BASIC DESIGN

CHAPTER FIVE BASIC DESIGN

A. PLANNING OF BUILDINGS

1. LAYOUT PLANNING

The entire campus development plan has been provided by NMP five year plan. Main approach is to be provided from a main gate facing the national highway. A loop road, 10 m wide, encircling the Administration Building is planned as the main traffic access within the Campus.

Topography of the site is such that the elevation along the national highway is +5 m above sea level, and terrain slopes to the southeast. There is a creek on the south side of the boundary.

2. TRAINING BUILDING

Proposed location of this building is near the seashore to the east of existing buildings. Axis line of this building is in line with existing buildings and at a 20 degree angle to the east-west orientation.

In consideration of the available area and shape of the proposed site, the building is designed as a two storied reinforced concrete building. Entrance is provided on the 2nd floor level to meet existing topography.

Floor elevation of the lower floor is designed to be +3.0 m above sea level in consideration of high tides.

3. ADMINISTRATION BUILDING

Proposed location of this building is at the center of the site, set back about 40 m from the national highway. The axis of the building is set at a right angle to the north-south orientation, in the same direction as future dormitory and library buildings.

Because the site is sloped towards south and in consideration of required floor area, it is designed as a two story reinforced concrete building.

4. GENERATOR BUILDING

This building is an ancillary facility of the Training Building. The generator is to be used for training. The building is to be located in the wooded area along the national highway (at the edge of Marcos Bridge) about 30 meters away from the Training Building taking into consideration the noise created when the generator is in operation.

B. DESIGN PRINCIPLES

Facilities of this Project are planned as part of the overall NMP master plan. Harmony with the overall master plan and existing buildings has been duly taken into consideration.

As to the quality of each building, use of local materials and construction methods are being adopted whenever possible. Emphasis is also being placed on ease and economy of maintenance and operation.

Design principles for each building are described below.

1. TRAINING BUILDING

As the retraining center of navigation and marine engineering at NMP, this building is to provide seamen with practical training. Lectures are to be heard in classroom buildings separate from this building.

Various simulators for retraining, actual equipment, models of hull construction, propulsion device, etc. based on the training program are to be installed in this building.

Grade of this building is to be equivalent to that of similar facilities of the Philippine Merchant Marine Academy (PMMA) with sufficient consideration given to the protection of the sensitive training equipment from the marine climate on Leyte, e.g. high temperature, high humidity, salty winds etc.

2. ADMINISTRATION BUILDING

Grade of the building is to be equivalent to standard local office buildings, and is being planned so that local materials and construction methods can be used. Emphasis is placed on providing well ventilated flexible office spaces.

3. GENERATOR BUILDING

This building is for training on the handling of diesel engine generator as a part of training. Sufficient space has been provided for trainees around the diesel generator. Grade of this building is to be that of a functional and practical shed.

C. ARCHITECTURAL DESIGN

1. TRAINING BUILDING

This facility is composed mainly of simulator and other training rooms where 17 training subjects are to be performed. As the subjects are to be distinctively divided into those of the navigation and engineering, the building proper is separated into two wings. An entrance hall and toilets are placed betweem these two wings, and are connected to the wings by corridors. The roof deck of the entrance hall is to be utilized for astronomical observation, sextant training and handling of magnet compass. Antennas for radar and other communication equipment are to be installed on this roof..

In determining the areas of the training rooms, spaces required for simulation equipment and ancillary equipment were laid out and spaces were provided around the equipment, not only for their operation, but also for observation by other trainees and instructors. Rooms for instructors, research and storage were also included to arrive at the total required spaces. As a result, two prototypes which can cope with all types of training were determined.

	Simulator	Research, Storage	Total
Large Type	196 m^2	70 m^2	226 m^2
Small Type	98 m^2	35 m^2	133 m^2

Since simulator computers are to be installed in the Large Type training rooms, 14-meter spans will be required in one direction. Module spaces of 7 x 14-meters was adopted, and utilized throughout by combining them into 14 x 14-meter spaces for Large Type room, or by utilizing them as 7 x 14-meter spaces for Small Type rooms.

a. Building Materials and Utilities

Where simulator computers are to be installed, air-conditioners primarily for dehumidification are to be installed. In order to cope with various wirings between equipment, a free-access double floor system is to be adopted in these areas. Surface finish of these floors is to be utility grade carpet for dustproofness and for absorging sound.

The windows of the training rooms are planned to be fitted with aluminum sash made in Japan to meet airtight requirement.

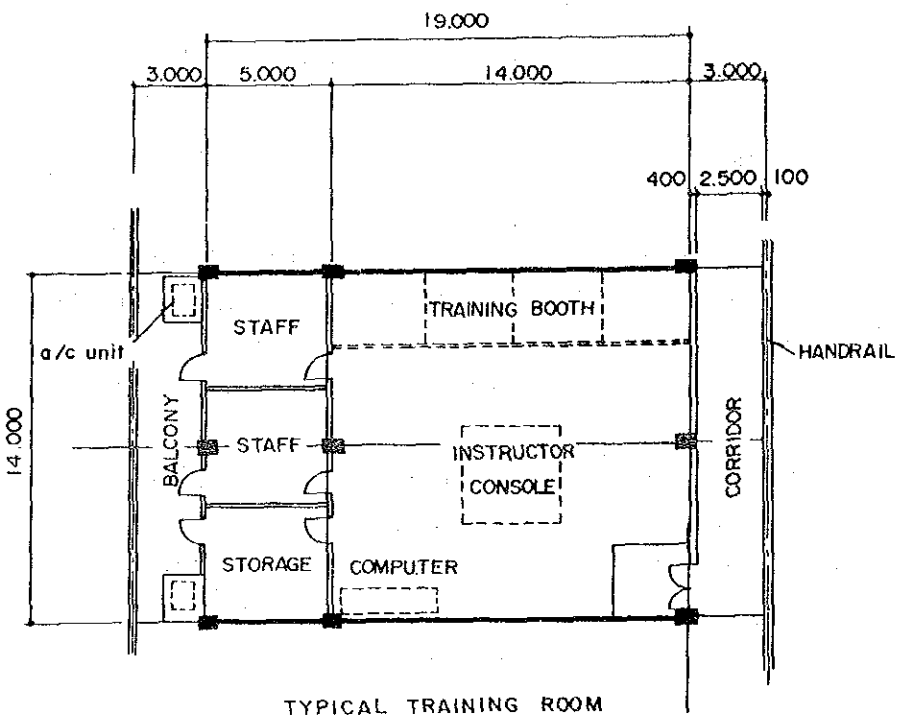
Corridors are designed as 2.5 meter wide single side roofed in open corridors in consideration of traffic of many trainees, carrying in and out of equipment and stormy rain during the rainy season.

A continuous balcony is to be provided on the outside of each training room to take advantage of the space for installation of outdoor units of the airconditioners.

A typical layout of training and staff rooms is shown on the next page.

Roof is to be a double wooden trussed roof on concrete slab roofed with local tiles.

Exterior wall finish is to be a exposed pebble aggregate finish, which is a local finish easy to maintain.



TYPICAL TRAINING ROOM

b. Exterior finish

1) Roof: Cement tiles made in the Philipines
wooden trussed roof on concrete slab
Asphalt waterproofing with concrete protection course over the entrance wing.

2) Exterior walls: Exposed pebble aggregate finish

3) Floors: Exposed pebble aggregate finish
(exterior corridor, balcony)

c. Interior Finish

	Floor	Wall	Ceiling
Training Room 1 (simulater related)	carpet (needle-punched, 5mm thick)	cement plaster or gypsum board, emulsion paint	acoustic mineral board
Training Room 2 (model and auxiliary training equipment rooms)	colored concrete hardener	same as above	same as above
Laboratory	pvc tile	same as above	same as above
Entrance Hall	exposed pebble aggregate	cement plaster, emulsion paint	cement plaster emulsion paint

d. Training Building Floor Areas

Navigation Department Building

	Simulator Rooms	Research and Storage Rooms
Ground Floor		
Steering Simulator	196 m^2	70 m^2
Hull Construction 196		70
Oil Loading and Cargo Safety Handling	196	70
Corridor and Balcony	327	
Subtotal	915 m^2	210 m^2
Second Foor		
Meteorological and Oceanic Climate Observation	98 m^2	35 m^2
Radar Handling	98	35
Electronic Navigation Instrument Handling	196	70
Radar Simulator (ARPA)	196	70
Corridor, Balcony 327		
Subtotal	915 m^2	210 m^2
Total	1,830 m^2	420 m^2

Entrance Building

Ground Floor	
Corridor, Staircase	108 m^2
Toilets	30
Mechanical Room	18
Electrical Room (incl. connecting corridor)	18
Subtotal	174 m^2

Second Floor

Entrance Hall	72 m^2
Corridor, Staircase	72 m^2
Toilets (incl. connecting corridor)	30
Subtotal	174 m^2
Total	308 m^2

Engine Department Wing

	Simulator Rooms	Research and Storage Rooms
Ground Floor		
Auxiliary Equipment Handling (water pumps)	98 m^2	35 m^2
Oil Cleaner Handling	98	35
Engine Construction	98	35
Auxiliary Equipment Handling (oil pumps)	98	35
Fire fighting, Rescue Equipment Handling	196	70
Corridor, Balcony	327	
Subtotal	715 m^2	210 m^2
Second Floor		
Diesel Engine Handling	196 m^2	70 m^2
Electrical, Electronic Circuits Handling	98	35
Auxiliary Equipment Handling (air conditioners, refrigerators)	98	35
Generator, Switchboard Handling	98	35
Process Control	98	35
Corridor, Balcony	327	
Subtotal	915 m^2	210 m^2
Total	1,830 m^2	420 m^2

2. ADMINISTRATION BUILDING

Office portion is envisioned to be an open type plan so as to provide large flexible spaces to cope with future changes in departments and sections. Departments and sections can be separated with plant boxes.

Floor plan consists of 3.2 m x 3.0 m grids so that positioning of office furnitures is easily dealt with. 7 spans of 6 m x 13 m unit spans having staircase and toilet on both sides are provided.

1st floor offices are for Administrative and General Services Department and Human Resource Department on the right and Finance Department on the left of Entrance.

2nd floor consists of Executive Staff Rooms and Teaching Staff Rooms, Conference Room, Reception Room, Radio Room and staircases.

a. Building materials

Windows of 1st floor office are aluminum jalousie windows of local make for function and ventilation. Floor material is terrazo finish in consideration of durability and cleanliness.

Floor of 2nd floor Executive Staff Rooms are to be finished with carpet, partition walls are of local Narra plywood and ceiling is of rockwool acoustic board. Other Executive Staff Rooms and Teaching Staff Rooms are to be finished with common office finish such as vinyl tile for floor, gypsum board with paint finish for walls and rock wool acoustic board finish for ceiling.

Rooftop is to be a double wood truss roof on concrete slab roofed with local cement tiles, the same as the Training Building.

b. Exterior Finish

1) Roof: Local cement tiles on wood truss

2) Exterior walls: Exposed pebble aggregate finish

3) Floor(Balcony): Exposed pebble aggregate finish

c. Interior Finish

	Floor	Wall	Ceiling
Entrance Hall Offices (large open spaces)	terrazzo	cement plaster, emulsion paint	cement plaster or gypsum board, emulsion paint
Executive Rooms, Conference Rooms	carpet	local Narra plywood, oil stain	mineral acoustic board
Vice President Rooms	pvc tile	cement plaster or gypsum board, emulsion paint	mineral acoustic board

d. Table of Floor Area of Administration Building

1st Floor Office (consisting of 14 sections for 47 staffs)	345.60 m^2
Counselling Corner	17.28
Lobby, Meeting Area, Reception	113.28
Corridor	98.56
Staircase	48.0
Toilet	48.0
Total	670.72 m^2
2nd Floor Office (Executive Staff Room, Secretary Room Teaching Staff Room)	282.88 m^2
Large Conference Room	67.84
Reception Room	16.96
Lobby	33.92
Corridor	121.60
Utility room	12.80
Storage Room	19.52
Staircase	47.68
Toilet	54.72
Total	657.92 m^2
Building Total	1,328.64 m^2

In determining the above floor areas, the following basic figures have been used:

President	35	m^2/person
Vice President	28	m^2/person
Office Staff	6.5	m^2/person
Training Staff	6.5	m^2/person

3. GENERATOR BUILDING

This is the facility where simulator training on diesel engine generator handling is to be conducted. Therefore, it is designed to be a practical shelter for machinery. It is of rigid frame structure

with exterior walls of concrete block, paint finish, roofed with local asbestos corrugated sheets. The basis for determining its floor area is as follows:

Diesel generator (4 x 1.5)	6.0 m^2
Auxiliary service tank	3.0 m^2
Space for training (4.0 x 10 persons)	40.0 m^2
Total Floor Area	49.0 m^2

D. STRUCTURAL DESIGN

Both Training and Administration Buildings are to be two storied and their framework must have sufficient bearing strength aginst all external forces so as to tansmit them to the ground simply and clearly.

In structural planning, therefore, they are designed by taking into consideration the above facts and economy as well.

1. FRAMING SYSTEM

Main framing of all these buildings is to be RC rigid frame construction, and for large framework (14 m for Training Building and 13 m for Administration Building), use of prestressed concrete beams (post-tension) is being considered.

2. DESIGN STANDARDS

Structural design is based on the National Structural Code, commonly used in the Philippines at present, which is based on ACI Standards.

For the design of this facility, ACI 318-77 (Ultimate Strength Design has been used.

3. LOADS

a. Live Loads

Live loads have been determined in accordance with NSCP Standards as follows:

Room	Live Load (kg/m^2)
Training Room	500
Office	300
Corridor, Lobby	500
Toilet	300

b. Seismic Force

Seismic force against buildings has been calculated by using the following formula based on NSCP Rules:

$V = ZKCW$, where

V : Base shear

Z : Coefficient characteristic of the region and soil bearing conditions of the building. Z is taken as 1.4 in this case.

K : Coefficient determined by type of structure

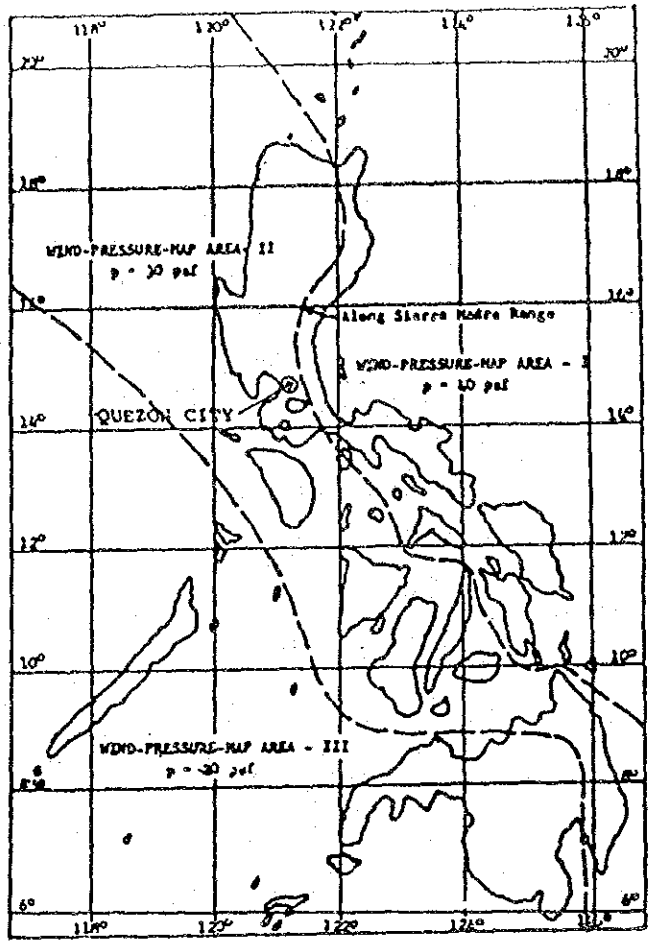
$K = 1.0$

C : Coefficient determined by the individual cycle of the building (T)

$C = 0.0.5/3\ T$

c. Wind Pressure

Wind pressure acting on the building is to be determined in accordance with NSCP. Tacloban is in Area I where the wind pressure coefficient is determined by the chart on the following page. Since the building height is 13 m (42.66 ft), the wind pressure coefficient is to be 40 psf.



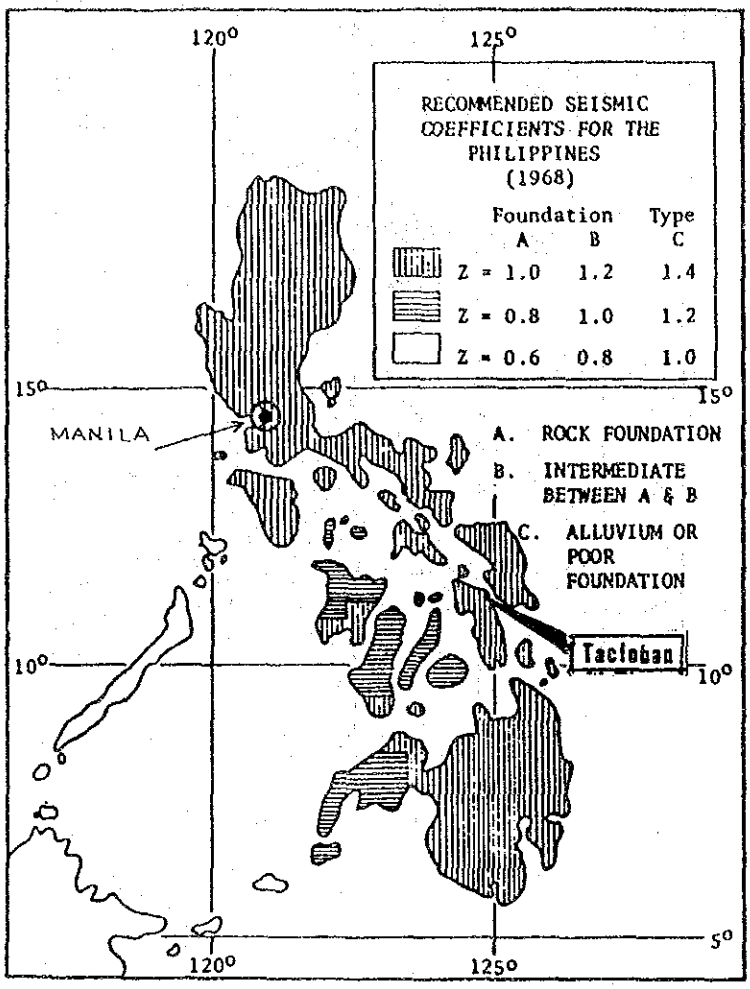
WIND-PRESSURE-MAP AREAS FOR THE PHILIPPINES

WIND PRESSURE AREA MAP

BASIC WIND PRESSURES FOR DIFFERENT HEIGHTS ZONES ABOVE GROUND FOLLOWING UNIFORM BUILDING CODE HEIGHT ZONES AND PRESSURE VARIATIONS (AUTHOR'S RECOMMENDATION)

HEIGHT ZONE IN FEET	WIND-PRESSURE-MAP AREA		
	AREA – I	AREA – II	AREA – III
Less than 30	30 psf	20 psf	10 psf
30 to 50	40 psf	30 psf	20 psf
50 to 100	50 psf	35 psf	25 psf
100 to 500	60 psf	40 psf	30 psf
500 to 1200	70 psf	45 psf	35 psf
over 1200	80 psf	50 psf	40 psf

WIND PRESSURE COEFFICIENTS



SEISMIC COEFFICIENT "Z"

d. Piles

Based on the analysis of boring data, concrete friction piles are being adopted.

Training Building	(300 x 300 mm)	L = 15 m
Administration Building	(300 x 300 mm)	L = 12 m
Generator Building	(300 x 300 mm)	L = 12 m

e. Concrete

Design strength

FC = 210 kg/cm^2 (3,000 psi)
FC = 280 kg/cm^2 (4,000 psi) for prestressed concrete
Slump: 15 cm (= 6 inches)

f. Reinforcement Steel

Standard Design Strength

Plain bar	Long term	1,600 kg/cm^2 (SR 24)
	Short term	2,400 kg/cm^2 (SR 24)
Deformed bar	Long term	2,000 kg/cm^2 (SD 30)
	Short term	3,000 kg/cm^2 (SD 30)
	Long term	2,200 kg/cm^2 (SD 35)
	Short term	3,500 kg/cm^2 (SD 35)

E. UTILITY DESIGN

1. DESIGN PRINCIPLES

Design principles of utility design is to be in compliance with domestic regulations of the Philippines and when they are not applicable, Japanese regulations are to be applied. Following items are to be taken into consideration in the planning:

a. Utility design is to be maintenance free with minimum operation cost for energy saving.

b. Utility system is to be safe and easy to maintain.

c. Local materials and equipment are to be used as far as possible.

d. Equipment and materials used are to be durable.

e. Equipment shall be selected so that maintenance can be performed locally.

f. Spare parts and supplies should be available locally.

g. Construction methods which are locally available are to be adopted as far as possible.

2. ELECTRICAL

a. Trunk line system

Incoming panelboards are to be in electric room of Training Building and in staircase of Administration Building. Electric supply is to be 3-phase,3-wire, 60Hz, 220V to distribution and power panelboards in each building.

Approximate loads estimated are as follows:

Training Building	240 kVA
Administration Building	55 kVA

Underground cable wiring from Generator Building to the incoming panelboard in Electrical Room in Training Building is to be provided so as to enable electric supply to Training Building for emergency electric supply.

Incoming panelboard in the Administration Building is to be self-standing, wall mounting type provided with trunk line protective relay and 100V transformers.

Incoming panelboard in the Training Building is to be cubicle type complete with items as follows:

Protective circuit breakers for trunk lines
Stepdown transformers for 100V use
Switching system for emergency electric supply from the Generator Building.

Electric system is as follows:

Trunk line power system 3P-3W, 220V, 60 Hz
Lighting system 1P - 2W, 220V, 60 Hz
Receptacle outlet system 1P - 2W, 220V, 60 Hz and
1P - 2W, 100V, 50 Hz

b. Power supply system

Power supply system includes installation of power panelboards and power controlboards for power supply for lift pumps, air conditioners, ceiling fans, etc. as well as secondary piping and wiring from panelboards.

Power supply system also to include installation of panelboards for power supply to training equipment and secondary piping and wiring from panelboards.

c. Lighting and receptacle outlet system

For lighting, fluorescent lamps are to be used in principle, with partial use of incandescent lamps.

Area divisions for on and off switching of lighting fixtures are to be provided in smaller areas with switches installed near each entrance so as to enable reduction of electricity cost.

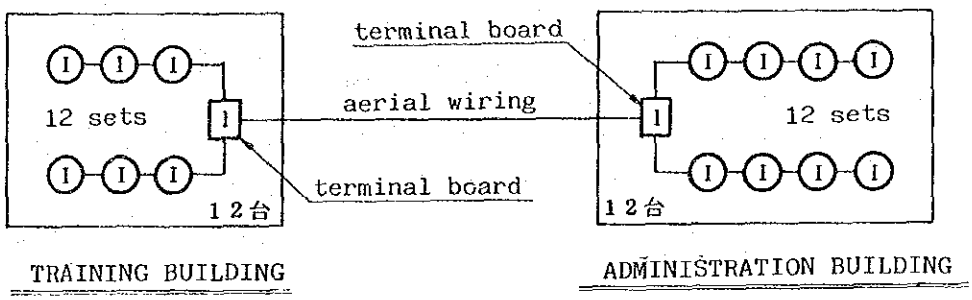
Luminous intensity in each room and lighting fixtures used are listed as follows, with fixtures of practical, effective and energy saving type.

Receptacle outlets are to be wall mounted types in principle with floor mounted types used where necessary.

d. Intercom system

There is no telephone system available near the site, however, preliminary telephone piping is to be provided for future wiring. Outlets are to be wall mounted in principle with floor sockets used where necessary.

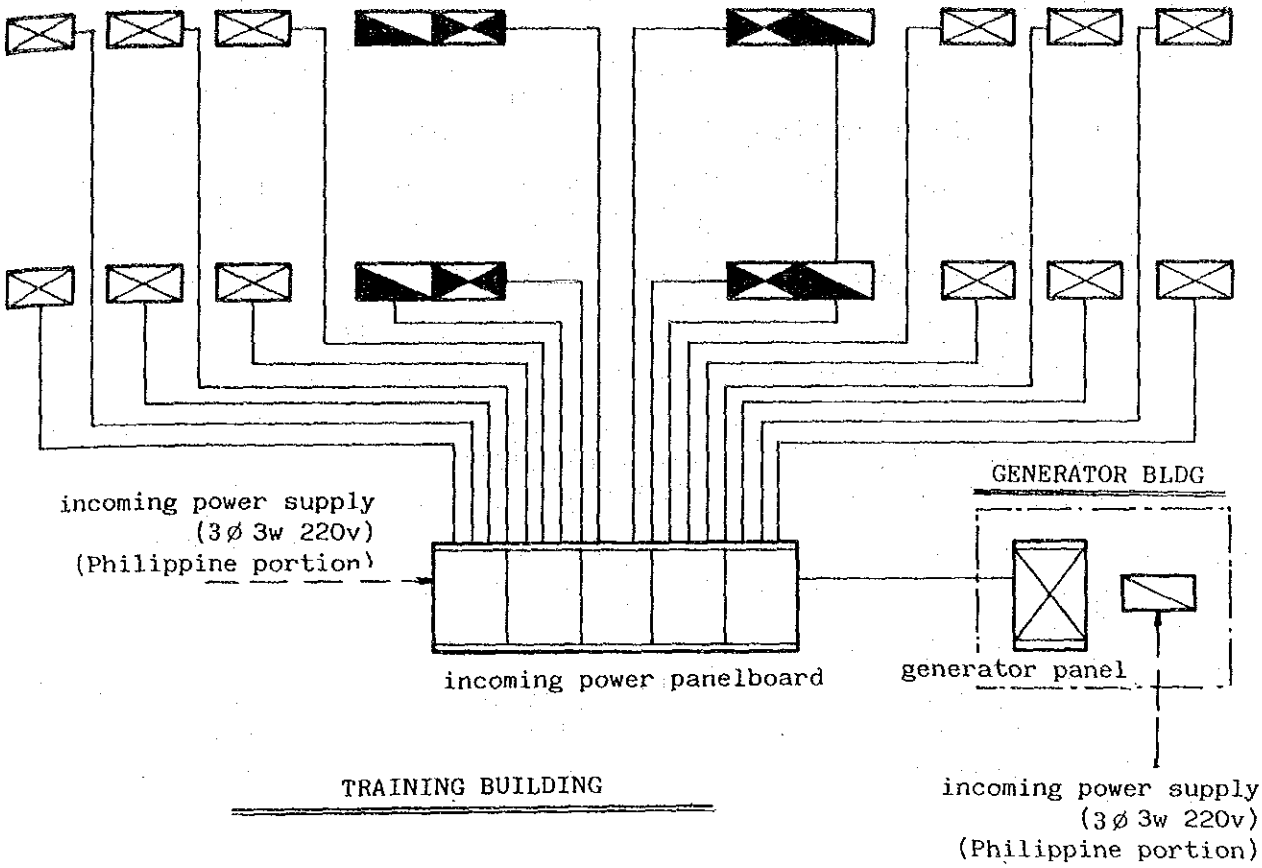
Since no telephone system is available, interphone system is to be provided for communication within the buildings and between Administration and Training Buildings.



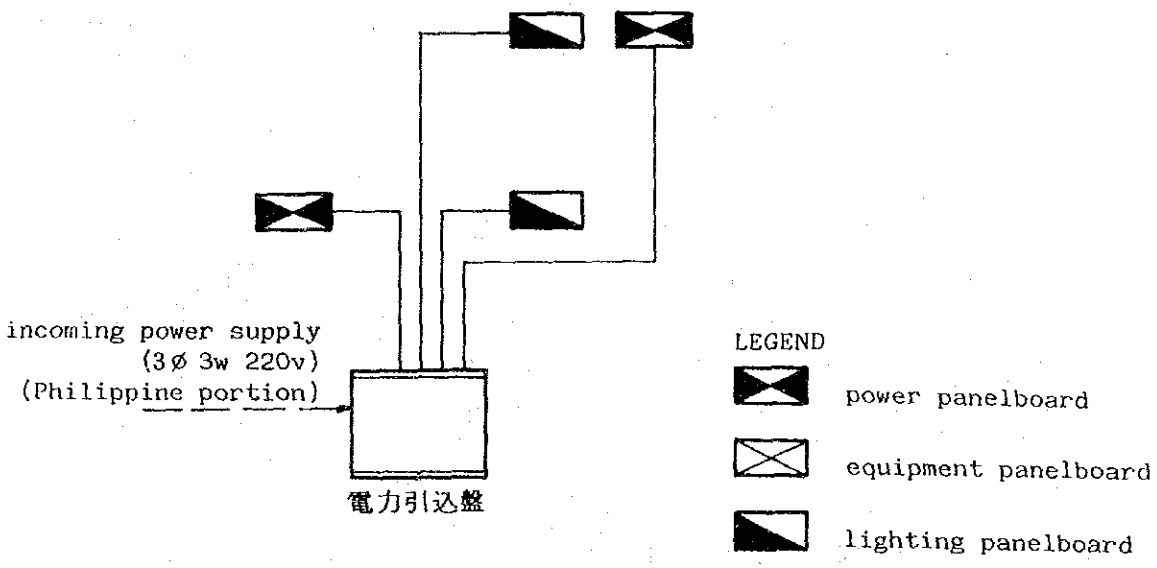
INTERCOM SYSTEM DIAGRAM

e. Automatic Fire Alarm System

In consideration of installation of valuable equipment in Training Building, each room is to be provided with heat detectors for early detection of fire. Manual button type fire warning bells are to be provided in the corridor.



TRAINING BUILDING



ADMINISTRATION BUILDING

ELECTRIC SUPPLY DIAGRAM

LIGHTING FIXTURES

	Fixtures Types	Luminous Intensity (Lux)
Training Building		
Training Rooms	pipe pendants with reflectors	300
Staff Rooms	surface mounted	300
Administration Building		
Ground Floor Office	pipe pendants with reflectors	300
Second Floor Executive Offices	flush mounted open type	300
Common Spaces		
Toilets	surface mounted	100
Corridors		50 to 100

3. AIR CONDITIONING AND VENTILATION

In rooms where simulators are installed in the Training Building, cooling system is to be provided because of large amount of heat generated from equipment and from considerations of dustproofing and dehumidifying for the precision equipment.

Four teaching staff rooms, rooms of the Chairman, the President and Conference Room are to be provided with air conditioning.

Air conditioning system is to be of individual, air cool, package type systems to save elecricity cost by operating individually to meet needs.Air conditioners are to be of split type with outside units installed on the balcony. Inside units are to be direct blow type either floor mounted or ceiling mounted.

Other rooms are to be provided with force ventilating ceiling fans commonly used locally in addition to ventilation means provided architectually.

In toilets and utility rooms, ventilation fans are to be provided for forced ventilation.

4. WATER SUPPLY, DRAINAGE AND PLUMBING

a. Water Supply System

Water supply system is to be the work portion of the Philippine side, but in consideration of low water pressure, water reservoirs are to be installed for each building. Water supply is to be by lifting water from the reservoirs to elevated water tanks, from where water is to be supplied to toilet, utility rooms, etc. by means of gravity.

Water reservoirs are to have the capacity to store 1/2 of water required for one day consumption (16 m^3 for Training Building, 8 m^3 for Administration Building). Water tanks of 8 m^3 for Training Building and 4 m^3 for Administration Building, made of FRP Panel, are to be installed on the ground outside the buildings. Elevated

water tanks of 40% of the reservoir capacity (3 m^3 for Training Building and 1.5 m^3 for Administration Building), made of FRP panels are to be installed in attic spaces of the buildings.

b. Drainage System

Drainage system is to be a dual system, one for sewage from toilets and the other for miscellaneous waste water. Sewage from toilets is to be led into septic tanks and treated before discharge. Miscellaneous wastewater is to be led to drainage within the site.

c. Plumbing Fixtures

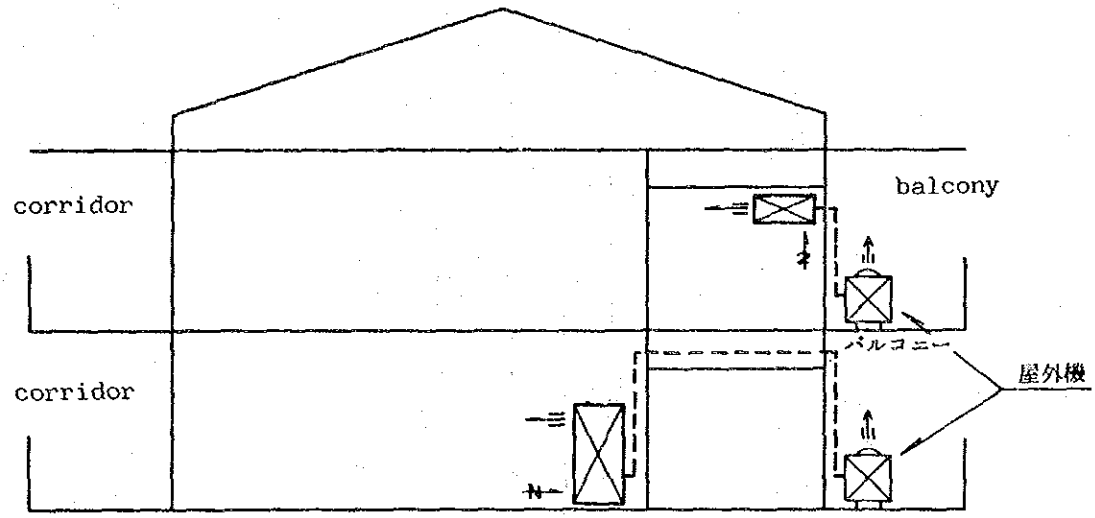
Toilets are to be provided with water closets, urinals and wash basins. Water saving type water closets are to be used.

d. Fire Fighting System

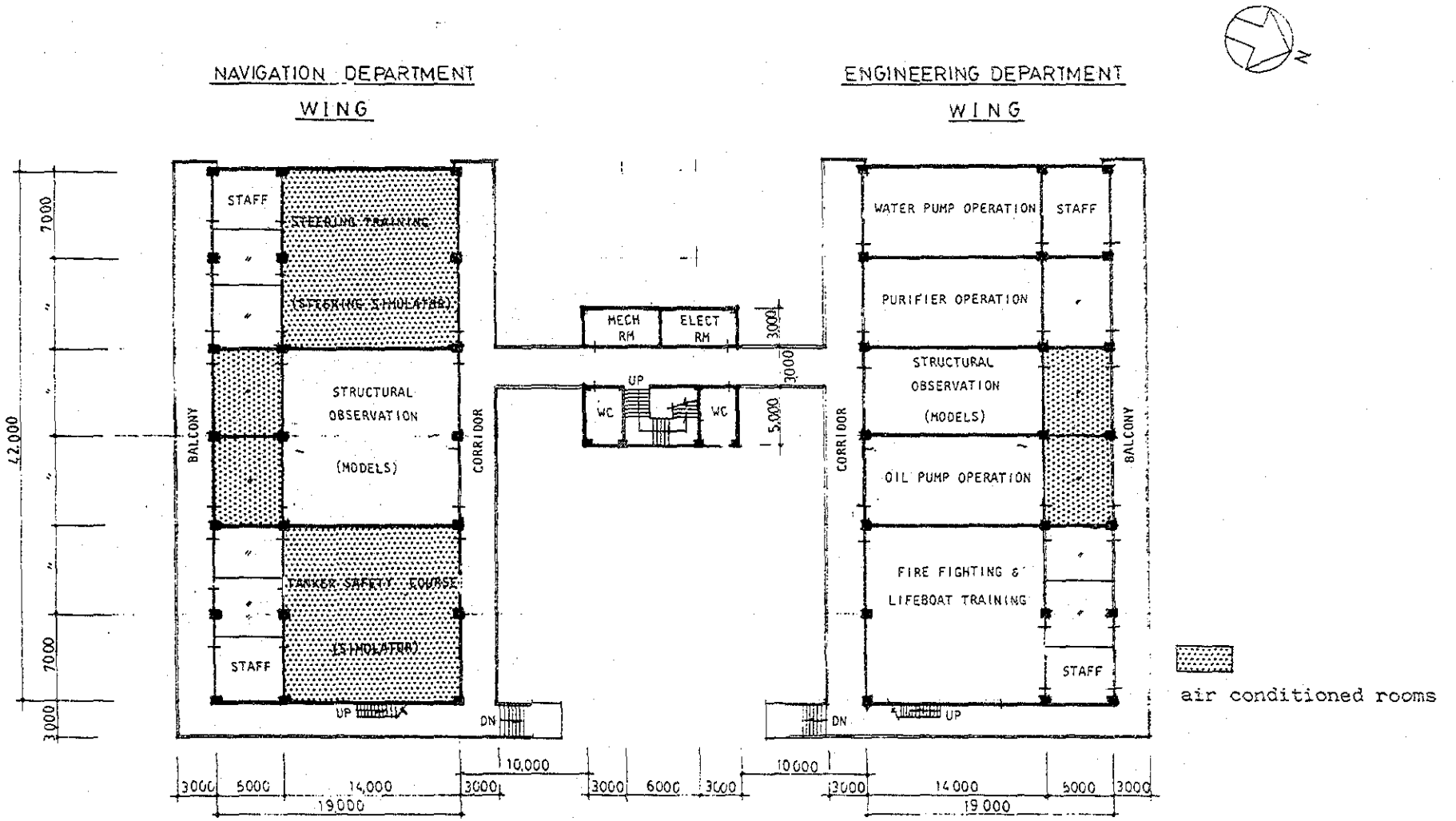
Fire hose equipment and fire extinguishers are to be provided in the fire hydrant boxes near staircases of the buildings. Siamese connections are to be provided on the exterior walls at ground level of each building. Dry risers are to be connected to hydrant boxes on upper levels.

e. Sewage Treatment System

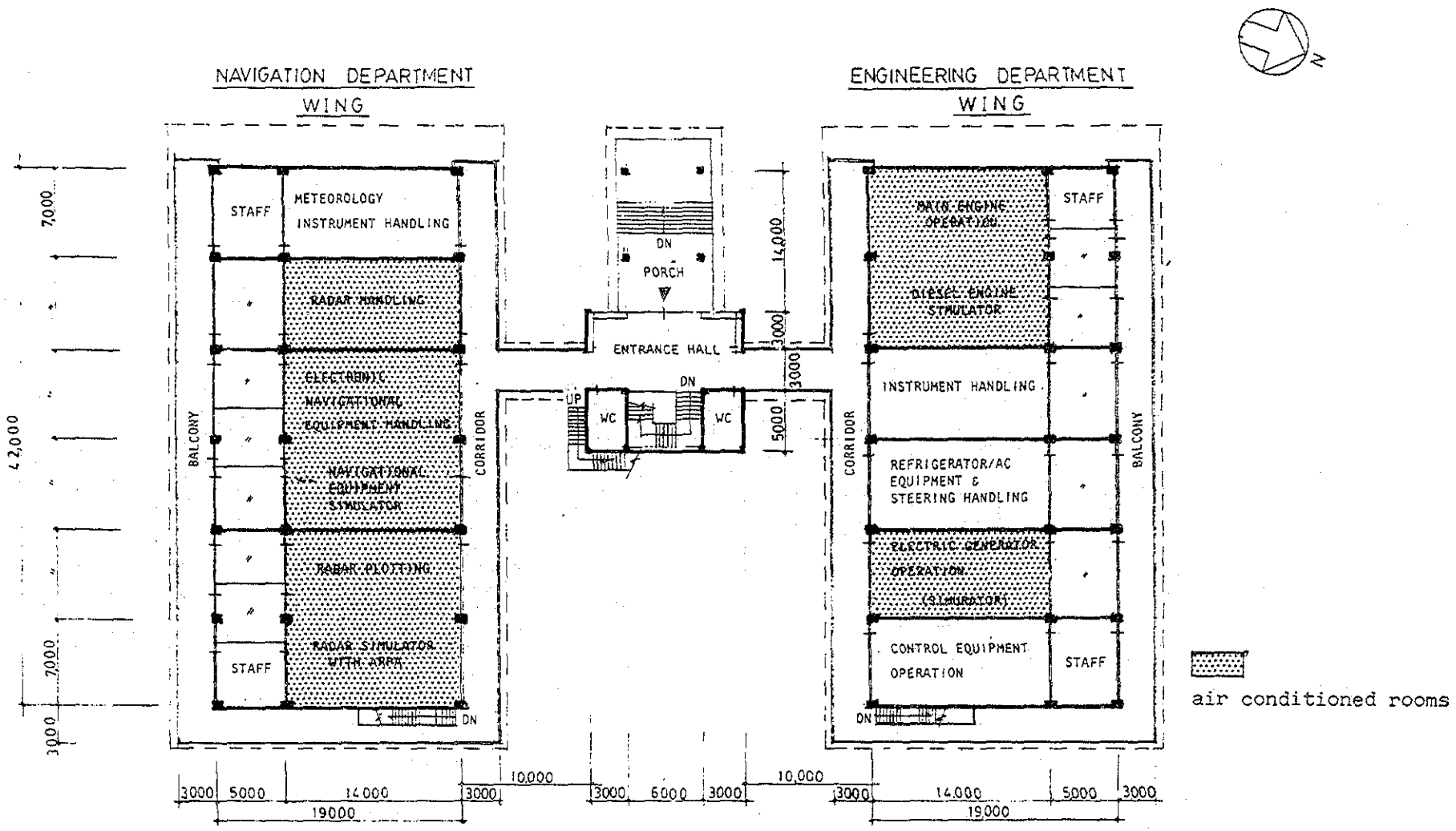
Sewage treatment system is to be composed of settling, decomposition and separation compartments with holding period of 6 days. Assuming sewage capacity to be 25 liters/person, Training Building will require 5 m^3/day, therefore the capacity of the treatment system is determined as 30 m^3, and as the Administration Building will require 1.5 m^3/day, its system is determined as 10 m^3.



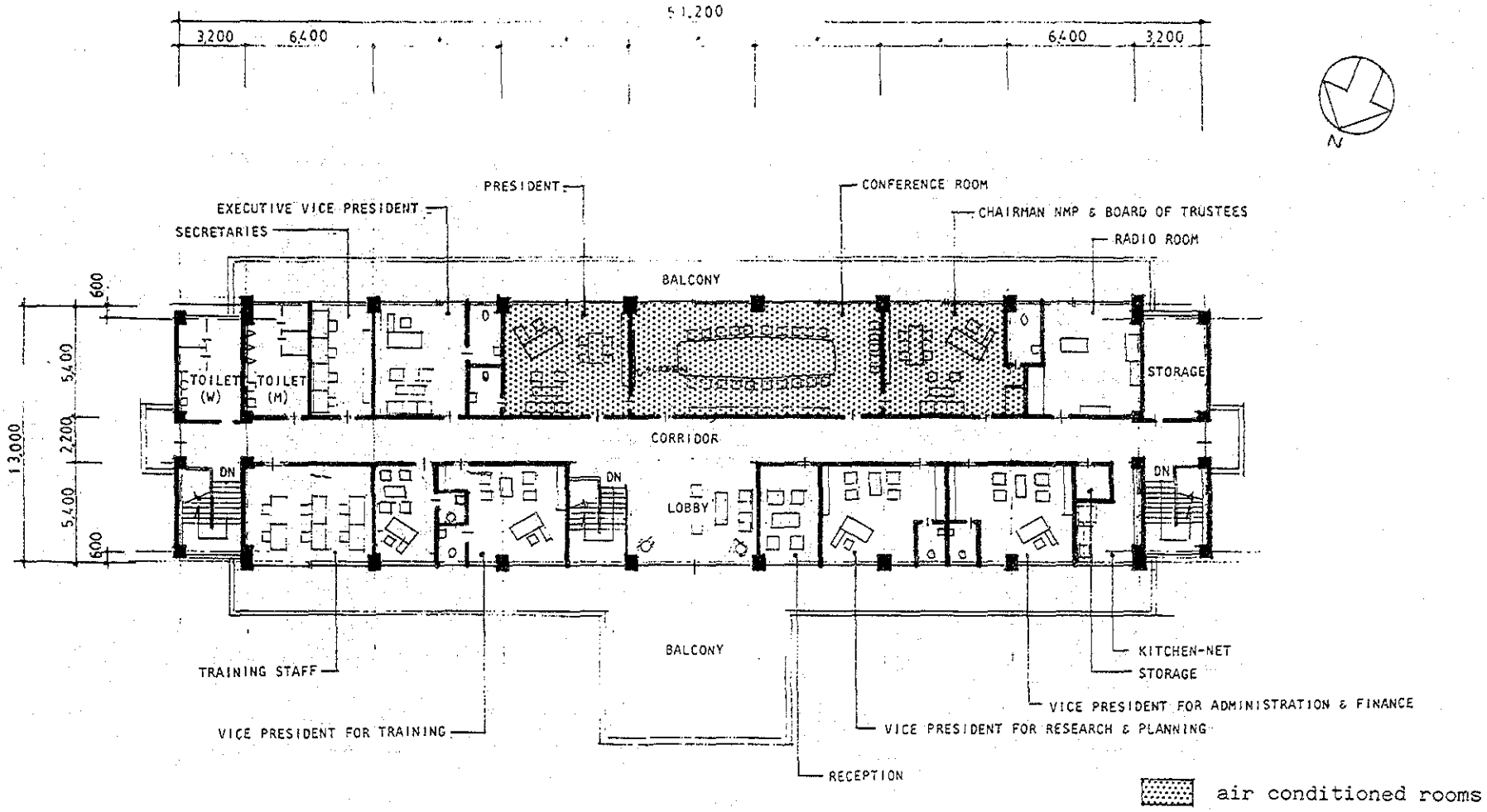
INSTALLATION OF SPLIT-TYPE REFRIGERATORS



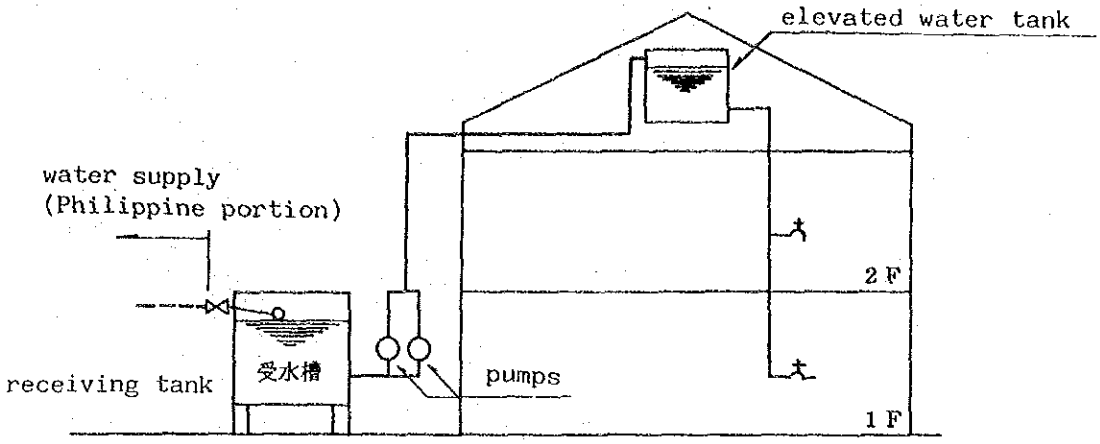
AIR CONDITIONED ROOMS
GROUND FLOOR
TRAINING BLDG



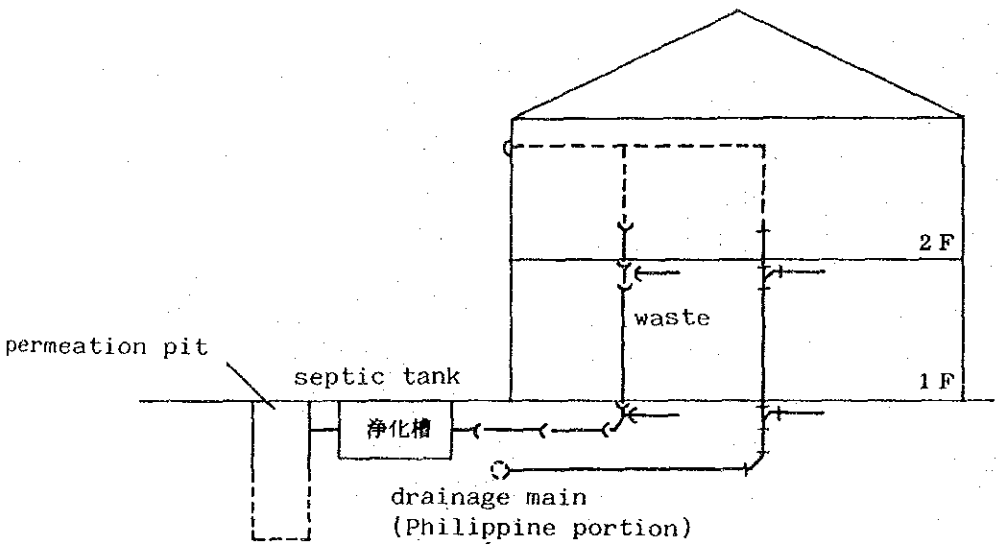
AIR CONDITIONED ROOMS
2ND FLOOR
TRAINING BLDG



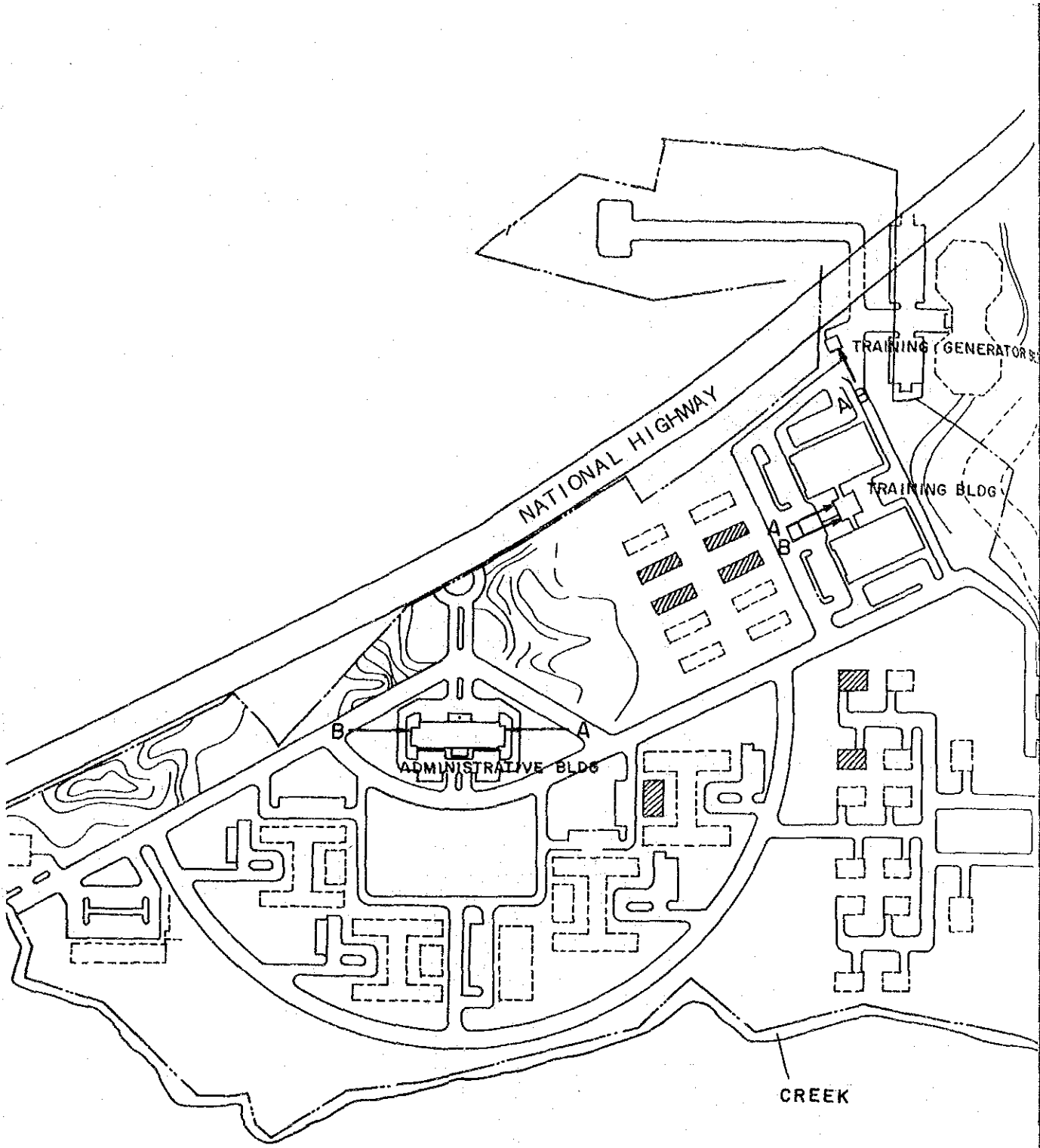
AIR CONDITIONED ROOMS
2ND FLOOR



WATER SUPPLY SYSTEM



DRAINAGE SYSTEM



LEGEND

A. water supply
B. electric supply (3 phase 3W 220

SERVICE CONNECTION LOCATIONS FOR WATER & ELECTRIC SUPPLIES

F. TRAINING EQUIPMENT DESIGN

The design of the Training Equipment was based on the curriculum of the retraining as mentioned in the previous chapter.

The reason for installation of each of the materials and equipment is shown hereunder.

1. UPGRADING COURSES

a. Navigation Department

1) Radars (Actual Equipment)

a) Purpose

All ocean-going vessels are equipped with radars to make sure the positions of Own Ship, Other Ships, various sea-marks, etc.

Captains and deck officers are by all means required to have the knowledge and techniques in the use of radar equipment. Accordingly, the STCW Convention obliges radar training . This is why radar equipment should be provided.

b) Outline

The equipment is composed of complete ship-borne radar sets --- X-band and S-band --- and a radar recording system.

The radar recording system (VTR) makes playback, on the radar display, of the provided actual echoes of the extraordinary situations, such as rough weather, electromagnetic interference, and so on.

This radar equipment enables the trainees to learn operation and use of shipborne radars under all conditions.

2) Radar Simulator (with ARPA)

a) Purpose

In radar navigation, nothing is more important than to distinguish whether informations received on radar are correct. Furthermore, avoidance maneuvers under analysis of such information must be performed and effects must be correct. These techniques are indispensable for the duties of captains and deck officers.

In order to learn these techniques, actual radar equipment fixed on land is not suitable as the amount of information is very little. Therefore, as stated by the STCW Convention, the Radar Simulator becomes necessary.

ARPA, receiving informations from the radar, automatically pursue Target Vessel or any object dangerous to Own Ship and then indicates situation of danger. SOLAS, the US and other nations require its installation on board. The Training of radar plotting and maneuver for collisioin avoidance, and of navigation with these equipment, should be done in particularly congested sea lanes and confined channels. This is why Radar Simulator should be provided.

b) Outline

This is composed of Own Ship Section, Instructor's Section, Central Processing Section and other attachments.

To Own Ship Section ARPA is attached and various echos via Central Processing Section are indicated on the display. The instructor can control necessary informations for training through programming.

This equipment can given trainings concerning radar navigation and collision prevention.

3) Navigational Aids Simulator

a) Purpose

The principal aim for navigation is to reach the destination safely and effectively. In order to do so it is necessary to grasp, at any time and precisely, the present position, absolute course of Own Ship, and the state on and in the water. Training in the use of and maintenance of navigational aids, and analysis of data received from such aids are necessary.

As actual navigational aids themselves installed on the fixed point cannot introduce satisfactory analysis of information, the simulator which is able to display various informations via the computer on the actual models is needed.

This type of training is also stated in the STCW Convention.

b) Outline

This is composed of various kinds of navigational aids such as NNSS, Loran, etc., a signal generator and a computer console. The navigational aids are capable of receiving real signals as well as computer-generated images through the signal generator.

This equipment gives training on the analysis of received informations, the use and maintenance of each equipment.

4) Observation Equipment for Meteorology & Marine Meteorology

a) Purpose

Grasping and predicting of the present situations of weather and sea are mandatory for safe navigation. The former is done by using meteorological instruments and the latter by facsimile, by means of analyzing weather informations from outside.

This instrument must be provided for the training of meteorological observation.

b) Outline

The instrument is made up of a thermometer with a recorder, a hygrometer, a barometer, a wind direction/velocity indicator and a hyetometer; added with facsimile.

This gives training on weather and sea condition observation, analysis of weather map, etc.

5) Sextants and Crystal Chronometer

a) Purpose

Vessels at sea use celestial bodies to determine their positions. So the training on a sextant and a crystal chronometer is required.

b) Outline

Sextants and crystal chronometer used on board general merchant vessels. These are required for training on celestial observations.

6) Steering Simulator

a) Purpose

One of the most important for ship's maneuvering and handling is the knowledge and skill of steering. Captains and deck officers must acquire these techniques. The steering simulator is needed that the trainees may have the same feeling as is given by the actual ship's steering apparatus and also may ahieve higher grade techniques.

b) Outline

The simulator is divided into two main parts. One is Navigational Condition Simulator composed of an input console, a display, a recorder and a computer; the other is composed of a ship handling console, a gyro-compass, an electrohydraulic steering gear, etc., fitted on a mock ship.

Through the computer Navigational Condition Simulator is able to simulate Own Ship's handling characteristics, Other Ship's navigation conditions and other peripheral situations, while the steering gear gives the same steering feeling as a real vessel.

This equipment gives trainings relative to steering techniques, such as avoiding, course changing, steady course keeping and emergency measures.

7) Magnetic Compass with Turntable & Repeater

a) Purpose

To find ship's direction, a magnetic compass is basically used. This type of compass produces errors when fitted on a magnetic body like a steel vessel. The equipment is required for the purpose of giving training on how to find, adjust and compensate errors.

b) Outline

The equipment is composed of a magnetic compass fitted on a turntable and of its deviation adjusting and compensating parts.

Various situations are produced by turning the table and training on using, adjusting and compensating the magnetic compass can be performed.

8) Vessel Bodies

a) Purpose

For the purpose of safe navigation, knowlege of ship construction is necessary to prevent damage or flooding in a compartment. Explanation using models produces the best effect on the training.

b) Composition

Models are those of a general cargo vessel, a bulk carrier, a container ship and a tanker.

They make it easy to understand ship construction.

b. Engineering Department

1) Diesel Main Engine Simulator

a) Purpose

Watchkeeping duty in the engine room is mainly operation and surveillance of engine plant, which require general understanding of the main engine (diesel) together with the engine propulsion machinery and the auxiliary associated machinery.

So it is necessary to provide a marine diesel engine simulator which makes it possible to give the training on engine room watchkeeping techniques with the similar atmosphere as in the engine roomand engine control room of an actual vessel.

b) Outline

This simulator consists of a graphic panel, a main and auxiliary engine control console, an instructor's console, a mimic sound generator and a central processing equipment.

The simulator is based on the characteristics of the main engine (diesel) and some typical auxiliaries in the engine room of a cargo vessel.

The graphic panel and engine control console are equivalent to real machinery and a real control console respectively, and then by means of the instructor's console and computer system, various operating conditions, malfunctions and accident situations are introduced.

This simulator enables the trainees to be trained on the operation and surveillance of the diesel engine propulsion plant in the engine room.

2) 4-stroke Diesel Engine for Emergency Generator

a) Purpose

A vessel has a standby generator to provide the minimum necessary power in case of emergencies. So it is necessary for equipment which can give training on starting and maintaining emergency generators.

This generator is also necessary as the back-up power source for the training equipment.

b) Outline

The equipment is composed of a generator, a diesel engine and a switchboard. It performs the training of operation and maintenance of the emergency generating sytem.

3) Training Equipment for Auxiliaries

a) Purpose

The important auxiliaries are pumping systems and steering gear intimately connected to propulsion system; a refrigerator and air conditioner requisite for life and work at sea; and the winches for cargo work.

As for these machinery the knowlege and technique about maintenance, rather than maneuvering skill, are necessary. Therefore, the best way is to give training using actual equipment.

b) Outline

The equipment consists of a centrifugal pump, a screw pump, a gear (or vane) pump, refrigerator/air conditioning siumulator, steering gear and a hydraulic winch.

For each part, performance test is possible. The equipment, as a whole, performs the training on operation/maintenance technique with each auxiliary.

4) Electric Generator Switchboard Simulator

a) Purpose

Operation of the switchboard for the generating plant has much to do with ship's propulsion system, such as parallel running of 2 or 3 generators and load transfer or distribution according to load conditions. The simulator provided with the equivalent function of shipboard generating plant is needed because NMP cannot attain such heavy load as the plant.

b) Outline

The simulator has a main control panel, a switchboard, motor-generator equipment, an instructor's console and a microcomputer. Motor-generator equipment is equivalent to the real generators and similarly loaded with the equivalent capacity of a real ship. Various types of trouble conditions can be created on the conrol panel using the instructor's console and microcomputer.

The simulator gives training on switchboard operation such as parallel running of generators, load distribution and measures for troubles.

5) Air & Electronic Type Process Controller

a) Purpose

Among the control systems in marine engine plants, so called process controlled variables such as temperature, pressure, flow rate, liquid level, etc., occupies the most part.

To control them a pneumatic controller and an electronic controller are used.

The process control system makes the function of the signal system which drives the propulsion system and auxiliaries. Therefore the process controller, which makes it possible to achieve automatic control technique, is required.

b) Outline

The equipment is composed of a pneumatic control device and an electronic control device. Each performs PID control action to the liquid level control system and the flow rate control system respectively.

This affords the fundamentals of process control systems and the training on the operation and maintenance of the automatic control equipment.

6) Marine Instrumentation Equipment

a) Purpose

In order to safely control the operation of propulsion system and associated auxiliaries, operating conditions of these systems should be taken out as informations using instrumentation. So it is necessary to have the practical knowledge of the operation and maintenance of these instruments.

b) Outline

The instrumentation equipment is composed of electric/electronic circuit trainers, oscilloscopes, meggers, testers, pressure gauges, thermometers, flow meters, level gauges and indicators.

Each show the principles of the device. This equipment gives the training on the operation of the instrumentation device and its maintenance.

7) Purifier (Actual Equipment)

a) Purpose

Purification of fuel oil has a great influence over the operation and maintenance of the main engine and the generator driven by diesel engine.

Recently as a general tendency low grade fuel oil is purified and put into use. So the knowledge on purification and handling of a purifier are necessary. Therefore a fuel oil (lubricating oil) purifier must be provided.

b) Outline

The equipment consists of a centrifugal purifier used on board common merchant vessels and its associated devices. It purifies the fuel oil in the setting tank, sending it into the service tank subsequently. It also discharges sludge using a sludge discharging device.

The equipment gives the training on the operation of the purifier and its maintenance.

8) Centering Monitoring Simulator Control of Engine Equipment

Included in Diesel Main Engine Simulator

9) Cut-Out Models

a) Purpose

As for appearance, structure and operational mechanism of machinery, there is a certain limitation for installation of actual machinery, e.g. site, the period needed for asembling and disassembling. So greater training effect can be expected by using cut-out models.

b) Outline

The models are a large 2-stroke diesel engine, a large steam turbine, a gas turbine, a propeller shaft and propeller, a controllable pitch propeller, and a side thruster.

Each large model is a cut-out or a transparent one so as to look into its inner structure. Some parts of the model are made movable to understand operation of the machinery.

The models give operational principles of the machine, as well as operational and maintenance techniques.

2. SPECIAL COURSES

a. Equipment for Fire Fighting Training

1) Purpose

The STCW Convention states that seafarers are compelled to take an approved practical fire fighting course. NMP is also giving this course but its training effect is far from satisfactory mainly because the training equipment are very poor. So these equipment are required.

2) Outline

Fire detection and alarm system, firemen's outfits, fire extinguishers, portable water pump equipment give the trainees more profound understanding over fire fighting methods and equipment.

b. Practical Survival Craft Training Equipment

1) Purpose

The STCW Convention forces seafarers to take lifeboat training course (including survival training).

NMP is also giving this training course but its effect is far from satisfactory because of its very poor training equipment. So it is necessary to provide the equipment.

2) Outline

Using a lifeboat, life jackets, signalling apparatus and other necessities, lifeboat training (including survival training) is carried out.

c. Radiotelephony System

1) Purpose

The STCW Convention compels the training course using radiotelephony. So the telephone must be provided as the training equipment.

2) Outline

The fixed type and portable type are to be provided for training.

d. Cargo Handling Simulator

1) Purpose

The STCW Convention states the qualifications to be held by the officers and ratings of oil tankers to make sure safety of tankers. To meet this term training on cargo handling is to be given using cargo handling simulator.

2) Outline

The simulator has a main console, an instructor's console, valve driving apparatus and computer system, simulating cargo handling equipment of about 200,000 DWT tanker.

The main console is Center of Oil Control (COC) equipment of a real vessel. The instructor's console creates various conditions and troubes on the main console.

The simulator gives the training on cargo handling procedures and measures against troubles.

G. BASIC DESIGN DRAWINGS

SITE DEVELOPMENT PLAN

SITE PLAN

GROUND FLOOR PLAN/TRAINING BUILDING

SECOND FLOOR PLAN/TRAINING BUILDING

ROOF PLAN/TRAINING BUILDING

ELEVATIONS (1)/TRAINING BUILDING

ELEVATIONS (2)/TRAINING BUILDING

SECTION/TRAINING BUILDING

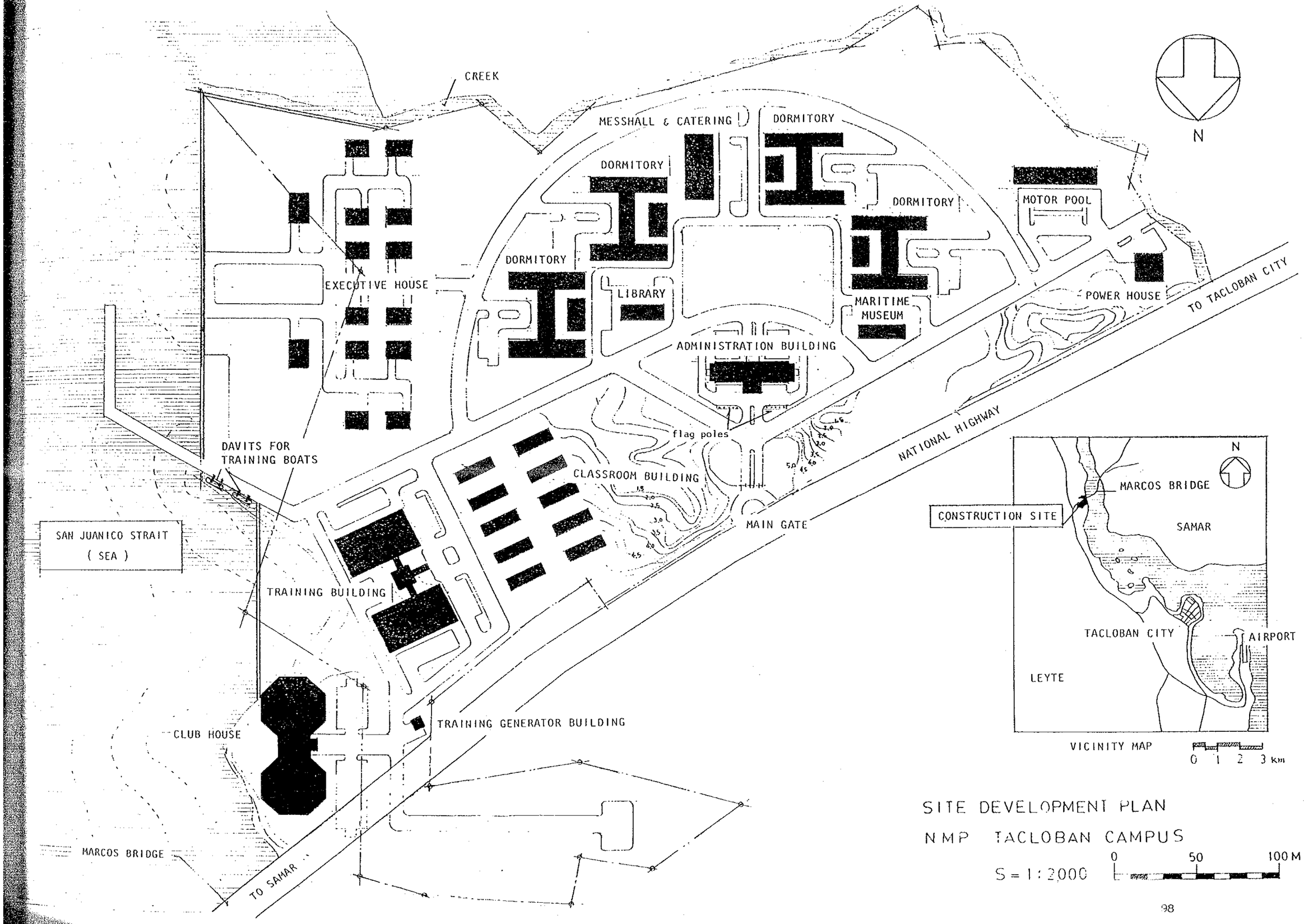
GROUND FLOOR PLAN/ADMINISTRATION BUILDING

SECOND FLOOR PLAN/ADMINISTRATION BUILDING

ELEVATIONS/ADMINISTRATION BUILDING

SECTIONS/ADMINISTRATION BUILDING

TRAINING GENERATOR BUILDING

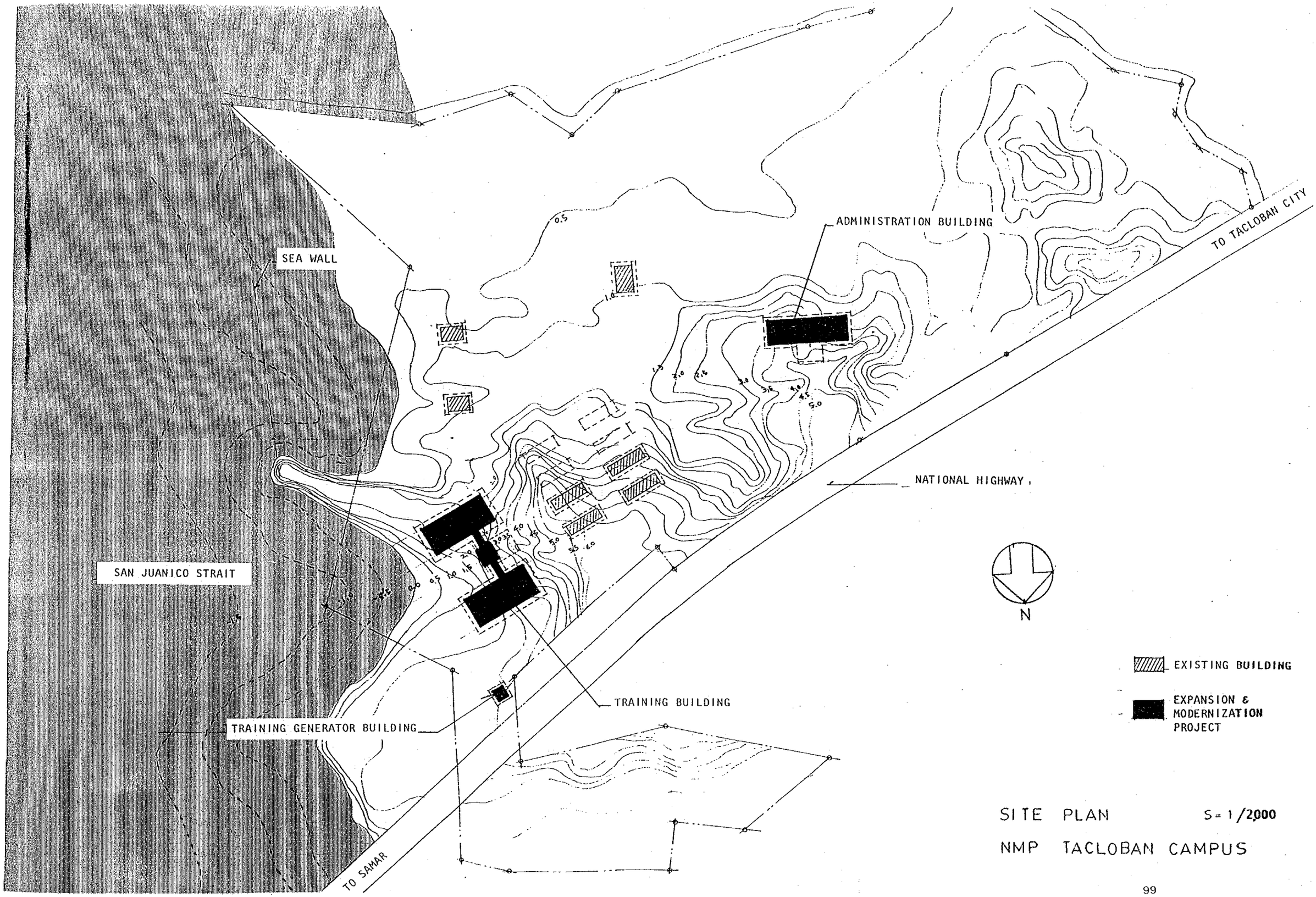


SITE DEVELOPMENT PLAN

NMP TACLOBAN CAMPUS

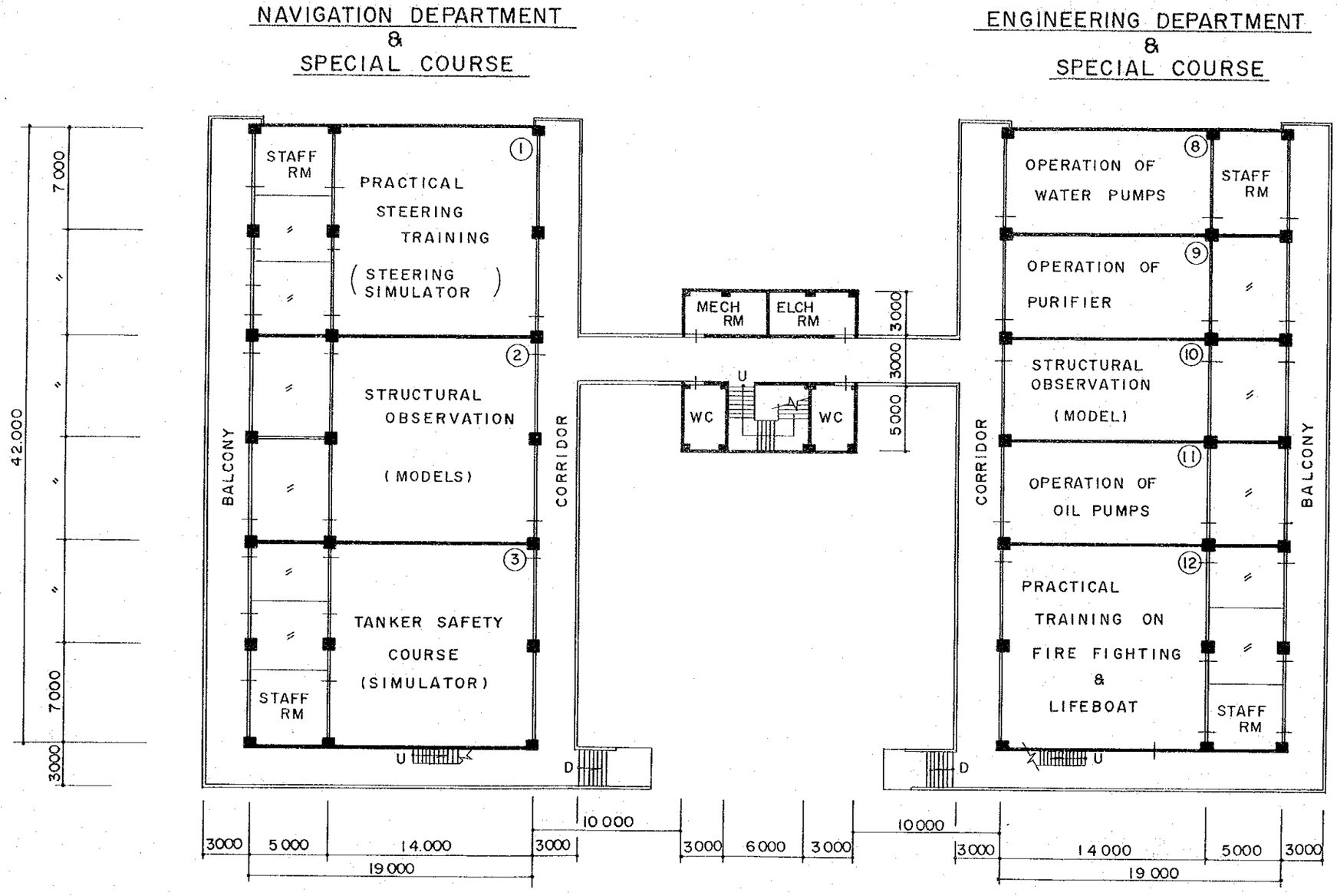
S = 1:2000

0 50 100 M



SITE PLAN S=1/2000

NMP TACLOBAN CAMPUS



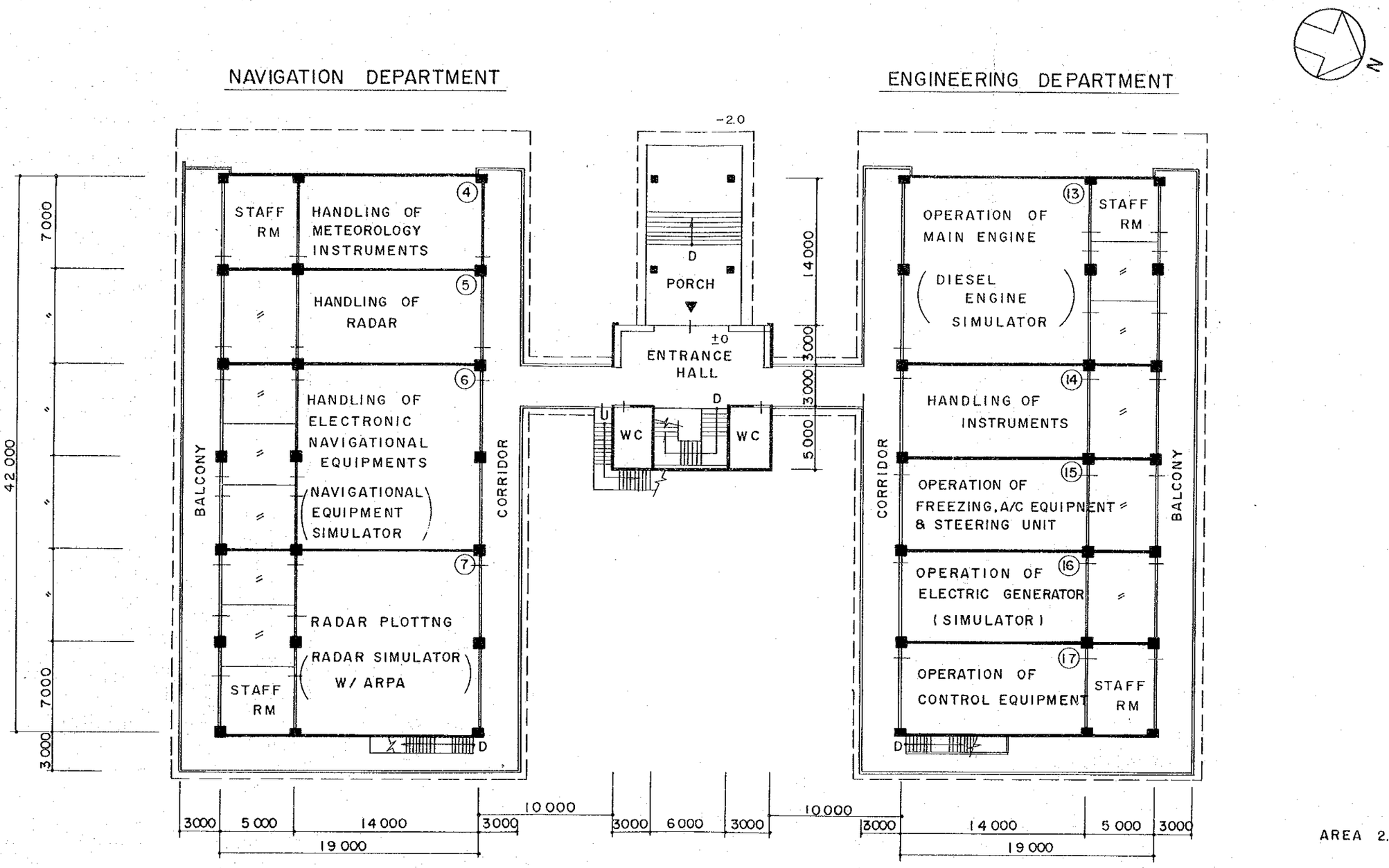
AREA 2.424 M²

FLOOR AREA

2F	2.424 M²
GF	2.424 M²
TOTAL	4.848 M²

GROUND FLOOR PLAN S = 1/300

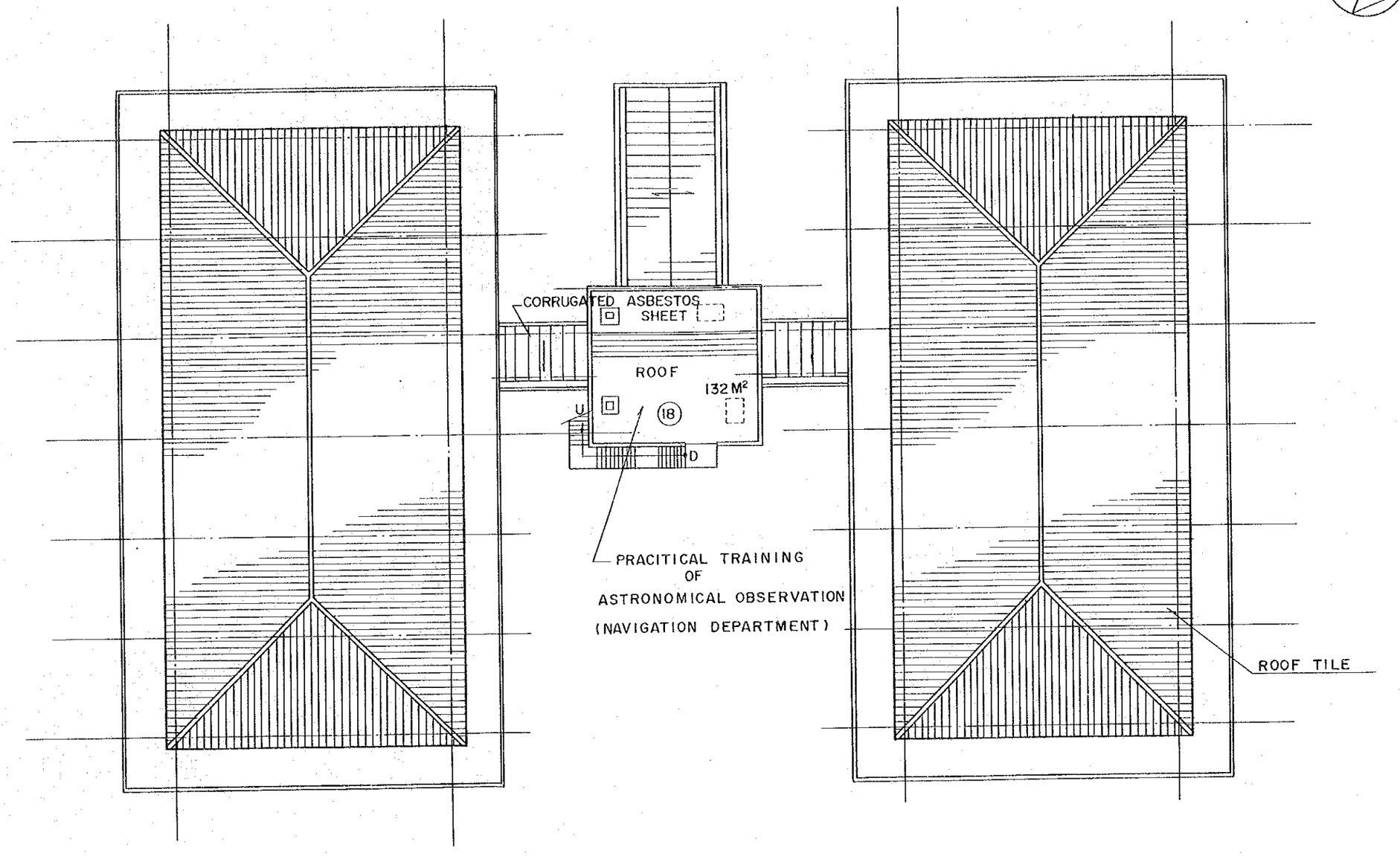
TRAINING BLDG



AREA 2.424M²

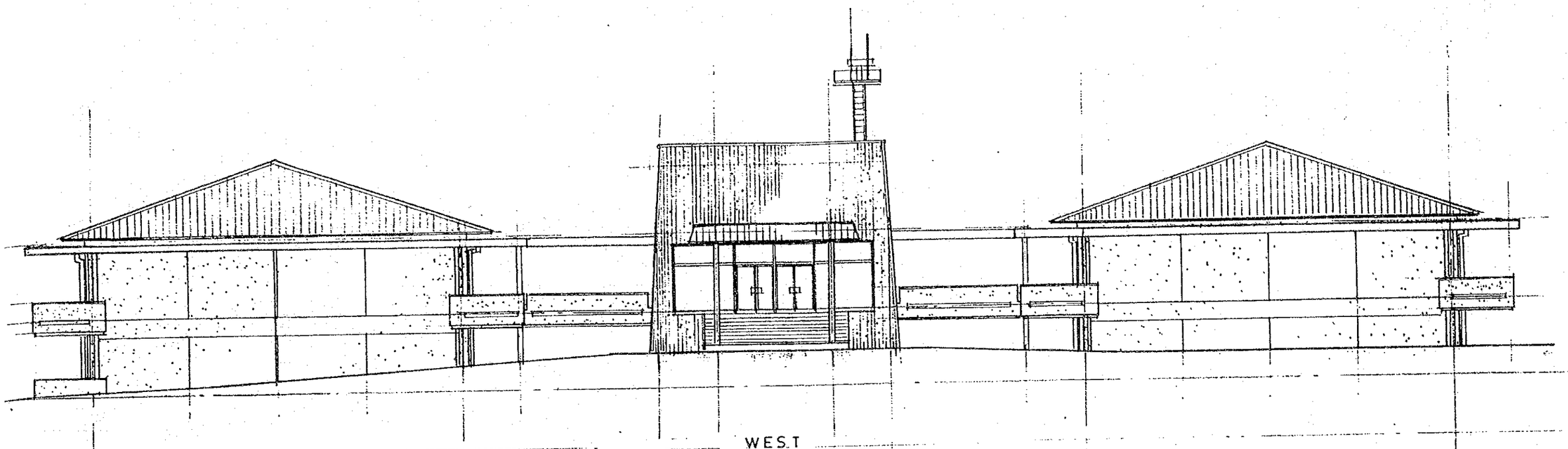
SECOND FLOOR PLAN S = 1/300

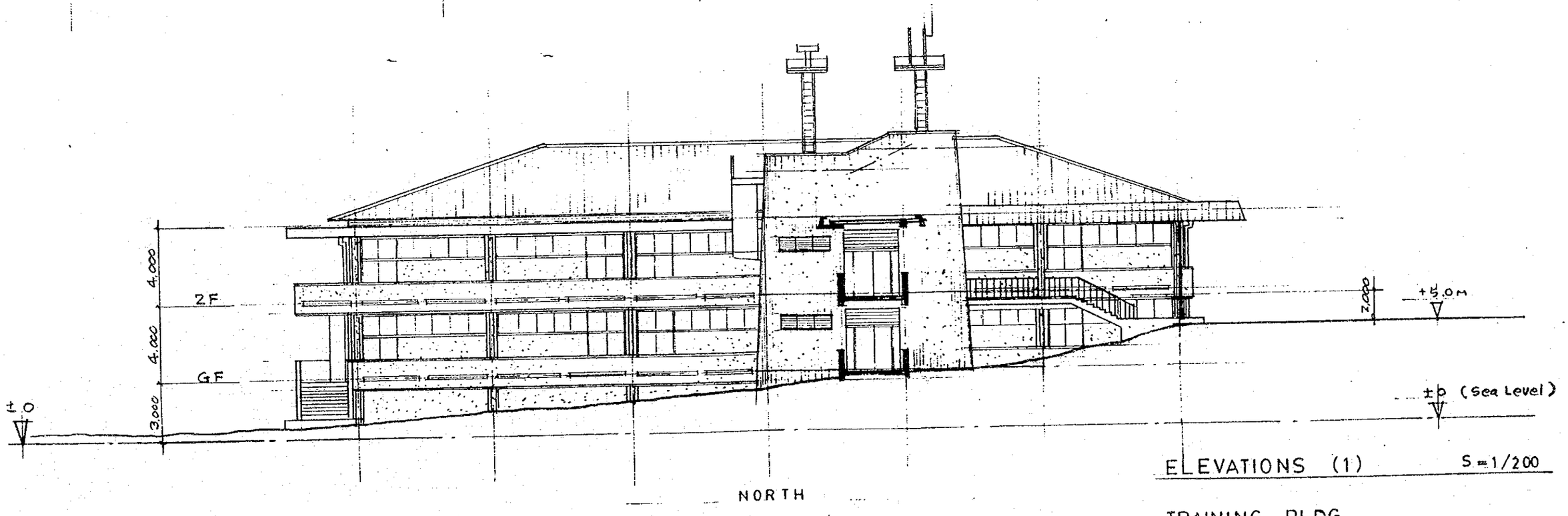
TRAINING BLDG



ROOF PLAN S = 1 / 300

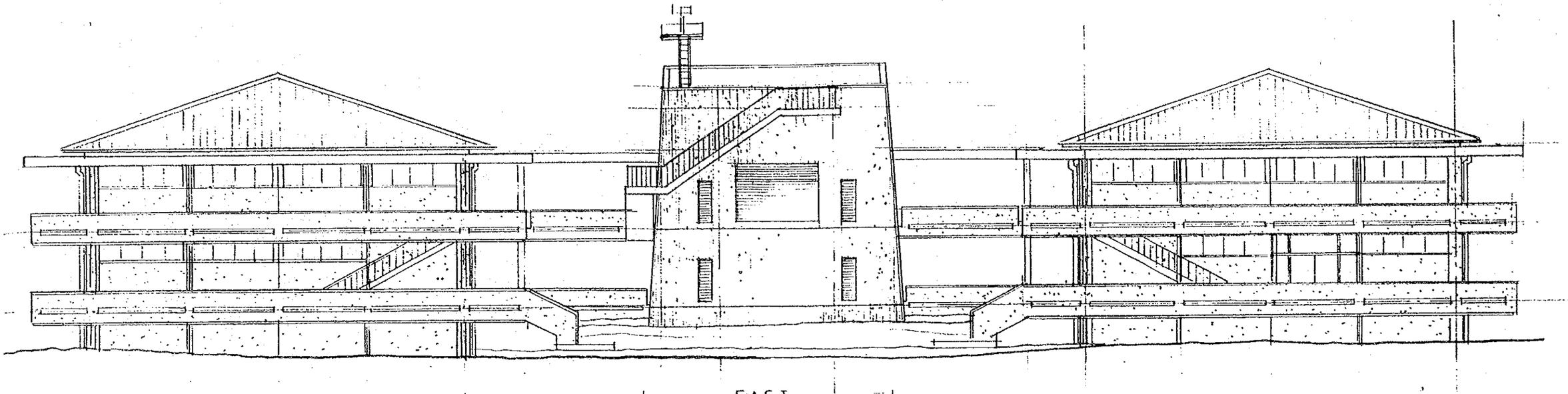
TRAINING BLDG





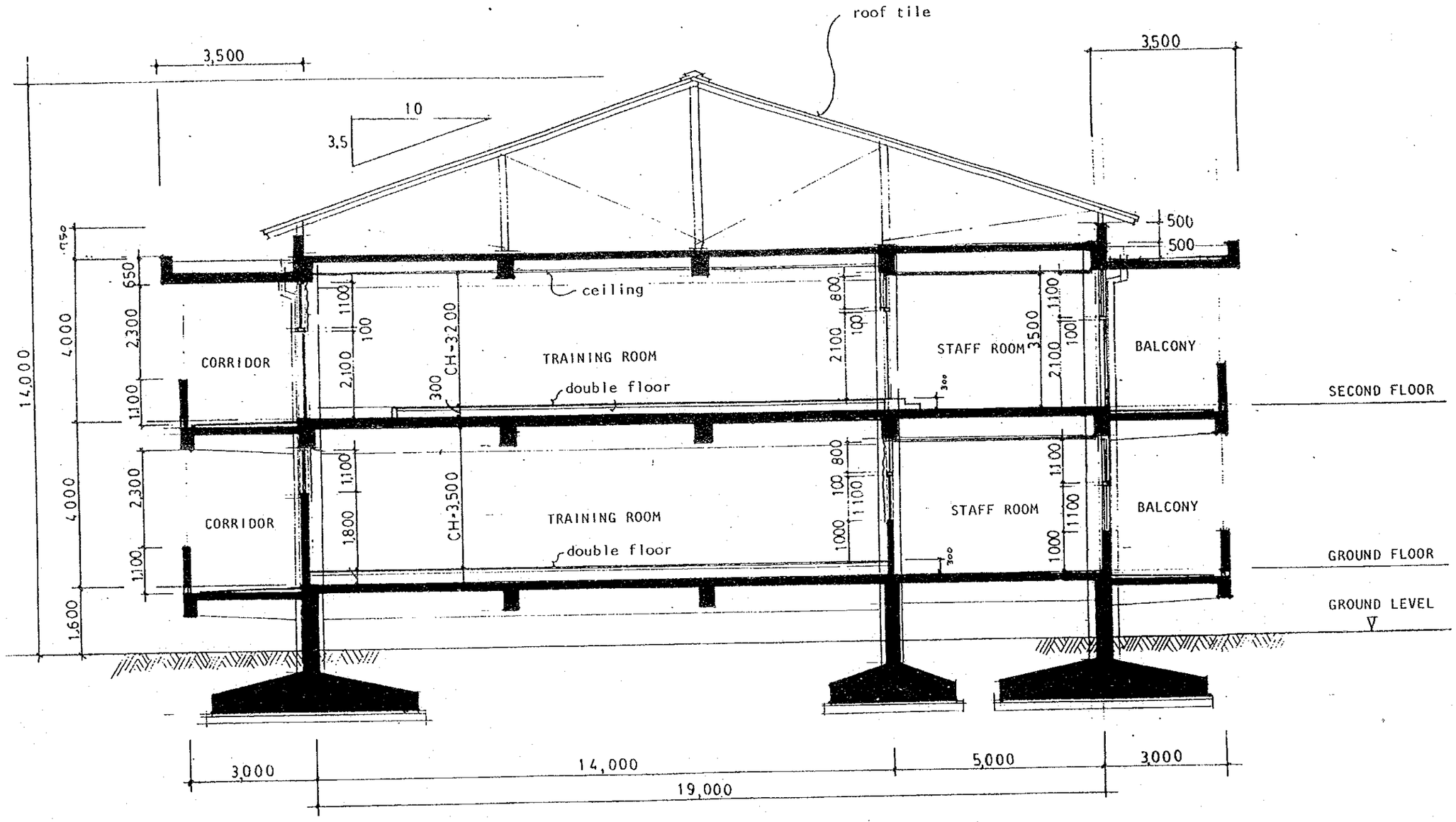
ELEVATIONS (1) S=1/200

TRAINING BLDG



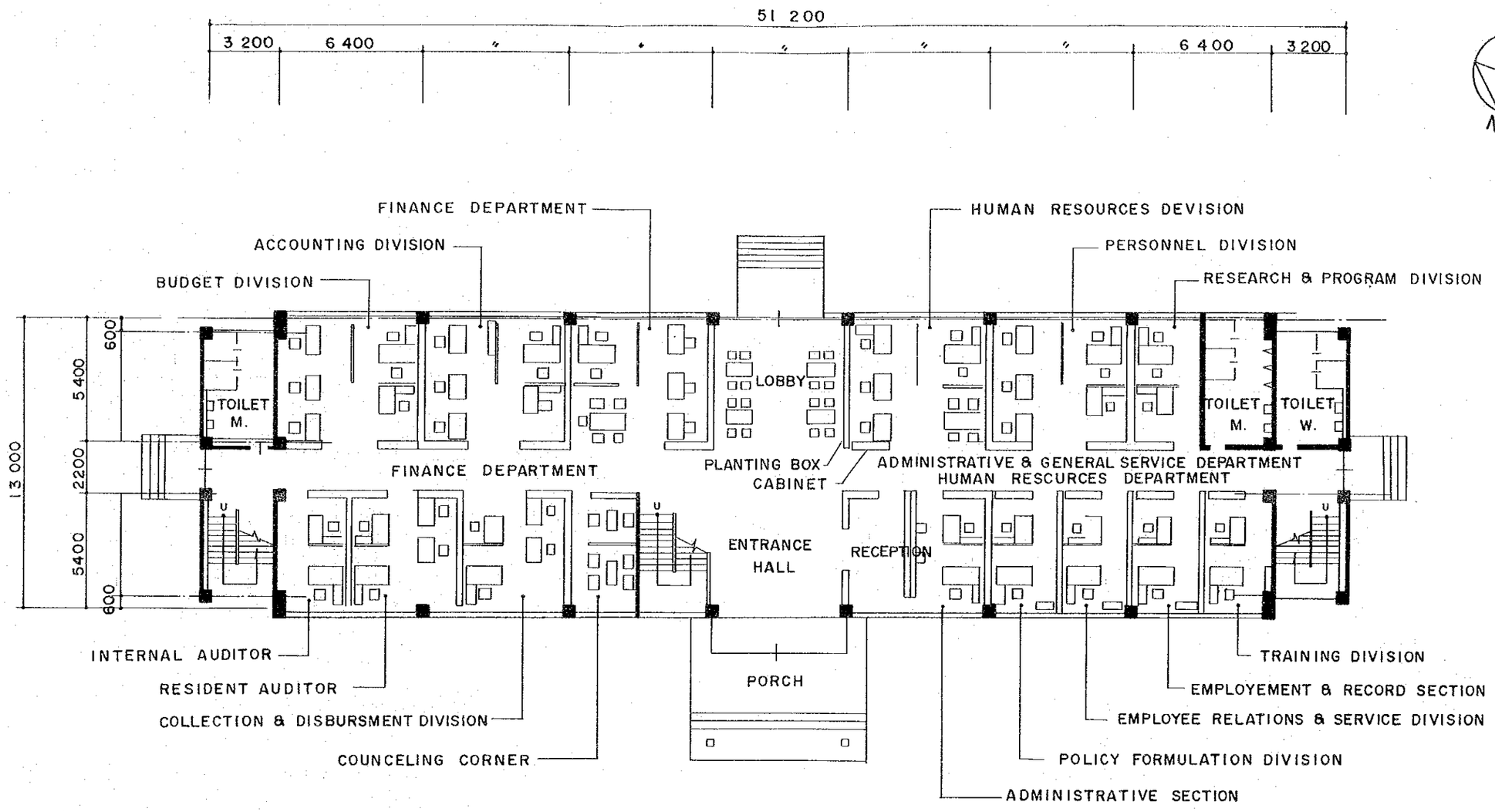
ELEVATIONS (2) S=1/200

TRAINING BLDG



SECTION S=1/100

TRAINING BLDG

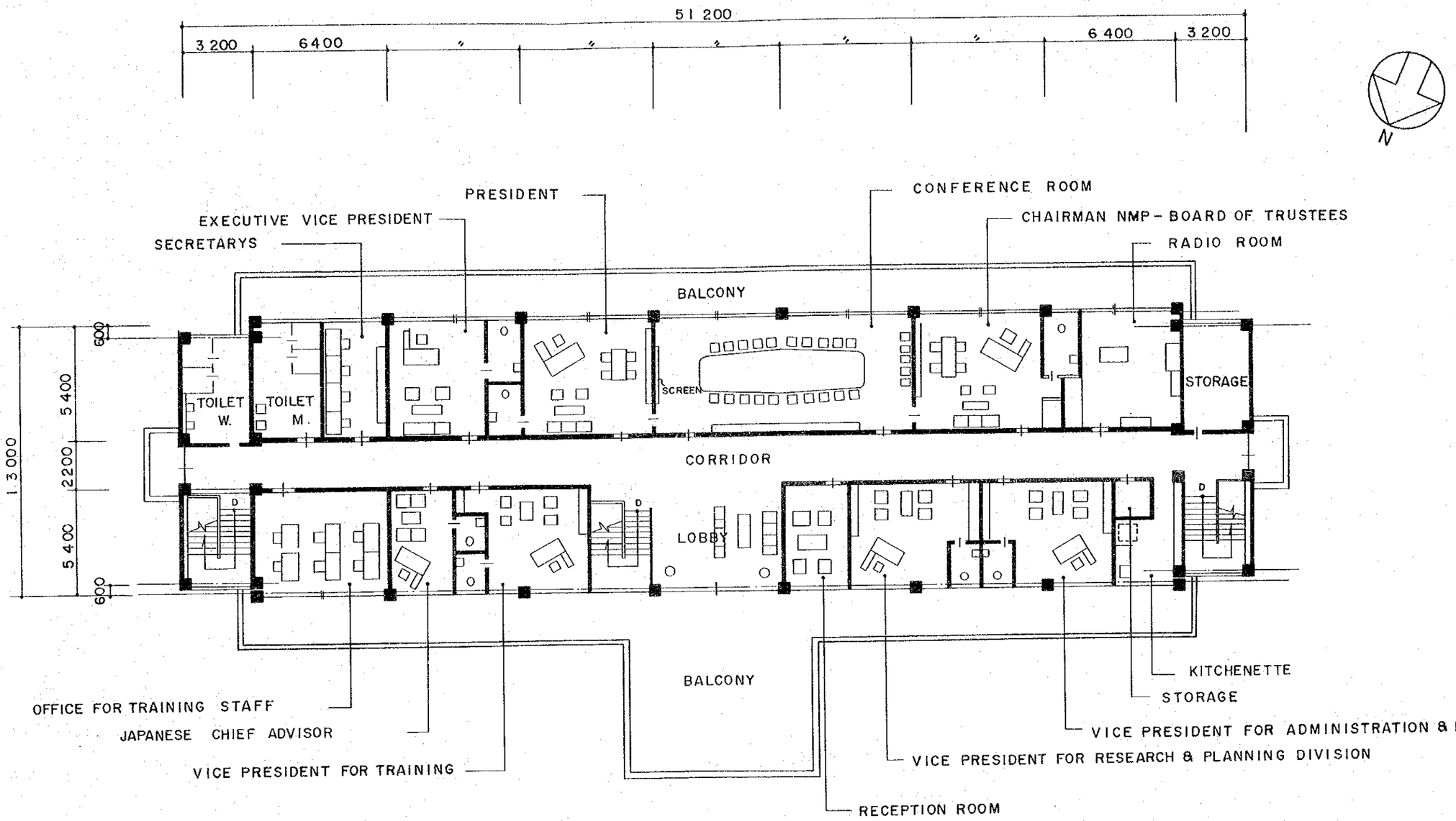


FLOOR AREA

2 F	657. 92 M^2
G F	670. 72 M^2
TOTAL	1328. 64 M^2

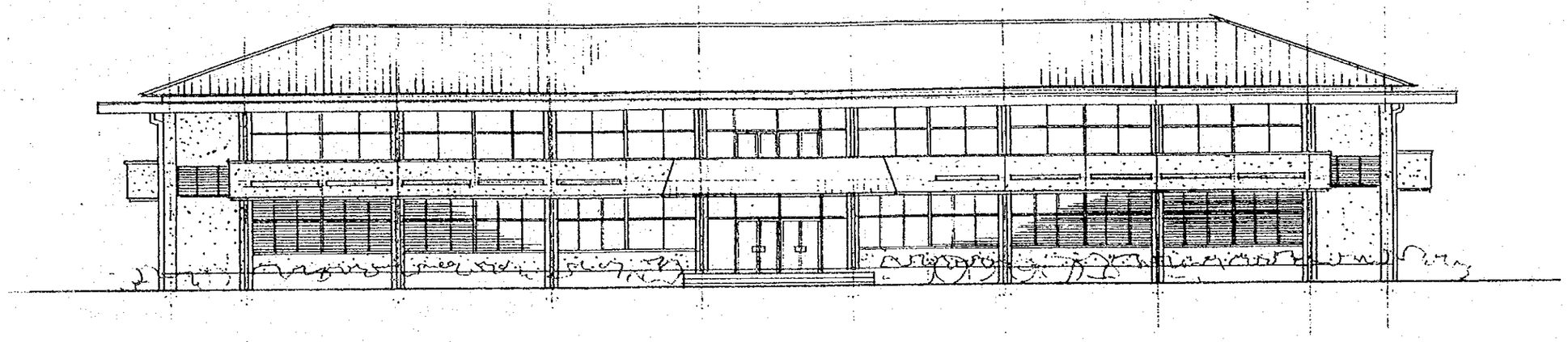
GROUND FLOOR PLAN S = 1 / 200

ADMINISTRATIVE BLDG

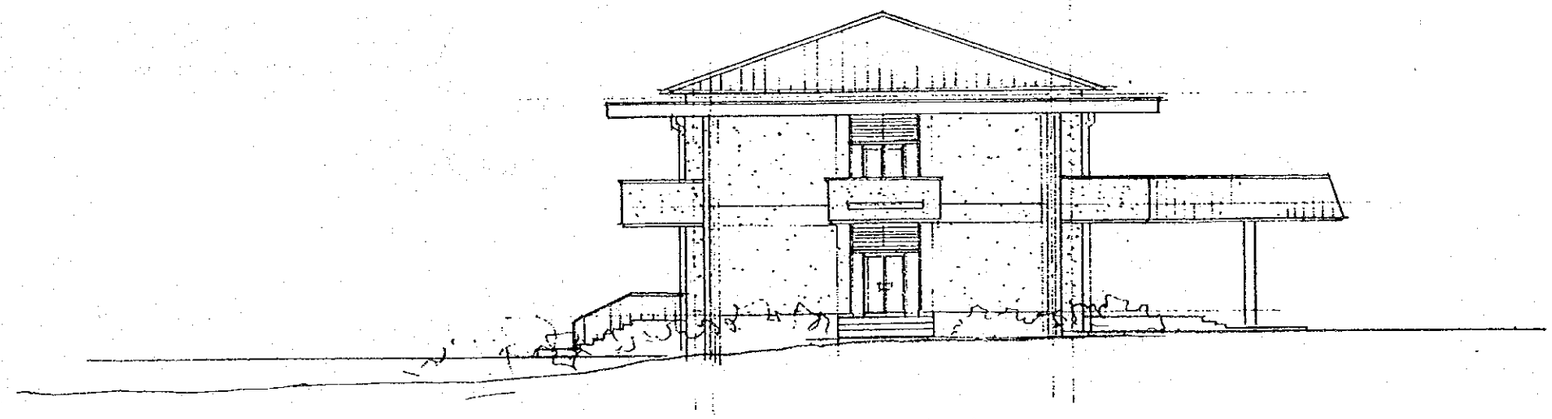


SECOND FLOOR PLAN S = 1/200

ADMINISTRATIVE BLDG



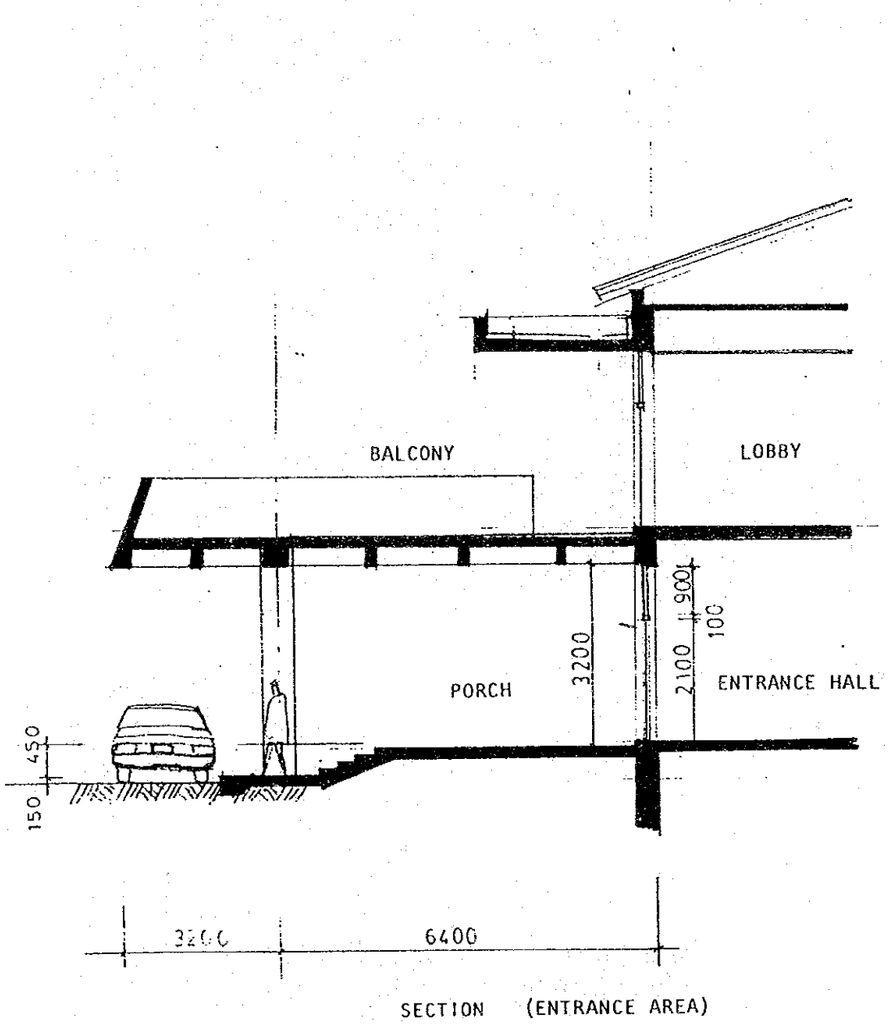
NORTH



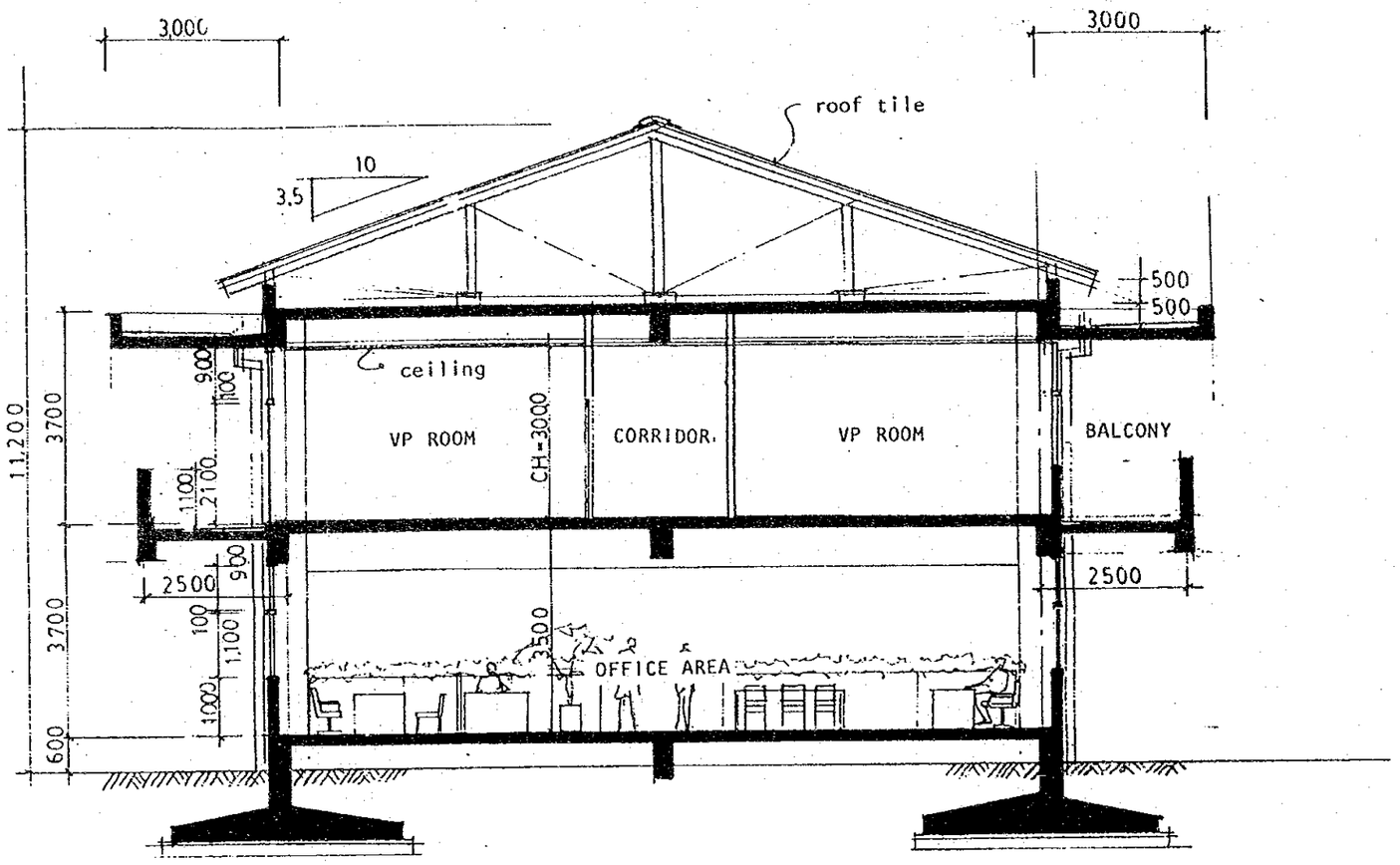
EAST

ELEVATIONS S=1/200

ADMINISTRATION BLDG



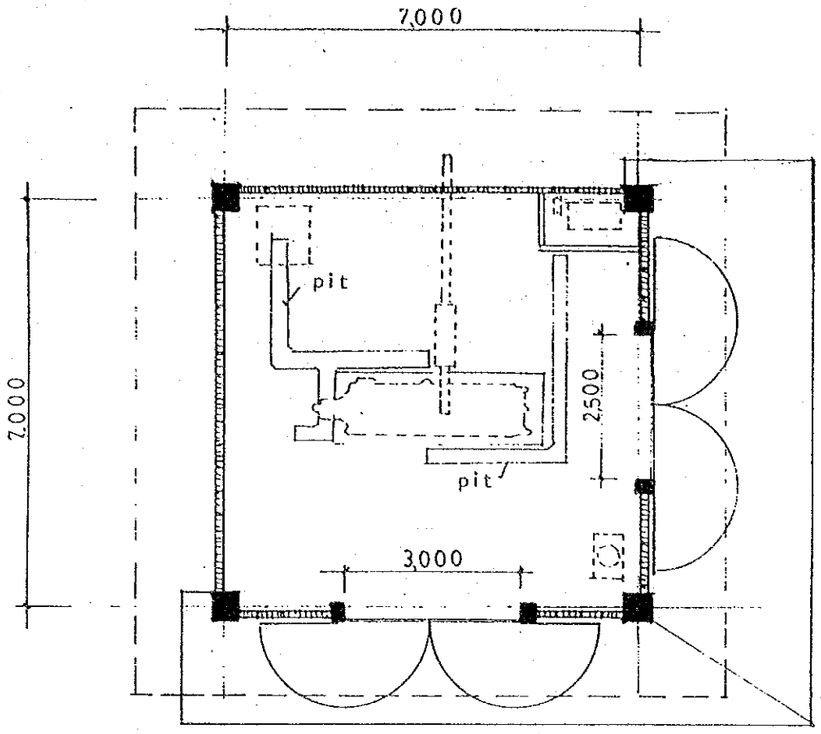
SECTION (ENTRANCE AREA)



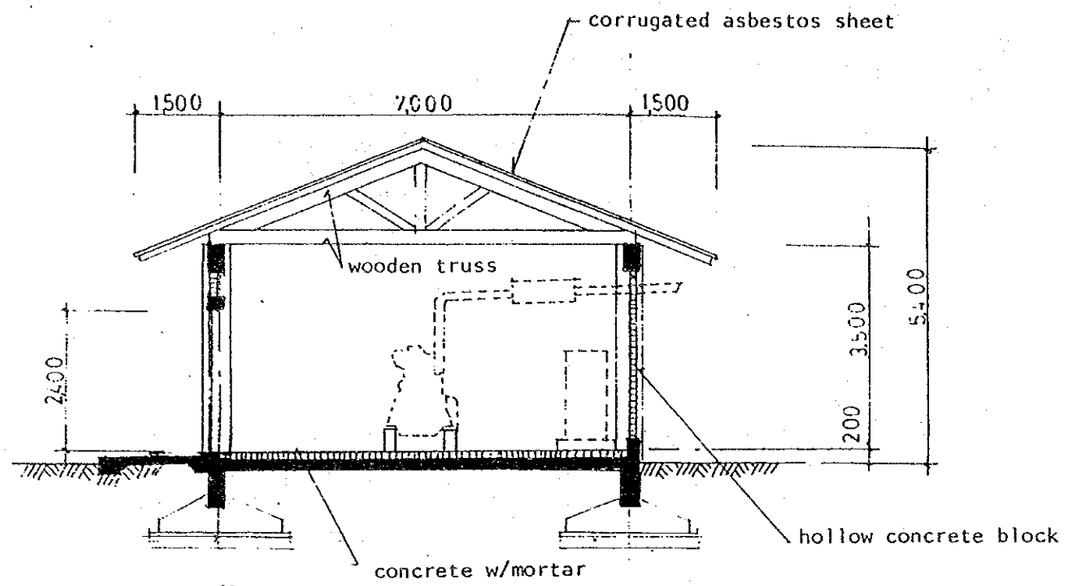
SECTION (OFFICE AREA)

SECTIONS S=1/100

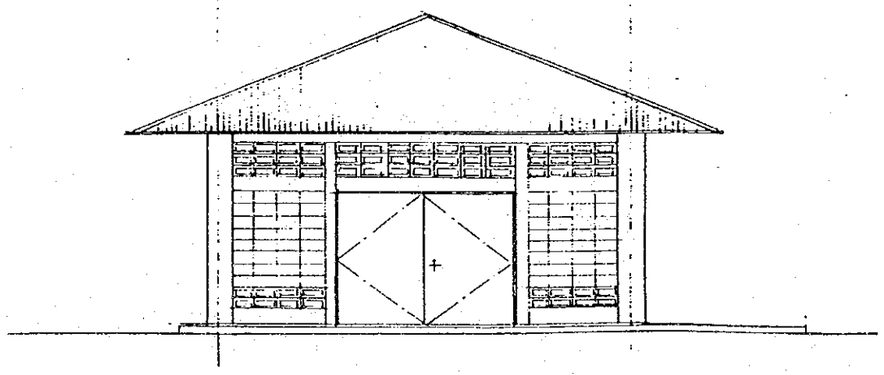
ADMINISTRATION BLDG



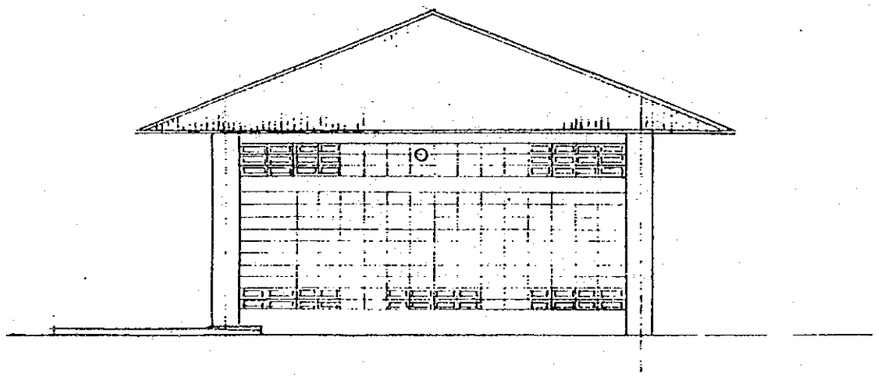
PLAN



SECTION



EAST ELEVATION



WEST ELEVATION

FLOOR AREA 49 m²

TRAINING GENERATOR BLDG S=1/100

H. LIST OF TRAINING EQUIPMENT

UPGRADING COURSES

Navigation Department

1.	Radars (x and s bands)	1 set
2.	Radar Simulator	1 set
3.	Navigational Equipment Simulator	1 set
4.	Observation Equipment for Meteorology & Marine Metorology	1 set
5.	Sextant & Crystal Chronometer	
	Sextant	20 sets
	Crystal Chronometer	1 set
6.	Steering Simulator	1 set
7.	Magnetic Compass with Turntable & Repeater	1 set
8.	Vessel Bodies	
	Vessel bodies model	4 sets
	Skeleton model	5 sets

Engineering Department

1.	Diesel Main Engine Simulator	1 set
2.	4-Stroke Diesel Engine for Emergency Generator	1 set
3.	Auxiliary Training Equipment	
	Centrifugal pump	1 set
	Screw pump	1 set
	Gear pump	1 set
	Refrigerator/air conditioning simulator	1 set
	Steering gear	1 set
	Hydraulic winch	1 set
4.	Electric Generator Switchboard Simulator	1 set
5.	Air & Electronic Type Process Controller	1 set
6.	Marine Instrumentation Equipment	
	Electric & electronic circuit trainer	20 sets
	Oscilloscope	5 sets
	Megger	5 sets
	Tester	20 sets
	Pressure gauge	1 set
	Thermometer	1 set

	Flow meter	1 set
	Level gauge	1 set
	Indicator	5 sets
7.	Purifier (actual equipment)	1 set
8.	Center Monitoring Simulator Control of Engine Equipment (included in Diesel Main Engine Simulator)	
9.	Cut-out Model	
	2-stroke diesel engine	1 set
	Large steam turbine	1 set
	Gas turbine	1 set
	Propeller shaft	1 set
	Controllable pitch propeller	1 set
	Side thruster	1 set
	On-deck equipment	

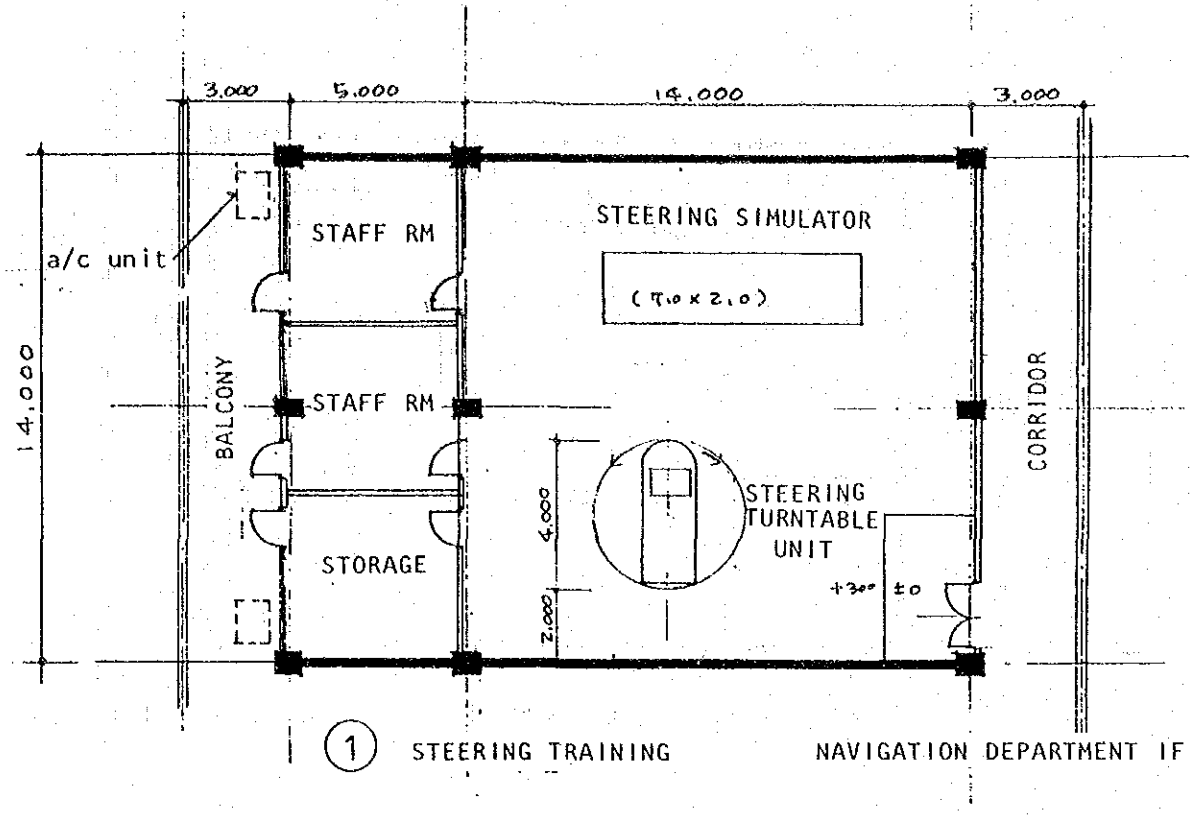
SPECIAL COURSES

1.	Aids for Fire-fighting Training	
	Fire detection & alarm system	1 set
	Fire men's outfits	5 sets
	Fire extinguishers	40 sets
	Portable water pump equipment	2 sets
	Gas detection system	2 sets
2.	Practical Life-Boat Training Equipmemt	
	Life boat	2 sets
	David	2 sets
	Life raft	2 sets
	Life jackets	50 sets
	Life buoy	5 sets
3.	Radiotelephony System	1 set
4.	Cargo Handling Simulator	1 set

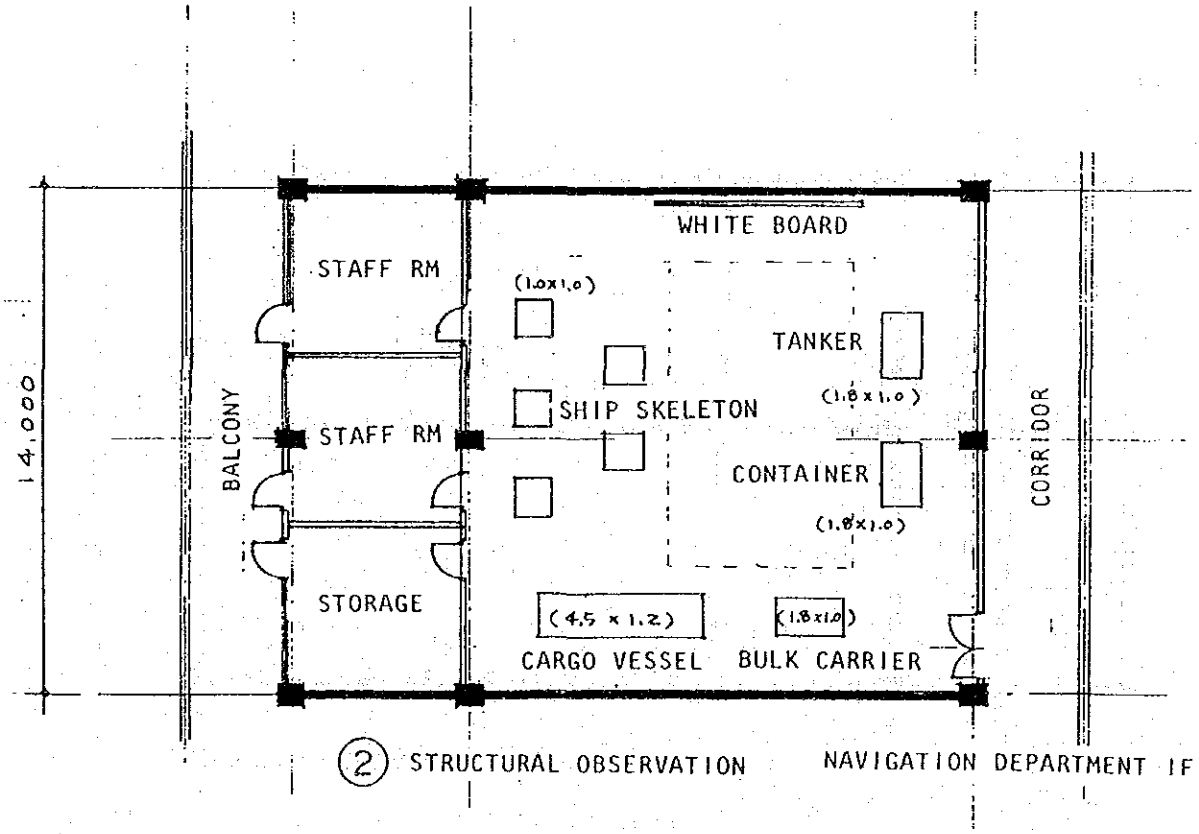
OFFICE EQUIPMENT

1.	Copying Machine	3 sets
2.	Binding Machine	1 set

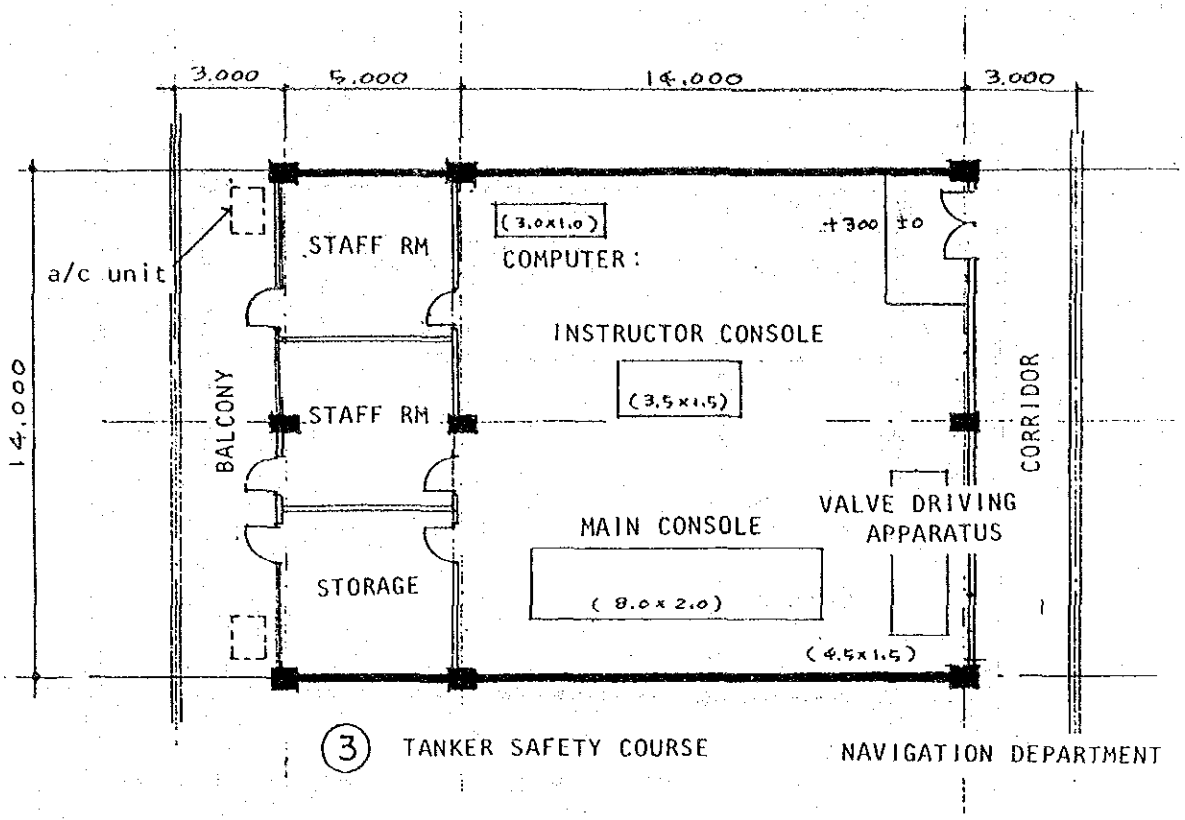
LAYOUT OF TRAINING EQUIPMENTS



① STEERING TRAINING NAVIGATION DEPARTMENT IF

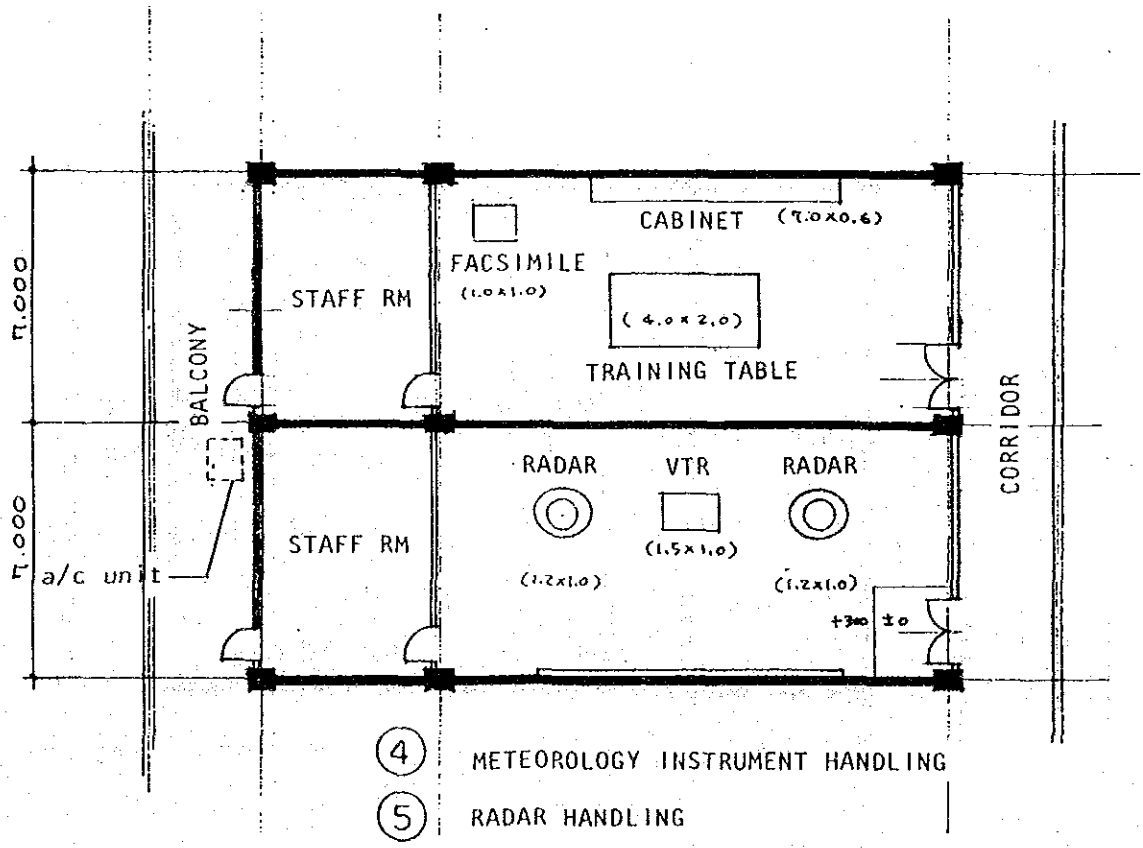


② STRUCTURAL OBSERVATION NAVIGATION DEPARTMENT IF



③ TANKER SAFETY COURSE

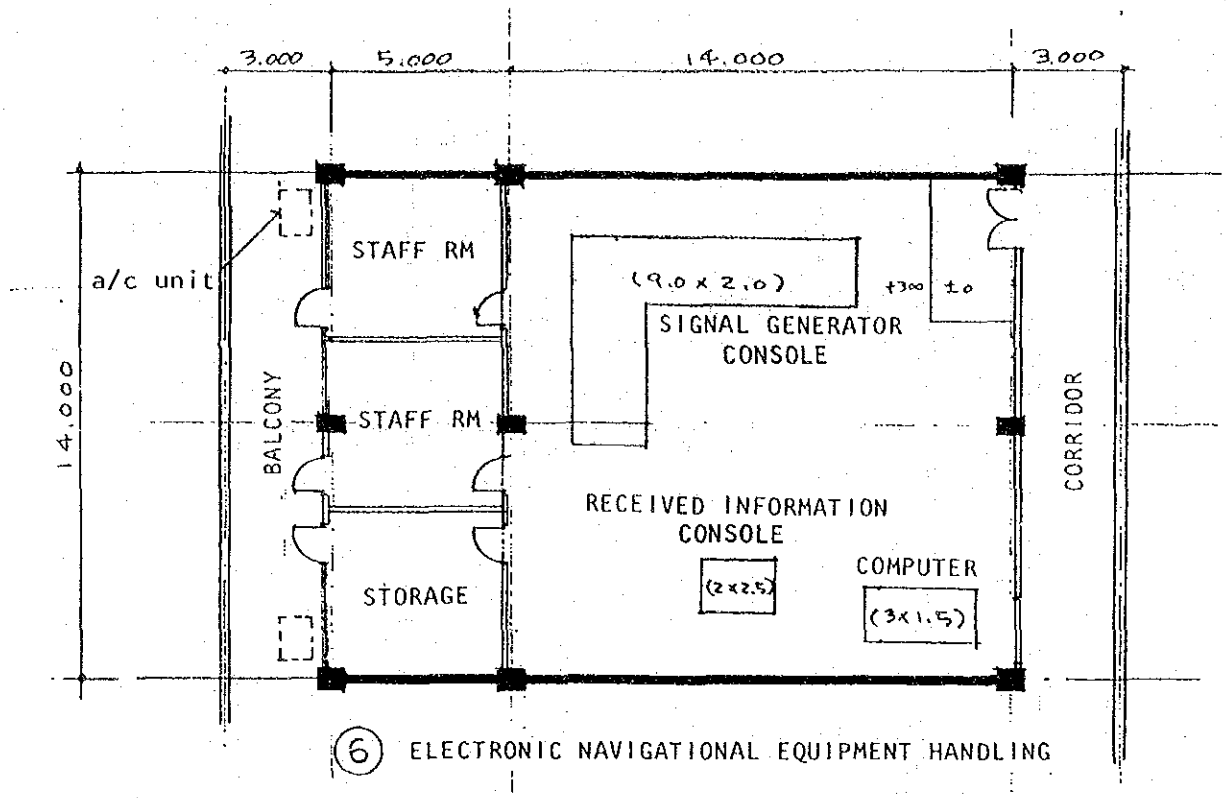
NAVIGATION DEPARTMENT 1F



④ METEOROLOGY INSTRUMENT HANDLING

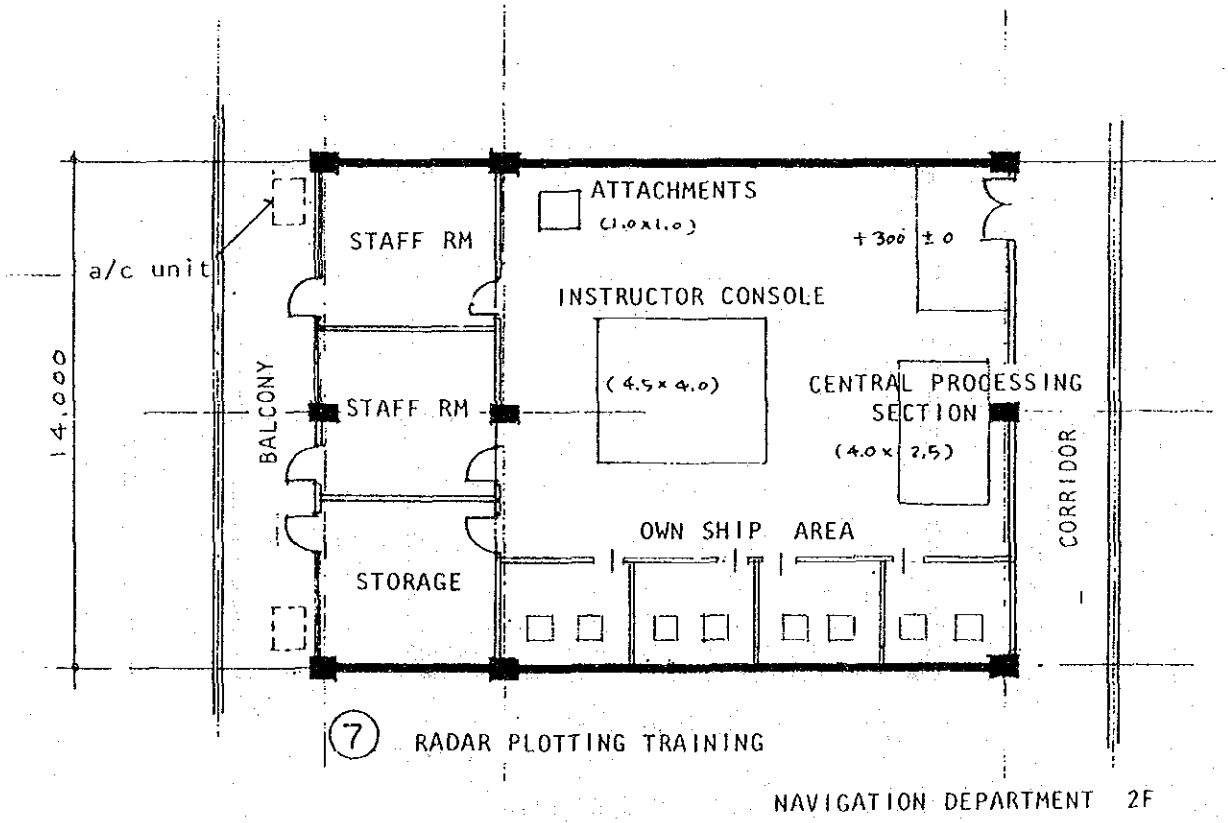
⑤ RADAR HANDLING

NAVIGATION DEPARTMENT



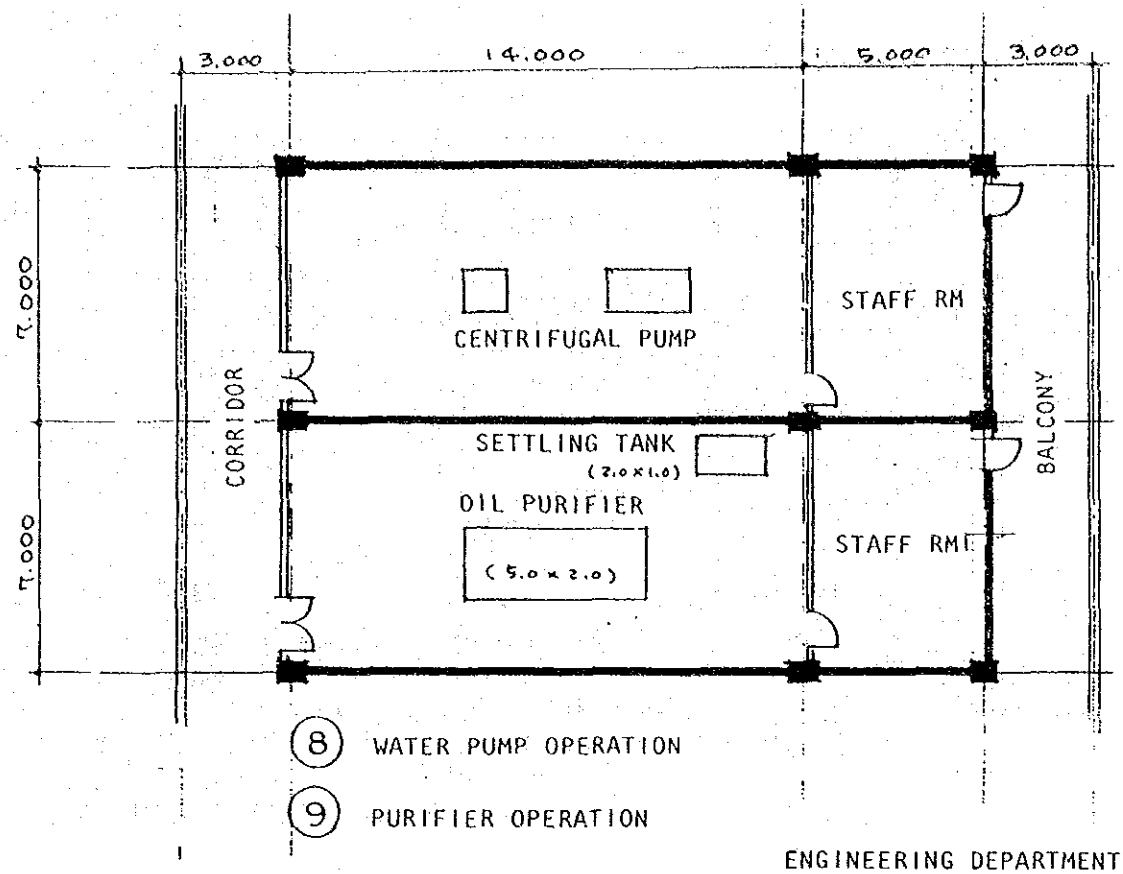
⑥ ELECTRONIC NAVIGATIONAL EQUIPMENT HANDLING

NAVIGATION DEPARTMENT 2F

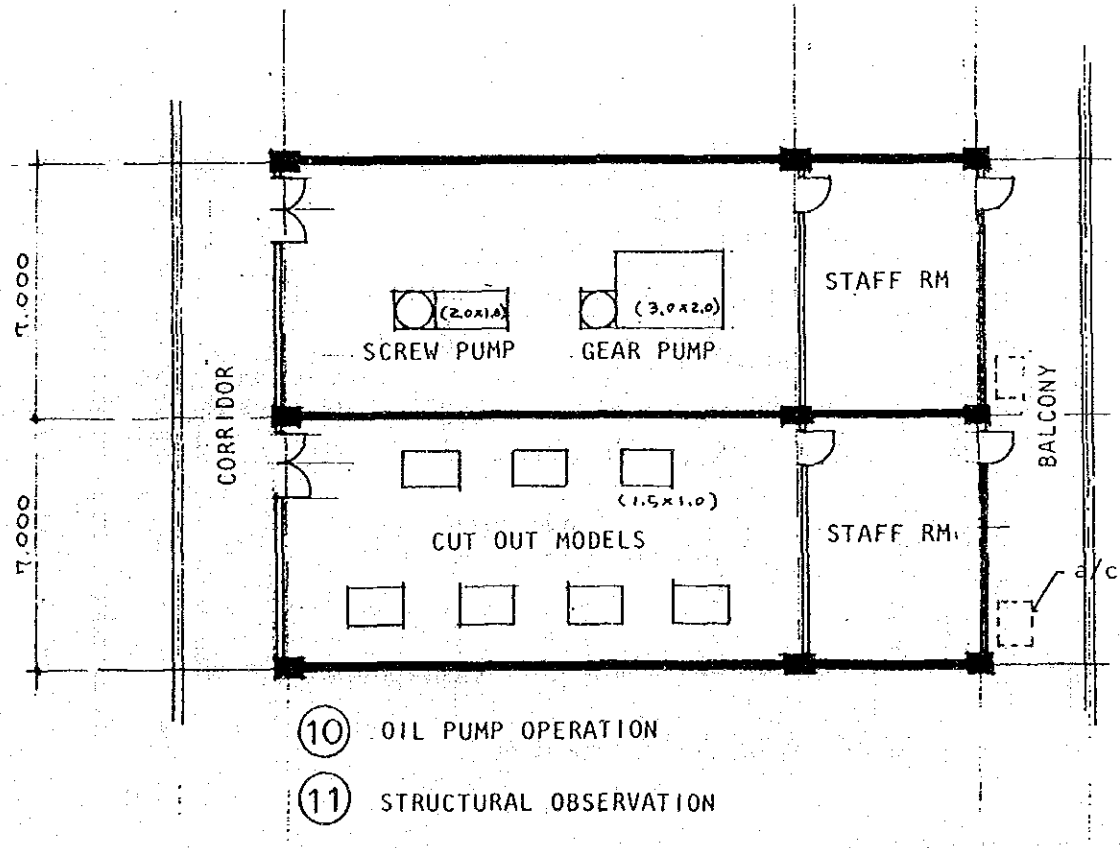


⑦ RADAR PLOTTING TRAINING

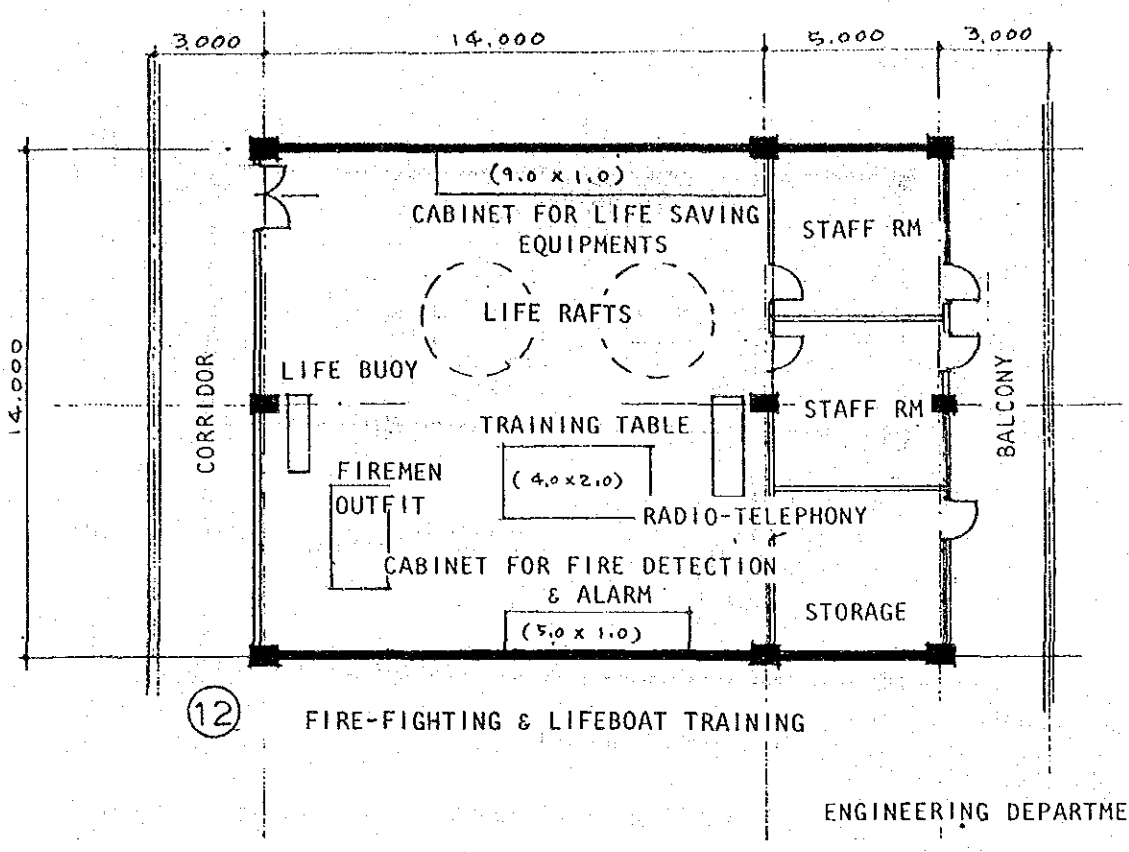
NAVIGATION DEPARTMENT 2F



ENGINEERING DEPARTMENT IF

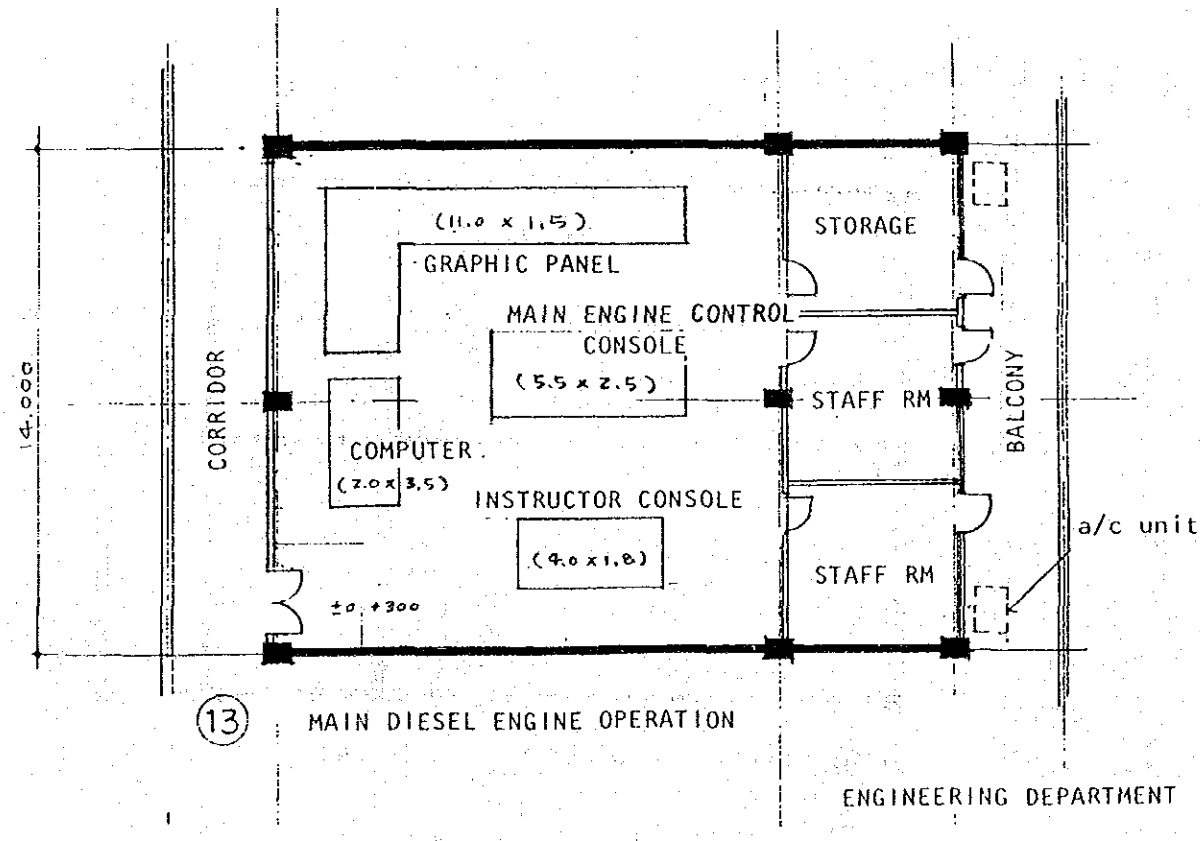


ENGINEERING DEPARTMENT IF



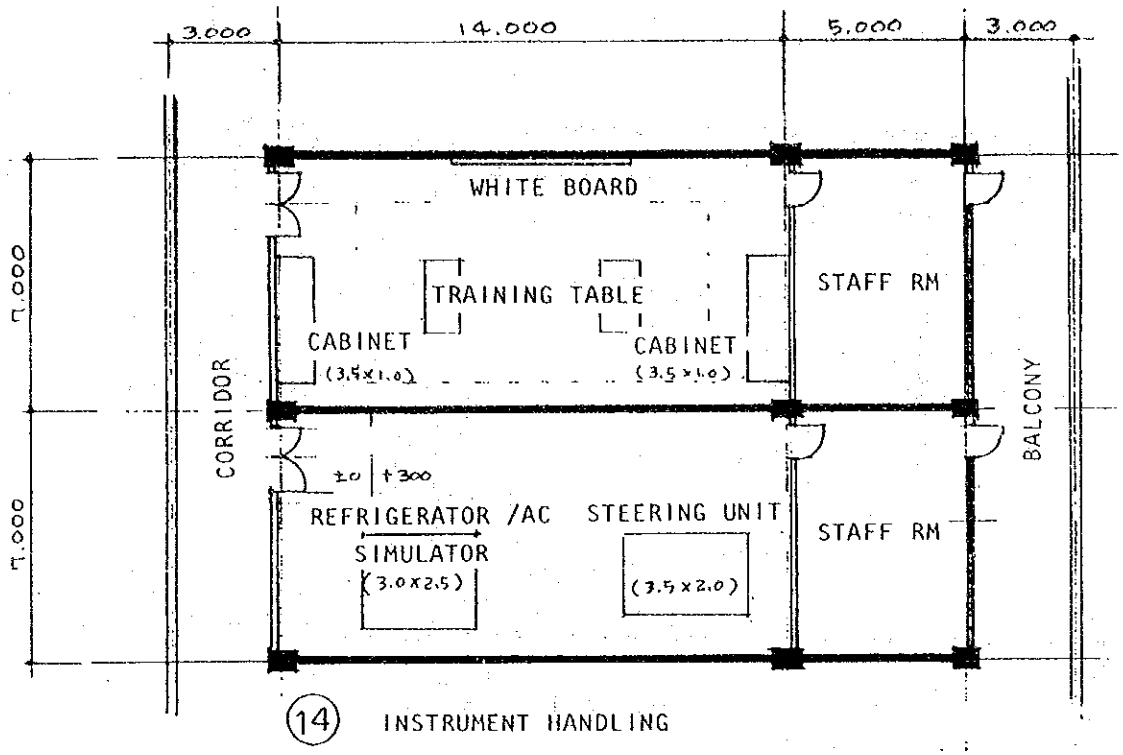
(12) FIRE-FIGHTING & LIFEBOAT TRAINING

ENGINEERING DEPARTMENT 1F



(13) MAIN DIESEL ENGINE OPERATION

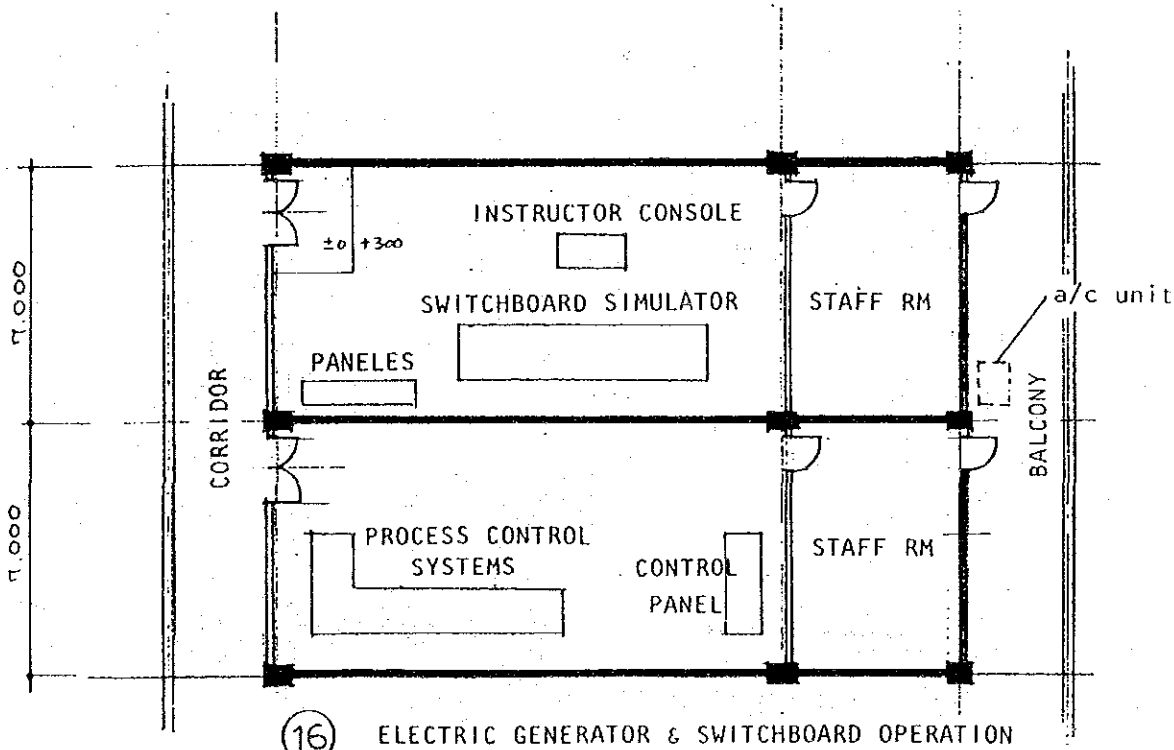
ENGINEERING DEPARTMENT 2F



(14) INSTRUMENT HANDLING

(15) REFRIGERATOR / AC EQUIPMENT & STEERING HANDLING

ENGINEERING DEPARTMENT 2F



(16) ELECTRIC GENERATOR & SWITCHBOARD OPERATION

(17) CONTROL EQUIPMENT OPERATION

ENGINEERING DEPARTMENT 2F

PROJECT IMPLEMENTATION

CHAPTER SIX PROJECT IMPLEMENTATION

A. IMPLEMENTATION PLAN

1. BUILDINGS

In relation to the implementation of constructing the facilities, the Republic of the Philippines is responsible, prior to the construction, for removing trees and the like on the site considered to hinder the construction, conducting remodelling of the site, providing temporary water supply and drawing electricity and the like.

2. TRAINING EQUIPMENT

After the consultancy agreement signing with the Republic of the Philippines, designing of education equipment and material (custom made simulators and the like) should be conducted. With completion of concluding contracts with manufacturers, manufacturing drawings should be prepared. With approval of such drawings, software should be developed and products should be manufactured at factories. With completion of product inspection at factories, they should be transported to the site, installed and adjusted at the designated location within the already completed facilities. After this, they should be inspected and approved and then delivered to the Owner.

B. SCOPE OF WORK

1. JAPANESE PORTION

a. Building

1) Training Building

2) Administration Building

3) Generator Building

b. Utilities

The following utility works for the buildings listed above:

1) Power receiving and transforming facilities
2) Lightning rod facilities
3) Water reception tank
4) Elevated water tank
5) Water supply works
6) Drainage work
7) Septic tank

c. Training Equipment

The project includes installation, adjustment and delivery of all training equipment.

2. PHILIPPINE PORTION

a. Remodelling of the site designated for constructing the facilities (remodelling of the site, removal of trees and the like)

b. Supply of electricity, telephone lines, water, drainage routes and supplementary facilities required for the facilities (provision up until the designated location of buildings)

c. Construction of approach roads to the site

d. Measures of tax exemption for construction equipment and material to be brought in to the Republic of the Philippines for the purpose of the project and customs clearance

e. Measures of tax exemption for Japanese organizations and individuals to be engaged in this project and customs clearance

f. Products to be required for the facilities and giving convenience to Japanese engineers to be dispatched for the purpose of implementing the project

g. Effective maintenance and control of the facilities and equipment and material given under the Japanese cooperation

h. All necessary expenses except for the construction equipment and material given under the Japanese cooperation

i. Exterior works (exterior fence and tree planting and the like)

j. Provision of sites for temporary office, work place, material stock location and the like to be required for the construction

k. Provision of temporary electricity and temporary water supply

C. IMPLEMENTATION SCHEDULE

1. BUILDINGS

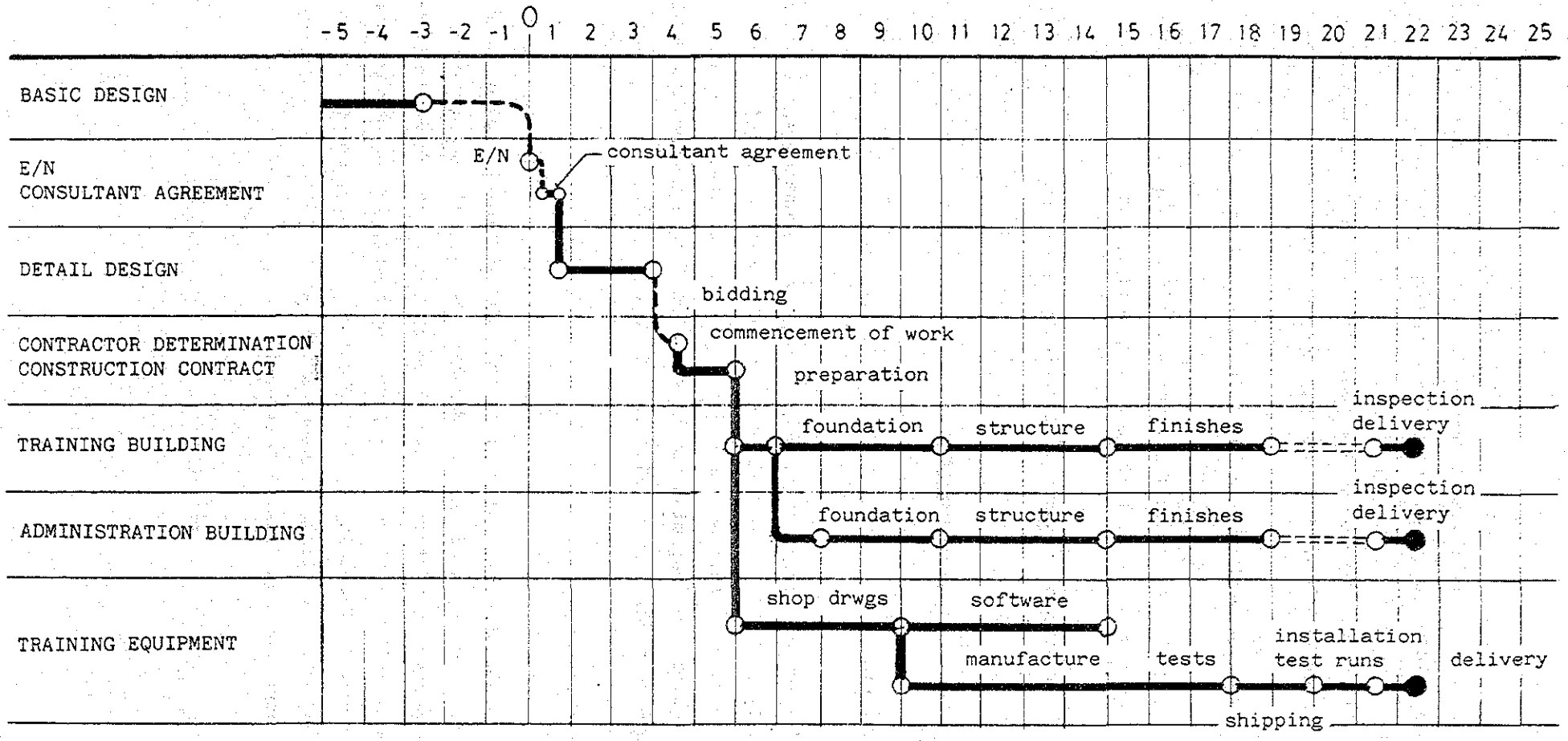
The actual period to be required for constructing the training building, the office building and the power generation building for training is 14.5 months. In actuality, however, 17.0 months will be required for coordination between training equipment and buildings due to required installation and adjustments.

2. TRAINING EQUIPMENT

Almost all of the simulators and other training equipment are to be custom made based on the education plans. Because of this, it is expected that it will take 17 months at least after the decision of manufacturers to complete preparing manufacturing drawings, obtain approval of drawings, development of software, manufacture at factories, testing, transportation, installation and adjustment, inspection and finally delivery.

IMPLEMENTATION SCHEDULE

NMP EXPANSION & MODERNIZATION PROJECT



D. PROCUREMENT OF CONSTRUCTION MATERIAL AND EQUIPMENT

The fundamental policy is to adopt local (or Philippine) equipment and material and construction methods as much as possible in construction for the purpose of reducing costs. It is planned, however, to procure Japanese equipment and material and bring them into the site when such equipment and material can not be procured locally.

1. LOCAL PROCUREMENT

a. Construction

Cement, sand, gravel, concrete block, concrete friction pile, molding box material, cement tile, asbestos corrugated slates, aluminum jalousies, plate glass and lumber.

b. Electrical

Manhole and manhole covers

c. Plumbing

Manhole cover, Hume pipe, cast iron pipe and septic tank

d. Airconditioning

Portion of polyvinyl chloride pipe (more than o 100), ceiling fan and ventilation fan

2. IMPORTS FROM JAPAN

a. Construction

Steel structure, metal fittings, metal accessories for fittings, steel frames, porcelain tile, 25 mm mosaic tile, vinyl tile, rock wool sound absorption board, free access floor and needle punch carpet

b. Electrical

Power board, power distribution board, lighting instrument, piping material, electric wire, SW outlet, fire alarm device and interphone

c. Plumbing

Plumbing material and device, piping material, valves, water tank and pump

d. Airconditioning

Airconditioner, pipes and valves

MAINTENANCE AND OPERATION

CHAPTER SEVEN MAINTENANCE AND OPERATION

A. MAINTENANCE AND OPERATION PLANS

The maintenance and control of the facilities after their construction are to be conducted by the Department of Administrative & Finance, the Department of Maritime Training and the Department of Research Planning & Projects of NMP under the supervision of the Board of Trustees.

In the maintenance and control, special attention should be given to the maintenance, inspection and repair of various expensive education equipment and material.

B. EXPENSES

1. ESTIMATE

Expenses for the maintenance, control and operation comprise personnel expenditures and utilities expenses. Based on the investigation and material gathered so far, the annual approximate expenses for the maintenance, control and operation are estimated as follows:

a. Expenditures

	(P)
Personnel expenses	
Salary of teaching staff	2,148,180
Salary of administrative staff	1,580,436
Utilities expenses inclusive of water	295,896
Miscellaneous expenses (expenses for maintenance, preparation of texts and the like)	1,105,888
Total	5,130,400

b. Revenues (tuition, registration fee and the like)

Upgrading course	
Tuition	2,880,000
Registration fee	14,400
Special Course	
Tuition	2,120,000
Registration fee	116,000
Total	5,130,400

2. NMP BUDGET

The budget covers the entire plans of NMP. The above-mentioned approximate computation is a trial computation covering only the project (the training building, the office building and the power generation building for training). It should be understood, therefore, that the following table is for reference purpose only.

Expenditures

	1982	1983	1984
1. Management/Operation			
Personnel	P 440,344	P 1,273,000	P 13,898,202
Maint/Operation	P1,859,656	P 1,100,000	P 15,374,742
Subtotal	P2,300,000	P 2,373,000	P 29,272,944
2. Capital Expenditures			
Land Acquisition		P 367,000	P 2,250,000
Building Construction	P1,774,189	P10,000,000	P128,183,761
Equipment			P 20,450,334
Subtotal	P1,774,189	P10,367,000	P150,889,095
TOTAL	P4,074,189	P12,740,000	P180,162,039

Income

	1982	1983	1984
Registration and Tuition Fee	P 136,948	P 1,229,990 (Estimate)	P 21,600,000 (Estimate)

EVALUATION OF THE PROJECT

CHAPTER EIGHT EVALUATION OF THE PROJECT

This Project is to contribute to the improvement and modernization of the National Maritime Polytechnic for the upgrading and retraining of Philippine seamen. This has become an acute requirement due to the implementation of international conventions such as the STCW Convention prescribing the minimum requirements for seamen to board merchant marine vessels. The project is evaluated as follows:

Selection and design of training equipment and buildings of this project are based on education plans and proposed curriculum of NMP. By the implementation of this project, it will become possible for NMP to turn out seamen who have acquired knowledge and skills through the use of actual equipment as designated by the the STCW Convention.

By receiving training and acquiring practical skills at NMP, it will be possible for seafarers of the Philippines to continue or to assume better employment on vessels, domestic and international, thus contributing towards the enhancement of livelihood and social advancement of the Philippines. It will also result in the increase of friendship and close relationships between the two countries, especially in the maritime field.

The implementation of this project is looked forward to with great anticipation, not only by relevant ministries and maritime organizations of the Philippines, but by future candidates for enrollment at NMP.

The operation and maintenance of the programs and facilities of NMP are to be conducted under the supervision of a Board of Trustees composed of 10 members selected from ministries and organizations of the Philippines, such as the Ministry of Labor and Employment, the Ministry of Education, Culture and Sports and various maritime organizations. The expenses for operation and maintenance are to be covered the the budget of NMP. Revenue is to be from enrollment and tuition fees and governmental allocations.

The assistance from Japan will be most meaningful in consideration of the great degree of contribution by the project towards the people of the Philippines and the enhancement of frienship between the two countries.

CONCLUSIONS AND RECOMMENDATIONS

CHAPTER NINE CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

In view of the results of the survey described above, it is concluded that this project can make a significant contribution to the Philippine economic development by expanding retraining facilities designed to upgrade the Filipino seafarers as a whole and that it is a project worthy of assistance.

B. RECOMMENDATIONS

The following are recommended made to the Philippine Government in implementing this project.

a. Selection, Training and Securing of Teaching Staff

In order to achieve the objectives of this project, selection of teaching staff from those who have had experience on merchant ships is very strongly recommended. This in accordance with the NMP 5-year plan, as quoted therein as follows:

> The first two years of operations (1981 and 1982) are the most critical in terms of the need to recruit qualified teaching staff, since the quality of the teaching staff will determine the quality of training to be offered and consequently, the image of NMP in the years to come. There is thus a need for managment to come up with strategic plans for the hiring of its teaching staff. The plan should include monetary incentives and professional development schemes.

It is also recommended that education of teaching staff be conducted in tie-up with Japan's technical cooperation to make full use of educational equipment to be installed.

b. The Philippine Budget

It is hoped that the budget for maintaining and administering this project be continuously allocated to achieve its objectives under sound management.

c. Reemployment after Retraining

It is recommended that a system be established whereby those who complete retraining provided by NMP, a national institution, will be given priority in finding reemployment through administrative guidance.

APPENDIXES

APPENDIXES

1. LIST OF PHILIPPINE SIDE PARTICIPANTS AND INTERVIEWEES - 2 -

2. BASIC DESIGN STUDY TEAM PARTICIPANTS - 5 -

3. SCHEDULE OF BASIC DESIGN TEAM IN THE PHILIPPINES - 6 -

4. MINUTES - 8 -

APPENDIX 1

LIST OF PHILIPPINES SIDE PARTICIPANTS AND INTERVIEWEES

1. National Maritime Polytechnic (NMP)

Capt. Benjamin M. Tanedo	President
Mr. Abelardo V. Oca	Vice President for Planning, Research & Project Development
Cdr. A. C. Lantin Bello	Assistant Vice President for Maritime Research
Capt. Rodulfo T. Barongan	Vice President for Administration, Finance and General Services
Capt. Santiago E. Torres	Vice President for Maritime Training
Capt. Exequiel Campo	Assistant Vice President for Special Courses
Miss Maiet Biliran	Assistant Vice President for Corporate Planning

2. National Economic and Development Authority (NEDA)

Mr. Romeo A. Reyes	Director
Mr. Vicente Salazar, Jr.	Assistant Director
Miss Victoria Ta-asan	Assistant Director

3. NEDA Regional Office (Tacloban)

Mr. Venancio Baclagon	Regional Executive Director
Mr. Joe Mazo	Assistant Director

4. Eastern Visayas Telephone Co.

Attorney Sano	Manager

5. Leyte Electric Corporative, Inc. (Leyeco II)

Mr. Manuel L. Sta Maria	General Manager

Mr. Rene Amano	Engineer

6. National Waterworks and Sewerage Authority (NAWASA)

Mr. Ranulfo C. Feliciano	General Manager Leyte Metro Water District

7. Pagasa Station, Romualdes Airport, Tacloban

Mr. Bonifacio G. Furing	Chief Meteorological Officer

8. Professional Regulation Commission (PRC)

Capt. Ceriaco Carvajal	Chairman, Board of Examiners for Marine Engineers
Engr. Jesus Bolos	Member, Board of Examiners for Marine Engineers
Engr. Ricarte Pillos	Member, Board of Examiners for Marine Engineers

9. Philippine Overseas Employment Administration (POEA)

Mr. Crescencio M. Siddayao	Deputy Administrator
Mr. Renato Palomo	Training Division Chief

10. Philippine Merchant Marine Academy (PMMA)

Cdr. Roberto Q. Moreno III	President
Lt. Andres I. Monsanto	Acting Dean of Academics
Cdr. Mabini C. Hernando	Acting Dean, Midshipmen's Affairs
Cdr. Honorio D. Calica	Assistant Professor
Capt. R. Dodds Giagonia	Chief of Research and Information

11. Philippine Merchant Marine School (PMMS)

Mr. Juan O. Nolasco III	Executive Vice President
Mr. Jesus V. Lanuza	Vice President
Mr. Willie D. Abuid	Vice President

Mr. Jose Clarito	Executive Assistant

12. Mitsui O.S.K. Lines

Mr. T. Watanabe	Owner's Representative in the Philippines

13. Daiichi Chuo Kisen Kaisha

Capt. Y. Miyamoto	Chief Representative in Manila

14. Leonis Navigation Company, Inc.

Capt. T. Muroki	Vice President

15. Magsaysay Lines, Inc.

Capt. Leopoldo T. Del Rosario	Training Administrator
Capt. Jose C. Roco	Training Director

16. Architect J. B. Ruiz

Arch. J. B. Ruiz	Architect
Mr. Jose Orlando O. V. Ruiz	Project Coordinator
Mr. Estefanco Ruiz	Engineer

17. Mr. Capistrano N. Ramientos, Jr. Structural Engineer, .

APPENDIX 2

BASIC DESIGN STUDY TEAM PARTICIPANTS

Capt. Shozo Kato	Team Leader Chairman of Navigation Department Institute for Sea Training Ministry of Transport
Takashi Nakamura	Training Scheme and Planning Assistant Professor Marine Technical College
Takeshi Komori	Project Coordination Basic Design Division Grant Aid Department Japan International Cooperation Agency
Masao Takahashi	Architectural Planning Matsuda, Hirata & Sakamoto Architects, Planners & Engineers, Inc.
Capt. Toru Aoki	Training Curriculum & Equipment Planning The Maritime International Cooperation Center of Japan
Tadamasa Goto	Architectural Designing Matsuda, Hirata & Sakamoto Architects, Planners & Engineers, Inc.
Shigeru Fujii	Building Utilities Designing Matsuda, Hirata & Sakamoto Architects, Planners & Engineers, Inc.

APPENDIX 3

SCHDEDULE OF BASIC DESIGN STUDY TEAM IN THE PHILIPPINES

October/November

12th	Wed	Arrival in Manila (Kato, Nakamura, Takahashi, Aoki and Goto)
13th	Thu	Japanese Embassy, JICA and NMP
14th	Fri	M/S Filipinas (observation of the training vessel) Study of the contents of the requests of NMP.
15th	Sat	Analysis of data
16th	Sun	Departure from Manila arrival in Tacloban.
17th	Mon	Investigation of the site Arrival in Manila (Komori and Fujii)
18th	Tue	NEDA Tacloban Office Arrival in Tacloban (Komori and Fujii) Consultations with J. B. Ruiz and others regarding construction conditions. Discussions with NMP regarding training curriculum and training equipment. Building design work.
19th	Wed	LEYECO, Eastern Visayas Telephone Co. and NAWASA. Discussions with NMP trainees. Preparation of schematic plans for Training Building.
20th	Thu	Preparation of minutes Confirmation of the building locations at the site. Designation of boring locations.
21th	Fri	Departure from Tacloban arrrival in Manila. (Kato, Nakamura, Kobayashi, Takahashi, and Aoki) Drafting of minutes. Confirmation of building locations. Collection of meteorological data at the Airport Meteorological Office.
22th	Sat	Departure from Tacloban arrival in Manila. (Goto and Fujii.) Confirmation of master plans at office of Architect J. B. Ruiz. Collection of material on construction conditions. Preparation of minutes.
23rd	Sun	Analysis of data.
24th	Mon	Signing and exchange of Minutes with NMP. Meeting with the Professionals Requlation Committee. Visit to the NEDA. Japan Internation Cooperation Agency Manila Office, Philippine Overseas Employment Agency.

25th	Tue	Departure for Japan (Kato, Nakamura and Komori). Philippine Merchant Marine Academy.
26th	Wed	Mitsui O.S.K. Line. Investigation of construction conditions
27th	Thu	Daiichi Chuo Kisen Kaisha. Investigation of construction conditions
28th	Fri	Japanese Embassy and JICA. Investigation of construction conditions
29th	Sat	Departure for Japan (Aoki). Investigation of construction conditions Analysis of data.
30th	Sun	Investigation of construction conditions. Analysis of data.
31st	Mon	Investigation of construction conditions
1st	Tue	Departure for Japan (Takahashi, Goto and Fujii)

ATTACHMENT Ⅳ

MINUTES OF DISCUSSIONS
ON
THE EXPANSION AND MODERNIZATION PROJECT OF
THE NATIONAL MARITIME POLYTECHNIC, TACLOBAN,
THE REPUBLIC OF THE PHILIPPINES

In response to the request by the Government of the Republic of the Philippines for assistance in Expanding and Modernizing the National Maritime Polytechnic in Tacloban (hereinafter referred to as "The Project"), the Government of Japan has sent through the Japan International Cooperation Agency (JICA) a Study Team headed by Capt. Shozo Kato, Chairman of the Department of Navigation, Institute for Sea Training, to conduct the Basic Design Survey on The Project from October 12th to November 1st, 1983. The Team held a series of discussions and exchanged views with the relevant Authorities of the Government of the Philippines. As a result of the study and discussions, both parties have agreed to recommend to their respective Governments to examine the result of the survey attached herewith toward the realization of The Project.

October 24, 1983

Capt. Shozo Kato

CAPT. SHOZO KATO
Team Leader
Japanese Study Team (JICA)

CAPT. BENJAMIN M. TAÑEDO
President
National Maritime Polytechnic

ATTACHMENTS

1. The objective of The Project is to provide necessary buildings, facilities, teaching equipment and aids for the Expansion and Modernization of the National Maritime Polytechnic in Tacloban (hereinafter referred to as "The NMP").

2. The proposed site of The Project is within the site of The NMP, Bgy. Cabalawan, Tacloban City, Leyte.

3. The basic concept of Expansion and Modernization of The NMP is as follows:

   a. The main role of The NMP is:

      (1) to upgrade the professional competence of merchant marine officers and ratings in accordance with the IMO Standards and the STCW Convention of 1978.

      (2) To develop and maintain a pool of trained maritime manpower to meet the needs of the maritime industry.

      (3) To develop advanced training programmes in order to keep abreast with the advances of maritime technology.

   b. The training departments, the training programmes and curricula are outlined in Annex I.

4. The Japanese Survey Team will convey the desire of the Government of the Republic of the Philippines to the Government of Japan that the latter will provide the teaching equipment and aids, listed in Annex II, buildings to accommodate the above-mentioned items and an administration building, within the scope of the Japanese Cooperation in Grant form.

5. The Government of the Republic of the Philippines will undertake the necessary measures listed in Annex III on condition that the grant assistance by the Government of Japan is extended to The Project.

6. Both sides have confirmed that the Japanese Survey Team explained Japan's Grant Aid Programme and that the Philippine side has understood the same.

A. UPGRADING COURSE

NAVIGATION DEPARTMENT

Subject / Class	Marine Master	Chief Mate	2nd Mate	3rd Mate
1. Subjects related to navigation	180 hours STCW II/2, 2, 4 and 5 articles	200 hours Same as shown on the left	240 hours STCW II/4, 1-3, 5, 6, 8 articles	240 hours Same as shown on the left
2. Subjects related to seamanship	180 hours STCW II/2,6-13 and 15-18 articles	200 hours Same as shown on the left	240 hours STCW II/4, 9-14, 17-20 articles	240 hours Same as shown on the left
3. Subjects related to laws	140 hours STCW II/2, 3 and 14 articles	100 hours Same as shown on the left	80 hours STCW II/4 4, 21 articles	80 hours Same as shown on the left
4. Subjects related to maritime affairs	100 hours	80 hours	-	-
5. Liberal arts	80 hours	100 hours	120 hours STCW II/4 16 articles	120 hours Same as shown on the left
Total	680 hours	680 hours	680 hours	680 hours

Remarks:

1. Subjects related to navigation comprise the subjects on navigational aids, geo-navigation, celestial navigation, electronics navigation, navigation planning and other navigation-technical subjects.

2. Subjects related to seamanship comprise subjects on naval architecture, marine meteorology, ship maintenance, ship handling, marine engines, cargo handling, emergency and other seamanship subjects.

3. Subjects related to laws comprise the domestic laws governing the maritime affairs of the Philippines and on international conventions (stipulated and designated in the IMO standards and STCW Conventions).

4. Subjects related to maritime affairs comprise sea transportation, sea transportation economics, marine insurance and other maritime subjects.

5. Liberal arts comprise physics, mathematics (included in the certificate of competency examination of the Philippines) and English (IMO maritime affairs English).

ENGINEERING DEPARTMENT

Class Subject	Chief engineer	2nd engineer	3rd engineer	4th engineer
1. Subjects related to main engine	200 hours STCW III/2, 3(c) 4(a) articles	180 hours Same as shown on the left	180 hours STCW III/4 3 (b)	180 hours Same as shown on the left
2. Subjects related to auxiliary machinery and electricity	220 hours STCW III/2 3(g) (h) and 4(b)- (e) articles	200 hours Same as shown on the left	200 hours STCW III/4 3(c)	200 hours Same as shown on the left
3. Subjects related to engine fundamentals	100 hours STCWIII/2, 4(5) - (n), 5 and 6	100 hours Same as shown on the left	80 hours	80 hours
4. Subjects related to general management of engineering	80 hours STCW III/2, 4(f)-(n), 5 and 6	100 hours Same as shown on the left	100 hours STCW III/4 3(e) (f) (g)	100 hours Same as shown on the left
5. Liberal Arts	80 hours	100 hours	120 hours	120 hours
Total	680 hours	680 hours	680 hours	680 hours

Remarks:

1. Subjects related to the main engine comprise subjects on internal combustion engines, steam and gas turbines, boilers, propellers and other propulsion equipment.

2. Subjects related to auxiliary machinery and electricity comprise subjects on steering gear, refrigeration and air-conditioning system, automatic control systems, pumping system, electrical equipment, deck machinery and other subjects such as auxiliary machinery and electrical equipment.

3. Subjects related to engine fundamentals comprise subjects on thermodynamics, fluid mechanics, material strength, marine engineering and other subjects of applied mechanics.

4. Subjects related to general management comprise subjects on watchkeeping in engine rooms, security, general engine items, maritime laws and regulations (domestic laws and international conventions) and other subjects dealing with practical guidelines.

5. Liberal arts comprise physics, chemistry and mathematics.

B. SPECIAL COURSE

1. Radar Observer Course

2. Radar Simulator Course (inclusive of ARPA Course)

3. Firefighting Course

4. Lifeboat Man Course (inclusive of survival craft and survival techniques)

   As the above four courses are already implemented at The NMP, we consider the current courses to be sufficient.

5. Tanker Safety Course

   Lectures and training are to follow the contents stipulated in the Annex to Resolution 10 of the STCW Convention.

   Practical Training and Lecture Period: 168 hours (maximum)

6. Dangerous Cargo Course

   The curriculum follows the contents stipulated in Chapter VII of SOLAS.

   Lecture period: 18 hours (maximum)

7. Chemical Tanker Course

   The curriculum and lectures are to follow the contents stipulated in the Annexes to Resolutions 11 and 12 of the STCW Convention.

   Lecture period: 42 hours (maximum)

8. Radio Telephony Course

   The curriculum is to follow the contents stipulated in Annex II and the Appendix of Resolution 15 of the STCW Convention.

   Lecture period: 12 hours (maximum)

9. Ship's Medicine Course

   The curriculum is as follows:

   a. Infectious diseases and methods of isolation
   b. Allergy diseases and their treatment
   c. Medical advice by radio
   d. Symptoms of death
   e. Storage of medicines
   f. Food and food preparation hygiene

   Lecture period: 18 hours (maximum)

ANNEX II

A. UPGRADING COURSE

NAVIGATION DEPARTMENT

Contents of practical training	Training equipment and aids	Class
1. Handling of radar (STCW Convention)	Radars (actual equipment)	Capt., C/O,2/O,3/O
2. Radar plotting (STCW Convention)	Radar simulator (with ARPA)	ditto
3. Handling of electronic navigational equipments (STCW Convention)	Navigational equipment simulator	ditto
4. Handling of meteorology instruments	Observation equipment for meteorology and marine meteorology	ditto
5. Practical training of astronomical observation	Sextants and crystal watch	ditto
6. Practical steering training (including practical autopilot training)	Steering simulator [inclusive of gyrocompass, repeater, magnetic compass, and steering gear (IMO rule)]	ditto
7. Practical training on magnetic compass	Magnetic compass with turntable and repeater	C/O,2/O,3/O
8. Structure observation of Vessel bodies	Vessel bodies: general cargo bulk carrier tanker container	Capt,C/O,2/O,3/O

ENGINEERING DEPARTMENT

Contents of practical training	Training equipment and material	Class
1. Operation of main engine for propulsion and auxiliary equipment (diesel engine plant)	Diesel main engine simulator	C/E,2/E,3/E,4/E
2. Operation of 4-stroke diesel engine for electric generator	4-stroke diesel engine for emergency generator	ditto
3. Handling auxiliary machinery		
a. Operation of water pumps	Centrifugal pump experiment unit	C/E,2/E,3/E,4/E
b. Operation of oil pumps	Screw and gear pump experiment unit	ditto
c. Operation of refrigeration and air-conditioning equipment	Refrigerating and air-conditioning simulator	ditto
d. Operation of steering unit	Steering gear simulator	ditto
e. Operation of hydraulic deck machinery	Hydraulic winch	ditto
4. Operation of electric generator	Electric generator switchboard simulator	ditto
5. Operation of control equipment	Air and electronic type process controllers	ditto
6. Handling of instruments	Electric and electronic circuit trainer and various types of instruments	2/E,3/E,4/E
7. Operation of purifier	Purifier (actual equipment)	
8. Operation of centering monitoring system device of engine equipment	Centering monitoring simulator control of engine equipment	C/E,2/E,3/E,4/E
9. Structural observation:	Cut-out models	C/E,2/E,3/E,4/E
a. Large two-stroke diesel engine	ditto	ditto
b. Large steam turbine	ditto	ditto
c. Gas turbine	ditto	ditto
d. Large boiler	ditto	ditto
e. Main shaft unit (inclusive of propeller)	ditto	ditto
f. C.P.P.	ditto	ditto
g. Side thruster	ditto	ditto
h. On-deck machinery (windlass, anchor, winch, etc.)	ditto	ditto

B. Special Course

Contents of practical training	Training equipment and material	Class
1. Practical training on radar	Radars provided for Navigation Department to be used.	Capt.,C/O,2/O,3/O
2. Practical training on firefighting	Fire detection and alarm system, protection tools, instruments, fire extinguisher, fire exguishing hose, nozzle, portable pumps, etc.	Capt,C/E,C/O,2/E,2/O 3/E,3/O,4/E, Ratings
3. Practical lifeboat training	Equipment inclusive of lifeboat with davits, life raft, signal and radio devices and life jackets.	ditto
4. Practical training on radio telephony	Radio telephony system, VHF	2/O, 3/O
5. Practical training on tanker safety	Cargo handling simulator	Capt,C/E,C/O,2/E,2/O 3/E,3/O,4/E, Ratings

Required Arrangements to be undertaken by the Government of the Republic of the Philippines

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 distribution 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 unloading, tax exemption and customs clearance at ports of disembarkation in the Philippines and prompt internal transportation therein of the products and related training 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 training 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 training 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.

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.

ATTACHMENT B-IV

MINUTES OF DISCUSSIONS

ON

THE DRAFT REPORT OF THE BASIC DESIGN STUDY

ON

THE EXPANSION AND MODERNIZATION PROJECT

OF

THE NATIONAL MARITIME POLYTECHNIC, TACLOBAN

The Government of Japan has sent, through the Japan International Cooperation Agency (JICA), a Basic Design Study Team to the Republic of the Philippines from 19 January to 25 January for the purpose of presenting and explaining the draft of the final report of the Basic Design Study (the Report) on the Expansion and Modernization Project of the National Maritime Polytechnic, Tacloban.

The team held meetings with officials concerned of the National Maritime Polytechnic to explain and to discuss the Report. As result of the discussions, both parties have agreed as follows:

1. The report principally satisfies the Philippine side and appropriate alterations in design agreed during the discussions will be incorporated in the Final Report.

2. The Final Report (10 copies in English) on the project will be submitted to the Philippine Government by the end of March 1984.

3. The Basic Design Study Team and the Government of the Philippines have both understood and confirmed the measures to be undertaken by both parties for the project.

24 January 1984

VICENTE LEOGARD

BLAS F. OPLE
Chairman, NMP Board of Trustees
Minister of Labor and Employment

CAPT. SHOZO KATO
Team Leader
Basic Design Study Team (JICA)