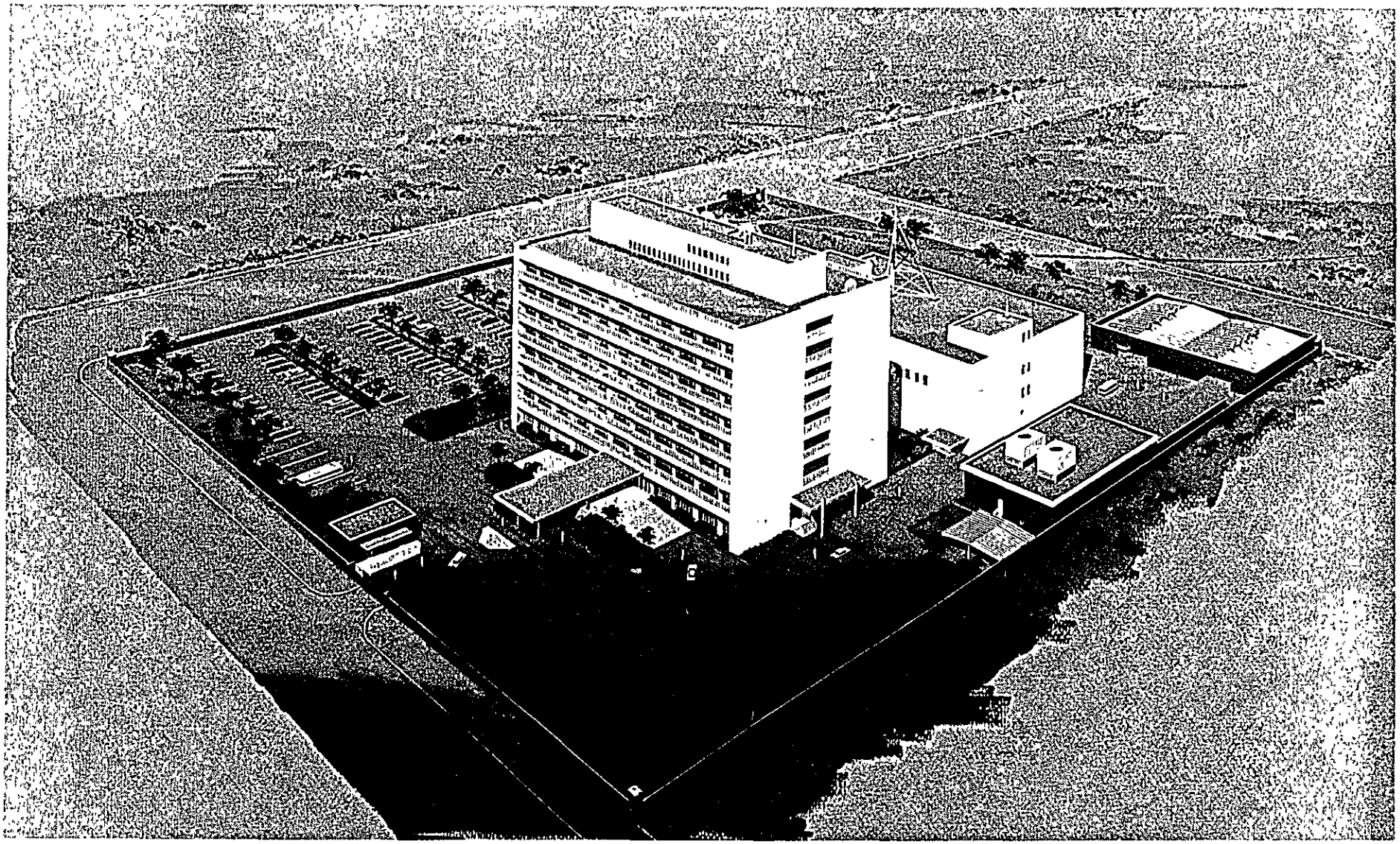
THE PEOPLE'S REPUBLIC OF BANGLADESH

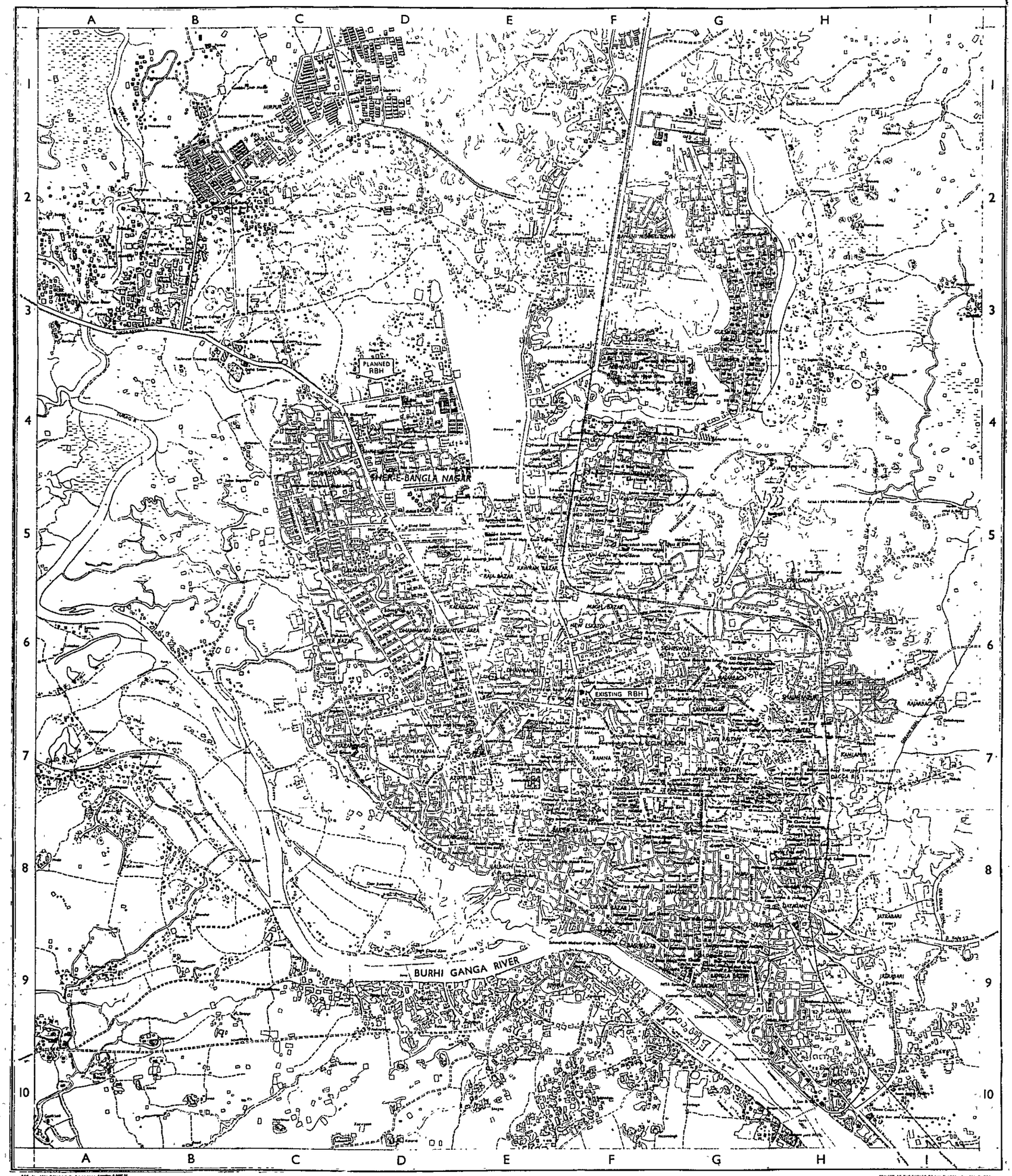
REPORT ON PRELIMINARY DESIGN
OF
THE NEW NATIONAL BROADCASTING HOUSE
RADIO BANGLADESH, DACCA

FEBRUARY 1979

JAPAN INTERNATIONAL COOPERATION AGENCY



DACCA GUIDE MAP



Published under the direction of Mr Hafizuddin Surveyor General of Bangladesh

1973

Scale 1:20,000 or 3·17 inches to 1 Mile

Yards 1000 500 0 1000 2000 3000 Yards

Furlongs 8 7 6 5 4 3 2 1 0 1 2 Miles

FOR SYMBOLS AND REFERENCES ETC. SEE REVERSE

Refer to this map as :—1:20,000
DACCA GUIDE MAP FIRST EDITION

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P R E F A C E

In response to the request of the Government of the People's Republic of Bangladesh, the Government of Japan decided to carry out a study necessary for the preparation of the preliminary design for the project to construct the New National Broadcasting House of Radio Bangladesh in Dacca, and the Japan International Cooperation Agency conducted the study.

The Japan International Cooperation Agency, recognizing that the establishment of the New National Broadcasting House of Radio Bangladesh which is in charge of the public relation programmes of the government such as family planning, agriculture, health control, weather forecast, etc. for the local inhabitants will contribute very much to the development of Bangladesh, dispatched a study team to Bangladesh from October 5 to 28, 1978 for the purpose of obtaining data necessary for preparing a preliminary design, and of exchanging views with Bangladesh authorities concerned on the project.

The field survey of the project was carried out very smoothly with the extensive cooperation of the Radio Bangladesh, and upon its return to Japan, the study team made further studies and analyses which have been compiled in this report.

I hope that this report will contribute to the progress of this project and to the strengthening of the friendly relations between the two countries.

I express my heartfelt appreciation to the government and people concerned of Bangladesh for their close cooperation extended to the study team.

February, 1979

Shinsaku Hogen
President
Japan International Cooperation Agency

CONTENTS

Floor naming is made in accordance with the Japanese way as shown below:

Japanese way	British way
First floor	Ground floor
Second floor	First floor
Third floor	Second floor
⋮	⋮

Chapter 1 Introduction

1-1 Objective and Scope

This report summarizes the results of preliminary design work for the building and related broadcasting facilities for the National Radio Broadcasting House now being planned by Radio Bangladesh in Dacca. This design was made in accordance with the wishes of the Government of the People's Republic of Bangladesh.

1-2 Background and History

Radio broadcasting services in Bangladesh are operated by Radio Bangladesh, one of organizations of the Ministry of Information and Broadcasting. Radio Bangladesh broadcasts its nation-wide Home Service throughout Bangladesh, and also broadcast its External Service to foreign countries. In Decca, it has a small broadcasting building built in 1959, prior to Bangladesh's independence which was studio of regional broadcasting station of the then Radio Pakistan. Since Bangladesh's independence, the demand for the production of various broadcasting programs has increased, while the building has aged. The present facilities are therefore no longer adequate to meet current needs.

Office space has become restricted. The office of the Director General and other offices are scattered among nine locations outside the existing broadcasting house, and it has become extremely inconvenient to carry out daily broadcasting services.

Recently, Radio Bangladesh has built and put into operation "transcription block" which has six studios. However, this alone is not enough to alleviate the present difficult situation.

For this reason, the Bangladesh Government has long been entertaining as one of the country's top priority projects a plan to build a broadcasting house with 25 to 30 studios. The Bangladesh Government has already acquired land covering about 31,400 m^2 (37,752 sq. yards) in a district in Dacca earmarked for government offices.

In 1977 at the request of the Bangladesh Ministry of Information and Broadcasting, a UNDP team visited Bangladesh and surveyed plans to build a National radio broadcasting house. The team submitted a report on its findings regarding buildings and broadcasting equipment and facilities.

In January, 1978, the Bangladesh Government asked the Government of Japan for technical cooperation in designing a new broadcasting house. The Japanese Government agreed to make a preliminary design. As a result, a design study mission of six specialists from the Ministry of Posts and Communications, the Japan Broadcasting Corporation and the Japan International Cooperation Agency was sent to Bangladesh in October, 1978. Following this study, specialists belonging to the Japan Broadcasting Corporation proceeded to make a preliminary design in Japan. The people engaged in the preliminary design were specialists in architecture and broadcasting technology. Between the end of January and February 1979, when the design work reached an intermediate stage, three members of the design study team visited again Bangladesh for a presentation of their draft and for discussion.

1-3 Organization of the Study Team and Study Items

Table 1-1 shows the organization of the preliminary design study team.

For 22 days starting October 6, 1978, the team had full discussions with officials in the Bangladesh Government, particularly with those in Radio Bangladesh. A survey was made regarding the present status of radio broadcasting in Bangladesh, her intentions and desires concerning the plan to build a new National Broadcasting House, the state of building construction in Dacca and other aspects.

The team's itinerary is shown in Table 1-2.

Three team members of the survey team participated for a presentation of the draft report are as indicated in Table 1-1.

They visited Bangladesh for eleven days beginning on January 30, 1979, the team briefed officials of the Bangladesh Government on the preliminary design and exchanged views with them. Additional survey items were studied.

Table 1-3 shows the team's itinerary.

Our sincere appreciation goes to officials in the Bangladesh Government, particulary the Minister and the Secretary of the Ministry of Information and Broadcasting, and to those in the Ministry of Planning, who graciously offered the design study team aid on a number of occasions during their stays in Bangladesh. The survey team would like to offer particular thanks to those at Radio Bangladesh and the Public Works Department who compiled various useful information in a short period of time at the request of the survey teams and participated in the discussions.

Name	Responsible For	Team Members for Draft Report	Position
Mr. Masaaki MINAMI	Leader	o	Special Advisor for International Cooperation, Minister's Secretariat, Ministry of Posts and Telecommunications
Mr. Hiroo SUZUKI	Broadcasting System	o	Manager, Overseas Technical Cooperation, Technical Coordination & Information Group, Technical Administration & Construction Headquarters, Japan Broadcasting Corp.
Mr. Osamu HASEGAWA	Studio Equipment and Facilities		Engineer, Planning, Technical Administration and Construction Headquarters, Japan Broadcasting Corp.
Mr. Harutoshi TSUKUDA	Architecture	o	Senior Architect, Architectural Engineering Group, Technical Administration and Construction Headquarters, Japan Broadcasting Corp.
Mr. Tetsuo HAMAYA	Architecture		Architect, Architectural Engineering Group, Technical Administration and Construction Headquarters, Japan Broadcasting Corp.
Mr. Akio ITOH	Coordinator		Special Assistant to the Director, Social Development Cooperation Department, Japan International Cooperation Agency (JICA)

Note: o indicates participants for a presentation of the draft report.

Table 1-1 Survey Teams for Radio Broadcasting House Construction Project

Date	Particulars
Oct. 5 (Thu)	Leave Tokyo
6 (Fri)	Arrive Dacca
7 (Sat)	Visit to the Ministry of Planning, the Ministry of Information & Broadcasting and Radio Bangladesh
8 (Sun)	- - - - -
9 (Mon)	Observation & Discussion at Radio Bangladesh, Visit to the Japanese Embassy
10 (Tue)	Observation & Discussion at Radio Bangladesh
11 (Wed)	- - do - -
12 (Thu)	Discussion with staff of Radio Bangladesh
13 (Fri)	Visit to the Secretary, Ministry of Information & Broadcasting, Visit to BTV, Discussion with staff of PWD
14 (Sat)	Discussion with staff of Radio Bangladesh
15 (Sun)	- - - - -
16 (Mon)	Discussion with staff of Radio Bangladesh
17 (Tue)	- - do - -
18 (Wed)	- - do - -
19 (Thu)	- - do - -
20 (Fri)	- - do - -
21 (Sat)	- - do - -
22 (Sun)	- - - - -
23 (Mon)	Discussion with staff of Radio Bangladesh
24 (Tue)	Analysis of information obtained and preparation of Memorandum
25 (Wed)	Signing of Memorandum by both parties at DG's Office
26 (Thu)	Report to the Japanese Embassy
27 (Fri)	Leave Dacca
28 (Sat)	Arrive Tokyo

Table I-2 Itinerary of the Preliminary Design Study Team

Date	Particulars
Jan. 29 (Mon)	Leave Tokyo
30 (Tue)	Arrive Dacca Meeting at the Japanese Embassy
31 (Wed)	Visit to the Director General of Radio Bangladesh
Feb. 1 (Thu)	Explanation of draft report to staff of Radio Bangladesh and PWD
2 (Fri)	--- do ---
3 (Sat)	Discussion with staff of Radio Bangladesh and PWD Observation of facilities of TUNGI Monitoring Station
4 (Sun)	----------
5 (Mon)	Discussion with staff of Radio Bangladesh, Collection of information on construction plan of Hotel SONARGA, Observation of studio facilities of Radio Bangladesh
6 (Tue)	Discussion with staff of PWD, Visit to Bangladesh TV Station, Observation of air conditioning facilities of State Bank, Observation of 1,000 kW medium-wave transmitting station
7 (Wed)	Meeting with Radio Bangladesh Chief Engineer, Visit to the Secretary of the Ministry of Information and Broadcasting, Visit to the Ministry of Planning, Observation of studio facilities of Radio Bangladesh
8 (Thu)	Attend the Director's meeting of Radio Bangladesh, Preparation of the memorandum, Observation of air conditioning facilities
9 (Fri)	Report to the Japanese Embassy, Signing of the memorandum
10 (Sat)	Leave Dacca,
	Arrival Tokyo

Table 1-3 Itinerary of the Team for the presentation of the draft report

Chapter 2 Basic Study Prior to Design

2-1 Present Status of Radio Broadcasting and Future Expansion Plans

Radio Bangladesh is providing nation-wide Home Service in the MF band through the existing Broadcasting House and three associated transmitting stations, as well as five regional stations in major provincial cities in the country. Further, "Zonal Service" for local listening and External Service for overseas listeners are broadcast in HF band.

In Dacca, a total of about 15 hours and 20 minutes a day is broadcast by three transmitting stations over two program channels; Dacca A and Dacca B. These programs are broadcast using three frequencies in the MF band. A total of 16 hours and 20 minutes is broadcast on Sundays. The Zonal Service in the HF band relays Dacca A programs throughout the country. External Service is transmitted for 6 hours in a total of six languages over one channel.

The transmitting stations are located in Mirpur, Savar and Nayarhat. Table 2-1 shows the transmission power and other details on these transmitting stations:

TX Station	Band	Power	Remarks
Mirpur	MF	5 KW	Dacca B
	HF	7.5	Zonal Service
	HF	10	Zonal and Ext. Services
Savar	MF	100	Dacca A
	HF	100	Zonal and Ext. Services
	HF	100	Ext. Service
Nayarhat	MF	1000	Dacca A

Table 2-1 Radio Transmitter Stations Dacca

Radio Bangladesh plans to complete building a short-wave transmitting station in Kabirpur in 1982.

As stated, the existing broadcasting house in the center of Dacca was built in 1959 on about 2 acres of land. The broadcasting house consists of one-storey studio block housing six small-scale studios, four studio control rooms, MCR, recording room, radio room, etc. The house also contains a 2-storey office block and auxiliary buildings. As mentioned above, the transcription block housing six studios, four studio control rooms and MCR has been completed recently, and part of it has been in use as of October, 1978.

In general, studios are mostly small, and two studios share a studio control room. Studio control rooms are also frequently used for editing. All these factors make the overall efficiency low, and it is observed that all studios are now being used to a full capacity.

The number of people on the Radio Bangladesh staff now totals about 850. However, only about one third of them can be accommodated in the existing broadcasting house, and all the personnel actually working in daily programme production and technical operation cannot be accommodated. Radio Bangladesh is now operating separate branch offices including the Director General's office, scattered at nine locations in Dacca, making daily business extremely inconvenient.

Radio Bangladesh has planned to build a modern, large-scale National Broadcasting House to correct this situation and to meet future broadcast expansion plans.

In making this plan, Radio Bangladesh has the following future plans in mind.

1. Broadcasting Channels:

In about five years' time:

- The Home Service will have three channels, instead of the present two.
- The External Service will have two channels, instead of the present one.

In about ten years' time:

- The Home Service will increase its channels to four.
- The External Service will increase its channels to four.

2. Personnel

- The number of personnel is estimated to increase to about 1,330 in five years' time.
- This is estimated to increase further ten percent over above mentioned figure in about ten year's time.

In order to meet these expansion plans, Radio Bangladesh has indicated the following plan: Studio block comprising 26 studios and various related rooms, a large scale auditorium and an administrative block with floor space of about 16,000 m^2 containing offices, meeting rooms, cafeterias and other rooms.

2-2 Results of Basic Study

2-2-1 Land and Problems

The Bangladesh Government has already secured land measuring about 31,400 m^2 at SHER-E-BANGLA NAGAR

in Dacca for the new National broadcasting house. A detailed survey and soil tests by boring have already been undertaken.

The land is trapezoidal, resembling a regular square, and measuring about 171 m x 182∿185 m. The land near the proposed site has been allocated for future government and public buildings. The site is considered most suitable for building a broadcasting house.

One drawback is that part of the land is lowland currently used as paddy field, and a considerable preparation work of land will have to be performed. Another point is that the land is located close to Bangladesh's international airport and that the height of buildings and tower structures will be limited to 45.7 m (150 feet) by civil aviation regulations. These regulations restrict buildings to about 8-storeys high and limit the FM broadcasting project which will be discussed below.

2-2-2 Studios and Facilities Related to Programme Production

In general, when estimating the size and number of studios required in the future, it is essential to forecast broadcasting modes after carefully analyzing the present data on programme production. It is very difficult to estimate the nature of transmitting eight channels in the future merely by judging the data currently available. However, the 26 studios planned by Radio Bangladesh are estimated to be adequate for producing programme for 3∿4 times more broadcasting hours than those produced at present. This is possible by increasing the studio operating efficiency by rectifying the shortcomings such as commonly used studio control rooms and editing facilities in the existing broadcasting house.

The following rooms have been considered as production related rooms:

° Editing rooms	4 rooms
° Rehearsal rooms	6 rooms
° Dubbing room	1 room
° Audition room	1 room
° Listening room	4 rooms

2-2-3 Construction of Large Auditorium

Radio Bangladesh is planning to build a large scale of auditorium capable of seating 1,000 ∿ 1,500 persons.

There is no such a large auditorium in Dacca at present, and the necessity for it can be fully justified. Nevertheless, in general, an auditorium requires a large sum of money for its construction and management. This question warrants a full examination by various specialists from many angles, including the frequency of use of the auditorium for broadcasting purposes, purposes other than broadcasting, management body and methods. For this reason, it is desirable to have other projects to push the construction plans for the auditorium.

In this report, the land necessary for building a large auditorium has been secured on the premises for the new broadcasting house as Radio Bangladesh wished.

2-2-4 Broadcasting Facilities and Systems

Each studio will have a studio control room equipped with all necessary equipment to permit it to produce entire programmes. The studio control rooms can be connected to any studios and OB when necessary.

For reverberation effects, portable spring type reverberation units, whose performance has improved recently, will be recommended, instead of building echo rooms.

In the technical area on the second floor, MCR and eight associated continuity studios are centralized so that enable effective operations for technical switching and transmission of the eight programme channels. The continuity studios have been designed to transmit news, information and other talks, disc music, taped programme materials and the like.

Recently, countries with advanced broadcasting technology have begun to use separate functions for programme production and transmission by completely packaging programmes in tapes. This is to simplify the MCR functions with less manpower by introducing an automated programme transmission system operated by electronic computors. At Radio Bangladesh, recorded tapes are used to a large extent as programme materials. However, most of the programmes are sent live, and the switcher in MCR in the new Broadcasting House is designed to allow live programmes to be transmitted from any studio according to necessity.

For this reason, both a routing switcher and an on-air switcher will be installed, as described below.

Equipment employing a computer system requires a regular maintenance service to maintain its functios. The use of such a system has been left for future consideration. For the moment, automated control with an on-air switcher by means of a pin-board memory of a simple construction is considered suitable.

2-2-5 Office Block Layout

The Total area necessary for the administrative block will be met with an 8-storey building.

The layouts for offices should be determined by Radio Bangladesh and designers when the detailed design is created.

For office layouts, a large-office type common to one division or section for the entire staff is recommended; this is the style generally adopted in other countries. Department or division heads will have their own offices.

Advantages of this type are: effective utilization of office space; simplified construction and management of air-conditioning, electricity and other utility facilities; flexibility for future organizational changes; ease of supervising the staff; and better communications among the staff.

2-2-6 Realization of FM Broadcast Plans

Radio Bangladesh plans to start FM stereo broadcasting by VHF in the future.

Because of its nature, FM broadcast will consist primarily of high quality programmes such as music. For this reason, consideration will be desirable to provide several studios applicable for stereo programme production.

As stated, the height of the tower structures for installation of transmitting antenna will be limited to 45.7 m (150 feet) if the transmitting station is to be built on the premises of the new National Broadcasting

House. Thus this site is entirely unsuitable to attain a wide coverage area. A transmitting station with an antenna tower measuring at least 100 m in height will be required. A careful study as to these points may be necessary, especially in case when regular FM broadcasting service is to be started.

The BTV transmitting tower which is already used to broadcast TV programmes will possibly be proposed as one of the candidates of FM tower by merely installing an FM transmitting antenna below the existing television transmitting antenna. The height of this FM transmitting antenna would be 105 m above the ground. The location is also considered most suitable from the fact that a station building, power supply and other facilities are available there. A full consultation among the parties concerned will be required in this case.

2-2-7 Phased Construction Schedule

The new National Broadcasting House will be a large building, and it may be necessary to build it in phases depending on the budget, schedule and other reasons.

For this reason, the design has been made so as to be divisible into two phases according to necessity. The concept of phasing will allow the minimum necessary functions for production and transmission of programmes with adequate office accommodation.

As a result of this consideration, Phase One will have 13 studios, including five continuity studios for five channels and an office block for three storeys. All stereo production studios are to be installed in the second phase.

With this plan, the cost will be about one half that of building the entire house in one step.

Chapter 3 Design of Buildings

3-1 Buildings Layout

3-1-1 Site and Buildings

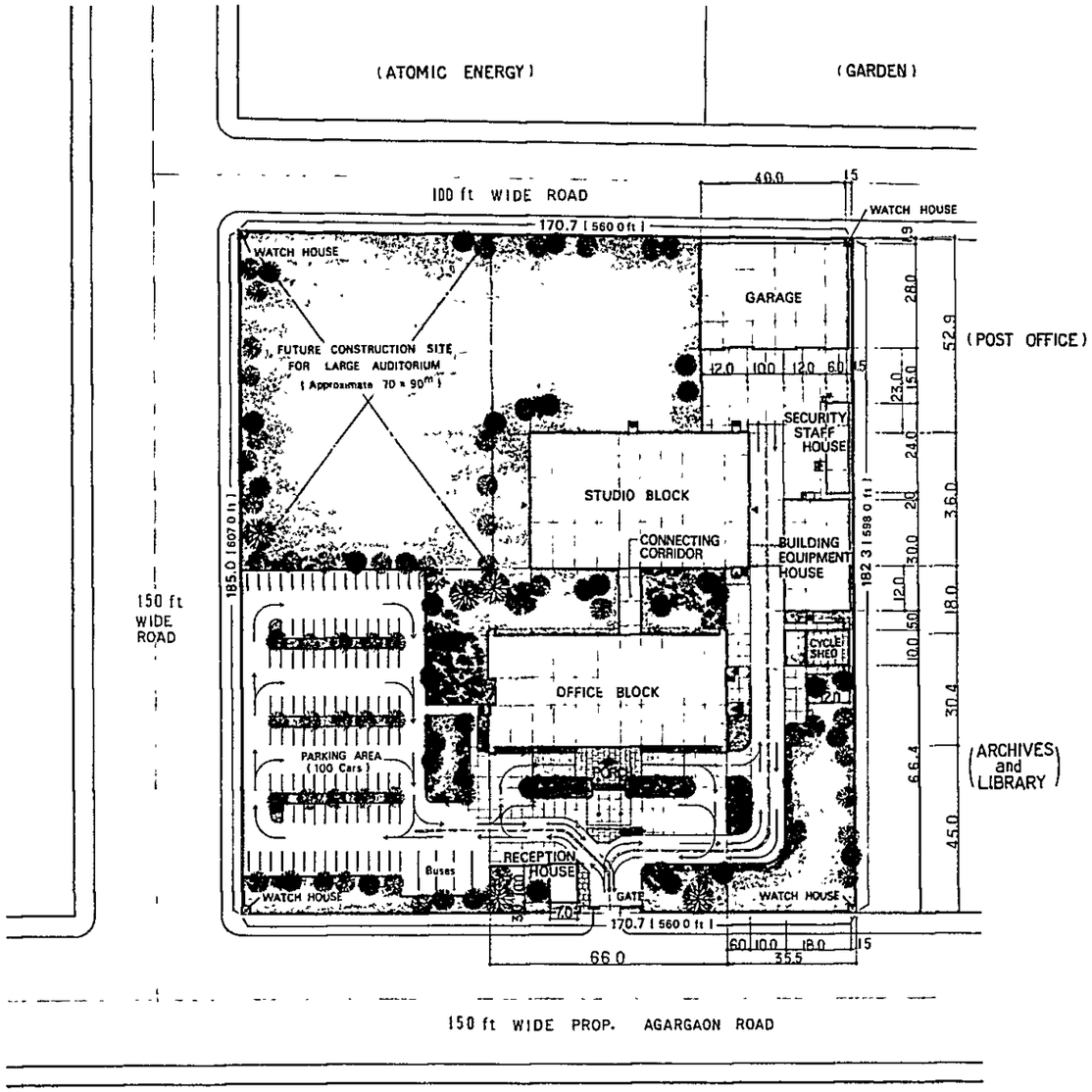
Fig. 3-1 shows the layout of the buildings. The site measuring 171 m from east to west and 182 ∿ 185 m from north to south resembles a regular square in its shape, and has an area of about 31,400m^2.

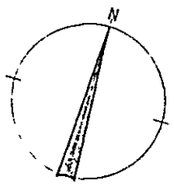
The specifications for the buildings appears in Table 3-1. The buildings cover a total of 24,662.8 m^2.

3-1-2 Layout

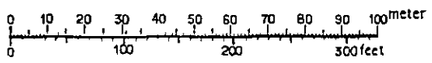
(1) The gate will be positioned to face a road on the south in view of the site shape, roads around, easy access from the center of Dacca, etc. Only one gateway will be provided for the site for security reasons.

(2) The land for a future auditorium will be reserved in the northwest section of the site to facilitate access to the studio building and to provide direct connection to roads. This land will measure about 70 m x 90 m.

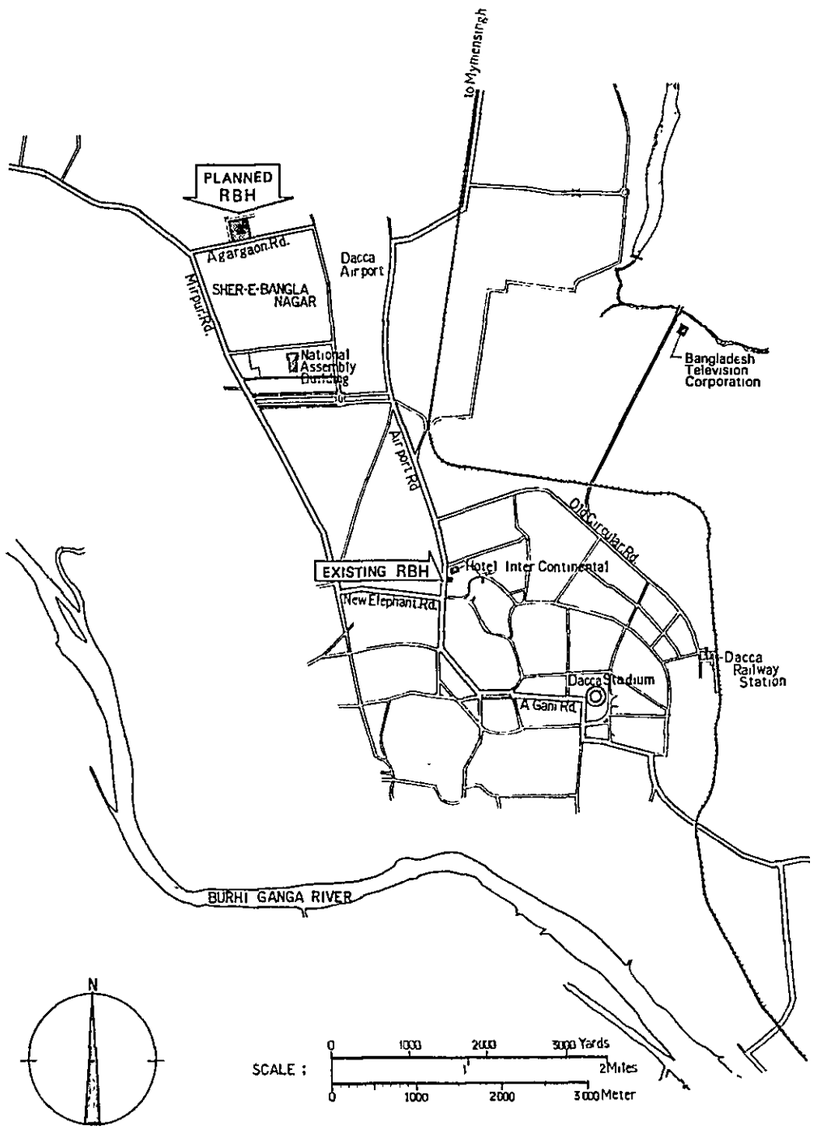




SCALE = 1 : 1000m



SITE PLAN



LOCATION MAP

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-1
TITLE OF DRAWING SITE PLAN & LOCATION MAP	SCALE 1 : 1000m

Table 3-1 Building Specifications

Building	Structure	Width(m) x depth(m)	Building Area (m^2)	Total Floor Area (m^2)
Studio Block	3-storied building with 1-story penthouse; reinforced concrete structure; partly of steel framed reinforced concrete structure; partly of steel framed structure.	60 x 36	2,160	5,727.6
Office Block	8-storied building with 2-story penthouse; steel framed reinforced concrete structure or preferably reinforced concrete structure.	66 x 30.4	2,006.4	16,746.6
Connecting Corridor	3-storied building; reinforced concrete structure with brick walls.	6 x 18	108	324.0
Building Equipment House	1-storied building; brick structure with reinforced concrete slabs.	18 x 30	540	540.0
Garage	1-storied building; steel framed structure with brick walls.	40 x 28	1,120	1,120.0
Reception House	1-storied building; brick structure with reinforced concrete slabs.	7 x 10	70	70.0
Security Staff House	-ditto-	6 x 24	144	144.0
	Total		6,148.4	24,672.2

(3) The buildings will be largely divided into four blocks, namely the studio, office, building equipment house and garage, for the following reasons:

1) Each block is considerably large in size.

2) The functions, flows of people and structure of the respective buildings are different.

3) The buildings will be so laid as to allow future expansions.

4) Construction works can be carried out in any way, i.e. by stages, as case may require.

(4) The office block will be located in front along the site stretching east to west with the studio block behind it. The building equipment house will come up near the studio block to facilitate laying of main pipelines for air-conditioning, electricity and other utilities.

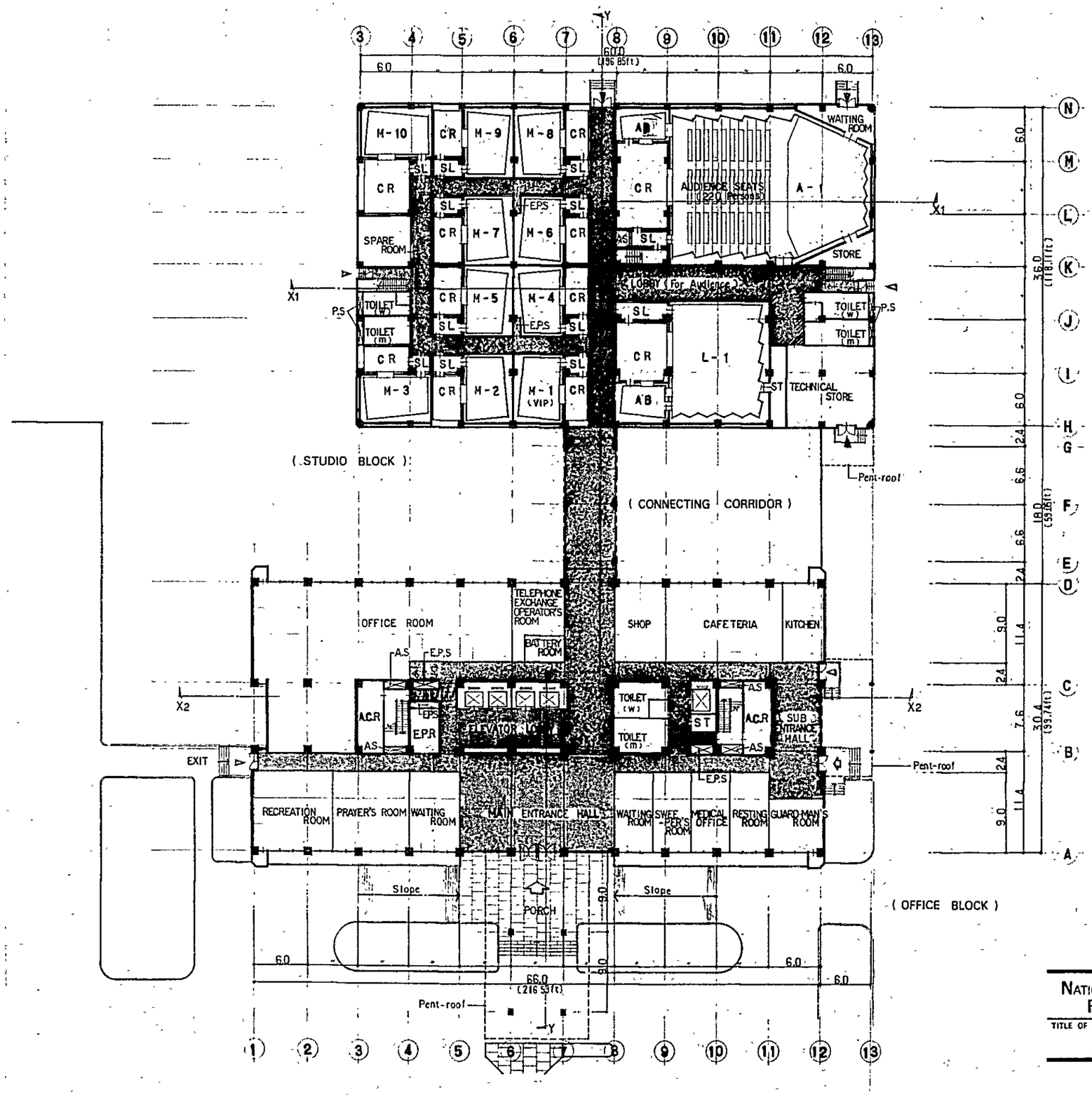
(5) Parking space for about 100 cars will be provided at the southwest section of the site. This will be about 3000 m^2 in area.

(6) Trees will be planted and grass will be grown on the site which will be enclosed by brick walls. A watch house will be built at each of the four corners of the site.

3-2 Floor Plans and Cross Sections

Fig. 3-2 ∿ 3-14 show the floor plans for each floor, cross sections and elevations and Table 3-2, their respective floor areas.

The attached plans of the office block are designed on the basis of steel framed reinforced concrete structure. In the case of reinforced concrete structure, additional two rows columns will be required in the office space.



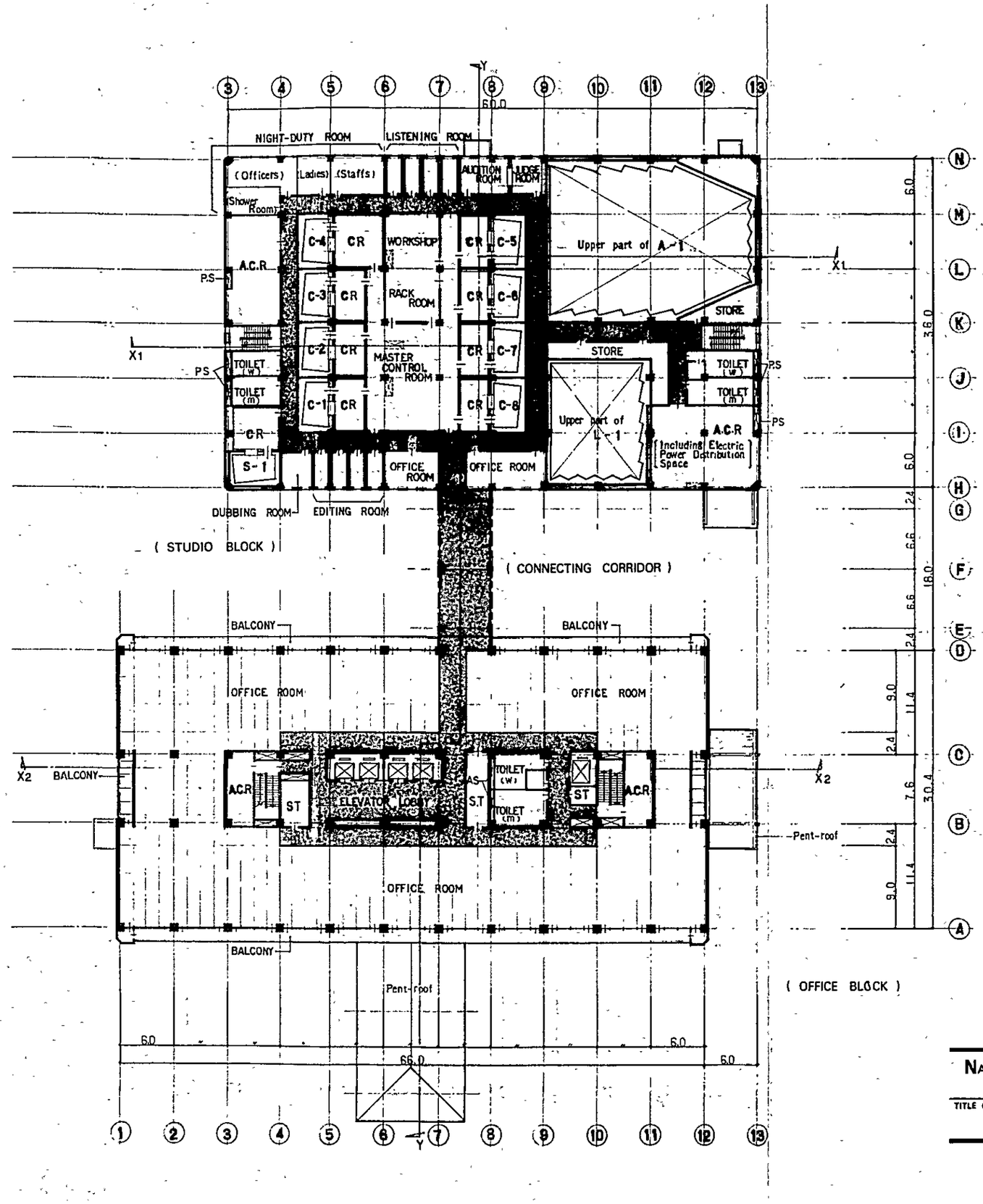
—NOTES—

- ; CORRIDOR
- ; DOUBLE SLAB (over THE CEILING)

M- ; MEDIUM STUDIO
L-1 ; LARGE STUDIO
A-1 ; AUDIENCE PARTICIPATING STUDIO
A B ; ANNOUNCE BOOTH
C R ; CONTROL ROOM
S L ; SOUND LOCK

A.C.R ; AIR CONDITIONING EQUIPMENT ROOM
S T ; STORE
E.P.R ; ELECTRIC POWER DISTRIBUTION ROOM
A S ; AIR SHAFT
EPS ; ELECTRIC PIPING SHAFT
P S ; PIPING SHAFT

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-2
TITLE OF DRAWING: FIRST FLOOR PLAN of STUDIO & OFFICE BLOCK	SCALE 1:300m



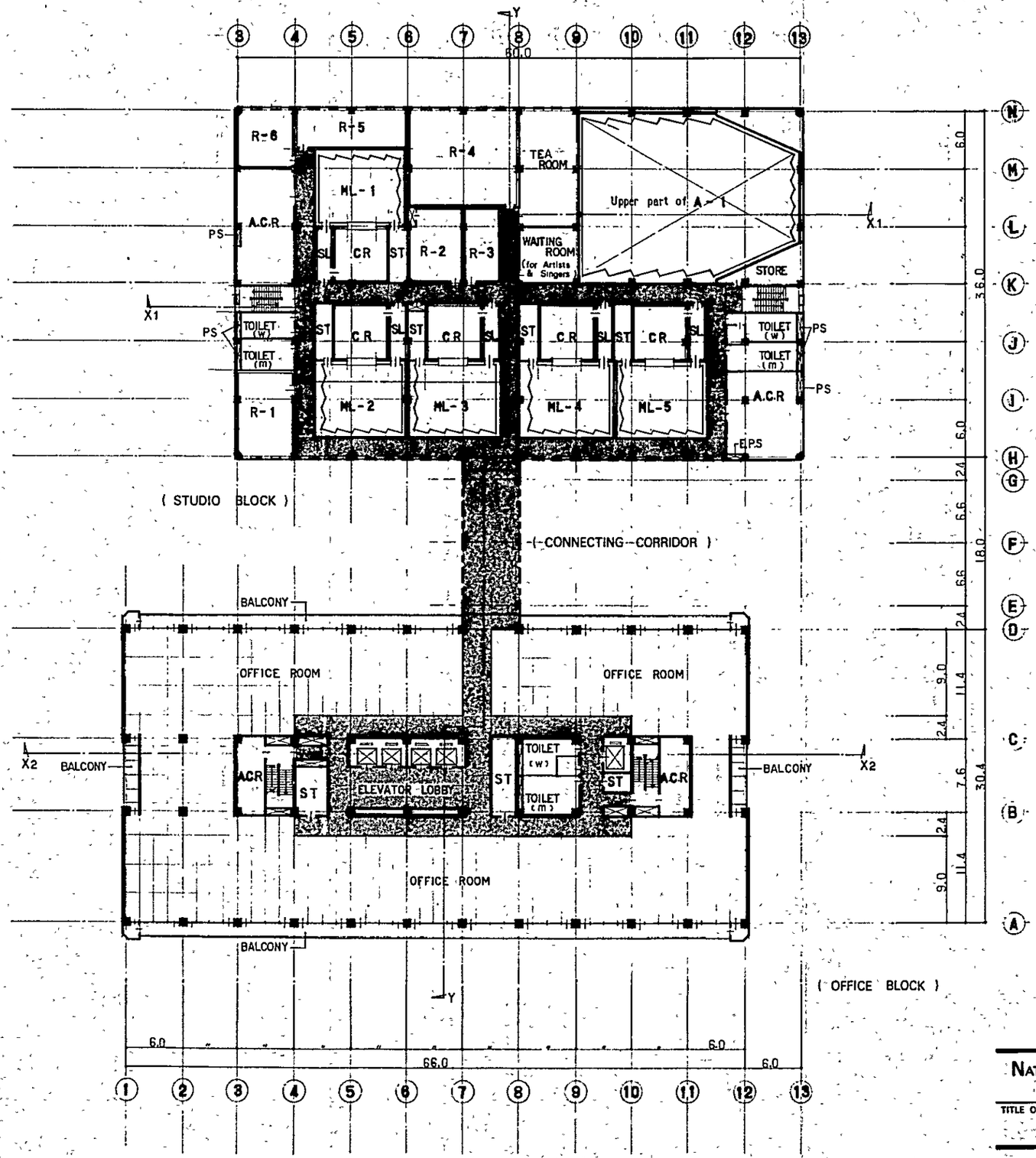
-NOTES-

▒ : CORRIDOR

C- : CONTINUITY STUDIO
S-1 : SMALL STUDIO
L-1 : LARGE STUDIO
A-1 : AUDIENCE PARTICIPATING STUDIO
C R : CONTROL ROOM

A.C.R : AIR CONDITIONING EQUIPMENT ROOM
S T : STORE
A S : AIR SHAFT
P S : PIPING SHAFT

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-3
TITLE OF DRAWING SECOND FLOOR PLAN of STUDIO & OFFICE BLOCK	SCALE 1:300m



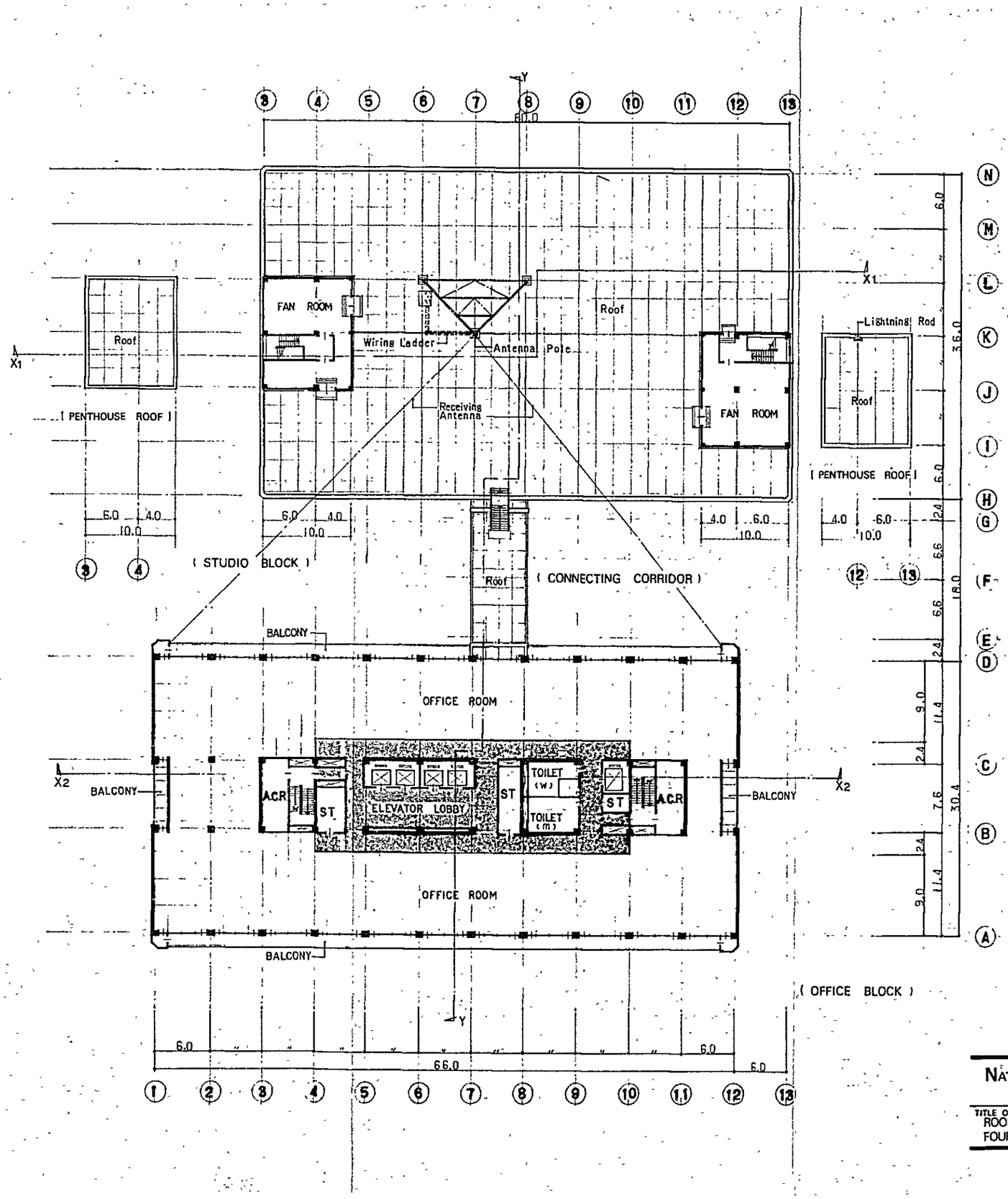
-NOTES-

▒ ; CORRIDOR

ML- ; MEDIUM-LARGE STUDIO
A-1 ; AUDIENCE PARTICIPATION STUDIO
C R ; CONTROL ROOM
S L ; SOUND LOCK
S T ; STORE
R- ; REHEARSAL ROOM

A.C.R ; AIR CONDITIONING EQUIPMENT ROOM
E P S ; ELECTRIC PIPING SHAFT
P S ; PIPING SHAFT

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-4
TITLE OF DRAWING THIRD FLOOR PLAN of STUDIO & OFFICE BLOCK	SCALE 1:300m



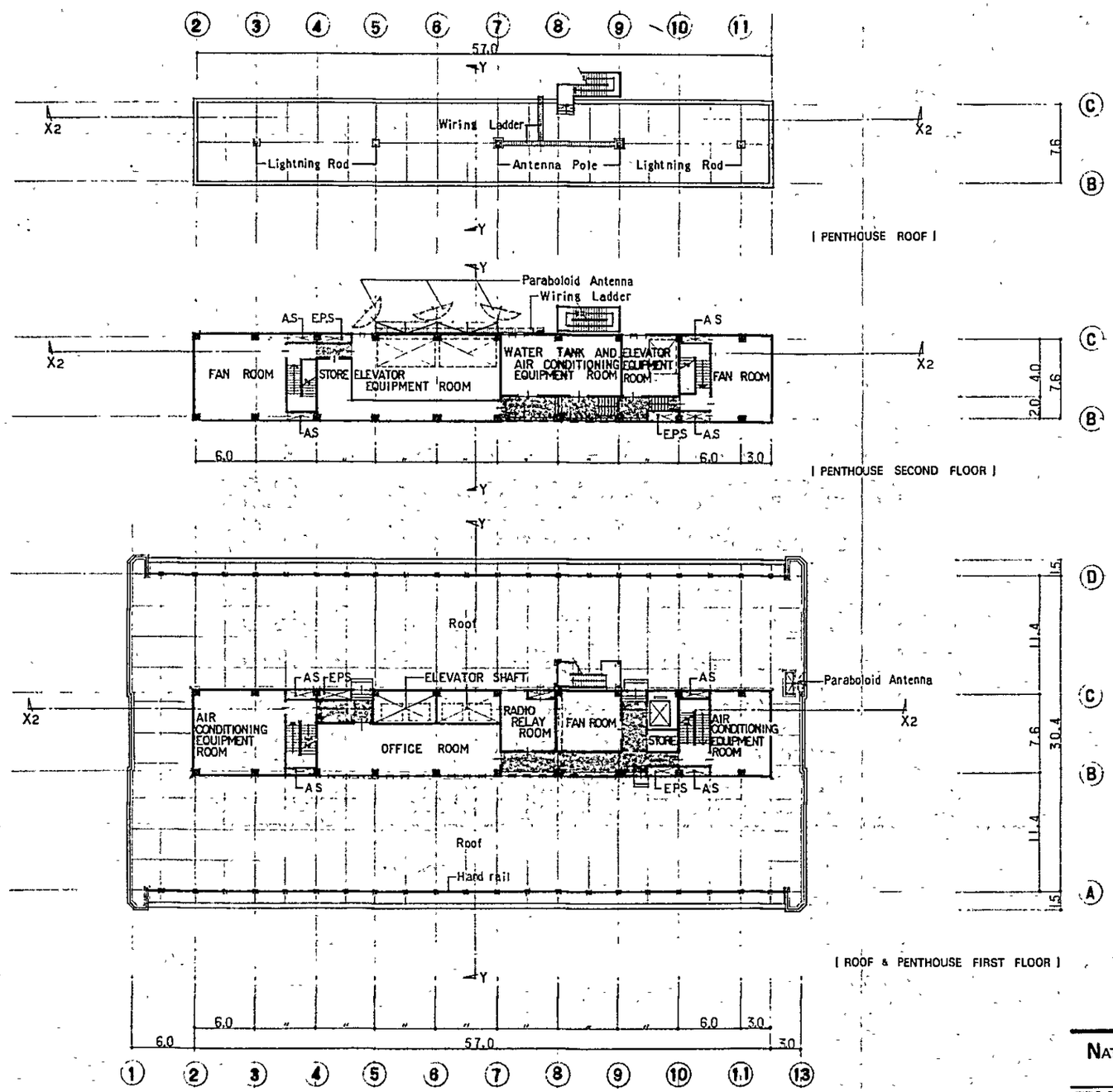
-NOTES-

▒ : CORRIDOR

A.C.R : AIR CONDITIONING EQUIPMENT ROOM

S T : STORE

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig: 3-5
TITLE OF DRAWING ROOF & PENTHOUSE FLOOR PLAN of STUDIO BLK. FOURTH~EIGHTH FLOOR PLAN of OFFICE BLOCK	SCALE 1:300m

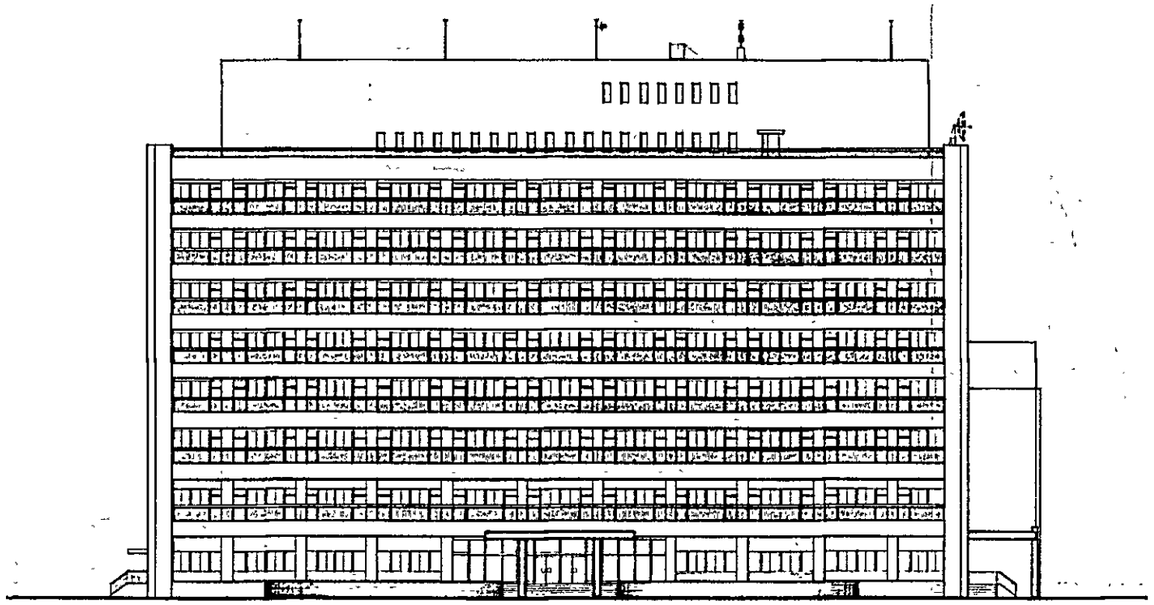


-NOTES-

▒ : CORRIDOR

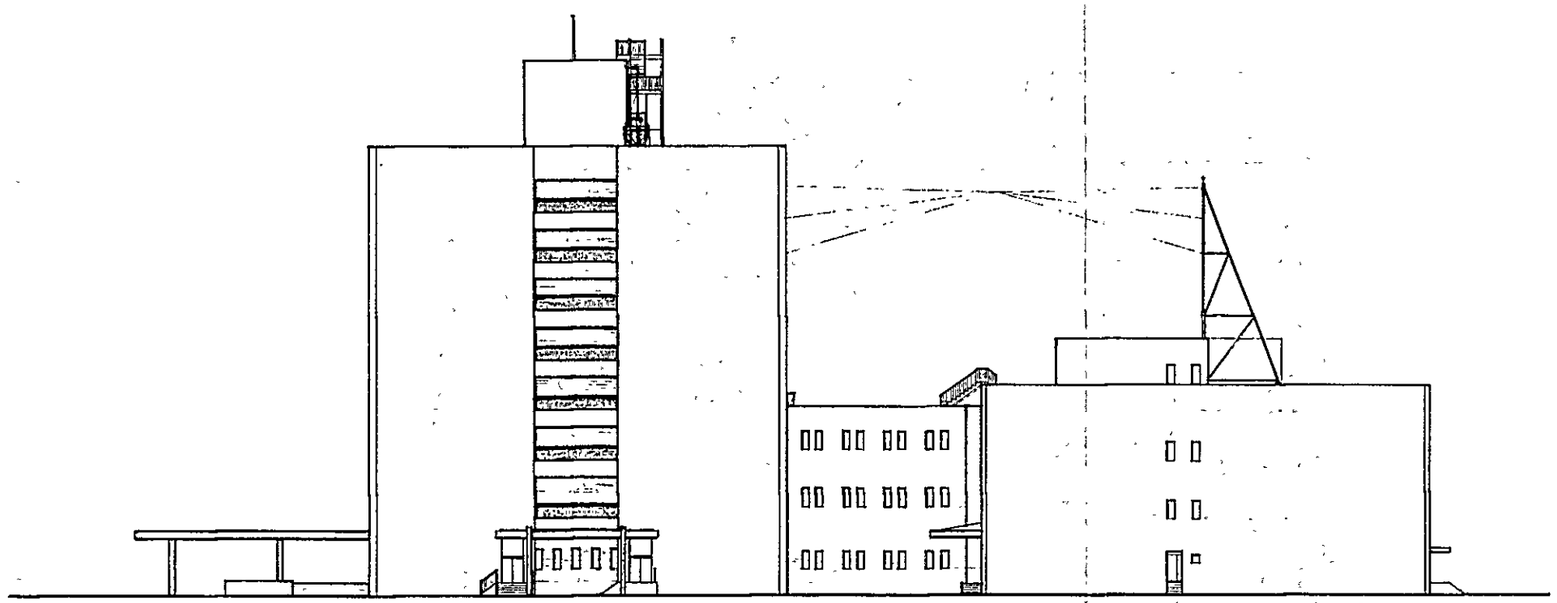
A S : AIR SHAFT
EPS : ELECTRIC PIPING SHAFT

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-6
TITLE OF DRAWING ROOF & PENTHOUSE FLOOR PLAN of OFFICE BLK.	SCALE 1:300m



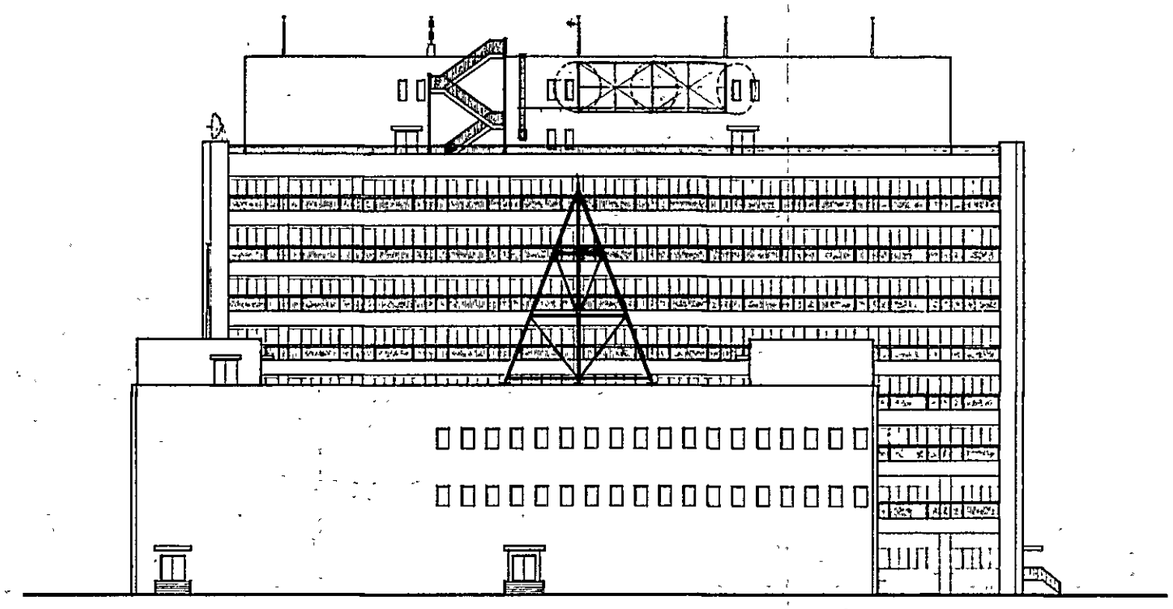
— FRONT ELEVATION —

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-7
TITLE OF DRAWING SOUTH ELEVATION of OFFICE & STUDIO BLOCK	SCALE 1 : 300 m



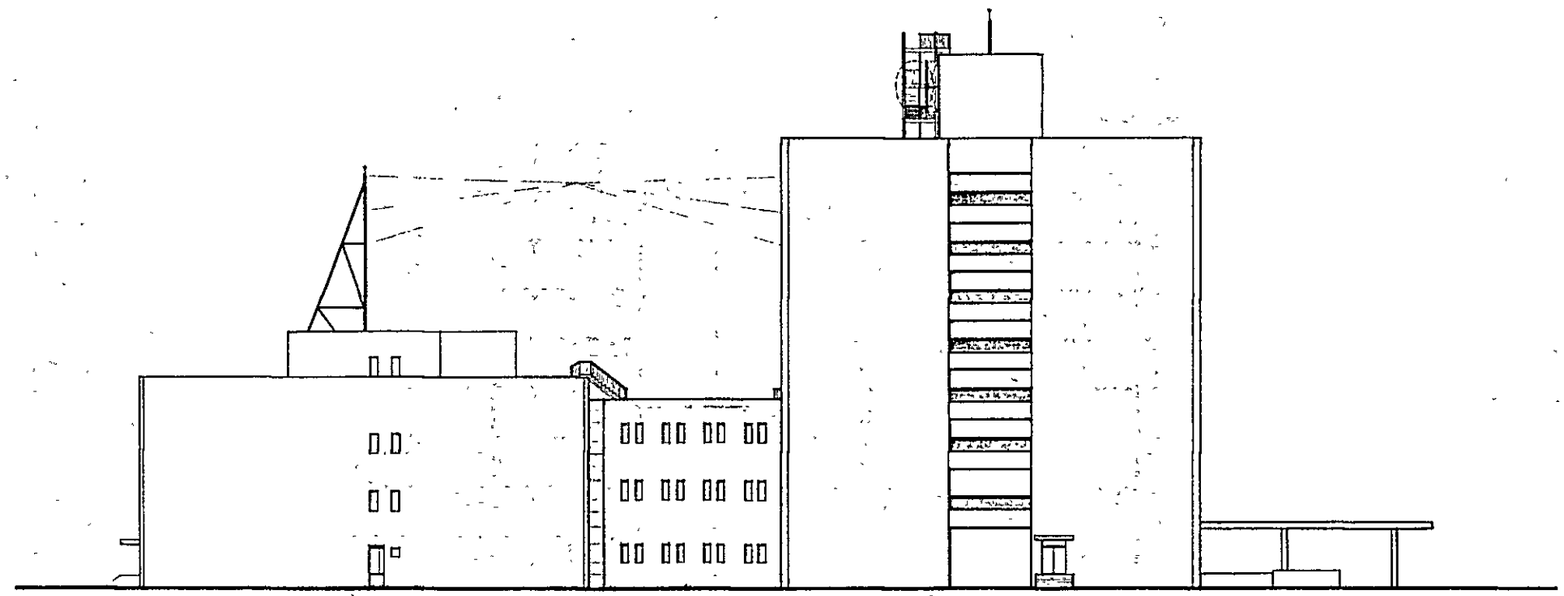
– EAST SIDE ELEVATION –

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-8
TITLE OF DRAWING EAST ELEVATION of OFFICE & STUDIO BLOCK	SCALE 1:300m



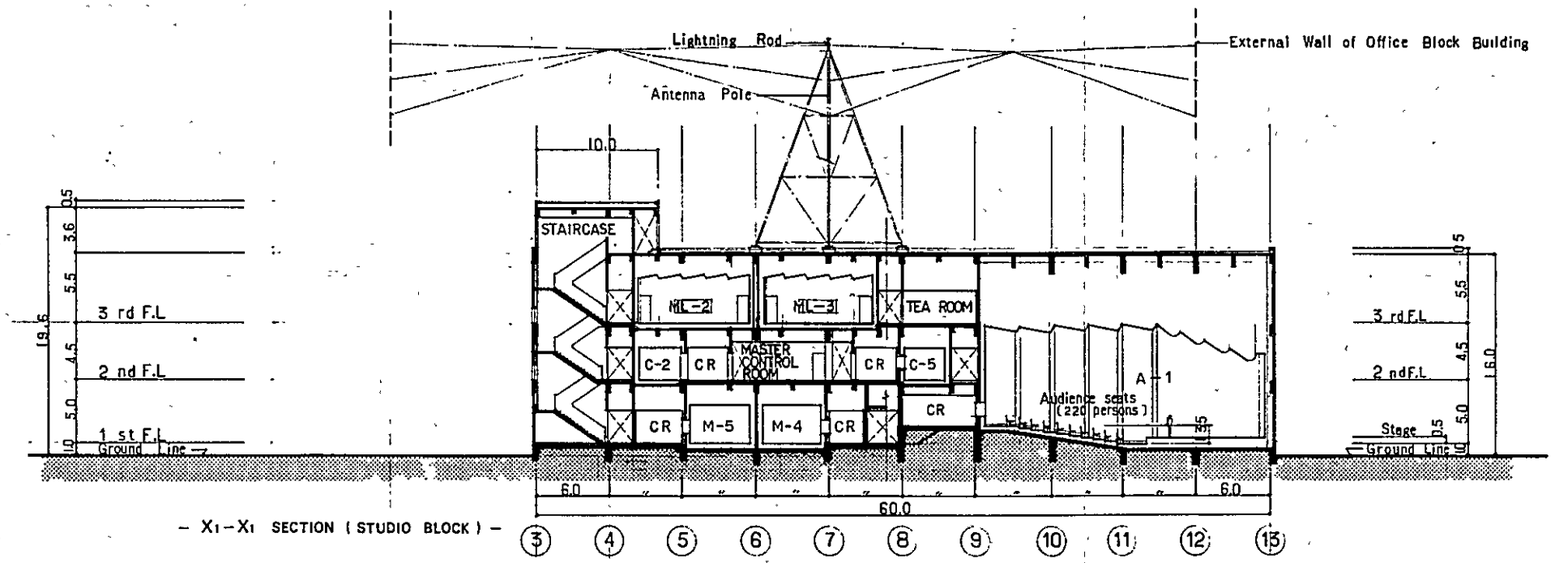
— REAR SIDE ELEVATION —

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-9
TITLE OF DRAWING NORTH ELEVATION of STUDIO & OFFICE BLOCK	SCALE 1:300m

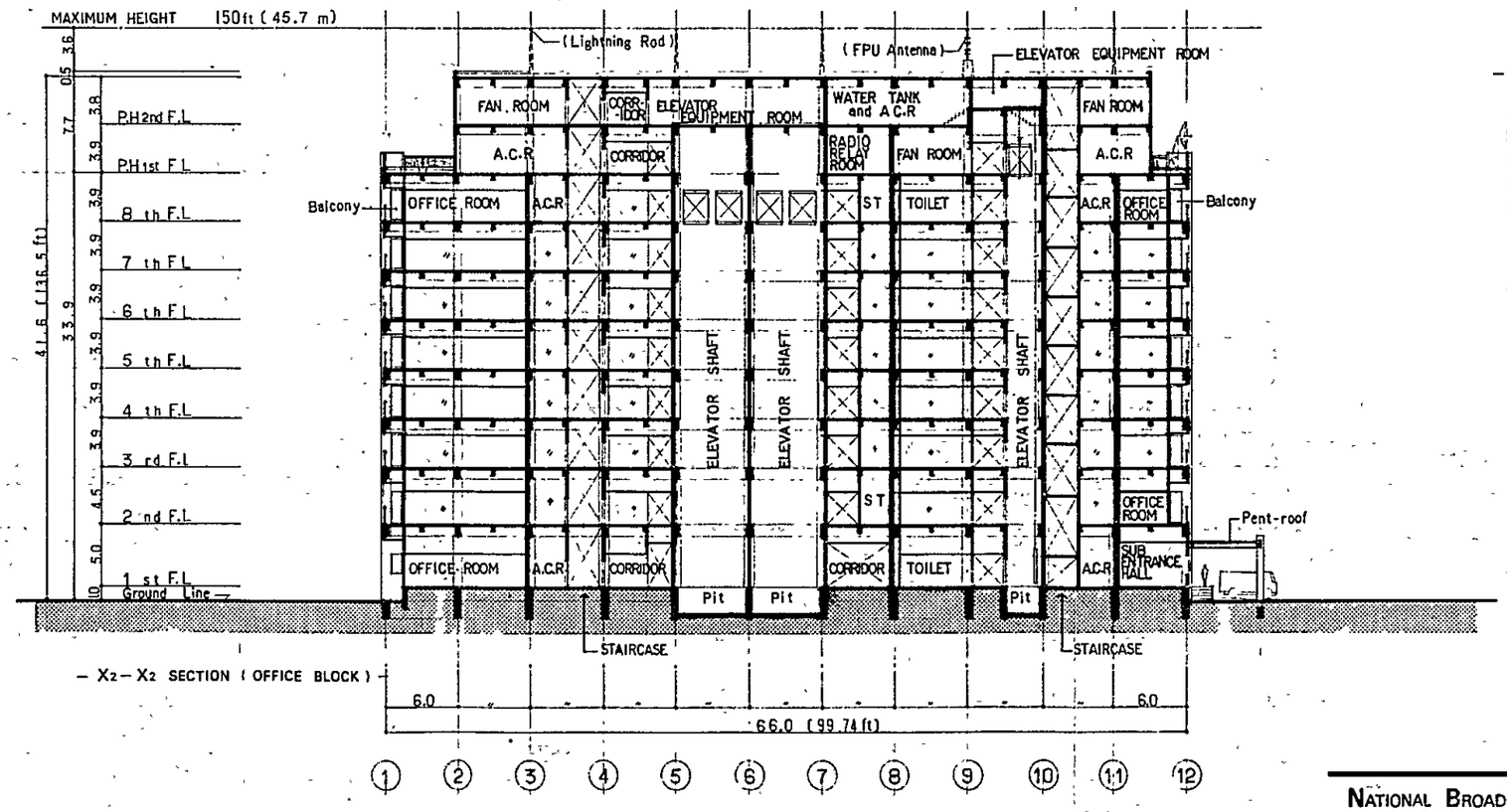


– WEST SIDE ELEVATION –

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH · DACCA	DRG. NO. Fig.3-10
TITLE OF DRAWING WEST · ELEVATION of OFFICE & STUDIO · BLOCK	SCALE 1 : 300 m



– X1–X1 SECTION (STUDIO BLOCK) –



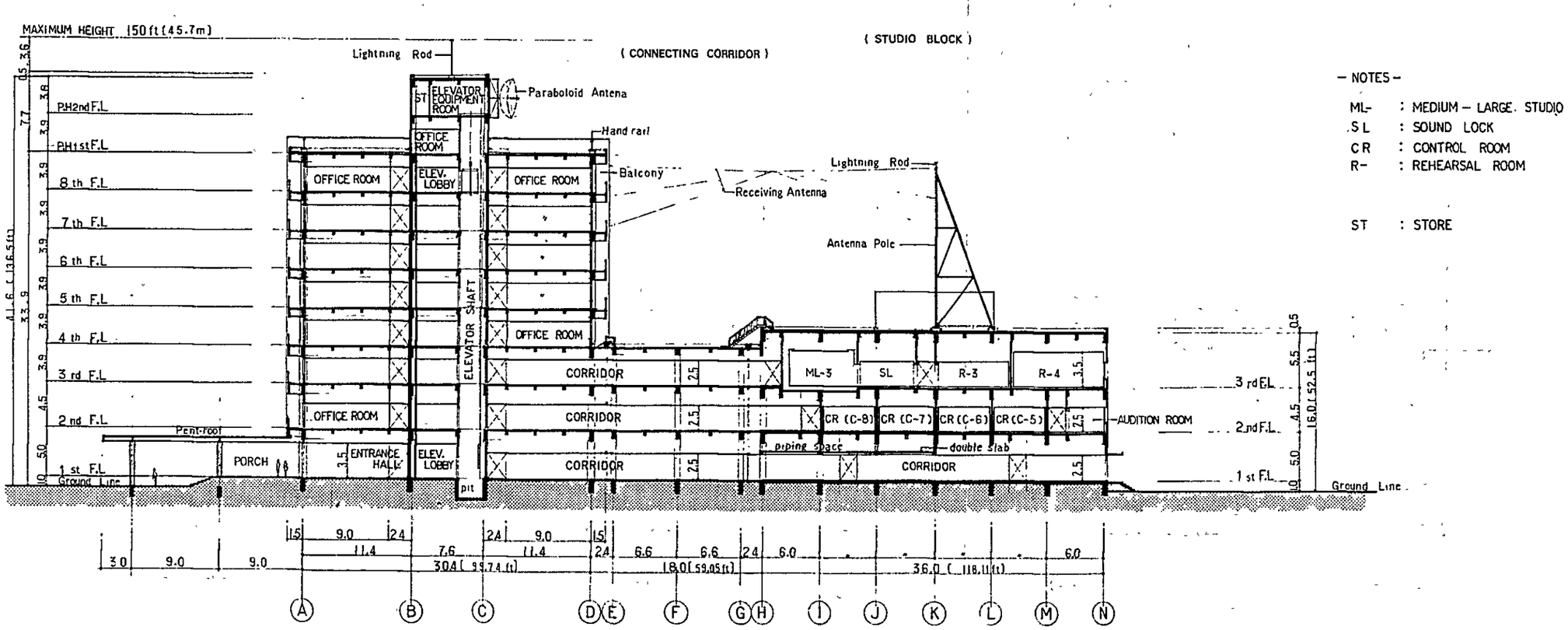
– X2–X2 SECTION (OFFICE BLOCK) –

-NOTES-

A-1 : AUDIENCE PARTICIPATING STUDIO
ML- : MEDIUM-LARGE STUDIO
C- : CONTINUITY STUDIO
M- : MEDIUM STUDIO
CR : CONTROL ROOM

A.C.R : AIR CONDITIONING EQUIPMENT ROOM
ST : STORE

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-11
TITLE OF DRAWING X1–X1 SECTION of STUDIO BLOCK X2–X2 SECTION of OFFICE BLOCK	SCALE 1:300m



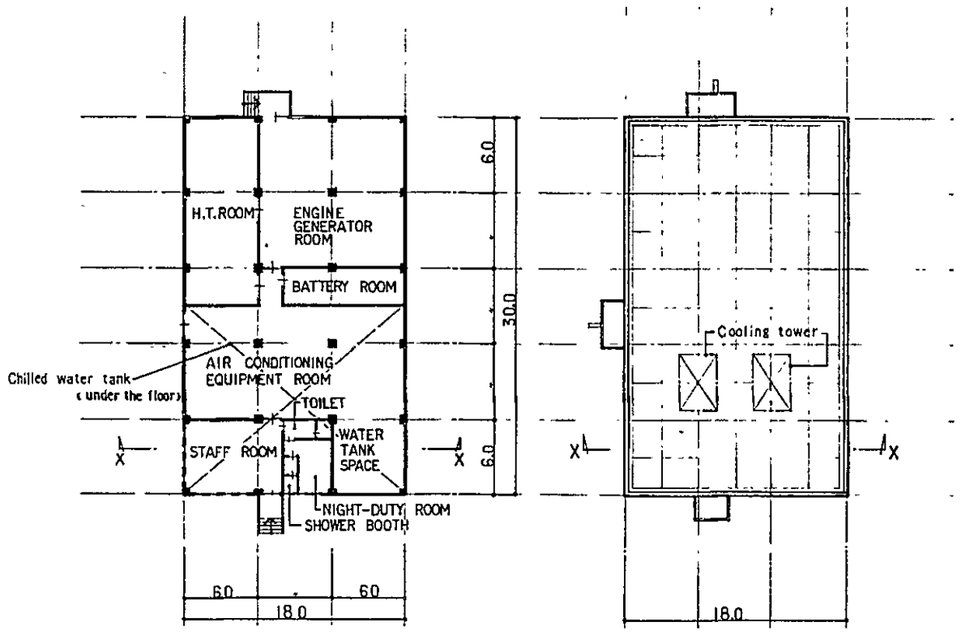
– Y–Y SECTION –

– NOTES –

ML– : MEDIUM – LARGE. STUDIO
SL : SOUND LOCK
CR : CONTROL ROOM
R– : REHEARSAL ROOM

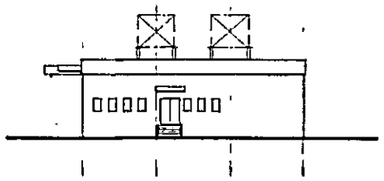
ST : STORE

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-12
TITLE OF DRAWING Y–Y SECTION of OFFICE & STUDIO BLOCK	SCALE 1 : 300m

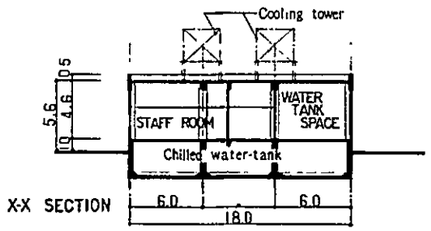


FIRST FLOOR PLAN

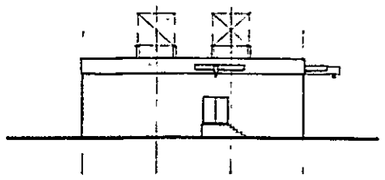
ROOF PLAN



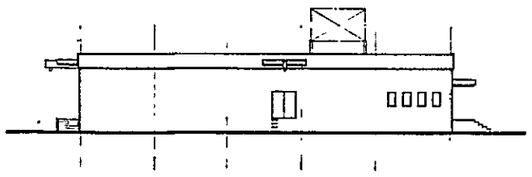
SOUTH ELEVATION



X-X SECTION



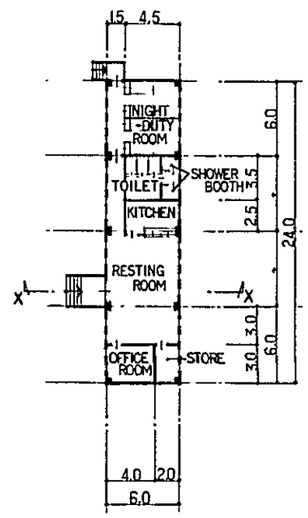
NORTH ELEVATION



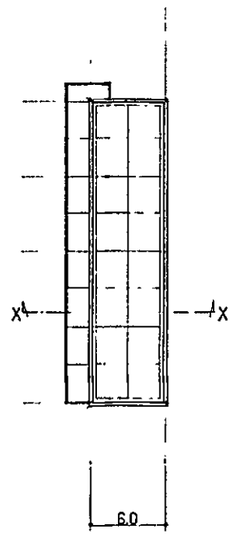
WEST ELEVATION

(BUILDING EQUIPMENT HOUSE)

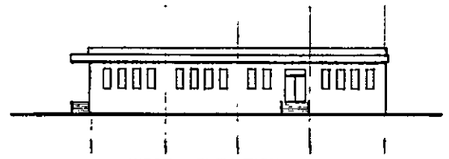
(SECURITY STAFF HOUSE)



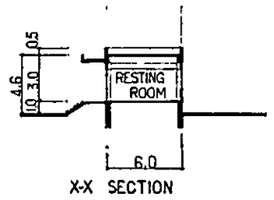
FIRST FLOOR PLAN



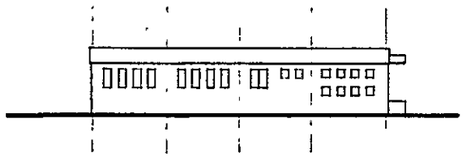
ROOF PLAN



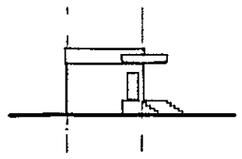
WEST ELEVATION



X-X SECTION

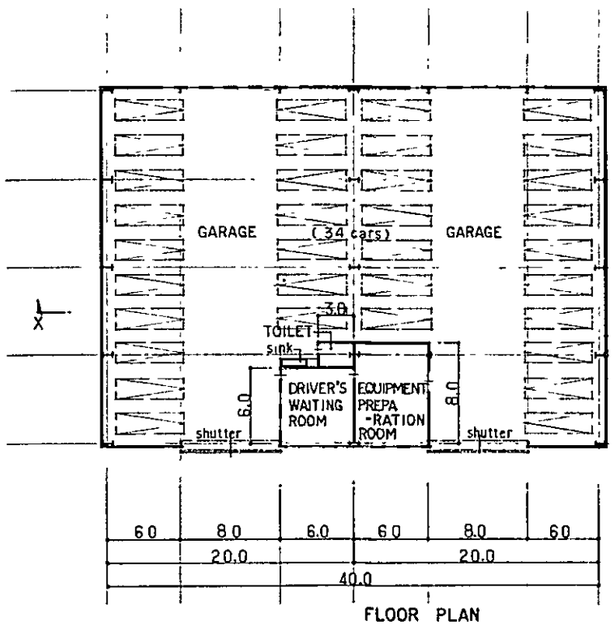


EAST ELEVATION

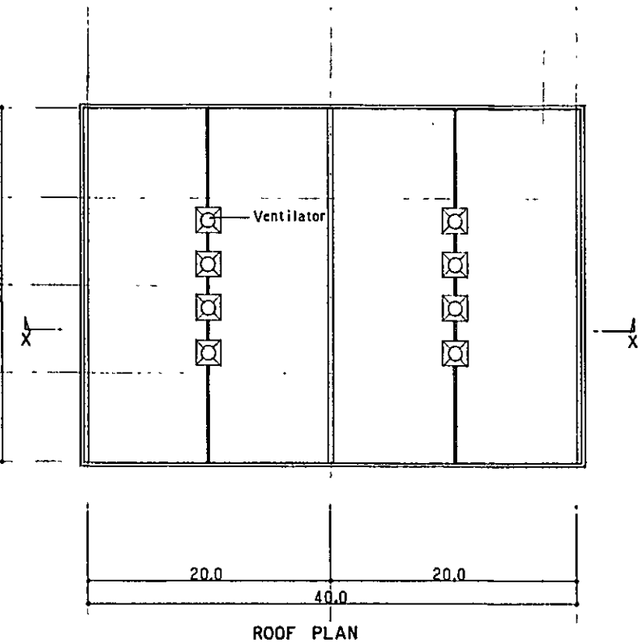


NORTH ELEVATION

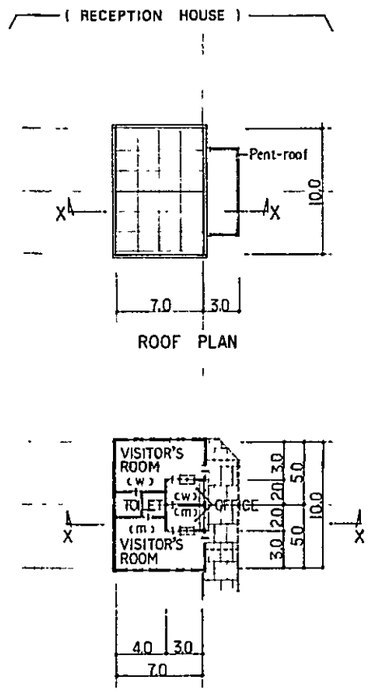
NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-13
TITLE OF DRAWING GENERAL DRAWING of BUILDING EQUIPMENT & SECURITY STAFF HOUSE	SCALE 1:300m

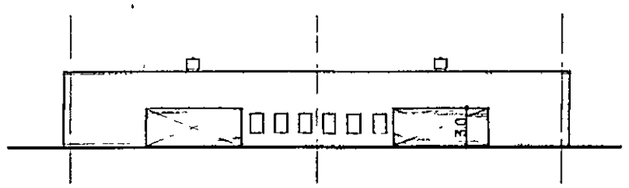


FLOOR PLAN

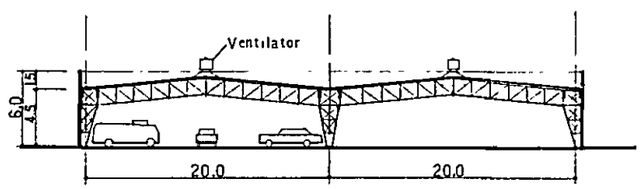


ROOF PLAN

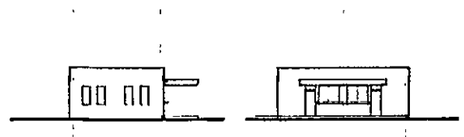




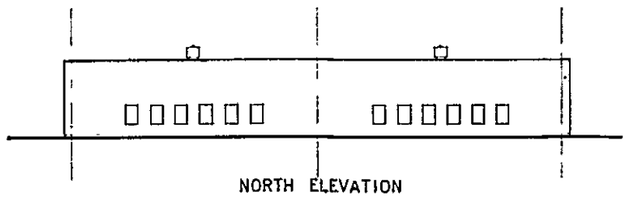
SOUTH ELEVATION



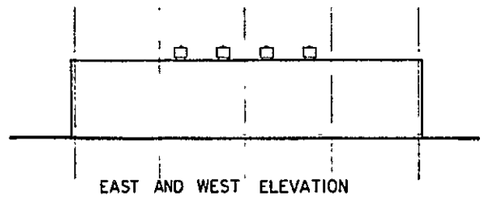
X-X SECTION



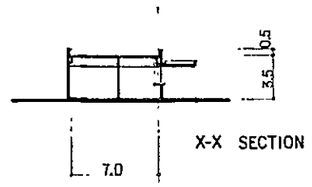
SOUTH ELEVATION EAST ELEVATION



NORTH ELEVATION



EAST AND WEST ELEVATION



X-X SECTION

(GARAGE)

NATIONAL BROADCASTING HOUSE RADIO BANGLADESH DACCA	DRG. NO. Fig. 3-14
TITLE OF DRAWING GENERAL DRAWING of GARAGE & RECEPTION HOUSE	SCALE 1:300m

Table 3-2 Floor Area of General Planning

	Function	Floor Area (m^2)	Remarks
I	Studio Block	5,727.6	3+1 stories
II	Office Block	16,746.6	8+2 stories
III	Connecting Corridor	324.0	3 stories
IV	Building Equipment House	540.0	One-storeid House
V	Garage	1,120.0	One-storied House
VI	Reception House	70.0	One-storied House
VII	Security Staff House	144.0	One-storied House
	Grand Total	24,672.2	

I. Studio Block

No.	Room Name	Floor Area (m^2)	Remarks
1.	Studio C-1	48.0	Including C.R.
2.	Studio C-2	48.0	Including C.R.
3.	Studio C-3	48.0	Including C.R.
4.	Studio C-4	60.0	Including C.R.
5.	Studio C-5	48.0	Including C.R.
6.	Studio C-6	48.0	Including C.R.
7.	Studio C-7	48.0	Including C.R.
8.	Studio C-8	48.0	Incluidng C.R.
9.	Studio S-1	54.0	Including C.R.
10.	Studio M-1	72.0	Including C.R., S.L.

(Continued)

(Continued)

No.	Room Name	Floor Area (m^2)	Remarks
11.	Studio M-2	80.0	Including C.R., S.L.
12.	Studio M-3	70.0	Including C.R., S.L.
13.	Studio M-4	72.0	Including C.R., S.L.
14.	Studio M-5	80.0	Including C.R., S.L.
15.	Studio M-6	72.0	Including C.R., S.L.
16.	Studio M-7	80.0	Including C.R., S.L.
17.	Studio M-8	72.0	Including C.R., S.L.
18.	Studio M-9	80.0	Including C.R., S.L.
19.	Studio M-10	88.0	Including C.R., S.L.,
20.	Studio ML-1	140.0	Including C.R., S.L., ST.
21.	Studio ML-2	140.0	Including C.R., S.L., ST.
22	Studio ML-3	140.0	Including C.R., S.L., ST.
23.	Studio ML-4	140.0	Including C.R., S.L., ST.
24.	Studio ML-5	140.0	Including C.R., S.L., ST.
25.	Studio L-1	270.0	Including A.B., C.R., S.L. ST.
26.	Studio A-1	540.0	Including A.B., C.R., S.L. ST. & Waiting Room 220 Audience Seats
27.	Master Control Room	156.0	Including Circulation Space
28.	Rack Room	72.0	Including Workshop
29.	Audition Room	40.0	Including Judge Room
30.	Listening Room	32.0	4 Boothes
31.	Editing Room	32.0	4 Boothes

(Continued)

(Continued)

No.	Room Name	Floor Area (m^2)	Remarks
32.	Dubbing Room	16.0	
33.	Rehearsal Room R-1	54.0	
34.	Rehearsal Room R-2	48.0	
35.	Rehearsal Room R-3	32.0	
36.	Rehearsal Room R-4	120.0	
37.	Rehearsal Room R-5	48.0	
38.	Rehearsal Room R-6	36.0	
39.	Waiting Room	36.0	for Artists & Singers
40.	Night-Duty Room	84.0	Including Shower Room
41.	Technical Store	90.0	
42.	Office Room	60.0	
43.	Store	77.6	
44.	Tea Room	72.0	Including Kitchen & Store
45.	Spare Room	36.0	
46.	Air Cond. Equip. Room	516.0	Including Fan Room
	(Sub-total of 1 - 46)	(4,383.6)	
47.	Common Part	1,344.0	Including Corridor, Stair, Toilet, etc.
	Total	5,727.6	(Total of 1 - 47)

(Continued)

(Continued)

II. Office Block

No.	Room Name	Floor Area (m^2)	Remarks
1.	Office Room	10,815.7	Including Conference Room, Store, etc.
2.	Waiting Room	94.5	Including Men's & Women's
3.	Guard - Man's Room	36.0	
4.	Sweeper's Room	40.5	
5.	Telephone Exchange Operator's Room	54.0	Including PABX & Battery Space
6.	Prayer's Room	81.0	Including Men's & Women's
7.	Recreation Room	81.0	
8.	Medical Office	40.5	
9.	Resting Room	40.5	Including Men's & Women's
10.	Shop	40.5	
11.	Cafeteria	175.5	Including Kitchen & Store
12.	Tea Room	54.0	Including Kitchen & Store
13.	Electric Power Distribution Room	(18.0)	
14.	Radio Relay Room	33.6	
15.	Elevator Equip. Room	120.0	
16.	Air Cond. Equip. Room	720.6	Including Water Tank & Fan Room
	(Sub-total of 1∿16)	(12,445.6)	
17.	Common Part	4,300.7	Including Entrance Hall Corridor, Stair, Toilet, Elevator Shaft etc.
	Total	16,746.6	

(Continued)

(Continued)

III. Connecting Corridor

No.	Room Name	Floor Area (m^2)	Remarks
1.	Connecting Corridor	324.0	Connecting for Studio & Office Block
	Total	324.0	

IV. Building Equipment House

No.	Room Name	Floor Area (m^2)	Remarks
1.	H.T. Room	90.0	
2.	Engine Generator Room	144.0	
3.	Battery Room	30.0	
4.	Equipment Room for Air Cond. & Cooling	204.0	Including Water Receive Tank Space
5.	Staff Room	48.0	
6.	Night-Duty Room	24.0	Including Toilet & Shower Booth
	Total	540.0	

- Note - Chilled Water-Tanks are provided under the floor of No. 4., 5., 6. Rooms.

(Continued)

(Continued)

V. Garage

No.	Room Name	Floor Area (m^2)	Remarks
1.	Garage	1,030.0	Including washing space
2.	Equip. Preparation Room	48.0	
3.	Driver's Room	42.0	Including Toilet
	Total	1,120.0	

VI. Reception House

No.	Room Name	Floor Area (m^2)	Remarks
1.	Office Room	12.0	
2.	Visitor's Room	50.0	Including Men's & Women's
3.	Toilet	8.0	
	Total	70.0	

VII Security Staff House

No.	Room Name	Floor Area (m^2)	Remarks
1.	Office Room	18.0	Including Store
2.	Resting Room	65.2	Including Kitchen
3.	Toilet & Shower Booth	24.8	Including Circulation Space
4.	Night Duty Room	36.0	
	Total	144.0	

3-2-1 Factors Common to All Buildings and Related Items

(1) The studio block will be designed to have 6-m spans both along the east-west and the north-south directions for easy studio layout and also because the desirable depth for the stereo control room is 6 m. The other buildings will also have 6-m spans likewise.

(2) The first floors of the studio and office blocks and building equipment house, etc. will be constructed at a level equal to GL + 1 m, taking into consideration the water level in the event of floods.

(3) The respective floors will have the heights given below to allow maintaining the ceiling heights required for the studios and rehearsal rooms, duct space for air-conditioning above the false ceilings, beams' depth, etc.: First floor is 5.0 m high, second floor 4.5 m and third floor 5.5 m in the studio block.

(4) The first, second and third floors in the studio and the office blocks will be connected by corridors on the same floor. Consequently, the floor height of the office block will be 5.0 m for the first floor and 4.5 m for the second floor.

(5) Floor height in the office block above the third floor will be 3.9 m, and the false ceiling height of the office will be 2.5 m.

3-2-2 Studio Block

(1) The studio block will be made accessible from outside only through the entrance of the office block and the connecting corridors. The studio block will have emergency exits and also a passage for equipment to and from the technical store.

The roof of connecting corridors will be used for emergency passage between the studio block and the office block.

(2) The first floor will accommodate a group of M studios and the A-1 and the L-1 studios, the latter ones requiring high open space.

(3) The second floor will have the MCR, a group of C studios and S studio.

(4) The third floor will have a group of ML studios and rehearsal rooms.

(5) Each floor will be provided with two stairways and toilets.

(6) Rooms which need paying no considerations for external noise will be laid along the exterior walls as far as possible and provided with windows.

(7) Main pipelines for circulation of chilled water and water supply and electric power lines will enter the studio block from the building equipment house at the technical store. These pipelines will go to the office block through the connecting corridor on the first floor.

(8) All the pipelines for the broadcasting equipment and facilities in the studio block will be collected within MCR, of which pipelines those needed for the office block will be led to it by way of the connecting corridor on the second floor.

3-2-3 Office Block

(1) The office block can be designed to provide it with either small rooms or large rooms. Greater independence is possible between smaller rooms rather than larger ones.

Smaller rooms also have the advantage that they allow undisturbed work. On the other hand, they show quite a few shortcomings. These are:

1) Poor utilization of office space.

2) Lack of flexibility in room layout if the partition walls are fixed, as where they are, say, brick walls.

3) The question of flexibility recommends light partition walls to which the building equipment must be compatible. If the small rooms proposed by Radio Bangladesh (Table 3-3) are to be taken in the plan, the total cost will be extremely high.

4) Aside from the cost problem, the fan-coil unit system is not applicable when the floor space is partitioned into too many small rooms; and air-conditioning will be the only method for cooling. Consequently, air-conditioning ducts will be thicker, and more space in the ceilings will be required for them. The floor height of 3.9 m can not accommodate. The floor area for the air-conditioner room will necessarily be larger.

(2) The following are recommended after a careful study:

1) The east/west spans will be 6 m. The depth for offices will be made 9 m.

2) The fan-coil unit system will additionally be used for air conditioning.

3) The smallest possible partitioned area will measure 3 m x 9 m. Therefore, the next larger sizes will be 6 m x 9 m, 9 m x 9 m, 12 m x 9 m, etc.

Table 3-3 Office Room Size Proposed by Radio Bangradesh

Floor Area		Name of the posts/unit purpose					
Ft^2	m^2	Director General	Engineering	Programme	Administration	News	Home Service
1,000	92.9		Technical Store			General News Room	
560	52.0						Library
540	50.2		Library	Library, Tape Library			
500	46.5		Workshop				
480	44.6			Librarian Cum & Library		Asstt: News Editor (Shift Duty) (16)	
460	42.7					Teleprinter Operator	
440	40.9					Stenotypist, etc. (11)	
400	37.2	D.G's Conference Room	Conference Room	Conference Room		Conference Room	Visitor's/Meeting Room
360	33.4		Radio Engineer, Conf. Room (4)	Assistant Director (3)	Superintendent/Head Asst. (4)		Asstt: Accounts Officer (30/5)
320	29.7	Director-General	Chief Engineer		Assistant (8)		Programme Secretary (11/2)
300	27.9		Technical Assistant (5)	Programme Producer (10)	Library Clerk & Library	Sub Editor (14)	
290	26.9			Superintendent, Stenotypist, etc. (6)			
280	26.0			Stenotypist, Clerk, etc. (7)			
270	25.1			Asstt: Prog. Executive (12)			
260	24.2			Store & Store Keeper			
250	23.2					Superintendent, Asstt, etc. (5)	
240	22.3		Additional Chief Engineer	Deputy Director-General	Deputy Director-General	Deputy Director-General	Director (D.D.G's Rank)

Floor Area		Name of the posts/unit purpose					
Ft^2	m^2	Director General	Engineering	Programme	Administration	News	Home Service
210	19.5			Superintendent, etc. (4)			
200	18.6		Typist (5)	Stenotypist, Clerk, etc. (10)			Lower Division Clerk (20/4)
180	16.7		Accounts Officer	Deputy Director	Administrative Officer (2)	C. News Editor (Shift Deputy) (4)	Deputy Director
160	14.9			Assistant (4)		Stenotypist, L.D.C. (4)	Stenotypist (4)
150	13.9					Sub Editor (5/2)	
140	13.0		Gestetner Operator	Gestetner Operator	Daftary & Record Keeper (2)	Gestetner Operator	Gestetner Operator
130	12.1			Superintendent & Assistant (2)			
120	11.1	P.A. to D.-G Asstt: P.A. to D.G.	Security Officer	Analyst (2)	Assistant Director		Accountant Cashier (2)
100	9.3		Daftary (2)	Daftary		Daftary	
90	8.4		Administrative Officer	Stenotypist (2)	Accountant	Administrative Officer	Driver (12)
60	5.6		P.A. to Chief Engineer	Stenographer	P.A. to Director	Librarian	Librarian

Notes: 1. Extracted from "Future requirements of floor layout of proposed National Broadcasting House."
2. Figures in parentheses are the number of persons.

4) For small or irregular rooms other than the above, air will be circulated by means of opening spaces made on the partition walls near the floor and ceilings.

(3) The central part of each floor will constitute a core surrounded by offices across the corridor.

(4) The offices will measure a total of 10,815.7 m^2 in area including conference rooms.

(5) Offices can be laid out entirely freely. However, considering connection with the studio block, a desirable layout will be: common space on the first floor, news section on the second floor, engineers section on the third floor, above of which home service section, programme section and headquarters section will be arranged in that order on each floor.

(6) Apart from the question of cost, a non-permanent type structure will be desirable for partition walls to meet future layout changes.

(7) The main entrance will be used for employees and visitors. The sub-entrance on the east side will be used exclusively for employees and cargo

(8) Four passenger elevators with a speed of 120 m/minute will serve from the first to eighth floor. A cargo elevator running at a speed of 60 m/minute from the first floor up to the roof will be installed.

(9) Balconies to shield the offices against direct sunshine will be provided in front of the windows on the north and south sides of the building. The occupants will be able to go out into the balconies from the offices.

(10) The offices on the east and west sides will also be shielded against direct sunshine.

(11) Parabolic and other antennas will be installed on the penthouse.

3-2-4 Other Buildings

(1) The height of the building equipment house will be 4.0 m below the beam.

(2) The building equipment house will have auxiliary rooms for persons in charge.

(3) The garage will have a height of 3.0 m below the beam.

3-3 Structure

3-3-1 Structural Design

All the buildings under this project will have the Rahmen or brick structure. They will be designed to make them resistant to earthquakes and storms by providing well balanced bearing walls and braces.

Each building will be structurally independent so that none of them will affect the other in the event of an earthquake or excessive wind loads.

Structural analysis and structural design will be made in conformity with the existing practices taken in Bangladesh, taking the building standards and regulations of Japan into consideration.

As for the lateral seismic force coefficient, a very small value, say 0.05, will be taken into account.

A maximum instantaneous wind velocity of 120 miles/hour (about 55 m/second) will be the criterion for the structural design against wind loads.

The designing live load will be decided referring to the Japanese building standards. For the Special rooms, such as studios, MCR, control rooms, etc. appropriate values will be determined on the basis of the weight of the equipment and facilities on floor, taking standard values used by NHK into consideration.

3-3-2 Foundation Structure

All foundations of the buildings planned will be reinforced concrete structure with foundation beams to give a rigid structure. The weight of the buildings will be supported on piles. These will be cast-in-place reinforced concrete piles with a diameter of 45∿55 cmø. The tips of the piles should be driven into sand layer (with N value of more than 50) deeper than about 21 m below the ground level. A load test shall be made to confirm the allowable bearing capacity of the piles prior to work.

3-3-3 Structure of Buildings

(1) Structure of the Studio Block (including the connecting corridor)

The studio block will have three storeys above the ground and a one-storey penthouse of Rahmen and reinforced concrete structure. The building will be partly of steel framed reinforced concrete structure and partly of steel framed structure. The large beams which support the third floor will have the steel framed reinforced concrete structure, and the roof beams of the large studios will be steel framed. The walls other than the bearing walls will be partly of brick structure.

The roof will have poles for antennas. The roof of the penthouse will have a frame for possible installation of antennas.

The connecting corridor for the flow of occupants between the office and the studio blocks will be of reinforced concrete structure with brick walls and will have three storeys. The joint sections between the office and the studio blocks will have an expansion-joint sturcture.

(2) Structure of the Office Block

The office block will be a Rahmen structure having eight storeys above the ground and a 2-storey penthouse. The basic floor area covers the dimensions of approx. 30 m x 66 m. The structure of the building may be either steel framed reinforced concrete (S.R.C.) or reinforced concrete (R.C.).

The S.R.C. structure allows the building to have a long span framing, which involves only four rows of columns along the longer profile. Such small number of column rows provides flexibility in planning the room layout assuring an easy modification of the room layout in the future. This sturcture gives ductility to the building and makes it much earthquake resistant.

The R.C. structure, on the other hand, necessarily requires a shorter span framing and two excessive rows of columns are to be added to the four rows of columns as mentioned in the case of S.R.C. structure. Therefore, the planning of the room layout becomes less flexible, limiting the free modification of the room layout in the future. The construction cost, however, is reduced when compared to the S.R.C. structure, therefore, should preference be placed on the less cost, the R.C. structure may be recommended.

Whether the building may take the S.R.C. structure or the R.C. structure, it will have reinforced concrete bearing walls in the core sections and on the gable sides to provide earthquake resistance. The walls other than the bearing walls will be made partly with bricks.

The penthouse structure will permit the installation of various antennas.

(3) Structures of Other Buildings

The building equipment house, reception house and security staff-house will be of brick structure with reinforced concrete slabs and will be single-storied.

The garage will be a single-storied, steel framed structure with brick walls. Braces will be provided in good balance to withstand winds.

3-3-4 Antenna Supporting Structure

(1) Frames to be built on one side of the penthouse on the roof of the office block and on the roof of the penthouse on the studio block will be steel framed. Antirust treatment will be made on their steel parts.

(2) The antenna pole to be built on the main roof of the studio block will be of a triangular truss tower structure of steel pipe. The materials will be treated for antirusting.

3-3-5 Materials Used for Structural Parts

(1) Steel Materials: All steel materials will conform to the JIS or similar standard and processed materials will be imported.

(2) Reinforcing Bars: Only materials conforming to the JIS or similar standard will be used.

(3) Concrete: Crushed stone concrete will be used for both building bodies and foundation piles. Imported cement will be used.

3-4 Acoustics

3-4-1 Environment Conditions from Standpoint of Noise

The area around the planned site is very quiet at present. When this area is developed, the site area will be surrounded on three sides by roads. Motor traffic is expected to gradually increase. The studio building, however, is distant at least 50m from the nearest road and does not create disadvantages in this respect.

A new international airport away from Dacca is now under construction. Majority of functions which the present airport has are expected to move to the new airport when it is built. The existing airport, however, will still continue to be used as an airport, and the buildings will have to be shielded against aircraft noise.

3-4-2 Noise Countermeasures

(1) Design criteria for air conditioning noise will be set as follows:

Studios C, S, M and ML groups	NC-15
Studios L and A	NC-20
Control rooms	NC-25
MCR	NC-30
Rehearsal rooms	NC-25
Audition room Listening rooms Editing rooms	NC-25
Conference rooms	NC-30
Offices	NC-35

(2) The noise entering the studios from outside will be suppressed to an extent that it will not cause a trouble, taking the effect of masking by air-conditioning noise into consideration.

(3) Double walls will be built where required by laying bricks aside from concrete walls.

(4) The studios will have a floating construction to prevent transmission of solid borne sounds, such as caused by footsteps.

(5) The studios will have sound-proof doors and windows.

3-4-3 Room Acoustics

(1) A desirable dimension ratio will be considered for the length, width and height of each studio.

(2) The design criteria will be as follows: The mean sound absorbing coefficient at 500 Hz for studios other than A-1 will be 0.35 ∿ 0.40. Studio A-1 will have a reverberation time of about 1.0 ∿ 1.2 seconds with the audience. Chairs designed for good sound absorption effects will be required to minimize a change in reverberation time when the seats are not occupied.

(3) For arrangement of materials in A-1, the live-end and dead-end system will be adopted.

(4) Difusion of sound will be considered by making the surfaces of walls and ceilings uneven for the studios ML, L and A.

(5) Table 3-4 shows the approximate values of specifications for the studios. These values may change more or less at the stage of making a detailed design.

Table 3-4 Specifications for the Studios

No.	Studio Symbol	Use	Dimensions of Studio: Length (m)	Width (m)	Height (m)	Floor Area (m^2)	Total Surface Area (m^2)	Volume (m^3)	$\frac{V}{S}$ (m)	Reverberation Time at 500Hz (sec)	Floor Area of Associated Rooms (m^2): CR	AB	SL	Store	Remarks
1	C - 1	Talk	4.6	3.2	2.4	15	67	35	0.53	0.17 ~ 0.20	24	-	-	-	Continuity Studio
2	2	"	"	"	"	"	"	"	"	"	"	-	-	-	"
3	3	"	"	"	"	"	"	"	"	"	"	-	-	-	"
4	4	"	"	"	"	"	"	"	"	"	36	-	-	-	"
5	5	"	"	"	"	"	"	"	"	"	24	-	-	-	"
6	6	"	"	"	"	"	"	"	"	"	"	-	-	-	"
7	7	"	"	"	"	"	"	"	"	"	"	-	-	-	"
8	8	"	"	"	"	"	"	"	"	"	"	-	-	-	"
9	S - 1	Talk	4.6	3.2	2.4	15	67	35	0.53	0.17 ~ 0.20	30	-	-	-	
10	M - 1	Talk/Music	6.7	4.6	3.0	31	130	92	0.71	0.22 ~ 0.27	18	-	6	-	
11	2	"	"	"	"	"	"	"	"	"	24	-	8	-	
12	3	"	"	"	"	"	"	"	"	"	18	-	4	-	
13	4	"	"	"	"	"	"	"	"	"	"	-	6	-	
14	5	"	"	"	"	"	"	"	"	"	24	-	8	-	
15	6	"	"	"	"	"	"	"	"	"	18	-	6	-	
16	7	"	"	"	"	"	"	"	"	"	24	-	8	-	
17	8	"	"	"	"	"	"	"	"	"	18	-	6	-	
18	9	"	"	"	"	"	"	"	"	"	24	-	8	-	
19	10	"	"	"	"	"	"	"	"	"	36	-	4	-	
20	ML - 1	Music/Drama	8.8	6.8	3.6	60	232	215	0.93	0.30 ~ 0.35	36	-	12	12	
21	2	"	"	"	"	"	"	"	"	"	"	-	"	"	
22	3	"	"	"	"	"	"	"	"	"	"	-	"	"	
23	4	"	"	"	"	"	"	"	"	"	"	-	"	"	
24	5	"	"	"	"	"	"	"	"	"	"	-	"	"	
25	L - 1	Music/Drama	12.8	10.6	4.8	136	496	651	1.31	0.40 ~ 0.50	48	15	12	18	
26	A - 1	Music	22.2	9.0 ~ 15.4	9.0	320	1170	2510	2.15	1.0 ~ 1.2	60	15	8	18	Audience seats, 220 Waiting room 18m^2

-Notes- V : Volume, S : Total Surface Area
CR : Control Room, AB : Announce Booth, SL : Sound Lock

(6) Control, audition, listening, and rehearsal rooms will be designed, taking room acoustics into consideration.

(7) The room which houses air conditioning units will have walls with good sound absorption feature to suppress the room noise.

3-5 Air Conditioning Equipment

3-5-1 Cooling Source Equipment

Two absorption chilling units of natural gas burning type (250 Ref-ton x 2) will be installed in the building equipment house for joint use by the studio and office blocks. Chilled water is to be stored in an underfloor heat storage tank. The chilled water is supplied to the air conditioners for various systems and fan coil units by 5 ∿ 6 chilled water supply pumps.

Cooling water for chilling units will be cooled by cooling towers.

3-5-2 Air Conditioner Equipment

In principle, all the buildings will be cooled. The air conditioning systems provided will be as follows:

(1) Studio Block

(a) System for M-1 through M-10 and control rooms.

(b) System for L-1, control room and announce booth.

(c) System for C-1 through C-8, S-1 and control rooms.

(d) System for MCR and work shop.

(e) System for ML-1 through ML-5 and control rooms.

(f) System for R-1 through R-6.

(g) System for A-1 control room and announce booth.

(h) System for waiting room and tea room.

(i) System for technical store.

(j) System for audition and dubbing rooms,etc.

(k) System for night duty rooms.

(l) System for power distribution room.

(2) Office Block

(a) North-east system for each floor (1 - 8F) 8 systems

(b) South-east system for each floor (1 - 8F) 8 systems

(c) North-west system for each floor (1 - 8F) 8 systems

(d) South-west system for each floor (1 - 8F) 8 systems

(e) System for office on the roof.

(f) System for elevator machine room.

(g) System for radio relay room.

Two floor-type fan-coil-units will be installed for each span in perimeter zones to process the sensible heat gain through the construction of the building. The air-conditioners for various systems are primarily to be for processing internally generated heat and for intake of fresh air.

3-5-3 Ventilation Equipment

The intake quantity of fresh air is to be 20 m^3 per hour per head as a rule.

(1) Studio Block

The air conditoner systems in (a), (c), (f) and (j) will form the west zone, while the (b), (d), (e), (g) and (h) systems will form the east zone. Systems (i), (k) and (l) will form another zone. Exhaust air from these zones will be collected on the roof to be exhausted after heat-exchange with fresh air in two air-to-air heat exchangers on the roof. The air in toilets, shower rooms, etc. is to be exhausted independently without a heat exchanger.

(2) Office Block

The air conditioner systems on each floor will be grouped into east and west zones. Exhaust air will be collected on the roof and after heat-exchange with fresh air in two air-to-air heat exchangers - one each for the east and the west zone. The fresh air is to be supplied to the air conditioners of the systems after heat exchange.

The air in the toilets, kitchen, etc. is to exhaust separately without passing through an air-to-air heat exchanger, as in the studio block.

3-5-4 Automatic Control Equipment

The chilling units will be fully automatic. The air conditioner for each system is to change the blowoff air temperature by controlling the chilled water quantity flowing in the cooling coil by a two-way valve. The supply air volume is to be maintained constant. The number of chilled water supply pumps to be operated must have automatic control depending on the load.

The fan-coil-units in the office block peri-

meters are to allow their air volumes manually controlled between 0 ∿ 100% by a switch nearby, and cold water is not automatically controlled.

3-6 Plumbing

3-6-1 Water Supply Facilities

Water will be obtained by bored well. Water is to be led to a water receiving tank through a sand settling tank and will be pumped up to two elevated water tanks on the roof of the office block. Water will be supplied to various points in the office and studio blocks etc. from these elevated water tanks.

3-6-2 Hot-Water Supply Facilities

Natual gas burning water heaters will be installed in the kitchen, tea rooms and kitchinette for hot-water supply.

Washbasins will have only water supplied. No hot water will be supplied.

3-6-3 Fire Extinguishing Facilities

A fire extinguishing pump will be installed in the building equipment house for use by both studio and office blocks. Both studio and office blocks will have two hydrants on each floor.

Neither sprinklers nor foam fire extinguishing facilities will be installed.

3-6-4 Drainage, Sewage and Vent Pipe

All drain water excluding rain water will be collected at one place and led to a septic tank.

The purified water will be sent to a seepage pit to allow it to permeate into the ground. Rain water will permeate naturally from the seepage pit.

The bored well and seepage pit must be separated as far as possible.

3-6-5 Kitchen Facilities

Necessary kitchen equipment and utensils will be provided in the kitchen, tea rooms, kitchinette, etc.

3-6-6 Natural Gas Supply Facilities

The gas supply system for absorption chilling units and water heaters will be provided, but outdoor piping work is not included in this design.

Radio Bangladesh will arrange for such outdoor piping work.

3-7 Electrical Equipment and Facilities

3-7-1 Incoming and Distributing Equipment and Engine Generator (Fig. 3-15)

Two incoming transformers, each having a capacity of 1000 kVA, and two engine generators, with a capacity of 150 kVA each, will be installed in the building equipment house. The engine generators will be started by a cell motor using battery. Cooling will be done by air cooling. Radio Bangladesh will arrange for the reception of the commercial power supply.

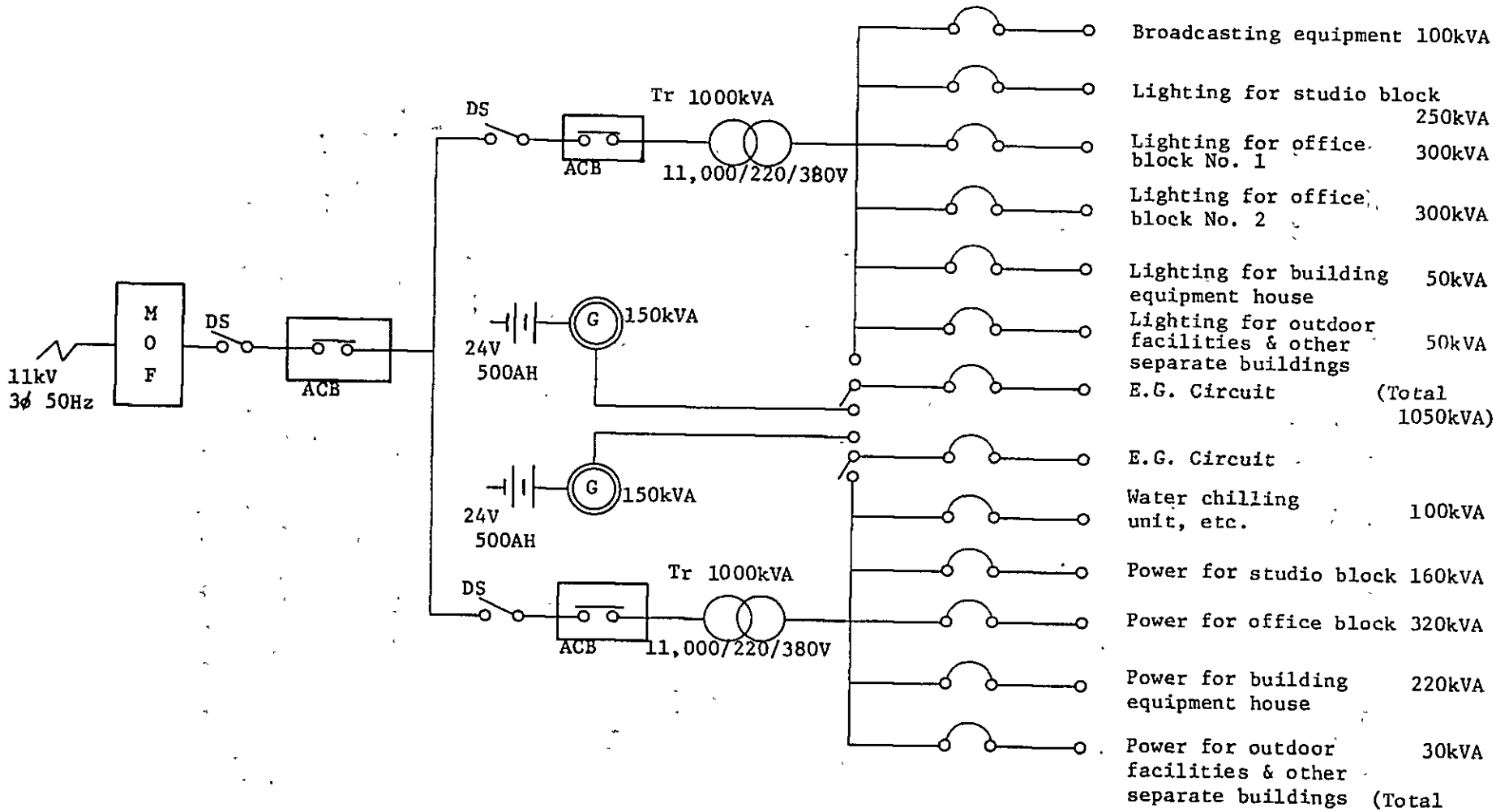


Fig. 3-15 Diagram of Incoming and Distribution Equipment and Engine Generator

3-7-2 Battery Facilities

Five battery units with a rectifier each will be installed. Two units will be installed in the building equipment house for starting the engine generators, one unit in the studio block jointly for the broadcasting equipment and facilities, clocks, and fire alarms. The fourth unit will be installed in the office block for emergency lights and the fifth unit for telephones.

3-7-3 Electric Power Trunk-Line Equipment

A low-voltage switchboard each will be installed in the studio and the office block to receive 3 ø 4 W 220 V/380 V from the power supply equipment installed in the building equipment house. The electric power is to be supplied to a switchboard for lights, motive power control panel, elevator panel, switchboard for broadcasting equipment and others.

A power supply panel in the building equipment house is to supply power to equipment and facilities in the building equipment house and other separate buildings.

3-7-4 Lighting and Plug Sockets

Fluorescent lighting fixtures will be used mostly for lighting in each building.

Offices and studios will have an illumination of 400 lux and other rooms, about 200 lux.

Plug sockets will be installed where necessary.

Direct-current lights will be installed near emergency exits and evacuation stairways as emergency lights in the event of power failures until the independent power plant starts working.

After the engine generator starts power supply, some of the lighting fixtures will be lighted by the power supply from the engine generator.

3-7-5 Power Facilities

Electric power control panels will be installed in the building equipment house and air-conditioning rooms. These control panels will supply elec-

tric power to the loads.

Except for some units such as water supply and draining pumps which require automatic operation, the equipment will be started and stopped by manually-operated push buttons.

Pushbuttons for equipment in the studio and the office blocks will be installed collectively in the building equipment house.

The hydrant pumps must allow themselves to be operated where the hydrant boxes are installed on each floor.

3-7-6 Earthing Facilities

Earthing poles for panels, switchboards, broadcasting equipment, telephones, lightning arresters, etc. will be provided. Lightning rods will be installed on the building roofs.

3-7-7 Fire Alarm Equipment

A thermally-sensitive fire detector will be installed in each room. Manually-operated pushbuttons for warning will be installed near the hydrant boxes on each floor.

Signals from these points will be received collectively in the guard-man's room on the first floor of the office block.

3-7-8 Clock Facilities

A master quartz-oscillation clock will be installed in MCR. Slave clocks will be installed in the studios and other rooms.

The slave clocks in the studios will be one-

second clocks, while those in other rooms are to be 30-second clocks.

3-7-9 Telephone Equipment

A telephone exchange will be placed on the first floor of the office block.

The private branch automatic exchange will have a capacity for 600 extension lines, with 400 lines actually operable. The switchboard will be a cordless switchboard.

The main cables will be laid between the main terminal panel in the telephone switching room to a terminal panel on each floor.

The wiring from the terminal panel on each floor to the telephones in the individual rooms and subscriber-line installation shall be carried out by Radio Bangladesh, who will also supply the telephone sets.

Chapter 4 Basic Design of Broadcasting System

4-1 The Broadcasting System

The broadcasting system to be applied in the new National Broadcasting House can be divided roughly into two functions: one is programme production facilities and the other is technical operation and transmission facilities of broadcasting programmes.

(1) Programme production facilities

1) Studios to produce programmes

2) Supporting facilities for programme production, such as editing rooms, listening rooms, dubbing room, and audition room.

3) OB facilities

4) News monitoring facilities

(2) Technical operation and transmission facilities in MCR and related technical areas

1) MCR

2) Continuity studios

3) STLs

The whole broadcasting system for the new National Broadcasting House is shown in Fig. 4-1.

The basic plan for each facilities is described in the sections below. In making a detail design, the following items should be taken into consideration:

(1) From the standpoint of operability and maintenability, all the facilities should have a simple design avoiding complexity.

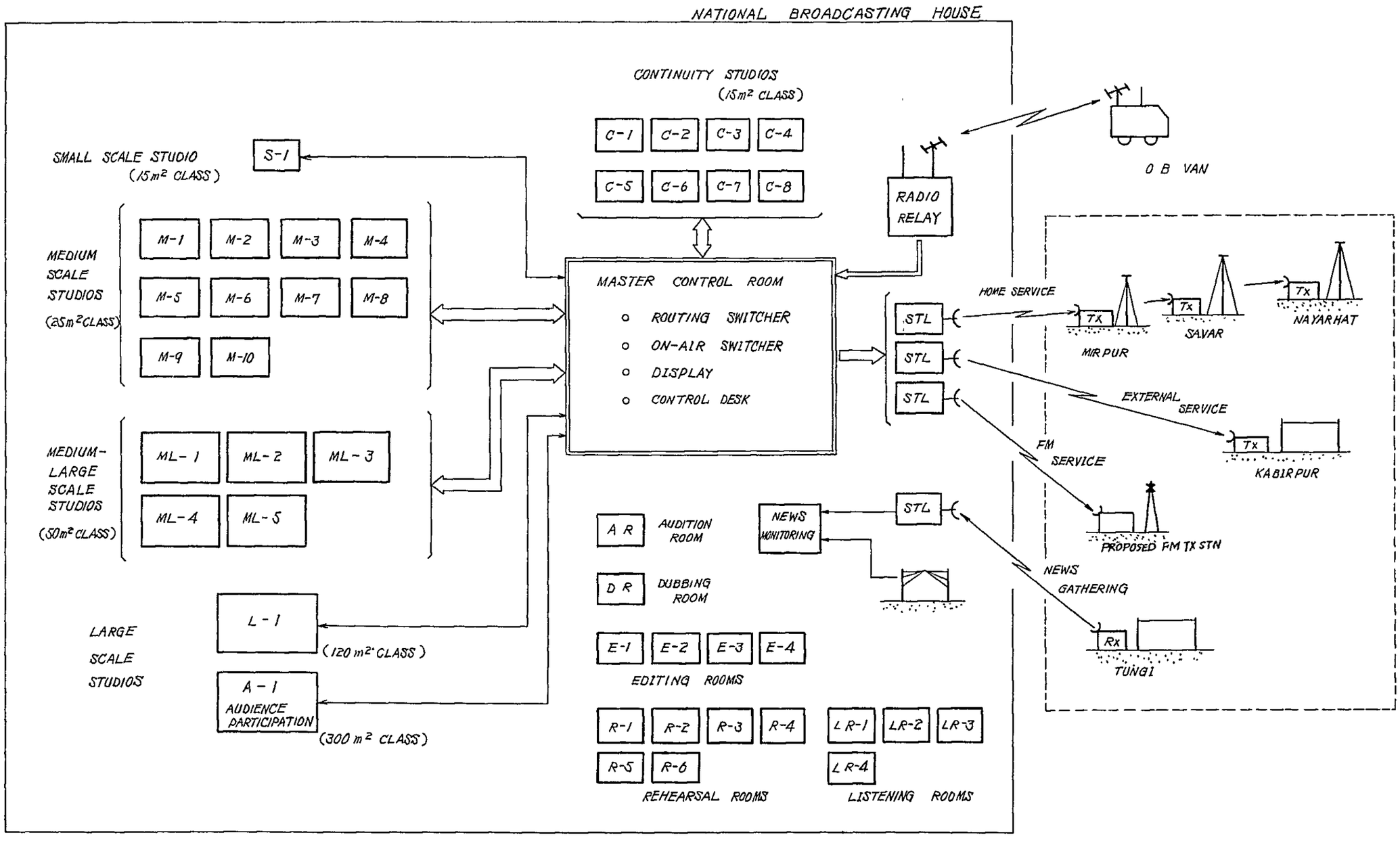


Fig. 4-1 Broadcasting System for the New National Broadcasting House

(2) The equipment in the entire Broadcasting House must be unified in their type. The operation methods of the equipment must be uniform, too.

(3) Each unit must be of a high standard so that it can be used for FM broadcasting as well. Equipment must ensure sufficient reliability to meet the meteorological conditions of Bangladesh - high temperature and high humidity.

The equipment should be designed to compose of standardized modules, so that it can be rapidly replaced by standby modules when so required.

Adequate number of spare modules must be provided so that technical maintenance will be made smoothly.

(4) Each system should be designed to have adequate redundancy for the main programme routes, so that broadcasting service can be resumed with minimum interruption when a failure occures.

4-2 Programme Production Facilities

4-2-1 Studios

Eighteen studios will be built for programme production each with its own studio control room.

Among these, four studios will also produce stereo programmes. Large studios, L-1 and A-1, will have their own announce booth.

Eight continuity studios, as described later, will be built around MCR.

Table 4-1 lists the major equipment these studios should provide. The schematic diagram of a typical

Studio Type (Symbol)	Number of Studio	Studio Area (Nominal)	Control Room Area (Nominal)	Console Input Channel	Tape Recorder	Disc Reproducer	Remarks
Continuity Studio (C-1 ∿ C-8)	8	15 m^2	20∿30 m^2	10 ch	2	1 ∿ 2	One studio for stereo.
Small Studio (S-1)	1	15	30	8	2	1	
Medium Studio (M-1 ∿ M-10)	10	30	20∿30	8	2∿3	1 ∿ 2	
Medium Large Studio (ML-1 ∿ ML-5)	5	60	35	12	3	2	Two studios for stereo
Large Studio (L-1)	1	120	50	16	3	2	For stereo, with announce booth.
Audience Participating Studio (A-1)	1	300	60	16	3	2	For stereo, with announce booth

Notes: 1) Microphones, microphone stands and audio monitors as required will be provided.

2) One of the medium studios will be provided exclusively for commercials. Multichannel cartridge tape recorders will be equipped.

3) Connection of portable reverberation equipment must be possible.

4) Intercom, tally equipment and clocks will be provided.

Table 4-1 Equipment in Studios

studios and their layouts are shown in Fig. 4-2 and 4-3 respectively.

The following is an explanation of the equipment and studio diagram and layout.

(1) Input of 8 ∿ 16 channels according to the studio scale is appropriate for an audio mixing console to be installed in each studio control room. The input must be compatible with a microphone or any other audio equipment. It is desirable to permit some optional channels to achieve mixing by connecting them to reverberation equipment.

(2) In principle, the equipment to be installed in a studio control room will comprise two tape recorders and a single type disc reproducer. The equipment can be reduced or added according to the scale of a studio and production. Table 4-1 shows one example.

(3) Portable spring-type reverberation equipment, with it performance greatly improved in recent years, will be suitable. It is desirable to have about four units of this type for common use in studios and OB.

(4) An intercom and tally equipment will be installed between MCR and each of them for smooth production of programmes.

(5) In studios producing commercial programmes, about three multichannel cartridge tape recorders will be provided for smooth recording and transmission of a number of programme materials.

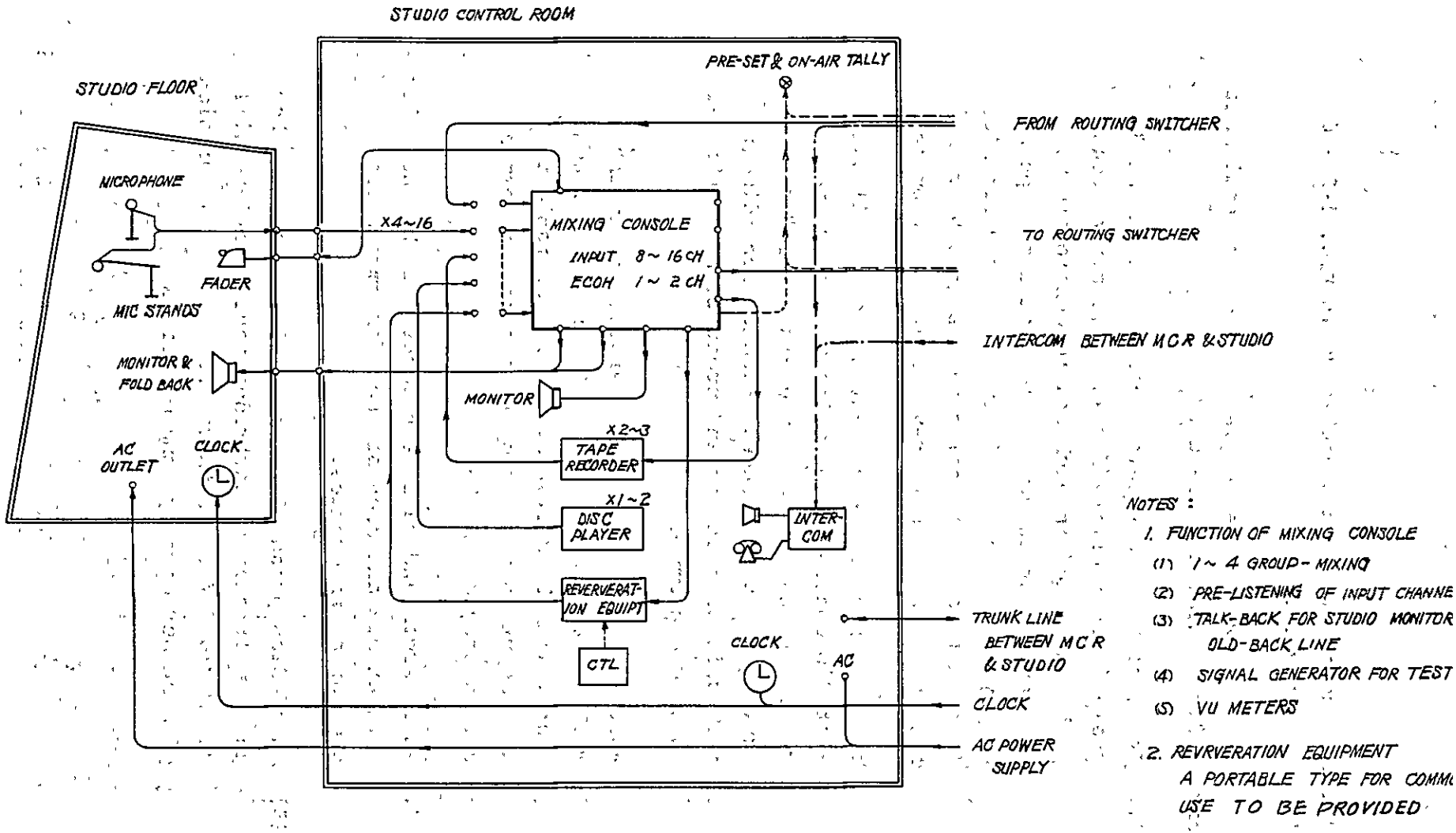
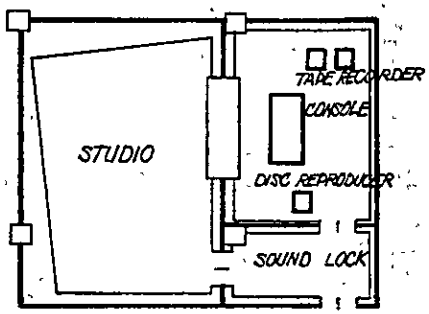
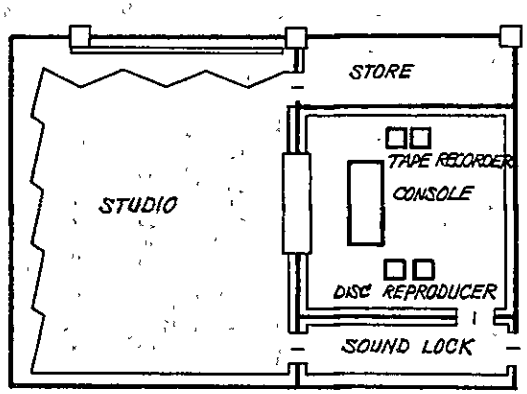


Fig 4-2 Schematic Diagram of a Typical Studio

1. 25 m² CLASS



2. 50 m² CLASS



3. 120 m² CLASS

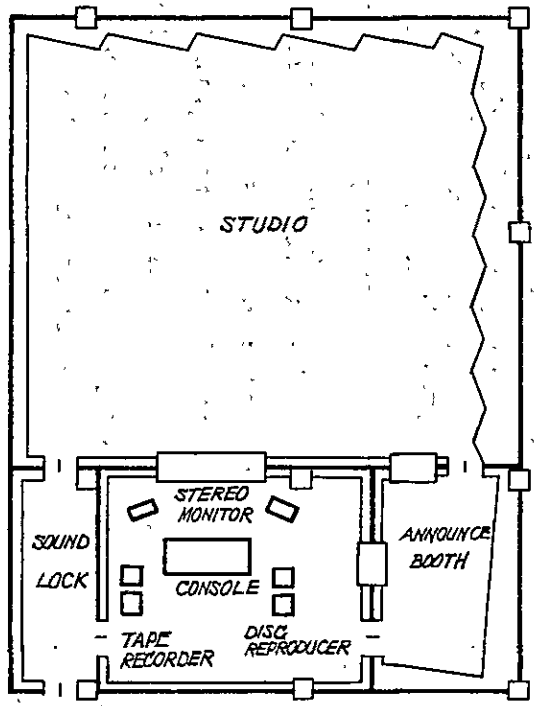


Fig 4-3 Layouts of Typical Studios

Thus, it will be convenient from the overall operation standpoint to allocate M2 or similar studio with large control room areas, as studios to produce and transmit comercial programmes.

4-2-2 Editing Rooms

Four editing rooms will be built. They will be used to produce complicate programmes, such as dramas, and to efficiently edit tapes from the tape library or programme materials recorded individually. These rooms separate editing from programme production in studio control rooms and serve to improve the studio operating efficiency.

Two tape recorders and a simple audio monitor will be installed in an editing room.

4-2-3 Dubbing Room

A dubbing room will be built for efficient transcription services to provide taped programmes to various sections.

One master and ten slave machines will be installed in this room. The machines should be ordinary broadcasting-purpose tape recorders provided with two speed choice, 15"/sec and 7.5"/sec. This will enable effective transcription services two times faster than normal operation.

4-2-4 Listening Rooms

Four listening rooms will be built to fasilitate listening to taped programmes.

One listening room will have a low-cost tape recorder with a monitor speaker unit.

4-2-5 Audition Room

An audition room with a simple studio and judge room will be built to test and train new performers. The audition room will have a set of microphones, a portable type mixing amplifier, a tape recorder and an audio monitor.

The room should also be designed to facilitate monitoring programmes from any other studios and so on through MCR switcher for evaluation purpose.

4-2-6 OB

OB can be classified into two large categories: Outside broadcasting or recording to pick up such programmes as news, sports and events, and programme recording carried out by producers or reporters by means of a compact portable tape recorder.

Radio Bangladesh has many years' experiences in this field, and holds a number of OB equipment. Consequently, our plan will mainly deal with the expansion plan in relation with the project of the new National Broadcasting House.

(1) OB Van

A number of broadcasting organizations have been able to achieve better broadcasting effects by using OB vans with radio relay equipment. The plan calls for one OB van to be acquired when the new Broadcasting House is completed. More OB vans may be procured as they become necessary.

An OB van carris a set of audio OB equipent such as an audio mixer and others. In addition

to this equipment, it carries a wide-band VHF transmitter to send programmes, narrow-band VHF radio communication equipment, independent power supply and other necessary equipment.

(2) Equipment in Radio Base Station of the Broadcasting House

Radio equipment will be installed in a radio relay room on the roof of the Broadcasting House to receive OB radio. Two short antenna poles will be installed on the roof of the penthouse. The top of the antennas must be within the range of 45.7 meters above ground by the regulation of the civil aviation.

Narrow-band VHF radio communication equipment can also be used for news gathering and technical ordering by a portable walkie-talkie with an output of about 1 W. It is desirable to have a few units of this radio equipment.

(3) OB Equipment and Vehicles

Audio mixing amplifiers, tape recorders, microphones and other OB equipment will be expanded as required.

Vehicles to transport equipment and personnel are indispensable for OB. It will be desirable to add a few more vehicles, circumstances permitting.

4-2-7 News Monitoring

Tungi monitoring station is now under construction to monitor overseas broadcasting and utilize as a source of overseas news. To supplement this station, two all-wave radio receivers and a tape recorder will be

installed in the new Broadcasting House. Two umbrella type doublet antennas for short wave reception will be installed between a mast on the studio block and the office block.

4-3 MCR

MCR, which is the technical nerve center in the Broadcasting House for operation and transmission of programmes, will contain collectively a routing switcher, continuity studios, an on-air switcher and related equipment. The STL transmitter for the transmitting stations and the receiver from Tungi monitoring station will be installed in the radio room on the roof of the office block.

A schematic diagram of the MCR is shown in Fig. 4-4. A layout of MCR and continuity studios is shown in Fig. 4-5. MCR will fully be able to meet future expansion plans.

4-3-1 Routing Switcher

(1) Objectives of Routing Switcher

Radio Bangladesh makes frequent live transmission of programmes from studios. It will be necessary to equip all the studios with the on-air function. For this reason, a routing switcher has been designed to select any necessary ones from various programme sources and to send to any technical areas including continuity studios.

This function will permit multi-connection of studio-to-studio or studio-to-OB when such complex programme productions are required.

Fig 4-4 Schematic Diagram of MCR and Continuity Studios

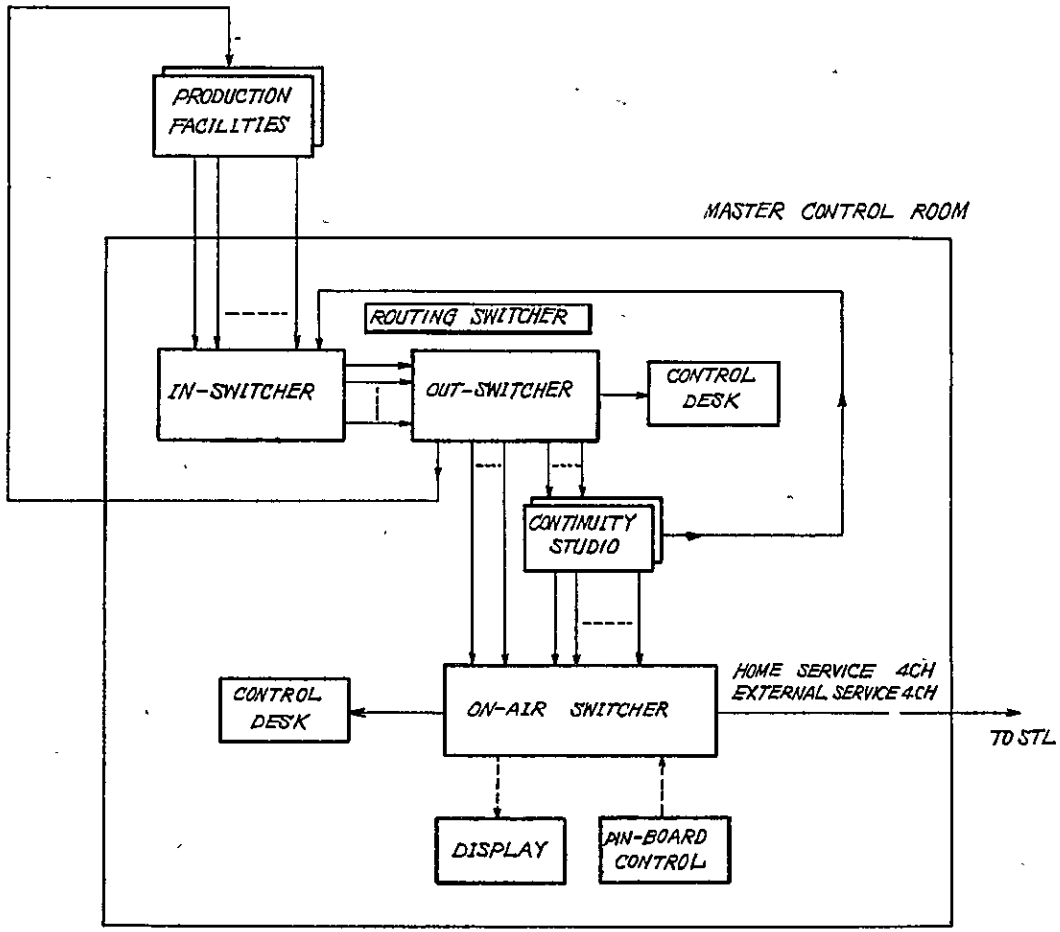
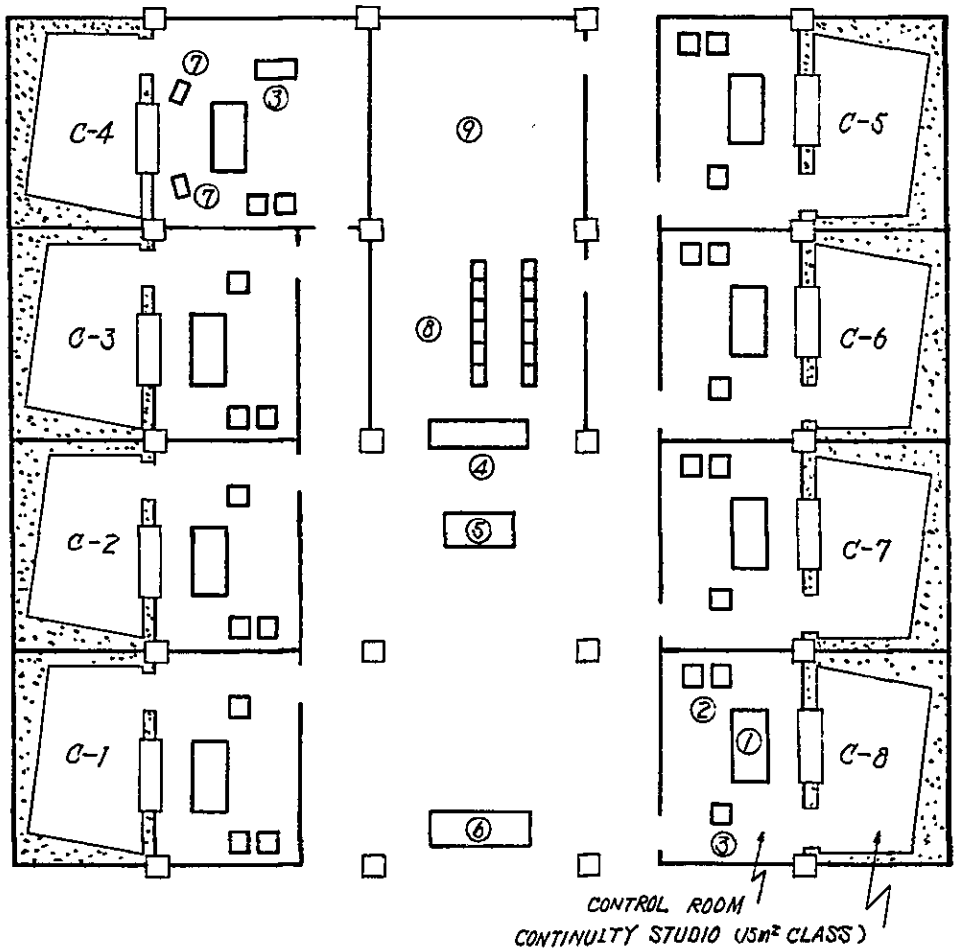


Fig 4-5 Layout of MCR & Continuity Studios



① STUDIO CONSOLE
② TAPE RECORDER
③ DISC REPRODUCER
④ ON-AIR DISPLAY
⑤ ON-AIR SWITCHER CONTROL DESK
⑥ ROUTING SWITCHER CONTROL DESK
⑦ MONITOR SPEAKER
⑧ RACK SPACE
⑨ MAINTENANCE SPACE