

CHAPTER 4 BASIC DESIGN

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4-1 Design Policy

(1) Design Policy for the Building

For OUSL which aims at achieving an overall development in education both qualitatively and quantitatively, the roles to be played by the projected AV Education Centre are tremendously large and the mission carried by the Centre is extremely important. Hence, in conducting the designing of the AV Education Centre, the following points shall be emphasized as the basic design policy:

1. The building shall be of appropriate size and structure that satisfactorily provide all the necessary functions in line with the objectives of the Centre.
2. It shall, as a whole, be of a well-balanced and durable structure.
3. It shall have a layout of rooms that takes into account the ease of the users and the efficiency in the flow of personnel working in the building.
4. It shall be based on a structural design that is rational and wasteless.
5. It shall be of a structure that ensures maximum facility and economy in maintenance and management.

Colombo is located in the south-western part of Sri Lanka. Situated in lat. 6°54' N., the city belongs to the tropical monsoon zone. It has heavy rainfalls throughout the year. The rainfalls are the heaviest both before and after (April-May and September-October) the southwesterly monsoon period (May-September). The annual rainfalls total an average of about 2,500mm. The temperature is high throughout the year. The average daytime temperature is 26-29°C but sometimes it reaches as high as 37°C. The humidity also is always high. It is on the whole quite sultry, the average humidity being 70-80% in the daytime and 85-90% in the night. As for the wind, the southwesterly winds blow from March to October and the northerly winds from November to February. But on the whole, the winds are quite calm, mostly with a velocity of about 2-3m/second.

In view of the high-temperature high-humidity climate as outlined

above, it is proposed that the building to be constructed should be of an open-type structure based on a design that fully takes into account the natural ventilation and lighting, with the exception of the portions that require airconditioning for functional reasons. It is also proposed that those rooms requiring airconditioning should not be dispersed but should instead be assembled into blocks so that the heat-insulation and airconditioning effects may be improved and further enhanced.

Following the guideline for architectural designing in Sri Lanka, the island is divided into three areas, for each of which a maximum wind velocity is set as a criterion. In the area to which Colombo belongs, guidances are given to those concerned that the standard wind velocities of 38m/s and 33.5m/s be adopted respectively for important public structures and other general structures. In the designing of the AV Education Centre under this project, the latter value shall be adopted.

In Sri Lanka, it is said that an earthquake occurs about once every ten years but the records show that the earthquakes occurred so far in this country have generally been quite small in scale and no damage report has been made. So, as far as the earthquakes are concerned, minimum amount of consideration will be sufficient in the designing of structures.

Along the site for the AV Education Centre runs a river with a breadth of about 30m. The normal water level of this river is about 1.6m lower than the average ground surface level of the project site. About 3km upstream of this river, there is a big lake and on the island located on this lake stands the new parliament building. And this lake plays the role of a big regulating reservoir.

The buildings currently under construction on the new campus are all designed to have [average ground level + 60cm] as the height of the ground floor. In the case of the AV Education Centre, too, it shall similarly be designed to have a ground floor with the same height.

The AV Education Centre is positioned as an element constituting the group of buildings which OUSL is currently constructing on its new campus. Therefore, it is most essential that all the plans for this Centre, including the building's positioning, layout and decorative designing, should be in conformity with the entire campus layout plan; the AV Education Centre plans should never be of a type that

may jeopardize the city-planning-type order of the campus as a whole. The buildings and structures currently under construction on the new campus are all based on such design concepts as tiled roofs of hipped-roof type (with waveform-slate grounding), an exterior view with pillars and beams exposed and small-sectioned fenestration. So, with regard to the AV Education Centre to be built as one of the buildings in such a group, it is necessary to pay special attention to such a design concept as mentioned above and to design it as one having an appearance that is in harmony with the entire group of buildings being constructed on the new campus.

As regards the rooms for use by the faculty in charge of production of AV teaching materials, the rooms that constitute the nucleus of the AV Education Centre, they should naturally be of a structure with a small number of openings. Also, from the point of view of maintenance and management of AV equipment, airconditioning (cooling) is necessary. Above all, the studios and their associated rooms require centralized airconditioning installations because such rooms are sensitive to sounds and noises. On the other hand, with regard to such rooms as the planning office, technical staff room and other general-purpose rooms, corridors and toilets, it is necessary to ensure that they are of designs that take account of the life-style to which the people of Sri Lanka are accustomed in the high-temperature high-humidity climate of the country.

In order to cope effectively with the natural conditions in and around Colombo and the special conditions of the project site, there is the need of paying particular attention to the following points when designing the building for the AV Education Centre.

1. Functional and clearcut grouping of rooms and facilities should be designed so that the layout adopted may ensure higher airconditioning effects and easier maintenance of the interior environment making the most of natural ventilation and lighting.
2. The building to be constructed shall be one that is in harmony with the entire plan for the new campus, the decorative designs of the neighbouring buildings and the environment of the surrounding areas.
3. General concept of architectural expressions in Sri Lanka shall be adopted and, at the same time, efforts shall be made to ensure

that maximum uses are made of construction materials available in Sri Lanka.

4. In view of the high-temperature high-humidity climate and heavy rainfalls, measures shall be taken to enhance the comfort of the users of the building by making such devices as extending the protrusions of the eaves, improving ventilations and drainage of the building.
5. Since the project site is a piece of reclaimed land and so the ground is soft, special consideration needs to be given to the designing of the foundation of the buildings.

(2) Design Policy for Teaching Material Production Facilities

Taking into account such factors as the natural conditions of Sri Lanka, the need of reducing maintenance and management expenses and the desirability of expanding utilization of teaching materials, the design policy for the AV teaching-material production facilities to be installed in the AV Education Centre shall be as follows:

- a) Considering the relations with TV broadcasting stations, PAL-B system shall be adopted as the TV system.
- b) Recent trends of TV technology circles shall be taken into account.
- c) The system composition shall be of the simplest possible design.
- d) While giving due consideration to the policy of producing high-quality teaching materials, every effort shall be made to select appropriate types of equipment.
- e) The equipment to be adopted shall be those with high operatability and stability.
- f) The TV cameras to be adopted shall be those of CCD system.
- g) The VTRs to be adopted shall be of 1/2-inch VCR system.
- h) The audio system to be adopted shall in principle be of monaural composition. However, consideration shall be given to ensure that this will in no way obstruct the use of stereophonic materials.

(Note)

• CCD Camera

CCD (Charge Coupled Devices) is a kind of solid pick-up element and has been recently improved remarkably in various aspects. Conventional pick-up tube type

camera is being replaced by CCD camera in broadcasting stations. As compared with pick-up tube, CCD has many merits such as smaller size, lighter weight, the same picture quality, easier handling, longer life and less electric consumption.

- Half-inch VTR

U-Matic VTR with 3/4-inch cassette type was used worldwide in combination with portable TV camera for ENG (Electronic News Gathering), which was developed in 1970s and replaced old film news gathering. Then in 1980s TV camera with half-inch VTR was created and 3/4-inch type ENG has almost disappeared in Japan.

Though most developing countries are still using 3/4-inch U-Matic type for programme production and exchange like a standardized type, they have just started to use half-inch VTR for ENG. Penetrating gradually into TV world, half-inch VTR seems to completely replace 3/4-inch VTR in the end.

As compared with 3/4-inch VTR, half-inch VTR is smaller, lighter, better in picture quality and easier in handling and takes less space for tape keeping.

4-2 Study and Examination on the Design Criteria

The AV Education Centre will be composed mainly of a video material production studio and an audio material production studio. The largest of all the rooms in the Centre is the video material production studio. The size of this studio shall be determined according to two factors; the types of camera lenses used and the required maximum distance between the subject being shot and the camera.

The camera lenses in general use at present for broadcasting purposes are, with the exception of those for special-effect shooting, the zoom lenses which enable shooting of subjects continuously in various dimensions, from wide-angle to telephoto. If the focal distance of a zoom lens were 8-112mm, then, it would be possible to shoot a subject measuring 28cm to 4.4m in breadth from a distance of 4m and a subject measuring 56cm to 8.8m from an 8m distance.

According to a collection of architectural design materials concerning broadcasting stations, the effective area of a small TV studio is normally estimated at 80% of the floor area of the building frame.

Let us now examine a case in which a school science experiment is videotaped to produce a TV programme for use as teaching-material. What is being examined here is a case where videotaping is conducted with a standard lens (the angle of view: $42^{\circ}09'$ horizontal and $32^{\circ}14'$ vertical) of the scenes in which 3-4 students under the guidance of a teacher actually conduct an experiment and thereby carry on the study of science.

The Fig. 4-1 shows a diagram that outlines how the studio production of teaching material is conducted in the present case of science experiment in the classroom.

◦ Set I A desk for the teacher (1,800mm × 900mm) and a desk for the students (1,800mm × 900mm) will be arranged at the front so that the class may be carried on with the teacher giving explanations using charts and the blackboard and conversing with the students about the contents of the studies being made. On the teacher's side will be set up a bulletin board or a blackboard (1,800mm long × 900mm wide, 2m high) so that the teacher may indicate the subjects being explained with his hand or with a stick. Behind the desks will be put up a set of appropriate design or colours.

- Set II With an experiment table (3,000mm long × 900mm wide) equipped with a sink and experiment instruments arranged on the table, an experimenter and his assistant conduct an experiment. At the back of the two persons will be put up a set suited to the contents of the experiment being conducted.

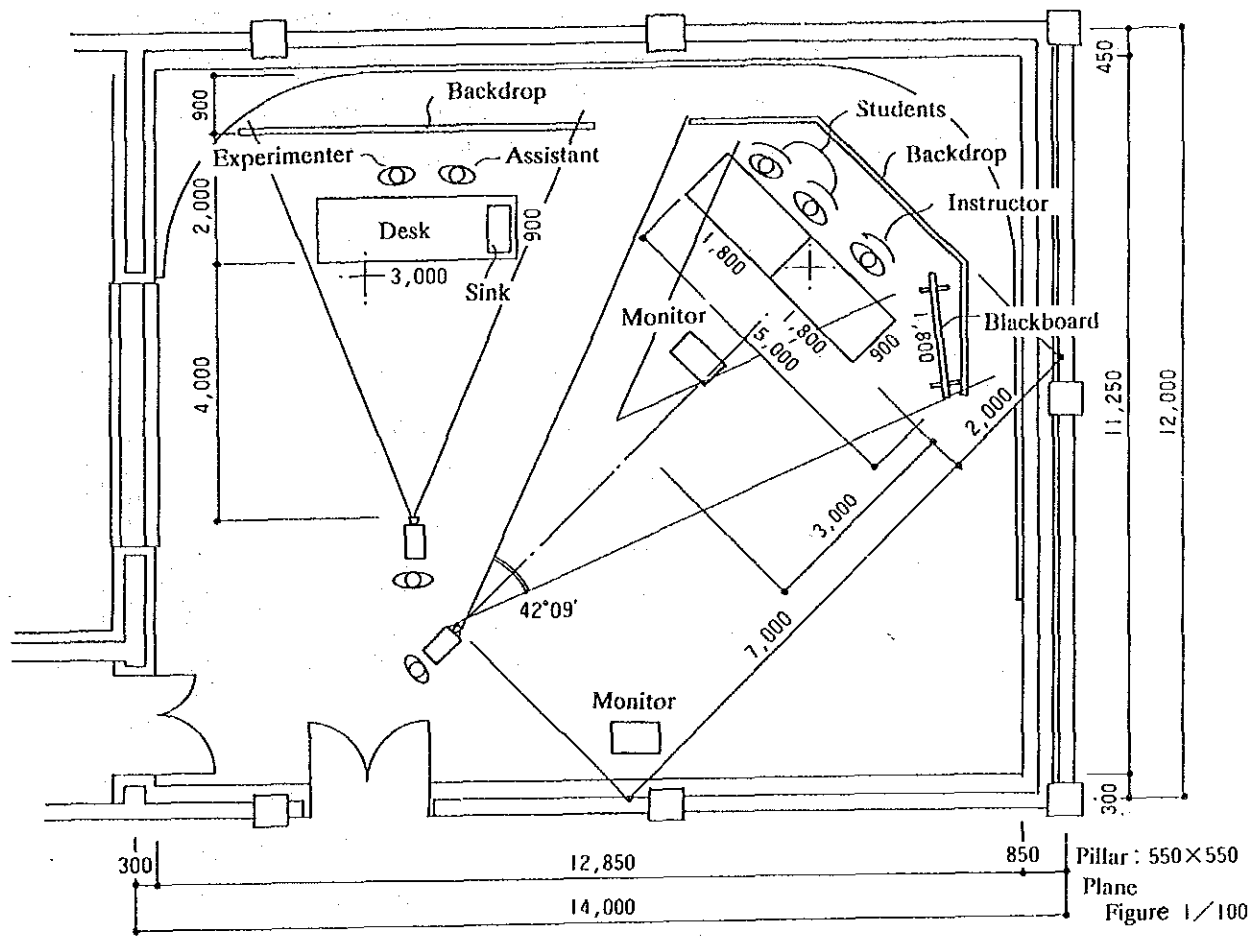


Fig. 4-1 Diagram Showing an Example of Production Work Conducted in the Video Material Production Studio

When a full shot is being taken with the camera of the entire set in the studio, the distance between the subject and the camera would be the largest.

As can be seen from the diagram, in the present assumed case of shooting of a scene in the studio, the required size of the studio would be 12m in width and 14m in length if the effective area were taken into account. In Japan, a studio of this size is called 50-tsubo (165m²) studio. According to NHK, it may be said from their experience that the best studio is one with a width-length ratio of 4:5.

This studio is measured as 12m : 14m \doteq 4 : 4.67 \doteq 4 : 5 and may be considered as the standard type of 50-tsubo studio. The height of the ceiling can be figured out as 10m, from such factors as the maximum necessary distance of the camera from the subject being shot, the height of the cyclorama and the height of the grid pipes. Such relationships between the different factors are shown in Fig. 4-2.

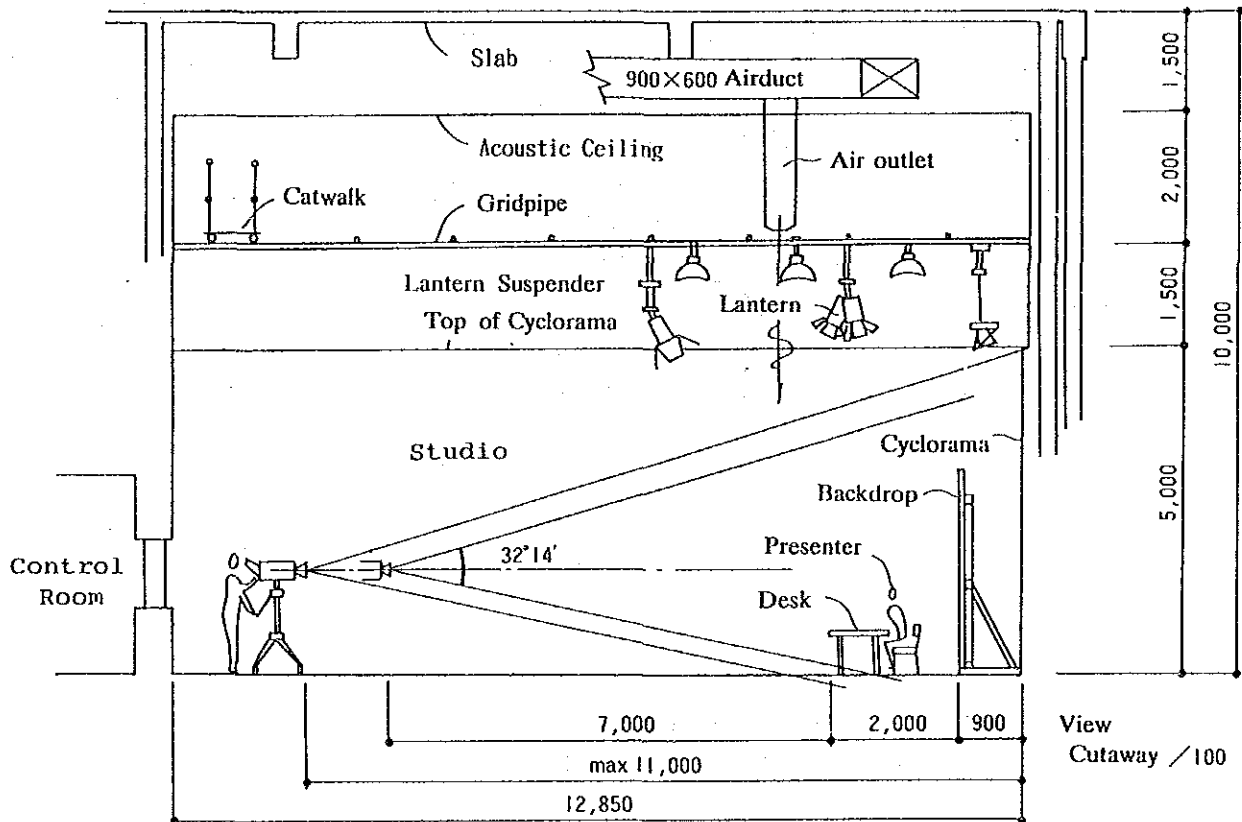


Fig. 4-2 Example of Production Work in the Video Material Production Studio

Next, an explanation will be given on the Audio Material Production Studio.

The size of an audio studio depends on the purpose of use and the acoustic effects aimed at. According to the above-mentioned volume of architectural design materials, the effective area in a small audio studio can be estimated at 70% of the floor space of the building frame.

Let us assume a case in which 4-5 persons conduct a discussion among themselves. In this case, the persons appearing in the TV programme would be facing one another over a square or round table on which a microphone is placed. This means that a space of about $3\text{m} \times 3\text{m}$ would be required.

The Fig. 4-3 shows an example of production work conducted in the Audio Material Production Studio.

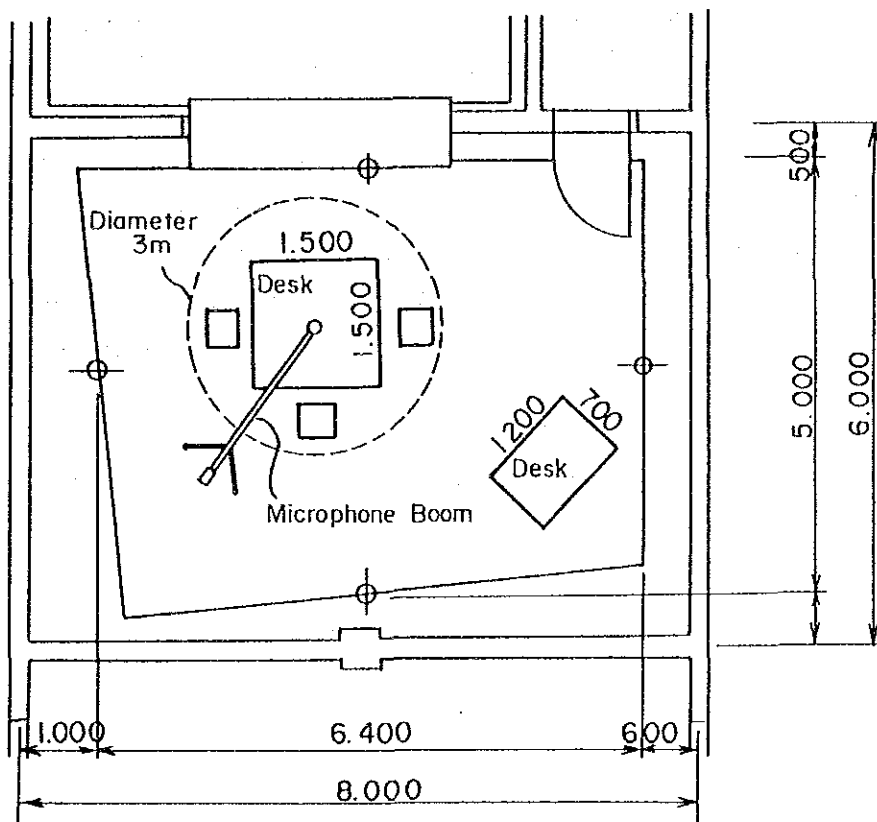


Fig. 4-3 Example of Production Work in the Audio Material Production Studio

As can be seen also from this diagram, this studio would provide a space most appropriate in size for the production of teaching materials on a scale as assumed here. But in the case of production on a larger scale

than this one, the space would be a bit too small. In this case, a minimum of 6m X 8m as shown in the diagram would be necessary.

An audio studio is normally designed with emphasis placed on the acoustics. In the case of an audio studio, it is considered best to determine the ratio of height: breadth and breadth: length as $(3\sqrt{2})^n$, and that of height: length as $(3\sqrt{4})^n$. In actual practice, a diagram showing such relationship is provided (the above-mentioned volume of design materials) and, accordingly the ratio of height: breadth: length = 1:1.24:1.6 will be adopted as a typical ratio in dimension.

The audio dubbing room is a room in which audio-dubbing is conducted on the completed video teaching materials and imported programmes in foreign languages.

In this room, an announcer's booth accommodating about two persons, a space for installation of related equipment and a work space for the operators are required.

The AV Education Centre would become truly operative when the functions of the production studios are reinforced and supplemented by a number of rooms which are positioned functionally around the studios. In the running of the AV Education Centre, the following members of staffs would be taking charge of the work in the Centre on a permanent basis:

Administration Staff	10
General Affairs Staff	5
Production Engineering Staff	15
Illustrators	3
Maintenance Staff	3
Janitors	3

39 persons

When actual production activities take place in the AV Education Centre, the production and direction work will be taken charge of by the respective faculties concerned of OUSL. Therefore, on such an occasion, the performers in the programme being produced as well as the staff in charge of production would be seen working in the Centre along with those people assisting in the production work.

When the scale of the production studio and the required number of personnel become clear, the composition of each of the other rooms will be determined, in such a way as to suit the purposes of this Centre.

The present campus of OUSL is located in Nugegoda of the Colombo District and does not belong to the city of Colombo. However, the University's new campus site which is located across the Kirillapone Canal belongs to the Kirillapone section in the south of Colombo city and therefore is subject to the laws and orders concerning the city-planning project for Colombo. This means that it is necessary to submit an application for confirmation to the municipal authorities of Colombo prior to the start of the construction work and receive guidances from the authorities concerned. Incidentally, the provisions made in the said laws and orders are mainly those applicable to the buildings as groups; there is no provision made about the designing of individual buildings as units. In actual practice at present in Colombo, the BS (British Standard Code of Practice) is applied *mutatis mutandis* as a standard for individual designing of buildings.

4-3 Basic Plan

4-3-1 Site Layout Plan

The site for a new campus of OUSL, the ground which contains the site for the AV Education Centre, is, as mentioned in "3-3-3 Location and Condition of the Project Site", is thin and long, measuring about 900m from end to end. The middle portion of the site is constricted and it is on this narrow portion of the site that the Library is to be located. And the portion of the land lying between the Library and the Engineering Technology Faculty building, measuring about 80m from north to south and about 60m from east to west, is to be the site for the AV Education Centre. According to the overall plan of OUSL, the 20 or so buildings which are either under construction at present or of which the construction is scheduled to be started soon are all planned to be constructed in such a manner that the completed buildings will deviate 45° from the direction of an axis drawn along the length of the thin site. It is judged that the AV Education Centre building, too, should be constructed more or less in parallel with the other buildings.

On the western side of the entire campus site, a public road with a width of 15m is planned to be constructed along the rim of the site. And along this projected public road runs a campus road of OUSL. The buildings adjacent to the projected AV Education Centre draw their main approach from the University's campus road at an angle of 45°. So, it is proposed that the AV Education Centre should also draw an approach in a similar manner and should be built with the river on its back.

4-3-2 Facilities Plan

(1) Floor Plan

The rooms constituting the AV Education Centre building may be classified into a number of groups as follows according to their functions and structures:

Table 4-1

Group	Functions and Structures	Main Rooms
A	The rooms in this group, which are mostly studios, have only a small number of openings and require high level of sound insulation and air-conditioning.	Video Material Production Studio, Audio Material Production Studio, Control Rooms and Post Production Studio
B	The rooms designed for copying, storage and viewing of AV tapes. They have only a small number of openings and require airconditioning.	Viewing Room, AV Library and Multiple Cassette Copying Room
C	The rooms for the planning, examination and preparations relating to teaching materials. Special importance is attached to natural lighting and ventilation.	Planning Office, P/D Staff Room, Visual Art Workshop and Technical Staff Room
D	The rooms containing installations for building maintenance	Airconditioning Machine Room and Electricity Room

If these four groups were distributed as architectural blocks on the floor plan according to "4-1 Design Policy" and with emphasis placed on the characteristics of each group and the inter-group relationship, then, the conceptual floor plan for the entire building would be as shown in Fig. 4-4.

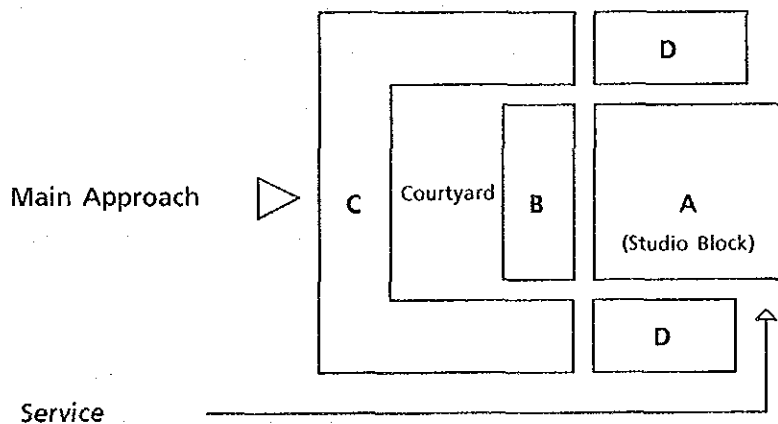


Fig. 4-4 Conceptual Floor Plan for the AV Education Centre

(2) Cross-section Plan

In the case of video studio, the height of the cyclorama and that of the lighting system are determined by the maximum distance the camera needs to be pulled away from the subject when a wide scene is being shot with that camera. Also determined accordingly is the height of the grid pipes to support the lighting equipment. And the type of roof slabs for sound insulation will be determined, taking into consideration the amount of space required for installation of the ducts and for check-up work by maintenance staff. In the case of the Video Material Production Studio under this project, there is the need of ensuring that the height of the fixed cyclorama is 5m, that of the grid pipes 6.5m and that of the sound-insulation ceiling more than 8.5m. The studio block requires the space to put the ducts through for airconditioning. Hence, the building as a whole needs to be reasonably tall. Taking into account the need of ensuring that the rooms are appropriately ventilated and that each room has enough air in proportion to its size, the blocks surrounding the studio block will be designed with the eaves height of 4m kept in mind as the criterion.

(3) Structure Plan

The studio block, which forms the core of the AV Education Centre, requires sound-insulation, light-shielding and heat-insulation. Hence, there is the need of minimizing the number of openings and also of enclosing the rooms as much as possible with heavy walls and floors. On the other hand, the administration block comprising offices and conference rooms should preferably be as open as possible, since such rooms require natural lighting and ventilation. Thus, different interior environments are required by different blocks in the same building. So, it is proposed that ferro-concrete Rahmen structure be adopted as the structural system that can meet both of the two different requirements. In the studio block, brick walls will be put up between the ferro-concrete pillars and beams and, with ferro-concrete roof slabs placed across, a closed space will be created. On the other hand, in the administration block, openings will be freely made between the ferro-concrete pillars and beams according to needs and, with a roof-truss supporting the roof, an open space is formed. As to the shape and finish material of the

roof, the hipped-type roof will be finished with the type of roof-tiles commonly used in Sri Lanka (with waveform asbestos-slate grounding), taking into consideration the building's harmony with the other neighbouring buildings within the context of the new campus as a whole.

As to the wind load, the wind velocity of 33.5m/s will be adopted as the standard as mentioned in "4-1 Design Policy" and the velocity pressure will be obtained accordingly. Sri Lanka is geographically outside the earthquake-prone regions of the world and the records show that occurrences of earthquakes in Sri Lanka have been quite rare and those that did occur in the past were of small scale. Hence, there is no need of taking an earthquake into consideration when a building is designed in this country.

A floor load of 300kg/m² will be estimated. However, in the case where concrete slab on grade is used, this would mean to put the building upon either the reclaimed ground or the back-filled ground, so it is necessary to adopt a design that gives full consideration to the possibility of sinking.

According to the results of the boring investigation conducted by OUSL in connection with its plan for the new campus, the firmness of the bearing subsoil has not been confirmed down to the depth of about 20m. The fill-up ground down to the depth of about 2m from the surface and also the peat deposits about 2m thick under the fill-up ground are extremely soft. So, if a building were to be put on these soft layers of soil, a considerable extent (30-10mm) of sinking would be inevitable. Besides, owing to the variation in thickness of different layers depending on their locations, unequal settlements are also feared to occur. Therefore, in the present project, it is necessary to adopt the pile foundation, a method in which the piles are driven deep into the ground down to the bearing subsoil so as to make them firmly support the building. Among the new buildings under construction by OUSL, those other than the one-storied dormitories are on the pile foundation. In this case, however, sinking of the neighbouring grounds can be expected to occur and therefore there is the need of taking appropriate measures to safeguard the equipment pipes going into or coming out of the building under the ground and the exterior structures.

(4) Building Equipment Plan

1) Electrical Equipment

a) Power-Source Facilities

From the substation currently existing in the southeastern corner of the new campus, power sources of 3-phase 4-wire system 400/230V 50Hz is drawn through the underground cable to the main switch in the Electricity Room of the AV Education Centre. Such wiring work shall be the responsibility of the Sri Lankan side.

Beyond the main switch in the Electricity Room, a branch switch will be installed for each of the different uses such as AV equipment, lighting, socket-outlets and airconditioning/ventilation, so that power may be supplied to each unit of equipment.

In the Electricity Room, an automatic voltage regulator (AVR) and no-break power unit (UPS), both of appropriate capacity, will be installed so as to enhance the stability and reliability of the power source for AV equipment, in addition to the switches mentioned above. As to various items of equipment in the Electricity Room, those of cubicle type will be adopted from the viewpoint of ease of installation and safety.

b) Non-Utility Power-Generating Equipment

In the generator room to be constructed in a separate building, a set of diesel-engine-driven power-generating equipment will be installed. This is a generator of 3-phase 4-wire system 400/230V 50Hz, with an output of about 50kVA. It is of automatic-starting type, equipped with automatic device for switching with the commercial power source. The units of equipment to which the power will be supplied from this non-utility power source shall be confined to the more important ones such as AV equipment and their associated lighting devices, a long-hour stoppage of whose functions owing to power failure should be avoided by all means.

c) Wiring Facilities for Main Power Lines

The main-line system includes those for AV equipment, lighting socket-outlets, airconditioning/ventilation and studio lighting. From the viewpoint of durability, economy and ease of installation, the system to be adopted for the wiring of main lines shall be one using cable-racks and metal and vinyl chloride tubes. In installing these main power lines, every effort shall be made to avoid their coming close to or crossing with AV equipment and their wiring in order to prevent AV equipment from being interfered with by electric noises.

d) Lighting Installations

As the light source, the fluorescent lamps shall be mainly used in view of their outstanding colour rendition and economy. As the luminance criteria for each room, the JIS (Japanese Industrial Standard) shall be used with necessary modifications. However, also taking into account the general conditions in Sri Lanka, the luminance criteria to be actually adopted in this project shall roughly be as follows:

Studios, control rooms, staff rooms, etc.	400 lux
Electricity room, airconditioning machine room, stage-setting store- room, etc.	200 lux
Corridors, anterooms, toilets, etc.	100 lux

As to the types of fluorescent lamps, the ceiling-embedded type is used in such rooms as the audio material production studio, control rooms, staff rooms, while the open directly-installed type is used in such rooms as the video material production studio, electricity room, airconditioning-machine room and stage-setting storeroom.

As to the fluorescent lamps in the studio, the stabilizer is separated from the lamps themselves in order to prevent noise interference with AV equipment.

e) Socket-outlets

In addition to those for general use, the socket-outlets will be appropriately installed for specific uses, such as for AV equipment and airconditioners.

Their shapes and specifications shall be those which conform with the socket-outlets generally used in Sri Lanka.

f) Fire-alarm Equipment

Considering the importance of the AV Education Centre, an automatic fire-alarm system of minimum necessary scale shall be installed within the Centre. In addition to the fire sensors of either heat-sensing or smoke-sensing type which will be installed in every room excepting the toilets, manually-operated fire-alarm signalers, alarm-bells and other devices will be installed at key locations such as corridors. And an alarm-signal receiver will be set up at the position of the personnel in charge.

g) Telephone Wiring Installations

In order that telephone lines and telephone sets may be set up at necessary locations in each room the wiring shall be done for telephone terminal boards, between the terminal boards and from the terminal boards to telephone outlets.

h) Grounding Installations

For the building electric facilities and for AV equipment, installation and wiring will be done of the terminal boards for grounding lines in order to accommodate the following grounding installations:

[Uses]	[Grounding Resistance Values]
For low-voltage equipment	10Ω or lower
For AV equipment	10Ω ∕
For telephone wiring	100Ω ∕

2) Water Supply/Drainage and Sanitary Installations

a) Water-supply Installations

The service water pipe for the AV Education Centre will be connected to the branching point of the main service pipe on the premises which is to be laid (as a part of the construction work for which the Sri Lankan side is responsible) from the main elevated water tank located on the campus. Through this pipe, the water will be drawn into the AV Education Centre building and to each instrument.

The water-supply system to be adopted shall be the gravitational water-supply system using a main elevated tank (18m high).

b) Drainage Installations

The drainage and waste-water from the building will be driven outside through an independent piping system. The waste-water will be purified by means of a purification tank with an appropriate capacity to be set up outdoors.

c) Sanitary Instruments and Installations

The toilets will be equipped with sanitary implements such as wash basins and toilet bowls and will be provided with accessorial items such as toilet stands and mirrors.

d) Fire-Extinguishing Installations

For fire-extinguishing use in the building, fire-extinguishers will be placed at key locations within the building, such as corridors.

3) Airconditioning/Ventilation Installations

a) Airconditioning Facilities Plan

Airconditioning facilities are extremely important in maintaining the environmental conditions in an appropriate state for AV equipment and their associated devices as well as the AV teaching-material production work. Moreover, a stoppage of functions of airconditioning equipment caused by mechanical failures or other reasons would seriously hinder the normal running of work in the Centre. Hence, for the

Centre building, an air-cooled airconditioning system of package type shall be adopted in view of its excellent reliability, maintainability and economy.

As for the studios, the airconditioning facilities will be installed in such a manner as to serve each studio separately according to the schedule of use of each studio. This is because each studio has its own schedule of use and also because it is most essential to prevent intrusion into the studios of noises and vibrations generated by the operation of the airconditioning equipment.

For the airconditioning equipment of single-duct system, an air-sending and circulating duct will be installed. In the designing of the duct that passes under the roof, full attention shall be paid to noise-insulation and vibration-resistivity.

b) Conditions for the Designing of the Airconditioning System

As outlined below, the designing conditions for the airconditioning system shall be set in accordance with the meteorological data owned by the Meteorological Agency of Sri Lanka and also on the basis of the internationally-adopted designing standards of the American Society of Heating, Refrigerating and Airconditioning Engineers (ASHRAE).

i) Outdoor Temperature & Humidity Conditions

All year round: 33.3°C D.B. 76% R.H.

ii) Target Room Temperature

All year round: 26 ± 3°C D.B.

iii) Rooms Applicable and Loads

The airconditioning shall be confined to cooling and shall serve such rooms as the studios, control rooms and the AV library.

The loads on equipment and personnel caused by the AV equipment, lighting installations, etc., shall roughly be in accordance with the following value as criteria:

Room Names	Load		
	Equipment		Personnel
Video Material Production Studio Control Room	Lighting equipment	90kW (Max.)	15
	AV equipment	10kW	5
Audio Material Production Studio Control Room	AV equipment	2kW	5 3
	AV equipment	10kW	8

c) Ventilation Facilities Plan

For the general-purpose rooms facing the outside air, no airconditioning shall be conducted but, instead, through architectural considerations, measures will be taken to ensure maximum use of natural ventilation so as to save energy. However, fixed-type ceiling fans will be installed in the rooms which will not be airconditioned, such as, staff room, planning office.

d) Mechanical-Type Ventilation Facilities

The mechanical-type ventilation facilities will be installed to serve those rooms that generate heat, dust, foul smell and moist, and the 3rd-type mechanical ventilation (exhaust) system shall be adopted as the ventilation system. The room names for which the mechanical-type ventilation will be conducted and the frequencies of ventilation shall be as follows:

[Rooms Names]	[Frequencies]
Electricity Room	8 times/hour
Airconditioning Machine Room	5 times/hour
Generator Room	8 times/hour
Storeroom	5 times/hour
Toilets	30m ³ / m ² ·h

e) Fixed-Type Ceiling Fans Facilities

The fixed-type ceiling fans shall be installed in the following rooms:

Staff room, planning office and workshops.

(5) Architectural Acoustics Plan

The projected AV Education Centre is going to house two recording studios and therefore high-level measures against noise and vibration are essential. On the new campus ground which contains the project site for the AV Education Centre, a 15m-wide road is planned to be constructed along the southern rim of the ground. At the present stage, however, it is difficult to predict the extent of the traffic noise that might be generated by this projected public road in the future. Besides, on the southern side of the produced road runs a railway which is already generating a considerable level of noise each time a train passes. So, taking such noises into account, the studios will be so positioned as to be surrounded by other rooms as much as possible and will be so designed as to have a double wall at the portions where they directly face the outdoors. And the studios will also be so positioned as to avoid their being built next to a room that might become a source of noise within the same building, such as the airconditioning machine room.

Since the project site is a plot of reclaimed land, the building would be easily affected by vibrations caused by the passing nearby of heavy vehicles and trains. So, there is the need of taking such countermeasures as designing the audio studio to float completely.

In the video material production studio, a fixed cyclorama with a height of 4m and occupying three sides of the interior of the studio will be set up and the rest of the wall surfaces and the ceiling will be finished mainly with sound-absorbing material. Curtains will be hung over the walls on three sides so as to extend the range of use of the studio. Near the ceiling of the studio, grid-pipes to support the device to hang the lighting sets will be installed. And over these grid-pipes will be constructed the ceiling (8.5m high) after securing enough space for the studio workers to move from one location to another.

Both the audio material production studio and the audio dubbing studio shall be so designed to have slanted walls with irregular

surfaces on two sides. For these two studios, a standard dimensional ratio of 1:1.25:1.6 (ceiling height : width : length) will be adopted. The ceiling height shall be 4m for the audio material production studio and 3m for the audio dubbing studio.

As to the reverberation time of the studios, it will be planned at about 1.0 second for the video studio. For the audio studio, this shall be 0.2 second. The target permissible value of the airconditioning noise level in the studios and control rooms shall be set at NC-25.

As to the airconditioning ducts for the studios and control rooms, necessary numbers of silencing ducts will be installed both on the noise source side (the side where the airconditioning machine is located) and the studio side so as to suppress the noise.

(6) Building Materials Plan

The construction method generally adopted in Sri Lanka is as follows: First, the main form-resistant members of framework, that is, the foundation, pillars, beams and floor slabs, will be constructed in ferro-concrete, the walls will be put up by piling of bricks and then, the roof will be constructed over the roof-truss made either of steel bars or wood and will be covered with clay tiles (there are many cases of roofs being constructed by the method of arranging the tiles on the waveform asbestos slates). Hence, in Sri Lanka, the local construction firms are quite used to works using ferro-concrete, brick-laying and plastering. So, it is considered quite easy to secure manpower with a certain level of skills for this type of construction work. In this project, too, the structure of the main body of the building shall be in ferro-concrete and the exterior walls and partitioning walls shall be built with brick-laying. As to the roof, measures shall be taken to minimize its weight. The roof will be constructed over the roof-truss built with steel bars and the clay tiles will be arranged on the waveform asbestos slates. The construction method plan is as shown in Table 4-2.

Table 4-2 Construction Method Plan

Item	Construction Method		Reasons of Adoption
	Local Method	Adopted Method	
Pile foundation	Cast-in-place concrete pile foundation	Pre-cast concrete pile foundation	The local method is short of reliable technique in the confirmation of bearing stratum, pile-point cleaning and concrete casting.
Foundation	Reinforced concrete work	Reinforced concrete work	Common and reliable
Skeleton	Reinforced concrete work	Reinforced concrete work	Common and reliable
Bearing wall	Brickwork	Reinforced brickwork	To make common local method safer with reinforcing bars
Ceiling	Void	Board ceiling	For airconditioning and soundproof effects
Roof	Corrugated slate ground and clay-tile roofing	Corrugated slate ground and clay-tile roofing (partly with insulator)	Common and appropriate for harmony with the surroundings
Exterior wall	Spray painting on mortar ground	Spray painting on mortar ground	Mortar is for soundproof effect and spray painting is common.
Opening	Wooden sash	Aluminum sash	Wooden sash is liable to cause a warp and a draft.

With the exception of some of the special kinds of interior-finish materials, the building materials are procurable domestically. In Colombo and its vicinity, supplies of ready-mixed concrete are available. However, with regard to any type of building materials, there are some uncertainties in a number of respects, such as quality, quantity available and delivery date. So, there is the need of selecting the materials with utmost care by examining them closely. Especially with regard to some of the more special kinds of building materials such as those for the interior of the studios, those being planned to be used will consist mainly of Japanese products, except for those local products whose quality and performances are well tested and clearly confirmed.

As to general fittings and fixtures, the locally-manufactured wooden products will be used in principle. However, as for the soundproof doors to be used for the studios, the steel products from Japan, which are considered reliable and have already produced good results, will be used since the locally-produced timber is too hard to be easily processed and, besides, such wooden products made locally are so prone to warping that there is some uncertainty in using them as the material to make fittings that work properly.

The Table 4-3 shows the types of materials used for the finish of the exterior and the interior.

Table 4-3 List of Finish Materials

[Exterior Finish]

Roofs	Steel roof-truss, heat-insulation material + waveform-slate grounding and clay-tile roofing
Reverse side of eaves	Flexible asbestos boards (partly perforated) and VP-painted
Exterior walls	Colour mortar-sprayed and AEP-painted
Waist-high walls	Mortar-painted
Openings	Aluminum sashes, wooden doors and steel doors

[Interior Finish]

Room Names	Floor			Skirting			Walls			Ceiling									
	Vinyl tiling on mortar grounding	Ceramic tiling	Mortar-painted	Terrazzo tiling on mortar grounding	Wooden skirting	Soft skirting	Mortar	Terrazzo tiles	GW + perforated plywood EP	GW + perforated plywood	GW + unperforated/perforated plywood EP	Mortar EP	Ceramic tiling	Mortar	GW boards + wire-netting	Rock-wool sound-absorbing materials	Gyptone	Flexible asbestos board EP	Concrete-mended
Video Material Production Studio	<input type="radio"/>			<input type="radio"/>				<input type="radio"/>						<input type="radio"/>					
Audio Material Production Studio	<input type="radio"/>			<input type="radio"/>					<input type="radio"/>						<input type="radio"/>				
Audio Dubbing Studio	<input type="radio"/>			<input type="radio"/>						<input type="radio"/>					<input type="radio"/>				
Control Room	<input type="radio"/>			<input type="radio"/>						<input type="radio"/>					<input type="radio"/>				
Anteroom	<input type="radio"/>			<input type="radio"/>								<input type="radio"/>					<input type="radio"/>		
Warehouse	<input type="radio"/>			<input type="radio"/>								<input type="radio"/>					<input type="radio"/>		
Stage-Setting Storeroom		<input type="radio"/>				<input type="radio"/>						<input type="radio"/>							<input type="radio"/>
Dimmer Room		<input type="radio"/>				<input type="radio"/>						<input type="radio"/>							
Post Production Studio	<input type="radio"/>			<input type="radio"/>							<input type="radio"/>						<input type="radio"/>		
Editing Room	<input type="radio"/>			<input type="radio"/>							<input type="radio"/>						<input type="radio"/>		
Control Apparatus Room	<input type="radio"/>				<input type="radio"/>						<input type="radio"/>						<input type="radio"/>		
Maintenance Room			<input type="radio"/>					<input type="radio"/>			<input type="radio"/>						<input type="radio"/>		
Viewing Room	<input type="radio"/>			<input type="radio"/>						<input type="radio"/>							<input type="radio"/>		
Visual Art Workshop	<input type="radio"/>				<input type="radio"/>						<input type="radio"/>						<input type="radio"/>		
Multiple Cassette Copying Room	<input type="radio"/>				<input type="radio"/>						<input type="radio"/>						<input type="radio"/>		
AV Library	<input type="radio"/>				<input type="radio"/>						<input type="radio"/>						<input type="radio"/>		
P/D Staff Room	<input type="radio"/>				<input type="radio"/>						<input type="radio"/>						<input type="radio"/>		
Planning Office	<input type="radio"/>				<input type="radio"/>						<input type="radio"/>						<input type="radio"/>		
Staff Room	<input type="radio"/>				<input type="radio"/>						<input type="radio"/>						<input type="radio"/>		
Make-up Room	<input type="radio"/>				<input type="radio"/>						<input type="radio"/>						<input type="radio"/>		
Technical Staff Room	<input type="radio"/>				<input type="radio"/>						<input type="radio"/>						<input type="radio"/>		
Airconditioning Machine Room		<input type="radio"/>					<input type="radio"/>					<input type="radio"/>							<input type="radio"/>
Electricity Room		<input type="radio"/>					<input type="radio"/>					<input type="radio"/>							<input type="radio"/>
Entrance Hall			<input type="radio"/>					<input type="radio"/>				<input type="radio"/>					<input type="radio"/>		
Corridor			<input type="radio"/>					<input type="radio"/>				<input type="radio"/>					<input type="radio"/>		
Toilet		<input type="radio"/>									<input type="radio"/>							<input type="radio"/>	
Water-heating Room		<input type="radio"/>									<input type="radio"/>							<input type="radio"/>	
Generator Room		<input type="radio"/>					<input type="radio"/>					<input type="radio"/>							<input type="radio"/>

4-3-3 Examination of the Scale

In this section, examination will be made of the necessity and scale of the main facilities and equipment to be installed at the projected AV Education Centre.

(1) Scale of the Facilities

The Education Centre which produces AV teaching materials is designed on a minimum necessary scale, and the functional rooms in this Centre are for the production of teaching materials by mutually different methods. Each of the functional rooms has a capacity to produce teaching materials and, therefore, as long as the number of teaching-material tapes is within these capacities of the functional rooms, it may be said that the number of tapes to be produced will not affect the setting of the scale of the facilities.

For example, let us suppose that the production capacity of the Video Material Production Studio is ten tapes a month. Then, as long as the requested number of the teaching-material tapes remains within the range of 10 tapes, at least one studio would be required even if the number of tapes requested to be produced were only one. In other words, it is not possible to reduce the scale or to eliminate the functions. Conversely, if the number of tapes requested to be produced exceeds the production capacity of the facilities, it would then become essential to expand the scale and two studios will become necessary.

The scales of the Video Material Production Studio and the Audio Material Production Studio, which are two of the main facilities, have been discussed in 4-2: Examination of Design Conditions.

The compositions of other rooms are shown in Table 4-4.

Table 4-4 Rooms Required

Room Names	Planned Floor Area (m ²)	Functions	Basis of Area Calculation
Video Materials Production Studio	168	Production of video teaching materials Supply and Drainage of water for experiments	Shall have an area that takes account of the maximum necessary distance from which a subject with a breadth of 3-4m may be shot with a standard type of lens, and the operatability.
Control Room	38	Video and audio control of the materials produced	Shall depend on the layout of equipment required for control.
Anteroom	10	Sound insulation	Shall depend on the lines of flow of personnel using the room.
Dimmer Room	21	Control of dimmers	Shall depend on the layout of equipment.
Stage-Setting Storeroom	90	Assembly, adjustment and storage of stage-settings	Shall take into account the need of 1/3 of the studio area as the storage space ^{(*)2} plus 6 × 6m as the work space.
Warehouse	18	Storage of cameras, studio lighting equipment, studio equipment, etc.	Shall have a minimum space of a little over 1/10 of the studio area, though general need is 1/3-1/5.
Audio Materials Production Studio	48	Production of audio teaching materials	Shall have an area which enables audio-recording of a discussion-type programme by 4-5 persons and which conforms with the appropriate dimension ratio.
Control Room	36	Control of the audio produced	Shall depend on the layout of equipment required for control work.
Anteroom	12	Sound insulation	Shall depend on the lines of flow of personnel using the room.
Audio Dubbing Studio	48	Equipped with an announcer's booth in which insertion of sounds into tapes and voice-dubbing are conducted	Shall have an area wide enough to set up in a corner of the studio an announcer's booth of minimum scale ^{(*)1} accommodating a maximum of 2-3 persons and also to install necessary items of equipment with comparative ease around the booth.
Post Production Studio	48	Processing of video and audio, and sophisticated editing of materials	Shall depend on the layout of equipment.
Editing Room	6 × 3 rooms	Editing of videotapes	Shall have a minimum space for a maximum of two persons to do the editing work.
Central Apparatus Room	18	Used for reception of broadcasts of other stations and for installation of centralized equipment	Shall depend on the layout of equipment.
Maintenance Workshop	51	Maintenance of equipment and installations and storage of outside-shooting equipment and spare parts	Shall have a work space for one maintenance specialist and a space for storage of maintenance equipment and tools. The required width of the area depends on the layout of work tables.
Faculty Viewing Room	18 × 3 rooms	Viewing for examining the contents of teaching materials	Shall have a minimum of space enabling viewing by 4-5 persons sitting more than 2.5m away from a 29-inch TV set. ^{(*)1}
Visual Art Workshop	72	Used for the production of visual artworks required in producing video teaching materials	Shall have an area enough to accommodate a work space for 4 persons: 4 × 10m ² /person ^{(*)1} + Artwork production space and two 15m ² work tables. ^{(*)1}
Multiple Cassette Copying Room	36	Production of AV tape copies	Shall depend on the layout of equipment.
AV Library	54	Filing and storage of teaching-material tapes, unused tapes and package materials	Shall have a space enough to store about 6,000 AV tapes and a space (6m breadth) for storage of package materials.
Planning Office	84	For use by production staff for planning and examinations	Shall have an area to accommodate two spaces, each wide enough to enable a meeting by a maximum of 8-10 persons in charge: that is, 10 × 4.5m ² /person. ^{(*)1}
Producers/Directors (P/D) Staff Room	84	For use by producers and directors for production work	Shall have a work space for 12-13 persons: 13 × 6m ² /person. ^{(*)1}
Technical Staff Room	90	For use by technical staff for technical work	Shall have a work space for 15 persons: 15 × 6m ² /person. ^{(*)1}
Make-up Room	18	For make-up work, equipped with a shower booth	Shall have a make-up space for a maximum of 4 persons at a time and a shower booth.
Airconditioning Equipment Room	216	Airconditioners for the studios and their associated rooms	Shall depend on the layout of equipment.
Electricity Room	54	Power receiving and distribution facilities	Shall depend on the layout of equipment.
Staff Room	18	Functions as a work room for the architectural engineering staff and also as a disaster-prevention centre for the AV Education Centre building.	
Toilets and Water-Heating Room	18 × 2 rooms	Toilets for men and women, and water-heating facilities	Shall have a minimum necessary space for installation of sanitary instruments and water-heating facilities in accordance with the Calculation Standards for the Required Numbers of Sanitary Instruments ^{(*)1} .
Entrance Hall and Corridors	416	The entrance hall is used also as a waiting lounge for visitors.	The entrance hall shall have a space corresponding to 5% of the total floor space of the building.
Sub Total	1,856		
Generator Room	15	Generator for emergency use	Shall be set up separately from the AV Education Centre building.
TOTAL	1,871		

- Notes
1. Areas are based on centre-to-centre measurements between walls or pillars.
 2. *1 is from the "Volume of Architectural Design Materials" of the Japan Architectonics Society.
 3. *2 is from the "Broadcast Architectural Engineering" of the Japan Broadcasting Corporation (NHK).

(2) Scale of Equipment

The objective of this project is to produce AV teaching materials for use in the distance education by OUSL. However, since the teaching materials produced may have the chances of being broadcast through SLRC, the broadcasting technology standards, based on such criteria as the recommendations by CCIR, which are applied to the installation of broadcasting stations, shall be respected. In examining the equipment to be selected, efforts shall be made to select the equipment of optimum scale and grade suited to the objective of the production of the AV teaching materials at the Centre.

1) Equipment for the Video Material Production Studio

As to the colour camera which is for use in following the movements of the performers and shooting the changes in scenes and phenomena in the studio, several units will be required because, in the course of production of the teaching materials, switching from one scene to another will need to be made smoothly. However, in this project, considering the scales of the teaching-material programmes to be produced, the number of colour cameras for studio use shall be two.

For the shooting of TELOPs and patterns containing charts and data, provision of a caption scanner will be planned.

The scale of the video switching equipment shall be determined by the number of video inputs such as those from the camera and VTR, while the scale of the audio mixing equipment shall depend on the number of audio inputs such as those from the microphone, VTR and audio tape.

In this studio, the numbers of video and audio inputs will be 12 and 15, respectively, as shown below:

Inputs into the Video Control Device

Names of Equipment	Nos. of Inputs
Colour camera	2
Caption scanner	1
Character signal	1
VTR	2
White signal, Black signal	2
Spare	2
Test signal	2
Total	12

Inputs into the Audio Control Device

Names of Equipment	Nos. of Inputs
Microphone	8
VTR	2
Tape recorder/player	1
Cassette tape recorder/player	1
Spare	2
Test signal	1
Total	15

As to the lighting equipment, a standard type of lighting equipment including motorized suspension system shall be planned to be installed, in view of the high ceiling of the studio and considering the physical safety of the personnel and the operatability of the lighting system.

2) Equipment for the Audio Material Production Studio

The scale of the audio mixing equipment, the same as in the case mentioned in the preceding section, is determined by the number of audio inputs from such sources as microphone and tape recorder/ player. Thus, in this studio, the numbers of audio inputs will be set a 14, as follows:

Names of Equipment	Nos. of Inputs
Microphone	6
Tape recorder/player	2
Cassette tape recorder/player	2
Disc player	1
Spare	2
Test signal	1
Total	14

3) Equipment for the Audio Dubbing Studio

In the audio dubbing studio, the voice to be dubbed into is produced in the announcer's booth while monitoring is done of the played-back video and audio of the video teaching material (original tape) which requires to be audio-dubbed. The voice from the announcer's booth will be recorded onto one of the channels of the multi-track tape recorder/player which is synchronized with the audio of the original tape. At the same time, the voice of the original tape will also be recorded onto another channel of the multi-track tape recorder/player. In addition to the above-mentioned voices, sounds necessary for the dubbing work, such as music and sound-effects, will also be recorded separately onto different channels of the multi-track tape recorder/player.

After that, all these sounds will be played back synchronously with the original tape and, while being put through a mixing process according to needs, the entire audio and recordings will be recorded, together with the original pictures, onto the VTR for recording use. Thus, the dubbing work is completed.

As for the video signals, no video switcher will be required because the played-back output is directly input into the VTR for recording use. Based on the following table, the number of inputs into the audio mixing device shall be set at 12.

Names of Equipment	Nos. of Inputs
Microphone	2
VTR	1
Multi-track tape recorder/player	4
Tape recorder/player	1
Cassette tape recorder/player	1
Spare	1
Test signal	2
Total	12

4) Equipment for Post Production Studio

From the tables given below, the numbers of video and audio inputs shall both be set at 8.

VIDEO

Names of Equipment	Nos. of Inputs
VTR	3
Caption scanner	1
Character signal generator	1
Computer graphics	1
Test signals	2
Total	8

AUDIO

Names of Equipment	Nos. of Inputs
VTR	3
Audio tape recorder/player	1
Audio cassette tape recorder/player	1
Spare	2
Test signals	1
Total	8

5) Outdoor Coverage Equipment

In order to cope effectively with long-period location shooting, the need of covering different events taking place at the same time or that of conducting multilateral coverage of the same event, provision of two sets of outdoor coverage equipment will be planned.

6) Equipment for the Editing Room

In the case of outdoor shooting, the total length of the recorded tapes normally exceeds ten times the length of the programme planned to be produced. And the editing of these tapes normally requires 3-5 times the duration of the recording made, including the time required by the editor in trying to compose the programme in the way he wants through trial and errors.

As mentioned previously, 2 sets are planned for outdoor coverage equipment. They will be fully used and accordingly, editing equipment will be also in full motion. Furthermore, editing work will be for not only the production of new materials but also the revision of old materials and will get so busy that 3 sets of editing equipment will be planned.

The set is called single step editing equipment, composed of 2

half-inch cassette VTRs, editing controller and monitoring equipment.

7) Equipment for the Viewing Room

In order to enable checking the contents and get-up of the recorded video teaching materials, the viewing room shall be equipped with a video monitor with a relatively wide screen and an audio monitor.

8) Equipment for the Central Apparatus Room

The synchroning pulse/test signal generator is a device that constitutes the basis of the technical standards for the teaching materials to be produced. So, the equipment with high reliability and satisfying the broadcasting standards shall be adopted.

9) AV Tape Copying Device

In order to cope with the need of producing a large number of copies of audio teaching materials speedily in cassette tapes and also of producing the copies of video teaching materials in VHS cassette tapes, a device capable of producing 20 copies at the same time will be adopted.

10) Measuring Instruments

Measuring instruments to be adopted shall be those which are required in maintaining the functions of the equipment installed at the AV Education Centre, in checking, adjusting, maintaining and repairing them, and which are reliable and easy to handle.

In accordance with the design policy for the teaching material production facilities and equipment as mentioned in "4-1 (2)" above, the composition of the main items of equipment and main common-use equipment, such as measuring instruments, to be installed in each room shall be as follows:

	Quantities
(1) Video Material Production Studio	
1) Colour Camera System	2 sets
Colour camera (3CCD)	2
Camera control unit	2
Zoom lens	2
Pedestal dolly	2
2) Caption Scanner	1 set
3) Character Generator	1 set
4) Video Switching Equipment	1 set
(with Chromakey and Video Effector)	
5) Audio Equipment	1 set
Audio mixing equipment	1
(with Reverberator)	
Tape recorder/reproducer	1
Cassette tape recorder/reproducer	1
Talk-back equipment	1 set
Microphone, microphone stand and others	1 set
6) VTR	2 sets
Half-inch cassette VTR	2
7) Monitoring Equipment	1 set
a) Video monitor	1 set
Video monitor for material production	1 set
Video monitor for video control	1 set
and adjustment	
b) Audio monitor	1 set
Audio monitor for material production	1 set
Audio monitor for studio floor	1 set
Audio speaker for talk-back	1 set
8) Equipment for Inter-communication	1 set
9) Lighting Equipment	1 set
Light controller	1 set
Suspension System	1 set
Lantern	1 set
(2) Audio Material Production Studio	
1) Audio Equipment	1 set
Audio mixing equipment	1

	(with Reverberator)		
	Tape recorder/reproducer	2	
	Cassette tape recorder/reproducer	2	
	Disc player	1	
	Audio effector	1 set	
	Microphone, microphone stand and others	1 set	
	Announcer cough-box	1	
2)	Monitoring Equipment		1 set
	Audio monitor for material production	1	
	Audio monitor for studio floor	1	
(3)	Audio Dubbing Studio		
1)	Audio Equipment		1 set
	Audio mixing equipment	1	
	(with Reverberator)		
	Multi-track tape recorder/reproducer	1	
	Tape recorder/reproducer	1	
	Cassette tape recorder/reproducer	1	
	Microphone, microphone stand and others	1 set	
	Announcer cough-box	1	
	Talk-back equipment	1 set	
2)	Monitoring Equipment		1 set
	Audio monitor for material production	1	
	Video monitor for booth	1	
3)	VTR		1 set
	Half-inch cassette VTR	2	
4)	Tape Synchronizing Equipment		1 set
(4)	Post Production Studio		
1)	VTR		1 set
	Half-inch cassette VTR (with DT)	2	
	Half-inch cassette VTR	1	
2)	Editing Controller		1 set
3)	Video Equipment		1 set
	Video switching equipment	1	
	(with Video Effector)		
	Caption scanner	1 set	

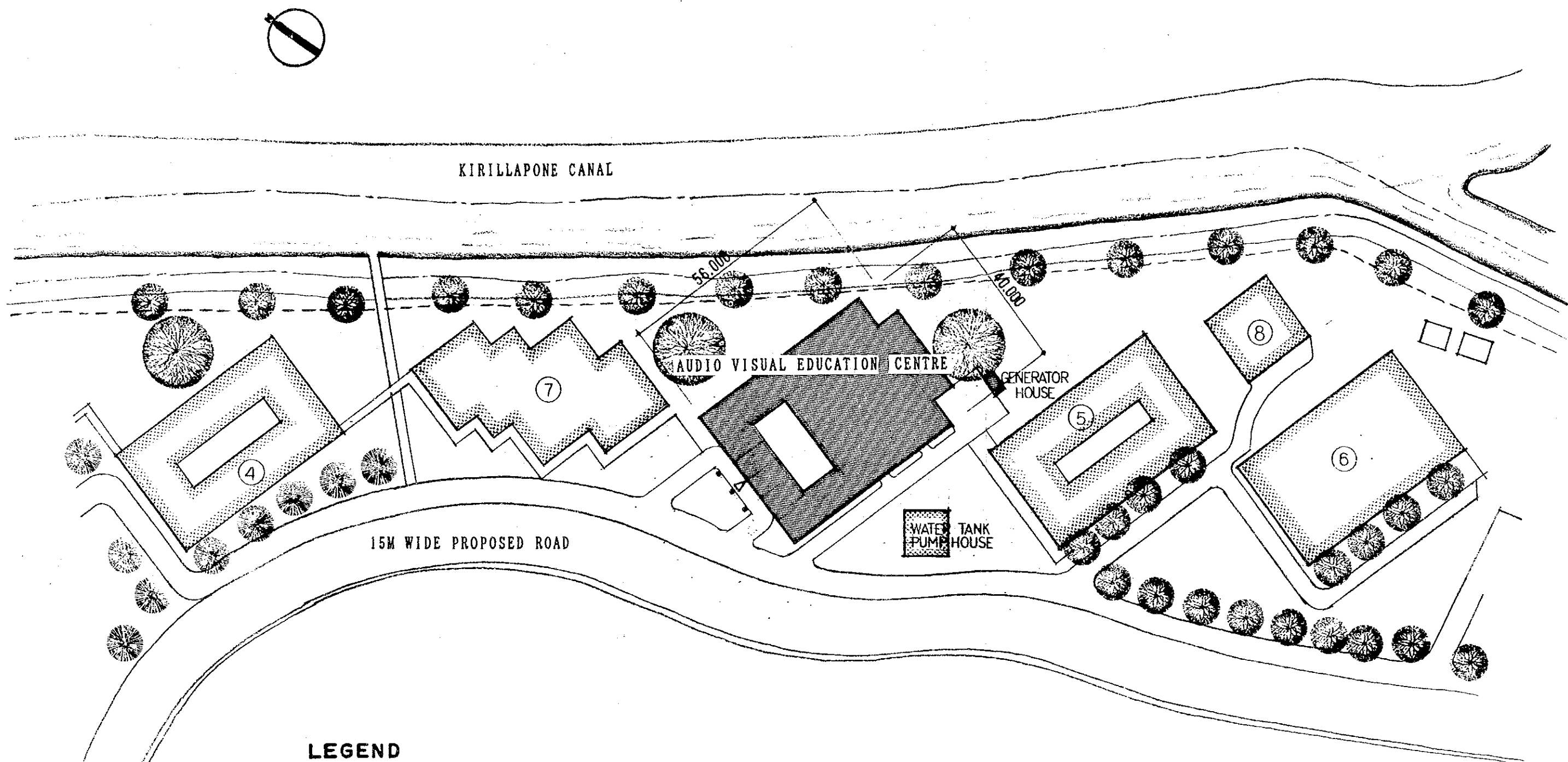
	Character generator	1 set	
	Computer Graphics	1 set	
4)	Audio Equipment		1 set
	Audio mixing equipment	1 set	
	Tape recorder/reproducer	1	
	Cassette tape recorder/reproducer	1	
5)	Monitoring Equipment		1 set
	Video monitor	1	
	Audio monitor	1	
(5)	Outdoor Coverage Equipment		2 sets
	1) Colour Camera with VTR		2
	2) Gun-Type Microphone		2 sets
	3) Monitoring Equipment		2 sets
	4) Lighting Equipment		2 sets
	5) Vehicle		2
(6)	Editing Equipment		3 sets
	1) VTR (Half-inch Cassette VTR)	6	
	2) Editing Controller		3
	3) Monitoring Equipment		3 sets
(7)	Faculty Viewing Room Equipment		3 sets
	1) VTR (Half-inch Cassette VTR)	3	
	2) Monitoring Equipment	3 sets	
(8)	Central Apparatus Room Equipment		1 set
	1) Synch-Signal Generator and Test Signal Generator	1 set	
	2) Clock Equipment	1 set	
	3) Communication Equipment between Rooms	1 set	
	4) TV Receiver	1 set	
	5) Television System Convertor	1 set	
	6) VTR (NTSC system Cassette VTR)	1	
	7) VTR (Half-inch Cassette VTR)	1	
(9)	Multiple Cassette Copying Equipment		1 set
	1) Video Duplicating Equipment	1	
	2) Audio Duplicating Equipment	1	

3) Monitoring Equipment	1 set	
(10) Measuring Equipment and Tools		1 set
1) Oscilloscope with Cart	1	
2) Vector Scope with Cart	1	
3) Television Signal Generator	1	
4) Audio Measuring Meter	1	
5) Light Value Meter	1	
6) Colour Temperature Meter	1	
7) Digital Volt Meter	1	
8) Megohm Meter	1	
9) Circuit Tester	5	
10) Ammeter	1	
11) Volt Meter	1	
12) Video Test Tape for VTR	5	
13) Audio Test Tape for Tape Recorder	2	
14) Variable DC Voltage Power Supply Unit (DC)	1	
15) Variable AC Voltage Power Supply Unit (AC)	1	
16) Wave Form Monitor/Vector Scope	1	
17) Tools	10	
(11) Power Supply Equipment		1
1) Power Reception Board		1 set
2) Power Distribution Board		1 set
3) Auto-Voltage Regulator (50kVA)		1 set
4) Insulation Transformer (100kVA)		1 set
5) Engine Generator (50kVA)		1 set
6) Automatic Switch-over Board		1 set
7) Uninterrupted Power Supply		1 set
(12) Spare Parts and Units		1
(13) Blank Tapes for Test etc.		1
(14) Wiring Materials		1

4-3-4 Basic Design Drawings

The following is the list of Basic Design Drawings concerning the AV Education Centre:

- Fig. 4-5 LAYOUT OF THE AV EDUCATION CENTRE
- Fig. 4-6 FLOOR PLAN OF THE AV EDUCATION CENTRE
- Fig. 4-7 ROOF PLAN OF THE AV EDUCATION CENTRE
- Fig. 4-8 ELEVATION OF THE AV EDUCATION CENTRE (1)
- Fig. 4-9 ELEVATION OF THE AV EDUCATION CENTRE (2)
- Fig. 4-10 SECTION OF THE AV EDUCATION CENTRE
- Fig. 4-11 SCHEMATIC DIAGRAM OF ELECTRICAL INSTALLATION OF THE AV EDUCATION CENTRE
- Fig. 4-12 SCHEMATIC DIAGRAM OF PLUMBING OF THE AV EDUCATION CENTRE
- Fig. 4-13 SCHEMATIC DIAGRAM OF AIRCONDITIONING SYSTEM OF THE AV EDUCATION CENTRE
- Fig. 4-14 DIAGRAM OF VIDEO MATERIAL PRODUCTION STUDIO SYSTEM
- Fig. 4-15 DIAGRAM OF AUDIO MATERIAL PRODUCTION STUDIO SYSTEM
- Fig. 4-16 DIAGRAM OF AUDIO DUBBING STUDIO SYSTEM
- Fig. 4-17 DIAGRAM OF POST PRODUCTION STUDIO SYSTEM
- Fig. 4-18 DIAGRAM OF OUTDOOR COVERAGE SYSTEM
- Fig. 4-19 DIAGRAM OF EDITING ROOM SYSTEM
- Fig. 4-20 DIAGRAM OF FACULTY VIEWING ROOM
- Fig. 4-21 DIAGRAM OF CENTRAL APPARATUS ROOM SYSTEM
- Fig. 4-22 DIAGRAM OF MULTIPLE CASSETTE COPYING ROOM SYSTEM
- Fig. 4-23 DIAGRAM OF POWER SUPPLY ROOM SYSTEM



LEGEND

- 4. ACADEMIC BUILDING (H.S.S.)
- 5. ACADEMIC BUILDING (ENGINEERING)
- 6. ACADEMIC BUILDING (SCIENCE)
- 7. LIBRARY
- 8. SENIOR-STAFF COMMON ROOM

SITE PLAN 1:1000

Fig. 4-5 LAYOUT OF THE AV EDUCATION CENTRE

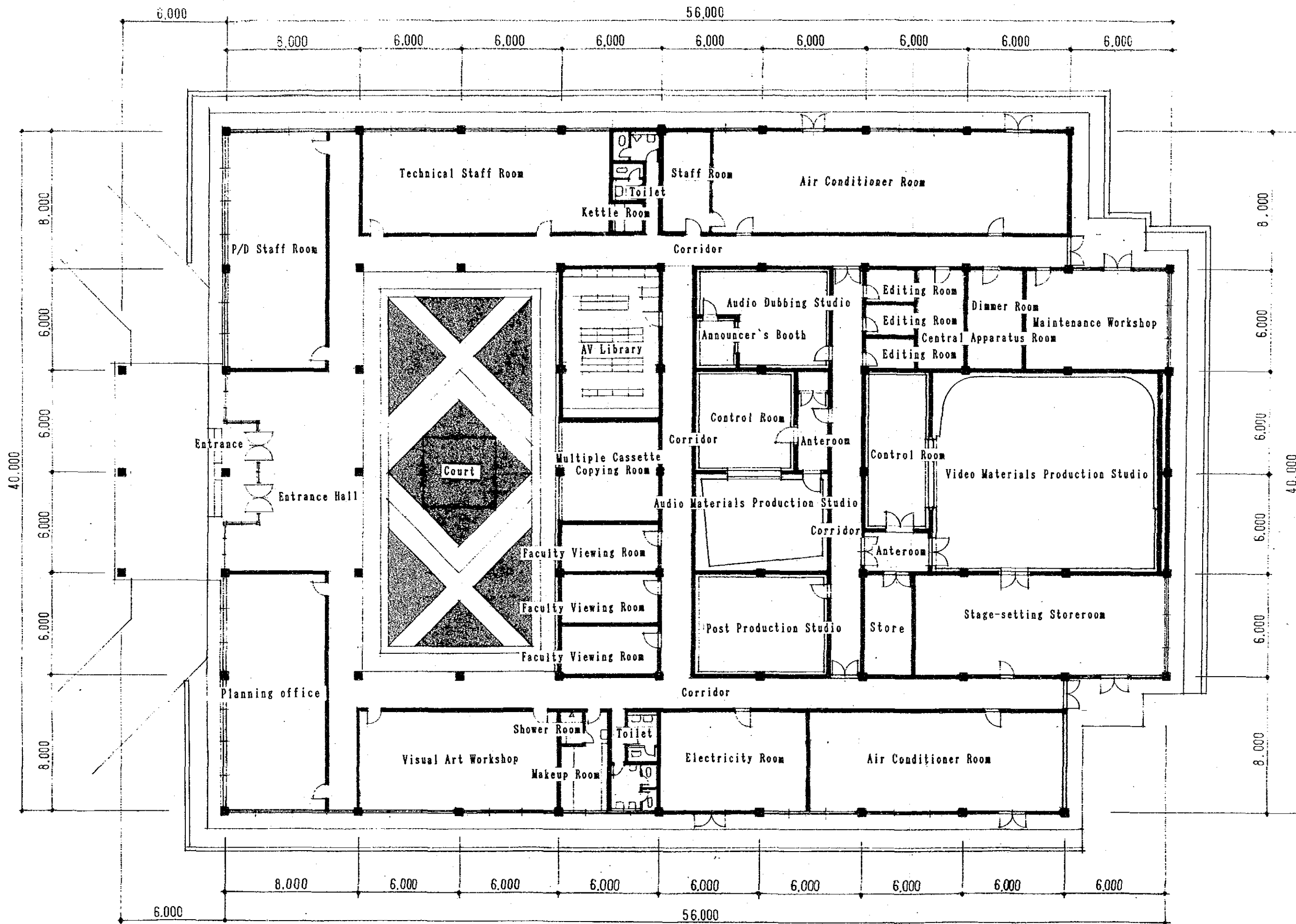


Fig. 4-6 FLOOR PLAN OF THE AV EDUCATION CENTRE 1:200

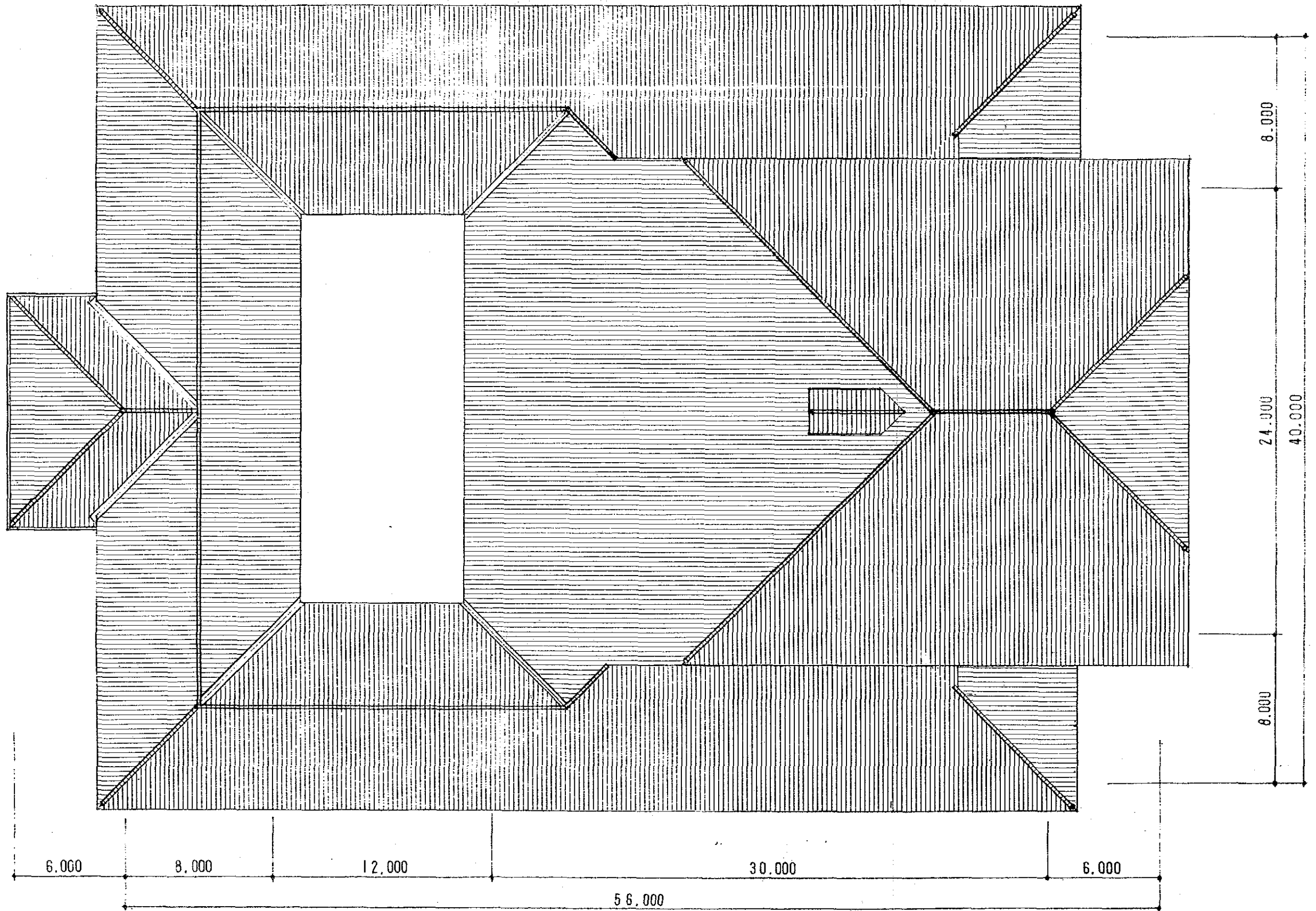
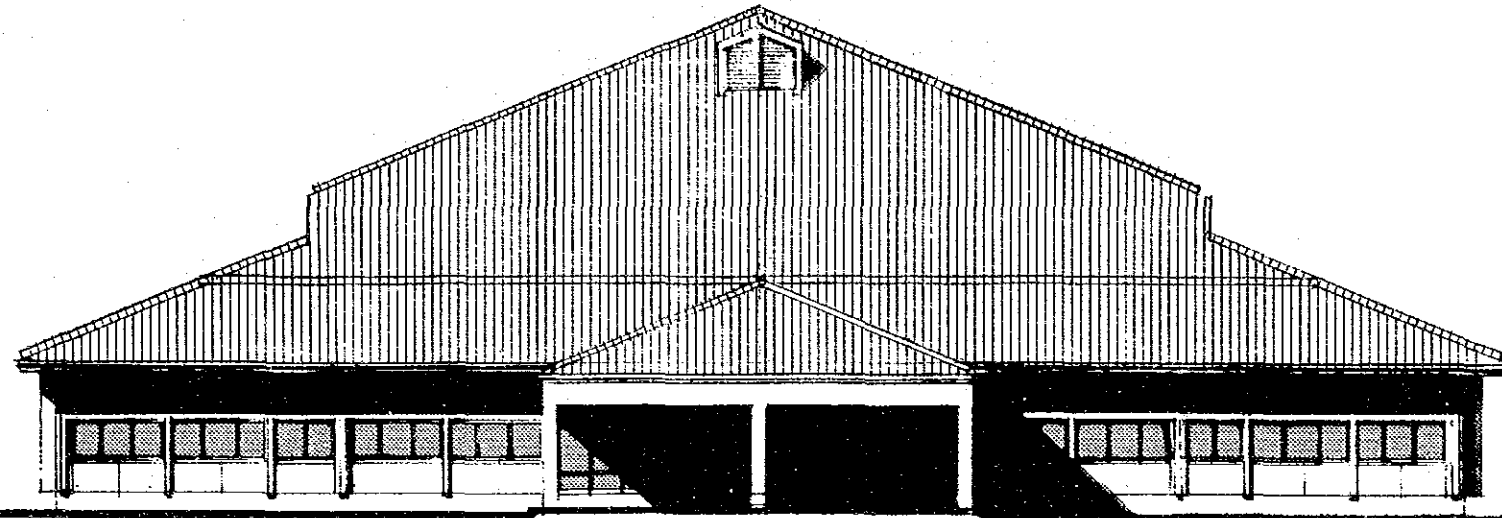
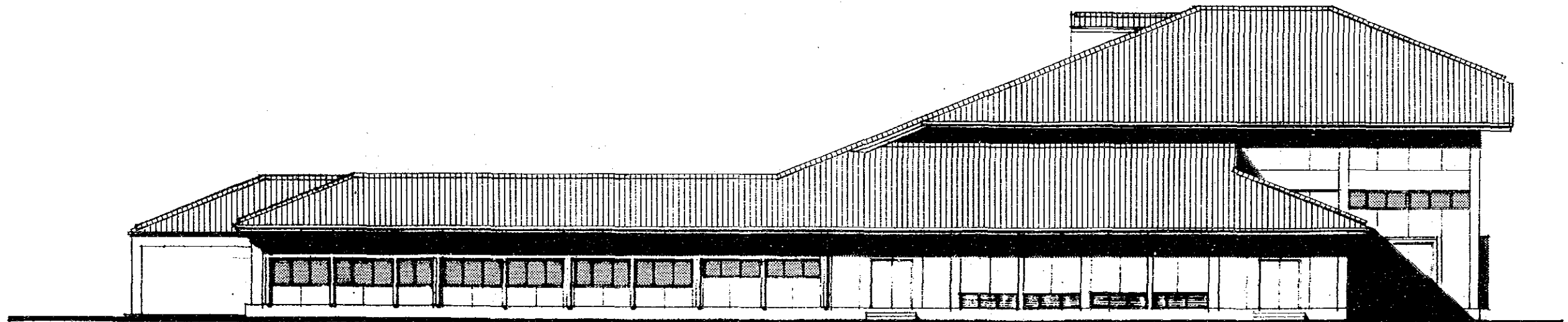


Fig.4-7 ROOF PLAN OF THE AV EDUCATION CENTRE 1:200

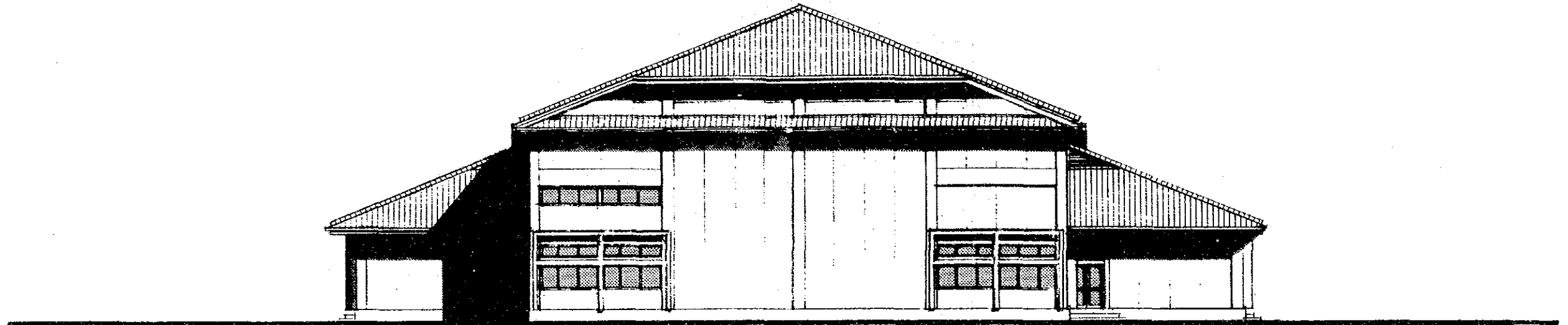


WEST SIDE ELEVATION

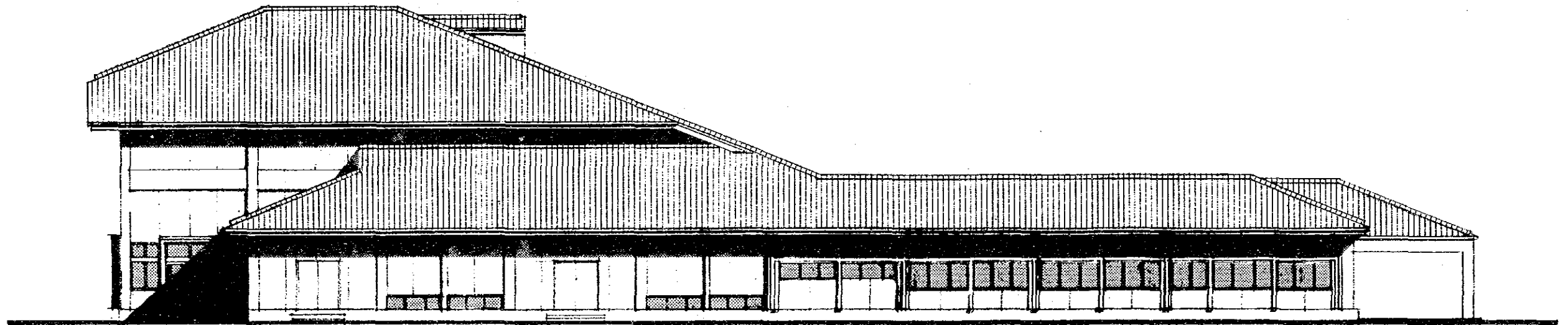


SOUTH SIDE ELEVATION

Fig. 4-8 ELEVATION OF THE AV EDUCATION CENTRE (1) 1:200

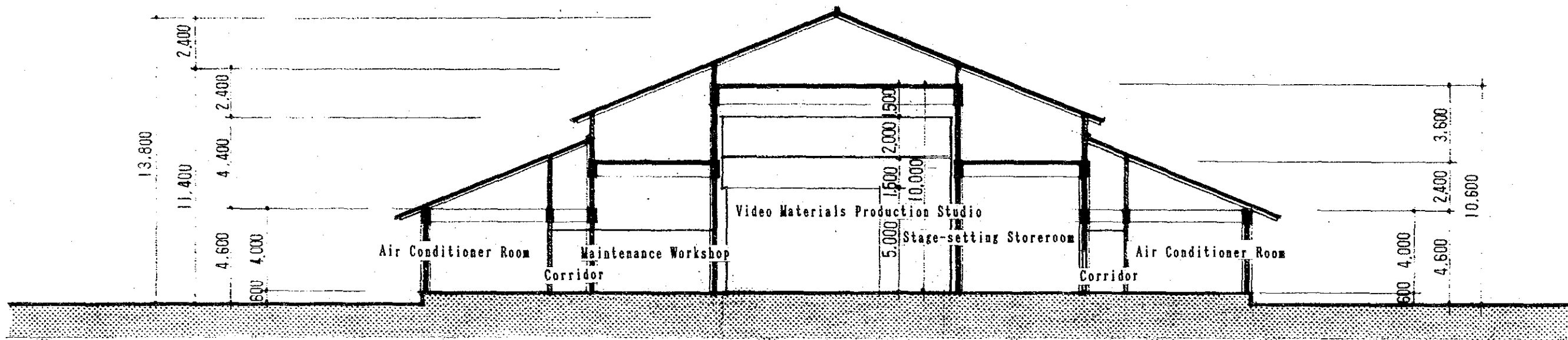


EAST SIDE ELEVATION

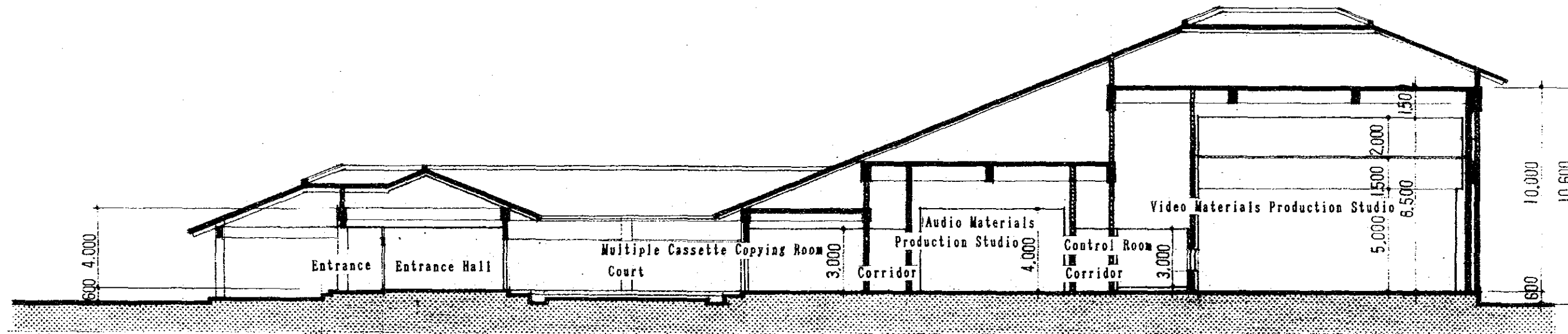


NORTH SIDE ELEVATION

Fig. 4-9 ELEVATION OF THE AV EDUCATION CENTRE (2) 1:200

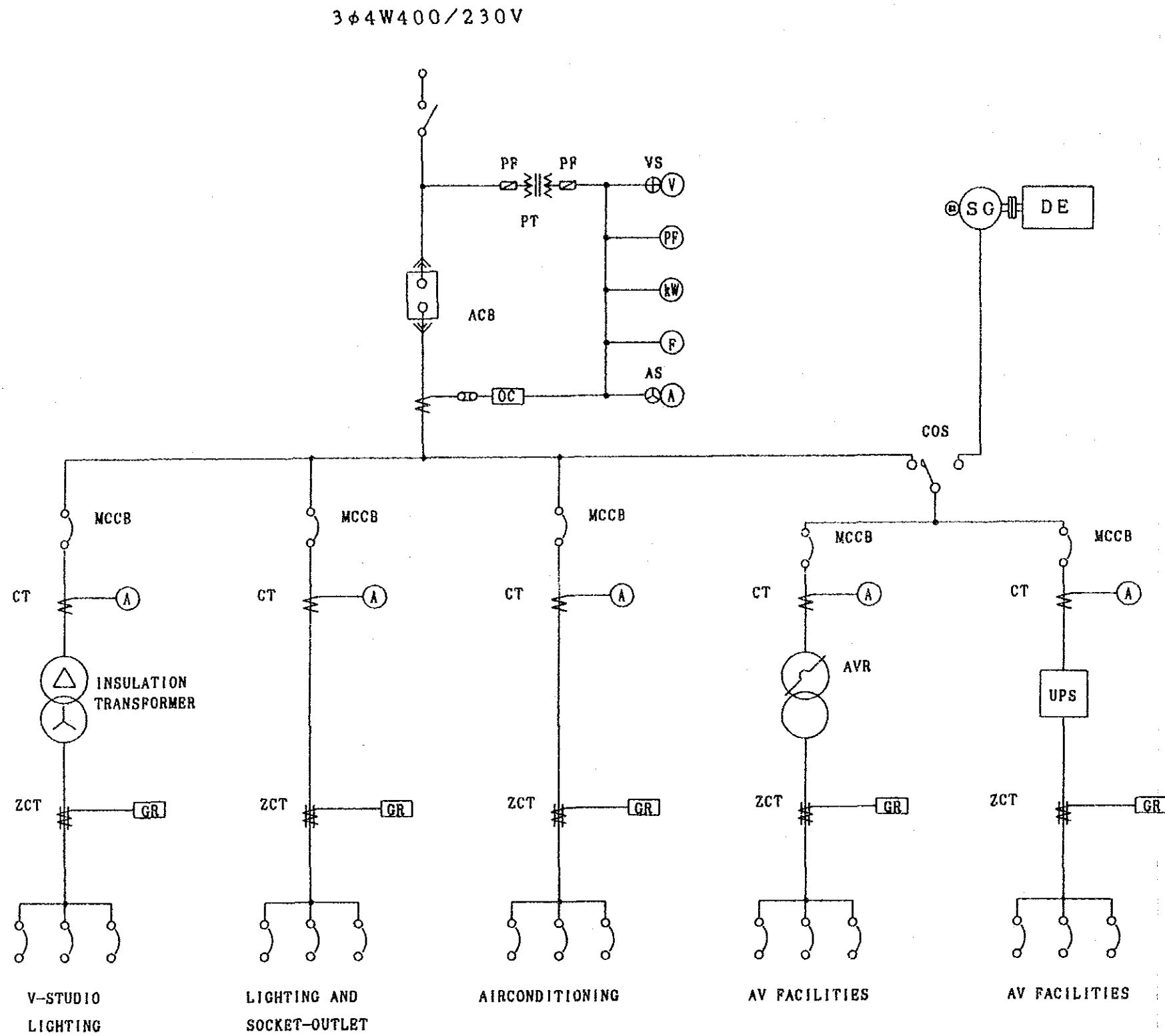


Y-Y SECTION



X-X SECTION

Fig. 4-10 SECTION OF THE AV EDUCATION CENTRE 1:200



LEGEND

A	AMMETER
ACB	AIR CIRCUIT BREAKER
AS	PHASE CHANGE OVER SWITCH FOR AMMETER
AVR	AUTOMATIC VOLTAGE REGULATOR
COS	CHANGE OVER SWITCH
CT	CURRENT TRANSFORMER
DE	DIESEL ENGINE
F	FREQUENCY METER
GR	GROUND RELAY
MCCB	MOLDED CASE CIRCUIT BREAKER
OC	OVER CURRENT RELAY
PF	POWER FACTOR METER
PT	POTENTIAL TRANSFORMER
SG	SYNCHRONOUS GENERATOR
TR	TRANSFORMER
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT METER
VS	PHASE CHANGE OVER SWITCH FOR VOLTMETER
kW	KILOWATT METER
ZCT	ZERO PHASE-SEQUENCE CURRENT TRANSFORMER

Fig. 4 - 1 1 SCHEMATIC DIAGRAM OF ELECTRICAL INSTALLATION OF THE AV EDUCATION CENTRE

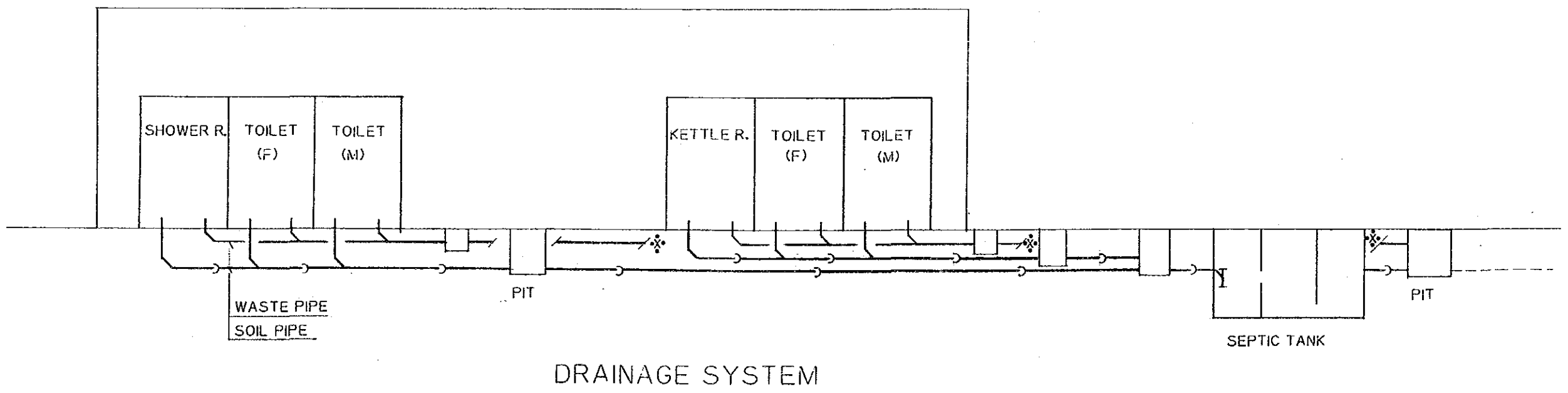
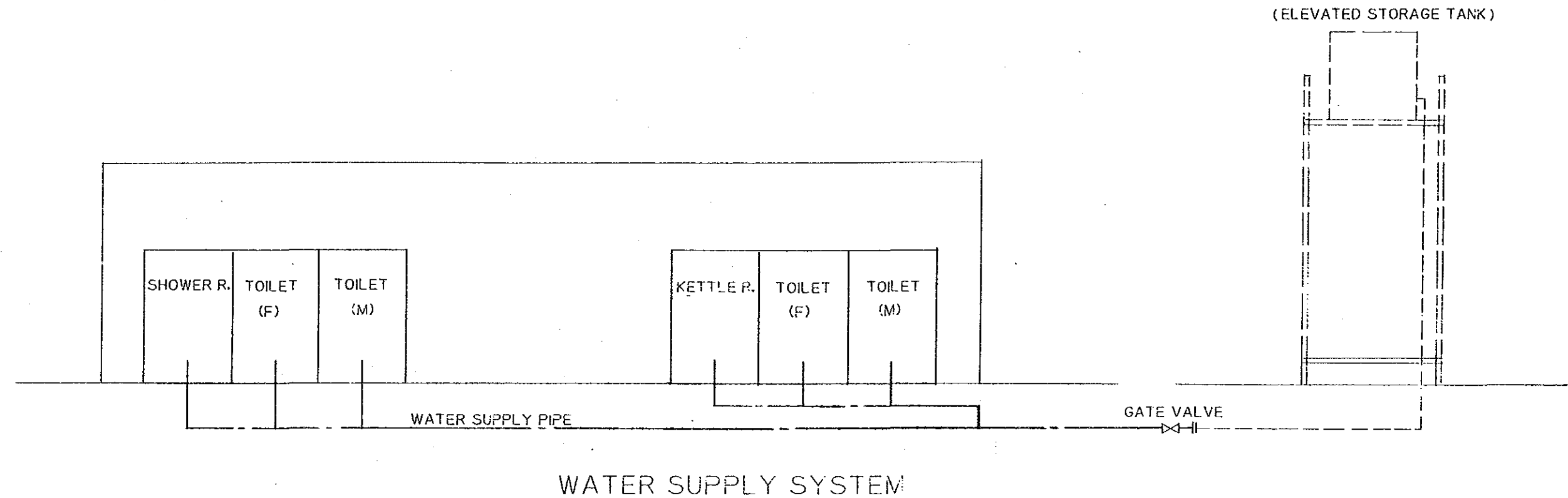


Fig. 4 - 1 2 SCHEMATIC DIAGRAM OF PLUMBING OF THE AV EDUCATION CENTRE

LEGEND

	FLOOR MOUNTED AIR COOLED TYPE AIRCONDITIONER (INDOOR UNIT/OUTDOOR UNIT)		AIR INLET LOUVER
			FAN
	AIR INLET		EXHAUST CHAMBER
	AIR OUTLET		AIR INTAKE CHAMBER (WITH AIR FILTER)
	DAMPER		REFRIGERANT PIPE
	AIR DUCT		VENT CAP

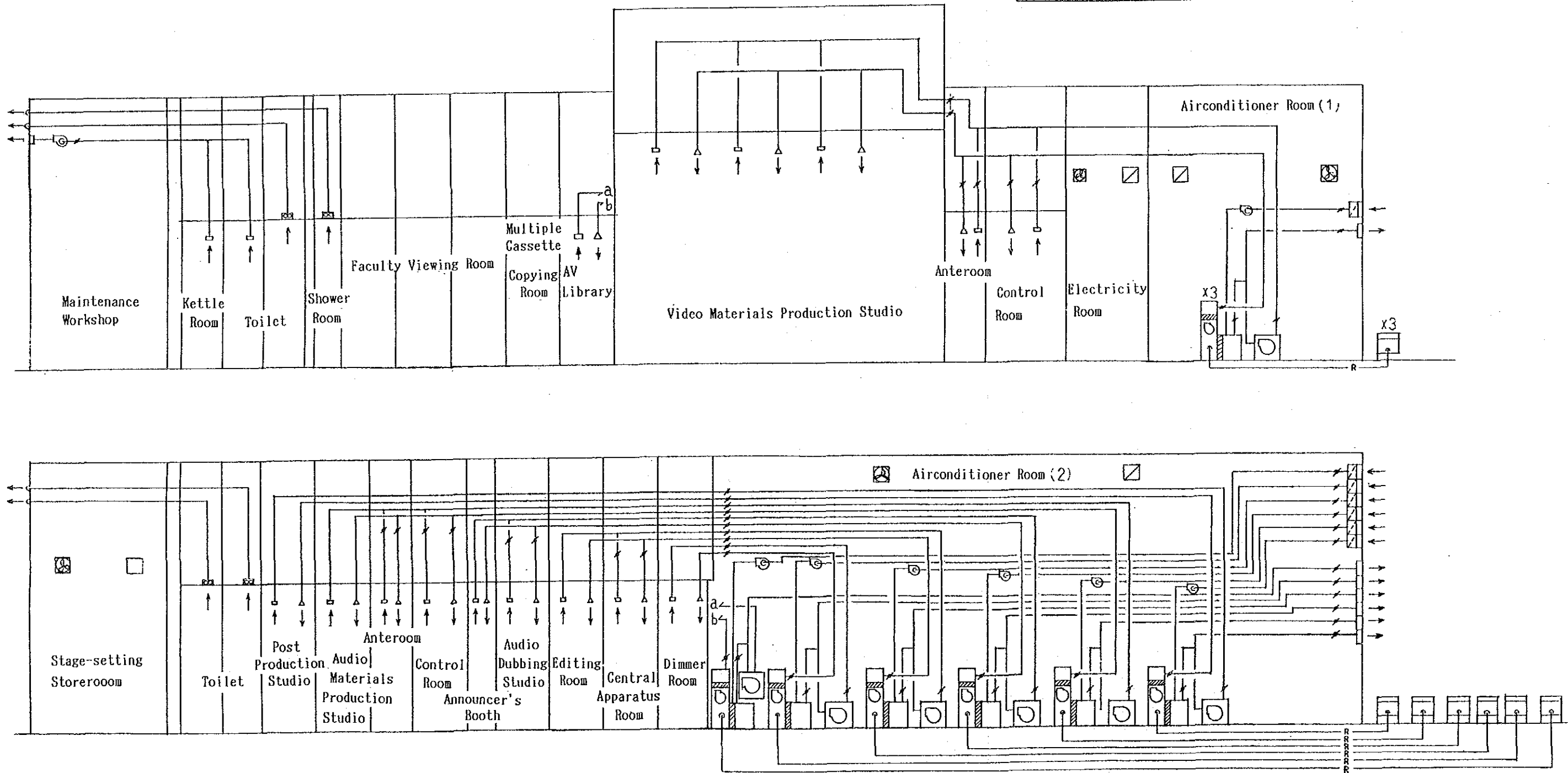


Fig. 4 - 1 3 SCHEMATIC DIAGRAM OF AIRCONDITIONING SYSTEM OF THE AV EDUCATION CENTRE

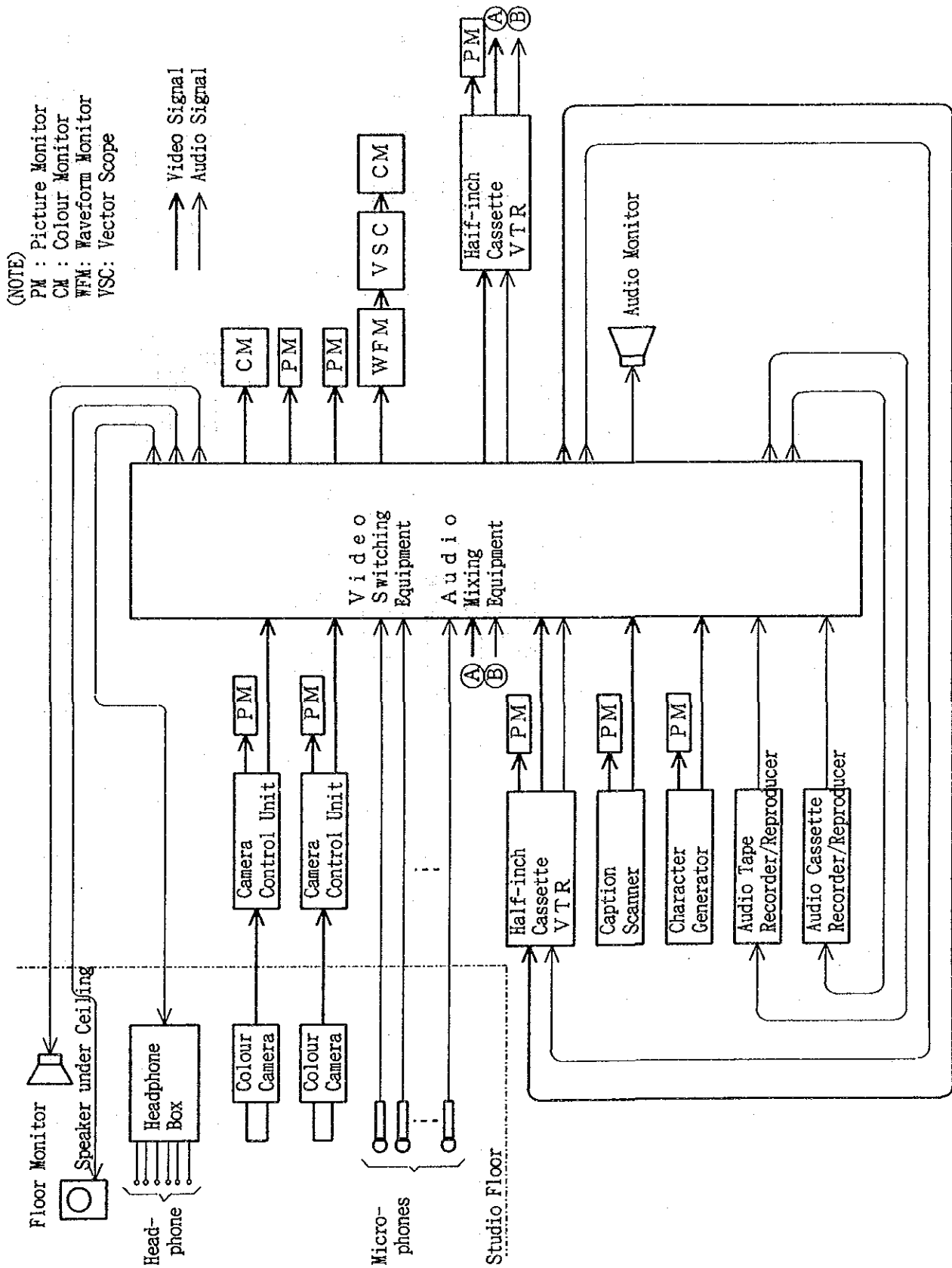


Fig. 4-14 DIAGRAM OF VIDEO MATERIAL PRODUCTION STUDIO SYSTEM

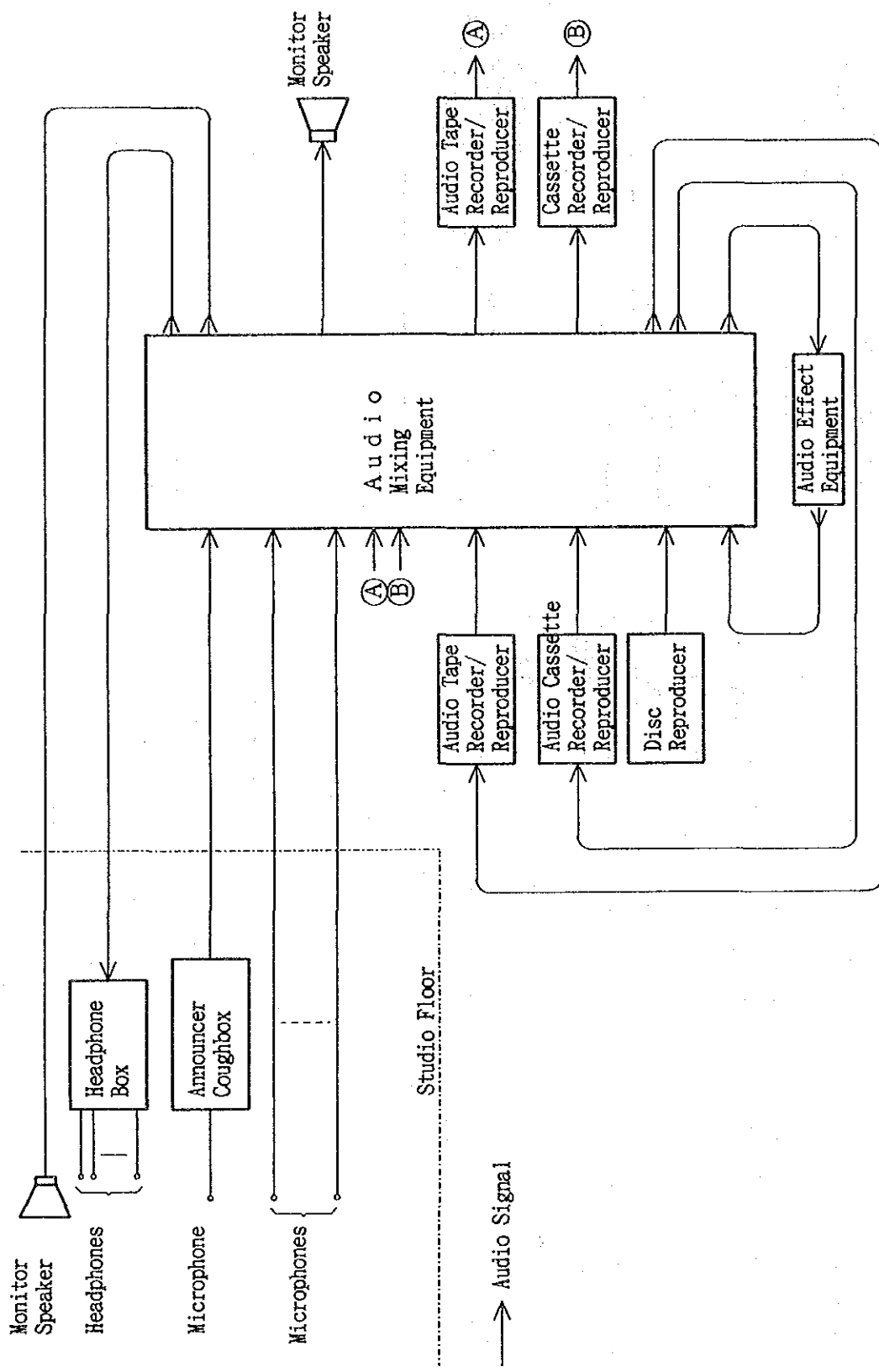


Fig. 4-15 DIAGRAM OF AUDIO MATERIAL PRODUCTION STUDIO SYSTEM

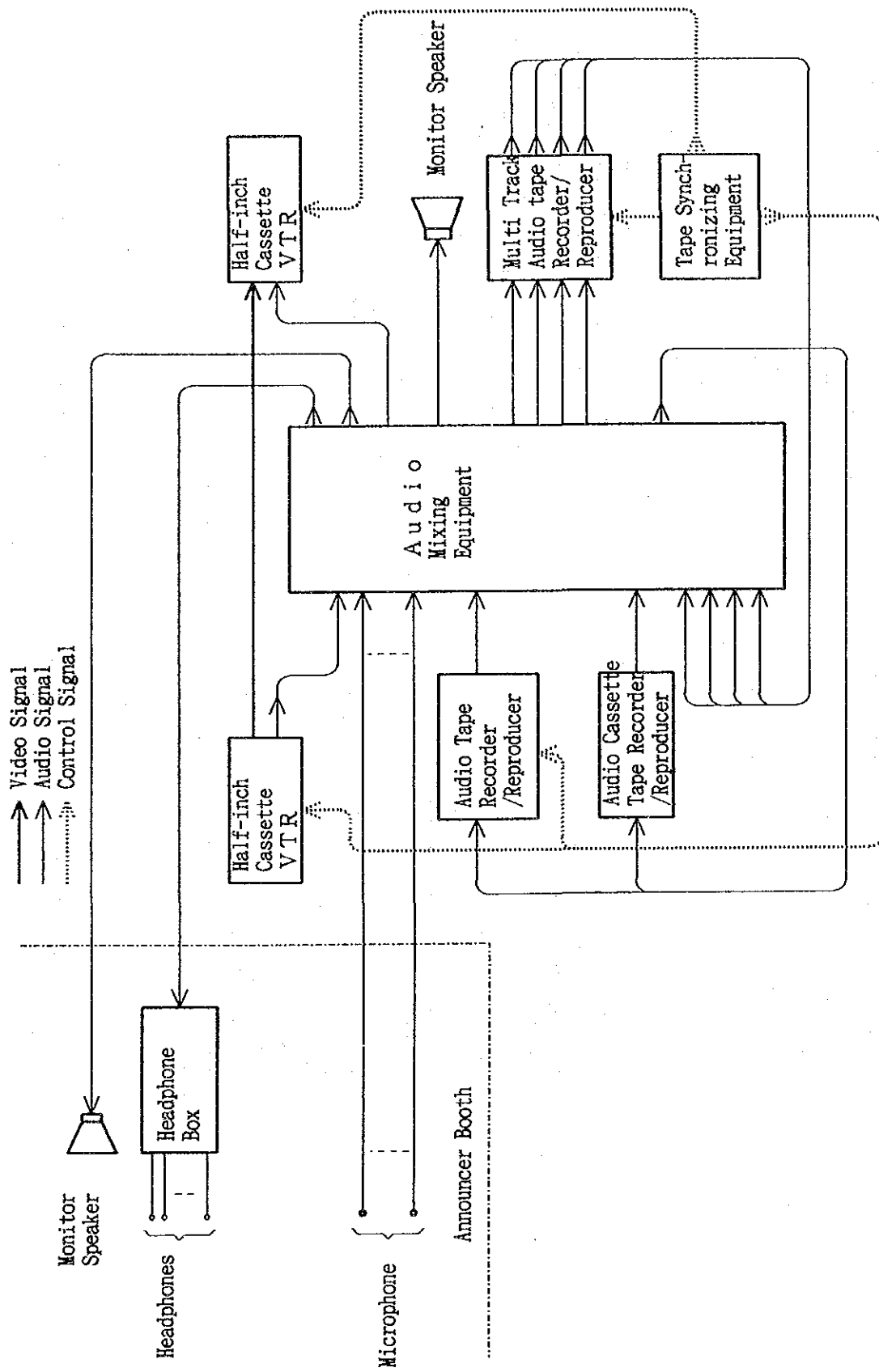


Fig. 4-16 SYSTEM DEIAGRAM OF AUDIO DUBBING STUDIO

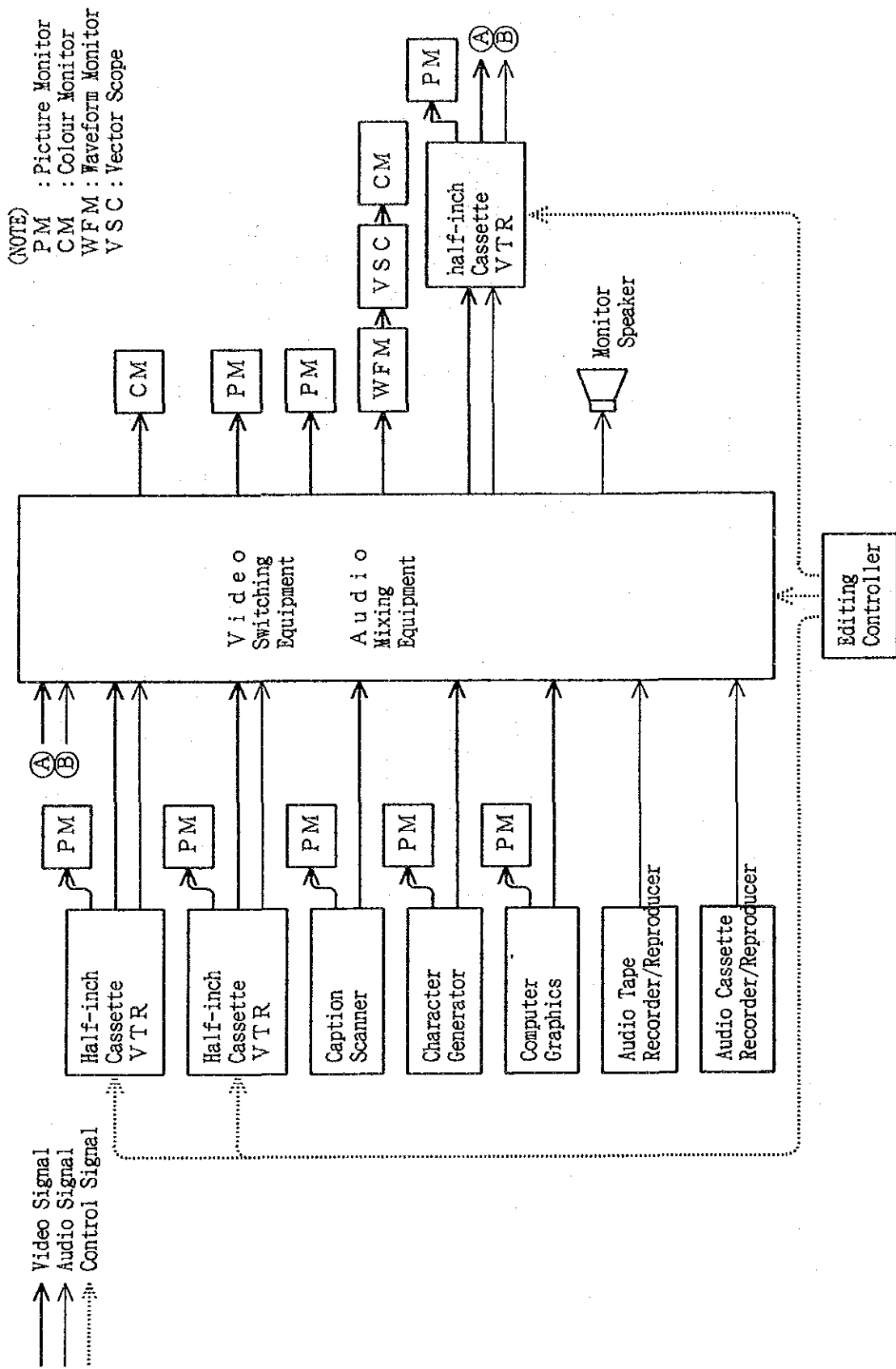


Fig. 4-17 SYSTEM DIAGRAM OF POST PRODUCTION STUDIO

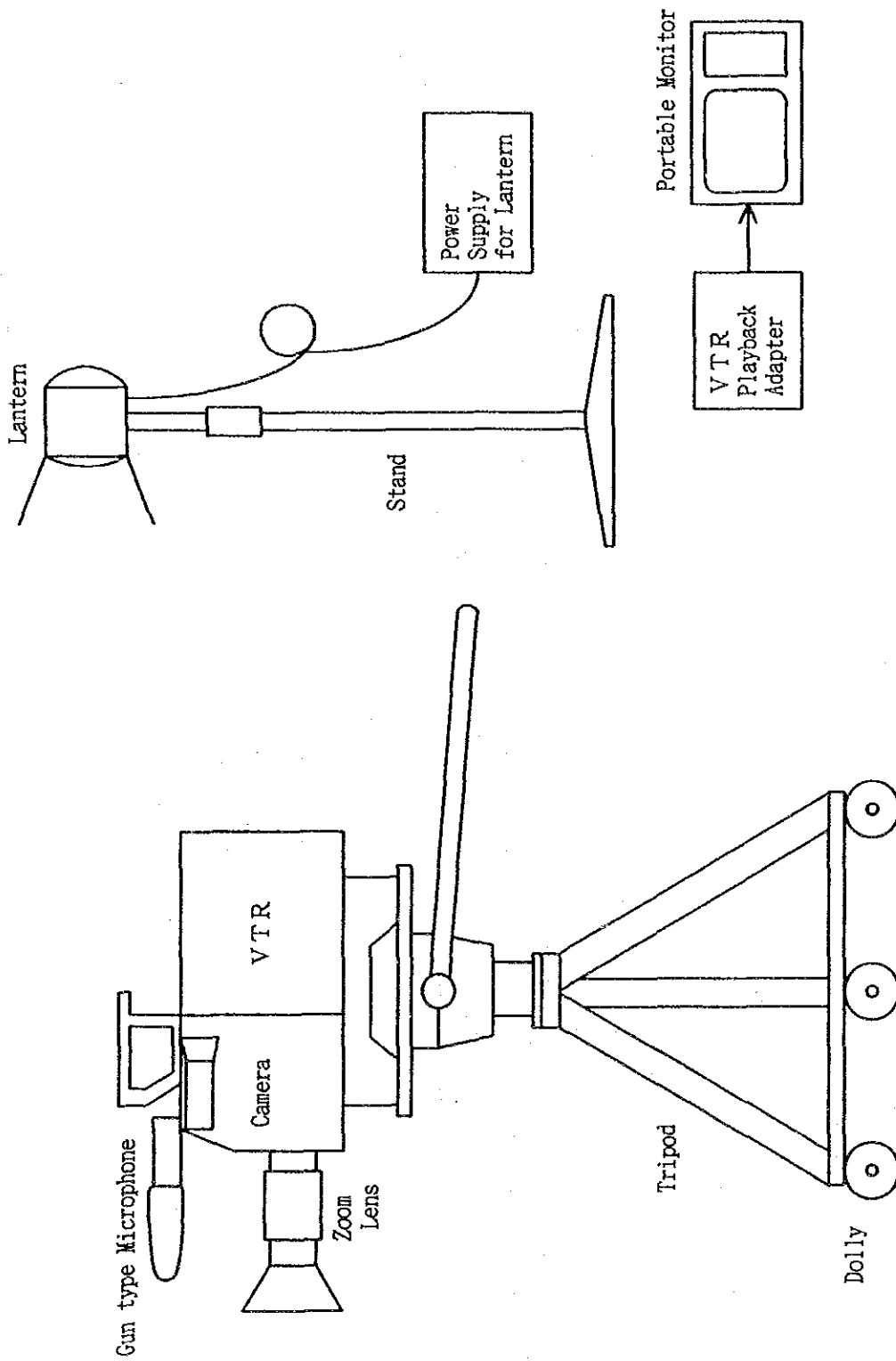


Fig. 4-18 DIAGRAM OF OUTDOOR COVERAGE SYSTEM

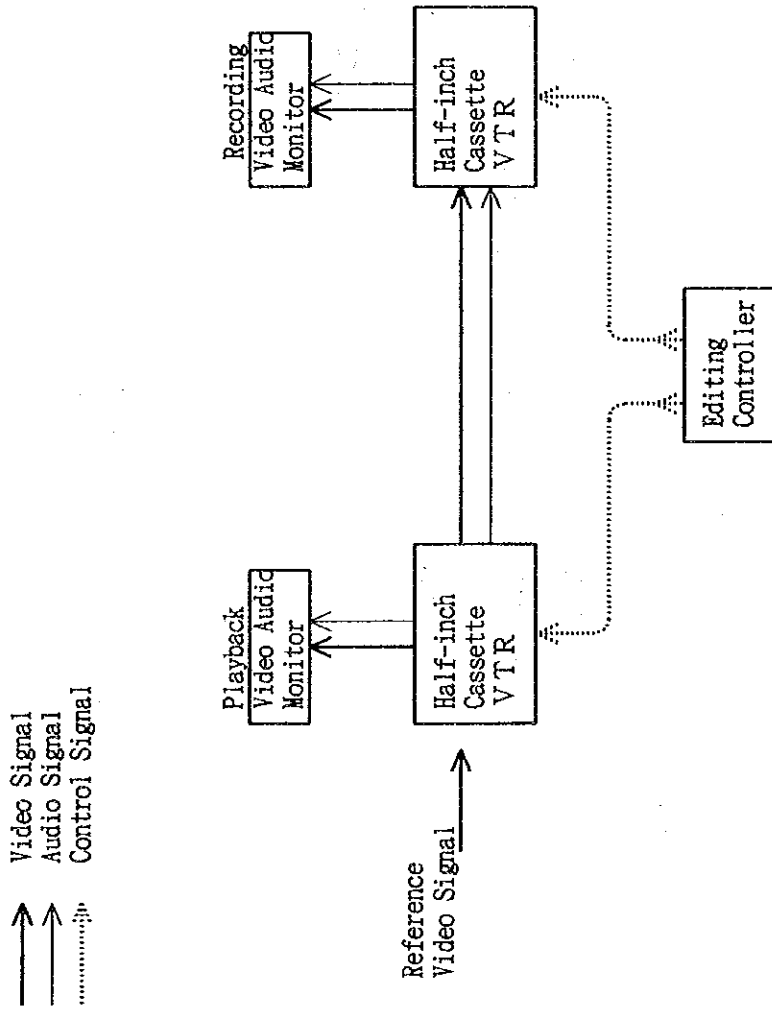


Fig. 4-19 DIAGRAM OF EDITING ROOM SYSTEM

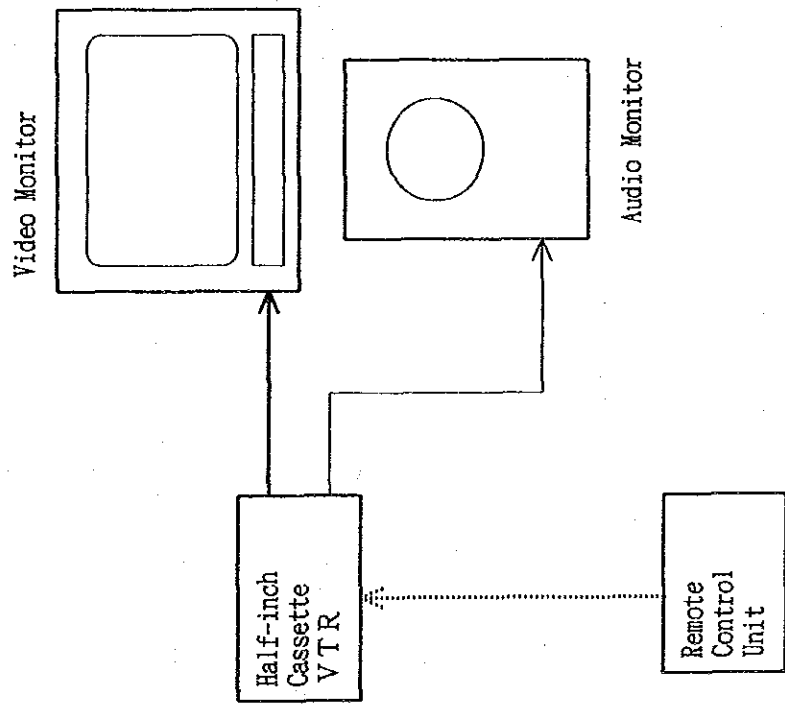


Fig. 4-20 DIAGRAM OF FACULTY VIEWING ROOM SYSTEM

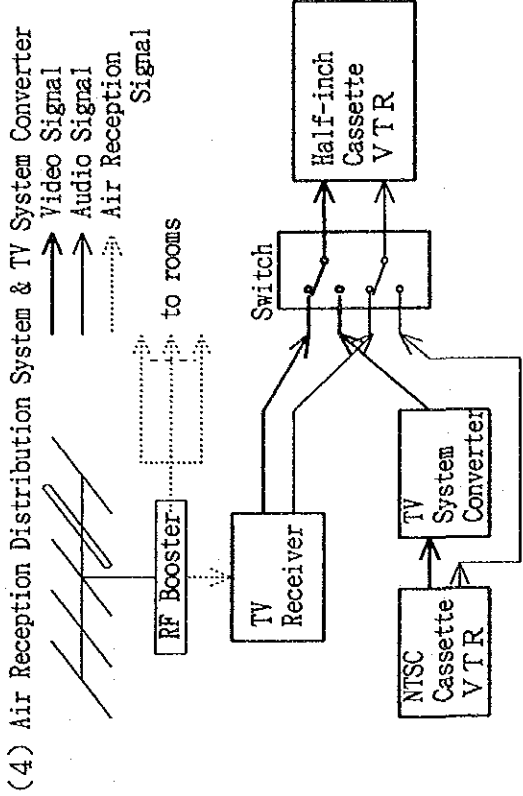
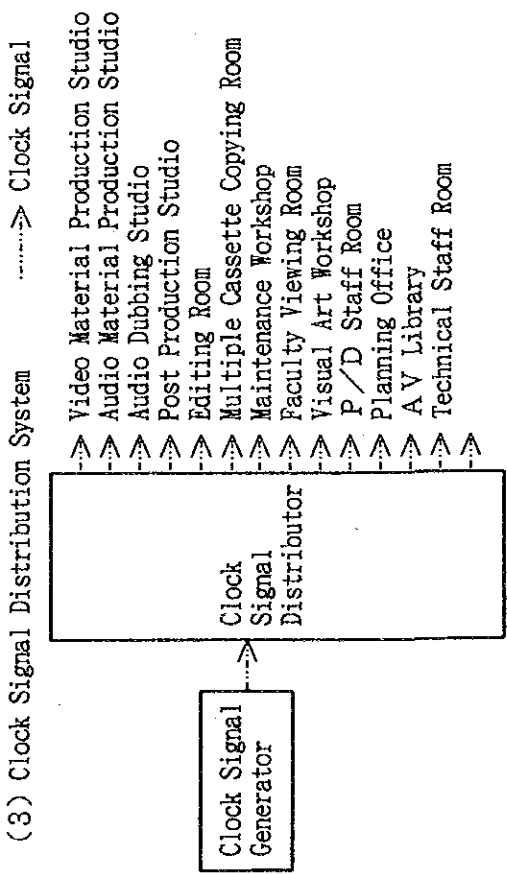
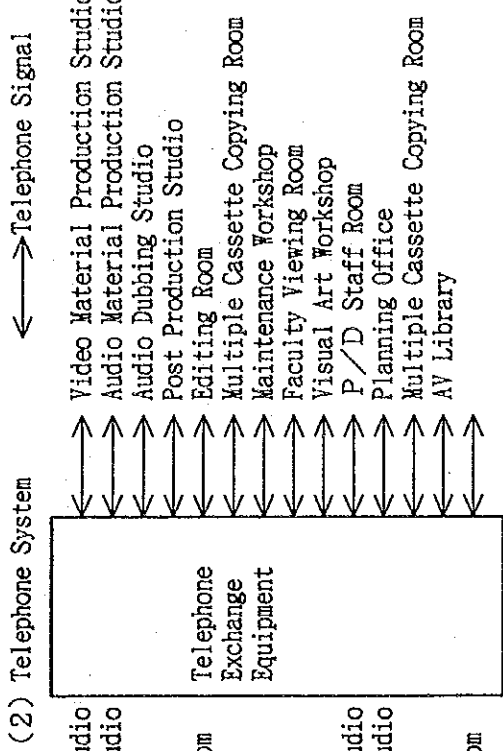
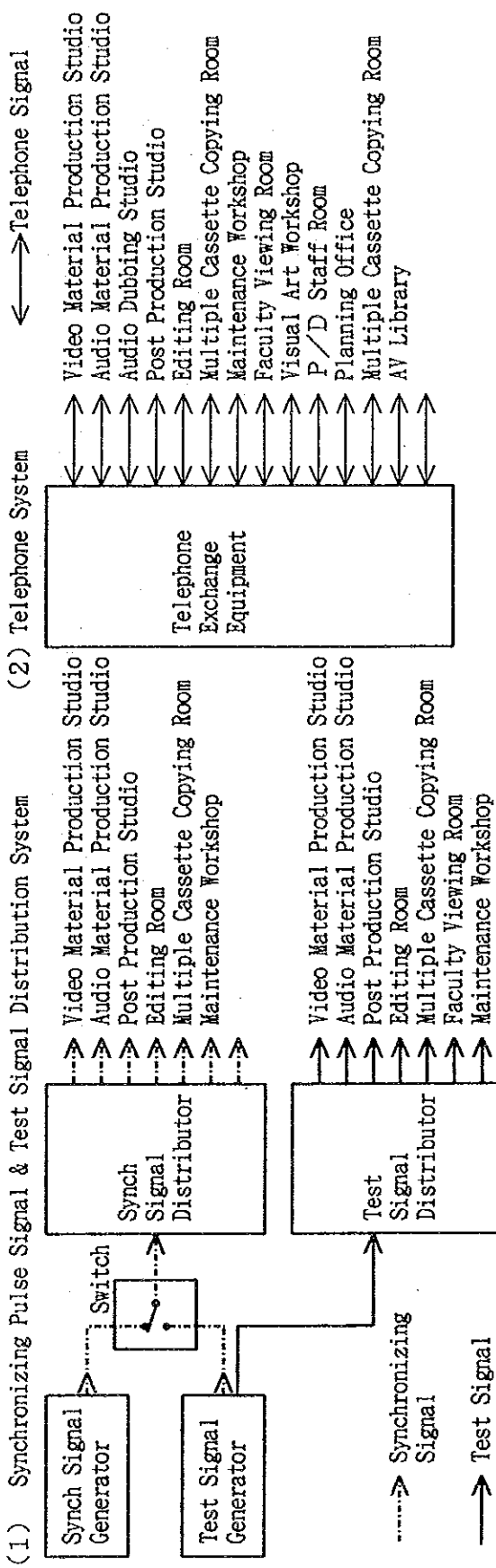


Fig. 4-21 DIAGRAM OF CENTRAL APPARATUS ROOM SYSTEM

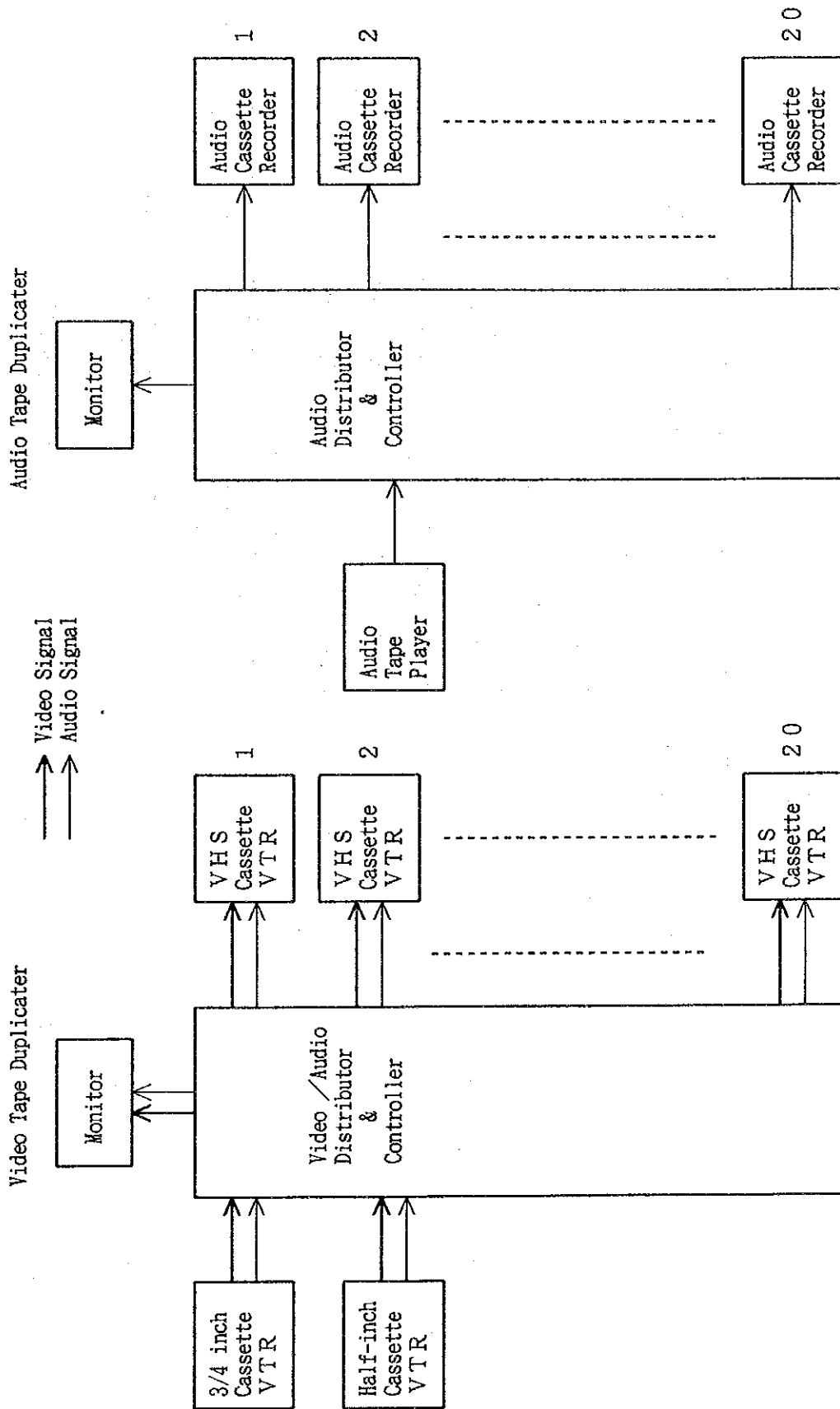


Fig. 4-22 DIAGRAM OF MULTIPLE CASSETTE COPYING ROOM SYSTEM

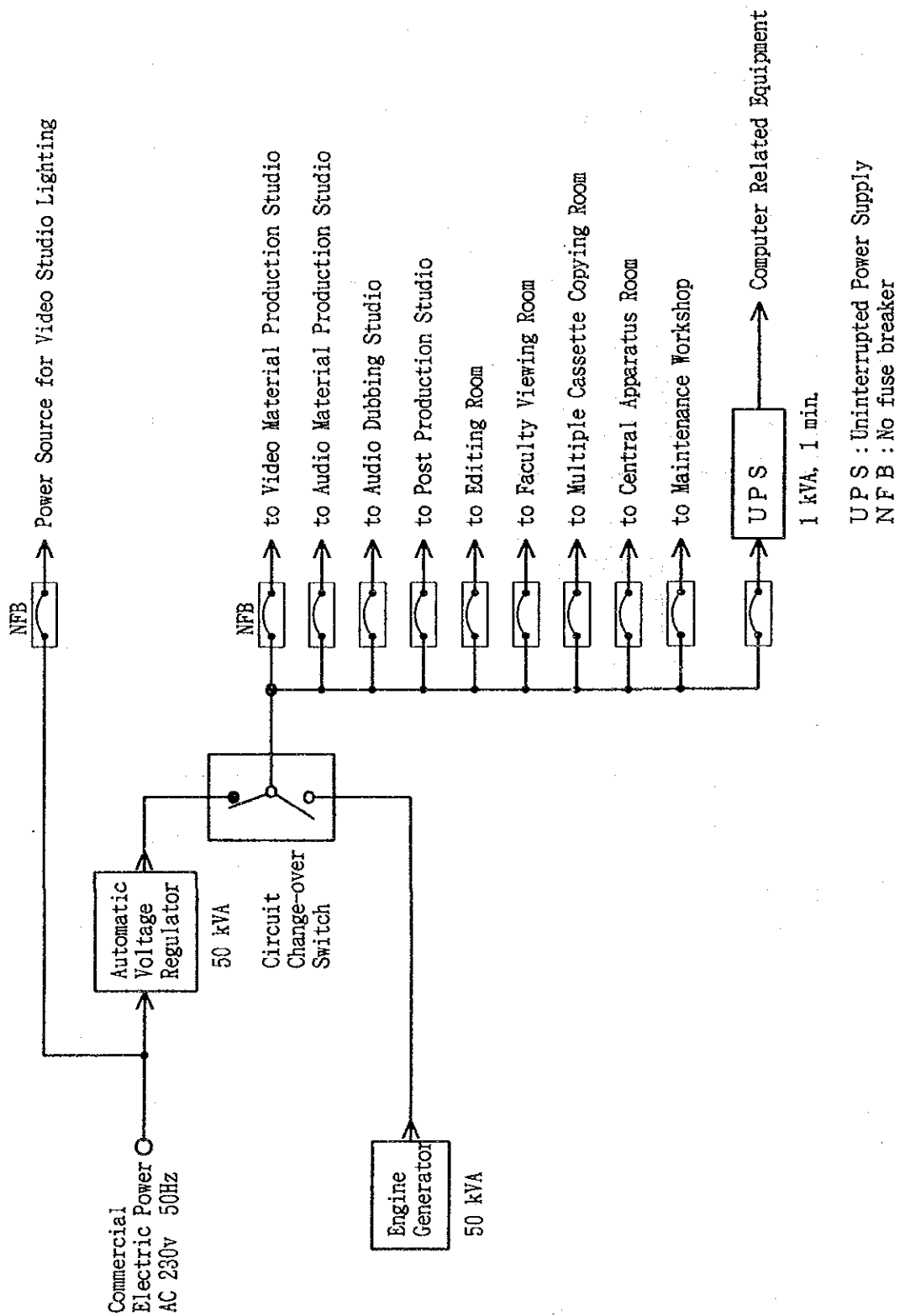


Fig. 4-23 DIAGRAM OF POWER SUPPLY ROOM SYSTEM

4-4 Implementation Plan

4-4-1 Implementation Policy

With regard to the construction of the facilities and provision of equipment under this project, the entire work from the executive designing to completion and delivery shall be undertaken by the consultant company of Japan in accordance with the policy of the Japanese government that provides the Grant Aid cooperation. The basic implementation policy for the execution of this project is as follows:

- (1) In conducting the construction work, every possible measure will be taken to ensure that the work will in no way hinder the operation of the existing facilities.
- (2) The construction work shall be finished completely within the scheduled period of work and full consideration shall be given to safety measures.
- (3) Close contact shall be maintained with the Sri Lankan side and a harmonious system of cooperation between the two sides shall be established for the execution of the construction work.
- (4) All Sri Lankan laws and orders pertaining to electric power source, construction work, radio communication, etc., shall be followed and all the customs and labour conditions in Sri Lanka shall be respected.
- (5) All necessary measures shall be taken to ensure perfect storage and management of construction materials and equipment.

4-4-2 Construction Conditions

The construction industry in Sri Lanka has been making a steady progress during the past 15 years, achieving an annual growth of 12-13%. Particularly remarkable has been the growth of the housing industry which, during the last 3 years, has nearly doubled in output, with a growth rate of about 190%. Including the non-housing and general civil-engineering sectors, the entire construction industry in Sri Lanka has shown a total growth of 177%. The main cause of this spectacular growth of the output of the construction industry in Sri Lanka can be found in the Government's energetic investment activities and also in the increasing economic assistance from foreign countries. However, it seems that the sharp increase in the construction expenses and labour costs may be one other factor contributing to the remarkable growth of the construction industry.

In fact, some of the main construction materials have risen in cost by as much as 40-90% during the last four years, while the labour charge of skilled workers has soared by 90%.

In Sri Lanka, when a public building is constructed, there are cases where the department in charge at the ministry concerned or the public corporation in charge of construction works undertake the entire process of work including the actual construction work itself. Of the four buildings currently being constructed on the new campus of OUSL, one is being taken charge of by a public corporation under government supervision. There also is a corporation called the Building Materials Corporation that is engaged in the sale and supply of building materials. The construction organizations under government supervision have the capacity to undertake large-scale construction works but they normally do not take part in private works. On the other hand, the private construction firms rarely receive large-scale construction orders. So, in the case of large-scale construction works, the construction is usually conducted by the subcontractors of foreign-capital firms or foreign companies.

As to the construction technology and techniques, one cannot expect so high a level owing to various circumstances, such as, shortage of skilled workers, lack of sophisticated construction techniques and the delay in mechanization. As to the installation of equipment and facilities, too, one must be ready to face the situation in which few reliable firms can be found as far as the special types of work, such as the laying of ducts, are concerned.

In Sri Lanka, even though the construction activities today are somewhat more active than at the time of racial disputes, the supply capability for building materials has not yet been fully restored. Especially for such key materials as cement, reinforcing rods and steel frames, the nation has essentially been dependent on imports for quite some time and therefore it is important that measures be taken as soon as possible for the procurement of these essential building materials.

Furthermore, prior to the start of the construction work, there is the need of submitting an application for confirmation by the authorities concerned in relation to the UDA Planning and Building Regulations based on the city-planning of Colombo.

As to the construction work concerning interior finish, installation of noise-insulation fittings and that of airconditioning facilities, all in relation to the processing of acoustics around the studios, it is necessary to send a staff from Japan to give technical guidances, since these construction works involve many factors that greatly affect the performances of the studios.

It must also be emphasized that, since the construction of the AV Education Centre is going to be conducted in parallel with the second phase of the work to construct the buildings on the new campus, the work now being pushed ahead by OUSL, it is most essential to maintain harmonious cooperative relations with those in charge of work at OUSL and do utmost to ensure that each other's work will not in any way obstruct the progress of the work being conducted by the other.

4-4-3 Construction and Supervisory Plan

A considerable amount of finish materials for the construction of the AV Education Centre and almost all of the items of equipment required for the production of AV teaching materials will be brought into Sri Lanka from Japan. Consequently, any delay in transportation will directly result in the delay of the construction work itself. Therefore, with regard to the transport from Japan of materials and equipment from their shipment to unloading in Sri Lanka, which is estimated to require 40-45 days, thorough-going preparations and careful supervision will be necessary. Especially in regard to the two studios which are to be the core of the projected AV Education Centre, there is the need of conducting the construction work according to a well-examined detailed timetable. Specifically for the interior finish work and installation of AV equipment in these two studios, which require special techniques and expertise, specialized companies with rich experience will be selected and, at the same time, an expert staff to give technical guidance will be sent from Japan. The consultant company, meanwhile, will conduct executive designing and will assign appropriate personnel to take charge of supervisory work. It will do everything in its power to ensure that the construction work will be carried out smoothly, safely and in such a way as to bring forth high-quality results by keeping in close touch not only with the organizations concerned on the Japanese side but also with those on the Sri Lankan side. Furthermore, in order to prevent the occurrences of any trouble or accident, and also to ensure appropriate and speedy

measures if any problem has arisen, the consultant company will make its best endeavours to give necessary guidances and advice.

4-4-4 Procurement Plan

(1) Construction Materials

While such building materials as reinforcing rods, moulds, concrete and bricks, all of which are to constitute the core of the main body of the building, are procurable in Sri Lanka, it is most important to make efficient and sure arrangements, since these materials will be needed soon after the start of the construction work and in substantial quantities. Among the finish materials, some of them, such as plywood, asbestos slate boards (including the waveform-surfaced ones) and tiles, are available from among the home-made products, but those of higher quality are imports and so there is a problem about the quantities in stock. Therefore, with regard to the finish materials, especially those for interior-finish use, all of them, with reliable quality, will be imported from Japan in substantial quantities. The material procurement plan is as shown in Table 4-5.

Table 4-5 Material Procurement Plan

Material	Sri Lanka	Japan	Reasons
Sand	○	—	Sand is manually scooped out upstream in the Mahaweli. Large scoop in a lump is difficult.
Gravel	○	—	Gravel is produced in small factories in the central mountain district and outside Kandy. Large production in a lump is difficult.
Cement	○	—	Though there are local factories, production is small. Imports are on the market in quantities and procurement is not difficult.
Steel bar	—	○	Though steel bar is produced domestically, the imports from India and Taiwan are on the market. The quality is poor, especially for processing.
Brick	○	—	Since there are many manufacturers in Colombo and Kandy, supply is sufficient. However quality is not well controlled and its exposure use is not appropriate.
Terrazzo tile	○	—	The tile is domestically used as common floor finishing material and appropriate in quality and sufficient in supply.

Material	Sri Lanka	Japan	Reasons
Rockwool acoustic board	—	○	Supply and variety are scanty.
Asbestos cement board	○	—	Though supply and variety are scanty, local products are to be used for some purposes.
Wood	○	—	Most wood on the market is hard and of tropical nature, suitable for fittings but not for construction.
Glass	○	○	The imports from Indonesia, Australia and Europe are on the market. They are short of smooth-facedness. No figured glass is available.
Metal fittings	—	○	The material of aluminum sash is imported, processed and assembled into the sash. The quality is inappropriate. The circumstances are the same with steel door.
Roof tile	○	—	Though burning temperature is low and the product is fragile, this is a traditional material.
Insulator	—	○	Imports are available but variety is scanty.
Painting material	○	—	Though local products are a little inferior, they are to be used for general specifications.
Vinyl pipe	—	○	The products available locally are short of thickness and supply.
Sanitary ware	—	○	Variety is scanty and quality is inappropriate.
Airconditioning equipment	—	○	Not manufactured locally.
Light fixtures	—	○	Variety is scanty and quality is inappropriate. However lamps are supplied with local standard pieces.
Wire · cable	—	○	Variety is scanty and quality is inappropriate.

(2) AV Equipment

All the materials and AV equipment to be installed at the AV Education Centre will be procured in Japan. Video viewing equipment for the 13 Study Centres will be procured at the local market in Sri Lanka.

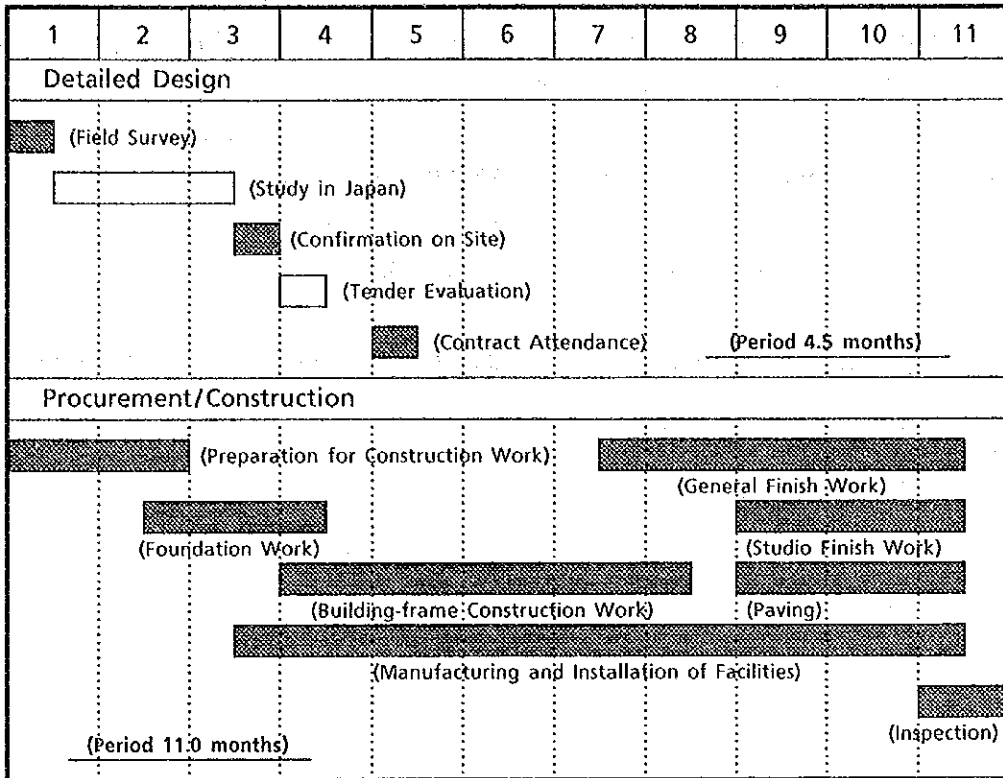
4-4-5 Implementation Schedule

With regard to the implementation procedures, a designing and supervision contract will be concluded between the Government of Sri Lanka and the Japanese consultant company after the Exchange of Notes between

the Government of Japan and the Government of Sri Lanka. And then, after the detailed design and tender documents are prepared, a tender will be held for participation by Japanese companies. After that, on completion of the evaluation of the outcome of the tender, a construction contract will be signed and the construction work will be started.

The construction period shall be divided into two phases, one phase is for construction of facilities and the other for installation of equipment. The period required for the 1st phase will be 4.5 months for the detailed design and 11 months for the procurement and construction, while the period for the 2nd phase will be 3.5 months for the detailed design and 11 months for the procurement and installation. The implementation schedule is shown in Fig. 4-24.

(1) The First Phase (Facilities)



(2) The Second Phase (Equipment)

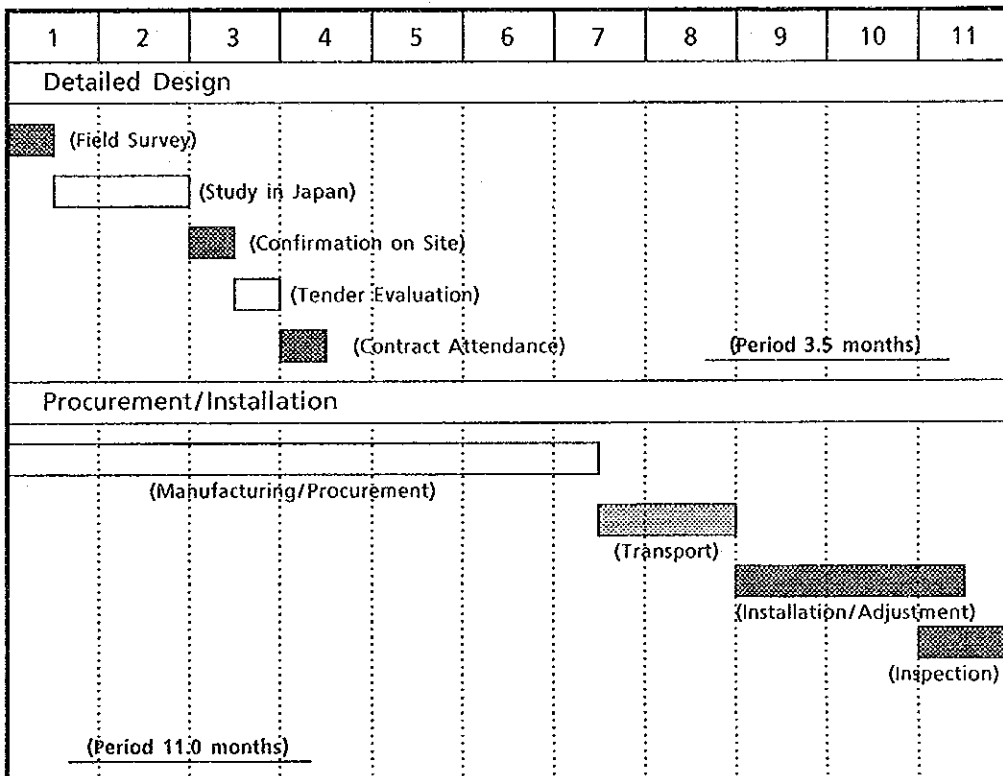


Fig. 4-24 Implementation Schedule

4-4-6 Scope of Work

The total amount of expenses required to be borne by the Sri Lankan side is estimated at Rs 644,000 (about 2 million yen in Japanese currency). The details are as follows.

- | | |
|------------------------------------|-------------------------------------|
| (1) Electrical construction cost | 326,400 Rs. (approx. ¥1.1 million) |
| (2) Water-supply construction cost | 0 Rs. |
| (3) Drainage construction cost | 109,800 Rs. (approx. ¥0.37 million) |
| (4) Telephone installation cost | 207,700 Rs. (approx. ¥0.7 million) |

CHAPTER 5 PROJECT EVALUATION AND CONCLUSION

CHAPTER 5 PROJECT EVALUATION AND CONCLUSION

5-1 Effects of the Project

The following is a table showing the present status and problems, the measures to be taken according to the project and the expected effects of its implementation.

Present Status and Problems	Measures to be Taken under This Project	Effects of the Project and Degree of Improvements Expected
<p>The main point of OUSL's distance education lies in the effective use of AV teaching materials. Hence, the fervent desire of OUSL to boost the production of AV teaching materials.</p> <p>However, because of the inadequacy of the existing production facilities, OUSL is finding it impossible to improve AV teaching materials.</p> <p>Owing to the inadequacy of AV teaching materials, the students are obliged to rely mainly on textbooks, and this has been making it difficult for them to improve the efficiency and level of studies.</p>	<p>Under this project, an AV Education Centre will be constructed at the Colombo headquarters of OUSL and planned for the following facilities and equipment:</p> <p>video teaching material production studio facilities, audio teaching material production studio facilities, dubbing studio facilities, post production studio facilities, editing rooms facilities, outdoor coverage equipment, tape copying room facilities and production related rooms.</p> <p>Video viewing equipment will be planned for each study centre, 13 in all.</p>	<p>The number of AV materials produced and stored by OUSL will increase significantly. At present OUSL has about 240 audio and about 70 video materials. If the project has been smoothly implemented and operated, by the year 2000 which is the goal line of the OUSL's development plan, OUSL will store anew about 600 audio and about 500 video materials.</p> <p>As a result of the increase of AV materials and of the subjects with the combined use of printed textbooks and AV materials, students' study efficiency will be enhanced substantially. Moreover, as a result of the spreading of effective education using AV materials, further enhancement of study levels can be realized.</p> <p>The implementation of the project will make it feasible for OUSL to improve the contents of its education and to cope with a plan of greatly increasing its enrollment (from 14,800 in 1990 to 50,000 in 2000), and will lead to the fostering of excellent human resources in great numbers.</p>

5-2 Conclusion

When this project is executed, it may be expected that the contents of education given by OUSL using AV teaching materials will be improved dramatically and that this will lead to more effective fostering of excellent human resources. Especially in Sri Lanka where the number of university graduates is restricted, such human resources of high caliber can be expected to carry out important responsibilities as the core of the work force taking part in the national development activities.

Furthermore, when the AV Education Centre comes to produce AV materials for the whole higher education in Sri Lanka, not only OUSL students but also all the other students on higher education level will enjoy the benefits of the Centre.

OUSL, which is the executing and operating body for this project, has already established concrete plans for maintenance and management of the AV Education Centre and, having obtained a formal approval from UGC concerning the increase of personnel and budget for the Centre, is getting ready with great enthusiasm to carry out the project. Therefore, there is no problem whatever concerning the execution and operation of the project.

Accordingly the project is judged appropriate to be executed on Japanese grant aid cooperation.

However, to ensure that optimum use is made of the AV Education Centre, the following training should be provided for engineering and production personnel.

- (1) With technical cooperation from Japan, training will be conducted in the form of on-the-job training, from the time the AV Education Centre goes into operation. For that purpose, two experts, one specializing in engineering and one in producing, are to be sent from Japan on a long-term basis.
- (2) Several of OUSL's senior staff members responsible for production work will be accepted for a short period into the work-place producing teaching materials in Japan to have them undergo training in the production work.

- (3) OUSL will consider taking advantage of JICA's Third Country Training Programme in broadcasting sector for its staff training.
- (4) Prior to the start of operation of the AV Education Centre, OUSL will send new employees to the training facilities of SLRC and SLBC in Colombo to have them undergo basic training in the production of teaching materials (programmes). Through this arrangement, the educational effects of the on-the-job training by Japan's experts will be further enhanced.

Concerning the recruitment of maintenance staff, it is prerequisite for OUSL to set up a system for preventive maintenance with strength enough to conduct regular maintenance work.

Side by side with its efforts to further enrich the AV teaching materials, OUSL will be required to improve and expand the listening/viewing system at regional/study centres.

APPENDIX

1. Member Lists of the Study Teams
2. Study Schedules
3. Member List of the Sri Lankan Parties Concerned
4. Minutes of Discussions
5. Country Data of Sri Lanka
6. Subject List of OUSL

1. Member Lists of the Study Teams

(1) Basic Design Study Team

<u>Name</u>	<u>Assignment</u>	<u>Post</u>
Dr. Hidetoshi KATO	Leader	Director General, National Institute of Multimedia Education, Ministry of Education
Mr. Makoto KUMAGAI	Cooperation Planning	Engineering Division, Broadcasting Bureau, Ministry of Posts and Telecommunications
Mr. Takumi MATSUDA	Grant Aid	Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
Mr. Shozo NAKANO	Survey Leader Studio Plan	NHK Integrated Technology Inc.
Mr. Hideo SATO	Studio Equipment	Ditto
Mr. Shigeo HORI	AV Production Equipment Cost Estimation	Ditto
Mr. Kiyoshi UEDA	Building Design	Ditto
Mr. Yoshishige NAGANO	Building Facilities	Nippon Sogo Architects & Engineers (NSK)

(2) Draft Final Report Discussion Team

<u>Name</u>	<u>Assignment</u>	<u>Post</u>
Dr. Hidetoshi KATO	Leader	Director General, National Institute of Multimedia Education, Ministry of Education
Mr. Takayuki SUZUKI	Cooperation Planner	Special Advisor for International Cooperation, International Cooperation Division, Communications Policy Bureau, Ministry of Posts and Telecommunications
Mr. Satoru WATANABE	Project Coordinator	Staff, Second Basic Design Study Division, Grant Aid Study & Design Department, Japan International Cooperation Agency
Mr. Shozo NAKANO	Studio Planner	NHK Integrated Technology Inc.
Mr. Kiyoshi UEDA	Architectural Planner	Ditto

2. Study Schedules

(1) Basic Design Study Team

No.	Date	Officials	Consultants
1	Feb. 28 (Thu)	Travel from Tokyo to Colombo (UL457)	
2	Mar. 1 (Fri)	Courtesy calls at JICA Office, Embassy of Japan, OUSL and ERD	
3	2 (Sat)	Move to Matara, Visit to the Regional Centre, Overnight Stay in Galle	
4	3 (Sun)	Visit to the Study Centres at Galle, Ambalangoda and Kalutara, Move to Colombo, Dr. KATO: Travel from Tokyo to Colombo (SQ402)	
5	4 (Mon)	Meeting at OUSL, Courtesy Call at UGC, Explanation on the Inception Report and Submission of a Questionnaire at OUSL	
6	5 (Tue)	Discussion at OUSL, Move to Kandy, Overnight Stay in Kandy	
7	6 (Wed)	Visit to the Kandy Regional Centre, Move to Colombo	
8	7 (Thu)	Discussion at OUSL	
9	8 (Fri)	Courtesy call on the Minister of Education, Signing of the Minutes, Reporting to Embassy of Japan and JICA Office, Officials: Travel from Colombo to Singapore (SQ401)	
10	9 (Sat)	Travel from Singapore to Tokyo (SQ012)	Collection of Materials
11	10 (Sun)		Putting the Materials in order, 2 Consultants: Travel from Tokyo to Colombo (SQ402)
12	11 (Mon)		Detailed study of OUSL (Educational system, university management, existing facilities, AV material production, project site, construction plans)
13	12 (Tue)		Detailed study of OUSL, Survey of Power Company, Waterworks Bureau
14	13 (Wed)		Detailed study of OUSL, Survey of Fire Board, Market Survey
15	14 (Thu)		Detailed study of OUSL

No.	Date	Officials	Consultants
16	15 (Fri)		Detailed study of OUSL
17	16 (Sat)		Detailed study of OUSL, Market Survey
18	17 (Sun)		Market Survey
19	18 (Mon)		Detailed study of OUSL (incl. future plans for production of AV materials)
20	19 (Tue)		Survey of SLBC, SLRC, City Planning Bureau and Meteorological Bureau
21	20 (Wed)		Supplementary Study of OUSL, Survey of Electricity Agency
22	21 (Thu)		Supplementary Study of OUSL, Survey of Ministry of Posts and Telecommunications
23	22 (Fri)		Supplementary Study of OUSL, Reporting to JICA Office
24	23 (Sat)		Travel from Colombo to Singapore (SQ401)
25	24 (Sun)		Travel from Singapore to Tokyo (SQ012)

(2) Draft Final Report Discussion Team

No.	Date	Schedule
1	June 23 (Sun)	Travel from Tokyo to Singapore (SQ097). Travel from Singapore to Colombo (SQ402)
2	24 (Mon)	Courtesy Calls at JICA Office, Embassy of Japan, Ministry of Education, ERD and OUSL
3	25 (Tue)	Meeting with UGC Chairman, Explanation and Discussion on the Draft Final Report at OUSL, Move to Kandy (Mr. Suzuki and Mr. Watanabe)
4	26 (Wed)	Visit to the Kandy Regional Centre, Move to Colombo
5	27 (Thu)	Preparation and Signing of the Minutes at OUSL, Collection of Supplementary Data
6	28 (Fri)	Reporting to JICA Office and Embassy of Japan, Dr. KATO: Travel from Colombo to Singapore (SQ401), Collection of Supplementary Data
7	29 (Sat)	Survey of SLRC and SLBC, Dr. KATO: Travel from Singapore to Tokyo (SQ012)
8	30 (Sun)	Survey of SLRC, Data Filling
9	July 1 (Mon)	Collection of Supplementary Data, Market Survey
10	2 (Tue)	Meeting with UGC Chairman, Collection of Supplementary Data
11	3 (Wed)	Visit to SLTTI, Collection of Supplementary Data, Reporting to JICA Office and Embassy of Japan, Travel from Colombo to Singapore (SQ401)
12	4 (Thu)	Travel from Singapore to Tokyo (SQ012)

3. Member List of the Sri Lankan Parties Concerned

Ministry of Education and Higher Education

Hon. Lalith Athulathmudali	Minister
Mr. M.D.D. Pieris	Secretary
Mr. A.P. Abeysinghe	Director, School Works
Mr. U.S.P. Senaratne	Head, Policy Planning and Review Division

Ministry of Finance

Mr. Senarat Weerapana	Deputy Director, External Resources Department
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Ministry of Posts and Telecommunications

Mr. K.K. Gunawardana	Director, Policy Planning and Implementation
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University Grants Commission

Prof. A.P.R. Aluwihare	Chairman
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Open University of Sri Lanka (Headquarter)

Prof. Dayantha S. Wijeyesekera	Vice-Chancellor
Prof. (Mrs.) D.E.M. Kotalawela	Dean, Faculty of Humanities and Social Sciences and Professor of Education
Prof. (Mrs.) Nalini Ratnasiri	Dean, Faculty of Natural Sciences and Professor of Zoology
Prof. H. Sriyananda	Dean, Faculty of Engineering Technology and Professor of Civil Engineering
Dr. G.M.K.B. Gunaherath	Senior Lecturer in Chemistry
Mr. W.V.K.M. Abeysekera	Senior Lecturer, Civil Engineering Division Faculty Representative, ET Board
Mr. Upali Vidanapathirana	Head, Social Studies Division Acting Head, Management Studies
Dr. W.L. Sumathipala	Representative, Mathematics
Mrs. Nobel Perera	Representative, Zoology
Mr. Mahim Mendis	Lecturer in Social Studies
Dr. K.W.S. Kularch	Senior Lecturer
Mrs. L.C. Gurisekera	Lecturer Education
Mr. C.M. Udugama	Teaching Assistant
Mr. Somasiri De Silva	Registrar
Mr. D.G. Jayasuriya	Senior Assistant Registrar
Mr. L.B. Samarakoon	Director, Regional Educational Services

Mr. A. Ranasinghe	Acting Director Operations
Mrs. T.F. Peiris	Acting Bursar
Mr. C.N. De Silva	Project Manager
Mr. R.M.A.G. Ranatunge	Works Engineering
Mr. Sisira Baranage	University Printer
Mr. Kingsley Wanigasundera	Media Officer
Miss Gayani Sanarawickura	Assistant Media Officer
Mr. Sesiri Wijesekera	Programme Assistant
Mr. Lal Guraneadara	Technical Officer
Mr. Gamasena Gamage	Illustrationist
Mr. G.S. Algama	Educational Assistant
Mr. M.N. Somasuri	Audio Visual Technician
Mrs. P.B.R. Fernando	Illustrationist
Mrs. Nirmalie Kannangara	Copy Editor
Mrs. Sita Kunatunga	Editor Educational Technology

Open University of Sri Lanka (Regional / Study Centres)

Mr. U.B. Mavilmada	Regional Officer, Kandy
Mrs. K.D.D.C. Mawilmada	Regional Officer, Matara
Mr. L.R. Gosalkorala	Regional Officer, Ambalangoda
Mr. S.K. Gunathilake	Coordinator, Galle

Engineering Consultants LTD

Mr. Sunil Amendra	Director
Mr. Sheiton Jayatileka	Residence Engineer

Sri Lanka Broadcasting Corporation

Mr. Hudson Samarasinghe	Chairman, Director General
Mr. M.P.A.L. Pinto	Deputy Director General (Engineering)
Rev. A. Iyadurai	Director, Education Services

Sri Lanka Rupavahini Corporation

Prof. Tissa Kariyawasam	Chairman
Mr. Asoka Malimage	Director General
Mr. Upali Arambewale	Deputy Director General (Engineering)
Mr. S.P. Jayasundara	Acting Director Engineering (Studios)

Sri Lanka Television Training Institute

Dr. Dharmapriya Wesumperuma	Director
Mr. Randolph Perera	Engineering Training Coordinator

Ceylon Electricity Board

Mrs. Mignon Sandanayake

Statistician

Lanka Electricity Co., Ltd.

Mr. V.P. Kaduwela

Branch Engineer

4. Minutes of Discussions

(1) Basic Design Study

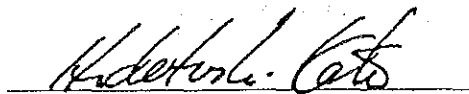
MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE PROJECT FOR ESTABLISHMENT
OF
AUDIO VISUAL EDUCATION CENTRE
IN
THE OPEN UNIVERSITY OF SRI LANKA

In response to the request made by the Government of the Democratic Socialist Republic of Sri Lanka, the Government of Japan decided to conduct a Basic Design Study on the Project for Establishment of Audio Visual Education Centre in the Open University of Sri Lanka (hereinafter referred to as "the Project") and the Japan International Cooperation Agency (JICA) has sent the Basic Design Team headed by Dr. Hidetoshi KATO, Director General, National Institute of Multimedia Education, Ministry of Education, Science and Culture, from February 28 to March 24, 1991.

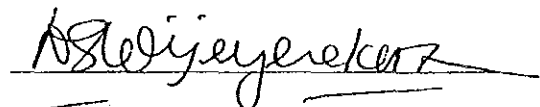
The Team had a series of discussions with the authorities concerned of the Government of the Democratic Socialist Republic of Sri Lanka and conduct a field survey.

As the result of the discussions and field survey, both parties confirmed the main articles as described on the attached sheets. The Team will proceed with the works and prepare the Basic Study Report on the Project based on these articles.

Colombo, March 8, 1991



Dr. Hidetoshi KATO
Leader,
Basic Design Team,
JICA



Prof. D.S. Wijeyesekera
Vice Chancellor,
The Open University of
Sri Lanka,
Nawala, Nugegoda, Sri Lanka

ATTACHMENT

1. Objective of the Project

The objective of the Project is to upgrade distance education by facilitating the production of AV materials both in quality and quantity in OUSL through establishment of the Audio Visual Education Centre, in order to make higher education opportunities available to everyone in Sri Lanka.

2. Executing Agency

Open University of Sri Lanka

3. Necessary Items

The necessary items for realization of the Project requested by the Government of Sri Lanka will be determined in the Basic Design by the Team, based on the request made by the Sri Lankan authorities, after the field study conducted by the Team.

Major facilities tentatively selected are shown in ANNEX I. However, the final list of items to be provided may differ from the above items, if modifications are judged necessary after detailed analysis back in Japan and further discussions with the Sri Lankan representatives.

4. Grant Aid Programme

(1) The Sri Lankan authorities have understood the Japanese Grant Aid System explained by the Team including the principle of use of a Japanese Consultant Firm and a Japanese Contractor for the implementation of the Project.

(2) The Sri Lankan authorities will take necessary measures as listed in ANNEX II on condition that the Grant Aid by the Government of Japan would be extended to the Project.

5. Schedule of the Study Report

(1) JICA will prepare the draft report and dispatch a mission in order to finalize the contents of the report around June 1991.

Handwritten signature and initials
E.S.K.
K.S.S.

(2) In case the contents of the report are accepted in principle by the Sri Lankan authorities, JICA will complete the Basic Design Study Report and submit it to the Government of Sri Lanka around the end of September 1991.

W.K.
R.S.

ANNEX I

- (1) a) Video material production studio (approximately 150 sq.m)
- b) Audio material production studio (approximately 50 sq.m)
- c) Dubbing studio.
- d) Post production studio
- e) Editing booths
- f) Outdoor coverage equipment
- g) Faculty viewing rooms
- h) Visual art workshop
- i) Multiple cassette copying room
- j) Course team conference room
- k) Producer/Director staff rooms
- l) AV library
- m) Maintenance workshop
- n) Power supply room

- (2) The total floor space is tentatively supposed to be around one thousand eight hundred square meters (1,800 sq.m) but will not exceed two thousand square meters (2,000 sq.m).

W.K.
ASUS

ANNEX II

1. To provide data and information necessary for detailed design.
2. To provide the land and space necessary for implementing the Project.
3. To provide facilities for distribution of electricity, drainage, communication and security at the site.
4. To provide necessary permissions, licences and other authorizations for carrying out the Project.
5. To ensure prompt unloading, tax exemption and customs clearance at ports of disembarkation in Sri Lanka and prompt internal transportation therein of products purchased under the Grant.
6. To exempt customs from duties, internal taxes and other fiscal levies which may be imposed in Sri Lanka with respect to the supply of products and services under the verified contracts.
7. To accord without delay to Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contract such facilities as may be necessary for their entry into Sri Lanka and stay therein for the performance of their work.
8. To bear advising commission of Authorization to Pay (A/P) and payment commission to the Japanese foreign exchange bank for the Banking Arrangement.
9. To secure and bear all the expenses, other than those to be borne by the Grant, necessary for construction of facilities as well as for the transportation and installation of the equipment.
10. To maintain and use properly and effectively all the facilities including newly introduced system and materials provided under the Grant.

(2) Draft Final Report Discussion

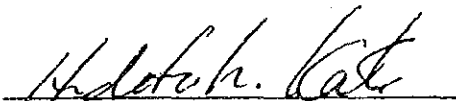
MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE PROJECT FOR ESTABLISHMENT OF AUDIO VISUAL EDUCATION CENTRE
IN
THE OPEN UNIVERSITY OF SRI LANKA
(CONSULTATION ON DRAFT REPORT)

In March, 1991, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for establishment of Audio Visual Education Centre in the Open University of Sri Lanka (hereinafter referred to as "the Project") and through a series of discussions, field survey in here, and technical examination of the results in Japan, has designed the appropriate plan for the Project and prepared the draft report of the Basic Design Study.

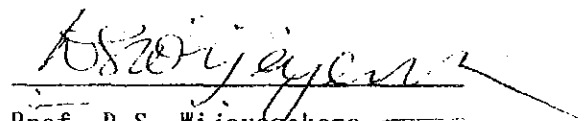
In order to explain and consult on the components of the draft report, JICA sent a team, headed by Dr. Hidetoshi KATO, Director General, National Institute of Multimedia Education, Ministry of Education, Science and Culture, from June 23 to July 4.

As a result of the discussions, both parties confirmed the main items described on the attached sheet.

Colombo, June 27, 1991



Dr. Hidetoshi KATO
Leader,
Basic Design Study Team,
JICA



Prof. D.S. Wijeyasekera
Vice Chancellor,
The Open University of
Sri Lanka

ATTACHMENT

1. The Government of Sri Lanka has agreed and accepted in principle the components of the draft report proposed by the Team.

2. Grant Aid Programme extended by the Government of Japan

1) The Government of Sri Lanka has understood the system of Japanese Grant Aid explained by the Team.

2) The Government of Sri Lanka will take the necessary measures, described in Annex, for smooth implementation of the Project on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

3. Further Schedule

The team will make the final report in accordance with the confirmed items, and send it to the Government of Sri Lanka around the end of September, 1991.

4. Technical Cooperation

Sri Lankan side requested the team that two long term experts will be dispatched and two Sri Lankans will be trained in Japan under the technical cooperation scheme conducted by JICA. The team promised to convey the desire to the Government of Japan and JICA and suggested Sri Lankan side to request it officially to the Government of Japan through the Embassy of Japan in Sri Lanka.

W.K.
A.S.S.

Annex

1. To provide data and information necessary for detailed design.
2. To provide the land and space necessary for implementing the Project.
3. To provide facilities for distribution of electricity, drainage, communication and security at the site.
4. To provide necessary permission, licences and other authorizations for carrying out the Project.
5. To ensure prompt unloading, tax exemption, customs clearance at ports of disembarkation in Sri Lanka and prompt internal transportation therein of the products purchased under the Grant Aid.
6. To exempt Japanese nationals involved in the Project from custom duties, internal taxes and other fiscal levies which may be imposed in Sri Lanka with respect to the supply of the products and services under the verified contracts.
7. To bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.
 - (1) Advising commission of authorization to pay (A/P) (about ¥3,000 for each A/P)
 - (2) Payment commission
8. To accord without delay to Japanese Nationals whose services may be required in connection with the supply of the products and services under the verified contracts such facilities as may be necessary for their entry into Sri Lanka and stay therein for the performance of their works.
9. To secure and bear all the expenses, other than those to be borne by the Grant, necessary for the execution of the Project.
10. To maintain and use properly and effectively all the facilities including newly introduced system and materials provided under the Grant Aid.

5. Country Data of Sri Lanka

(1) Geographical Features

Sri Lanka is an island country in the Indian Ocean, located at a distance of 48km from the southeastern end of India.

It measures a maximum of 435km from north to south and a maximum of 225km from east to west and having a total area of 64,454km². To the north of the centre, there is a mountain 2,524m above sea level. The plains below the mountain are rather small on the western, southern and eastern sides, but the plain on the northern side is open long and wide. Sri Lanka occupies a strategic point of traffic between east and west and the port of Colombo is known as an important port of call for the ships travelling on sea routes linking Europe/Middle East and East Asia.

(2) Weather

The weather of Sri Lanka is tropical and varies little throughout the year. The temperature in the city of Colombo is 27.2°C on the annual average. The periods from May to September and from November to March are the rainy seasons owing to the monsoons. In the south-western part of the island, the annual average rainfalls reach a total of 3,740mm.

(3) Inhabitants

According to the "Socio-Economic Data 1990" of the Central Bank of Sri Lanka (hereinafter called "the Data"), the nation's population in 1989 was 16.8 million and the trend of the population since 1986 has been as follows:

Population Increase

	1986	1987	1988	1989
In 1,000 persons	16,117	16,361	16,586	16,806
Rate of Increase (%)	1.8	1.5	1.4	1.3

Source: the Data

The rate of population increase has been falling gradually but still the population density of Sri Lanka as of 1987 was 248 people per 1km², the highest among the neighbouring nations (India, Thailand, Malaysia, Indonesia, the Philippines).

The ethnic percentages are, 74% Sinhalese, 18.1% Tamil and 7.9% others.

(4) Languages

The official languages of Sri Lanka are Sinhala and Tamil, while English is positioned as a link language.

The classes at the Open University, too, are normally given in these three languages.

(5) Religions

Of the entire population, Buddhists account for 69.3%, Hindus (mostly the Tamils), 15.5%, Muslims, 7.6% and Christians, 7.5%.

(6) Brief History of Sri Lanka

After the early stages in the classical era of the Sri Lankan history, in the 11th century, two dynasties were established; Sinhala dynasty in the south and Tamil dynasty in the north, respectively. In the 16th century onwards, the country was placed under foreign rule; first under Portugal and then under Holland. And toward the end of the 18th century, the country became a colony of Great Britain.

After having become independent as a member of the British Commonwealth of Nations in 1948, the country achieved perfect independence in 1972 as the Republic of Sri Lanka and in 1978 changed its name to the present Democratic Socialist Republic of Sri Lanka.

Sri Lanka is a constitutional republic. The ruling President Ranasinghe Premadasa took office in January 1989 with a term of six years. The parliament, called the National State Assembly, is of a unicameral system.

The nation's basic diplomatic policy upholds nonaligned neutralism. With Japan, Sri Lanka established its formal diplomatic relations in 1952.

(7) Economy

The ruling government, which vigorously promotes free economy, has set the following economic targets:

- 1) Promotion of employment.
- 2) Enhancement of living standard.
- 3) Acceleration of economic growth.
- 4) Elimination of deficits in international income and expenditure.
- 5) Controlling of inflation.

Sri Lanka's industry is composed mainly of agriculture and fisheries (26% of GDP as of 1989) and manufacturing (15% of GDP, 1989). The following table shows the outputs of main products in 1986 - 1989:

Outputs of Main Products

(in million Rupees)

	1986	1987	1988	1989
[Agriculture]				
Tea	6,483	8,371	9,708	11,304
Paddy	10,249	8,966	10,996	10,820
Coconut	2,888	4,332	6,050	5,235
Rubber	2,674	2,432	3,092	2,512
TOTAL	22,294	24,101	29,846	29,871
[Manufacturing]				
Textile	12,088	15,428	18,166	22,072
Food	12,129	12,962	14,675	18,458
Chemical Products	11,088	13,477	13,681	12,710
Mineral Products	2,053	2,156	2,267	2,474
TOTAL	37,358	44,023	48,789	55,714

Source: the Data

In U.S. dollars, the total amount of agricultural products in 1989, 29,871 million Rupees, would be approximately 747,000,000 dollars (conversion rate: 1 US\$ = 40 Rs.).

Similarly, the total amount of manufactured products, 55,714 million

Rupees would be about 1,393,000,000 dollars.

Since the above-mentioned total of agricultural products comprises that of only four individual products, this figure alone indicates how large a percentage the agriculture occupies in the nation's GDP. In terms of the working population, too, the number of workers engaged in agriculture and fisheries as of 1981 was so many as to account for 45.5% of the entire working population (4,120,000).

Sri Lanka's exports include tea, rubber, coconuts, textile and jewelry and imports, rice, flour, sugar, fertilizer and oil. The export-import records during 1987 - 1989 show continuous deficits of about 20 billion Rupees (500 million U.S. dollars) per annum.

In 1990, Sri Lanka exported some 215,000 tons of tea and thus became the world's top tea exporting country surpassing India.

The nation's average GDP growth rate in 1986 - 1989 was 2.7%, which, compared with the average GNP growth rate of 6.2% in 1978 - 1983, showed the continuation of recession in domestic economy.

The following table shows the breakdowns of GDP in 1988 and 1989:

Breakdown of GDP

	(in million Rupees)		(%)
	1988	1989	1989 Component Ration
Agriculture & Fisheries	53,600	59,388	26.0
Wholesale & Retail	40,578	46,625	20.4
Manufacturing	31,298	34,941	15.3
Transport & Communication	21,988	23,109	10.1
Construction	14,943	17,332	7.6
Administration	11,050	13,039	5.7
Banking & Insurance	9,002	10,496	4.6
Services	7,748	8,648	3.8
Mining	5,567	6,157	2.7
Others	7,742	8,638	3.8
TOTAL	203,516	228,373	100.0

Source: the Data

The 1989 total of 228.373 billion Rupees would be about 5.709 billion U.S. dollars.

Sri Lanka's per-capita national income during 1986 - 1989 were as follows, showing slow growth:

Per-capita Income

	1986	1987	1988	1989
In Rupees	9,918	10,598	11,953	13,237
In U.S. dollars	354	360	375	367

Source: the Data

The commodity prices in 1986 - 1989 show a considerably high rate of increase. In the cast of the consumer prices in Colombo, an average increase of 10.3% was recorded.

The unemployment rates against the total working population were 11.7% in 1981/82 and 15.5% in 1986/87, respectively, showing an upward trend.

The government finance in recent years is as follows. It shows successive deficits and increasing debts.

Government Finance

(in million Rupees)

	1986	1987	1988	1989
INCOME	37,238	42,145	41,749	54,003
Tax	31,272	35,119	35,946	47,419
Non-tax	5,966	7,026	5,803	6,584
EXPENDITURE	59,194	63,894	76,532	79,093
Current	33,967	39,560	46,132	54,981
Capital	23,236	22,816	22,878	19,644
Others	1,991	1,518	7,522	4,468
DEFICIT	21,956	21,749	34,783	25,090
FINANCING	18,204	17,072	28,193	18,684
Foreign	9,061	5,716	7,128	5,926
Domestic	9,143	11,356	21,065	12,758
DEBT OUTSTANDING	157,803	191,438	224,252	272,305
Foreign	88,304	112,441	125,657	154,744
Domestic	69,499	78,997	98,595	117,561

Source: the Data

The 1989 income of 54,003 million Rupees would be 1.35 billion dollars, the expenditure of 79,093 million Rupees would be 1.977 billion dollars, the deficit of 25,090 million Rupees would be 627 million dollars, the loans of 18,684 million Rupees would be 467 million dollars and the debt outstanding of 272,305 million Rupees would be 6.88 billion dollars, respectively.

Of the above, the foreign debts of 154,744 million Rupees would be equivalent to 3.869 billion dollars.

6. Subject List of OUSL

COURSES IN THE FACULTY OF HUMANITIES AND SOCIAL SCIENCES

HSS (1/4)

EDUCATION	
Certificate in Pre-school Education (ONE ACADEMIC YEAR)	
ESC 1101	Philosophy and Principles
Ditto	Aims and Objectives of Pre-school Education
ESC 1102	Child Psychology
ESC 1103	Development of Language Skills
ESC 1104	Creative activities and Aesthetic Education
ESC 1105	Development of Mathematical Concepts
ESC 1106	Exploration of the Environment
ESC 1107	Physical and Health Education
ESC 1108	Development of Manipulative Skills
ESC 1109	Organization and Management of Pre-school and Creches
ESC 1110	Home and School Cooperation and Parential Involvement
ESC 1111	Integrated Approach in Activities
Ditto	Guided Observation of Pre-schools
Ditto	Supervised Teaching Practice
Ditto	Preparation of Visual Aids and Handbook
Diploma in Distance Education	
ESD 3301	Course Development
ESD 3302	Instructional Design
ESD 3303	Beyond Course Material
ESD 3304	Administration and Management
Post-Graduate Diploma in Education (Minimum 2 years)	
ESP 1305	Principles of Education
ESP 1306	Educational Psychology
ESP 1307	Assessment of Learning Outcomes
ESP 1308	Student Adjustment and Counselling
ESP 2305	Teaching Practice
ESP 2306	Techniques of Teaching
ESP 2307	Curriculum, School and Society
ESP 2308	Comparative Education and Educational Problems
ESP 2309	Educational Administration and Management
Community Education (Non-Qualification)	
	Law and Society
	Nutrition
	Child Care

	Environment
	Civic Consciousness
	Community Education
LANGUAGE STUDY	
Basic Course in English	
LSE 1304	Legal Study
LSE 2304	Legal Study Level 3
LSE 3304	Legal Study Level 4
Certificate in Professional English (ONE ACADEMIC YEAR)	
LSC 0301	Basic Course (comprising of 8 subjects)
LSC 1301	Intermediate/advanced Course
LAW STUDY	
Bachelor of Law Degree (Minimum 4 years)	
LWU 1401	Constitutional Law
LWU 1402	Introduction to the Laws in Sri Lanka
LWU 1404	Legal Method
LSE 1304	English
LWU 2401	Criminal Law
LWU 2402	Family Law
LWU 2403	Law of Contract and Agency
LSE 2304	English
LWU 3301	Law of Delict
LWU 3302	Land Law
LWU 3303	Law of Trusts
LWU 3305	Administrative Law & The Law of Public Corporations
LSE 2306	English
LWU 4401	Jurisprudence
LWU 4402	Mercantile Law
LWU 4403	Company Law & Partnership
LWU 4404	Conflict of Laws
LWU 4405	Public International Law
LWU 4406	Tax Law
LWU 4407	Law of Evidence
LWU 1401	Law of Procedure
LWU 4409	Landlord and Tenant

MANAGEMENT STUDY	
Certificate in Entrepreneurship and Small Business Management (ONE ACADEMIC YEAR)	
MCF 2601	Setting up of a small business venture
MCF 2601	Management of a small business firm
MCF 2601	Production management
MCF 2601	Marketing products
MCF 2601	Accounting and finance management
MCF 2601	Project
Diploma in Management (Minimum 2 years)	
MCD 1201	Managerial Process I
MCD 1204	Computer Application in Management
MCD 1205	Human Resource Management
MCD 1302	Export Marketing (Marketing Management)
MCD 1303	Management(managerial) Economics and Statistics
MCD 2203	Project
MCD 2204	Production Management and (Elementary) Quantative Methods
MCD 2206	Contract Law
MCD 2301	Management Process II
MCD 2302	Financial Management
MCD	Business Project Evaluation
MCD	Export Marketing
Post Graduate Diploma in Management	
MCP 2201	Management Theory and Practice
MCP 2202	Information Systems and Communication Techniques
MCP 2203	Independent Project
MCP 2204	Administration and Management of Higher Education
MCP 2205	Development Administration
MCP 2206	Environment of the Firm
MCP 2207	Industrial Policy
MCP 2208	Marketing
MCP 2209	Industrial Relations
MCP 2210	Human Resources Management
MCP 2211	Financial Management
MCP 2212	Educational Planning and Management
MCP 2213	Public Enterprise Management
MCP 2214	Formulation, Appraisal and Management of Public Sector Project

S C I E N C E	
Foundation course in Science	
LSE 1603	English for Science and Technology (contain 5 subjects)
MAF 1301	Pure Mathematics I
MAF 1302	Applied Mathematics I
PSF 1305	Botany
PSF 1306	Zoology
PSF 2305	Botany
PSF 2603	Chemistry
MAF 2301	Pure Mathematics II
MAF 2302	Applied Mathematics II
PSF 2602	Foundation Physics
PSF 2306	Zoology
B O T A N Y	
Bachelor of Science Degree (3 Academic Years)	
PSU 1105	Plant Diversity
PSU 1106	Plant Form and Function I
PSU 2105	Plant Form and Function II
PSU 1107	Plant Ecology I
PSU 2106	Plant Ecology II
PSU 2108	Plant Taxonomy
PSU 1108	Practical Botany
PSU 2107	Cytology and Genetics
PSU 3108	Plants & Man
PSU 3109	Plant Pathology
PSU 3110	Principles of Microbiology
PSU 3111	Soil and Soil Processes
PSU 3112	Environment with social reference to Sri Lanka
PSU 3129	Applied Microbiology
Proposed Courses for Future	
	Horticulture
	Tissue Culture
	Forestry
	Wood Technology
	Environmental Science
	Industrial Microbiology

	Silviculture
	Soil Science
	Food Science
	Landscaping
CHEMISTRY	
Bachelor of Science Degree (3 Academic Years)	
PSF 1113	General and Inorganic Chemistry
PSF 1114	Physical Chemistry
PSF 1115	Organic Chemistry
PSF 1116	Practical Chemistry
PSU 1017	Mathematics
PSU 2113	Inorganic Chemistry
PSU 2114	Organic Chemistry
PSU 2115	Physical and Theoretical Chemistry
PSU 2116	Analytical Chemistry
PSU 3118	Physical Chemistry
PSU 3119	Topics and Industrial Chemistry
PSU 3120	Organic Chemistry
PSU 3121	Natural Product Chemistry
PSU 3122	Chemistry of Polymers
PSU 3123	Bio-Chemistry
PSU 3124	Spectroscopic Methods in Chemistry
MATHEMATICS	
Bachelor of Science Degree (3 Academic Years)	
(I) Applied Mathematics	
MAU 1105	Mathematical Modelling I (Non Stastical Models)
MAU 1106	Mathematical Modelling II (Stastical Models)
MAU 1107	Mathematical Modelling III (Miscellaneous Model)
MAU 1108	Mathematical Modelling IV (Report on Self Study)
MAU 2101	Newtonian Mechanics
MAU 2102	Mathematical Methods
MAU 2103	Fluid Mechanics
MAU 2104	Numerical Computations
MAU 3113	Mathematical Methods
MAU 3114	Dynamics
MAU 3115	Special Relativity
MAU 3116	Quantum Mechanics

(2) Pure Mathematics	
MAU 1101	Algebra
MAU 1102	Analysis
MAU 1103	Differential Equations
MAU 1104	Conics and Vector Algebra
MAU 2105	Mathematical Methods
MAU 2106	Linear Algebra
MAU 2107	Real Analysis
MAU 2108	Number Theory and Polynomials
MAU 3117	Complex Analysis I
MAU 3118	Complex Analysis II
MAU 3119	Numerical Computations II
MAU 3120	Theory of Integration
MAU 3217	Complex Analysis
MAU 3221	Automata Theory
MAU 3119	Numerical Computations II
MAU 3120	Theory of Integration
PHYSICS	
Bachelor of Science Degree (3 Academic Years)	
PSU 1109	General and Thermal Physics
PSU 1110	Waves Vibrations and Geometrical Optics
PSU 1111	Basic Electromagnetism
PSU 1112	Practical Physics
PSU 2109	Advanced Electromagnetism
PSU 2110	Circuit Theory and Electronic
PSU 2111	Thermodynamics and Radiations
PSU 2112	Practical Physics
PSU 3114	Physical Optics
PSU 3115	Physical Basis of Quantum Theory, Theory of Relativity and Solid State Physics
PSU 3116	Atomic and Nuclear Physics
PSU 3117	Practical Physics
PSU 3130	Atmospheric Physics
PSU 3131	Atmospheric Dynamics
PSU 3233	Industrial Physics

Diploma in Technology (Minimum 2 years)	
(1) Common courses on the Diploma in Technology	
MPF 1301	Pure Mathematics
MPF 1302	Applied Mathematics
CEE 1301	Properties of Materials
LSF 1301	English for Technology
MPF 2301	Mathematics
MEF 2301	Engineering Drawing
ECF 2301	Principles of Electricity
MEF 2302	Heat and Fluids
CIVIL ENGINEERING	
Diploma in Technology (Minimum 2 years)	
CED 1201	Theory of Structure I
MED 1202	Strength of Materials
CED 1202	Hydraulics and Hydrology
CED 1203	Surveying
CED 1204	Construction Materials
CED 1205	Engineering Geology
CED 2201	Theory of Structures II
CED 2202	Soil Mechanics
CED 2203	Civil Engineering Construction
CED 2204	Construction Management
CED 2205	Irrigation Engineering
CED 2206	Public Health Engineering
CED 2207	Building Engineering
CED 2208	Highway Engineering
CED 2209	Quantity Surveying
ELECTRICAL ENGINEERING	
Diploma in Technology (Minimum 2 years)	
(1) Common Courses on Diploma in Technology in Electrical Engineering	
ECD 1201	Electronic Components and Circuits
ECD 1202	Introduction to Digital Circuits
ECD 1203	Electrical Measurements
ECD 1204	Circuit Theory
ECD 1205	Introduction to Radio & Line Communication
ECD 2201	Micro Processors & Computers

ECD 2211	Switching Systems
ECD 2215	Control Systems
ECD 2216	Digital Computer Simulation
(2) Communication Technology	
ECD 1206	Telecommunication Switching Principles
ECD 2202	Radio Communication
ECD 2203	Line Communication
ECD 2204	Digital Communication
ECD 2217	Television
ECD 2218	Microwave communication and Radar
ECD 2219	Telecommunication Construction and Planning
(3) Electrical Technology	
ECD 1207	Power Generation, Transmission & Distribution
ECD 1208	Introduction to Electrical Machines
ECD 2205	Power System Studies
ECD 2206	Protection of Systems
ECD 2207	Electrical Machines
ECD 2210	Industrial Electronics
ECD 2221	Controlled Power Drives
ECD 2222	Elements of Electrical Machine Design
ECD 2223	Design of Electrical Installations
(4) Electronic Technology	
ECD 1209	Physical Electronics
ECD 2208	Electronic Manufacturing Technology
ECD 2209	Fault Diagnosis in Electronic Systems
ECD 2210	Industrial Electronics
ECD 2220	Automotive Electronics
ECD 2221	Controlled Power Drives
ECD 2224	Medical Electronics
MECHANICAL ENGINEERING	
Diploma in Technology (Minimum 2 years)	
MED 1201	Mechanics of Machines
MED 1202	Strength of Materials
MED 1203	Thermodynamics
MED 1204	Fluid Mechanics
MED 1205	Workshop Technology
ECD 1212	Electrical Technology
MED 2201	Production Technology

MED 2202	Elementary Machine Design
MED 2203	Automobile Technology
MED 2204	Materials Engineering
MED 2205	Plant Maintenance and Work Services
MED 2206	Production Management
ECD 2201	Micro Processors & Computers
ECD 2210	Industrial Electronics
ECD 2215	Control Systems
Bachelor of Technology (Minimum 3 years)	
Common courses on the Bachelor of Technology	
MPU 3601	Engineering Mathematics
MPU 3302	The Scientific Outlook
MPU 3303	Technology, Society and Environment
MPU 4302	Work and Human Organization in Industry
CEU 4399	Project(CE)
ECU 4399	Project(ECs)
MEU 4399	Project(ME)
MPU 4301	Discrete Mathematics
MEU 3301	Fluid Mechanics and Thermodynamics (EC & ME)
ECU 3301	Fields and Networks(ECs)
ECU 4302	System Dynamics (ECs & ME)
MEU 4304	Advanced Manufacturing Technology (EC & ME)
ECU 3303	Computer Systems Architecture (ECs)
ECU 4305	Data Communication System (ECs)
MEU 4305	Thermal Power Generator (EC & ME)
MEU 4306	New and Renewable Sources of Energy (EC & ME)
CIVIL ENGINEERING	
Bachelor of Technology	
CEU 3301	Fluid Mechanics
CEU 3302	Geotechnics and Surveying
CEU 4301	Construction Engineering
CEU 4302	Geotechnical Engineering
CEU 4303	Structural Engineering
CEU 4304	Hydraulic Engineering
CEU 4305	Transportation Engineering
CEU 4306	Structural Engineering
CEU 4307	Water Resources Engineering
CEU 4308	Foundation Engineering

CEU 4309	Irrigation Engineering
CEU 4310	Public Health Engineering
CEU 4311	Soil Mechanics
ELECTRICAL ENGINEERING	
Bachelor of Technology	
(1) Electrical Engineering	
ECU 4301	Power Systems Planning
(2) Electronic Engineering	
ECU 4303	Microelectronics
(3) Computer Engineering	
ECU 3302	Software Systems Engineering
ECU 4306	Information Systems
ECU 4304	Analysis and Design of Management Systems
ECU 4307	Theory of Computation
ECU 4308	Knowledge Engineering
MECHANICAL ENGINEERING	
Bachelor of Technology	
MEU 3302	Applied Mechanics and Strength of Materials
MEU 4301	Mechanics and Materials
MEU 4302	Automobile Engineering
MEU 4303	Industrial Engineering
TEXTILE TECHNOLOGY	
Certificate in Textile Technology (ONE ACADEMIC YEAR)	
TTC 1301	Textile Mathematics & Science
TTC 1302	Introduction to Textile Technology
TTC 1603	Yarn Manufacture
TTC 1604	Weaving
TTC 1606	Chemical Processing
TTC 1607	Clothing Technology
Diploma in Textile Technology	
MPP 1301	Pure Mathematics
LSE 1603	English for Science and Technology
MPP 1302	Applied Mathematics
TTF 2303	Physical Science for Textile Technology
TTF 2301	Engineering Drawing
TTF 2301	Fibre Science
TTF 2302	Introduction to Textile Technology
TTD 1301	Statistical Quality Control and Textile Testing

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