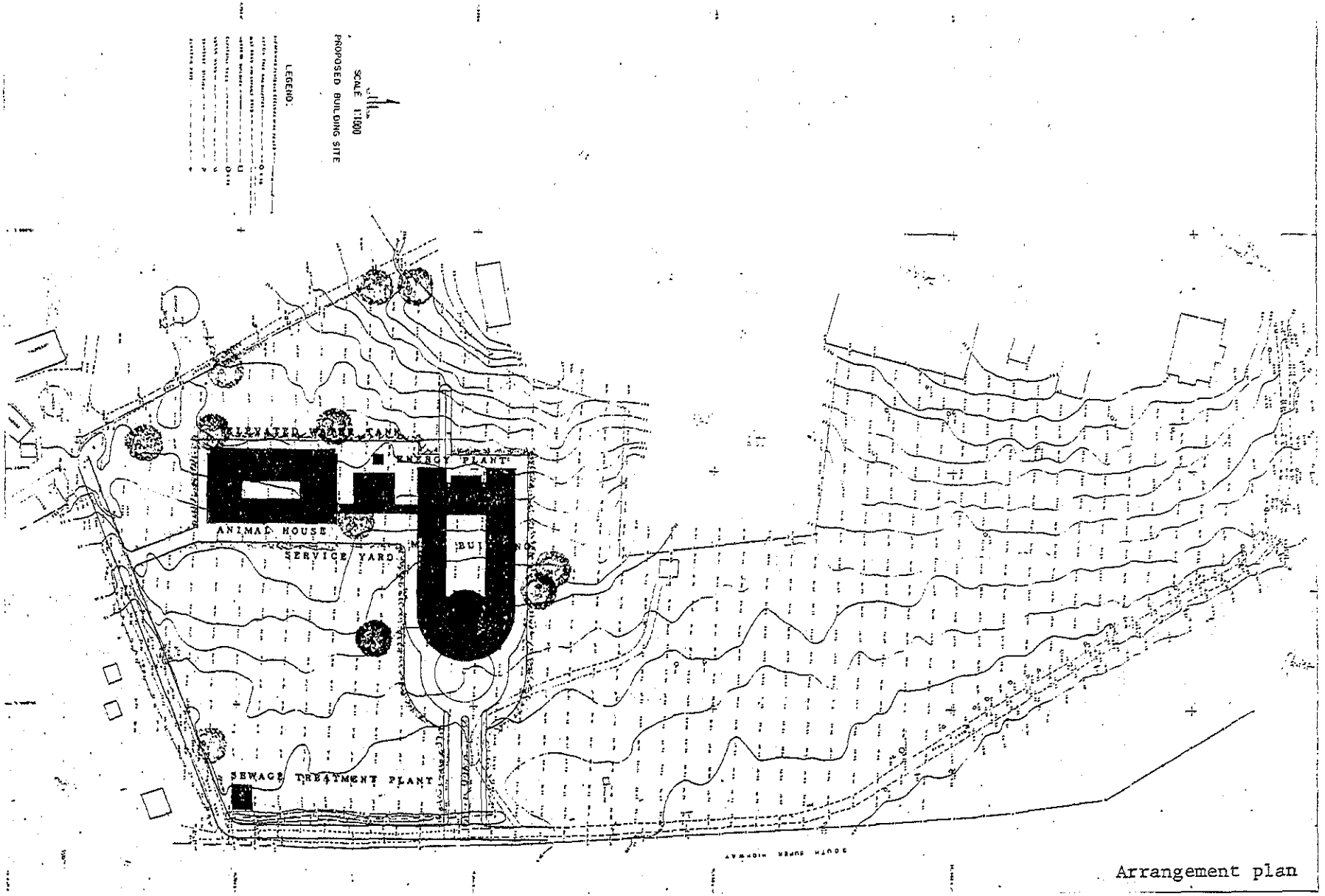
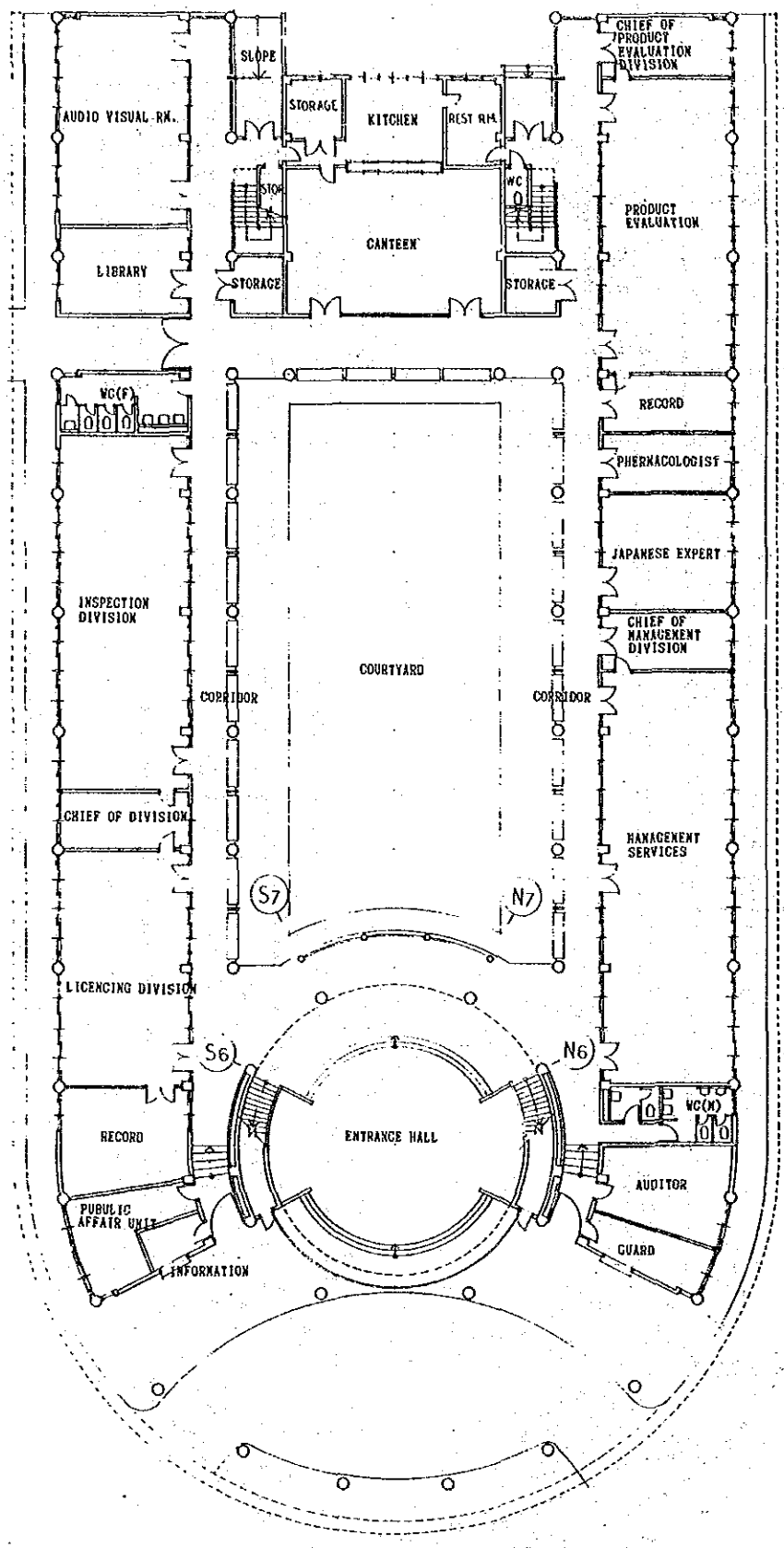
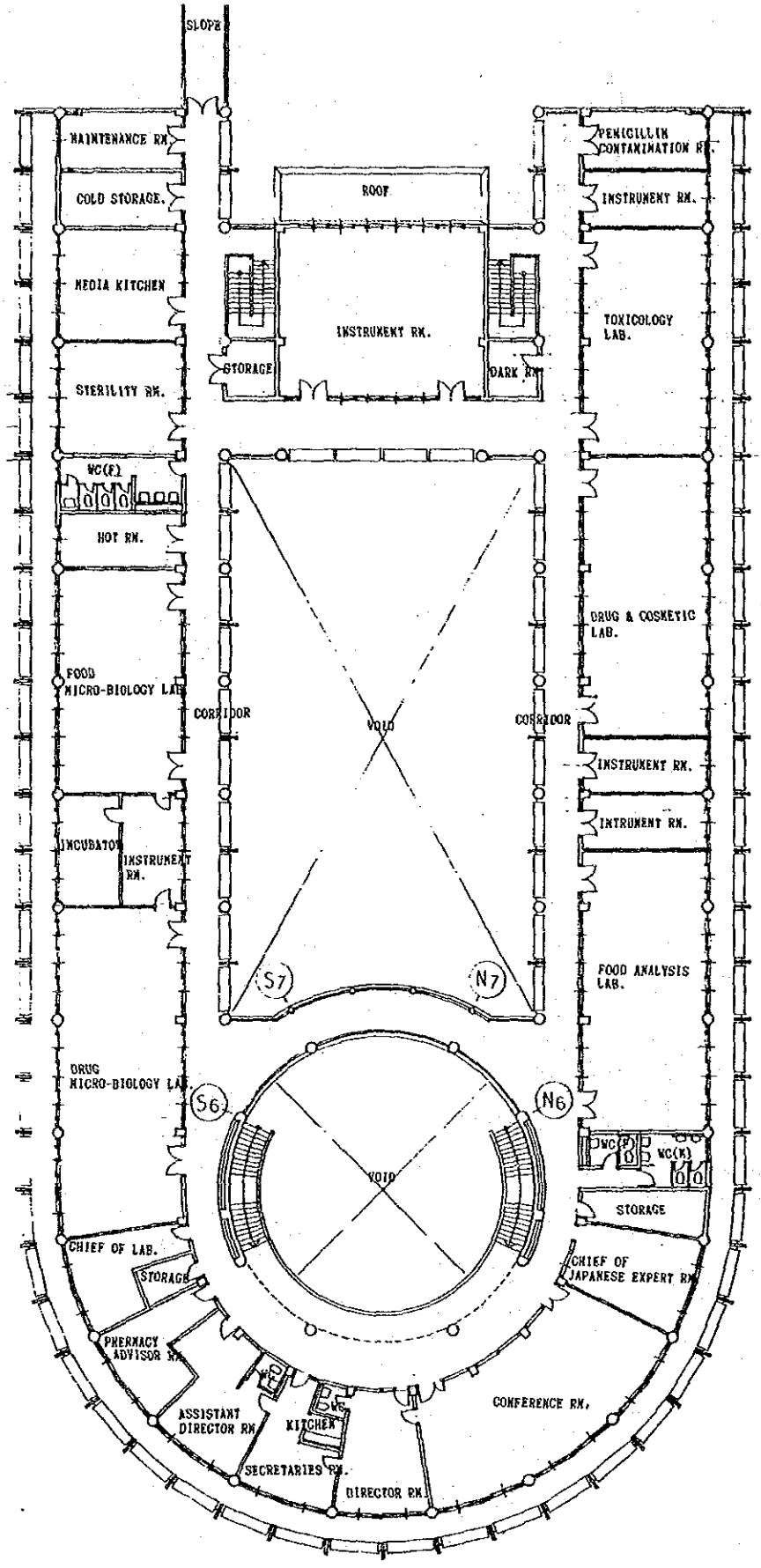
(4) Basic Design Drawings



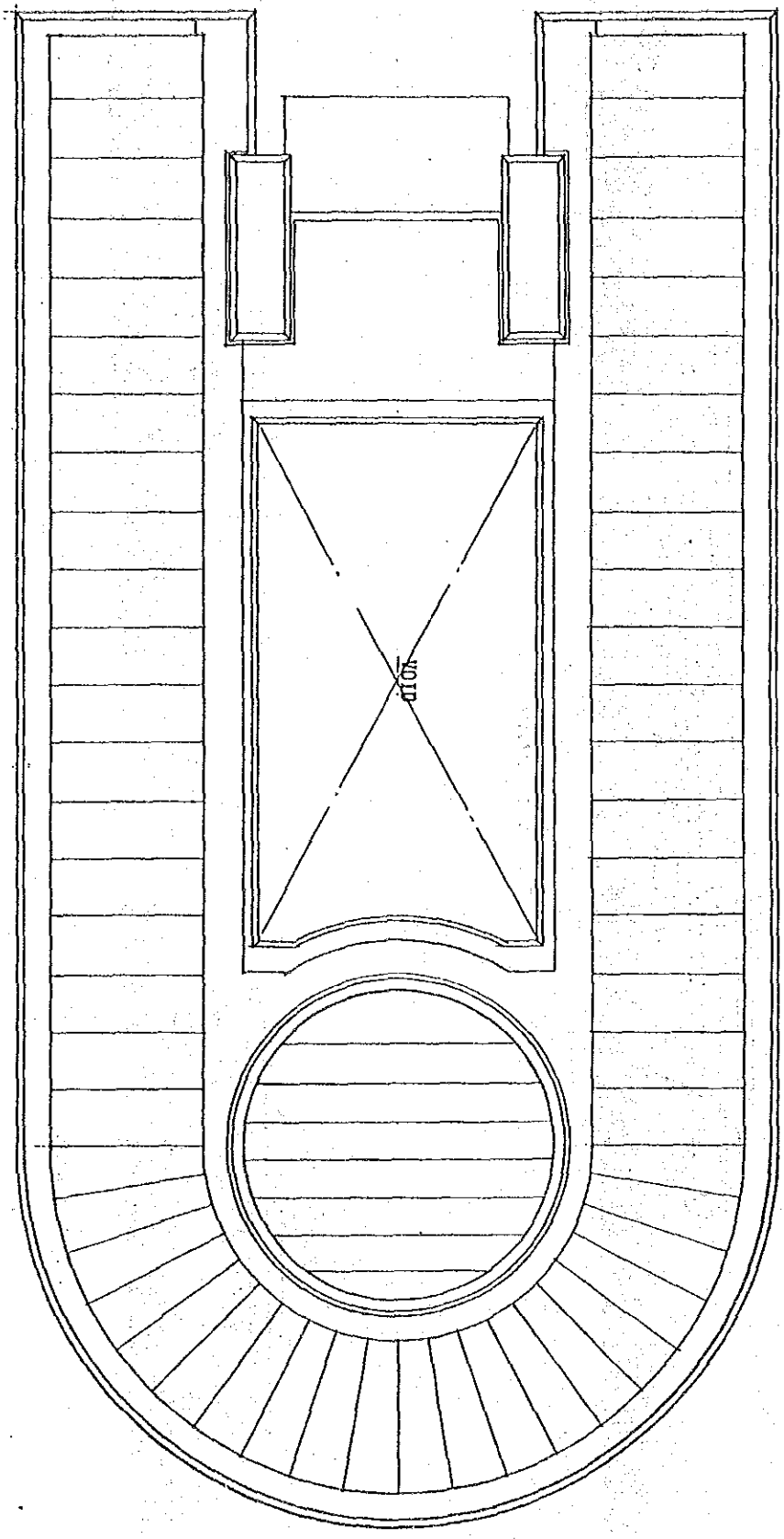
Arrangement plan



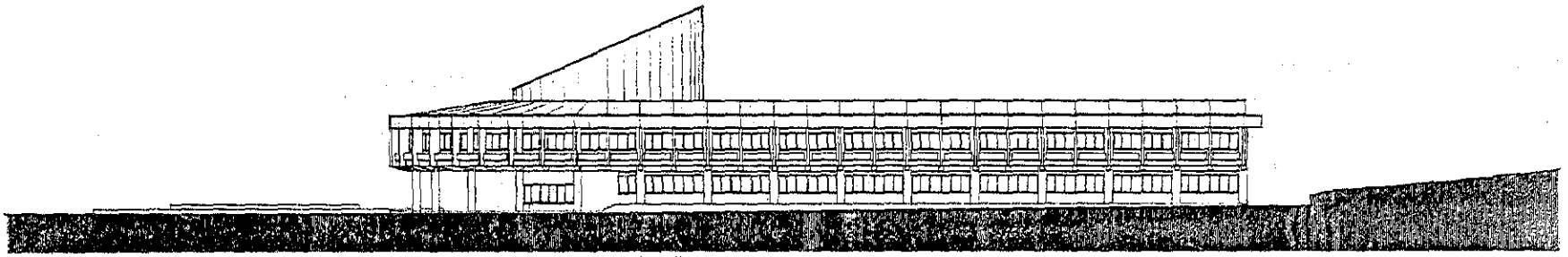
(Main building) First floor plan



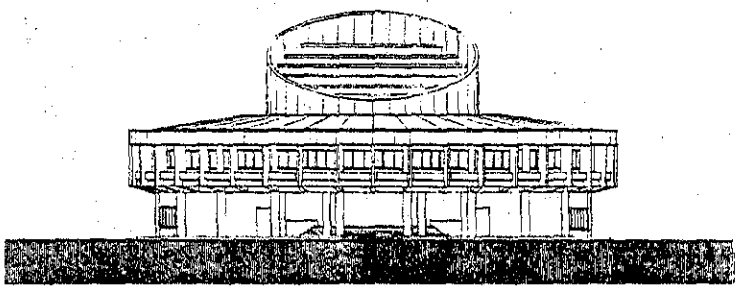
(Main building) Second floor plan



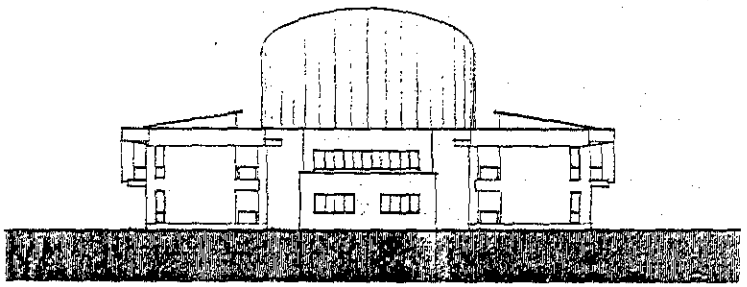
(Main building) Roof plan



NORTH ELEVATION

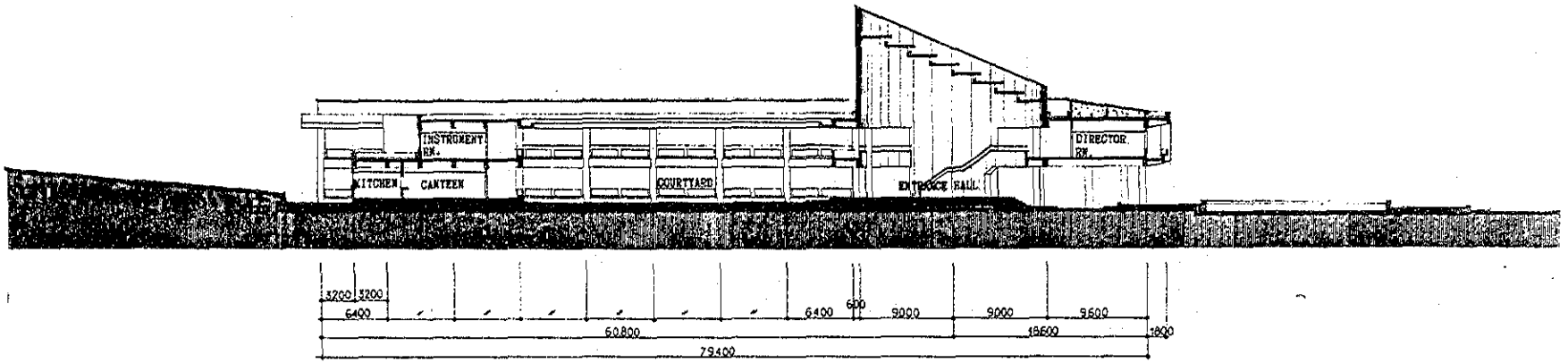


EAST ELEVATION

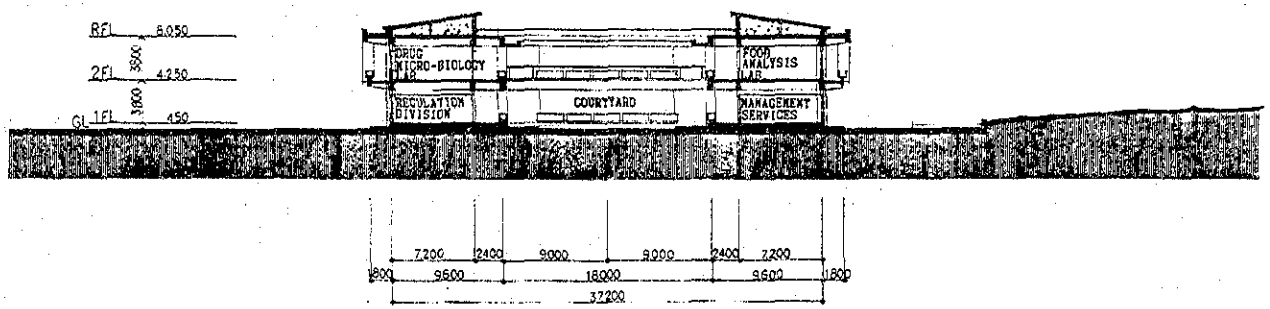


WEST ELEVATION

(Main building) Front plan



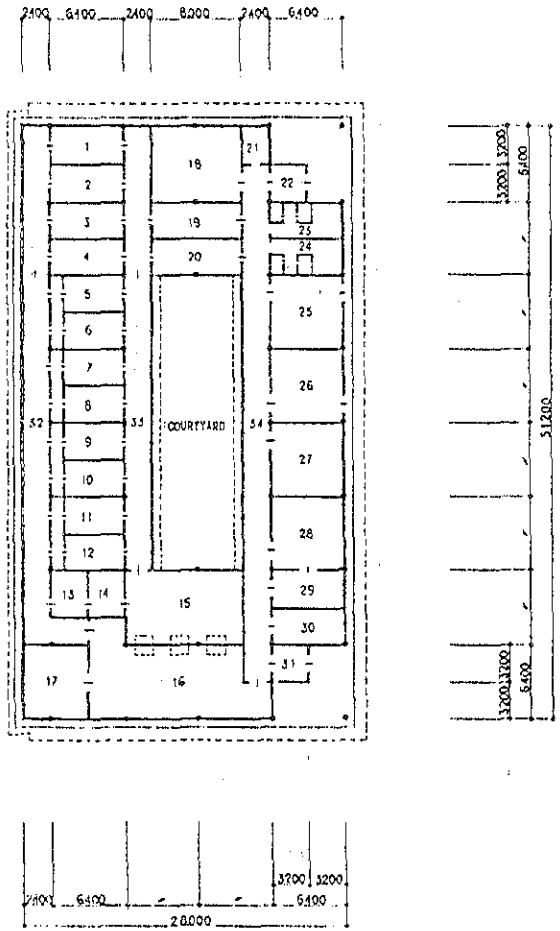
SECTION - 1



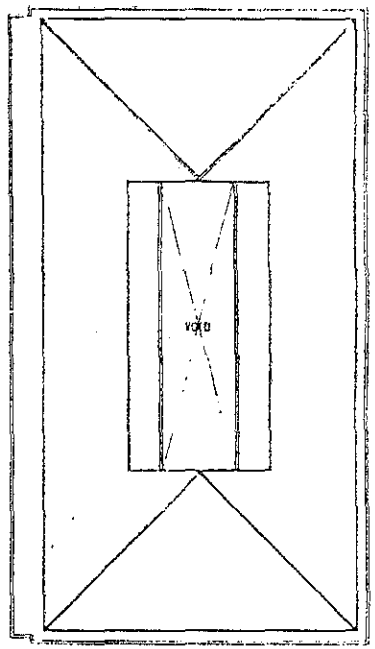
SECTION - 2

(Main building) Cross section plan

1. ALLERGY TEST ROOM (GUINEA PIG)
2. MUCOUS MEMBRANE PROPULSION TEST ROOM (RABBIT)
3. ACUTE MOUSE TEST ROOM
4. ACUTE RAT TEST ROOM
5. MOUSE FEEDING ROOM
6. MOUSE BREEDING ROOM
7. RAT FEEDING ROOM
8. RAT BREEDING ROOM
9. GUINEA PIG FEEDING ROOM
10. GUINEA PIG BREEDING ROOM
11. RABBIT FEEDING ROOM
12. RABBIT BREEDING ROOM
13. PYROGEN TEST ROOM
14. TEMPERATURE RECORDING ROOM
15. CAGE STERILIZING ROOM
16. WASHING ROOM
17. STORAGE
18. CONTROL ROOM (ANIMAL HUSBANDRY)
19. PASS ROOM
20. PASS ROOM
21. KITCHENETTE
22. VESTIBULE
23. W.C & SHOWER ROOM (MALE)
24. W.C & SHOWER ROOM (FEMALE)
25. DISSECTION ROOM
26. PATHOLOGICAL PREPARATION
27. HISTAMINE TEST ROOM
28. FEED PREPARING ROOM
29. DRUG PREPARATION
30. FEED STORAGE
31. VESTIBULE
32. CORRIDOR (NON-CLEAN ZONE)
33. CORRIDOR (CLEAN ZONE)
34. CORRIDOR

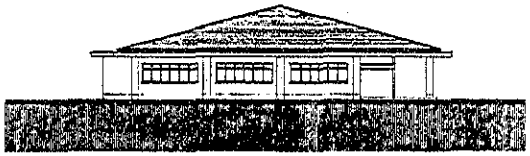


1st FLOOR PLAN

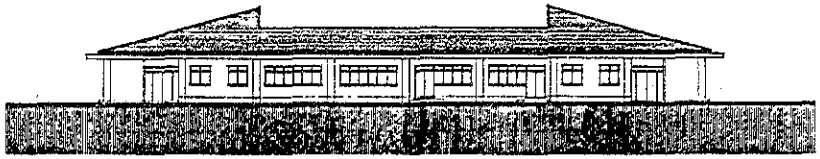


ROOF PLAN

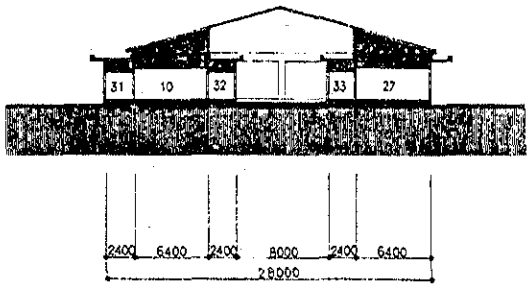
(Animal house) Floor plan, roof plan



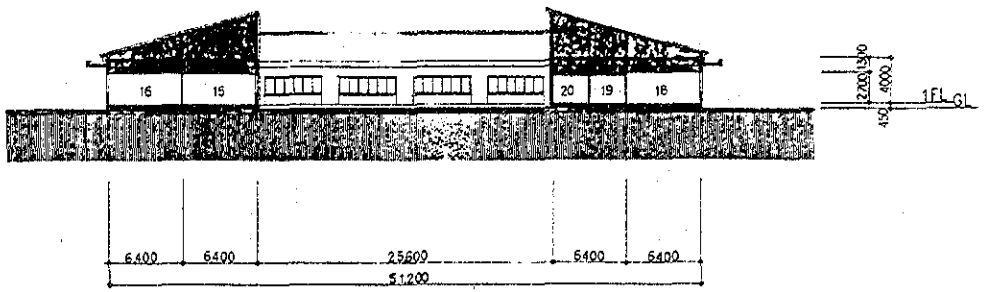
SOUTH ELEVATION



EAST ELEVATION



SECTION - 1



SECTION - 2

(Animal house) Front plan, cross section plan

4. Construction Plan

(1) Implementation Body

The body for implementation will be the Bureau of Food and Drugs of the Ministry of Health.

(2) Construction Policy

After the conclusion of the Exchange of Notes concerning this project, a Japanese consultant selected and the Philippine government will conclude a contract concerning detailed design, construction supervise, and start the work. The selected consultant has to do a careful adjustment of opinions and examination with B.F.A.D. concerning execution plan, a bidding method, construction contract and construction guarantee, in accordance with the basic planning policy.

In executing the construction of this facility, necessary works such as preparatory works have to be completed by the Philippines Government in accordance with the items provided for every construction sections in order to ensure no obstacle in the initiation of the construction.

With respect to the execution plan, the consultant and BFAD will examine the construction procedure, and decide a precise schedule for works to be performed by the Philippines Government, time schedule of the start of connection to infrastructures in the neighbourhood.

The following items have to be thoroughly examined in the construciton execution plan:

1) The plan during rainy season (June to October) will greatly influence the whole schedule. Therefore, a temporary construction plan with emphasis on safety and a curing plan during and after concrete placing are required.

2) As the supporting layer adobe is exposed in a relatively shallow depth (50 cm to 1 m), the structual advantages will cause negative effects on excavation works. Careful examination on excavation techniques is required.

3) Finishing works will be during the dry season (December to May). The main finishing work will be plastering, which requries special consideration of the curing period and drying of the groundwork.

4) Since this facility includes many special Air conditioning systems and experimental instruments, full scale electricity supply should be done as soon as possible in order to ensure a sufficient time period for test operation and adjustment and thorough explanation to the Philippine side before the completion and the delivery.

5) In the whole construction schedule, security and prevention of crimes will be important factors in the execution plan. In particular, special considerations against burglary, including regular stay of guardmen, have to be examined.

6) The success of the construction greatly depends on cooperation with local expert interests. Role division between the general contractor and sub contractors and personnel arrangement have to be carefully examined in order to establish an organization which can ensure smooth management.

(3) Work Allocation

The allocation of the construction works between the Japanese Government and the Philippines Government will be as follows:

1) Responsibility of the Japanese Government

a. Works relating to the facility

a) Main building
b) Animal house
c) Energy plant
d) Storage of dangerous substances
e) Waste water treatment facility (within building part)
f) Others (connecting corridors)

b. Works relating to foundation construction

a) Elevated water tank
b) Water supply system
c) Drainage system
d) Waste water purification facility

e) Electricity receiving/transformation facility

f) Telephone operation facility

c. Outside works

a) In-facility roads

b) In-facility drainage

d. Equipment

Equipment necessary for following sections:

- o Micro-Biology section
- o Physicochemical analysis section
- o Toxicology testing section
- o Animal breeding and propagation section
- o Inspection/Evaluation section

2) The Responsibilities of the Philippines Government

a. Construction works

a) Ensuring the site required to construct these facilities

b) Gate, Fence

c) Improving the access road to the construction site

d) Works relating to foundation

- o Laying on electricity and installation of transformers
- o Supply of well
- o Connecting drainage (outside the site)
- o Laying on telephone line to MDF inside the building

e) Installation of general furnitures (carpets, curtains, tables and chairs)

b. Expences and assistance

a) Defrayment of expenses

- o Expenses associated with banking
- o Expenses associated with leading electricity and telephone lines
- o Expenses associated with tax exemption

b) Defrayment of maintenance and running expenses of the facility and equipments

c) Procedures relating to customs clearance

d) Tax exemption procedures concerning products

e) Provision of facility necessary for Japanese concerned to enter and stay in the country for the execution of the business.

f) Other expenses which are not covered by the construction works to be done by the Japanese party but are necessary for the construction of the facility.

g) Provision of staff members who are required to execute and manage this project based on the deliberately planned personnel arrangement schedule.

(4) Supervising Plan

The consultant has to send an expert supervisor with adequate knowledge and experience who will stay at the site at the stage of the construction execution, and will be engaged in quality control, construction schedule control and safety control. At the same time the consultant has to send expert engineers who will be in charge of inspection, attendance and construction guidance for a short period (one week to one month) in any time necessary for the construction.

1) Policies for Supervision

- o Close communication and discussion between the Philippine organizations concerned and the Japanese organizations concerned are ensured for smooth execution of the construction.
- o Persons concerned with the construction will be given proper advice and guidance for the construction in accordance with the contract documents.
- o With respect to the execution policies, planning and technologies, both the Philippines and Japan should make efforts for technology transfer and better understanding of the traditional technologies which have been grown in the Philippine climate and tradition.
- o Appropriate advice and guidance should be given about maintenance and management after the completion and delivery of the facility.

2) Supervising Works

a. Assistance for the construction contract

Selection of construction contractors by bidding, examination of a construction contract system, preparation of contracts, review of detailed construction estimates, and attendance to construction contracts.

b. Checking and approval of documents on construction plan

Checking and approval of execution plans, construction plan, design plan, sample materials which are submitted by construction executants.

c. Construction guidance

Examining the execution plan, construction schedule and safety, guiding construction executants, and reporting problems and progress of the construction to the BFAD.

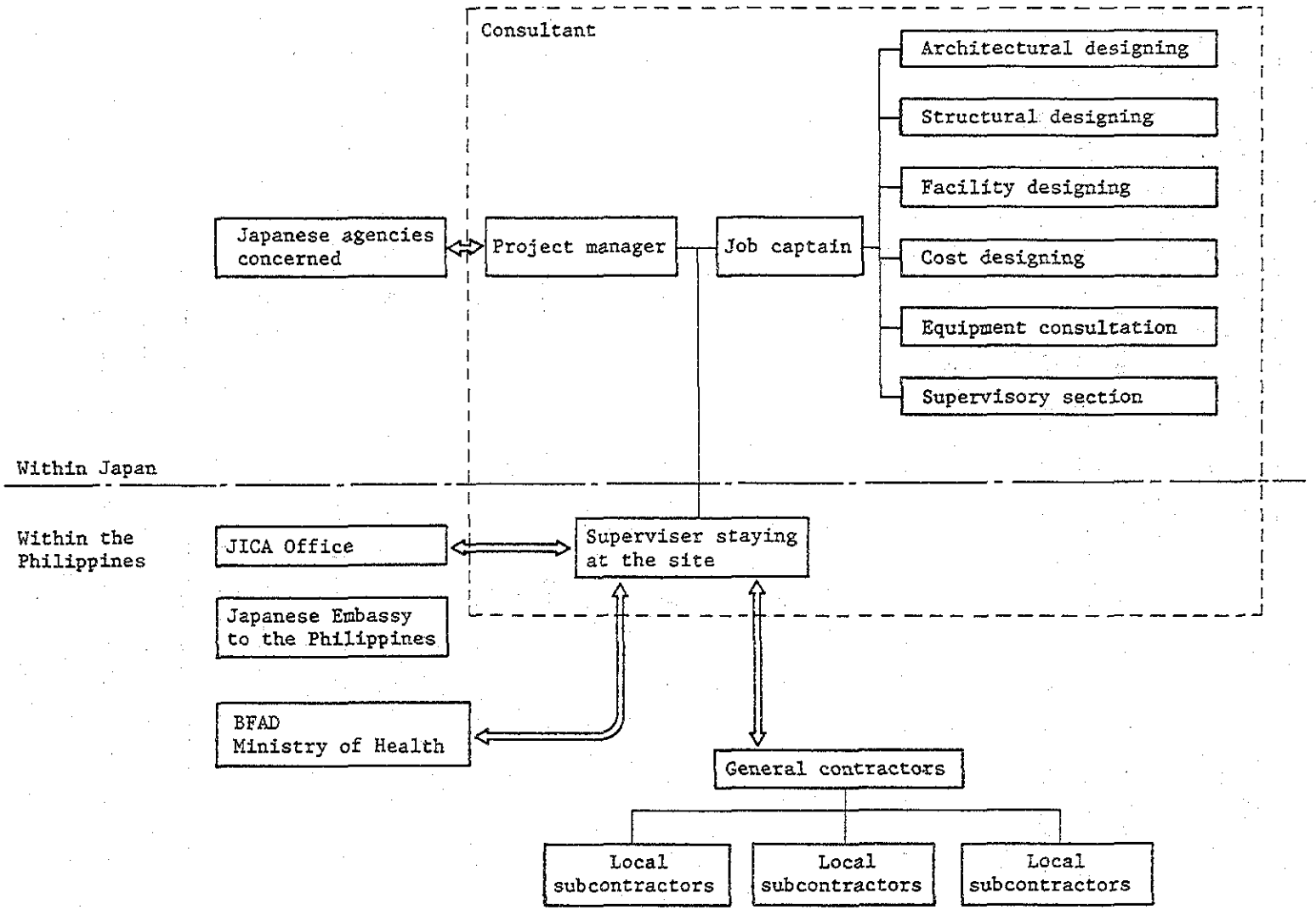
d. Payment approval procedures

Examination of the deatils of bills concerning construction expenses which will be payed during and after the construction and cooperation in the payment procedure.

e. Inspection

Inspection of monthly performance during the construction, attendance to placing reiforcing bars and concrete during the construction, and inspection after the completion and at the time of the delivery.

3) Supervising System



(5) Procurement Plan

Taking account of the construction technology, the ability of maintenance and management, and the construction schedule, basically, construction materials produced in the Philippines will be utilized.

With respect to labour, although Manila City can supply good construction workers and skill labors, it is necessary to make careful preparation to ensure trained workers and engineers.

Furthermore, as difficulties are expected in some fields, specialized engineers who can deal with special facilities with high technology will be sent from Japan, if necessary.

1) Materials and Equipments to be Procured in Japan

- o Reinforcing rods and steel frames
- o Pipes
- o Air conditioning facilities
- o Ventilation facilities
- o Switchboard
- o P.B.X
- o Experimental materials and spare parts
- o Generators and transformers
- o Draft chambers and scrubbers
- o Special interior materials (heat resistant P.V.C floor sheet, antistatic vinyl clothe and others)
- o Sanitary ceramic wares
- o Electric wires and cables
- o Lighting facilities, electric stations, consents, and switches

2) Major Materials and Equipments which can be Procured in the Philippines

- o Construction machines (bulldozers, cramshells, yunbos, tractors, dumping trucks, concrete mixers, cranes and others)
- o Survey instruments (transits, levels and others)
- o Temporary construction materials (scaffolds, platforms)
- o Concrete aggregates (sand and gravel) and cement
- o Secondary concrete products (concrete piles, culverts, blocks, precast concrete products)
- o Timbers, and plywoods

- o Window & Door (wooden, steel, and aluminum)
- o Glasses
- o Paints
- o Interior materials (ceiling boards, wall materials, floor materials)
- o Marks (notice boards, black boards, pictographs and others)

There are some problems as to homogenuity of production and quality of local materials, but adoption of amounts and places for the use of these materials after thorough examination of local makers can solve the difficulty.

Makers and agents of factories which will supply the above listed materials and equipments are mostly located in the Metropolitan Manila, and so there is no problem in transportation. With respect to the materials and equipments to be imported from Japan, the delivery time has to be carefully decided after the confirmation of transportation period and custom clearance.

3) Machine and Equipment Procurement Plan

The greater part of the equipment will be procured from Japan but one of the most important aspects of this procurement will be the selection of equipment that is easy to maintain and manage, and for which after service entails no problems. Because of this, there will be no problem with equipment that is either manufactured or sold in the Philippines but for machines and equipment that have to be imported, it will be necessary to choose those that have agencies or service systems in The Philippines, or those for which the available service systems are in conformity.

Because of the precision nature of the equipment, the importation and installation of the machines and equipment will require careful scheduling so that it is installed and adjusted as soon as possible after it has been handed over.

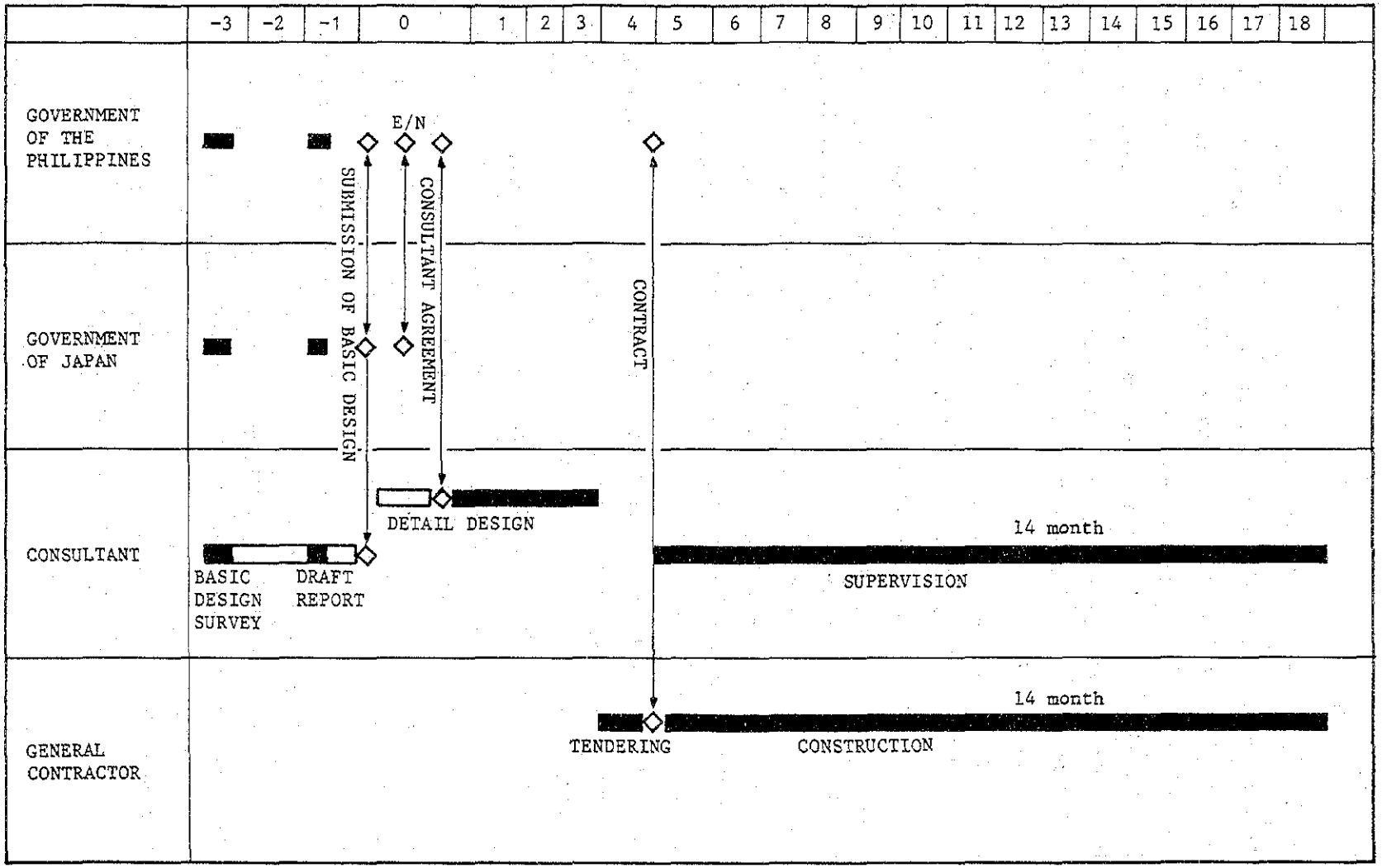
5. Execution Schedule

The term for the construction of the facility is expected to be approximately 14 months. In Japan the construction term for a similar scale facility will be about 12 months. The reasons why a longer construction term is required are as follows:

- o The hard soil called adobe lying 50 cm - 100 cm below the ground surface requires a longer time in excavation.
- o The five months rainy season will reduce the working amount by 60 to 70% of that in the dry season.
- o The finishign works require a longer curing period such as plastering and tile works.

Construction schedule table is on the next page. Three months for detail design, 1.5 months for tendering and 14 months for construction are expected to be necessary.

Execution Schedule



6. Maintenance and Control Plan

(1) Staffing Plan

The maintenance and control structure of the experiment center should be organized under the management of BFAD, with due regard to the special features of the new facilities. "Organization Structure and Function of Bureau of Foods and Drugs" in the separate paper was proposed by BFAD.

The maintenance and control system has been organized in the Administrative Division and 36 persons are expected as personnel requried. In the fields except for Animal breeding and raising, it is judged that maintenance and control are being performed fairly well through the present activities of BFAD. However, as far as Animal breeding is concerned, all-out assistance by Japan is expected because BFAD has no experience in the field. BFAD intends to provide about 10 persons, including a veterinarian, at the beginning, as staff for the animal house and will increase the staff number when necessary. At R.I.T.M., which started full operation in June, five persons--two veterinarians, two animal technicians and a helper--and an expert from JICA are in charge of the animal house. It may be possible that the animal house staff of the experiment center will have preparatory training at R.I.T.M.

As for maintenance and control of equipment, it is not realistic to train a technician expecting that he can maintain the whole equipment collectively, because the kinds of equipment provided by the project vary and some differ largely from the other in terms of their function and performance. It would be more practical, therefore, to station one or two persons for simpler works such as electrical and mechanical repairs as well as repair of glass instruments glass, while asking a local agent of the equipment manufacturer for repairs which are beyond the staff's capacity.

As new facilities other than the animal house, water purification facilities, drainage and incinerator facilities are scheduled to be installed. In order to secure smooth operation with proper maintenance for a long period of time, management by skilled technicians of the facilities is greatly expected.

At present the initial staffing plan for the facilities is provided by BFAD, under the commission of the Government, as follows:

Director Office	12	persons
Product Evaluation Division	44	"
Regulation Division	93	"
Laboratory Division	89	"
Administrative Division	36	"
Total	274	"

(2) Running Cost

An estimate made by BFAD as the running cost for the facilities is shown below.

Budget at the Time of Establishment Made by BFAD (1986)

Items	Amount (peso)	Percentage to Total (%)
1. Personnel expense	4,199,984	45.6
2. Transportation	200,000	2.2
3. Communication expense	100,000	1.1
4. Fuel and light expenses	200,000	2.2
5. Maintenance expense	1,000,000	10.9
6. Material and equipment expneses	3,500,000	38.0
Total	9,199,984	100.0%

In addition, the 1984 payments by BFAD are listed as follows. The budget upon completion of the faicilty is therefore estimated to be approximately 1.75 times the amounts in the following.

BFAD Expenditure (1984)

Items	Amount (peso)	Percentage to Total (%)
1. Personnel expense	3,291,073	62.7
2. Transportation	139,137	2.7
3. Communication expense	44,835	0.8
4. Fuel and light expenses	121,681	2.3
5. Maintenance expense	36,471	0.7
6. Material and equipment expenses	997,665	19.0
7. Others	618,012	11.8
Total	5,248,874	100.0%

(3) Maintenance Plan for Facilities

1) Building

The life time of a building depends greatly on frequency of everyday maintenance and cleaning. If a building is well-maintained, the occupants can enjoy a comfortable working environment and, as a result, they are likely to use the facilities with care. In such cases, breakage and damage are often detected in their early stages, which can minimize the cost for maintenance.

For cleaning of the facilities, 8 to 10 cleaners will be needed. Although the facilities of BFAD are old structures, they are clean and well-maintained, giving a good impression to everybody. This is considered to be partly due to the situation that many women are working there and wages of cleaners are cheap, in addition to the fact that people have awareness for cleaning and hygiene due to the character of the facility.

Since the life cycle of the facilities is considered to be 25 to 30 years, there will be almost no repairs for the main building structures during the period but only interior and exterior repairs and some remodeling may be required.

In the meantime, some remodeling and repairs of the facilities may be needed in future owing to possible expansion of function, alteration in uses, increase in the staff number, etc. The policy for this will be stated in the section concerning the building plan.

As for the checking and repairs of the building, following items are desired to be carried out regularly.

(Exterior)

o Exterior repairs, repainting, checking of concrete neutralization cracks	once/5 years
o Roof shingles--repairs, painting, checking	checking--once/year others--once/5 years
o Roof waterproofing--partial repair, checking	checking--once/year others--as required
o Eaves trough, drain--regular cleaning	once/month
o Exterior joiner sealing--checking, repairs	once/year
o Exterior fittings--painting	once/5 years
o Ditches, manholes--regular checking, cleaning	once/month
o Fence-painting	once/5 years
o Gardening, tree pruning--regular maintenance	on occasion

(Interior)

o Interior alteration	on occasion
o Interior walls--repairs, repainting	on occasion
o Interior ceiling--replacement	on occasion
o Fittings joints--adjustment; hardware--replacement	once/year and as requied

Judging from the present circumstances, 24-hour patrolling by a guard will be necessary to check going in and out of people, carrying in and out of materials, etc., for burglarproofing for research and other equipment.

2) Facilities

The most decisive point for facility maintenance is how well a person in charge can understand the function of equipment and how well he can master its operation.

In addition to routine operaiton control and regular checking of facilities and equipment, special maintenance including repairs at the time of breakdowns would be required. Therefore, in order to eliminate possible accidents and troubles, an appropriate maintenance system with adequate operation of facilities should be adopted to assure the sound operation as a whole.

According to the present facility and equipment plan, the number of technicians required is three: one in charge of electricity, one for air-conditioning and ventilation and one for water supply and drainage.

Facilities and equipment demand regular overhaul and replacement of consuming parts, as well as regular checking and maintenance, according to the frequency specifically fixed for each equipment.

The general life of each equipment is listed below and replacement is necessary at the time of expiration.

(Electrical equipment)

o Generator	15-20 years
o Distributing board	20-30 years
o Fluorescent lamps	5,0000-10,000 hours
o Incandescent electric lamps	1,000-1,500 hours
o Telephone switchboard (P.B.X)	40 years
o Loudspeaker	10-20 years

(Water supply and drain equipment)

o Pumps	10-15 years
o Tanks	15-20 years
o Pipes and valves	10-15 years
o Sanitary ware	25 years
o Extinguishers	20 years
o Gas appliances	6 years
o Sewage disposal machine	7 years

(Air-conditioning facilities)

o Pipes	10-15 years
o Blowers	10-15 years
o Air-conditioner	10-15 years
o Package air-conditioner	5-10 years
o Freezer	5-10 years

3) Testing and Analysis Equipment

The equipment to be used in testing and analysis can be broadly divided into that for analysis and that for use in general purpose testing.

a. Analysis machines and equipment

In recent years, there has been much electronic and microcomputer equipment incorporated into analysis equipment and the main failures of such equipment tend to be due to fluctuations in the source power voltage. Because of this, the major items of analysis equipment have been provided with their own power stabilization equipment and by doing so, major failures due to electrical causes can be avoided.

However, the analysis equipment requires periodic inspection and adjustment against standard equipment data for those items that are frequently used.

One example of this is the pH meter, which requires that it be zeroed against a standard liquid meter every time it is used, and that it be corrected against a standard pH value once every three months.

b. General purpose test equipment

The general purpose test equipment is of simple configuration and so will necessitate that periodic inspections be carried out, and that a repair room be provided so that basic repairs can be performed in case of out of order.

c. Glass experiment equipment

Glass materials used for precise analysis is difficult to repair but repairs to general purpose glass equipment are possible. It is therefore necessary that the repair room be provided with fine work tools, and a special burner for small repairs.

d. Optical equipment

Microscopes constitute the main optical equipment in use and it is therefore necessary that the equipment required to perform basic cleaning of the lenses once a year, be supplied in consideraiton of the frequency of use of the equipment, and of the meteorological characteristics of The Philippines. (This equipment will consist of a microscope mirror disassembly/assembly set, and a dessicator, etc.)

The life time of the testing and analysis equipment are listed in the following table. It will be necessary of course, to repalce the equipment once the respective working lives have been exceeded.

Name	Working life	Maintenance period
Electron microscope	15 years	1/1 year
Gas chromatograph, mass spectrometer	15 years	1/1 year
High-speed liquid chromatograph	10 years	1/1 year
Atomic absorption spectrometer	10 years	1/1 year
Gas chromatograph	10 years	1/1 year
Spectrometers	10 years	1/1 year
Analysis balances	10 years	1/1 year
Optical microscope	10-15 years	2/1 year
Sugar gauge tester	10 years	2/1 year
Centrifuge (ultra)	10 years	1/1 year
Centrifuge (general purpose)	15 years	2/1 year
Large scale sterilizer	15 years	1/1 year

The analysis equipment differs from other equipment in that it requries a high degree of measurement precision and so the working life is predetermined since the precision of the measurement data can drop even if the external appearance of the equipment is still favorable.

Machine maintenance according to the general standard maintenance periods mentioned in the above table, and the management and maintenance system should be considered in the selection of the equipment. This makes it necessary to select the major items of equipment from those which had either contracted outlets, manufacturer's agencies or an instant maintenance service available in The Philippines.

(4) Maintenance Cost

The annual maintenance cost of facilities of the project, after the official acceptance of the equipment, is shown below with breakdowns according to the current price as of June 1985.

The items of annual maintenance expense are:

1) Personnel Expense
2) Facility Operation Expense
3) Cleaning and Guard Expenses
4) Maintenance, Checking and Repair Expenses
5) Maintenance Expenses for Research Equipment, etc.

1) Personnel Expense

According to the project plan made by BFAD, the personnel expense is worked out as follows:

4,199,984 peso (1986 budget)

2) Facility Operation Expense

Assusming the load at the time of operation, the annual operation cost is claculated based on the consumption quantities of electricity, LPG, fuel oil and special gases. Meanwhile, water cost is included in electric charges because well water is used in the project.

a. Electric charges

Electric lights, outlets	150 kW	×		8 hrs./day × 365 × 5/7 days	×	0.36 peso/KWh	=	112,600 peso/year
Research equipment	160 kW	×		8 hrs./day × 365	×	0.36 peso/kWh	=	120,100 peso/year
Freezers and refrigerators	40 kW	×	0.3 ×	24 hrs./day × 365	×	0.36 peso/kWh	=	37,800 peso/year
Special air-conditioning	50 kW	×	0.5 ×	24 hrs./day × 365	×	0.36 peso/kWh	=	78,800 peso/year
General air conditioning	130 kW	×		8 hrs./day × 365 × 5/7 days	×	0.36 peso/kWh	=	97,600 peso/year
Ventilation equipment	30 kW	×		8 hrs./day × 365 × 5/7 days	×	0.36 peso/kWh	=	22,500 peso/year
Sewage disposal equipment	15 kW	×		8 hrs./day × 365	×	0.36 peso/kWh	=	15,700 peso/year
Water supply equipment	20 kW	×		3 hrs./day × 365 × 5/7 days	×	0.36 peso/kWh	=	5,600 peso/year
Well equipment	5 kW	×		3 hrs./day × 365 × 5/7 days	×	0.36 peso/kWh	=	1,400 peso/year
Base charge	600 kW	×	12.6 peso/kW × 12 months/year				=	90,700 peso/year
Total								582,800 peso/year

b. LPG (Liquefied petroleum gas)

Research use:

30 units × 300 kcal./hour × 5 hrs./day/11,000 kcal./kg
× 365 days × 5/7 days × 8.34 peso/kg = 8,900 peso/year

Kitchen use:

200 meals/day × 700 kcal./meal/11,000 kcal./kg × 365 days
× 5/7 days × 8.34 peso/kg = 27,700 peso/year

Sub-total 36,600 peso/year

c. Fuel oil

Electric generator:

10 hrs./month × 12 months/year × 125 kVA × 0.8 × 0.35 ℓ/kWh
× 29.5 peso/ℓ = 123,900 peso/year

Autoclave:

60,000 kcal./hour · unit × 2 units × 4 hrs./day/9,300 kcal.
365 days × 5/7 days × 29.5 peso/ℓ = 396,900 peso/year

Sub-total 520,800 peso/year

d. Special gases

These are gases for use by the gas chromatograph and the mass spectrometer.

Gases for use in analysis:

The following amounts were calculated on the basis of machine analysis requiring one hour per time, with one time per week, and 40 weeks to the year.

Hydrogen: 30 lit/mm × 60 mins = 1,800 lit × 40 times
= 72,000 lit/year
1 cylinder 60,000 lit (362 peso)
= 21,720,000 peso

Argon: 9 lit/mm × 60 mins = 540 lit × 40 times
= 21,600 lit/year
1 cylinder 60,000 lit (1,261 peso)
= 75,660,000 peso

Helium: 9 lit/mm × 60 mins = 540 lit × 40 tiems
= 21,600 lit/year
1 cylinder 60,000 lit (4,470 peso)
= 268,620,000 peso

3) Cleaning and Guard Expenses

The cleaning and guard expenses are claculated as personnel expense for the persons in charge of cleaning and guard.

(a) Cleaning expense 10 persons
65 peso/day/person × 10 persons × 365 days × 5/7 days
= 169,500 peso/year

(b) Goard expense 4 persons (24-hour system; 2-shift basis; 2 persons at a time)
65 peso/day/person × 4 persons × 365 days
= 94,900 peso/year

Sub-total 264,400 peso/year

4) Maintenance, Checking and Repair Expenses

a. Building

Repair cost for a building differs largely depending on how old the structure is. Assuming that the life cycle of the building is 30 years, the repair cost for the facilities, based on the annual repair cost per unit area of ¥20/m^2, is:

20 peso/m^2 × 5,500 m^2 = 110,000 peso/year

However, for the first 3 to 5 year period it is expected that the actual cost will be 1/20 to 1/10 of the above amount.

b. Facilities

Similar to the situation of buildings, facilities also require only few part replacement for 3 to 5 years after completion. However, they will gradually need replacement of parts and overhaul, or replacement of equipment itself as time goes on.

When the estimation is based on 10-year span of time, the average annual maintenance cost is considered to be 3 to 5% to the direct cost of the facilities.

22,600,000 peso 3% = 678,000 peso/year

Total 110,000 peso/year + 678,000 peso/year = 788,000 peso/year

5) Maintenance and Management Expenses for Testing and Analysis Equipment, etc.

In order to smoothly obtain percise data, the testing and analysis equipment requires that a supply of parts for the equipment be readily available.

The running costs for the main items of analysis equipment are as follows.

(for one year)

No. of times of use (for one hour per time, at one time per week at 40 weeks per year)

Electron microscope:	1 time (8,000 peso) special disposble element, test solution, electricity, water rates 8,000 peso × 40 = 320,000 peso
Liquid chromatograph:	1 time (600 peso) column consumable cost, tst solution, 600 peso × 400 = 24,000 peso
Gas chromatograph:	1 time (1,800 peso) column consumable cost, gas fee
Gas chromatograph, mass spectrometer:	1 time (6,800 peso) special consumable item, gas fee, electricity fee 6,800 peso × 40 = 272,000 peso
Cells for diffraction spectrometer:	Necessary to be replaced once every two years 15,000 peso
Optical microscopes:	Lens cleaning solution (1 bottle) 3,800 peso
Centrifigal separator:	Carbon brushes for high speed motor, etc. 18,000 peso

Regarding periodic maintenance of the mass spectrometer:

As was noted in the table for periodic maintenance, it is necessary for specially trained persons to conduct periodic maintenance for the analysis equipment in order for the required precision to be maintained.

Calculation of maintenance expenses per year:

In the case of special pesonnel being sent from Japan:

Electron microscope:	One person Air fare	210,000 peso
	7 days @ 50,000 peso/day	= 350,000 peso
	TOTAL	= 560,000 peso
Major items of	One person Air fare	210,000 peso
analysis equipment:	10 days @ 50,000 peso/day	= 500,000 peso
	TOTAL	= 710,000 peso

Other general purpose analysis equipment can have maintenance performed by the personnel at manufacturers' agencies or by specialist technicians in Manila.

Two persons for 14 days = 100 peso 14
= 2,800 peso

7. Outline of Construction Cost to be Born by the Philippines Government

The total amount of work for which the cost is to be borne by the Philippines Government is estimated at 1,000,000 pesos. The breakdown for this is as follows.

Road from offsite to the site	200,000 peso
Gates and fences	250,000 peso
Basic work	150,000 peso
- Electricity	
- Wells	
- Drainage connection	
- Telephone connection	
General fittings	400,000 peso

CHAPTER 5 EVALUATION

This project is to serve for the upgrading of the health and hygiene in the Philippines and to be judged in view of the social and economic effect.

Assurance for the safety and potency of foodstuffs and pharmceuticals is an essential factor to maintain the health of the people of the Philippines. However, at the present stage, there are not sufficient laboratory facilities to meet these demands. Because of this, sufficient laboratory tests quality confirmaton for safety of food and the quality control of drugs cannot be performed. At the present state, the establishment of standard for the quality control and of the unification of the quality testing method.

The establishment of the new "Food and Drugs Laboratories," with the strengthening of microbiological, physico-chemical analysis, and the addition of new toxicology and animal section will introduce a considerable improvement and development of the Food and Drugs administration.

The following effects will be expected on the implementation of this project.

(1) The establishment of the updated system for testing and inspection will greatly speed up the processes of inspection and evaluation in all stages of the manufacture, processing, packaging, export, import, distribution and sales of foodstuffs and pharmaceuticals. In addition, it will also lead to a clarification of the administrative guidance and so this will lead to greater safety and improved reliability of the indications relating to the contents.

(2) The facility will not only be a replenishment as the core facility for quality control of foodstuffs and pharmaceuticals in The Philippines, but will also function as a training center for health workers and personnel from regional health offices.

(3) Animal testing and toxicology do not have enough history in The Philippines, and so the facility will serve to bring up the technical level, and also will serve as a training facility.
Furthermore, The Animal House will cause the maintenance and management expenses to be slightly higher than similar facilities without these functions. However, the Government of The Philippines has already

allocated a budget of 9,000,000 pesos per year for the running of the facility and is taking adequate measures for the implementation of the project.

It is considered that there would be no particular problems concering the personnel for the facility, as described in Chapter 4, "6. Maintenance, Management and Operation."

The construction of the facility will endeavor to use local products and local methods as much as possible and to reduce the construction cost. For example, the design will incorporate natural lighting and ventilation as much as possible. Both will reduce the running cost and will keep the easy maintenance.

As has been described above, the implementation of this project will lead to an improvement in the safety and quality of foodstuffs and pharmaceuticals in the Philippines and is also expected to make a great contribution to the health and the welfare of the people of the Republic of the Philippines.

CHAPTER 6 CONCLUSION AND RECOMMENDATIONS

(Conclusion)

As was described in Chapter 4, the Basic Design was compiled on the Project Proposal from the Government of the Philippines for the establishment of the "Food and Drugs Laboratories" and also on the basis of a thorough investigation and analysis of the various problems relating to the implementation of the project. This Basic Design follows closely to the content of the request of the Government of the Philippines and would be indispensable for the improvement of the health and hygiene situation of the people of The Philippines. Especially, the safety of foodstuffs and pharmaceuticals has a great affect upon later generations and therefore the implementation of this project shall bring many and varied benefits to the country. Accordingly, it is concluded that it is extremely important and appropriate that this project be implemented as grant-in-aid cooperation extended by Japanese Government.

(Recommendations)

In order to increase the effect of this project and to assist its smooth implementation, we would like to make the following recommendations to both the Government of Japan and the Government of the Philippines so that the necessary measures can be taken for the following matters.

(1) In order to function the Laboratories as planned, it is necessary that the staff to be adequately trained in the facility operation and management. In order to achieve this, both Governments should institute a system for the timely implementation of technical cooperation so that it can take place concurrent with the construction of the facility itself.

(2) The Government of the Philippines should have the staff ready for the operation, management and maintenance of the facility, and should also take measures to procure the budget for such. In particular, the section for the breeding and raising of test animals is one in which the BFAD has had little experience and so special consideration should be given to both the procurement of personnel and the budgetary measures.

(3) The both governments should request the necessary technical guidance from the contractors so that the technicians in charge of the opertion, maintenance and management of the facility be supplied with sufficient knowledge and skills regarding the handling and maintenance, etc., of the building's facilities and the various types of equipment.

(4) The Government of the Philippines should erect the necessary measures so that through their daily activities, the staff can assist to upgrade the skills and knowledge of the younger health workers and personnel at regional health centers.

As mentioned above, it is important to construct and furnish the appropriate facility matching to the requirement of the Philippines, and at the same time, to implement the technical cooperation to function the facility at its ultimate condition in the long term.

APPENDICES

Material 1. Member List of Basic Design Study Team

(1) Member List for Basic Plan Research Group

Leader Shigeo, Iwahara M.D.	(General)	Head, Food Environment Dept., Hatano Resarch Institute, Food and Drugs Safety Center
Hiroshi Ono, M.D.	(Physicochemical analysis)	Head, Pharmacology & Toxicology Dept. at the above
Yoichi Furusawa	(Food & drug administration & inspection)	Quality Assurance Manager at the above
Toshio Namai	(Coordinator)	1st Basic Design Study Division, Grant Aid Planning & Survey Dept., JICA
Ichiro Kanagawa	(Planning)	Nihon Architects, Engineers & Consultants, Inc. (NAEC)
Michio Kurakazu	(Architecture)	NAEC
Arihiro Okada	(Engineering)	NAEC
Chikashi Ozaki	(Equipment)	NAEC

(2) Member List for Draft Report Research Group

Leader Toshio Namai	(General)	1st Basic Design Study Division, Grant Aid Planning & Survey Dept., JICA
Ichiro Kanagawa	(Architecture Planning)	NAEC
Chikashi Ozaki	(Equipment)	NAEC

Material 2. List of Authorities Concerned and of Persons Interviewed

Ministry of Health

Dr. Jesus C. Azurin	Minister
Dr. Acosta	Deputy Minister
Mrs. Catalina C. Sanchez	Director, Bureau of Food & Drugs (BFAD)
Ms. Virginia O. Barros	Chief, Inspection & Licensing Division, BFAD
Ms. Manuela L. Buensucaso	Chief, Laboratory Division, BFAD
Ms. Amor Cita M. Pallera	Pharmacy Adviser, Office of Minister
Mr. Rodrigo A. Castillo	Acting Chief, Administrative Division, BFAD

NEDA (National Economic & Development Authority)

Mr. Ednardo G. Corpuz	Assistant Director General
Mrs. Ma Resurreccion R. Suarez	Division Head, Japanese Affairs
Ms. Mariles A. Romero	Staff
Ms. Dione Saba	Staff

Japanese Embassy

Takashi Koezuka	Secretary
Kazuhiro Adachi	Secretary

Manila Office, JICA

Mr. Akihiro Mitarai	Resident Representative
Mr. Toichi Iwata	Staff

R.I.T.M. (Research Institute for Tropical Medicine)

Mr. Yoshinori Kaneko	Team Leader (Expert, JICA)
Mr. Jun Ichinose	Coordinator (Expert, JICA)
Mr. Toshihiko Asano	Animal Raising specialist (Expert, JICA)

San Miguel Corp. Magnolia Dairy Products Plant

Mr. Mel Balelo	Head, Quality Control Division
Mr. Herman Balelo	Head, Laboratory Division, Technical Dept.

College of Pharmacy U.P. (University of the Philippines)

Dr. Nafividad F. De Castro	College Secretary

United Laboratories, Inc.

Mr. D. B. Samson, Jr.	President
Mr. Luis P. Jimenez	Assistant Vice-President

Philippine Institute of Pure and Applied Chemistry

Mr. William J. Schamitt, S.J.	Director, Analytical Services

California Manufacturing Co. Inc.

Mr. Dominador Elguerra	Executive Assistant, R & D/Q.A.

Material 3. Itinerary

(1) Basic Design Study Team

June 10 (Mon.)	10:15	Lv. Narita by PR 431
	13:30	Arr. Manila
	15:30 ~	Preliminary meeting concerning investigation and schedule with Messrs. Mitarai and Iwata at JICA office
	17:00 ~ 18:00	Meeting concerning purpose and schedule of investigation with Secretary Adachi at Japanese Embassy
June 11 (Tue.)	9:00	1st meeting with Director Sanchez at BFAD (Bureau of Food & Drugs)
		Explanation about inception report; questionnair to be submitted; talk concerning schedule
	10:30	Visit to BFAD facilities (laboratory, etc.)
	14:30	Visit to R.I.T.M. (Research Institute for Tropical Medicine)
		Talk with Messrs. Kaneko, Ichinose and Asano, specialists of JICA
		inspection of R.I.T.M. facilities
	16:30 ~ 18:00	Site investigation for BFAD Project Giving instruction for soil test at the site
	21:00 ~ 22:00	Internal group meeting
June 12 (Wed.)		(Philippine Independence Day--national holiday)
	9:00 ~	General investigation of buildings at Makati district
	12:00 ~ 17:30	General investigation of buildings in an old city in Quezon district

June 13 (Thur.)	9:00	Meeting concerning schedule to visit similar facilities at BFAD
	10:00 ~ 12:00	Visit to San Miguel Grop. Magnolia Dairy Products Plant (Plant producing ice cream, dairy products, juice)
	14:00 ~ 18:30	General investigation of building at Makati district
	20:00 ~ 22:30	Internal group meeting Sorting out information and investigation items
June 14 (Fri.)	9:00 ~	Visit to BFAD, discussion concerning items for questionnaire
	10:00	Obtaining survey map of the site (scale: 1/500)
	10:30 ~ 12:30	Visit to College of Pharmacy U.P. (University of Philippines)
	14:00 ~ 15:30	Internal meeting, sorting out information
	16:00 ~ 17:30	Investigation general circumstances of local buildings at a local building design office
June 15 (Sat.)	8:30 ~ 10:00	Visit to Normal College Library
	10:00 ~ 11:00	Visit to the Saomeo Regional Center for Education & Technology
	11:20 ~ 13:00	Infrastructure investigation of project site
	14:30 ~ 16:30	Visit to Human Resources Development Center III
	17:00 ~ 18:30	Visit to Petrological, Mineralogical & Geochronological Services Laboratory

June 16 (Sun.)	10:00 ~ 12:00	Internal meeting
	14:00 ~ 15:00	Sorting out of information
		Messrs. Iwahara, Ono, Furusawa and Namai arrive in Manila
	15:00 ~ 18:00	Discussion of facility layout plan based on site investigation
	20:00 ~ 24:00	Internal meeting Design of layout plan
June 17 (Mon.)	9:30 ~	Meeting with Messrs. Mitarai and Iwata at JICA office Re. schedule, report on investigation between June 10 and 16
	12:00	Discussion about minutes
	13:30 ~ 14:00	Courtesy call on Director Sanchez at BFAD
	14:00	Courtesy call on Deputy Minister Dr. Acosta at Ministry of Health
	~	Explanation about purpose and schedule of investigation
	14:45	Courtesy call on Minister Dr. Jesus C. Azurin at Ministry of Health
		Explanation about purpose and schedule of investigation
	15:30	Talk based on site utilization plan
	16:00 ~ 17:30	Courtesy call to National Economic & Development Authority (NEDA)
	16:00 ~	Talk with BFAD concerning detailed schedule of investigation
	17:30	Detailed investigation about BFAD facilities

June 18 (Tue.)	9:00	Internal discussion on minutes draft
	~	
	12:00	Visit to foodstuffs factory (Magnolia)
		Checking of answers to questionnaire at BFAD, arrangement to obtain information on unreplied items
	13:30	Inspect the soil test at project site
	~	
	17:00	Discussion on test pit
		Making minutes draft
		Detailed investigation of R.I.T.M. animal house
June 19 (Wed.)	8:40	Site investigation and discussion on location and approach of buildings with Minister Azurin and Deputy Minister Acosta at the site
	~	
	12:00	
	14:00	Visit to Philippine Institute of Pure &
	~	Applied Chemistry, Ateneo University
	16:00	
	16:00	Visit to University of Philippines
	~	
	17:30	
June 20 (Thur.)	9:00	Discussion on minutes draft with Director Sanchez of BFAD
	10:15	Visit to United Laboratories Inc.
	~	
	13:30	
	14:30	Visit to California Manufacturing Co.
	~	
	17:00	Investigation of drainage at site
	20:00	Internal meeting
	~	
	21:30	

June 21 (Fri.)	9:00	Signing minutes by BFAD Director Sanchez and Leader Iwahara
	10:00 ~ 12:00	Visit to College of Medicine U.P. Visit to Metropolitan Water Work & Sewerage System Investigation of Filter Plant
	14:30 ~ 15:30	Internal meeting (checking of items which have not been investigated)
	15:30 ~ 17:30	Report of investigation results at JICA office Report of investigation results to Messrs. Koezuka and Adachi, secretaries, Japanese Embassy
June 22 (Sat.)	10:00 ~ 12:00	Internal meeting, sorting out of collected information Leader Iwahara and other three members leave for Japan
	14:00 ~ 17:00	Internal meeting, schedule for the 2nd half; work allotment; checking of items to be investigated
June 23 (Sun.)	10:00 ~ 16:00	Internal meeting, sorting out of information (hard rain all day)
June 24 (Mon.)	9:30 ~ 12:00	Investigation on construction circumstances at a local design office Investigation on Philippine economy at Manila branch of Bank of Tokyo
	14:00 ~ 16:00	Detailed investigation of PIPAC
	16:00 ~ 18:00	Visit to Philippine Social Science Center

June 25 (Tue.)	9:00 ~ 12:00	Discussions on the questionnaire at BFAD
		Investigation on equipment agents
	14:00 ~ 16:00	Investigation on general construction circumstances at a local design office
		Investigation of buildings at Manila district
	16:00 ~ 18:00	Investigation on equipment agents
June 26 (Wed.)	9:00 ~ 12:00	Investigation of buildings at Quezon district
		Investigation on equipment agents
	14:00 ~ 18:00	Visit to Micro Biological Laboratory, Inc.
		Visit to Linol Marketing Corp.
	20:00 ~ 23:00	Internal meeting, sorting out of collected information
June 27 (Thur.)	9:00 ~ 12:00	Final meeting at BFAD
		Re. reconfirmation of discussion during the investigation period
		Visit to College of Veterinary Medicine U.P
	13:30 ~ 15:00	Visit to National Institute of Science & Technology
		Report of latter half investigation to Mr. Iwata of JICA office
	17:00	Report of latter half investigation to Secretary Adachi of Japanese Embassy
June 28 (Fri.)	11:30	Lv. Manila
	17:00	Lv. Manila by PR 432
	23:00	Arr. Narita

(2) Draft Report Explanation Team

9 (Mon.)	10:15	Lv. Narita by PR 431
	13:30	Arr. Manila
	12:30	Discussions on the schedule with Messrs. Mitarai and Iwata of JICA
	17:00	Meeting with Secretary Adachi of Embassy
10 (Tue.)	9:30	Explanation of draft report to Director Sanchez, Mr. Castillo, Ms. Barros, Ms. Buensuceso and others at BFAD
	14:00	Courtesy call on Minister Azurin and Deputy Minister Acosta
11 (Wed.)	9:30 ~ 15:00	Explanation on actual schedule and equipment list, talk about drawings at BFAD
12 (Thur.)	9:30 ~ 12:00	Submitting revised drawings to BFAD Discussion and signing of minutes
	15:00	Courtesy call to NEDA
	17:00	Final report to Messrs. Mitarai and Iwata at JICA office
13 (Fri.)	14:20	Lv. Manila by PR 432
	19:30	Arr. Narita

Material 4.

MINUTES OF DISCUSSION

BASIC DESIGN STUDY ON FOOD AND DRUGS LABORATORIES
IN THE REPUBLIC OF THE PHILIPPINES

In response to the request made by the Government of the Republic of the Philippines for the Food and Drugs Laboratories Project (Hereinafter referred to as "the project"), the Government of Japan has sent through the Japan International Cooperation Agency, a team headed by Dr. Shigeo Iwahara, Director, Food and Environmental Dept., Hatano Research Institute of Food and Drug Safety Center to carry out a basic design study for the project from June 10 to June 28, 1985. The team carried out field survey, had a series of discussions and exchanged views about the project with the Authorities concerned of the Government of the Republic of the Philippines.

As a result of the survey and discussions, both parties have agreed to recommend to their respective Governments to examine the result of the survey attached herewith.

Manila
June 21, 1985

S. Iwahara
(Dr. SHIGEO IWAHARA)
Team Leader
The Japanese Basic Design Study Team,
The Japan International Cooperation Agency

C. Sanchez
(Mrs. CATALINA C. SANCHEZ)
Director
Bureau of Food and Drugs,
Ministry of Health

S. I.

Main Result of the Basic Design Study Team

1. Name of the Project

Food and Drugs Laboratories

2. The Objective of the Project

The objective of the Project under the Grant Aid is to establish Food and Drugs Laboratories in order to improve the safety and quality control system of food and drugs in the Republic of the Philippines.

3. The Activities of the Laboratories

The followings are the major activities to be carried out in the Laboratories

A. Laboratories Works
   1. Physico-chemical
   2. Microbiological
   3. Toxicological

B. Inspection on
   1. Food establishments
   2. Drugs and cosmetics establishments
   3. Household Hazardous Substance establishments
   4. Import and export

C. Evaluation
   1. Drugs
      . Marketed Product
      . New Products
      . Traditional Medicines

2. Food
3. Cosmetics
4. Household Hazardous Substance
5. Medical Devices

4. Location of the Project Site

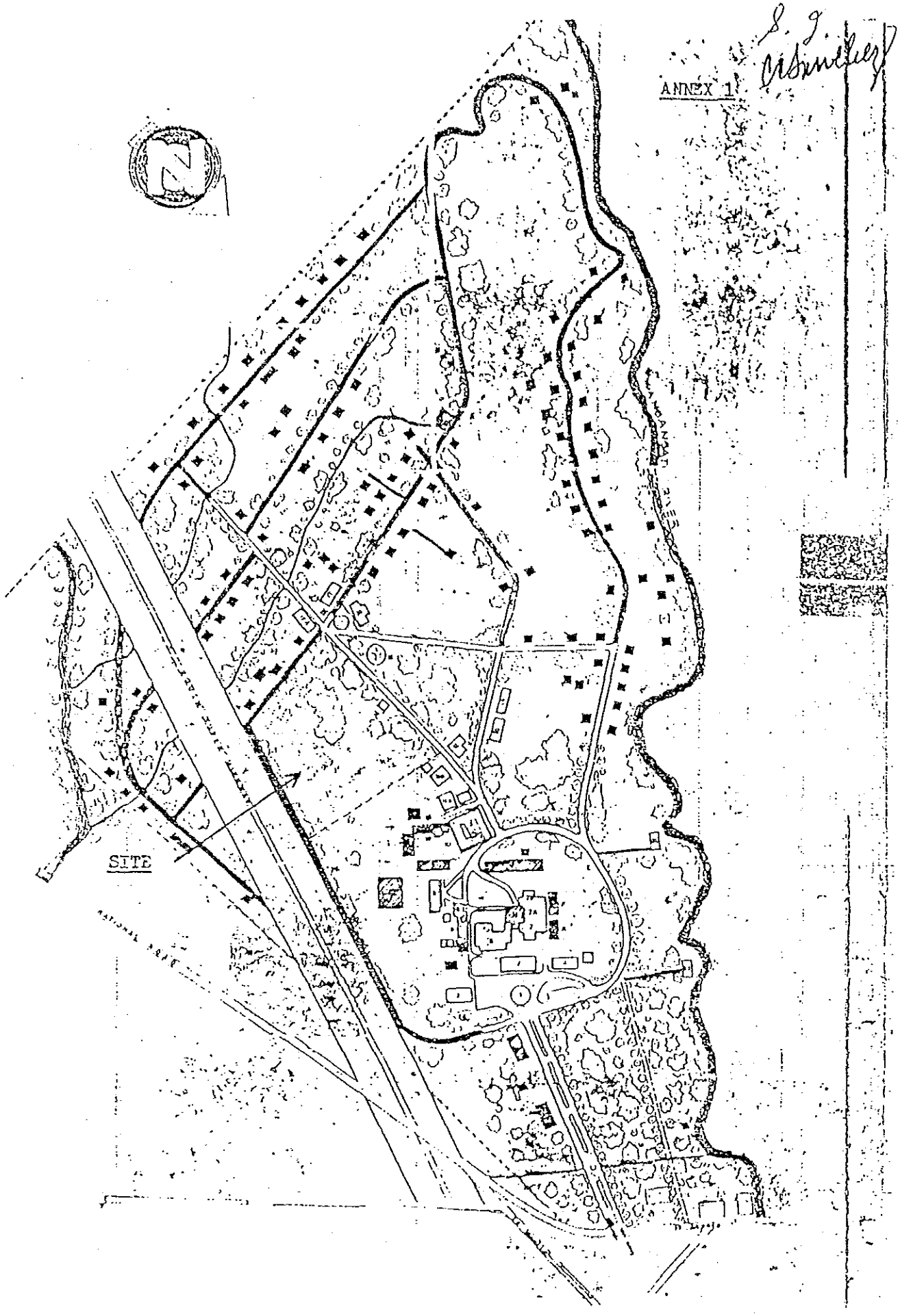
Project site is within the property of Ministry of Health, located at Alabang, Muntinlupa, Metro Manila (Annex 1)

5. Bureau of Food and Drugs, Ministry of Health, is responsible for the administration and execution of the Project.

6. The Japanese Team will convey to the Government of Japan the desire of the Government of the Republic of the Philippine that the former takes necessary measures to cooperate in implementing the Project and bear the cost of the facilities and equipment listed in Annex 2 within the scope of Japanese Economic Cooperation programme in Grant Aid Form.

7. The Japanese Team explained the systems of the Japanese Grant Aid and the Philippine side understood it.
Government of the Republic of the Philippines will take necessary measures listed in Annex 3 on condition that the Grant Aid Assistance would be extended.

ANNEX 1



ANNEX 2

The cost of the following facilities and the equipments will be borne by the Government of Japan.

1. Facilities

   a. Main Building

      Laboratories

      Technical Services

      Management Services

   b. Animal house

   c. Other necessary facilities

2. Equipments

   1. Gaschromatograph Mass Spectrometer
   2. Electron Microscope
   3. High Performance Liquid Chromatograph
   4. Spectrophotometer
   5. Gaschromatograph
   6. Atomic Absorption Spectrometer
   7. Ultra High-speed Centrifuge
   8. Equipments necessary for the animal experiments
   9. Other necessary equipments.

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ANNEX 3

The Government of the Republic of the Philippines will take necessary measures on the following matters.

1. Provision of a lot of Land.
2. Construction of the gate and fence in and around the site.
3. Construction of the road to the site.
4. Provision of electricity, power line to the site and transformer.
5. Water supply by well.
6. Telephone trunk line to the main distribution frame/panel (MDF) of the building.
7. Provision of general furniture (carpet, curtain, table, chair and others).
8. Ensuring unloading and customs clearance at port of disembarkation in the Philippines.
   - Tax exemption and customs clearance of the products at the port of disembarkation.
9. Accomodate Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the Philippines and stay therein for the performance of their work.
10. Bearing all the expenses necessary for construction of the facilities as well as for the transportation and the installation of the equipments (general furnitures and existing equipments) other than those to be borne by the Grant.

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- All necessary application for permits and their expenses as required by law in the Philippines.

ANNEX 4

Member List of Both Side is as follows :

1. Japanese Basic Design Study Team

Team Leader Mr. SHIGEO IWAHARA (General)	Head, Food and Environmental Dept., Hatano Research Institute of Food and Drug Safety Center (H.R.I.,F.D.S.C.)
Mr. HIROSHI ONO (Pharmacology)	Head, Pharmacology Dept., H.R.I., F.D.S.C.
Mr. YOUICHI FURUSAWA (Veterinary)	Quality Assurance Manager, H.R.I., F.D.S.C.
Mr. TOSHIO NAMAI (Project Coordinator)	First Basic Design Study Div., Grant Aid Planning and Survey Dept., Japan International Cooperation Agency
Mr. ICHIRO KANAGAWA (Planning)	Senior Architect, Nihon Architects, Engineers and Consultants, Inc. (NAEC)
Mr. MICHIO KURAKAZU (Architecture)	Architect, NAEC
Mr. MOTOHIRO OKADA (Mechanical Engineer)	Engineer, NAEC
Mr. CHIKASHI OZAKI (Equipment)	Specialist, NAEC

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2. Philippine Side

Mrs. CATALINA C. SANCHEZ	Director, Bureau of Food and Drugs, Ministry of Health
Ms. VIRGINIA O. BARROS	Chief, Regulation Division, Bureau of Food and Drugs, Ministry of Health
Ms. MANUELA BUENSUCESO	Chief, Laboratory Division, Bureau of Food and Drugs, Ministry of Health
Mr. RODRIGO CASTILLO	Acting Chief, Administrative Division, Bureau of Food and Drugs, Ministry of Health
Ms. AMOR CITA PALLERA	Pharmacy Adviser, Office of the Minister, Ministry of Health

Material 5.

MINUTES OF DISCUSSIONS

THE DRAFT FINAL REPORT OF THE BASIC DESIGN STUDY

ON

FOOD AND DRUGS LABORATORIES PROJECT IN THE

REPUBLIC OF THE PHILIPPINES

The Government of Japan has sent, through Japan International Cooperation Agency (JICA), a Basic Design Study Team to the Republic of the Philippines from 9 to 13 September 1985 for the purpose of presenting and explaining the Draft Final Report of the Basic Design Study on Food and Drugs Laboratories Project.

After a series of discussions between the Team and the Philippine side, both parties confirmed the following results attached herewith (ATTACHMENT).

M a n i l a

12 September 1985

Mr. TOSHIO NAMAI
Leader
Japanese Study Team
J I C A

Mrs. CATALINA C. SANCHEZ
Director
Bureau of Food and Drugs
Ministry of Health

ATTACHMENT

1. Both parties agreed to reconfirm the Minutes of Discussions which was mutually signed on June 21, 1985.

2. The Philippine side has agreed in principle to the basic design proposed in the Draft Final Report and appropriate alterations agreed upon during the discussions will be incorporated in the Final Report.

3. The Philippine side has accepted Japan's grant aid system and the arrangement to be taken by the Philippine side for realization of the Project.

4. The Final Report (10 copies in English) will be submitted to the Philippine side by the end of October 1985.

Material 6. Country Data

(1) Basic Index

1)	Name of country	The Republic of the Philippines
	Capital	Metropolitan Manila
	Population	5,926,000 persons (as of mid-1984; estimated by U.N.)
	Date of Independence	July 4, 1946
2)	National land and population	
	Area	299,681 km^2
	Population	49,000,000 persons (as of mid-1981; estimated by U.N.)
	Population density	160.3/km^2
	Population growth rate	2.7% (as of mid-1981; estimated by U.N.)
	City population rate	10%
	Average life span	Male--56.9 years; female--60.0 years (1970-1975)
3)	Government system	Republic form
		President : Ferdinand Marcos (inaugulated in 1965)
4)	Religions	Roman Catholicism--85%; Islam--4%; Protestantism and others--1%
5)	Languages	Official language: English Tagalog, Spanish, Bisayan, Illocano and many others
6)	Races	Many language groups such as Bisayan, Tagalog, Illocano and Bikol
7)	Education	Adult literacy rate: 82.6% (above 15 years old; 1970)
		Compulsory education: 7-12 years old (6 years)

8)	Monetary unit	Philippine peso 1 US$ = 18.464 peso (June 1985)
9)	Climate	Tropical monsooon region; annual average temperature--27°C The temperature does not change largely by season. June-October--rainy season; November-May--dry season.

(2) Economic Statistics of Philippines

1) GDP Growth Rate

(%)

	GNP per capita		GDP	
	1982	Average annual growth rate 1960∿80	Average annual growth rate 1960∿70	Average annual growth rate 1970∿82
	(US$)	(%)	(%)	(%)
Philippine	820	2.8	5.1	6.0
Indonesia	580	4.2	3.9	7.7
Thailand	790	4.5	8.4	7.1
Malaysia	1,860	4.3	6.5	7.7
Singapore	5,910	7.4	8.8	8.5
Korea	1,910	6.6	8.6	8.6
Brazil	2,240	4.8	5.4	7.6
Mexico	2,270	3.7	7.6	6.4

Source: World Development Report, the World Bank, 1984

2) Transition of GNP (1983, 1984-1987)

(%)

	Actual value (r)	Estimate (P) for 1st half	Average annual growth rate (estimate)	
	1983	1984	1984	1985∿1987
1. Actual GNP	1.3	(-) 5.4	(-) 5.5	2.8
2. Real GNP by factor				
Private consumption expenditure	2.9	1.6	1.6	2.5
Public consumption expenditure	(-) 3.9	(-)11.8	(-)15.0	1.0
General fixed capital formation	(-) 4.7	(-)34.5	(-)31.1	0.9
Exports	5.7	(-) 1.2	(-) 1.0	6.0
Imports	(-) 1.6	(-)27.1	(-)27.0	1.3
3. Real GDP	1.1	(-) 3.7	(-) 4.5	3.0
Agriculture, forestry and fishery	(-) 2.1	2.2	1.5	4.4
Mining and other industries	0.7	(-) 9.0	(-)10.3	2.5
Mining	(-) 2.5	(-)19.7	(-)19.0	2.2
Manufacturing	2.3	(-) 6.3	(-) 8.3	2.7
Construction	(-) 4.8	(-)16.2	(-)17.0	1.5
Electricity, gas and water service	10.0	4.7	5.0	5.6
Services	3.7	(-) 2.4	(-) 2.9	2.3

Source: NEDA, Updated Philippine Development Plan, 1984∿87, Sep. 1984

Note: (r) Revised value as of Sep. 7, 1984
(P) Estimated value as of Sep. 7, 1984

3)

PERSONAL INCOME AND OUTLAY ACCOUNT:
1950 TO 1983
(In million pesos at current prices)

Item	1950	1955	1960	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983[a]
1. Compensation of employees)																		
2. Entrepreneurial and property income of persons)	6,140	8,021	11,616	19,387	32,876	39,276	43,885	54,428	75,877	85,236	100,586	117,550	129,834	160,758	194,238	223,297	249,059	277,104
3. Social security benefits	-	6	26	55	156	179	201	351	366	581	658	670	994	1,083	1,173	1,418	1,697	2,040
4. Other current transfers from general government	33	51	91	116	395	486	590	741	896	1,312	1,253	1,678	1,843	2,373	2,486	3,064	3,952	5,135
5. Current transfers from the rest of the world	226	17	193	311	559	675	1,051	1,175	1,366	1,826	1,767	1,795	2,088	2,497	3,034	3,595	3,834	4,512
CURRENT RECEIPTS	6,399	8,095	11,926	19,869	33,986	40,616	45,727	56,695	78,505	88,955	104,264	121,693	134,759	166,711	200,931	231,374	258,542	288,791
6. Personal consumption expenditures	5,384	7,879	10,702	17,949	29,552	35,565	39,922	48,241	67,202	76,165	87,120	102,626	118,846	146,577	178,119	206,942	234,486	268,239
7. Personal direct taxes	23	30	77	325	544	761	927	1,336	1,079	1,429	1,635	2,682	3,070	3,951	4,510	4,725	4,527	4,423
8. Social security contributions	-	42	133	266	431	455	512	741	856	1,310	1,647	1,655	1,976	2,334	2,692	2,950	3,250	3,577
9. Current transfers to the rest of the world	-	-	-	-	12	17	40	22	7	21	17	27	20	35	37	40	17	52
10. Statistical discrepancy	(65)	(405)	(43)	(1,462)	531	216	(223)	(670)	(258)	(427)	298	(366)	1,251	(1,109)	293	(3,168)	2,682	4,318
11. Personal savings	1,057	539	1,057	2,791	2,916	3,602	4,549	7,025	9,619	10,457	13,547	15,079	9,596	14,853	15,280	19,885	13,580	8,182
CURRENT DISBURSEMENTS	6,399	8,095	11,926	19,369	33,986	40,616	45,727	56,695	78,505	88,955	104,264	121,963	134,759	166,711	200,931	231,374	258,542	288,791

[a]Advance estimates as of December 1983
Source: National Accounts Staff, Statistical Coordination Office, National Economic and Development Authority.

4) GNP Breakdown by Industry (1982-83)

(million peso; price in 1972)

Items	1983 (P)	1982
1. Agriculture, forestry and fishery	24,845	25,378
Unhulled rice	3,953	4,544
Sugar cane	1,255	1,402
Banana	2,393	2,358
2. Mining and other industries	36,048	35,812
A. Mining	2,082	2,016
B. Manufacturing	25,084	24,535
Foods	9,244	9,099
Chemicals	2,304	2,273
Petroleum and coal products	1,350	1,313
Electric machinery	1,743	1,475
C. Construction	7,705	8,177
D. Electricity, gas, water service	1,177	1,084
3. Services	39,232	37,907
A. Transportation and communication	5,329	5,165
B. Commerce	21,438	20,355
C. Services	12,466	12,387
Gross domestic product (GDP)	100,125	99,097
Net factor income from abroad	(-)77	(-)418
GNP	100,048	98,679
GNP growth (%)	1.39	2.75

Source: National Income Accounts of Philippines, CY 1970-1983
National Economic and Development Authority (NEDA)

Note: P means provisional values.

5)-1 Import Trends of Main Items

(Thousand $, %)

Items	1983		1984	
	Jan.-June	Jan.-Dec.	Jan.-June	Comparison with previous year
Capital goods	834,450	1,697,760	538,010	(-)35.5
(Machinery)	(430,250)	(902,130)	(208,220)	((-)51.6)
(Electric machinery)	(206,510)	(404,430)	(212,780)	(3.0)
(Transport equipment)	(118,620)	(270,440)	(64,540)	((-)45.6)
Raw materials/ Intermediate	1,440,600	3,000,240	1,262,890	(-)12.3
(Wheat)	(70,220)	(134,580)	(54,330)	((-)22.6)
(Synthetic fibers)	(34,270)	(66,050)	(20,860)	((-)39.1)
(Chemicals)	(360,650)	(771,270)	(267,040)	((-)26.0)
(Cotton yarn)	(82,220)	(182,910)	(76,950)	((-) 6.4)
(Iron and steel)	(163,720)	(356,240)	(94,700)	((-)42.2)
(Non-ferrous metals)	(46,230)	(95,600)	(28,080)	((-)39.3)
(Metal goods)	(98,780)	(146,780)	(26,920)	((-)72.7)
(Embroidery)	(64,400)	(140,050)	(116,930)	(81.6)
(Machine parts)*	(359,650)	(765,450)	(409,930)	(14.0)
Raw fuel	1,134,820	2,132,290	830,260	(-)26.8
(Crude oil)	(958,770)	(1,750,060)	(740,530)	((-)22.8)
Consumption goods	301,590	638,870	237,370	((-)21.3)
(Foods)	(191,930)	(393,070)	(133,350)	((-)30.5)
(Drinks and tobacco)	(25,560)	(72,350)	(7,970)	((-)68.8)
Total	3,711,460	7,469,160	2,868,530	(-)22.7

Source: Philippine Central Bank

Note: *Components to be assembled.

5)-2 Export Trends of Main Items

(Thousand $, %)

Items	1983		1984	Comparison with previous year
	Jan.-June	Jan.-Dec.	Jan.-June	
Coconut products	262,984	680,175	378,837	44.1
(Coconut oil)	(193,502)	(515,811)	(320,898)	(56.5)
Sugar	216,392	316,137	152,192	(-)29.7
Forest products	170,939	331,330	134,305	(-)21.4
Minerals	253,977	439,761	128,870	(-)50.2
(Copper concentrate)	(152,729)	(249,481)	(57,067)	((-)62.6)
(Gold)	(91,451)	(153,594)	(46,699)	((-)48.9)
Fruit and vegetables	135,514	267,209	139,154	2.7
(Pineapple)	(46,625)	(73,627)	(45,764)	((-) 1.8)
(Banana)	(60,519)	(104,725)	(68,810)	(13.7)
Abaca	10,219	18,040	11,877	16.2
Tobacco	27,154	33,436	20,240	(-)25.5
Petroleum products	43,188	142,311	52,787	22.2
Non-conventional products (Manufactured goods)	1,057,972	-	1,355,747	28.1
(Garments)	(233,985)	(545,224)	(275,738)	(17.8)
(Electronics)	(489,766)	(1,053,765)	(591,195)	(20.7)
(Wooden goods)	(25,109)	(53,548)	(25,404)	(1.2)
(Chemicals)	(42,245)	(87,055)	(44,129)	(4.6)
(Machinery)	(29,904)	(39,316)	(16,020)	((-)46.2)
(Furniture)	(38,582)	(83,556)	(42,732)	(10.8)
(Copper cathode)	-	(25,720)	(60,539)	100.0
Non-conventional products (Others)	129,063	345,580	141,770	9.8
Total	2,413,000	5,005,291	2,582,753	7.0

Source: Philippine Central Bank

5)-3 Philippines' Foreign Trade by Country/Region

(Million $)

Country/Region	Export		Import		Trade balance
	Value	Share	Value	Share	
U.S.A.					
1982	1,586.3	31.6	1,702.7	22.2	(-) 116.4
1983	1,799.6	36.0	1,737.8	23.3	61.8
1984 (Jan.-June)	1,026.6	39.7	783.4	27.3	243.3
Japan					
1982	1,145.5	22.8	1,532.0	20.0	(-) 386.5
1983	1,015.0	20.3	1,266.0	17.0	(-) 251.0
1984 (Jan.-June)	531.3	20.6	401.9	14.0	129.5
EC					
1982	726.3	14.5	813.8	10.6	(-) 87.5
1983	816.0	16.3	879.9	11.8	(-) 63.9
1984 (Jan.-June)	324.4	12.6	284.6	9.9	39.8
Middle East					
1982	90.3	1.8	1,455.0	19.0	(-)1,364.7
1983	78.6	1.6	1,451.5	19.4	(-)1,372.9
1984 (Jan.-June)	38.4	1.5	470.4	16.4	(-) 432.0
Total					
1982	5,020.6		7,666.9		(-)2,646.3
1983	5,005.3		7,469.2		(-)2,463.8
1984 (Jan.-June)	2,583.0		2,868.5		(-) 285.5

Source: Philippine Central Bank

5)-4 Export Breakdown by Item

Items	Actual result (F.O.B.; mil.$)			Average annual growth rate (%)	Growth rate (%)
	1972	1982	1983	1972∿83	1982∿83
Traditional products	947	1,948	1,820	6.1	(6.6)
Coconut oil	228	563	639	9.8	13.5
Sugar	216	396	282	2.4	(28.8)
Timber	225	289	327	3.4	13.1
Minerals	233	496	413	5.3	(16.7)
Others	45	204	159	12.2	(22.1)
Non-conventional products (Manufactured goods)	95	2,456	2,588	35.0	5.4
Electric machinery and parts	2	1,000	1,053	76.8	5.3
Garments	2	539	542	66.4	0.5
Chemicals	6	96	86	27.4	(10.4)
General machinery and transport equipment	3	48	35	25.0	(27.1)
Foods and drinks	15	214	175	25.0	(18.2)
Craftworks	13	139	140	24.1	0.7
Furniture and fixtures	2	72	84	40.5	16.6
Shoes and textile	1	62	55	44.0	(11.3)
Others	51	286	418	21.1	46.2
Non-conventional products (Non-manufactured goods)	59	563	506	21.6	(10.1)
Sintered iron ore	-	106	114	-	7.5
Banana	24	146	105	14.4	(28.1)
Nickel	-	49	54	-	10.2
Sea foods	9	71	77	21.5	8.4
Coffee	-	49	47	-	(4.1)
Others	26	142	109	13.9	(23.2)
Others	5	54	91	30.2	68.5
Total	1,106	5,021	5,005	14.7	(0.3)

Source: NEDA, Updated Philippine Development Plan, 1984-87

5)-5 Export Share by Product

(Million $)

	Fuels Minerals Metals		Other primary products		Textile Garment		Machinery Transport equipment		Other products	
	1960	1981	1960	1981	1960	1981	1960	1981	1960	1981
Philippines	10	16	86	39	1	7	0	3	3	35
Indonesia	33	83	67	13	0	1	0	1	0	2
Thailand	7	8	91	65	0	10	0	5	2	12
Malaysia	20	36	74	44	0	3	0	12	6	5
Shingapore	1	29	73	15	5	4	7	26	14	26
Korea	00	2	56	8	8	30	0	22	6	38
Brazil	8	14	89	45	0	4	0	18	3	19
Mexico	24	-	64	-	4	-	1	-	7	-

5)-6 Export Share by Economic Bloc

(Million $)

	Free market industria-lized countries		East European non-free market countries		High-income petroleum exporting countries		Developing countries	
	1960	1982	1960	1982	1960	1982	1960	1982
Philippines	94	73	0	2	0	1	6	24
Indonesia	54	75	11	0	0	0	42	25
Thailand	47	55	2	3	3	4	48	38
Malaysia	58	51	7	3	0	1	35	45
Singapore	38	40	4	1	1	5	57	54
Korea	89	65	0	0	0	10	11	25
Brazil	81	60	6	6	0	1	13	33
Mexico	93	91	0	0	0	0	7	9

5)-7 Import Breakdown by Item

	Actual result (F.O.B.; mil.$)			Average annual growth rate (%)	Growth rate (%)
	1972	1982	1983	1972∿83	1982∿83
Foods	175	650	528	10.6	(18.8)
Drinks and tobacco	9	66	73	21.0	10.6
Raw materials	70	267	233	11.5	(12.7)
Petroleum and lubricants	149	2,104	2,132	27.4	1.3
Animal and vegetable oils	4	16	25	18.1	56.2
Chemicals	148	743	771	16.2	3.8
Manufactured goods	214	1,031	931	14.3	(9.7)
General machinery and transport equipment	418	1,668	1,592	12.9	(4.5)
Other manufactured goods	34	195	178	16.2	(8.7)
Others	9	927	1,024	53.8	10.5
Total	1,230	7,667	7,487	17.8	(2.3)

Source: NEDA, Updated Philippine Development Plan, 1984-87

6) Transition of Employment Index in Major Manufacturing Industries

(Values of 1981 are regarded as 100)

	1983			1984									
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Manufacturing industries as a whole	89.8	90.0	89.1	87.5	88.7	88.6	87.7	85.8	84.5	84.8	85.4	84.6	84.4
Foodstuffs	96.5	98.6	101.9	100.4	100.1	99.6	98.9	97.0	94.3	94.4	91.2	91.2	91.8
Drinks	91.3	88.7	88.3	87.1	91.4	92.3	93.6	93.6	94.3	92.2	82.0	88.6	88.6
Tobacco	84.2	83.4	83.1	78.7	78.2	79.6	78.0	77.8	77.7	77.4	77.2	76.7	75.0
Textile	90.6	92.2	90.3	85.3	90.1	88.5	86.3	77.2	78.3	78.8	85.9	84.6	84.8
Garments	99.3	100.7	101.7	106.0	107.9	109.8	109.0	108.9	106.3	108.2	108.9	107.6	107.5
Wood and wooden products	92.8	93.0	89.7	93.3	93.3	93.9	93.8	93.4	93.2	95.7	95.7	96.7	93.2
Paper and paper products	93.0	94.0	103.7	100.1	99.6	100.9	99.4	100.3	101.6	102.0	101.0	99.3	97.4
Chemicals & chemical products	87.1	87.1	86.7	84.6	85.5	85.7	85.7	84.1	83.4	83.2	83.4	81.9	82.0
Rubber products	100.5	98.2	97.6	97.9	97.4	96.4	96.9	90.5	91.8	95.7	99.7	99.7	101.1
Petroleum products	113.7	114.0	113.6	113.2	113.1	112.0	110.7	109.3	108.5	108.3	107.0	107.0	107.9
Non-ferrous metal and mineral products	86.0	82.5	81.9	80.0	79.2	78.3	80.2	82.6	80.7	77.7	78.0	75.5	74.4
Base metals	72.4	71.7	70.6	70.2	71.8	72.0	70.6	69.9	70.1	71.1	73.2	73.0	73.5
Transport equipment	81.5	73.4	61.8	60.5	59.8	53.4	49.4	47.9	33.2	32.5	32.4	32.3	31.5
Electric machinery	84.7	82.3	72.1	65.5	63.5	65.1	64.6	64.6	61.4	60.9	59.9	61.8	61.5
Miscellaneous	145.9	140.5	139.9	141.0	139.3	139.9	149.0	157.0	161.5	172.3	174.3	173.3	174.4

Source: Monthly Survey of Manufacturing Enterprises, Statistical Coordination Office, NEDA

7)-1 International Balance of Payment (1972, 1982, 1983)

(Million $)

	1972	1982	1983
Exports	1,106	5,021	5,005
Imports	1,230	7,667	7,487
Trade balance	(-)124	(-)2,646	(-)2,482
Service balance (net)	(-) 55	(-)1,040	(-) 747
Transfer balance (net)	188	486	472
Current balance (net)	9	(-)3,200	(-)2,757
Long-term debt loan (net)	140	1,540	1,392
Direct investment (net)	(-) 22	17	112
Short-term capital (net)	27	- 56	(-) 836
Non-financial capital	62	1,302	500
Overall balance	94	(-)1,621	(-)2,074
Debt service	404	2,369	1,819
Debt service ratio (%)	19	19.4	15.4
Reserve in foreign currency (mil. $)	549	2,429	1,112

Source: Monthly Survey of Manufacturing Enterprises, Statistical Coordination Office, NEDA

7)-2 International Balance of Payment
(Provisional values between January and June 1984)

(Million $)

	Jan. ∿ June 1984		Jan. ∿ June 1983
	① Actual value	② Adjusted value	
Trade balance	(-)286	(-)286	(-)1,305
Export	2,583	2,583	2,430
Import	2,869	2,869	3,735
Invisible trade	(-)401	(-)561	(-) 221
Inflow	1,125	1,125	1,701
Outflow	1,526	1,686	1,922
Transfer balance	118	118	219
Inflow	118	118	225
Outflow	-	-	6
Current balance total	(-)569	(-)729	(-)1,307
Long-term capital balance	322	130	611
Inflow	563	563	1,102
Outflow	241	433	491
Direct investment	12	22	54
Inflow	48	48	133
Outflow	36	26	79
Short-term capital balance	216	330	(-) 174
Capital Transaction balance	550	482	491
Gold	89	89	135
Grand balance (*)	70	(-)158	(-) 681

Source: Philippine Central Bank

Notes: (*) includes some errors and ommission.
① is the actual values between January and June 1984; while ② is the adjusted value taking account of accrued liabilities.

8) Foreign Liabilities of the Philippines (as of June 30, 1984)

(Million $)

	Short term		Long-medium term	Total
	Trade	Invisibles		
Grand total	4,807	4,583	15,458	24,848
Financial institutions	1,108	4,077	2,939	8,124
(1) Commercial banks	657	2,826	600	4,083
Government	173	550	354	1,077
Private banks	484	2,276	246	3,006
Branches of foreign banks	52	1,099	195	1,346
Domestic banks	432	1,177	51	1,660
(2) Central bank	451	1,251	2,339	4,041
Non-financial institutions	3,535	506	12,519	16,560
(1) Public sector	1,757	268	9,826	11,851
(2) Private sector	1,778	238	2,693	4,709
Export advanced received	164	-	-	164
(1) Public sector	124	-	-	124
(2) Private sector	40	-	-	40

Source: Philippine Central Bank

9) Outline of Economic Adjustment of the Philippines

(Million $)

	1983 (Actual result)	1984 (Estimate)	1985 (Target)	1986 (Target)
Deficit of current balance (bil. $)	2.8	1.5	1.1	0.6
" (percentage to GNP)	8.2	5.2	4.1	2.3
Export growth rate	(-) 0.3	5.9	10.0	11.0
Import growth rate	(-) 2.3	(-)23.0	(-) 1.6	3.4
Trade balance (bil. $)	(-) 2.5	(-) 0.5	0.1	0.5
Increase rate of net foreign currency reserve (%)	(-) 0.5	(-) 0.4	2.5	
Liabilities in arrears (bil. $; as of the end of year)	1.6	1.9	0	0
Total of domestic investment (percentage to GNP)	27.5	22.0	22.5	23.0
Central government (")	1.8	1.2	0.9	
13 state corporations (")	4.8	2.2	2.8	
Others (")	20.9	18.6	18.8	
Gross saving (")	27.5	22.0	22.5	23.0
National gross saving (")	19.4	16.8	18.4	20.7
Overseas saving (")	8.1	5.2	4.1	2.3
Deficit in public sector (")	3.7	3.6	1.4	1.0
Deficit in private sector (")	4.5	1.6	2.7	1.3
M 3 increase rate (%; as of the end of year)	19	10	13	12
Reserve money (")	49	15	11	10
GNP real growth rate (%)	1.4	(-) 6	0	1

	1983 (Actual result)	1984 (Estimate)	1985 (Target)	1986 (Target)
Consumer price index (%, as of the end of year)	26.1	40∿45	10∿15	8∿10
Consumer price index (%: annual average)	10.0	45∿50	20∿25	10
Finance balance of Central Government (bil. peso)	(-) 7.4	(-)10.5	(-) 6.6	
Finance balance of Central Government (percentage to GNP,%)	(-) 2.0	(-) 2.1	(-) 1.0	
Finance balance in public sector (bil. peso)	(-)14.1	(-)18.1	(-) 8.8	
Finance balance in public sector (percentage to GNP, %)	(-) 3.7	(-) 3.6	(-) 1.4	

Source: Economic Memorandum

Material 7. General Condition of Project Site

(1) Soil Condition

Borings were made at six places to explore the soil In addition, the bearing stratum was confirmed by means of at test pit at one place over the area of 1.00 ∿ 1.50 m with a depth of 1.20 m.

Along the declines at the ground level, the dark brown surface soil spread over the whole site with a thickness of 0.50 m to 1.0 m. Beneath the surface soil is locally called 'adope'--solid yellow clayey soil. This 'adope' soil spreads not only over the surroundings of the site but covers a wide area including Metropolitan Manila. Buildings in Metropolitan Manila stand on 'adope' as their bearing stratum. In the site of the project, buildings are scheduled to be constructed on the 'adope' as their bearing ground as well.

'Adope' is considered to be unpermeable. The upper surface soil is not so permeable either. Therefore, we should take into consideration the fact that water absorption in this area is not sufficient.

The results of site exploration with borings are as follows:

1) Borings (15.00 m in depth each at 6 places)
2) Standard penetration test
3) Soil exploration
   a. Specific gravity test
   b. Liquid limit test
   c. Plastic limit test
   d. Grain size test
   e. Uniaxial compression test

(2) Weather Condition

The Philippines comprise more than 7,000 islands and are located in the tropics and situated at lat. from 4° to 20° N. in the East Asian monsoon zone.

Climate of a year is broadly divided into two: the dry season from December to April; and the rainy season from May to November. According to the weather data of Muntinglupa City, where the project is scheduled to be constructed, the annual mean temperature is 26.3 °C with the highest monthly average temperature of 34.4 °C in April. The annual average of relative

humidity is 77%; hot and stuffy days last from July to September with the high average relative humidity of about 85%. Annual rainfall is 1,750 mm, with 400 mm in August, slightly more than that in Tokyo. The prevailing wind is west, south-west, south or south-west, which will control layout arrangement of the buildings.

Typhoons pass mostly from June, often causing the loss of life and property damage by storms.

There sometimes occur earthquakes due to volcanic activity, folds and faults. Recently a church collapsed and buildings were damaged because of an earthquake.

(3) Overview of Infrastructure

1) Electricity

Electricity is being supplied by NPC (National Power Corporation) and transmission voltage of the area is 34,500 V with the frequency of 60 Hz.

Interior wiring voltage in building in general is 220 V. Electricity supply for the project will be taken from 34,500 V capacity which is built at the east and south sides of the site. The branch capacity is now being investigated. It is said that there are power stoppages two or three times a month. Although any power cuts are not expected as far as the scheduled line for the project is concerned, it is reported that the voltage fluctuates largely.

2) Telephone

Telephones will be installed by PLDT (Philippine Long Distance Telephone Company) to be connected by an overhead service wire, although ground wires are gradually being introduced from some parts in Manila City. During the rainy season there are frequent suspensions against which some improvement is anticipated. The arrangement for the telephone drop for the project is now being discussed.

3) TV and Radio

There is a relay station in Quezon City and almost no obstacles lay between the site and the station. Therefore, a desirable reception can be expected. There are several channels for TV broadcasting and many radio stations, including FM broadcasting, some having 24-hour programs.

4) Water Supply

In the metropolitan area of Manila, drinkable city water is supplied by MWSS (Metropolitan Waterworks and Sewerage System). The water quality is controlled so that the final chlorine content should be 0.3 ppm.

Since the area for the project is not covered by the city water supply system, people have to rely on well water. According to the water quality analysis of the well water in the area, the water is considerably hard and requires softening processing.

5) Drainage

Sewerage system has not been accomplished in the area for the project. Wastewater from everyday living and experiments is discharged after treatment, while rainwater is discharged straightly.

There is a waterway, about 50 m from the south-east end of the site, which leads into a river about 80 m ahead after passing under the highway.

The site is situated at the height of 21 m or more above the sea level, and there is no fear of submergence.

6) Gas

City gas supply system has been accomplished in some parts of Manila City, though LPG is being used in most areas.

LPG is expected to be used for the project as well.

7) Waste Disposal

Waste disposal is undertaken by ESC (Environment Sanitation Center) and garbage collected by disposal trucks is incinerated or buried. Paper, cloth, metals, glass, etc. are re-used after collection.

Material 8. Result of Observations of Related Facilities

(1) Water treatment plant for Manila City

Water supply for greater Manila covers the five cities of Manila City itself, Quezon City, Pasay City, Clooncan City and Cavite City, and also includes the 24 wards of Antipolo, Macati, etc., which together encompass an area of some 1,470 square kilometers and includes a population of some 5,400,000 people. In 1982, the water supply performance stood at about 2,500,000 tons per day.

The source of the water supplied is the Angat River which lies about 40 kilometers away in the mountains to the north of Manila City. The water is stored in the Angat Dam and transferred through a 6.4 kilometer tunnel to Bicti and then sent through water pipes for a further 17 kilometers to the Novaliches Reservoir from which it travels another 7 kilometers through an enormous pipeline to the Balara Treatment Plant. After treatment here, the purified water is sent to the San Juan Csuered Reservoir and distributed from here using 11 pumping stations.

The water treatment plant for Manila City is located in the mountains away from inhabited parts an can be said to be in a favorable location for the prevention of contamination. The water that is led into a mixing lake at the water treatment plant where it is mixed with aluminum sulphate and other coagulants, and then into a flocculation lake where it is agitated slowly to generate flock. It then passes to a sedimentation lake where the matter is then removed by sedimentation and the water transferred to an indoor filtration lake where it is filtered through sand layers before it undergoes final debacteriorization through the addition of chlorine. Testing of the water is continuously performed and chlorine is then added according to the results of these tests so that the final chlorine content is in the range of 1 to 1.5 ppm, and the content at the user outlets is maintained at 0.3 ppm. (The chlorine content in Japan is in the range of 0.1 to 0.4 ppm.) The water treatment plant is provided with a laboratory where chemical analyses and bacteria testing is performed. It can be said that the water quality is clearly better than WHO standards, and a look at the plentiful water sources, and the channeling network, and the fact that the natural environment is superior to that of Japan makes the good quality

of the water easy to understand. Furthermore, the methods used for water treatment are approximately the same as those used in Japan.

The problem of water losses due to the deterioration of the end user piping was unable to be studied this time because of time limitations but this problem is one that is present to some degree or another in Tokyo, New York and other places, and without making an examination of the extent of this problem, it would be premature to make any negative evaluation of the water supply in Manila.

Furthermore, according to an explanation given by Ms. Buensuceso of the Food and Drug Administration, the rivers and wells used for water supply in most of the cities in the country are provided with water supply piping facilities. The Alabang region that provides the site for this project does not at the present time have water supplied but the Metropolitan Manila Water Supply Plan includes nearby Muntinlupa and so it is thought that the Alabang region will be serviced with water supply in the near future.

(2) Research Institute for Tropical Medicine (RITM)

This research institute was provided as part of a grant-in-aid cooperation project of the Government of Japan and the site provided for this present project lies adjacent to this institute where Dr. Kaneko and Dr. Asano are both working (at the Preventive Hygiene Research Laboratory) as part of the technical cooperation extended.

An inspection was made of the entire research laboratory (with the exception of the wards) and of the animal house which was provided as a later construction. The animal house was newly constructed as a separate building because the existing one was both lacking in space and because the location in the main building produced problem with unpleasant odors. The new building is a one-storey building with an area of 252 m^2 and was completed on March 15, 1985 for a total cost of 2,900,000 pesos (provided by the Government of Japan as grant-in-aid cooperation). This animal house has three conventional rearing rooms (that can accommodate approximately 500 mice each), three separately provided rearing rooms (of approximately half the size of the three mentioned above), a sterilizing room, a feed production room and a laboratory. The separate feed room has a high partition (so that the mice cannot escape) and is conventionally treated but entry procedures were simple, perhaps out of special treatment for us. Air

conditioners were in operation in all of the rooms and one part was provided with an air cooled rack (with a fixed volume of air flowing over each shelf) which was also in operation. Humidity control was not provided and so the humidity was about 80%.

The infection laboratory had mice in closed racks, with the air being drawn out through the rear but rabbits and guinea pigs could not be housed in this arrangement and so it is assumed that these animals would have to be housed in the same room while experiments were being performed.

Feed is made at the house using crushed corn and rice powder as the raw materials (since flour is costly and therefore not used). Fresh grass is cut and fed to the rabbits. However, the quality of the rice powder is not good and so many grain weevils an moths were mixed in with it. This too was the result of cost problems.

Dr. Asano is presently in charge of this animal house but there are also two veterinarians, two technical staff and one part-time worker in attendance. It is therefore somewhat overstaffed for the amount of work at present but this allocation was presumably made with view to the growth of activities in the future.

(3) PIPAC (Philippine Institute of Pure and Applied Chemistry)

This is located on the campus of the Ateneo de Manila University and is an independent laboratory that was completed in February, 1984 as a grant-in-aid cooperation project of the Government of Japan. Here, entrusted experiments and technical training are performed as well as other activities as part of the Philippine Government policy of agricultural self sufficiency.

The three-storey building has an area of 3,000 m^2 and can be partially air conditioned zones according to necessity. The remainder of the building is of energy-saving open design with good cross ventilation. There was also much equipment in place.

(4) University of the Philippines Medical College

An inspection was made of the biology lecture rooms and the pharmacology lecture rooms. Several persons were present in the biology lecture rooms for preparatory training but the equipment was not yet in operation. These persons appeared somewhat unaccustomed to their new surroundings. The equipment was all of old types and there was nothing

outstanding about the laboratories themselves, and their lack of popularity was understandable. By way of explanation it was said that "there were many students in biological chemistry as the laboratories are very good." One laboratory contained a veritable mountain of equipment that could no longer be used. The polygraphs, television monitors, oscilloscopes and other equipment were all outdated models and appeared to be not very well maintained. Problems with the repair service and the procurement of spare parts were also evident here.

Quite a considerable part of this fundamental medical facility was being used for medical consultation purposes, with the neurobiology laboratory being used for neurological scanning and electromyograms. However, it is said that the latter was being conducted as part of research to investigate the nervous function of laborers who have been using agricultural chemicals and organic solvents.

We noted that the polygraphs in the pharmacological lecture rooms also tended to be inoperational. In one room, research into pharmaceuticals to treat blood parasites was being conducted as part of a WHO project, and measurements using HPLC were being conducted for the concentration in the blood of the agent Praziquantel.

In both of the rooms, we were only able to obtain the information that animals for experiments were purchased from suppliers but a request for information was made to university staff who showed us the commonly used animal houses. The scale of these was considerable (at roughly twice that of the animal houses of RITM) but the conditions of the block-building for animal raising were not so good.