

2.2.2 Basic Plan

The components of the Project based on the required rooms to implement the new curricula and also based on the basic principles are shown in Table 2-13. Main component of renovation works are workshops, classrooms, special classrooms, self-study room, administration, toilets, canteen, gate house and infrastructure facilities, and demolishing the existing administration building.

Table 2-13 Main Component of Renovation Works

Existing Facilities	Judgement	Contents of Renovation
Existing Physical and Chemical Laboratory	Renovation	New Name: New Administration and Lecture Building
Roof, External Wall, Glass		Change all roof material , Repair of external wall , Change glass
3 Lab. rooms on Ground Fl.		(1) Each Lab. divide into 3 class rooms. Total 9 class rooms.
3 Lab. rooms on First Fl.		(1) Lab. 1 changes to Dean's R. and Vice Dean and Administration Rm. (2) Lab. 2 changes to Library and Storage. (3) Lab. 3 changes to Head of Depts' Rm and Computer Rm.
Toilet and Storage on Ground and First Fl.		Renovation of Toilets and change to prep. Rm. and Conference Rm.
Existing Mechanical Workshop	Renovation	New Name: Electrical and Mechanical Workshop
Roof		Change all roof material, Repair of External wall Roof and change ALM sashes.
Lower roof area		Lecturers and Technician's Rm.(2), Class Rm. (1), Drawing Rm.(1), Storage(1), Toilet
Workshop area		Divide the room into Electrical Workshop and Mechanical Workshop
Existing Civil Workshop	Renovation	New Name: Civil Workshop
Roof, External Wall, Sashes		Change all roof material , Repair of external wall , Change sashes.
Lower roof area		Lecturers and Technician's Rm.(1), Class Rm. (1), Storage(1), Prep. Rm.
Workshop area		Renovate as Civil Workshop
Canteen	Renovation	New Name: Canteen
Roof, eternal Wall		Change all roof material, repair of external wall
Kitchen		Construction of CB wall.
Gate House	Renovation	New Name: Gate House
Roof and external wall		Reconstruction of the building above ground level
Sliding steel gate		Repair.
Electrical facilities	Renovation	
Trans Rm.		Repair of building , change transformer, installation of AVR
Panel Board Rm.		Repair of building , Change electrical panel board.
Electrical wire and conduit pipe		Change to new materials
Plumbing facilities	Renovation	
Deep well pump		Clean the deep well and change to new deep well pump
Lift pump		Repair pump house and change to new pump
Elevated water tank and reservoir tank		Repair of Water proof and repaint of external wall
Sewage treatment tank		New construction
Existing Administration Building	Demolish	
2 floor building		Demolish all structure above ground level.
Electrical Workshop	Can be renovated	No renovation work by lower priority.
Existing Library	Need to be demolish	No demolish work by lower priority.

Existing Assemble Hall	Can be renovated.	No renovation work by lower priority.
Class Rm. Building A, B and C	Need to be Demolished	No demolish work by lower priority.
Existing Staff Houses	Need to be Demolished	No demolish work by lower priority.
Existing Students Dormitory A and C	Can be renovated.	No renovation work by lower priority.
Existing Students Dormitory B	Need to be Demolished	No demolish work by lower priority.
Existing Maintenance Workshop	Can be renovated.	No renovation work by lower priority.
Existing Automotive Workshop	Can be renovated.	No renovation work by lower priority.

2.2.2.1 Layout of Required Rooms

All of the required rooms can be housed by the existing laboratory building and two workshop buildings to be rehabilitated and will be distributed to these buildings in accordance with the principles described below.

(1) New Administration and Lecture Building (existing Laboratory Building)

- 1) The classrooms (9) and computer room (1) will be placed together to ensure the efficiency of teaching.
- 2) Administration rooms, excepting the lecturers' rooms, will be placed together to ensure efficient management.
- 3) Library will be placed on first floor for security and management reason.

(2) Workshop Buildings

- 1) The mechanical and civil workshop building adjacent to the laboratory building will be rehabilitated to house the required rooms.
- 2) The three departments will be distribution in these buildings in the following manner.
 - Mechanical workshop building : electrical and mechanical departments
 - Civil workshop building : civil department

The reasons for the above distribution are explained below.

- The mechanical workshop building has enough space for the installation of the range of equipment for the two departments and also has a structure which can be divided into space for the two departments.
- The civil workshop building is not large enough to separately install the range of equipment for the two departments.
- The mechanical department and civil department should not be located in the same building because of the high level of noise generated by the practical training under these departments.

- The civil department requires an outdoor work area for concrete mixing and other training.
- 4) Lecturers' rooms (Total 3 rooms) will be provided to facilitate equipment maintenance.
 - 5) The drawing room (1 room) will be located in the mechanical workshop building, which will accommodate two departments.
 - 6) The workshop toilets will be located in the mechanical workshop building, which will be used by the largest number of lecturers and students.
- (3) Canteen
To rehabilitate existing Canteen by changing roofing material and ceiling material, repair of kitchen wall, installation of sink and toilets.
- (4) Gate House
- 1) To rehabilitate existing Gate House to secure the campus from outsider.
 - 2) There were two Gate Houses along the front road. A Gate House which is located near the rehabilitation facilities should be rehabilitated.
 - 3) To repair the existing steel gate.

2.2.2.2 Building Plan

1. Plan

- (1) New Administration and Lecture Building (existing Laboratory Building)
 - Classrooms will be distributed on the ground floor to give top priority to student access to these rooms while administration rooms will be located on the first floor.
 - The computer room will be located on the first floor to give top priority to security.
 - The library will be located on the first floor as top priority is given to its management by the administration office.

Table 2-14 New Administration & Lecture Building (Existing Laboratory)

Room Name	Capacity	Planning Size(m ²)	Room Nos.	Total Size(m ²)	Remarks
Ground Floor					
Class Room - 1	25 persons	42	6	252	Dividing into 2 kinds room size due to existing window span
Class Room - 2	25 persons	46	3	138	
Storage	-	37	2	74	Existing room rehabilitation
Toilet	Men, Lady	20	1	20	Existing toilet rehabilitation
Others	Entrance hall, Corridor, Stair etc.			186	Existing rooms rehabilitation
Ground Floor Subtotal				670	
First Floor					
Computer Room	25 persons	80	1	80	Dividing existing column
Preparation Room	-	37	1	37	Existing room rehabilitation
Library	25 sheets	105	1	105	Dividing existing column
Dean Room	1 person	50	1	50	Existing room rehabilitation
Vice Dean Room	1 person	37	1	37	Existing room rehabilitation
Head of Dept. Room	3 persons	50	1	50	Dividing existing column
Administration	6 persons	80	1	80	Dividing existing column
Meeting room	20 persons	53	1	53	Dividing existing column
Storage	-	25	1	25	Dividing existing column
Toilet	Men, Lady			20	Existing toilet rehabilitation
Others	Corridor, Stair etc.			133	Existing room rehabilitation
First Floor Subtotal				670	
Total				1,340	

(2) New Electrical and Mechanical Workshop Building (existing Mechanical Workshop Building)

- The electrical workshop with a smaller space requirement for equipment will be located to the east side and the mechanical workshop requiring larger space will be located to the west side.
- These two workshops will be separated by the existing storage room and a mezzanine floor to reduce noise invasion and to prevent a loss of concentration on the part of students.
- The toilets will be located to the east side to facilitate their access from the civil workshop.
- The drawing room and classroom will be located on the electrical workshop side to minimize any adverse impacts of noise generated by the practical training.

Table 2-15 Electrical & Mechanical Workshop (Existing Mechanical Workshop)

Room Name	Capacity	Planning Size(m ²)	Room Nos.	Total Size(m ²)	Remarks
Electrical Workshop	Equipment Layout	320	1	320	Existing room rehabilitation
Mechanical Workshop	Equipment Layout	640	1	640	
Workshop Class room	25 persons	53	1	53	Dividing existing window
Drawing Room	25 persons	70	1	70	Dividing existing window
Lecturer's Room (Elec.)	20 persons	90	1	90	Dividing existing window
Lecturer's Room (Mech.)	20 persons	90	1	90	Dividing existing window
Storage (Elec.)		35	1	35	Dividing existing column
Storage (Mech.)		53	1	53	Dividing existing column
Toilet	Lecture. M. F			53	
Others	Corridor, Mezzanine etc.			286	Existing room rehabilitation
Total				1,690	

(3) New Civil Workshop Building (existing Civil Workshop Building)

- As some machines produce loud noise, such machines and other equipment will be located in large space to the west side to reduce the adverse impacts of noise in the neighboring area. This space is, in fact, near to the outdoor workshop.

Table 2-16 Civil Workshop (Existing Civil Workshop)

Room Name	Capacity	Planning Size(m ²)	Room Nos.	Total Size(m ²)	Remarks
Civil Workshop	Equipment Layout	630	1	630	Existing room rehabilitation
Mechanical Workshop	25 persons	53	1	53	Dividing existing window
Lecturer's Room (Civil)	20 persons	90	1	90	Dividing existing window
Preparation Room	-	35	1	35	Dividing existing column
Storage (Civil) -1		53	1	53	Dividing existing window
Storage (Civil) -2		53	1	53	Dividing existing window
Others	Corridor, Mezzanine etc.			236	Existing room rehabilitation
Total				1,150	

(4) Canteen (Existing Canteen)

- To rehabilitate the existing Dining, Kitchen and install new Toilets.

Table 2-17 Canteen (Existing Canteen)

Room Name	Capacity	Planning Size(m ²)	Room Nos.	Total Size(m ²)	Remarks
Roof		all			Change all roofing material
Dining	36 sheets	300	1	300	Existing room rehabilitation
Kitchen	Existing size	25	1	25	Existing room rehabilitation
Toilet	M, F	15	—	15	New installation
Total				340	

(5) Gate House

- To demolish the existing Gate House upper ground level, and construct on the Existing newly, because structure has no durability by the fire.

Table 2-18 Gate House (New Construction Upper Ground of Existing Gate House)

Room Name	Capacity	Planning Size(m ²)	Room Nos.	Total Size(m ²)	Remarks
Gate House	Existing size	25	1	25	New construction upper ground
Total				25	

(6) Administration Building Demolition

- To demolish the existing Administration Building to secure safety circumstance for study, because the existing Building is dangerous and close to rehabilitation area

2. Sectional Plan

(1) New Administration and Lecture Building

- The computer room will be located on the first floor for security reasons.
- The natural ventilation will be taken into classrooms on first floor, because the first floor level is 1-meter higher than the surrounding ground.

(2) New Electrical and Mechanical Workshop Building and new Civil Workshop

- Noisy equipment will be located in high ceiling workshop space where the dispersion of noise can be expected.
- The equipment need heat radiation shall be installed in the workshop which has natural ventilation through the high window.
- The lecturers' rooms, drawing room and classrooms, all of which are smaller than the workshop proper, will be located in the low ceiling area so that the ceiling height matches the room size.
- As in the case of the existing workshop buildings, a security grill will be installed on the windows.

3. Structural Planning

The subject items for structural planning are listed below.

- New pillars and beams for the lower section of the workshop buildings
- Bearing strength of the workshop floor (to support heavy equipment)

(1) Design Policy

The structural strength for the pillars and beams for the lower section of the workshop buildings will be designed in accordance with the relevant Australian standards, that is the referral standard of new structural standard in East Timor. Because of the absence of design data for the existing structures, the weight of the new pillars will be designed within the scope of not exceeding the weight of the existing pillars and beams.

(2) Structural Materials

In principle, structural steels and reinforcing bars will be those made in Australia, Indonesia or Singapore which can be purchased locally.

- Design concrete strength : 25 MPa (25 N/mm²)
- Cement : ordinary Portland cement
- Rough aggregate : locally produced crushed stone
- Fine aggregate : locally produced river sand
- Reinforcing bars : deformed bars: equivalent to GRADE 400Y (made in Australia); round bars: equivalent to GRADE 250R (made in Australia)
- Structural steel : equivalent to GRADE 250-350 (made in Australia)

(3) Bearing Strength of Workshop Floor

As a result of California Ratio Test (CBR Test) of the existing Workshop floor, base soil layer has a capacity to support planning equipment, because the base has 500 ~ 800kg/m² capability.

(4) Bearing Strength of Library Floor

Because of the absence of structural design calculation data for the new administration and classroom building, its bearing strength is unknown. Judging from the structure and composition of the building, the maximum live load of the floor is estimated to be around 300 kg/m². Open shelves to house 3,000 books will be distributed to ensure a live load of some 200 kg/m² to provide an adequate safety margin. Even if the collection of the library increases in the future, the open shelves should be distributed to maintain a live load of some 200 kg/m².

4. Building Services Plan

(1) Air-Conditioning

Air-conditioning will be planned in line with the following principles.

- The rooms to be air-conditioned will be determined with reference to the level of necessity for each room and the use of air-conditioning equipment at the main campus.
- Separate air-conditioning will be installed in the required rooms to reduce the overall running cost.
- Split type air-conditioners which are generally used in East Timor will be installed.
- The design outdoor temperature and indoor temperature are as follows.
 - Outdoor temperature : 30°C
 - Indoor temperature : 26°C

Air-conditioners will be installed in the following rooms.

Dean's room; Vice-Dean's room; Head of Dept.; administration office; meeting room; library; computer room; drawing room; lecturers' rooms

(2) Ventilation

In principle, natural ventilation will be employed to reduce the running cost and in view of the existing building style. An exhaust fan will be installed at Kitchen of Canteen.

(3) Plumbing Work

In principle, all of the materials for plumbing work will be locally available materials made in Australia, Indonesia or Singapore.

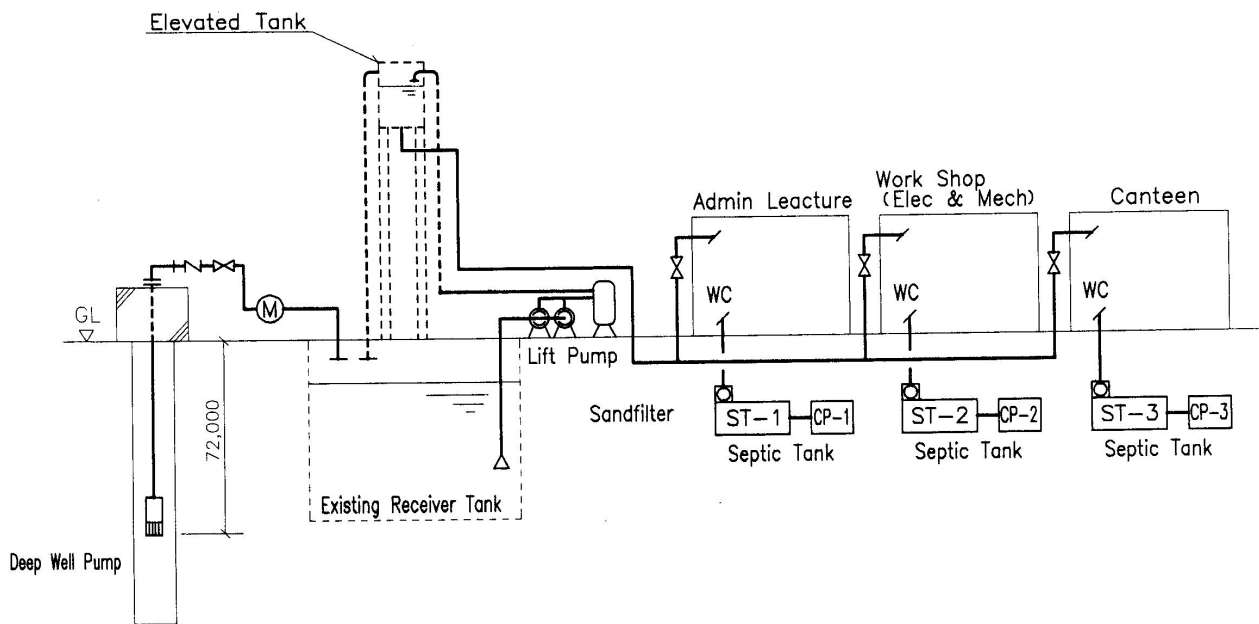
1) Water Supply

The existing system where groundwater is extracted from a deep well, is pumped to an elevated water tank and then supplied to each building using the gravity method will be rehabilitated. As all of the pumping equipment is out of order, new equipment will be installed for the existing water supply facilities. A new door will replace the broken door of the existing pumping station.

- The existing deep well (6" in diameter and 72 m in depth) will be dredged for new use as it has been found to be capable of supplying the required water volume (40 tons/day) by the pumping test.
- Submerged pump: a pump with the same capacity (240liter/minute) as the existing submerged pump will be newly installed.
- Water reservoir tank: the existing concrete water tank will be used after waterproofing and repair work.
- Elevated water pumps: two pumps with a pumping capacity of approximately 730liter/minute calculated by elevated water tank capacity and an operating panel will be newly installed.

- Pressure tank: this will not be installed as it is used for fire hydrant.
- Elevated water tank: the existing concrete elevated water tank will be used after waterproofing and repair work.
- Water pipes to each building: new water pipes will be laid as the existing routes and pipe diameter, etc. is unknown.
- Water supply pipes inside each building will be newly installed as the existing pipes are no longer usable.

Fig.2-1 Water Supply System Diagram



2) Hot Water Supply System

A hot water supply system will not be installed, as there is no local custom of taking a shower with hot water.

3) Drainage Facilities

- In line with the existing system, the drainage facilities will be divided into rain water drainage and foul and miscellaneous waste water drainage channels.
- Rain water will be drained to a U-shaped trench around the buildings.
- Sewage and miscellaneous waste water will be drained to a septic tank.
- A new septic tank will be constructed as the existing one cannot be rehabilitated.
- This new septic tank will adopt the same penetration system as the existing septic tank because of the absence of any water drainage standards.
- Drainpipes will be newly laid as the existing ones cannot be rehabilitated.

4) Sanitary Service Facilities

- Water closets, urinals and washbasins will have direct water supply pipe connection as in the case of the existing system.
- All sanitary service facilities will be newly installed as the existing ones cannot be rehabilitated.
- The type of water closets which are popularly used in East Timor will be used.

5) Fire-Hydrant System

Outdoor and indoor fireplugs will not be installed because of their difficulty to maintain and fire extinguishers which are commonly used in East Timor will be provided instead.

(4) Electrical Installation

In order to effectively use the existing layout of the campus facilities, the existing power supply system consisting of power flow from an overhead cable to a high voltage panel, transformer, main distribution panel and main panel of each building will be used. At present, there are no electrical installation standards and the entire electrical infrastructure has been developed based on Indonesian standards. As future standards are likely to be based on Indonesian standards, electrical installation under the Project will be based on Indonesian standards. All electrical equipment and appliances will be renewed as the existing ones cannot be rehabilitated and will be installed using the existing power facilities. A new door will replace the destroyed door of the existing power facilities.

1) Power Receiving and Transforming Facilities

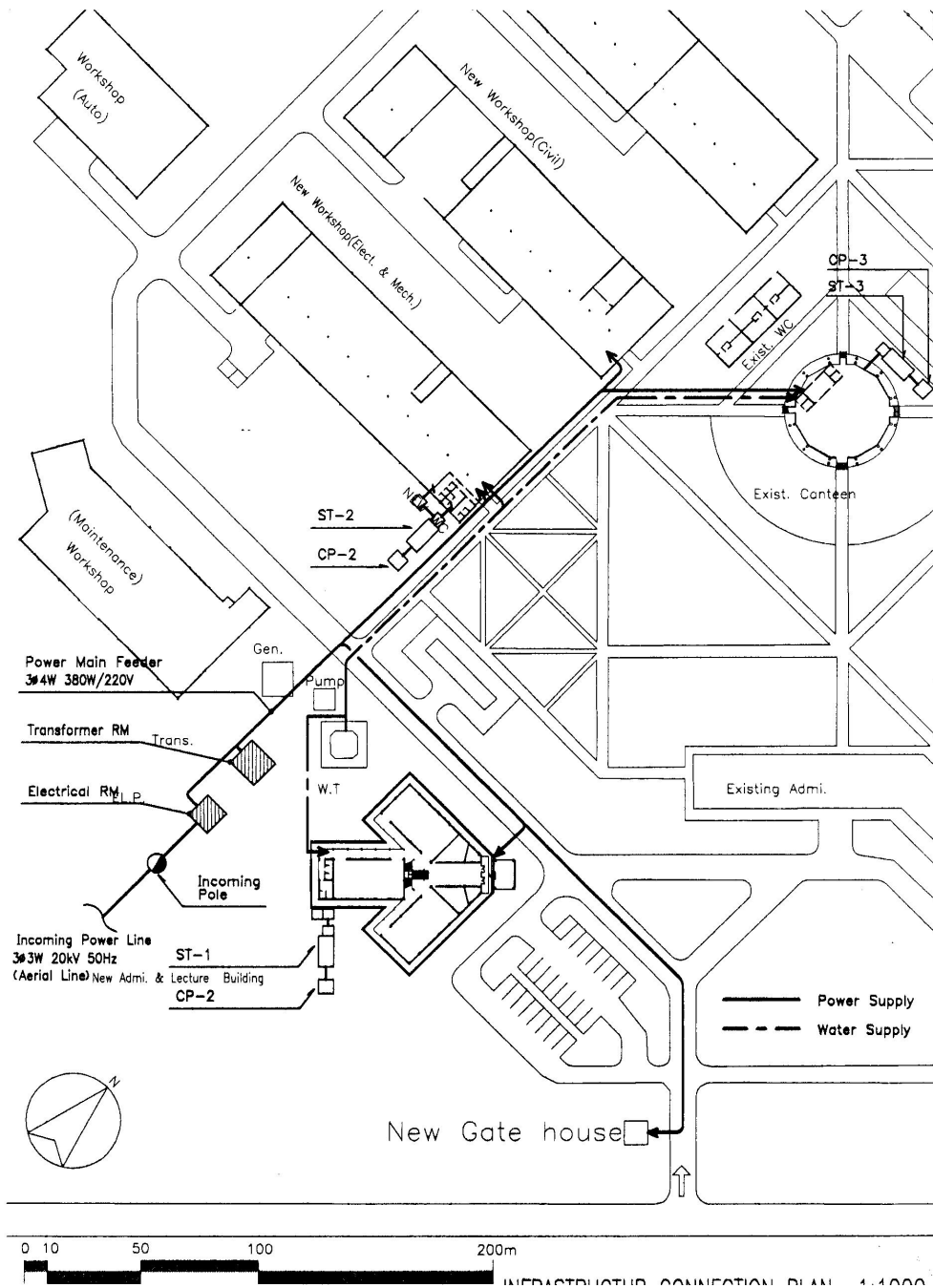
Power is supplied to the campus from an overhead high voltage transmission cable running along the road in front of the campus to receiving and transforming facilities located in the western corner of the campus. At present, no power supply is made because the campus is out of use. The service voltage is 20,000 V (50 Hz) and the work under the Project will feature power supply after the service pole. The power supplier will install a watt-hour meter. Because of the tight power supply situation, the maximum supply level will be around 200 kVA. An AVR will be installed to deal with the voltage drop of as much as 20%. Power supply is suspended on a daily basis for approximately three hours and power cuts due to voltage drop also frequently occur. As of October 2001, one of five generator set was broken by breaking crank case by crank shaft and can not repair anymore, and another one set of generator was over all maintenance, so the generating capacity in Dili power plant became much less than the demand and causes the frequent blackout. Because of this power supply condition, there was a strong request to install generator by the Ministry of education, culture, youth and sports and faculty of Engineering. If we install full size of generator to cover all facilities and equipment for the Project, it needs a lot of operation and maintenance cost for the generator set and Faculty of Engineering will have difficulty to manage the operation fund for generator. Therefore, the team decide to install three set of small size of generator for computer, electric and mechanical workshop and civil workshop to be able to operate practical lessons even in

the blackout..

Back up Generator Sets (fuel for three generators are diesel oil)

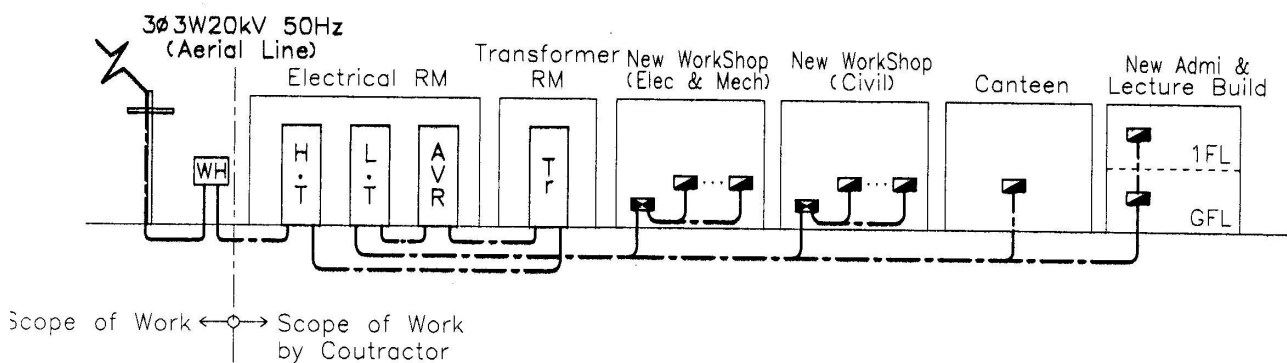
- A Generator Set (Single phase 20KVA) install for Computer room at Administration and Lecture Building.
- A Generator Set (3 phase 9KVA) install in the Electric and Mechanical Workshop
- A Generator Set (3 phase 9KVA) install in the Civil Workshop

Fig.2-2 Infrastructure Connecting Plan



- High voltage panel : the existing high voltage panel will be removed and a new panel will be installed in the existing high tension electric room.
- Transformer : the existing 400 kVA transformer may be reusable provided that it satisfies the withstanding test. However, because of the absence of testing equipment, the large scale of this test and its inability to respond to voltage drop due to the extension of distribution lines, a new 200 kVA transformer capable of stepping up to the rated voltage will be installed.
- Main distribution panel the old panel installed in the existing generator room has been burned out. The new panel will be installed in the high tension electric room where the existing cable pit can be used.
- Should the power supply capacity be increased in the future due to extension of the campus facilities, the following method will be used.
 - High voltage panel: an additional panel will be installed in the high tension electric room (space is available).
 - Transformer: either change to a new transformer of which the capacity is large enough to meet the additional power demand or installation of a new transformer to supply additional power (space is available).

Fig. 2-3 System Diagram of Electrical Power Supply



2) Trunk Power System

Power used to be supplied from the main distribution panel to each building. Because of the change of the electrical capacity of each building and the impossibility of using the existing underground cables, new underground cables will be installed to supply power to each building. The electrical system used for the trunk and branch circuits are as follows.

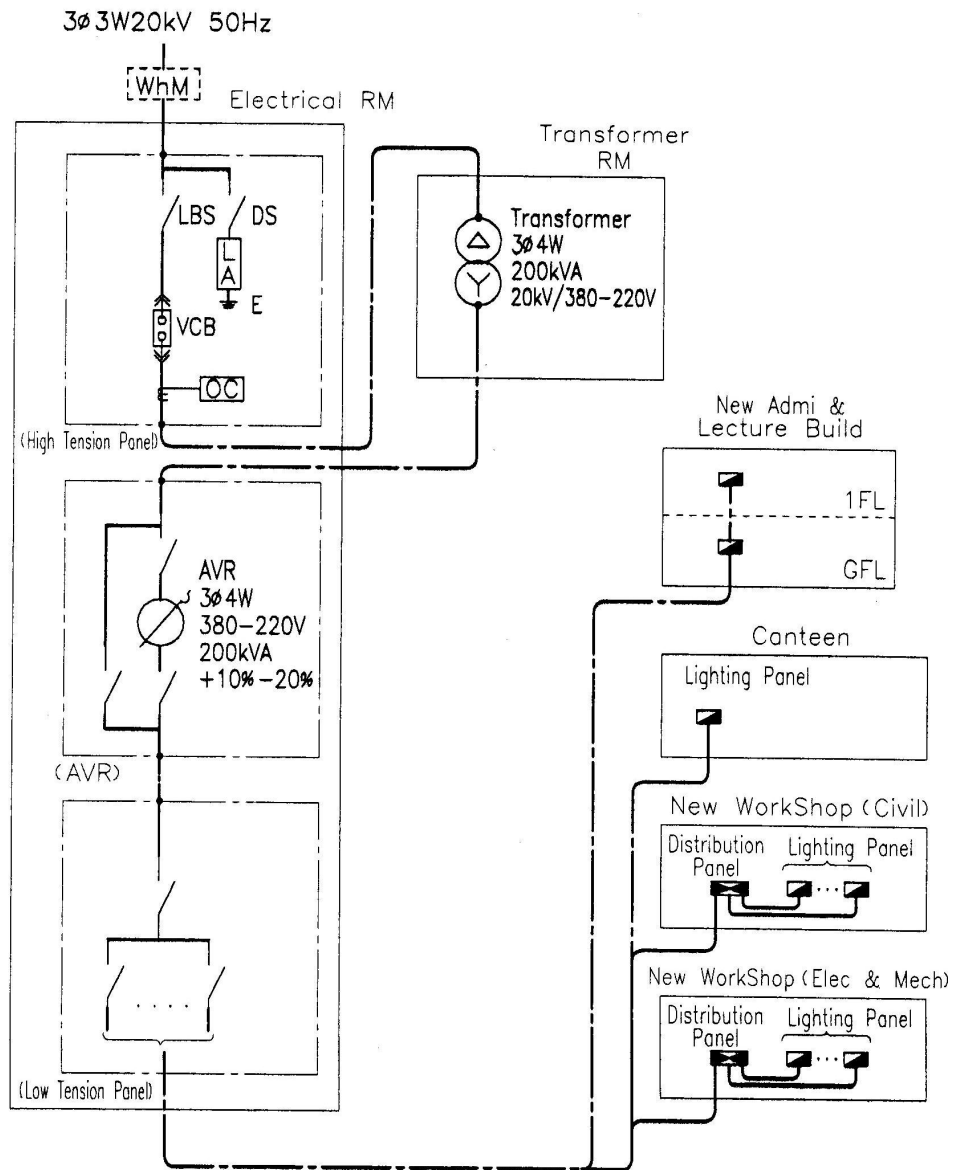
- Trunk power line : three phase, four wire, 220/380 V
- Lighting and receptacles : single phase, two wire, 220 V
- Power for air-conditioning : three phase, three wire, 380 V

3) Wiring for Receptacles

The locations and quantity of the receptacles in the computer room and worktables in the

workshops will be determined in accordance with the layout and load of the equipment.

Fig. 2-4 Skeleton Diagram of Power Supply System



4) Lighting

- The new curricula suggest that the workshops and drawing room may be used in the evening as well as the daytime. The number of lighting equipment will be determined with reference to the existing number of such equipment to ensure a low running cost.
- The existing lighting equipment in the upper section of the workshops is directly installed to the ceiling and did not function well. A raceway will be introduced at an appropriate height from the viewpoints of effective lighting and ease of maintenance for the installation of lighting equipment.
- The planned size and type of lamps should be those of lamps which can be procured locally.

- The planned luminous intensity for the main rooms is as follows.

- Administration office, etc.	: 300 lx
- Classroom	: 300 lx
- Computer room	: 350 lx
- Drawing room	: 500 lx
- Workshop	: 150 lx
- Corridor	: 100 lx

5) Telephone System

- There is no telephone line between Dili and the Hera area. As no mobile transmission facilities exist in the Hera area, a telephone system will not be installed. An interphone system will be installed the new administration & lecture building, two workshop buildings and gate house to realize smooth interface among those buildings.

6) Fire Alarm System

No fire alarm system has been introduced at the main campus building or Faculty of Education building in Dili and there is no local company or agent capable of providing a maintenance service. A fire alarm system will not, therefore, be installed.

7) Control Equipment

Because of the difficulty of securing local maintenance, no remote control system will be introduced to indicate the water level of the water tank and elevated water tank. Instead, such levels will be indicated on the panel in the pumping station.

8) Lightning Rod

Because of frequent lightning in the Hera area, a lightning rod with a grounding system will be installed on top of the two workshop buildings, new administration and lecture building and the elevated water tank.

5 . Building Materials Plan

As the Project intends the rehabilitation of some existing facilities using their structural frame, the finishing materials will be the same as those used for the existing facilities or similar materials using the local construction method. The finishing materials used for the existing facilities are those which can be procured locally. The construction method used for the existing facilities, the present condition of these facilities and the outline of the intended rehabilitation of the building exterior are shown in the table below. The main differences from the existing construction method and materials are described below. However, the newly selected materials will be those which can be procured locally.

(1) New Administration and Lecture Building

- Roof: the roof tiles will be replaced by corrugated coloured metal sheeting which is popularly used in East Timor to prevent the leakage of rainwater. However, the roof tiles over the eaves will be preserved to maintain the atmosphere of the existing buildings.
- Classrooms, etc.: the plywood ceiling boards will be replaced by gypsum boards.

(2) Electric and Mechanical Workshop, Civil Workshop Buildings

- Inner lining of the roof and ceiling boards for workshop buildings: the asbestos cement boards containing carcinogenic substances will be replaced by cement boards.
- Shutters: the existing shutters will be replaced by the sliding type which are easy to maintain by local maintenance workers

(3) Canteen

- Roofing material is corrugated poly vinyl chloride but there are many water leakage on the ceiling from the roof joint of polygon shape roof. Roofing material change to galvanized steel sheet and ceiling material change to cement board.

Table 2-19: Comparison of Existing Facility Condition and Rehabilitation Method

Exterior: New Administration & Lecture Building (Existing Laboratory)

	Structure/Finishing	Condition	Rehabilitation Method
Wall	RC frame: Mortar + Paint	Some cracks, dirty	Crack repair + Paint
Roof Eaves Ceiling	Cement Roof Tile	Leakage from Roof, Roof tile color was changed.	Color metal sheeting instead of roof tile to protect leakage.
	Cement Roof Tile	Rough installation	Roof tile adjustment
	Plywood + Paint	Paint deterioration	Repainting
Porch Roof Eaves Ceiling	Asphalt Roofing	Good condition	No rehabilitation
	Exposed RC slab	Exposed re-bar at bottom	Epoxy painting for rust proofing
	Plywood + Oil stain	Oil stain deterioration	Oil stain repainting
Fitting	Aluminum Window	Almost glass broken including Jalousie type	Glass installation

Exterior: Electrical and Mechanical Workshop, and Civil Work Shop

	Structure/Finishing	Condition	Rehabilitation Method
Low-rise frame	RC frame + Steel beam	Neutralized structure concrete , Deteriorated steel beam	Demolish neutralized structure concrete, and new construction with same method as the existing .
Wall	RC frame: Mortar + Paint	Burned, crack, come off paint	Crack repair + Paint
	CB wall	Burned, dirty	Cleaning
Low-rise roof	Steel purlin + Corrugated Alumin. Sheet	Some area burned down	New steel beam installation, purlin adjustment, new roofing.
High-rise roof	Steel purlin + Corrugated Alumin. Sheet	Some part broken, leakage. Curving and rusty purlin	Purlin adjustment, new roofing
Ceiling	ACB + Paint	Some part burned, leakage	Demolish asbestos cement board(ACB), and new ceiling (Cement board + paint)
	Expansion area: Plywood + Paint		
Pavement	Interlocking block	Some part settled	No rehabilitation (no effect for function)
Fitting	Jalousie fixed on Alumin frame	Broken and rusty Jalousie. Broken glass and some Alumin frame	New Jalousie and glass installation. Alumin frame installation (some frame)
	Alumin Window	Some part no window, broken glass	New glass installation
	Steel Shutter	Broken	Sliding type shutter installation

Exterior: Canteen

	Structure/Finishing	Condition	Rehabilitation Method
Wall	RC frame: Mortar + Paint	Come off paint	Repainting
Roof Ceiling	Color metal sheeting	Come off paint	No rehabilitation (If rehabilitation is done, roof might be broken because of complicated shape)
	Plywood + Paint	Some part burned, leakage	Cement board + paint
Fitting	Nil	-	-

Exterior: Gate House

	Structure/Finishing	Condition	Rehabilitation Method
Wall	CB + Concrete Lintel: Mortar + Paint	Pinky mortal, many cracks, come out paint	Neutralized concrete lintel. New construction upper ground (same finishing as the existing).
Roof Ceiling	Wooden truss + Roof tile	Burned down	New concrete flat slab + Cement waterproofing
	Plywood + Paint	Burned down	Mortar + Paint
Fitting	Wooden Door and Window	Burned down	New wooden door and Alumin window

Table 2-20: Interior Finishing

Room Name	Part	Structure/Finishing	Condition	Rehabilitation Method
Class Room, Computer Room, Library	Floor	Ceramic Tile	Broken, dirty	New Ceramic Tile
	Wall	Mortar + Paint	Cracks, dirty	Crack repair + Paint
	Ceiling	Plywood + Paint	Some part broken	Gypsum Board(durability) + Paint
	Fitting	Wooden Door	Curved frame, no door	New Alumin frame and wooden door
		Alumin Window	Glass broken	New glass
Dean, Vice Dean, Head of Dept., Administration	Floor	Ceramic Tile	Burned, broken	New Ceramic Tile
	Wall	Mortar + Paint	Burned, cracks	Crack repair + Paint
	Ceiling	Plywood + Paint	Some part burned	Gypsum Board(durability) + Paint
	Fitting	Wooden Door	Curved frame, no door	New Alumin frame and wooden door
		Alumin Window	Glass broken	New glass
Lecturer's Room, Drawing Room	Floor	Ceramic Tile	Burned, broken	New Ceramic Tile
	Wall	Mortar + Paint	Burned, cracks	New Mortar + Paint
	Ceiling	Plywood + Paint	Some part burned	Gypsum Board(durability) + Paint
	Fitting	Wooden Door	Curved frame, no door	New Alumin frame and wooden door
		Alumin Window	Glass broken	New glass
Workshop	Floor	Concrete + Hardener	No damaged	Hardener painting
	Wall	RC frame: Mortar + Paint	Cracks, come off paint	Crack repair + Paint
		CB Wall	Dirty	Cleaning
	Ceiling	Steel Truss, Wooden Frame + ACB + Paint	Rusty steel truss, burned ceiling, curved purlin	New paint on steel truss. Purlin adjustment. New Wooden frame + Gypsum board + Paint
		Fitting	Shutter	No movement, rusty
	Transom	Jalousie fixed on Alumin frame	Broken and rusty Jalousie. No glass and frame(some part)	New Jalousie and glass. New Alumin frame (some part)
		Steel Mesh + Alumin Frame	Rusty steel mesh	No rehabilitation (no effect for function)
Dining	Floor	Ceramic Tile	Some tile broken	10% tile rehabilitation
	Stair	Ceramic Tile	Some tile broken	20% tile rehabilitation
	Wall	Mortar + Paint	Cracks, come off paint	Crack repair + Paint
	Ceiling	Plywood + Paint	Some part burned, leakage	Gypsum Board(durability) + Paint
	Fitting	Nil	-	-
	Others	Wooden Handrail	Base connection corrosion	New Wooden Handrail
Kitchen	Floor	Ceramic Tile	Broken	New Ceramic Tile
	Wall(in)	Mortar + Paint	Burned, come off, cracks	New Mortar + Paint
	Wall(out)	Mortar + Paint	Burned, come off, cracks	New Mortar + Paint
	Ceiling	Unknown (burned)	-	New Gypsum Board + Paint
	Fitting	Wooden Door	Curved frame, no door	New Alumin frame and wooden door
		Alumin Window	Curved and burned frame, no glass	New Alumin window and glass
	Others	Floor Drainage Pit	Broken	New pit
RC Sink/Counter + Ceramic Tile		Broken and burned tile	New Ceramic tile on existing RC base	
Gate House	Floor	Ceramic Tile	Broken	New Ceramic Tile
	Wall	Mortar + Paint	Burned down	New CB + Mortar + Paint
	Ceiling	Plywood + Paint	Burned down	Mortar + Paint
Toilet	Floor	-	New construction	Ceramic Tile
	Wainscot	-	New construction	Ceramic Tile
	Wall	-	New construction	Mortar + Paint
	Ceiling	-	New construction	Gypsum Board + Paint
	Fitting	-	New construction	Alumin Window, Wooden Door

2.2.2.3 Equipment Plan

(1) Educational Equipment

Equipment plan are shown in Table 2-21 – Equipment List.

For the selection of equipment to be provided under the Project, the scientific experiments and practical training listed in the curricula were compared with the requested equipment to identify the minimum range of equipment for engineering education in line with the equipment policy described in 2.1.1.6. As a result, equipment which is not compatible with the new curricula and unnecessarily advanced or large equipment have been either eliminated or have undergone a change of the specifications. Meanwhile, the equipment quantity has been decided in line with the policy to determine the equipment quantity described in 2.2.1.2. Equipment.

Among the selected equipment, the material tester for the Mechanical Engineering Department, the concrete tester and soil tester for the Civil Engineering Department and the measuring equipment for the Electrical Engineering Department will be the only equipment of its kind in East Timor. As this equipment will enable the acceptance of testing requests from industries, it should contribute to an improvement of the quality of industrial products.

(2) Furniture and Fixtures

Furniture and fixture are shown in Table 2-21 – Equipment List. The grades of these items were decided with reference to the corresponding items used by the University of East Timor and similar facilities.

A request for a whiteboard was put forward. As equipment in the computer room could malfunction or break down due to dust, the provision of a whiteboard for the computer room has been agreed. Other classrooms will be provided with a blackboard. No copier is included in the planned equipment list as the copier currently owned by the Faculty of Engineering will be relocated to the new campus.

Table 2-21 Equipment List

1. List of the devices used in the Electrical Engineering Department

Planned device NO.	Request ed device NO.	Name of the device	Main specification or configuration	Planned number	Objects of use
ELD-1	EL-1	Circuit tester	Portable analogue circuit tester	26	Device to measure voltage, current and resistance of an electronic circuit.
ELD-2	EL-3	Oscilloscope	3channel 50MHz oscilloscope	6	Device to investigate the type of waveform on an electrical circuit.
ELD-3	EL-4	Function generator	Function/Pulse generator	6	Device which provides various waveforms on an electrical circuit.
ELD-4	EL-6	DC ammeter	0.01mA, 0.1mA, 10 A (each 1)	3	Necessary for measuring DC current on an electrical circuit.
			1mA, 10mA, 100mA, 1 A (each 6)	24	
ELD-5	EL-7	AC ammeter	1mA, 10mA, 100mA, 1 A (each 6)	24	Necessary for measuring AC current on an electrical circuit.
			10A	1	
ELD-6	EL-8	DC voltmeter	10mV, 100 mV, 1V, 10V, 100V (each 6)	30	Necessary for measuring DC voltage on an electrical circuit.
ELD-7	EL-9	AC voltmeter	1V, 10V, 500V (each 6)	18	Necessary for measuring AC voltage on an electrical circuit.
ELD-8	EL-10	Wattmeter	DC wattmeter: 25Hz - 1000Hz	1	Necessary for measuring electric power on an electrical circuit.
ELD-9	EL-11	LCR meter	Impedance meter	1	Necessary for measuring impedance factors on an electrical circuit.
ELD-10	EL-12	Tool set	Tools for constructing an electrical or electronic circuit.	26	
ELD-11	EL-13	Electrical component set	Resistance, Capacitor, Diode and Transistor sets	6	Components for designed circuits.
ELD-12	EL-14	Device for experiment of an electrical circuit	Breadboard type device for experiment of an electrical circuit (include a pulse generator)	6	Necessary for constructing and testing an electronic circuit.
ELD-13	EL-17	Single-phase AC measuring and loading device	The characteristics of a single-phase AC circuits measuring and loading device	6	Necessary for identifying characteristics of a single-phase AC circuit under a load.

Planned device NO.	Requested device NO.	Name of the device	Main specification or configuration	Planned number	Objects of use
ELD-14	EL-18	Three-phase AC measuring and loading device	The characteristics of a three-phase AC circuits measuring and loading device	6	Necessary for identifying characteristics of a three-phase AC circuit under a load.
ELD-15	EL-19	Variable resistor	Dial variable resistor	6	
ELD-16	EL-20	Variable capacitor	Dial variable capacitor	6	
ELD-17	EL-23	Experimental device of an OP amplifier	The experimental device which consists of Basic OP amplifier circuit, Transistor circuit and Voltage setting circuit.	6	Necessary for investigating an electronic circuit using an OP amplifier.
ELD-18	EL-25	1. Experimental device for a motor (Single-phase)	Cut model of a single-phase induction motor.	1	Necessary for testing characteristics of single and three phase motor.
		2. Experimental device for a motor (Three-phase)	The experimental device which combines with motor and generator.	1	
ELD-19	EL-26	Experimental device for a logic circuit	The experimental device which 74 series TTL/IC logic circuits.	6	Necessary for understanding logic circuits equipped with the TTL/IC.
ELD-20	EL-28	DC power for an electronic circuit	DC power for an electronic circuit	6	
ELD-21	EL-29	Experimental device for a relay circuit	Including electromagnetic relay function, timer relay function, a button switch, indicators	6	Device to arrange the basic operation of contact relay and a controlling circuit.
ELD-22	EL-30	Z80 experimental device	The one-board micro computer which consists of Z80 CPU, memories, and various I/O.	1	Necessary for understanding control devices through a one-chip microcomputer.
ELD-23	EL-31	Experimental device for electric power control	The experimental device which consists of DC power, AC power and various power circuit modules.	1	Necessary for understanding power circuits characteristics.
ELD-24	EL-32	Sliding voltage regulator	Sliding voltage regulator	1	

2. List of the devices used in the Mechanical Engineering Department

Planned device NO	Request ed device NO	Name of the device	Main specification or configuration	Planned number	Objects of use
MED-1	ME-1	Normal lathe	Swing on the carriage: 210mm Distance between cores: 550mm	1	Machining practice
MED-2	ME-2	Vertical milling machine	Moving range of the table: Side-to-side 300mm, back-and-forth 120mm, vertically 300mm	1	Ditto
MED-3	ME-4	Shaper	Stroke: 457mm Maximum working range: 480mm Vertical moving range: 250mm	1	Ditto
MED-4	ME-5	Sawing machine	Sawing capability: Round ϕ 210mm	1	Cutting materials
MED-5	ME-7	Double-ended grinder	Diameter of the grindstone approx. ϕ 300 mm	1	Grinding material
MED-6	ME-8	Engine driven welding machine	Welding current 25 - 100A using gasoline	1	Welding practice
MED-7	ME-9	Gas welding tool	Medium-sized	1	Ditto
		Safely glasses	Lightproof level: #5 - 6	26	Protect eyes
MED-8	ME-10	Arc welding machine	Welding current 200A	1	Welding practice
		Electrode	ϕ 3.2mm Ilminite or high titanium oxide type (40kg)		Ditto
		Protection	Hand shield type	26	Protect eyes and a face
		Lightproof glass	Lightproof level: #10 - 11	26	Protect eyes
		Plain glass	Thickness: 2.3mm	104	Guard of Lightproof glass
		Welding gloves	Cowhide, 5 fingers	26	Protect from harmful light and
MED-9	ME-11	Bending machine	Manual, maximum bending plate thickness : 3.2mm maximum bending width: 1200mm	1	Sheet metal working practice
MED-10	ME-12	Shearing machine	Maximum cutting plate thickness : 3.2mm, maximum cutting width: 1200mm	1	Cutting metal sheet
MED-11	ME-13	Surface plate	W450×D600×H100, accuracy 60 μ	1	Scribing measuring
MED-12	ME-14	Outside vernier calipers	200mm	26	Measuring practice
MED-13	ME-18	Height gauge	300mm	2	Ditto
MED-14	ME-20	Dial gauge	Measurement range: 10mm, Scale: 0.01mm, 0 - 100mm	6	Ditto
MED-15	ME-22	Magnet stand	Length of the supporting rod: 150mm	6	Ditto
MED-16	ME-23	Outside micrometer	Measurement range: 0 - 25mm, 25 - 50mm, 50 - 75mm, 75 - 100mm	4	Ditto
MED-17	ME-24	Inside micrometer	Measurement range: 5 - 30mm, 25 - 50mm, 50 - 75mm, 75 - 100mm (each 1)	4	Ditto
MED-18	ME-25	Gauge block	1.0005 - 60mm, 32 pcs, grade B	1	Ditto
MED-19	ME-26	Level	Size: 200mm	1	Ditto
MED-20	ME-30	Vice	Jaw width: 150mm	26	Manual work practice
MED-21	ME-31	Electric drill	Maximum diameter of drill: ϕ 6.5mm	1	Machining practice
MED-22	ME-32		Maximum diameter of drill: ϕ 13mm	1	Ditto
MED-23	ME-33	Bench drill	Maximum diameter of drill: ϕ 13mm	1	Ditto
MED-24	ME-34	Marking tool set	Marking-off pin, center punch, compass (each 1).	26	Scribing practice
MED-25	ME-35	Straight edge	Flat type L200×W24×t3mm	2	Scribing and measuring practice
MED-26	ME-37	Right-angle gauge	200×115mm	26	Ditto
MED-27	ME-38		400×200mm	1	
MED-28	ME-41	Convex	L5.5m	6	Measuring practice
MED-29	ME-43	Bevel protractor	ϕ 90×L200mm	6	Scribing and measuring practice

Planned device NO	Request ed device NO	Name of the device	Main specification or configuration	Planned number	Objects of use
MED-30	ME-44	Precise bevel protractor	ϕ 90×L200mm with lense	1	Ditto
MED-31	ME-45	Hammer	Weight: 250g	26	Various practice
MED-32	ME-46	Hand saw frame	For blade L250mm	26	Manual work
MED-33	ME-47	Saw blade for	24 edges / inch, L250mm	104	Ditto
MED-34	ME-48	Sheet metal snap	Straight, 300mm	6	Ditto
MED-35	ME-49	Snap ring pliers	Edge ϕ 0.8 Range of use: ϕ 3~10mm, ϕ 5~28mm, ϕ 28~50mm, ϕ 50~100mm (each 2)	8	Disassembling and assembling practice for machinery
MED-36	ME-50	Vice pliers	Length: 230mm	12	Fixing works
MED-37	ME-51	Monkey wrench	Length: 150, 200, 250, 300mm (each 6)	24	Disassembling and assembling practice for machinery
MED-38	ME-52	Tap/Die set (Inch thread)	1/8W28, 1/4W19, 3/8W19, 1/2W14 (each 6)	24	Manual work practice
MED-39	ME-53	Tap/Die set (Metric thread)	M3×0.5, M4×0.7, M5×0.8, M6×1, M8×1.25, M10×1.5, M12×1.75 (each 6)	42	Ditto
MED-40	ME-54	Tap wrench	For M3 - M10, M4 - M13 (each 6)	12	Ditto
		Die wrench	Nominal diameter: ϕ 20mm, ϕ 25mm, ϕ 38mm, ϕ 50mm (each 6)	24	
MED-41	ME-55	R gauge (For both inside and	1.0-7mm, 30 sheets, 7.5-15mm, 30 sheets (each 1)	2	Measuring practice
MED-42	ME-56	Center gauge	55, 60° steel (each 1)	2	Scribing and measuring practice
MED-43	ME-57	Pitch gauge	0.25 - 6.0mm, 60° , 25 sheets	1	Practice for measuring the pitch of thread
MED-44	ME-58	Steel ruler (Straight)	300mm	26	Scribing and measuring practice
MED-45	ME-59	Steel ruler	300mm	6	Ditto
MED-46	ME-60	Thickness gauge	0.03 - 0.3mm, 10 sheets	2	Practice for measuring clearance
MED-47	ME-61	Flat chisel	19×190mm	26	Manual work
MED-48	ME-62	Combination files	Second-cut, set of 5 files	26	Ditto
MED-49	ME-65	Air compressor	Maximum pressure: 14kg/cm ² Capacity of the air tank: 120L iter	1	Operation of pneumatic equipment, blow cleaning for machnery
MED-50	ME-77	Pneumatic training device	Experiments and practices of pneumatic circuit with various units.	1	Experiments of fluid mecanic and pneumatic training
MED-51	ME-78	Hydraulic training device	Experiments and practices hydraulic circuit with various units.	1	Experiments of fluid mecanic and hydraulic training
MED-52	ME-80	Automobile cut model	Revolution by an electrical motor, water-cooled four-cylinder gasoline engine type	1	Use in the "Automobile engine system" course as a piece of instructional material.
MED-53	ME-82	Material testing machine	Tension, Compression, bending, Maximum load 100kN(approx 10tons)	1	Tests or experiments for the subjects of dynamics

3. List of the devices used in the Civil Engineering Department

Planned device NO	Requested device NO	Name of the device	Main specification or configuration	Planned number	Objects of use
CVD-1	CV-1	Concrete compression test	1. Concrete compression test machine 1,000kN Readout range: 50, 25, 10 t	1	Investigate compression strength of freely-mixed concrete.
			2. Cylinder mold for frame for making a test piece	30	Accessory
			3. Cylinder mold for frame for making a test piece	30	Ditto
			4. Frame for making a test piece □150×150×	30	Ditto
			5. Concrete Curing bath, Standard temperature:	1	Ditto
			6. Concrete mixer mortar: 3 phase, 750w capacity: 50 liter drum speed: 1m/s	1	Ditto
			7. Capping apparatus φ150×300mm φ100×200mm □ 150×150×530mm	1	Ditto
			8. Capping compound warmer Stainless Maximum temperature: 300°C	1	Ditto
			9. Concrete air content tester	1	Ditto
			10. Balance 30kg - sensitivity 5g	1	Ditto
			11. Sieve set for concrete aggregate test	1	Ditto
CVD-2	CV-2	Soil test	1. Soil test machine (triaxial compression testing) Air control type	1	The test is for determining the shearing strength constant.
			2. Vernier calipers: 200mm	1	Accessory
			3. digital Stopwatch	1	Ditto
			4. Enamel tray 235×190×35mm	10	Ditto
			5. Moisture containing tin (Steinress sharye)	10	Ditto
			6. Desiccator: φ300mm	1	Ditto
			7. Water sink temperature controller Inside diameter: 915×160×360 Heater: 500W×2 0-	1	Ditto
			8. Mechanical analyzing stirrer Number of motor revolution: 10,000rpm W270×D285×H570mm	1	Ditto
			9. Hydrometer Diameter: 30mm, Length: 280mm Minimum scale: 0.001mm	5	Ditto
			10. Hydrometer jar Inside diameter: 60mm×	5	Ditto
			11. Liquid limit measure set Counter: 3digit Drop speed: 2/sec	1	Ditto
			12. Plastic limit measure 300×400×5mm	1	Ditto
			13. Electronic balance: 12kg - 0.1g	1	Ditto
CVD-3	CV-5	Theodolite	Shifting type Scaling: 30 Times Suitable diameter of objective lens: 40mm Accessories, precision tripod	2	Measures the angle and distance.
CVD-4	CV-6	Base support	Accessories for measurement trainings.	2	Used in measurement
CVD-5	CV-7	Marshall compression tester	1. Data readout: 0.6-60mm/m Maximum ability: 10t	1	Investigates the appearance level of combination strength.
			2. Marshall mold Inside diameter: 101.6mm	10	Accessory
			3. Asphalt mixer Capacity: 20 liter Inside diameter of the tank: 340mm Maximum	1	Ditto
			4. Asphalt compaction machine Drop speed: 70/ min Drop distance: 457.2mm Diameter of the area reached by the material: 98.4mm Weight of the hammer: 4.5kg	1	Ditto
			5. Asphalt Curing Bath W450×D350×H300 Thermal capacity: 1.5kw Weight: 45kg	1	Ditto
			6. Sieve set for Asphalt test	1	Ditto
CVD-6		Level	Auto type, grade 3, accessories	1	Measurement machine
CVD-7		CAD for civil design	Topographic map, Structural calculation, Surveying calculation	1	CAD Software

4. List of the devices for Drawing Room

Planned device NO	Requested device NO	Name of the device	Main specification or configuration	Planned number	Objects of use
DRD-1	DR-1	Drawing board with parallel ruler	A1-size, with A1 parallel ruler, magnet sheet, stainless sheet for paper holding.	26	Used for drawing. 25 (students/class)+1 (teacher)=26
DRD-2	DR-2	Drawing table	For A1-size paper, made of steel pipes.	26	ditto
DRD-3	DR-3	Triangle	240mm-size, graduated	26	ditto
DRD-4	DR-4	Triangle scale	Graduation: 300mm, Scale: /100, 1/200, 1/300, 1/400, 1/500, 1/600	26	ditto
DRD-5	DR-5	Protractor	150mm, half-round	26	ditto
DRD-6	DR-6	Template (Combined)	Types that can be combined: Triangle, square, hexagon, round 140mm×92mm× t 0.8mm	26	ditto
DRD-7	DR-7	Template (For electrical symbols)	Curve for electrical symbols, 140mm×92mm× t 0.8mm	26	ditto
DRD-8	DR-8	Template (For electrical symbols)	For MIL symbols, 85×55mm×10.6mm	26	ditto
DRD-9	DR-9	French curve	Transparent plastic, 6 curves/set	26	ditto
DRD-10	DR-10	Curve for free-form curve	No graduation 300mm	26	ditto
DRD-11	DR-11	Drawing tool set	Large and small compasses, dividers, Mechanical pencil, refill, driver, etc. 10 tools per set	26	ditto
DRD-12	DR-12	Brush for drawing	Length: 300mm	26	ditto

5. List of Computer devices and Audiovisual devices

Planned device NO	Requested device NO	Name of the device	Main specification or configuration	Planned number	Objects of use
PCD-1	PC-1	Personal computer	PC/AT compatible machine (network client)	25	Necessary as client PCs for students for education of computer literacy
PCD-2	PC-2	Network server	PC/AT compatible machine (network server)	1	Server is necessary for teachers to show operation to their students.
PCD-3	PC-3	Printer	Monochrome laser beam printer (include network port)	2	Necessary as documents printing.
PCD-4	PC-4	UPS	Uninterruptible Power System for PCD-1 and/or PCD-2.	26	Necessary as avoid computer breakdown caused by a power failure or change of voltage.
PCD-5	PC-5	The equipments for LAN construction	Switching HUB : 10BASE-T/100BASE-TX port, 8port	6	Necessary for constructing a network in the computer room.
			OA tap : 6 sockets, 1000W in total	5	
			LAN cable : UTP twisted-pair cable, category 5	1	
			LAN connector : RJ-45 connector	2	
			LAN tester : RJ-45 cross cable/straight cable continuity tester	1	
			RJ-45 connector swaging tool : Pressure welder with ratchet mechanism	1	
Cable duct : The duct for laies LAN cables.	20				
AVD-1	AV-1	Television	21 inch, Including video input, Replays in PAL and NTSC	1	Necessary for replaying video educational-materials.
AVD-2	AV-2	Video	VHS, Replays and records in PAL and NTSC	1	Necessary for replaying video educational-materials.
AVD-3	AV-3	Screen for OHP	W1,800×H1,800	2	Necessary for projecting OHP

6. List of the devices for Physical Experiment

Planned device NO	Requested device NO	Name of the device	Main specification or configuration	Planned number	Objects of use
PHD-1	PH-1	Experimental device for droppings		2	Essential for measuring the acceleration of droppings with a recording timer.
		1. Recording timer	Switching pulse		
		2. Stand	$\phi 16 \times H665\text{mm}$, 1kg, Stainless		
		3. Timer supporter	$\phi 12\text{mm} \times L80\text{mm}$		
		4. Recording tape	60m		
		5. Safety weight	500g		
PHD-2	PH-2	Experimental device for reservation of momentum		2	Essential for experiments for verifying the principle of conservation of momentum with a mechanical truck.
		1. Mechanical truck	Metallic, $W176 \times D80 \times H40\text{mm}$, Weight: 1kg		
		2. Guide track	Length: 1200mm		
		3. Recording timer	Switching pulse		
		4. Recording tape	60m		
PHD-3	PH-3	Experimental device for air column resonance		2	Essential for investigating the number of vibration of a tuning fork caused by air column resonance.
		1. Device for air column resonance	Glass tube, $\phi 30 \times L 890\text{mm}$, with graduations of mm Accessories: Bottle for water level control, supporting board		
		2. Tuning fork for device for air column resonance	Steel Number of vibration 600Hz		
		3. Glass tube for resonance	$\phi 30\text{mm} \times L 890\text{mm}$, with graduations of mm Accessories		
		4. Bucket	5/set		
		5. Rubber ring of glass tube	5/set		
PHD-4	PH-4	Experimental device for specific heat of metal		2	Physical experiment: Essential for measuring specific heat of metal.
		1. Water calorimeter	Steel container 200ml, Mass: 84g with heat insulation container Thermometer: 50°C .		
		2. Objects of measurement of specific heat	Object: Steel, aluminum, copper Mass: 100g (steel, copper), 50g (aluminum)		
		3. Top-loading balance	Capacity: 200g, $W185 \times D85 \times H145\text{mm}$		
		4. Alcohol lamp	Stainless steel, copper cord, 120ml with tight stopper of rubber		
		5. Iron tripod	$\phi 80 \times H200\text{mm}$ apx.		
		6. Ceramic mesh	$150 \times 150\text{mm}$ Ceramic part: $\phi 110\text{mm}/10\text{set}$		
		7. Beaker	500ml, Glass		
PHD-5	PH-5	Experimental device for a diffracting grating		2	Essential for investigating the grating constant and the wavelength of monochrome light.
		1. Grating	$W50 \times H40 \times D5\text{mm}$, 2000 lines/10mm		
		2. Laser device for education	He-Ne gas laser tube $W50 \times D250 \times H72\text{mm}$		
		3. Stand	$\phi 16 \times H665\text{mm}$ apx. 1kg, Stainless SUS304		
		4. Jack table	20kg, with a knob		
		5. Graduated ruler of 1m	Minimum graduation: 1mm, Wood, $W30 \times L1000 \times D5\text{mm}$		

7. List of Furniture

Planned device NO	Requested device NO	Name of the article	Main specification or configuration	Planned number	Objects of use
FUD-1	FU1-1	Double Pedestal	W1600×D750×H750	1	Dean's Room 1
FUD-2	FU2-1	Single Pedestal	W1400×D700×H750	2	Vice Dean's Room 1
	FU3-1	Desk-A			
FUD-3	FU3-4	Single Pedestal	W1200×D750×H750	9	Head of Dept's Room 3, Library 1, Administration Room 5
	FU4-1	Desk-B			
	FU6-4				
FUD-4	FU9-1	Single Pedestal Desk-C	W1200×D600×H750	60	Lecturer's Room 60
FUD-5	FU5-1	Table for Meeting	W1200×D600×H750	10	Meeting Room 10
FUD-6	FU6-1	Desk for Library	W960×D600×H1170	25	Library 25
	FU7-2				
FUD-7	FU7-5	Teacher's Desk	W1000×D800×H800	13	Classroom 9, For Physical Experiments 2, Classroom for Workshop 2
	FU10-3				
	FU11-3				
FUD-8	FU1-2	Armchair-A	Armchair with Hightback	1	Dean's Room 1
FUD-9	FU2-2	Armchair-B	Armchair	2	Vice Dean's Room 2
	FU3-2				
FUD-10	FU4-2	Armchair-C	Armrest	3	Head of Dept's Room 3
	FU3-5				
FUD-11	FU6-5	Armchair-D	Armrest	66	Lecturer's Room 60, Administration Room 5, Library 1
	FU9-2				
FUD-12	FU5-2	Chair for Meeting	Without armrest	20	Meeting Room 20
	FU7-1				
FUD-13	FU10-1	Chair with Table for Student	Chair with table	275	Classroom 225, Classroom of Workshop 50
	FU11-1				
FUD-14	FU6-2	Chair for Library	Pipe Chair with Armrest	25	Library 25
FUD-15	FU12-1	Chair for Drawing	Pipe Chair	26	Drawing Room 26
FUD-16	FU1-3	Cabinet-A	W1600×D500×H1800	1	Dean Room 1
	FU2-3				
FUD-17	FU3-3	Cabinet-B	W1400×D500×H750	2	Vice Dean's Room 2
FUD-18	FU4-3	Cabinet-C	W1200×D500×H750	3	Head of Dept's Room
FUD-19	FU9-3	Cabinet-D	W1200×D400×H750	30	Lecturer's Room 30
	FU3-6				
FUD-20	FU6-3	Book Shelf	W800×D250/400×H2000	18	Administration Room 3, Library 15
FUD-21	FU7-6	Cabinet for Physical Experiments	W1000×D450×H2000	2	Shed for Experimental Tools 2
	FU3-7				
FUD-22	FU9-4	Schedule Board	W1800×H1200	4	Administration Room 1, Lecturer's Room 3
	FU7-3				
FUD-23	FU10-2	Black Board	W750/1500/750×H1200	12	Classroom 9, Classroom of Workshop 2, Drawing Room 1
	FU11-2				
	FU12-2				
FUD-24	FU8-4	White Board	W750/1500/750×H1200	1	PC Laboratory 1
FUD-25	FU8-1	PC Table	W800×D600×H750	26	PC Laboratory 26
FUD-26	FU8-2	Chair for PC	Without armrest	26	PC Laboratory 26
FUD-27	FU8-3	Printer Table	W700×D600×H750	2	PC Laboratory 2
FUD-28	FU7-7	Table for TV/VIDEO	W800×D550×H1200	1	Table for TV/VIDEO 1
FUD-29	FU7-4	Black Curtain	Blackout curtain for OHP, 20m ²	1	Classroom 1 set
FUD-30	FU13-1	Table for Canteen	W2000×D800×H750	6	Canteen 6
FUD-31	FU13-2	Chair for Canteen	W1800×D400×H450	12	Canteen 12
FUD-32	FU14-1	Notice Board	W3200×H1200	2	Entrance Hall 2

8. Generator for Practical Training Equipment

Planned device NO	Requested device NO	Name of the article	Main specification or configuration	Planned number	Objects of use
GPD-1	GP-1	Diesel Generator	9kVA, Single/3Phase	2	For Electrical/Mechanical, Civil
GPD-2	GP-2	Diesel Generator	20kVA, Single Phase	1	For Computer

Table 2-22 List of reasons for selection of equipment

(1) Electrical Engineering Department

Name of the experiment and training course	Names of related courses	Objects and contents of the experiment and the training	Names of the devices planned to be used in the course (Only devices with the priority of A)	Names of available devices (Devices with the priority of from B to D)	Reasons for not using the available devices
Training I	Basic assembly Electrical drawing Electrical materials Electrical measurement I Electrical Circuit I	Learn meanings of drawing symbols and passive and positive components consisting electrical or electronic circuit, as well as Ohm's law, Kirchhoff's law, measurement of middle resistance, and analysis of direct current circuit.	EL-1 : Circuit tester EL-6 : DC ammeter EL-8 : DC voltmeter EL-12 : Tools set EL-13 : Electronic components set EL-14 : Devices for experiment of electronic circuit EL-19 : Variable resistor EL-20 : Variable capacitor EL-28 : DC line for electronic circuits Common PC	EL-2 : Digital multimeter EL-21 : P-spice EL-22 : PC	- Although EL-2 displays measurement results in digital form and therefore there are few readout errors, it can be replaced by EL-1 without problems. - The CAD function of EL-21 can be utilized for circuit designing, but CAD software is already installed in the PCs in the common PC laboratory.
Training II	Electromagnetism I Electrical circuit II Electrical measurement II Electrical devices I	Learn operating principles of an ammeter and a voltmeter, as well as the characteristics of a bridge circuit.	EL-1 : Circuit tester EL-6 : DC ammeter EL-8 : DC voltmeter EL-10 : Wattmeter EL-12 : Tools set EL-13 : Electronic components set EL-14 : Devices for experiment of electronic circuit EL-19 : Variable resistor EL-20 : Variable capacitor EL-28 : DC line for electronic circuit	EL-2 : Digital multimeter	- Although EL-2 displays measurement results in digital form and therefore there are few readout errors, it can be replaced by EL-1 without problems.
Training III	Electromagnetism II Electrical circuit III Electrical components II	Learn handling of electrical components in an AC circuit, as well as characteristics of the voltage and current of each passive component in a single-phase AC circuit, and characteristics of serial and parallel resonance circuits.	EL-7 : AC ammeter EL-9 : AC voltmeter EL-10 : Wattmeter EL-11 : LCR meter EL-12 : Tools set EL-17 : Measurement and loading device for single-phase AC EL-18 : Measurement and loading device for three-phase AC EL-19 : Variable resistor EL-20 : Variable capacitor EL-25 : Device for experiment of a motor EL-31 : Device for experiment of electricity control EL-32 : Sliding voltage regulator		
Training IV	Electrical equipment I	Learn characteristics of an electric motor, by controlling electricity of devices consisting electrical equipment and understanding the characteristics of the equipment.	EL-3 : Oscilloscope EL-4 : Function generator EL-12 : Tools set EL-13 : Electronic components set EL-14 : Device for experiment of electronic circuit EL-26 : Device for experiment of logic circuit EL-28 : DC line for electronic circuit	EL-15 : Oscilloscope EL-16 : Digital-storage oscilloscope EL-21 : P-spice EL-22 : PC	- Although the concurrent use of EL-15 and EL-16 allows for comparison and study of waveform around Z80, the operating frequency of Z80 can be handled by EL-3 without problems, and high-level techniques are necessary for EL-15 and -16, depending on operating method. - EL-21 enables us to previously simulate characteristics of a circuit, but it needs high level techniques depending on operating method.
Training V	Electronic circuit I Digital engineering I	Learn operating principle of digital circuit by 74 series TTL IC.			

Name of the experiment and training course	Names of related courses	Objects and contents of the experiment and the training	Names of the devices planned to be used in the course (Only devices with the priority of A)	Names of available devices (Devices with the priority of from B to D)	Reasons for not using the available devices
Training VI	Electrical equipment II Controlling device I	Learn methods of controlling devices consisting electrical equipment by effecting the operation of a motor through relay circuit.	EL-12 : Tools set EL-25 : Device for experiment of a motor EL-29 : Device for experiment of a relay circuit	EL-15 : Oscilloscope EL-16 : Digital storage oscilloscope EL-21 : P-spice EL-22 : PC EL-27 : Device for experiment of a pulse circuit	- Although the concurrent use of EL-15 and EL-16 allows for comparison and study of waveform around Z80, the operating frequency of Z80 can be handled by EL-3 without problems, and high-level techniques are necessary for EL-15 and -16, depending on operating method. - EL-21 enables us to previously simulate characteristics of a circuit, but it needs high level techniques depending on operating methods. - EL-27 enables us to directly assemble a circuit for experiment, but the concurrent use of EL-26 and -29 also allows for construction of a comparable circuit.
Training VII	Electronic circuit II Digital engineering II C language and assembler Microprocessor / Interface I	Learn operating method of a microprocessor of a device that is controlled through a hybrid circuit of a digital and analogue circuits and the pulse response given to the circuit.	EL-3 : Oscilloscope EL-4 : Function generator EL-12 : Tools set EL-13 : Electrical components set EL-14 : Device for experiment of an electronic circuit EL-23 : Device for experiment of an OP amplifier EL-26 : Device for experiment of a logic circuit EL-28 : DC line for electronic circuit EL-29 : Device for experiment of a relay circuit EL-30 : Device for experiment of Z80 Common PC		
Training VIII	Electricity engineering I Controller II	Learn methods of controlling electricity by understanding the electrical characteristics of a motor that are originated from changes in voltage.	EL-17 : Measurement and loading device for single-phase AC EL-18 : Measurement and loading device for three-phase AC EL-12 : Tools set EL-25 : Device for experiment of a motor EL-31 : Device for experiment of electricity control EL-32 : Sliding voltage regulator		
Training IX	Electricity engineering II Controller II	Carry out experiments investigating static characteristics of various power devices such as diode, transistor, MOS FET, thyristor, and multivibrator, and learn characteristics of an AC amplification circuit and a power electronics circuit.	EL-17 : Measurement and loading device for single-phase AC EL-18 : Measurement and loading device for three-phase AC EL-12 : Tools set EL-25 : Device for experiment of a motor EL-31 : Device for experiment of electricity control EL-32 : Sliding voltage regulator All devices from EL-1 to EL-32.		
General training for Electrical Departments I and II	All courses of the Electrical Departments	Actually design a facture and compose it according to the design, utilizing the knowledge you have learned.			
Composition for graduation	All courses of the Electrical Departments	Evaluate and carry out experiments of the factures composed in the general training for Electrical Department I and II and submit a report of the process from the designing.			

(2) Mechanical Engineering Department

Name of the experiment and training course	Names of related courses	Objects and contents of the experiment and training	Names of the devices planned to be used in the course (Only devices with the priority of A)	Names of available devices (Devices with the priority of from B to D)	Reasons for not using the available devices
Training I	Mechanical drawing I Material technology	<ul style="list-style-type: none"> Based on the knowledge learned in related courses, observe familiar industrial materials and understand their uses. Learn simple measurement and marking. Learn simple working by hand tools. 	<p>ME-7,-8,-14,-61,-52 ~ 54,-55 ~ 59 : Working tool</p> <p>ME-34 - 39 : Marking tool</p> <p>ME-40 - 45 : Measurement tool</p>	<p>ME-15,-16,-17 : Various vernier caliper (Digital)</p> <p>ME-40,ME-42 : Convex measuring tape</p> <p>ME-61 : Flat chisel (except 19 × 190mm)</p>	<p>ME-15,-16,-17 : Analogue measurement is suited for education.</p> <p>Moreover, all the measurement tools are set at 200mm because the length is the most frequently used.</p> <p>ME-40,-42 : Can be replaced by ME-41 (convex5.5mm)</p> <p>ME-61 : Can be used by just the 19 × 190mm one.</p>
Training II	Mechanical drawing II Basic electrical Static structure I Machine introduction I	<ul style="list-style-type: none"> Observe actual electrical circuits and learn connection of electrical appliances and safety knowledge on the site of electricity. Understand simple construction and mechanism of a machine by actually observing it. Learn about sheet-metal development. Learn simple operation of a machine. 	<p>ME-5 : Sawing machine</p> <p>ME-7 : Double-ended grinder</p> <p>ME-7,-8,-61,-52 ~ 59 : Working tool</p> <p>ME-11 : Bending machine</p> <p>ME-12 : Shearing machine</p> <p>ME-31 ~ 33 : Electric drill, Bench drill</p> <p>ME-34 ~ 39 : Marking tool</p> <p>ME-40 ~ 44 : Measurement tool</p> <p>ME-82 : Material testing machine</p>	<p>ME-6 : Double-ended grinder</p> <p>ME-39 : Uni block</p>	<p>ME-6 : Can be replaced by ME-7.</p> <p>ME-39 : Can be doubled by ME-37,-38,-56.</p>
Training III	Engineering dynamics Machine energy Machine element I Material strength	<ul style="list-style-type: none"> Acquire practical knowledge by actually operating various a manufacturing machines. Learn about energy conversion through a device for experiment of a motor. Acquire practical knowledge by testing the strength of materials with a material testing machine, and learn the operation of the machine. 	<p>ME-1 : Normal lathe</p> <p>ME-2 : Vertical milling machine</p> <p>ME-4 : Shaper</p> <p>ME-9 : Gas welding device</p> <p>ME-10 : Arc welding device</p> <p>ME-11 : Bending machine</p> <p>ME-12 : Shearing machine</p> <p>ME-14,-18,-20 : Various vernier calipers and gauges</p> <p>ME-31 ~ 33 : Electric drill, Bench drill</p> <p>ME-82 : Material testing machine</p>	<p>ME-3 : Universal milling machine</p> <p>ME-9 : Gas reel</p> <p>ME-19,-21 : Various gauges (Digital)</p> <p>ME-84 : Device for experiment of a motor</p>	<p>ME-3 : Can be doubled by ME-2.</p> <p>ME-9 : Not needed because a hose is included in the "Gas welding device set".</p> <p>ME-19,-21 : Can be replaced by ME-18 and -20.</p> <p>ME-84 : EL-25 of the Electrical Dpt. can be utilized.</p>
Training IV	Thermodynamics Fluid mechanic Machine element II Statics structure II	<ul style="list-style-type: none"> Learn mechanism of a fluid machine by designing, constructing, and making a trial run of a circuit through a pneumatic and hydraulic training device. Accumulate knowledge by assembling and disassembling a machine. 	<p>ME-1 : Normal lathe</p> <p>ME-2 : Vertical milling machine</p> <p>ME-77 : Pneumatic training device</p> <p>ME-78 : Hydraulic training device</p>	<p>ME-3 : Universal milling machine</p> <p>ME-79 : Device for experiment of thermal conductivity</p> <p>ME-83 : Device for experiment of fluid</p>	<p>ME-3 : Can be doubled by ME-2</p> <p>ME-79 : Ranked D for low frequency.</p> <p>ME-83 : Ranked D for low frequency.</p>

Name of the experiment and training course	Names of related courses	Objects and contents of the experiment and training	Names of the devices planned to be used in the course (Only devices with the priority of A)	Names of available devices (Devices with the priority of from B to D)	Reasons for not using the available devices
Training V Automobile engine system Thermodynamics Measurement engineering Choice subject I		<ul style="list-style-type: none"> Understand engine systems of automobiles. Understand and learn the method of precis measurement. Select from fields such as machining, sheet-metal working, or welding and learn practical knowledge and techniques. 	<ul style="list-style-type: none"> ME-1 : Normal lathe ME-2 : Vertical milling machine ME-4 : Shaper ME-9 : Gas welding device ME-10 : Arc welding device ME-11 : Bending machine ME-12 : Shearing machine ME-13~27 : Precise measuring instrument ME-77 : Pneumatic training device ME-78 : Hydraulic training device ME-80 : Automobile cut model 	<ul style="list-style-type: none"> ME-28 : Precise universal projector ME-29 : Toolmaker's microscope ME-63 : Foil balancer ME-64 : Tire changing device ME-65 : Air compressor ME-66 : Car washer ME-67 : Two-pole lifter ME-68 : Component washer ME-69 ~ -73 : Various tools for car maintenance ME-74 ~ -76 : Various gauges for car maintenance 	<ul style="list-style-type: none"> ME-28, -29 : Not needed considering the current level of equipment. ME-63~76 : Training of car maintenance is not suited for college education and takes too much long time.
Training VI Management production Maintenance and services Choice subject II Thesis		<ul style="list-style-type: none"> Learn basic maintenance by assembling and disassembling typical machines. Acquire more knowledge and techniques through option courses, and acquire comprehensive ability through a series of works from designing to construction. 	<ul style="list-style-type: none"> ME-1 : Normal lathe ME-2 : Vertical milling machine ME-4 : Shaper ME-7, -8, -61, -56~54 : Working tool ME-9 : Gas welding device ME-10 : Arc welding device ME-11 : Bending machine ME-12 : Shearing machine ME-13~27 : Precise measurement device ME-34~38 : Marking tool ME-40~45 : Measuring tool ME-77 : Pneumatic training device ME-78 : Hydraulic training device ME-82 : Material testing machine 	<ul style="list-style-type: none"> ME-23-24 : outside and Inside micrometers (Measurement range:100-125mm) ME-27 : Square level 	<ul style="list-style-type: none"> ME-23-24 : Both inside and outside micrometers are deleted because the ones with 100 - 125mm measurement range will be used with low frequency. ME-27 : Ranked B because it can be replaced by ME-26 in most cases.
CAD/CAM		<ul style="list-style-type: none"> Learn the summary and the operation of machine CAD. 		<ul style="list-style-type: none"> ME-81 : CAD software 	<ul style="list-style-type: none"> ME-81 : Ranked *A because The CAD software installed in the common PCs can be used.

(3) Civil Engineering department

Name of the experiment and training course	Names of related courses	Objects and contents of the experiment and training	Names of the devices planned to be used in the course(Only devices with the priority of A)	Names of available devices (Devices of the priority of B to D)	Reasons for not using the available devices
Test of civil engineering materials	Material engineering I Material engineering II Ferro concrete engineering I Ferro concrete engineering II	<ul style="list-style-type: none"> Learn compression strength of arbitrarily formulated concrete and the method in which the formula suited for necessary strength can be selected. Ensure that the material(cement, aggregate, water or additive)s suitable for use and learn how to select the material that can compose concrete with necessary characteristics most economically. Investigate various compression strength, estimate summary of some characteristics(bending strength, tensile strength, a modulus of elasticity, etc.), and learn quality control of concrete. Investigate the quality of the concrete made into actual structures and check that it has the characteristics that were assumed to have when designing. Learn how to determine when you can remove molds or when you can introduce prestress. 	CV-1 : Concrete Compression test machine and accessories		
Soil test	Soil mechanics I Soil mechanics II	<ul style="list-style-type: none"> Learn how to calculate shearing strength of soil (adhesion: C, friction angle of inside: ϕ). Change the type and size of a cylinder mold and learn how to calculate the strength by affecting the concentrated load. 	CV-2 : Soil test machine (Three-axis compression tester and accessories)		
Measure-ment training	Measurement	<ul style="list-style-type: none"> Learn measurement of length that needs high precision, such as a base line of triangle measuring. 	CV-5 : Theodolite CV-6 : Base support CVD-6 : Auto Level	CV-3 : High-precision lightwave distance measure CV-4 : Field book	CV-3 : Deleted because it can be replaced by theodolite without problems.
Pavement device test	Highway engineering I Highway engineering II	<ul style="list-style-type: none"> Test strength of cement. Investigate the level of appearance of bidding force of cement as binder. This is the quality test of cement. Learn how to measure the strength of the concrete or the asphalt made from the cement 	CV-7 : Marshall compression tester (10-ton power compression tester and accessories)		
CAD	Civil drawing I CAD drawing	<ul style="list-style-type: none"> Learn the summary and the operation of construction CAD. 	CVD-7 : CAD software for Civil design (Topographic map ,Structure Calculation,Surveying Calculation)		

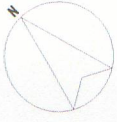
2-2-3 Basic Design Drawings and Equipment Layout Plans

Building Drawings

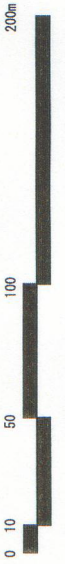
		Scale
1.	Building Layout Plan	
2.	New Administration and Lecture Building - Ground & First Floor Plan	1:200
3.	New Administration and Lecture Building - Elevation & Section	1:200
4.	Electrical & Mechanical Workshop - Ground Floor Plan	1:300
5.	Electrical & Mechanical Workshop - Elevation	1:300
6.	Electrical & Mechanical Workshop – Section	1:300
7.	Civil Workshop – Ground Floor Plan	1:300
8.	Civil Workshop – Elevation	1:300
9.	Civil Workshop – Section	1:300
10.	Canteen – Plan, Section, Elevation	1:200
11.	Gate House, Miscellaneous Building	1:200

Equipment Layout Drawings

1. New Administration and Lecture Building - Ground Plan
2. New Administration and Lecture Building - First Floor Plan
3. Electrical & Mechanical Workshop - Ground Floor Plan
4. Civil Workshop – Ground Floor Plan
5. Canteen

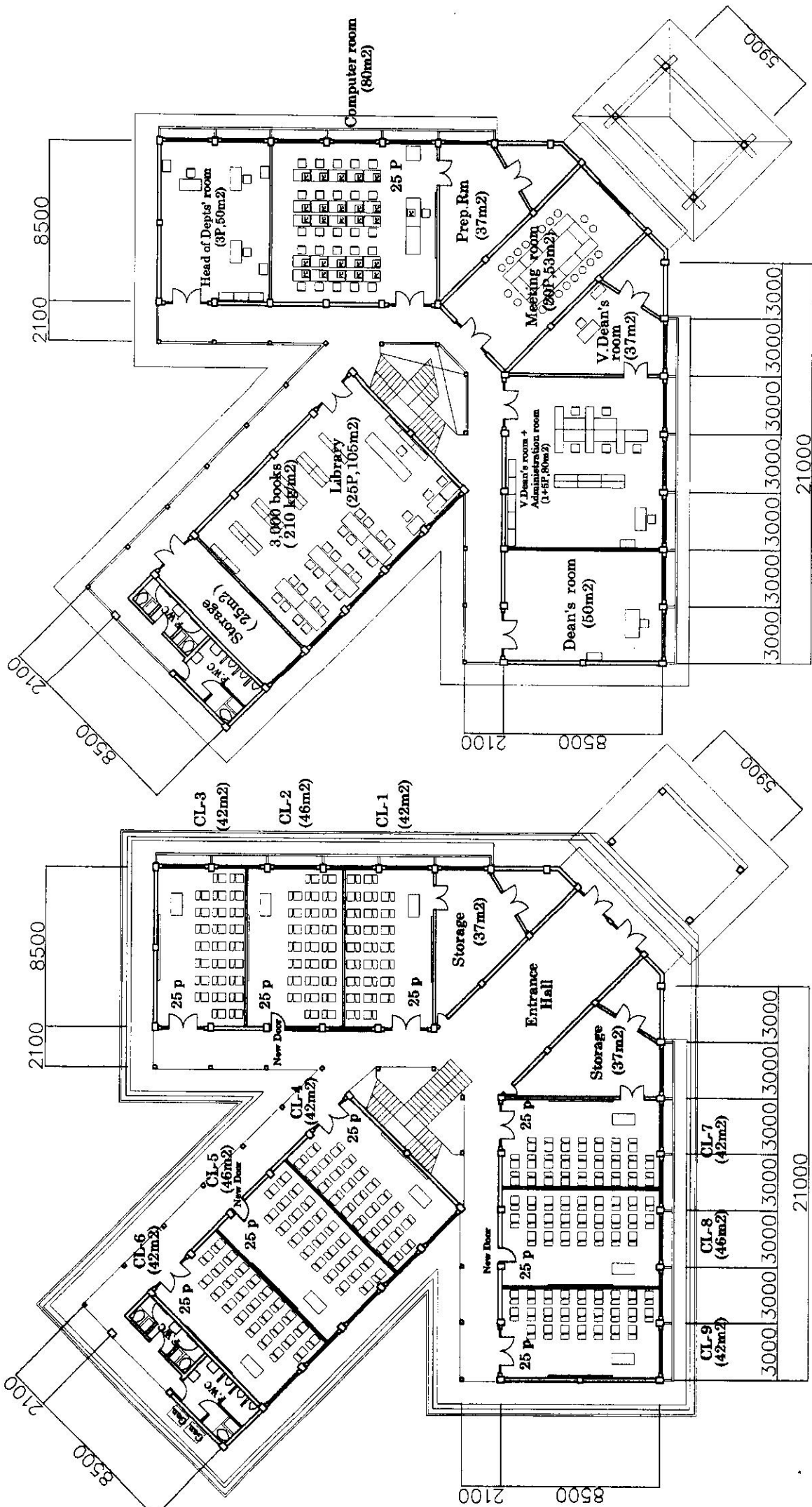


- Legend:
- : Building which will be renovated
 - : Building which will be demolished
 - : Building which need to be demolished
 - : Building which can be renovated



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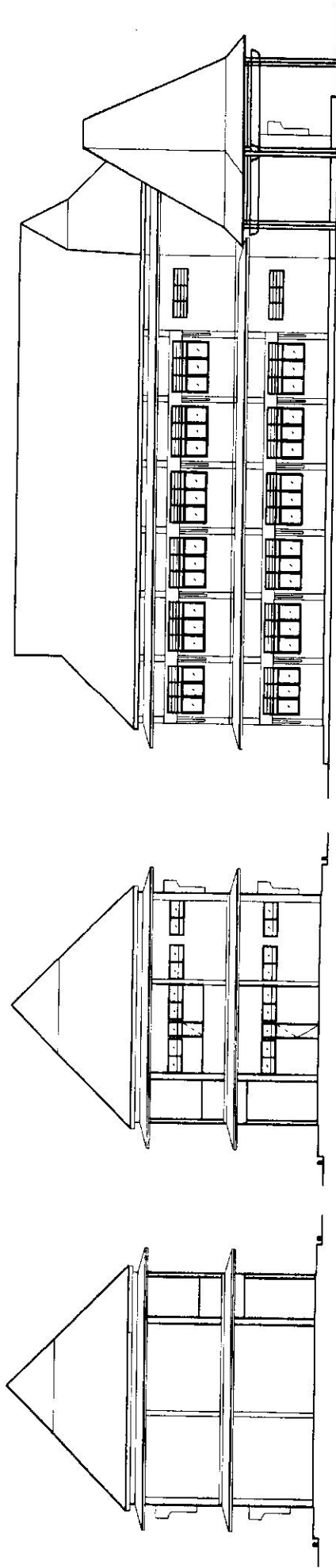
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First Floor Plan

Ground Floor Plan

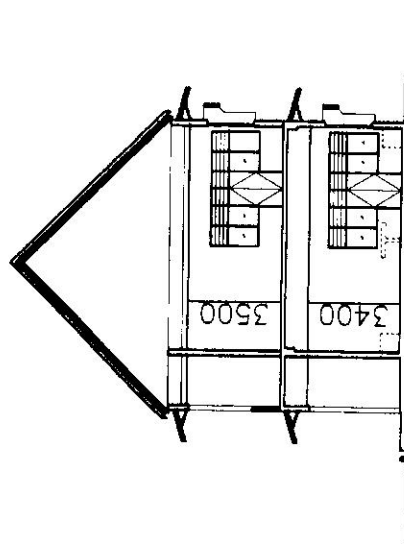




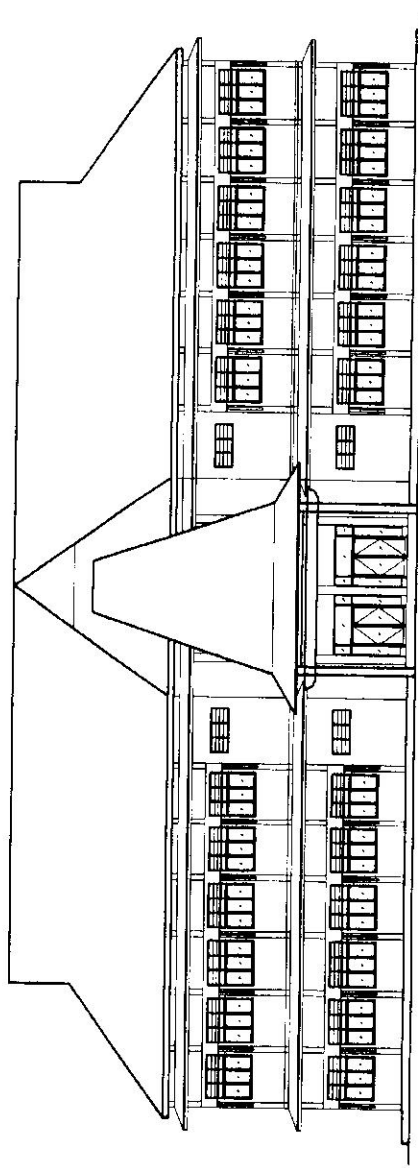
West Elevation

South-West Elevation

East Elevation

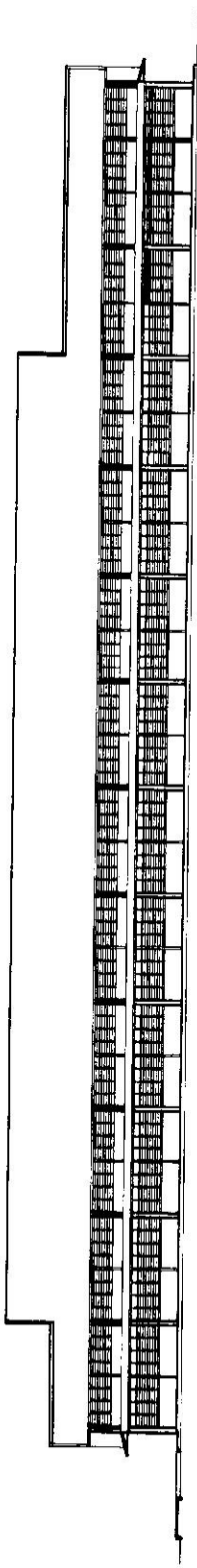


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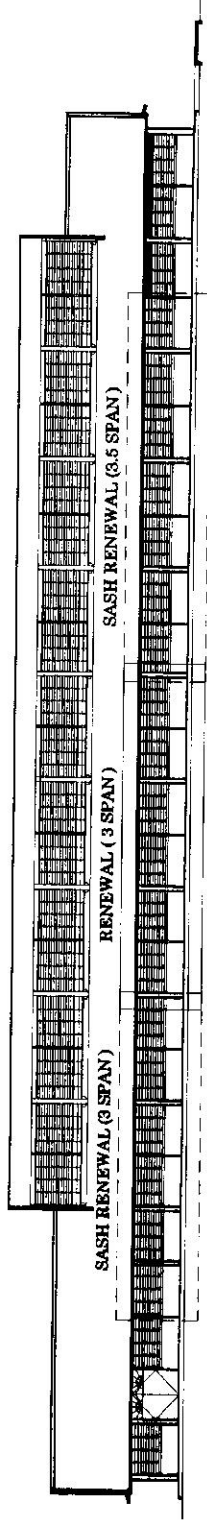


North-East Elevation

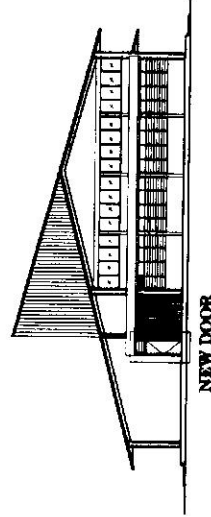




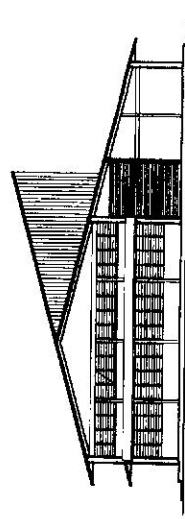
ELEVATION



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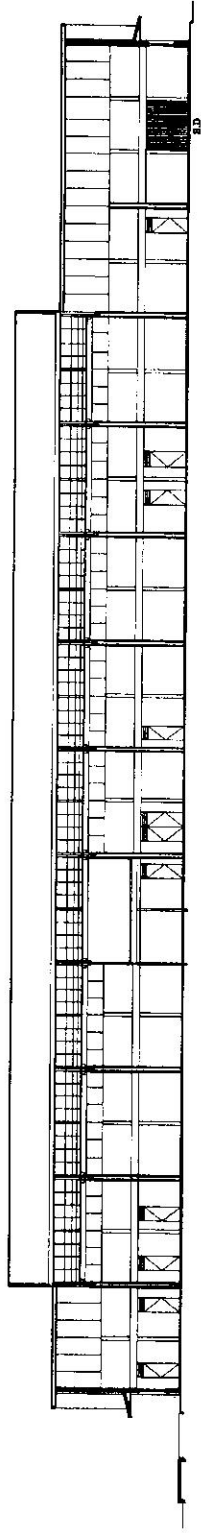


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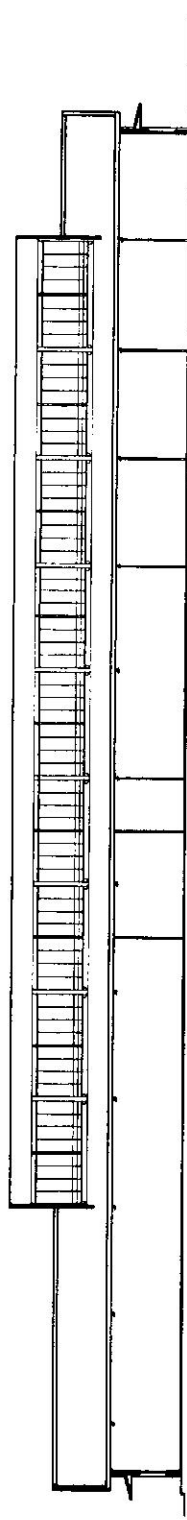


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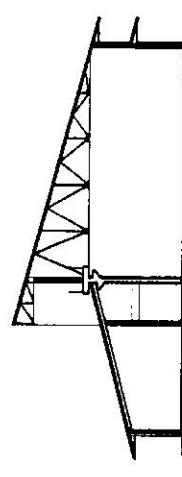




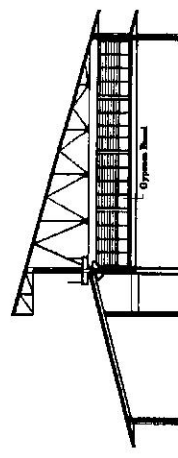
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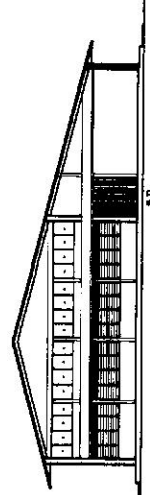
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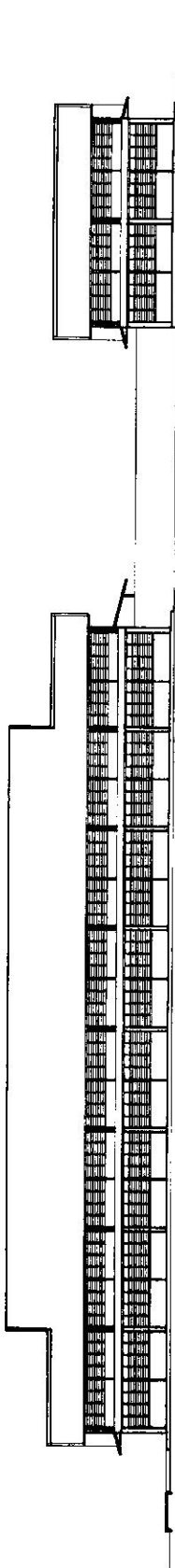


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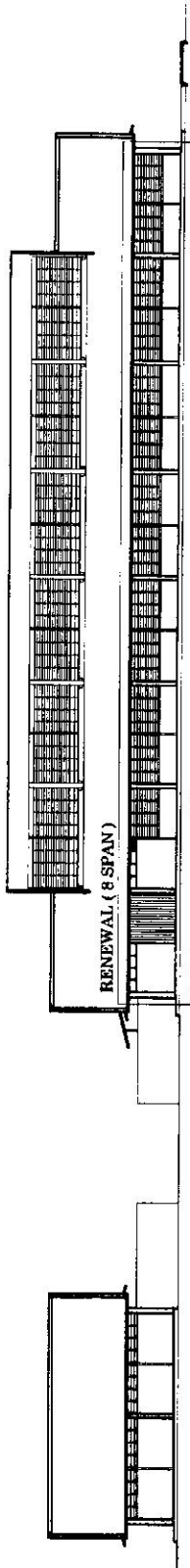


Interior Elevation

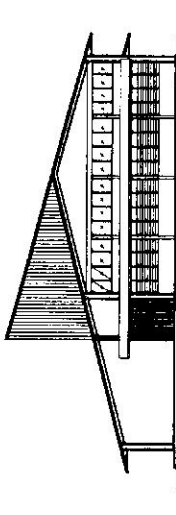




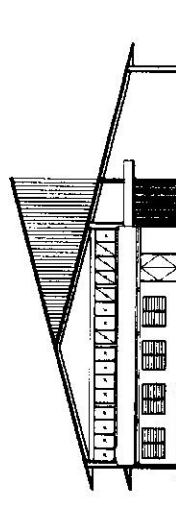
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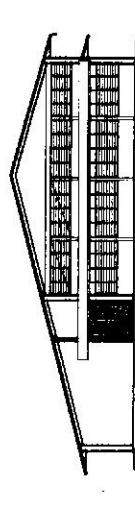
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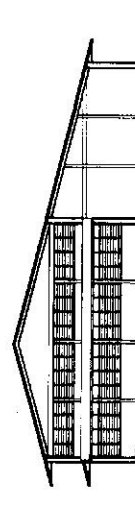
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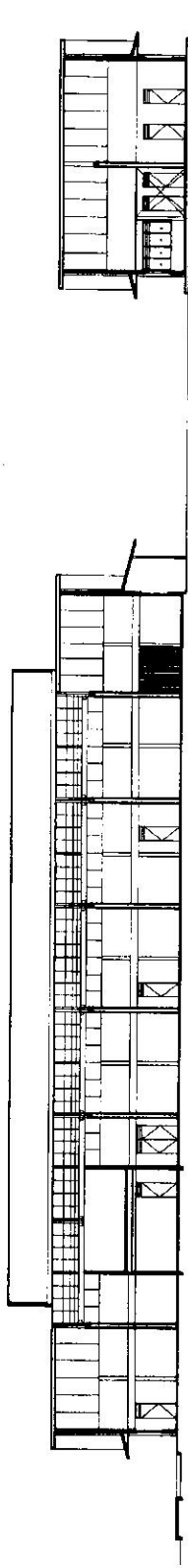


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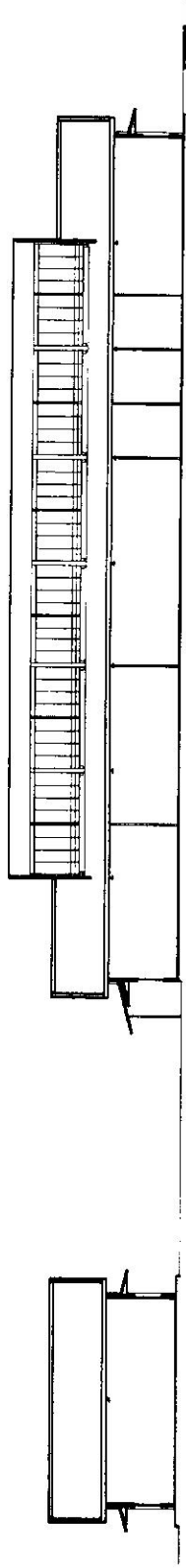


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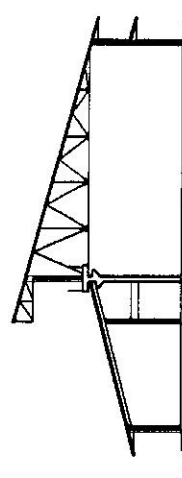




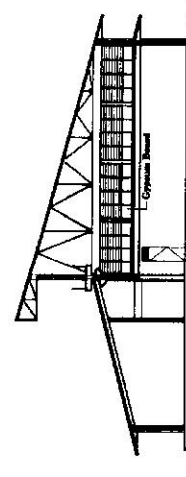
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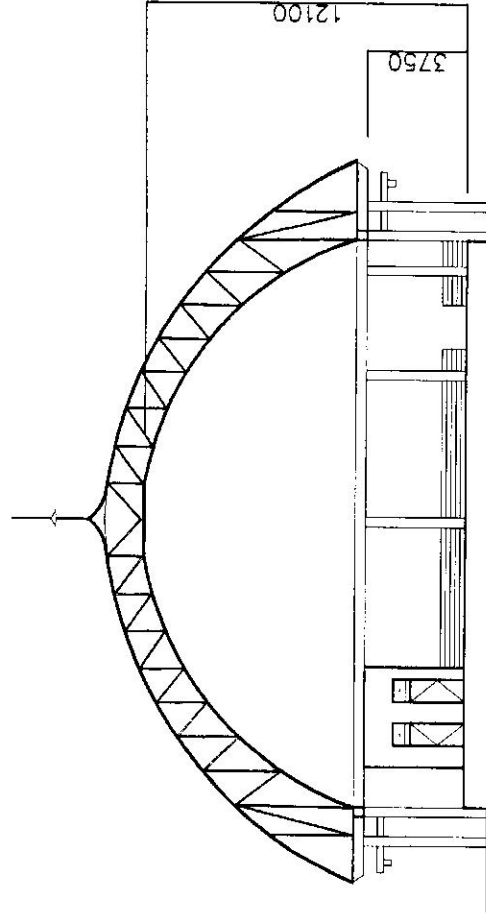
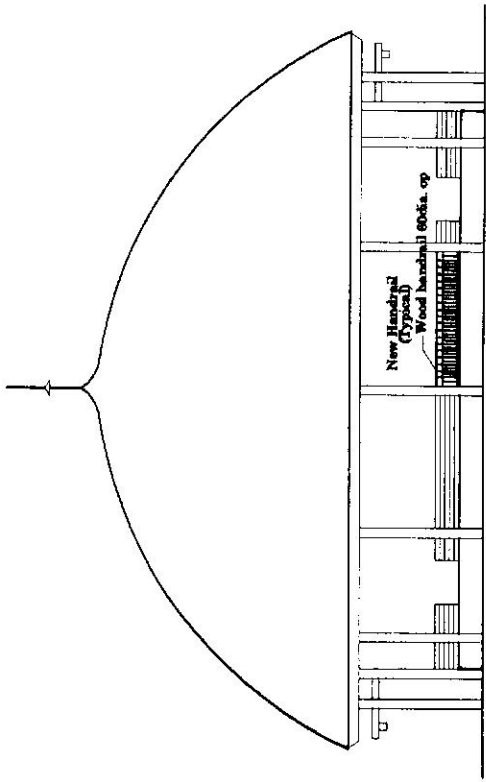


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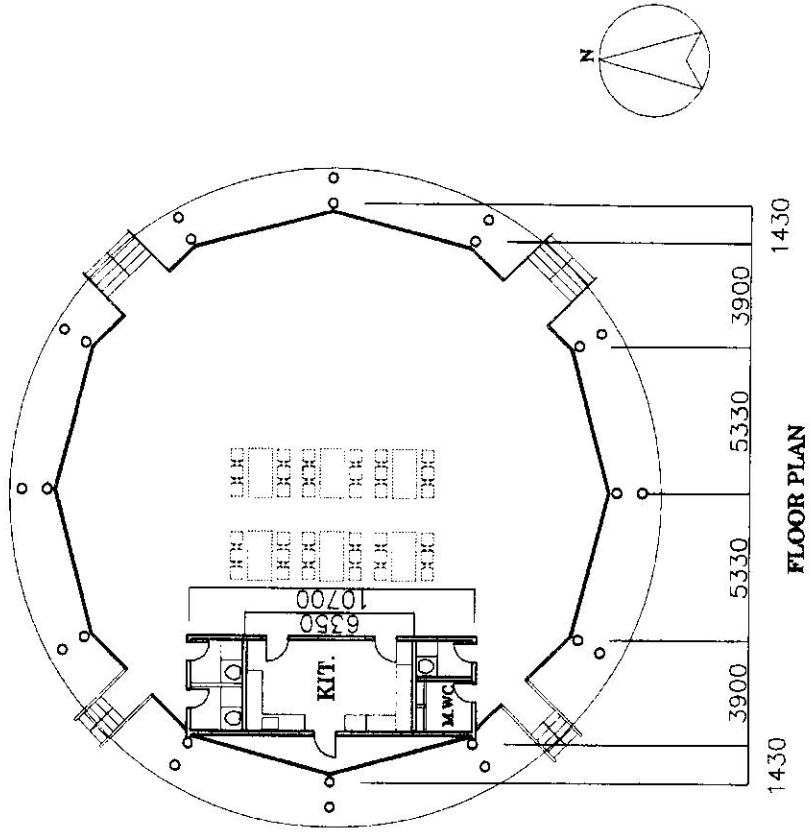
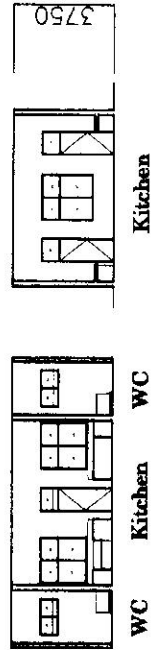
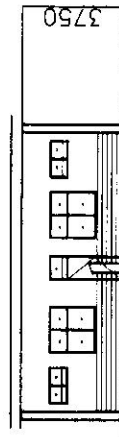
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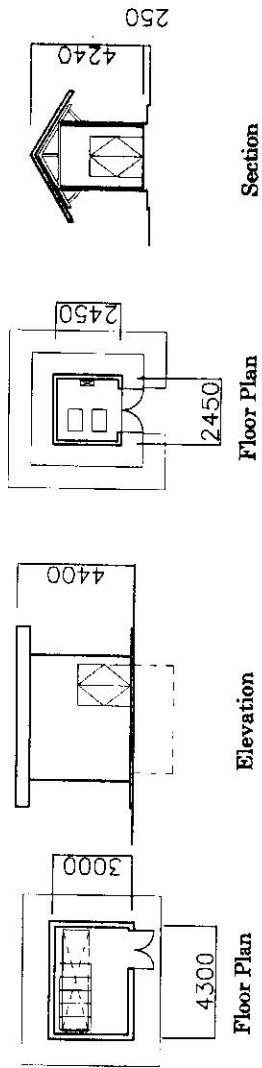
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SECTION



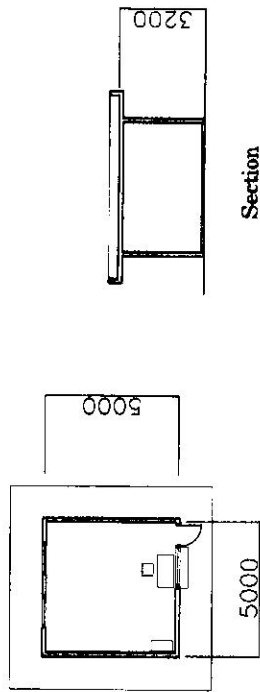
Canteen

1:200



Electrical Panel Room

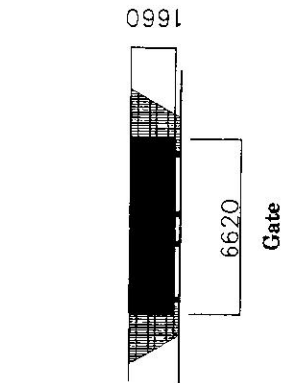
Pump Room



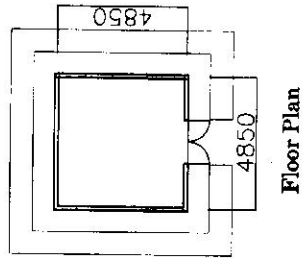
Floor Plan

Section

Gate House



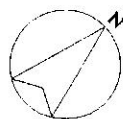
Gate



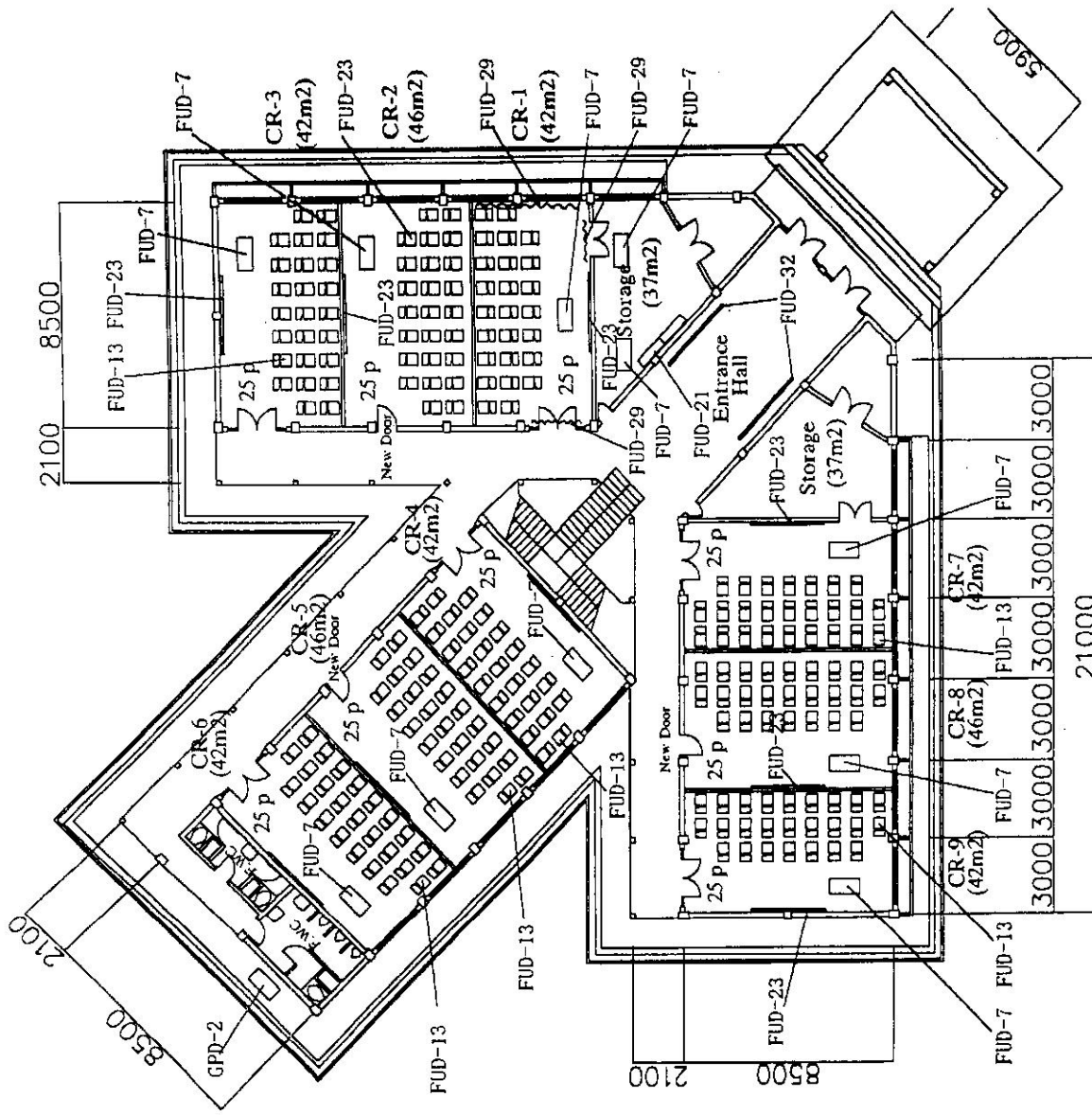
Floor Plan

Section

Transformer room



No.	Name of Equipment	Qty
	Class Room	
FUD-13	Chair with Table for Student	225
FUD-7	Teacher's Desk	9
FUD-23	Black Board	9
FUD-29	Black Curtain	1
FUD-7	Teacher's Desk	2
FUD-21	Cabinet for Physical Experiments	2
FUD-32	Notice Board	2
GPD-2	Generator	1



Ground Floor Plan

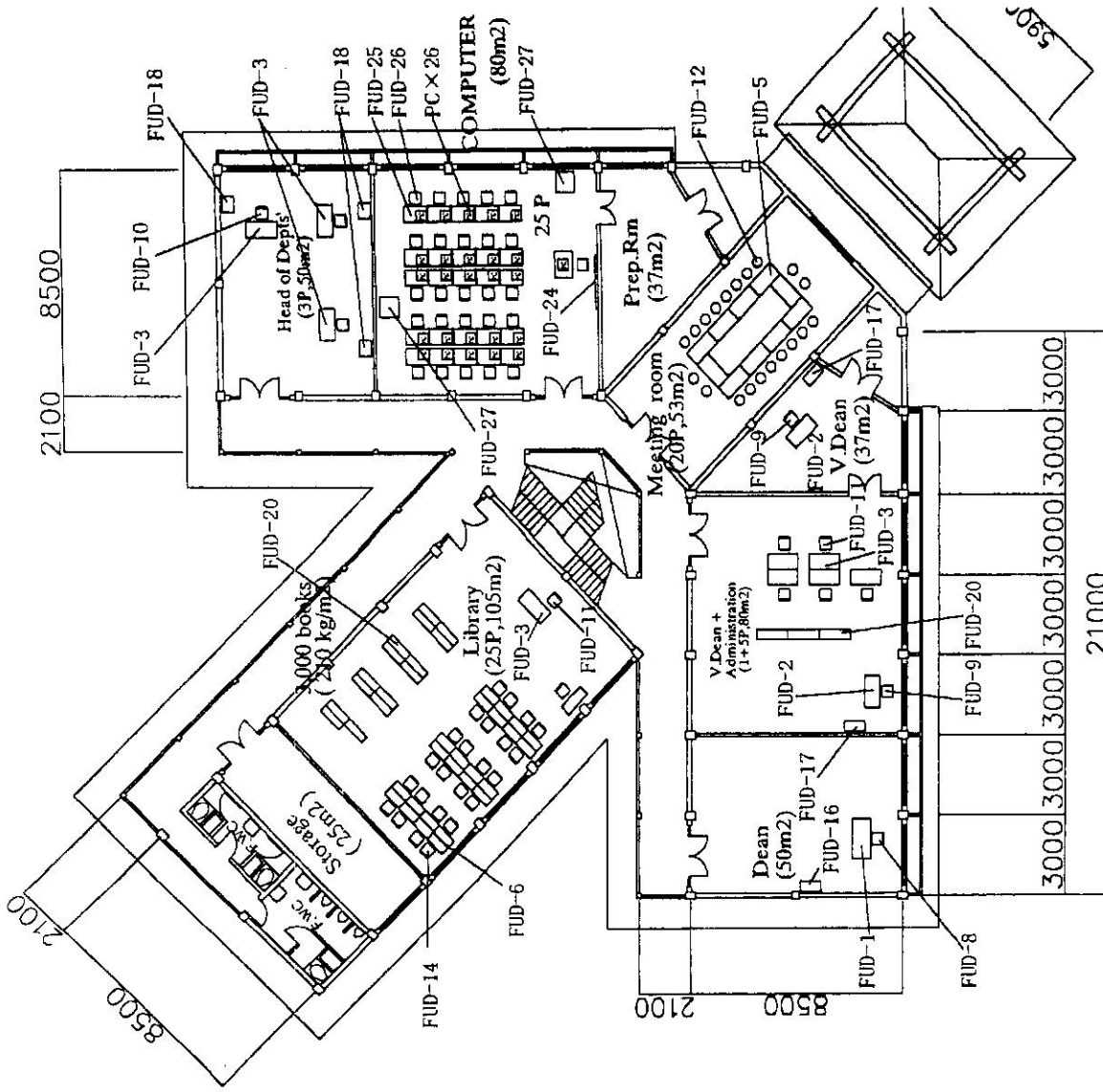


Equipment Layout Drawings

1. New Administration and Lecture Building

1:200

No.	Name of Equipment	Qty
Dean		
FUD-1	Double Pedestal Desk	1
FUD-8	Armchair-A	1
FUD-16	Cabinet-A	1
Vice Dean		
FUD-2	Single Pedestal Desk-A	1
FUD-9	Armchair-B	1
FUD-17	Cabinet-B	1
V. Dean + Administration		
FUD-2	Single Pedestal Desk-A	1
FUD-9	Armchair-B	1
FUD-17	Cabinet-B	1
FUD-3	Single Pedestal Desk-B	5
FUD-11	Armchair-D	5
FUD-20	Book Shelf	3
Head of Depts		
FUD-3	Single Pedestal Desk-B	3
FUD-10	Armchair-C	3
FUD-18	Cabinet-C	3
Meeting room		
FUD-5	Table for Meeting	10
FUD-12	Chair for Meeting	20
Library		
FUD-6	Desk for Library	25
FUD-14	Chair for Library	25
FUD-20	Book Shelf	15
FUD-3	Single Pedestal Desk-B	1
FUD-11	Armchair-D	1
Computer Room		
FUD-25	PC Table	26
FUD-26	Chair for PC	26
FUD-27	Printer Table	2
FUD-24	White Board	1



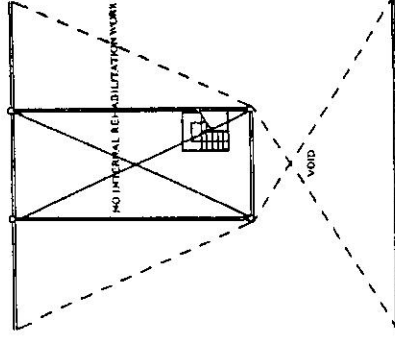
First Floor Plan



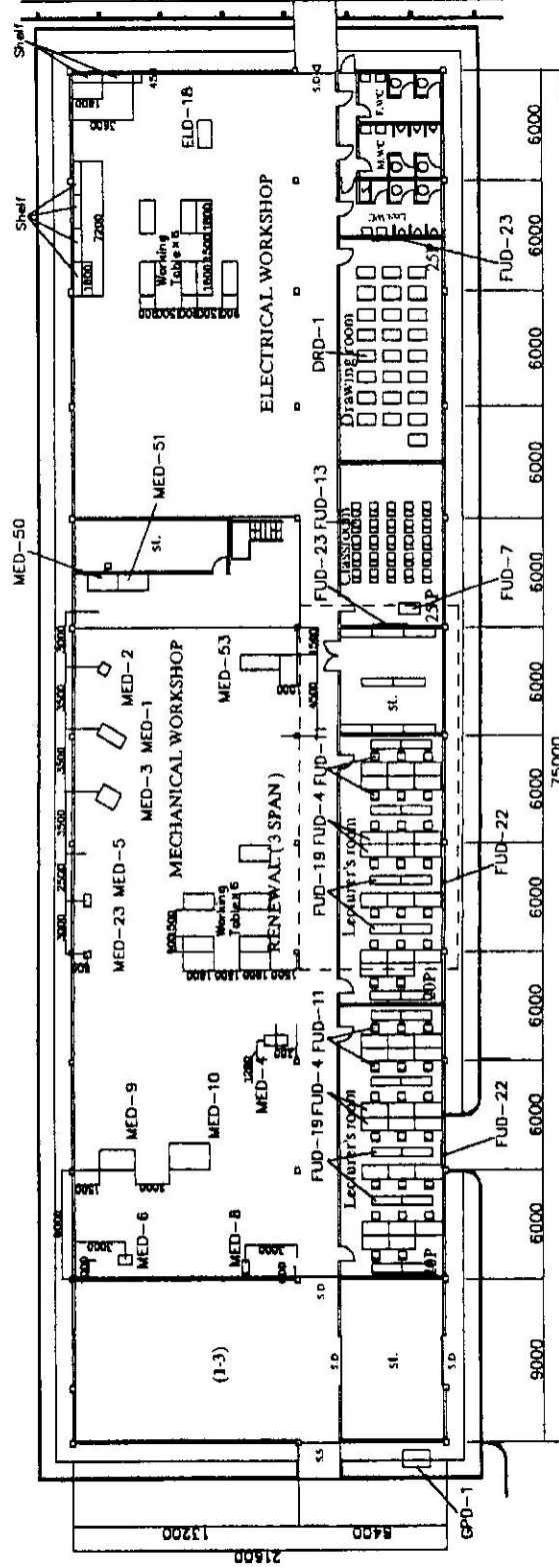
Equipment Layout Drawings

No.	Name of Equipment	Qty
	Mechanical Workshop	
MED-1	Normal lathe	1
MED-2	Vertical milling machine	1
MED-3	Shaper	1
MED-4	Sawing Machine	1
MED-5	Double-ended grinder	1
MED-6	Engine driven welding machine	1
MED-8	Arc welding machine	1
MED-9	Bending machine	1
MED-10	Shearing machine	1
MED-23	Bench drill	1
MED-49	Air compressor	1
MED-50	Pneumatic training device	1
MED-51	Hydraulic training device	1
MED-53	Material testing machine	1
GPD-1	Generator	1

No.	Name of Equipment	Qty
	Electrical Workshop	
	Lecturer Room	
ELD-18	Induction Motor Training set(3phase)	1
FUD-4	Single Pedestal Desk-C	40
FUD-11	Armchair-D	40
FUD-19	Cabinet-D	20
FUD-22	Schedule board	2
	Class Room	
FUD-13	Chair with Table for Student	25
FUD-23	Black Board	1
FUD-7	Teacher's Desk	1
	Drawing Room	
DRD-1	Drawing board with parallel ruler	25
FUD-24	White Board	1



MEZZANINE FLOOR PLAN

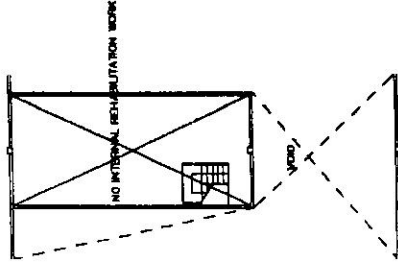


GROUND FLOOR PLAN

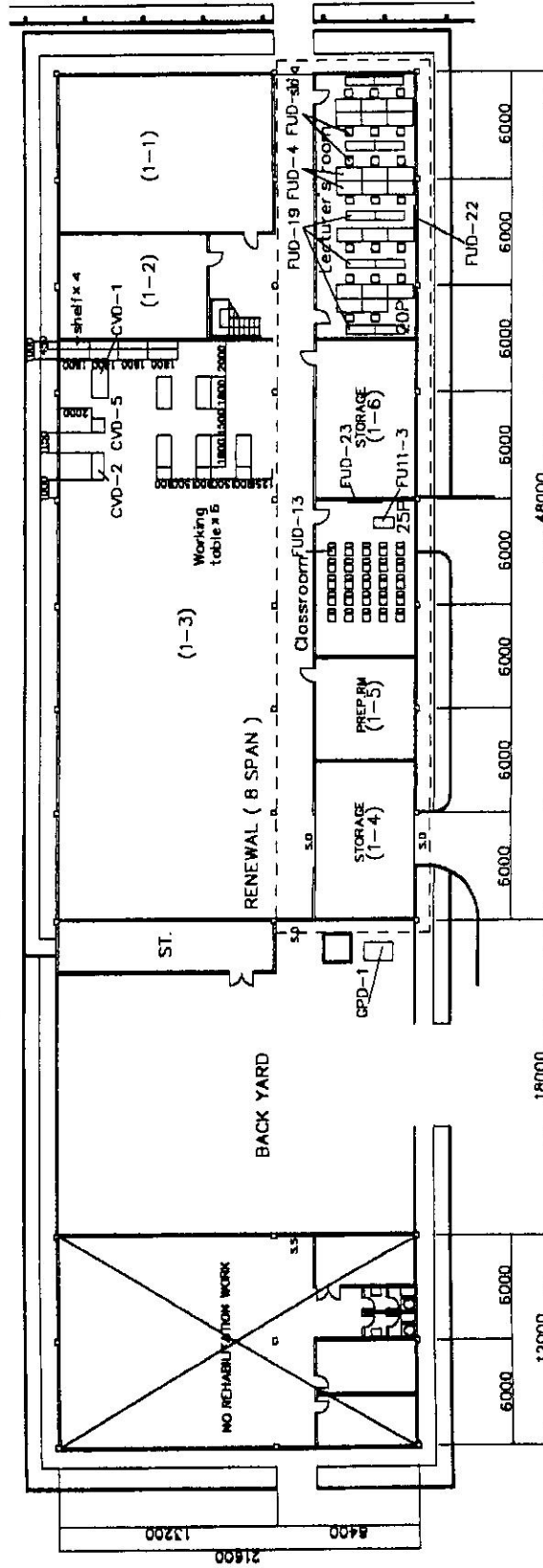


Equipment Layout Drawings

No.	Name of Equipment	Qty
CVD-1	Concrete Compression Test	1
CVD-2	Soil Test	1
CVD-5	Marshall Compression Tester	1
GPD-1	Generator	1
Lecturer Room		
FUD-4	Single Pedestal Desk-C	20
FUD-11	Single Pedestal Desk-C	20
FUD-19	Cabinet-D	10
FUD-22	Schedule Board	1
Civil Work Shop		
FUD-13	Chair with Table for Student	25
FUD-23	Black Board	1
FUD-7	Teacher's Desk	1

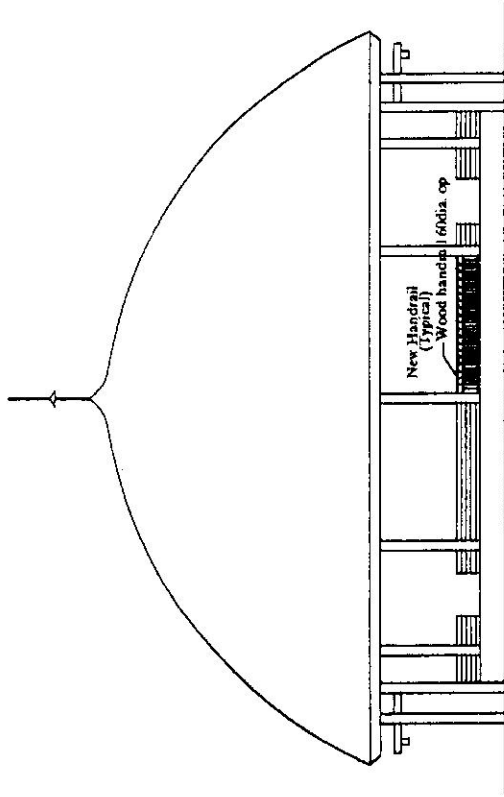


MEZZANINE FLOOR PLAN



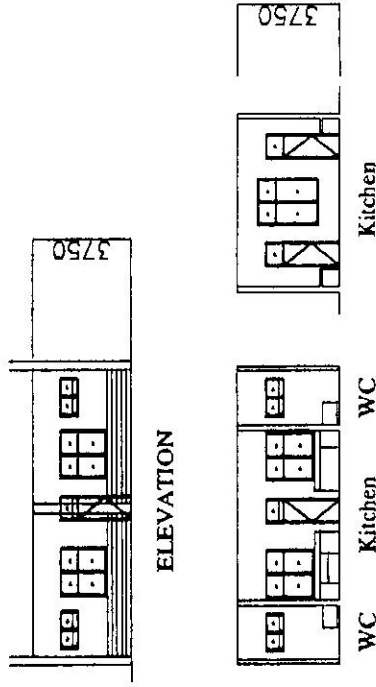
GROUND FLOOR PLAN



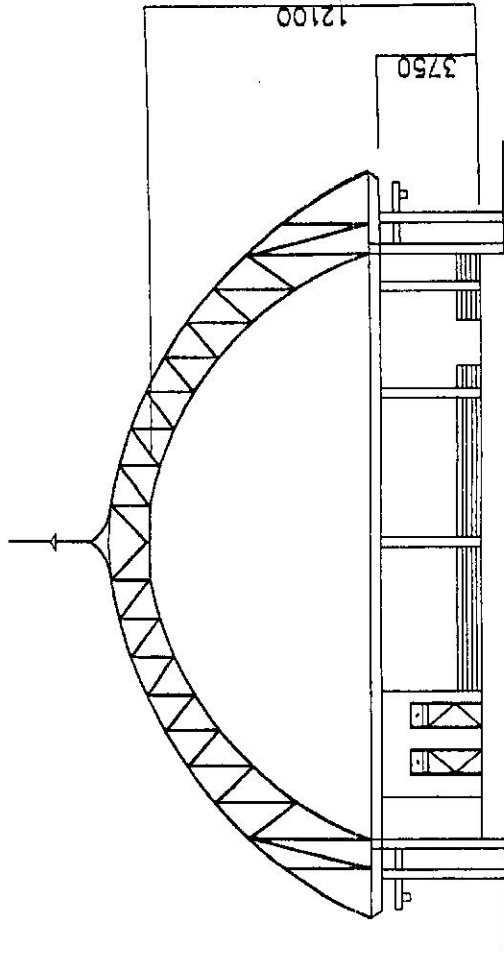
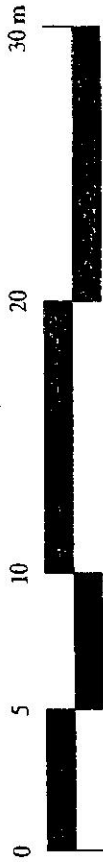


ELEVATION

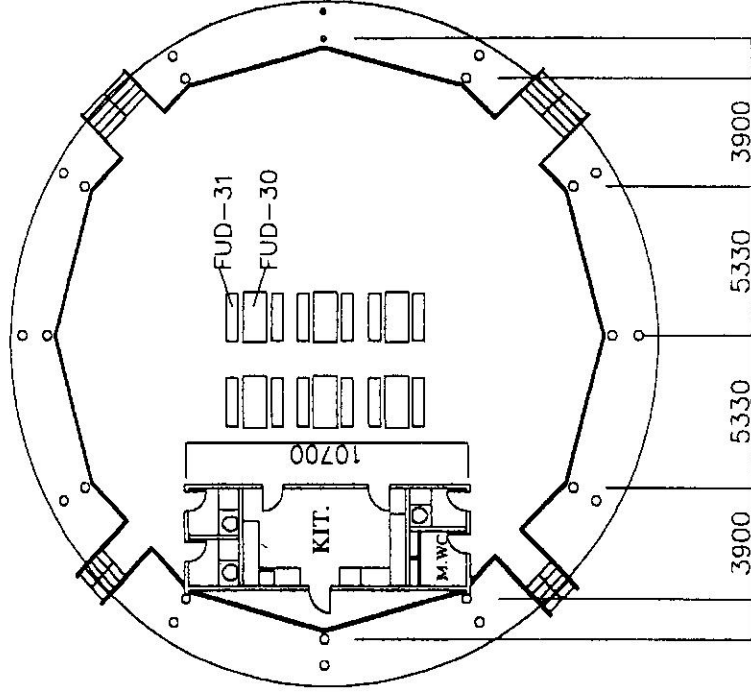
No.	Name of Equipment	Qty
	Dining	
FUD-30	Table for Canteen	6
FUD-31	Chair for Canteen	12



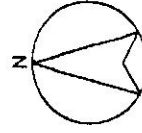
INTERNAL ELEVATION



SECTION

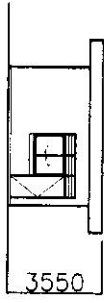


FLOOR PLAN

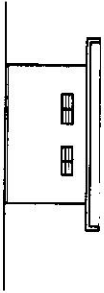


Equipment Layout Drawings

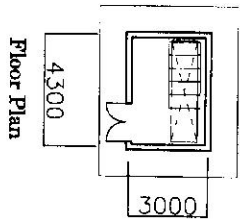
5. Canteen 1:200



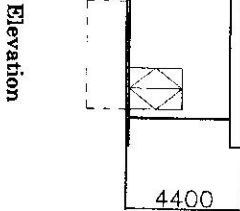
North-East Elevation



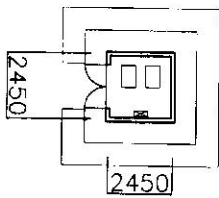
South-West Elevation



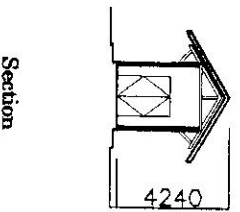
Floor Plan



Elevation

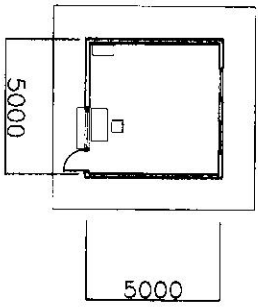


Floor Plan

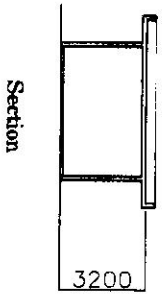


Section

250



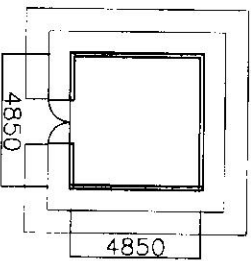
Floor Plan



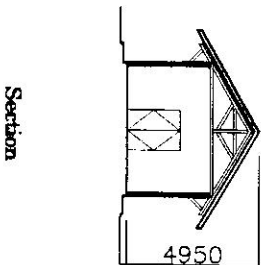
Section



Gate

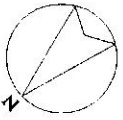


Floor Plan



Section

250



Gate House

