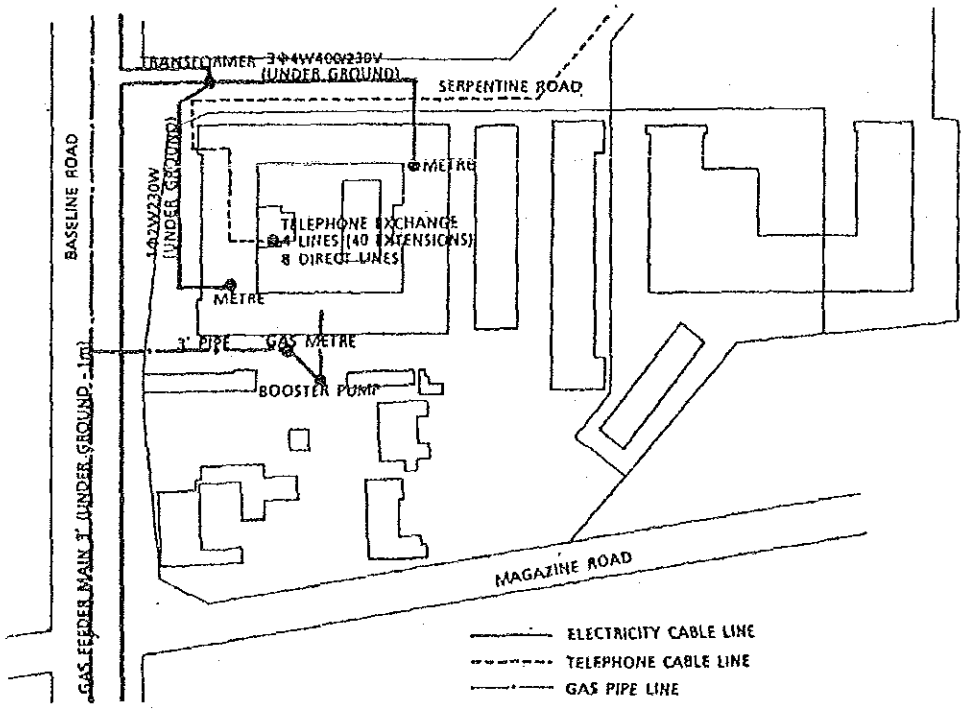
4-4-2 Infrastructure Around the Site

(1) Power Supply

Power can be supplied to the site by branching from the high-voltage, 3-phase, 3-live 11KV 50Hz cable buried below Baseline Road. As well as the necessary space for the construction of the power facility for the planned buildings in the Project, space (12ft x 13ft) should also be secured for the installation of the high-voltage breaker of the Ceylon Electricity Board (CEB). The CEB can be responsible for the entire work if the equipment and installation costs for a sub-station with a maximum capacity of 800KVA are paid by the Owner. In the case of the required capacity exceeding 800KVA, however, the equipment for the sub-station must be prepared by the Owner. As far as the temporary power supply during the construction work is concerned, a supply capacity of approximately 200KVA with high-voltage, 3-phase, 3-line 11KV 50Hz is confirmed.

Low-voltage, 3-phase, 4-line 230V/400V 50Hz is supplied to the 2 low-voltage service panels in the existing MRI building by an underground cable from the transformer currently located on Serpentine road.

Fig. 4-4-2 (a) Existing Electricity, Telephone, Gas Supply System



(2) Telephone Lines

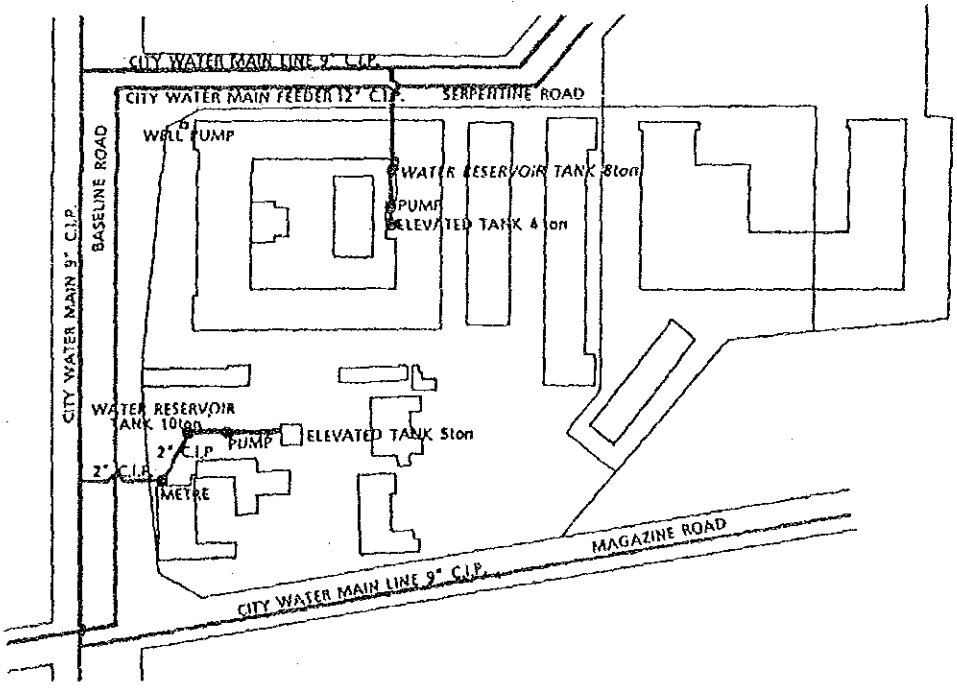
According to the Telecommunications Department, while there are not available lines enough in the area at present, the necessary lines will be secured with the completion of the ongoing construction of Colombo's Telephone Network in 1990. In view of this, while sufficient telephone lines will not be available at the time of the completion of theconstruction, but the demand will be met 6 months to 1 year later. At present, however, the main building has 4 operator lines and 8 direct lines which can be transferred to the new building to cater for the immediate demand.

(3) Water Supply

A municipal water main of 9" (225mm) is currently laid under Base line Road with branching water mains of 9" under both Serpentine Road and Magazine Road. A trunk water main of 12" (300mm) supplying water to the municipal main described above is also laid under Baseline Road.

2 branch pipes of 3" (75mm) from the water mains under Baseline Road and Serpentine Road supply water to the existing MRI facilities. The water pressure in the area is low, from 5 psi (0.4 kg/cm^2) to 20 psi (1.4 kg/cm^2) and, therefore, the water

Fig. 4-4-2 (b) Existing City Water Supply System



tank to be installed in the Project should be located on low ground in view of the estimated daily water requirement of 160m^3.

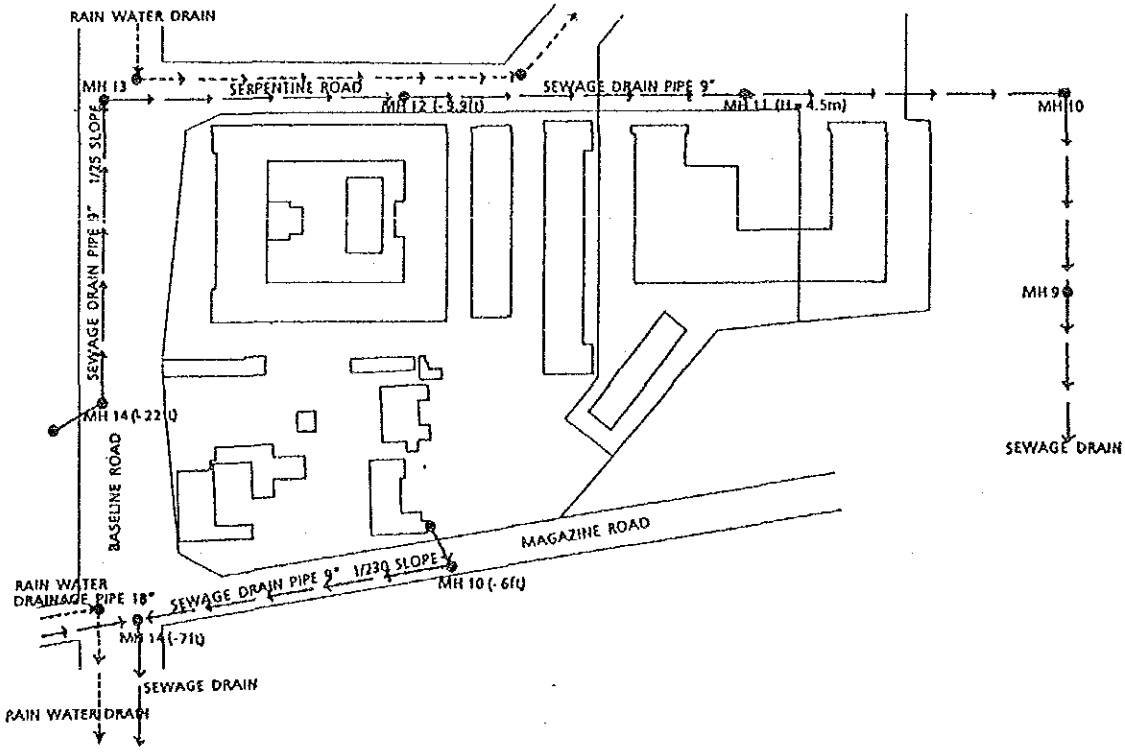
The 2 existing water tanks and 2 auxiliary elevated water tanks are located on the roof of the main building and in open spaces. those in the open which will obstruct the Project can, therefore, be easily removed without causing any problems in regard to the water supply to the existing main building.

- Existing Water Tank - 10 tons (concrete) ··· Removable
  Existing Elevated Water Tank - 5 tons (steel) ··· Removable
- Existing Water Tank - 8 tons (concrete) ··· for existing main building
  Existing Elevated Water Tank - 4 tons (concrete) ··· for existing main building

Although the water quality is good enough for it to be used for drinking purposes, pretreatment is required before its use for testing equipment due to its high degree of hardness.

A temporary water supply during the construction work can be secured by extending the 75mm pipe which currently supplies water to those tanks which will be removed.

Fig. 4-4-2 (c) Existing Sewarage System



(4) Drainage

Waste water from the MRI premises is currently drained to the public sewage system through different channels, i.e. that for general waste water and that for rainwater. There are 2 public drainage routes in the area, i.e. (i) from Serpentine Road to Magazine Road via the site used by the Ministry of Trade and (ii) running westwards under Magazine Road from the southeastern corner of the premises where the land elevation is comparatively high across Baseline Road. Both these routes consist of old clay pipes with a diameter of 9" (25mm) and the sewage is finally discharged to Keranya River via the sewage treatment plant located in north Columbo.

Based on discussions with the Works Department, it has been agreed that the waste water form the facilities to be constructed in the Project will be discharged through the existing sewage system following the treatment which appears necessary in view of the nature of the planned facilities.

Rainwater will be continuously drained from the premises through connections with the 12" (300mm) and 18" (450mm) rainwater drainage pipes laid under Serpentine Road and Baseline Road respectively.

(5) City Gas

The main gas pipe is laid 1m below the surface of Baseline Road and gas is supplied to the existing main building from this pipe via a branch pipe of 3' (75mm) in diameter. Since the gas pressure is as low as 25mmAq, a blower is installed after the gas meter on the premises to increase the pressure to 150mmAq and gas is then supplied to the testing equipment.

When this blower is out of operation due to blackouts, etc., the laboratories are provided with a 40kg LPG cylinder in order that the respective tests can be continued. The Study Team and the Gas Company have agreed that city gas will be used in the existing building by moving the blower. The few facilities will be provided with a gas supply by introducing a gas supply center and installing LPG cylinders to provide the laboratories with LPG at a constant pressure.

(6) Solid Waste Disposal

Since the collection of solid waste by disposal trucks is in operation in the area, this method will be used for the ordinary solid waste generated by the MRI. Given the character of the research work, however, incineration will be required in the case of contaminated waste and dead animals.

(7) RI Treatment

The treatment method involves the introduction of a reservoir for the dilution and discharge of RI waste water while solid waste will be stored at the RI waste storage facility in suburban Colombo.

4-5 Technical Cooperation

In the initial planning stage of the project, the Feasibility Study Team and Preliminary Study Team were sent to Sri Lanka prior to the implementation of the Basic Design Study in order to investigate both the feasibility and the suitability of technical cooperation. As a result, it was subsequently agreed that the immediate implementation of Project-type Technical Cooperation in the following fields for a period of 5 years would be important in response to the relevant requests made by the Sri Lankan Government.

(1) Reconfirmation of Requested Contents

1) Improvement and expansion of various clinical testing techniques.

2) Improvement of and research on vaccine and antisera production methods (including anti-vinin sera and diagnostic antisera)

3) Promotion of basic medical research.

4) Improvement in the fostering of Medical Laboratory Technologists and promotion of various educational activities.

5) Appropriate control of animals for experiment.

6) Improvement of other activities for which the MRI is responsible.

(2) Subjects of Technical Cooperation

1) First Stage
   a. Strengthening of diagnostic function of the MRI.
   b. Strengthening of reference function of the MRI.
   c. Improvement of education at the School of Medical Laboratory Technologists

2) Second Stage
   a. Strengthening of production sector.
   b. Strengthening of research activities of the MRI.

(3) Fields of Cooperation and Targets

The subject fields of cooperation and their respective targets are given in the table below

1–1 –2	Entomology Parasitology	1 General Training (mainly Field Training) 1 General Training - Analysis of Parasitic Antigen, Measurementof IgE Antibody
2-1 -2	Pathology Immunology	1 Diagnosis Techniques a. Immunofluorescence (IF) b. coagulation System 2 Histopathology 1 Production of Diagnostic Pharmaceuticals (HB, AFP) 2 Immunological Methods (Electrophoresis, Invivo, Invitro) 3 Diagnosis of Immunity-Related Diseases
3-1 -2	Nutrition Biochemistry	1 Lipid Measurement (Field Survey) 1 Quality Control of Chemical Diagnosis 2 Metabolism-Related Diseases
4-1 -2	Pharmacoogy Medicinal Plant	1 general Training 1 Development of New Technologies to Extract Compounds 2 Spectrophotometry of Phytochemicals
5	Bacteriology	1 Diagnosis of Anaerobic Bacterial Infections 2 Diagnosis of Enteric Bacterial Infections 3 Diagnosis of Mycotic Infections 4 Establishment of Food Bacteriology
6	Virology	1 Diagnosis of Viral Diarrhoea (Caused by Lota, Adeno and Parvo Viruses) 2 Diagnosis of Acute Viral Respiratory Diseases: Early Deagnosis by IF and ELISA Methods 3 Diagnosis of Rickettsial and Chlamydial Infections
7	Biological Production	1 Production of Anti-Venin Sera
8	Medical Instrumentation	1 General Training (Including Computer Operation)
9	Education and Training	1 Curricula Development for SMLT 2 Improvement and New Development of Educational Methods at SMLT
10	Others	1 Recombinant DNA and Monochlonal Antibody

(4) Recommendations for Smooth Implementation from Technical Cooperation Side

1) Individual Work

a. As far as the general items for routine tests are concerned, a system to conduct them at a hospital level should be established as soon as possible.

b. Improvement measures should be introduced for the transportation method and labelling of test specimens.

c. Referred patients should be examined at the clinic instead of them visiting the laboratories.

d. The Department of Biological Production should soon make a decision on whether to rely on the State Pharmaceutical Corporation or import foreign countries for the supply of vaccines so that it can devote itself to laboratory tests and development activities.

2) Research Work

a. Although each department appears satisfied with the service, production or educational work, a system should be established whereby problems relating to the current work can be clarified and subject to further study.

b. The absolute number of researchers is inadequate. Vacant consultant posts should be filled and the number of middle-standing researchers should be increased. It is also important that young researchers be provided with guidance.

c. The presentation of research papers at academic conferences or on other occasions should be made compulsory as part of a new obligation of all researchers to produce concrete research results. Research funds must be secured, however, prior to imposing this obligation on researchers.

CHAPTER 5

BASIC DESIGN

CHAPTER 5. BASIC DESIGN

5-1. Basic Policies

5-1-1. Basic Design Policies

The objective of the Project is the consolidation of the MRI as the central medical research institute in Sri Lanka by activating its organizational activities and functions through both its improvement and expansion. This objective must be achieved by aiming at the gradual development of the basic research within the framework of the Sri Lankan medical system rather than by quickly strengthening the MRI's research system and the reduction of the service work currently conducted by the MRI should also be planned during this gradual development process.

The Basic Design is prepared by the Preliminary Study Team for the establishment of efficient, as well as effective, facility and equipment plans based on the following policies, in turn determined based on a thorough understanding of the background, status, objective and functions of the Project.

1) Facility Composition presupposing Future Development

The land use plan should allow the expansion and self reliance of the MRI in the future, taking the modernization of the existing main building and its future rebuilding planned by the Sri Lankan side into consideration. While the MRI currently conducts a variety of activities, the ground plan should be able to cater for the anticipated development, decline or transfer of each activity in the future.

2) Functional and Safe Facility Plan

Although functional differentiation by means of the introduction of a zoning system is difficult to achieve due to the restrictive site conditions, the facility plan should stress on the functionability of the laboratories and research facilities and on researchers' safety.

3) Building Details reflecting Local Climate

In view of Sri Lanka's tropical climate, various measures should be adopted vis-

a-vis strong sunshine and heavy rainfall, etc. The climatic conditions should be taken into consideration in the building design and the facility plan should actively utilize natural lighting and ventilation in order to provide comfortable facilities which reflect the local climate.

4) Easy Maintenance and Low Operating Cost

Energy saving measures should be adopted to reduce the maintenance and operating costs. In the case of those facilities where air-conditioning is required due to the nature of the research activities involved, heat insulation and moisture-proofing measures should be considered to reduce the power consumption. All buildings should be strong, and easy to clean and the materials and construction methods used should allow for repair work to be carried out locally.

5) Interchangeable Utilities and Equipment

The types of utilities and equipment to be used should be minimized at the design stage so that their interchange-ability can be established and the types of spare parts should also be minimized in view of easy maintenance. Those utilities and equipment with proven durability should be given priority and the provision of proper afterservices should be stressed in their selection.

6) Coordination with Technical Cooperation

Since the Project-type Technical Cooperation of the Japanese Government is planned as part of the Project, the facilities and their functions should be thoroughly coordinated with the technical cooperation plan.

5-1-2. Project Outline

Name : Project for the Improvement and Expansion of the Medical Research Institute

Objectives :

1) Improvement and expansion of the deteriorated existing research facilities to vitalize their organization and functions and to carry out advanced basic research concerning the prevention of infections.
2) Improvement of the vaccine and other production sections to provide safe and high quality products. Introduction of product development and inspection work in the future.
3) Improvement of national health care and preventive medicine levels through public health and surveillance activities.
4) Supply of laboratory staff through the education / training of medical laboratory technologists to improve the testing level in local areas.
5) Fostering of the highly capable researchers required for medical research activities.

Research Departments

: Department of Entomology and Parasitology
Department of Clinical Pathology and Immunology
Department of Nutrition and Biochemistry
Department of Pharmacology and Medicinal Plant
Department of Bacteriology
Department of Virology
Department of Biological Production
Center for Medical Instrumentation
Center for Animal Experiments
School of Medical Laboratory Technology

Project Implementation Body

: Medical Research Institute, Department of Laboratory Services, Ministry of Health

Project Site

: Baseline Road, Colombo 08

Site Area : 14,500m²

Outline of Facilities

: Laboratory Complex	RC, 4-story	6,849m²
Animal Experiment Building	RC, 2-story	1,584m²
Medical Training Building	RC, 2-story	1,359m²
Animal Quarantine Building	RC, single-story	99m²

Supplementary Facilities - Connecting Corridors, Sewage Treatment Facility, Incinerator, Oil Tank, etc.

Total Area : 9,891m²

Outline of Equipment

: Equipment for Laboratories
Equipment for the Center for Medical Instrumentation
Equipment for the Animal Center
Equipment for Medical Training
Other Equipment

5-1-3. Determination of Project Size

The size of each facility to be provided in the Project is given in terms of units. The sizes were initially determined through consultations with the Sri Lankan side during the Basic Design Study Survey on the basis of the respective activities, the number of rooms required by each department and the staff distribution. After the Study Team's return to Japan, the Project facilities were compared with similar facilities in Japan and the original sizes were modified to reflect the results of this comparison with consideration given to the future prospects of the departmental activities and the required room sizes calculated by both the Sri Lankan and Japanese sides. Consequently, the design size of each room was determined as shown in the tables below. With regard to the staff distribution, the planned completion year for the Project (1989) was used as the reference year, taking the modified use of the existing main building into account. (Fig. 4-3-1 (c))

Fig. 5-1-3 Floor Area Criteria

Space	Criteria
Laboratory, Testing Space	3.0m²/person : General Laboratory One unit consists of one labo-table (36m²) (according to the layout of various equipment and apparatus)
Office Space	5.5~7.5m²/person (executive) 4.0~5.0m²/person (ordinary)
Conference Space	2m²/person apx.
Lecture Space	0.6~0.7m²/seat : in case of seat only 1.5m²/seat : seat with table
Seminar Space	2m²/person apx.
Audio Visual Space	2.8m²~3.0m²/seat
Library Space	150~160 books/m² : Open access shelves 1.8m²~2.0m²/person : Reading space
Printing Space	According to the layout of printing equipment
Canteen Space	1.5m²~2.0m²/seat (including of kitchen)

(Research and Laboratory Block)

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
1. Department of Entomology & Parasitology	(12.0)	(460.8)	8 research officers, 9 MLTs & 9 supporting staff (plus 8 entomology trainees & 10 field survey assistants)
Entomology Laboratory No.1	1.0	38.4	Standard size laboratory mainly engaged in the study of vectors
Entomology Laboratory No.2	1.0	38.4	Study of insecticides, biological control and cytogenetics
Consultant's Room	0.5	19.2	Consultant's office
Entomologists' Room	0.5	19.2	Staff room for 8 trainees undergoing 9 months' entomological training
Insectory	3.0	115.2	Breeding & observation of 4 species of insects (mosquitoes), including instrument washroom & cabinet space
Parasitology Laboratory No.1	1.0	38.4	General study of parasites
Parasitology Laboratory No.2	1.0	38.4	Study of amoebic dysentry, maleria, filaria & toxoplasma, etc.
Specimen Room	0.5	19.2	Storage of specimens of enteric parasites
Consultant's Room	0.5	19.2	Consultant's office
Washroom	1.0	38.4	Common use
Cold Room	0.5	19.2	Common use
Seminar Room	1.0	38.4	Common use by the Department. Also used as a staff room for officers & technologists. Computer is housed here
Changing Room	0.5	19.2	

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
2. Department of Clinical Pathology & Immunology	(11.5)	(441.6)	6 research officers, 10 MLTs & 10 supporting staff
Histopathology Laboratory	2.0	76.8	Study of histopathology & cytology. Combined in a single room to facilitate common use of equipment
Preparation Room	0.5	19.2	Common preparation room for histopathology & cytology
Haematology Laboratory	1.0	38.4	Study of haematology & clinical pathology
Quality Control Laboratory	1.0	38.4	Control of testing precision by means of spectroscopic analysis & other methods
Specimen Room	0.5	19.2	Storage of pathological specimens
Consultant's Room	0.5	19.2	Consultant's office
Immunology Laboratory	1.5	57.6	Study of immunology in general
Preparation Room	0.5	19.2	Common preparation room for immunology & allergy laboratories
Allergy Laboratory	1.5	57.6	Study of allergic diseases & incomplete immunity
Consultant's Room	0.5	19.2	Consultant's office
Washroom	0.5	19.2	Common use
Seminar Room	1.0	38.4	Common use
Changing Room	0.5	19.2	Common use

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
3. Department of Nutrition & Biochemistry	(11.5)	(595.2)	11 research officers, 15 MLT's & 9 supporting staff (plus 6 public health inspectors)
Nutrition Laboratory No.1	1.0	38.4	Study of sitology in general
Preparation Room	0.5	19.2	Common preparation room for nutrition laboratories & also acts as an anteroom
Nutrition Laboratory No.2	1.5	57.6	Analysis of glucide, protein & fat in foods
Instrument Storage	0.5	19.2	Storage of instruments used for field investigations & public health activities, etc.
Consultant's Room	0.5	19.2	Consultant's office
Biochemistry Laboratory No.1	2.0	76.8	Study of biochemistry in general
Biochemistry Laboratory No.2	2.0	76.8	Biochemical testing
Quality Control Laboratory	0.5	19.2	Quality control & analysis of clinical chemistry data
Washroom	0.5	19.2	Washing of testing & inspection instruments
Consultant's Room	0.5	19.2	Consultant's office
Seminar Room	1.0	38.4	Common use
Anteroom	0.5	19.2	Includes an emergency shower room
RI Diagnosis Laboratory No.1	1.0	38.4	Diagnostic research using RIA kit
RI Diagnosis Laboratory No.2	1.0	38.4	Hormone imbalance & others
Preparation Room	1.0	38.4	Storage of RIA kit & waste. Also acts as a preparation room to establish safe use of RI

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
Anteroom	0.5	19.2	Includes an emergency shower room as in the case of the anteroom for the RI area
Consultant's Room	0.5	19.2	Consultant's office
Changing Room	0.5	19.2	Common use
4. Department of Pharmacololgy & Medicinal Plant	(10.5)	(403.2)	8 research officers, 5 MLTs & 5 supporting staff
Pharmacololgy Laboratory No.1	1.5	57.6	Study of pharmacololgy in general
Preparation Room	0.5	19.2	Common preparation room for pharmacology laboratories
Pharmacololgy Laboratory No.2	1.5	57.6	Analysis of medicinal substances & study of pharmacological effects & safety, etc.
Consultant's Room	0.5	19.2	Consultant's office
Medicinal Plant Laboratory No.1	1.5	57.6	Study of the extraction of useful substances from medicinal plants & microbes
Preparation Room	0.5	19.2	Common preparation room for medicinal plant laboratories
Medicinal Plant Laboratory No.2	1.5	57.6	Objectives are the same as in the case of Laboratory No.1 but with different subjects
Consultant's Room	0.5	19.2	Consultant's office
Specimen Room	0.5	19.2	Storage of specimens of medicinal plants & microbes
Washroom	0.5	19.2	Common use
Seminar Room	1.0	38.4	Common use
Changing Room	0.5	19.2	Common use

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
5. Department of Bacteriology	(17.5)	(672.0)	13 research officers, 24 MLTs & 19 supporting staff
General Bacteriology Laboratory	2.5	96.0	General bacteriological studies
Enteric Bacteriology Laboratory	1.0	38.4	Identification & isolation, etc. of enteric bacilli (salmonella & dysentry bacilli, etc.)
Anaerobic Bacteriology Laboratory	1.0	38.4	Study of anaerobic bacteria (gas gangrene, tetanus, botulism & others)
Micology Laboratory	2.5	96.0	2 sections engaged in the study of mycology are integrated into a single laboratory
Leptospira Laboratory	1.0	38.4	Mainly diagnosis of leptospira
Food & Water Bacteriology Laboratory	1.0	38.4	Study of bacterial infections of drinking water & fresh foods
Quality Control Laboratory	1.0	38.4	Quality control in Bacteriology and Micology
Walk-in Incubator Room	0.5	19.2	Common use
Cold Room	0.5	19.2	Common use
Media Preparation Room	1.5	57.6	Common use by the entire Institute. Also supplies media for outside use
Washing & Sterilization Room	1.0	38.4	Common use
Dark Room	0.5	19.2	Common use
Consultant's Room No.1	0.5	19.2	Consultant's office

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
Consultant's Room No.2	0.5	19.2	Consultant's office
Storage	1.0	38.4	Common use by the Department. Has 2 Compartments
Seminar Room	1.0	38.4	Common use
Changing Room	0.5	19.2	Common use

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
6. Department of Virology	(16.5)	(633.6)	6 research officers, 15 MLTs & 10 supporting staff
Tissue Culture Room No.1	1.0	38.4	Tissue culture experiments of viruses in general
Media Preparation Room	1.0	38.4	Preparations for the above experiments, including media preparation
Tissue culture Room No.2	0.5	19.2	Same as Room No.1 but with different viruses
Anaerobic Virus Laboratory	1.0	38.4	Study of anaerobic viruses, including Japanese encephalitis & dengue fever viruses
Rabies Laboratory	1.0	38.4	Study of rabies in general
Respiratory Laboratory	1.0	38.4	Study of viruses causing respiratory infections
Chlamydia & Rickettisia Laboratory	2.0	76.8	Study of typhus & scrub typhus, etc.
Quality Control Laboratory	0.5	19.2	Common quality control of the Department
High Risk Laboratory	2.0	76.8	Experiments using high risk viruses
General Virology Laboratory-1	1.0	38.4	General Viological studies
General Virology Laboratory-2	1.0	38.4	ditto as above
Washroom	1.0	38.4	Common use
Cold Room	0.5	19.2	Common use
Walk-in Incubator Room	0.5	19.2	Common use

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
Seminar Room	1.0	38.4	Common use
Consultant's Room No.1	0.5	19.2	Consultant's office
Consultant's Room No.2	0.5	19.2	Consultant's office
Changing Room	0.5	19.2	Common use
7. Department of Biological Production	(13.5)	(518.4)	5 research officers. 15 MLTs & 20 supporting staff
Diagnostic Sera Production Laboratory	1.5	57.6	Preparation of laboratory pharmaceuticals & solutions for vaccines
Washing & Sterilization Room	0.5	19.2	Common use
Cold Room	0.5	19.2	Common use
Storage	0.5	19.2	Common use
Anti-Venin Production Laboratory No.1	1.5	57.6	Preparation of anti-venin
Freeze-Dry Room No.1	0.5	19.2	Freeze-dry of secrum
Anti-Venin Production Laboratory No.2	1.0	38.4	Preparation and research of anti-venin.
Bacterial Vaccines Production Laboratory No.1	1.0	38.4	Preparation of bacterial vaccines
Media Production Room	1.0	38.4	Preparation of media, etc.

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
Bacterial Vaccines Production Laboratory No.2	1.0	38.4	Preparation and research of Bacterial vaccines
Consultant's Room No.1	0.5	19.2	Consultant's office
Consultant's Room No.2	0.5	19.2	Consultant's office
Virus Vaccines Production Laboratory No.1	1.5	57.6	Preparation of virus vaccines
Freeze-Dry Room No.2	0.5	19.2	Freeze-dry of serum
Virus Vaccines Production Laboratory No.2	0.5	19.2	Preparation and study of virus vaccines
Changing Room	0.5	19.2	Common use
8. Center for Medical Instrumentation	(6.5)	(249.6)	1 electro-engineer, engineer, 9 technicians & 5 supporting staff
Heavy Equipment Room	1.5	57.6	Central control of heavy & precision medical equipment for common use
Photomicrography Room	1.0	38.4	Photographing & developing of macro & micro photographs
Maintenance Workshop	1.5	57.6	Maintenance of medical equipment used by the entire Institute
Maintenance Office	0.5	19.2	Maintenance staff & engineer's office
Electro-Microscope Room	1.5	57.6	Includes an anteroom & dark room. Has 2 separate compartments for scan-type & transmission -type microscopes

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
EM Office	0.5	19.2	Electro-engineer's office for the control of electro-microscopes
9. Administration	(8.0)	(288.0)	The administrative work for the entire Institute is carried out in the existing main building
Reception Office	1.0	36.0	Reception for laboratories, including telephone switchboard & control of room keys. The main reception on the Institute is located in the existing main building
Night Duty Room	0.5	18.0	Night duty (MLT) room for the security of the laboratories
Director's Room	1.0	36.0	Director's office
Assistant Director's Room	1.0	36.0	Assistant Director's office
Secretary's Room	0.5	18.0	Office of the Director & Assistant Director's secretary
Typist Room	0.5	18.0	Room of the Director & Assistant Director's typists
Branck Library	1.5	54.0	Library for research staff, stocking new books. The main library of the Institute is housed in the existing main building
Senior Staff Room No.1	1.0	36.0	Staff room
Senior Staff Room No.2	1.0	36.0	Same as above. Initially for use by Japanese Experts for the Technical Cooperation
Common Space (Corridor, Stairs, WC, etc.)		2,586.6	
Total		6,849.0	

(Animal Experiment Block)

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
1. Animal Breeding Section	(11.0)	(380.0)	1 vet, 2 MLTs, 4 animal supervisors & 20 supporting staff
Vet Office	0.5	18.0	Office of the vet responsible for the Animal Center
Staff Room No.1	0.5	18.0	room for animal breeding staff
Feed Preparation Room	0.5	18.0	Preparation & mixing of animal feed
Feed Storage No.1	0.5	18.0	Storage of animal feed
Bedding Materials Storage No.1	0.5	18.0	Preparation & storage of bedding for animals
Mice Breeding Room	1.5	50.3	Houses 2,000 mice (400 cages ×5 mice/cage) with 13 breeding shelves. Shelf measurements: 1,540mm(W)×330mm(D)×1,500mm(H)
Hamster Breeding Room	0.5	16.5	Houses 45 hamsters (15 cages×3 hamsters/cage) with 2 breeding shelves. Shelf measurements: 1,540mm(W)×330mm(D)×1,460mm(H)
Rat Breeding Room	1.0	33.0	House 230 rates (76 cages×3 rats/cage) with 4 water flush shelves. Shelf measurements: 1,600mm(W)×480mm(D)×1,550mm(H)
Guinea Pig Breeding Room	0.5	16.5	Houses 80 guinea pigs (30 cages×2-3 guinea pigs/cage) with a water flush shelf. Shelf measurements: 2,060mm(W)×560mm(D)×1,700mm(H)
Rabbit Breeding Room	1.0	34.2	Houses 130 rabbits (130 cages) with 8 water flush shelves. Shelf measurements: 2,060mm(W)×640mm(D)×1, 800mm(H)

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
Storage	0.5	18.0	Includes a washroom. The breeding facilities for 4 types of snakes for the study of venin in the future will be provided in this storage
Central Washing & Sterilization Room	3.0	102.0	Washing, disinfecting & sterilizing of instruments excepting those used for virus infection experiments
Case Storage	1.5	54.0	Storage of sterilized cages & pallets, etc.
2. Animal Experiment Section	(9.0)	(325.0)	
Staff Room No.2	0.5	18.0	Room for animal experiment staff
Changing Room	1 1/3	37.0	Changing room for access to the clean area. Separate shower rooms & toilets are provided for men& women
Feed Storage No.2	2/3	24.0	Storage of feed prepared in the basement
Bedding Material Storage No.2	0.5	18.0	Preparation & storage of bedding materials
Animal Experiment Room No.1	1	36.0	Common use for general experiments involving large animals
Animal Experiment Rooms Nos. 2-6	2.5 (0.5x5)	90.0	Common use of 5 rooms for general experiments involving small animals
Animal Experiment Storage	0.5	18.0	Storage of instruments used for animal experiments
Operating Theater	2/3	24.0	Common use for animal operations
Postmortem Room	2/3	24.0	Common use for postmortems of experimental animals

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
Instrument Storage	0.5	18.0	Storage of instruments used for the above postmortems
Washroom	0.5	18.0	Common use for the above operations & postmortems
3. Infected Animal Experiment Section	7.5	237.0	
Infected Animal Experiment Rooms Nos.1-4	2.0 (0.5x4)	72.0	4 rooms for infected animal experiments
High-Risk Animal Experiment Room	1.0	30.0	High-risk animal experiments. Includes an adjoining room for use as a safety zone
Washing & Sterilization Room	1.5	54.0	Washing and sterilizing of instruments used for infected animal experiments. Disinfected large instruments will be moved to the Central Washroom for sterilization
Anteroom	0.5	9.0	Anteroom used as a safety zone before access to the infected animal experiment section. Has a shower room & a changing room
Clean Corridor	1.0	25.2	2.1m×12.0m
Dirty Corridor	1.0	37.8	2.1m×18.0m
4. Animal Experiment Section for Biological Production	3.5	130.8	To be controlled by the staff of the Department of Biological Production
Infected Large Animal Room	1.0	36.0	Houses medium & large size animals used for vaccine production & other purposes
Infected Small Animal Room	0.5	19.2	Houses small animals used for vaccine production & other purposes

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
Animal inoculation Room	1/4	9.6	Production of animal infections by pathogens for antibody reaction
Animal Sacrifice Room	1/4	9.6	Slaughter of animals weakened by blood-drawing & other reasons
Anti-sera Preparation Room	1.0	38.4	Blood-drawing & separation of antisera
Preparation Room	0.5	18.0	Common preparation room for the above rooms. Washing facilities are also provided
Boiler Room	1.5	58.5	High-pressure boiler for steam supply will be installed
Boiler Operation Office	0.5	18.0	Control of the Boiler, Incinerator and Fuel tank
Common Space (Corridor, Stairs, WC, etc.)	-	434.7	
Total		1,584.0	

(Medical Training Block)

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
MLTs Training Laboratory	3.5	126.0	Practical training of MLTs students. 6 experiment tables (4 trainees/ table) will be provided for 24 students (1 unit : half of the class)
Lecture Hall	8.0	288.0	Lecture hall for all students. Also used for public health activities, campaigns, student meetings & conferences, etc. (seating capacity : 180)
Canteen	4.0	144.0	Provides light meals for the staff & students in shifts. Indoors : 100 seats, outdoors : 40 seats
Kitchen	1.0	36.0	Preparation of some 250 light meals per day
Water Tank & Pump Room	2.5	90.0	Houses a water tank ($160m^3$) & 2 pressure pumps
Electricity Sub-Station	4.0	144.0	Houses the high-voltage service panel of the CEB & the high-voltage panel, transformer, low-voltage panel & self-generating power panel, etc. of the MRI
Maintenance Office	1.5	54.0	Maintenance office & equipment/ materials storage
Common Space (Corridor, Stairs, WC, etc.)		400.5	
Total		1,359.0	

(Animal Quarantine Shed)

Room Name	Planned No. of Units (6.4mx6m)	Planned Area (m^2)	Remarks
Animal Quarantine	—	99.0	Animal observation of quarantine for purchased large animals
Grand Total		9,891.0	

5-2. Basic Plan

5-2-1. Land Use and Facility Layout

The project site consists of flat land and elevated land beside and to the south of the existing main building respectively. The proposed facility layout should achieve the effective interaction of the existing buildings and should also allow the smooth connection of the additional facilities when the existing buildings are removed in the future.

In view of the shape of the project site and the relative locations of the existing buildings, the proposed facilities will be constructed on either flat or elevated land. If priority is to be given to a good view or easy access to the new facilities from the main road (Baseline Road), the main facilities should be constructed on the elevated land. This would, however, necessitate large scale land preparation work prior to facility construction, causing problems in terms of the construction cost and the constructions period.

In addition, the Urban Development Agency has stipulated that any redevelopment work along Baseline Road should involved at least medium-height buildings. The construction of medium-height buildings must, therefore, be planned for the flat land behind the existing main building.

Given the above conditions, the new laboratory complex will be constructed on the flat land while the educational/training/welfare facilities which require less land preparation work will be constructed on the elevated land. Direct access from Baseline Road will be planned in deciding the facility distribution in view of the future prospect of the facilities becoming functionally independent from the existing facilities. In addition, the facility layout should also allow service access to the facilities from the roads to the north and south.

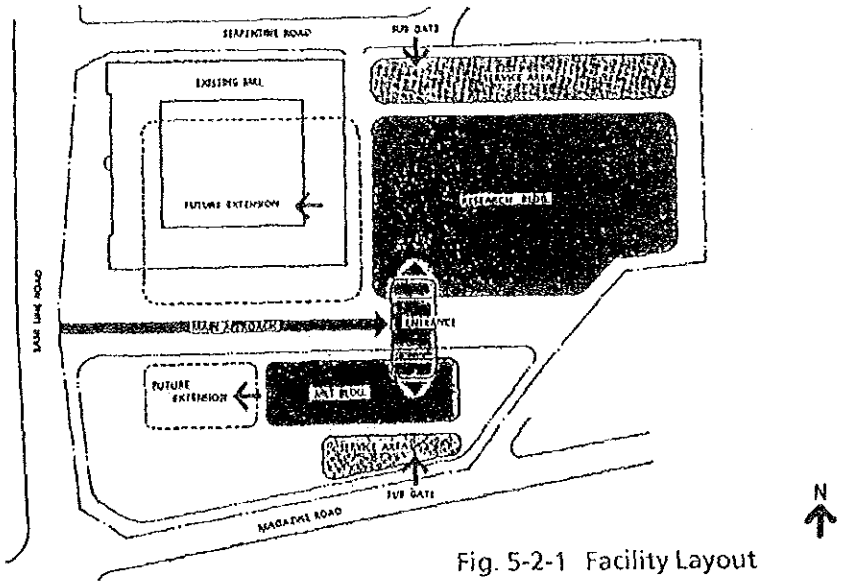
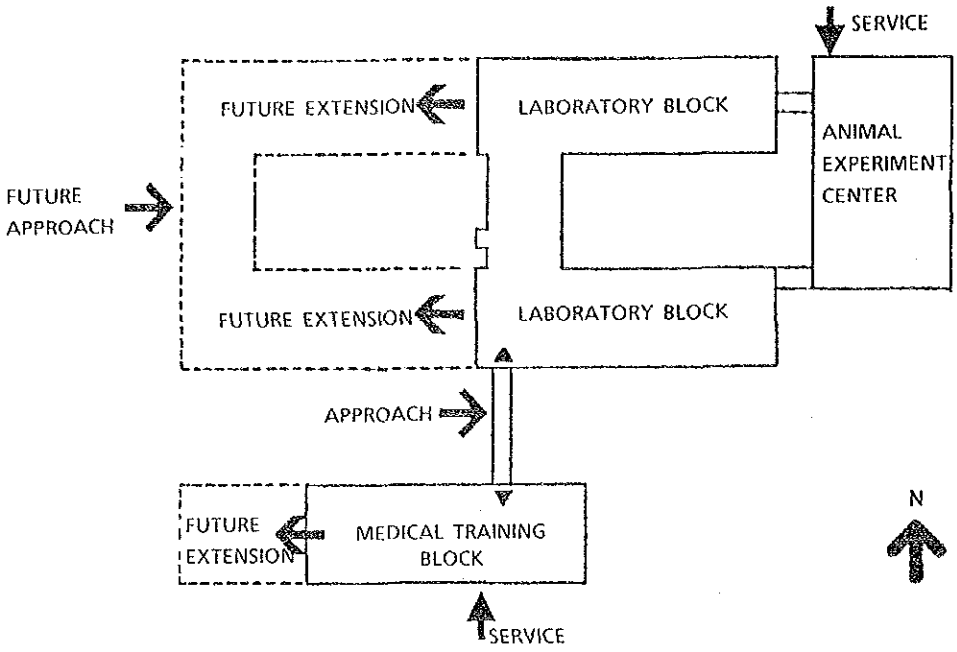


Fig. 5-2-1 Facility Layout

5-2-2. Block Plan

The facilities to be constructed in the Project will be classified into 3 groups, i.e. 1 laboratory group, 2 animal experiment group and 3 education and training group, in view of their functions, sizes and the nature of their activities, etc. The following block layout will be introduced for these 3 groups in view of their interaction between themselves and with the existing main building, their respective construction periods, annual construction schedules and future expansion.



1) Laboratory Group

This group consists of 6 laboratory departments and the Department of Biological Production. In the light of the unit size of each laboratory, the block is divided into 2 buildings which are located on the east-west axis to match the natural conditions.

2) Animal Experiment Group

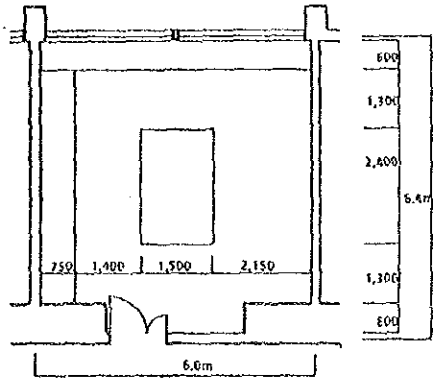
As the facilities belonging to this group are for common use by all departments, they will be located to the east of the laboratory group. Service access to these facilities will be from the north (Serpentine Road).

3) Education and Training Group

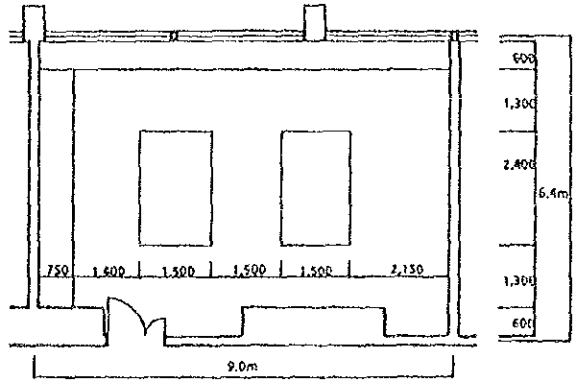
While the education and training of medical laboratory technologists will be mainly conducted in the existing main building in the future, the laboratories, lecture hall, canteen and other facilities will be housed in a single building.

In view of the different elevations of the site, the laboratories and machine rooms, including the power room, will be located on the ground floor of the building while the lecture hall and canteen will be located on the 1st floor. The 1st floor will be connected to the laboratory building by a bridge. Service access to the canteen will be from the south (Magazine Road).

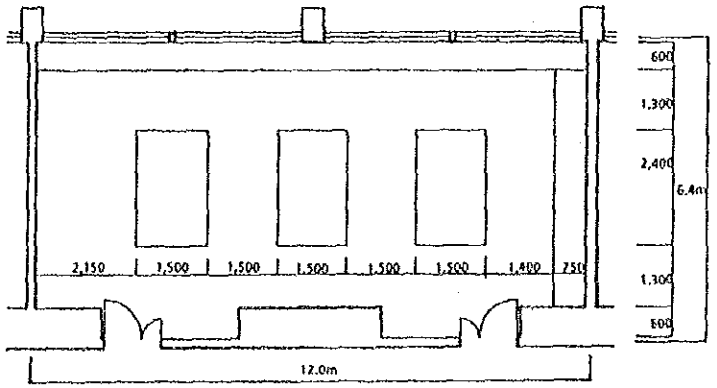
Fig. 5-2-3 (a) Unit Plan



1.0 Units



1.5 Units



2.0 Units

5-2-3. Building Plan

1. Floor Plan

(1) Laboratory Group

a. Determination of Basic Module Size for Laboratories

It has been decided that the unit size for the laboratories will be 6m × 6m. The size of each laboratory in terms of units has been determined through consultations with the Sri Lankan side at the basic design study stage.

A standard laboratory width of 6m will allow adequate space for both working and moving around after the layout of standard laboratory tables in centre and work benches beside the walls. The depth of each laboratory will depend on the size of the centre laboratory table and the type of equipment to be installed. In the present Project, water supply / drainage facilities will not be located at the centre laboratory table in view of maintaining flexibility to meet the current and future different purposes of use and these facilities will instead be located at the work bench by the wall. As a result, a room depth of 6m will be adopted to secure adequate work space for the use of the main laboratory table (1.5m × 2.4m). Each laboratory will have an adequate variation of units. (to Fig. 5-2-3 (a))

b. Building Composition

As the introduction of the more attractive side corridor type of building for the laboratory complex is impossible due to the site restrictions, central corridors will be introduced in view of the effective utilization of the limited area. Particular attention will be paid in the floor plan, however, for the provision of open corridors facing the courtyard on the ground floor for natural lighting and ventilation. In the case of the 1st floor, side corridors will be adopted so that the flow line from each department to the Animal Center does not cross the central corridors of the department.

The 2 laboratory blocks will be connected by a common use section where staff rooms, seminar rooms and rooms for common use equipment, etc. are located. The research department distribution will be as shown in Fig. 5-3-2 (b).

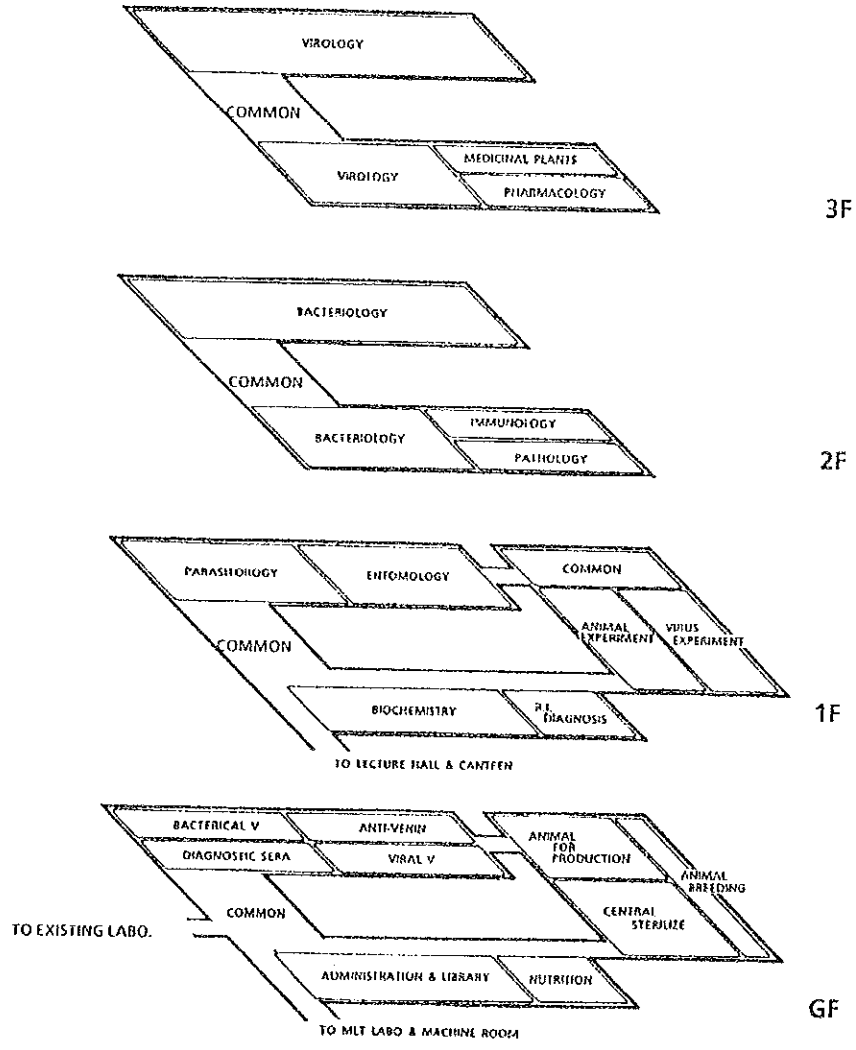
(2) Animal Experiment Group

High grade facilities, including contamination prevention zones and temperature and humidity control, will be required for the Animal Center due to its complicated nature. While a compact floor plan will be introduced to reduce the maintenance cost, natural lighting will be utilized to deal with blackouts and to save energy. Natural ventilation will be planned for all sections other than contamination prevention zones.

Animal breeding rooms, biological production animal rooms, animal experiment rooms and washing and sterilization rooms will be located on the ground floor. The animal quarantine shed including large animal rooms will be housed in separate building.

Animal experiment rooms and the infected animal and high risk animal experiment rooms will be located on the 1st floor.

Fig. 5-2-3 (b) Department Distribution Plan



(3) Education and Training Group

Using the different levels of the proposed site for this group, the canteen and lecture hall will be located on the 1st floor of the building while the training laboratory for the SMET, machine rooms and the maintenance office will be located on the ground floor. A gallery will be provided to minimize the maintenance cost by facilitating the use of natural lighting and ventilation.

The lecture hall will have desks and chairs for 150 people and will be equipped with a projector, sound control and lighting control equipment. A direct entrance from the south (Magazine Road) will be provided for easy access by visitors.

The canteen will be located next to the lecture hall so that it can be used as a lounge when events concerning a large number of people are planned in the lecture hall.

The location of the kitchen will allow for the smooth delivery of food and the collection of waste from Magazine Road.

2. Vertical Plan

Harmony with the surrounding environment and the existing facilities will be stressed in the preparation of the vertical plan and the modeling of the entire facilities. A sloping tiled roof and eaves above the open sections of the outer walls will be provided to suit the local climate.

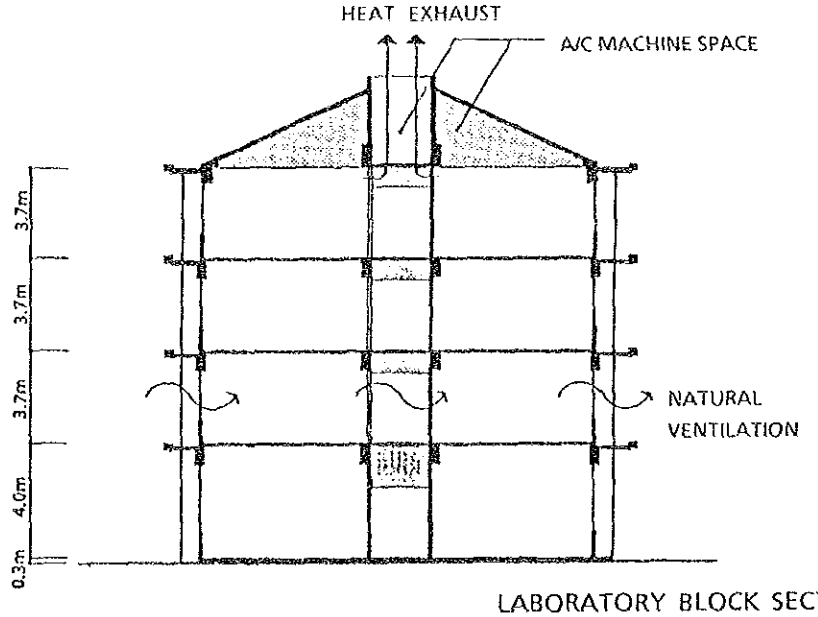
3. Cross-Section Plan

1) Laboratory Block

Floor heights of over 4m for the ground floor and over 3.7m for the 1st floor and higher floors will be adopted to provide comfort by means of mainly natural ventilation rather than mechanical ventilation.

In principle, direct concrete slab ceilings instead of suspended ceilings will be introduced for all rooms excepting those where ducts and pipes are required for air-conditioning. The structure of the direct ceiling should be of a type which will prevent the accumulation of dust.

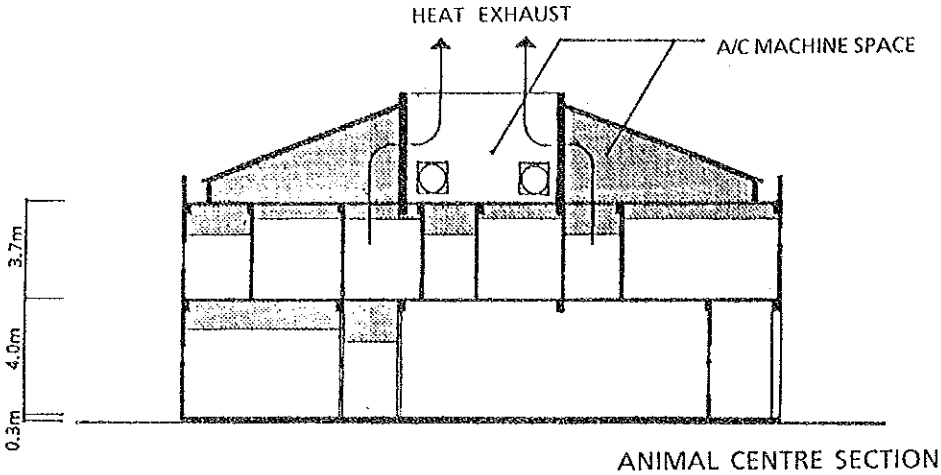
The quick drainage of rainwater will be achieved by the sloping roof and the attics will have adequate ventilation to increase the heat insulation effect on the highest floor. Eaves will be provided to prevent sunlight from directly entering the rooms.



LABORATORY BLOCK SECTION

2) Animal Center

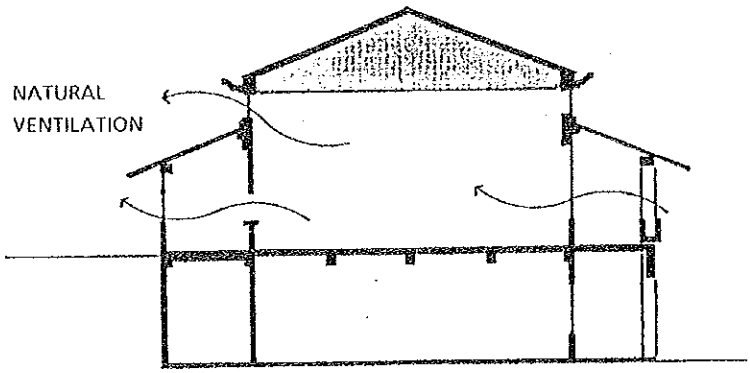
Since the experiment rooms on the 1st floor require highly efficient air-conditioning, concrete slab ceilings will be introduced, as well as a sloping roof, to secure air-tightness. The attics will be used to store various A/C machines while the section with the flat roof will be used for the installation of external fans.



ANIMAL CENTRE SECTION

3) Medical Training Block

As already described earlier, this building will be provided with a gallery to prevent strong sunlight and rainwater from entering the rooms and to facilitate natural ventilation. The lecture hall and canteen where a large number of people will congregate will have high ceiling heights to maximize the air space.



MLT BLOCK SECTION

4. Building Material Plan

Strong and easy to maintain building materials in view of the local climate and the required functions of the facilities will be selected and local materials will be used where possible.

1) Main Structural Components

Columns, Beams, Floor ..... Reinforced concrete.
Generally used in Sri Lanka and the most rational choice.

Walls ..... Concrete blocks or bricks. As concrete walls constructed using shutterings are not commonly used is Sri Lanka, they would involve technical difficulties and a cost increase. Since concrete walls are not required from the structural viewpoint, the use of concrete blocks or bricks is the most rational choice.

Roof Frames ... Steel frames or light steel frames.
Wooden frames have maintenance and durability problems due to their procurement difficulty and possible damage caused by termites.

2) Exterior Finish Components

Sloping Roofs .. Corrugated slates with tiling above.
Tiles roofs will be introduced in view of heat insulation and a better appearance with the tiles being laid on top of corrugated slates which are most commonly used and which have excellent waterproofness.

Flat Roofs ..... Waterproof coating

Outer Walls ... Mortar finish sprayed with acrylic resin paint. Local repair and respray must be possible.

Doors and Windows ..... Wood and aluminium, While the doors will be made of wood, aluminium window frames will be used to secure the air-tightness of the laboratories.

3) Interior Finish Components

(Laboratory Block)

Room Name	Floor	Baseboard	Walls	Ceiling
Laboratories	Long vinyl chloride sheet	Long vinyl chloride sheet	Mortar & paint	Mortar & paint.
Preparation Rooms	Vinyl sheet	Mortar & paint	〃	〃
Staff Room	〃	〃	〃	〃
Seminar Rooms	〃	〃	〃	〃
Changing Rooms	〃	〃	〃	〃
Director's Room	〃	〃	〃	Mortar & Paint
Library	〃	〃	〃	〃
Toilets	Mozaic tiles	Semi-ceramic tiles	Semi-ceramic tiles	Calcium silicate board & paint
Central Corridors	Vinyl sheet	Mortar & paint	Mortar & paint	Mortar & paint
External Side Corridors	Cement press tiles	Mortar	〃	〃

(Animal Center)

Experiment Rooms	Long vinyl chloride sheet	Long vinyl chloride sheet	Mortar & paint	Calcium silicate board & paint
Infected Animal Experiment Rooms	〃	〃	〃	〃
Breeding Rooms	〃	〃	〃	〃
Sterilization Rooms	〃	〃	〃	〃
Staff Rooms	Vinyl sheet	Mortar & paint	〃	〃

(Education and Training Block)

Lecture Hall	Terrazzo tiles	Wood	Mortar & paint	Calcium silicate acoustic board
Canteen	Cement press tiles	Mortar	〃	〃
Laboratories	Long vinyl chloride sheet	Long vinyl chloride sheet	〃	Mortar & paint
Corridors & Hall	Cement press tiles	Mortar	〃	〃
Machine Rooms	Mortar	〃	Mortar	Mortar

5. Exterior Facilities Plan

1) Roads on the Premises

There will be 2 approach roads to the proposed building, i. e. a main approach road from Baseline Road and a service road from Serpentine Road. A pavement will be separately constructed for the main approach road.

2) Car Park

Since the MRI does not have many staff or visitors using cars at present, a car park with a capacity of some 20 cars will be provided.

3) Retaining Walls

As part of the elevated land in the southern part of the Project site will be excavated in view of the construction of the main approach road, retaining walls will be necessary. In addition, the facility layout plan anticipates that the education and training building will almost reach the southern boundary of the premises where the land dips. Retaining walls should, therefore, also be provided at this point. Side ditches top prevent the intrustion of rainwater from the adjoining land and ditches to drain rainwater from the premises are planned in this area.

4) Exterior Facilities

The construction of the gate, guard post and supplementary facilities for the Animal Center is planned.

5) Grass and Trees

Excluding buildings and paved areas, the entire premises should be covered with grass to minimize undesirable sand and dust in the air.

While as many as possible of the existing trees will be kept, tall trees should be planted in the area surrounding the car park to provide shade.

5-2-4. Structural Plan

A rational and economic structure will be employed in the preparation of the structural plan for the buildings to be constructed in the Project, taking the purposes and functions of the buildings into consideration. The geological survey results and the level of construction technologies in Sri Lanka will also be considered in deciding the type of foundations to be used. Furthermore, Sri Lankan standards and past results will be taken into consideration to decide the design loads and the design standards.

1) Soil Conditions and Foundation Types

According to the geological survey data on the site (see Appendix), there is a relatively soft layer of clayey silt, etc. At a depth of 10-15m below the surface soil with highly weathered rock located below this layer.

With regard to the buildings to be constructed, 2-story buildings will have their foundations directly on the clayey silt layer (N is around 10) while 3-story buildings or higher will have pile foundations using the highly weathered rock ($N \geqq 50$) as the supporting layer.

2) Structure and Design Standards

A reinforced concrete rigid frame structure will be employed in view of it being the most economic and rational choice for buildings in Sri Lanka. The outer walls and inner dividing walls will be made of either concrete blocks or bricks and the roofing will be generally composed of steel frames.

In regard to the design standards, as British standards are generally used in Sri Lanka, the following standards will be adopted.

- Dead Load, Live Load - BS 6399 Part 1 (1984)
- Wind Load - BS CP3 Chapter V (1972)
- Reinforced Concrete Structure - BS CP110 (1972)
- Steel - Frame Structure - Japan Architectural Society Standards

Table 5-2-4 gives the main dead loads to be used in the design of the buildings. The design wind velocity used for the wind load calculation is 35m / sec (approximately 75 miles / hour) which is the standard velocity given in BS CP3 for monsoon zones. No consideration is given to the earthquake load as no earthquakes have been recorded in Sri Lanka.

Table 5-2-4 Live Loads for Major Parts of Buildings

Room Name	Live Load (kg/m^2)
Research Rooms	306
Laboratories	306
Administrative Offices	225
Large Lecture Halls	610
Corridors, Balconies	306

Source : BS 6399 Part 1 (1984)

3) Materials

The materials to be used should be procured locally as much as possible and only those materials where the Sri Lankan supply capacity or product quality is inadequate will be imported from Japan. The design concrete strength will be $255kg/cm^2$.

- Cement : Ordinary Portland cement
- Rough Aggregate : Crushed local stones
- Fine Aggregate : Local river sand
- Steel Bars : Japanese deformed reinforcing bars : SD30 , SD35 (JIS G3112)
- Structural Steel : Japanese H sections and light weight steel sections : SS41 (JIS G3101) , SSC41 (JIS G3350)

5-2-5. Utilities Plan

1. Basic Policy

As such dangerous substances as pathogens and vectors will be handled by the research facilities to be constructed in the Project, careful consideration should, therefore, be given to the safety of researchers vis-a-vis research and laboratory tests and to the prevention of contamination vis-a-vis the local residents. The following should be carefully considered in the preparation of the utilities plan.

1) Establishment of a flexibility which corresponds to the progress of research.

2) Economical electricity, fuel and maintenance costs.

3) Selection of easy-to-repaire and interchangeable machinery and spare parts.

4) Assurance of proper operation and maintenance of the utilities from the technical and financial viewpoints.

5) Establishment of appropriate breeding conditions and facilities to ensure the smooth implementation of animal experiments so that the living environment of the animals does not affect the research results.

6) Establishment of an emergency power supply to cater for those facilities and equipment whose operation must be continued during a blackout due to the nature of the research activities concerned.

2. Electricity Plan

1) Power Supply and Sub-Station

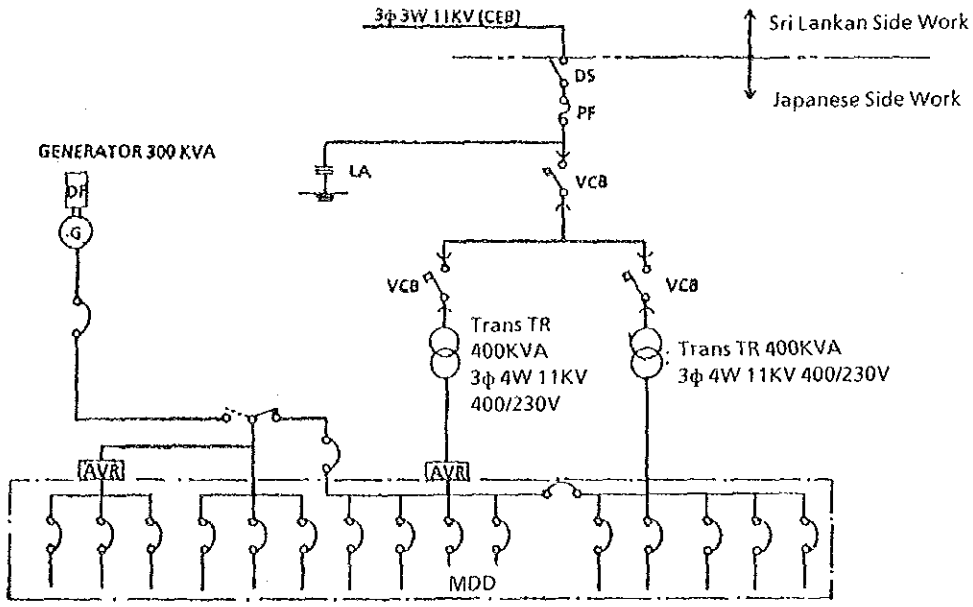
(a) Power Supply

A high-voltage power cable (11KV 50Hz) of the CEB is buried below Baseline Road in front of the Project site and branching work from this cable will be conducted by the Sri Lankan side to provide the site with a power supply.

(b) Sub-Station

A sub-station (15m^2) of the CEB will be provided on one of the proposed buildings and a high-voltage breaker and various instruments will be installed by the CEB. A transformer and low-voltage distribution panel will be installed in the power room of the MRI. Although a facility with a transformer with a capacity of upto 800KVA could be installed by the CEB provided the necessary cost is paid by the MRI, this transformer will be installed by the Japanese side in view of the fact that more than a year would be required for the CEB to deliver the required transformer. Consequently, the Japanese side will be responsible for the electrical work for the MRI's transformer onwards. The planned transformer capacity is approximately 800KVA.

The main power, changed to low-voltage, 3-phase, 4-line 400 / 230V by the transformer, will be supplied to the distribution panels and power control panels in each building via the low-voltage distribution panel. In the case of those instruments requiring a stable power supply, an automatic voltage regulator will be installed in the power room to supply stable power to the distribution panels for those instruments in each laboratory. To prevent damage by a voltage fluctuation of over ± 15 - 20%, a protective relay will be installed to automatically switch over from the commercial power source to the emergency power source.



2) Emergency power Supply

A diesel power generator will be installed in the generator room as a precaution against blackouts. The generating capacity will be approximately 300KVA with 3-phase, 4-line 400 / 230V 50Hz. The possible load for this generator will include fire pumps, emergency lights, refrigerators and air-conditioning equipment for the RI facilities, the biohazard laboratory and the animal breeding room. A battery with a capacity of approximately 200AH will also be installed for the purpose of emergency lighting and the alarm indicator for transformer operation.

3) Main Power Circuit

The main power, with a reduced voltage by the transformer, will be distributed to the distribution panels and the power control panels in each building via the MCB of the low-voltage distribution panel in the power room. This main power circuit will be composed of metal glands and IV electrical wire.

The power types for the main and branch circuits will be as follows.

· Main circuit for lighting and power	:	3-phase, 4-line, 400 / 230V
· Lighting and socket outlets	:	Single-phase, 2-line, 230V
· Power for fans and pumps, etc	:	3-phase, 3-line, 400V

4) Lighting

(a) Lighting Appliances

The lighting source will be basically fluorescent tubes to minimise the running cost. Incandescent lamps will also be used whenever deemed necessary. 2 single use stabilizers for the fluorescent lamps will be used instead of a double use stabilizer so that a single fluorescent lamp of a pair of lamps can be individually lit. Emergency lights and illuminated signs will be installed at critical points for disaster prevention and evacuation purposes. The installation of sterilizing lamps and clean room equipment will be planned depending on the purpose of a specific room. A small zoning system will also be introduced for light switches to minimise the running cost. The luminous intensity will be as follows.

● Laboratories	400~500lx
● Administration Office, Meeting Rooms	300~400lx
● Library	400~500lx
● Animal Breeding Room	100~200lx
● Toilets, Corridors	50~100lx

(b) Power Points

Apart from the general power points and those for cleaning purposes, the installation of socket outlets for testing equipment should also be planned in view of the equipment layout and required power. Although a single-phase 230V outlets will also be installed for large machines and equipment.

(c) Ceiling Fans

Ceiling fans will be installed for each span of the administration office, meeting rooms and laboratories, etc.

5) Motive Power

A motive power control panel will be installed in each machine room to supply power to the fans and pumps, etc. Alarms for the power loads and water levels will be combined for either each panel or each machine room and will be displayed on the warning panel in the administration office.

6) Telephones

(a) Installation

Since the availability of telephone lines in the area is very tight at present, the existing lines used by the main building will be transferred to the new buildings. As far as the cabling for the telephone lines is concerned, an adequate number of outlets will be provided to meet the demand for an increased number of lines with the future improvement of the telephone network in the area.

(b) Telephone Cabling

Metal glands will be used from the telephone service panel to the room outlets via relay panels. The cabling should be able to meet the future increase of trunk lines and extensions.

(c) Telephone Switchboard

A telephone switchboard with a capacity of 100 / 100 lines will be installed in the switchboard room in the administration building and 50 extensions will be installed in the required locations. The inclusion of the extensions in the existing MRI building in the new network in the future should also be planned.

7) Public Address System

An amplifier and a microphone will be installed in the switchboard room in the administration building and speakers will be installed in all rooms for communication and paging purposes. The output system should allow a separate address in each building and on each floor.

8) Interphone System

An interphone system will be installed between those rooms requiring frequent and close communication in view of their respective functions.

9) Automatic Fire Alarm System

An automatic fire alarm system operating on sensors and push buttons will be installed for the early detection of fire and for safe evacuation. A fire alarm display panel will be installed in the administration office to indicate the area (s) of fire.

10) TV Facilities

TV outlets will be provided in training rooms, halls and other rooms for group viewing. An aerial will be installed on the roof of the main building and TV signals will be distributed to each outlet via coaxial cables.

11) Lightning Arrester

A lightning arrester will be installed to protect both people and property.

12) Outdoor Lighting

Mercury lamps will be provided for outdoor lighting in view of the premises' security at night. Switching will be either manual or automatic using a timer (interchangeable).

13) Lifts

A passenger / cargo lift and a dumb waiter will be installed in the new main building and the Animal Center respectively.

Lift	:	Capacity	13 persons / 900kg
		Speed	60m/minute
		Stops	4 stops
Dumb Waiter	:	Capacity	200kg
		Speed	20mn/minute
		Stops	2 stops

3. Air-Conditioning and Ventilation System

1) Air-Conditioning System

The air-conditioning system to be installed will be decided depending on the room purposes, taking into consideration

(1) temperature control, (2) humidity control, (3) air cleanness control,

(4) differential pressure control and (5) air current control.

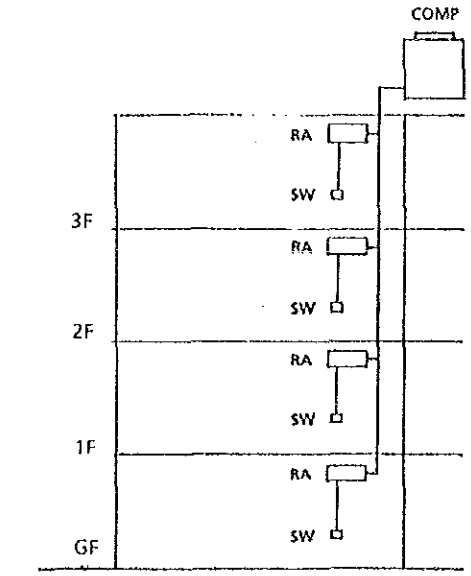
(a) Air-Cooled Air-Conditioning

For those rooms where strict temperature and humidity controls are not required but where air cooling and dehumidifying are required.

Design Temperature : 28°C

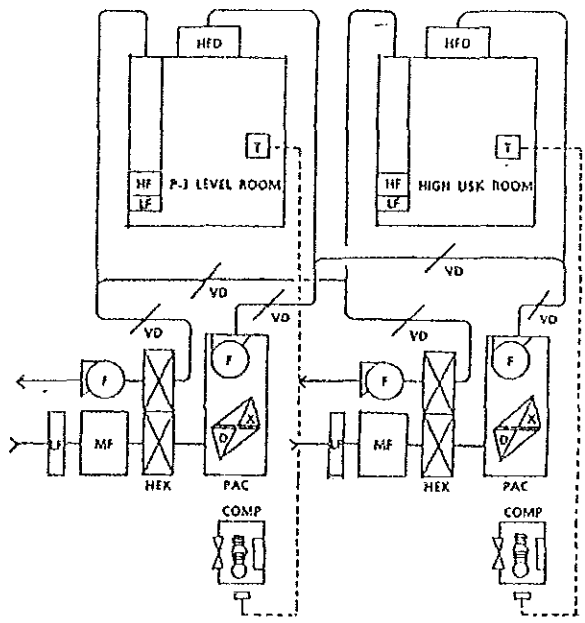
Design Humidity : 50~60%

Subject Rooms : Ordinary laboratories, meeting rooms, library, consultant rooms, dark room and central equipment control room, etc.



LEGEND
COMP : COMPRESSOR
RA : ROOM AIR-CON.
SW : SWITCH

GENERAL LABORAOTRY ZONE



HIGH LISK ROOM ZONE

(b) Fresh Air Package Type Air-Conditioning

For those rooms where fresh air operation is required to prevent cross contamination and to remove odours. Reheating coils will be installed whenever deemed necessary.

Design Temperature : 27°C±2°C

Design Humidity : 55%±5%

Subject Rooms : Part of animal laboratory, high risk laboratories, RI laboratory

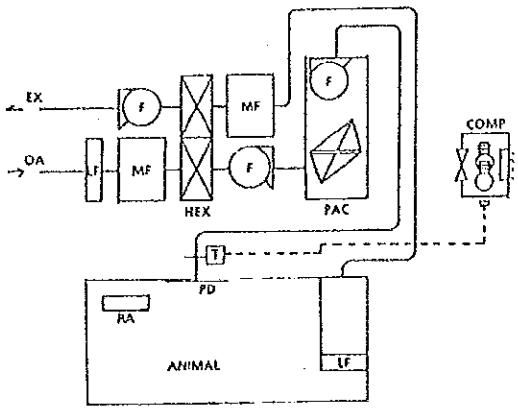
(c) Package Type Air-Conditioning

For those rooms where a high degree of cleanness is to be provided by medium or high performance filters.

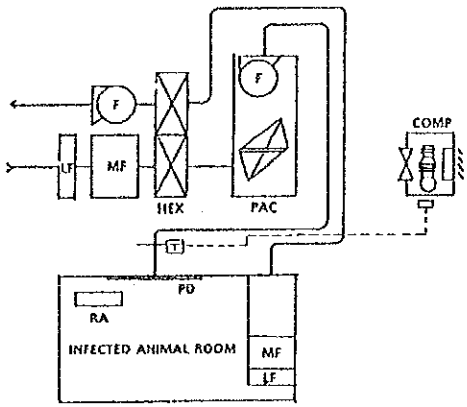
Design Temperature : 27°C±2°C

Design Humidity : 55%±5%

Subject Rooms : Mycology laboratories, Virus laboratories



ANIMAL BREEDING ROOM



INFECTED ANIMAL ROOM ZONE

2) Ventilation Facilities

(a) Natural ventilation will be used as much as possible for general ventilation purposes in machine, power and generator rooms. If the ventilation volume appears inadequate, a mechanical ventilation system will be installed.

(b) Toxic gas and dangerous exhaust fumes generated by draft chambers or safety cabinets installed in the laboratories will be directly removed through the ceiling via special ducts.

4. Water and Sanitation Facilities

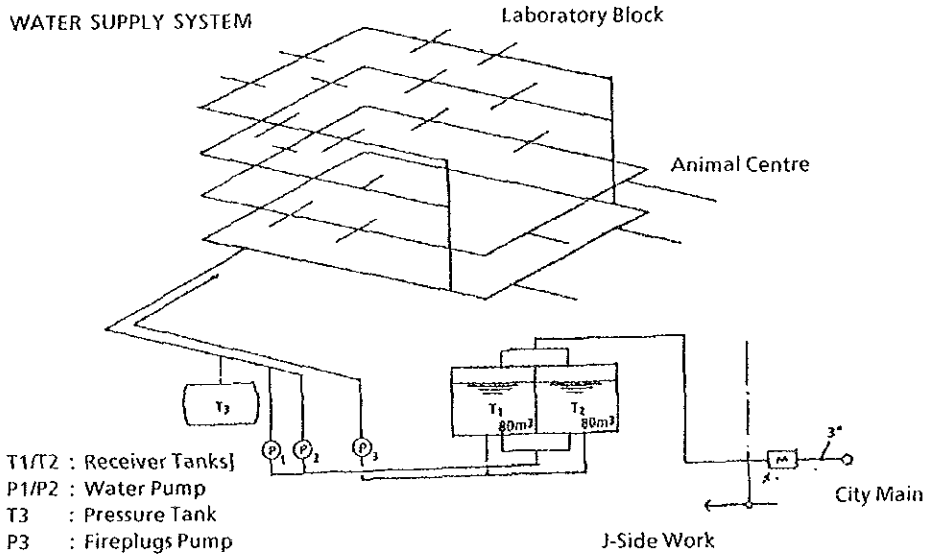
1) Service Water Supply

(a) Service water will be supplied to the new buildings by extending the 3 inch cast iron water pipe laid in the western part of the present site and the water will be stored in ground water tanks made of FRP.

(b) The design water volume is 160m^3 and two 80m^3 water tanks will be installed, both catering for the water required for fire-fighting (150m^3).

(c) Water will be supplied using a pressure pump installed in the pump room. An auxiliary pump will also be provided to be operated by emergency power.

(d) The supply of drinking water for the animals in the Animal Center will be made from the elevated water tanks (1.5m^3) on the roof using the gravity method with a constant water pressure.



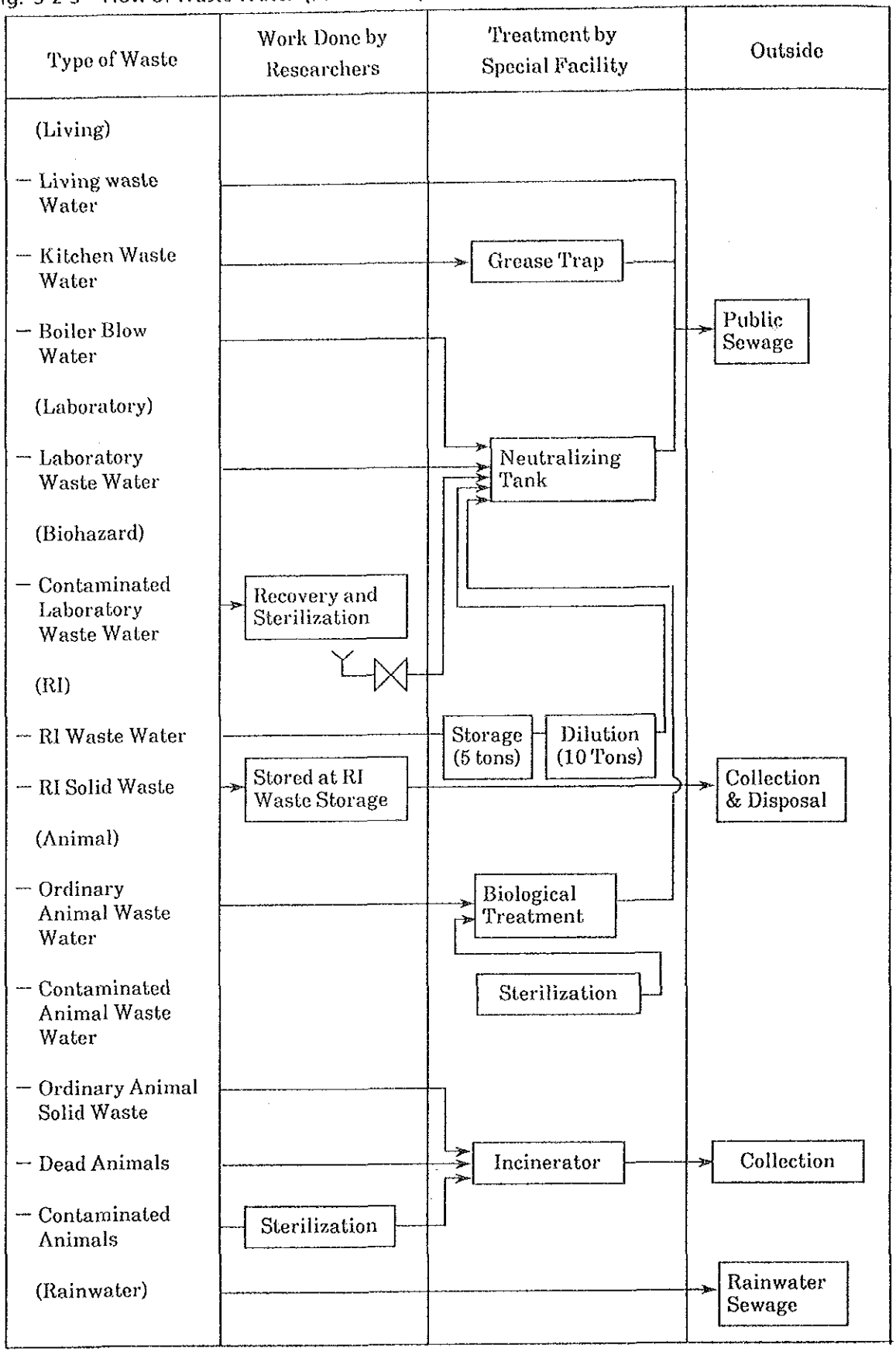
2) Hot Water Supply

(a) Hot water will be supplied from the solar collectors to be installed on the roof for the cleaning of animal cages in the Animal Center, staff showers and for other purposes. Mixer taps will be provided where required.

(b) A water storage type electric heater will be installed to provide hot water for drinking purposes.

(c) All pipes will be made of copper.

Fig. 5-2-5 Flow of Waste Water (Solid Waste)



3) Water Discharge

(a) The discharge of waste water from the premises will be separately arranged for each of the 5 different types of waste water, i.e. (1) waste water from living activities, (2) waste water from laboratory work, (3) waste water from animal-related activities, (4) waste water from RI activities and (5) rainwater.

(b) The waste water from (2), (3) and (4) above will be treated prior to its drainage to the public sewage system.

- Waste Water from Laboratory Work

  General waste water will be drained after being neutralized in the neutralizing tank. the waste water from biological tests will be stored in polyethylene tanks, sterilized and then discharged via the overflow in each laboratory.

- Waste Water from Animal-Related Activities

  This type of waste water will be treated in the primary treatment tank on the premises in order to reduce its BOD value to less than 90ppm and will then be discharged.

- Waste Water from RI Activities

  Waste water from the RI control area will be stored in a special tank until its radiation level is low enough for it be drained. It will then be discharged via the discharge tank where it is diluted. The solid waste from the RI control area will also be stored in a special tank and will be disposed of at the designated location.

(c) Rainwater will be directly discharged to the rainwater sewage main.

(d) Discharge Pipe Materials

Waste Water Pipes	:	Cast iron
Living Waster Water Pipes	:	Steel, PVC
Air Pipes	:	Steel, PVC
Laboratory Waste Water Pipes	:	Polypropylene, PVC
RI Waste Water Pipes	:	Steel with vinyl chloride lining
Animal Waste Water Pipes	:	Steel with vinyl chloride lining, PVC

4) Fire Fighting

(a) The fire fighting facilities required in the Project will be planned pursuant to the Sri Lankan Fire Services Act and the Japanese Fire Services Act.

(b) Indoor fireplugs will be installed every 100 feet.
Hoses will be the fixed reel type capable of automatic operation.

(c) Carbon oxide fire extinguishers will be provided for the power and machine rooms, etc. while powder fire extinguishers will be installed every 100 feet in other places.

5) Liquedfied Petroleum Gas (LPG)

(a) Although city gas is currently supplied to the existing buildings, the field survey found that the gas pressure is as low as 50mmAq, necessitating the use of a blower to increase the pressure to 200mmAq. Since a gas supply with a constant pressure is extremely important for the testing equipment, LPG will be used in the Project instead of city gas.

(b) A number of LPG cylinders capable of 1 week's supply will be provided with an automatic switch-over device.

(c) The LPG will be supplied via 2 channels to the laboratories and via 1 channel to the kitchen from the separate LPG supply center for each channel which will have independent gas meters.

(d) The LPG outlets in the laboratories will be (1) draft chambers, (2) clean benches, (3) Safety cabinets, (4) glass work tables and (5) others.

(e) LPG will also be supplied to the boiler room to be used for the pilot light.

6) Special Gas

Special gas required for laboratory work will be supplied from the relevant gas cylinders installed near the testing equipment concerned.

7) Sanitation Facilities

(a) Hand basins, mirrors, wash basins for washing sweeping tools, toilet bowls and men's bowls will be provided in the toilets. Both western and local toilet bowls will be provided.

(b) Mixer showerheads will be provided in the shower rooms.

(c) The laboratory sinks will be made of china and will have drum type taps.

(d) Emergency showers will be provided in those rooms where large quantities of acids, lye and solvents are used and also in the RI room.

5. Special Facilities

1) Laboratory Waste Water Treatment

A neutralizing tank will be installed for the treatment of laboratory waste water.

2) RI Waste Water Treatment

The storage tank and dilution tank for the RI waste water will be of the ground installation type with drainage water level meters.

3) Incinerator

An incinerator for the exclusive use for ordinary solid waste and the disposal of dead animals will be provided.

4) Fuel Tank

A fuel tank for the incinerator, boiler and emergency automatic power generator will be installed. The tank will be of the ground type and will have a storage capacity of 10 days' supply of diesel oil.

5) Boilers

2 high-pressure steam boilers using diesel oil will be installed to supply high-pressure steam to the autoclaves.

6) High Lisk Laboratory

A high list laboratory equivalent to the P-3 level designated by the National

Institute of Health's Safety Control Regulations Concerning Pathogens and Others in Japan will be introduced.

7) Special Ventilation

(a) A mechanical air supply will be provided using high performance filters (colorimetric value of 80% or more) in those laboratories where safety cabinets are installed.

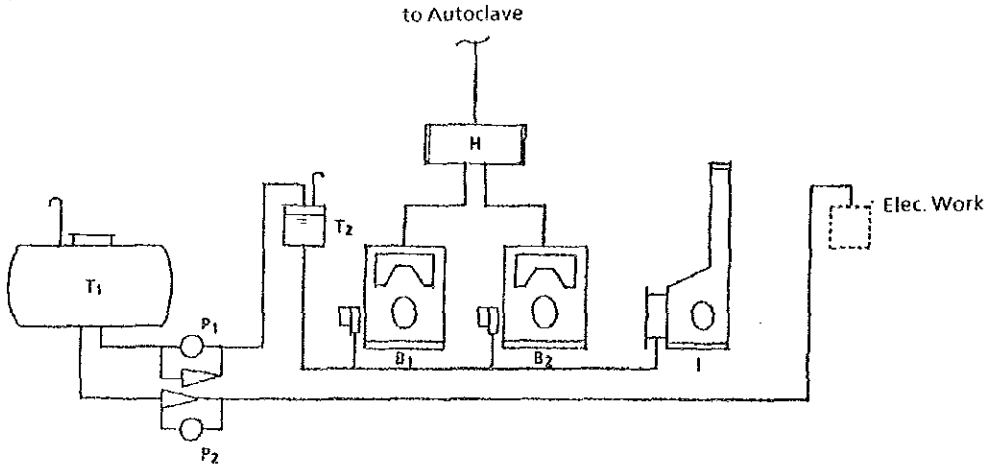
(b) The exhaust from the draft chambers or safety cabinets will be individually conducted through the ceiling.

(c) The exhaust from the RI laboratory will be made through the ceiling using HEPA filters and activated charcoal filters pursuant to the relevant standards.

8) Low Temperature Unit

A prefabricated type low temperature unit using an air cooling compressor will be installed with a set temperature of 5°C.

STEAM BOILER SYSTEM



T1 : Fuel Storage Tank
T2 : Service Tank
P1/P2 : Oil Pump
B1/B2 : Steam Boiler
I : Incinerator
H : Steam Header

Room Schedule

Legend

RA	:	Room air-conditioner
PAC	:	Packaged air-conditioner
AHU	:	Air-handling unit
CF	:	Ceiling fan
L	:	Low performance filter (Weight method 80%)
M	:	Middle performance filter (DST method 80%)
H	:	High performance filter (DOP method 99.97%)
F	:	Fresh air intake
E	:	Exhaust air
All Fresh	:	All fresh air intake
FH	:	Fume hood
CB	:	Crean bench
SC	:	Safety cabinet

Note : Design criteria of temperature and humidity show in case of hot summer, they can be made lower depending upon mean temperature in each season. And they can also be changed when necessary.

<Laboratory Block>

Room Name	PROPOSED UNIT (6.4m×8m)	PROPOSED AREA (m²)	DESIGN CONDITION			AIR CONDITION			CEIL-ING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
1. Dept. of Entomology and Parasitology															
Entomology Labo-1	1.0	38.5	28			RA									
Entomology Labo-2	1.0	38.4	28			RA									
Consultant Rm	0.5	19.2	28			RA			CF						
Entomologists Rm	0.5	19.2	28			RA			CF						
Insectory	3.0	115.2	28			RA									
Parasitology Labo-1	1.0	38.4	28			RA									
Parasitology Labo-2	1.0	38.4	28			RA								1	
Specimen Rm	0.5	19.2	28			RA									
Consultant Rm	0.5	19.2	28			RA			CF						
Washing Rm	1.0	38.4							CF		E				
Cold Rm	0.5	19.2		5											
Seminar Rm	1.0	38.4	28			RA			CF						
Change Rm	0.5	19.2									E				

Room Name	PROPOSED UNIT (0.4m×6m)	PROPOSED AREA (m^2)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
2. Dept. of Clinical Pathology and Immunology															
Hist-pathology Labo	2.0	76.8	28			RA									
Preparation Rm	0.5	19.2	28			RA									
Haematology Labo	1.0	38.4	28			RA									
Quality Contro Labo	1.0	38.4	28			RA									
Specimen Rm	0.5	19.2	28			RA									
Consultant Rm	0.5	19.2	28			RA			CF						
Immunology Labo	1.5	57.6	28			RA									
Preparation Rm	0.5	19.2	28			RA									
Allergy Labo	1.5	57.6	28			RA									
Consultant Rm	0.5	19.2	28			RA			CF						
Washing Rm	0.5	19.2							CF		E				
Seminar Rm	1.0	38.4	28			RA			CF						
Change Rm	0.5	19.2									E				

Room Name	PROPOSED UNIT (6.4m×6m)	PROPOSED AREA (m²)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
3. Dept. of Nutrition and Biochemistry															
Nutrition Labo-1	1.0	38.4	28			RA									
Preparation Rm	0.5	19.2	28			RA									
Nutrition Labo-2	1.5	5.6	28			RA									
Instrument Storage	0.5	19.2													
Consultant Rm	0.5	19.2	28			RA			CF						
Biochemistry Labo-1	2.0	76.8	28			RA						1			
Biochemistry Labo-2	2.0	76.8	28			RA									
Quality Contral Labo	0.5	19.2	28			RA									
Washing Rm	0.5	19.2							CF		E				
Consultant Rm	0.5	19.2	28			RA			CF						
Seminar Rm	1.0	38.4	28			RA			CF						
Ante Rm	0.5	19.2	28			RA									
RI Diagnosis Labo-1	1.0	38.4		27±2	55±5	PAC		ALL FRESH		E/ L.C.H					
RI Diagnosis Labo-2	1.0	38.4		27±2	55±5	PAC		ALL FRESH		E/ L.C.H					
Preparation Rm	1.0	38.4		27±2	55±5	PAC		ALL FRESH		E/ L.C.H					

Room Name	PROPOSED UNIT	PROPOSED AREA	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
Ante Rm	0.5	19.2		27±2	55±5	PAC		ALL FRESH			E/ L.C.H				
Consultant Rm	0.5	19.2		27±2	55±5	PAC		ALL FRESH			E/ L.C.H				
Change Rm	0.5	19.2		27±2	55±5	PAC		ALL FRESH			E/ L.C.H				
4. Dept. of Pharmacology and Medicinal Plant															
Pharmacology Labo-1	1.5	57.6	28			RA									
Preparation Rm	0.5	19.2	28			RA									
Pharmacology Labo-2	1.5	57.6	28			RA									
Consultant Rm	0.5	19.2	28			RA			CF						
Medicinal Plants Labo-1	1.5	57.6	28			RA						1			
Preparation Rm	0.5	19.2	28			RA									
Medicinal Plants Labo-2	1.5	57.6	28			RA						1			
Consultant Rm	0.5	19.2	28			RA			CF						
Specimen Rm	0.5	19.2	28			RA									
Washing Rm	0.5	19.2									E				
Seminar Rm	1.0	38.4	28			RA			CF						

Room Name	PROPOSED UNIT (0.5m×5m)	PROPOSED AREA (m²)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
Change Rm	0.5	19.2									E				
5. Dept. of Bacteriology															
Bacteriology Labo	2.5	96.0	28			RA							CLASS IIB		
Enteric Bacteriology Labo	1.0	38.4	28			RA									
Anaero Bacteriology Labo	1.0	38.4	28			RA									
Mycology Labo	2.5	96.0		27±2	55±5	RAC	L.M.H	30%							
Leptospira Labo	1.0	38.4	28			RA							CLASS IIB		
Food & Water Bacteriology Labo	1.0	38.4	28			RA									
Quality Contral Labo	1.0	38.4	28			RA									
Walk-in Incubator	0.5	19.2													
Cold Rm	0.5	19.2													
Media Rm	1.5	57.6	28			RA									
Washing Rm	1.0	38.4									E				
Dark Rm	0.5	19.2	28			RA					E				
Consultant Rm-1	0.5	19.2	28			RA			CF						

Room Name	PROPOSED UNIT (6.4m×6m)	PROPOSED AREA (m^2)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
Consultant Rm-2	0.5	19.2	28			RA			CF						
Storage	1.0	38.4													
Seminar Rm	1.0	38.4	28			RA			CF						
Change Rm	0.5	19.2									E				
6. Dept. of Virology															
Tissue Culture Rm-1	1.0	38.4	28			RA								1	
Media Prepararion Rm	1.0	38.4	28			RA									
Tissue Culture Rm-2	0.5	19.2	28			RA									
Arbo-virus Labo	1.0	38.4	28			RA							CLASS IIB		
Rabies Labo	1.0	38.4	28			RA							CLASS IIB		
Respiratory Labo	1.0	38.4	28			RA							CLASS IIB		
Clamydeae & Rickettsiae Labo	2.0	76.8	28			RA							CLASS IIB		
Quality Control Labo	0.5	19.2	28			RA									
High Lisk Labo	2.0	76.8		27±2	55±5	RAC	L,H,M	ALL FRESH			E		CLASS IIC		
Virology Labo-1	1.0	38.4	28			RA							CLASS IIB		

Room Name	PROPOSED UNIT (6.5m×8m)	PROPOSED AREA (m²)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
Virology Labo-2	1.0	38.4	28			RA									
Washing Rm	1.0	38.4							CF		E				
Cold Rm	0.5	19.2		5											
Walk-in Incubator	0.5	19.2		37											
Seminar Rm	1.0	38.4	28			RA			CF						
Consultant Rm-1	0.5	19.2	28			RA			CF						
Consultant Rm-2	0.5	19.2	28			RA			CF						
Change Rm	0.5	19.2									E				
7. Biological Production unit															
Diagnostic Sera Production Labo	1.5	57.6	28			RA									
Wash & Steriling Rm	0.5	19.2							CF		E				
Cold Rm	0.5	19.2		5											
Storage	0.5	19.2	28			RA									
Production Labo-1	1.5	57.6	28			RA									
Freeze-dry Rm-1	0.5	19.2	28			RA									

Room Name	PROPOSED UNIT (8.4m×8m)	PROPOSED AREA (m²)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
Anti-venin Production Labo-2	1.0	38.4	28			RA								1	
Bacterial Vaccines Production Labo-1	1.0	38.4	28			RA									
Media Production Rm	1.0	38.4	28			RA									
Bacterial Vaccines Production Labo-2	1.0	38.4	28			RA									
Consultant Rm-1	0.5	19.2	28			RA			CF						
Consultant Rm-2	0.5	19.2	28			RA			CF						
Virus Vaccines Production Labo-1	1.5	57.6	28			RA									
Freeze-dry Rm-2	0.5	19.2	28			RA									
Virus Vaccines Production Labo-2	1.0	38.4	28			RA									
Change Rm	0.5	19.2									E				
8. Centre for Medical Instrumentation															
Heavy Equipment Rm	1.5	57.6	28			RA									
Photomicrography Rm	1.0	38.4	28			RA									
Maintenance Workshop	1.5	5.6	28			RA									

Room Name	PROPOSED UNIT (8.4m×8m)	PROPOSED AREA (m^2)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	I.F.	
Maintenance Office	0.5	19.2	28			RA			CF						
Elec. Microscope Rm	1.5	57.6	28			RA									
EM Office	0.5	19.2	28			RA									
9. Administration															
Reteception Office	1.0	36.0							CF						
Night Duty	0.5	18.0							CF						
Director Rm	1.0	36.0	28			RA									
Sub-Director Rm	1.0	36.0	28			RA									
Secretary Rm	0.5	18.0	28			RA									
Typist Rm	0.5	18.0	28			RA									
Branch Library	1.5	54.0	28			RA									
Senior Staff Rm-1	1.0	36.0	28			RA									
Senior Staff Rm-2	1.0	36.0	28			RA									

<Animal Experimental Block>

Room Name	PROPOSED UNIT (6.4m×6m)	PROPOSED AREA (m^2)	DESIGN CONDITION COOLING °C	DB °C	RH %	AIR CONDITION TYPE	FILTRATION	OA INTAKE	CEILING FAN	VENTILATION IN	OUT	HOOD EXHAUST LAB HOOD	B.S.C.	L.F.	NOTE
1. Animal Breeding															
Vet. Office	0.5	18.0	28			RA			CF						
Staff Rm-1	0.5	18.0	28			RA			CF						
Feed Prep Rm	0.5	18.0									E				
Feed Storage	0.5	18.0	28			RA			CF						
Bedding Material Storage	0.5	18.0	28			RA			CF						
Mice Breeding Rm	1.5	50.3		27±2	55±5	PAC + RA	L. M.	ALL FRESH			E/L				
Hamster Breeding Rm	0.5	16.5		27±2	55±5	PAC + RA	L. M.	ALL FRESH			E/L				
Rat Breeding Rm	1.0	33.0		27±2	55±5	PAC + RA	L. M.	ALL FRESH			E/L				
Guinea Pig Breeding Rm	0.5	16.5		27±2	55±5	PAC + RA	L. M.	ALL FRESH			E/L				
Storage	0.5	18.0									E				
Central Wash & Sterilize Rm	3.0	102.0							CF		E				
Cage Storage	1.5	54.0							CF						
Rabbit Breeding Rm	1.0	33.0		27±2	55±5	PAC + RA	L. M.	ALL FRESH			E/L				
2. Animal Experimental															

Room Name	PROPOSED UNIT (6.4m×6m)	PROPOSED AREA (m^2)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
Office	0.5	18.0	28			RA									
Change Rm	1 1/3	37.0									E				
Feed Storage	2/3	24.0	28			RA					E				
Bedding Materical Stg	0.5	18.0	28			RA					E				
Animal Experimental Rm-1	1.0	36.0		27±2	55±5	PAC + RA	L.M.	ALL FRESH			E/ L.H				
Animal Experimental Rm-2~4	2.5 (0.5×5)	90.0		27±2	55±5	PAC + RA	L.M.	ALL FRESH			E/ L.H				
Animal Experimental Storage	0.5	18.0							CF						
Operation Theatre	2/3	24.0		27±2	55±5	PAC + RA	L.M.	ALL FRESH			E/ L.H				
Post Morten Rm	2/3	24.0		27±2	55±5	PAC + RA	L.M.	ALL FRESH			E/ L.H				
Instrument Storage	0.5	18.0							CF						
Wash Rm	0.5	18.0							CF		E				
3. Infected Animal Experimental															
Infected Animal Experimental Rm-1~4	0 (0.5×4)	72.0		27±2	55±5	PAC	L.M.H	ALL FRESH			E/ L.H				
High-Risk Animal Experimental Rm	1.0	30.0		27±2	55±5	PAC	L.M.H	ALL FRESH			E/ L.H				
Wash & Sterilize Rm	1.5	54.0							CF		E				

Room Name	PROPOSED UNIT (2.4m×6m)	PROPOSED AREA (m^2)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
Ante Rm	0.5	9.0		27±2	55±5	PAC	L.M.H	ALL FRESH			E/ L.H				
Clean Corridor	1.0	25.2		27±2	55±5	PAC	L.M.H	ALL FRESH			E/ L.H				
Dirty Dunts Corridor	1.0	37.8		27±2	55±5	PAC	L.M.H	ALL FRESH			E/ L.H				
4. Animal Experiment for Production															
Infected Large Animal Rm	1.0	36.0								F.	E.				
Infected Small Animal Rm	0.5	19.2								F.	E.				
Inoculation Rm	1/4	9.6								F.	E.				
Animal Sacrifice Rm	1/4	9.6							CF		E.				
Anti-sera Preparation Rm	1.0	38.4	28			RA									
Preparation Rm	0.5	18.0	28			RA									
Boiler Rm	1.5	58.5								F./L	E.				
Boiler Operation Office	0.5	18.0							CF						

Room Name	PROPOSED UNIT (6.4m×6m)	PROPOSED AREA (m²)	DESIGN CONDITION			AIR CONDITION			CEILING FAN	VENTILATION		HOOD EXHAUST			NOTE
			COOLING °C	DB °C	RH %	TYPE	FILTRATION	OA INTAKE		IN	OUT	LAB HOOD	B.S.C.	L.F.	
MLT Training Labo	3.5	126.0	28			RA									
Lecture Hall	8.0	288.0	28			RA			CF						
Canteen	4.0	144.0							CF						
Kitchen	1.0	36.0								F.	E.				
Water Tank & Pump Rm	2.5	90.0								F.	E.				
Elec. Sub-Station	4.0	144.0								F.	E.				
Maintenance Office	1.5	54.0							CF						
Toilet (General)	–	–									E.				
Storage (General)	–	–									E.				

<Animal Quarantine Block>

Animal Quarantine Rm	–	99.0									E.				

5-3. Equipment Plan

5-3-1. Basic Policies

The MRI currently has 20 departments, each conducting independent activities. The original Project plan of the Sri Lankan side was basically prepared based on the understanding that the organizational structure would be maintained. The Preliminary Study Team, however, suggested the functional integration of the research departments and it was subsequently agreed that a new structure consisting of 7 new departments would be established to facilitate cooperation between laboratories.

The current independent status of each laboratory was also reflected in the original request for equipment, resulting in many duplications. Therefore, the equipment plan has been prepared to reduce the amount of required equipment and to facilitate its efficient use, as in the case of the facility layout plan. Additional policies adopted for the equipment plan are as follows.

1) The subject equipment are those to be newly constructed by the Project for the MRI.

2) The equipment whose urgent introduction is of crucial importance will be selected by examining the research activities and the methods of each department and the current status, as well as future prospect, of the MRI's research work.

3) The existing equipment which can be reinstalled in the new facilities will be effectively used.

4) Large and precision equipment requiring special operating techniques will be subject to common use under the control of specialized technicians. This equipment will be installed in the Center for Medical Instrumentation in view of the efficient use of facilities and equipment.

5) With regard to general laboratory equipment, equipment which is easy to operate or repair and which has proven durability will be selected. Uniform standards should be introduced for as many items as possible for the simplification of the repair work and the reduction of the required number of spare parts.

6) As Project-type Technical Cooperation by the Japanese Government is planned as part of the Project, equipment which corresponds to the expected cooperation activities should be selected.

7) The equipment to be provided by the Project should be selected based on the assumption that the Sri Lankan side will make every effort to strengthen its technical capability in view of conducting ordinary maintenance and inspection work and a certain amount of repair work.

5-3-2. Equipment List

<Equipment for Laboratories>

1. Dept. of Entomology and Parasitology

1-1 Entomology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	ET-02	Deep Freezer	420L, -40°C	1
2	ET-03	Refrigirator	230L 0~14°C	1
3	ET-10	Specimen Storage	590×475×1300mm	2
4	ET-13	Electronic Balance	Capacity 300g Readability 0.001g	1
5	ET-15	Table-Top Centrifuge	4000rpm, Timer (0~15 Min.)	1
6	ET-16	Incubator	Ambient temp +5~60°C, ±0.5°C,306L	1
7	ET-17	Bunsen Burner	For LP Gas	2
8	ET-18	PH Meter	0-14PH 0.01PH	1
9	ETC-01	Freezer	-70°C, 300L Up Right	1
10	ETM-05A	Research Microscope	Trinocular, 4, 10, 40, 100X	1
11	ETM-05B	Teaching Head	For Three Persons	1
12	ETW-1	Autoclave	100°C~130°C, 3L, Bench Model	1
13	ETW-2	Autoclave	100°C~130°C 1.7kg/cm2, 47L	1
14	ETW-5	Deionizer	ION-Exchange, 25L/h	1
15	ETW-6	Pipet Washer	Polyethylene Ultrasonic	1

Insectory

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	IN-02	Hot Air Oven	40~250°C,159L	1
2	IN-04	Washing Machine	Timer: 15min. for Washing cloth	1
3	IN-05	Stereoscope Microscope	6.6X - 40X	2
4	IN-06	Cage for Mosquitoes	200 x 250 x 300mm	24
5	IN-07	Cage for Mosquitoes	240 x 290 x 400mm	24
6	IN-08	Cage for Mosquitoes	450 x 450 x 450mm	24
7	IN-09	Breeding Trays	7.3L, Polyethylene	24
8	IN-12	Humidifier	0.45~0.55L/h	2
9	IN-13	Aspirator	2.5L/min, 250mmHg	2
10	IN-14	Sorting Tray	2L, 210 x 300 x 42mm	12
11	IN-16	Mosquito Net	900mm x 3m	50
12	IN-18	Thermo-Hygrograph	-20°~+40°C, 0~100%RH	4
13	IN-19	Fish Tank	350 x 200 x 245mm, Styrene	10
14	IN-20	Air Pump	1L/min	3
15	IN-25	Teasing Needle	Approx. 150mm	24
16	IN-27	Deionizer	Ion- Exchange 25L/H	1
17	IN-28	Autoclave	100~130°C, 3L, Bench Model	1
18	IN-30	Refrigerator	230L, 4°C, 2 Door	1

1-2 Parasitology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	PR-01	Autoclave	100~130°C, 3L, Bench Model	1
2	PR-03	Electronic Balance	Capacity 300g Readability 0.001g	1
3	PR-05	Centrifuge Centrifuge	5000rpm Timer (0~30 min.) Floor Type	1
4	PR-06	Refrigerated	200 x 250 x 300mm	24
5	PR-09	Electro Phoresis-Apparatus	Isoelectric Apparatus	1
6	PR-10	Vacuum Pump	Desk Top 1400rpm 50L/Min.	1
7	PR-11	Incubator	Ambient Temp. +5~60°C, 150L	1
8	PR-13	Instrument steriliser	Desktop Pipeheater	1
9	PR-14	Lamirar Flow Horizontal Cabinet	Floor Type, Class 10, 99.99%	1
10	PR-16A	Binocular Microscope	Built in Transformer Object 4, 10, 40, 100X	1
11	PR-16B	Teaching Head	For Three Persons	1
12	PR-20	PH Meter	Digital, PH 0~14, 0.1 PH Min Graduation	1
13	PR-21	Refregerator	396L 2 Door	1
14	PR-23	Water Bath	Room Temp. +5~80°C± 0.1°C 42L	1
15	PR-24	Sonicator	Sonic vibrator Titanium 2~500ml	1
16	PR-25	Shaker	Hold 4, 40~280 Strokes/min	2
17	PR-26	Blender Electric	0.95L Glass Jar	2
18	PR-27	Magnets Stirrer	200~2300rpm, 100~5000ml	1
19	PR-30	Voltage Stabilizer	48~62HZ Range±5% 2KVA	1
20	PR-31	Co^2 Incubator	37°C±0.1°C, 77L	1
21	PR-33	Hot Air Blower	With Stand	1
22	PR-34	Incubator	Ambient Temp. +5~60°C,150L	1
23	PR-38	Micro Pipetter	0.01~0.05ml, Piston Push Type	1
24	PR-40	Seitz Type Filter	142mm Dia, 1.5L, 1 Filter	1
25	PRM-17	Microscope Inverted	Eyepiece 10X OBJ. CF4, 10, 20, 40	1
26	PRM-18	Microscope Fluorescent	Mercury Lamp, Halogen Lamp, CF 10, 20, 40, 100X	2

2. Dept. of Clinical Pathology and Immunology

2-1 Pathology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	PA-01	Electrophoresis Apparatus	20 Sample, Tank 300×170×55 Densitometer	1
2	PA-03	Freezing Microtome	Cutting Size 50×50m/m 0~20u	1
3	PA-06	Platelet Aggrecometer	37°C±0.2°C 1~99 Min 4-Channels, RE	2
4	PA-07	Cytospin	6ml Specimen X12Pcs	1
5	PA-08	Spectrophotometer Visual + uv	UV200~1000NM Slition	1

1-2 Parasitology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
6	PA-10	Tacho Meter	2000rpm/20000rpm	1
7	PA-11	Deep Freezer	-20°c 270L	1
8	PA-13A	Binocular Microscope	Built in Transformer Object 4,10,40, 100×	1
9	PA-13B	Teaching Head for Microscope	For Three Persons	1
10	PA-14	Auto Microtome Knife Sharpner	74m/m Stone Shappner, 80~250mm	1
11	PA-15	Automatic Cell Counter	Dilutng Aample 10ml HBC,RBC,GHB,HCT,MCV,MHC	1
12	PA-16	Microscope Slide Cabinet	4500 Slide (15 Drawers)	6
13	PA-17	Rotary Microrome	1~3microns. 1micron Graduation	1
14	PA-19	Incubator	Ambient Temp. +5~60°c 150L	1
15	PA-20	Analytical Balance	0.1mg~200gr Electronic	1
16	PA-22	PH Meter	Digital, PH 0~14, 0.1 PH Min Graduation	1
17	PA-23	Centrifuge	5000rpm, Floor Type	1
18	PA-24	Colorimeter	Double Cell, Single Beam, 370~1000nm	1
19	PA-25	Centrifuge	5000rpm Timer (0~30 min), Floor Type	2
20	PA-27	Drying cabinet	300×345×535mm	1
21	PA-28	Refregerator	396L 2 Door	1
22	PA-30	Hot Air Oven	40~250°c , 159L	1
23	PA-33	Water Filter Paper	42.5, 90, 150mm (3 size)	1
24	PA-37	Angle Poised Lamp	Table Top Type with Arm, 100W	1
25	PA-40	Shaker	Hold 4, 40~280 Strokes / min	2
26	PA-42	Wax Dispenser	Temp. Range 50~70°c	1
27	PA-43	Heating Mantle	Max 450°c 500~5000ml	1
28	PA-45A	Microscope Slide Tray	Slide Tray Flat Type	10
29	PA-45B	Slide Case	Slide Box	5
30	PA-50	Hot Air Oven	40~250°c 159L	1
31	PA-51	Self-Indicating Desicator	App. 300×300×400mm	2
32	PA-52	Automatic Slide Stainner	Sliding Cap : 0~6, Vessel 900ml	1
33	PA-58	Burner	Bunsen Burner Set	1
34	PA-59	Automatic Buret	25ml×0.1ml Bottole 2000ml	3
35	PAC-12	Deep Freezer	-70°c 300L	2
36	PAM-05	Research Microscope Phase Cont.	Trinocular Photo Phase Dark Polarisation	1
37	PAM-31	Camera	35mm single-lens Reflex	1
38	PAS-5	Maggi Board	1800×900mm	1
39	PAS-7	Microcomputer	16 Bit Personal Computer	1
40	PAW-1	Autoclave	100~130°c, 3L, Bench Model	2
41	PAW-2	Uni Temperature Drying Cabinet	300×345×535mm	1
42	PAW-4	Hot Air Oven	Oven 40~250°C 159L	1
43	PAW-5	Deionizer	Ion-Exchange, 25L / h	1

2-2 Immunology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	IM-01	Innuno-Electrophoretic Apparatus	Complete Set	1
2	IM-02	Elisa-Reader	Wave Length 340 Through 800nm, Measurement 50sec / p	1
3	IM-04	Binocular Microscope	Built in Transformer Object 4, 10, 40, 100x	1
4	IM-06	Fraction Collector	1~20g, 160 Tubes, Balancing Type	1
5	IM-08	Refrigerator	4°c 230L	2
6	IM-09	Deep Freezer	-20°c 270L	1
7	IM-12	Centrifuge	5000rpm Timer (0~30 min)	2
8	IM-13	Water Bath	Room Temp. +5~80°c ±0.1°c 42L	2
9	IM-17	Vortex Mixer	2800rpm, for Test Tube	3
10	IM-18	Sonicator	Sonic Vibrator Titanium 2~500ml	1
11	IM-19	PH Meter	Digital, PH 0~14, 0,1 PH Min Graduation	1
12	IM-23	Voltage Stabilizer	48~62hz Range5% 2kva	1
13	IMC-07	Freeze Dryer	-20°c~-80°c 4L	1
14	IMM-03	Fluorescent Microscope	Mercury Lamp Halogen Lamp cf 10,20,40,100x	1

3. Dept. of Nutrition and Biochemistry

3-1 Nutrition

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	NU-01	SpectroPhotometer	325~1100nm ±1nm	1
2	NU-02	Electronic Balance	3000g 0.01g	1
3	NU-03	Electronic Balance	300g, 0.01g	1
4	NU-04	Nutrition Balance	CAP 5kg Accuracy 1g	1
5	NU-05	Refregerator	396L 2 Door	1
6	NU-06	Deep Freezer	-20°c 429L	1
7	NU-07	Drying Cabinet	8 Shelves 400×435×790mm	1
8	NU-09	Water Still	2L/h Water Tank (20L)	1
9	NU-10	PH Meter	0-14PH 0.01PH	1
10	NU-11	Blender Electronic	0.95L Glass Jar	1
11	NU-12	Vortex Mixer	2800rpm ,for Test Tube	3
12	NU-13	Eppendolf Pipettes	Set of 3pcs., 2~1000μL	1
13	NU-14	Pipette Washer	Polyethylene Ultrasonic	1
14	NU-15	Burner	Bunsen Burner Set	1
15	NU-17	Binocular microscope	Built in Transformer Object 4, 10, 40, 100x	1
16	NU-18	Heamacytometer	Thoma Counting Olate, Pipettes for Red and White Cell	6
17	NU-25	Stethescope	Litman	3
18	NU-26	Sphygmomanometer	Aneroid 300m / m with Cuff	3
19	NU-32	Voltage Stabilize	48~68hz Range± 5% 2kva	1

3-1 Nutrition

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	BC-01	Spectrophotometer	325~1100nm ±1nm	2
2	BC-02	Bench Centrifuge	4000rpm Timer (0~15 min)	1
3	BC-03	Electrophoresis Apparatus	20 Samples Tamk 330×170×55 mm	1
4	BC-04	Densitometer	440~620nm, Recording	1
5	BC-06	Refrigerator	4°c 230L 2 Door	1
6	BC-08	Deep Freezer	-40°c 378L	1
7	BC-10	Recording Spectrophotometer	190~1100rpm ±0.4nm (UV/VIS)	1
8	BC-14	Centrifuge	5000rpm Timer (0~30 min)	1
9	BC-15	Vortex Mixer	2800rpm for Test Tube	1
10	BC-17	Fume Hood	1200×940×2450mm	1
11	BC-22	Eppendolf Pipettes	Set of 3pcs., 2~1000μL	1
12	BC-24	Stopwatch	60min Accur 1/100 Sec Digital	2
13	BC-27	Heating Mantles	Max 450°c 500~5000ml	1
14	BC-37	Voltage Stabilizer	48~62hz Range ±5% 2kva	1
15	BCS-5	Maggi Board	1800×900mm	1
16	BCS-7	Microcomputer	16 Bit Personal Computer	1
17	BCW-1	Drying Cabinet	300×345×535mm	2
18	BCW-2	Pipette Washer	Polyethylene Ultrasonic	1
19	BCW-3	Deionizer	10N - Exchange, 25L/h	1
20	BCW-5	Auto clave	100°c~130°c 1.7Kg/cm2, 47L	1

3-3 RI Diagnosis

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	RI-01	Gammer Counter System	Auto Sample Change, 240Sample, Auto Measuring	1
2	RI-05	Refrigerator	4°C 230L	1

4. Dept. of Pharmacology and Medicinal Plant

4-1 Pharmacology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	PH-01	Electronic Balance	0.1mg 0.1mg~200gr	1
2	PH-02	Deep Freezer	-20°c 270L	1
3	PH-03	Refrigerater	40°c 230L 2 Door	1
4	PH-05	Centrifuge	5000rpm Timer (1~30 min)	1
5	PH-06	Centrifuge	4000rpm Timer (1~15 min)	1
6	PH-10	Hot Air Blower	with Stand	1
7	PH-12	Water Bath	Room +5°c~80°c ±0.07 70L	1

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
8	PH-13	Klett Summerson Colorimeter	Cell Volume 5ml	1
9	PH-14	Electric Recording Drum	1601×55mm 6 Sec~60 min/rotate	1
10	PH-15	Electric Shaver	for Animal	1
11	PHS-5	Maggi Board	1800×900mm	1
12	PHW-1	Auto Clave	100°c~130°c 1.7kg/cm 47L	1
13	PHW-2	Hot Air Oven	40~250°c 159L	1
14	PHW-3	Reverse Osmosis Units	90L/h tank 100L	1

4-2 Medicinal Plant

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	MP-02	Ampule Sealing Apparatus	Used for Sealling Ampules	1
2	MP-04	Ampule Filling Apparatus	5~100ml Less Than 1%	1
3	MP-05	Electronic Balance	300g, 0.01g	1
4	MP-07	PH Meter	Digital, PH 014, 0.1PH Min Graduation	1
5	MP-11	Hot Air Oven	40~250°c 159L	2
6	MP-12	UV Spectrophotometer	UV 200~1000nm Slit 10nm	1
7	MP-13	IR Spectrophotometer	4000~400cm Double Beam	1
8	MP-14	Polarimeter (Recording)	180° ~ 0°~ -179.95° Sodium Lump	1
9	MP-15	Refrigerator	4c° 230L 2 Door	2
10	MP-18	Fraction Collector	1~20g, 160 Tubes, Balancing Type	2
11	MP-19	Masserator	25,000rpm 1~10ml (Nomogenizer)	2
12	MP-20	Shaker	Hold 4, 40~280 Strokes/min	2
13	MP-21	Rotary Evaporator	15~190rpm 5~35°c	4
14	MP-22	Electronic Balance	300g, 0.01g	1
15	MP-23	UV Viewing Cabinet	SW : 1290LW ; 2100 (μW/cm2)	1
16	MP-24	Vacuum Pump	Desk-Top, 1400 rpm, 50L/min	2
17	MP-25	Water Bath	Room Temp. +5~80°c±0.1°c 42L	2
18	MP-26	Freeze Dryer	20~80°c 4L	1
19	MP-28	Heating Mantles	Max 450°c 500~5000ml	1
20	MP-31	Thin Layer Chromatography	Complete Set (T.L.C. Apparatus)	1
21	MP-34	Hot Air Blower	with Stand	2
22	MP-35	Ultrasonic Cleaner	Tank 295×150×150mm 43KHz	1
23	MPC-16	Deep Freezer	-40°c 378L	1
24	MPW-	Washing Machine for Ampoules	100 Ampoules (10~20ml)	1

5 Dept. of Bacteriology

5-1 Bacteriology-I

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	BA-00	Voltage Stabilizer	48~62HZ Range±5% 2kva	1
2	BA-02A	Biological Microscope	Binocular 10x-4x 10x 40x 100x Micrometer	2
3	BA-02B	Teaching Head	for Three Persons	1
4	BA-07	Vaertical Laminar Flow	8m3/min 99.99% Hepa Filter	1
5	BA-09	Electronic Balance	3000g 0.01g	1
6	BA-13	CO^2 Incubator	37°c±0.1°c, 77L	1
7	BA-14	Centrifuge	5000rpm Timer	1
8	BA-20	Autoclave	100~130°c, 3L Bench Model	2
9	BAC-04	Freezer	701L -85°c	1
10	BAC-06	Freeze Dryer	-45°c 1L/1 Time	1
11	BAM-11	Microscope Inverted	Ultra-Wide Field Eyepiece 10x-5x 10x 20x 40x 100x	1
12	BAS-5	Maggi Board	1800×900mm	1
13	BAW-06	Hot Air Oven	40~260°c, 159L	1
14	BAW-08	Autoclave	100~130°c 3L, Bench Model	2
15	BAW-09	Water Still	Distiled & Ion-Exchange	1
16	BAW-10	Oven	40~250°c 162L	2
17	BAW-4	Auto clave	100°c~130°c 1,7kg/cm2, 47L	1
18	BAW-5	Pipette Washer	Polyethyene Ultrasonic	1

5-2 Bacteriology-II

1) Enteric Bacteriology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	EB-02A	Binocular Microscope	Built in Transformer Object 4, 10, 40, 100x	1
2	EB-02A	Teaching Head	for Three Persons	1
3	EB-03	Centrifuge	5000rpm Timer (0~30 min)	1
4	EB-04	Water Bath	Room Temp. +5~80°c±0.1°c 42L	1
5	EB-14	CO^2 Incubate	37°c±0.1°c, 77L	1

2) Anaerobic Bacteriology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	AB-01	Gas Packs (Anaerobic Jar)	-600mmhg 220x260mm Hard Glass	10
2	AB-11	Centrifuge	5000rpm Timer (0~30 min)	1
3	AB-13	PH Meter	Digital PH 0~14, 0.1 PH Min Graduation	1
4	AB-19	Electronic Balance	300g, 0.01g	1
5	AB-12	Binocular Microscope	Dark Field 10x-4x 10x 40x 100x	1

3) Leptospirosis

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	LP-01	Vertical Laminar Flow	8m³ / min 99.99% Hepa Filter	1
2	LP-02	Electronic Balance	0.1mg 0.1mg~200gr	1
3	LP-05	Cooled Incubator	0~+50°c ±0.5°c, 150L	1
4	LP-06	Water Bath	Room Temp. +5~80°c±0.1°c 42L	1
5	LP-07	Deep Freezer	-20°c 270L	1
6	LP-08	Centrifuge	5000rpm Timer (0~30 min)	1
7	LP-09	Vacuum Pump	Desk Top 1400rpm, 50 L/min	1
8	LP-12	Bacteriological Filter	Capacity 1L	1

4) Food and Water Bacteriology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	FW-01	Incubator	Ambient Temp. +5~60°c 150L	2
2	FW-03	Water Filtration App	300ml 10cm2 ø47mm	1
3	FW-04	Water Bath	Room Temp. +5~80°c±0.1°c 42L	2
4	FW-05	Bender Electric	0.95L Glass Jar	1
5	FW-07	Gas Packs (Anacrobic Jar)	-600mmHg 220×260mm, Hard Glass	10
6	FW-08	Thin Layer Chromatography	Complete Set (T.L.C. Apparatus)	1
7	FW-09	Electronic Balance	300g, 0.01g	1

5) Quality Control

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	QC-02	Binocular Microscope	Built in Transformer Object 4, 10, 20, 40x	1
2	QC-05	Refregirator	4°c 230L 2 Door	1
3	QC-06	Incubator	Ambient Temp. +5~60°c 150L	1

5-3 Mycology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	MY-00A	Research Microscope w/Phase Con	Trinocular Filters 10x-4x 10x 20x 40x 100x	1
2	MY-00B	Teaching Head	for Three Persons	1
3	MY-02	Disecting Microscope	Zooming Eyepiece 10x Illimination	1
4	MY-04	Orbital Incubator	500ml Flask × 4, 10~60°c (Rotary Shaker)	1
5	MY-05	Electrophoresis Apparatus	20 Samples, Tank 330×170×55	1
6	MY-07	Refrigerated Centrifuge	20,000rpm 45.170xg	1
7	MY-09	Vertical Laminar Flow	8m³/min 99.99% Hepa Filter	1

5-3 Mycology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
8	MY-10	Upright Freezer	-40°c, 420L	1
9	MY-11	Micro Centrifuge	15,000rpm 16,000xg	1
10	MY-12	Micropipeter (Finn Type)	0.01~0.05ml Piston Push Type	1
11	MY-13	Slide Storage Cabinet	Spring Holder Type	4
12	MY-14	Camera & Close-Up Acc	35mm Single-lens Reflex	1
13	MY-16	Magnetic Stirrer	200~2300rpm 100~5000ml	1
14	MY-20	Electronic Balance	300g, 0.01g	1
15	MY-21	Fraction Collector	1~20g, 160 Tubes, Balancing Type	1
16	MY-24	CO^2 Incubator	37°±0.1°C, 77L	1
17	MY-25	Liquid Nitrogen Cylinder	22,7L 0.16L/day(Evaporation)	1
18	MY-28	Rotor Mixer	40~300prm, 2 Flasks	1
19	MY-31	Hamilton Type Microsyringe	0.01~0.05ml Piston Push Type	2
20	MY-37	Microscope Inverted	Desk Top Eye Piece 10x Obj. 4,10,20,40	1
21	MYM-15	Fluorescent Microscope	Mercury Lamp Halogen Lamp cf 10, 20, 40, 100x	1

6. Dept. of Virology

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	VI-00	CO^2 Incubator	37°C±0.1°C, 77L	1
2	VI-05	Autoclave	100~130°C, 3L, Bench Model	2
3	VI-07	Horizontal Laminar Flow	8m3/min, 99.99% Hepa Filter	1
4	VI-08	Vertical Laminar Flow Cabinet	Spring Holder Type	5
5	VI-12	Upright Freezer	-20°C、270L	2
6	VI-14	Refregerator	230L, 0~14°C	3
7	VI-18A	Binocular Microscope	Built In Transformer Object 4X, 10X, 40X	3
8	VI-18B	Teaching Head	for Three Persons	2
9	Vi-19	Refrigerated Centrifuge	20000rpm、45, 170Xg (High Speed)	2
10	VI-20	Refrigerated Centrifuge	5000rpm, Timber (0~30 min)	3
11	VI-21	Centrifuge	4000rpm, Timber (0~15 min)	3
12	VI-22	Mosquito Incubator	200×250×300mm	3
13	VI-23	Egg Incubator	Ambient Temp. +5°C~60°C 150L	2
14	VI-24	Precision	Room Temp. +5°C~80°C±0.1°C 70L	2
15	VI-25	Water Bath	Room Temp. 5~80°C±0.1°C 42L	4
16	VI-26	Sonicator	Sonic Vibrator Titanium 2~500mL	1
17	VI-27	PH Meter	0~14PH, 0.1PH	1
18	VI-29A	Liquid Nitrogen Refrigerator	-10~196°C, 100L	1

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
19	VI-29B	Liquid Bitrogen Refrigerator	-10~196°C, 40L	1
20	VI-30	Liquid Nitrogen Transport Carn	22.7L, 0.16L/Day , (Evaporation)	1
21	VI-31	Vortex Mixer	2800rpm, for Test Tube	3
22	VI-32	Voltage Stablizer	48~62KHZ, Range ±5%, 2KVA	1
23	VI-33	Autoclave	100~130°C, 3L, Bench Model	1
24	VI-39	Micro Pipetter	0.01~0.05ml, Piston Push Type	3
25	VIC-11	Deep Freezer	701L, -85°C	2
26	VIH-01	Safty Cabinet Class 3	Grove Box Type Glass 3 Hepa Filter	1
27	VIM-01	Water Still	Ion-Exchange Disrillation 0.4 -- 0.7L/min	1
28	VIM-02	Deionizer	Ion-Exchange 25L/H	1
29	VIM-03	Hot Air Oven	40~250°C, 159L	2
30	VIM-05	Shaker	Hold 4, 40~280 Strokes/min	2
31	VIM-06	Ice Maker	64kg/day, Cube Ice	1
32	VIM-09	Heavy Duty Raugh Balance	300mg, 0.01g	1
33	VIM-10	Formalin Vapouriser	100~500g, 22Ø×37cm	1
34	VIM-11	Vacuum Pump	Desk-Top, 100001400rpm, 50L/min	1
35	VIM-15	Microscope with Dark Field	Built in Transformer Object 4x, 10x, 40x 100x	1
36	VIM-16	Inverted Phasecontrast	10x-4x, 10x, 20x, 40, Halgen Illuminator	1
37	VIM-17	Fluorescent Microscope	Mercury Lamp Halgen Lamp 10, 20, 40, 100x,	1
38	VIS-05	Magge Board	1800×900mm	1
39	VIS-07	Microcomputer	16 Bit Personal Computer	1
40	VIW-01	Horizontal Autoclave	Horizontal Capa : 500mm×600mm	1
41	VIW-02	Auto Clave	100~130°C, 1.7kg/cm2, 47L	2
42	VIW-03	Electric Brushing Machine	1300rpm	2

7. Dept of Biological production

7-1 Diagnostic Sera

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	DS-01	Ampule Filling Apparatus	5~100ml, Less than 1%	1
2	DS-02	Ampule Sealing Apparatus	Used for Sealing Ampules	1
3	DS-03	Autoclave	100~130°C, 1.7kg/cm2, 55L	1
4	DS-04	Hot Air Oven	40~250°C, 159L	1
5	DS-05	Vacuum Pump	Desk-Top, 1400 rpm, 50L/min	1
6	DS-06	PH Meter	Digital PH0~14, 0.1PH min Graduation	1
7	DS-07	Washing Machine for Ampoules	100 Ampules, (10~20ml)	1
8	DS-08	Deionizer	Ion-Exchange 25L/H	1

7-2 Anti-venin (snake)

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	AV-01	Refrigerated Centrifuge	5000rpm, Floor Type	1
2	AV-02	High Speed Refrigerated Centrifuge	20000rpm, 45, 170Xg	1
3	AV-04	Instrument Sterilizer	Desk-top, Pipe Heater :12KW	1
4	AV-05	Filter Apparatus	47mm Dia 500ml with Pupm	1
5	AV-06	Magnetic Mixer	200~2300rpm、100~5000ml	1
6	AV-07	Clean Bench	Floor Type, Class 10, 99.99%	1
7	AV-08	Freeze Dryer	-20°C~80°C, 4L	1
8	AV-09	Glass Vial Automatic Binding App.	4000~4500pcs/h	1
9	AV-20	Muffle Furnace	100~1150°C、±5°C	1
10	AV-21	Centrifuge	5000rpm Timer (0~30min)	1
11	AV-22	Rotary Evaporator	15~190rpm, 5~35°C	1
12	AV-23	Vacuum Pump	Desk-top,1400rpm, 50L/min	1
13	AV-24	Ace Homoganizer	18000rpm	1
14	AV-30	Binocular Ordinary Microscope	Built in Transformer Object 4x, 10x, 40x 100x	1
15	AV-35	Electronic Balance	200g, 0.1mg	1
16	AV-36	Balance	100g, 200mg	1
17	AV-37	Beam Spectrophotometer	UV.200~10000mm, Slit 10mm	1
18	AV-38	PH Meter	Digital Pho~14, 0.1 PH min Graduatiom	1
19	AV-40	Incubator	Ambient Temp. +5~60°C、±0.5°C, 306L	1
20	AV-41	Fraction Collector	1~20g, 160 Tube Balancing Type	1
21	AV-42	Electrophoresis Apparatus	20Samples,Tank 300×170×55mm	1
22	AV-44	Ice Maker	64kg / day, Cube Ice	1
23	AV-46	Magnetic Mixer	200~2300rpm, 100~5000ml	1

7-3 Bacterial Vaccines

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	BV-01	Auto Clave	100~130°C, 1.7kg / cm2, 47L	2
2	BV-02	Washing Machine for Ampoules	100 Anpules (10~20ml)	1
3	BV-03	Ampule Filling Apparatus	5~100ml, Less than 1%	1
4	BV-04	Ampule Sealing Apparatus	Used for Sealing Ampules	1
5	BV-05	PH Meter	Digital Pho~14, 0.1PH min Graduation	1
6	BV-08	Deep Freezer	-40°C, 420L	2
7	BV-09	Magnetic Stirrer	200~2000rpm、100~5000ml	3
8	BV-10	Lamirar Flow Horizontal Cabinet	Floor Type Class 10, 99.99%	1
9	BV-11	Tissue Culture Equipment	5L Fermentor Set	1
10	BV-12	Freeze Dryer	-20°C~-80°C, 4L	1

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
11	BV-13	Hot Air Oven	40~250°C, 159L	1
12	BV-14	Milli Q Water System	Pilogen Free 60L/h RO System	1
13	BVC-07	Upright Freezer	-70°C, Appx. 300L	2

7-4 Viral Vaccines

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	VV-03	Laminar Flow Cabinet	8m³/min, 99.99% Hepa Filter	2
2	VV-04	Auto Clave	100~130°C, 1.7kg/cm², 47L	2
3	VV-05	Hot Air Oven	40~260°C、159L	2
4	VV-06	Refrigerator	444L, Full - Auto	2
5	VV-07	Freeze Dryer	9L, -50°C	2
6	VV-08	Magnetic Stirrer	200~2300rpm、100~5000mL	3
7	VV-09	Automatic Dispenser	0.2~12ml, Less than 1%	2
8	VV-10	Milli-Q Water System	Pilogen Free 60L/H RO System	1
9	VV-13	Balance	300g, 0.01g	1
10	VV-14	PH Meter	Digital PH0~14, 0.1PH min Graduation	1
11	VV-15	Washing Machine for Ampoules	100 Ampules (10~20ml)	1
12	VV-16	Ampule Filling Apparatus	5~100ml, Less than 1%	1
13	VV-17	Ampule Sealing Apparatus	Used for Dealing Ampules	1
14	VVC-02	Low Temperature Cabinet	86L, -70°C, Recorder	1

<Equipment for Common Use>

1. Common Use Equipment

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	C-00	Vehicle	2000cc, 4-cyl (Wagon Type)	1
2	C-00	Vehicle	2500cc, 4WD (Station Wagon type)	1
3	C-02	Scanning Electron Microscope	6nm, 20x~200,000x	1
4	C-03	Transmission Electron Microscope	2.0A & 4.5A Max:100KV with Ultramicrotome,etc.	1
5	C-04	Ultra Centrifuge	60,000rpm, 485,00Xg Rotors	1
6	C-07	Ultra Centrifuge	Micro 100,000rpm, 541,000Xg, Rotors	1
7	C-24	Gas Chromatograph	Complete Set with Detector, Column, Gas Set	1
8	C-25	Liquid Chromatograph	Complete Set with Detector, Spectrophotometer	1
9	C-29	Dark Room Equipment	Enlarger, Timer, Lamp, Bat, etc.	1
10	C-30	Ultrasonic Cleaner	Tank 295×150×mm, 43KHz	1
11	P-15	Slide Maker	Slode Maker, Camera, Photograph Euipmen	1

2. Maintenance Equipment

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	LW-06	Glass Drilling Machine	Swing 400mm, Drilling Cap 0.4~3mm	1
2	LW-07	Glass Blowing Burners	Table Top All Gas Burner for Glass Working	3
3	LW-10	Electric Arc Welding Transform	Current Range50~300A, Max.80V	1
4	LW-13	Potable Electric Drill	Cap.13mm/30mm, 300~1200rpm	1
5	LW-14	Potable Electric Grinder	Set of 16mm, 12000rpm/min	1
6	LW-15	Hand Tool & Measuring Tools	Set of 46 Kinds	1
7	LW-16	Work Bench & Cabinet	1200×600×740mm, Loading500kg	1
8	LW-22	Logic Analyzer	Analyzer for DCV, DCmA, ACmA, K Orm	1
9	LW-23	Circuit Tester	Testing for DCV, ACA, ACV, Ohm etc.	1
10	LW-24	Electrician Tool	36 Kinds Tool Set	2
11	LW-25	Oscilloscope	150mm, Rectangular, Domed Mesh, Post-Accelerator	1

3. Office Equipment

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	LIS-01	Electric Typewriter	English	1
2	LIS-02	Slide Projector	Project for Slide 35mm	1
3	LIS-03	Overhead Projector	Apeture : 245×254mm Image : 0.97~2.79m	1
4	LIS-04	Screen	Screen (Stand Type)	1
5	LIS-05	Maggi Board	1800×900mm	1
6	LIS-06	Photocopier	Max. A3 Size	1
7	LIS-07	Microcomputer	16Bit Personal Computer	1

<Equipment for Animal Experiment>

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	AN-00	Wing Cage	for Hen, 400×500×600m	20
2	AN-01	Auto Clave	100~130°C, 1.7kg/cm2, 47L	2
3	AN-02	Large Basket	SUS	8
4	AN-06	Refrigerator	230L 0~14°C	1
5	AN-08	Cage for Mouse & Rat	265×426×150mm	1000
6	AN-09	Cage for Hamuster	280×440×150mm	200
7	AN-10	Cage for Rabbit	350×500×400mm	200
8	AN-14	Operating Table	600×900×750mm	3
9	AN-16	Trolley	1200×900×800mm, Stainless Steel	2
10	AN-17	Transfusion Ttand	1250mm~2,050mm	3

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
11	AN-19	Surgical Examination Table	1200×600mm	3
12	AN-20	Lighting System for Theater	Free-Standing	3
13	AN-30	Operation Set	Small Animal Opration Set	3
14	AN-31	Hot Air Oven	40~260°C, 159L	1
15	AN-36	SPF Clean Rack	Irack for 5 Mouse and 5 Rat	2
16	AN-39	Stereoscope Microscope	Zoom, Stereoscope	1
17	AN-41	Health Meter	100kg, 500g	6
18	AN-42	Refrigerator	444L, Full-Auto	1
19	AN-43	Health Meter	100kg, 500g with Stage	2
20	AN-51	Animal Food Pelletting Machine	Pellet Size App. 10mm	1

<Equipment for Medical Training>

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q'TY
1	L-00	Vortex Mixer	2800rpm, for Test Tube	3
2	L-00	Immuno Electrophoresis App.	Complete Set	1
3	L-00	Hot Air Oven	40~250°C, 159L	1
4	L-00	Drying Cabinet	300×345×535mm	1
5	L-00	Pipet Washer	Polyethlenne Ultrasonic	2
6	L-00	Multi Meter	AC&DC Volt/Current, Resistance	1
7	L-00	Research Microscope	Teaching Head (for 2pns), Photo Appa. Phase Con.	1
8	L-00	Analytical Balance	200g, 0.1mg	1
9	L-00	Balance	100g, 200mg	1
10	L-00	Still Electric	Distilled& Ion-Exchange, 5L/W	1
11	L-00	Microtome	Slide Way Length: 30cm, Thickness : 2~30 micron	1
12	L-00	PH Meter	Digital Pho~14 0.1PH min Graduation	1
13	L-03	Shaker	Hold 4, 40~280 Strokes/min	2
14	L-05	Table -Top Autoclave	Portable, 1--~130°C	1
15	L-06	Electronic Balance	300g, 0.01g	2
16	L-07	Vacuum Pump	Desk-Top,50L/min, 1400rpm	2
17	L-08	Magnetic Mixer	200~2300rpm, 100~5000ml	3
18	L-09	Incubator	Ambient Temp+5°C~60°C 150L	2
19	L-10	Water Bath	Room Temp+5~80°C±0.1°C, 42L	5
20	L-11	Deionizer	Ion-Exchange 25L/H	1
21	L-12	Glassware	Various kind	1
22	L-13	Screen	Screen 1,500×1,500mm	2

NO.	CODE NO.	ITEM NAME	SPECIFICATION	Q"TY
23	L-14	Centrifuge	5000rpm, Timer (0~30 min)	4
24	L-15	Large Rotary Microtome	1~30Micron	1
25	L-16	Binocular Microscope	1000x, with Illuminator	2
26	L-17	Stereoscope Dissecting Micro.	Zooming, Eyepiece 10x Illuminator	1
27	L-18	Multi-Teaching Microscope	for 5 Viewers	1
28	L-19	Refrigerator	4°C, 230L	2
29	L-20	UV Spectrophotometer	325~1100nm, ±1nm	2
30	L-21	Slide Projector	Projector for Slode 35mm	2
31	L-22	Overhead Progector	Aperture : 245×254mm, Image : 0.97~2.7m	1
32	L-23	TV with Hanger	TV 20-inch with Hanger	6
33	L-24	VTR with Console	VIdeo Recorder with Console	1
34	L-26	Video Camera	Single Chip CCD Color	1
35	L-27	Camera Adaptor	AC Adaptor	1
36	L-28	Color Video Monitor	Super Fine Pitch, 4-Color System	1
37	L-29	Video Casette Recorder	Portable U-Matic Recorder (Pal)	1
38	L-30	Video Casette Recorder	1/2 inch Video Recorder (Betamax)	1
39	L-40	Binocular Microscope	1000x, with Illumenator and Mirror	25
40	L-41	Colorimeter Flowthrough Type	Sample vol. 1.5ml	4
41	L-42	Photocopier	Max. A3 Size	1
42	L-43	Electric Typewriter	English	1

5-3-3. Equipment-Related Facilities Plan

The main points of the building facilities plan, the preparation of which will be necessary following the equipment plan, are described here. As the facilities envisaged in the Project deal with high-risk pathogens, safe research conditions for researchers must be established. It addition, the proper functioning of equipment at all times should be assured to improve the research results.

1) Adequate air-conditioning / ventilation facilities should be installed to prevent the intrusion of microbes and laboratory contamination. In addition, the exhaust facilities should not adversely affect the external environment.

2) In the case of those areas which are designated as hazardous or clean areas, the air-conditioning/ ventilation facilities should meet the respective standards which are established to secure the safety of researchers and research accuracy.

3) As the water used in laboratory tests has a crucial influence on the research accuracy and the equipment durability, treated water which is suitable for specific purposes should be supplied.

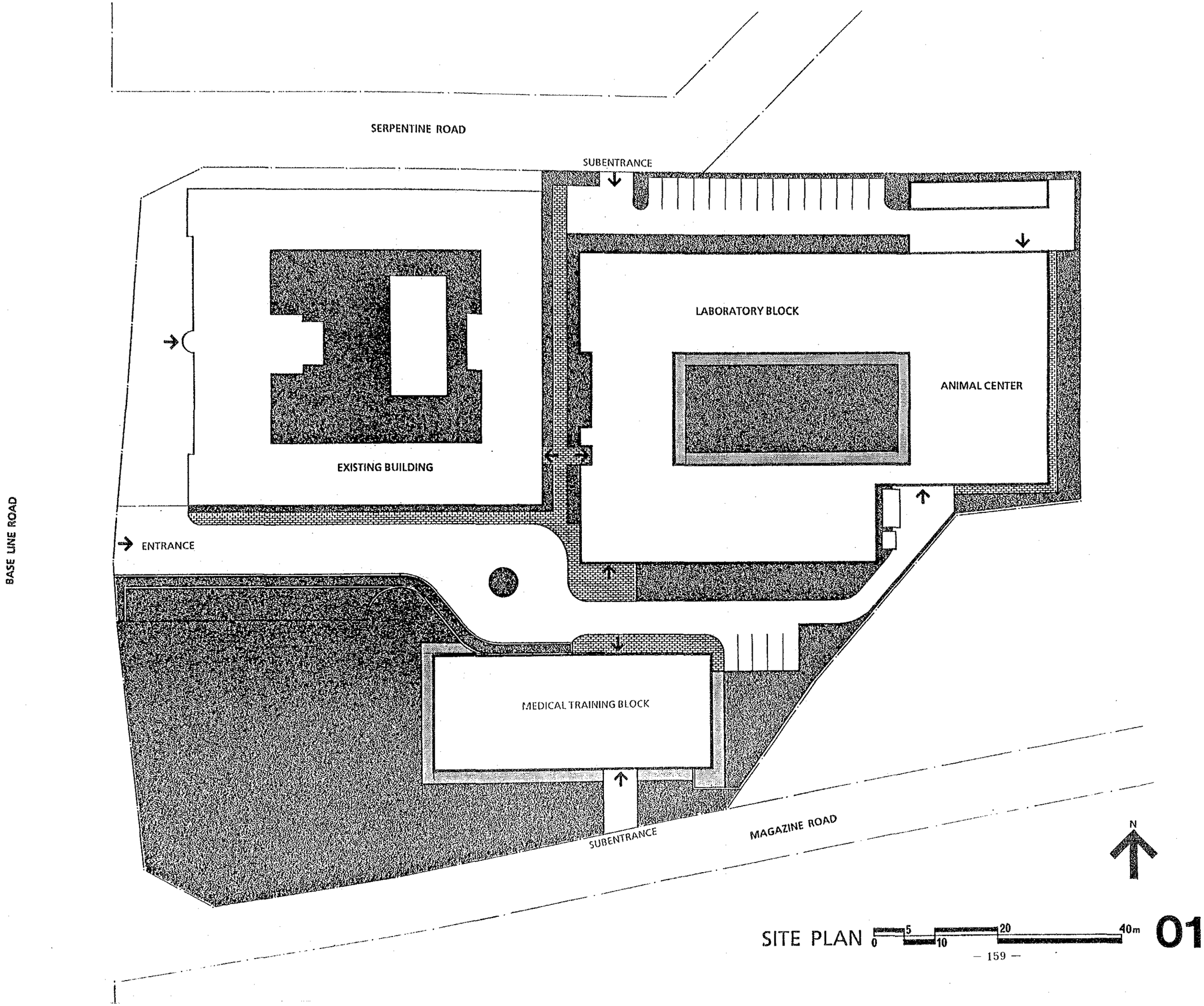
4) The power sources for the general equipment and heavy equipment are single-phase, 230V power points (earthed) and 3-phase, 400V power points respectively.

5) While a power fluctuation of ±15-20% will be handled by the power room, a CVCF device will be installed on equipment requiring a stable power supply.

6) The provision of facilities (power, water supply, water drainage, air-conditioning, ventilation and special gas, etc.) which become necessary following the transfer of the existing equipment will be included in the Project. Details in this regard will be decided in consultation with the MRI at the detail design stage.

5-4. BASIC DESIGN DRAWINGS

01	SITE PLAN
02	GROUND FLOOR PLAN
03	1ST FLOOR PLAN
04	2ND FLOOR PLAN
05	3RD FLOOR PLAN
06	4TH FLOOR PLAN
07	ROOF PLAN
08	ELEVATION - 1
09	ELEVATION - 2
10	SECTION
11	ELECTRICITY AND TELEPHONE SYSTEM
12	WATER SUPPLY AND DRAINAGE SYSTEM


SERPENTINE ROAD
SUBENTRANCE
LABORATORY BLOCK
ANIMAL CENTER
EXISTING BUILDING
ENTRANCE
BASE LINE ROAD
MEDICAL TRAINING BLOCK
SUBENTRANCE
MAGAZINE ROAD
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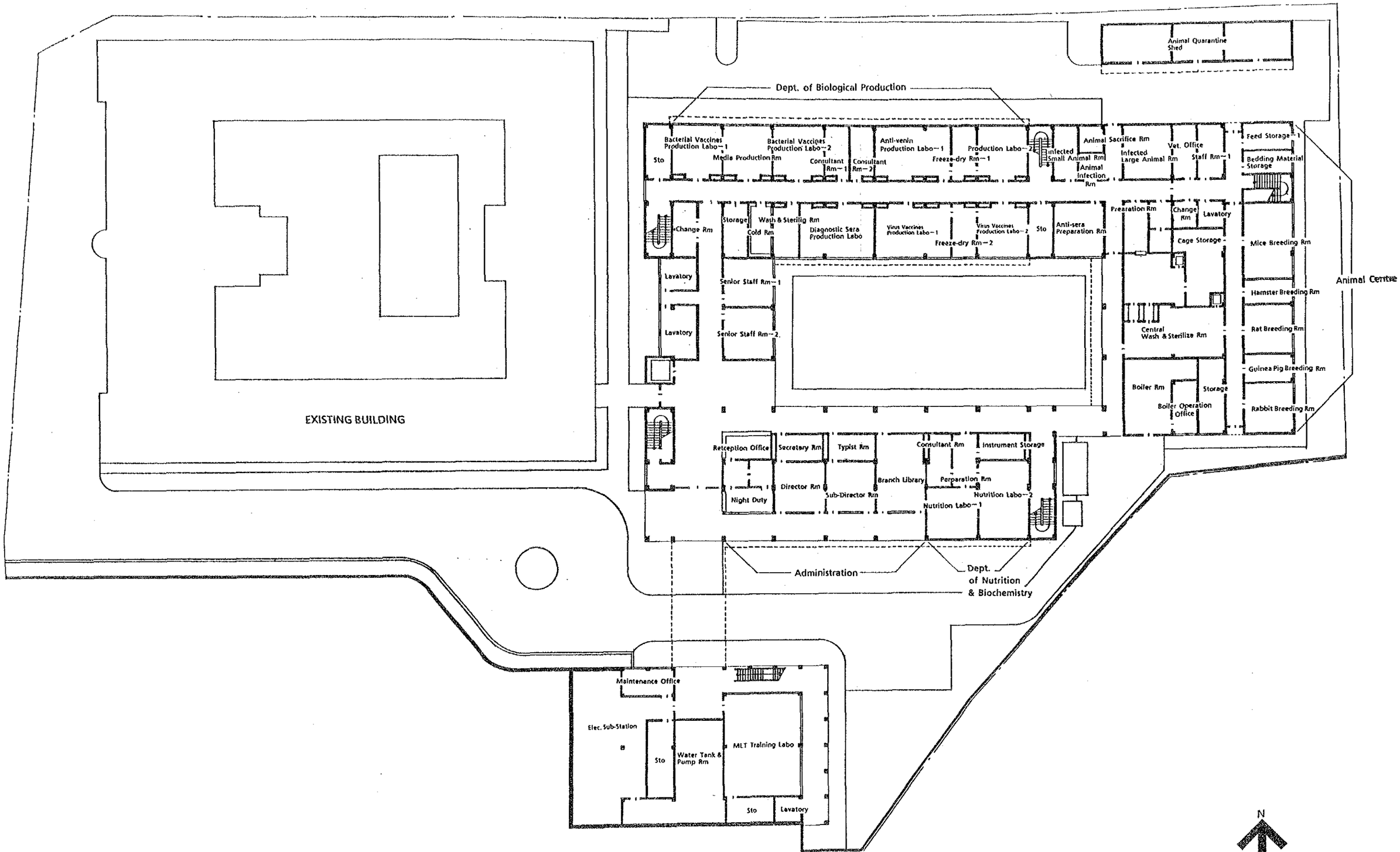
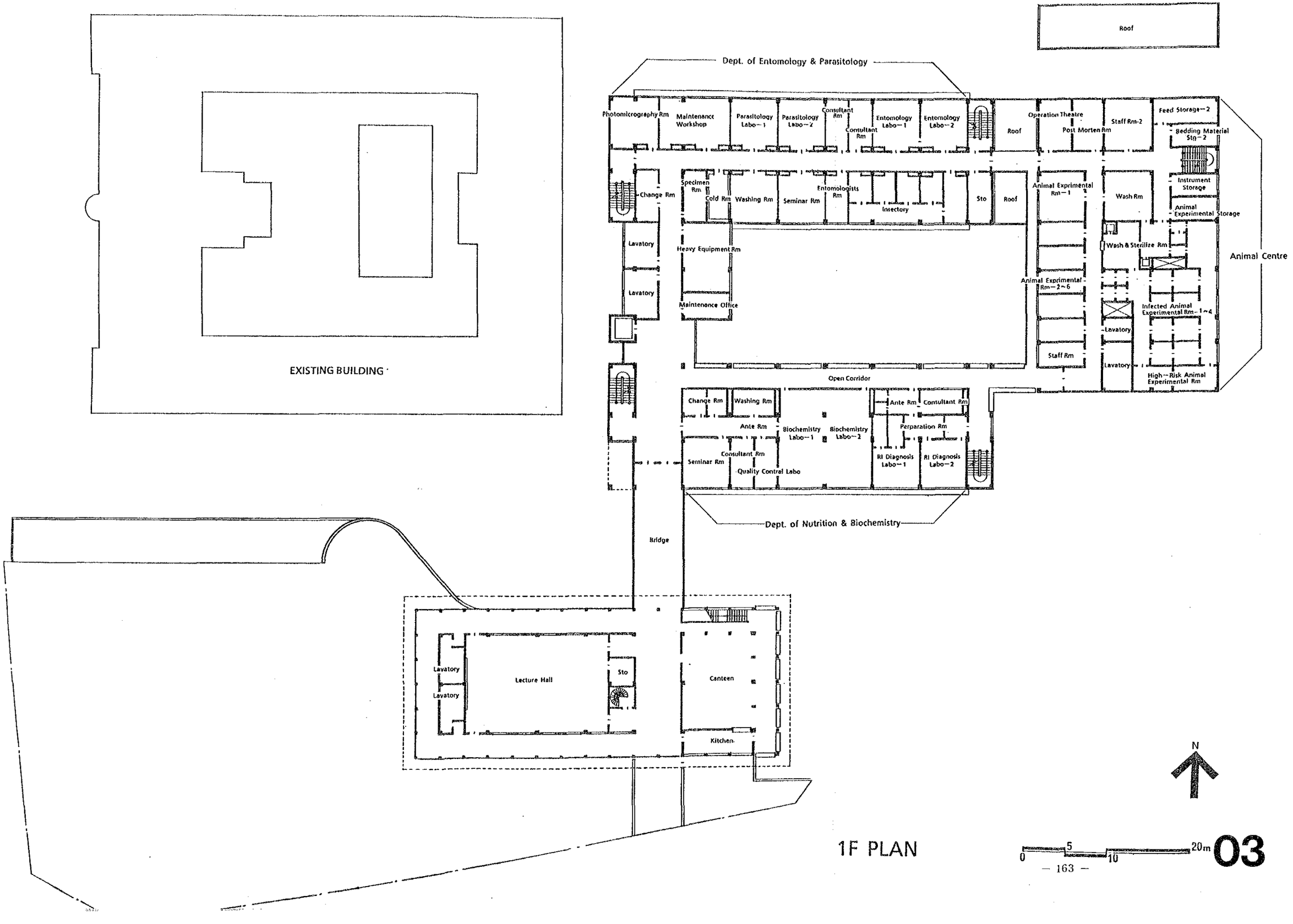
0
5
10
20
40m

SITE PLAN 01


EXISTING BUILDING
Animal Quarantine Shed
Dept. of Biological Production
Bacterial Vaccines Production Labo—1
Bacterial Vaccines Production Labo—2
Anti-venin Production Labo—1
Production Labo—2
Sto
Media Production Rm
Consultant Rm—1
Consultant Rm—2
Freeze-dry Rm—1
Infected Small Animal Rm
Animal Sacrifice Rm
Infected Large Animal Rm
Vet. Office
Staff Rm—1
Animal Infection Rm
Feed Storage—1
Bedding Material Storage
Change Rm
Storage
Wash & Sterilig Rm
Cold Rm
Diagnostic Sera Production Labo
Virus Vaccines Production Labo—1
Virus Vaccines Production Labo—2
Freeze-dry Rm—2
Sto
Anti-sera Preparation Rm
Prearation Rm
Change Rm
Lavatory
Cage Storage
Mice Breeding Rm
Lavatory
Senior Staff Rm—1
Lavatory
Senior Staff Rm—2
Hamster Breeding Rm
Central Wash & Sterilize Rm
Rat Breeding Rm
Guinea Pig Breeding Rm
Boiler Rm
Storage
Boiler Operation Office
Rabbit Breeding Rm
Animal Centre
Reception Office
Secretary Rm
Typist Rm
Consultant Rm
Instrument Storage
Night Duty
Director Rm
Sub-Director Rm
Branch Library
Preparation Rm
Nutrition Labo—2
Nutrition Labo—1
Administration
Dept. of Nutrition & Biochemistry
Maintenance Office
Elec. Sub-Station
Sto
Water Tank & Pump Rm
MLT Training Labo
Sto
Lavatory
N
0
5
10
20m

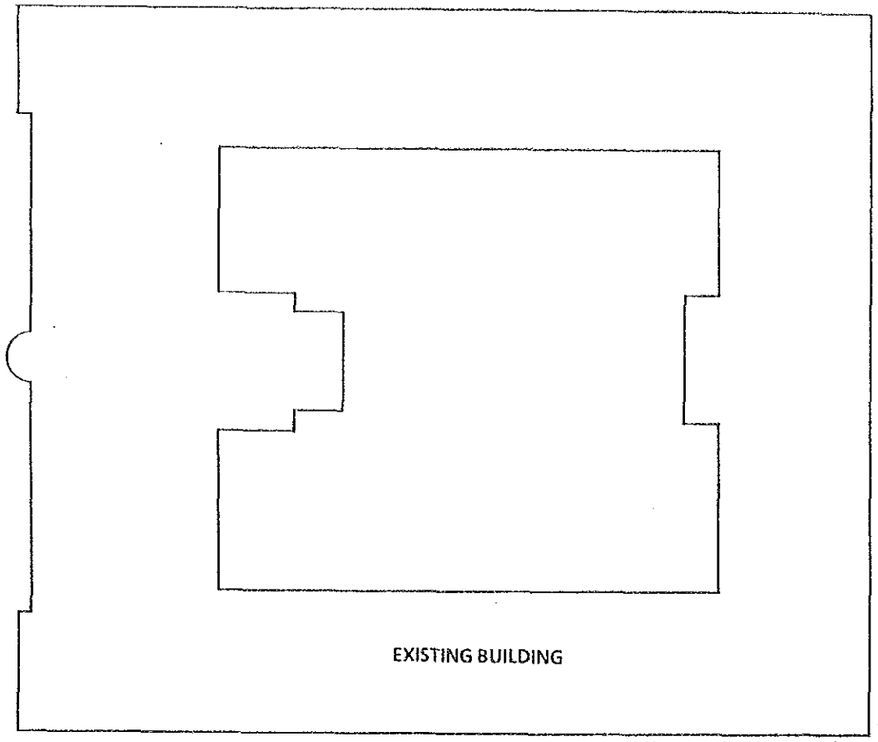
GF PLAN

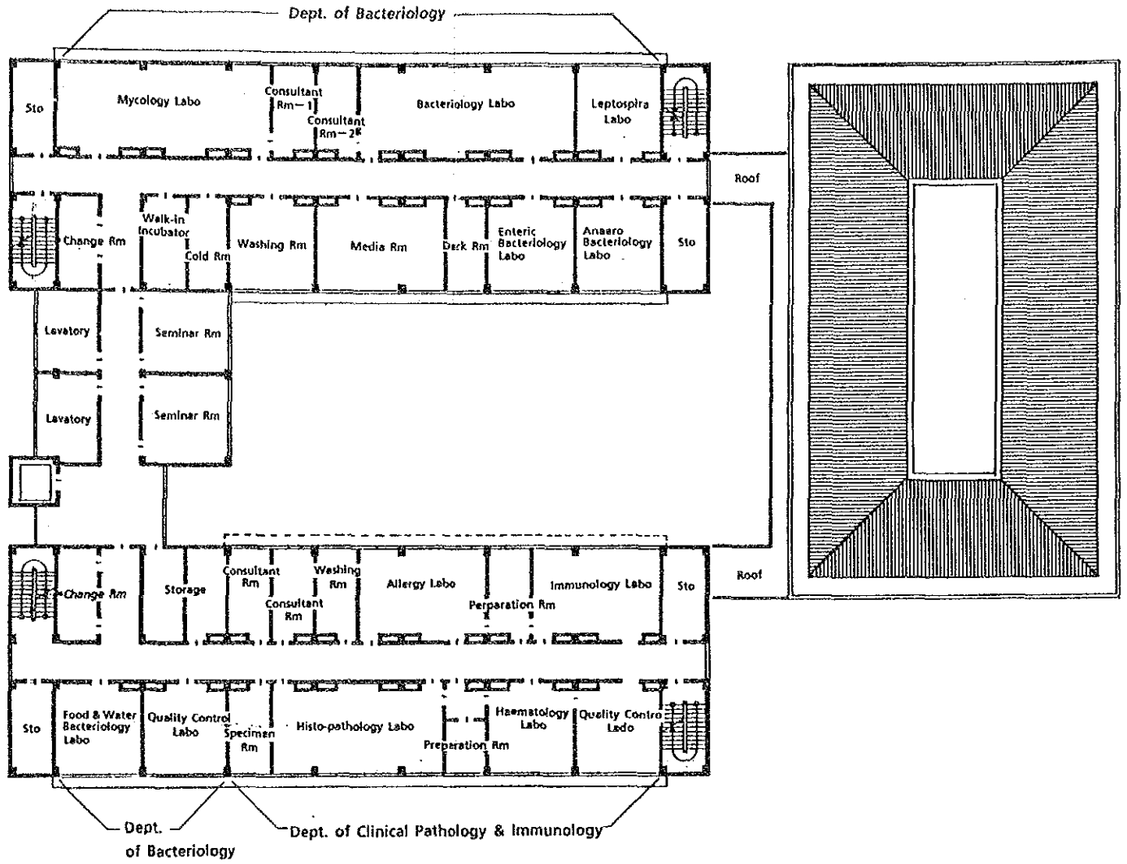
02

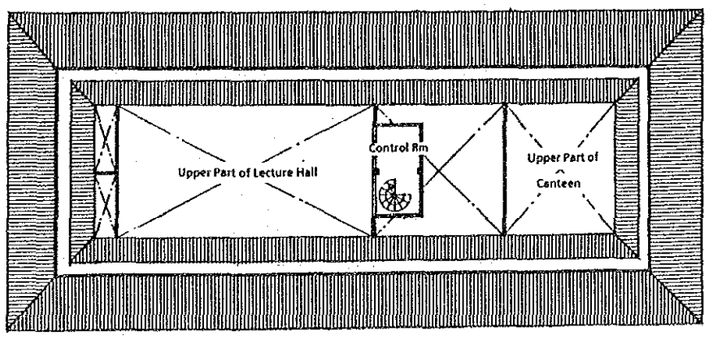

EXISTING BUILDING
Roof
Dept. of Entomology & Parasitology
Photomicrography Rm
Maintenance Workshop
Parasitology Labo—1
Parasitology Labo—2
Consultant Rm
Consultant Rm
Entomology Labo—1
Entomology Labo—2
Roof
Operation Theatre
Post Morten Rm
Staff Rm-2
Feed Storage—2
Bedding Material Stg—2
Instrument Storage
Animal Experimental Storage
Change Rm
Specimen Rm
Cold Rm
Washing Rm
Seminar Rm
Entomologists Rm
Insectory
Sto
Roof
Animal Exprimental Rm—1
Wash Rm
Wash & Sterilize Rm
Animal Centre
Lavatory
Lavatory
Heavy Equipment Rm
Maintenance Office
Animal Exprimental Rm—2~6
Infected Animal Experimental Rm—1~4
Lavatory
Staff Rm
Lavatory
High—Risk Animal Experimental Rm
Open Corridor
Change Rm
Washing Rm
Ante Rm
Consultant Rm
Ante Rm
Biochemistry Labo—1
Biochemistry Labo—2
Perparation Rm
Consultant Rm
Seminar Rm
Quality Control Labo
RI Diagnosis Labo—1
RI Diagnosis Labo—2
Dept. of Nutrition & Biochemistry
Bridge
Lavatory
Lavatory
Lecture Hall
Sto
Canteen
Kitchen
N
0
5
10
20m

1F PLAN

03





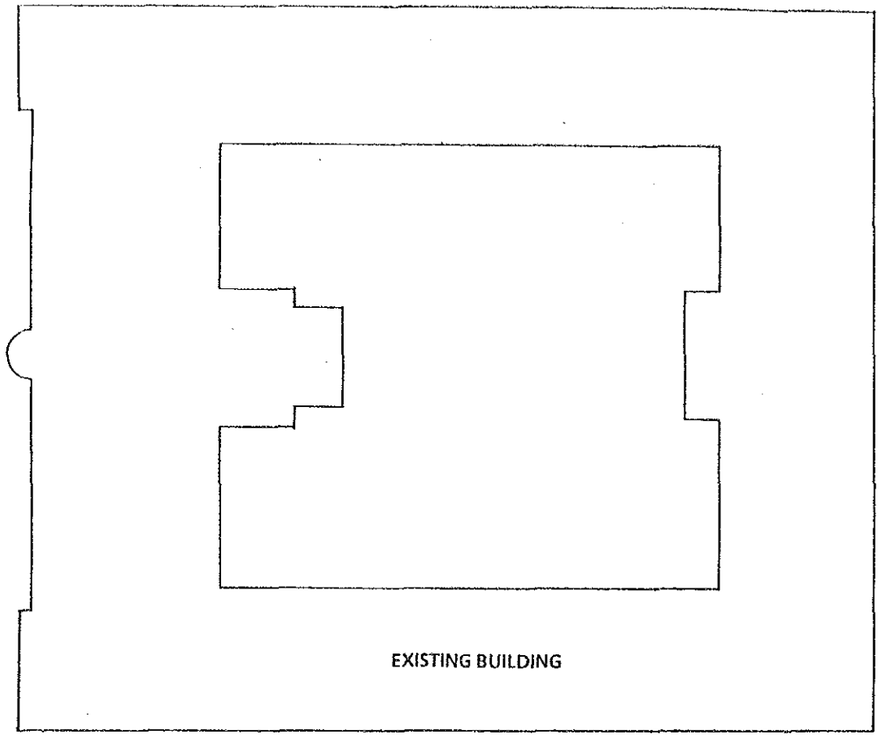


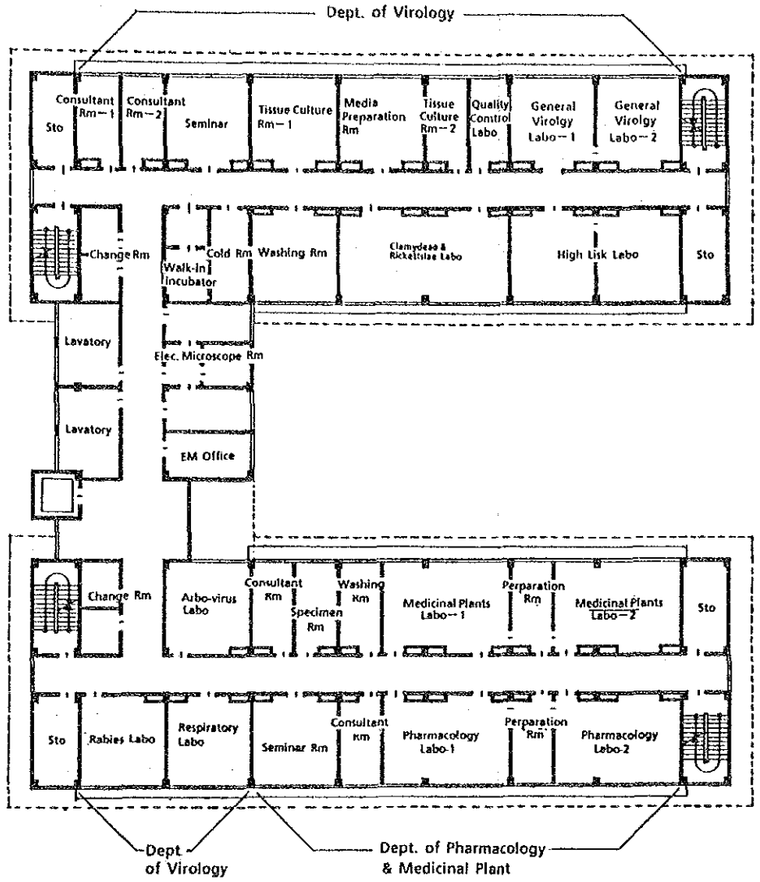
N

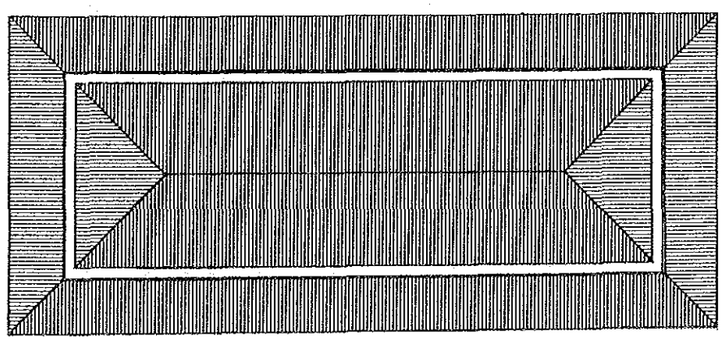
2F PLAN

0 5 10 20m

04



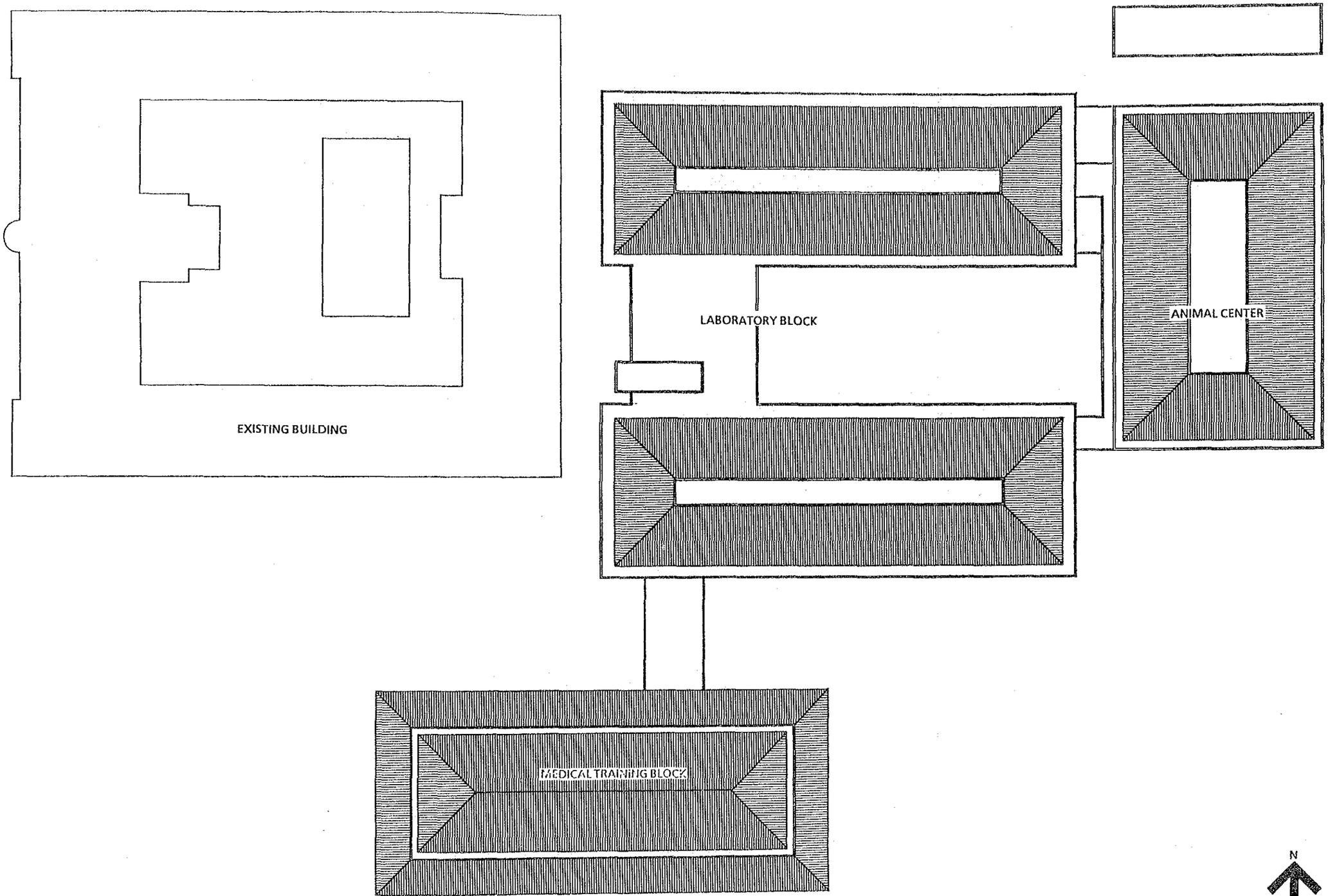




3F PLAN

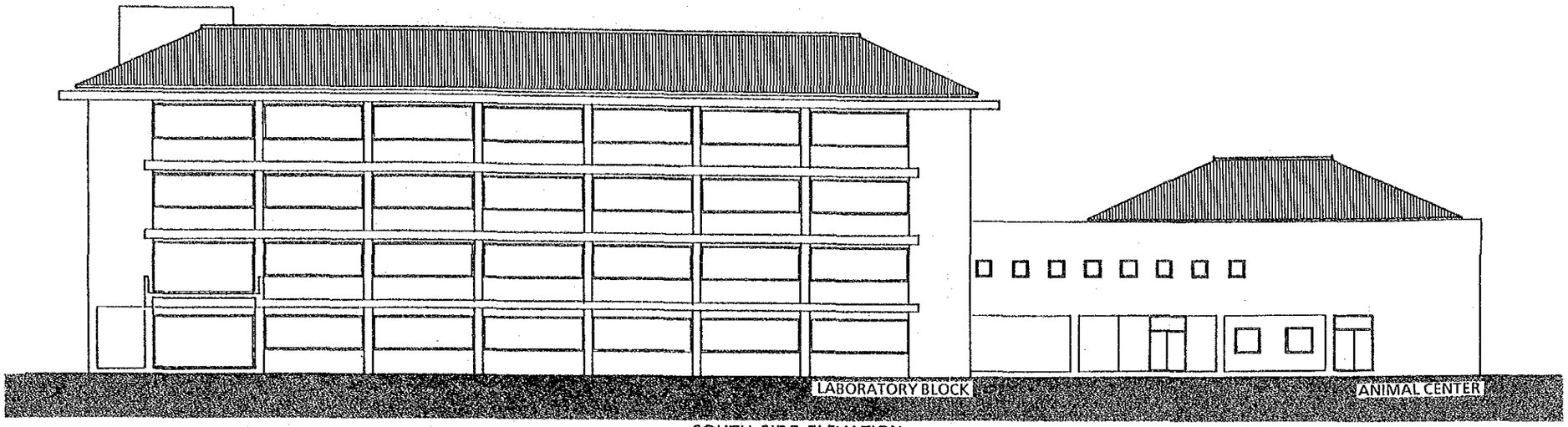
0 5 10 20m

05

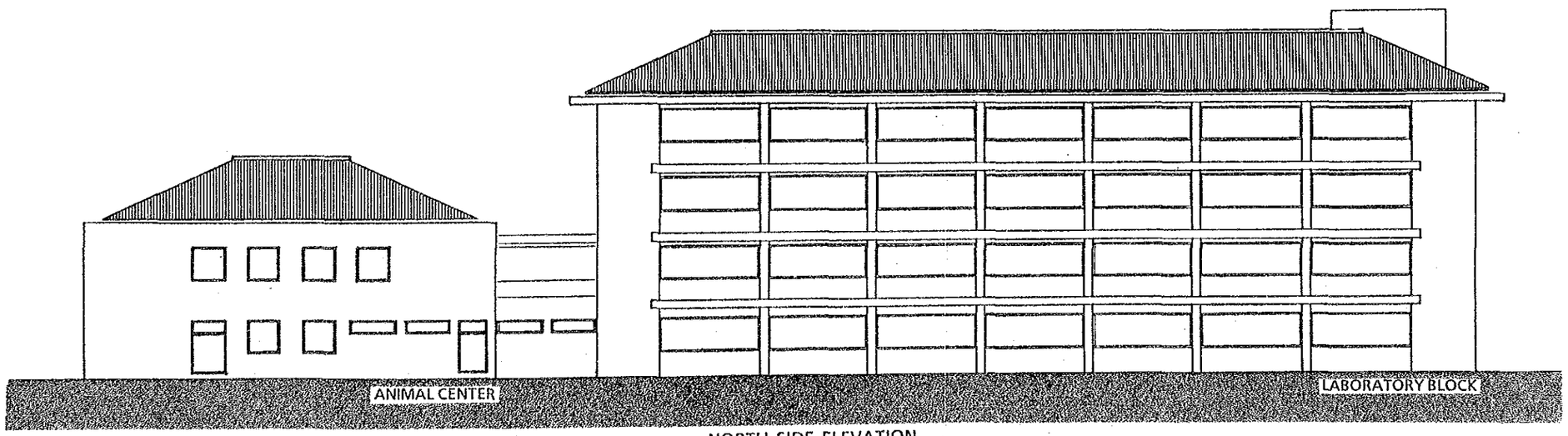

EXISTING BUILDING
LABORATORY BLOCK
ANIMAL CENTER
MEDICAL TRAINING BLOCK
N
0
5
10
20m

ROOF PLAN

06



SOUTH SIDE ELEVATION

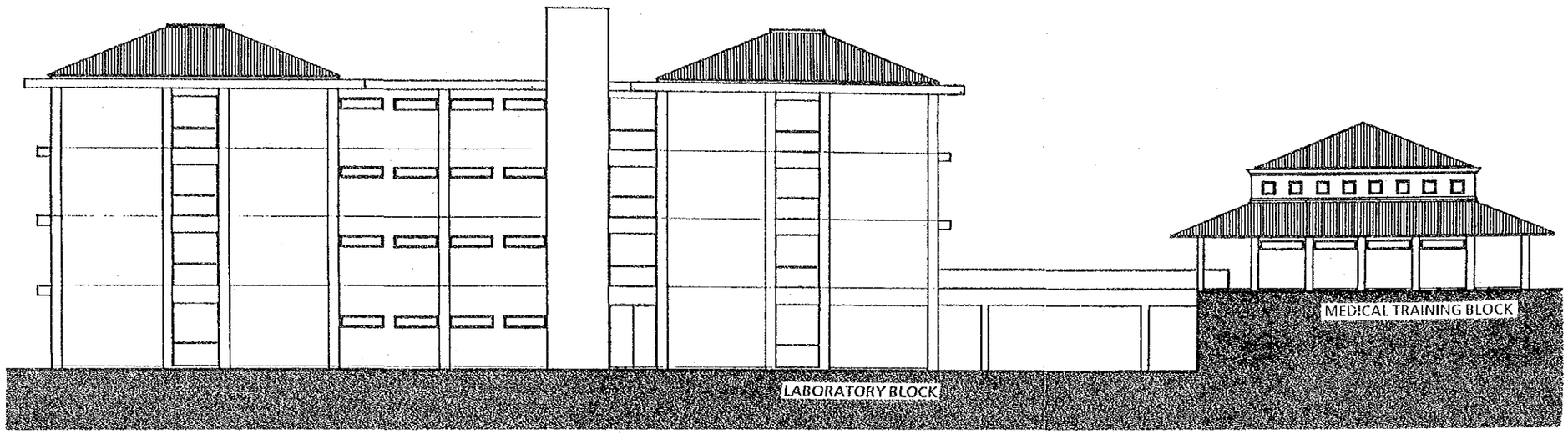


NORTH SIDE ELEVATION

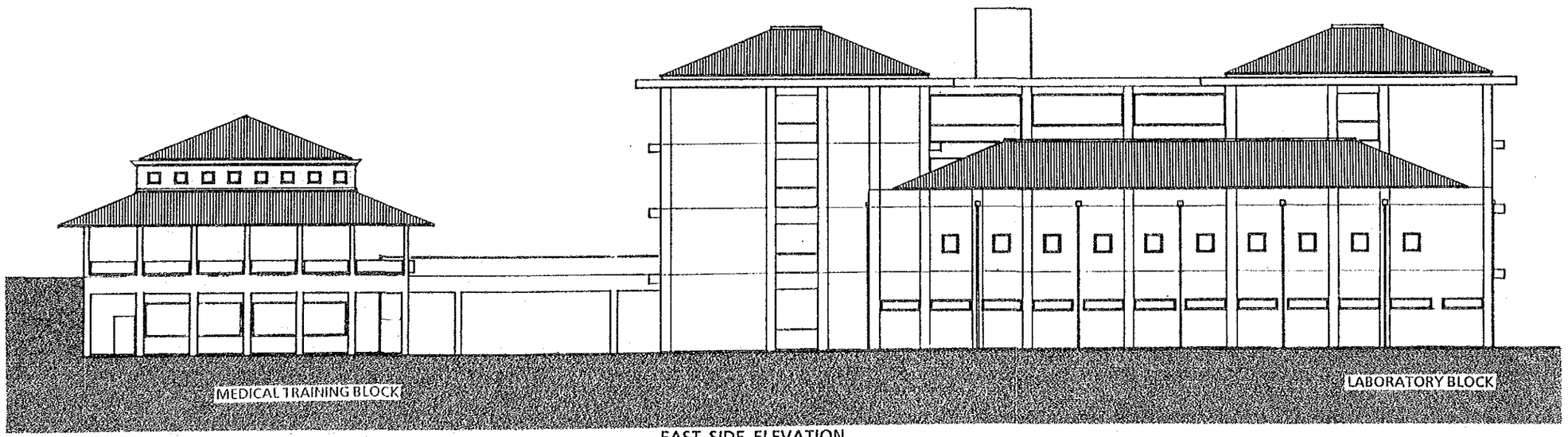
ELEVATION

0 5 10 20m

07



WEST SIDE ELEVATION



EAST SIDE ELEVATION

ELEVATION

0 5 10 20m

08