NO. 5

Basic Design Study Report

on

Veterinary Assay Laboratory

in

The Republic of Indonesia

August 1983

JAPAN INTERNATIONAL COOPERATION AGENCY

G
83 - 75

JICA LIBRARY
1056370[8]

Basic Design Study Report

on

Veterinary Assay Laboratory

in

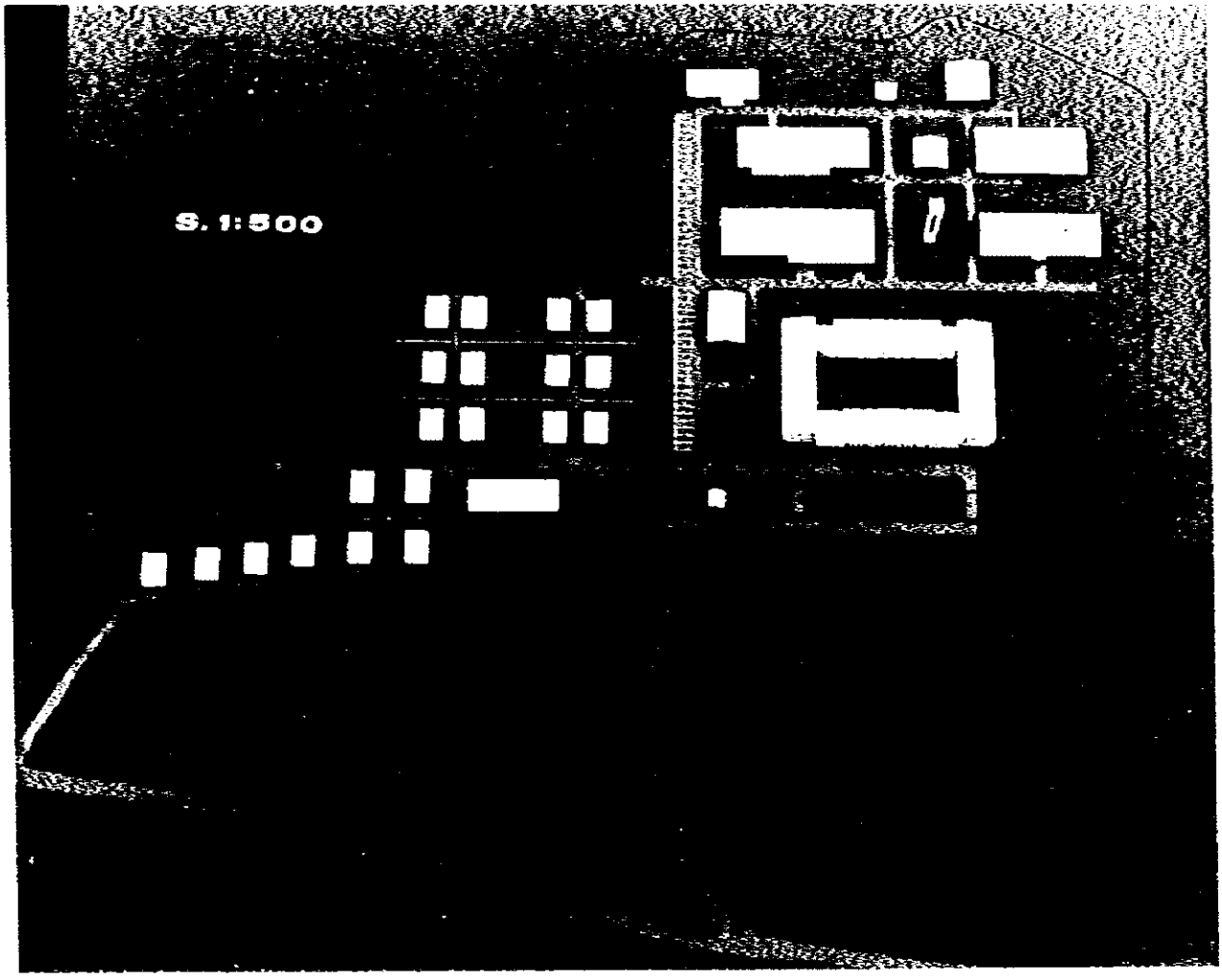
The Republic of Indonesia

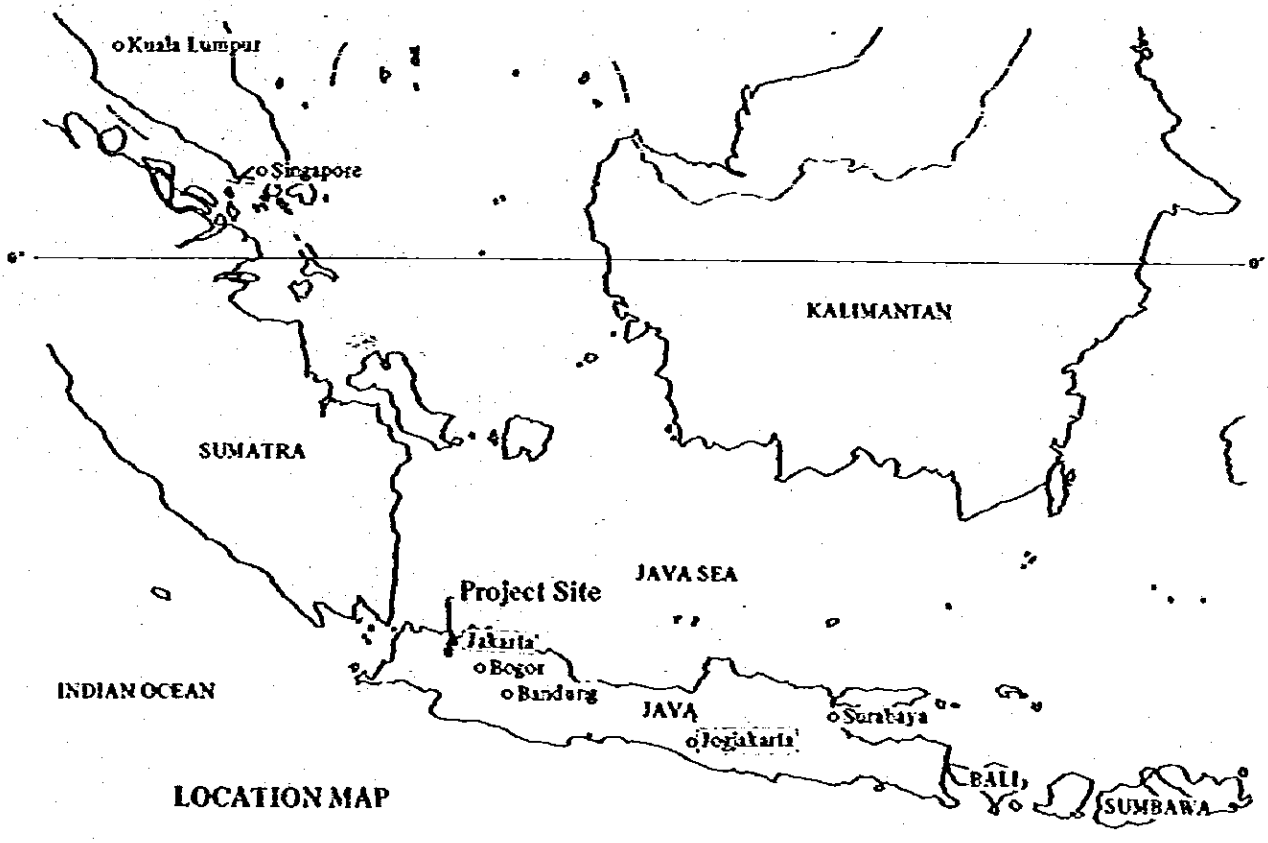
August 1983

JAPAN INTERNATIONAL COOPERATION AGENCY

14195
108
879
GRB

国際協力事業団
受入月日 84.29.14
登録No. 09639
108
87-9
GRB


S. 1:500



LOCATION MAP

PREFACE

In response to the request of the Government of the Republic of Indonesia, the Government of Japan decided to conduct a survey on the Veterinary Assay Laboratory Establishment Project and entrusted the survey to the Japan International Cooperation Agency (JICA). The JICA sent to Indonesia a survey team headed by Dr. Shozo TANAKA, Chief of Second Bacterial Deseases Section, First Assay Division, National Veterinary Assay Laboratory from March 30 to April 24, 1983.

The team had discussions with the officials concerned of the Government of Indonesia and conducted a survey necessary for making a basic design of the Project. After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Republic of Indonesia for their close cooperation extended to the team.

August 1983

Keisuke Arita

Keisuke Arita
President
Japan International Cooperation Agency

SUMMARY

For years, the Republic of Indonesia has given a national priority to development of its agriculture sector in an effort to achieve self-sufficiency of food supply. One major target of the current Third Five-Year Development Plan (PELITA III) is the expansion of food production, which is expected to increase incomes, elevate the standard of living of farmer families, facilitate development of rural communities, and improve the nutritional aspect of Indonesian citizens' eating life through expanding supply of foodstuff in non-carbohydrate categories. An important aspect of the national policy to help developing the agricultural sector is a promotional program for livestock farming, and efforts in this field have already been producing successful results to some extent. However, the significant incidences of infectious diseases among domestic animals still remain as a factor thwarting healthy development of livestock raising since they have caused remarkable economic damages and worsening productivity in the livestock farming.

Under the existing health management system for domestic animals in Indonesia, the government agencies are responsible for research, surveillance, diagnostic investigations and prevention of livestock diseases, while there is no governmental organization authorized to assay veterinary drugs in terms of their potency and safety, nor there is any national assay procedure applicable to these drugs. In this connection, a governmental management system for veterinary drugs is insufficient in the country. As a result, many veterinary drugs poor in quality have been allowed to enter veterinary services, and in fact many livestock farmers have suffered economic damages from the alleged use of these problem drugs for livestock.

In order to assure the distribution and the use of proper veterinary drugs, the Government of Indonesia has projected to establish the Veterinary Assay Laboratory (the Project) and requested the Government of Japan for a grant aid to help finance for the Project. In response to this request, the Government of Japan determined to despatch a basic design survey team to the country,

and the Japan International Cooperation Agency (JICA) conducted a field survey of the proposed Project from March 30 to April 24, 1983.

This Project aims to establish the Veterinary Assay Laboratory (the Laboratory) as an authorized and competent governmental organization, has the Laboratory carry out potency, safety and other quality tests for all the biological products, antibiotics and other veterinary drugs, allows distribution of effective and proper veterinary drugs, and thereby helps facilitate improvement of the hygienic environment for livestock and development of livestock raising.

The functions of the Laboratory will include tests and issuance of compliance certificates for veterinary drugs, research and investigations of assay procedures, breeding and feeding animals necessary for assay activities, and training programs for qualified veterinary drug supervisors and other specialists.

The Laboratory is to be a subsidiary organ of the Directorate General of Livestock Services (DGLS) of the Department of Agriculture, holding a status equal to other Directorates within the DGLS.

The Laboratory will carry out the national pre-distribution assay on every lot of biological products, antibiotics or other veterinary drugs, either locally produced or imported, and conduct an in-use sampling test for these products in distribution. Also, it will perform the residue chemical test on antibiotics and general drugs. To begin with, the laboratory is expected to assay 42 kinds of biological products (549 lots yearly) and 24 kinds of antibiotics (some 800 lots yearly).

Animals required for assay activities at the Laboratory include cattle, pigs, dogs, rabbits, hamsters, guinea pigs, mice and chickens. Small animals, i.e. hamsters, guinea pigs and mice, will be supplied by in-house SPF[1] breeding at the laboratory. Chickens will be supplied by in-house hatch and breeding on purchased SPF and conventional[2] eggs at the Laboratory. Other animals will be purchased from outside breeders. Feeds for small animals will be produced in the Laboratory from raw materials supplied by outside vendors.

For veterinary drug supervisors in service and technical staff working for the Disease Investigation Centers in the country, the Laboratory will provide necessary technical knowledges and information through its regular training courses. Also, the Laboratory will conduct educational programs and technical guidance for technical staff working at manufacturers of veterinary drugs in order furnish them with necessary information and knowledge of management techniques and of the national assay standards and criteria. These training courses will last two to three months and each class will accommodate 20 trainees.

With regard to the assay of biological products and antibiotics as well as breeding of experimental animals to be employed in the Laboratory, Technical Cooperation from Japan will be implemented.

The project site of the Laboratory premises is an area within the Serpong rubber plantation administered by the Department of Agriculture in Gunung Sindur, Bogor District, some 30km to the south of Jakarta. Jurisdiction over the construction site is now transferred to the DGLS. The project site extends over a some 5.5 ha area in a generally even terrain occupied with rubber trees. The site is receded about 130m from the Serpong-Parung road. And the land development works and preparation of infrastructure could be done easily.

The premises of the Laboratory will comprise the main building, annex buildings and living quarters for the Laboratory staff and trainees. The main building will accommodate the assay section, the administrative section and the technical extension service section. Annex buildings will include animal sheds and other facilities. Of these premises, eleven buildings with a total floor space of 4,266.04m^2 will be constructed with the Japanese Grant Aid Programme (see the table below), which living quarters for the Laboratory staff and dormitories for trainees will be provided by the Indonesian government. Since availability of quality water supply is essential for the Laboratory activities, the Programme includes construction works of deep wells and pumping facilities.

Buildings constructed with Japanese grant	
Main building	2,454.08m^2
Fowl house	494.20m^2
Breeding house for small animals	336.96m^2
Small animal house	379.80m^2
Breeding house for small animals	312.00m^2
Large animal house	81.00m^2
Post-mortem house	42.00m^2
Incinerator house	36.00m^2
Storage for explosives	10.00m^2
Transformer substation	84.00m^2
Lavatory	36.00m^2
Total	4,266.04m^2

In planning the Laboratory buildings efforts have been made in order to facilitate the use of the construction methods commonly employed in Indonesia, and also these planning considerations allow the use of construction materials available from the local market as much as possible in an attempt to reduce the construction cost. Further, design considerations for the Laboratory buildings take into account the prevailing climate in the country and easier maintenance.

The type and quantity of laboratory equipment and supplies required for the Laboratory assay activities were agreed with through consultations between counterparts from Indonesian Government and the Japanese delegates consisting of the Basic Design Survey Team and the Technical Cooperation Consultation Team which visited the country prior to the Basic Design Survey Team. It was agreed that such equipment that their installations are closely related to the building construction be included in this Grant Aid for the Project.

Implementation of the Project will require five months for preparations of drawings, tender procedures and other preparatory works, and ten months for construction work.

With regard to operational expenses and manning requirement for the Laboratory activities, the original budget estimate was reduced to match virtually with the amount of the budget appropriated by Indonesian Government for the Laboratory operation. Also, in

designing the Laboratory buildings, emphasis was put on reducing management and maintenance costs, so that it is unlikely that the Laboratory operations would incur heavy financial burdens to the Department of Agriculture.

Modernization of the health and hygiene services for livestock is of urgent necessity for Indonesia which has been committing to development of livestock farming to secure increased production of animal protein resources. An adequate quality control system for veterinary drugs to be realized through this project is expected to play a key role in this endeavor of Indonesian government.

Specifically, the Project will establish a national certification system for veterinary drugs including assay standards, and promote knowledge and technologies relating to the national assay system. These objectives of the Project are eligible for a grant aid program.

This Project will contribute, through its efforts to improve the nation's health and hygiene activities for livestock, to expand livestock production, to increase the incomes of livestock farming families, to improve the eating life of Indonesian citizens, and for betterment of the public health in the country.

Notes:

1. SPF is an acronym for "Specific Pathogen Free", and the SPF animals are not contaminated by the designated microbes and parasites.
2. General animals being not subject to microbe control.

CONTENTS

CHAPTER 1. INTRODUCTION

In reply to the request from the Government of Indonesia regarding establishment of Veterinary Assay Laboratory, the Contact Mission was dispatched to Indonesia in November, 1982.

The outline of the request from the Directorate General of Livestock Services, Department of Agriculture, Government of Indonesia that has jurisidiction over the Project is as follows: first a "Veterinary Assay Laboratory" authorized as the supreme institution of the Republic of Indonesia will be established at Serpon, in Bogor District, and it will then conduct assay on the potency and safety of veterinary drugs now being used in the Republic of Indonesia and issue Approval Certificates. For veterinary supervisors of the relevant organizations of the provinces and districts, and the quality control staff of the manufacturers of veterinary drugs the Laboratory shall conduct technical training relating to the assay activities. In order to attain these objectives, experts shall be dispatched from Japan while training be provided for Indonesian trainees in Japan until the Government of Indonesia becomes capable of operating the Assay Laboratory on its own. The Contact Mission surveyed the feasibility of the Project, confirming the details of this request and discussing with the authorities concerned.

Receiving an affirmative survey report, the Basic Design Survey Team was dispatched to survey details required for basic design and to evaluate the Project in terms of a grant aid programme.

The survey was conducted for 26 days, starting on March 30, 1983. Prior to this Team, the Technical Cooperation Consultation Team was dispatched on March 27 to discuss with the Indonesian authorities concerned about the outline of the technical cooperation programme of this Project. This Team then joined the Basic Design Survey Team. The discussion covered confirmation of the request for grant aid, position of the Project in the livestock administrative structure, and details of the basic design such as for the function, scale and composition of the facilities. The agreement in the discussion was summarized in the form of "Minutes of Discussions".

This agreement was signed by Dr. Daman, the Director General of the Livestock Services, Department of Agriculture and Dr. Tanaka, the Head of the Basic Design Survey Team.

CHAPTER 2. PROJECT BACKGROUND

2-1 Introduction

Since 1969, the Republic of Indonesia has been implementing its Five Year Development Plan, locally known as PELITA. The target of the program is to create an equitable and prosperous society, well-balanced in both material and moral standards. This is a long term program with emphasis on realizing a balanced economic structure, based on an advanced industrial capability and a firm economic strength.

Five Year Development Plan is constituted from First Phase (1969-1974) to Third Phase (1979-1983). Agriculture constitutes the center of each of these phases. In addition, the program stresses on the importance of a secure industrial base for the country and proposes to achieve its ends in several steps.

At present the Republic of Indonesia is going through the Third Five Year Development Plan (PELITA III, 1979-1983). Agricultural development projected in the third development plan intends to increase food production towards food self-sufficiency. Also, the third development plan aims at improving the health of people living in the low nutrition areas through provision of protein, fat and vitamines. At the same time expanded food production is expected to increase jobs for farmers, increase their incomes, and thereby improve their standard of living. In this way, it will promote the development of well-balanced farming communities.

The Government of Indonesia is trying through this development plan to encourage people to consume more food products in higher nutritive values than carbohydrates. Promotion of animal husbandry is part of its program to supply people with more protein, fat, and vitamines. To increase production of livestock, the Government has been promoting livestock raising techniques and knowledge for livestock farmers, in particular, for those who have been raising cattle and chicken. The efforts of the Government and the livestock farmers have begun to produce positive results. On the other hand, however, as a tropical country, Indonesian livestock farming has been suffering from considerable damages on its livestock

by infectious diseases, and the fact has been a significant obstacle to increased livestock production. For this reason, the Government of Indonesia has planned to seek for assistances of other countries for improving operations of the Disease Investigation Centers deployed throughout the country. These centers undertake investigations on diagnosis, and prevention, as well as treatment of the frequently occurring diseases. The Government of Japan has been cooperating in constructing A-type Disease Investigation Centers in two areas and in providing related technical assistance in this field.

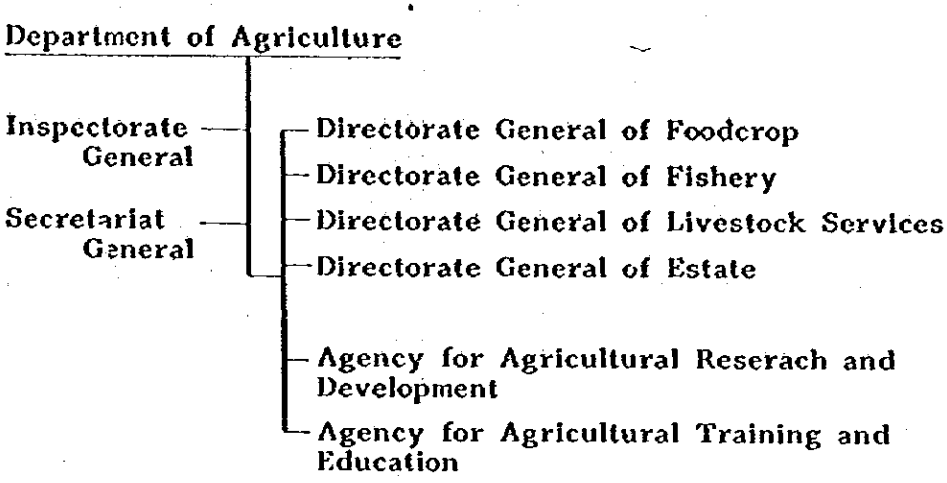
In Indonesia a variety of veterinary drugs have been distributed for effective prevention of infectious diseases, and these include both locally manufactured and imported products. However, the system of official pre-distribution certification for drugs is not virtually effected in Indonesia. As a result, such veterinary drugs that often do not satisfy potency and safety requirements have been distributed. Furthermore, these drugs are not properly prescribed according to instructions because of insufficient in-use regulations. All these have led to a number of problems, and this project is expected to provid solutions of these problems by establishing a national organization that will assay the biological products such as vaccines, serums, diagnostics and antibiotic products, as well as general medicaments, and to investigate the methods of their production, quality control, and use. It will also provide training for specialists engaged in these activities. In this way, it will promote distribution and the use of veterinary drugs for effective prevention of animal diseases. This project will constitute an important step towards improved stock-raising, and make substantial contributions to Indonesian animal husbandry and livestock production.

2-2 Current Situation of Animal Husbandry in Indonesia

2-2-1 Livestock Control and Administrative Structure

Indonesian livestock administration is under the control of Directorate General of Livestock Services, Ministry of Agriculture. The following shows the administrative structure of Department of

Agriculture. For the Directorate General of Livestock Services, refer to 3-2.



2-2-2 Livestock Development Plan

The Government of Indonesia has been engaged in promoting self reliance in non-carbohydrate food products and improvement of the food habits of the country's people. In the Third Five Year Development Plan (PELITA III), livestock production target (289.2 million Rupiah) occupies 7.8% of the total of the agriculture sector, (refer to Table 1). As for the aim of the stock breeding industry, the Government delineates the following:

(1) To preserve livestock resources by means of increasing animal population and animal improvement.

(2) To increase the livestock products to satisfy the domestic demands, and to take advantage of the potency of livestock and livestock products exportation.

(3) To stimulate the producing capacity of livestock farmers in order to increase their income.

(4) To create and increase working opportunity in rural areas, particularly offering for youths and female farmers.

Table 1. The Target of Bruto Domestic Product (low projection and in accordance with the fixed price in 1973)

Field of Business	REPELITA II		REPELITA III	
	% gorwth per year	Billion rphs yearly	% growth per year	Billion rphs in 1983
AGRICULTURE	2.9	3,043.6 (31 % Nat.)	3,5	3,728.6 (27 % Nat.)
(a). Food Crops	3.0	1,771.2	3.8	2,215.4
(b). Livestock	5.7	215.3	5.0	289.2
(c). Fishery	3.9	156.0	4.0	197.4
(d). Small holder estate	1.2	338.3	2.0	381.0
(e). State Estate	3.6	211.8	5.0	283.8
(f). Forestry	- 0.3	350.5	1.0	372.1
NON AGRICULTURE	9.1	5,726.5 (69 % Nat.)	7.9	9,057.8 (71% Nat.)
National	6.7	8,770.1 100 %	6.5	12,796.7 100 %

Table 2. Projection of Livestock Population increment Repelita III.

Sort of Anisal	1978	1979	1980	1981	1982	1983	Increment / year (%)
- Slaughtered cattle	6.150	6.212	6.274	6.336	6.400	6.464	1,0
- Buffalo	2.280,	2.280,	2.280,	2.280,	2.280,	2.280,	0,0
- Goat	5.885,	6.004,	6.124,	6.246,	6.371,	6.498,	2,0
- Sheep	3.438,	3.507,	3.577,	3.648,	3.271,	3.796,	2,0
- Pig	2.458,	2.487,	2.536,	2.587,	2.639,	2.692,	2,0
- Horse	0.630,	0.630,	0.630,	0.630,	0.630,	0.630,	0,0
- Dairy cattle	0.106,	0.111,	0.117,	0.123,	0.129,	0.135,	5,0
- Native chicken	108.917	114.363	120.081	126.085	132.389	139.009	5,0
- Exotic chicken (layer)	6.071	6.617	7.213	7.862	8.570	9.341	9,0
- Duck	17.542	18.594	19.910	20.893	22.146	23.475	6,0

Note : Projection of Slaughtered Cattle increment 1 %/year separate to inport projection about 1 % of population

Table 3. Target of Production Improvement of meat, egg & fresh milk in Repelita III (ton).

Commodity	1978	1979	1980	1981	1982	1983	Increment /year (%)
Meat							
Cattle	165,787	168,875	174,110	179,507	185,072	190,925	3,1
Buffalo	36,480	36,480	36,480	37,392	38,327	38,327	1,5
Goat	29,430	30,019	30,619	31,844	35,117	34,442	3,2
Sheep	17,130	17,534	17,884	18,600	19,344	20,118	3.2
Poultry meat	58.140	59,303	60,489	62,908	65,425	68,042	3,2
- Native chicken	98,025	103,907	110,141	116,749	123,754	131,179	6.0
- Exotic chicken	9,553	10,728	12,048	13,529	15,194	17,063	12.3
- Duck	13,156	13,945	14,782	15,669	16,609	17,606	6.0
- Others	120,734	128,520	136,971	145,947	155,557	165,848	6.6
Total meat	425,771	440,791	456,553	476,198	496,842	518,260	4.0
Egg							
Native chicken	32,675	34,309	36,024	37,825	39,717	41,703	5.0
Exotic chicken	40,676	44,337	48,327	52,677	57,417	62,585	9.0
Duck	84,202	89,254	94,609	100,286	106,303	112,680	6.0
Total egg	157,553	167,900	178,960	190,788	203,437	216,968	6.6
Fresh milk							
Local dairy cattle	65,712	68,998	72,447	76,070	79,873	83,867	5.0
Imported dairy cattle	41,300	7,127	10,301	13,876	17,899	22,411	39,6
Total fresh milk	70,032	76,125	82,748	89,946	97,772	106,278	8,7

Table 4. Estimated Consumption & Growth in Repelita III (000 ton & %).

Commodity	1978	1979	1980	1981	1982	1983	Increment /tahun %
MEAT							
Cattle	137,7	146,1	155,0	164,5	174,5	185,1	6,1
Buffalo	42,9	45,5	48,3	51,2	54,4	57,7	6,1
Sheep/Goat	33,6	35,2	37,0	38,8	40,7	42,7	4,9
P i g	75,5	79,2	83,1	87,1	91,4	95,9	4,9
Chicken	123,9	131,4	139,5	148,0	157,0	166,6	6,1
Other	17,2	18,2	19,4	20,5	21,8	23,1	6,1
Total	430,8	455,6	492,3	510,1	939,8	571,1	5,8
EGG							
Chicken	07,3	92,5	98,1	104,0	110,2	116,8	6,0
Other	37,3	39,8	42,4	45,2	48,2	51,3	6,6
Total	124,6	132,3	140,5	149,2	158,4	168,1	6,2
MILK							
Fresh	62,9	68,2	74,3	80,3	87,3	94,6	8,5
Condense	44,5	48,0	51,8	55,9	60,3	65,1	7,9
Powdered	35,1	37,7	40,4	43,4	46,5	49,9	7,3

(5) To improve the people's nutrition particularly for the rural poor.

(6) To contribute to reserving natural resources, saving energy by taking advantage of livestock power.

Furthermore, the Government of Indonesia lays down the following guidelines for implementation of the above and specifies the following targets for livestock production (as it is shown in Table 2 & 3) and consumption (refer to Table 4).

2-2-3 Transitions in Livestock Development

To achieve its aims in livestock production, the Government of Indonesia is proceeding along the above guide-lines. The guidelines contemplated for the attainment of the targets may be summarised as follows:

An effort is being made to reduce the mortality of animals and at the same time increase breeding efficiency. To improve meat production, slaughter is controlled. To increase livestock productivity, and to improve quality, breeding cattle is being introduced into various areas. As for the funds required for the development, this is being made available through grant aid or loan from other countries and international organizations.

As a result of the above efforts, Indonesian livestock industry is steadily progressing according to the plans. Except for the dairy cattle, Indonesia achieved its 1979's target (refer to Table 5) for domestic animals. In livestock products the country has achieved its target for meat production, but not for eggs and milk (refer to Table 6). For more eggs and milk, the country has been importing foreign chicken and dairy cattle, and expects a rapid increase in production. While the production in the livestock industry seems to have already reached the target, unexpected population increase has led to an increase in domestic demand. Most of this increased demand cannot be satisfied. For example, Indonesia can supply only 10% of the country's demand for milk (refer to Table 7). Furthermore, statistical data of 1979 shows that annual per capita consumption of

Table 6. Development of Livestock Population Since Pelita I to 1980 (000 head)

Sort of animal	Average growth Pelita I 1969-1973 (%)	Average growth Pelita II 1974-1978 (%)	1977	1978 a)	1979 a)	1980 b)	increment/year (%)
1. Cattle	- 0.18	- 0.19	6.217	6.330	6.362	6.435	1.1
2. Dairy cattle	7.8	+ 7.5	91	93	94	99	5.3
3. Buffalo	- 4.2	- 1.04	2.292	2.312	2.432	2.506	3.0
4. Goat	2.5	+ 5.56	7.232	8.051	7.659	7.906	
5. Sheep	2.3	+ 1.66	3.864	3.611	4.071	4.197	
6. Pig	- 1.5	+ 0.15	2.979	2.902	3.183	3.296	3.5
7. Horse	0.9	+ 0.72	659	615	596	616	3.5
8. Native chicken	6.8	+ 4.99	101.686	108.916	114.350	120.067	5.0
9. Exotic chicken	49.4	+ 15.42	5.807	6.071	7.007	7.638	9.0
10. Duck	15.6	+ 6.55	16.032	17.541	18.089	19.810	6.0

Note : a). improved figure
b). temporary figure

Table 6. Development of Production of meat, egg & milk Since Pelita I to 1980 (000 ton)

No.	Commodity	Average growth Pelita I (%)	Average growth Pelita II (%)	1977	1978	1) 1979	2) 1980	
1.	Meat	4.5	4.7	467.7	474.6	486.5	505.9	3.99
2.	Egg	4.4	14.7	131.4	151.0	164.1	172.6	5.18
3.	Milk	5.1	12.5	60.7	62.3	72.2	78.4	8.59

Note : 1). improve figure
2). temporary figure

Table 7. Consumption of meat, Egg & milk per caput per year 1974 – 1980.

No.	Commodity	1974	1975	1976	1977	1978	1979 [1]	1980 [2]	% increment 1979-1980	% increment 1974-1980
I.	1. Meat (000 ton)									
	Production (interval)	403.1	435.0	443.7	467.7	474.6	486.5	505.9	3.99	3.38
	Import	2.1	1.0	2.4	1.3	1.7	1.6	1.6	0	0.90
	Supply	405.2	436.0	450.1	469.0	476.3	488.1	507.5	3.97	3.84
	2. Egg (000 ton)									
	Production (interval)	57.4	65.5	69.3	110.7	122.7	134.1	141.3	5.37	17.53
	Import	0.1	0.1	0.1	0.1	-	0.2	0.1	- 50.0	- 8.33
	Supply	57.5	65.6	69.4	110.8	122.7	134.3	141.4	5.29	17.50
	3. Milk (000 ton)									
	Production (interval)	49.5	44.5	50.7	52.8	54.2	58.5	68.6	17.26	5.97
	Import	200.4	209.7	328.6	365.2	440.3	474.2	594.3	25.33	21.02
	Supply	249.9	254.2	379.3	418.0	594.5	532.7	662.9	24.44	19.57
II.	Population in half first periode (000 person)	127,586	130,596	133,650	136,766	139,960	143,246	147,383	-	-
III.	Consumption per caput/year (kg)									
	1. Meat	3.18	3.34	3.37	3.42	3.41	3.46	3.44	-0.58	1.34
	2. Egg	0.45	0.50	0.52	0.80	0.88	0.94	0.96	2.13	14.65
	3. Milk	1.96	1.95	2.84	3.06	4.25	3.72	4.50	20.97	16.71

Note : 1) improved figure
2) temporary figure

meat, eggs, and milk is, 3.46kg, 0.94kg, and 3.72kg respectively, in Indonesia. Thus, per capita consumption of meat in Indonesia is 1/6 and eggs and milk 1/14 as much as those of Japan. This indicates that the intake of nutrition by the Indonesian is not sufficient.

Therefore, livestock industry in Indonesia is requested to proceed its development fast and to increase production so as to satisfy increased domestic demands.

2-3 Current Situation of Animal Health

Indonesian efforts towards efficient livestock production is hampered by the losses due to prevalence of infectious diseases among its livestock and consequently dropping its productivity.

2-3-1 Present Conditions of Animal Diseases

The following are conspicuous animal infectious diseases and their conditions in Indonesia.

(1) Foot and Mouth Disease

It is expected to be free of this disease in 1984.

(2) Haemorrhagic Septichaemia

Cattle and buffaloes are affected by this bacteria. The disease spreads fast causing great losses. The spread of this disease covers the whole country, except the province of Maluku and Irian Jaya. The vaccination is carried out periodically especially in places of the outbreak of the disease.

(3) Anthrax

The distribution of this disease is almost the same as that of Haemorrhagic Septichaemia. This disease occurs sporadically. The total death caused by this disease is decreasing annually by the innoculation of attenuated live vaccine.

(4) Surra, Trypanosomiasis

This hematozoic disease is widely spreading among horses all over the country except the provinces of Maluka and Irian Jaya.

(5) Brucellosis

This disease has been noted as one of zoonosis in Indonesia. In Java island, a large number of the cattles infected with this disease are found in dairy farm. It is also found in the imported breeding cattle lately.

(6) Rabies

Rabies is one of the most dangerous zoonosis found in Indonesia. Control of pet animal movements from contaminated areas to free areas are carried out intensively. Animals (dogs and cats) in which the disease is detected are immediately killed. The only free zones are Bali, West Nusa Tenggara, East Nusa Tenggara, Maluku and Irian Jaya. Vaccine for human use against this disease does not meet the demand and it makes dangerous circumstances all over the country.

(7) Newcastle Disease

Newcastle Disease has long been known in Indonesia since 1926. It is spreading widely all over the country and is the widest spread disease among chicken, so that the priority has been given to the eradication of this disease and largest quantity of vaccine is used for that purpose.

(8) Helmintic Diseases

No complete data is available on the incidence and distribution of parasitic and helmintic diseases in Indonesia. The D.I.C. report high incidences of parasitic disease of Fasciola hepatica among cattle, Dioctophyma renale among pigs and Ascaris among pigs and chicken. Proper execution of the investigation system is expected to be done for details on these diseases.

(9) Jembrana Disease

This is prevalent among Bali cattle. This disease is an acute infectious disease and shows various symptoms. The cause and treatment is not concluded yet.

2-3-2 Animal Health Administrative Organizations

Indonesian animal health administration is under the control of Directorate General of Livestock Services (DGLS), Ministry of Agriculture. The organs under the control of DGLS for animal health are as follows.

(1) Directorate of Animal Health, DGLS

Decisions of strengthening policy for animal health, decisions and directions of quarantine plan, distribution of vaccine and medical devices and planning of systematic vaccination.

(2) Center for Veterinary Biologics, Surabaya

The function of the Center is production of vaccine, biological diagnostics and sera.

(3) Disease Investigation Centers

The seven A-type D.I.C.s in the country are engaged in investigation on diseases prevalent in the areas. They conduct investigation on endemic diseases and training of the veterinarians and livestock experts working in the B and C type D.I.C.s as well as other organizations dealing with livestock.

(4) Animal Quarantine Offices

Animal quarantine offices are working on the inspection of import-export of animals, livestocks and their products as well as inspection of inter-island transportation. As a part of measures for the animal health improvement, planning of inspection strengthening is under consolidation by redistributing all of Indonesia into 5 regions and arranging check points at 12 airports, 72 seaports and 11 areas.

(5) Provincial Livestock Services and District Livestock Services

Decision on provincial livestock development policy. Conducting vaccination, diagnosis and treatment of diseases. Sampling and delivery of contaminated materials for diagnosis.

2-3-3 Animal Disease Control Measure

As for animal disease control, the following measure is taken.

(1) Necessary reporting of 19 sorts of infectious diseases including Cattle-plague Anthrax, Haemorrhagic septichaemia, Foot and Mouth Disease etc., are designated as such.

(2) To prevent invasion and spread of animal infectious diseases, prohibit import of specified animals and animal products from countries contaminated by the disease. Also prohibit the transportation of animals and animal products from affected area of designated infectious diseases to free area, thereby preventing invasion and spread of these diseases.

(3) Implementation of a systematic vaccination at the primal outbreak area of these diseases including Foot and Mouth Disease, Haemorrhagic Septichaemia, Anthrax, Rabies, Newcastel Disease etc. and its surroundings.

(4) Killing animals actually contaminated by the disease or suspected to be so, and also vaccination and isolation of the animals in the surrounding areas as well as disinfection.

2-3-4 Present Situation on Veterinary Drugs

In animal health control, the control as well as circulation and appropriate applications of good veterinary drugs besides implementation of proper control of animal diseases are indispensable conditions.

Regarding veterinary drugs in Indonesia, in 1982, 1029 kinds of drugs, are under circulation. They are 144 biological products, 816 antibiotics and general medicaments, and 69 premix-vitamines of which, 634 are imported and 395 are domestic. As for biological products, about 10% of total circulation is manufactured at the National institute, Center for Veterinary Biologics, Surabaya (VETMA). There is no private manufacture at present (P.T.

Vaksindo Satwa Utama Raya will start production within this year). At the VETMA, 18 kinds of products are prepared covering 73,304,300 doses including vaccines, biological diagnostics and sera, among them, 90% of products are applied to chickens. In addition, more than 98% of biological products under circulation, within Indonesia, are applied to chickens. There is a trend to increase both the amount and variety of veterinary drugs circulating within Indonesia. However, since there is no proper organization for investigation on the quality of drugs, there have been many losses of livestock in different regions, caused by application of drugs of which potency and safety have not yet been confirmed. On the other hand, while the manufacturers of veterinery drugs and importers, are concentrated on Java island, most of the users are situated on the other islands. Because of this, and because of an adverse climatic condition, quality control is being proposed as a step for improving the drugs in the circulation.

2-3-5 Regulations of Veterinary Drugs

At present, there are authorized regulations concerning manufacturing, import and selling of veterinary drugs. They are:

(1) Business Licencing in the Field of Veterinary Drug

In order to participate in this field, manufacture, import and circulating of biological products or other veterinary drugs, authorization by Minister of Agriculture is required.

(2) Registration of Veterinary Drug

First, the registration form is to be submitted. After acceptance of the registration form, the Director General of Livestock Services appoints the institutions where clinical or laboratory examination will be conducted on the drug concerned.

(3) The Assay of Veterinary Drug

All biological products are subjected to be assayed covering their potency, sterility and immunity prior to marketing and usage at the institute appointed by Minister of Agriculture. The appointed

institutes to conduct assay on biological products are the Centre for Veterinary Biologics, Surabaya and the Animal Disease Research Institute, Bogor.

(4) Classification of Veterinary Drugs

The veterinary drugs are classified into three groups, they are, strong drugs (requires direction for their application), limited free drugs and free drugs.

(5) Application of Veterinary Drugs

The handling of strong drugs, injections, narcotics and limited free drugs as well as the qualification of the person for handling are regulated.

(6) Veterinary Drug Supervision

Duties and authority of the supervisor is stipulated. The supervisor of each region is appointed by the Director General of Livestock Service.

(7) The Commission of Veterinary Drug

The function of the commission is to make recommendation on pharmaceutical administration and law to the Ministry of Agriculture.

(8) The Committee of Veterinary Drug Assessment

The function of this committee is to examine the registered veterinary drugs at sub-organization and to make recommendations to the D.G.L.S. for the approval of their manufacturing, circulation and application of veterinary drugs in the territory of Indonesia.

(9) Other Regulations

Packing and labelling of pharmaceutics, preferential measure on taxation system for the imported veterinary drugs are regulated.

2-3-6 Institution for Veterinary Drug Assay

As observed in the preceding section, in Indonesia, the enforcement systems are not functioning well concerning

pre-distribution assay of veterinary drugs, though there are rules and regulation stipulating every aspect ranging from registration to manufacturing, marketing and usage of them. The two governmental organizations currently assigned the national assay are laboratories engaged in research of veterinary diseases and of pharmaceuticals, rather than institutions exclusively engaged in assay operations. Under the on-going reorganization programs, the Center for Veterinary Biologics, Surabaya is restructured as a national biological products manufacturing factory and the Animal Disease Research Institute, Bogor is developed as a national research institution. Most of veterinary drugs in distribution at present in Indonesia are voluntarily assayed only by the manufacturers. These facts are caused by an absence of an appropriate institution where potency and quality of the drugs are examined in Indonesia. Therefore, it is an urgent concern for the country to establish an authorized institution to conduct the national assay.

2-3-7 Assay Standards for Veterinary Drugs

At present, the olny assay standards for veterinary drugs in effect in the country are used within the Center for Veterinary Biologics, Surabaya, and no national assay standard has yet been established in Indonesia. In order to assure proper functions of any assay laboratory and to promote distribution of veterinary drugs of good quality, a crash program is necessary for the establishment of national assay standard and certification procedures which take into account the present state of prevalence of diseases in the country, needs for preventive drugs arised from the state or livestock raisers, and technical level at veterinary drug manufacturers in Indonesia and overseas.

2-4 Aids to Indonesia's Livestock Industry from the Foreign and International Organizations

2-4-1 Livestock Development

(1) Center for Dairy Development at Baturraden, Central Java
Establishment of the Center.
Total grant by the European Economic Community: $6.4 million.
Five years.

(2) Livestock Development Project in South Kalimantan
Purchase and distribution of cattle (17,000 heads) and goats (30,000 heads).
Total loan from Asian Development Bank (ADB): $30 million.
Five years.

(3) Smallholder Cattle Development Project
Distribution of breeding cattle (45,000 heads) from South Sulawesi and West Java to Lampang, South Sumatra, Riau, and Djambi.
Total loan from International Fund for Agricultural Development (IFAD): $40 million.
Six years.

(4) South Sulawesi Transmigration and Area Development Project
Purchase and distribution of cattle (15,000 heads).
Loan from Islamic Development Bank (IDB): $8.4 million.
Five years

2-4-2 Improvement of Animal Health and Hygiene

(1) Disease Investigation Centers
Countries to cooperate in the establishment and improvement of A type D.I.C.s and training for personnel:

1)	Medan (North Sumatra)	Japan
2)	Bukittinggi (Central Sumatra)	West Germany
3)	Tanjung Karang (Lampung)	Japan

4)	Yogyakarata (Central Java)	Canada
5)	Banjarmasin (Kalimantan)	Australia
6)	Denpasar (Bali Island)	FAO
7)	Ujungpandang (Sulawesi Island)	FAO

(2) B and C Type Animal Health Laboratories

The establishment of B and C type Animal Health Laboratories, 17 in number, in the eastern islands was assisted by the Australian Government.

(3) Center for Veterinary Bioogics, Surabaya

Australia has cooperated in the establishment and improvement of the vaccines for Foot and Mouth disease manufacturing facilities and the technical cooperation. (Total amount earmarked for the project: Rupiah 2.3 billion.)

CHAPTER 3. DETAILS OF THE PROJECT

3-1 Objectives and Specifications

As the name of the project indicates, "Establishment of Veterinary Assay Laboratory", this is a project to set up a national organ to carry out assay of veterinary drugs used in Indonesia. The construction site locates in Serpong of Bogor District near Jakarta. This Laboratory is to become the only national assay laboratory in Indonesia; its primary purpose is to assay veterinary drugs in terms of their potency and safety, and allow certified products to be distributed in the market. The improved enforcement activities including those to be carried out in this Laboratory are expected to help achieving the following purposes:

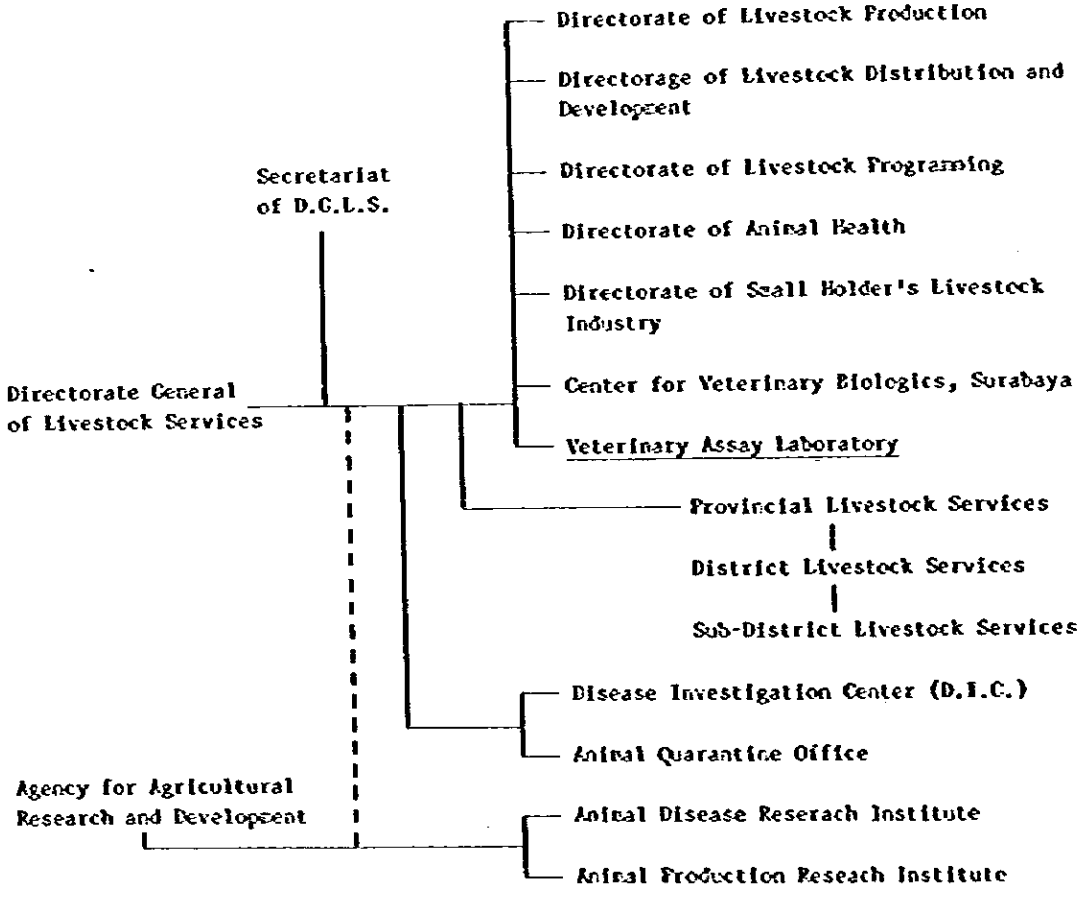
As the outright objective, the Laboratory is to assure the quality of the veterinary drugs, and thereby to improve health and hygienic conditions of livestock, increase production and incomes of the live stock raising families. It will also improve public health and the eating life of Indonesian citizens. From a broader scope of developing national economy, establishment of this laboratory will mark the achievement of one of the targets of the Government's Five-Year Development Plan. In the Five-Year Plan, development of livestock farming is expected to result in expanded production of animal protein and increase in incomes of livestock raising families due to increased exports of livestock products among other things. The Project takes a part of the livestock raising development programs in the country.

3-2 Relative Government Organization

The laboratory will form part of the DGLS (Directorate General of Livestock Services). It will enjoy the same status as any other organization under DGLS. The Relative Government Organizations appear on the next page.

Of all the organizations under DGLS, DIC must be introduced here. This organization is engaged in investigations on common diseases in livestock and identifying the nature of these diseases. There is a plan to establish the centers in seven areas around Indonesia, and five of these have already been completed. Japan and several other foreign countries are cooperating with DIC in its functions. Apart from these, referred to as type A laboratories, there are the B and C type laboratories that operate under the A type in the different regions of the country. For the maintenance of livestock health hygiene, DIC is playing a very important role in Indonesia. However, each cooperating country follows its own diagnostic pattern in the DIC laboratories. The diagnostic standard, too, are different. The Veterinary Assay Laboratory Project is expected to play an important role in straightening out this discrepancy. (Refer to 3-4-4)

Organizational Chart of The Directorate General Livestock Services



3-3 Activities

As already mentioned, the Laboratory will engage mainly in the assay of veterinary drugs to be distributed in Indonesia. Also the Laboratory will carry out in-house breeding, feeding and management of the animals required for the assay operations. It will also provide periodic training programs for veterinary drug supervisors, veterinarians and other specialists engaging in livestock health and hygiene services. The Laboratory will further carry out studies on the assay methods, certification procedures and standards. These main activities of the Laboratory are described below:

3-3-1 Assay Activities

(1) Assay Activities

The three main assay jobs are registration, certification, and re-evaluation.

1) Registration

Irrespective of their country of origin, all new drugs shall be subjected to assay before they are registered. Permission for manufacture or import shall be granted only to drugs passing the assay, and thereby assigned registration numbers.

2) Certification

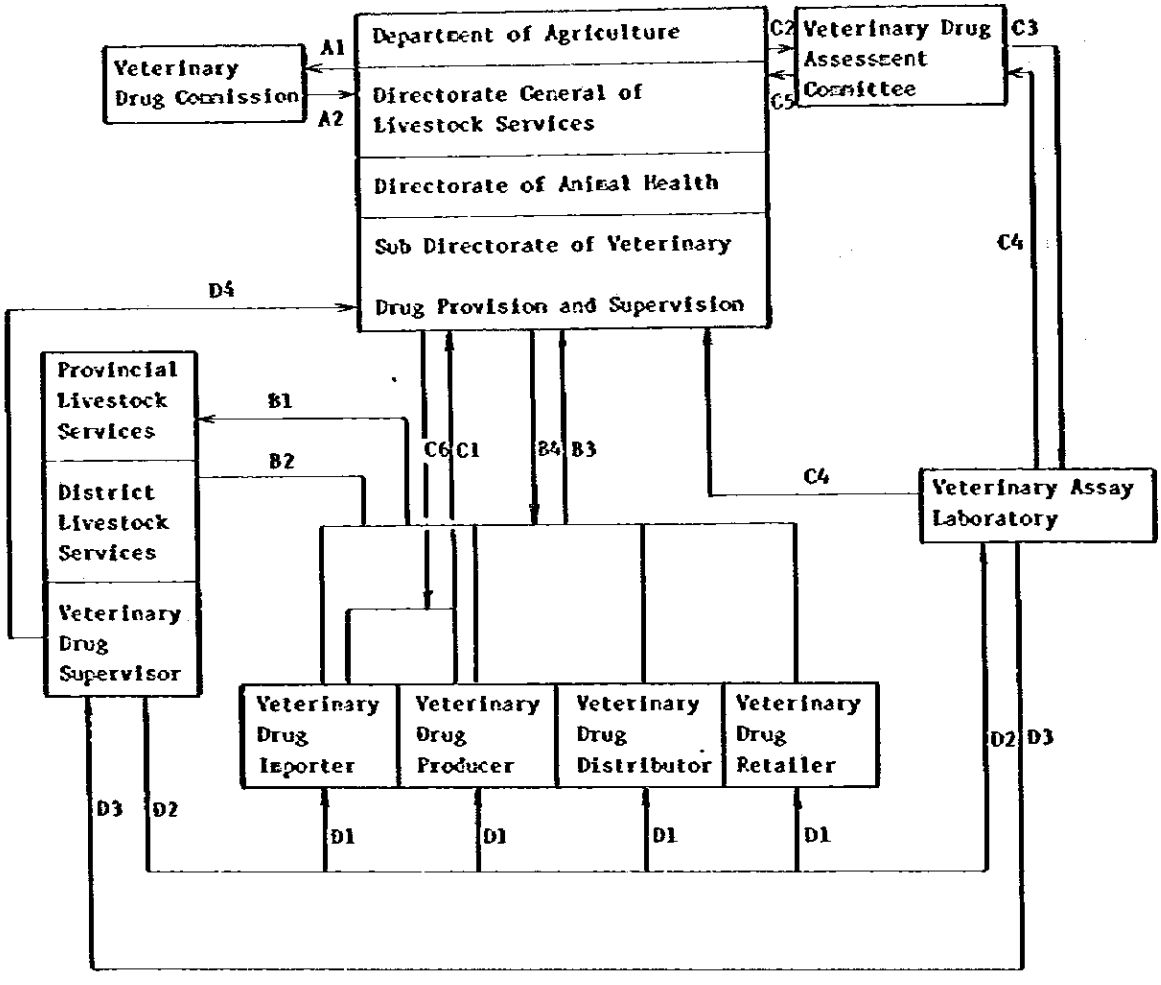
Samples collected from each lot of the registered domestic or imported drugs shall be subjected to assay. Following the method stipulated, drug inspectors shall collect samples from each lot of the drugs manufactured in Indonesia and assayed by the manufacturers and of the drugs just imported, and send them for assay according to the standards laid down by the government. Drugs shall be certified for distribution if their samples, pass the assay, and the certificate shall be affixed on each container in the presence of the drug inspector.

3) Re-evaluation

Assay shall be carried out in the warehouses of wholesellers as well as retailers on drugs already in use in the country. Object of the assay is to check the quality of these drugs.

For the assay of the drugs, the related organizations shall extend their cooperation as shown in the following.

Chart of Veterinary Drug Handling



LEGEND

A. Policy on Veterinary Drug

A1 - Asking for the suggestion & consideration

A2 - Giving suggestion & consideration

B. Licencing for Veterinary Drug Business

B1 - Asking for recommendation for business licence

B2 - Observation of the business spot

B3 - Applying for business licence

B4 - Granting business licence

C. Veterinary Drug Registration

C1 - Registering of drugs to be produced/imported

C2 - Providing data of veterinary drug to be assessed

C3 - Submissin of drug sample to be assessed

C4 - Giving the result of drug testing

C5 - Giving the result assessment

C6 - Giving the decision on the drug registration

D. Veterinary Drug Supervision

D1 - Collecting drug samples

D2 - Testing drug samples

D3 - Giving the result of testing

D4 - Reporting the result of supervision

(2) Drugs to be Assayed

The Veterinary Assay Laboratory is going to be the only institution of its kind in the Republic of Indonesia. As a result, it shall exercise jurisdiction over the entire country, and shall be responsible for assaying all the veterinary drugs used in Indonesia. These drugs can be classified into three types as follows:

a. Vaccines, sera and diagnostics Biological Products

b. Pharmaceutics consisting of antibiotics, chematherapeutics and other drugs

c. Animal feed additives consisting of vitamines, mineral and specific antibiotics

All drugs shall be assayed, irrespective of whether they are product of a domesitc manufacturer or are imported. At present, more than 1000 drugs are registered, and it is not possible to assay them all immediately. For the present, therefore, the greatest importance shall be laid on biological products and antibiotics which

are the most urgently required drugs in the country. It is mainly in this area that Technical Cooperation is sought from Japan. Indonesia also seeks cooperation in the field of assay on the general drugs, but efforts shall be made for self-reliance in thier establishment. (For the types of drugs and the number of lots assayed in a year, refer to Appendix 3-a.)

(3) Assay System

The system of assay to be carried out in the laboratory shall be organized as shown below. The samples to be assayed shall be collected by the inspectors from the approved products, and then sent assay. These shall firstly be brought to the General Assay laboratory. This consists of common tests like property test, vaccum extent test, sterility test, purity test, etc. Almost simultaneously, the respective laboratories shall assay the products for their potency and safety. A certificate shall be issued for the products if they pass the tests.

The Assay Division is divided into three sections, namely the bacteriological assay section, viral assay section, and section for the other assay tests. Of these, the bacteriological assay section shall perform general assay, bacteriological assay, and diagnostics and immune serum assay. The viral assay section shall perform assay on viral vaccines for cows, pigs, dogs, cats, and chickens. In the other assay section, assay shall be carried out antibiotics. Furthermore, this section shall perform pathological assay and assay on general drugs.

3-3-2 Breeding, Feeding and Management of Experiemental Animals

Animals necessary for the state assay and certification program will include large and medium-sized animals (cattle, goat, and pig) small animals (dog, rabbit, hamster, guinea pig, and mouse), and chickens of varying ages and hatching eggs will be required. The yearly requirements of experimental animals necessary for assay operations on veterinary drugs in this Laboratory are as follows:

Cattle	16	Dog	58		
				Chicken, conventional, one day old	100
Goat	4	Cat	4	Chicken, SPF, one day old	750
Pig	8	Rabbit	90	Chicken, SPF, 30 to 50 days old	2,630
		Guinea pig	913	Chicken, conventional	7,758
		Hamster	20	Hatching egg, conventional	2,450
		Mouse	5,810	Hatching egg, SPF	1,550

For types and quantity of experimental animals required for every lot of drugs in veterinary products assay, see Appendix 3-a.

Among these animals, cattle, goats and pigs will be purchased from outside breeders and be fed for blood letting in the Laboratory. For small animals and chickens, the Laboratory plans to breed an feed both conventinoal and SPF ones within the Laboratory premises. Since in Indonesia there is no commercial breeders for such frequently used animals as mice, guinea pigs, and hamsters, these animals will be suplied by in-house breeding in the Laboratory. For dogs, cats and rabbits, the Laboratory will purchase them fed under ordinary conditions from outside breeders and use them to its assay operations. As for SPF chickens, these cannot be bred within the Laboratory without large-scale arrangements. Therefore, for the time being, the Laboratory intends to purchase eggs of both the conventinal and SPF grades, and hatch and rear the chickens within the Laboratory. For SPF eggs, appeared difficult to obtain, the Laboratory will purchase them from Indonesia's private vaccine manufacturers or from importers.

The solid feed required for feeding the small animals will be prepared in the Laboratory since they are not available for the local market. For the rest of the animals, the feed will be wholly purchased from outside vendors.

3-3-3 Training

The Laboratory plans two types of training.

(1) Training on Veterinary Drug Quality Control

Veterinarians belonging to the national or regional supervisors serve as samplers for the drugs to be assayed or as inspectors for the storage and use of drugs. These jobs must be performed at every stage (production, distribution, and use) for the drugs manufactured, imported, or sold. The Laboratory shall import specialized knowledge on drugs and provide related information on their job. The purpose of such training courses being to improve the technical level of the specialists engaged in activities relating to the drug quality control. For the personnel engaged in quality control in the country's veterinary drug manufacturers, the Laboratory shall offer training on control of raw materials, manufacturing processes, and the final products both the domestic and imported items of drugs. For each type of training, the Laboratory shall accept 20 trainees. Every year two training courses are to be arranged, each lasting two months.

(2) Training for the DIC Laboratory Technicians

The training course for the DIC technicians (types A, B and C) shall accept 20 trainees from different regions of the country. Three courses shall be arranged per year, each to last three months.

3-3-4 Investigations and Studies on Veterinary Drug Assay and Certification Procedures

It is urgentrly required to establish national assay standard (standard requirement) for each veterinary product submitted to the national certification and to draw up the concrete manuals dealing with each assay procedure. Also, it is necessary to conduct investigations and studies to prepare for future revisions on the existing assay standards in order to keep abreast with changing social needs and the progress in assay technologies in the world.

Furthermore, there exist significant differences between veterinary products used in preventive and therapeutic applications, which account for a majority of all the veterinary products, and those used for diagnostic purposes of critical infectious diseases in the national epidemic prevention. For drugs in the former category,

strict safety standards including residue criteria with adequate margin of safety is the minimum requirement since they are directly dosed to animals. For diagnostic reagents, most of them are used in-vitro rather than in-vivo except a few antigens for intradermal applications, less strict safety standards would be allowed, however, diagnostic reagent must show specific and reproducible reactions against corresponding diseases, and sensitivity of the reagents must keep within the specified upper and lower limit strictly, so that they have to meet stricter criteria for particularity of reactions and their potency. Presently, Indonesian Government has established the Disease Investigation Centers under assistance of international organization and other countries as the field epidemic prevention service organization, while several obstacles in terms of epidemiological investigations and epidemic prevention policies have been reported, which have been resulted from one-exsistence of both uniform diagnostic reagents and diagnostic criteria.

For biological products the manufacturing conditions and application conditions at the users' level must be taken in the account, and particularly for diagnostic reagents a quality control program which rinked with diagnostic criteria is required.

3-4 Administrative Structure in the Laboratory and Staff Allocation Plan

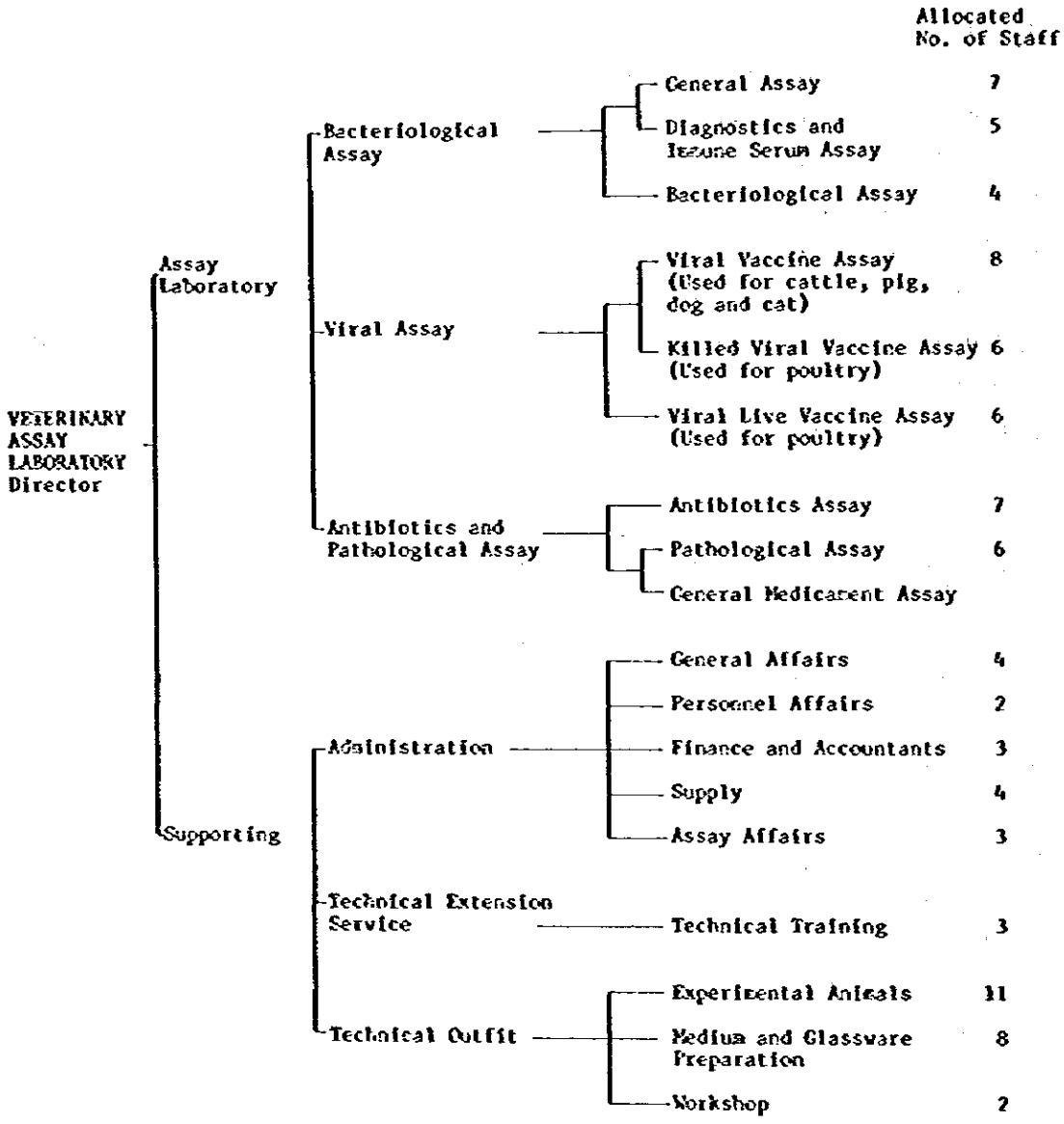
The Laboratory is divided into two divisions, one encompassing the assay section and the other involving all the remaining activities. The latter division comprises sections such as Administration, Technical Extension Service, and Technical Outfit. Details on the activities of above sections may be found in Appendix 3-a. The Technical Extension Service consists in executing study, research and establishing standards for assay. The organizational chart of the Laboratory is indicated on the next page.

The Laboratory shall appoint in all 87 persons: 18 veterinarians, 2 pharmacists, 50 technicians, and 17 for administrative staff. All the 87 members cannot be recruited immediately at the time of establishment of the Laboratory. For the veterinarians, for example, the appointments shall take place as follows:

August 1983	3
June 1984	3
November 1984	5
June 1985	5
November 1985	2
Total	18

(For the allocation of the personnel see Appendix 3-a)

Chart of Organization for Veterinary Assay Laboratory in Indonesia



CHAPTER 4. THE PROJECT SITE

4-1 General Conditions Prevailing at the Project Area

Two sites are considered suitable candidates for the project. One of these, inspected by the Contact Mission last year, is located about 30km from Jakarta. It is a 6ha plot or so in area (Site 1), lying the south of the National Center for Research, Science and Technology (PUSPIPTEK) in Serpong, Bogor District. The other, a plot of about 5.5ha area (Site 2), is situated 3km further south. Both have been handed over to the Department of Agriculture by the state-owned rubber plantations, and are specified as sites for national projects.

The actual plans for utilization of these areas are based on the development schemes contemplated by the West Jawa Provincial Planning Board. None of the sites is situated in the vicinity of any railway station, and both must be reached by car from Jakarta. The area (Gunung Sindur) has a population of 20,000, most of the inhabitants depending on farming for their livelihood and raising livestock for their consumption only.

Gunung Sindur has a maritime tropical climate characterised by high temperature, high humidity, and copious rain. According to the data (Appendix 4-d) collected at Curug, 14km to the northwest of the project site, the maximum and minimum annual temperatures of 31.5 and 22.5°C respectively (average annual temperature: 26.5°C), maximum and minimum humidities are 96% and 47% respectively (average humidity: 80%), and a wind speed of 0.5m/sec. The maximum wind speed recorded in the past was 30m/sec, but the area never experiences storms or tropical depressions. Wind blows more or less southwards throughout the year. Hundred days or so a year are rainy, annual precipitation being 1,900mm. Rainy season persists almost all through the year but is concentrated between October to next March. Geology of the area shows predominance of iron in the form of laterite. The area gets frequent thunders and almost no earthquakes.

4-2 Site-1

Site-1 is located on the top of a hill within a rubber plantation about 500m west off the Serpong-Parung Road. It includes a southward dipping slope that gives it the semblance of the back of a horse. Ricefields stretching in the valleys both in the east and the west, are located about 12m lower than the site. The access road for the site must be constructed from the main road across the ricefields. These ricefields are said to get almost completely inundated during the rainy season. Electric power to the site shall be supplied from a substation adjoining PUSPIPTEK lying about 1.5km away.

There is no telephone line in the area, and the project must make use of the radiotelephonic system used by the PUSPIPTEK. No pipelines are available for water supply, and well must be dug. Water may be pumped from a depth of 8m or so, but to obtain good quality water it must be pumped from a depth of 100m or more, accordingly construction of deep well is needed for the project. As there are no services for drainage, waste water must be treated and infiltrated naturally into the ground. As there are no gas supply lines in the area, it must be used of LNG in cylinder. Maximum resistance of the surface soil is $5t/m^2$.

4-3 Site-2

This site is situated 130m west off the Serpong-Parung Road and 3km south of site 1. It is a more or less plane land in rubber plantation, ricefields and pastures adjoining to the east. Besides these, the site is surrounded by farms beyond clearly defined boundaries. Electric power shall be supplied from the line along the road 300m south of the site and or the substation adjoining PUSPIPTEK about 4km north. For telephone, the Bogor district line along the road 300m south can be used, but this line has less the capacity then to accommodate the project demand. For water supply and discharge, the same provisions are required as site 1. The soil resistance is the same as site 1.

4-4 Site Selection

Site-1, as it being not plane, cannot be suitable for large scale building. If the terrain conditions are preserved, many restrictions must be reckoned with for building planning. This will lead to rise in construction cost, and to avoid this it will require expenditure on land reformation. Access to the project site must be constructed across the ricefields. Besides, cost of construction cost of the access road will increase because of the undulating terrain.

Site-2 is plane and can be accessed by constructing a road a fourth in length in comparison to the access road required to lead to site-1. Besides, construction of the road is not difficult here. Conditions relating to power supply and telephone connection are better in site-2 than in site-1. Terrain conditions impose no restrictions, and allow greater flexibility to the planning of buildings. The area available is smaller than in site-1, but considering the difficulties with an inclined plot, site-2 is preferable to site-1.

Because of the above, site-2 was selected as the project site with the consent of the Indonesian Government.

Project address:

Cikarang, Gunung Sindur, Bogor District,
West Java Province

4-5 The Project Site

Two existing access roads, each about 2m wide, lead to the project site both being used as short cuts by the neighbouring farmers. For the project site, one of these may be widened and used as the main access road. Ground level of the project site is at more or less the same level as the Serpong-Parung Road, ricefields and pastures lying between them are situated about 2m below.

CHAPTER 5. BASIC DESIGN

5-1 Design Policy

The basic design planning on the facilities, materials and equipment for the Project was carried out based upon the following design policy.

1. The Laboratory shall harmonize with the nature of the Republic of Indonesia in such as aspects as its natural conditions, culture, and mode of living. This constitutes the underlying guiding policy in determining such factors as the materials, construction methods, and configurations.

2. The Laboratory has the speciality on the functional needs, for example it has facilities for chemical and biological analyses and sterilized sheds for the experimental animals, satisfying a very rigid set of conditions. The large range of data already available shall be referred to, and the desired functional qualities shall be achieved after taking into consideration the local conditions relating to materials used and construction method.

3. In order to strive for the most effective utilization of the funds within the framework of the limited grant aid of the Government of Japan, efforts shall be made to achieve any possible reductions in costs while still satisfying the necessary functions and levels thereof. Specifically speaking, this means that in addition to design considerations, efforts shall be made in such areas as the use of construction methods suiting the local conditions, and the use of domestically produced materials or materials that are otherwise easy to procure on the spot.

4. The facility shall be one designed to enable easy maintenance and administration, while efforts shall be made to reduce running costs by such measures as utilization of natural conditions in

such aspects as ventilation and lighting, or considerations in the construction of the facilities.

5. As for the assay equipment, types that enable easy maintenance and control, and for which parts and components can be procured locally as much as possible, shall be adopted.

5-2 Site Planning

Since the site is flat, there is no particular need to carry out any land preparation work. At the present, it consists entirely of rubber tree groves, however, these trees comprise invigorating and clear groves, and so felling of the trees shall be kept to a minimum from the standpoint of screening off the direct sun light too. As for the access road, at the present, there are two that lead into the site from the Parung-Serpong road (refer to site drawing), however, both of them are simple paths of two to three meters in width, and cannot be used in their current state. The one on the south is somewhat larger however, from the standpoint of the shape of the site, the road on the northern side that leads to the center of the site shall be expanded and used as the access road.

5-3 Basic Planning

5-3-1 Outline of Facilities

The facilities comprise the main building, the blocks of animal houses, and supplementary ones. The main building houses the assay sections, administration section, and technical extension service section, and shall fulfill the major functions of the Assay Laboratory. The animal houses consist of five buildings: the breeding house for small animals plus the inspection house therefore, the breeding house for chickens plus the inspection house therefore, and the large animal house; and inspection houses for small animals and chickens have infection rooms. The planning also provides for a transformer

sub-station (an in-house power generator system shall be installed here too), post-mortem house, incinerator facility, storage for explosives, and lavatory, plus elevated water tank and drainage and waste processing facility, as the minimum and indispensable facilities.

5-3-2 Plot Planning

(1) Zoning

The planning of the basic zoning was carried out dividing the site into four zones; the laboratory zone, the zone for the supporting facilities, the zone for the residential facilities and the zone for the future extension space. The first two are the area for the Assay Laboratory proper; they have been put together in rectangular form and sited on the northern side of the site, with the irregular shaped space on the southern side remaining for the residential facility zone and space for future extension.

According to meteorological data obtained, the prevalent winds are in the the north-south direction, with north winds being particularly prevalent, and so in order to prevent any inter-action caused by winds between the laboratory zone and the supporting facility zone, the Assay Laboratory area is separated into two, i. e., east and west, with the approach side being made the laboratory zone and the west side being made the zone for the supporting facilities. The space for extension is provided at the south-west sector.

(2) Positioning of Buidlings within the Assay Laboratory Area

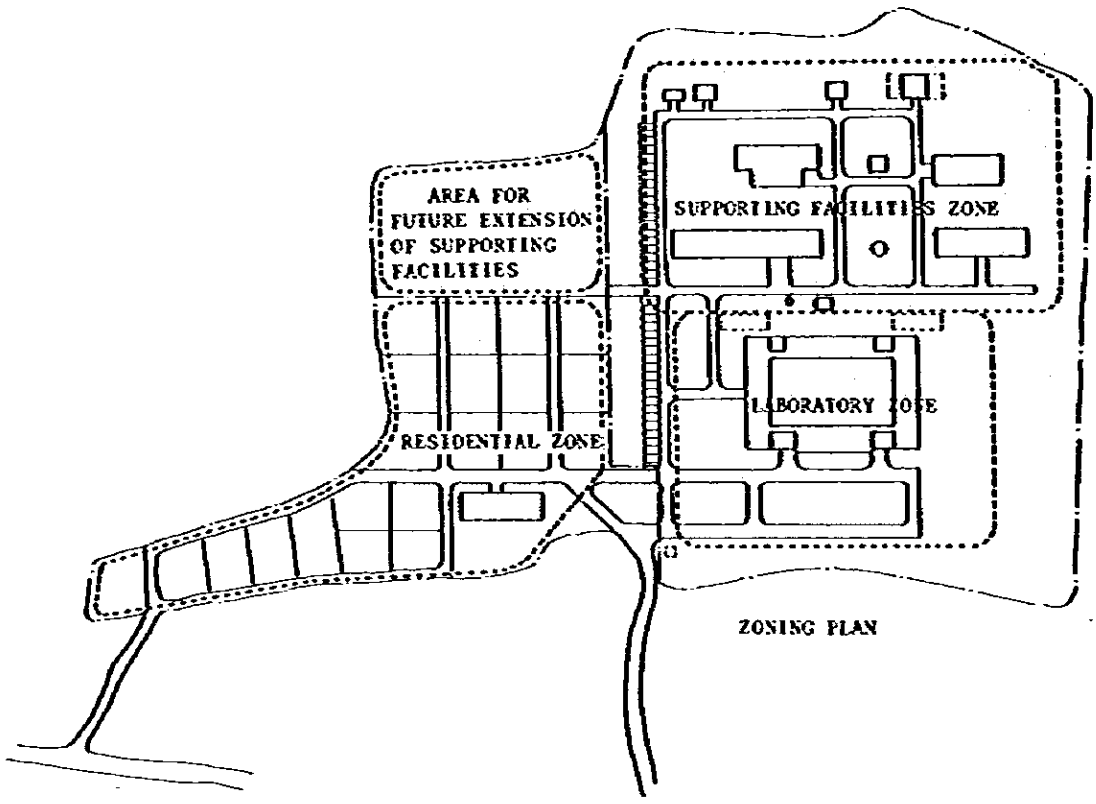
The space between the Serpong-Parung road and the site consists of irrigated rice fields and pastures, and the site can be seen from the road without any screening objects in between. Taking this into consideration, although the area in front of the main structure slopes down towards the east, the trees in shall be felled to comprise an open front garden. However, other than this, except for those places the facilities or roads are to be built, as much of the existing trees should be left as they are, to retain the current serene atmosphere of them. Other than the main building the facilities can be classified into three groups namely the small animal houses, the

chicken houses, and other structures. Taking into consideration the prevalent winds, these structures are positioned in parallel in the form of 'strata' in the north-south direction. The post-mortem house and the incinerator house are the facilities with the highest possibilities of causing contamination, so they were positioned at the far west side along with the storage for explosives and large animal house, while the small animal houses which have the closest connections with the post-mortem house, were positioned in the center, and the chicken houses on the east side, directly behind the main building. Taking into consideration the prevalent north winds, for each of these blocks which is laid out in the form of strata, the cleaner facility shall be positioned in the north and those with the higher degrees of contamination possibilities in the south. The lavatory is positioned in the center as an independent building, and shared by the staff of the facilities except the main building.

In order to reduce the distances from the water tower (deep well is also scheduled to be positioned beneath this water tower) and the transformer sub-station to each structure, these facilities are also positioned in the center of the Assay Laboratory area.

As mentioned earlier, the access road shall be the northernmost of the two existing roads; it is to be widened and put in good order and put to use. This access road shall be extended straight to the blocks of facilities behind the main structure and it is planned to position the parking lot for staff and visitors (providing space for 40 vehicles) requested by the Indonesian side along the road.

Although this is not included in the work to be handled by the Japanese side, insofar as the residential zone is concerned, a layout plan of residential quarters of 350 to 400 square meters and a dormitory for 20 persons is submitted. (These are items that were requested by the Indonesian side.)


AREA FOR
FUTURE EXTENSION
OF SUPPORTING
FACILITIES
SUPPORTING FACILITIES ZONE
RESIDENTIAL ZONE
LABORATORY ZONE

ZONING PLAN

5-3-3 Architectural Planning

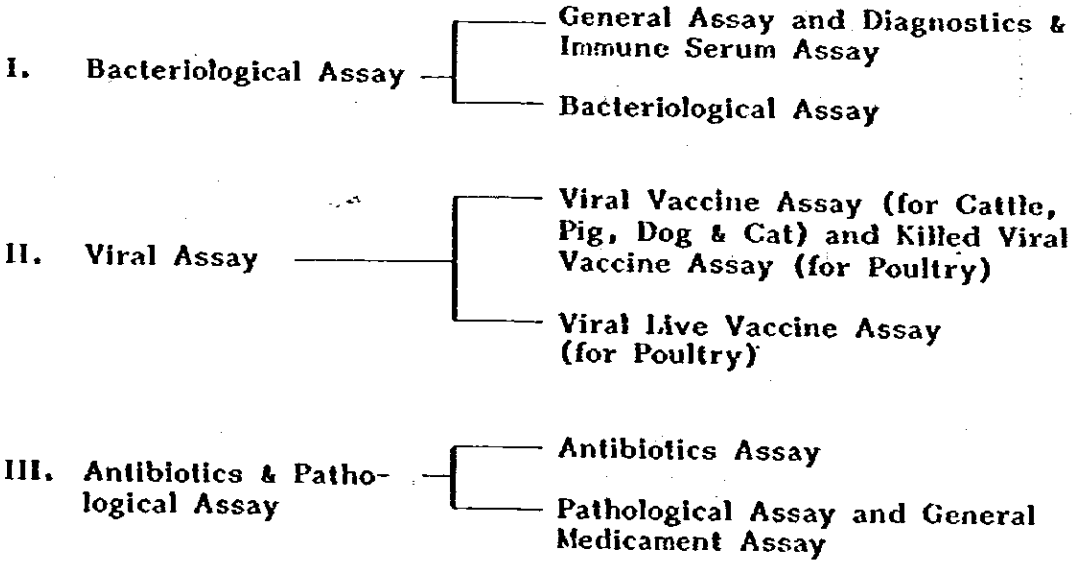
(1) Building Planning

1) Main building

The main building will house the assay sections, administration section, and technical extension service section, and layouts have been made for each of these sections; the assay division is isolated from other sections in the main building to assure a high degree of cleanliness.

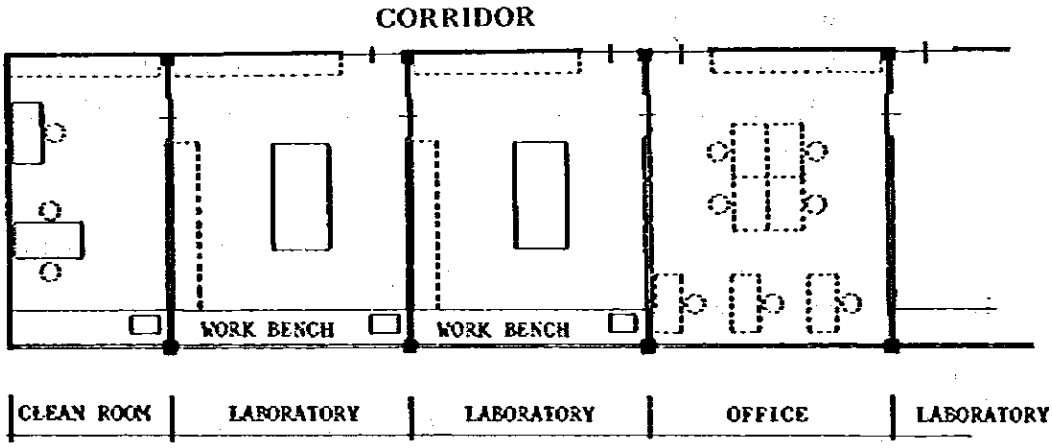
a) Assay division

This division will consist of three assay sections, or nine laboratory rooms in the original plan, but as a result of later consultations, under the current plan those sections that handle work in lessor priority are integrated and now the division consists of three assay sections comprising six units. Each assay section will have two units, and basically, each unit will comprise two assay laboratories. The relation of the nine laboratory rooms and the units is as follows.



Office rooms for veterinarians and pharmacists will be provided for each group, and this office room in the center is flanked by laboratory units in both wings. Direct access between the office and the laboratory rooms will be possible, and the configuration of the laboratory unit is such that the farther remote from the office to the end, the higher the degree of sterility.

The incubation rooms and instrument rooms annexed to the assay division serve to shared uses to allow provisions of these utility facility to the minimal. With regard to freezing and refrigeration facilities, pre-fabricated units will be employed since on-the-spot works for these facilities could not meet insulation and other high precision requirements.



TYPICAL LABORATORY UNIT PLAN

b) Administration section

Taking into consideration the request of the Indonesian side for adequate office space, the office spaces are planned on the standard of 5.5m^2 per head except reception area.

c) Technical extension service section

There were requests from the Indonesian side for office space, library, and a seminar room with

accommodations for some 40 persons; however, in order to save floor space, an independent conference room for preparatory discussions was not provided for; instead, the size of this seminar room was increased somewhat and designed so that it could be partitioned into sub-rooms at two places so as to serve as smaller conference rooms.

d) Configuration

If the structure was to be single-story then they would take up too much space vis-a-vis the size of the site, while if it was to be made three story structures or higher, then this would pose inconveniences in moving various types of equipment and samples, while it was anticipated that construction costs would go up with the use of piles, and so the structure was made two story structures. In addition, there had been a request from the Indonesian side to the effect that the structure would not exceed two stories. Insofar as the basic concept was concerned, in order to endow the structure with 'Monumentality', it is being laid out in a symmetrical manner, while in order to improve natural ventilation, side corridor style is applied. As a result of functional study, it has a rectangular configuration built around an inner court. The Four straight blocks compose the four sides of the quadrangle, namely the east, west, south, and north blocks. In order to avoid direct exposure to the sun light at sunrise and sunset and taking into consideration the prevalent north winds, the laboratory rooms, which comprise the central facilities of the Assay Laboratory and call for the most stringent environmental conditions, are positioned in the south and north blocks. In the west block are lined up the sterilization rooms and instrument rooms which are to be shared by assay sections, while in the east block that is the front block of the quadrangle, on the first floor the administration section and on the second floor the technical extension service section are to be located, isolated from the other blocks. As for the entrances, there shall be

three, one on the front of the east block for the officials and visitors, and one for receiving the items to be assayed, while taking into consideration better convenience in access to the animal houses, one for laboratorians on the south side.

2) Animal houses

As for the blocks of animal houses, the number of animals that shall have to be accommodated was calculated from such informations as the annual lots of medicaments to be assayed, the periods of assay, and number of animals that is necessary for each assay, and based upon the figures obtained, the size and number of rearing rooms, and the scale of the structure was thus determined. (Refer to (4) for details of animals to be housed in each rearing room.) In the interests of reducing the construction costs and convenience in the moving of equipment, each of the structures is made single storied.

a) Fowl house

The viral live vaccine area and killed viral vaccine area are separatead from each other with the former having separate clean and dirty corridors and designed with barrier system. The cages and other equipment are sterilized and fumigated by formalin within each of the rooms after the assay, and so there is no washing room, and it is necessary to ensure air-tightness of the room. As for the killed viral vaccine room, taking into consideration the possibility of challenge examination using virulent strain, preparation-room is being provided.

b) Breeding house for chickens

This is a facility where purchased eggs from outside incubated and bred to chickens, to supply the chickens necessary for the various assays (650 SPF chickens and 1600 conventional ones). Like the small animal breeding house, this structure does not apply barrier system. However, the eggs which purchased consist of both S.P.F. types and conventional types, and so the S.P.F. area and

the conventional area have been isolated from each other with a void space in between.

c) Small animal house

This structure houses dogs, rabbits, cats, guinea pigs, hamsters and mice, and comprises an area for viral live vaccine which has a very high contagion risk, and an area for killed viral vaccine. The Japanese experts pointed out with reference not only to the live vaccine area but also the killed vaccine area that there is the risk of contamination occurring because of faulty inactivation or presence of assay items requiring challenge examination using virulent strain. Accordingly, clean corridors and dirty corridors are to be provided for both areas, with barrier system applied.

d) Breeding house for small animals

This is the facility which provides the small experimental animals (mice, guinea pigs, hamsters) used in the Assay Laboratory. Out of consideration of the scale thereof, the breeding shall all take place with S. P. F. conditions. However, when isolation from outside the structure can be assured, in light of the contents, since it is considered that there is very little possibility of sources of contamination being brought into the structure, barrier system is not applied.

e) Large animal house

This stable is to house cattle, horse, pigs, sheep and goats, and is for the drawing of blood from healthy animals, however, in designing the facility, the possibility that part of it might also be used for infectious examination is taken into consideration.

f) As for the other facilities, i.e., the post-mortem house, incinerator house, storage for explosives, and transformer sub-station, efforts were made to achieve low cost in con-

struction, in accordance with their necessary functions and scales of activities.

(2) Element Design

The tropical climate with high temperature and humidity must be considered first in designing each element. Because of the intensity of sunlight and rain fall, a comfortable and healthy environment with good ventilation and water proofing is to be planned, attempting to save energy and to cut down the cost of construction.

Reinforced concrete, common in Indonesia, is basically used as the building material. Many parts of buildings shall be air-conditioned and mutual pollution must be prevented. Therefore reinforced concrete construction with high enclosing capacity is more suitable for these buildings than a steel structure as the other conceivable. Finishing materials should be selected considering firstly special function of the laboratories and animal houses.

As a general rule there is much damage caused by termites, so wooden materials need special treatment for preventing such damage.

(a) Roof

Each roof shall be sloped to allow heavy rainfall runoff. Locally manufactured roof tiles shall be used to match the buildings with the surroundings. To raise waterproof, heat insulation and closing efficiency, each roof shall be applied first with waterproof and heat insulation, then finishined with tiles.

(b) External wall

Reinforced concrete, locally manufactured brick and concrete blocks, etc., shall be used. Heat insulation materials shall be applied to wide wall surfaces exposed to the sun to prevent heat conduction.

(c) Window

Each window shall be as wide as possible to utilize the most sunlight. To obstruct the direct sunlight, louvers and eaves shall be used. In the main building, laboratories as well as

non-air-conditioned offices, there shall be some high side lights etc., because natural ventilation is enough for comfort without air-conditioning. Each window of the external walls uses an aluminum sash to prevent damage by termites.

(d) Ceiling

In the non-air-conditioned rooms and laboratories, the ceiling should be high enough for a comfortable environment under natural conditions. Ceiling materials, especially in animal houses shall be selected to resist formalin fumigation and water washing.

(e) Partition wall

Reinforced concrete, locally manufactured brick and concrete blocks, etc., shall be used, and in laboratories flexible wooden partitions shall be used. Finishing materials used in laboratories and animal houses, etc., shall be selected to resist water or chemicals.

(f) Floor

Finished synthetic resin floors shall be selected for laboratories to resist chemicals and water. Terrazzo blocks and vinyl tiles etc., shall be used for the other rooms.

(3) Structural Design

1) Design Policy

Prudent considerations should be adopted on structural design for both seismic forces and wind forces. This construction site is located about 30km far from the sea, and the maximum wind speed is 30m/sec. The Republic of Indonesia lies on the area where the Pan Pacific Seismic Zone and the Asian Longitudinal Seismic Zone cross each other, so earthquakes frequently occur there.

Earthquakes, however, can be observed mainly along the Indian Ocean rather than along the Java Sea. Eventhough this site is in a rare seismic zone, it is neighbouring a powerful

seismic zone. Therefore aseismatic design shall be based on the Indonesian Earthquake Prevention Standard.

The structural design shall adopt reinforced concrete frame, and consider larger than usual seismic energy. Because the soil seems to make a 5 - 10t/m^2 bearing power based on the given data, it is possible to have a foundation directly on the soil.

2) Design Standard

The Indonesian Construction Standard is in the Indonesian Building Performance Standard (Part 17 of Laws concerning Indonesian businesses in which live load wind pressure force and seismic load are specified in details).

The construction design should be made based on the Standard as described above referring to some standards determined by the Architectural Institute of Japan. Loads on buildings should take account of the following items:

a) Dead Load

It is necessary to calculate the weight of construction materials, finishing materials and accessory materials fixed in the building.

b) The value specified in Indonesian Standard should be used in principle, but we should calculate some values to match the real conditions especially on heavy loads. Live load on main rooms for slab is as follows:

Office room, laboraty and school room	250 kg/m^2
Steps and corridors	300 kg/m^2
Balcony	300 kg/m^2
Operating room, library and machine room	250 kg/m^2 or more

c) Wind pressure force

Because the project site is located more than 5 km far from the sea, the wind velosity pressure of 25 kg/m^2 is stipulated due to the Indonesian Performance Standard. Wind force coefficieint affecting the entire building or each element of the buildings are also specified in the Standard.

d) Seismic force

Because the job site is referred to as the area of Zone factor II, the seismic force should be at 0.05 judging from the scale of its foundation and structure.

3) Construction Material

a) Normal weight concrete should be used for construction material and four-week cylinder strength should be 210 kg/cm^2. The cement plant should be built on the job site to perform measuring and mixing operations. Because the job site is in a tropical zone, the concrete should be stiff-consisted and cured by supplying or spraying water over the concrete to raise its quality.

b) Reinforcing bar

All local products should be used as reinforcing bar; mainly SD30 and SR24.

(4) Outline of the Room Area

The standard area of the laboratory in main building is determined by arranging the following equipment: the experimental table at the center, the table along the window and the required instruments. The area of each laboratory is varied according to its specified function. The space of each instrument room is determined by the arrangement of machineries and that of each office is by the number of staff and the furniture in it.

In case of the animal room, the number of animals necessary for an assay at one time is calculated each assay and kind of animals, and the number of rooms is determined by dividing animals into groups which can not be gathered in the same room. The area of one room is determined by calculating the needed cage size on the basis of the number of animals in each room, and the arrangement of the cages.

1) Main buidling

o Assay division

Bacteriological assay sec.

Laboratory:	$35.64m^2$ x 3, $53.46m^2$
Clean room:	$17.82m^2$ x 2
Office:	$35.64m^2$

Viral assay sect.

Laboratory:	$35.64m^2$ x 3, $53.46m^2$
Clean room:	$17.82m^2$ x 2
Office:	$35.64m^2$

Antibiotic, pathological and general medicament assay sect.

Laboratory:	$35.64m^2$ x 3, $47.52m^2$, $15.66m^2$ x 2
Balance room	$8.91m^2$
Moisture content testing room:	$8.91m^2$
Office:	$35.64m^2$

Common use

Refrigerating room (-20°C):	$9.72m^2$ x 2
Freezing room (+4°C):	$12.15m^2$ x 3
Incubating room (37°C):	$14.58m^2$, $19.44m^2$
Incubating room (22°C):	$14.58m^2$
Incubating room (for eggs):	$19.44m^2$
Freeze dryer room:	$12.15m^2$
Deep freezer room:	$19.44m^2$ x 2
Centrifuge room:	$19.44m^2$, $12.15m^2$
Dark room:	$14.58m^2$
Fluorescent microscope room:	$19.44m^2$
Medium preparation room:	$29.16m^2$
Washing and sterilizing room:	$72.9m^2$

o Supporting division

Administration sect.

Director's room:	$46.08m^2$
Office:	$86.40m^2$, $46.98m^2$

Technical extension service sect.

Office:	$17.82m^2$
Library:	$35.64m^2$
Training room:	$106.92m^2$

2) Fowl house

o Viral live vaccine assay

For 100 chickens:	$14.4m^2$ x 5
For 200 chickens:	$21.6m^2$ x 4

o Killed viral vaccine assay

For 200 chickens:	$21.6m^2$ x 2

o Others

Office:	$16.2m^2$

3) Breeding house for chickens

o For SPF chickens

Breeding room:	$14.4m^2$ x 2
Breeding box room:	$14.4m^2$
Incubator room:	$14.4m^2$
Office:	$14.4m^2$

o For conventional chickens

Breeding room:	$14.4m^2$ x 5
Breeding box room:	$21.6m^2$
Incubator room:	$14.4m^2$

4) Small animal house

o viral live vaccine assay

Breeding room:	$16.2m^2$ x 3

o Killed viral vaccine assay

Breeding room:	$16.2m^2$ x 3

o Other rooms

Washing and sterilizing room:	$55.2m^2$
Observation room:	$22.5m^2$
Office:	$13.5m^2$

5) Breeding house for small animals

o Breeding rooms

Breeding room:	$9m^2$, $16.2m^2$x5, $32.4m^2$

o Others

Washing and sterilizing room:	$32.4m^2$
Office:	$12.0m^2$
Feed factory:	$32.4m^2$

6) Large Animal house

Breeding room:	$10.8m^2$ x 4
Office:	$10.8m^2$

7) Post-mortem house

Post-mortem room:	$30.0m^2$
Small post-mortem room:	$6.0m^2$

8) Transformer substation

Transformer room:	$49.0m^2$
Generator room:	$20.0m^2$
A.V.R. room:	$9.0m^2$
Distributing:	$6.0m^2$

(5) Floor Area of Each Building

Each building was designed including corridor, lavatory, stair case and warehouse, etc., in based on the main room area described above according to the Architectural Planning in 5-3-3. (See 5-4 Basic Design Drawings) The area of each building is as follows:

Main building	$2,454.08m^2$
Fowl house	$494.20m^2$
Breeding house for chickens	$336.96m^2$
Small animal house	$379.80m^2$
Breeding house for small animals	$312.00m^2$
Large animal house	$81.00m^2$
Post-mortem house	$42.00m^2$
Incinerator house	$36.00m^2$
Storage for explosives	$10.00m^2$
Transformer substation	$84.00m^2$
Lavatory	$36.00m^2$
Total	$4,266.04m^2$

5-3-4 Utility Planning

(1) Air Conditioning Installation

In the laboratories and the clean rooms of the main building, and in the breeding rooms and the inspection rooms of the animal houses, the air conditioning equipments are installed to gain required conditions to fulfill their functions.

In synthetic consideration of required sorrounding conditions of each room, saving of the running cost, easy maintenance and simple daily operation, the air conditioning systems are designed. They are planned as follows;

1) Laboratories

They are the subject in the main building and are required to be in quasi-clean conditions. Therefore the air conditioners are installed in these rooms and they are the individual unit type. Their cooling capacities should be 150 kcal/m^2 or more.

2) Clean rooms

They are required to keep an aseptic condition. It is, however, difficult to provide this condition only by the air conditioners for economical reasons. Therefore ventilation and sterilizing lamps are used jointly, and the work which need strict aspetic condition are performed on operating tables. The air conditioners are of the individual unit type and their cooling capacities should be 180 kcal/m^2 or more.

3) The director's room, measuring equipment rooms, dark room, the post-mortem rooms, etc.

The air conditioners in these rooms are also performed by individual unit type. And their cooling capacities should be 150 kcal/m^2 or more.

4) The fowl house for viral live and killed viral vaccine assay

The air conditioner is installed to provide the required condition for testing chickens, and to limit the polluted area. It is a central all fresh air system, and the air conditioning capacity should be 300 kcal/m^2 or more. The air ducts are made

of vinyl chloride to prevent them from being corroded by formalin fumigation.

5) The house of small animals for viral live and killed viral vaccine testing

The air conditioning is performed in the same way as described in 4).

6) The small animal breeding rooms and chick breeding rooms

The air conditioning is performed in the same way as described in 4). But high-performance filters should be provided for the air supplying systems.

7) Freezing and refrigerating

The freezers are installed in a machinery room and cooling towers are installed on the roof top. The systems for the first floor and for the second floor are separated from each other. The temperature should be -20°C in the freezing rooms, and +4°C in the refrigeration rooms.

(2) Ventilating Installation

The ventilating installation is planned as follows according to their uses.

1) The offices, laboratories, conference room, etc.

The ventilation is a local exhaust system by ventilating fans or ducted fans.

2) The clean rooms, washing and sterilizing rooms, animal rooms, etc.

The method of exhaust is the same as 1), and the air supply is also performed.

3) The fowl house

The ventilation is a central exhaust system and the air supply is performed through the air conditioner. High-performance filters should be applied in its exhaust outlets.

4) The house of small animals

The way of ventilation is the same as described in 3).

5) The small animal breeding rooms and check breeding rooms

The ventilation is performed by a central system.

(2) Plumbing and Sanitary Installation

1) Water supply system

In order to supply good quality of water, a deep well is constructed in the site which is required to be 100m deep with 200mm diameter and available to pump up 200l of water par minute. Well water is pumped up and once reserved in a reservoir tank, then pumped up to an elevated tank and thereafter distributed to required places by gravity. The capacity of a reservoir tank shall be $30m^3$ because the required maximum quantity of water for the Laboratory shall be about $92m^3$ par day, when all facilities in the site are completed and fully operated. An elevated tank shall be installed 20m above the ground level and have capacity of $10m^3$. The lifting pump shall have capacity to satisfy the maximum instantaneous supply capacity and two units shall be installed against any trouble.

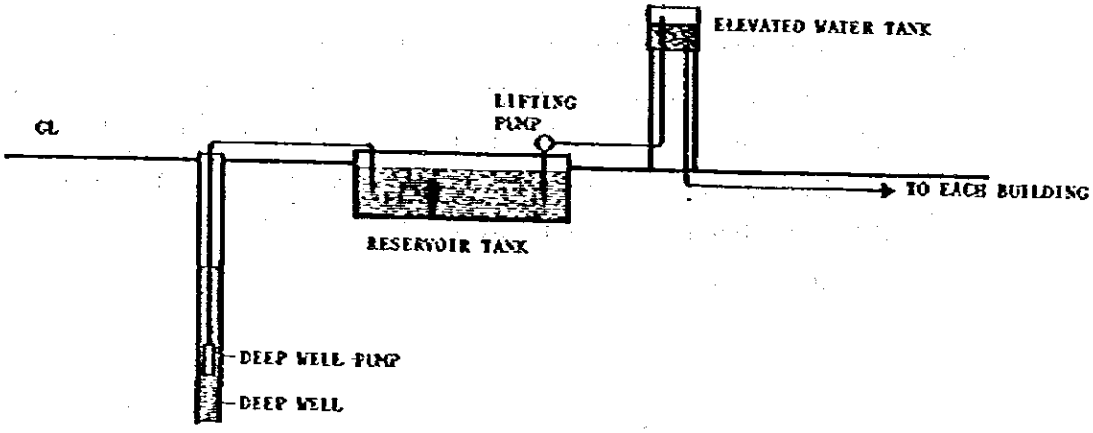


DIAGRAM OF WATER SUPPLY SYSTEM

2) Drainage system

Drainage is performed by different means according to the contents of waste water. The classification is as follows;

a) Sanitary sewage
b) Domestic waste water
c) Waste water from animal houses
d) Waste water containing chemicals

a) Sanitary sewage

The sanitary sewage from lavoratories is led to primary treatment tanks installed near the building to precipiate the waste. Then the water is led to secondary treatment tanks installed around the site to be finally treated with aeration and sterilization, and infiltrated into the ground.

b) Domestic waste water

Domestic waste water from each building is led to the secondary treatment tanks, and infiltrated into the ground.

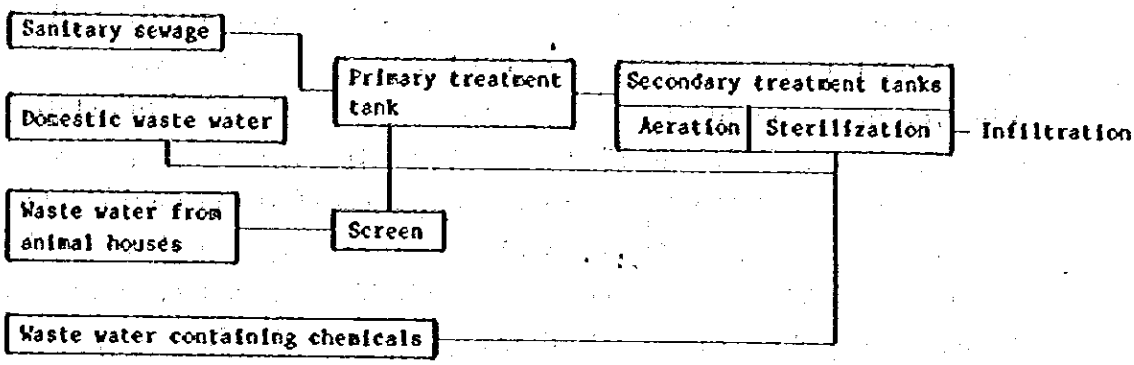
c) Waste water from animal houses

Waste water from animal houses is filtered before primary treatment, because it contains much hair, feathers and down.

d) Waste water containing chemicals

Waste water containing much chemicals from laboratories and washing rooms, etc. is directly led to sterilizing tank in the secondary treatment tanks and diluted with other sorts of waste water to be infiltrated into the ground.

The following flow chart shows these disposal.



3) Hot Water Supply System

Hot water is supplied by gas water heaters installed in places where it is required.

4) Sanitary fixtures

Necessary sanitary fixtures are provided for required places in each building. The closet bowls of lavatory are Western-style for main building and local-style for the toilet building. Showers are provided for testing animal houses.

5) Gas installation

Liquefied natural gas (LNG) is used. The LNG cylinders are placed outside close to the place that requires gas.

6) Incinerator installation

Next to the post-mortem room, a incinerator for animals is installed. It is a side-door type one for small to medium-size animals. The burning capacity should be 200kg/2hr. The oil tank for incinerator is placed close to the incinerator room.

(3) Electrical Installation

1) Substation

PLN (Perusahaan Umum Listrix Negara) supplies electricity. Electricity is supplied to the substation via the PLN substation constructed in the project site. Electricity is conducted to the

substation by means of the overhead line beside the public road and the underground line in the project site. For the underground conductor, tape-armored cables are used, and at the special place such as the road and the cables cross each other,piping should be taken to protect them. Substation employs an indoor-open system and its transformer capacity is planned to be 300kVA by using one transformer bank. The primary power 20kV, 50Hz, 3-phase, 3-wire is supplied to the substation. The secondary power 380V/220V, 50Hz, 3-phase, 4-wire is supplied to each building. Automatic voltage regulator (AVR) which capacity is 75kVA should be equipped in the substation. And it is used for the power supply to the units largely effected by the high range of voltage fluctuation in the primary power distribution line. A 3-phase static type AVR is planned to be used.

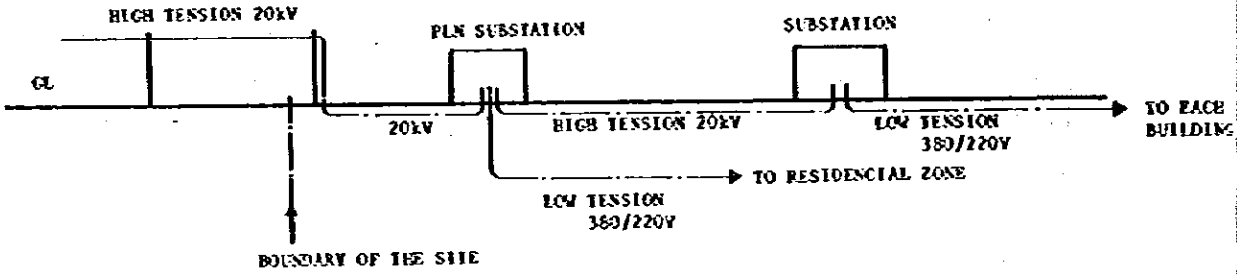


DIAGRAM OF ELECTRIC POWER SUPPLY SYSTEM

2) Generator for Emergency

Power failure caused by the frequent lightning often occurs in this region, therefore the generator should be equipped for emergency in order to supply power for the pumps, refrigerators, and air conditioners. The radiator cooled indoor type generator is equipped and the oil tank capable of running the generator for thirty hours is installed. The generating capacity is planned to be 100kVA. The generator should be equipped in a building separated from other buildings, because its noise and vibration may affect the test equipment and experimental animals.

3) Lighting Fixtures and Receptacles

Fluorescent lamps are mainly used for illumination of each buidling. The switching system for each room is divided into small divisions to save energy. The mean intensity of illumination for each room is as follows:

a)	Laboratories:	400 lux
b)	Offices, conference room, and library:	300 lux
c)	Rooms in the animal houses:	200 lux
d)	Hallways and lavatories:	100 lux

Sterilizing lamps are installed in the clean rooms, laboratories and SPF animal houses. Insecticidal devices using electrical shock are installed in the place where insects cluster at night (ex. animal house).

Receptacles consist of three types, that is, for general use, testing equipment and AVR equipment and mounted at each place which requires them.

Power is supplied to each lighting fixture and receptacle via the distribution board installed in each building. For the protection of branch circuits, molded case circuit breakers are used. Wiring of each circuit must meet the Indonesian Industrial Standards (S.I.I., i.e. Standard Industries Indonesia), and should be wired by the concealled wiring method.

4) Telephone

The cable from the access road to the MDF in the main buidling is wired under the ground. Due to the shortage of telephone circuits, a radio telephone system will be used for some time. The telephone which also serves as a interphone is installed in the administration office, laboratories, and each office of animal houses. The telephone exchanger should be selected considering the possible increase of telephone lines in the future.

5) Public Address System Equipment

A public address system is planned for announcing messages and information to each building. Its equipment is to be placed in the administration office of the main building. This system should be capable of announcements to specific blocks.

6) Automatic Fire Alarm

Automatic fire alarm is installed in the main building, according to the Japanese Fire Service Act, because the Indonesian standards are not sufficient in content. The alarm receiver is installed in the office and alarm unit (bells, lamps, and buttons) are installed in appropriate places. Considering the maintenance, heat sensors should be used only in the places where fire is to be used.

7) Antenna Installation

A radio broadcast receiving antenna is to be installed and its outlets are mounted in the head manager's office and administration office. Also, piping for radio telephone antenna and TV antenna are to be installed.

8) Lightning Conductor

The Indonesian regulation requires that a building taller than 15m should be provided with a lightning conductor. However, each important building should be provided with a lightning conductor due to the frequent lightning.

5-3-5 Equipment and Apparatus

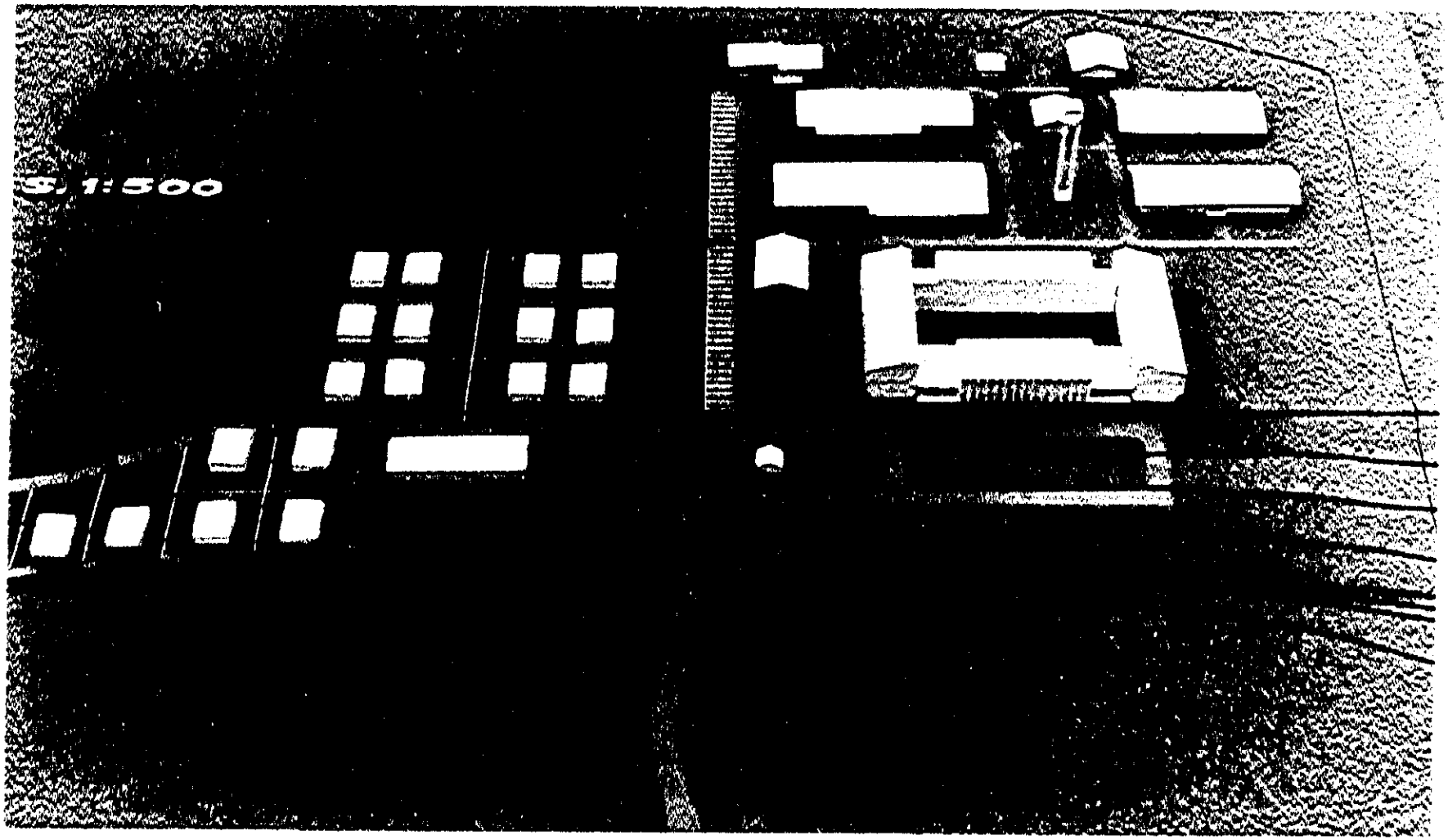
Japan is going to extend the Technical Cooperations for the implementation of this project. The equipment and apparatus for the test and examiantion provided by Japan have been selected mainly by the Technical Cooperation party, after consultations with the counterparts of Indonesia. And it was decided to install the equipment as a part of the grant where such installation is related to the construction of the buildings, or involves a large number of units.

5-3-6 Equipment and Apparatus List

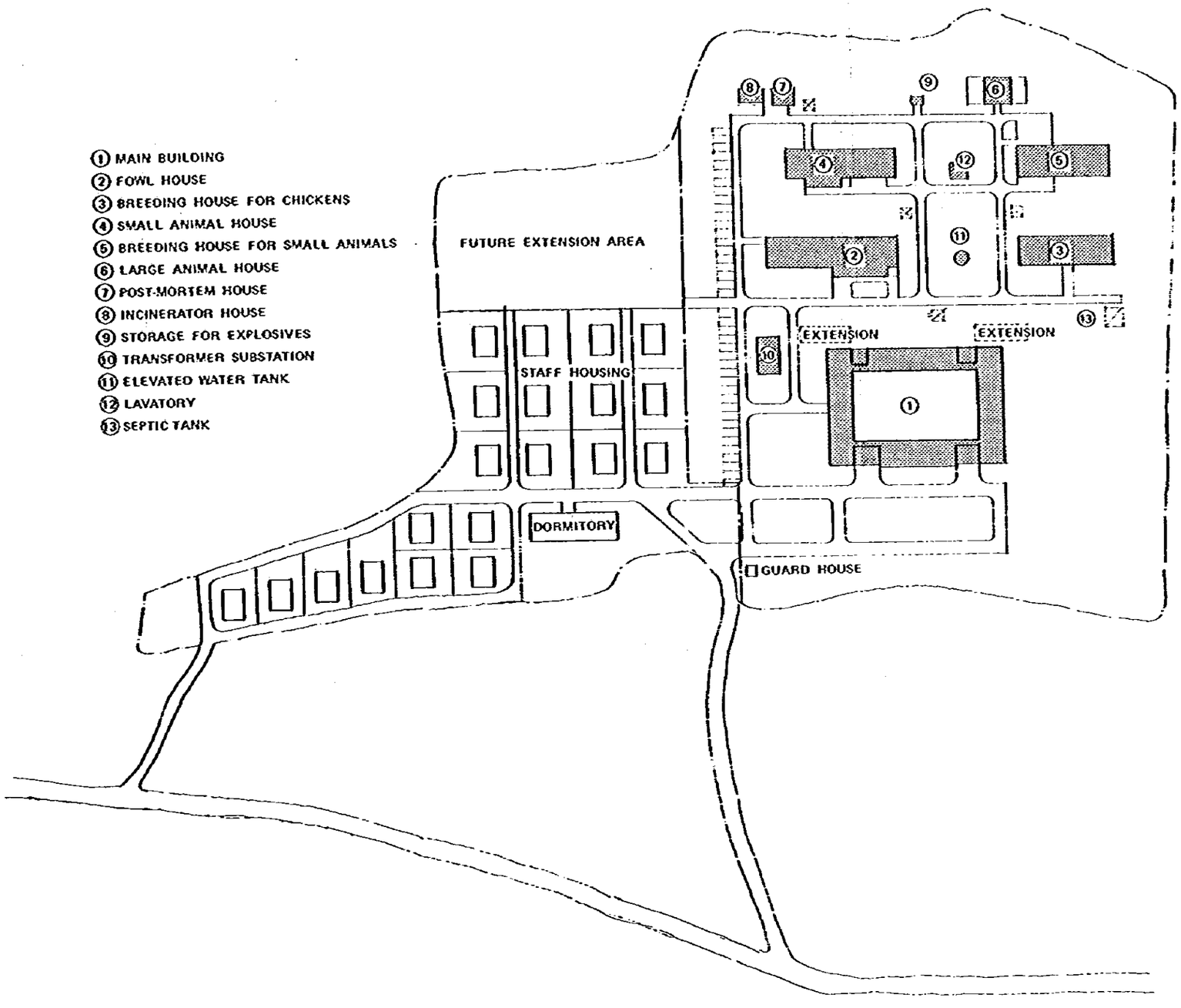
1.	High-Pressure Steam Sterilizer	2
2.	Fume Hood	1
3.	Clean Bench, both side use	4
4.	Clean Bench, one side use	5
5.	Fume Hood for Post-Mortem of small animal	1
6.	Center Table	14
7.	Fume Hood, table-top type, both side use	1
8.	Freezer	5
9.	Refrigerator	6
10.	Feed Producting Equipment	1
11.	Water Purifier	1
12.	Cage-Rack for experimental animals	
	a) for Chicken	76
	b) for Mouth & Hamster	15
	c) for Guneia Pig	9
	d) for Guneia Pig & Rabbit	22

5-4 Basic Design Drawings

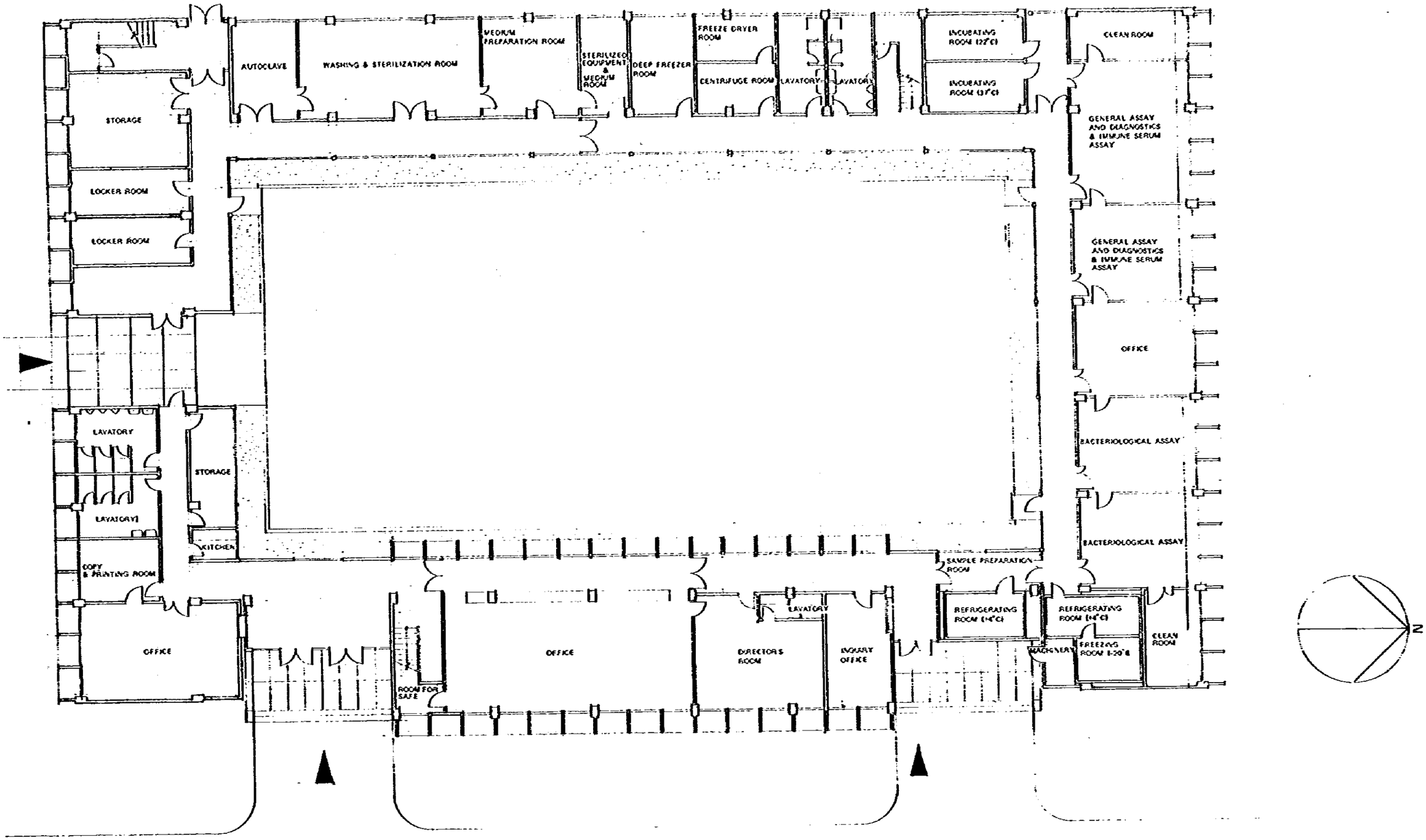
01	PLOT PLAN	1/1500
02	1ST FLOOR PLAN FOR MAIN BUILDING	1/200
03	2ND FLOOR PLAN FOR MAIN BUILDING	1/200
04	ELEVATIONS AND SECTION FOR MAIN BUILDING	1/200
05	FOWL HOUSE	1/200
06	BREEDING HOUSE FOR CHICKENS	1/200
07	SMALL ANMIAL HOUSE	1/200
08	BREEDING HOUSE FOR SMALL ANIMALS	1/200
09	LARGE ANIMAL HOUSE, STORAGE FOR EXPLOSIVES INCINERATOR HOUSE AND POST-MORTEM HOUSE	1/200
10	TRANSFORMER SUBSTATION AND LAVATORY	1/200
11	WATER SUPPLY SYSTEM	1/1000
12	ELECTRIC POWER SUPPLY SYSTEM	1/1000
13	SEWAGE SYSTEM	1/1000


1:500

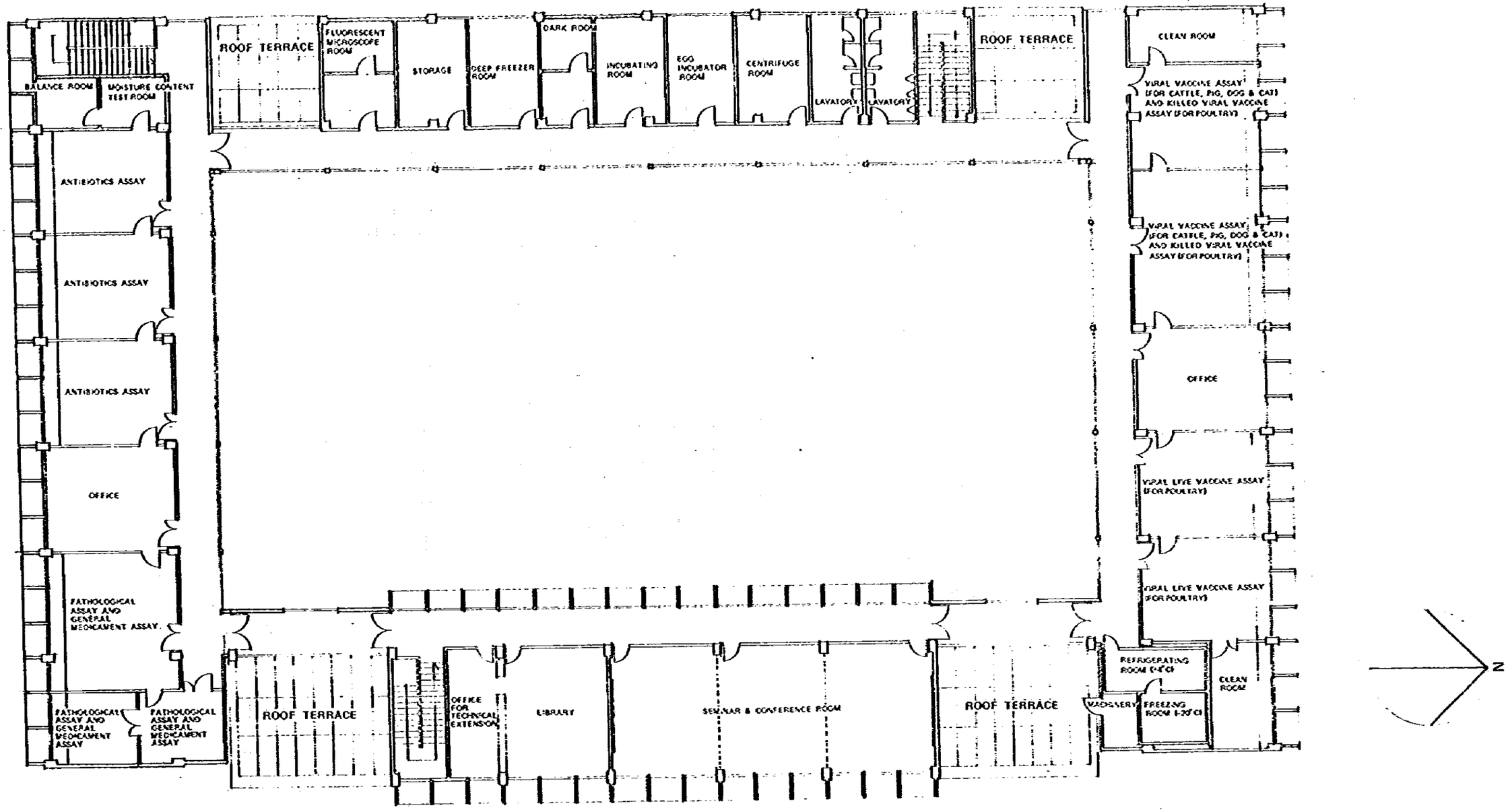
① MAIN BUILDING
② FOWL HOUSE
③ BREEDING HOUSE FOR CHICKENS
④ SMALL ANIMAL HOUSE
⑤ BREEDING HOUSE FOR SMALL ANIMALS
⑥ LARGE ANIMAL HOUSE
⑦ POST-MORTEM HOUSE
⑧ INCINERATOR HOUSE
⑨ STORAGE FOR EXPLOSIVES
⑩ TRANSFORMER SUBSTATION
⑪ ELEVATED WATER TANK
⑫ LAVATORY
⑬ SEPTIC TANK



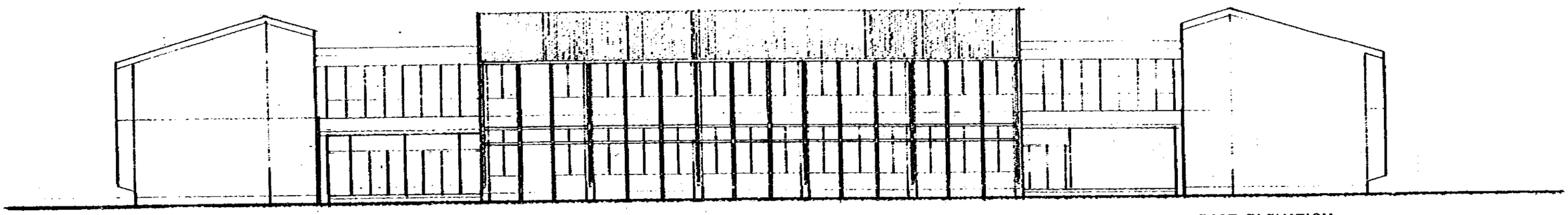
PLOT PLAN 1/1500 **01**



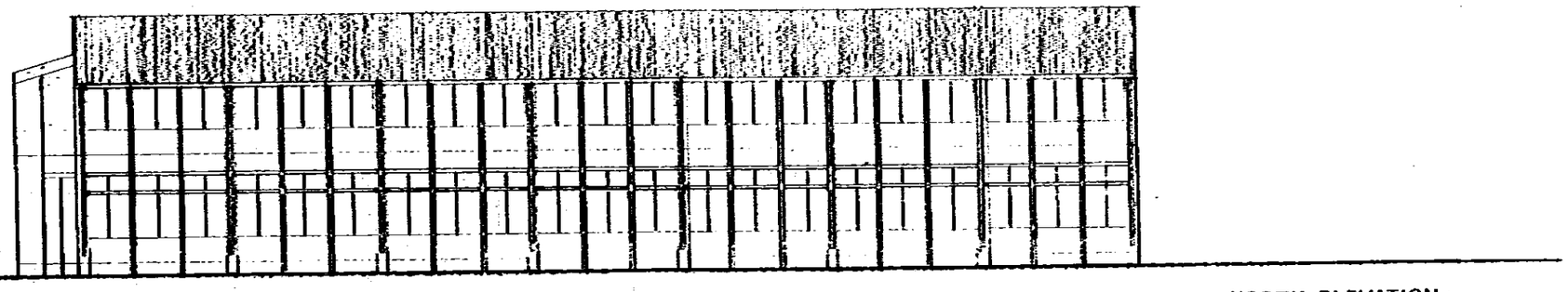
1ST FLOOR PLAN FOR MAIN BUILDING 1/200 **02**



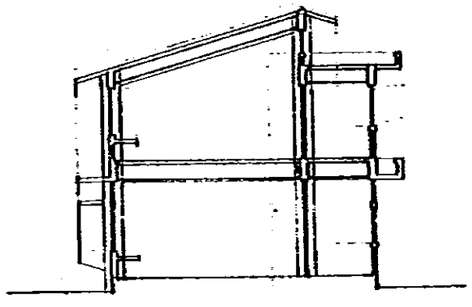
2ND FLOOR PLAN FOR MAIN BUILDING 1/200 03



EAST ELEVATION

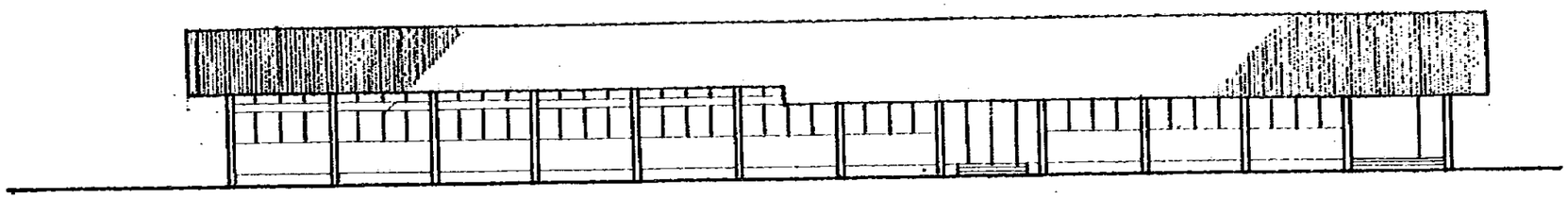


NORTH ELEVATION

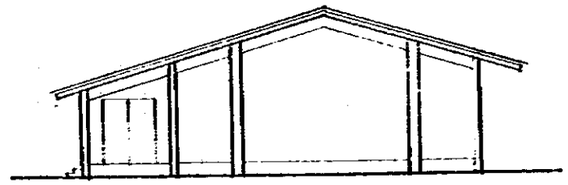


SECTION

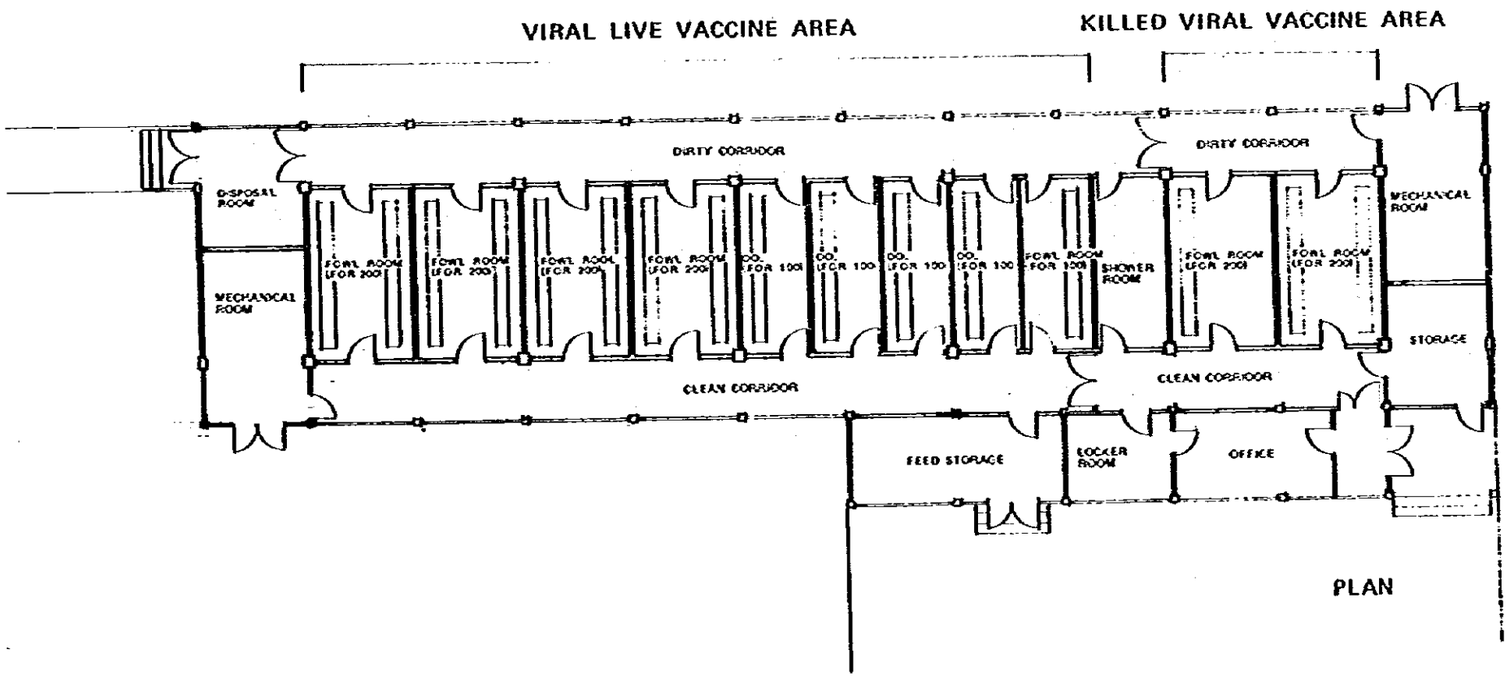
ELEVATIONS AND SECTION FOR MAIN BUILDING 1/200 **04**



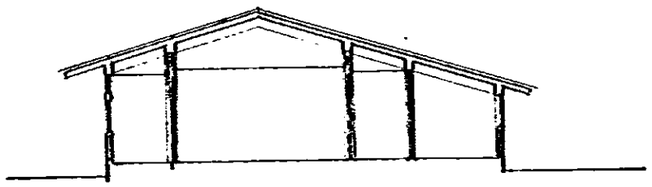
EAST ELEVATION



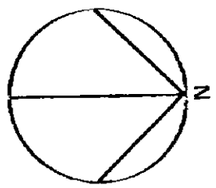
NORTH ELEVATION



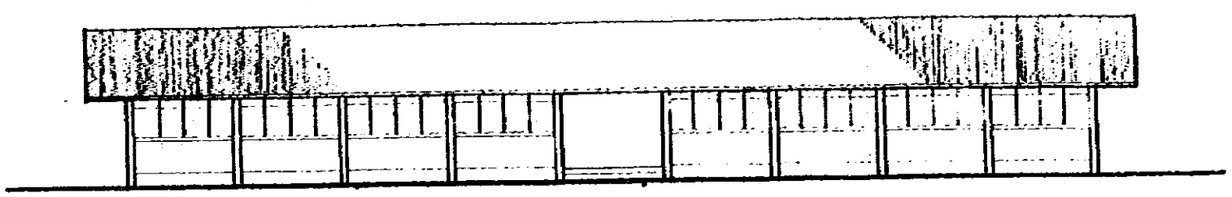
PLAN



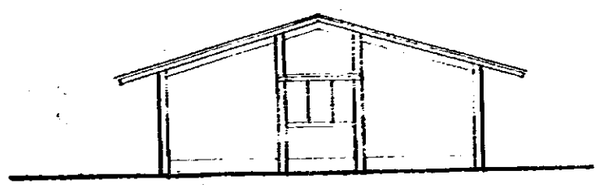
SECTION



FOWL HOUSE 1/200 **05**



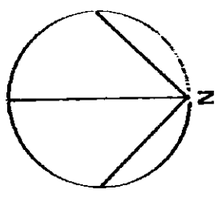
EAST ELEVATION

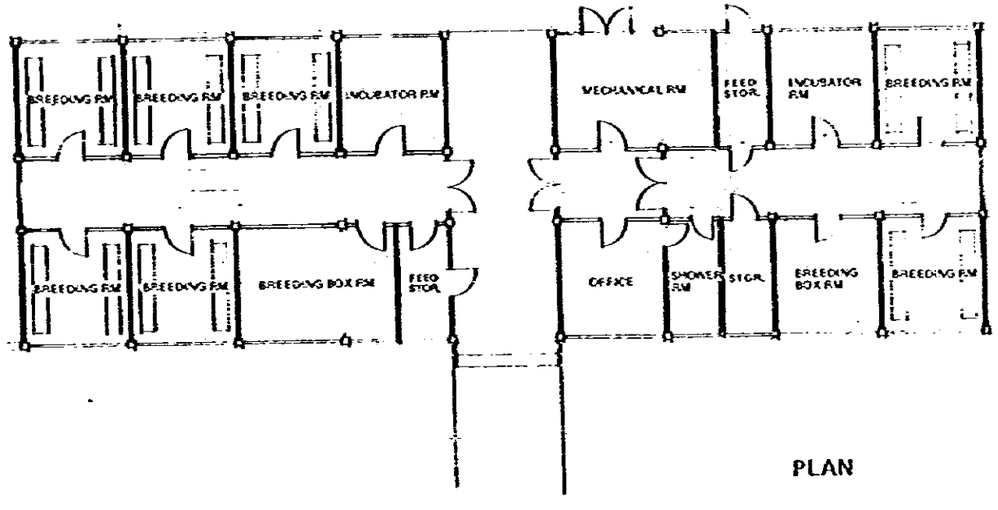


NORTH ELEVATION

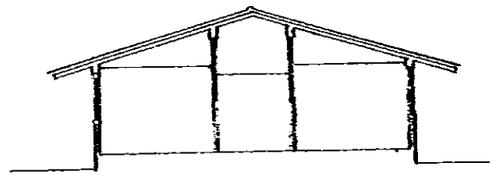
CONVENTIONAL

S.P.F.



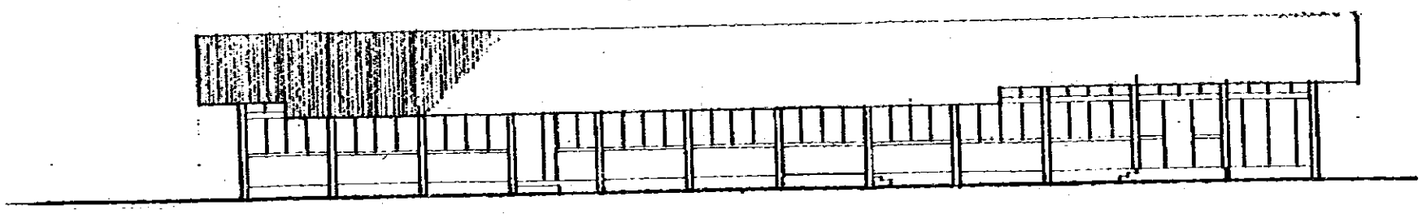


PLAN

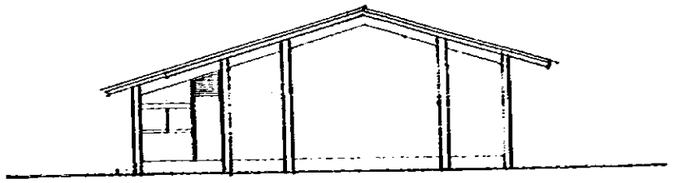


SECTION

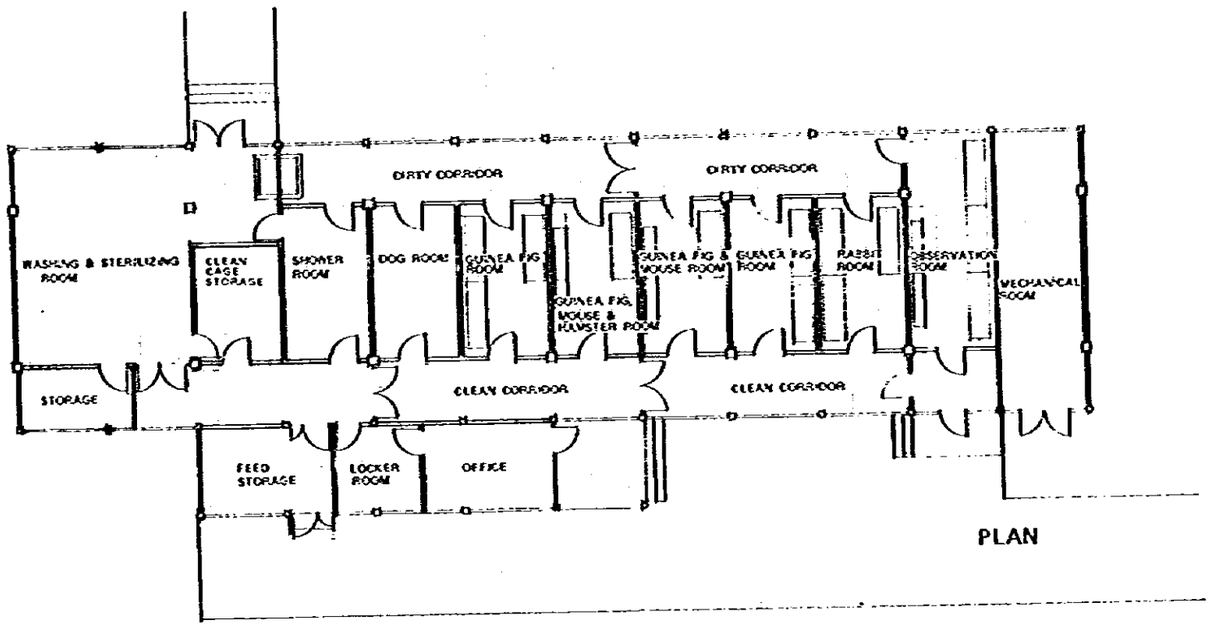
BREEDING HOUSE FOR CHICKENS 1/200 **06**



EAST ELEVATION

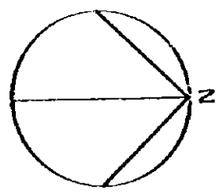


NORTH ELEVATION

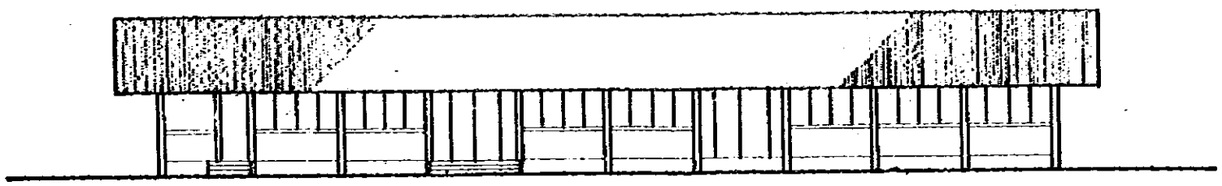


PLAN

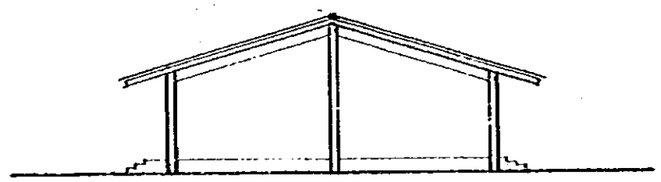
SECTION



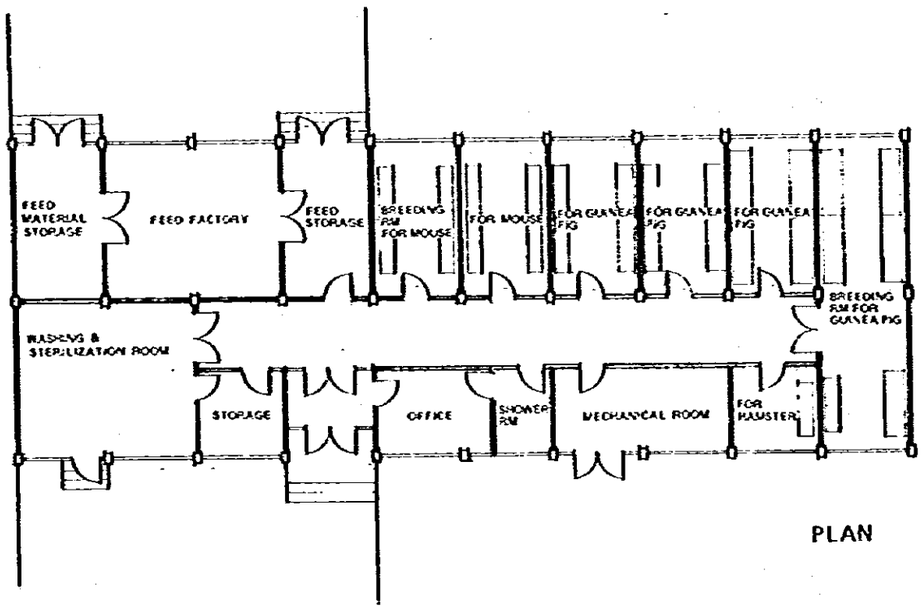
SMALL ANIMAL HOUSE 1/200 **07**



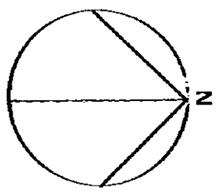
EAST ELEVATION

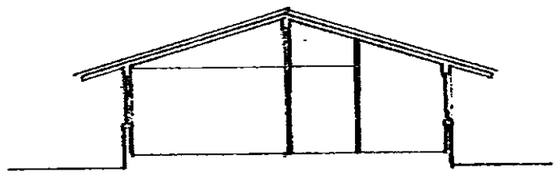


NORTH ELEVATION



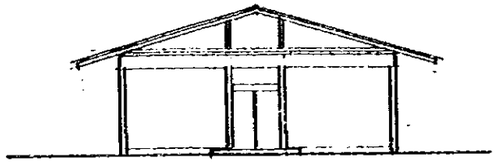
PLAN



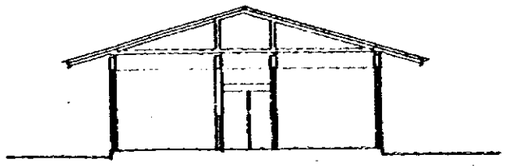


SECTION

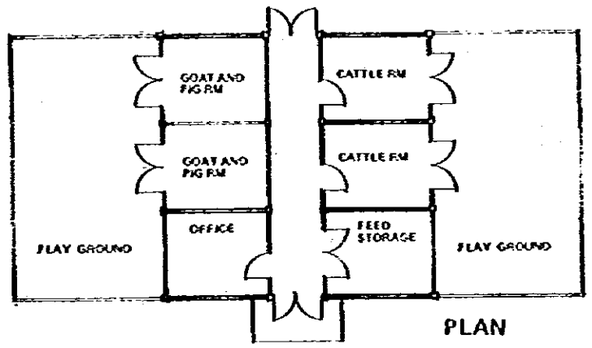
BREEDING HOUSE FOR SMALL ANIMALS 1/200 08



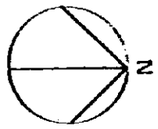
EAST ELEVATION



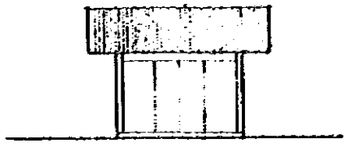
SECTION



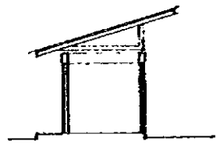
PLAN



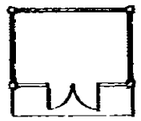
LARGE ANIMAL HOUSE 1/200



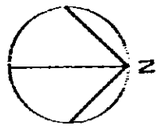
EAST ELEVATION



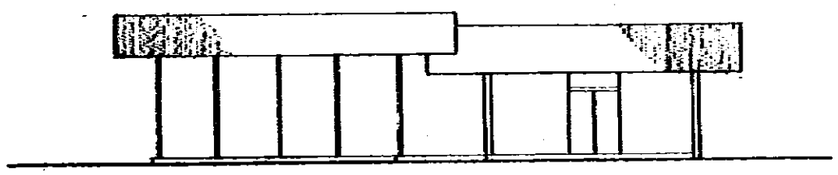
SECTION



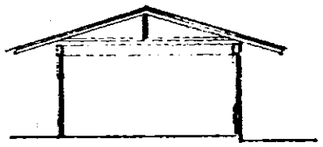
PLAN



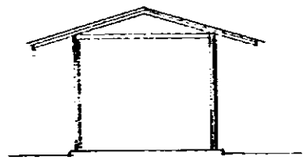
STORAGE FOR EXPLOSIVES 1/200



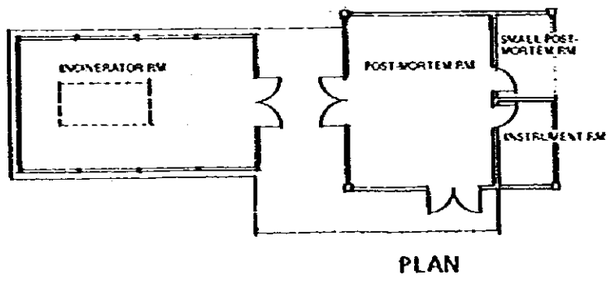
EAST ELEVATION



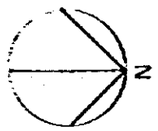
SECTION OF POST-MORTEM HOUSE



SECTION OF INCINERATOR HOUSE



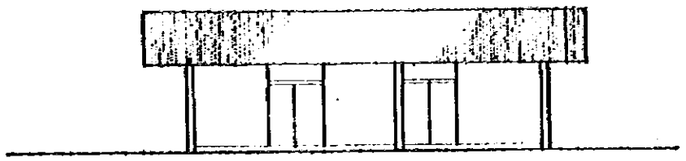
PLAN



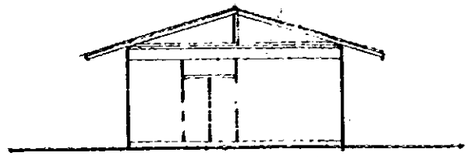
INCINERATOR HOUSE AND POST-MORTEM HOUSE 1/200

LARGE ANIMAL HOUSE, STORAGE FOR EXPLOSIVES INCINERATOR HOUSE AND POST-MORTEM HOUSE

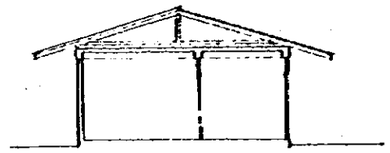
09



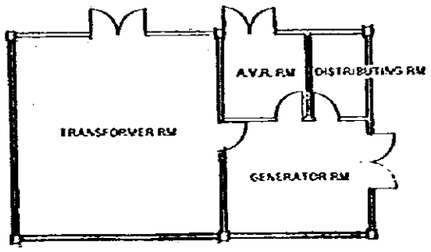
WEST ELEVATION



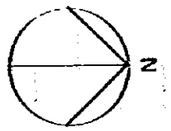
NORTH ELEVATION



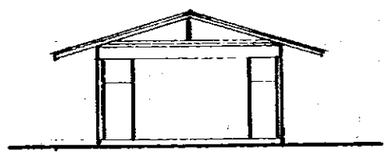
SECTION



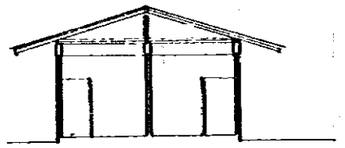
PLAN



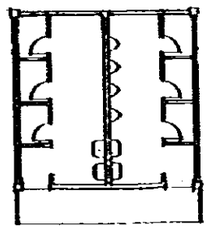
TRANSFORMER SUBSTATION 1/200



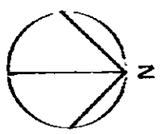
EAST ELEVATION



SECTION



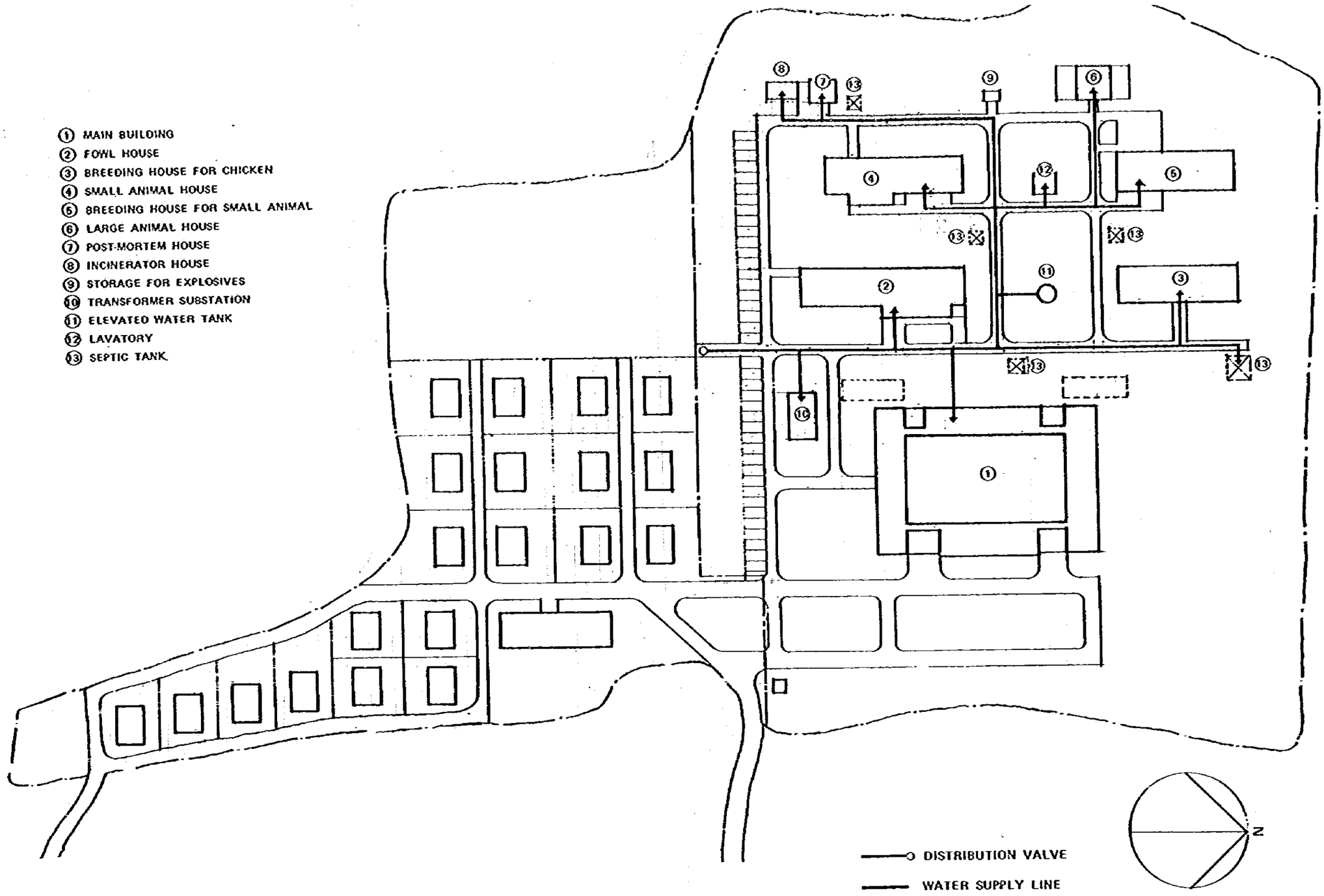
PLAN



LAVATORY 1/200

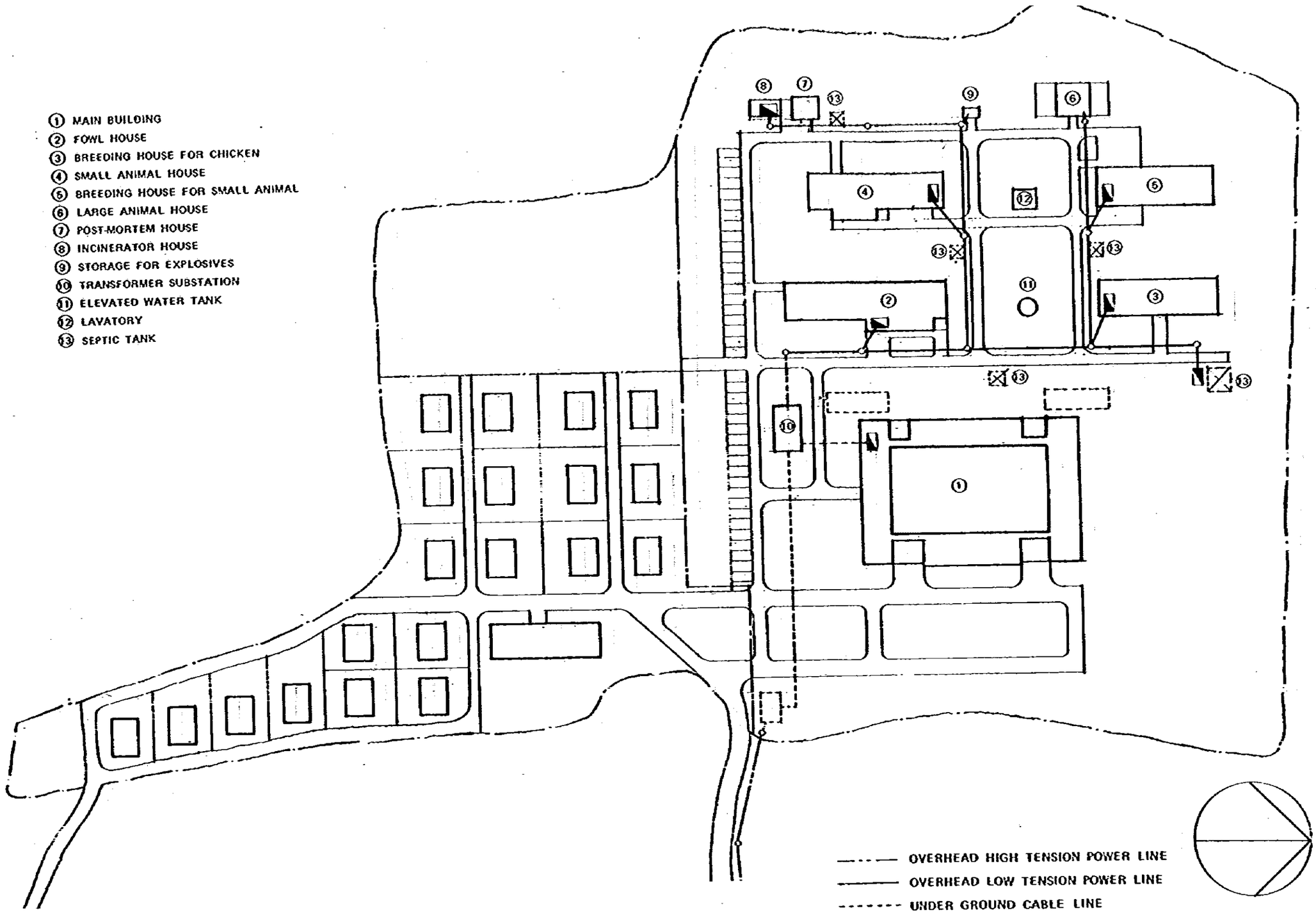
TRANSFORMER SUBSTATION AND LAVATORY 10

① MAIN BUILDING
② FOWL HOUSE
③ BREEDING HOUSE FOR CHICKEN
④ SMALL ANIMAL HOUSE
⑤ BREEDING HOUSE FOR SMALL ANIMAL
⑥ LARGE ANIMAL HOUSE
⑦ POST-MORTEM HOUSE
⑧ INCINERATOR HOUSE
⑨ STORAGE FOR EXPLOSIVES
⑩ TRANSFORMER SUBSTATION
⑪ ELEVATED WATER TANK
⑫ LAVATORY
⑬ SEPTIC TANK



WATER SUPPLY SYSTEM 1/1000 11

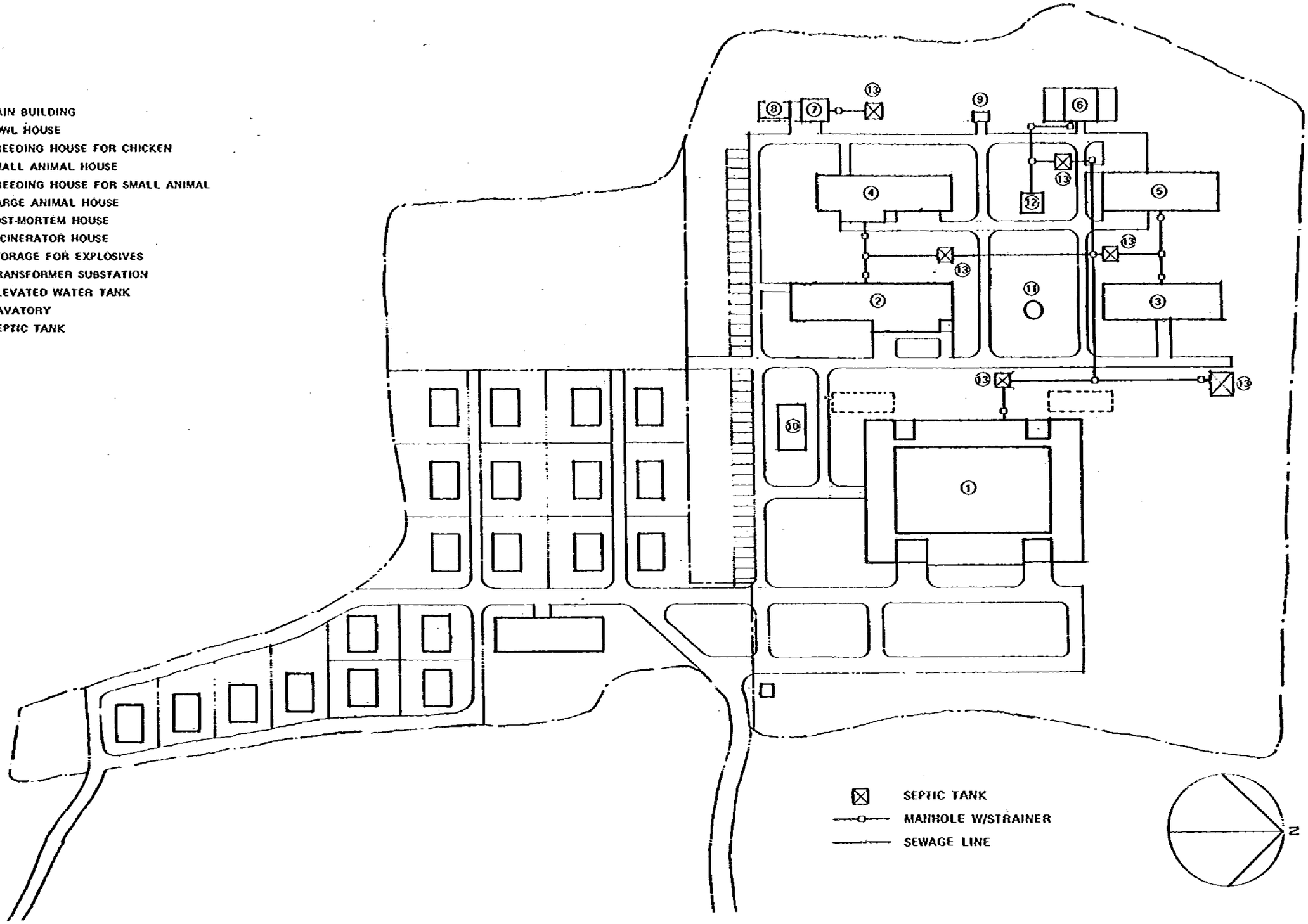
① MAIN BUILDING
② FOWL HOUSE
③ BREEDING HOUSE FOR CHICKEN
④ SMALL ANIMAL HOUSE
⑤ BREEDING HOUSE FOR SMALL ANIMAL
⑥ LARGE ANIMAL HOUSE
⑦ POST-MORTEM HOUSE
⑧ INCINERATOR HOUSE
⑨ STORAGE FOR EXPLOSIVES
⑩ TRANSFORMER SUBSTATION
⑪ ELEVATED WATER TANK
⑫ LAVATORY
⑬ SEPTIC TANK



——·——·—— OVERHEAD HIGH TENSION POWER LINE
———— OVERHEAD LOW TENSION POWER LINE
- - - - - - UNDER GROUND CABLE LINE
DISTRIBUTION PANEL

ELECTRIC POWER SUPPLY SYSTEM 1/1000 12

① MAIN BUILDING
② FOWL HOUSE
③ BREEDING HOUSE FOR CHICKEN
④ SMALL ANIMAL HOUSE
⑤ BREEDING HOUSE FOR SMALL ANIMAL
⑥ LARGE ANIMAL HOUSE
⑦ POST-MORTEM HOUSE
⑧ INCINERATOR HOUSE
⑨ STORAGE FOR EXPLOSIVES
⑩ TRANSFORMER SUBSTATION
⑪ ELEVATED WATER TANK
⑫ LAVATORY
⑬ SEPTIC TANK



SEWAGE SYSTEM 1/1000 **13**

6-5 Approximate Estimate of Cost of Works

To be undertaken by the Government of Indonesia

1. Construction		
(1) Building		
1) Staff Residences		Rp 487,970,000
2) Dormitory for 20 persons		97,590,000
3) Guard's House		3,200,000
Sub-Total		588,760,000
(2) External Work		
1) Site preparation		34,000,000
2) Site prepartion for residential zone		16,000,000
3) Access road		21,600,000
4) Road within the residential zone		15,000,000
5) Fence & Gate		21,000,000
6) Gardening		12,000,000
Sub-Total		119,600,000
(3) Basic Service Work		
1) Electric power supply to the Sub-Station		18,000,000
2) Electric power supply system		2,000,000
3) Water supply system		10,400,000
4) Drainage system		14,300,000
5) Leading telephone line to the Site		2,500,000
Sub-Total		47,200,000
2. Furniture and Equipment		
(1) Laboratory materials and equipment		65,800,000
(2) Furniture and fittings		22,800,000
Sub-Total		88,600,000
3. Others		
(1) Charges for filing of the application		6,000,000
Grand Total		Rp 850,160,000
		(¥212,540,000)

5-6 Technical Cooperation

The Veterinary Assay Laboratory is the first and only organization of that kind in Republic of Indonesia; there is no other similar one in existence. Also, when considering the current state of the animal health setup in Indonesia, many difficulties are anticipated before the operation gets underway as a going concern. In light of this, it has already been decided that Technical Cooperation shall be implemented by Japan, and in fact, such cooperation can be considered to be essential for the smooth develoment of the Project.

The period is to be for five years, and the following activities are scheduled, for the fields of biological products and antibiotics.

(1) To advise for the formulation of a national assay system and assay standard.
(2) To transfer technology of bacteriological, virological, pathological, and antibiotics assay.
(3) To transfer technology of breeding and management of experimental animals necessary for the above mentioned assay.

Accordingly tangible measures are to be implemented by the Japanese Government; for example, dispatching of various experts, training of Indonesian personnel, and provision of equipment and materials.

CHAPTER 6. IMPLEMENTATION OF THE PROJECT

6-1 Organization

The main organization concerned in the implementation of this project is called the Directorate General of Livestock Services, Department of Agriculture.

For the promotion of this Project, the Directorate of Animal Health, DGLS is in charge of various jobs, that is, decision and planning of function in the Assay Laboratory, facilities planning and discussion regarding detail design, and also different preparations necessary for building and facilities, meeting, office management and negotiations provided with the processing of construction work. Various kinds of applications for permission necessary to construct facilities on this Project should be done.

BAPPENAS, SEKNEG and Department of Public Works have been concerned with the execution of the Project.

Upon completion of this Project, the Assay Laboratory will be managed under staff consisting of a Director and exclusive veternarians, pharmacists, technician, and clerical staff.

6-2 Construction Scheme

6-2-1 Construction System

Construction of the facilities for this Project should be performed in accordance with the general contract system. The contractor will be selected by the tendering. Tenderers should be exclusive Japanese construction companies who have passed the qualification done by the owner. The successful bidder should be subjected to the assessment of the contract cost breakdown, and after the confirmation on validity of the contract terms by the owner the contractor shall conclude the contract with the owner.

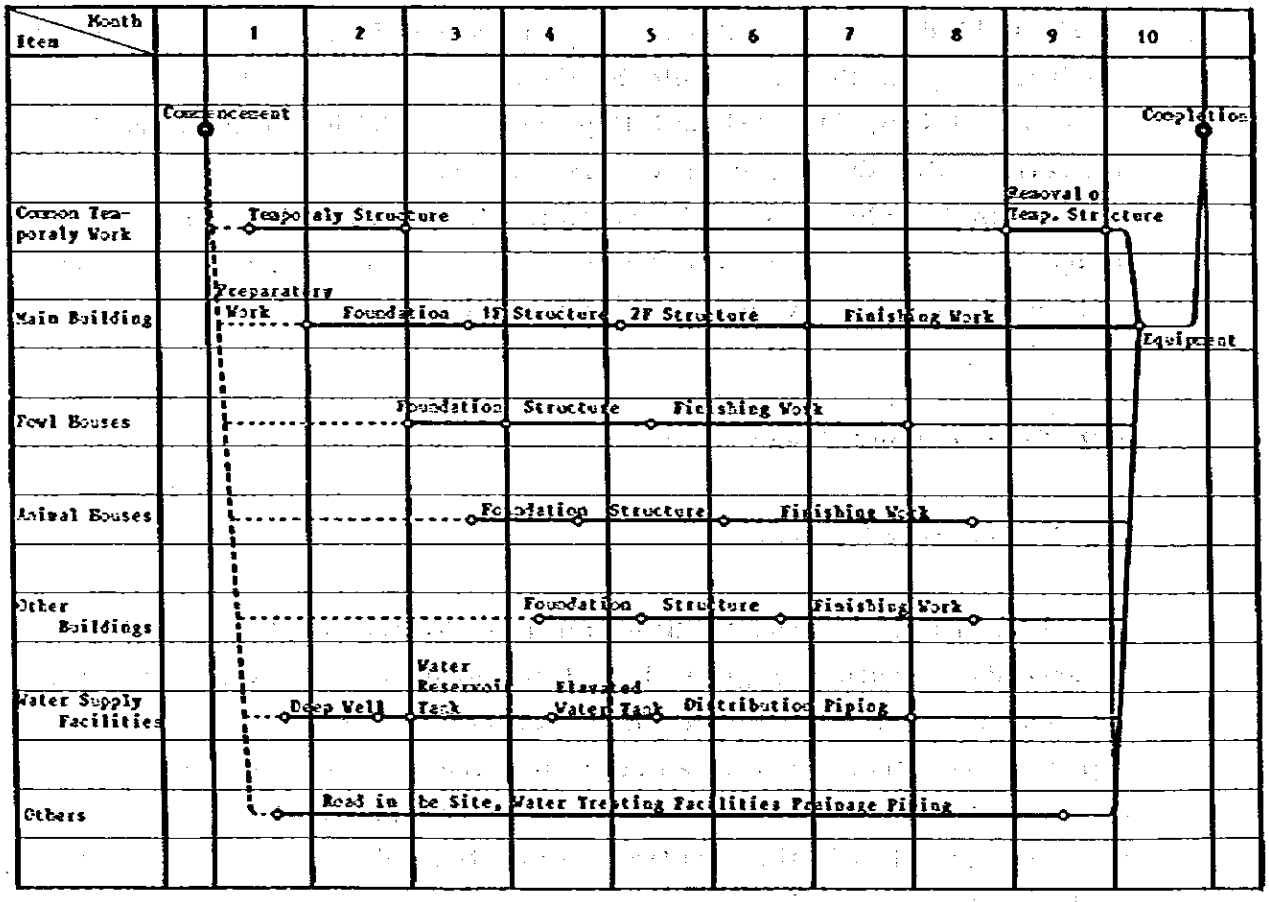
Construction of the facilities for this Project will be commenced after the construction agreement is verified by the Japanese Government.

It is estimated that the work of this project will start about five months after the Exchange of Notes between Indonesian and Japanese Governments.

6-2-2 Construction Schedule

It is estimated that the construction period of the facilities for this Project will be 10 months. The Outline of the Construction Schedule is as follows:

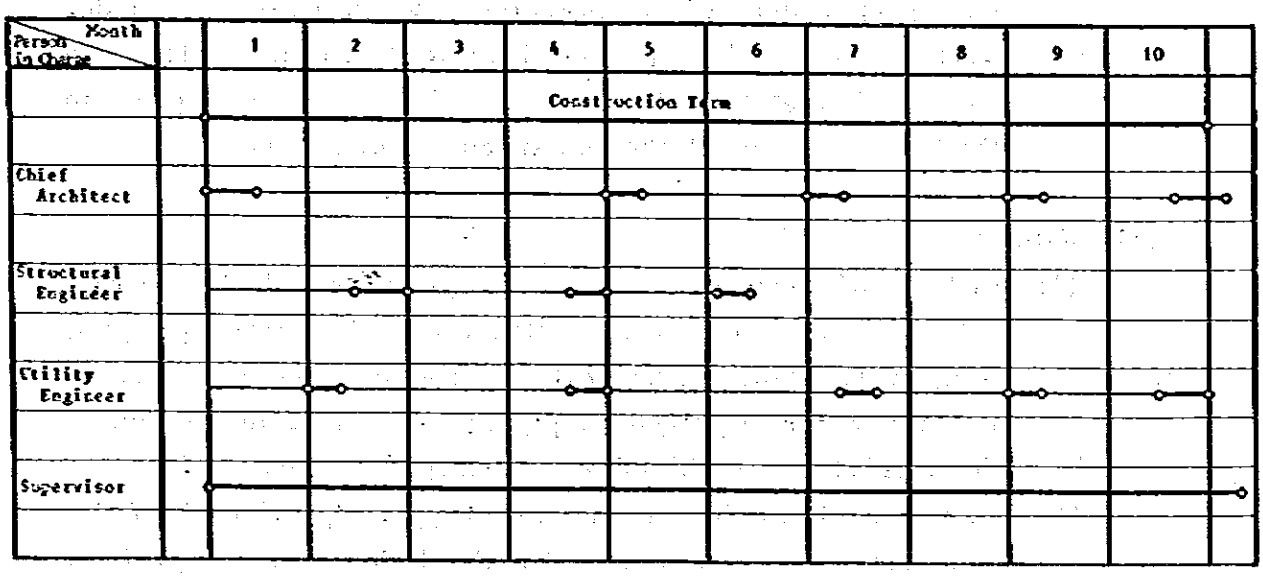
TENTATIVE CONSTRUCTION SCHEDULE



6-2-3 Supervision Scheme

Upon concluding the construction agreement of this Project, both the Chief Architect and Supervisor should go to the Project Site to give instructions on the construction works to the Contractor, have discussions and confirmations on the work schedule, and file necessary applications to competent authorities. After commencing the work, the Supervisor should be stationed at the Project Site and supervise the work until delivery of the facilities to the owner is perfected without any trouble. The Chief Architect and Engineers in charge of structure and installation of equipment should go to the Project Site, when necessary to perform on-the-spot inspections of critical jobs. The qualifications of them and the supervision schedule are as follows:

TENTATIVE SUPERVISION SCHEDULE



6-3 Scope of Construction Work

On the sharing of the construction work between the Japanese party and the Indonesian party, the scope of shared to be borne by each side are shown below for each item. ((J) refers to work to be carried out by the Japanese party; (I) refers to work to be carried out by the Indonesian party.)

6-3-1 Basic Work

(1) Permission

(I) Obtaining required permissions of authorities concerned with regard to implementation of the Project, this includes filing of application and necessary expenses.

(2) Preparation of Site

(I) Site preparation and leveling work in accordance with the site preparation plans prepared by the Japanese side. Leveling and other preparative work on the site, and construction of the access road shall be completed prior to the commencement of the construction work.

(3) Water Supply

(J) Drilling of deep well within the premises will be carried out, followed by the installation of water pumping equipment, water reservoir tank, and elevated water tank; also the water supply main piping to each of the buildings to be provided by the Japanese party.

(I) Extension piping from main water supply pipe to each of the buildings to be constructed by the Indonesian party, from the distribution valves installed by the Japanese party.

(4) Drainage

(J) All drainage facilities of which including water treating facilities for the facilities to be provided by the Japanese party.

(I) Drainage equipment for facilities other than those given above, such as for the residential facilities, etc.

(5) Electric Power

(J) Distribution of electric power from sub-station to each of the facilities to be provided by the Japanese party.

(I) Supplying of electric power to the sub-station to be provided by the Japanese party and distribution of electric power from PLN sub-station to facilities being provided by Indonesian side. (PLN sub-station will be installed by the PLN)

(6) Telephones

(I) Leading into MDF to be installed in the Main Building from telephone lines in the vicinity of the site.

6-3-2 Building

(J) 11 buildings listed in 5-3-3 (5).

(I) Residences for staff, a dormitory for trainees, in residential zone and a guardhouse, in accordance with the budget capability of the Government of the Republic of Indonesia.

6-3-3 Outdoor Conctruction

(J) Paving of roads and parking areas, and outdoor lights inside the Assay Laboratory Zone.

(I) Gates and fences, and landscaping work including planting of grass and shrubbery.

6-3-4 Furniture and Fittings

(I) Carpet, desks, chairs, other furnitures and fittings for office use.

6-3-5 Equipment and Apparatus for Experiments

(J) The materials and equipment listed in 5-3-6 and the delivering in and installation thereof.

(I) Materials and equipment required other than those given above, and the bringing in and installation thereof.

6-3-6 Transportation of Materials and Equipment

(J) Packing, insurance charges, loading on ships, and marine transportation of materials and equipment to be exported from Japan; unloading thereof at the port of Jakarta, and inland transportation to the site.

(I) Customs clearance procedures and duty exemption procedures at the time of landing.

6-4 Implementation Schedule

(1) Tender Documents

Upon conclusion of the Exchange of Notes between both governments regarding the grand aid from the Japanese Government for implementation of this Project, a consultant agreement should be concluded to let start the work on the tender documents. The work for the tender documents will start one month after the Exchange of Notes and complete within two months. The work will be carried out in consultation with representatives of Indonesian government from time to time.

(2) Tender

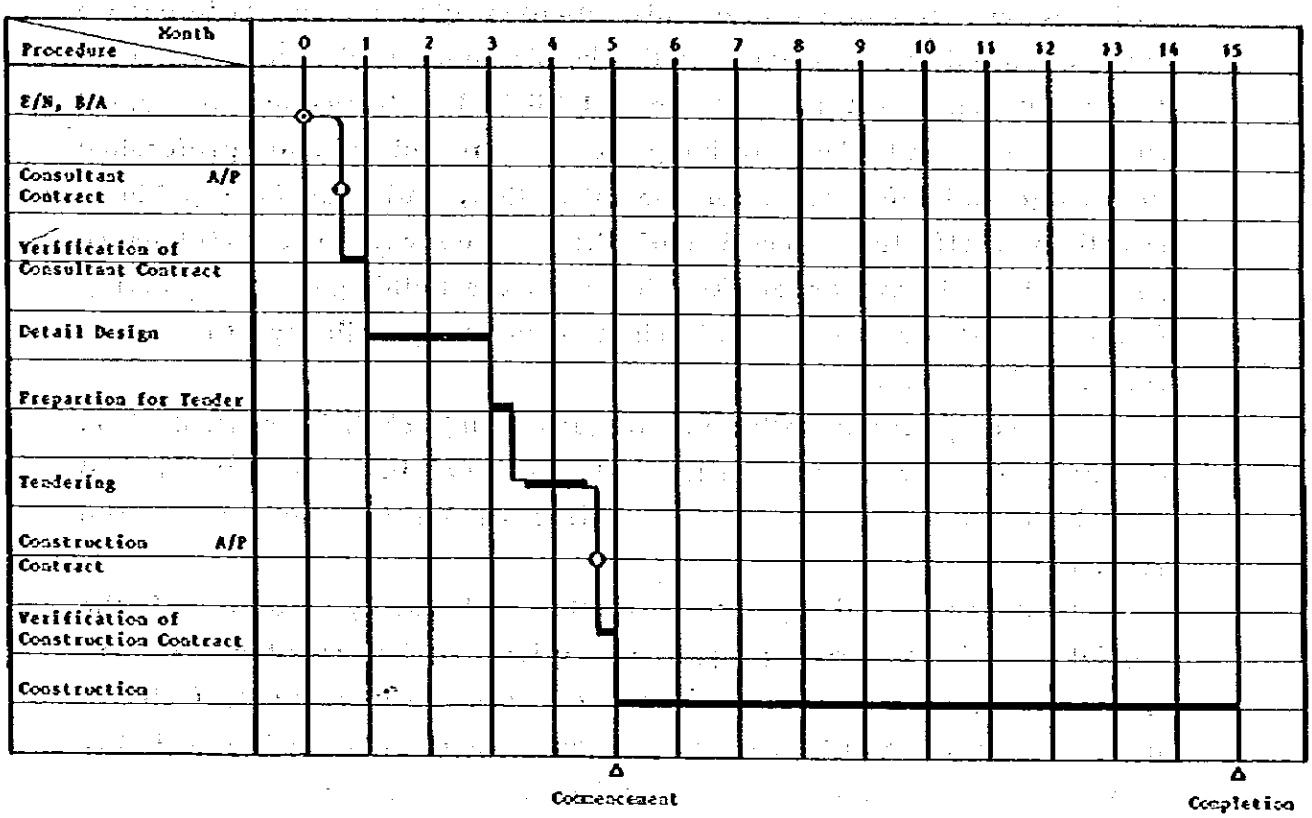
Completion of the tender documents will be followed by implementation of the tender procedure. Contractors who participate in the tender will be given drawings and other documents on this project. The tender business will take a one-month period.

(3) Construction Work

After conclusion of a construction contract between Indonesian Government and the successful contractor, the contract is verified by Japanese Government before the commencement of the construction

work. The construction period is expected for about ten months. Since the commencement of the work is slated for five months after the Exchange of Notes between the both governments, some 15 months will be passed after the date of the Exchange of Notes till completion of the construction.

TENTATIVE IMPLEMENTATION SCHEDULE



6-5 Maintenance/Management Plan

6-5-1 Plan

Adequate maintenance and management as well as effective organization of the Laboratory and administrative setup are necessary to ensure satisfactory functions of the Laboratory for achievement of the intended purposes.

For implementing the maintenance plan of this Center, to begin with proper personnel for administration, inspection and maintenance must be hired in accordance with the Personnel Schedule, and then the maintenance setup must be established. Inspection personnel must receive sufficient training to get technical and professinal knowledge and information for the inspection, and shall be capable of smooth and effective execution of these activities. The maintenance personnel shall have expert knowledge on the buildings, accompanying facilities and equipment and shall have responsibility to ensure required functions.

The equipment installed in each assay unit shall be controlled on the responsibility of the designated personnel in each section, and shall be entrusted to the outside contractors for the maintenance and service.

Maintenance and operation of this Laboratory require of the bugdet which assures proper execution. The maintenance and operation expenses comprise of such expenses as personnel, facilities and equipment maintenance, animal for experiment, fuel and light, vehicle maintenance, consumables and miscellaneous expenses.

6-5-2 Expenses

The following shows the approximate estimate of maintenance and operation expenses for initial fiscal year (1985 - 1986) based on locally obtained data:

1.	Personnel expenses	111,600,000
2.	Facilities and equipment maintenance cost	6,160,000
3.	Experimental animal expenses	20,740,000
4.	Fuel and light expenses	51,820,000
5.	Vehicle maintenance expenses	1,800,000
6.	Consumables expenses	25,130,000
	Total	218,250,000

NOTE: The above does not include construction expenses for the facilities, equipment and material expenses to be borne by the Government of Indonesia.

Breakdown of Maintenance/Management Expenses

(Unit: Indonesian Rp)

1.	Personnel expenses		
	A.	Rp 150,000 x 26 persons x 12 months	46,800,000
	B.	Rp 100,000 x 47 persons x 12 months	56,400,000
	C.	Rp 50,000 x 14 persons x 12 months	8,400,000
		Total	111,600,000
2.	Facilities/equipment maintenance expenses		
		Construction expenses x 0.2% (for initial year)	6,160,000
		(Construction expenses x 0.5% 15,400,000)	
3.	Experimental animal expenses		
	1)	Chicken's egg expenses	
		SPF eggs 1,000 x 5,000	5,000,000
		Conv. eggs 200 x 10,500	2,100,000
		Sub-total	7,100,000
	2)	Large/medium animal expenses	
		Rabbits 2,000 x 90	180,000
		Dogs 20,000 x 58	1,160,000
		Cats 5,000 x 4	20,000
		Pigs 75,000 x 8	600,000
		Goats 50,000 x 8	200,000
		Cattle 300,000 x 16	4,800,000
		Sub-total	6,960,000
	3)	Small animal expenses for breeding	
		Mice 100 x 200	20,000
		Guinea pigs 1,000 x 50	50,000
		Hamster 2,000 x 10	20,000
		Sub-total	90,000

4)	Feed expenses	
	Chickens	2,740,000
	Small animals	3,650,000
	Large/medium animals	200,000
	Sub-total	6,590,000
	Total	20,740,000

4.	Fuel and light expenses	
	Electric power Rp3,840 x 12 months	46,080,000
	Gas Rp265 x 25m^3 x 300 days	1,987,500
	Light oil (for generator) Rp158 x 18 liters x 120 hours	341,280
	Light oil (for incinerator) Rp158 x 30 liters x 60 hours x 12 months	3,412,800
	Total	51,821,580

5.	Vehicle maintenance expenses	
	Light oil Rp158 x 10 liters x 4 x 300 days	1,890,000

6.	Consumables expenses	
	Glasswares for experiment	4,600,000
	Reagent for experiment	8,290,000
	Miscellaneous expenses for experimental use	9,040,000
	Consumables expenses for clerical works	2,400,000
	Miscellaneous expenses	1,800,000
	Total	26,130,000

CHAPTER 7. EVALUATIONS

Modernization of Animal health setup can be said to be of urgent necessity for the Republic of Indonesia which seeks to promote livestock industry for improvement of agricultural income and production increase for animal protein. Many efforts are being made for this purpose, including survey and research of livestock diseases and sanitation measures. Quality control of veterinary drugs by this Project is also an important step toward achievement of this purpose.

The Veterinary Assay Laboratory is intended as an organization to authorize the veterinary drugs used in Indonesia, and be sole organization for it in this country, entitled to issue cirtificates. This Laboratory shall handle all major works concerned with assaying veterinary drugs. It will also serve as a major center to establish organizational structure, to formulize procedures and to establish the assay standard. It will also offer training courses to the quality control staff for the veterinary drug manufacturers, and pharmaceutical supervisors of the provinces and D.I.C. technical staff to assist improvement of their technical standards. In this sense, this Laboratory can be said to be a central organization for veterinary drug quality control structure.

The Project shall establish assay organizational structure, the Assay Standard, and distribution system of required information and technical knowledges. These ensure establishment of veterinary drug quality control system, as a total achievement. In this sense, this Project can be justified for a grant aid programme.

For the assay activities, the Laboratory intends to cover all veterinary drugs used in this country, but due to the extensive range and technical level, the major emphasis shall be placed, for the time being, on the biological products and antibiotics. Biological products shall include a total of 42 kinds (approximately 550 lots per annum) comprising 30 types of vaccines, 3 types of immune serum and 9 type of diagnostics while the antibiotics shall include a total of 24 kinds (approximately 800 lots per annum).

Training courses for veterinary drug quality control is offered in about two classes a year, each class intended for 20 people for a period of two months. Also training courses for D.I.C. technical staff shall be given in about three classes a year, each class intended for 20 people for a period of 3 months.

For the facilities, the grant aid programme covers the main building for main assay works and annexes including five animal sheds, the water supply and drain equipment, including the deep well for water supply. The required equipment and materials are selected through discussion with the Technical Cooperation Consultation Team and expenses shall be shared by both sides.

The above contents are projected with the maximum efficiency and minimum waste, while meeting all ranges of activity requirements.

However, the residential buildings for the staff members and dormitoriy for trainees shall be constructed by Indonesia. It is urgently required that preparation should be started for necessary budget.

As for the subsequent maintenance and operation expenses after the commencement of activities, a budget worked out by the Directorate General of Livestock Services has already been presented. While there are some points of inadequacy in the basis employed for the calculations of the costs of experimental animals and costs of expendable items, insofar as the other items are concerned, as compared to our trial calculations shown in 6-5-2, the figures are generally ample, and will not pose any hindrances in the operation and management of the institute. (The total figures of the trial calculations is Rupiah 218,250,000, however in contrast to this, the budget calculated by the Indonesian side is Rupiah 203,571,400 for the first year; the difference between these two figures is resulting from previoiusly stated differences.)

The Project shall be supported by the Technical Cooperation of the Japanese Government. This Cooperation will comprise supply of the aforesaid equipment and materials, dispatch of the Japanese experts, and training of the Indonesian personnel in Japan. Therefore sound achievement can be anticipated both in assay activities and running of the Laboratory.

CHAPTER 8. CONCLUSIONS AND RECOMMENDATIONS

8-1 Conclusions

This Project can be taken as a step toward the efforts of Indonesia for modernization of the animal health and hygiene. Currently, the country is placing considerable emphasis on the promotion of livestock industdry; one of the target of Five Year Development Plan to increase producton of animal protein and to expand livestock exports thereby to improve farmers' income. For achievement of this target, improvement and modernization of the animal health and hygiene can be said essential. For this purpose, many efforts have been made for the animal disease research and sanitation measures, including the Disease Investigation Center Project for which the Government of Japan cooperated. The veterinary drug quality control by this Project also serves as an important step for this purpose.

The Project prepared through discussions with Indonesian authorities has a sufficient feasibility as a project, from the standpoint of functions, scale, composition, operation and financing, and shall achieve the intended purposes.

Through contribution to the livestock industry development policy of this country by modernizing animal health setup, this Project will assist expansion of livestock industry, improvement of farming people's income, improvement of the nutrition and public hygiene of the nation.

8-2 Recommendations

1. In the implementation of the Project, technical cooperation on its operation and management by the Japanese side is indispensable. It is important that both sides will make an effective cooperation with each other. It is especially vital that veterinarians, pharmacists, and technicians on the Indonesian side be trained and nurtured through training conducted in Japan and on-the-

job training conducted by the Japanese experts despatched to Indonesia after completion of the facilities, so that these people can conduct assay activities independently and propose the Assay Standards for new items or revisions of the Standards.

2. In the Republic of Indonesia there is no assay standards relating to the national assay of veterinary medical supplies. To uphold the international level of the assay which shall be carried out at the Veterinary Assay Laboratory and to fulfill the function as a fair and authentic assay organization, it is urgently required to establish the standard that are most adequate in all respects.

3. The facilities are planned minimum to fulfill the functional requirements, based on the given data and information. It is desirable to establish the annual assay schedule, taking into account the quantity of medicaments (subjected to assay), details and required term for each assay and to execute it smoothly as soon as possible. In particular, insofar as assay that use experimental animals are concerned, it is necessary to prepare and decide upon meticulous assay programs, taking into consideration the scale of the size of the experimental animal stable.

4. In order to uphold the functions and achieve the desired objectives, appropriate maintenance of the facilities is vital. Towards this end, personnel who will be in charge of maintenance and supervision of the facilities must be secured, and a maintenance system in which the facilities and equipment are inspected at regular intervals be established and kept in good order.

APPENDIX

APPENDIX

1. Basic Design Servey Team
   a. Members of Team
   b. The officials concerned of the Indonesian Government
   c. The officials concerned of the Japanese Government, resident in Indonesia
   d. Survey Schedule
   e. Minutes-I
   f. Minutes-II
   g. Proposal of the Indonesian Government to extend grand aid for Deep Well and Dormitory

2. General Information
   a. Area and Population of Main Islands
   b. Meteorological Data
   c. Government Actual Receipts
   d. Government Actual Payments
   e. Exchange Rated of Selected Currencies
   f. Crude oil and oil products
   g. Consumer Price Index for Indonesia
   h. Consumer Price Index for Jakarta
   i. Cost of Living Index in Jakarta
   j. Selected Agricultural Production
   k. Selected Industrial Production
   l. Financing of Government Development Expenditures the Five Year Development Plan III.

3. Project
   a. Chart of Organization and Function for Veterinary Assay Laboratory
   b. Recruitment Schedule of Veterinarians
   c. Kinds and Numbers of Lots of Bilogical Products to be Assayed
   d. Operation Budget and Maintenance System

4. The Project Site
   a. Letter of Confirmation on the Project Site
   b. Geological Data at PUSPIPTEK
   c. Analysis Data on Water of Deep Well at PUSPIPTEK
   d. Meteorological Data at CURUG
   e. Survey Drawing
   f. Views of the Project Site

5. Others
   a. Product of Vaccine & Diagnostic of VETMA

1-a Members of Survey Team

1) Basic Design Survey Team-I

Shozo Tanaka	Team Leader Chief, Second Bacterial Section, First Assay Division, Veterinary Assay Laboratory, Ministry of Agriculture Forestry and Fisheries
Katsuji Onoda	Coordination Staff, Basic Design Division, Grant Aid Department, Japan International Cooperation Agency
Yasuchika Nishijima	Architecture Planning Chief Architect, Architectural Department, Raymond Architectural Design Office, Inc.
Yasuhiro Matsuda	Architecture Designing Architect, Architectural Department Raymond Architectural Design Office, Inc.
Hiroshi Sugimoto	Utility Planning Engineer, Utility Department, Raymond Architectural Design Office, Inc.
Kazuo Ito	Structure Planning Architect, Architectural Department Raymond Architectural Design Office, Inc.

Period

Fourteen days:	from Mar. 30 to Apr. 12, 1983 (Tanaka, Onoda)
Twenty-six days:	from Mar. 30 to Apr. 24, 1983 (Nishijima)
Nineteen days:	from Apr. 6 to Apr. 24, 1983 (Matsuda, Sugimoto, Ito)

2) Consultation Team for Technical Cooperation

Masatake Muramatsu	Chemical Examination Senior Veterinary Officer, Animal Health Division, Livestock Industry Bureau, Ministry of Agriculture, Forestry and Fisheries
Hideo Ono	Operation Plan Head, Livestock Development Division, Agriculture Development Cooperation Department, Japan Internatinoal Cooperation Agency

Period

Fourteen days:	from Mar. 27 to Apr. 9, 1983

3) Basic Design Survey Team-II (Confirmation of Basic Design)

Shozo Tanaka	Team Leader Chief, Second Bacterial Section, First Assay Division, Veterinary Assay Laboratory, Ministry of Agriculture Forestry and Fisheries
Hideki Tomobe	Coordination Staff, Basic Design Division, Grant Aid Department, Japan International Cooperation Agency
Yasuchika Nishijima	Architecture Planning Chief Architect, Architectural Department, Raymond Architectural Design Office, Inc.
Yasuhiro Matsuda	Architecture Designing Architect, Architectural Department, Raymond Architectural Design Office, Inc.

Period

Nine days: from Jul. 18 to Jul. 26, 1983

1-b Counterpart Staff of the Indonesia Side

o Directorate General of Livestock Services, Department of Agriculture

Dr. Daman	Director General
Dr. Teken	Director for Directorate of Animal Health
Dr. Sukobagyo	Head, Sub-directorate of Animal Disease Surveillance
Dr. Tjiptardjo	Head, Sub-directorate of Veterinary Drug Control
Dr. Endang	Staff, Directorate of Animal Health
Mr. Asmara	Administrative Officer
Dr. Hardono	Staff, Directorate of Animal Health
Dr. Tatty	Staff, Directorate of Animal Health
Dr. Soemarmo Poespooihardjo	Director for Livestock Production
Dr. Suhadji	Director for Livestock Programming
Dr. Jaman Zailani	Secretary of D.G.L.S.
Dr. A. Hermansjah	Director of Livestock Distribution & Extension
Miss Hariyati	Staff, Directorate of Livestock Programming

o Other Agencies

Mr. Astian	Department of Foreign Affairs
Miss Ratna Djuwite	Staff, Board of National Development Planning
Mr. Burhanudin	Bilateral Cooperation Division, Cabinet Secretariat
Mrs. Sri Mariati	Bilateral Cooperation Division, Cabinet Secretariat
Mr. Ali Sadey	Bilateral Cooperation Division, Cabinet Secretariat
Dr. Ronohardjo	Director of Animal Disease Research Institute, Bogor
Mr. Sutadi, T.Ir	Chief of Bureau Logistic Secretariat General Department of Agriculture

o Center for Veterinary Biologics, Surabaya (VETMA)

Dr. Hadi Soenarto	Head, Administration Division
Mr. Boedi Romano	Head of Laboratory, Animal Sub-Division
Dr. Suprato Maat	Sub-division, FMD Center
Dr. Darmawan	Sub-division, Quality Control Vaccine Viral
Dr. Hardowarno	Sub-division, Vaccine Production

o DIC B type Laboratory, Jakarta

Dr. Huyarso

Dr. A. Panggabean

Dr. U. Purwanti

o Center for Biomedical Research (CBR)

Ir. Pudjoprajitono

Mrs. Muriati — Chief of Bacteriology

1-c Participants of the Japanese Side in Indonesia

o Embassy of Japan
Mr. Tanabe, First Secretary
Mr. Yamamoto, First Secretary

o JICA Jakarta Office
Mr. Miyamoto, Director
Mr. Yamamura, Director (from Jun.)
Mr. Sasaki, Staff

1-d Survey Schedule

1) Basic Design Survey

Order of Day	Date	Day of Week	Schedule	Activity
1	Mar. 30	Wed.	11:00 - 19:00	Tokyo to Jakarta (GA 877)
			21:00 - 24:00	Joint meeting (Survey Team and Consulting Team for Technical Cooperation)
2	Mar. 31	Thu.	09:30 - 12:30 DGLS	Explanation of the Teams and the survey purpose and schedule, and Grant Aid system, Arranged survey schedule Courtesy call to Director General
			14:30 - 19:00 JICA	Courtesy call to JICA Joint meeting of the Japanese party
3	Apr. 1	Fri.	Public Holiday	Summarized the contents of discussion and collected data and information
4	Apr. 2	Sat.	09:30 - 10:30	Surveyed the Site-1
			12:00 - 14:00	Visited Vaksindo vaccine plant and the animal breeding facilities Collected data and information
5	Apr. 3	Sun.	15:00 - 16:20	Jakarta to Surabaya (GA 356)
6	Apr. 4	Mon.	10:00 - 13:00	Visited Center for Veterinary Biologics, Surabaya (VETMA)
			15:15 - 16:30	Surabaya to Jakarta (GA 357)
7	Apr. 5	Tue.	09:30 - 13:00 JICA	Discussed the contents of Minutes and Memorandum with the Indonesian couter-parts
			15:30 - 16:00	Courtesy call to Embassy of Japan
			16:00 - 18:30 JICA	Joint meeting (Survey Team and Consulting Team)
8	Apr. 6	Wed.	10:00 - 13:00 DGLS	Find discussion on the contents of Minutes and Memorandum
			18:00 - 20:00	Held dinner party by Survey Team and Consulting Team
			10:30 - 17:40	Tokyo to Jakarta (JL 711) (Three succeeding members)

Order of Day	Date	Day of Week	Schedule	Activity
9	Apr. 7	Thu.	10:00 - 11:00	Visited and inspected DIC-B type Lab., Jakarta
			12:00 - 13:30 DGLS	Collected information about the Project Confirmed survey program
10	Apr. 8	Fri.	11:00 - 17:45	Team meeting Discussed contents of the Laboratory and scale of animal facilities
11	Apr. 9	Sat.	09:30 - 11:30	Visited C.B.R.
			11:30 - 12:30 DGLS	Discussed problem of the Project Site
			14:00 - 23:00	Team meeting Discussed the framework for the facilities for the Project
12	Apr. 10	Sun.	16:00 - 18:30	Surveyed the Site-2
13	Apr. 11	Mon.	11:30 - 12:00 JICA	Reported survey result about the Site-2 to JICA
			13:00 - 14:00	Signed Minutes at DGLS
			14:30 - 15:00	Briefed survey progress to JICA
			15:00 -	Summarized contents of discussion and collected data
14	Apr. 12	Tue	11:00 - 14:30	Visited National Center for Reserch, Science and Technology (PUSPIPTEK), Collected data and information
			14:30 - 16:30	Surveyed the Site-2
15	Apr. 13	Wed.	13:00 - 14:30 DGLS	Confirmed the counterplan of Indonesia with regard to the Site-2
				Prepared materials for discussion and collected data and information
16	Apr. 14	Thu.	12:00 - 14:30 DGLS	Discussed facilities for the laboratory section
				Prepared materials for discussion and collected data and information

Order of Day	Date	Day of Week	Schedule	Activity
17	Apr. 15	Fri.	10:00 - 12:00 DGLS	Discussed about facilities for experimental animal Prepared materials for discussion Collected data and information
18	Apr. 16	Sat.	10:00 - 13:00	Discussed contents and scale of laboratory unit Reviewed the contents of discussion on the facilities for the Project
19	Apr. 17	Sun.		Summarized data and information
20	Apr. 18	Mon.		Prepared materials for discussion on the facilities for the Project
21	Apr. 19	Tue.		Same as above
22	Apr. 20	Wed.	10:00 - 12:00 DGLS	Discussed the facilities for the Project
23	Apr. 21	Thu.		Reviewed the contents of discussion and collected data and information
24	Apr. 22	Fri.	11:00 - 12:00 DGLS 16:30 - 17:30	Final discussion on the facilities for the Project Briefed survey progress to JICA
25	Apr. 23	Sat.	11:00 - 12:00 DGLS 14:30 - 15:00 JICA 19:50 -	Confirmed the requirement about the facilities for the Project. Received data and information. Greeting on returing Japan Greeting on returning Japan Jakarta to Tokyo (JL 722)
26	Apr. 24	Sun.	- 07:25	

2) Comfirmation of Basic Design Study

Order of Day	Date	Day of Week	Schedule	Activity
1	Jul. 18	Mon.	10:30 - 18:30	Tokyo to Jakarta (JL 721)
2	Jul. 19	Tue.	09:00 - 09:30	Courtesy call to JICA
			10:00 - 11:30 DGLS	Arranged Survey schedule, Explained on Draft Report
			13:45 - 15:40 JICA	Joint Meeting of Japanese party
3	Jul. 20	Wed.	09:00 - 12:00 DGLS	Discussed contents of Draft Report
				Summarized contents of discussion
4	Jul. 21	Thu.	11:00 - 13:30 DGLS	Discussed contents of Draft Report
			16:00 - 17:30	Team meeting
				Confirmed and summarized contents of discussion
5	Jul. 22	Fri.	09:00 - 12:00 DGLS	Discussed contents of Draft Report and Draft Minutes
				Arranged data and information
6	Jul. 23	Sat.	09:00 - 16:00	Observed the Site
7	Jul. 24	Sun.		Arranged data and information, Prepared Minutes
8	Jul. 25	Mon.	10:00 - 12:30 DGLS	Confirmed Draft Report Signed Minutes
			14:00 - 14:30	Briefed contents of discussion to the Embassy of Japan and JICA
9	Jul. 26	Tue.	08:00 - 21:30	Jakarta to Tokyo (CX 710, CX 500)

1-e. Minutes-I

MINUTES OF DISCUSSIONS
ON
THE ESTABLISHMENT OF THE VETERINARY ASSAY LABORATORY
IN THE REPUBLIC OF INDONESIA
(ATA - 297)

In response to the request made by the Government of the Republic of Indonesia for the Establishment of Veterinary Assay Laboratory in Serpong (hereinafter referred to as "the Project"), the Government of Japan, through Japan International Cooperation Agency (JICA), has dispatched a survey team headed by Dr. Shozo Tanaka, Chief of Second Bacterial Section, First Assay Division, National Veterinary Assay Laboratory (hereinafter referred to as "the Team") to conduct the basic design study on the Project from March 30th, 1983 to April 24th, 1983.

The Team has carried out a field survey, had a series of discussions and exchanged views with the Indonesian authorities concerned of the Project.

As a result of the survey and discussions, the Team and the Indonesian authorities concerned have agreed to recommend to their respective Governments that the result of the discussions attached herewith should be examined toward the realization of the Project.

Jakarta, April 11th, 1983

Shozo Tanaka

Dr. Shozo Tanaka
Head of Japanese
Survey Team.

Dr. Daman Danuwidjaja
Director General of Livestock
Services,
Department of Agriculture
Republic of Indonesia.

ATTACHMENT

1. The objective of the Project is to provide necessary buildings, facilities and equipment for establishment and development of the Veterinary Assay Laboratory in Serpong.

2. The proposed site of the Project has been acquired by the Government of the Republic of Indonesia in Serpong, Bogor District (hereinafter referred to as "the Project Site") as attached in Annex I.

3. Priority of activities in the Laboratory is listed in Annex II.

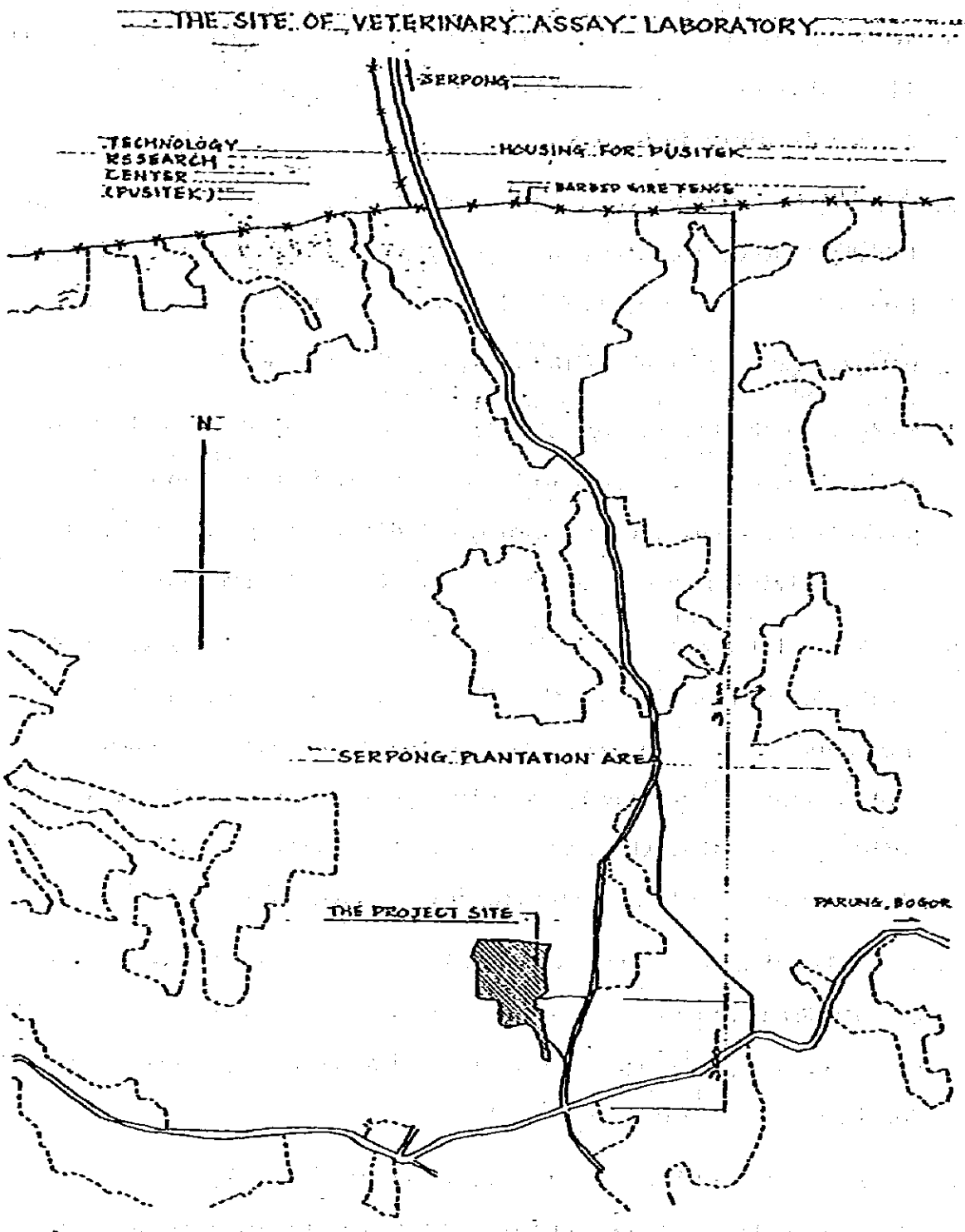
4. To operate the Laboratory activities effectively, the Technical Cooperation Project is expected to be implemented in the field of biological products (vaccine, sera and biological diagnostics) and antibiotics assay activities as well as management of experimental animals.

5. The Team will convey the desire of the Indonesian authorities concerned to the Government of Japan that the Japanese Government will take necessary measures to cooperate with the Government of Indonesia in implementing the Project by extending grant aid for construction of buildings and other items as listed in Annex III, with priority within the scope of Japan's Economic Cooperation Programme.

6. The Indonesian authorities concerned have understood and confirmed Japan's Grant Aid system explained by the Team which includes a principle of use of a Japanese consultant firm and a Japanese general contractor for implementation of the Project.

7. The Indonesian authorities concerned have confirmed that the Government of the Republic of Indonesia will take necessary measures as listed in Annex IV on condition that the grant aid by the Government of Japan is extended to the Project.

ANNEX : 1


THE SITE OF VETERINARY ASSAY LABORATORY
SERPONG
TECHNOLOGY RESEARCH CENTER (PUSITEK)
HOUSING FOR PUSITEK
BARBED WIRE FENCE
N
SERPONG PLANTATION ARE
THE PROJECT SITE
PARUNG, BOGOR
LOCATION OF THE PROJECT SITE ; CIKARANG , GUNUNG SINDUR
BOGOR DISTRICT, WEST JAVA PROVINCE
; PLANTATION
Scale 1 ; 15.000

ANNEX II-1

THE SITE OF VETERINARY ASSAY LABORATORY