4-3-6 Equipment Plan

(1) Policy

The following points should be taken into account for selecting the equipment for the project in line with the basic design.

1) To select equipment of general purpose necessary, and most suitable, for every stage of agroforestry from fundamental studies to application.

2) To select equipment for field training and experiments in agroforestry in highlands and mountains that would also enable a direct feedback of the results to residents of the region .

3) To select equipment necessary for promoting the extension of knowledge and technology in agroforestry.

4) Functions for scientific research will be centralized on the eastern side of each floor, so that the equipment of respective laboratories can be shared among the faculty.

5) To avoid, as far as possible, equipment that call for high skills for operation and those that are difficult to maintain and inspect. Selection will be made, instead, from among t expendables that are easily provided.

6) To select equipment that would not cause environmental pollution.

(2) Outline of Equipment

Appropriate equipment will be selected in relation to the instruction, research and extension of agroforestry, specifically in the following areas:

1) Equipment for Agroforestry Biological Sciences
2) Equipment for Processing of Agroforest Products
3) Equipment for Agroforestry Resources Management
4) Equipment for Agroforestry Extension
5) Equipment for Agroforestry Dispensary

(3) Facilities related to Equipment Planning

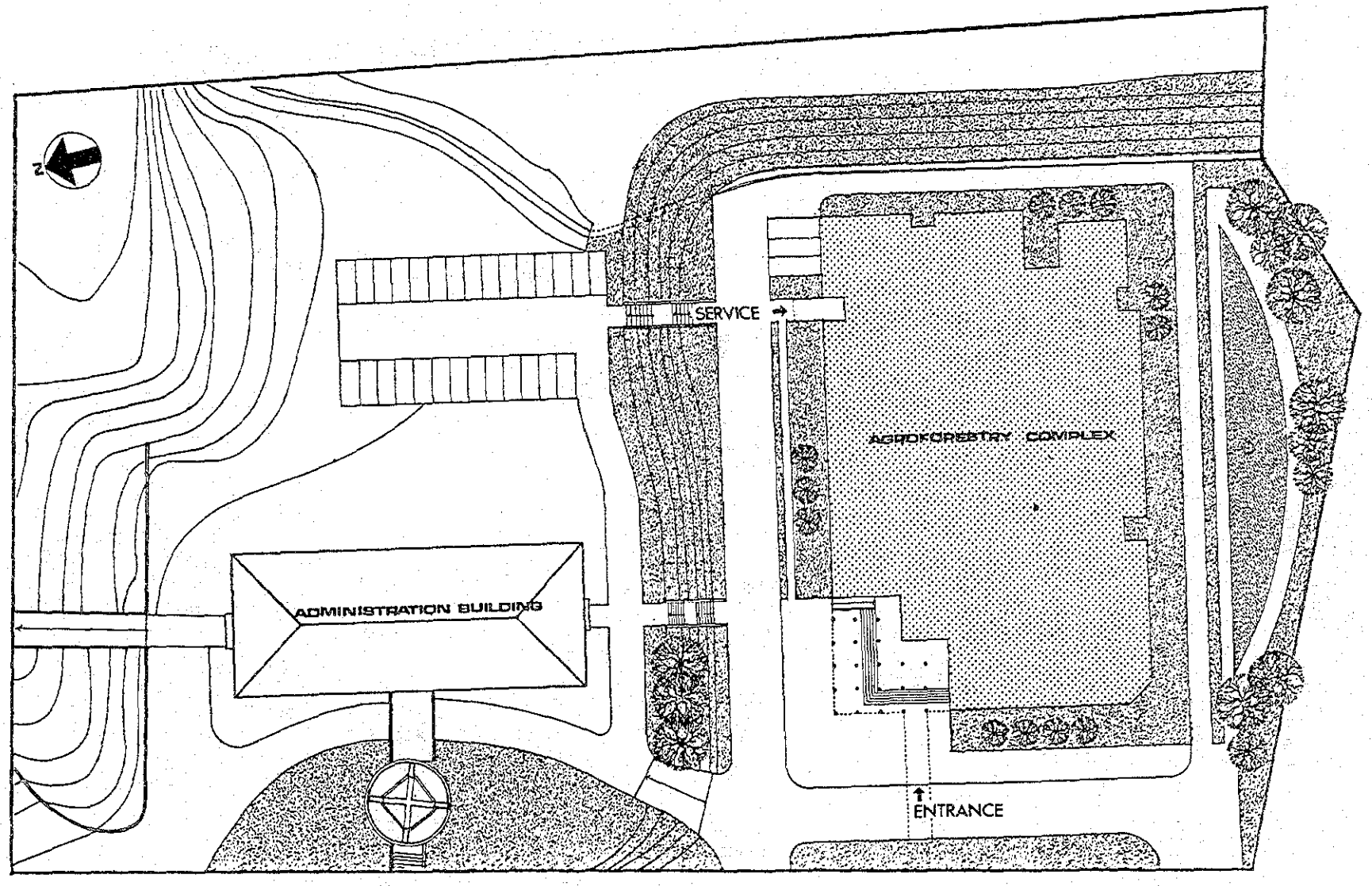
1) Water for experiments will be supplied in respective laboratories, with water distilling and softening apparatus installed wherever necessary.

2) Cylinders for special kinds of gas to be used for experiments will be installed outside, near the place where they will be used.

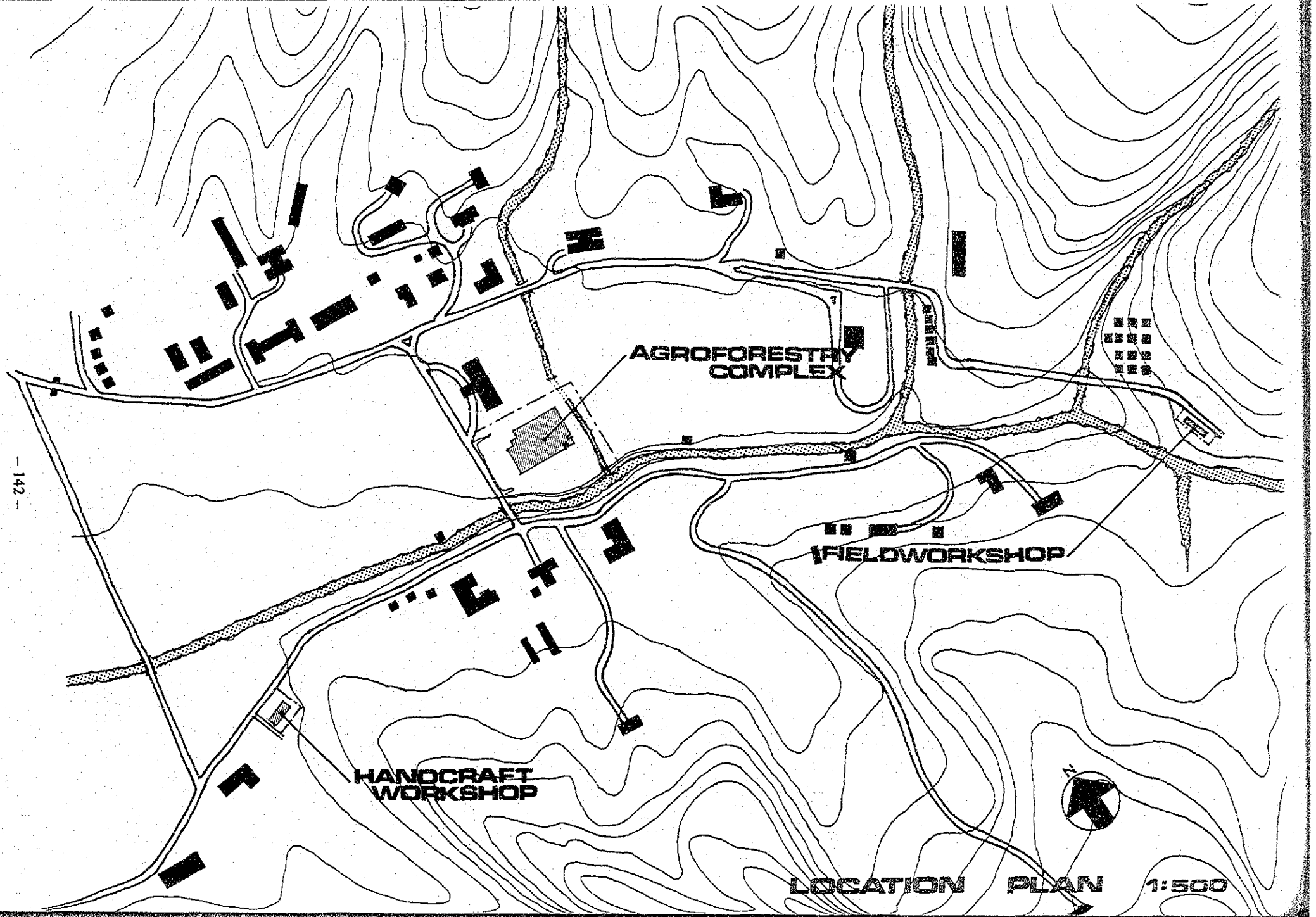
3) Receptacles will be installed where necessary for supplying power to equipment related to experiments. Receptacles with earth electrodes or individual power switches will be installed, according to the kind of equipment.

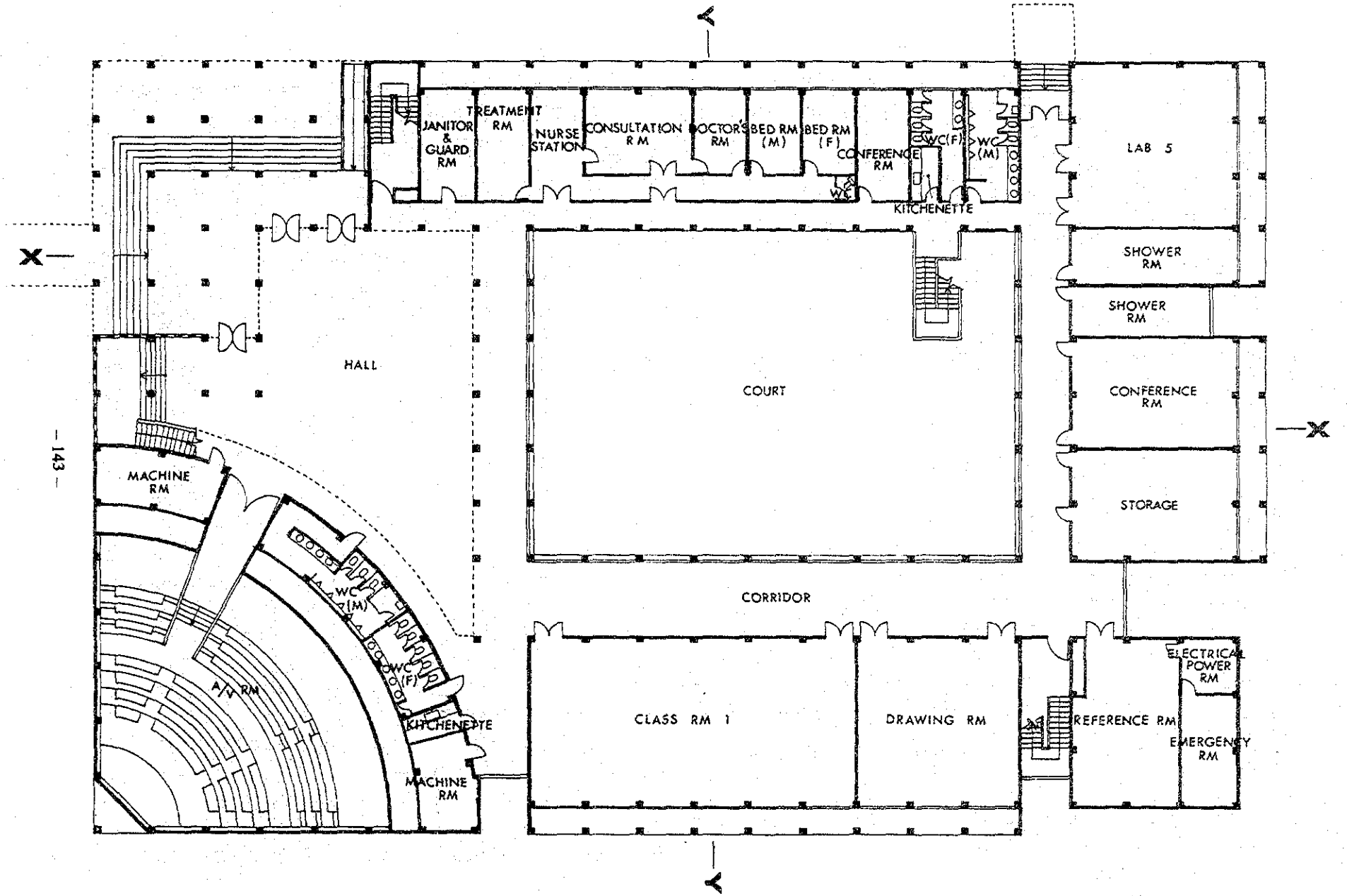
4-4 Basic Design Drawings

Site Plan	1:800
Location Plan	1:500
Agroforestry Complex	
1F Plan	1:300
2F Plan	1:300
3F Plan	1:300
Section	1:300
Elevation 1	1:300
Elevation 2	1:300
Field Workshop	
Plan, Section, Elevation	1:200
Handcraft Workshop & Garage	
Plan, Section, Elevation	1:200
Agroforestry Complex Isometric	

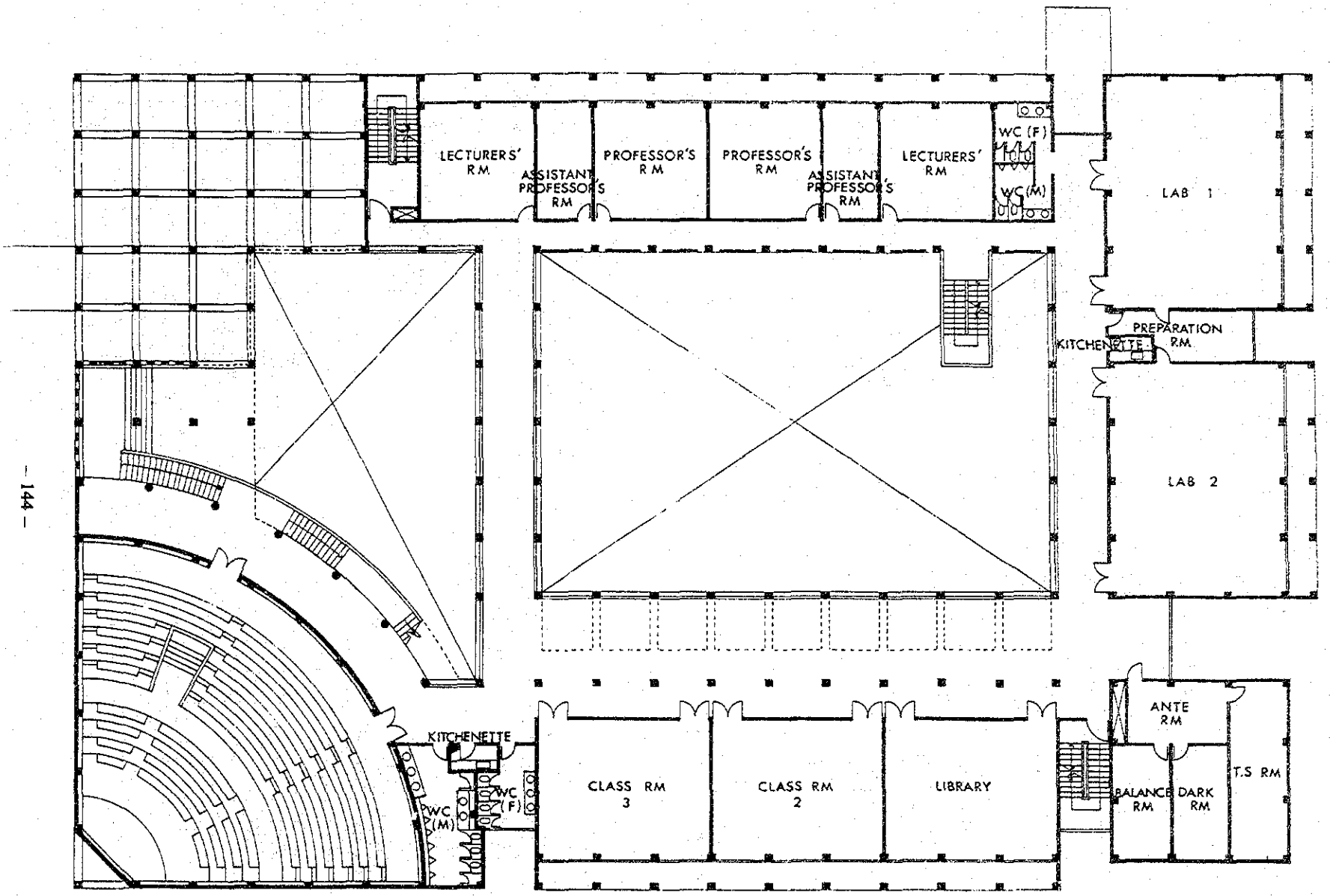


SITE PLAN 1:800

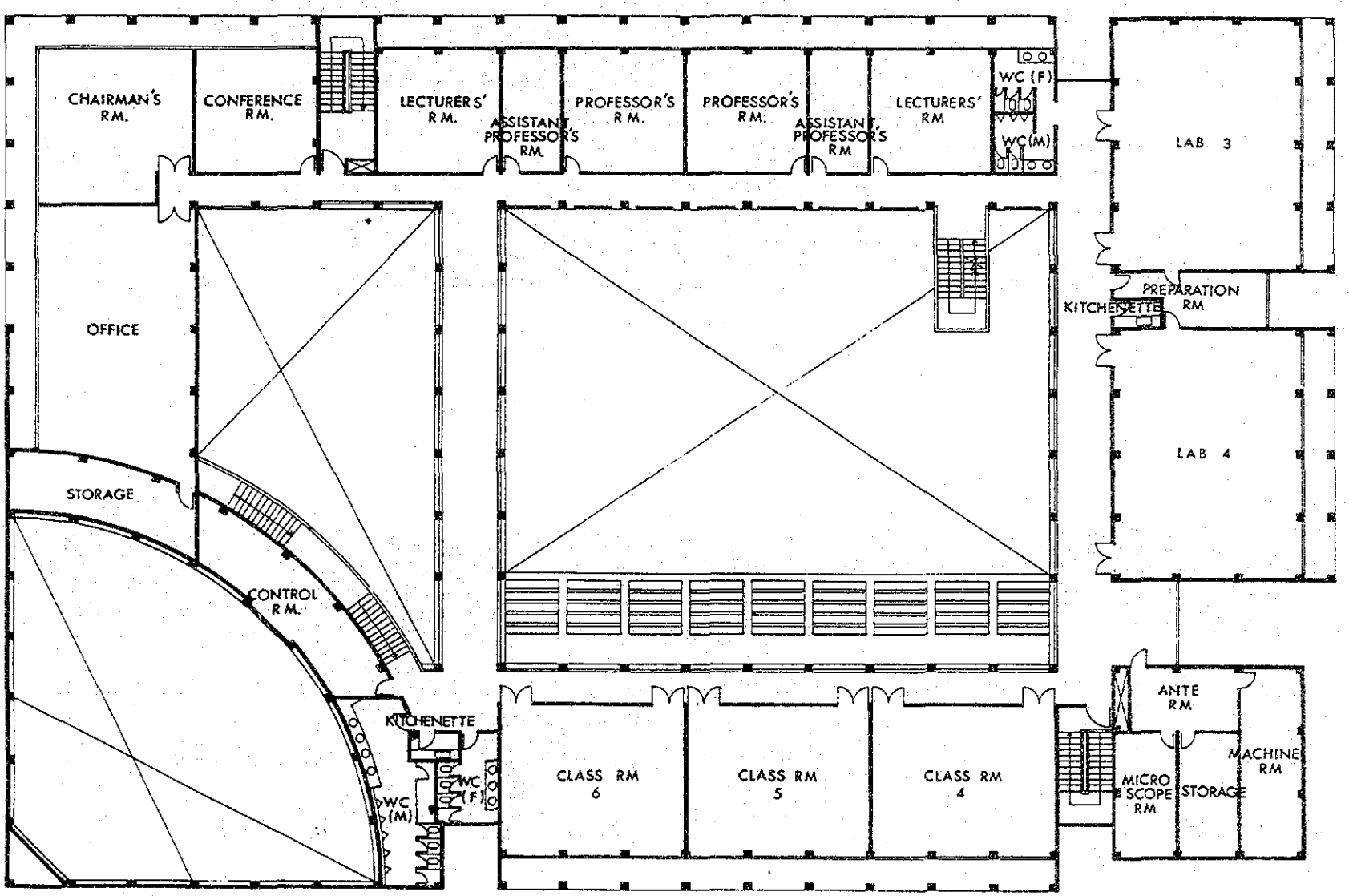

AGROFORESTRY
COMPLEX
FIELDWORKSHOP
HANDCRAFT
WORKSHOP
N
LOCATION PLAN 1:500


Y
X
JANITOR & GUARD RM
TREATMENT RM
NURSE STATION
CONSULTATION RM
DOCTOR'S RM
BED RM (M)
BED RM (F)
CONFERENCE RM
WC(F)
WC (M)
KITCHENETTE
LAB 5
SHOWER RM
SHOWER RM
CONFERENCE RM
STORAGE
HALL
COURT
MACHINE RM
WC (M)
WC (F)
KITCHENETTE
A/V RM
MACHINE RM
CORRIDOR
CLASS RM 1
DRAWING RM
REFERENCE RM
ELECTRICAL POWER RM
EMERGENCY RM
Y
X

1:300 1F PLAN


LECTURERS' R.M.
ASSISTANT PROFESSOR'S RM
PROFESSOR'S R.M
PROFESSOR'S RM
ASSISTANT PROFESSOR'S RM
LECTURERS' RM
WC (F)
WC (M)
LAB 1
PREPARATION R.M.
KITCHENETTE
LAB 2
KITCHENETTE
WC (F)
WC (M)
CLASS RM 3
CLASS RM 2
LIBRARY
ANTE RM
BALANCE RM
DARK RM
T.S RM

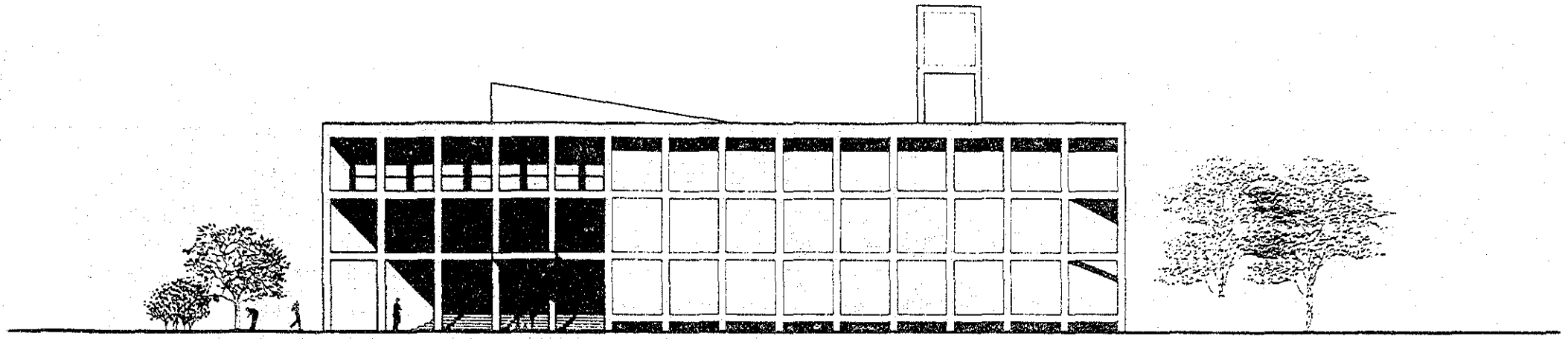
1:300 2F PLAN


CHAIRMAN'S RM.
CONFERENCE RM.
LECTURERS' RM.
ASSISTANT PROFESSOR'S RM.
PROFESSOR'S RM.
PROFESSOR'S RM.
ASSISTANT PROFESSOR'S RM
LECTURERS' RM
WC (F)
WC (M)
LAB 3
PREPARATION RM
KITCHENETTE
LAB 4
OFFICE
STORAGE
CONTROL RM.
KITCHENETTE
WC (M)
WC (F)
CLASS RM 6
CLASS RM 5
CLASS RM 4
ANTE RM
MACHINE RM
MICRO SCOPE RM
STORAGE

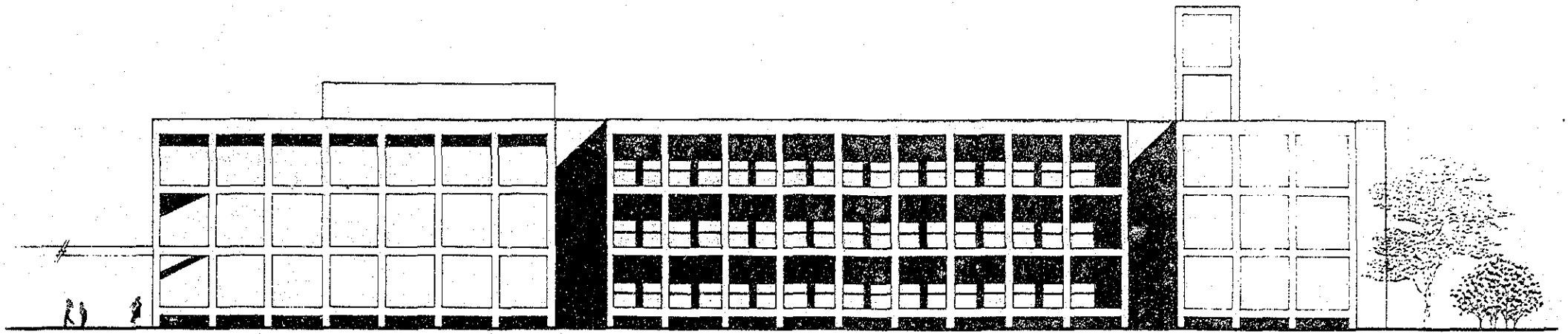
1:300 3F PLAN

X-SECTION
1:300

Y-SECTION
1:300

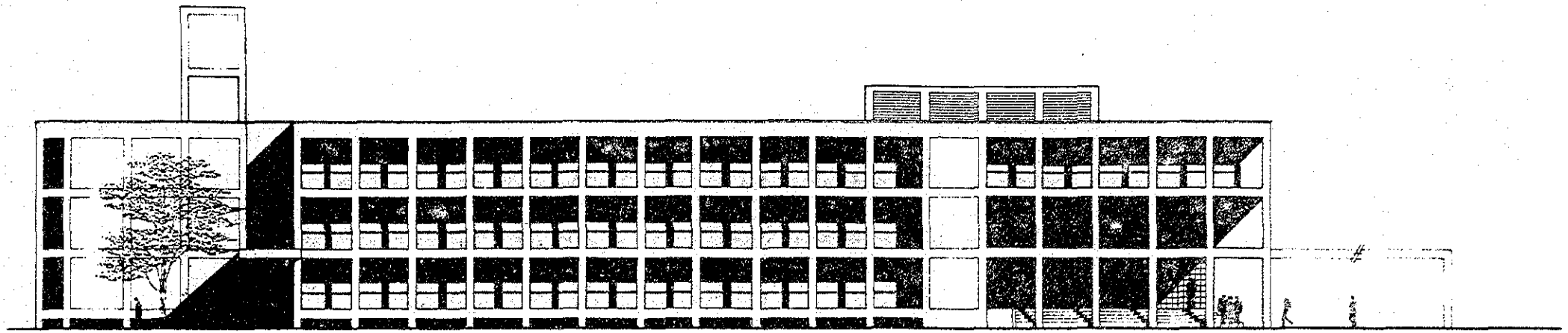


WEST ELEVATION

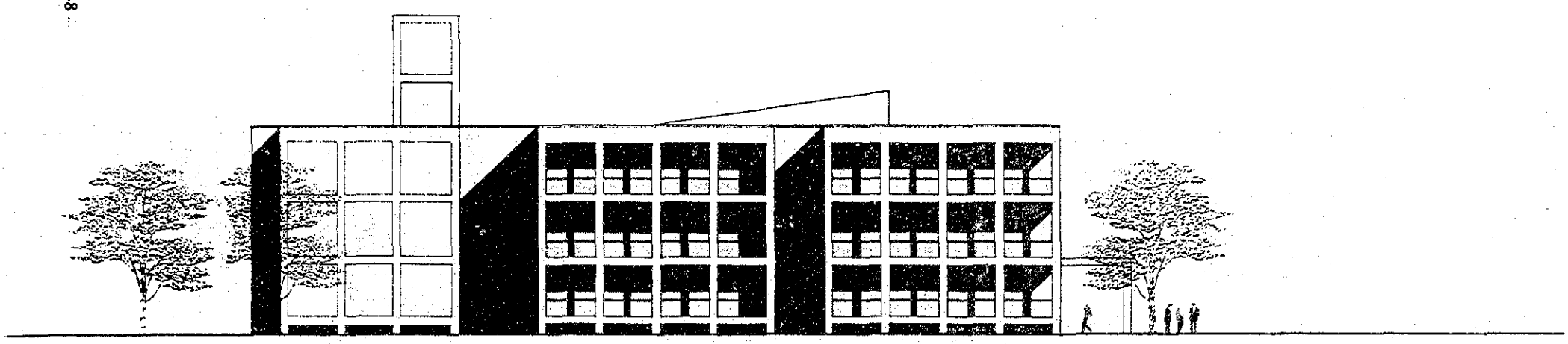


SOUTH ELEVATION

ELEVATION 1 1:300

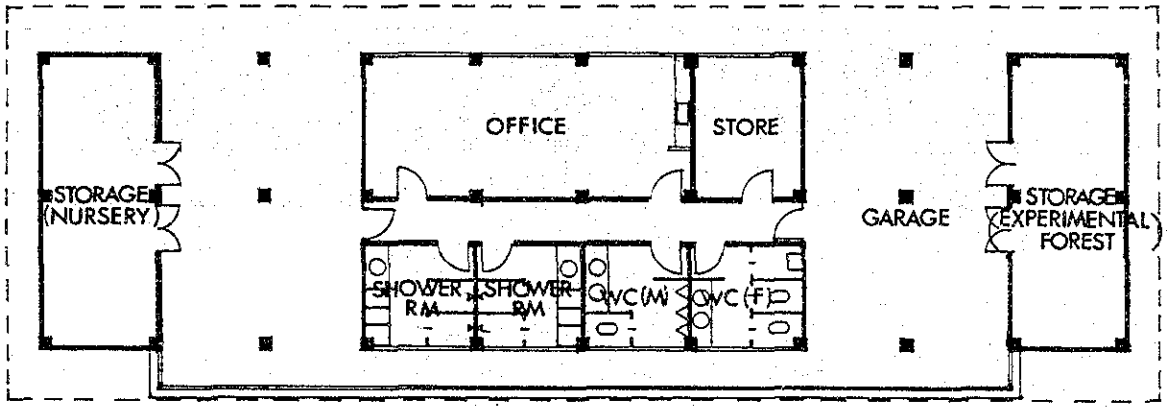


NORTH ELEVATION

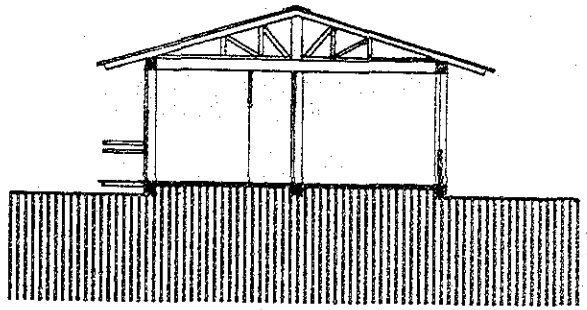


EAST ELEVATION

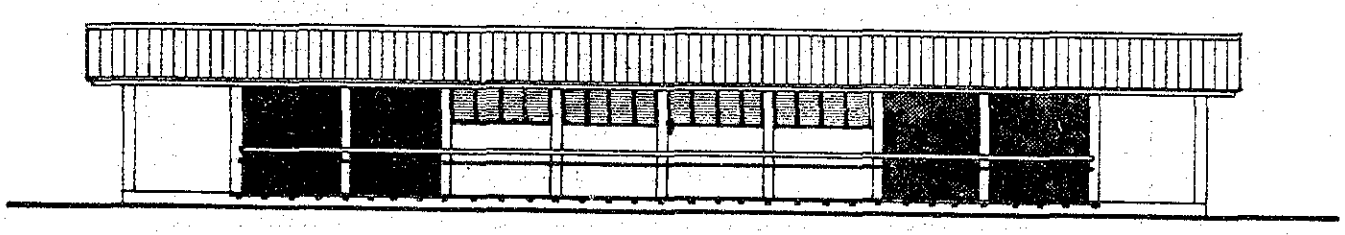
ELEVATION 2 1:200



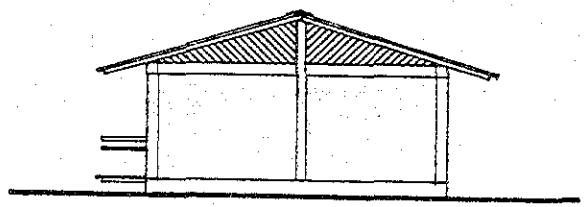
PLAN



SECTION

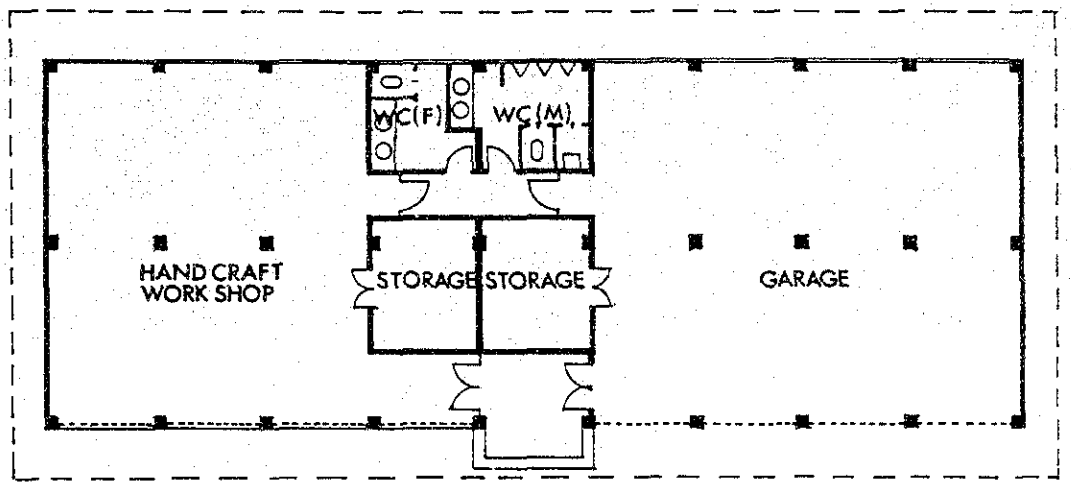


ELEVATION

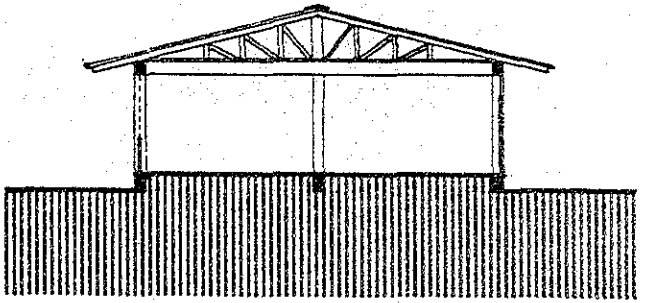


ELEVATION

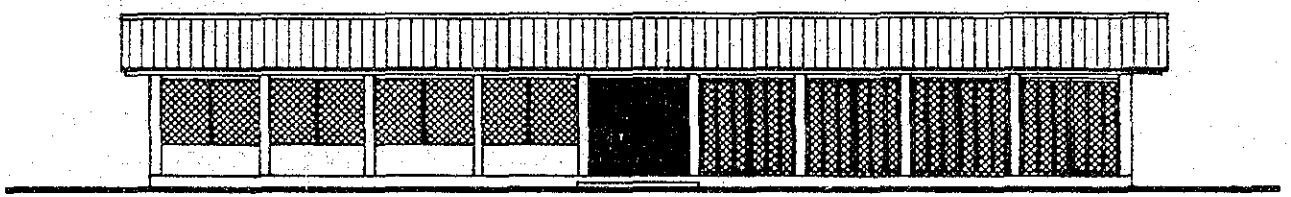
FIELDWORK WORKSHOP 1:200



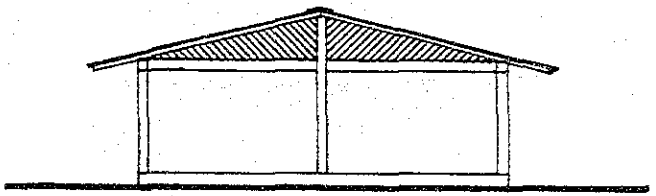
PLAN



SECTION

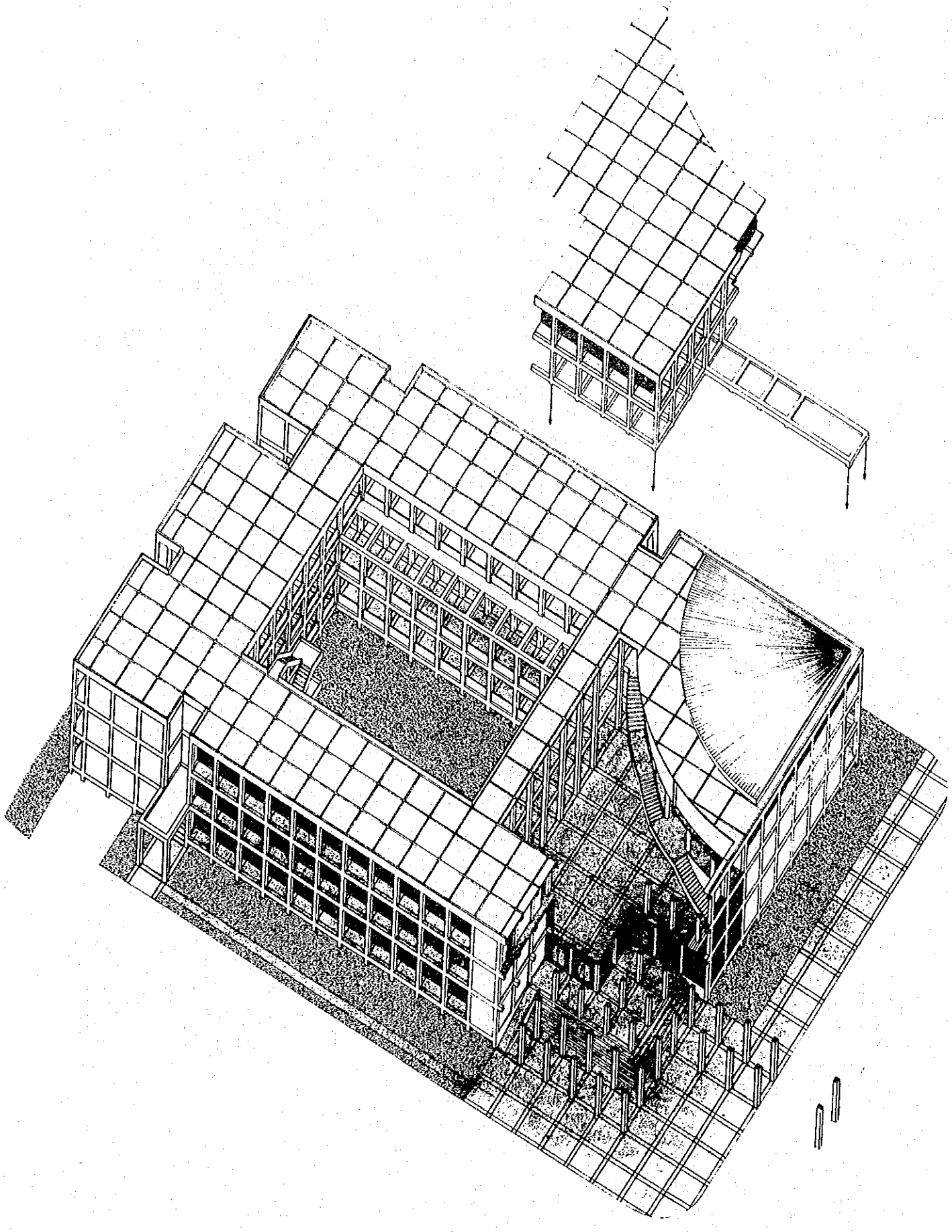


ELEVATION



ELEVATION

HANDCRAFT WORKSHOP & GARAGE 1:200



ISOMETRIC

CHAPTER 5: IMPLEMENTATION OF THE PROJECT

CHAPTER 5: IMPLEMENTATION OF THE PROJECT

5-1 Implementation Organization of the Philippines

The executive agency of the implementation organization of the Philippines of the Project is the Don Mariano Marcos Memorial State University, the structure and organization of which are shown in Chapter 1. With his outstanding aptitude for leardership, the indefatigable Dr. Bienvenido P. Agpaoa, President of the University, is certain to play a major role in the implementation of this Project.

5-1-1 Administration

The administration and management of the Agroforestry Complex will be carried out directly by the faculty of Agroforestry Department headed by Prof. Rodrigo Bumarlong, the organization chart for which was shown in chapter 4, under the guidance of the previously mentioned Dr. Agpaoa and his staff including Prof. Rodolfo Ulep, Executive Vice-President and Dr. Pablito Picardal, Dean, College of Agriculture and Forestry. Since a continual employment of facilities and installations over a long period of time is essential to the accomplishment of this Project, a well-planned appointment of the staff is called for.

5-1-2 Personnel Plan

As previously mentioned in the personnel plan and organization chart in 4 - 1 - 1, the estimated number of staff for the agroforestry faculty of the University is 4 professors, 8 associate and assistant

professors, 40 lecturers and researchers, 1 physician, 4 nurses and assistant nurses, 2 forest rangers, 10 clerks, 3 or 4 cleaning staff and 2 janitors. Although sufficient considerations are currently given on the appointment of teaching staff corresponding to the various courses provided by the faculty, further reinforcement of the staff is required for a more effective and rapid development in the research for agroforestry. A sufficiently equipped team of engineers headed by the university architect, Arch. Ariston Yañez, is currently taking charge of a total of 60 facilities of the University, making steady progress in the maintenance work through extension and reconstruction of buildings.

As to buildings for the Agroforestry Complex which will require special ventilation installations in laboratories and some other rooms, an adequate personnel plan based on sufficient understanding of the facilities and equipment is called for.

5-2 Construction Plan

5-2-1 Implementation System for Construction and Supply

All the construction and supply related to the Project shall be implemented by Japanese contractor under the supervision undertaken by the Japanese Consultant. Because of the location of the Project site, which is 300km from the Metro Manila, the only method of transportation for materials and equipment is by vehicles. This poses a serious problem in the schedule and supervision for the construction work. The only solution for minimizing confusions involving construction work for the Project is to establish a close and stable means of communication between the parties in Japan and the Bacnotan Campus in the Philippines, by setting up a simplified network for communication.

5-2-2 Construction Plan

The manners and customs, and technical level of the Republic of the Philippines should be taken into account for drawing up the construction plan for this Project. As previously mentioned, a successful implementation of the cnstruction schedule will depend a great deal on the transportation by land of the materials and equipment. It is therefore important for the Japanese side to undergo a careful study on the schedule for ordering and production of materials and equipment to realize an effective and flexible plan for transportation. This will not only minimize the risk to mix-ups in the procedures or inadequate quantities of materials and equipment but will also facilitate a prompt substitution of a counter-plan in case of unexpected troubles.

In line with the transportation plan, it is important to set up a system and organization that would enable a simple yet reliable means of communication. The general contractor in charge of the Project should therefore have communication grounds not only in Bacnotan but also in Manila to facilitate a prompt communication with various governmental offices in the Philippines and with related parties in Japan. Incidentally, provision of cement from Bacnotan Integrated Cement company located in Bacnotan should be considered for drawing up the schedule for building frame construction, in particular.

5-2-3 Supervision Plan

The establishment of a system for a reliable and close communication between Japan, Manila and Bacnotan is also a key factor for the supervision plan, to enable a smooth implementation and quality of the Project.

The above-mentioned system for construction and supervision, and the process of communication, reporting and instruction is shown in the following charts.

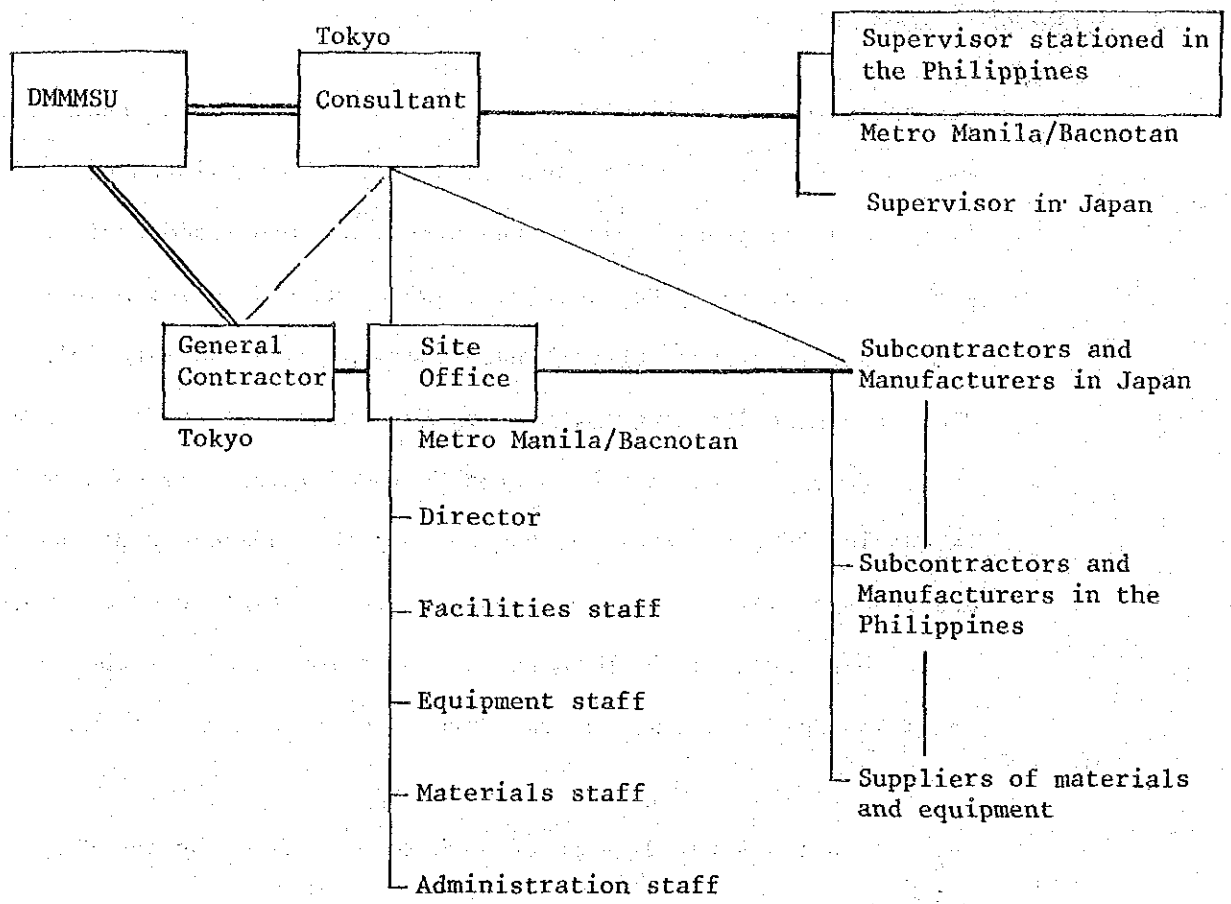


Fig. 5–2–3–a) System for Construction and Supervision

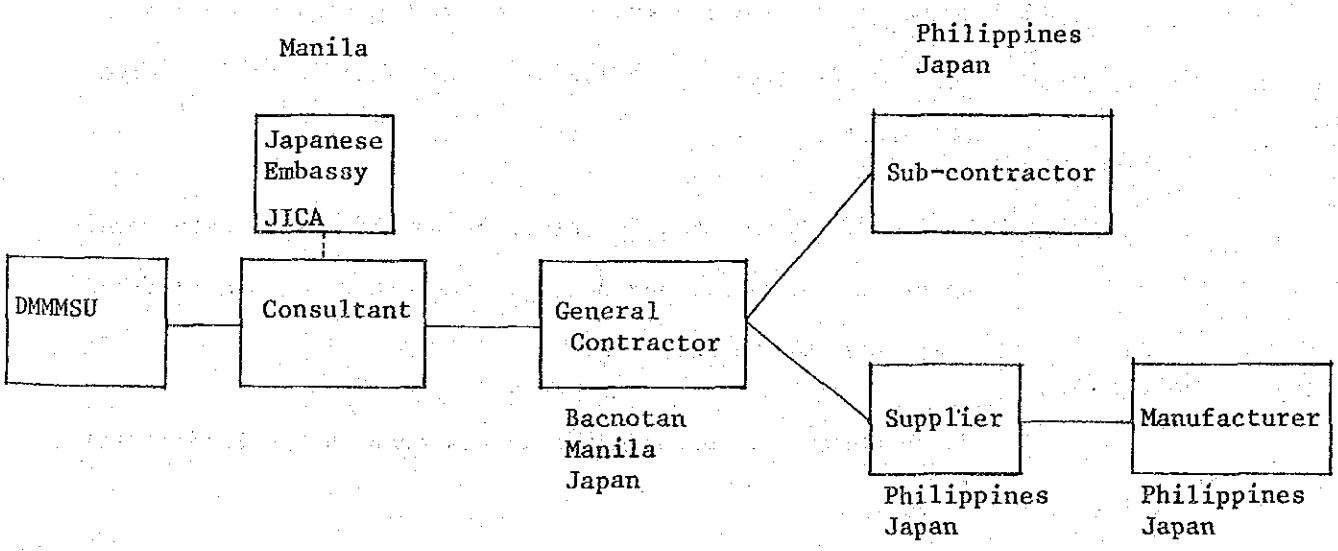


Fig. 5–2–3–b)

Flow Chart of the Process of Communication, Reporting and Instruction

5-3 Scope of Works

According to the outline of this Grant-Aid Project, the range of work to be covered by the Japanese side is the provision of facilities and equipment based on the previously mentioned basic design of the Project, the details of which have been shown in the Facility Plan, Construction Plan, Equipment Plan and Materials Plan of the Project and the List of Equipment. On the other hand, there are some items to be covered by the Philippine side simultaneously with, or prior to, the work by the Japanese side, which are indispensable to a smooth implementation of the Project. Details were given in the Minutes of Discussion dated November 4, which was duly confirmed by the Government of the Philippines.

The following is the details of work to be covered by the Philippine side.

1. To secure land necessary for the construction of the facilities and to clear, fill and level the site as needed before the start of the construction.

2. To provide facilities for distcibution of electricity, telephone, water supply and drainage and other incidental facilities outside the building.

3. To construct and prepare the access road to the Project site.

4. To ensure prompt unlaoding, tax exemption and customs clearance at ports of disembarkation in the Philippines and prompt internal transportation therein of the products and related equipment purchased under the Grant.

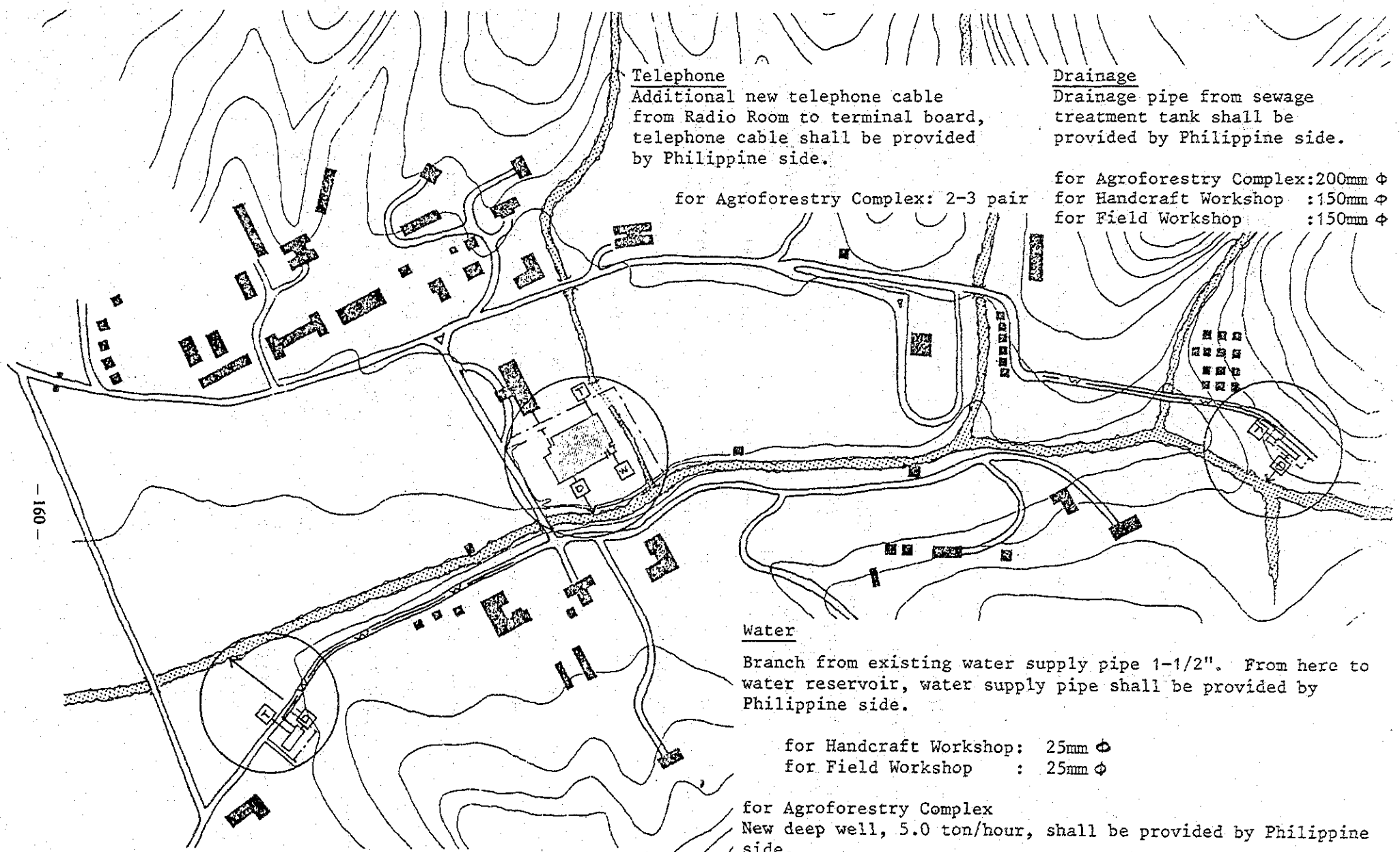
5. To exempt Japanese nationals engaged in the Project from custom duties, internal taxes and other fiscal levies which may be imposed in the Philippines with respect to the supply of the products and related equipment and the services under the verified contracts.

6. To accord without delay to Japanese nationals whose services may be required in connection with the supply of the products and related equipment and services under the verified contracts such facilities as may be necessary for their entry into the Philippines and their stay therein for the performance of their work.

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

8. To bear all the expenses, other than those to be borne by the Grant, necessary for the construction of the facilities.

9. To undertake incidental civil works such as planting and fencing, if needed.



Telephone
Additional new telephone cable from Radio Room to terminal board, telephone cable shall be provided by Philippine side.

for Agroforestry Complex: 2-3 pair

Drainage
Drainage pipe from sewage treatment tank shall be provided by Philippine side.

for Agroforestry Complex: 200mm Φ
for Handcraft Workshop : 150mm Φ
for Field Workshop : 150mm Φ

Water

Branch from existing water supply pipe 1-1/2". From here to water reservoir, water supply pipe shall be provided by Philippine side.

for Handcraft Workshop: 25mm Φ
for Field Workshop : 25mm Φ

for Agroforestry Complex
New deep well, 5.0 ton/hour, shall be provided by Philippine side.

Electrical
Branch from exsiting power supply line, 3φ 3W 4160V, on the electrical pole. From here to distribution board, power cable & transformers shall be provided by Philippine side.

for Agroforestry Complex: 450 KVA
for Handcraft Workshop: 20 KVA
for Field Workshop: 15 KVA

Fig. 5—3 Infrastructure Plan

10. To provide the space necessary for such construction as temporary offices, working areas, stock yards and others.

11. To ensure that temporary electric power and water supply are made available for the construction and incidental activities relative to the Project.

12. To provide appropriate experimental field.

Estimated Construction Costs.....₱1,963,000

a. leveling of ground for Project site

b. extension work for electricity, telephones and plumbing installations

c. exteriors, planting

d. furniture and fixtures

5-4 Implementation Schedule

The proposed Implementation Schedule is as follows:

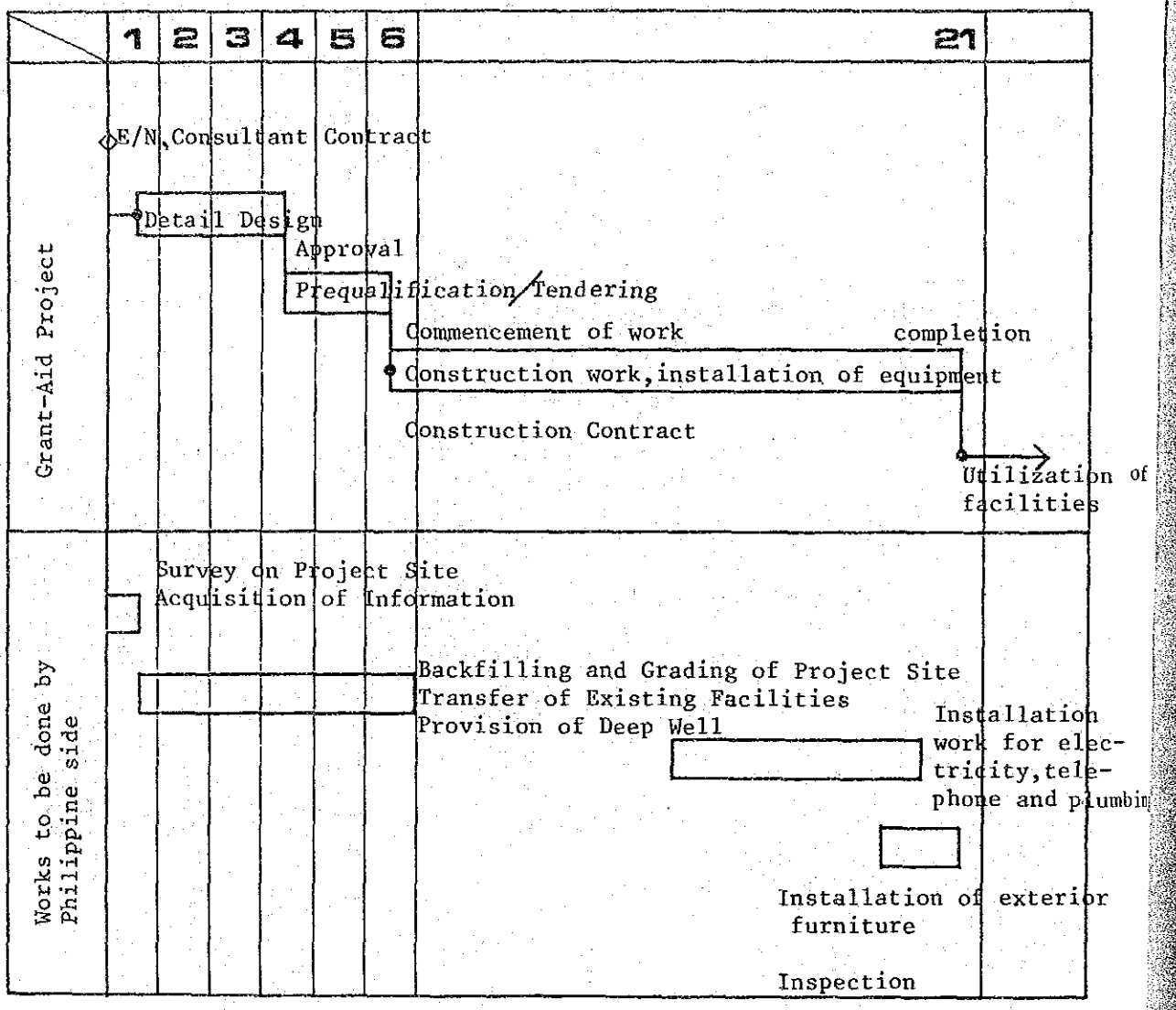


Fig. 5–4

5-5 Maintenance Plan

5-5-1 Proposed Plan for Maintenance

After the facilities for this Project are completed and turned over to the Republic of the Philippines, they will be utilized and maintained in line with the previously-mentioned objectives of the Project.

The following are the tentative issues on management and maintenance of the facilities. Maintenance work should be conducted on buildings, facilities and, particularly for this Project, equipment.

Maintenance work for buildings can be divided into two kinds: those that require regular tasks like cleaning and guarding, and those that call for inconstant supervision in emergency cases of abrasion, failure or aging of buildings. Buildings constantly tended with care not only give a good impression to users but also contribute to extending the durable period of valuable equipment and early detection of any damages or failures in the facilities. A cleaning staff of 2 to 4 will be necessary for this Project.

Adequate guarding will also be provided for valuable equipment, which should invariably be kept in lock ed rooms with bars on the openings to guard against robbery. The Project site being near

the sea-side, special check-up plans should be drawn up for facilities and equipment using metal.

The following is the check list for points of concern regarding maintenance on an irregular basis:

(Exterior)

1. touch-up and re-coating of exterior, inspection of neutralization cracks in the concrete structure (once/5 years)
2. touch-up, coating and inspection of roof plate (inspection: once/year, others: once/ 5 years)
3. partial touch-up and inspection of roof waterproofing (inspection: once/year, others: on occasion)
4. regular clean-up of drain pipe and the drain (once/month)
5. inspection and touch-up of the sealing around the exterior fittings (once/year)
6. coating of exterior steel fittings (once/5 years)
7. regular clean-up of side ditch and lids (once/month)
8. coating of ditch fence (once/5 years)
9. regular tending to the landscaping and planting (once/year)

(Interior)

10. alteration of interiors (on occasion)
11. touch-up and re-coating of interior walls
12. re-plastering of interior ceiling material (on occasion)
13. curing and replacing of wooden fixtures (once/year, on occasion)

For smooth implementation of the maintenance plan for the Project, discussions should be held with the architect team including university architect, Arch. A. Yañez, on the subject of maintenance of the existing facilities in order to establish an efficient and well-planned system for personnel management as well as for inspection and repair of the facilities.

Routine operations, maintenance and regular check-ups are necessary for electricity, airconditioning, sanitary and other installations. It is important to maintain the facilities by adequate routine operations, regular inspection, oiling, adjustment, coating and repair so as to prevent failures and accidents and enable the facilities to be constantly used in good conditions. The equipment also require regular overhauling and improvement, and exchange of consumable parts. It is therefore necessary to draw up a schedule for checking the facilities at intervals ranging from aa few months to a few years, depending on the kind of facilities.

The general equipment are subject to replacement when they reach the end of the durable period, the details of which are indicated below. A total of 8 staffers are required for the operation, management and maintenance of the facilities, namely, 1 engineer for each of the electrical, airconditioning, sanitary and electronic field, and 4 technical staffers.

(Durable Period of Equipemnt)

Electrical Equipment:

generator	15 to 20 years
switch board	20 to 30 years
fluorescent lamp	5,000 to 10,000 hours
incandescent lamp	1,000 to 1,500 hours
amplifier broadcasting system	10 to 20 years
telephone exchanger	10 to 20 years

Plumbing Equipment:

pumps	10 to 20 years
tanks	15 to 20 years
pipes and valves	10 to 20 years
sanitary ware	20 to 30 years
sewage disposal facilities	5 to 10 years

Pipes and Valves for Airconditioning/Ventilation

ventilator	10 to 20 yeras
blower fan	15 to 20 years
airconditioner	10 to 15 years

A systematic organization will be necessary of the teachers, students and operators using the equipment, and the maintenance staff. The teachers are no problem, since they can be depended on for mastering the technics for operating the equipment when they are installed, so the main issue for maintenance of the equipment is the securing of operators and maintenance staff.

Equipment that are relatively easy to operate can be handled by teachers, but specialized operators are necessary for A/V and other devices that require special technics. Such trained operators should be posted in each room, and the program for training them should be studies in detail by the Philippine side, with due regard to the implementation of the Project.

Regarding the maintenance staff, the common practice is to post maintenance staff for regular check-up of equipment and to contact dealers in case of breakdown of failures. For this Project, however, it is desirable to enter into maintenance contract with dealers for A/V devices and some of the measuring instruments. In the event that the Project is to be implemented as a Grant-Aid program of the Government of Japan, a major part of the equipment installed will be those manufactured in Japan.

As previously mentioned, the equipment planning should be focused on selecting those that are easy to maintain, however, some of the equipment are, by nature, unable to complete its life span or perform its capacity unless they are maintained on a regular basis.

The maintenance contract with dealers, which will provide repair jobs in case of failures, will also contribute to a longer life span of the equipment. The required maintenance staff will consist of about one engineer trained in maintenance of A/V devices and about one engineer expert in laboratory equipment who will also take charge of maintenance of building facilities.

No equipment is an exception from superannuation in the course of years, and such high-technology equipment like microcomputers, AV devices and laboratories will call for upgrading according to technological development and increase of users, etc. Without considerations on these subjects, an effective maintenance plan over a long period of time will be impossible. Regular check-ups and constant effort for coping with new situations are also indespensable.

5-5-2 Estimated Cost for Operation and Maintenance

(1) Operation cost for facilities

1) Electrical

a) Demand
Charge: 560KVA x 0.8 x 0.5 x 19.80₱ = 4,435.2₱/month

b) Energy
Charge: 560KVA x 0.8 x 0.5 x 8 hours/day x 21 days/month
= 18,816 KWH/month

0 - 200KWH : 200KWH x 0.5603₱/KWH = 112.06₱/month

200 - 450KWH: 250KWH x 0.5218₱/KWH = 130.45₱/month

450KWH and above: 18,366KWH x 0.4924₱/KWH = 9,043.42₱/month

sub-total 9,285.93₱/month

c) Fuel Adjustment Cost: 18,816KWH/mon.x 0.0582₱/KWH
= 1,095.09₱/month

d) Steam Adjustment Cost: 18,916KWH/month x 0.0051₱/KWH
= 95.96₱/day

$$\text{Total} = \left\{ (a) + (b) + (c) + (d) \right\} \times 12 \text{ months}$$
= 14,912.18₱/month x 12 months
= 178,946.16₱/year

2) Water: 0¥/year

3) Gas: 10 cylinders/month x 12 months x 91₱/cylinder
= 10,920₱/year

4) Oil for Generator: 2 hours/week x 4 times/day x 12 months x 75 KVA x 0.8 x 0.35 l/KWH x 6₽/l = 12,096₽/year

5) Telephone: (depend on actual use)

6) Special Gas :(depend on actual use)

Operation Cost for Facilities (total of (1) to (6))

approximately 220,000 ₽/year

(2) Maintenance Costs

The following shows the estimated annual costs for operation, maintenance and repairing of the facilities and equipment required for a span of 30 years after completion.

maintenance cost	171,600
repair cost	1,075,000
total	1,246,600 ₽/year

* basis for calculation

Maintenance costs are calculated as personnel expenses for the maintenance staff. (Please note that all personnel expenses are estimates.)

engineer: 1,500₽/month x 4 staffers x 13 months = 78,000₽/month

technical staff: 1,000₽/month x 4 staffers x 13 months = 52,000₽/month

cleaning staff: 800₽/month x 4 staffers x 13 months = 41,600₽/month

Total 171,600₽/month

b) Repairing costs will vary considerably according to the number of years after completion. For example, repairing costs for up to 5 years after completion are estimated to be relatively low; 2₽/m^2 for buildings and 10₽/m^2 for facilities, but is subject to large increases after that. The calculation used here is based on an average rate over a span of 30 years, which is estimated to be 50₽/m^2 for buildings and 100₽/m^2 for facilities.

(50 + 100) ₽/m x 5,500m = 825,000 ₽/year

The rough estimation on the repairing costs for equipment is 2% of the cost for amterials, although this is subject to change, depending on how frequently the equipment is used. As a result, an annual amount of 250,000 ₽ is necessary for maintenance, aside from the operation costs including personnel expenses for researchers.

total = 825,000 + 250,000 = 1,075,000 ₽/year

(3) Others

Guarding Costs

for 3 janitors; 2 on regular duty (7:00 a.m. to 12:00 midnight)

800 ₽/month x 3 x 13 months = 31,200 ₽/year

These calculations are based on the assumption that the facilities will be used in a regular way; there may be a large disparity with the actual results, depending on how the facilities are used.

It should also be noted that the above calculations do not include the operation costs and personnel expenses in case of repairing of damages caused by unforseen accidents and natural disasters.

An adequate and well-planned management and maintenance of the facilities is certain to contribute to the realization of the objectives of this Project over a long period of time.

5-6 Procurement

5-6-1 Procurement of Materials

(1) Finish Material

With the exception of finish hardware, high polymer chemical products and high-quality asphalt waterproofing material, almonst all kinds of building materials are domestically produced in the Philippines. In terms of quality and variety, however, there are some problems in cast iron products. On the other hand, excellent quality is available for wooden products such as windows and doors, grille, parquet, fancy plywood boarding and furniture.

Iron hardware is most common today, although more and more aluminum is also being used, and thre is a large variety of imported foreign products on the market including Japanese products such as vinyl tile, sound-absorbing rock-wool board, corner beams and finish hardware. Stainless steel hardware and varnish are also being produced in the Philippines through affiliates and technological collaboration with overseas companies.

As previously mentioned, the basic policy of the Project is to use materials easily provided in the Philippines to construct buildings that can be maintained with less trouble and faciliated to rebuilding and change of plans. Although a large part of the materials may be supplied domestically,

it is more inexpensive, and higher in quality, to import petro-chemical products and some of the metal products from Japan.

(2) Structural Materials

The ASTM standard is applied to a majority of the various materials used for the Project. Piles are of concrete moulded in square columns by the horizontal casting, not cylinders of pre-cast concrete using the centrifugal method that are common in Japan. Although steel pipe piles are not commonly used in the Philippines, construction by cast-in-place pile seems to be possible.

There are currently 18 plants in the Philippines for producing cement, with an annual output of 104 million sacks regulated by ASTM standard. 84% of the output is consumed in the Philippines and the remaining 16% is exported to Indonesia, Hong Kong, India, etc.

Located near the coast, about a 15-minutes' drive from the Project site, is the plant of a cement company called Bacnotan Consolidated Industry, Inc. which is fully equipped to produce cement on a steady pace. It therefore seems relatively easy to obtain cement for the Project. However, there are no plants for ready-mixed concrete nearby, the nearest being the one in the city of Dagpan about a 2-hours' drive from Bacnotan.

This distance is the utmost limit for transporting ready-mixed concrete by truck-mixer and, considering the traffic conditions, it seems necessary to study the possibility of mixing concrete on the Project site, to stay on the safe side. This method of mixing concrete on the site is not unusual in the Philippines; on the contrary, it is more commonly practiced than the method of transporting ready-mixed concrete by truck-mixer, and causes no problems either in the quality or the quantity of the required concrete mixture.

Crushed stone is mainly used for coarse aggregate, while river sand is used for fine aggregate. Reinforced bars processed in electric furnace are domestically produced, and both round steel bars and deformed reinforced bars are usually imported, except for small versions that can be produced in the Philippines.

Sometimes, when reinforced bars and steel products are in demand in large quantities, there are troubles in domestic provision that may even affect the construction process and the time process. The recent slackening of the Philippine economy seems to make matters even worse, with the results that it may be more inexpensive to import those products from Japan. In any case, this leaves space for further study.

(3) Utility Materials

Although large equipment like refrigerators have to be imported or depended on domestic knock-down production, plumbing and wiring material, electric wires, sanitary wares and concrete pipes, except for special stainless pipes and vinyl chloride linings, are generally produced in the Philippines. Most of these products are limited in variety, however, and as things stand today, many of the imported goods, lighting fittings for example, are more reliable than domestically produced ones. Provision of materials will have to depend on transportation from Manila, since the location of the Project site makes it difficult to secure all the required materials locally. However, considering the current restrictions on imported goods, it is expected that a large part of the materials will be unavailable on the Project site, resulting in a greater dependence on imports from Japan.

5-6-2 Procurement of Equipment

Many of the equipment required for this Project are special ones like A/V devices, microcomputer and laboratory equipment that are not produced in the Philippines and, moreover, are very expensive in the domestic market. It is therefore necessary to make a careful selection of the equipment, with due regard to the maintenance system in the Philippines, and many of them are expected to be imported from Japan.

5-6-3 Labor Force

Many of the experienced construction workers of the Philippines are working in the Middle East and other foreign countries, causing a serious shortage of workers for domestic production, even for public service works sponsored by the Government. Although many of the Philippine workers prove to be hard workers when assigned a certain task, not all of them are regarded as efficient in undertaking a systematic process or working in collaboration with those of other complicated areas. The labor efficiency is not good, even when considering the severe climate, with inexperienced workers achieving 50%, and even experienced workers achieving only 75%, of the labor efficiency in Japan.

The wage paid to construction workers in the Philippines is comparatively low, but investment is indispensable for providing adequate guidance and management on the construction works. Needless to say, all construction workers for this Project will be provided in the Philippines, except for a few Japanese members who will supervise the construction work in general.

CHAPTER 6: PROJECT APPRAISAL

CHAPTER 6: PROJECT APPRAISAL

The important points to be considered for evaluating this Project are whether it qualifies as as object of Grant-Aid Project of Japan, how it conforms to the social and economic needs of the Republic of the Philippines and to its environments, and whether it fits in with the programs of higher level.

The next point to be taken into account is whether the curriculums, facilities, equipment and schedules being planned for implementation of the Project are sufficiently aligned with the systems and operation schedules prepared by the Republic of the Philippines.

It is very difficult to estimate, in terms of quality, the benefits to be gleaned from this Project, because the objects include the diffusion of knowledge throughout the area, and also because it involves education and research. Although it is important, in the process of appraisement, to assess the costs required for the implementation and the benefits gleaned from the Project to make a cost-benefit analysis, benefits to be assessed in this case are required to be more qualitative than quantitative for reasons stated above. It is therefore the aim of this chapter to take these three steps for appraising the plan, to explain the adequacy of the Project as a whole, and to check the systems on the part of the Republic of the Philippines and review the prospects for future.

As was described in detail in Chapter 2, the Republic of the Philippines, currently being inflicted by critical economic circumstances such as increasing foreign debts, unstable exchange rate of the peso, rising in consumer price index, inactive domestic consumption and tardiness in promoting economic industrialization, is now putting her best effort to activate its economy.

In the "5-Year Program for Socio-Economic Development" drawn up in 1983 as a means of breaking the deadlock caused by such unfavorable economic situations, the Government of the Philippines outlined its policy of improving the productivity through well-balanced development of rural region and to promote the vitality of the nation as a whole. The KKK Program started in 1981 aims to meet these urgent social and economic needs, and the objects of the Agroforestry Complex Project, namely, the instruction, research and extension of agroforestry are quite adaptive to these present circumstances in the Philippines.

Agroforestry was mentioned in the above "5-Year Program" as one of the important subjects for regional development, and considering its conformity with the topography and climate of Region I where the site of this Project is located, it can be regarded as sufficiently qualified as the background for this Project. Agroforestry is a science which aims at highly efficient use of land most appropriate to the natural conditions and nature of the soil of the region without the need to introduce large capitals.

Since the success of this Project is certain to substantially contribute to the improvement of the living standards of local residents, the Project can be regarded as a model example of a Grant-Aid Project by Japan to developing countries suffering from economic stagnations, population increase and shortage of food. We also consider that the adequacy of this Project should be positioned as one of the prototypes of economic cooperation.

About 60% of the land area in Region I is occupied by mountains, and the decrease of forest area, deterioration of soil and concerns for disasters caused by hazard migrating shifting cultivation over long periods of time have become serious social problems in the Region. Agroforestry is also effective for preserving natural systems, so the research, education and extension of agroforestry will contribute a great deal to the various countermeasures against Kaingiñeros being taken by the Government of the Philippines.

After making various surveys on the University campus, its facilities, personnel organizations, plantation and geology of the surrounding area, the Study Team drew up a curriculum necessary for the development of agroforestry in this region and, after consultation with the University authorities, were able to reach an agreement. Importance was laid on grasping the meaning of the relatively new field of agroforestry in order to draw up a curriculum conforming to the present circumstances in the Republic of the Philippines. Thanks to the recognization on the part of the University, the Study Team was able to draw up an ideal curriculum

based on their technical findings. After the contents of the curriculum were determined, through examinations which were made to make out the best detailed plans for the facilities and equipment, with due respect to the present circumstances of the Republic of the Philippines. Owing to the precise personnel organization chart prepared by the Republic of the Philippines and the clear positioning of the various facilities and equipment throught discussions on the curriculums, a functional planning for facilities and equipment conforming to the objectives of the University was made smoothly.

Natural ventialtion and lighting were adopted as much as possible in the facilities plan, in order to economize the maintenance costs, and efforts were made to make the facilities functional, safe and convenient to use, to meet the aim of the University to use the facilities for education and extension of agroforestry.

Local technical standrads were sufficiently taken into account for selecting equipment, and choices were made in favor of equipment essential to the development of agroforestry. As to maintenance and management, it is possible to keep the facilities and equipment for this Project in good use for a long period of time by understanding the aim of the Project, grasping the contents of the facilities and equipment, reinforcing the organization of personnel, considering the fact that the maintenance of the existing buildings on the Project site are carried out favorably. Providing an Auditorium for the sake

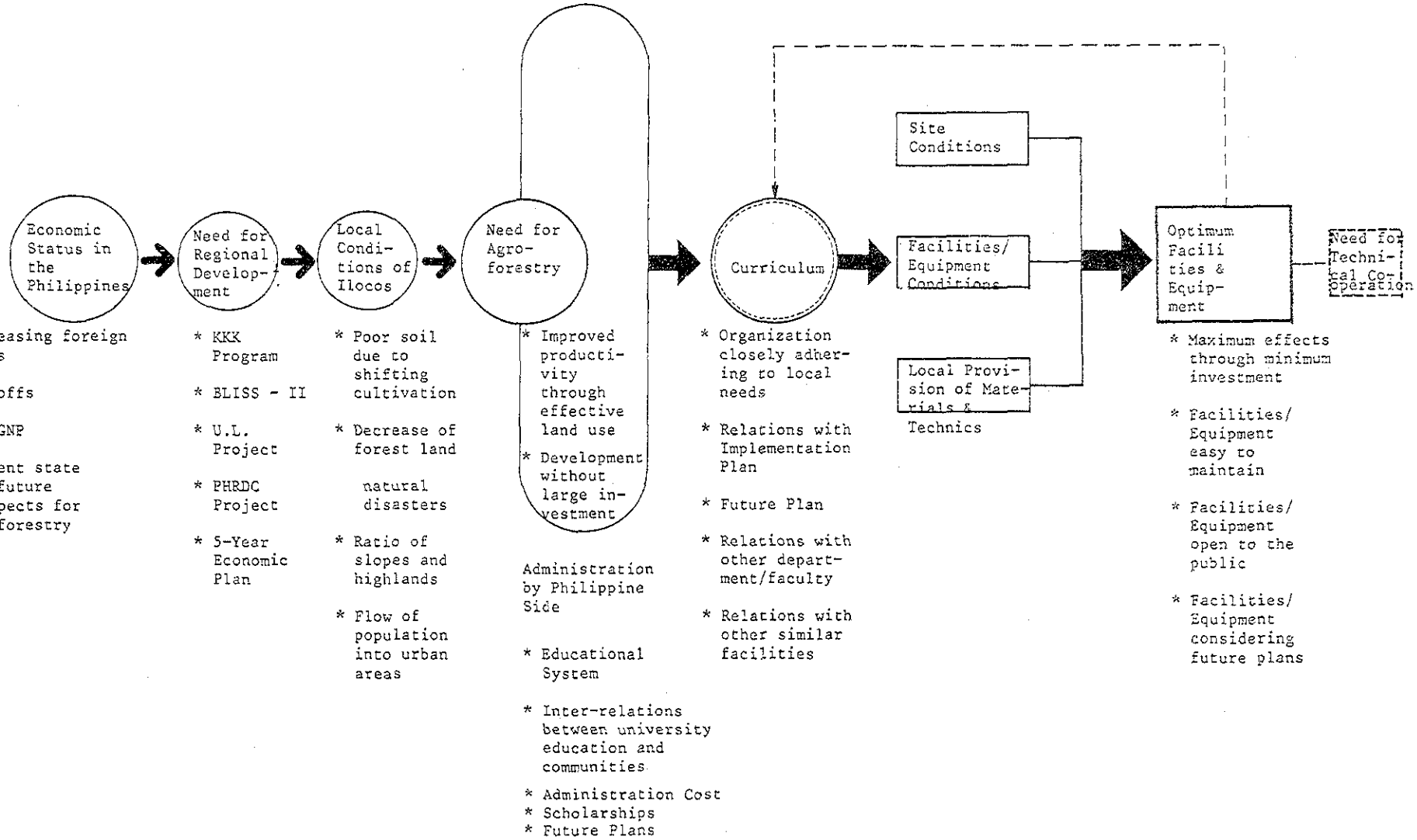
of diffusion of knowledge based on the objectives of the University is not only appropriate for such a pragmatic field as agroforestry but is also expected to contribute substantially to the welfare of the local residents.

This Project serves not only for the two hundred students but also contributed to the welfare of many people in the Region and, by succeeding in the development and extension of agroforestry in the area, it has a potential to be a great help to those countries in tropical areas all over the world suffering from similar problems.

Authorities on the Philippine side led by Dr. Agpaoa, President of the University, have shown such an enthusiasm to this Project that, provided the Project is driven forward steadily under their prominent leadership, we consider the role of the University as the center of the local community, will be enhanced by leaps and bounds and that it will contribute a great deal to the friendly relations between the Republic of the Philippines and Japan.

Key Points for Agroforestry

natural conditions: climate, topology, soil, geology
economical conditions: distribution, demand, cost



Flow Chart of the Project

CHAPTER 7:CONCLUSION AND SUGGESTION

CHAPTER 7:CONCLUSION AND SUGGESTION

The Don Mariano Marcos Memorial State University Agroforestry Complex Project is a program that links the domestic policy in the Philippines to promote socio-economic growth through regional development to the urgent call in Region I to improve the devastated forests and low productivity in the highlands, and the aim of this program is to conduct scientific research, raise specialists and extend knowledge in agroforestry, a field which is expected to bring practical benefits to local residents. The urgency of the subject, natural conditions for scientific research, geological features and the system in the Philippines for promoting this plan, all point out that the Project is adequately qualified to be udnertaken as a Grant-Aid Project of the Japanese Government. The Project is also expected to contribute a great deal to a friendly relations between Japan and the Philippines.

It is therefore appropriate and meaningful that the facilities and equipment required for this Project be supplied in the form of a Grant-Aid Project of Japan, and that the Government of Japan extends its cooperation for any special measures necessiated by the Project.

At the same time, the cooperation of the Government of the Philippines is also counted upon for establishing a well-planned system for personnel and management, detailed programs for extension, etc. on the understanding of the urgency and importance of the Project.

To achieve its original purposes, the Project should be carried out, not on short-term and make-shift programs but on elaborate programs based on long-term prospects. A positive collaboration by the Government of the Philippines is indispensable, since the Philippine side is expected to cover a considerable amount of the cost for this Project, including the cost for maintaining the facilities and equipment, and the cost for education and research.

The results of various surveys conducted on the Project site justified the selection of the region for instruction and research of agroforestry science and its extension, and the Study Team is convinced that the function of the University will make a great leap forward to become one of the world's foremost organizations for systematic study in the field of agroforestry. In other words, all factors on the Project site are in favor of the implementation of the Project.

The Study Team sincerely hopes that the Project will be carried out smoothly by the collaboration of the Governments of Japan and the Philippines, leading to a goodwill and friendly relations between the two nations in the long run.