(5) BUILDING FLOOR AREAS

1) Summary of Floor Areas

a.	Main Building (Administrative, Multipurpose Training & Canteen)		3,088
b.	Workshops		
	Machining Workshop	1,356	
	Electrical Workshop	1,421	
	Welding and Sheet Metal Workshop	1,264	
	Ceramics Workshop Wing	934	
	Painting Workshop	1,154	
	Building Construction Workshop	1,201	
	Agro-Mechanics & Car Body Repair Workshop	1,374	
	Auto Mechanics Workshop	1,264	
	Subtotal		9,968
c.	Dormitory		1,895
d.	General Storage		354
e.	Mobile Training Garage		200
f.	Guard and Security Staff Houses		69
g.	Covered Walk		670
	Grand Total		16,244 m^2

2) Breakdown of Floor Areas

a. Main Building

1. Ground Floor

Entrance Hall	58
Application & Registration (w/Chief Room & Storage)	32
Administration (w/Chief Room & Storage)	54
Accounting (w/waiting space & Strong Room)	21
Director Room (w/Locker Room)	25
Exhibition Room (w/Storage)	50
Training Aid Production	43
Library	64
Research & Planning	43
Staff Room	64
Chief Room	21
Conference Room	64
First Aid (w/Nurse Office & Toilet)	21
Storage	14
Multipurpose Training Hall	488
Canteen (w/Pantry)	396
Toilets (Men & Women 3 units each)	72
Corridors & Stairs	353
Subtotal	1,883 m^2

2. Second Floor

Training Promotion & Non Technical Training (w/Chief Room & Storage)	56
Retraining Seminar Room 1, 2 (2 Seminar Rooms w/movable partition)	112
Retraining Seminar Room 3, 4	96
Drawing Room	84
Blue Printing Room (w/Storage)	28
Non Technical Classroom	56
Dress Making Training Room	60
Audio-Visual Room (w/Control Room)	84
Seminar Room (w/movable partition)	56
Electronics Training Room	
Monochrome & Colour TV Repair Training	84
Receiver & Amplifier Repair Training	70
Instructor Room and Mechanical Room for Electronics Training	28
Storage	57
Toilet (Men & Women 2 units each)	18
Corridors & Stairs	99
Subtotal	274
	1,205 m^2

Main Building Total 3,088 m^2

b. Workshops

1. Machining Workshop

Instructor Room	37
Chief and Meeting Room	24
Pantry	7
Toilet (for Instructor)	2
Storage	7
Classroom	46
Toilet (for Trainees)	15
Shower Room (for Trainees)	15
Locker Room (for Trainees)	17
Material Storage	47
Workshop	1,069
Corridor, Stairs & Balcony	70
Sub total	1,356 m^2

2. Electrical Workshop

Instructor Room	37
Chief and Meeting Room	24
Pantry	7
Toilet (for Instructor)	2
Storage	7
Classroom	46
Toilet (for Trainees)	15
Shower room (for Trainees)	15
Locker Room (for Trainees)	17
Material Storage	47
Workshop	1,087
Training Stage (Mezzanine)	47
Corridor, Stairs & Balcony	70
Subtotal	1,421 m^2

3. Welding & Sheet Metal Workshop

Instructor Room	37
Chief & Meeting Room	24
Pantry	7
Toilet (for Instructor)	2
Storage	7
Classroom	46
Toilet (for Trainees)	15
Shower Room (for Trainees)	15
Locker Room (for Trainees)	17
Material Storage	47
Workshop	977
Corridor, Stairs & Balcony	70
Subtotal	1,264 m^2

4. Ceramics Workshop

Instructor Room	37
Chief and Meeting Room	24
Pantry	7
Toilet (for Instructor)	2
Storage	7
Classroom	46
Toilet (for Trainees)	15
Shower Room (for Trainees)	15
Locker Room (for Trainees)	17
Material Storage	47
Workshop	647
Corridor & Stairs	70
Subtotal	934 m^2

5. Painting Workshop

Instructor Room	37
Chief and Meeting Room	24
Pantry	7
Toilet (for Instructor)	2
Storage	7
Classroom	46
Toilet (for Traines)	15
Shower Room (for Trainees)	15
Locker Room (for Trainees)	17
Material Storage	47
Workshop	867
Corridor & Stairs	70
Subtotal	1,154 m^2

6. Building Construction Workshop

Instructor Room	37
Chief and Meeting Room	24
Pantry	7
Toilet (for Instructor)	2
Storage	7
Classroom	46
Toilet (for Trainees)	15
Shower Room (for Trainees)	15
Locker Room (for Trainees)	17
Material Storage	47
Workshop	914
Corridor & Stairs	70
Subtotal	1,201 m^2

7. Agro-Mechanics & Car Body Repair Workshop

Instructor Room	37
Chief and Meeting Room	24
Pantry	7
Toilet (for Instructor)	2
Storage	7
Classroom	46
Toilet (for Trainees)	15
Shower Room (for Trainees)	15
Locker Room (for Trainees)	17
Material Storage	47
Workshop	1,087
Corridor & Stairs	70
Subtotal	1,374 m^2

8. Auto Mechanics Workshop

Instructor Room	37
Chief and Meeting Room	24
Pantry	7
Toilet (for Instructor)	2
Storage	7
Classroom	46
Toilet (for Trainees)	15
Shower Room (for Trainees)	15
Locker Room (for Trainees)	17
Material Storage	47
Workshop	977
Corridor & Stairs	70
Subtotal	1,264 m^2

Workshop Total 9,968 m^2

3) Dormitory Floor Area

a. Entrance Wing

Hall	30
Lounge	36
General Purpose Area	192
Warden's Quarters	30
Toilet	24
Pantry	12
Subtotal	324 m^2

b. Quarters

Pre-Employment Quarters (104 persons)	533 m^2
Type A (20 beds x 2 rooms)	
Type B (16 beds x 2 rooms)	
Type C (12 beds x 2 rooms)	
Type D (8 beds x 2 rooms)	
Up Grading/Re-Training (28 persons)	117
Type A (20 persons)	
Type B (8 persons)	
Toilet & Shower Room	316
Corridor & Stairs	510
Covered Corridor	95
Subtotal	1,571 m^2

Dormitory Total	1,895 m^2

4) General Storage

Store Keeper's Office	18
Waiting Area	30
Toilet, Shower & Pantry	12
Corridor	30
Training Material Storage	60
Administrative Material Storage	60
Scrap Material Storage	30
Training Products Storage	120
Subtotal	360 m^2
Scrap Material Stock Area (Exterior w/Fence)	100 m^2
General Storage Total	460 m^2

5)	Mobile Training Garage	
	Total	200 m^2
6)	Guard & Security Staff Houses	
	Front Guard House	
	Information Room	7
	Staff Room	29
	Toilet & Shower Room	3
	Subtotal	39 m^2
	Back Guard House	
	Information Room	7
	Staff Room	20
	Toilet & Shower Room	3
	Subtotal	30 m^2
	Guard House Total	69 m^2

(6) MATERIAL DESIGN

1) Main Building

a. Administration Zone

RC, 1-Story

Exterior Finish

Roof	:	RC slab and asphalt roofing with roofing tiles
Walls	:	exposed aggregate finish aluminium sashwork balcony walls: exposed aggregate finish balcony railings: aluminium
Floor	:	open-ended corridors: exposed aggregate finish

Interior Finish

Room	Floor	Walls	Ceiling
Entrance Hall	terrazzo tiles (brass jointing)	cement plaster paint finish	acoustical boards
Offices	long vinyl sheets	"	"
Conference Rooms	parquet	"	"
Director's Room Staff Rooms	"	cloth finish	"
Corridors	terrazzo tiles	cement plaster paint finish	"
Toilets	asphalt waterproofing, mosaic tiles	108mm square tiles	calcium silicate board
Storage	mortar finish using metal trowel	cement plaster paint finish	"

b. Multi-Purpose Training Zone

RC, 2-Storys

Exterior Finish

Roof	:	RC slab and asphalt waterproofing with roofing tiles Corrugated cement colour boards for the roof of the multi-purpose hall.
Walls	:	aluminium sashwork jalousie windows (partially) balcony walls: exposed aggregate finish balcony railings: aluminium aluminium louvre screens
Floor	:	open-ended corridors: exposed aggregate finish

Interior Finish

Room	Floor	Walls	Ceiling
Entrance Hall	terrazzo tiles	exposed aggregate finish	acoustical boards
Seminar Rooms	long vinyl sheets	cement plaster paint finish	"
Electronics Rooms	OIC carpet	acoustical boards paint finish	
Training Aid Room	"	"	"
Multi-Purpose Hall	terrazzo tiles	"	"
Corridors	exposed aggregate	cement plaster paint finish finish	"
Toilets	mosaic tiles	108mm square tiles	calcium silicate board

2) Workshops

RC columns and Steel Beams
Single story with 2-story portion (partial)

Exterior Finish

Roof	:	reinforced concrete, paint finish
Walls	:	PC boards and concrete blocks in parts paint finish steel sashwork (casement windows) aluminium louvres concrete canopies for sunshade rainwater storage tanks (PVC)
Connecting Corridors	:	roof: corrugated cement sheets columns and beams: RC paint finish floor: RC exposed aggregate finish

Interior Finish

Room	Floor	Walls	Ceiling
Chief's Room Instructors' Rooms	parquet paint finish plaster board paint finish	cement plaster boards	acoustical boards
Meeting Rooms	long vinyl sheet	"	"
Classrooms	"	"	"
Corridors	exposed aggregate finish	cement plaster paint finish plaster board paint finish	"
Toilets/ Shower Rooms	mosaic tiles	108mm square tiles	calcium silicate board paint finish
Workshops	colour hardener	PC boards, skirting paint finish concrete blocks paint finish	exposed rafters paint finish
Material Storage	mortar finish using metal trowel with jointing	"	calcium silicate boards paint finish

3) Dormitory

RC, 2-story and single story accommodation wings and single story entrance wing and connecting corridors

Exterior Finish

Roof	:	RC slab and asphalt with roofing tiles
Walls	:	exposed aggregate finish aluminium sashwork and some jalousie windows wooden louvre paint finish (corridor sides of dormitories) balconies and corridors: exposed aggregate finish (skirting) aluminium railings concrete canopies for sunshades
Floor	:	open-ended corridors: exposed aggregate finish
Connecting Corridors:		roof: corrugated cement sheets columns and beams: RC or AP floor: RC exposed aggregate finish

Interior Finish

Room	Floor	Walls	Ceiling
Entrance Wing			
Entrance Hall	terrazzo tiles	cement plaster paint finish	acoustical boards
General Purpose Area	parquet	"	"
	"	"	"
	"	tiles (partially)	"
	"	cement plaster	"
Warden's Quarters	"	"	"
Corridors	terrazzo tiles	"	"
Pantries	mosaic tiles	cement plaster paint finish 108mm square tiles for skirting	calcium silicate boards paint finish
Toilets	mosaic tiles (asphalt water-proofing)	"	"
Accommodation Wing			
Quarters	parquet	cement plaster paint finish	acoustical board
Toilets/Shower Rooms	mosaic tiles (asphalt water-proofing)	cement plaster paint finish 108mm square tiles for skirting	calcium silicate boards paint finish

4) Canteen

RC, Single Story

Exterior Finish

Roof	:	RC slab and asphalt waterproofing with roofing tiles
Walls	:	exposed aggregate finish aluminium sashwork and jalousie windows
Terrace Floor	:	exposed aggregate finish
Service Yard	:	concrete with jointing, drainage covers
Refuse Disposal Area	:	concrete blocks
Roof	:	corrugated cement sheets

Interior Finish

Room	Floor	Walls	Ceiling
Entrance Hall	terrazzo tiles	cement plaster paint finish	acoustical boards
Dining Room	"	"	"
Cooking Booth	mosaic tiles	cement plaster paint finish 108mm square tiles for skirting (H=1,500mm)	calcium silicate boards paint finish
Toilets	"	"	"

5) General Storage and Mobile Training Garage

RC, Single Story

Exterior Finish

Roof	:	corrugated cement sheets
Walls	:	columns, RC mortar finish using metal trowel, concrete blocks paint finish aluminium sashwork and jalousie windows security grills, steel paint finish

Interior Finish

Room	Floor	Walls	Ceiling
Store Keeper's Office	parquet	cement plaster paint finish double plaster boards (H=2,500mm) paint finish	face plaster boards paint finish
Storage Area	mortar with jointing using metal trowel	"	exposed
Toilets	mosaic tiles	" 108mm square tiles for skirting	calcium silicate board paint finish
Mobile Training Garage	"	concrete block paint finish cement plaster paint finish	

6) Guard and Security Staff Houses

RC, Single Story (2 Buildings)

Exterior Finish

Roof	:	RC slab with exposed asphalt waterproofing
Walls	:	exposed aggregate finish aluminium sashwork

Interior Finish

Room	Floor	Walls	Ceiling
Information and Guard Space	terrazzo tiles	cement plaster paint finish	acoustical boards
Staff Rooms	"	"	"
Bedrooms	"	"	"
Pantries	mosaic tiles	" 108mm square tiles for skirting	calcium silicate boards paint finish
Toilets	"	"	"

(7) STRUCTURAL PLANNING

1) Design Standards

The structural design standards which are currently applicable in Thailand are those of the Engineering Institute of Thailand, the By-Laws of the Bangkok Metropolis (1979), the Re-Control of the Construction of Buildings (1979), the ACI (American Concrete Institute), the AISC (American Institute of Steel Construction) and JIS/JAS. In principle, therefore, these Thai standards are to be used and the relevant JIS/JAS standards will be used for those fields where local standards do not exist.

2) Foundation Construction Method

The use of locally manufactured precast concrete piles (300 x 300mm, 350 x 350mm, lengths = 8m) with friction and point supports is planned. This is based on the analysis and examination of the boring tests.

3) Framing Method

In principle, reinforced concrete will be used. Light gauge structural steel and regular structural steel (in case of large spans), which are frequently used in Thailand, will be used only for the top floors.

With regard to floorboards, reinforced concrete and precast concrete floorboards (local products) will be used for the first floors and the second/third floors respectively for economical construction costs and a short construction period.

4) Design Loads

a. Fixed Loads

Reinforced Concrete	:	2.4 t/m^2
Reinforced Concrete Block	:	2.0 t/m^2

b. Live Loads

Roof (standard type)	:	50 kg/m^2
Roof, Eaves (concrete type)	:	100 kg/m^2
Offices	:	300 kg/m^2
Workshops	:	500 kg/m^2
Halls, Stairs, Corridors	:	300 kg/m^2
Multi-Purpose Hall	:	400 kg/m^2
Dormitories	:	200 kg/m^2
Toilets, Shower Rooms	:	150 kg/m^2
Canteen	:	400 kg/m^2

Regular alcoves or independent foundations may be introduced for those places where a heavy load is expected in view of heavy equipment or water tanks, etc. depending on the actual weight and location.

c. Seismic Load

As Thailand is outside Asia's seismic belt and as there are no standards for seismic load, seismic force will not be considered in the design of the buildings. Seismic provisions are not included in the current bylaws of the Bangkok Metropolis for building construction.

d. Wind Force

Based on existing data, a wind coefficient of 50 kg/m^2 will be adopted.

5) Main Structural Materials

The following materials will be used as the main structural materials.

Concrete : FC = 210 kg/cm^2 (3,000 Psi)
Slump - 6.5 cm (16 inches)

Reinforcing Bars:

Type	Long-Term	Short-Term	JIS
Plain Bar	1,600 kg/cm^2	2,400 kg/cm^2	SR24
Deformed Bar	2,000 kg/cm^2	3,000 kg/cm^2	SD30
	2,200 kg/cm^2	3,500 kg/cm^2	SD35

Steel:

Type	Long-Term	Short-Term	JIS
H Beam	1,600 kg/cm^2	2,400 kg/cm^2	SS41
Steel Plate	1,600 kg/cm^2	2,400 kg/cm^2	SS41

(8) ELECTRICAL EQUIPMENT DESIGN

1) Design Policy

Consideration is to given to easy maintenance and to the facilitation of future improvements in view of changing conditions in the future, especially in the design of the workshops. Utility equipment which can be easily maintained locally is to be selected. Exposed piping is to be adopted to enable maintenance and future changes. Energy saving measures such as individual light switches and simple power facilities, including air-conditioning, sanitation and power facility are to be introduced, in addition to energy saving construction methods.

In the case of the administration section, higher building standards, including concealed piping and a standard luminous intensity of some 400 lux, is to be adopted so that the building does not become out-dated too soon.

2) Sub-Station

A power supply of 3-phase, 3-wire, 12 KV, 50 Hz will be received by an outdoor sub-station via a suspended power cable. This is to be transformed to 3-phase, 4-wire, 380V/220 V for supply to each power point.

As the total facility load is roughly estimated to be 800-1,000 KW. 2 transformers with capacities of either 400 KW or 500 KW should be installed.

Power System Trunk Line	3P, 4W, 380V/220V
Power	3P, 3W, 380V
Lighting, Power Points	1P, 2W, 220V

3) Trunk Line and Power Facilities

Power supply from the sub-station to each building is to be via underground cables. Power supply to each power point is to be via distribution boards and control panels.

As the power load in workshops is expected to be high, a special distribution board is to be installed for each workshop.

A main breaker which can be easily operated from outside is to be installed as a safety measure.

4) Lights and Power Points

While fluorescent fixtures will be mainly used for lighting purposes, mercury lamps and glow lamps are to be used partially.

The lighting appliances are to be divided into a number of small blocks for the sake of energy saving.

The luminous intensity standards are to be some 300 lux for the work places in workshops and 400 lux for offices and classrooms.

Wall power points are to be used in all the rooms excepting the workshops where the power is to to be supplied via floor ducts.

The light switches are to be centralized into 1 switch on the distribution boards.

The lighting fixtures in the workshops are to be fixed to raceways (H = 5.0m) suspended from the ceiling.

5) Telephone Facilities

A switchboard is to to be installed in the administration building for internal and external calls.

6) Alarms

Manual fire and burglar alarm buttons and alarm bells are to be installed in the corridors, etc. for early detection and escape purposes.

7) Broadcasting Facilities

Broadcasting equipment, including an amplifier, timer and a chime, are to be installed in the administration building for in-house broadcasting and speakers are to be installed in the canteen, outdoors and in those rooms where installation is deemed to be appropriate. A 20 position conference system is to be provided for the Conference Room on the ground floor.

8) Grounding

An influence type of lightning rod is to be installed on the elevated water tank in view of the considerable lightning in the area in the rainy season.

(9) WATER SUPPLY, DRAINAGE AND SANITARY FACILITIES

Priority should be given to a system which is easy to maintain and whose functions can be quickly restored after damage due to flooding, etc., avoiding reliance on mechanical power as much as possible. The system should also be designed to function well for a long period of time.

1) Water Supply Facilities

In principle, tap water should only be used as miscellaneous and industrial water. Cartridge tank type water coolers filled with mineral water sold on the market are to be installed at appropriate locations throughout the Centre.

An FRP water tank is to be installed near the general storage area. Although there are various water supply systems, i.e. the gravity system using an elevated water tank, the pump running system and the pressure tank system, the gravity system using an elevated water tank is to be adopted in view of its easy maintenance.

The total design water supply is $140m^3$/day, i.e. $70m^3$/day required by the equipment and personnel plans and $70m^3$/day for use in staff accommodations. The capacity of the water tank is designed to be equivalent to 2 days' supply volume, i.e. $280m^3$ to allow flexibility in water use. 2 elevated water tanks are to be independently installed near the water tank and the dormitories with a capacity of $60m^3$ each. A well is to be dug as a back-up in the case of a failure of the water supply. A number of rainwater storage tanks are to be provided for use at appropriate locations, such as under the eaves of the buildings, etc.

2) Drainage Facilities

Drainage ditches are to be constructed on both the eastern and western sides of the site and final drainage from the site is to use the existing culverts.

3) Sanitation Fixtures

Those sanitation fixtures used in the toilets and shower rooms are to be local products.

4) Fire-Fighting Facilities

As there are no clear regulations concerning fire-fighting facilities in Thailand, all fire-fighting facilities are voluntarily provided. In the present plan, fire extinguishers are to be provided at appropriate locations.

5) Gas Facilities

The gas used in the canteen is to be LPG and the cylinders for the gas are to be located outside the cooking booths. The number of cylinders required is estimated to be 32 (50kg each) which are to cover 2-use cycles.

Cylinders containing various welding gases are to be stored at the outdoor gas storage and the gases supplied to the welding booths from there.

(10) AIR-CONDITIONING AND VENTILATION FACILITIES DESIGN

In consideration of the maintenance requirements, future running costs and the area's current conditions, design priority should be given to the use of natural ventilation methods as far as possible.

Forced ventilation is to be adopted for the toilets and pantries in each building. Those rooms where mechanical air-conditioning and ventilation equipment are to be installed are listed below.

1) Air-Conditioning

a. Rooms to be Air-Conditioned

Administrative Zone of Main Building

- Director's Room
- Staff Room
- Conference Room

Multi-Purpose Training Zone of Main Building

1F
- Training Aid Production
- Library

2F
- Drawing Room
- Electronics Training Instructors Room
- Non-Technical Staff Room
- Audio Visual Room
- A/V Control Room

Workshops

- Instructor Rooms

General Storage

- Store Keeper's Office

b. Design Temperatures for Air-Conditioning

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

c. Rooms to be Equipped with Overhead Fan

Main Building

All staff rooms where air-conditioning is not provided.

Workshops

Meeting Rooms and Classrooms in all Workshops

Dormitory

All living quarters

Canteen

Cooking Booth

Dining Area

General Storage

Waiting Area

Guard and Security Staff Room

All private rooms

d. Rooms to be Equipped with Special Ventilation Facilities

Welding and Sheet Metal Workshop

Semi Automatic Welding Booths - Individual ventilation system for each booth

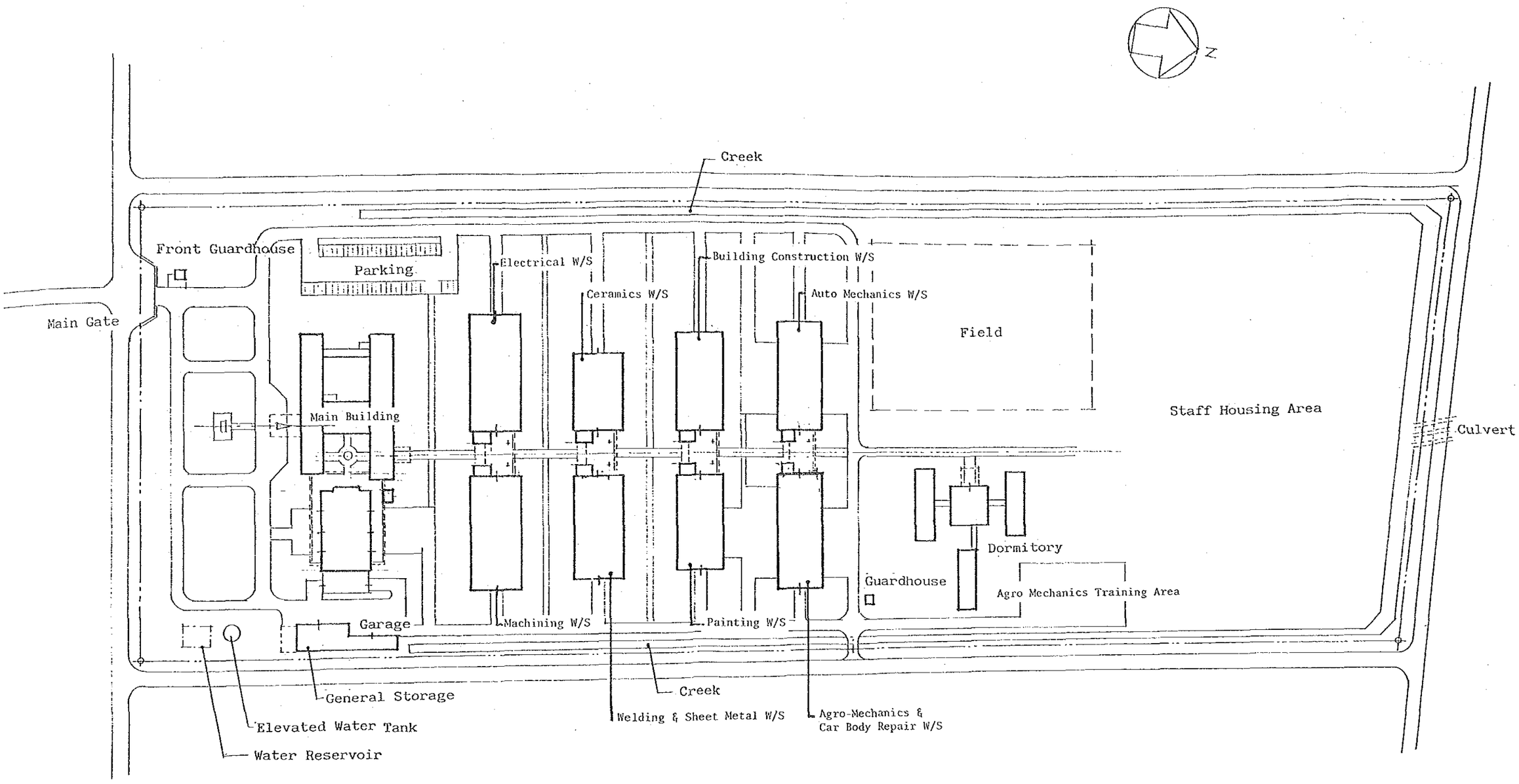
Arc Welding	-	Same as above
Gas Cutting	-	Wall-type pressure fan
Work Bench	-	Wall-type pressure fan
Gas Welding	-	Ventilation system with hood above work tables
Sheet Metal	-	Same as above (for special chemicals)

Painting Workshop

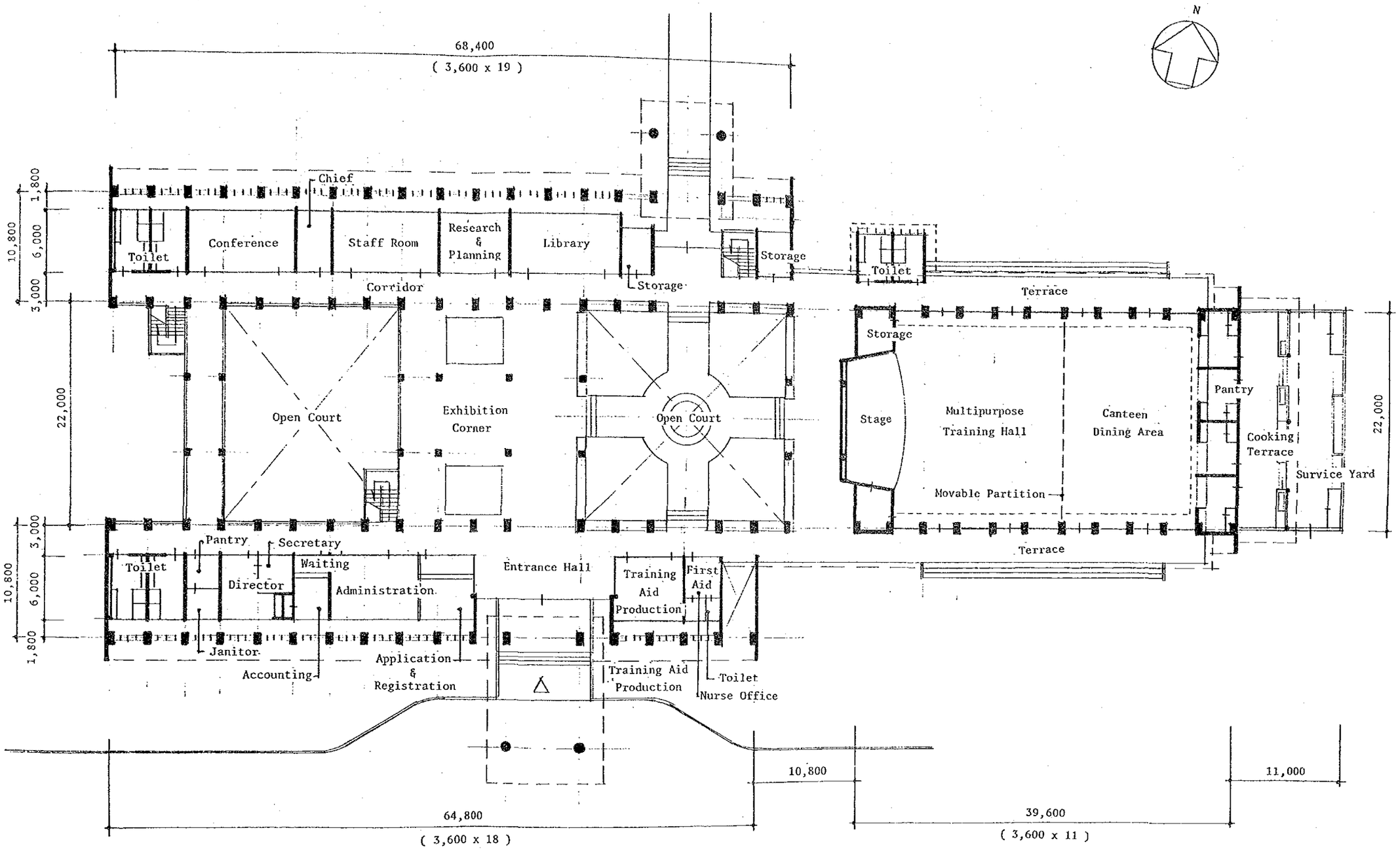
Spraying Cab (wall-type pressure fan)

(11) BASIC DESIGN DRAWINGS

1. Site Plan
2. Main Building Ground Floor Plan
3. Main Building Second Floor Plan
4. Main Building Elevations
5. Main Building Elevations
6. Main Building Sections
7. Machining Workshop Wing Floor Plan
8. Electrical Workshop Wing Floor Plan
9. Welding & Sheet Metal Workshop Wing Floor Plan
10. Ceramics Workshop Wing Floor Plan
11. Painting Workshop Wing Floor Plan
12. Building Construction Workshop Wing Floor Plan
13. Agro-Mechanics and Car Body Repair Workshop Wing Floor Plan
14. Auto Mechanics Workshop Wing Floor Plan
15. Workshop Wing Elevations
16. Workshop Wing Sections
17. Dormitory Ground Floor Plan
18. Dormitory Second Floor Plan
19. Dormitory Elevations
20. Dormitory Section
21. General Storage & Mobile Training Garage
22. Guardhouse

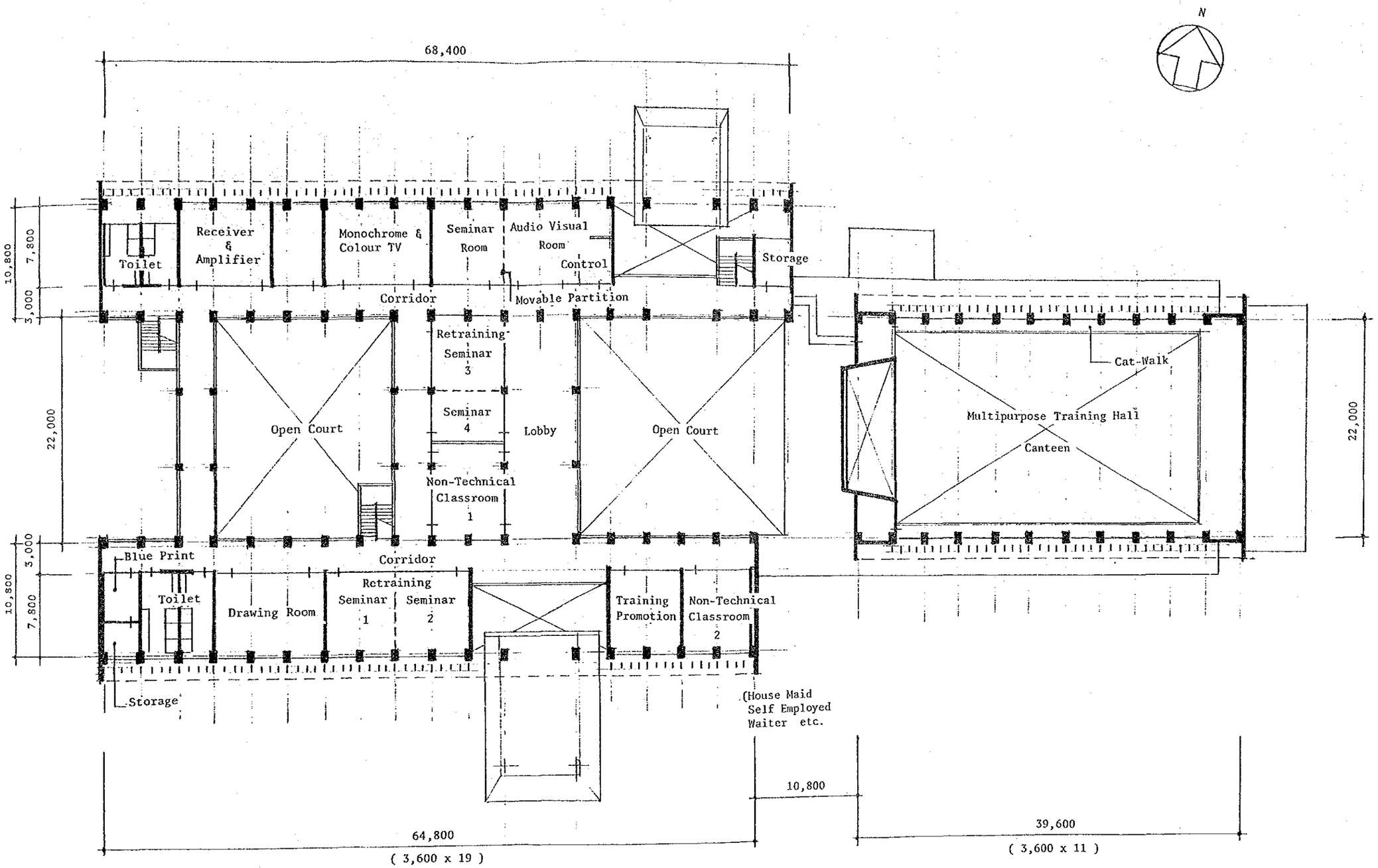


1 . Site Plan S=1:2,000



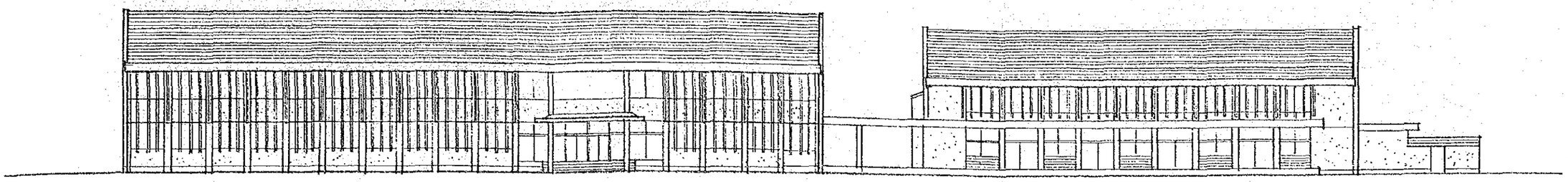
2. Main Building

Ground Floor Plan S=1:400

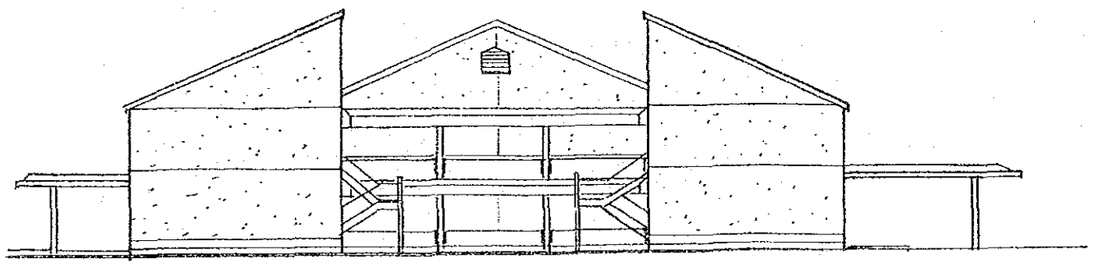


3. Main Building

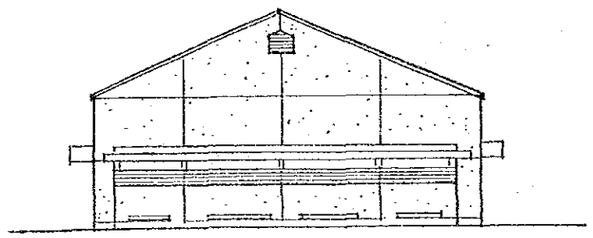
Second Floor Plan S=1:400



South Elevation

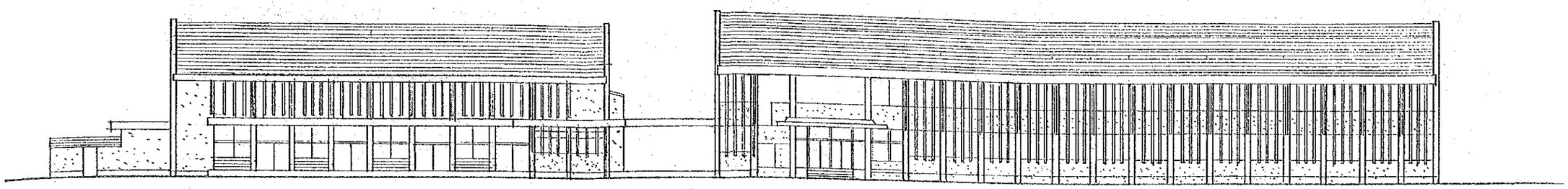


West Elevation

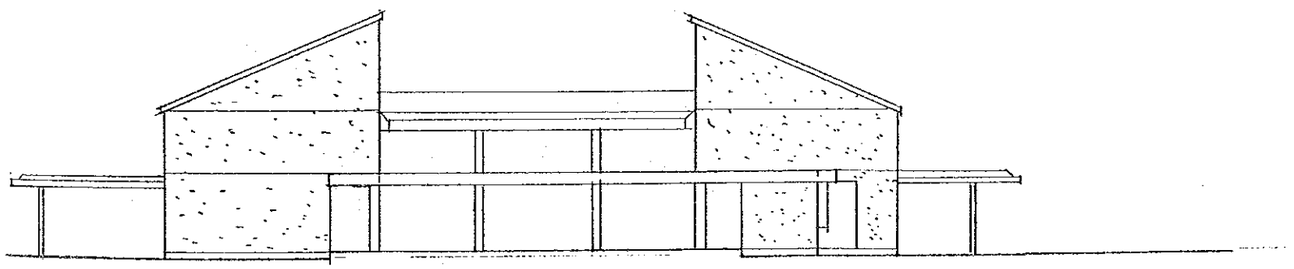


Multipurpose Training Building Elevation

4. Main Building
Elevations S=1:400



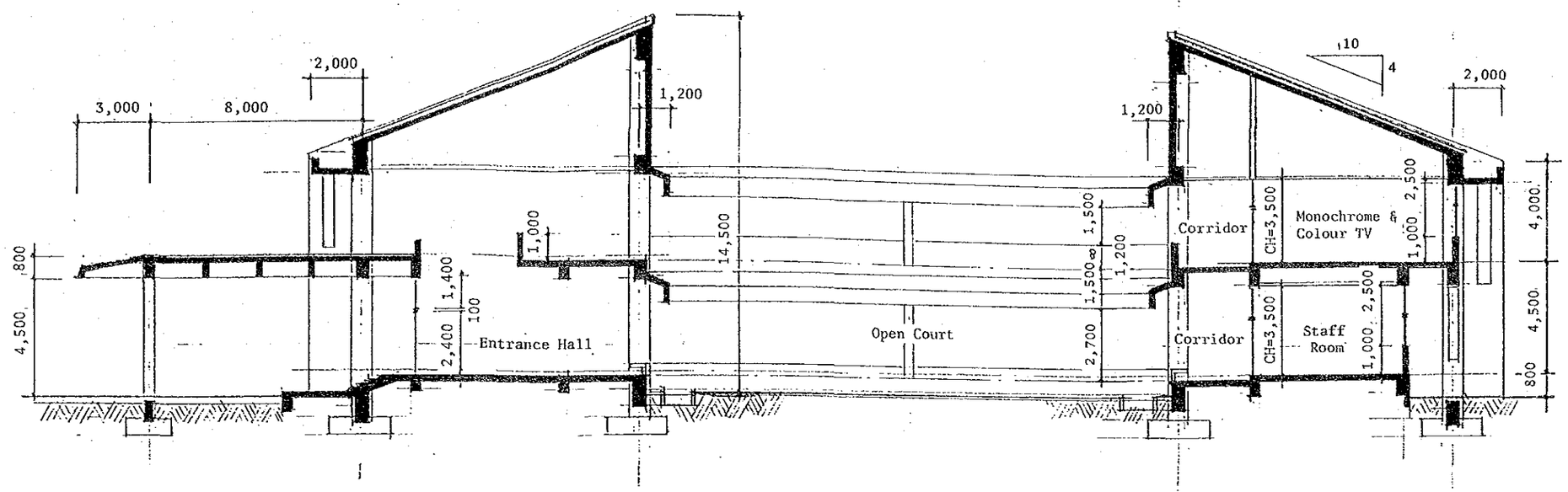
North Elevation

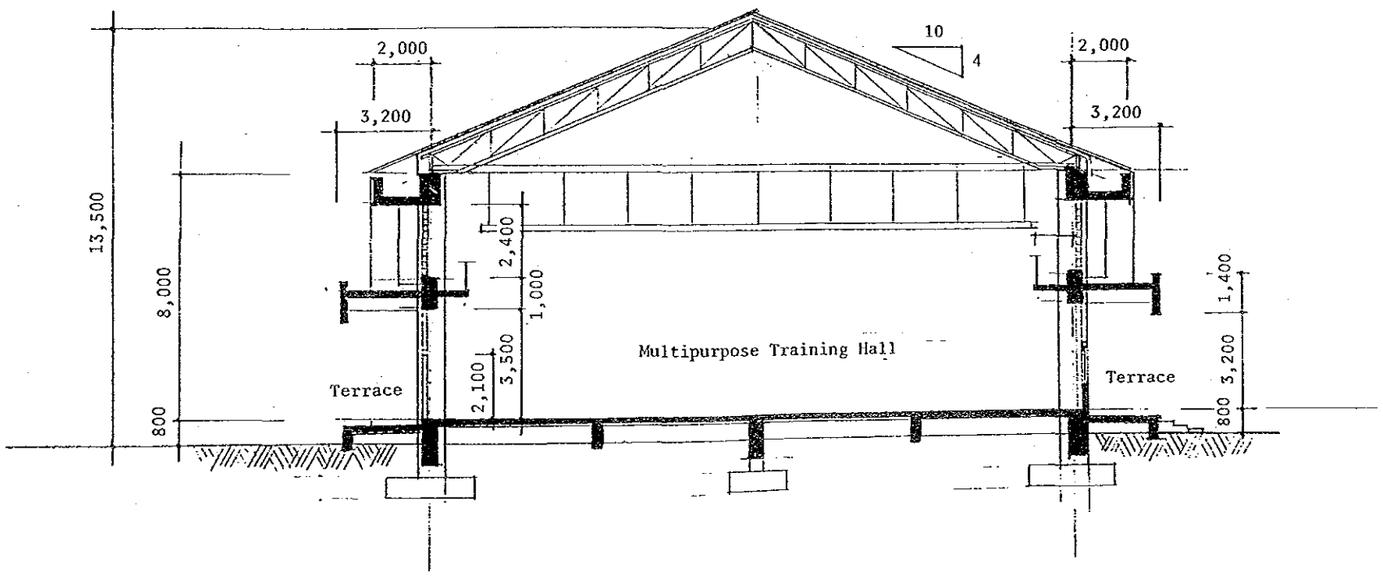


East Elevation

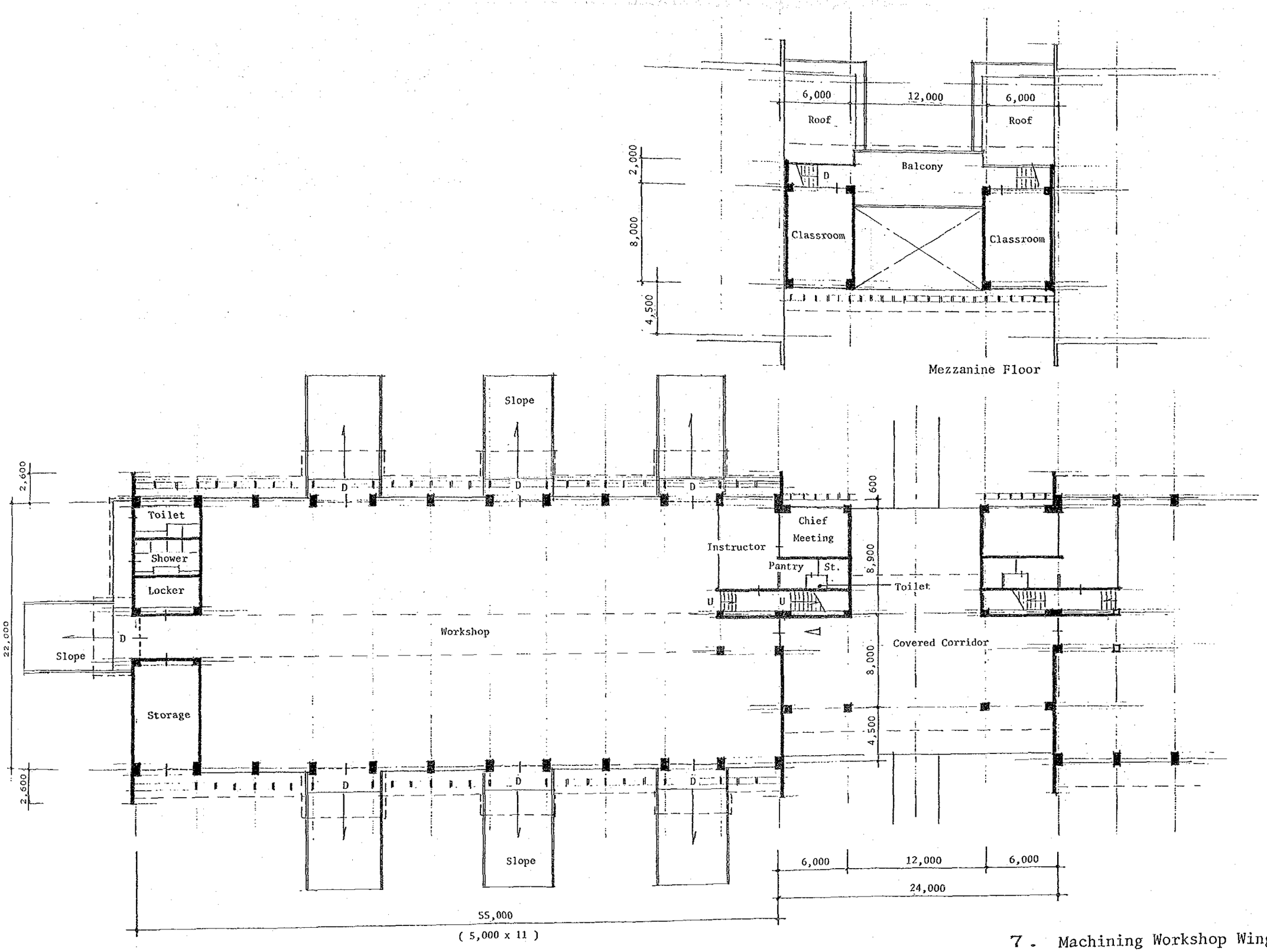
5. Main Building

Elevations S=1:400



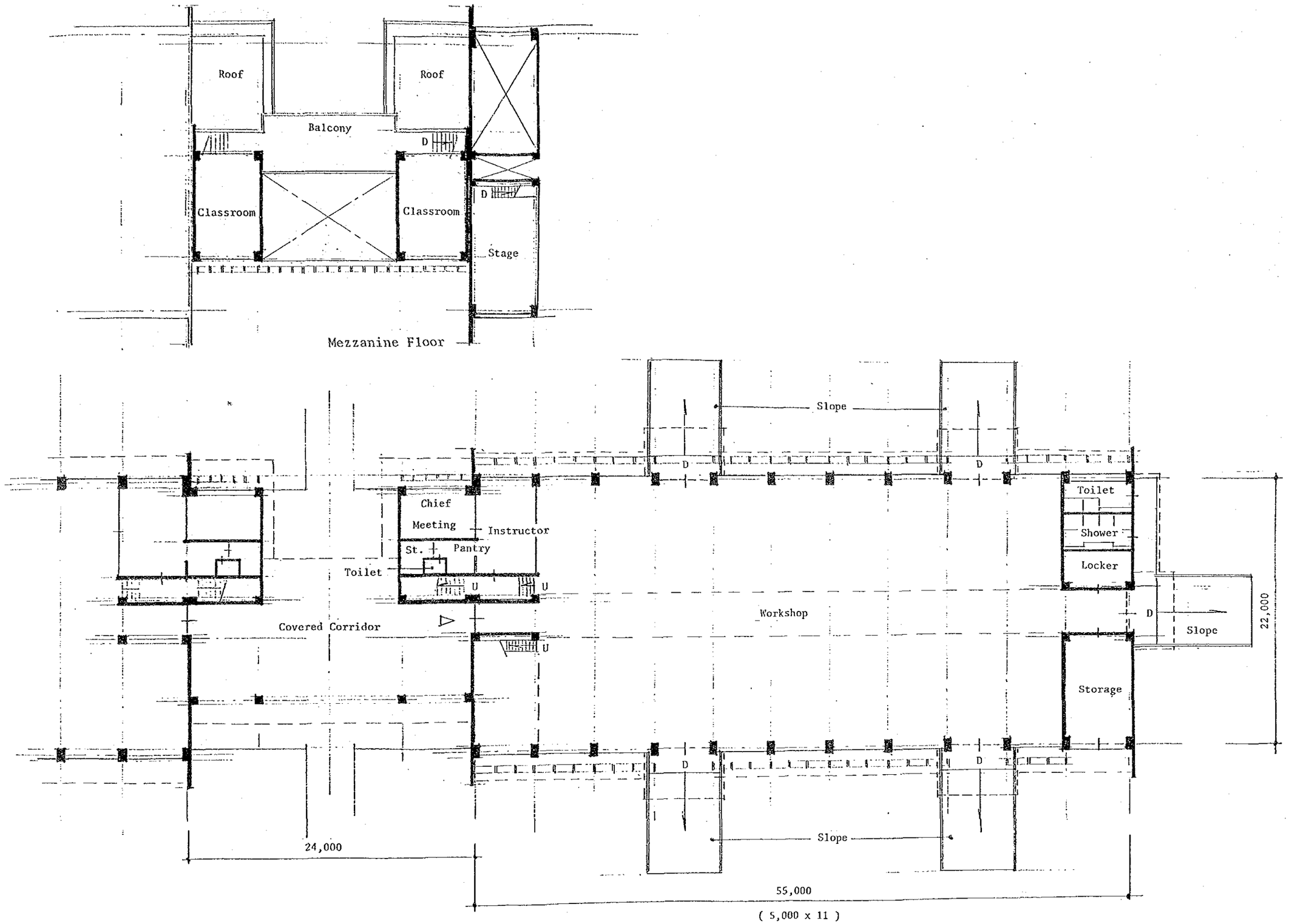


6. Main Building
Sections S=1:200

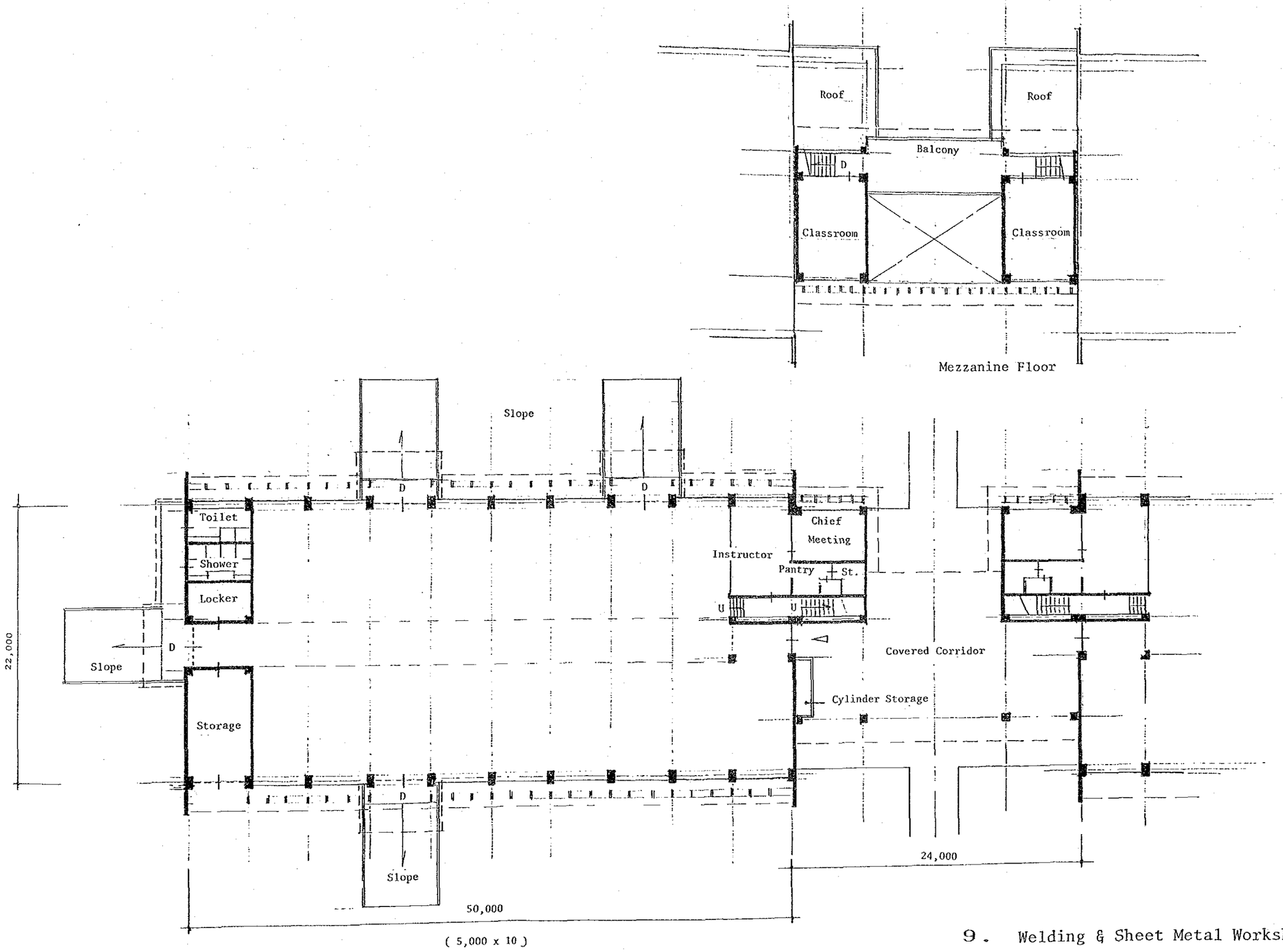


7 . Machining Workshop Wing

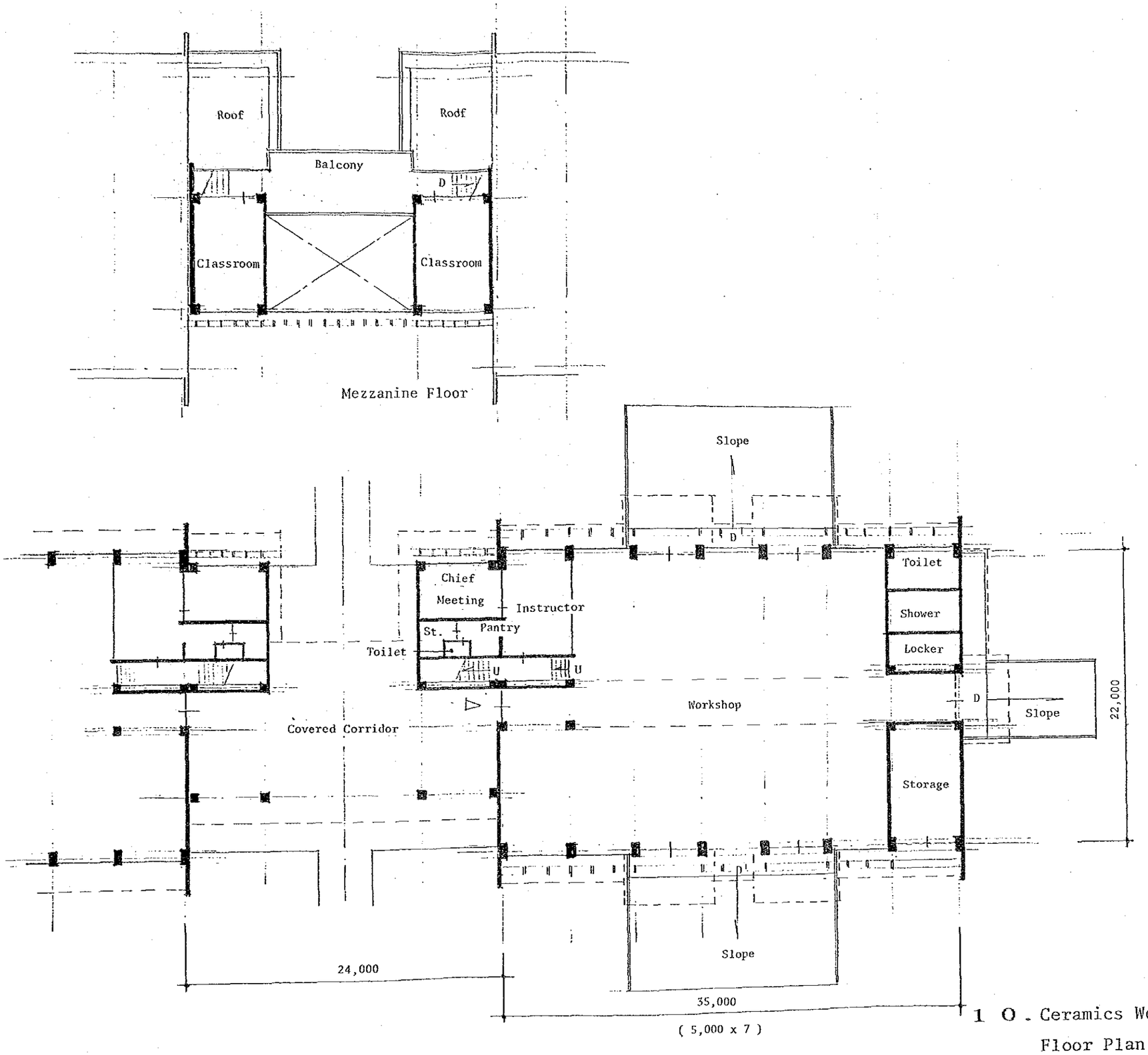
Floor Plan S=1:300



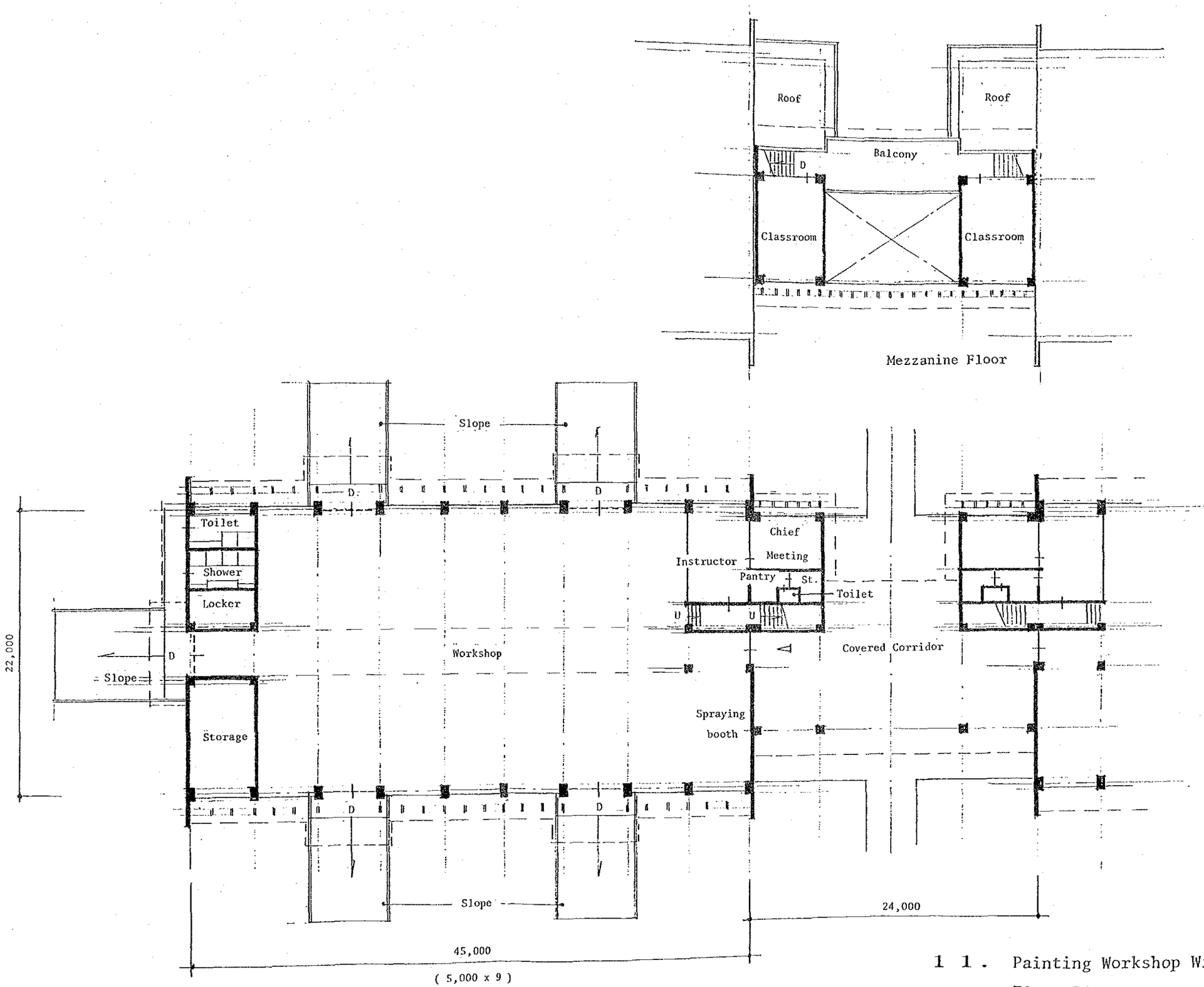
8. Electrical Workshop Wing
Floor Plan S=1:300



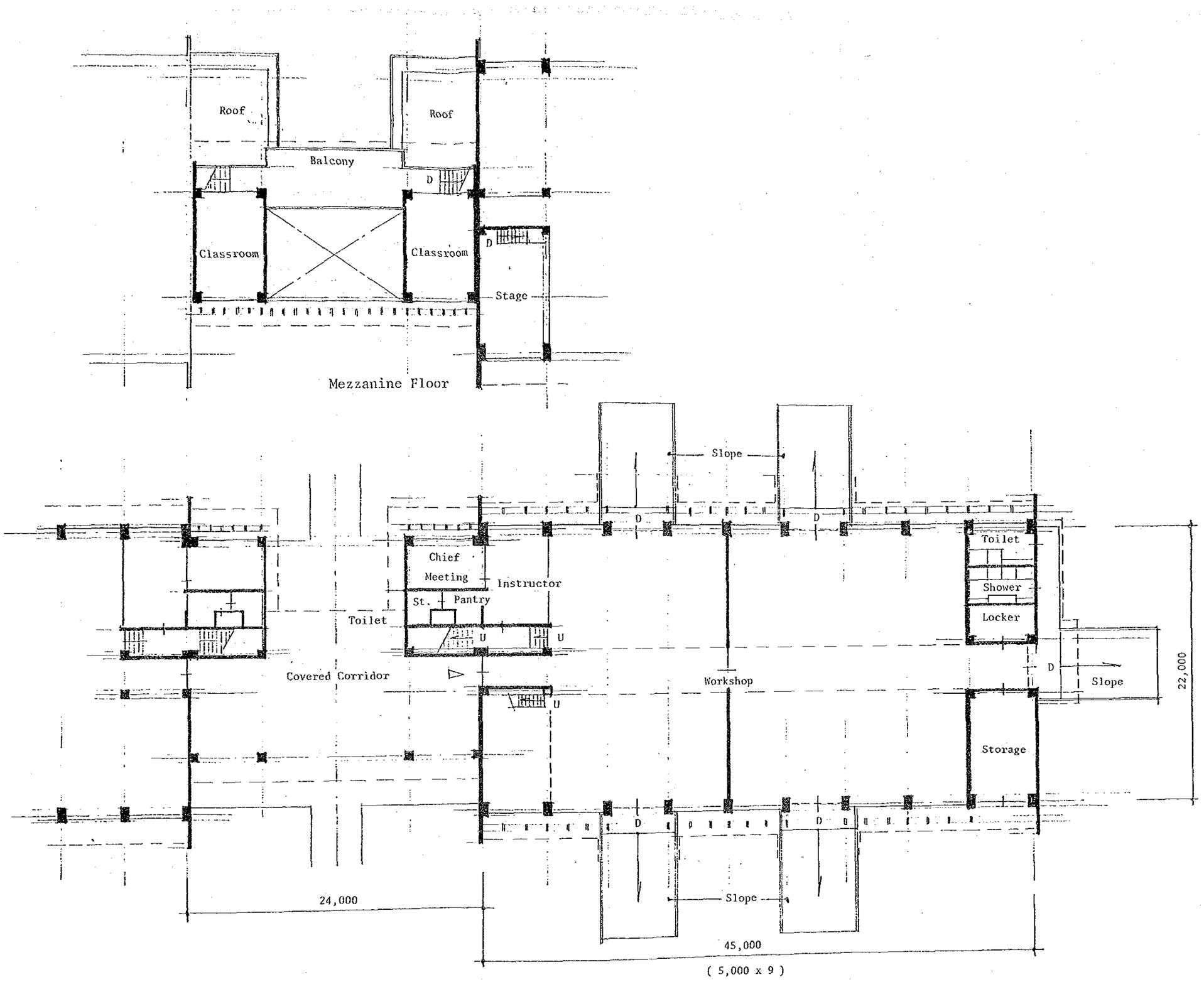
9. Welding & Sheet Metal Workshop Wing
Floor Plan S=1:300



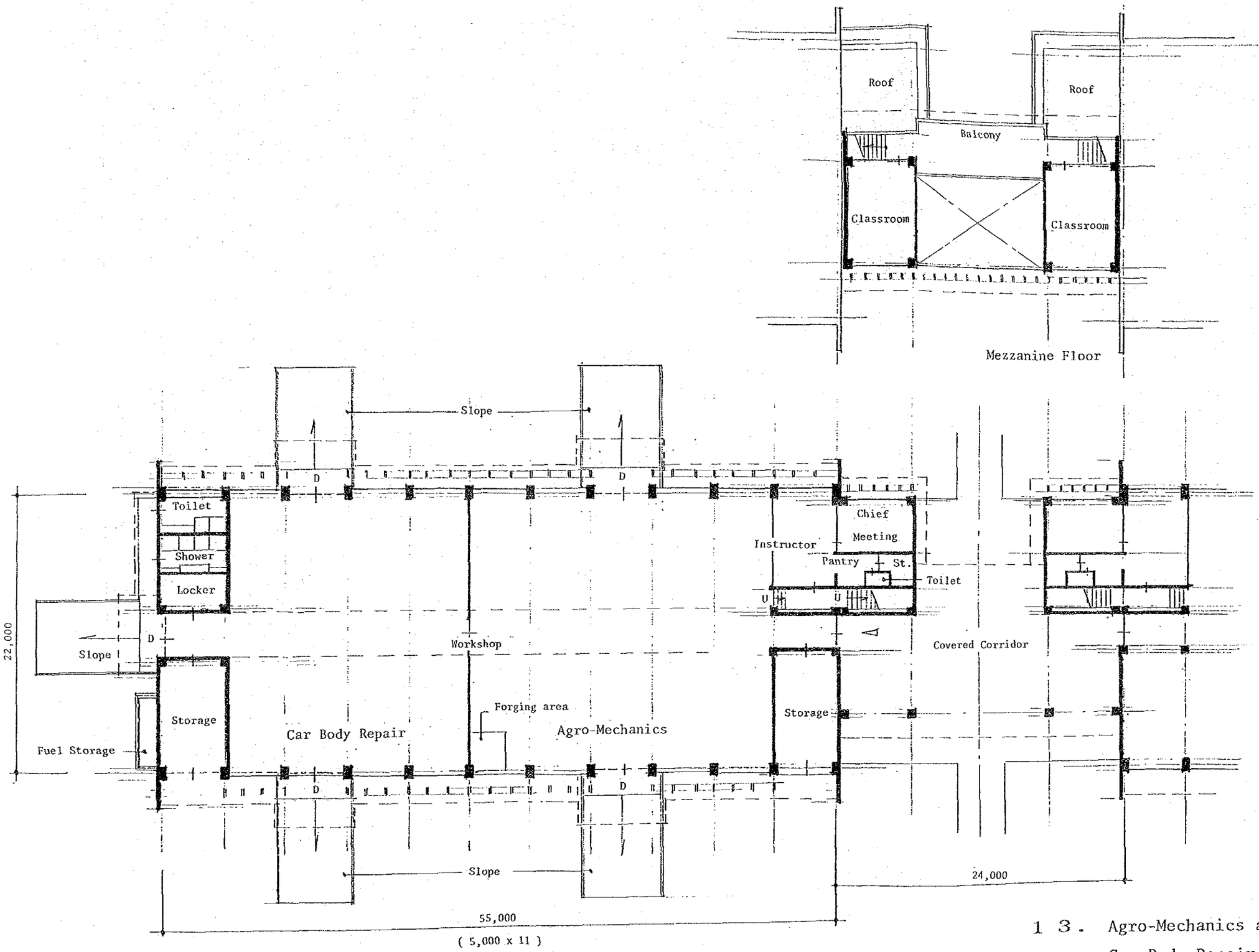
1 0 . Ceramics Workshop Wing
Floor Plan S=1:300



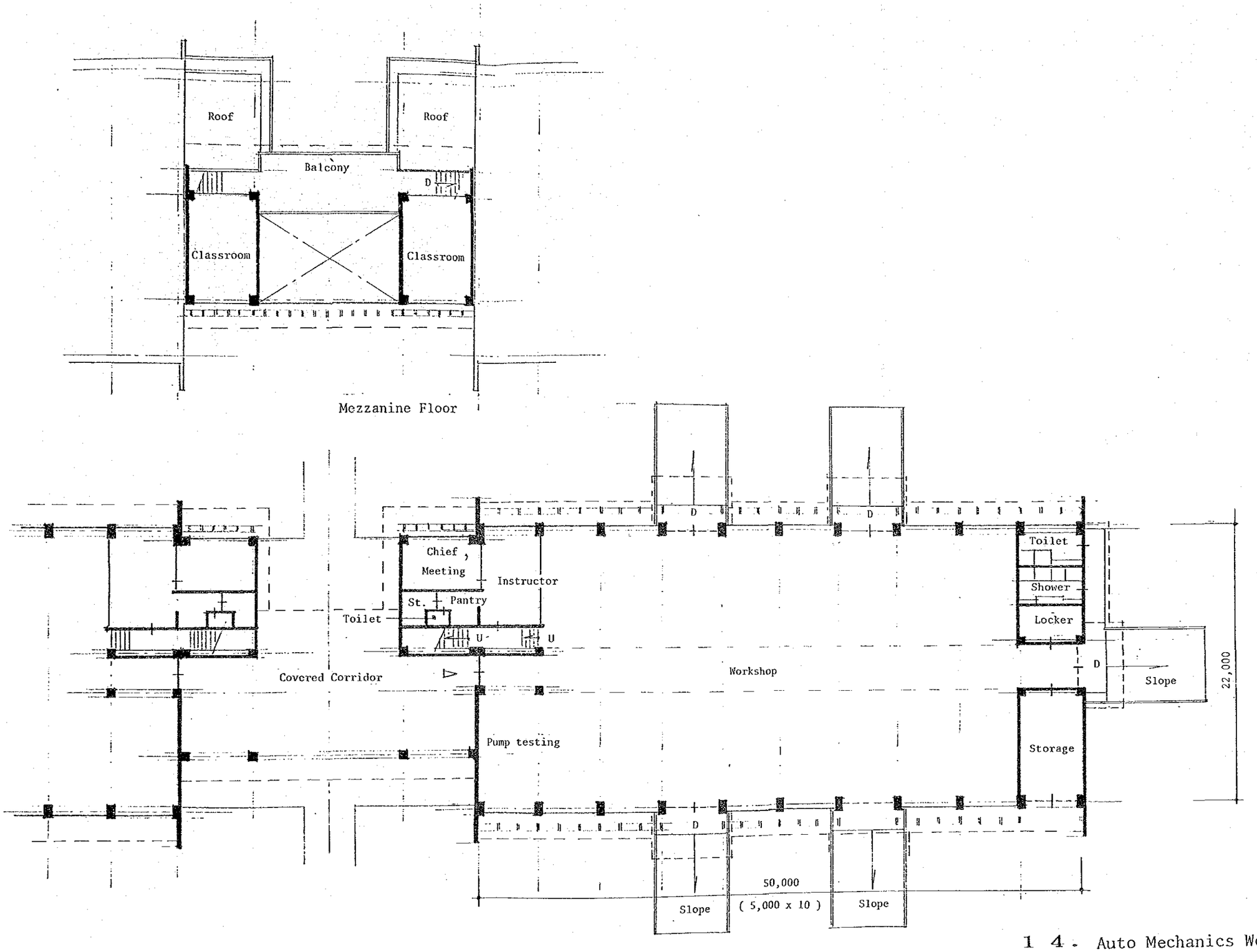
1 1 . Painting Workshop Wing
Floor Plan S=1:300



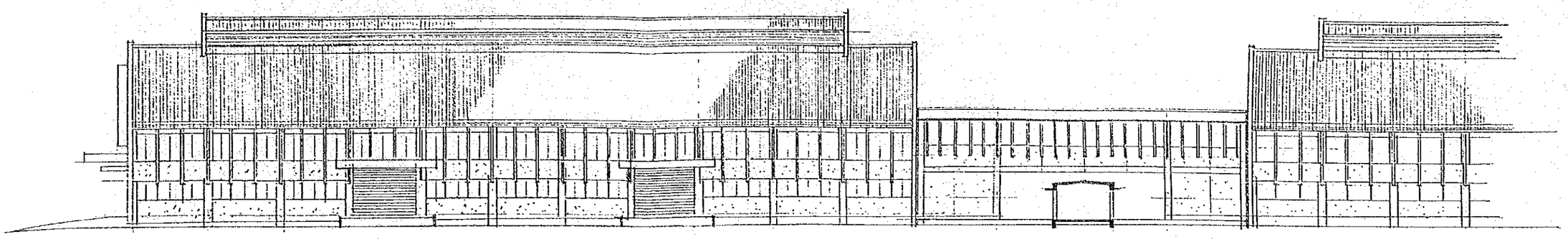
1 2. Building Construction Workshop Wing
Floor Plan S=1:300



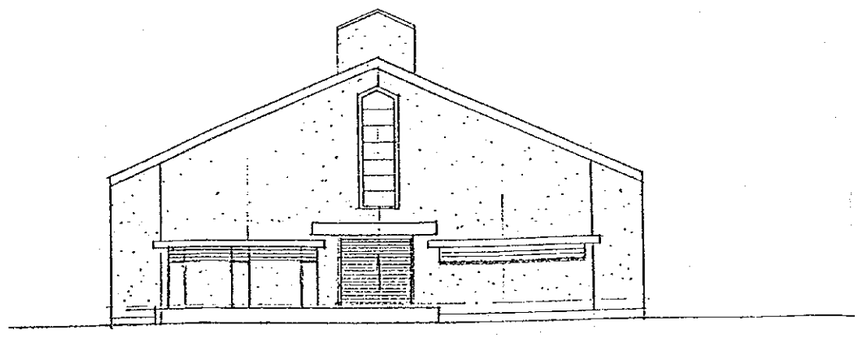
1 3. Agro-Mechanics and
Car Body Repair Workshop Wing
Floor Plan S=1:300



1 4 . Auto Mechanics Workshop Wing
Floor Plan S=1:300

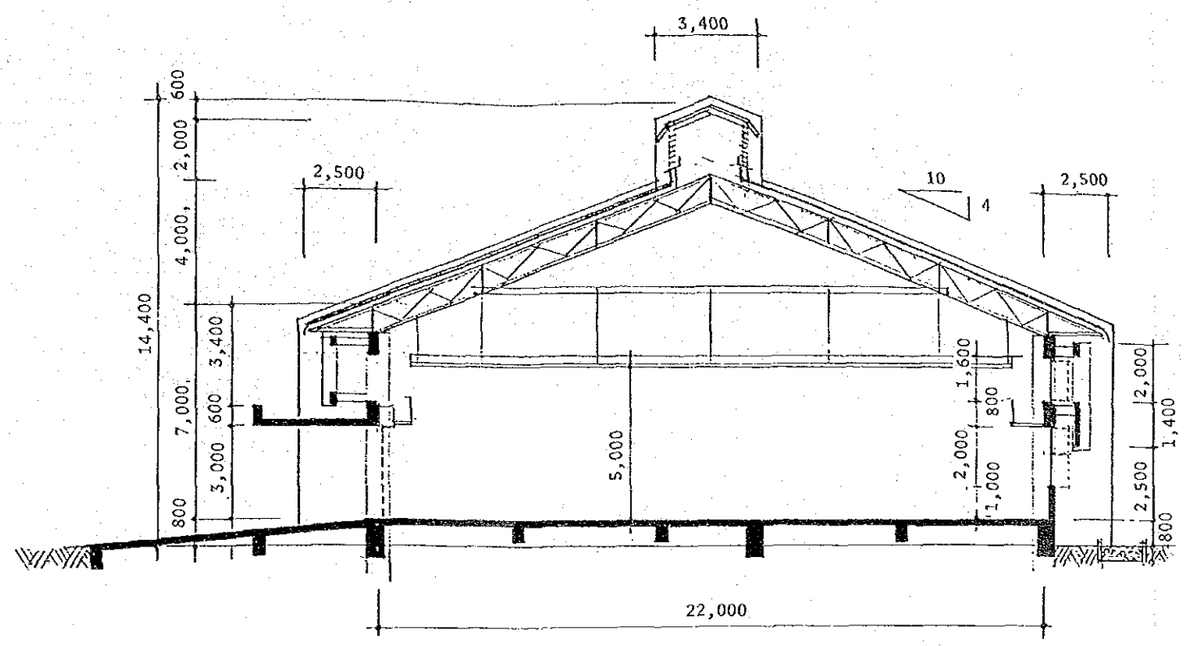


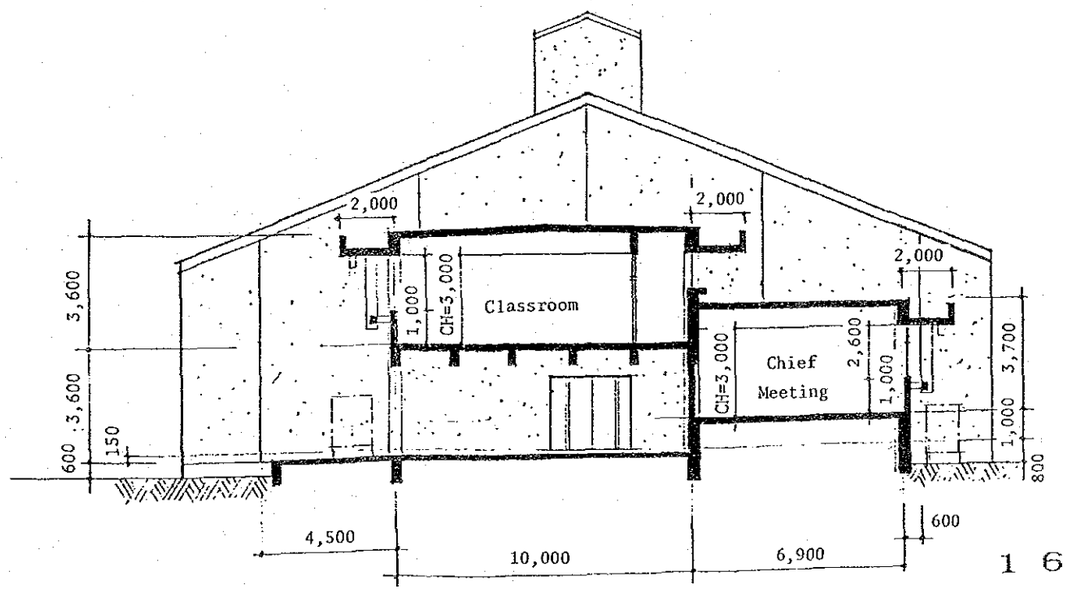
North Elevation



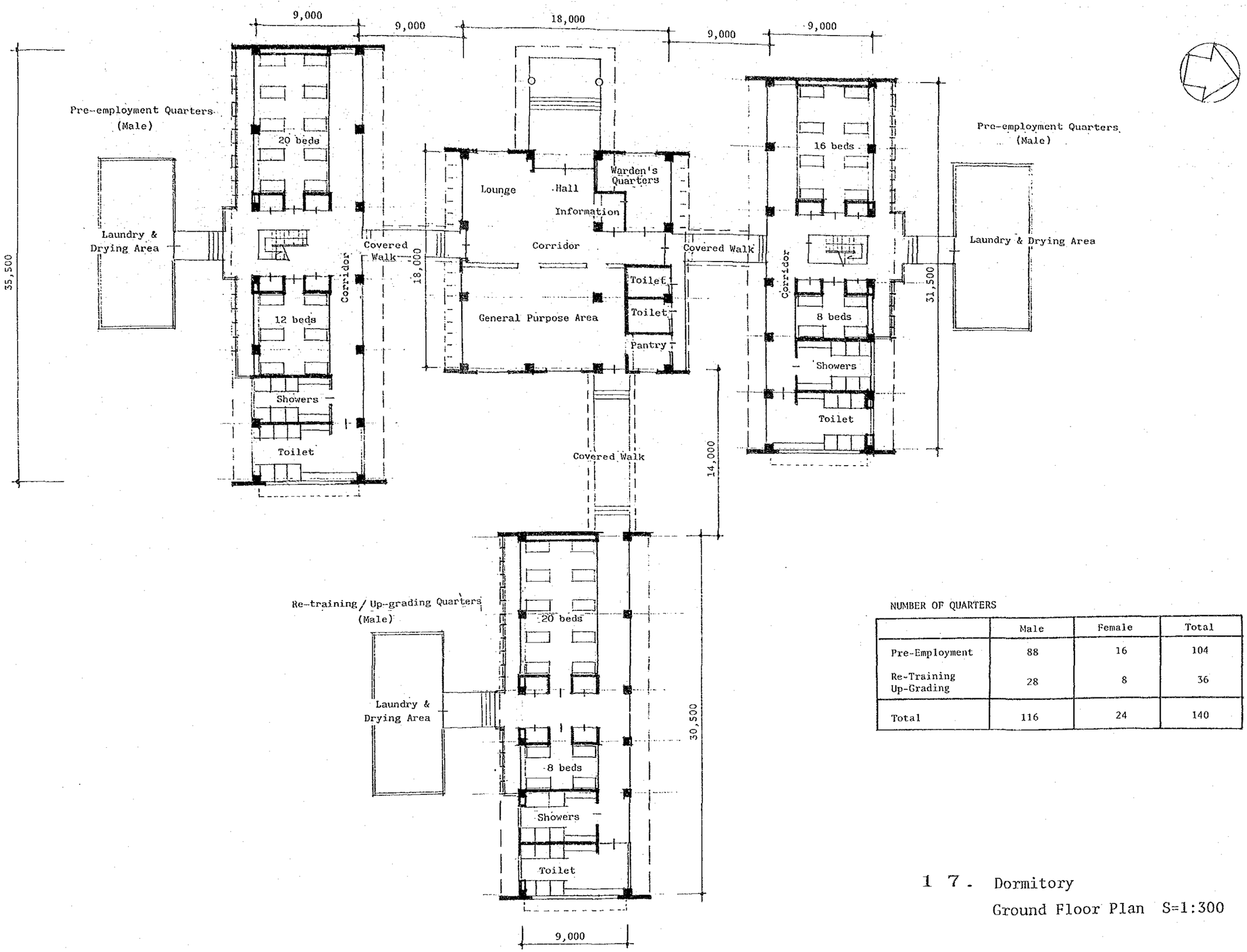
East Elevation

1 5. Workshop Wing
Elevations S=1:300





1 6. Workshop Wing
Sections S=1:300

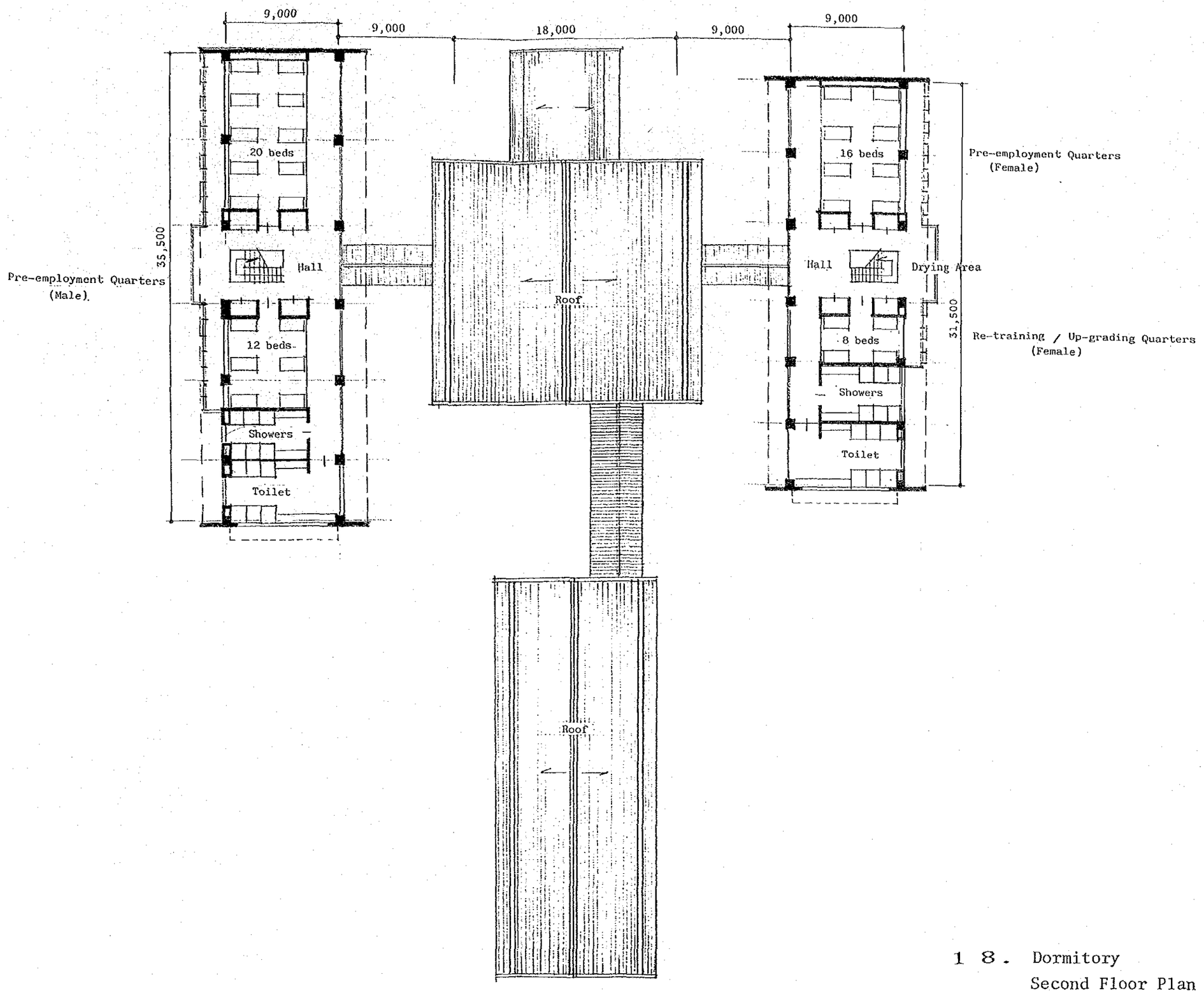


NUMBER OF QUARTERS

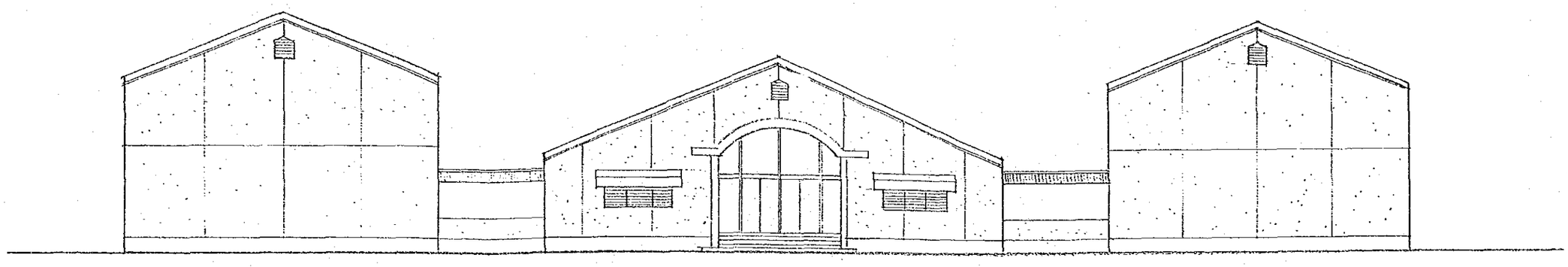
	Male	Female	Total
Pre-Employment	88	16	104
Re-Training Up-Grading	28	8	36
Total	116	24	140

1 7. Dormitory

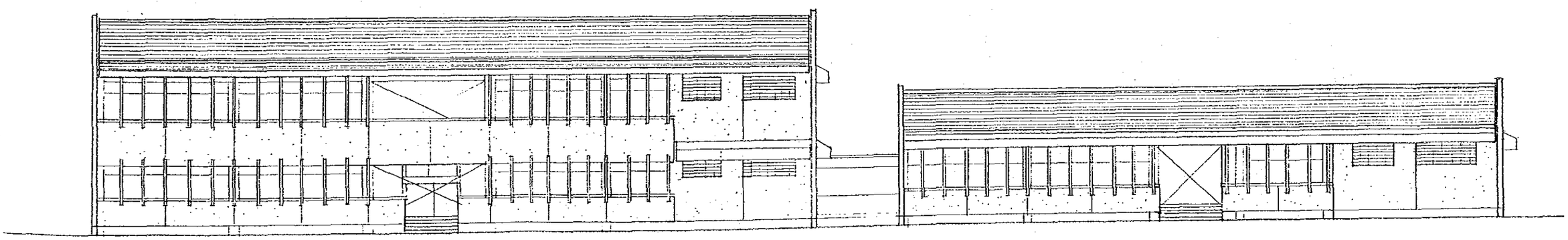
Ground Floor Plan S=1:300



1 8. Dormitory
Second Floor Plan S=1:300

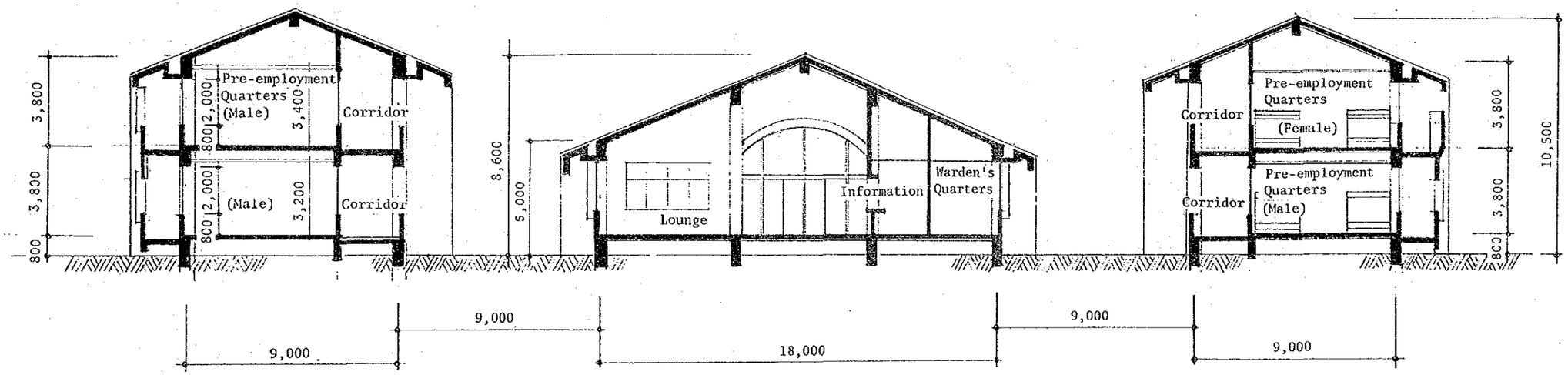


West Elevation

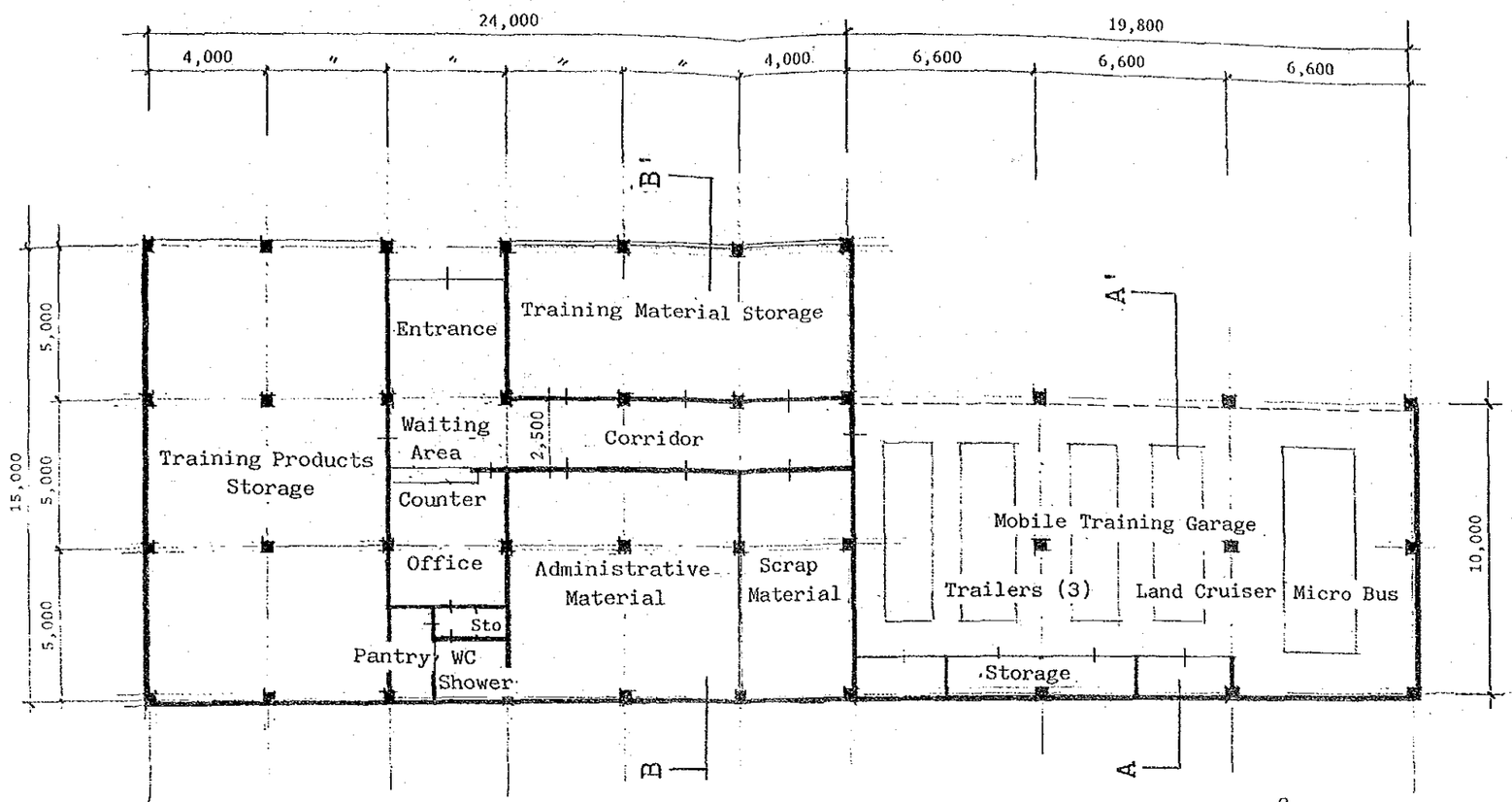


South Elevation

1 9. Dormitory
Elevations S=1:200

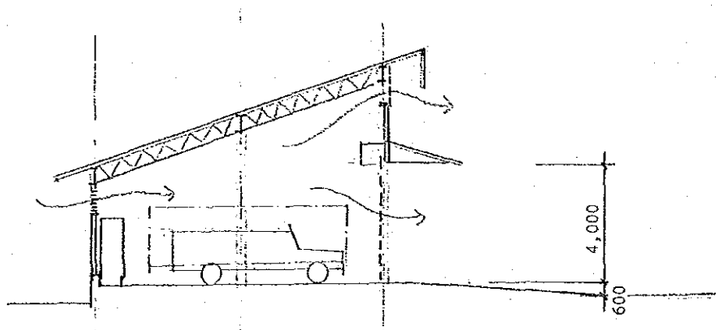


2 0. Dormitory
Section S=1:200

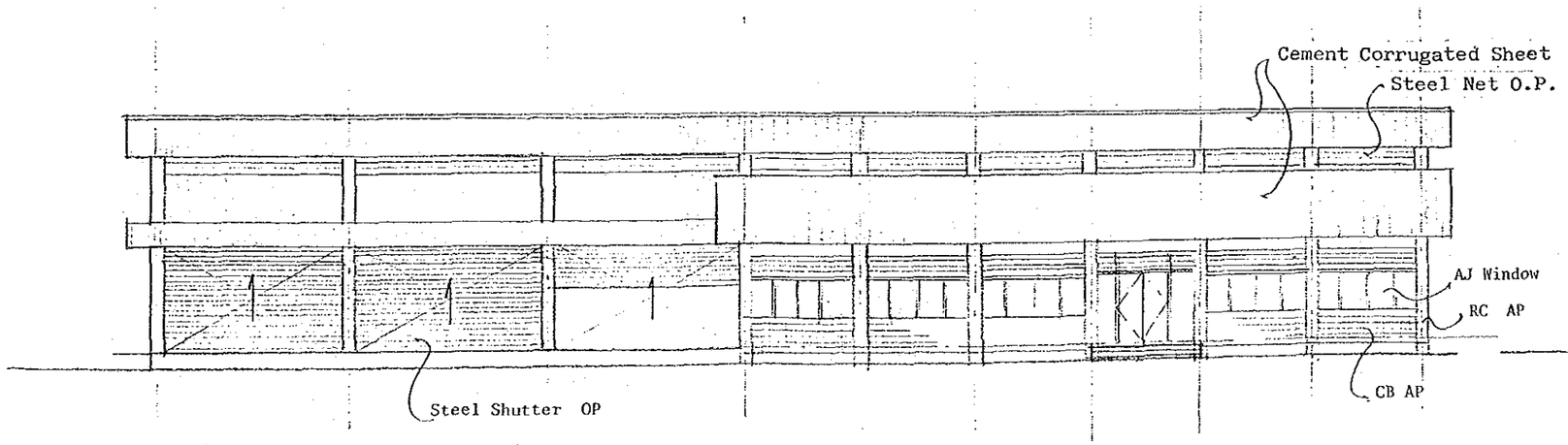


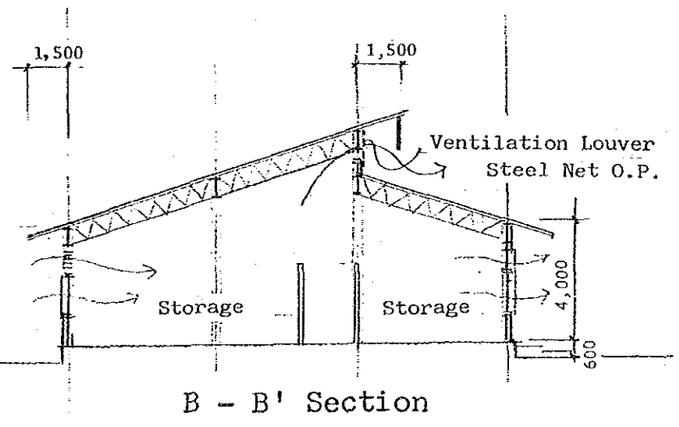
Floor Area 560 m^2

(Storage 360 m^2, Garage 200 m^2)



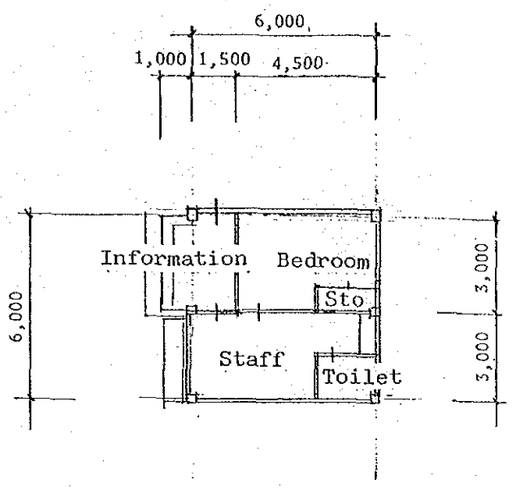
A - A' Section



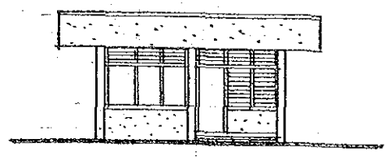


B - B' Section

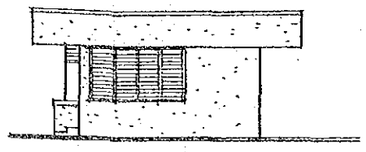
2 1. General Storage &
Mobile Training Garage
1 : 200



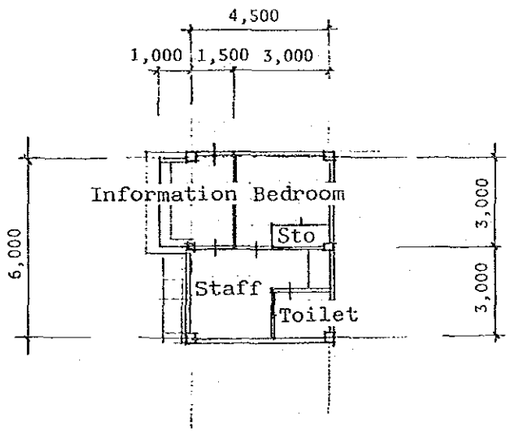
Front Guardhouse 39m^2



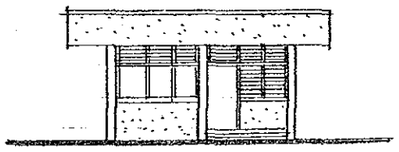
Front Elevation



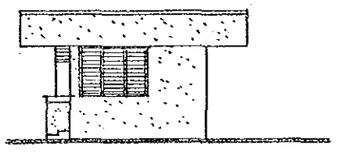
Side Elevation



Back Guardhouse 30m^2



Front Elevation



Side Elevation

2 2. Guardhouse 1 : 200

4-2 TRAINING EQUIPMENT

(1) SELECTION OF TRAINING EQUIPMENT

The present technical level in Thailand, needs of enterprises, capability of local staff, implementation budget, ease of maintenance and other future problems were taken into consideration in determining the appropriate selection and grade of training equipment.

The capabilities of trainees and the condition of enterprises in the Ubon area were also considered.

In accordance with the Governments policy of fostering regional enterprises and the development of manpower, such equipment that would enable the turning out of trainees who would be immediately of use to the industries was considered. The equipment selected is adaptable to trainees from areas other than the Northeastern Region, including the Bangkok area, so that the needs of an increased number of unemployed can be met.

(2) DETERMINATION OF EQUIPMENT GRADES

1) As the UBISD is planned as a job training centre for unemployed youth (primary school and lower secondary school graduates), the equipment was selected so that it will not be too far above the current equipment and technical levels to be encountered in the future by the youths.

2) In view of future maintenance requirements, simple and reliable equipment is to be selected.

3) In the selection of the equipment, preference is to be given to the equipment of those manufacturers with agents or service networks in Thailand or Southeast Asia.

4) The training equipment required for each training course is to be determined on the basis of the training plans and curriculum formulated by NISD in consultation with the Long-Term Survey Team.

5) Work tables are to be provided as part of this Work as indicated on the layout drawings.

(3) BASIS OF EQUIPMENT SELECTION

In accordance with the request of NISD, the training program formulated with the assistance and advice of the Long-Term Survey Team is being considered as the basis of equipment selection, in addition to consideration of the current conditions in Thailand.

In principle, judging from the proposed curriculum and hours to be spent with specific equipment, the quantity of some equipment should coincide with the number of trainees. The number of other types of equipment was determined by the number of trainees and the contents of the training curriculum.

An ample supply of tools of substantial quality will be provided.

1) Machine Workshop

The main items of training on the curriculum are lathe, milling machine, shaping machine, drilling machine and grinding machine work.

In regard to the most basic work using lathes or milling machines, an appropriate number of machines has been decided with the view to achieve effective practical training, taking into consideration their importance in the curriculum and student grouping.

In regard to shaping and grinding machine work, a surface grinding machine, a universal cylindrical grinding machine, a universal tool grinding machine, a tungsten-carbide tool grinding machine and shaping machines will be provided with the view to provide the minimum variety of machines required for the various types of training.

Bench grinders and bench drilling machines will be provided for drilling and metal sawing training to facilitate practical training, as well as an upright drilling machine and band sawing machines.

In addition, appropriate auxiliary tools required for machining processes and for final finishing have been selected.

2) Electrical and Electronics Workshop

a. Electrical Training

The main training subjects on the curriculum are indoor wiring, repair of motors, freezers, refrigerators and air-conditioners, and study of the basic theories relating to motors, generators and various instruments.

Wiring training booths will be provided for indoor wiring training. Various types of motors, coil winding machines for motors and work tables will be provided for motor repair training.

Automobile air-conditioners, separate type air-conditioners, window type air-conditioners, one-door refrigerators and two-door refrigerators will be provided for the training in freezer, refrigerator and air-conditioner repair.

Transformers, rectifiers, generators, various types of resistors, reactors, condensers and voltage regulators, etc. will be provided for teaching basic theories related to motors, generators and various instruments.

Portable drilling machines, electric drills and grinders, etc. will be provided as auxiliary tools.

b. Electronics Training

The main items of training on the curriculum are the basic theory of electronics engineering, radio repair and television repair.

For teaching the basic theory of electronics engineering, pulse circuit testing devices, semi-conductor application testing devices and oscilloscopes, etc. will be provided.

Various types of receivers, in addition to sweep marker transmitters, signal generators and low frequency transmitters, etc. for use as measuring instruments, will be provided for the training in radio and television repair.

3) Welding and Sheet Metal Workshop

The main items of training on the curriculum are arc welding, gas welding, gas cutting and basic training in sheet metal work.

Alternate current arc welders will be provided in individual booths along the window side for arc welding training and a ventilation system using ducts from under the work tables to outlets on the outer wall will also be provided.

For gas welding training, 16 work tables are to be provided with O^2 and C^2H^2 supplies at each table. Gas is to be supplied via a manifold from a cylinder storage located outside the workshop building. Each table will have a hood above for ventilation through ducts. In addition to the basic welding equipment, CO^2 arc welders, a CO^2 MAG welder, a TIG welder and spot welders will be provided to enable broader training in welding techniques.

Automatic gas cutting machines and plasma arc cutters will be provided for gas cutting training.

An appropriate number of various shearing machines, bending machines and surface plates will be provided for basic training in sheet metal work.

4) Building Construction Workshop

The main items of training on the curriculum are cabinet making and plumbing.

In regard to cabinet making, training equipment is to be selected to enable the students to manufacture various types of cabinets through basic tooling techniques, basic assembly work and application work.

A circular saw bench, band saws, cross cut saws, universal scroll saws and universal saw benches will be provided for sawing machine training. A single surface planer and a double surface planer will be provided for planer training. An appropriate number of various types of drilling, boring and chiseling tools will be provided. Single tenoners, wood laths, a dovetail machine and table sanders, etc. will be provided for assembling and finishing work. Grinders and other machinery required for the maintenance of tools and cutters are also to be provided. Industrial sewing machines will also be provided for upholstering to enable training in the manufacture of higher quality furniture.

As woodwork produces a large amount of wood shavings, in order to maintain a good working environment, dust collection ducts will be provided at locations above the machines as part of a cyclone-type dust disposal system located outside the workshop building.

The equipment and tools for plumbing training have been selected to enable training in a number of processes, starting with such basic work as pipe welding, cutting, threading and drilling, and going up to the assembly and repair of valves and pumps, and on further to the comprehensive plumbing techniques required for water supply and discharge, sanitation, gas and air-conditioning work.

Pipe benders, pipe threading machines, cutters, welders, a water pipe drilling machine and an asbestos pipe drilling machine will be provided for training in basic plumbing work. In addition, various types of valves and pumps will be provided to enable the students to become familiar with the most typical types of pumps. A piping practice model is to be added to the above list for comprehensive application training in plumbing work.

5) Ceramic Workshop

The main training items on the curriculum required for the production of ceramics are clay preparation, wheel work, press moulding, design, glazing, painting and kiln baking. A crusher, ball mills, balances, pot mills and clay sieves, etc. will be

provided for clay preparation training. An appropriate number of electric wheels, kicking wheels and hand wheels will be provided for wheel work in view of the characteristics of each type of wheel.

Screw presses will be provided for press moulding purposes while glaze preparation tables, air-brush sets, a silk screen set and spray guns will be provided for design, glazing and painting work.

An electric kiln, LPG kilns, a frit kiln and gas burners, etc. will be provided for the field of kiln baking to enable the students to acquire wide knowledge of the subject. In addition, kiln materials will be provided for the basic training in kiln making.

6) *Painting Workshop*

The curriculum consists of the basic painting of metals and wood, surface finishing, the colour preparation of dyes and application painting on metals and wood. Spray guns, blow guns, bodycoat spray guns and wide spray guns will be provided as painting equipment while disc sanders, orbital sanders, polishers and infrared dryers will be provided for surface finishing work.

A colour adjuster and viscometers, etc. will be provided for the colour preparation of dyes.

A car painting booth will be installed for training in the painting of cars.

7) Auto Mechanics Workshop

The main items on the curriculum are the maintenance and repair of gasoline engines, diesel engines and engine-related auxiliary devices. The maintenance, as well as sheet metal/welding work, of the chassis, suspension systems and steering-related devices are also included.

An appropriate number of gasoline and diesel engines will be provided in view of their importance in the training curriculum and the number of trainees.

A cylinder boring machine, a cylinder honing machine, a valve refacer and various testers, etc. will be provided for the engine maintenance training while a chassis analyzer will be provided for chassis maintenance training. For steering maintenance training, a wheel alignment analyzer, a side-slip tester and other equipment will be provided. An appropriate number of pertinent machine tools such as bench drills and double headed grinders will be provided.

As training with actual automobiles is indispensable to improve the effects of training, different types of automobiles will also be provided.

8) Agro Mechanics and Car Body Repair Workshop

a. Agro Mechanics

The main items of training on the curriculum are the maintenance of agricultural engines and machinery, welding work and forging work.

In the field of agricultural engine maintenance, an appropriate number of gasoline and diesel engines will be provided.

As training using actual equipment is an indispensable part of maintenance training, a tractor, a tiller, a bush cutter, a thresher, etc. will be provided.

Arc welders and anvils, etc. will be provided for welding and forging training, together with an appropriate number of grinders, portable bench drills, jacks, etc.

b. Car Body Repair

A frame aligner required for the measurement of body deformations and tools for sheet metal work will be provided.

An adequate amount of welding equipment, shearing equipment for sheet metal, grinders and drills will also be provided for this section.

9) Mobile Training

The minimum number of vehicles required in this training scheme is decided on the understanding that a towing vehicle takes a trailer with the necessary training equipment to the location where the training course is held. After returning to the Institute, the towing vehicle then takes another trailer to another place.

2 trailers for the 3 types of training (small engine repair, welding, and radio repair), a land cruiser for towing, 2 mini busses (one for training equipment and one for personnel) will be provided. In addition, such supplementary equipment as night lighting devices, filming equipment, a video camera and a welder, etc. will be provided.

10) Non-Technical Training

Equipment for special short course curriculums for dressmaking, housemaid, self-employed, waiter/waitress and receptionist training are to be provided.

The following equipment for the intended training and demonstrations purposes are to be provided:

For the dressmaking course, standard Sewing Machines (15), industrial sewing machines (5), zig-zag sewing machines (3), sewing sets (15), irons (15) and male and female manikins (15) are to be provided.

For the housemaid course, a microwave oven, a gas oven, a washing machine, a vacuum cleaner and a dish washer are to be provided.

For the waiter/waitress course, dining table with dinner sets (3) are to be provided.

A demonstration telephone set will be provided for the receptionist course.

(4) TRAINING EQUIPMENT LIST

1. MACHINE, WELDING & SHEET METAL
2. ELECTRICAL & ELECTRONICS
3. AUTOMOTIVE
4. BUILDING CONSTRUCTION
5. MOBILE TRAINING
6. MISCELLANEOUS

No.	Name	Descriptions	Q'ty
1.	MACHINE, WELDING & SHEET METAL		
	1-a. Machine		
1	Precision Lathe	Swing-over bed: 470 mm Distance between center: 800 mm	15
2	Copying Equipment	for above lathe	1
3	Vertical Milling M/C	Table size: 1,350 x 270 mm Spindle speed: 68 - 1,760 rpm	6
4	Universal Milling M/C	Table size: 1,350 x 270 mm Spindle speed: 68 - 1,760 rpm Special accessories 1. Round table 400 mm 2. Vert. axis dividing head	2
5	Surface Grinding M/C	Table size: 600 x 300 mm Grinding wheel: 305 mm	1
6	Cylindrical Universal Grinding M/C	Swing-over table: 300 mm Center distance: 400 mm	1
7	Shaping Machine	Maximum stroke: 520 mm	2
8	Universal Tool Grinding Machine	Swing-over table: 250 mm Working surface: 135 x 940 mm	1
9	Tungsten-Carbide Tool Grinder	Table for grinding: 213 x 425 mm	1
10	Bench Grinder	Wheel size: 305x32x25.4 mm With dust collector	2
		Wheel size: 205x19x15.8 mm With dust collector	2
11	Contour Machine	Cutting capacity: 250 x 400 mm Wheel size: 425 mm	1
12	Bench Drilling Machine	Drilling capacity: 13 mm	3
13	Upright Drilling Machine	Drilling capacity: 40 mm	1
14	Band Sawing Machine	Cutting capacity: 250 mm	1
15	Hi-speed Cutoff Machine	Grinding wheel size: 305 mm	1

No.	Name	Descriptions	Q'ty
16	Heat Treatment Furnace	450 x 450 x 350 mm 1,200°C	1
17	Oil Bath for Heat Treatment	600 x 800 x 600 mm	1
18	Tool Stand	900 x 600 x 740 mm	20
19	Tool Cabinet	1,100 x 770 x 705 mm	4
20	Tool Wagon with Casters	700 x 450 x 800 mm	2
21	Tool Cabinet (for measuring tools)	1,790 x 880 x 450 mm	1
22	Tool Box	290 x 150 x 100 mm	20
23	Hand Truck	600 x 900 mm	1
24	Parts Cabinet	910 x 320 x 1,240 mm	2
25	Measuring Instruments		1 lot
26	Machinist tools		1 lot
27	Cutting Tools (Lathe)		1 lot
28	Cutting Tools (Shaper)		1 lot
29	Cutting Tools (Milling)		1 lot
30	Cutting Tools (Common)		1 lot
31	Hand Finishing Tools		1 lot

No.	Name	Descriptions	Q'ty
	1-b, 1-c. Welding & Sheet Metal		
	(Installations)		
1	O_2 - C_2H_2 Manifold		1
2	Local Booth Exhausts for Gas Welding		1
	(Machinery)		
3	AC Arc Welder	Output current: 300 A	10
4	AC-DC Arc Welder	Output current: 300 A	10
5	AC Arc Welder	Output current: 200 A	5
6	CO_2 Arc Welder	Output current: 350 A	5
7	CO_2 (MAG) Welder	Output current: 350 A	1
8	TIG Welder	Output current: 300 A	2
9	Plasma Cutting Machine	8.3 KVA, 50 A	1
10	Engine Welder	Output current: 300 A	1
11	Spot Welder	Nominal power: 35 KVA	1
12	Portable Spot Welder	25 KW	1
13	Automatic Gas Cutting Machine	Cutting thickness: 5 - 100 mm Cutting speed: 80 - 800 mm/min	2
14	Dryers for Welding Rod	Capacity: 50 kg	1
15	Bench Grinder	Wheel size: 305 x 32 x 25.4 mm with dust collector	2
16	Hydraulic Shearing Machine	Capacity: 10 mm x 2,000 mm	1
17	3-Roll Bending Machine	Capacity: 6 mm x 2,000 mm	1
18	Bench Drilling Machine	Drilling capacity: 13 mm	2
19	Upright Drilling Machine	Drilling capacity: 40 mm	1
20	Hi-Speed Cutoff Machine	Grinding wheel size: 405 mm	1

No.	Name	Descriptions	Q'ty
21	Power Hack Sawing Machine	Cutting capacity: 280 mm	1
22	Press Brake	Capacity: 85 ton	1
23	Manual Universal Bending Machine	Bending capacity: 1.6 mm x 1,250 mm	1
24	Roll Forming Machine	Shaft dia: 45 mm	1
25	Vibro Shear	Capacity: max 1.6 mm	1
26	Hydraulic Test Pump	Manual operating 1,000 kg/cm^2 Stroke: 50 mm	1
27	Porto-Power Set	4 ton bantam set 10 ton master set	1
28	Hydraulic Puncher	Punching capacity: 24 mm	1
29	Tomson Hydraulic Puncher	Punching capacity: 3.2 mm	1
30	Corner Shear	Corner cutting capacity: 3.2 x 220 x 220 mm	1
31	Surface Plate	1,200 x 2,400 x 200 mm	1
		1,200 x 1,200 x 150 mm	3
		1,000 x 750 x 225 x 800 mm	1
32	Hand Truck	900 x 600 mm 400 kg	2
33	Gas Cylinder Truck	2 - cylinder type	3
34	Hand Lifter	500 kg	1
35	Hand Pallet Truck	2,500 kg	1
36	Plastic Welder	0 - 350°C with compressor	2
		0 - 450°C	1
37	Wining Heater	450°C 3,600 rpm.	1
38	Ace Cutter	Cutting capacity: 1.6 mm	1
39	High Nibbler	Cutting capacity: 1.6 mm	1
40	Keystone Cutter	Cutting capacity: 2.3 mm	1
		Cutting capacity: 1.6 mm	1

No.	Name	Descriptions	Q'ty
41	Garage Jack	Capacity: 1.5 ton	2
42	Cast Iron Anvil	100 kg	4
43	Cast Iron Swage Block	315 x 315 x 115 mm 75 kg	4
44	Lever Shear	4.5 mm x 250 mm	2
45	Foot Shear	1.6 mm x 1,000 mm	1
46	Hand Shear	Cutting capacity: 2.9 mm	2
47	Reed Type Parallel Vice	150 mm	30
48	Portable Electric Drill	Drilling capacity: 6.5 mm	3
		Drilling capacity: 13 mm	2
49	Impact Drill	Drilling capacity: 19 mm	2
50	Disc Grinder	Grinding wheel: 100 mm	3
		Grinding wheel: 125 mm	2
		Grinding wheel: 150 mm	2
51	Air Sander	Sanding paper: 125 mm	1
52	Air Polisher	Polishing dia: 180 mm	2
53	Air Grinder	Grinding wheel: 125 mm	2
54	Eagle Puncher	Punching capacity: 0.6-1.0 mm	2
55	Compressor	Capacity: 2 Hp 11-14 kg/cm^2 Tank: 300 liter	1
56	Bolt Clipper	Cutting capacity: 16mm dia.	1
57	Cable Cutter	Length: 750 mm Cutting capacity: 30 mm	1
58	Welding Joint Bending Tester	Compression: 20 ton Extension: 7 ton with special jigs	1
59	Tools		1 lot
60	Measuring Tools		1 lot

No.	Name	Descriptions	Q'ty
2.	ELECTRICAL & ELECTRONICS		
	Equipment		
1	Training Operation Panel	MG	1
		AC	1
		DC Reverse model	1
		M Sequence circuit control	1
	(Radio, TV)		
2	Antenna and Earth Equipment	For FM radio with accessories	1
		For TV with accessories	1
	Main Equipment		
	(Electrical)		
3	Training Low Tension Switch Board	1 P 220 V 5 circuits	1
4	Induction Voltage Regulator	1 P 2 KVA 220 V ± 100%	1
		1 P 5 KVA 220 V ± 100%	2
		3 P 5 KVA 380 V ± 100%	1
		3 P 10 KVA 380 V ± 100%	2
5	Hydraulic Pipe Bender	60.5 dia. x 3.8 t 1 P 220 V	1
		5/8inch - 3inch	1
6	Hydraulic Compression Tools		1 lot
7	Testing Generator Set	DC 2 KW motor-generator with panel	1
		3 P 2 KVA motor-generator with panel	1

No.	Name	Descriptions	Q'ty
8	Testing Transformer	1 P 50 KV 5 KVA	1
9	Transformer	1 P 220 V/100 V 3 KVA	3
		3 P 380 V/200 V 5 KVA	4
10	Rectifier	Input: 3 P 380 V Output: DC 120 V 100 A	1
11	Coil Winding Machine	For motor	2
		For transformer	2
12	Drying Oven	1,000 x 1,000 x 1,000 mm 3 P 5 KW	1
13	Motor	1 P 220 V 250 W split type	4
		1 P 220 V 200 W condenser type	4
		1 P 220 V 400 W repulsion type	5
		3 P 380 V 0.75 KW squirrel-cage type 4 poles	5
		3 P 380 V 1.5 KW squirrel-cage type 4 poles	2
		3P 380 V 2.2 KW squirrel-cage type 4 poles	2
		3 P 380 V 3.7 KW squirrel-cage type 4 poles	1
		3 P 380 V 2.2 KW wound-rotor type 4 poles with starter	1
14	Generator	3 P 380 V 2 KW 4 poles synchronous type	2
		DC 100 V 2 KW shunt type	2
15	Insulation Puncture Tester	1 P 50 KV 5 KVA	1
16	Automatic Voltage Regulator	1 P 220 V 2 KW	2
17	Load Rheostat	3 KVA 21 notches 220 V	3
		5 KVA 11 notches 380 V	2

No.	Name	Descriptions	Q'ty
18	Insulation Paper Cutter	550 x 365 mm	1
	(Radio, TV Training)		
19	Electronics Circuit Trainer		1
20	Transistor Circuit Trainer		1
21	Constant Voltage Power Supply	0 - 35 V 1 A	10
		0 - 32 V 3 A	10
22	Oscilloscope	DC-20 MHZ 5 mV - 5 V dual trace	5
		DC-20 MHZ 1mV/div 1 channel	10
		DC-5 MHZ 10mV/div 1 channel	10
		DC-4 MHZ 20 mV 1 channel	5
		DC-10 MHZ 10 mV-5V/div 1 channel	5
23	Vacuum Tube Voltmeter	10 HZ - 1,000 MHZ 0 - 3 V 8 ranges	1
24	Radio Receiver	FM, AM, TV sound	5
		FM, AM, MW 3-bands	5
		AM 9-transistor	25
		FM, AM 2-bands	25
25	TV Receiver	Colour 16 inch	5
		Colour 21 inch	20
		Colour 20 inch	5
		Monochrome 14 inch	5
		Monochrome 17 inch	20
		Monochrome 20 inch	5
26	Record Player	DC motor type	2
27	Tape Recorder	2-speed	1

No.	Name	Descriptions	Q'ty
28	Tape Deck		1
29	Sweep Marker Generator	For television	2
		VHF 5 - 300 MHZ	1
30	Signal Generator	FM-AM 100 KHZ - 30 MHZ	3
31	Test Oscillator	100 KHZ - 30 MHZ	2
32	Audio Oscillator	5 HZ - 500 KHZ	2
33	Function Generator	0.0005 HZ - 1 MHZ	1
34	FM-AM Standard Generator	10 HZ - 240 MHZ	1
35	Transistor Checker	3-ranges	1
36	Vacuum Tube Checker		1
37	Pulse Circuit Trainer	Portable type	5
38	Semiconductor Application Trainer	Portable type	5
39	Attenuator	0 - 121 dB 4 dials	2
40	Q Meter	15.5 KHZ - 50 MHZ Q : 5 - 750 7 ranges	2
41	FM Stereo Signal Generator	100 HZ - 10 KHZ	1
42	Stereo Amplifier	40 W + 40 W 20 - 20,000 HZ	1
43	FM-AM Tuner	FM, AM 2-bands	1
44	Output Meter	10 HZ - 500 KHZ	1
	Refrigerator and Air Conditioner Equipment		
45	Separate Type Air Conditioner	Cooling: 2,240 Kcal Heating: 3,300 Kcal	5
46	Window Type Air Conditioner	12,500 BTU/h	5
47	Automotive Air Conditioner	3,000 Kcal/h	5

No.	Name	Descriptions	Q'ty
48	Refrigerator	One-door type 78 liter	5
		Double-door freezer 23 liter Refrigerator 55 liter	5
49	Vacuum Pump	100 liter/min 10^{-3} torr	2
		125 liter/min 10^{-3} torr	1
50	Steam Cleaner	0 - 25 kg/cm^2 4.7 liter/min	1
	(Common use)		
51	Wheatstone Bridge	1 ohm - 1 M ohm	2
52	Double Bridge	0.1 m ohm - 110 ohm	1
53	LCR Bridge	Analog type	1
54	Kohlrausch Bridge	0.01 - 50 K ohm	1
55	Foot Shear	1.6 x 1,000 mm	1
56	Lever Shear	6.4 x 220 mm	1
57	Bench Drilling Machine	Drilling capacity: 13 mm	3
58	Bench Grinder	Wheel size: 205 mm	2
59	Portable Electric Drill	Drilling capacity: 6.5 mm	4
		Drilling capacity: 13.0 mm	4
60	High-Speed Cutoff Grinder	Grinding wheel size 335 mm 50 Hz 220 V	1
61	Disk Grinder	125 mm dia. 590 W 1 P 50 Hz 220 V	2
62	Portable Electric Hammer	Drill dia.: 25 mm 1,050 W 1 P 50 Hz 220 V	2
63	Chain Block	1 ton 2.5 m	2
64	Steel Cabinet	800(W) x 380(D) x 880(H) mm	6
65	Air Compressor	2.2 KW 3 P 380 V	1
	Measuring Apparatus		
	(Electrical)		
66	Watt-hour Meter	1 P 220 V 30 A	10
67	Frequency Meter	45 - 500 Hz 4 pcs/set	5

No.	Name	Descriptions	Q'ty
68	Power Factor Meter	5/25 A	5
69	Single Phase Power Meter	240 V, 5/25 A	10
70	Three Phase Power Meter	5/25 A	10
71	Testing Voltage Transformer	Primary: 220/440/2,200/3,300 V Secondary: 110 V	1
72	Testing Current Transformer	Primary: 10 - 1,500 A Secondary: 5 A	1
73	Load Rheostat	AC, DC 3 KW	3
		AC, 3 P 5 KW	3
74	Leakage Ammeter	2 mA - 300 A 600 V	1
75	Growler	For stator	1
		For rotator	1
76	Motor Gap Gage	0.04 - 0.3 9 pcs/set	2
	(Radio, Television)		
77	Distortion Meter	0.01 - 100% 9 ranges	1
78	Function Generator	0.1 HZ - 1 MHZ 7 ranges	1
79	TV Field Strength Meter	VHF : 40 - 300 MHZ UHF : 470 - 890 MHZ	1
80	Grid Dipmeter	1.5 MHZ - 200 MHZ	2
81	Digital Multimeter	4-1/2 Digit LED	2
82	Frequency Counter	10 Hz - 1,000 MHZ	2
83	Electronic Voltmeter	50 V - 150 V 1 channel	3
84	Condenser Meter	200 PF - 2,000 F digital	2
85	High Voltage Meter	DC 30 KV	2
	(Refrigerator, Air Conditioner)		
86	Gas Detector	For refrigerators and air conditioners	1

No.	Name	Descriptions	Q'ty
87	Thermistor Thermometer	-20° - $800^{\circ}C$	1
	(Common use)		
88	Megger	250 V/50 M ohm	5
		500 V /1,000 M ohm	5
89	Lux Meter	3,000 lux	2
90	Circuit Tester	AC, DC 0 - 1,200 V	15
			45
91	Earth Tester	0 - 1,000 ohm	4
		0 - 1,000 ohm	1
92	Tacho Meter	60 - 20,000 rpm	1
		1 - 20,000 rpm	5
93	Portable AC Voltmeter	30/75 V 2-ranges	20
		150/300 V 2-ranges	20
		300/750 V 2-ranges	20
94	Portable AC Ammeter	0.5 - 5 A 4-ranges	20
		2 - 20 A 4-ranges	20
		10 - 100 A 4-ranges	20
95	Portable DC Voltmeter	3 - 100 V 4-ranges	20
		30 - 1,000 V 4-ranges	20
96	Portable DC Ammeter	0.1 - 3 A 4-ranges	20
		1 - 30 A 4-ranges	20
97	Galvanometer	0.9 A/Div $\pm$ 10%	4
98	Clamp Ammeter	0 - 2,500 A	3
		0 - 300 A	3
99	Flux Meter		2

No.	Name	Descriptions	Q'ty
100	Slide Rheostat	4.7 ohm/6 A	3
		10 ohm/4 A	3
		170 ohm/1 A	3
		600 ohm/0.5 A	3
		4,800 ohm/0.18 A	3
		24/50 ohm	6
		60 ohm	6
		60/15 ohm 2/4 A	6
101	High Frequency Ammeter	100 - 1,000 mA, 4 ranges	2
102	Slidac	0 - 260 V, 5 A	12
103	Variable Self-Inductor	10 mH, 0.4 A	2
104	Variable Condenser	100 PF - 1.111 F	1
105	Star-Delta Switch	3.75 KW	4
106	Magnet Switch	3.75 KW	40
107	Outside Micrometer	0 - 25 mm	5
108	Inside Micrometer	5 - 35 mm	5
109	Outside Compass	200 mm	5
110	Inside Compass	200 mm	5
111	One-side Compass	200 mm	5
112	Outside Caliper	200 mm	10
113	Square	150 mm	10
114	Compass	200 mm	10
115	Surface Plate	1,000 x 1,000 x 140	1
116	Vee Block	300 x 150 x 120	10
117	Surface Gauge	500 mm, 300 mm, 150 mm each 1	3
118	Steel Rule	300 mm	10
		600 mm	20

No.	Name	Descriptions	Q'ty
119	Thickness Gauge	10 pcs/set, 200 mm	1
120	Wire Gauge	0.1 - 12 mm	10
121	Wooden Rule	1,000 mm	50
122	Pattern Generator	5 patterns + 8 Color rasters	5
123	Relay Sequence Trainer	Contact relay type	20
124	Pipe Threading Machine	1/4 inch - 3 inch	2
125	Standard Resistor	0.01, 1, 10, 100, 1,000 ohm	5
126	One Board Micro Computer	CPU: Z-80A ROM: 32 K BYTE RAM: 32 K BYTE	10
		Step motor relay assembly 4 poles step motor 2 pcs. step angle 7.5°	5
		Input output board 32 pins	5
		A/D, D/A converter A/D 9 bit 8 channels D/A 8 bit	3
		Power supply ± 15 V DC	3
		Transistor inverter Training unit motor 3 P 24 V 4 poles	3
		Step motor positioning Unit step motor 4 poles DC 12 V controller PMM 8713	3
		SSR Unit output solid state relay photocoupler 16 pcs.	3
		Sensor & I/O Interface unit ultrasonic 1 pair frequency type	3

No.	Name	Descriptions	Q'ty
		Mechatrolabo AC & stepping motor (open type)	1
127	Electrical Tools and Appliance		1 lot
128	Radio, Television Tools and Appliance		1 lot
129	Refrigerator, Air Conditioner Tools and Appliances		1 lot
130	Common Use Tools and Appliances		1 lot

No.	Name	Descriptions	Q'ty
3.	AUTOMOTIVE		
	3-a. Auto Mechanics		
1	Monorail	Electric chain block with trolley x 2 sets, Capacity: 2 ton with special accessories	1
2	Flat Lift	Plate type, capacity: 2.5 ton (max.: 3 ton) Plate size: 1,300 x 400 x 50 mm	1
3	Separate Lift	Plate type: twin lift Capacity: max. 2 ton Plate size: 1,300 x 400 x 50 mm	1
4	Frame Contact Auto Lift	Air oil type, capacity: 4 ton Frame opening: 1,500 mm (max.)	1
5	Inspection Line		
	a. Side Slip Tester	AC 220 380 V	1
	b. Brake Tester		1
	c. Chassis Dynamo Meter		1
	d. Wheel Alignment Tester		1
	e. Headlight Tester	Automatic system Measuring range: 0 - 40,000 cd.	1
	f. Inspection Pit	(by construction works)	(1)
	Pit Lift	Air pressure: 5 - 9.9 Kg/cm^2 Capacity: 1.5 ton Stroke: 320 mm Width of pit: 750 - 950 mm	1
6	Air Supply System (Airoutlet with chuck for the air lift & others, span of each outlet: 12 m)	Air compressor: 7.5 KW 220 liter	1
		Auxiliary tank: 300 liter	1
		Air hose reel: 15 m x 8 mm dia.	4
		Refrigerated air dryer	1
7	Piston Heater	AC 220 V, 1 P, 1 KW	1
8	Valve Seat Grinder	AC 220 V, 1 P, 120 W, 12,000 rpm Capacity: valve seat 28 - 60 mm valve dia. 6 - 10 mm	1

No.	Name	Descriptions	Q'ty
9	Valve Refacer	Chuck capacity: 6 - 14.5 mm Revolutions: 350 rpm AC 220 V, 1 P	1
10	Cylinder Boring Machine	Capacity: dia. 53.5 - 90 mm depth 240 mm Motor: AC 380 V 3 P	1
11	Cylinder Honing Machine	Capacity: dia. 54 - 150 mm Stroke: 70 - 300 mm Motor: AC 380 V, 3 P	1
12	Surface Grinder	Motor: AC 380 V, 3 P Grinding wheel size: 280 mm Table size: 1,276 x 368 mm with blower	1
13	Brake Lining Bonding Oven	Inner size: 655 x 400 mm Timer: 0 - 30 min. Motor: AC 220 V, 1 P	1
14	Tyre Changer	Rim dia.: 10-16 inch Rim width: - 10 inch Motor: AC 380 V, 3 P	1
15	Chassis Lubricator	For Grease Pump ratio: 40:1 Output pressure: 230 kg/cm^2 Output volume: 350 g/min.	1
16	Brake Shoe Grinder	Capacity: dia. 150 - 410 mm width 110 mm Motor: AC 220 V, 1 P	1
17	Brake Drum Lathe	Capacity: dia. 130 - 380 mm width 200 mm Motor: AC 380 V, 3 P	1
18	Oil Changer	Glass cylinder capacity: 13 liter Tank capacity: 100 liter Motor: AC 220 V, 1 P	1
19	Oil Bucket Pump	Output volume: 40 cc/stroke Tank capacity: 20 liter	1
20	Hotwater Car Washer	Pump: ceramic plunger Output volume: 850 liter/h. Output pressure: 80 kg/cm^2 Motor: AC 380 V, 3 P	1

No.	Name	Descriptions	Q'ty
21	Steam Cleaner	Steam pressure: 4 - 7 kg/cm^2 Water consumption: 250 liter/h. Motor: AC 220 V, 1 P	1
22	Garage Jack	Capacity: 5 ton Lift: 410 mm	1
		Capacity: 3 ton Lift: 480 mm	4
		Capacity: 1.5 ton Lift: 360 mm	1
23	Portable Oil Jack	Capacity: 2 ton Lift: 115 mm	3
		Capacity: 5 ton Lift: 120 mm	2
24	Air Lift	Capacity: 1,200 kg Lift: 1,240 mm	1
25	Hydraulic Press	Capacity: 35 ton Stroke: 140 mm	1
26	Transmission Jack	Capacity: 800 kg Lift: 610 mm	1
27	High Mission Jack	Capacity: 150 kg Lift: 995 mm	1
28	Differential Jack	Capacity: 500 kg Lift: 460 mm	1
29	Jiggle Jack	Lift: 45 mm	1
30	Bench Grinder	Wheel size: 255 x 25 x19.05 mm with dust collector Motor: AC 380 V, 3 P	1
31	Parts Washing Stand	Motor: AC 220 V, 1 P Tank capacity: 62 liter Output volume: 12 liter/min.	2
32	Bench Drilling Machine	Drilling capacity: 13 mm Motor: AC 220 V, 1 P	1
33	Floor Crane	Capacity: 500 kg	1
34	Arc Welder	Capacity: 40 - 150 A Power source: AC 380 V, 3 P with welding accessories	1

No.	Name	Descriptions	Q'ty
35	Battery Charger	Type: silicon DC. output: 20 A (6 - 48 V) AC. input: 220 V, 1 P	1
		Type: quick charge DC. output: max 70A (6 - 12 V) max 35A (18 - 24 V) AC. input: 220 V, 1 P	1
36	Battery Starter Caddy	With booster cable	1
37	Oil Drain	Output volume: 13 liter/min. Tank capacity: 70 liter	1
38	Engine Stand	Capacity: 250 kg	6
		Capacity: 450 kg	6
39	Gasoline Engine for Training	Small 1,300 - 1,600 cc with radiator, caburator, distributor and other parts for operation	5
		Middle 1,800 - 2,000 cc, DOHC with radiator, caburator, distributor and other parts for operation	1
		Middle 1,800 - 2,000 cc Turbo changer with radiator, caburator, distributor and other parts for operation	1
40	Diesel Engine for Training	Small, 1,800 - 3,000 cc with radiator, injection pump and other parts for operation	5
41	Automobile for Training	Small, 1,300 cc passenger car, FF	1
		Middle, 1,600 cc passenger car, FR	1
		Small truck, Pick-up 2,000 cc, 2 ton, gasoline	1
42	Rigid Rack	Capacity: 1.5 ton x 2 pcs.	8
		Capacity: 2.5 ton x 2 pcs.	2

No.	Name	Descriptions	Q'ty
		Capacity: 3 ton x 2 pcs.	2
		Capacity: 5 ton x 2 pcs.	2
43	Spark Plug Service Set	Power source: AC 220 V, 1 P Air pressure required: $7 - 10$ kg/cm^2 with standard accessories	1
44	Hand Truck	Capacity: 400 kg Platform size: 900 x 600 mm	1
		Capacity: 750 kg Platform size: 750 x 1,200 mm	2
45	Tool stand	Caddy tool stand Size: 660 x 330 x 825 mm	7
		Mechanic tool stand Size: 600 x 400 x 1,050 mm	8
46	Read type Parallel Vise	Nominal size: 125 mm JISB4620	10
47	Vise for Drilling Machine	Norminal size: 75 mm Jaw width: 60mm	1
48	Foot Shear	Capacity: 1.6 x 1,000 mm	1
49	Portable Fan	Exhaust fan for engine operation with duct 2 m AC 220 V, 1 P	1
		For cooling of eingine operation, with caster AC 220 V, 1 P	1
50	Air Inflator	Portable type Pressure range: 0 - 10 kg/cm^2	1
51	High-Speed Cutoff Machine	Grinding wheel size: 405 mm Motor: AC 380 V, 3 P with spare wheels (20 pcs.)	1
52	Motorcycle for Training	2 Cycle engine, 125 cc	1
		4 Cycle engine, 125 cc	1

No.	Name	Descriptions	Q'ty
53	Gas Changer	For air conditioner with standard accessories	1
54	Cooler Injector	Air pressure required: 6 kg/cm^2	1
55	Wheel Balancer	Rim dia: 9.4 - 23.5inch Rim width: 1 - 13.8inch Motor: AC 380 V, 3 P	1
56	Injection Pump Tester	Capacity: up to 12 cylinders Motor: AC 380 V, 3 P with attachments	1
57	Diesel Timing Tachometer	Tachometer: 120 - 9,990 rpm Advance: 0 - 90^o	1
58	Air Filter Element Tester	With standard accessories Power source: AC 220 V, 1 P	1
59	Radiator Cap Tester	Pressure range: 0 - 2 kg/cm^2	1
60	Brake Booster Tester	Vacuum gauge: 76 cm/Hg Pressure gauge: 15/100/250 kg/cm^2	1
61	Exhaust Gas Analyzer	Range: CO 0-2/0 - 10% HC 0-500/2,000/4,000/ 10,000 rpm Power source: AC 220 V, 1 P	1
62	Diesel Smoke Meter	Range: 0 - 100% Power source: AC 220 V, 1 P	1
63	Sound Level Meter	Range: 30 - 130 dB, 40 - 130 dB	1
64	Diesel Nozzle Tester	Pressure gauge: 0 - 500 kg/cm^2 with standard accessories	1
65	Regulator Tester	For 2, 4, 6, 8 cylinder (2, 4 cycle engine) Power source: AC 220 V, 1 P	1
66	IC Regulator Tester	DC Volt range: 5 - 20 V Power source: AC 220 V, 1 P	1
67	Auto Analyzer	Test items: point voltage dwell angle voltage & Amperage resistance vacuum	1

No.	Name	Descriptions	Q'ty
68	Engine Tune-up Tester	Contents: timing advance tester tacho-dwell tester volt ampere meter coil condenser tester	1
69	Universal Test Bench	Testing item: generator test, regulator test, starter test, distributor test, ignition coil, circuit and resistance Motor: AC 380 V, 3 P	1
70	Armature Tester	Range: 0 - 2 amp. Power source: AC 220 V, 1 P	1
71	Scoped Engine Analyzer		1
72	Valve Spring Tester	Capacity: 100 kg	1
73	Cam Angle Tacho Tester	Applicable engines: 2 and 4 cycle gasoline engines 2, 3, 4, 5 cylinders, rotary engine	1
74	Coil Condenser Tester	Range: 0 - 1,000 ohm/ 0 - 100 Kohm.	1
75	Volt Ampere Tester	Range: Volt 0 - 2/10/20/50 V Amp. -5 to - to 50 A	1
76	Timing Advance Tester	Range: 0 - 60°/0 - 30°	1
77	Battery Tester	Capacity: 6/12 V (6 - 150 AH)	1
78	Timing Light		5
79	Camber Caster Kingpin Gauge	With compensator	1
80	Turning Radius Gauge	Capacity: 750 kg	1
81	Toe-in Gauge	Range: 900 - 1,600 mm	1
82	Connecting Rod Aligner	Contents: dia. 30 - 75 mm dia. 50 - 105 mm	1
83	Gas Leak Tester	For air conditioners Power source: AC 220 V, 1 P	1

No.	Name	Descriptions	Q'ty
84	Hydraulic Test Pump	Pressure: 35 kg/cm^2	1
85	Compression Gauge	For gasoline engine Capacity: 0 - 25 kg/cm^2	2
		For diesel engine Capacity: 0 - 70 kg/cm^2 with adaptor	1
86	Vacuum Gauge	Range: 0 - 76 cmHg 0 - 0.5 kg/cm^2 with standard accessories	2
87	Battery Hydrometer Set	Contents: for battery for coolant	1
88	Circuit Tester		2
89	Surface Plate	For body repair Size: 900 x 600 x 100 mm	1
		For measurement Size: 900 x 900 x 125 mm	1
		For precision measurement Size: 300 x 200 x 80 mm	1
90	Outside Micrometer Set	Range: 0 - 75 mm each 4 pcs./set	1
		Range: 75 - 150 mm each 1 pc./set	2
91	Inside Micrometer	Range: 50 - 150 mm	2
		Range: 5 - 25 mm, 25 - 50 mm each 2 pcs./set	2
92	Vernier Caliper	Range: 0 - 150 mm	10
		Range: 0 - 450 mm	2
93	Dial Gauge	Range: 0 - 10 mm	3
94	Micrometer	For depth measurement	1
95	Micrometer Stand	For 15 - 100mm	4
96	Steel Rule	Range: 600, 1,000, 2,000 mm each 1 pc.	1

No.	Name	Descriptions	Q'ty
97	Thickness Gauge	Range: 0.03 - 1.00, 25 leaves	5
		Range: 0.04 - 0.3, 9 leaves	5
98	Tape Measure	Range: 0 - 20 m	1
99	Depth Gauge	Range: 0 - 150 mm	1
		Range: 0 - 300 mm	1
100	Screw Pitch Gauge		1
101	Piston Feeler Gauge		2
102	Cylinder Gauge		1
			1
103	Tire Pressure Gauge	Contents: 4.2 kg/cm^2, 10 kg/cm^2 each 4 pcs./set	1
104	Battery Hydrometer Set		1
105	Thermometer		1
106	Insulation Tester	Range: 500 V (0 - 100 ohm)	1
107	Plug Gap Gauge	Leaf length: 45 mm	3
108	Caburator Balancer	For twin caburator	2
109	Spring Tension Tester		1
110	Steel Protractor	Range: 150 mm	2
111	Cast Iron Level	Length: 300 mm	1
112	Stop Watch	Range: 60 sec.	3
		Range: 30 sec.	2
113	Straight Edge	Length: 500 mm	2
114	Ball Joint Checker	Gauge stroke: 10 mm	3
115	Square	Size: 150 mm	10
116	Portable Disc Sander	Wheel size: 100 mm Motor: AC 200 V, 1 P	1
		Wheel size: 100 mm Motor: AC 200 V, 1 P	1

No.	Name	Descriptions	Q'ty
117	Electric Polisher	Capacity: 125 mm Motor: AC 220 V, 1 P	1
118	Portable Electric Drill	Drilling capacity; 6.5 mm	1
		Drilling capacity: 13 mm	1
119	Portable Air Orbital Sander	Paper size: 114 x 140 mm	1
120	Mechanic Tool Set	For auto-mechanics students	10
121	Tool Set	For auto-mechanics	5
122	Hand Tool Set	Consists of socket wrench, offset wrench, spanner, piston ring compressor, piston ring tool and other hand tools	1 lot

No.	Name	Descriptions	Q'ty
	3-b. Car Body Repair		
1	Jib Crane	Wall type, Capacity: 2 ton Lift: 3 m	1
2	Air Supply System (Airout let with Chuck for the air lift & others, span of each outlet: 12 m)	Air compressor: 7.5 KW 220 liter	1
		Auxiliary tank: 300 liter	1
		Air hose reel: 15 m x 8 mm dia.	4
		Refrigerated air dryer	1
3	Garage Jack	Capacity: 1.5 ton	2
4	Portable Oil Jack	Capacity: 2 ton	3
5	Hot Water Car Washer	Pump: ceramic plunger Output volume: 850 liter/h. Output pressure: 80 kg/cm^2 Motor: AC 380 V, 3 P	1
6	Air Lift	Capacity: 1,200 kg Lift: 1,240 mm	1
7	Bench Grinder	Wheel size: 255 x 25 x 19.05 mm with dust collector Motor: AC 380 V, 3 P	2
8	Bench Drilling Machine	Dlilling Capacity: 13 mm Motor: AC 380 V, 3 P	2
9	Body & Frame Repair System	Capacity: 10 ton	1
10	Porto Power Set	Capacity: 4 ton	1
11	Spot Welder	With accessories	1
12	Wrecker Jack	Capacity: 1.5 ton Height: 135 - 495 mm	1
13	Automobile for Training	Small, Passenger car 1,200 cc - 1,600 cc FR	1
		Medium, Passenger car 1,600 cc - 2,000cc	1
14	Rigid Rack	Capacity: 1.5 ton x 2 pcs.	4

No.	Name	Descriptions	Q'ty
15	Gas Welding,Gas Cutting and Gas Cylinder Carrier		2 sets
16	Hand Truck	Capacity: 400 kg Platform size: 900 x 600 mm	2
		Capacity: 750 kg Platform size: 750 x 1,200 mm	1
17	Tool Stand	Caddy tool stand Size: 660 x 330 x 825 mm	3
		Mechanic tool stand Size: 600 x 400 x 1,050 mm	2
18	Read type Parallel Vise	Nominal size: 125 mm JISB4620	20
19	Vise for Drilling Machine	Jaw width: 125 mm	2
20	Circuit Tester		1
21	Surface Plate	For body repair Size: 900 x 600 x 100 mm	2
		For measuring Size: 900 x 900 x 125 mm	1
22	Vernier Caliper	Range: 0 - 150 mm	10
		Range: 0 - 450 mm	2
23	Steel Rule	Range: 600, 1,000, 2,000 mm each 1 pc.	4
24	Thickness Gauge		4
25	Tape Measure	Range: 0 - 20 m	1
26	Tire Pressure Gauge	Contents: 4.2 kg/cm^2/10 kg/cm^2 each 4 pcs./set	1
27	Steel Protractor	Range: 150 mm	2
28	Cast Iron Level	Length: 300 mm	1
29	Straight Edge	Length: 500 mm	2
30	Vernier Height Gauge	Range: 500 mm	1
31	Square	Length: 150 mm	10

No.	Name	Descriptions	Q'ty
32	Portable Disc Sander	Wheel size: 100 mm Motor: AC 220 V, 1 P	1
		Wheel size: 100 mm Motor: AC 220V, 1 P	1
33	Electric Polisher	Capacity: 125 mm Motor: AC 220 V, 1 P	1
34	Portable Electric Drill	Drilling capacity: 6.5mm	1
35	Air Orbital Sander	Paper size: 114 x 100 mm	2
36	Mechanic Tool Set	For car body repair students	10
37	Tool Set	For car body repair	20
38	Hand Tool Set	Consists of punch, chisel, wood hammer, etc.	1 lot

No.	Name	Descriptions	Q'ty
	3-c. Agro Mechanics		
1	Air Supply System (connection from Car Body Repair, distance 12 m)	Auxiliary tank: 300 liter	1
		Air hose reel: 15 m x 8 mm dia	4
2	Quick Rivetter Set	For brake lining with standard accessories	1
3	Oil Bucket Pump	Output volume: 40 cc/stroke Pump strike: 50 mm	1
4	Garage Jack	Capacity: 5 ton	2
5	Portable Oil Jack	Capacity: 5 ton	3
6	Parts Washing Stand	Motor: AC 220 V, 1 P Tank capacity: 62 liter Output volume: 12 liter/min.	2
7	Bench Drilling Machine	Driling capacity: 13 mm Motor: AC 220 V, 1 P	1
8	Oil Drain	Output volume: 13 liter/min. Tank capacity: 70 liter	1
9	Engine Stand	Capacity: 450 kg	5
		Capacity: 250 kg	5
10	Rigid Rack	Capacity: 3 ton x 2 pcs.	2
		Capacity: 5 ton x 2 pcs.	2
		Capacity: 2.5 ton x 2 pcs.	2
11	Gas Welding, Gas Cutting, and Gas Cylinder Carrier		2 sets
12	Tool Stand	Caddy tool stand Size: 660 x 330 x 825 mm	5
		Mechanic tool stand Size: 600 x 400 x 1,050 mm	5
13	Vice for Drilling Machine	Jaw width: 75 mm Jaw opening: 60 mm	1
14	Tractor for Training	4 cylinder diesel engine 2,771 cc, 50 Hp with standard accessories	1

No.	Name	Descriptions	Q'ty
15	Power Tiller	With standard accessories gasoline engine	1
16	Automatic Sprayer		1
17	Power Sprayer		1
18	Diesel Engine	7 Hp	3
		10 Hp	1
19	Gasoline Engine	6.4Hp with parts for operation	4
20	Rice Thresher	5 Hp diesel engine	1
21	Bush Cutter	With accessories	1
22	Large Rivet Forge	For blacksmith training AC 220 V, 1 P, 0.2 KW	1
23	Cast Steel Anvil	Weight: 150 kg	4
24	Cast Iron Swage Block	Weight: 55 kg	4
25	Rail Anvil	Size: 180 mm x 1.5 m	2
26	Diesel Timing Tacho Tester	Tachometer: 120 - 9,990 rpm Advance: 0 - 90° with standard accessories	1
27	Compression Gauge	For diesel engine Capacity: 0 - 70 kg/cm^2 with standard accessories	1
28	Circuit Tester		2
29	Surface Plate	For body repair Size: 900 x 600 x 100 mm	1
		For measuring Size: 900 x 900 x 125 mm	1
		For precision measurement Size: 300 x 200 x 80 mm	1
30	Outside Micrometer Set	Range: 0 - 75 mm each 4 pcs./set	1
		Range: 75 - 150 mm, each 1 pc.	1

No.	Name	Descriptions	Q'ty
31	Inside Micrometer Set	Range: 50 - 150 mm	1
		Range: 5 - 25 mm, 25 - 50 mm each 2 pcs./set	1
32	Vernier Caliper	Range: 0 - 150 mm	10
		Range: 0 - 450 mm	2
33	Dial Gauge	Range: 0 - 10 mm	1
34	Micrometer	For depth measuring	1
35	Micrometers Stand	Type: 15 mm - 100 mm	4
36	Steel Rule	Range: 600, 1,000, 2,000 mm each 1 pc.	1
37	Thickness Gauge		1
38	Tape Measure	Range: 0 - 20 m	1
39	Depth Gauge	Range: 0 - 150 mm/0 - 300 mm each 1 pc.	1
40	Screw Pitch Gauge		1
41	Piston Feeler Gauge		2
42	Tire Pressure Gauge	Contents: 4.2 kg/cm^2, 10 kg/cm^2 each 1 pc.	1
43	Plug Gap Gauge	Leaf length: 45 mm	2
44	Caburator Balancer	For Twin caburator	1
45	Steel Protractor	Range: 150 mm	1
46	Straight Edge	Length: 500 mm	1
47	Ball Joint Checker	Gauge stroke: 10 mm	2
48	Portable Grinder	Wheel size: 100 mm Motor: AC 220 V, 1 P	1
49	Portable Disc Sander		1
50	Electric Polisher	Capacity: 125 mm Motor: AC 220 V, 1 P	1

No.	Name	Descriptions	Q'ty
51	Portable Electric Drill		1
52	Mechanic Tool Set	For agro mechanics students	10
53	Tool Set	For agro mechanics	15
54	Hand Tool Set		1 lot

No.	Name	Descriptions	Q'ty
4.	BUILDING CONSTRUCTION		
	4-a. Cabinet Making		
1	Electronics Portable Calculator	Type: 8-digits 47 functions	20
2	Portable Circular Saw	Saw dia: 290 mm Max. cutting depth: 109 mm	4
3	Portable Hand Planer	Blade width: 120, 136, 156 mm each 1 model/set	4
4	Circular Saw Bench	Max. saw dia: 405 mm Spindle rev: 3,700/5,000 rpm Table area: 700 x 840 mm	1
5	Universal Saw Bench	Max. saw dia: 405 mm Spindle rev: 2,500/4,000 rpm Table area: 700 x 800 mm Max. table tilt: 45°	1
6	Single Surface Planer	Max. work width: 450 mm Max. work thickness: 320 mm Spindle rev: 5,000 rpm Feed speed: 4 - 22 m/min	1
7	Single Tenoner	Max. tenon depth: 90 mm Max. work width: 300 mm Max. cutter thinckness: 70 mm	1
8	Band Saw	Saw size: 51 x 1,848 mm Wheel dia: 255mm Cutting capacity: 180mm	1
9	Crosscut Saw	Saw dia: 255 - 355 mm Work thickness: 80 mm Saw stroke: 600 mm Max. work width: 475 mm	1
10	Dovetail Machine	Work thickness: 10 - 25 mm Max. work width: 410 mm No. of bits: 16 Spindle rev: 5,000 rpm	1
11	Universal Scroll Saw	Max. cutting capacity: 60mm Stroke: 30mm Table size: 500 x 500 mm	2
12	Router	Max. work thickness: 200 mm Max. distance from table to spindle: 250 mm Max. head stroke: 120 mm	1

No.	Name	Descriptions	Q'ty
13	Wood Lathe	Bed length: 1,880 mm Swing-over bed: 250 mm Spindle rev: 600 - 2,400 rpm	1
14	Hollow Chisel Mortiser	Chisel size: 6-24 mm Max. work size: 170 x 150 mm Vertical travel of chisel: 125mm	2
15	Tool Grinder	Chuck size: 0 - 13 mm Max. cutter dia: 250 mm Spindle rev: 3,450 rpm	1
16	Portable Router	Capacity (shank size): 6 - 12 mm No-load speed: 22,000 rpm with various kinds of bits	4
17	Portable Electric Drill	Drilling capacity: 30 mm (wood) 13 mm (steel) Type: reversible	4
18	T-Bar Clamp	Nominal size: 60, 90, 120, 150 180, 240, 300 cm each 10 pcs/set	6
19	Portable Belt Sander	Belt width: 110 mm Belt length: 620 mm Belt speed: 300/350 m/min	4
20	Universal Table Sander	Table size: 635 x 180 mm Paper size: 180 x 2,150 mm Paper speed: 1,100 mm/min with dust collector	1
21	Dust Collector	Max. sealed suction: 1,700 mm of water Capacity dust: 30 liter water: 25 liter	2
22	Carbide Tool Grider	Max. saw dia: 405 mm Max. cutter dia: 305 mm Max. knife length: 100 mm	1
23	Knife Grinder	Max. grinding capacity: 450 (L) x 90 (W) mm	1
24	Corner Locking Machine	Max. work thickness: 120 mm Max. work width: 450 mm	1
25	Industrial Sawing Machine	Sawing speed: 2,800 spm Presser lift: 7 mm Stitch length: 5 mm with working table	3

No.	Name	Descriptions	Q'ty
26	Band Saw Blade Grinding Machine	Effective saw size: 152 - 610 mm Grinding stone: 203 & 255 mm	1
27	Dust Collecting System	Type: cyclone system Air blow: 75 m^3/min	1
28	Ripper	Saw dia: 255 - 355 mm Table: 1,600 x 1,000 mm	1
29	Hand Feed Planner	Max. effective work width:300mm Table: 2000 x 300mm	1
30	Bench Drilling Machine	Drilling capacity: 23 mm Power output: 400 W Swing: 430 mm	2
31	Flush Press	Table size: 1,020 x 2,020 mm Stroke: 800 mm Total pressure: 20 ton	1
32	Air Compressor	Working pressure: 5.5 - 7.0 kgf/cm^2 Air receiver: 120 liter Motor: 3.7 KW	1
33	Air Tucker	Air pressure: 4 - 7 kg/cm^2	2
34	Air Driver	Bolt dia: 4 - 5 mm	2
35	Air Boring Machine	Drill shank: 8 mm dia. Drill stroke: up to 50 mm Table: 1,100 x 350 mm	1
36	Wood Moisture Tester	Measuring range: 7 - 35% Accuracy: within 0.5%	1

No.	Name	Descriptions	Q'ty
	4-b. Painting		
1	Spray Gun	Type: gravity type Material output: 285 cc/min	5
		Type: suction type Material output 135 cc/min	5
2	Blow Gun	Nozzle dia.: 4.5 mm Blow pressure: 6 kg/cm^2	5
3	Portable Disc Sander	Disc size: 125 mm dia. No-load speed: 9,500 rpm	4
4	Orbital Sander	Paper size: 114(W) x 280(L) mm No-load speed: 9,900 rpm	4
5	Portable Belt Sander with Dust Collector	Paper size: 110(W) x 620(L) mm No-load speed: 350/300 m/min	4
6	Portable Polisher	Size of polishing disc: 180 mm dia.	4
7	Neumatic Sander with Dust Collector	Paper size: 100(W) x 175(L) mm No-load speed: 8,000 rpm Air consumption: 0.35 m^3/min	4
8	Portable Grinder	Wheel size: 125 mm No-load speed: 9,500 rpm	4
9	Vacuum Cleaner	Max. sealed suction: 1,700 mm of water Capacity: dust 30 liter water 25 liter	2
10	Air Compressor	Working pressure: 5.5 - 7 kg/cm^2 Free air delivery: 371 liter/min	1
11	Gasoline Engine Air Compressor	Working pressure: 5.5 - 7 kg/cm^2 Free air delivery: 380 liter/min Engine capacity: 3.5 Hp	1
12	Air Transformer	Air flow: 780 l/min Air regulating range: 0.5 - 8 kg/cm^2	4
13	Digital Balance	Max. capacity: 12 kg Min. graduation: 0.1 g Loading space: 284 x 344 mm	1
14	Color Adjuster	Tank cpacity: 90 liter	1

No.	Name	Descriptions	Q'ty
15	Viscometer	Type: Constant speed rotary type	2
16	Infrared Ray Drier	Light holder: 100 V 250 W x 12 Power consumption: 3 KW	2
17	Air Brush Set	Compressor: 7.0 kg/cm^2 Hand piece: nozzle dia. 0.2 - 0.4 mm (7 cc/cup) 0.55 - 0.65 mm (50 cc/cup)	2
18	Scaffolding Unit	Assembly size: 10(W) x 10(H) m 100m^2 (approx.)	1
19	Aluminium Ladder	2 piece set Overall lengths: 3 & 5 m	5
20	Buffle Spray Booth	Size: 1,500(L) x 2,000(W) x 2,000(H) mm	1
21	Hot Water Cleaner	Capacity: 500 liter/min Temperature: 15 - 85°C	1
22	Spray Booth	Fan: 2.2 KW (intake & exhaust) Exhaust pit size: 800(W) x 1,000(D) mm Blow: 0.45 m/sec. Pressure: 5 - 10 Aq. Drying temp.: 80°C (max.) Light: 6 units (1 unit is 40 W x 3)	1

No.	Name	Descriptions	Q'ty
	4-c. Ceramics		
1	Clay Storing Container	Size: 520(D) x 425(H) mm Capacity: 65 liter with lid & casters	20
2	Sink	With plaster trap	6
3	Storage Cabinet for Tools & Materials	450(W) x 360(D) x 450(H) mm steel	20
4	Drying Rack for Products	1,800(H) x 1,800(W) x 950(D) mm Steel frame, wood shelf plate	12
5	Disc Pugmill	Manual type, capacity: 5 kg/min. Disc size: 60 mm Holder: 75 mm	4
6	Tatara Plate Making Machine	Effective forming width: 450mm with caster, 230 V, 200 W	1
7	Tool Wagon		5
8	Hand Wheel	Cast iron, 250 dia. x H100 mm	20
9	Clay Storing Container	Square type, capacity: 120 liter	5
10	Crusher	Normal type	1
11	Ball Mill	100 kg class with 50 kg pebbles	1
		50 kg class with 25 kg pebbles	1
12	Filter Press	230 V, 750 W	1
13	Agitator	230 V, 750 W, 210 liter	1
14	De-airing Pugmill	230 V, 750 W, pump 200 W Capacity: 500 kg/h. Mouth piece dia: 150 mm	1
15	Balance	For 100 kg, 20 kg, 10 kg each 1	1
16	Balance	Triple beam type for 200 g	5
17	Sieve	Mesh: 30, 50, 80, 100, 120	5
18	Pot Mill Stand	Pot dia: 120 - 300 mm for 2 pcs., 230 V 200 W	2

No.	Name	Descriptions	Q'ty
19	Pot Mill	Porcelain, Capacity: 1 liter Capacity: 10 liter	20 4
20	Potter's Wheel	230 V, 200 W dia. of turntable: 300mm 0 - 190 rpm clockwise & counter clockwise	20
21	Kick Wheel	Dia: 380 mm	5
22	Agitator	230 V, 800 W, 300 rpm Shaft length: 500 mm stainless Screw dia: 180 mm stainless	1
23	Drying Oven		1
24	Screw Press	Capacity: 500 kg/cm^2	2
25	Mortar with Pastel	Porcelain, dia: 210 mm	20
26	Compressor	230 V, Spray gun nozzle size: 1.5, 2.0, 2.5 mm	1
27	Spot Exhaust Booth	Fume collector Portable type, 2 mouth	1
28	Spray Gun	For inside use, Nozzle dia: 1.5, 2.0, 2.5 mm	4
29	Desk for Glaze Mixing		2
30	Air Brush Set	Compressor: Max. pressure 4.7 kg/cm^2 Tank capacity 30 liter	2
31	Silk Screen Set	Hand piece: 1.2 - 0.65 mm	1
32	Electric Kiln	Inside: 350 x 400 x 350 mm 230 V, 6 KW, Max. temp: 1,340°C	1
33	LPG Kiln	Inside: 380 x 415 x 395 mm Max. temp: 1,400°C	1
34	LPG Kiln with Kiln Car	Car size: 750 x 900 mm Max. temp: 1,350°C	1
35	Frit Kiln	Inside: 200 x 250 mm Max. temp: 1,350°C	1
36	Thermometer	Measuring range: 0 - 1,600°C Thermocouple: l = 450 mm platinium/radium	2

No.	Name	Descriptions	Q'ty
37	LPG Gas Burner	Nozze dia: 2.5 mm	6
38	Materials for Kiln	Refractory fire brick " mortar " casting powder " ceramic fiber (for making 1 m^3 kiln)	1 lot
39	Pigment & Glaze		1 lot
40	Ferro Filter	Capacity: 1 - 2 metric ton/h Water content: 60%	1
41	Clay Hardness Tester		1
42	Infrared Moisture Determination Balance		1
43	Standard Hydrometer	19 pcs./set	1
44	Vibration Sieve		1
45	Jiggering Machine	1 wheel	5
46	Visco Meter		1
47	Glaze Wiping Machine		1

No.	Name	Descriptions	Q'ty
	4-d. Plumbing & Pipe Fitting		
1	Piping Practice Model		1
2	Tripod with Chain Hoist	Capacity: 1 ton	1
3	AC Arc Welder	Output current: 250 A	2
4	CO_2 Arc Welder	Output current: 350 A	2
5	Portable Type Automtic Gas Cutting Machine	Cutting capacity: 150 - 600 mm dia. 5 - 30 mm thick	1
6	Bench Grinder with Dust Collector	Grinding stone size: 305 x 32 x 25.4 mm dia.	1
7	Bench Drilling Machine	Drilling capacity: 13 mm	1
8	Hi-Speed Cutoff Machine	Grinding wheel size: 405 mm	1
9	Hydraulic Pipe Bender	Manual operation Bending capacity: 60.5 mm dia. x 3.8	2
		Manual operation Bending capacity: 89.1 mm dia. x 4.5 t	1
		Electric motor driven Bending capacity: 89.1 mm dia. x 4.5 t	1
10	Pipe Threading Machine	Threading capacity: 1/2 - 3 inch	3
		Threading capacity: 1/2 - 4 inch	1
11	Water Pipe Drilling Machine	Drilling capacity: 25 mm	1
12	Asbestos Pipe Drilling Machine	Drilling capacity: 25 mm	1
13	Water Test Pump Working pressure:	Manual operation for water pipe 100 kg/cm^2	1
14	Surface Plate (Swage)	Size: 1,200 x 2,400 x 200 mm	1
15	Cast Iron Swage Block	40 kg, size: 95 x 245 mm	1
16	Hand Truck	900 x 600 mm, 400 kg	1
17	Gas Welding, Gas Cutting and Cylinder Carrier		2 sets

No.	Name	Descriptions	Q'ty
18	Plastic Welder	0 - 350°C with compressor	2
19	Delta Cutter	Cutting capacity: 75 - 100 mm dia.	1
		Cutting capacity: 150 - 200 mm dia.	1
20	Polyethylene Pipe Welder	0 - 350°C	1
21	Centrifugal Pump	65 mm dia. (suction) x 50 mm dia. discharge 1.5 KW	1
22	P-Line Pump	50 mm dia. x 1.5 KW	1
23	Roots Pump	65 x 50 mm dia.	1
24	Roots Blower	50 mm dia.	1
25	Self Cascade Pump	20 mm, 6.3 liter/min. x 15.5 m	1
26	High Pressure Type Pump	20 mm dia. x 1.5 KW	1
27	Self Centrifugal Pump	50 mm dia. x 1.5 KW	1
28	Turbine Pump	50 mm dia. x 5 stages x 3.7 KW	1
29	Multistage Pump	50 mm dia. x 8 stages x 3.7 KW	1
30	Submersible Turbine Pump	For fresh water, 1.5 KW	1
		For shallow well type, 1.5 KW	1
31	Control Panel including Meters and necessary accessories		1 lot
32	Lever Shear	4.5 x 250 mm with 1 set of extra blade	1
33	Reed Type Parallel Vise	150 mm	10
34	Pressure Switch	5/10 A, 3 P 380 V, 2 P Single throw	1
35	Gate Valve	Flange type, 50 mm dia., 60 mm dia. each 1 pc.	2
		Screw type, 50 mm dia.	1
		Flange ball type, 50 mm dia.	1

No.	Name	Descriptions	Q'ty
36	Check Valve	Bronze lift, 50 mm dia.	1
		Bronze swing, 50 mm dia.	1
		Cast iron flange, 50 mm dia.	1
37	Pressure Regulating Valve	Bellows type, diaphragm type, piston type, 50 mm dia. each	3
38	Automatic Temperature Valve	Flange type, 50 mm dia.	1
39	Expansion Joint	Bronze, screw type 50 mm dia.	1
40	Safty Valve	Hoop type, tightly shut type, Spring type, 50 mm dia. each	3
41	Automatic Injector	Gunmetal, 50 mm dia.	1
42	Automtic Ejector	Gunmetal, 50 mm dia.	1
43	Ball Valve	Cast iron, ductile 50 mm dia. each	2
44	Diaphragm Valve	Cast iron, cast iron with lining, 50 mm dia. each	2
		Cylinder type, torque cylinder type, 50 mm dia. each	2
45	Butterfly Valve	Manual type, cylinder type 50 mm dia. each	2
46	Pinch Valve	50 mm dia.	1
47	Plate Valve	Cast iron, 50 mm dia.	1
48	Portable Electric Drill	Drilling capacity: 6.5 mm 1 P 220 V	2
		Drilling capacity: 13 mm 1 P 220 V	2
49	Hammer Drill	Drilling capacity: 38 mm 1 P 220 V	1
50	Electric Hammer (Concrete Drill)	Impact rate: 3,000/min.	2
51	Disc Grinder	Grinding wheel: 100 mm	2
		Grinding wheel: 125 mm	2
		Grinding wheel: 150 mm	2

No.	Name	Descriptions	Q'ty
52	Air Sander	Sanding paper dia: 125 mm	1
53	Pipe Threding Machine	Oster type with extra conduit blade	20
		Oster type with extra conduit blade	5
		Oster type with extra conduit blade	2
		Baby reed type	5
54	Pipe Cutter	One blade type Capacity: 10.5 - 60.5 mm	20
		One blade type Capacity: 34 - 90 mm	5
		3-blade type Capacity: 43 - 90 mm	5
55	Pipe Vise	Capacity: 1/8 - 4-1/2 inch	20
		With tripod, 1/8 - 4-1/2 inch	5
56	Chain Pipe Cutter	For cast iron pipe capacity: 80 - 200 mm dia.	1
		For ductile pipe capacity: 80 - 200 mm dia.	1
57	Burring Reamer	For steel pipe with handle	20
58	Pipe Wrench	Capacity: 2-1/2 inch, length 450mm	20
		Capacity: 2 inch, length 300 mm	5
		Capacity: 5 inch, length 900 mm	1
59	Working & Hand Tools		1 lot
60	Measuring Tools		1 lot

No.	Name	Descriptions	Q'ty
5.	MOBILE TRAINING		
1	Land Cruiser	4-wheel drive, diesel engine 3,400cc, 6-seater	1
2	Cargo Trailer	For training equipment	2
3	Mini bus	For training equipment	1
		For personnel	1
4	Typewriter		1
5	Tent	3 m x 4 m	2
6	Working Table	Folding type, 1,000 x 2,000 mm	2
7	Generator	Single phase	1
		Three phase	1
8	Lighting Equipment	For nightwork	1
9	Universal Lathe	Universal working machine	1
10	Bench Grinder	Wheel size: 150 mm	1
11	Engine Arc Welder	With generator	2
12	Gas Welding Set		3
13	Circuit Tester		1
14	Cutting Tools	For lathe	1 lot
15	Hand & Working Tools	For mechanical use	1 lot
16	Hand & Working Tools	For electrical use	1 lot

No.	Name	Descriptions	Q'ty
6.	NON-TECHNICAL TRAINING		
	(Dressmaking)		
1	Sewing Machine	Household sewing machine Electric operated light-weight, complete with built-in motor	15
2	Industrial Sewing Machine	Single needle lock stitch industrial sewing machine automatic lubrication	5
3	Household Sewing Machine	Electric operated super-automatic zigzag sewing, complete with built-in motor	3
4	Sewing Set	Needle works & other necessary goods	15
5	Electric Steam Iron	1,200W, AC220-240V	15
6	Mannequin	Male & female, 15 each	30
	(Housemaid)		
7	Microwave Oven	18.9 liter cap.	1
8	Gas Stove with Gas Oven	For LPG	1
9	Washing Machine	Twin-tub, capacity: 3.6kg	1
10	Vacuum Cleaner	900W, capacity: 5 liter	1
11	Refrigerator/Freezer	Double door type refrigerator 175 liter freezer 60 liter	1
12	Tableware Washer	Capacity: 7 persons, AC 100V	1
	(Waiter)		
13	Dinner Table	For 2 persons	3
14	Tableware		3
	(Receptionist)		
15	Telephone Set	2 pcs./set	1

No.	Name	Descriptions	Q'ty
7.	MISCELLANEOUS		
	7-a. Audio Visual		
1	Main Speaker	Input impedance: 8 ohm Rated power: 30 W Frequency response: 50 - 20,000 Hz	2
2	Motor-drive Main Screen	Surface material: beads Size: 2,000(W) x 1,500(H) mm	1
3	OHP with Pedestal	Lamp: metal-halide 575 W Lens: f=350 - 180 mm variable focul lens	1
4	Screen for OHP	Motor-drive Size: 1,800(W) x 1,800(H) mm	1
5	Lecture Table	Size: 600(W) x 1,500(H) x 500(D) mm Material: laminated plywood with microphone, table stand and casters	1
6	Control Console		
	1) Control Panel	Materials: acrylic resin push button type	1
	2) Automatic Controller	Slide: advance, return and adjustment of focus 16 mm: projection and stop Video: power on/off Audio: power on/off Microphone: power on/off	1
	3) Power Amplifier	Rated power: 100 W + 100 W (8 ohm, continuous rms)	1
	4) Mixer	Input: 8 channels Output: 2 group	1
	5) Cassette Deck	Direct-drive 3-head 3 system noise reduction	1
	6) Wireless Tuner	Reception frequency: 200 MHz zone	1
	Tuner Unit	" "	2
	Wireless Microphone	" "	2
	Wireless Antenna	" "	2

No.	Name	Descriptions	Q'ty
	7) Input/Output Connector Panel	With input/output for automatic controller mixer and wireless antenna	1
	8) Console	Material: laminated plywood Size: 1,200(W) x 900(H) x 800(D) mm with casters	1
7	Auto-slide Projector	Rear screen type Screen size: 620(W) x 420(H) mm with pedestal	1
8	Video Projector	100 inch PAL system with pedestal	1
9	Data Viewer		
	1) Color Camera	1/2" Saticon pickup tube PAL system	1
	2) VHS VTR	Triple-system (PAL/SECAM/NTSC) 4-head system	2
	3) Console	Material: laminated plywood Size: 600(W) x 900(H) x 800(D) mm	1
10	Slide Projector/ pedestal	Lamp: Xenon 550 W	1
11	16 mm Projector/ Pedestal	Lamp: Xenon 300 W	1
12	Video Production System		
	1) Color Camera	Pickup tube: 2/3" plumbicon x 3 PAL system	1
	2) Portable Video Cassette Recorder	Format: VHS standard Video system: PAL-type	1
	3) Tripod/Dolly	Material: wood	1
	4) 6 inch Color Monitor TV	Color system: PAL Picture tube: 6" Portable type	1
	5) Carrying Case	Material: aluminium with casters	1
	6) Lighting Kit	650 W synchronized lights: 3 1,000 W synchronized lights: 2	1

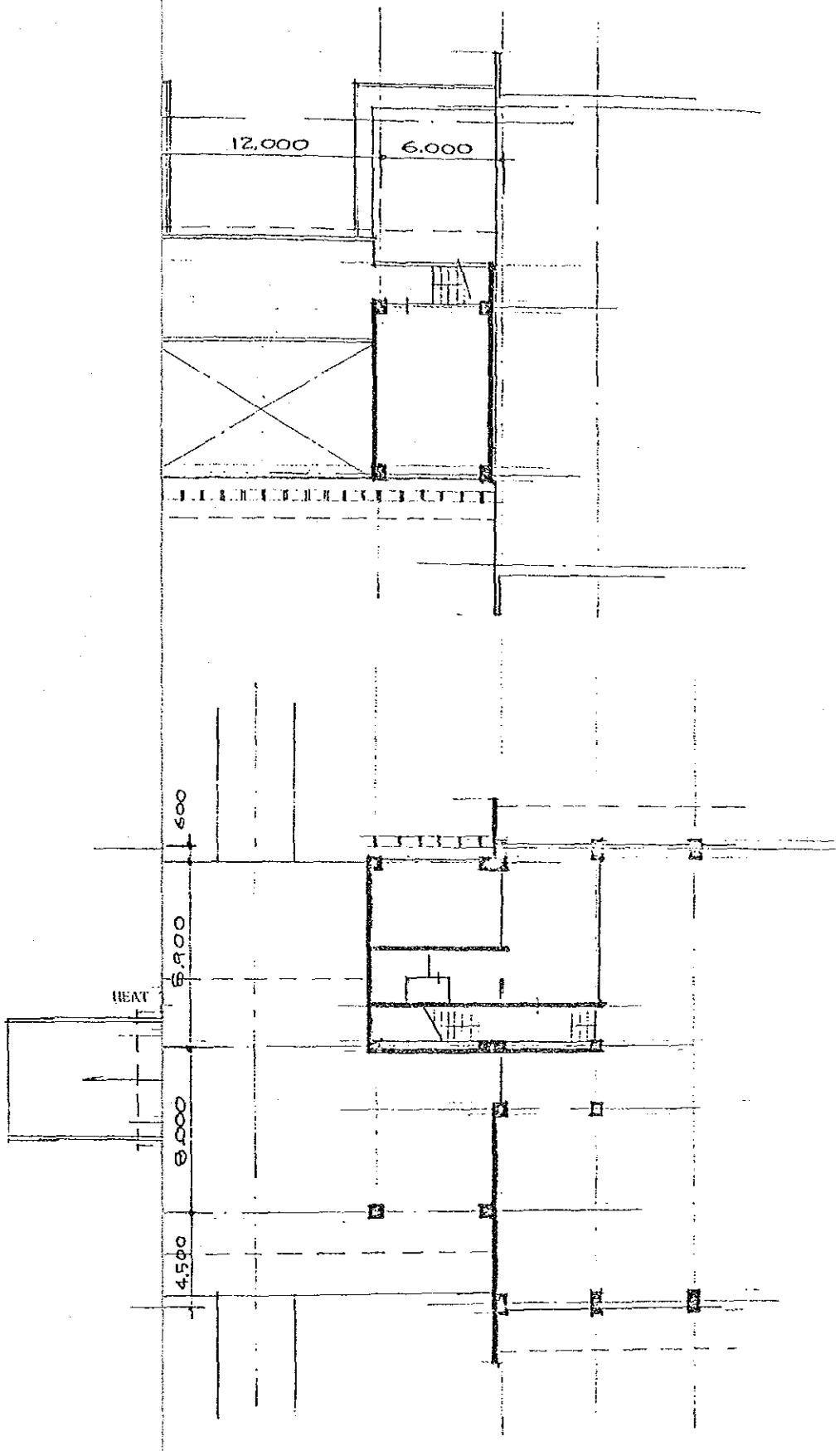
No.	Name	Descriptions	Q'ty
13	Video Editing Console		
	1) Console	Material: laminated plywood Size: 1,500(W) x 900(H) x 800(D) mm	1
	2) VHS Video Cassette Editing Recorder	Format: VHS PAL standard	3
	3) Editing Controller	Dial search control for both the recorder and player automatic control of edit-in and edit-out points	1
	4) Control Unit	For manual editing of two VCRs	1
	5) Audio Mixer	Input: 10 channeles Output: 3 channeles	1
	6) Microphone	Unidirectional with talk switch flexible type	1
	7) Telop Adaptor	Generation of back-color signal and black signal	1
	8) 10" Color Monitor TV	Color system: PAL/SECAM/NTSC	4
	9) Monitor Speaker	Input: 80 W (rms) 160 W (continuous) Impedance: 6 ohm	2
	10) Monitor Amplifier	Output: 40 W + 40 W	1
14	Software		
	1) Slide	"Sheet metal I"	1
	2) Slide	"Welding I, II"	2
	3) Slide	"Plumbing I"	1
	4) Slide	"How to read vernier calipers"	1
	5) Slide	"How to handle micrometer calipers"	1
	6) Slide	"Sheet metal processing of stainless steels"	1
	7) Slide	"Arc welding of stainless steels"	1

No.	Name	Descriptions	Q'ty
8)	Slide	"Welding part I, II, III"	3
9)	Slide	"Manufacturing process of steel and its structure"	1
10)	Slide	"Press processing"	1
11)	Slide	"Press processing of metal molds"	1
12)	Slide	"Metal coating"	1
13)	Slide	"Safe handling of oxygen and acetylene"	1
14)	Video Tape	"Drilling I"	1
15)	Video Tape	"Drilling II"	1
16)	16 mm Film	"Series of standard operation of arc welding"	5
17)	Video Tape	"Heat treatment"	1
18)	16 mm Film	"Nondestructive inspection"	1
19)	16 mm Film	"Nondestructive test"	1

No.	Name	Descriptions	Q'ty
	7-b. Drawing		
15	Drafting Set	1) Drafting machine	20
		2) Drafting stand	20
		3) Drafting board	20
		4) Drafting lamp	20
		5) Drafting chair	20
16	Drafting Instrument	18 pcs./set	20

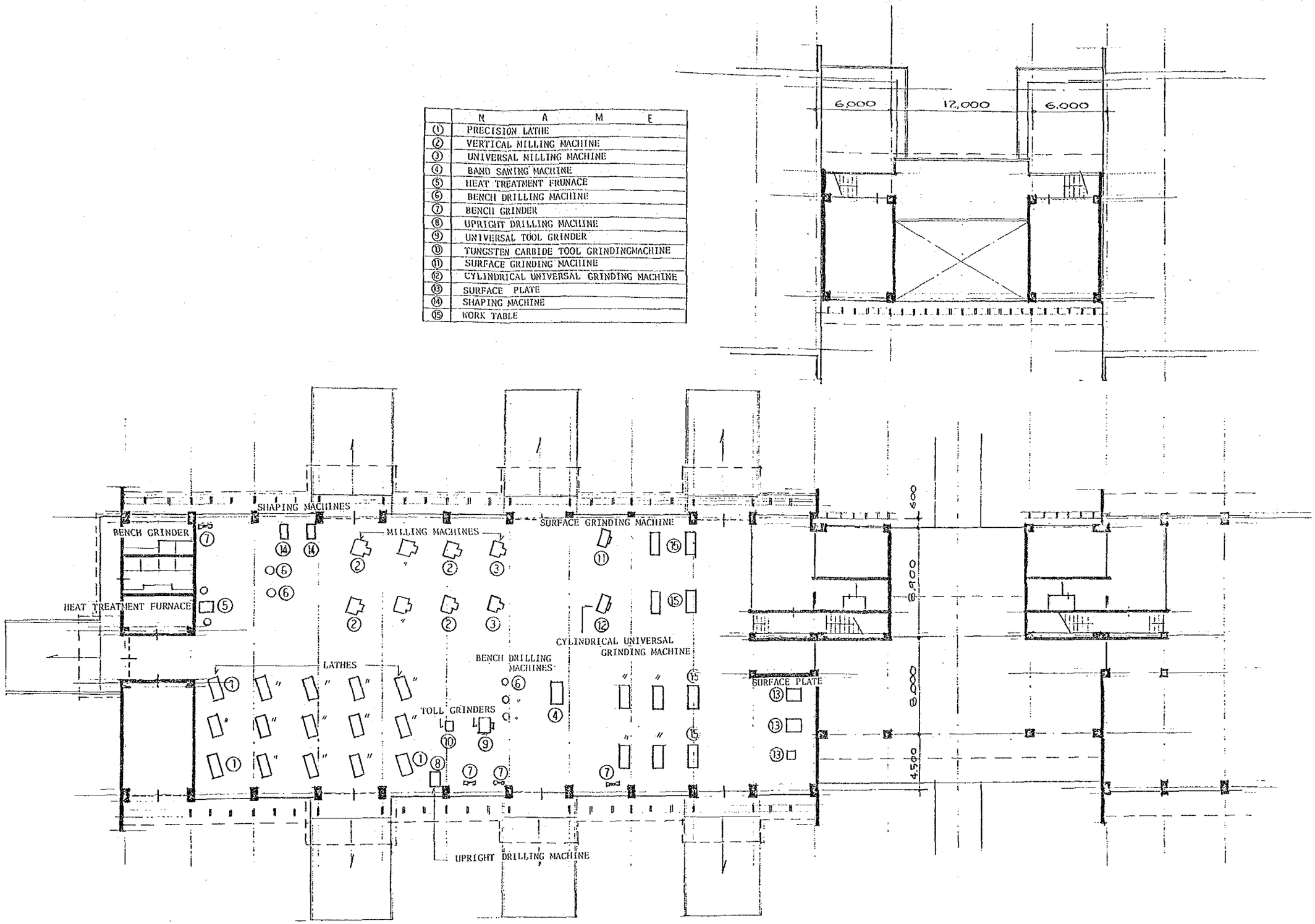
(5) EQUIPMENT LAYOUT DRAWINGS

1. Machining Workshop
2. Electrical Workshop
3. Welding & Sheet Metal Workshop
4. Ceramics Workshop
5. Painting workshop
6. Building Construction Workshop
7. Agro-Mechanics and Car Body Repair Workshop
8. Auto Mechanics Workshop



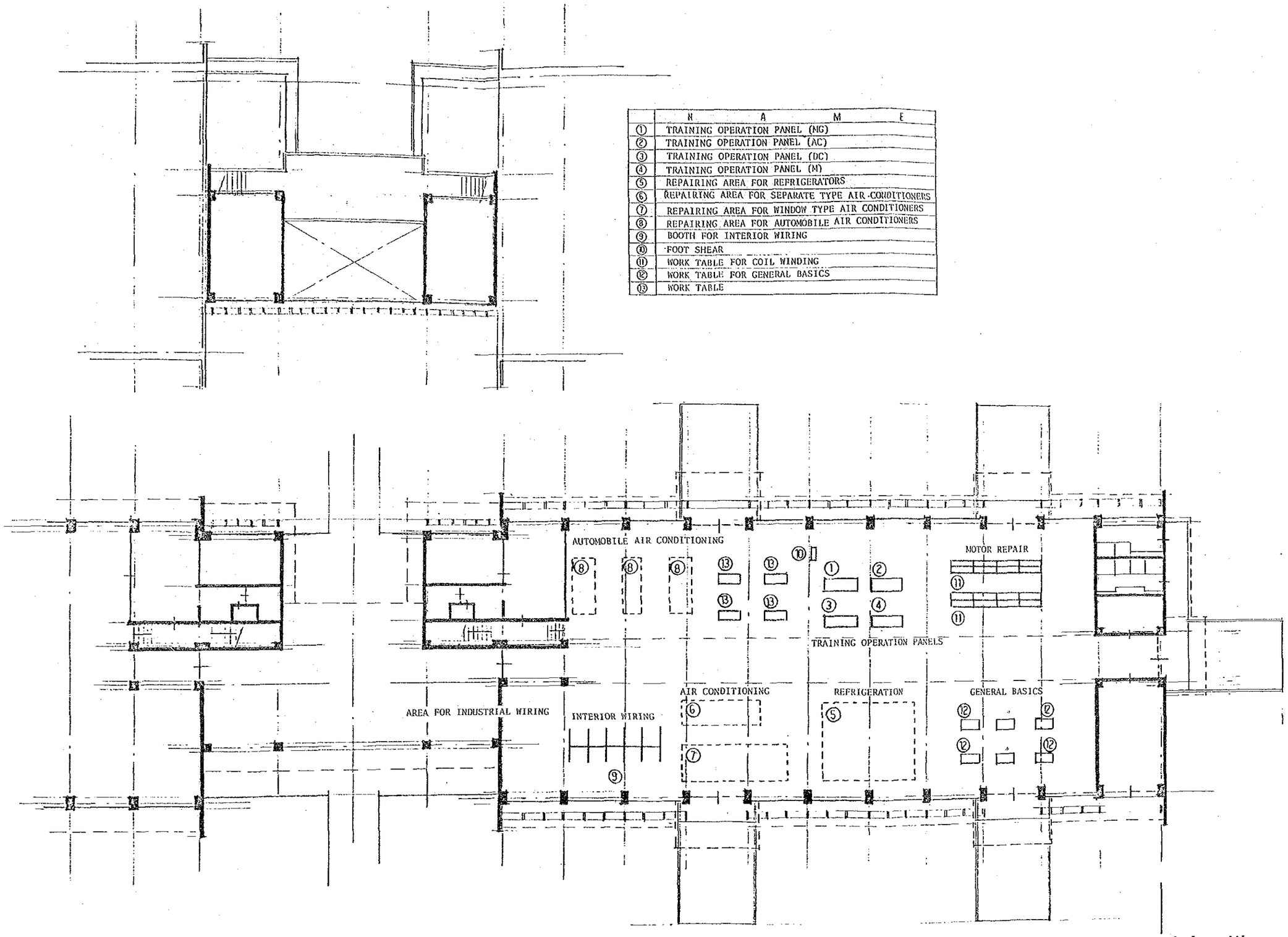
1. Machining Workshop Wing
   Training Equipment Layout S=1:300

	NAME
①	PRECISION LATHE
②	VERTICAL MILLING MACHINE
③	UNIVERSAL MILLING MACHINE
④	BAND SAWING MACHINE
⑤	HEAT TREATMENT FRUNACE
⑥	BENCH DRILLING MACHINE
⑦	BENCH GRINDER
⑧	UPRIGHT DRILLING MACHINE
⑨	UNIVERSAL TOOL GRINDER
⑩	TUNGSTEN CARBIDE TOOL GRINDINGMACHINE
⑪	SURFACE GRINDING MACHINE
⑫	CYLINDRICAL UNIVERSAL GRINDING MACHINE
⑬	SURFACE PLATE
⑭	SHAPING MACHINE
⑮	WORK TABLE



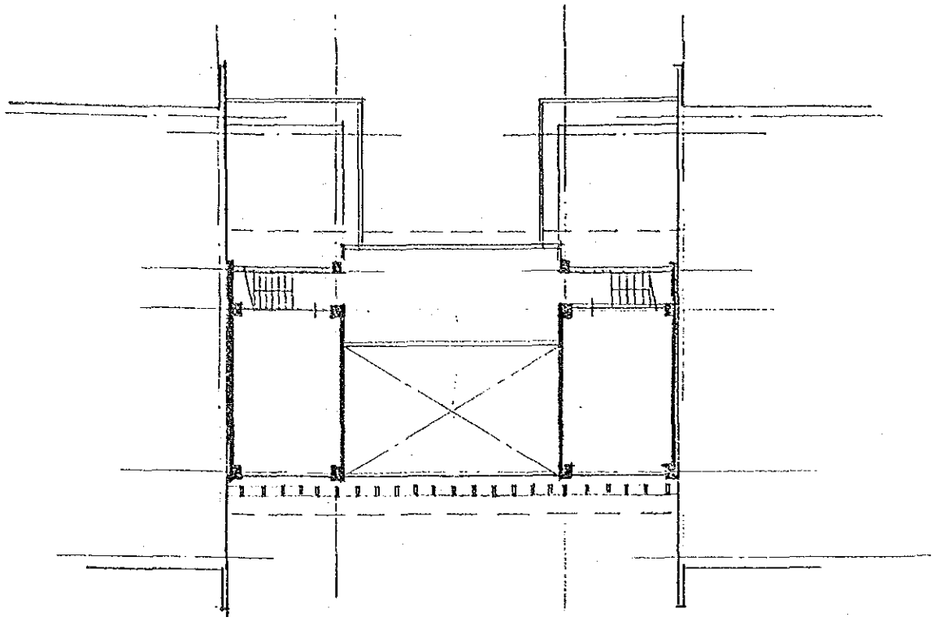
1. Machining Workshop Wing
   Training Equipment Layout S=1:300

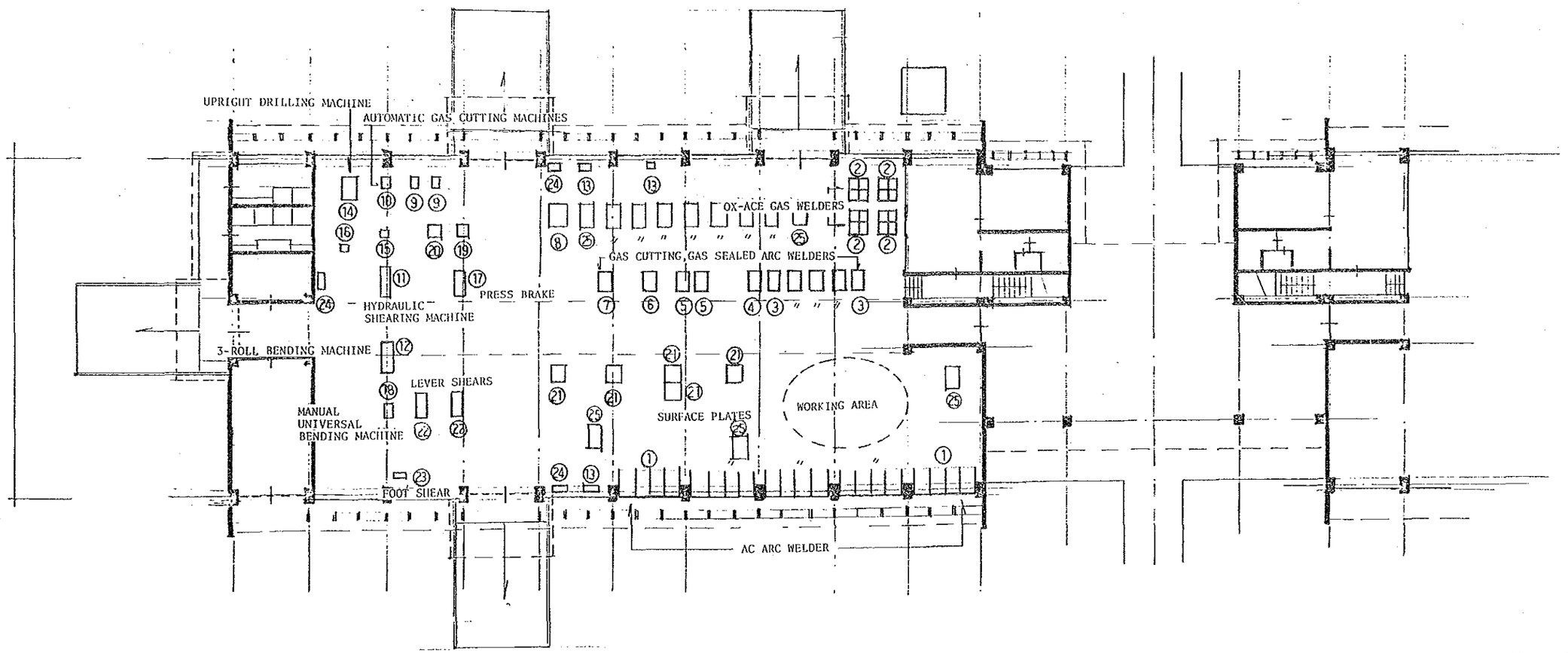
	NAME
①	TRAINING OPERATION PANEL (MG)
②	TRAINING OPERATION PANEL (AC)
③	TRAINING OPERATION PANEL (DC)
④	TRAINING OPERATION PANEL (M)
⑤	REPAIRING AREA FOR REFRIGERATORS
⑥	REPAIRING AREA FOR SEPARATE TYPE AIR CONDITIONERS
⑦	REPAIRING AREA FOR WINDOW TYPE AIR CONDITIONERS
⑧	REPAIRING AREA FOR AUTOMOBILE AIR CONDITIONERS
⑨	BOOTH FOR INTERIOR WIRING
⑩	FOOT SHEAR
⑪	WORK TABLE FOR COIL WINDING
⑫	WORK TABLE FOR GENERAL BASICS
⑬	WORK TABLE



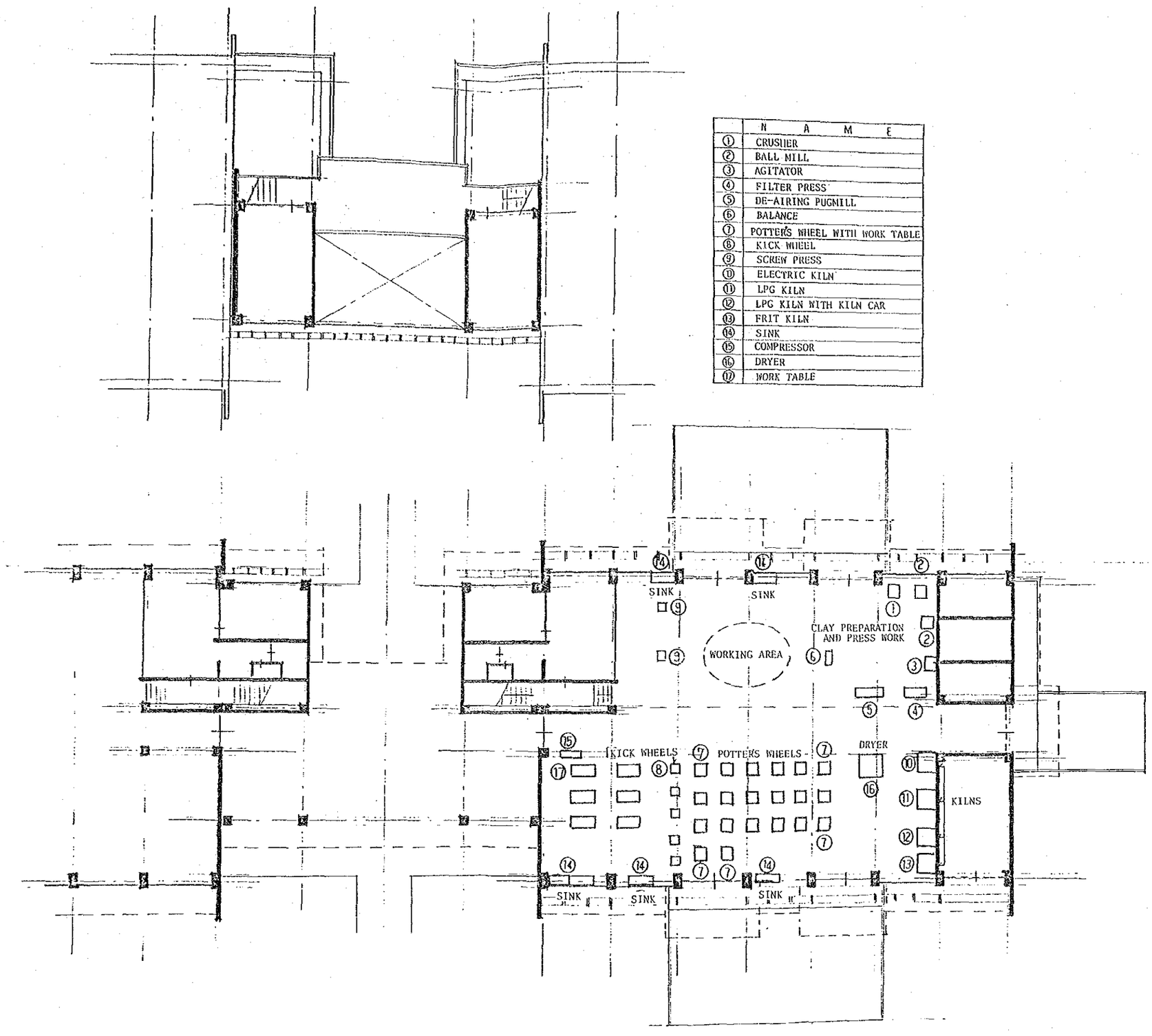
2. Electrical Workshop Wing
Training Equipment Layout S=1:300

	N A M E		N A M E
①	AC ARC WELDER, AC-DC ARC WELDER	⑱	MANUAL UNIVERSAL BENDING MACHINE
②	OX-ACE GAS WELDER WITH WORK TABLE	⑲	ROLL FORMING MACHINE
③	CO2 ARC WELDER	⑳	CORNER SHEAR
④	CO2 MAG WELDER	㉑	SURFACE PLATE
⑤	TIG WELDER	㉒	LEVER SHEAR
⑥	PLASMA CUTTING MACHINE	㉓	FOOT SHEAR
⑦	DRYER FOR WELDING RODS	㉔	DOUBLE HEAD GRINDER
⑧	ENGINE WELDER	㉕	WORK TABLE
⑨	SPOT WELDER		
⑩	AUTOMATIC GAS CUTTING MACHINE		
⑪	HYDRAURIC SHEARING MACHINE		
⑫	3-ROLL BENDING MACHINE		
⑬	BENCH DRILLING MACHINE		
⑭	UPRIGHT DRILLING MACHINE		
⑮	HIGHSPEED CUTOFF MACHINE		
⑯	POWER HACKSAWING MACHINE		
⑰	PRESS BRAKE		





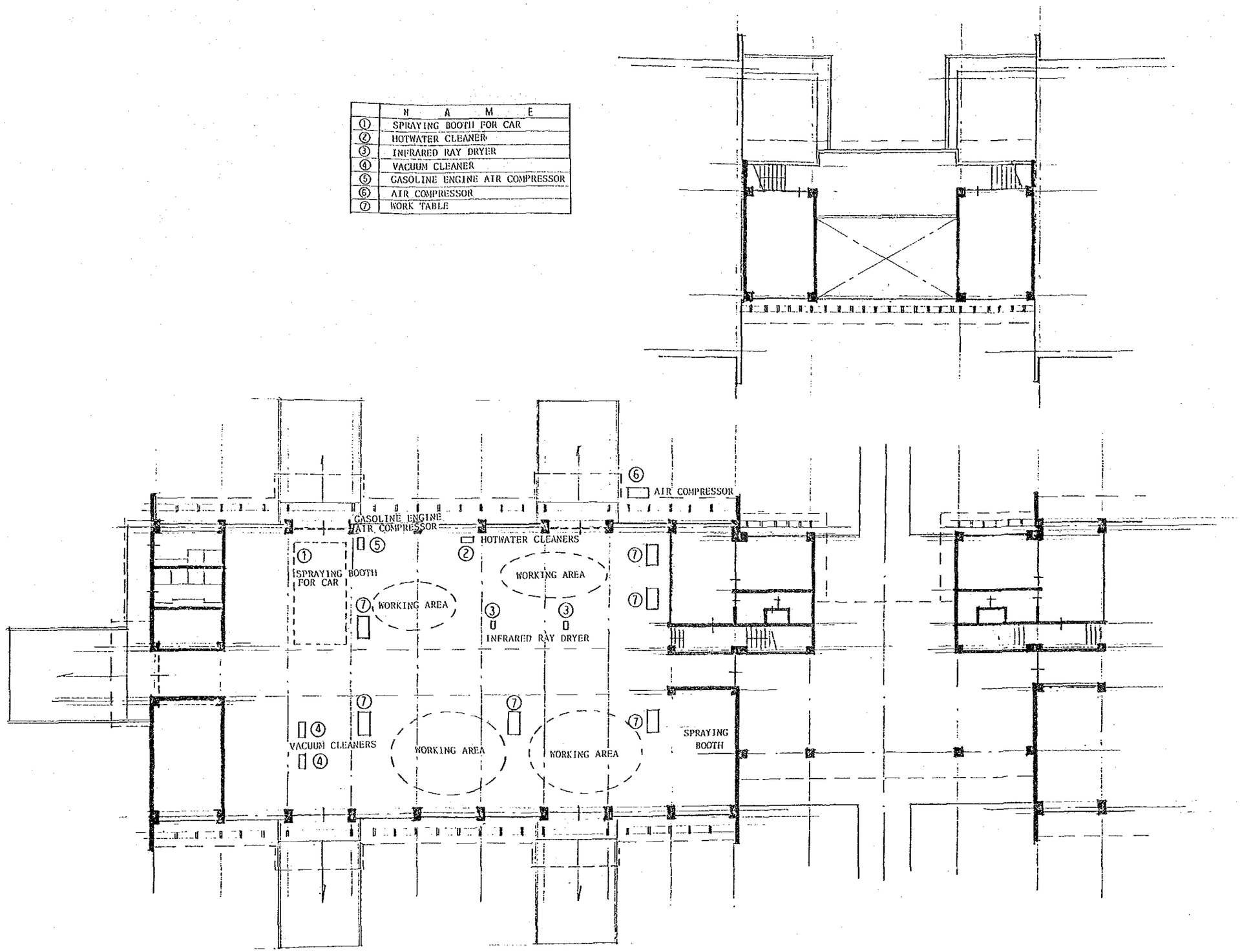
3 Welding & Sheet Metal Workshop Wing
Training Equipment Layout S=1:300



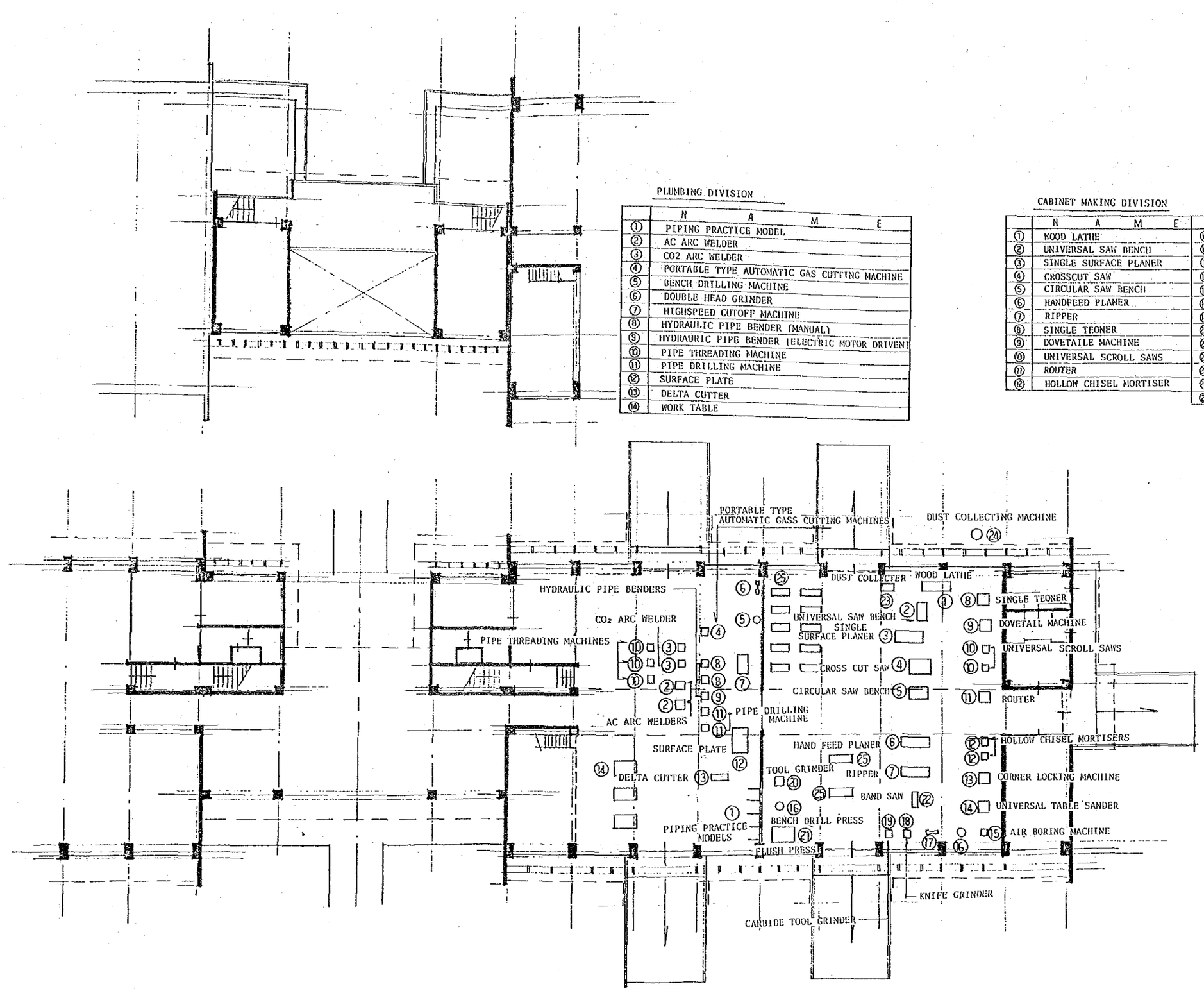
	NAME
①	CRUSHER
②	BALL MILL
③	AGITATOR
④	FILTER PRESS
⑤	DE-AIRING PUGMILL
⑥	BALANCE
⑦	POTTERS WHEEL WITH WORK TABLE
⑧	KICK WHEEL
⑨	SCREW PRESS
⑩	ELECTRIC KILN
⑪	LPG KILN
⑫	LPG KILN WITH KILN CAR
⑬	FRIT KILN
⑭	SINK
⑮	COMPRESSOR
⑯	DRYER
⑰	WORK TABLE

4. Ceramics Workshop Wing
   Training Equipment Layout S=1:300

	NAME
①	SPRAYING BOOTH FOR CAR
②	HOTWATER CLEANER
③	INFRARED RAY DRYER
④	VACUUM CLEANER
⑤	GASOLINE ENGINE AIR COMPRESSOR
⑥	AIR COMPRESSOR
⑦	WORK TABLE



5. Painting Workshop Wing
   Training Equipment Layout S=1:300



PLUMBING DIVISION

	NAME
①	PIPING PRACTICE MODEL
②	AC ARC WELDER
③	CO2 ARC WELDER
④	PORTABLE TYPE AUTOMATIC GAS CUTTING MACHINE
⑤	BENCH DRILLING MACHINE
⑥	DOUBLE HEAD GRINDER
⑦	HIGHSPEED CUTOFF MACHINE
⑧	HYDRAULIC PIPE BENDER (MANUAL)
⑨	HYDRAURIC PIPE BENDER (ELECTRIC MOTOR DRIVEN)
⑩	PIPE THREADING MACHINE
⑪	PIPE DRILLING MACHINE
⑫	SURFACE PLATE
⑬	DELTA CUTTER
⑭	WORK TABLE

CABINET MAKING DIVISION

	NAME		NAME
①	WOOD LATHE	⑬	CORNER LOCKING MACHINE
②	UNIVERSAL SAW BENCH	⑭	UNIVERSAL TABLE SANDER
③	SINGLE SURFACE PLANER	⑮	AIR BORING MACHINE
④	CROSSCUT SAW	⑯	BENCH DRILL PRESS
⑤	CIRCULAR SAW BENCH	⑰	DOUBLE HEAD GRINDER
⑥	HANDFEED PLANER	⑱	KNIFE GRINDER
⑦	RIPPER	⑲	CARBIDE TOOL GRINDER
⑧	SINGLE TEONER	⑳	TOOL GRINDER
⑨	DOVETAILE MACHINE	㉑	FLUSH PRESS
⑩	UNIVERSAL SCROLL SAWS	㉒	BAND SAW
⑪	ROUTER	㉓	DUST COLLECTER
⑫	HOLLOW CHISEL MORTISER	㉔	DUST COLLECTING MACHINE
		㉕	WORK TABLE

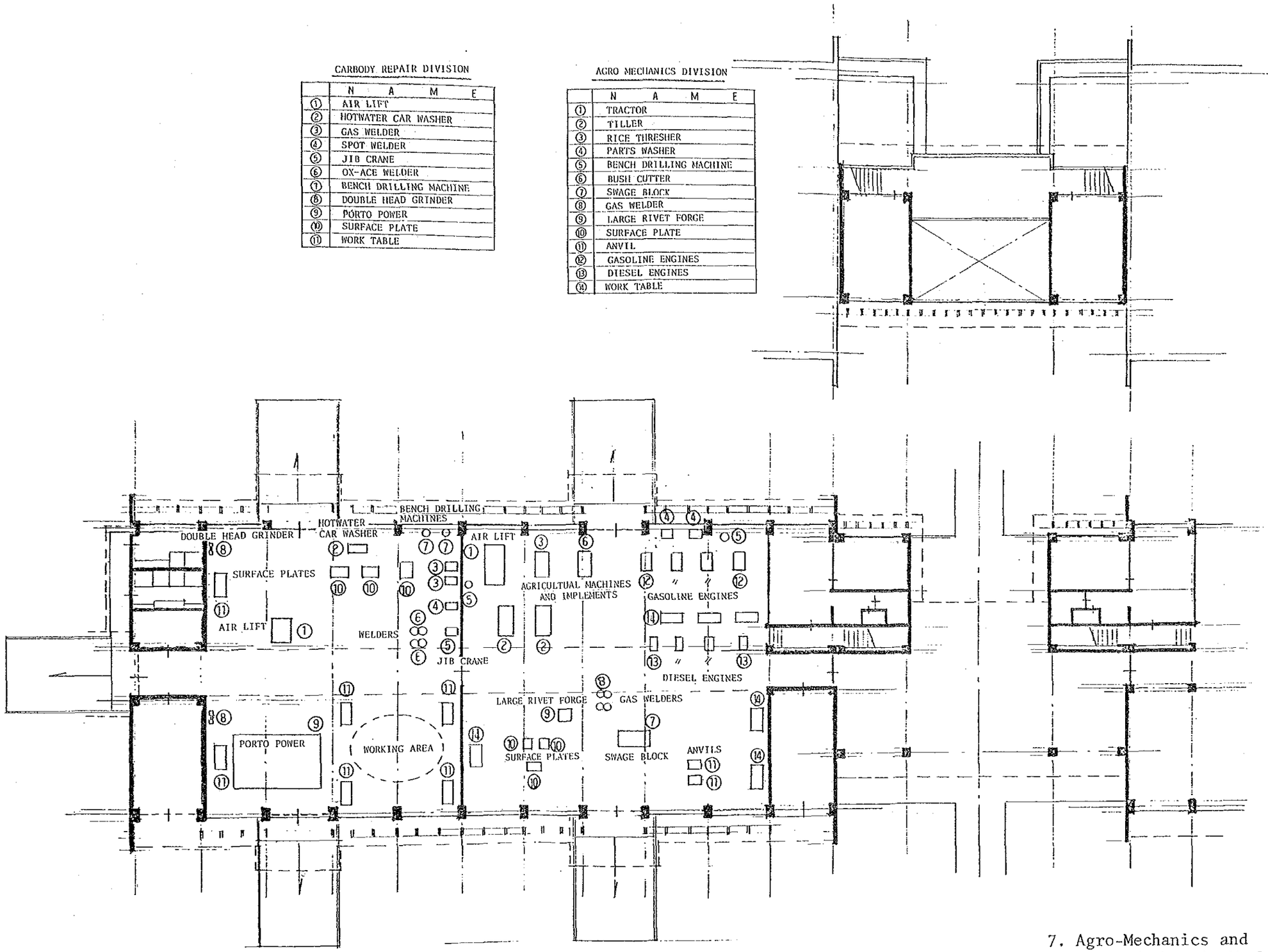
6. Building Construction Workshop Wing
Training Equipment Layout S=1:300

CARBODY REPAIR DIVISION

	N A M E
①	AIR LIFT
②	HOTWATER CAR WASHER
③	GAS WELDER
④	SPOT WELDER
⑤	JIB CRANE
⑥	OX-ACE WELDER
⑦	BENCH DRILLING MACHINE
⑧	DOUBLE HEAD GRINDER
⑨	PORTO POWER
⑩	SURFACE PLATE
⑪	WORK TABLE

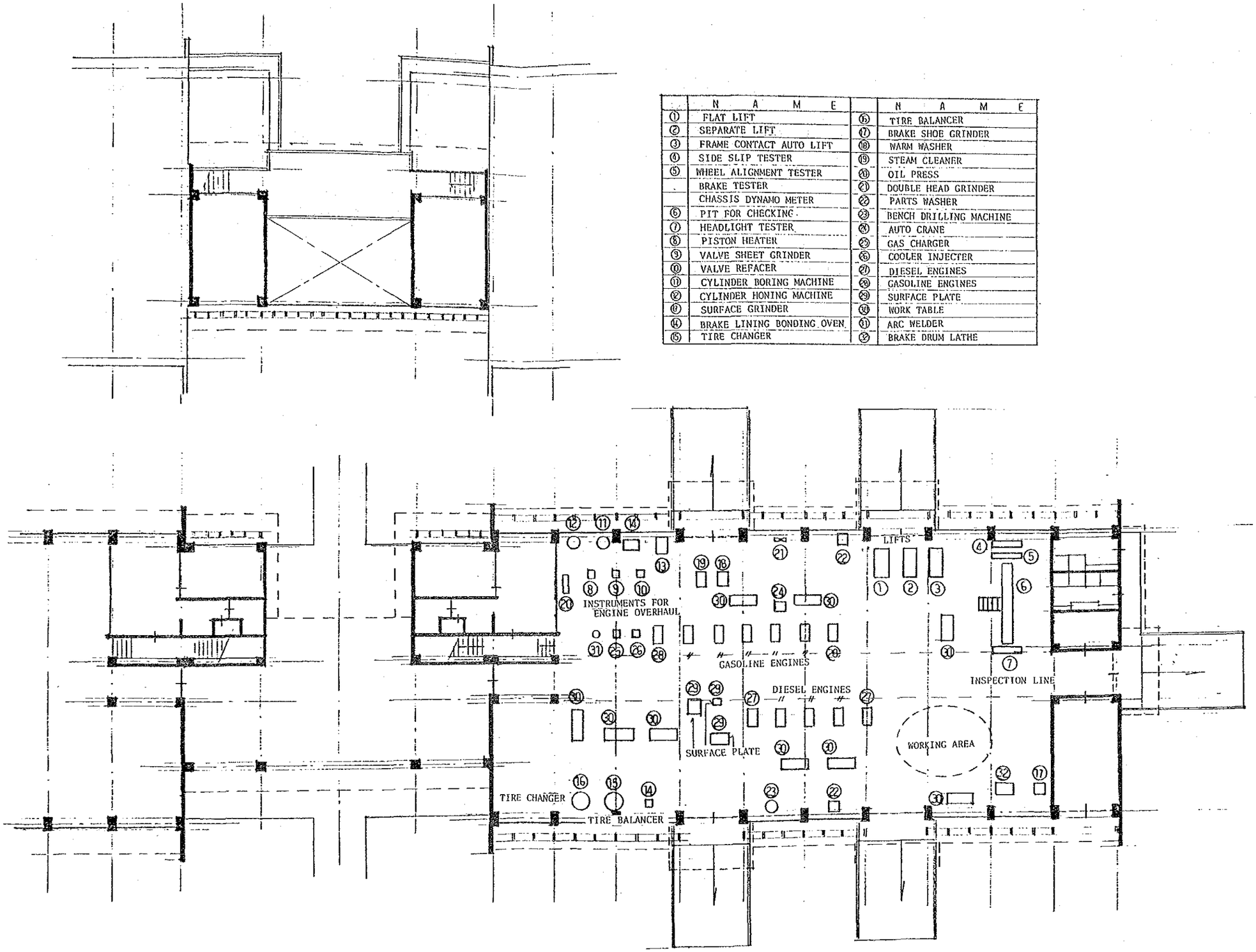
AGRO MECHANICS DIVISION

	N A M E
①	TRACTOR
②	TILLER
③	RICE THRESHER
④	PARTS WASHER
⑤	BENCH DRILLING MACHINE
⑥	BUSH CUTTER
⑦	SWAGE BLOCK
⑧	GAS WELDER
⑨	LARGE RIVET FORGE
⑩	SURFACE PLATE
⑪	ANVIL
⑫	GASOLINE ENGINES
⑬	DIESEL ENGINES
⑭	WORK TABLE



7. Agro-Mechanics and
Car body Repair Workshop Wing
Training Equipment Layout S=1:300

	N A M E		N A M E
①	FLAT LIFT	⑯	TIRE BALANCER
②	SEPARATE LIFT	⑰	BRAKE SHOE GRINDER
③	FRAME CONTACT AUTO LIFT	⑱	WARM WASHER
④	SIDE SLIP TESTER	⑲	STEAM CLEANER
⑤	WHEEL ALIGNMENT TESTER	⑳	OIL PRESS
	BRAKE TESTER	㉑	DOUBLE HEAD GRINDER
	CHASSIS DYNAMO METER	㉒	PARTS WASHER
⑥	PIT FOR CHECKING	㉓	BENCH DRILLING MACHINE
⑦	HEADLIGHT TESTER	㉔	AUTO CRANE
⑧	PISTON HEATER	㉕	GAS CHARGER
⑨	VALVE SHEET GRINDER	㉖	COOLER INJECTER
⑩	VALVE REFACER	㉗	DIESEL ENGINES
⑪	CYLINDER BORING MACHINE	㉘	GASOLINE ENGINES
⑫	CYLINDER HONING MACHINE	㉙	SURFACE PLATE
⑬	SURFACE GRINDER	㉚	WORK TABLE
⑭	BRAKE LINING BONDING OVEN	㉛	ARC WELDER
⑮	TIRE CHANGER	㉜	BRAKE DRUM LATHE



8. Auto Mechanics Workshop Wing
Training Equipment Layout S=1:300

4-3 IMPLEMENTATION PLANS

(1) CONSTRUCTION CONDITIONS AND IMPLEMENTATION POLICIES

1) Situation of Construction in Ubon Ratchathani

The study on the situation of construction in Ubon Ratchathani shows that most equipment and materials are available as construction on a small scale is frequent in the area. However, as all equipment and materials, excluding sand and gravel, are originally transported from Bangkok and other cities to Ubon, prices are 5 - 7% higher in general than in Bangkok due to the additional transportation costs.

Good quality sand and gravel are available from a suburb of Ubon. Ubon and its suburban areas are covered by a potable water supply system. Good quality groundwater is also available from a water vein system located some 20 - 30m below the ground surface. Therefore, no problems are anticipated regarding drinking water and water for construction work.

Cement is available from Bangkok. As there are no commercial concrete batcher plants in Ubon, a batcher plant will have to be provided at the construction site. A public organization for concrete compaction testing is available in Ubon.

Although there are 3 major construction companies in Ubon, the general contractor is usually from Bangkok in the case of large scale construction projects. There is also an ample supply of local labour, but its technical level and capabilities are slightly lower than that of the Bangkok area.

2) Basic Construction Policy

a. The quality and functions of the buildings and equipment must not be sacrificed.

b. The transfer of technology must be attained during implementation of the project in addition to the provision of building facilities and training equipment.

c. The work schedule and final completion date must be strictly adhered to so that disbursements for the completion of works can be made within the designated periods.

d. The cultivation of brotherhood and friendly relationships between the nationals of both countries participating in the implementation of the project is considered to be most important.

3) Construction Methods

The maximum use of local construction methods using locally purchased materials is to be the principle. Transfer of Japanese construction technology, adaptable to Thailand, is also to be attempted.

5) Working Conditions

A good road network is available for the smooth implementation of construction work, including access to the Institute after completion.

With regard to the site environment, the Army Voluntary Refugee Camp and the Sri Pratum High School are located to the south and southeast of the site respectively. The large area to the west of the site will be used for the planned Ubon School of the Khon Kaen University.

A perimeter fence should, therefore, be properly erected to prevent any accidents or burglaries by intruders and to prevent the school students and refugees from having free access to the Institute.

According to the 4 boring tests made at the site, suitable load bearing capacity for the buildings is available at about 9 meters deep. As soil above this depth is soft, piles will be required for all the buildings.

The buildings are to be designed so that no special construction methods will be required.

6) Others

Commencement of the construction of buildings will be largely affected by the results of the work to be carried out by the Thai side, in particular, the levelling of the site.

(2) SHARING OF RESPONSIBILITIES

1) Responsibilities of the Japanese side

a. Buildings:

Main Building with Canteen	1
Workshops	8
Dormitories	5
General Storage and Mobile Training Garage	1
Guard and Security Staff Houses	2

b. Building related works:

Construction of building structures and finishing work
Electrical Utilities
Water Supply, Drainage and Sanitary Utilities
Air-Conditioning and Ventilation Utilities
Exterior facilities within the site such as roads, parking areas, septic tanks, power service lines, water storage tanks, elevated water tanks, etc.

c. Training Equipment:

Provision, installation, adjustment, test runs and briefing of local staff on training equipment for the following workshops and courses:

Machine Workshop
Electrical and Electronics Workshop
Welding and Sheet Metal Workshop
Building Construction Workshop
Ceramics Workshop
Painting Workshop
Auto Mechanics Workshop
Agro Mechanics and Car Body Repair Workshop
Mobile Training Course
Non-Technical Training Courses

2) Responsibilities of the Thai side:

a. Building Related Items

1. Preparation of the site, including removal of existing concrete slabs and foundations, leveling of the ammunition embankments and existing ditch, provision of drainage ditches along the east, west and north sides of the site, and removal of trees hampering building construction.

2. Provision of the necessary land for a temporary office, equipment and material storage, construction workshops, etc. which are required for the implementation of the work.

3. Provision of power line, telephone lines, water supply, and drainage services up to the boundary of the site for temporary use connections during construction and for permanent use connections.

4. Construction of staff housing.

5. Perimeter fencing, landscaping and gardening, etc.

b. Conveniences

1. Tax exemption and conveniences regarding customs clearance procedures for all Japanese nationals and companies engaged in the Project.

2. Tax exemption and conveniences regarding customs clearance procedures for all construction material and utilities, training equipment and supplies to be imported into Thailand for implementation of the Project.

(3) CONSTRUCTION PERIOD

1) Building Construction

Preparation and approval of execution drawings, pile driving, foundation laying, erection of structures, interior and exterior finishing work including utilities, placement of exterior facilities, work incidental to the installation of training equipment, inspection and hand-over procedures are the main stages of work to be performed after the contractors for the work are selected.

A period of 13 months will be necessary for the completion of all these stages after the contractors have been decided upon.

2) Training Equipment

After the decision has been made in regard to the suppliers, the equipment-related work consists of such stages as the checking and approval of drawings, manufacture at plants, plant tests, sea transportation, inland transportation, delivery to the construction site, unpacking, installation and adjustment, inspection and the final handing over to the Thai side.

A period of 13 months will be necessary for the completion of all these stages after the suppliers have been decided upon.

(4) PROCUREMENT PLANS FOR CONSTRUCTION MATERIALS

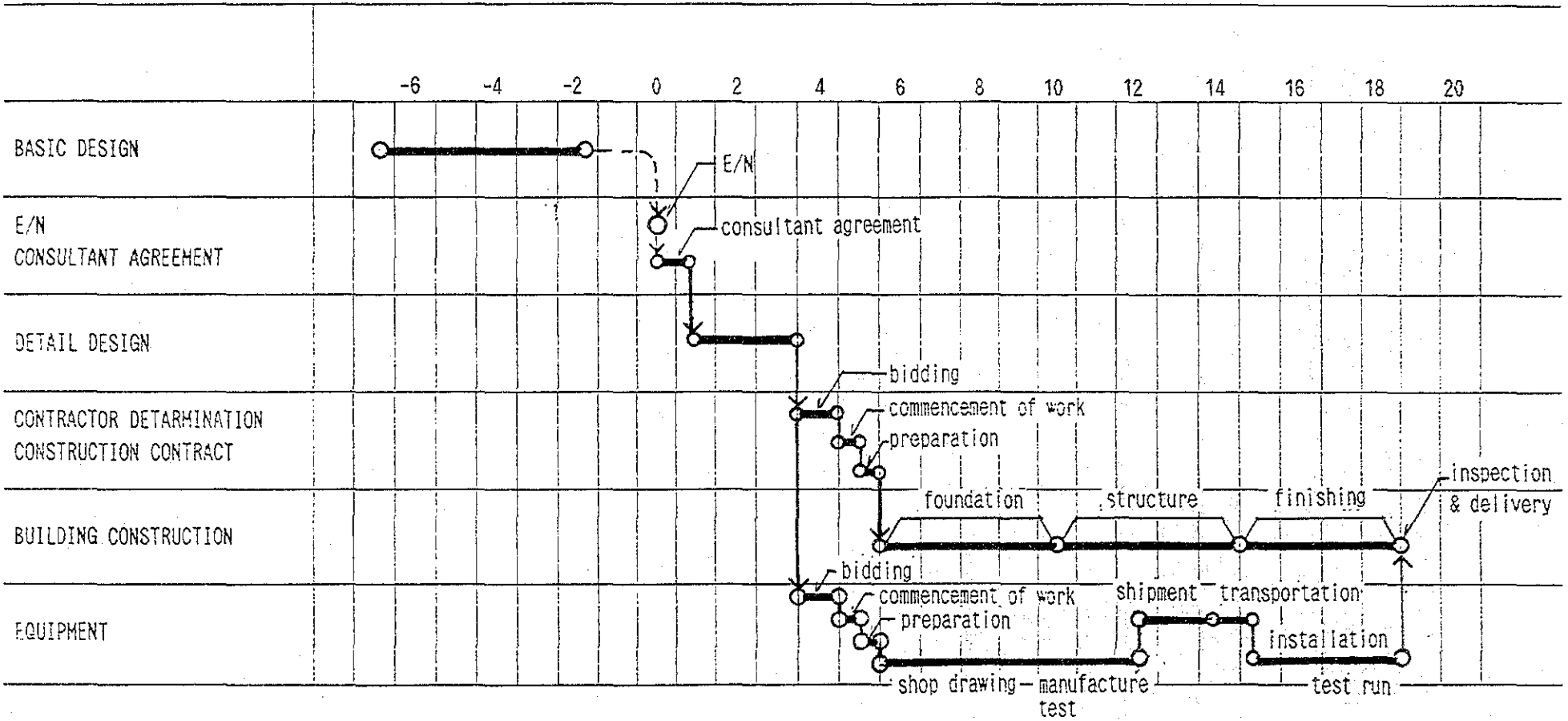
Although the basic design policy for the Project is the use of local materials and construction methods, in view of reducing construction cost, such equipment and materials which cannot be purchased locally, or when the performance or degree of precision of local purchases do not meet the required standards, or where the price is higher than in Japan, such items may be purchased in Japan.

1) Materials to be purchased locally:

Building:	Cement, sand, gravel, concrete blocks, PC concrete piles, steel beams, steel bars, roofing tiles, corrugated roofing tiles, PC concrete floor boards, pebble dash finishing, tiles, aluminium windows, aluminium jalousie windows, accoustical boards, glass, timber (for frames and surface finishing), paint, steel girders, terrazzo tiles, parquet flooring, caulking materials, gypsum boards, aluminium pipes for handrails and ventlights
Electrical:	Manholes, manhole covers, wires, switches, power points, lighting fixtures, power distribution boards and bull boxes
Water Supply, Drainage & Sanitation:	Manholes, manhole covers, concrete and cast iron pipes, toilet fittings, piping materials, elevated water tanks and water storage tanks
Air-Conditioning & Ventilation	Vinyl chloride pipes (dia. 100mm or over), ceiling fans and ventilation fans

2) Materials to be purchased in Japan

Buildings:	Metal fittings, needle punch carpets, blinds, roller screens and white boards
Electrical:	Manual transmitter, alarms, interphone equipment, transformers and broadcasting equipment
Water Supply, Drainage and Sanitation:	Valves, pumps and grease traps
Air-Conditioning & Ventilation:	Air-conditioners, pipes and valves
Special Facilities:	



(5) Implementaion Schedule

4-4 EXPENSES REQUIRED FOR MAINTENANCE AND OPERATION

Rough estimate of operational costs in 1987 when full-scale activities are expected to commence:

Total: 9,450,750 Baht

Breakdown is as follows:

(1) Personnel Costs

Wages (84 persons)		2,647,000 B
Training, Day and Night-Duty Allowances, Overtime Pay		80,000 B
	Total	2,727,000 B

(2) Heating and Lighting Costs

1) Electricity Rate (rate for government organizations)

1. General Facilities

800 KWH/Day x 25 Days x 12 Months x 1.44 Baht 345,600 B

2. Educational and Training Purposes

400 KWH/Day x 25 Days x 10 Months x 1.44 Baht 144,000 B

Total 489,600 B

2) Water Rate

70 m^3/Day x 25 Days x 12 Months x 8.65 Baht 181,650 B

(excl. consumption at staff houses)

3) Gas Rate

1. Domestic Purposes (LPG)	
50 kg Cylinder x 10 Pcs x 12 Months x 455 B/Pc	2,724,000 B
2. Educational Purposes (CO_2-C_2H_2, Argon Gas, etc.)	
1.5 Pc/Day x 25 Days x 10 Months x B400	190,000 B
Total	2,914,000 B

(3) Materials Costs

Pre-Employment Training: B3,300/Person/Year x 315	1,039,500 B
Upgrading Training: B1,000/Person/Year x 585	585,000 B
Non-Technical Training: B500/Person/Year x 180	90,000 B
Total	1,714,500 B

(4) Teaching Materials Costs

Cabinets, etc. for Educational Use:	650,000 B
Text Preparation:	24,000 B
A/V Teaching Materials:	200,000 B
Total	874,000 B

(5) Others

Books and Reference Materials	100,000 B
Office Equipment Expendables	30,000 B
Gasoline (B25,000/Month x 12 Months)	300,000 B
Total	430,000 B