

No. 5

THE DETAIL DESIGN
FOR
THE ANIMAL EXPERIMENTAL LABORATORY
AT
THE RESEARCH INSTITUTE FOR TROPICAL MEDICINE
IN
THE REPUBLIC OF THE PHILIPPINES

April 1984

JAPAN INTERNATIONAL COOPERATION AGENCY

MCF

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PREFACE

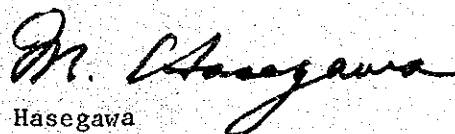
The five-year technical cooperation project for the Institute for Tropical Medicine between the Government of Japan and the Government of the Republic of the Philippines was started on October 17, 1980, aiming at developing widely applicable measures against tropical diseases such as diphtheria, pertussis, tetanus and diarrhea not only in the Philippines but also in similarly situated countries.

Construction of a research and a hospital building was completed on March 1981, by Japanese government grant aid and projected activities have been practiced in these facilities. The Philippine government requested the Japanese government to reorganize the animal experimental laboratory, because the existing animal rooms on the second floor of the research building are getting too small to meet the expansion of new research activities.

In response to the Philippine government request, the Japan International Cooperation Agency sent a study team to examine the existing facilities and design new facilities from February 5 to 29, 1984. The investigation was successfully conducted with the cooperation of the Philippine government officials and the Japanese experts sent for the project. After the team returned to Japan, further studies were made and this report has been prepared.

We hope that this report will contribute to the implementation of the project, and we would like to express our deep appreciation to the officials who cooperated to dispatch the team, and all the others who have assisted the study team.

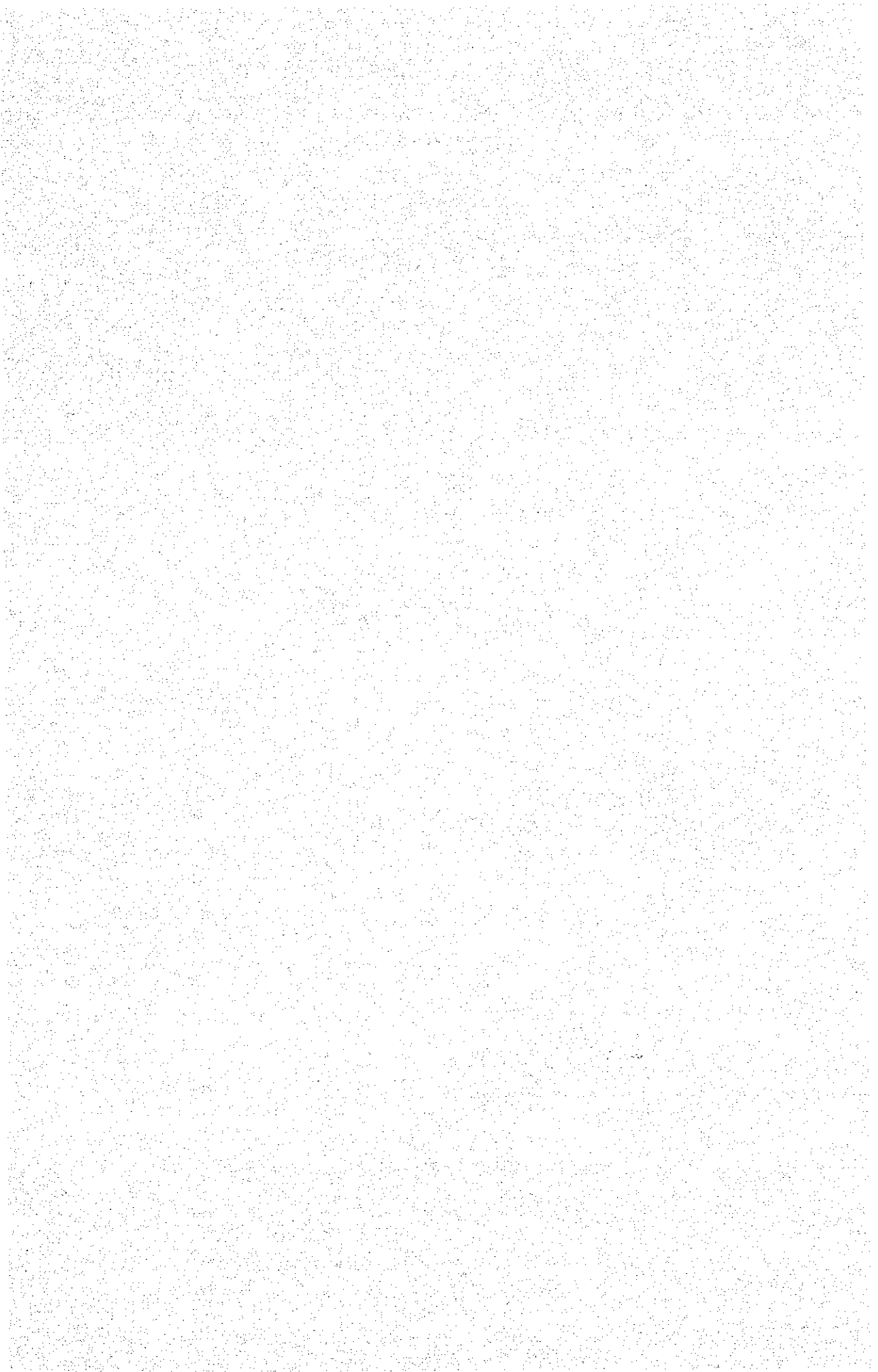
April, 1984

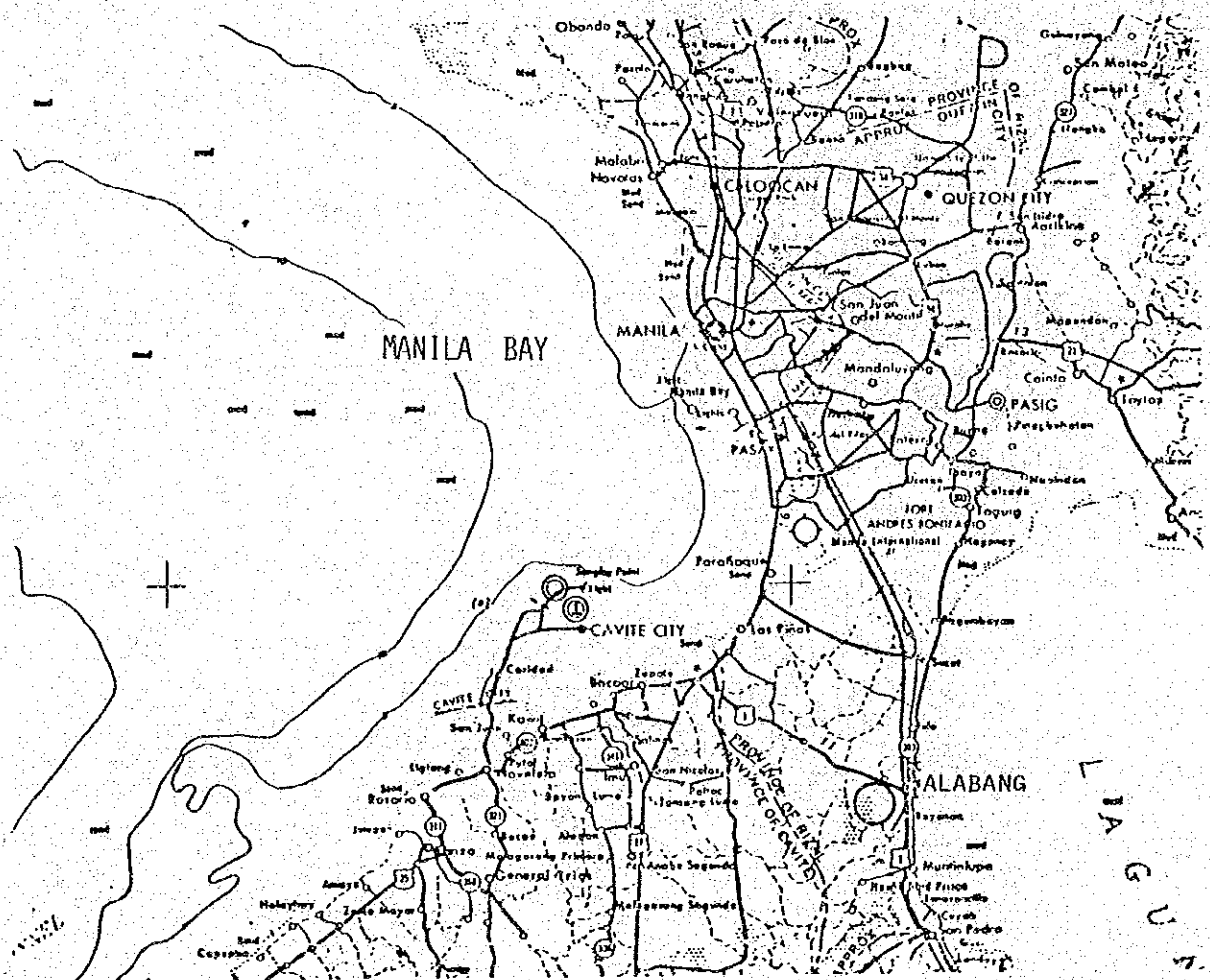


Masao Hasegawa

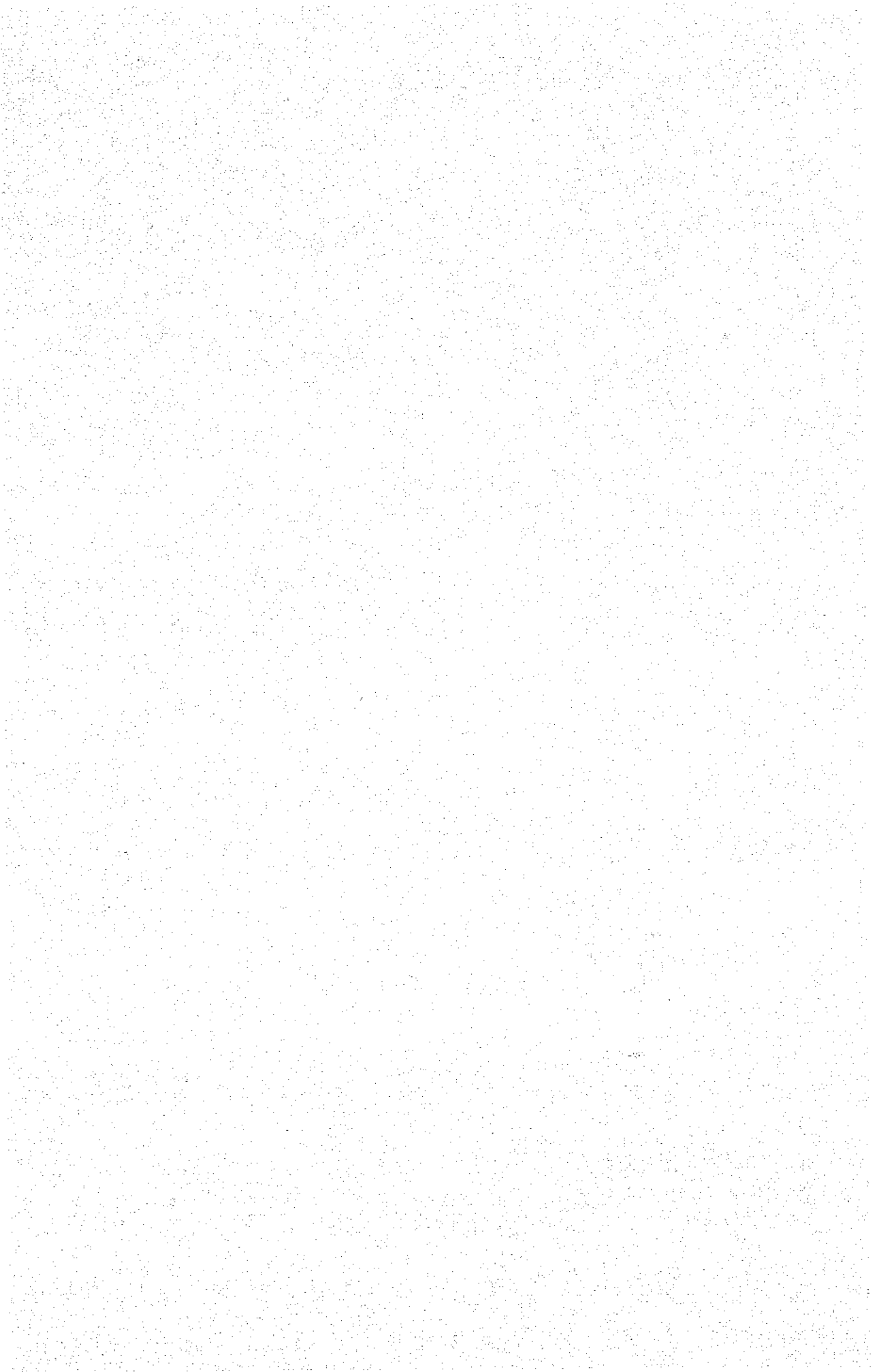
Executive Director

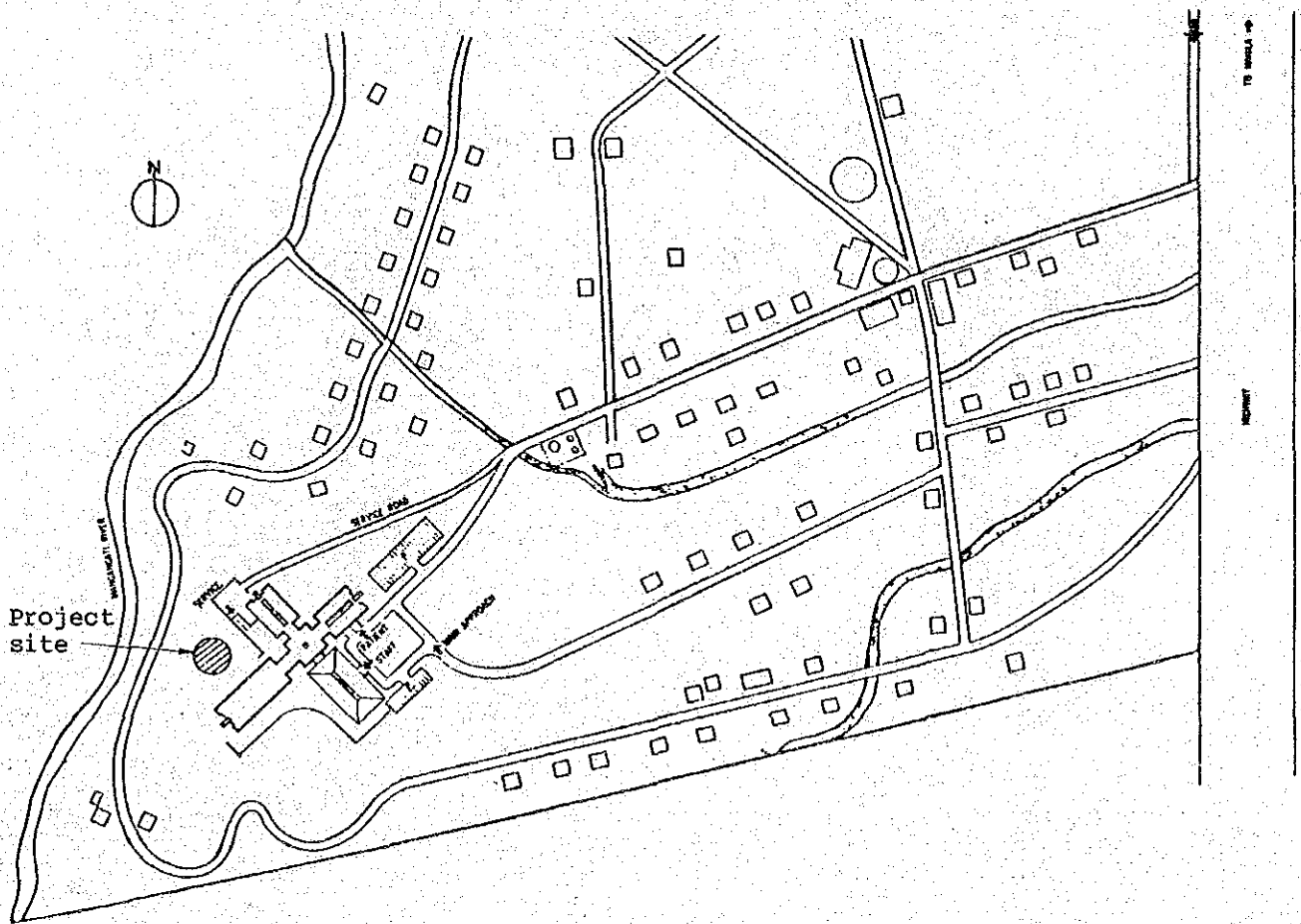
Japan International Cooperation Agency



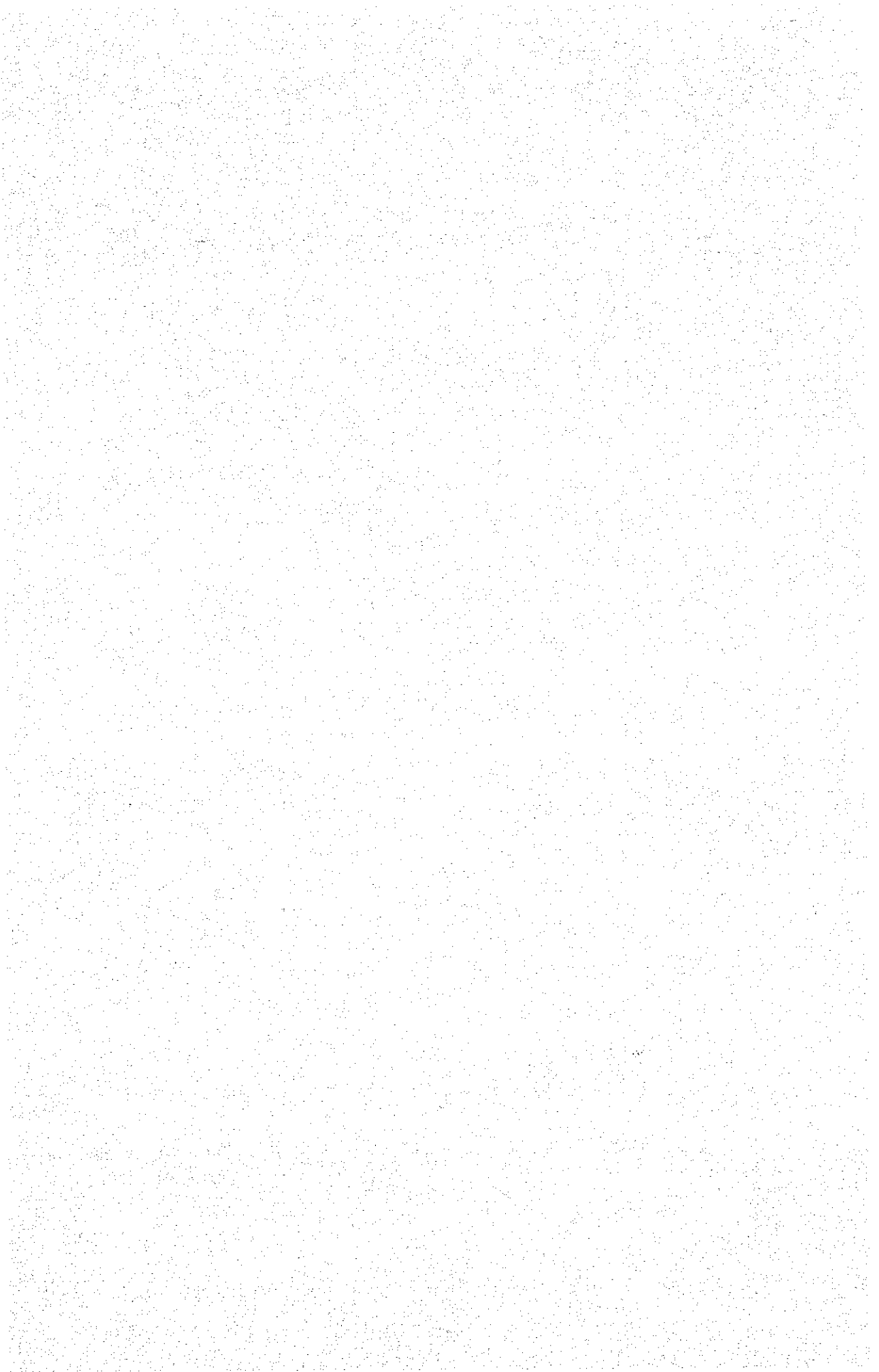


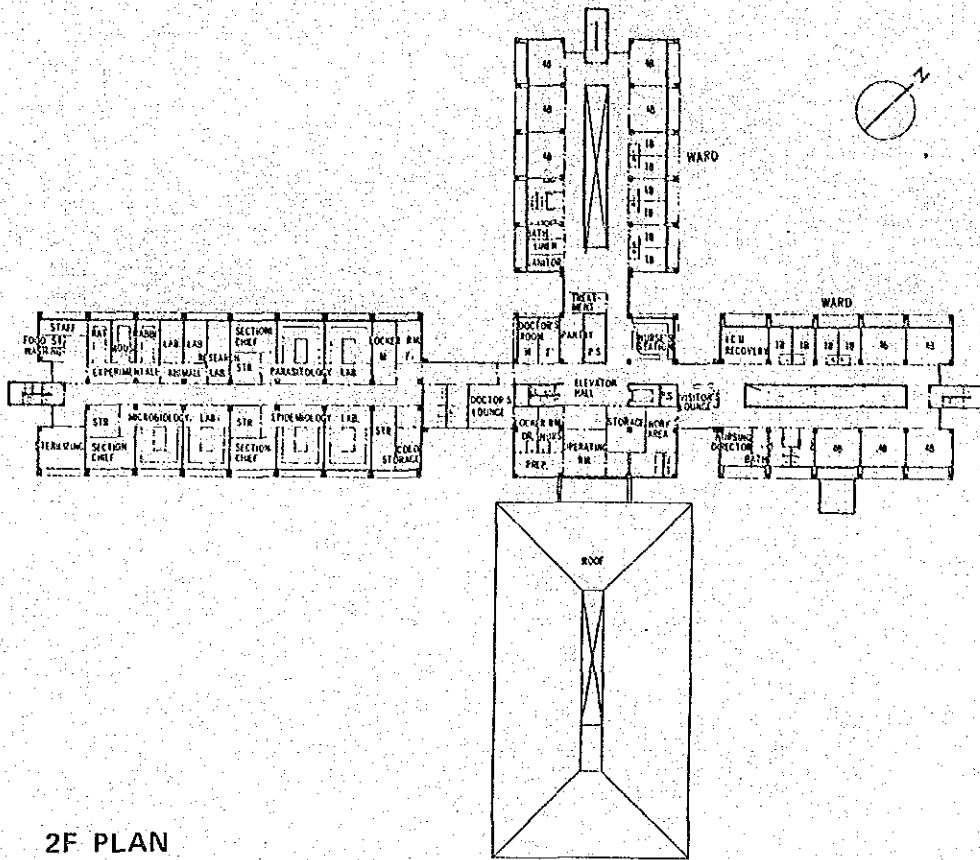
LOCATION MAP



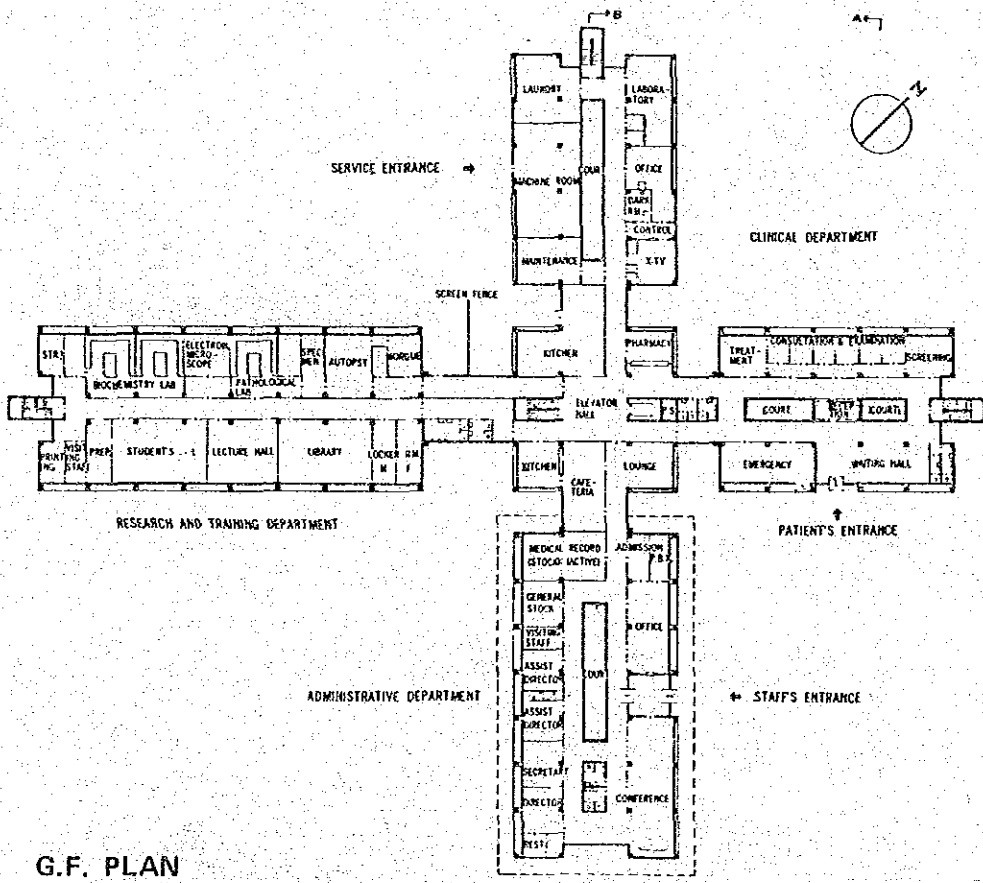


PROJECT SITE IN ALABANG COMPOUND



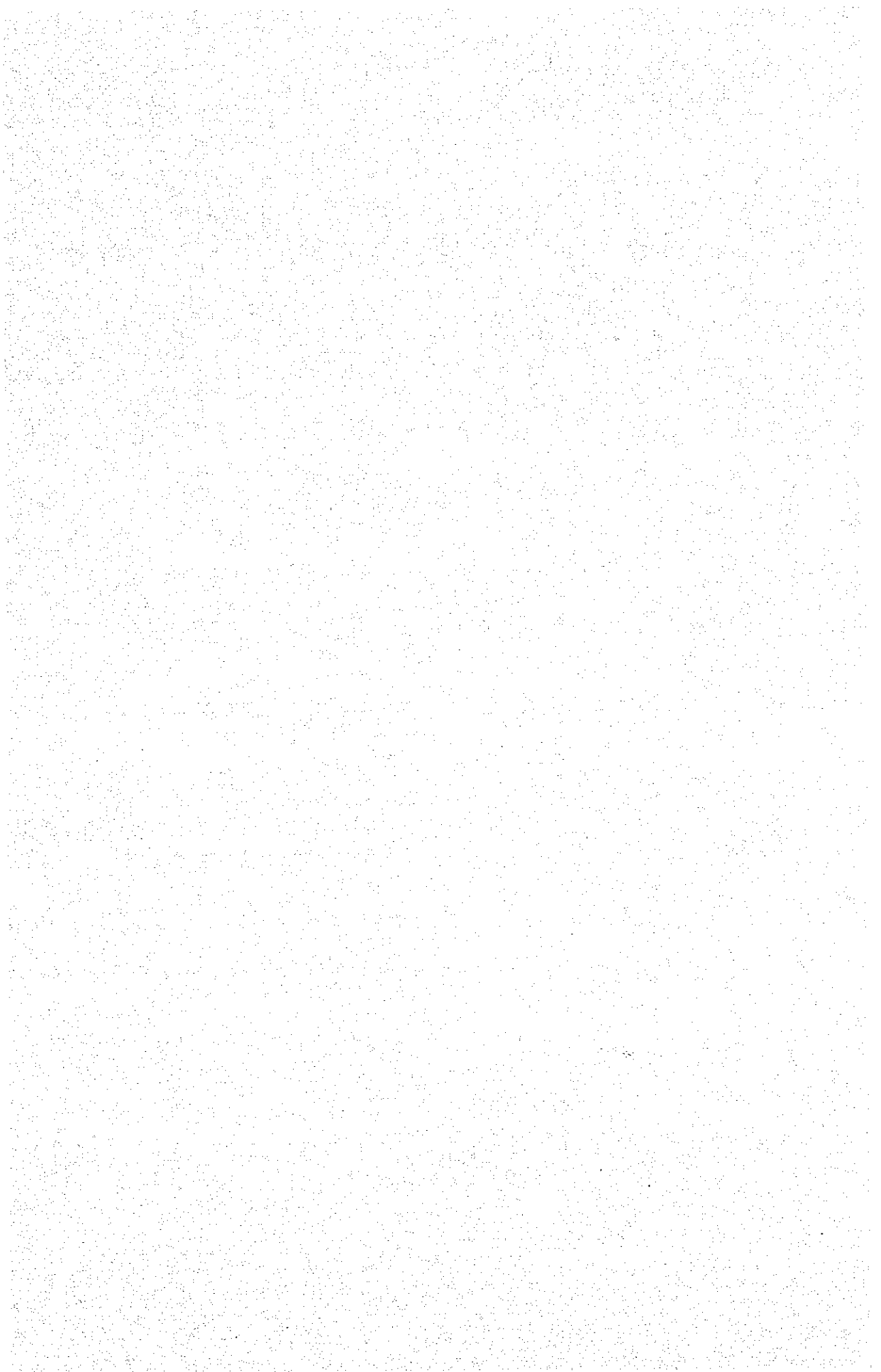


2F PLAN



G.F. PLAN

FLOOR PLAN OF THE INSTITUTE OF TROPICAL MEDICINE



SUMMARY

The Research Institute for Tropical Medicine in the Republic of the Philippines (hereinafter referred to as the "Research Institute"), a modern medical research facilities having the total area of 6,113m² constructed in March, 1981 by Grant Aid of the Japanese government, and the institute is situated in Alabang of Muntinlupa City, Rizal, about 25km to the south of Manila City. Japan International Cooperation Agency has signed Record of Discussions (R/D) with this research institute on October 17, 1980 for the technical cooperation for five years. The objectives of this research institute are;

- (1) the research for the prevetion of the controllable types of the infectious diseases which are prevailing in the Philippines and
- (2) the training and the practice for the research personnel needed for the activity of the research institute.

The acute respiratory infections and the diarrhea are the two diseases most common in the Philippines, and for the microbiological research of these diseases, the experimental animal such as the mice and the rats are indispensable.

The research institute has requested Japan International Cooperation Agency to construct a new building within the existing site as the part of the technical cooperation program mainly due to the following reasons concerning the existing animal experimental laboratory facilities.

1. The offensive odor spreads towards other laboratories due to the inadequate ventilation system.
2. The existing space for keeping the experimental animals has become too small to meet the need of larger space for the expanded scope of the research.
3. Rise of the need for the production facilities of the feed for the experimental animals, since the compressed animal feed currently available in the domestic market of the Philippines are not good enough in both the form and the quality.

The survey was conducted for the existing facilities, and, based on the result of this survey, the proposal has been made for the construction of a one-story building of the reinforced construction having the total area of 252m² for accommodating three isolated rooms for the experimental animals, three laboratory rooms for the conventional animals, one washing and sterilizing room, one animal feed production room and one record keeping room in the open space in the northwest of the existing research building instead of the originally proposed site for the construction.

As for the administration of the facilities, the animal experimental laboratory will be raised to the status of a department of the research institute consisting of the head of the department and four staffs. In designing this animal experimental laboratory, it is required to place the emphases on the ease of the administration and the maintenance of the building, low maintenance cost. The experimental laboratory for the conventional animals is required to be ventilated mainly by the natural ventilation, while the experimental animal laboratory is required to be provided with the window coolers which are to be operated when the temperature exceeds 30°C.

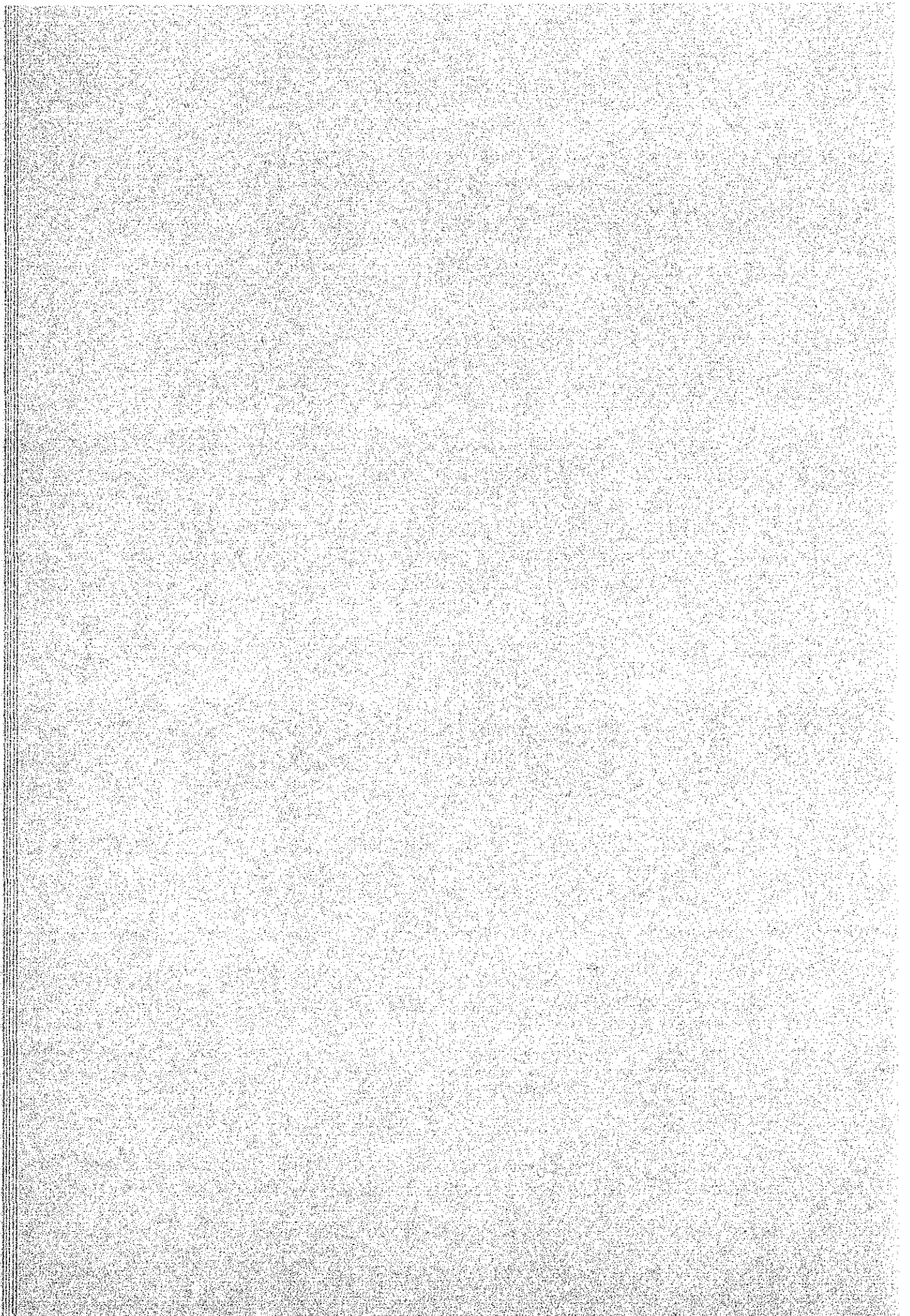
As for the animal feed production facilities, the mixer and the pelleter will be installed in the animal feed production room so that the compressed feed for the consumption in a week will be produced by operating these equipments once a week. Other experimental equipments to be supplied newly will be one set of the negative clean rack for the experiment using the infected animals, one set of positive clean rack for SPF animal experiment, one freezer for the storage of the bodies of the animals and one set of drying sterilizer for the animal feed, bedding materials and cages. As for other equipments, those in the existing experimental animal laboratory will be re-installed in the new laboratory.

At least about eight months will be required before the commencement of the regular activity of the new animal experimental laboratory including the two months for the preparation of the construction work, five months for the execution of the construction work for the

building and one month for the preparation of the transfer of the animals.

The contractors participating in the various works for the construction of the new animal experimental laboratory should be selected carefully in consideration of the importance of the laboratory that is supposed to be in activity for 24 hours every day, and thus the contracts with these contractors are desired to take the form of the free contract.

The completion of this project is expected to enable not only the control and the reproduction of the experimental animals which can be used for obtaining the research data which are acceptable on the international level but also the infection experiment using the safe segregated laboratory provided with the barriers, and these things are expected to contribute to the prevention of the infectious diseases in the Philippines, which is the ultimate goal of the Research Institute for Tropical Medicine.



CONTENTS OF SURVEY REPORT ON THE DESIGN AND WORK EXECUTION SCHEDULE

PREFACE

Location Map

SUMMARY

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CHAPTER 1 INTRODUCTION

The Research Institute for Tropical Medicine in the Republic of the Philippines is situated in Alabang of Muntinlupa City, Rizal, about 25km to the south of Manila City. It is a modern medical research facilities having the total area of 6,113m² constructed in March, 1981 by Grant Aid of the Japanese government. This research institute comprises the administration department, clinical department consisting of the out-patient section and the clinical section of 50 beds for the in-patients, research department and training department. Japan Internation Cooperation Agency is now providing the technical cooperation service for 5 years (1981 to 1985) to this research institute under the Record of Discussions (R/D). The technical cooperation service covers the following fields:

- A. Epidemiology for infectious diseases, microbiology, epidemiology and preventive measures
 - o Epidemiology for diphtheria, pertussis and tetanus, microbiology, epidemiology and others.
 - o Microbiology for laxative diseases, host and environmental factors, therapy and others.
 - o Other fields of medicine based on the mutual agreement.
- B. Training of the health workers engaging in the epidemic disease prevnetion activity.

Also, during the period of this technical cooperation, the Japanese experts in the fields of the public health, microbiology, epidemiology, parasitology, biochemistry, pathology, clinical medicine, bionics, medical bionics, experimental animals and others are scheduled to be sent by Japan International Cooperation Agency, and this technical cooperation program is expected to contribute to the promotion of the public health of the people of the Philippines and the friendship between the two nations.

Recently, the Research Institute for Tropical Medicine has requested Japan International Cooperation Agency to provide its aid for the survey, design and construction of a new experimental animal laboratory to replace the one at present located on the second floor of the research and training building as the part of the technical cooperation program of the agency. This request has been made due to the following reasons:

1. The offensive odor from the experimental animal laboratory spreads towards other laboratories due to the inadequate ventilation system.
2. The presently available space for the research is too small to meet the need for the expanding scope of the research activity.
3. The feed for the experimental animals is not readily available in the domestic market of the Philippines, so that the production facilities for the animal feed has become necessary.

In compliance with this request, the Japanese government has sent a detail design survey team headed by Dr. Masao Nakagawa, Chief of No.1 Laboratory of Experimental Animals, Department of Veterinary Science, National Institute of Health to the Philippines through the arrangement made by Japan International Cooperation Agency from February 5th to 29th, 1984.

This detail design survey team has conducted the on-site survey for the following purposes in consideration of the result of the preliminary on-site survey conducted from Dec. 18th to 24th, 1983.

- 1) The collection of the data concerning the scale, content, administration system, activity program of the experimental animal laboratory which are necessary for the estimate of the construction cost and the detail design.

The matters on which both the survey team and the representative of the Republic of the Philippines have agreed concerning the proposed project through the discussion held during the stay of the survey team were summarized into the minutes in duplicate, which were signed and exchanged by the representatives of both of the parties.

The survey team, after their return to Japan, has analyzed the result of their survey, prepared the detail design schedule for the execution of the proposed subject, and has made it public as the detail design report.

CHAPTER 2 BACKGROUND OF PROJECT

The Research Institute for Tropical Medicine has been engaging in the researches for the prevention of the controllable infectious diseases spreading in the Philippines, and also it has been training the staffs needed for the promotion of the research activity, and providing the chances of the practice to these trainees. The major fields of researches in which the research institute has been engaging are the prevention of the controllable diseases such as the diphtheria, pertussis, tetanus and the laxative diseases.

The research program of this research institute includes the introduction of the technical cooperation program with Japan such as the invitation of the Japanese experts, introduction of the Japanese equipments and materials and sending its research staffs to Japan for training; and the introduction of the aids from WHO, NSTA (National Science and Technology Authority) and the aid from the Australian government which has been started in this year (1984).

The acute respiratory disease and the laxative disease are the most common types of the disease in the Philippines, and the experimental animals such as the mice, rats, guinea pigs and rabbits are indispensable for the microbiological researches of these diseases.

The activity of the research institute is now maintained by 310 staff (as of January 1st, 1984), the substantial increase from 150 estimated at the start of the project, and the total operating expense comprising the personnel expense, maintenance expense and equipments & materials expense in 1983 totaled P5,696,363.05 (see Annex 1). The clinical department of the institute is now receiving 25 to 30 in-patients monthly on the average, and about 80% of these in-patients are for the clinical treatment and the clinical research. The patients transferred from the associated hospitals were those of advanced cases (see Annex 2).

The experimental animal laboratory is now playing quite an important role for the research activity of the institute, and the further perfection of the Research Institute for Tropical Medicine is expected by other organizations in association with it, since the facilities for the experiments using the animals are limited in number in the Philippines.

In order for the quality of any research paper written based on the result of the experiment conducted using the animals to be appreciated duely and internationally in the field of relevant study, quite large importance must be attached to the qualities of the animals as the sources of the experimental data.

Besides, in conducting the experiment using the infections elements, the appropriate facilities must be provided in order to prevent the people from being infected. The planned breeding of the experimental animals such as the mice and others to be used for the researches is one of the basic requirements for the maintenance of the activity of the experimental animal laboratory.

The existing experimental animal laboratory is now confronted with the following problems that prevents the ideal reproduction of the experimental animals.

- ① The qualities of the animal feeds cannot be controlled by the laboratory.
- ② The barrier requied in conducting the infection experiment is not available in the existing laboratory.
- ③ The ideal form of the reproduction of the experimental animals cannot be expected in the existing laboratory facilities, since large and small animals are kept in the same room.

Today, the research institute not only has more experienced research personnel than before but also has the capacity for accepting the entrustement of the research projects from the international research organizations, and thus it is essential for the research institute to establish the internationally acceptable experimental system by further perfecting the existing experimental animal laboratory.

ANNEX 1

Fiscal Year 1983

| | <u>GENERAL FUND</u> | <u>NSTA FUND</u> |
|--|-----------------------------|---------------------------|
| I. PERSONAL SERVICES: | | |
| 1. Salaries | P1,828,307.31 | P586,180.43 |
| 2. Terminal Leave Benefits | 28,874.80 | 0.00 |
| 3. Commutable Allowance | 28,250.00 | 0.00 |
| 4. Honorarium & Incentive Pay | 84,400.00 | 188,790.00 |
| 5. Bonuses | 45,100.50 | 0.00 |
| 6. Cost of Living Allow. & Laundry | 264,938.57 | 45,075.80 |
| Total Personal Services | <u>P2,275,871.18</u> | <u>P820,046.23</u> |
| II. MAINTENANCE AND OTHER OPERATING EXPENSES: | | |
| 1. Travelling & Per-Diem | P11,118.15 | P37,349.30 |
| 2. Communication | 5,000.99 | 0.00 |
| 3. Repairs & Maintenance | 686,040.00 | 0.00 |
| 4. Other Service | 516,717.77 | 14,000.00 |
| 5. Supplies & Materials | 1,923,563.59 | 278,217.12 |
| 6. Water, Illumination & Power | 98,016.78 | 0.00 |
| 7. Maintenance of Motor Vehicles | 131,046.59 | 0.00 |
| 8. Representation Expenses | 400.00 | 0.00 |
| Total MCCE | <u>P3,371,903.87</u> | <u>P329,566.42</u> |
| III. EQUIPMENT OUTLAY: | | |
| 1. Furniture & Equipment | P48,588.00 | P5,350.00 |
| Total Equipment Outlay | <u>P48,588.00</u> | <u>P5,350.00</u> |
| GRAND TOTAL | <u><u>P5,696,363.05</u></u> | <u><u>P277,152.97</u></u> |

Prepared by:

SALVADOR I. GALINATO, JR.
Accountant III

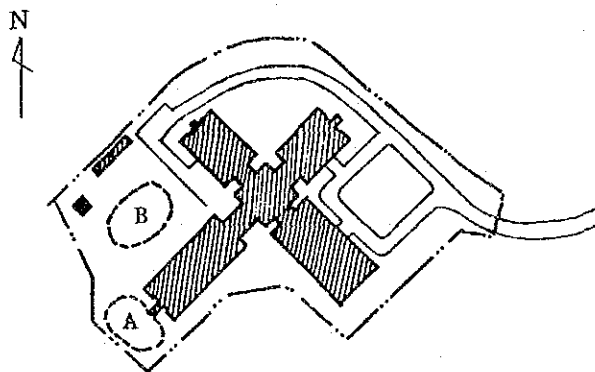
ANNEX 2

| MEDICAL AND NURSING SERVICES | 1982 | 1st Quarter 1983 |
|--|----------------------------|----------------------------|
| Out-patient services | 2940 (73.2% infectious) | 1359 (78.6% infectious) |
| Emergency room | 878 (80.6% infectious) | 519 (84.9% infectious) |
| In-patient admissions | 250 | 131 |
| SUPPORT SERVICES | | |
| Clinical Laboratory Service | 4,751 | 3,179 |
| Autopsy service (Autopsy rate 50-53%) | 7 | 14 |
| Radiology service | 773 | 363 |
| Social service | 1,233 | 365 |
| Pharmacy (prescriptions) | 8,149 | 6,153 |
| Dietary Service | 7,056 | 3,781 |

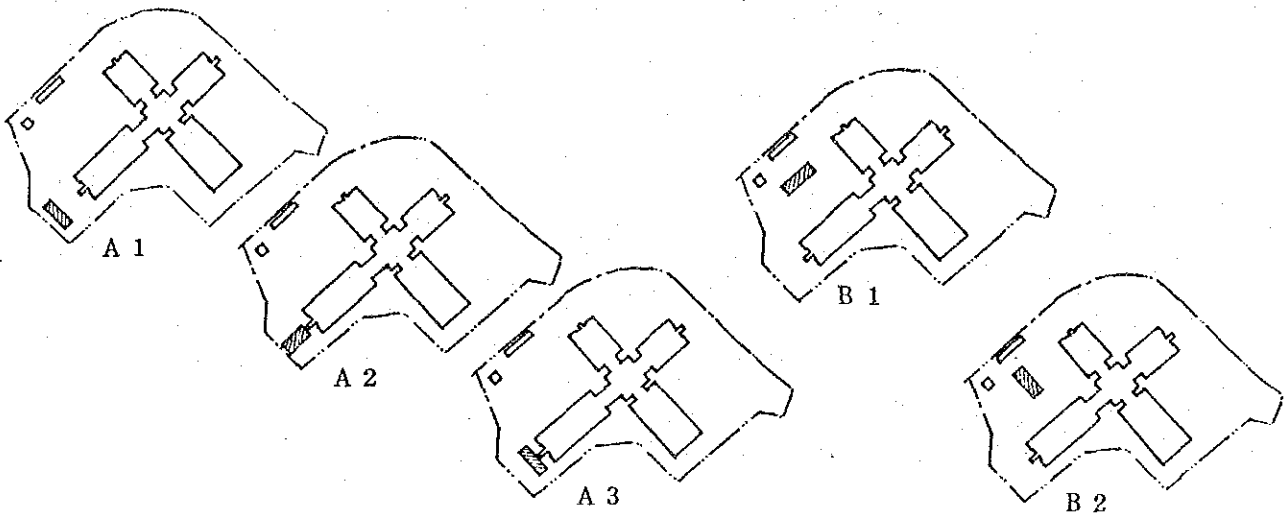
CHAPTER 3 CONDITIONS OF PROPOSED CONSTRUCTION SITE

3-1 Location of Proposed Construction Site

The present site of Research Institute for Tropical Medicine occupies about 20ha of 70ha of Alabang compound owned by Ministry of Public Health. The site of the research institute is now surrounded with the wire fence for the security purpose. For the construction of the proposed new experimental animal laboratory building, the site of the construction has been decided to be situated adjacent to the existing experimental animal laboratory building, since the activity of the new experimental animal laboratory is closely related with that of the research department located in the existing building. Within the existing compound, the lot A and B having the area of about 200m² have been considered as the possible site for the construction of the new building. Other lots have not been considered as the site of construction from the various reasons such as the limitation of the available area, the distance from the existing building and the limitation of the available area due to the existing fence.



As the Lot A, three different plans namely A1, A2 and A3 have been considered, while in Lot B, two plans, B1 and B2 have been considered.



Note: The marked areas (▨) indicate the new experimental animal laboratory building.

In considering these lots as the possible site of the new building, the following conditions have been taken into account:

(1) Direction of the wind

The wind from the lagoon blows from the southeast to the northwest, and the wind during the summertime blows from the northwest to the southeast is prevailing.

(2) Direction of the spread of the offensive odor and the location of Lot A which can be seen from the growing residential area located adjacent to the southwest side of Lot A.

(3) Communications

Systems for the communications with the research building, supply of the animal feeds and removal of the wastes.

(4) Services

Systems for the supply and drainage of the water, supply of hot water, supply of steam, supply of electricity, telephone service and intercom .

(5) Future plan

Future expansion plan of the research institute.

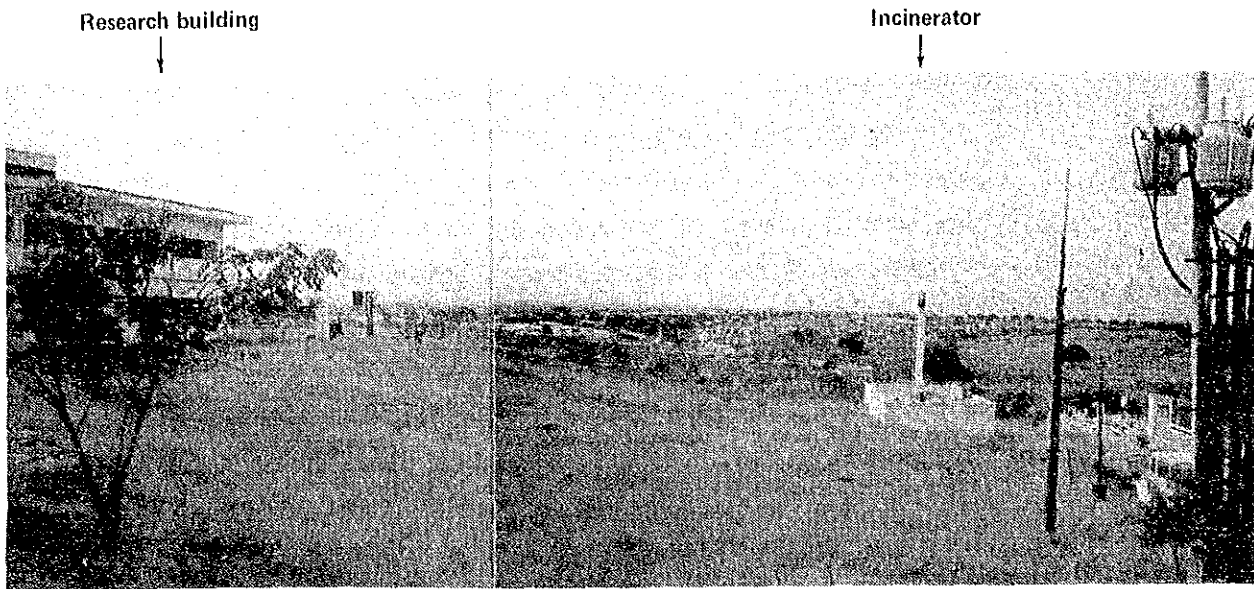
(6) Security and administration

Checking the traffic of outsiders, animal feeds, materials and the wastes.

(7) Effects of new building on the existing facilities

Effects of the work for connecting the new building to the existing building and repair works and the noise and the traffic of the outsiders during the execution of the construction work.

Keeping the above conditions in mind, the senior staffs of the research institute have considered all the above-mentioned lots as the possible sites of the construction of the new building through their conferences. As a result, they have eliminated the Lot A1 due to the consideration to the inhabitants in the adjacent residential area, Lots A2 and A3 due to the possibility of the future expansion, and Lot B2 due to the geographical condition that it includes the incline requiring extra earth-moving and banking works. As a result, the plan using the Lot B1 has been adopted finally.



Overlooking the proposed site of construction from the service building
Project Site

3-2 Natural Conditions

3-2-1 Weather conditions

The site of construction is geographically located in the tropical monsoon territory, and the season is divided clearly into the dry season (November to April) and the wet season (May to November).

Temperature and humidity

| Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Annual average |
|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|----------------|
| Maximum | 29.7 | 30.3 | 31.4 | 33.2 | 33.5 | 32.1 | 31.2 | 30.5 | 30.6 | 31.1 | 30.6 | 29.8 | 31.2 |
| Minimum | 22.2 | 22.4 | 23.5 | 24.9 | 25.6 | 25.2 | 24.7 | 24.5 | 24.4 | 24.3 | 23.7 | 22.9 | 24.0 |
| Monthly average humidity % | 72 | 68 | 65 | 64 | 69 | 76 | 79 | 82 | 89 | 77 | 76 | 75 | |

Precipitation

The Philippines comprise a number of islands scattering in an area covering about 1,850km from the north to the south, and 1,100km from the east to the west. The weather conditions vary by the geographical locations of the individual islands. For example, in Manila City, the largest precipitation reaching 480mm (on the average) is normally observed in August of the wet season, and the smaller precipitation of 6mm (on the average) in February of the dry season. The nature of the wet season in the Philippines differs the rainy season in Japan, since the wet season in the Philippines is characterized by the heavy rainfall occurring only once or twice a day during the season, whereas the rainy season in Japan is characterized by the intermittent drizzling rain continuing throughout the substantial part of a day and throughout the season (see Annex for the annual precipitation and the numbers of wet and dry days in the Philippines).

Direction of wind

In the Philippines, the strong wind blows during the typhoon season. The maximum wind velocity ever recorded was 55.56m/m (November, 1970). In Manila City, the wind blows from the northeast from October through January, from the southeast from February through May, and from the southwest from June through September.

| Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|-----------------------|------------|---------------|---|---|---|---------------|---|---|---|---------------|----|----|
| Direction of wind | North-east | ← Southeast → | | | | ← Southwest → | | | | ← Northeast → | | |
| Wind velocity (m/sec) | 5 | 5 | 6 | 5 | 6 | 8 | 8 | 9 | 8 | 5 | 5 | 5 |

Earthquake

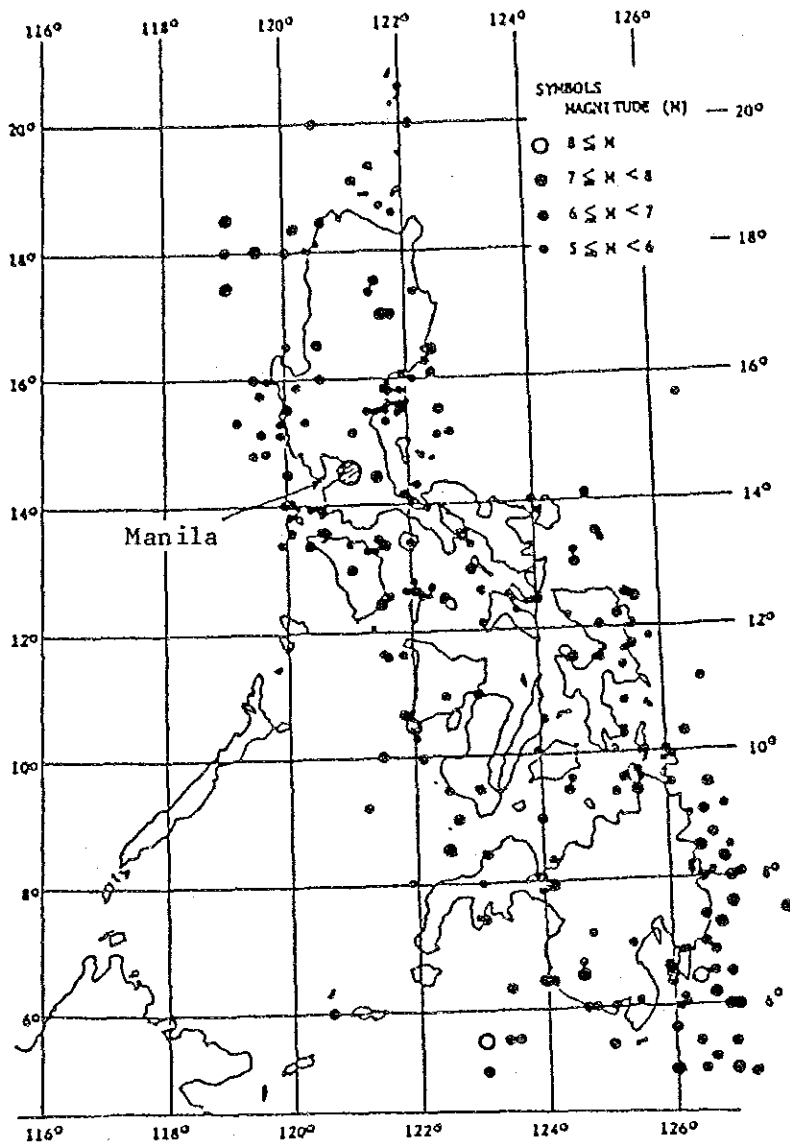
The Philippines belong to the circum-pan-Pacific earthquake belt, and is one of the major earthquake-ridden countries of the world like Japan. The earthquake registering a magnitude of over 6 occurs annually. For example, the earthquake in 1918 whose seismic center was in the Selebes Sea registered a magnitude of 8.5. The record of the damages by the earthquakes occurred in the Metropolitan Manila District including Quezon City shows that the earthquake in August, 1968 with the seismic center in the eastern part of Casiguran and the registered magnitude of 7.3 caused the serious damages to a number of the reinforced concrete buildings and the loss of the lives of some 400 people. In April, 1970, the earthquake with the seismic center in Baler and the registered magnitude of 6.8 also caused the serious damaged to the buildings including the collapse of a school building in P. Guevara. The minor earthquakes occur two to three times a year (For the details of the records of the earthquakes whose magnitudes were over 5, refer to the official records of earthquake in the Philippines).

Damages from storms and floods

The typhoon occurs about 20 times in a year mainly in July through October; however, all the typhoons passing the islands of the Philippines are not so violent as imagined in Japan, since the Philippines are situated near the sea area where the typhoons are born. Thus, many of the typhoons formed in this sea area are still small in size and not accompanied by the violent storm. On the other hand, however, the typhoons occurring in this area moves very slowly in many instances, thereby causing the local heavy rainfalls over many days, but they are not accompanied by the storm except a few cases.

Thunder

In the Metropolitan Manila District, there are 49 stormy days accompanying the thunder out of the most of the 53 stormy days during the period of May through October. The lightning occurs mostly in June, but only a few cases of the damage by the lightning have been reported by now.



Epicenter and magnitude of earthquake (Magnitude: > 5)

Annual average temperatures in the Philippines

| Month District | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Months in a year |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------------------------|
| Manila | 26.0 | 26.4 | 27.7 | 29.1 | 29.6 | 28.7 | 28.0 | 27.5 | 27.5 | 27.8 | 27.2 | 26.3 | 27.6 |
| Legaspi | 25.5 | 25.6 | 26.3 | 27.3 | 28.1 | 28.1 | 27.7 | 27.7 | 27.5 | 27.1 | 26.6 | 26.0 | 27.0 |
| Tugarao | 24.5 | 25.3 | 27.5 | 29.3 | 30.5 | 29.7 | 29.3 | 29.0 | 28.5 | 27.5 | 26.0 | 25.0 | 27.7 |
| Baguio | 17.8 | 18.5 | 19.5 | 20.1 | 20.3 | 19.7 | 19.3 | 19.0 | 19.1 | 19.3 | 19.0 | 18.3 | 19.2 |
| Tacloban | 26.0 | 26.0 | 26.6 | 27.5 | 28.0 | 28.0 | 27.7 | 28.0 | 28.0 | 27.7 | 27.1 | 26.5 | 27.3 |
| Cebu | 26.3 | 26.5 | 27.3 | 28.3 | 28.7 | 28.0 | 27.5 | 27.5 | 27.5 | 27.5 | 27.2 | 26.7 | 27.4 |
| Iloilo | 25.6 | 25.8 | 26.7 | 28.0 | 28.3 | 27.7 | 27.3 | 27.1 | 27.1 | 27.1 | 26.7 | 26.1 | 27.0 |
| Zamboanga | 26.5 | 26.6 | 27.1 | 27.5 | 27.5 | 27.0 | 26.7 | 26.7 | 27.0 | 26.8 | 27.0 | 26.6 | 26.8 |

3-3 Condition of Infrastructure

Water supply

In the research institute, the water pumped from the two wells in the site is stored in a water tank of 40m³ on the roof of the central section of the research building, and the water is supplied by the gravity method. This water supply system is primarily designed for the daily consumption 100m³.

The present water consumption is not known, since the maintenance section has not been keeping the record, but, at present, it is known that the water is supplied to the following residences and the building which were not planned in the original supply plan.

The residences (7 residences) adjacent to the research institute:

From 7:00 To 8:00 a.m. From 5:00 To 6:00 p.m.

Nurses' ward accommodating about 50 nurses:

From 8:30 To 9:00 a.m. From 3:30 To 4:00 p.m.

Men's ward accommodating about 15 persons:

From 4:00 To 5:00 p.m.

The water supply to these facilities is manually controlled by any one of the maintenance staff in charge who opens and close the valve of the Garden Hose Bibb from which the water supply line to these facilities starts, but the control of the water supply does not seem to have been made regularly. This outdoor (hydrant for the water sprinkler), when opened fully, can provide the pressure large enough to supply the water to the new building.

Drainage system

The water used for the experiment is first discharged into the neutralizing tank, then into the drainageway, the septic for the sewage in the site and the river.

Supply of electricity

The total load of the electric equipments in the research institute was originally estimated to be 500KVA, and the circuits for the medical equipments are provided with the voltage stabilizers (AVR) by way of the precaution against the voltage drop. The breakdown of the load capacity in the design stage were as follows:

| | |
|--|--------|
| 1. Lighting system circuit | 120KVA |
| 2. Air-conditioning and ventilation system circuit | 160KVA |
| 3. Water-supply and drainage system circuits | 50KVA |
| 4. Medical equipment circuit | 120KVA |
| 5. Others | 50KVA |
| | <hr/> |
| | 500KVA |

In preparation for the power failure, a 150KVA generator is provided for the emergency circuit. The maximum and the minimum power consumption of the maintenance section are as follows:

| | | |
|---------------------------------|---|---|
| Maximum consumption (May) | : | 27,800KW/month (Average: 897KWH/day) |
| Minimum consumption (December): | | 21,300KW/month (Average: 688KWH/day) |

(Source: Annex 3)

At present, (the research institute) is paying 6,000 to 8,000 pesos monthly as the electricity charge.

Telephone service

According to the original design, a switchboard to handle 4 incoming telephone lines and 30 extension lines was installed, but, at present, only one incoming telephone line (Direct line to the room of the secretary for the director of the research institute, which is also used for the outgoing call) is used, and the switchboard is used only for the extension lines in the research institute.

ANNEX 3

RESEARCH INSTITUTE FOR TROPICAL MEDICINE
ALABANG, MUNTINLUPA, M.M.DAILY POWER CONSUMPTION

MONTH: MAY '83 TOTAL KWHR = 27,801
Ave. daily KWHR consumption = 896.806

| <u>ITEM NO.</u> | <u>METER READING IN KWH</u> | <u>DATE</u> | |
|-----------------|-----------------------------|-------------|--------|
| 785 | 854580 - 570 | 5- 1-83 | * |
| | 355150 - 570 | | |
| 786 | 355720 - 570 | 5- 2-83 | |
| 787 | 356640 - 920 | 5- 3-83 | |
| 788 | 357580 - 940 | 5- 4-83 | |
| 789 | 358490 - 910 | 5- 5-83 | |
| 790 | 359470 - 980 | 5- 6-83 | |
| 791 | 360200 - 730 | 5- 7-83 | 3 min. |
| 792 | 361040 - 840 | 5- 8-83 | * |
| 793 | 361740 - 700 | 5- 9-83 | |
| 794 | 362800 - 1040 | 5-10-83 | |
| 795 | 363890 - 1090 | 5-11-83 | |
| 796 | 365050 - 1100 | 5-12-83 | |
| 797 | 366090 - 1040 | 5-13-83 | |
| 798 | 367180 - 1090 | 5-14-83 | |
| 799 | 367820 - 640 | 5-15-83 | * |
| 800 | 368490 - 670 | 5-16-83 | |
| 801 | 369560 - 1070 | 5-17-83 | |
| 802 | 370520 - 960 | 5-18-83 | |
| 803 | 371620 - 1100 | 5-19-83 | |
| 804 | 372690 - 1070 | 5-20-83 | 4 min. |
| 805 | 373830 - 1140 | 5-21-83 | * |
| 806 | 374410 - 580 | 5-22-83 | * |
| 807 | 375070 - 660 | 5-23-83 | |
| 808 | 376080 - 1010 | 5-24-83 | * |
| 809 | 376750 - 670 | 5-25-83 | |
| 810 | 377810 - 1060 | 5-26-83 | |
| 811 | 378860 - 1050 | 5-27-83 | |
| 812 | 379960 - 1100 | 5-28-83 | |
| 813 | 380660 - 700 | 5-29-83 | * |
| 814 | 381300 - 640 | 5-30-83 | |
| 815 | 387350 - 1080 | 5-31-83 | |

ANNEX 4

RESEARCH INSTITUTE FOR TROPICAL MEDICINE
ALABANG, MUNTINLUPA, M.M.DAILY POWER CONSUMPTION

MONTH: DEC '83 TOTAL KWHR = 21,300
Ave. daily KWHR consumption = 687.096

| <u>ITEM NO.</u> | <u>METER READING IN KWH</u> | <u>DATE</u> |
|-----------------|-----------------------------|-------------|
| 998 | 537510 - 550 | |
| | 538120 - 550 | |
| 999 | 539040 - 920 | |
| 1000 | 539990 - 950 | |
| 1001 | 540430 - 440 | * |
| 1002 | 540920 - 490 | |
| 1003 | 541630 - 710 | |
| 1004 | 542390 - 840 | |
| 1005 | 543120 - 730 | |
| 1006 | 543830 - 710 | |
| 1007 | 544640 - 810 | |
| 1008 | 545210 - 570 | |
| 1009 | 545620 - 410 | |
| 1010 | 546360 - 740 | |
| 1011 | 547050 - 790 | |
| 1012 | 547830 - 780 | |
| 1013 | 545610 - 780 | |
| 1014 | 549460 - 850 | |
| 1015 | 549960 - 500 | * |
| 1016 | 550470 - 510 | |
| 1017 | 551320 - 850 | |
| 1018 | 552140 - 820 | |
| 1019 | 552880 - 740 | |
| 1020 | 553610 - 730 | |
| 1021 | 554380 - 770 | |
| 1022 | 554900 - 520 | |
| 1023 | 555420 - 520 | * |
| 1024 | 555950 - 530 | |
| 1025 | 556690 - 740 | |
| 1026 | 557480 - 810 | |
| 1027 | 558150 - 750 | |
| 1028 | 558670 - 420 | |

3-4 Environmental Condition for Construction

In the Metropolitan Manila District, the construction projects are confronted with the rising material and labor costs, and some of the projects are compelled to suspend or reduce their scales. Though this can be said as to all the local industries, the recent political instability in the Philippines and the resultant shortage of the foreign exchange add to the stagnation of the construction industry.

On the other hand, the overseas activities (of Philippine construction companies) are increasing mainly in the Middle East, Indonesia, Hong Kong and many other areas of the world by being aided considerably by the government's promotion policy, and expected to increase further from now on. As a result, the supply of the skilled construction workers at home has become considerably tight, and this has caused the number of unskilled construction workers to increase at home.

As for the wage of the construction workers, the levels of the minimum wage and the livelihood allowance have been raised from October, 1983 by the Presidential Ordinance. As a result, the following wage system has been established.

| | | |
|------------------------------|---|------------|
| Minimum daily wage | : | P22.5/day |
| Minimum livelihood allowance | : | P210/month |

This wage system promises each construction labor the monthly wage of at least P1,065 when worked 8 hours a day and 26 days a month. The wages of various occupations as of February, 1984 are shown in Annex 5.

As for the construction materials, almost all of those needed for the construction work are produced domestically. For the materials of the equipments and the related parts are undersupplied recently due to the domestic manufacturers' lacking in the production capacities to meet the demand and the control of the imports by the government. Also, the construction cost has begun to rise conspicuously. For example, some of the

construction companies estimate the annual price increase to be as high as 40% judging from the recent trend of the increase in the consumer price.

ANNEX 5

| | <u>Labor Cost</u> | <u>Per Day</u> | <u>Per Hour</u> |
|-----|-----------------------------|----------------|-----------------|
| 1. | Common Laborer | 18.36 | 2.295 |
| 2. | Carpenter (foreman) | 28.00 | 3.50 |
| 3. | Common Carpenter | 24.00 | 3.00 |
| 4. | Fixing Carpenter | 24.00 | 3.00 |
| 5. | Assistant Carpenter | 20.00 | 2.50 |
| 6. | Reinforcing-bar Placer | 24.00 | 3.00 |
| 7. | Assistant Placer | 18.36 | 2.295 |
| 8. | Scaffolding Man | 24.00 | 3.00 |
| 9. | Block Worker (foreman) | 28.00 | 3.50 |
| 10. | " | 24.00 | 3.00 |
| 11. | " (assistant) | 20.00 | 2.50 |
| 12. | Plaster Worker (foreman) | 28.00 | 3.50 |
| 13. | " | 24.00 | 3.00 |
| 14. | " (assistant) | 20.00 | 2.50 |
| 15. | Painter (foreman) | 28.00 | 3.50 |
| 16. | " | 24.00 | 3.00 |
| 17. | " (assistant) | 20.00 | 2.50 |
| 18. | Welder | 24.00 | 3.00 |
| 19. | Black Smith | 24.00 | 3.00 |
| 20. | " (assistant) | 20.00 | 2.50 |
| 21. | Mason | 24.00 | 3.00 |
| 22. | Assistant Mason | 20.00 | 2.50 |
| 23. | Tinsmith | 24.00 | 3.00 |
| 24. | Assistant Tinsmith | 20.00 | 2.50 |
| 25. | Terrazzo Worker | 24.00 | 3.00 |
| 26. | Glazier | 24.00 | 3.00 |
| 27. | Bricklayer | 24.00 | 3.00 |
| 28. | Assistant Bricklayer | 20.00 | 2.50 |
| 29. | Tiling Worker | 24.00 | 3.00 |
| 30. | Assistant Tiling Worker | 20.00 | 2.50 |
| 31. | Waterproofing Worker | 24.00 | 3.00 |
| 32. | " (assistant) | 18.36 | 2.295 |
| 33. | Sashing Worker | 24.00 | 3.00 |
| 34. | Roofing-tile Layer | 24.00 | 3.00 |
| 35. | " (assistant) | 18.36 | 2.295 |
| 36. | Machine Operator | 24.00 | 3.00 |
| 37. | Plumber (foreman) | 32.00 | 4.00 |
| 38. | " | 24.00 | 3.00 |
| 39. | " (assistant) | 20.00 | 2.50 |
| 40. | Machine Installation Worker | 24.00 | 3.00 |
| 41. | Duct Placer | 24.00 | 3.00 |
| 42. | Heat Insulation Worker | 24.00 | 3.00 |
| 43. | " (assistant) | 20.00 | 2.50 |
| 44. | Electrician (foreman) | 28.00 | 3.50 |
| 45. | " | 24.00 | 3.00 |
| 46. | " (assistant) | 20.00 | 2.50 |

ANNEX 6

CONSTRUCTION COST AND MATERIALS

Note: (i) in Pesos

- EARTHWORK -

| | |
|----------------------|----------|
| Excavation | 107/cu m |
| Soil Disposal | 50/cu m |
| Backfill | 80/cu m |
| Soil Banking | 80/cu m |
| Crushed Stone Laying | 360/cu m |

- STEEL BARS -

| | |
|-----------------|-----------|
| 16 ϕ Steel | 9,800/ton |
|-----------------|-----------|

- FORMWORK -

| | |
|---------------------------------|-----------|
| Foundation, Install and Removal | 120/sq. m |
| Slab, ditto | 130/sq. m |

- CONCRETE WORK -

| | |
|---|------------|
| Foundation and Grade Girder, Slump 15, 3,000 psi | 1,120/cu m |
| Ground Floor Concrete, 2,500 psi | 1,020/cu m |

- MASONRY -

| | |
|--|--------------|
| Hollow Concrete Block, 150 mm thick, 1,000 psi | 180.0/sq. m |
| Hollow Concrete Block, 100 mm thick, 1,000 psi | 140.0/sq. m |
| Concrete Lintel | 100.0/lin. m |

- CERAMIC TILE WORK -

| | |
|-------------------------------------|-------------|
| Wall Vitreous Tile, 100 mm x 100 mm | 230.0/sq. m |
|-------------------------------------|-------------|

- CARPENTRY -

| | |
|--|--------------|
| Roof Rafter and Batten for Roof Tile | 200.0/sq. m |
| Eaves Facia Board (30 mm x 450 mm) w/ Wood Rafters | 150.0/lin. m |
| Eaves Ceiling Wood Furring | 75.0/sq. m |
| Ceiling Wood (Tanguile), 12 x 100 | 150.0/sq. m |
| Ceiling Furring w/ Suspension Bar | 85.0/sq. m |

- MISCELLANEOUS METAL WORK -

| | |
|---|--------------|
| Down Spout G.I. Pipe, 150mm ϕ | 200.0/lin. m |
| Roof Drain, Vertical Type, 150mm ϕ | 640/Nos. |

- PLASTERING WORK -

(Interior)

| | | |
|-----------|---|-----------|
| Floor | Pebble Washout Finish | 120/sq. m |
| | Leveling Cement Mortar (for Waterproof) | 30/sq. m |
| Baseboard | Cement Mortar Baseboard, H = 100 | 13/lin. m |
| Wall | Cement Mortar | 38/sq. m |

- STEEL DOORS -

| | | |
|---------------|-------------|-------------|
| SD Flush Door | 1500 x 2400 | 2,121.7/ea. |
|---------------|-------------|-------------|

- WOOD DOOR -

| | | |
|---------------|------------------------|-------------|
| WD Flush Door | (Narra) 1800x2400 | 1,795.5/ea. |
| WD | " (Tanguile) 1800x2400 | 1,202.3/ea. |
| WD | " (Narra) 900x2400 | 895.7/ea. |
| WD | " (Tanguile) 900x2400 | 501.9/ea. |
| WD | " (Narra) 900x2100 | 784.4/ea. |
| WD | " (Tanguile) 900x2100 | 438.9/ea. |

- GLASS -

| | |
|------------------------------|-----------|
| Clear Sheet Glass, 5mm thick | 326.3/ea. |
|------------------------------|-----------|

- PAINTING WORK -

| | |
|----------|-----------|
| A.E.P. | 55/sq. m |
| O.S.C.L. | 100/sq. m |
| E.P. | 55/sq. m |

- INTERIOR FINISHING -

| | | |
|-----------|---------------------------------|--------------|
| Floor | Marble Block | 300/sq. m |
| Baseboard | Marble Block Baseboard, H = 100 | 121.3/lin. m |
| Ceiling | Asbestos Cement Board 4 mm | 100/sq. m |

CHAPTER 4 CONTENT OF PROJECT

4-1 Objective and Basic Concept of the Project

In recent years, the experiments using the animals have become active in various fields of industry including the medicine, drug manufacturing and food processing. As a result, the demand has arisen for the animal keeping facilities which enables keeping various kinds animals for high quality of experimental use which can fill the needs for the multi-purpose and high-quality experiments.

As experiments using the animals are spreading year after year in Japan, not only the qualities of the experiments have been improved but also the conventional animal keeping facilities have been evolved into the research facilities using the such animals.

On the other hand, in the Philippines, as seen from the example that even the University of the Philippines have not been providing any education based on the experiments using the animals, and the students have been taught only the theories, the people's understanding of the experiments using the animals has been quite limited although they have begun to realize importance recently.

The same can be said as to the private businesses. Even in the field of the drug manufacturing industry, few manufactures have well-established experimental animal laboratory. It can readily be imagined that the Ministry of Public Health of the Philippines, which is suffering from the shortage of the budget, tends to appropriate larger budgets to the projects from which the immediate effects can be expected than those for the long-ranged basic research projects such as the experiments using the animals, since no immediate effects can be expected from the budget appropriated for such pruposes. Under such circumstances, Research Institute for Tropical Medicine has been performing its function actively by utilizing the foreign

technical assistance programs comprising both the physical and the financial assistances such as the invitation of the foreign specialists, sending its research staffs to foreign countries for training, the introduction of foreign equipments and drugs, etc., and its activity has come to be appreciated by the Ministry of Public Health.

The problems with which the experimental animal laboratory of the research institute is now confronted can be summarized as follows:

4-1-1 Problems of the existing experimental animal laboratory

According to the completion drawing of the research institute, the experimental animal laboratory is located adjacent to the parasite experimental laboratory on the second floor of the research building, and it faces the microbiological experimental laboratory and the infectious disease experimental laboratory over the corridor of the same floor. The experimental animal laboratory comprises the following rooms:

| Room | Area (m ²) | Remarks |
|-------------------------------|------------------------|---|
| Office | 15.0 | Air-conditioned; Not belonging to the laboratory at present. |
| Feed stockroom | 7.5 | Used as low-temperature (5°C) stockroom at present, and two refrigerators are placed. |
| Washing room | 15.0 | |
| Air-conditioning machine room | 7.5 | |
| Animal room 1 | 15.0 | Air-conditioned for 24 hours by package type air conditioner. |
| Animal room 2 | 15.0 | |
| Animal room 3 | 15.0 | |
| Ante room of animal room | 30.0 | |
| Ante room with entrance | 10.0 | |
| Experimental room 1 | 15.0 | No air-conditioning, since the removal of originally installed separate type window cooler. |
| Sub-total: | 145.0 | |
| Experimental room 2 | 21.0 | Used for medical entomology at present. |
| Total: | 166.0 | |

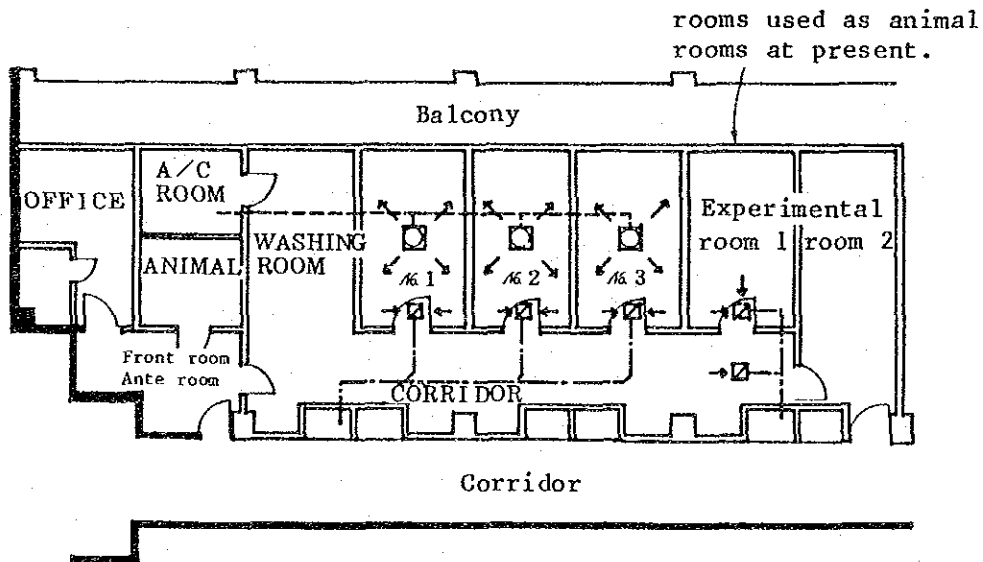


Fig. 1 Existing Experimental Animal Laboratory

The layout of the building at the start of the research institute has been changed considerably due to the expansion of the research activity. The principal alterations which have already been made are as follows:

1. The office has been made to belong to the microbiological research section but it is not used regularly (The room is not used at all by the experimental animal laboratory).
2. In the feed stockroom, a prefabricated type low-temperature stockroom for research department is installed, and, as a result, the stock space for the feed is reserved in front of the animal room.
3. Two refrigerators are placed in the ante room, and considerable amount of heat is accumulated in the room due to the poor ventilation.
4. The corridor in front of the animal room is used as the front room, and the lockers, shelves for the experimental apparatuses and materials, sterilizers and the animal feeds are placed, and as a result, the corridor is actually used as the stock space.
5. The air-conditioner of the experimental room 1 has been removed, and used as the animal room with natural ventilation (Animals for the experiments of infectious diseases belonging to biological research section).
6. Experimental room 2 is used as the experimental room for the medical entomology.
7. The ventilation fan of the corridor has been moved to the washing room. This has caused the loss of the balance between the supply and discharge of the air, which has resulted in the problem of the offensive odor.
8. The valve of the hot-water supply system is kept closed, and thus the hot water is not used at all.
9. The package air-conditioner (Nos.1, 2 and 3) for animal rooms are operated for 24 hours, but when it stops due to the trouble, the natural ventilation is not available during the repair time.

10. When the research institute started its activity, there was the problem that the part of the building was directly exposed to the afternoon sun, and this caused the death of the experimental animals kept near the windows on the west side.

When these problems are taken into consideration, the requirements for the new experimental animal laboratory building may be summarized as follows:

1. Expansion of the research spaces (Those for the parasite and microbiology).
2. Solution of the offensive odor problem through the alteration of the existing equipments and facilities.
3. Improvement of the rooms for the workers in the experimental animal laboratory.
4. Provision of the feed production room.

Animal room No. 1



Viewing the left side from the entrance of the room.



Viewing the right side from the entrance of the room.

Animal room No. 2

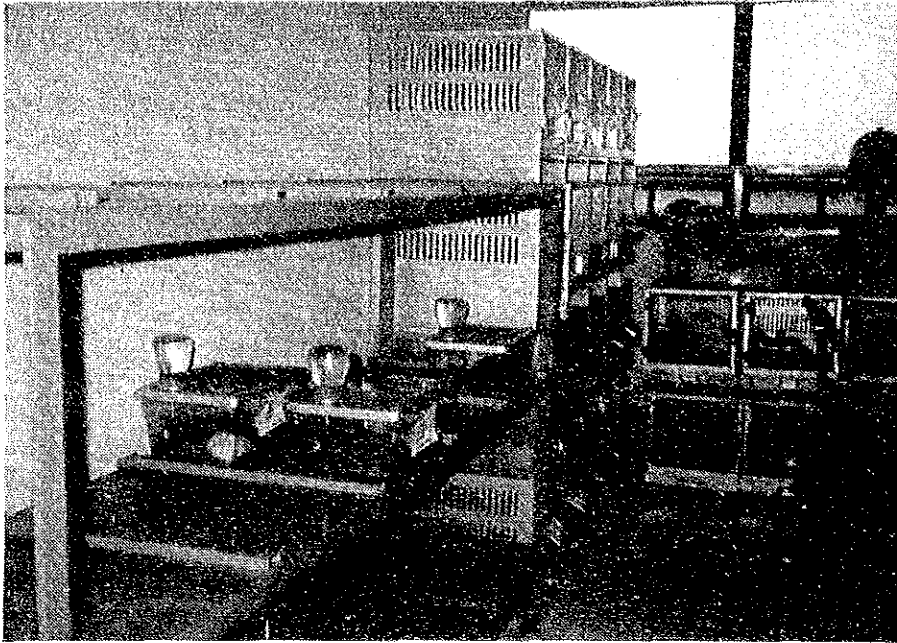


**Viewing the left side
(Rat cages) from the
entrance of the room.**



**Viewing the right side
(Rabbit cages) from the
entrance of the room.**

Animal room No. 3



The cages on the right are not used now.



Animal room No. 4 altered from a laboratory

The cage racks on the left were manufactured by the local manufacturer. The cages on the right were local products.

4-1-2 Research involving experimental animals

Research on the following subjects will be carried out in a period of five years (1984 - 1989).

1. Control of acute respiratory infections.
2. Study of the epidemiology of diarrheal diseases
3. Quantification, dynamics, and mechanism of pulmonary inflammatory response around Schistosomula of *S. Japonicum*
4. Monocyte-mediated killing of Schistosomula of *S. Japonicum*; Alteration in Human Schistosomiasis
5. Comparative morphology of small bowel mucosa in cholera, diarrhea and in the normal Filipino; a biopsic study by light and electrons microscopy
6. Study of suppurative meningitis among Filipinos
7. Study of viral pathogens in acute respiratory infections.
8. Study of rotavirus in diarrheal infections.
9. Role of human hepatosplenic in *Schistosoma Japonicum* in the genesis of suppressed T-cells
10. Effect of diabetes mellitus on nature course of *S. Japonicum*
11. In-vitro killing of Schistosomula of *S. Japonicum* by human monocyte: an ultra structural study
12. Study on Hepatitis B
13. Study on Malaria
14. Study on Amebiasis
15. Study on Salmonellosis
16. Study of Filariasis
17. Study on Zoonotic diseases
18. Study on Leprosy

4-1-3 Raised animals

The changes in the raising of the experimental animals in the last quarter of 1983 are as follows:

| Kind | Month | October | November | December |
|---------------|------------------|---------|----------|----------|
| 1. Mice | a. Balb/c | 200 | 350 | 400 |
| | b. C57B1/63 | 350 | 400 | 500 |
| | c. Swiss Webster | 25 | 35 | 50 |
| 2. Rabbits | | 10 | 13 | 13 |
| 3. Rats | | 40 | 40 | 50 |
| 4. Guinea Pig | | 20 | 20 | 18 |

The annually required numbers of various experimental animals after the completion of the new experimental animal laboratory in 1985 are estimated as follows:

| Kind | Annual need | Standing number of animal |
|--------------------------------------|-------------|---------------------------|
| 1. Mice (adult) | 6000/Year | } 630 |
| 2. Mice (suckling) | 9000 | |
| 3. Rat | 200 | 20 |
| 4. rabbits | 100 | 30 |
| 5. guinea pigs | 500 | 100 |
| 6. monkeys | 75 | 20 |
| 7. hamsters | 50 | 20 |
| 8. avian species | few | — |
| 9. others (gerbils, sheep, goat etc) | few | — |

4-1-4 Feed

Since the start of the raising of the experimental animals by the research institute, the pigeon pellet has been used as the feed for the animals. According to the catalog, this pigeon pellets contain the following ingredients:

| | |
|---------------|-----------|
| Crude protein | Over 16% |
| Crude fat | Over 30% |
| Crude fiber | Over 7.5% |
| Moisture | Over 10% |

The pellets are manufactured from the yellow corn, corn germ meal, corn gluten meal, corn cake, sorghum, pollard, rice bran, copra meal, meat and bone meal, ipilipil meat, fish meal, soybean meal, molasses, limestone/shell salt.

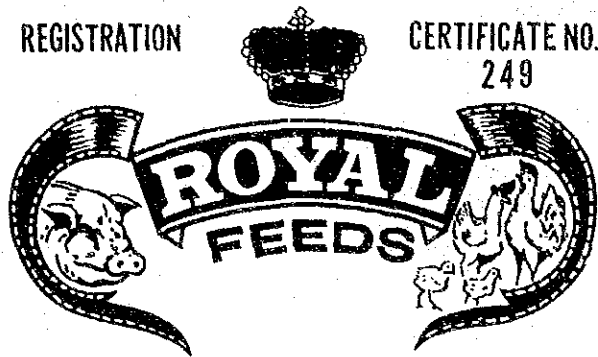
The research institute has proposed the production of the animal feeds by its own production facilities due to the following three reasons:

1. The result of the analysis indicates that the purchased feed contains only 14% of protein, which is lower than 16 to 20% required for the raising of the animals.

Besides, the purchased feed shows considerable dispersion in quality, and this makes difficult the control of the animal feed which is extremely important in raising the experimental animals. Furthermore, the pellets have problems that the size is too small for the mice and that the hardness of the pellets lacks in uniformity.

2. The supply of the commercially available pigeon pellets is unstable, and the shortage of the supply occurs from time to time.
3. The market price of the pigeon pellets is unstable, and this makes the budgeting for purchase difficult for the research institute as a buyer. For instance, the market price in the first half of 1983 was P500/kg, but it has risen to P600/kg at present.

4. The pellets vary in size, and this causes the waste of the feed, since the small pellets fall through the feeders which have been provided to the research institute on gratuitous basis.



PIGEON PELLETS
"POULTRY"

Net Weight 50 Kilos

GUARANTEED ANALYSIS

| | | |
|------------------------------|-------|-----------|
| Crude Protein, not less than | | <u>16</u> |
| Crude Fat, not less than | | 3.0% |
| Crude Fiber, not more than | | 7.5% |
| Moisture, not more than | | 10.0% |

INGREDIENTS

Yellow Corn, Corn Germ Meal, Corn Gluten Meal, Corn Cakes, Soybean Meal, Polished Barley, Copra Meal, Meat and Bone Meal, Ipil-ipil Meal, Fish Meal, Soybean Meal, Molasses, Limestone/Shell and salt. Fortified with vitamin A, D, E, K, B12, Calcium Pantothenate, Niacin, Choline, Amino Acid, Trace Minerals and Growth Promotants.

Manufactured By

ROYAL FEEDS & MERCANTILE CORP.

Aurora Subdivision, Maysilo, Malabon, Metro-Manila

Telephones:

23-71-54 * 23-39-32 * 23-56-10

48-56-22 * 49-13-11

(Package Label)

According the result of the survey conducted by the research institute, 10 to 15% of the feed cost will be able to be saved by producing the animal feeds by the own production facilities of the research institute (For the unit prices of the raw materials of A and B types, refer to Annex 7).

The nutritional requirements of the experimental animals are as follows:

Nutritional requirements of experimental animals

| | %: unit | | | | | |
|------------------|---------|-------|------------|--------|---------|----------|
| | Mouse | Rat | Guinea Pig | Rabbit | Hamstor | Primates |
| 1. Crude Protein | 16-20 | 16-20 | 20 | 15 | 22-25 | 16-20 |
| 2. Fat | 3-12 | 5 | 3-5 | 3-5 | 5-7 | 3-5 |
| 3. Carbohydrate | 45-55 | 45-55 | 45-50 | 45-55 | 60-65 | 45-55 |
| 4. Calcium | 1.1 | 0.94 | 1.08 | 0.91 | 0.94 | 0.96 |
| 5. Phosphorus | 0.75 | 0.74 | 0.83 | 0.53 | 0.74 | 0.56 |

The result of the survey conducted by the research institute indicates that the materials of the associated feed of A and B types are locally available, and thus can be manufactured locally.

(Compounding ratio per 100g)

| A type | | B type | |
|----------------|------------------------|---------------|------|
| 1. Corn | 54 | 1. Corn | 54.5 |
| 2. CGM | 4 (Corn Germ Meal) | 2. Rice Bran | 12 |
| 3. Rice Bran | 5 | 3. SOM | 22 |
| 4. SOM | 16 (Soybeans Oil Meal) | 4. Fish meal | 6.5 |
| 5. Fish Meal | 13 | 5. Skim milk | 3 |
| 6. Copra Meal | 5 | 6. Dical | 1.2 |
| 7. Ipil Ipil | 1 | 7. Limestone | 0.4 |
| 8. Traphos D | 0.5 | 8. Salt | 0.2 |
| 9. Salt | 0.5 | 9. VTM Premix | 0.2 |
| 10. VTM Premix | 0.5 | | |
| 計 | 100. | 計 | 100. |

ANNEX 7

A type

| Ingredients | Amt (kg) | Cost/kg | Total Cost |
|---------------------------|-----------|---------|-----------------|
| 1. Corn | 54 | ₱ 2.50 | ₱ 135.00 |
| 2. Corn gluten meal | 4 | 8.00 | 32.00 |
| 3. Rice bran | 5 | 2.00 | 10.00 |
| 4. Soybean oil meal | 16 | 5.35 | 88.80 |
| 5. Fish meal | 13 | 9.05 | 117.65 |
| 6. Copra meal | 5 | 2.55 | 12.75 |
| 7. Ipil-ipil leaf | 1 | 1.80 | 1.80 |
| 8. Traphos D ^r | 1 | 15.00 | 15.00 |
| 9. Salt | 0.5 | 1.10 | .55 |
| 10. VTM premix | 0.5 | 30.00 | 15.00 |
| Total: | 100.00 kg | | ₱ 428.55/100 kg |

B type

| Ingredients | Amt (kg) | Cost/kg | Total Cost |
|---------------------|-----------|---------|-----------------|
| 1. Corn | 54.5 | ₱ 2.50 | ₱ 136.25 |
| 2. Rice bran | 12 | 2.00 | 24.00 |
| 3. Soybean oil meal | 22 | 5.55 | 122.10 |
| 4. Fish meal | 6.5 | 9.05 | 58.85 |
| 5. Skim milk powder | 3 | 27.00 | 81.00 |
| 6. Dical | 1.2 | 5.00 | 6.00 |
| 7. Limestone | 0.4 | .80 | .32 |
| 8. Salt | 0.2 | 1.10 | .22 |
| 9. VTM premix | 0.2 | 30.00 | 6.00 |
| Total: | 100.00 kg | | ₱ 434.74/100 kg |

(Note: Figures are given converting the yen at P1=¥16.)

These materials can be purchased in Manila and its vicinity, and their prices are as follows:

| I. Feed Stuffs | P Cost/kg | Yen/kg 1 P = 16 Yen |
|------------------------------------|--------------------|---------------------|
| a. Bone Meal | 1.95 ~ 2.50 | 32.0 ~ 41.0 |
| b. Fish Meal | 8.00 ~ 9.05 | 131.4 ~ 148.6 |
| c. Meat and Bone meal | 8.55 ~ 9.00 | 140.5 ~ 147.8 |
| d. Yellow cover grain | 2.35 ~ 2.65 | 38.6 ~ 43.5 |
| e. Soybean oil meal | 4.00 ~ 5.55 | 65.7 ~ 91.1 |
| f. Ipil-ipil. leaf meal | 1.80 | 29.5 |
| g. Copra cake | 2.35 | 38.6 |
| h. Salt | 0.75 ~ 1.10 | 12.3 |
| i. Lime Stone | 0.80 | 13.1 |
| j. Oyster Shell | 0.80 | 13.1 |
| k. Skim milk powder | 620 ~ 675/25kg Bag | 10,185.7 ~ 11,089.2 |
| l. Rice Bran b ₁ 13% CP | 2.0 | 32.8 |
| m. " 9% CP | 1.65 ~ 1.85 | 27.1 ~ 30.4 |

According to the estimate, the material cost (not including the labor, heat and machine depreciation costs) of the feed of A and B types is about P450. The nutritive ratios of the feeds of A and B types are shown in the accompanying table.

* Tables for And B types

The monthly consumption of the feeds by the existing experimental animals is about 400kg.

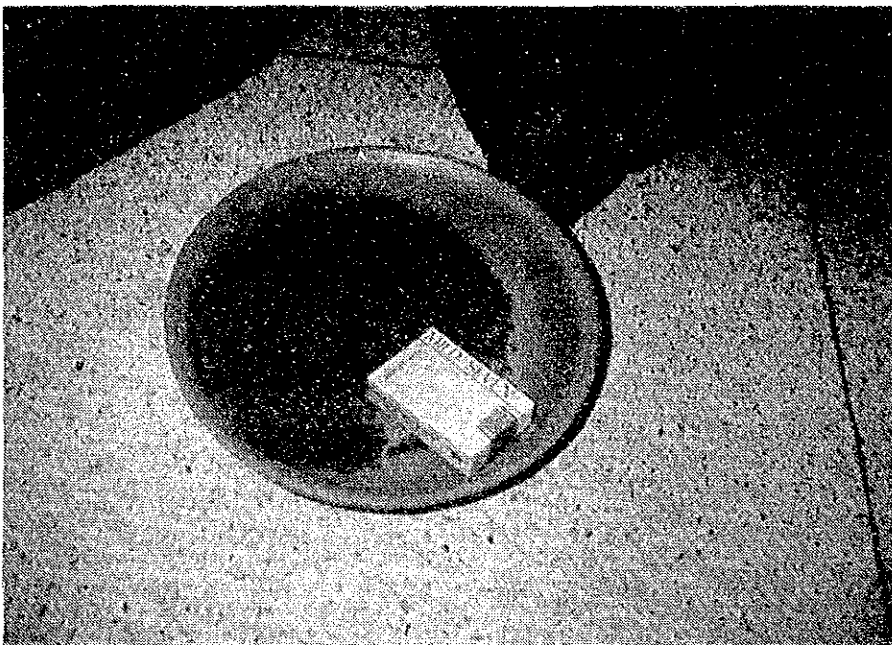
Table of nutrition analysis of A type feed

| Ingredients | Amount (kg) | Crude protein (CP) | Metabolizable energy (ME) | Calcium (Ca) | Phosphorus (Total P) | Amino acids | | | |
|---------------------------|-------------|--------------------|---------------------------|--------------|----------------------|---------------|-------------|--------------|---------------|
| | | | | | | Arginine | Methionine | Tryptophan | Lysine |
| 1. Corn | 54 | 4.698 | 1877.04 | .216 | .1296 | .216 | .0756 | .0432 | .0772 |
| 2. Corn gluten meal | 4 | 1.716 | 132.28 | .0064 | .016 | .056 | .04 | .008 | .032 |
| 3. Rice Bran | 5 | .55 | 110 | .005 | .0855 | .005 | .012 | .011 | .03 |
| 4. Soy beans oil meal | 16 | 7.04 | 351.04 | .004 | .10768 | .448 | .1088 | .0928 | .4448 |
| 5. Finsh meal (1st class) | 13 | 8.45 | 386.1 | .585 | .299 | .3341 | .297 | .0624 | .7306 |
| 6. Copra Meal | 5 | 1.0 | 85 | .0035 | .03 | .0114 | .0125 | .0075 | .0175 |
| 7. Ipil-ipil leaf meal | 1 | .24 | 20 | .01 | .0027 | .0141 | .0031 | | .0148 |
| 8. Trephos D | 1 | | | .345 | .17 | | | | |
| 9. Salt | 0.5 | | | | | | | | |
| 10. Vit, Min, Mix | 0.5 | | | | | | | | |
| Total | 100 | 23.694 | 2969.5 | .9805 | .84 | 1.1872 | .499 | .2249 | 1.3769 |

Table of nutrition analysis of B type feed

| Ingredients | Amount (kg) | crude protein (CP) | Metabolizable energy (ME) | Calcium (Ca) | Phosphorus (Total P) |
|------------------------------|----------------|-----------------------|---------------------------------|-----------------|-------------------------|
| 1. Corn | 54.5 | 4.85 | 1809.54 | .0109 | .15805 |
| 2. Rice bran, D ₁ | 12 | 1.62 | 363.30 | .0436 | .2052 |
| 3. Soy beans oil meal | 22 | 9.62 | 636.08 | .15805 | .1474 |
| 4. Fish meal | 6.5 | 3.9 | 193.05 | .28905 | .16445 |
| 5. Skim milk powder | 3 | 0.99 | 100.18 | .0375 | .01 |
| 6. Dicalcium | 1.2 | | | .29208 | .29502 |
| 7. Limestone | 0.4 | | | .08032 | .00004 |
| 8. Salt | 0.2 | | | | |
| 9. Vit, Min, Mix | 0.2 | | | | |
| Total | 100 | 20.98 | 3103.45 | 0.9605 | 0.89106 |

Pigeon pellets currently
in use.



Feed manufacturing company
(Royal)

Grinder



Mixer



Pelleter

4-1-5 Standards for equipments

Air-conditioner

In the existing experimental animal laboratory, three animal rooms are air-conditioned by the "all-fresh method" using the package type air-conditioner, and the Re-heaters are installed to the Air Supply duct so that the temperature of each animal room can be controlled to the set temperature by the thermostat.

As for the target temperatures and the humidity ranges for raising the experimental animals, there are optimum target values shown in the following Table, but these values, when applying to the new laboratory, need to be adjusted in consideration of the maintenance cost and the local weather condition in the Philippines.

Target temperatures and humidity ranges for raising experimental animals

| Kind | Temperature (°C) | | | Humidity (%) | | | Source |
|------------------------|------------------|---------|---------|--------------|---------|---------|--------------|
| | Minimum | Optimum | Maximum | Minimum | Optimum | Maximum | |
| Mouse | 20.0 | 22.2 | 26.7 | 30 | 50 | 80 | A.W. I |
| | 22.2 | — | 24.4 | | | | W. Thorp |
| | 21.0 | — | 26.7 | 50 | — | 55 | Inst. L.A.R. |
| Rat | 20.0 | 22.2 | 26.7 | 30 | 50 | 80 | A.W. I |
| | 22.2 | 23.3 | 24.4 | | | | W. Thorp |
| | 21.0 | — | 26.7 | 50 | | 55 | Inst. L.A.R. |
| Hamster | 20.0 | 22.2 | 29.4 | 30 | 50 | 80 | A.W. I |
| | 21.0 | — | 24.0 | | | | Inst. L.A.R. |
| Hamster (the young) | 20.6 | — | 21.7 | | | | " |
| Reproduction room | 22.2 | — | 23.3 | | | | " |
| Guinea pig | 15.6 | 21.2 | 26.7 | 30 | 50 | 80 | A.W. I |
| | 22.2 | — | 24.4 | | | | W. Thorp |
| Rabbit and cat | 15.6 | 20.0 | 26.7 | 30 | 50 | 80 | A.W. I |
| | 18.3 | 22.2 | 24.4 | 30 | 50 | 80 | A.W. I |
| Monkey | 23.9 | 24.8 | 25.6 | | | | W. Thorp |
| | 16.7 | 28.2 | 37.8 | 30 | 50 | 80 | A.W. I |

Note: A.W.I.: Animal Welfare Institute; Comfortable Quarters for Laboratory Animals, Oct. 1956.

W. Thorp: The Design of Animal Quarters; J. of Med, Education Vol. 35, No. 1, Jan. 1960.

Inst. L.A.R.: Institute of Animal Resources, National Academy of Sciences, May, 1962.

Necessary number and volume of air changes

The necessary number of air changes (Hourly volume of air supply divided by volume of room) for the animal raising room and the laboratory is recommended to be as follows:

| Number of air changes (times/hour) | Kind of animal | Remarks |
|------------------------------------|-------------------|----------------------------|
| 5 to 10 | Animal in general | Ashrae Guide 1961 |
| 10 to 15 | " | Guide for Lab. Anim. Care |
| 10 to 12 | Mouse | Inst. Lab. Animal Research |

In the new building to be constructed, the isolated animal rooms and the conventional animal room will not be divided by the kinds of the animals. The conventional animal rooms will be ventilated by the natural ventilation method, and so the room temperature will vary depending on the outdoor temperature (Average minimum temperature: 22°C, Maximum temperature: 33.5°C, Humidity: 64 to 89%).

As for the isolated animal rooms, the room temperature will be controlled to about 28°C; the humidity will not be controlled, and so the humidity in the room will be almost same as the outdoor humidity; and the number of air changes will be about 8 times per hour. These standards have been decided in consideration of the maintenance cost rather than the environmental conditions of the animal raising rooms.

4-1-6 Equipments and materials used for existing animal raising rooms

The equipments and the materials currently used for the existing experimental animal laboratory are as shown in the following table. All these equipments and materials are expected to be transferred to the proposed new experimental animal laboratory.

| No. | Items | Quantity |
|-----|------------------------------------|----------|
| 1. | Dissecting/Operating Instrument | 3 |
| 2. | Balance (a) Mouse | 2 |
| 3. | " (b) Rabbit | 2 |
| 4. | Push Cart | 3 |
| 5. | Movable table | |
| 6. | Cage (a) Mouse | 200 |
| | (b) Rabbit | 100 |
| | (c) Rat | 40 |
| 7. | Shelves (a) Mouse | 6 |
| | (b) Rabbit | 4 |
| | (c) Rat | 2 |
| | (d) Washed cages | 2 |
| | (e) Instrument | 1 |
| 8. | Sterilizing Box for Feeds Beddings | 2 |
| 9. | Surgical table for rod cuts | 2 |
| 10. | Movable transporting table | 3 |
| 11. | Spatula for Scoping Beddings | 5 |
| | " | 2 |
| 12. | Portable Washer Sterilizing | 1 |
| 13. | Washing Basin | 3 |
| 14. | Shelf | 1 |
| 15. | Locker | 1 |
| 16. | Bucket | 2 |
| 17. | Boiling Water Sterilizing | |

4-2 Detail Design

4-2-1 Basic policy

In designing the proposed new experimental animal building, the importance will be attached to the following points:

(1) Low maintenance cost and low running cost

In order to meet these requirements, the uses of the long-lasting materials and the natural ventilation system should be recommended.

(2) Flexible layout adaptable to future changes

In order to meet this requirements, the size of animal room should be determined so that it can be adapted to the future changes in the kinds and the numbers of the animals. As for the isolated animal room, no special arrangement for the infected animal laboratory or SPF animal laboratory will not be provided in order to keep the use of the room flexible to the changing conditions, although the cages which can meet the above-mentioned special needs are provided.

(3) The proposed new building should be designed so that not only the research activities but also the electricity, water supply, drainage, steam and telephone services can be free of the disturbances caused by the construction work of the new building as far as possible.

4-2-2 Layout plan

The (new) building should be located in the site determined as described in Chapter 3. For the actual determination of the site of the new building, however, the following conditions are taken into consideration.

- (1) To avoid the location of the drainage pipe system for the existing research building.
- (2) To avoid the location of the underground wiring conduit leading to the switchboard of the service department from the high-voltage receiving end.
- (3) To avoid being too close to the existing incinerator.
- (4) To make the walking distance to the existing research building as short as possible.
- (5) To keep the adequate distance between the new building and the existing research building so that the natural ventilation for the new building can be made available effectively, since the new building will be located on the leeward of the existing building.

The location of the (new) building has been determined in consideration of the above-mentioned requirements.

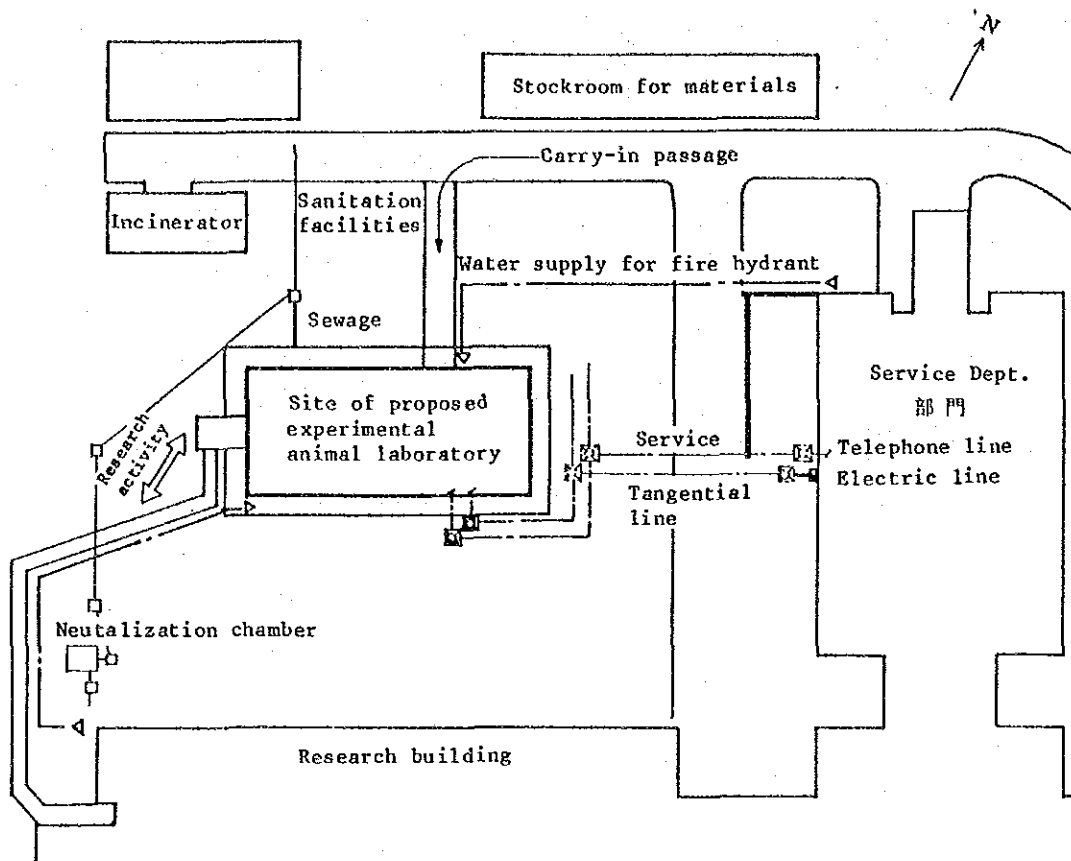


Fig. 2 Layout of Building

4-2-3 Building plan

The experimental animal laboratory provides the research materials and the research data to the various research departments in the research institute.

The experimental animal laboratory comprises the following rooms:

| Room name | Floor area |
|---|--------------------|
| . Record keeping room and workers station | 17.8m ² |
| . Feed production room | 26.6 |
| . Conventional animal room (3 rooms) | 36.9 |
| . Washing and sterilizing room | 63.0 |
| . Isolated animal room | 63.0 |
| . Stockroom | 12.3 |
| . Others (Corridor, toilet, etc.) | 32.4 |
| Total area: 252.0m ² | |

The exterior of the building is supposed to be finished as follows:

- . Roofing To be finished with corrugated asbestos boards.
- . Rainwater gutter Steel rainwater gutter.
- . External wall Concrete-block wall with mortar finishing and epoxy-resin paint spray finishing.
- . External wall waincot Mortar finishing
- . Sashing Steel sash with VP finishing and wire screen.
- . Berm Concrete finishing

The interior of the building will be finished using the following materials attaching importance to the durabilities of the materials that lead to the low maintenance cost, and also in consideration of the conditions of the construction work.

- . Flooring Polished terazzo
- . Baseboard "
- . Wall Mortar with paint finishing
- . Ceiling Asbestos board with paint finishing

4-2-4 Structural plan

The proposed building will be of the combination of the partial reinforced concrete wall structure and the reinforced concrete block structure. The wall shall have the structure that is strong enough to withstand the dead load, seismic force and wind pressure acting on the wall. The roof structure shall be of the wooden truss.

The construction site has the top soil of about 20 to 60cm deep and the underlying mild stone layer called the adobe. The adobe layer has the adequate strength (25 tons/m²) as the bed rock, and so the foundation of the building shall be placed on this layer. The floor of the building shall be designed as the earth floor.

Load

The load shall be set according to the following conditions:

| Line Load | | | | Unit: kg/m ² |
|----------------------|------|-----|-------|-------------------------|
| Room | NSBC | MBO | Japan | Proposed project |
| Reserch Laboratories | 500 | 250 | 300 | 500 |
| Business Office | 250 | 300 | 300 | 300 |
| Corridor | 400 | 500 | 360 | 500 |

Note: NSBC: National Structural Code for Buildings

MBO : Manila Building Ordinance

Seismic force

The seismic force in terms of the lateral load shall be calculated by the following formula:

$$V = 0.16W \quad \text{where } V: \text{ Total lateral load (Lateral force)}$$

W: Dead load

Wind load

Under NSCB, the wind load is calculated by the following formula:

$$\text{Wind pressure} = (P) \times (\text{Wind force coefficient})$$

The proposed construction site belongs to the wind zone II, and, in this zone, the wind velocity of 50m/sec is required to be considered in designing the building. In this wind zone II, P in the above formula is given as follows:

Height of building

| | |
|----------|--------------------------|
| Under 7m | P = 150kg/m ² |
| 9 to 30m | P = 200kg/m ² |
| Over 30m | P = 250kg/m ² |

4-2-5 Equipment plan

Air-conditioning and ventilation system

The three isolated animal rooms and the record keeping room will be air-conditioned by the air-cooled separate type air-conditioners. As for the ventilation system for the animal room, the air will be introduced from the front room, and discharged outside at the rate of 8 times an hour by the ventilation fan installed under the window.

The ventilation for the washing and sterilizing room and the feed production room will be made by the natural ventilation method mainly using the ceiling fans. The conventional animal rooms will be ventilated mainly by the natural ventilation method, though the ventilation fan will be used only when there is the fear of having the room temperature risen too high. (The conventional animal room shall be provided with the power outlets so that the air-conditioners can be installed in the future).

Water-supply, drainage and sanitation systems

1. Water-supply system

The water-supply system (for the new building) will be installed so that the water branched from the outdoor hydrant (for water sprinkler) of the existing research building can be supplied directly to all the places where the water supply is need in the new building.

2. Drainage system

The rainwater shall be collected in one place, and discharged into the drainage near the incinerator. The sewage and other waste water pipes shall be connected to the existing sewage and waste water pits leading to the septic tank.

3. Gas supply system

The gas supply system will not be provided as the system attached to the (new) building, but the gas will be supplied from the portable LPG cylinders when necessary.

4. Hot water supply system

The hot water for the washing room will be supplied from the small electric water heater installed in the washing room, and the hot water will be supplied to the washing tank.

5. Hydrant

The piping for the hydrant of the new building will be connected to the main pipe of the existing building, and one hydrant will be provided for the new building.

6. Incinerator

As for the incinerator, the incinerator for the existing building will be used for the new building, since it is located near the site of the new building.