 2,097 | 15,000 | 8,400 |
| ● MCH Services | | | |
| Antenatal clinic | 706 | 3,400 | 2,025 |
| Deliveries conducted | --- | 2,050 | 629 |
| ● Nutritional Services | | | |
| Annual no. of supplies of iron and folic, vitamin A | 3,145 | 12,810 | 6,485 |
| ● IEC Activities | | | |
| Annual no. of events (Motion picture, gatherings/meetings, classes for mothers) | 86 | 730 | 185 |

(Source: Lady Hardinge Medical College)

○ Present Conditions of the Facilities and Equipment of Kalawati Saran Children's Hospital and the 3 Health Centres

① Facilities and Equipment of Kalawati Saran Children's Hospital

Facility

Kalawati Saran Children's Hospital began operations in 1956 with 60 beds. At that time, it was estimated that it would accept about 100 outpatients per working day. Since then its facilities have been extended in keeping with the increase in the daily number of outpatients accepted. At present, however, its outpatient building

and wards are too small for the scale of medical services it provides. They are both overcrowded with outpatients and their relatives to take care of them. The facilities had already been superannuated when they began operations, and subsequent facility extension work was of such low quality that almost all the facilities need repair or reconstruction.

Equipment

Existing X-ray equipment and many other main items of equipment are superannuated. Equipment for clinical examination and care of patients is not only superannuated but also in short supply, which makes it impossible for the hospital to provide sufficient child health care services for community residents. To improve the quality of the hospital's child health care, it is necessary to replace the superannuated equipment and to increase supplies of equipment in short supply.

② Kalyanpuri Urban Health Centre

Facility

This Health Centre's facilities were originally not intended for use as part of a health centre. The space is the lower half of a high-ceilinged building which looks like a warehouse, so the rooms are not partitioned completely. Some of them have no windows. Furthermore, the partitioning work is of such low quality that these rooms are not in good sanitary condition. The Health Centre does not have an adequate number of rooms because of the limited space. It is also difficult to secure sufficient water supply due to a rapid increase in the population of the surrounding local community.

Equipment

Superannuated medical examination tables are the only basic equipment for medical examination installed in the health centre. Under such circumstances, the Health Centre is unable to provide sufficient basic health care services to community residents. It is necessary to procure medical examination rooms and equipment for treatment and care of outpatients.

③ Najafgarh Primary Health Centre and Palam Primary Health Centre

Facility

Each of these Health Centres is finds it difficult to secure adequate water supply because of rapidly increasing local populations.

Equipment

These Health Centres' main items of equipment are monocular microscopes, centrifuges and medical examination tables, almost all of which are no longer serviceable. To improve the quality of primary health care services offered by these Health Centres, it is necessary to replace these superannuated items of equipment and to increase supplies of equipment in short supply.

○ Summary of the Results of the Examination of the Request

Since 1956, Kalawati Saran Children's Hospital, the centre of Delhi's only national children's hospital has provided primary and secondary child health care services, as well as preventive/community health services under the National Health Plan, in and around Delhi. The hospital accepts more than 230,000 outpatients every year. Its annual average bed occupancy rate for 1994 was 87.1 percent. In summer, in

particular, the bed occupancy rate exceeds 100 percent. In light of such increasing demand for health care services in and around Delhi, it is necessary to ease congestion in the outpatient building and increase the number of beds installed in the hospital. Existing hospital medical equipment is superannuated. The hospital also functions as the teaching hospital attached to Lady Hardinge Medical College, where students and interns of the College receive practical training. The Hospital gets manpower support from the College, and the Hospital and the College share the use of some facilities. Lady Hardinge Medical College, on the other hand, is cooperating with the three Health Centres, sending its staff members, students and interns to these Health Centres, to improve the quality of primary health care services in and around Delhi. Infant patients with untreatable diseases at these Health Centres are referred to Kalawati Saran Children's Hospital; adult patients with untreatable diseases at these Health Centres are referred to Suchita Kripalani General Hospital. These three Health Centres find it difficult to attain their common objective of promoting the health of community residents because of shortages of facilities and equipment. It is imperative, therefore, to improve the facilities and equipment of these three Health Centres to reduce the burden imposed on the above-mentioned referral hospitals.

It is difficult, however, for Lady Hardinge Medical College to work out and implement plans to improve the facilities and equipment of Kalawati Saran Children's Hospital and to resolve problems facing the three Health Centres on its own, mainly because of budgetary limitations. Under such circumstances, the principal of the Medical College requested the Government of Japan to provide grant aid to construct a central building on the premises of Kalawati Saran Children's Hospital, for its outpatient, operation theatre, X-ray and laboratory departments, as well as ICUs, to procure equipment for these facilities, to reconstruct the facilities

of Kalyanpuri Urban Health Center and procure equipment for the facilities of the Health Centre, as well as Najafgarh Primary Health Centre and Palam Primary Health Centre. The existing facilities of Kalawati Saran Children's Hospital are to be remodeled into wards by the Government of India after the completion of the planned central hospital building.

Facilities and equipment requests are to be examined in light of the above.

1. Requested Rooms

- ① Kalawati Saran Children's Hospital
 (□ indicated part completed in phase 1)

Table 2-7 Examination of Requested Rooms

| Room Name | No. of rooms (in the Request) | No. of rooms (in the basic design) | Result of the examination |
|---|-------------------------------|---|---|
| • Outpatient Department Reception | 1 | 1 | Six reception counters (emergency, new visit, revisit, reporting, hospitalization, Special Clinic reception counters) are to be installed. |
| Internal Medicine Examination Rm and Doctors' Offices | 22 | 8 (Examination room) 14 (Doctor's offices) | Average daily no. of outpatients: $69,393/\text{year} \div 293\text{day}/\text{year} = 237/\text{day}$ Daily consultation hours: 4 hours (240 minutes) Average consultation time: (5~10minutes) 7.5 minutes/patient on average $237 \text{ patients} \times 7.5 \text{ minutes} \div 240 \text{ minutes} = 7.4 \text{ rooms} \rightarrow 8 \text{ rooms}$ These facilities are equivalent to medical offices in Japan. No. of offices of LHMC professors in charge of paediatric medicine: 9 (1 for the chief, 6 for paediatric internists, and 2 for internists in charge of health care of newborn infants) |
| Paediatric Surgical Rm Examination Rm | 2 | 2 | Average daily no. of outpatients: $7,152/\text{year} \div 293\text{day}/\text{year} = 24 \text{ outpatients}/\text{day}$ Average daily consultation hours: 4 hours (240 minutes) Average consultation time : 20 minutes/patient $24 \text{ patients} \times 20 \text{ minutes} \div 240 \text{ minutes} = 2 \text{ rooms}$ 1 examination room and 1 treatment room |
| Paediatric Orthopedic Examination Rm & Treatment Rm | 2 | 2 | |
| Plaster Rm | 1 | 1 | |
| Paediatric Ophthalmology Examination Rm | 1 | 1 | |

| Room Name | No. of rooms (in the Request) | No. of rooms (in the basic design) | Result of the examination |
|---|----------------------------------|--|---|
| Paediatric E. N. T. Examination Rm | 1 | 1 | For paediatric surgery and paediatric orthopedics For all the surgical departments |
| Paediatric Dermatology Examination Rm | 1 | 1 | |
| Dressing Rm | 1 | 1 | |
| Central Injection Rm | 1 | 1 | |
| Specimen Collection Rm | 1 | 2 | |
| Deputy Supt. Nurse Rm | 1 | 1 | |
| Assit. Nurse Supt. Rm | 1 | 1 | |
| Stretcher Rm | 1 | 1 | |
| Pharmacy / Dispensary | 1 | 1 | |
| Storage (general purpose and drug storage) | 2 | 1 | |
| • Physical Medicine & Rehabilitation (Following rooms are proposed in the basic design as below) | 2 | | Average daily no. of outpatients: $72,954/\text{year} \div 293\text{day}/\text{year} = 249$ outpatients/day Average daily consultation hours: 8 hours (480 minutes) Average consultation time: 7.5 minutes/patient $249 \text{ patients} \times 7.5 \text{ minutes} \div 480$ minutes = 3.89 → 4 room Two senior doctor's offices and senior residents' office (for two senior residents) A senior physiotherapist's office and a physiotherapists' office (for 5 physiotherapists) To be equipped with two microwave treatment devices, a whirlpool bath device and a low-frequency treatment device (these devices are all for the treatment of both infant and adult patients). To be equipped with devices for the treatment of infant and adult patients. An occupational therapists' office (for two occupational therapists) |
| Reception | | 1 | |
| Examination Rms | | 4 | |
| Doctor's Rm | | 3 | |
| Physiotherapist's Rm | | 2 | |
| Physiotherapy Treatment Rm | | 1 | |
| Exercise Therapy Rm | | 1 | |
| Occupational Therapists' Office | | 1 | |
| Speech Therapy Rm | | 1 | |
| • Radiology Department | | | |
| Reception | 1 | 1 | |

| Room Name | No. of rooms (in the Request) | No. of rooms (in the basic design) | Result of the examination |
|--|-------------------------------------|--|---|
| X-ray Rm | 4 | 3 | Annual no. of X-ray examinations (general): 32,191 Annual no. of X-ray examinations (special): 5,112 Average daily no. of X-ray examinations: 102 An average 34 X-ray examinations are to be conducted each working day in each X-ray examination room. |
| Control Rm | 0 | 1 | |
| Darkroom | 1 | 1 | The darkroom is to serve also as a drying room |
| Radiographer' s Rm | 1 | 0 | |
| Ultrasound Rm | 1 | 1 | To be equipped with two ultrasonic devices. Annual no. of ultrasonic diagnoses : 3,684 |
| Radiologist' s Rm | 2 | 1 | A middle-rank radiologist' s office cum assistant radiologist' s room |
| Technicians' Rm | 1 | 1 | A technicians' room (for 8 technicians) |
| • Laboratory Department | | | |
| Chemical Biochemistry Lab. | 1 | 1 | Annual no. of biochemistry tests: 67,875 Average daily no. of biochemistry tests: 201 |
| Biochemical Store | 1 | 1 | To serve as a store for common use |
| Autoanalyzer Rm | 1 | 1 | The existing one is to be transferred to the planned facility. |
| Common Lab. for Bacteriology, Parasitology | 1 | 1 | Those tests were conducted at LHMC. |
| Store | 1 | 0 | The above-mentioned store can be utilized also by this section. |
| Common Lab for Hematology, Pathology | 1 | 1 | Annual no. of pathological tests: 133,077 |
| Immuno Hematology Lab. | 1 | 1 | |
| ECG Rm | 1 | 1 | To be equipped with three electrocardiographs (two types) |
| EMG Rm | 1 | 1 | An existing electromyograph and a new one are to be installed. |
| EEG Rm | 1 | 1 | The existing electroencephalograph is to be transferred to the planned facility. |
| Officer' s Rm | 2 | 2 | Two senior researcher' s offices (for a senior bacteriologist and a senior biochemist) |
| Technicians' Rm | 1 | 1 | A technicians' room (for 4 assistant technicians, 9 testing technicians, 4 assistant testing technicians and 5 testing assistants) |
| Office Rm | 1 | 1 | An office room for a middle-rank chemist and assistants |
| Operation Theatre | | | |
| Reception | 1 | 1 | |

| Room Name | No. of rooms (in the Request) | No. of rooms (in the basic design) | Result of the examination |
|--|----------------------------------|--|--|
| Major Operation Theatre | 1 | 1 | Annual no. of major operations: 591 Major operations such as chest surgery, artificial anus operations and palatoplasty are to be performed in the major operation room. |
| Minor Operation Theatre | 2 | 2 | Annual of no. of minor operations: 1,919 Minor operations such as simple hernioplasty, artificial anus operations, lithectomy and preputiotomy are to be performed in one of the minor operation rooms. It is to be provided with an anteroom and a store. Another minor operation room is for the use of the paediatric orthopedics and paediatric ophthalmology . |
| Changing Rm | 1 | 2 | One for males and the other for females |
| Surgical ICU | 1 | 1 | For 3 beds |
| Scrubbing | 1 | 1 | 2 unit of scrubbers will be installed |
| Recovery Rm | 1 | 1 | |
| Doctor' s Rm | 1 | 1 | |
| Surgical Nurse Station | 1 | 1 | |
| Preoperation/ Postoperation Rms (12 beds) | 1 | 2 | A preoperative room with 6 beds and a postoperative room with 6 beds |
| • Central Supply & Sterilization ◆ The following autoclave-related rooms are proposed. | 1 | | |
| Reception | | 1 | |
| Washing Rm | | 1 | |
| Autoclave Rm | | 1 | To be equipped with 3 autoclaves (1 large-size and 2 medium-size) |
| Assembly Rm | | 1 | |
| Clean Storage | | 1 | |
| Distribution Rm | | 1 | |
| • Emergency Department | | | |
| Reception | 1 | 1 | |
| Examination Rm | 1 | 1 | Annual no. of emergency outpatients accepted : 30,630 Average daily no. of emergency outpatients accepted: 104 Working hour: 24 hours |
| Treatment Rm | 1 | 1 | |
| Nurse Station | 1 | 1 | |
| Doctor' s Rm | 2 | 2 | One for an LHMC professor and the other for a senior doctor in charge of emergency medical care |
| Police Post Rm | 1 | 1 | It is a law that a policeman shall be stationed on the premises of the hospital. |

| Room Name | No. of rooms (in the request) | No. of rooms (in the basic design) | Result of the examination |
|---|----------------------------------|--|--|
| • ICU | | | |
| Treatment Rm | 1 | 1 | |
| Examination Rm | 1 | 1 | |
| Nurse Station | 1 | 1 | |
| Isolation Rm | 1 | 1 | |
| ICU | 2 | 2 | There are already 4 ICUs (27 bed) in the hospital which are shared with the Emergency Department. Included in the project are two additional ICUs (for 17 beds and 13 beds). |
| Laboratory | 1 | 1 | The existing equipment (autoanalyzer) is to be transferred to the planned facility. |
| Doctor' s Rm | 2 | 0 | Doctors of the Emergency Department are also to be in charge of medical care at these ICUs. |
| Store | 1 | 1 | |
| • Preventive & Social Medicine Department | | | |
| Reception | 1 | 1 | |
| Child Health Promotion Clinic Immunization Rm | 1 | 1 | Annual no. of Immunization DPT (diphtheria, pertussis, tetanus): 12,318 Polio: 13,457 Measles: 2,653 BCG: 5,012 Tetanus: 161 Diphtheria: 997 Annual no. of cases : 23,29 Average daily no. of patients accepted: 60~65 |
| Nutrition Councelling /Growth Monitoring Rm | 1 | 1 | To be used for various follow-up clinics |
| Child Guidance Clinic | 2 | 1 | Annual no. of cases: 3,109 |
| High Risk Clinic | 1 | 1 | |
| Psychological Testing Rm | 1 | 1 | For the use of psychologist |
| Malaria Clinic | 1 | 1 | For the use of two engineers from NDMC |
| Family Welfare Clinic | 1 | 1 | Annual no. of patients receiving advise : 9,576 |
| Medical Social Services | 2 | 2 | There are already two medical consulting rooms. Average daily no. of patients receiving advise: 15-20 |
| Doctor' s Rm | 1 | 1 | A doctor' s office for a senior doctor in charge of child health promotion. |
| Store | 1 | 1 | Common use with Lab. |
| • DITU | 1 | 1 | Annual no. of cases: 11,373 |
| Doctor' s Rm | 1 | 1 | To serve also as the reception counter |
| Treatment Rm | 1 | 1 | |
| Children' s Sitting Rm | 1 | 1 | |
| Health Education Rm | 1 | 1 | |
| • Others | | | |
| Telephone Exchange Rm | 1 | 1 | To be provided with a rest station for the operators. |

| Room Name | No. of rooms (in the request) | No. of rooms (in the basic design) | Result of the examination |
|----------------|----------------------------------|--|---|
| Mechanical Rm | -- | 1 | |
| Substation | 1 | 1 | |
| Workshop | 1 | 1 | |
| Laundry | 1 | 1 | Planned as a independent building where linen and operating gowns are washed. |
| Incinerator Rm | 1 | 1 | Planned as a independent incinerator room building |

② Kalyanpuri Urban Health Centre

Table 2-8 Examination of Requested Rooms -2

| Room Name | No. of rooms (in the request) | No. of rooms (in the basic design) | Result of the examination |
|-------------------------------|----------------------------------|--|---|
| Examination Rms | 4 | 4 | Annual no. of outpatients accepted: 35,000 Annual no. of working days: 293 Daily working hours: 4hours Average consultation time: (5-10 minutes) Average: 7.5 minutes/patient $35,000 \div 293 \times 7.5 \div 240 = 3.7 \rightarrow 4$ room One each for the internal medicine, paediatrics, obstetrics/gynecology and ophthalmology departments |
| Doctor's Rm | 1 | 1 | |
| Medical Social Workers' Rm | 1 | 1 | A room where advice on preventive social medicine is given |
| Seminar Rm (25~30 persons) | 1 | 1 | Annual no. of mothers' classes: 86 The seminar room is to serve also as a waiting hall. |
| Treatment Rm (Minor OT) | 1 | 1 | It will be possible to treat more than 586 (2 / day X 293days) external injuries a year in the treatment room |
| Observation Rm | 1 | 1 | To be used for observation of emergency outpatients |
| Laboratory | 1 | 1 | It will be possible to conduct about 5,860 (20/day X 293) basic tests such as malaria, blood and urine tests a year |
| Injection Rm | 1 | 1 | |
| Dressing Rm | 1 | 1 | |
| Pharmacy | 1 | 1 | |
| Store | 1 | 1 | |
| Guard Rm | 1 | 1 | |

2. Requested Items of Equipment (☐ indicate part completed in phase 1)

Table 2-9 Examination of Requested Equipment

| No. | Equipment name | No. of units (in the request) | No. of units (in the basic design) | Result of the examination |
|-------------------------------------|----------------------------------|----------------------------------|--|--|
| Radiology Department | | | | |
| 1 | X-ray TV monitor | 1 | 1 | It is necessary to take X-ray photos and contrast photos of abdomen and other blood vessels. Since this equipment is operated from the control room, there is no danger of doctors and technicians being exposed to X-rays. Although no TV-mounted X-ray equipment is used at the hospital, its radiologists have the ability to operate such equipment. The existing superannuated equipment is to be replaced. |
| 2 | Color doppler ultrasound scanner | 1 | 1 | This equipment is used for diagnosis of circulatory disorders. It was difficult to do this type of diagnosis at the hospital due to a lack of the equipment. The introduction of this equipment will make it possible to do more accurate diagnosis of paediatric circulatory disorders, which will lead to a marked improvement in health care in the country. |
| 3 | Diagnostic X-ray | 1 | 1 | This equipment is used for taking general and emergency photos of bone fractures and chest diseases. The existing equipment is to be replaced. |
| 4 | X-ray film changer | 2 | 0 | This equipment is not to be included in the project because no contrast photos of blood vessels are taken at the hospital. |
| 5 | Contrast medium injection unit | 2 | 0 | This equipment is not to be included in the project because no contrast photos of blood vessels are taken at the hospital. |
| Operation Theatre Department | | | | |
| 1 | Examining light | 4 | 4 | These lights are necessary in lighting the affected part and the color of the patient's skin for observation purposes. |
| 2 | Cryosurgical unit | 2 | 0 | This equipment is not to be included in the project. No significant therapeutic effects can be expected of it. |
| 3 | Electro mygraph | 1 | 1 | This equipment is necessary in measuring the degree of malfunction of skeletal muscles. |
| ICU Department | | | | |
| 1 | Infant incubator | 6 | 3 | <u>Standard Type</u> This device is necessary to maintain an environment similar to mother's body for a premature baby until his or her weight reaches normal level. 6 incubatoras composed of 3 standard type and 3 ICU type. |
| 2 | Infant incubator | 6 | 3 | <u>ICU Type</u> This device is necessary to maintain an environment similar to a mother's body for a premature baby until his or her weight reaches normal level. This type is definitely required for infants whose conditions are serious. |

| No. | Equipment name | No. of units (in the project) | No. of units (in the basic design) | Result of the examination |
|-------------------------------------|------------------------------------|----------------------------------|--|--|
| 3 | Infant warmer | 12 | 3 | To maintain the body temperature of the infant is most important for which phototherapy unit should be included. 3 units are reasonable quantity for 30 ICU beds. |
| 4 | Neonatal monitor | 4 | 3 | This equipment is necessary to monitor vital changes in a patient's heart, as well as his or her respiration and temperature. 3 units are sufficient for 30 beds ICU. |
| 5 | Infant ventilator (neonatal) | 0 | 1 | In 1993, about 6,800 patients, including 3,700 respiratory disorder patients, were treated at the hospital. It is estimated that there were about 300 cases when these patients had to be treated using ventilators. These devices are necessary for artificial ventilation control for newborn infants in the case of IRDS and dyspnea. |
| 6 | Infant ventilator | 2 | 2 | |
| 7 | Defibrillator | 0 | 1 | This equipment is necessary in removing ventricle fibrillation. It can also be used for emergency monitoring. |
| Operation Theatre Department | | | | |
| 1 | Operating table | 4 | 3 | These are electrohydraulic (height adjustable) operating tables for use with infant patients. A total of 3 such operating tables are to be procured under the project. 1 additional for paediatric orthopedic surgery. |
| 2 | Operating light with TV monitor | 0 | 1 | Shadowless lamps are indispensable in performing operations. A TV-mounted shadowless lamp is to be procured under the project for educational purposes. |
| 3 | Operating light | 4 | 2 | |
| 4 | Operating light with spot light | 0 | 1 | Shadowless lamps are indispensable in performing operations. They are necessary in performing ophthalmological and E.N.T. operations. |
| 5 | Anesthesia Mac. | 4 | 3 | This device is indispensable when an operation is performed on a patient put under general anesthesia. Though 4 of them are to be procured to match the 4 operating tables to be procured under the project, 3 are reasonable quantity in consideration of one anesthesia machine is now utilized without trouble. |
| 6 | Multi channel patient monitor | 4 | 2 | This device is necessary to monitor vital changes in a patient's heart, temperature, the oxygen content of blood and his or her respiration and blood pressure during operation. Since this device included in the anesthesia machine, it is appropriate to procure two units of general-purpose anesthesia machine under the project. |
| 7 | Table top E.O.G. steriliser | 1 | 0 | This equipment is necessary for low-temperature sterilization. However, this equipment should not be procured for this department since it was decided that Central Sterilization Supply will procure it. |

| No. | Equipment name | No. of units (in the report) | No. of units (in the basic design) | Result of the examination |
|---|--|---------------------------------|--|---|
| 8 | Hand washing sink unit | 0 | 2 | This equipment is indispensable to keep surgeons' and assistants' hands sterile. |
| Newborn Baby Room in KSCH | | | | |
| 1 | Neonate room | | | No newly equipment is to be procured for this department since the existing equipment is sufficient. |
| Premature Baby Room in KSCH | | | | |
| 1 | Infant care incubator | 8 | 0 | This equipment should be deleted since the existing one and the one existing equipment is sufficient. |
| 2 | Infant care center | 4 | 2 | Maintenance of normal body temperature is important for premature babies. The equipment is indispensable to prevent premature babies' temperatures from falling and treatment. The existing superannuated equipment is to be replaced. |
| 3 | Infant ventilator | 4 | 0 | No equipment is to be procured since the equipment to be procured for ICU will suffice. |
| 4 | Transcutaneous PO ₂ /PCO ₂ monitor | 2 | 1 | This equipment is used for measuring oxygen and carbon dioxide content in blood for premature and newborn babies without collecting blood from them and for monitoring oxygen replacement in these babies' lungs. It is appropriate to procure the equipment under the project since it requires no blood collection and therefore minimizes damage to patients. 1 unit is sufficient from the scale of the hospital. |
| Ward | | | | |
| 1 | Patient bed | 150 | 50 | It is appropriate to procure the required number of beds under the project since these beds are necessary for patients to get medical treatment in a healthy environment 50 for new facility will be provided. |
| 2 | Bedside cabinet | 150 | 50 | |
| 3 | Overbed table | 150 | 50 | |
| 4 | Doppler fetus detector | 4 | 0 | This equipment should be deleted since it is for obstetric use. |
| 5 | Stretcher trolley | 4 | 0 | This equipment should be deleted since ordinary equipment can be used for this purpose. |
| Feeding, Bath and Milk Kitchen Room in SKGH | | | | |
| 1 | Breast pump | 4 | 0 | This equipment is unnecessary since there is no need for milking. |
| 2 | Nursing bottle sterilizer | 2 | 0 | This equipment is unnecessary since there is no need for milking. |
| 3 | Nursing bottle warmer | 1 | 0 | This equipment is unnecessary since there is no need for milking. |
| 4 | Infant warmer | 2 | 3 | Declines in newborn babies' temperatures are very dangerous. It is therefore appropriate to procure 3 devices under the project. |

| No. | Equipment name | No. of units (in the request) | No. of units (in the basic design) | Result of the examination |
|--------------------------------------|---------------------------|----------------------------------|--|---|
| Gas Supply System | | | | |
| 1 | Medical gas supply system | 1 | 0 | This equipment should be deleted since it is included in the facility construction work. |
| Incinerator | | | | |
| 1 | Paging system | 1 | 0 | This equipment should be deleted since it is included in the facility construction work. |
| 2 | Incinerator | 4 | 3 | This equipment is necessary in incinerating medical waste. It is appropriate to procure three units of the equipment under the project. It will be necessary to incinerate 600kg (1.2kg/bed X500) of medical waste a day. |
| Transportation | | | | |
| 1 | Ambulance | 4 | 4 | An ambulance is indispensable in transporting an emergency or serious patients to a medical facility when it is impossible to care by themselves. The existing ambulance is to be replaced. |
| 2 | Mini bus | 1 | 1 | A microbus is indispensable in transporting doctors and nurses for outreach health care services, as well as in transporting them for in-service training programs. |
| 3 | 4 wheeler (Jeep) | 1 | 1 | This type of motor vehicle is necessary to transport outreach service doctors/nurses to the places where the road conditions are poor, and when the infectious diseases are required to be cared during the rainy season. |
| Autopsy Room in SKGH | | | | |
| 1 | Autopsy table with shower | 2 | 2 | Pathological autopsy is indispensable in investigating the causes of diseases. This equipment is necessary in conducting pathological autopsy. |
| 2 | Morgue refrigerator | 1 | 1 | A refrigerator is necessary to prevent corpses for use in pathological autopsy from decomposing. An additional refrigerator is to be procured for emergency use (when the existing refrigerator with a capacity of up to 12 corpses breaks down.) |
| Central Laboratory Department | | | | |
| | Chemical biochemistry | | | |
| 1 | Blood cell counter | 4 | 0 | This equipment, which is used to count the number of blood corpuscles, should be deleted since it is not needed at any biochemistry laboratory |
| 2 | Blood bank refrigerator | 2 | 0 | This equipment, which is used in storing blood for use in blood transfusion, should be deleted since it is not needed at any biochemistry laboratory. |

| No. | Equipment name | No. of units (in the request) | No. of units (in the basic design) | Result of the examination |
|----------------|---|----------------------------------|--|--|
| 3 | Refrigerated centrifuge | 1 | 1 | This equipment is used to separate tangible ingredients and liquid ingredients in liquid specimens in which cells and special tangible ingredients are suspended. It is therefore appropriate to procure this equipment under the project. |
| 4 | Electrophoresis | 1 | 0 | This equipment should be deleted since it will not be used at the planned facility. |
| 5 | Immuno & Agar Electrophoresis apparatus | 1 | 0 | This equipment should be deleted since it will not be used at the planned facility. |
| 6 | Electrophoresis (disk type) | 1 | 0 | This equipment should be deleted since it will not be used at the planned facility. |
| 7 | Thin-layer chromatograph | 1 | 0 | This equipment should be deleted since it will not be used at the planned facility. |
| 8 | Elisa system | 1 | 1 | This equipment, which is used to measure various types of active oxygen in blood and grasp the degree of seriousness of patients' diseases, is indispensable. |
| Bacteriology | | | | |
| 9 | CO ₂ incubator | 2 | 1 | This equipment is used mainly in culture of bacteria. It is indispensable in culturing bacteria in laboratory dishes or otherwise in not so precisely controlled condition. |
| 10 | Low temperature incubator | 0 | 1 | This equipment is used mainly in fixed temperature culture of bacteria. It is indispensable for this department. |
| 11 | Elisa system | 0 | 1 | This equipment is used in biological examinations aimed at identifying pathogenic organisms and is therefore indispensable for this department. |
| 12 | Clean hood | 0 | 1 | This equipment is necessary to carry out aseptic activities in ordinary rooms and is therefore indispensable for this department. |
| Hematology | | | | |
| 13 | Electrophoresis apparatus | 1 | 0 | This equipment should be deleted since it is hardly needed by this department. |
| 14 | Automatic blood cell counter | 0 | 1 | This equipment, which is used in screening tests to keep track of the progress of patients suffering from blood diseases, is indispensable in treating these patients. |
| 15 | Elisa system | 4 | 0 | This equipment should be deleted since it is hardly needed by this department and it is used mainly in the fields of biochemistry and microbiology. |
| Histopathology | | | | |
| 16 | Microscope | 8 | 1 | One microscope will suffice. |
| 17 | Freezing microtom | 2 | 1 | This equipment, which is used to freeze and slice a tissue section promptly when there is not enough time to do paraffin burying, is indispensable for this department. |

| No. | Equipment name | No. of units in the request | No. of units (in the basic design) | Result of the examination |
|---|--|--------------------------------|--|--|
| 18 | Tissue infiltrator | 12 | 1 | This equipment, which automatically does dehydration, decreasing and paraffin penetration of a tissue section, is indispensable for this section. It is appropriate to procure one unit of this equipment under the project. |
| Surgical ICU | | | | |
| 1 | Neonatal ventilator | 2 | 1 | |
| 2 | Paediatric ventilator | 4 | 2 | |
| 3 | Defibrillator | 0 | 1 | The resuscitation device is important and indispensable for any ICU. |
| Follow-up Clinic | | | | |
| 1 | Hemodialysis system | 4 | 2 | Acute diseases such as kidney insufficiency require this system 4 systems are not necessary, but 2 systems are adequate. |
| Central Supply & Sterilization | | | | |
| 1 | High pressure sterilizer, big size | 1 | 1 | This equipment is used to sterilize linen, small steel articles at the operation theatre and ward departments. It is indispensable for any hospital. |
| 2 | High pressure sterilizer, middle size | 1 | 1 | |
| 3 | High pressure sterilizer, middle size high speed | 1 | 1 | |
| 4 | Ultrasonic equipment cleaner | 2 | 1 | This equipment is necessary in cleaning metal goods such as forceps. |
| 5 | Washer / Dryer for surgical gloves | 2 | 1 | This equipment is necessary in cleaning rubber gloves used in operations. Its use will lead to a reduction in the running cost. |
| 6 | EO gas sterilizer table model | 0 | 1 | This equipment is required to do low-temperature sterilization. One unit of this equipment, which was originally to be procured for the operation theatre, is to be procured for this department. |
| Suchita Kripalani General Hospital Dental Department | | | | |
| 1 | Dental | 1 | 0 | Deleted as project is limited to KSCH. |
| Outpatient Department Paediatric Orthopedic | | | | |
| 1 | Paediatric orthopedic operation table | 1 | 1 | An operating table is indispensable for paediatric orthopedic surgery. |
| 2 | Surgical apparatus set for Ortho. Surgery | 1 | 1 | These devices are indispensable for paediatric orthopedic surgery. |
| 3 | C-arm X-ray TV system | 1 | 1 | This equipment is used to take X-ray photos of bone fractures. It is used mainly in the operation theater. Since it is portable, it can also be used in the emergency department. |

| No. | Equipment name | No. of units in the request | No. of units in the budget | Result of the examination |
|--|---|-----------------------------|----------------------------|--|
| Outpatient Department E.N.T. | | | | |
| 1 | Otorhinolaryngological treatment table | 1 | 1 | This equipment is used in minor operations. |
| 2 | Otorhinolaryngological treatment unit with compressor | 1 | 1 | This equipment is used in E.N.T. treatment. |
| 3 | Cryosurgical unit | 1 | 0 | This equipment should be deleted because it has no significant therapeutic effect. |
| 4 | CO ₂ laser surgical unit | 1 | 0 | This expensive equipment should be deleted because there is no significant difference in therapeutic effect between this equipment and other similar equipment. |
| Outpatient Department Paediatric Ophthalmology | | | | |
| 1 | Cryosurgical set | 1 | 0 | These devices are used in operations for cataract and retinal detachment, as well as for corpus ciliare freezing for hemorrhagic glaucoma, however, this should be deleted as the paediatric cases are rare. |
| 2 | Slit lamp with camera | 1 | 1 | This equipment is indispensable in conducting the ophthalmological examination of the turbidity of the cornea and the like. |
| 3 | Projection perimeter | 1 | 1 | This equipment is indispensable in testing the entire vision from the retina to the visual centre to detect glaucoma, retinal optic nerve disorders and cerebral hemorrhage. |
| 4 | Autorefractometer | 1 | 1 | This equipment, which automatically measures the refractive index of the eyes, the degree of astigmatism and the like, is indispensable in conducting ophthalmological tests. |
| 5 | Cataract set microsurgery | 12 | 1 | This equipment is used in operations for cataract. The number of units of this equipment in the request are too large. 1 is sufficient. |
| 6 | Fundus camera | 1 | 1 | This equipment, which is used in observing the condition of the optic disk, the retina and the choroidea, is indispensable in conducting ophthalmological tests. |
| 7 | Echo-scan | 1 | 1 | This equipment is used in diagnosing tumorous lesions in the eye or the eye socket and retinal detachment. |
| 8 | Ophthalmology yag laser | 1 | 0 | This equipment is used in treating diabetic retinopathy, thrombosis of the central vein of retina, rhegmatogenous retinal detachment and orbit disorders, for which there is no viable pharmacotherapy. This equipment should be deleted since it is not used so frequently in paediatric ophthalmology. |

| No. | Equipment name | No. of units (in the request) | No. of units (in the basic design) | Result of the examination |
|--|------------------------------|----------------------------------|--|--|
| 9 | Argon laser | 1 | 1 | This equipment is necessary in treating diabetic retinopathy, thrombosis of the central vein of retina, hemogenous retinal detachment and orbit disorders, for which there is no viable pharmacotherapy. It is indispensable in treating eye diseases. |
| 10 | Vitreous operation apparatus | 2 | 0 | This equipment is used in operations to remove suspended vitreous bodies as a result of vitreous bleeding or vitreous acyloidosis. But this equipment should be deleted since it is usually used in operations performed on elderly patients rather than on infant patients. |
| 11 | Computer graphic analyzer | 1 | 0 | This equipment is used in collecting and analyzing eyeground examination records. But this equipment should be deleted because there is no sufficient application software for it. |
| 12 | Phacoemulsifier | 1 | 0 | This equipment is suited for use in operations for senile cataract. But this equipment should be deleted since it is rarely used in operations performed on infant patients. |
| Outpatient Department Paediatric Dermatology | | | | |
| 1 | Cryosurgical unit | 1 | 0 | This equipment should be deleted since it has no significant therapeutic effect. |
| 2 | Dermatology laser unit | 1 | 0 | This equipment, which is used mainly in treating congenital hemangioma, should be deleted because there are few cases of this diseases. |
| Laundry | | | | |
| 1 | Washing machine | 4 | 2 | This equipment is necessary in washing line and bedclothes. Two washing machines with a capacity of 50kg and one with a capacity of 25kg are to be procured under the project on the assumption that 600kg of linen and bedclothes will be washed daily. |
| 2 | Washing machine | 0 | 1 | |
| 3 | Drying tumbler | 4 | 2 | |
| 4 | Drying tumbler | 0 | 1 | |
| 5 | Press machine | 2 | 0 | |
| 6 | Extractor | 0 | 2 | |
| Endoscopes | | | | |
| 1 | Bronchoscope | 1 | 0 | This equipment should be deleted since it is to be procured for E.N.T. |
| 2 | Duodenoscope | 1 | 1 | This equipment is indispensable in diagnosing and observing the progress of duodenal ulcer, which it is difficult to diagnose by X-ray examination. |

| No. | Equipment name | No. of units (in the request) | No. of units (in the basic design) | Result of the examination |
|---------------------------------------|------------------------|----------------------------------|--|--|
| 3 | Laparoscope | 1 | 1 | This equipment is necessary in diagnosing chronic hepatitis, cirrhosis of the liver and hepatomegaly, as well as in conducting open biopsy of these diseases. |
| Medical Record | | | | |
| 1 | Computer | 4 | 4 | This equipment is necessary in compiling statistics on patients and thereby improving the quality of hospital services. |
| Preventive Social Medicine Department | | | | |
| 1 | Computer | 1 | 1 | This equipment is necessary in compiling statistics on public health and thereby improves the community health service level. |
| The 3 Health Centers | | | | |
| 1 | Sterilizer table model | 4 | 4 | This equipment is necessary in preventing infections and cross infections. 2 units for Kalyanpuri, 1 unit for Najafgarh and 1 unit for Palam are to be procured under the project. |
| 2 | Incinerator | 3 | 3 | It is necessary to incinerate medical waste. |
| Administration | | | | |
| 1 | Computer | 2 | 2 | This equipment is necessary in managing patients records and medical equipment and thereby increasing the efficiency of hospital management. |

2-3 Basic Design

2-3-1 Design Concept

The Project aims to strengthen the primary and secondary medical functions of Kalawati Saran Children's Hospital located on the premises of Lady Hardinge Medical College, improve the quality of regional health activities conducted at the three Health Centres working closely with the Medical College, promote the health of local community residents, including infants, and thereby improve the country's health indicators such as the infant mortality rate. The facility and equipment plan for the Project is therefore to be worked out paying close attention to the functionality, economy and safety of each item in accordance with the following basic design policies.

(1) Design Concept Concerning Natural Conditions

As stated in Chapter 2, the National Capital Territory of Delhi (hereinafter referred to as Delhi) belongs to a semiarid climate which consists of the rainy season and the dry season. There is a considerable difference in temperature between the May to June period, when the average temperature exceeds 30 C and the maximum temperature reaches 45 C and the December to February period, when the average monthly temperature is about 15 C and the lowest temperature reaches 4 C. The July to August period is the very sultry rainy season when average monthly rainfall exceeds 200m/m. In light of such natural conditions, the following basic design policy was worked out.

- Since the operation theatre, ICUs and laboratories to be constructed under the Project require air conditioning, their walls and roofs should be insulated sufficiently and the amount of sunlight coming through the window glass should be minimized so that maintenance and management costs, including air conditioning expenses, may be minimized.

- To protect the medical equipment to be procured under the Project against dust during the dry season, window frames which are highly resistant to dust should be used.
- Measures should be taken to protect against unclean condition especially during the rainy season.

(2) Design Concept Concerning Social Condition

The Project site is located in the New Delhi District in the centre of the National Capital Territory of Delhi. New Delhi Municipal Committee attaches importance to the maintenance of the beauty of the streets and environmental protection. Applications for the building permit are screened by Delhi Urban Arts Commission. As regards environmental protection, it is difficult to obtain permission to cut down existing trees. Since the Project is going to be implemented as one aimed at expanding and improving the existing facilities of Kalawati Saran Children's Hospital on the premises of Lady Hardinge Medical College, the following basic design policy was worked out.

- The design of the outer appearance of the planned facilities should be in harmony with that of the existing facilities.
- As many of the existing trees on the Project site should be preserved as possible considering the surrounding natural environment.

(3) Design Concept Concerning Local Construction Situation

India has detailed building laws and regulations, which require that architectural plans shall be subject to screening of their contents. In working out the architectural plan for the Project it is essential to comply with the local building laws and regulations so that the building permit may be obtained smoothly.

(4) Design Concept Concerning Utilization of Local Contractors and Locally Available Equipment and Materials

In India, the import of foreign-made goods which are the same as domestic goods is restricted. Activities of foreign companies in the country are also limited. Since the country has a viable construction industrial base, there will be no problem with the procurement of domestically produced building equipment and materials. In implementing the Project, therefore, the qualified Japanese contractor should give technical advice to its Indian subcontractor to make full use of domestically produced building equipment and materials.

(5) Design Concept Concerning Maintenance and Management Capability

The building maintenance and management cost is included in the annual budget of Kalawati Saran Children's Hospital. As the Project is aimed at expanding and improving the facilities of the existing hospital, it is expected that the building maintenance and management cost will increase as the total floor space of its facilities increases. It is important to minimize the hospital's building maintenance and management cost for the Project so that too heavy a financial burden may not be imposed on the hospital. To reduce the maintenance and management cost, natural ventilation and lighting should be utilized as much as possible, planned buildings should be sufficiently insulated, and highly durable building equipment and materials should be used.

(6) Design Concept Concerning Scope and Level of the Facilities and Equipment

After considering all the above basic design policies, the following basic design policy was worked out for the facilities and equipment to be procured under the Project.

- The facility plan should be consistent with the functions of Kalawati Saran Children' s Hospital and the three Health Centres (in Kalyanpuri, Najafgarh and Palam).
- The facility/equipment maintenance and management cost should be minimized.
- The planned facilities should match the characteristics of the Project site.

(7) Design Concept Concerning Implementation period of the Project.

In determining the period of the implementation of the Project, care should be taken to minimize the period of suspension of operations at the hospital while the planned facilities are connected to the existing facilities. In India, the July to August period is the rainy season when temperatures often exceed 35 C. It will therefore be difficult to carry out the earth and foundation work during this season. This should also be taken into account in determining the period of Project implementation. Considering the above conditions, it is difficult to complete construction and equipment supply within 12 months. Therefore, the Project should be divided and work carried out in 2 phases.

2-3-2 Examination of the Design Condition

(1) Facility Composition

The facilities to be constructed under the Project are as follows.

1) Kalawati Saran Children's Hospital

① Central Building (Completed in the scope of the phase 1)

- Outpatient Department:

Examination Rooms (Paediatric Internal Medicine, Paediatric Surgery, Paediatric Orthopedics, Ophthalmology, E.N.T., Dermatology), Treatment Room (Paediatric Orthopedics), Plaster Room, Treatment Room for common use, Central Injection Room, Specimen Collection Room, Add. Medical Superintendent Office, Doctor's Office, Dpty. Nurse Supt. Room, Stretcher Stockroom, Pharmacy/Dispensary, Drug Storage, General-purpose Storage, etc.

- Radiology Department:

Reception, X-ray Room, Control Room, Darkroom, Technician's Room, Ultrasound Room, Waiting Room, etc.

- Laboratory Department:

Chemical Biochemistry Laboratory Room, Autoanalyzer Room, Common Laboratory (Bacteriology & Parasitology, Hematology & Histopathology), Immuno Hematology Laboratory, ECG room, EMG Room, EEG Room, Doctor's Room, Officer's Room, Technicians' Room, Storage, etc.

- Operation Department:

Reception, Major Operation Theatre, Minor Operation Theatre, Changing Room, Surgical ICU, Recovery Room, Doctor's room, Surgical Nurse Station, Preoperative/Postoperative Room, Central Supply & Sterilization Room, Store, etc.

- Emergency Department:

Reception, Examination Room, Treatment Room, Doctors' room, Nurse Station, Police Post Room, etc.

- ICU Department:

Treatment Room, Examination Room, Nurse Station, Isolation Room,

ICU, Laboratory, Doctor's room, Store, etc.

- Preventive Social Medicine Department:

Reception, Immunization Room, Nutrition Counseling & Growth Monitoring Room, Child Guidance Clinic, High Risk Clinic, Malaria Clinic, Family Welfare Clinic, Doctor's Room, Store, etc.

- Diarrhea Training & Treatment Unit:

Doctor's Office, Treatment Room, Waiting Room, Health Education Room, etc.

- Physical Medicine & Rehabilitation Department:

Reception, Medical Record Room, Examination Room, Doctor's Office, Physiotherapy Treatment Room, Occupational Therapy Room, Language Therapy Room, Physiotherapist's Room, Occupational Therapist's Room, etc.

② Workshop • Substation Building

Generator Room, High-tension Panel Room, Low-tension Panel Room, Transformer Room, Metal Processing Workshop, Wood Workshop, Electrical Workshop, Electronic Workshop, Parts Store, Engineer's Room, Technician's Room, etc.

③ Laundry Building

Washing/Extract Room, Drying Room, Press Room, Reception Counter/Distribution Room, Rest Room, Store, etc.

④ Incinerator Building

Incinerator Room, etc.

2) Kalyanpuri Urban Health Centre

Reception, Examination Room, Minor OT (Treatment Room), Injection Room, Pharmacy, Store, Observation Room, Dressing Room, Laboratory, Seminar Room, Medical Social Worker' s Room, Doctor' s Room, etc.

3) Palam Primary Health Centre

Deep tube well, water supply & drainage for existing building.

(2) Scale of the Planned Facility

The scale of the facilities to be contracted under the Project is determined on the basis of the contents of the Indian request, staffing of each room, contents of activities, standard floor spaces required in Japan, the equipment arrangement plan and other data and information collected in India. The scale of each room is determined based on the contents of the following table.

2-3-3 Basic Design

(1) Facility Plan

1. Kalawati Saran Children' s Hospital

(1) Site and Layout Plan

The Project site is located on the premises of Lady Hardinge Medical College. The following figure shows the locational relationship between the planned facilities and the existing facilities.

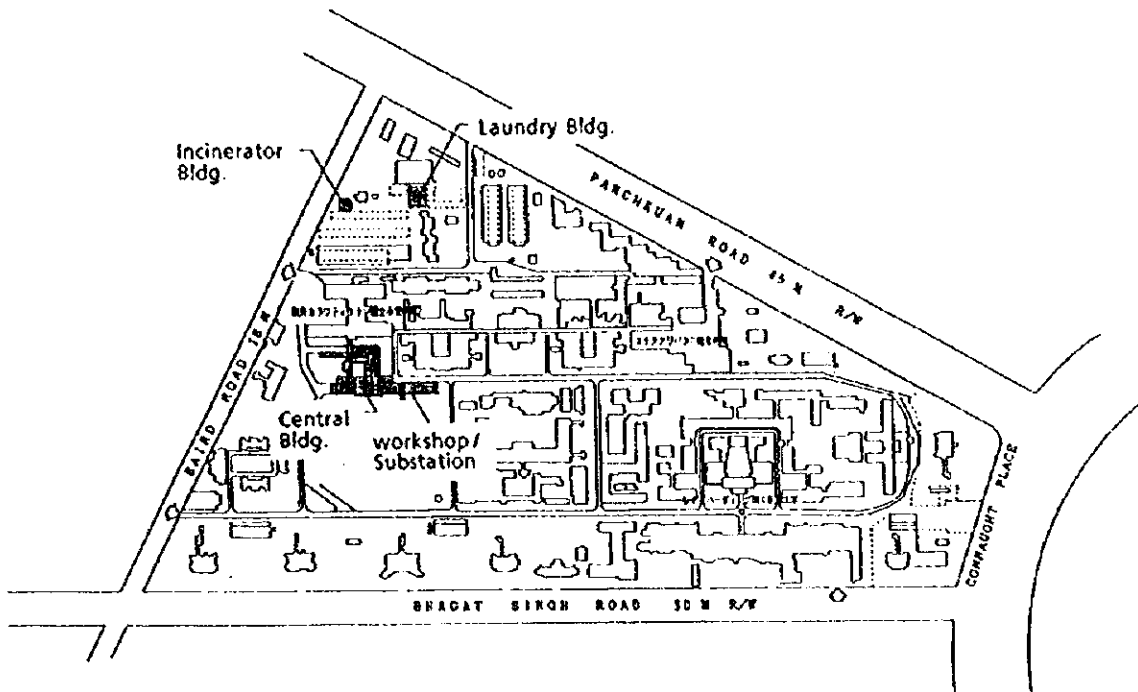


Fig. 2-2 Locational Relationship between the Planned Facilities and the Existing Facilities

The planned facilities are considered to be an extension of the existing facilities of Kalawati Saran Children's Hospital. In other words, the planned facilities and the existing facilities combine to constitute a single children's hospital. It is therefore necessary to design the planned facilities in a manner that makes connection of the two functional and easy. The traffic flow of the service approach should be completely separated from those for outpatients, their attendants and other visitors. As many of the existing trees in the Project site should be preserved as possible and included in the site plan so that the building arrangement plan may make full use of the natural environment.

(2) Facility/Architectural Plan

- **Building Control**

The Indian building standards require that the building coverage ratio

to the site for hospital buildings shall be 25 percent or less. The planned buildings are to be constructed on the premises of Lady Hardinge Medical College. Therefore the building coverage ratio should be calculated using the entire area of premises and building. At present, the building coverage ratio for the campus is 24.93 percent, which is very close to the allowable maximum. In implementing the Project, therefore, the Indian side will relocate the existing boarding house with a floor space of 1,800m² and remove unnecessary existing facilities so that the problem of the building coverage ratio may be overcome. The building area and the building coverage ratio for the existing facilities is as shown in the following table.

Table 2-10 Site and Building Area

| | Area (m ²) | Building coverage ratio (%) |
|---|------------------------|-----------------------------|
| 1. Site Area | 1,94,916.17 | |
| 2. Allowable maximum building area | 48,729.04 | 25.0 |
| 3. Total building area for the existing facilities confirmed in the 1994 basic design study | 48,590.59 | 24.93 |
| 4. Building area under the project | 2,680.14 | 1.37 |
| 5. (3+4) | 51,270.73 | 26.3 |
| 6. Building area of existing facilities to be removed (5-2) | 2,541.69 | 1.3 |

- Floor Plan

The arrangement of main rooms is determined on the basis of activities to be carried out in these rooms and functions required of them. The optimal scale of required rooms is determined after examining the equipment arrangement plan for these rooms and functions required of these rooms. The rationale for the determination of the functions and floor space of each of these rooms is as shown in the following table.

Table 2-11 Determination of the Scale of Each of the Main Rooms
 (□ indicated part completed in phase 1)

① Central Building

| Room | No. of Room | Floor Area / Rm (m ²) | Rationale / functions |
|--------------------------------------|-------------|-----------------------------------|--|
| Ground Floor | | | |
| Outpatient Reception | | 18.0 | A total of 6 reception counters for an average 261 outpatients/day. |
| Central Specimen Collection Rm | | 6.0 | |
| • Emergency Department | | | |
| Emergency Reception Examination Rm | | 18.0 | Emergency care to be received at the counter. |
| Treatment Rm | | 18.0 | An average emergency outpatients/day are to be screened (24 hours./day). |
| Nurse Station | | 36.0 | Emergency treatment and minor operations. |
| Doctor' s Rm | | 18.0 | To operate 24 hours./day. A napping space included. |
| Police Post Rm | | 18.0 | For an LHMC professor and the senior doctor to be in charge of emergency care. |
| Pharmacy Department | | 10.0 | Legal treatment of emergency cases. |
| Pharmacy / Dispensary | | 18.0 | |
| Store | | 27.0 | One for storing drugs and the other for storing documents. |
| • Diarrhea Training & Treatment Unit | | | |
| Doctor' s Rm | | 18.0 | To serve also as the reception counter. |
| Treatment Rm | | 18.0 | With toilet |
| Children Sitting Corner | | 14.0 | |
| Health Education Rm | | 18.0 | |
| Nurse Station | | 18.0 | |
| • ICU Department | | | |
| ICU | | 72.0 | Each provided with 15 beds. |
| Isolation Rm | | 18.0 | For cases of infectious diseases. |
| Treatment Rm | | 18.0 | |
| Examination Rm | | 18.0 | |
| Laboratory | | 18.0 | To be provided with the existing equipment (autoalayzer). |
| Nurse Station | | 18.0 | To be used to monitor two ICUs. |
| Store | | 18.0 | |
| • Radiology Department | | | |
| Reception | | 9.0 | To be used to receive patients. |
| X-ray Rm A | | 36.0 | To be provided with general-purpose (two-bulb) X-ray equipment. |
| X-ray Rm B | | 22.0 | One to be provided with general-purpose X-ray equipment and the other with special X-ray unit. |
| Control Rm | | 8.0 | To serve also as X-ray room B |
| Darkroom | | 9.0 | To serve also as a drying room. |
| Ultrasound Rm | | 14.0 | To be provided with two units of ultrasonic diagnosis equipment. |

| Room Name | No. of Room | Floor Area / Rm (m ²) | Rationale / functions |
|---|-------------|-----------------------------------|--|
| Radiologist's Rm | | 18.0 | One for a middle-ranking radiologist and for a radiologist. |
| Technicians' Rm | | 12.0 | A large room for the use of 8 technicians. |
| First Floor | | | |
| • Outpatient Department (Internal Medicine) | | | |
| Examination Rm | | 18.0 | Examination rooms for Paediatric Internal Medicine |
| Central Injection Rm | | 18.0 | |
| Store | | 18.0 | To be used to store documents. |
| Stretcher Rm | | 9.0 | To store stretchers. |
| Telephone Exchange Rm | | 18.0 | Telephone Exchange to be installed (to be operated around the clock). |
| • Physical Medicine & Rehabilitation | | | |
| Reception | | 36.0 | To receive patients and store case records. |
| Examination Rm | | 18.0 | Designed to examine 249 patients a day on average. |
| Doctor's Rm | | 18.0 | One office for two doctors (two senior doctor's offices and a senior resident's office.) |
| Physiotherapist's Rm | | 18.0 | A single room for a senior physiotherapist and other for physiotherapists. |
| Physiotherapy Treatment Rm | | 27.0 | To be provided with two units of microwave treatment equipment, one unit of whirlpool treatment equipment, one unit of low-frequency treatment equipment, etc. |
| Electro Therapy Treatment Rm | | 36.0 | |
| Occupational Therapy Rm | | 27.0 | To be provided with equipment for use in occupational therapy of infant and adult patient. |
| Occupational Therapists Rm | | 18.0 | A room for two occupational therapists. |
| Language Therapy Rm | | 18.0 | |
| Store | | 18.0 | |
| Second floor | | | |
| • Laboratory | | | |
| Chemical Biochemistry Laboratory | | 36.0 | To be provided with laboratory equipment. |
| Autoanalyzer Rm | | 18.0 | Existing equipment will be transferred. |
| Bacteriology/ Parasitology Laboratory | | 36.0 | To be provided with laboratory equipment. |
| Hematology/ Histopathology Laboratory | | 36.0 | To be provided with laboratory equipment. |
| Immuno Hematology Laboratory | | 36.0 | To be provided with laboratory equipment. |
| ECG Room | | 15.0 | Two kinds of electrocardiographs (3 units in total). |
| EMG Room | | 15.0 | To be equipped with one of the existing electromyographs and a new one. |
| EEG Room | | 15.0 | To be equipped with one of the existing. |
| Officer's Rm | | 18.0 | One for a senior parasitologist and the other for a senior biochemist. |

| Room Name | No. of Room | Floor Area / Rm (m ²) | Rationale / functions |
|---|-------------|-----------------------------------|--|
| Technicians' Rm | | 18.0 | To be used as technicians' resting room. |
| Office Rm | | 18.0 | To serve also as a reception counter. |
| • Outpatient Department (Surgical) | | | |
| Paediatric Orthopedic Treatment Rm | | 18.0 | To be used for Paediatric orthopedic treatment |
| Plaster Rm | | 18.0 | To be used for plaster cast treatment. |
| Examination Rm | | 18.0 | 2 for Surgery, 1 for Orthopedic, 1 for ENT, 1 for Dermatology, 1 for Ophthalmology |
| Assit. Nurse Supt. Rm | | 18.0 | A single room. |
| Depty. Nurse Supt. Rm | | 18.0 | A single room. |
| • Preventive & Social Medicine Department | | | |
| Reception | | 18.0 | To be used to receive patients. |
| Child Health Promotion Clinic's Immunization Rm | | 36.0 | DPT, polio, BCG, diphtheria, measles, tetanus |
| Nutrition Counseling /Growth Monitoring Rm | | 18.0 | Designed to provide follow-up clinic services to 3,109 patients a year. |
| Child Guidance Clinic | | 36.0 | To be used to give child guidance. |
| Psychological Testing Room | | 18.0 | To be used to give psychological tests (in a soundproof booth set up at a corner of the room) |
| High Risk Clinic | | 18.0 | A soundproof room to be used to examine those patients who have difficulty in speaking. |
| Malaria Clinic | | 18.0 | To be used to give guidance on malaria. The guidance is to be given by a technician dispatched from NDMC. |
| Family Welfare Clinic | | 18.0 | To treat 9,576 patients a year. |
| Doctor's Rm | | 18.0 | A single room for the senior doctor to be in charge of Child Health Promotion Clinic. |
| Medical Social Services | | 9.0 | To give guidance to an average of 15-20 patient per day. |
| Store | | 18.0 | |
| Third Floor | | | |
| • Operation Theatre | | | |
| Reception | | 12.0 | To receive patients to undergo operations. |
| Major Operation Theatre | | 36.0 | To be equipped with two operating tables. It is estimated that 591 major operations will be performed a year in the major operation theatre |
| Minor Operation Theatre | | 27.0 | It is estimated that 19,169 minor operations (hernia, artificial anus, lithectomy, circumcision) will be performed a year at the two minor operation theatres. |
| Surgical ICU | | 18.0 | An ICU provided with 3 beds. |
| Recovery Rm | | 18.0 | |
| Doctor's Rm | | 13.0 | A single room. |
| Surgical Nurse Station | | 18.0 | |
| Preoperation / Postoperation Rm | | 36.0 | Each room is to be provided with 6 beds. |
| Changing Rm | | 11.0 | One for males and the other for females. |

| Room Name | No. of Room | Floor Area / Rm (m ²) | Rationale / functions |
|---|-------------|-----------------------------------|--|
| Scrubbing Corner | | | 2 scrubber unit will be installed. |
| Store | | 18.0 | 2 scrubber unit will be installed. |
| • Central supply & Sterilization Department | | | |
| Reception | | 16.0 | To receive washing. |
| Washing Rm | | 33.0 | To be provided with cleaning equipment and working space. |
| Autoclave Rm | | 17.0 | To be provided with 3 high-pressure sterilizers (a large-size one and two medium-size ones). |
| Assembly Rm | | 30.0 | To be used to assemble cleaned devices. |
| Clean Store | | 24.0 | To be used to store cleaned devices. |
| Distribution Rm | | 15.0 | To be used to deliver sterilized devices. |
| Staff Rm | | 18.0 | |
| Store | | 54.0 | |
| • Others | | | |
| Doctor' s Rm | | 18.0 | 14 single rooms for 14 doctors. |

② Workshop/Substation Building

| Room Name | No. of Room | Floor Area / Rm (m ²) | Rationale / functions |
|---------------------------|-------------|-----------------------------------|--|
| Generator Rm | | 68.0 | No. of rooms determined according to the equipment arrangement plan. |
| High-tension Panel Rm | | 68.0 | Ditto |
| Low-tension Panel Rm | | 68.0 | Ditto |
| Transformer Rm | | 34.0 | Ditto |
| Metal Processing Workshop | | 34.0 | Ditto |
| Wood Workshop | | 34.0 | Ditto |
| Electrical Workshop | | 34.0 | Ditto |
| Electronic Workshop | | 34.0 | Ditto |
| Parts Store | | 11.0 | One each for 4 workshops. |
| Engineers' Rm | | 11.0 | |
| Technician's Rm | | 18.0 | |
| Store | | 23.0 | |

③ Laundry Building

| Room Name | No. of Room | Floor Area / Rm (m ²) | |
|-----------------------------|-------------|-----------------------------------|--|
| Washing / Extract Room | | 60.0 | No. of rooms determined according to the equipment arrangement plan. To be provided with two 50kg washing machines 25kg washing machine and two 35kg extractors. |
| Drying Rm | | 20.0 | No. of rooms determined according to the equipment arrangement plan. To be provided with two 50kg dryers and a 25kg drier. |
| Press Rm | | 40.0 | No. of rooms determined according to the equipment arrangement plan. To be equipped with two press |
| Reception / Distribution Rm | | 40.0 | To receive washing and distribute washed article |
| Resting Rm | | 16.0 | |
| Store | | 16.0 | |

④ Incinerator Building

| Room Name | No. of Room | Floor Area / Rm (m ²) | |
|----------------|-------------|-----------------------------------|---|
| Incinerator Rm | | 100.0 | No. of rooms determined according to the equipment arrangement plan. To be equipped with 3 medium size incinerator and two small-size incinerators. |

• Section Plan

In working out the section plan, natural ventilation and lighting will be secured for general rooms giving due consideration to protection against direct sunlight and rainwater. The height of each story will be determined taking into account connection of planned facilities with existing facilities (where story height is 3.5m). To prevent sharp rises in room temperature, the allowable maximum ceiling height should be employed. Also, in consideration of the possibility of floods as a result of heavy rainfalls and Indian building standards, the height of the ground floor (from the ground) should be the same as that for existing facilities (0.65m)

• Structural Plan

■ Outline of the Structure

The planned facilities are considered to be an extension of the

existing facilities of Kalawati Saran Children's Hospital. The central building consists of the Outpatient Department, Emergency Department, Operation Theatre, Radiology Department, Central Laboratory Department, Preventive Social Medicine Department and Physical Medicine & Rehabilitation Department facilities. It is a reinforced concrete building with four stories and a basic span of 6.0m×6.0m. Each story's height is 3.5m.

■ Foundation System

According to the soil investigation conducted at the time of the field survey, the Project site has uniform geological features. Up to a depth of 3.0m, there is back filling soil with N values ranging from 0 to 5, a sandy silt layer with N value of about 10 at a depth of 3.0 to 6.0m, and a clayey silt layer with trace of gravel with N values ranging from 15 to 20 following the sandy silt layer. The foundation base depth will be about 3.0m below ground. Since judging from the scale of the planned building, it is possible to use this portion of the layer as the supporting layer for the planned building, spread foundation is employed as the foundation system. It is possible to secure bearing capacity of 12t/m². At the time of investigation during the dry season, groundwater level of 4.5m was confirmed. It is likely that the groundwater level will rise to 2.0m below ground during the rainy season. This should be taken into consideration in working out the structural design of the planned building. It should be noted that the ground water contains 300 to 350 mg/l of sulfate. Therefore, the quantity of cement used in production of the foundation concrete should be more than 330kg/m³ and the water/cement ratio should be less than 55 percent. The geological survey data are included in the Appendix to this report.

■ Superstructure System

In light of the degree of ease of the construction work, cost factors, natural conditions and the scale of the planned building, it is appropriate to employ reinforced concrete rigid frame structure as the superstructure system for the planned building. The external walls should be of brick or sand stone common in the country, in consideration of local construction conditions and cost factors.

■ Applicable Structural Standards

The Indian Building Standards (1993) Chapter 6 (Structural Design) and the Indian Concrete and Reinforced Concrete Standard should be applied as structural standards.

■ Load and External Force

● Live Load

The live load of each room is determined in accordance with Table 1 in Article 1.3 of Chapter 6 of the Indian Building Standards (1993). The live load of each of the main rooms is as shown in the table.

Table 2-12 Live Load for Main Rooms

| Room | Live load (kg/m ²) |
|-------------------|--------------------------------|
| Laboratory | 300 |
| Operation theatre | 300 |
| X-ray room | 300 |
| Office | 250 |
| Toilet | 200 |
| Corridor/hall | 400 |
| Machine room | 500 |

● Earthquake Load

As the northern part of India belongs to the Eurasian Seismic Zone,

earthquakes occur in Delhi area. For this reason, buildings must feature earthquake-resistant construction. The calculation of the earthquake load should be conducted in accordance with Article 1.5 of Chapter 6 of the Indian Building Standards (1983).

○ Calculation of Base Shear Coefficient (V)

$V = K \cdot C \cdot \alpha_h \cdot W$

K : structural form coefficient (1.0)
 C : building cycle coefficient (1.0)
 α_h : design seismic coefficient (0.075)
 W : building's seismic weight

$\alpha_h = \beta \cdot I \cdot \alpha_o$

β : foundation form coefficient (1.0)
 I : coefficient of degree of importance (1.5)
 α_o : basic seismic coefficient (0.05)

$$\alpha_h = 1.0 \times 1.5 \times 0.05 = 0.075$$

Therefore,

$$V = 1.0 \times 1.0 \times 0.075 \times W = 0.075W$$

6) Electrical Plan

Only the electric equipment plan for the planned buildings (Central Building, Workshop/Substation Building, Laundry Building, Incinerator Building) will be included in the scope of the Project (that for the existing buildings of Kalawati Saran Children's Hospital will not be included in the scope of the Project). However, consider the possibility of future unification of electrical facilities of those two buildings. The electric plan for the Project should be efficient to make it easy to maintain and manage the facilities.

■ Power Receiving and Substation Facilities

A substation will be built on the southern side of the planned building. 11kV 50Hz high-tension power shall be led in to the substation from

the cable installed along Baird Road running along the western side of the Project site. The high-tension electric power will be stepped down to 400V/230V low-tension electric power via the substation and will be distributed to each load in the planned building. Each of two transformers (each with a capacity of about 1,250kVA), able to meet the total load requirements of the hospital will be installed in the room so that the spare transformer may be used when the other breaks down. According to the records of the existing substation of Lady Hardinge Medical College, power supply to the Medical College is relatively stable, the voltage fluctuation rate ranging from -5 percent to +5 percent. There will be no need to install an automatic voltage regulator (AVR). However, an AVR should be attached to each unit of medical equipment requiring electricity with a very low voltage fluctuation rate. The Indian side should be responsible for applying for approval of high-tension power receiving, power lead-in up to the substation, and relocation of the existing power cable.

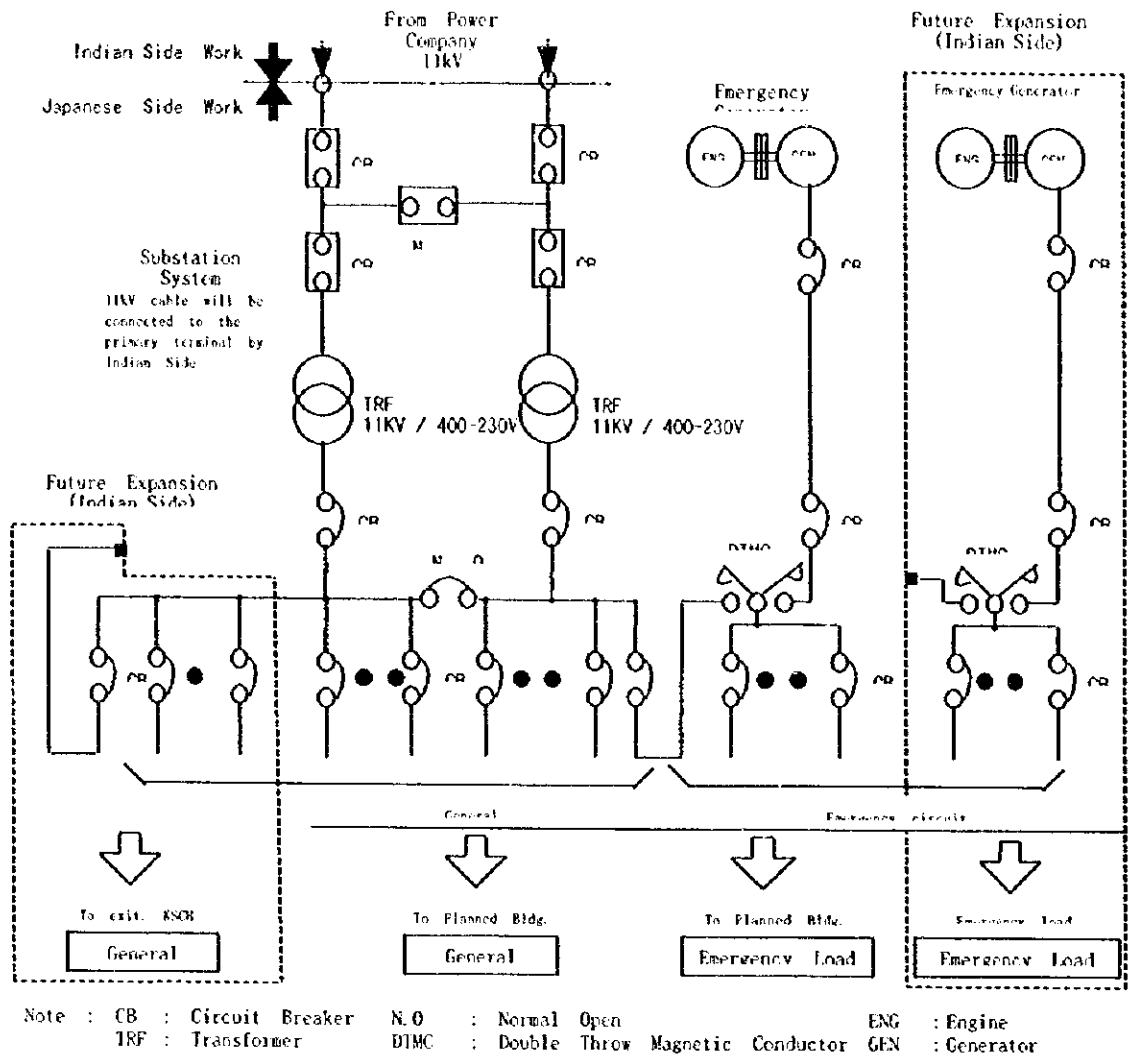


Fig. 2-3 Power Supply System

■ **Generator**

A diesel engine generator will be installed for the emergency power supply at the time of power failure. It should have a capacity large enough to cover the facilities of Operation Theatre, Emergency Department, ICU, etc. (about 250kVA). Electric power by the generator will not be supplied to the existing facilities of the hospital. No spare generator will be procured under the Project.

■ Lighting Fixtures and Wall Sockets

Lamps will be mainly fluorescent lamps. Lighting fixtures will be directly mounted onto the ceiling or suspended from the ceiling. Embedded lighting fixtures will be installed in clean zones such as operation theatres. The following table shows the target illuminance for each main room.

Table 2-13 Target Illuminance of Each Main Room

| Room | Target illuminance (lux) |
|---|--------------------------|
| Operation Theatre | 1000~750 |
| Examination Rm, Treatment Rm, Nurse Station, Pharmacy, Laboratory Rm, Central Injection Rm | 500~300 |
| Dpty. Nurse Supt. Rm, Doctor's Rm, Isolation Rm, Health Education Rm, Plaster Rm, Specimen Collection Rm, Exercise Therapy Rm, Language Therapy Rm, X-ray Rm, Control Rm, Technician's Rm | 350~250 |
| Entrance Hall, Reception, Drug Store, Waiting Rm, Laundry, Stretcher Rm | 250~100 |
| Corridor, Machine Rm, Store | 150~50 |

Wall sockets that comply with the applicable Indian standard will be procured. General-purpose wall sockets and emergency generator-powered wall sockets will be installed in each room.

■ Fire Alarm System

An automatic fire alarm system will be installed in the planned building in accordance with the Indian Building Standards (1983) and the Indian Fire Prevention Manual.

■ Lightning Arresting System

A lightning arresting system will be installed in accordance with applicable Indian standards. It will include lightning arresters to protect hospital equipment against lightning.

- Air Conditioning Plan

The air conditioning to be planned under the Project should be determined with due consideration to usage, location of installation, the ease of operation and maintenance, and running cost and safety.

- Design Conditions

- Design Outdoor Temperature and Humidity

| | | | | | |
|--------|----------------|----------|--------|----------------|----------|
| Summer | Dry bulb temp. | 39.3 CDB | Winter | Dry bulb temp. | 10.0 CDB |
| | Wet bulb temp. | 22.0 CWB | | Wet bulb temp. | 7.6 CWB |

(Source: National Buildings Organization Ministry of W.H. & R.)

- Design Indoor Temperature and Humidity

(Operation theatre)

| | | | | | |
|--------|-------------------|---------|--------|-------------------|---------|
| Summer | Dry bulb temp. | 26°C ±2 | Winter | Dry bulb temp. | 22°C ±2 |
| | Relative humidity | 45% ±5 | | Relative humidity | 45% ±5 |

(Other rooms)

| | | | | | |
|--------|----------------|---------|--------|----------------|---------|
| Summer | Dry bulb temp. | 26°C ±2 | Winter | Dry bulb temp. | 22°C ±2 |
|--------|----------------|---------|--------|----------------|---------|

Note: Indoor temperature and humidity in the case of heating may be dependent on the type of the heater used.

- Ventilating Equipment Plan

In principle, a ceiling fan will be installed in each of the rooms which do not require air conditioning. Ventilators will be used to discharge odor, heat and dust. The method of ventilation will be Class 1 (intake/exhaust) or Class 3 (exhaust) depending on the use of the room.

- Plumbing System Plan

- Water Supply System

The gravity type water supply system will be introduced so that the two existing elevated water tanks may be utilized. The two existing elevated water tanks ensure stable water supply because they are used jointly. Basically, water will be supplied to the planned building directly from the existing elevated water tanks.

- Hot Water Supply System Plan

In principle, the spot hot water supply system by the use of electric water heaters will be introduced.

- Drainage System Plan

Waste water from the indoor facilities will flow into the first outdoor waste water pits, from which it will be discharged into the drain pipe installed along the road running in front of the northern side of the project site.

In accordance with applicable local ordinance, rainwater will be made to penetrate into the ground.

- Sanitary Fixture Plan

Sanitary fixtures that conform to the local standards will be installed.

- Fire Extinguishing System Plan

An indoor fire extinguishing system will be introduced in accordance with the Indian Building Standards (1983) and the Indian Fire Prevention Manual.

- Building Material Plan

Building materials that suit local climatic conditions and local construction methods, as well as functions required of the planned facilities, will be used in the Project construction work. They also must be economical highly durable, and easy to maintain and manage.

- Main Structural Materials

Table 2-14 Classification of Building Materials by Component (1)

| Part of building | Material | Remarks |
|--------------------------------------|------------------------|--|
| Foundation Column / beam Floor | Reinforced concrete | Sufficient quality control of concrete is required. |
| Wall | Brick | There will be no problem with the quality of locally available bricks since bricks are widely used and there are detailed brick specifications in the country. |

- Exterior Finishing Materials

Table 2-15 Classification of Building Materials by Component(2)

| Part of building | Material | Remarks |
|------------------|--|---|
| Roof | Asphalt (for use in asphalt membrane waterproofing) Heat insulating brick concrete | Due consideration should be given to heat insulation to protect the building against intense heat in summer. |
| Wall | Brick / sand stone | The wall should be a combination of an ordinary brick wall or sand stone wall to ensure sufficient heat insulation. |
| Fittings | Aluminum sash | Heat reflecting glass will be used to protect the rooms against direct sunlight. |

■ Main Interior Finishing Materials

Table 2-16 Classification of Building Materials by Component(3)

| Room Name | Floor | Wall | Ceiling | Remarks |
|-------------------------------|----------------------|--|------------------------------------|---|
| Waiting Hall, Corridor | Kota stone | Ceramic tile (FL-2,000) Upper part: paint finishing | Paint on exposed concrete | Ceramic tiles up to FL+2,000 in consideration of ease of maintenance / management and durability |
| Operation Theatre | Colored resin mortar | Ceramic tile | Ready-made sound absorbing ceiling | Due consideration should be given to protection against static electricity |
| Examination Rm Doctor's Rm | Kota stone | Ceramic tile (FL+2,000) Upper part: paint finishing | Plaster board Paint finishing | Ceramic tiles up to FL+2,000 for ease of maintenance / management and durability |
| X-ray Rm | Ditto | Ditto | Ditto | Fittings should have lead glass to prevent X-ray leaks. |
| ICU | Ditto | Ditto | Ready-made sound absorbing ceiling | Sound absorbing ceiling should be used to lessen reverberations. |
| EEG Rm | Ditto | Ditto | Ditto | The walls should be shielded with copper wire mesh. |
| Laboratories | Colored resin mortar | Ceramic tile | Plaster board Paint finishing | Due consideration should be given to waterproofing and durability. |
| Toilet | Mosaic tile | Ceramic tile | Chemical board Paint finishing | Due consideration should be given to waterproofing of toilets to be installed on the second to fourth floors. |

2. Kalyanpuri Urban Health Centre

(1) Site Plan

The project site, with an area of about 700m² (21m × 33m), is a plane rectangular site. At present it has a single-story brick building with a total floor space of about 160m², around which is a concrete pavement with a thickness of about 5cm. The allowable maximum building coverage ratio applicable to the project site is 33.33 percent, and the allowable maximum floor area ratio is 100 percent. The work to demolish the existing building will be carried out by the Indian side.

(2) Architectural Plan

- Floor Plan

The architectural plan covers the following rooms.

Table 2-17 Determination of the Scale of Each Room

| Rm | No. of Rooms | Floor area (m ²) | Rational/function |
|----------------------------|--------------|------------------------------|---|
| Ground Floor | | | |
| Reception | | 10.0 | To be used to receive patients. |
| Examination Rm | | 12.0 | Internal medicine, Paediatrics, obstetrics and gynecology, ophthalmology |
| Treatment Rm | | 18.0 | Minor operations for injuries are to be performed in this room. |
| Injection Rm | | 8.0 | To be used to carry out immunizations |
| Pharmacy | | 10.0 | |
| Store | | 4.0 | |
| Observation Rm | | 9.0 | To be used to screen patients. |
| Dressing Rm | | 8.0 | |
| Laboratory Rm | | 9.0 | Equipment for use in basic malaria, blood and urine examinations is to be installed in this room. |
| Guard Rm | | 9.0 | |
| First Floor | | | |
| Seminar Rm | | 60.0 | Seating capacity: 25 to 30; space per person: 2.0 to 2.5m ² |
| Medical Social Worker's Rm | | 14.0 | |
| Doctors' Rm | | 20.0 | A large office room for four doctors |

- ◆ Structural Plan

- Outline of Structure

After demolishing the existing building of the Urban Health Centre (with a total floor space of about 150m²) by Indian side, construct under the Project a two-story reinforced concrete building with a total floor space of about 400m². The story height for the planned building is 3.5m for both the ground floor and the first floor.

- Foundation System

According to soil investigation conducted at the time of the field survey, the Project site has uniform geological features. There is a sandy silt layer with N values ranging from 7 to 10 up to a depth of 5m, and a layer of fine sand with N values ranging from 14 to 20 below the sandy silt layer. Since it is possible to secure bearing capacity of 12t/m² at a depth of 1.5m, it is appropriate to employ continuous footing using the layer at 1.5m below the ground as the supporting layer. At the time of soil investigation during the dry season (December), a groundwater level of 3.5m was confirmed. It is likely that the groundwater level will rise to about 2.0m below ground. But this should not cause any problem since that groundwater level is below the foundation base level.

- Other Factors

Other factors such as the superstructure system, the applicable structural standard, load and external force are as stated in the plan for Kalawati Saran Children's Hospital.

- Electric Equipment Plan

- Power Source Equipment

Low-tension electric power will be led in from the city line and distributed to the necessary load in the planned facility. No emergency generator will be installed.

- Lighting Fixtures and Wall Sockets

The same lighting fixtures and wall sockets as those installed in Kalawati Saran Children's Hospital will be installed.

- Telephone Equipment

A telephone exchange with a capacity of 2 circuits and 10 extension circuits will be installed.

- Plumbing System Plan

- Water Supply System Plan

Since Kalyanpuri Urban Health Centre is unable to secure sufficient supply of city water, a tube well will be newly installed in the Project site. Water from the tube well will be sent to an elevated water tank via a water receiving tank, and then will be supplied to the necessary places.

- Estimation of Daily Water Consumption

According to the Japanese standard (Air Conditioning Engineering Handbook), the daily water consumption at a medium-size hospital is 500 l/day per bed. Given 50m² floor space per bed, a daily water consumption of 10 l/day m² can be assumed. Therefore, the daily water consumption at the planned building can be estimated as follows.

Total floor area: 400m²

$$400\text{m}^2 \times 10 \text{ l/day} \cdot \text{m}^2 = 4,000 \text{ l/day}$$

The capacity of the water reservoir tank is equivalent to the daily water consumption. Therefore, the capacity of the water reservoir tank capacity will be 4,000 l/day.

The capacity of the elevated water tank is equivalent to the daily water consumption. Therefore, the capacity of the elevated water tank will be 4,000 l/day.

The well water pump should be able to pump up the above-mentioned quantity of water in an hour.

$$4,000 \text{ l/day} \div 1\text{hour} \div 60\text{min.} = 60 \text{ l/min.}$$

Therefore, the capacity of well water supply pump will be 60 l/min.

The depth of the well will be 100m.

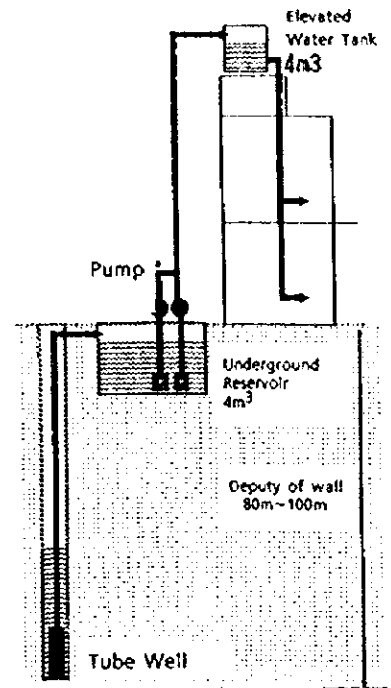


Fig. 2-4 Well System Diagram

Tube Well Specifications:

Regarding installation of the tube well, it is necessary to submit application to the Central Underground Water Board, the organization to do trial drilling. The appropriate depth of the tube well is determined based on the result of the trial drilling. The results of the survey of the wells existing in and around the Project site, conducted at the time of the field survey show that there is a water vein that contains high-quality water at a depth of 80 to 100m. It is also estimated through the survey that a sufficient quantity of water can be supplied from the water vein.

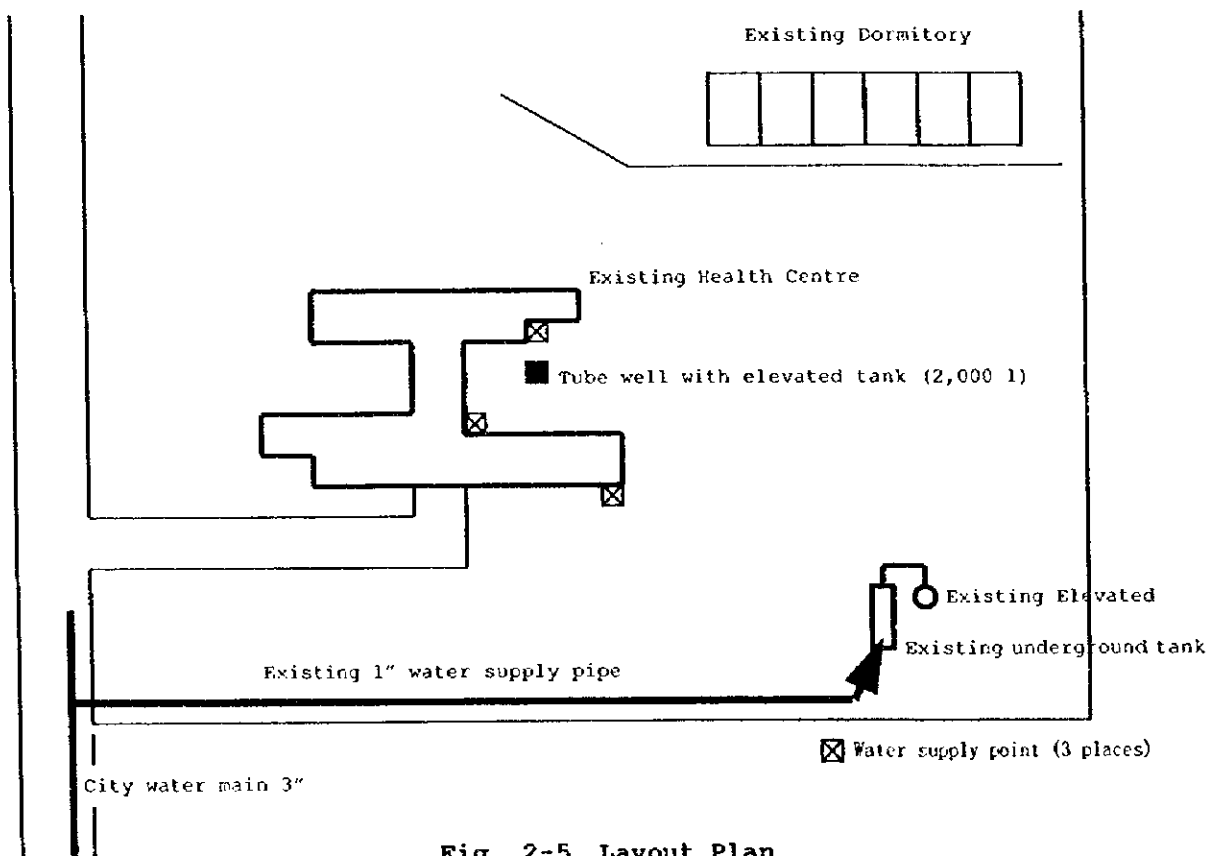
■ Drainage

Waste water from the indoor facilities will penetrate into the ground via an outdoor septic tank. Rainwater will be discharged into the side ditch laid along the Project site.

3. Palam Primary Health Centre

(1) Site Plan

A deep tube well is to be installed at a point marked on the following rough map of the premises of Palam Primary Health Centre.



1) Plumbing System Plan

Palam Primary Health Centre is unable to secure a sufficient supply of city water. Furthermore, at present, no city water is supplied to the health centre since its plumbing system has become too old to use. If the plumbing system is to be repaired, it will be necessary to repair all the related facilities as well. Under this project, a tube well will be installed and an elevated water tank to receive the water from the tube well will be installed on the premises of the health centre.

• Estimation of Daily Water Consumption

Suppose that the daily water consumption per unit area is 10 l/m^2 and that water is to be supplied only to the outpatient clinical department (which means that the boarding facilities are excluded). On above assumption the health centre's daily water consumption can be calculated as follows.

The total floor space of the existing facilities of the health centre is around 200m^2 , therefore the daily water consumption is:

$$200\text{m}^2 \times 10 \text{ l/day} \cdot \text{m}^2 = 2,000 \text{ l/day}$$

The capacity of elevated water tank should be equivalent to the daily water quantity supplied considering the power failure. Then we have 2,000 l as the elevated tank's capacity.

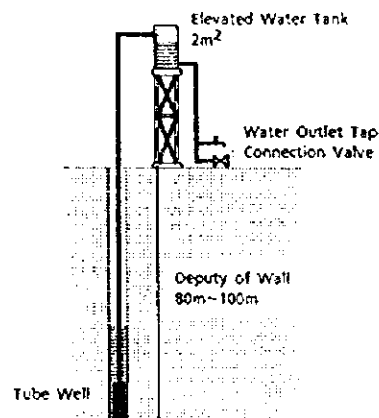


Fig. 2-6 Well System Diagram

The well water pump should be able to pump up the above-mentioned quantity of water in an hour.

$2000 \text{ l/day} \div 60 \text{ min.} = 33 \text{ l/min.}$

Therefore, the capacity of well water pump will be 33 l/m^2 .

The depth of the well will be 100m.

Tube Well Specifications:

The tube well specifications which are the same as those for Kalyanpuri Urban Health Centre will apply.

(2) Equipment Plan

The equipment to be procured under the project can be classified as follows.

Table 3-38 shows the details of the items of equipment to be procured under the project.

Equipment for:

- | | |
|--|--|
| 1. Radiology Dept. | 14. Physical Medicine & Rehabilitation Dept. |
| 2. Outpatient Dept. | 15. Central Supply & Sterilization |
| 3. ICU Dept. | 16. OPD Paediatric Orthopedic |
| 4. Operation Theatre Dept. | 17. OPD Paediatric ENT |
| 5. Premature Baby Rm in Existing KSCH | 18. OPD Paediatric Ophthalmology |
| 6. Ward | 19. OPD Paediatric Dermatology |
| 7. Feeding, Bath & Milk Kitchen Room in Suchita Kripalani General Hospital | 20. Endoscopic Room |
| 8. Incinerator | 21. Workshop |
| 9. Transportation | 22. Laundry |
| 10. Autopsy Room in Suchita Kripalani General Hospital | 23. Medical Record Dept. |
| 11. Central Laboratory Dept. | 24. Preventive & Social Medicine Dept. |
| 12. Surgical ICU | 25. Hospital Administration |
| 13. Follow-up Clinic Kidney | 26. Photography |
| | 27. Urban Health Centre & Primary Health Centres |

The required items of equipment were determined on the basis of the list of the requested items of equipment and the results of the discussions with the representatives of the departments concerned of the Indian project implementing organization, paying special attention to the following points.

1. Of the requested items of equipment, inclusion of the following items in the Project was judged to be quite appropriate.

- ① Those used widely in medical services offered at the hospital.
- ② Those to replace the existing superannuated items of equipment or to lessen shortages of the existing items.
- ③ Those required to improve the quality of medical services offered at the hospital.
- ④ Those designated as basic items of equipment by the World Bank, the World Health Organization and UNICEF.

2. Of the requested items of equipment, it was decided not to include the following items in the project because they' re irrelevant.

- ① Those not related directly to medical services such as medical examination, medical treatment and preventive medicine.
- ② Those not necessary for clinical activities.
- ③ Those not so effective for medical treatment.
- ④ Those whose functions can be fulfilled by other equipment.
- ⑤ Those not used frequently but which are very expensive (Those used for relatively small numbers of specimens and patients.)
- ⑥ Those with which only reagent kits from a limited number of manufacturers can be used.
- ⑦ Those for which it is difficult both financially and geographically to procure expendable supplies and spare parts.
- ⑧ Those considered appropriate for use at other departments.

- ⑨ Those to be procured for other departments or which are in excess supply.

The required items of equipment should not be of higher grade than is needed, but should be of types that can be utilized in the future and that help the planned facilities attain their respective objective.

Table 2-18 Uses and Functions of Main Items of Equipment

| Item of equipment | Use and Function |
|---|---|
| X-ray TV monitor (Completed in phase 1) | This equipment is used in fluoroscope and radiography of the digestive organs, as well as contrast radiography of the kidney and the ureter. It consists of an examining table with a movable plate, a control unit, a monitor and a suspended tube unit. |
| Color doppler ultrasound scanner (Completed in phase 1) | This equipment is used mainly to diagnose circulatory disorders. Blood flow and the like can be displayed on the screen accompanied by a voice-over and also can be recorded. |
| Electro myograph | This equipment is used to examine patients for skeletal muscle disorders. Skeletal muscles can be contracted or relaxed voluntarily to display their functions on the screen. |
| Neonatal monitor | This equipment is used to monitor abnormalities or changes in newborn infants and infant diseases. Electrocardiograms, respiratory modes and temperatures can be displayed on the screen accompanied by a voice-over. |
| Infant ventilator (neonatal) | This equipment is used in treatment of respiratory disorders or in life saving. Respiratory modes, oxygen concentration, respiration frequency and air breath flows can be adjusted. |
| Operating table (Completed in phase 1) | This equipment is used by adjusting height, angle and so on according to the positioning of the patients. Its components can be moved electrohydraulically. |
| Operating light (Completed in phase 1) | This is an astral lamp used to perform operations. One provided with a TV camera or a spotlight (for use in E.N.T. operations) is also available. |
| Anesthesia | This is used for general anesthesia. It consists of an oxygen / laughing gas flow meter, two kinds of vaporizers, a patient monitor and an automatic ventilator. |
| Scrubber unit (Completed in phase 1) | This equipment is used to sterilize the operator's and the assistant's hands. Two persons can use it simultaneously. |
| Transcutaneous PO ₂ /PCO ₂ monitor | This equipment is used to measure the oxygen concentration and the carbon dioxide concentration in the blood of premature babies and newborn babies. Unlike the blood gas analyzer, this equipment does not require blood collection and therefore does no damage to patients. Measured values of PO ₂ /PCO ₂ are displayed on the screen and the recorder. |
| High pressure sterilizer, big size (Completed in phase 1) | This equipment is used to sterilize linen, copper products and the like. Sterilization is carried out automatically. It is provided with a vaporizer. |
| C-arm X-ray TV system | This equipment is used to do fluoroscope and radiography of bone fracture patients. It is provided with a monitor. |
| Argon laser | This equipment is used to treat patients suffering eyeground diseases such as retinal detachment for which no viable pharmacotherapy is available. It consists of a laser beam generator and a treatment table. |

The main equipment proposed in basic design are shown in the following list.

Table 2-19 Equipment List

(□ indicate part completed in phase 1)

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|---------------------------------|--|------|------|-------------------|
| 1. Radiology Department | | | | |
| 1 | X-ray TV monitor, compatible double tube ※ | 1 | No | Japan |
| 2 | Color doppler ultrasound scanner ※ | 1 | No | Japan |
| 3 | Diagnostic X-ray ※ | 1 | No | Japan |
| 4 | Mobile X-ray unit ※ | 2 | Nos | Japan |
| 5 | Darkroom equipment | 1 | Set | Japan |
| 6 | X-ray film cabinet | 1 | No | Japan |
| 7 | Instrument cabinet | 1 | No | Japan |
| 8 | Portable ultrasonic diagnostic apparatus ※ | 1 | No | Japan |
| 9 | Film viewer | 2 | Nos | Japan |
| 2. Outpatient Department | | | | |
| 1 | Examination table | 8 | Nos | India |
| 2 | Examination unit | 8 | Sets | Japan |
| 3 | Stethoscope for doctor | 10 | Pcs | Japan |
| 4 | Stethoscope for nurse | 10 | Pcs | Japan |
| 5 | Hemoglobin meter | 2 | Nos | Japan |
| 6 | Clinical thermometer | 100 | Pcs | Japan |
| 7 | Ultrasonic nebulizer | 2 | Nos | Japan |
| 8 | Suction unit | 2 | Nos | India |
| 9 | Examining light | 4 | Nos | Japan |
| 10 | Electro cardiograph 1ch. ※ | 2 | Nos | Japan |
| 11 | Electro cardiograph 3ch. ※ | 1 | No | Japan |
| 12 | Diagnostic set | 2 | Sets | Japan |
| 13 | Doctor desk | 8 | Nos | India |
| 14 | Doctor chair | 8 | Nos | India |
| 15 | Patient chair | 8 | Pcs | India |
| 16 | Film illuminator | 8 | Nos | India |
| 17 | Sphygmomanometer | 8 | Nos | Japan |
| 18 | Medicine cabinet | 2 | Nos | Japan |
| 19 | Instrument cabinet | 2 | Nos | Japan |
| 20 | Dressing cart with drawers | 4 | Nos | Japan |
| 21 | Instrument cart with 3 trays | 2 | Nos | Japan |
| 22 | Digestive system ultrasound scanner ※ | 1 | No | Japan |
| 23 | Chair for patient | 100 | Nos | India |
| 24 | Clothes basket | 8 | Nos | India |
| 25 | Wash basin stand | 4 | Nos | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|--|---|------|------|-------------------|
| 26 | Treatment bed | 2 | Nos | Japan |
| 27 | Medicine refrigerator | 2 | No | Japan |
| 28 | Refrigerator | 4 | Nos | India |
| 29 | Deep freezer 300l, -20 deg. | 1 | No | Japan |
| 30 | Electro myograph ※ | 1 | No | Japan |
| 3. ICU Department | | | | |
| 1 | Infant incubator, manual ※ | 3 | Nos | Japan |
| 2 | Infant incubator, servo / manual ※ | 3 | Nos | Japan |
| 3 | Infant warmer ※ | 3 | Nos | Japan |
| 4 | Infusion pump ※ | 3 | Nos | Japan |
| 5 | Irrigating stand, twin hanger | 4 | Nos | Japan |
| 6 | Ultrasonic nebulizer | 3 | Nos | Japan |
| 7 | Neonatal monitor ※ | 3 | Nos | Japan |
| 8 | Infant ventilator (neonatal) ※ | 1 | No | Japan |
| 9 | Infant ventilator ※ | 2 | Nos | Japan |
| 10 | Instrument cart | 2 | Nos | Japan |
| 11 | Instrument cabinet | 1 | No | Japan |
| 12 | Bilirubin analyzer ※ | 1 | No | Japan |
| 13 | Defibrillator ※ | 1 | No | Japan |
| 4. Operation Theatre Department | | | | |
| 1 | Operating table ※ | 3 | Nos | Japan |
| 2 | Operating table for pediatric orthopedics ※ | 1 | No | Japan |
| 3 | Suction unit | 2 | Nos | India |
| 4 | Automatic infusion pump | 1 | No | Japan |
| 5 | Operating light with TV monitor ※ | 1 | No | Japan |
| 6 | Operating light ※ | 2 | Nos | Japan |
| 7 | Operating light with focused spot light ※ | 1 | No | Japan |
| 8 | Anesthesia Mac. with monitor & ventilator ※ | 3 | Nos | Japan |
| 9 | Defibrillator ※ | 1 | No | Japan |
| 10 | Film illuminator, two hanging ※ | 2 | Nos | Japan |
| 11 | Multi channel patient monitor | 2 | Nos | Japan |
| 12 | Laryngoscope | 6 | Nos | Japan |
| 13 | Electro cautery | 2 | Nos | Japan |
| 14 | Portable light | 2 | Nos | Japan |
| 15 | Emergency power unit | 2 | Nos | Japan |
| 16 | Irrigating stand | 4 | Nos | Japan |
| 17 | Instrument tray table | 2 | Nos | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|---|---|------|------|-------------------|
| 18 | Instrument cart with 3 trays | 2 | Nos | Japan |
| 19 | Instrument cabinet | 2 | Nos | Japan |
| 20 | Operating instrument set | 2 | Nos | Japan |
| 21 | Patient warming system | 1 | No | Japan |
| 22 | Oxygen analyzer | 2 | Nos | Japan |
| 23 | Stretcher | 2 | Nos | Japan |
| 24 | Recovery stretcher | 2 | Nos | Japan |
| 25 | Hand washing sink unit | 2 | Nos | Japan |
| 5. Premature Baby Room in Existing KSCII | | | | |
| 1 | Intensive care incubator ✖ | 3 | Nos | Japan |
| 2 | Phototherapy unit ✖ | 3 | Nos | Japan |
| 3 | Apena alarm | 2 | Nos | Japan |
| 4 | Automatic infusion pump ✖ | 1 | No | Japan |
| 5 | Neonatal monitor ✖ | 2 | Nos | Japan |
| 6 | Oxygen analyzer ✖ | 2 | Nos | Japan |
| 7 | Infant care center ✖ | 2 | Nos | Japan |
| 8 | Syringe infusion pump ✖ | 1 | No | Japan |
| 9 | Transcutaneous PO ₂ /PCO ₂ monitor ✖ | 1 | No | India |
| 10 | Bilbirubin analyzer ✖ | 2 | Nos | Japan |
| 11 | Hematocrit centrifuge | 1 | Nos | Japan |
| 12 | Instrument cart with 3 trays | 2 | Nos | Japan |
| 13 | Portable infant incubator | 2 | Nos | Japan |
| 14 | Oxygen head box | 2 | Nos | India |
| 15 | Instrument cabinet | 1 | No | Japan |
| 6. Ward in Existing KSCH | | | | |
| 1 | Patient bed (ICU 30, Isolation 3, Surgical ICU 3, Pre/Postoperation 12, DTTU 2) | 50 | Nos | India |
| 2 | Bedside cabinet | 50 | Nos | India |
| 3 | Overbed table | 50 | Nos | India |
| 4 | Oxygen tent | 5 | Nos | India |
| 5 | Automatic infusion pump ✖ | 2 | Nos | Japan |
| 6 | Suction unit | 8 | Nos | India |
| 7 | Oxygen analyzer | 1 | No | Japan |
| 8 | Ultrasonic nebulizer | 2 | Nos | Japan |
| 9 | Silicone resuscitator | 2 | Nos | Japan |
| 10 | Oxygen inhalation set | 2 | Sets | Japan |
| 11 | Film Illuminator | 4 | Nos | India |
| 12 | Stretcher trolley | 2 | Nos | Japan |
| 13 | Diagnostic set | 4 | Sets | Japan |
| 14 | Chart film cart | 4 | Nos | Japan |
| 15 | Instrument cabinet | 2 | Nos | Japan |
| 16 | Instrument cart with 3 trays | 2 | Nos | Japan |
| 17 | Examining light | 4 | Nos | Japan |
| 18 | Dressing cart with drawers | 2 | Nos | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|--|--|------|------|-------------------|
| 19 | Medicine cabinet | 2 | Nos | Japan |
| 20 | Laundry bag with cart | 4 | Nos | India |
| 21 | Irrigating stand, twin hanger | 2 | Nos | Japan |
| 22 | Vacuum cleaners | 2 | Nos | India |
| 7. Feeding, Bath and Milk Kitchen Room in SKGH | | | | |
| 1 | Infant warmer ※ | 3 | Nos | Japan |
| 2 | Digital baby scale | 2 | Nos | Japan |
| 3 | Infant length scale | 2 | Nos | Japan |
| 4 | Infant stretcher | 2 | Nos | Japan |
| 5 | Refrigerator | 1 | No | India |
| 6 | Dressing cart | 2 | Nos | Japan |
| 7 | Infant examination dressing table | 2 | Nos | Japan |
| 8. Incinerator | | | | |
| 1 | Incinerator | 3 | Nos | Japan |
| 9. Transportation | | | | |
| 1 | Ambulance with resuscitative measures 4 wheeler (diesel) ※ | 4 | Nos | Japan |
| 2 | Mini bus (15 seater) ※ | 1 | No | Japan |
| 3 | 4 wheeler (Jeep) ※ | 1 | No | Japan |
| 10. Autopsy Room in SKGH | | | | |
| 1 | Autopsy table with shower | 2 | No | Japan |
| 2 | Shadowless light, 5000 lux | 1 | No | Japan |
| 3 | Morgue refrigerator, two bodies | 1 | No | India |
| 4 | Photographic unit with camera | 1 | No | Japan |
| 5 | Autopsy instrument set | 1 | Set | Japan |
| 11. Central Laboratory Department | | | | |
| | Chemical Biochemistry | | | |
| 1 | Binocular microscope | 1 | No | Japan |
| 2 | Precision inverted microscope | 1 | No | Japan |
| 3 | Incubator, 150ℓ | 1 | No | India |
| 4 | Drying oven, 150ℓ | 1 | No | India |
| 5 | Vertical sterilizer, 50ℓ | 1 | No | Japan |
| 6 | Water bath | 1 | No | India |
| 7 | Medical refrigerator, 500ℓ | 2 | Nos | Japan |
| 8 | Stirrer, dia. 120 m/m | 1 | No | Japan |
| 9 | Mixer for test tube | 1 | No | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|-----|------------------------------------|------|------|-------------------|
| 10 | pH meter | 2 | Nos | Japan |
| 11 | Hematocrit centrifuge | 1 | No | Japan |
| 12 | Refrigerated centrifuge | 1 | No | Japan |
| 13 | Electronic balance, 200g | 1 | No | Japan |
| 14 | Distilling apparatus, 5l/h | 1 | No | Japan |
| 15 | Laboratory instrument set | 1 | Set | Japan |
| 16 | Spectrophotometer ※ | 1 | No | Japan |
| 17 | Glassware for clinical chemistry | 1 | Set | Japan |
| 18 | Small items for clinical chemistry | 1 | Set | Japan |
| 19 | Ultrasonic cleaner | 1 | No | Japan |
| 20 | Bilirubin meter | 1 | No | Japan |
| 21 | Desiccator | 1 | No | Japan |
| 22 | Elisa system ※ | 1 | Set | Japan |
| 23 | Instrument cabinet | 1 | No | Japan |
| 24 | Reagents for biochemistry test | 1 | Set | India |
| | Bacteriology | | | |
| 25 | Incubator | 1 | Nos | India |
| 26 | Refrigerator | 1 | Nos | India |
| 27 | CO ₂ incubator | 1 | Nos | India |
| 28 | Sterilizer | 1 | No | Japan |
| 29 | Microscope | 2 | Nos | Japan |
| 30 | Table top centrifuge | 1 | No | Japan |
| 31 | Binocular microscope | 1 | No | Japan |
| 32 | Centrifuge | 1 | No | Japan |
| 33 | Glassware for staining preparation | 1 | Set | Japan |
| 34 | Electronic balance | 1 | No | Japan |
| 35 | Low temperature incubator ※ | 1 | No | India |
| 36 | Elisa system ※ | 1 | Set | Japan |
| 37 | Clean hood ※ | 1 | No | India |
| 38 | Freezer | 1 | No | Japan |
| 39 | Small items for bacteriology tests | 1 | Set | Japan |
| | Hematology | | | |
| 40 | Hand tally counter | 4 | Nos | Japan |
| 41 | Microscope | 2 | Nos | Japan |
| 42 | Spectrophotometer | 1 | No | Japan |
| 43 | Centrifuge | 1 | No | Japan |
| 44 | Water distiller | 1 | No | Japan |
| 45 | Hot air sterilizer | 1 | No | India |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|-----|-------------------------------------|------|------|-------------------|
| 46 | Autoclave | 1 | No | Japan |
| 47 | Shaker | 1 | No | Japan |
| 48 | Coagulometer | 1 | No | Japan |
| 49 | Hemoglobinmeter | 4 | Nos | Japan |
| 50 | Standard hemmometer | 20 | Nos | Japan |
| 51 | Blood sedimentator | 50 | Pcs | Japan |
| 52 | Autlet | 3 | Sets | Japan |
| 53 | Laboratory small instrument sets | 1 | Set | Japan |
| 54 | Glassware set | 1 | Set | Japan |
| 55 | pH meter | 2 | Nos | Japan |
| 56 | Water bath | 1 | Nos | Japan |
| 57 | Ultrasonic cleaner | 1 | No | Japan |
| 58 | Donor bed | 1 | No | Japan |
| 59 | Blood bank refrigerator | 1 | No | India |
| 60 | Instrument cabinet | 1 | No | Japan |
| 61 | Hematocrit centrifuge | 1 | No | Japan |
| 62 | Automatic blood cell counter ※ | 1 | No | Japan |
| 63 | Incubator | 1 | No | India |
| 64 | Refrigerated centrifuge | 1 | Nos | Japan |
| | Histopathology | | | |
| 65 | Microscope | 1 | No | Japan |
| 66 | Small rotary microtom ※ | 1 | No | India |
| 67 | Freezing microtom ※ | 1 | No | India |
| 68 | Paraffin bath | 1 | No | Japan |
| 69 | Paraffin spreading apparatus | 1 | No | Japan |
| 70 | Paraffin Cutting and smoothing iron | 1 | No | Japan |
| 71 | Paraffin burying frames | 1 | No | Japan |
| 72 | Paraffin burying cutter | 1 | Pc | Japan |
| 73 | Burying basket | 1 | No | Japan |
| 74 | Histofume hold | 1 | No | Japan |
| 75 | Dissection stand | 1 | No | Japan |
| 76 | Block adjusting box | 1 | No | Japan |
| 77 | Specimen box | 1 | No | Japan |
| 78 | Card filing box | 6 | Nos | Japan |
| 79 | Tissue infiltrator | 1 | No | India |
| 80 | Histological dissecting apparatus | 1 | No | Japan |
| 81 | Staining jar | 24 | Nos | Japan |
| 82 | Slide basket | 24 | Pcs | Japan |
| 83 | Staining jar holder | 24 | Pcs | Japan |
| 84 | Test tube stand | 24 | Pcs | Japan |
| 85 | Incubator | 1 | No | India |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|---|------------------------------------|------|------|-------------------|
| 86 | Magnetic stirrer | 1 | No | Japan |
| 87 | Mini mixer | 1 | No | Japan |
| 88 | Electronic balance | 1 | No | Japan |
| 89 | Timer | 4 | Pcs | Japan |
| 90 | Pipette washer | 1 | No | Japan |
| | Immuno Hematology | | | |
| 91 | Immuno electrophoresis apparatus ※ | 1 | No | Japan |
| 92 | Centrifuge | 1 | No | Japan |
| 93 | Incutabor | 1 | No | India |
| 94 | Water bath | 1 | No | India |
| 95 | Fluorescent microscope | 1 | No | Japan |
| | Common | | | |
| 96 | Flame photometer ※ | 1 | No | Japan |
| 97 | Refrigerator | 1 | No | India |
| 98 | Deep Freezer | 1 | No | India |
| 99 | Autoclave | 1 | No | Japan |
| 100 | Water distiller | 2 | Nos | Japan |
| 12. Surgical ICU | | | | |
| 1 | Pediatric ventilator (neonatal) ※ | 1 | No | Japan |
| 2 | Ventilator for infant ※ | 2 | Nos | Japan |
| 3 | Incubator ※ | 4 | Nos | Japan |
| 4 | Bed side multichannel monitors ※ | 4 | Nos | Japan |
| 5 | Open care system ※ | 2 | Nos | Japan |
| 6 | Defibrillator ※ | 1 | No | Japan |
| 7 | Instrument cabinet | 1 | No | Japan |
| 13. Follow-up Clinic Kidney | | | | |
| 1 | Hemodialysis system | 2 | Nos | India |
| 2 | Instrument cabinet | 1 | No | Japan |
| 14. Physical Medicine & Rehabilitation | | | | |
| 1 | Microwave therapy unit ※ | 1 | No | Japan |
| 2 | Air massager | 1 | No | Japan |
| 3 | Whirl pool bath ※ | 1 | No | Japan |
| 4 | Traction unit ※ | 1 | Nos | Japan |
| 5 | Shortwave apparatus | 1 | No | Japan |
| 6 | Infrared ray lamp | 1 | No | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|---|--|------|------|-------------------|
| 7 | Ultraviolet lamp | 1 | No | Japan |
| 8 | Paraffin bath | 1 | No | Japan |
| 9 | Shoulder wheel | 1 | No | Japan |
| 10 | Wrist roll machine | 1 | No | Japan |
| 11 | Bicycle exerciser | 1 | No | Japan |
| 12 | Rowing machine | 1 | No | Japan |
| 13 | Wall stall bars | 1 | No | Japan |
| 14 | Wheel chair | 2 | Nos | India |
| 15 | Walker | 2 | Nos | Japan |
| 16 | Parallel bars | 1 | No | Japan |
| 17 | Exercise stairs | 1 | No | Japan |
| 18 | Dumbbell set | 1 | Set | Japan |
| 19 | Training ball | 1 | Pc | Japan |
| 20 | Roll | 1 | Pc | Japan |
| 21 | Laser therapy unit | 1 | No | Japan |
| 15. Central Supply & Sterilization | | | | |
| 1 | High pressure sterilizer, big size ※ | 1 | No | Japan |
| 2 | High pressure sterilizer, middle size ※ | 1 | No | Japan |
| 3 | High pressure sterilizer, middle size high speed ※ | 1 | No | Japan |
| 4 | Ultrasonic equipment cleaner ※ | 1 | No | Japan |
| 5 | Dry/sterilizer | 1 | No | India |
| 6 | Washer/dryer for surgical gloves | 1 | No | Japan |
| 7 | Powder sprayer for surgical gloves | 1 | No | Japan |
| 8 | Transfer cart | 1 | No | Japan |
| 9 | Storage cabinet | 1 | No | Japan |
| 10 | Dressing jar | 1 | Set | Japan |
| 11 | Sink unit | 2 | Nos | Japan |
| 12 | Drying cabinet | 1 | No | Japan |
| 13 | Tube washer | 1 | No | Japan |
| 14 | Tube drying cabinet | 1 | No | Japan |
| 15 | Table top EOG sterilizer ※ | 1 | No | Japan |
| 16 | Instrument cabinet | 1 | No | Japan |
| 16. OPD Paediatric Orthopedic | | | | |
| 1 | Surgical apparatus set for Ortho. Surgery | 1 | Set | Japan |
| 2 | Kuncher intermedullary nail apparatus set | 2 | Sets | Japan |
| 3 | Orthopedic fragment plate and screw set (large/small) | 2 | Sets | Japan |
| 4 | Arthroscope apparatus set (for shoulder/knee/small joints) | 1 | No | Japan |
| 5 | Electric drill set | 1 | Nos | Japan |
| 6 | Electric surgical saw | 1 | No | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|----------------------------------|---|------|------|-------------------|
| 7 | Spinal surgery set | 1 | Set | Japan |
| 8 | Nerve stimulator system | 1 | No | Japan |
| 9 | Coagulator | 1 | No | Japan |
| 10 | Wire traction instrument set | 1 | Set | Japan |
| 11 | Hand drill | 2 | Nos | Japan |
| 12 | Fixation nail set | 1 | Set | Japan |
| 13 | Bone plate set (small mini fragment) | 2 | Sets | Japan |
| 14 | Bone screw set (small mini fragment) | 1 | Set | Japan |
| 15 | Bone fracture set | 1 | Set | Japan |
| 16 | Plaster table | 1 | No | Japan |
| 19 | Gypsum cutter | 2 | Nos | Japan |
| 20 | Automatic pneumatic tourniquets with pressure monitor | 1 | No | Japan |
| 21 | C-arm X-ray T.V. system ※ | 1 | No | Japan |
| 22 | Electric dermatome with blades | 1 | No | Japan |
| 23 | Instrument cabinet | 1 | No | Japan |
| 17. OPD Paediatric E.N.T. | | | | |
| 1 | Otorhinolaryngological treatment table | 1 | No | Japan |
| 2 | Mobile operating light | 1 | No | Japan |
| 3 | Optical fiber light sources, for ENT | 1 | No | Japan |
| 4 | Microsurgery apparatus for ear & throat ※ | 1 | Set | Japan |
| 5 | Paediatric hearing tester | 1 | No | Japan |
| 6 | Otorhinolaryngological treatment unit with compressor | 1 | No | Japan |
| 7 | Instrument set for otorhinolaryngology | 1 | No | Japan |
| 8 | Audiometer | 1 | No | Japan |
| 9 | Otorhinolaryngoscope | 1 | No | Japan |
| 10 | Laryngeal fiberscope | 1 | No | Japan |
| 11 | Eardrum fiberscope | 1 | No | Japan |
| 12 | Fiberscope light source | 1 | No | Japan |
| 13 | Head mirror | 6 | Nos | Japan |
| 14 | Instrument set for ORL | 1 | Set | Japan |
| 15 | Instrument cabinet | 1 | No | Japan |
| 16 | Rhinomanometer | 1 | No | India |
| 17 | Electro cochleography | 1 | No | India |
| 18 | Sterilizer (hot air) | 1 | No | India |
| 19 | Deep freezer for storage of graft materials | 1 | No | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|----------------------------------|--|------|------|-------------------|
| 18. OPD Paediatric Ophthalmology | | | | |
| 1 | Slit lamp with camera ※ | 1 | No | Japan |
| 2 | Projection perimeter | 1 | No | Japan |
| 3 | Ophthalmometer of javal | 1 | No | Japan |
| 4 | Synoptoscope | 1 | No | Japan |
| 5 | Diathermy unit full system | 1 | No | Japan |
| 6 | Co-ordinator | 1 | No | Japan |
| 7 | Cataract set microsurgery | 1 | Set | Japan |
| 8 | Glaucoma surgery set | 1 | Set | Japan |
| 9 | Retinal detachment surgery set | 1 | Set | Japan |
| 10 | Iris hook and lens manipulator | 1 | Set | Japan |
| 11 | Keratoplasty set | 1 | Set | Japan |
| 12 | Intra ocular lens forceps | 1 | Set | Japan |
| 13 | Forceps corneal suturing | 1 | Set | Japan |
| 14 | Scissors iris | 1 | Pc | Japan |
| 15 | Scissors corneal vannas | 1 | Set | Japan |
| 16 | Instrument set for Ophthalmology | 1 | Set | Japan |
| 17 | Aspiration irrigation unit simcoe | 1 | Set | Japan |
| 18 | Indirect ophthalmoscope | 1 | No | Japan |
| 19 | Ophthalmoscope | 1 | No | Japan |
| 20 | Three mirror universal contact lens | 1 | No | Japan |
| 21 | Tonometer | 1 | No | Japan |
| 22 | Fundus camera ※ | 1 | No | Japan |
| 23 | Slit lamp ※ | 1 | No | Japan |
| 24 | Trial lens set | 1 | No | Japan |
| 25 | Test type object chart illuminating unit | 1 | Set | Japan |
| 26 | Instrument sterilizer | 1 | No | Japan |
| 27 | Instrument cabinet | 1 | No | Japan |
| 28 | Refracting unit (complete) with motorized chair | 1 | No | Japan |
| 29 | Pediatric trial frames | 1 | No | Japan |
| 30 | Focimeter | 1 | No | Japan |
| 31 | Echo-scan (ultrasonography A & B scan) ※ | 1 | No | Japan |
| 32 | Argon laser phtocoagulator with indirect ophthalmoscope | 1 | No | Japan |
| 33 | Operating microscope with co-observer tube with footswitch ※ | 1 | No | Japan |
| 34 | Streak retinoscope | 1 | No | Japan |
| 35 | Perkin's hand held tonometer | 1 | No | Japan |
| 36 | Ultrasonic cleaner for microsurgical | 1 | No | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|------------------------------|--|------|------|-------------------|
| 37 | Single mirror contact lens | 1 | No | Japan |
| 38 | Indirect lens | 1 | No | Japan |
| 19. OPD Paedatric Dematology | | | | |
| 1 | UVR therapy unit | 1 | No | Japan |
| 2 | Wood's lamp | 1 | No | Japan |
| 3 | Microscope with photography attachment | 1 | No | Japan |
| 4 | Skin biopsy punches (3mm, 4mm, 5mm) | 5 | Sets | Japan |
| 5 | Automatic slide projector | 1 | No | India |
| 6 | Overhead projector | 1 | No | India |
| 7 | Magnifying lenses | 2 | Nos | Japan |
| 8 | Examination bed | 2 | Nos | India |
| 9 | Biopsy trays | 2 | Nos | Japan |
| 10 | Instrument cabinet | 1 | No | Japan |
| 20. Endoscopic Room | | | | |
| 1 | Panendoscope ※ | 1 | No | Japan |
| 2 | Esophagoscope ※ | 1 | No | Japan |
| 3 | Duodenoscope ※ | 1 | No | Japan |
| 4 | Colonoscope ※ | 1 | No | Japan |
| 5 | Laparoscope ※ | 1 | No | Japan |
| 21. Workshop | | | | |
| | Section of Iron Works | | | |
| 1 | Welding machine for their sheets | 1 | No | Japan |
| 2 | Arc welding machine | 1 | No | Japan |
| 3 | Spot welding machine | 1 | No | Japan |
| 4 | Drilling machine | 1 | No | Japan |
| 5 | Bench grinder | 1 | No | Japan |
| 6 | Drill | 1 | No | Japan |
| 7 | Portable cutter | 1 | No | Japan |
| 8 | Disc grinder | 1 | No | Japan |
| 9 | Pipe threading tool set | 1 | Set | Japan |
| 10 | Pipe bias (1/8 2") with stand | 1 | No | Japan |
| 11 | Pipe cutter | 1 | No | Japan |
| 12 | Cord reel | 1 | No | Japan |
| 13 | Instrument shelf | 1 | No | Japan |
| 14 | Iron work tool | 1 | No | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|-----|--------------------------------|------|------|-------------------|
| 15 | Tool cabinet | 1 | No | Japan |
| | Section of Wooden Works | | | |
| 16 | Table saw | 1 | No | Japan |
| 17 | Power planer | 1 | No | Japan |
| 18 | Mortiser | 1 | No | Japan |
| 19 | Router | 1 | No | Japan |
| 20 | Zig saw | 1 | No | Japan |
| 21 | Circular saw | 1 | No | Japan |
| 22 | Finishing sander | 1 | No | Japan |
| 23 | Cord reel | 1 | No | Japan |
| 24 | Instrument cabinet | 1 | No | Japan |
| 25 | Tool cabinet | 1 | No | Japan |
| 26 | Groove cutter | 1 | No | Japan |
| 27 | Angle clamp set | 1 | No | Japan |
| 28 | Hand clamp set | 1 | No | Japan |
| | Section of Electric Works | | | |
| 29 | Motor rotor balance controller | 1 | No | Japan |
| 30 | Varnish dryer | 1 | No | Japan |
| 31 | Automatic winding machine | 1 | No | Japan |
| 32 | Phase tester | 1 | No | Japan |
| 33 | Multi tester | 1 | No | Japan |
| 34 | Clump tester | 1 | No | Japan |
| 35 | Meg-ohm tester | 1 | No | Japan |
| 36 | Soldering iron | 1 | No | Japan |
| 37 | Cramping player | 1 | No | Japan |
| 38 | Portable cutter | 1 | No | Japan |
| 39 | Wire stripper | 1 | No | Japan |
| 40 | Cord reel | 1 | No | Japan |
| 41 | Instrument shelf | 1 | No | Japan |
| 42 | Tool cabinet | 1 | No | Japan |
| 43 | Electric work tool set | 1 | Set | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|-------------------------------|----------------------------------|------|------|-------------------|
| Section of Electronic Works | | | | |
| 44 | Oscilloscope 30 MHz | 1 | No | Japan |
| 45 | LCR meter | 1 | No | Japan |
| 46 | DC power supply | 1 | Nos | Japan |
| 47 | Digital multimeter | 1 | No | Japan |
| 48 | Meg-ohm tester | 1 | No | Japan |
| 49 | Slide resistor | 1 | No | Japan |
| 50 | Thyristor voltage regulator | 1 | Nos | Japan |
| 51 | Clump meter | 1 | No | Japan |
| 52 | Portable AC voltage meter | 1 | No | Japan |
| 53 | Transistor tester | 1 | No | Japan |
| 54 | Temperature meter | 1 | No | Japan |
| 55 | Circuit tester | 1 | No | Japan |
| 56 | Tool set | 1 | Set | Japan |
| 57 | Instrument shelf | 1 | No | Japan |
| 58 | Biomedical engineering equipment | 1 | Set | Japan |
| Section of Painting | | | | |
| 59 | Compressor for painting | 1 | No | Japan |
| 60 | Sprayer for painting | 1 | No | Japan |
| 61 | Brass set | 1 | No | Japan |
| 62 | Scraper | 1 | No | Japan |
| 63 | Vacuum cleaner | 1 | No | Japan |
| 64 | Small items for painting works | 1 | Set | Japan |
| 22. Laundry | | | | |
| 1 | Washing machine ※ | 2 | Nos | India |
| 2 | Washing machine ※ | 1 | No | India |
| 3 | Drying tumbler ※ | 2 | Nos | India |
| 4 | Drying tumbler ※ | 1 | No | India |
| 5 | Press machine ※ | 2 | Nos | India |
| 6 | Extractor ※ | 2 | Nos | India |
| 7 | Other materials for laundry | 1 | Set | India |
| 23. Medical Record Department | | | | |
| 1 | Computer | 4 | Nos | Japan |
| 2 | Revolving ladder | 1 | No | Japan |

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|--|--|----------------------|------|-------------------|
| 3 | Electronic stapler | 1 | No | Japan |
| 4 | Photocopy machine | 1 | No | India |
| 5 | Patient record shelf | 2 | Nos | Japan |
| 24. Preventive & Social Medicine Department | | | | |
| 1 | Personal computer system | 1 | No | Japan |
| 2 | Photocopy machine | 1 | No | India |
| 3 | Portable generator | 2 | Nos | Japan |
| 4 | Slide projector | 1 | No | Japan |
| 5 | Overhead projector | 1 | No | Japan |
| 6 | Portable video monitor | 1 | Nos | Japan |
| 7 | Portable PA system | 1 | No | Japan |
| 8 | Video camera system | 1 | No | Japan |
| 9 | Camera with zoom lens | 1 | No | Japan |
| 25. Hospital Administration | | | | |
| 1 | Personal computer with laser printer and monitor | 2 | Nos | Japan |
| 2 | Photocopy machine | 1 | No | India |
| 3 | Filing rack | 4 | Nos | India |
| 4 | Automatic stencil machine | 2 | Nos | India |
| 5 | Calculator machine | 2 | Nos | India |
| 6 | Stapler machine big size | 2 | Nos | Japan |
| 7 | Weighing machine for dispatch of mail | 2 | Nos | Japan |
| 8 | Typewriter bilingual (English & Hindi) | 2 | Nos | India |
| 9 | Vacuum cleaner | 1 | No | India |
| 26. Photography | | | | |
| 1 | Camera with zoom lens and accessories | 3 | Sets | Japan |
| 27. Three Health Centers | | | | |
| | Equipment | | | |
| 1 | Sterilizer table model | K: 2 P: 1 N: 1 | Nos | Japan |
| 2 | Laboratory small equipment | K: 2 P: 1 N: 1 | Sets | Japan |
| 3 | Suction apparatus - neonatal (foot operated) | K: 2 P: 1 N: 1 | Nos | Japan |

(Note) K: Kalyanpuri Urban Health Centre P: Palam PHC N: Najafgarh PHC

| No. | Equipment Name | Q'ty | Unit | Country of Origin |
|---|---|----------------------|------|-------------------|
| 4 | Oxygen cylinder with 2 regulators with key stand and tubing | K: 2 P: 1 N: 1 | Nos | Japan |
| 5 | Portable resuscitation set | K: 1 P: 1 N: 2 | Nos | Japan |
| 6 | Portable oxygen concentrator | K: 1 P: 1 N: 2 | Nos | Japan |
| 7 | Incinerator | K: 1 P: 1 N: 1 | Nos | Japan |
| 8 | Minor surgical kit | K: 2 P: 2 N: 5 | Sets | Japan |
| 9 | Examination table | K: 2 P: 1 N: 1 | Nos | Japan |
| Additional Obstetric / Paediatric Equipment | | | | |
| 10 | Obstetric table | K: 1 P: 1 N: 2 | Nos | Japan |
| 11 | Blower | K: 0 P: 0 N: 1 | No | Japan |
| 12 | Mini Lap. kit (tubectomy kit) | K: 1 P: 1 N: 2 | Kits | Japan |
| 13 | MCH kit | K: 1 P: 1 N: 2 | Kits | Japan |
| 14 | Neonatal care kit | K: 1 P: 1 N: 2 | Kits | Japan |
| 15 | Family welfare kit | K: 1 P: 1 N: 2 | Kits | Japan |
| 16 | Episiotomy scissor | K: 1 P: 1 N: 2 | Sets | Japan |
| 17 | Needle holder | K: 1 P: 1 N: 2 | Pcs | Japan |
| 18 | Dressing forceps tooth | K: 1 P: 1 N: 2 | Pcs | Japan |
| 19 | Dissecting forceps without tooth | K: 1 P: 1 N: 2 | Pcs | Japan |
| 20 | Obstetric forceps wrigley's outlet | K: 1 P: 1 N: 2 | Pcs | Japan |
| 21 | E. B. currette | K: 1 P: 1 N: 2 | Pcs | Japan |
| 22 | Skin retractor | K: 1 P: 1 N: 2 | Pcs | Japan |
| 23 | Detachable scalpel blade handle | K: 1 P: 1 N: 2 | Pcs | Japan |
| 24 | Cautery machine | K: 0 P: 0 N: 1 | No | Japan |

(Note) K: Kalyanpuri Urban Health Centre P: Palam PHC N: Najafgarh PHC

| No. | Equipment Name | Q' ty | Unit | Country of Origin |
|-----|--|----------------------|------|-------------------|
| 25 | Towel clips | K: 1 P: 1 N: 2 | Pcs | Japan |
| 26 | High Risk Pregnancies Kit Obstetric table | K: 1 P: 0 N: 1 | Nos | Japan |
| 27 | Artery forceps (curved and straight) | K: 3 P: 3 N: 6 | Sets | Japan |
| 28 | Sponge holding forceps | K: 1 P: 1 N: 2 | Pcs | Japan |
| 29 | Dissecting forceps (tooth and non-tooth) | K: 1 P: 1 N: 2 | Sets | Japan |
| 30 | Uterine sound set | K: 1 P: 1 N: 2 | Pcs | Japan |
| 31 | Scalpel blade handle | K: 1 P: 0 N: 1 | Pcs | Japan |
| 32 | Umbilical clamp | K: 1 P: 0 N: 1 | Pcs | Japan |
| 33 | Mosquito forceps (straight and curved) | K: 3 P: 3 N: 6 | Sets | Japan |
| 34 | Doyen's retractor | K: 2 P: 2 N: 4 | Pcs | Japan |
| 35 | Kocher's forceps (straight and curved) | K: 2 P: 2 N: 4 | Sets | Japan |
| 36 | Maternity cradle | K: 1 P: 0 N: 3 | Nos | Japan |
| 37 | Sterilizer (small) table model | K: 0 P: 0 N: 1 | No | Japan |
| 38 | Sterilizer (medium) | K: 0 P: 0 N: 1 | No | Japan |
| 39 | Obstetric forceps (simpson's and wrigley's) | K: 1 P: 1 N: 2 | Pcs | Japan |
| 40 | Abdominal retractor | K: 1 P: 1 N: 2 | Nos | Japan |
| 41 | Shadowless lamp (pedestal) | K: 1 P: 1 N: 2 | Nos | Japan |
| 42 | Instrument trolley | K: 1 P: 0 N: 1 | Nos | Japan |
| 43 | Weighing machine (newborn) | K: 1 P: 1 N: 2 | Nos | Japan |
| 44 | Portable resuscitation set | K: 1 P: 1 N: 2 | Sets | Japan |
| 45 | Metal catheter case | K: 0 P: 0 N: 1 | Set | Japan |

(Note) K: Kalyanpuri Urban Health Centre P: Palam PHC N: Najafgarh PHC

| No. | Equipment Name | Qty | Unit | Country of Origin |
|-----|---------------------------------|----------------------|------|-------------------|
| 46 | Cervical punch biopsy | K: 1 P: 1 N: 2 | Pcs | Japan |
| 47 | EB currette | K: 1 P: 1 N: 2 | Pcs | Japan |
| 48 | Cautery machine | K: 0 P: 0 N: 1 | No | Japan |
| 49 | Rubbin' s cannula | K: 1 P: 1 N: 4 | Pcs | Japan |
| 50 | Green armytage clamp | K: 0 P: 0 N: 2 | Pcs | Japan |
| 51 | Suction apparatus (high vacuum) | K: 1 P: 1 N: 2 | Nos | India |

(Note) K: Kalyanpuri Urban Health Centre P: Palam PHC N: Najafgarh PHC

3-3 Basic Design Drawings

(1) Area Schedule

1. Kalawati Saran Children' s Hospital

Central Building

| | |
|--------------|---|
| PH Floor | 90.0 m ² |
| 3rd Floor | 1,373.0 m ² |
| 2nd Floor | 1,373.0 m ² |
| 1st Floor | 1,373.0 m ² |
| Ground Floor | 1,391.0 m ² |
| Total | 5,600.0 m² (Completed in Phase 1) |

Workshop/Substation Building

| | |
|--------------|---|
| 1st Floor | 334.0 m ² (completed in Phase 1) |
| Ground Floor | 348.0 m ² |
| Total | 682.0 m² |

| | |
|----------------------|----------------------|
| Laundry Building | 234.0 m ² |
| Incinerator Building | 100.0 m ² |

2. Kalyanpuri Urban Health Centre

| | |
|--------------|----------------------------|
| Penthouse | 16.0 m ² |
| 1st Floor | 220.0 m ² |
| Ground Floor | 225.0 m ² |
| Total | 410.0 m² |

(2) Basic Design Drawings

1. Kalawati Saran Children's Hospital

01 Layout Plan

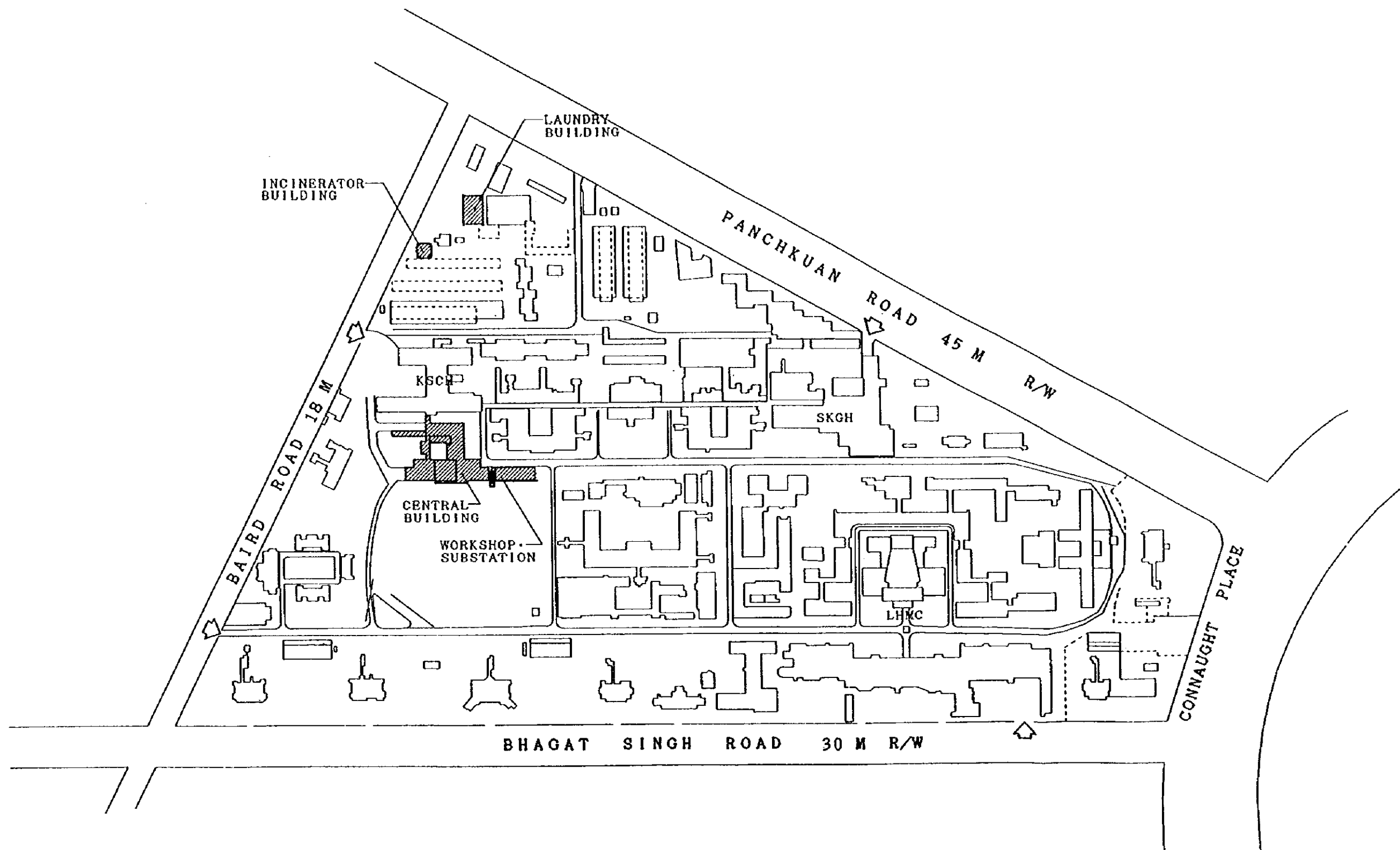
02 Laundry Building/ Plan, Elevation, Section

03 Incinerator Building/ Plan, Elevation, Section

2. Kalawati Saran Children's Hospital

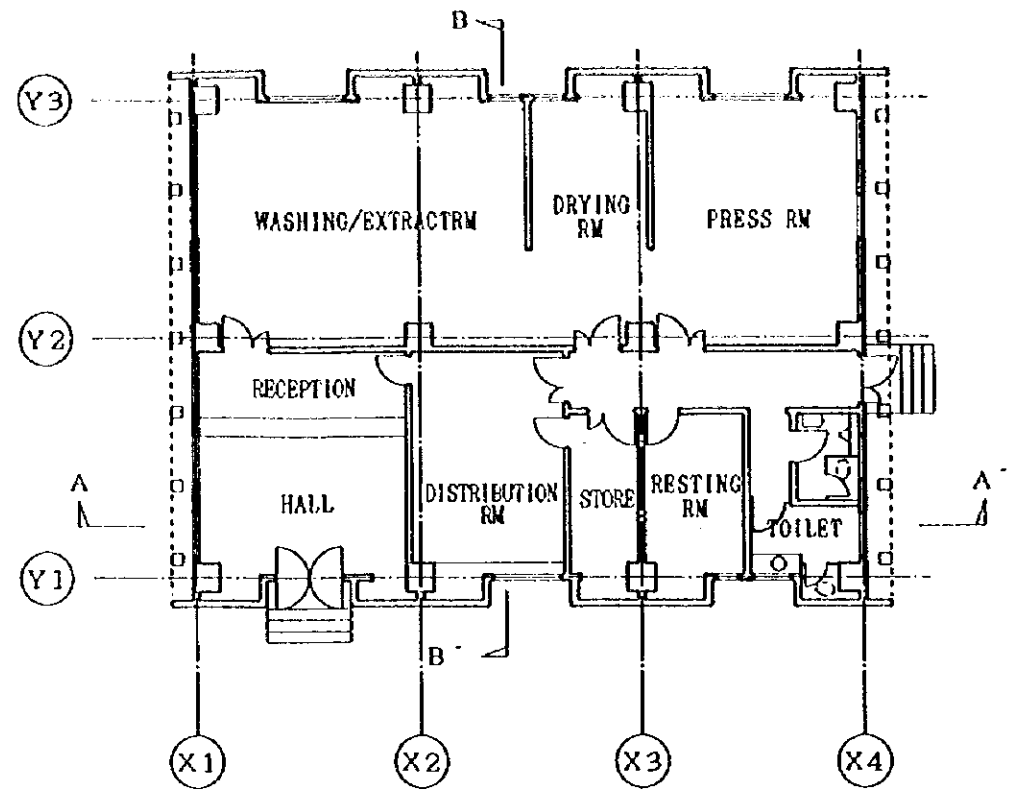
04 Layout Plan, Plan

05 Section, Elevation

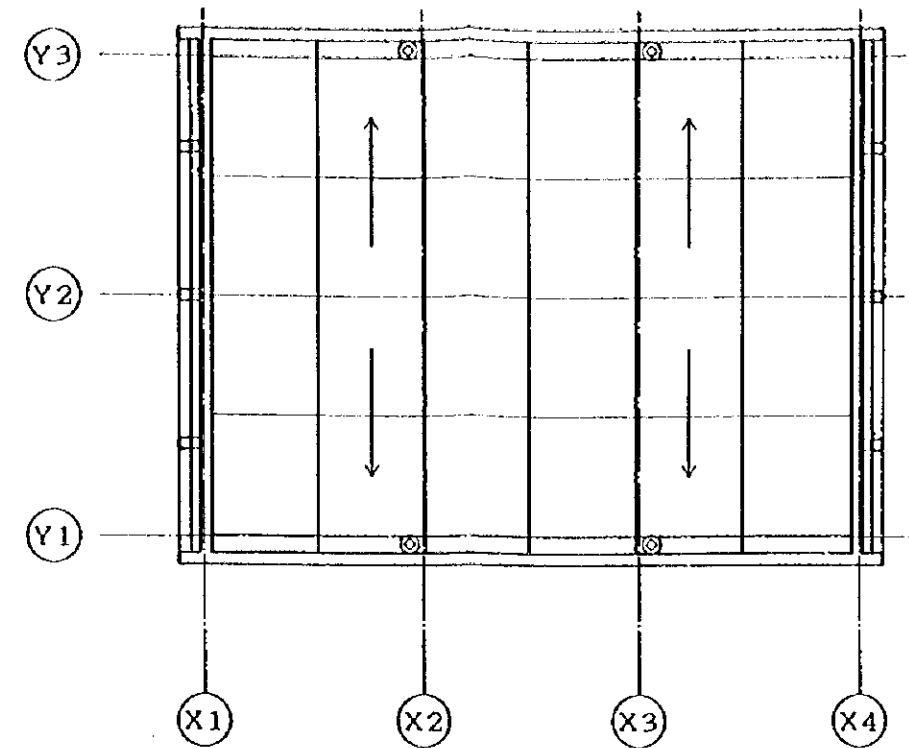


THE PROJECT FOR THE IMPROVEMENT OF
KALAWATI SARAN CHILDREN'S HOSPITAL IN INDIA

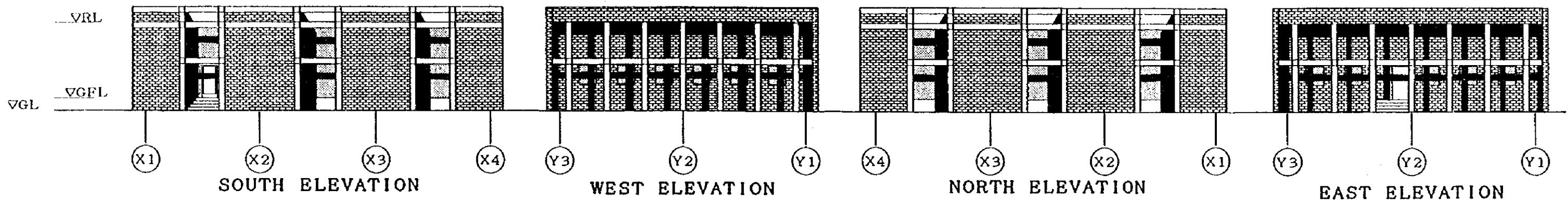
CENTRAL BUILDING
SITE PLAN



GROUND FLOOR PLAN



ROOF FLOOR PLAN

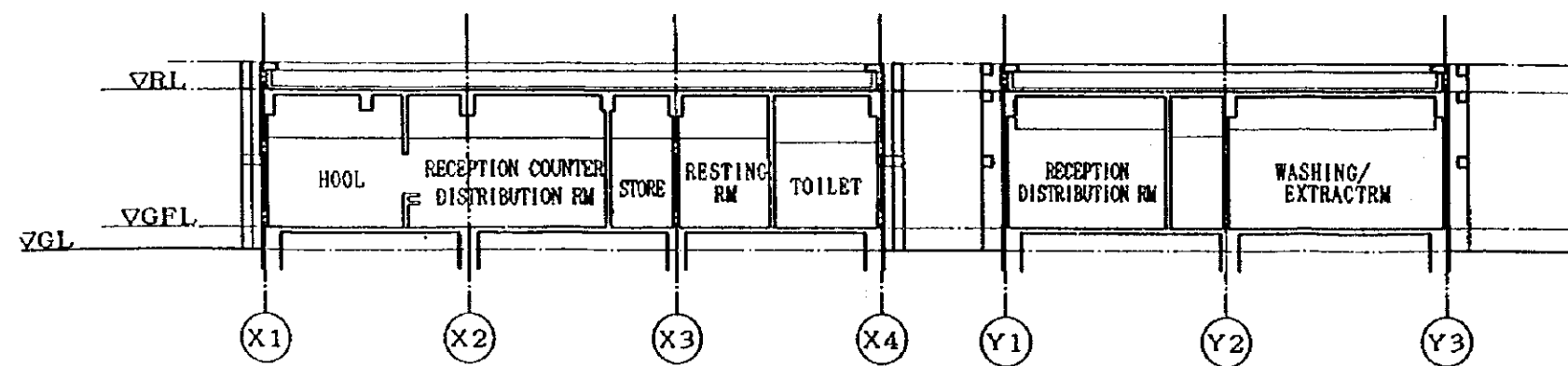


SOUTH ELEVATION

WEST ELEVATION

NORTH ELEVATION

EAST ELEVATION



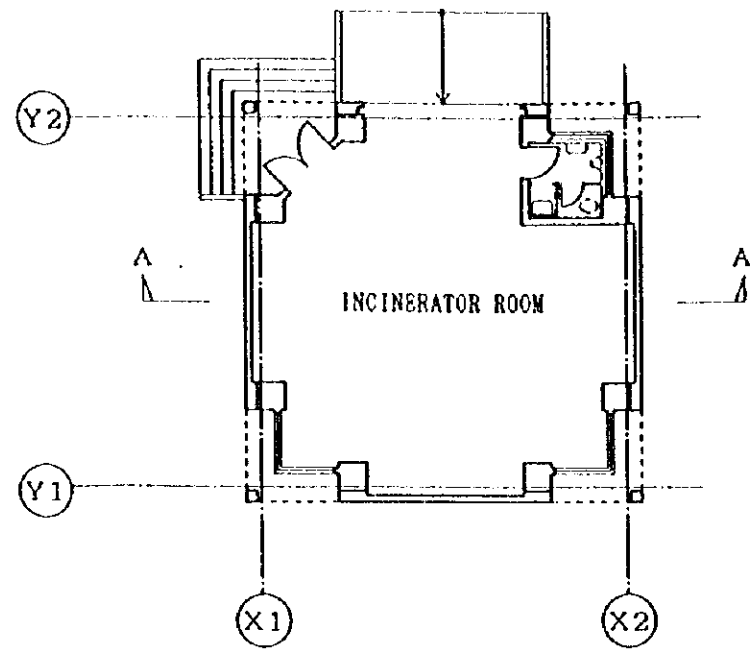
A-A' SECTION

B-B' SECTION

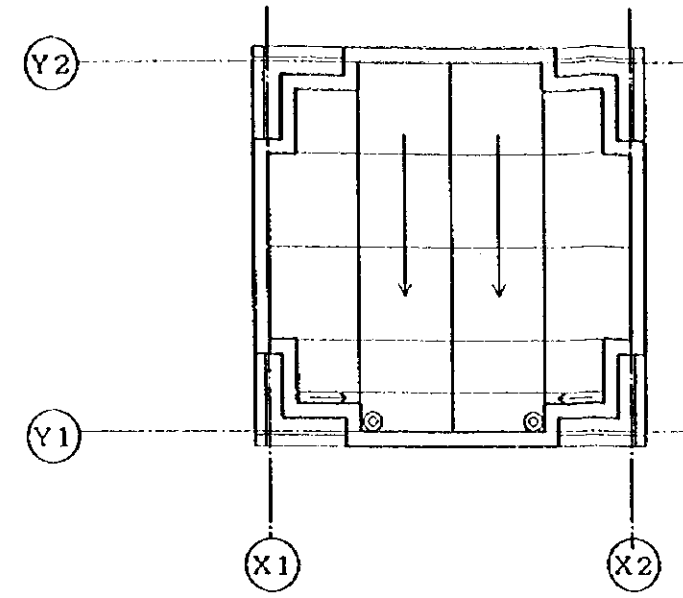


THE PROJECT FOR THE IMPROVEMENT OF
KALAWATI SARAN CHILDREN'S HOSPITAL IN INDIA

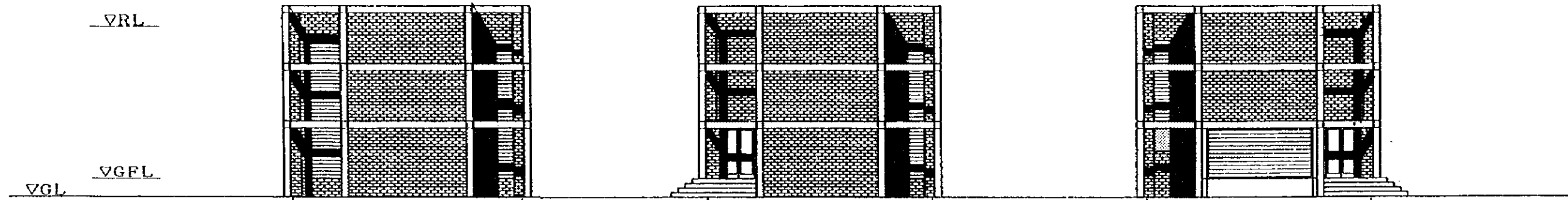
LAUNDRY BUILDING
PLAN/ELEVATIONS/SECTIONS



GROUND PLAN



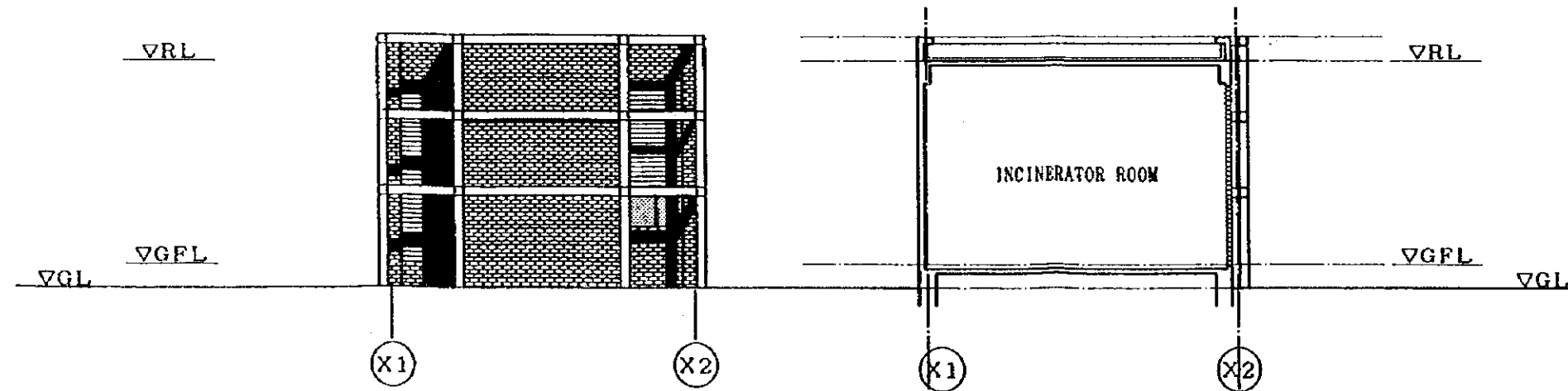
ROOF PLAN



SOUTH ELEVATION

WEST ELEVATION

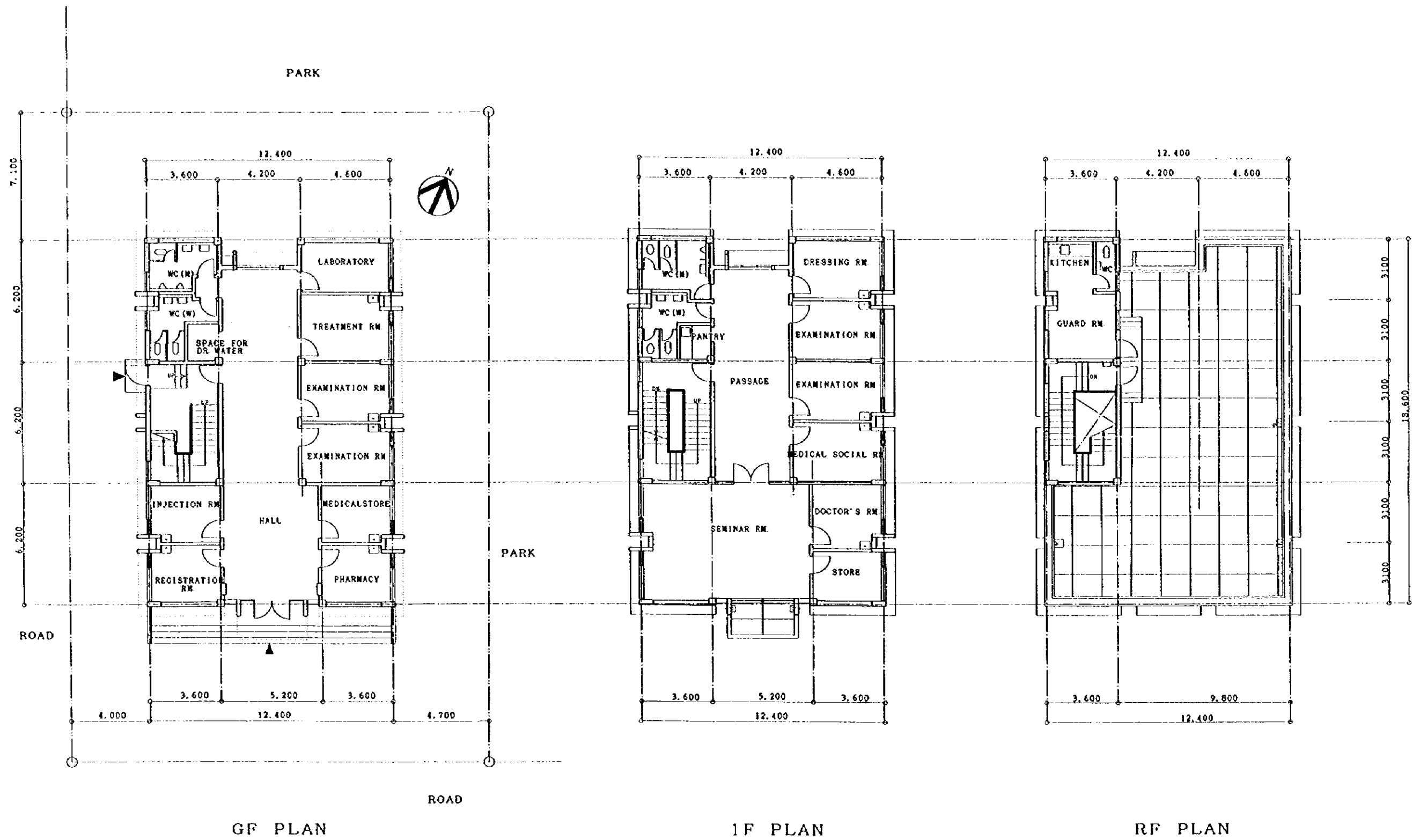
NORTH ELEVATION



EAST ELEVATION

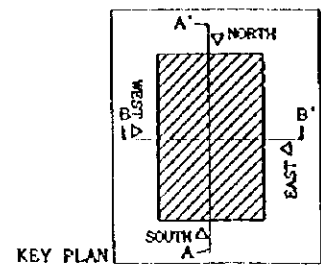
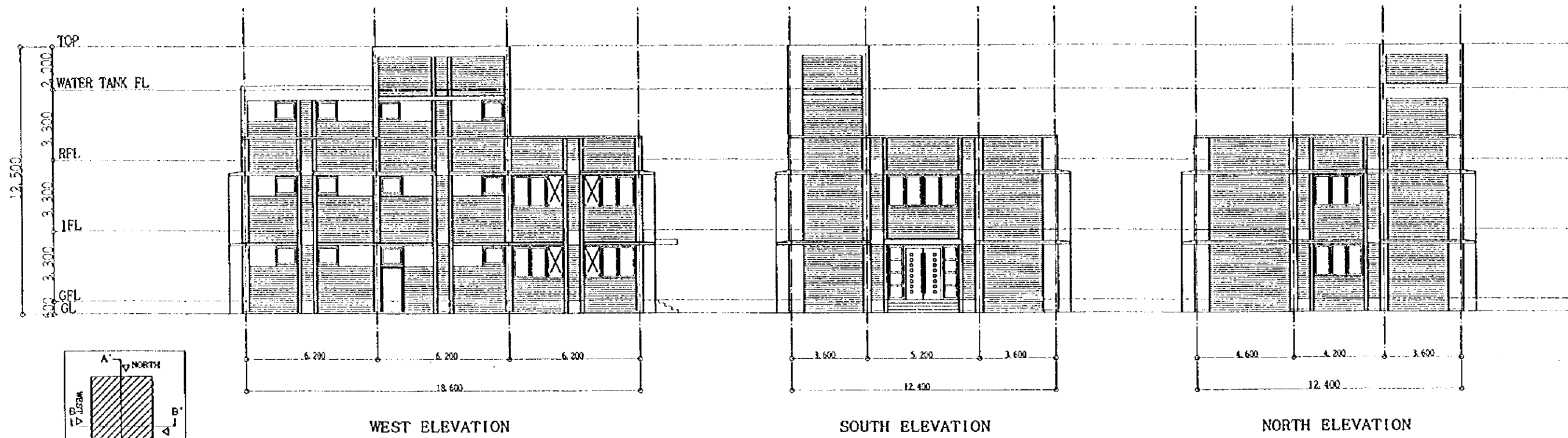
A-A SECTION





THE PROJECT FOR THE IMPROVEMENT OF
KALAWATI SARAN CHILDREN'S HOSPITAL IN INDIA

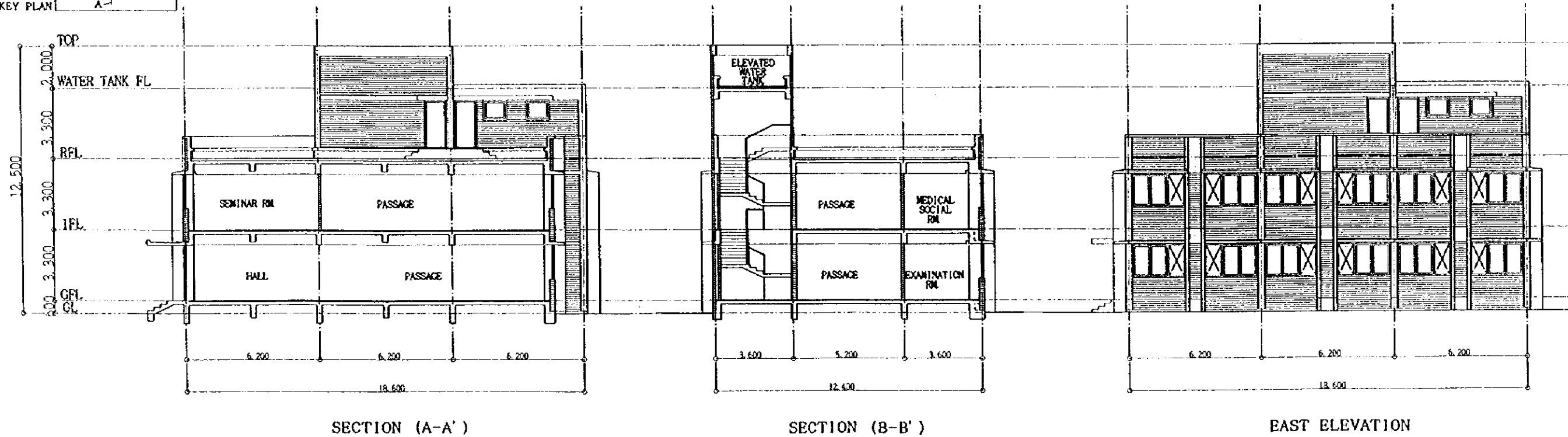
KALYANPURI URBAN HEALTH CENTRE
SITE PLAN/FLOOR PLAN



WEST ELEVATION

SOUTH ELEVATION

NORTH ELEVATION



SECTION (A-A')

SECTION (B-B')

EAST ELEVATION



THE PROJECT FOR THE IMPROVEMENT OF
KALAWATI SARAN CHILDREN'S HOSPITAL IN INDIA

KALYANPURI URBAN HEALTH CENTRE
ELEVATION/SECTION