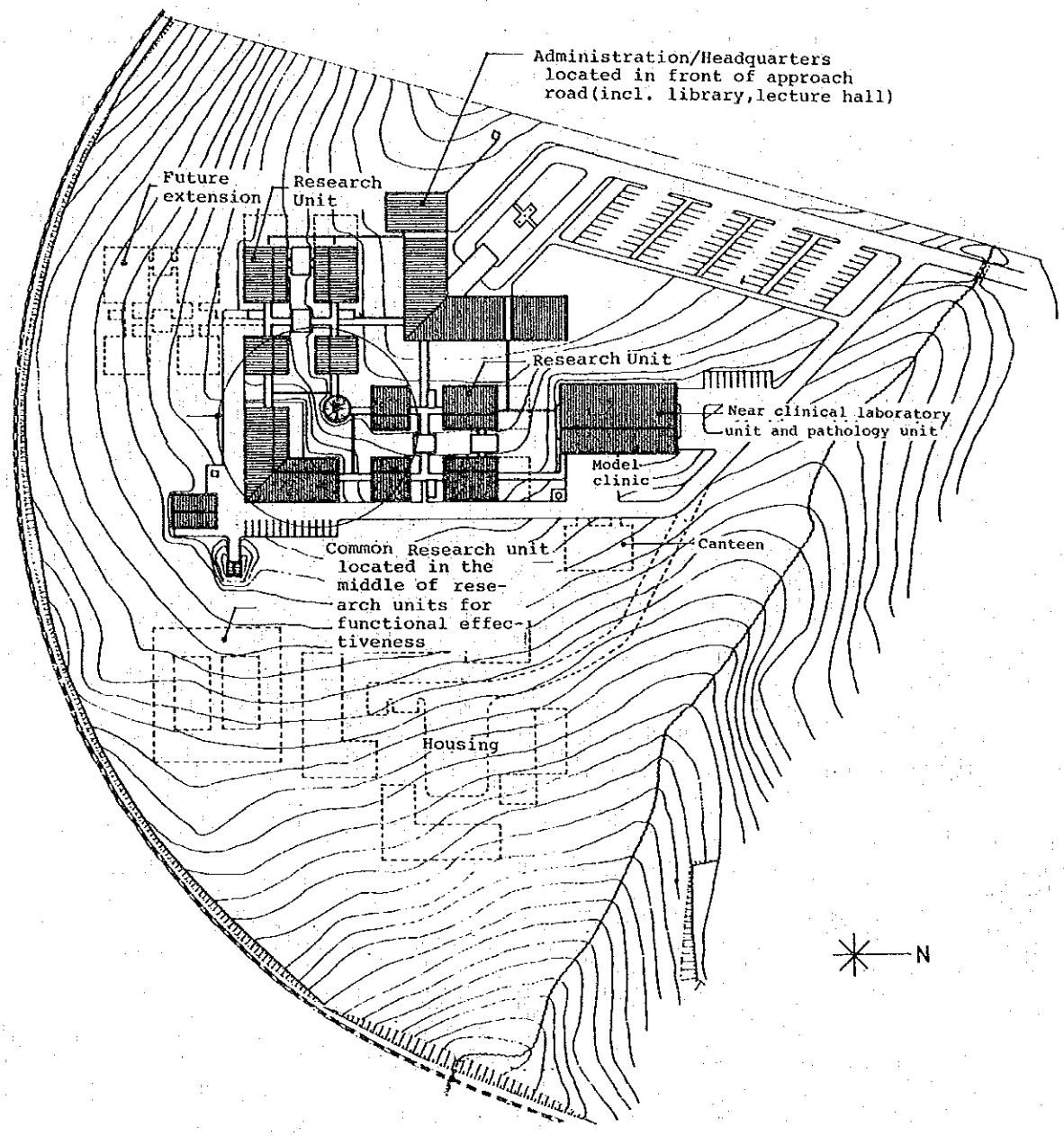
4-4 Basic Design

(1) Basic Design Principles

- The number of rooms required in the research units and model clinic is shown in a separate paper.
- The level of the laboratory will be max. P_3-level.*1
- The floor area of the research units will be the same.
- Forty beds will be capacitated in model clinic.
- Future expansion will be taken into consideration, e.g. open-end design and the securing of vacant lots.
- The configuration, i.e. the slope, of the site will be put to effective use in terms of planning and design.
- In the design, emphasis will be put on the saving of energy with due consideration given to Kenya's natural conditions (natural ventilation and lighting).
- Local construction methods and materials will be used as much as possible, not only from the standpoint of cost-effectiveness but also from that of the maintenance and preservation of the buildings.
- The buildings will be so planned that they may be easily kept clean, e.g. separation of the infected zone from the clean zone, and the selection of materials which will keep the buildings clean.
- The image of central medical research institute and a model clinic in Kenya will be created as models for East Africa.
- Planning will be such that the construction phases may be clearly demarcated so as to hinder the operation.
- Measures against sunshine and rain by using pitched roof balconies and louvres.

*1 P_3 level: Biohazard category of pathogenic organ (3rd grade by NIH classification, USA)

(2) Site Planning



Zoning is made based on the discussion with Kenyan side (esp. laboratories, housing area)

(3) Functional Planning

a) Computation of Floor Area

It is quite important in basic design process to determine the scale of the facilities from the view point of construction cost and research activities.

Computation of floor area for 1 research unit is done based on the number of research staff per 1 research unit (about 300 m^2).

For the effective use of floor space and equipments, 1 common zone for neighbouring 2 research units and the minimization of common research units are considered.

Site planning of these units is made in such manner that the future extension will be possible along the progress of research activities.

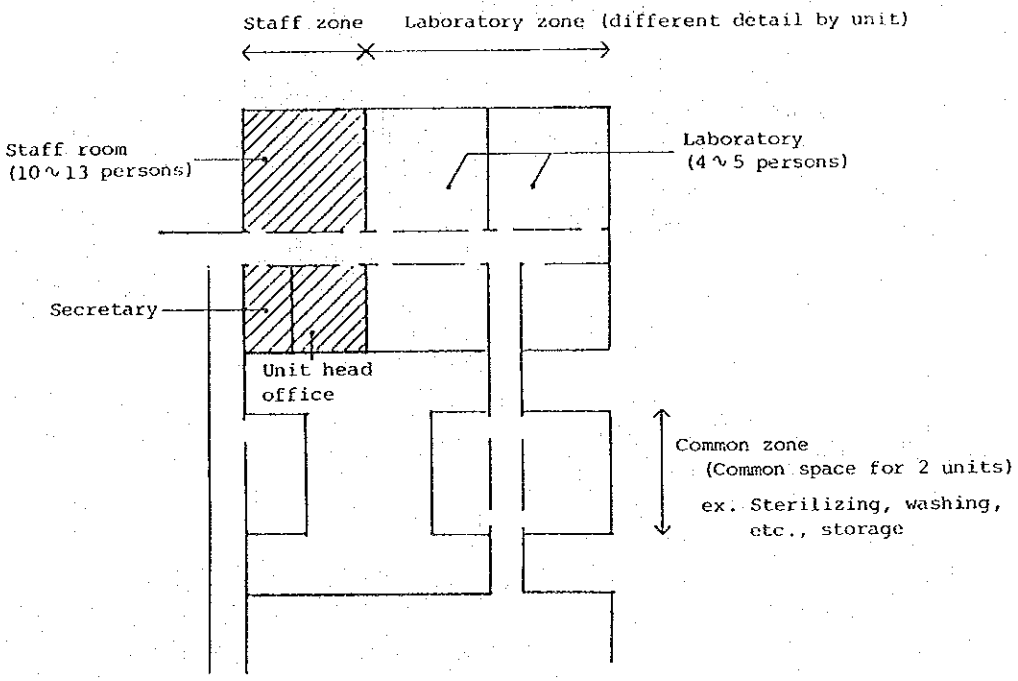
The floor area of administration block is also minimized.

b) Administration Block

- The administration block will be located in front of the approach to facilitate management and control both from the internal and external aspects.
- There will be one main and two sub-entrances, by which an auditorium and a library will be located to facilitate their use by visitors.
- The general administration, library and lecture hall will be placed on the first floor and the headquarters on the second floor.

c) Research Units

- Between each 2 main research unit there will be a zone for common use. (See below)



d) Common Research Units

- A common research units will be located in the centre area of the above research units to streamline its research work.

- A laboratory animal house and a workshop will also be placed in the same group as the common research unit to take charge of part of the research work.

e) Model Clinic

- In the two-storey building, the central treatment will be on the first floor to facilitate the provision of sophisticated medical care. Also part of the pathological sector will be on the first floor.

- On the second floor, 40 beds will be installed as one nursing unit, and the bedroom will be so arranged that they may be divided into five groups, depending on the diseases: (e.g. two single-bed rooms and three twin-bed rooms) x 5.

f) Necessary Rooms

Unit		Section
Adm. Block	Director's Office	Director's Office, Deputy Director's Office, Principal Research Officer's Office, Administrative Secretary Office, Committee Clerk Office, Committee Rooms, Other Office.
	Gen. Adm.	Principal Adm. Officer's Room, Senior Executive Officer's Room, Accountant Div. Office, Personnel Div. Office, Security Div. Office, Supply Div. Office, Transport Div. Office, Estate Div. Office.
	Medical Library	Reading Area, Book Store etc. for about 15,000 volumes, Printing Rooms.
	Training/ Lecture	Lecture Hall etc. for about 150 persons.
Central Lab.	Central Research Units	Virology, Bacteriology, Parasitology, Vector-Biology, Clinical Research, Public Health & Epidemiology, Pathology, Human Reproduction, Environmental Physiology, Traditional Medicine.
	Common Research Units	Medical Illustration, Electronmicroscope, Central Cold Room and Chilled Room, RI-laboratory, P_3 -laboratory, Laboratory Animal House, Workshops
Model Clinic	Model Clinic	Ward {(1Bx2+2Bx3)} x5 = 40 beds, Central lab. X-ray, Endoscopy, Autopsy, Mortuary, Kitchen, Laundry, Machine Room, Pharmacy, Clinic Office, Clinic Heads Office.

(4) Structural, Material and Service Facility Planning

a) Structural and material planning

① Conditions

- Structural calculation is due to the ultimate strength design method and the permissible stress design method.
- External force is due to Kenyan code.
- Calculation method is due to computor using consultant's programme.
- Structural drawings is due to Reinforced Concrete Code in A.I.J.

② Structure and materials

- Number of floors; two partly in a one-story
- Structural materials; Reinforced concrete and wood
- Structural system; Framed structure with partly shear walls
- Foundation; Independent foundation(alteration possible due to the results of Kenyan side soil survey)
- Concrete ; Fc = 210 kg/cm^2 (slamp 10 - 12 cm) (w/c $\leq$ 50)
- Reinforcement; gen. 410 N/mm^2 (small size 250 N/mm^2)
- Roof ; Roof tile + purlin
- Finish of external walls; Concrete exposure and Paint finish, Concrete block with plaster and paint finish, Stone finish partially
- External door & windows; Alminum sashes Clear glass t = 5mm
- Internal finish

(standard)	Floor	Skirt	Wall	Ceiling
Office room;	PVC tile	PVC Soft tile	Paint	Paint
Laboratory;	Terrazzo	Terrazzo	Paint	Paint
Model Clinic;	Terrazzo	Terrazzo	Paint	Paint
Water Section;	Terrazzo	Terrazzo	Ceramic tile	Paint

. Internal doors & Windows; Wooden

. Partition wall; Concrete block

b) Electrical Equipment Planning

Following system will be planned.

① Incoming facilities Power Supply and Distribution System

② Stand-by Generator Sets for Emergency

③ Power Supply System

④ Lighting Fixture

⑤ Telephone facilities

⑥ Fire alarm system

⑦ Broadcasting system

⑧ Nurse call system

⑨ Interphone system

⑩ Lightning rod & grounding system

c) Plumbing Equipment Planning

Following system will be planned.

① Water supply facilities

② Domestic hot water supply system

③ Drainage system

④ Sanitary fixtures

⑤ Gas supply system

⑥ Fire extinguishing equipment

⑦ Kitchen equipment (for model clinic)

⑧ Laundry equipment (for model clinic)

⑨ Boiler equipment

⑩ Chemical drain treatment facility.

d) Air-Conditioning & Ventilation Planning

Following system will be planned.

(1) Air-conditioning system

① Central laboratory (P3 level)

② Animal house (Germ free)

③ Other animal house

(2) Ventilation system - Principally natural ventilation will be considered for ordinal rooms. And mechanical ventilation will be installed in necessary points such as draft chamber etc.

e) Special Equipment

Following system will be planned

① Cold & chilled room

② Constant temperature & humidity room

③ Medical gas system (for model clinic)

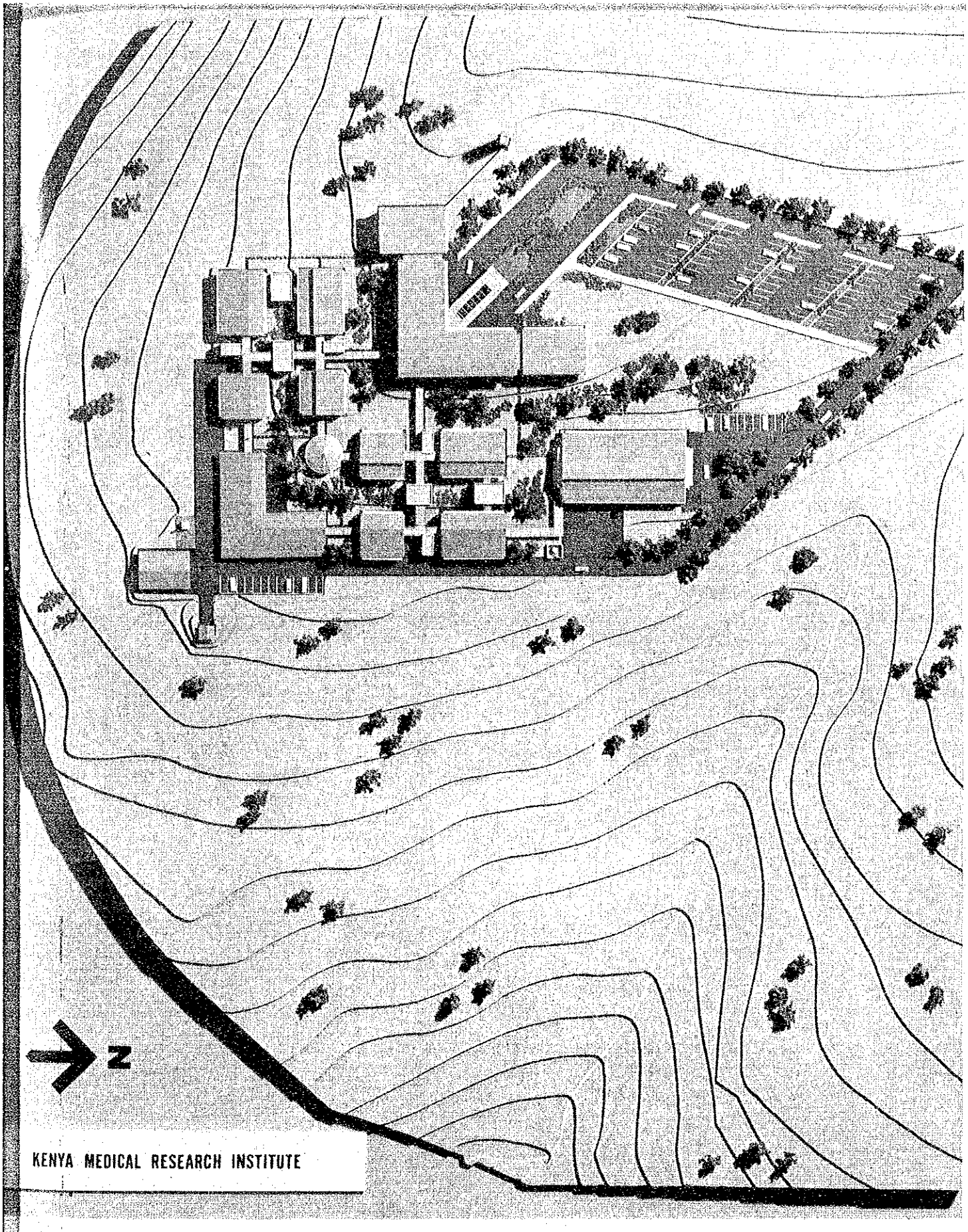
④ Laboratory tables & draft chambers

⑤ Incinerator

(5) Basic Design Drawings

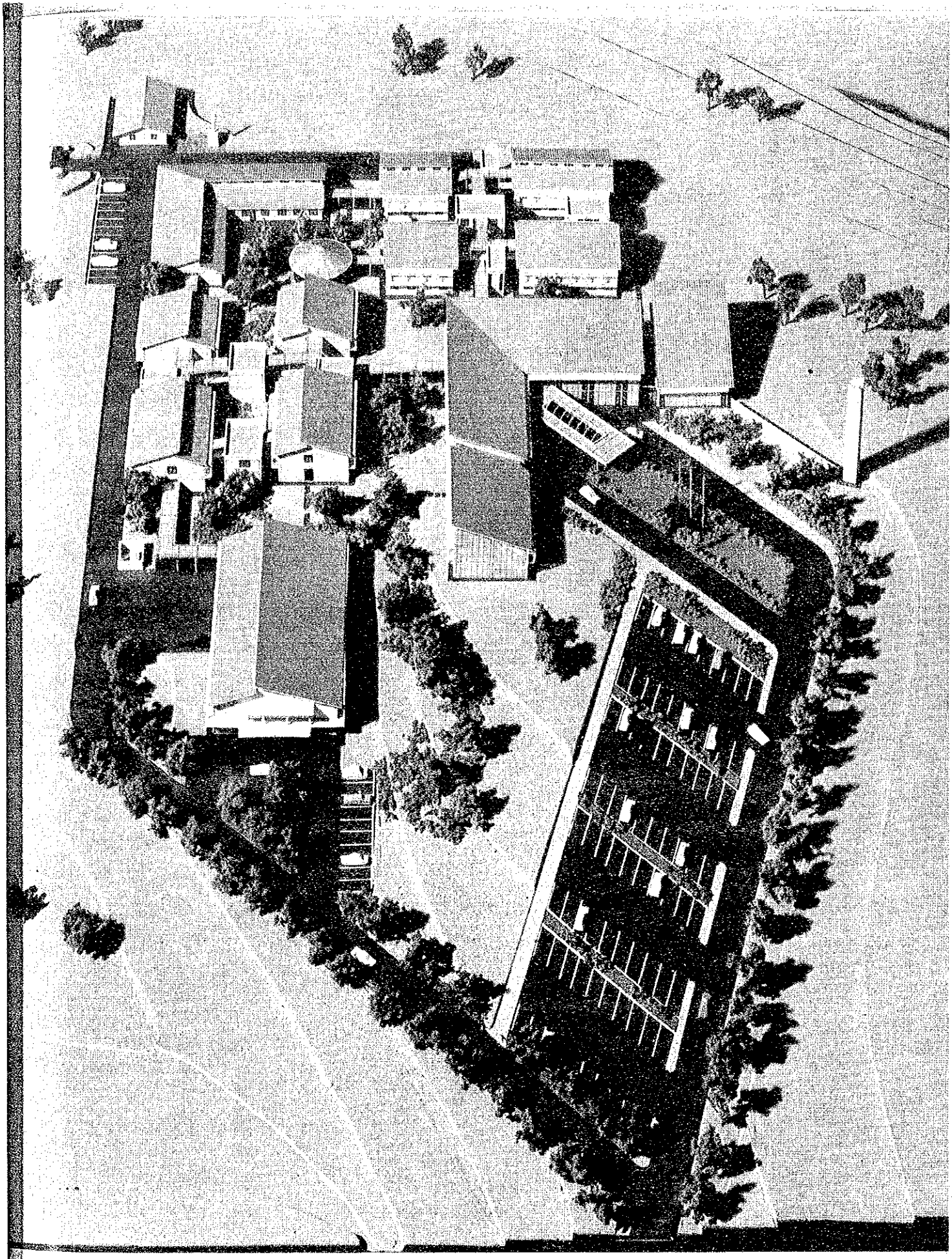
Following are the contents of Basic Design Drawings.

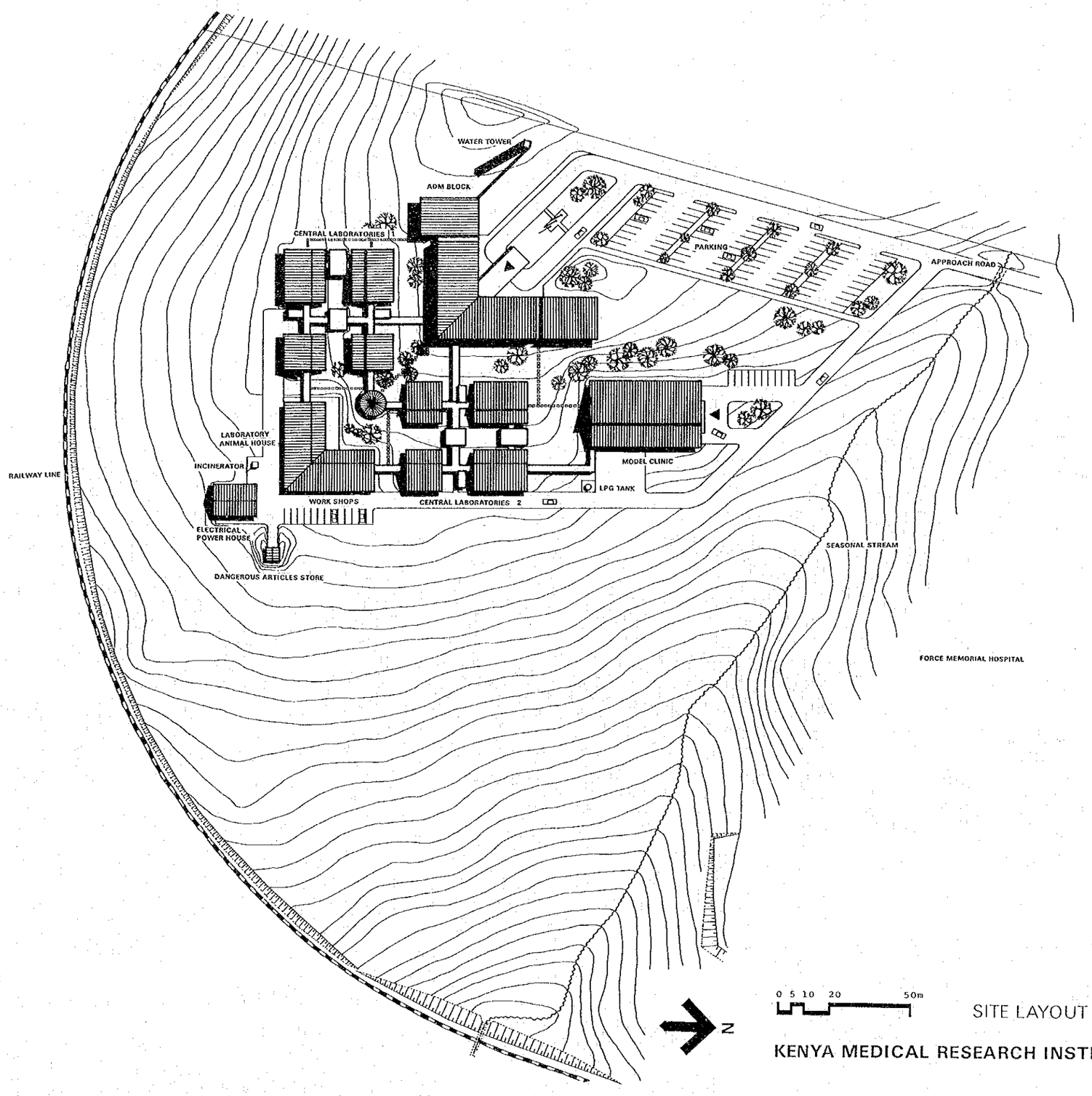
- Bird eye view model photo
- Site layout plan
- 1FL plan
- 2FL plan
- Section-Elevation



BIRD EYE VIEW MODEL PHOTO **1**

KENYA MEDICAL RESEARCH INSTITUTE

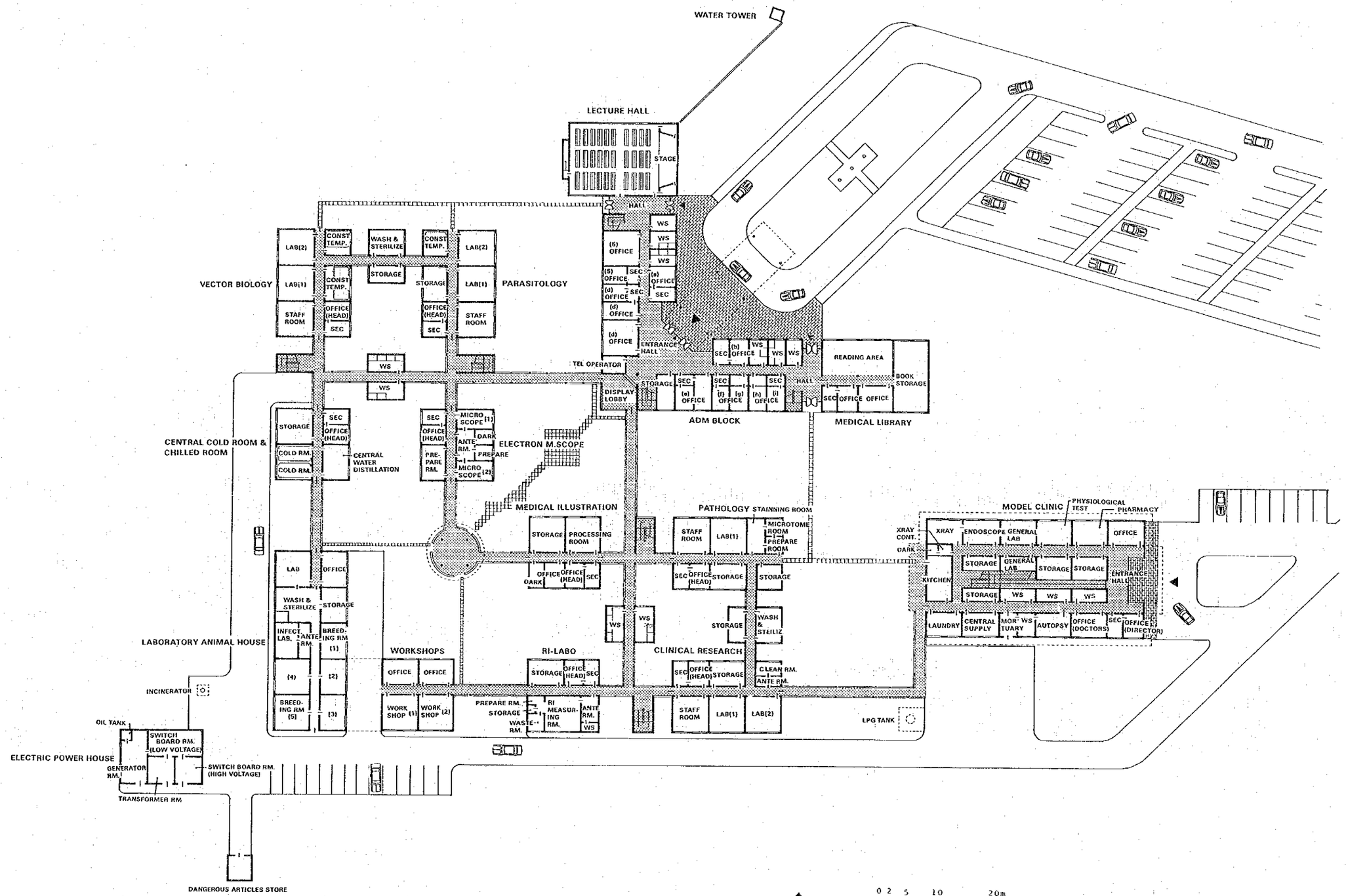




SITE LAYOUT PLAN

KENYA MEDICAL RESEARCH INSTITUTE

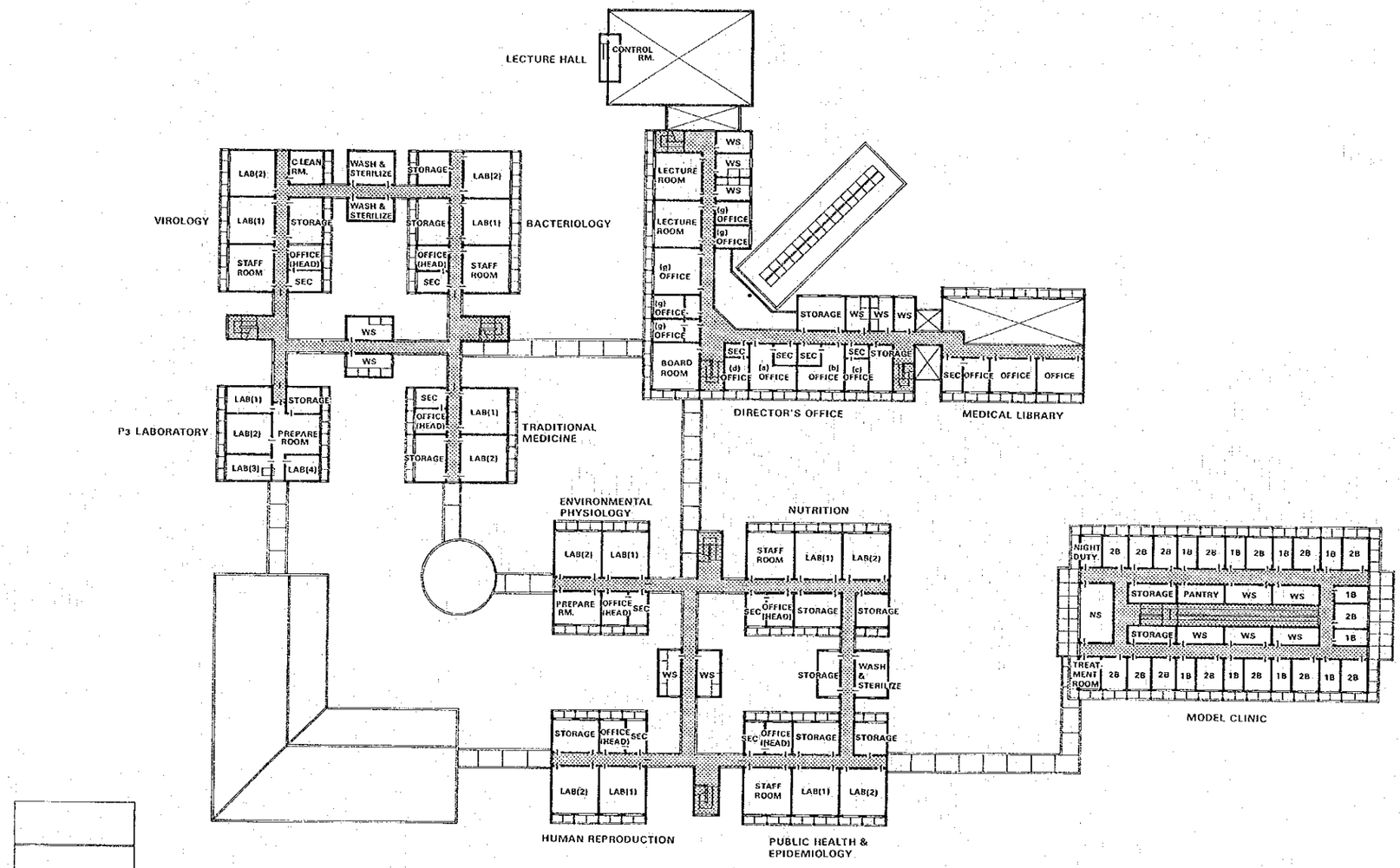
2



FIRST FLOOR PLAN

KENYA MEDICAL RESEARCH INSTITUTE

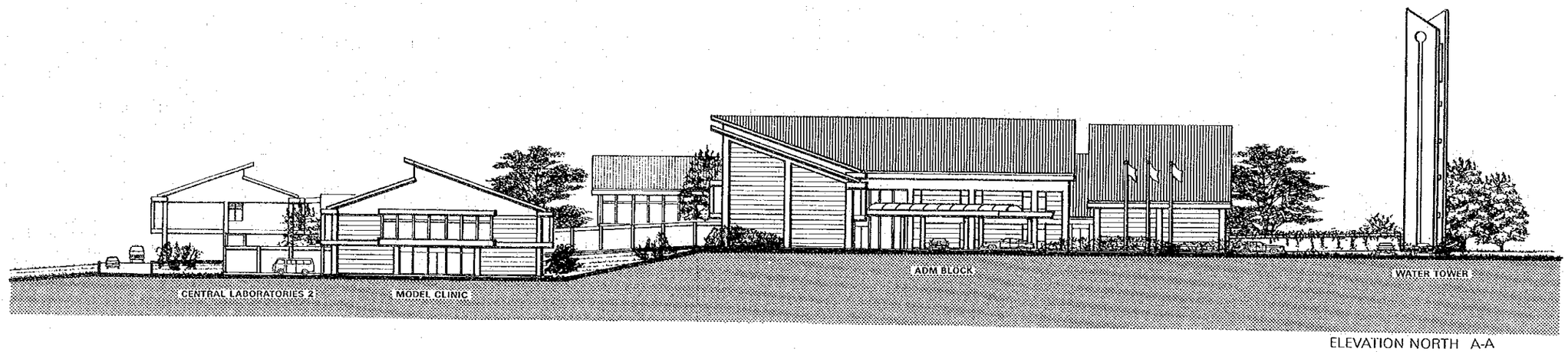
3



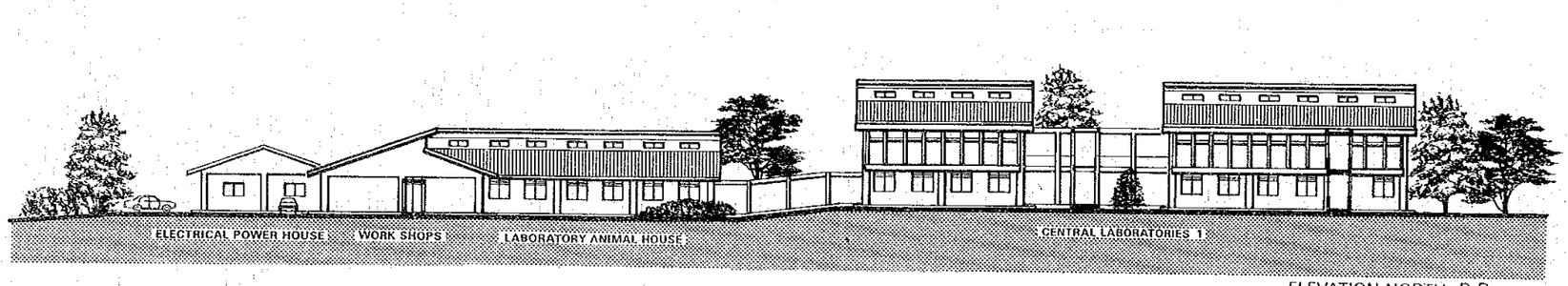
SECOND FLOOR PLAN

KENYA MEDICAL RESEARCH INSTITUTE

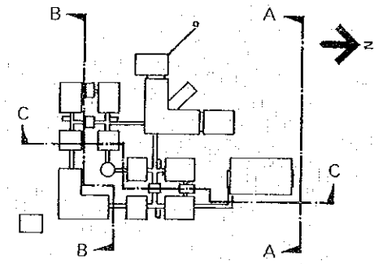
4



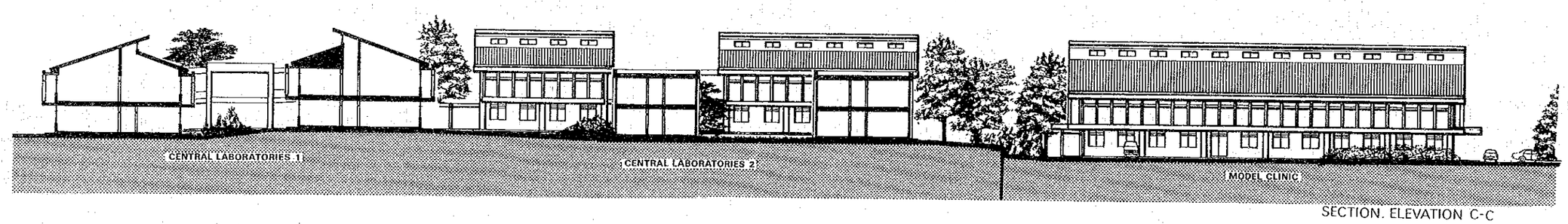
ELEVATION NORTH A-A



ELEVATION NORTH B-B



KEY PLAN



SECTION. ELEVATION C-C

0 2 5 10 15m

SECTION-ELEVATION

KENYA MEDICAL RESEARCH INSTITUTE

5

(6) Research and Medical Equipment Planning

The following points will be taken into consideration in planning of research & medical equipment.

① The basic research and medical equipment will be selected.

② In selecting equipment, the natural conditions, power supply conditions, water quality, etc., will be taken into consideration and durable equipment will be chosen.

③ Consideration will be given also to the maintenance system of equipment and the training of such staffs.

④ In selecting medical and research equipment, those with ordinary level will be chosen with due consideration given to the easiness for using and also for maintenance.

RI laboratory;	supply of only space, securing the future activities.
Central Cold Room and Chilled Room;	Cold & Chilled rooms will be made as a part of architectural works.
Medical illustration;	supply of only space
Workshops;	Maintenance equipments for research and medical equipments.
Others;	laboratory table, constant temperature room etc. will be made as a part of architectural works.

For other units see equipment list.

a) Equipment List of Research Units

Virology Unit	Bacteriology Unit
Equipment	Equipment
. Research Binocular Microscope . Handstand Type Microscope . Fluorescence Microscope . Spectrophotometer for Micro-Plate . Clean Bench . Incubator . Rotating Incubator . Ultra Low Temp. Freezer . High Speed Refrigerated Centrifuge . Preparative Ultracentrifuge . High Pressure Sterilizer . Other Research Equipments	. Research Binocular Microscope . Anaerobic Box . Incubator . Water Bath . Refrigerator . Other Research Equipments

EQUIPMENTS FOR COMMON USE

. Koch's Steam Sterilizer	. Direct Reading Balance
. High Pressure Sterilizer	. Self Indicating Balance
. Dry Heat Sterilizer	. Ice Maker

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

. Laboratory Table and other relating built-in furniture

Vector Biology Unit	Parasitology Unit
Equipment	Equipment
. Biological Research Microscope . Stereomicroscope . Micro-Photo Camera . Freezer . Refrigerator . Other Research Equipments	. Biological Research Microscope . Dark Field Stereomicroscope . Zoom Stereomicroscope . Micro-Photo Camara . Centrifuge (small type) . High Speed Refrigerated Centrifuge . Refrigerator . Other Research Equipments

EQUIPMENTS FOR COMMON USE

. High Pressure Sterilizer	. Ultrasonic Washer
. Dry Air Sterilizer	
. Direct Reading Balance	

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

. Laboratory Table and other relating built-in furniture

. Constant Temperature, Humidity Room Units

Pathology Unit	Clinical Research Unit
Equipment	Equipment
. Trinocular Research Microscope with Photo Attachments . Research Binocular Microscope . Fluorescence Microscope with Camera Set . Automatic Tissue Processor . Microtome . Incubator (Temp. 60°C) . Table Top Low Speed Centrifuge . Automatic Microtome Knife Sharpner . Refrigerator . Other Research Equipments	. Universal Biological Research Microscope with Camera Set . Biological Research Microscope with Teaching Head . Draft Chamber . Anaerobic Box . Incubator . Table Top Low Speed Centrifuge . Water Bath . Automatic Pipet Washer . Other Research Equipments

EQUIPMENTS FOR COMMON USE

. High Pressure Sterilizer	. Laboratory Glass Washer
. Hot Air Sterilizer	. Ultrasonic Washer
. Deep Freezer (-80°C)	

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

.Laboratory Table and other relating built-in furniture

Nutrition Unit	Public Health & Epidemiology Unit
Equipment	Equipment
. Research Binocular Microscope . Portable Hb. Meter . Hydrometer . Centrifuge (small type) . Refrigerator . Other Research Equipments	. Research Binocular Microscope . Hemoglobin Meter . Hematocrit Centrifuge . Health Meter . Measuring Rod . 1-ch Electrocardiograph . Water Analytical Set . Refrigerator . Other Research Equipments

EQUIPMENTS FOR COMMON USE

. Spectrophotometer	. Deep Freezer
. pH Meter	
. Direct Reading Balance	

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

. Laboratory Table and other relating built-in furniture

Electron Microscope Unit	P-3 Laboratory Unit
Equipment	Equipment
. Electron Microscope with Automatic Voltage Regulator and Closed Circuit Water Chiller . Stereomicroscope . Vacuum Evaporator . Ultrotome . Knife . Water Distillation Apparatus . Dark Room Equipment & Tools . Other Research Equipments	. Bio-Hazard Safety Cabinet . Clean Bench . CO_2 Incubator . Handstand Type Microscope . High Pressure Sterilizer . Dry Air Sterilizer . Ultrasonic Washer . Other Research Equipments

EQUIPMENTS FOR COMMON USE

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

. Laboratory Table and other relating built-in furniture

Central Cold & Chilled Room Unit	Animal Houses
Equipment	Equipment
. Central Water Distillation Apparatus . Other Research Equipments	. Autoclave . Direct Reading Balance . Animal Autopsy Set & Autopsy Table . Animal Cages . Other Research Equipments

EQUIPMENTS FOR COMMON USE

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

. Cold Room Unit
. Chilled Room Unit
. Laboratory Table and other relating built-in furniture

Workshops
Equipment
. Maintenance Tools for Mecanical & Electrical Equipments

EQUIPMENTS FOR COMMON USE

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

. Built-in furniture

b) Equipment List of Model Clinic

Central Treatment	
. Mag Mixer . Water Bath . Spectrophotometer . pH Meter . Table Top Centrifuge . Electrophoresis Apparatus . Densitometer . Flame Photometer . Osmometer . Deep Freezer . Direct Reading Balance . Refrigerator . Auto Analizer	. Research Binocular Microscope . Hematocrit Centrifuge . Water Bath . Blood Cell Counter with Dilutor . Blood Gas Refrigerator . Incubator . Table Top Centrifuge . High Pressure Sterilizer . Drying Sterilizer . Water Bath . Desiccator . Refrigerator

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

. Laboratory Table and other relating built-in furniture

Central Treatment	
. Remote Controlled Diagnostic X-Ray Fluoroscopy and Radiography System . Portable Diagnostic X-Ray Apparatus . Film Illuminator . Flexible Bronco Cutter . Auxiliary Stand Light . Gastrointestinal Fiberscope . Bronchofiberscope . Endoscope Cabinet . Endoscope Table . Fiberscopes Cleaner . Biopsy Forceps Set . Colono Fiberscope . Lecture Scope	. Electrocardiograph . Examining Bed . Respiratory Function Measuring System . Blood Gas Analyzer . Steam Sterilizer . Ethylene Oxide Gas Sterilizer . Ultrasonic Washer . Washing Apparatus . Clinic-Oven . Autopsy Table . Intestine Photographic Unit . Film Illuminator . Morgue Cart . Other Medical Equipments . Ambulance Car

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

. Refrigerated Mortuary

Ward	
. Bed Pan Washer with Bed Pan . Bed Pan Rack . Film Illuminator . Spygmomanometer & Stethoscope . Treatment Carriage . Wheel Stretcher . Wheel Chair . Refrigerator . Ice Maker . Examining Beds . Laundry Bag Carrier . I.V Stand . 1-ch. Electrocardiograph . Desk Type Sterilizer . Auxiliary Stand Light . Cardiac Resuscitation System . Low Pressure Continuous Suction Unit	. Oxygen Cylinder Truck . Respirator . Ophthalmoscope . Hair Washing Stand . Tray for Leg . Mobil Type Bathtub . Invalid Walker . Ultrasonic Nebulizer . Glucorse Meter . Standard Gatch Beds . Mattress . Other Medical Equipments

EQUIPMENTS COVERED BY ARCHITECTURAL WORK

CHAPTER 5 CONSTRUCTION PLAN

5-1 Construction Schedule

Construction schedules of both Japanese side and Kenyan side works are shown in next pages with mutual arrangement for smooth promotion of the project.

5-2 Owner's Obligations

(1) Owner's obligations (arrangements to be taken by the government of Kenya) are agreed in Minutes as follows;

① To ensure a lot of land necessary for the construction of facilities and to clear the site, and to undertake the soil tests.

② To ensure external works such as landscaping, planting, gates and gatehouse, fencing, road pavement and outside lighting.

③ To provide facilities for distribution of electricity, water, telephone and drainage, and other incidental facilities outside the site.

④ To provide architectural works such as curtains, blinds and furniture.

⑤ To ensure prompt unloading and customs clearance at ports of disembarkation in Kenya and prompt internal transportation therein of the products purchased under the Grant.

⑥ To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Kenya with respect to the supply of the products and the services under the verified contracts.

⑦ To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts such facilities as may be necessary for their entry into Kenya and stay therein for the performance of their work.

⑧ To maintain and use properly and effectively the facilities constracted and equipment purchased under the Grant.

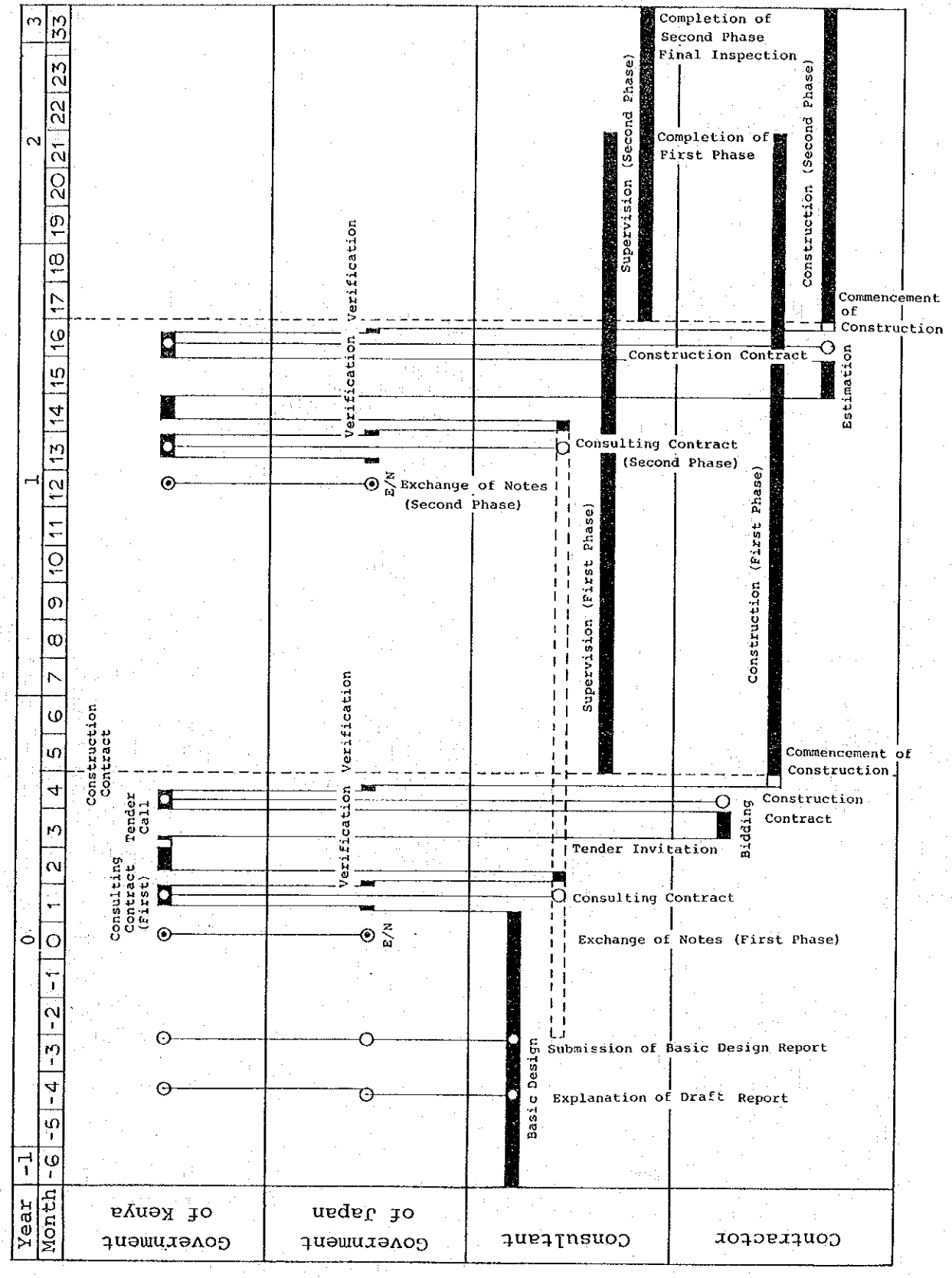
⑨ To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment.

⑩ To accord normal security arrangements for Japanese nationals whose services may be required in Kenya in relation to the project.

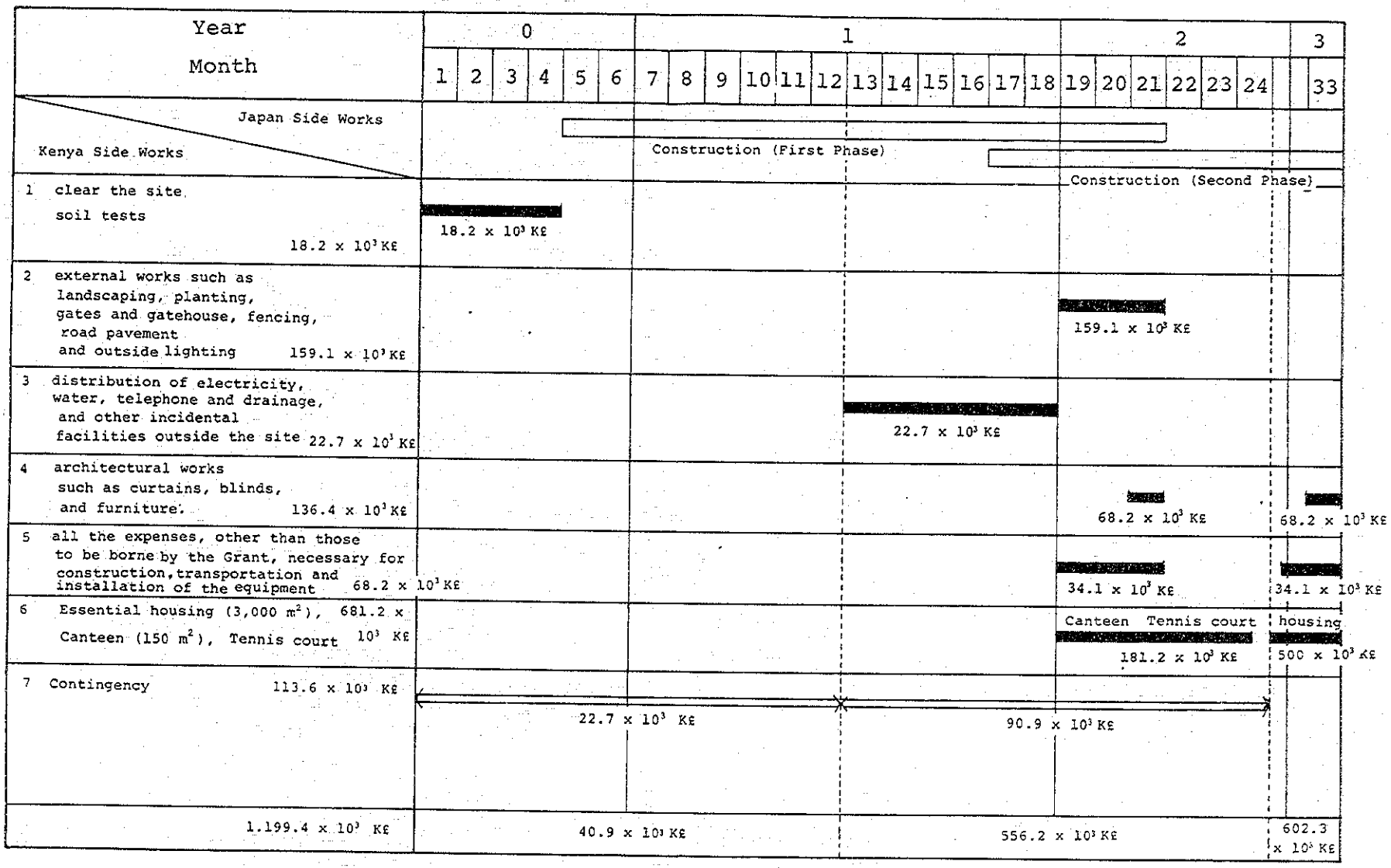
(2) Cost Estimate of Kenyan Side Works

Rough cost estimate of Kenyan side works and proposed schedule are shown next;

Construction Schedule of Japanese Side Works.



Construction Schedule and Cost Estimate of Works arranged by Government of Kenya



5-3 Implementation Scheme

(1) Construction Scheme

General contractor (Japanese national) with sufficient experiences in Africa and/or knowledge based on the enough preliminary field survey shall be selected.

During the construction phase, the success of the project is owed by the availability of the co-operations of adequate specialized local contractors. Therefore it is important to organize the construction scheme which enable the smooth management to take adequate partial charge of works between general contractor, and such-contractors, or to allocate effective construction manpower.

(2) Supervising Scheme

In designing stages, close co-operation between Japanese consultant and MOH, and other relating bodies.

In supervising stages, resident consultant will be despatched for discussions, negotiations and other relating works with MOH, MOW etc and naturally for the supervision of quality and schedule control.

In addition to this necessary engineers for supervisary services will be despatched from Japan according to the construction stages.

(3) Implementation Scheme of Kenyan Side

Owner in this project is Ministry of Health(MOH) and for the implementation of the project the consulting contract will be made probably between Japanese Consultant and Kenyan Ministry of Works(MOW) and construction contract between Japanese general contractor and Kenyan Ministry of Health(MOH). During construction stage, the discussions etc. of construction relating items will be done mainly at Job Site Meetings(about 2 times/month) which is composed by MOH, MOW, Japanese Consultant and Japanese General Contractor.

(4) Procurement Plan of Materials and Equipments

a) Construction Materials

In principle local material will be used but those materials which is not available or not adequate will be imported from Japan or other country.

Such materials are;

Alminium sashes, ceiling material etc.

b) Service Facility Equipment

Mainly imported from Japan

c) Research and Medical Equipment

Mainly imported from Japan

d) Construction Machine and Temporal Equipment

Fork Lift, Tructor, Truck, Concrete bucket, Concrete mixer compressor, Portable generator, Compression tester, Scaffolding equipment etc. will be necessary and available in Kenya. To use those, machine etc. by rent is advisable from the view point of cost.

CHAPTER 6 MANAGEMENT PLAN

6–1 Management Scheme

6–2 Operation Expenses

6-1 Management Scheme

(1) Management of this Project

a) As KEMRI is national institute under Ministry of Health, its general management(financial, staffing etc.) will be conducted by Ministry of Health.

b) On the other hand, on those items which covers multi-institutional fields or medical specific fields Board of Management has responsibilities under the supervision of the National Council for Science and Technology(NCST) which is now placed under the Office of the President. Members of Board of Meeting consists as follows;

Min. of Agriculture
Min. of Higher Education
Min. of Industry
Min. of Social Services
Min. of Water Development
Min. of Natural Resources
and other 7 members of leading scientists and experts in health and medical fields.

c) Functions ofBoard of Management is shown in 3-1,(2) b).

d) Director of KEMRI functions as the Secretary to the Board of Management.

(2) Maintenance of this Project

a) Building maintenance will be conducted financially by KEMRI budget, but the execution of maintenance works will be done by Government Buildings Dept. of Ministry of Works.

b) Maintenance of research and medical equipmentswill be conducted financially by KEMRI budget, and the execution of maintenance works is supposed to be done by Equipment Maintenance Workshop under Medical Store Dept. of MOH(proposed to be established during this 5 year plan). In reality both financial and technical hindrance will cause problems.

6-2 Operation Expenses

Management expenses of KEMRI are estimated roughly in next table by Kenyan Financial Year in 1985/86 value.

Estimate bases;

- Cost increase during 1981/82 - 1985/86 (4 years) are
  for personnel expenses 5%/year x 4 year = 20%
  material expenses 12.5%/year x 4 year = 50%
- Personnel expenses = Personal Emoluments x 1.2,
- Personal Emoluments is based on average wages of KEMRI in 1981/82 estimation and number of staff is shown in 4-2.
- Material expenses are calculated as follows based on average expenditure per research staff (excl. technician) (or per hospital bed) in existing public research institute and hospitals of Kenyan government.

Item	Research labo etc. (per 1 research staff)	Model clinic (per bed)
Transport/communication	200K£/year	25K£/year
Information/training	450K£/year	10K£/year
Research material (medical material)	2,000K£/year	650K£/year
Other expenses	300K£/year	250K£/year
Energy expenses	Calculated based on existing plan	
Maintenance expense	- ditto -	

CHAPTER 7 PROJECT EVALUATION

7-1 Prospect to Manpower Procurement

(1) Existing Manpower of KEMRI

	Existing No. for Total KEMRI	Applicable for this Project *1
Research Scientist Research Officer Doctor level staff	~28	~18
Technologist level staff	~26	~16
Technician level staff	~40	~25
Other medical staff (nurse, photographer clinical officer etc.)	~5	
Adm. officer	~22	
Gen. Adm. staff(inc. secretary, typist)	~90	
Support staff	~40	
Sub-ordinate staff	~200	~200
Total	~450	

*1 From the existing number for total KEMRI, following number of staff are estimated to be continuously allocated to existing research centres like, Kenya Tuberculosis Investigation Centre, Virus Research Centre, Malaria and other Protozoal Disease Research Centre etc.

- Research Scientist, Research officer & doctor level staff ~10 persons
- Technologist level staff ~10 persons
- Technician level staff ~15 persons

(2) Manpower Reinforcement Programme of MOH and the Manpower Procurement Prospect for this Project.

- 2.5%[*1] of the no. of manpower reinforcement programme of MOH during 4th 5 Years Development Plan will be a reasonable base for the procurement of manpower for this project.

*1 2.5% is a ratio of planned total medical research budget(recurrent + development) of MOH to total MOH budget during 4th 5 years Development Plan.

	(A) Reinforcement Programme of MOH during 5 years plan	Prospect of Manpower Procurement			(E) Proposed No. in Chapter 4-2	
		(B) Reinforcement to KEMRI (x 0.025)	(C) Applicable for this Project from existing No. of staff	(D) Total	KEMRI Staff	Training Staff
Research Scientist Research Officer Doctor	292	7	18	25	24	10
Pharmacist	84	2	-	2	1	-
Clinical Officer	472	12	-	12	1	1
Registered Nurse	384	10	-	10	6	-
Lab. Technologist	32	1	16	17	16	12
Pharmaceut. Technologist	85	2	-	2	1	-
Radiographer	53	1	-	1	1	-
Enrolled Nurse	1,234	31	-	31	17	-
Lab. Technician	188	5	25	30	32	16

(A) Health Manpower Development Programme "Development Plan 1979 - 1983 Part I"

(B) (A) x 0.025

(C) From the Table in previous page

(D) (D) + (C)

(E) From the Table in Chapter 4,4-2,(3)

(3) Prospect to Manpower Procurement

Followings can be concluded as a prospect to manpower procurement, comparing the no. of staff proposed and the no. of staff existing + increase expected.

① Proposed No. of staff for this project will be at realistic level (compare (D) to (E)).

② Procurements of staff for training or collaborative research staff (research scientists, research officers and doctors) are not yet clarified in this stage.

③ Based on the explanation by Kenyan side, reinforcement of researching staffs (research officer, doctor, technologist)will be covered mainly newly graduated younger staff and therefore training scheme is quite important.

④ As a conclusion the training scheme related to the research activities of visiting scientists is strongly recommendable.

7-2 Financial Evaluation

(1) Recurrent Expenditure and Dependency on Governmental Budget

a) Medical Income

Medical incomes expected in this project are only those from the patients of model clinic. Following are the conditions for the calculation of those income.

- 20Kshr/admission; from patients over 19 years old is only source for income
- Adults in patient ratio; 30% of total inpatient (hearing in KNH)
- Average duration of stay; 14.3 days(excl.Obsterics dept.)
- Bed occupancy ratio; 95%(estimated value)
- Increase rate of medicare expenses in recent 3 years;5.5%

No. of new admission= $\frac{365 \times 40 \times 0.95}{14.3}$ =970 cases

Estimated total medical income in 1981

970cases x 0.3 x 20Kshr/case = 5820Kshr = 291K£

Estimated total medical income in 1985/86

291K£ x{1 +(0.055) x 5) } = 371K£

- In any cases, medical income is very limited and even for Model Clinic, nearly all recurrent expenditure are dependent to governmental funding.

b) Recurrent Expenditure of this project

Recurrent expenditure of this project is calculated and shown in the table of "Estimated Recurrent Expenditure by Financial year of KEMRI", based on the management expenses shown in 6-2

Estimated Recurrent Expenditure by Financial Year of KEMRI (All cost are shown in 1985/86 value and no fractuation is included after this)

$\times 10^3$kE

Year			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Kenyan financial year			0/1		1/2	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	10/11	11/12	12/13	13/14	14/15	15/16
I phase construction			⊢—— Cost value calculation on this point																
II phase construction					⊢—— ▼														
I phase operation						⊢—— Operation of 70% of laboratory. ADM. Headquarters													
II phase operation							⊢—— Operation of 30% of the rest above and 100% of model clinic												
Recurrent expenditure	Laboratory & ADM. Headquarters	*1 Operation ratio	Phase I	15%	70%	70%													
			Phase II	0%	5%	30%													
			Total	15%	75%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Personal expenses		60.2	301.2	401.6	401.6	401.6	401.6	401.6	401.6	401.6	401.6	401.6	401.6	401.6	401.6	401.6	401.6
		Transport/communication		2.7	13.5	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
		Information/training		6.1	30.4	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
		Energy expense		11.5	57.5	76.7	76.7	76.7	76.7	76.7	76.7	76.7	76.7	76.7	76.7	76.7	76.7	76.7	76.7
		Research materials		27.0	135.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0
		Maintenance fee		-	12.1	35.5	35.5	35.5	35.5	35.5	44.7	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5
		Other expenses		4.1	20.3	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
		Subtotal		111.6	570.0	779.3	779.3	779.3	779.3	779.3	788.5	808.3	808.3	808.3	808.3	808.3	808.3	808.3	808.3
	Model clinic	*1 Operation ratio	Phase II	0%	20%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Personal expenses		-	44.3	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0
		Transport/communication		-	1.1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		Information/training		-	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		Energy expense		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Medicare materials		-	29.3	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0
		Maintenance fee*2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Other expenses		-	11.3	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
		Subtotal		-	86.5	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1
	Expenses to existing KEMRI research centers			377.0	377.0	377.0	377.0	377.0	377.0	377.0	377.0	377.0	377.0	377.0	377.0	377.0	377.0	377.0	377.0
	Expenditure total			488.6	1,033.5	1,271.4	1,271.4	1,271.4	1,271.4	1,271.4	1,280.6	1,300.3	1,300.3	1,300.3	1,300.3	1,300.3	1,300.3	1,300.3	1,300.3
Recurrent income	Clinic income			-	-	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Dependency on budget of Ministry of Health			488.6	1,033.5	1,271.0	1,271.0	1,271.0	1,271.0	1,271.0	1,280.2	1,299.9	1,299.9	1,299.9	1,299.9	1,299.9	1,299.9	1,299.9	1,299.9
	Income total			488.6	1,033.5	1,271.4	1,253.9	1,271.4	1,271.4	1,271.4	1,280.6	1,300.3	1,300.3	1,300.3	1,300.3	1,300.3	1,300.3	1,300.3	1,300.3

*1 It is assumed that 20% of expenses is necessary for previous year of operation.

*2 Maintenance and energy expenses are shown altogether in laboratory etc. side.

Note; This table is made based on the supposition that the full operation of this project starts soon after the completion of phase II (year 3).

c) Recurrent Expenditure for the Existing Research Centres under KEMRI which will be independently managed in future.

(x 10^3 K£)

	80/81 Recurrent Expenditure	Estimation after the completion of this project	Estimation*7 for 85/86
Kenya Tuberculosis*1 Investigation Centre	190	190	314.5
Virus Research Centre*2	25 (126,211 Dutch Guilder)	12.5*5	20.7
Clinical Research Centre*3	20 (only KEMRI part)	- *6	-
Malaria and other *4 Protozoal Disease Research Centre + Alupe Leprosy Centre	25 (Estimated)	25	41.4
Total	260	227	377

*1 Annual Report of KTIC 1980

*2 Data from VRC 1980

*3 Annual Report of CRC 1980

*4 Estimated by hearing

*5 on the assumption that half of the activity will be undertook in this new project after the phasing out of Dutch cooperation within a few years.

*6 On the assumption that only KEMRI part will be covered in this new project.

*7 Recent increase ratio of MOH recurrent expenditure 13.1%/year.

d) Recurrent Expenditure by Financial Year of KEMRI

- Recurrent expenditure by financial year of KEMRI is shown in next page in the value of the year of 100% commencement of operation.
- Total recurrent expenditure in that year is estimated to reach to 1,250 x 10^3K£/year.
- After 5 year of commencement of 100% operation, sharp increase of maintenance costs is seen but these are still limited whithin 5% ranges of total expenditure.

e) Prospect to the dependency on the governmental budget

① Prospect estimated through the tendency of governmental budget

.Estimation of total recurrent expenditure of MOH in 1985/86

$41.0^{*1} \times 10^6$K£ x {1+(0.13^{*2}x 5)}=67.7 x 10^6K£

*1 total recurrent expenditure of MOH in 1980/81

*2 annual increase ratio of total recurrent expenditure of MOH in recent 4 years.

.Estimation of recurrent expenditure for medical Research of MOH in 1985/86

67.7 x 10^6K£ x 0.035^{*3}=2.37 x 10^6K£

*3 estimated percentage of recurrent expenditure of medical research to total recurrent expenditure. (1980/81 - 2.5%, 1981/82 - 3.0%)

.Estimation of recurrent expenditure for KEMRI in 1985/86

2.37 x 10^6K£ x 0.6^{*4}= 1.42 x 10^6K£

*4 KEMRI:KETRI = 60 ~ 65 : 40 ~ 35

② Prospect estimated through the comparison with other national research institutes

. Recent recurrent expenditure in other national research institues are shown in next figure.(1980/81 approved and 1981/82 estimated)

. Through the comparison with other national research institutes, 700 x 10^3K£(in 1980/81 value) recurrent expenditure level is not unrealistic.

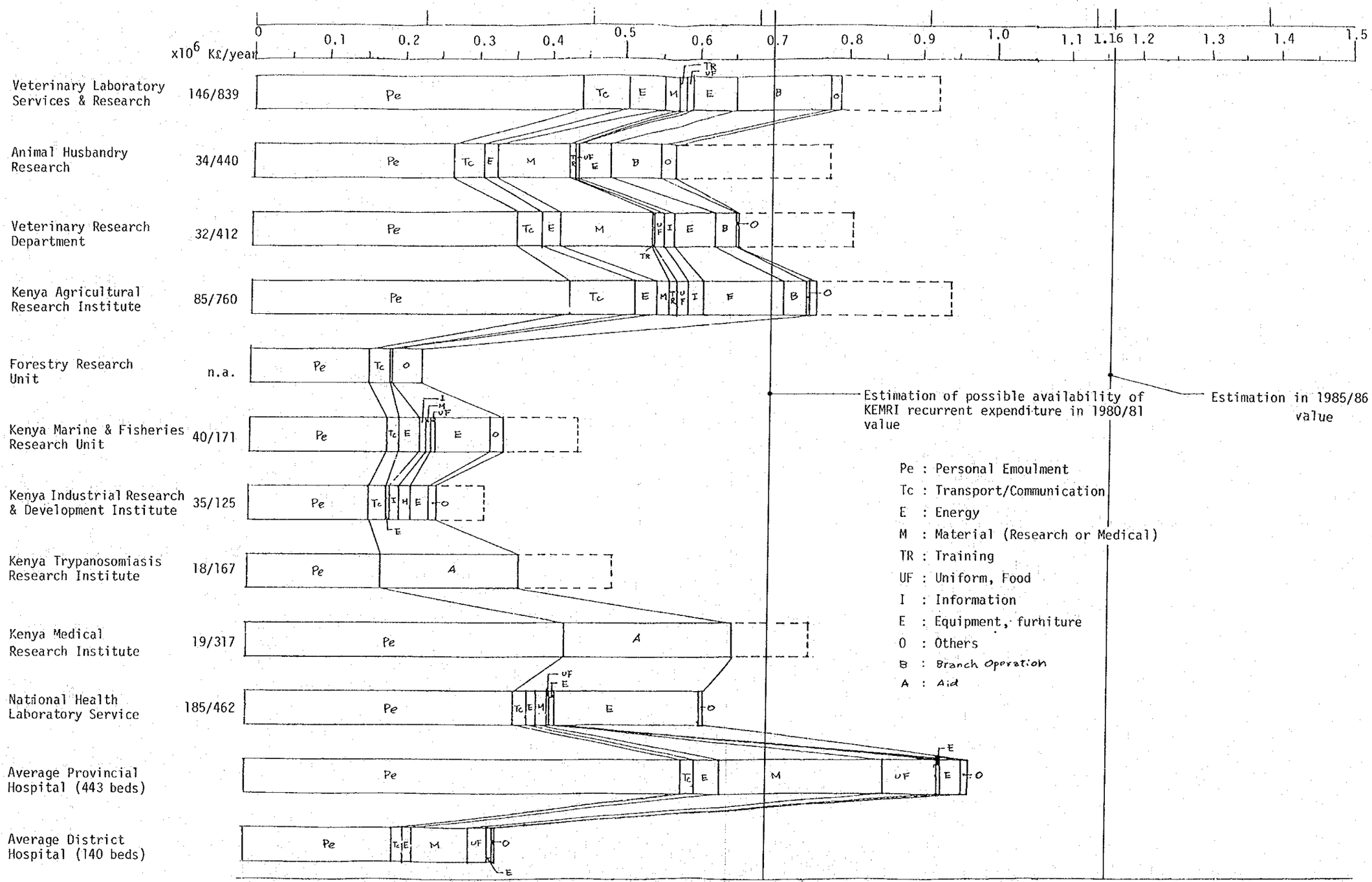
. In 1985/86 value, above amount is estimated to be as follows:

700 x 10^3K£ x(1+0.13^{*1}x 5) = 1.16 x 10^6K£

*1 Annual increase ratio of total recurrent expenditure of MOH in recent 4 years.

③ Conclusion of the prospect

From the results of ①, ②, it can be concluded that lower figure 1.16 x 10^6K£ is less than the figure(dependency on budget of MOH) shown in "Estimated Recurrent Expenditure by Financial year of KEMRI" ranging 111 x 10^3K£ (at the commencement of 100% full operation) to 120 x 10^3K£ (after 5 years)



Name of Institute — Research staff / Total staff (1980/1981)

*Source : "1981/82 ESTIMATES OF RECURRENT EXPENDITURE".
*Technician is not included in no. of research staff.

——— 1981/82 estimated
----- 1980/81 approved

COMPARISON OF RECURRENT EXPENDITURE (1980/81 ESTIMATED) OF PUBLIC RESEARCH INSTITUTES AND HOSPITALS

(2) Development Expenditure and Dependency on the governmental budget

a) Development Expenses covered by the Kenyan Side Works

As shown in 5-2(2), development expenses covered by the Kenyan side works are as follows;

Phase I*1	(0/1)	40.9×10^3 K£
Phase II*1	(1/2)	556.2×10^3 K£
Phase III*1	(2/3)	602.3×10^3 K£

*1 Kenyan Work's phase is based on the Kenyan financial year.

b) Prospect to the dependency on the governmental budget

During the field survey discussions Kenyan side explained the prospect of financing development expenditure by showing the planned development budget schedule of 4th 5 years development plan.

Among those scheduled development budget, Kenyan side showed the prospect of securing the development budget for this project at least such amount as is shown for KEMRI headquarter development. Those figures are as follows;

1981/82	500×10^3 K£
1982/83	500×10^3 K£

These total sum can be estimated to re-allocate based on this project as follows;

Phase I	(0/1)	50×10^3 K£
Phase II	(1/2)	450×10^3 K£
Phase III	(2/3)	500×10^3 K£

If these re-allocation is possible, phase I works (land development etc.) will not be problem. In both phase II, and III about 100×10^3 K£ is not enough, but in these works, most of expenses are for staff housing, canteen or tennis court. And such works which is not essential for the functioning of the facilities, like infrastructure intake, furnitures etc. will not be so critical because these total are estimated as follows;

Phase II	375.0×10^3 K£
Phase III	102.3×10^3 K£

Therefore the prospect of dependency on the governmental budget in development expenses are promisible to the promotion of this project for the time being and roughly 70% of staff housing, canteen and tennis court is estimated to be covered in these manner with still expecting additional allocation of development budget for the total completion of this project.

7-3 Benefit

Under this project (KEMRI Development Project),priority is given to communicable disease. The project is designed to offer appropriate facilities for research and clinical activities. The following benefits are anticipated.

(1) Effective proposals for major communicable disease in Kenya will be made through medical research activities by selecting adequate research items.

(2) The addition of Model clinic will make it possible to treat relatively serious inpatient suffering from communicable disease and present a model of a new type of communicable disease hospital. It will also contribute to the integration of basic research work followed by clinical and pathological studies for the direction of communicable disease control.

(3) Contribution will be made to the development of highly skilled personnel with a deep knowledge to counter communicable disease through the training centering on the transfer of technology.

CHAPTER 8 CONCLUSION AND RECOMMENDATION

8--1 Conclusion

8--2 Problems Left for the Project Implementation

8--3 Recommendation to Technical Co-operation

8-1 Conclusion

It is recommendable to implement the project with the level, scale and contents proposed in this report because based on the studies on financial evaluations and the prospect of manpower procurement, the project is in realistic level and the various benefits can be expected as shown in previous chapter. But as the items shown next, further attention will be needed.

8-2 Problems Left for the Project Implementation

Followings are the major points of problems left for the project implementation.

(1) Training

For the effective functioning of the project, procurement and training of medical/research manpower both qualitatively and quantitatively is a key problem.

As Kenyan government has clarified its position that it will give due consideration in terms of finance and the manpower programme upon completion of the facilities, positive attitude toward the severe condition of manpower is expected with special emphasis on the training scheme of KEMRI.

(2) Maintenance

It is needless to say that the planning of this project shall be done to the directions of easy maintenance of the facilities, further attempts for the effective maintenance scheme with sufficient budgetal background are expected by the owner. Especially for the maintenance of medical and research equipments, establishment of long-term maintenance scheme shall be considered.

8–3 Recommendation to Technical Co-operation

Considering above mentioned problems, Basic Design Study Team recommend the necessity of Japanese Technical Co-operation in KEMRI upon the completion of new facilities with special emphasis on following items.

(1) To promote the research activities of Japanese medical experts closely related to the training programme of KEMRI fulfiling the capacity of visiting scientist of this facilities (16 experts for laboratories, 2 experts for model clinic) as many as possible.

(2) To supplement the supposed lack of recurrent expenditure (net ~100 x 10^3 K£/year) at the beginning of operation of new facilities by the programme of materials and equipments supply related to the technical cooperation.

(3) To dispatch the specialists of equipment maintenance from Japan in addition to medical experts.

APPENDIX

Appendix 1 Members of the Japanese Basic Design Study Team

(1) Basic Design Study Team

Dr. Keizo MATSUMOTO;	Leader	Director & Professor Institute of Tropical Medicine,University of Nagasaki
Dr. Koomi KANAI;	Medical Coordination	Director of First Dept. of Bacteriology National Institute of Health
Mr. Yoshihisa KONDO;	Project Coordination	Grant Aid Dept. Japan International Cooperation Agency
Mr. Kazuo NAGATA;	Construction Coordination	NAEC
Mr. Seiji MATSUMOTO:	Mechanical Engineering	NAEC
Mr. Shunran TAKAHASHI;	Structural Engineering	NAEC
Mr. Shunji KAWADA;	Planning	NAEC

(2) Draft Report Explanation Team

Dr. Keizo MATSUMOTO;	Leader	(See above)
Mr. Yoshihisa KONDO;	Project Coordination	(See above)
Mr. Kazuo NAGATA;	Construction Coordination	(See above)
Mr. Shunji KAWADA;	Planning	(See above)

NOTE; Nihon Architects, Engineers & Consultants Inc.(NAEC) has participated in this Basic Design Study.

Appendix 2 List of Kenyan Officials Concerened

(1)	Ministry of Health (MOH)	
	Director of Medical Service	Dr. W.K. KOINANGE
	Chairman of KEMRI Board of Management	Dr. K. THAIR
	Director of KEMRI	Dr. J.M. GEKONYO
	Director of NPHLS	Dr. J.N. KAVITI
	Director of Virus Research Centre (VRC)	Dr. P.M. TUKEI
	Director of Clinical Research Centre (CRC)	Dr. M. MUGAMBI
	Deputy Secretary, Chief of Planning and Development	Mr. P.W. KARIUKI
	Principle Administrative Officer of KEMRI	Mr. A.R. GATHOGO
(2)	Office of the Vice President & Ministry of Finance	
	Under Secretary	Mr. E.A. WANGAI
(3)	Ministry of Works (MOW)	
	Chief Architect of Health Group 1	Mr. L.W. KUNGU
	Architect of Health Group 1	Mr. M. NJURU

AGREED MINUTES OF DISCUSSION

On the basis of the preliminary study report submitted to the Government of Japan, the Kenya Medical Research Institute (KEMRI) Development Project for Central Laboratories and Administrative Headquarters featured prominently as a means to respond to Kenya Government's objective of promotion of biomedical research, particularly in the field of communicable diseases, for the improvement of the provision of basic health needs of the people of Kenya.

In response to the request, the Government of Japan sent through the Japan International Cooperation Agency (JICA) a team headed by Dr. Keizo Matsumoto, Director and Professor, Institute for Tropical Medicine, University of Nagasaki to Kenya to conduct a basic design study for 15 days from November 11 to 25, 1981. The Team had a series of discussions and exchanged views with leading officials from the Ministry of Health, Ministry of Works, and other ministries.

As a result of the study and discussions, both parties agreed that the captioned principal concepts that have been agreed up to the date of the team leader's departure from Kenya shall form the basis of the report made to the Governments of Kenya and Japan. These are prescribed herein and in the Annex I and II.

Nairobi 14th November 1981

Keizo Matsumoto

DR. KEIZO MATSUMOTO
Leader
Japanese Basic Design Study Team

DR. J. M. GEKONYO
Director
Kenya Medical Research Institute
for: Permanent Secretary
Ministry of Health
Nairobi, KENYA

ANNEX I

AGREED ITEMS ON MUTUAL DISCUSSIONS

1. The full project title is Kenya Medical Research Institute (KEMRI) Development Project for Central Laboratories and Administrative Headquarters, and may be briefly referred to as KEMRI Development Project.

2. The Japanese assistance under this Project shall mainly be related to development of researches in communicable diseases.

3. The Vaccine Development Unit as listed in the "Agreed Minutes of Discussion" of 26th June 1981 by the Government of Kenya and the Japanese preliminary study team, shall be deleted to be replaced with Pathology Unit, within the central research laboratories.

4. The Government of Kenya is committed to the proper management of the new facilities to be provided for the KEMRI, adequate provision of financial support and the necessary manpower, and undertakes to furnish the Team with a summary of the mechanism for making such financial arrangements and provision of manpower for the institutions.

5. Regarding the provision of the new research facilities for the KEMRI, which is under serious consideration for Japan's grant aid programme, the Government of Kenya expressed her desire to request the basic design study team for technical cooperation, and was, in due course, committed to make the request to the Government of Japan through normal diplomatic channels.

Keizo Matsumoto

6. Clinical Research Unit

The Kenyan side expressed desire to have a model clinic included, attached to the KEMRI Development Project, in order to enhance the efficiency and scope of research of the Institute. The Japanese basic design team expressed

...../2

the view that the necessity of a model clinic was understandable and that the request would be transmitted to the Japanese Ministry of Foreign Affairs.

7. Buildings and Facilities

Regarding buildings and facilities, the Japanese side conveyed the views of the Ministry of Foreign Affairs in relation to the level of funding, making it necessary for the basic design study team to exclude the Grade P 4 biohazard establishment from the development project.

8. Equipment

Regarding equipment for the KEMRI Development Project, the Japanese side requested the Kenyan side to submit in writing a list of equipment indicating priority, specifications and user's objectives. The Kenyan and Japanese sides agreed on the need for close consultation and collaboration in drawing up the list.

Keizo Matsumoto

ANNEX II

1. Administration Block

2. Central research laboratories

2 - 1 Virology unit

2 - 2 Bacteriology unit

2 - 3 Parasitology unit

2 - 4 Vector Biology unit

2 - 5 Nutrition unit

2 - 6 Clinical research unit

2 - 7 Pathology unit

2 - 8 Public health and epidemiology unit

2 - 9 Electron and scanning microscopes unit

Central cold room and chilled room

Isotopes laboratory and disposal facilities

Medical illustration section

*2 - 10 Human reproduction studies unit

*2 - 11 Traditional medicine unit

*2 - 12 Environmental Physiology unit

3. Laboratory animal houses

4. Workshops

5. Housing for essential staff and visiting scientists, home and abroad, to the Institute, to be included as a Kenya commitment.

* Regarding the above units marked *, the Kenya side shall arrange her own medical equipment and materials.

ANNEX III

In accordance with the "Agreed Minutes of Discussion" signed on 14th November 1981 by the Kenya Government representative and the Leader of the Japanese basic design study team, the study team had follow-up discussions with the Kenya Government officials, and conducted the actual survey in Nairobi, and in Mombasa at the Kenya Coast.

Following the survey and further study on the project, both parties agreed that the Japanese team shall submit a basic design study report to the Government of Japan for assessment under the Japan's Grant Aid Programme.

The main issues relating to the Project, in addition to the principal concepts already confirmed by the representatives of both Governments are herewith attached in ANNEX III, III-A, III-B, III-C, and III-D.

Nairobi, 25th November 1981

DR. KOOMI KANAI
For: Dr. Keizo Matsumoto
Leader
Japanese Basic Design Study Team

DR. J. M. GEKONYO
Director
Kenya Medical Research Institute
For: Permanent Secretary
Ministry of Health
Nairobi, Kenya

ANNEX III-A

ARRANGEMENTS TO BE TAKEN BY THE GOVERNMENT OF KENYA

1. To ensure a lot of land necessary for the construction of facilities and to clear the site, and to undertake the soil tests.

2. To ensure external works such as landscaping, planting, gates and gatehouse, fencing, road pavement and outside lighting.

3. To provide facilities for distribution of electricity, water, telephone and drainage, and other incidental facilities outside the site.

4. To provide architectural works such as curtains, blinds, and furniture.

5. To ensure prompt unloading and customs clearance at ports of disembarkation in Kenya and prompt internal transportation therein of the products purchased under the Grant.

6. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Kenya with respect to the supply of the products and the services under the verified contracts.

7. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts such facilities as may be necessary for their entry into Kenya and stay therein for the performance of their work.

8. To maintain and use properly and effectively the facilities constructed and equipment purchased under the Grant.

9. To bear all the expenses, other than those to be borne by the Grant necessary for construction of the facilities as well as for the transportation and installation of the equipment.

10. To accord normal security arrangements for Japanese nationals whose services may be required in Kenya in relation to the project.

ANNEX III-B

M O D E L C L I N I C

1. The Model Clinic will be organized and supervised as part of the Clinical Research Unit of the Kenya Medical Research Institute.

2. The Clinic will have servicing facilities, equipment, and accommodation for 40 beds, whose breakdown is agreed as follows:

Gastrointestinal infections	- 8 beds
Liver infections	- 8 beds
Protozoal and parasitic diseases	- 8 beds
Pulmonary infections	- 8 beds
Cerebrospinal infections	- 8 beds

ANNEX III-C

E Q U I P M E N T

Equipment already donated or still to be provided by the Government of Japan to the on-going Kenya/ Japan Communicable Diseases Research and Control Project have been/will be distributed to strengthen the various laboratories used by or collaborating with the Project, in Nairobi particularly in the National Public Health Laboratory Service, and in model areas of the Project, for the purpose mainly of disease surveillance and control. Such equipment will necessarily be retained in those laboratories and used mainly for similar purposes.

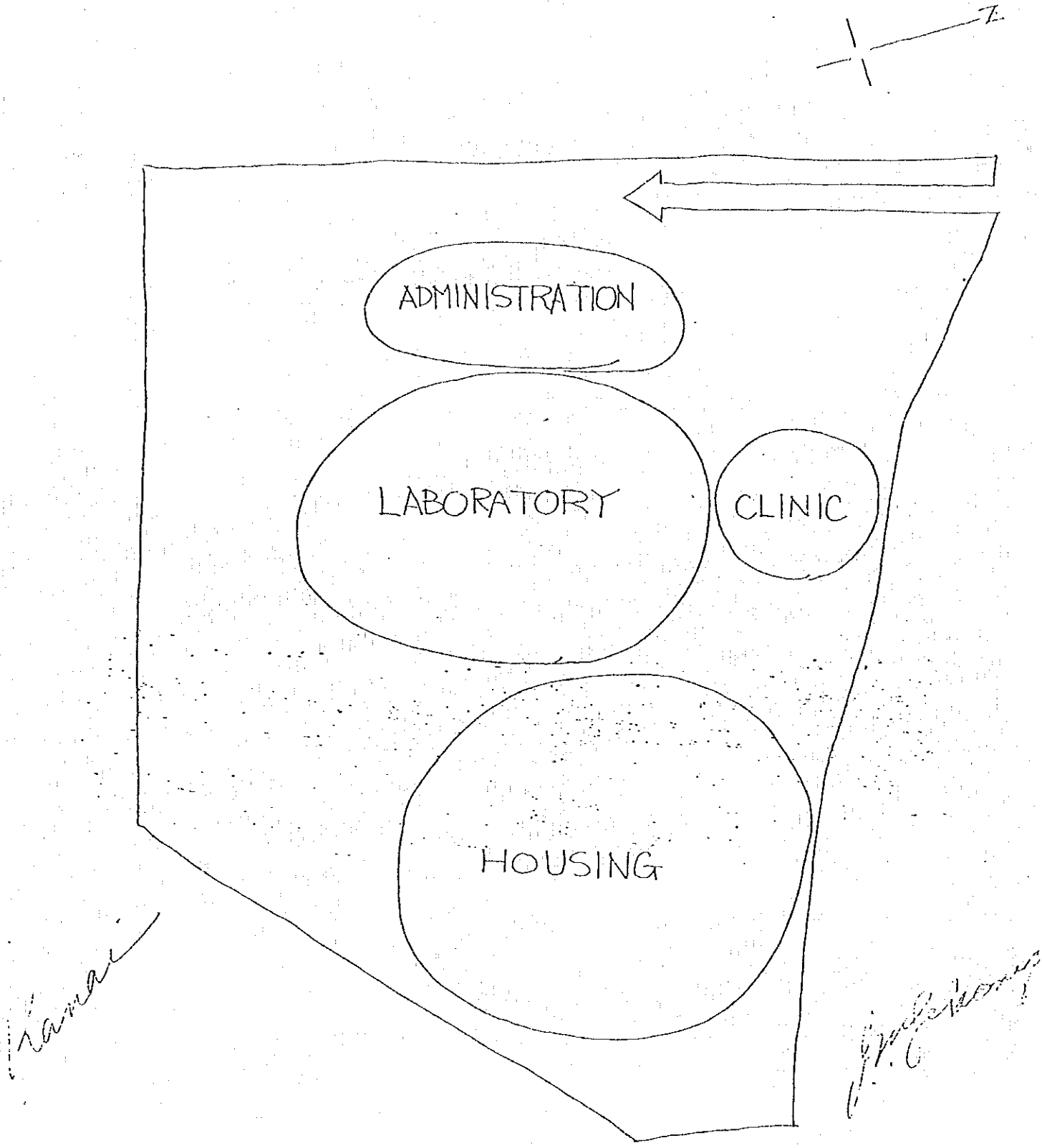
The new facilities to be constructed under the Kenya Medical Research Institute Development Project, and further related technical cooperation in joint research project, will accordingly, require a full complement of basic equipment as part of Japan's Grant Aid Programme to the new Project areas, as outlined in Annex II.

ANNEX III-D

Z O N I N G

Preliminary zoning was agreed in principle according to the attached zoning plan (Annex III-D-I).

ANNEX III-D-1 ZONING PLAN



A G R E E M E N T

ON THE BASIC DESIGN STUDY REPORT FOR KEMRI DEVELOPMENT PROJECT IN NAIROBI, KENYA

Following the earlier visit of the Japan basic design survey team of November 11th to 25th 1981, on the Kenya Medical Research Institute (KEMRI) Development Project, the draft report explanation team, headed by Dr. Keizo Matsumoto, visited Kenya from 9th to 16th February 1982.

The team discussed the contents of the draft basic design report submitted by Japan, with Kenyan officials from the Ministry of Health, Ministry of Works and KEMRI.

As a result of the study and discussions of the draft basic design report both parties agreed on the contents of the report to be presented to both Governments.

The major issues regarding the report, agreed by the Kenyan and Japanese counterparts, are attached herewith in the annex I and II.

In confirmation of mutual agreement we fix our signature.

Nairobi 15th February, 1982.

Dr. J. M. Gekonyo
DIRECTOR, KEMRI
for: Permanent Secretary
Ministry of Health
Nairobi, Kenya.

Dr. KEIZO Matsumoto,
Leader,
Japanese Draft Report
Explanation Team.

Annex I

MEDICAL RESEARCH EQUIPMENT

Both parties agreed that general basic medical equipment be considered for installation at each unit on priority basis, initially equipment directly connected with communicable diseases research, to be followed later by suitable basic research equipment, in relation to the Grant aid project. The Kenyan side requested close collaboration from the Japanese side in the selection of suitable equipment.

Particular priority was given to equipment related to the following:-

1. Bacteriology Unit: To promote and improve as a bacteriologic reference centre.

2. Virology Unit: To study infectious diseases on Rotavirus and Arbovirus.

3. Parasitology Unit: To study Filariasis and Schistosomiasis

4. Pathology Unit: To study liver diseases (epidemiology and pathology of hepatitis, liver-cirrhosis, hepatoma) and Koposi's Sarcoma.

5. Clinical Research Unit: To study pulmonary infectious diseases (phneumonia etc.) and clinical tropical diseases.

Provided that the fore-mentioned need for medical research equipment, and research priorities will be possible to modify in the future corresponding to development and progress of medical research organization of KEMRI, and the Japan/Kenya technical cooperation in research.

Annex II

Basic Design:

Both parties confirmed in general the contents of the basic design outlined in the draft report, and the Kenyan side made the recommendations as listed in (1) to (9) below, which the Japanese side agreed to give serious consideration to, for appropriate incooperation in the design:-

1. To arrange a general transformer, incinerator, and L.P.G. tank (under consideration).

2. Regarding the administration block (building), to be rearranged with the major offices relocated appropriately, in regard to the best view, and appropriate relocation of the library and the entrance canopy.

3. To rearrange the approach road, and to provide more pedestrian paths and spacious parking lots.

4. To provide an entrance canopy of the model clinic.

5. To re-arrange rampway to be structurally attached to the building wall at the turning end of the ramp, and to be roofed.

6. Regarding the mortuary and the autopsy units, to provide an independent service road to the mortuary and the autopsy units, and install the mortuary refregerator with the capacity of two (2) bodies.

7. To provide service roads to the storage and the laboratory block.

8. To give positive consideration to design pitched roof rather than the flat roofs as shown in the report.

9. To accommodate a lecture hall with the increased capacity of 150 persons with amphi-theatre type of sitting.