

4--3 Infrastructure

4-3-1 Electricity

Currently, the NEC (Nepal Electricity Corporation)'s 11 kV overhead line runs along the eastern boundary of the site. The Teaching Hospital built next to the proposed site receives electricity from this 11 kV line. The proposed buildings are to get its electrical supply from this line.

(1) Voltage

Primary voltage -- 11 kV 3 phases 3 wires 50 Hz

Secondary voltage -- 400 V/230 V 3 phases 4 wires 50 Hz

(2) Voltage fluctuation and power failure

There are important facilities such as the government's guest house, embassies, etc. near the site. NEC is trying to provide a stable supply of electricity in this area. And electrical supply of the area is most stable and reliable in Kathmandu. Voltage fluctuation is the largest from 5:00 pm to 7:30 pm and varies from 0 to 7.3 percent (data obtained by NEC at an NEC substation near the site). There is no serious fluctuation during the other hours of the day. Power failures occur about six times per year, and the longest outage lasts about two hours. These are scheduled shutdowns for the maintenance of lines. Lightning discharge sometimes causes failures also.

4-3-2 Telephone

The telephone cable (central office line) is supported by the power distribution poles. This cable currently has a maximum capacity of 500 lines which are estimated to be occupied by the end of 1984 because there are so many applicants waiting to be facilitated. Expansion of the capacity will be executed three years from now. The Teaching Hospital occupies ten lines from the cable now.

4-3-3 Water Supply

Municipal water supply can be obtained from the main pipe running under the road on the east side. The Water Supply and Sewage Board is presently improving the existing water mains in the neighboring areas, and the site's water supply will be derived from new water mains that are under construction. In addition, a deep-tube well is presently being boreholed next to the Teaching Hospital which will also be able to supply water to the site.

(1) Municipal water supply capacity

At present, the diameter of the lateral water pipe which can be derived from the main pipe is supposed to be one inch which is not enough to provide an adequate water supply.

The improvement of the water mains is expected to increase the water supply.

(2) Supply capacity of the well

The well is being boreholed at present, and the supply capacity cannot be fully determined yet. A flow of about 1000 m³/day is estimated.

(3) Applying drinking water

In Kathmandu, it is popular to purify drinking water by passing it through unglazed porcelain filters after boiling. Purification by chemicals is not done except in some special cases.

4-3-4 Drainage

Public sewer lines are only constructed in part of central Kathmandu, and are not available in the area of the site. However, a gutter which can discharge rainwater and wastewater is under construction at the site, so it will be possible to discharge site water into this gutter. Sewage is eventually discharged into nearby river through this gutter. No public sewer line is planned to be constructed in Maharajgunj in the coming years. Soil-water is usually penetrated into the ground after processed by septic tank.

4-3-5 Fuel

In Nepal, wood is mainly used for cooking, in spite of the serious deforestation problem. On the other hand, gas and electricity are becoming popular even though they cost more. The only available gas is L.P.G. because there is no municipal gas supply. In Kathmandu, only one supplier, Nepal Gas Industries (Pvt.) Ltd., distributes gas, in 15 kilogram cylinders. L.P.G., imported from India, consists of 80% butane gas and 20% propane gas.

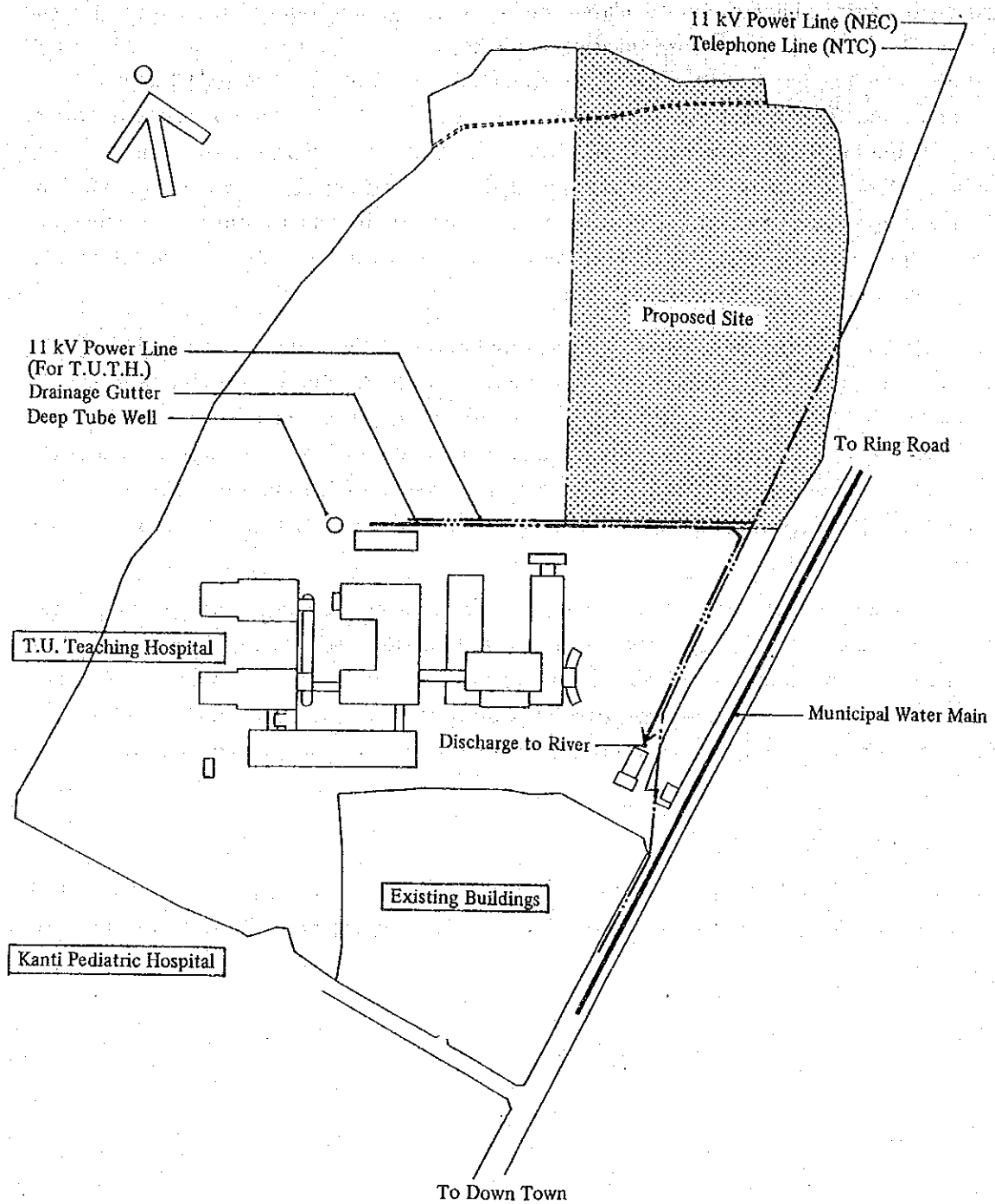


Fig. 4-1 Present Conditions of Infrastructure

4-4 Construction Situation

4-4-1 General Situation for Construction

In Kathmandu, the majority of buildings are houses and stores. These are fairly old, two or three-story brick buildings with unglazed roof tiles. The ground floor is a concrete slab on a grade. The floors above are suspended concrete slabs on wooden beams. Houses, stores and official buildings being built recently are commonly adopting so-called pure Rahmen, with columns, and floors constructed of reinforced concrete and walls made of brick. However, some of the houses and small stores constructed in the recent past are already leaning, which indicates the low quality of present architectural techniques and construction workmanship. Kathmandu, has suffered serious damage from earthquakes in the past, but there seems to be no development in structural design or construction techniques. Construction techniques to be prevent disasters are important issues to be considered.

Most of the construction materials are imported from foreign countries, particularly India. There seems to be few materials that can be procured locally due to consideration of both quantity and quality, except for sand, gravel, bricks, and terrazzo blocks. Some wooden furniture can also be procured locally. PVC pipes are also produced with imported materials. The pipes' production depends upon the cost and volume of the imported materials. They cannot always meet the demands, production items are limited, and their quality is not uniform.

There are few skilled labour in Kathmandu, so some construction companies employ experienced Indian labours, expecting higher efficiency despite the higher cost. Workers get off 52 Saturdays and about 30 national holidays annually, which numbers about 80 days. The climate has little bearing upon construction work. However the clayey top soil of the site does not absorb the heavy rains and this may cause problems during the rainy season.

4-4-2 Codes and Standards

Codes and standards for construction have not yet been established. Currently Indian standards are adopted when necessary. The standards of Japan, U.K. & U.S.A. are also adopted.

CHAPTER 5
BASIC DESIGN

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5-1 Basic Design Policy

- 1) The layout of the Nurse Campus should be programmed to be compact and to save the land so as not to impede the future expansion (which IOM of Tribhuvan Univ. is planning) for more wards and residential quarters for the staff member.
- 2) Considering each facility's function, administration, maintenance and future expansion, the Academic Block and Administrative Block should be situated in the same building, while the Student Dormitory should be an independent building.
- 3) The building should harmonize with the surrounding area, and fit the climatic conditions, the people's lifestyles and natural features of the land should be fully considered in designing the buildings. As the maintenance and repair of the facilities must be within the operation's budget, the materials to be used should be domestically procured as much as possible.
- 4) Since official codes and standards for architecture have not yet been established, the design of buildings in Nepal is based upon the designers' professional experience, except in some categories such as structural design, where Indian Standards are basically applied. In this project the numerical values which are used for seismic force, wind pressure, etc. are those which have been established in Nepal. If other values are needed in the analysis, Japanese Codes and Standards or Indian standards shall be applied.
- 5) The popular local construction method in the country which is a combination of reinforced concrete frames with brick walls will be used in this project. It seems appropriate to use the local standard construction method, considering the local construction techniques, domestic labor and machinery procurement and cost efficiency.
- 6) Since the project aims to relocate and expand the Mahaboudha Nurse Campus, the present situation of the facilities and equipment of the Campus should be considered basically to set the grade of the project.

5-2 Site Planning

5-2-1 Proposed Site

- 1) The site of the Nurse Campus occupies a part of the Teaching Hospital. The main gate of the site faces the main road connecting the northern-most point of Ring Road and the center of Kathmandu City.
- 2) The site of the Nurse Campus is situated in the inner-campus away from the main gate. An approach road to the Nurse Campus should be build. Being where the site is situated, noise and disturbances of traffic are held at minimum.
- 3) The proposed site is owned by Tribhuvan University.

5-2-2 Site and Land Features

- 1) The proposed site which has been selected for the project is a part of the entire area of the Teaching Hospital and the Nurse Campus. It is about 110m from east to west and about 200m from north to south. Its area is about 2.2 ha. The shape and the area not problems for the construction of the proposed facilities.
- 2) The site slopes slightly to the south. No special consideration to this slope is necessary when designing the facilities.
- 3) The proposed site is an open field except in the eastern part where a few houses are situated along the boundary. Beyond the north boundary the land slopes toward a branch of the Bisnumati River.
- 4) As the site was formerly the cultivated land, no trees exist on it.

5-2-3 Soil Conditions

According to the soil investigation report for the Proposed site and the Teaching Hospital, the soil conditions are uniform throughout the site.

The top soil is 0.2 m deep from the surface including vegetation. Beneath it, a light gray clayey silt layer exists down to 1.5m followed by fine to medium sand layer down to 3.0m. This sand layer involves micaceous components produced by the weathering of pegmatite. The water level varies from 1.3 m to 2.0 m from the surface between dry season and rainy season. Being as there are no traces of excavations for brick clay at the site, there will be no fear of land settlement.

5-3 Layout Plan

- 1) The Nurse Campus is to be accessible from the campus road running along the eastern side of the Teaching Hospital. The Academic and Administrative Building, which will be frequented by students and visitors, should be situated to the south, and the Student Dormitory to the north, away from the campus main gate.
- 2) The buildings are designed to occupy as small an area as possible so as to provide space for facilities which may be annexed to the Teaching Hospital by the Nepalese in the future. In the layout plan of the Student Dormitory, sufficient space between the wings is to be provided so that sunshine might be enjoyed during the winter, for the cold weather of in winter is more of a consideration in Kathmandu than the hot weather in summer.
- 3) A parking lot for visitors cars and minibuses to be used in the field clinical practice program will be located near the main entrance of the Academic and Administrative Building. As car traffic in the campus will not be heavy, it is not necessary to consider traffic separation of pedestrians and automobiles.
- 4) A brick wall will be constructed (by the Nepalese) around each building. Each building is to have its own guardhouse at its entrance with 24 hour guards.
- 5) A certain space for anticipated future expansion is provided north of the Academic and Administrative Building.
- 6) Trees are recommended to be planted on the eastern boundary to relieve the sense of visual incompatibility of the facilities and local houses, and to mitigate the noise from the school. It is also suggested for the courtyard of the Academic and Administrative Building, as an area of enjoyment for students and the staff members.

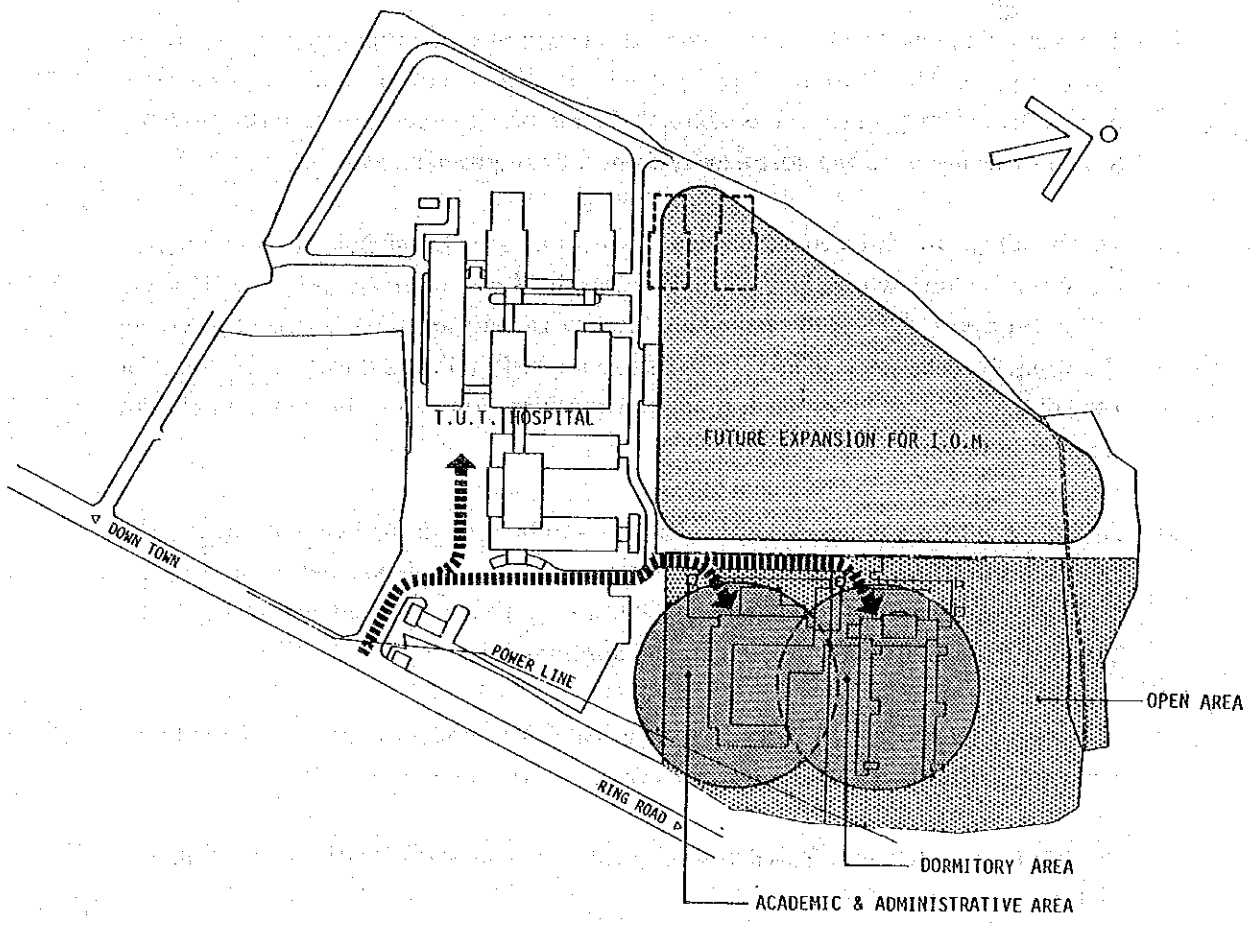


Fig. 5-1 Concept of Site Plan

5-4 Architectural Plan

5-4-1 Facilities

(1) Academic and Administrative Building

Administrative blocks and special training rooms are located on the ground floor, and classrooms and teaching staff members' rooms are on the first floor, thus reducing the flowlines and simplifying the administration of the building. The building is U-shaped. The student's rooms are designed in the "outer-corridor" style for better ventilation and corridor are lighted naturally. As for the staff members' rooms, which accommodate fewer people, are of the "inner-corridor" style. This layout takes into account shortening the corridor while providing enough ventilation and lighting for it. As many rooms as possible are planned to face south and east. A balcony is arranged on the west side of the first floor where some of the teaching staff members' rooms are located, so as to avoid the afternoon sun in the summer. At the south-west end of the building, beside the campus road, is an entrance hall for the use of students, the staff members, and visitors. The courtyard can be seen from the hall, thus making administration easier.

(1)-1 Academic Block

Classrooms are arranged on the first floor. Lectures in an 80-persons classroom will be carried out without voice amplification, sometimes with an overhead projector. Therefore, the classrooms are designed so that the length of the room moderate in size, thus ensuring visual and auditory advantages. This effort to make the classroom in a moderate rectangular shape is also used in designing the 40-persons classrooms. A storage room for furniture, will also be prepared according to local conditions, in order that the school may cope with an increase or decrease in the number of students and as in the case of national examinations. Three seminar rooms will be provided, two of them on the first floor next to classrooms so that they can also be used for the lectures for Bachelor Level Courses. The seminar room on the ground floor is for group discussions after field clinical practice. The teaching staff members' rooms are situated on the first floor, to facilitate smooth connections with the classrooms. There are several rooms for special use such as the demonstration rooms, preparation room, nutrition laboratory, library, etc. are situated on the ground floor, so as to make maintenance and handling of materials easier. This arrangement also precludes exposed piping beneath the ground floor ceiling.

(1)-2 Administrative Block

A reception counter is located in the entrance hall. An administration office is to be adjacent to the reception counter to ensure smooth connection. The entrance hall will have a section for the visitors room. The Campus Chief's room is between the account office and the meeting room. The room is centrally located so as to easily observe the activities of the entire school.

(2) Student Dormitory

Each bed room houses two students, 120 rooms are for 240 students of the Certificate Level Course, 20 rooms are for 40 students of the Bachelor Level Course, totaling 140 rooms for 280 students. Every room faces south and a "outer-corridor" style is adopted in order to provide natural ventilation and sufficient sunlight in the winter. To mitigate the hot weather in the summer, the "outer-corridor" which faces north is designed to be an open corridor, for the wind direction is in most cases, south-westerly.

To use the site efficiently, multi-storied construction is desirable. A four-story building is appropriate from the view points of the bearing capacity of the soil and the limited construction schedule. The main entrance is on the west side facing the campus road.

Near the entrance hall is a visitor's room and an office for both the warden and the house-keeper. The dining hall accommodates about 140 persons, thus 280 students in two shifts. The meals are in a "self-service" style. Both firewood and electric power will be used for cooking at the kitchen. A firewood storehouse is provided, because a truckload of firewood is purchased at a time. The flowline of firewood in the building is designed to be short in distance. The kitchen is directly accessible from the outside. A sick room is provided on the ground floor for students.

5-4-2 Building Components

Each section of the building will be designed in consideration of the function required by each facility, local weather conditions, and local construction situation. It should be noted that 80% of the annual precipitation concentrates during the rainy season (June to September) and that the wind direction is, in most cases, south-westerly.

(1) Structural Materials

The locally adopted combination of reinforced concrete frames and brick walls is to be used as a fundamental structural method. But, because of the unstable local procurement of bricks during the rainy season, when the brick factories stop production, concrete blocks will be partially used for partition walls in order to shorten the construction period. As domestic cement has some problems in quality, procurement, and cost-performance, imported cement should be used in the project.

Domestic reinforcing bars, also have some problems in terms of procurement and cost-performance. However, the early stages of construction, local reinforcing bars of adequate quality can be used. Sand (collected from the Bagmati and Bisnumati Rivers) and gravel (manually crushed in the mountains), are easily obtained under a systematic procurement schedule with consideration given to the production fluctuation in the rainy season.

(2) Finishing Materials

The finishing materials of the Mahabouda Nurse Campus and similar facilities in Kathmandu have been surveyed in detail. If they are considered to be adequate for the project, as many similar finishing materials as possible will be adopted.

(2)-1 Roof

Similar to the Mahabouda Nurse Campus, a flat concrete roof finished with asphalt waterproofing membrane will be used. Though the sunshine is not so harsh in summer, heavy rains are expected during the rainy season. It is necessary to finish the roof with reliable waterproofing materials. Unglazed roof tiles, that are used for houses in the district, are not suitable, because additional waterproofing membrane would be necessary due to the material's poor waterproofing effectiveness. As the existing Teaching Hospital and the IOM Student Dormitory in the Maharajgunj Campus, and Kanti Pediatric Hospital are all flat-roofed, it is appropriate to adopt roofs for these buildings of the project to make them harmonize with the surrounding environment.

(2)-2 External walls

Brick, which is generally used in the district for building walls, will be used for the external walls. Cement mortar will be troweled on the surface with a cement paint finish where waterproofing is necessary. In summer as far as sufficient consideration for natural ventilation is made, then air conditioning systems are not needed for these buildings.

(2)-3 Floors

The floors of existing campuses are finished with terrazzo tile or are cement-plastered with a steel trowel. These finishing methods are appreciated for their durability and easy maintenance. These materials can be easily procured in the district. Terrazzo tiles are appropriate for finishing the floors of rooms and corridors. As a cement-plastered floor easily gets dirty, this finish is adopted only partially in the project such as the storage room. PVC floor tile, commonly used in Japan, is inappropriate for the project, because it gets dirty and is easily scratched, and it soon needs to be renewed.

(2)-4 Interior walls

The finishing method planned is to plaster the brick walls with cement mortar and to apply an emulsion paint finish on it. Although a lime plaster finish would provide a smoother and more beautiful surface, it is not durable against impact. Since the durability should be emphasized in the project, the painted cement mortar finish will be used. Concrete blocks will be used for the partition walls in the

Student Dormitory since the blocks are easily made at the site, the cost is almost the same as bricks. Using concrete blocks makes up for the instability of brick procurement, and it will contribute to shortening the construction period.

(2)-5 Ceiling

The commonly used finish is cement mortar applied to the pointed bottom side of the concrete floor slab above with paint finish. As no cracks or flakes have been observed, this method seems to be suitable for the project. Suspended ceilings are not observed in the district except in buildings for special functions. In the project, suspended ceilings will be used only where piping is exposed under the floor slab.

(2)-6 Fittings

Most of the local windows are wooden framed, but they usually warp after being installed. Wooden-framed windows, which can be observed in high quality buildings such as high-class hotels, are specially imported from India and are very expensive.

Although aluminum sash is good for weatherproofing and sound insulation, it is too expensive. These alternatives are inappropriate for the project.

Steel sash will be used for the following reasons:

1. Kathmandu has a factory which produces steel sash of adequate quality (though there is no galvanizing equipment).
2. Steel sash can be purchased at a price only a little higher than that of wooden-framed window.
3. Steel sash has sufficient quality required for the project.
4. In case of any lack of supply of steel sash can be made up with imported goods from Japan can be used.
5. Rust of steel sash is rarely observed in the district, probably because of the climatic conditions.

The common design of the windows in the district is to arrange steel grills for crime prevention between windows and the screens. This type of window will be used for the project, as it meets the local needs although it will be a little difficult to clean.

Wooden doors and windows which are domestically produced will be used internally, (sufficient time should be allotted for seasoning the wood.)

5-5 Structural Plan

As Nepal is located within the Europe-Asia seismic zone, many earthquakes have been reported in the area. The Great Earthquake of 1934 caused terrible damage in Kathmandu and seismic force should be considered in structural planning. Considering land efficiency, soil conditions, and the construction schedule, the proposed buildings are designed to be 2 and 4 stories. Considering these factors, Rahmen structure of reinforced concrete should be used for the buildings. Bricks (which are widely used in Nepal) will be used for interior and exterior walls. The foundation will be designed based upon the soil investigation data of the proposed site and the Teaching Hospital. The data shows the top soil which includes vegetable components measures about 0.2 m from the present surface. Beneath it, a light gray clayey silt layer exists down to 1.5 m followed by a rather dense layer (N-value: 12-15) of sand with micaceous component which goes down to 2.5m. The next layer between 2.5m and 5.5m consists of rather soft silty clay followed by a consolidated sand layer. As the proposed buildings are 2 and 4 storied of reinforced concrete, a spread footing on the sand layer 1.5m below the present surface will be adequate for a foundation. Judging from the result of plate loading test and soil laboratory tests, $7.5t/m^2$ for bearing capacity of soil can be expected. Considering the expansion and contraction of concrete caused by the change of temperature, variable settlement, etc., expansion joints should be provided every 50m or so.

The external forces and loads on the building shall be taken as follows:

(1) Seismic Force (Indian Standards)

$$F = \alpha_h \times W$$

$$\alpha_h = \alpha_o \times I \times \beta$$

whereas:

α_o : Zone Coefficient (zone V) 0.08

I : Coefficient of Importance (school) 1.5

β : Coefficient of Soil Reaction 1.2

$$\alpha_h = 0.08 \times 1.5 \times 1.2 = 0.144$$

(2) Wind Pressure (Indian Standards)

$$p = c \times q$$

whereas:

p : Wind Pressure (kg/m^2)

c : Wind Pressure Coefficient 1.0

q : Velocity Pressure $150 kg/m^2$ (H = 30m)

(3) Live load

(Conformity with Japanese Building Standards and Indian Standards.)

The main building materials are as follows.

(1) Concrete

$f_c = 210 \text{ kg/m}^2$ (Compressive strength at 28 days)

Cement equivalent to Japanese product shall be used

(2) Reinforcing Bar (Deformed bar)

SD 35 (above D 19), SD 30 (below D 16)

5-6 Service Plan

5-6-1 Air Conditioning and Ventilation

(1) Air Conditioning

Considering the factors such as function of the facilities and climatic conditions, there is no need for air conditioning.

(2) Ventilation

In principle the ventilation of each room should be natural ventilation. However, for rooms stated below, a ventilation fan or a ceiling fan will be installed considering each room's function.

Rooms to have ventilation fans:

<u>A & A Building</u>	<u>Student Dormitory</u>
Nutrition Laboratory	Dining Hall
Storage Room	Kitchen
Toilet	Storage Room
Electrical Room, etc.	Laundry
	Toilet, etc.

Rooms to have ceiling fans:

<u>A & A Building</u>	<u>Student Dormitory</u>
Classroom	Dining Hall
Demonstration Room	Visitor's Room
Maternity Demonstration Room	
Seminar Room	
Library	
Professor's Room	
Reader's Room	
Lecturer's Room	
Teacher's Room	
Campus Chief's Room	
Administration office	
Account Office	
Meeting Room, etc.	

5-6-2 Water supply & Drainage

(1) Water Supply System

At the proposed site, a reservoir tank for the project will be provided to contain municipi-

pal water and well water (from a well which is under-construction near the reservoir tank of the Teaching Hospital). The piping for municipal water from the boundary of the proposed site and for well water from the grit chamber tank to the reservoir tank will be included in the project. The grit chamber tank and the water supply pumps for well water to the reservoir tank will also be included in the project. The capacity of the grit chamber tank is estimated to contain the water consumption of the Teaching Hospital and the Nurse Campus only. The piping for municipal water from the main pipe up to the boundary of the proposed site and the piping (including well pump) for well water from the well to the grit chamber tank should be provided by the HMG of Nepal. An elevated water tank will be installed on the roof of the Student Dormitory, and from this tank, water will be supplied by gravity. Neither well water nor municipal water are suitable for drinking. Therefore, the water is to be boiled and filtered through an ceramic filter. The ceramic filters for this purpose will be set in each pantry, etc.

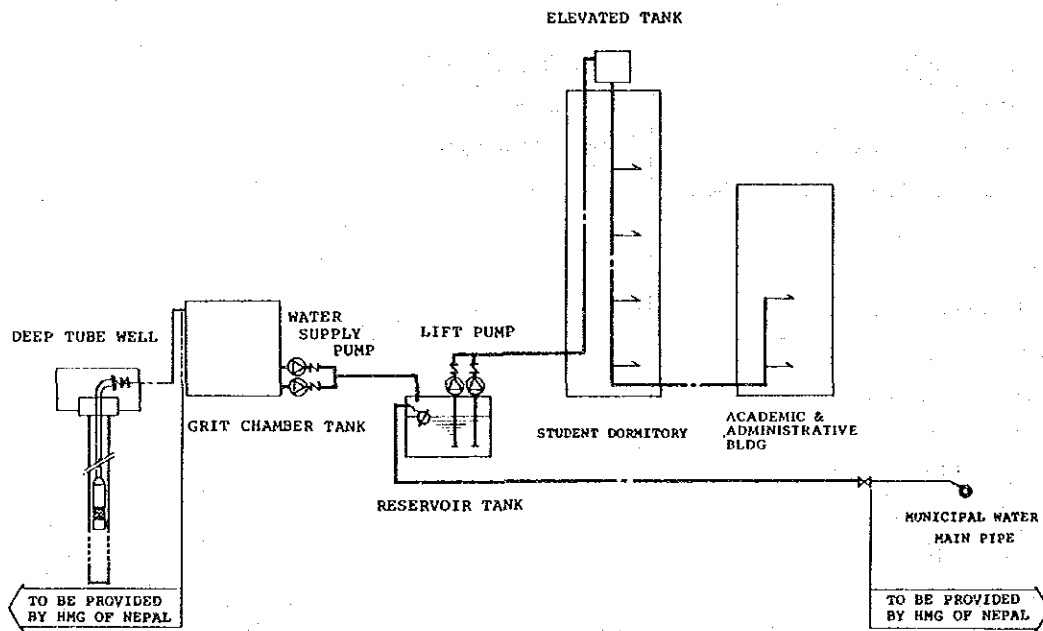


Fig. 5-2 Outline of Water Supply System

(2) Hot Water Supply

Considering local condition, there is no need for a central hot water supply system.

(3) Drainage System

A septic tank will be built within the proposed site, and the soil water processed through the tank will be penetrated into the ground. However, the top soil of the site is clayey, and penetration under present conditions may be difficult to accomplish, so the soil where the slotted pipes will be installed should be replaced with suitable soil.

Rain water, kitchen water, other drain water will be discharged into the existing gutter constructed along the south boundary of the site. However, considering the capacity of existing gutter, penetrating catch basin will be planned along the drainage line to reduce the amount of drainage to the existing gutter. The interior drainage system will be separated into 3 systems: soil water, kitchen water, and other drain water. Kitchen water will be discharged through a grease trap to prevent flow-out of oil and fat.

(4) Sanitary Fixtures

Eastern-style toilets will be installed to meet the local customs. A water faucet will be provided in each toilet stall.

(5) Kitchen Equipment

A cooking table, sink, and range will be installed to fit the local cooking customs. In consideration of the shortage of the firewood in the near future in Nepal, electric ranges will be provided in the kitchen of the Student Dormitory. However, in the present condition, adopting the firewood is effective to keep the operation cost low. The firewood furnace and chimney should be provided by the Nepalese. Electric ranges will be provided at the Nutrition Laboratory and the Pantries of the Academic and Administrative Building.

(6) Laundry Equipment

No equipment such as washing machines or spin-dryers will be installed. Sink will be installed on each floor of each wing of the dormitory for students to wash their clothes.

5-6-3 Electrical Facilities Plan

(1) Power Receiving and Substation

The 11 kV power will be led to the substation from the existing overhead line which runs along the eastern boundary in the site, through underground cable. The disconnecting switch with power fuse and watt-hour meter with MOF at the lead-in point should be provided by the Nepalese. The substation equipment will be installed on the

ground floor of the Academic & Administrative Building. High-tension and low-tension devices will be enclosed in the cubicle except the transformer. The capacity of transformer will approximately 200 kVA. Automatic voltage regulators and emergency generator will not be necessary considering the present power supply conditions and the function of the proposed facilities.

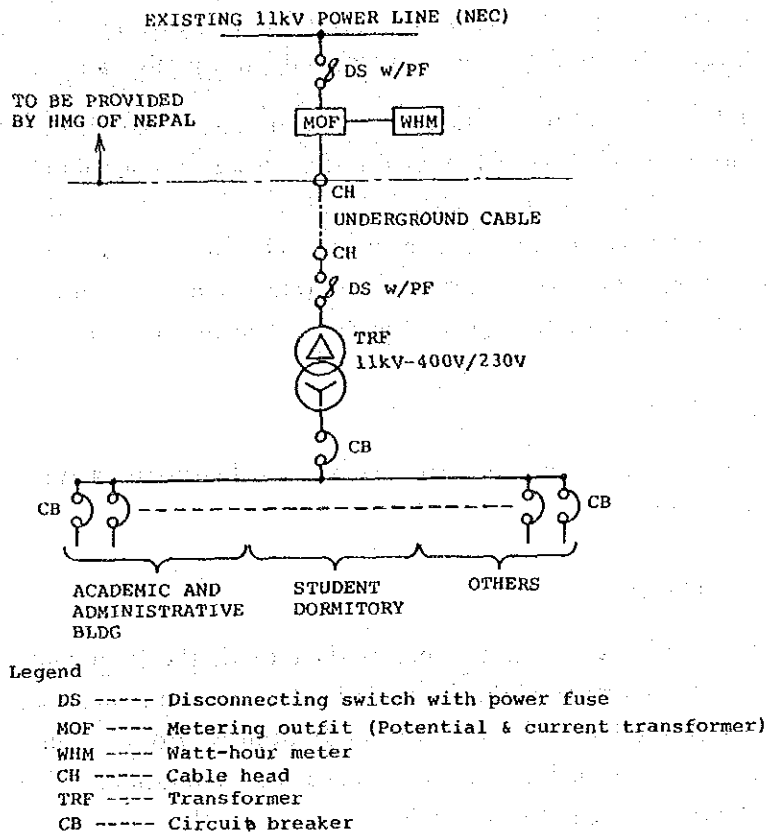


Fig. 5-3 Outline of Power Supply System

(2) Electric Power Distribution

Electric power is to be supplied from the main distribution panel (low voltage) of the substation to each distribution board and motor control board.

1) Supply voltage

Motors	3 phase, 3 wire, 400 V
Lighting & socket outlet	3 phase, 4 wire, 400 V/230V

2) Power distribution – Mainly, power distribution through wiring with piping.

(3) Lighting and Socket Outlets

1) Lighting

For light source, fluorescent lamps will be mainly used in the Academic & Administrative Building and incandescent lamps for the Student Dormitory. Principally, fluorescent lighting fixtures will be the suspended type. Considering the natural lighting effects, the illumination levels from the lighting fixtures will be minimized according to room conditions and functions.

Average illumination for the rooms will be as follows:

Academic and Administrative Building

Classrooms	200 lux
Demonstration Room	
Maternity Demonstration Room	
Nutrition Laboratory	
(Natural lighting is expected to be available because of windows. Therefore the illumination level will over 300 lux.)	
Library	300 lux
(Natural lighting is not expected to be available because of bookshelves)	

Student Dormitory

Dining hall and Visitor's room	300 lux
Bed rooms	250 lux
(on the surface of the writing counter. Average room illumination level will be 30 lux.)	

External lightings will be provided along the campus road and in the courtyards.

2) Socket Outlets

Socket outlets will be provided at necessary locations. The British standards which were used for the Teaching Hospital will also be applied in the project.

3) Distribution Wiring

Distribution will be wiring (PVC insulated wire) with piping (PVC pipe). Conduit pipes will be embedded in the walls or in the floor slabs.

(4) Public Address System

1) Academic and Administrative Building

An amplifier will be installed in the Warden's office and loud speakers in the corridors.

2) Student Dormitory

An amplifier will be installed in the Warden's office and loud speakers in the corridors.

The above Public Address systems in two buildings will be operated separately.

(5) Intercome System

Intercome systems will be provided at the Student Dormitory for calling students. The Master-intercome will be installed in the Warden's office and Sub-intercome is to be provided in the corridor of each floor.

(6) Telephone System

Telephone switchboard (push-button system) will be installed at the Academic & Administrative Building on the ground floor, and telephones will be provided according to the list shown below. The central office line cable (3 or 4 lines) to the MDF should be provided by the Nepalese.

Rooms	Floor	Telephones
(A & A Building)		
Administration Office	Ground Floor	2
Examination Office	"	1
Account Office	"	1
Typist Room	"	1
Campus Chief's Room	"	1
Library	"	1
Storage Room	"	1
Professor's Room	1st Floor	1
Reader's Room	"	2
(Student Dormitory)		
Warden's Office	Ground Floor	1
Total		12

(7) Lightning Protection System

A lightning protection system will be provided. The lightning rods, conductors, and groundings will be installed in accordance with the Japanese Standards.

5-6-4 Others

(1) Fire Extinguishing System

The Fire extinguishing system will be provided mainly based on the Japanese Fire Law. Power Source for the fire hydrant pump will be the municipal power supply (from NEC) and the emergency generator is not provided. The fire hydrant pump will be operated manually.

(2) Incinerator

Incinerator will be installed for flammable wastes. Garbage and non-inflammable wastes can be disposed of the site, by the municipal contracting.

5-7 Equipment Plan

This project basically aims to relocate with an expanded campus (In Maharajgunj) the existing Mahaboudha Nurse Campus. The existing equipment at the Mahaboudha Nurse Campus will be transferred to the new campus. However, some of the equipment are damaged and are limited in number, according to the field survey. Considering that the number of students will increase approximately twofold and that the equipment should be increased.

Considering the above mentioned conditions, the selection and use of equipment will be planned taking into account the following items:

1. Existing equipment at the Mahaboudha Nurse Campus will be transferred and utilized as much as possible.
2. The plan should fit the Nepalese education policy.
3. The plan should facilitate easy operation and maintenance of equipment by the Nepalese.

Although nurse education policy in Nepal is similar to that in Japan, curriculum and teaching method are slightly different.

Equipment is listed hereafter.

5-7-1 Education Equipment

(1) General Education Equipment

Item	No.
Overhead Projector	2
Transparency Maker	1
35mm Slide Projector	1
16mm Movie Projector	1
Screen for Projection	2
35mm Camera	1
Cassette Tape Recorder	1
Cassette Tape Recorder with Radio	1
Typewriter (English)	2
Typewriter (Nepalese)	2
Plain Paper Photo copier	2
Duplicating Machine	1
Photocopy Machine	1
Refrigerator	2
Vacuum Cleaner	2
Voltage Stabilizer	2
Micro Bus (29 seats, 1 driver)	1
Micro Bus (21 seats, 1 driver)	1
Others	

(2) Nursing Education Equipment

Item	No.
Stryker Bed	1
2--Crank Gatch Bed	4
Patient Bed	4
Instrument Trolley	2
Medicine Trolley	2
Dressing Trolley	2
Wheel Chair	1
Thomas Splint for Adult	1
Thomas splint for Child	1
Bowler's splint	1
Blood Pressure Apparatus, Stand Type w/Cuff	5
Blood Pressure Apparatus, Desk Type w/Cuff	15
Velcro Cuff, for Child (6cm)	2
Velcro Cuff, for Adult (8cm)	3
Stethoscope for Baby	10
Stethoscope (Nurse's Type)	20
Sponge Holding Forceps	12
Towel Forceps	12
Operating Knife Handle, No.3	4
Operating Knife Handle, No.4	4
Operating Knife Blade, No. 11, Pack of 100	1
Operating Knife Blade, No. 20, Pack of 100	1
Dissecting Forceps, without Teeth	6
Dissecting Forceps, with Teeth, 6"	5
Kocher Artery Forceps, Straight, 6"	2
Kocher Artery Forceps, Curved, 4"	2
Mosquito Artery Forceps, Straight, 4"	6
Mosquito Artery Forceps, Curved, 4"	6
Episiotomy Scissors	2
Cheetle Forceps	12
Allis Tissue Forceps, 6"	6
Double Hook Retractor	2
Single Hook Retractor	2
Suture Scissors, Straight 6"	2
Bandage Scissors 8"	2
Operating Scissors, 6"	2
Suture Needle, Straight	6
Suture Needle, 3/8 Circle, Round	6
Suture Needle, 3/8 Circle, Cutting	6

Item	No.
Needle Holder, Straight, 6"	2
Needle Holder, Curved, 6"	2
Oxygen Inhaler Apparatus	1
Suction Unit	1
Suction Unit, for Obstetrics	1
Weight and Height Scale	2
Portable Weighing Scale	2
Percussion Hammer	2
Mouth Gag	2
Ophthalmoscope	2
Otoscope	2
Rectal Speculum, Large	2
Rectal Speculum, Small	2
Autoclave, Desk Type	1
Bone Marrow biopsy Needle	2
Liver Biopsy Needle	2
Lumbar Puncture Needle	4
Trocar and Cannula for Abdominal Tapping	2
Lumbar Puncture Instrument Set	1
Three-way and Two-way Connector	6
Luer Lock Syringe, 50cc	2
Aneurysm Needle	1
Fine Dissecting Forceps, with Teeth	2
Fine Dissecting Forceps, without Teeth	2
Ointment Jar, with Cover,	2
Atomizer	1
Instrument Sterilizer	1
Female Pelvis	5
Model of Fetal Circulatory System	5
Doppler Fetus Detector	1
Obstetric Stethoscope	10
Female Organs	12
Set of 8 Pregnant Uteri	1
Fetal Skull	20
Obstetrical Manikin	1
Obstetrical Forceps, 3 Types	1
Vacuum Extractor	1
1st Stage of Labour Model	4
2nd Stage of Labour Model	4
3rd Stage of Labour Model	4

Item	No.
Resuscitator, Hand-driven Type, for Adult	1
Resuscitator, Hand-driven Type, for Child	1
Resuscitator, Hand-driven Type, for Baby	1
Airway (L, M, S)	6
Endotracheal Catheter, for Adult	1
Endotracheal Catheter, for Child	1
Endotracheal Catheter, for Baby	1
Bellows Tracheal Catheter,	6
Miller-Abbott double Lumen Tube	2
Stomach Irrigator	2
Stomach Catheter	2
Suction Catheter	6
Finger Stall	12
Hemoglobinmeter	2
Microscope	2
Bedside Cabinet	8
1-ch Electrocardiograph	1
Hair Washing Trolley	1
Film illuminator	5
Squeeze Dynamometer	2
Ultrasonic Nebulizer	1
Ice Maker	1
Atlas of Physiological Anatomy	1
O & K Half Metreurynters Set	1
Umbilical Cord clamp	1
Bassinet Cart	2
Incubator	1
Training Doll	2
Others	

(3) Furniture List

Item	No.
Lecturer's Desk	29
Lecturer's Chair	17
File-Cabinet	17
Meeting Table	8
Meeting Chair	42
Education Equipment Cabinet	21
Lecture Table	10
Shelves for Food	2
Utensil Shelves	7
Student's Stool	400
Student's Chair with Hand	244
Mobile Table	2
Book Shelves	66
Reading Table	4
Card Catalog Cabinet	2
Dining Table	16
Dining Chair	87
Student's Bed with Mattress	280
Staff's Bed with Mattress	10
Mobile Chalkboard	2
Others	

5-7-2 Existing Equipment List of the Mahaboudha Nurse Campus

The equipment listed below are owned by the Mahaboudha Nurse Campus. The listed equipment is planned to be transferred to the new campus to the extent that it is possible.

(1) General Education Equipment

NO.	Name of Goods	Quantity
1.	Metal cooling handle (kitchen spoon)	9 Nos
2.	Copper cooking handle (kitchen spoon)	1
3.	Balancer	1 Set
4.	Balancer	1 Nos
5.	Kilos	8
6.	Balance chain	1
7.	Khukuri	2
8.	Saber	1
9.	Spade	2
10.	Iron plate scruber	4
11.	Rab	3
12.	Pathi (Unit of measuring pot)	1 Set
13.	Frying pan	7 Nos
14.	Frying pan	3
15.	Refrigerator	1
16.	Dry machine	1
17.	Grinding stone	1 Set
18.	Plastic Bucket	40 Nos
19.	Plastic Big bowl	50
20.	Aluminum Mug	30
21.	Filter	4
22.	Metal water jug	4
23.	Metal cooking pot	3
24.	Metal cooking pot	7
25.	Metal kitchen spoon	4
26.	Metal kitchen spoon	11
27.	Alminum cooking pot	2
28.	Bread roller	2 Set
29.	Kitchen Knife	5 Nos
30.	Drum (water tank purposes)	2
31.	Coal oven	2
32.	Nala (Iron tire string tool)	2
33.	Pressure cooker	2

NO.	Name of Goods	Quantity
34.	Scissors	
35.	Tiffin carrier	2
36.	Metal cooking big pot	9
37.	Aluminum big bowl	4
38.	Meat grinding machine	1
39.	Iron grinding tool	1
40.	Charcoal Iron	4
41.	Plastic jerkin	
42.	Milk bucket	3
43.	Grass cutter (hansia)	1
44.	Plastic Basket	3
45.	Plastic Bowl	
46.	Pick	1
47.	Iron leveler	1
48.	Khukuri	1
49.	Bed (Cotton)	148
50.	Pillow (Cotton)	126
51.	Sitar (Musical Instrument)	1
52.	Guitar	1
53.	Harmonium (Musical Instrument)	2
54.	Madal (Nepali Typical Drum)	2
55.	Bango sistrum	1
56.	Tabala (Nepali Typical Drum)	1 Set
57.	Metal beads (Musical Instrument)	2 Nos
58.	Metal beads (Musical Instrument)	2 Sets
59.	Cheque writer	2 Nos
60.	Numbering machine	2
61.	Big water tank	1
62.	Voltage stabilizer (Non-automatic)	1
63.	Table lamp	4
64.	Iron safe	1
65.	Book Rack	26
66.	Filing Rack	1
67.	Magazine Rack	2
68.	Store Rack (Wooden)	6
69.	Filing Rack (Steel)	1
70.	Angala Rack (Steel)	2
71.	Library Rack	2
72.	G.I. Box	3
73.	Wall clock	3
74.	Dinner plate (Clay)	58
75.	Dinner plate (plastic)	48

NO.	Name of Goods	Quantity
76.	Quater plate (Clay)	47
77.	Microscope	2
78.	Wooden table	100
79.	Dining table with sunmica	12
80.	Table tennis board	1
81.	Cupboard (Wooden)	78
82.	Cupboard (Steel)	6
83.	Bedside cupboard	200
84.	Filing cabinet	5
85.	Wooden hanger	60
86.	Wooden chair with hand	180
87.	Wooden cot	164
88.	Steel cot (Hospital)	4
89.	Stand board	4
90.	Filter Stand	4
91.	Small Stool (Chair)	11
92.	Type-writer	4
93.	Dunlop chair	98
94.	Duplicating machine	2
95.	Metal hanging bell	5
96.	Black Board	5
97.	Glass Board	6
98.	Plastic Ice-Bucket	2
99.	Bed side screen	2
100.	Slide projector	2
101.	Sound projector	1
102.	Over head projector	2
103.	Tape-Recorder	2
104.	Wooden ordinary chair	400
105.	42 name plate In-Out Board	1
106.	Metal water carrier	4
107.	Steel Bowl	150
108.	Dinner Steel Bowl	12
109.	Anatomy chart stand	1
110.	Model stand	2
111.	Lecture stand	1
112.	Paper stand	2
113.	Tube stand	3
114.	Weighing Machine	3 Nos (1 Nos Baby)

NO.	Name of Goods	Quantity
115.	Enamel Jar	1
116.	Pumping Stove (Kerosine)	2
117.	Burner (Kerosine)	1
118.	Blanket	40
119.	Sofa set	1
120.	Steel cooking pot	27
121.	Steel Round dish	12
122.	Steel Cabin dish	150
123.	Steel Glass	297
124.	Steel Jug	1
125.	Steel Tiffin carrier	3
126.	Aluminum Tiffin carrier	2
127.	Steel Plate	150
128.	Steel Plate	12
129.	Steel Dinner Plate	66
130.	Aluminum cooking hand	1
131.	3 burner kerosine stove	3
132.	Wooden Ladder	2
133.	Carving water pot	2
134.	Petrol Wax	3
135.	Film Screen	3
136.	Coal Iron	4
137.	4" Iron catching tools	1
138.	Key board	1
139.	Trolley	1
140.	Radio	1
141.	Radio Box	1
142.	Intercom	1
143.	Steel tea seat	1
144.	Electric Fan	20
145.	Voting Box	1
146.	Jute Carpets	26

(2) Nursing Education Equipment-1

NO.	Name of Goods	Quantity
1.	Trolley	2
2.	Drum	2
3.	Kidney dish (large)	4
4.	Kidney dish (small)	5
5.	Tray (different size)	21
6.	Bowl (medium)	2
7.	Bowl (small)	2
8.	Callipot (different size)	6
9.	Sputum Mug	3
10.	Syringe container with lid	1
11.	Feeding cup	7
12.	Small pot with funnel	3
13.	Pint measure	5
14.	Sterilizer (different sized)	3
15.	Cheate's forcep	1
16.	Funnel	1
17.	Urinal	2
18.	Enema can	5
19.	Bed pan	2
20.	Speculum	2
21.	Curette (sharp and blunt)	3
22.	Proctoscope	1
23.	Sinus forceps	1
24.	Koches forceps	3
25.	Ovum forceps	6
26.	Artery forceps	16
27.	Ear syringe	1
28.	Tongue depressor	2
29.	Probe	1
30.	Aneurism hook (small)	1
31.	Foreign body removal holder	2
32.	Equipment holder (large)	1
33.	Jug	1
34.	Spirit lamp with 4 burner	1
35.	Spirit lamp with 2 burner	33
36.	Dissecting forcep	2
37.	Dissecting forcep (Tooth)	1
38.	Mask	1
39.	Aspiration needle	4

NO.	Name of Goods	Quantity
40.	Urinimeter (Glass)	1
41.	Knife	4
42.	Spirit lamp with 1 burner	1
43.	Vorsellum forceps	1
44.	Container with lid	2
45.	Airmeter	2
46.	Specific gravity urinimeter	3
47.	Steel bowl (large)	
48.	Prism	1
49.	Magnet	1
50.	Conical flasher (large)	4
51.	Undye	2
52.	Minus glass	3
53.	Lotion stand	1
54.	Pelvis model	1
55.	Thermometer (rectal, oral)	28
56.	Family planning models	1 box
57.	Blanket	12
58.	Small blankets	2
59.	Bed sheet (large)	7
60.	Draw sheet	8
61.	White gown	2
62.	Colour bed sheet	6
63.	Curtain	8
64.	Rubber sheet	10
65.	Bath towel	7
66.	Sponge cloth	17
67.	Pillow case	4
68.	Pillow	4
69.	Table cloth	1
70.	White towel	11
71.	White cloth pieces	191
72.	White cap	59
73.	Small cover clothes	6
74.	Apron	1
75.	Bandage	1 bundle
76.	Bed sheet	6
77.	Zinc bucket	2
78.	Plastic bucket with top	1
79.	Plastic bowl	1
80.	Steel bowl	4
81.	Kidney basin (large)	4
82.	Towel clip	6

(3) Nursing Education Equipment-2

NO.	Name of Goods	Quantity
1.	Enamel jug (large)	1
2.	Aluminum container	2
3.	Toroid light	2
4.	Enamel tray (different size)	7
5.	Inhaler	1
6.	Uterine sound	2
7.	Oxygen meter	1
8.	Dilator (8 pices)	1 Set
9.	Clamp	8
10.	Bath thermometer	5
11.	Metal catheter	2
12.	Knee hammer	1
13.	Curve scissors	1
14.	Mouth gag	1
15.	Plastic syringe	1
16.	Feeding bottle	3
17.	2 c.c. syringe	16
18.	5 c.c. syringe	10
19.	Douche nozzle	1
20.	Asepto syringe	2
21.	Wall thermometer	1
22.	Glass jar	1
23.	Air cushion	6
24.	Gastric washtube	3
25.	Gastric washtube (plain)	2
26.	Rubber tube	1
27.	Rectal rubber tube	3
28.	Ryles tube	1
29.	Small catheter	7
30.	Hot water bag	1
31.	Ice bag	1
32.	Rubber mask	1
33.	Weight machine	1
34.	Enamel basin	1
35.	Balancer	1
36.	Weight box	1
37.	Microscope	1
38.	Larynx spray	1
39.	Dirty linen box	2
40.	10 c.c. syringe	1
41.	Wooden test tube stand	1
42.	Test tube holder	2
43.	Conical flasher (large, glass)	4

5--8 Floor Area Plan

This project is basically a relocation plan for the Mahaboudha Nurse Campus. Educational equipment, furniture and utensils will be transferred to the new campus to the extent that is possible. The plan will principally be based on the present situation of the Mahaboudha Nurse Campus, studying in detail the size and number of rooms equipment, furniture and so on, in serious consideration of the local conditions and with regard to similar facilities in Japan. The room areas will be as follows:

(1) Academic & Administrative Building

<u>Rooms & Facilities</u>	<u>Area (sq.m)</u>
1) Academic Block	
Classroom for Certificate Level (3 Rms)	302
Classroom for Bachelor Level (2 Rms)	118
Demonstration Room	134
Maternity Demonstration Room	67
Preparation Room	34
Nutrition Laboratory	101
Seminar Room (3 Rms)	88
Library	147
Professor's Room	21
Reader's Room (2 Rms)	42
Lecturer's Room (8 Rms)	168
Teacher's Room (2 Rms)	42

<u>Rooms & Facilities</u>	<u>Area (sq.m)</u>
2) Administrative Block	
Campus Chief's Room	21
Administration office (w/Reception)	42
Account Office	21
Examination Section Office	21
Meeting Room	42
Typist Room	14
Janitor's Room	16
Visitor's Room (2 Rms)	21
Storage Room	32
Electrical Room	32
Pump Room	11
Corridor, Staircase, Toilet, Pantry, etc.	1,074.6
<hr/> Total	<hr/> 2,607.6

(2) Student Dormitory

<u>Rooms & Facilities</u>	<u>Area (sq.m)</u>
Bed Room (140 Rms)	1,428
Dining Hall	176
Kitchen	71
Warden's Office	12
Visitor's Room	27
Warden's Living Quarters	41
Housekeeper's Living Quarters	31
Sick Room	10
Corridor, Staircase, Toilet, Shower Room, Laundry, Penthouse, etc.	1,858.1
<hr/> Total	<hr/> 3,654.1

(3) Others

<u>Rooms & Facilities</u>	<u>Area (sq.m)</u>
Guard House (25sq.m x 2)	50.0
Firewood Storehouse	20.0
<hr/> Total	<hr/> 70.0

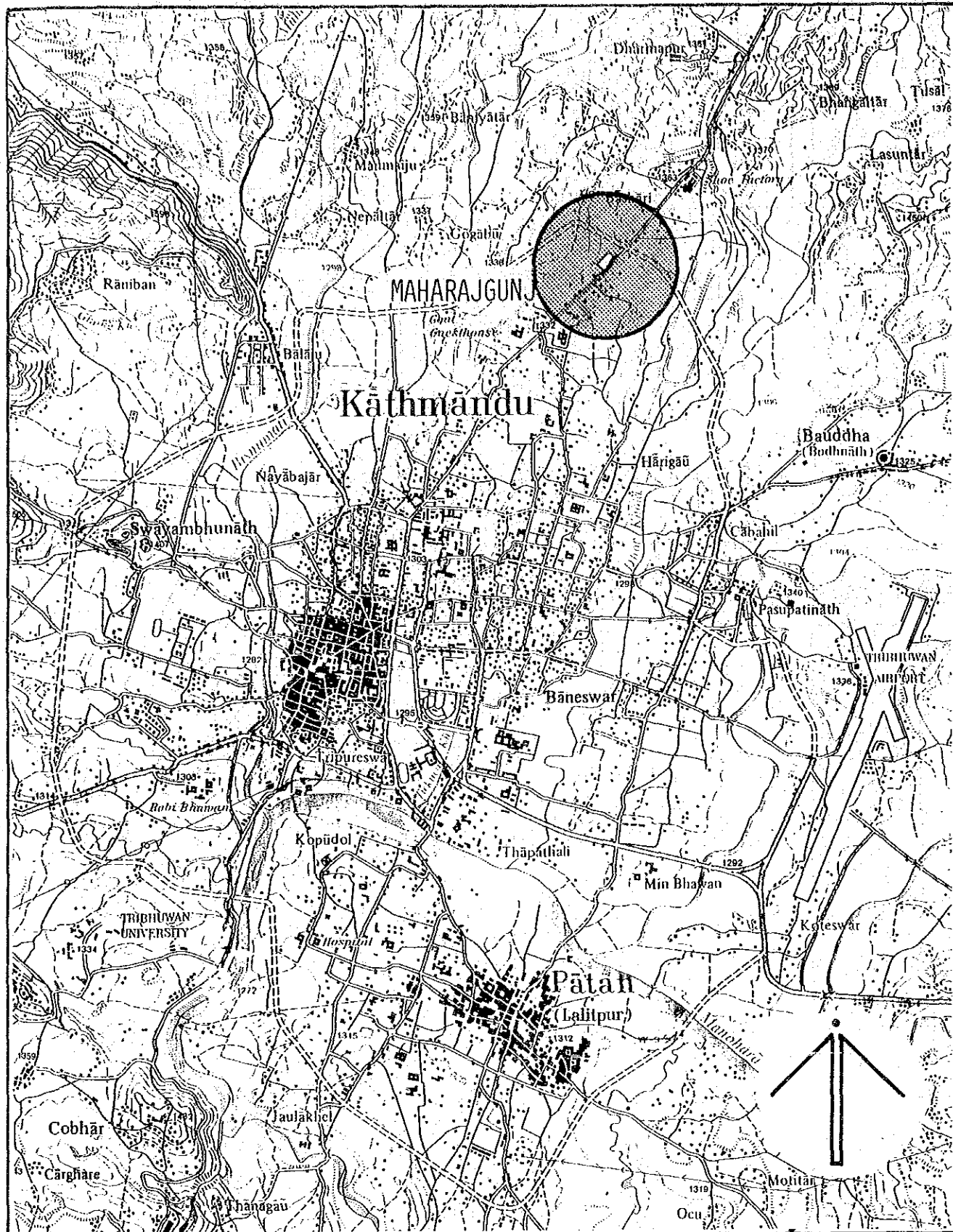
5-9 Basic Design Drawings

(1) List of Drawings

01	Location Map, Survey Map
02	Site Plan
03	Academic & Administrative Building Ground Floor Plan
04	Academic & Administrative Building 1st Floor Plan
05	Academic & Administrative Building Elevation and Section
06	Student Dormitory Ground Floor Plan
07	Student Dormitory 1st Floor Plan
08	Student Dormitory 2nd and 3rd Plan
09	Student Dormitory Elevation and Section

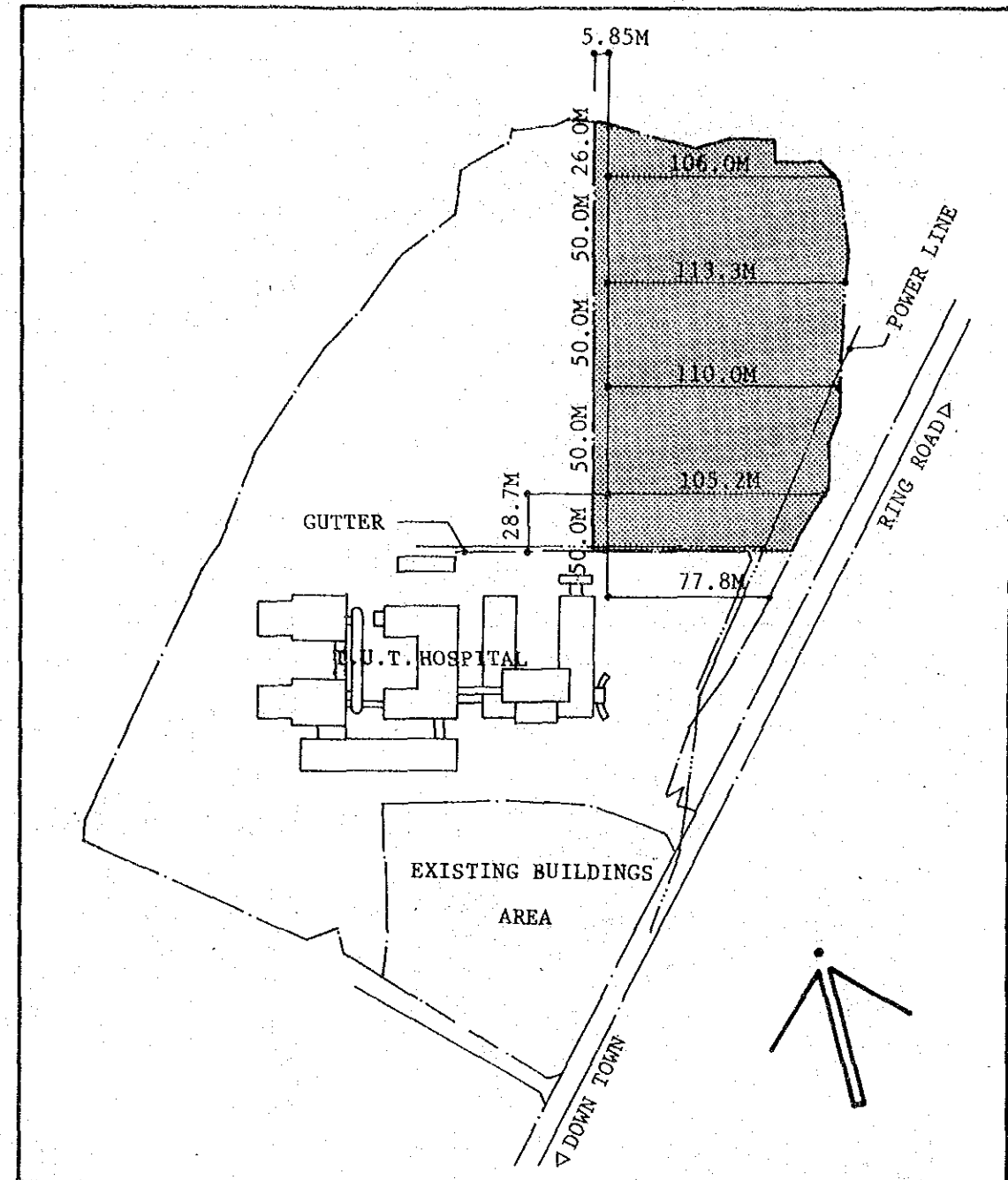
(2) Floor Areas (square meters)

Floors	A & A Building	Student Dormitory	Others	Total
Ground Fl.	1,333.6	1,217.2	70.0	2,620.8
1st Fl.	1,274.0	782.6		2,056.6
2nd Fl.		782.6		782.6
3rd Fl.		782.6		782.6
Penthouse		89.1		89.1
Total	2,607.6	3,654.1	70.0	6,331.7



LOCATION MAP (Base Map: THE KATHMANDU VALLEY MAP published by the Arbeitsgemeinschaft für vergleichende Hochgebirgsforschung, Munich 1977)

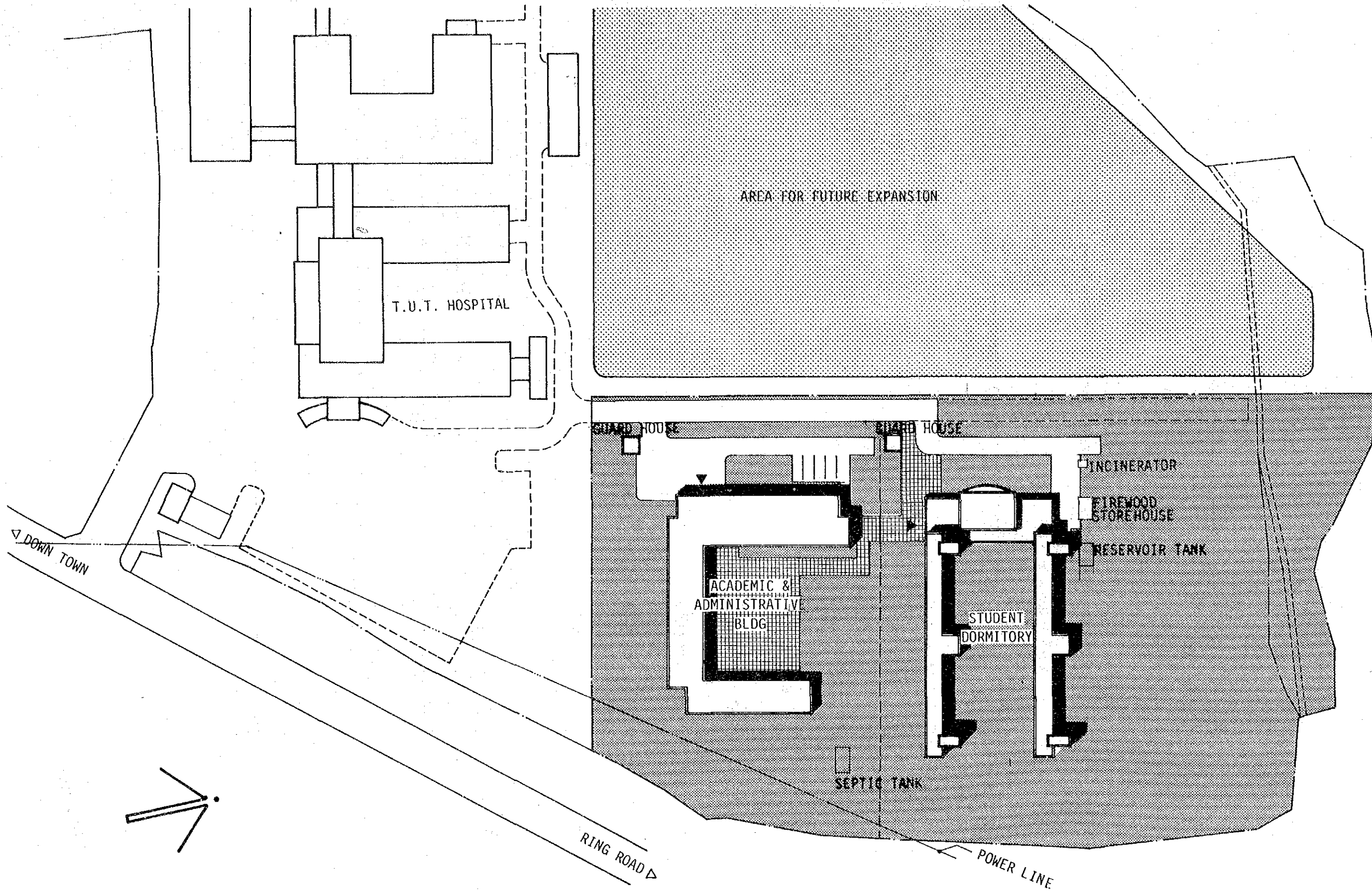
THE CONSTRUCTION PROJECT OF THE NURSE CAMPUS IN KATHMANDU



SURVEY MAP 1 : 3,000

--- PROPOSED SITE

LOCATION MAP SURVEY MAP 1 : 3,000

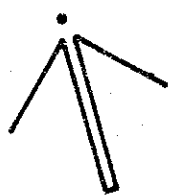
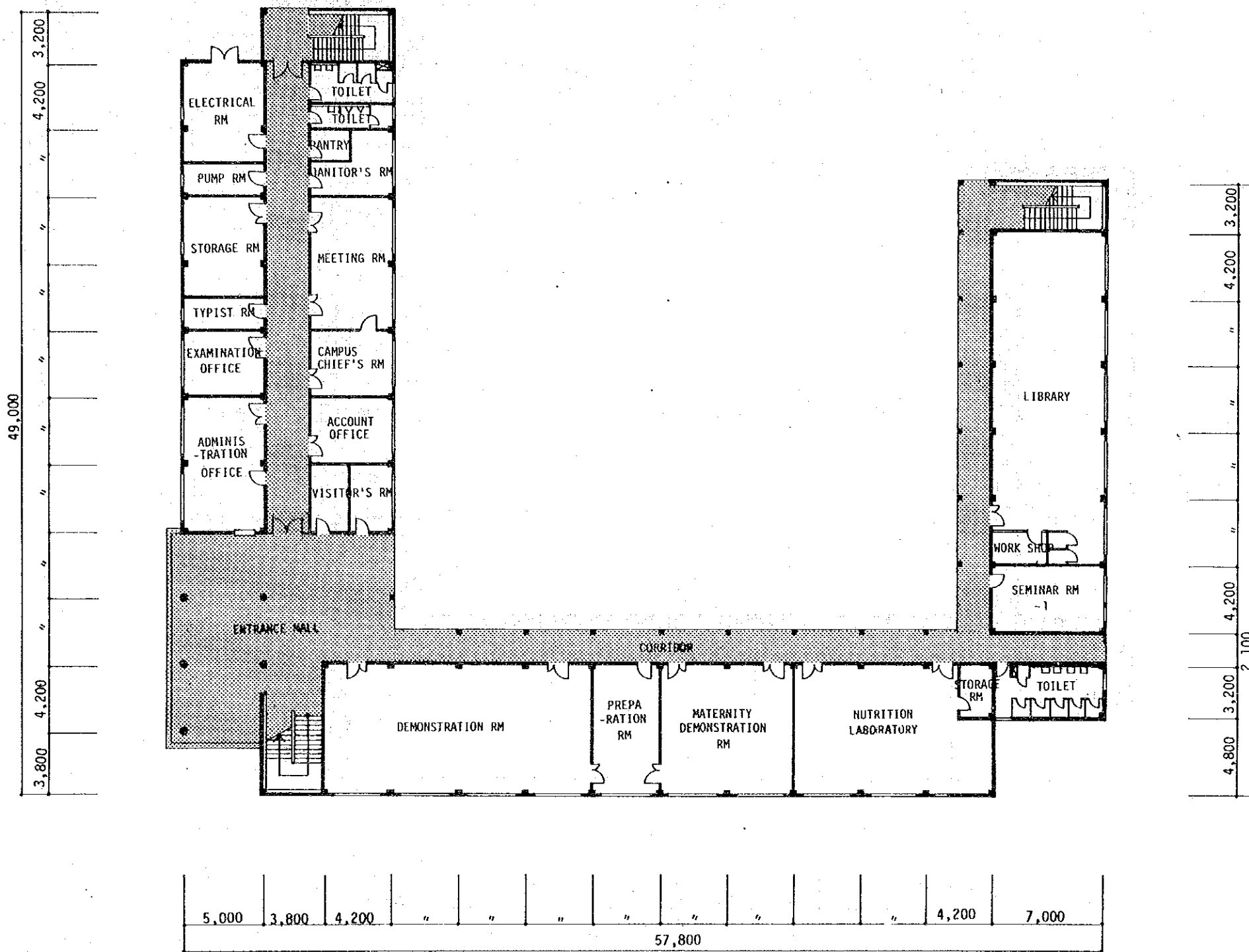


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SITE PLAN

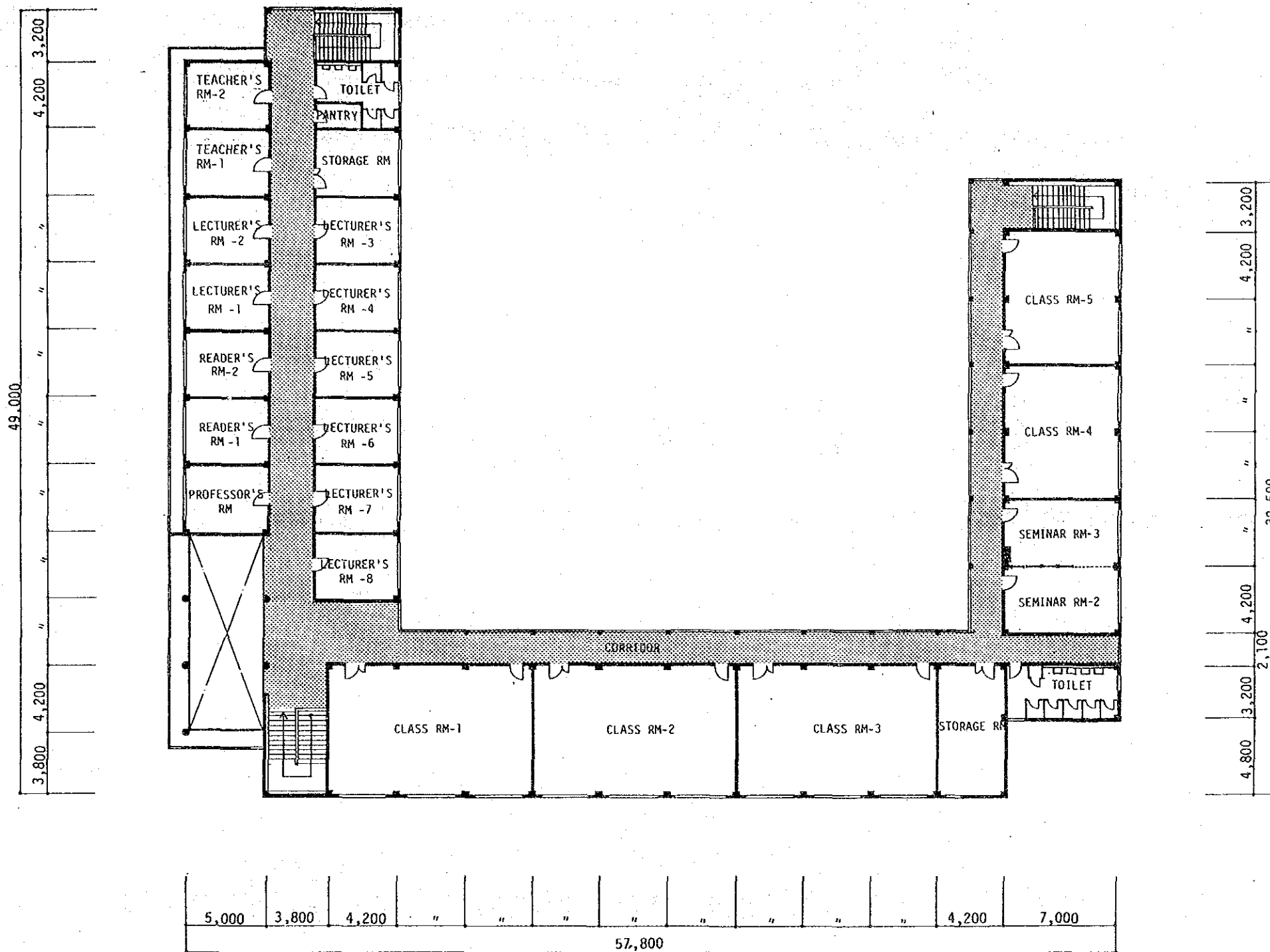
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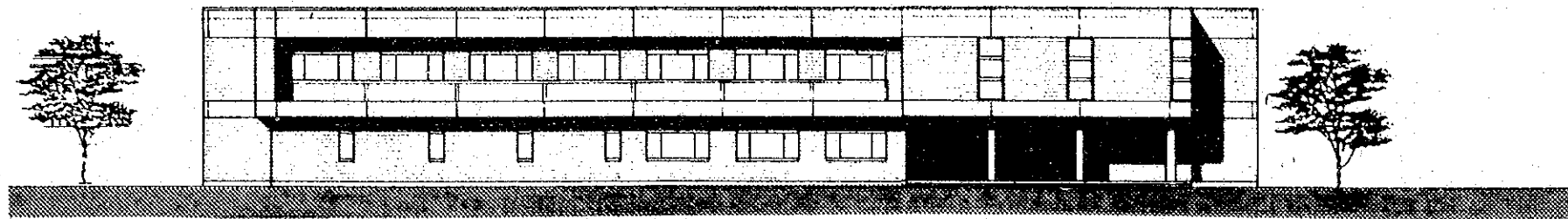
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**ACADEMIC & ADMINISTRATIVE BLDG
GFL PLAN 1 : 300**

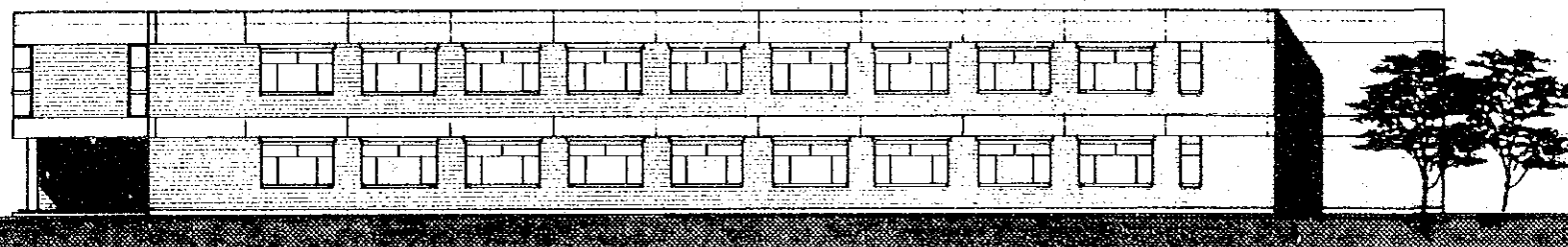


**THE CONSTRUCTION PROJECT OF
THE NURSE CAMPUS IN KATHMANDU**

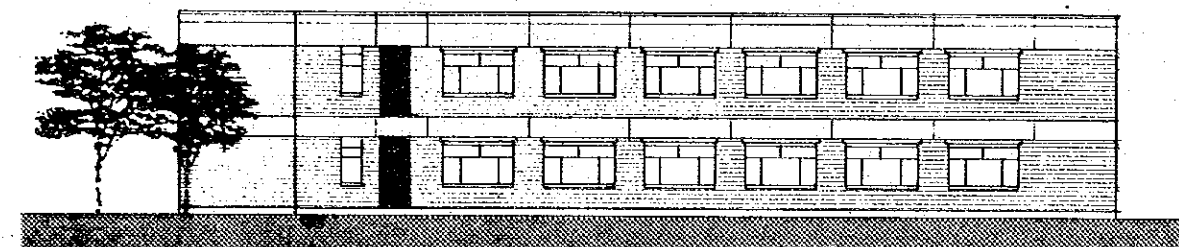
**ACADEMIC & ADMINISTRATIVE BLDG
1ST FL PLAN 1:300**



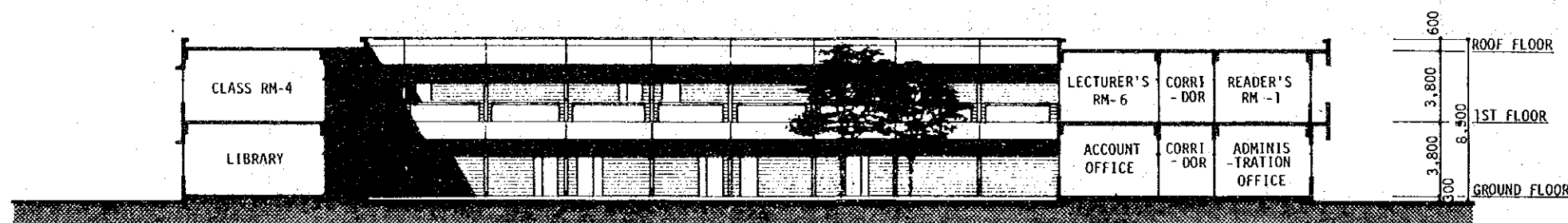
WEST ELEVATION



SOUTH ELEVATION



EAST ELEVATION



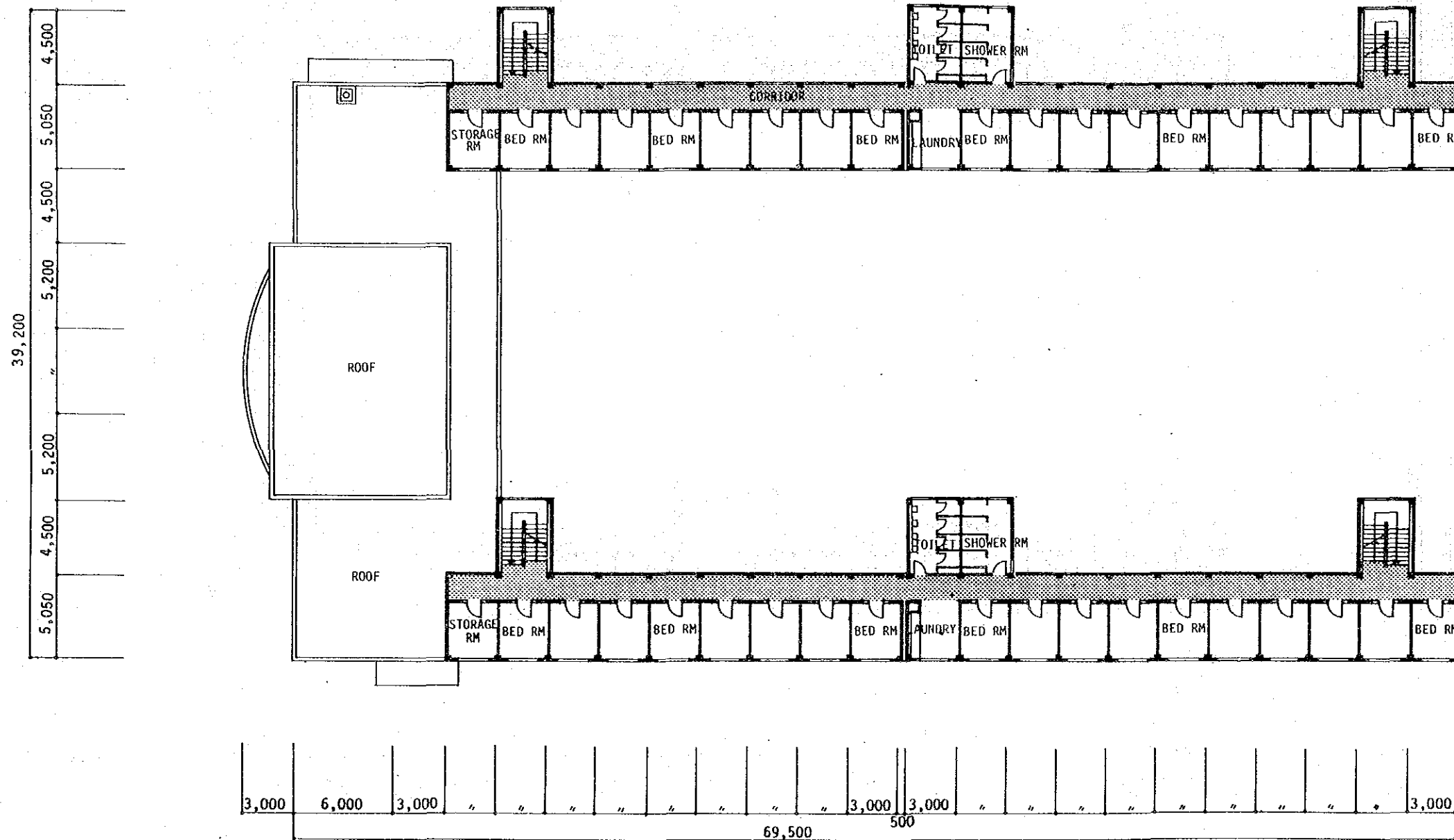
SECTION

THE CONSTRUCTION PROJECT OF
THE NURSE CAMPUS IN KATHMANDU

ACADEMIC & ADMINISTRATIVE BLDG
ELEVATION & SECTION 1 : 300

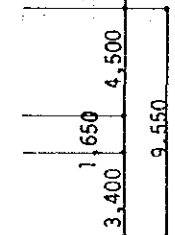
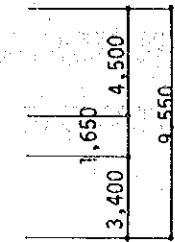
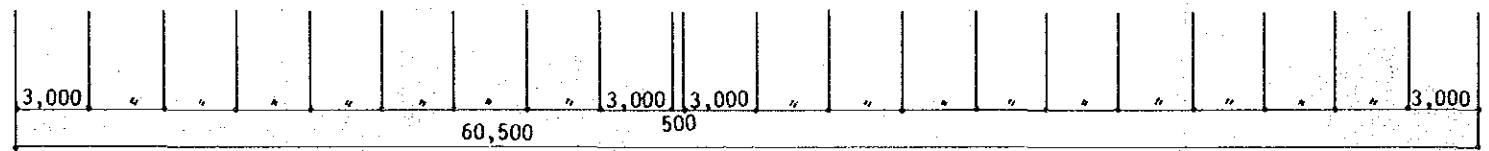
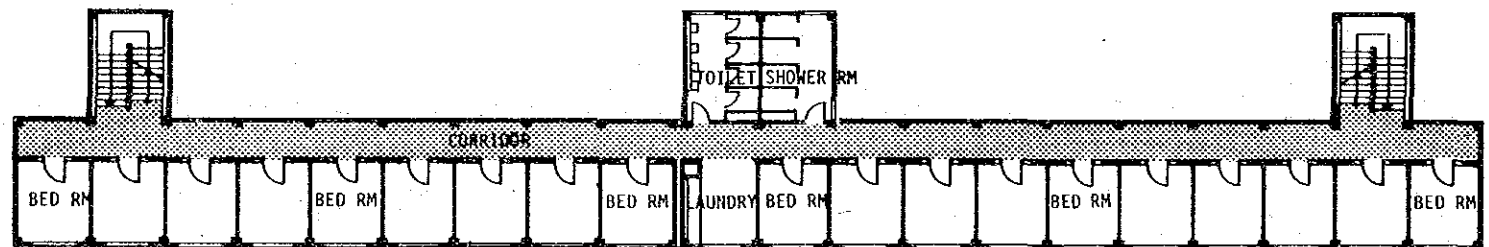
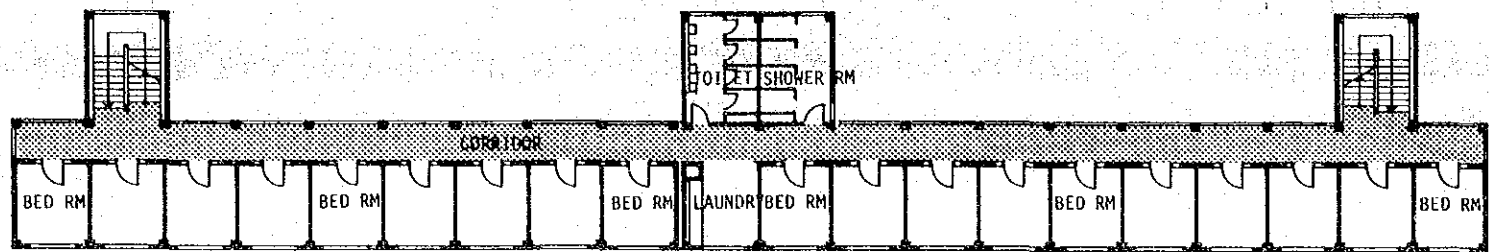
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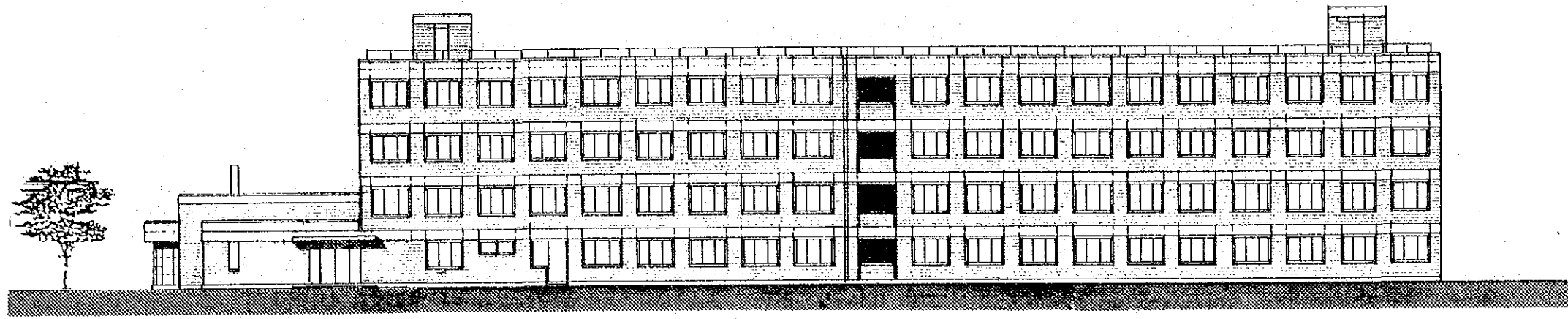
**STUDENT DORMITORY
1STFL PLAN 1 : 300**



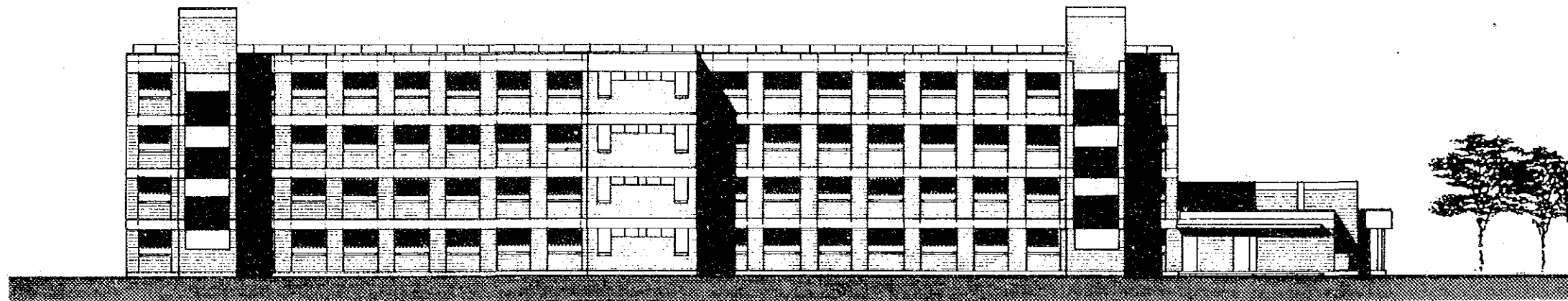
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**THE CONSTRUCTION PROJECT OF
THE NURSE CAMPUS IN KATHMANDU**

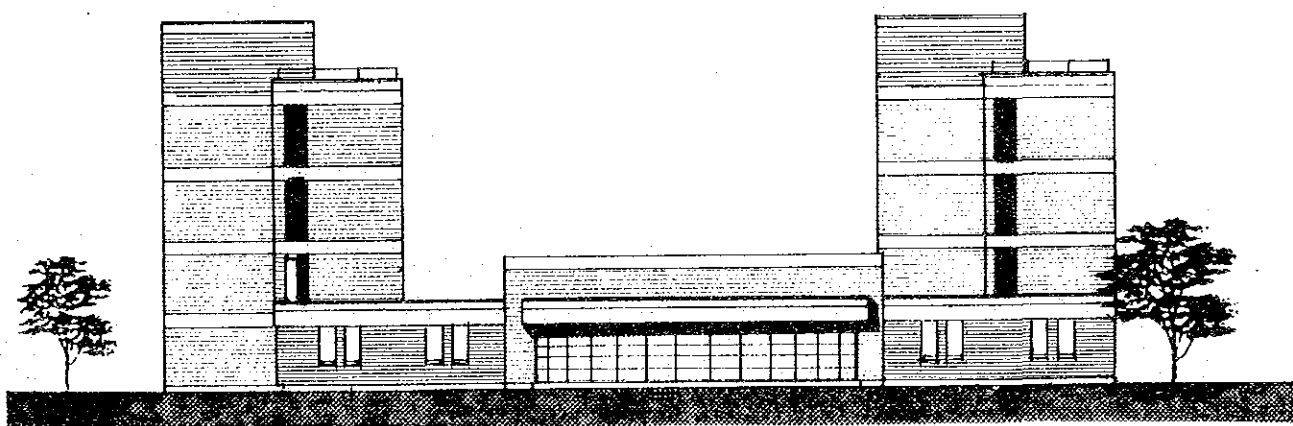
**STUDENT DORMITORY
2ND • 3RD FL PLAN 1 : 300**



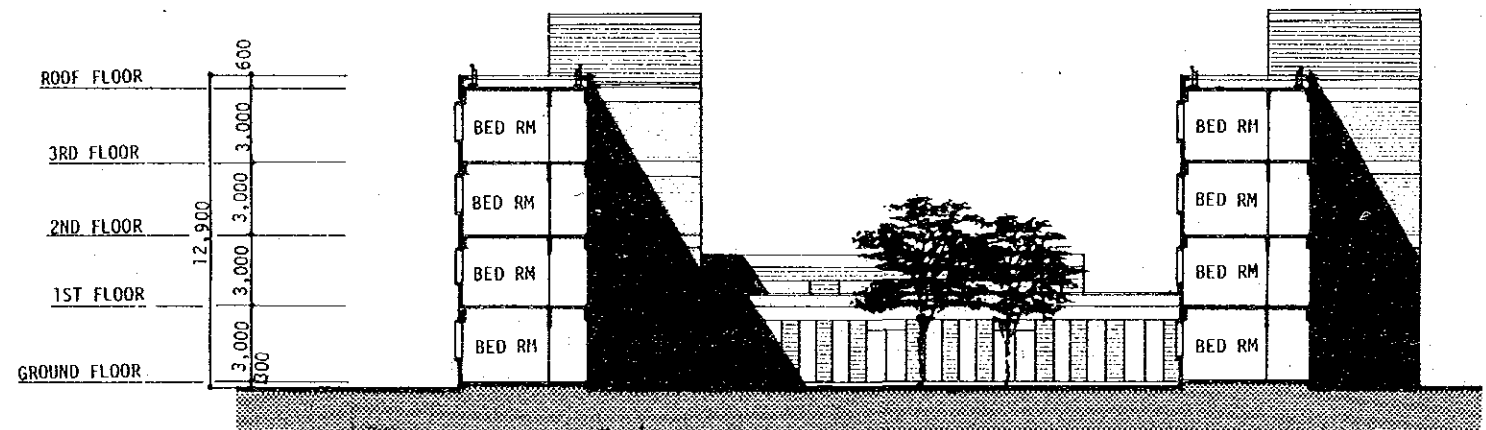
SOUTH ELEVATION



NORTH ELEVATION



WEST ELEVATION



SECTION

THE CONSTRUCTION PROJECT OF
THE NURSE CAMPUS IN KATHMANDU

STUDENT DORMITORY
ELEVATION & SECTION 1 : 300

CHAPTER 6
PROJECT EXECUTION SYSTEM

CHAPTER 6 PROJECT EXECUTION SYSTEM

6-1 Outline of the Administration of the Operation

The operation of this project by the Nepalese will be as follows:

It will be operated by IOM, Tribhuvan University, which is responsible for selecting and educating the health manpower including nurses in Nepal, under the supervision of the Ministry of Education and Culture. The Mahaboudha Nurse Campus will be in charge of the practical affairs. To guide, supervise and monitor the project activities, a committee has been organized. It consists of members from IOM, Tribhuvan University and its Teaching Hospital, Mahaboudha Nurse Campus, with the Dean of IOM, Tribhuvan University, as Chairman. The organization of the Mahaboudha Nurse Campus will assume the maintenance and administration of the new Nurse Campus after its completion. The organization chart for implementing the project is shown below:

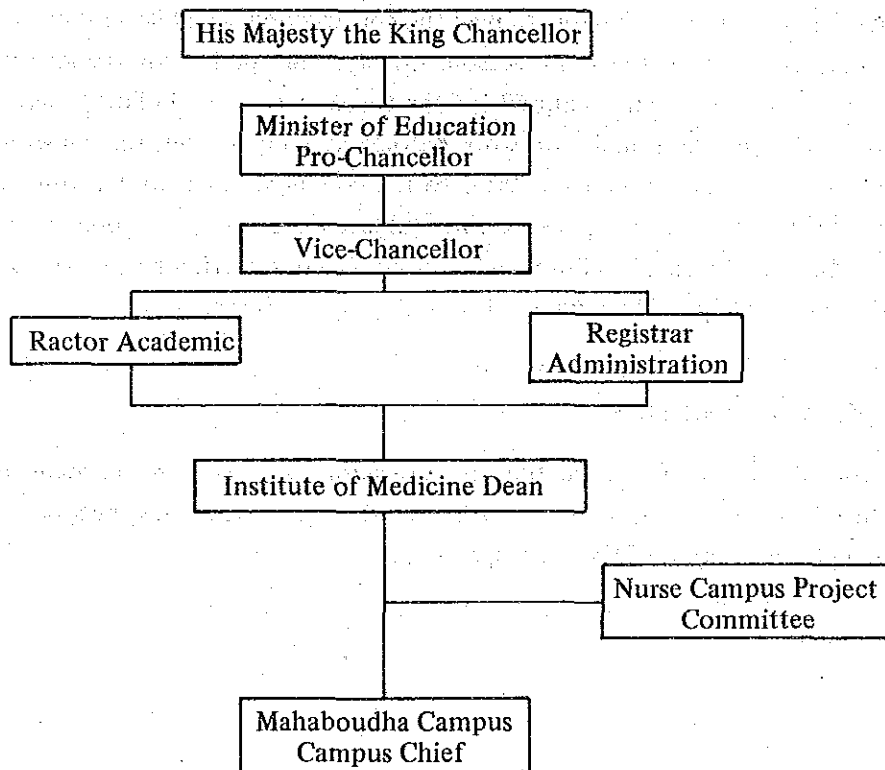


Fig. 6-1 Organization Chart for Implementing the Project

6-2 Construction Work Program

6-2-1 Contract System

Subsequent to conclusion of the Exchange of Notes between His Majesty's Government of Nepal (HMG) and the Japanese Government in regard to Grant Aid for the construction project of the Nurse Campus in Kathmandu, HMG of Nepal will select a Japanese Consultant, and then detail design work will be carried out.

After completion of the detail design, tenders will be held and a Japanese Contractor will be selected. The Construction Contract will include both building works and equipment works.

6-2-2 Construction Planning

In Kathmandu, as stated before, the rainy season starts in June and runs until September. Top soil at the site is clayey, the water level is estimated to be from 1.3 – 2.0 meters below the surface. Therefore, it is advisable to plan the construction schedule so that the foundation work is completed before the rainy season. Construction period for the Project will be 14 months. Considering the time required for the transportation of building materials and the matter of completing the foundation work before the rainy season, the construction should be started by the middle of January. Prior to the commencement of construction, the work to be done by the Nepalese, such as clearing and leveling of the site, supply of water, electric power and drainage, should be completed. During the construction period, customs clearance of imported materials should be managed smoothly by the Nepalese.

6-2-3 Supervising Schedule

Viewed from the scope of construction, the Consultant shall station a resident supervisor for the length of the construction period. Also, as the work progresses, necessary experts will be dispatched to the site for required inspection.

6-3 Scope of Work

6-3-1 Infrastructure

(1) Site Preparation

Nepalese: Clearing obstacles and leveling the site.

(2) Electricity

Nepalese: Installation of 11 kV line at the site for the buildings planned, including supply and installation of the main disconnecting switch gear (with power fuse) and watt-hour meter (with MOF) at the service entrance.

Japanese: Installation of 11 KV cable from the secondary side of MOF to the substation within the site.

(3) Water Supply

Nepalese:

1. **Municipal water:** Plumbing work from the main to the boundary.
2. **Well water:** Plumbing work (including well pump) from the deep-tube well adjacent to the Teaching Hospital to the grit chamber tank (provided by the Japanese).

Japanese: Plumbing work from the boundary for municipal water, and plumbing work from the grit chamber tank for well water.

(4) Drainage

Nepalese: Completion of a drain gutter alongside of the site.

Japanese: Completion of drainage facilities (rain water, soil water, and sewage) within the site and septic tank.

(5) Telephone

Nepalese: Preparation of central office lines (up to MDF)

Japanese: Installation and supply of telephone equipment, pipings and cables.

(6) Others

Nepalese:

1. **Provision of area necessary for construction** such as temporary office, working area, stock yards, etc..

2. Supply of water, electric power 400 V/230 V 3 phase 4 wires 50 Hz, and telephone service for construction

3. Priority supply of fuel oil for construction, etc..

Item (1), (6)-1 and (6)-2 shall be completed prior to the commencement of the construction work.

6-3-2 Buildings

Nepalese: Construction of buildings and facilities which are not indicated in the Basic Design Study Report.

Japanese: Construction of buildings and facilities which are indicated in the Basic Design Study Report.

6-3-3 Exterior Work

Nepalese: Landscaping and planting; construction of gate, periphery fence. (including gate and fence between the Academic & Administrative Building and the Student Dormitory.) Completion of the approach road to the site.

Japanese: Completion of the road within the site, exterior work of courtyards (except planting) and parking area, which are indicated in the Basic Design Study Report.

6-3-4 Equipment

Nepalese: Equipment which is not indicated in the Basic Design Study Report.

Japanese: Equipment which is shown in the proposed equipment list of the Basic Design Study Report.

6-3-5 Transportation of Materials

Nepalese: 1. Assurance of prompt unloading and customs clearance at Birganj (Raxaul) for imported materials and equipment for the project. Payment of customs, duties, internal taxes and other fiscal levies for customs clearance, unloading, inland transportation, etc. of imported materials and equipment for the project.

2. Transportation of existing equipment from the Mahaboudha Nurse Campus to the new Campus.

Japanese: Payment for packing, loading, shipping, marine transportation, unloading, insurance and inland transportation of the materials and equipment for the project.

6-3-6 Permission, License and Procedure

Nepalese: To cope with acquisition of permissions and license and procedure of applications for carrying out of the project.

Japanese: Provision of necessary data required for the above-mentioned procedures.

6-3-7 Tax Exemption

Nepalese: To exempt Japanese nationals from customs duties, internal taxes, and other fiscal levies which may be imposed in Nepal on the occasion of the supply of materials, equipment and services for the project.

6-3-8 Rough cost estimate for the Nepalese work

Construction costs of preliminary work and permanent work done by the Nepalese are estimated roughly as follows:

(1) Preliminary Work

1) Leveling Work	52,000 Rs
corresponding to item 6-3-1-(1)	
2) Electric Power Supply	74,000
corresponding to item 6-3-1-(6)-2	
3) Water Supply (Municipal Water)	31,000
corresponding to item 6-3-1-(6)-2	
Total	157,000 Rs

(2) Permanent Work

1) Exterior Work	2,227,000 Rs	
corresponding to item 6-3-3, excluding planting		
2) Transportation of Existing Equipment	8,000	
corresponding to item 6-3-5-2		
3) Curtain Work	122,000	
corresponding to item 6-3-4		
4) Electric Power Supply	70,000	
corresponding to item 6-3-1-(2)		
5) Central Telephone Office Line Service	24,000	
corresponding to item 6-3-1-(5)		
6) Water Supply (Municipal Water)		Water Supply of preliminary work is expected to be used permanently
corresponding to item 6-3-1-(3)-1		
7) Well Water Supply (Piping with well pump from tube well to the grit chamber tank)	7,000	
corresponding to item 6-3-1-(3)-2		
Total	2,458,000	

6-4 Construction schedule

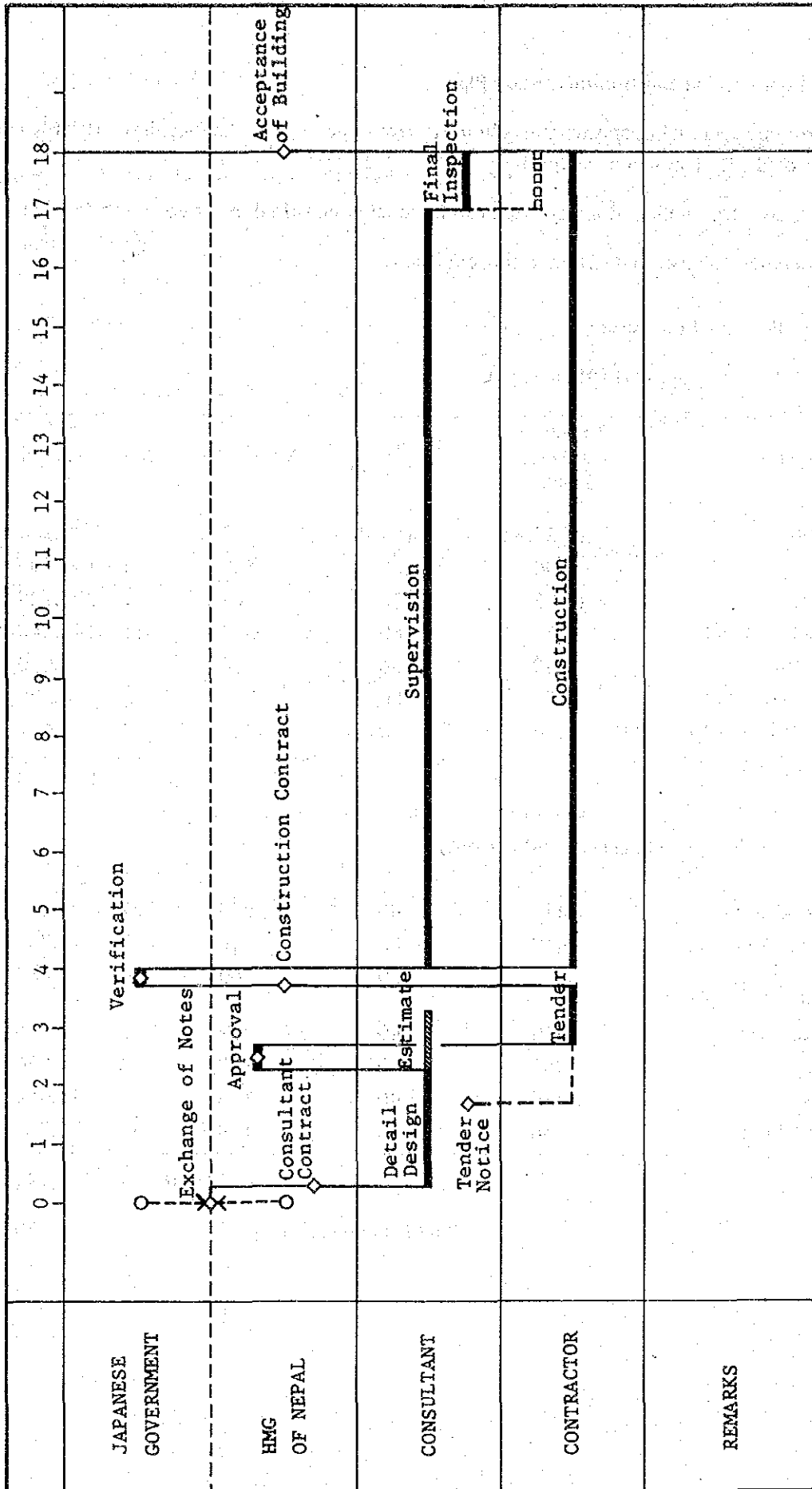


Fig. 6-2 Construction Schedule

6-5 Maintenance and Administration Plan

The estimated annual operating and administrative expenses for the Nepalese after the completion of the Project will be as follows:

The expenses for facility administration can be roughly classified into two categories:

(1) personnel expenses and (2) operating expenses.

(1) Personnel Expenses

1) Teaching staff (46 persons)

Status	Current Monthly Salary	Estimated Increment	Allowance	No.	Annual
Professor	1,825 RS	150 RS	465 RS	1	29,280 RS
Reader	1,500	100	500	4	100,800
Lecturer	1,095	100	369	21	394,128
Assistant Lecturer	875	60	335	11	167,640
Instructor	850	60	320	4	59,040
Deputy Instructor	750	60	310	3	40,320
Assistant Instructor	650	60	308	2	24,432
				Total	815,640 RS

2) Non-Teaching staff (50 persons)

Administrator	1,475	100	910	1	29,820
Assistant Administrator	850	50	330	5	73,800
Account Officer (includes Assistant)	750	50	360	4	55,680
Store Keeper	470	40	289	2	19,176
Typist	355	40	149	2	13,056
Others, Driver	390	40	156	2	14,064
Peon and Others	250	40	128	34	170,544
				Total	376,140 RS

Total Personnel Expenses → 1,191,780 RS

(2) Operating Expenses

Items	Annual Expenses (RS)
Electricity (including expenses for electric range of the Kitchen)	271,000
Municipal Water	23,000
Consumables and Spare Parts	30,000
Stipend	320,000
Other Expenses	408,000
Sub Total	1,052,000
Inflation Allowance (estimated 11.5% annually)	255,870
Total for (2)	1,307,870
Total of Expenses (1) + (2) = 2,499,650 (RS)	

Conclusion

The present estimate of the annual maintenance and administrative expenses for the Nurse Campus is approximately 2,500,000 RS.

This estimate excludes the following items:

1. Food and firewood for the student meals in the Student Dormitory.
2. Increase of expenses due to rising public official wage base.
3. Preparation expenses for opening the campus (moving from the Mahaboudha Nurse Campus, purchasing additional, textbooks, etc.)

Note: If firewood is used exclusively for cooking instead of electricity in the Student Dormitory, total of expenses will be approximately 2,435,000 (RS).

6-6 Procurement and Transportation

Considering the local construction situation, the Project scale, and the whole construction schedule, many construction materials should be imported from Japan or other countries. From the view point of maintenance and operation, the use of Indian products should be considered but it should be remembered that there are some products that would be difficult to use because of quality and delivery time. As for Nepalese products, the main adoptable items are sand, gravel, bricks, terrazzo tiles and wooden furniture. PVC pipe and cement are produced in Nepal, however, they are difficult to use because of varying quality, production capacity and supply conditions. The outline of the procurement plan for the construction materials will be as follows:

1) Materials planned to be procured in Nepal:

- Sand
- Gravel
- Bricks
- Some reinforcing bars
- Concrete blocks
- Wooden furniture
- Some metal fittings
- Some PVC pipes

2) Materials planned to be procured in Japan or other countries:

- Cement
- Reinforcing bars and Light gauge steel
- Metal fittings
- Glass
- Paint
- Interior finishing materials
- Pipes
- Wire and cable
- Lighting fixtures, Socket outlets, Switches
- Ventilation fans, Ceiling fans, Pumps, Sanitary ware
- Panel boards, Substation equipment
- Educational equipment
- Construction Machinery and Tools

There will be no problem with the transportation of construction materials procured in Nepal. With regard to imported materials, 10 to 20 days will be required for delivery to the site from the customs clearance at the Port of Calcutta, including the term of inland transportation in India, the customs clearance at Birganj (Raxaul) (on the border between Nepal and India), and inland transportation in Nepal. Therefore, it will require about 1.5

months for transportation of materials from Japan to the site.

There are some transportation companies in Kathmandu, and transportation is available from Calcutta to the site generally in two ways: Truck transshipment of cargo between Raxaul and Birganj, or transportation from India to Kathmandu without transshipment. In either case, the period of time required for transportation depends upon prompt customs clearance at the Port of Calcutta and Birganj.

Judging from the quality of buildings in Kathmandu, there will be few skilled workers available for the construction project. Therefore, some of the works should be done with the guidance of skilled workers from Japan. Considering the construction schedule and construction work program, proper procurement of labor should be arranged in order to avoid waiting for labor and, thus falling behind schedule.

