Table 4-3-8 Allowable Stress of Reinforcement Bars

(unit: kg/cm^2)

Type of Steel Bar	Long-term Stress	Short-term Stress	JIS Material
Round bar	1,600	2,400	SR24
Deformed bar	2,000	3,000	SD30
Deformed bar	2,200	3,500	SD35

Table 4-3-9 Allowable Stress of Steel

(unit: kg/cm^2)

Type of Steel	Long-term Stress	Short-term Stress	JIS Material
H-shaped	1,600	2,400	SS41
Steel plate	1,600	2,400	SS41

4.3.4 Utilities Plan

The utilities plan should be prepared by taking into account of the following items:

(1) Project utility systems should be capable of meeting the Indonesian social and living habits of those people living in the Project site areas. The systems should be appropriate for use under the natural conditions and infrastructure conditions at the Project sites.

(2) Utility systems should be standard Indonesian types. The systems should be easy to maintain.

(3) The standard Indonesian type utility systems used in the Project should be readily obtainable and simple to repair.

(4) The capacities and specifications of Project use utility equipments should be derived at after carefully considering the conditions under which they operate and their operating and maintenance costs.

(5) Project utility systems should be planned by taking into account of related Indonesian laws and regulations as well as referring to related Japanese laws and regulations.

2) Power Facility Plan

(1) Capacity of Power Facility

The approximate capacity of each Project site power facility is as shown in Table 4-3-10 through 4-3-13.

Table 4-3-10 Capacities of Power Facilities at the Lembang Horticulture Research Institute

Building Name	Building Area (m^2)	Power Use Purpose	Area x Requirement (VA/m^2) x Efficiency x Use Rate	Load Capacity (kw)
a. Laboratory Building	247.5	Lighting and outlets	247.5 x 20 x 0.8 x 0.6	2.3
		Air conditioning equipment	63 x 0.7	44.1
		Equipments	47.3 x 0.2	9.5
b. Screen House	97.5	Lighting and outlets	97.5 x 15 x 0.8 x 0.5	0.6
c. Soil Storage	16	Lighting and outlets	16 x 15 x 0.8 x 0.1	0.1

Table 4-3-11 Capacities of Power Facilities at the Foundation Seed Farm

Building Name	Building Area (m^2)	Power Use Purpose	Area x Requirement (VA/m^2) x Efficiency x Use Rate	Load Capacity (kw)
a. Office Building	248	Lighting and outlets	248 x 20 x 0.8 x 0.5	2.0
		Equipments	10.5 x 0.2	2.1
b. Farm Machinery House	90	Lighting and outlets	90 x 15 x 0.8 x 0.5	0.6
c. Grading and Storage House	70	Lighting and outlets	70 x 10 x 0.8 x 0.3	0.2
f. Lectures' House	456	Lighting and outlets	456 x 40 x 0.8 x 0.8	11.6
g. Experts and Guest House	176	Lighting and outlets	176 x 40 x 0.8 x 0.8	4.5
h. Training Facility	208	Lighting and outlets	208 x 20 x 0.8 x 0.6	2.0
i. Trainees' Lodging	472	Lighting and outlets	472 x 40 x 0.8 x 0.6	9.1
j. Screen House	3,042	Lighting and outlets	3,042 x 10 x 0.8 x 0.1	2.4

Table 4-3-12 Capacities of Power Facilities at the Stock Seed Farm

Building Name	Building Area (m^2)	Power Use Purpose	Area x Requirement (VA/m^2) x Efficiency x Use Rate	Load Capacity (kw)
a. Grading House	95	Lighting and outlets	95 x 20 x 0.8 x 0.5	0.8
b. Farm Machinery and Storage House	253	Lighting and outlets	253 x 15 x 0.8 x 0.5	1.5

Table 4-3-13 Capacities of Power Facilities at the Seed Control and Certification Service Center

Building Name	Building Area (m^2)	Power Use Purpose	Area x Requirement (VA/m^2) x Efficiency x Use Rate	Load Capacity (kw)
a. Laboratory Building	320	Lighting and outlets	320 x 20 x 0.8 x 0.6	3.1
b. Screen house	48	Lighting and	48 x 15 x 0.8 x 0.5	0.3

(2) Power Receiving Facility

1 Lembang Horticulture Research Center

Power for Project use should be taken from existing power lines at the Research Center.

2 Foundation Seed Farm

Power for Project use should be obtained from a town that is approximately 1km away from the Seed Farm.

3 Stock Seed Farm

Power for Project use should be taken from the existing power lines at the Seed Farm.

4 Seed Control and Certification Service Center

Power for Project use should be taken from the existing power lines at the Center.

(3) Power Generating Facility

1 Lembang Horticulture Research Center

For the continuous supply of power necessary for the culture room, clean room, inspection room, and inuring preparation room, a power generating facility must be installed for emergency use. This facility must take over automatically in the event of a power failure.

Power generating facility features:

Rated output	:	50KVA (continuous output)
Voltage	:	3 phase 380/220V, 50Hz
Engine	:	Diesel
Cooling System	:	Air cooled, indoor type
Fuel tank	:	kilo-liters (for approximately 24 hours of operation)

2 Seed Control and Certification Service Center

Since the isolation and equipment rooms require a continuous supply of power, an emergency power supply generator should be installed. The generator must automatically take over if there is a power failure.

Feature of the generator unit:

Rated output	:	8KVA (continuous output)
Voltage	:	3 phase 380/220V, 50Hz
Engine	:	Diesel
Cooling System	:	Air cooled, indoor type
Fuel tank	:	kilo-liters (for approximately 24 hours of operation)

3 Foundation Seed Farm and Stock Seed Farm

There is no specific necessity for installing a power generating facility.

(4) Lighting and Outlet Facilities

- Voltage : Single phase, 2 wires, 220V
- Intensity of illumination : Based on Indonesian standards
- Lighting fixtures : Direct connection type
- Light source : Two sources. If needed, add extra sources or take from an outlet that is grounded.

Average illumination intensity for major rooms of Project buildings is shown in Table 4-3-14.

Table 4-3-14 Average Illumination Intensity for Major Rooms of Project Buildings

Name of Building	Name of Room	Average Illumination Intensity (Lux)	Lighting Fixture Type
Laboratory Building	Staff Room, Inspection Room, Laboratory	300	Fluorescent lamp
	Clean Room	200	Fluorescent lamp
	Incubator Room	100	Fluorescent lamp
	Culture Room	100	Fluorescent lamp
	Toilet & Hallway	100	Fluorescent lamp
Office Building	Office, Director's Room, Laboratory Meeting Room	300	Fluorescent lamp
Training	Training Room	300	Fluorescent lamp
	Instructor's Office	200	Fluorescent lamp
	Trainees' Rest Room	100	Fluorescent lamp
Lodging House	Lodging Room	100	Fluorescent lamp
	Dining Room	150	Fluorescent lamp
	Kitchen	200	Fluorescent lamp
Laboratory Building	Staff Room and Inspection Room	300	Fluorescent lamp
	Director's Room and meeting Room	300	Fluorescent lamp
	Instrument Room and Storage Room	200	Fluorescent lamp
	Culture Room	100	Fluorescent lamp
	Balance Room	300	Fluorescent lamp
Other Buildings	Work Space	200	Fluorescent lamp
	Storage	70	Fluorescent lamp

(5) Power System for Equipment

A 380 volt, 3 phase power supply is required for equipment use. In order to prevent the generator from overheating when overloaded, a circuit breaker should be installed

(6) Communications Facility

For communications between Project related agencies, a radio (transmitting/receiving) system should be installed.

3) Air Conditioning and Ventilation System Plan

Project buildings will have high ceiling. Louvers are to be installed to allow natural ventilation.

(1) Air conditioning should be installed in the clean room, cultural room, and inuring preparation room at the Lembang Horticulture Research Institute.

(2) Ventilation System

1 Lembang Horticulture Research Institute

A forced ventilation system should be installed in the toilet and incubator room.

2 Foundation Seed and Stock Seed Farms

A forced ventilation system should be installed in smoking areas, in rooms where fires are used, and in rooms where undesireable odors are produced.

Air intake and exhaust openings should be installed in storage houses.

3 Seed Control and Certification Center

A forced ventilation system should be installed in the workshop and inspection room where no windows are provided.

4) Water Supply, Drainage, and Sanitation System Plan

(1) Water Supply System

1 Lembang Horticulture Research Institute

Water for Project use will be taken from existing water supply pipe having ground water sources.

2 Foundation Seed Farm

Water for farm use will be taken from the 150mm diameter water main that is buried beneath the public road.

3 Stock Seed Farm

An existing well will be used for the Project water source. An elevated tank will be installed and the well water will be pumped into the tank for supply purposes.

4 Seed Control and Certification Service Center

An existing well will be used for the Project water source. An elevated tank will be installed and the well water will be pumped into the tank for supply purposes.

(2) Drainage Facility

Ordinary drain water and sewage from Project buildings will be separated.

The ordinary drain water will be combined with the existing storm drainage system. Sewage will be placed in a treatment tank; the treated water will be disposed of by an infiltration tank.

(3) Sanitation Fixtures

As a general rule, sanitation fixtures for use in Project buildings should be procured locally. Domestic style flush toilets should be used.

(4) Septic Tanks

Septic tanks should be the standard Indonesian decomposing types not having pumps. Treated sewage water is to be disposed of by an infiltration tank.

(5) Irrigation System in Screen House

A mist type irrigation system should be installed in the screen house.

4.3.5 Material Plan

1) Exterior Finish

(1) Roof

Corrugated acrylic sheets should be used for screen house roofs. The roofs of other buildings should be made with domestic roof tiles (Spanish roofing tiles).

(2) Exterior Walls

The exterior walls of reinforced concrete Project buildings should be tile finish on mortar base. Some parts of the walls may require a paint finish.

Stainless steel nets (mesh #40) should be used for screen house walls.

(3) Floors

All room floors of the Project buildings should be mortar finish on a concrete base. In general, floors and beams of other Project facilities should be mortar finish on concrete.

(4) Ceilings

Project building ceilings should be paint finish on gypsum boards.

(5) Openings

Most of the openings in the Project buildings should be provided with aluminium sash having see-through or mosaic glass. Other openings should be operable aluminum bar-type windows. No windows will be installed in the openings of the farm machinery house.

2) Interior Finish

(1) Floors

In general, the floors of the Project buildings should be tile finish. In some cases, however, the floors will have a partial mortar finish.

Carts will be used to carry samples and chemicals in the screen houses at the Lembang Horticulture Research Institute, in the Foundation Seed Farm's laboratory, and in the Seed Control and Certification Service Center's inspection and certification building. The floors in these buildings should be smooth.

If resinous material is used, it should be strong and adhere to concrete. In the laboratories chemicals will be handled; lab floors should be acid and alkali resistant.

(2) Walls

As a rule, room walls should be paint finish on mortar base on concrete blocks. Walls made of wood or gypsum board should be painted.

The walls of the storage houses should be paint finish on mortar base or decorative concrete block finish.

(3) Ceilings

In general, Project building ceilings should be paint finish on plywood base. Soil storage houses and pump rooms will have no ceilings. cloth shades that can be opened should be installed in the screen houses.

A summary of the major finishing work to Project buildings is as follows:

- Exterior Finish:

Roofs	:	1	Spanish roof tile
		2	Plastic sheet
		3	Corrugated slate (paint finish)
Walls	:	4	Tile
		5	Paint
		6	Mortar

- Interior Finish:

Floors	:	7	Tile
		8	Terazzo
		9	Mortar
Walls	:	10	Paint
		11	Mortar
		12	Plywood
		13	Wood
		14	Tile
		15	Lysin spray finish
Ceilings	:	16	Paint
		17	Plywood (OS)

4.3.6 Yard Plan

1) Approach Plan

(1) Lembang Horticulture Research Institute

The entrance to the laboratory building should be installed so that access to the Institute's existing road and existing central laboratory will be possible. If the elevation between two points is relatively steep, mild steps should be installed.

The access road to the laboratory building should be made of reinforced concrete with a mortar joint-cutting finish.

A parking lot should be built along the screen houses; a new 6.0m wide independent access road should be built to the parking lot from the existing road.

(2) Foundation Seed Farm

The approach to the Farm should be made from the existing T-section road which is in the northeast of the Farm and ground elevation difference is minor. The approach road should be 6.0m wide. A gate should be built at a point where the road reaches the top of the slope. A driving circle should be built at the center of the Farm. Three flag poles will be installed on this circle. A parking lot for vehicles belonging to Farm staff members, visitors and trainees will be built on the right side of the approach road immediately inside the gate. A walkway will be installed along the Farm's western boundary.

(3) Stock Seed Farm

The Stock Seed Farm site faces a trunk road. Facility buildings exist on the site which is virtually a square piece of land.

The Farm's existing approach road will be used for the Project facility. The paved area in front of the existing Farm building will be repaired and used as the Project parking lot.

(4) Seed Control and Certification Service Center

The Project site is located on the east side of the end of the Center's road. The site is approximately 15cm lower than the surrounding area. The approach to the site should be along the existing Center building. The ground elevation difference will be adjusted by filling.

2) Outdoor Lamp Plan

The minimum number of outdoor lamps necessary for maintaining the security of the Project facilities will be installed.

3) Fencing Plan

The Foundation Seed Farm and Stock Seed Farm should be encircled by fences to prevent unauthorized entry. The Indonesian Government should bear the cost for the fence installation.

4) Others

About a 10m high blight preventing hedge should be planted in the Stock Seed Farm along the trunk road. An access road should be built along the hedge. Costs for the hedge and access road should be borne by the Indonesian Government.

4.3.7 Screen House

1) Standards

Except for the items to be purchased on the domestic market, all the equipments and materials to be used for the Screen House should meet the following standards:

- Equipments and materials : Japan Industrial Standards (JIS)
  The Standard of the Japan Electrical Manufacturers' Association (JEM)
- Plant Houses : Japan Horticulture Facility Association
  Horticulture Facility Safety standards (tentative)

2) Arrangement Plan

(1) Lembang Horticulture Research Institute

A screen house should be built along the laboratory building. The screen house will be used for the multiplication of breeder seed (G0). The house will be divided into two rooms. One room will be equipped with 8 planting beds and the other room will be equipped with 14 planting beds. The beds will be 0.9m x 1.8m x 0.2m high. Features of the screen house are as follows:

Structure type	:	Steel roof frame with MMA corrugated plastic sheets; walls with stainless steel nets
Partitions	:	Stainless steel nets with doors
Room size	:	6.5m wide x 15m long with 3m x 3m doorway
Floor space	:	$97.5m^2 + 9m^2$; total $106.5m^2$

(2) Foundation Seed Farm

Screen houses will be built in the present Seed Farm Complex in Pengalengan for the purpose of multiplying Gl seed potatoes.

By taking into account of the number of planting beds and the nature of seed culturing work in the houses, the size and number of screen houses were decided as follows (refer the attached arrangement drawings):

Structure type and number of houses:

Steel roof frame with MMA corrugated plastic sheets; walls with stainless steel nets; 12 houses

Number of planting beds (0.9m x 1.8m x 0.2m size, each):

84/hours

House size : 6.5m wide x 39m long/each

Floor space : 253.5m^2/house: Total 3,042m^2

(3) Seed Control and Certification Service Center

A screen house will be built at the present Seed Control and Certification Center in Bandung to culture seed potatoes and for the seed inspection and certification purpose.

Features of the screen house area as follows:

Structure type	:	Steel roof frame with MMA corrugated plastic sheets; walls with stainless steel nets; one building
Windows	:	Glassed aluminum sash sliding windows
House size	:	5.4m wide x 9m long; floor space 48.6m^2.

A summary of screen house features is listed below:

OUTLINE OF SCREEN HOUSE			
SCREEN HOUSE : LEHRI			
Overall	Width and length	:	6.5^{m} x 15.0^{m} and 3.0 x 3.0
	Area	:	106.5$^{m^2}$
	Eaves height	:	GL + 3.1^{m}
	Roof type (slope)	:	Single type(5/10) with monitor roof for ventilation
Structure and Foundation	Main structure	:	Steel structure
	Foundation	:	Reinforced concrete
	Floor	:	Concrete paving
Roof and Wall	Roof	:	Corrugated MMA sheet t=1.1
	Wall	:	Corrugated MMA sheet t=1.1 and/or SUS wire screen
	Lower wall	:	Reinforced concrete
Doors and Windows	Doors	:	Aluminium sliding door (Hanger type)
	Partition	:	SUS wire screen with door
Facilities and Equipments	Water	:	Hydrant
	Electric	:	Service receptacle outlet
	Curtain	:	Shading curtain
	Irrigation	:	Overhead type water spray
	Others	:	Culture bed (Out of scope)

OUTLINE OF SCREEN HOUSE			
SCREEN HOUSE : BPSB			
Overall	Width and length	:	5.4^{m} x 9.0^{m}
	Area	:	48.6^{m^2}
	Eaves height	:	GL + 3.1^{m}
	Roof type (slope)	:	Single type(5/10) with monitor roof for ventilation
Structure and Foundation	Main structure	:	Steel structure
	Foundation	:	Reinforced concrete
	Floor	:	Concrete paving
Roof and Wall	Roof	:	Corrugated MMA sheet t=1.1
	Wall	:	Corrugated MMA sheet t=1.1 and /or SUS wire screen
	Lower wall	:	Reinforced concrete
Doors and Windows	Doors	:	Aluminium sliding door (Hanger type)
	Windows	:	Aluminium sliding windows
Facilities and Equipments	Water	:	Hydrant
	Electric	:	Lighting and service receptacle outlet

OUTLINE OF SCREEN HOUSE			
SCREEN HOUSE : BBI UNIT			
Overall	Width and length	:	6.5^{m} x 39.0^{m} (No. of Houses12)
	Area	:	253.5^{m^2}
	Eaves height	:	GL + 3.1^{m}
	Roof type (slope)	:	Single type(5/10) with monitor roof for ventilation
Structure and Foundation	Main structure	:	Steel structure
	Foundation	:	Reinforced concrete
	Floor	:	Concrete paving
Roof and Wall	Roof	:	Corrugated MMA sheet t=1.1
	Wall	:	Corrugated MMA sheet t=1.1 and/or SUS wire screen
	Lower wall	:	Reinforced concrete
Doors and Windows	Doors	:	Aluminium sliding door (Hanger type)
Facilities and Equipments	Water	:	Hydrant
	Electric	:	Service receptacle outlet
	Curtain	:	Shading curtain
	Irrigation	:	Overhead type water spray
	Others	:	Culture bed (Out of scope)

4.3.8 Irrigation Facility Plan

1) Irrigation Plan

Pengalengan is blessed with an abundance of rainfall. The average annual rainfall there is 2,500mm. No irrigation is applied to potato farming. The dry season is during the June, July and August period. Since the growing of potatoes is not practiced during dry seasons, there is no need for irrigating the potato fields. However, as the Project's Foundation Seed and Stock Seed farms will play very important roles in the production of seed potatoes, an irrigation system should be provided.

A severe drought was recorded during a 60-day period in July - August 1987. To provide a stable supply of foundation and stock seed potatoes, it is essential for the farms to have an irrigation system.

The irrigation system was designed based on the following basic policies:

a. Potato growing fields should be provided with a furrow irrigation system. Screen houses should be provided with a mist irrigation system.

b. Irrigation water should be taken from nearby streams. The irrigation system should be a semi-closed type having a pump and discharge tank.

c. According to similar existing agricultural development projects, the peak gross water consumption rate for the Project should, in general, 5mm/day. Peak system capacity at the Foundation Seed Farm should be 2.08 liters/sec; the Stock Seed Farm should have a peak capacity of 10.4 liters/sec.

2) Irrigation Facility Plan

The building plan summary is listed in Table 4-3- . Following is a list of Basic Design Drawings:

4.3.9 Basic Design Drawings1

1) Lembang Horticulture Research Institute (LEHRI)

1 Layout of LEHRI

2 Laboratory and Screen House, for LEHRI, Plan, S=1:200

3 Laboratory and Screen House, Elevation and Section, S=1:200

4 Electrical Power and Water Supply and Drainage Diagram, S=1:500

2) Foundation Seed Farm (BBI Unit)

5 Layout of BBI Unit, S=1:1,000

6 Administration Building, Plan, S=1:200

7 Administration Building
Elevation S=1:200, Section S=1:200

8 Grading & Storage Bldg. and Others
Plan, Section S=1:200, Elevation S=1:200

9 Soil Yard, Gate House and Others
Elevation S=1:200, Plan, Section S=1:200

10 Lectures' House (A), Plan, Section S=1:200, Elevation S=1:200

11 Lectures' House (B), Plan, Section S=1:200, Elevation S=200

12 Dormitory for Experts and Guests
Plan, Section S=1:200, Elevation S=1:200

13 Training Bldg. Plan, Section S=1:200, Elevation S=1:200

14 Dormitory for Trainees', Plan, S=1:200

15 Dormitory, Elevation S=1:200, Section S=1:200

16 Screen House, Plan, Section S=1:200, Elevation S=1:200

17 Irrigation Facilities for BBI Unit, S=1:1,000

18 Electrical Power Diagram, S=1:1,000

19 Water Supply and Drainage Diagram

3) Stock Seed Farm

20 Layout of Stock Seed Farm, S=1:500

21 Grading Bldg, Plan, Section S=1:200, Elevation S=1:200

22 Machinary Bldg. Plan, Section S=1:200, Elevation S=1:200

23 Storage House, Plan, Section S=1:200, Elevation S=1:200

24 Manure Shed, Plan, Section S=1:200, Elevation S=1:200

25 Irrigation Facilities for Stock Seed Farm, S=1:5,000

26 Electrical Power Diagram, S=1:500

27 Water Supply and Drainage Systems Diagram, S=1:500

4) Seed Control and Certification Service Center

28 Layout of BPSB, S=1:500

29 Laboratory and Screen House for BPSB,
Plan, Section S=1:200, Elevation S=1:200

30 Electrical Power Diagram, S=1:500

31 Water Supply and Drainage Diagram, S=1:500

Table 4-3-15 Summary of Building Area

BUILDING NAME	ROOM NAME	CEILING HEIGHT m	ROOM AREA m²	SUMMARY
LEHRI				
LABORATORY BLDG.				CULTURAL FACILITY
	STAFF ROOM	2.8	34.0	
	INSPECTION ROOM	2.8	14.6	
	OBSERVATION ROOM	3.3	81.0	
	CLEAN ROOM	-	19.4	PREFABRICATED PANELS
	INURING PREPARATION ROOM	-	17.0	PREFABRICATED PANELS
	CULTURAL ROOM	-	17.0	PREFABRICATED PANELS
	INCUBATOR ROOM	3.0	7.2	
	OTHERS		57.3	GENERATOR, WC, AISLE etc.
		SUB-TOTAL	247.5	
SCREEN HOUSE				
	A		39.0	SCREEN HOUSE FOR GO
	B		58.5	
		SUB-TOTAL	97.5	
SOIL PLACE AND				SOIL PLACE FOR
TOOL STORE				SCREEN HOUSE
	SOIL PLACE	-	6.0	
	TOOL STORE	-	5.0	
	BOILER PLACE	-	5.0	
		SUB-TOTAL	16.0	
BBI UNIT				OFFICE AND LABORATORY
ADMINISTRATION BLDG.				
	OFFICE ROOM	3.0	64.0	
	INSTRUCTOR ROOM	2.8	22.0	
	DIRECTOR ROOM	2.8	19.0	
	MEETING AND			
	SECRETARIATE ROOM	3.5	27.5	
	LABORATORY ROOM	3.0	40.0	
	OTHERS		75.5	AISLE, WC etc.
		SUB-TOTAL	248.0	

Table 4-2-15 (Cont'd)

BUILDING NAME	ROOM NAME	CEILING HEIGHT m	ROOM AREA m²	SUMMARY
FARM MACHINERY BLDG.				
	FARM MACHINERY ROOM	-	60.0	
	WORK SHOP	-	30.0	INCLUDING SPARE PARTS STORAGE
		SUB-TOTAL	90.0	
SEED STORAGE				GRADING AND STORAGE FOR G1 AND G2
	GRADING ROOM FOR G1	3.0	9.2	
	STORAGE ROOM FOR G1	3.0	10.8	
	GRADING ROOM FOR G2	3.0	11.5	
	STORAGE ROOM FOR G2	3.0	38.5	
		SUB-TOTAL	70.0	
FARM INPUT STORAGE				FARM INPUT FOR SCREEN HOUSE AND FARM
	FERTILIZER STORAGE	-	25.0	
	AGRICULTURAL CHEMICALS STORAGE	-	15.0	
		SUB-TOTAL	40.0	
DORMITORY FOR INSTRUCTORS				3 L D K x 1 FAMILIES
	LIVING AND DINING ROOM	2.8	37.3	
	KITCHEN ROOM	2.4	9.7	
	BED ROOM(3 ROOMS)	2.5	45.3	
	OTHERS		53.5	
				2 L D K x 4 FAMILIES
	LIVING & DINING ROOM	2.8	90.4	(22.6 x 4)
	KITCHEN ROOM	2.4	29.2	(7.3 x 4)
	BED ROOM (2 ROOMS)	2.5	103.6	(25.9 x 4)
	OTHERS		87.8	(21.96 x 4)
		SUB-TOTAL	456.8	
EXPERT AND GUEST HOUSE				FOR 4 PEOPLES
	LIVING ROOM	2.8	64	(16.0 x 4)
	BED ROOM	2.5	64	(16.0 x 4)
	KITCHEN ROOM	2.4	10	(2.5 x 4)
	OTHERS		38	(9.5 x 4)
		SUB-TOTAL	176.0	(44.0 x 4)

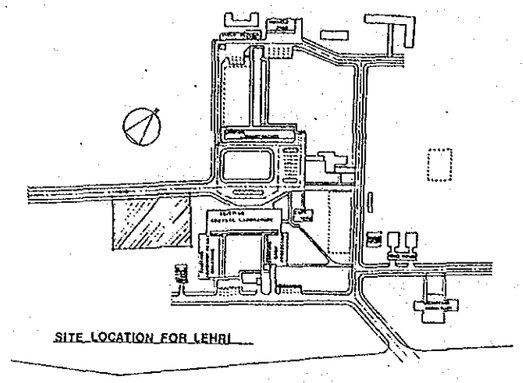
Table 4-3-15 (Cont'd)

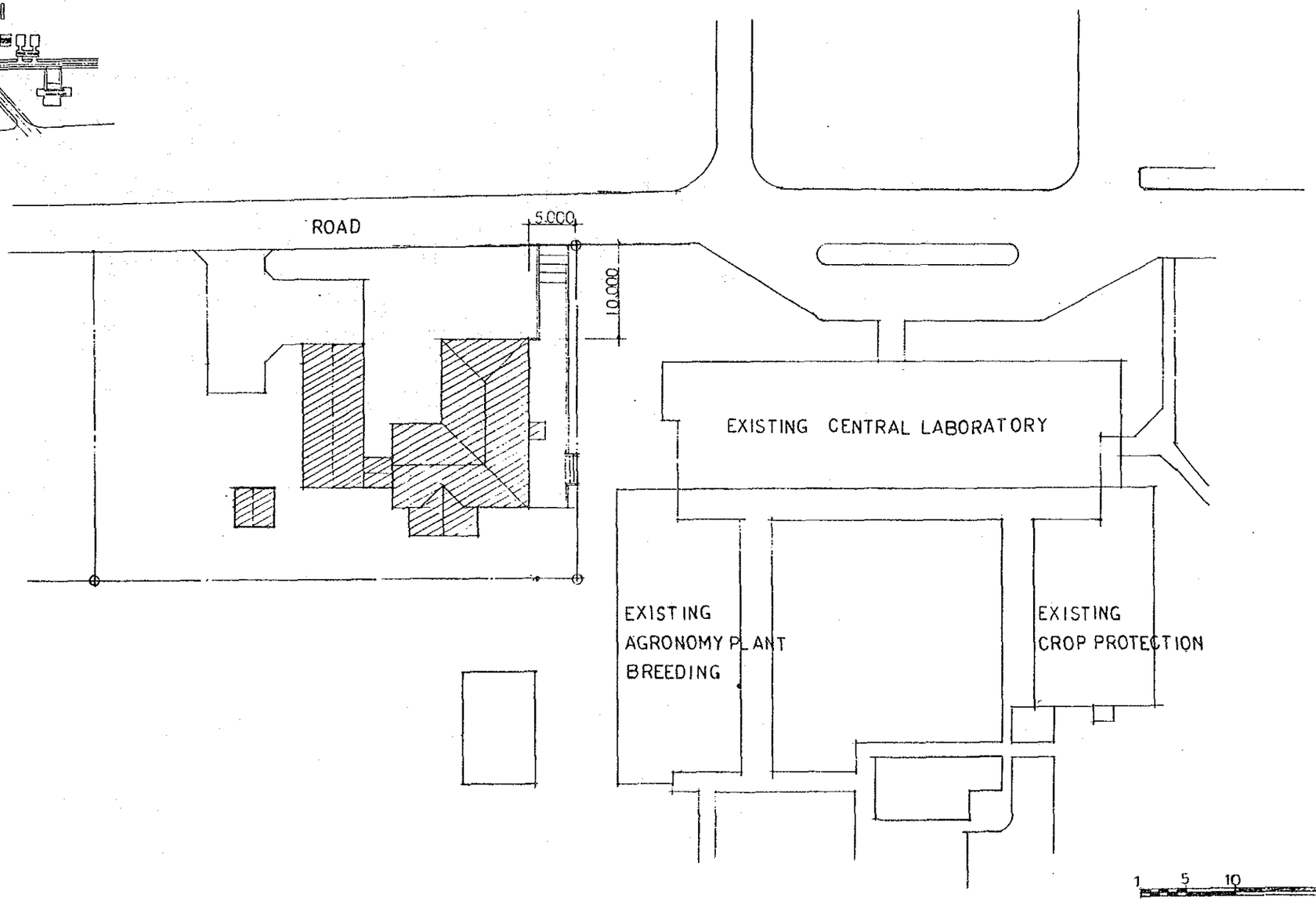
BUILDING NAME	ROOM NAME	CEILING HEIGHT m	ROOM AREA m²	SUMMARY
TRAINING BLDG.				TRAINING BLDG. FOR 20 TRAINEES
	TRAINING ROOM	4.0	64.0	
	ADMINISTRATION ROOM	2.5	10.5	
	UTILITY	2.8	17.5	
	INSTRUCTOR ROOM	2.8	26.0	
	RESTING ROOM	3.0	32.0	
	OTHERS		58.0	HALL, WC, AISLE, etc.
		SUB-TOTAL	208.0	
DORMITORY				DORMITORY FOR 20 TRAINEES AND FARM STAFF
	BED ROOM	2.4	200.0	(200 x 10)
	DINING ROOM	2.8	60.0	
	KITCHEN ROOM	2.6	33.0	
	OTHERS		179.0	HALL, WC, AISLE, etc.
		SUB-TOTAL	472.0	
SOIL PLACE				
	TOOL STORE	-	18.0	
	SOIL PLACE	-	72.0	
		SUB-TOTAL	90.0	
COMPOST AND MANURE SHED				WITH ROOF
	COMPOST AND MANURE SHED	-	32.5	
		SUB-TOTAL	32.5	
SCREEN HOUSE				
	SCREEN HOUSE	-	3042.0	(253.5 x 12)
		SUB-TOTAL	3042.0	
STOCK SEED FARM GRADING HOUSE				GRADING FOR G3 AND OFFICE
	GRADING ROOM	3.0	35.6	
	OFFICE	2.5	29.2	
	CHIEF AND INSTRUCTOR ROOM	2.5	16.2	
	OTHERS		14.0	AISLE, WASHING SPACE, WC etc.
		SUB-TOTAL	95.0	
FARM MACHINERY BLDG.				
	WORK SHOP	-	40.0	
	FARM MACHNEY BLDG.	-	48.0	
		SUB-TOTAL	88.0	
SEED STORAGE				
	SEED STORAGE	3.0	152.7	
		SUB-TOTAL	152.7	
COMPOST AND MANURE SHED				WITH ROOF
	COMPOST AND MANURE SHED		50.0	
		SUB-TOTAL	50.0	

Table 4-3-15 (Cont'd)

BUILDING NAME	ROOM NAME	CEILING HEIGHT m	ROOM AREA m²	SUMMARY
BPSB LABORATORY				INSPECTION AND CERTIFICATION OF POTATO
	OFFICE ROOM		45.0	
	CHIEF AND INSTRUCTOR ROOM		25.0	
	MEETING ROOM		25.0	
	BALANCE ROOM		15.0	
	INCUBATOR ROOM		15.7	
	OBSERVATION ROOM		64.0	
	INSTRUMENT ROOM		20.0	
	STORE ROOM		10.0	
	ISOLATION ROOM		17.5	
	GENERATOR ROOM		15.0	
	SOIL PLACE		10.0	
	OTHERS		57.8	HALL, AISLE, WC etc.
		SUB-TOTAL	320.0	
SCREEN HOUSE				
	SCREEN HOUSE		48.6	
		SUB-TOTAL	48.6	

BUILDING AREA TOTAL 6040.6 m² (SCREEN HOUSE 3188.1 m²)

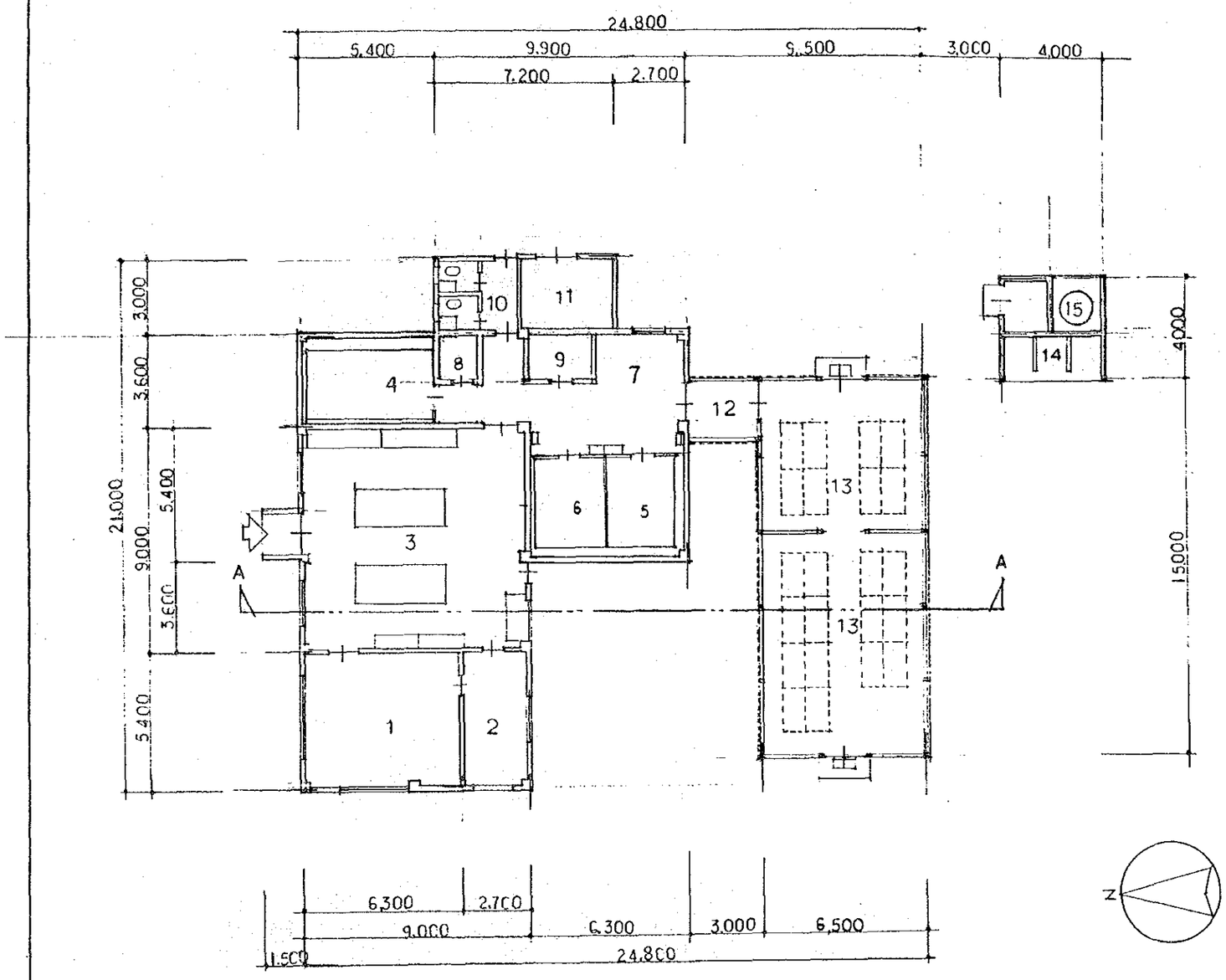




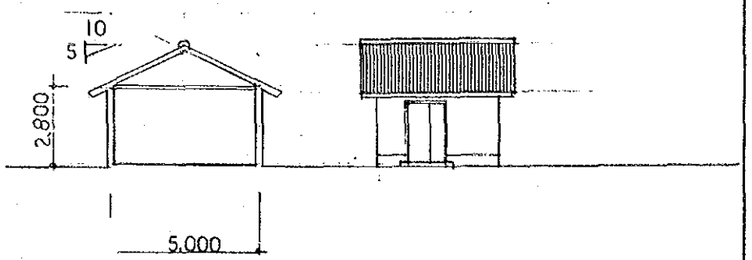
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

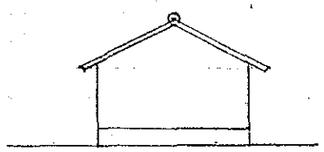
LAYOUT OF LEHRI

1



PLAN S=1:200





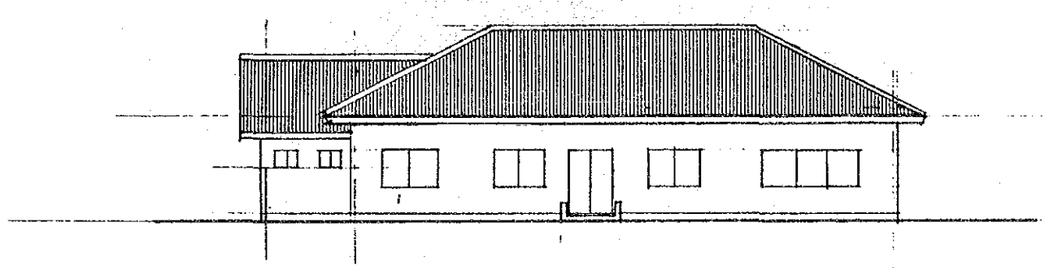
1	STAFF RM.
2	INSPECTION RM.
3	OBSERVATION RM.
4	CLEAN RM.
5	INURING PREPARATION RM.
6	CULTURAL RM.
7	INCUBATOR RM.
8	MACHINERY RM.
9	STORE RM.
10	W.C.
11	GENERATOR RM.
12	PASSAGE
13	INURING SCREEN HOUSE
14	SOIL STO.
15	BOILER RM.

1 5 10M

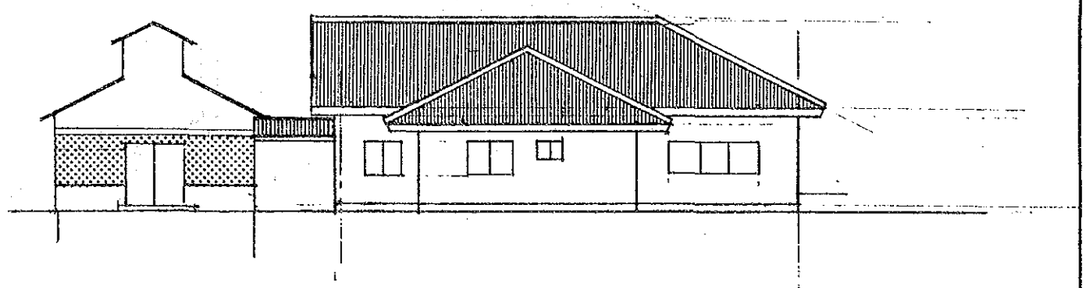
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

LABORATORY AND SCREEN HOUSE FOR LEHRI
PLAN S=1:200

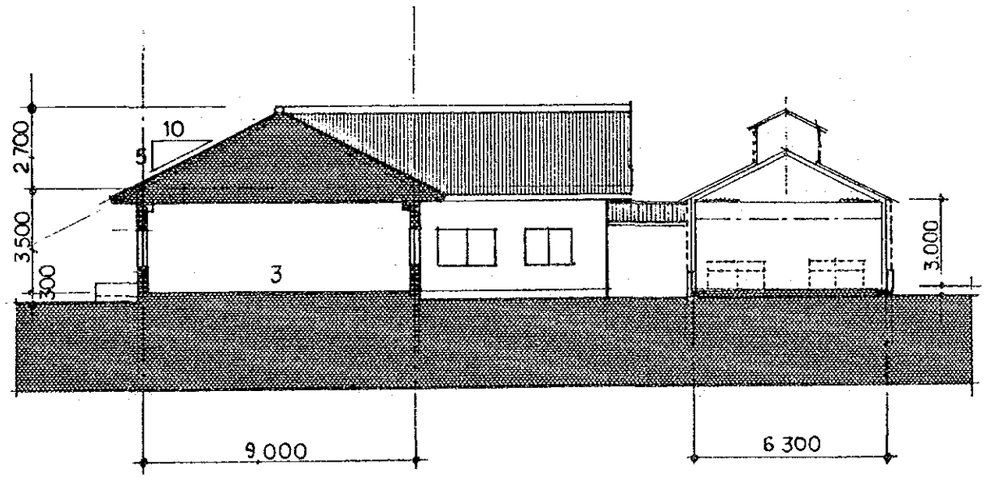
2



ELEVATION



ELEVATION

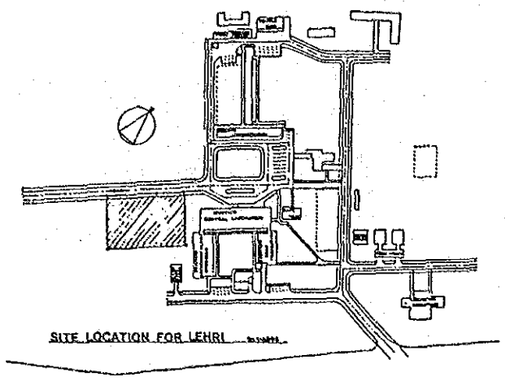


SECTION A—A

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

LABORATORY AND SCREEN HOUSE
ELEVATION S=1:200 SECTION S=1:200

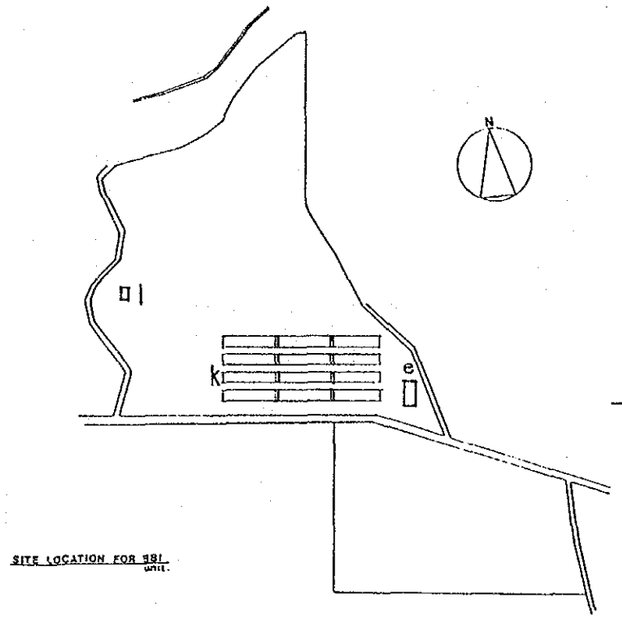
3



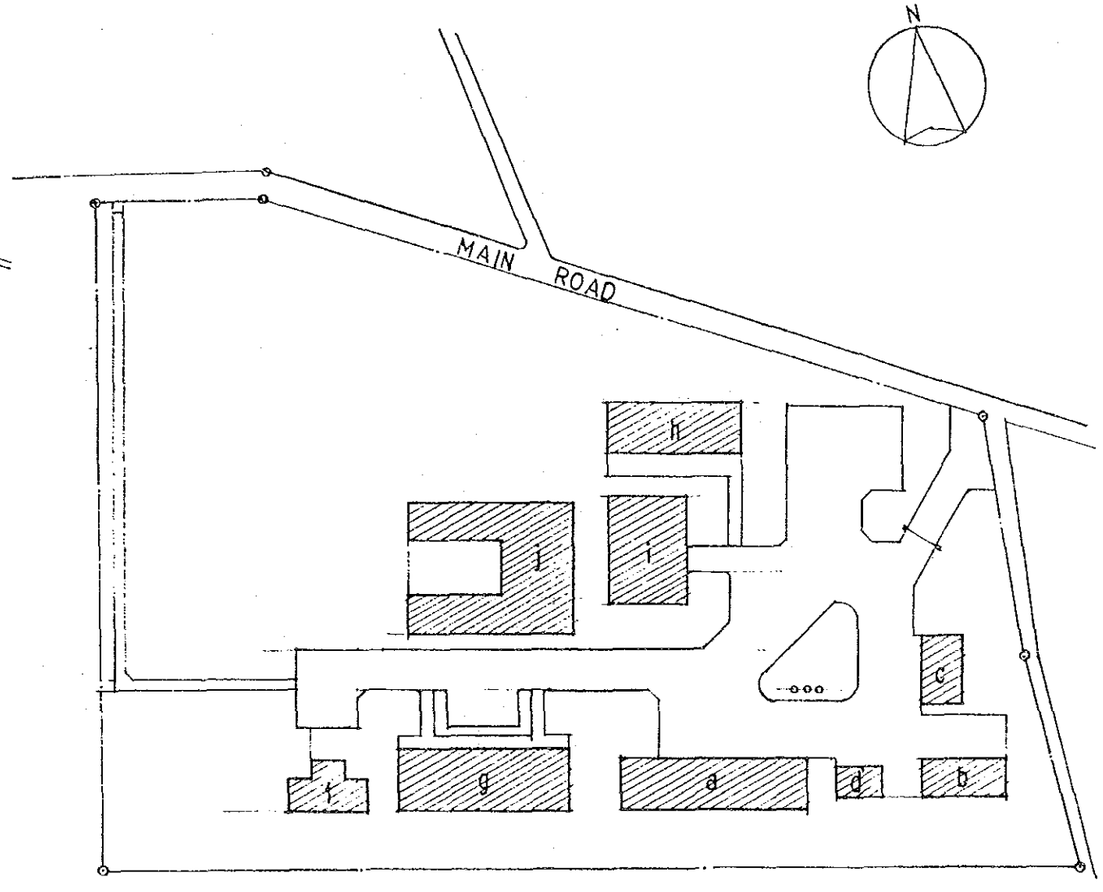
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

ELECTRICAL POWER AND WATER SUPPLY AND DRAINAGE DIAGRAM S=1:500

4



SITE LOCATION FOR BBI unit.



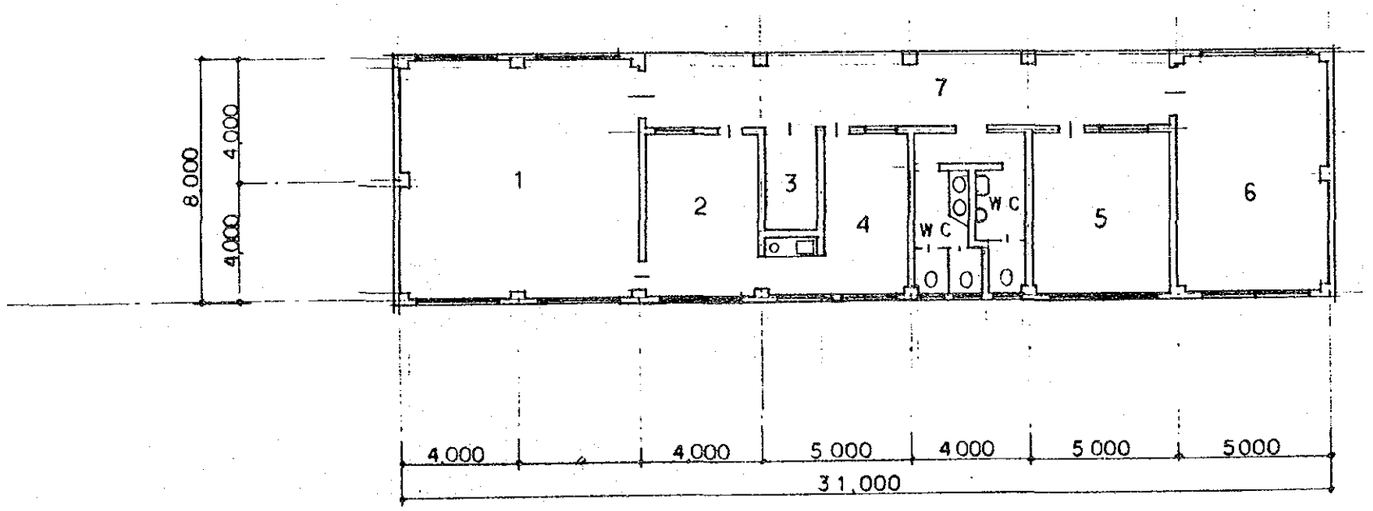
a. ADMINISTRATION BLDG.
b. FARM MACHINERY BLDG.
C. GRADING & STORAGE BLDG.
d. FARM INPUT HOUSE
e. SOIL YARD
f. DIRECTOR HOUSE
g. STAFF HOUSE
h. DORMITORY FOR INSTRUCTOR
i. TRAINING BLDG.
j. DORMITORY
k. SCREEN HOUSE
l. MANURE SHED

1 10 20 50M

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

LAYOUT OF BBI unit S=1:1000

5



1 OFFICE R.M.
2 INSTRUCTOR R.M.
3 STORE R.M.
4 DIRECTOR R.M.
5 MEETING & SECRETARIAT R.M.
6 LABORATRY
7 CORRIDOR

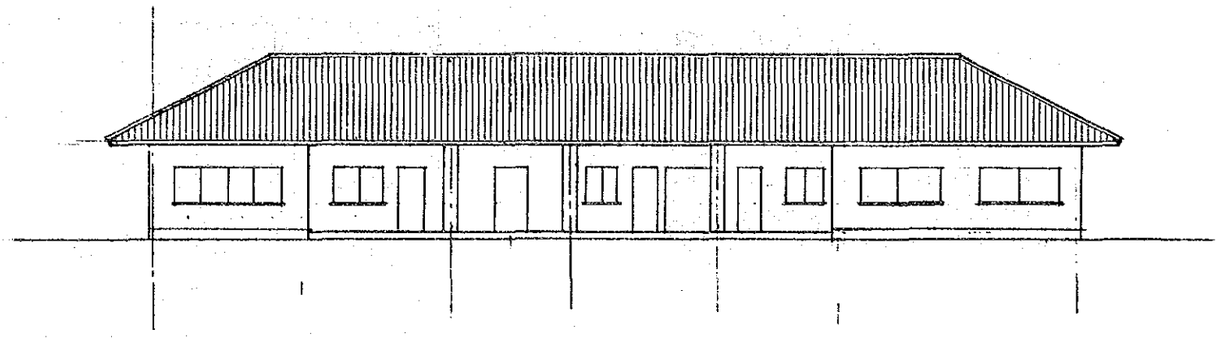
PLAN S=1:200

0 5 10M

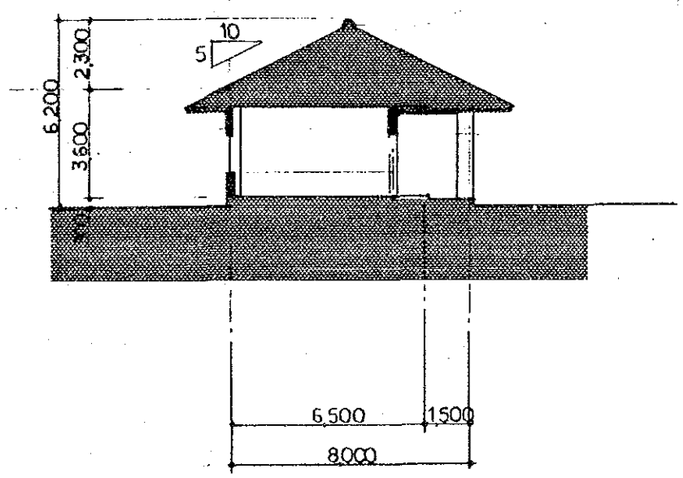
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

ADMINISTRATION BLDG. PLAN S=1:200

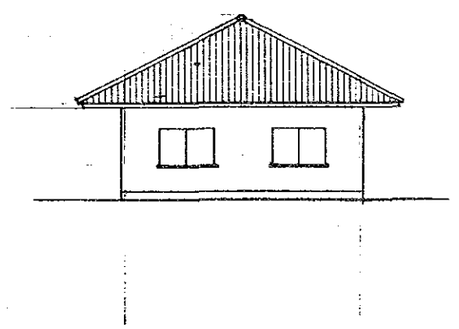
6



ELEVATION



SECTION A-A S=1:200

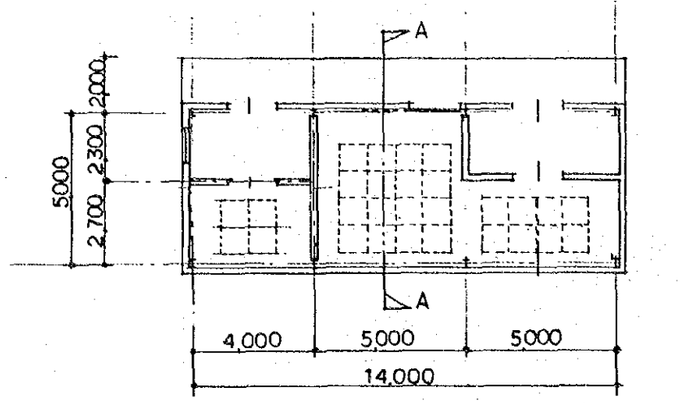


ELEVATION

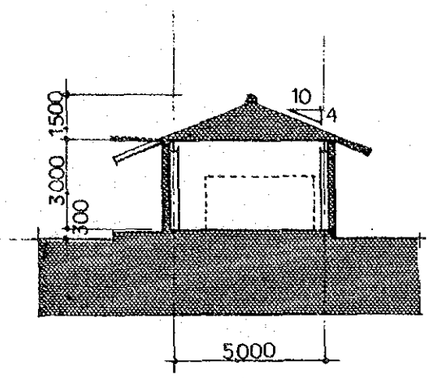
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

ADMINISTRATION BLDG.
ELEVATION S=1:200 SECTION S=1:200

7



PLAN OF GRADING AND STORAGE



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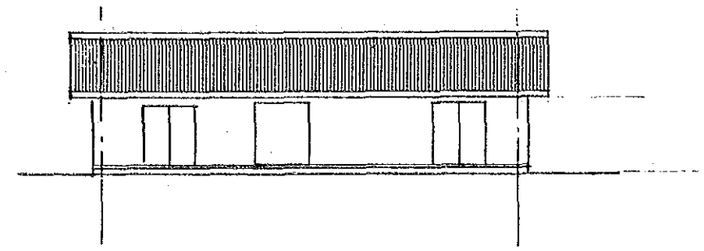

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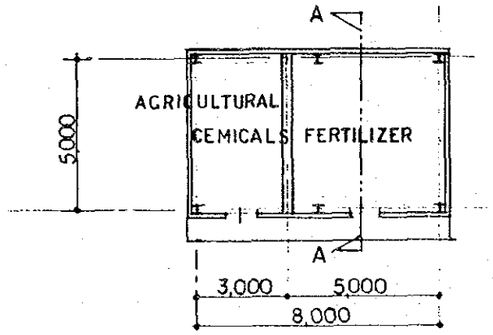
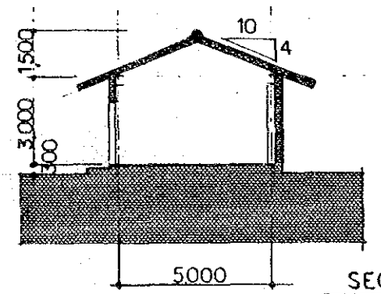
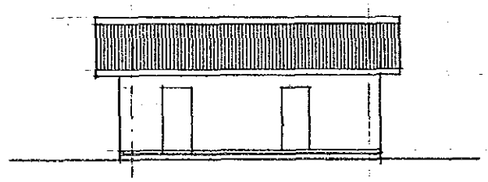


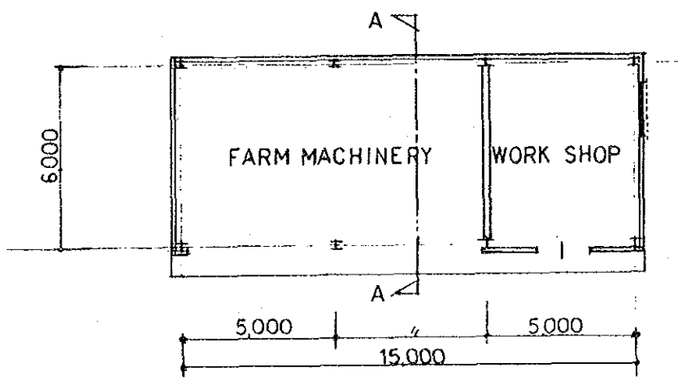
PLAN



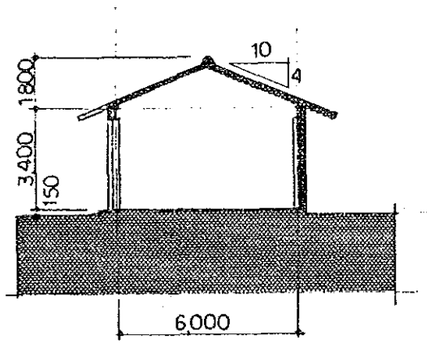
SECTION



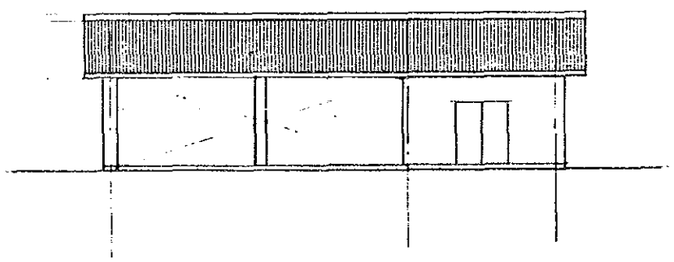
ELEVATION



FARM MACHINERY BLDG. PLAN S=1:200



SECTION A-A



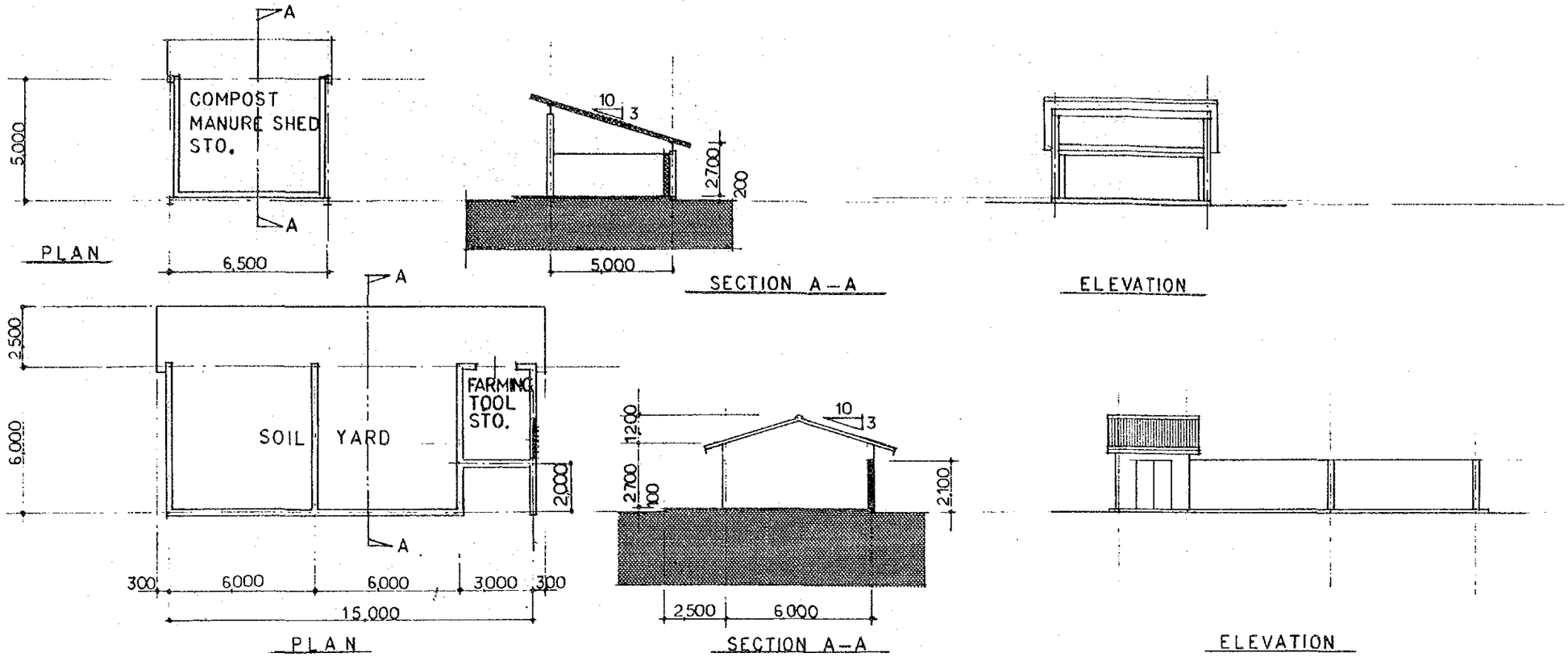
ELEVATION

1 5 10M

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

GRADING & STORAGE BLDG. AND OTHERS PLAN, SECTION S=1:200 ELEVATION S=1:200

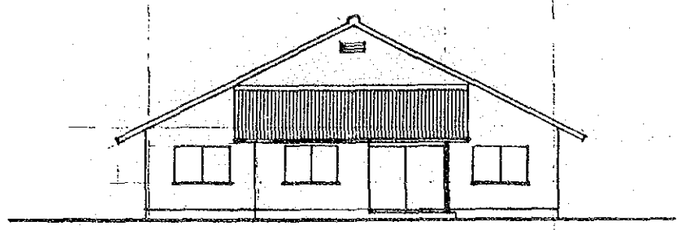
8



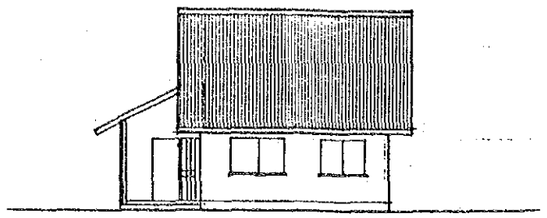
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

SOIL YARD, GATE HOUSE AND OTHERS
ELEVATION S=1:200 PLAN, SECTION S=1:200

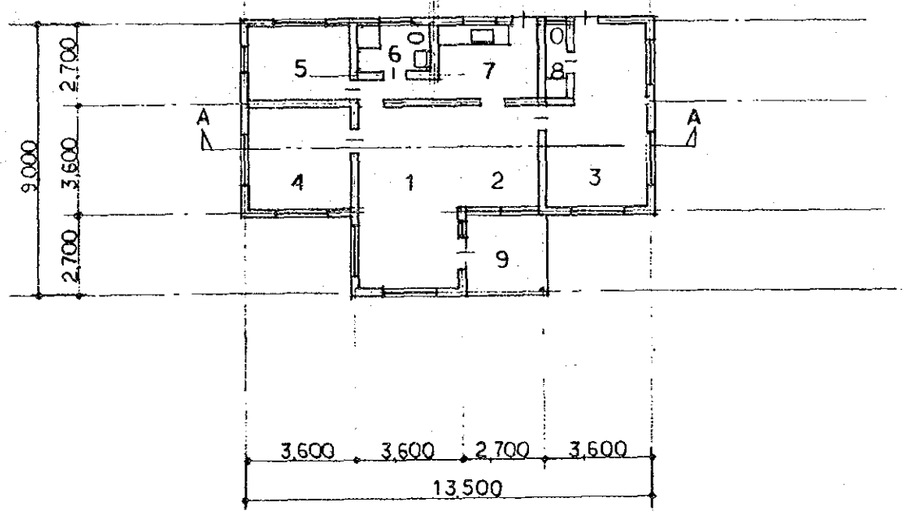
9



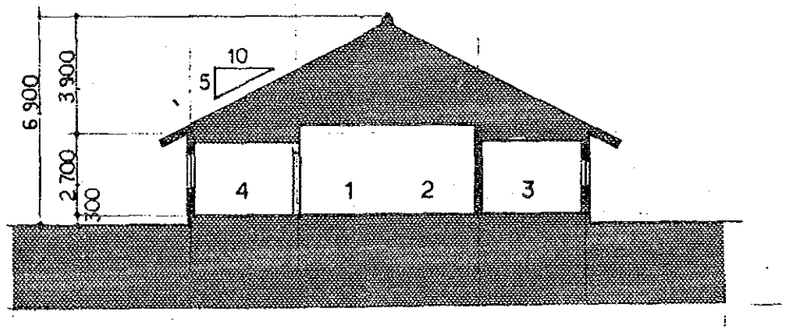
ELEVATION



ELEVATION



PLAN S = 1 : 200



SECTION A-A

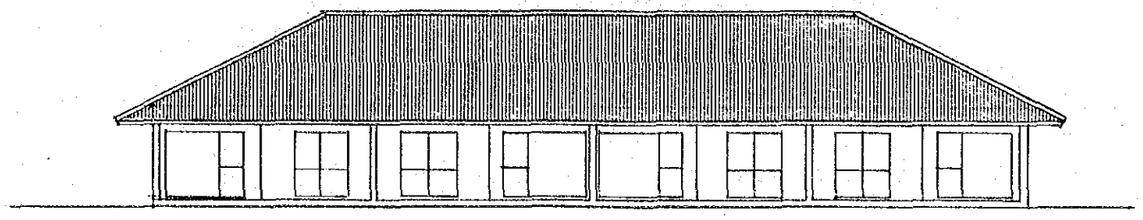
1. LIVING RM.
2. DINING RM.
3. BED RM.
4. —〃—
5. —〃—
6. BATH RM.
7. KITCHEN
8. TOILET
9. ENTRANCE

5 10M

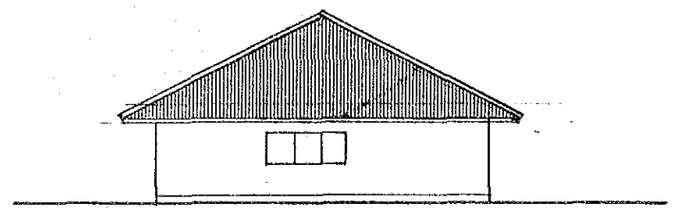
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

LECTURES' HOUSE (A)
PLAN, SECTION S=1:200 ELEVATION S=1:200

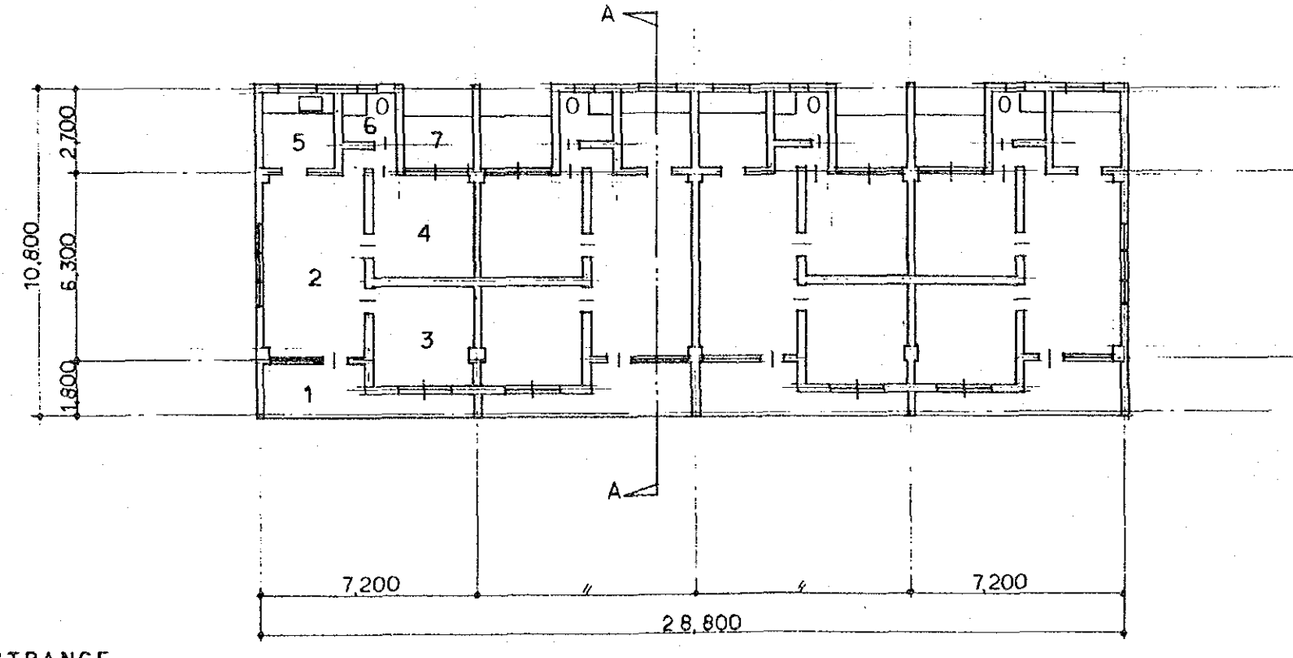
10



ELEVATION

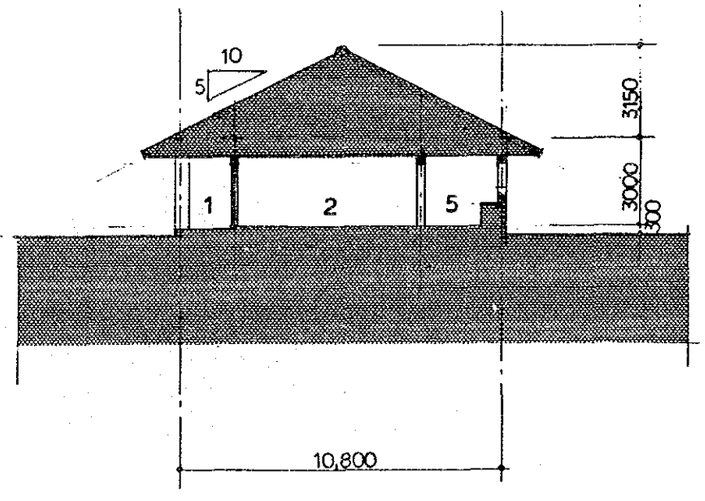


ELEVATION



1 ENTRANCE
2 LIVING RM.
3 BED RM.
4 — 〃 —
5 KITCHEN
6 BATH RM.
7 VERANDA

PLAN S=1:200



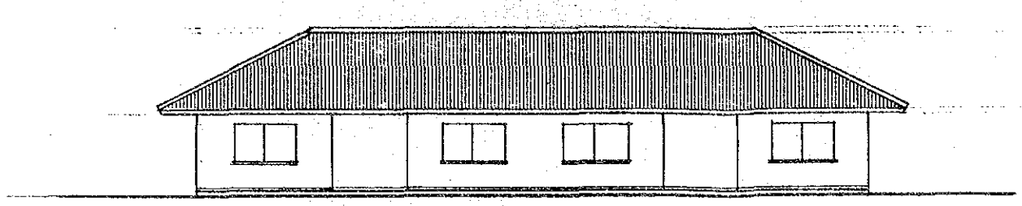
SECTION A–A

1 5 10M

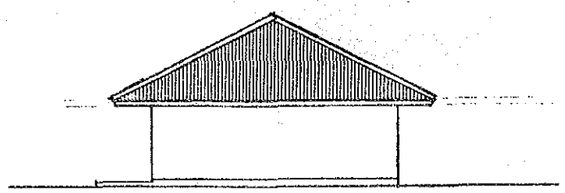
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

LECTURES' HOUSE (B)
PLAN, SECTION S=1:200 ELEVATION S=1:200

11

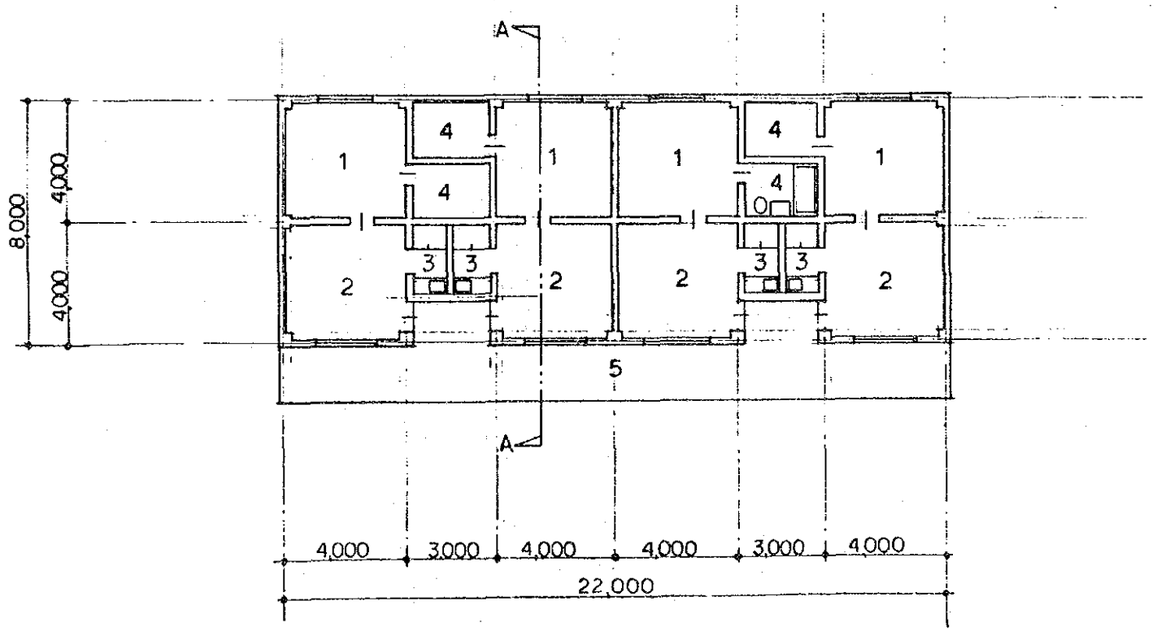


ELEVATION

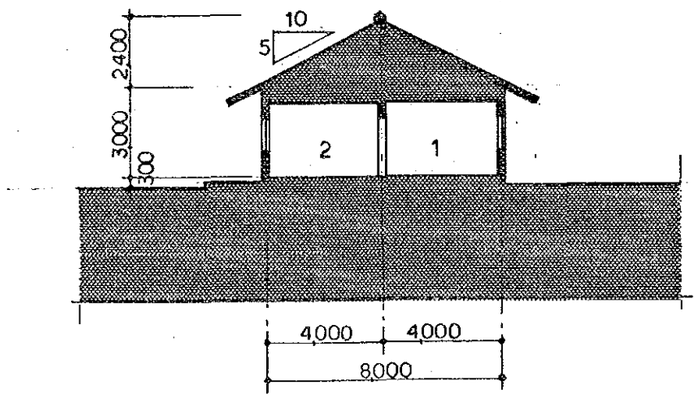


ELEVATION

1	BED RM.
2	LIVING RM.
3	BATH RM.
4	KITCHEN
5	CORRIDOR



PLAN S=1:200



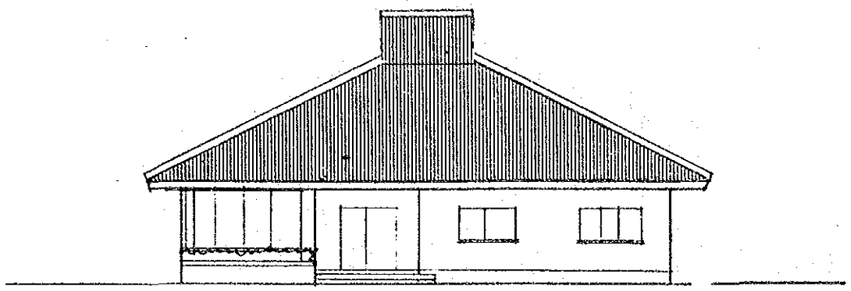
SECTION A-A

1 5 10M

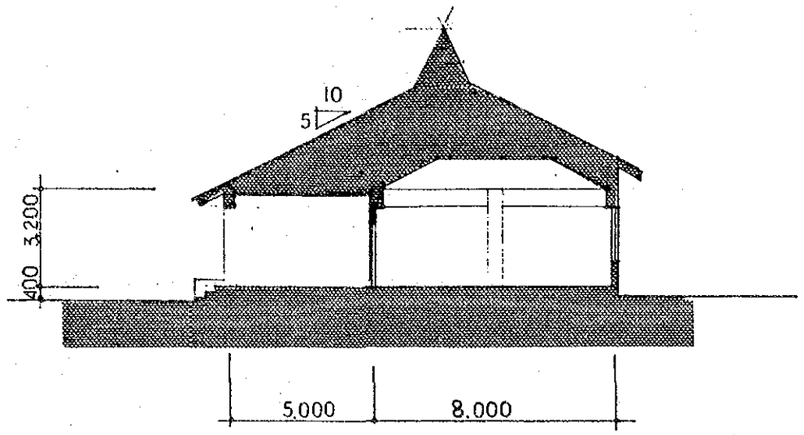
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

DORMITORY FOR EXPERTS AND GUEST PLAN, SECTION S=1:200 ELEVATION S=1:200

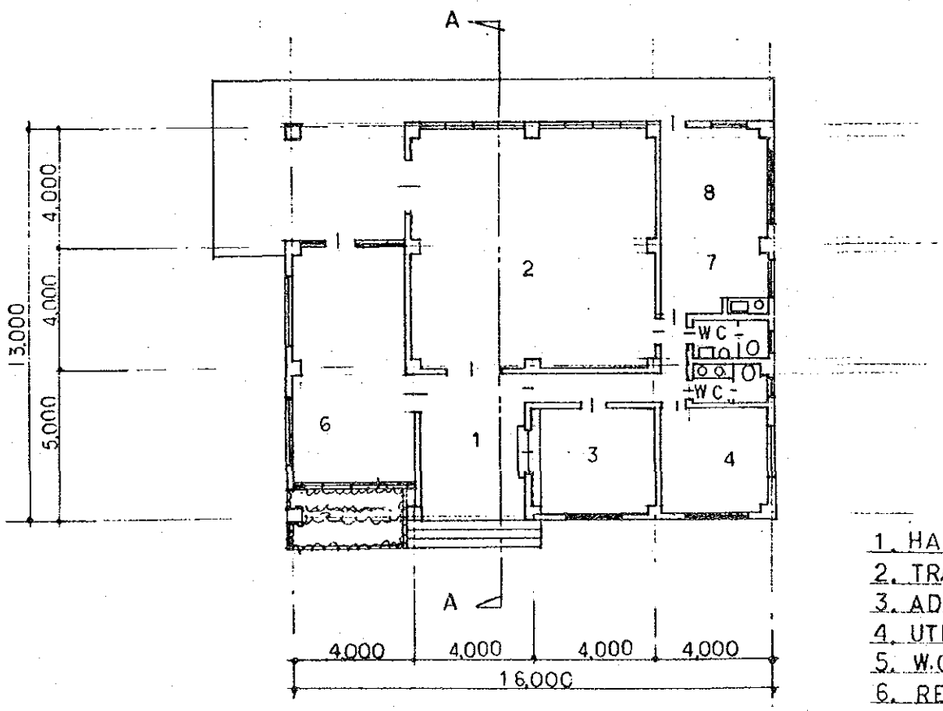
12



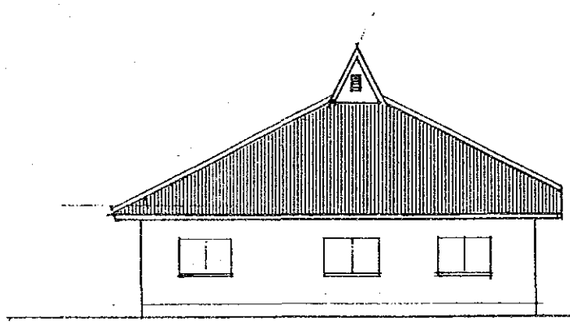
ELEVATION



SECTION A-A



1. HALL
2. TRAINING RM.
3. ADMINISTRATION RM.
4. UTILITY RM.
5. W.C
6. REST RM.
7. ASSISTANT INSTRUCTOR RM.
8. INSTRUCTOR RM.
9. STORE RM.



ELEVATION

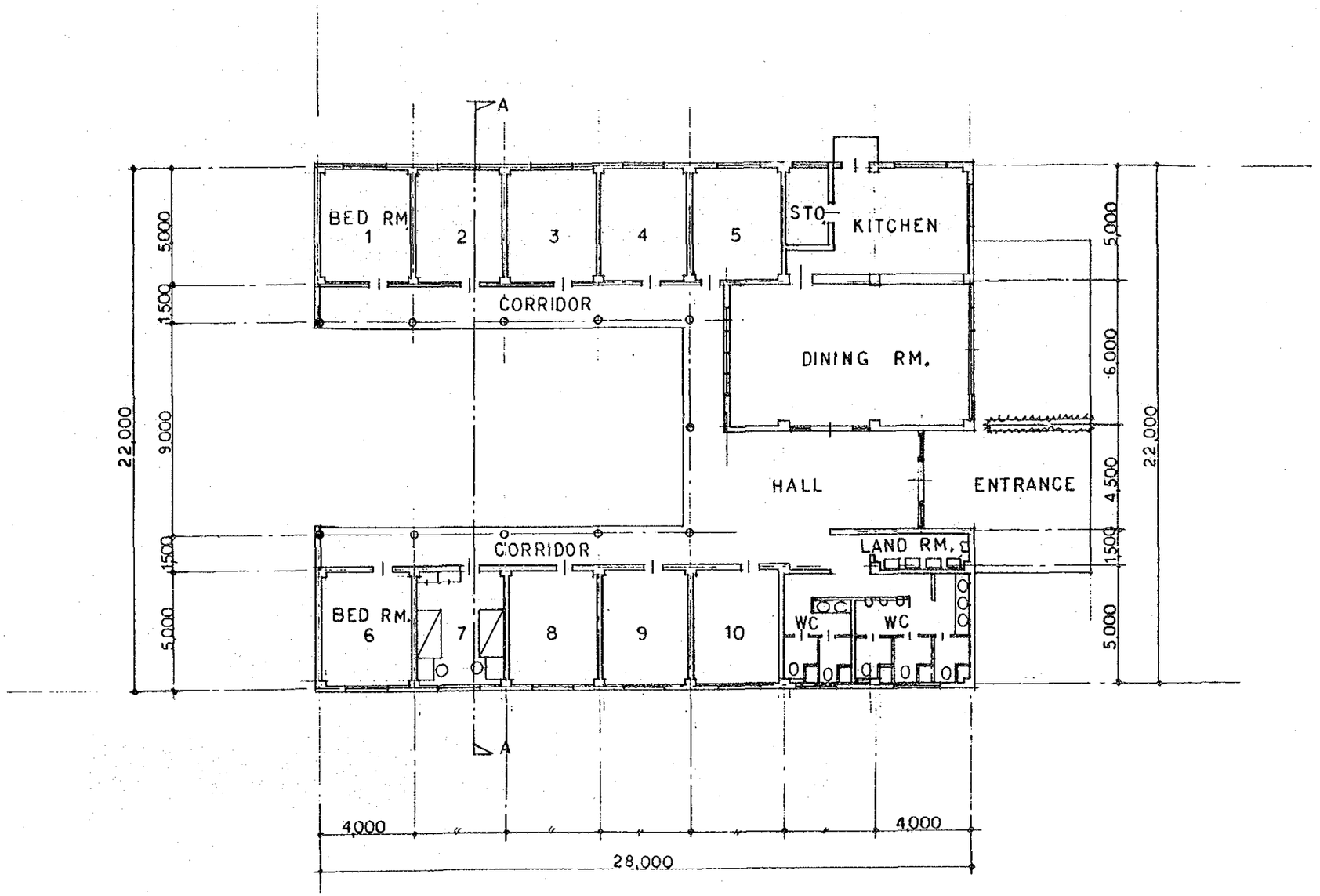
1 5 10 M

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

TRAINING BLDG.

PLAN, SECTION S=1:200
ELEVATION S=1:200

13



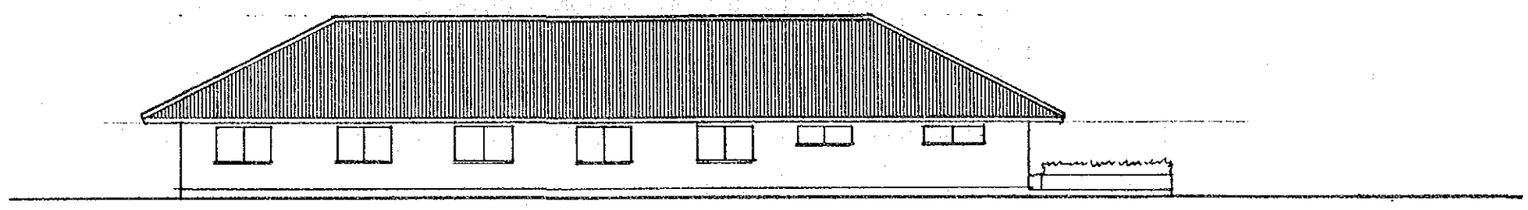
PLAN S=1:200

1 5 10M

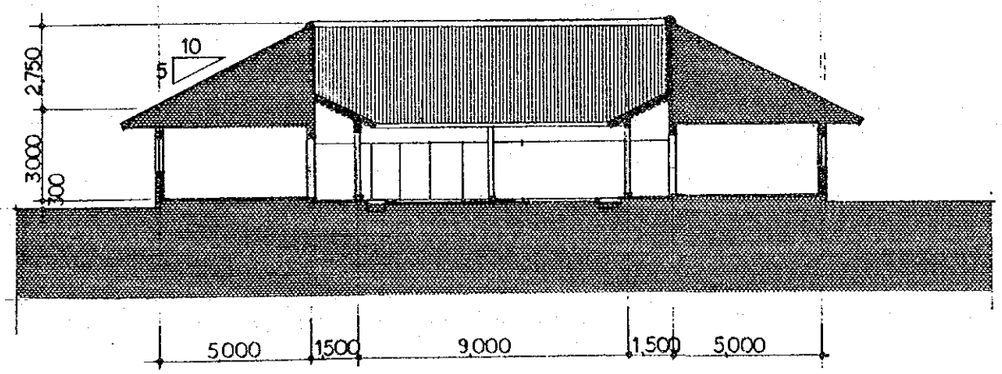
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

DORMITORY FOR TRAINEES PLAN S=1:200

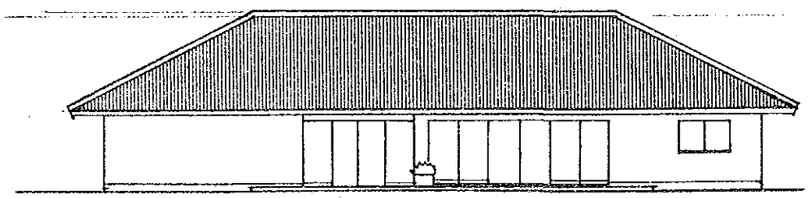
14



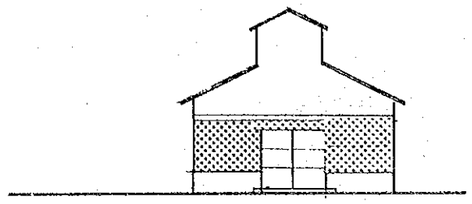
ELEVATION



SECTION A-A S=1:200



ELEVATION



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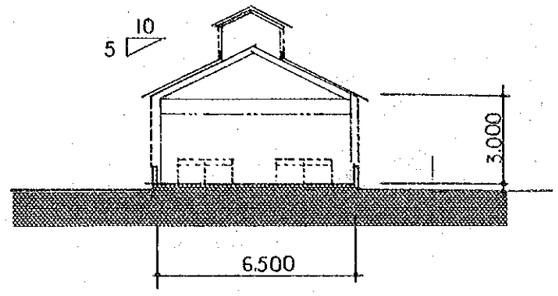
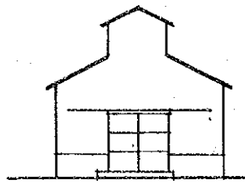


SECTION



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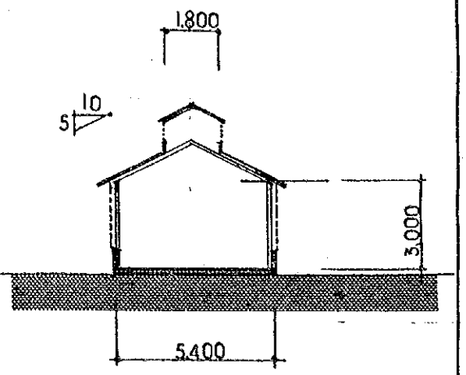

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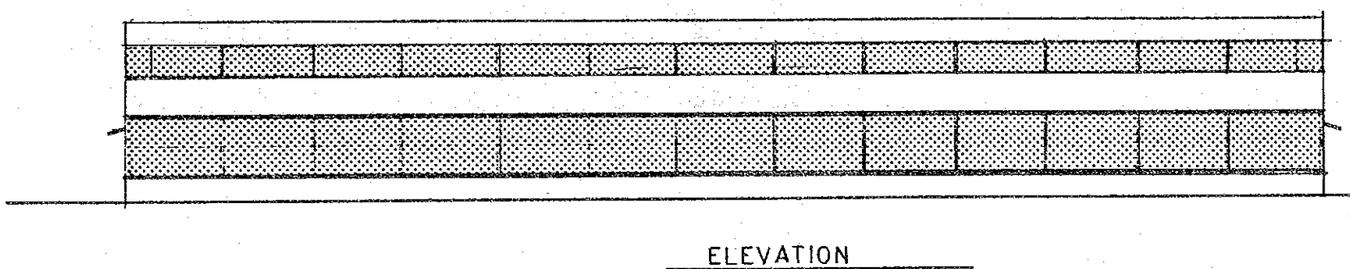

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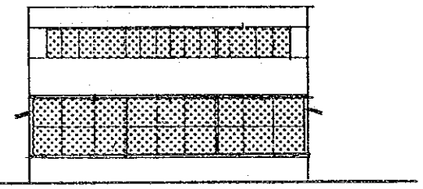

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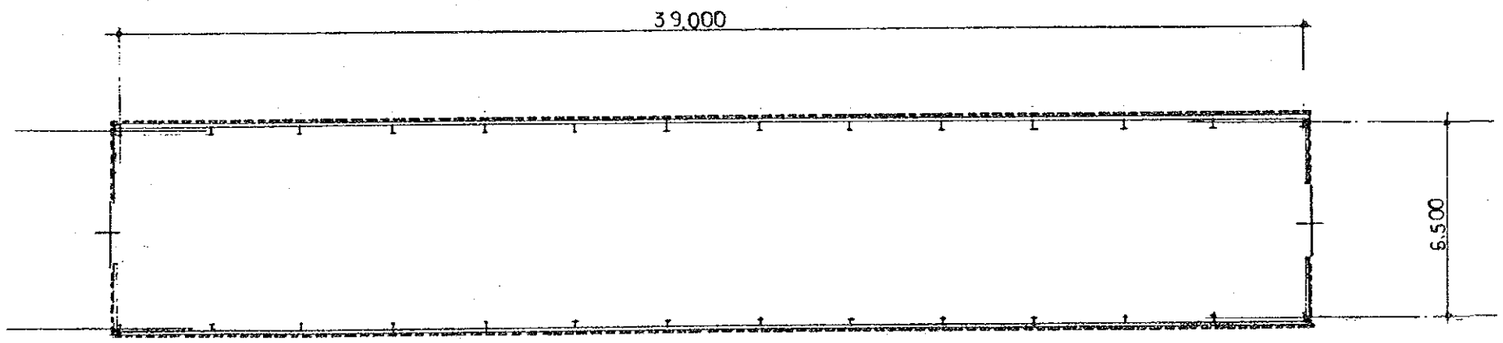

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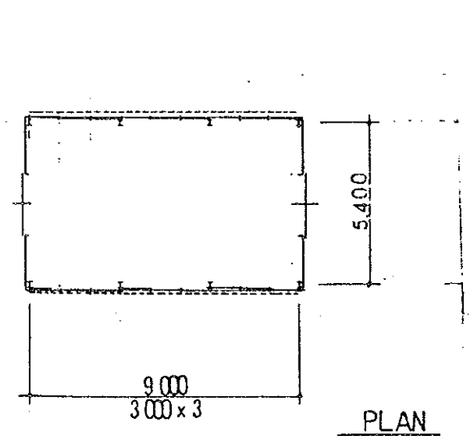


PLAN

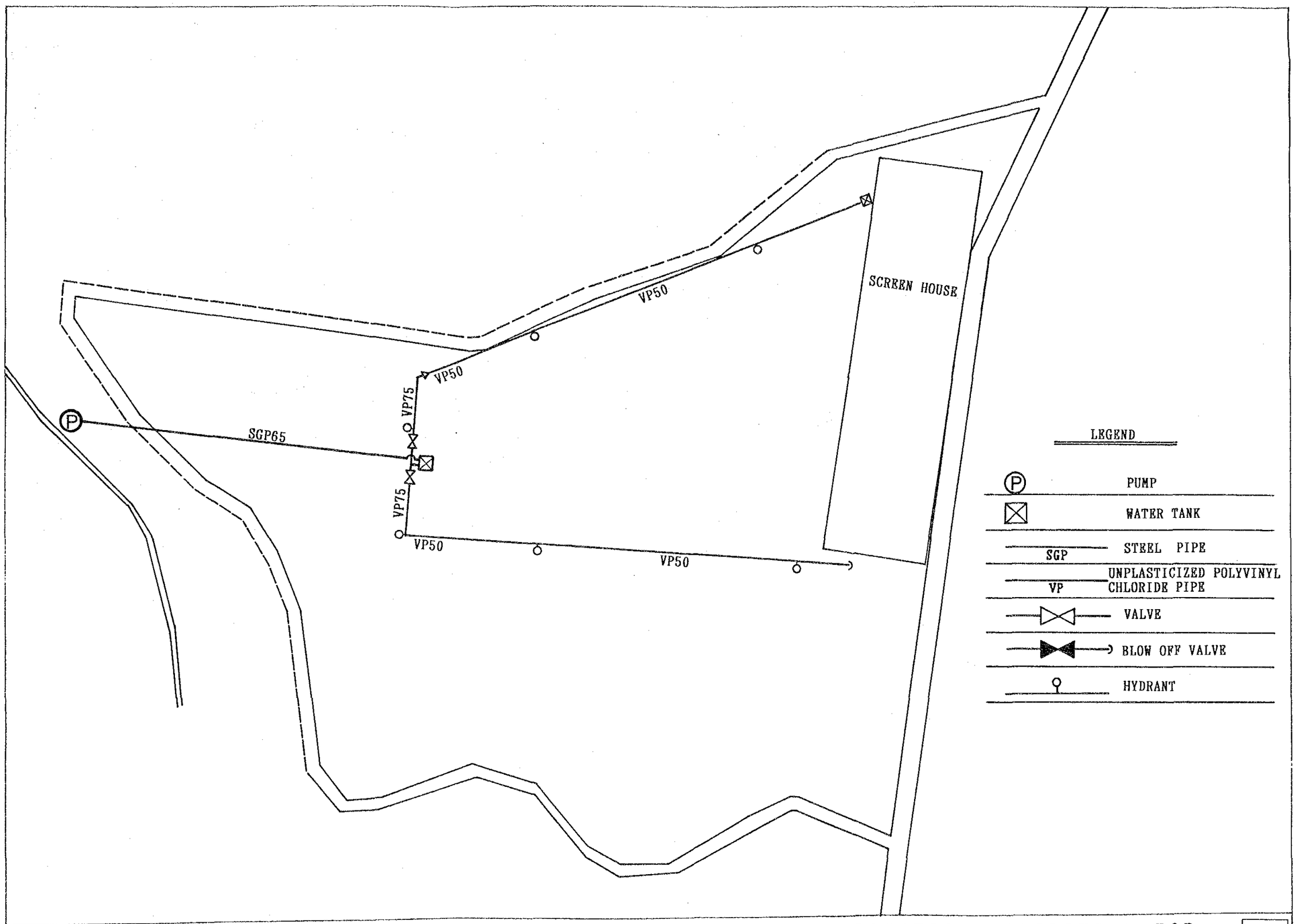
1 5 10 M

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

SCREEN HOUSE
BBI unit , BPSB

PLAN, SECTION S=1:200
ELEVATION S=1:200

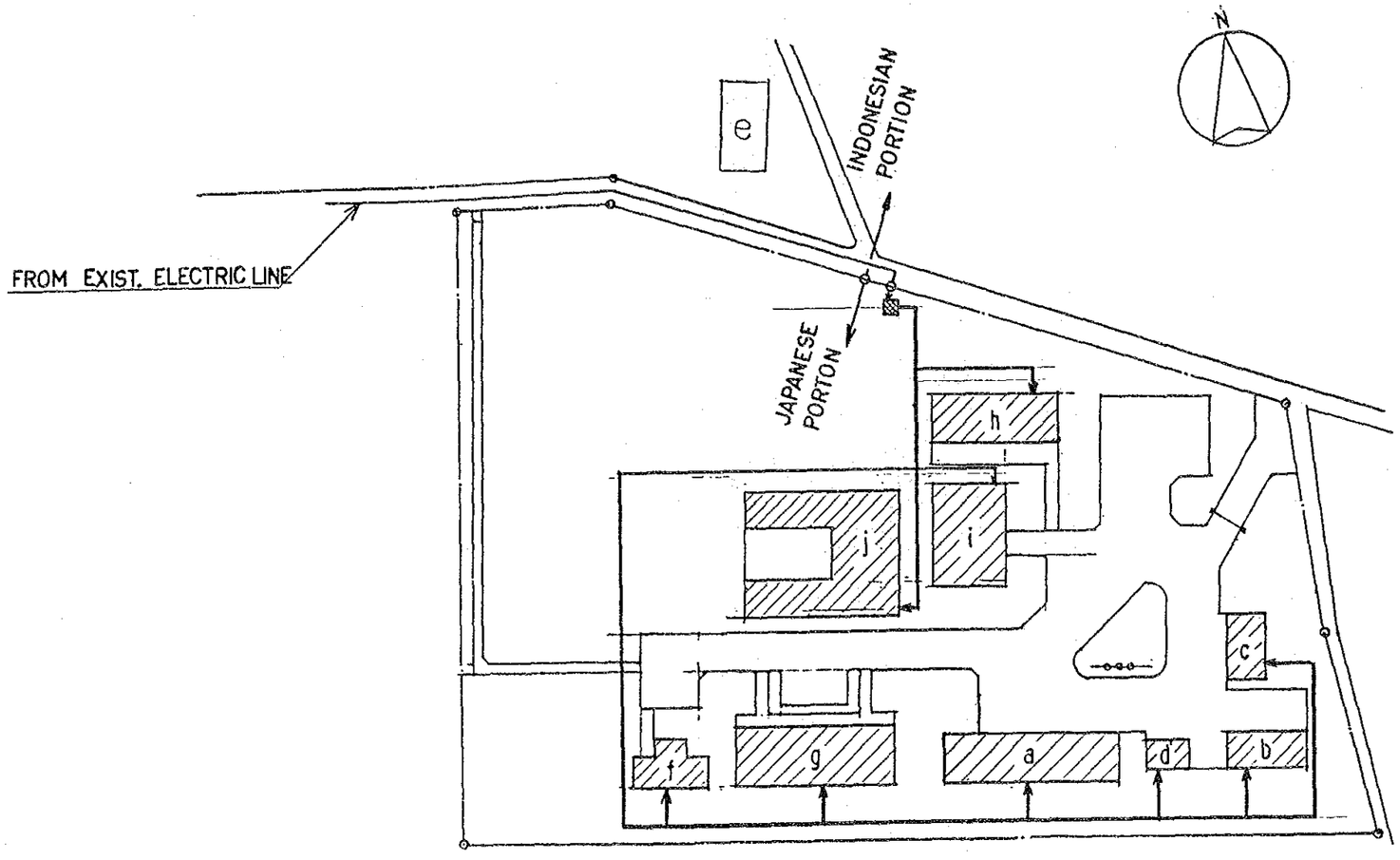
16



THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

IRRIGATION FACILITIES FOR BBI UNIT S=1:1000

17



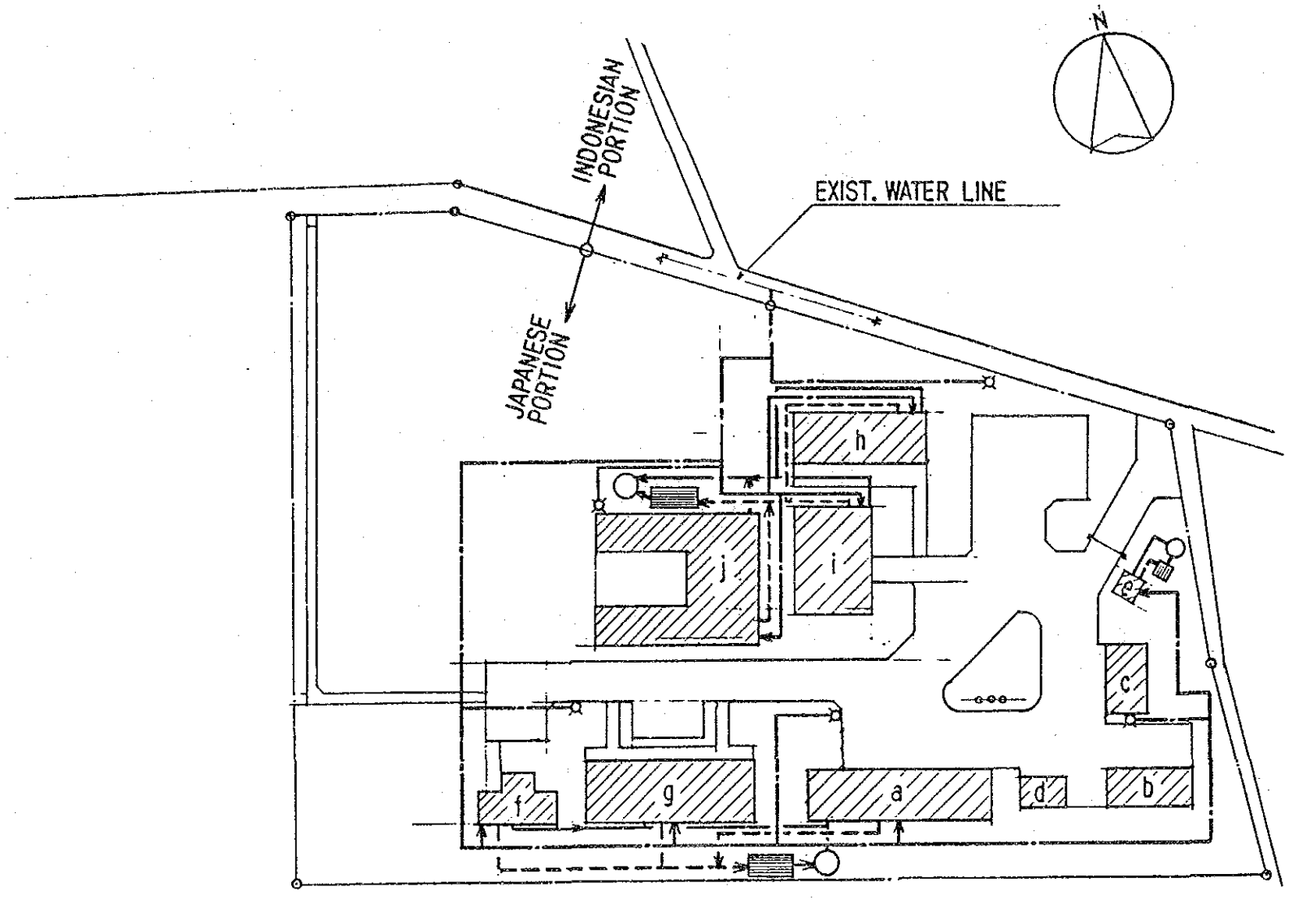
a ADMINISTRATION BLDG.
b FARM MACHINARY BLDG.
c GRADING & STORAGE BLDG.
d FARM INPUT HOUSE
e SOIL YARD
f DIRECTOR HOUSE
g STAFF HOUSE
h DORM. FOR INSTRUCTOR
i TRAINING BLDG.
j DORM.

LEGEND

▩ CUBICLE

ELECTRIC POWER LINE

S=1 : 1000

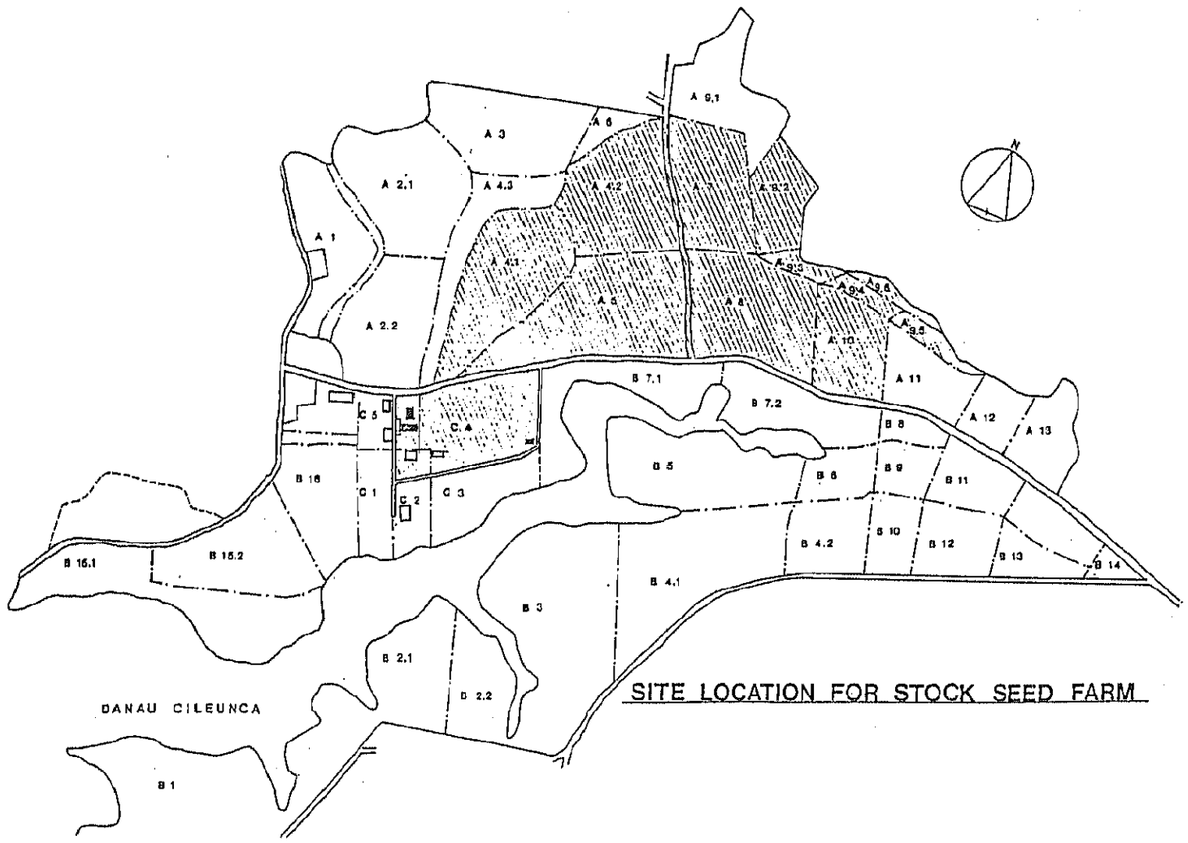


a ADMINISTRION BLDG.
b FARM MACHINARY BLDG.
c GRADING & STORAGE BLDG.
d FARM INPUT HOUSE
e SOIL YARD
f DIRECTOR HOUSE
g STAFF HOUSE
h DORMITORY FOR INSTRUCTOR
i TRAINING BLDG.
j DORMITORY

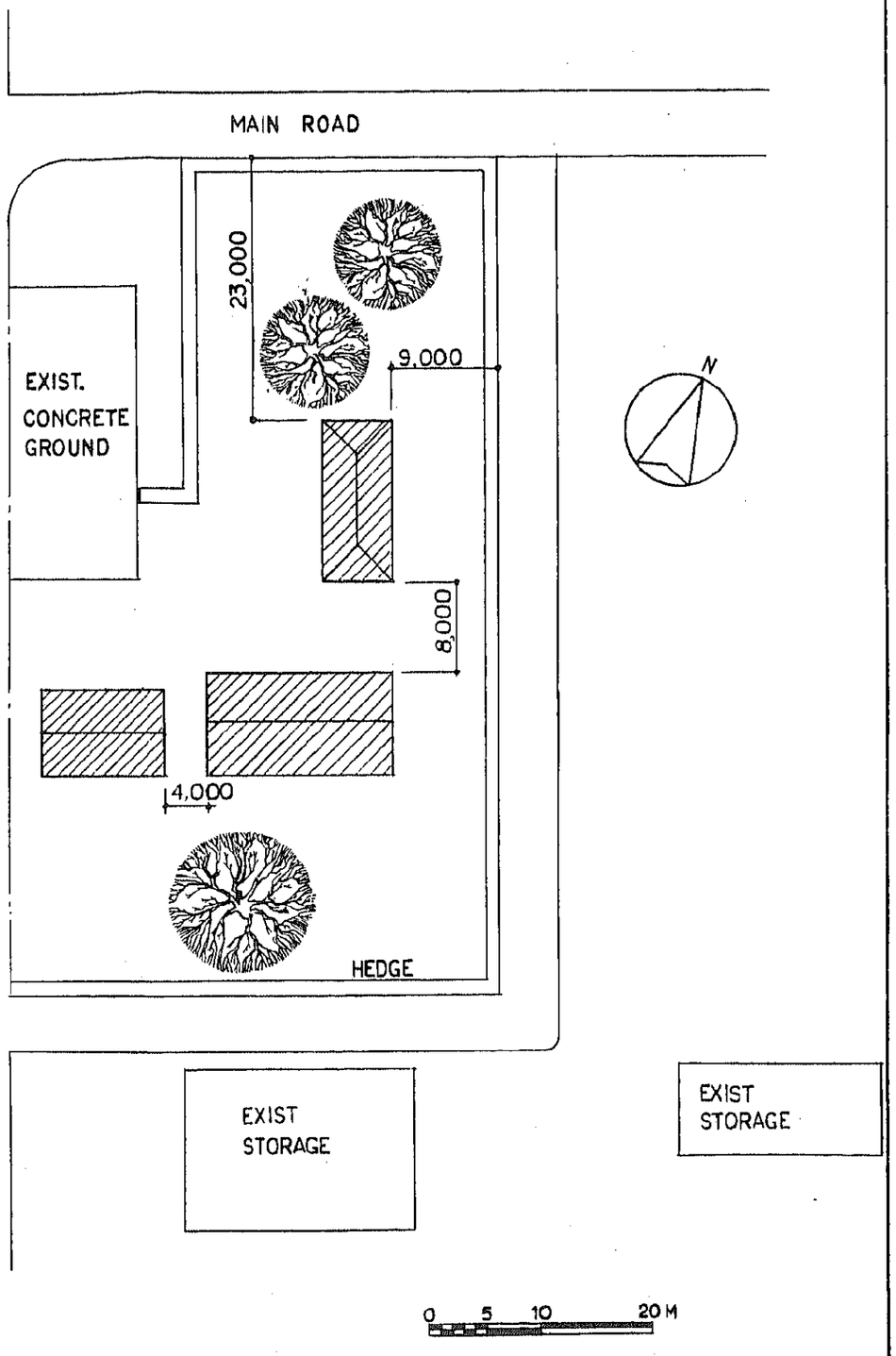
LEGEND

- SEPTIC TANK
- PERCOLATED BASIN
- FAUCET
- WATER SUPPLY LINE
- DRAINAGE LINE
- SEWAGE LINE

S=1:1,000



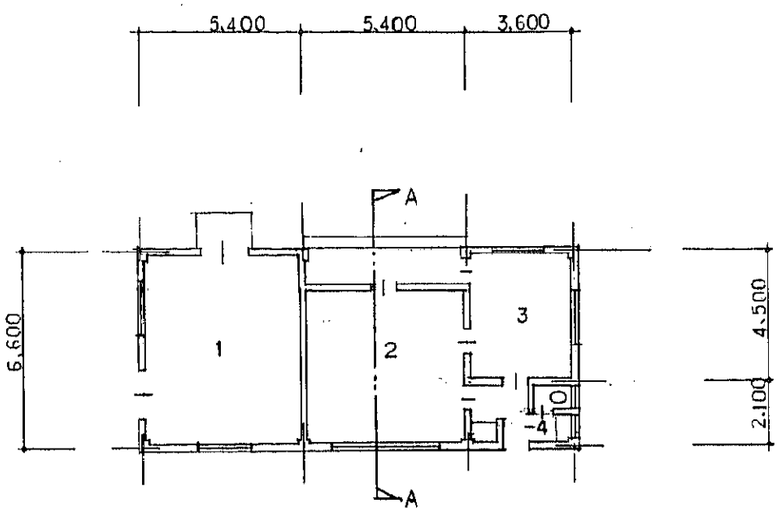
SITE LOCATION FOR STOCK SEED FARM

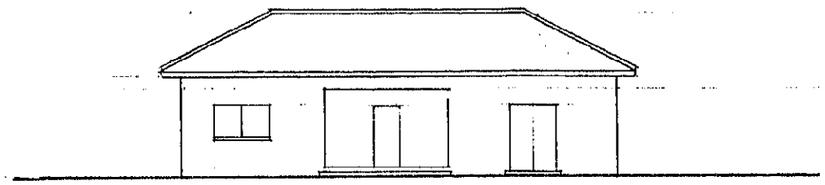


THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

LAYOUT OF STOCK SEED FARM S=1:500

20





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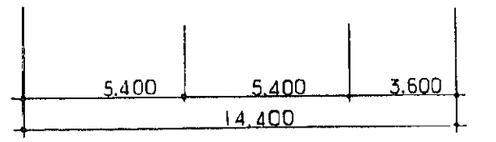
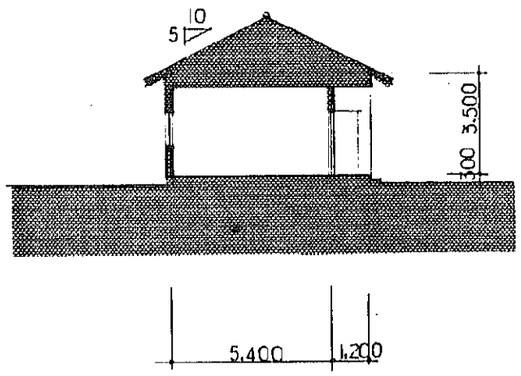
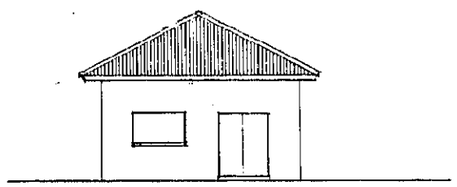


PLAN S=1:200

1. GRADING RM.
2. OFFICE RM.
3. CHIEF & EXPERT
4. W.C



SECTION A — A

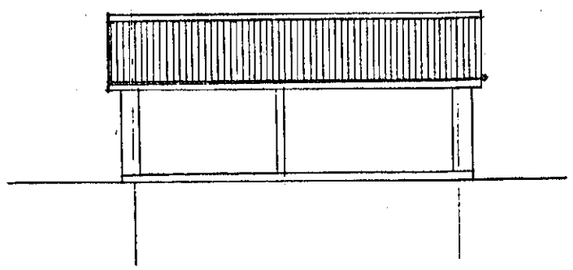


ELEVATION

1 5 10 M

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO	GRADING BLDG.	PLAN, SECTION S=1:200 ELEVATION S=1:200

21



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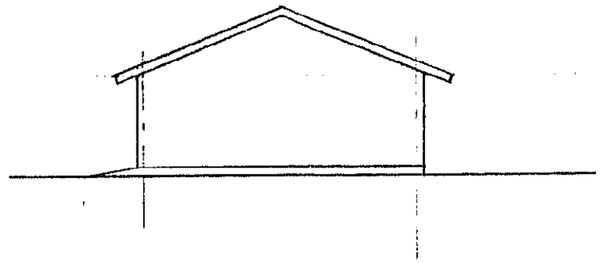

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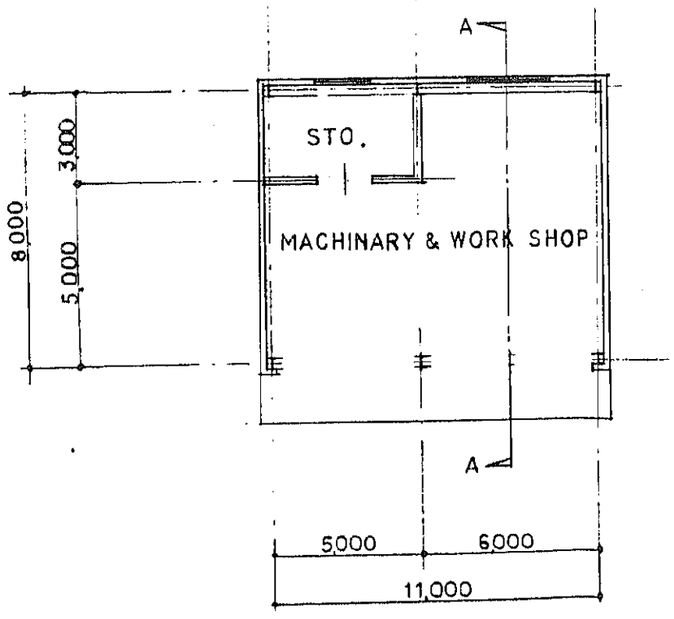

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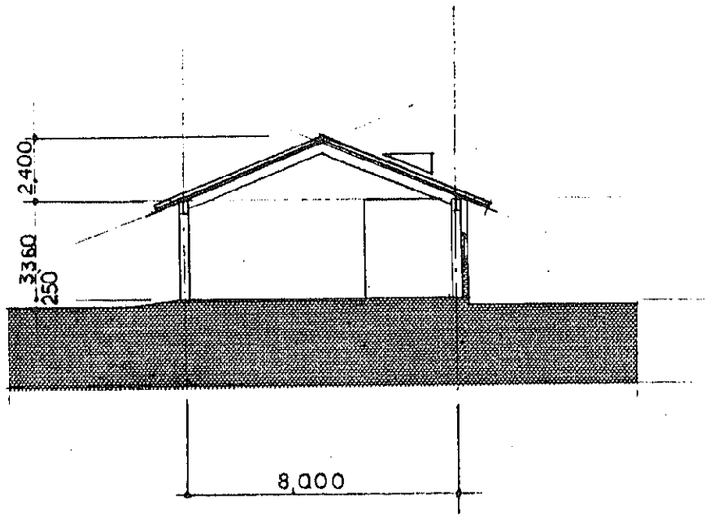


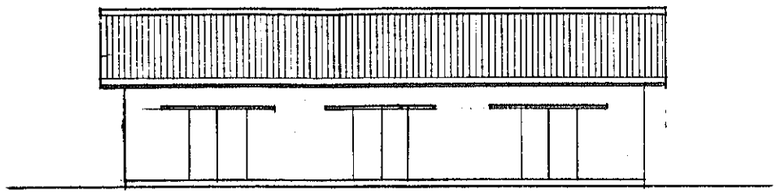
SECTION A-A

1 5 10M

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

MACHINERY BLDG. PLAN, SECTION S=1:200
ELEVATION S=1:200

22



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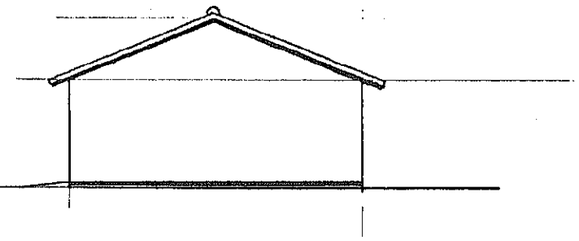

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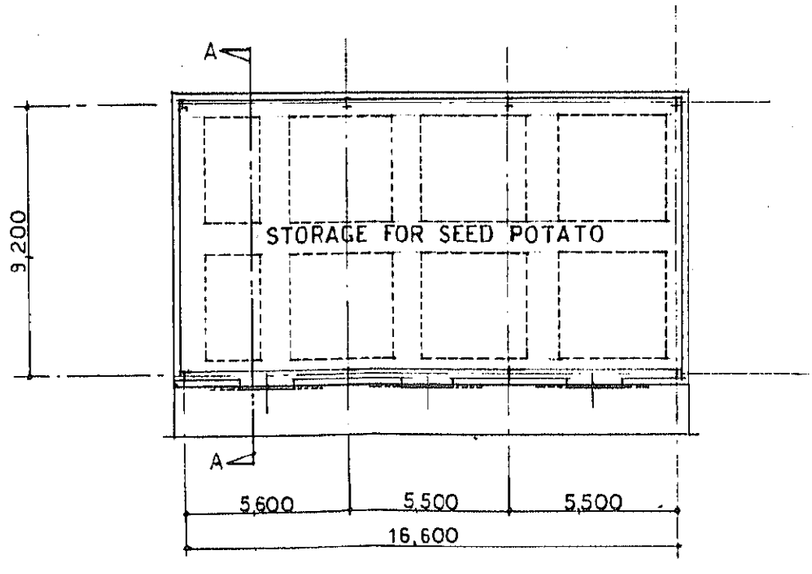
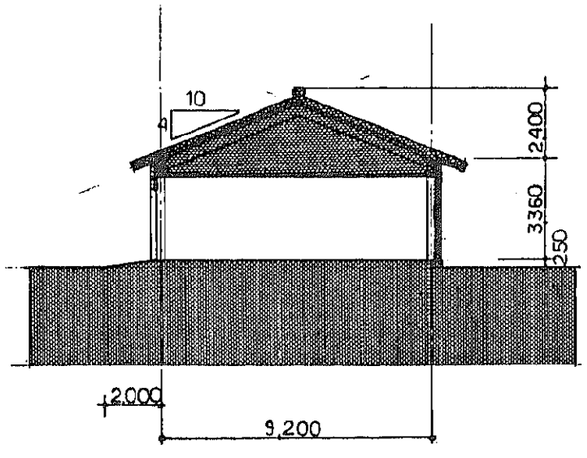


PLAN S=1 : 200

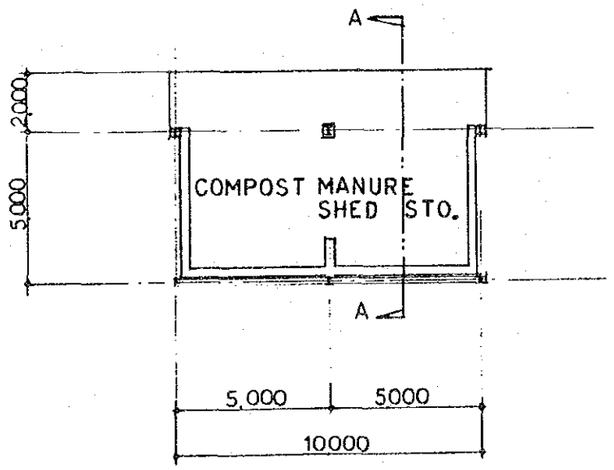


SECTION A–A

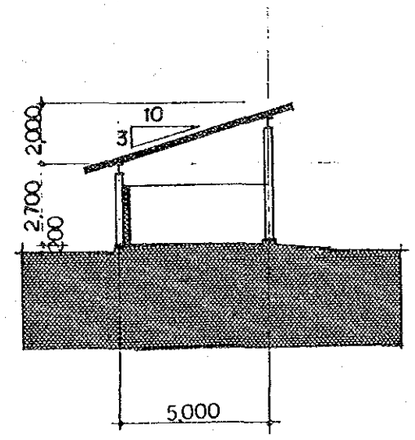
1 5 10M

THE PROJECT FOR THE MULTIPLICATION AND STORAGE AND DISTRIBUTION OF HIGH QUALITY SEED POTATO PLAN, SECTION S=1:200 ELEVATION S=1:200

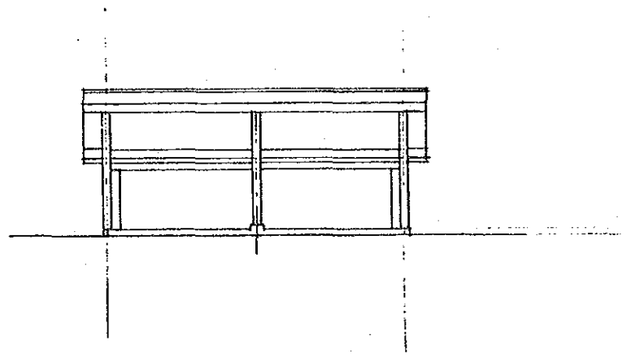
23



PLAN



SECTION A-A



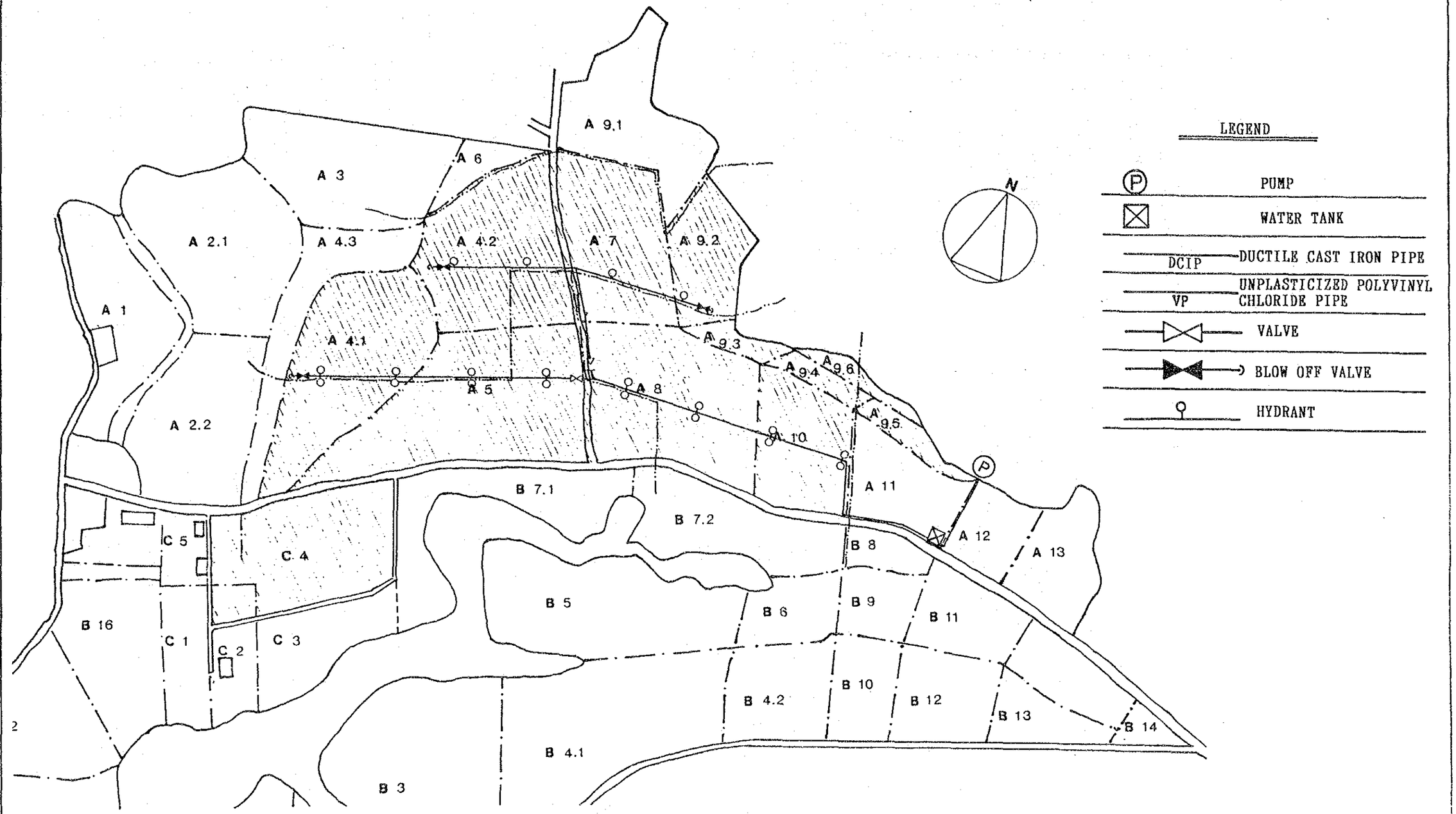
ELEVATION

1 5 10M

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

MANURE SHED PLAN, SECTION S=1:200
ELEVATION S=1:200

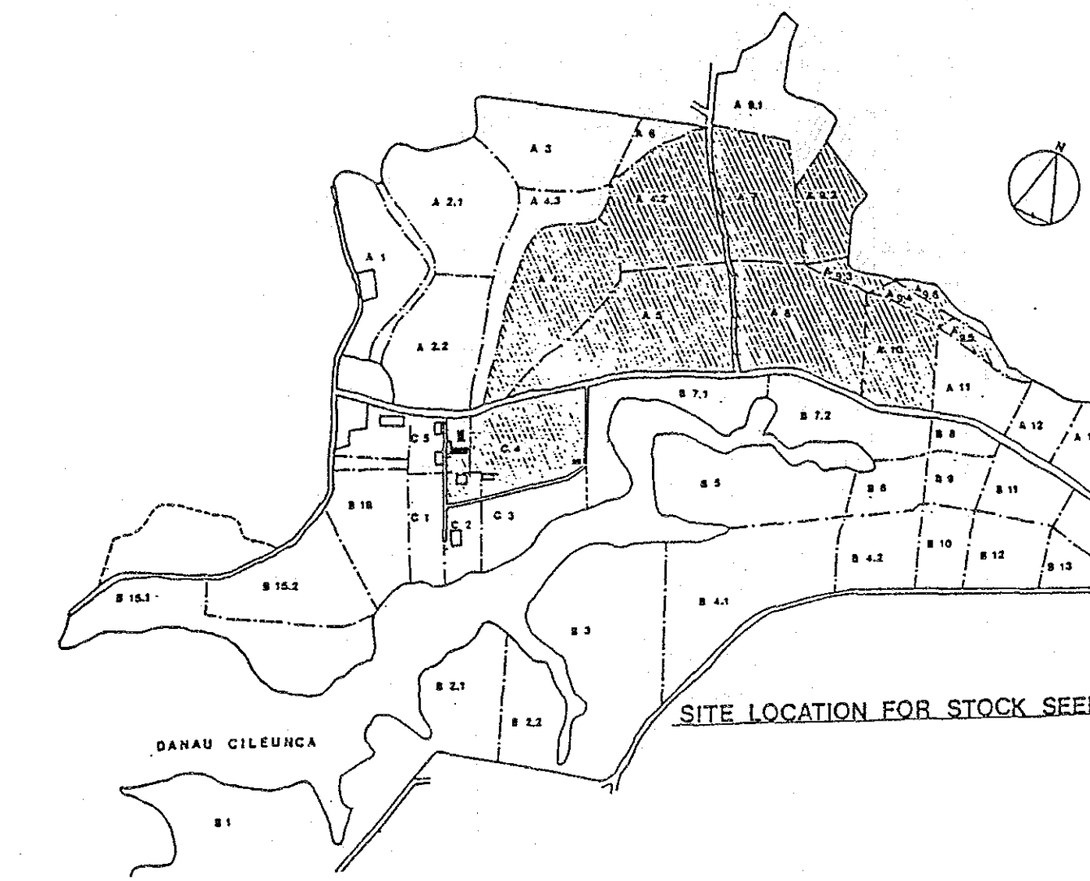
24

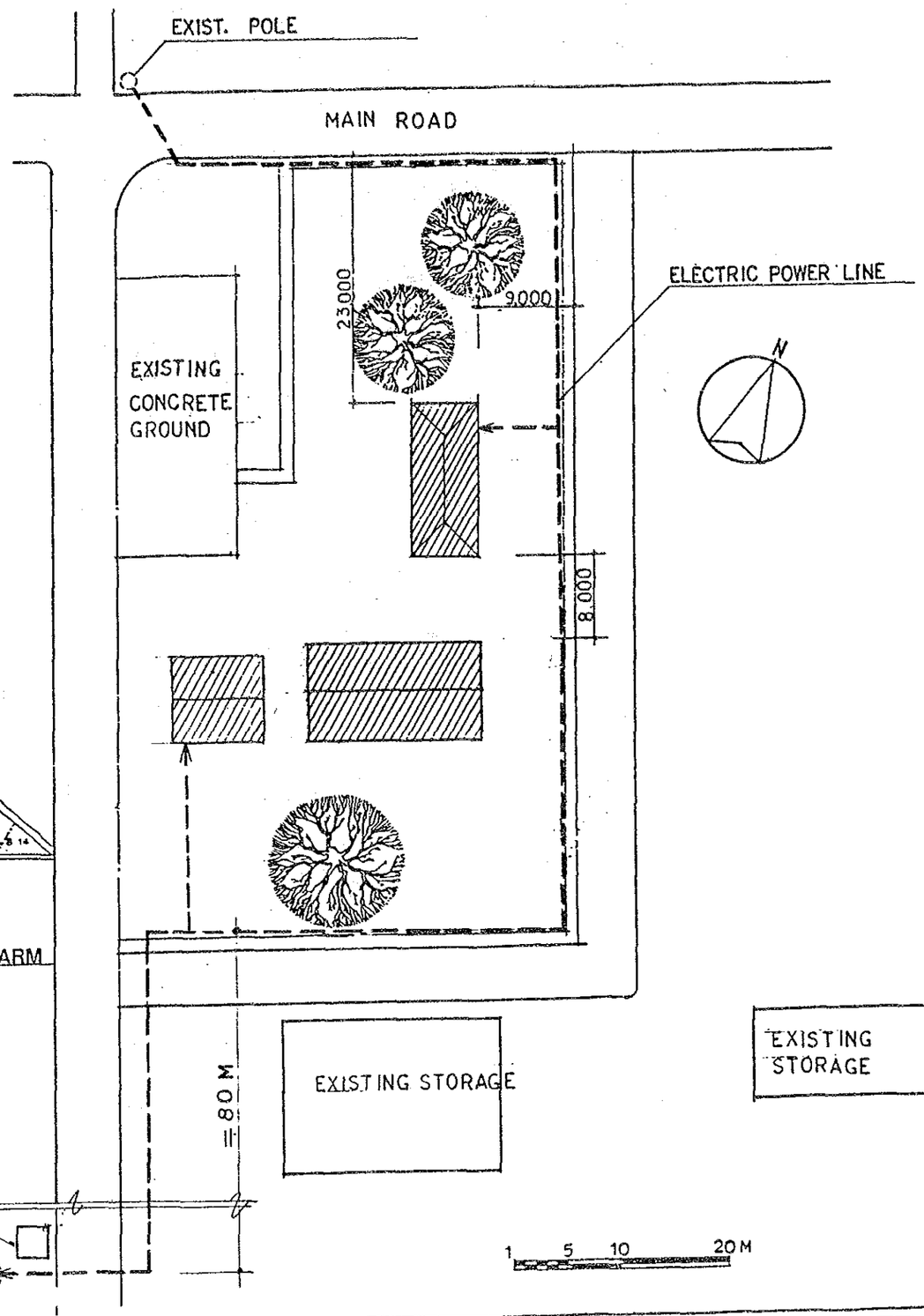


THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

IRRIGATION FACILITIES FOR STOCK SEED FARM S=1:5000

25

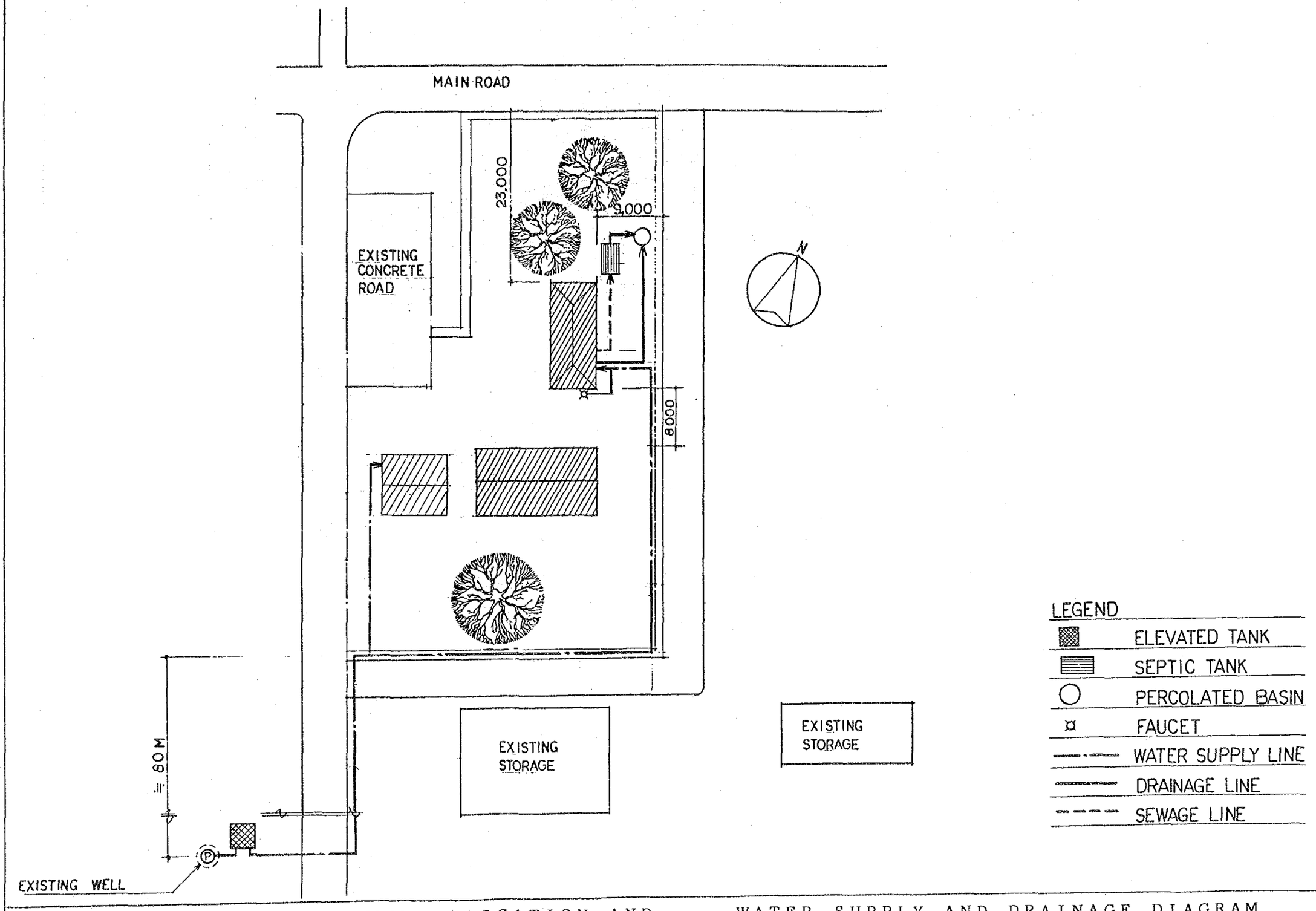




THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

ELECTRICAL POWER DIAGRAM S=1:500

26



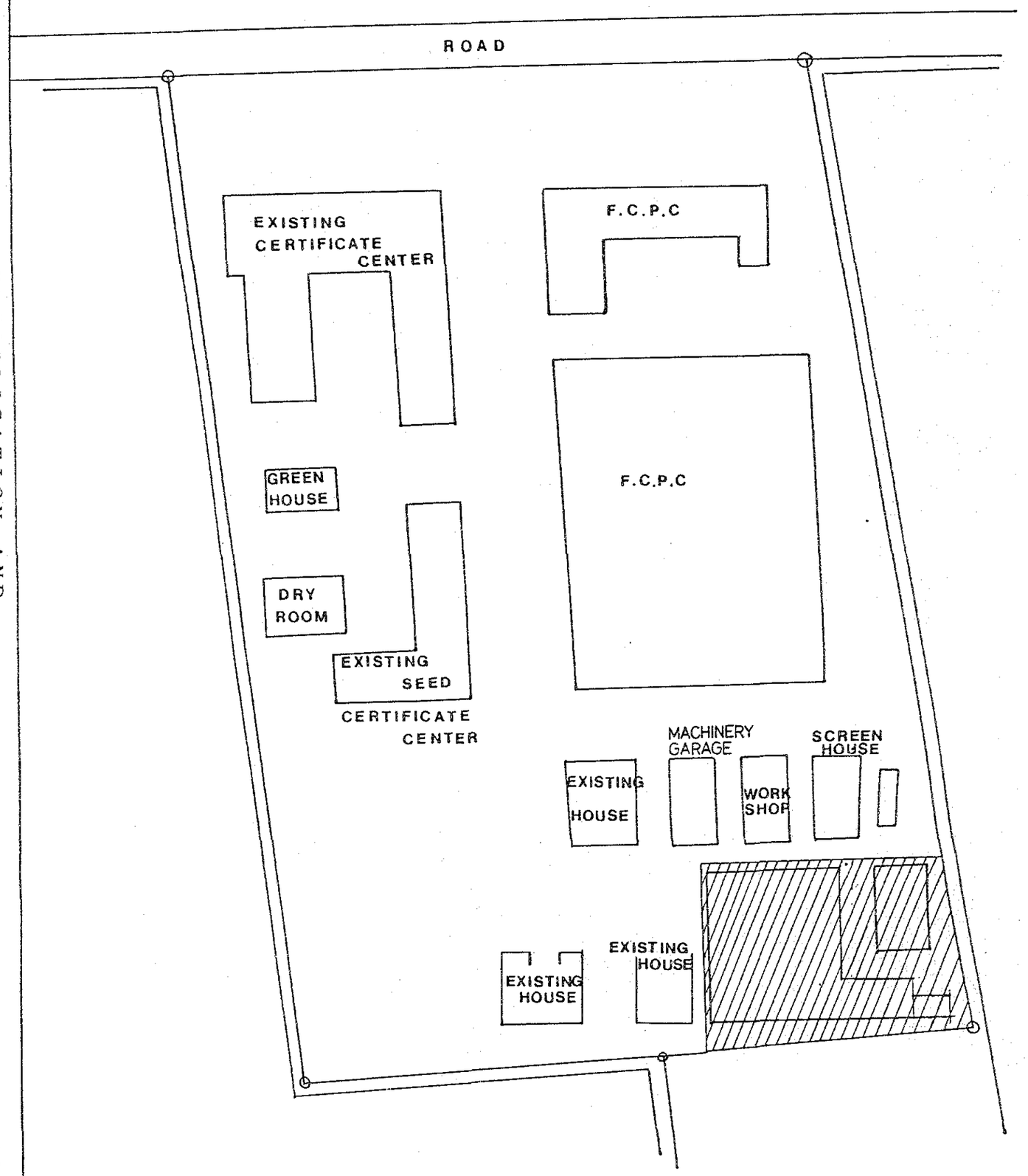
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

WATER SUPPLY AND DRAINAGE DIAGRAM
S=1:500

27

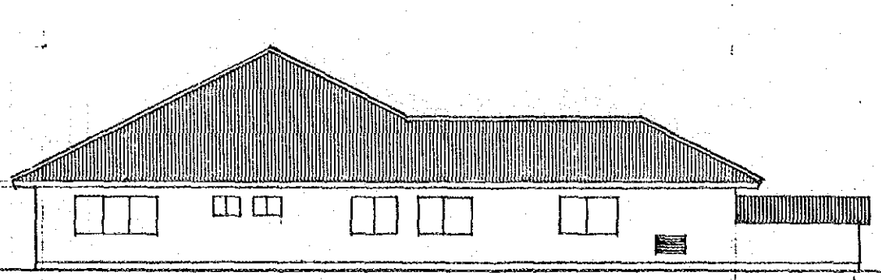
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

LAYOUT OF BPSB S=1:500



SITE LOCATION FOR BPSB S=1:500

28



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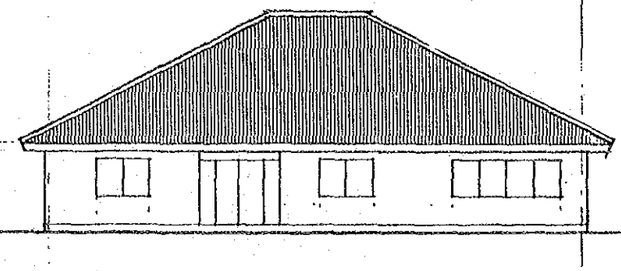

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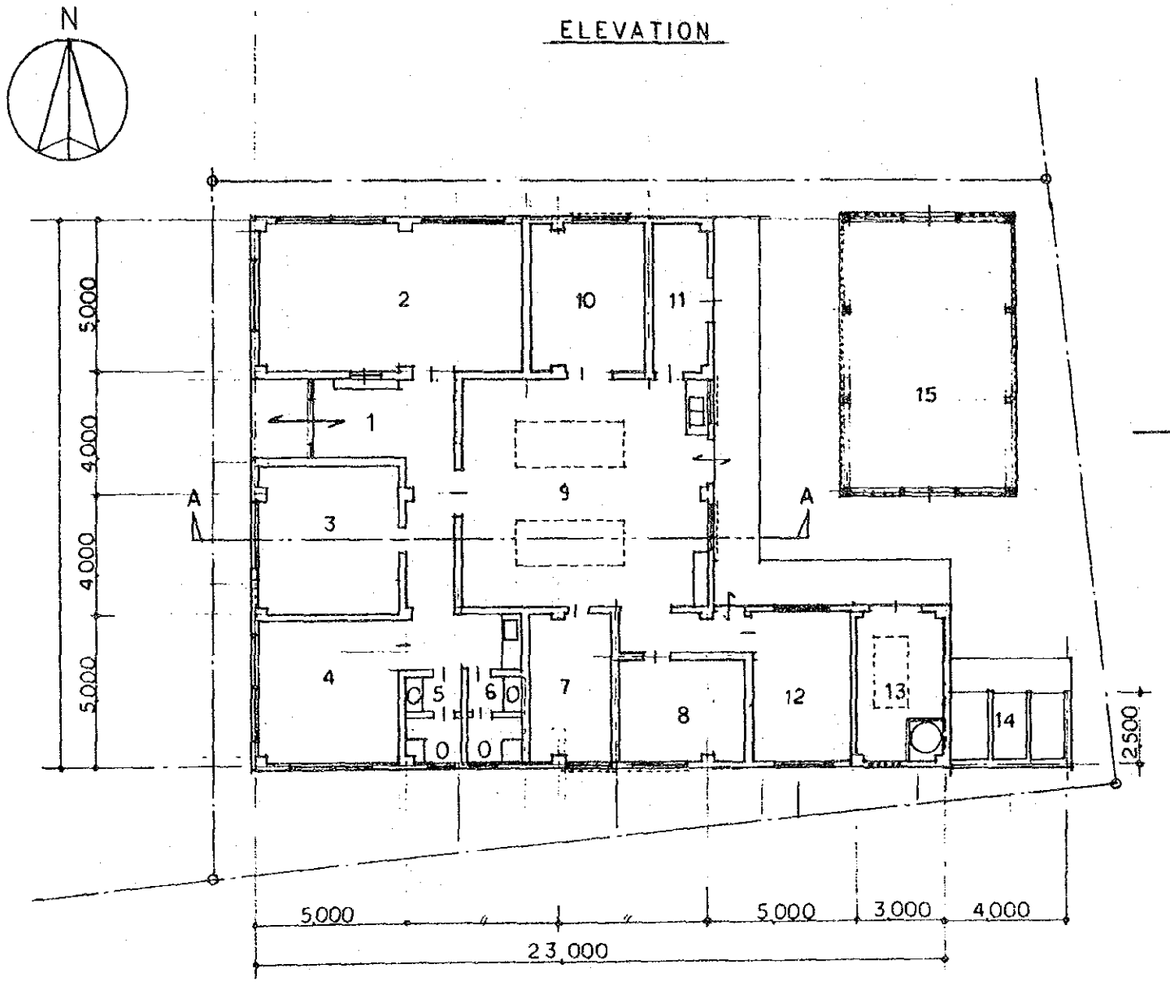
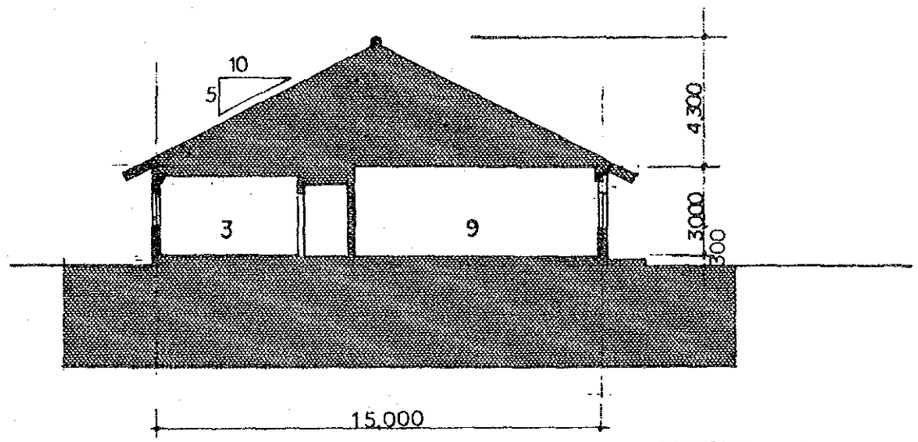


PLAN S=1:200



SECTION A—A

1 HALL	11 STORE RM.
2 OFFICE RM.	12 ISOLATION RM.
3 DIRECTOR & INSTRUCTOR RM.	13 GENERATOR RM.
4 MEETING RM.	14 SOIL PLACE
5 W.C.	15 SCREEN HOUSE
6 W.C.	
7 BALANCE RM.	
8 INCUBATION RM.	
9 OBSERVATION RM.	
10 INSTRUMENT RM.	

1 5 10 M

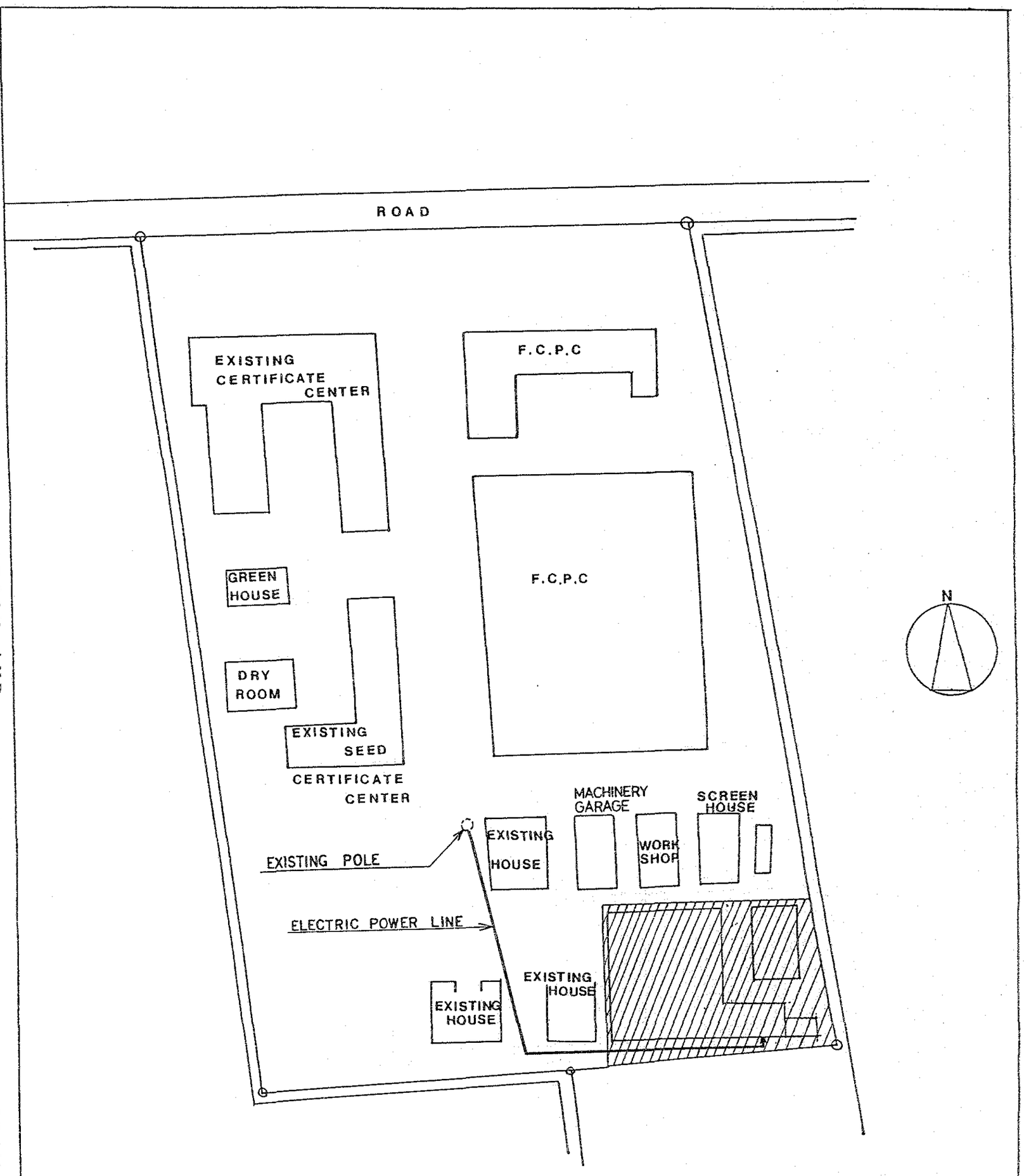
THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

LABORATORY AND SCREEN HOUSE FOR BPSB
PLAN, SECTION S=1:200 ELEVATION S=1:200

29

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

ELECTRICAL POWER DIAGRAM S=1:500

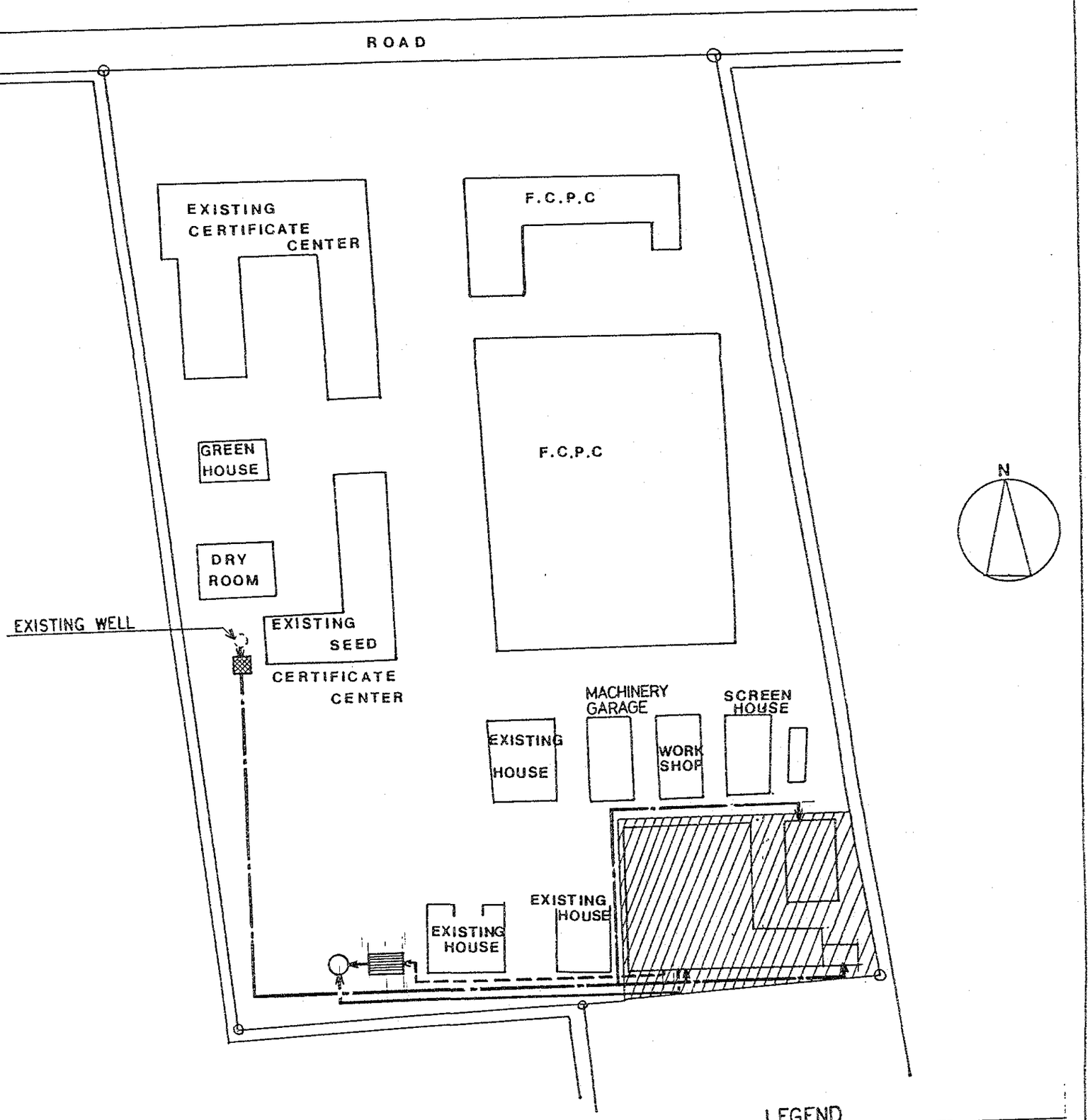


30

THE PROJECT FOR THE MULTIPLICATION AND DISTRIBUTION OF HIGH QUALITY SEED POTATO

WATER SUPPLY AND DRAINAGE DIAGRAM

S=1:500



31

4.3.10 Equipment Plan

The selection of research instruments and equipment was made based on the results of the examination of the Indonesian request and the field survey, and by taking into account of the requirements of the Japanese Grant Aid Cooperation Program, and the selection was decided as a result of the meeting with the Indonesian side according to the following basic principles:

- Priority should be given to such items which will be the main instruments or equipment at the Project related agencies;
- Priority should be given to such items which may be commonly used at various agencies and can be centrally maintained;
- Priority should be given to the types which are easy to operate;
- Priority should be given to such items which may require low operation and maintenance costs and should have domestically obtainable spare parts and consumable supply items;
- Similar items which are already possessed by Project related agencies should not be included with Project instruments and equipment;
- Each research instrument or equipment should be supplied together with standard attachment items, spare parts, and special use fixtures.
- The amount of consumable supply items and spare parts (except for a few special items) should be adequate for one year's use. Priority should be given to consumable supply items. Spare parts should only be provided for those parts that may possible wear out or become damaged. Other parts should be replaced or repaired under the terms of the manufacturer's warranty.

The list of instruments and equipment selected for Project use based on the above basic policies is provided in the Annex.

The installation requirements for major instruments and equipment are shown in Table 4-3-16.

Table 4-3-16 Conditions for Installation of Equipment

Name of Instrument of Equipment	Required Power	Temperature and Humidity	Other Requirements
Elisa Reader			
Liquid Chromotograph	Single phase 1.2KVA Single phase 20VA x 3 each	15 to 13°C	4 outlets
Clean Bench			
Refrigerator	3 phase, 18KVA	Ambient	Water supply and drain systems
Incubator	3 phase, 4.6KVA	Ambient	Water supply and drain systems
Water Cooler Unit	3 phase, 12KVA	Ambient	Water supply and drain system
Distillation Apparatus (deionized)	Single phase 1.5kva	Ambient	Water supply and drain systems
Draft Chamber		Ambient	Electricity or gas heat source. Water supply and drain systems. Exhaust duct with roof-top forced exhaust unit
Central Laboratory Beach		Ambient	One or two power outlets. Water faucet (10mm diameter). Sink

4.4 Construction Plan

The responsible and implementation agency for the Project is the Directorate of Horticulture, Directorate General of Food Crop Agriculture (DGFCA), Ministry of Agriculture of the Government of Indonesia.

After the Exchange of Notes for the Project is signed by the Governments of Japan and Indonesia, a contract agreement for the Project will be made between the two countries and a Japanese consultant company.

After the contract agreement is certified by the Government of Japan, the detailed design for the Project will be undertaken.

The Project will be financed by the Grant Aid Program of the Government of Japan.

Immediately after the Exchange of Notes for the Project is signed by the Japanese and Indonesian Governments, the Government of Indonesia will make a contract agreement with a Japanese foreign exchange bank to handle the banking services necessary for processing the Project's construction fund that is to be provided by the Grant Aid Cooperation Program of the Government of Japan.

The Government of Indonesia will put out the bid for the Project's design and construction supervision work and will make a contract agreement with the successful bidding Japanese consultant firm. The Government of Indonesia will then commence the Project construction based on the detailed design.

4.4.1 Construction Conditions and the Attention to be Paid to Project Construction

There are no large rivers existing near the Lembang Horticulture Research Institute and the Foundation Seed and Stock Seed farms in Pengalengan. Fine and course aggregate for the Project should therefore be procured in Bandung City and transported to Project sites.

Upon completion of Project construction, all the Project equipment and facilities will be operated and maintained by Indonesian personnel. To facilitate for the smooth transfer of Project equipment and facilities to Indonesian personnel, it is necessary that the technical training concerning the operations and maintenance of Project equipment and facilities should be given during the Project construction period.

4.4.2 Project Construction Policies

1) Basic Policies:

(1) All personnel responsible for building construction recognize their duties and do their best work in constructing the quality buildings which the Project requires.

(2) All personnel responsible for building construction should attempt to transfer the techniques of building construction and equipment installation to the Indonesian personnel.

(3) For the smooth implementation of the Project, all the Project construction personnel should communicate frequently with the Project related Japanese and Indonesian agencies.

(4) Cooperation between Indonesian agencies, consultants, and construction contractors must be maintained at a high level to carry out the Project construction smoothly.

(5) The utmost effort should be made to complete the Project construction on schedule.

(6) Japanese technicians specialized in the following fields should be dispatched for Project construction:

- Screen house:

  Supervision and technical transfer of steel frame fabrication.

- Clean room, culture room, and inuring preparation room:

  Supervision and technical transfer of panel fabrication and air conditioning unit installation.

- Radio communications units:

  Supervision and technical transfer of communications equipment installation.

- Major research equipment :

  Supervision and technical transfer of equipment installation.

2) Matters Pertaining to Project Construction Requiring Special Attention

(1) To expedite the utility installation work, such as the connection of power lines, any agreement made with responsible Indonesian agencies should be arrived at carefully.

(2) Since the Project construction will take place at four different sites, the construction methods and the capabilities of the contractors should be studied carefully.

(3) The boundary of the construction work to be borne by the Indonesian Government and financed by the Japanese Grant Aid Program must be clarified. Both parties must cooperate fully to perform the construction work.

(4) Coordinate wall and floor construction with power facility installation work.

(5) Coordinate wall and floor construction work with water supply and drainage facility installation work.

4.4.3 Construction and Construction Supervision Plan

1) The most important facet of construction supervision is to coordinate the technical, administrative, and construction work between the concerned Indonesian and Japanese parties. Therefore, the resident engineers who are sent to and will remain in Indonesia during the entire Project construction period should possess managerial skills and be qualified and capable of providing technical guidance.

2) Resident engineers must be experienced construction supervisors who can evaluate construction the site conditions and make accurate decisions for accomplishing the construction work.

3) Resident engineers must judge the construction work being performed at the Project sites and act as the coordinators between Project related Indonesian agencies and Japanese and Indonesian construction contractors in construction matters. The resident engineers must maintain close contact with Indonesian agencies, the Japanese embassy and JICA office in Indonesia to ensure that the construction work progresses smoothly.

4) Important duties of the resident engineers include erecting the buildings that are of quality sufficient to meet the needs of the Project, completing Project construction on schedule, providing technical transfer to local construction contractors, and supervising Project construction work.

5) The major duties of the resident engineers are listed below:

- Prepare monthly construction reports;
- Being witness to Project site ground bearing capacity determinations;
- Check and approve the construction drawings, inspect reinforcement bar setting work, and supervise concrete placing work;
- Check and approve detailed finish-work drawings and supervise the finish work.
- Witness and inspect the procurement of domestic materials and equipment.
- Hold periodic meetings relevant to Project construction.
- Manage the Project's construction schedule.
- Inspect and examine the completed Project construction work (witness the inspection and examination of completed Project construction work by the consultants and the Indonesian agencies).

6) One resident engineer will be required for building construction, one for farm improvement work, and one for equipment installation work. Thus, a total of three resident engineers should be dispatched to Indonesia to work on the Project.

4.4.4 Equipment and Materials Procurement Plan

The Project's basic policy is to procure the necessary equipment and materials in Indonesia to the greatest extent possible, so that it will allow the use of local construction methods and will contribute to Indonesian social and economic improvement.

Equipment and materials that are either not available in Indonesia, or required to be extremely accurate and of high performance, or are simply more expensive in Indonesia than in Japan should be procured in Japan. Equipment and materials that are prohibited from being imported into Indonesia should, of course, be procured in Indonesia.

If possible, domestic construction materials should be procured in the vicinity of the Project sites.

Building finish materials should be procured in Jakarta or Bandung and transported by trucks to the Project sites.

Equipment and materials procured in Japan will be unloaded at the Port of Jakarta and transported to Project sites by using trucks.

1) Major Equipment and Materials to be Procured in Indonesia

(1) Building Materials:

Cement, sand, coarse aggregate, concrete blocks, shaped steel, reinforcement bars, form materials, corrugated slate, tile, aluminium sash, aluminium jalousie, window glass, wood products for base and finish work, paint, terrazzo blocks, caulking material, gypsum board, and vinyl sheeting.

(2) Electrical Equipment and Materials:

Wire, cable, conduit, switching units, electrical wall outlets, gages, lighting fixtures, and telephone switchboards.

(3) Water Supply, Drainage, and Sanitation Work Items:

Ploy vinyl chloride pipes, vinyl pipes, toilet fixtures, and water faucets.

2) Equipment and Materials to be Procured in Japan

(1) Building Materials:

Building finishing fixtures, steel plate frames, acoustic boards, and framed panels.

(2) Electrical Equipment:

Generator units, and radio communications equipments.

(3) Water Supply and Drainage Facility:

Elevated water tanks and pumping units.

(4) Screen house material

(5) Irrigation system materials

(6) Vehicles

4.4.5 Construction Schedule

Project construction will be under the auspices of the Government of Japan's Grant Aid Cooperation Program and will be carried out in accordance with the following schedule:

1) The Exchange of Notes (E/N) concerned with the objectives and contents of the Project, and with the amount of grant aid required for the Project will be signed by representatives of the Governments of Indonesia and Japan.

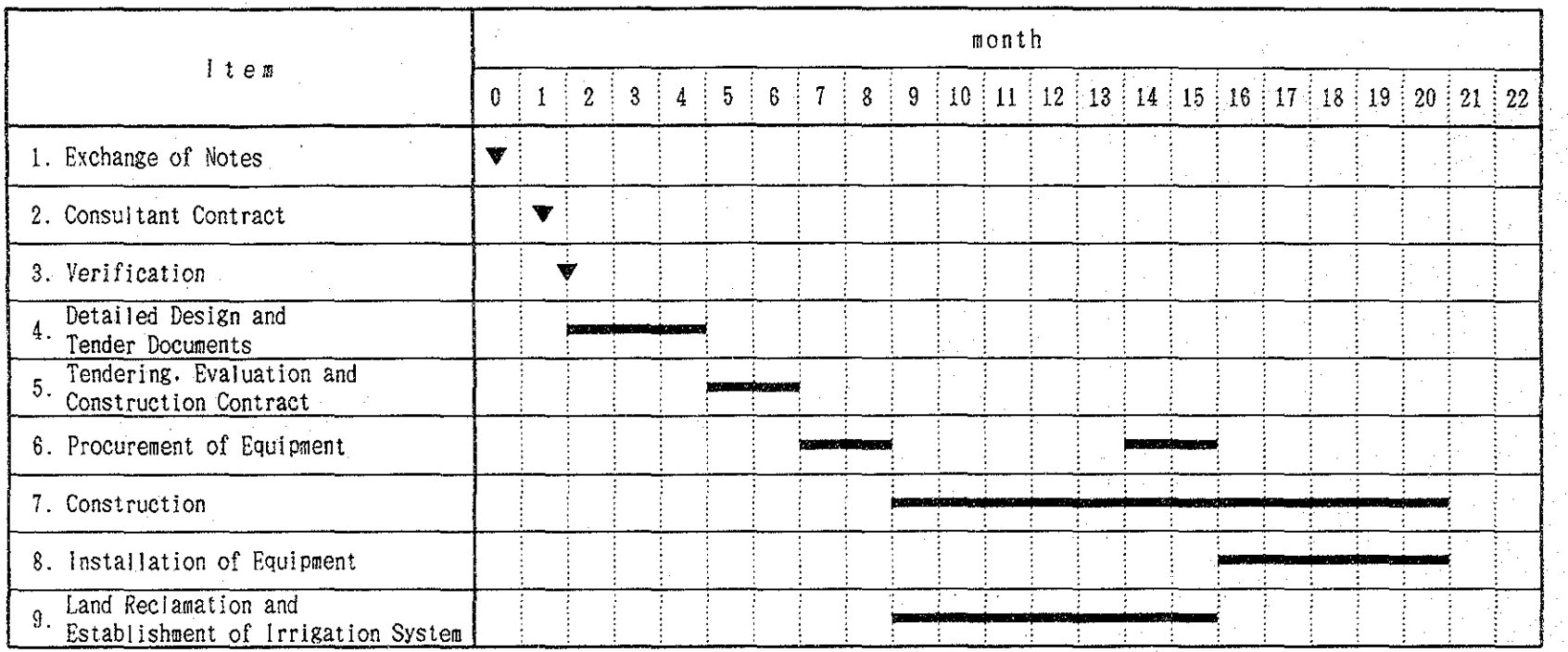
2) The Government of Indonesia will make a banking agreement with a Japanese foreign exchange bank for transferring the money covered by Grant Aid cooperation in accordance with the Exchange of Notes.

3) The Government of Indonesia will make contract agreements with consultant firms for the procurement of Project use equipments and materials, and for facility construction work that are needed to fulfill the objectives of the Project.

4) After the Project's Exchange of Notes is signed, it will take approximately about 4 - 6 months to conduct field surveys, prepare detailed design and contract documents, make the construction contract agreement, and procure and inspect Project use equipments and materials.

The Project's construction schedule is shown in Fig. 4-4-1.

Fig.4-4-1 Implementation Schedule



4.4.6 Project Construction Costs

1) Construction Costs

Project construction costs as borne by the Indonesian Government are estimated as Rp314 million.

The foreign exchange rate used for estimating the cost was US$1.00 = 137.74 yen (Rp1.00 = 0.0781 yen, September 1989 rates).

2) Construction work items and their costs that will be borne by the Indonesian Government are as follows:

	(Unit: Rp1,000)
(1) Site reclamation and preparation works	6,180
(2) Access road construction	12,500
(3) Gates and fence construction	27,000
(4) Power line connection works	30,000
(5) Tree planting	15,000
(6) Furniture, office equipment, utensils, etc.	110,000
(7) Banking services	3,700
(8) Tax exemption and import duties	75,000
(9) Legal fees to obtain building permits	20,000
(10) Labor costs for installing equipment	5,000
TOTAL:	314,380

4.4.7 Work Items to be Undertaken by the Governments of Japan and Indonesia

For Project construction, the work items to be undertaken by the governments of Japan and Indonesia are as follows:

1) Work Items to be Undertaken by the Japanese Government:

(1) Supply of Project use equipment and materials.

(2) Dispatching the engineers and specialists necessary for installing the Japanese supplied equipment and facilities.

(3) Pay the transportation and insurance fees for shipping Project use equipment and materials from Japan to Project sites in Indonesia.

(4) Pay the detailed design and construction supervision fees necessary for the Grant Aid Cooperation Project.

2) Work Items to be Undertaken by the Indonesia Government:

(1) Procurement of Project sites and the installation of the primary utility lines and other facilities necessary for Project construction (power lines, air conditioning, water supply, drainage, and the repair and improvement of existing facilities).

(2) Procurement of furniture and utensils.

(3) Planting of trees.

(4) Installation of equipment supplied by the Japanese Government.

(5) Pay the custom fees and unloading charges for the equipments and materials supplied by the Japanese Government.

(6) Pay the import duties and incidental expenses and take necessary measures for obtaining customs clearance for the materials, equipment, and spare parts to be brought into Indonesia by the Japanese consultant and contractors for use in the implementation of the Project.

(7) To smooth the way for Japanese nationals whose services may be required in connection with the supply of Project use goods and construction work to enter Indonesia and remain in the country to perform their assigned tasks.

(8) Perform all the other works not covered by the Grant Aid Cooperation Program of the Japanese Government but is necessary for Project implementation.

CHAPTER 5 : EFFECTS OF THE PROJECT AND CONCLSION

CHAPTER 5 EFFECTS OF THE PROJECT AND CONCLUSION

5.1 Effects of the Project

To cope up with the diversification of food crops after becoming self-sufficient in their rice production, the government of Indonesia is planning to increase potato production as an alternate source of carbohydrate. However, it is not possible to increase potato cultivation areas in the climatically suitable areas of over 1,000m in elevation. Instead, potato production will now be increased in farming areas having elevations in the 400m to 1,000m range.

In West Java, the present potato yield rate is low (10 tons/ha), which indicates that increasing the potato yield along with increasing the cultivation area is important for the production of potatoes. One of the main reasons for the low yield rate is that potato producing farms use low quality seed potatoes

High quality seed potatoes are presently being imported from West Germany and other countries. But due to the high prices and inadequate distribution system, most of the ordinary farms are unable to obtain them.

During the initial stage of the Project, it will be possible to supply 1,500 tons/year of pathogen-free high quality seed potatoes to farms at reasonable prices. Finally the Project will allow a supply of 4,500 tons/year.

By implementating the Project, it is expected with the introduction of high quality seed potatoes, a present yield of 10 tons/ha will be increased to 20 tons/ha or more.

5.2 Conclusion

The Project can produce effective results and thereby improve the living standards of the inhabitants. For this reason, the decision to implement the Project under the Grant Aid Cooperation Program is

quite appropriate. Indonesia has adequate budget and the personnel for the operations and management of the Project; there should be no problems for Project implementation.

5.3 Recommendations

This Project has been considered appropriate for receiving the Grant Aid Cooperation. Project operations will run smoother and more effectively, if the following points are improved or modified:

1) Improvement of Personnel Education and Operation System:

For the effective functioning of each Project related organization, the personnel should be educated in accordance with the staff plans which clearly indicates their individual roles. Also, the operational system should be modified.

2) Implementation of Training Programs for Project Personnel and Farmers:

Operators and other personnel should be provided with the training necessary to become skilled in operating the Project's high performance equipments and machinery.

It is necessary to increase the cultivation skills of seed potato farmers. It is also necessary for them to be made aware of the importance of using high quality seeds and of establishing a distribution system.

3) Conditions for Installing Equipments and Machinery

With regard to the installation of farm machinery and equipments, improvements of the necessary facilities is, of course, important. It is also important to consider the installation conditions of the machinery and equipments so that their functions can be fully demonstrated.

4) Establishment of Machinery and Equipments Operation and Maintenance System

Engineers must be exclusively assigned the task of operating and maintaining the machinery and equipments; they must make certain that it is functioning properly. The necessary budget for operations and maintenance must be secured.

5) The Provision of Technical Cooperation

After the Project has been efficiently and effectively implemented and the foundations for the activities of Project related organizations have been established, project-type technical cooperation would be desirable for the multiplication of high quality seed potatoes and for the strengthening of the distribution system.