

2-3 Basic Design

2-3-1 Design Concept

Shown below is the design concept of the facility and equipment plans, which was worked out taking into consideration the natural conditions, the present state of the project site, the current situation of the local construction industry, the objective of this project and the details of the activities carried out by the Sri Lankan project implementing organization as well as of the project-type technical cooperation program.

(1) Design Concept in Relation to Natural Conditions

① Climatic conditions

Sri Jayewardenepura, which is the project site, is located about 7km inland from Colombo City. It is in a region of high temperatures and humidity. It is therefore essential for the proposed facilities to fit in with the natural conditions of the project site. The proposed facilities should make full use of natural ventilation, be highly durable, provide a comfortable living environment, and be easy to maintain and manage. Close attention should also be paid to the possible effects on the proposed facilities of slanting rain caused by strong winds blowing from southwest during the rainy season.

② Ground conditions

The forms of the foundations of the proposed buildings are to be determined on the basis of the results of the ground survey conducted at the time of the basic study. It is appropriate to divide the project site into Zone A on the southern side and Zone B on the northern side. In Zone A, it is appropriate to employ pile foundation supported by the weathered rock formation (GL-10-

12mm) since the upper part of the ground is not firm (up to GL-6) and load on it may cause uneven subsidence.

In Zone B, spread foundation is to be employed since the surface layer has already been cut off and the ground consists of a sufficiently consolidated silty sand stratum (N value of more than 40).

(2) Design Concept in Relation to the Use of Local Contractors and Locally Available Equipment/Materials

In Sri Lanka, local contractors are conducting business operations very actively, and therefore it will be easy for the Japanese contractor to locate qualified subcontractors in the country. As regards the supply of construction materials, it is possible to procure basic items such as cement, gravel, sand, blocks, bricks, unglazed roof tiles and ceramic tiles in the country. But it will be necessary to use imported aluminum sashes and steel doors or to procure such materials abroad.

In selecting construction materials, therefore, it is important to work out a most economical procurement plan after comparing unit prices, which include transportation cost and domestic taxes in third countries, to ensure reasonably high quality of construction materials.

(3) Design Concept in Relation to the Sri Lankan Project Implementing Organization's Maintenance and Management Capabilities

This project is to construct the country's 11th national school of nursing. As is the case with the 10 existing national schools of nursing, the Building management Department of the Ministry of Health

will be responsible for the maintenance and management of the facilities of the new school of nursing.

However, in view of the fact that at the existing schools of nursing it is difficult to conduct repair works, it is essential to work out a facility plan which makes it easy to clean the floors and walls and which minimizes the maintenance and management costs through the use of highly durable materials.

(4) Design Concept in Relation to the Range and Grades of Facilities and Equipment

① Facilities

In designing the proposed facilities, the design grades should be determined with reference to other similar facilities in the country and Sri Jayewardenepura General Hospital's system for students education. Basically, the proposed facilities should be similar to the existing buildings, namely, they should have necessary and sufficient functions and require minimum maintenance and management.

The most part of the project site is a slope, the maximum difference in ground level between it and the road running in front of it is 11 meters. It has also been found that there are the director's house and a garage, both of which it is not allowed to remove, on the project site. It will therefore be difficult to construct as many low buildings as requested by the Government of Sri Lanka on the project site. There is no alternative but to construct buildings of medium height (with about 4 stories) if the objective of this project is to be attained. As the results of the ground survey show, it will be necessary to employ pile

foundation in some parts of the project site in order to construct buildings of medium height. But it will also be necessary to design the proposed buildings in a manner that minimizes the construction cost.

② Equipment

Basically, the grades of equipment should be similar to those employed for the existing schools of nursing and at the same time meet the new school's curricular requirements. In other words, the grades of equipment should not be unnecessarily high. In the case of those items of equipment whose frequency of use is relatively high, their grades should be so high that the maintenance and management costs may be minimized. As the new school of nursing is to serve as a model school, it will be necessary to install such items of equipment which are not available in the existing schools of nursing. The grades of such items should be determined on the basis of the results of surveys of other similar facilities and the manufacturers concerned.

(5) Design Concept in Relation to the Period of Project Implementation

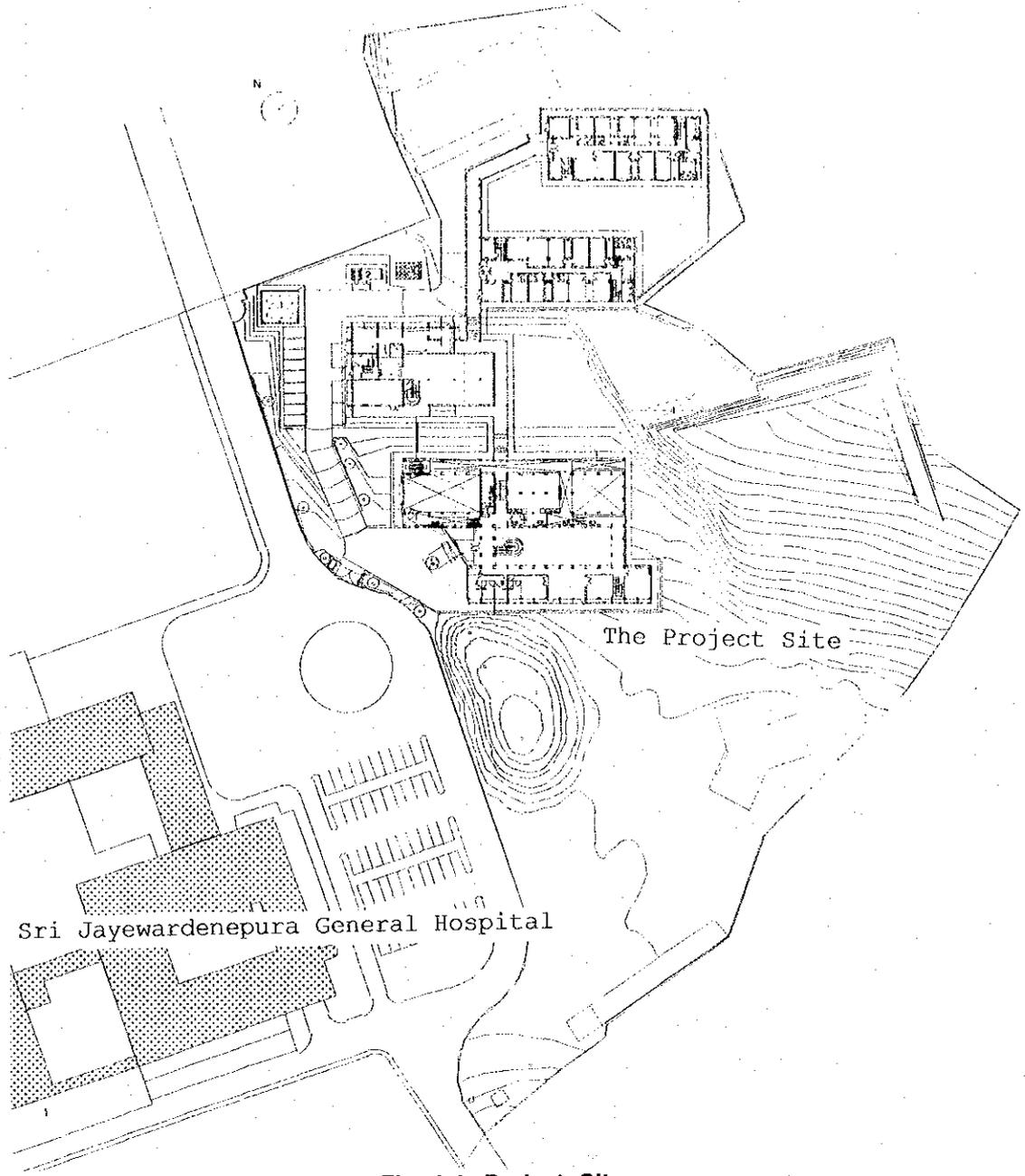
In calculating the period of project implementation, special emphasis should be placed on construction methods in which construction materials are used widely by local contractors so that the implementation of the project may proceed smoothly. It will be necessary, however, to use piles in the foundation work as the results of the geological survey of the project site. Since it is predicted that the progress of the piling work will greatly affect that of the entire project, the construction work should be designed as to make it possible to carry out the piling works for all buildings

simultaneously so that the period of the entire works may be reduced as much as possible.

2-3-2 Basic Design

(1) Site Plan and Facility Arrangement Plan

The project site is located east of the premises of Sri Jayewardenepura General Hospital. The total area of the project site is approximately 20,000m². The project site is a slope with a maximum ground level difference of more than 11 meters. In addition, there are such existing facilities as a garage, the director's house and a heliport, and therefore it is only about half of the total area of the project site that will be available for this project. Shown below is the site plan and the facility arrangement plan for the 4 main buildings to be built under this project.



Sri Jayewardenepura General Hospital

The Project Site

Fig. 2-1 Project Site

1) Floor Plan

The following table shows the floor space of each room and the method of its calculation.

Table 2-5 Floor Plan

Building	Room	No.	Area	Remarks
Academic	1. Entrance Hall	1	133.14	Students in and out are check by security and warden.
	2. Library	1	163.92	2.03m ² /person x 51 + Librarian 10m ² + Counter 4.88m ² + Book stock 45m ²
	3. Multipurpose Rm	1	307.80	0.81 m ² /person x 350 + Stage 24.3 m ²
	4. Equipment Store	1	48.64	For training equipment used in Multipurpose Rm
	5. Store	2	62.43	For storing chairs used in meetings
	6. Office	1	58.00	6.5 m ² /person x 5 + working area 6.5 m ²
	7. Principal's Rm	1	34.13	Working area and meeting area
	8. Store	1	6.30	Store important documents
	9. Vice Principal's Rm	1	27.00	Working area and meeting area
	10. Meeting Rm-1	1	35.06	2.54 m ² /person, for 14 people
	11. Janitor's Rm	1	16.65	Tea serving and room for Janitorial staffs
	12. Tutors' Rm	1	90.85	Working area for 10 tutors
	13. Preparation Rm	1	22.05	Tutor's preparation room and store for training equipment of Technical cooperation
	14. Meeting Rm-2	1	44.10	Seminar room for experts, technical cooperation
	15. Meeting Rm-L	1	89.30	Working room for experts
	16. Toilet	3	53.56	Two rooms for female tutors and one room for male.
	17. Pantry	1	17.48	Tea serving room
	18. Lecture Rm (100)	1	193.03	1.57 m ² x 100 + Stage 27 m ² + Store 9 m ²
	19. Students' Locker Rm-F	1	158.60	0.53 m ² x 285 + hand wash area 18 m ² + ante room 27 m ² + shower 13 m ²
	20. Students' Locker Rm-M	1	27.03	1.5 m ² x 15 + shower 4.5 m ²
	21. Lecture Rm (50, desk)	2	216.00	With student desk
	22. Preparation Rm	1	55.35	Can be used for microscope training
	23. Lecture Rm (50, Chair)	2	162.00	With chair
	24. Preparation Rm	1	27.00	Store and show case for models
	25. Practical Training Rm (Pediatrics)	1	137.25	13.7 m ² x 10 Beds (5 beds, 5 cotts)
	26. Equipment Store	1	38.91	Store training equipment
	27. Practical Training Rm (Clean/Dirty Utility)	1	73.50	According to the layout of training equipment
	28. Practical Training Rm (Ward)	1	335.98	16 m ² x 15 Beds + Washing sink
	29. Equipment Store	1	39.00	Store training equipment
	30. Toilet	2	118.75	One toilet for 15 male, other toilet for 285 female
	31. Machine Rm	1	23.40	Distribution board
	32. Security Rm	1	7.18	

Building	Room	No.	Area	Remarks
	33. Locker Rm-F1	1	18.87	For 9 female tutors with shower
	34. Locker Rm-F2	1	11.83	For 3 female tutors with shower
	35. Locker Rm-F3	1	12.45	For 3 female with shower
	36. Locker Rm-M1	1	12.45	For 2 male + 1 AV technicians
	37. Elevated Tank Rm	1	47.50	
	38. Fun RM	4	42.25	Ventilation room for toilets
	39. Stair, Corridor		1,456.53	
	Total	1	4,430.27	
Common Facilities and Dining Hall	1. Dining Rm	1	218.70	1.4 m ² x 156
	2. Kitchen	1	146.70	According to the layout of equipment
	3. Laundry	1	72.00	According to the layout of equipment
	4. Toilet	2	36.00	One for female staffs, other for male staffs
	5. Cooking Practical Rm	1	127.77	According to the layout of equipment
	6. Preparation Rm	1	27.00	According to the layout of equipment
	7. Tutors' Dining Rm	1	36.00	2.4 m ² x 15
	8. Pantry	1	7.20	Small kitchen for tutors' dining
	9. Change Rm (M)	1	13.50	For 2 drivers, 3 cooks, and security w/shower
	10. Change Rm (M)	1	13.50	For 9 minor staffs w/shower
	11. Change Rm (F)	1	13.50	For kitchen staffs, 3 minor staffs and security w/shower
	12. Change Rm (F)	1	13.50	For 10 minor staffs w/shower
	13. Stair and Corridor	—	191.94	
	Total		917.31	
Hostel	1. Bed Room	35	871.15	8.29 m ² x 3 x 35 rooms
	2. Warden's Rm	1	49.78	25 m ² x 2 x 1 room, w/shower
	3. Tutor's Rm	1	24.89	25 m ² x 1 x 1 room, w/shower
	4. Shower Toilet	7	401.12	1 toilet/5 person, 1 shower/15 person
	5. Meeting Lounge	1	56.02	Multipurpose room for students
	6. Equipment Store	1	15.10	
	7. Maintenance Store	1	24.75	Repair room for equipment and furniture
	8. Stair and Corridor	—	438.62	
	Sub-total		1,881.43	x two buildings
	Total		3,762.86	
Other	1. Septic Tank & Pump House	1	60.00	
	2. Water Tank & Pump House	1	36.50	
	3. Substation	1	5.29	
	4. Garage	1	62.90	
	5. Connecting Corridor	1	378.00	
	6. Cylinder House	1	5.00	
	Total		547.69	
	Grand Total		9,658.13	

2) Section Plan

In working out the section plan, due consideration should be given to protection against rainwater, effective use of natural ventilation and protection against direct sunshine. Particularly protection against rainwater that comes with the northeasterly or southwesterly monsoon is very important. Each building should be provided with deep eaves and balconies.

The project site is a slope with a maximum ground level difference of more than 11 meters and is now part of a rainwater drainage route. In addition, the lowest ground level of the project site is lower than that of the road running in front of it. To cope with such a situation of the project site, a rainwater drainage ditch should be dug around each building. On the other hand, an elevation that fits in with the construction methods used widely in the country should be worked out in light of the above-mentioned factors.

3) Structural Plan

① Outline of the structure

The proposed facilities are divided broadly into 3 blocks -- the administration/academic block, the common facility/dining hall block and the hostel block. These buildings are to be connected to each other any means of passages. The administration/academic building is to have 3 stories, the common facility/dining hall 2 stories, and the hostel 4 stories.

② Foundation forms

The forms of the foundations of the proposed buildings are to be determined the basis of the contents of the report on the geological survey report, the project site can be divided broadly into two zones, namely, Zone A and Zone B. In Zone A at the southern side of the project site (for the administration/academic building and the common facility/dining hall block), the upper part of the ground soil is not so firm (up to GL-6m) and therefore it may cause uneven subsidence if heavy load presses down on it. It is appropriate, therefore, to employ pile foundation supported by the weather rock formation (N value of 30 to 40) which is located at a depth of GL-10m to 12m. In Zone B (for the hostel block), on the other hand, the surface layer has already been cut off and there remains a sufficiently consolidated silty sand layer (N value of more than 40). Therefore spread foundation should be employed for this block.

③ Building frame form

In light of the size of the proposed buildings, the financial consideration on the project, the natural conditions in and around the project site and the present situation of the local construction industry, it was decided to employ reinforced concrete pure Rahmen (frame) structure as the building frame form. Since the ground of the project site is likely to cause the buildings' uneven settlement, all the three blocks should be separated from each other.

④ Load

a. Dead load

The value of dead load is to be calculated on the bases of the type of materials to be actually used.

b. Live load

The value of live load is to be calculated in accordance with the BS Standard. The following table shows the value of live load for each of the main rooms.

Table 2-6 Value of Live Load for Each of Main Rooms

(Unit: kg/m²)

Room	Live load
Office room, Meeting room	255
Lecture room, Training room	306
Toilet	204
Library, Warehouse	800
Dining hall	306

⑤ Materials to be used

Concrete : ready-mixed concrete
F_c=210kg/cm² (4-week compressive strength)

Reinforcing bar : diameter : less than 16mm SD295
F_t=3,000kg/cm²
diameter : 19mm or more SD345
F_t=3,500kg/cm²

Steel frame : SS41 F_t=2,400kg/cm²

4) Electrical Equipment

① Electricity equipment

A service line from the power station to be installed on the project site can be connected to the 33kV overhead power line by means of which Sri Jayewardenepura General Hospital is

receiving electric power from the Ceylon Electricity Board (CEB).

- Power receiving system : 3Ø3W 33kV
- Low tension power system : 3Ø4W 400-230V
- Transformer capacity : 150kVA~250kVA

A sub-station is to be installed on the project site, at a proper distance from the existing director's house. No generator is to be installed since in light of the functions of the proposed facilities, power stoppages are unlikely to affect their operation. As a safeguard against the worsening of the power supply situation in and around the project site, however, the electric circuit system for the proposed facilities should have general circuits and a special circuit for a generator so that a generator may be installed when it becomes necessary to do so. Also as a safeguard against power failures, each of the computers and other similar items of equipment should be provided with a UPS.

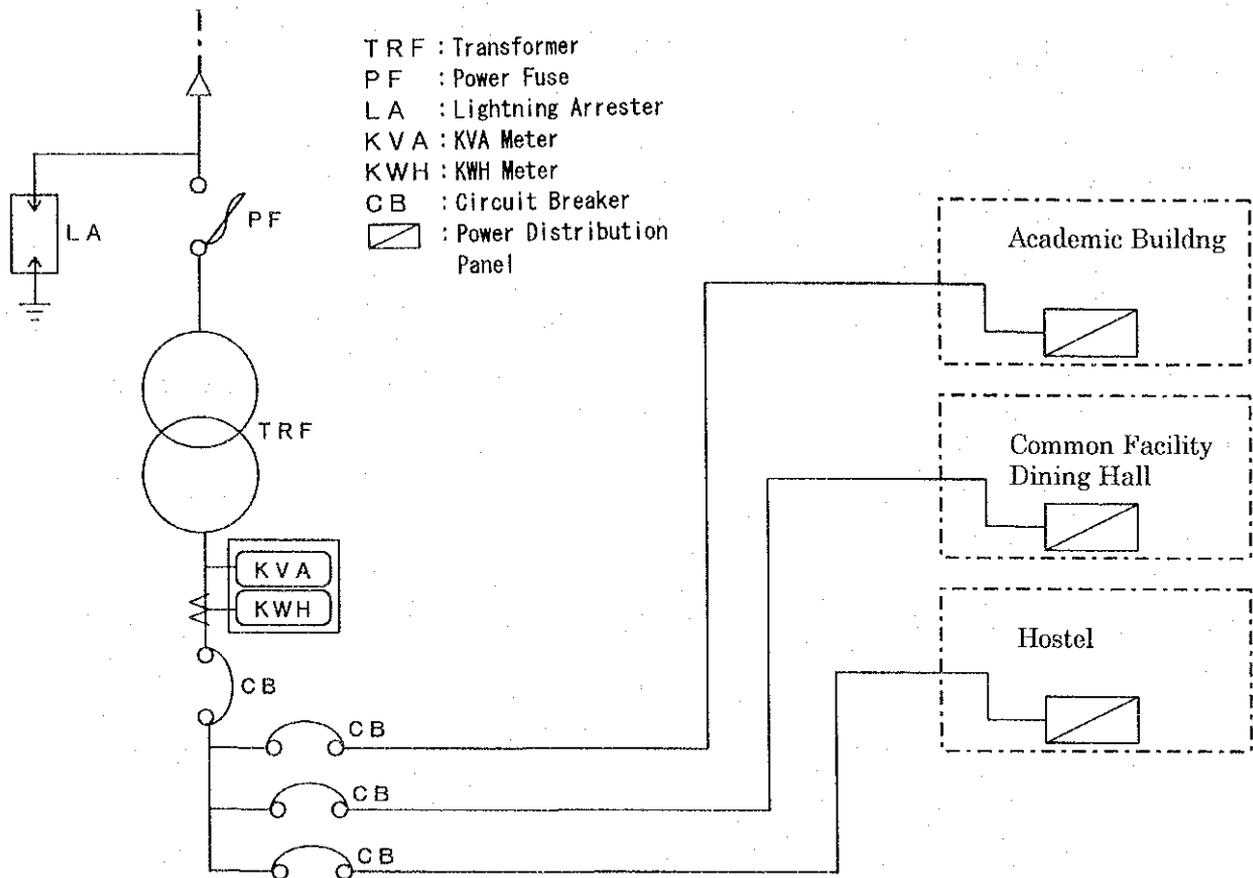


Fig. 2-2 Power Distribution System

② Lighting equipment

In view of the need to minimize the equipment maintenance and management costs, the number of units of lighting fixtures should be minimized by making full use of natural lighting in the lecture rooms and the training rooms, all of which are to be used only in the daytime. On the other hand, sufficient illuminance must be secured by means of lighting fixture for the director's office, the tutor's room, the multipurpose room and the hostel for the students, which are to be used not only in the daytime but also at night and in which it is difficult to make use of natural lighting.

The following table shows the values of illuminance for the main rooms, which were calculated with reference to the values of illuminance in other similar facilities in Sri Lanka. These values are lower than those specified in the JIS Illuminance Standard of Japan, but the results of the field survey indicate that these are sufficient.

Table 2-7 Illuminance (Target Illuminance)

Room	Target illuminance	JIS-specified illuminance
Tutors' room	200 lux	200-750 lux
Multipurpose room	100 lux	75-300 lux
Meeting room	100 lux	200-750 lux
Storage room	50 lux	30-75 lux
Equipment store	50 lux	200-750 lux
Lecture room	100 lux	200-750 lux
Practical training room	200 lux	300-1000 lux
Corridor	Lighting equipment is to be installed where lighting is needed in case of emergency evacuation at night.	
Hostel	Luminance of approx. 30 Lux at night is to be secured.	

* The illuminance in hostels meant to be in the room, additional lighting is necessary at desk.

③ Telephone equipment

A lead-in wire from the MDF of the General Hospital can be connected to the cable terminal in a manhole on the premises of the general hospital.

Five or so telephone lines will be needed to cover 4 telephones and 1 facsimile.

The telephones are installed in each of the following rooms but no switchboard is installed.

- Principal's office, Vice principal's office, tutors' room, Meeting room for experts of technical cooperation

10 extension lines from the general hospital are used for communication between the general hospital and the proposed school. Each of the main rooms should be provided with a pipe to house a telephone wire to cope with future increases in the number of telephones. As for the installation of telephones for use in the project-type technical cooperation program, no such telephones are to be procured and only pipes are to be installed under this project. The material of cable between the boundary of the project to the MDF of the general hospital will be provided by the project. But the installation of the cable will be done by the general hospital.

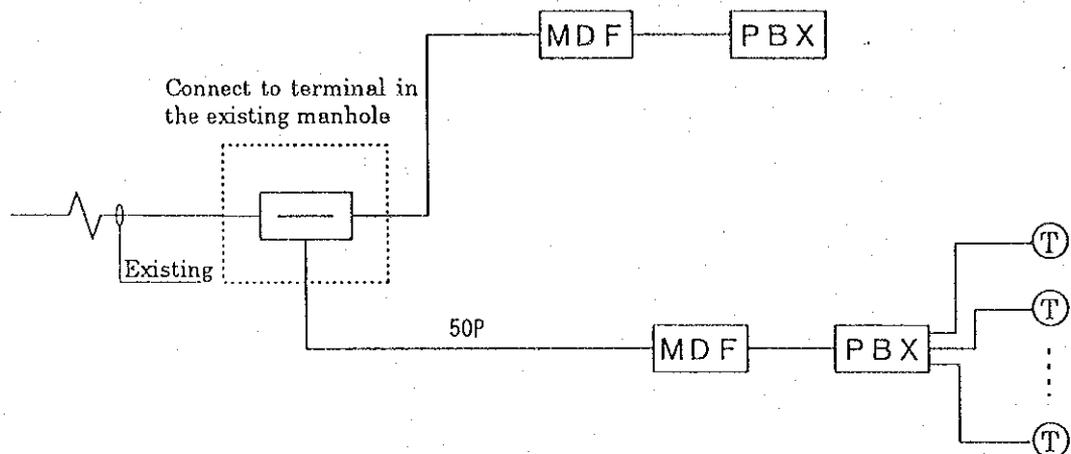


Fig. 2-3 Telephone System

④ Public address system

An amplifier is to be installed in the office room to signal the starting and closing times. The public address system is also to be used for paging.

⑤ Fire alarm systems

An automatic fire alarm system is to be installed in the

hostel, and a manual fire alarm system in the school, in accordance with the instructions of the fire station. The main receiving set is to be installed in the security room of the school, and secondary receiving set is to be installed in the wardens' room of the hostel so that it may be used when there is no one to operate the receiving set at night in the school.

5) Air-conditioning/Ventilation Equipment Plan

① Air-conditioning equipment plan

In principle, only the following rooms are to be air-conditioned to minimize the facility/equipment maintenance and management costs.

- Large conference room, small conference room

All the other rooms are to be equipped with ceiling fans to enhance the comfort of the occupants.

② Ventilation equipment plan

In principle, the proposed facilities are to be ventilated by means of natural ventilation in order to minimize the facility /equipment maintenance and management costs.

However, facilities such as the kitchen, where mist and odor are likely to be generated in large quantities, are to be ventilated by means of ventilation equipment.

6) Plumbing System Plan

① Water supply equipment plan

City water is supplied to the proposed facilities from a water main with a diameter of 200mm \varnothing of the National Water Supply and Drainage Board (NWS & DB).

A service pipe with a diameter of 100mm \varnothing is to be connected to the water main at the northwestern corner of the project site and city water is to be sent to a water receiving tank via a water meter for storage.

City water is to be supplied to the proposed facilities from an elevated water tank. A pump to send city water to the elevated water tank is to be installed in a pump house to be built near the water receiving tank.

The capacities of the water receiving tank and the elevated water tank are calculated as follows.

■ Daily water supply $a + b = 49,200 \text{ lit/day} = 50 \text{ m}^3/\text{day}$

Training school:

Students $300 \text{ students} \times 60 \text{ lit/student} \cdot \text{day} = 18,000 \text{ lit/day}$

Staffers $12 \text{ staffers} \times 100 \text{ lit/staffer} \cdot \text{day} = 1,200 \text{ lit/day}$

$19,200 \text{ lit/person} \cdot \text{day} \dots\dots\dots a$

Residence hall:

Student $300 \text{ students} \times 100 \text{ lit/student} \cdot \text{day}$

$= 30,000 \text{ lit/day} \dots\dots\dots b$

The capacity of the water receiving tank should be one that meets the daily water demand in light of possible water supply stoppages. The capacity of the elevated water tank should be 20 percent of the daily water demand in light of possible power failures.

- Water receiving tank capacity $\dots\dots\dots 50 \text{ m}^3$
- Elevated water tank capacity $\dots\dots\dots 10 \text{ m}^3$

The work to mount a water meter onto the service pipe with a diameter of 100mm \varnothing is to be carried out by the NSW & DB.

② Drainage equipment plan

In principle, indoor sewage and waste water are to be discharged separately and outdoor sewage and waste water are to be discharged jointly into a septic tank to be installed in the project site. The treated sewage and waste water are to be discharged into the existing drainage basin. Since the existing drainage basin is located at the highest part of the project site, the treated sewage and waste water are first to be stored into the treated waste water storage tank and then to be pumped up and discharged into the existing drainage basin. The treated waste water tank should have a capacity to store the daily volume of treated waste water. Rainwater is first to be discharged into side ditches to be dug around the proposed facilities and then to be discharged into a rainwater control pond to be dug in the project site, from which it is to be discharged into the existing side ditch, which is located on the eastern side of the project site.

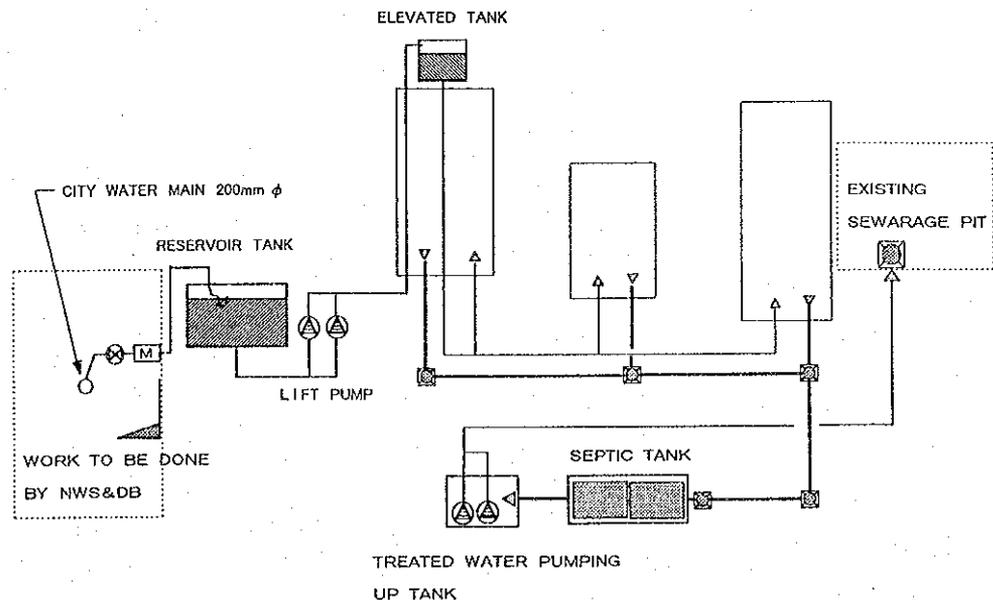


Fig. 2-4 Plumbing System

③ Sanitary fixture plan

Each toilet is to be equipped with a sanitary fixture in accordance with the architectural plan.

In Principle, Western-style toilet stools are to be installed.

④ LP gas equipment plan

As there is no city gas supply facility near the project site, LP gas equipment is to be installed as the heat source for the kitchen. LP gas is to be supplied from gas cylinders installed all together in a proper place.

⑤ Fire extinguishing equipment plan

Indoor fire extinguishers are to be installed in numbers large enough to cover all the proposed facilities in accordance with the BS Standard and Singapore's relevant standard(s).

Since no generator for emergency use is to be installed under this project, engine-powered fire hydrant pumps should be procured as a safeguard against power failures.

7) Construction Material Plan

Construction materials to be used for the construction of the proposed facilities should be functionally fit in with the local climatic conditions, the local customs and the construction methods used widely by local contractors and which make it easy to retain the durability of the proposed facilities and to maintain and manage them.

① Main structural materials

List of structural materials to be used in the project (by part of structure)

Part of structure	Material	Remarks
Foundation, Column, Beam, Floor	Reinforced concrete	They are all used widely in the country. Ready-mixed concrete is available from local suppliers. Reinforcing bars are to be imported.
Wall	Brick	Bricks were used widely in the country and locally made bricks are very workable and economical.

② Exterior finishing materials

List of finishing materials to be used in the project (by part of structure)

Part of structure	Material	Remarks
Roof	Asphalt membrane waterproofing, lightweight block	They are commonly used in the country. They excel in terms of workability and cost.
Exterior wall	Brick	Bricks are used widely and efficiently in the country, and locally made bricks are highly durable and easy to maintain and manage. They also excel in design.
Fittings	Aluminum sash	Aluminum sashes can be assembled on the spot and are therefore easy to maintain and manage. They also excel in durability and design.

③ Interior finishing materials

List of finishing materials to be used in the project (by part of structure)

Room	Floor	Wall	Ceiling	Remarks
Lecture room, Conference room, Library	Terrazzo	Facing brick	Rock wool acoustic tile	They excel in durability and function. They also are easy to maintain and manage and excel in design.
Multipurpose room, Training room	Terrazzo	Facing brick	Exposed concrete, paint	They are highly durable and economical. They are also easy to repair.
Warehouse, Equipment storage	Cement mortar	Brick	Exposed concrete, paint	They excel in durability and are easy to maintain and manage.
Toilet, Shower room	Mosaic tile	Ceramic tile	Exposed concrete, paint	They excel in durability and function and are easy to maintain and manage.
Hostel	Terrazzo	Facing brick	Exposed concrete, paint	They are highly durable and economical and are also easy to maintain and manage.

8) Equipment Plan

In working out the equipment plan, the required items and quantities of equipment were determined on the basis of the draft

list of the required items of equipment, which was prepared based on the results of the field survey and the discussions with the project-type technical cooperation team. Underlying the above-mentioned work were the need to improve the quality of nursing training in Sri Lanka and to promote the smooth progress of the technical cooperation team's action plan. Shown below are the guidelines for the preparation of the equipment plan.

1. To place emphasis on the choice of those items of equipment which are required to make the function of the new school of nursing as a viable model school of basic training in nursing and which meet the Government of Sri Lanka's educational policy.
2. To determine the quantities of each item of equipment on the basis of the total number of students to enroll in the new school of nursing so that all the students may study each subject efficiently.
3. To place emphasis on local procurement of the chosen items of equipment for greater economy and better maintenance.
4. To procure special items of equipment from Japan for educational use, such as models, which are hard to procure locally and which may cause problems in terms of quality.
5. In the case of items of equipment that require careful maintenance and management, priority is to be given to those which are available from local distributors who have sufficient maintenance and management capabilities.
6. To procure locally those appliances which do not require maintenance.

The grades of the items of equipment to be chosen should basically be similar to the grades of those owned by the existing schools of nursing. In other words, those items of equipment which can be made full use of to attain the goal of this project, not those of

unnecessarily high grade, are to be chosen. A few items of equipment which are not available in the existing school of nursing are to be procured for the new school. The grades of these items of equipment are to be determined on the basis of the results of the survey of other similar institutions and the local suppliers concerned.

Items of equipment which are to be procured under this project can be divided broadly into the following types.

- ① Nursing Education Equipment
- ② General Education Equipment
- ③ Furniture, fixtures and other
- ④ A/V Equipment
- ⑤ Vehicle

Table 2-8 Equipment List

★ Marks indicates that the equipment required by the project-type Cooperation and added in the list.

△ Marks indicates that the equipment required by the project-type Cooperation and increased the number.

Nursing Education Equipment

No.	Equipment name	Q'ty	Funda- mental of nurse	Medical Surgical	MCH	Anatomy Physiology	Nutrition	Science/ Micro- biology	Pharma- cology
1	Human Anatomical Model, Male Figure	1				○			
2	Human Anatomical Model, Female Figure	1				○			
3	Human Skeleton Model, Articulated	1				○			
4	Human Skeleton Model, Disarticulated	1				○			
5	Model of Circulatory System	1				○			
6	Model of Skull	1				○			
7	Model of Anatomical Heart	1				○			
8	★ Model of Dynamic Heart with ECG	1				○			
9	Model of Respiratory Organs	1				○			
10	Model of Digestive Organs	1				○			
11	Model of Brain	1				○			
12	Model Nervous System	1				○			
13	Model of Muscle of Human Body	1				○			
14	★ Model of Muscle of Upper extremity Model	1				○			
15	Model of Section of Skin	1				○			
16	Model of Eye	1				○			
17	Model of Ear	1				○			
18	Model of Teeth	1				○			
19	Model of Nasal Cavity/Throat/Pharynx	1				○			
20	Model of Kidney and Urinary System	1				○			
21	Model of Pelvis	1				○	○		
22	Model of Pregnant Uterine	1				○	○		
23	Model of Development Stage of Fetus	1				○	○		
24	Model of Conception System	1				○	○		
25	Model of Parasites in Human Body	1				○		○	
26	Model of Feces of Child	1				○			
27	Model of Tracoma	1				○			
28	Model of Alveolar Pyorrhea	1				○			
29	Model of Pathogenic Microbes	1				○		○	
30	Anatomical Charts	1				○			
31	X-ray Film Viewer	1		○		○			
32	Training Dummy	5	○	○					

No.		Equipment name	Q'ty	Funda- mental of nurse	Medical Surgical	MCH	Anatomy Physiology	Nutrition	Science/ Mico- biology	Pharma- cology
33		Case for Training Dummy	2							
34		Dummy for Baby Care	2	○	○	○				
35		Training Dummy for Baby Bath	15			○				
36		Training set for Mammy Massage	1			○				
37		Phantom for Delivery	2			○				
38	★	Pregnancy Palpation Simulator	2			○				
39	★	Dressing Simulator	1	○	○					
40	★	Blood Collection and I. V. Injection, Simulator	3	○						
41	★	I. M. Injection Simulator	3	○	○					
42	★	Catheterize Simulator, Male	1	○	○					
43	★	Catheterize and Enema Simulator, Female	15	○	○					
44		Resuscitation Training Dummy, Adult	1	○						
45		Nebulizer, Portable Type	2	○	○	○				
46	★	Automatic Resuscitator	1	○	○	○				
47		ECG, Portable Type	1	○	○					
48		Emergency Instrument Set	1	○	○	○				
49	★	Oxygenator	1	○	○	○				
50	★	Panel with Oxygenator & Suction	1	○	○	○				
51	★	Electric Suction Unit	1	○	○	○				
52	★	Oxygen Tent	1	○	○	○				
53	★	Incubator	1			○				
54	★	Standard Gatch Bed	15	○	○					
55	★	Mattress for Gatch Bed	15	○	○					
56		Paediatric Bed with Mattress	5	○	○	○				
57		Mattress for Paediatric Bed	5	○	○	○				
58		Baby Bassinet with Casters	5	○		○				
59	△	Bed Side Table	15	○	○	○				
60	△	Bed Side Chair	15	○	○	○				
61	△	Over Bed Table (Two Legs)	9	○	○	○				
62	△	Over Bed Table (One Leg)	6	○	○	○				
63	△	Screen	10	○	○	○				
64	★	Set for Bed Making (Adult)	30	○	○					
65	★	Set for Bed Making (Infant)	10	○		○				
66	★	Linen for New Born Baby	10			○				
67		Shampoo Cart	1	○	○	○				
68	△	Shampoo Tray Set	15	○	○	○				
69	★	Shampoo Chair	1	○	○	○				
70	★	Bed Bath Set	15	○	○	○				
71		Baby Bath Set	15			○				

No.		Equipment name	Qty	Funda- mental of nurse	Medical Surgical	MCH	Anatomy Physiology	Nutrition	Science/ Micro- biology	Pharma- cology
72		Table for Baby Bath	3			○				
73	★	Mouth Care Set	15	○	○	○				
74	★	Pajamas for Patient	2	○	○					
75	★	Clothes for New Born Baby	15			○				
76	△	Back Rest	5	○	○	○				
77	△	Over-bed Cradle	5	○	○	○				
78		Decubitus Protecting Mattress	1	○	○					
79		Round Sitting Sand Bag, assorted	1	○	○	○				
80		Splint, assorted	3	○	○					
81	★	Fixing Belt	2	○	○	○				
82		Wheel Chair (Adult)	2	○						
83	★	Wheel Chair (Infant)	1	○		○				
84		Stretcher	1	○	○	○				
85		Walking Aid with Casters & Saddles	1	○						
86		Litters	1	○						
87		Bedpan Rack	1	○						
88	★	Bedpan Cleaner	1	○						
89	△	Enema Set	15	○	○	○				
90	★	Bedpan	10	○	○	○				
91	★	Urinal	5	○	○	○				
92	★	Scale	1	○	○					
93	★	Set for Stoma	1	○	○					
94	★	Feeding Tube Set	5	○	○	○				
95		Conception Control Training Set	1		○	○				
96		Set for Milk Preparation	1			○				
97	△	Milking Device, Hand Type	15			○				
98		Examination Instrument Set	2	○						
99		Traube's Obstetric Stethoscope	5			○				
100		Ear Scope	1	○	○					
101		Nasal Scope	1	○	○					
102		Proctoscopes	1	○	○					
103		Vaginal spectrum (large)	1	○	○	○				
104		Vaginal spectrum (medium)	1	○	○	○				
105		Vaginal spectrum (small)	1	○	○	○				
106		Set for Stomach Pump	1	○	○					
107	△	Irrigator Stand	5	○	○	○				
108	★	I. V. Set	15	○	○	○				
109	★	Eye Applicator	1 box	○	○					
110	★	Examination Bed	1	○						

No.		Equipment name	Q'ty	Funda- mental of nurse	Medical Surgical	MCH	Anatomy Physiology	Nutrition	Science/ Mico- biology	Pharma- cology
111	★	Examination Chair	1	○						
112		Operating Instrument Set	1	○	○					
113		Linen for Surgery	2	○	○					
114		Delivery set	1	○		○				
115		Tracheotomy Instrument Set	1	○	○	○				
116	★	Lumber Puncture Instrument Set	1	○	○	○				
117		Medication Trolley Set	1	○		○				○
118	★	Medication Set	2	○		○				○
119	★	Ice, Hot Bottle	5	○		○				○
120	★	Blanket	3	○	○	○				
121	★	Ice Cube Machine	1	○	○	○				
122		Boiling Sterilizer (large)	1	○	○					
123		Boiling Sterilizer (small)	1	○	○					
124		Gauze Drum (large / small)	5	○	○					
125	△	Instrument Trolley	15	○	○	○				
126	★	Set for Dressing	2	○	○					
127	★	Kidney Tray (large / Medium / Small)	15	○	○					
128	★	Waste Receptacle	2	○	○					
129	★	Shaving Set	5	○	○					
130	★	Wash Basin	10	○	○	○				
131	★	Wash Basin Stand for Two Basins	4	○	○	○				
132	★	Wash Basin Stand for One Basin	2	○	○					
133	★	Brush Case Stand with pedal	1	○	○					
134	△	Blood Sedimentation Rack with Pipettes	5	○						
135	★	Urinometer with Pipettes	2	○						
136		Weighing Scale (Adult)	1	○		○				
137		Weighing Scale (Infant)	1	○		○				
138		Measuring Rod (Adult)	1	○						
139		Measuring Rod (Infant)	1	○		○				
140		Dynamometers	1	○						
141		Breisky's Pelvimeter	2	○		○				
142	★	Chart of sight Test	1	○	○					
143	★	Rotary Spirometer	1	○						
144	★	Martin's Body Measure	1	○						
145	★	Baby Head Measure	1	○		○				
146	△	Sphygmomanometer (mercurial compact type)	25	○	○	○				
147	★	Sphygmomanometer (mercurial stand type)	2	○	○	○				
148	★	Sphygmomanometer (Aneroid)	2	○	○	○				

No.		Equipment name	Q'ty	Funda- mental of nurse	Medical Surgical	MCH	Anatomy Physiology	Nutrition	Science / Mico- biology	Pharma- cology
149	△	Temperature Taking Set	15	○	○	○				
150	★	Stethoscope (Adult)	25	○	○	○				
151	★	Stethoscope (Teaching)	2	○						
152	★	Stethoscope (Infant)	2	○		○				
153	★	Thermometer (Digital)	1	○	○	○				
154	★	Thermometer (Oral)	1	○	○	○				
155	★	Thermometer (Rectal)	1	○	○	○				
156	★	Microscope	1		○		○		○	
157	★	Gas Stove	6	○	○	○		○		
158	★	Food Model	1		○	○		○		
159	★	Sauce Pan Set	6	○	○	○		○		
160	★	Kitchen Equipment Set	6	○	○	○		○		
161	★	Set of plates and cups	6	○	○	○		○		
162	★	Wagon	6	○	○	○		○		
163	★	Scale	6	○	○	○		○		
164	★	Measuring Cup Set	6	○	○	○		○		
165	★	Rice Cooker	1	○	○	○		○		
166	★	Micro Wave	1	○	○	○		○		
167	★	Refrigerator	1	○	○	○		○		

General Education Equipment

No.		Equipment name	Q'ty	Location
1	★	White Board with caster	4	Lecture Room
2	★	Chart Stand	5	Lecture Room

Furniture, fixtures and other

No.		Equipment name	Q'ty	Location
1	★	Safe	1	Tutor's Room
2	★	Refrigerator	3	Tutor's Room
3	★	Printing Machine	1	Tutor's Room
4	★	Washing Machine	1	Practical Training room
5		Education/Training Furniture	whole set	Various Room

A/V Equipment

No.		Equipment name	Q'ty	Location
1	★	Video Monitor Set (50)	4	Lecture Rms (50)
2	★	Portable PA Amprifier Set (50)	4	Lecture Rms (50)
3	★	Video Monitor Set (100)	1	Lecture Rms (100)
4	★	PA System (100)	1	Lecture Rms (100)
5	★	PA System (Multipurpose)	1	Multipurpose Rm
6	★	Hi8 Video Camera	1	Meeting Rm
7	★	Over Head Projector (OHP)	1	Meeting Rm
8		Direct Projector	2	Meeting Rm
9		Spare Parts	1	

Vehicle

No.		Equipment name	Q'ty	Remarks
1		Bus	1	30 passenger (One driver included)

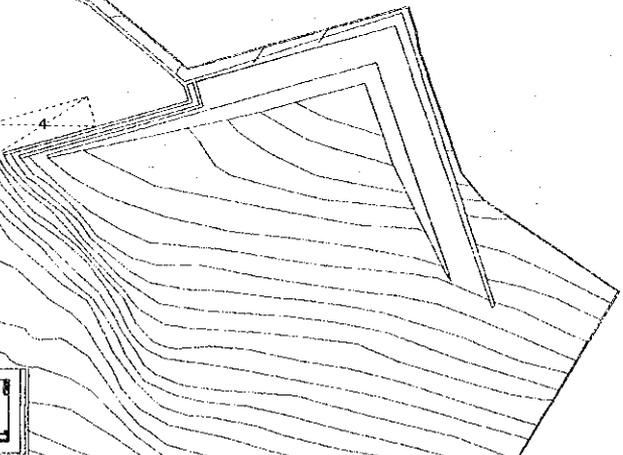
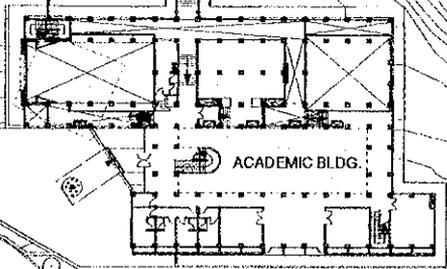
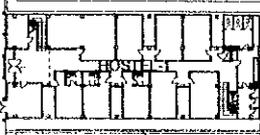
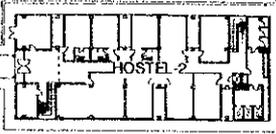
9) Basic Design Drawings

- | | |
|-----------------------------------|--------------------------|
| 1. Site Plan | |
| 2. Academic Building | Ground Floor Plan-1 |
| 3. Academic Building | Ground Floor Plan-2 |
| 4. Academic Building | First Floor Plan |
| 5. Academic Building | Second Floor Plan |
| 6. Academic Building | Elevation |
| 7. Academic Building | Elevation |
| 8. Academic Building | Section |
| 9. Common Facilities Dining Hall | Ground Floor Plan |
| 10. Common Facilities Dining Hall | First Floor Plan |
| 11. Common Facilities Dining Hall | Elevation |
| 12. Common Facilities Dining Hall | Elevation |
| 13. Common Facilities Dining Hall | Section |
| 14. Hostel | Ground Floor Plan |
| 15. Hostel | First ~ Third Floor Plan |
| 16. Hostel | Elevation |
| 17. Hostel | Section |



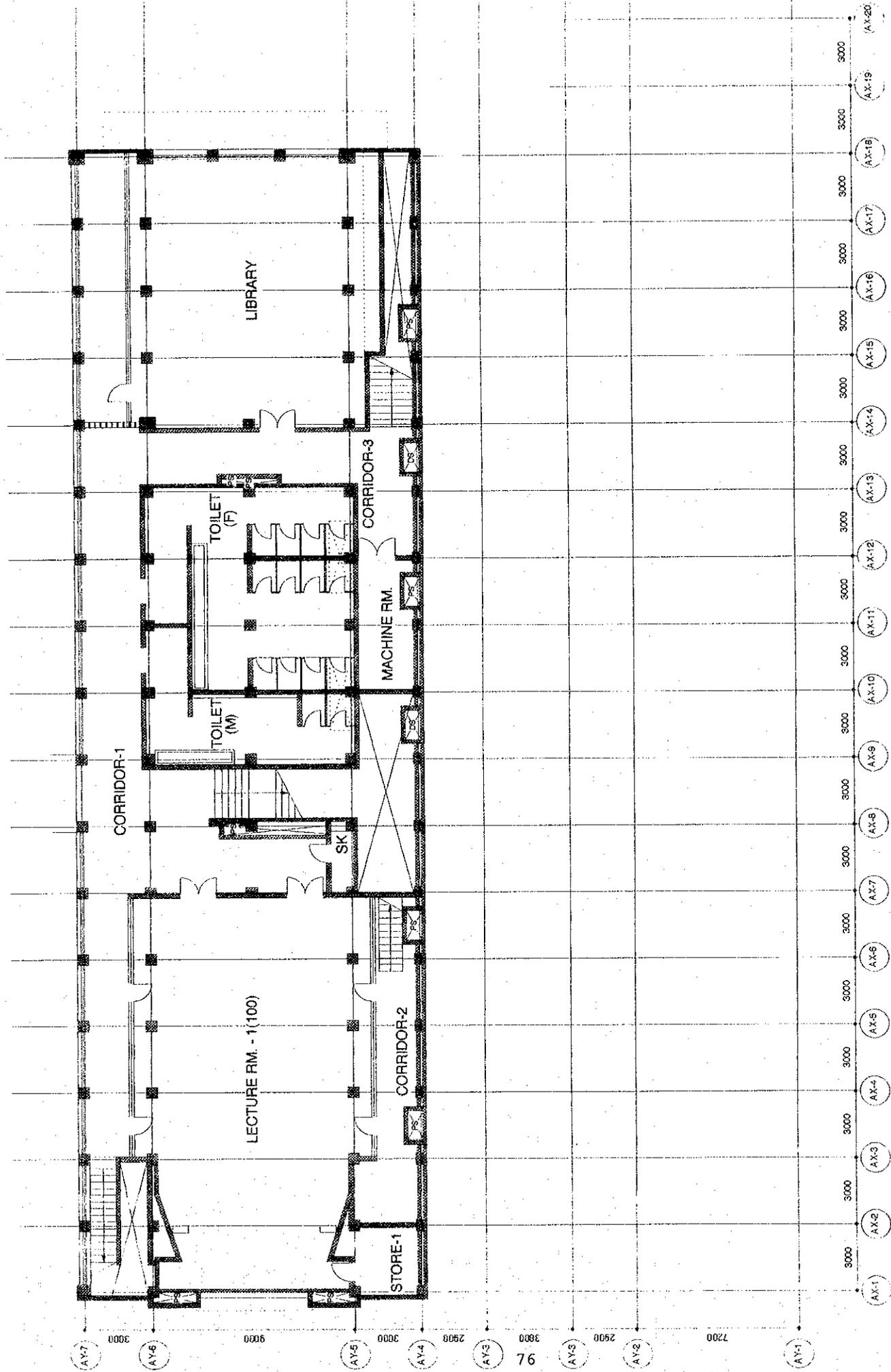
FUTURE EXPANSION SITE
FOR HOSTEL-3

- 1 GARAGE
- 2 PUMP & GAS CYLINDER HOUSE
- 3 WATER RESERVOIR TANK
- 4 SEPTIC TANK

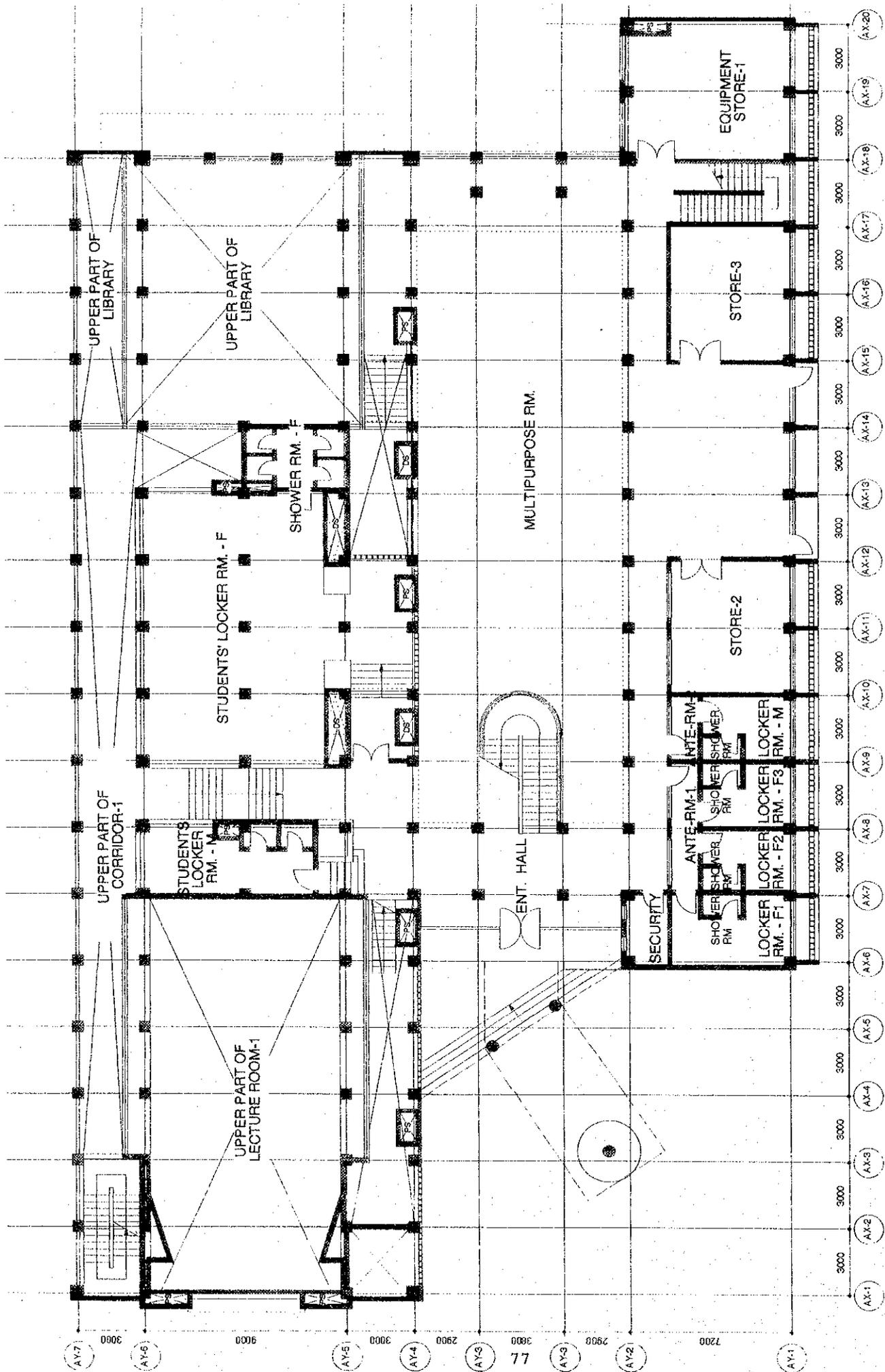


SJGH EXISTING BUILDINGS

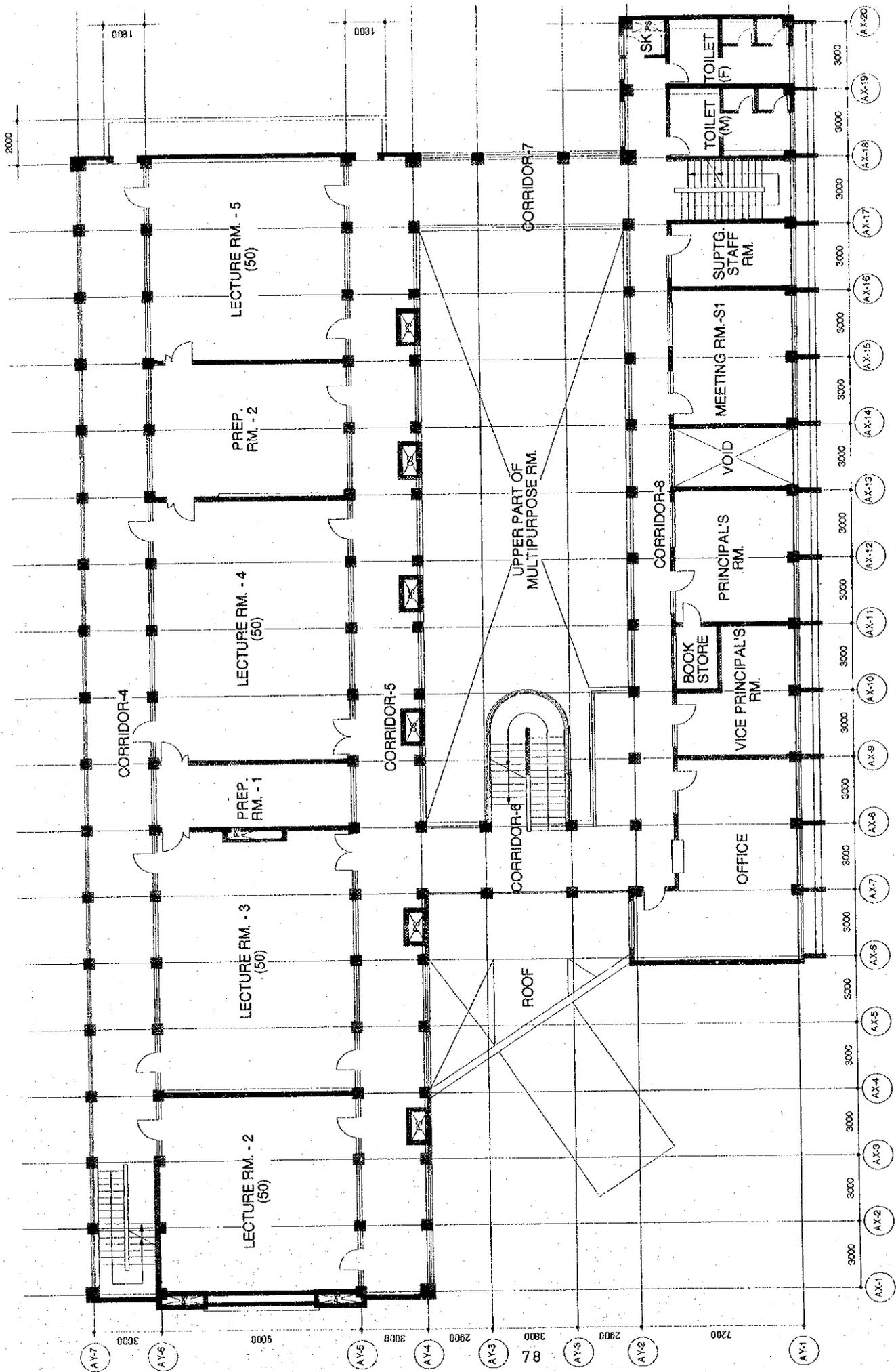
SITE PLAN



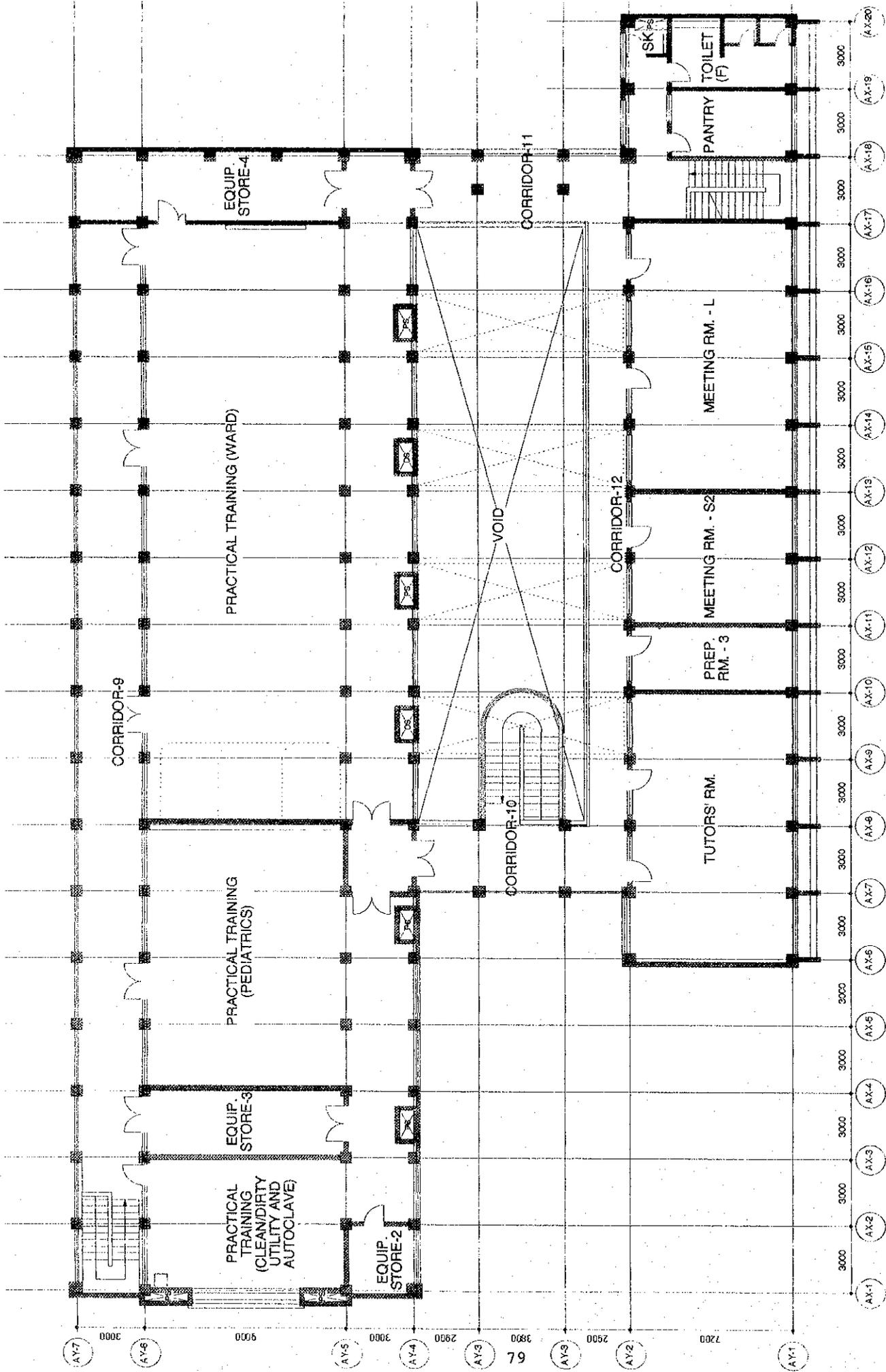
ACADEMIC BUILDING GF(1) PLAN



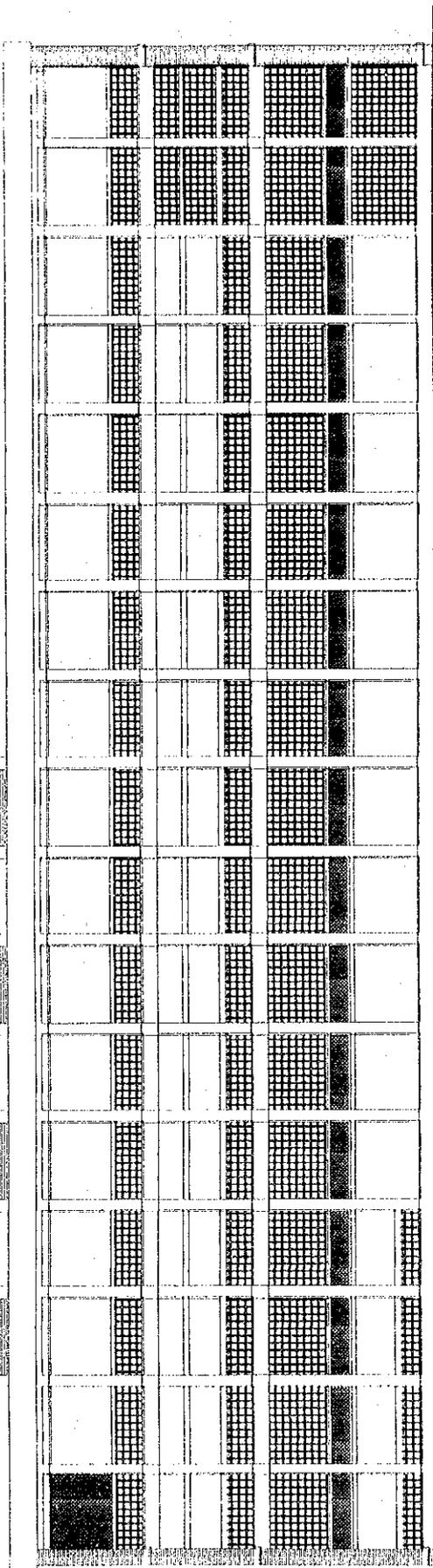
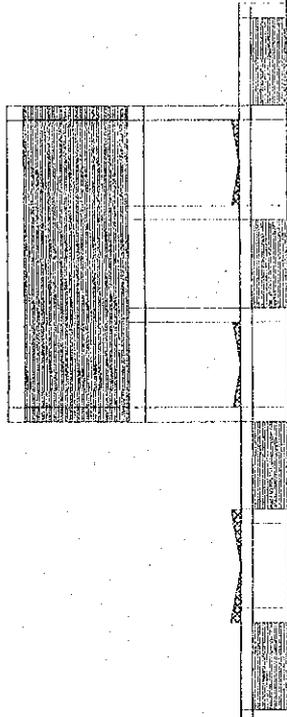
ACADEMIC BUILDING GF(2) PLAN



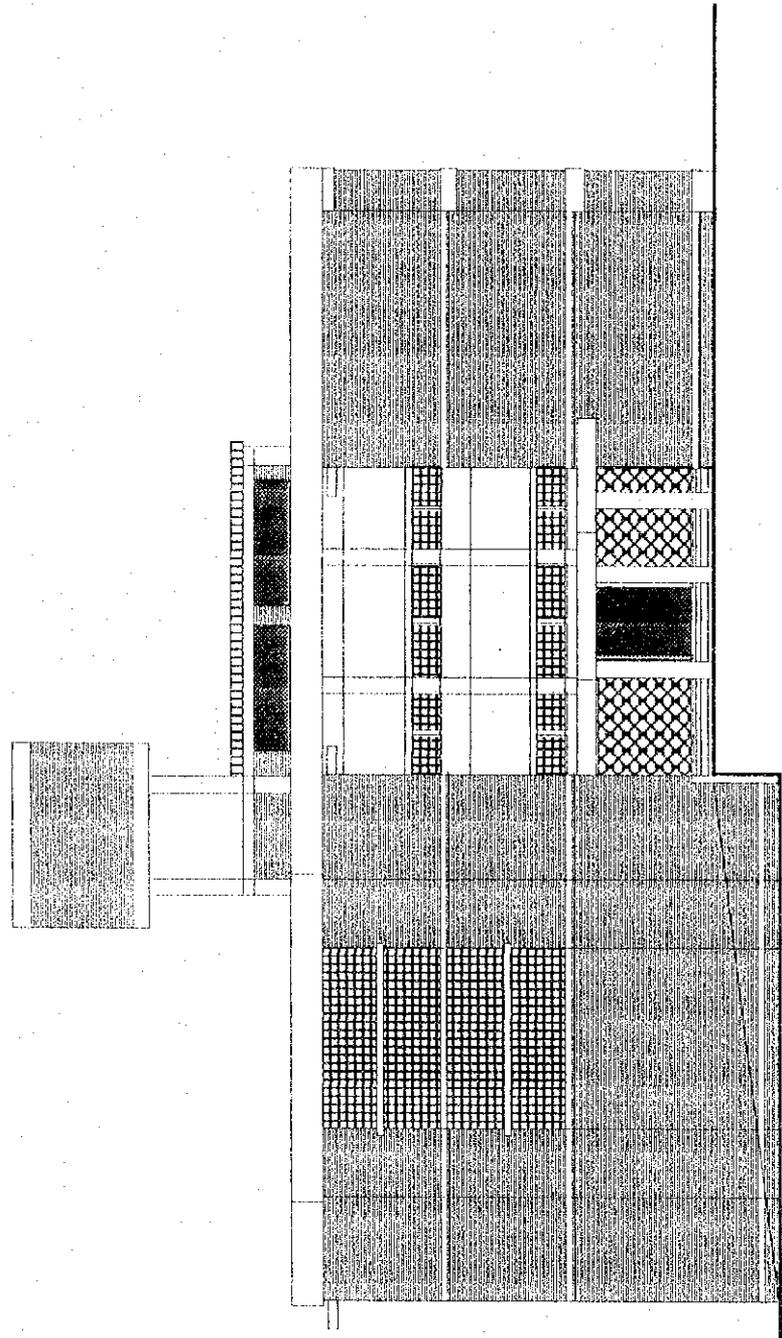
ACADEMIC BUILDING 1F PLAN



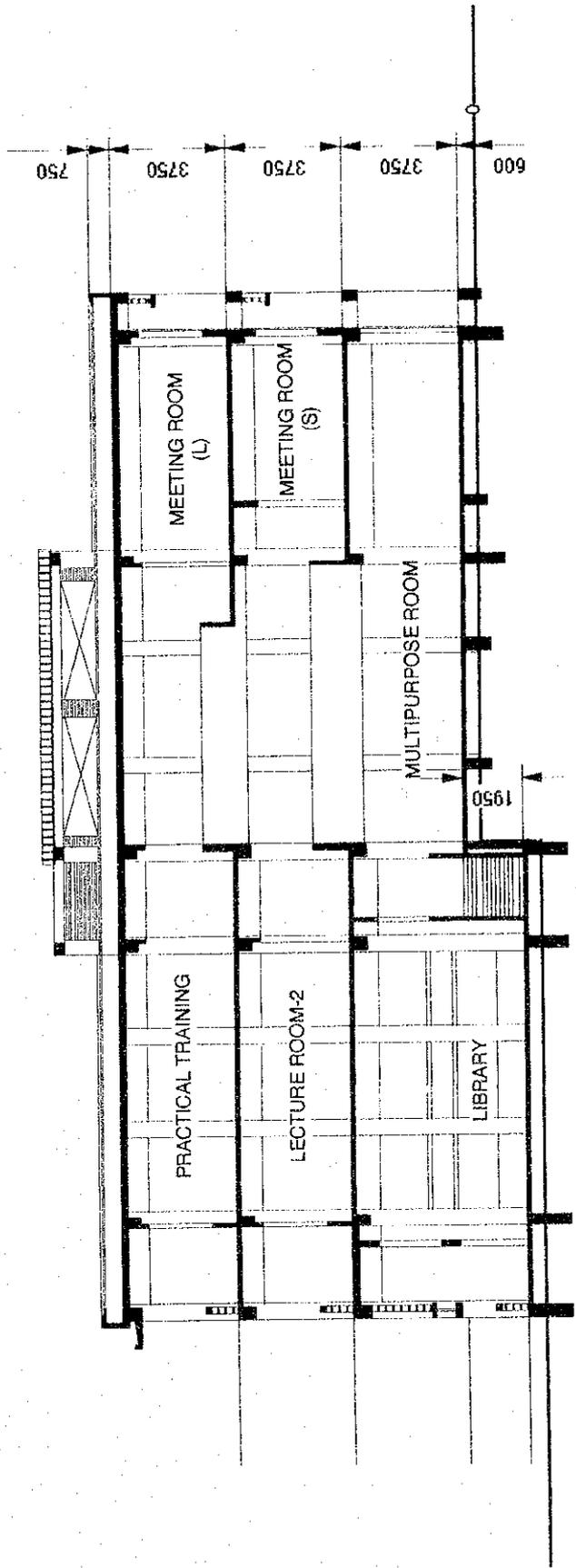
ACADEMIC BUILDING 2F PLAN



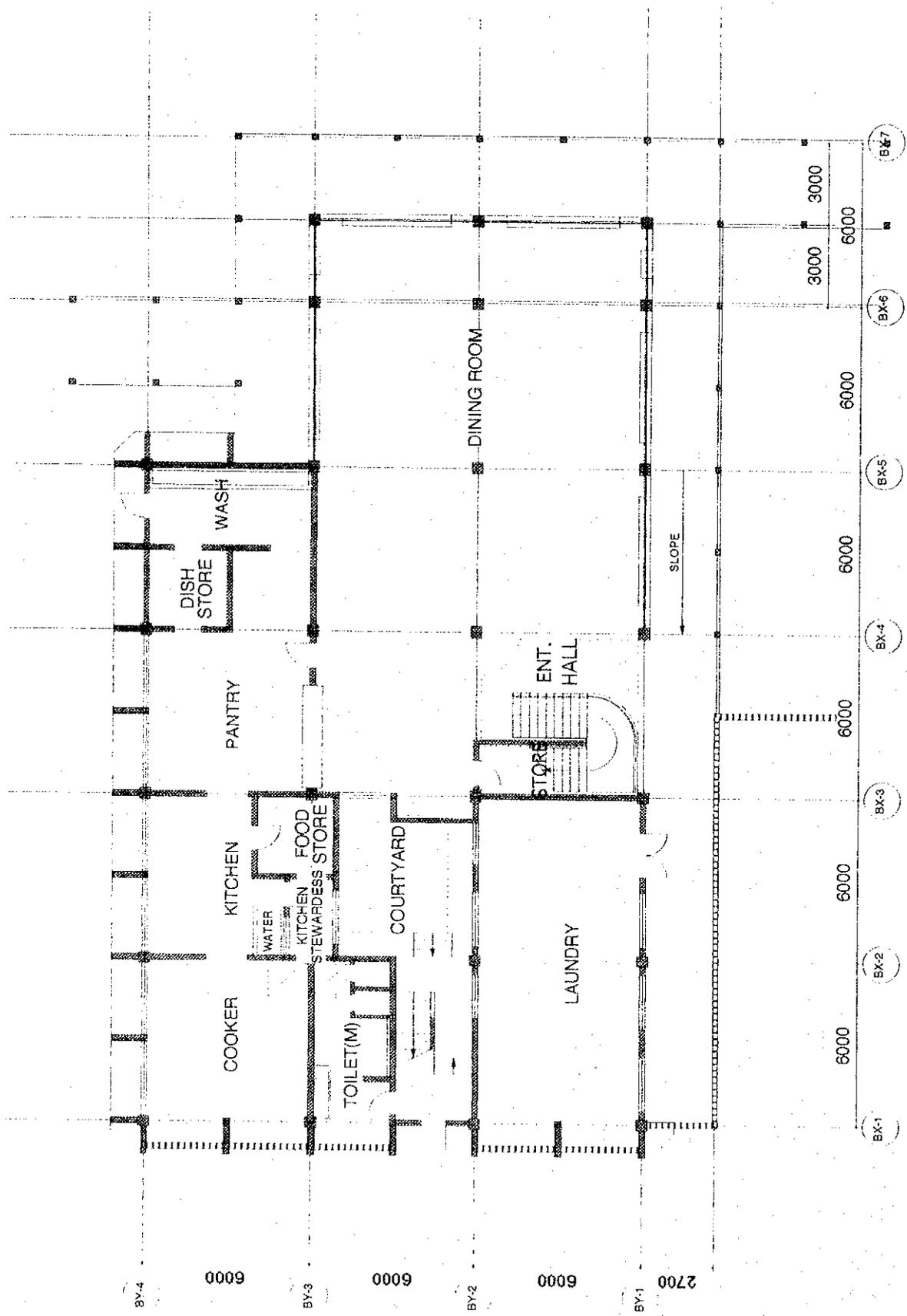
ACADEMIC BUILDING NORTH ELEVATION



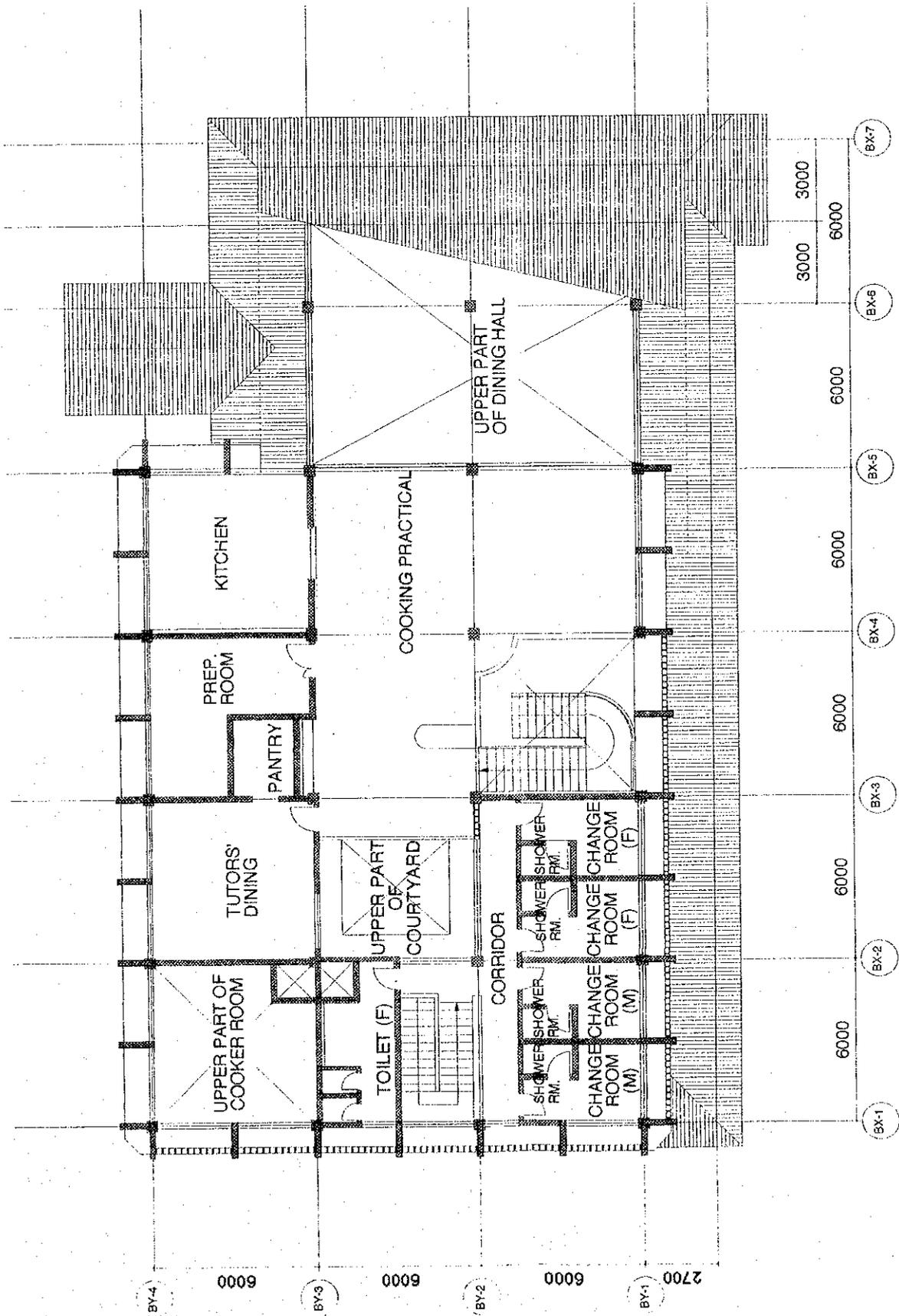
ACADEMIC BUILDING WEST ELEVATION



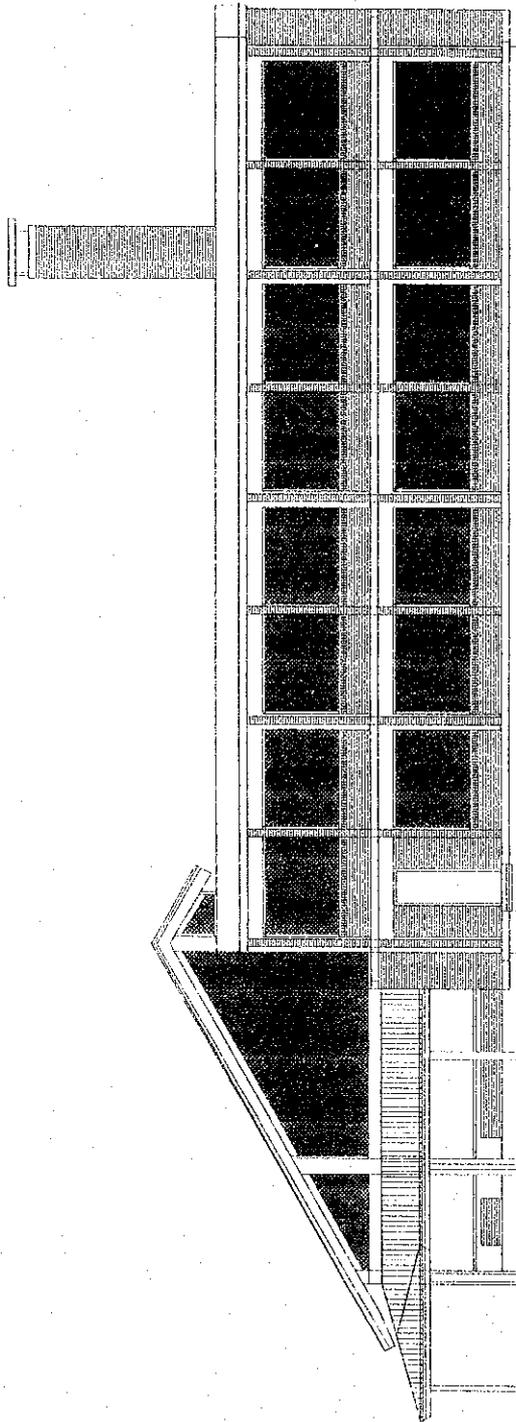
ACADEMIC BUILDING A-A SECTION



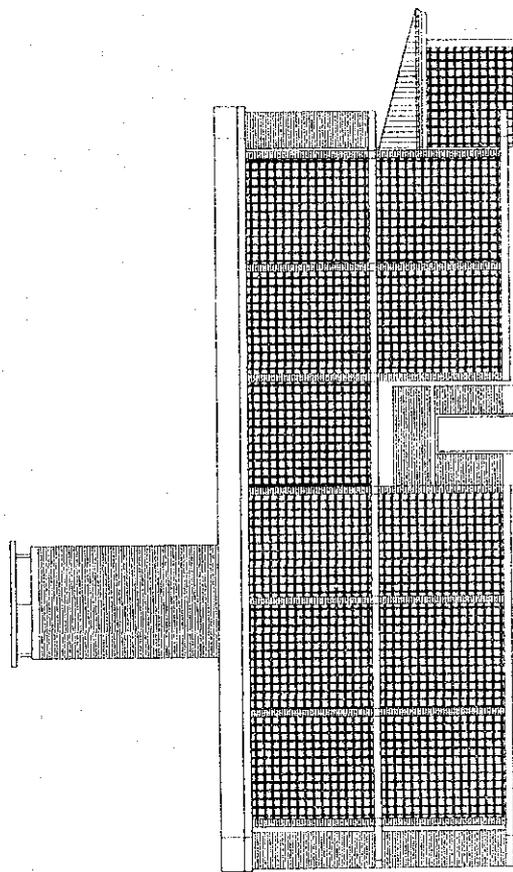
COMMON FACILITIES & DINING HALL GF PLAN



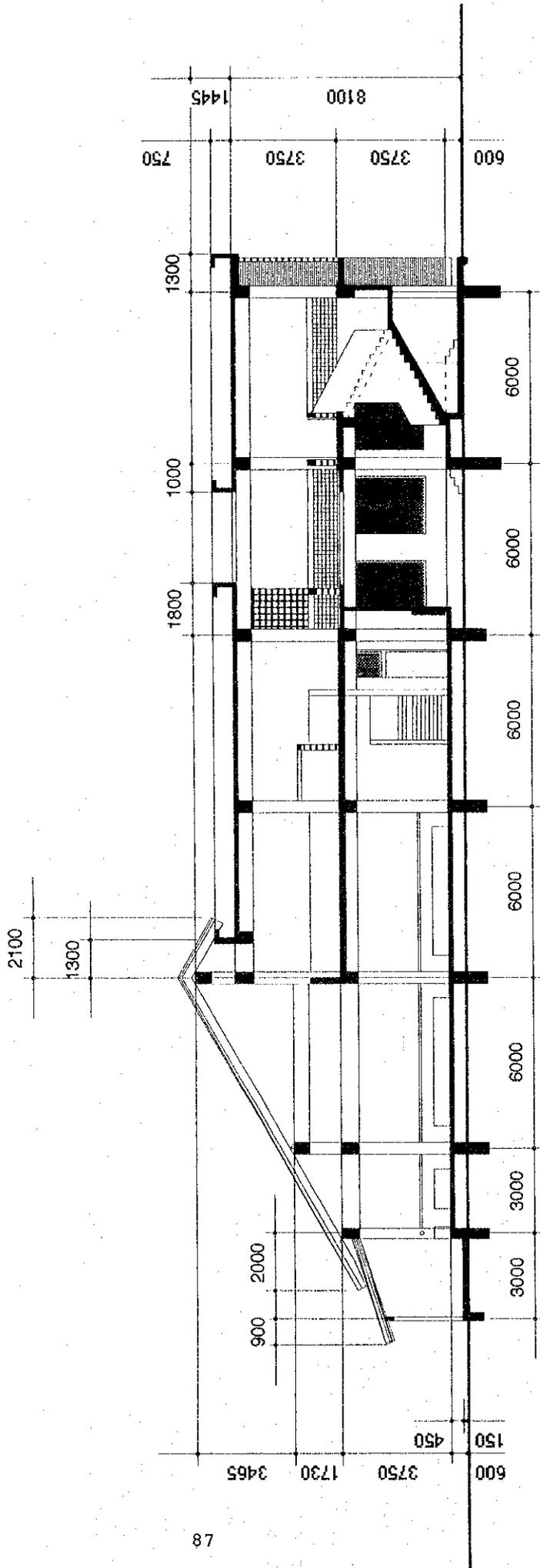
COMMON FACILITIES & DINING HALL 1F PLAN



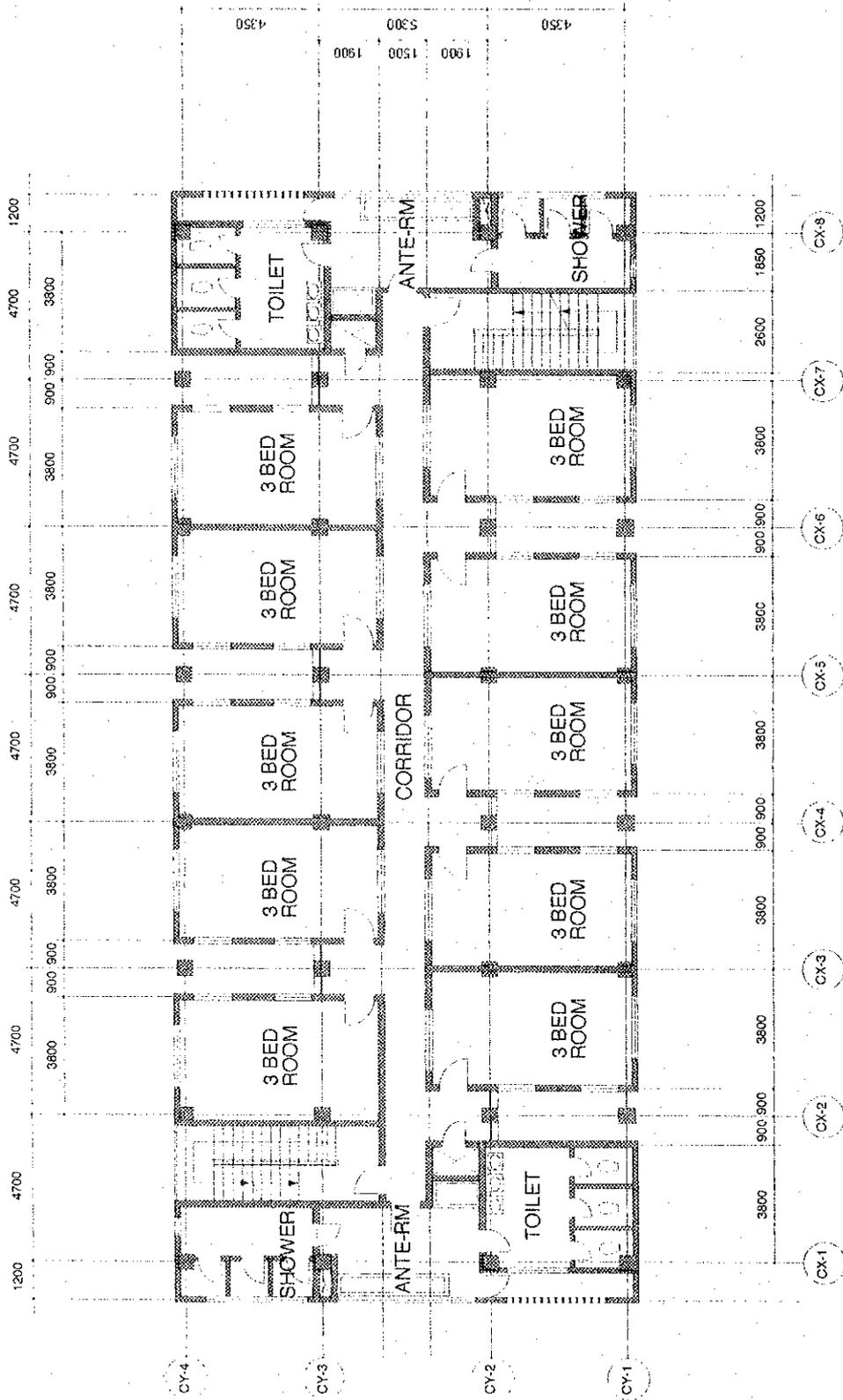
COMMON FACILITIES & DINING HALL NORTH ELEVATION



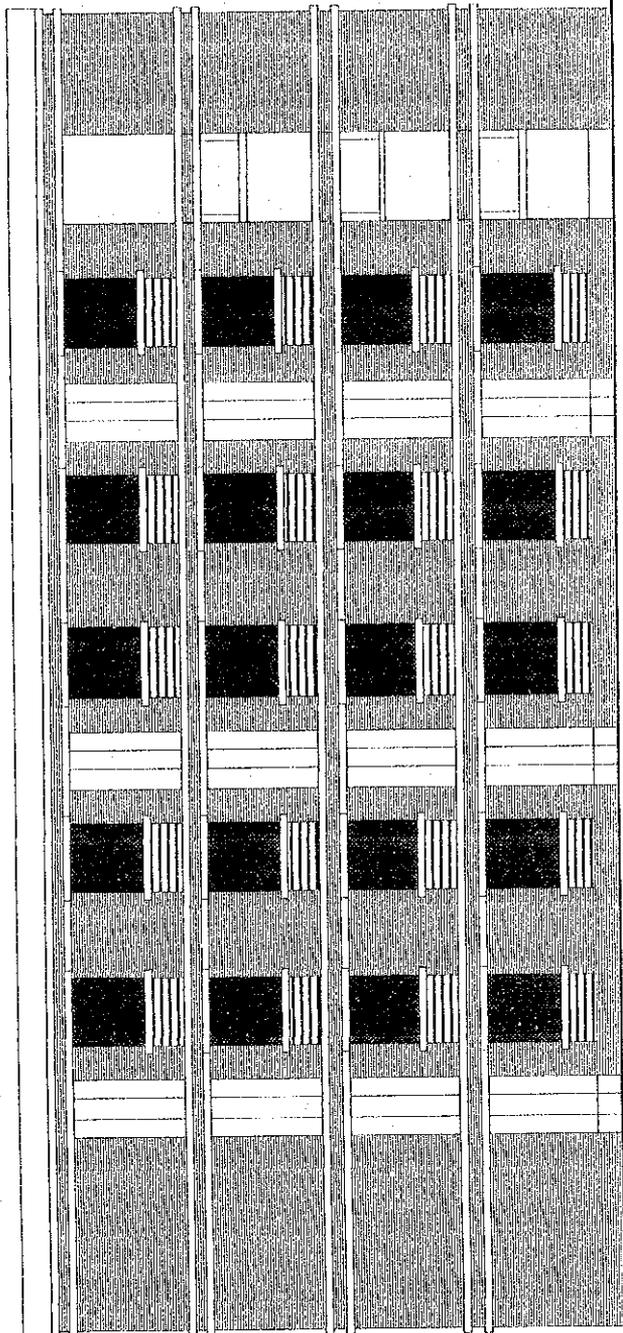
COMMON FACILITIES & DINING HALL WEST ELEVATION



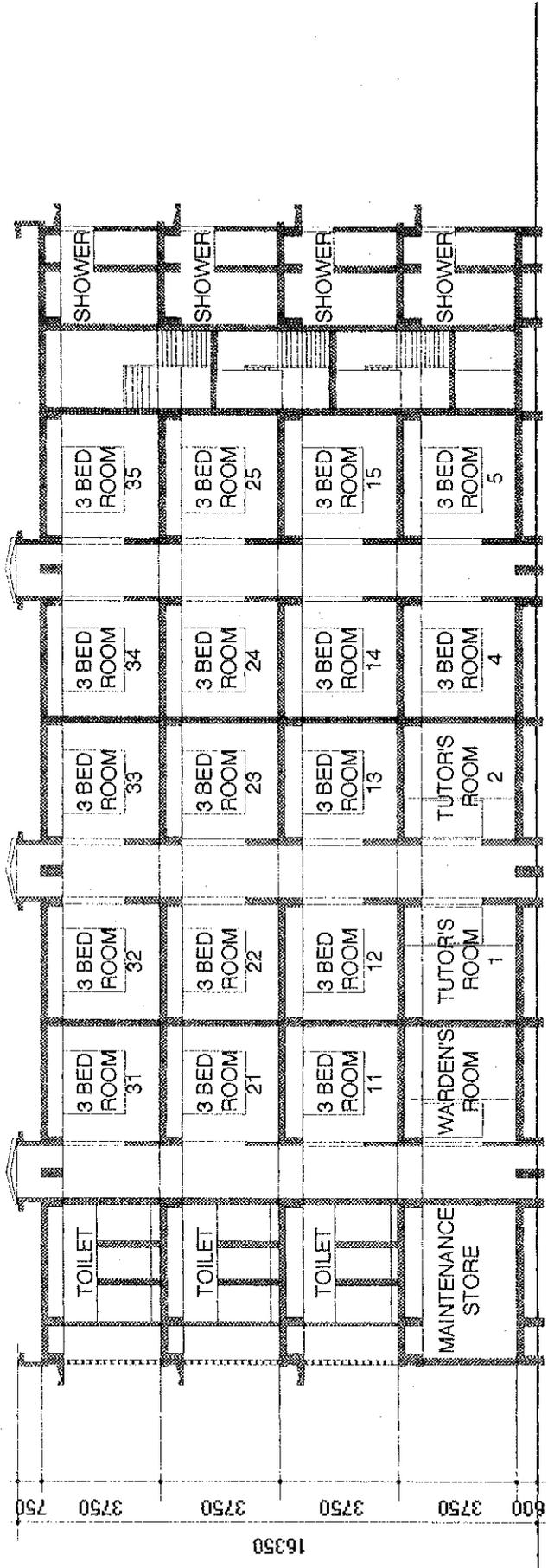
COMMON FACILITIES & DINING HALL A-A' SECTION



HOSTEL 1~3F PLAN



HOSTEL NORTH ELEVATION



HOSTEL B-B' SECTION

CHAPTER 3. IMPLEMENTATION PLAN

CHAPTER 3. IMPLEMENTATION PLAN

3-1 Implementation Plan

3-1-1 Implementation Concept

This project is to be implemented with the grant aid cooperation of the Government of Japan after the signing of the Exchange of Notes by the governments of the two countries subject to a Cabinet decision by the Government of Japan. Basic matters that concern the construction of the facilities under this project are as follows.

(1) Construction Period

This project consists of the construction of new buildings with a total floor area of approximately 10,000m² and the procurement and installation of equipment for use in nursing education. Judging from the details and sizes of the two works, the present state of the project site and the construction material procurement situation in Sri Lanka, it will take 16 months to complete both the construction work and the equipment procurement/installation work.

(2) Contracting Method

The construction work and the equipment work will be contracted to a Construction company and a trading company who are Juridical persons under Japanese Law or to a consortium formed by these two companies. Contractors for each work or a consortium are to be selected by a conditional public tender. Since the project includes water and hot water pipe connection and electrical wire connection for equipment work, and also require a supervision of experts on the stage of procurement for locally manufactured equipment, it is appropriate if the contract to be entered with a consortium formed by a general

contractor and a trading company. However, supposing the contract is separated to construction work and equipment work, locally manufactured equipment and equipment require any connecting work shall be excluded from the scope of equipment work and included to the scope of construction work in order to attain a quality work.

(3) The Government of Sri Lanka's Project Implementing Organization

This project is to be implemented under the control of the Ministry of Health, Highways and Social Services of Sri Lanka. The ministry is to be a contractual party involved in the conclusion of the consultant agreement and other contracts and bank arrangements. The Department of External Resources of the Ministry of Finance of Sri Lanka is to carry out operations concerning financial aid arrangements between the governments of the two countries as the Sri Lankan contact point concerning the grant aid cooperation of the Government of Japan.

(4) Project Implementation System

1) Consultant

Immediately after the signing of the Exchange of Notes concerning the grant aid cooperation for the implementation of this project by the governments of the two countries, the Government of Sri Lanka needs to conclude a consulting agreement with the Japanese consultant firm subject to the certification of the Government of Japan. After the signing of the said Exchange of Notes, the Japanese consultant firm is to prepare detail design drawings based on the contents of the basic design study report in consultation with the Government of Sri Lanka and then carry out tender and design/supervision operations.

2) Contractors

Contractors to take charge of the two works are to be selected by public tender from among Japanese applicants. On the basis of the results of such tender, the Government of Sri Lanka is to conclude a contract with the successful applicants (the lowest tenderers, as a rule) for the construction work and equipment work, which subject to the certification of the Government of Japan. The contractor must complete the construction work and the equipment procurement/installation work and deliver the facilities and the equipment to the Government of Sri Lanka by the date as specified in the contracts.

3-1-2 Implementation Conditions

(1) Present Situation of the Local Construction Industry

1) Local Consultants

In Sri Lanka, several consultant firms, each with a staff of 10 to 20, are active mainly in Colombo City. The staff members of these consultant firms were educated in Britain or Australia, in particular, and are therefore proficient in preparation of detail design drawings and construction supervision. Many of them have experience of preparing detail design drawings for financial aid projects of foreign countries other than Japan. For these reasons, it is very likely that they will be able to prepare detail design drawings under the supervision of the Japanese consultant firm.

2) Local Construction Companies

The Central Engineering Consultancy Bureau and the architecture departments of the other Sri Lankan government agencies concerned are responsible for the most part (design through construction) of large-scale construction projects. Private construction companies are also actively taking part construction works ordered by foreign-owned companies, as well as in public works, as subcontractors responsible for recruiting local construction workers. However, many of them are still faced with a shortage of skilled construction workers, which fact is posing problems in terms of quality control, construction schedule control and material management. When the services of local construction companies are to be used for the construction work under this project, it is important that the Japanese construction company place orders for different processes of the construction work with a number of local construction companies according to the type and size of process and that Japanese engineers carry out sufficient quality control.

3) Supply of Construction Materials

In Sri Lanka, ordinary construction materials are manufactured or imported and therefore it is possible to procure such construction materials in the country. But many of them pose problems in terms of quality. Furthermore, few of them are supplied in sufficient quantities. Many of them also come in a limited number of types and grades. Since it is essential to procure required quantities of high-quality materials at the proper time in implementing this project, a most economical construction material procurement plan

should be worked out after comparing unit prices, including transportation costs and domestic taxes.

(2) Points to Note in Carrying Out the Construction Work

Judging from the present state of the project site and the local construction industry, it is imperative to pay close attention to the following points in carrying out the construction work under this project.

1. Sufficient safety measures should be taken in the transportation of materials and equipment to the project site since access to the project site is to be provided via a road running on the premises of the hospital.
2. As the project site was developed at the time of the construction of Sri Jaywardenepura General Hospital, the ground is thought to be rather soft. It is necessary, therefore, to inspect and maintain the temporary road, the scaffolds and so on after getting a firm grasp of the present state of the ground.
3. In Sri Lanka, there is a shortage of skilled construction workers, as well as of tools for use in construction work. For this reason, it is essential that the Japanese construction company give technical guidance to local construction workers and conduct sufficient quality control on its own.
4. The Government of Sri Lanka needs to quickly follow the procedures for the payment of import duties on construction materials and equipment and customs clearance.

3-1-3 Scope of Works

The construction of the proposed facilities is to be carried out through the cooperation between the Government of Japan and the Government of Sri Lanka within the framework of grant aid cooperation. The scope of works and operations to be carried out by the governments of the two countries respectively and the details of such works and operations are as shown below.

(1) Works to be Carried Out by the Government of Japan

1. Facilities

- Construction of the facilities specified in this basic design study report
- Providing the facilities with electrical, mechanical and plumbing systems

2. Equipment

- Procurement of equipment
- Installation of equipment

3. Infrastructure

- Power station
- Water supply / drainage equipment

4. Construction of outdoor structures

- Road, Parking lot
- Septic tank
- Sewage pump

5. Related operations

- Transportation of construction materials and equipment from Japan and third countries
- Operations related to the transportation of construction materials and equipment

(2) Works to be Carried Out by the Government of Sri Lanka

1. Preparation of the project site and construction of outdoor structures

- Securing the site for the construction of the proposed facilities
- Removing obstacles such as the existing structures and trees and preparing the land for the construction of the proposed facilities
- Construction of an access road to the site
- Construction of fences and other outdoor structures
- Planting and landscape gardening

2. Infrastructure

- Supply of electricity up to the site
- Installation of telephone line up to the site
- Connecting water / drainage pipes

3. Construction Preparation Work

- Provision of temporary office, workshop and material shed
- Temporary power supply, installation of telephone

4. Supply of furniture and fixtures

- Supply of furniture and fixtures other than those to be supplied by the Government of Japan

5. Related operations

- Defraying expenses incurred in making bank arrangements
- Paying expenses incurred in following the procedures for tax exemption
- Taking quick measures concerning customs clearance and inland transportation
- Following the procedures for exempting Japanese nationals to take part in the implementation of this project in accordance with the provisions of the certified agreement from import duties, domestic taxes and other surcharges
- Accommodating such Japanese nationals so that they may fulfill their respective duties efficiently and effectively
- Defraying the costs of maintenance and management for the proper and effective operation of the facilities and equipment
- Defraying expenses incurred in following other procedures related to the construction work

3-1-4 Construction Supervision

In accordance with the Government of Japan's requirements concerning grant aid cooperation, the Japanese consultant firm is to conclude a consultant agreement with the Government of Sri Lanka's project implementing organization, prepare detail design drawings and conduct construction supervision. The objectives of such construction supervision are to check if the construction work is carried out just as specified in the drawings and specifications and to provide guidance, advice and coordination from an impartial standpoint throughout the construction period to ensure that the construction work is carried out properly and in a manner that enhances the quality of the facilities and equipment. The construction supervision work consists of the following operations.

1. Cooperation in tender and conclusion of the construction contract

The consultant firm is to prepare documents required to invite tenders for the construction work and the equipment procurement/installation work and carry out tender-related operations such as advertisement of tender, reception of applications, screening of applications, distribution of tender documents, reception of tenders and evaluation of the results of tender. The consultant firm is also to provide advice on the conclusion of contracts between the Sri Lanka project implementing organization and the contractors selected.

2. Providing guidance, advice and coordination to the contractors

The consultant firm is to examine the stages of the construction schedule, the scheme of execution, the construction materials/equipment procurement plan and the equipment procurement/installation plan and provide guidance, advice and coordination to the contractors

3. Examination and Approval of the working/shop drawings and other related documents

The consultant firm is to approve the working/shop drawings and other related documents submitted by the contractors after examining them and giving advice to the contractors.

4. Affirmation and approval of the construction materials/equipment and equipment for nursing education

The consultant firm is to approve the procurement of construction materials/equipment and the equipment for use in nursing education after affirming their consistency with the provisions of the contracts.

5. Inspection of manufacturing processes

The consultant firm is to be present at the examination of the processes of manufacture of building parts and equipment for use in nursing education in order to affirm their quality and performance.

6. Reporting on the progress of the construction work

The consultant firm is to get a clear grasp of the construction schedule and the current state of the construction site and report the progress of the construction work to the governments of the two countries.

7. Completion inspection and test runs

The consultant firm is to make a completion inspection of the facilities completed and the equipment installed, as well as test runs of the equipment, in order to ascertain that they are all consistent with the provisions of the contract and then submit a document certifying the completion of the inspection to the Government of Sri Lanka.

Judging from the size of this project, it is appropriate that the consultant firm, in carrying out the above-mentioned operations, have one of its engineers stay in Sri Lanka throughout the period of implementation of this project. The consultant firm is also to send another engineers to the project site from time to time as the construction work progresses to make necessary inspections and provide guidance and coordination. Furthermore, the consultant firm is to establish a system for appointing another engineer to take charge of communication with the engineer stationed at the project site and other backup operations. The consultant firm is also to report the payment procedures and the delivery of the

facilities and equipment, as well as the progress of this project, to the governments of the two countries.

3-1-5 Procurement Plan

(1) Guidelines for Procurement of Materials and Equipment

Close attention is to be paid to the following points in procuring materials and equipment for use in the construction work.

1) Local procurement

Materials and equipment for use in the construction work are to be procured locally as much as possible so that they may be maintained and repaired easily after the completion of this project. In this case, it is necessary to place orders for them in quantities large enough to ensure the smooth progress of the construction work.

Of the items of equipment for use in nursing education, those which can be used without any need for maintenance are to be procured locally, on condition that they are of reasonable quality and are supplied in sufficient quantities.

2) Import

Those materials and equipment which may pose quality problems and which are judged to be in short supply are to be procured in Japan or third countries. In this case, the contractors need to keep in touch with the Sri Lankan project implementing organization concerning the import and customs clearance procedures so that these procedures may be followed smoothly.

3) Unit prices of materials and equipment

A comparative analyses is to be made of the unit prices of materials and equipment which are to be imported and those which can be procured locally. When the unit prices of those which can be procured locally or when there are no significant differences in unit price between these two types, precedence is to be given to those which can be procured locally.

(2) Construction Materials/Equipment Procurement Plan

The main construction materials and items of equipment to be used in the construction work and places of their procurement are as listed in the following table.

1) Construction materials procurement plan

Table 3-1 Construction Materials Procurement Plan

Type of work	Materials / equipment	Place of procurement			Remarks
		Sri Lanka	Japan	Third country	
Construction Work	Cement	<input type="radio"/>			Their supply is erratic but they can be procured in Sri Lanka because imported cement is also marketed.
	Sand	<input type="radio"/>			River sand can be procured in Sri Lanka.
	Gravel	<input type="radio"/>			Crushed stones can be procured in Sri Lanka.
	Reinforcing bar			<input type="radio"/>	No reinforcing bars are manufactured in Sri Lanka.
	Form			<input type="radio"/>	No Plywood for forming are manufactured in Sri Lanka.
	Brick	<input type="radio"/>			Bricks are manufactured in Sri Lanka.
	Concrete block	<input type="radio"/>			Concrete blocks are manufactured in Sri Lanka.
	Terrazzo tile	<input type="radio"/>			Terrazzo tiles are used widely in Sri Lanka. But there are only a few types of them.
	Porcelain tile	<input type="radio"/>			Porcelain tiles are manufactured in Sri Lanka.
	Glass	<input type="radio"/>			Glass is manufactured in Sri Lanka.
	Tile / slate	<input type="radio"/>			Tiles and slates used widely in the roofing work in Sri Lanka are of poor quality.
	Timber	<input type="radio"/>			Timber is used widely in the local construction industry.
	Calcium silicate board			<input type="radio"/>	No calcium silicate boards are manufactured in Sri Lanka.

Type of work	Materials / equipment	Place of procurement			Remarks
		Sri Lanka	Japan	Third country	
	Metal fittings			<input type="radio"/>	No metal fittings are manufactured in Sri Lanka.
	Wooden fixtures	<input type="radio"/>			Wooden fixtures are manufactured in Sri Lanka.
	Ironware for use with fittings			<input type="radio"/>	No such ironware is manufactured in Sri Lanka.
	Paint	<input type="radio"/>			Paints are to be procured in Sri Lanka.
Equipment work	Pump		<input type="radio"/>		Pumps made in third countries are of poor quality and break down often.
	Electric fan		<input type="radio"/>		No electric fans are manufactured in Sri Lanka, but they are sold at low prices in Japan.
	Room air conditioner			<input type="radio"/>	Cheap room air conditioners are sold at low prices in third countries, and they can be maintained and managed relatively easily in Sri Lanka.
	Sanitary fixtures			<input type="radio"/>	The same as above.
	Vinyl chloride pipe			<input type="radio"/>	The same as above.
	White gas pipe			<input type="radio"/>	The same as above.
Electric work	Transformer	<input type="radio"/>			Transformers are manufactured in Sri Lanka.
	Power / electric panel board			<input type="radio"/>	No such boards are manufactured in Sri Lanka.
	Lighting equipment			<input type="radio"/>	The same as above.
	PAS		<input type="radio"/>		No PAS's are manufactures in Sri Lanka, but they are sold at low prices in Japan.
	Fire alarm system		<input type="radio"/>		The same as above.
	Power line pipe			<input type="radio"/>	Power line pipes are sold at low prices in third countries. They are of relatively high quality.

2) Equipment for Use in Training in Nursing Plan

Table 3-2 Nurse Training Equipment Procurement Plan

Equipment	Country			Remarks
	Sri Lanka	Japan	Third country	
Human Anatomical Model, Male Figure		<input type="radio"/>		Not manufactured in the country
Human Anatomical Model, Female Figure		<input type="radio"/>		do
Human Skeleton Model, Articulated		<input type="radio"/>		do
Human Skeleton Model, Disarticulated		<input type="radio"/>		do
Model of Circulatory System		<input type="radio"/>		do
Model of Skull		<input type="radio"/>		do
Model of Anatomical Heart		<input type="radio"/>		do
Model of Dynamic Heart with ECG		<input type="radio"/>		do
Model of Respiratory Organs		<input type="radio"/>		do
Model of Digestive Organs		<input type="radio"/>		do

Equipment	Country			Remarks
	Sri Lanka	Japan	Third country	
Model of Brain		○		Not manufactured in the country
Model of Nervous System		○		do
Model of Muscle of Human Body		○		do
Model of Muscle of Upper Extremity Model		○		do
Model of Section of Skin		○		do
Model of Eye		○		do
Model of Ear		○		do
Model of Teeth		○		do
Model of Nasal Cavity/Throat/Pharynx		○		do
Model of Kidney and Urinary System		○		do
Model of Pelvis		○		do
Model of Pregnant Uterine		○		do
Model of Development Stage of Foetus		○		do
Model of Conception System		○		do
Model of Parasites in Human Body		○		do
Model of Feces of Child		○		do
Model of Trachoma		○		do
Model of Alveolar Pyorrhea		○		do
Model of Pathogenic Microbes		○		do
Anatomical Charts		○		do
X-ray Film Viewer	○			Can be procured in the country
Training Dummy		○		Cannot be procured in the country
Case for Training Dummy		○		do
Dummy for Baby Care		○		do
Training for Mammy Massage		○		do
Phantom for Delivery		○		do
Pregnancy Palpation Simulator		○		do
Dressing Simulator		○		do
Blood Collection and I. V. Injection Simulator		○		do
I. M. Injection Simulator		○		do
Catheterize Simulator, Male		○		do
Chatheterize and Enema Simulator, Female		○		do
Resuscitation Training Dummy, Adult		○		do
Nebulizer, Portable Type	○			Can be procured imported.
Automatic Resuscitator	○			do
ECG, Portable Type	○			do
Emergency Instrument Set	○			do
Oxygenator	○			do

Equipment	Country			Remarks
	Sri Lanka	Japan	Third country	
Panel with Oxygenator & Suction		○		Not manufactured in the country.
Electric Suction Unit	○			Imported can be procured.
Oxygen Tent	○			Can be procured imported.
Incubator	○			do
Standard Gatch Bed	○			do
Mattress	○			do
Paediatric Bed with Mattress	○			do
Mattress for Paediatric Bed	○			do
Baby Bassinet with Casters	○			do
Bed Side Table	○			Locally manufactured can be procured.
Bed Side Chair	○			do
Over Bed Table (Two Legs)	○			do
Over Bed Table (One Legs)	○			do
Screen	○			do
Set for Bed Making (Adult)	○			do
Set for Bed Making (Infant)	○			do
Linen for New Born Baby	○			do
Shampoo Cart		○		Not manufactured in the country.
Shampoo Tray Set		○		do
Shampoo Chair		○		do
Bed Bath Set		○		do
Baby Bath Set		○		do
Table for Baby Bath		○		do
Mouth Care Set		○		do
Pajamas for Patient	○			Not manufactured in the country.
Clothes for New Born Baby	○			do
Back Rest		○		Not manufactured in the country.
Over-bed Cradle		○		do
Decubitus Protecting Mattress		○		do
Round Sitting Sand Bag, assorted		○		do
Splint, assorted		○		do
Fixting Belt		○		do
Wheel Chair (Adult)		○		Imported can be procured but has quality problem.
Wheel Chair (Infant)		○		do
Stretcher		○		do
Walking Aid with Casters & Saddle		○		do
Litters		○		do
Bedpan Rack		○		do

Equipment	Country			Remarks
	Sri Lanka	Jepen	Third country	
Bedpan Cleaner		○		Not manufactured in the country.
Enema Set		○		Imported can be procured but has quality problem.
Bedpan	○			Imported can be procured.
Urinal	○			do
Scale	○			Local product can be procured.
Set for Stoma		○		Not manufactured in the country.
Feeding Tube Set		○		do
Conception Control Training Set		○		do
Set for Milk Preparation		○		do
Milking Device, Hand Type	○			Local product can be procured.
Examination Instrument Set		○		Not manufactured in the country.
Traube's Obstetric Stethoscope	○			Local product can be procured.
Ear Scope	○			Imported can be procured.
Nasal Scope	○			do
Proctoscope	○			do
Vaginal spectrum (large)	○			do
Vaginal spectrum (medium)	○			do
Vaginal spectrum (small)	○			do
Set for Stomach Pump		○		Not manufactured in the country.
Irrigator Stand	○			Imported can be procured.
I. V. Set		○		Local product can be procured, but has quality problem.
Eye Applicator		○		do
Examination Bed	○			Local product can be procured.
Examination Chair	○			do
Operating Instrument Set	○			Imported can be procured.
Linen for Surgery		○		Local product can be procured.
Delivery Set	○			Imported can be procured.
Tracheostomy Instrument Set	○			do
Lumber Puncture Instrument Set	○			do
Medication Trolley Set	○			do
Medication Set		○		do
Ice, Hot Bottle		○		do
Blanket	○			do
Ice Cube Machine		○		Can not be procured in the country.
Boiling Sterilizer (large)	○			Indian product has no quality problem can be procured.
Boiling Sterilizer (small)	○			do
Gauze Drum (large/small)	○			do
Instrument Trolley		○		Local product can be procured, but has quality problem.
Set for Dressing	○			Imported can be procured.

Equipment	Country			Remarks
	Sri Lanka	Japan	Third country	
Kidney Tray (large/medium/small)	○			Imported can be procured.
Waste Receptacle		○		Can not be procured in the country.
Shaving Set		○		do
Wash Basin		○		Can be procured in the country, but has quality problem.
Wash Basin Stand for Two Basins		○		do
Wash Basin Stand for One Basins		○		do
Brush Case Stand with pedal		○		Can be procured in the country.
Blood Sedimentation Rack with Pipettes		○		do
Urinometer with Pipettes		○		do
Weighing Scale (Adult)		○		Can be procured in the country, but has quality problem.
Weighing Scale (Infant)		○		do
Measuring Rod (Adult)		○		do
Measuring Rod (Infant)		○		do
Dynamometer		○		Not manufactured in the country.
Breisky's Pelvimeter		○		do
Chart of Sight Test		○		do
Rotary Spirometer		○		do
Martin's body Measure		○		do
Baby Head Measure		○		do
Sphygmomanometer (Mercurial compact type)		○		Can be procured in the country, but has quality problem.
Sphygmomanometer (Mercurial stand type)		○		do
Sphygmomanometer (Aneroid)		○		do
Temperature Taking Set		○		do
Stethoscope (Adult)		○		do
Stethoscope (Teaching)		○		do
Stethoscope (Infant)		○		do
Thermometer (Digital)		○		do
Thermometer (Oral)		○		do
Thermometer (Rectal)		○		do
Microscope	○			Imported can be procured.
Gas Stove	○			do
Food Model		○		Not manufactured in the country.
Source Pan Set	○			Can be procured from local market.
Kitchen Equipment Set	○			do
Plates	○			do
Wagon	○			do
Scale	○			do
Measuring Cup	○			do

Equipment	Country			Remarks
	Sri Lanka	Japan	Third country	
Rice Cooker	<input type="radio"/>			Can be procured from local market.
Micro Wave	<input type="radio"/>			do
Refrigerator	<input type="radio"/>			do

Table 3-3 General Educational Equipment Procurement Plan

Equipment	Country			Remarks
	Sri Lanka	Japan	Third country	
White Board with caster		<input type="radio"/>		Local product can be procured but has quality problem.
Black Board with casters		<input type="radio"/>		do
Black Board (large)		<input type="radio"/>		do
Chart Stand		<input type="radio"/>		do

Table 3-4 Furniture, Fixture and Other Equipment Procurement Plan

Equipment	Country			Remarks
	Sri Lanka	Japan	Third country	
Safe	<input type="radio"/>			Can be procured from local market.
Refrigerator	<input type="radio"/>			do
Printing Machine	<input type="radio"/>			do
Washing Machine	<input type="radio"/>			do
Education/Training Furniture	<input type="radio"/>			do

Table 3-5 A/V Equipment Procurement Plan

Equipment	Country			Remarks
	Sri Lanka	Japan	Third country	
Video Monitor Set (50)		<input type="radio"/>		Not manufactured in the country.
Portable PA Amplifier Set		<input type="radio"/>		do
Video Monitor Set (100)		<input type="radio"/>		do
PA System (100)		<input type="radio"/>		do
PA System (Multipurpose)		<input type="radio"/>		do
Hi8 Video Camera		<input type="radio"/>		do
Over Head Projector		<input type="radio"/>		do
Direct Projector		<input type="radio"/>		do
Screen with stand		<input type="radio"/>		do

Table 3-6 Bus Procurement Plan

Equipment	Country			Remarks
	Sri Lanka	Japan	Third country	
Bus		<input type="radio"/>		Can be maintained in the country

3-1-6 Implementation Schedule

When the Exchange of Notes concerning the implementation of this project is signed by the governments of Sri Lanka and Japan, the construction of the proposed facilities and the procurement/installation of the chosen items of equipment are to be carried out in stages as described below.

1. Design Work

After the conclusion of the consulting agreement, the consultant firm is to prepare detail design drawings, specifications and tender documents on the basis of the contents of this basic design study report. The consultant firm is to obtain for the design drawings after due consultation with the Sri Lankan side. It will take 3 months to complete this work.

2. Tender Operation

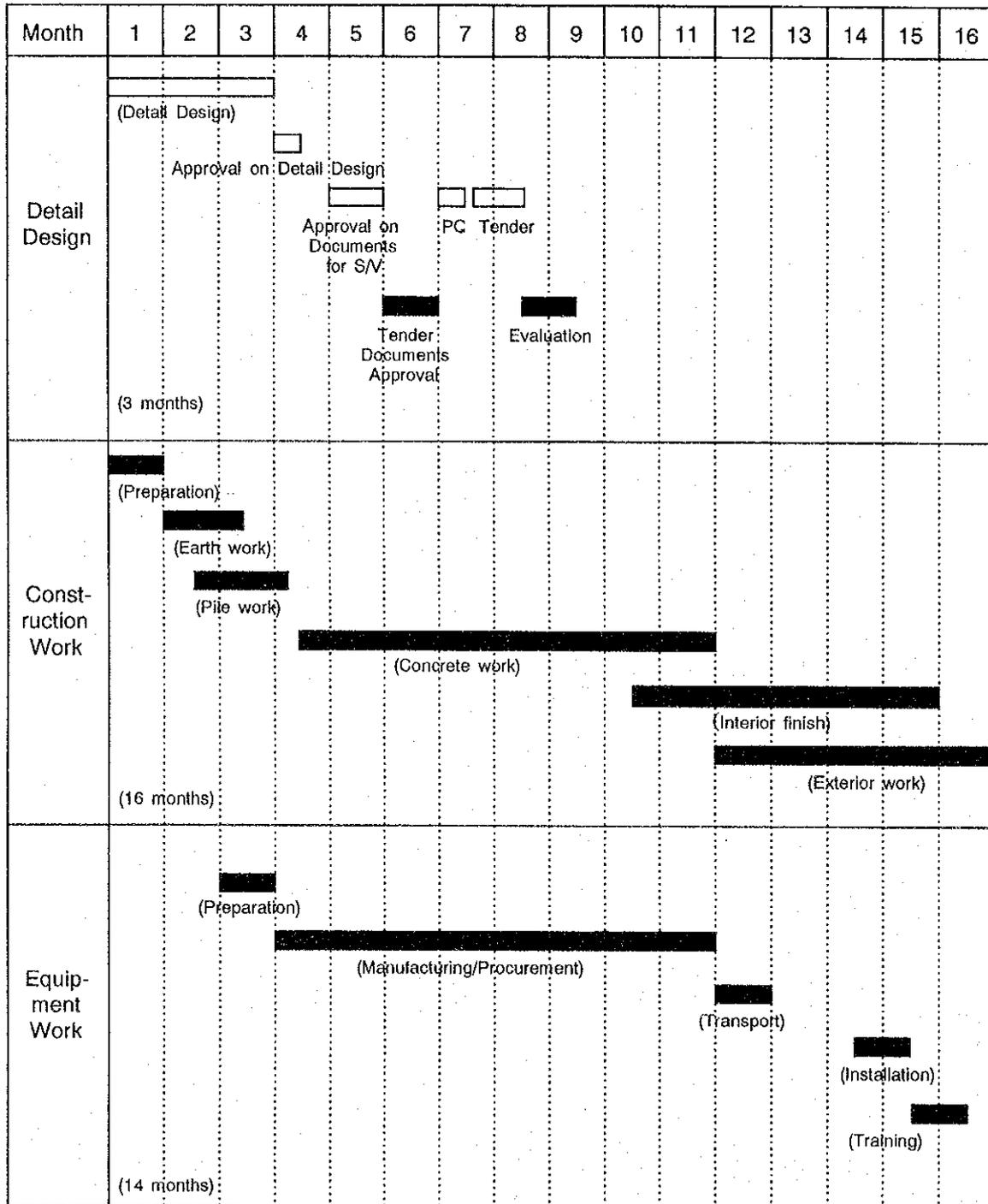
The contractors to take charge of the construction work and the equipment procurement/installation work respectively are to be selected by tender. The tender operation will include public advertisement of tender, screening of applicants, tender, evaluation of the results of tender, appointment of the contractors and conclusion of contracts, in that order. It will take about 2 months to complete this operation.

3. Construction Work and Equipment Procurement/Installation Work

Judging from the details and sizes of the proposed facilities and the present situation of the local construction industry, the construction work and the equipment procurement/installation work will be completed in 16 months if the procurement of construction materials and customs clearance are carried out smoothly.

Table 3-7 shows the implementation schedule after the signing of the Exchange of Notes, which was worked out taking into account all the above-mentioned factors.

Table 3-7 Implementation Schedule



3-2 Operation and Maintenance Costs

When this project is implemented, the Government of Sri Lanka will have to make the following budgetary appropriations for the operation, maintenance and management of the facilities and equipment.

Table 3-8 Operation, Maintenance and Management Costs

Item	Amount
1. Facility operating cost -----	2,122,000 Rs/year
① Electricity charges	1,198,000
② Telephone charges	50,000
③ Water charges	361,000
④ LP gas charges	441,000
⑤ Vehicle fuel expenses	72,000
2. Facility maintenance cost -----	324,000 Rs/year
① Facility maintenance expenses	100,000
② Facility equipment maintenance expenses	200,000
③ Training equipment maintenance expenses	24,000
Sub total	2,446,000
3. Educational cost	162,000 Rs/year
Total	2,608,000 Rs/year

(1) Facility operating cost

① Electricity operating cost 1,198,000 Rs

• Calculation of maximum power demand

Item	Equipment load capacity	Maximum demand rate	Maximum power demand (for each building)
Administration / education building	75 kW	50% (day time)	37.5 kW evening 10kW
Common facility / dining hall building	25 kW	50% (evening)	12.5 kW
Hostel	65 kW	70% (evening)	45.5 kW
Other	40 kW	50% (day and night)	20 kW

As the above table shows, it is expected that there will be maximum power demand in the evening. Maximum power demand is about 100kW (10kW+12.5kW+45.5kW+20kW=88kW=100kW).

Therefore contract power consumption should be 100kW.

• Electricity charges

Basic charge

$$100\text{kW} \times 270\text{Rs/month} \times 12\text{months} = 324,000 \text{ Rs}$$

Electricity charges

Administration / education building:

$$75\text{kW} \times 0.3 \times 8\text{h/day} \times 25\text{days} \times 12\text{months} = 54,000 \text{ kWh}$$

Common facility / dining hall building:

$$25\text{kW} \times 0.3 \times 3\text{h/day} \times 30\text{days} \times 12\text{months} = 27,000 \text{ kWh}$$

Hostel:

$$65\text{kW} \times 0.5 \times 8\text{h/day} \times 30\text{days} \times 12\text{months} = 93,600 \text{ kWh}$$

Other:

$$40\text{kW} \times 0.1 \times 6\text{h/day} \times 30\text{days} \times 12\text{months} = 8,640 \text{ kWh}$$

$$\text{Total} \quad \quad \quad 158,940 \text{ kWh}$$

$$158,940 \text{ kWh} \times 5.5\text{Rs/kWh} = 874,000 \text{ Rs}$$

② Telephone charges 50,000 Rs

If the average daily number of calls for the period from Monday through Saturday is 40 and the average length of time per call is less than 2 minutes.

$$40\text{calls} \times 2\text{minutes} \times 1.98\text{Rs} \times 6 \text{ days/week} \times 52\text{weeks/year} = 50,000\text{Rs}$$

③ Water charges 361,000 Rs/year

The amount of water charges is to be calculated on the basis of water supply per student (school: 60ℓ/day·person; hostel: 100ℓ/day person).

• Annual consumption

$$(60\ell/\text{day}\cdot\text{person}\times 300\text{persons}+100\ell/\text{day}\cdot\text{person}\times 12\text{persons}) \\ 286\text{day}/\text{year} + 100\ell/\text{day}\cdot\text{person}\times 300\times 364\text{day}/\text{year}=16,411\text{m}^3/\text{year}$$

• Annual water charges

Basic charge : 20 Rs/month \times 12 days = 240 Rs/year

Consumption charge : $16,411\text{m}^3/\text{year}\times 22\text{Rs}/\text{m}^3 = 361,042\text{Rs}/\text{year}$

Total : 361,282 Rs/year

④ LP gas charges 441,000 Rs

• Gas consumption/meal 800kcal/meal

• No. of meals/day

Students : $300\text{students}\times 3\text{meal}/\text{day}\cdot\text{person} = 900\text{meal}/\text{day}$

Instructors : $12\text{instructors}\times 1\text{meal}/\text{day}\cdot\text{person} = 12\text{meal}/\text{day}$

Total 912meal/day

• Meal charges

$$912\text{meal}\times 800\text{kcal}/\text{meal}\times 286\text{day}/\text{year}\div 11,000\text{kcal}/\text{kg}\times 23.27\text{Rs}/\text{kg}$$

$$= 441,423\text{Rs}$$

$$\approx 441,000\text{Rs}$$

⑤ Vehicle fuel expenses 72,000 Rs/year

• 2 Vehicles

$$3,000\text{Rs}/\text{vehicle}\cdot\text{month}\times 2\text{Vehicles}\times 12\text{months}/\text{year} = 72,000\text{Rs}$$

(2) Facility maintenance cost

① Facility maintenance 100,000 Rs/year

② Facility equipment maintenance 200,000 Rs/year

③ Training equipment maintenance 24,000 Rs/year

(3) Education cost 162,000 Rs/year

(4) Salaries / allowances 13,092,000Rs

① Salaries 3,336,000 Rs

(total annual amount for 57 staff members)

② Training-related expenses 9,756,000 Rs

Grade I students:

$31,860 \text{ Rs/student} \times 100 \text{ students} = 3,186,000 \text{ Rs}$

Grade II students:

$32,520 \text{ Rs/student} \times 100 \text{ students} = 3,252,000 \text{ Rs}$

Grade III students:

$33,180 \text{ Rs/student} \times 100 \text{ students} = 3,318,000 \text{ Rs}$

$= 9,756,000 \text{ Rs}$