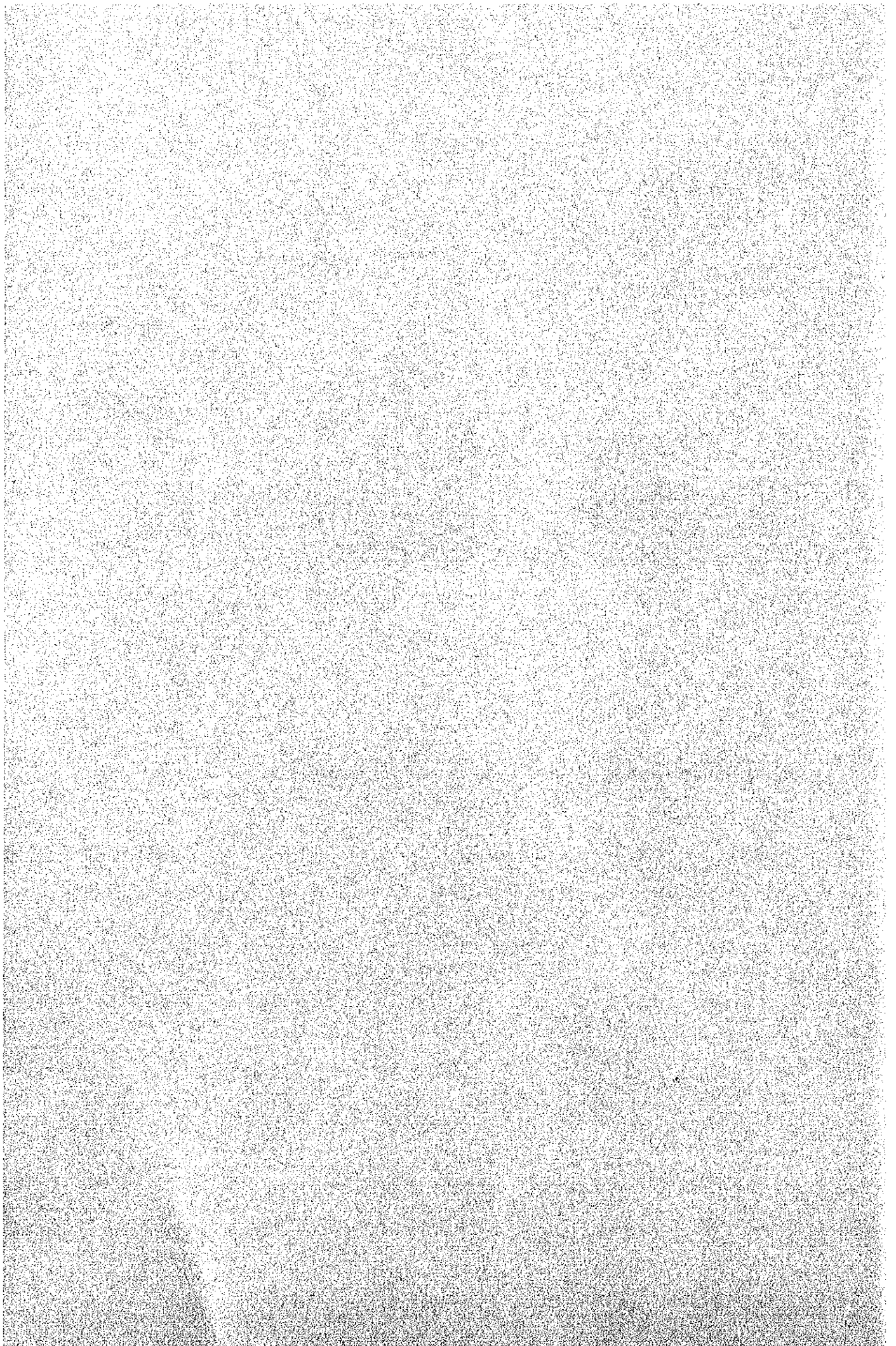


CHAPTER 4: PROJECT



CHAPTER 4: PROJECT

4-1 OBJECTIVES AND IMPORT

The objectives and import of the Philippine Human Resources Development Center (PHRDC) and its individual four programs were outlined in the RECORD OF DISCUSSIONS and further developed in subsequent discussions between the Philippine authorities and the Japanese survey teams. The following is a summary of those discussions.

4-1-1 ON PHRDC

Extending the concept of "ASEAN Human Resources Development Project" the Republic of the Philippines established PHRDC under Executive Order No. 785 with the object of enhancing the people's livelihood and productivity through new technology and training, in coordination with the movement of Kilusang Kabuhayan at Kaunlaran.

The Governing Council shown in the appendices is the PHRDC policy-making body which approves annual program plans and budget allocation. The Joint Steering Committee will assist the Governing Council in reviewing annual program plans and recommending budget allocation, to facilitate effective implementation of the programs.

The PHRDC itself is an internal organization of the government of the Philippines. It was made clear that the Japanese technical and grant aid cooperation would be limited to technical matters and the provision of facilities and equipment for the four programs to be implemented under the PHRDC.

However, since the lead agencies for the programs include a variety of authorities and agencies, the PHRDC performs a very important role in controlling and implementing the four programs as one PHRDC Project. For this reason and at the strong recommendation of the Philippine authorities the Basic Design Survey Team (the Team) considered including a secretariat office in the building for Program I to house the secretary general.

The lead agencies for the implementation of each program are listed below and elsewhere in this report. They are members of the PHRDC.

- Program I : University of Life, Ministry of Human Settlement
- Program II : Ministry of Human Settlements, and Ministry of Natural Resources*
- Program III: Construction Manpower Development Foundation (CMDF) Ministry of Trade and Industry
- Program IV : National Cottage Industries Development Authority (NACIDA) Ministry of Trade and Industry

* To be implemental in a joint basis

These authorities and agencies will participate in the execution of this project as members of PHRDC, undertaking the responsibilities for the implementation of each program. When this project is completed they are to be responsible also for administration, operation and maintenance of facilities and equipment.

PHRDC will support and coordinate these programs, and as the executive agency of the total project will strive to accomplish the objectives.

4-1-2 PROGRAM I

As a part of a project to enhance the livelihood of the community on a grass-roots level, this program aims to produce teaching and extension materials for effective transfer of technology and to set up systematic administration by establishing data bank and information systems for the follow-up of trained personnel as well as other training activities in the Philippines.

In addition, the Philippine Authority plans to establish research divisions to study training methods, market research and labor policy in the PHRDC. When these divisions are realized and functioning the PHRDC will become more instrumental in the other programs.

Thus, it is understood within the project that Program I will support and coordinate the other programs.

At a glance, the objectives and scope of the Japanese grant-aid cooperation in the Program are as follows.

- (1) Objectives
 - a. Establishment of human resources data bank and information system
 - b. Production of teaching materials
 - c. Orientation of newly recruited trainees
 - d. Language Practice (for trainers to be trained in Japan)

- (2) Scope
 - a. Building : To renovate existing dormitory for offices for PHRDC and Program I

To add a new wing for A/V class rooms, T/V production studio and computer room

- b. Equipment : Computer machine, TV production apparatus, A/V apparatus, LL apparatus, outdoor production car, outdoor training van and others

4-1-3 PROGRAM II

Today in the Philippines, the oysters sold in the market have simply been washed with water without any special treatment. Even the locals are very careful about an oyster's freshness and usually do not eat them raw.

Oyster purification technology in Japan was developed for seawater cooler than that of the Philippines. However, some techniques may be found applicable, in principle, to the warmer Philippine environment and will be extended. Application of such technology will contribute to the oyster culture industries in Pangasinan which serve such large markets as Manila, Baguio and San Fernando, as well as to other oyster farming communities all over the Philippines by increasing production and aiding market development. To that end, proper freezing or cooling technology and improvement of transportation means are important.

Since existing Japanese technology cannot be directly applied to the Philippines, the objectives of this program are limited to the research and development of oyster culture and depuration technology. When the research and development work shows success, training and extension shall be carried out by the Philippine authorities.

The objectives and scope of Japanese grant-aid are as follows:

- (1) Objectives Research and development of oyster culture and depuration technology

- (2) Scope
- a. Building : A building to house an administrative department, with laboratories (3), conference room, oyster treatment plant, cold storage
 - b. Equipment : Laboratory equipment, oyster treatment and purification and refrigerating apparatus, A/V apparatus, outdoor training van and others

4-1-4 PROGRAM III

As mentioned in "2-4 Construction Industries of the Philippines" of this report, the Philippine construction work force, highly skilled, capable, and English speaking, is much employed abroad, mainly in the Middle East, to such an extent that the domestic construction industry is suffering from a chronic lack of skilled manpower.

This program, which aims at training teachers who will in turn train construction manpower, will not only improve the domestic situation but also contribute to boosting the overseas Philippine construction industry.

This program has seven courses: Heavy Equipment Operation (20), Heavy Equipment Maintenance (20), Steel Bar (20) and Steel Erection (20), Plumbing (20), Electric Wiring (20), Welding (20) and Hollow Concrete Block (20). The figures in brackets indicate the number of trainees; and the training period will be 3 to 6 months.

Since the public transportation service between the project site at Carmona and Manila, where most of the trainees recruited from rural areas will have to find lodging, is very poor, the Survey Team is considering providing a dormitory for about 60 persons - half of the expected maximum number of trainees.

Objectives	Training of instructors in the following 7 subjects
	(1) Heavy Equipment Operation
	(2) Heavy Equipment Maintenance
	(3) Steel Bar and Steel Erection
	(4) Plumbing
	(5) Electric Wiring
	(6) Welding
	(7) Hollow Concrete Block
Scope	Building: Administrative department, classrooms, A/V class room, practice room, dormitory
	Equipment: Training machinery for each course, A/V apparatus, outdoor training van and others

4-1-5 PROGRAM IV

Philippine wood, bamboo and rattan craft products, which utilize the abundant local materials are exported to many countries, generating foreign exchange. The underdevelopment of fundamental treatment of materials and skills, however, make the products not so competitive on the world market.

Improvement of skills and the subsequent quality of the products by introducing advanced manufacturing machines from Japan under this program will contribute very much to the development of the cottage industry of the Philippines.

The machines brought over from Japan will be installed in the existing workshops. However, these workshops were damaged in the last typhoon and are somewhat deteriorating, so replacement of roofing materials, and repair of gutters and downspouts is needed for protection from further rain damage. These and other minor repairs will be carried out under this Project. NACIDA on the other hand will see to the removal of existing machines, construction of partitions for classrooms and offices for specialists, and renovation of the dormitory - at its own expense.

Starting in 1983 NACIDA plans to set up training centers in 13 regions throughout the Philippines to drive the cottage industries. It is going to transfer the existing machines to the following four regional training centers, yet to be established.

Region I	San Fernando, La Union	(Bamboo)
Region II	Tuguegaro, Cagayan or Santiago, Isabel	(Wood)
Region X	Butuan City	(Rattan)
Region XI	Davao City	(Wood)

The Survey Team may assist NACIDA's promotion of rural cottage industries by supplying educational and extension equipment.

The objectives and scope of Japanese grant aid are:

Objectives Assistance in training of wood and bamboo craft instructors and supply of machines for wood, bamboo and rattan craft

(1) PROGRAM I

Item	Content	Training
1. Data Bank and Information Network	1) Development of Data Bank	1) 15psn x 2yrs
	a. Confirmation of required output	(staff of Prog.I)
	b. System design	
	c. Establishment of output utilization system	
	2) Installation	2) 10psn x 15days
	a. Data collection	4 times/year
	b. Preparations of manual	(staff of Progs. II-IV)
	3) System Operation	
2. A/V Education System	4) System Follow-up	
	1) Development of A/V Teaching Materials	1) 13psn x 1yr
	2) Utilization of Outdoor Production Car	2) 6psn x 15days once/year
	3. Orientation	1) Orientation on PHRDC*
	2) Japanese Language Training	
4. Research and Development*	1) Training Methodology	
	2) Market Development	
	3) Labor Policy Planning	
	4) Research and Development of ASEAN Technology	

* not included in Japanese cooperation

(2) PROGRAM II

Item	Content	Training
1. Research and Development	1) Environmental Survey and Research on Pangasinan Area	5 years as staff of Program II with on-the-job training
	2) Development of Oyster Culture Through the Year	
	3) Introduction of High Technology on Oyster Depuration Through Establishing the Pilot Plant	
	4) Development of Research and Training Method for Extension	
2. Training*	1) Workers' Course	1) 1.5 years
	2) Fishermen's Course	10psn x 14days
	3) Researchers' and Planners' Course	x 10times

* Based on research and development results, training may be carried out by the Philippine authorities.

(3) PROGRAM III

Item	Number of Trainees	Duration*
1. Heavy Equipment Operation		
a. Caterpillar Type	10	4 months
b. Tire Type	10	4 "
2. Heavy Equipment Maintenance	20	6 months
3. Steel Bars and Erection	20	3 months
4. Plumbing	20	3 months
5. Electric Wiring	20	6 months
6. Welding	20	3 months
7. Hollow Concrete Block	20	3 months

* Each 2 times a year

(4) PROGRAM IV

Item	Content	Duration
1. Woodcraft	1) Treatment 2) Processing 3) Finishing 4) Assembly 5) Test and Quality Control	15psn, 2yrs
2. Bamboocraft	1) Treatment 2) Processing 3) Weaving 4) Finishing	15psn, 2yrs
3. Rattancraft	1) Treatment 2) Processing 3) Finishing	15psn, 2yrs

The Japanese experts to be dispatched to the Philippines for this project are:

- 1) Chief Advisor
- 2) Coordinator
- 3) Leader for each program
- 4) Experts in the following fields
 - a. Computer Systems
 - b. A/V education systems
 - c. Culture (oyster and depuration)
 - d. Heavy equipment operation
 - e. Heavy equipment maintenance
 - f. Steel bars, erection and hollow concrete block
 - g. Welding
 - h. Plumbing, electric wiring
 - i. Woodcraft
 - j. Bamboo craft

4-3 BASIC DESIGN

4-3-1 BASIC DESIGN POLICY

The basic design for this project was prepared according to the following design policy:

- (1) Embody the ideals of the project in the design of buildings and selection of equipment most appropriate to Philippine conditions.
- (2) Execute a cost-effective design with consideration of the intentions of the user.
- (3) Fully consider the natural and environmental conditions and the custom of the people.

- (4) Design maintenance-free buildings making utmost use of domestic construction skills, materials and methods.

4-3-2 BASIC DESIGN

(1) SITE UTILIZATION PLAN

1) PROGRAM I

The administration building with brick walls and a red-colored roof faces the road which approaches the campus of the University of Life from Meralco Avenue.

The road north-east of this administration building leads through a parking area to the slope where the dormitory provided to use by this program exists. North-west of the dormitory, there is a pond with a water fountain and in amongst the pond, the dormitory, the administration building and the stadium there is a 25 m² garden.

A road runs along this garden in front of the dormitory. Security reasons and a time capsule commemorating the establishment of the University of Life buried in this garden, require that it be left intact in planning any facility in the area.

Existing buried obstacles and drain gutters are show in Fig. 3-3-1.

Removal of the buried electric wiring duct is impractical, so extension of the building should be planned around it. Natural ventilation, natural light and views of the existing building must also be considered in expansion.

Integrating these points, the most feasible extension of the dormitory is that shown in Basic Design Drawings 4-4. The approach road along the new wing will be visible to people coming from the administration building and lead them to this building very smoothly.

The garage for program vehicles which was requested by the Philippine authority will be a simple structure with a roof, and will be located in the vacant lot to the north of the stadium observation stands.

2) PROGRAM II

The site for Program II is located on the sandbank facing the Lingayen Gulf at the mouths of the Mangueragday and Cayanga Rivers.

The building should be located in a place least affected by sea winds and far enough inland so that high tide and typhoon waters cannot reach it. It is also desirable that the building be located near the existing unpaved road at the southern corner of the site, the only approach to the site till the planned 20m-wide road on the south-east side of the site is completed.

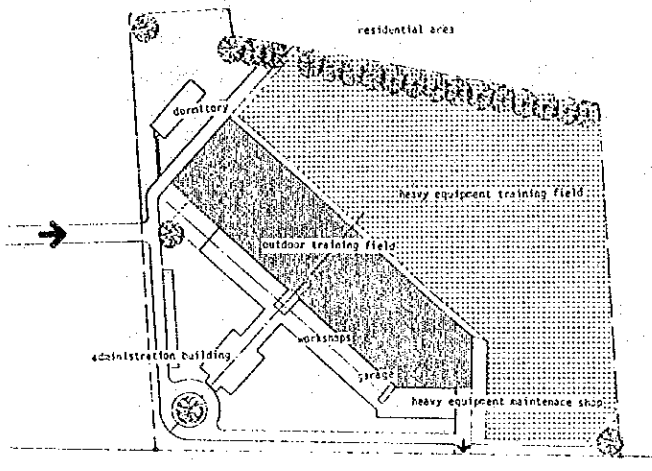
Taking these conditions into consideration, we decided to place the building at the southmost corner of the site adjacent to the planned road and farthest from the shore.

Just inside the entrance gate, a reinforced concrete one-story administration building with laboratories and offices will be built. The road circles the front garden to allow cars to turn around, and leads on to the oyster treatment plant through a parking area.

To prevent odors and noise from reaching the administration building the oyster treatment plant will be separated from it by about 13 m. The sea-water intake machine room which might cause noise will be located at the far end of the plant.

All remaining area will be used later by the Philippine authorities to build training facilities to extend the technology developed by Program II.

3) PROGRAM III



As stated in 3-3-1 of this report, only one access to this site is a 15m wide approach road connected about middle point of the site from the auxiliary road about 130m east from the site to be constructed by the Philippine side.

FIG. 4-3-2-(1)-3)

Our plan is to locate the building at a 45° angle to the national high way to secure a front court keeping serene out-look for the view from the national high way and to provide some flexibility against the final position of the approach road.

The reinforced concrete frame 2 storied main building shall be a center of building complex having workshops and training field at the back. This location will be able to put each independent training facilities in order not exposing untidiness of equipment during the training to the national high way.

On the other hand, plantation is being planned by the Philippine side at the neighbouring zone to the residential area to prevent the noise caused by the heavy equipment operation.

A reinforced concrete frame two-story administration building will be placed just inside the front gate to maintain the service atmosphere while workshops for training will be located 21 m to the rear.

Since heavy equipment will be used on the heavy equipment training field and outdoor training field for other courses, the garage is located at a 90° angle to the other training workshops. We also provided a space for fueling and equipment cleanup, by positioning the heavy equipment maintenance shop 45° off the main axis of the building. This maintenance shop will also separate the operation training field from the administration building.

4) **PROGRAM IV**

Recessed on the left side of the Cottage Industries Training Center (CITC), in the NACIDA Marikina compound, there are an administration building and dormitory, while bamboo, rattan, porcelain, wood (1 and 2) and metal factories are located on the right side with a service road in between.

The Program will supply and install machines for bamboo rattan and woodcraft after renovating the roofs, gutters and downspouts of four of the buildings. Provision of a shed for finished wood products and renovation apart from that done by the Japanese - including erection of partitions for classrooms and offices - should be made by the Philippine government.

4-3-2-(2) Architectural Design

1) PROGRAM I

The existing dormitory is to be renovated for offices and a new wing built for A/V classroom, TV production studio and computer room which horizontal or vertical allowances made it impossible for the dormitory to accommodate.

Many people will gather in the A/V (audio-visual) classroom; therefore, to facilitate emergency exit it should be located on the ground floor. The second floor, which is actually only half a story above ground level, is convenient for conveyance of materials and will be utilized as TV production studio; the fourth floor will house the computer machine room.

Offices for Information, Research and Development, Teacher Training and Administration, and a seminar room and library will be situated on the floors most related to their classification - near the A/V classroom, TV production studio or computer machine room - in the new wing.

(see Fig. 4-3-(2)-1)- 1)

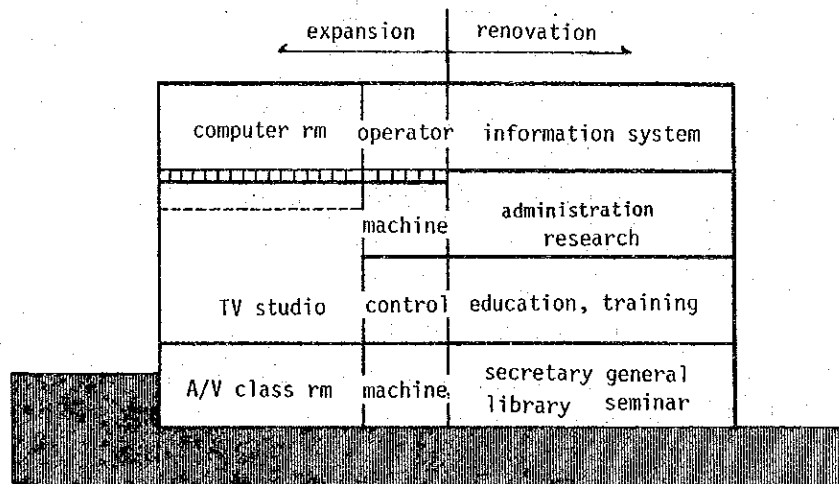


FIG. 4-3-2-(2)-1)-①

In each wing of the existing dormitory, there are H-shaped earthquake-resistant walls surrounding the shower room and lavatory. As these sanitation facilities will be needed as lavatories, bathrooms and kitchenettes requiring water and drainage, or for storage, and to diminish flushing noise these structural walls should remain.

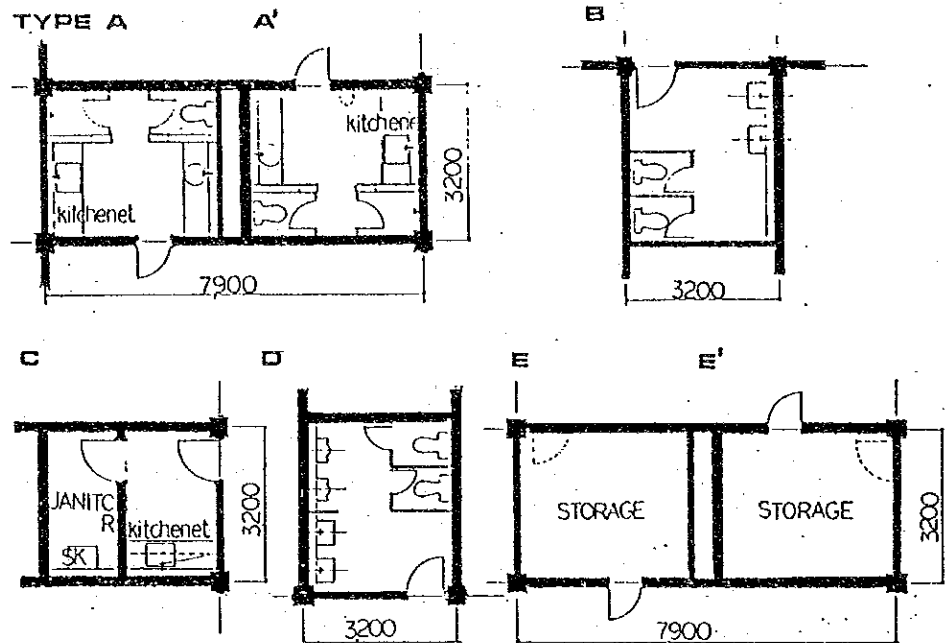


FIG. 4-3-2-(2)-1)-②

We also plan to leave existing finishings, doors, and sashes as they are, as long as they do not interfere with functional requirements. Work on the building will be limited to replacement of interior doors which have been removed and touch-up of wall finishings and some waterproofing of exterior sashes.

The office of the PHRDC secretary general and the executive conference room, located on the ground floor, will be provided with new doors to close them off from the corridor and their interior finishings will be of a higher grade than those of the ordinary rooms.

Its relation with the existing building will determine the new wing's height. Each room in the new wing will be provided with an anteroom for security and sound-proofing. Each will have a minimum number of openings to the outside to reduce outside noise and heat penetration. Exterior walls will echo the brick finish of the existing buildings and the roof be similar to existing ones.

Planned finishes are:

a. Exterior

Roof	Flat part:	Asphalt built-up, concrete finish
	Sloping part:	Asbestos roof tile
Wall		Brick, lithin-spray finish
Sashes		Aluminum

b. Interior

Room	Floor	Wall	Ceiling
Computer-Machine Rm	Raised floor Anti static elec. flooring	Mortar, painted Rock- wool A.T.	Rock wool A.T.*
TV Studio	Linoleum	Acoustic treatment	Rock wool spray
Control Rm	Raised floor	Mortar, painted	Rock wool A.T.
A/V Class	Vinyl tile	Mortar, painted	Rock wool A.T.
Office	Vinyl tile	Mortar, painted	Rock wool A.T.
Lavatory	Mosaic tile	Glazed tile	Asbestos board, painted

* A.T. - Acoustic Tile

PROGRAM I: ROOM SCHEDULE

	Room	Area (m ²)	Number of Persons	Effective Height (m)	Air-Conditioner	Remarks
1F	A/V classroom	80	60	2.8	Cooling	Chair w/ledge
	A/C Machine Room	15	-	2.8	Exhaust Fan	
	Seminar Room	37 x 2	ea 20	2.8	Window Cooler	Blackboard Table and Chair
	L/L classroom	37	16	2.8	↑	L/L Booth
	Administration Office	37	5	2.8	↑	
	Executive Conference	50	10	2.8	↑	Table, Chair P.A. System
	Secretary General	37	2	2.8	↑	Bath Room
	Library	37	2	2.8	↑	VTR Booth
	Library Storage	11 x 2	-	2.35	Exhaust Fan	
	Janitor's Room	15	2	2.8	↑	
	Kitchnet	11	-	2.35	↑	Sink
	Storage	11 x 4	-	2.35	Natural Ventilation	
	Lavatory	26	-	2.35	Exhaust Fan	
	Entrance Hall	64	-	2.8	Natural Ventilation	
Corridor & Others	225	-	2.8	↑		
Sub-Total	782					
2F	Studio	80	-	4.5	Cooling	
	Control Room	15	-	2.8	↑	
	Educational P.M. Room	48	2	2.8	Window Cooler	Bathroom

Room	Area (m ²)	Number of Persons	Effective Height (m)	Air-Conditioner	Remarks	
Training Office 1, 2	37 x 2	9	2.8	Cooling		
Educational Tech. Office	37	2	2.8	↑		
A/V Technician Office	37	5	2.8	↑		
VTR Technician Artist Room	37	5	2.8	↑		
Maintenance	37	5	2.8	↑		
Conference	37	10~20	2.8	↑		
Storage	11 x 3	-	2.35	Natural Ventilation		
Lavatory	22	-	2.35	Exhaust Fan		
Darkroom	11	-	2.35	↑		
Kitchnet	11	-	2.35	↑	Sink	
Corridor & Others	236		2.8	Natural Ventilation		
Sub-Total	715					
3F	Director's Office	50	2	2.8	Cooling	Bathroom
	Chief Advisor	48	2	2.8	↑	Bathroom
	Senior Staff Room	37 x 2	3	2.8	↑	
	Research P.M. Room	48	2	2.8	↑	Bathroom
	Conference	37	10	2.8	↑	
	Research Development Office	37 x 2	9	2.8	↑	
	Storage	11 x 2	-	2.35	Natural Ventilation	

Room	Area (m ²)	Number of Persons	Effective Height (m)	Air-Conditioner	Remarks
Kitchnet	11	-	2.35	Exhaust Fan	Sink
Lavatory	22	-	2.35	†	
Air-Conditioning Machine Room	24	-	2.8	†	
Corridor & Others	226	-	2.8	Natural Ventilation	
Sub-Total	646				
4F Computer Room	65	-	2.8	Air-Conditioner	Raised Floor
Operator Room	25	-	2.8	†	
Data Storage	14	-	2.8	Exhaust Fan	
Information P.M. Rm.	48	2	2.8	Window Cooler	Bathroom
Data Bank Office	37 x 5	21	2.8	†	
Publication Office	37	3	2.8	†	
Conference	37	10 ~ 20	2.8	†	
Storage	11 x 4	-	2.35	Natural Ventilation	
Kitchnet	11	-	2.35	Exhaust Fan	
Lavatory	22	-	2.35	†	
Corridor & Others	238	-	2.8	Natural Ventilation	
Sub-Total	726				
Total	2,870				

2) PROGRAM II

Undulating sand hills near a seashore, this site is almost bare except for some bushes.

A building with an inner court will provide protection from strong sunshine, harsh winds and heavy rains expected from the location. Not only will a court provide protection but it will give good natural ventilation to rooms around the court.

Rooms are categorized into those for administration and research and each group faces onto the court.

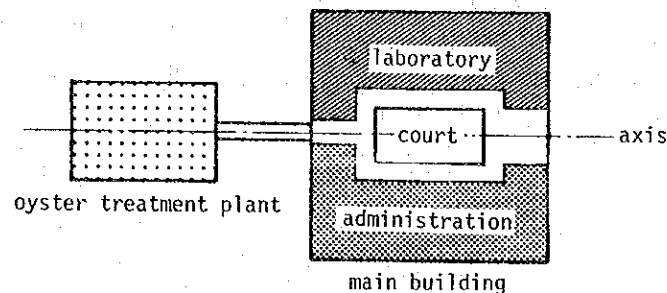


FIG. 4-3-2-(2)-2)

The positioning of the building at a 45° longitudinal deviation from the south matches the site configuration and will protect laboratories from sudden changes of temperature caused by the afternoon sunshine.

Vertical louvers will also provide protection.

The oyster treatment plant, which utilizes sea water for depuration, will be separated from the main building for humidity and noise control. Located on the shore side of the main building the plant will incorporate a machine room, freezing storage, refrigerator and operator's room. Walls of the plant will be wood jalousies to protect the oysters from direct sunshine while keeping the plant cool. Wood is the best material in an environment with salt, so sashes of the main building will be of wood.

An ordinary tile roof finishing is most suited to the climatic conditions of the Philippines. However, the problem of typhoon winds from the Lingayen Gulf initiated the design of a built-up asphalt type roof with outer thermal insulation which has become popular in the Philippines recently; and we will also suspend ceilings some distance from the roof slabs to provide thermal insulation.

Planned finishes are:

a. Exterior

Roof	Built-up asphalt with outer thermal insulation
Wall	Concrete, HCB mortar, troweled, epoxy resin paint finish
Sashes and doors	Wood, paint finish

b. Interior

Room	Floor	Wall	Ceiling
Office	Vinyl tile	Mortar, painted	Asbestos board, painted
Conference Rm	Vinyl tile	Mortar, painted	Rock wool A.T.
Plant	Concrete troweled finish	HCB, painted	White cement spray
Machine Rm	Concrete troweled finish	HCB, painted	White cement spray
Lavatory	Mosaic tile	Glazed tile	Asbestos board, painted

PROGRAM II: ROOM SCHEDULE

Room	Area (m ²)	Number of Persons	Effective Height (m)	Air-Conditioner	Remarks
Administration Office	42	4 to 6	2.7	Cooling	
Reception	15	2	2.7	†	
Director's Office	42	2	2.7	†	Bathroom
Senior Staff Room	42	1	2.7	†	Bathroom
Staff Room	42	5	2.7	†	
Environment Survey Preparation	42	-	2.7	†	
Laboratory	42 x 3	-	2.7	†	Laboratory Bench
Lecture Room	84	60	2.7	†	
Balance Room	10	-	2.7	†	
Darkroom	15	-	2.7	†	
Oyster Treatment Plant	130	-	3.4	Natural Ventilation	
Operator's Room	20	3	2.7	Window Cooler	
Machine Room	20	-	3.4	Natural Ventilation	
Storage	25	-	3.4	†	
Lavatory	20	-	2.7	†	
Others	299	-	3.4		
Total	1,100				

3) PROGRAM III

This program consists of seven construction manpower development courses where trainees are trained both in classrooms and at training workshops.

The facility will occupy two buildings. The main building, for classrooms, teachers' offices and administrative offices requires quiet, whereas the workshop will put out machine noise and require a high ceiling.

The main building will be a two-story building. Rooms used by trainees, such as classrooms, drawing rooms, A/V classroom and locker rooms will be on the ground floor and on the second floor will be administrative rooms such as the director's office, administrative offices, teachers' rooms and offices for the Japanese experts

The Philippines is hot all year round and it experiences heavy precipitation during the rainy season. In such a climate, an open space where people can meet and socialize is very useful, especially in a school-type facility. We are planning a covered inner court to provide such an area for communication and relaxation and also to give natural ventilation to the rooms around it.

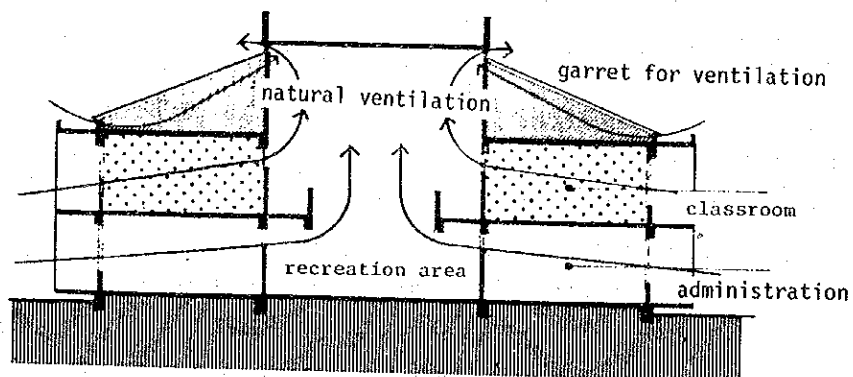


FIG. 4-3-2-(2)-3)-①

The workshop has a linear plan consisting of sixteen 7 m x 14 m bays with effective beam spans of 14 m. This configuration was employed to separate the training field from the front garden and for flexibility within limited space for the various classes.

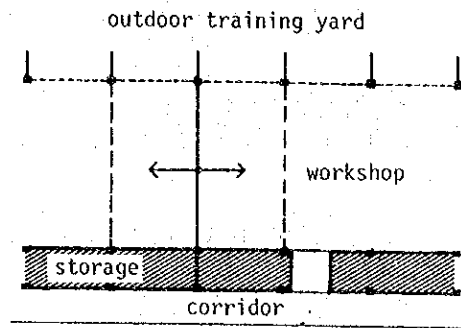


FIG. 4-3-2-(2)-3)-②

Storage areas, lavatories and electric sub-stations are located at the side of the main building, and act as an acoustic barrier. Also on this side is a connecting corridor which also leads into the main building. At this connection there is a canteen, which could be utilized by trainees as another rest area.

The sloped roof of the main building rests upon a flat concrete slab and the space in between creates natural ventilation protecting the rooms below from the heat. On the workshop roof a G.I. sheet with thermal insulation is used.

The dormitory will be located at the south-east corner of the site near to the residential area and facing the primary school across the road.

In the interest of optimum use of space, the dormitory will consist of 8 units with 8 beds each. A superintendent's room, dining room, kitchen, shower and toilets will be also provided.

We are considering some natural ventilation possibilities for the corridor.

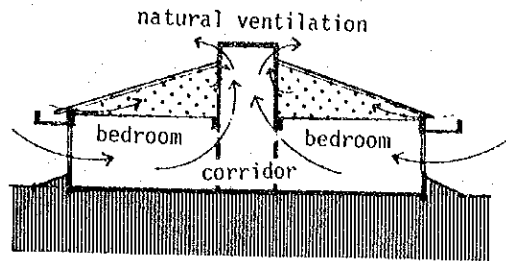


FIG. 4-3-2-(2)-3)-③

Planned finishes are:

a. Exterior

° Main Building

Roof	Vinyl-coated GIS (steel sheet)
Wall	Concrete, HCB mortar, troweled, epoxy resin finish
Sash	Aluminum, dyed

° Workshop

Roof	GIS, painted
Wall	HCB lithin spray finish
Sash	Steel, painted

° Dormitory

Roof	Iron sheet with baked enamel
Wall	HCB mortar, troweled, lithin spray finish
Sash	Steel, painted

b. Interior

Room	Floor	Wall	Ceiling
Offices	Vinyl tile	Mortar, painted	Asbestos board, painted
Classroom	Vinyl tile	Mortar, painted	Asbestos board, painted
A/V Classroom	Vinyl tile	Mortar, painted	Rockwool A.T.
Drawing Rm	Vinyl tile	Mortar, painted	Rockwool A.T.
Corridor	Concrete	Mortar, painted	Lithin, sprayed
Canteen	Concrete	Mortar, painted	Lithin, sprayed
Workshop	Hard mortar	HCB, exposed	Insulation, exposed
Bedroom	Vinyl tile	Mortar, painted	Asbestos board, painted

PROGRAM III: ROOM SCHEDULE

Room	Area (m ²)	Number of Person	Effective Height (m)	Air-Conditioner	Remarks	
Adm. 1F	A/V classroom	74	50	2.8	Cooling	Chair W/ledge
	Drawing Room	98	20	2.8	↑	Drawing Board, Chair Blackboard
	Classroom	49 x 4	ea.20	3.35	Natural Ventilation	Table, Chair, Blackboard
	Guard Room	25	2	3.35	↑	
	Lavatory Locker Room	98	-	2.8	↑	
	Hall	350	-	-	↑	
	Sub-Total	841				
Adm. 2F	Director's Office	49	2	2.8	Cooling	Bathroom
	Senior Staff Room	49	2	2.8	↑	Bathroom
	Teacher's Room	147	20	3.35	↑	
	Administration Office	49	5	3.35	↑	
	Conference	74	30	3.35	↑	
	Library	49	-	3.35	↑	
	Dispensary	25	-	3.35	↑	
	Lavatory	25	-	2.8	Natural Ventilation	
	Others	157				
	Sub-Total	649				
	Total	1,490				

Room	Area (m ²)	Number of Persons	Effective Height (m)	Air-Conditioner	Remarks
Workshop HCB 1	238	20	4	Exhaust Fan	
Workshop Plumbing 2	238	20	4	†	
Workshop Welding 3	357	20	4	†	
Workshop Electric Wiring 4	238	20	4	†	
Workshop Re-bar 5	238	20	4	†	
Workshop Erection 6	595	20	4	†	
Workshop Garage 7	588	20	4	†	
Workshop Maintenance 8	900	20	5	†	
Canteen	240	150	3.35	Natural Ventilation	
Others	628				
Sub-Total	4,340				
Total	5,830				

4-3-2 (3) STRUCTURAL DESIGN

1) DESIGN PRINCIPLES

1 BASIC POLICY

- a. Structural system should suit the size, layout and mode of use of the building facilities, all in relation to the physical and social conditions in the Philippines.
- b. Structural system should be adaptable to the locally available materials and their quality and construction techniques, and preference be given to the local products and methods unless special problems are involved.
- c. Structural system should be economical yet durable.

2 APPLICABLE STANDARDS AND CODES

The structural design will conform to the following standards and codes for external forces acting on the proposed buildings, loads, allowable stresses of structural materials and calculation method.

- a. National Structural Code for Buildings, the Philippines (NSCB).
- b. Uniform Building Code (UBC)
- c. AIJ Standards

3. DESIGN LOADS

The design loads specified in the codes mentioned above are given below.

a. Dead Loads

- (a) Reinforced concrete 2.4 t/m³
- (b) Structural steel 7.85 t/m³
- (c) Brick and concrete block 1.95 t/m³
- (d) Dead weights of other materials and finishing materials will be evaluated in the detail design stage

b. Live Loads

- (a) Roof (General) 60 kg/m²
- (b) Flat roof 100 kg/m²
- (c) Toilet, dormitory, Lecture room 200 kg/m²
- (d) Office 250 kg/m²
- (e) Lobby, corridor, A/V room 500 kg/m²
- (f) Laboratory, oyster treatment, studio 500 kg/m²
- (g) A/C room, storage 500 kg/m²

c. Wind Loads

The equation for wind loads provided in the NSCB will be used as the standard.

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

All the project sites for Programs I, II and III are located within Zone II, where the value of (P) is given as follows in NSCB

Height = Less than 9 m (P) = 150 kg/m^2
9 m to 30 m (P) = 200 kg/m^2
Over 30 m (P) = 250 kg/m^2

d. Seismic Load

The seismic load will be determined conforming to the provisions of the NSCB and UBC.

4 STRUCTURAL MATERIALS

Major construction materials will be designated as follows.

- a. Reinforcing Bars: Deformed bar SD 30 (JIS) or equivalent
- b. Concrete : $f_c' = 210 \text{ kg/cm}^2$
(Cylinder test for 4-week strength)
- c. Cement : Normal Portland Cement (ASTM)
- d. Structural Steel: SS41 (JIS) or equivalent
- e. Pile : Precast concrete product

2) PROGRAM I

1 STRUCTURAL SYSTEM

The main structure will be of reinforced concrete rigid frames, and shear walls will provide earthquake-resistance. The roof structure will be a reinforced concrete flat roof.

2 FOUNDATION SYSTEM

Since the adobe layer in the site is expected to have sufficient bearing capacity, reinforced concrete spread footings will be used. The allowable bearing capacity is assumed to be 20 t/m^2 .

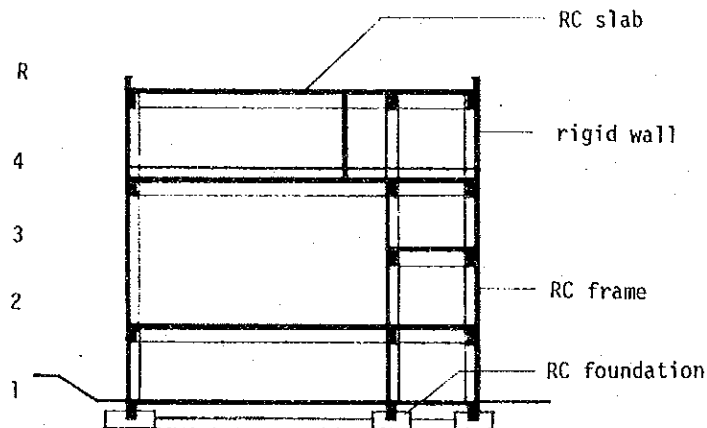


FIG. 4-3-2-(1) PROGRAM I STRUCTURAL SYSTEM

3) PROGRAM II

1 STRUCTURAL SYSTEM

The main structure will be of reinforced concrete rigid frames as in Program I. Rigid frames will provide main resistance to seismic forces. The roof structure will be a reinforced concrete flat roof.

2 FOUNDATION SYSTEM

The proposed building will be constructed on the sand by a seashore. According to the results of boring tests, the uppermost stratum is a fine sand layer with an N-value of 10, and a thickness of 3.0 m to 7.0 m. Judging from the particle size distribution of this layer, this fine sand layer may liquefy in an earthquake. Therefore, in designing foundations, it is necessary to give this matter careful study.

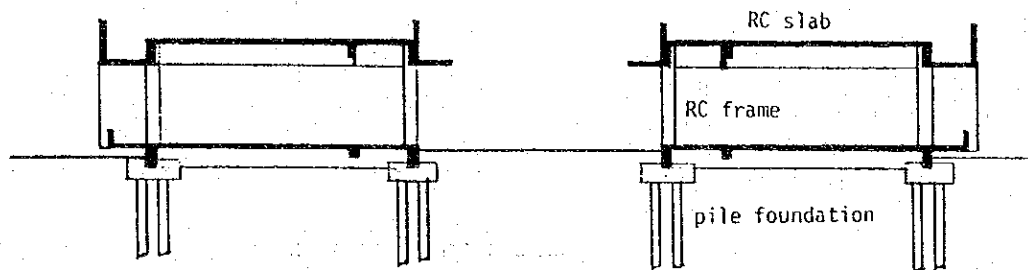


FIG. 4-3-2-(2) PROGRAM II STRUCTURAL SYSTEM

4) PROGRAM III

I STRUCTURAL SYSTEM

The main structure of each building will be of reinforced concrete rigid frames with shear walls placed at appropriate locations. The roof structure of the administration building will be steel frames on reinforced concrete roof slab. The roof structures of the workshops and dormitory will be of structural steel construction.

2 FOUNDATION SYSTEM

The project site is within a rice field, and composed of adobe covered by a 30 cm layer of very soft soil. This very soft soil will be removed, and the site will be filled with sandy soil with a thickness of 1100 mm. The readjusted ground level will be 200 mm higher than the front road level.

The foundations will be of reinforced concrete, and will rest on the adobe.

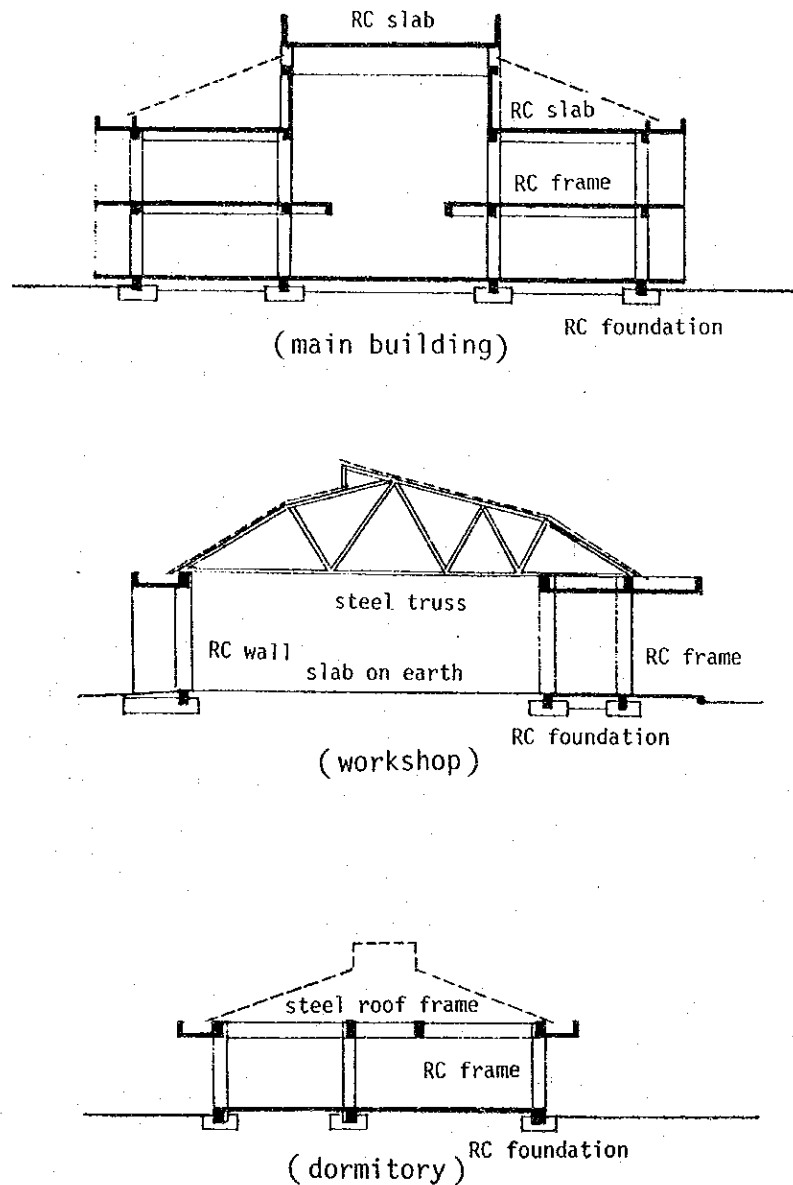


FIG. 4-3-2-(3) PROGRAM III STRUCTURAL SYSTEM

4-3-2 (4) UTILITY DESIGN

1) DESIGN PRINCIPLES

1. Simple operation, easy maintenance and economical running cost should be primary considerations in designing the electrical and mechanical systems for this project.
2. Wherever possible, standardized equipment and fixtures will be selected to facilitate future replacement and exchange.
3. The design of electrical and mechanical systems should follow the codes and regulations of the Philippines. When these are not available for reference, Japanese standards will be referred to.
4. Equipment and materials to be imported from Japan should comply with JIS (Japanese Industrial Standard) and those purchased in the Philippines should comply with the applicable domestic standard.
5. Extensive consideration will be given to corrosion protection for all equipment relating to sea water.
6. In renovation, maximum use will be made of existing facilities.

2) PROGRAM I

1 ELECTRIC SYSTEM

a. Power supply system

The new power supply of 60 Hz 3-phase 220 V and single-phase 220 V power to run from the substation to the distribution board in the existing building will be provided by the Philippine government.

Estimated system design loads are as follows:

For the building to be renovated

° Lighting, service outlets	35 kVA
Sub total	35 kVA
(to be supplied by the existing power main)	

° Air conditioning, ventilation	90 kVA
---------------------------------	--------

After expansion

° Lighting, service outlets	5 kVA
° Air conditioning, ventilation	45 kVA
° Computer system	40 kVA
° Studio	20 kVA
Sub total	170 kVA

(to be supplied by the new power main)

Total 205 kVA

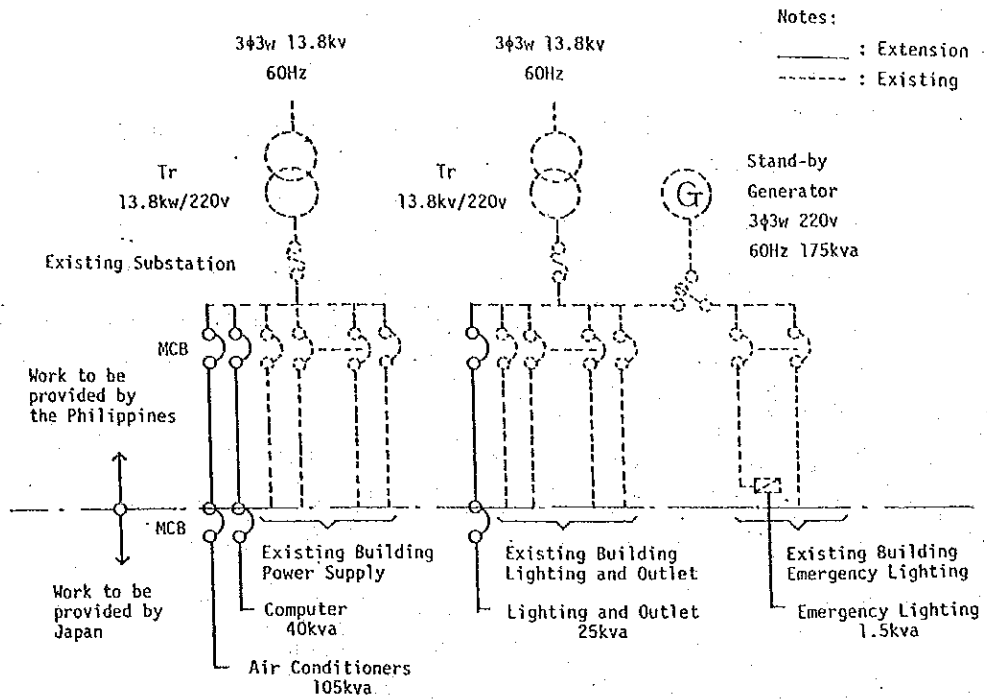


FIG. 4-3-2-(4)-2)-① POWER SUPPLY ONE LINE DIAGRAM

b. Power mains

3-phase 220 V and single-phase 220 V power mains will be installed from the distribution panels to the power control panels and lighting panel boards respectively.

Wiring will be generally installed in conduit pipes or racks.

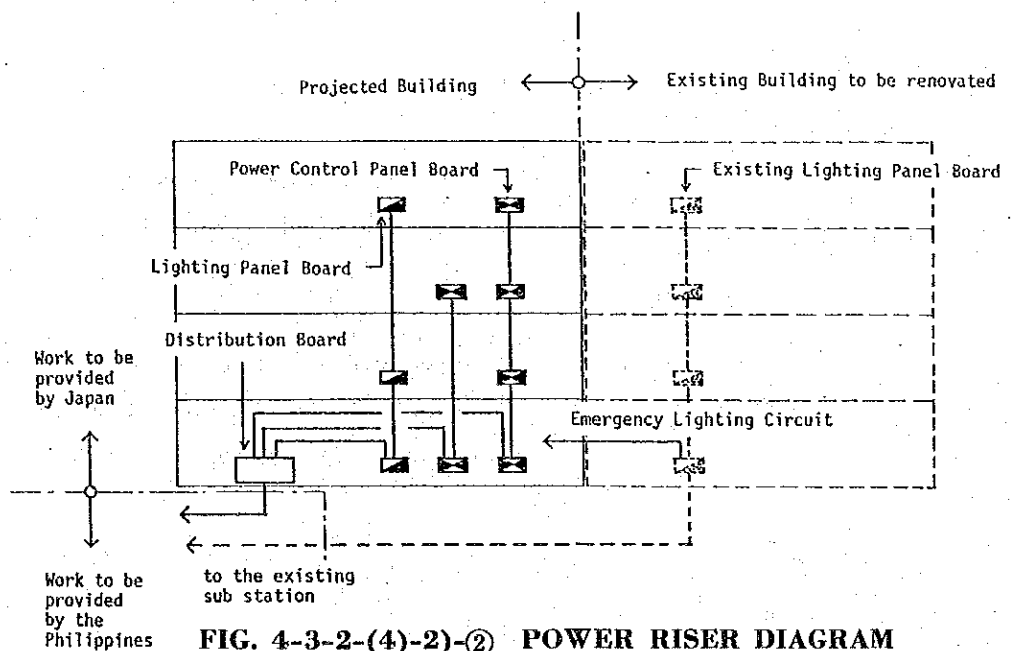


FIG. 4-3-2-(4)-2)-② POWER RISER DIAGRAM

c. Lighting and Service outlets

(a) In the building to be renovated, the existing facilities will be used as they are where possible and the existing fittings will be reused.

(b) Fluorescent lighting will be used mostly. In the T/V studio a studio-lighting system will be provided.

(c) The average intensities of illumination in typical rooms will be as follows:

Office	250 lux
Conference Rm	250 lux
A/V Rm	300 lux
Computer Rm	300 lux
Toilet, Corridor	70 lux

(d) Service outlets for general use and laboratory equipment will be of single-phase 220V power. Where necessary outlets with grounding will be provided.

d. Wiring and conduits to motors

Wiring and conduits from power control panels will be provided to supply power to air conditioning units and ventilating fans.

In principle the supply voltage will be single-phase 220V power for small motors and 3-phase 220V power for bigger motors.

e. Telephone system

About 10 city lines and 30 extensions will be supplied to the terminal board in the projected building from the main terminal board of the university by the Philippine government. Wiring and conduits from the main terminal board will be led to terminal boards on each floor and then further on to the telephones.

f. Public address system

An amplifier set with a microphone will be installed in the office and loudspeakers placed in the corridors.

g. Audio system

There will be an audio system in the A/V room.

h. TV and radio antenna

TV and radio antennas will be erected on the roof and outlets installed in the studio and A/V room.

i. Fire alarm system

A heat detecting automatic fire alarm system will be installed. The indication panel for fire alarm signals will be placed in the administration office.

2 PLUMBING SYSTEM

a. Water supply

Water supply main for the new building will be extended from the existing supply line to Dormitory A. Water consumption is estimated as follows:

$$200\text{psn} \times 0.09 \text{ m}^3/\text{psn}\cdot\text{day} = 18 \text{ m}^3/\text{day}$$

b. Drainage

Drainage pipes from the new building will be connected to the existing drainage pipes of Dormitory A.

c. Hot water supply

Individual electric heaters will supply hot water to kitchenettes and shower rooms.

The existing electric water heaters will be re-used in the building to be renovated.

d. Plumbing fixtures

Water closets, urinals, lavatories, mirrors, service sinks and showers will be installed.

In the building to be renovated, the existing facilities will be used wherever possible and existing plumbing fixtures will be reused.

e. Fire fighting system

A wet standpipe system similar to that in Dormitory A will be installed in the projected building.

Harogenated agent fire extinguishers will be installed in the computer room. In the building to be renovated, the existing facilities will be used.

f. Others

In the building to be renovated, the existing facilities will be reused as much as possible, and installations such as pipings and faucets will be eposed.

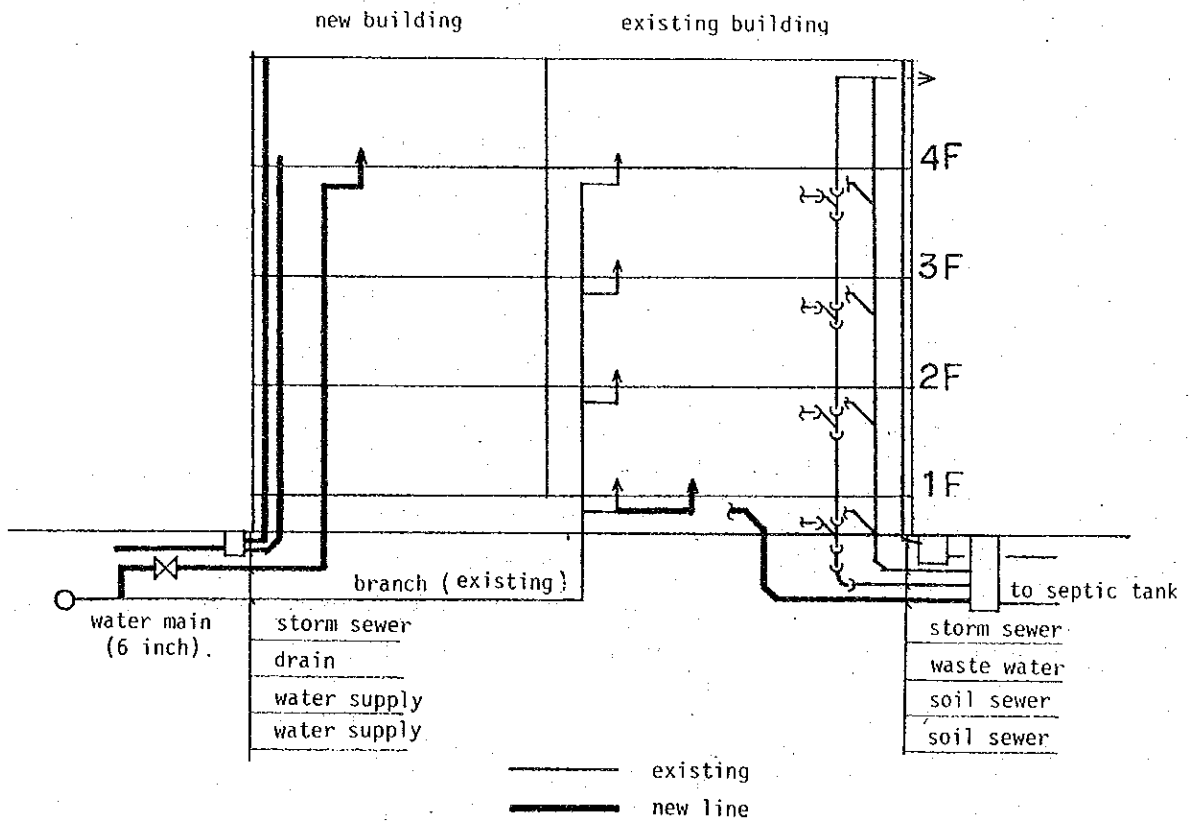


FIG. 4-3-2-(4)-2)-③ PROG. I WATER SUPPLY AND DRAINAGE SYSTEM DIAGRAM

3 AIR CONDITIONING AND VENTILATION SYSTEM

a. Air conditioning system

- (a) Window type room air conditioners will be installed in the following rooms.

Seminar Rm., L/L Rm., Offices, Conference rooms, Library, Project manager rooms, VTR tech. artist Rm., Maintenance Rm., Director Rm., Seminar Staff Rm.

- (b) The following rooms will be furnished with air-cooled split type air conditioners.

A/V Rm., Studio, Control Rm.

- (c) A special air-cooled package type air conditioner will be installed in the computer room.

- (d) Design temperature is as follows:

Outdoor air temperature 35°C DB

Room air temperature

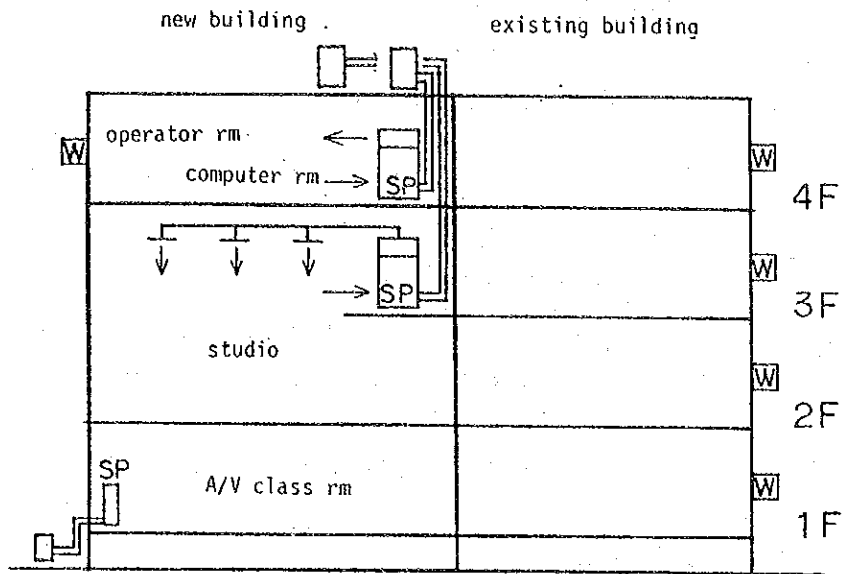
General 29°C DB

Computer room 27±3°C DB

60±5% RH

b. Ventilation system

Exhaust fans will be used where there is no natural ventilation.



SP: air cooled split type air-conditioner
 W: window type room air-conditioner

FIG. 4-3-2-(4)-2)-④ PROG. I AIR-CONDITIONING SYSTEM DIAGRAM

3) PROGRAM II

1. ELECTRICAL SYSTEM

a. Power supply system

The Philippine government will arrange for 60Hz, 3-phase 220 V and single-phase 220 V electric power to be led to distribution boards in the projected building, then distributed to the power control panels and panel.

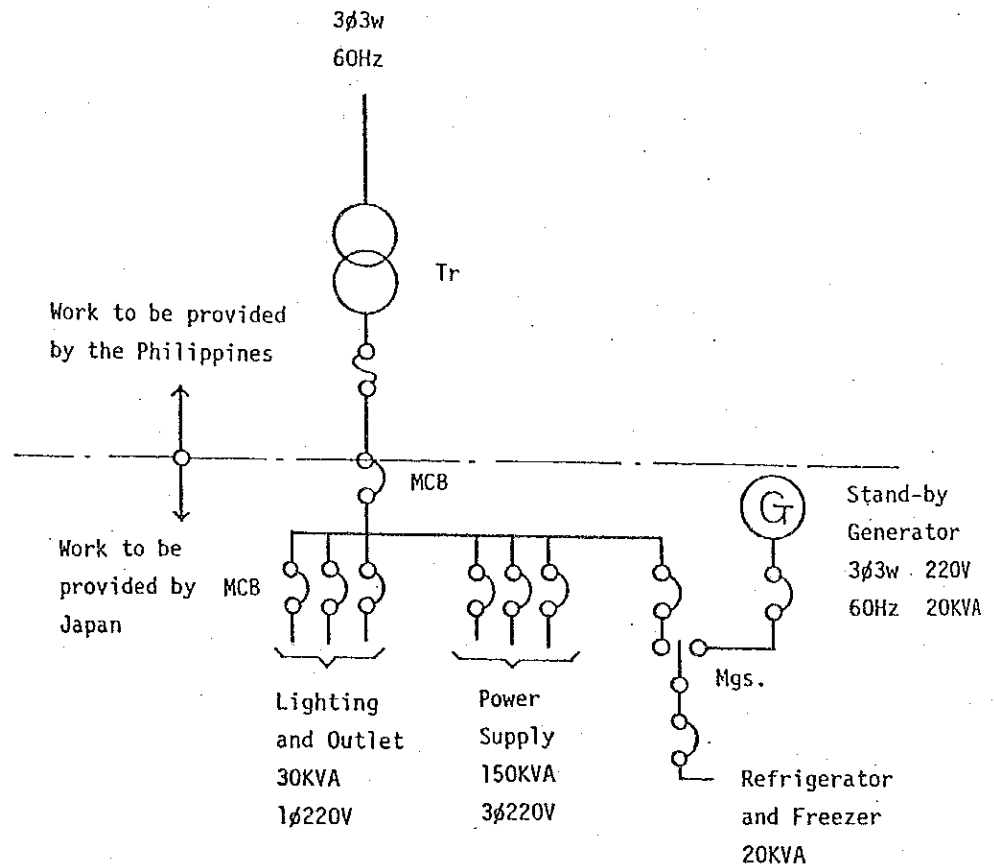


FIG. 4-3-2-(4)-3)-① POWER SUPPLY ONE LINE DIAGRAM

Estimated system design loads are as follows:

Lighting, service outlets	30 kVA
Air conditioning, ventilation	45 kVA
Plumbing and oyster treatment facilities	45 kVA
Laboratory equipment	60 kVA

Total 180 kVA

b. Emergency generator

A 20 kVA generator will be installed in the generator room to supply power to freezers and the laboratory in a power failure.

c. Power mains

Three-phase 220 V and single-phase 220 V power mains will be installed between the distribution panels and the power control panels and lighting panel boards.

Wiring will generally be run through UPVC conduit pipes and cables.

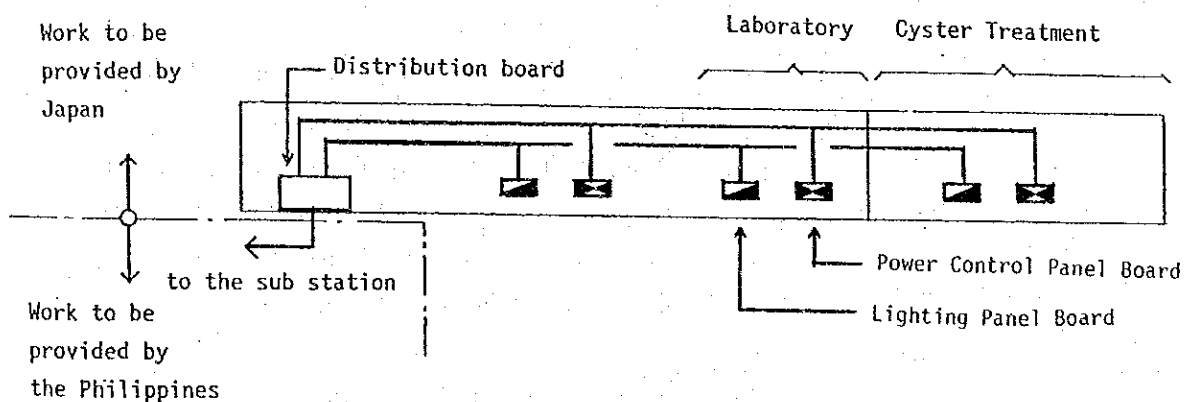


FIG. 4-3-2-(4)-3)-② POWER RISER DIAGRAM

d. Lighting and service outlets

- (a) Natural lighting will be exploited as much as possible throughout the buildings. Fluorescent lighting will predominate while incandescent lamps will be used in some places.

For protection from the sea air, fitting will be anti-corrosive.

- (b) The average intensities of illumination in typical rooms will be as follows:

Office	250 Luxe
Laboratory	300 "
Conference Room	250 "
Oyster Treatment Rm	250 "
Toilet, Corridor	70 "

- (c) Service outlets for general use and equipment will be single-phase 220 V power. Where necessiated outlets with grounding will be provided.

e. Wiring and conduits to motors

Wiring and conduits from power control panels will supply power to air-conditioning units, ventilating fans, ceiling fans, pumps, etc. As a rule, the supply voltage will be single-phase 220 V power for small motors and 3-phase 250 V power for bigger motors.

CPVC conduit pipes will be used.

f. Public address system

There will be a amplifier set with a microphone in the administration office and loudspeakers placed in the corridors.

g. Fire alarm system

A heat detecting automatic fire alarm system will be installed. The indication panel for fire alarm signals will be placed in the administration office.

h. Lightning protection system

A lightning protection system will be provided.

2. SEA WATER SUPPLY SYSTEM

a. Oyster treatment system

(a) Capacity of oyster treatment

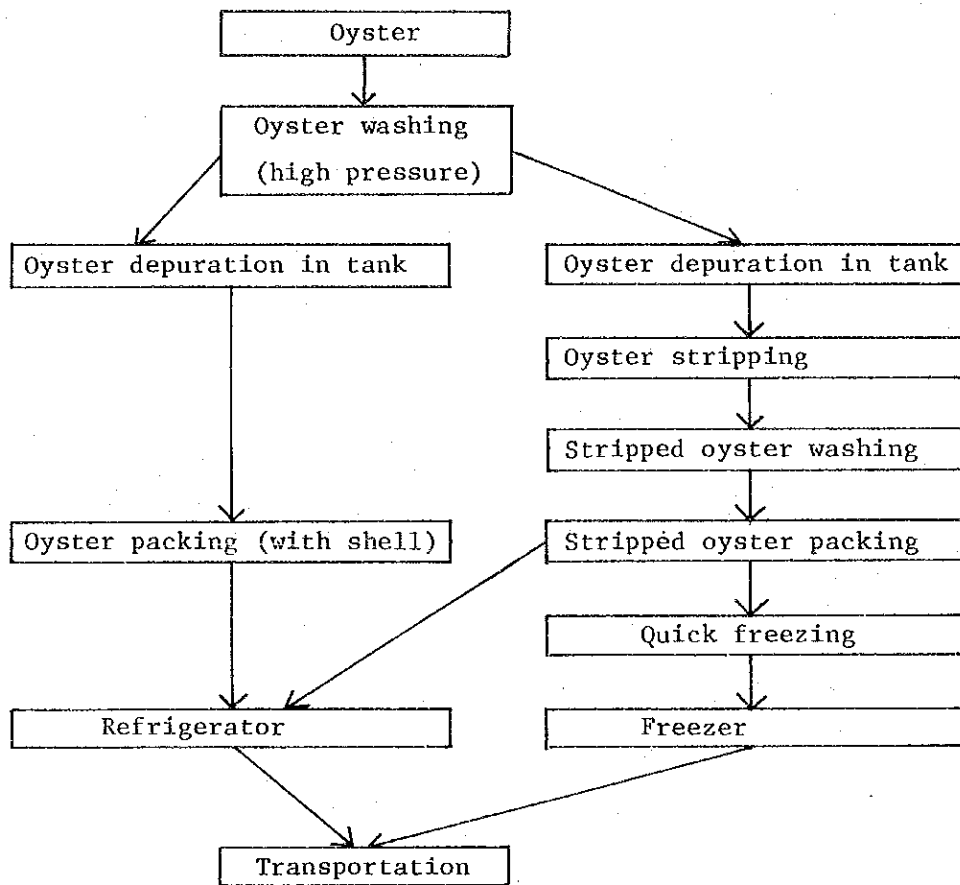
Ten workers will each strip 10 kgs of oysters a day and 210 - 300 oyster in the shell will be treated. Total oyster treatment capacity will be as follows:

Oyster treatment : 200 - 300 oysters/day
(with shell)

Stripped oyster : 100 kg/day
(100 g/oysters x
1000 oysters/day)

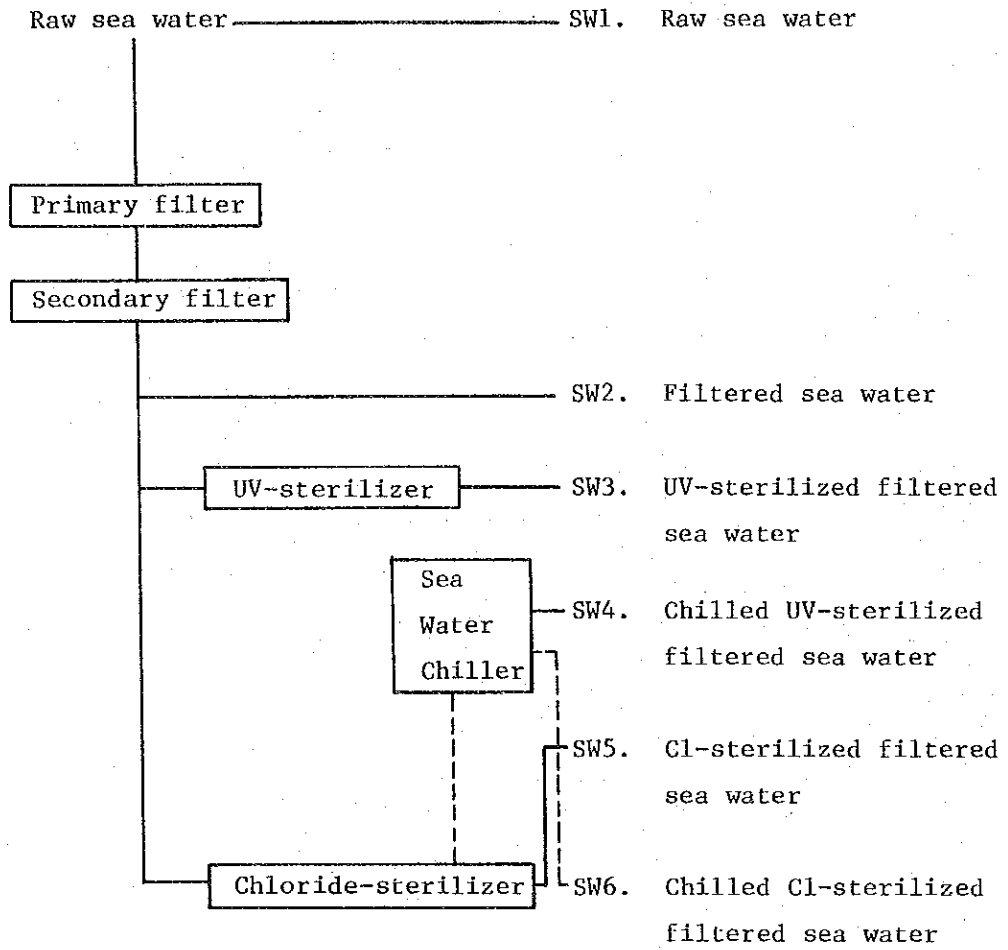
(b) Oyster treatment system

Flow diagram for oyster treatment is shown on the next page.



OYSTER TREATMENT FLOW DIAGRAM

b. The following six kinds of sea water will be supplied



c. Sea water consumption is estimated as follows:

(a) Oyster treatment Rm.

Oyster washing (SW2) = $3.0\text{m}^3/\text{day}$

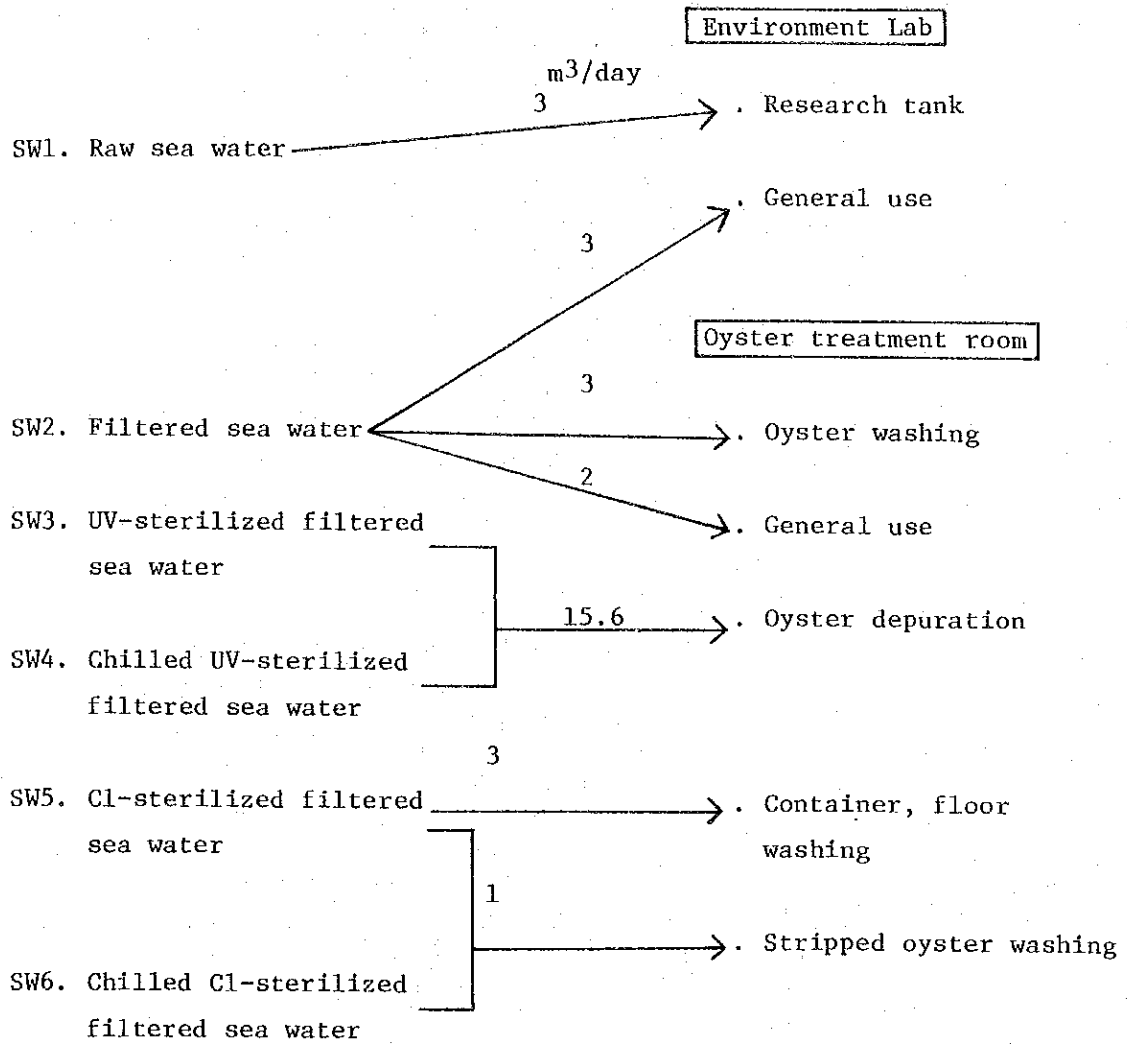
$100\text{P}/\text{min} \times 30 \text{ min}/\text{day}$

° Oysters depuration in tank (SW3 and/or SW4)		
Oysters with shell	300 oys/day x 1ℓ/h.oys x 12h =	3.6m ³ /day
Oysters to be stripped	1000 oys/day x 1ℓ/h.oys x 12h =	12.0
° tripped oyster washing (SW5 or SW6)		
	1000 oys/day x 1ℓ/h.oys	= 1.0
° Container, floor washing (SW5)		= 3.0
° General use (SW2)		= 2.0
Sub Total		24.6m ³ /day

(b) In the Environmental Laboratory

° Research tank (SW1)		
	Tank 100ℓ/set x 3 sets x 10 turns	= 3.0m ³ /day
° General use (SW2)		= 3.0
Sub Total		6.0
Total		30.6m ³ /day

d. Sea water balance is:



Total 30.6 m³/day

e. Sea water supply system

An intake pipe will direct sea water into an intake-well from which it will be pumped to a reservoir. Sea water from the reservoir will be treated by primary and secondary filters and then pumped up into an elevated tank via the treated sea water reservoir. The primary filter will be a sand filter and the secondary filter a cartridge filter. From the elevated tank, the sea water will descend to the oyster treatment plant and laboratory after further treatment - ultra-violet sterilization, chloride sterilization or chilling, according to its use.

Untreated sea water will be supplied to the environmental laboratory from the first sea water reservoir.

f. Sea water chilling

Chilled sea water will be supplied for depuration and experiments in treating oysters for raw consumption.

(a) Required chilled sea water

° Oyster depuration tank (chilled UV sterilized)

Oyster with shell

$$300 \text{ oys} \times 1\ell/\text{h.oys} \times 12\text{hrs} = 0.3\text{m}^3/\text{h} \times 12\text{hrs}$$

Stripped oyster

$$1,000 \text{ oys} \times 1\ell/\text{h.oys} \times 12\text{hrs} = 1.0\text{m}^3/\text{h} \times 12\text{hrs}$$

$$\text{Sub-total} \quad 1.3\text{m}^3/\text{h} \times 12\text{hrs}$$

° Stripped oyster washing (chilled, chloride sterilized)

$$1,000 \text{ oys} \times 1\ell/\text{h.oys} \times 1\text{hr} = 1.0\text{m}^3/\text{h} \times 1\text{hr}$$

(b) Sea water will be chilled to the following temperatures:

In-take sea water : 30°C

Chilled sea water : 20°C

g. The capacities of the reservoir and elevated tank are 60 m³ and 10 m³ respectively.

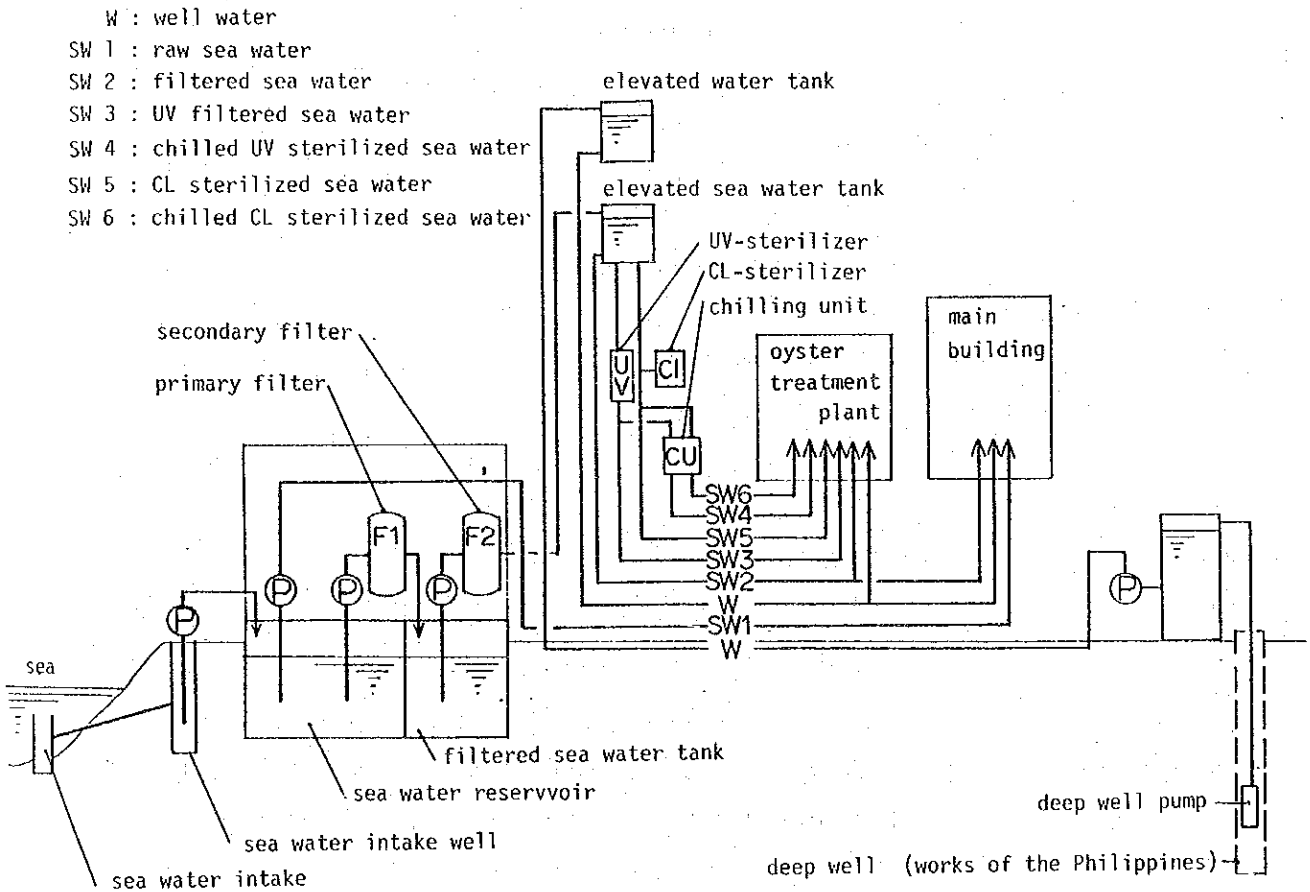


FIG. 4-3-2-(4)-2)-③ PROG. II SEA WATER AND WATER SUPPLY SYSTEM DIAGRAM

3. PLUMBING SYSTEM

a. Water supply

(a) A deep well with casing for water supply will be dug at the site by the Philippine government. Water will be pumped up to the reservoir by a submersible deep well pump, then up to an elevated tank to create water pressure.

(b) Water consumption is estimated as follows:

Staff	12psn x 0.1m ³ /psn.day	1.2m ³ /day
Researcher	10psn x 0.2	2.0
Visitor	50psn x 0.01	0.5
Workers	10psn x 0.2	2.0
Misc.		5.0
Total		11.0m ³ /day

(c) Capacities of a water reservoir and an elevated water tank are:

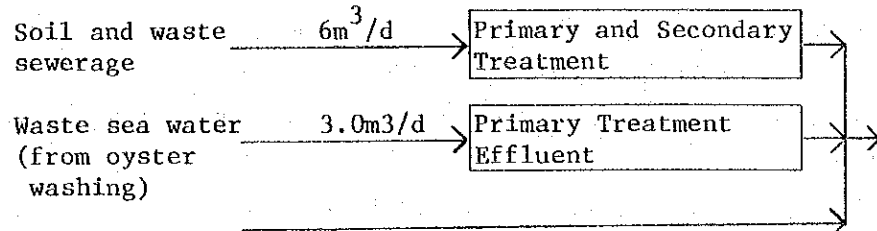
Reservoir	6m ³
Elevated tank	2m ³

b. Drainage system

The drainage system will include tanks for soil sewerage and waste water sewerage, which will be led to a septic tank for primary and secondary treatment, and waste sea water sewerage, which will be treated by means of screening and setting. After treatment, effluent water will be discharged to the sea.

Toxic substances, radioactive substances, heavy metals and harmful chemicals should be recovered and not be discharged into these drainage systems.

Anticipated drainage flow is:



Septic tank performance will accommodate the following water quality:

Influent BOD 200ppm, Effluent 120ppm

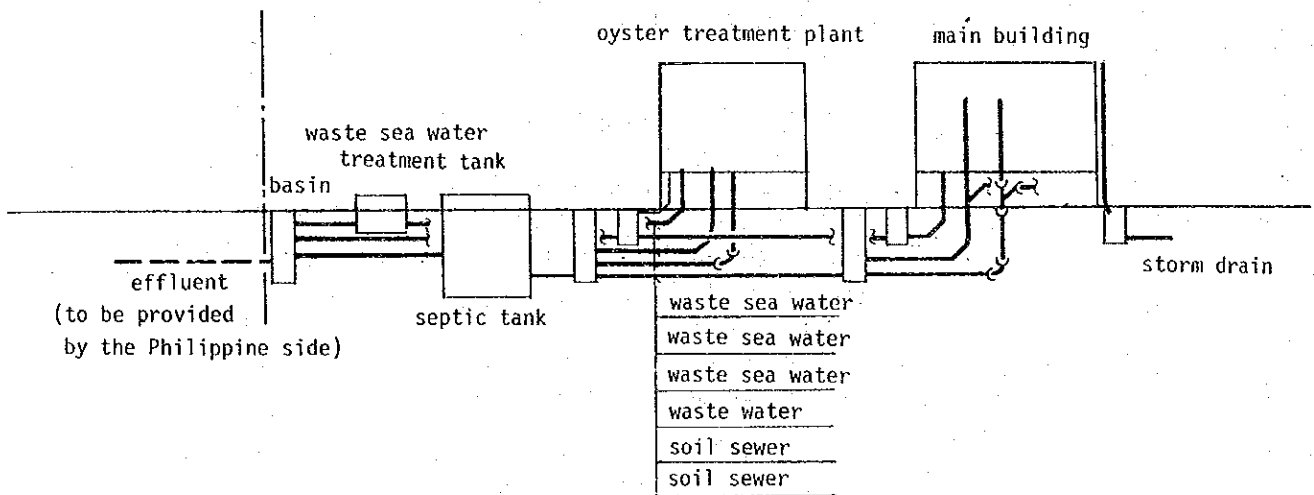


FIG. 4-3-2-(4)-2-④ PROG. II DRAINAGE SYSTEM DIAGRAM

c. Plumbing Fixtures

Water closets, urinals, lavatories, mirrors, service sinks and showers will be installed.

d. Gas supply

L.P.G. will be supplied to the laboratories from cylinders installed near the laboratories.

e. Hot water supply

Hot water will be supplied to kitchenettes and shower rooms by electric water heaters.

f. Fire fighting system

Dry chemical fire extinguishers will be installed.

4. AIR-CONDITIONING AND VENTILATION

a. Air-conditioning

Window-type room air-conditioners will be installed in:

The administration office, director's office, senior staff room, Philippine expert staff room, conference room, laboratory and darkroom.

b. Design temperature will be:

Outdoor air temperature : 35°C DB

Room air temperature: 29°C DB

c. Ventilation

- ° Mechanical exhaust fans will be provided in the laboratory, oyster treatment area and shower room.
- ° Ceiling fans will be provided in the field work preparation area and the workmen's room.

3) PROGRAM III

1. ELECTRICITY

a. Power supply system

The Philippine government will provide a sub-station on the site and run 60Hz 3-phase 220V and single-phase 220V power lines to the distribution board in the building.

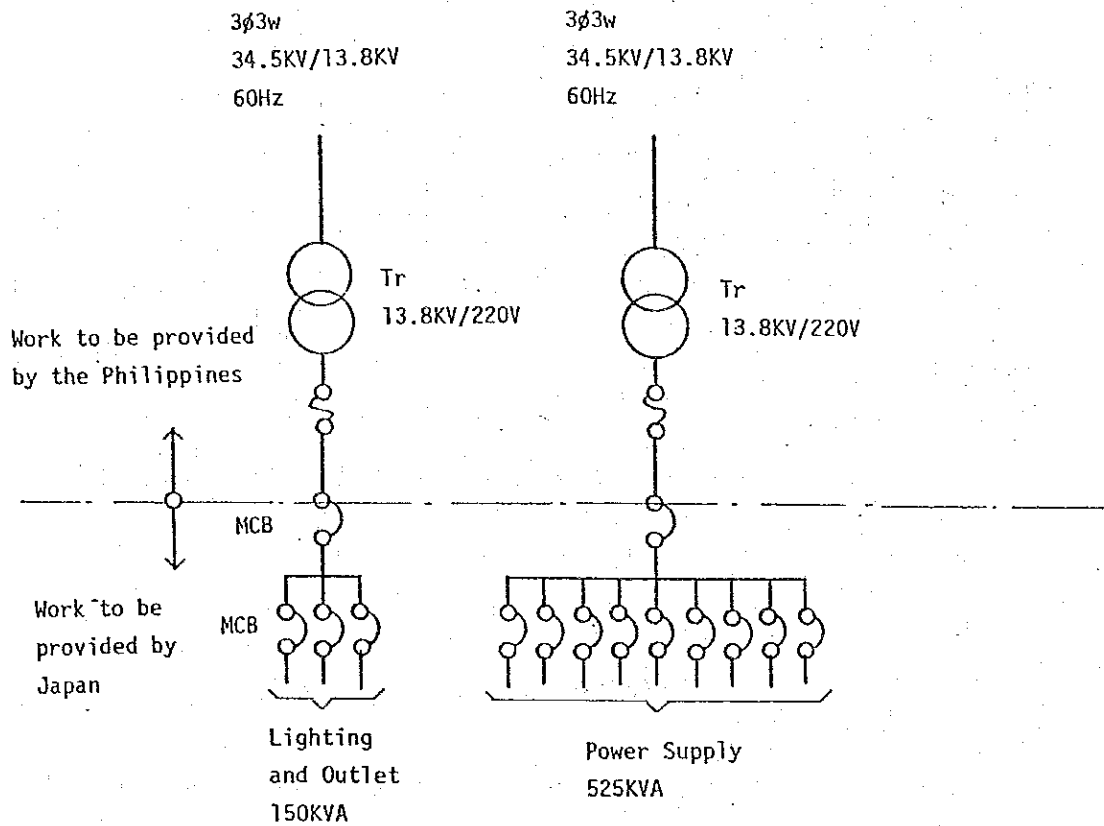


FIG. 4-3-2-(4)-3)-① POWER SUPPLY ONE LINE DIAGRAM

Estimated loads are:

Lighting, service outlets	150kVA
Air-conditioning, ventilation	125kVA
Plumbing	50kVA
Equipment	350kVA

Total	675kVA
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b. Power mains

3-phase 220V and single-phase 220V power mains will be installed between the distribution board and the power control panels and lighting panel boards. Wiring will run through conduit pipes and racks,

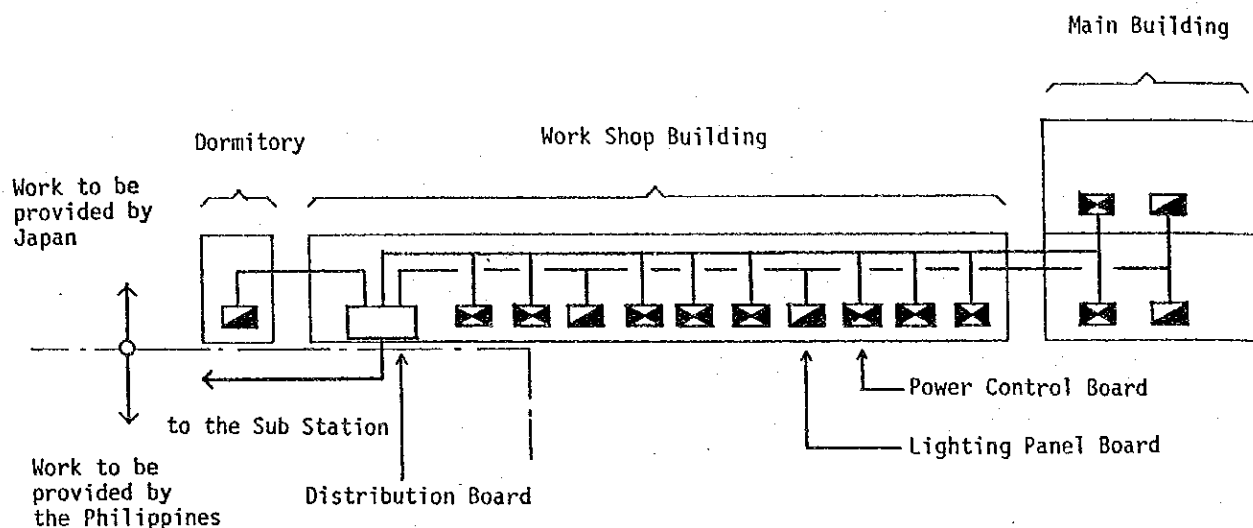


FIG. 4-3-2-(4)-3)-② POWER RISER DIAGRAM

c. Lighting and Service outlets

(a) Fluorescent lighting will be used throughout.

(b) The average intensities of illumination in typical rooms will be:

Office	250 Luxe
Conference	250 "
Workshop	250 "
Toilet, corridor	70 "

- (c) Other than in the workshops where 3-phase 220V power will be used, service outlets for general use and equipment will be single-phase 220V power.

Some outlets in laboratories and workshops will be provided with grounding.

- (d) Wiring and conduits to motors

Wiring and conduits will be run from power control panels to supply power to air conditioning units, ventilating fans, ceiling fans, pumps, etc.

Generally, the supply voltage will be single-phase 220V power for small motors and 3-phase 220V power for bigger motors.

- (e) Telephone

There is no telephone circuit at present, but conduit pipes and outlets will be installed for future installation.

- (f) Intercom system

For internal communication, an intercom system will be installed to connect the administration office and workshops.

- (g) Public address

There will be an amplifier set with a microphone in the administration office and loudspeakers placed in the corridors.

(h) TV and radio antenna system

TV and radio antennas will be installed on the roof and outlets will be installed in the A/V room.

(i) Fire alarm system

A heat-detecting automatic fire alarm system will be installed. The indication panel for fire alarm signal will be placed in the administration office.

(j) Lightning protection system

A lightning protection system will be provided.

2. PLUMBING SYSTEM

a. Water supply system

(a) A deep well will be drilled by the Philippines government. A submersible deep well pump will pump water from this well to a reservoir from which it will be pumped up to an elevated water tank to create water pressure.

(b) Water consumption is estimated to be:

Staff	45psn x 0.12m ³ /psn.day	= 5.4m ³ /day
Trainees	120psn x 0.12	= 14.4
Dormitory	60psn x 0.100	= 6.0
Workshops		= 10
Miscellaneous		= 20

Total 56m³/day

(c) The capacity of the reservoir and elevated tank is as follows:

Reservoir 30m³

Elevated tank 10m³

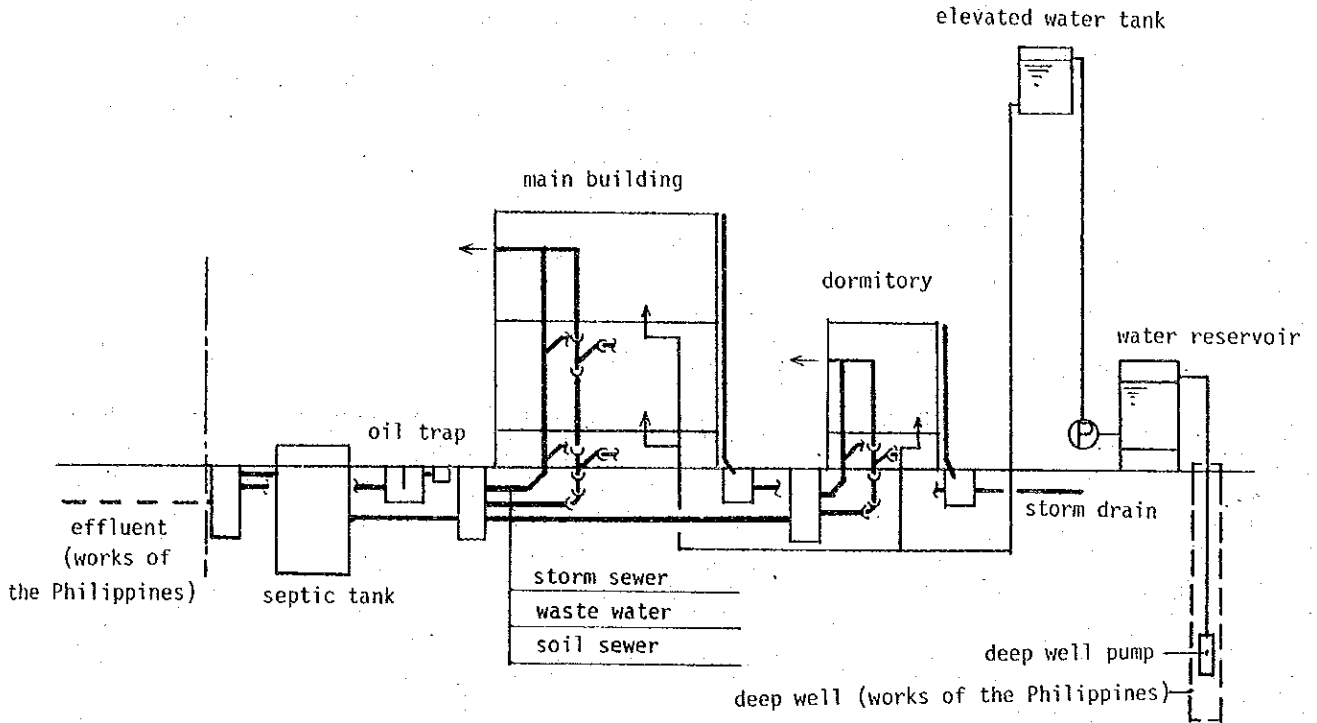


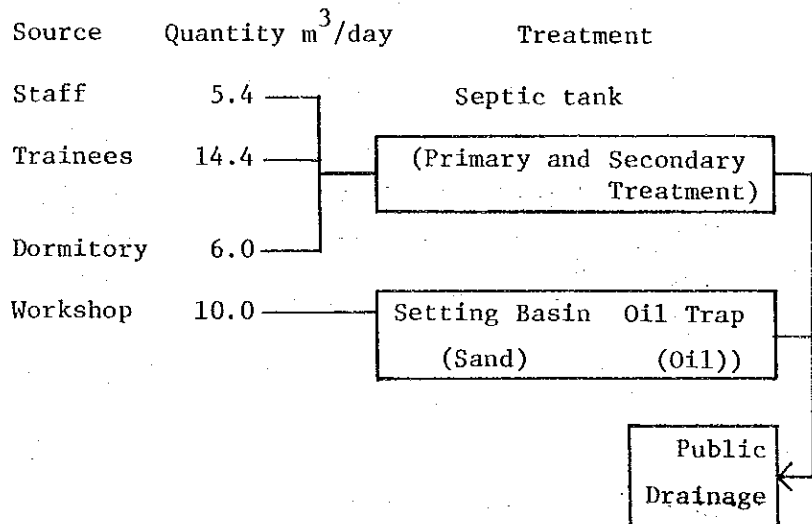
FIG. 4-3-2-(4)-3)-③ PROG. III WATER SUPPLY AND DRAINAGE SYSTEM DIAGRAM

b. Drainage

(a) The drainage system will handle soil sewage and waste water sewage. They will be mixed at the septic tank for treatment.

Sewage water from workshops will pass through an oil trap and a setting basin to remove oil and sand. It will finally be discharged into the public drainage system. Toxic substances, harmful chemicals and heavy metals should be recovered on the spot.

The drainage system is as follows:



(b) The septic tank will treat 26 m³ sewage a day and have the following capacity:

Influent sewage	BOD 200ppm
Effluent sewage	BOD 20ppm

A sedimentation and contact aeration treatment system will be employed.

c. Plumbing fixtures

Water closets, urinals, basins, mirrors, service sinks and showers will be installed.

d. Kitchen equipment

The following kitchen equipment will be installed to serve the 60 persons in the dormitory 3 meals a day.

Gas range, rice cooker, sinks, cabinet, pan rack, refrigerator.

e. Gas supply

LPG will be supplied to the kitchen from LPG cylinders

f. Hot water supply

Hot water will be supplied to the kitchenette and shower rooms by electric water heaters. The feasibility of solar energy hot water supply will be studied.

g. Fire fighting system

Wetstand pipes will be installed and dry chemical fire extinguishers will be provided to some of the workshops.

3. AIR CONDITIONING AND VENTILATION SYSTEM

a. Air conditioning system

- (a) Window type room air conditioners will be installed in the following rooms:

Administration office, director's office, teachers' room, senior staff room, conference room, dispensary

- (b) Air-cooled split type air conditioner will be installed in the A/V classroom.

- (c) Design temperature will be:

Outdoor air temperature	35°C DB
Room air temperature	around 29°C DB

b. Ventilating System

Mechanical ventilation will be used in the following rooms:

Exhaust fan	:	Kitchen, workshops
Ceiling fan	:	Classrooms, workshops, Dormitory

4-3-2 (5) EQUIPMENT PLANNING

1) PLANNING POLICIES

1. Equipment planning will cover the equipment from Programs 1 to 4 and should correspond with the activity plans of these programs.
2. Plans will be limited to those permitting the programs to proceed immediately after completion of the facilities as laid out in the activity plan of each program. Equipment programs that not scheduled to be used immediately is excluded.
3. Since technical cooperation is scheduled, equipment with which Japanese experts are familiar will be primarily selected.
4. We will avoid whenever possible equipment that requires high-level operating techniques and for which maintenance is difficult.
5. Audio visual training equipment will be provided to each program to be used with teaching materials prepared in Program I.
6. A communications car, office equipment including a copying machine, and a video training vehicle with TV monitor and VTR camera and recorder should be provided to each program for teaching and recording.
7. Because of the poor communication facilities at some sites, radio equipment will be installed to maintain close communication between individual programs.

2) GENERAL DESCRIPTION OF EQUIPMENT-PROGRAM I

1. A computer and software suitable for data bank creation will be installed for the data bank on human resources. Audio and video equipment will be installed for training in computer operation.
2. A video studio and video tape editing equipment will be installed to produce video teaching materials for other programs. An outdoor production vehicle will be secured for production of video teaching materials on location.
3. For audio visual education, the audio visual classroom will be provided with a 100-inch screen. Audio visual equipment including small 20-inch TV monitors will be installed in conferenoems and the library for multipurpose use.
4. A language-laboratory (LL) classroom will be built for language training of those who will be sent to Japan for technical training.
5. For communication between programs, a master station will be installed at the Program I site, and slave stations at the other program sites.

For communications between Program I in Manila and Programs III and IV, UHF communication equipment will be installed, and VHF communication equipment will be installed for communication with Program II, approximately 300 km away from Manila.

3) GENERAL DESCRIPTION OF EQUIPMENT-PROGRAM II

1. Equipment and facilities for the raft and pile driving cultivation of oysters and natural cleaning systems for oyster farming experiments, and equipment and facilities for environmental survey of a farming experiment station including a small boat, will be provided.
2. Equipment and facilities for a cleaning system for oysters with shells and stripped oysters and a seawater cleaning system for depuration tests of oysters will be provided.
3. Research laboratories for environmental studies, biological studies, and bacteriology will be built for oyster farming and depuration experiments and all necessary equipment and facilities for research work will be provided.

4) GENERAL DESCRIPTION OF EQUIPMENT-PROGRAM III

1. Eight types of heavy construction equipment for training will be provided, including a bulldozer, for driver training. A trailer will be provided to transport heavy construction equipment for on the job training.
2. Cut-away models, assemblies such as engines and real construction equipment will be provided for the maintenance service course.
3. Cutters, bending machines, pressure welding machines, etc., needed for fabricating concrete reinforcement bars, tower crane, steel scaffolding, steel structure.

fabrication samples etc., for reinforced concrete and steel frame building courses will be provided.

4. A variety of welding machines including AC and DC are welding machines will be provided for welding training.
5. Practice panels and various meters and instruments needed for indoor electrical work training will be provided.
6. Equipment and materials needed for training in plumbing work such as fabrication of pipes, air-conditioning piping, and sewage piping work will be provided.
7. Equipment needed for training in hollow concrete block work such as concrete mixer and vibrator will be provided.
8. Equipment and instruments such as flat-panel surveying instruments and universal testers will be provided for common use by the various courses.

5) GENERAL DESCRIPTION OF EQUIPMENT-PROGRAM IV

1. Timber drying kiln, dust collector, hand and electrical tools, cutting machine, planing machine, press, woodworking machine, boring machine, woodwork lathe, grinder, blade sharpener, painting equipment, test and measuring tools, assembly and packing machines, and other equipment needed for woodworking will be provided.

2. Bamboo treatment and preservation equipment, coloring and bleaching machines, processing, cutting, special processing, boring, grinding, sanding, polishing, weaving machine, hand tools, and other equipment needed for bamboo work will be provided as teaching equipment for bamboo craft.
3. Material rounding equipment, cutting machine, barker, rattan sander, painting and coating machines, hand tools, and other special machines needed for rattan work will be provided as teaching equipment.
4. Repair of roofs of the 4 existing buildings - namely, 2 buildings for wood working, 1 bamboo work building, and 1 rattan work building - related to the project will be executed under this project.
5. The secondary electric side power necessary for wood work, bamboo work, and rattanwork equipment will be provided. The Philippine government will provide the primary-side power, including a switchboard.
6. To produce teaching materials and for the dissemination of new technology to the various regions, office equipment including copying machines, and outdoor training van with TV monitors, VTR recorder and player and hand held VTR camera will be provided at the four regional training centers.
7. More detailed discussions on the equipment among the authorities concerned will be necessary to finalize the selection and specifications.

6) FACILITY PLAN FOR EQUIPMENT

1. The following facilities for the training equipment will be provided under the individual programs.

- a. Program I

- Power supply, grounding and air-condition of computer room and TV studio.

- b. Program II

- Sea water supply to laboratory and oyster treatment plant. Power supply to equipment.

- c. Program III

- Power supply to equipment. Exhaust system for equipment. Compressed air supply to equipment.

2. Electric outlets will be provided for equipment needing power supply. Outlets with grounding or individual switch will be provided upon request.

3. Renovation of Roofs in Program IV

- As stated elsewhere in this report, the roofs of the workshops in CITC NACIDA have deteriorated. Corrugated asbestos roofing is leaking in many places and eave gutters and down spouts are not functioning. The Japanese decided to renovate at least these roofs, gutters and down spouts to protect the new machines in the bamboo, rattan and wood work-1 buildings from rain.

Since the steel frames supporting these roofs appear to be deteriorating also, new roofing material should be lighter than the existing roofs. The roof of the woodwork-2 building was recently changed to GIS standards but not painted. To lengthen its life, the Japanese side will paint it.

As existing buildings were renovated or expanded in an unordered manner, a detailed survey will be necessary at actual renovation.

The Philippine government will provide experts' offices and classrooms necessary for the execution of the project and will transfer existing machines to regional training centers. This work should be carried out in advance so as not to delay the schedule of Japanese grantaid cooperation.

4. ELECTRICAL FACILITIES

a. Power Supply and Distribution Equipment

An outdoor type transformer for power supply to NACIDA has been installed in the compound, and the government of the Philippines will run in the electric power from the supply equipment to the proposed buildings. However, as shown in the power distribution system diagram (on the next page), a new power supply system will be needed for woodworking building No. 3. The currently installed lead-in cables will be utilized for other existing buildings. The power will be 3-phase, 220 V and single-phase, 220 V, at 60 Hz.

The total load of equipment and facilities has been estimated as 1460 KVA based on the estimate described in Fig. 4-3-2-(5)-6)-4 on next page.

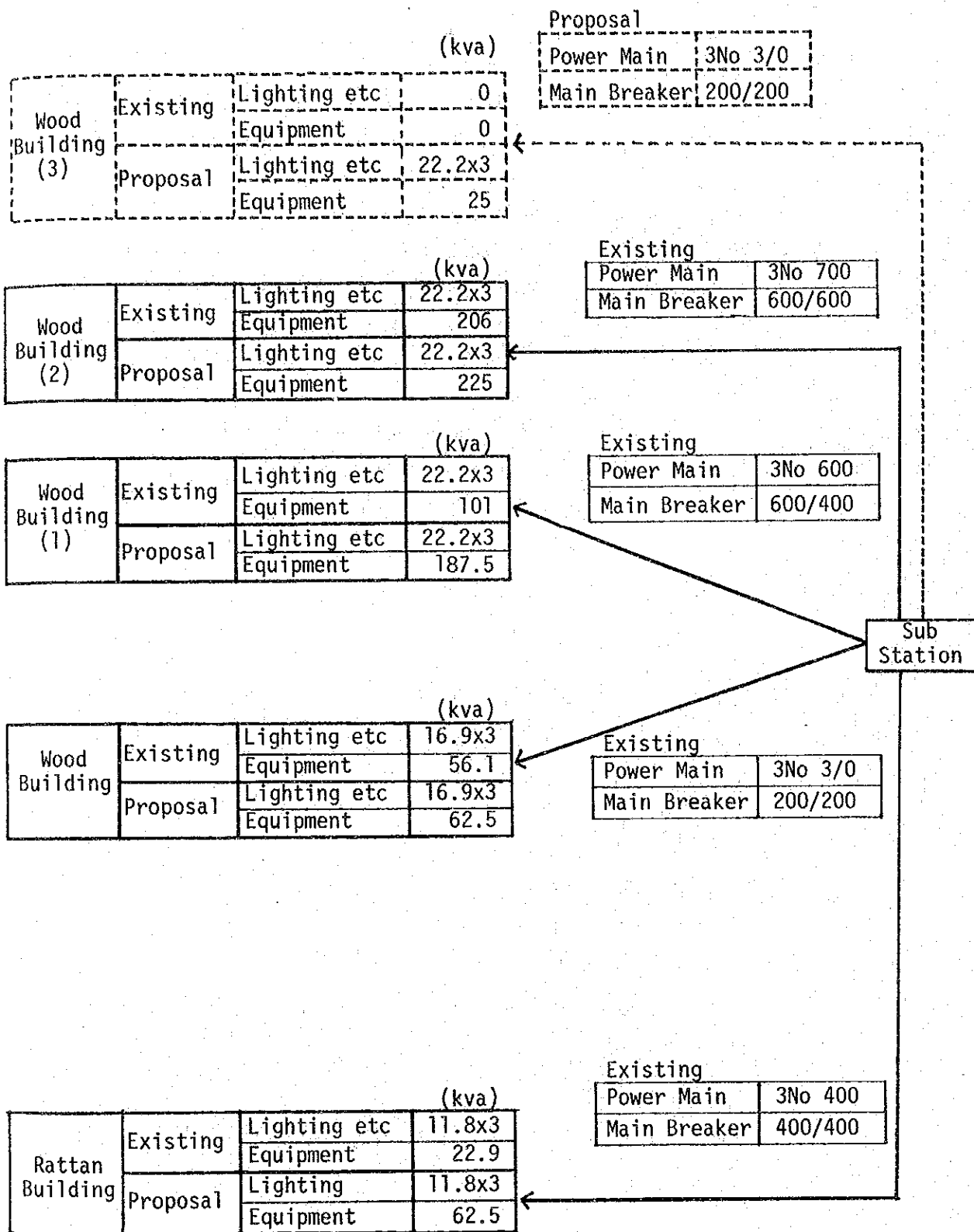


FIG. 4-3-2-(5)-6)-④-A POWER DISTRIBUTION DIAGRAM

b. Power for Motors

A conduit or cable will be provided to supply power to the motors for wood work, bamboo work, and rattan work. The equipment will be installed in the existing buildings, and all the cables will be exposed. The voltage will be single-phase, 220 V power for small-capacity equipment and 3-phase, 220 V power for other equipment, unless there are other requirements.

The work scope is shown in Figure below.

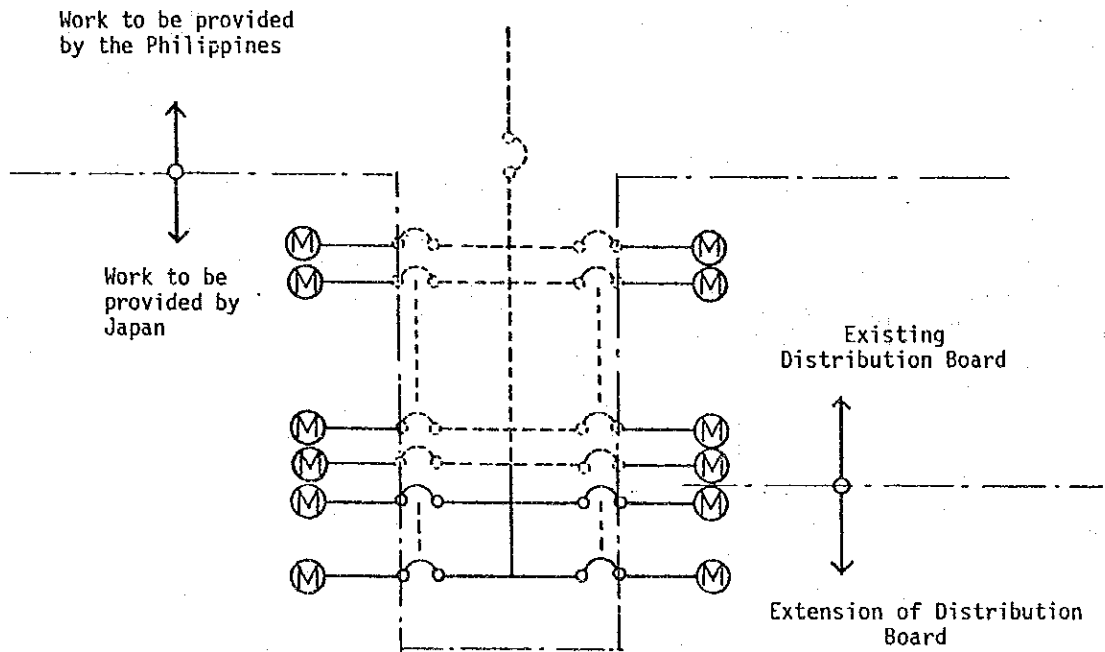


FIG. 4-3-2-(5)-6)-④-b EXTENSION OF DISTRIBUTION BOARD

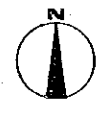
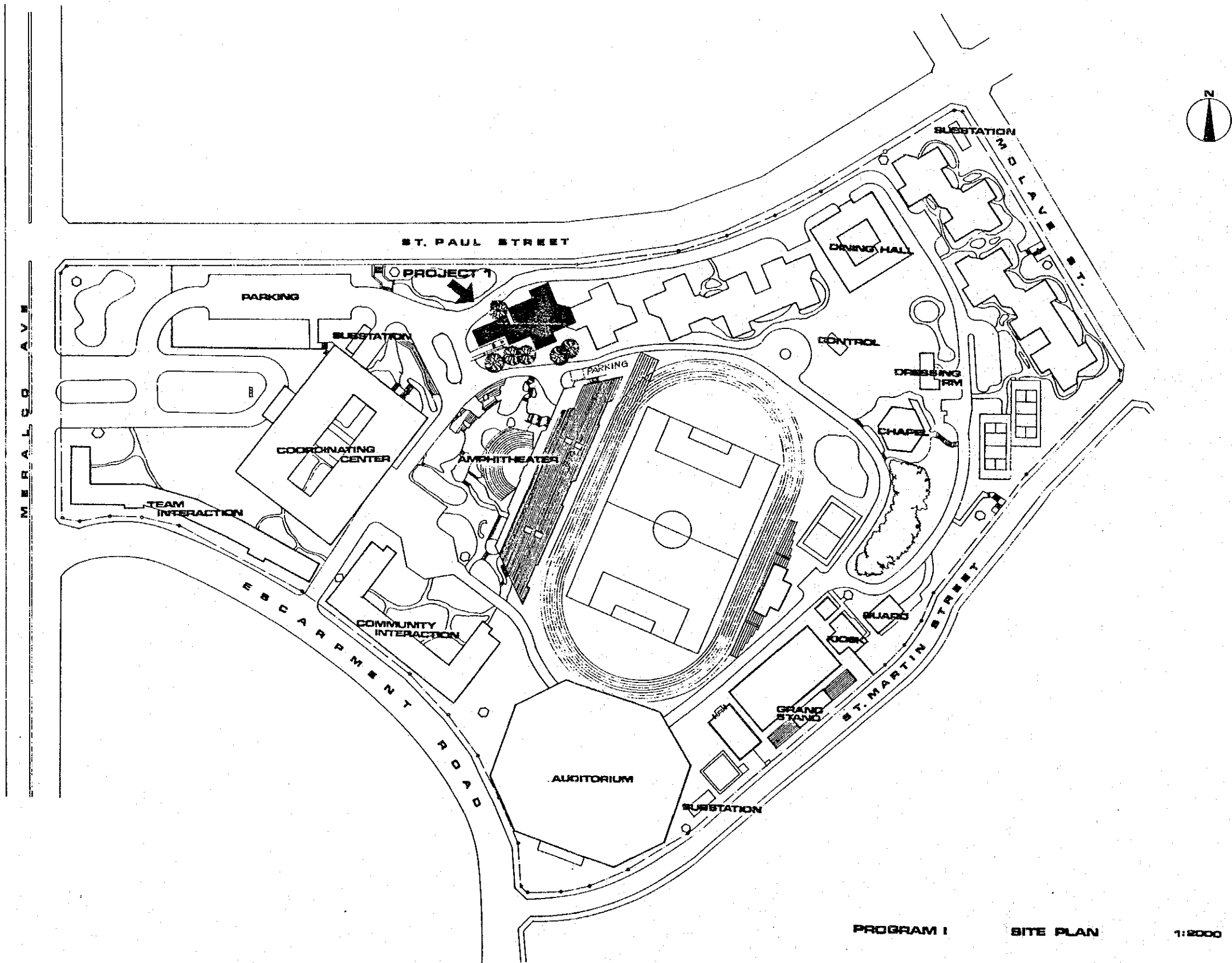
4-4 DRAWINGS

(1) PROGRAM I Site Plan 1:2,000
Floor Plan 1: 400
Elevation, Section 1: 400

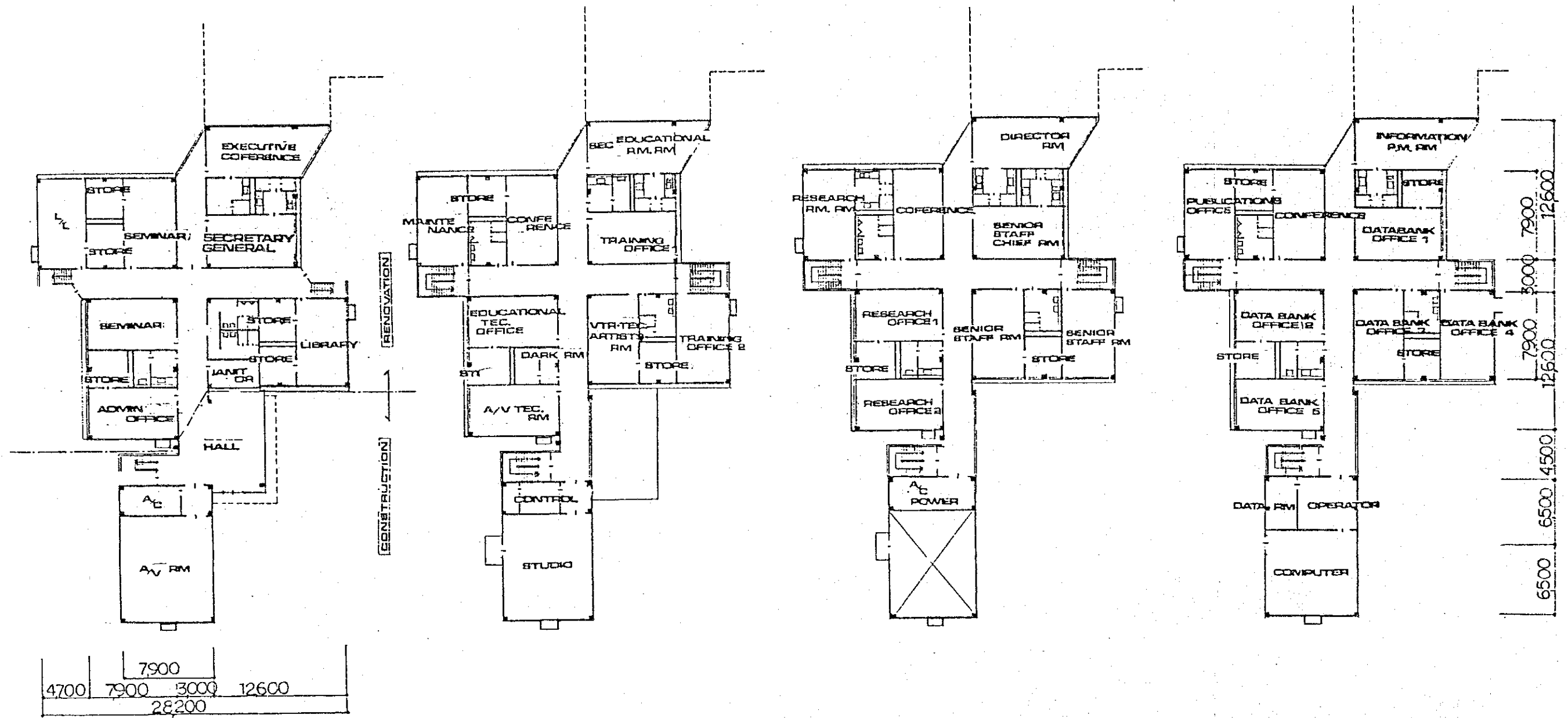
(2) PROGRAM II Site Plan 1:4,000
Floor Plan 1: 400
Elevation, Section 1: 200

(3) PROGRAM III Site Plan 1:2,000
Floor Plan 1: 600
Elevation 1: 600
Section 1: 400
Dormitory 1: 400

(4) PROGRAM IV Site Plan 1:1,000



PROGRAM I SITE PLAN 1:2000



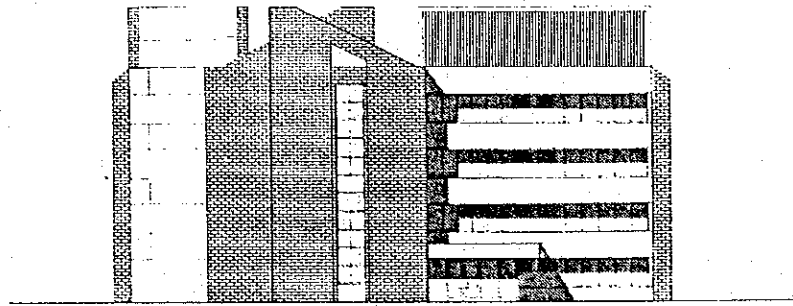
1F

2F

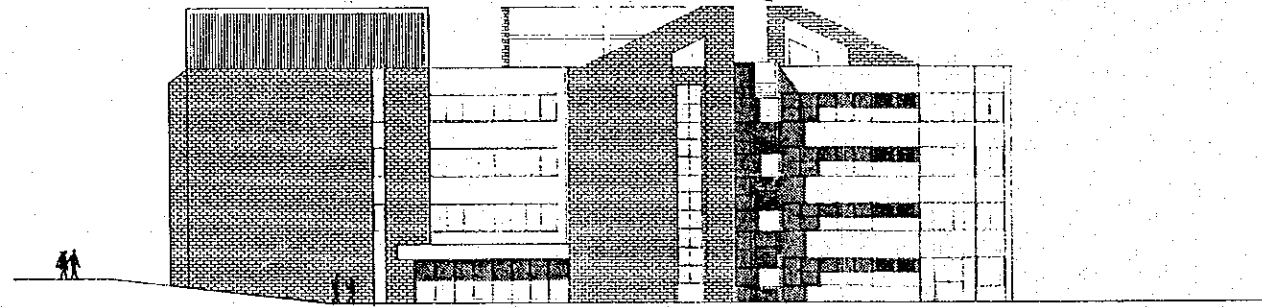
3F

4F

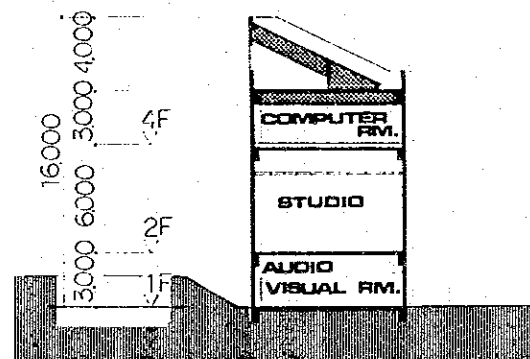
PROGRAM I PLAN 1:400



WEST ELEVATION

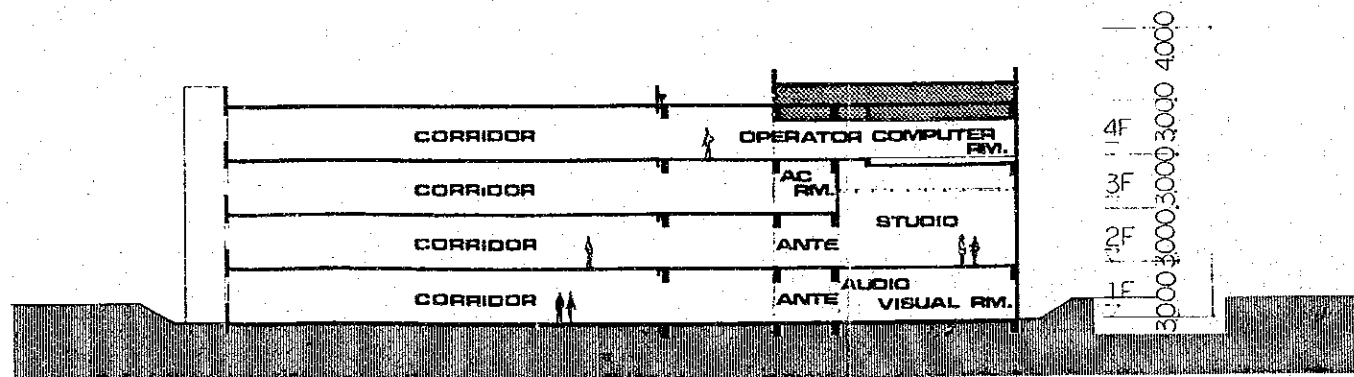


SOUTH ELEVATION



SECTION A

7,900



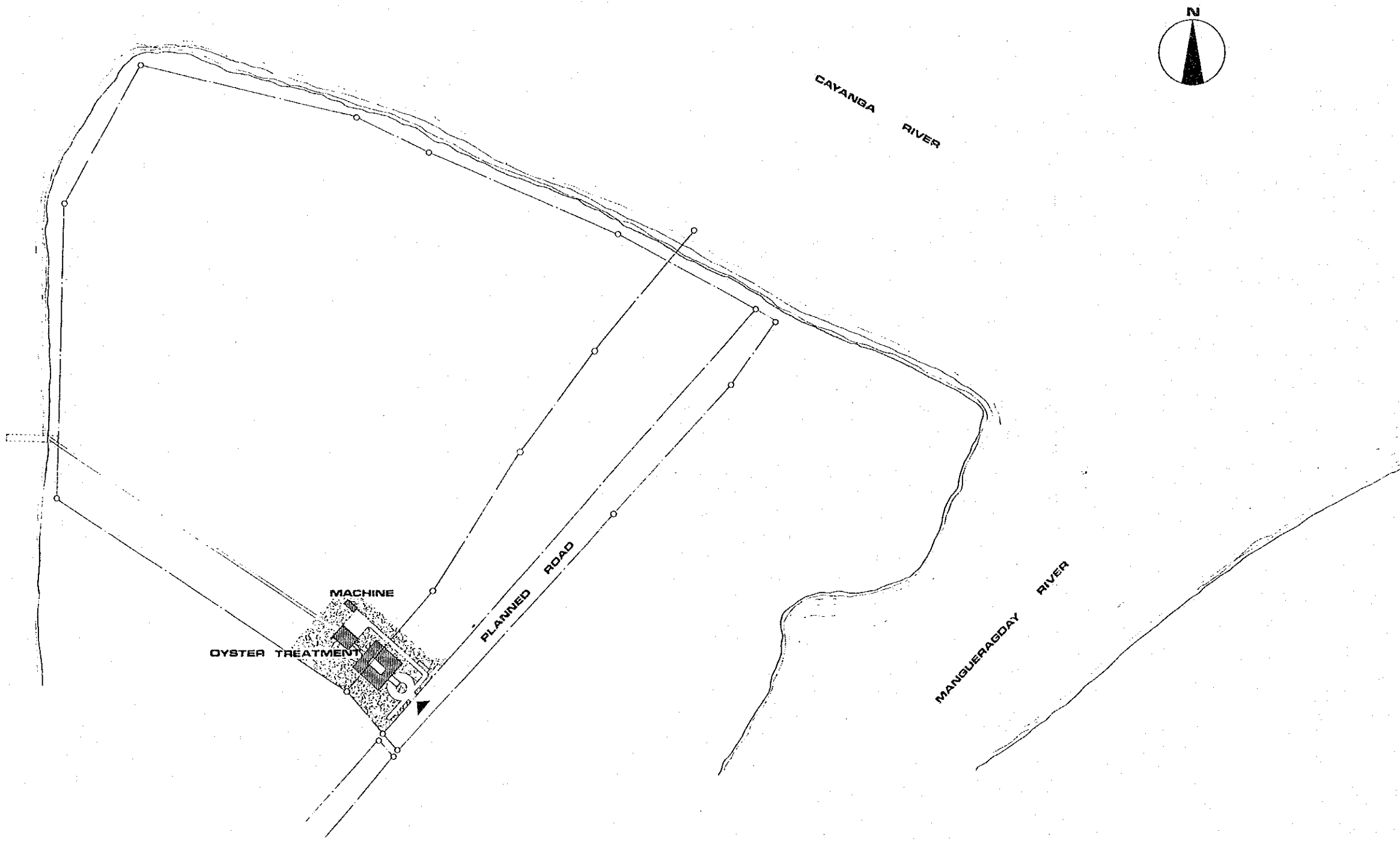
SECTION B

PROGRAM 1

ELEVATIONS & SECTIONS

1:400

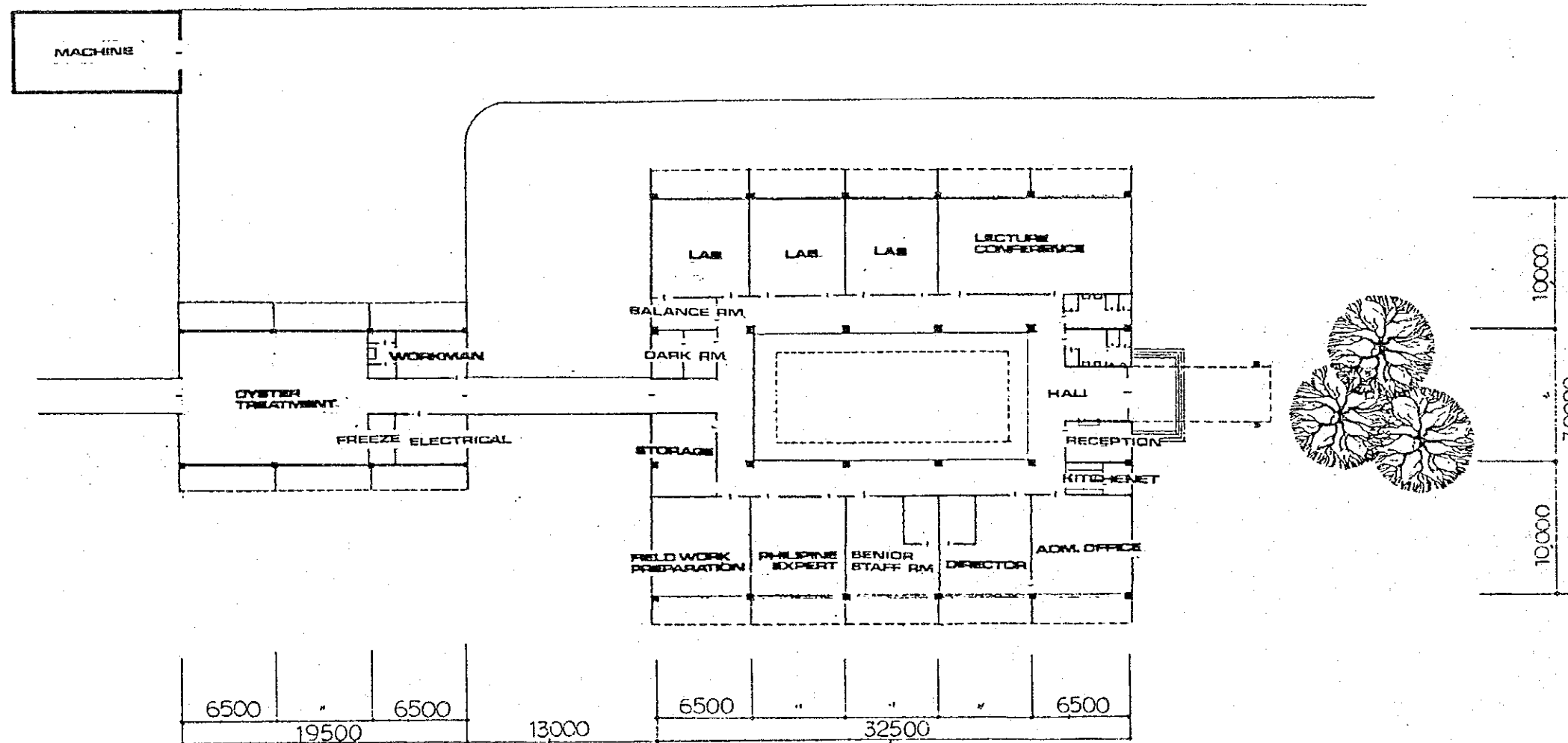
LINGAYEN GULF



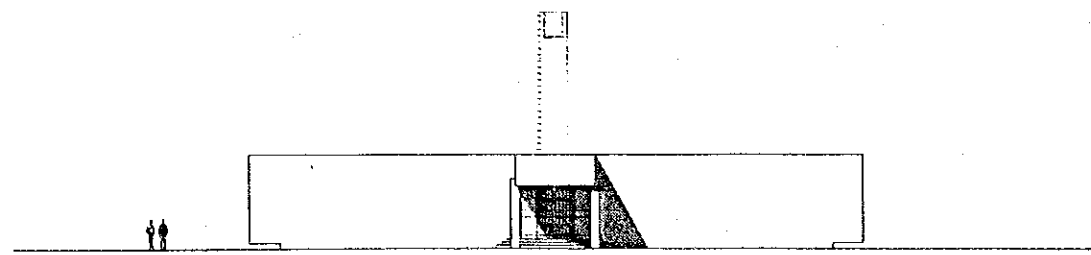
PROGRAM II

SITE PLAN

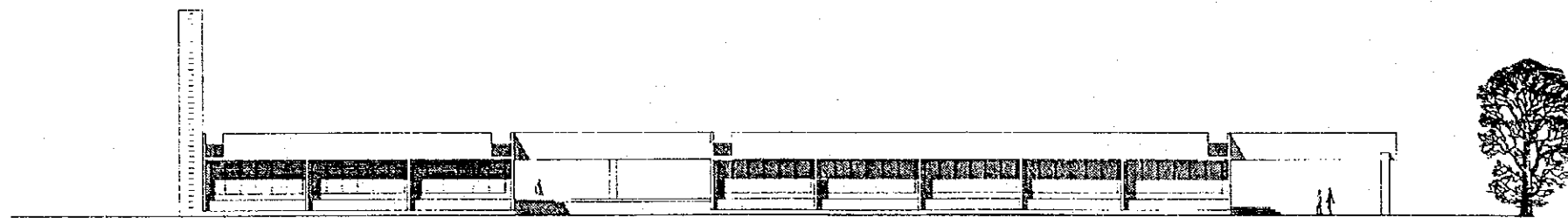
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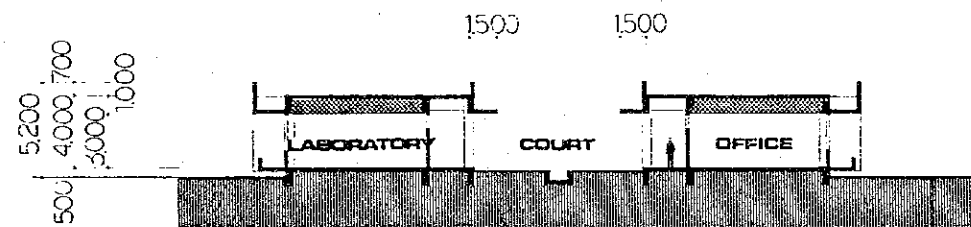
PROGRAM II PLAN 1:400



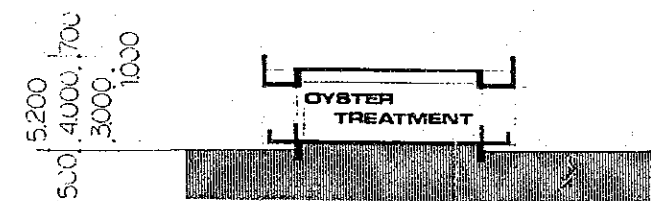
SOUTH-EAST ELEVATION



SOUTH-WEST ELEVATION



SECTION A

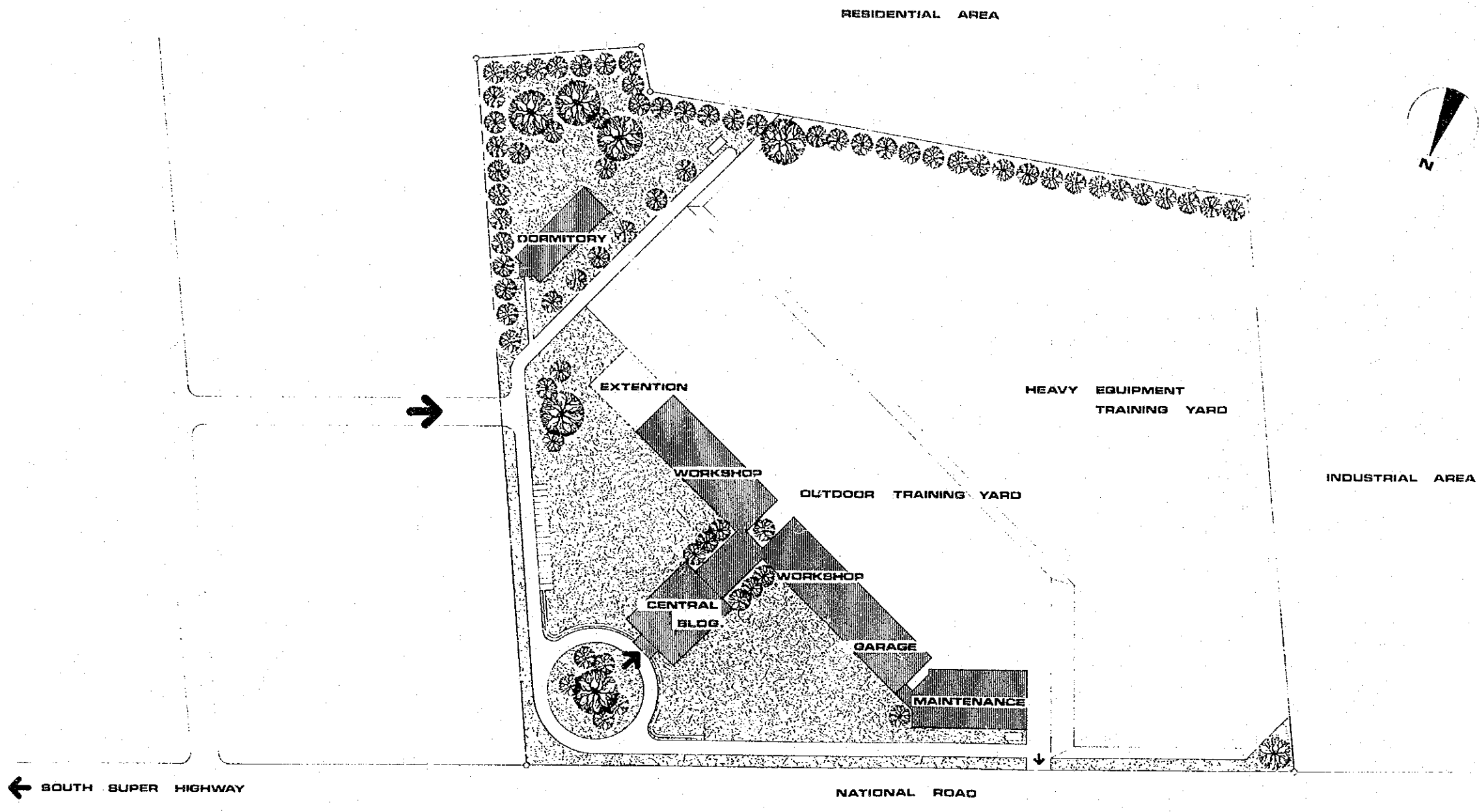


SECTION B

PROGRAM II

ELEVATIONS & SECTIONS

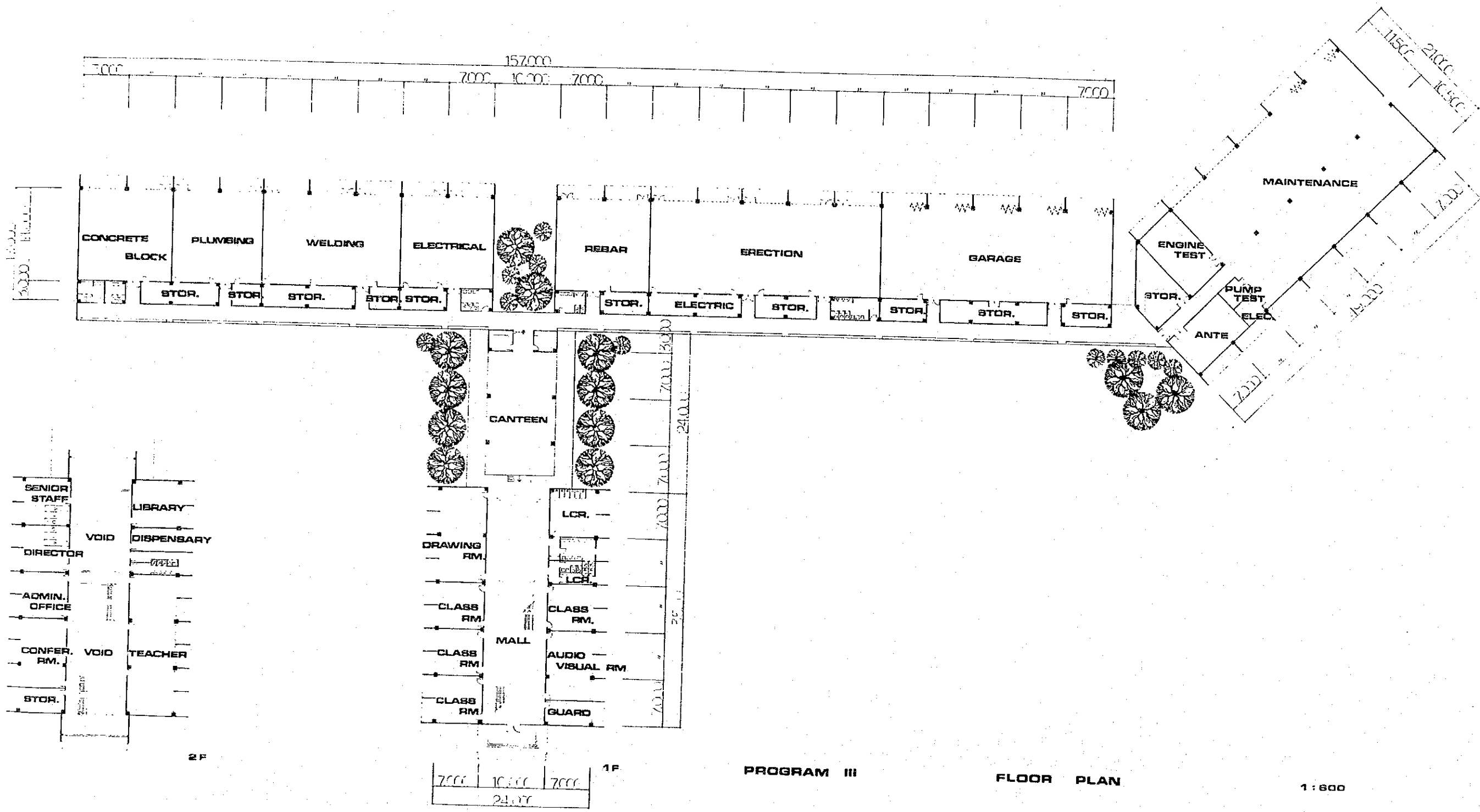
1:400



PROGRAM III

SITE PLAN

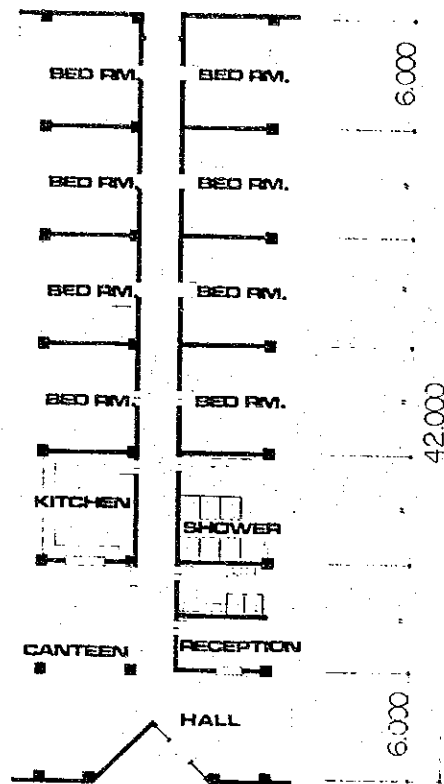
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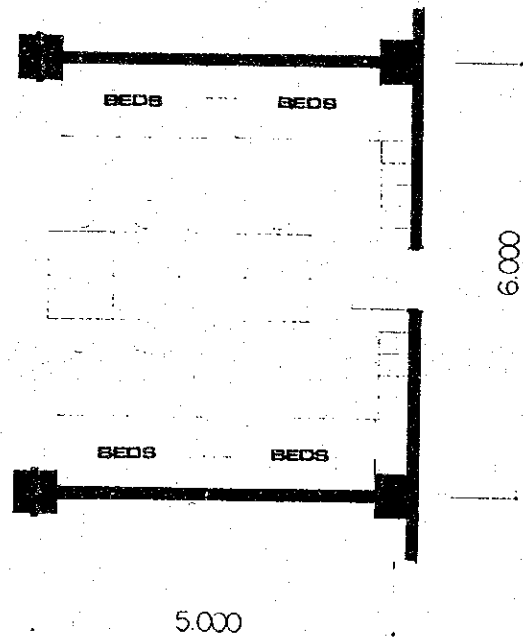
PROGRAM III

FLOOR PLAN

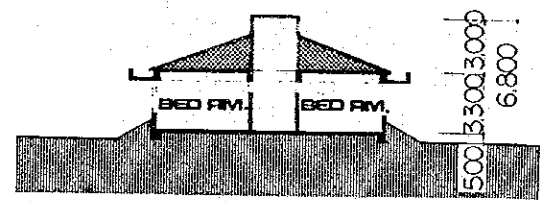
1:600



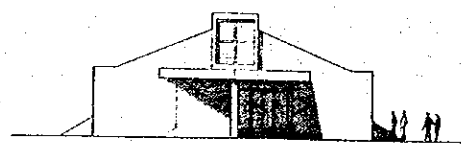
5.000 7.500
12.500 FLOOR PLAN



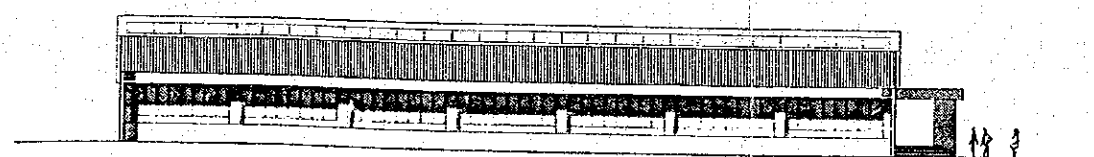
ROOM PLAN 1:100



5.000 7.500
12.500 SECTION

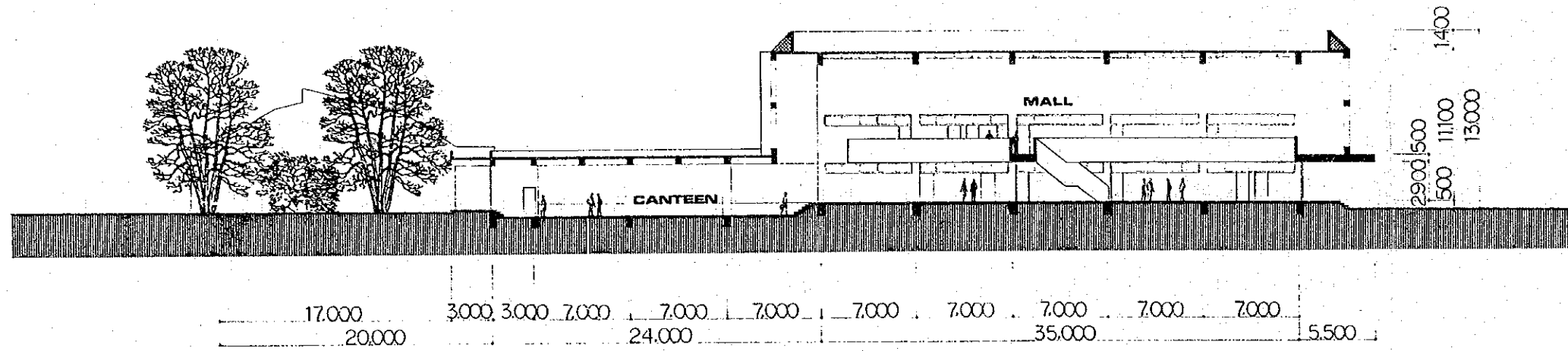


ELEVATION A

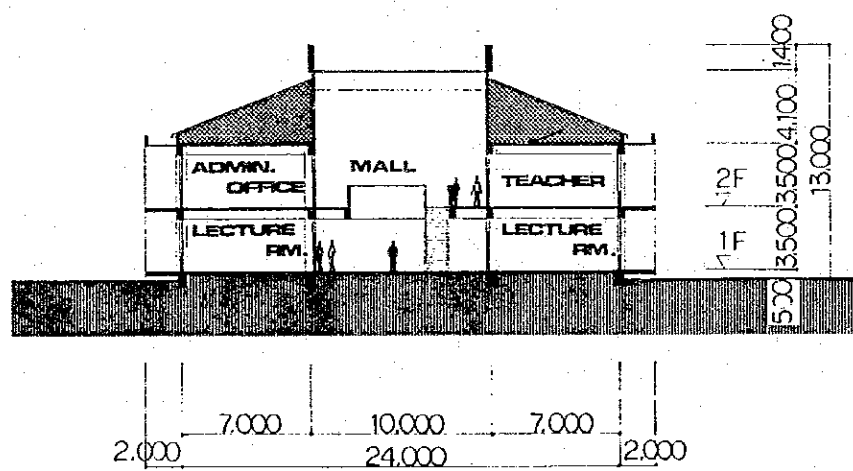


ELEVATION B

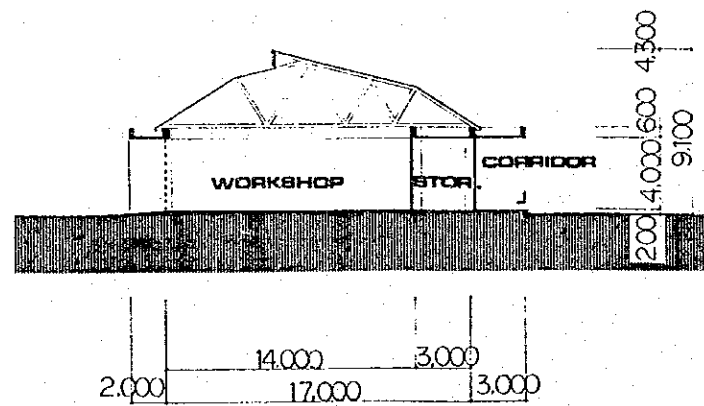
PROGRAM III DORMITORY PLANS, SECTION, ELEVATIONS 1:400, 1:100



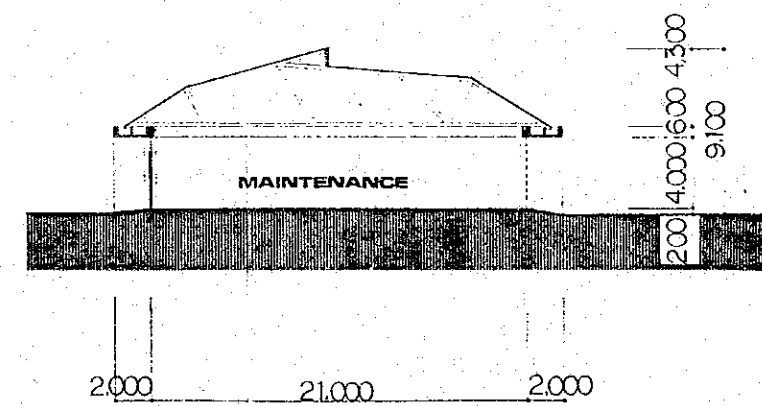
SECTION A



SECTION B



SECTION C

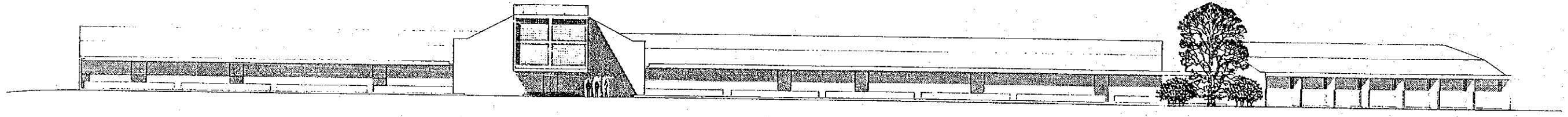


SECTION D

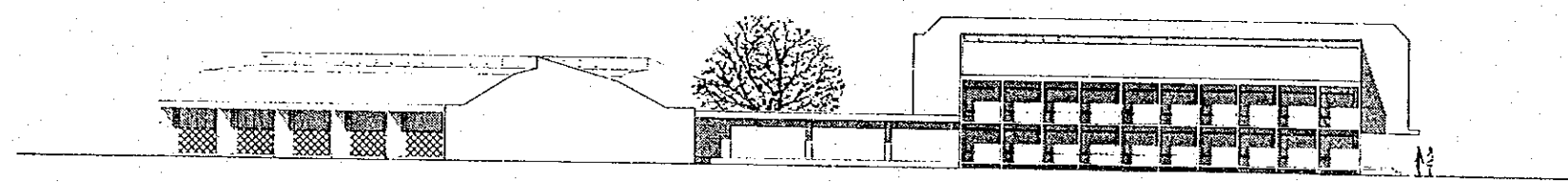
PROGRAM III

SECTIONS

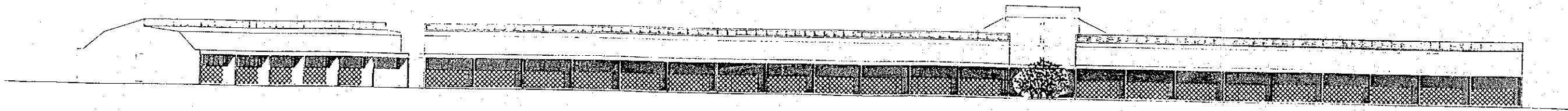
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ELEVATION



ELEVATION

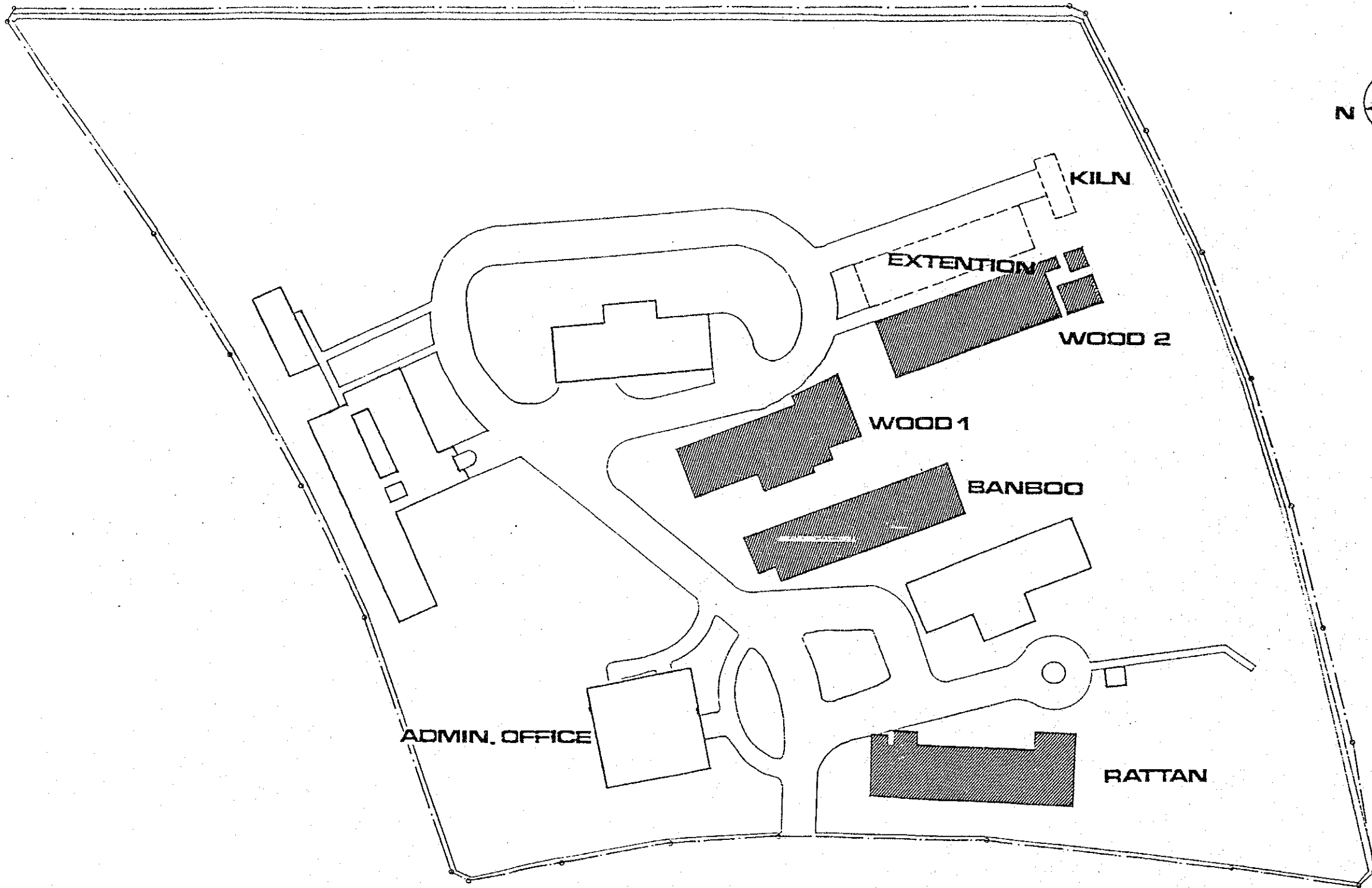


ELEVATION

PROGRAM III

ELEVATIONS

1 : 600



1,1000

4-5 LIST OF THE EQUIPMENT

1. PROGRAM I

(1) Equipment for Data Bank

- A Central Processing Unit System
- B Mass Storage Processor System
- C Magnetic Tape Unit System
- D Operator Station, I/O Driver System
- E Plotter, Terminal Control System
- F Off Line Equipment
- G Power Supply Equipment
- H VTR for Education
- I Software

(2) Equipment for Audio Visual Education

- A Video Studio System
- B Outdoor Production Car
- C Video Training Van
- D Audio Visual Classroom for 60 Students
- E Individual Playback System
- F LL Classroom Equipment
- G Dubbing System

(3) General Equipment

2. PROGRAM II

- (1) Experimental Equipment for Oyster Cultivation
 - A Equipment for both Raft and Pile Methods
 - B Natural Sterilization Method

- (2) Experimental Equipment for Oyster Sterilization
 - A Sterilization of Oyster with Shell
 - B Sterilization of Oyster without Shell
 - C Equipment for Sea Water Sterilization

- (3) Equipment for Environmental Research in Experimental Cultivation
 - A Dissolved Oxygen Analysis
 - B PH
 - C Salinity Assay
 - D Suspended Solid Analysis
 - E Chalorophll Analysis
 - F Plankton Determination
 - G Bottom Sediment Analysis
 - H Photographic Equipment
 - I Sample Preserve Equipment
 - J Others

- (4) Equipment for Biological Research in Experimental Cultivation
 - A Oyster Larva Determination
 - B Oyster Spat Determination
 - C Equipment for Growth and Adherent Creature
 - D Experimental Equipment for Indoor Breeding

- (5) Equipment for Biological Research in
Experimental Cultivation

- (6) Equipment and Vehicles
 - A Laboratory Equipment
 - B Freshness Preservation Equipment
 - C Equipments for Operation and Survey in
Cultivation
 - D Freshness Preservation

- (7) General Equipment

3. PROGRAM III

- (1) Heavy Equipment for Operation Practice in Construction Work
- (2) Equipment for Construction Machine Maintenance
 - A Machinery Unit
 - B Secondhand Construction Equipment for Maintenance Training
 - C Equipment for Body Maintenance Shop
 - D Engine Testing Equipment
 - E Fuel Pump Testing Equipment
 - F Electric Testing Equipment
 - G Measuring Instruments
 - H General Tool
 - I Special Tool
- (3) Equipment for Steel Work and Rebar Work
 - A Reinforcing Bar Work
 - B Erector
- (4) Equipment for Welding Work
- (5) Equipment for Electrical Work
- (6) Equipment for Plumbing Work
- (7) Equipment for CHB Work
- (8) General Equipment
 - A Field Instrument
 - B Training Equipment
 - C Office Equipment
 - D Video Training Van
 - E Audio Visual

4. PROGRAM IV

(1) Equipment for Woodwork

- A Equipment for Connecting to the Building
- B Hand Tools
- C Power Electric Hand Tools
- D-1 Working Machine for Cutting
- D-2 Planing Machine
- D-3 Wood Pressing Machine
- D-4 Carving Machine
- D-5 Wood Drilling
- D-6 Wood Lathe Machine
- D-7 Sanding Machine
- D-8 Other and Special Machines
- E Sharpening Equipment
- F Finishing Equipment
- G Testing and Measuring Equipment
- H Assembling and Packing Equipment

(2) Equipment for Bamboo Craft

- A Bamboo Treatment and Preservation
- B Bamboo Coloring / Bleaching
- C Material Processing Equipment
- D Circular Saw Cutting Equipment
- E Special Material Processing Equipment
- F Drilling Equipment
- G Polishing Equipment
- H Sanding Equipment
- I Planer Equipment
- J Special Equipment
- K Finishing Equipment
- L Dust Collector
- M Press
- N Hand-Held Equipment

(3) Equipment for Rattan Craft

- A Rattan Pole Processing Equipment
- B Cutting / Sawing Equipment
- C Rattan Peel Processing Equipment
- D Rattan Sanding Equipment
- E Painting / Coating Equipment
- F Hand-Held Equipment
- G Others

(4) General Equipment

4-6 ESTIMATION OF BUDGET

The work to be carried out by the Philippine authorities related to this Project is now estimated as stated below.

Program I ₱850,000.-

- (1) Removal of furniture and utilities in the existing building
- (2) Supply main of electricity, water and telephone to the building
- (3) Removal of water supply main at the site
- (4) Exterior work
- (5) Furniture and utilities

Program II ₱3,900,000.-

- (1) Site preparation
- (2) Deep well with casing
- (3) Supply main of electricity and telephone to the building
- (4) Exterior work (including jetty)
- (5) Furniture and utilities

Program III ₱8,710,000.-

- (1) Backfill of the site
- (2) Soil survey
- (3) Deep well with casing
- (4) Exterior work
- (5) Furniture and utilities
- (6) Supply main of electricity and telephone to the building

Program IV	₱2,850,000.-
	(1) Removal of existing machines in four workshops
	(2) Additional supply main of electricity
	(3) Renovation of existing buildings except their roofs and expansion works
	(4) Renovation of the existing dormitory
	(5) Furniture and utilities
Total	₱16,310,000.-

Note:

1. The amount stated above is for physical work only.
2. Cost for maintenance and operation mentioned in 5-5-2 of this report and administration expenses such as salaries for the Philippine staff, counterpart and trainees are excluded.
3. Furniture and utilities mentioned above do not include those provided by the Japanese cooperation.
4. The Philippine authorities are kindly requested to study these matters and take necessary measures so that the total implementation schedule might not be delayed.