

2-3 Basic Design

2-3-1 Design Concept

This project is aimed at raising the level of medical examination and treatment at the Department of Pediatrics and Child Health of the UTH through the extension and reconstruction of its existing facilities and establishing a system to link medical services offered at the UHCs through the establishment of an outreach centre with a function to provide training tours to the UHCs. The basic design for the facilities and equipment to be procured under this project will be worked out in accordance with the following guidelines, taking into consideration such important factors as functionality, economy and safety.

(1) Guideline concerning Natural Condition

Zambia is situated at lat. 9° to 18°S and long. 23° to 34°E. It is 1,000m to 1,350m above sea level and has a relatively mild climate.

• The Wind and the Direction of the Wind

In Zambia, the wind blows from the northeast from April to September, and from the northwest from October to March, due to the effects of the trade winds. During the rainy season, a strong wind blows immediately before the start of a squall. In the basic design for this project, however, it will be sufficient to take into account a wind force of 30m/sec. In light of the direction in which the planned buildings are to face and the prevalent wind in and around the project site, the buildings should have as many openings as possible on its southward and northward sides for effective natural ventilation.

- Rainfall

In Lusaka, the period from November to March is the rainy season and the period from May to September is the dry season. During the rainy season, there are heavy rainfalls that some drainage systems will not work. In working out the architectural plan for this project, due consideration should be given to the method of rainwater disposal, the drainage route and the ground floor level. In working out the construction schedule, the earth work and the foundation work during the rainy season should be avoided.

- Sunshine and Solar Radiation

During the dry season (from May to September), there are long sunshine hours (9 hours a day on average) and strong solar radiation. Sunshine and solar radiation should be controlled with wings, eaves and louvers. Careful attention should be paid to the selection of construction materials, such as exterior wall materials and roofing materials, which have large areas to be exposed to sunshine and solar radiation.

- Thunder

During the rainy season, squallish rainfalls are sometimes accompanied by thunder. For this reason, due consideration should be given to measures against lightning.

(2) Guideline Concerning Social Conditions

This project is to form a part of the facilities of the UTH and is to function also as a children's hospital. In designing the new facilities, utmost emphasis should be placed on their relationship with the existing ones, particularly on the following points.

- Outside appearance which is in harmony with that of the existing facilities
- Future changes in the methods of medical examination and treatment
- Conservation of the natural environment on the premises of the UTH, as well as in the surrounding area

(3) Guideline concerning the Actual Conditions of the Local Construction Industry

Zambia's building code was developed on the basis of the Building Standards of Britain (BS), taking into account the actual conditions of the local construction trade. When applying for building permit, it is necessary to first notify the Urban Planning Section of the City Council of Lusaka. In implementing the project, it is essential to comply with the local building code so that building permission may be obtained without any trouble.

(4) Guideline Concerning Local Supplier and Locally Available Construction Machines and Materials

This project should be implemented by making good use of locally available building materials and those which can be procured in third nations such as South Africa and other neighboring nation so that the specifications for this project may be the same as those for the existing facilities and that the building cost may be minimized.

(5) Guideline Concerning the Project Implementing Organization's Facility /Equipment Operating and Managing Capabilities

Under this project the UTH's existing facilities are to be expanded and their increased total floor space will entail and increase in the costs of

their operation and maintenance. In working out the architectural plan for this project, therefore, due consideration should be given to effective use of natural ventilation and lighting, as well as locally available building materials, so that the additional operation and maintenance costs may be minimized.

(6) Guideline Concerning the Scope and Grades of the Facilities and Equipment to be Procured under the Project

In light of the above-mentioned results of the examination of the requested facilities and equipment, the design concept for the facilities and equipment to be procured under this project can be summarized as follows.

- The facilities of the outpatient ward in the Department of Pediatrics and Child Health are to be expanded, the isolation ward are to be rebuilt, and an outreach centre to support the UHCs is to be set up.
- A basic items of equipment necessary for the expansion of the facilities of the outpatient ward, the rebuilding of the isolation ward and the establishment of an outreach centre are to be procured.
- The costs of operation and maintenance of the facilities should be minimized.
- A Japanese contractor should give guidance on effective use of locally available construction machines and materials to qualified local contractors.
- The specifications for this project should be the same as those for the buildings constructed under the UTH's master plan so that the building costs may be minimized.

(7) Guideline Concerning the Period of Construction Work

During the period of the construction work under this project, some of the hospital's routine operations will be suspended. In working out the construction schedule for this project, therefore, minute care should be taken to minimize the period of such suspension of the hospital's routine operations. In Zambia, the period from November to March is the rainy season, during which period it is difficult to execute the earth work and the foundation work. During the rainy season, the efficiency of execution of some other works will also decline. Close attention should be paid to this possibility.

2-3-2 Basic Design

(1) Site Plan

The project site is located on the premises of the UTH. The relationship between the planned facilities and the existing buildings is as illustrated below.

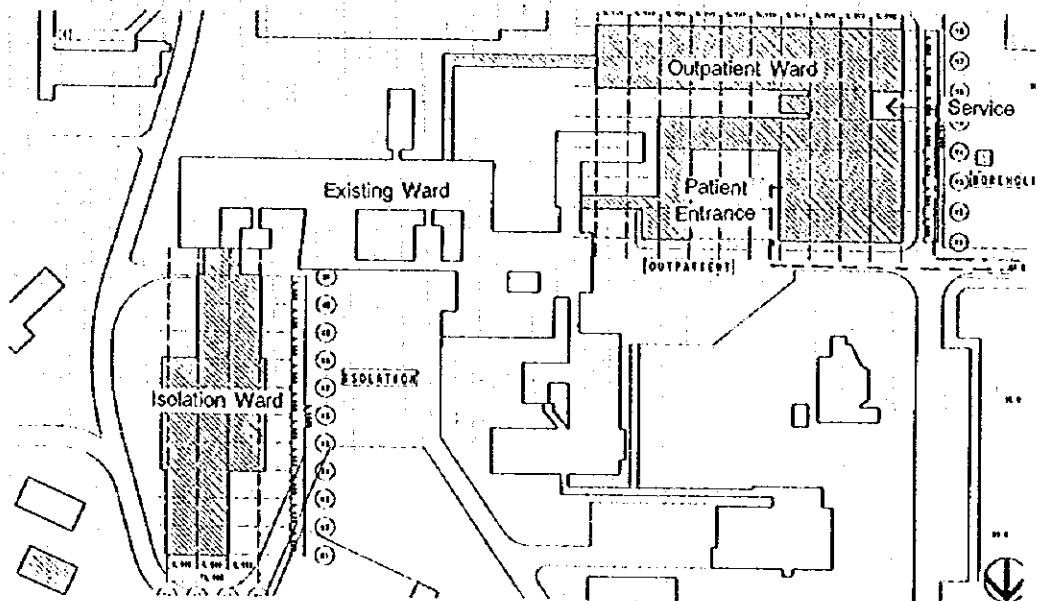


Fig. 2-1 Relationship between the Planned Facilities and the Existing

(2) Architectural Plan

1) Floor Plan

The layout of the main rooms for each ward should be worked out on the basis of the details of activities to be carried out in, and functions required of, these rooms. The size of each of these rooms should be determined taking into consideration the arrangement and the functions of the necessary items of equipment. The following table shows the rooms to be designed under this project and floor space of each of them, as well as the rationale for determining the floor space and the function(s) of each these rooms.

Table 2-6 Examination of the Main Rooms for Each Ward

Room	No. of rooms	Floor space/room (m ²)	Rationale and function(s)
(1) Outpatient Ward			
⊙ Outpatient			
Waiting hall	1	144.0	• Assuming that 200 outpatients visit a day on average and that the average daily examination length is 5 hours, the average number of patients per hour is 40/hour (=200 outpatients/day ÷ 5 hours). Taking outpatients' attendants into consideration, the waiting hall's floor space should be 80-100 persons/hour × 2.0m ² /person.
Cashier room	1	12.0	• This floor space should be determined on the assumption that the room will have two desks for the two cashiers and the necessary items of office equipment.
Registration room	1	16.0	• The room should be equipped with desks, chairs and other items of office equipment necessary for the screening and registration of outpatients.
ORT-Weight room	1	16.0	• This room should be equipped with scales, desks and chairs.
Security room	1	12.0	• This is a room for two security guards. The floor space per guard should be about 6m ² .
Social worker room	1	12.0	• This room should be equipped with a desk, a chair and a cabinet, all of which should be for the exclusive use of the social worker.
Emergency room	1	36.0	• This room should be twice as large as ordinary treatment rooms since this room is used for both treatment of emergency cases and training of medical students.
Clinic	4	18.0	• These are ordinary examination rooms. The arrangement of the necessary items of equipment was taken into consideration in deciding the size of these rooms.

Room	No. of rooms	Floor space/room (m ²)	Rationale and function(s)
Anteroom	1	10.0	• This room should be located between the waiting hall and the toilet for common use so that it may serve as the ventilating zone.
Toilet	2	12.0	• The toilet's floor space was decided on the assumption that it will be used by 40 males and 40 females. It should be equipped with 2 urinals for males and 2 stools for females.
Maid room	1	12.0	• This room should have a space large enough for two cleaning women and cleaning equipment.
Store room	1	18.0	• This is a room to store those items of equipment which are to be used at the clinics.
Treatment room	1	18.0	• This is an ordinary treatment room, and its size should be decided on the basis of the arrangement of the necessary items of equipment.
Doctor room	1	18.0	• This room should function both as a examination room and as a night duty room and should be furnished accordingly.
Toilet	1	9.0	• This toilet, equipped with a shower room, is for the exclusive use of the doctors on night duty.
Store room	1	9.0	• This size of this store should be decided taking into account the arrangement of drug shelves.
Pharmacy	1	18.0	• This size of this pharmacy should be decided taking into account the arrangement of the necessary items of equipment.
Nurse station	1	18.0	• This nurse station should be equipped with necessary items of equipment and furniture for the use of the nurses to work in the observation room.
Observation room	1	72.0	• This observation room's floor space per bed should be 7.2m ² , which is a little larger than that for standard ward rooms in Japan.
③ Admission			
Acute bay	1	108.0	• The room's floor space per bed should be 10.8m ² , which is a little larger than that for ordinary hospital rooms, in consideration of the arrangement of the necessary items of equipment and the working space.
Nurse station	1	18.0	• This nurse station's floor space should be decided taking into consideration those items of equipment which are necessary for patient monitoring and nursing.
Treatment room	1	12.0	• This room's floor space should be decided after the example of ordinary treatment rooms.
Store room	1	12.0	• This is a room to store the items of equipment for use in the Acute bay.
Sluice room	1	9.0	• This is a room where filth from the Acute bay is disposed of.
Toilet (staff)	1	12.0	• This is the toilet for the exclusive use of the female staff to work at the outpatient ward. It should be equipped with 2 stools and 2 washbasins.
Toilet (staff)	1	9.0	• This is the toilet for the exclusive use of the male staff to work at the outpatient ward. It should be equipped with 2 urinals and 2 washbasins.
Doctor room	1	18.0	• This is an anteroom for the doctors to work in the admission ward and therefore should have a space large enough for the necessary items of equipment, including desks and chairs.

Room	No. of rooms	Floor space/room (m ²)	Rationale and function(s)
Nurse room	1	12.0	• This is a resting room for the nurses to work in the admission ward.
Treatment room	1	12.0	• This is a treatment room attached to the admission ward and therefore should be designed in accordance with the standard applicable to ordinary treatment rooms.
Store room	1	6.0	• This is a room to store the items of equipment for use in the admission room.
Linen room	1	6.0	• This is a room to store linen for use in the admission room.
Nurse station	1	12.0	• This is a nurse station for the use of the nurses to monitor the admission ward.
Admission ward	1	348.0	• This room's floor space per bed should be about 6.2m ² after the example of ordinary hospital rooms.
Machine room	1	12.0	• This is the machine room for the admission ward.
Sluice room	1	6.0	• This is a room where filth from the admission room is disposed of.
Toilet	1	12.0	• This is the toilet for the use of patients to stay in the admission ward. It should be equipped with 3 stools and 3 washbasins after the example of ordinary hospital rooms.
Bathroom	1	12.0	• This room should be equipped with 2 bathtubs, each provided with a shower.
⊙ Service			
Laboratory	1	36.0	• This is a room where ordinary tests can be conducted and should therefore be equipped with the necessary items of equipment.
Store room	1	12.0	• This is a room to store the items of equipment for use in the laboratory.
Kitchen	1	24.0	• This kitchen's floor space should be decided taking into account the arrangement of the items of equipment for use in it.
Nutrition education room	1	24.0	• This is a room where guidance on nutrition is given to groups of patients' mothers, each group consisting of about 10 patients' mothers.
Nutrition office	1	16.0	• The floor space per person of this room, which is to serve as the office room and anteroom for 4 kitchen staff members, should be 4.0m ² after the example of ordinary office rooms.
Washing room	1	30.0	• This room's floor space should be decided taking into account the arrangement of washing machines and other devices.
Clean store room	1	6.0	• This is a room where washed lines are distributed.
Store room	1	18.0	• This is a room to receive and store lines to be washed.
⊙ Administration			
Lecture room	1	72.0	• This room's floor space per student should be 4.0m ² on the assumption that the room has a seating capacity of about 30.
Board room	1	54.0	• This room's floor space per person should be 2.4m ² on the assumption that about 20 medical staffs and nurses will meet in this room

Room	No. of rooms	Floor space/room (m ²)	Rationale and function(s)
Store room	1	12.0	•This is a room to store the equipment to be used in the administration section.
Night duty room	1	18.0	•This is a room for two doctors that keep night watch.
Shower room	1	3.0	•This is a facility to be attached to the night duty room.
Toilet	1	3.0	•This is a facility to be attached to the night duty room.
Toilet (for women)	1	12.0	•This toilet should be equipped with 2 stools and 2 washbasins.
Toilet (for men)	1	12.0	•This toilet should be equipped with a stool, 2 urinals and 2 washbasins.
Outreach centre	1	72.0	•This is a facility to be used to support the UHCs. its size should be decided on the basis of the arrangement of the necessary items of equipment.
Library	1	42.0	•This facility, which is also to serve as a preparation room for lecturers and students, should be equipped with 5 desks and 4 shelves.
Computer room	1	42.0	•This room should be equipped with 5 personal computers. Its size should be decided on the basis of an 8.1m ² floor space per computer.
S.H.O.	1	36.0	•This is an anteroom for 9 S.H.O.'s. Its floor space should be decided on the basis of a 4.0m ² floor space per S.O.H.
Registrar room	1	36.0	•This is an anteroom for registrars.
PG room	2	54.0	•This is to serve as an anteroom for the use of about 20 doctors.
Secretary room	1	18.0	•This is an ordinary secretary room for the use of the secretary of Department Head.
Head of Department room	1	36.0	•This is the office of the Head of the pediatric department. Its size should be decided after the example of the similar existing facilities.
Machine room	1	18.	•This is a machine room for the administration section.
Toilet (for women)	1	12.0	•This toilet for the use of the female staff members of the administration section should be equipped with 2 stools and 2 washbasins.
Toilet (for men)	1	12.0	•This toilet for the use of the male staff members of the administration section should be equipped with a stool, 2 urinals and 2 washbasins.
Matron room	1	24.0	•This is a head nurse's office similar to the existing ones.
Senior doctor room	4	24.0	•Each of these rooms should be shared by two senior doctor. Its floor space per person should be 12.0m ² .
Housekeeping room	1	16.0	•This is a room for the head of the cleaning, maintenance and operation section.
Pantry	1	8.0	•This is a room where tea is made for the staff of the administration.
(2) Isolation ward			
⊙ Administration			
Reception room	1	12.0	•This is a room where the comings and goings of patients, their attendants and visitors are monitored and managed.

Room	No. of rooms	Floor space/room (m ²)	Rationale and function(s)
Food supply	1	12.0	• This is a room where meals are dished up and tableware is washed.
Change room (for women)	1	16.5	• This is locker room where women change clothes.
Change room (for men)	1	11.0	• This is a locker room where men change clothes.
⊙ Ward			
Ward (TB)	3	55.0	• 1 The floor space of this ward should be 137.5m ² (= 5.5m ² /bed × 25beds).
Sluice room	2	8.0	• This is a room where filth from the ward is to be disposed of.
Bathroom	2	8.0	• Each bathroom should be equipped with a bathtub with a shower.
Toilet	2	12.0	• This toilet should be equipped with 2 stools and 2 washbasins.
Nurse station	1	42.0	• To observe the entire ward
Linen room	2	7.5	• This is a room where linen is stored.
Treatment room	2	20.0	• This size of this treatment room should be decided taking into account the arrangement of the necessary items of equipment, including the medical examination /treatment table.
Acute room	2	27.5	• This room's floor space per bed should be 6.92m ² on the basis of the arrangement of the necessary items of equipment and 4 beds should be installed in this room.
Ward (measles)	2	55.0	• The floor space of this room should be 110m ² on the assumption that its floor space per bed is 5.5m ² and that 20 beds is installed in the room.
Ward (meningitis)	1	55.0	• This floor space of this room should be 55m ² on the assumption that its floor space per bed is 5.5m ² and that 10 beds are installed in the room.
Ward (other)	1	55.0	• This room's floor space should be 55m ² on the assumption that its floor space per bed is 5.5m ² and that 10 beds are installed in the room.

2) Section Plan

In working out the section plan, natural ventilation and lighting should be secured for the rooms and due consideration should be given to measures against direct sunlight and rainwater. The floor height should be so designed as to secure a sufficient ceiling height in order to prevent the room temperature from rising. An enough height from the ground level should be also be secured to protect against floods caused by heavy rains.

3) Structure Plan

- Structure Outline

This project is aimed primarily at improving the facilities of the outpatient ward and isolation ward in the Department of Pediatrics and Child Health of the UTH. The basic span for the Outpatient ward building should be 6.0m×6.0m and the building should be a reinforced concrete with two stories above ground. The basic span for the Isolation ward building should be 5.5m×6.0m and the building should be a one-storied reinforced concrete building. The story height should be 3.8m for both buildings.

- Foundation System

The results of the conventional penetration test conducted at the time of the basic design study show that the geological features of the project site are even and its ground consists of a sandy laterite layer. The N value at a depth of 1.5m to 2.0m is approximately 15 and it will be possible to secure an allowable bearing capacity of 12t/m². Judging from the scale of the facilities under this project, it will be appropriate to choose spread foundation as taking into account the above-mentioned allowable bearing capacity of soil. The data on the existing tube well shows that no groundwater has been detected within 10m below the ground, which means that there will be no need to consider the pumping up the underground water during the foundation work nor to pay special attention to the hydraulic pressure to act on the planned buildings.

- **Superstructure System**

In light of ease of construction, economic efficiency, the natural conditions and the scale of the planned buildings, it is appropriate to choose reinforced concrete rigid frame structure for the superstructure of the building. In principle, the exterior walls should be faired brick walls and the interior walls should be concrete block walls in consideration of the actual condition of the local construction industry and economic efficiency. These walls should not be required to bear horizontal load or vertical load.

- **Applicable Standard**

The British Standards on Concrete Structures (BS8100: Part 1-3: 1985) shall be applied.

- **Seismic Force**

Zambia does not belong to any earthquake zone. The country has no past records of earthquakes. It is therefore not necessary to take seismic force into consideration in working out the structural design.

4) **Building Facility Plan**

- ① **Electrical Plan**

Under this project, scope of electrical plan shall be limited to the planned facilities (the outpatient ward and the isolation ward). In principle, electrical plan of the existing facilities is not included in this project. In working out the electrical plan, utmost emphasis should be placed on ease of operation and maintenance and simple structure.

• Power Substation Plan

At present, electrical power is received at ZESCO Substation No.1 and then is supplied to each substation in the premises of the UTH through network circuits.

The 11kV, 50Hz electric current is transformed to 380V at substation No.2 with capacity of 200kVA, which is located on the northern side of the project site, for distribution to the existing facilities of the Pediatric Department. Since Substation No.2 is operating almost at peak capacity to supply electric power to the existing facilities, substation No.2 should be extended to supply electric power to the planned facilities.

A transformer with a capacity of 300kVA should be procured for this project. Although the voltage is relatively stable ($\pm 5\%$) in and around the project site, an AVR should be attached to the power supply of each item of precision medical equipment in order to avoid the trouble caused by voltage fluctuation.

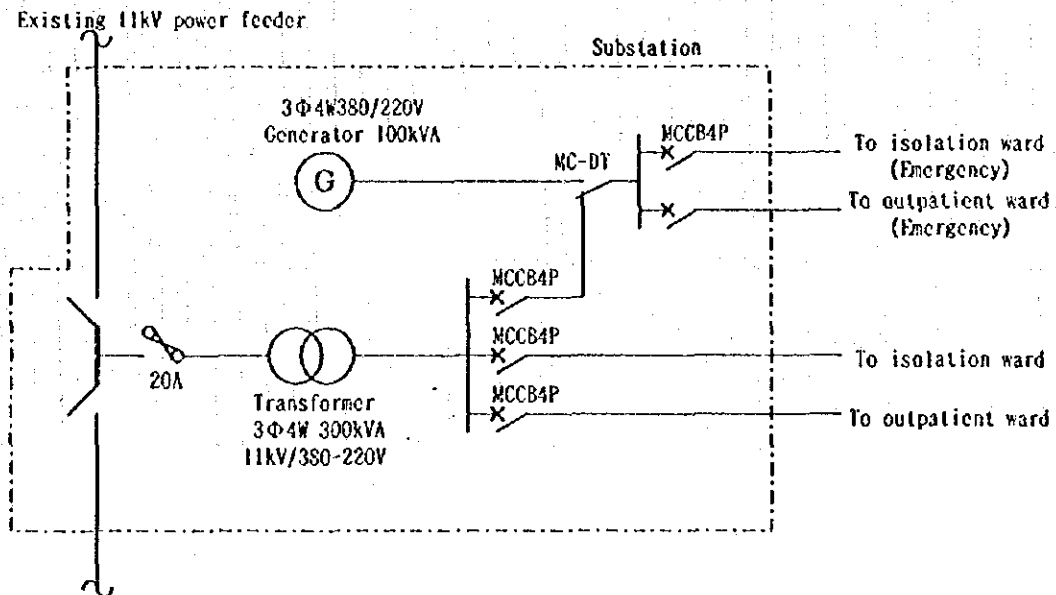


Fig. 2-2 Power Supply System Diagram

- Emergency Generator Plan

The existing emergency generator has a capacity of 150kVA and is therefore unable to cover the planned facilities. A diesel engine-powered emergency generator with a minimum required capacity (100kVA) should be procured for this project. The emergency generator is to cover those items of equipment which are to be installed in the Laboratory and the Acute Bay, emergency lighting fixtures and a water pump under this project.

- Lighting/Wall Socket Plan

Under this project, the main light sources should be fluorescent lamps, which can easily be procured locally. In principle, the fluorescent lamps should be mounted direct to the ceilings. The target illuminance for the main rooms is as shown in the following table.

Table 2-7 Target Illuminance of Man Rooms

Room	Illuminance (lx)
Ward, Acute Bay, etc.	200~300
Laboratory	300~500
Examination room	300~500
Office room and others	200~300

The necessary number of wall sockets should be installed in each room. The wall socket wiring method should be not series wiring but zoning wiring in order to increase the reliability of each wall socket. (* zoning wiring: in this wiring method, the wall sockets installed in each room are grouped into a number of blocks so that when a group of

wall consents break down, all the other groups of wall sockets may continues to work.)

- Telephone Equipment Plan

The existing telephone equipment is connected to the telephone exchange installed in the UTH's main building. However, no telephones are used for communications among the wards of the pediatric department, making the communications insufficient. Under this Project, small-size telephone exchange to cover the planned facilities and existing wards should be installed in order to make the communications within the Pediatric Department more sufficient. The telephone exchange should therefore be installed in the planned facilities. And a total of 8 telephone, one for each existing ward, should be installed in the Department. The number of incoming lines should be increased from 2 to 3 and the number of extension circuits should be about 30.

- Intercom Plan

No intercommunication systems will be procured under this project because the planned telephone system will be provided with intercommunication functions.

- Fire Alarms

Fire alarms that comply with the Birth Standard should be procured for this project.

• Lightning Arresting System

Although there are no official standards on lightning arresting systems which are applicable to this project, a lightning arresting system should be installed on the project site in light of the possible effects of lightning on the planned facilities, the topographical features of the project site (a relatively on an eminence), the buildings are relatively low around the site of the planned facilities and the data from the survey of the existing facilities. The design of the lightning arresting system should be conducted taking into consideration the possible effects of lightning on the equipment procured under this project.

② Air Conditioning/Ventilation System Plan

Under this project, an air conditioning system should be procured only for the planned facilities. In principle, no new air conditioning system should be installed in the existing facilities of the Department under this project. In working out the air conditioning system plan, the purpose of the use of the air conditioning system should be defined, and utmost emphasis should be placed on low cost of operation and maintenance, a simple but efficient air conditioning system, and ease of operation and maintenance. At the UTH, steam as the heat source is supplied from the boiler building (located almost in the center of the hospital complex), but at present steam is utilized only in the Block D building located on the eastern side of the premises of the hospital.

As a result of a survey of the actual conditions of the supply of steam to the facilities of the department, it has been found out that the supply of steam to these facilities was discontinued in the 1970s and that the steam heat exchanger and the plumbing have corroded too

much for reuse. As to the possibility of repairing the plumbing, it will be necessary to repair the plumbing from the project site to the boiler building (the distance of 200-300m). Thus the scale of the repair work is too large compared with the load required for the project. It has been concluded, it is not rational or reasonable to repair the steam line under this project.

• Air Conditioning Plan

The air conditioning system for this project should consist mainly of electrical, air heat source, heat pump-type air conditioners in light of its the purpose, the cost of operation and maintenance and measures against air conditioner breakdowns. Those rooms not to be equipped with an air conditioner should be equipped with a ceiling fan (for from cooling in summer) and an electric heater (for room heating in winter). The rooms which are to be equipped with an air conditioner are as shown in the following table.

Table 2-8 Table of Specifications

Room	※ A/C	Ceiling fan	Venti- lation	Water supply	Hot water supply	Medical Gas		Tele- phone	Inter- com	Emer- gency	Remarks
						Oxygen	Vacuum				
(1) Outpatient Ward											
⊙ Outpatient											
Waiting hall		○									
Cashier		○									
Registration room		○						○			
Maid room											
Social worker room		○						○			
Toilet											
Examination room		○									
Treatment room		○									
Observation room		○									
Doctor room		○		○				○			
Nurse room		○		○				○			
Store room											

Room	✕ A/C	Ceiling fan	Venti- lation	Water supply	Hot water supply	Medical Gas		Tele- phone	Inter- com	Emer- gency	Remarks
						Oxygen	Vacuum				
Toilet			○	○							
Pharmacy		○									
Store room											
⊙ Admission											
Admission ward room	○	○				○	○				
Treatment room		○		○							
Nurse station		○						○			
Doctor room		○		○				○			
Nurse room		○		○							
Toilet			○	○							
Acute bay	○	○				○	○	○		○	
Treatment room		○									
Sluice room											
⊙ Service											
Laboratory			○	○	○			○			
Kitchen			○	○	○						
Nutrition office		○						○			
Nutrition education		○									
Washing room		○		○	○						
⊙ Administration											
Head of Department	○	○		○	○						
Secretary room	○	○						○			
Senior doctor room	○	○		○	○			○			
Registrar room	○	○		○	○			○			
PG room		○						○			
Night duty room		○						○			
Outreach centre		○						○			
Meeting room		○						○			
Lecture room		○									
Library	○	○									
Computer room		○									by UPS
Machine room											
Housekeeping room		○						○			
Toilet			○	○	○						
(2) Isolation ward											
⊙ Administration											
Reception		○						○			
Change room		○						○			
Nurse station		○						○			

Room	※ A/C	Ceiling fan	Ventilation	Water supply	Hot water supply	Medical Gas		Telephone	Inter-com	Emergency	Remarks
						Oxygen	Vacuum				
Toilet			○	○	○						
Store room											
⊙ Ward											
Ward (TB)		○						○			
Treatment room		○									
Acute room		○				○				○	
Bathroom			○	○	○						
Ward (Measles)		○									
Treatment room		○									
Acute room		○				○				○	
Bathroom			○	○	○						
Ward (Meningitis)		○						○			
Ward (other)		○						○			

※ Electrical, air heat source, heat pump-type air conditioner: This type of air conditioner works on electrical energy. It utilizes air heat for air conditioning. Most of the air conditioners for household use are air conditioners of this type.

● Ventilation Plan

On the project, mechanically operated ventilation method is planned for the rooms generate heat or smell, the rest of rooms should be ventilated with air vent blocks which are frequently utilized in the local construction.

The rooms should be ventilated mechanically by the use of the following methods.

Class 1 ventilation (mechanical air supply and exhaustion)

Laboratory, Kitchen, Laundry

Laboratory and kitchen to be provided with an air exhaustion hood)

Class 2 ventilation (mechanical air exhaustion)

Toilet, Ward, Acute bay,

Office room, Board room

③ Plumbing/Sanitary Plan

• Water Supply System Plan

A new tube well for the project will be installed since the stability of city water supply varies with the season. However, a system to shift to city water supply when city water supply is stable should be introduced. Under this project, water from the new tube well or the water main should be first stored in a new underground water tank and then pumped up into the elevated water tank installed on the roof of outpatient ward for distribution to the planned facilities. The isolation ward requires only a small quantity of water and is to be located away from the outpatient ward. For these reasons, only city water should be supplied to the isolation ward. Since a water main is laid under the project site, it will be necessary to divert the line in order to plan the new facilities there. The followings are the specification of the plumbing system for the project.

Water tank capacity	:	capacity of 1 day
Daily water usage	:	$3,500\text{m}^2 \times 10\ell/\text{day} = 35,000\ell/\text{day} = 35\text{m}^3$
Half of the daily water usage is stored in the elevated water tank	:	$35\text{m}^3 \div 2 \approx 20\text{m}^3$
Water pump	:	$20\text{m}^3 \times 60/30 = 60\text{min.} = 600\ell/\text{min}$

DIAGRAM OF WATER SUPPLY

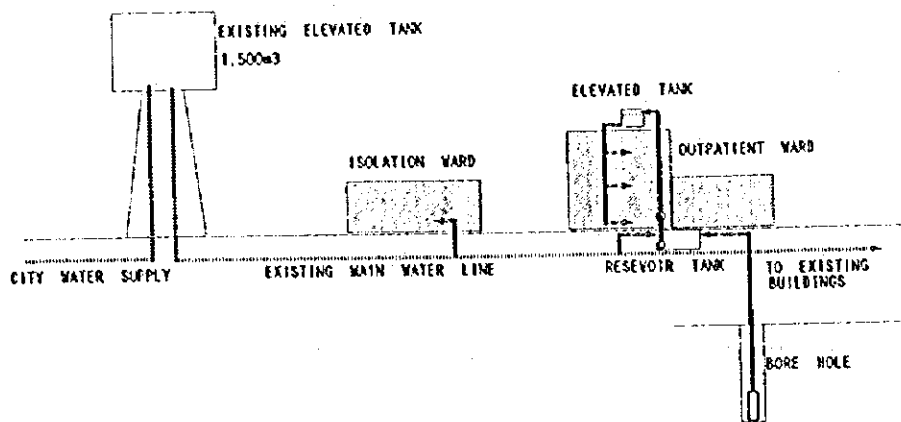


Fig. 2-3 Plumbing System Diagram

• Hot Water Supply System Plan

A solar water heater should be procured for this project so that the cost of operation and maintenance may be minimized. A solar water heater manufactured in Zambia or a third country should be procured. The solar water heater will be installed on the roof. (solar water heater: This type of water heater absorbs solar energy through the heat collecting panel (solar collector) and the absorbed solar energy is used to raise the temperature of the water stored in the tank. When it is difficult for the solar water heater to absorb a sufficient quantity of solar energy at night or on cloudy days, the attached electrical water heater is used.)

• Drainage System Plan

In the drainage system for the project, soil and waste water should be collected separately and both discharged into the first outdoor drainage pit. Rainwater should be discharged into the other outdoor drainage pit through the drainspouts. The soil and waste water from indoor should be finally discharged into the existing drainage pit, which is located adjacent to the project

site. Rainwater should be finally discharged into the existing open channel, which is located adjacent to the project site. The existing drainage pipes and rainwater pipes are laid under the project site. It will be necessary to divert the route of these pipes before the commencement of the project without hindering the operations carried out at the existing facilities.

- Fire Extinguishing System Plan

Fire extinguishing equipment that complies with the BS should be procured for this project.

5) Building Material Plan

The building materials to be used for the construction of the planned facilities should be suited for the local climatic conditions and construction methods, as well as for the functions required of the planned facilities. Emphasis should also be placed on their ability to secure the durability, ease and low cost of operation and maintenance.

- Main Structural Materials

Table 2-9 Classification of Materials -- Part-1

Part	Material	Remarks
Foundation, Column, Beam, Floor	Reinforced concrete	Since concrete is to be mixed on site, sufficient quality control will be required.
Wall	Concrete block	Concrete blocks, which have been used widely in the country, excel in durability and ease of repairing and maintenance.

- Exterior Finish Materials

Table 2-10 Classification of Materials --- Part-2

Part	Material	Remarks
Roof	Asphalt waterproofing on concrete with insulation	Special attention should be paid to heat from direct sunlight.
Wall	Brick	Bricks, which have been used widely in the country, excel in durability and ease of repairing and maintenance, as well as in design.
Fittings	Aluminum sash	Being manufactured in the country, they are easy to repair and maintain. They also excel in weather ability and design.

- Main Interior Finishing Materials

Table 2-11 Classification of Materials -- Part-3

Room	Floor	Wall	Ceiling	Remarks
Waiting hall	Terrazzo	Acrylic paint	Sound absorbing board	Materials that excel in ease of repairing and maintenance and durability should be selected.
Examination room Treatment room	ditto	Vinyl paint	Decorative plaster board	The paints should be durable and easy to repair and maintain.
Doctor room	ditto	Acrylic paint	Sound absorbing board	The ceiling material should excel in sound absorption so that reverberations may be minimized.
Admission ward	ditto	Vinyl paint	ditto	The floor and wall materials should excel in ease of maintenance and repairing.
Head of department, Senior doctor room, Board room, Lecture room	Parquet	Acrylic paint	Sound absorbing board	Materials which have been used widely in the country and which excel in ease of maintenance and repairing and design should be used.
Nurse station	Terrazzo	Vinyl paint	Finished plaster board	These materials should excel in cleanliness and ease of maintenance.
Toilet Shower room	Ceramic tile	Ceramic tile	Calcium silicate board finished with paint	The floor and wall materials should excel in waterproofness and durability.

(3) Medical Equipment Plan

- Guidelines for the Medical Equipment Plan

- ① Under this project, mainly basic items of medical equipment should be procured for the purpose of improving the quality of the medical examination and treatment activities carried out at the

Department, as well as streamlining these activities, on the basis of the results of the field survey.

- ② Most of the items of equipment for the project can be procured in the country or third countries (EU countries, U.S.A., South Africa and etc.). Those which it is difficult to procure in the country or third countries or those which have problems in terms of quality should be procured in Japan.
- ③ As to those items of equipment which require careful consideration in terms of operation and maintenance, priority should be given to those which are sold by local distributors who have sufficient operation and maintenance capabilities or those which are products of local or South African manufacturers.
- ④ Those items of equipment which should be procured in the country in consideration of availability of repair parts and expendable supplies and operation and maintenance services (such as computers and copiers).
- ⑤ As measures against voltage fluctuations and power failures, AVR units should be procured for certain items of equipment.

In selecting the required items of equipment, a basic design plan was worked out on the basis of the above-mentioned guidelines, the list of the requested items of equipment and the results of the discussions with the staff members in charge of the Department, which is the Zambian project implementing organization.

Judging from the actual condition of the use of the existing items of equipment and the results of the basic design study of related facilities in the country, the grades of the required items of

equipment need not be higher than necessary. But these items of equipment should withstand long continued use with little decline in efficiency. The uses and functions of the main items of equipment are as shown in the following table.

Table 2-12 Uses and Functions of the Main Items of Equipment

Equipment	Uses and function
Spectrophotometer	Important specimen analyzer used in biochemical tests
Blood cell counter	Used in screening tests of all patients and tests to monitor the progress of blood diseases. Can be effectively used in medical examination and treatment.
ECG monitor	Equipment to monitor the ECG, temperature, oxygen concentration in blood, respiration and blood pressure of the patient.
Defibrillator	Important equipment used to revive the heart.
Washing machine	Machine used to wash linen, bedclothes and etc. used in the department. The daily quantity of washing is estimated at 150kg.
Distiller	To use water distillation
X-ray film processor	To develop X-ray film
Microscope	To use immunofluorescence test
Medical gas piping	For use in oxygen therapy
Incinerator	Used to incinerate medical waste. Daily quantity of medical waste is estimated at 260kg (300beds×1.33kg/day×0.8)

The Items of equipment for the project is shown on the Table below.

The origins of the items of equipment shown in the table 2-13 are for reference use only. The actual origins of equipment might be changed by the result of the tender.

Table 2-13 Equipment List

No.	Description	Q'ty	Origin
(1) Outpatient ward			
① Outpatient			
(Cashier)			
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
	Electric calculator (more than 12 figures)	2 pcs	Zambia
	Photocopy machine (A3-B5, zooming facility)	1 pc	Zambia
(Registration)			
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Zambia
(Weight room)			
	Weighting scale for infant	2 pcs	Zambia
	Weight scale with height scale for child	2 pcs	Zambia
(Waiting room)			
	Wheel chair (for pediatric, foldable, solid tire)	3 pcs	Third country
	Stretcher (detachable litter, size: W1900×D586×H780)	3 pcs	Third country
	Patient bench (for 5~6 persons)	9 pcs	Third country
	TV with vide tape recorder	1 pc	Third country
(Doctor's room)			
	Bed with mattress (size: L1200×W985×H570)	2 pcs	Third country
(Examination room 1)			
	Sphygmomanometer, wall mounted type (mercurial, 4 sizes of cuff)	1 pc	Third country
	Examination coach (size: W1800×D750×H630)	1 pc	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	File cabinet (with lock, W1760×D400×H880)	1 pc	Third country
	Examination light (mobile type)	1 pc	Third country
	Foot step (2 setps, size: D400×W300×H230)	1 pc	Third country
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope)	1 set	Third country
	Stainless tray (with cover, L/M/S)	1 set	Third country
	Kidney tray (stainless steel, L/M/S)	1 set	Third country

No.	Description	Q'ty	Origin
	Dust bin (foot pedal type, dia. 255×H355)	1 pc	Third country
	Dressing containers (SS round type, Dia. 270×H180)	1 pc	Third country
	Boilding sterilizer (1.2KW, D400×W200×H150)	1 pc	Third country
(Examination room 2)			
	Sphygmomanometer, wall type (mercurial, 4 sizes of cuff)	1 pc	Third country
	Examination coach (size: W1800×D750×H630)	1 pc	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	File cabinet (with lock, W1760×D400×H880)	1 pc	Third country
	Examination light (mobile type)	1 pc	Third country
	Foot steps (2 steps, size: D400×W300×H230)	1 pc	Third country
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope)	1 set	Third country
	Stainless tray (with cover, L/M/S)	1 set	Third country
	Kidney tray (stainless steel, L/M/S)	1 set	Third country
	Dust bin (foot pedal type, Dia.255×H355)	1 pc	Third country
	Dressing container (SS round type, Dia. 270×H180)	1 pc	Third country
	Boiling sterilizer (1.2kW, D400×W200×H150)	1 pc	Third country
(Examination room 3)			
	Sphygmomanometer, wall type (mercurial, 4 sizes of cuff)	1 pc	Third country
	Examination coach (size: W1800×D750×H630)	1 pc	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	File cabinet (with lock, W1760×D400×H880)	1 pc	Third country
	Examination light (mobile type)	1 pc	Third country
	Foot steps (2 steps, size: D400×W300×H230)	1 pc	Third country
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope)	1 set	Third country
	Stainless tray (with cover, L/M/S)	1 set	Third country
	Kidney tray (stainless steel, L/M/S)	1 set	Third country
	Dust bin (foot pedal type, Dia.255×H355)	1 pc	Third country
	Dressing container (SS round type, Dia. 270×H180)	1 pc	Third country

No.	Description	Q'ty	Origin
	Boiling sterilizer (1.2kW, D400×W200×H150)	1 pc	Third country
(Examination room 4)			
	Sphygmomanometer, wall type (mercurial), 4 sizes of cuff)	1 pc	Third country
	Examination coach (size: W1800×D750×H630)	1 pc	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	File cabinet (with lock, W1760×D400×H880)	1 pc	Third country
	Examination light (mobile type)	1 pc	Third country
	Foot steps (2 steps, size: D400×W300×H230)	1 pc	Third country
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope)	1 set	Third country
	Stainless tray (with cover, L/M/S)	1 set	Third country
	Kidney tray (stainless steel, L/M/S)	1 set	Third country
	Dust bin (foot pedal type, dia. 255×355)	1 pc	Third country
	Dressing container (SS round type, dia. 270×H180)	1 pc	Third country
	Boiling sterilizer (1.2kW, D400×W200×H150)	1 pc	Third country
(Emergency treatment room 1)			
	Sphygmomanometer, wall type (mercurial, 4 sizes of cuff)	3 pcs	Third country
	ECG Monitor, 3 channel	1 pc	Third country
	Examination coach (size: W1800×D750×H630)	3 pcs	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	3 pcs	Third country
	Examination light (mobile type)	3 pcs	Third country
	Section unit (rotary pump, 2 bottles, -750mmHg)	1 pc	Third country
	Stretcher (detachable litter, size: W1900×D586×H780)	2 pcs	Third country
	Foot step (2 steps, size: D400×W300×H230)	3 pcs	Third country
	Minor operating set (consists of: needle holder, hemostatic forceps, forceps, scissors, scalpel, tourniquet)	3 set	Third country
	Sterilizer, small (table top, capacity: 12ℓ, 132°C)	1 pc	Third country
	Instrument trolley (2 shelves, size: W600×D450×H800)	3 pcs	Third country
	Instrument trolley (2 shelves, size: W600×D450×H800)	1 pc	Third country

No.	Description	Q'ty	Origin
	Medicine trolley (size: W600×D450×H800)	3 pcs	Third country
	IV stand (2 hooks, with castors)	1 pc	Third country
	Instrument cabinet (with lock, size: W1800×D450×H1700)	3 pcs	Third country
(Treatment room)			
	Examination coach (size: W1800×D750×H630)	1 pc	Third country
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope)	1 set	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	Instrument trolley (2 shelves, size: W600×D450×H800)	1 pc	Third country
	Nebulizer (ultrasoci, with stand)	1 pc	Third country
	Medicine trolley (size: W750×D500×H800)	1 pc	Third country
	Sterilizer, small (table top, capacity: 12ℓ, 132°C)	1 pc	Third country
	Foot step (2 steps, size: D400×W300×H230)	1 pc	Third country
	Refrigerator (with freezer)	1 pc	Third country
	IV stand (2 hooks, with castors)	2 pcs	Third country
	Suction unit (rotary pump, 2 bottles, -750mmHg)	1 pc	Third country
	Instrument cabinet (with lock, size: W900×D360×H1700)	1 pc	Third country
	Dust bin (foot pedal type, dia. 255×H355)	3 pcs	Third country
(Observation room)			
	Hospital bed with mattress (size: L2053×W920×H100)	5 pcs	Third country
	Pediatric bed with mattress (with safety rail, size: L1998×W1060×H1465)	5 pcs	Third country
	IV stand (2 hooks, with castors)	5 pcs	Third country
(Nurse station)			
	Diagnostic set (consists of: stethoscope, thermometer, scissors, forceps, tongue depressor)	1 set	Third country
	Sphygmomanometer (mercurial, table top, 4 sizes of cuff)	2 pcs	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	Medicine cupboard (with lock, size: W900×500×H700)	1 pc	Third country
	Refrigerator (with freezer)	1 pc	Third country

No.	Description	Qty	Origin
	Stainless jar (dia. 120×150)	1 pc	Third country
	Kidney tray (stainless steel, L/M/S)	1 set	Third country
	Dust bin (foot pedal type, dia. 255×H355)	1 pc	Third country
	Ambu bag (manual, bag: 4 size, silicon rubber)	1 pc	Third country
	Dressing container (SS round type, dia. 270×H180)	1 pc	Third country
	Instrument cabinet (with lock, size: W900×D360×H1700)	1 pc	Third country
	Emergency cart (Size: W915×D500×H1000)	1 pc	Third country
(Pharmacy)			
	Medical refrigerator (capacity: 340ℓ, temperature 2 to 14°C)	1 pc	Third country
(Store)			
	Drug shelves (with lock, size: W1760×D400×H880)	1 pc	Third country
② Admission			
(Admission ward)			
	Hospital bed with mattress (size: L2053×W920×H1000)	25 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	25 pcs	Third country
	Over bed table (size: W900×D360×H1000)	25 pcs	Third country
	Pediatric bed with mattress (with safety rail, size: L1998×W1060×H1465)	25 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	25 pcs	Third country
	Stretcher (detachable litter, size: W1900×D586×H780)	5 pcs	Third country
	Wheel chair (for pediatric, foldable, solid tire)	5 pcs	Third country
	IV stand (2 hooks, with castors)	25 pcs	Third country
(Treatment room)			
	Examination coach (size: W1800×D750×H630)	2 pcs	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	2 pcs	Third country
	Instrument trolley (2 shelves, size: W600×D450×H800)	2 pcs	Third country
	Nebulizer (ultrasonic, with stand)	2 pcs	Third country
	Medicine trolley (size: W750×D500×H800)	1 pc	Third country
	Sterilizer, small (table top, capacity: 12ℓ, 132°C)	1 pc	Third country
	Refrigerator (with freezer)	1 pc	Third country

No.	Description	Qty	Origin
	IV stand (2 hooks, with castors)	2 pcs	Third country
	Suction unit (rotary pump, 2 bottles, -750mmHg)	1 pc	Third country
	Foot step (2 steps, size: D400×W300×H230)	2 pcs	Third country
	Wheel chair (for pediatric, foldable, solid tire)	1 pc	Third country
	Instrument cabinet (with lock, size: W900×D360×H1700)	1 pc	Third country
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope)	2 sets	Third country
	Dust bin (foot pedal type, dia.255×H355)	2 pcs	Third country
(Doctor room)			
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope, sphygmomanometer, carry bag)	2 pcs	Third country
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	2 pcs	Third country
	Doctor desk (size: W1200×D700×H700)	2 pcs	Third country
	Doctor chair (arm rest, castor, height adjustable)	2 pcs	Third country
(Nurse room)			
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
	Table (size: W1600×D700×H700)	3 pcs	Third country
	Chair (castor, height adjustable)	3 pcs	Third country
(Nurse station)			
	Instruments set (consists of: stethoscope, thermometer, scissors, forceps, tongue depressor)	1 set	Third country
	Sphygmomanometer (mercurial, table top, 4 sizes of cuff)	4 pcs	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	2 pcs	Third country
	Medicine cupboard (with lock, size: W900×D500×H700)	1 pc	Third country
	Refrigerator (with freezer)	1 pc	Third country
	Stainless jar (dia. 120×150)	2 pcs	Third country
	Kidney tray (stainless steel, L/M/S)	4 sets	Third country
	Dust bin (foot pedal type, dia. 255×H355)	2 pcs	Third country
	Ambu bag (manual, bag: 4 size, silicon rubber)	2 pcs	Third country

No.	Description	Q'ty	Origin
	Dressing container (SS round type, dia. 270×H180)	2 pcs	Third country
	Instrument cabinet (with lock, size: W900×D360×H1700)	1 pc	Third country
	Emergency cart (size: W915×D500×H1000)	1 pc	Third country
(Sluice room)			
	Bedpan (stainless steel)	15 pcs	Third country
	Urine pan (stainless steel)	15 pcs	Third country
	Bedpan washer (with rack, reagent type)	1 pc	Third country
(Acute bay)			
	2 crank gatch bed with mattress (with safety side rail, L2215×W950×H935)	10 pcs	Third country
	ECG monitor (3 channel)	3 pcs	Third country
	Ambu bag (Manual, bag: 4 size, silicon rubber)	5 pcs	Third country
	Nebulizer (ultrasonic, with stand)	5 pcs	Third country
	Suction unit (rotary pump, 2 bottles, -750mmHg)	2 pcs	Third country
	Oxygen tent (with vinyl hood, nebulizer)	2 pcs	Third country
	IV stand (2 hooks, with castors)	10 pcs	Third country
(Treatment room)			
	Examination coach (size: W1800×D750×H630)	1 pc	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	Instrument trolley (2 shelves, size: W600×D450×H800)	1 pc	Third country
	Nebulizer (ultrasonic, with stand)	1 pc	Third country
	Medicine trolley (size: W750×D500×H800)	1 pc	Third country
	Sterilizer, small (table top, capacity: 12ℓ, 132°C)	1 pc	Third country
	Refrigerator (with freezer)	1 pc	Third country
	IV stand (2 hooks, with castors)	1 pc	Third country
	Suction unit (rotary pump, 2 bottles, -750mmHg)	1 pc	Third country
	Foot step (2 steps, size: D400×W300×H230)	1 pc	Third country
	Wheel chair (for pediatric, foldable, solid tire)	1 pc	Third country
	Instrument cabinet (with lock, size: W900×D360×H700)	1 pc	Third country
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope)	1 set	Third country

No.	Description	Qty	Origin
	Dust bin (foot pedal type, dia. 255×H355)	1 pc	Third country
(Nurse station)			
	Diagnostic set (consists of: stethoscope, thermometer, scissors, forceps, tongue depressor)	1 set	Third country
	Sphygmomanometer (mercurial, table top, 4 sizes of cuff)	2 pcs	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	Medicine cupboard (with lock, size: W900×D500×H700)	1 pc	Third country
	Refrigerator (with freezer)	1 pc	Third country
	Stainless jar (dia. 120×150)	1pc	Third country
	Kidney tray (stainless steel, L/M/S)	1set	Third country
	Dust bin (foot pedal type, dia. 255×H355)	1pc	Third country
	Ambu bag (manual, bag: size, silicon rubber)	1pc	Third country
	Dressing container (SS round type, dia. 270×H180)	1pc	Third country
	Instrument cabinet (with lock, size: W900×D360×H1700)	1pc	Third country
	Emergency cart with defibrillator (size: W915×D500×H1000)	1pc	Third country
(Sluice room)			
	Bedpan (stainless steel)	10pcs	Third country
	Urine pan (stainless steel)	10pcs	Third country
	Bedpan washer (with rack, reagent type)	1pc	Third country
(X-ray, existing room)			
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1pc	Third country
	X-ray protective set (apron, gloves, 2 each, 0.35mmPb)	1pc	Japan
	Foot step (2 steps, size: D400×W300×H230)	1pc	Third country
	X-ray film processor (sem automatic, max. size: 14×17")	1pc	Third country
	Name printer (alphabetic/number, 2 sets each)	1set	Japan
	Cassettes (6 size, 1 each)	1set	Japan
	Film hunger (14×17")	10pcs	Third country
(Ultrasound room, existing room)			
	EKG (3 channel)	1pc	Third country

No.	Description	Qty	Origin
	Examination coach (size: W1800×D750×H630)	1pc	Third country
③ Service			
(Laboratory)			
	Microscope (binocular)	3pcs	Japan
	Spectrophotometer (single beam)	1pc	Japan
	Calorimeter (digital type)	1pc	Japan
	Analytical balance (cap.: 200g, 0.01g)	1pc	Japan
	Differential leucocyte counter (digital)	1pc	Japan
	Blood cell counter (automatic)	1pc	Japan
	Centrifuge (for hematology use)	2pcs	Japan
	Blood bag refrigerator (capacity: 79ℓ, temp.: +4 ± 1°C)	1pc	Japan
	Ultra-low temp. freezer (capacity: 222ℓ, -40°C)	1pc	Japan
	Water bath (SS bath, temp.: room temp. to 74°C)	2pcs	Japan
	Dry air oven (capacity: 27ℓ, temp.: 20 to 260°C)	1pc	Third country
	Sterilizer (vertical type, capacity: 82ℓ, 127°C)	1pc	Third country
	Distiller (15ℓ/h)	1pc	Japan
(Washing room)			
	Washer and extractor (automatic, capacity: 23kg/h)	2 pcs	Zambia
	Dryer (automatic)	1 pc	Zambia
	Presser (electric, with compressor)	1 pc	Zambia
(Store)			
	Laundry cart (with bag, dia. 600×H700)	3 pcs	Third country
	Laundry bag (cotton)	3 pcs	Third country
	Laundry store rack (W1305×D550×H1700)	2 pcs	Third country
④ Administration			
(Head of department)			
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	Examination coach (size: W1800×D750×H630, with screen)	1 pc	Third country
	Doctor desk (size: W1600×D700×H700)	1 pc	Third country
	Doctor chair (arm rest, castor, height adjustable)	1 pc	Third country
(Secretary room)			
	Photocopy machine (A3-B5, zooming facility)	1 pc	Third country

No.	Description	Q'ty	Origin
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
(Board room)			
	X-ray film illuminator (mobile type, 4 films)	1 pc	Third country
	Overhead projector (with screen)	1 pc	Third country
	White board (mobile, W1880×D608×H1854)	1 pc	Third country
	Table (size: W1600×D600×H700)	10 pcs	Third country
	Chair (with arm rest)	20 pcs	Third country
(Library)			
	Book shelf (size: W1880×D250×H1920)	10 pcs	Third country
	Table (size: W1200×D750×H700)	4 pcs	Third country
	Chair (with arm rest)	5 pcs	Third country
(Senior doctor room 1)			
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	2 pcs	Third country
	Examination coach (size: W1800×D750×H630, with screen)	1 pc	Third country
	Doctor desk (size: W1600×D700×H700)	2 pcs	Third country
	Doctor chair (arm rest, castor, height adjustable)	2 pcs	Third country
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
(Senior Doctor room 2)			
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	2 pcs	Third country
	Examination coach (size: W1800×D750×H630, with screen)	1 pc	Third country
	Doctor desk (size: W1600×D700×H700)	2 pcs	Third country
	Doctor chair (arm rest, castor, height adjustable)	2 pcs	Third country
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
(Senior Doctor room 3)			
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	2 pcs	Third country
	Examination coach (size: W1800×D750×H630, with screen)	1 pc	Third country
	Doctor desk (size: W1600×D700×H700)	2 pcs	Third country
	Doctor chair (arm rest, castor, height adjustable)	2 pcs	Third country
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country

No.	Description	Qty	Origin
(Senior Doctor room 4)			
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	2 pcs	Third country
	Examination coach (size: W1800×D750×H630, with screen)	1 pc	Third country
	Doctor desk (size: W1600×D700×H700)	2 pcs	Third country
	Doctor chair (arm rest, castor, height adjustable)	2 pcs	Third country
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
(Matron room)			
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
	Desk (size: W1600×D700×H700)	1 pc	Third country
	Chair (arm rest, castor, height adjustable)	1 pc	Third country
(Lecture room)			
	X-ray film illuminator (mobile type, 4 films)	1 pc	Third country
	White board (mobile, W1880×D608×H1854)	1 pc	Third country
	Chair with table	30 pcs	Third country
	Lecture's desk/chair (W600×D450×H1000)	1 pc	Third country
(Outreach center)			
	Overhead projector with screen	1 pc	Third country
	Slide projector (with screen)	1 pc	Third country
	Portable TV with video tape recorder	1 pc	Third country
	Computer (CPU: 486, 66Hz, CRT: Colour, 15" over, IBM compatible, MS-DOS/WINDOW, printer, desk and chair)	1 pc	Zambia
	Doctor desk (size: W1600×D700×H700)	6 pcs	Third country
	Doctor chair (arm rest, castor, high adjustable)	6 pcs	Third country
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
(Computer room)			
	Computer (CPU: 486, 66Hz, CRT: color, 15" over, IBM compatible, MS-DOS/WINDOW, printer, desk and chair)	5 pcs	Zambia
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
(Night duty room)			
	Bed with mattress (size: L1200×W985×H670)	2 pcs	Third country

No.	Description	Qty	Origin
(Other)			
	Medical gas piping system (oxygen and vacuum, Spec.: BS)	1 set	Third country
	Incinerator (capacity: 20~30kg/h)	2 pcs	Third country
(2) Isolation ward			
① Administration			
(Reception)			
	File cabinet (with lock, W1760×D400×H880)	2 pcs	Third country
(Nurse station)			
	Sphygmomanometer (mercurial, table top, 4 sizes of cuff)	4 pcs	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	Medicine cupboard (with lock, size: W900×D500×H700)	1 pc	Third country
	Refrigerator (with freezer)	2 pcs	Third country
	Instrument set (consist of: stethoscope, thermometer, scissors, forceps, tongue depressor)	2 sets	Third country
	Stainless jar (dia. 120×150)	2 pcs	Third country
	Kidney tray (stainless steel, L/M/S)	2 sets	Third country
	Dust bin (foot pedal type, dia. 255×H355)	2 pcs	Third country
	Ambu bag (manual, bag: 4 size, silicon rubber)	2 pcs	Third country
	Dressing container (SS round type, dia. 270×H180)	2 pcs	Third country
	Instrument cabinet (with lock, size: W900×D500×H700)	2 pcs	Third country
	Emergency cart (W915×D500×H1000)	2 pcs	Third country
(Sluice room)			
	Bedpan (stainless steel)	10 pcs	Third country
	Urine pan (stainless steel)	10 pcs	Third country
	Bedpan washer (with rack, reagent type)	1 pc	Third country
(Sluice room)			
	Bedpan (stainless steel)	10 pcs	Third country
	Urine pan (stainless steel)	10 pcs	Third country
	Bedpan washer (with rack, reagent type)	1 pc	Third country

No.	Description	Qty	Origin
② Ward			
(Ward TB)			
	Hospital bed with mattress (size: L2053×W920×H1000)	5 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	5 pcs	Third country
	Over bed table (size: W900×D360×H1000)	5 pcs	Third country
	IV stand (2 hooks, with castors)	3 pcs	Third country
	Double basin with stand (2 basins, W800×D355×H840)	1 pc	Third country
(Ward TB)			
	Hospital bed with mattress (size: L2053×W920×H1000)	10 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	10 pcs	Third country
	Over bed table (size: W900×D360×H1000)	10 pcs	Third country
	IV stand (2 hooks, with castors)	5 pcs	Third country
	Double basin with stand (2 basins, W800×D355×H840)	1 pc	Third country
(Ward TB)			
	Pediatric bed with mattress (with safety rail, size: L1998×W1060×H1405)	10 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	10 pcs	Third country
	IV stand (2 hooks, with castors)	5 pcs	Third country
	Double basin with stand (2 basins, W800×D355×H840)	1 pc	Third country
(Treatment room)			
	Examination couch (size: W1800×D750×H630)	1 pc	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	Instrument trolley (2 shelves, size: W600×D450×H800)	1 pc	Third country
	Medicine trolley (size: W750×D500×H800)	1 pc	Third country
	Sterilizer, small (table top, capacity: 12ℓ, 132°C)	1 pc	Third country
	Suction unit (rotary pump, 2 bottles, -750mmHg)	1 pc	Third country
	Instrument cabinet (with lock, size: W900×D360×H1700)	1 pc	Third country
	Foot step (2 steps, size: D400×W300×H230)	1 pc	Third country
	Refrigerator (with freezer)	1 pc	Third country

No.	Description	Qty	Origin
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope)	1 set	Third country
	IV stand (2 hooks, with castors)	1 pc	Third country
	Nebulizer (ultrasonic, with stand)	1 pc	Third country
	Dust bin (foot pedal type, dia. 255×H355)	1 pc	Third country
(Acute bay)			
	2 crank gatch bed with mattress (with safety side rail, L2215×W950×H935)	4 pcs	Third country
	Oxygen basin with stand (2 basins, W800×D355×H840)	1 pc	Third country
	Double basin with stand (2 basins, W800×D355×H840)	1 pc	Third country
	IV stand (2 hooks, with castors)	4 pcs	Third country
(Measles ward)			
	Hospital bed with mattress (size: L1053×W920×H1000)	10 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	10 pcs	Third country
	Over bed table (size: W900×D360×H1000)	10 pcs	Third country
	IV stand (2 hooks, with castors)	4 pcs	Third country
	Double basin with stand (2 basins, W800×D355×H840)	1 pc	Third country
(Measles ward)			
	Pediatric bed with mattress (with safety rail, size: L1998×W1060×H1465)	10 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	10 pcs	Third country
	IV stand (2 hooks, with castors)	5 pcs	Third country
	Double basin with stand (2 basins, W800×D355×H840)	1 pc	Third country
(Treatment room)			
	Examination coach (size: W1800×D750×H630)	1 pc	Third country
	X-ray film illuminator (desk top/wall mounted changeable, 2 films)	1 pc	Third country
	Nebulizer (ultrasonic, with stand)	1 pc	Third country
	Medicine trolley (size: W600×D450×H800)	1 pc	Third country
	Medicine trolley	1 pc	Third country
	Sterilizer, small (table top, capacity:L 12ℓ, 132°C)	1 pc	Third country

No.	Description	Qty	Origin
	Suction unit (rotary pump, 2 bottles, -750mmHg)	1 pc	Third country
	Instrument cabinet (with lock, size: W900×D360×H1700)	1 pc	Third country
	Foot step (2 steps, size: D400×W300×H230)	1 pc	Third country
	Refrigerator (with freezer)	1 pc	Third country
	Diagnostic set (consists of: forceps, thermometer, scissors, stethoscope, diagnostic set, tongue depressor, laryngoscope)	1 set	Third country
	IV stand (2 hooks, with castors)	1 pc	Third country
	Dust bin (foot pedal type, dia. 255×H355)	1 pc	Third country
(Acute bay)			
	2 crank gatch bed with mattress (with safety side rail, L2215×W950×H935)	4 pcs	Third country
	Oxygen tent (with vinyl hood, nebulizer)	1 pc	Third country
	Double basin with stand (2 basins, W800×D355×H840)	1 pc	Third country
	IV stand (2 hooks, with castors)	4 pcs	Third country
(Meningitis ward)			
	Hospital bed with mattress (size: L2053×W920×H1000)	5 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	5 pcs	Third country
	Over bed table (size: W900×D360×H1000)	5 pcs	Third country
	Pediatric bed with mattress (with safety rail, size: L1998×W1060×H1465)	5 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	5 pcs	Third country
	IV stand (2 hooks, with castors)	5 pcs	Third country
	Double basin with stand (2 basins, W800×D355×H784)	1 pc	Third country
(Other ward)			
	Hospital bed with mattress (size: L2053×W920×H1000)	5 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	5 pcs	Third country
	Over bed table (size: W900×D360×H1000)	5 pcs	Third country
	Pediatric bed with mattress (with safety rail, size: L1998×W1060×H1465)	5 pcs	Third country
	Bedside cabinet (size: W440×D390×H760)	5 pcs	Third country
	IV stand (2 hooks, with castors)	5 pcs	Third country
	Double basin with stand (2 basins, W800×D355×H784)	1 pc	Third country

(4) Preliminary Drawings

1) Area Table

• Outpatient Ward

Ground floor	1,740.0 m ²
First floor	1,046.0 m ²
<hr/>	
Total	2,786.0 m ²

• Isolation Ward

869.0 m²

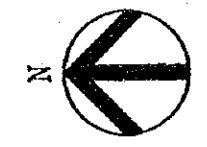
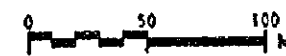
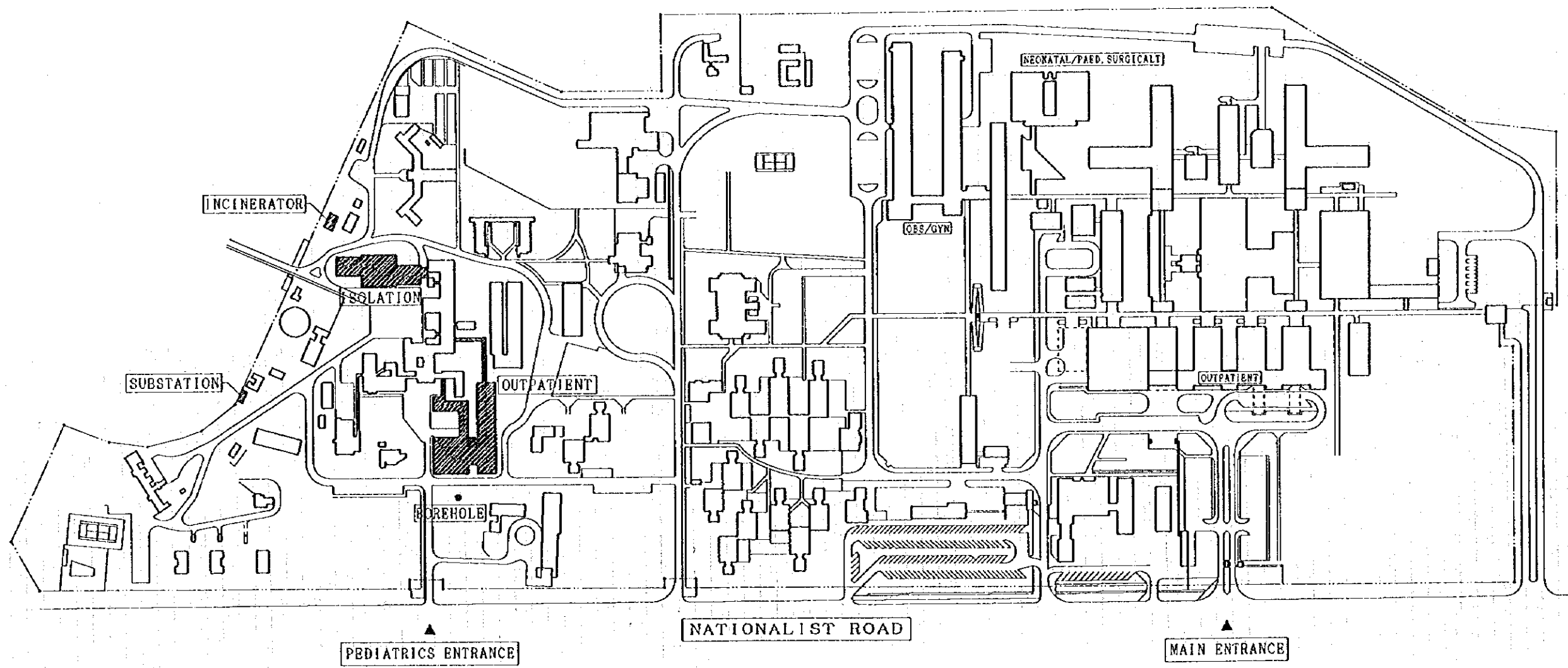
• Other

Electric room	48.0 m ²
Roofed passage	130.0 m ²
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Total	178.0 m ²

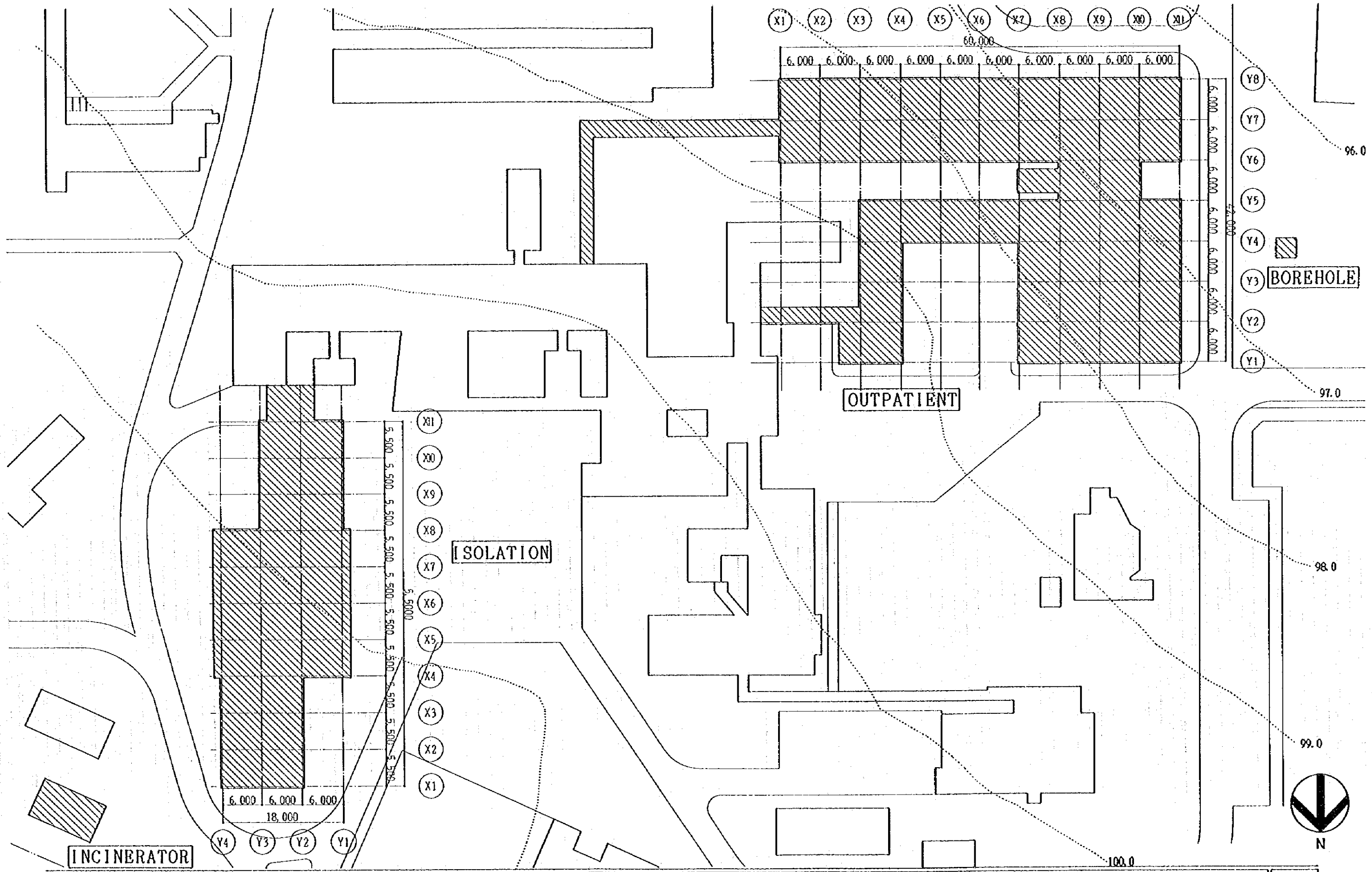
Grand total 3,833.0 m²

2) Preliminary Drawings

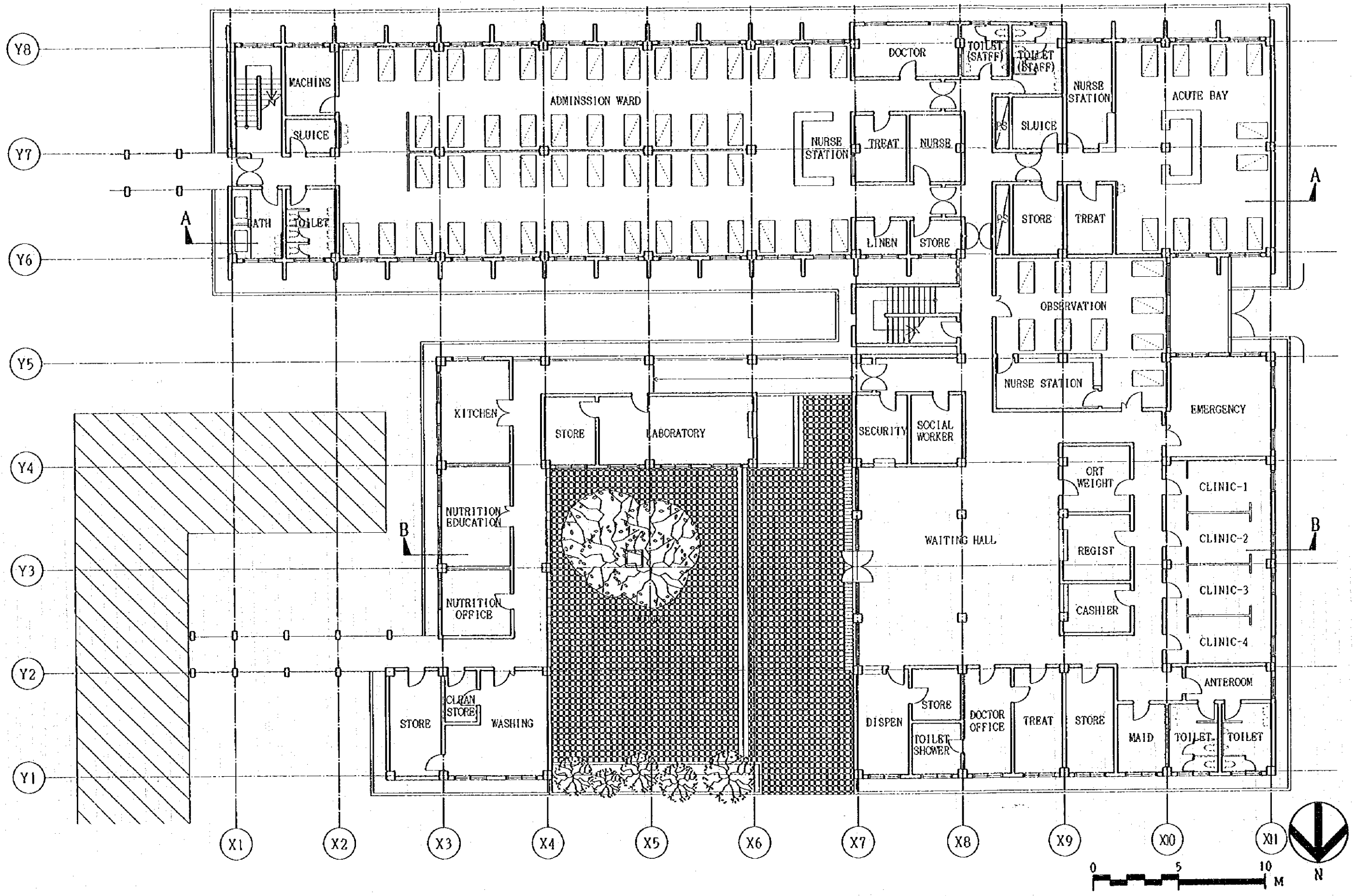
- 1 Site plan -1
- 2 Site plan -2
- 3 Outpatient Ground floor plan
- 4 Outpatient First floor plan
- 5 Outpatient Elevation -1
- 6 Outpatient Elevation -2
- 7 Outpatient Section
- 8 Isolation ward Ground floor plan
- 9 Isolation ward Elevation
- 10 Isolation ward Section



<p>THE PROJECT FOR IMPROVEMENT OF THE DEPARTMENT OF PEDIATRICS AND CHILD HEALTH OF UNIVERSITY TEACHING HOSPITAL</p>	<p>SITE PLAN-1</p>	<p>1</p>
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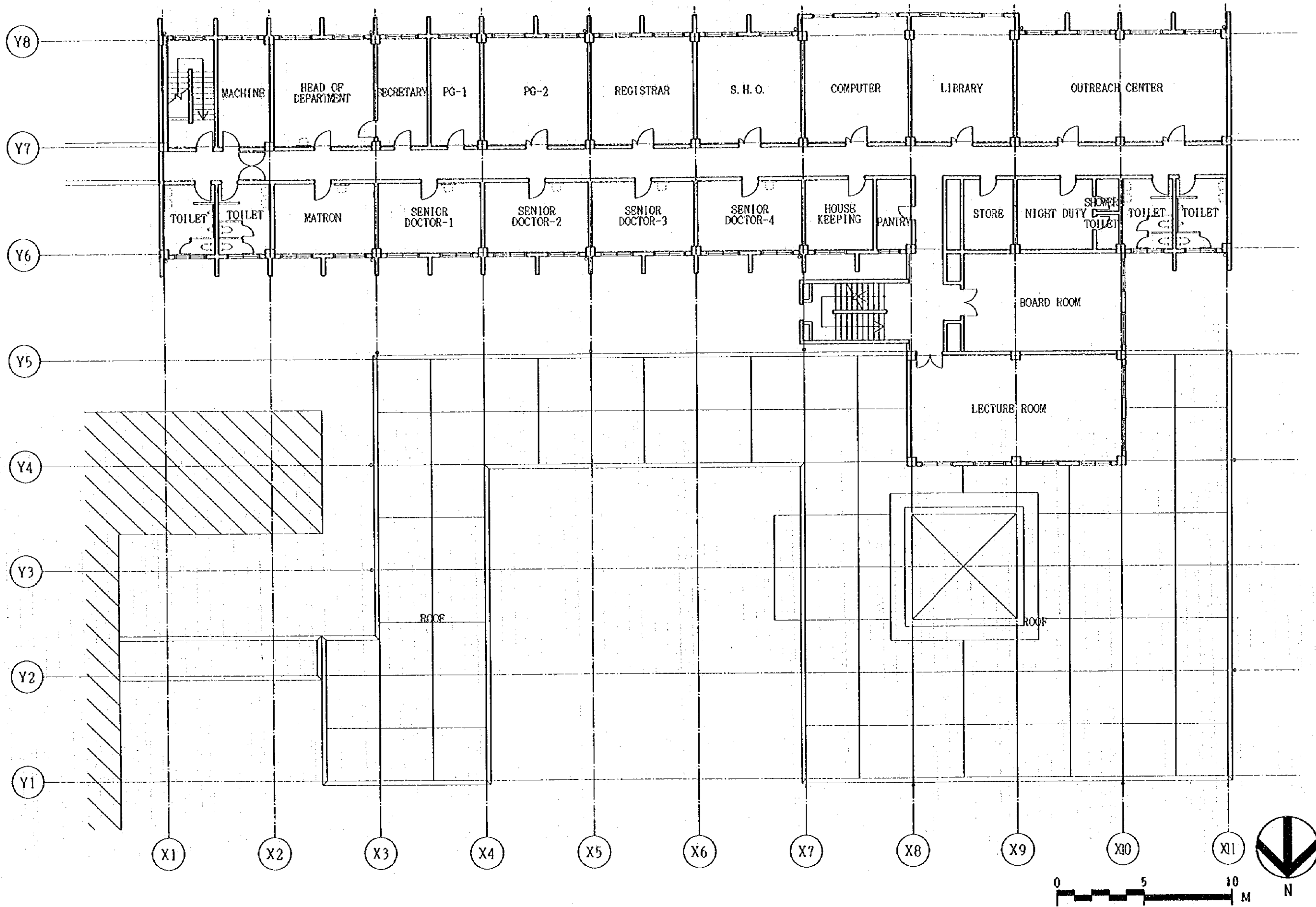
THE PROJECT FOR IMPROVEMENT OF THE DEPARTMENT OF PEDIATRICS AND CHILD HEALTH OF UNIVERSITY TEACHING HOSPITAL SITE PLAN-2 2



THE PROJECT FOR IMPROVEMENT OF THE DEPARTMENT
 OF PEDIATRICS AND CHILD HEALTH OF UNIVERSITY TEACHING HOSPITAL

OUTPATIENT GROUND FLOOR PLAN

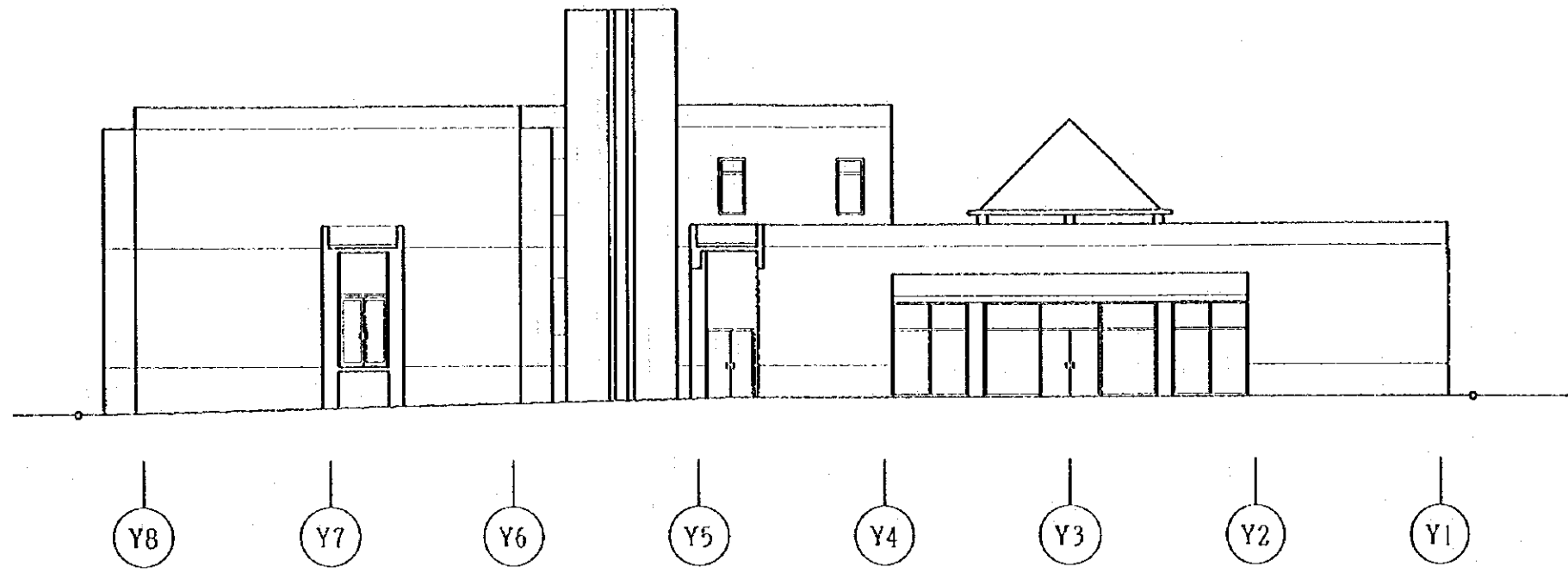
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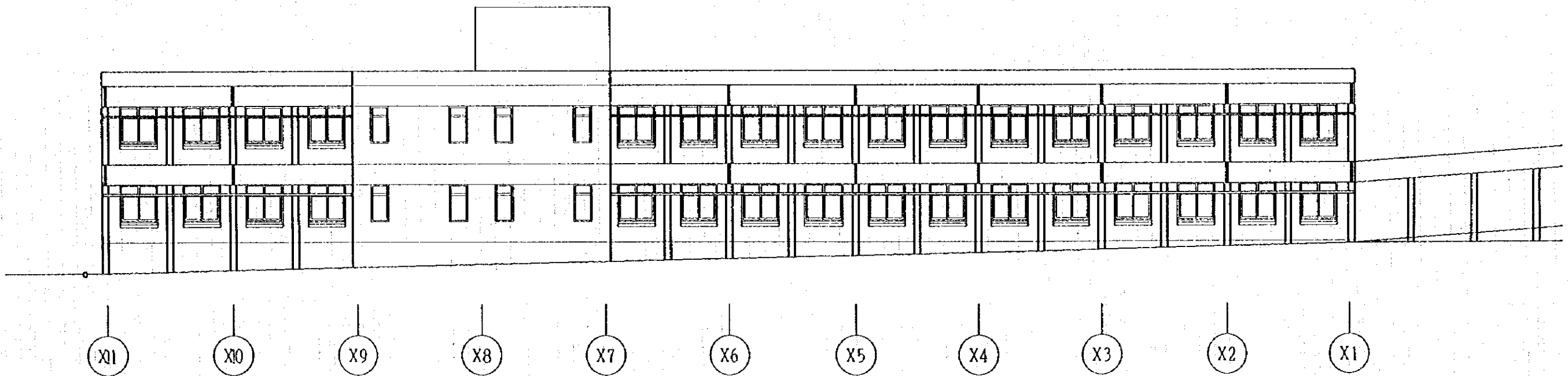
THE PROJECT FOR IMPROVEMENT OF THE DEPARTMENT
 OF PEDIATRICS AND CHILD HEALTH OF UNIVERSITY TEACHING HOSPITAL

OUTPATIENT FIRST FLOOR PLAN

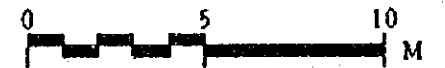
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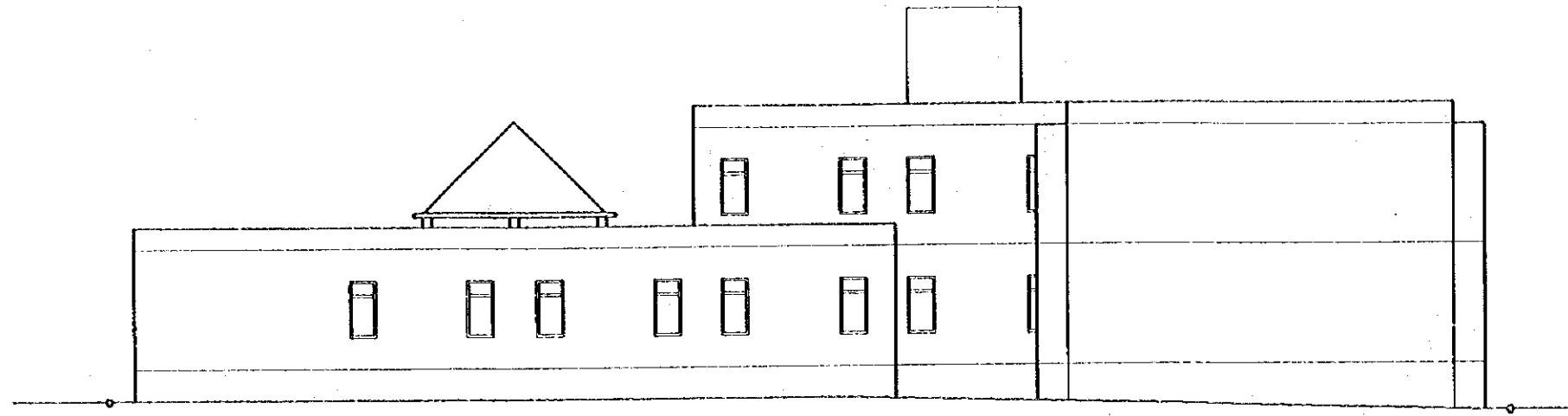


EAST ELEVATION



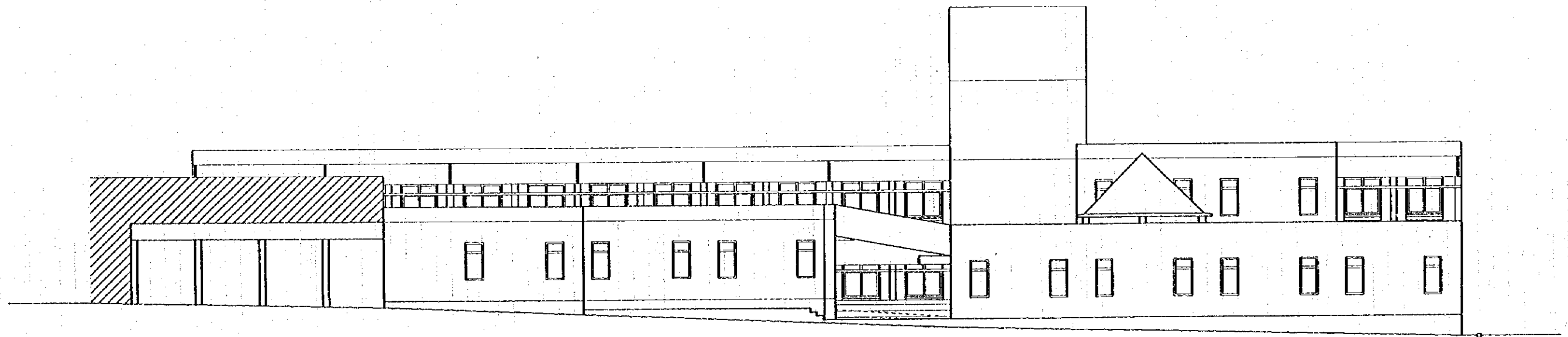
SOUTH ELEVATION





Y1 Y2 Y3 Y4 Y5 Y6 Y7 Y8

WEST ELEVATION



X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 XI

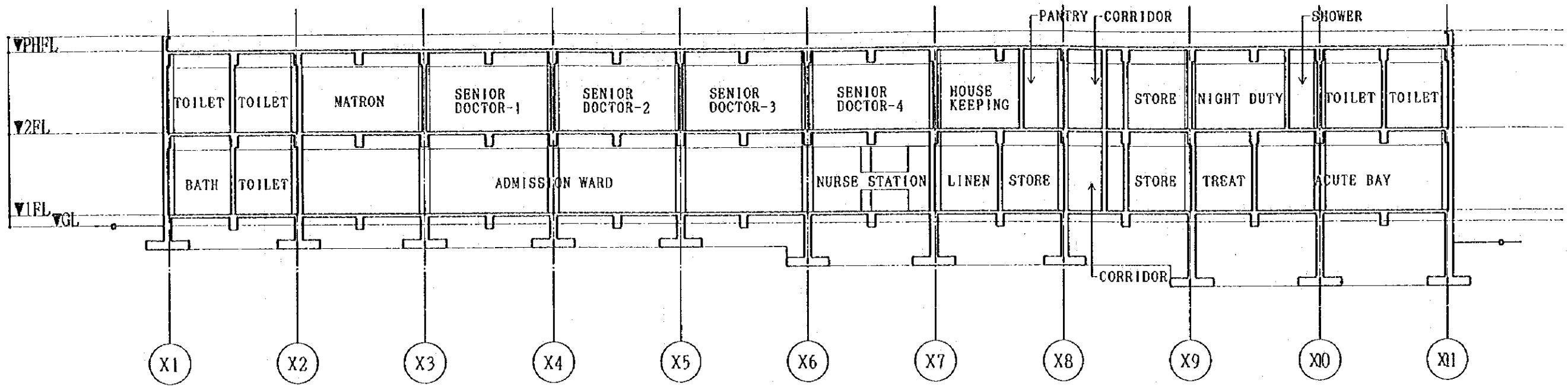
NORTH ELEVATION



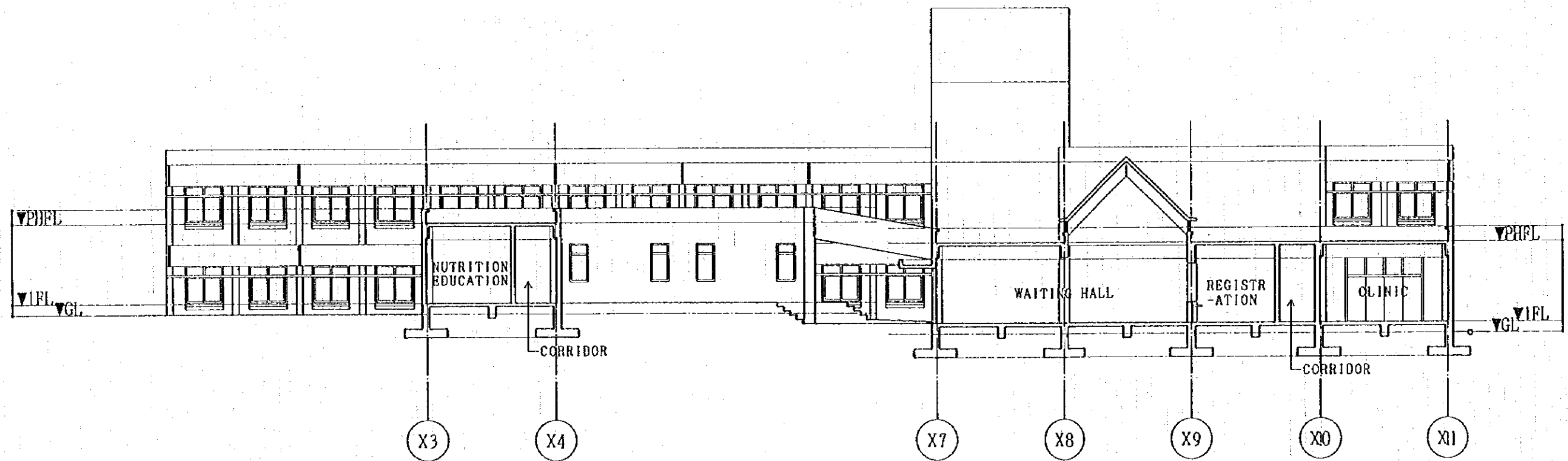
THE PROJECT FOR IMPROVEMENT OF THE DEPARTMENT
OF PEDIATRICS AND CHILD HEALTH OF UNIVERSITY TEACHING HOSPITAL

OUTPATIENT ELEVATION-2

6



A-A SECTION



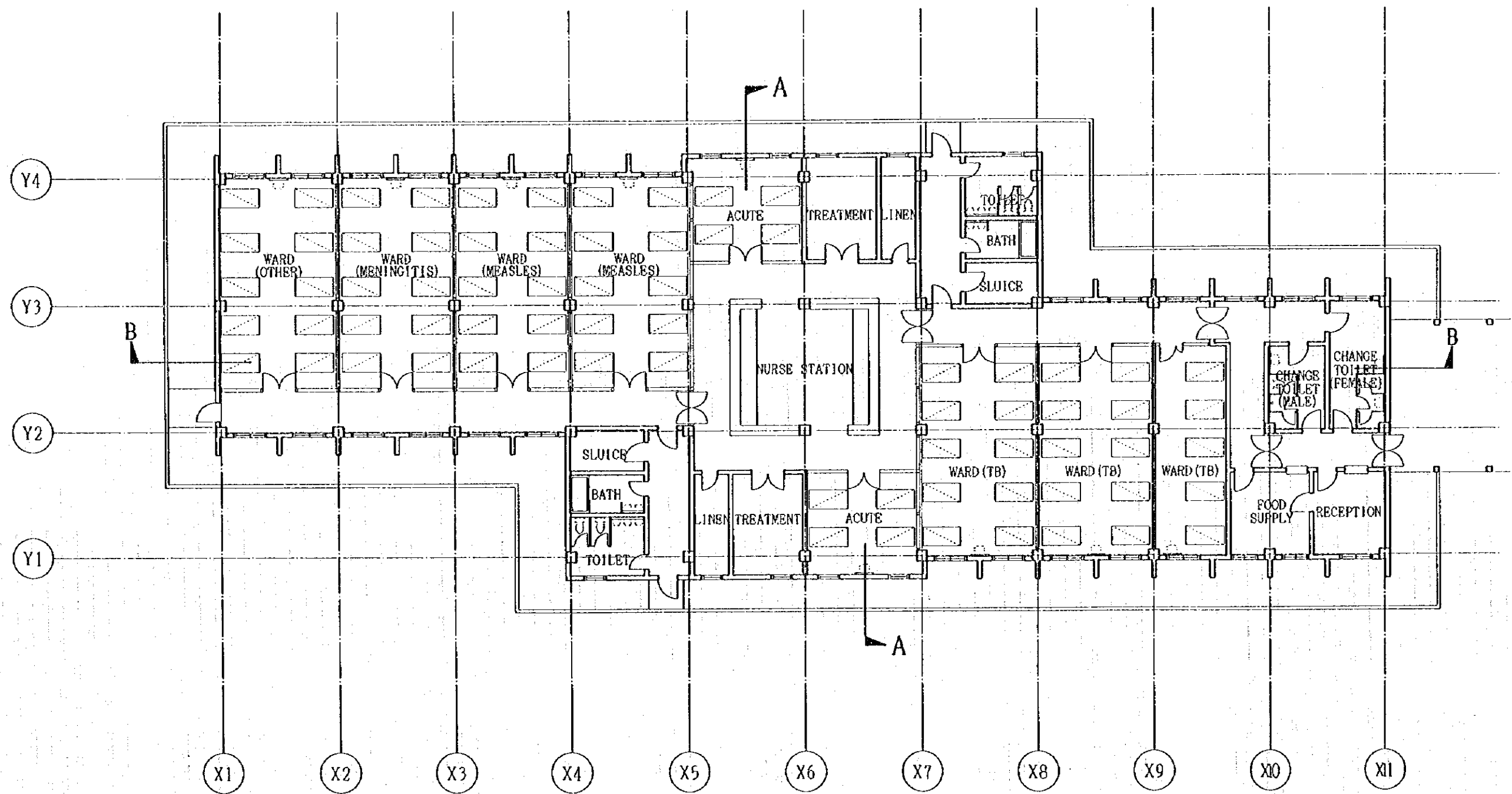
B-B SECTION



THE PROJECT FOR IMPROVEMENT OF THE DEPARTMENT
OF PEDIATRICS AND CHILD HEALTH OF UNIVERSITY TEACHING HOSPITAL

OUTPATIENT SECTION

7

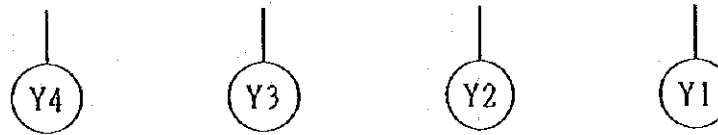
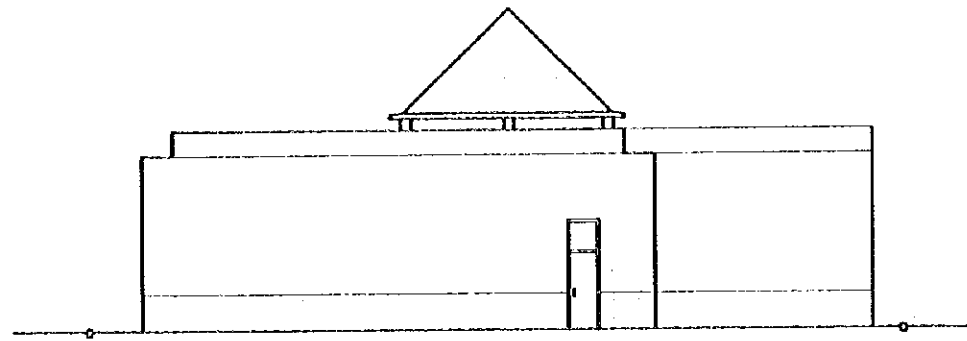


THE PROJECT FOR IMPROVEMENT OF THE DEPARTMENT
 OF PEDIATRICS AND CHILD HEALTH OF UNIVERSITY TEACHING HOSPITAL

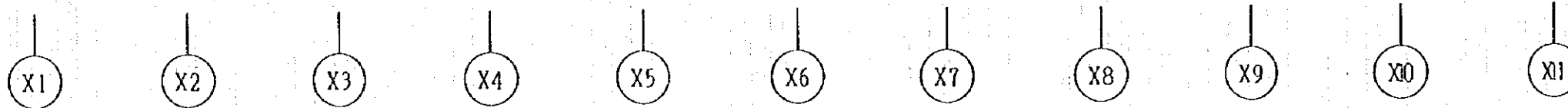
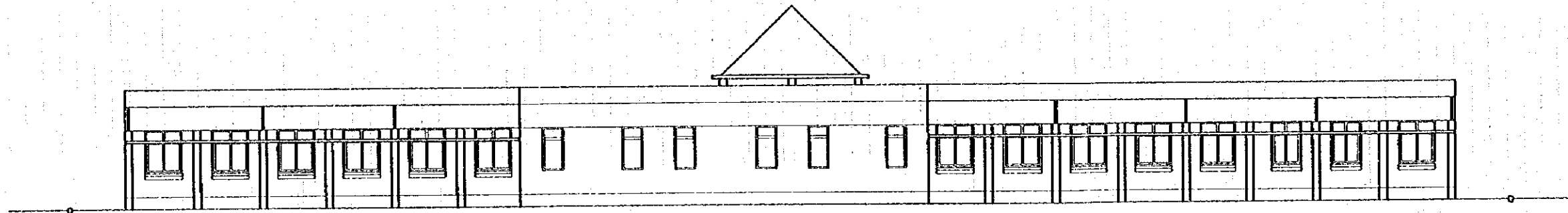
ISOLATION WARD

PLAN

8



NORTH ELEVATION

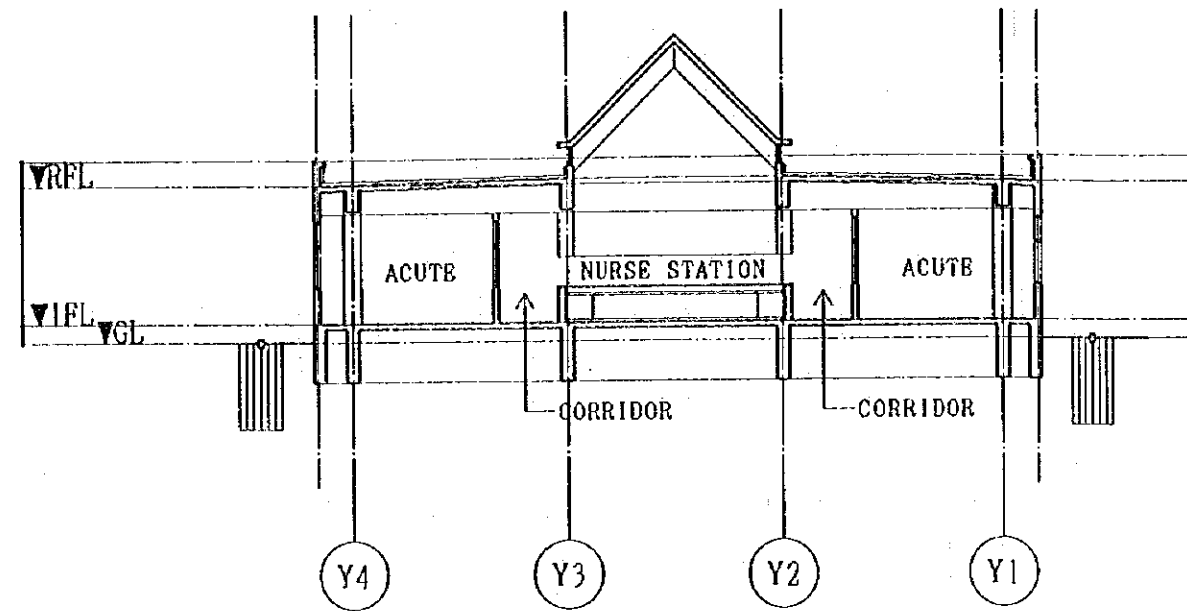


EAST ELEVATION

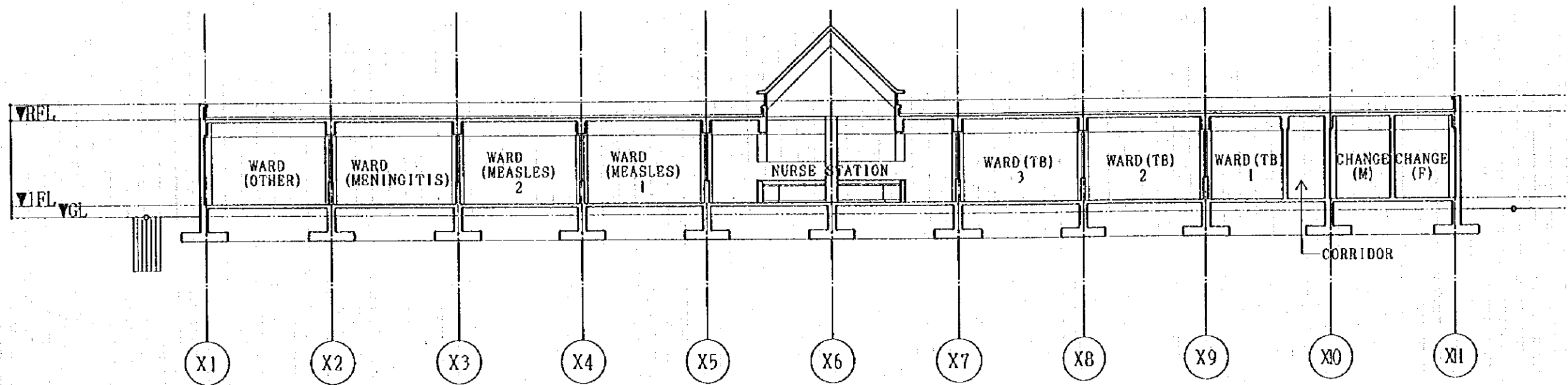
THE PROJECT FOR IMPROVEMENT OF THE DEPARTMENT
OF PEDIATRICS AND CHILD HEALTH OF UNIVERSITY TEACHING HOSPITAL

ISOLATION WARD ELEVATION

9



A-A SECTION



B-B SECTION



THE PROJECT FOR IMPROVEMENT OF THE DEPARTMENT
OF PEDIATRICS AND CHILD HEALTH OF UNIVERSITY TEACHING HOSPITAL

ISOLATION WARD SECTION

10

CHAPTER 3 IMPLEMENTATION PLAN

CHAPTER 3 IMPLEMENTATION PLAN

3-1 Implementation Plan

3-1-1 Implementation Concept

(1) Guidelines for the Implementation of the Project

This project is to be implemented within the framework of the Government of Japan's grant aid cooperation, subject to the Government of Japan's approval at a Cabinet meeting and conclusion of an Exchange of Notes between the governments of the two countries. The main facilities to be constructed under this project are a two-story outpatient ward building with a total floor area of about 2,780m² and a single-story isolation ward building with a total floor area of about 869m². Judging from the situation in and around the project site and actual condition of procurement of building materials in Zambia, it will be possible to complete the construction work and the equipment procurement/installation work in 10 months. Therefore, this project is to be implemented with a single fiscal year. The equipment procurement/installation work under this project will involve such items of equipment as medical gas system, laboratory equipment and incinerator, which require special installation work, it will be necessary to make close coordination with the construction work. In order to make clear the responsibility for coping with troubles that may occur in the course of the execution of the connection work, it is desirable that the companies responsible for execution of the construction work and the equipment procurement/installation work should form a consortium. As regards the method of placing orders for the construction work and the equipment procurement/

installation work, consortium led by qualified Japanese construction firms and trading firms should be invited to tender for the project.

(2) Zambia's Project Implementing System

As stated earlier, this project is to be implemented within the framework of the Government of Japan's grant aid cooperation after the governments of the two countries sign the Exchange of Notes concerning this project. The UTH, which is the Zambian side's organization to implement this project, shall be a party to conclude a consultant agreement, construction contract and equipment procurement/installation contract concerning the project. It shall also execute the Zambian side's project work.

(3) Consultant

After the signing of the above-mentioned Exchange of Notes, the UTH shall conclude a consultant agreement concerning the design and supervision of the project with a Japanese consultant firm, such agreement being subject to verification by the Government of Japan. It is important that the consultant agreement for the project should be concluded immediately after the signing of the Exchange of Notes for smooth and efficient implementation. After the conclusion of the consultant agreement, the Japanese consultant firm shall prepare tender documents including technical drawings and specifications, in consultation with the UTH, based on the contents of this basic design study report. Then, upon the UTH's approval for such documents, the Consultant shall proceed to the work to support the tender procedure and the construction supervision work.

(4) Contractors

The contractors are to be selected by open tender from among consortium consisting of qualified Japanese construction firms and trading firms. In

principle, the UTH shall conclude agreement with the successful tenderer (whose is the lowest bidder), subject to certification by the Government of Japan. The contractor shall make good use of the services offered by local firms as subcontractors to procure locally available materials and local labor force.

It should be noted that except for the installation, test runs and adjustment of special items of equipment, there seems to be no need to have Japanese expert(s) sent to the project site concerning the construction work and the equipment procurement/installation work.

3-1-2 Implementation Conditions

(1) Local Construction Situation

1) Local Consultants

Services of architectural consultant firms are available in and around Lusaka. However, the detail design for this project, which is to be worked out within the framework of the Government of Japan's grant aid cooperation, must be completed in a limited period of time. In addition, project is medical facilities, close coordination in Japan is necessary between the building design side and the equipment design side. For these reasons, it will be difficult to make the most of the services of local consultant firms in the course of preparation of the detail drawings and specifications for this project.

2) Local Construction Firms

There are some construction firms, large and small, including branches of South African construction firms in and around Lusaka. But few of them have modern management organizations. They have supervisors who

have an understanding about design and quality control, but there basically is a shortage of such engineers. These construction firms have adequate execution capabilities, but they have yet to improve construction productivity, realize prompt execution of the construction work, modernize their organizations and improve the quality of finishing details. It will be possible for the Japanese construction firm to make good use of the services of the local construction firms as subcontractors.

3) Building Materials

The main building materials produced in Zambia include sand, gravel, cement and bricks. Yet, some of Zambian-made materials such as bricks are not of high quality, and therefore it will be necessary to consider importing bricks to be used as exterior finishing material from South Africa. It will be possible to procure most of the other construction materials (such as reinforcing bars, fittings and hardware) from the third countries.

From the standpoint of geographical conditions, it will be appropriate to procure these construction materials from South Africa. Since it will take some time to procure some of these construction materials, it is important to work out a proper procurement schedule that accommodates the supply situation.

(2) Implementation Conditions

In executing the construction work under this project, special attention should be paid to the following point in light of the present state of the project site and the local construction situation.

1. It is necessary that the Zambian side should have completed the following activities before the start of this project.

- Removal of obstacles (such as the existing outpatient reception facility, toilet and isolation ward) and clear the unnecessary trees at the project site.
- Installation of the service wire (power supply), the lead-in wire (telephone) and the service pipe (water supply) for construction up to the site.

2. In executing the construction work by the Japanese side, special attention should be paid to the following points.

- The building material procurement plan should be worked out taking the delivery time into consideration.
- The hospital will continue its operations during the construction period, and therefore the temporary work plan should be worked out taking into account safety on the premises of the hospital so that the temporary work may not hinder operations carried out at the existing facilities of the Department.
- During the construction period, sufficient coordination should be secured between the construction work and the equipment procurement/installation work.

3-1-3 Scope of Works

This project is to be implemented jointly by the governments of Zambia and Japan within the framework of the Government of Japan's grant aid cooperation. The scope of work for the project by the governments of the two countries is as described below.

(1) The Work and Activities to be Carried Out by the Japanese Side

1. Facilities

- Construction of the facilities described in this basic design study report (the outpatient ward, isolation ward, substation

and incinerator base of the Department of the Pediatrics and Child Health of UTH).

- Electrical work, air conditioning work and plumbing/sanitary work related to the above construction work.
- Installation of a tube well for the outpatient ward and other subsidiary work.

2. Utilities

- Substation and low tension / power supply work (including the installation of a generator with a capacity of 100kVA).
- Water supply and drainage facilities.
- Telephone exchange.

3. Exterior Construction Work

- Courtyard.
- Outdoor lamps on the project site.

4. Equipment

- Procurement of the items of equipment listed in this basic design study report.
- Installation of the above-mentioned items of equipment.

5. Related Activities

- Packing and shipping of equipment and materials to be imported into Zambia, payment of indemnity insurance premiums, loading and unloading, and inland transportation.

(2) Work and Activities to be Carried Out by the Zambian Side

1. Preparation of the Project Site for the Construction Work

- Removal of obstacles (the existing outpatient reception facility, toilet, isolation ward and trees) and ground leveling.

2. Preparation Work

- Provision of sites for the temporary office, the workshop and the materials shed.
- Supply of temporary electricity, telephone and water for the construction work.

3. Utility Work

- Installation of power service wire up to the substation.
- Installation of telephone lead-in wire up to the new MDF connection point.

4. Installation of Furniture and Fixtures

- Supply of furniture and fixtures which are not included in the scope of work by the Japanese side.

3-1-4 Consultant Supervision

In compliance with the principle of the Government of Japan's grant aid cooperation, the Japanese consultant firm shall conclude a consultant agreement with the Zambian organization responsible for the implementation of the project and prepare the tender documents for this project. Then the consultant conduct construction supervision work in accordance with the provisions of the agreement. Such construction supervision is aimed at giving guidance to the constructor during the construction period and securing high quality of the construction work by ensure that the construction is carried out in accordance with the drawings and specifications. The construction supervision work consists of following tasks.

(1) Cooperation in Tendering and Contracting

The consultant shall prepare tender documents necessary for inviting tenderers to select the Japanese contractor to take charge of the construction work and the equipment procurement/installation work, make a public announcement to invite tenderers, accept applications for the tender, screen tenderers, distribute tender documents, accept tenders and evaluate the results of the tender. The Japanese consultant firm shall also give advice on contracts to be concluded between the Zambian project implementing organization and the Japanese contractor.

(2) Guidance, Advice and Coordination Service to the Contractors

The consultant shall examine the execution schedule, the scheme of execution, the construction machines/materials procurement plan, the medical equipment procurement plan and the medical equipment installation plan and give guidance, advice and coordination service to the contractor.

(3) Examination and Approval of the Shop Drawings, Manufacturers' Drawings and Other Documents

The consultant shall examine the shop drawings, manufacturers' drawings and other documents submitted by the contractor and give guidance on these documents and final approval to them.

(4) Confirmation and Approval of the Construction Equipment/Materials and the Medical Equipment

The consultant shall approve the procurement of the construction equipment/materials and medical equipment after confirming their consistency with the contract documents.

(5) Inspection

The consultant shall be present at the inspection of the construction equipment/materials and the medical equipment which is conducted at the Construction site or at the manufacturers factory in order to secure high quality and performance.

(6) Reporting on the Progress of the Construction work

The consultant shall have a firm acknowledgement of the execution schedule and conditions of the construction site and report the progress of the work to the organization concerned of the two countries.

(7) Completion Inspection and Test Runs

The consultant shall conduct final inspection of the facilities, and make test runs of the medical equipment procured under this project to confirm that everything is consistent with the contents of the contract documents, and then shall submit as inspection report to the Zambian side.

(8) Training in Operation of the Medical Equipment

Some of the items of equipment to be procured under this project require basic knowledge of their operation and maintenance. For this reason, it will be necessary to provide training in the installation, troubleshooting and repair of equipment at the time of construction. The consultant shall work out a plan for such training and give guidance and advice.

In carrying out the operations as described in (1) through (8) above, the consultant shall have one of its engineers stationed at the construction site throughout the period of construction. The consultant shall also send a necessary number of engineers to the construction site whenever appropriate to make inspections and give guidance and advice, and

establish a viable backup system. In addition, the consultant shall report the progress of the project, the payment procedures under the project and completion and delivery schedule of the planned facilities and equipment to the Japanese government agencies concerned.

3-1-5 Procurement Plan

(1) Guidelines for Equipment/Materials Procurement

In procuring equipment and materials for the project, care attention should be paid to the following points.

- Local Procurement

Construction equipment and materials should be procured in Zambia wherever possible in order to facilitate their repair, maintenance and operation after the completion of the planned facilities. In this case, purchase orders should be issued after confirming the actual supply situation to ensure that construction work is not adversely affected by delivery delays. As to the medical equipment, any item of equipment which is sufficient in terms of quality and quantity should be procured locally.

- Import

Those items of equipment which can be obtain in the country should be procured. However, if those are open to question in terms of quality and quantity should be imported from other countries. In this case, to priority should be given to South Africa because it is relatively easy to place orders from Zambia. And it is also required to give thoughts on the standpoint of their maintenance and management after the completion of the planned facilities. The contractor shall keep in

close contact with the Zambian project implementing organization as to the import and customs clearance of the equipment and materials for smooth implementation.

3-1-6 Implementation Schedule

The execution scheme after the signing of the Exchange of Notes concerning the project by the governments of Japan and Zambia will be divided into three stages, preparation of the detail design stage, the tender stage and the construction work stage.

(1) Preparation of the Detail Design

After concluding the consultant agreement with the Zambian project implementing organization, the consultant shall start the work to prepare the detail design for this project, subject to verification of the agreement by the Government of Japan. In this process, tender documents including detail design drawings and specifications shall be prepared. In the meantime, the consultant shall discuss the details of the planned facilities and items of equipment with the Zambian side and finally obtain the Zambian side's approval for the tender documents. It is estimated that it will take about two months to prepare the detail design.

(2) Tender

The contractor (a consortium of the qualified Japanese constructor and trading firm) shall be selected by tender. The tender procedures should be carried out in the order of public announcement to invite tenderers, acceptance of applications, screening of tenderers, distribution of tender documents, tender, evaluation of the results of tender and conclusion of

the contract. It will take about one and a half months to complete this process.

(3) Construction Work

The construction work will be started after the conclusion of the construction contract, subject to verification of the contract by the Government of Japan. It is estimated that it will take about 10 months to complete the construction work and the equipment procurement/installation work in light of the scale and details of the planned facilities and the actual conditions of the local construction situation and on the assumption that no unavoidable trouble will occur during the construction period.

The execution schedule from the signing of the Exchange of Notes to the completion of the project is as follows.

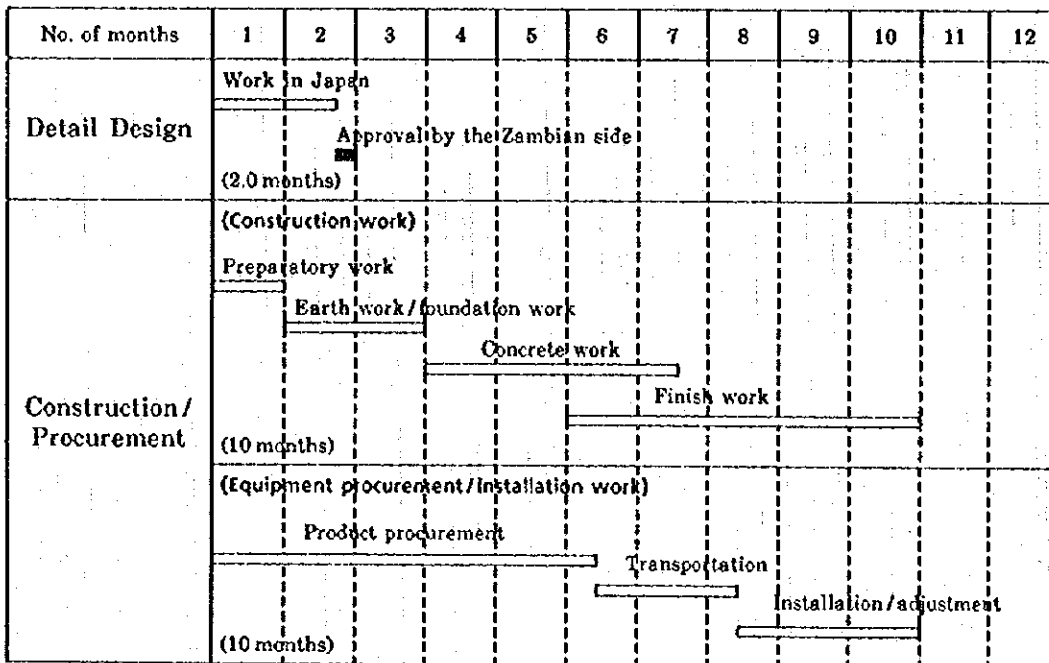


Fig. 3-1 Execution Schedule

3-1-7 Obligation of Recipient Country

The Zambian sides' obligations are as follows.

(1) Before the Start of the Construction Work

- Removal of obstacles on the project site

(2) During the Construction Work

- Power supply (11.5kV-300kVA) upto substation No.2
- Installation of telephone lead-in wire (upto MDF)

Besides above, it is necessary for the Zambian side to take a measure on Bank Arrangement (B/A) and Authorization to Pay (A/P).

- Payment of the costs of Bank Arrangement (B/A) and Authorization to Pay (A/P).
- Prompt measures relating to customs clearance of equipment and materials imported into Zambia.
- Exemption from value-added tax, customs duty, other domestic taxes and fiscal levies.
- Provision of every necessary facility to the Japanese who enter Zambia and stay there in for the performance of their work under the verified agreement.
- Official procedures relating to application for building permit and payment of the costs incurred.
- Payment of the cost of operation and maintenance necessary for the appropriate and effective operation of the facilities and equipment procured under this project.
- Payment of those costs other than to be borne by the grant, necessary for the implementation of the project.

3-2 Operation and Maintenance Plan

(1) Maintenance and Management Plan

1) Facilities

In working out the facility operating plan, minute care should be taken to prevent the maintenance and management cost (including heating and lighting expenses and building repair expenses) from imposing a financial burden on the operation of the planned facilities. To this end, the scope of air conditioning should be limited, a solar hot water supply system should be introduced, natural lighting and ventilation should be utilized as much as possible and highly durable finishing materials should be chosen. The maintenance staff of the UTH should take charge of routine maintenance of the facilities and equipment. The equipment maintenance to be done in accordance with manufacturers' instructions to cope with equipment breakdowns.

2) Equipment

The system and detail of the maintenance are as follows.

Table 3-2 Medical Equipment Maintenance System

Maintenance works		Person in charge	
Maintenance Work	Regular Inspection	Accuracy Test	Doctor, Labo-technician,
		Routine Check, Change Consumable, adjustment	Operators
	Repair Work	Repair	Bio-medical
		Repair by Manufacturer	Engineering Section, Authorized Agent or Manufacturer
		Maintenance Contract	Authorized Agent or Manufacturer

At present, maintenance works on the existing equipment of UTH are managed by the Bio-Medical Engineering Section which is not only responsible for the daily maintenance work but also education of engineers through lecturers on maintenance and management. The Section has high standards toward the technical level and is dealing with various kinds of equipment including medical electronics of the hospital. However, due to the insufficient funds for the section, procurement of the necessary parts is difficult.

The sophisticated equipment is indispensable to receive a regular inspection by manufacturers or agents in order to keep it in good working condition and requires more maintenance cost. Considering such condition, the basic equipment will mainly be supplied under this project. And the sophisticated equipment which requires the regular inspection by manufacturer or agent will not included in the plan.

(2) Tentative Calculation of the Operating Cost

The UTH's operating cost is divided broadly into personnel expenses, facility maintenance and management expenses, and equipment maintenance and management expenses. This project is aimed at rebuilding and expansion of the existing facilities of the Department and therefore there will be no increase of the department's personnel. For this reason, the tentative calculation of the operating cost should be that of the facility maintenance and management expenses and the equipment maintenance and management expenses.

1) Facility Maintenance and Management Expenses (expenses for the existing facilities not included)

Facility maintenance and management expenses 23,516,000 K/year

① Electricity Charges 2,623,000 K/year

It is estimated that this project require an electric load of about 300kW and so the electricity charges should be calculated on the assumption that contract electricity accounts for about 60 percent of the electric load. In the Zambian power rate structure hospitals are exempted from basic charges. Monthly number of days of use of facilities will be 30 days.

Fig. 3 - 2 Electricity Consumption Per Day

Item	Floor Area (m ²)	Loading factor (xkW/m ²)	Demand factor (x%)	Operating hours (xH)	Daily Consumption (kW)
Lighting fixture / wall sockets	4,500	0.03	60	24	1,944
Air conditioner / ventilator	4,500	0.05	40	12	1,080
Sanitary	4,500	0.01	30	24	324
Equipment	4,500	0.01	40	24	432
Other	4,500	0.02	20	24	432
Total					4,212

Annual total electricity charges

$$4,212 \text{ kW/day} \times 30 \text{ day/month} \times 12 \text{ months/year} \times 1.73 \text{ kW} = 2,623,234 \text{ K/year}$$

② Water Charges 8,426,000 K/year

The following calculations are based on a unit of 10ℓ/m² day.

Daily water supply

$$4,500 \text{ m}^2 \times 10 \ell / \text{m}^2 \cdot \text{day} = 45,000 \ell / \text{day}$$

Monthly water supply

$$45 \text{ m}^3 / \text{day} \times 30 \text{ day/month} = 1,350 \text{ m}^3 / \text{month}$$

Water charge structure

0-100m ³	238 K/m ³
100-170m ³	370 K/m ³
170m ³ <	553 K/m ³

Calculation of water charges

100m ³ =100×238 K/m ³ =	23,800 K
170m ³ -100m ³ =70×370K/m ³ =	25,900 K
1,350m ³ -170m ³ =1,180×553K/m ³ =	652,540 K

702,240 K/month

Annual total water charges

$$702,240 \text{ K/month} \times 12 \text{ month/year} = 8,426,880 \text{ K/year}$$

③ Telephone Charges 2,044,000 K/year

Telephone charges are calculated on the basis of the daily number of telephone calls (3 minutes/call and 100 calls/day)

Calculation of telephone charges

$$70\text{K}/3\text{minuts} \times 100\text{calls/day} = 7,000 \text{ K/day}$$

Annual total telephone charges

$$7,000\text{K/day} \times 365\text{days} \times 0.80 = 2,044,000 \text{ K/year}$$

④ Incinerator Running Cost 6,063,000 K/year

The calculation of the running cost is based on the assumption that 0.45kg of medical waste from one bed per day. Total number of bed is 450 and the rate of operation of incinerator is 70%.

Daily medical waste

$$450 \text{ beds} \times 0.45\text{kg/ bed} \cdot \text{day} = 200\text{kg/day}$$

200kg of medical waste will be incinerated for the period of eight hours per day, which means that 25kg of waste per hour is

Incinerated (with 0.25kW/h incineration capacity). Then the consumption of fuel will be 5.7ℓ/h.

Calculation of light oil charge

$$5.7\ell/h \times 8h/day \times 365day/year \times 520K/\ell \times 0.7 = 6,058,000 \text{ K/year}$$

Electricity Charge

$$0.2kW/h \times 8h/day \times 365days/year \times 13K/kW \times 0.7 = 5,000 \text{ K/year}$$

Total 6,063,000 K/year

⑤ Building Maintenance Expenses 4,360,000 K/year
(interior painting repair: once every 5 years)

$$21,800,000 \text{ K/repaint} \div 5\text{years} = 4,360,000 \text{ K/year}$$

2) Equipment Maintenance and Management Expenses (expenses for the existing equipment not included)

Equipment maintenance and management expenses 1,522,000 K/year

① ECG Monitor (4 Nos.) 436,000 K/year

Recording paper

$$109,000 \text{ K/year} \times 4 \text{ Nos.} = 436,000 \text{ K/year}$$

② 3 Channel ECG. (1 No.) 327,000 K/year

Recording paper

③ Blood Cell Counter (Automatic, 1 No.) 341,000 K/year

Reagent etc.,

Assumption of test per year: 7,500 tests/year

④ Distiller 91,000 K/year

change cartridge once every 2 years

$$182,000 \text{ K/cartridge} \div 2 = 91,000 \text{ K/year}$$

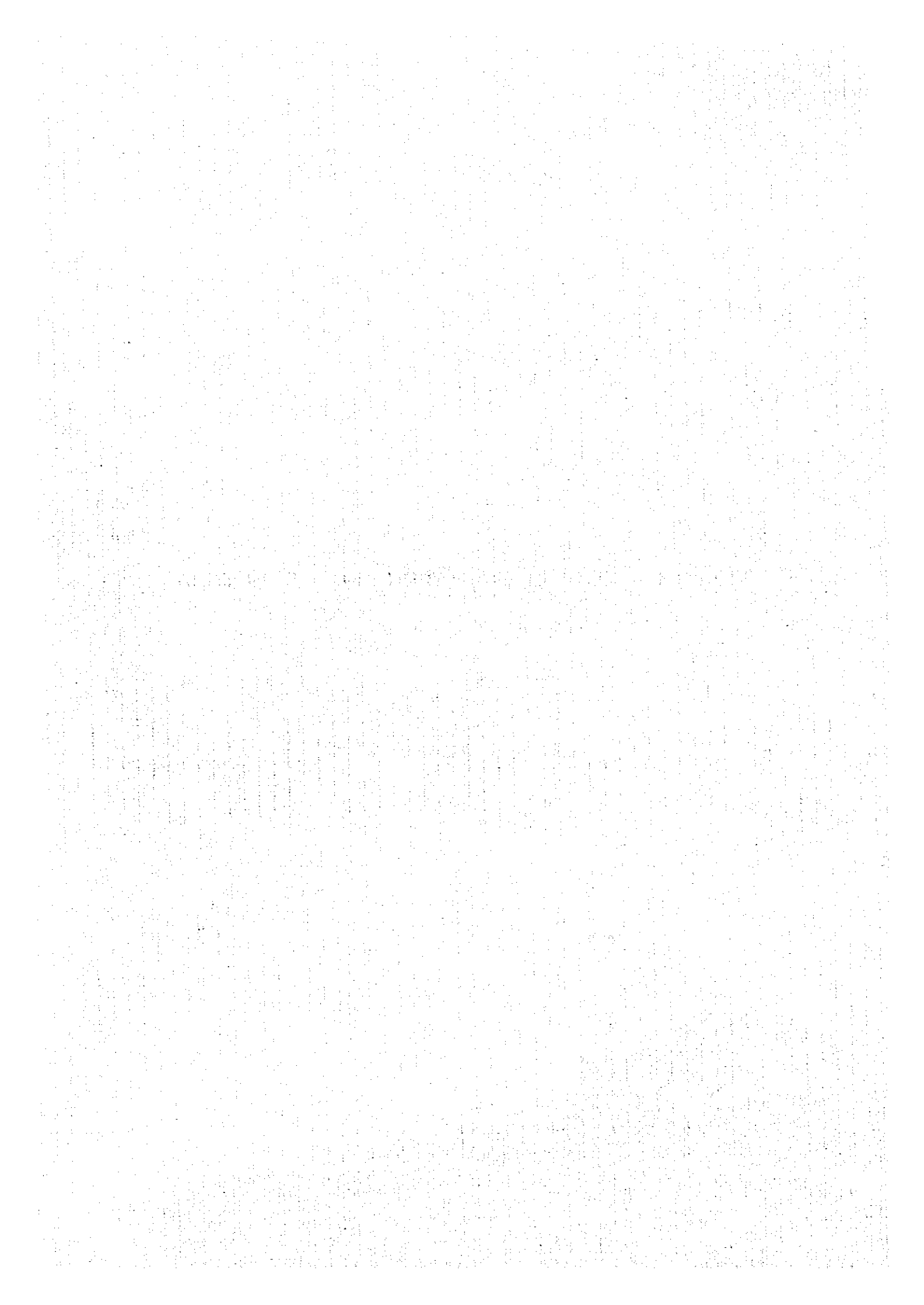
⑥ Spectrophotometer (1 No.) 327,000 K/year

Assumption of test per year: 10,000 tests/year

Grand total (Facility + Equipment) 25,038,000 K/year

Above total expenses 25,038,000 K/year is about 1.65% of the 1995 budget for the Department of Pediatrics and Child Health (1,512,300,000 K). And a budget of the department and income generated by medical fee are constantly increased each year. It is therefore possible for the department to cover expenses as the operating cost which will be increased after the implementation of the project.

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATIONS



CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATIONS

4-1 Project Effect

(1) Appropriateness of the Implementation of the Project

This project is aimed at enhancing the health care services and health care environment of Zambia University Teaching Hospital (UTH), which is responsible for tertiary health care in Zambia, by improving the facilities and equipment of the Outpatient Ward and Isolation Ward of the Department of Pediatrics and Child Health. At the same time, it is also aimed at making the referral system function by enhancing quality of health care services offered at Urban Health Centres (UHCs) through outreach activities (medical guidance/training), which are planned to carry out by UTH to medical staff of UHCs. At present patients tend to visit tertiary health care facilities instead of UHCs, which are responsible for provision of primary health care in and around Lusaka, due to their poor medical services.

Implementation of this project will inevitably lead to an increase in the operating cost. In view of the fact that the government of Zambia is faced with a serious economic difficulty of accumulation of fiscal deficits, it is necessary to minimize the increase in the operating cost. Medical care services offered at the outpatient ward and the isolation ward, the total number of staff members to provide medical care services and the technical level will remain unchanged after the completion of this project. Therefore, the total number of staff members will not increase by this project.

About 40,000 children in Lusaka Urban District who utilize the medical services offered at the UTH are the direct beneficiaries of this project.

About 620,000 children who live in Lusaka Urban District and who utilize the medical care services offered at UHCs are the indirect beneficiaries of this project. Lusaka Urban District area's annual rate of population increase was 6.7 percent (as of 1994 survey), it is expected that the number of children to utilize the medical care services at the UTH will continue to increase. The ultimate goal of this project is to establish a viable referral system by getting patients who tend to first visit the UTH to visit the UHCs.

In view of the fact that to maintain the present role of UTH and to enhance the function of UHCs are considered indispensable in the Government of Zambia's "National Strategic Health Plan, 1995-1999" for the long-term growth of Zambia and fact that the operation and maintenance plan for the facilities to be procured under this project is considered realistic, it is therefore judged to be appropriate to implement this project within the framework of Japan's grant aid cooperation system.

(2) Benefits Expected

It is expected that the implementation of this project and the proper operation by the Zambian side of the facilities and equipment procured under the project will produce such benefits as shown in the following table.

Present state / problems	Measures to be taken under this project	Benefits and improvements expected of this project
<p>UTH is the largest of the three central hospitals in Zambia. Its pediatric department is playing a central role in the country's health care services for mothers and children. But most of its existing facilities, which were constructed in the 1930s, have become too superannuated and too small for the present number of patients to cope sufficiently with.</p>	<p>The outpatient ward of the department is to be extended and its isolation ward should be reconstructed, and the same time basic items of medical equipment should be procured.</p>	<p>At present, about 200 outpatients are examined and treated a day (from 8:00 to 14:00) on average at the existing outpatient ward, which consists of 2 examination rooms. Under this project, the number of examination rooms is to be increased from 2 to 4, the present average consultation time per patient ($6 \text{ hours} \times 60 \text{ minutes}$) $\times 2 = 200 \text{ patients/day} = 3.6 \text{ minutes}$) will be doubled to 7.2 minutes.</p>

Present state/problems	Measures to be taken under this project	Benefits and improvements expected of this project
		<p>The admission ward where patients are observed for first 24 hours to determine whether or not they should be hospitalized presently has a total of 17 beds and these beds' occupancy rates exceed 200 percent. It is expected that upon completion of this project, there will be a bed for each patient to undergo observation at the ward and that as a result it will become possible to prevent infections in beds. As to the isolation ward, the total number of beds, which is presently 51, will be increased to 65 (that of beds for acute cases will be increased to 8) and as a result it will become possible to accept about 1.5 times as many patients. Upon completion of this project, the functions of the follow-up clinic, which is located about 700m away, are to be transferred to the 2 existing examination rooms in the outpatient ward and so the functions of the pediatric department will become more comprehensive.</p>
<p>The Government of Zambia's national health care policy focuses on the improvement of the quality of primary health care (PHC) activities. PHC concerns prevention, diagnosis and treatment of diseases in local communities and the urban health centres (UHCs) are responsible for PHC. Since facilities and medical equipment are lacking and the technical level of the medical staff is rather low at the UHCs, patients tend to visit the UTH frequently, which is designed to function as a tertiary health care institution.</p>	<p>An outreach centre is to be established within the facilities of the outpatient ward in the department. Also, basic medical and educational equipment required to carry out outreach activities is to be procured.</p>	<p>The technical level of the medical staff members who are working at the 21 UHCs located in Lusaka Urban District will be raised through outreach activities to be carried out by the department. The cumulative annual total number of outpatients visiting the UHC, exceeds 600,000, and these outpatients will be able to receive more advanced medical care services. Moreover, the enhancement of its medical staff's technical level will serve to get patients who have tended to first visit UTH to visit the UHCs. As a result, the total number of outpatients to visit the UTH will decrease, which in turn will result in the UTH functioning far better as a tertiary health care hospital.</p>
<p>Medical waste from the department is dumped together with other waste at a dumping ground located at the back of the isolation ward, without immediate collection. When the quantity of waste dumped there reaches a certain level, waste is transported to the incinerator of the Centre. As a result, the hospital is always faced with environmental problems and dangers to the human health.</p>	<p>A new incinerator is to be installed near the existing dumping ground. Another trash bins, where it will be possible to separate general waste from medical waste, is also to be built.</p>	<p>It will become customary to separate from medical waste to general waste, and it will become possible to immediately incinerate dangerous medical waste. As a result, it will become easier to cope with the problems of environmental pollution.</p>

4-2 Recommendation

When this project is implemented, the facilities and equipment of the Department of Pediatrics and Child Health will be improved and an outreach centre to support the UHCs will be established. As a result, the quality of medical examination and treatment conducted at the Department will be improved and outreach activities will contribute to the enhancement of the technical level of medical care services offered at the UHC, and a medical care supply system between the UTH and the UHCs will be established.

Thus, this project is expected to produce many positive effects on the human resources development at the UTH as the country's only teaching hospital, and it is also expected to give good effects on the country's health policy as well as to improve the medical care environment in the country. It will contribute to the sound growth of the technical level of medical care for children, the enhancement of the quality of health care for mothers and children and the reduction of the infant mortality rate. For these reasons, it is judged to be appropriate to implement this project under the Government of Japan's grant aid cooperation.

There seems to be no problem with the Zambian side to operate and maintain this project, particularly on the staffing plan and the budgetary provision for the project. However, careful attention should be paid to the following points if this project is to attain objectives through smooth implementation and effective operation.

(1) Prompt Correspondence on the Contract/Approval Procedures

Since the project is to be implemented within the framework of the Government of Japan's grant aid cooperation, there are temporal restrictions imposed on the implementation of the project. The construction work under this project must be completed by the time limit

as specified in the Exchange of Notes or by the end of the Government of Japan's fiscal year. The Zambian side is therefore required to promptly follow the procedures for the signing of the Exchange of Notes, the conclusion of the consultant agreement, the approval of the detail design drawings and specifications prepared in accordance with this basic design study report, the application for permission, the construction contract and the exemption of imported construction materials and equipment from customs duty.

(2) Budgetary Provision for the Implementation of the Project

When the implementation of this project is officially approved by the governments of the two countries, it is important that the Zambian side should promptly make budgetary appropriations for the implementation of this project. It should be noted that the implementation of this project conforms with the national health policy which has been formally approved by the National Commission for Development Planning, the Zambian government agency responsible for national development planning. However, the budget for the implementation of this project is not expressly included in the Government of Zambia's budget for fiscal 1995. It will be therefore be necessary for the Government of Zambia to make special budgetary provision for the implementation of this project in its budget for fiscal 1996 if it is decided to implement this project within the framework of the Government of Japan's budget for fiscal 1995.

(3) Maintenance and Management of the Facilities and Equipment

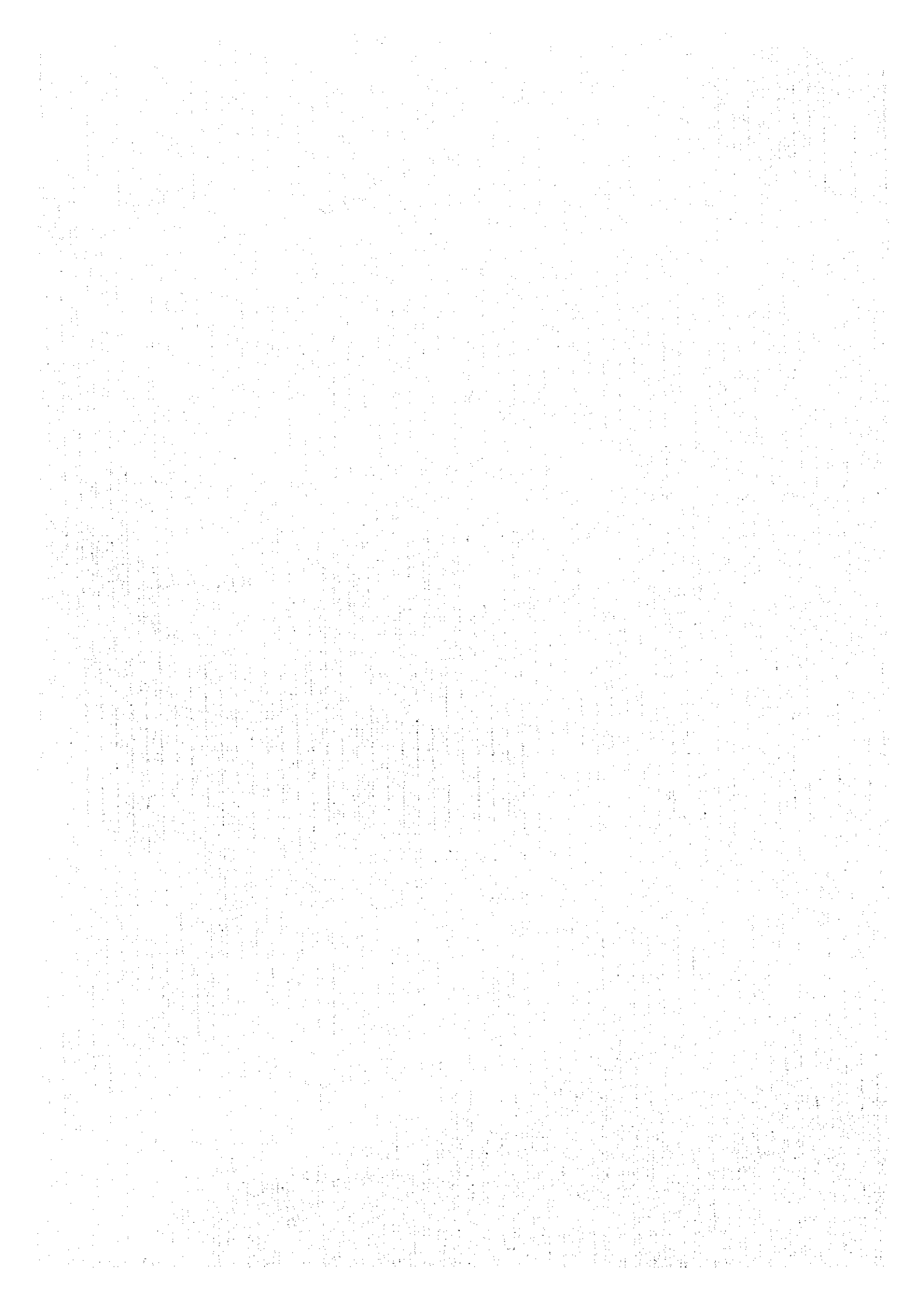
When this project is implemented, the total floor space of the facilities of the UTH's pediatric department will be increased by about 3,000m² and there will be an increase in the number of basic items of medical equipment installed in these facilities. In this connection, it is

important to make budgetary provision for an increase in the cost of operation and maintenance of the facilities and equipment. A deficiency in such budgetary appropriations may result in a decline in durability of the facilities and equipment as well as in operational efficiency. It is essential to make well planned budgetary appropriations for the operation and maintenance of the facilities and equipment to be procured under this project in order to attain its objectives.

(4) Outreach Activity

The objectives of the outreach activities are to enhance the medical service quality with regard to PHC through technical guidance and trainings by UTH. In order to operate, effectively, outreach center which is planned in the project, it is important to organize the personnel who gives instructions and programs of outreach activities.

APPENDICES



1. MEMBER LIST OF THE SURVEY TEAM

(1) Basic Design Study (July 30~September 1, 1995)

Mr. Kazuhiko TERAO	Leader	Grant Aid Division Economic Cooperation Bureau Ministry of Foreign Affairs
Dr. Hitoshi MURAKAMI	Technical Advisor	Bureau of International Cooperation, International Medical Center of Japan Ministry of Health and Welfare
Mr. Minoru TANAKA	Project Manager Architect Planner I	Yamashita Sekkei Inc. Consultant
Mr. Fumio ARAI	Architect Planner II	Yamashita Sekkei Inc. Consultant
Mr. Kazuhiko KON	Facility Planner	Yamashita Sekkei Inc. Consultant
Mr. Shinji TOHAMA	Equipment Planner	Yamashita Sekkei Inc. Consultant

(2) Explanation of Draft Report (November 7~November 19, 1995)

Dr. Shigeki ASAHI	Leader	Bureau of International Cooperation Intentional Medical Center of Japan Ministry of Health and Welfare
Mr. Minoru TANAKA	Project Manager Architect Planner I	Yamashita Sekkei Inc. Consultant
Mr. Shinji TOHAMA	Equipment Planner	Yamashita Sekkei Inc. Consultant

2. Survey Schedule

(1) Basic Design Study (July 30~September 1, 1995)

No.	Date	Schedule
1	Jul. 30 (Sun)	• Lv. Tokyo Ar. London (NH 201)
2	Jul. 31 (Mon)	• Lv. London (BA053)
3	Aug. 1 (Tue)	• Ar. Lusaka (Mr. Terao, Dr. Murakami, Mr. Tanaka, Mr. Arai) • Courtesy call on Embassy of Japan • Meeting at JICA • Meeting with Expert
4	Aug. 2 (Wed)	• Investigation of University Teaching Hospital (UTH) • Meeting at JICA office
5	Aug. 3 (Thu)	• Courtesy call on Ministry of Health • Courtesy call on National Commission for Development Planning (NCDP) • Meeting at University Teaching Hospital (UTH) on inception report, Japan's Grant Aid system, survey schedule, questionnaire, etc.)
6	Aug. 4 (Fri)	• Observation of facilities, equipment and proposed site at UTH • Meeting at UTH (Mrs. Munkanta, Mr. Bbuka, Mr. Mbilishi, Mrs. Mumba, Mr. Daka, Mr. Chishimba)
7	Aug. 5 (Sat)	• Visit Urban Health Centres (UHC) • Survey of Japan's Grant Aid Project
8	Aug. 6 (Sun)	• Ar. Lusaka (Mr. Kon, Mr. Tohama) • Meeting within the study team • Study on collected information
9	Aug. 7 (Mon) Holiday	• Meeting within the study team (study existing facilities) • Discussion on Minutes of Discussions
10	Aug. 8 (Tue)	• Meeting at UTH on request's contents. (Dr. Osborne, Mr. Bbuka, Mr. Chishimba, Mrs. Muba, Mrs. Mndia, Mrs. Munkanta, Dr. Yikona)
11	Aug. 9 (Wed)	• Meeting at MOH and UTH • Signing of Minutes of Discussions • Report to Embassy of Japan
12	Aug. 10 (Thu)	• Meeting at MOF • Visit Chainama Hospital • Report to JICA office
13	Aug. 11 (Fri)	• Meeting at Ministry of Works and Supply (MOWS) • Survey of local construction condition • Survey of local equipment supplier
14	Aug. 12 (Sat)	• Survey proposed site • Meeting within the study team
15	Aug. 13 (Sun)	• Meeting within the study team • Study on collected information
16	Aug. 14 (Mon)	• Meeting at UTH • Survey of proposed site (Infrastructure)

No.	Date	Schedule
17	Aug. 15 (Tue)	<ul style="list-style-type: none"> ● Visit UHCs (Kalingalinga, Hilltop) ● Photograph of the Site
18	Aug. 16 (Wed)	<ul style="list-style-type: none"> ● Arrangement of site survey ● Survey of local construction condition ● Meeting at UTH
19	Aug. 17 (Thu)	<ul style="list-style-type: none"> ● Collection of exchange rate ● Survey of local construction condition ● Survey of local equipment supplier
20	Aug. 18 (Fri)	<ul style="list-style-type: none"> ● Meeting at UTH (Dr. Osborne) ● Preparation of building plan ● Survey of local construction condition ● Survey of local equipment supplier
21	Aug. 19 (Sat)	<ul style="list-style-type: none"> ● Observation of Site Survey ● Study on collected information ● Survey on local construction & equipment market
22	Aug. 20 (Sun)	<ul style="list-style-type: none"> ● Meeting within the study team ● Preparation of building plan ● Study on collected information
23	Aug. 21 (Mon)	<ul style="list-style-type: none"> ● Meeting at UTH ● Collection of questionnaire ● Survey of local construction condition ● Survey of local equipment supplier
24	Aug. 22 (Tue)	<ul style="list-style-type: none"> ● Survey of existing building ● Survey of local construction condition ● Survey of local equipment supplier
25	Aug. 23 (Wed)	<ul style="list-style-type: none"> ● Observation of Soil investigation ● Survey of local construction condition
26	Aug. 24 (Thu)	<ul style="list-style-type: none"> ● Water sampling ● Meeting at UTH (Dr. Osborne) ● Survey of existing buildings
27	Aug. 25 (Fri)	<ul style="list-style-type: none"> ● Meeting at UTH on building plan and equipment plan ● Report to JICA office ● Report to Embassy of Japan
28	Aug. 26 (Sat)	<ul style="list-style-type: none"> ● Meeting within the study team ● Study on collected information ● Lv. Lusaka (Mr. Tanaka)
29	Aug. 27 (Sun)	<ul style="list-style-type: none"> ● Meeting with the study team ● Study on collected information ● Lv. Lusaka (Mr. Kon, Mr. Tohama)
30	Aug. 28 (Mon)	<ul style="list-style-type: none"> ● Meeting at UTH on building plan ● Meeting at MOWS ● Collection of questionnaire ● Ar. Tokyo (Mr. Tanaka)
31	Aug. 29 (Tue)	<ul style="list-style-type: none"> ● Meeting at UTH on building plan ● Collection of cost survey data ● Sum-up meeting at UTH
32	Aug. 30 (Wed)	<ul style="list-style-type: none"> ● Lv. Lusaka (Mr. Arai)
33	Aug. 31 (Thu)	<ul style="list-style-type: none"> ● Ar. London ● Lv. London
34	Sept. 1 (Fri)	<ul style="list-style-type: none"> ● Ar. Tokyo

(2) Explanation of Draft Report (November 7~November 19, 1995)

No.	Date	Schedule
1	Nov. 7 (Tue)	● Lv. Tokyo (NH201) ● Ar. London
2	Nov. 8 (Wed)	● Lv. London (BA053)
3	Nov. 9 (Thu)	● Meeting with JICA expert
4	Nov. 10 (Fri)	● Courtesy call on Ministry of Health and Meeting (Mr. V. Musowe, Ms. J. Nyoni, Mrs. G. E. Mundia) ● Meeting at UTH (Dr. G. Katema, Dr. T. Lambert, Prof. G. J. Bhat, Dr. C. Osborne)
5	Nov. 11 (Sat)	● Meeting within the study team
6	Nov. 12 (Sun)	● Meeting within the study team
7	Nov. 13 (Mon)	● Meeting at UTH (Dr. C. Osborne, Mr. Chishimba, Mr. T. J. Bbukku) ● Courtesy call on JICA office ● Courtesy call on Embassy of Japan ● Meeting at NCDP (Mr. M. C. Soko)
8	Nov. 14 (Tue)	● Courtesy call on and meeting at MOF (Mr. W. D. Musonda) ● Discussion on Minutes of Discussion ● Survey of UHC
9	Nov. 15 (Wed)	● Singing of Minutes of Discussions
10	Nov. 16 (Thu)	● Report to Embassy of Japan ● Report to JICA office
11	Nov. 17 (Fri)	● Lv. Lusaka (BA052)
12	Nov. 18 (Sat)	● Ar. London ● Lv. London (NH202)
13	Nov. 19 (Sun)	● Ar. Tokyo

3. LIST OF PARTY CONCERNED IN THE RECIPIENT COUNTRY

1. Ministry of Health

Dr. Kawaye Kamanga	Permanent Secretary
Ms. Jennife Nyomi	Assistant Secretary
Mr. V. Musowe	Chief Health Planner
Mrs. G. E. Mundia	Donor Coordinator
Mrs. B. M. Mumba	Physical Planner
Mr. Eli Nangawe	PHC Advisor

2. University Teaching Hospital

Dr. G. Katema	Executive Director
Dr. T. Lambert	Deputy Executive Director
Prof. C. Chintu	Dean. School of Medicine
Prof. G. J. Bhat	Associate Professor
Dr. C. M. Osborne	Acting Head of Paediatrics Dept.
Mr. T. J. Chishimba	Technical Service Manager
Mrs. E. M. Munkanta	Development Projects Manager
Mr. D. Daka	Chief Technician, Electrical
Mr. G. Banda	Senior Technician, Plumbing
Dr. Isaiah Yikona	Consultant Radiologist
Ms. Justina Hachungula	Acting Sr. Incharge A-Admission
Ms. Phyllis Muhwanga	Acting Sr. Incharge PICU
Ms. Lynelly Mbilish	Acting Nurse Officer
Ms. Angeline M. Lunga	Enrolled Midwife Family Support Unit
Ms. Jennie Chpeshamano	Nutritionist
Ms. Christine Meashe	Pharmacist
Mr. Aaron Mwale	Health Information System Manager

3. Ministry of Finance

Mr. W. D. Musonda	Director Loans and Investments
Mr. Emmanuel Ngulube	Revenue Analyst

4. NCDP

Mr. M. C. soko Director, ETC

5. Ministry of Works and Supply, Buildings Department

Mr. Kamayoyo Imashiku Architect
Mr. Maendende Quantity Surveyor

6. Embassy of Japan in Zambia

Mr. Tadashi Masui Ambassador
Mr. Tatsuro Koga Second Secretary
Mr. Hisatoshi Shimada Second Secretary
Mr. Syunji Tabushi Special Assistant

7. JICA Zambia Office

Mr. Yoshinori Ebata Resident Representative
Mr. Katsuhiko Sasaki Deputy Resident Representative
Mr. Shinji Obuchi Assistant Resident Representative

8. Expert on Infectious Diseases Control Project

Dr. Yoshio Numazaki Team Leader, Virologist
Dr. Masanori Saijo Pediatrician, Virologist
Dr. Hiroshi Terunuma Virologist, Neuropathologist
Mr. Katsunori Shirai Coordinator

9. Expert on PHC

Dr. Osamu Yoshida Doctor