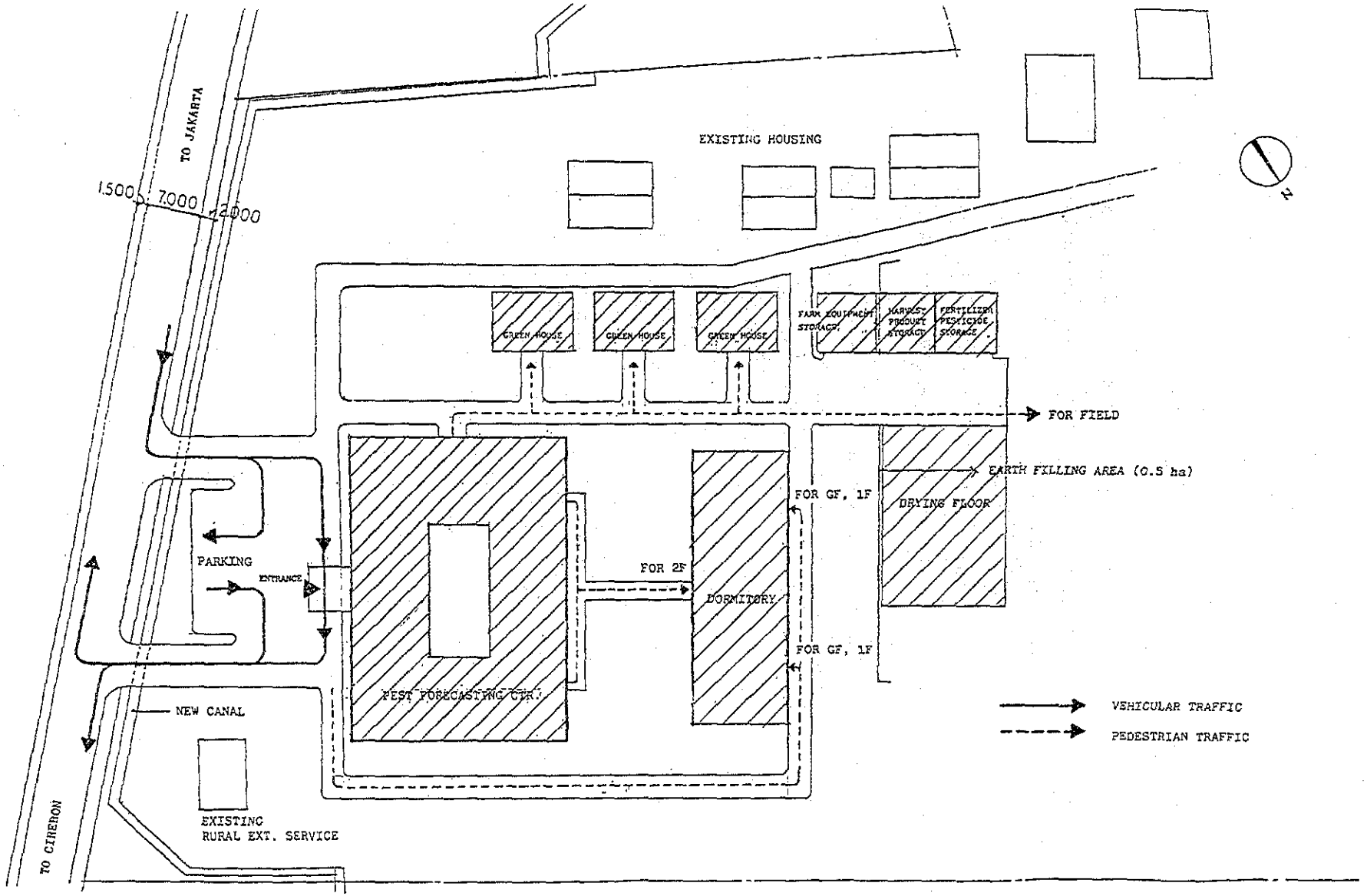


PEST FORECASTING CENTER – JATISARI

LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM

2) Food Crop Protection Centers (FCPC)

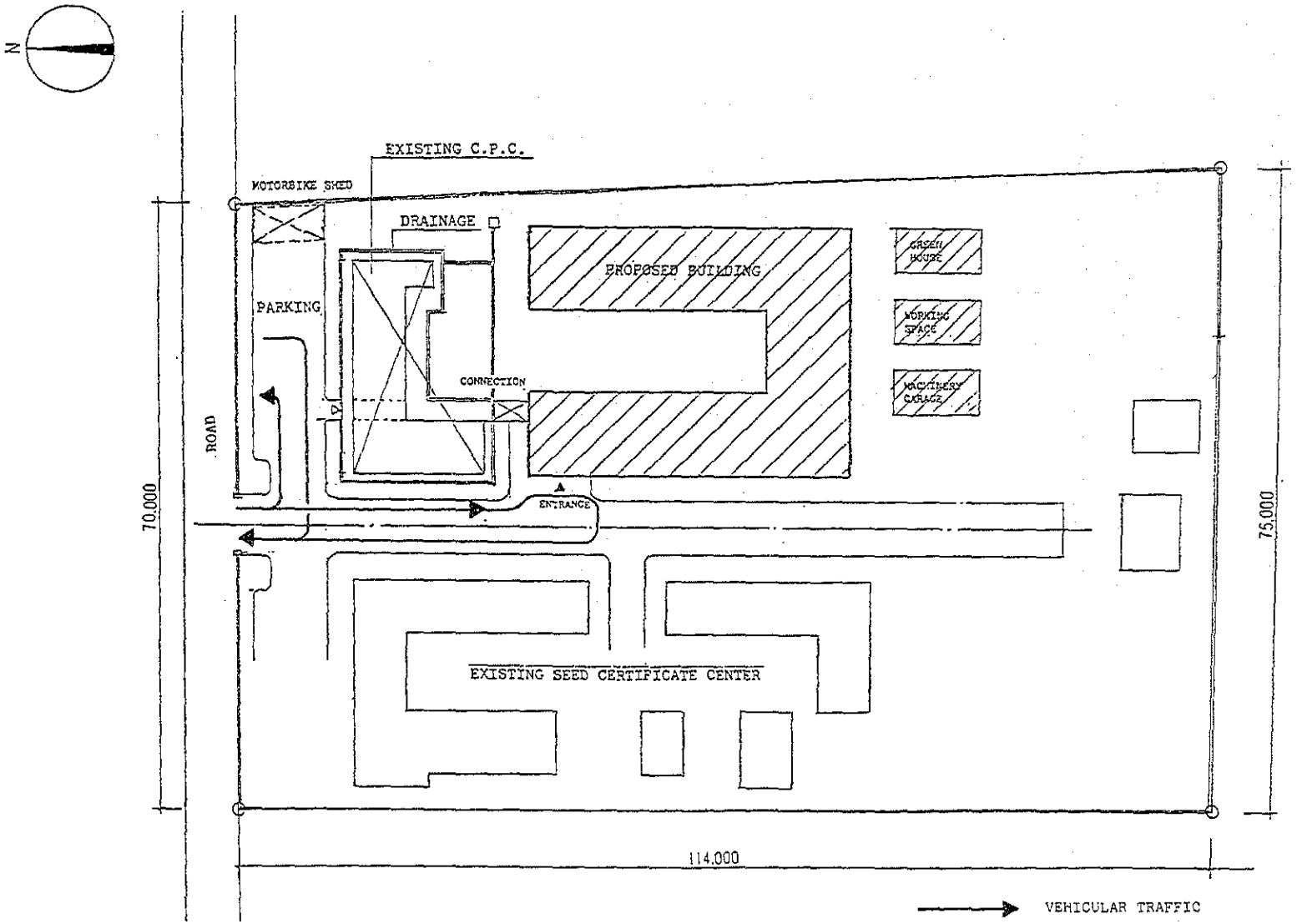
(a) Bandung FCPC

The main building will be constructed behind (south side) the existing FCPC building as its extension. The two buildings will be connected by an open corridor.

Access to the extended part of the building will be made from the private road between it and the existing Seed Certificate Center.

Net houses, a workshop and a storage will be arranged in the rear part (on the south side) of the new FCPC.

The existing single-story storage of approximately 60 m^2 in floor area will be dismantled to locate the new FCPC.



FOOD CROP PROTECTION CENTER – BANDUNG

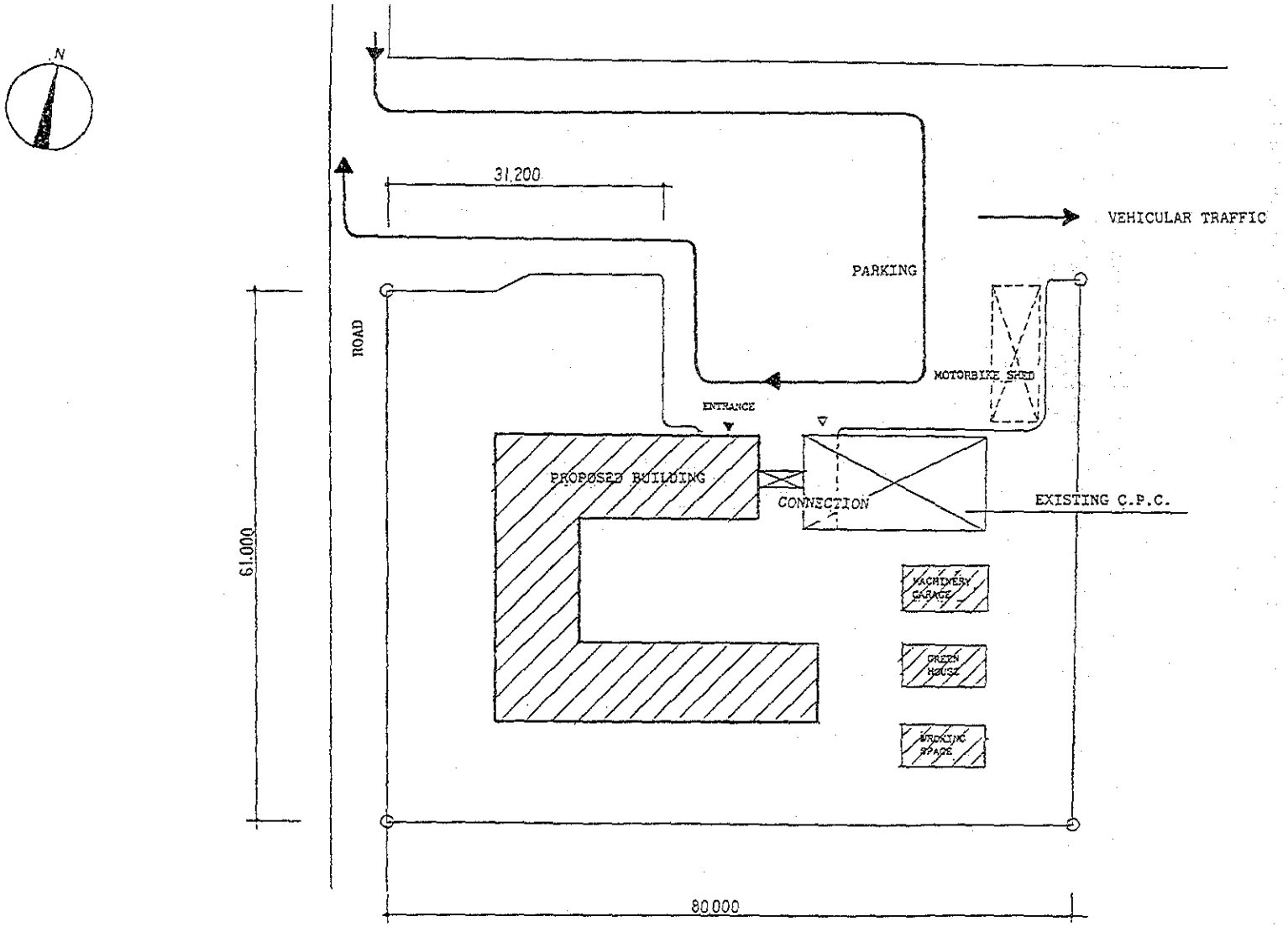
LAYOUT OF FACILITIES

TRAFFIC FLOW DIAGRAM

(b) Semarang FCPC

The main building will be arranged on the west side of the existing FCPC building as its extension. Access to the new FCPC building will be made from the parking space between it and the Radio Center on its north.

The net houses, a storage and a workshop will be arranged parallel to the existing FCPC on the east side of the site. The existing garage (which is used as storage now) will be dismantled.



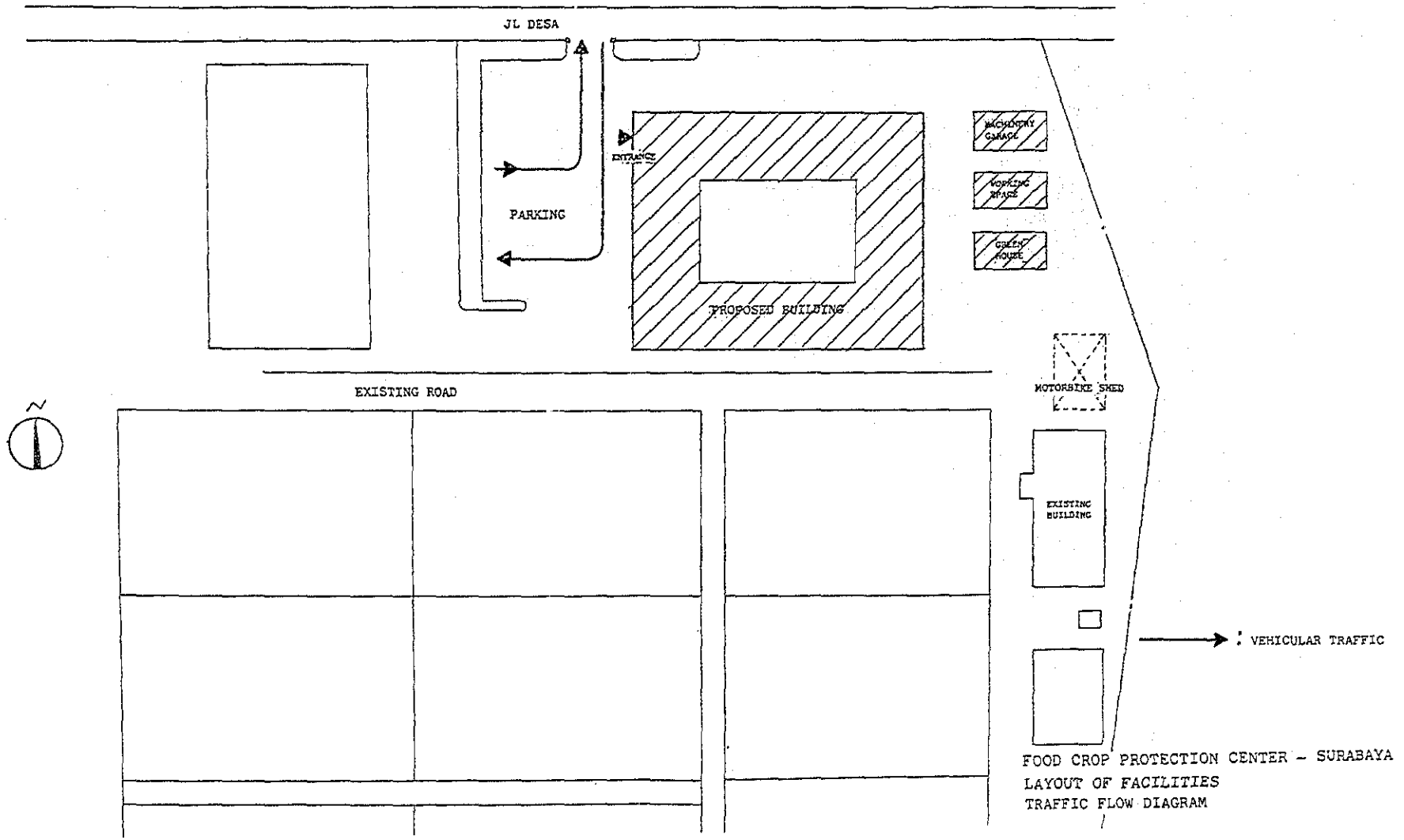
FOOD CROP PROTECTION CENTER - SEMARANG

LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM

(c) Surabaya FCPC

The main building will be newly constructed along the front road on the north, and will be approached from the parking space on the west.

The net houses, a storage and a workshop will be arranged on the south side of the main building across the private road on the premises.

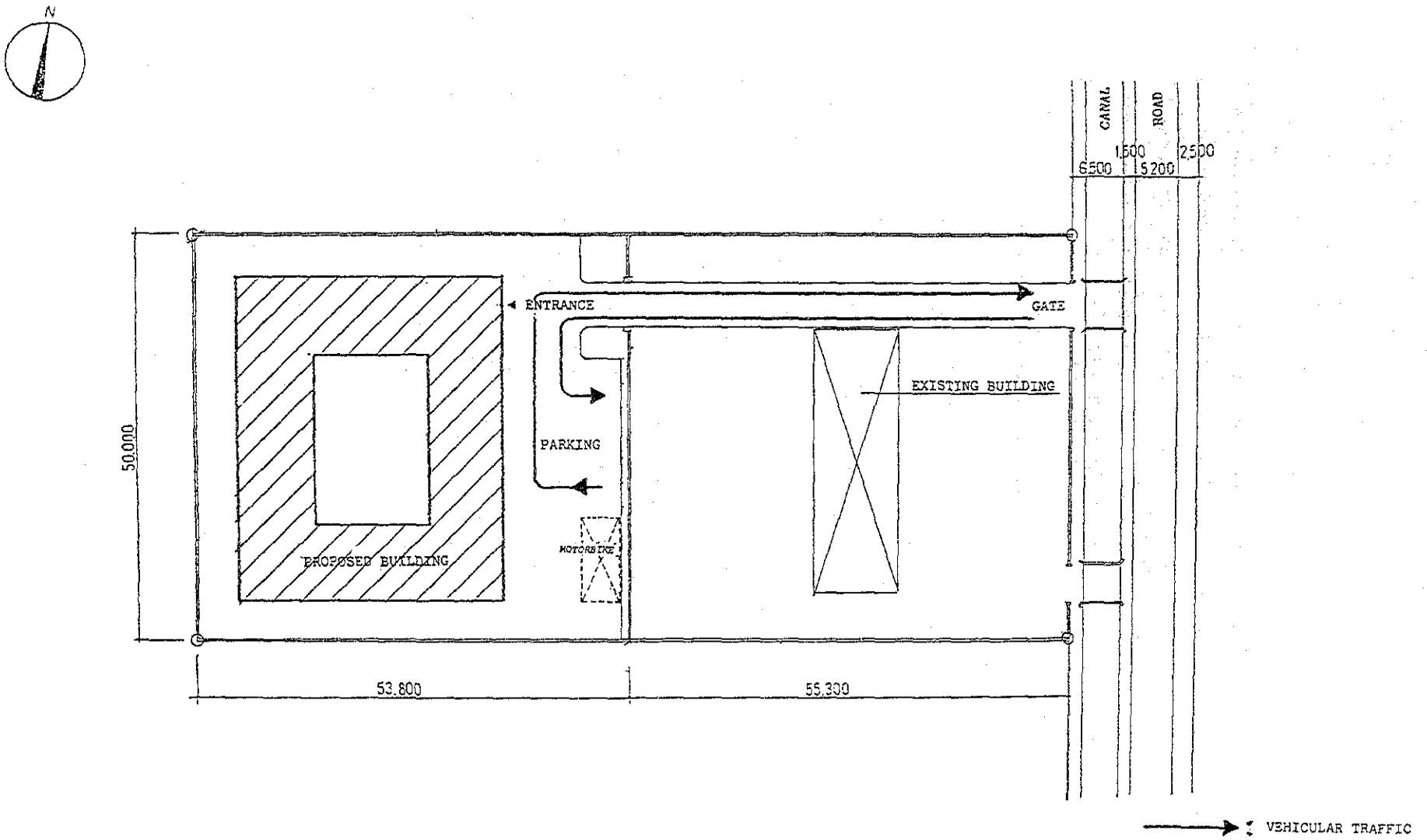


FOOD CROP PROTECTION CENTER - SURABAYA
LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM

(d) Denpasar FCPC

The building will be newly constructed on a site of 53.8 m x 50 m (about 2,690 m^2), leaving a space of 5 m from the boundary line on three sides except on the side facing the parking space.

Access to the building will be made from the front road on the east of the site by constructing a new private road on the north side of the existing Department of Agriculture's Provincial Office.

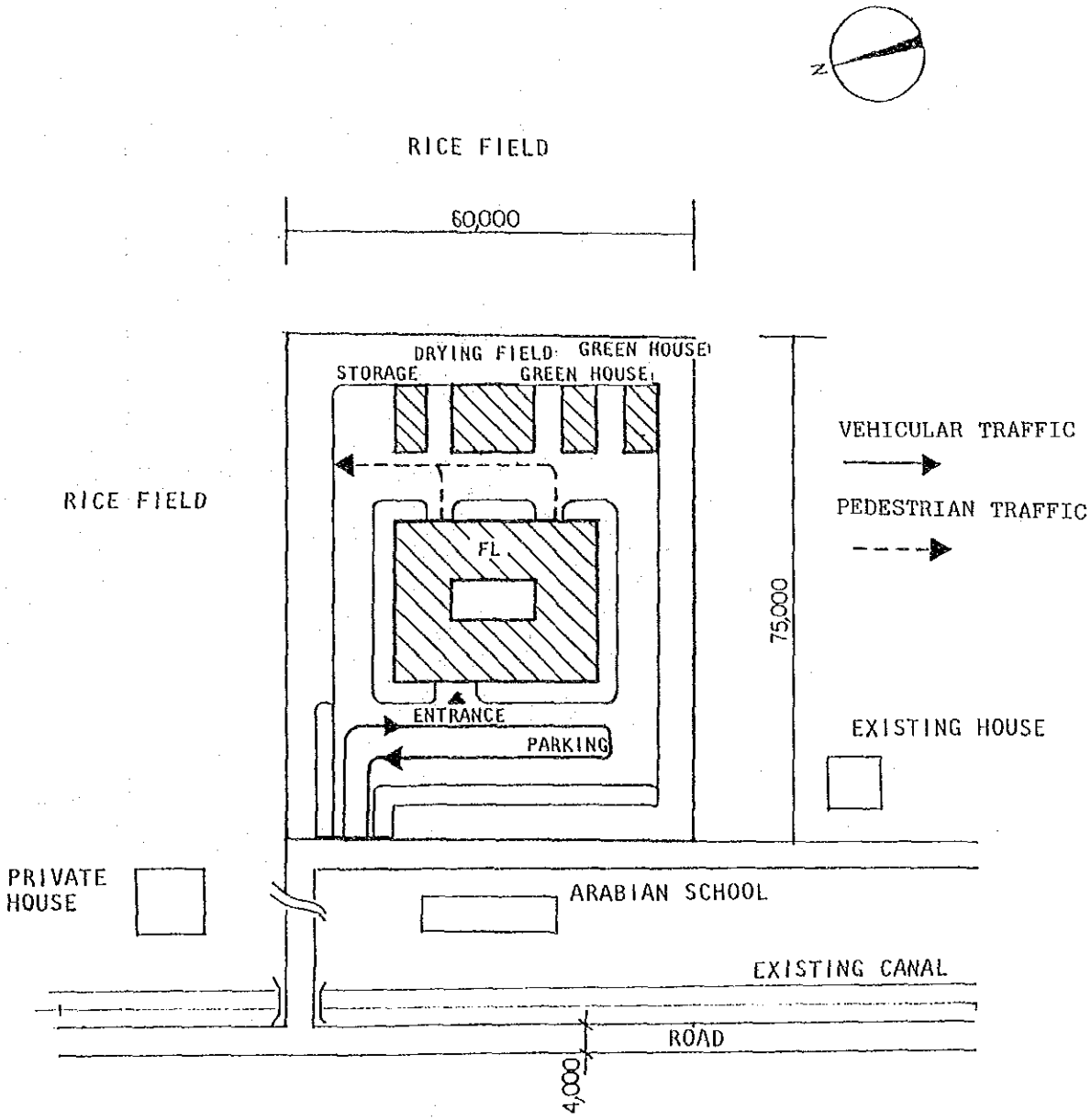


FOOD CROP PROTECTION CENTER – DENPASAR
LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM

3) Field Laboratories (FL)

The 15 FLs scheduled for construction under this project in the three Java provinces and on Bali Island will be constructed in two prototypes. Although most of the construction sites are paddy fields at present, they are ample enough in space and should pose no difficulty in the layout of the buildings.

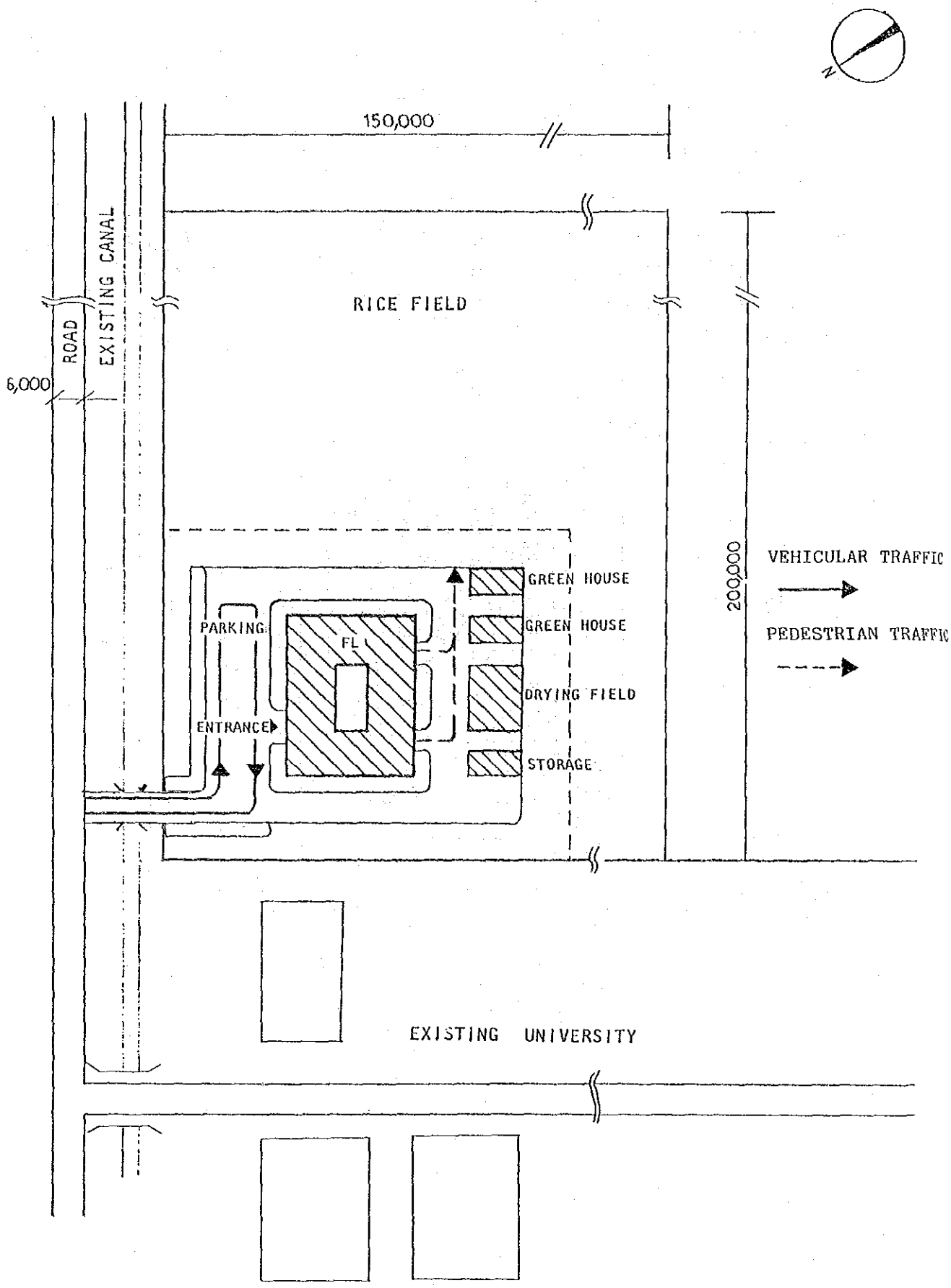
Layout of facilities planned for the proposed construction site of each FL is shown below.



FIELD LABORATORY - Kasemen/SERANG

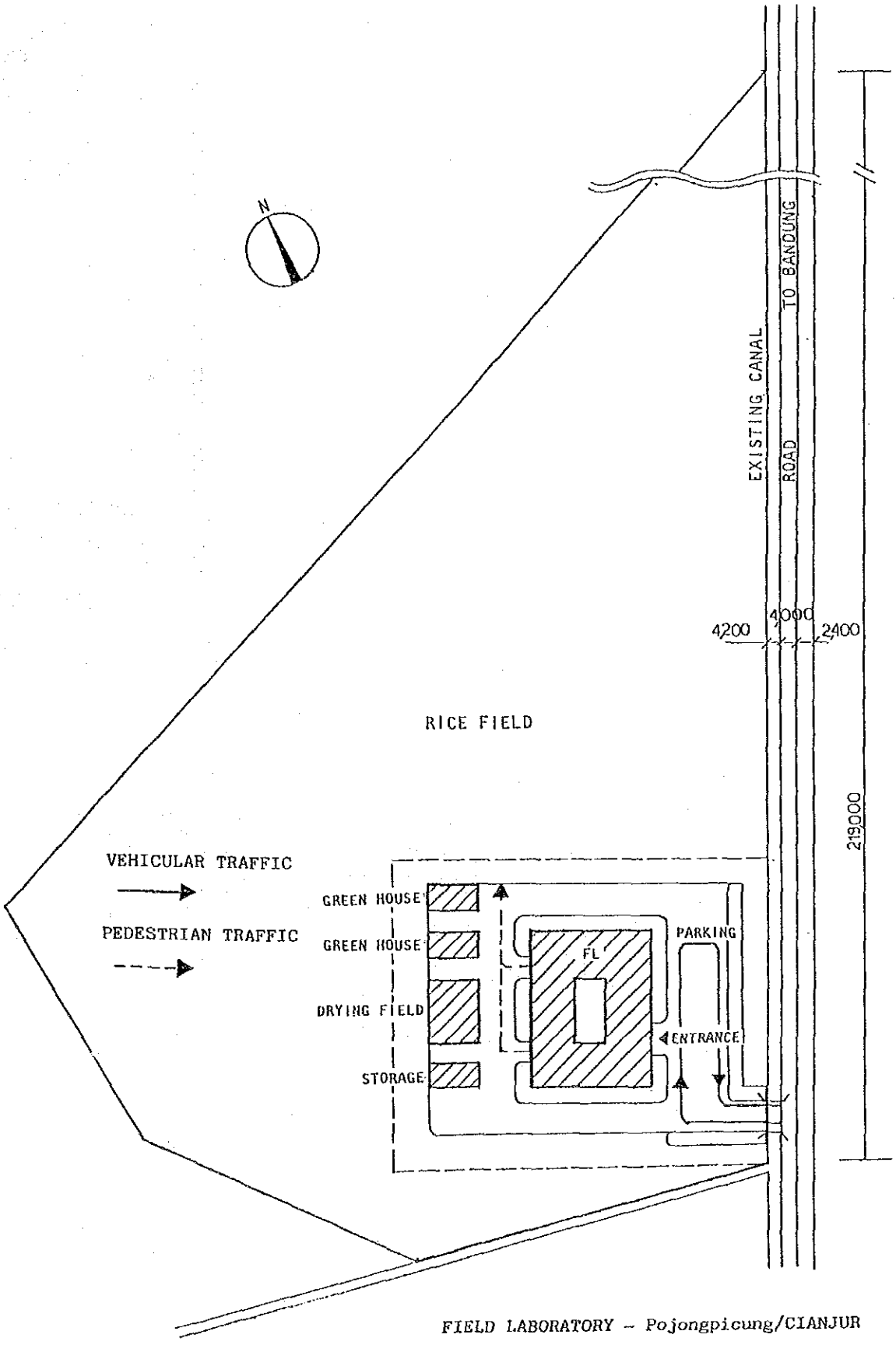
LAYOUT OF FACILITIES

TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Singajaya/INDRAMAYU

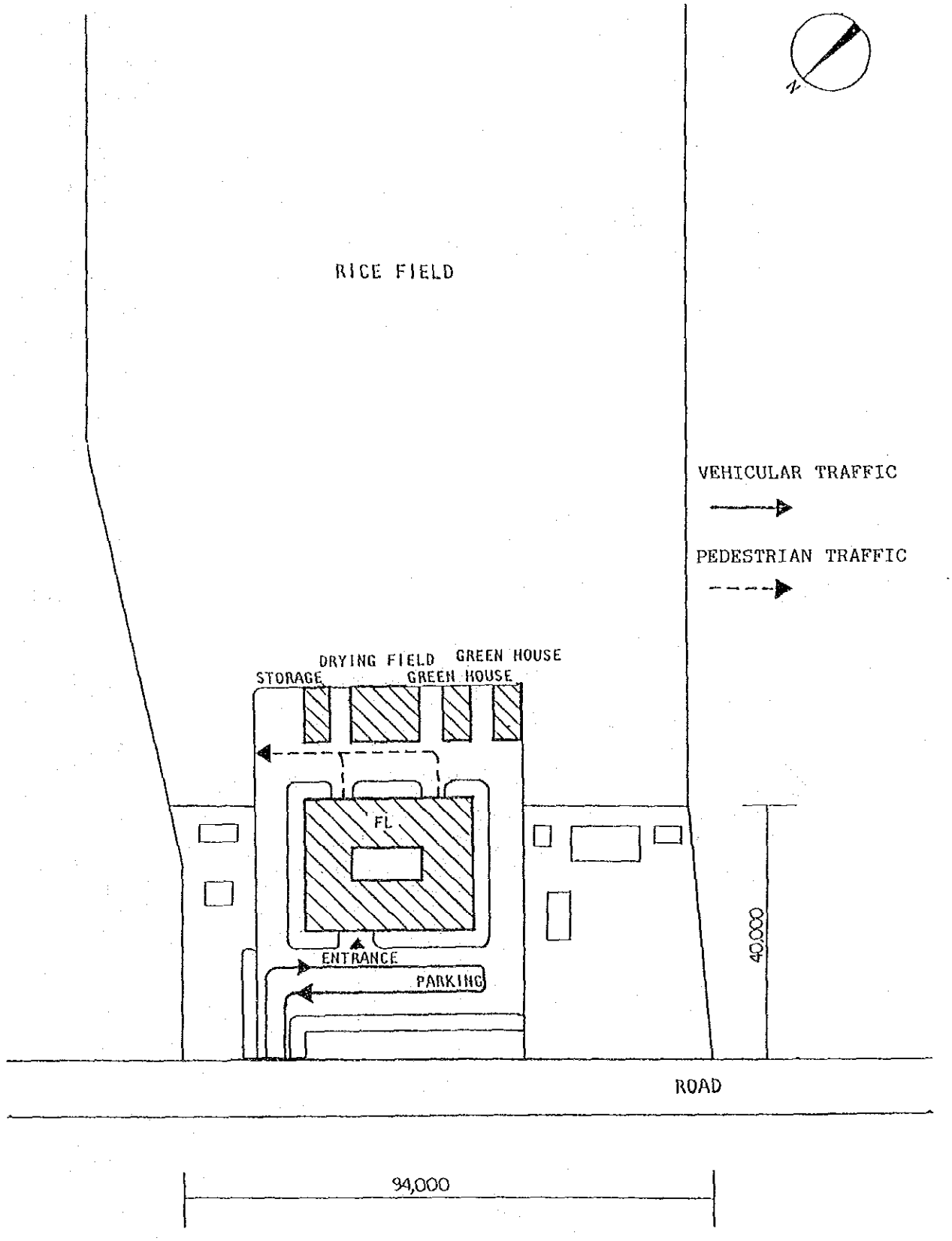
LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Pojongpicung/CIANJUR

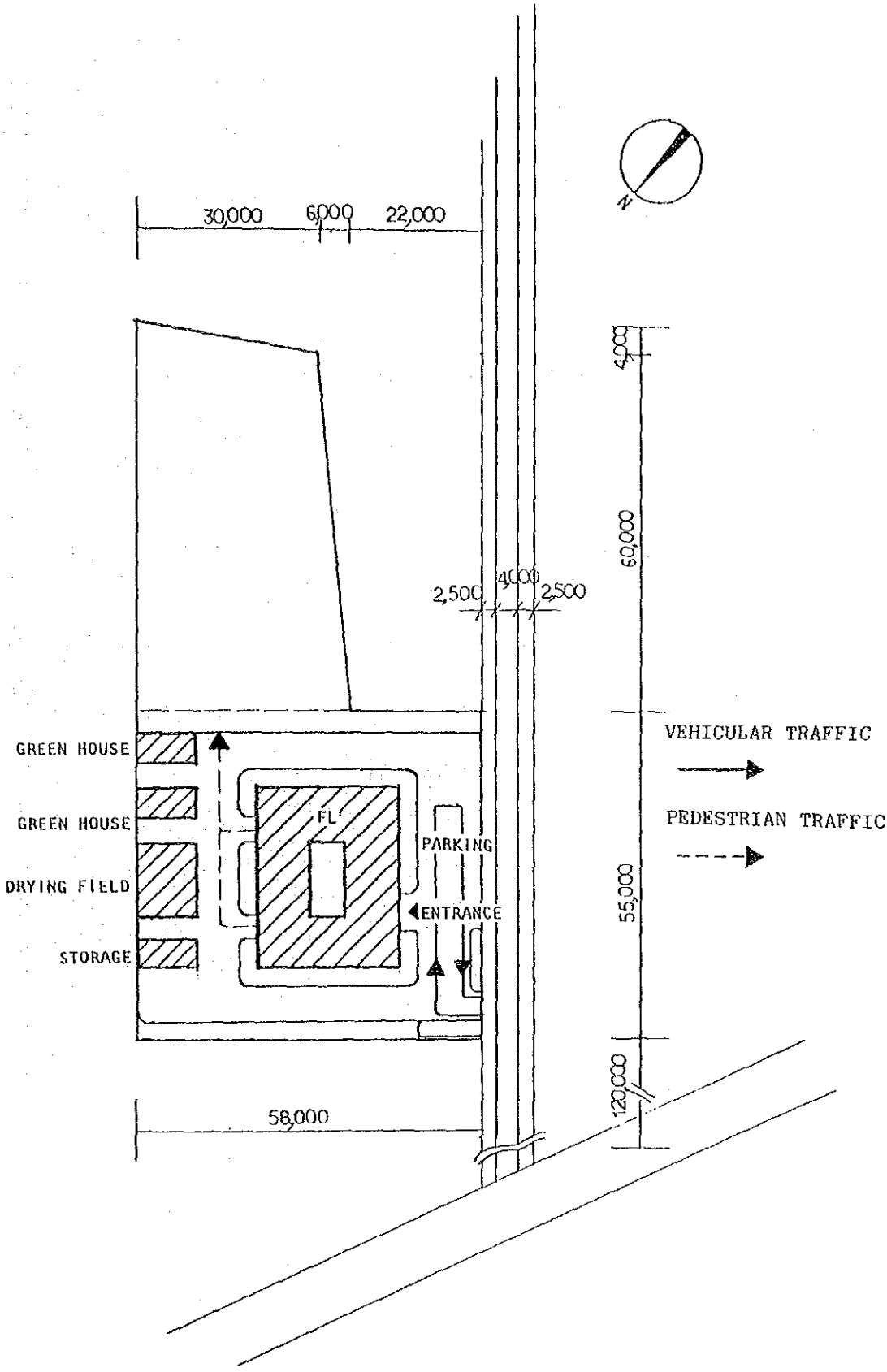
LAYOUT OF FACILITIES

TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Cilembang/TASIKMALAYA

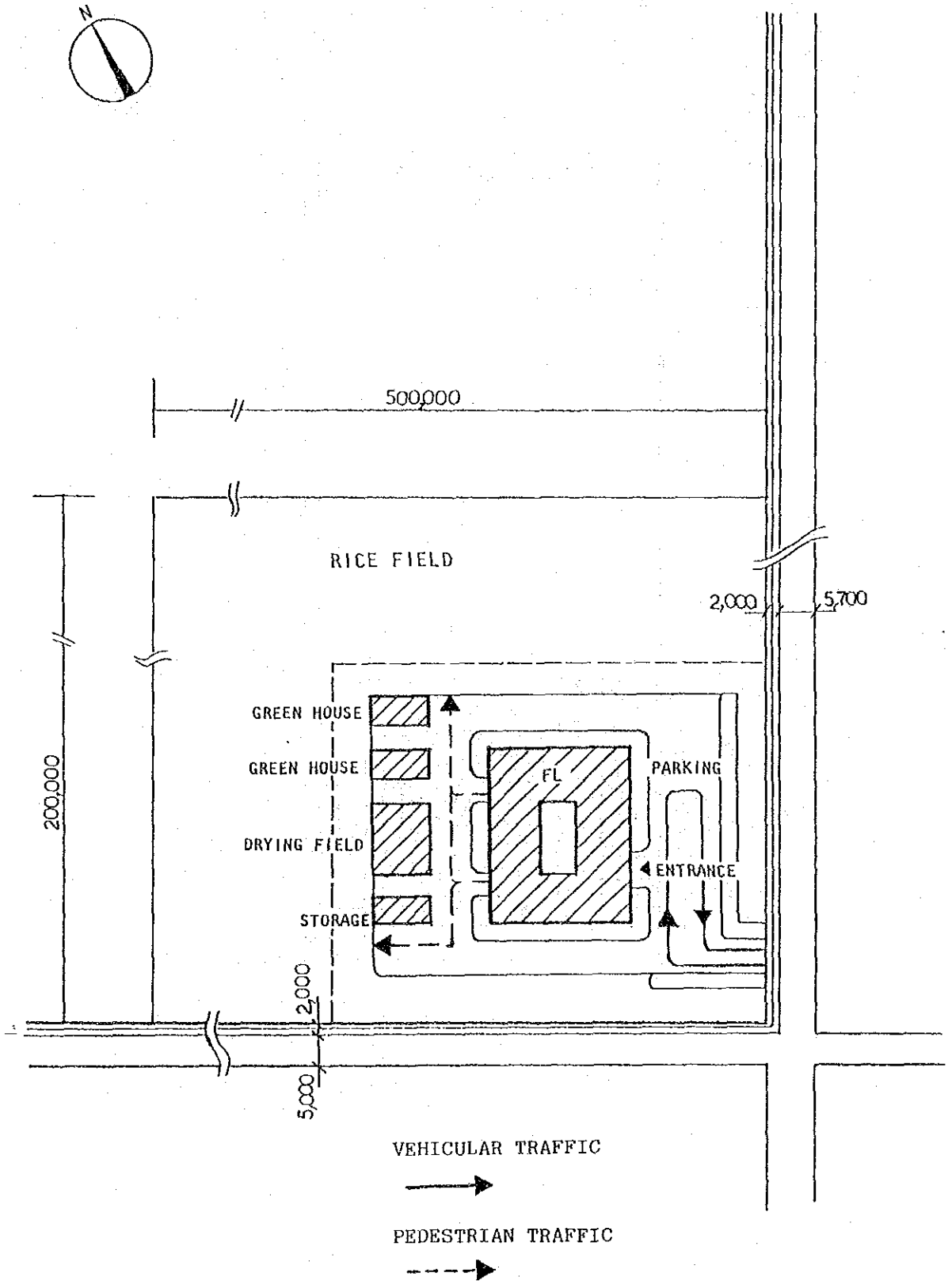
LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Winong II/PATI

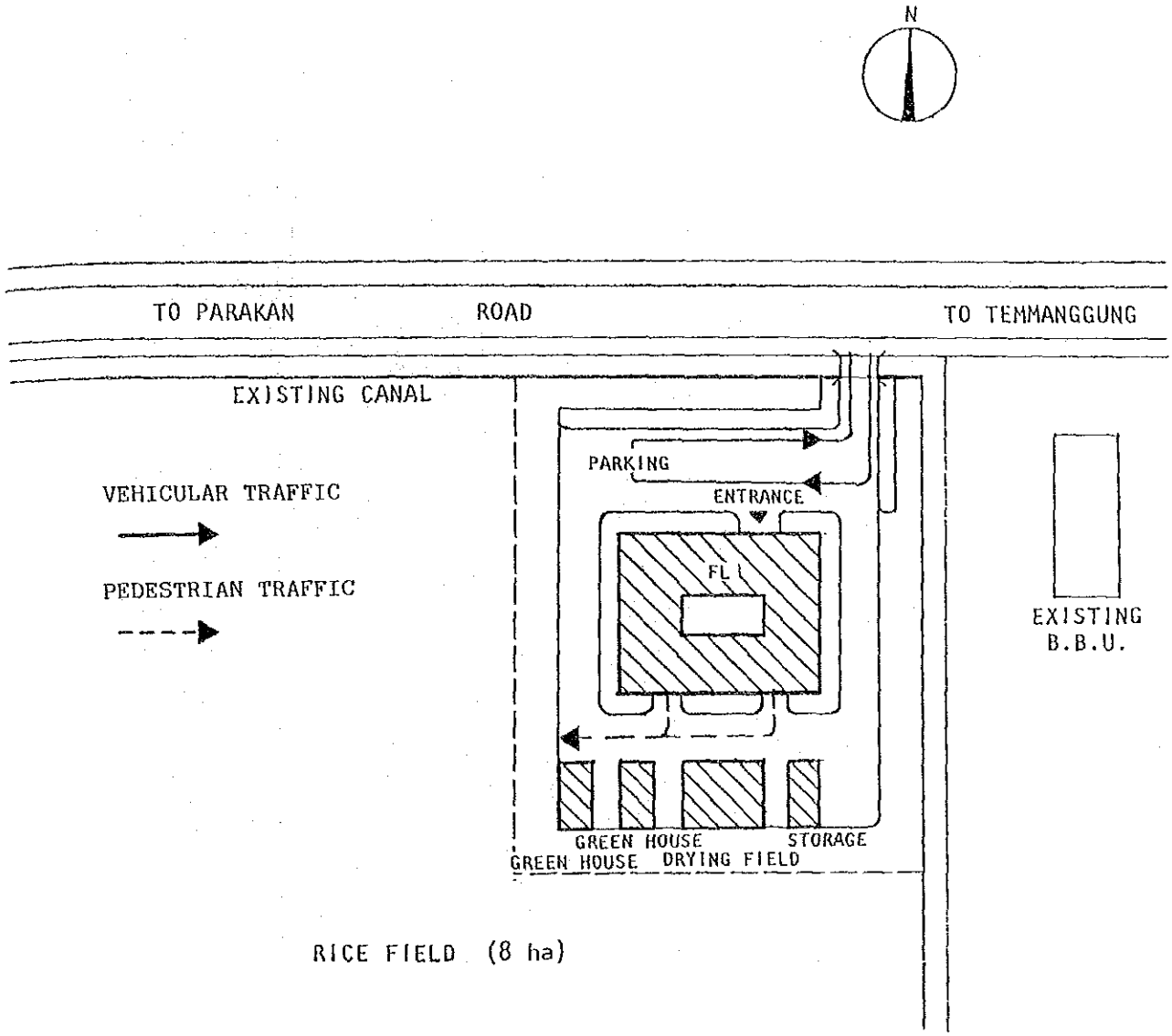
LAYOUT OF FACILITIES

TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Palur/SUKOHARJO

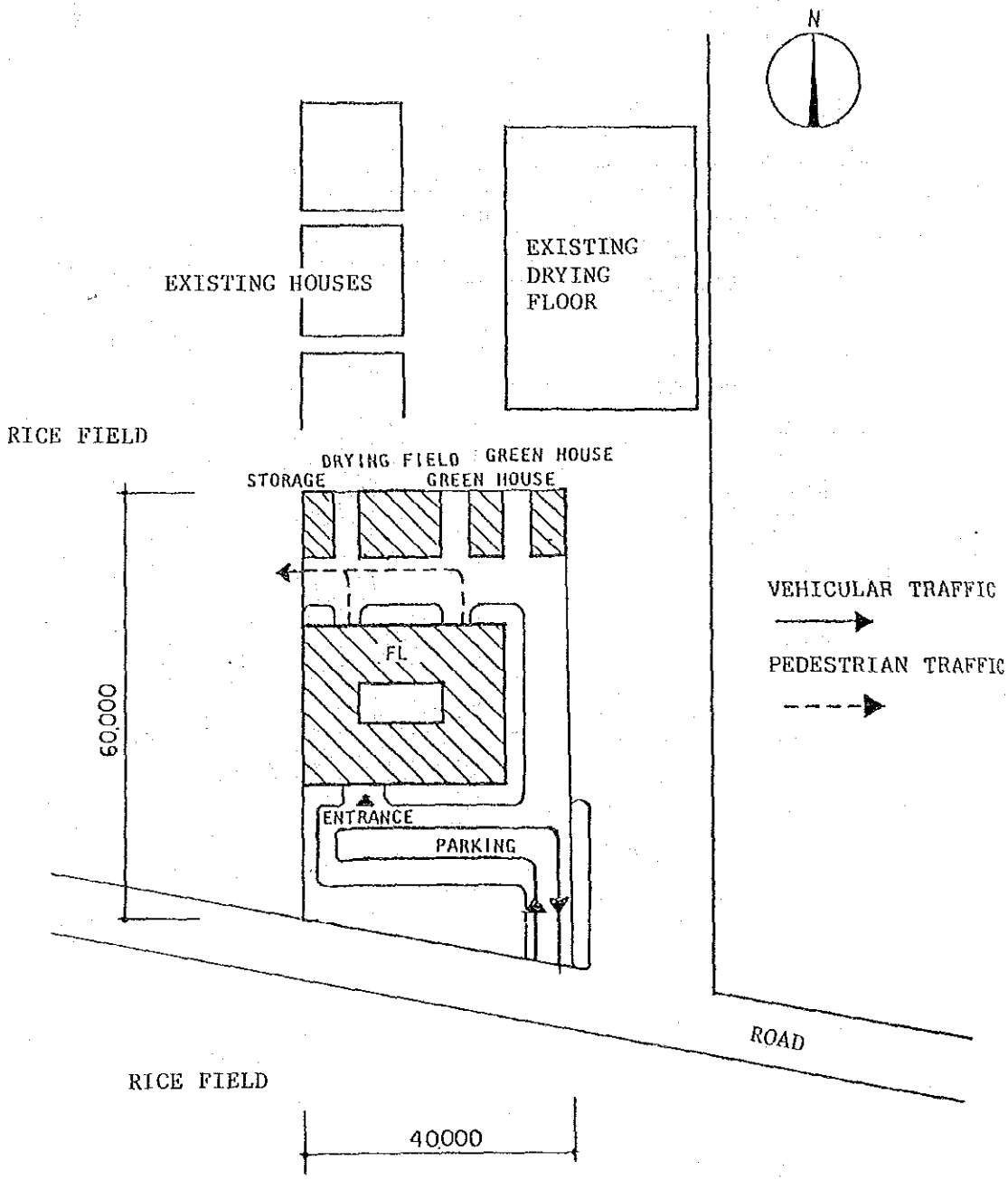
LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Kedu/TEMANGGUNG

LAYOUT OF FACILITIES

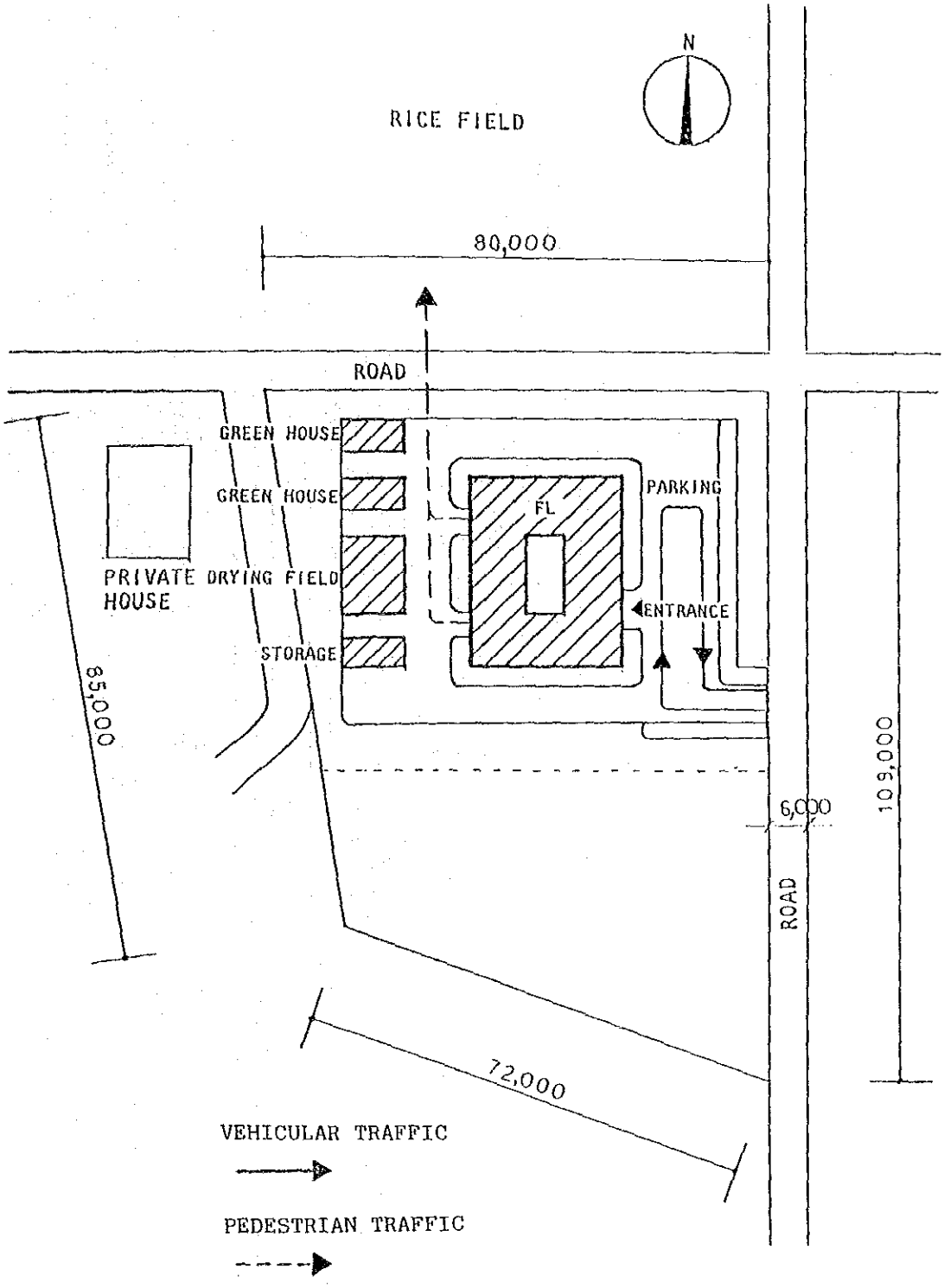
TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Tajum/BANYUMAS

LAYOUT OF FACILITIES

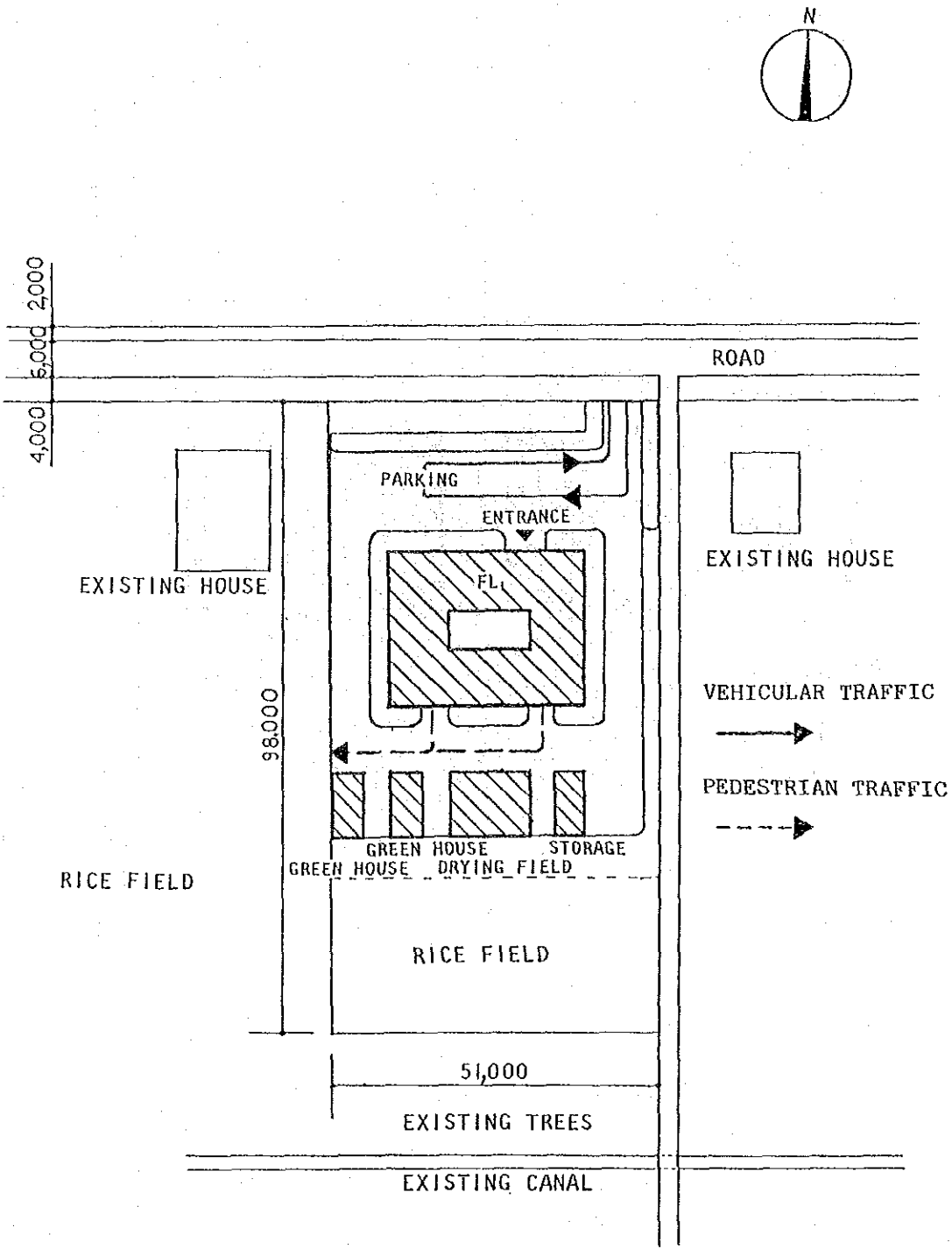
TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Pandak/BANTUL

LAYOUT OF FACILITIES

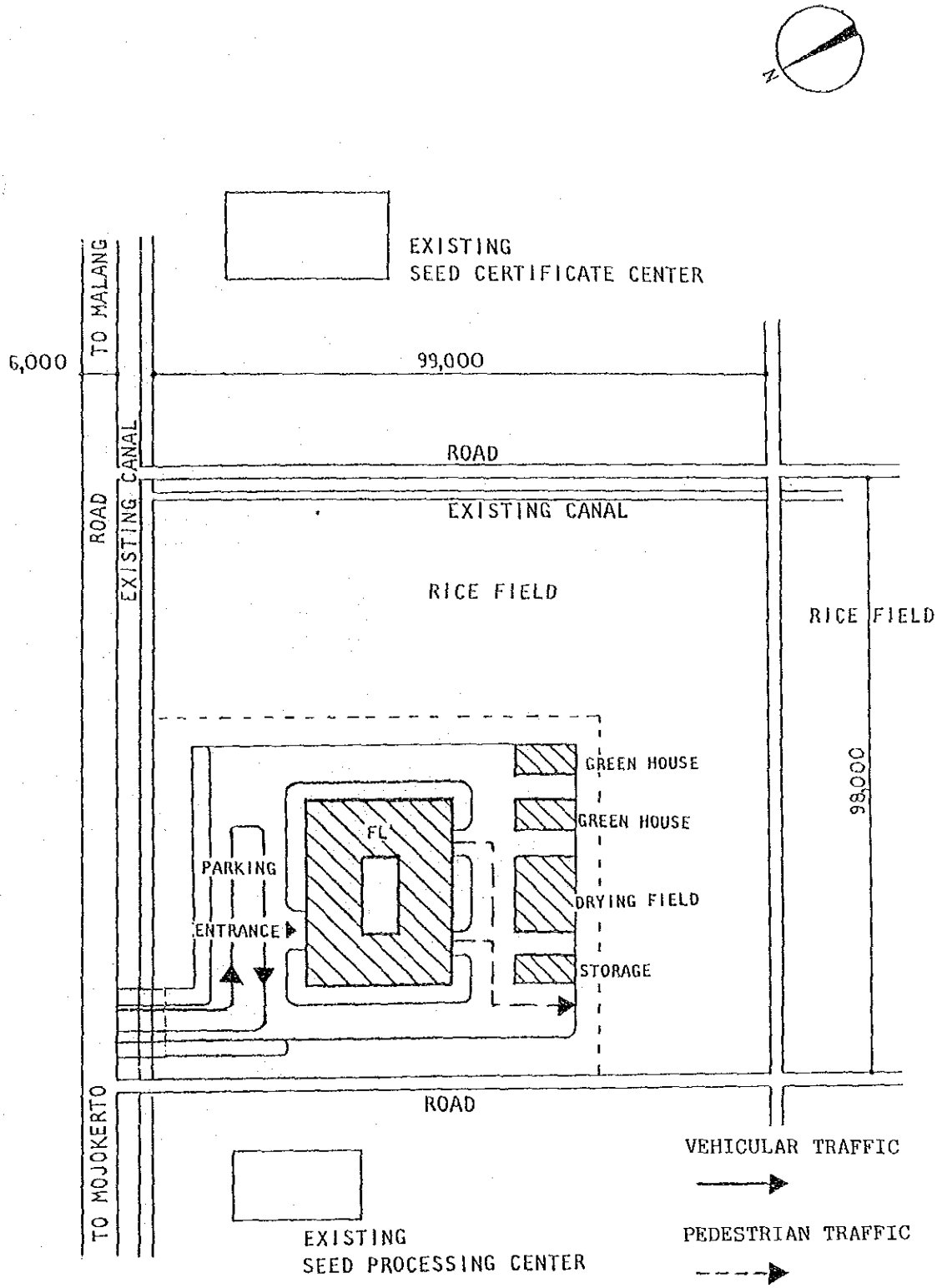
TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Pandaan/PASURUAN

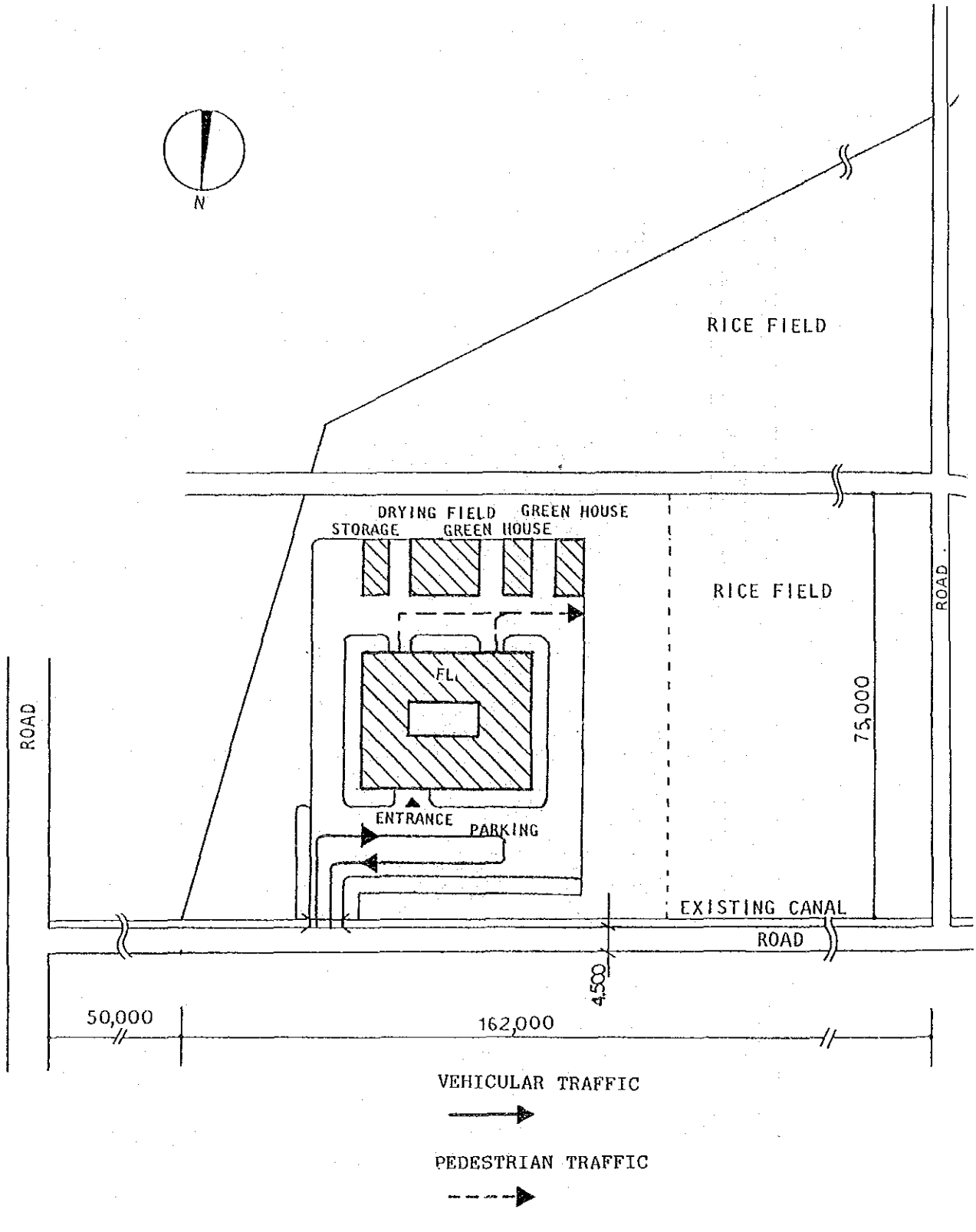
LAYOUT OF FACILITIES

TRAFFIC FLOW DIAGRAM



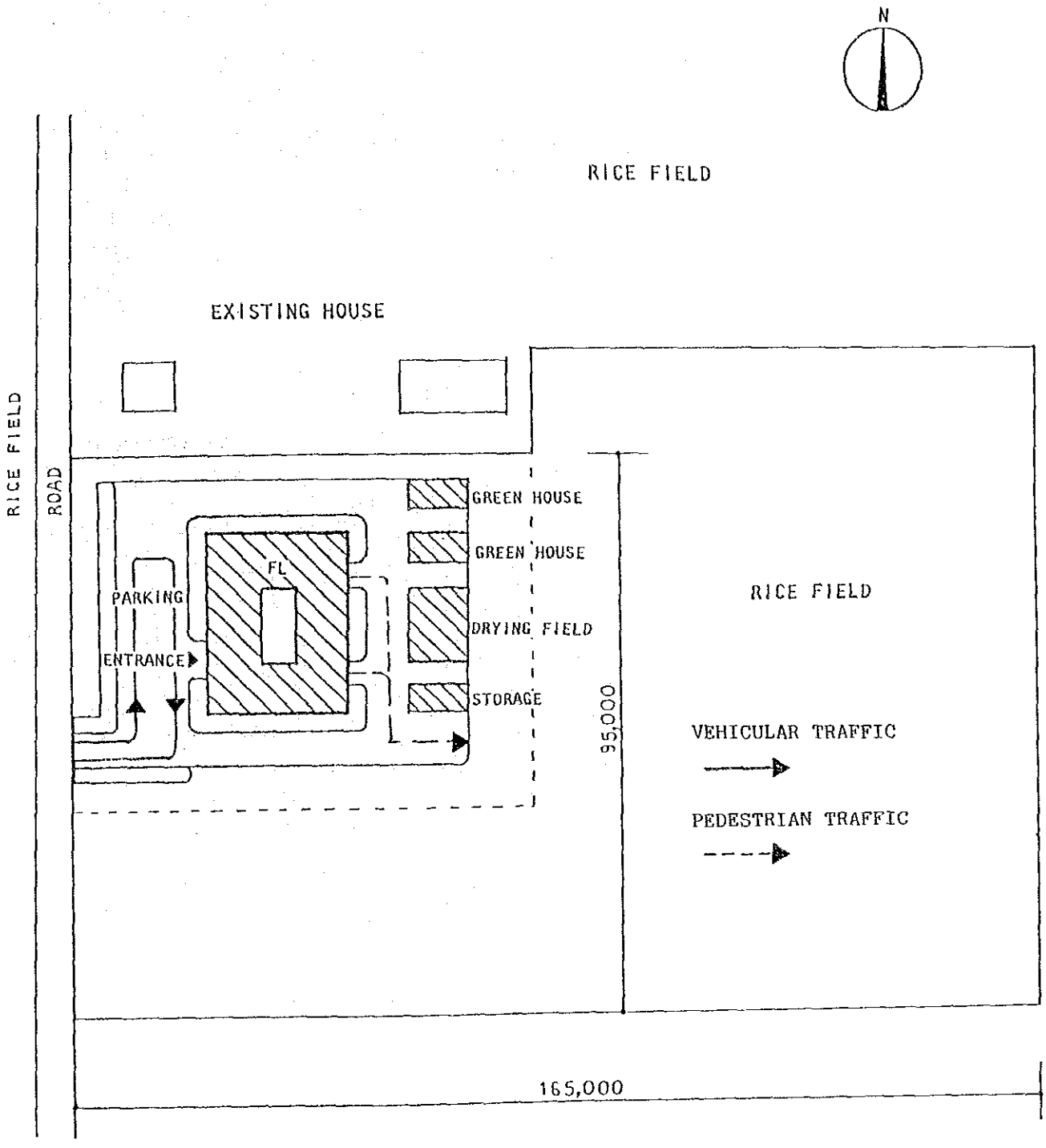
FIELD LABORATORY - Jabon/MOJOKERTO

LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Pamekasan/PAMEKASAN

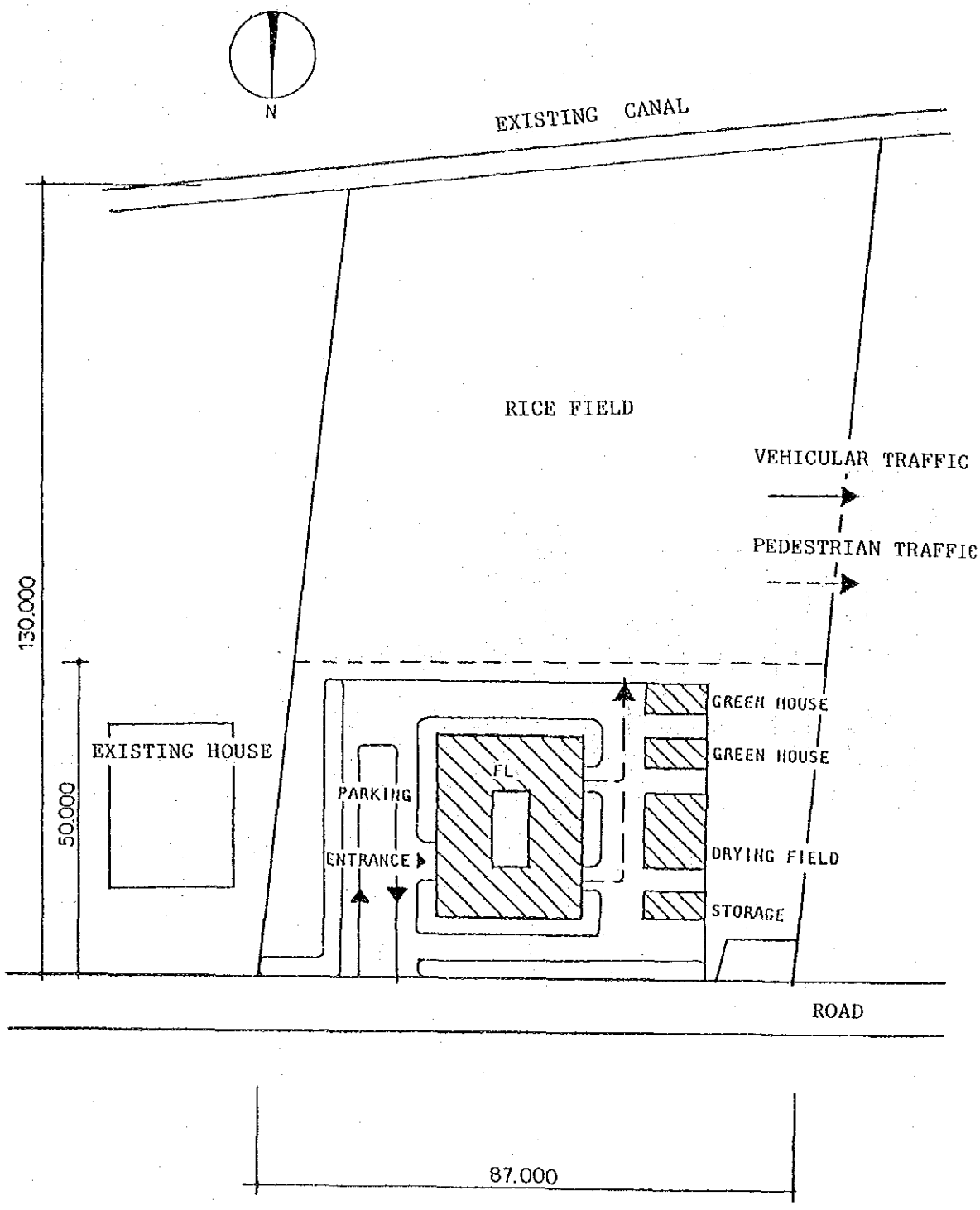
LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Pilangkenceng/MADIUN

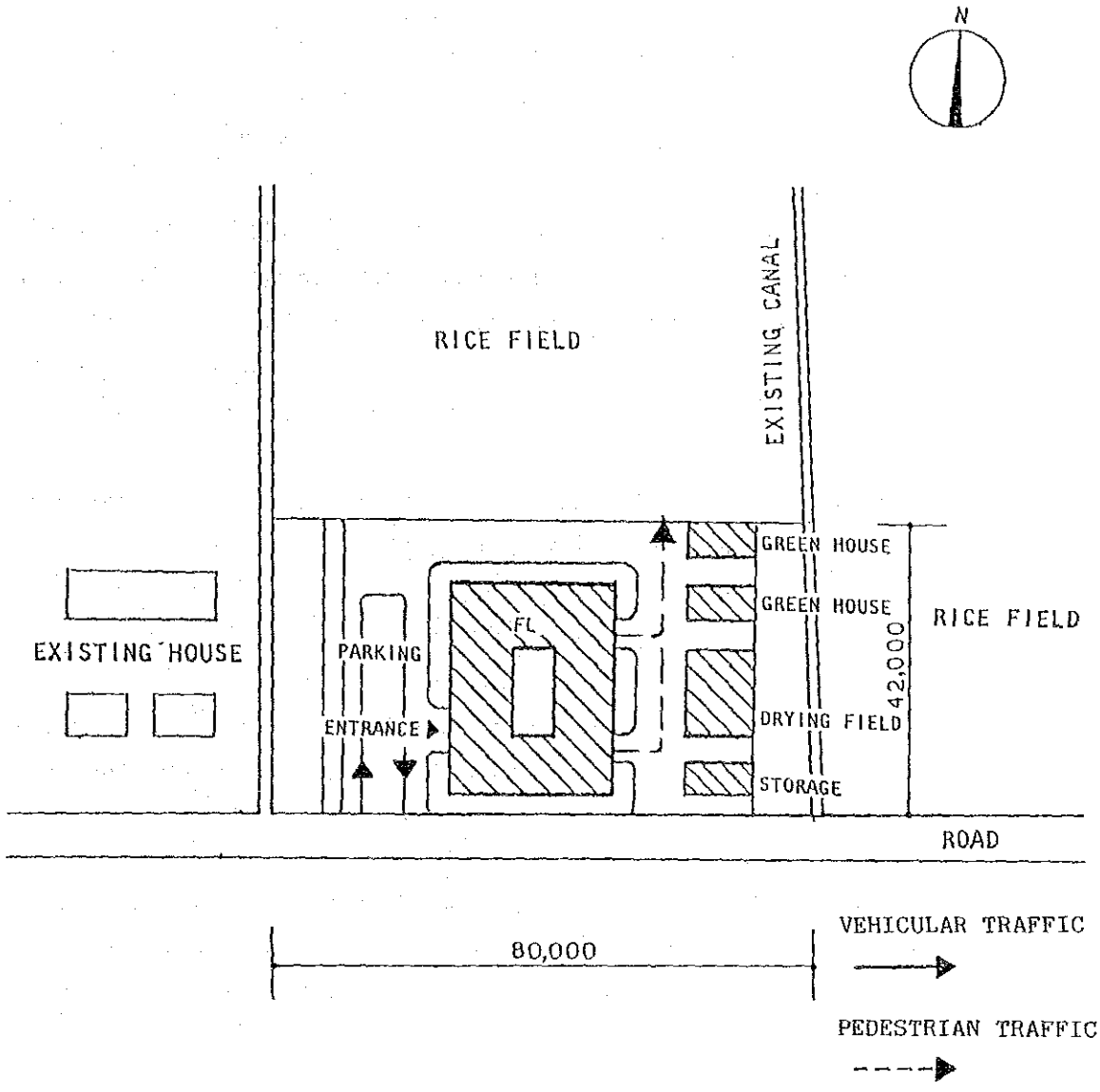
LAYOUT OF FACILITIES

TRAFFIC FLOW DIAGRAM



FIELD LABORATORY – Celuk/GIANYAR

LAYOUT OF FACILITIES
TRAFFIC FLOW DIAGRAM



FIELD LABORATORY - Seririt/BULELENG

LAYOUT OF FACILITIES

TRAFFIC FLOW DIAGRAM

(2) Building Design

1) Pest Forecasting Center (PFC)

(a) Function

PFC is a facility for performing experiments and research on forecasting and control of rice pest and disease which are matters closely associated with actual production on the fields. It is also a facility where practical training is offered to the staff of FCPCs and FLs on a nationwide basis.

The functions of the PFC main building, dormitory and other appurtenant facilities are described below.

a) Main building

In terms of activities, the main building consists of the experiment and research function, education and training function and administration and operation function.

The experiment and research function consists of five laboratories, namely the Entomology Laboratory, Vertebrate Laboratory, Weed Management Laboratory, Virology and Phytopathology Laboratory and Pest Management Laboratory.

The facilities for the education and training function consist of lecture rooms, seminar rooms, library and operation room.

The administration and operation function consists of an Administration office, Head office, technical staff room, experts office, etc.

Since this PFC is to be built by dismantling the existing Jatisari FL, it is to incorporate in addition to the foregoing functions, the functions of FL on the ground floor. The floor area that will be allocated to Jatisari (Karawang) FL is about 205 m^2.

b) Dormitory

The dormitory is a facility for lodging trainees from various rice producing provinces and lecturers invited from overseas and from the Agricultural Research Institute in Bogor.

A cafeteria will be provided on the ground floor and will be made available not only to the people staying in the dormitory but to whoever utilizes the facilities of PFC.

c) Appurtenant facilities

The net houses will be used for experiments on rice damage due to pests and diseases and also for training. The storage will be used for storing agricultural machinery and implements, pesticides and harvested crops.

(b) Floor Planning and Story Height Planning

a) Main building

It shall be a two-story building with a courtyard, and the rooms shall be connected by an open corridor surrounding the courtyard as a traffic line.

On the ground floor is the administration office placed next to the entrance hall for the convenience of receiving visitors.

The laboratories (four rooms) shall be provided on the ground floor since they must be closely located to the appurtenant facilities and the experimental paddy field.

The first floor shall be mainly used for education and training. The floor shall accommodate the technical staff room, Expert office, Seminar rooms, Lecture Room, Library and Pest Management Laboratory.

The ceiling height of each room on the ground floor shall be 3.5 m in accordance with the height of other buildings of the same category in Indonesia. Accordingly, the height of the first story shall be 4.5 m.

b) Dormitory

It shall be a three-story building: the topmost floor for lodging of trainees from other parts of the provinces; the ground and the first floor for instructors' quarters.

The dormitory for trainees shall be planned with a central corridor and shall consist of 20 private bed rooms. The stairway shall be provided in the central void and trainees shall approach the dormitory from the side of the main building.

The quarters for instructors on the ground and second floors shall consist of six dwelling units, each unit consisting of three bedrooms. The entrance of each unit shall face the experimental paddy field so as to separate it from the entrance for trainees.

The ground floor shall accommodate a cafeteria and the living quarters of the resident superintendent. The cafeteria will be opened not only to the trainees but to whoever utilizes the PFC.

The ceiling height of each room shall be 3 m high. The height of each story shall therefore be 3.8 m.

(Bases for Room Area Calculations are shown on the following table.)

BASES FOR FLOOR AREA CALCULATION - PFC -

MAIN BUILDING			
Room	Features/Norms	Floor Area (m^2)	Actual (m^2)
ADMINISTRATION OFFICE	for FINANCIAL : 3 persons for PERSONNEL : 3 persons for GENERAL AFFAIRS : 5 persons 5 m^2 per person with reception space 11 x 5 = 55 + 10 = 65	65	59
CHIEF ADMINI-STRATION OFFICE	for Chief Admin. with meeting space	15	15
HEAD OFFICE	for the Head with meeting space	40	44
SECRETARY	for Secretary with waiting space	10	11
FUNCTIONAL COORDINATOR	for Functional Coordinator with meeting space	20	20
LABORATORY (1) (ENTOMOLOGY)	for ENTOMOLOGIST : 2 persons for TECHNICIAN : 2 persons	60	59
LABORATORY (2) (VERTEBRATE)	for VERTEBRATE PEST : 1 person for TECHNICIAN : 1 person	30	36
LABORATORY (3) (WEED MANAGEMENT)	for WEED MANAGEMENT : 1 person for TECHNICIAN : 2 persons	45	55
LABORATORY (4) (VIROLOGY & PHYTOPATHOLOGY)	for VIROLOGIST : 1 person for PHYTOPATHOLOGY : 2 persons for TECHNICIAN : 2 persons	75	85
SEMINAR RM (1) - (3)	Two rooms mainly for training by actual practice	60	117

Room	Features/Norms	Floor Area (m^2)	Actual (m^2)
EXPERT OFFICE	for 6 Experts 6 x 10 = 60 with meeting space 20	80	88
PEST MANAGEMENT LABORATORY	for PEST MANAGEMENT : 1 person for TECHNICIAN : 1 person	30	36
LIBRARY	Reading area : 3.5 m^2x 7 persons = 24.5 Book area for 5,000 Books at 165 books per 1 m^2= 30 m^2	55	59
OPERATION RM	for meeting and discussion for 30 o/u persons 2 m^2 per person	60	59
TECHNICAL STAFF	for 8 persons 7 m^2 per person 8 x 7 = 56	56	59
TECHNICAL RM	for 8 persons with storage (15 m^2) 8 x 5 m^2/person = 40	55	59
LECTURE RM	for 30 persons 2 m^2 per person with stage (30 m^2)	90	88
COMPUTER RM	for 5 sets personal computer	40	39
FIELD & WAREHOUSE COORDINATOR	for Field Warehouse Coordinator with meeting space	20	29
F/L OFFICE (1) (2)	for ADMINISTRATION : 5 persons for TECHNICAL STAFF : 3 persons for HEAD OFFICE : 30 m^2 meeting space : 20 m^2	90	88

Room	Features/Norms	Floor Area (m^2)	Actual (m^2)
F/L LABORATORY (1)	for TECHNICIAN : 2 persons x15m^2 for ASSISTANT : 2 persons x10m^2 for SUB. ASSIS.: 2 persons x 5m^2	60	59
F/L LABORATORY (2)	for TECHNICIAN : 2 persons x15m^2 for ASSISTANT : 2 persons x10m^2 for SUB ASSIS. : 2 persons x 5m^2	60 M^2	59
DORMITORY			
LECTURER'S RM	Three Bed Rooms Kitchenette Living, Dining Room	100	80
CAFETERIA	for 40 persons 1.5 m^2 per person	60	60
BED RM	for 1 person	13	11

2) Food Crop Protection Centers (FCPC)

FCPCs to be built in Bandung and Semarang shall be extensions of the existing FCPCs. The ones planned for Surabaya and Denpasar shall be newly built.

(a) Function

The function of the FCPC is to perform administrative activities as sub-organ of the Directorate of Food Crop Protection (DFCP) located in Pasar Minggu and to oversee the FLs placed under its control. In addition to the above, facilities which will enable it to perform technical activities will also be provided under this project.

Its facilities shall consist of the administration office, rooms for technical staff, laboratory, library, computer room, meeting room, etc.

As appurtenant facilities, it shall be provided with net house, storage, and working space.

(b) Floor Planning and Story Height Planning

It shall be a single-story building with a courtyard, and each room shall be connected by an open corridor that faces the yard. The ceiling of each room shall be 3.5 m high and heat shall be insulated by means of the space provided above the ceiling by the pitch of roof at 7/10.

(Bases for Room Area Calculation for FCPC are shown on the following table.)

BASES FOR FLOOR AREA CALCULATION - FCPC -

Room	Features/Norms	Floor Area (m^2)	Actual (m^2)
ADMINISTRATION RM	for 15 persons 5 m^2 per person 15 x 5 = 75	75	A. ___ B. ___ C. 74
CHIEF ADMINISTRATION	for chief administration with meeting space	25	A. ___ B. ___ C. 25
HEAD OFFICE	for office of Head with meeting space (30 m^2) and secretary (20 m^2)	50	A. 49 B. 49 C. 49
TECHNICAL STAFF RM	for office of 12 technicians 5 m^2 per person, 12 x 5 = 60	80	A. 74 B. 63 C. 63
ASSISTANT RM	for office of 6 Assistants 5 m^2 per person 6 x 5 = 30	30	A. ___ B. ___ C. 32
WORK SHOP	for 2 persons work space	35	A. ___ B. 35 C. 49
COMPUTER RM	for 3 sets personal computer	35	A. 35 B. 35 C. 35
GENERAL OFFICE (1)	for 2 Sec. chiefs 10 m^2 per person	20	A. 22 B. 18 C. 18
GENERAL OFFICE (2)	for 2 Sec. chiefs 10 m^2 per person	20	A. 22 B. 18 C. 18
LIBRARY	Reading area 3.5 m^2 x 5 persons = 17.5 Book area for 2,900 books at 165 per 1 m^2 =17.5	52 (35x1.5=52)	A. 49 B. 49 C. 49
MEETING RM	for 42 FCPC staffs and 5 - 6FL persons 2 m^2 per person 50 x 2 = 100	100	A. 98 B. 98 C. 100
LABORATORY	TECHNICIAN - 3 x 5 m^2 ASSISTANT - 2 x 10 m^2	65	A. 81 B. 88 C. 81

Abbreviations A: BANDUNG FCPC
B: SEMARANG FCPC
C: SURABAYA DENPASAR FCPC

3) Field Laboratories (FL)

The FL has a technological development function closely relevant to the actual production field, and performs experiment and research adapted to the regional characteristics of each locality.

The FLs planned at 15 locations under this project are classified into two types. (Refer to Chapter 3)

Type A is the FL which functions as a research organization collaborating with FCPCs and also one that has laboratory facilities for natural enemies and field rat. Type B includes all others than the aforementioned.

Type B FL shall be designed as a single-story building with a courtyard, and two Laboratories, operation rooms, administration office and storage and wash room shall line the open corridor surrounding the courtyard. The Type A FL shall have a laboratory of about 70 m^2 in addition to these.

(Bases for Floor Area Calculation are shown on the following table)

BASES FOR FLOOR AREA CALCULATION - FL -

Room	Features/Norms	Floor Area (m^2)	Actual (m^2)
OFFICE (1)	for ADMINISTRATION : 5 persons for TECHNICAL STAFF: 3 persons 5 m^2 per person 8 x 5 = 40	40 M^2	42 M^2
OFFICE (2)	for Head including meeting space	30	30
OPERATION RM	for meeting and discussion with display board for 35 o/u persons 2 m^2 per person 35 x 2 = 70	70	72
LABORATORY (1)	for TECHNICIAN : 2 persons x15m^2 for ASSISTANT : 2 persons x10m^2 for SUB. ASSIS.: 2 persons x 5m^2	60	54
LABORATORY (2)	for TECHNICIAN : 2 persons x15m^2 for ASSISTANT : 2 persons x10m^2 for SUB. ASSIS.: 2 persons x 5m^2	60	54
MULTIPURPOSE LAB. (A type FL)	for VERTEBRATE LAB. : 6 persons for BIOLOGICAL LAB. : 6 persons	60	72

4-1-4 Structural Design

(1) Design Principle

1) The structure of each building under this project shall be designed as reinforced concrete structure. The number of stories of major buildings of each establishment are as shown below.

   (a) Pest Forecasting Center (PFC), Main Building: Two-stories

   (b) Pest Forecasting Center (PFC), Dormitory: Three-stories

   (c) Food Crop Protection Center (FCPC),
   Main Building: Single-story

   (d) Field Laboratory (FL), Main Building: Single-story

2) The structure of each building shall be strong enough to resist every external force and be able to transmit the force simply and clearly to the ground.

3) As the site planned for the multi-story PFC main building and dormitory was developed by earth filling of paddy field, a request for boring test was made to the Indonesian government. As a result of analysis and review of the survey data, it was decided that each building should be supported by precast PS concrete piles.

   With respect to the single-story FCPC and FL facilities, it was decided, upon an analysis and review of the conditions of existing buildings and the results of boring tests, that each building should be supported by an independent footing down to the bearing stratum instead of driving piles.

4) As the sites proposed for the construction of each PFC, FCPC and FL are, or were once paddy fields (except Denpasar FCPC on Bali Island), the method of placing concrete directly on the earth as flooring of the ground floor shall be avoided in consideration of

future ground subsidence. Instead, structural reinforced concrete floor slabs supported by the building itself shall be adopted as flooring.

5) The familiar structural methods generally practiced locally shall be employed, with a view to smoothly perform construction work.

(2) Structural Design

1) Design Criteria

The structural design standards currently adopted in Indonesia are the National Architectural Design Standards of Indonesia (PERATURAN BANGUNAN NASIONAL), the Regulation on Superimposed Load of Architecture (PERATURAN PEMBEBANAN INDONESIA UNTUK GEDUNG), the Regulation on Reinforced Concrete Structure (PERATURAN BUTON BERTULANG INDONESIA), American Standards, British Standards, and the standards of JIS and JAS. Each facility under this project shall be designed in accordance with the standards of JIS and JAS.

2) Frame System

Major frames of each PFC, FCPC and FL facility shall be of reinforced concrete rigid frame which is the generally adopted construction method in Indoneisa. The roof shall be of wood truss. The main frame of the PFC dormitory building shall also be of reinforced concrete rigid frame, and the roof of wood truss over reinforced concrete roof slab.

3) Foundation Work Method

As the pile foundation of the two-story main building and the three-story dormitory of PFC, a total of 46 pcs of 15 m - 25 m long precast PC concrete piles (400 ϕ) shall be driven for frictional bearing and tip bearing.

As for each FCPC and FL facility, the direct foundation work method of having the bearing stratum directly support the structure will be employed.

4) Design Load

(a) Dead load

The unit weight by volume of major materials shall be as follows.

Reinforced concrete	2.4 t/m^3
Red brick	2.6 t/m^3
Wood roof truss	1.0 t/m^3

(b) Live load

Live loads for typical rooms are determined as follows.

a)	Office room, conference room, seminar room	300 kg/m^2
b)	Laboratory, research room	300 kg/m^2
c)	Library	500 kg/m^2
d)	Computer room	300 kg/m^2
e)	Dormitory room, dining room	180 kg/m^2
f)	Corridor, stairway	350 kg/m^2
g)	Storage	500 kg/m^2

(c) Seismic force

In Indonesia, numerous earthquakes have been recorded due to the seismic belt that runs along the Sumatra Island, Java Island and Bali Island.

The structural design under this project shall be planned with due regard to the Indonesian Seismic Load Standards and in accordance with the Japanese Seismic Load Standards.

(d) Wind pressure

Based on the data on maximum wind pressure at various places in Indonesia, the coefficients of 20 m/sec. for wind velocity and $20\sqrt{h}$ kg/m^2 for wind pressure will be adopted.

(e) Principal structural materials

Pursuant to the Japanese Industrial Standards, the following values will be adopted as the allowable unit stress for each material.

a) Concrete

Design strength after 28 days: Fc = 210 kg/cm^2
Slump : 15 cm

b) Reinforcing steel bar

Kind	Long term	Short term	JIS material
Ordinary round bar	1,600 kg/cm^2	2,400 kg/cm^2	SR 24
Deformed round bar	2,000 kg/cm^2	3,000 kg/cm^2	SD 30
Deformed round bar	2,200 kg/cm^2	3,500 kg/cm^2	SD 35

c) Steel frame

Kind	Long term	Short term	JIS material
H-section	1,600 kg/cm^2	2,400 kg/cm^2	SS41
Plate	1,600 kg/cm^2	2,400 kg/cm^2	SS41

4-1-5 Utilities Planning

(1) Basic Policy

As a basic policy for designing of equipment, domestic regulations of Indonesia shall apply wherever applicable, and on items for which there is no Indonesian regulation, domestic regulations of Japan shall apply.

In planning, the following points must be considered in particular.

1) Equipment shall be designed with due consideration to energy and resource conservation and to reduce, they shall also be easy to maintain and operate.

   (a) Adoption of energy saving type lighting fixtures
   (b) Minute division of lighting switch circuits
   (c) Utilization of natural ventilation, minimum installation of mechanical cooling systems, and adoption of individual package cooling systems where necessary.

2) Equipment shall be safe and easy to maintain and operate.

   (a) All of the switchboards and distribution boards shall be housed in steel cases.
   (b) Wiring shall be in conduit pipes as a rule.
   (c) Feeding and draining of water shall be by the gravity method
   (d) Water receiving tanks shall be made of fiber reinforced plastic (FRP)

3) Equipment, utensils and materials manufactured in Indonesia shall be adopted as much as possible. Conceivable ones are shown below.

   (a) Cast iron pipe, Hume pipe
   (b) Sanitary fixtures
   (c) Septic tank
   (d) Manhole and manhole lid

4) Equipment and utensils to be used shall be easy to repair locally. In case Japanese products are to be used, they must be the products of Japanese manufacturers with agents or representatives in Indonesia, and they must be capable of being maintained locally.

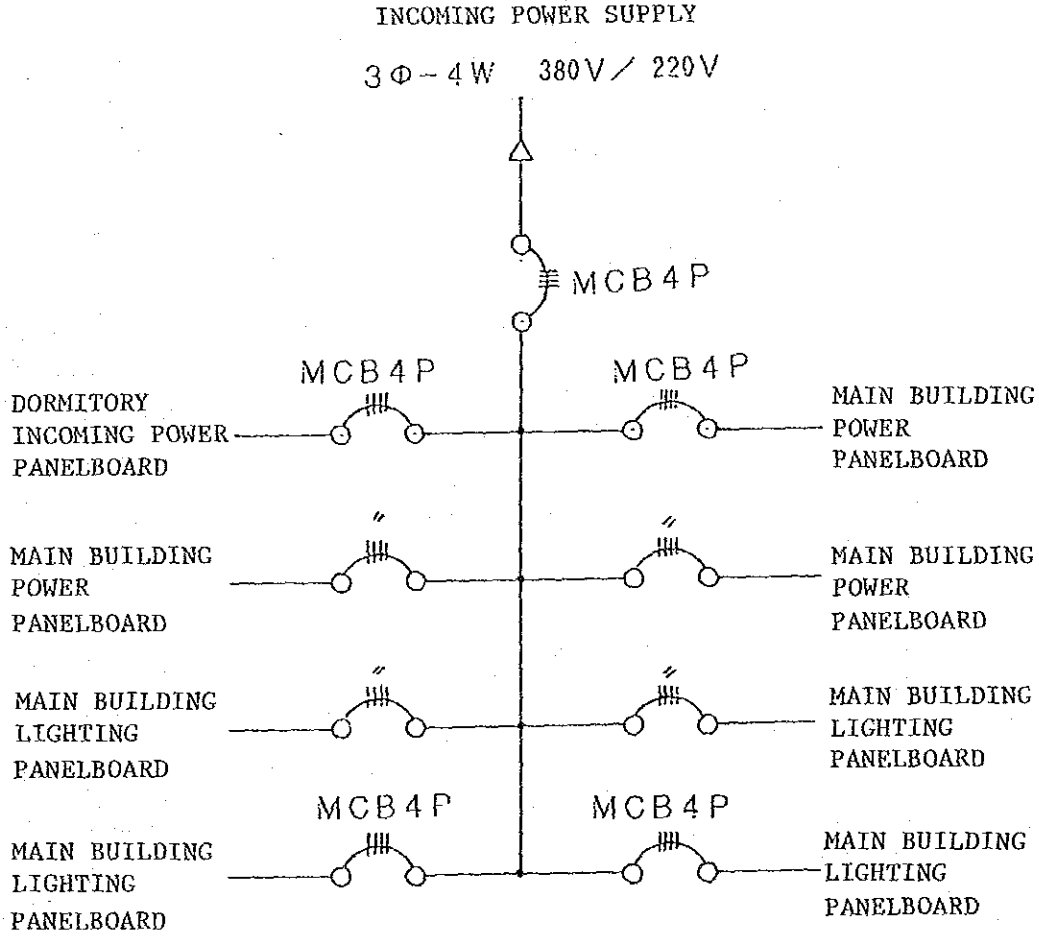
(2) Electric Facilities Design

1) Receiving Facilities

(a) PFC main building and dormitory

Power transmitted in 3ϕ - 3W, 20KV, 50Hz along the front road of site shall be transformed into 3ϕ - 4W, 380V/220V, 50Hz and led into the incoming panel inside the building via aerial wiring and supplied to each load via the distribution board. The capacity for receiving power shall be 120 KVA.

The receiving facility connection diagram is shown below.

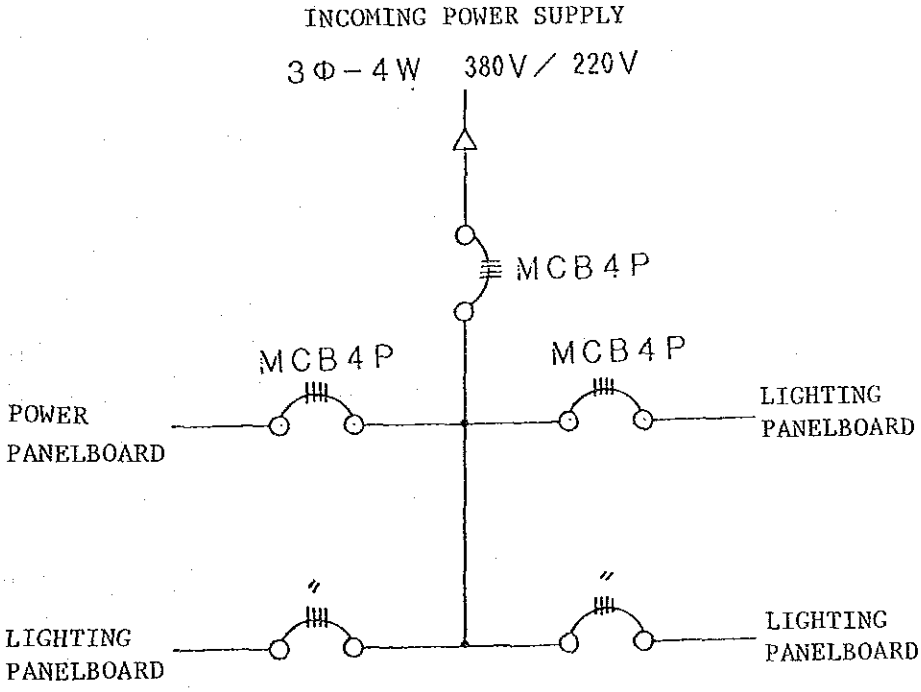


(b) Each FCPC

Power transformed into 3ϕ - 4W, 380V/220V, 50Hz shall be directly received into the distribution board inside the building from the transmission line laid along the front road of the site via aerial wiring and supplied to each load.

The capacity for receiving power shall be 40 KVA.

The receiving facility connection diagram is shown below.

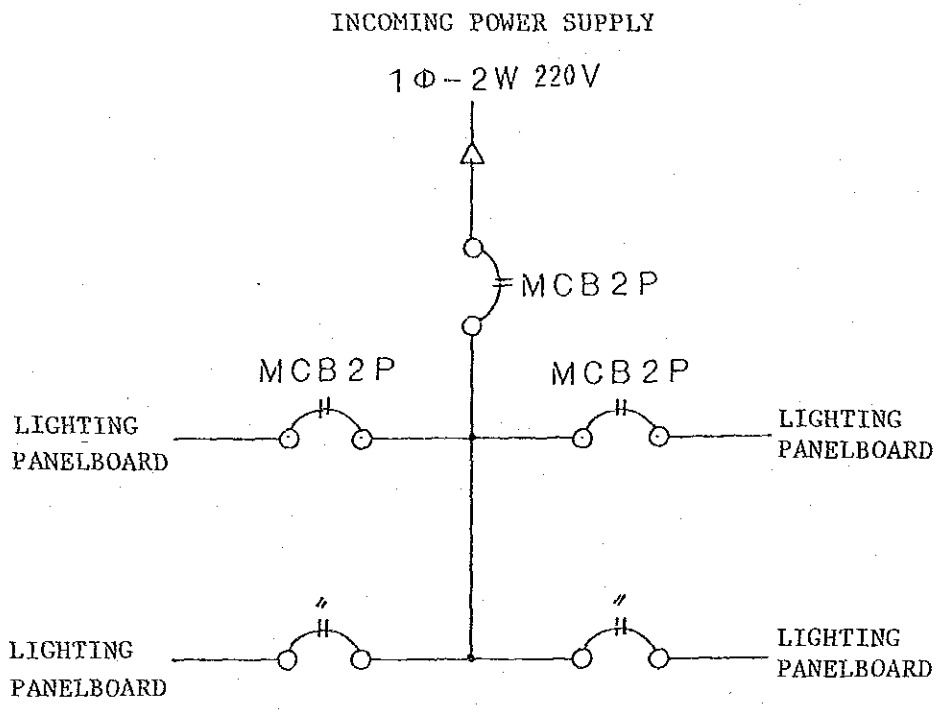


(c) Each FL

Power of 1ϕ - 220V, 50Hz shall be directly received from the power transmission line along the front road of the site into the distribution board inside the building via aerial wiring and supplied to each load.

The capacity for receiving power shall be 15 KVA.

The receiving facility connection diagram is shown below.



2) Electric System

(a) PFC main building and dormitory, and each FCPC

Trunk line	3φ - 4W 380V/220V
Power	3φ - 3W 380V
Lighting & convenience outlets	1φ - 2W 220V

(b) Each FL

Trunk line	1φ - 2W 220V
Power (incl. well pump)	1φ - 3W 220V
Lighting & convenience outlets	1φ - 2W 220V

3) Power Feeder System

(a) PFC main building and dormitory

Power from the leading-in electric pole on the site shall be led into the building via aerial wiring and connected to each load through the distribution board and control board.

For each of the laboratories and other places where the load is heavy, a separate distribution board shall be provided from where power shall be fed to each load.

(b) Each FCPC, each FL

Power from the adjacent transmission line shall be directly led into the building by aerial wiring and connected to each load through the distribution board.

4) Lighting and Convenience Outlets

Lighting and convenience outlets of PFC main building and dormitory, each FCPC and each FL shall be as follows.

Fluorescent lamps shall be mainly used as lighting facilities, with partial use of incandescent lamps. Flashing blocks of lighting fixtures shall be divided as finely as possible to permit saving of power costs.

The standard lighting intensity shall be 300 Lux in office spaces and laboratories and 200 - 300 Lux at the bench top of workshops.

Convenience outlets shall be of the wall mounted type, and shall be provided at least at two places where necessary in each room.

5) Telephone Facilities

(a) PFC main building and dormitory

A master-and-extension type push button telephone system shall be installed in the administration office of the PFC main building and shall be connected with the extension sets in the rooms of the PFC main building and dormitory building where necessary.

About 10 telephone sets shall be provided.

(b) Each FCPC

The master telephone of the master-and-extension type push button telephone system shall be installed in the administration office and shall be connected to the extension sets in rooms where needed.

About 4 telephone sets shall be provided.

(c) Each FL

A conduit tube and a terminal board box shall be installed, and the tube shall be extended to the rooms where required, but provided with an outlet only.

6) Television Antenna

A TV antenna shall be installed on the roof of the PFC dormitory building, and outlets for TV with necessary wiring shall be provided in the cafeteria and living space, etc.

No TV antenna will be installed at any of the FCPCs and FLs.

7) Lightening Conductor

A lightening conductor shall be installed on the elevated water tower of the PFC dormitory building. None, however, shall be installed in any of the other facilities.

8) Captive Power Generation Facilities

At each of the FLs that require installation of deep well, a manually operated generator to match the three phase well pump (3.7 kw) shall be installed.

(3) Water supply and Drainage

1) Water Supply System

(a) PFC main building and dormitory

Since public water service piping has not been laid yet, a well shall be installed on the site from which water shall be pumped up by motor.

A water receiving tank made of FRP panel shall be installed outside the building, from which water shall be pumped up to the elevated tank made of FRP panel installed on the dormitory building. From the elevated tank, water shall be supplied by the gravity system to each room of the dormitory building and also to the PFC main building.

The planned water supply quantity shall be 14 m^3/day as estimated from the equipment capacities and number of people who utilize the facility.

The capacity of the receiving tank shall be large enough to secure one day's supply of estimated water consumption (14 m^3), and the capacity of the elevated tank, one half of it or 7 m^3.

(b) Bandung and Surabaya FCPCs

Since public water service piping has not been laid yet, a well shall be installed on the site, from which water shall be pumped up by motor.

An elevated water receiving tank made of FRP panel shall be installed outside the building, from which water shall be supplied by gravity to whichever room that needs it.

The planned water supply quantity shall be 6 m^3/day as estimated from the equipment capacities and number of people who utilize the facility.

The capacity of the elevated receiving tank shall be large enough to store one day's supply of estimated water consumption (6 m^3).

(c) Semarang FCPC

Although a 13ϕ caliber public water service piping is already laid, its supply capacity is not large enough. A well shall therefore be installed on the site, from which water shall be pumped up by motor.

An elevated water receiving tank made of FRP panel shall be installed outside the building, from which water shall be supplied by gravity to each room that needs it.

The planned water supply quantity shall be 6 m^3/day as estimated from the equipment planning and manpower planning.

The capacity of the receiving tank cum elevated tank shall be large enough to store one day's supply of estimated water consumption (6 m^3).

(d) Denpasar FCPC

A 6 inch caliber public water service pipe is already laid along the front road of the Ministry of Agriculture's local office on the adjacent site. Under this project, a 2 inch pipe shall be branched from the aforesaid 6 inch pipe, and water received into a water receiving tank(6 m^3) shall be supplied to each room that needs it by means of a pressure pump.

(e) Each FL

Since public water service piping has not been laid yet, a well shall be installed on the site from which water shall be pumped up by motor.

An elevated water receiving tank made of FRP panel shall be installed outside the building, from which water shall be supplied by gravity to each room that needs it.

The planned water supply quantity shall be 4 m^3/day as estimated from the equipment planning and manpower planning.

The capacity of the receiving tank cum elevated tank shall be large enough to store one day's supply of estimated water consumption (4 m^3).

2) Drainage System

Drainage system for PFC main building and dormitory, each FCPC and each FL shall be as follows.

Sanitary sewage shall be led into the septic tank exclusive for sanitary sewage, and after treatment there, shall be allowed to seep into the ground through seepage sumps.

As commingling of neutral detergent and laboratory liquid chemicals is anticipated in miscellaneous waste water, it shall be discharged separably from sanitary sewage by allowing it to flow into the storm sewage draining system outside the building.

Storm sewage shall be collected in one place by open drain ditch around buildings and then discharged into existing drainage ditches.

3) Sanitary Fixtures

In all of the buildings (the PFC main building and dormitory, each FCPC and FL) the sanitary wares shall be the locally made, popular type, as a rule. As for closet, one set each of the local type generally used in Indonesia shall be installed in the toilet for male and for female, respectively, while the rest shall be western-style.

4) Septic Tanks

The septic tanks in all of the buildings (PFC main building and dormitory, each FCPC and each FL) shall be for treating sanitary sewage only and shall have the structure and functional performance to make the quality standard of the effluent below 90 MMP in terms of BOD.

The septic tanks shall be made of cast-in place concrete and shall be capable of accommodating 40 persons in each of the PFC main building and dormitory, 60 persons in each FCPC and 35 persons in each FL.

5) Fire Fighting Equipment

Indonesia, particularly the localities where the proposed sites of this project exist, has no specific regulations on fire fighting equipment.

As things stand now, it is useless to expect any sort of public fire fighting activities. In this project, therefore, the only consideration that will be given in this respect is to provide proper fire extinguishers at necessary places.

(4) Air Conditioning and Ventilation Facilities Plan

Air conditioning and ventilation facilities planned for PFC main building and dormitory, each FCPC and FL are as follows.

1) A cooling system shall be planned for rooms where a lot of heat is generated and where noise must be shut out, like in the lecture room and operation room where pictures are projected, etc.

2) The cooling system shall be an individual air-cooled package type air conditioner in consideration of maintenance and running costs.

3) Architectural considerations for the sake of natural ventilation will be given to rooms which are to have no cooling system, such as providing a louver window for ventillation and making the ceiling high.

4) In view of the possibility that a cooling system may be installed in the future, extra wall penetrating sleeves and plug sockets for power shall be provided.

5) Temperature and humidity conditions for cooling shall be set as follows.

	Indoor	Outdoor
Temperature	27°C	35°C
Humidity	60%	70%

6) Rooms for which cooling system shall be planned are as follows:

PFC Main building

GF	Head Office
	Meeting Room
	Computer Room
1F	Lecture Room
	Operation Room
	Expert Room

Each FCPC

GF	Head Office

7) Ventilating fans shall be installed in the toilets for forced ventilation. Laboratories and workshops shall be provided with ventilating fans for forced air intake and exhaust. The rooms planned for ventilation are as follows.

PFC Main Building

GF	Entomology Laboratory
	Vertebrate Laboratory
	Weed Laboratory
	Virology & Phytopathology Laboratory
	Laboratories of FL
	Toilet
1F	Pest Management Room

Each FCPC

	Laboratory
	Workshop
	Toilet

Each FL

	Laboratory
	Toilet

(5) Gas Facilities

PFC Main Building and Dormitory

Gas to be used shall be LPG. An LPG cylinder yard shall be provided outside the PFC main building and also outside the dormitory to supply LPG to various places as required.

4-1-6 Finishing

(1) Exterior Finish

1) Roof

Roof frame shall be wood truss. Sheathing shall be 9 mm thick waterproof plywood. Roof tile and wood shingle over asphalt roofing.

2) Exterior Walls

Concrete and brick base shall be coated with cement plaster and finished with spray epoxy resin paint. Exterior walls of Denpasar FCPC (on Bali Island) shall be finished with finish brick and sand stone relief.

3) Floor

Floor of open corridor and balcony shall be finished in terrazzo tile (30 cm x 30 cm). Skirting floor shall be concrete, cement plaster with grooving.

4) Ceiling

Ceilings of open corridors shall be finished with hard wood tongue-and-groove strip, oil stain.

5) Fenestration

Aluminium sash, transparent glass and jalousie windows. Aluminium movable louvers in portions. Doors shall be steel flush doors, oil paint finish. Portionally wooden doors.

(2) Interior Finish

Interior finish in PFC, FCPCs and FLs shall be as follows:

1) Floor

Parquet flooring finish for offices in general, conference rooms, library, and quarters.

Terrazzo block finish (30 cm x 30 cm) for laboratory rooms, entrance hall, corridors stairways and cafeteria.

Computer rooms shall be provided with double deck, raised wood floor - with vinyl top sheet over 12 mm thick plywood.

Toilet and kitchen floors shall be finished with porcelain mosaic tile.

2) Walls

Cement plaster emulsion paint finish over concrete and brick base. Partly wood base, dressed plywood finish.

Toilet and kitchen walls shall be 100 mm x 100 mm tile.

Toilet booth partitioning shall be terrazzo block.

3) Ceiling

Ceiling of entrance hall and corridors shall be finished with hardwood tongue-and-groove strips.

Ceiling of ordinary rooms such as office, conference, and computer rooms and quarters shall be finished with waterproof, acoustic mineral board.

Ceiling of toilet and kitchen shall be calcium silicate board finish.

4-1-7 Basic Design Drawings

1. PFC

1)	Main Building	Site Plan
2)		Ground Floor Plan
3)		First Floor Plan
4)		Roof Plan
5)		Section
6)		Elevation 1
7)		Elevation 2
8)	Dormitory	Floor Plan
9)		Section
10)		Elevation 1
11)		Elevation 2

2. BANDUNG FCPC

12)	Site Plan
13)	Ground Floor Plan
14)	Roof Plan
15)	Section
16)	Elevation 1
17)	Elevation 2

3. SEMARANG FCPC

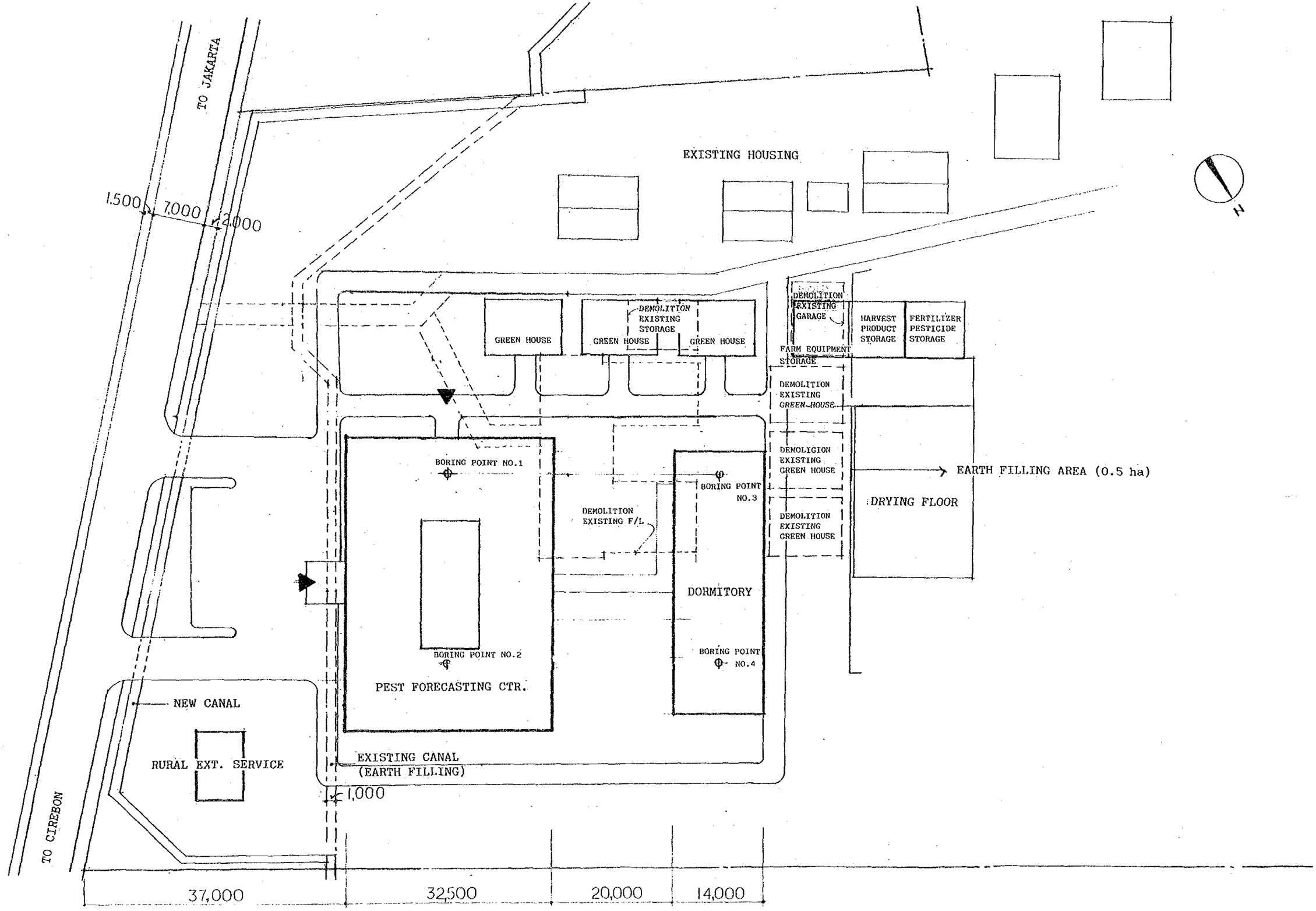
18)	Site Plan
19)	Ground Floor Plan
20)	Roof Plan
21)	Section
22)	Elevation 1
23)	Elevation 2

4. SURABAYA FCPC·DENPASAR FCPC

24)	Site Plan
25)	Site Plan
26)	Ground Floor Plan
27)	Roof Plan
28)	Section
29)	Elevation 1
30)	Elevation 2

5. FL

31)	A Type Ground Floor Plan
32)	B Type Ground Floor Plan
33)	Roof Plan
34)	Section
35)	Elevation 1
36)	Elevation 2



1

PEST FORECASTING CENTER - JATISARI

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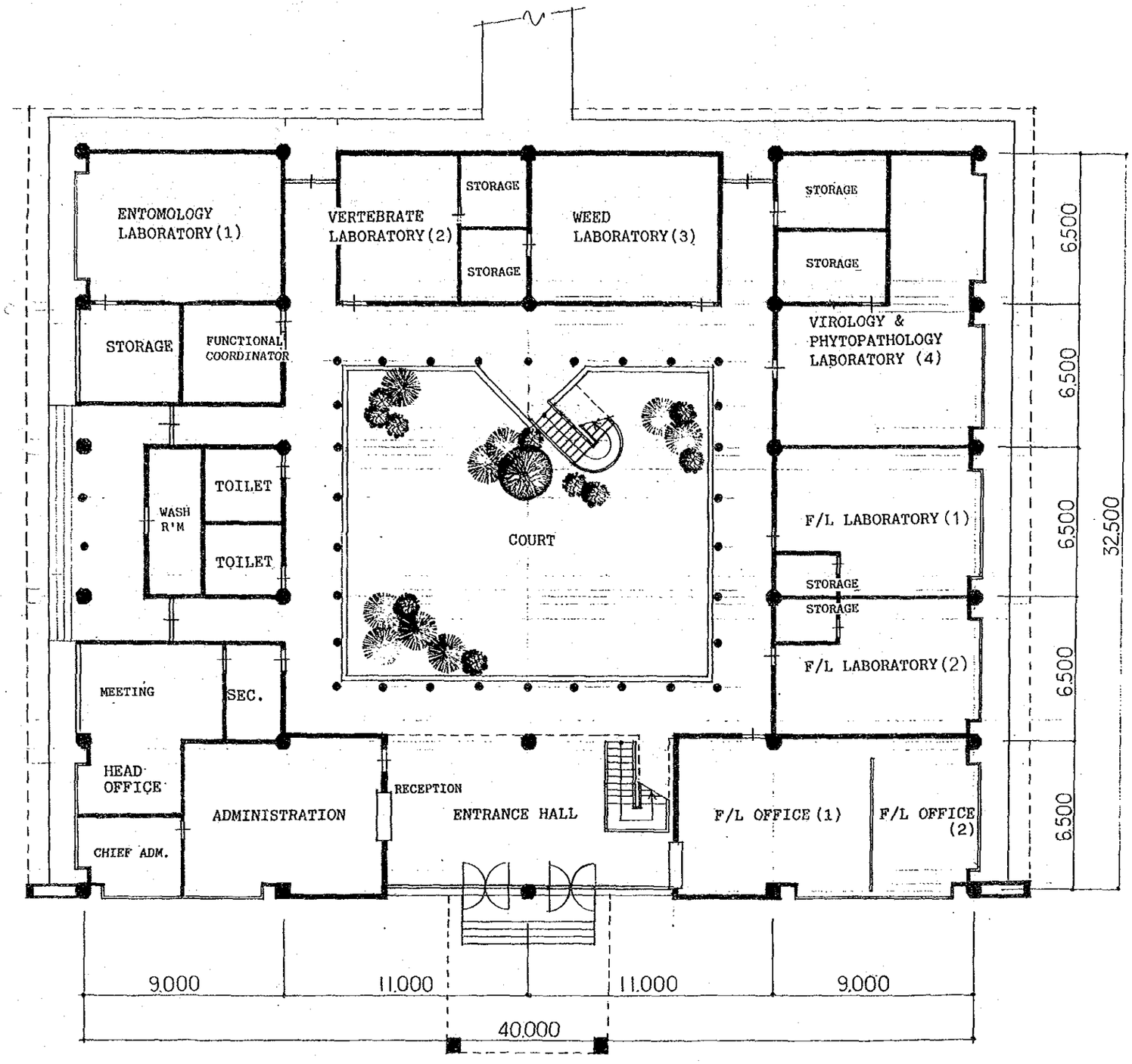

2

PEST FORECASTING CENTER - MAIN BUILDING

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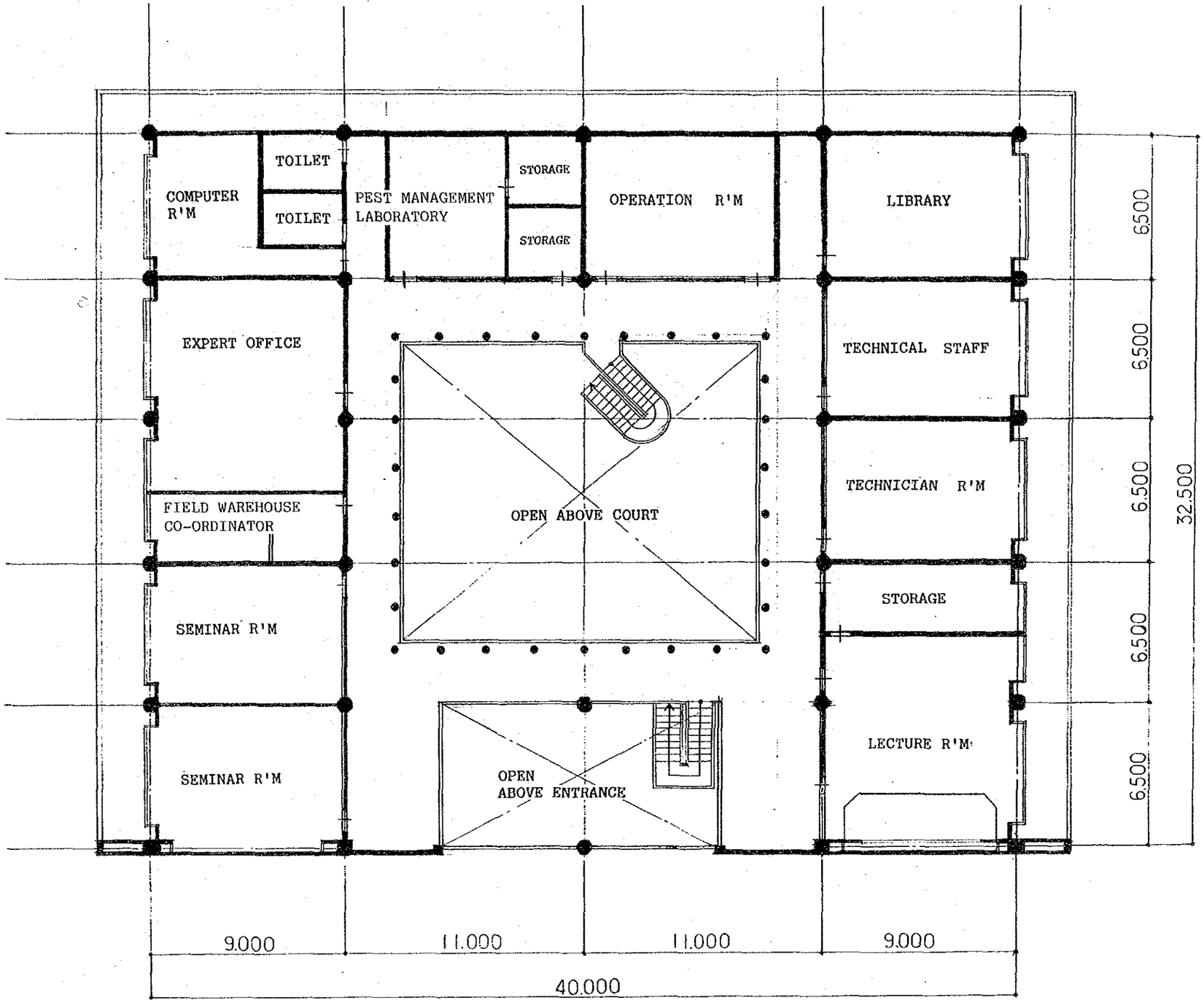

3

PEST FORECASTING CENTER - MAIN BUILDING

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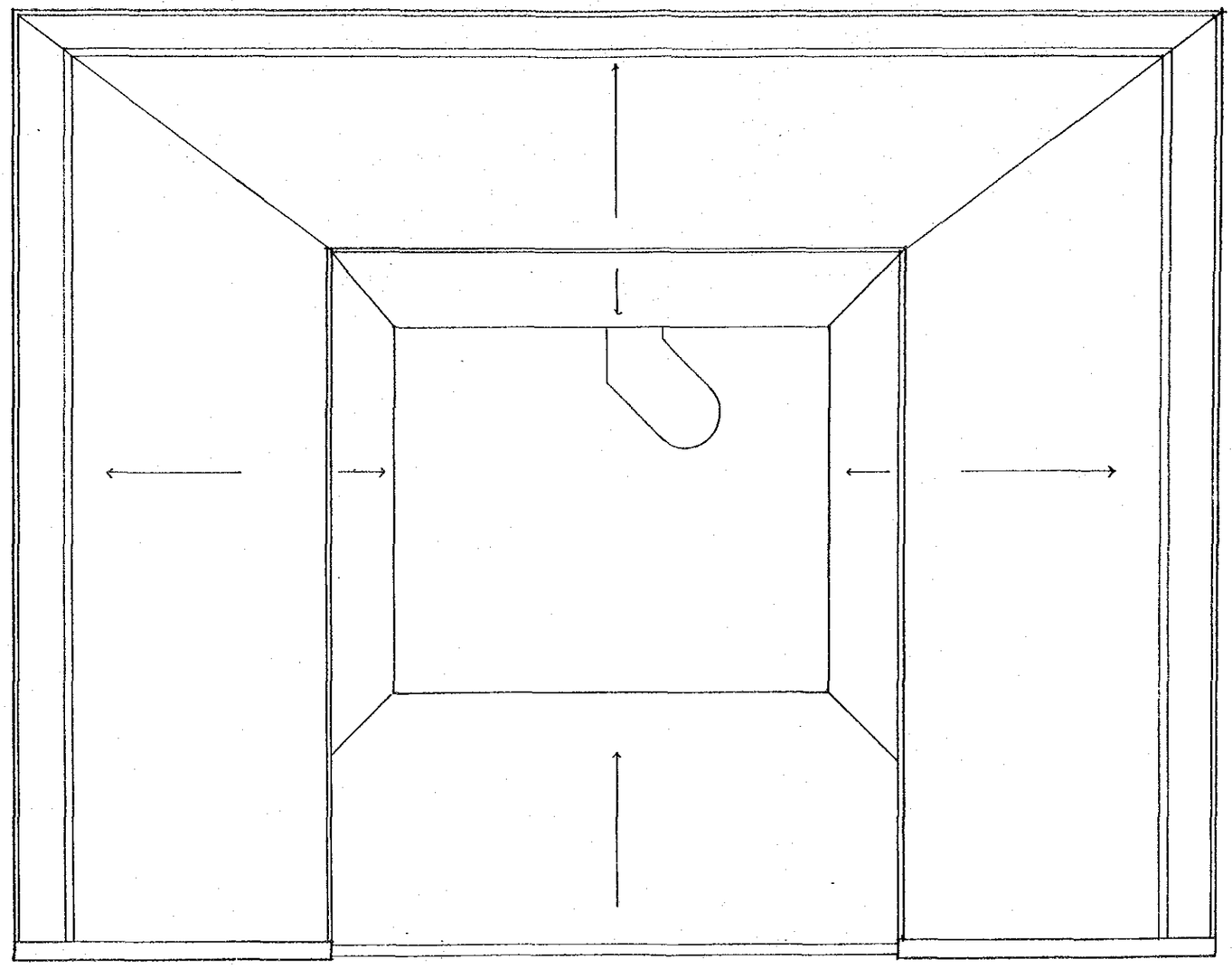
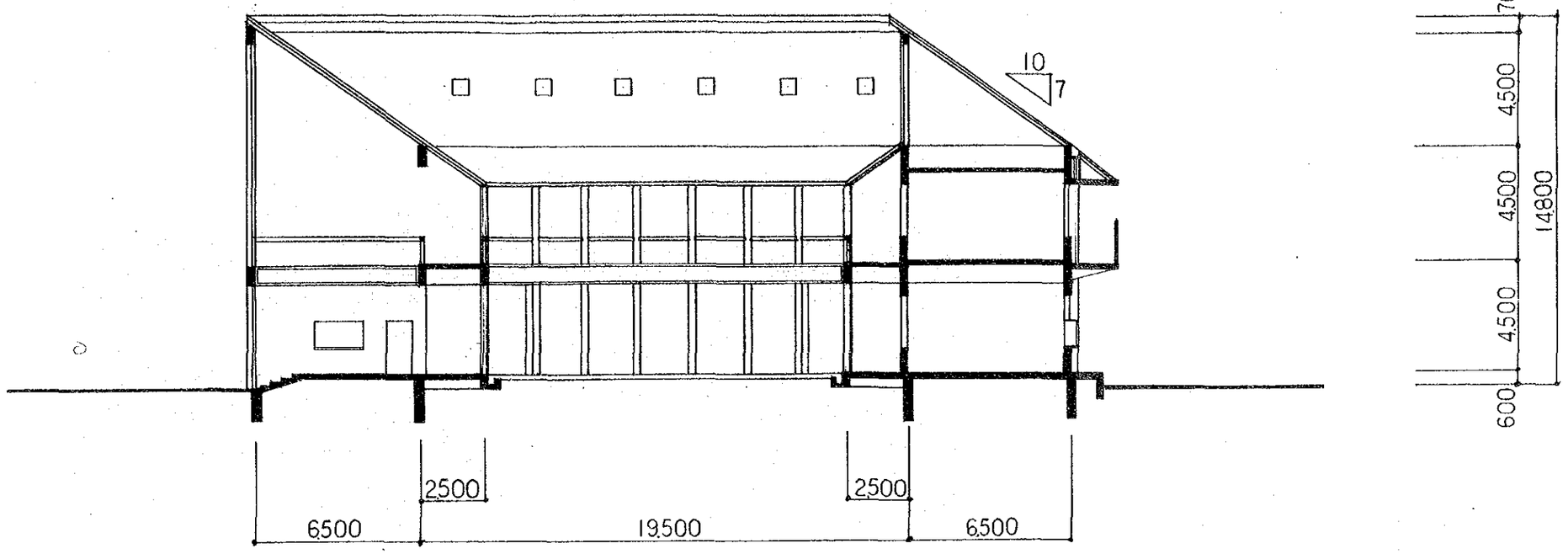


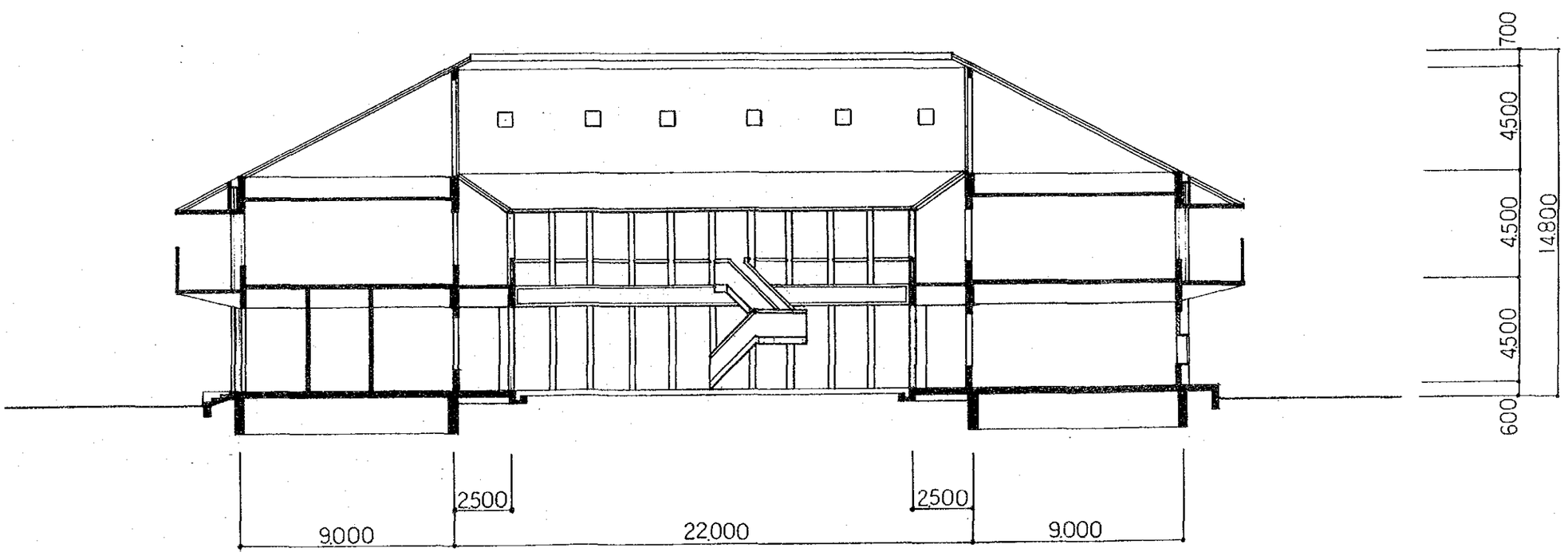
PEST FORECASTING CENTER - MAIN BUILDING

ROOF PLAN

S = 1:200

4





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PEST FORECASTING CENTER - MAIN BUILDING

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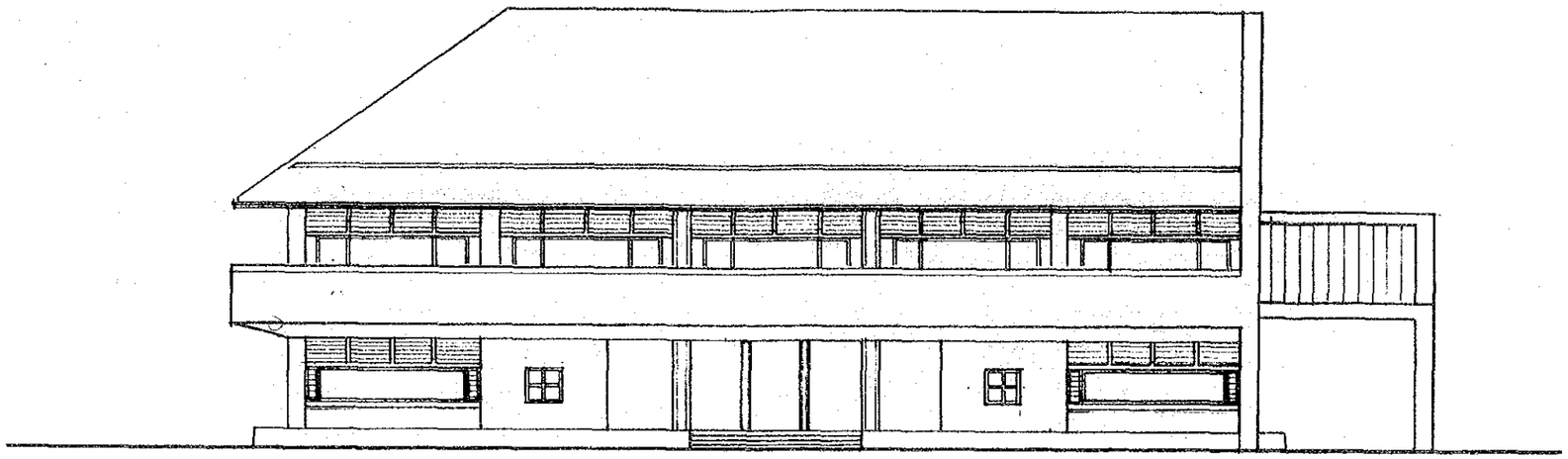

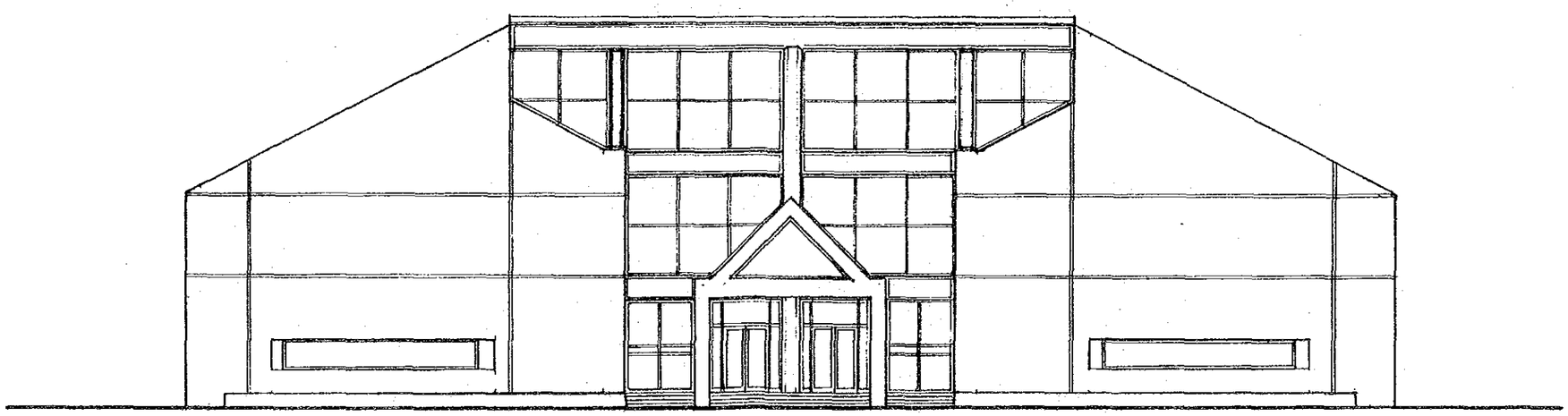

6

PEST FORECASTING CENTER - MAIN BUILDING

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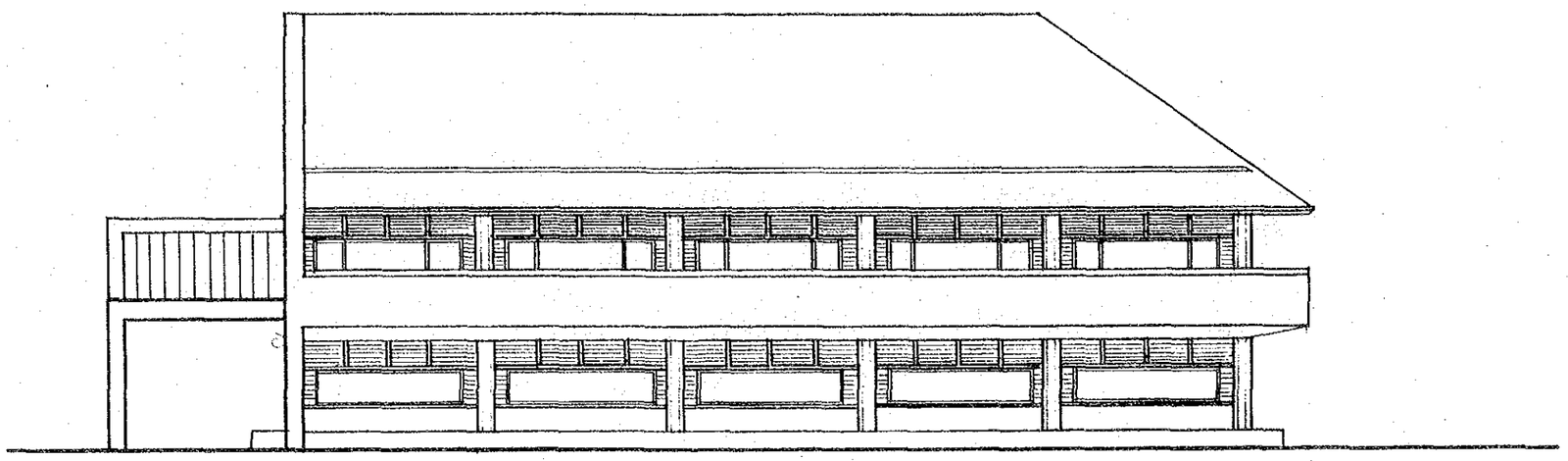
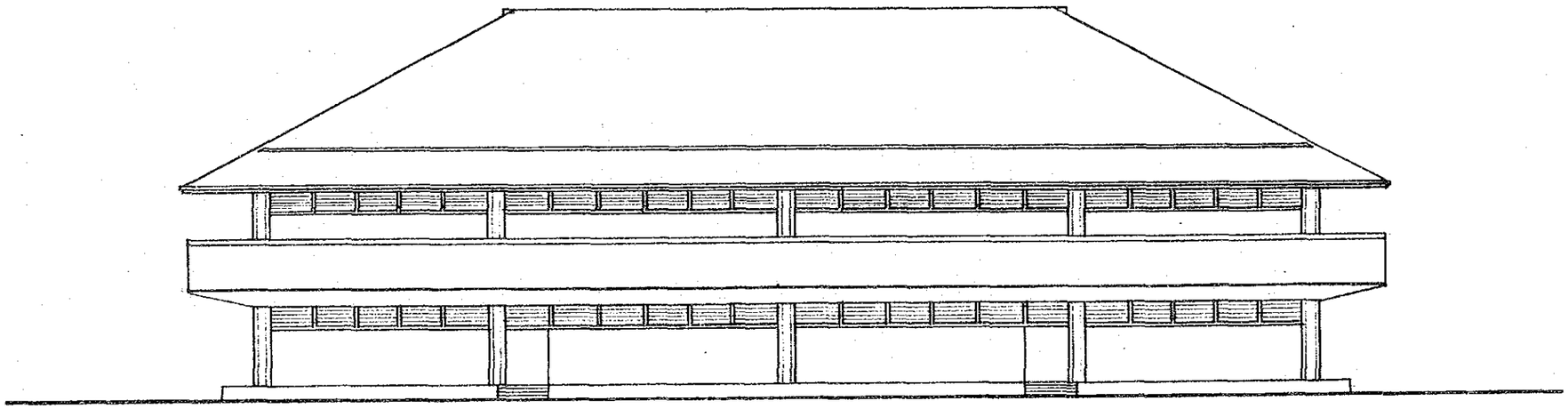
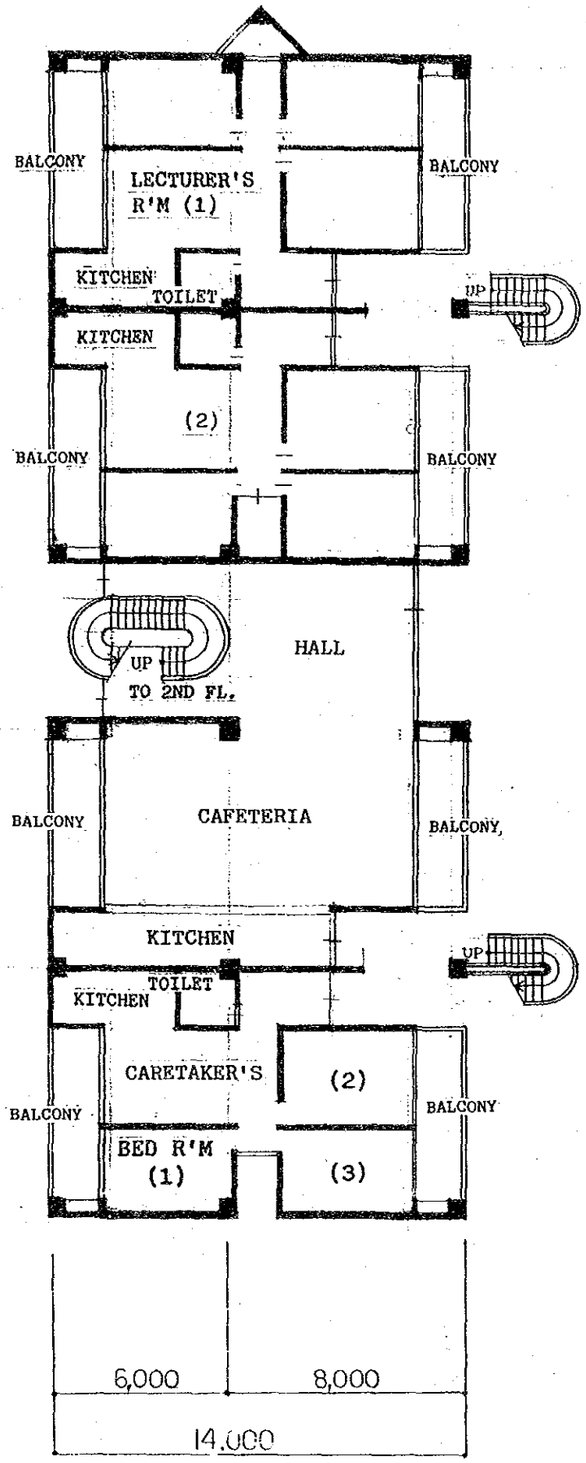


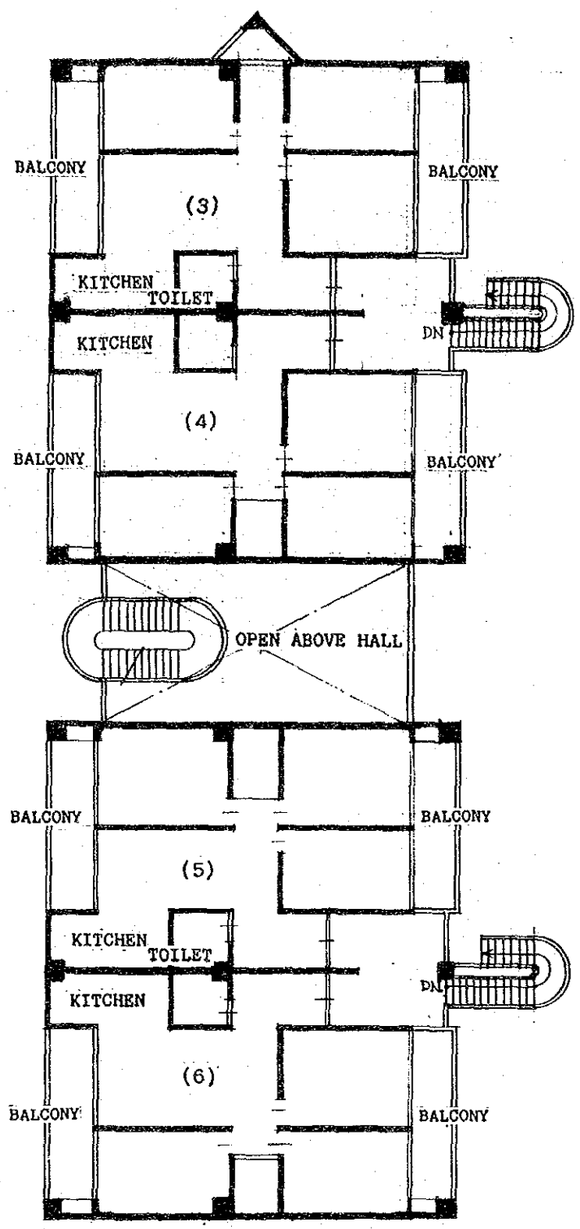


PEST FORECASTING CENTER - MAIN BUILDING

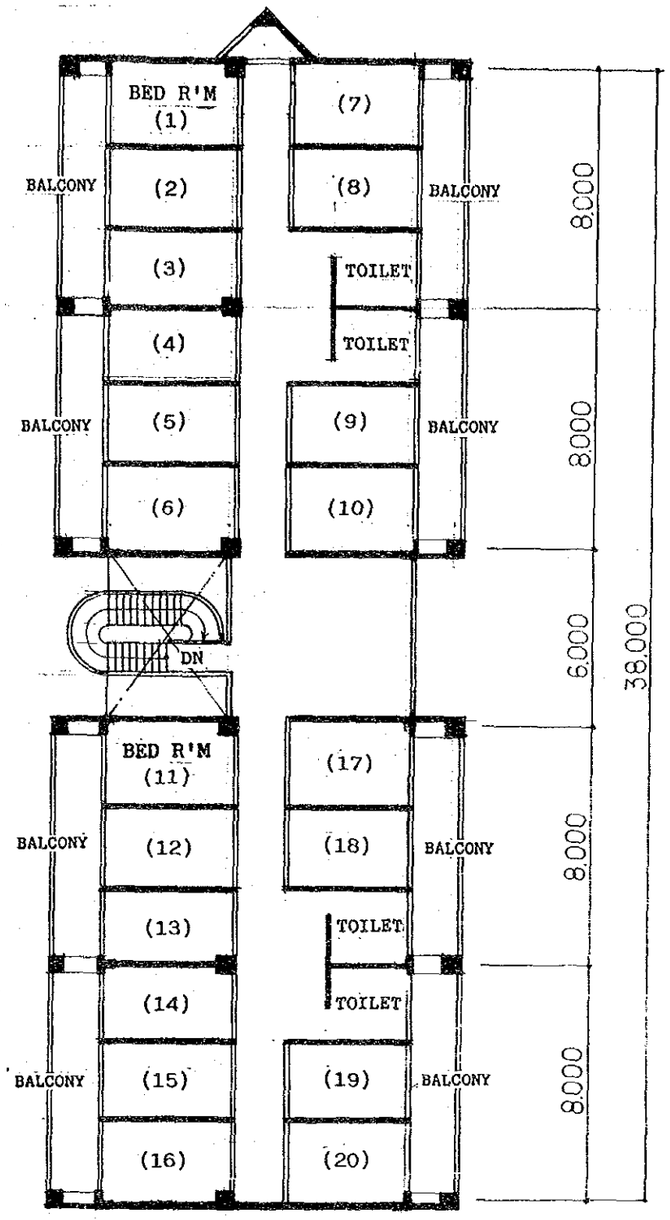
ELEVATION S = 1:200



GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

8

PEST FORECASTING CENTER - DORMITORY

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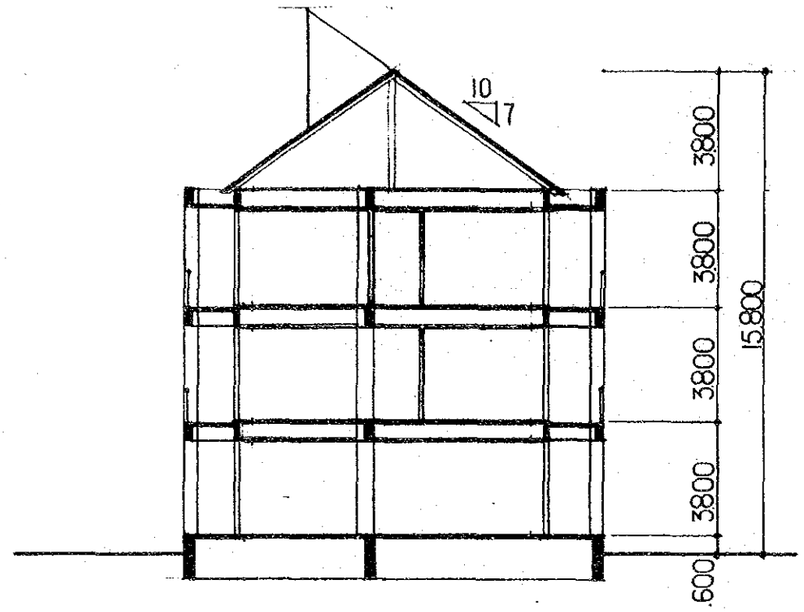
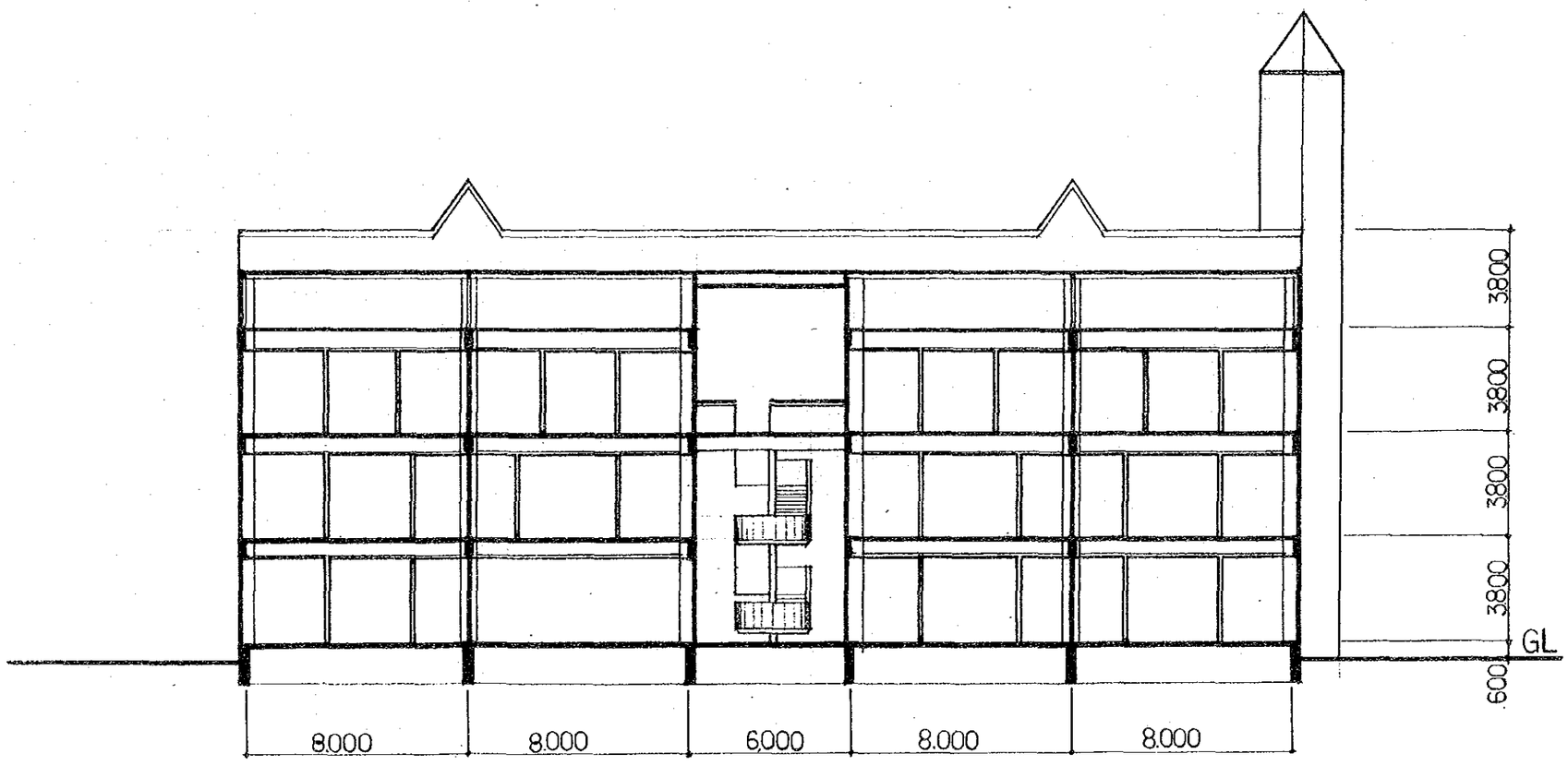
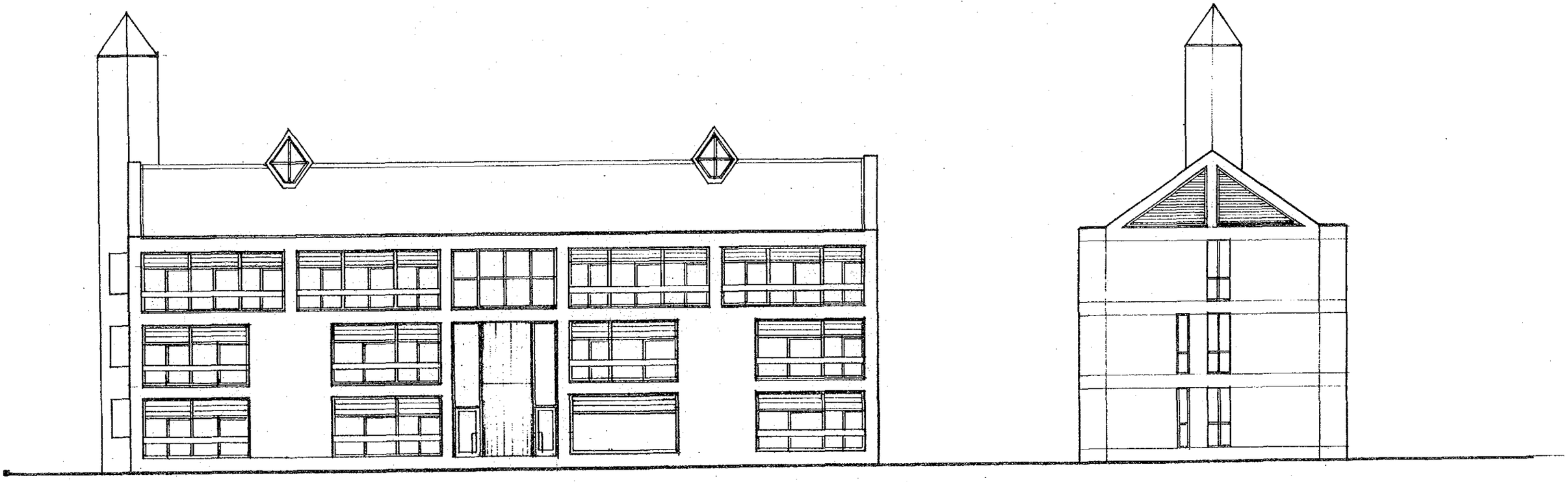




PEST FORECASTING CENTER – DORMITORY

SECTION S = 1:200

9



PEST FORECASTING CENTER - DORMITORY

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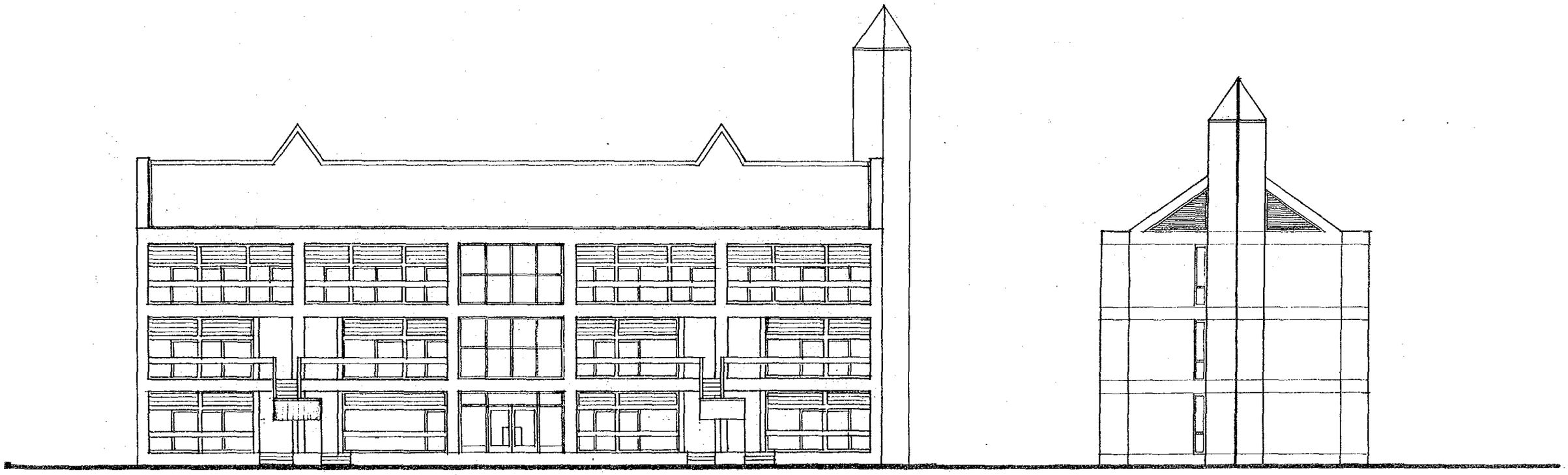

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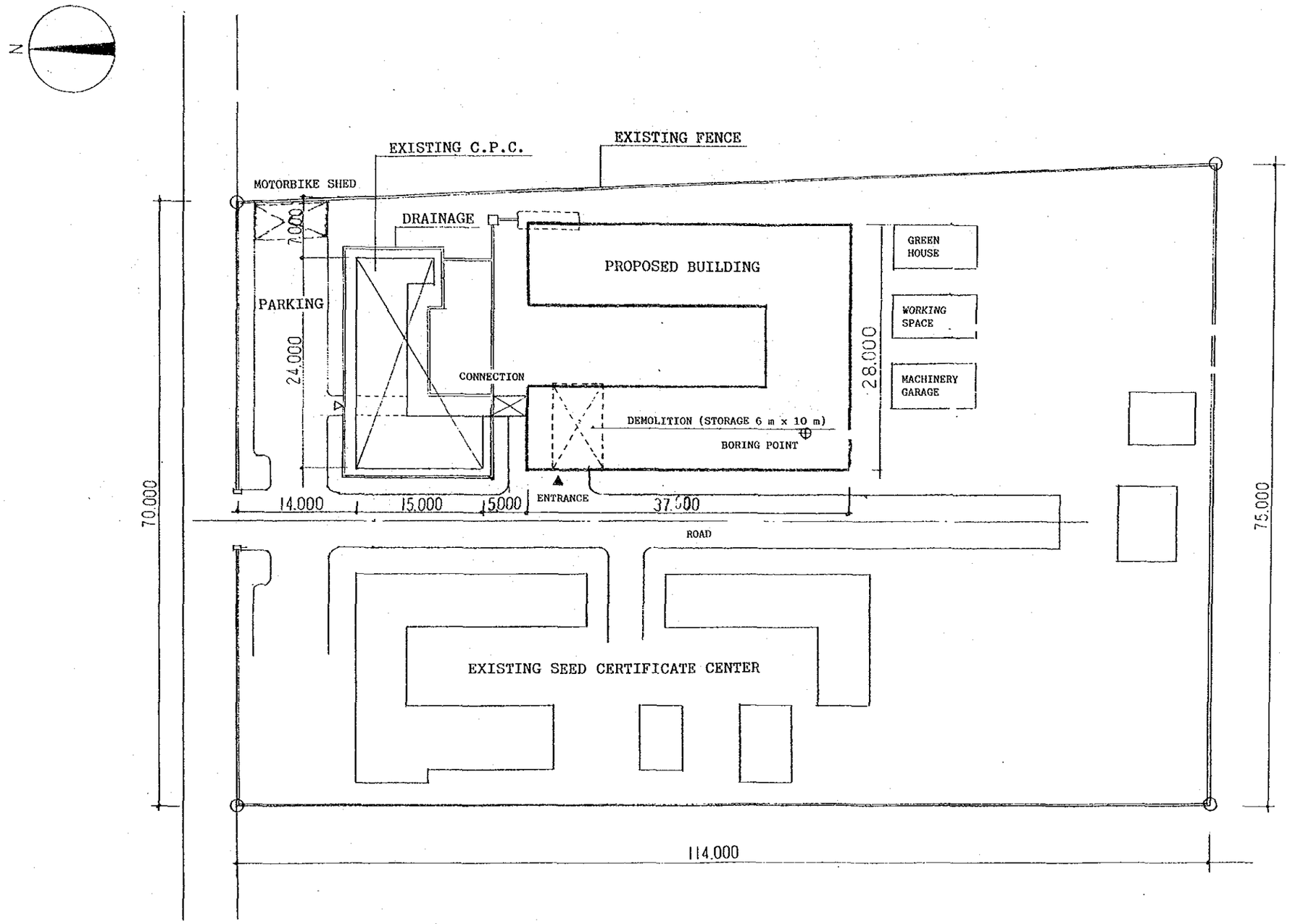

12

FOOD CROP PROTECTION CENTER - BANDUNG

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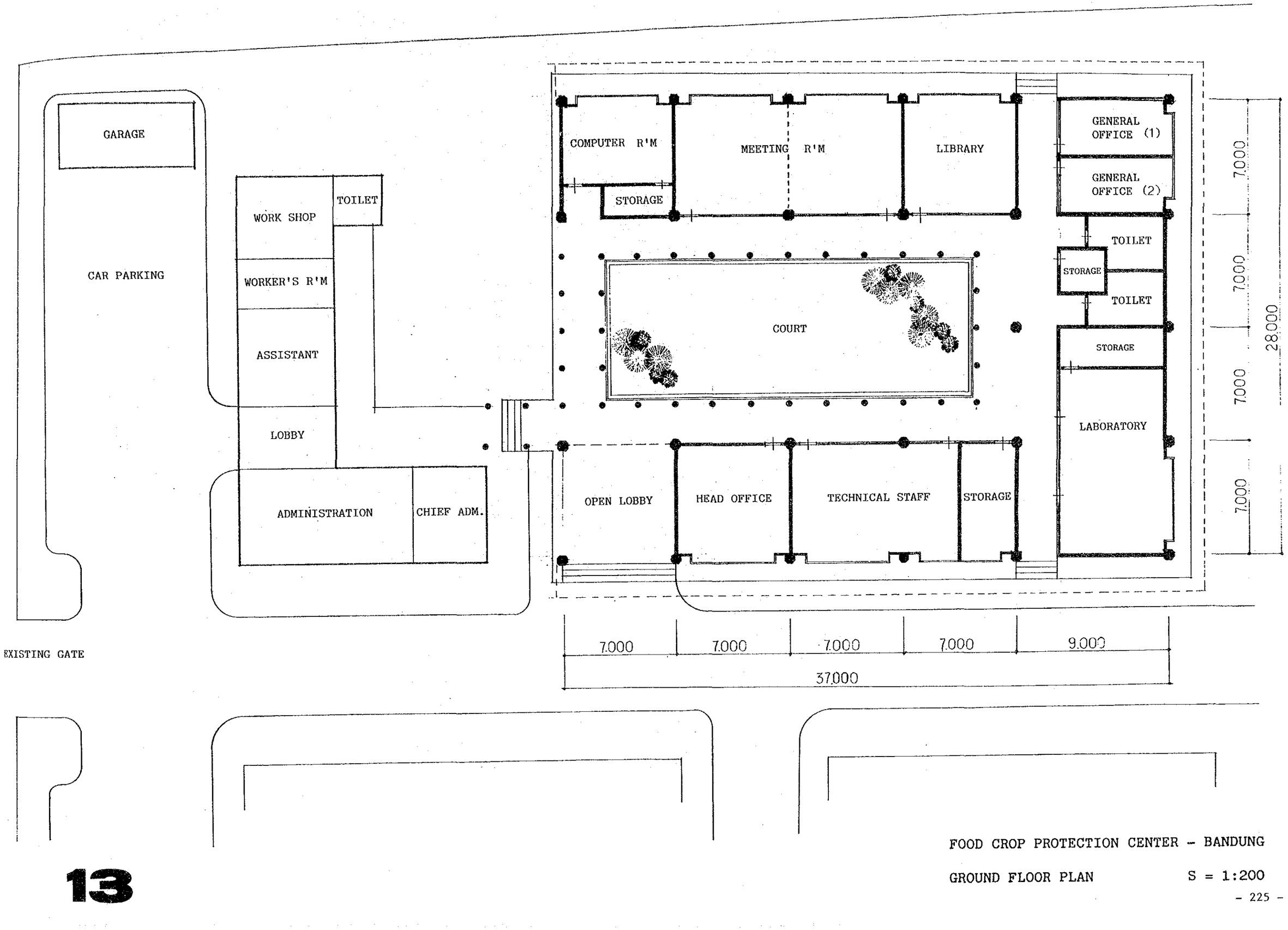
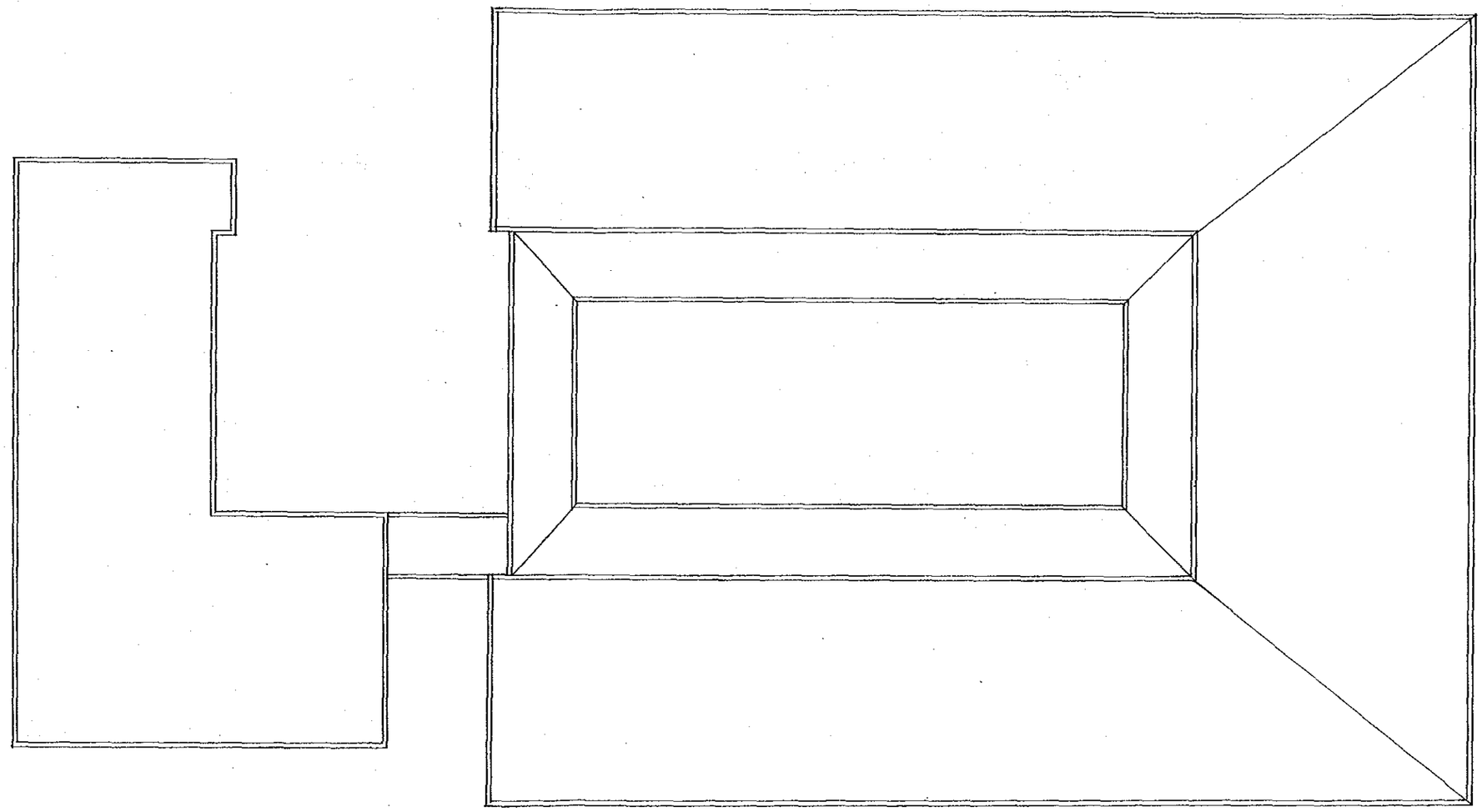


FOOD CROP PROTECTION CENTER - BANDUNG

GROUND FLOOR PLAN S = 1:200

13



14

FOOD CROP PROTECTION CENTER - BANDUNG

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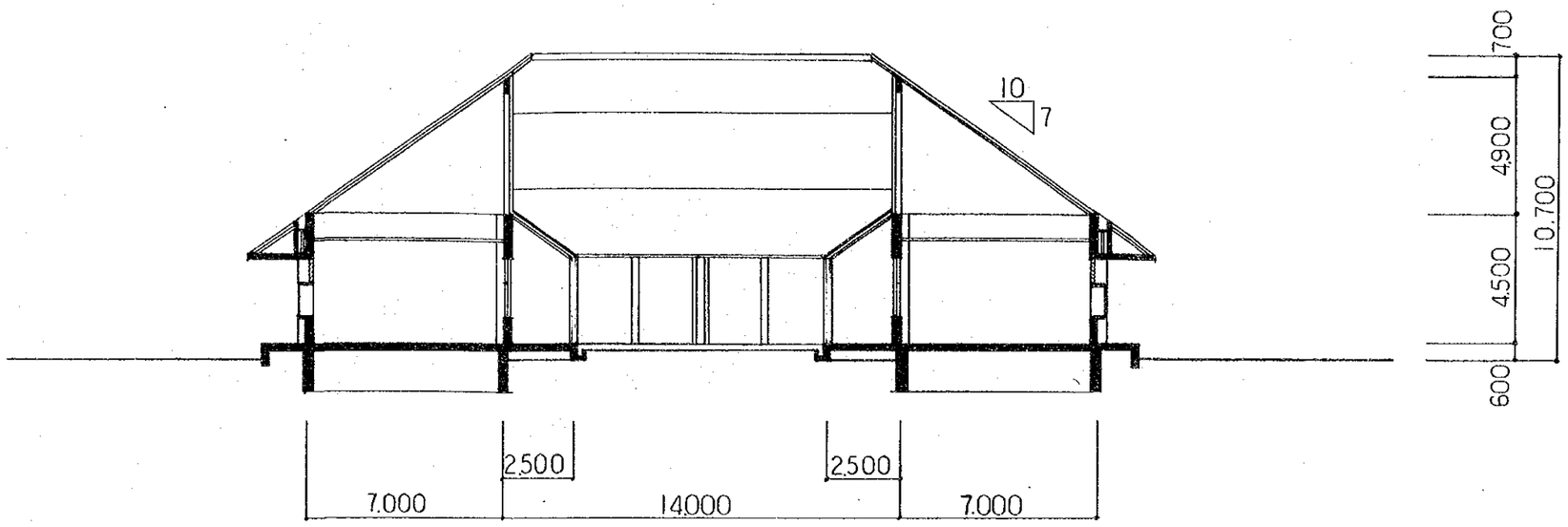

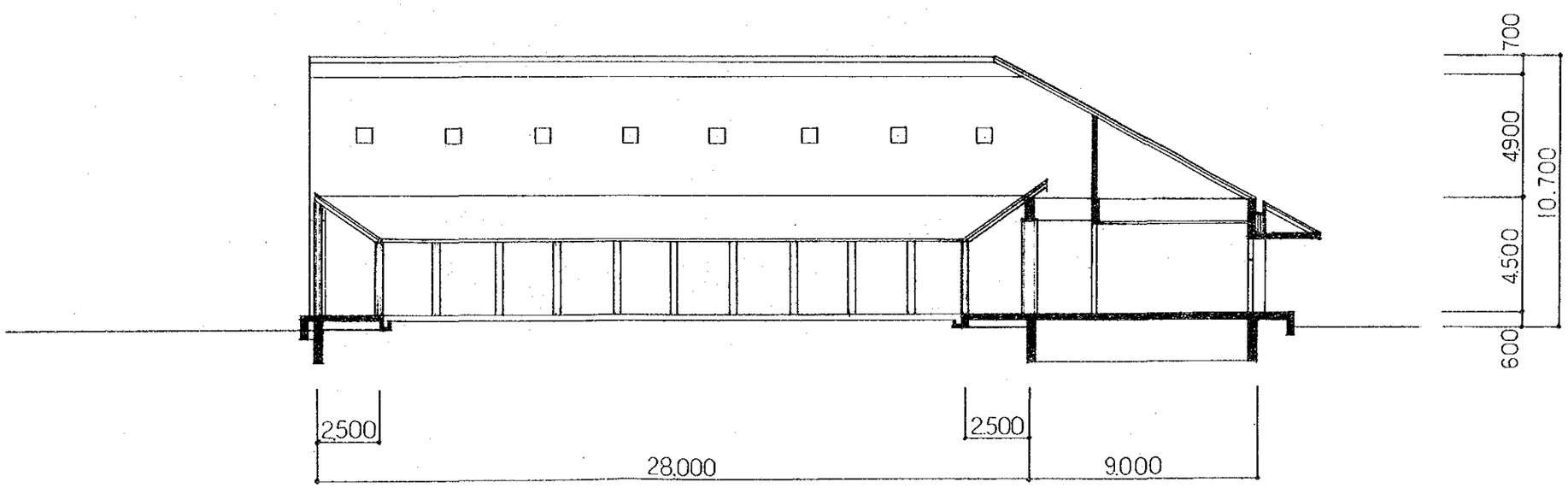

15

FOOD CROP PROTECTION CENTER - BANDUNG

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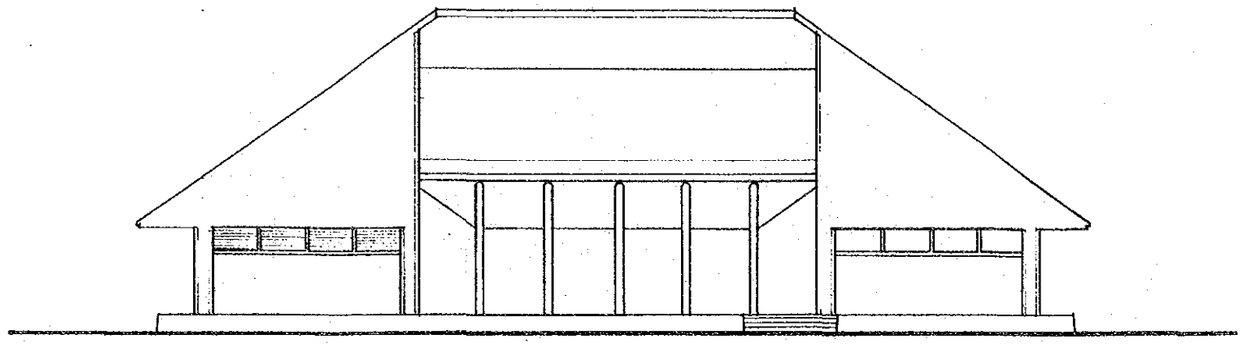
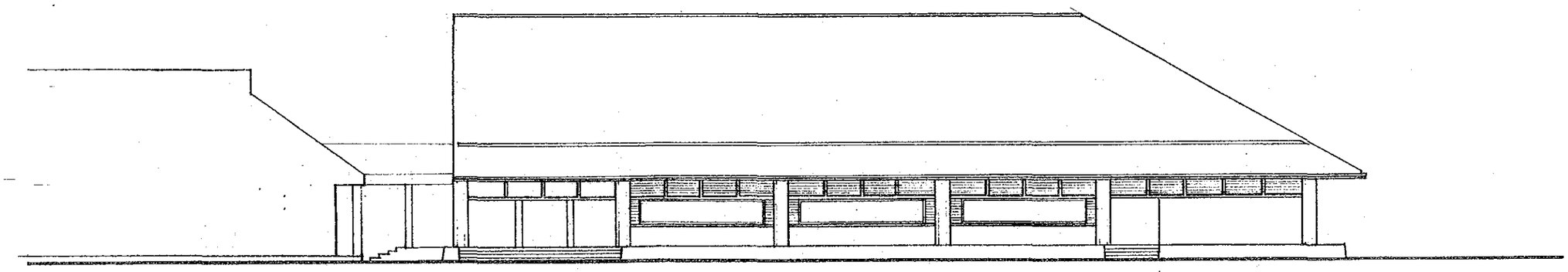
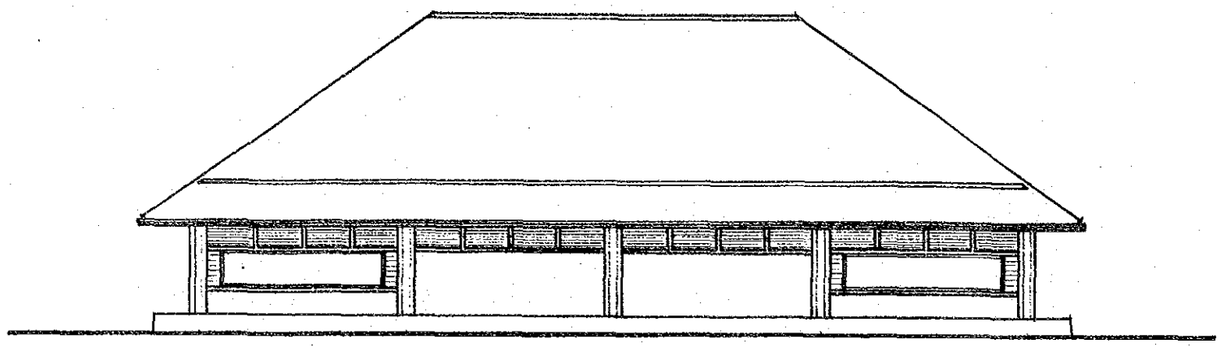


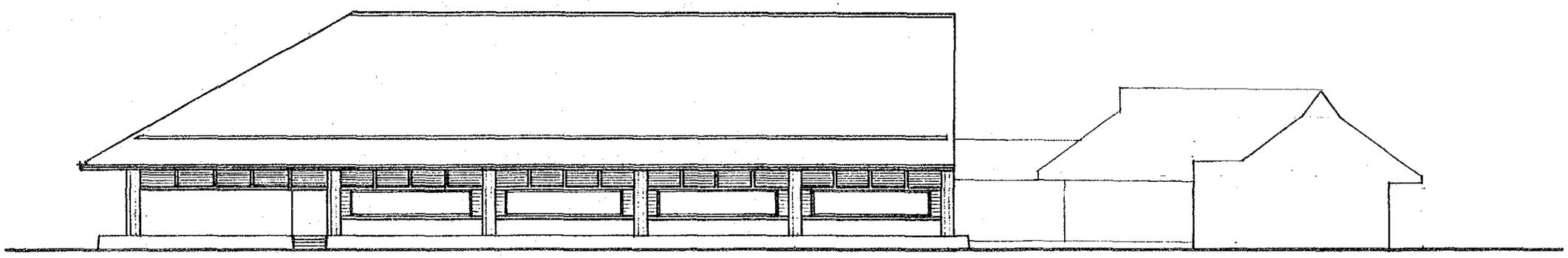


FOOD CROP PROTECTION CENTER - BANDUNG

ELEVATION S = 1:200

16

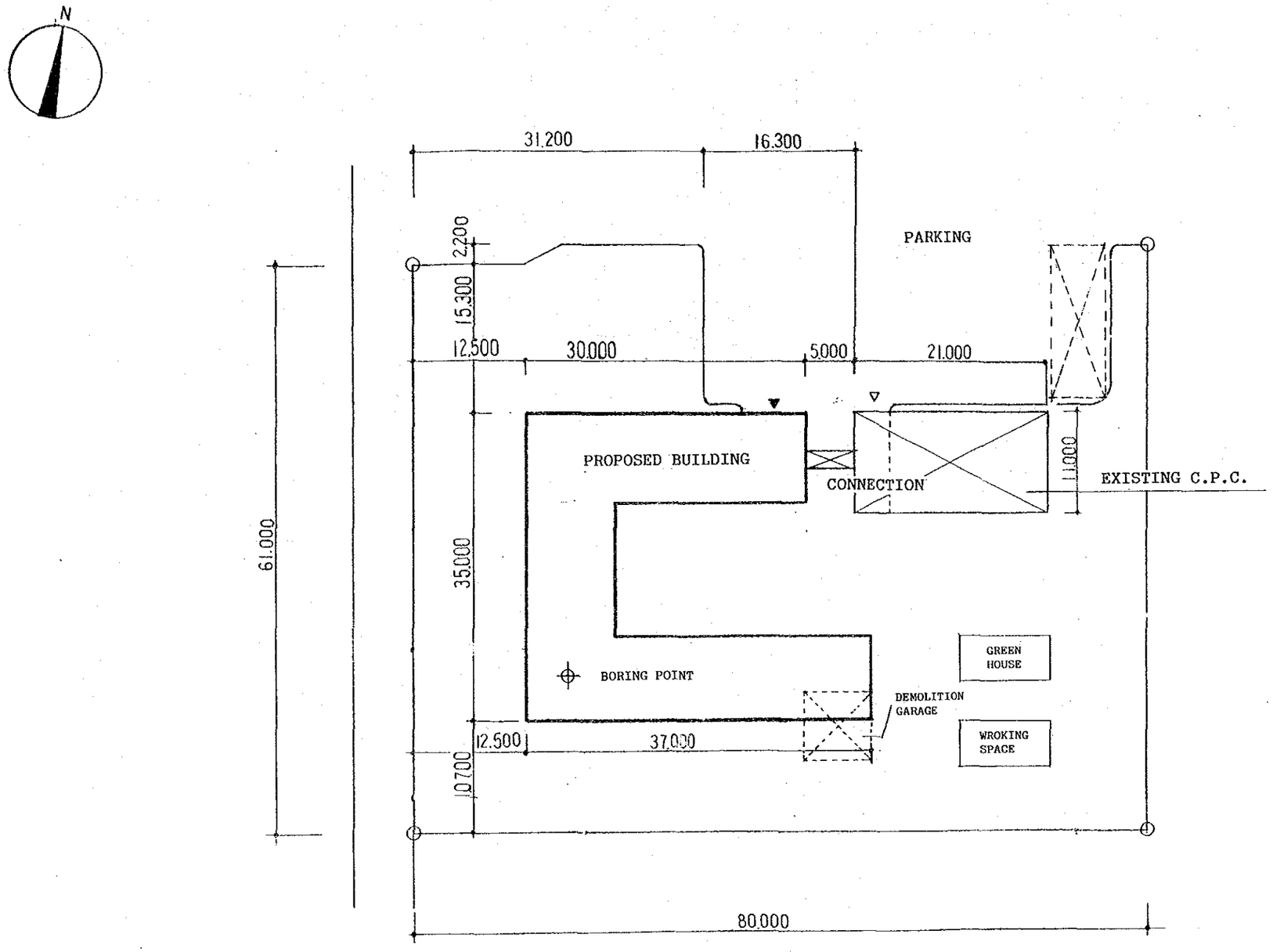




FOOD CROP PROTECTION CENTER - BANDUNG

ELEVATION S = 1:200

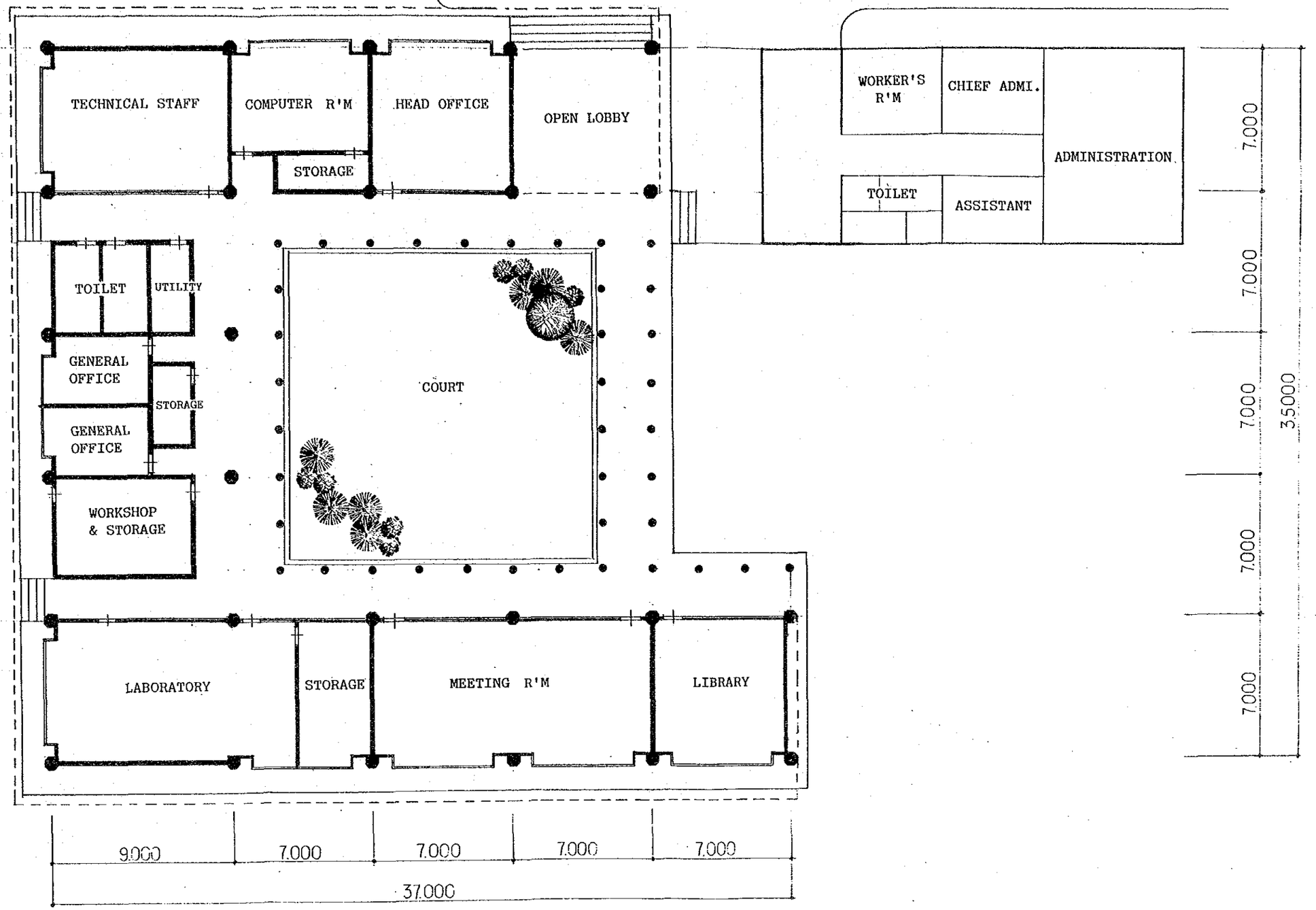
17



FOOD CROP PROTECTION CENTER - SEMARANG

SITE PLAN S = 1:500

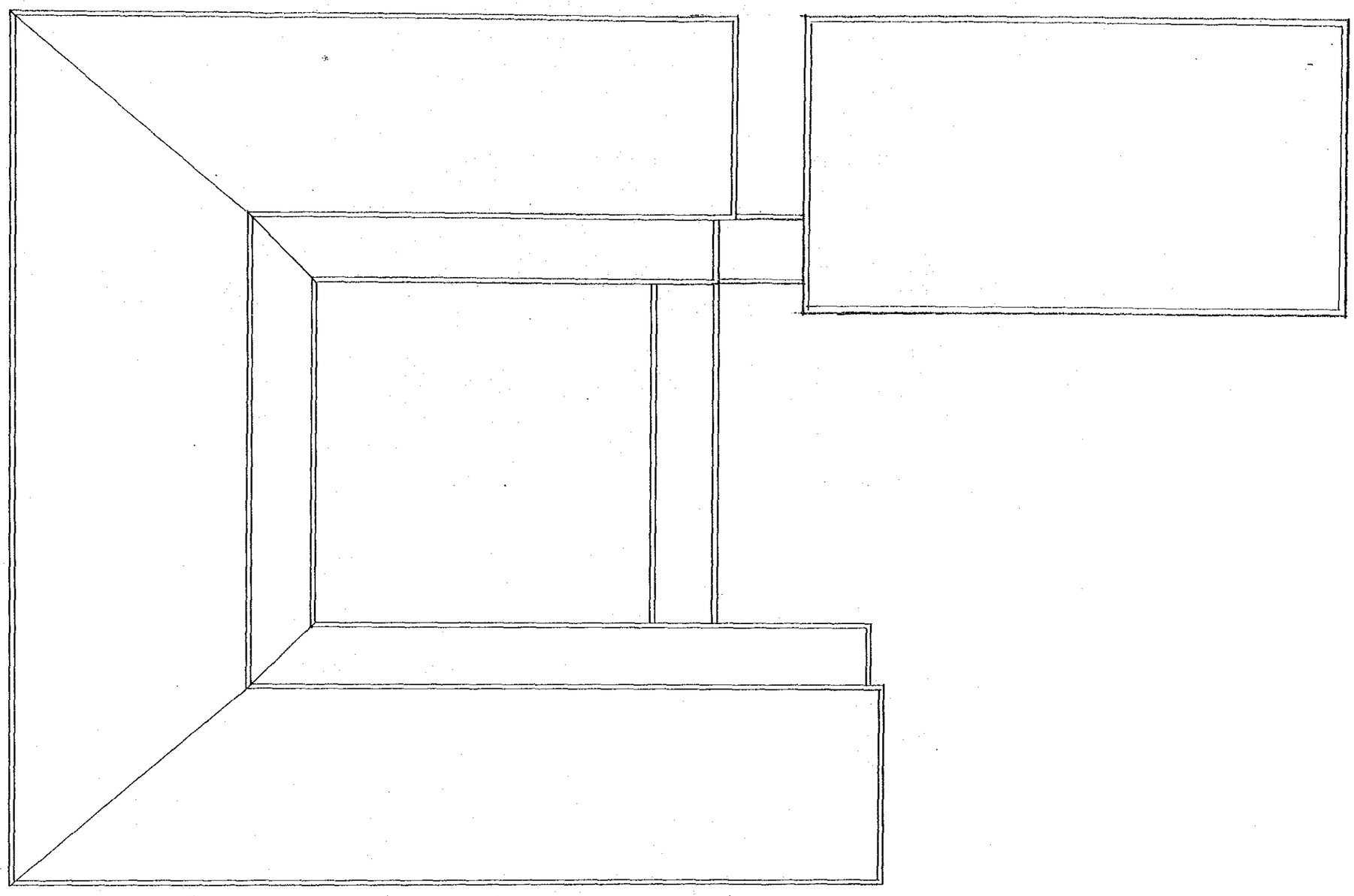
18



19

FOOD CROP PROTECTION CENTER - SEMARANG

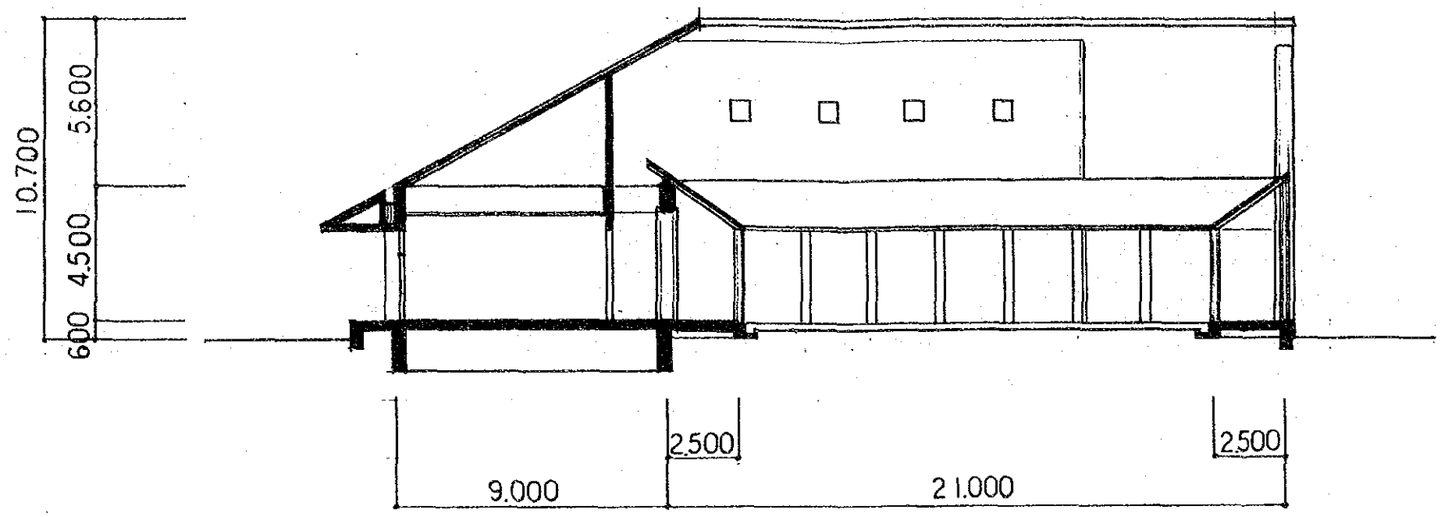
GROUND FLOOR PLAN S = 1:200

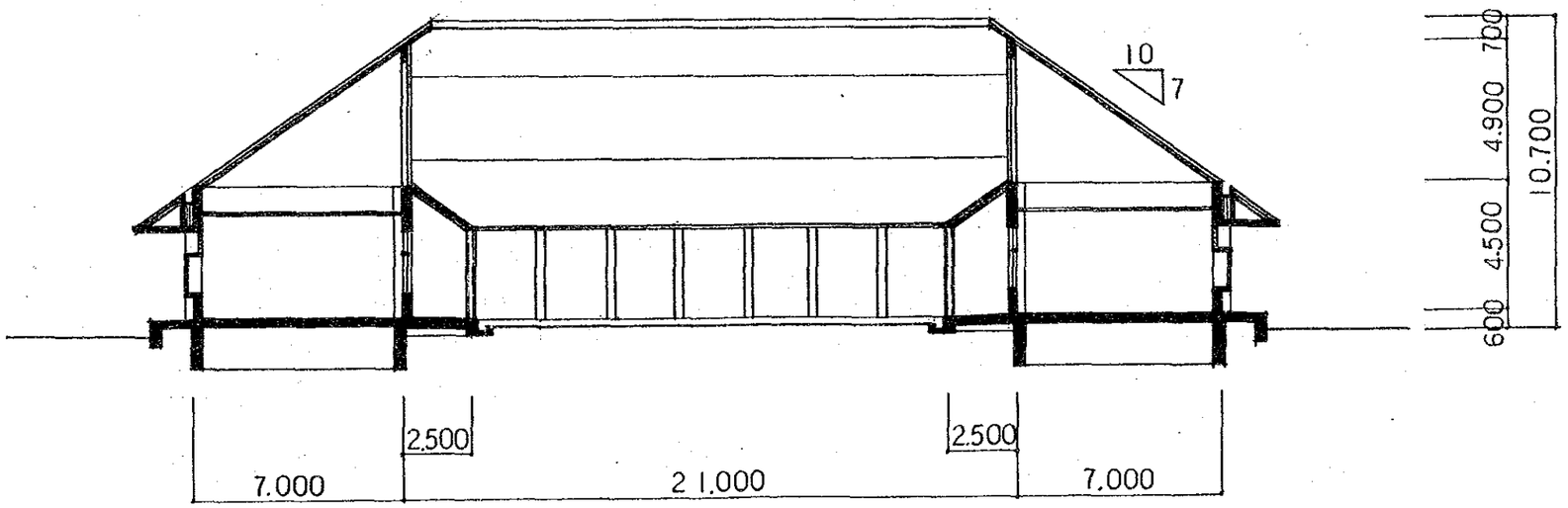


20

FOOD CROP PROTECTION CENTER - SEMARANG

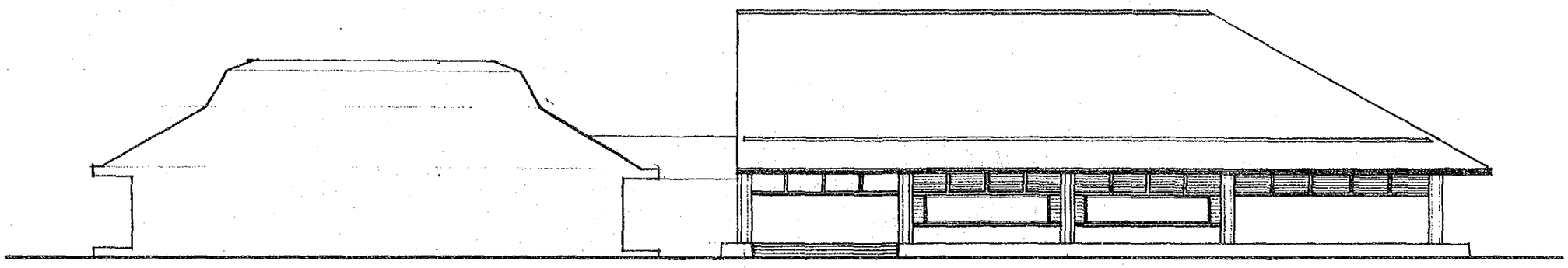
ROOF PLAN S = 1:200

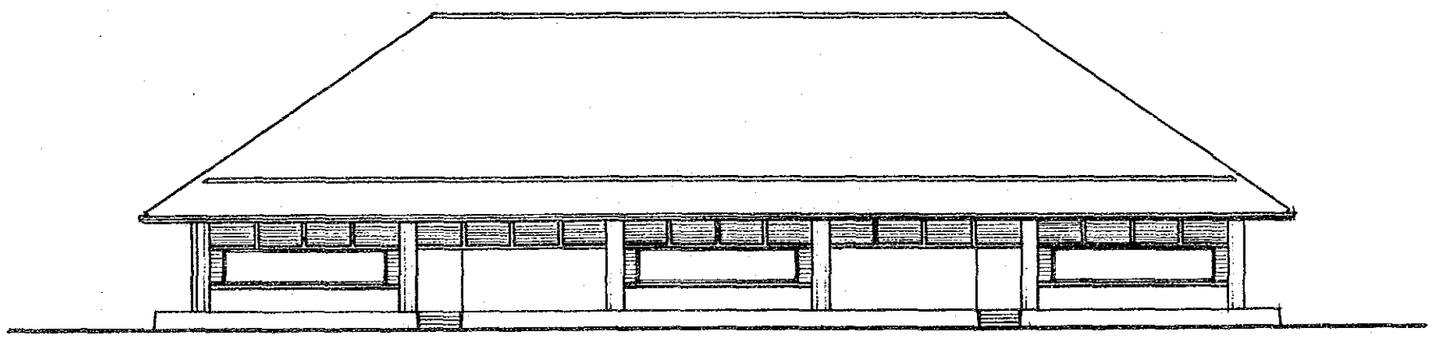




FOOD CROP PROTECTION CENTER - SEMARANG

SECTION S = 1:200

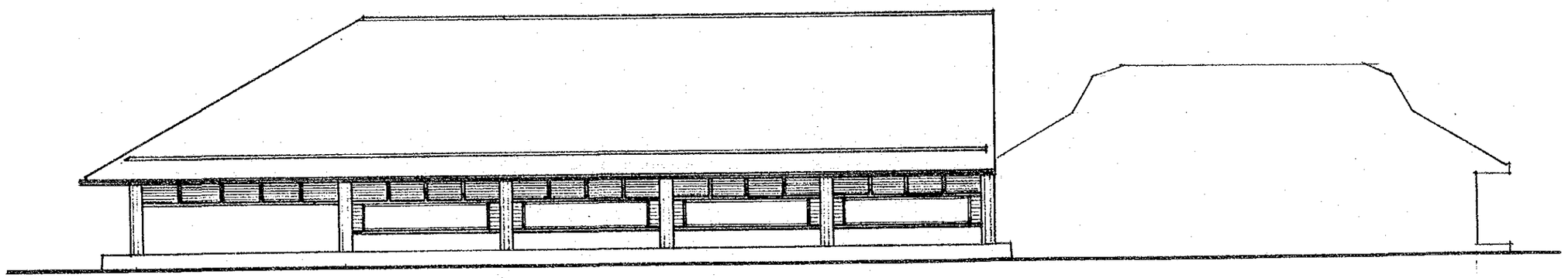


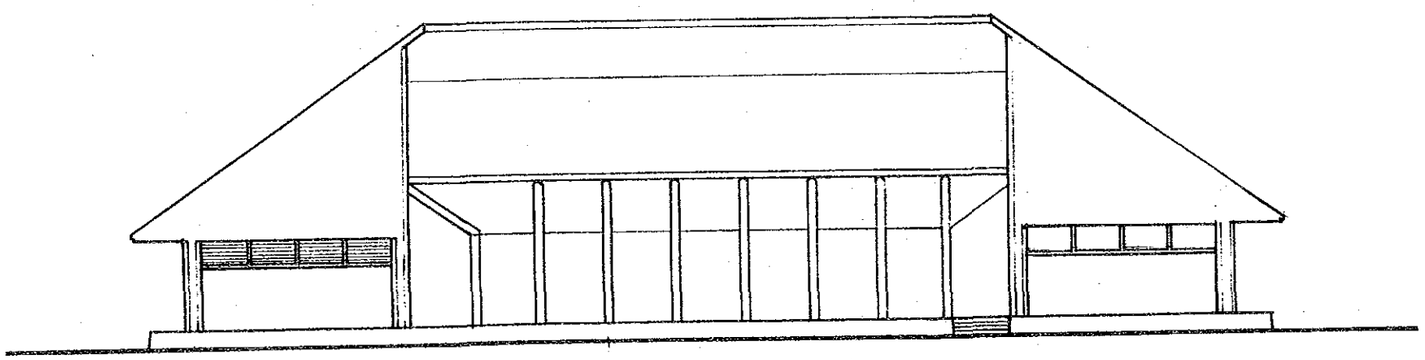


FOOD CROP PROTECTION CENTER - SEMARANG

ELEVATION S = 1:200

22

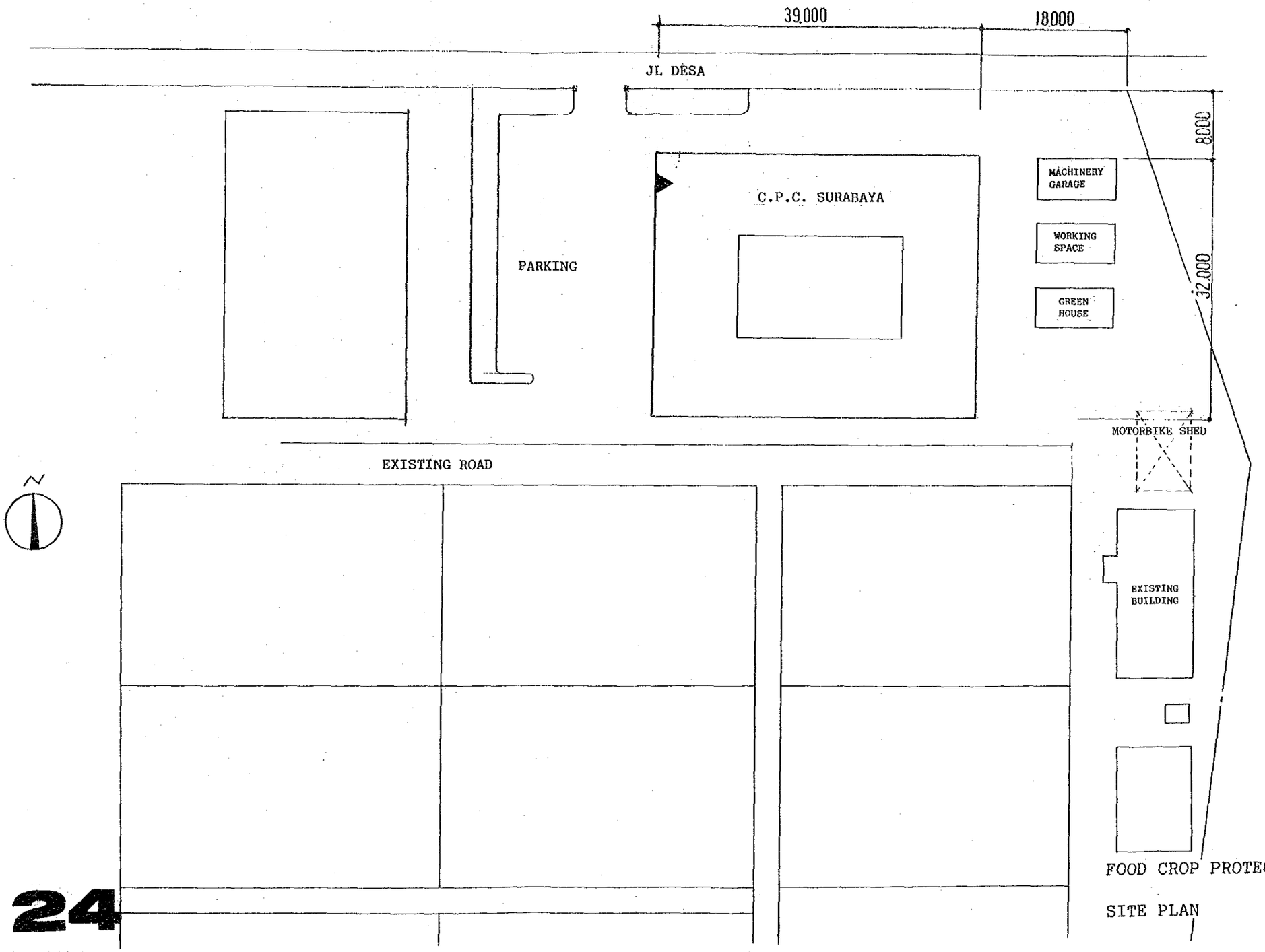




FOOD CROP PROTECTION CENTER - SEMARANG

ELEVATION S = 1:200

23

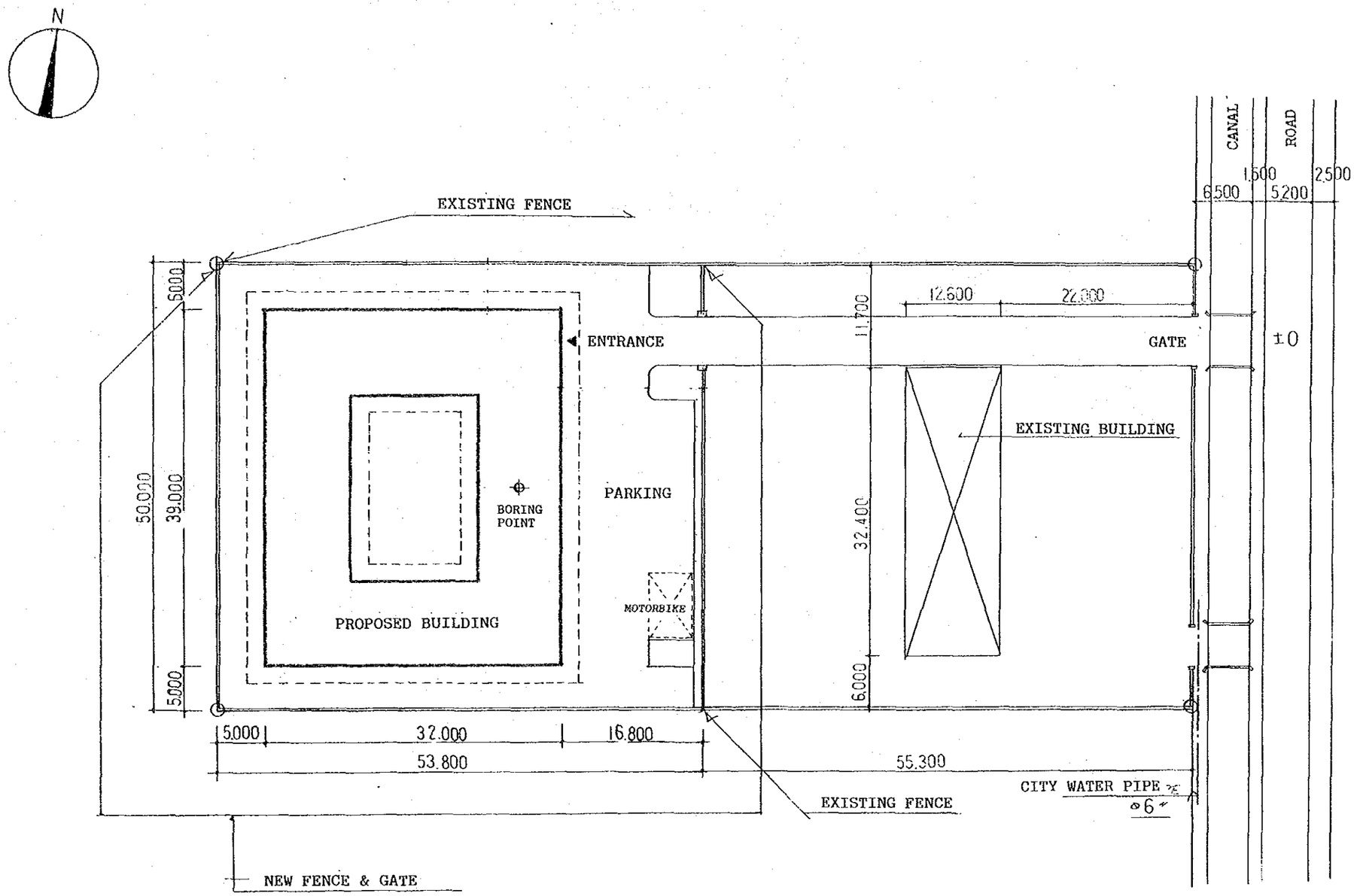


24

FOOD CROP PROTECTION CENTER - SURABAYA

SITE PLAN

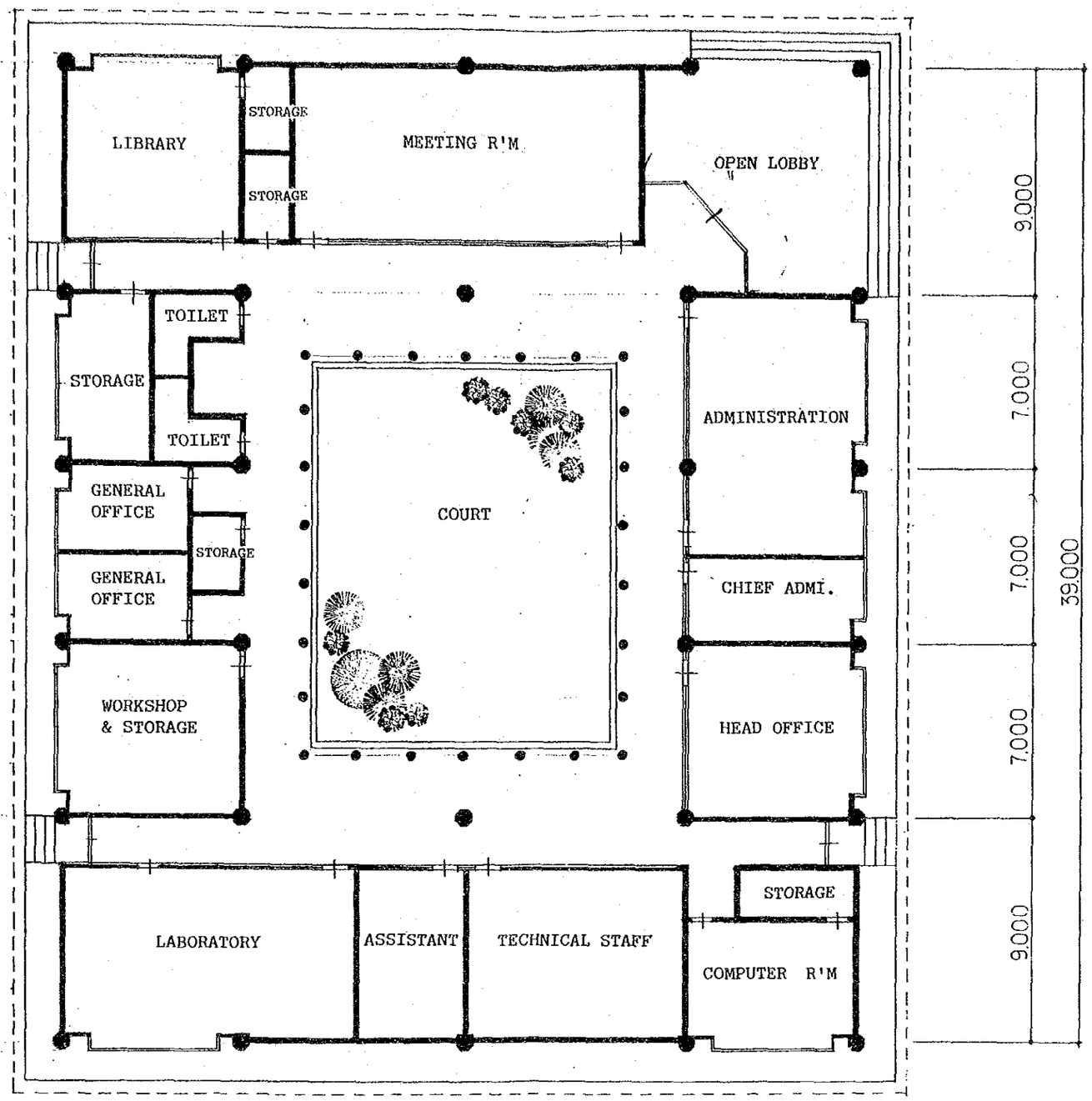
S = 1:500



25

FOOD CROP PROTECTION CENTER - DENPASAR

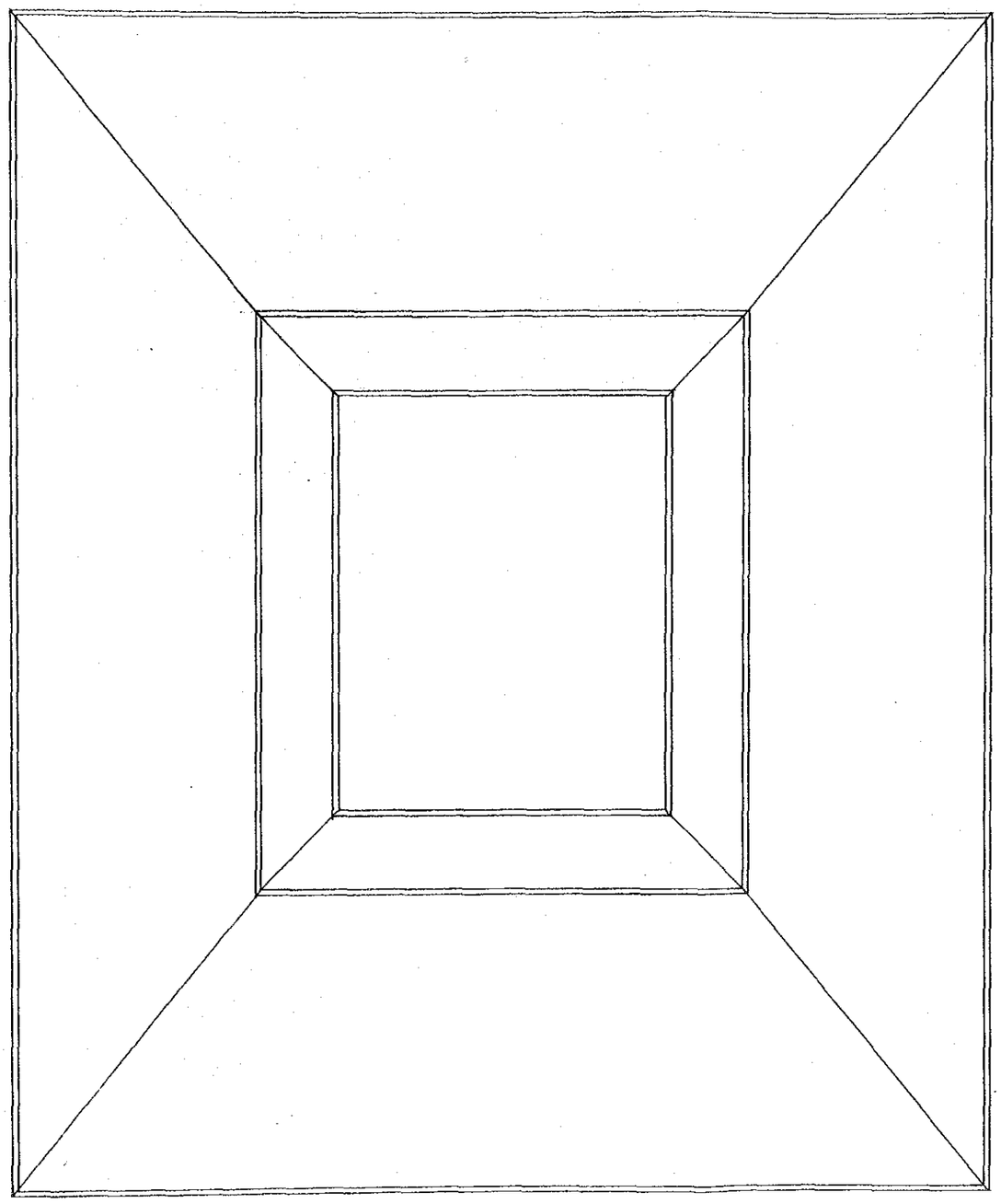
SITE PLAN S = 1:500



26

FOOD CROP PROTECTION CENTER - DENPASAR
SURABAYA

GROUND FLOOR PLAN S = 1:200

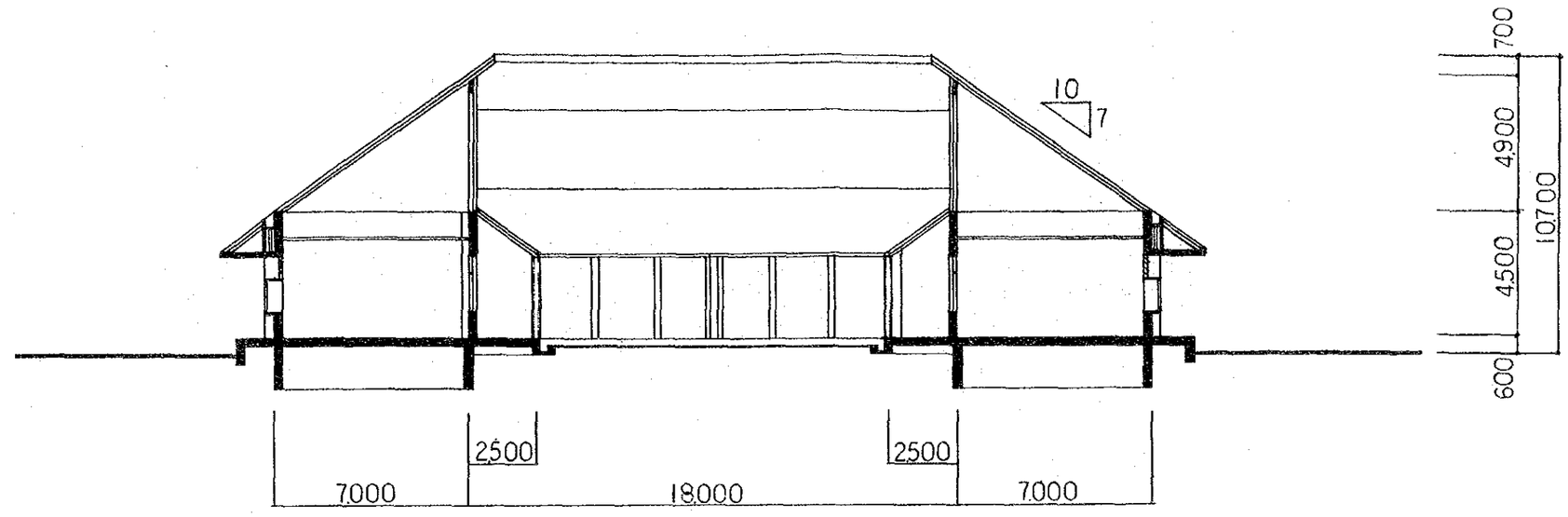


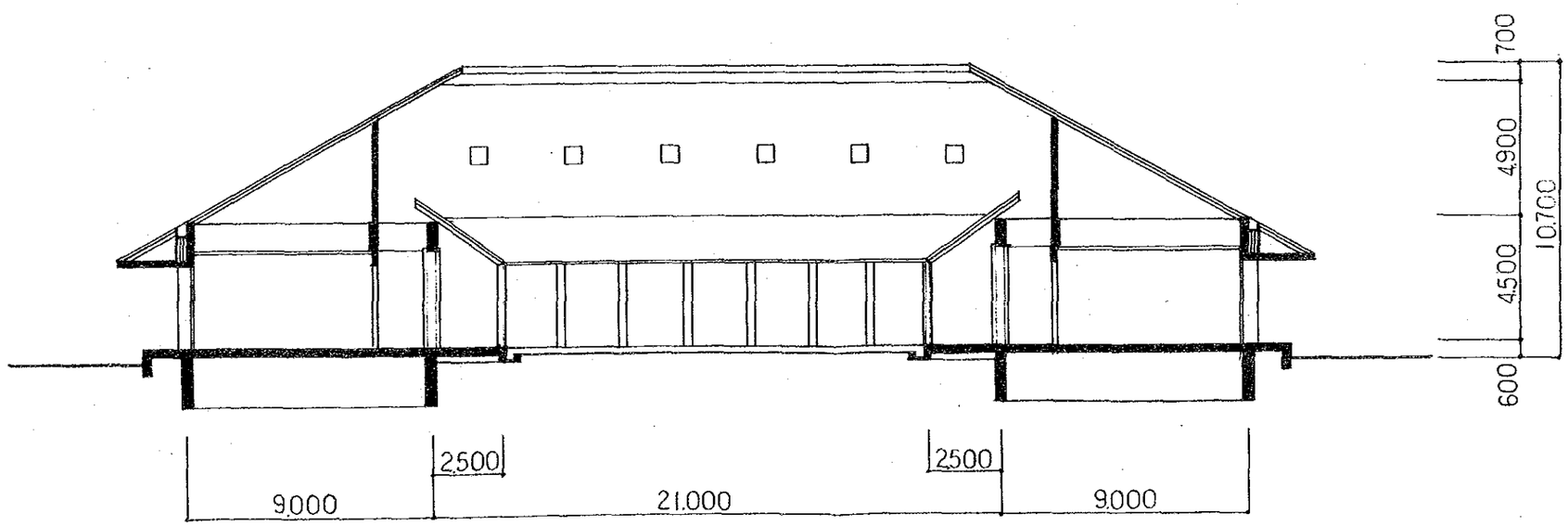
27

FOOD CROP PROTECTION CENTER - DENPASAR
- SURABAYA

ROOF PLAN

S = 1:200

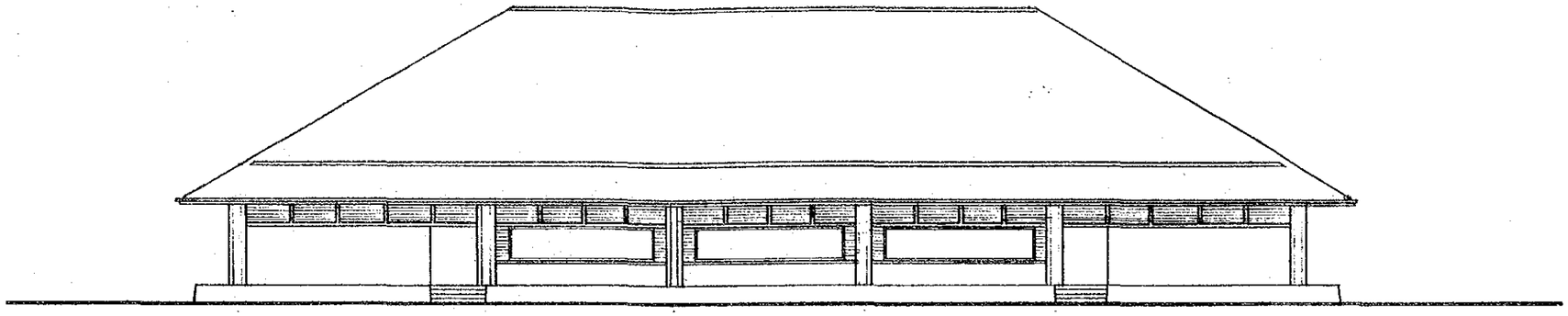


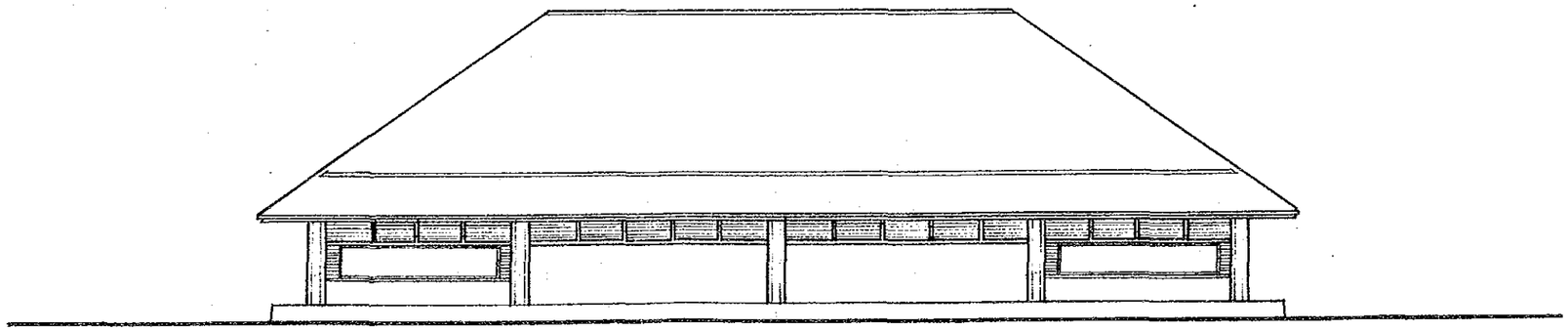


28

FOOD CROP PROTECTION CENTER - DENPASAR
- SURABAYA

SECTION S = 1:200

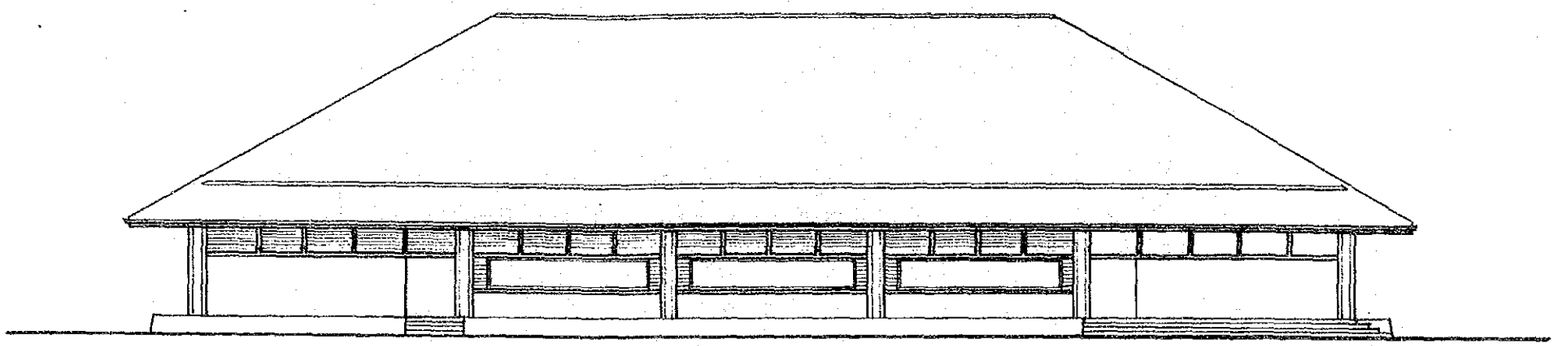


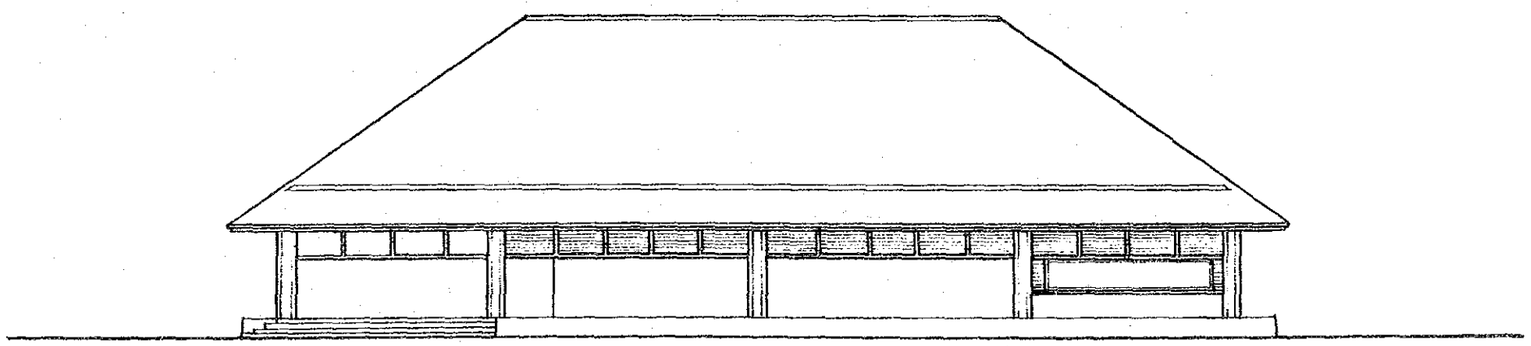


FOOD CROP PROTECTION CENTER - DENPASAR
- SURABAYA

ELEVATION S = 1:200

29

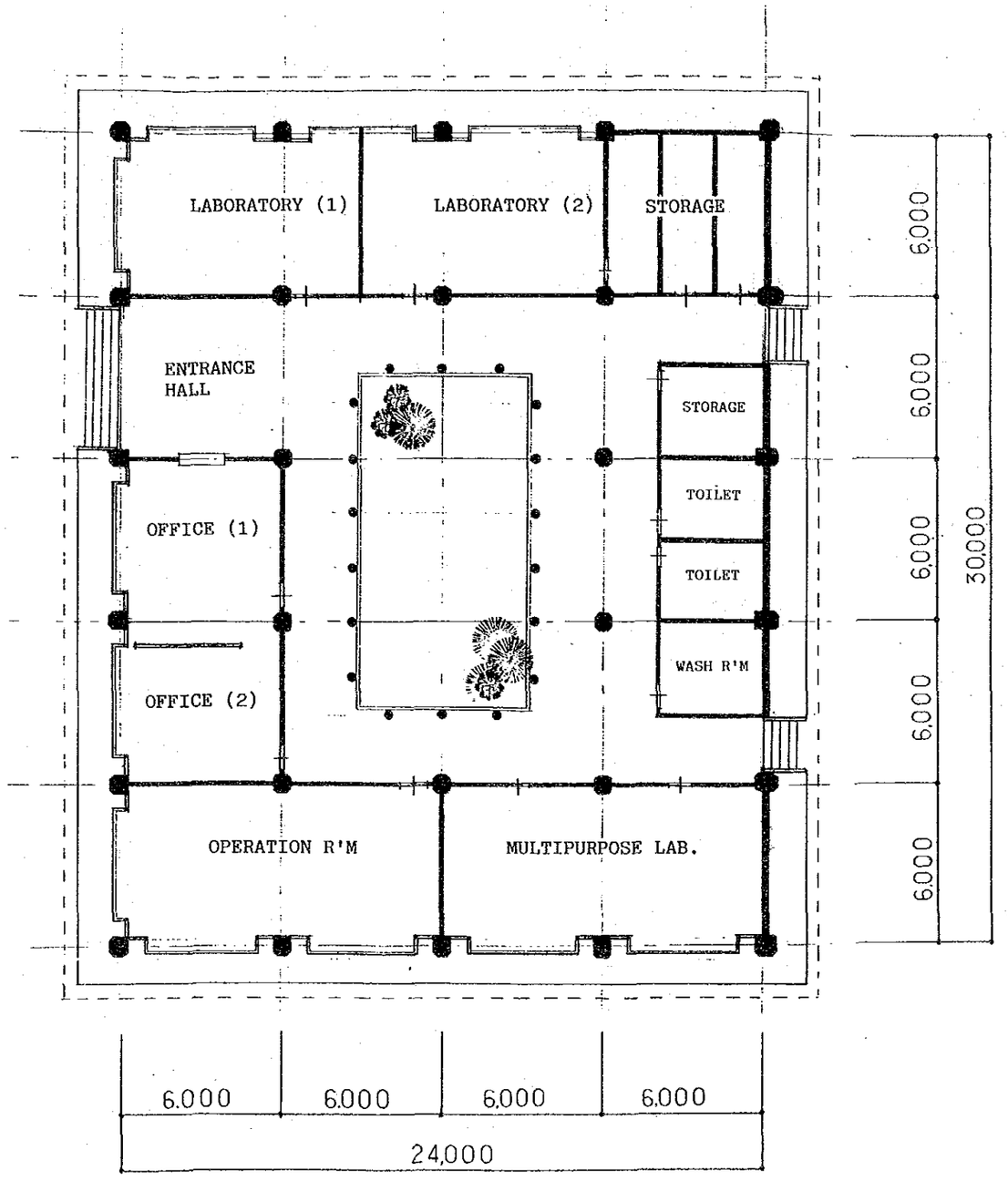




FOOD CROP PROTECTION CENTER - DENPASAR
- SURABAYA

ELEVATION S = 1:200

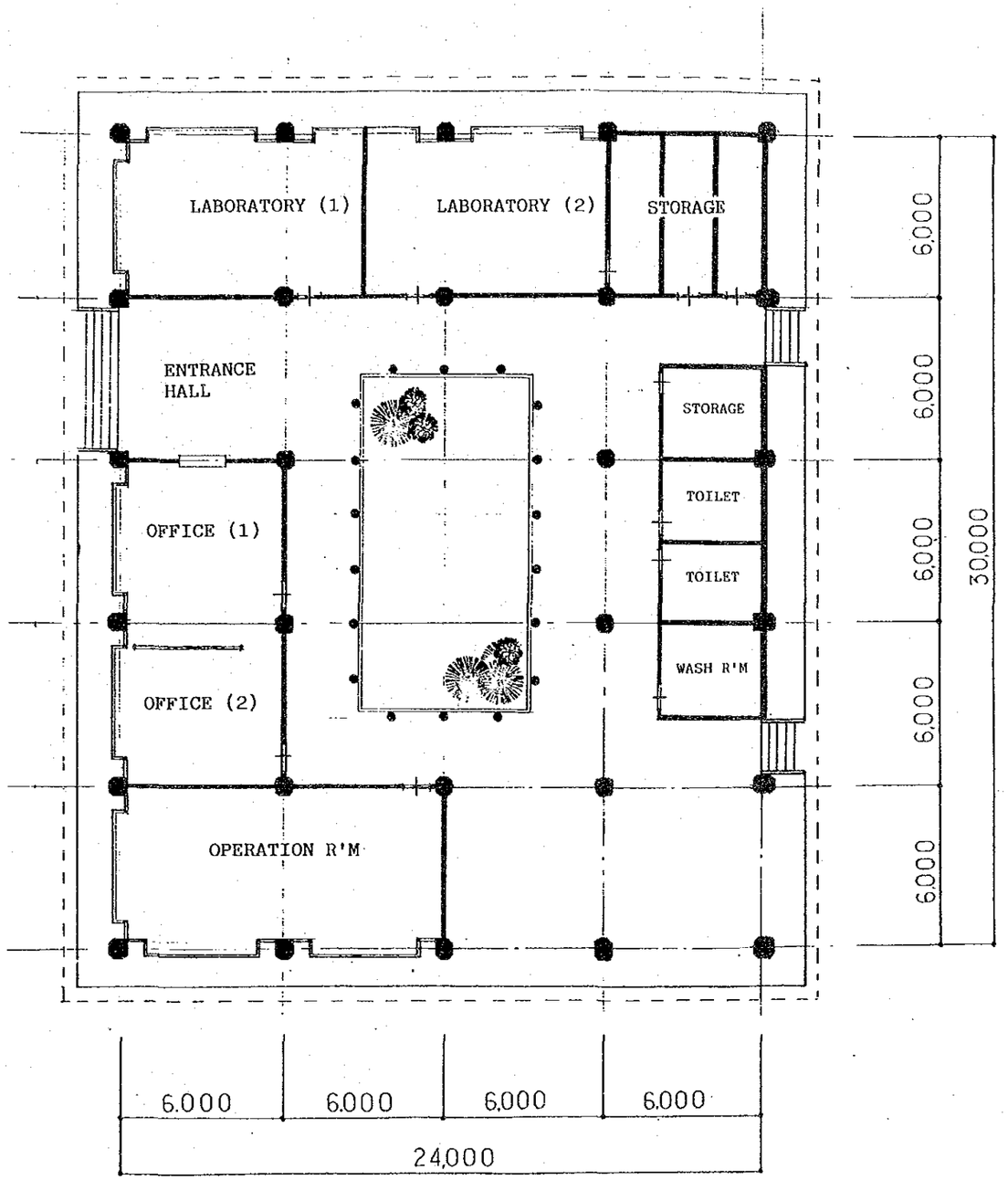
30



FIELD LABORATORY - A TYPE

GROUND FLOOR PLAN S = 1:200

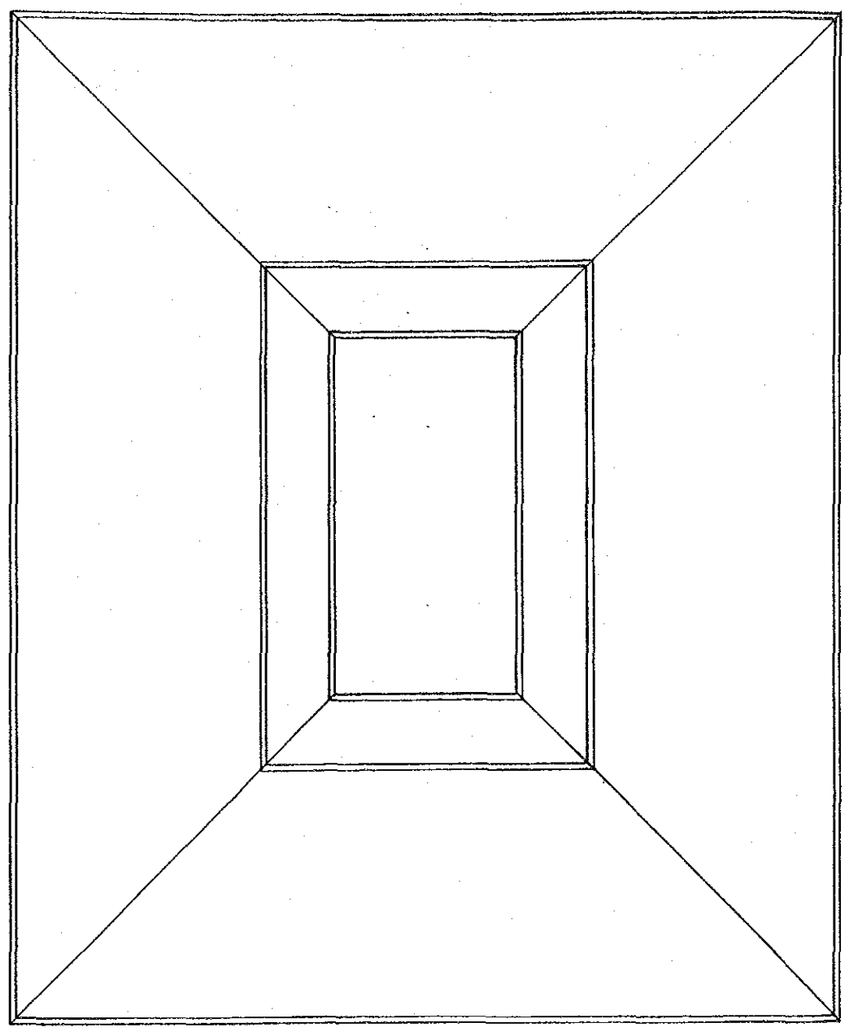
31



FIELD LABORATORY - B TYPE

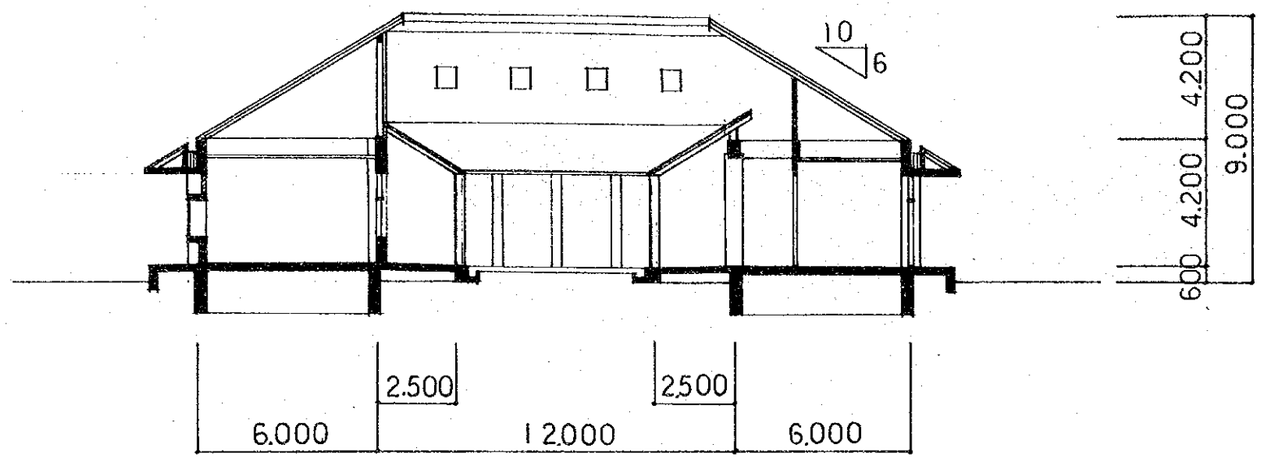
GROUND FLOOR PLAN S = 1:200

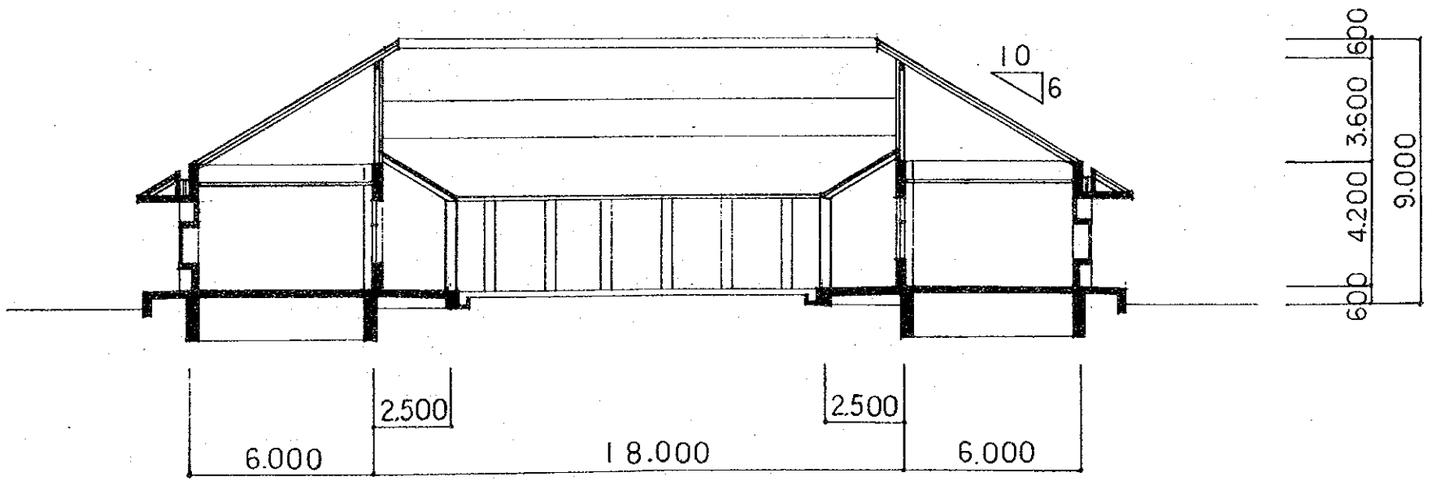
32



FIELD LABORATORY

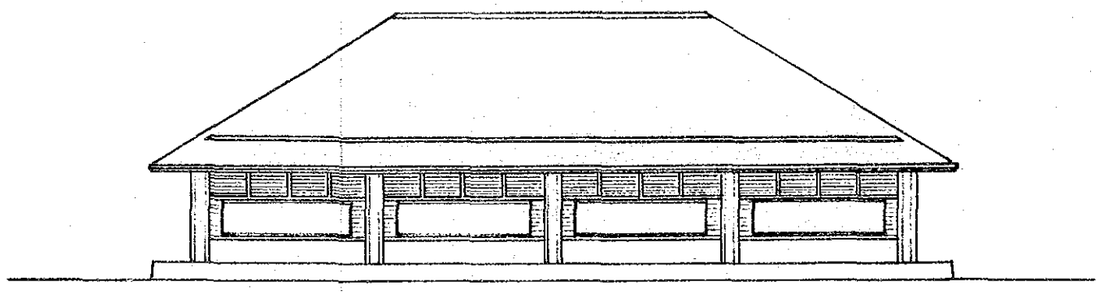
ROOF PLAN S = 1:200

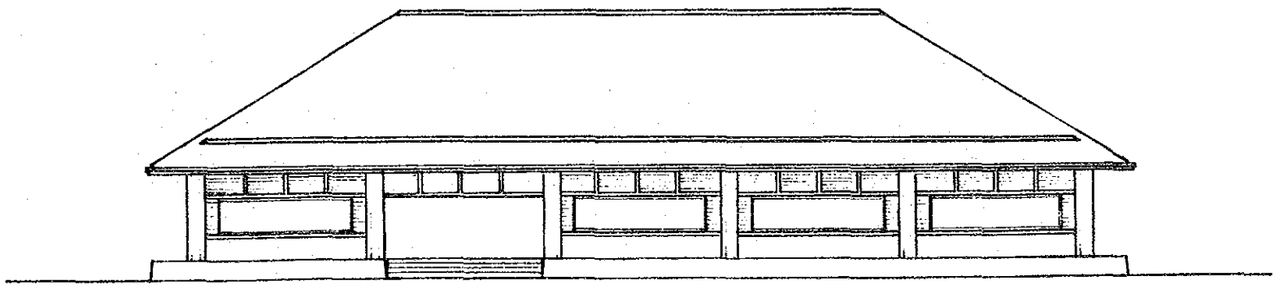




FIELD LABORATORY

SECTION S = 1:200





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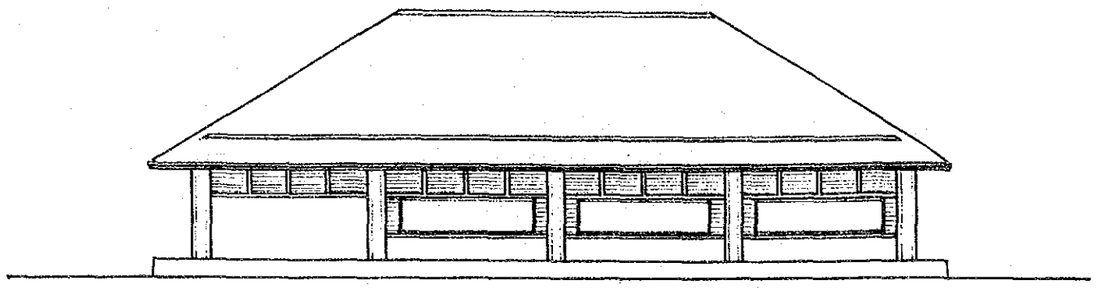
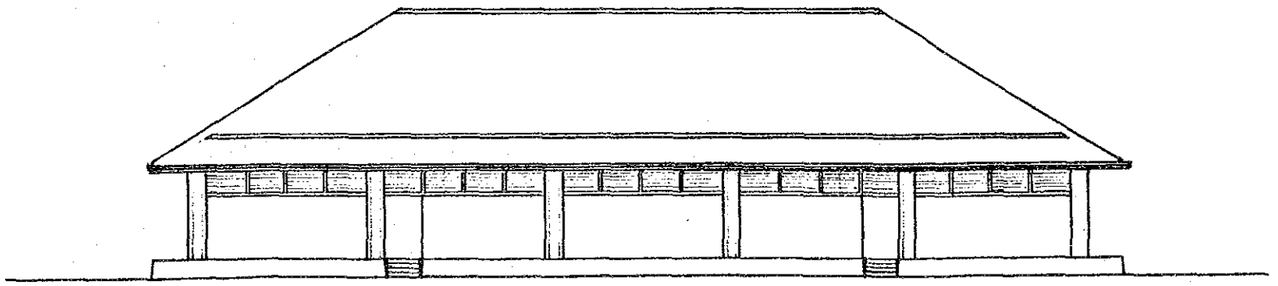
FIELD LABORATORY

ELEVATION S = 1:200





FIELD LABORATORY

ELEVATION S = 1:200

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4-2 BASIC DESIGN OF EQUIPMENT

4-2-1 Basic Design Concept

Basic design of equipment and materials consists of study and selection of appropriate type, specifications and scale for each item of equipment and material proposed under the Project. Appropriate type, function and scale of each proposed material, etc. will be reviewed on the basis of the study in CHAPTER 3 for basic design. The basic design concept is outlined as follows:

1. Design will be based upon consideration of the results of the feasibility study, present conditions, and equipment provided under ATA-162 and grant aid assistance for 1984.

2. The basic design will ensure maximum functionability at minimum scale without any reduction in effects anticipated from ATA-389.

3. Materials essential to basic functioning of ATA-389 when unmentioned in the request list, will be added to the basic design.

4. Items such as office and dormitory furnishings which are to be covered by the local portion, will be eliminated from the request.

5. In consideration of quality, specifications and import restrictions, items will be procured locally whenever possible.

6. With regards to items requiring substantial maintenance, only those for which appropriate maintenance can be obtained locally will be provided under the Project.

7. In principle, a one year supply of expendable items vital to smooth facilitation of the Project will be provided.

4-2-2 Conditions Concerning Equipment

(1) Laboratory Equipment

The majority of experimental equipment is equivalent to that introduced under ATA-162 and 1984 grant aid assistance and therefore such equipment provided under the present Project will be of the same standard. The number of lab tables and other incidental lab equipment will be adjusted according to the scale of each laboratory. Moreover, lab equipment such as FCPC lab tables which have not been included in the request will be added. Incidental lab equipment from the original request and as proposed under the Project are compared below.

Laboratory furniture	PFC	FCPC	A-FL	B-FL	Total
1. Island table	12/6	(0/2)x4	(2/3)x7	(2/2)x8	42/51
2. Side bench	18/10	(-)	(-)	(-)	18/10
3. Side bench w/cupboard	16/27	(-)	(-)	(-)	16/27
4. Sink cabinet	10/8	(0/2)x4	(2/3)x7	(2/2)x8	40/53
5. Filing cabinet	8/6	(-)	(1/0)x7	(1/0)x8	23/6
6. Storage cabinet	5/4	(-)	(1/0)x7	(1/0)x8	20/4
7. Desk & chair set	5/5	(-)	(1/0)x7	(1/0)x8	20/5
8. Glassware cabinet	4/4	(-)	(1/0)x7	(1/0)x8	19/4
9. Shelves unit	12/5	(-)	(1/0)x7	(1/0)x8	27/5

Numbers: Requested/Proposed

(2) Meteorological Equipment

Meteorological equipment will be of standard type as provided under 1984 grant aid.

(3) Training & Extensional Equipment

In consideration of management and maintenance, all typewriters will be electric typewriters rather than portable type. Copy machines will be fixed table top types. All other equipment will be standard types.

(4) Data Consolidation Equipment

Calculators and programmable calculators will have 12 digits and be equipped with recorders. Personal computers will have software which is compatible and interchangeable with that of the office computer (NEC 100) intorduced in the DFCP. The proposed numbers of equipment are as listed below.

Facilities	Personal Computer	Programmable Calculator	Calculator (large)
PFC	2	5	5
FCPC	4 (1 x 4)	16 (4 x 4)	12 (3 x 4)
A-FL	-	21 (3 x 7)	-
B-FL	-	16 (2 x 8)	-
Total	6	58	17

(5) Vehicles

1) Mobile Laboratory

The mobile laboratory will be a delivery van type with air-condition.

2) Pickup Truck

A canvas hood will be attached to the rear bed of the pickup truck and folding bench seats will be attached on both sides inside the rear bed to allow a total seating capacity of over 8 people.

3) Motorcycle

To discourage private use, motorcycles for O/U will be single seaters with a metal container (about 0.15 m^3) of a tool box fastened to the back. A sign will be printed on the box in large letters to indicate that the vehicle is for O/U use. A special holder will be attached to the back for the sweep net handle to keep it out of the way. Motorcycles for F/L, etc. will be two-seaters.

Facilities	Mobile Labo.	Pick-up Truck	Motorcycle
PFC	-	-	-
FCPC			
Bandung	1	-	-
Semarang	1	1	3
Surabaya	1	1	-
Denpasar	1	1	3
F/L	15(1 x 15)	-	45(3 x 15)
O/U	-	-	129
Total	19	3	180

(6) Communication Equipment

One facsimille will be provided in the DFCP and each FCPC and PFC for a total of six machines. The FCPC and each F/L will also be equipped with SSB wireless telephones. The facsimille will be standard type and capacity of the SSB wireless telephones will be about 200 ~ 300 km. The facsimille are to be connected with a dial phone while the permission of the government authorities concerned is required for use of SSB wireless telephones. This is further discussed below.

(7) Projection of the Possibilities of Communications Equipment

1) For Communication among DFCP, PFC, and FCPC

At present the DFCP is equipped with three dial phones for communication with each FCPC. On the other hand, only the Surabaya FCPC is equipped with a dial phone and only Semarng FCPC and Tanggul F/L have electromagnetic phones. As it is very difficult to reach long distances with electromagnetic phones, most communications are carried out by letter.

Rapid communication is necessary for effective functioning of the proposed pest forecasting and control network. Accordingly, dial phones should be installed in each of these Project facilities, preferably with additional installation of facsimille machines for written communications.

Installation of dial phones for each facility is proposed as outlined below.

Jatisari PFC

An electromagnetic telephone has been installed in Jatisari area at the Cikampek telephone office about 7 km from Jakarta. It is necessary to install a seperate line from Purwakarta about 12 km distant from Cikampek for a dial phone. As there are existing dial and electromagnetic phone lines running between Purwakarta, Cikampek and Jatisari, installation of telephone poles is unnecessary and only such materials as telephone wires are required for construction work.

Phones can be installed 3 to 6 months after application; however, costs are only assessed upon receipt of application.

Bandung FCPC

The Bandung FCPC presently uses the radio circuit type dial phone in the nearby Seed Certification Center. As this is only a single line, expansion is difficult. Installation of dial phones is desirable. If impossible, SSB communication will be recommended. possible within about 3 months of application for a cost of about Rp. 500,000.

Semarang FCPC

Semarang FCPC is located in Ungalan, about 12 km from Semarang. The FCPC is equipped with an electromagnetic phone; however, it is insufficient for communication to such distant areas as Jakarta. Installation of dial phones is desitable, however, if impossible, SSB communication will be recommended.

Surabaya and Denpasar FCPC

Surabaya FCPC presently uses a dial phone and transfer of this phone to new facilities or new installations represents no particular problem.

The proposed sites for the new Denpasar FCPC are within the area of each governmental office on Bali Island and thus installation of dial phones should be uncomplicated.

Applications for installation of new telephone facilities as outlined above will be included within the budget for 1986 after Exchange of Notes.

2) Communications between FCPC and F/L

Only one F/L, Tanggul F/L in East Java, is equipped with a telephone, while the remaining four existing F/L have none. Based on present conditions in the proposed 15 new F/L sites, speedy installation of telephones is considered difficult. Accordingly, use of SSB communication is considered the most effective means of communication system between each FCPC and F/L.

(8) Experimental Paddy Field Equipment

Experimental paddy field equipment includes a 6-7Hp power tiller with rotavator, a trailer with 500 kg loading capacity, an automatic thresher and a manual winnower. Thresher engines will be fuelled by gasoline.

4-2-3 Equipment List

Equipment proposed for each facility are listed below. A-type FL will be furnished with specific equipment for Biological Laboratory or Vertebrate Laboratory in addition to equipment for B-type FL.

EQUIPMENT FOR PEST FORECASTING CENTER

1. Laboratory Equipment

	Items (1)	Amount (2)
1-1-1	Insect Pest Laboratory Equipment	
(1)	Light trap	1
(2)	Spore trap	1
(3)	Portable battery light traps	1
(4)	Malaise trap	10
(5)	Rice yield analyser	1
(6)	Suction sampler	2
(7)	Knapsack sprayor	5
(8)	Oven/Sterilizer	1
(9)	Micro syringe	1
(10)	Ripening rate measuring apparatus	1
(11)	Refrigerator (large: capacity 370ℓ)	1
(12)	Desiccator (with aspirator)	5
(13)	Miniature thresher	1
(14)	Toxic gas incinerator	2
(15)	Biological microscope (with accessories)	1
(16)	Deissectoin microscope	1
(17)	Hydrometer	1
(18)	Analytic balance (1 division 10mg)	1
(19)	Chemical balance	1
(20)	Thermometer	2
(21)	Psychrometer	2
(22)	Insect killing bottle	2
(23)	Glassware	
	A. Petri dishes	
	11cm	240
	15cm	40
	B. Beakers	
	150mℓ	20
	250mℓ	50
	500mℓ	20
	1ℓ	10

(1)	(2)
C. Cylinders	
10mℓ	20
100mℓ	10
250mℓ	10
500mℓ	5
1ℓ	5
D. Conical Flasks	
200mℓ	20
500mℓ	20
1ℓ	20
E. Others	
Preparatory glass	2 box
Cover glass	5 box
Pipettes	5
Wash bottles	2
(24) Insect collection equipment set	1
(25) Water still	1
(26) Clear plastic cages/rearing boxes	
- round (4.5" x 3 5/8")	50
- square (6 7/8" x 4 5/8")	50
- larva collecting bins	20
(27) Dissecting instrument (kits)	10
(28) Setting boards	
- 1.5" wide	6
- 2" wide	10
- 3" wide	4
- 4" wide	2
- pinning board	5
- pinning stage	2
- PDCB (large tins)	10
- cells to hold above	6
- labels	24
(29) Single lens camera (with accessories)	1
(30) Eye piece micrometer	25
(31) Miniature thresher	1
(32) Handy insect box	10
(33) Mass rearing cabinet (Net box)	10
(34) Desiccator for lens	1

(1)		(2)
1-1-2.	Insect Pest Laboratory Support Equipment	
(1)	Island table with cupboard	1
(2)	Side benches	2
(3)	Side benches with cupboards	6
(4)	Sink cabinet	1
(5)	Storage cabinet	1
(6)	Shelf unit	1
(7)	Filing cabinet	1
(8)	desk and chair	1
1-1-3	Net house	
(1)	Net house table and chairs	2
(2)	Pots (159ø x 190mm, 159ø x 300mm)	200
(3)	Aspirator	5
(4)	Pocket magnifiers (magnification 10x)	5
1-2-1	Phytopathology Lab Equipment	
(1)	Autoclave	1
(2)	Incubator	1
(3)	Biological microscope (with accessories)	2
(4)	Deep freezer	1
(5)	Oven (including steriliser)	1
(6)	Blender	2
(7)	Dissecting instrument (kits) (contains 10units more)	3
(8)	Hot plate	2
(9)	Magnifying glass	5
(10)	Preparatory glass (box)	10
(11)	Cover glass (box)	10
(12)	Knapsack sprayers	2
(13)	Hand counter	5
(14)	Thermometer (standard)	2
(15)	Recording thermo-hygrometer (w/10 spare pens)	1

	Items (1)	Amount (2)
(16)	Charts	200
(17)	Glassware: - Beakers (1ℓ)	20
	(250mℓ)	20
	- wide mouth jars (250mℓ)	500
	- conical flasks (1ℓ)	10
	- petri dishes (4cm)	500
	- Erlenmeyer (50mℓ)	500
	- test tubes	500
	- measuring cylinder (1ℓ)	10
	- - do - (500mℓ)	20
	- - do - (250mℓ)	20
	- - do - (100mℓ)	10
(18)	Parafilm	2 rolls
(19)	Plastic rearing boxes	100
(20)	Laminar flow hood (900-1000mm)	1
(21)	Sterilization canister	2
(22)	Fermentation canister	2
(23)	Spatulas (stainless steel)	10
(24)	Filter funnels	15
(25)	Filter paper	10
(26)	Bunsen burners	5
(27)	Test tube rack	10
(28)	Constant temperature inoculator	1
(29)	Inoculation box	1
(30)	Inoculation pins	10 pcs

	Items (1)	Amount (2)
1-2-2	Phytopathology Lab. Support Equipment	
(1)	Side benches	8
(2)	Side benches with cupboards	6
(3)	Island table with cupboards	2
(4)	Sink cabinet	2
(5)	Equipment cabinet	1
(6)	Storage cabinet	1
(7)	Shelf unit	2
(8)	Desk and chair	1
(9)	Filing cabinet	1
1-3-1	Weed Laboratory Equipment	
(1)	Herbarium storage cabinet	1
(2)	Plant presses	2
(3)	Herbarium mounting sheets	10
(4)	Herbarium drying paper	10
(5)	Herbarium waxed paper	10
(6)	Herbarium preservative	10
(7)	Woodworking adhesive	1
(8)	Knapsack sprayer	1
(9)	Glassware, measuring jugs, filters	1 lot
(10)	Dissection microscope	1
1-3-2	Weed Laboratory Support Equipment	
(1)	Island table with cupboard	1
(2)	Sink cabinet	2
(3)	Equipment cabinet	2
(4)	Storage cabinet	2
(5)	Desk and chair	1

	Items (1)	Amount (2)
1-4-1	Vertebrate Pest Laboratory Equipment	
A.	Nuropsi	
(1)	Dissecting instrument (kits)	2
(2)	Divider	10
(3)	Tape measure (15m, 50m)	2
(4)	Steel rule	3
(5)	Vernier calipers (30cm, 40cm)	2
(6)	Micrometer screw square	1
(7)	Reagents	1 set
(8)	Deep freezer	1
B.	Laboratory Rodenticide Evaluation	
(1)	Laboratory test cages, (including food pots water bottles, label holders etc.)	10
(2)	Multiple Reflectory Microscopic Projecter	1
(3)	Auto-top-pan balance (160g, 240g, 600g)	3
(4)	Spoons, spatulas, glassware	1
C.	Laboratory Histology Equipment	
(1)	Vacuume pump	1
(2)	Dissection microscope	1
1-4-2	Vertebrate Laboratory Support Equipment	
(1)	Desk and chair	1
(2)	Filing cabinet	1
(3)	Cupboard	1
(4)	Shelf	1
(5)	Island table with cupboard	2
(6)	Storage cabinet	1
(7)	Sink cabinet	2
(8)	Side bench with cupboard	5

	Items (1)	Amount (2)
1-5-1	Biological Laboratory Equipment	
(1)	Autoclave	1
(2)	Incubator	1
(3)	Dissection Microscope	1
(4)	Deep Freezer	1
(5)	Refrigerator (370ℓ)	1
(6)	Oven (including steriliser)	1
(7)	Blender	1
(8)	Dissecting instruments (kits)	2
(9)	Hot plate	2
(10)	Magnifying glass	4
(11)	Filter paper	10 box
(12)	Bunsen burners	2
(13)	Knapsack sprayers	2
(14)	Hand counter	5
(15)	Thermometer	2
(16)	Recording thermo-hygrometer (w/10 spare pens)	1
(17)	Charts	200
(18)	Glassware:	
	- beakers (1ℓ)	20
	- beakers (250mℓ)	20
	- wide mouthed jars (250mℓ)	500
	- conical flasks (1ℓ)	10
	- wide mouthed jars (2.5ℓ)	10
	- petrie dishes (4m)	500
	- erlenmayer conical flasks (125mℓ)	500
	- test tubes (and caps)	500
	- measuring cylinder (1ℓ)	10
	- - do - (500mℓ)	20
	- - do - (250mℓ)	20
	- - do - (100mℓ)	10

	(1)	(2)
(19)	Parafilm	2 rolls
(20)	Plastic rearing boxes-various size (1-5 ℓ)	100
(21)	Laminar flow hood (900-1000mm)	1
(22)	Sterilization canister (portable small)	2
(23)	Fermentation canister (reserve tower suite cooker)	2
(24)	Spatulas (stainless steel)	10
(25)	Filter funnels	15
1-5-2	Biological Labo. Support Equipment	
(1)	Island table w/cupboard	2
(2)	Sink cabinet	2
(3)	Side bench with cupboard	5
(4)	Equipment cabinet	1
(5)	Desk and chair	1
(6)	Filing cabinet	1
(7)	Storage cabinet	1
(8)	Shelf unit	1

(1)		(2)
2.	Meteorological Stations	
(1)	Sunshine duration recorder (incl. charts and stand)	1
(2)	Wet and dry type thermometer	1
(3)	Cup counter anemometer	1
(4)	Recording rain gauge	1
(5)	Piche evaporimeter	1
(6)	Soil thermometer (5,8,20cm)	3
(7)	Evaporimeter hook gauge	1
(8)	Still well	1
(9)	Recording thermohygrograph	1
(10)	Evaporation pan A,	1
(11)	Max. min. thermometer	1
(12)	Instrument shelter	1

Items (1)	Amount (2)
3. Training & Extention Equipment	
3-1. General Training Equipment	
(1) Overhead projector	1
(2) 35mm slide projector	1
(3) 16mm film projector (automatic feed)	1
(4) Screen	2
(5) Video recorder	1
(6) TV receiver (wide screen)	1
(7) White board	6
(8) Video movie camera	1
(9) Type writer (manual)	2
(10) " (electrical)	2
(11) Photocopier	1
(12) Stencil machine and printing machine set	2
(13) Library equipment	1
(14) Large size screen	1
(15) Single lens camera (with accessories)	1
3-2. Laboratory Training Equipment	
(1) Biological Microscope (w/accessories)	5
(2) Dissection microscope	5
(3) Dissecting instrument (kits)	20
(4) Suction sampler	20
(5) Hand counter	20
(6) Magnifying glass	20
(7) Folding chair	20

Items (1)	Amount (2)
4. Data Consolidation Equipment	
(1) Calculator (large)	5
(2) Programmable calculator	5
(3) Personal computer	2

(1)	(2)
5. Farm equipment	lot
(1) Power tiller (7HP) with rotorvator	2
(3) Trailer (500kg capacity)	1
(4) Thresher	1
(5) Winnower	1

EQUIPMENT FOR FOOD CROP PROTECTION CENTER

(for West Java, Central Java, East Java)

No.	Item/Type Component (1)	Amount (2)
1.	Scientific Equipment	
1-1	General Equipment	
(1)	Light trap	1
(2)	Portable battery light traps	2
(3)	Refrigerator (200ℓ)	1
(4)	Knapsack sprayer	2
(5)	Vacuum pump	1
(6)	Constant temperature oven	1
(7)	Rice yield analyser	2
(8)	Laboratory dish (schale)	100
(9)	Portable insect experiment box	5
(10)	Analytic balance	1
(11)	Thermometer	1
(12)	Psychrometer	1
(13)	Killing bottle	5
(14)	Glassware:	
	- Petri dish (15cm)	20
	- Beakers 250mℓ	10
	- Beakers 500mℓ	10
	- Test tube (5 x 10mℓ) (5 x 100mℓ)	10
	- Pipettes	10
	- Microscope slides and cover	1
	- Measure, wash bottles, funnels, etc.	1 lot
(15)	Rearing boxes/clear plastic cages	40
(16)	Toxic gas incinerator	1
(17)	Dissecting instrument (kits)	3
(18)	Apparatus for cleaning extracts	1
(19)	Autoclave	2
(20)	Magnetic stirrer	1
(21)	Desiccator for lens	1

(1)	(2)
1-2. Vertebrate Pest Laboratory Equipment	
(1) Laboratory Test Cages (w/accessories)	50
(2) Auto-top-pan balance (160g, 240g, 600g)	3
1-3. Weed Science Laboratory Equipment	
(1) Herbarium cupboards	1
(2) Plant presses (set)	2
(3) Herbarium mounting sheets (set)	10
(4) Herbarium drying paper (set)	10
(5) Herbarium waxed paper (set)	10
(6) Herbarium preserative (set)	10
(7) Wood working adhesive (set)	1
(8) Knapsack sprayer	1
(9) Glassware, measuring jugs, filters, tools, etc. (set)	1 lot
1-4. Laboratory support equipment	
(1) Island table w/cupboard	2
(2) Sink cabinet	2

(1)	(2)
2. Training Equipment	
(1) Screen (multipurpose for OHP/Firm)	1
(2) Video recorder	1
(3) TV receiver (large screen)	1
(4) White board	3
3. Data Consolidation Equipment	
(1) Calculator (large)	3
(2) Personal computer	1
(3) Programmable calculator	4

EQUIPMENT FOR FOOD CROP PROTECTION CENTER
(for Bali)

No.	Item/Type Component (1)	Amount (2)
1.	Scientific Equipment	
1-1.	General Equipment	
(1)	Light trap	1
(2)	Portable battery light traps	2
(3)	Refrigerator (200ℓ)	1
(4)	Knapsack sprayer	2
(5)	Vacuum pump	1
(6)	Hand numbering apparatus	10
(7)	Insect specimen cabinet	5
(8)	Portable insect experiment box	5
(9)	Dissection microscope	2
(10)	Desiccator for lens	1
(11)	Analytic balance	2
(12)	Thermometer	1
(13)	Psychrometer	1
(14)	Killing bottle	5
(15)	Biological microscope (with accessories)	2
(16)	Glassware:	
	- Petri dish (15cm)	20
	- Beakers 250mℓ	10
	- Beakers 500mℓ	10
	- Test tube (5 x 10mℓ) (box)	10
	- Pipettes	10
	- Preparatory glass and cover glass	1
	- Measure, wash bottles, funnels, etc.	lots
(17)	Rearing boxes/clear plastic cages	40
(18)	Magnifier lens	30
(19)	Dissecting instrument (kits)	2
(20)	Apparatus for cleaning extracts	1
(21)	Autoclave	2

(1)		(2)
(22)	Magnetic stirrer	1
(23)	Toxic gas incinerator	1
(24)	Micro syringe	5
(25)	Ripening rate measuring apparatus	1
(26)	Rice yield analyser	2
(27)	Miniature thresher	1
(28)	Constant temperature oven	1
(29)	Constant temperature inoculator	1
(30)	Desiccator (with aspirator)	10
(31)	Laboratory dish (schale)	100
1-2.	Vertebrate Pest Laboratory Equipment	
(1)	Laboratory test cages w/accessories	5
(2)	Auto-top-pan balance (160g, 240g, 600g)	3
1-3.	Weed Science Laboratory Equipment	
(1)	Herbarium cupboards	1
(2)	Plant presses (set)	2
(3)	Herbarium mounting sheets (set)	10
(4)	Herbarium drying paper (set)	10
(5)	Herbarium waxed paper (set)	10
(6)	Herbarium preservative (set)	10
(7)	Wood working adhensive (set)	1
(8)	Knapsack sprayer	1
(9)	Glassware, measuring jugs, filters, tools etc. (set)	1 lot
1-4.	Laboratory Support Equipment	
(1)	Island table w/cupboard	2
(2)	Sink cabinet	2

(1)	(2)
2. Training Equipment	
(1) Overhead projector	1
(2) 35mm slide projector	1
(3) 16mm projector (automatic feed)	1
(4) Screen (multipurpose for OHP/Film)	1
(5) Video recorder	1
(6) TV receiver (wide screen)	1
(7) Single lens camera, (with accessories)	1
(8) White board	3
(9) Typewriter (electric)	3
(10) Photocopier	1
(11) Stencil machines and Printing Machine	1 set
(12) Single lens camera (with accessory)	1
3. Data Consolidation Equipment	
(1) Calculator (large)	3
(2) Personal computer	1
(3) Programable Calculator	4

EQUIPMENT FOR B-TYPE FIELD

Items (1)	Amount (2)
1. Laboratory Equipment	
1-1. General Laboratory Equipment	
(1) Magnifying glass	10
(2) Dissecting instrument (kits)	5
(3) Labo. moisture tester	2
(4) Autoclave	1
(5) Compact camera	1
(6) Light trap	1
(7) Spore trap	2
(8) Portable battery light trap	5
(9) Malaise trap	10
(10) Knapsack sprayer	5
(11) Oven/sterilizer	1
(12) Micro syringe	1
(13) Refrigerator (100ℓ)	1
(14) Biological microscope	1
(15) Dissection microscope	1
(16) Hydrometer	1
(17) Analitic balance	1
(18) Thermometer	2
(19) Psychrometer	2
(20) Insect killing bottle	10
(21) Petri dishes (11cm, 15cm)	100 each
(22) Beakers (150mℓ, 250mℓ, 500mℓ, 1000mℓ)	10 each
(23) Cylinders (10mℓ, 100mℓ, 250mℓ, 500mℓ, 1ℓ)	10 each
(24) Conical flasks (200mℓ, 500mℓ, 1ℓ)	10 each
(25) Preparatory glass	5 boxes
(26) Cover glass	10 boxes
(27) Pipettes	10

(1)		(2)
(28)	Measures, wash bottles, funnels, etc.	1 lot
(29)	Insect collection equipment set	1 set
(30)	Desiccator for lens	1
(31)	Clear plastic cages/rearing box	20
1-2.	Laboratory Support Equipment	
(1)	Island table w/cupboard	2
(2)	Sink cabinet	2

(1)	(2)
2. Meteorological Station	
(1) Sunshine duration recorder	1
(2) Wet and dry Thermometer	1
(3) Cup counter anemometer	1
(4) Rain gauge	1
(5) Piche evaporimeter	1
(6) Soil thermometer (5, 10, 20cm)	3
(7) Evaporimeter hook gauge	1
(8) Still well	1
(9) Recording thermohygrograph	1
(10) Evaporation pan A	1
(11) Max. min. thermometer	1
(12) Instrument shelter	1
3. Training Equipment	
(1) Overhead projector	1
(2) 35mm slide projector	1
(3) Screen	1
(4) White board magnetic (6 x 4 feet)	2
(5) Stencil machine and Printing Machine	1 set
(6) Typewriter (manual)	1
(7) Typewriter (electrical)	1
4. Data Consolidation Equipment	
(1) Programmable calculator	3
5. Farm equipment	
(1) Power tiller 7HP w/rotorvator	1
(2) Thresher	1
(3) Trailer 500kg	1
(4) Winnower	1

(1)		(2)
1-3. Equipment for Biological Laboratory (alternative)		
1-3-1	Laboratory Equipment	
(1)	Dissection microscope	2
(2)	Bunsen burners	2
(3)	Dissecting instruments (kits)	4
(4)	Hot plate	4
(5)	Magnifying glass	4
(6)	Incubator	1
(7)	Knapsack sprayers	2
(8)	Hand counter	5
(9)	Thermometer	1
(10)	Recording therme-hygrometer (with 2 spare pens)	1
(11)	Charts	200
(12)	Parafilm	2 rolls
(13)	Plastic rearing baxes-various sizes (1 - 5ℓ)	100
(14)	Spatulas - stainless steel	5
(15)	Filter funnels	15
(16)	Filter paper	10 boxes
1-3-2	Laboratory Support Equipment	
(1)	Island table w/cupboard	1
(2)	Sink cabinet	1

(1)		(2)
1-3.	Equipment for Biological Laboratory (alternative)	
1-3-1	Laboratory Equipment	
(1)	Dissection microscope	2
(2)	Bunsen burners	2
(3)	Dissecting instruments (kits)	4
(4)	Hot plate	4
(5)	Magnifying glass	4
(6)	Scalpel blades	100
(7)	Knapsack sprayers	2
(8)	Hand counter	5
(9)	Thermometer	1
(10)	Recording therme-hygrometer (with 2 spare pens)	1
(11)	Charts	200
(12)	Parafilm	2 rolls
(13)	Plastic rearing boxes-various sizes (1 - 5ℓ)	100
(14)	Spatulas - stainless steel	5
(15)	Filter funnels	15
(16)	Filter paper	10 boxes
1-3-2	Laboratory Support Equipment	
(1)	Island table w/cupboard	1
(2)	Sink cabinet	1

VEHICLE

Items (1)	No. (2)
(1) Pick-up Track (FCPCs except Bandung)	3
(2) Mobile Laboratory (each FCPCs and FLs)	19
(3) Motorcycle	180

COMUNICATION SYSTEM

Items (1)	No. (2)
(1) SSB Radio (Main Station)	4
(2) - do - (Sub Station)	19
(3) Facsimile Machine	6

4-3 PROJECT IMPLEMENTATION

4-3-1 Construction Situation and Implementation Policy

(1) Characteristics Affecting Construction

1) The characteristic of this Project is that the proposed construction sites are scattered over 20 locations on Java Island and Bali Island.

2) The construction sites of the 15 FLs are 50 to 220 km away from the city areas of Jakarta, Bandung, Semarang, Surabaya and Denpasar where the procurement of construction materials are planned. A detailed transportation plan for construction materials must therefore be developed.

3) Since the current ground height of the FL sites, most of which are paddy field at present, is lower than the front road by 0.5 m to 1.5 m, earth filling and ground improvement with due regard to subsequent ground subsidence are necessary.

(2) Execution Policy

The special conditions under which the facilities of this project must be constructed are as described before. We consider it necessary to cope with these conditions as follows.

(a) A construction schedule shall be established so that construction may be executed efficiently within the limited period.

(b) The above construction schedule shall permit diversion of materials for temporary works and form for structural frames in order to reduce construction costs.

(c) The general contractor shall assign engineers to each construction site for progress control and quality control.

4-3-2 Scope of Implementation and Sharing of Responsibilities

(1) Work to be Undertaken by the Japanese Side

1) Facilities

(a) Pest forecasting center (PFC)

a) Buildings

Pest forecasting center Main Building	1 bldg.
Dormitory	1 bldg.
Net House	3 bldgs.
Storage Cum Garage	1 bldg.
Drying Floor	1 spot

b) Contents of work

- Building work

  Foundation, structure, finishing

- Electrical equipment work

  Work within buildings, work of leading-in wiring into the site

- Water supply, drainage, and sanitary equipment work

  Work within buildings, well drilling and completing work, septic tank construction work, piping work up to the drainage ditch

- Air conditioning and ventilation equipment work

  Work within buildings

- Outdoor work on premises

  Roads on the premises, parking areas, outdoor lighting equipment

(b) Food Crop Protection Centers (FCPC)

* Bandung FCPC

a) Buildings

Food Crop Protection Center Main Building	1 bldg.
Storage	1 bldg.
Net House	2 bldgs.
Workshop	1 bldg.

b) Contents of work

- Building work

  Foundation, structure, finishing, work of connecting with existing buildings

- Electrical equipment work

  Work within buildings, work of leading-in wiring into the site, work of connecting with existing buildings

- Water supply, drainage, and sanitary equipment work

  Work within buildings, well drilling and completing work, septic tank construction work, piping work up to the drainage ditch, work of connecting with existing buildings

- Air conditioning and ventilation equipment work

  Work within buildings

- Outdoor work on premises

  Improvement of existing roads on the premises and parking lot

* Semarang FCPC

a) Buildings

Food Crop Protection Center Main Building	1 bldg.
Storage	1 bldg.
Net House	2 bldgs.
Workshop	1 bldg.

b) Contents of work

- Building work

  Foundation, structure, finishing, work of connecting with existing buildings

- Electrical equipment work

  Work within buildings, work of leading-in wiring into the site, work of connecting with existing buildings

- Water supply, drainage, and sanitary equipment work

  Work within buildings, well drilling and completing work, septic tank construction work, piping work up to the drainage ditch, work of connecting with existing buildings

- Air conditioning and ventilation equipment work

  Work within buildings

* Surabaya FCPC

a) Buildings

Food Crop Protection Center Main Building	1 bldg.
Storage	1 bldg.
Net House	2 bldgs.
Workshop	1 bldg.

b) Contents of work

- Building work

  Foundation, structure, finishing

- Electrical equipment work

  Work within buildings, work of leading-in wiring into the site

- Water supply, drainage, and sanitary equipment work

  Work within buildings, well drilling and completing work, septic tank construction work, work of connecting piping up to the drainage ditch

- Air conditioning and ventilation equipment work

  Work within buildings

- Outdoor work on premises

  Roads on the premises, parking area

* Denpasar FCPC

a) Buildings

Food Crop Protection Center Main Building 1 bldg.

b) Contents of work

- Building work

  Foundation, structure, finishing

- Electrical equipment work

  Work within buildings, work of leading-in wiring into the site

- Water supply, drainage, and sanitary equipment work

  Work within buildings, work of leading service pipe into the site, septic tank construction work, work of connecting piping up to the drainage ditch

- Air conditioning and ventilation equipment work

  Work within buildings

- Outdoor work on premises

  Roads on the premises, parking lot

(c) Field Laboratories (FL)

a) Buildings

Field Laboratory A Type	7 bldgs.
Field Laboratory B Type	8 bldgs.
Net House	30 bldgs.
Warehouse for agricultural machinery and implements	15 bldgs.
Drying Floor	15 bldgs.

b) Contents of work

- Building work

  Foundation, structure, finishing

- Electrical equipment work

  Work within buildings, work of leading-in wiring into the site

- Water supply, drainage, and sanitary equipment work

  Work within buildings, well drilling and completing work, septic tank construction work, piping work up to drainage ditch

- Air conditioning and ventilation equipment work
  Work within buildings

- Outdoor work on premises
  Roads on the premises, parking lot, outdoor lighting fixtures

2) Equipment

Provision of laboratory equipment under this project shall also include their installation, adjustment and delivery.

(2) Work to be Undertaken by the Indonesian Side

1) Work Related to Construction

(a) Improvement of the sites for construction of facilities

a) Dismantling and removal of existing buildings, clearing and levelling of sites (including foundation and concrete floor slabs)

Subject locations:

Jatisari PFC	
Field laboratory	1 bldg.
Net house	3 bldgs.
Garage	1 bldg.
Bandung FCPC	
Storage	
Semarang FCPC	
Garage	
Serang FL	
Storage	
Residence	
Tasikmaraya FL	
Residence	
Tennis court	

Pati FL
RC flat building
Residual foundation

Banyumas FL
Storage
Garage

b) Removal of trees, stumps and levelling

Subject location: Bantul FL, Pasuruan FL

c) Filling and levelling

Subject locations:

Jatisari PFC, Bandung FCPC, Indramayu FL, Cianjur FL, Tasikmalaya FL, Sukoharjo FL, Temanggung FL, Bantul FL, Mojokerto FL, Pamekasan FL, Buleleng FL, Gianyar FL

d) Bridge Construction

Serang FL, Indramayu FL, Cianjur FL, Sucoharjo FL, Temanggung FL, Mojokerto FL, Pamekasan FL,

e) Relocation of irrigation canal

Subject location: Jatisari PFC

(b) Provision of electric power, telephone circuits, water service piping, drainage canal and other ancillary facilities necessary for the facilities, extended as far as the specified locations within respective site.

Subject locations: All of the proposed construction sites

(c) Supply of temporary electric power and source of service water for construction

Subject locations: All of the proposed construction sites

(d) Outdoor facilities (entrance gates, fencing, plantings)

Subject locations: All of the proposed construction sites (with the exception of Bandung)

(e) Provision of furniture and Fixtures

Subject locations: All of the proposed construction sites

2) Provision of Conveniences

(a) Tax exemptions and provision of conveniences in making entry and exit to and from the country and during sojourn for organizations and individual persons of Japanese nationality who shall engage in this project.

(b) Tax exemptions and provision of conveniences in customs clearance formalities on construction equipment and materials, laboratory equipment and others which shall be brought into Indonesia for the implementation of this project.

(c) Effective maintenance and management of facilities and equipment which shall be constructed and/or provided under this project.

(d) Acquisition of the building permit prior to commencement of construction.

(e) Securing of sites for temporary office, working area, equipment and construction materials yard, etc. necessary for the construction work.

4-3-3 Execution Management Plan

(1) Arrangement for Execution Management

The proposed construction sites for PFC, FCPCs and FLs under this project are scattered over 20 locations on Java Island and Bali Island. In view of the planned construction period, it is believed that construction work will proceed in parallel at least about half of these 20 locations. The Consultant to cope with such a situation, will dispatch capable resident engineers to Indonesia from Japan at the time of starting up construction, and they shall endeavor to establish a cooperative system among client (Indonesian Government), contractors and other parties involved.

1) Resident engineers shall be selected from among the most experienced and capable in supervising.

2) Duties assigned to the resident engineers are as follows.

- Preparation of a Monthly Progress Report (once a month) (A report to clarify the progress of work)
- Determination of the layout of buildings and leveling
- Witnessing of the ground bearing capacity tests
- Checking of working drawings and their approval, inspection of placement of reinforcement, supervision of concrete placement
- Checking and approval of detailed finishing drawings, supervision of finishing work.
- Holding of regular meetings for preliminary discussion and arrangement, schedule control
- Conduct of inspection (including materials and equipment)
- Preparation of overall report

3) The Project Manager and engineers in charge shall back up the activities of the resident engineers from Japan.

They shall also visit the construction sites as necessary and try to secure high quality buildings through consultation on design and technical guidance. They shall also hold meetings for preliminary discussion and arrangement with the Government of Indonesia, JICA personnel in charge and contractors to establish a congenial relationship among them to ensure smooth progress of construction work.

4-3-4 Procurement Plan for Construction Materials

In formulating the procurement plan for construction materials, the basic policy is to adopt local construction methods and materials to the maximum extent possible. However, materials which cannot be procured locally or materials whose accuracy and functional performance do not satisfy the requirements or whose prices are higher than when procured in Japan shall be planned for procurement in Japan.

Materials whose import into Indonesia is embargoed shall be procured locally.

With respect to procurement of local construction materials, they shall be procured in the vicinity of the proposed construction site as much as possible. Finishing materials, however, will have to be truck hauled from the big cities.

Most of the materials procured in Japan will be landed at the Port of Jakarta and then transported overland to each construction site, but in order to reduce inland transportation costs, landing at Semarang Port and Surabaya Port shall also be considered.

4-3-5 Procurement Schedule for Equipment

(1) Local Procurement

In principle, Japanese items will be procured in Japan and imported into Indonesia. However, due to strict import restrictions in Indonesia, certain items, import of which is prohibited, will be procured locally. A tentative list of such items is outlined below; however, it is possible that some of these items may be found locally unprocurable after specifications have been drawn up in the Detail Design stage.

Local market price was adopted for locally procured equipment in calculation of project cost. All equipment procured under grant aid should be tax-free; however, it is impossible to estimate the amount of tax exemption which will be allowed for locally procured items. These figures are to be made clear upon application to the Government of Japan after determination of the procurement list. It is uncertain whether bidders will be able to complete the application in the short period between announcement of tender and bidding. The outcome will largely depend upon the efforts of the DFCP and accordingly, at this point, estimates must be based on present market prices.

1) Main Equipment for Local Procurement

- Vehicles (import of mobile laboratories from Japan after completion of specifications is a high possibility)
- Part of specimen equipment (equipment made of wood, pin sets, paper, balances, etc.)
- Communications equipment (Although import from Japan is also possible, equipment will be locally procured in consideration of maintenance. Solar batteries for the SSB wireless phone will be imported from Japan)
- Personal computer (an appropriate computer is manufactured in Japan and in view of maintenance, etc., will be locally procured)

2) Procurement Schedule

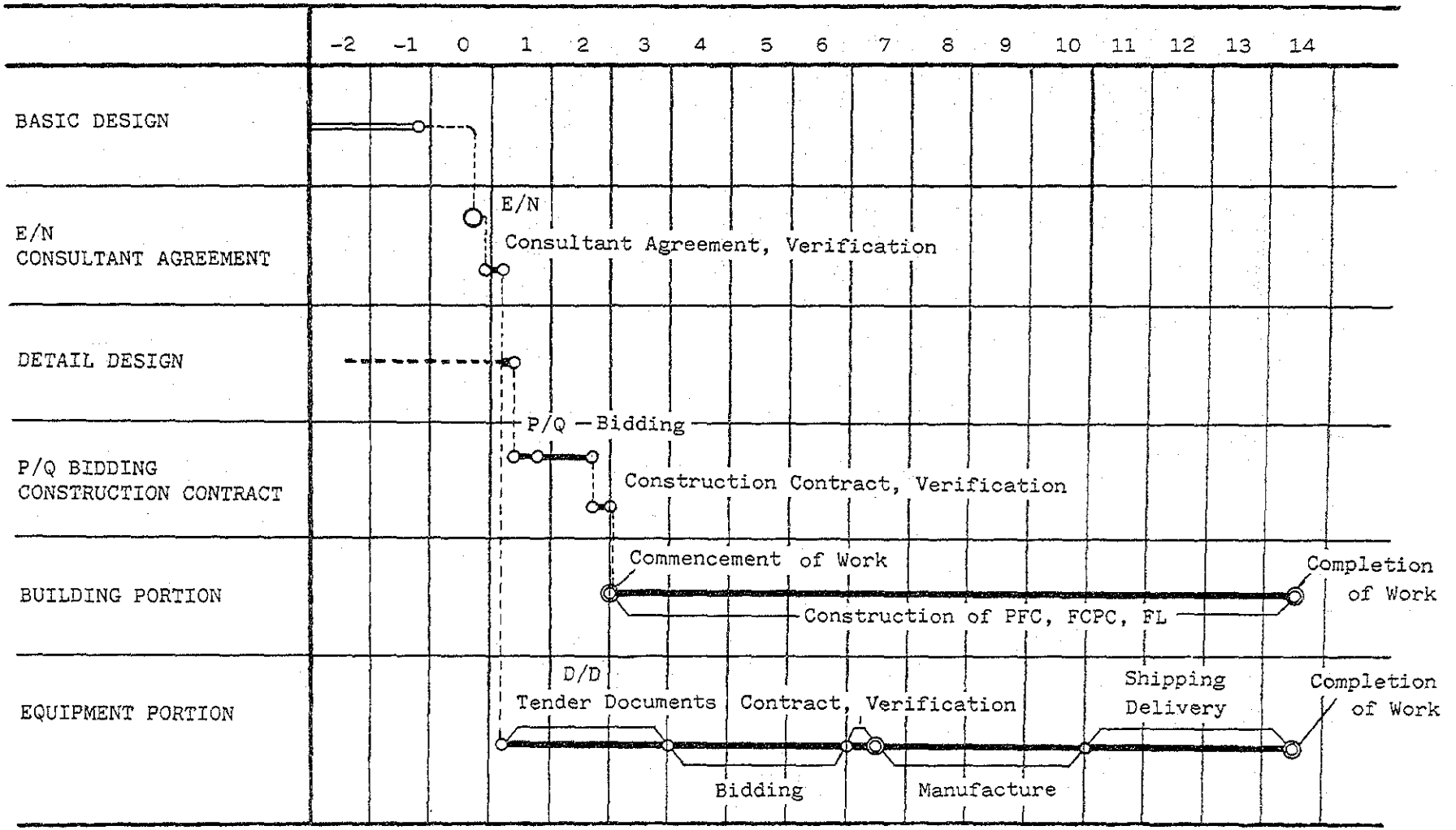
The procurement schedule is as presented in Fig. 4-1.

4-4 IMPLEMENTATION SCHEDULE

The period that will be required to complete the buildings and the period that will be required to procure and deliver the equipment in the event this project is to be implemented are shown in the following table.

The estimated construction period is about one year for Jatisari PFC, about eight months for each FCPC and about six months for each FL.

FIG. 4-1 Implementation Schedule



4-5 OPERATION AND MAINTENANCE

4-5-1 Equipment Operation and Maintenance Measures

Due to the variety of equipment proposed under the Project, the operation and maintenance system must also be varied. This system should be broadly divided into two categories: experimental equipment and vehicles.

(1) Experimental Equipment

Operation and maintenance are presently carried out for existing experimental equipment; however, the methods used are not systematic, and the majority of maintenance is left up to the individual user. With this approach, maintenance is often carelessly conducted and deterioration of equipment is widespread. Instead, a check list of each type of experimental equipment at each laboratory should be drawn up and all laboratory staff should check their equipment according to this list at a designated time (eg. twice a month on Friday morning). The list should then be submitted to a superior for approval. Moreover, 1 percent of the purchase price should be appropriated annually for maintenance costs of each type of equipment. Economic life of each type should be about 8 years and replacement cost should be depreciated in consideration of equipment life.

(2) Vehicles

1) Operation and Maintenance of PFC, FCPC and F/L Vehicles at Present

Vehicles are maintained by the individual drivers or users. As drivers are discharged when maintenance is poor, the condition of each vehicle is quite good. However, maintenance of experimental equipment is not systematic and therefore separate check lists should be made for regular daily (before and after use), weekly and monthly checks, inspections should be implemented and the data obtained should be filed for a designated period. When repairs are required, content and cost should also be recorded on the check list. Completed check lists should be submitted to a superior at the end of each week and filed.

Maintenance costs for each type of vehicle are estimated by the DFCP as follows:

Pickup trucks	:	Rp 1,500,000
Mobile laboratory	:	Rp 1,500,000
Motorcycles	:	Rp 325,000

Maintenance costs include fuel, oil, spare parts, repairs and other costs.

2) O/U Motorcycles

Motorcycles are presently maintained by the Pest Observers themselves, and their condition ranges from poor (eg. those in use for 7 years) to good. Maintenance is not systematic and there is a wide range in the mechanical ability of the users. Moreover, in order to fully carry out his duties, the Pest Observer must subject his motorcycle to heavy use, naturally resulting in mechanical deterioration and thus it is not possible to judge users of all poorly kept vehicles as being slack in their maintenance duties.

The DFCP is presently making a check list and manual on vehicle maintenance for the Pest Observers, strictly enforcing daily and weekly inspections in which Pest Observers take their vehicles with the check list to the F/L once a week, and developing a system in which the F/L official checks and approves equipment maintenance. When this official receives the check list, he conducts a weekly inspection of the vehicle by another inspection method and files the check list. As the number of F/L is much fewer than that of existing O/U, implementation of this system is difficult; however, with completion of all F/L requested under the Project, full implementation is considered possible.

At present, Pest Observers park their motorcycles at their own homes as it is considered safer than keeping them at the O/U overnight. The DFCP allotts Rp 325,000 annually for motorcycle maintenance. This however, is insufficient and the following methods should be considered in determination of maintenance costs.

- Weekly submission of a proposed travel schedule and provision of an adequate sum for maintenance by F/L upon approval of the proposed distance; and,

- Review of cases in which distance travelled exceeded the original proposal and reconsideration of the subsequent weekly maintenance allottment.

The above steps would not only eliminate obstacles to performance of observation duties but also reduce private use and differences in area observed.

Vehicle maintenance costs are estimated according to the number of vehicles; however, depreciation for replacement cost is not presently used in calculation. The DFCP plans to include replacement cost in their 1986 budget estimation. Useful life of motorcycles is designated as 5 years by DFCP, while that for other vehicles is considered to be as long as about 10 years.

4-5-2 Operation and Maintenance Plans

Approximate expenses necessary for administration and maintenance of facilities after their completion under this project are estimated to be as follows.

The amount was estimated on the condition that all PFCs, FCPCs and FLs to be established in the three Java Province and Bali Province including the office of the Directrate of Food Crop Protection located in Pasar Minggu shall be covered.

Manpower costs of pest observers as well as vehicle expenses incurred in the three Java Provinces and Bali Province were also included.

Total administration and maintenance expenses (per annum)

3,252,371,600 Rupiahs
(Approximately 580,000,000 Yen)

(1) Personnel Expenses

University graduate personnel	125,000 Rps./month x 12 months x 76 persons = 114,000,000 Rps.
Academy graduate personnel	100,000 Rps./month x 12 months x 225 persons = 270,000,000 Rps.
High school graduate personnel	75,000 Rps./month x 12 months x 920 persons = 828,000,000 Rps.
Primary & secondary school graduate personnel	50,000 Rps./month x 12 months x 366 persons = 219,600,000 Rps.
Total	1,431,600,000 Rps.

(2) Training Expenses

PFC Training Expenses	71,800,000 Rps.
FCPC & FL Training Expenses	43,400,000 Rps.
Total	115,200,000 Rps.

(3) Laboratory Equipment and Supplies Expenses

Maintenance expenses 2,238,000,000 x 1% =	22,380,000 Rps.
Depreciation charges 2,238,000,000 ÷ 8 years =	279,750,000 Rps.
Total	302,130,000 Rps.

(4) Vehicle Expenses

Maintenance expenses (incl. fuel, lube oil, spare parts and repairs)

Automobiles 1,500,000 Rps. x 37 automobiles =	55,500,000 Rps.
Motorcycles 325,000 Rps. x 661 motorcycles =	214,825,000 Rps.
Total	270,325,000 Rps.

Depreciation charges

Automobiles 394,000,000 ÷ 10 years =	39,400,000 Rps.
Motorcycles 378,000,000 ÷ 5 years =	75,600,000 Rps.
Total	115,000,000 Rps.

(5) Lighting and Heating Expenses of Facilities

1) Electric Rates

For electric capacity of 200 KVA or less, the electric rate schedule for offices shall be applied.

(a) Jatisari (PFC)

Electricity consumption

120 KVA x 0.6 x 8 hours/day x 25 days = 14,400 KWH

Basic charge

120 KVA x 3,680 Rps./KVA/month x 12 months = 5,299,000 Rps.

Metered charge

140,400 KWH/month x 97.7 Rps./KWH x 12 months
= 16,891,200 Rps.

Total 22,190,400 Rps.

(b) Bandung, Semarang, Surabaya and Denpasar (FCPCs)

Electricity consumption

40 KVA x 0.6 x 8 hours/day x 25 days = 4,800 KWH

Basic charge

40 KVA x 3,680 Rps./KVA/month x 12 months = 1,766,400 Rps.

Metered charge

4,800 KWH/month x 97.75 Rps./KWH x 12 months
= 5,630,400 Rps.

Sub-total, per FCPC 7,396,800 Rps.

Total for 4 FCPCs 29,587,200 Rps.

(c) Each FL (15 locations)

Electricity used

15 KVA x 0.6 x 8 hours/day x 25 days = 1,800 KWH

Basic charge

15 KVA x 3,680 Rps./KVA/month x 12 months = 2,111,400 Rps.

Sub-total, per FL 2,166,600 Rps.

Total for 15 FLs 32,499,000 Rps.

2) Gas Rates

Gas consumption

25 pcs 13 kg cylinders/month x 12 months = 300 cylinders

Gas charge

300 cylinders x 1,800 Rps./cylinder = 540,000 Rps.

Total	540,000 Rps.

(7) Others

Total	933,300,000 Rps.

(Travel Expenses, Electricity Consumption for DFCP and etc.)

CHAPTER 5. PROJECT EVALUATION

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The present Project is envisioned to have a significant impact on the results of the National Crop Protection Project-NCPP aimed at attainment of self-sufficient food supply and increased production of rice on which the Government of Indonesia places high priority. The objectives of the present Project are strengthening of the rice pest and disease forecasting and control system, and transfer of the most appropriate pest control system to the farmers thereby increasing rice production.

The DFCP, which is under the jurisdiction of the Directorate General of Food Crop Agriculture, is the implementing agency for the Project and as such, is in charge of the PFC, FCPC, F/L, etc. The Project proposes construction of the Jatisari PFC, one FCPC in each of the three provinces of Java, one in Bali, and several F/L, expansion of their functions and organization through provision of necessary materials and equipment, strengthening of their activities and improvement of technology.

With successful project implementation, significant effects are anticipated as outlined hereunder.

5-1 IMPROVEMENT OF FORECAST AND CONTROL TECHNOLOGY

Pest forecasting and control technology in the Project area will include: i) accurate observation and reports at the O/U level for forecasting purposes; ii) utilization of data from the said reports for highly accurate pest forecasts; and, iii) implementation of technical and administrative measures for prevention of a forecasted outbreak, including estimation of agrochemicals and equipment required for prevention, and distribution of the same. As these functions will be fulfilled through integrated and effective operation of the O/U, F/L and, FCPC network, provision of materials and facilities under the Project is envisioned to substantially contribute to improved technology.

Provision of facilities alone, however, is insufficient. Improvement of the technical function of the system and establishment of O/U observation methods and F/L, FCPC, and PFC forecasting technology, also require training, education, supervision, technology transfer through daily activities between the different levels of organization, and long-term training of FCPC, F/L and O/U technical staff at the PFC. Specifically, this Project comprises construction of 15 F/L in Bali and Java which will greatly stimulate O/U activities and emphasize forecast technology as a function of the FCPC. It is further anticipated that the Project will result in fulfillment of the technical responsibility of F/L with regards to rice pest control through submission of accurate and valuable reports.

Improvement in facilities and equipment of PFC under this Project will facilitate technological transfer under the Project type technical co-operation and provide the arena for technological interchange between local and foreign experts, which will lead to further technological improvement and enhance the role of FCPC, FL and others agencies of technical training.

5-2 DEVELOPMENT AND EXTENSION OF FORECASTING AND CONTROL TECHNOLOGY

Knowledge of pest forecasting and control technology among other agricultural research, education and extension agencies is limited. It is therefore necessary to inform such agencies, as well as the farmers themselves, of the importance of forecasting and control methods which, instead of relying solely on agrochemical application calendars introduced from abroad, employ appropriate control measures based on accurate forecasts including not only agrochemicals but use of varietal resistance cultivation practises and biological control agents. The Project will contribute significantly to the awareness of such agencies in the rural areas through establishment of facilities which will form the basis of forecasting and control technology development and become the focal point of the control network's technical function.

Technology transfer to agricultural research institutes will stimulate technological development while transfer to agricultural education institutes will make forecasting and control technology as well as technical

publications, etc. available to agricultural high schools, Agricultural Personnel Training Center and Extension Workers (PPL). Moreover, cooperation with and transfer of technology to each level of the aforementioned Agricultural Extension Offices, the agency directly responsible for pest control, will result in efficient extension of technology acquired through the Project.

The Project thus offers a place for transfer of technical knowledge through cooperation with other agencies in the fields of technological development and extension, thereby strengthening the agricultural support system for food production in Indonesia.

5-3 EFFECTS OF THE ECONOMY AND FARMERS' INCOME

Foreign currency expenditures on imports of rice, wheat, soybean, livestock products and other staple foods exceed US$1 billion/year. It is true that imports of rice have recently decreased to an annual average of 500,000t (US$ 150 million). However, 500,000t of milled rice is equivalent to about 770,000t of paddy. The imported amount therefore still represents 2.2 percent of total paddy production (35 million tons).

At present, yield loss due to pest or disease damage is estimated at 10 to 20 percent of total production. If 1 or 2 percent of this loss were reduced through establishment of an efficient forecasting system, the resultant increase in domestically produced rice would equal the amount of imported rice, and therefore rice imports would no longer be necessary.

Economic impact on farmers' income will be derived from a reduction in expenditure on chemical control and from direct increases in production. Calendar application pest control methods prescribe an excessive application of 4kg as a standard for BIMAS application regardless of cost. (Average national application is presently 1.2kg/ha). Through establishment and expansion of a pest forecasting system however, wasteful application and adverse effects of over application will be eliminated and expenditures on agrochemicals will be reduced as appropriate application

technology is transferred to the farmers and chemical application standards which reflect the individual characteristics and needs of each locality are established.

Moreover, integrated pest management methods which include seed varieties, cultivation practices and biological agents, versus agrochemicals alone, will be introduced. This will not only reduce use of expensive agrochemicals but also increase production.

5-4 SOCIAL AND OTHER EFFECTS

With establishment of F/L facilities in the rural area and of a crop protection network, crop protection activities of various agricultural support agencies such as extension offices, KUD and seed centers, will be promoted which will in turn stimulate such activities among the farmers. Moreover, farmers will be relieved from the uncertainties of crop damage by pests and disease and given freedom to concentrate on other aspects of their daily life.

The concept of using crop damage statistics obtained from the observation system will permeate to the individual farmer and more accurate estimates of yield loss rather than just damaged area will be made possible. This is particularly important in preparation for establishment of a crop insurance system. Establishment of farm statistics concerning crop damage, yield loss, etc. through the Project's integrated pest management measures will thus indirectly have a substantial effect on agricultural development and production. Expansion of the function and organization of the DFCP as described above will greatly contribute not only to increased rice production, but also to economic development in Indonesia.

Realization of the Project is urgent, and, in view of the many direct effects as well as its contribution to the relationship between Indonesia and Japan, the Project is accordingly considered appropriate for implementation under the Grant Aid Program.

CHAPTER 6. CONCLUSION AND RECOMMENDATIONS

CHAPTER 6. CONCLUSION AND RECOMMENDATIONS

The present Project aims to provide the equipment and construct the facilities required for formulation of an integrated pest management system appropriate to pests, diseases and conditions in the Project area. Through establishment of this system it also aims to improve and extend forecasting technology in order to effectively prevent at minimum cost serious damage caused by rice pests and diseases thereby achieving the priority-given self-sufficient food supply and increased rice production by the Government of Indonesia in the national plan.
The Project is considered highly appropriate for technical cooperation under Japan's Grant Aid Program. Urgent implementation is recommended.
In order to achieve the above objectives, administrative and technical support from the Government of Indonesia is essential.

6-1 STAFF TRAINING FOR EACH FACILITY

Although there are some education and training programs available through the BLPP, university diploma courses and the present Project, the quantity and quality are inadequate for training of staff to perform the functions required for each facility. University graduates are preferred as crop protection specialists; however, these are anticipated to be in short supply throughout the nation for some time to come. Accordingly, each responsible institution must utilize every opportunity both at home and abroad, to train personnel at every level in appropriate concepts and methods of crop protection and control.

6-2 ADMINISTRATIVE SUPPORT

Administrative support is essential for smooth project implementation including planning of forecast and control activities, securing and placement of personnel, budget allocation, etc. In particular, admini-