

**Basic Design Study Report
on
The Project for Improvement
of
Kenya Medical Research Institute
in
the Republic of Kenya**

November 1997

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**Japan International Cooperation Agency
Nihon Sekkei Inc.**

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PREFACE

In response to a request from the Government of the Republic of Kenya, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Kenya Medical Research Institute and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent a study team to Kenya from June 29 to July 13, 1997.

The team held discussions with the officials concerned of the Government of Kenya, and conducted a field study at the study area. After the team returned to Japan, further studies were made, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Kenya for their close cooperation extended to the teams.

November, 1997



Kimio Fujita
President
Japan International Cooperation Agency

November, 1997

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Basic Design Study on Project for Improvement of Kenya Medical Research Institute in the Republic of Kenya.

This study was conducted by Nihon Sekkei, Inc., under a contract to JICA, during the period from June 16, 1997 to December 4, 1997. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Kenya and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

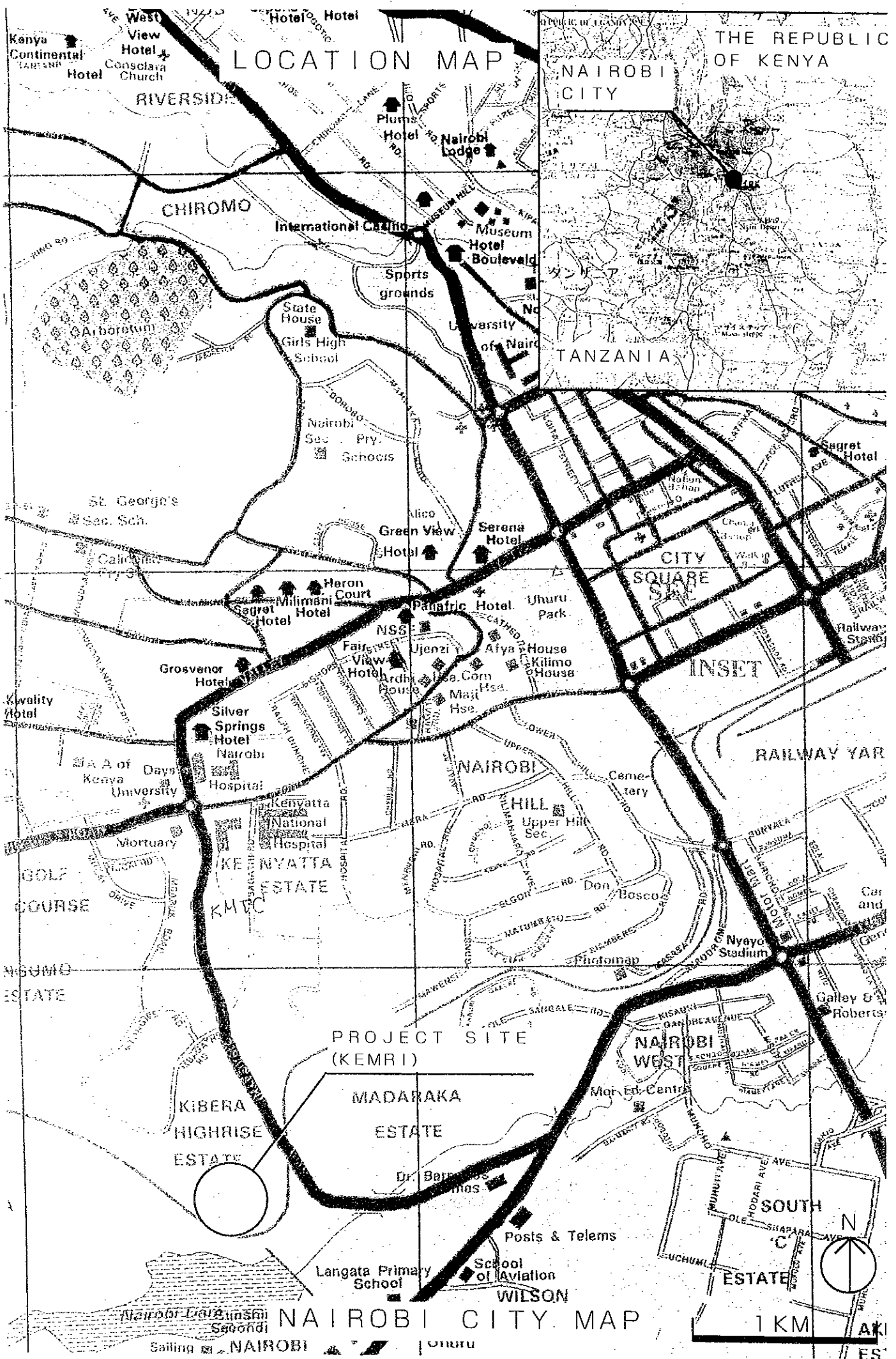
Very truly yours,



Kiyomichi Okuma

Project manager,
Basic Design Study team on
the Project for Improvement of
Kenya Medical Research
Institute

Nihon Sekkei, Inc.



LOCATION MAP

THE REPUBLIC OF KENYA

NAIROBI CITY

TANZANIA

CITY SQUARE

INSET

RAILWAY YARD

NAIROBI HILL

PROJECT SITE (KEMRI)

MADARAKA ESTATE

NAIROBI WEST

KIBERA HIGHRISE ESTATE

NAIROBI CITY MAP

SOUTH



1 KM

AKI

ES

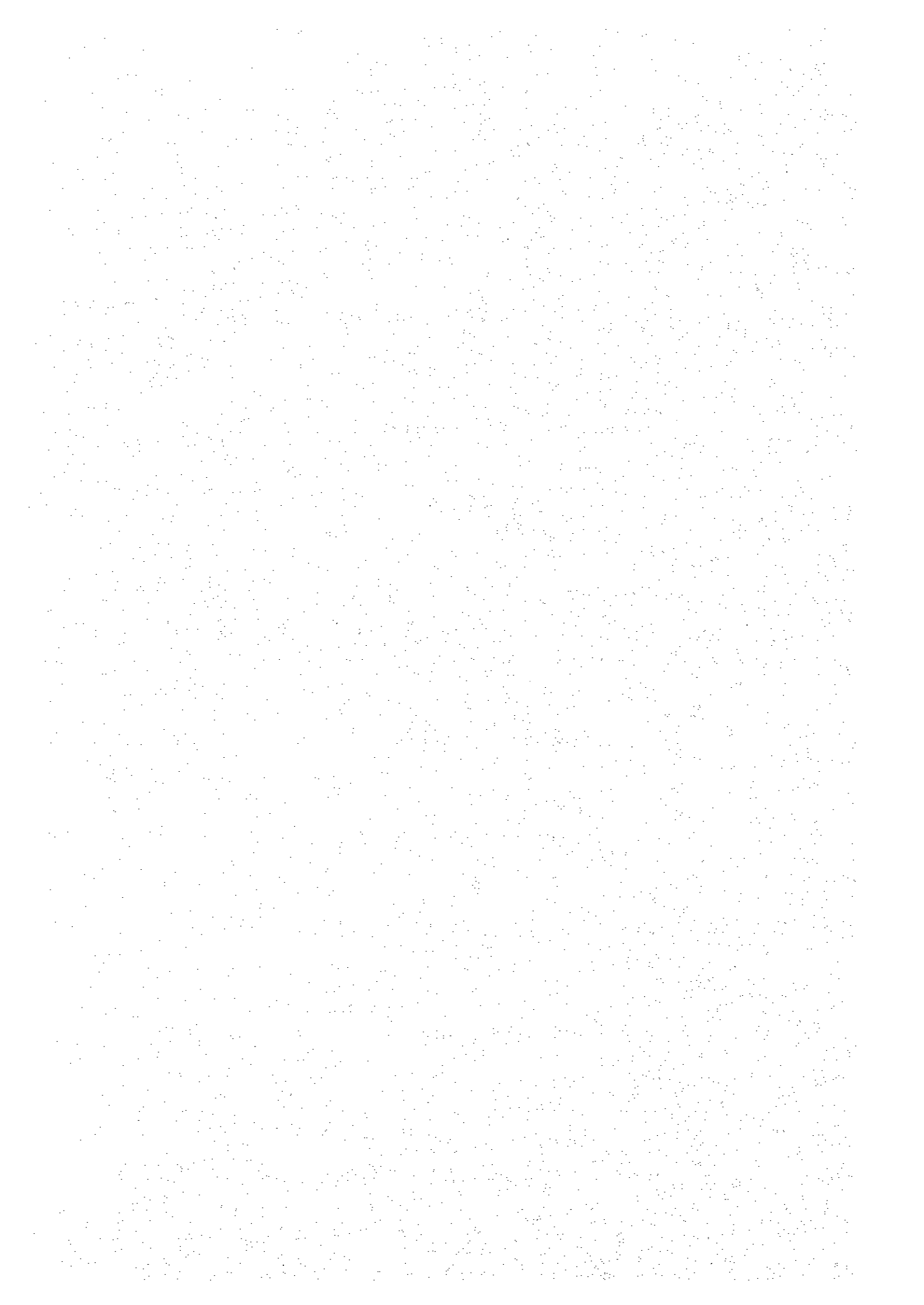
ABBREVIATIONS

AIDS	: Acquired Immune Deficiency Syndrome
APS	: AIDS Programme Secretariat
CIDA	: Canadian International Development Assistance
EC	: European Community
HIV	: Human Immunodeficiency Virus
KEMRI	: Kenya Medical Research Institute
MOH	: Ministry of Health
MRTT	: Ministry of Research, Technical Training and Technology
NAC	: National AIDS Council
NASCOP	: National AIDS/STDs Control Programme
UNDP	: United Nations Development Programme
UNFPA	: United Nations Fund for Population Assistance
UNICEF	: United Nations International Children's Emergency Fund
USAID	: United States Agency for International Development
WHO	: World Health Organization

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Chapter 1
Background of the Project



CHAPTER 1 BACKGROUND OF THE PROJECT

The first case of AIDS was recognized in 1984 in Kenya. Since that time, blood test for HIV screening has gradually been progressed and then the seriousness of AIDS infection has been revealed accordingly.

The annual incidence of AIDS ranges from 5 percent to 7 percent, according to the data obtained through screening of blood for transfusions, STD clinics, Ante-Natal/Obstetric clinics, Skin clinics, and so on. It also shows wide dispersion regionally, reaching 10 percent in some region. These data, however, have certain grade of error since they are estimated from small number of screened samples.

"Sessional Paper No. 4 1997 on AIDS in Kenya," published by the MOH, estimates that as of the end of 1996, the total number of HIV carriers should be 1.3 million, the cumulative number of AIDS patients being 200,000 and the cumulative mortality linked to AIDS being 86,000. These data on AIDS in Kenya are sufficient to indicate that the country is one of those which are hard hit by AIDS infection. On the other hand, these data are all estimates based on a limited number of blood samples, and therefore it will not be appropriate to use them as reliable statistics.

Therefore, it is the most urgent task among the measures regarding national AIDS programme to promote the diffusion of blood test (HIV screening) to get reliable national data.

Kenya is one of those countries which are given top priority in the "Global Issues Initiative on Population and AIDS." In July 1996, a project organizing survey team was sent to the country as part of the international community's efforts to actively cooperate in the solution of the serious AIDS problem.

Under such circumstances, a wide variety of organizations from foreign governments to NGOs have been extending various assistance schemes against AIDS to the country.

The organization playing the most important role among them is WHO, which has been concerned with the formulation and implementation of the First / Second Medium Term Plan and many other cooperation undertakings. Most of the reagent kits used in the HIV screening conducted in the country are foreign-made ones provided by WHO.

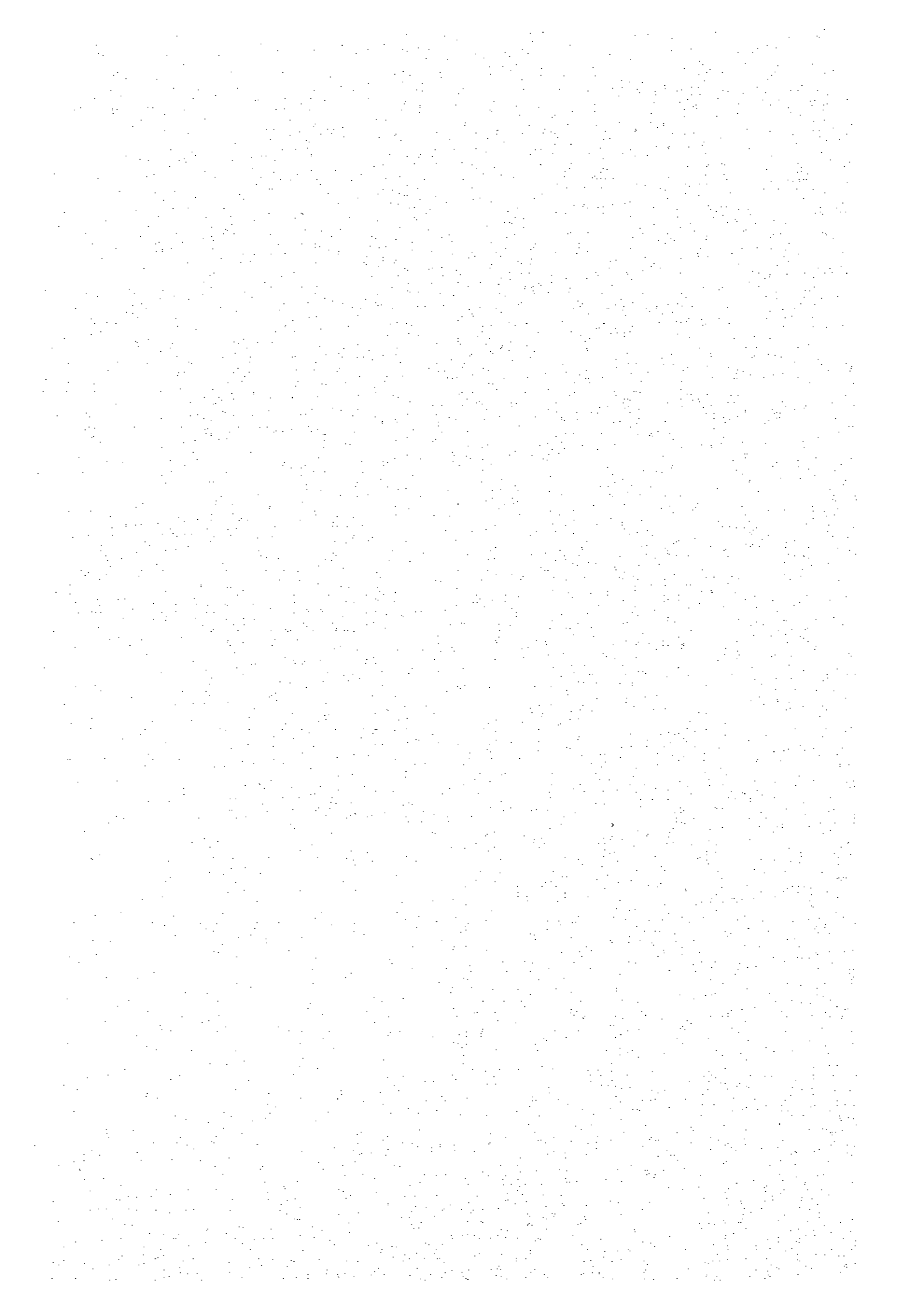
If the country remains simply reliant on the free supply of foreign-made reagents, the end of the donors' cooperation will mean the discontinuance of reagent supply, which in turn will inevitably mean the dead lock of the national efforts to diffuse the HIV screening.

Furthermore, foreign-made reagents are made from HIV that are prevalent in foreign countries and there would possibly be a problem of such reagents becoming inadequate against the HIV prevalent in Kenya especially when a mutated strain should be generated locally.

In an attempt to break such circumstances, the Government of Japan is implementing an assistance programme to contribute to the diffusion of HIV screening by new method (PA method) forming a new scheme, "HIV/AIDS" in the Research and Control of Infectious Diseases Project in Kenya (Phase II) (1996-2001) under the Project-type Technical Cooperation with KEMRI, in which technology transfer to produce the reagent kits relevant to locally prevalent HIV is going to be executed.

In the process of this technology transfer, it is inevitable to handle unsealed densified HIV and its antigen. Then, in order to prevent bio-hazards against the external environment, a physical containment laboratory of P3 level (P3 lab) has become necessary. Hence, a grant aid cooperation to construct the said laboratory has been requested to the Japanese Government. The original contents of the Request by the Government of Kenya were the establishment of a P3 lab by remodeling the existing two laboratories in KEMRI and the procurement of the equipment necessary for manufacture of reagent kits.

Chapter 2
Contents of the Project



CHAPTER 2 CONTENTS OF THE PROJECT

2-1 Objective of the Project

This project is to procure a part of the facilities and equipment necessary for the implementation of the scheme "HIV/AIDS" of the "Research and Control of Infectious Diseases Project in Kenya (Phase II)" under the Japanese Project-type Technical Cooperation.

The main objective of the above mentioned scheme is "technology transfer to help KEMRI to produce the reagent kits for screening HIV prevalent in Kenya on its own".

In Kenya, HIV screening has thus far been conducted by the ELISA method, which requires highly advanced technique and expensive equipment, with the result that the country has had no choice but to rely on the foreign donors the diffusion of HIV screening.

The objectives of the above-mentioned scheme is to promote the diffusion of HIV screening by PA method developed in Japan instead of ongoing ELISA method. The former requires simpler technology and cheaper equipment than the latter. Consequently, the former is more advantageous for the diffusion by the local effort. In order to achieve the diffusion of HIV screening by local effort, however, local capability to produce reagents kits for HIV screening is indispensable. Without technology transfer to this end, the termination of the assistance means the discontinuance of the reagent supply and the diffusion of HIV screening should be at a deadlock.

By this scheme, in addition, local suitability of reagent should be improved. HIV, a kind of retroviruses, have a tendency to generate mutated strains easily in response to its environmental stimulus, and then a strain shows locality accordingly. Therefore, a reagent made from locally prevalent HIV is always more suitable for the local use and less expensive than those imported from the other countries. And even when a new strain is generated in the country, it is easy to develop a new reagent suitable to the mutated strain shortly.

The technology transfer in the scheme "HIV/AIDS" which is characterized by simplicity, reliability, low costs and possibility of local continuance is so unique that no other donors have ever conceived or planned.

As stated above, this project is to provide minimum facilities and equipment necessary for execution of the scheme "HIV/AIDS". However, capability of the

laboratory is sufficient to serve as a production laboratory where reagent kits are produced continuously.

2-2 Basic Concept of the Project

Originally, the contents of the Request by The Government of Kenya was to furnish a P3 lab with an area of about 45 m² as a minor structure of the existing two laboratories of KEMRI with an area of about 80 m². And all the requested items of equipment are to be installed in the P3 lab. By this plan, almost all the laboratory works relating to the reagent kit production are to be executed solely in the P3 lab. And the plan poses the following problems.

- (1) Rational laboratory factors specified in the original design eg. modular coordination, installation systems, etc. were ignored, and in addition, the space efficiency of the new P3 lab was very low.
- (2) Even a safe laboratory work which need not to be contained in a P3 lab has to be conducted in it. (The higher is the level of a physical containment laboratory, the worse becomes the working condition.)
- (3) The running cost should be considerably high. (The initial cost should also be high.)

To clear these problems, an alternative plan was made in accordance with the following ideas.

- a) To transfer safe laboratory activities which need not be contained in a P3 lab to a preparation room with P2 level of physical containment. By this measure, the size of the P3 lab could be minimized accordingly.
- b) To install machines and apparatuses for air conditioning, power supply and so on in the attic space as much as possible not to spoil the efficiency and rationality of the laboratory space planned and designed originally.
- c) To propose the rearrangement of the function of the surrounding rooms and laboratories to prevent invasion of clerical or storage function into the bio-safety laboratories within the scope of work by Kenyan side. (Even a small portion, admixture of clerical or storage function brings much impediment to a bio-safety laboratory works.) By these rearrangement, the bio-safety control area is to be formed accordingly and isolated from the other area of research activity.

As a result of the above-mentioned measures, an alternative plan was concluded as to furnish a P3 lab of about 22 m² (as a minor structure), in liaison with a preparation room with P2 level of physical containment (the Prep Room) of about 54 m² in the existing two laboratories of about 80 m². The laboratory combination of the P3 lab and the Prep Room is to be denominated as the Bio-Safety Lab. By this alteration, most of the above problems were solved to a certain grade. The concept of this alteration was consented by KEMRI, and the physical alternative plan was also accepted with a minor modifications. In addition, KEMRI understood and accepted the scope of work to be undertaken by the Kenyan side.

2-3 Basic Design

2-3-1 Design Concepts

The basic design for the facilities and equipment to be built or provided under this project is to be worked out in accordance with the following concepts.

(1) Facilities

Any research organization in the world which bold a physical containment laboratory of higher level than P3 are more or less suffering from its expensive operation and maintenance cost.

Therefore, design concept of the top priority should be the reduction of the running cost for operation and maintenance.

Laboratory buildings of KEMRI were constructed 13 years ago and the deteriorated points are seen here and there. Therefore, this project has to be carried out giving flaw-check and repair.

In the original design, module dimensions, interior finish, built-in furniture, lighting, power supply, water supply, drainage, gas supply and so on were decided systematically at a high cost so that they should be convenient and flexible for laboratory use. At the designing of this project, therefore, the elaborate original design should be respected and utilized effectively.

Selection and specification of the building materials and installation machines should be made so as their maintenance and repair to be accomplished by the locally available technology and materials as much as possible.

(2) Equipment

Since one of the objectives of the scheme "HIV/AIDS" is to localize the manufacture

maintenance technology should be given the top priority in the criteria for selection. And then, saving of running cost required for above matter comes after. The existing safety cabinets (actually used in the Virology Research Centre) are not maintained well owing to the lack of instrumentation apparatuses. Therefore, minimal items of the apparatuses to fill up the lack should be included in the Project.

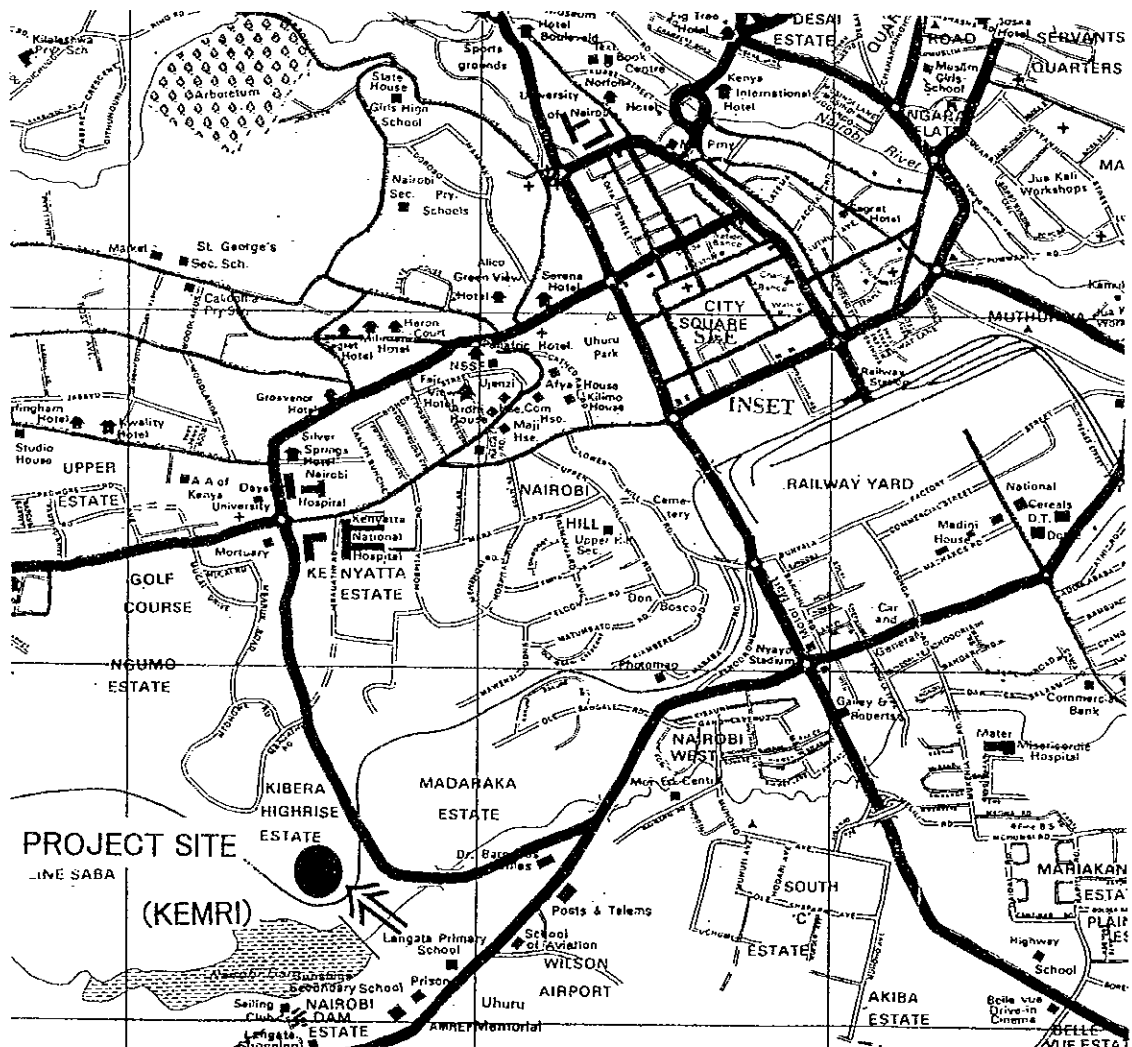
2-3-2 Basic Design

(1) Site Plan

1) Site

This project is the renovation of the existing facilities of KEMRI, of which the site is located about 3 km southwest of the centre of Nairobi City. It has an area of 6.11 ha.

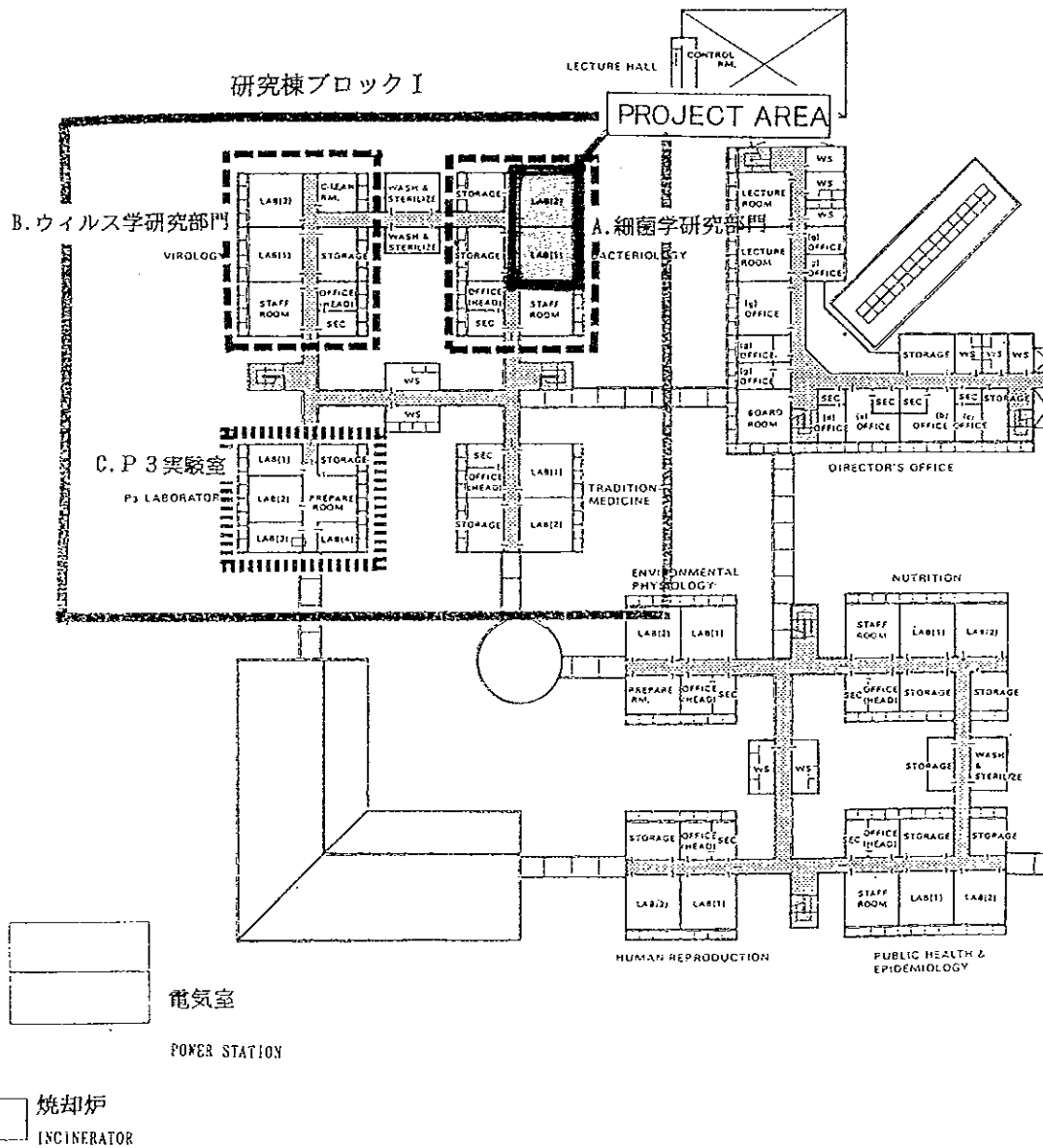
Figure/Table 2-1 Project Site



2) Location Planning

Under this project, two laboratories (around 80 m² in total) of the Bacteriology Research Centre in the first floor of the existing building are to be renovated. KEMRI is planning to create an independent Biosafety Control Zone isolated from the other functional area at its own cost, of which total floor area is about 250 m², including the area renovated under this project.

Figure/Table 2-2 Layout Plan of the Project



(2) Equipment Planning

1) Principle of Selection

The equipment for the production of HIV screening kits and training of technical staff should be selected in compliance with the following principle.

- a) Equipment of which reagents, consumables, and spare parts are locally available.
- b) Equipment which can be operated and maintained at a low cost.
- c) Equipment which can be maintained and repaired by local agents of the manufacturer, under a regular after-sales services.

2) Consumables and Spare Parts

Some items of the equipment for this project require foreign made consumables and/or spare parts. For these items, certain quantities of consumables and/or spare parts are to be included in the project taking into consideration the time to be taken in procurering them in Kenya.

3) Training on the Operation and the Maintenance of the Equipment

Training requisition on operation and maintenance differs considerably by items. Therefore, the item by item instruction on the operation and the maintenance should be given to the related person(s) with manuals thereof at the time of hand over.

In view of bio-hazard prevention, special instruction and training on operation and maintenance should be specified for the P3 lab unit and the safety cabinet.

4) The specifications of the Equipment

Specifications, origins of products and the back ground for selection are shown in Figure/Table 2-3, Figure/Table 2-4 and Figure/Table 2-5, respectively.

Figure/Table 2-3 Specifications of Major Equipment

Equipment Name	Specifications	Purpose
Biosafety Cabinet	1)Filter: HEPA 2)Efficiency of HEPA not less than 99.99% at 0.3 μ m particles 3)Leakage of cabinet • Leakage shall not exceed 8.9×10^{-5} ml/sec when the cabinet is pressurized with Freon gas at 489 Pa	Works of hazardous nature like HIV are performed on the bench which is inside the cabinet.
Inspection Devices for Biosafety Cabinet	1)Anemometer • Measuring range: 0~5m/s • Accuracy: $\pm 2\%$ 2)Freon gas leak tester • Sensitivity: $9 \times 10^{-4} \sim 9 \times 10^{-6}$ Std.cc/sec 3)Particle counter • Sample volume: 0.2 CMF • Sensitivity: 0.3 μ m	The devices are necessary to carry out the periodical inspections (air flow velocity test, leak test of the cabinet and HEPA efficiency test) of Biosafety Cabinet. The inspections are performed at least once a year.
CO ₂ Incubator	1)Effective capacity: approx. 170 $\ell \times 2$ 2)Temperature control: approx. 0~50°C 3)Inner humidity range: not less than 95%RH 4)CO ₂ gas percentage: approx. 0~20%vol.	The equipment are used for growing HIV and other cells for virus culture.
Deep Freezer	1)Effective capacity: approx. 490 ℓ 2)Cooling performance: -85°C 3)Type: vertical	Serum, reagents and other materials are kept in the equipment.
Ultracentrifuge	1)Type: biohazard 2)Maximum speed: 90,000 rpm 3)Maximum g-force: approx. 700,000 $\times g$	The equipment is used for separation of HIV cells, etc.
Refrigerated Centrifuge	1)Type: biohazard 2)Maximum speed: not less than 7,000 rpm 3)Maximum g-force: not less than 9,000 $\times g$ 4)Temperature control: -20~40°C	The equipment is used for separation of serum from the blood.
Fluorescent Microscope	1)Observation tube: trinocular, inclined 30° 2)Eyepiece: 10 \times , 2 pieces 3)Objectives: 4 \times , 10 \times , 20 \times , 40 \times , 100 \times	HIV confirmatory test is based on Fluorescent Antibodies Test method in which the fluorescent microscope is indispensable.

Pass Box	1)Type: interlocking system 2)Inner dimensions: approx $\times 750(w) \times 750(h)$ \times 700(d) mm	The samples and other materials coming into the P3 LAB is passed through the pass box.
Centrifuge (Small)	1)Micro Centrifuge • Maximum speed: approx. 15,000 rpm • Maximum g-force: approx. 20,000 \times g 2)Multipurpose Centrifuge • Maximum speed: approx. 6,000 rpm • Maximum g-force: approx. 5,000 \times g	The equipment are used for purification of virus, separation of cells in extremely small quantities, etc.
PCR	1)Sample capacity: up to 24 2)Temperature range: approx. 4~99 $^{\circ}$ C 3)Temperature accuracy: $\pm 0.75^{\circ}$ C 4)Temperature uniformity: $\pm 0.5^{\circ}$ C	A very small quantity of sample of DNA is multiplied using this device, possibilitating the analysis, measurement and observation of samples.
Sonicator	1)Components: power supply, disruptor horn micro tip, soundproof box, etc. 2)Power supply • Output power: approx. 400 w • Frequency: approx. 20 kHz	The device is used for ultrasonic disintegration and homogenization of cells, tissues, etc.
Liquid Nitrogen Container	1)Dry shipper type 2)Rack 3)Box	The samples which should be kept in ultra-low temperatures are carried in the container.
Personal Computer	1)Processor • Memory: 32 MB • Extended memory slot: 8 2)Printer • Printing method: laser • Printing paper size: up to A3 size	The computers are used for processing laboratory data, preparation of documents, materials for training of staff, etc.
P3 Lab Unit	1)Panel: 6,300 \times 3,400 \times 2,400 mm 2)Air conditioner: 13,000 Kcal/h 3)OA fan unit: 1,500 m ³ /h 4)Exhaust fan: 1,500 m ³ /h	When undertaking works of biological hazardous nature of P3 level like HIV, etc., these works are performed in the P3 Lab Unit in order to avoid contamination of the adjacent areas and prevent spreading of biological materials.

Figure/Table 2-4 Equipment List

No.	Equipment Name	Quantity	Remarks
1	Biosafety Cabinet	2	
2	Inspection Devices for Biosafety Cabinet	1	
3	CO ₂ Incubator	2	
4	Refrigerator	1	
5	Freezer	3	
6	Deep Freezer	3	
7	Ultracentrifuge	1	Third country product
8	Refrigerated Centrifuge	1	Third country product
9	Inverted Microscope	2	
10	Fluorescent Microscope	1	
11	Laboratory Table	1	
12	Autoclave	1	
13	Pass Box	1	
14	Vortex Mixer	2	Third country product
15	Micro Centrifuge	1	Third country product
16	Multipurpose Centrifuge	1	Third country product
17	Water Bath	2	
18	PCR	2	Third country product
19	Sonicator	1	Third country product
20	Water Distiller	1	
21	Liquid Nitrogen Container	1	Third country product
22	Pipette	1	
23	Personal Computer	2	Third country product
24	P3 Lab Unit	1	

Figure/Table 2-5 The Origins of the Products

No.	Equipment Name	Production Country	Supplying Country	Reasons
7	Ultracentrifuge	Switzerland USA	Switzerland USA	1) There is only one manufacturer in Japan. 2) After sales services of Japanese product is difficult in Kenya.
8	Refrigerated Centrifuge	Ditto.	Ditto.	Ditto.
14	Vortex Mixer	USA	Japan (※)	1) The device is not produced in Japan. 2) Would be better supply the equipment from the manufacturer's agent in Japan since it is not so expensive device. Also the price in Japan is not too expensive comparing with the price in the USA. (※)
15	Micro Centrifuge	Switzerland Germany	Switzerland Germany	1) There is one manufacturer in Japan but they do not export to overseas countries. 2) After sales services of Japanese product is difficult in Kenya.
16	Multipurpose Centrifuge	Ditto.	Ditto.	Ditto.
18	PCR	USA	Japan (※)	1) The device is not produced in Japan. 2) Due to the manufacturer's rule, the equipment for the Japanese Grant Aid should be supplied from the agent in Japan. (※)
19	Sonicator	USA	Japan (※)	1) The device is not produced in Japan. 2) Would be better supply the device from the manufacturer's agent in Japan since it is only one unit and, in addition to this, normally the manufacturer sells their products through the agents in overseas countries. (※)
21	Liquid Nitrogen Container	USA	Japan (※)	Ditto.

23	Personal Computer	USA	Japan (※)	<p>1) Almost all of the existing computers in KEMRI are products of third countries.</p> <p>2) After sales services of products of third countries are better than Japanese products in Kenya.</p> <p>3) Third countries products supplied from Japan is cheaper than products supplied through manufacturer's agents in Kenya. (※)</p>
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5) P3 Lab Unit

P3 lab is to consist of panel units to achieve a higher precision and shorter period of the construction work.

P3 lab is to be equipped with airconditioning and specific exhausting systems. The air is to be taken from outside through a prefilter, and supplied to P3 lab by an air conditioner through a medium filter and a HEPA. The air exhausted from P3 lab is to be let out through a HEPA.

Balance of the dynamic air pressure between P3 lab and Pass Room is to be -3 mmAq, and between Pass Room and Prep Room to be -2mm Aq. The fans with sufficient capacity are to be equipped with to keep the dynamic pressure balance above, affording stand-by operation connected to the emergency power supply. Air intake grilles are to be installed under the eaves, and exhaust grilles on the wall of the raised roof for ventilation, in order to prevent the mixture of exhaust and intake air.

(3) Architectural Planing

1) Floor Plan

P3 lab is to be furnished at a corner of the renovation area and the remaining part is to be remodeled into the Prep Room. P3 lab and Prep Room are to be in liaison with each other functionally.

2) Sectional Planing

Floor area for this project (the renovation area) is limited. Therefore, machines and equipment for air condition and other purposes are to be installed in the attic space as much as possible for effective use of the floor.

There are no adequate structural members to sustain the top of P3 lab unit in the attic of the existing building. Then, a steel frame is to be installed therein which will also serve as the rack to support the above-mentioned air conditioner and other machines.

A ladder leading to the attic space, a catwalk and stages for use in the maintenance work are also to be installed.

(4) Structural Planning

1) Permissible Load of the Existing Floor

The permissible load of the existing floor is 250 kg/m², while the heaviest item to be installed there weighs about 500 kg. Therefore, it is recommendable not to install

such an item neighboring the other heavy items --- to avoid the concentration of load --- and to install such an item near the guarders or beams wherever possible.

2) Sustaining Structural Members

H-shaped steel frames are to be installed to sustain the top of P3 lab unit and the machines installed in the attic space. In principle, the frames are to be installed near the existing concrete girders or beams in parallel with them so that the most load should be borne directly by the collums.

(5) Electrical and Mechanical Installation Planning

1) Electrical Power Supply

The existing transformer has a sufficient capacity to cover the demand by this project, and the existing distribution panel has also a surplus to cover the Project, then, through these existing systems the power is to be distributed to the Project.

2) Emergency Power Supply

An emergency power supply is indispensable for a bio-safety laboratory to keep steady control of bio-hazard in a case of power interruption.

The existing generator for emergency use has a surplus capacity to cover the emergency power demand of the Project. However, the existing generator has caused tripping trouble frequently owing to the undue loading at the end for research use. For this reason, it will be necessary to investigate the whole circuit of the emergency power system and then recommend the alteration of management and maintenance in reference to the result of the investigation. The existing generator takes 15 to 30 seconds of idling time from its start to the stable power supply, it will be essential to install an uninterruptible power supply system (UPS) equipped with battery, of which the capacity is to be 10 KVA. (The permissible operation time of UPS is to be 5 to 10 minutes at one time.)

3) Waste Disposal

Most wastes from Bio-Safety Lab are to be incinerated. The wastes includes contaminated sealed organic solvents which cannot be sterilized with an autoclave. In order to incinerate such sealed volatile goods as they are (without unsealing), a specified incinerator is to be provided, which is to be for exclusive use of Bio-Safety Lab in view of infallible bio-hazard control.

4) Air Conditioning

Prep Room is to be equipped with an air-conditioner of wall-mount type.

(6) Building Material Planning

Building materials for the Project are to be selected in accordance with following criteria.

- to be available in the local market.
- to be maintained and repaired by local technology.

1) Exterior Finishing Materials

a. Exterior walls

The exterior walls of the incinerator house are to be finished with a paint directly on concrete block face.

b. Roof

The roof of the incinerator house is to be shingled with concrete tiles, being consistent in appearance with the existing building.

2) Interior Finishing Materials

a. Floor

The floor of Prep Room is to be finished with synthetic resin coating, aiming that the finish and the repair of the existing floor should be accomplished by single material.

b. Walls

The existing walls are to be repaired with plaster and then finished with emulsion paint.

c. Ceiling

The ceiling is to be covered with rockwool acoustic boards, which is to be consistent in appearance with the existing ceiling.

Figure/Table 2-6 shows a list of the building materials selected.

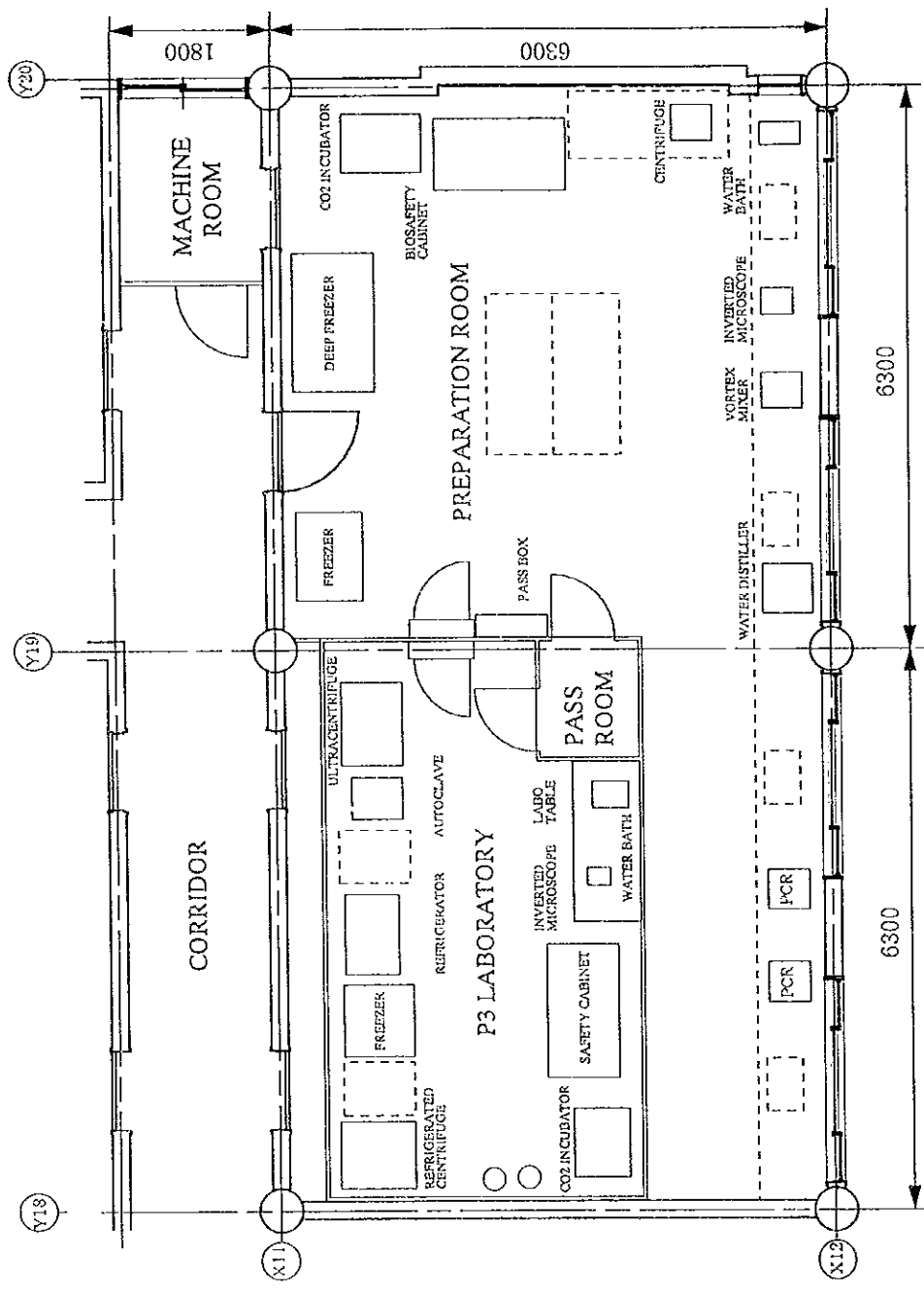
Figure/Table 2-6 Building material Plan

	Local method	Adopted method	Reasons
Roof	Concrete roof tile	Concrete roof tile	Locally popular and reliable
Exterior walls	Concrete block	Concrete block	Locally popular and reliable
Interior walls	Paint	Paint	Locally popular and reliable
Flooring	Terrazzo, Tile	Synthetic resin coating	Repair of the existing floor and finishing by single material
Ceilings	Soft board	Acoustic gypsum board	To fit to the remaining part of the existing ceiling

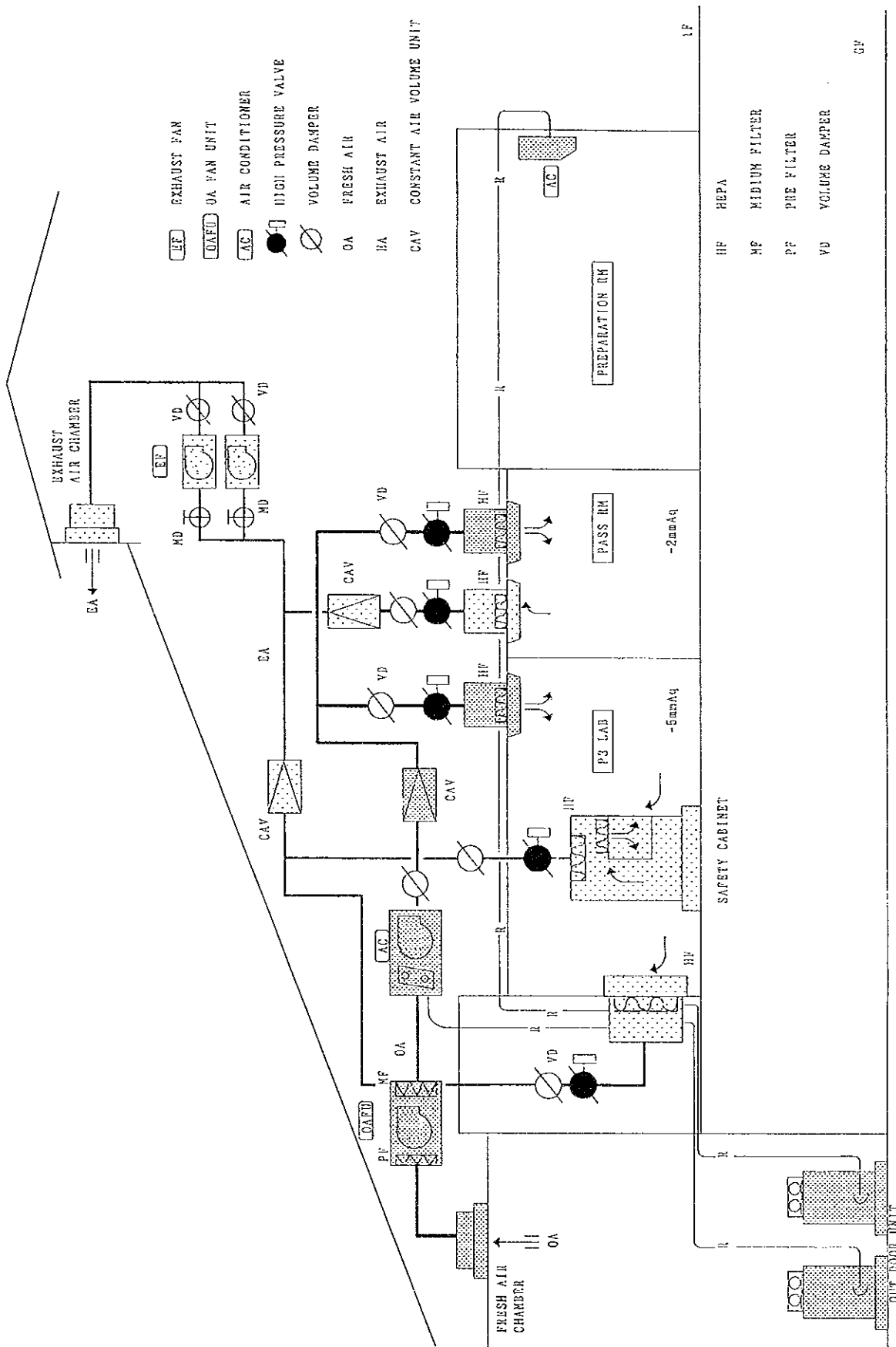
(7) Basic Design Drawings

Figure/Table 2-7 List of Basic Design Drawings

Name of Drawings	Scale
Bio-Safety Laboratory Layout Plan	1/80
Air Conditioning System Diagram	NO SCALE

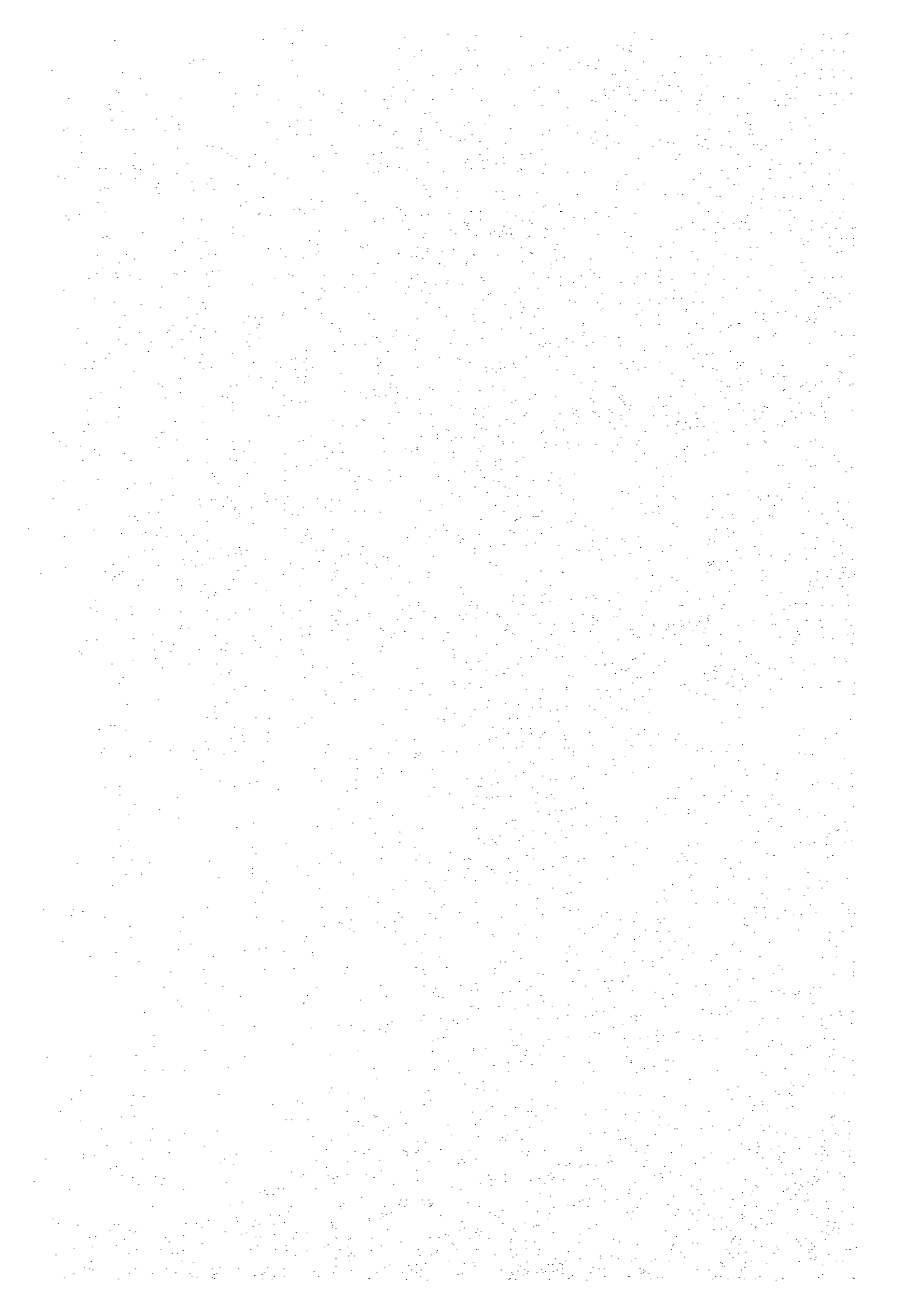


THE PROJECT FOR IMPROVEMENT OF
 KENYA MEDICAL RESEARCH INSTITUTE
 IN THE REPUBLIC OF KENYA
 BIOSAFETY LABORATORY LAYOUT PLAN SCALE 1 : 80



THE PROJECT FOR IMPROVEMENT OF
 THE KENYA MEDICAL RESEARCH INSTITUTE
 IN THE REPUBLIC OF KENYA
 AIR CONDITIONING SYSTEM DIAGRAM NO SCALE

Chapter 3
Implementation Plan



CHAPTER 3 IMPLEMENTATION PLAN

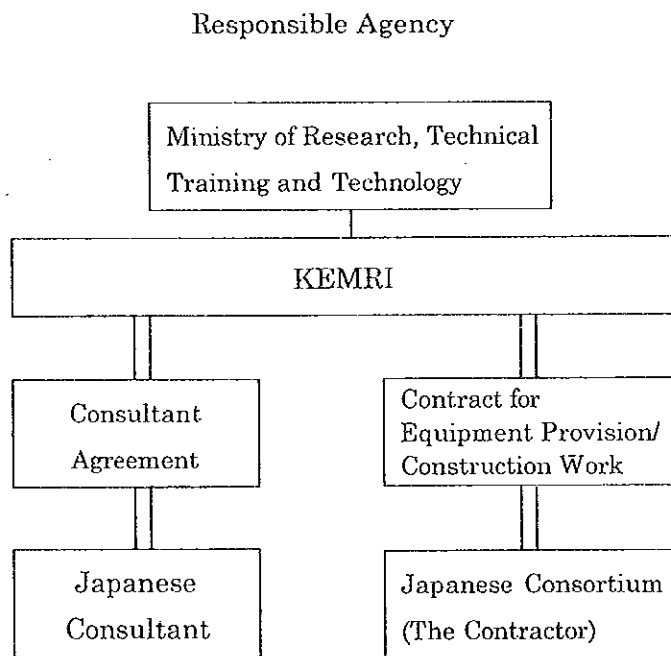
3-1 Construction Plan

3-1-1 Construction Policy

(1) Implementation Organization

The Project is implemented under the Japan's Grant Aid, which is to be commenced upon conclusion of the Exchange of Notes (E/N) for the Project between the Governments of Kenya and the Government of Japan. The implementation organization of the Project is shown in Figure/Table 3-1.

Figure/Table 3-1 Organization for Project Implementation



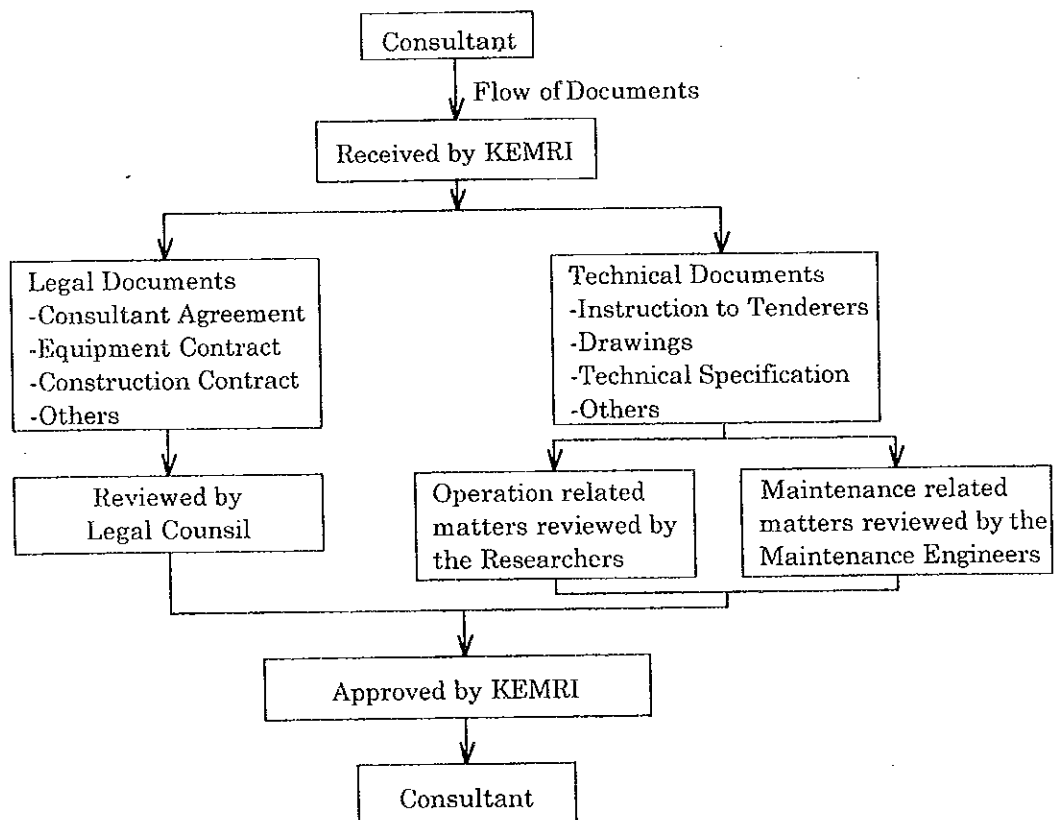
KEMRI is the executing agency of the Republic of Kenya for the Project. KEMRI will be responsible for a Consultancy Agreement as well as for a Contract for Equipment Provision and Construction Work under the Project. KEMRI will also be in charge of the works to be carried out by the Government of Kenya.

(2) Consultant

Upon conclusion of E/N, KEMRI concludes the Consultant Agreement for the detailed design and supervision (the Agreement) with a consultant firm, which is a Japanese legal person (the Consultant). Then, the Agreement has to be approved by the Treasury of Kenya, and after the Treasuring's approval, the Agreement is to be verified by the government of Japan. Upon verification by the government of Japan, the Agreement becomes valid. Then, the Consultant prepares the Contract Documents which consist of the documents necessary for Tender procedure including Drawings and Specifications in accordance with the Agreement and the Basic Design Study Report.

The Contract Documents Prepared by the Consultant are to be approved by KEMRI, (detailed design drawings, specifications, etc.), of which juristic matters are to be reviewed and approved by the legal counsel of KEMRI, while the operation related matters by researchers and the maintenance related matters by the engineers of KEMRI. These procedures are illustrated in Figure/Table 3-2.

Figure/Table 3-2 Procedure for Approval of Contract Documents



Upon approval of the Tender Document by KEMRI. The Consultant will carry out the Tender Procedure for the Contract for Equipment Provision and Construction Work (the Contract).

And, upon verification of the Contract by the Government of Japan, The Consultant executes the Supervision for the Contract in accordance with the Agreement and the Contract.

(3) Contractor

The Project consists of the equipment provision and construction work. The amount portion in Contract for the Equipment Provision is about 70% and for the Construction Work about 30%. Although minor in scale, the Construction Work requires a highly sophisticated capability on management and engineering. It is therefore recommended that the Contract should be concluded with a consortium of a qualified Japanese trading company and a prequalified Japanese construction company. The Tender is to be done by open competition.

The successful Tenderer may conclude the Contract with KEMRI. The Contract has to be approved by the Treasury of Kenya, and then, the Contract is to be valid and the successful Tenderer is to be authorized as the contractor for the Project (the Contractor) upon verification of the Contract by the Government of Japan.

After that, the Contractor commences their works immediately in accordance with the Contract.

(4) Local Consultants, Contractor or Dispatched Technical Experts

Technological ability of the local contractors seems to be tolerable in executing the Project. However, administrative and engineering capability of them (eg. time programing, labour / material arrangement, judgement on the existing material decrepitude, arrangement of technical alternatives, etc.) seems to be insufficient to conduct the Project properly.

Consequently, local contractors are to be employed only for the specified technological work items under the mandate of Japanese manager.

3-1-2 Implementation Conditions

Original Request by Kenya included the furnishment of a large P3 lab of about 45 m², for which an alternative plan was prepared to improve working condition and to reduce the running cost, and was approved by the Kenyan side. The agreed alternative plan includes a Bio-Safety Lab consists of a small-sized P3 lab of about

22 m² in liaison with a Prep Room of about 54 m². As the result, a P3 lab can be procured as a part of Equipment Provision, while Prep Room has to be built up as a Construction Work.

The area to be renovated was originally built 13 years ago and defects by decrepitude are seen here and there. Therefore, the construction work, has to be executed with investigation and repair for each component of the building when such measures are estimated to be necessary.

In addition, all the works at site which include the knock down of the P3 lab unit, the delivery and storage of the equipment at the site and the installation thereof are to be carried out keeping the disturbance to the neighboring research activities at least. Furthermore, these works must be completed in the shortest possible time ensuring proper adjustments and coordination to the work progress.

Therefore, the Construction Work requires a highly sophisticated capabilities in terms of technical judgement, quality control, construction time programing and so on. A Japanese construction company is holding the most excellent skills in such area of capability.

This is a reason why it is recommended to conclude a contract with a consortium of a Japanese trading company, and a Japanese construction company.

3-1-3 Scope of Works

The demarcation of the scope of work between the Japanese and Kenyan sides are specified in Figure/Table 3-3.

Figure/Table 3-3 Scope of Construction Works

Works to be done by Japanese side	Works to be done by Kenyan side
<p>1. Equipment Provision Procurement and installation of the equipment and P3 Lab-units</p> <p>2. Construction Work Establishment of the Prep Room Construction of a incinerator house</p> <p>3. Electrical System Main wiring system, Lighting and receptacle system, telephone and communication system</p> <p>4. Pumping and Air Conditioning system Water supply, Drainage, LPG supply and Air conditioning system</p> <p>5. Special Equipment Works UPS system and Incinerator system</p>	<p>1. Removing work for existing furniture</p> <p>2. Removing and Resetting work for furniture and utensils</p> <p>3. Inspection and preparation for existing generator</p> <p>Existing generator should be inspected and maintained in good condition by checking whole loading circuit so as the power should be supplied to the project steadily in case of emergency.</p>

3-1-4 Consultant Supervision

The Consultant executes the detail design and supervision services for the Project, of which the purpose is to ascertain the Equipment Provision and the Construction Work to be carried out strictly in accordance with the Contract Document, and to ensure possible quality upgrade by giving instructions and advice during the Contract Period.

(1) Advisory Service and assistance for Contracting Procedure

In order to decide the Contractor, the Consultant prepares the Tender Documents, and upon approval of the Tender Document by KEMRI, the Consultant conducts Tendering Procedure, which include Tender Announcement, Prequalification of the Tenderers, Instructions to the Tenderers and Evaluation of the Tender. The Consultant gives advice and assistance to KEMRI relating to the conclusion of the Contract with the Successful Tenderer.

(2) Instruction and Advice to the Contractor

The Consultant gives instructions and advice to the Contractor, with regard to the equipment procurement, production, installation schedules as well as building materials, engineering and the time programme.

(3) Review and Approval of Shop Drawings

The consultant reviews shop drawings prepared by the Contractor, requires modifications thereof, provides instructions and gives approvals to the completely incorporated ones.

(4) Inspection

Where necessary, the Consultant attends the inspections at factories where the equipment and construction components are manufactured, to ensure that quality and performance are up to the requirement by the Contract.

(5) Reporting of Work Progress

The Consultant keeps in touch with production and construction schedules as well as actual work progress at the Project site, and reports the work progress to the agencies concerned of both the Japanese and Kenyan governments.

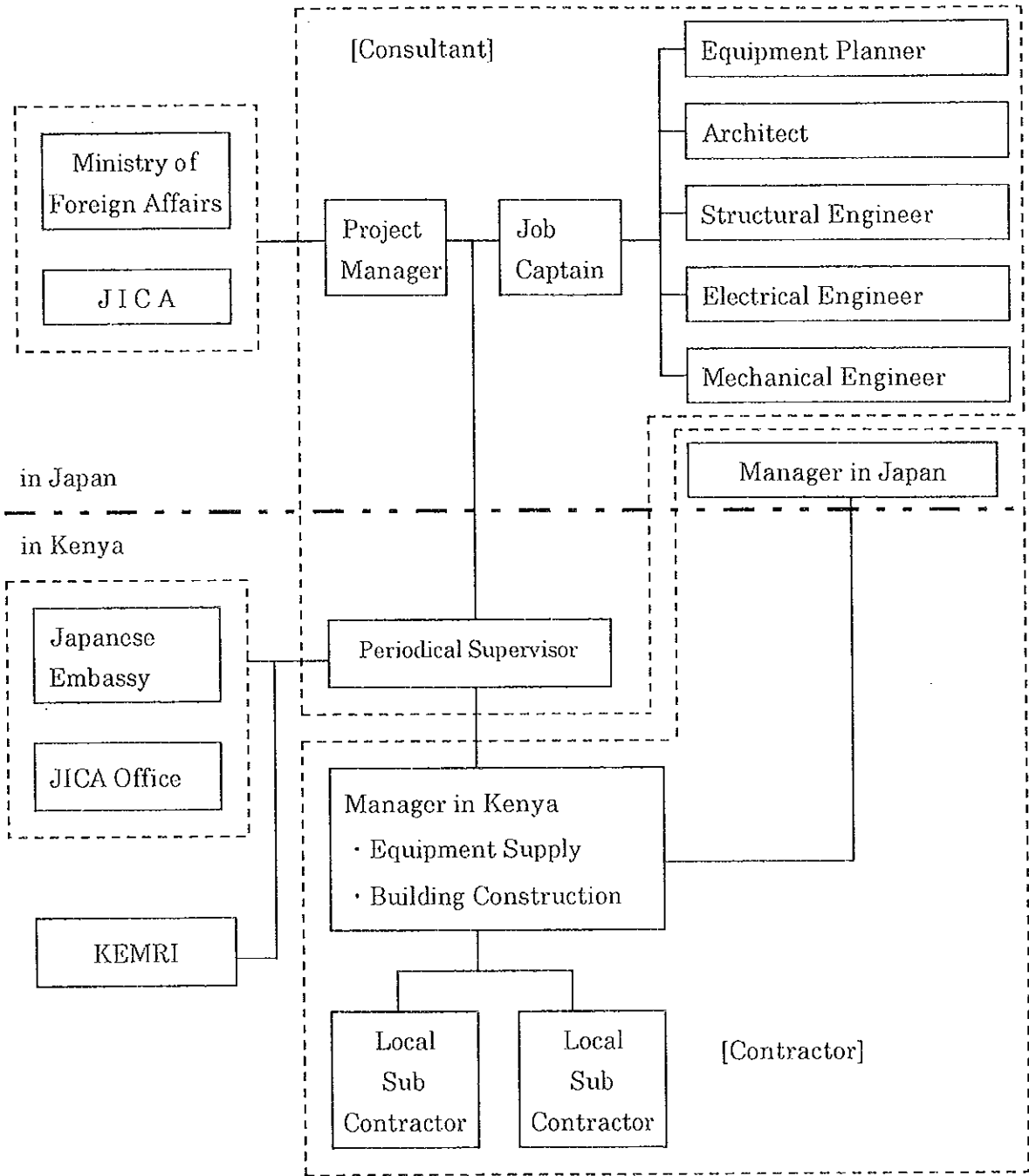
(6) Inspection on Completion and Test Operation

The consultant carries out the inspection on the works upon completion of them as well as the test operations of the equipment and building and its utilities, to ensure that the performance meets the Contract Documents, and then submits a final inspection certificate to KEMRI.

(7) Supervisory System in Kenya

Considering the contents and the size of the Project, the Consultant carries out the above-mentioned services by periodical visit to the site without dispatching a resident supervisor at the site. And the Consultant dispatches the required number of technical experts of the fields concerned in compliance with the progress of the work at the site, in order to engage them in inspection and instruction. The consultant dispatches a technical expert in charge of supervision of the equipment at the time of the test operation and the final adjustments thereof. The Consultant nominates domestic back up members for the Project in Japan. Also, the Consultant reports the progress of the Project, payment procedures, hand over upon completion, etc., to the relevant agencies of the Government of Japan. Figure/Table 3-4 shows the supervisory organization in Japan and Kenya.

Figure/Table 3-4 Organization for Construction Supervision

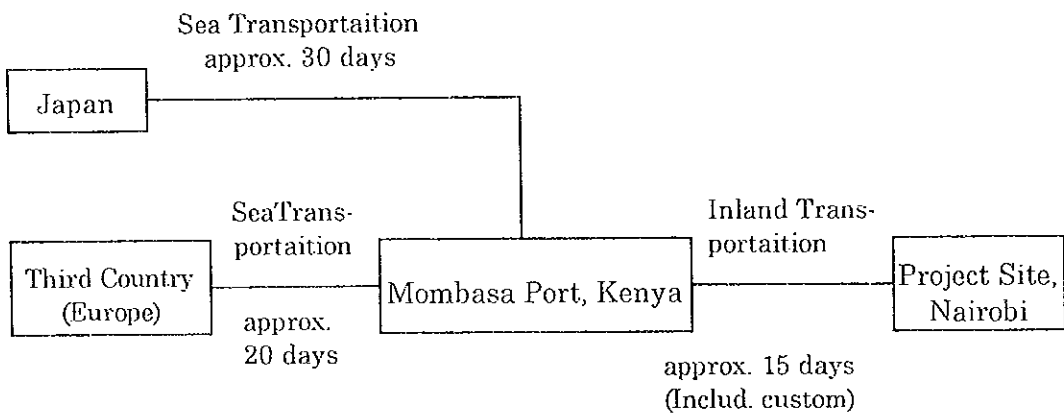


3-1-5 Procurement Plan

(1) Equipment Procurement Plan

The equipment for the Project, which are not manufactured in Kenya, are to be imported from Japan or a third country. Such items of the equipment are to be transported from a Japanese or an European port to Mombasa by shipping, then from Mombasa to the site in Nairobi by inland road. The estimated transportation time from Japan or Europe to the site is shown in Figure/Table 3-5.

Figure/Table 3-5 Necessary Time for Transportation



(2) Buildings Materials Procurement

The origins of the product of the building materials for the Project are shown in Figure/Table 3-6.

Figure/Table 3-6 List of Major Construction Material Procurement Plan

Classification	Material	Procurement in Kenya	Procurement from Japan	Remark
Reinforced Concrete work	Portland cement	○		
	Fine aggregate	○		
	Coarse aggregate	○		
	Reinforcing bar	○		
	Mold	○		
Masonry works	Concrete blocks	○		
Structural Steel works		○		
Plaster work	Cement mortar	○		
	Plaster	○		
Metal works	Steel plates	○		
Painting works	Interior paint	○		
	Exterior paint	○		
Interior works	Rock wool acoustic boards	○		
Electrical work	Wiring appliances	○		
	Lighting	○	○	Only sterilizing lights are imported
	Panel	○		
	UPS	○		
Mechanical work	Air conditioner	○		
	Piping	○		
	Insulation	○		
	Incinerator		○	For high quality and steadiness

3-1-6 Implementation Schedule

The implementation schedule following the conclusion of the E/N is shown in Figure/Table 3-7.

(1) Detailed design

The estimated time for the execution of the detailed design will be 1.5 months.

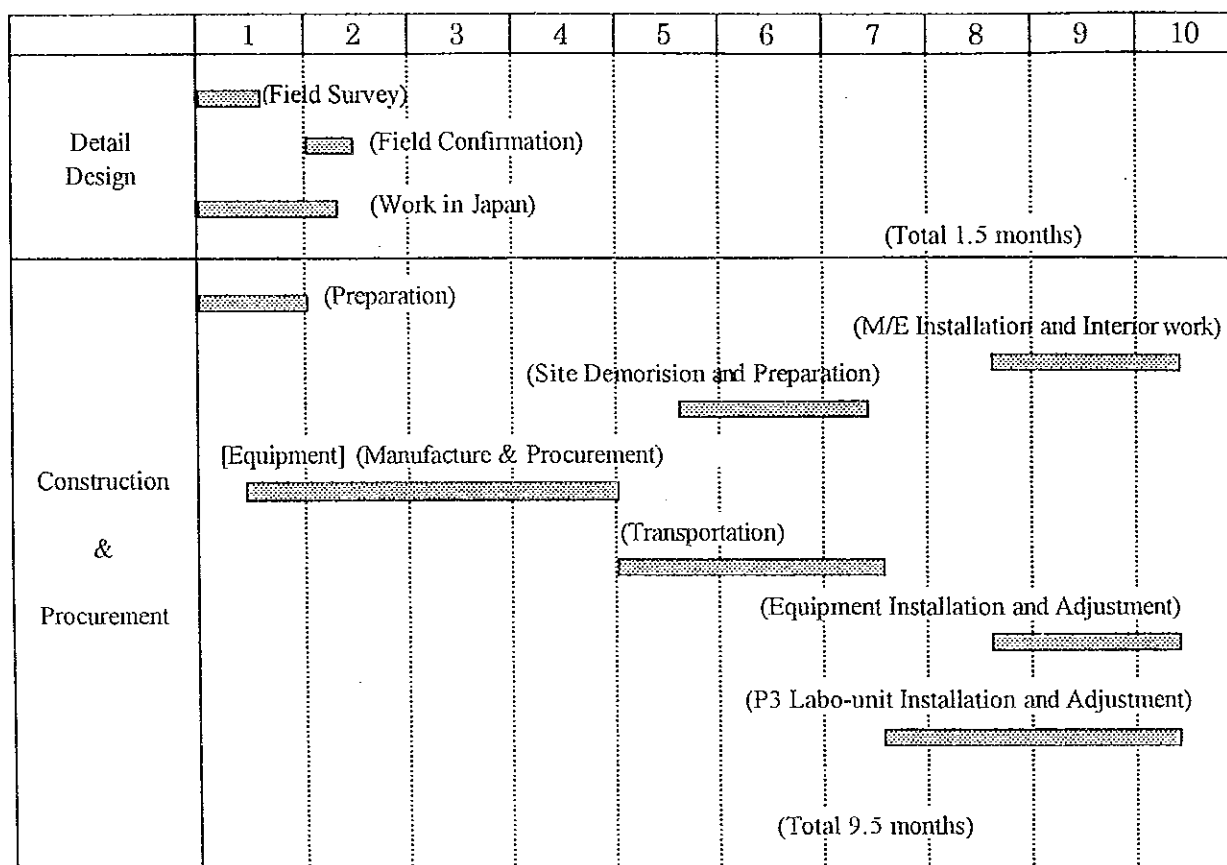
(2) Contracting Procedure

The estimated time for Contracting Procedure will be 1.5 months.

(3) Contract Period

The estimated time for the execution of Contract will be 9.5 months.

Figure/Table 3-7 Implementation Schedule



3-1-7 Obligations of Recipient Country

Following items of the work are to be undertaken by the Kenyan side.

- (1) To bear commissions to the Japanese foreign exchange bank for its banking service based upon the Banking Arrangement (B/A), namely the advertising commission of the Authorization to Pay (A/P) and payment commission.
- (2) To ensure prompt unloading, tax exemption and custom clearance at the port of disembarkation in Republic of Kenya and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid.
- (3) To exempt Japanese judicial and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Kenya with respect to the supply of the products and services under the verified contracts.

may be necessary for their entry into Kenya and stay therein for the performance of their work.

- (5) To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary.
- (6) To assign appropriate budget and teaching and administrative staff members for proper and effective operation and maintenance of equipment procured under the Grant Aid.
- (7) To maintain and use properly and effectively the facilities constructed and the equipment procured under the Project.
- (8) To bear all the expenses, other than those to be borne by the Japan's Grant Aid within the scope of the Project.

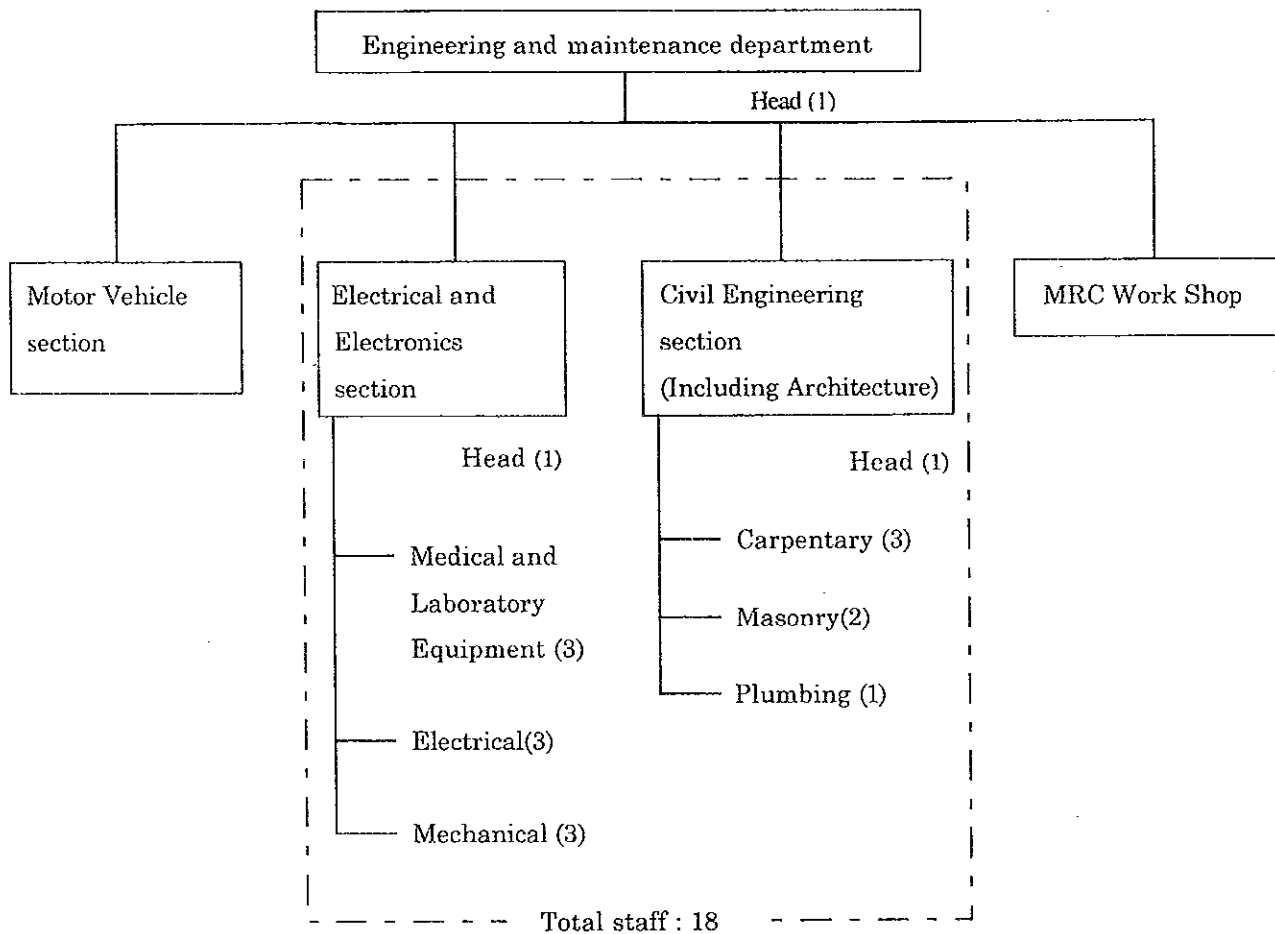
3-2 Operation and Maintenance Cost

(1) Maintenance Organization

Engineering Maintenance Department of Development Division is mainly in charge of maintenance, which has 4 sections: 1) vehicle repair section; 2) electronics and electrical section; 3) civil engineering section (including architectural work); and 4) workshop section. Sections mentioned under 2) and 3) are carrying out maintenance of building, utilities, electrical work, and equipment.

The organization chart of Engineering Maintenance Department is shown in Figure/Table 3-8.

Figure/Table 3-8 Organization Chart for Engineering and Maintenance
 () : number of people assigned person



As shown in Figure/Table 3-8, the electronics and electrical section has one chief, supported by 3 people in charge of electronics and research equipment; 3 electricians; and 3 mechanical staff, thus totaling at 10 people.

The civil engineering section has one chief, supported by 3 carpenter, 2 masons, and one plumber, thus totaling at 7 people.

Accordingly, a total of 18-people staff including two responsible persons are carrying out day-to-day operation as well as periodical maintenance and repairs.

The workshops are housed in the common research building; one for building and mechanical equipment which is holding a lathe, a thread cutting machine, a welding machine, and a shearing machine installed therein, to carry out duct forming and repairs to piping and equipment, where the lack of spare parts and consumables seems to be a hindrance, another for maintenance of electronic devices which is holding only simple instruments and devices, carrying out insufficient services.

KEMRI has to achieve the following matters:

- a) Establishment of a committee/council which is authorized to conduct the mandate for operation and maintenance of the equipment in the Bio-Safety Lab (P3 lab unit and equipment), and preparation of budgetary arrangement for expenses required by the proper operation and maintenance of the equipment.
- b) Assignment of a responsible person for the operation of the equipment installed in the Bio-Safety Lab.
- c) Steady planning on procurement of the reagents, consumables and spare parts.

Imperfectness of the actual maintenance are well understood by KEMRI and various efforts for rectification are being made.

With regard to the personnel, strengthening plan as shown in Figure/Table 3-9 is being planned.

Figure/Table 3-9 Engineering and Maintenance Staff List

(unit : Number of people)

Items	Existing Staff	Additional Staff	Total
Head of Unit	1		1
Head of Electrical and Electronics	1		1
Medical and Laboratory Equipment	3	2	5
Electrical	3		3
Mechanical	3	1	4
Head of Civil Engineerings	1		1
Carpentry	3		3
Masonry	2		2
Plumbing	1	1	2
Total	18	4	22

(2) Operation and Maintenance Cost

Estimate of Annual cost required for operation and maintenance of the Bio-Safety Lab is shown in Figure/Table 3-10.

Figure/Table 3-10 Operation and Maintenance Cost

(Unit : K Shs.)

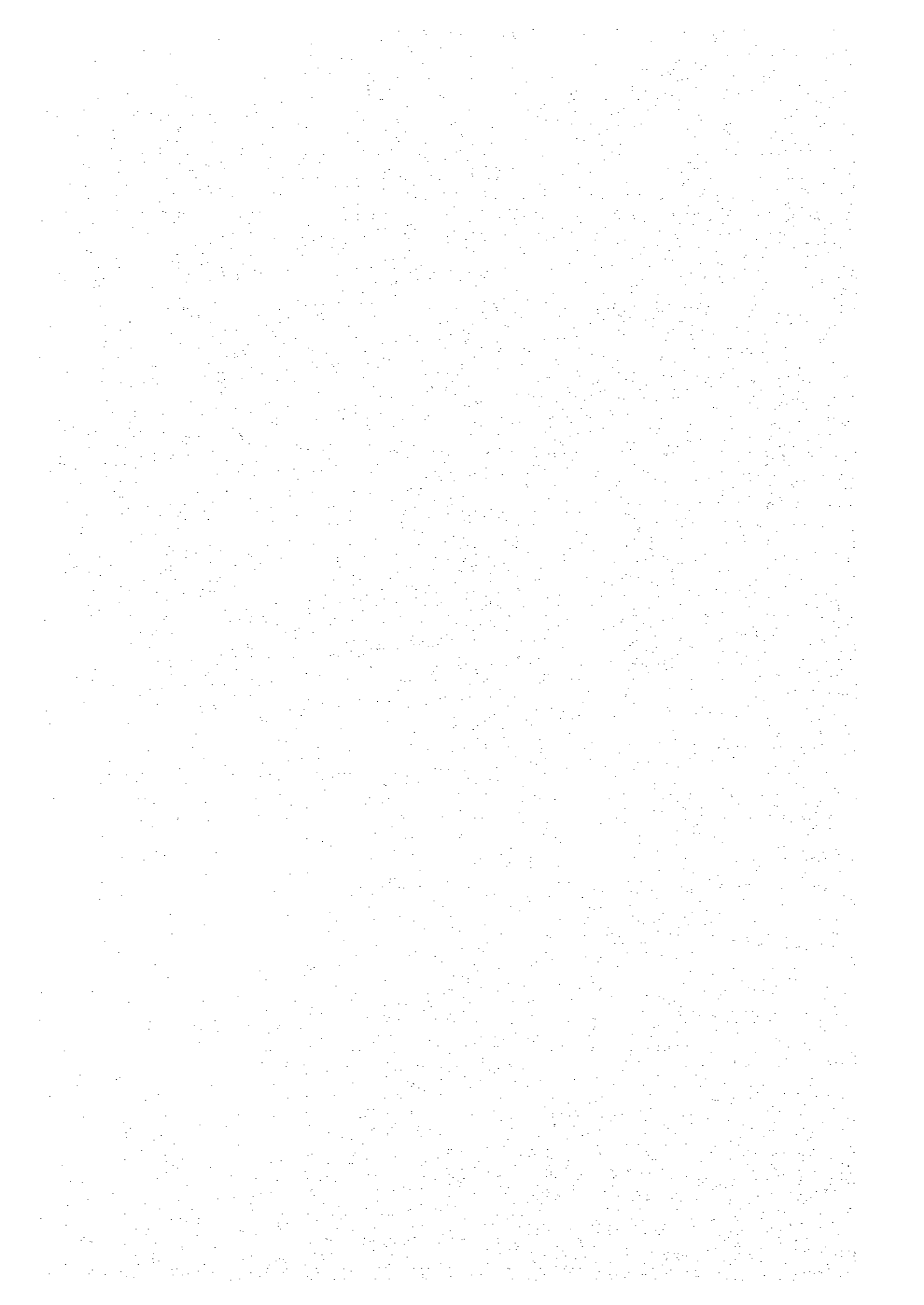
	1st Year	2nd Year	3 to 5 Year~
Electricity	219,360	219,360	219,360
Building Maintenance	0	39,600	39,600
Equipment O/M	32,000	366,000	1,673,000
Total	251,360	624,960	1,931,960

(3) 1997/1998 budget allocation for the maintenance department of KEMRI consists of electric power charge at Kshs. 1,190,000; equipment maintenance cost at Kshs. 430,000; and building maintenance cost at Kshs. 380,000, thus totaling at Kshs. 2,000,000. Including the expenditure for water charge, oil expense, gas expense, and spare parts cost, the total paid out cost of the department should be about Kshs.3,000,000 to 4,000,000.

Comparing the estimated annual cost for operation and maintenance of the Bio-Safety Laboratory after around 5 years from the hand over to that of 97/98, electrical power charge will increase by about 18% and equipment maintenance cost will reach to the 4 times.

Regarding the operation and maintenance cost estimated by the Japanese study team the KEMRI side stated that it should be within the possible budget arrangement of KEMRI THIS statement by KEMRI seems to be reasonable considering the budget allocated actually for the operation and maintenance.

Chapter 4
Project Evaluation
and Recommendation



CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATION

4-1 Project Effect

This project has sufficient capability to function as a production laboratory to manufacture the reagent Kits for HIV screening while the scheme "HIV/AIDS" under the Japanese Technical Cooperation is limited to the experimental production of the reagents and the training of local operational staff using the facilities supplied under the Project.

At this stage where no production software, (regarding the production system, annual production target etc.), is determined, it is impossible to estimate the maximal economic benefit by means of the feasibility study. Therefore, The project evaluation is to be made by the impact to be generated by the execution of the scheme "HIV/AIDS" under the Japanese Technical Cooperation.

This scheme is so unique in the terms of the assistance to enable the counterparts to diffuse the HIV screening for themselves that no other donors have ever conceived.

Relating to the research on virology, Kenya is one of the most advanced country in Africa. And the counterpart of the Japanese Technical Cooperation, KEMRI is one of the most authoritative research organisation in the country regarding the field and has achieved significant results through phase I of the same Japanese Technical Cooperation.

With regard to "Viral Hepatitis", KEMRI has succeeded in developing a reagent kit for screening during the Phase I, and improved it in the Phase II. The kit is now applicable to the practical use.

The scheme "HIV/AIDS" was newly adopted in the Phase II. Now in one year from the commencement of the cooperation, technology transfer for the manufacture of the screening kit for PA method by imported materials from Japan has already been achieved. The products are being distributed to eight public hospitals and the clinics under them.

The next step for this scheme is the technology transfer for local production of the reagents from the HIV prevalent in Kenya. This requires the transfer of a series of technology in a package, including the virus collection, identification of strain, tissue culture, extraction of antigen, production of reagent and so on.

This means a highly advanced level of technology transfer compared to the past steps. Such high level of technical transfer, however, is most likely to be successful,

considering the KEMRI's high capabilities in the field of virology research and the series of achievements in the former steps of the Japanese Technical Cooperation.

The success in the production of the reagent responding to locally prevalent HIV is expected to bring the following secondary effects.

- (1) Even when a new strain is generated in Kenya (it is a highly probable matter) and the conventional reagents may reduce their response, it is speedy, infallible and economical to produce a new reagent responding to the mutated strain.
- (2) Kenya will shortly be successful in the production of the reagent kit responding to the local HIV. However, it will take far longer time for neighboring countries to be so. Therefore the success of this technology transfer, will have a huge impact on a lot of donors that have been extending assistance to Kenya.

Most of the major donors for Kenya are also the donors for the neighboring countries as well. Thus, when Kenya is able to develop and produce inexpensive reagent kits infallibly responding to locally prevalent HIV, the capable donors will change the ongoing screening measures used in the assistance to the neighbouring countries into PA method and order the production of the locally responsible reagent kits to Kenya, because it is more effective and economical choice for such donors to do so.

Capacity of the Project is sufficient but minimal to achieve the technology transfer aimed in the scheme "HIV/AIDS". However, the Project has the possibility to make a greater contribution to the AIDS control programme of Kenya after the termination of the Japanese Technical Cooperation should the adequate management programme be provided.

4-2 Recommendations

To let the Project display its capability to the maximal extent, it is recommended that another assistance should be followed to the ongoing Japanese Technical Cooperation regarding the multilateral management software, which includes production target by demand forecast, expansion plan of the products under the promotion strategy, personnel and its rotation, storage control on raw materials and products, management on manufacturing cost and selling price, and so on.

When such cooperation is successfully carried out, the Project is expected to produce the products steadily responding to the community needs and then to make a great contribution to the diffusion of HIV screening in Kenya.

Appendices

Appendices

1. Member List of the Survey Team (1)
2. Survey Schedule (2)
3. List of Party Concerned in the Recipient Country (3)
4. Minutes of Discussion (4)

1. Member List of the Survey Team

Basic Design Study Team (June 29 to July 13, 1997)

Name	Duty	Occupation
Dr. T. Kurimura	Leader	Professor Research Institute for Microbial Diseases Osaka University
Mr. T. Hirahara	Coordinator	Coordinator and appraisal Div., Grant Aid Project Study Dept. JICA
Mr. K. Okuma	Project Manager	Architectural Design Div. Nihon Sekkei, Inc.
Mr. T. Isobe	Building Equipment Planner	Environmental & M/E, Engineering Design Div. Nihon Sekkei Inc. (June 29 to July 5)
Mr. M. Okada	Building Equipment Planner	Environmental & M/E, Engineering Design Div. Nihon Sekkei Inc. (July 3 to July 13)
Mr. M. Suzuki	Medical Equipment Planner & Cost Planner	Medical Equipment Div. Nihon Sekkei, Inc.

2. Survey Schedule

Basic Design Survey (June 29 to July 13, 1997)

NO.	Date	Activity
1	June 29 (Sun.)	11:55 Departure from Narita - 16:25 Arrival London (JL-401) 22:25 Departure from London (BA-2069)
2	30 (Mon.)	9:00 Arrival in Nairobi Courtesy visit to JICA Office, Japanese embassy in Kenya
3	July 1 (Tue.)	Courtesy visit to KEMRI Submission of Inception Report and Questionnaire Discussion and Investigation at KEMRI Courtesy visit to MOH
4	2 (Wed.)	Discussion and Investigation at KEMRI
5	3 (Thu.)	Discussion and Investigation at KEMRI
6	4 (Fri.)	Discussion and Investigation at KEMRI
7	5 (Sat.)	Investigation of Construction/Equipment Situation Sorting out of collected data and team discussion
8	6 (Sun.)	Sorting out of collected data and team discussion
9	7 (Mon.)	Signing of minutes of discussions of KEMRI
10	8 (Tue.)	Discussion and Investigation at KEMRI Sorting out of collected data Report to JICA Investigation at KEMRI Leader/Coordinator Departure from Nairobi
11	9 (Wed.)	Investigation at KEMRI Discussion of Technical Note
12	10 (Thr.)	Signing of Technical Note Sorting out of collected data 22:25 Departure from Nairobi (BA-2068)
13	11 (Fri.)	5:15 Arrival in London
14	12 (Sat.)	19:45 Departure London (JL402)
15	13 (Sun.)	15:20 Arrival in Narita

3. List of Party Concerned in the Recipient Country

(1) Kenyan Government

- Mr. J. Nyanumba Permanent Secretary
The Treasury
- Mr. N. Mathenge Permanent Secretary
Ministry of Research, Technical Training
and Technology

(2) Kenya Medical Research Institute (KEMRI)

- Dr. Davy K. Koech Director, KEMRI
- Dr. Peter M. Tukei Director, VRC
- Dr. J. I. Githure Director, BSRC
- Dr. Monique Wasunna Director, CRC
- Dr. P. G. Waiyaki Director, CMR
- Dr. J. A. Odhiambo Director, RDRU
- Dr. W. M. Kofi-Tsekpo Director, TMDRC
- Dr. J. O. Gasemi Senior Deputy Director, MS
- Mr. D. M. Ngumo Chief Administrative Officer
- Mr. James Muttunga, Ag. Director, MRC
- Mr. J. K. Lelei Senior Institute Eng.
- Mr. J. N. Kariuki Senior Principal Administrative Officer

4. Minutes of Discussion

**MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE PROJECT FOR IMPROVEMENT
OF
KENYA MEDICAL RESEARCH INSTITUTE
IN
THE REPUBLIC OF KENYA**

In response to the request from the Government of Kenya, the Government of Japan decided to conduct a Basic Design Study on the Project for Improvement of KENYA MEDICAL RESEARCH INSTITUTE (hereinafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency(JICA).

JICA sent to the Republic of Kenya a study team (hereinafter referred to as "the Team"), which is headed by Dr.Takashi KURIMURA, Professor Emeritus, Osaka University, and is scheduled to stay in the country from June 30 to July 10, 1997.

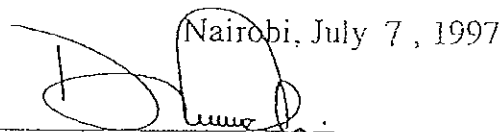
The Team held discussions with officials concerned of the Government of Kenya and conducted field surveys of the facilities concerned.

In the course of the discussions and field surveys, both parties have confirmed the main items described on the attached sheets. The Team will proceed to further work and prepare the Basic Design Study Report.



Dr.Takashi KURIMURA
Leader,
Basic Design Study Team, JICA,
Japan.

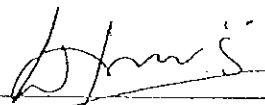
Nairobi, July 7, 1997



Dr.DAVY.K.KOECH, Director,
Kenya Medical Research Institute,
Republic of Kenya



Mr.MOHAMED KAITTANY,
Permanent Secretary,
Ministry of Health, Republic of Kenya



Mr.WAMATU NJORORE,
Permanent Secretary,
Ministry of Research, Technical
Training and Technology,
Republic of Kenya



Mr.SIMEON LESRIMA, Permanent Secretary,
The Treasury, Republic of Kenya

ATTACHMENT

1. Objective

The objective of the Project is to improve laboratory conditions of The Kenya Medical Research Institute (hereinafter referred to as KEMRI) through construction of a Biosafety laboratory (hereinafter referred to as the LAB) within the existing building and procurement of appropriate equipment.

2. Project Site

KEMRI

3. Responsible and Executing Organization.

- (1) Responsible Agency The Ministry of Research, Technical Training and Technology
- (2) Executing Agency KEMRI

4. Items requested by the Government of Kenya.

After discussions with the Team, the following items were finally requested by the Government of KENYA .

- (1) Construction of the LAB : see ANNEX 1
- (2) Procurement of Equipment : see ANNEX 2

However, the final items of the Project will be decided after further studies.

5. Japan's Grant Aid Program

- (1) The Government of Kenya has understood the system of Japan's Grant Aid Program as described in ANNEX 3.
- (2) The Government of Kenya will take necessary measures, as described in ANNEX 4 for the smooth implementation of the Project, on condition that the Grant Aid by the Government of Japan is extended to the Project.

6. Schedule of the Study

- (1) The consultants will proceed to further studies in the Republic of Kenya until July 10, 1997.
- (2) In case that the contents of the Project are accepted in principle by the Government of Kenya, JICA will complete the final report and send it to the Government of Kenya around November, 1997.

7. Other Relevant Issues

- (1) The Kenyan side indicated to the team that it had the plan for the LAB. The concept of the Project was reviewed and confirmed in the discussions.
- (2) In order to operate and maintain the LAB newly provided in KEMRI, the Kenyan side shall organize and conduct a permanent management system for operation and maintenance which shall be sustained through personnel recruitment and training
- (3) The Kenyan side requested for training of its personnel for the operation and maintenance of the LAB as "Kenshuin" in Japan.
- (4) The Kenyan side confirmed that the necessary recurrent cost and personnel for the LAB shall be secured by the Kenyan side.
- (5) All existing equipment located in the room where the LAB is to be allocated and in the corridor which leads to the room shall be removed by the Kenyan side prior to the commencement of the Project..
- (6) Further improvement of adjacent space (corridor, D5 laboratory and D6 laboratory) is to be undertaken by the Kenyan side.

ITEMS REQUESTED BY THE GOVERNMENT OF KENYA
- CONSTRUCTION OF THE LAB -
(see the attached drawing)

- (1) Provision of the LAB to consist of P3 laboratory and the preparation room in a part of existing laboratory of the Bacteriology Department
- space (X11~12, Y18~20)
- (2) Construction of the machine room for air conditioning to cover exclusively the LAB at the Y20 end of the corridor leading to the LAB
- (3) Installation of power generator in the the existing generator house
- space (X2~3, Y7~8) - to cover exclusively the LAB

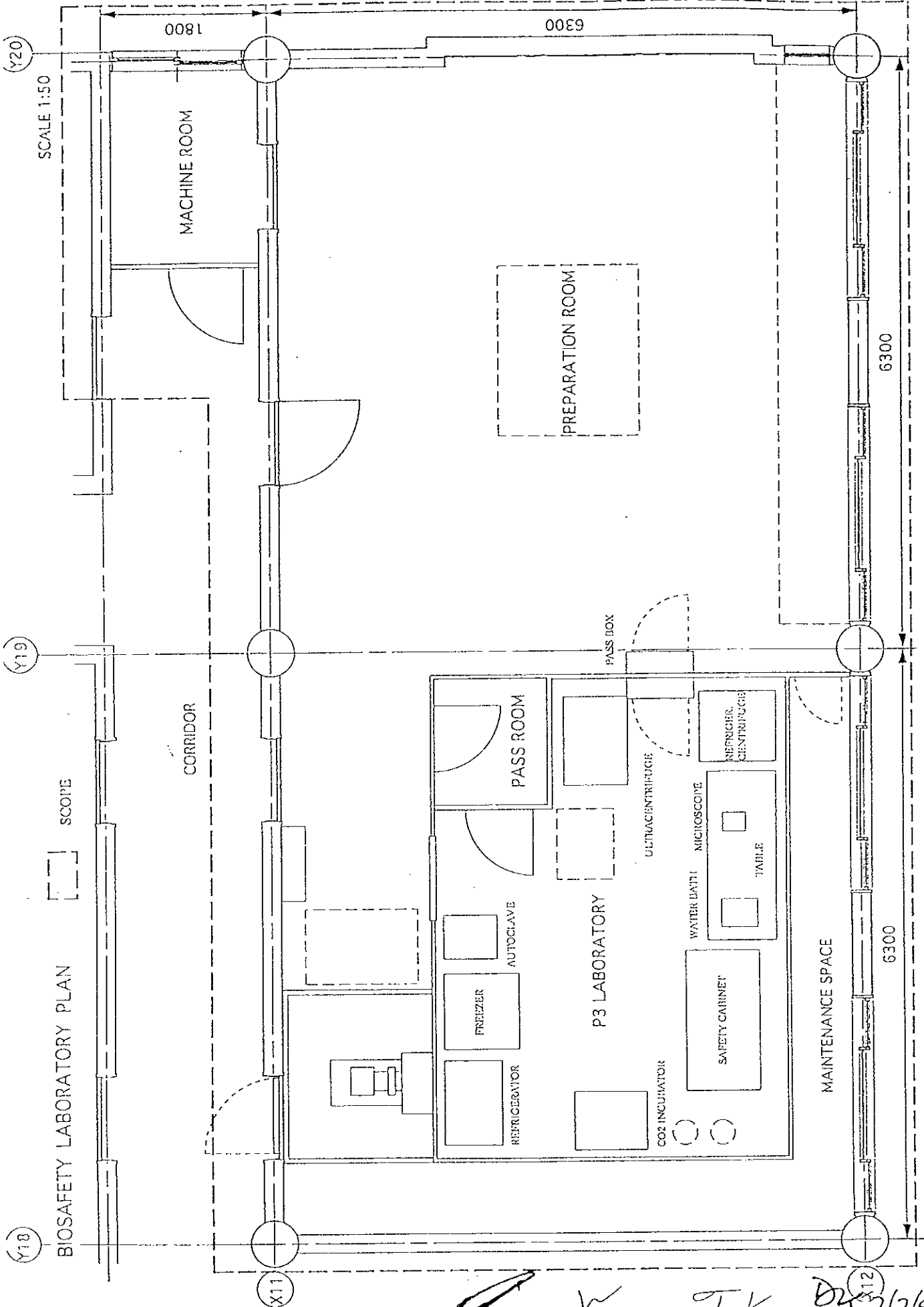


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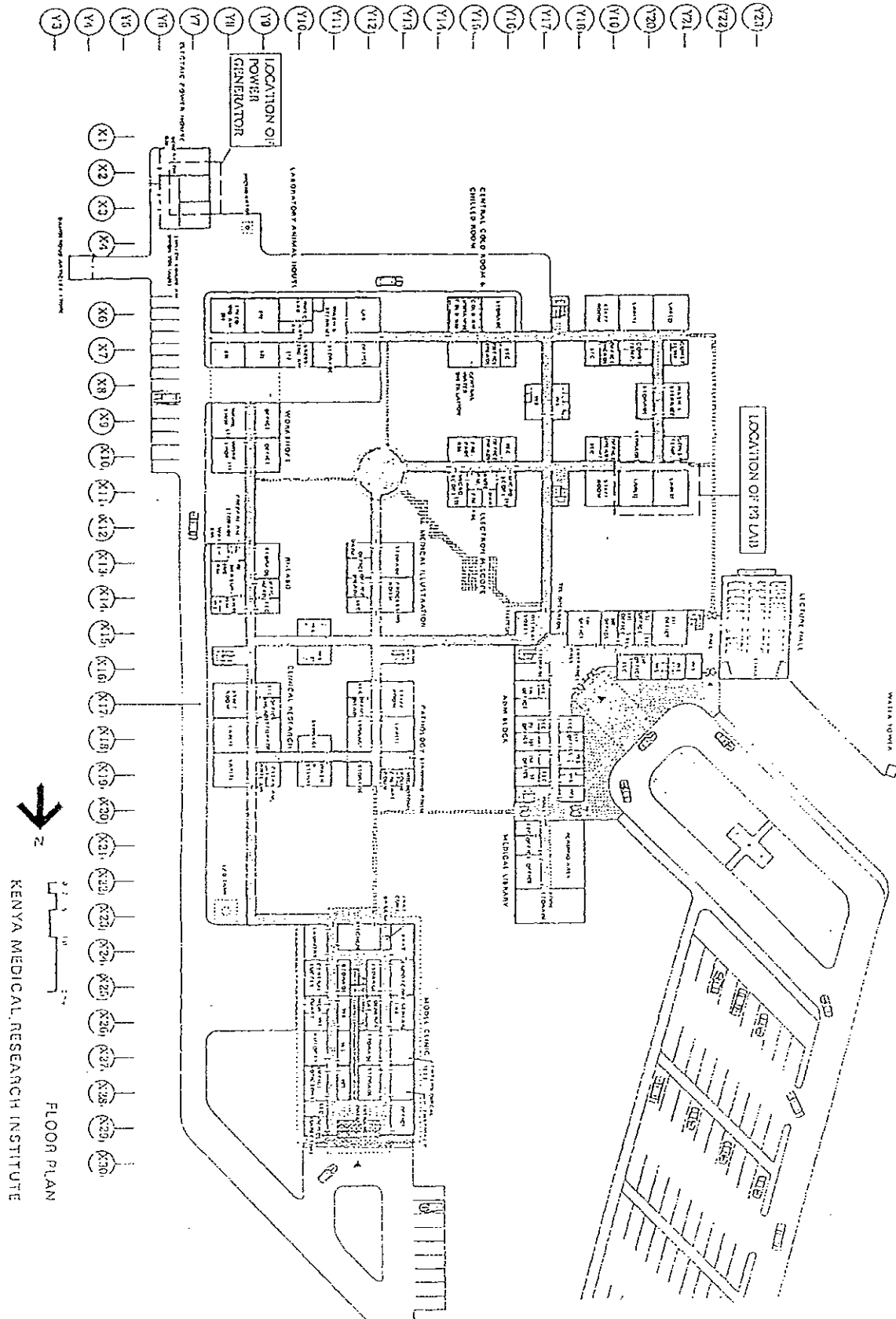
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Dr. J.K.
 2/1/92

ANNEX 2

EQUIPMENT LIST

Item No.	Equipment Name	Quantity	Category
01	Biosafety Cabinet	2 units	I
02	CO2 Incubator	2 units	I
03	Refrigerator	1 unit	I
04	Freezer	3 units	II
05	Deep Freezer	3 units	II
06	Ultracentrifuge	1 unit	I
07	Refrigerated Centrifuge	1 unit	I
08	Inverted Microscope	2 units	I
09	Fluorescence Microscope	1 unit	I
10	Laboratory Table	1 unit	I
11	Autoclave	1 unit	I
12	Pass Box	1 unit	I
13	Vortex Mixer	2 units	II
14	Centrifuge	2 units	II
15	Water Bath	2 units	II
16	PCR Thermal Cycler	2 units	II
17	Sonicator	1 set	I
18	Water Distiller	1 unit	I
19	Liquid Nitrogen Container	1 set	II
20	Pipette	1 set	I
21	Personal Computer	2 sets	II

Note: Category

- I. The Equipment, including the quantity, are essential for sustaining the function of the Project.
- II. The Equipment are essential for the Project. However, the quantity shall be revised and confirmed.



(10)




JAPAN'S GRANT AID PROGRAM1. Japan's Grant Aid Procedures

(1) The Japan's Grant Aid Program is executed by the following procedures:

Application (Request Made by a Recipient Country)

Study (Preliminary Study / Basic Design Study Conducted by JICA)

Appraisal & Approval (Appraisal by the Government of Japan and Approval by Cabinet of Japan)

Determination of Implementation (Exchange of Notes Between both Governments)

Implementation (Implementation of the Project)

(2) Firstly, an application or a request for a project made by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to see whether or not it is suitable for Japan's Grant Aid. If the request is deemed suitable, the Government of Japan entrusts a study on the request to JICA.

Secondly, JICA conducts the Basic Design Study, using a Japanese consulting firm. If the background and objectives of the requested project are not clear, a Preliminary Study is conducted prior to a Basic Design Study.

Thirdly, the Government of Japan appraises the Project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study Report prepared by JICA and the results are then submitted to the Cabinet for approval.

Fourthly, the Project approved by the Cabinet becomes official after the Exchange of Notes signed by both Governments.

Finally, for the implementation of the Project, JICA assists the recipient country in preparing contracts and monitoring progress.

2. Contents of the Study

(1) Contents of the Study

The purpose of the Study (Preliminary Study/Basic Design Study) conducted on a project requested by JICA is to provide a basic document necessary for appraisal of the project by the Japanese Government.




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The contents of the Study are as follows:

- a) to confirm background, objectives, benefits of the project and also institutional capacity of agencies concerned of the recipient country necessary for project implementation,
- b) to evaluate appropriateness of the Project for the Grant Aid Scheme from a technical, social and economical point of view,
- c) to confirm items agreed on by both parties concerning a basic concept of the project,
- d) to prepare a basic design of the project, and
- e) to estimate cost involved in the project.

Final project components are subject to approval by the Government of Japan and therefore may differ from an original request.

Implementing the project, the Government of Japan requests the recipient country to take necessary measures involved which are itemized on Exchange of Notes.

(2) Selecting (a) Consulting Firm(s)

For smooth implementation of the study, JICA uses (a) consulting firm(s) registered. JICA selects (a) firm(s) through proposals submitted by firms which are interested. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference made by JICA.

The consulting firm(s) used for the study is (are) recommended by JICA to a recipient country after Exchange of Notes, in order to maintain technical consistency and also to avoid possible undue delay in implementation caused if a new selection process is repeated.

(3) Status of a Preliminary Study in the Grant Aid Program

A Preliminary Study is conducted during the second step of a project formulation and preparation as mentioned above.

The result of the study will be utilized in Japan to decide if the Project is to be suitable for a Basic Design Study

Based on the result of the Basic Design Study, the Government would proceed to the stage of decision making process (appraisal and approval).

It is important to notice that at the stage of Preliminary Study, no commitment is made by the Japanese side concerning the realization of the Project in the scheme of Grant Aid Program.

3. Japan's Grant Aid Scheme

(1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non reimbursable funds needed to procure facilities, equipment and services for economic

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and social development of the country under the following principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not in a form of donation or such.

(2) Exchange of Notes (E/N)

The Japan's Grant Aid is extended in accordance with the Exchange of Notes by both Governments, in which the objectives of the Project, period of execution, conditions and amount of the Grant etc. are confirmed.

(3) "The period of the Grant Aid" means one Japanese fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as Exchange of Notes, concluding a contract with (a) consulting firm(s) and (a) contractor(s) and a final payment to them must be completed.

(4) Under the Grant, in principle, products and services of origins of Japan or the recipient country are to be purchased. When the two Governments deem it necessary, the Grant may be used for the purchase of products or services of a third country origin. However the prime contractors, namely, consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means Japanese physical persons or Japanese judicial persons controlled by Japanese physical persons.)

(5) Necessity of the "Verification"

The Government of the recipient country or its designated authority will conclude into contracts in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. The "Verification" is deemed necessary to secure accountability to Japanese tax payers.

(6) Undertakings required to the Government of the recipient country

In the implementation of the Grant Aid, the recipient country is required to undertake necessary measures such as the following:

- a) to secure land necessary for the sites of the project and to clear and level the land prior to commencement of the construction work,
- b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
- c) to secure buildings prior to the installation work in case the Project provides equipment,



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- d) to meet all the expenses and undertake prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
- e) to exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,
- f) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(7) Proper Use

The recipient country is required to maintain and use facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for their operation and maintenance as well as to bear all expenses other than those to be borne by the Grant Aid.

(8) Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

(9) Banking Arrangement (B/A)

- a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the contracts verified.
- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay issued by the Government of the recipient country or its designated authority.



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NECESSARY MEASURES TO BE TAKEN
BY THE GOVERNMENT OF THE REPUBLIC OF KENYA

1. To provide data and information necessary for the Project,
2. to secure the site for the Project,
3. to clear, level and reclaim the site prior to commencement of the Project,
4. to undertake incidental outdoor works such as gardening, fencing, gates and exterior lighting in and around the site,
5. to provide facilities for distribution of electricity, water supply, telephone, drainage, sewerage and other incidental facilities to the site,
 - (1) electricity distributing line to the site
 - (2) city water distribution main to the site
 - (3) drainage city main to the site
 - (4) telephone trunk line and the main distribution panel of building
 - (5) general furniture such as carpets, curtains, tables, chairs and others
6. to bear commissions to the Japanese foreign exchange bank for its banking service based upon the Banking Arrangement (B/A), namely the advertising commission of the Authorization to Pay (A/P) and payment commission,
7. to ensure prompt unloading, tax exemption and customs clearance at the port of disembarkation in Republic of Kenya and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid,
8. to exempt Japanese judicial and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Kenya with respect to the supply of the products and services under the verified contracts,
9. to accord Japanese nationals whose services may be required in connection with the supply of the products and 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,
10. to provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary,
11. to assign appropriate budget and teaching and administrative staff members for proper and effective operation and maintenance of equipment procured under the Grant Aid,
12. to maintain and use properly and effectively the facilities constructed and the equipment procured under the Project, and
13. to bear all the expenses, other than those to be borne by the Japan's Grant Aid within the scope of the Project.

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