KADUNA STATE TELEVISION STATION, KADUNA

(TOWARDS BETTER NOISE CONTROL IN TELEVISION STUDIO)

BY

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BEING A THESIS SUBMITTED TO THE POSTGRADUATE SCHOOL, AHMADU BELLO UNIVERSITY, ZARIA IN PARTIAL FULFILMENT OF THE AWARD OF MASTER OF SCIENCE IN ARCHITECTURE (M.Sc. ARCHITECTURE)

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AHMADU BELLO UNIVERSITY, ZARIA NIGERIA.

AUGUST, 1991.

DECLARATION

I, SOYEBO, O. Olufemi of the Department of Architecture, Faculty of Environmental Design, Ahmadu Bello University, Zaria hereby declare that this work presented in this thesis for the degree of Master of Science in Architecture (M.Sc. Arch) has not been wholly or partially presented for any other degree nor is it concurrently being submitted for any other degree and that all quotations have been duly acknowledged.

SOYEBO, O. Olufemi

C E R T I F I C A T I O N

This thesis entitled "KADUNA STATE TELEVISION STATION, KADUNA (Towards better noise control in Television Studio) by SOYEBO, O. Olufemi meets the regulations governing the award of the degree of Master of Science in Architecture of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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D E D I C A T I O N

To the memory of my late Father, Mr. O.B. Soyebo

and to my Mother, brother and sisters.

A C K N O W L E D G E M E N T

First and foremost, I thank the Lord for giving me the knowledge and understanding in my educational career in this life and for seeing me through to this point.

For the success of this thesis work, I acknowledge my Supervisor, Arch.M.D. Ahmed for his contributions. I also thank the lecturers in the department who have contributed in one way or the other to see this work through.

I thank Engr. Tayo Soyebo and Engr. Yomi Bolarinwa of the NTA 12 Abeokuta for their contribution towards this thesis. My gratitude also goes to Mrs. Sangokunle of the OGTV 25 Abeokuta and of course my uncle Mr. A.A. Akinyemi for providing me with various links.

At this point, I am expressing my deepest gratitude and many thanks to my fatherly uncle Mr. E.O. Soyebo and his wife for their great concern and for giving me the opportunity to attain this level of education. My cousins, Dr. Jide Soyebo and Miss Sola Soyebo have also been wonderful

For my mother; thanks mummy for your motherly advice which comes in times most needed and for your love and care.

My appreciation goes to Mrs. T.A. Akinyemi, Mrs. Durojaiye, Mrs. Ogunrinu and to all others I would not be able to mention here. Friends are not left behind; I acknowledge my friends in persons of Wale Awosanmi, Aide Akhibi, Jide Bandipo, Ayo Ogunjimi, Kunle Shonibare, Kemi Solabi and a host of others for their worthwhile criticism and contribution towards this work.

ABSTRACT

Television is most desired in many societies. It's impact on the people could even surpass one's imagination as it plays a role in man's everyday life activities such as education, politics, economy, social welfare and other aspects.

For effective usage of the television, its provision should oonsider those factors problematic to the use, through the understanding of the working of the television programme production system. The issue of noise control is pre-eminent, thus its control has to be effective particularly for the television studio. The understanding of noise and its source with respect to the studio contribute to some extent in order to achieve good results. Therefore, an attempt to isolate noise from the studio brings about the considerations such as those of site selection/location, site survey and analysis with respect to noise, site zonning and other architectural noise control methods such as the use of double walls, double doors, sound lobby, double glazing windows, sound absorbers and other studio interior treatment which, all put together made impact in solving the problem of noise in the television studio.

Therefore, this thesis seeks to carry out a study of the control of noise in the television studio which involves the considerations mentioned above.

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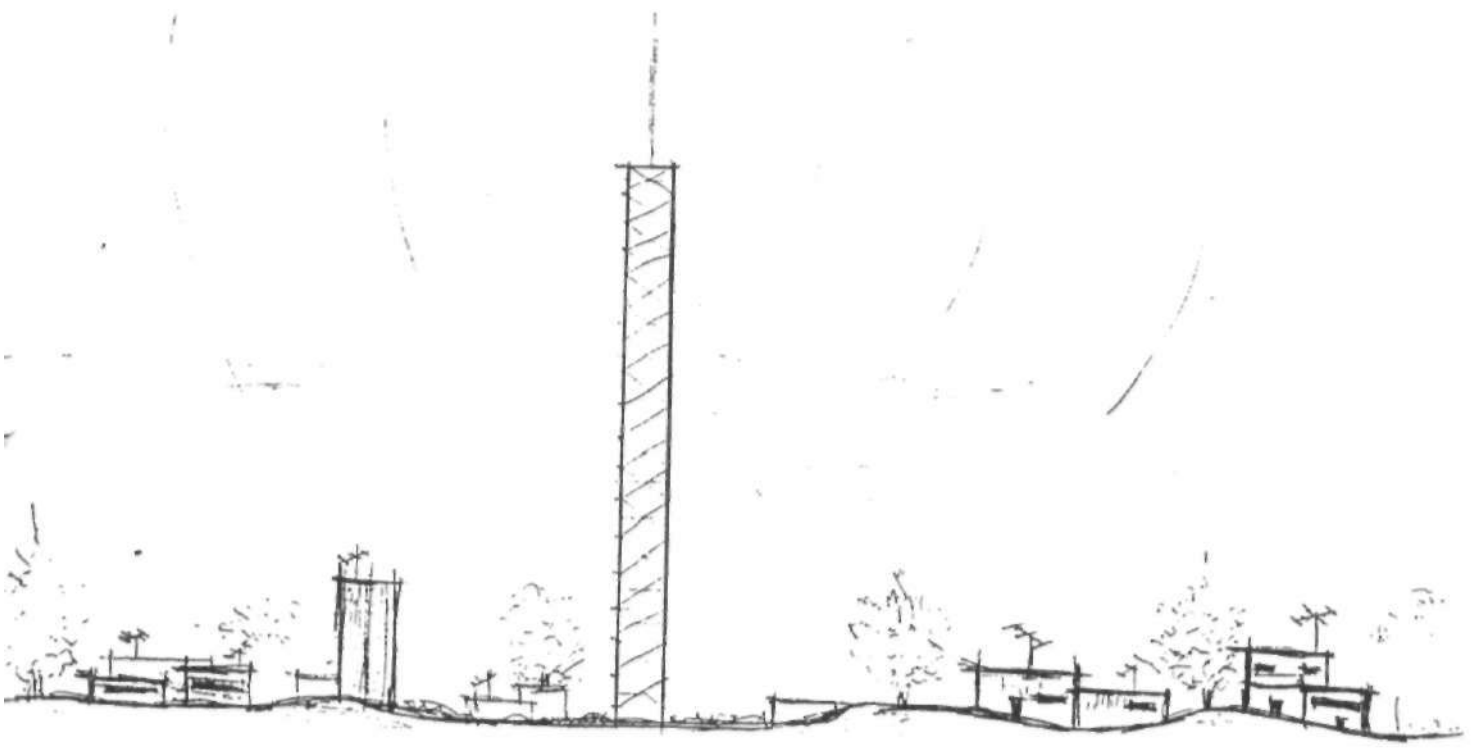
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Chapter : 1



CHAPTER ONE

INTRODUCTION:

Buildings of complex nature requires specialists' attention which depends solely on its function and characteristic use. These, with the consideration of the users' comfort as regards space use and treatment, indicate the level of functionality of such buildings.

The issue of noise control and acoustics in buildings where they are likely to be of utmost importance can not however be underscored. The study of these parameters and their understanding goes a long way in achieving an ultimate good results in their application to the design, construction and treatment of buildings. The Architect is therefore faced with the challenge of employing basic knowledge of these parameters to the realization of his goals. Though it is expected that a specialist in the field contribute a lot towards a perfect design.

The control of noise and acoustic treatment of the studio in particular, requires special attention in television broadcasting. Noise of unwanted nature have to be effectively kept out of the studio. The studio also has to be adequately treated against the reverberation of sound inside. Therefore, for effective control and treatment of these parameters in the television studio, there is need for a consideration and study of some factors responsible for defects. However, the participation of specialists in other aspect of building particularly a television studio, such as ventilation or air-conditioning, lighting and others need to be perfectly intergrated with the noise control and acoustic requirements.

This thesis write up shall therefore serve as a guide in the general design consideration of a television station with particular attention to the ways in which noise could be controlled architecturally.

1.1 Motivation:

The energy generated outside the studio and those being radiated internally constitute the background noise in the studio which is often audible from television sets in homes. This could be attributed to inadequate consideration and control of noise from the programme source, that is, the studio. Moreover, some television studios, at least in Nigeria, are not often built from the scratch. The situation in most cases is either a structure being used for another purpose earlier, would now be converted into a television studio of a proposed station, or there is inadequate consideration of factors affecting or contributing to the generation of noise in a television studio during the very early stages of planning.

1.2 Aim:

For a long time now, the Nigerian Television Authority, N.T.A. Kaduna has been enjoying the monopoly of television broadcast and audience part in its catchment areas. This, in effect, as compared to other States with multiple television stations, has created a kind of programme dictation and lack of variety for the vast television audience. With this in mind, the thought of creating a source or an avenue for choise and variety started to materialize. Also, the approval by the Kaduna State Government for the award of a contract for the establishment of a State television station on the 1990 financial

year makes this, significant. Furthermore, it is foreseen that the television would play a crucial role in the general mobilization and public enlightenment during the political transition period and after.

The government too, intends to use all available media, of which television is a part, for the accurate reporting of developments at grass-roots level and in order to realise the general mobilization of the people in the rural areas. The television would also help in organising and carrying out public enlightenment, propagate on a continous basis, democratic values and culture and disseminate information on government and social activities.

1.3 Objective:

The objective is set to evolve considerations in design towards better noise control. This involves the study of the methods employed in controlling noise and acoustic requirements with respect to television studio.

1.4 Scope And Limitation:

This thesis covers the study of the control of noise and studio acoustics. It deals basically with the identification of noise source for studio environment and the methods of controlling them architecturally. It also covers the application of this study in the design of a television station with particular attention to the studio. This thesis doest not however cover the aspect of mathematical calculations and solutions in the noise and acoustic study.

1.5 Methodology:

The methods employed in conducting this research include the review of various literatures on the problem, that is, the study of the control of noise in television studio. Also, some field study was conducted to study cases of existing television stations. The study of this cases was divided into two, namely; the local case studies and the foreign case studies. The local case studies are located here in Nigeria and were visited. During the visits, short oral interviews were conducted with official workers of the station concerned. The author also had the opportunity to look around the station, particularly the studio to document the existing architectural conditions.

Some of the questions asked during the interview includes:-

(a) The organisational set up of the television station

(b) The choice of location of the station

(c) Suitability of the site

(d) Provisions made in controlling noise in the studio.

The foreign case studies were not visited but reviewed and documented from various architectural journals. The measures for noise control were deducted from their planning generally.

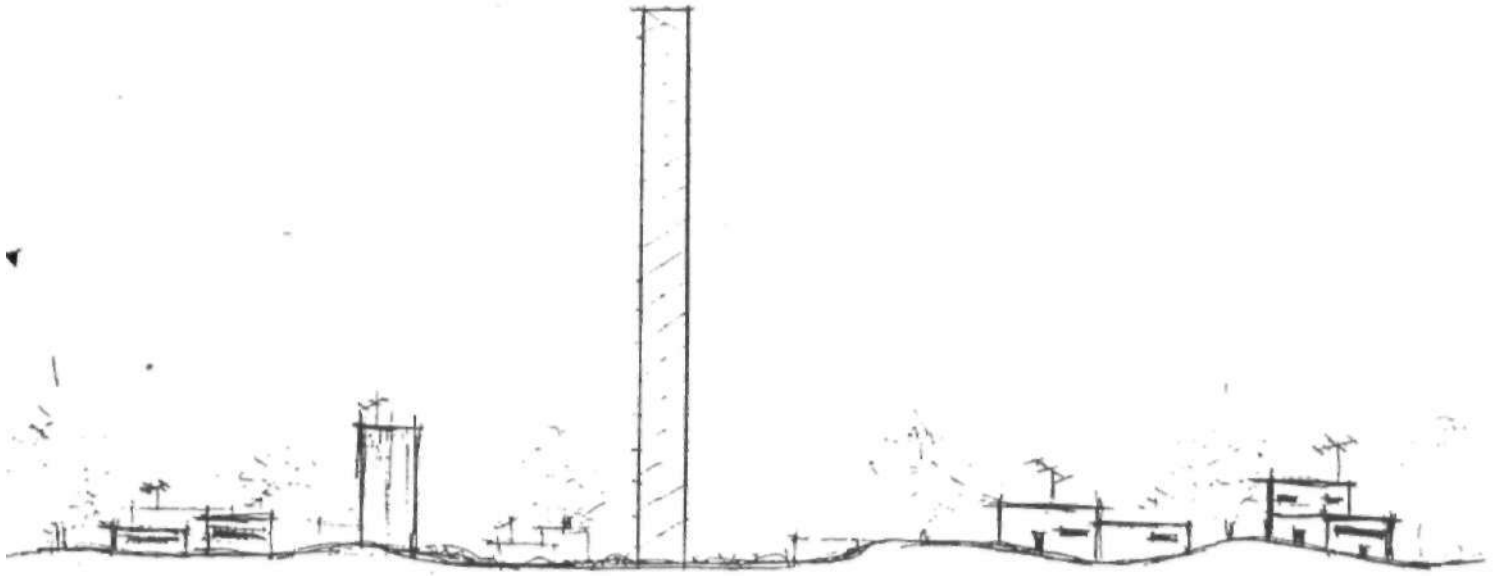
1.6 Constraints:

The major constraint in this field study is the non acquisition of accurate or detail drawings of the cases documented.

1.7 Architectural Significance:

The most peculiar problem in television broadcasting is that of Background noise originating from different sources. Attempt is therefore being made to check the incidence of this noise through architectural planning. This involves the proper zonning of the parts of a television station complex in addition to other technical control measures.

Chapter : 2



CHAPTER TWO

TELEBROADCASTING

2.1 Historical Survey:

According to the book, encyclopeadia Americana, one cannot pick on any particular person as the real inventor of the television as it involves the combination of several discoveries in the science world. The basic principles behind the television invention were said to have been already established in the nineteenth century but the actual realization of the television was not through until the evolution of the electron tubes which took a sharp rise in 1920s. During the period, as further explained, a lot of improvements were made by researchers of major radio manufacturers. One Vladimir Zworykin patented the Konoscope which led to the modern television broadcasting. Furthermore, Allen B. Dumont was said to have developed the Kinescope tubes and also put to market, along modern lines in 1939, the first television receiver. The same year, public telecasting was experimented by the National Broadcasting Company. Later, the Broadcasting Company staged demonstrations at the world's fair in New York city. This gave many people the opportunity to have their first experience with the new medium.

2.2 Developments:

The encyclopeadia Americana mentioned that the first television broadcasting in the world began in 1936 by the British television broadcasting using the British Broadcasting Corporation's (B.B.C) transmitter at Alexandra Palace in London. Programmes were said to be broadcast every day at the rate of 13 hours every week. The station offered a number and variety of programmes which was expected to increase the number of television audience. It was understood that the second

world war however distrupted the transmission of programmes which led to the closure of the station.

It was further stated that television broadcasting in the United States of America started before the reopening of the British television service. It explained further that about 9 percent of homes in the United States acquire television sets in four years. The rate increased tremendously to 87 percent in ten years and by the end of 1963, it had risen to about 93 percent. At that time, there were nearly 52 million television sets at homes, receiving television signals from about 657 television stations on the air.

In Nigeria, television broadcasting was noted to have started officially in 1959 with the opening of the Western Nigeria Television Service (now NTA, Ibadan) which was the first in Africa. The television signals received was however restricted to the township of Ibadan and its environs for a long time. Later, a number of transmitters were erected for a wider transmission coverage. The television broadcasting in Nigeria started setting a pace with the establishment of the Eastern Nigeria Television, (ENTV) in 1960. There was also the establishment of the Radio Television Kaduna (RTK) in 1962 serving the Northern area then. With the division of Nigeria into 12 States in 1966, there was a sharp rise in the establishment of Television Broadcasting in various parts of the country.

Information from the history of broadcasting in Nigeria explained the decree which was promulgated on the 2nd day of April 1977 establishing the Nigerian Television Authority (NTA) by the Federal Military Government and signed by the then Head of State, Lt. General Olusegun Obasanjo. It was formerly launched on the 2nd of June 1977 with one Mr. Babatunde Jose appointed as the first Chairman. The decree stipulated

that the Nigerian Television Authority (NTA) will be responsible for all aspect of Television broadcasting in Nigeria. It was being proposed then that by the end of 1980, every state in Nigeria (19 then) will have a production centre and that no single station could afford to produce exclusively, for its own use, a single live or filmed programme.

2.3 The Present Set Up:

It is believed that within the last four decades, the television production technology and audience has grown tremendously. There are several thousands of television broadcasting stations springing up the world over. This has been encouraged by the positive advances and breakthrough in the world of electronics and telecommunications technology in general. It is also believed to be even more encouraged by the growing interest of the people of the world in the television. For example, the United States of America has several hundreds of television stations offering different services through different transmission modes. The response of the people, according to Rachard Adler in the book, "Television as a social force" with Douglass Cater using the number of households that has at least one television set in their homes as a basis, is presently about 97 percent. Some stations transmit on a local level to a defined geographical area which is usually small. Some others transmit on network covering a greater area and usually have a variety of supporting services. Cable television renders services through a receiving antenna and associated electronic equipments.

It could be said that nearly, if not all the countries of the world has a television production centre, at least, as it serves a major role in the telecommunication world. As a testimony, the last Olympic games in Seoul, South Korea, was believed to have been watched in all

parts of the world through sattelite transmission.

In Nigeria, the story had not been any different. The television industries have to their credit, several equipments and facilities that placed Nigeria on the television map as Africa's largest television network. Nigeria also aspires among the biggest television countries in the world, broadcasting about 85,000 hours of variety of programmes annually. The Nigerian Television Authority (NTA) is said to have under its umbrella, 24 television stations operating on about 40 VHF channels. Six other stations are under construction and eleven others are at the planning stage.

Following the termination of the NTA's monopoly of television broadcasting in Nigeria by the 1979 constitution, the ownership rights of television broadcasting stations was extended to State Governments, groups, organisations and individual.

This action gave rise to the establishment of State owned television stations particularly during the political period. The State televisions are however only allowed to transmit on UHF channels. Also, the television audience has grown very large. With the NTA alone recently claiming 30 million viewers throughout the country, other local stations will surely pep up the figure in their vicinity. This depends on the type of programmes and services provided. Presently, there are about 38 television stations functioning in the country. Of these, 14 are owned by the State Governments and there are others yet to be set up.

2.4 Societal Impact:

The television is known to be watched by a very large audience anywhere in the world. Researchers on its impact on the society has come out with the results of the effects. In general, the television

has changed the ways of life and behaviour of the people. As Richard Adler pointed out in his book; Television as a Social Force; it is the believe that before the coming of the television some decades ago, families generally spent a great deal of their evenings talking and interracting with each other or with their neighbours. In another scene, some families sit together just outside home, inside gardens or the surroundings and idle away the time after a hard day's work. Some might go out generally to visit friends, relatives or even go and be drinking at a local bar. These however are just some settings of some family life before the advent of the television. It does not represent the general trend of the pre-television family life. On a general note, one can say that whatever could have been the way of life before television, the influence of television has been to a great extent. If one should take the American society for example, within a decade of the introduction of the television, the average family started spending more time at home watching television. The bigger acuse was said to be the children who spend so much more time watching the television than what they spend at school. The television has altered previous activities ranging from the interraction within the family including the supervision of the children and family recreation. It has also altered the interraction with relatives and neighbours, involvement in social, occupational and civic activities beyond the neighbourhood, individual leisure activities spent on reading or recreation to the free times spent for random wandering or strolling around.

One can see how the television has successfully infused itself into the lives of the people that it is not imaginable the situation whereby television cease to exist. It has interwound itself into all aspect of human lives. It is not surprising therefore when the late

Chief Obafemi Awolowo made a speech during the occasion of the opening of the Western Nigeria Television then on October 31st 1959, declaring that "television will serve as teacher, an entertainer and a stimulus to us all to transform Nigeria into a modern and prosperous nation". His explanation was that the venture was initiated because the regional government was convinced that television could play a major role in increasing both the pace and standard of education which was regarded as the key to progress in all other fields. The television indeed, has affected several aspect of our daily lives, namely; the educational, social, economic, political, cultural and sporting activities.

The impact of television in education cannot be over-emphasised. It is now possible for the people to sit at home and learn basic things of the science and the arts world courtesy of the educational instructional television. This means that one does not necessarily have to be in the classroom or even pay high educational fees to acquire these knowledge. This has therefore promoted the educational standard largely amongst the populace. It is therefore true from a saying about television that in an era when life long learning has become essential to prevent human obsolescence, television surely has a role to play.

The television has also had an impact on the social lives of the people that one could merely see it in our ways of life. It is believed that it has direct influence on our way of reactions and approach to reality. It also develops a psychic structure of expectation in the people. This, according to Richard Adler is effected in exactly the same way as leesons are taught in school,

slowly over the time, educate the unformed mind and teach it the way to think. Apart from these, most television programmes portrays the desires and values of our society while its continuing efforts in gaining our attention makes it the major factor of our values and desires. It provides a variety of day and night time entertainment programmes such as dramas which often reflect social learnings. It predicts the routine for so many people as it makes them come back home on certain times of the day. On the negative side, according to television critics, television voilence is said to make children callous and causes anxiety and tension. It is believed that it infuses criminal tendency and triggers off juvenile deliquency. Adult television addicts also has the tendency to be less active in social organisations and go out less in the evenings.

Economic boost could even be partially attributed to the effect television has on it. Still according to Richard Adler and Douglass Cater as mentioned earlier, the television is a highly attractive medium for national advertising and it has helped in creating new kinds of mass national markets. The use of television advertising has glaringly become almost a sure thing for any sales executive who wishes to pass its products into the national consciousness. This is because the television commercials makes people more conscious of what kinds of product there is, and at what cost. It also gives room for the comparison and use of products through their advertisements. The television is therefore known to some as the advertiser and selling machine as it pre-sold goods and yield great public relations opportunities and thus increase the level of patronage.

The television has also brought about a high level of political awareness. Unlike the newspapers, it reaches many who do not even have any motivation to acquire knowledge or information about public affairs. It imparts understanding of the political parties and their manifestoes and helps in the understanding of the sections of government and their implication on individuals. This is also linked with the knowledge of law and human rights in a nation.

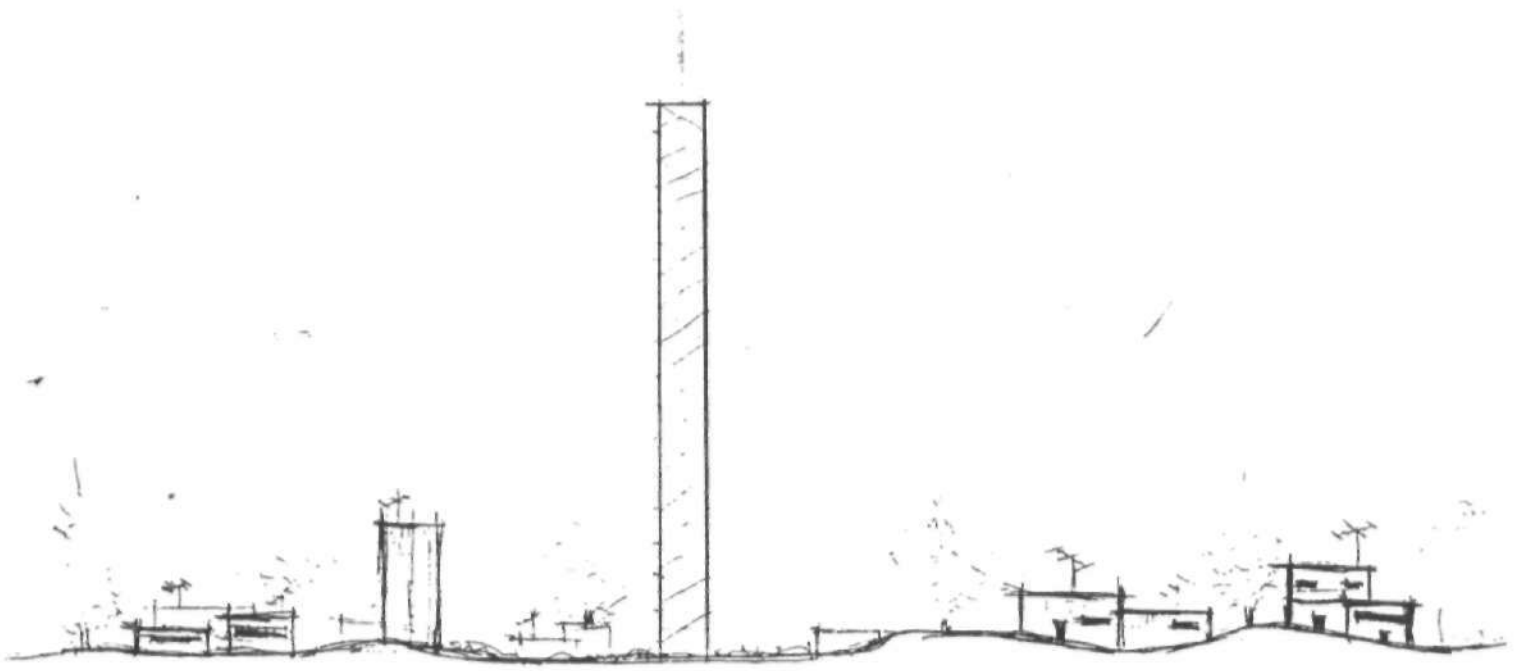
The television can be seen to be used as a device of the national mobile culture and works as a medium in creating homogenity in a nation and also to unite the nation. The type of programmes introduced have elements of culture in them thus promoting it on a national level. Fore example, the programmes, "new masquerade", "new village headmaster" and the popular soap opera, "Behind the clouds" all have some cultural background and also portrays the true picture of the society. In a way, one can say these programmes goes a long way to correct some social ills. They aid the formation of habits and tastes and also the imitation of modes of dressing, speech and so on by a large segment of the public.

Perhaps, the television has the greatest impact on sports. According to critics, it has done a lot of harm by drawing people away from the sports centres-courts, stadia, pools and so on to the comfort of watching same events on their television screens. It has therefore become necessary for the introduction of television rights to provide sports with promotional financial support. This has also helped in selling some variety of other sports such as basket ball, tennis, wrestling and others.

Finally, the television has been providing information of all kinds for the inquisitive public and also educating in the widest possible sense. It has also acquired a kind of power which its is referred to as its capacity for instantaneous diffusion of its information to a very large audience. This has made the television both a vital national communications link and an important means for commercial advertising. Also, it has served as an important talent source in many countries and helps to sustain the international status of the people.

Summarily, the television had displaced other leisure time activities and has attained an indisputable high position over the other mass media. According to a critic, the television is a parade of experts instructing the unenlightened about the weather, aspirins, toothpastes, the latest books or proposals for social reform and the correct attitude to have with respect to race, poverty, social conflicts and new morals.

Chapter : 3



CHAPTER THREE

KADUNA URBAN SETTING

3.1 Television Service in Kaduna

3.1.1 Situation Report:

Kaduna State has been enjoying the services of only one television station. This is the Nigerian Television Authority (NTA) Kaduna. It is located in Kaduna town along Hospital road by Independence way. The station is being controlled by the Federal Government of Nigeria.

3.1.2 Technical Operation And Problems:

The operation of the NTA Kaduna is such that its broadcasting complex which involves the administration, production of programmes, recording and other services are located in Kaduna. The transmitting station is located in Jaji along Kaduna-Zaria road which is some several tens of Kilometres from the broadcasting complex in Kaduna.

The station operates everyday from 4.00pm till around 11.00pm in the night on weekdays and a little later on weekends. The problems mostly encountered by the station are as a result of the distance between the broadcasting complex and the transmitting complex. It often takes sometime to rectify problems relating to transmission of programmes, therefore obstructing some day's television service in Kaduna.

3.1.3 Television Programmes:

The programmes transmitting on the services of the NTA Kaduna is determined by the general objectives of the NTA's national body.

This is being stated that television in the country should influence societal values profoundly and in so doing, improve and strenghten the social, cultural, economic, political and technological fabric. This is further broken down below:-

(a) Social Fabric: This entails the principles and qualities of knowledge which follows specific subject curricula. It deals with any topic in order to enrich the viewers knowledge without going to details of principles.

(b) Cultural Awareness: This covers the areas of aesthetics, religion, philosophy, language, history and arts. It strives to develop and promote the appreciation of indigenous aesthetic values. It also strive to promote the development of high level of intellectual and artistic creativity, and foster moral and spiritual values.

(c) Economy: The objective is to monitor the trends and development in production process with a view to arousing creativity and inquisitiveness in the people, promote knowledge of available production through balanced and controlled information. It is also to foster the spirit of hardwork and high productivity with a view of increasing the nation's wealth and elevating the quality of life of the people. It is however also to encourage the production and consumption of local products in order to achieve self sufficiendy and self reliance.

(d) Political Aspect: The objective is to create and promote civic responsibility among Nigerians in order to achieve a democratic society. To identify and promote civic responsibility among the people, incultate in the nation, the spirit of tolerance

and of variety of opinion. To mobilise the public towards the achievement of national goals and to promote social justice based on the responsibility and rights of the individual in the society.

(e) Technology: This is to keep the people abreast of technological developments. To promote and encourage the study of science and technology, scientific and national attitude to life, by encouraging the spirit of inquiring, analysis, balanced thinking, impartiality and objectivity.

From the above objectives set up by the NTA's national body, the NTA Kaduna derives its various programmes to suit the local trends of the people. There are of course some programmes transmitted on network from the NTA's headquarters in Lagos.

3.2 The People's View:

Due to the diverse nature of the people of the town in terms of culture, language and social learnings, people holds different opinion about the programmes service of the station.

The general opinion tends towards complaints that the station lacks good programmes and that the services are poor. This complaints is alleviated due to the fact that the people in Kaduna does not receive any other television programme signals from neighbouring States and neither is there any alternative television service within the town or State. Therefore, for a long time before the government's intension on the issue of State television, the people had been calling for a State owned television which according to the people would give better service and even create a competitive atmosphere that could lead to

the improvement of programme production. This idea was expressed in an article published in the Democrat of June 15th 1990 under the column for people's reaction to events and activities happening around the State.

3.3 Government's Position:

The government of Kaduna State had expressed its wish to establish a State owned television station, for quite a while now. An unpublished report by the Ministry of Information, Kaduna and a number of articles published in the newspaper dailies confirm this. This intention might not be unconnected to the fact that the people of Kaduna State had been crying for an indigenous television station and also due to the fact that several other States are enjoying the services of a multiple television station. According to the report, the government intended to use the medium for grass-root enlightenment and mobilization of the people particularly during this period of political transition.

3.4 Locational View:

Kaduna town is a strong potential for the location of the proposed State television station. This is due to the fact that Kaduna town is the most populated in the State. It also has several infrastructural facilities and acts as a strong base for the socio-cultural and economic setting. It is also strategically located for military and the administrative seats in early Northern Nigeria.

Kaduna lies roughly between latitude 10° 27' North and longitude 70° 27' East of the Greenwich meridian and is located in the central position of the Northern part of the country.

3.4.1 The Physical Conditions:

In the general study of the Kaduna town, the following aspects of the physical conditions were examined:-

(a) Relief and Geology: The region has a generally rolling terrain with an average rise of about 600 metres above sea level. The geology of the region has characteristic streaky rock, granite in some parts with darker and softer margins. Most of the top soils in the area has decomposed to laterite over the surface.

(b) Climate and Vegetation: There are four distinguished climatic seasons recorded over the years in the region. These include the following:-

1. The Dry season from November to February
2. The Hot season from March to April
3. Thunderstorms season from May to June
4. The Wet season from July to October

The prevailing wind directions include that of the North-east trades winds in the dry season and that of the South-west monsoon winds in the wet season. The average rainfall data recorded is between 40 and 60 inches (100 - 150mm) with its peak from July to September.

The vegetation of the region comprises mainly of well developed trees. These trees ranges in height between 2 metres and 10 metres. The grasses also develops to about 1m height. The soil is thickly laterite covered and usually water logged in the wet season. The soil becomes very dry and cracks in the dry season. The relative humidity has a maximum value of about 72% in August and a minimum of 12% in February. The temperature ranges from minimum of between 45° and 55°F

in January and maximum of between 95° and 105°F in April.

3.4.2 Socio-Cultural Nature:-

Kaduna inhabits a variety of people with diverse cultures. The people live in wards the choice of which is influenced by earlier settlers. This means that the new comers to the town search for the area where he is best fit into. This is normally among a group with similar tribes with the new comer. The different wards include Tudun Nupawa, Tudun Wada, Nassarawa, Kawo, Kakuri, Doka, Ungwan Rimi, Ungwan Munchi, Ungwan Shanu, etc.

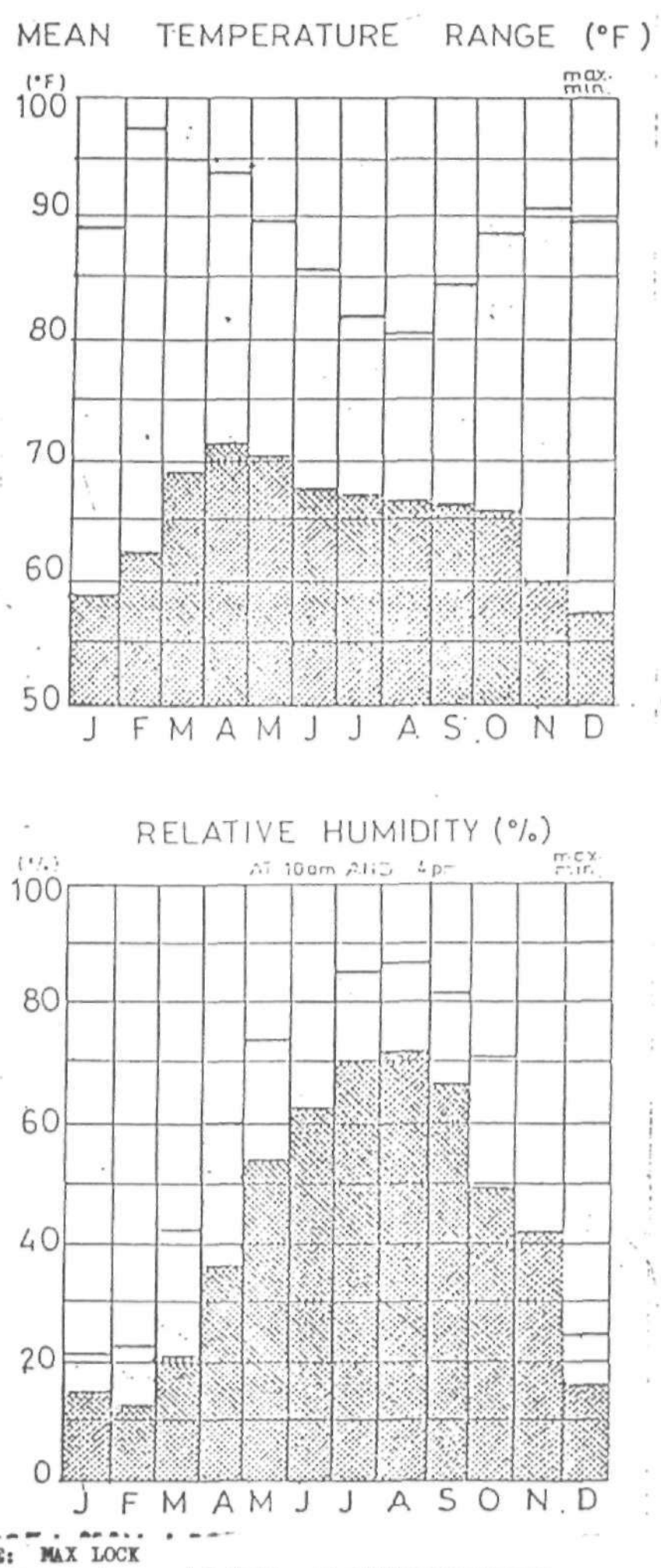
3.4.3 Demography:

Kaduna is recognised as a cosmopolitan town. It has the fastest population growth rate in the country next to Lagos. The population was estimated at 578,000 in 1978 as compared with 149,000 in 1963. The growth rate is however expected to reduce from 8.6% to 3.5% by 1990. The population estimate for the city using the expected growth rate of 3.5% is shown in the table below.

Table 1 - Population Projection of Kaduna.

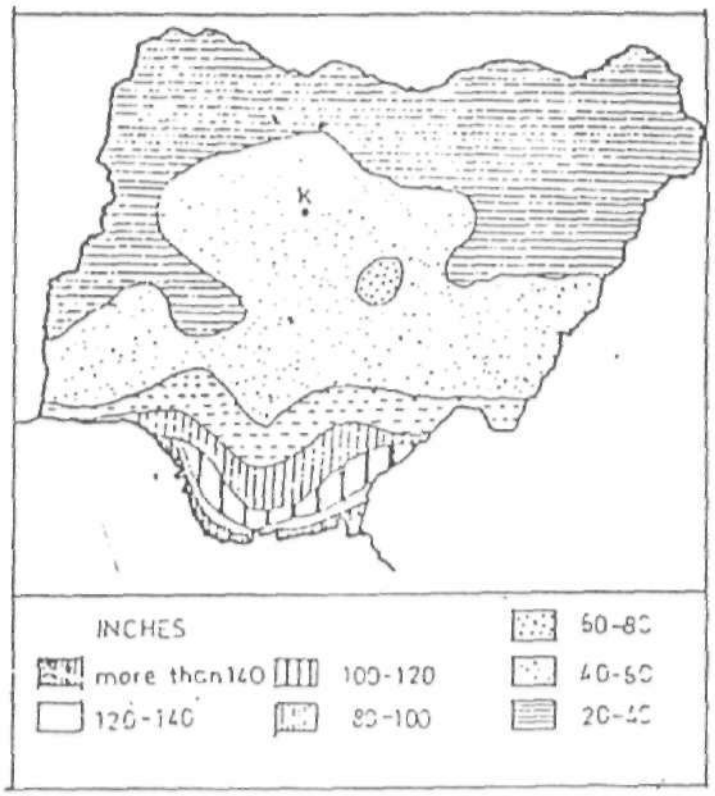
Year	1978	1985	1995	2005
Total Population	520,000	964,000	1,400,000	2,000,000

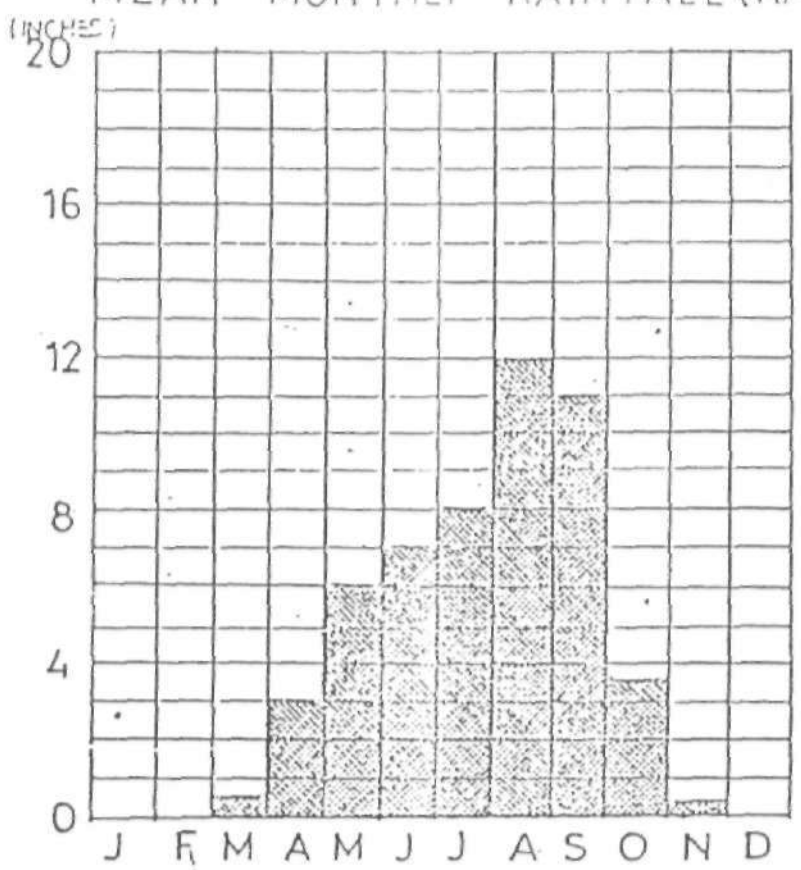
Source: Bestarc International (1982) UNDP



SOURCE: MAX LOCK

FIG. 3.1 - Temperature and Relative Humility for Kaduna

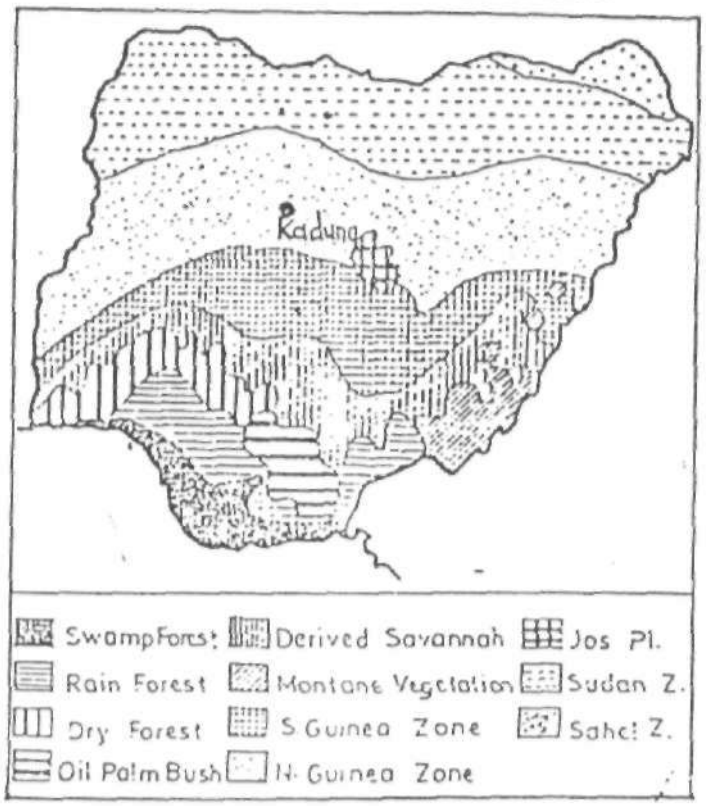




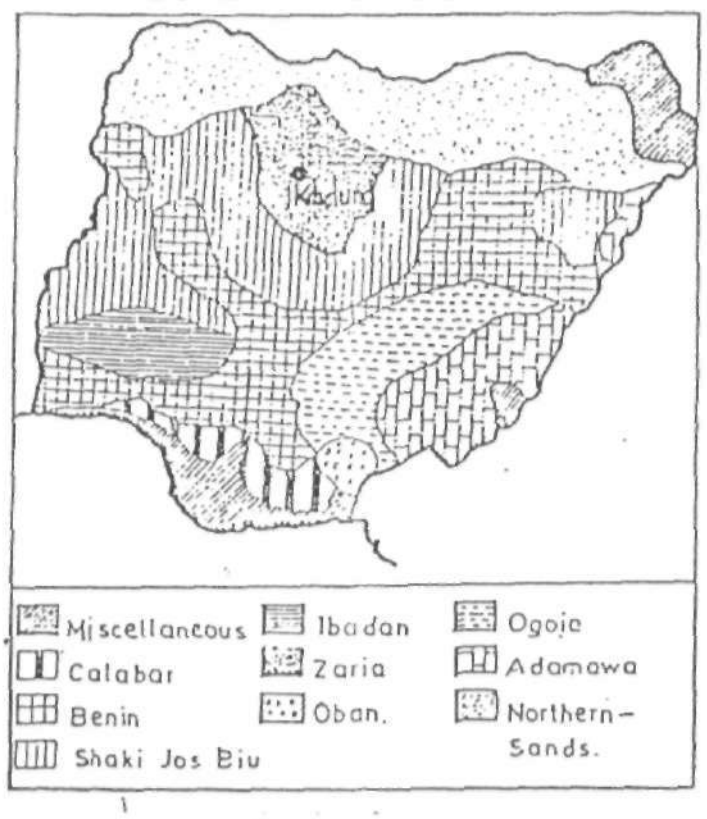
SOURCE: MAX LOCK

FIG. 3.2 - Total Annual and Mean Monthly Rainfall for Kaduna.

VEGETATION ZONES



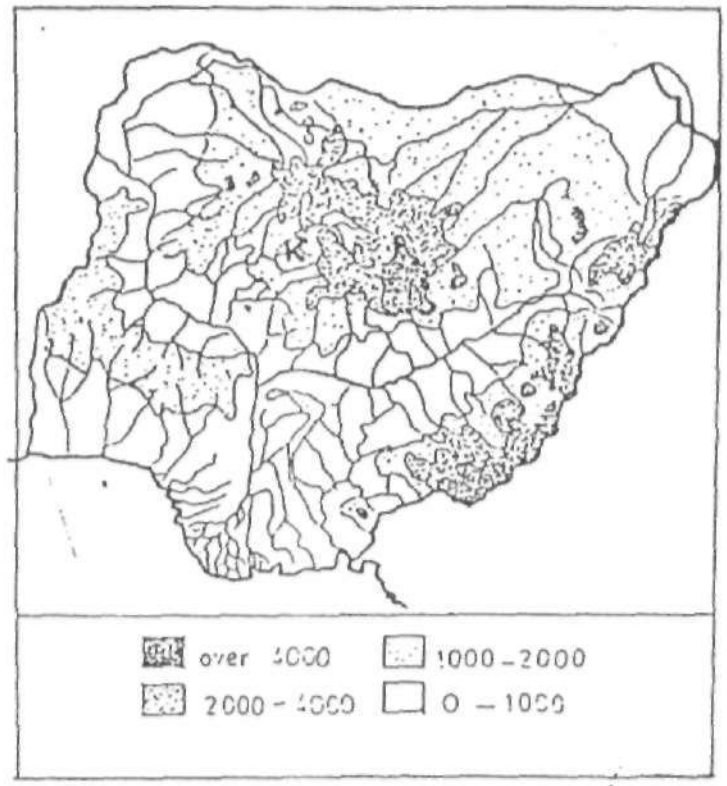
SOIL GROUP



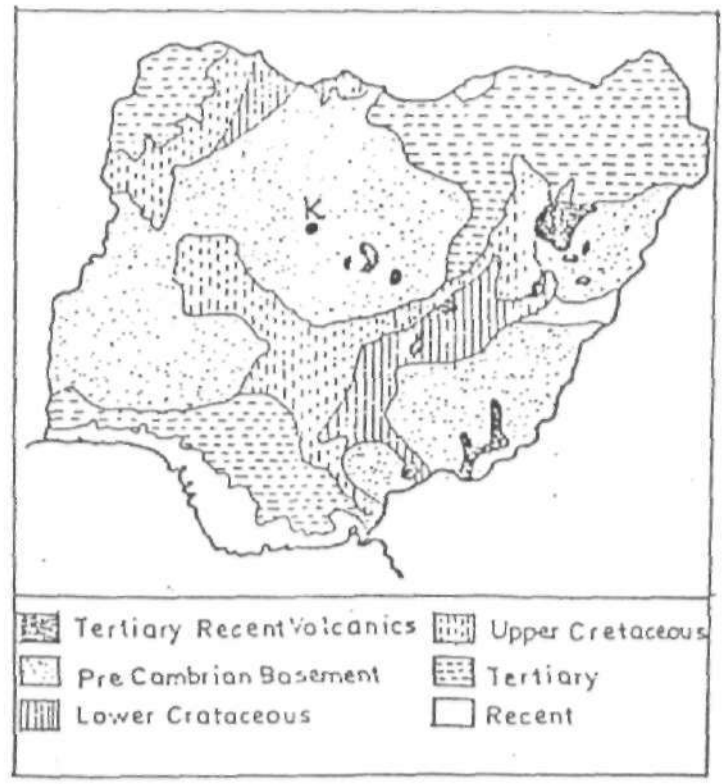
SOURCE: MAX LOCK

FIG. 3.3 - Vegetation and Soil Types for Kaduna

RELIEF AND DRAINAGE



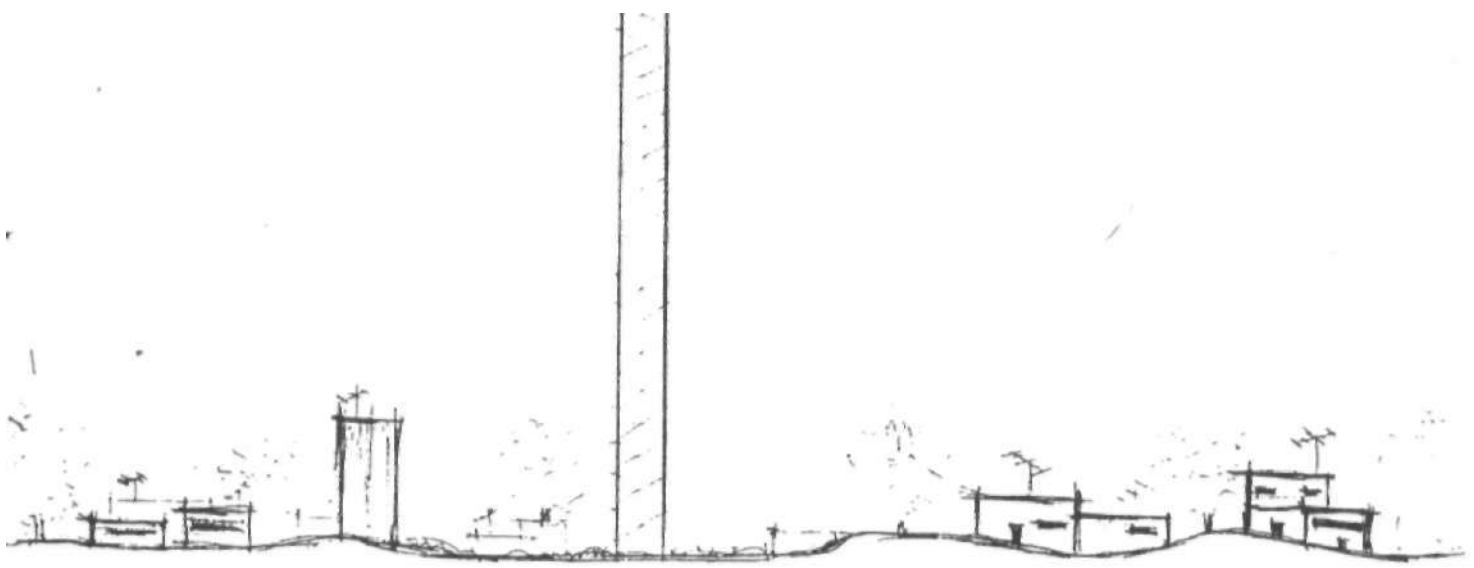
GEOLOGY



SOURCE: MAX LOCK

FIG. 3.4 - Relief Drainage and Geology showing Kaduna

Chapter : 4



the general confusion of sounds resulting into noise. This occurs because the sounds are continously being reflected by the surfaces until finally decays or totally being absorbed. This is not a suitable condition for television broadcasting studio as a clear and defined sounds are required.

(g) Noise From Other Areas:- This include the noise produced from other noisy areas which forms part of the television studio centre. This noise originate mainly from the technical areas comprising of several types of workshops and garages. The noise from this source could not be totally neglected in planning as it could create a problem in design.

6.3 Approaches to Noise Control:

In order to achieve effective noise control in buildings generally, some basic approaches would be mentioned here. This include:-

(a) The identification of noise sources and their separation from those areas where quietness is required, by the greatest distance practicable.

(b) The planning of buildings or part of building where noise reduction is not strictly required to act as shield or screen between the noise source and areas requiring quietness,

(c) The location of parts of the building which produces noise at area where there are likely to be incidences of noise on the site. Same treatment to be given to the quiet areas.

(d) Location of machineries and any other noise sources which may transmitt noise to the building through the structure to areas where they have little or no effect on the building.

(e) Finally, considerations should be given to those parts of the building which admits noise easily. These include the windows and doors.

In a television studio, to achieve a very low noise level for broadcasting, the idea is to reduce the impact of all noise from external sources and those inside the studio to very low values. The degree to which the studio would be protected from external noise sources depends on the intensities of the noise produced from those source. In the case of control of internal studio noise, television studios particularly the large ones are normally treated to be very dead with respect to sound. This is basically because of the position of microphones which are kept out of vision thus further away the performers. This helps to cut down the peculiar noise from various parts in the studio which have been mentioned earlier.

After identifying the possible sources of noise with respect to the studio, the methods of control of the noise from these sources shall be explained.

6.4 Methods of Noise Control In Television Studio:

For the purpose of this thesis to study noise control for television studios, the methods used in theory and practice to control noise peculiar to television studios shall be outlined. The methods of control shall be treated for each of the noise sources stated in section 6.2 earlier in this chapter.

6.4.1 Traffic Noise:

As earlier stated, traffic noise comprises those from vehicular traffic, rail traffic and air traffic. For the control of vehicular traffic noise, avoidance of heavy traffic from highways is usually employed to at least reduce the intensity of noise from this type

of traffic. It is also known that access to any site is related to traffic, therefore the methods used to control road traffic is the location of the studio on the parts of the site remote to the road. Also other building blocks are usually used to screen the studio from the road traffic noise.

Rail routes are generally being avoided in the location of a television studio as this does not only produce noise but cause vigorous vibrations depending on the closeness to the source. This is not to say that there is no remedy to control the noise and vibrations produced here, it is but it is discovered that the construction and material could be rather expensive. However, the control of vibrations produced are normally achieved by suspending the floors ceiling and walls of the studio on resilient materials to act against vibration noise. Figure 6.1

As for the control of aircraft noise, the general consensus is never to locate the studio near an airport and to generally avoid the airport's run-way routes as the aircrafts are closer to the ground surface at these positions, thus the increase in noise level.

6.4.2 Machinery Noise:

The machinery such as a power generating plant used on site are often located away from studio positions on site. They are often located in the noisy parts of the site where the noise could not easily get to the studio. Furthermore, a barrier such as thick wall or screen are also used to reduce the transmission of the noise to the studio. This helps in reflecting away most of the noise generated. The plant could also be entirely housed to prevent the radiation of noise.

6.4.3 Airconditioning And Ventilation Plant Noise:

This is often a major problem in noise control for television studios. Noise are generated from the equipment plant and are transmitted through the ducts into the ventilated space. To control noise in ducts, the common methods includes the lining of the inner surface of the duct with sound absorbing material to reduce transmission over a long distance or to even absorb all the sounds totally. The effect of control of noise in the duct depends on the type of lining materials (with its absorption coefficient) and the size of the duct. Splitters which are impervious sheets lined with absorbent are often used along the length of large ducts. This controls the transmission of the noise from fan in the duct and the transmission of external noise through the duct. The noise produced from the grilles and louvres at duct inlets and outlets of the studio are often considered unnecessary as they only serve to control and change direction of the out-coming air. However suitable designs of the grilles are arrived at to suit the velocity of the moving air thus producing less noise.

Other noise associated with ventilation plants arises from the vibrations produced by the plants itself. Therefore the need arose to isolate the plant from the building structure by using resilient anfivibration mountings to avoid machine's direct contact with the structural floor or wall. Also construction techniques are used in isolating the vibrations produced. Figure 6.2.

6.4.4 Circulation Noise:

The circulation noise originate from corridors, stairs and working areas in the studio. This results from the people's impact from walking or moving in the areas. To control these, stairs are structurally isolated or prevented in the studio directly. Corridors

floors are often covered with thick sound absorbing carpet. If possible, the movement of people in these corridors related to the studio is reduced to the bearest minimum. The working areas in the studio are also covered with carpets but this could not be introduced into the areas where the television cameras are expected to manouvre. On a personal point of view, camera operators and other studio technicians should not put on hard soled shoes. Rubber soled shoes should be recommended for them.

6.4.5 Lighting Equipment Noise:

The noise made by the contact of rollers over the lighting grids are usually solved by using rubber rollers. Also, the noise made by the electric driving motor are controlled by encasing the motor in a wooden box padded with sound absorbing materials.

6.4.6 Reverberation Noise:

As earlier discussed, sounds in an enclosed space will be reflected several times by the interior surfaces of the space. Through some part of the sound are being absorbed at each reflection, this resulting situation in the studio is not suitable for broadcasting. Therefore to control this, consideration is usually being given the reverberation time of the studio space. This is the time taken for a sound to die away to one-millionth part of its original intensity, that is, by 60dB. The shorter this time is, the more suitable for television studio for broadcast. In practice, absorbers of sound are used on wall surfaces in the studio. This absorb the sounds striking the surfaces of the wall therefore reducing the number of sound reflections that could occur and hence the reverberation time of the studio.

But as the characteristics of sounds vary from one sound to another in terms of their frequency, so also, the type or properties of a suitable sound absorbers vary. Generally, there are three basic types of absorbers, namely;

(a) Panel absorbers

(b) Porous absorbers and

(c) Resonance absorbers.

The performance of these absorbers depends on the characteristic of the sound to be absorbed. Therefore, a general knowledge of the frequency range of sound is necessary. In many cases, the combination of these absorbers are used for effective control of sound reverberation in television studios.

6.4.7 Noise From Other Areas:

The noise from other areas around the studio is mainly from the technical areas which are somehow very busy with technicians activities. The other areas include the various workshops particularly the noisy ones which forms part of support facilities for the studio. Normally, the control of noise from these source are taken care of by adequate or effective zonning of the spaces. Buffer zones are also often introduced between the noise source and the quite studio area. In as much as some technical areas which are noisy are required to be close to the studio, planning is used to reduced the effect of noise travelling to the studio. This is often achieved by introducing barriers such as walls between these two areas.

To further ensure the effective control of noise in the studio, there are other parts which are always given much consideration. These would be discussed in the following sections.

6.5 Other Specifications For Noise Control:

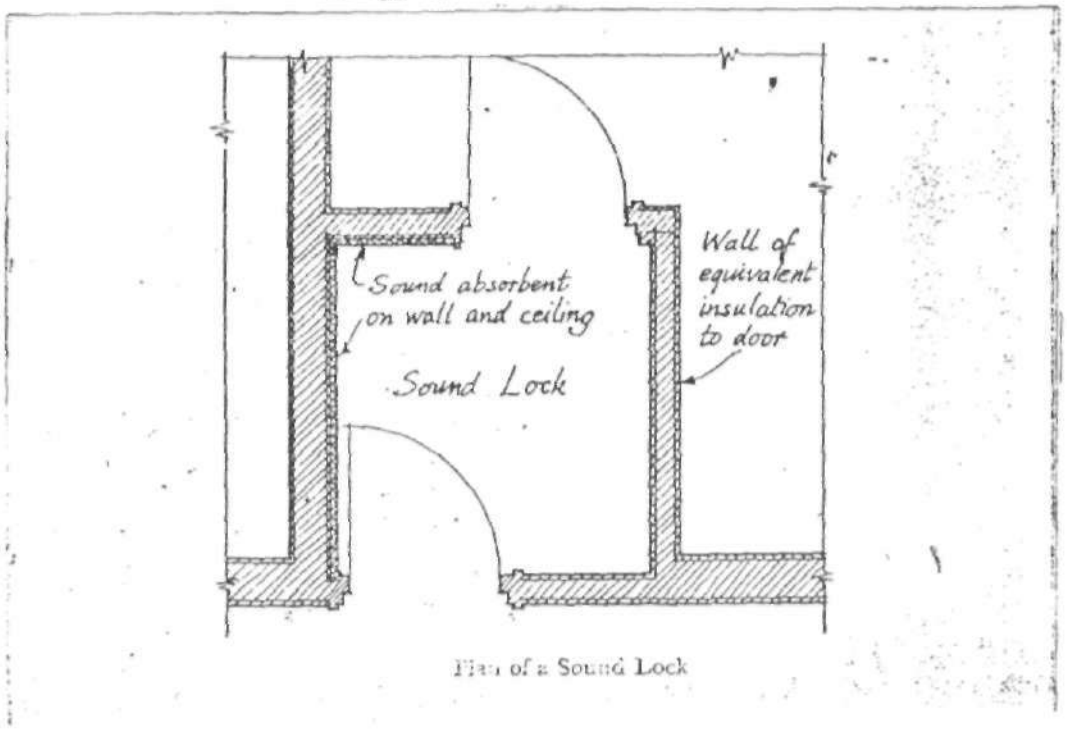
These specifications are related to the type of doors, windows, floors, walls and ceilings used in the studio to protect against the intrusion of sound. This can be described as sound insulation.

6.5.1 Doors and Windows:

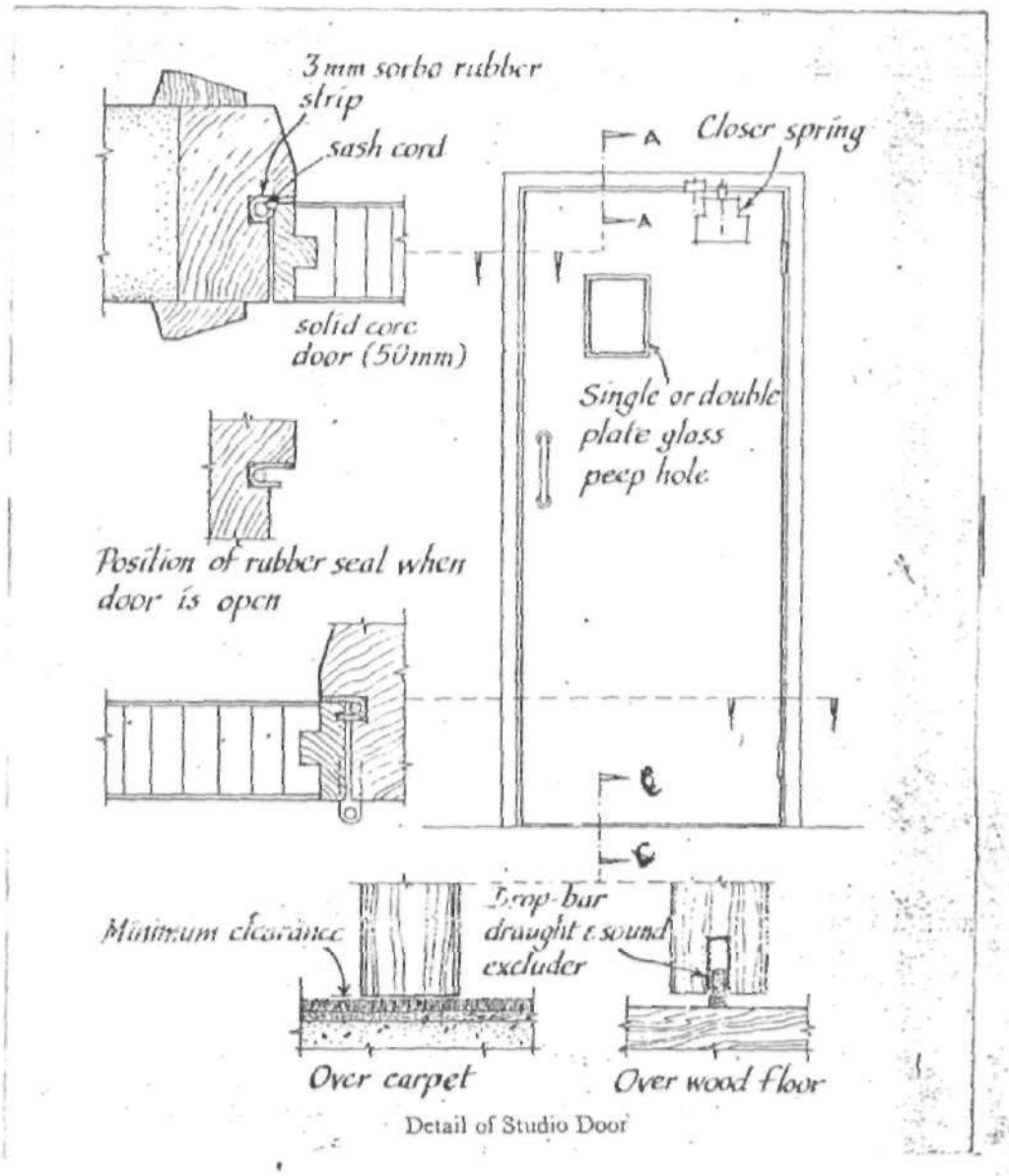
These parts of a building structure easily enhance the transmission of sound into the enclosed space. For studios, double doors are used in practice with sound lobby in-between for insulating against noise entry into the studio. The sound lobby is also often treated with sound absorbing materials on all the surfaces. The doors used are heavy sound insulating doors. The windows particularly the observation windows overlooking the studio floors from the control rooms are made to consist two or three sheets of glass with the loopholes sealed with suitable mastic or absorbent. The same treatment is also being used for the doors. The details of these are shown in the figure 6.3

6.5.2 Walls And Ceilings:

For protection against external noise, the construction of the television studio normally involves the use of heavy massive walls. Furthermore, the use of double walls with cavities proves to be sound insulative. For the interiors, as explained under sound reverberation, the walls are usually covered with absorbent to reduce noise or unwanted sounds to a very low value. The ceiling also are usually treated with sound absorbing materials particularly to absorb the noise from the roof such as rainfall impacts.



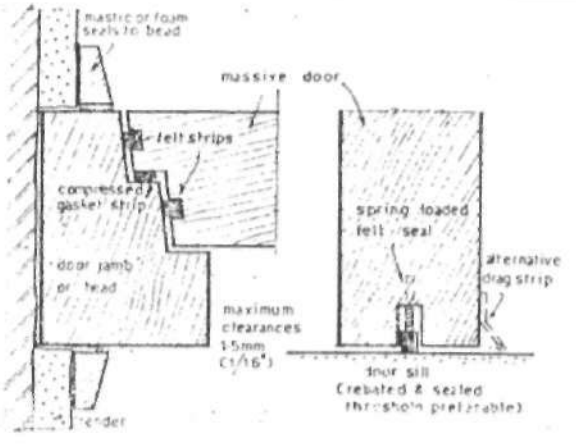
Plan of a Sound Lock



Detail of Studio Door

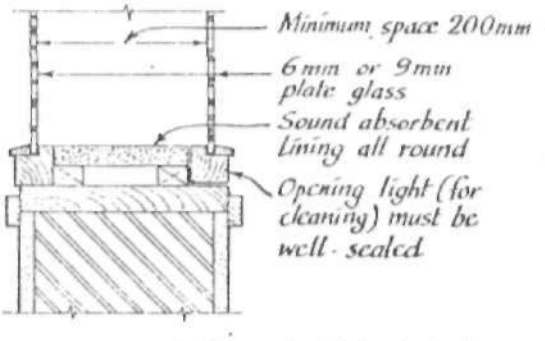
FIG. 6.3a - PLAN OF A SOUND LOCK AND DETAILS OF THE STUDIO DOOR

SOURCE: P.H. PARKINS AND H.R. HUMPHREYS (1969)



Details of door sealing to reduce airborne sound transmission; locking mechanism should provide positive compression on gasket when closed (lock itself should not become a flanking transmission path).

SOURCE: ANITA LAWRENCE (1970)

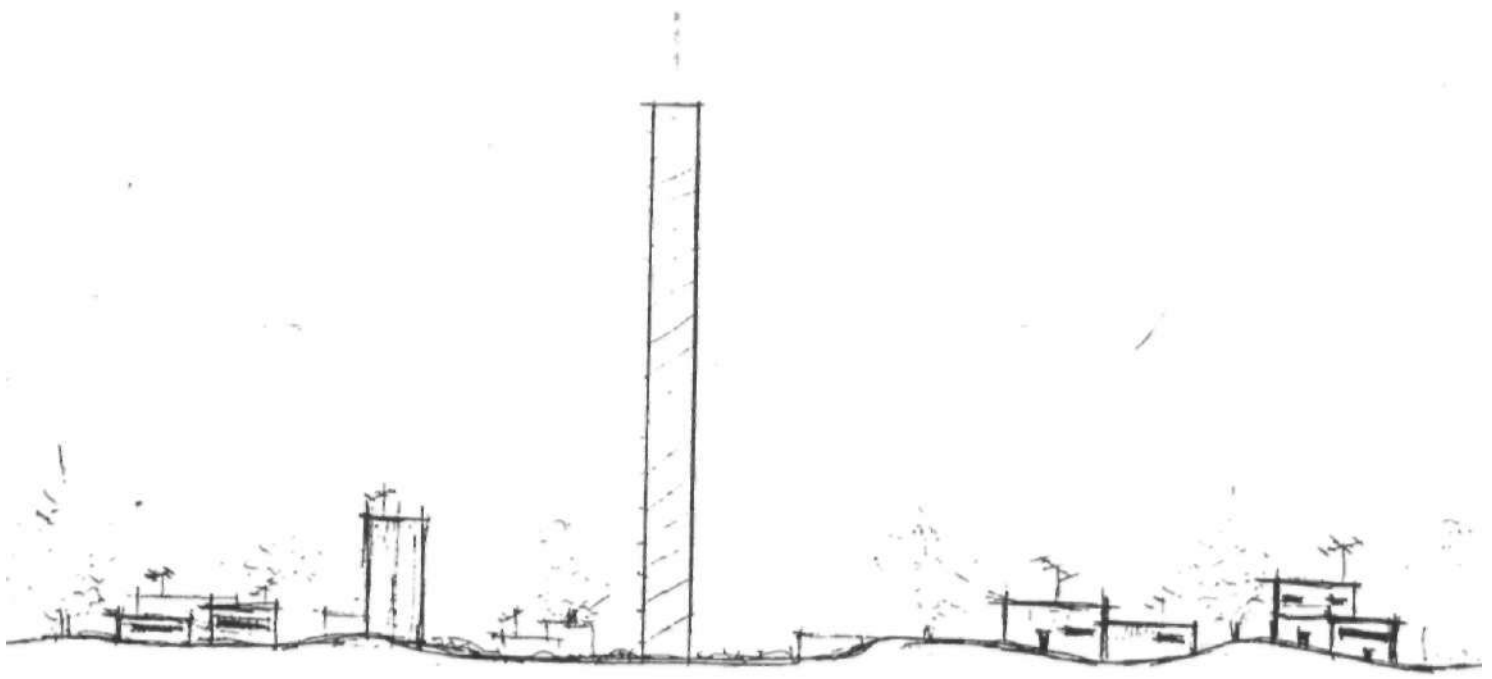


Detail of Observation Window for Studios

SOURCE: P.H. PARKINS AND H.R. HUMPHREYS (1969)

FIG. 6.3b - DETAILS OF DOOR SEALING AND OBSERVATION WINDOW

Chapter : 6



CHAPTER SIX

6.0 TOWARDS BETTER NOISE CONTROL IN TELEVISION STUDIOS:

6.1 Introduction:

Noise, one could define as being any unwanted sound especially one that causes a lot of disturbance to people who are directly or indirectly affected by its impact on hearing. This phenomenon therefore presents a lot of problems in the design of buildings in a bid to keep it (noise) out of these buildings. One might therefore suggest that this could be part of the reason why towns are planned for an ideal situation, that is, certain areas of the town are allocated for particular developments such as industrial areas, commercial areas, residential areas and others. This pattern of planning is known as the land-use zonning; noise producing buildings are kept together in an area while the quiet areas are also grouped together in another area, away from the noisy ones.

The energy generated outside a building and those being radiated internally constitute the background noise particularly in television studios. These are perceived at certain level of intensities depending on the characteristic output of the noise source. To keep noise out of buildings, a television studio particularly, a survey of noise have to be carried out on site before the planning of such buildings commence. This is in order to identify all important noise sources, the control of noise generated from integral parts of the building should normally be taken care of at the planning stage. Noise producing areas are also normally separated as much as possible from the areas where noise level is required to be very low. Also, noise generated as a result of the characteristic properties of buildings such as the television studios interior are controlled by the adequate treatment of the surfaces of the interiors.

The followings are therefore studies being carried out on the aspect of noise and controls in order to understand the problems and methods which are used in solving them.

6.2 Sources of Noise in Television Studio:

Here is an attempt to outline the source, from which noise reaching the television studio are likely to originate. The general break-down include all noise sources outside the studio and those inside the studio. They are as follows:-

(a) Traffic Noise source:- Traffic noise could be that of motor vehicles plying motor ways or rail engines and waggons along the rail routes. Also included is the air-traffic noise from aircraft at airports or flying overhead.

Traffic noise is inevitable on any site as it is directly associated with access into the site even though the level of noise depends on the type of road, whether a highway or just a less used street.

Rail and air traffic would also have to be considered when the choice of site is close to their routes.

(b) Machinery Noise source:- This is the noise produced from machines operating on site. Machinery noise source on same site as television studio centre usually originate from the heavy power generating plants used as standby or for continous power supply particular for the operations in a television studio.

(c) Airconditioning and Ventilation Plant Noise:- The noise originate from the operations of the motor parts of the plant and from the fans. The noise from the plant engine and from external sources are passed through the connecting ducts into the studio. Together with these, aerodynamic noise from the fan blades is also carried along the ducts. The movement of air through the duct also produces noise which depends on the velocity of flow of air through the duct. Noise is also produced as a result of air movement over the grilles and louvres where the duct terminates into the conditioned spce.

(d) Circulation Noise:- Circulation noise include those produced from the movement of people in and around the studio. These are often originated from corridors close to the studios and from the working spaces in the studio. This could also be called impact noise produced from the impact of people on floors as a result of walking around.

(e) Noise From Lighting Equipment:- As a result of the need to light television studios for programmes production, the need also arise for the movement of lighting equipments from one scene of a programme to another. This movement to and from one place to another produces some form of noise as the lighting hoists moves over the lighting metal grid in the studio ceiling.

(f) Sound Reverberation:- This is a phenomenon about the reflection of sound in the studio interior. The sound produced from a source is being reflected by the interior surfaces of the studio such as the floor, walls and ceilings. This results into the generation of sound of different noise level at different points in the studio. The experience one gets in this situation is

CHAPTER FOUR

4.0 CASE STUDIES

This chapter deals with the study of existing television stations in order to find out their working conditions. There are two types of cases to be looked into. This include the ones on the local level and those of a foreign level. The local cases are those efiating here in Nigeria. This include the Ogun State Television (OGTV), Abeokuta and the Nigerian Television Authority (NTA), Kaduna. The foreign cases are located outside Nigeria, this include the Yorkshire television and the B.B.C. television.

4.1. OGTV, Abeokuta:

This station was commissioned on the 13th of May 1982 by the former Governor, late Chief Bisi Onabanjo. It was a turn-key project executed by a construction company by name International Generics in Abeokuta. The project, named UHF 25 was announced as a christmas gift on 25th December 1981 to the people of Ogun State by the administration of the late chief Bisi Onabanjo.

Objectives:

The main objectives of the station is self sufficiency right from the on-set commercial goals were realized in August 1st 1984 when Brig. Oladapo Diya set the motion for the station to generate enough revenue to meet its expenditure.

Location:

The station is located on the outskirt of Abeokuta town in the area called television village at kilometre 9 along Ajebo road.

Architecture:

The station has outstanding features which include giant studios for audience participation shows, large office complex and massive balconies on three floors suitable for outdoor recording.

The site can be clearly divided into zones depending on the level of noise. These are the noisy, the quite and the intermediate zones. The planning takes care of noise from road traffic by using the administrative area to shield the studio against these noise and also those noise from the parking areas.

Facilities:

The facilities provided for includes central airconditioning, water reservoir, powerful generating plant and residential quarters for staff. Others include well equiped and massive recording studio for major drama and entertainment programmes. A giant mast standing at 1,750 feet above sea level.

Merits:

Site takes care of the problem of noise from heavy traffic and vibrations which are common in the city centres. The zonning also controls noise infiltration in to the studio. The planning and internal treatment further controls noise.

Demerits:

Site is too far away from talent source as the station is on the outskirt of the town.

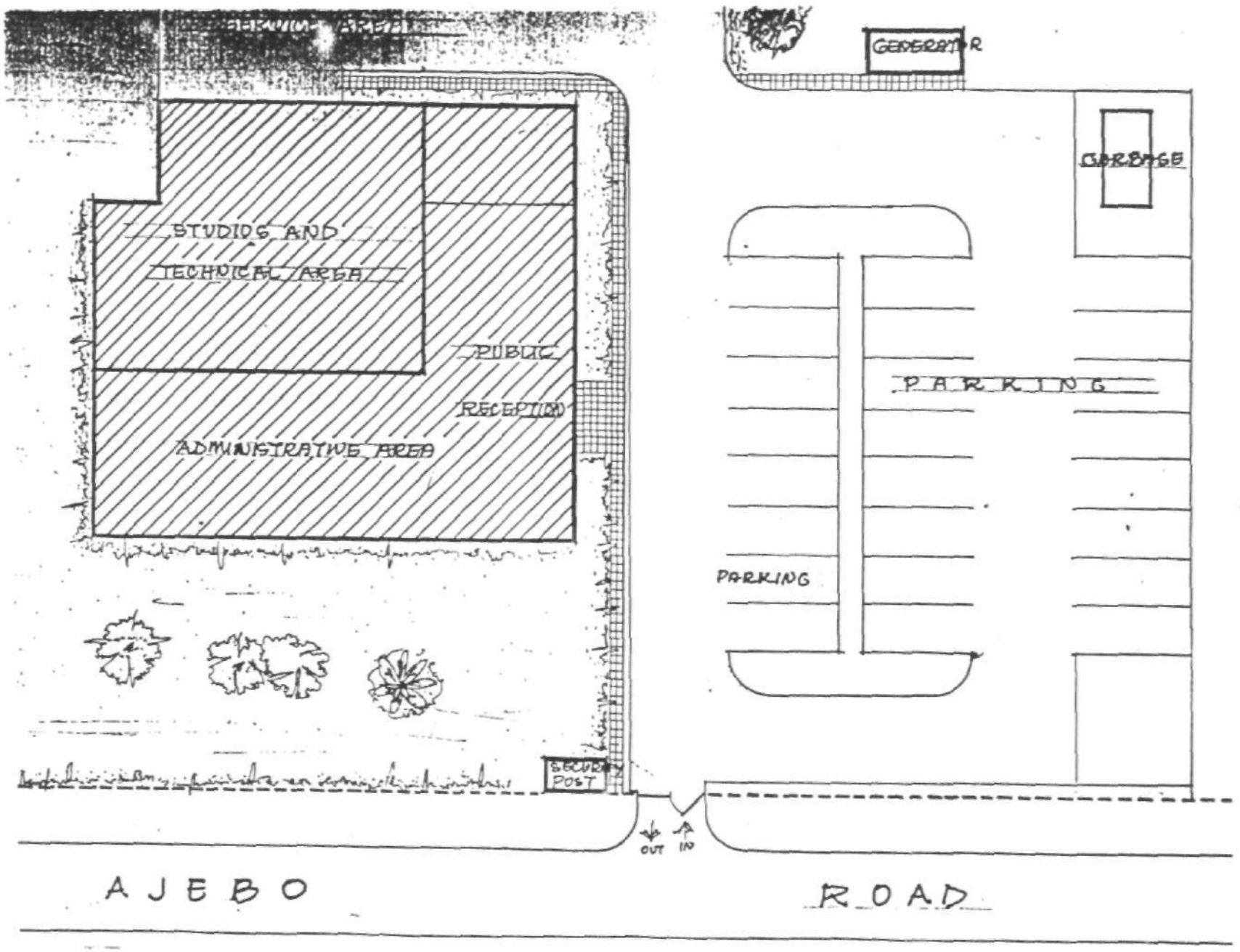


FIG. 4.1 - CONCEPTUAL LAYOUT OF OGTV, ABEOKUTA

4.2 Nigerian Television Authority (NTA), Kaduna:

The station started operating by March 1962 under the name of Radio Kaduna Television, now separated into the NTA and FRCN, Kaduna. The two are located within the same complex and in some cases, their technical areas are housed within the same block.

Location:

The broadcasting complex of the NTA, Kaduna is located along Hospital road by Independence way in Kaduna while the transmitting complex is located at Jaji along Kaduna-Zaria road. This in essence means that all the recordings takes place at the broadcasting complex in Kaduna, while the transmission takes place at Jaji.

Objectives:

This is in line with the general objectives of all NTA stations in the country. This is to influence societal values profoundly and in so doing, improve and strenghten the social, cultural, economic, political and technological fabrics of the society.

Architecture:

All the units in the complex were not designed initially as a whole but existed with time when the need arised. The first block to be erected in the site was the broadcasting block. This is where the television and radio broadcasting takes place. There is repetition of functions between the two. The technical block contains three studios, two small ones and one large studio. All the studios are located on the ground flowr while the supporting facilities are located on the upper floors. The larger studio has its own control units consisting of production, sounds and visions control.

The studios are surrounded by other functions. The lighting and ventilation provisions are by artificial means.

Merits:

There is good relationship between the larger studio and its control unit with double glassed observation windows. The location of the sets making and storage from the larger studio is well appreciated.

Because of the growing sophistications of electronics, the old idea of using telecine for movies is done away with to the new idea of video machine. In other words, the film making and processing units are absent. The set up, in modern equipments, NTA Kaduna is advanced in Northern Nigeria. The lighting system in the studios are being controlled by electrically controlled telescope. There is also a provision for outside broadcasting van.

Demerits:

The site is not an ideal one because there is a problem of noise from heavy traffic that bounded the site in two directions. All zones that make up the technical area are not properly grouped together as one can see the juxtaposing of administration within the technical area. The administrative block forms the point of focus as one approach the complex. Impressions of office accommodation is portrayed. No economy in planning as the transmitter is located off the broadcasting site. The radio and television within the same complex are operating as autonomous body from each other, each with its general manager. This will create redundancy of workers and over staffing.

4.3 Yorkshire Television:

This station was designed by George Trew/Dunn Partner. The task was to design and equip the centre and also to staff to meet the requirement of the independent television authority. It had to be designed and operational within thirteen months.

Location:

The site for this project is located in a large slum clearance between Kirstall road and Burby road about 1.6 km west of the city centre. The area is partly developed as an industrial estate to the S.E. of the site. The site is also said to be under the flight path of air traffic using the Leeds/Bradform Airport. The size of the site was seven (7) acres.

Architecture:

The main elements of the centre were the three large studios $149m^2$, $465m^2$ and $743m^2$. The plan was a linear studio block with parallel zones running south to north on the site. The north end of this zone were envisaged for expansion. The middle zone contains the large studios.

The design also housed multifarious essential facilities e.g. safetaria, outside broadcast garages, workshops, etc. The major elements is the administrative block. The challenge faced by the designer was the fixed time for completion. The overall plans had to allow for development and changes throughout the course of the operation.

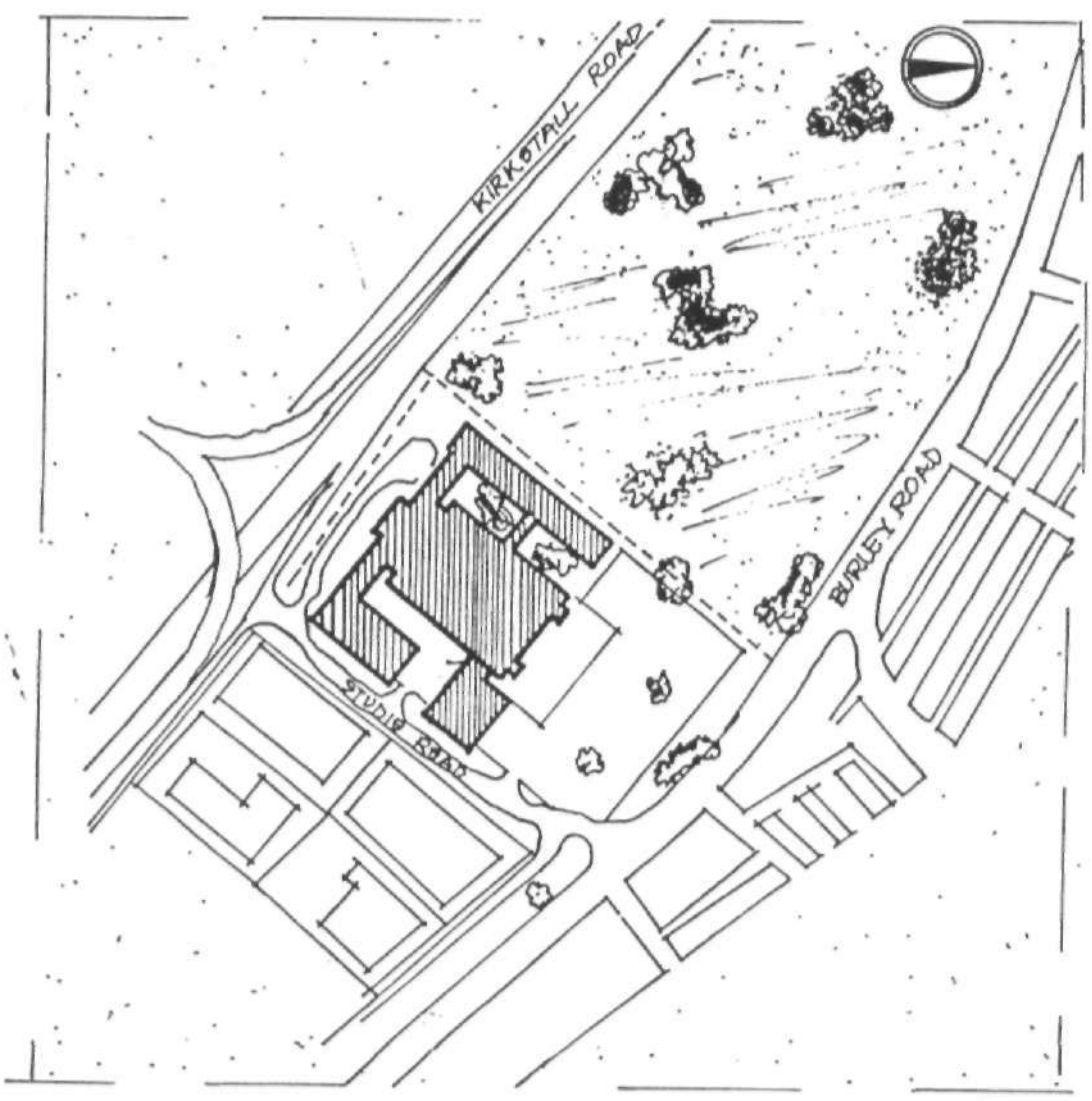


FIG. 4.2 SITE PLAN

KASHMIR LIBRARY

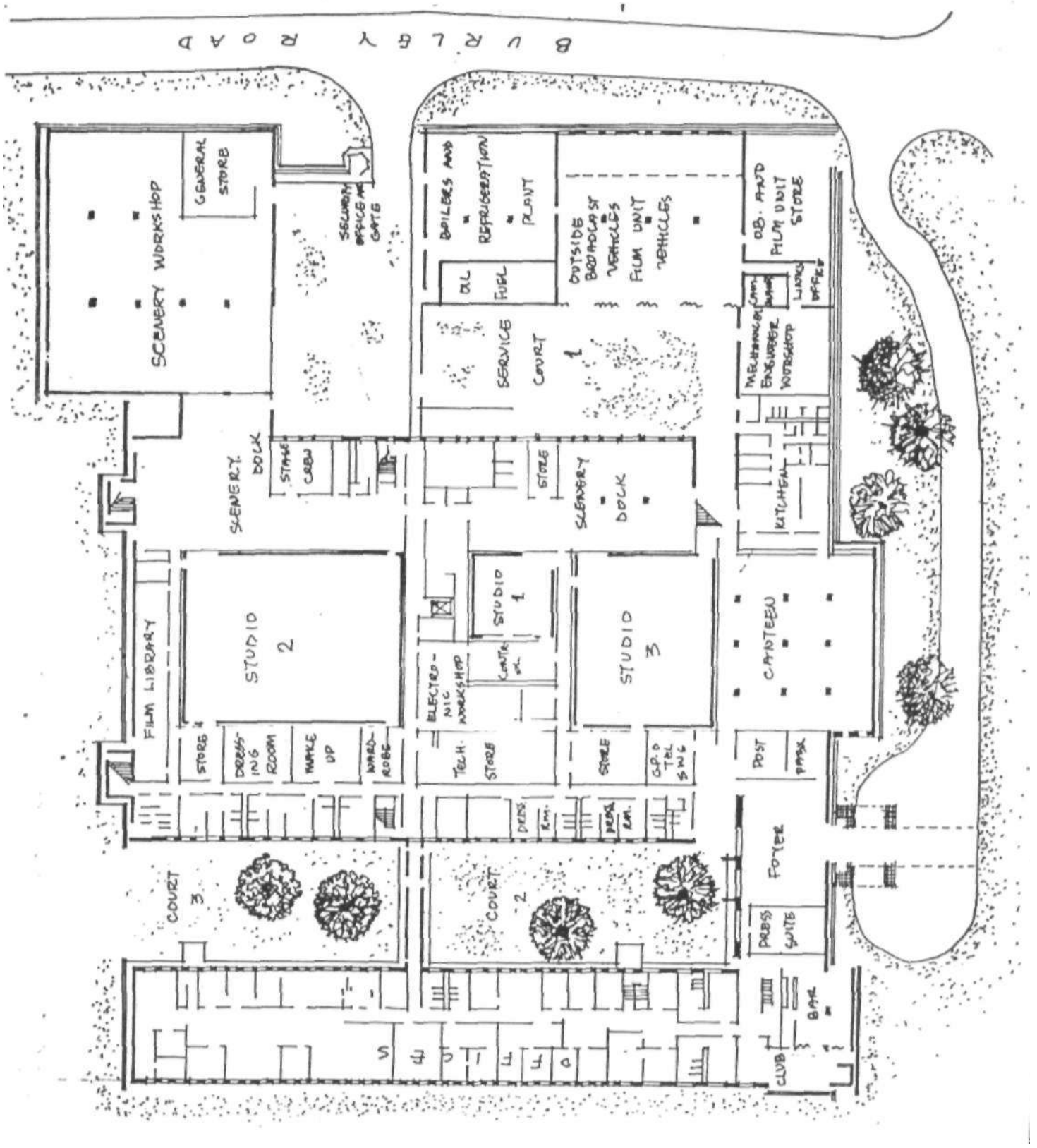


FIG. 4.3 GROUND FLOOR PLAN

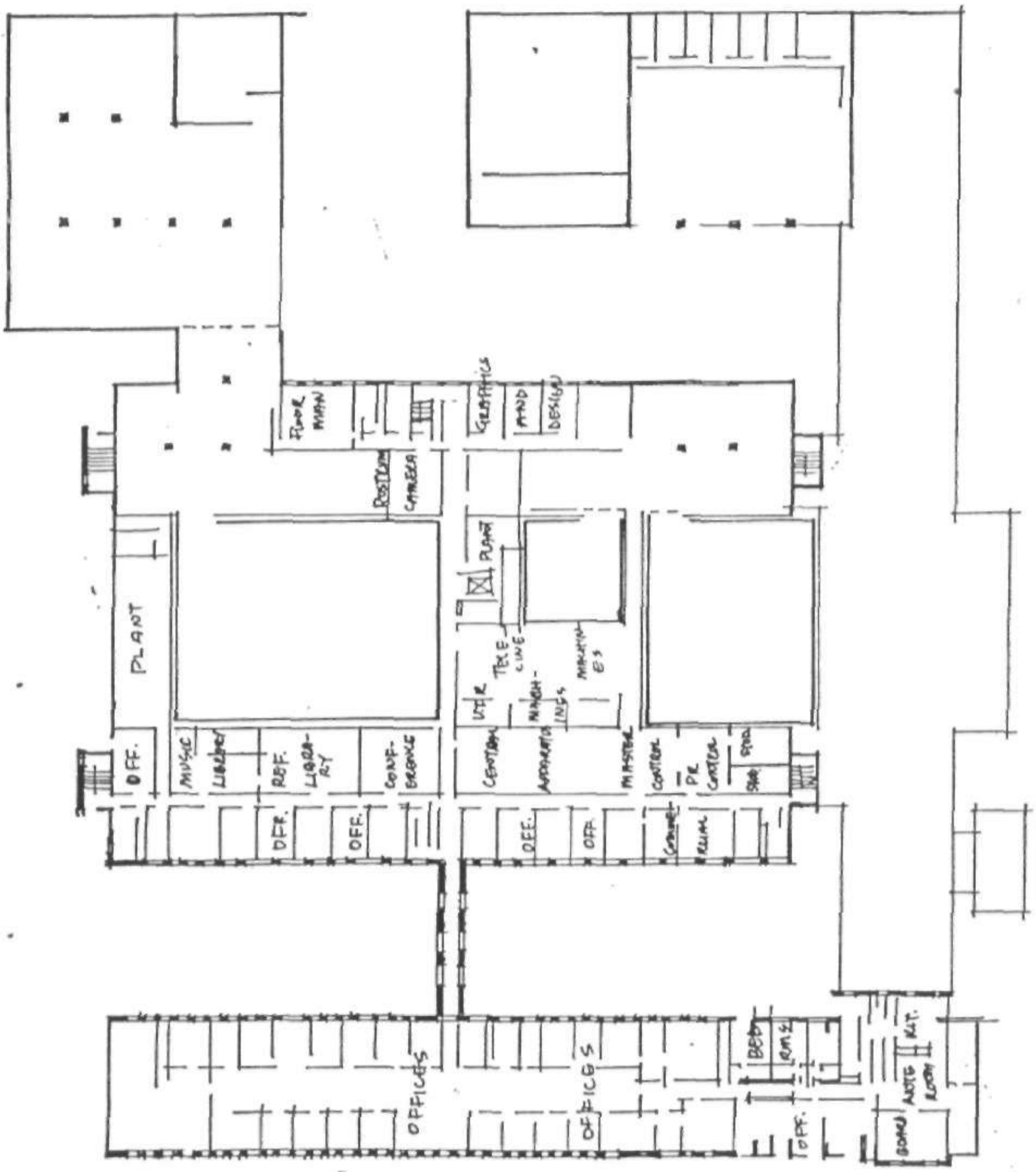


FIG. 4.4 FIRST FLOOR PLAN

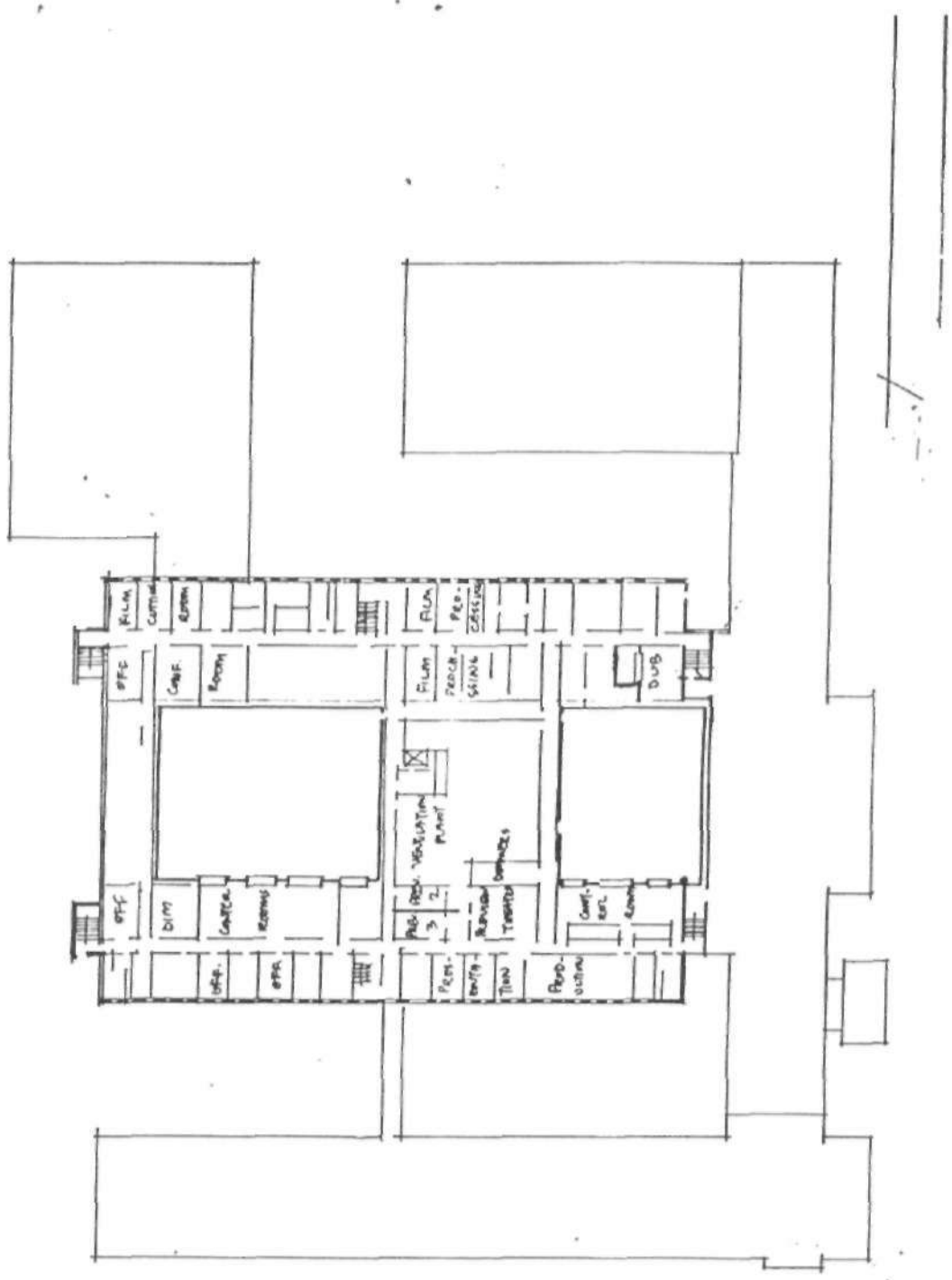


FIG. 4.5 SECOND FLOOR PLAN

Merits:

The link between the services block and the studio block was well incorporated than that of the administrative block and studio. The technical offices are directly adjacent to the studios. The nerve centre, that is the master control room is close to the studios, reducing the cost of cables. The architect symbolised the studio making it a focal point to the visitors and workers.

Demerits:

The site for the station is at disadvantaged position in terms of its location in an industrial area and also under air traffic. This causes a lot of noise on the site.

4.4 B.B.C. Television:

This is a very large station covering about 13 acres of land. The concept is a functional circular form designed according to the conditions imposed by the location and shape of the site. The design aim was to provide one main studio and office block with three separate blocks surrounding it. These are the scenery production block, restaurant and the works and service block.

Architecture:

The design was finally conceived as a circular form resulting from an architectural conception of a vast main studio and office block with separate blocks gathered around it. The main block has a circular inner ring of nine storeys. The entrance separate workers and artistes and visitors by the use of lifts, escalators to the ground floor. The basement takes care of dressing room, band practice room, locker room and ventilation plant.

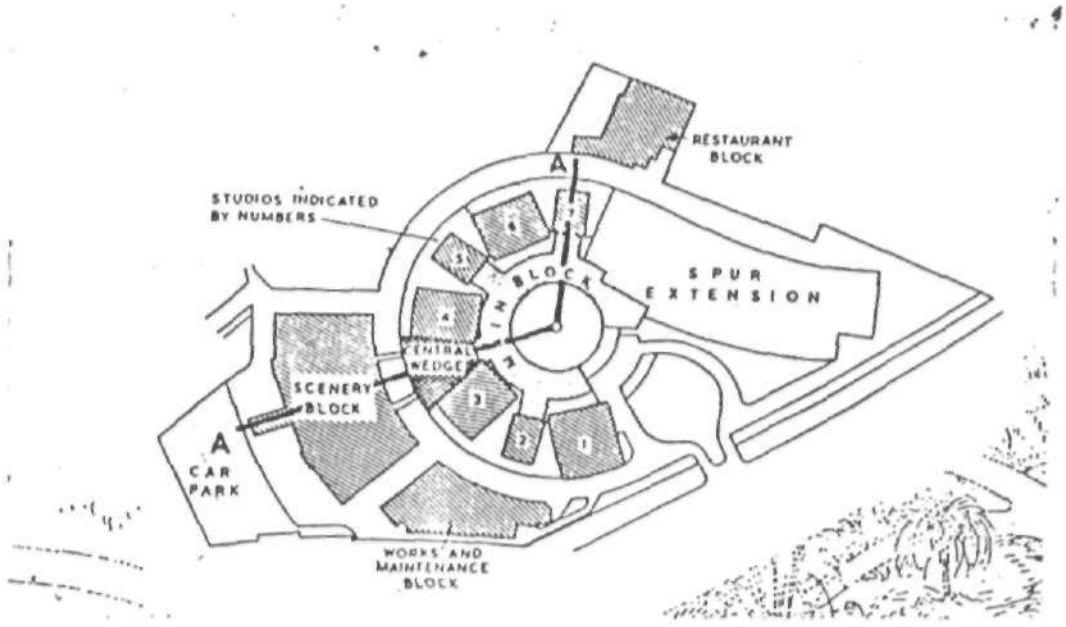


FIG. 4.6 SITE PLAN/LAYOUT

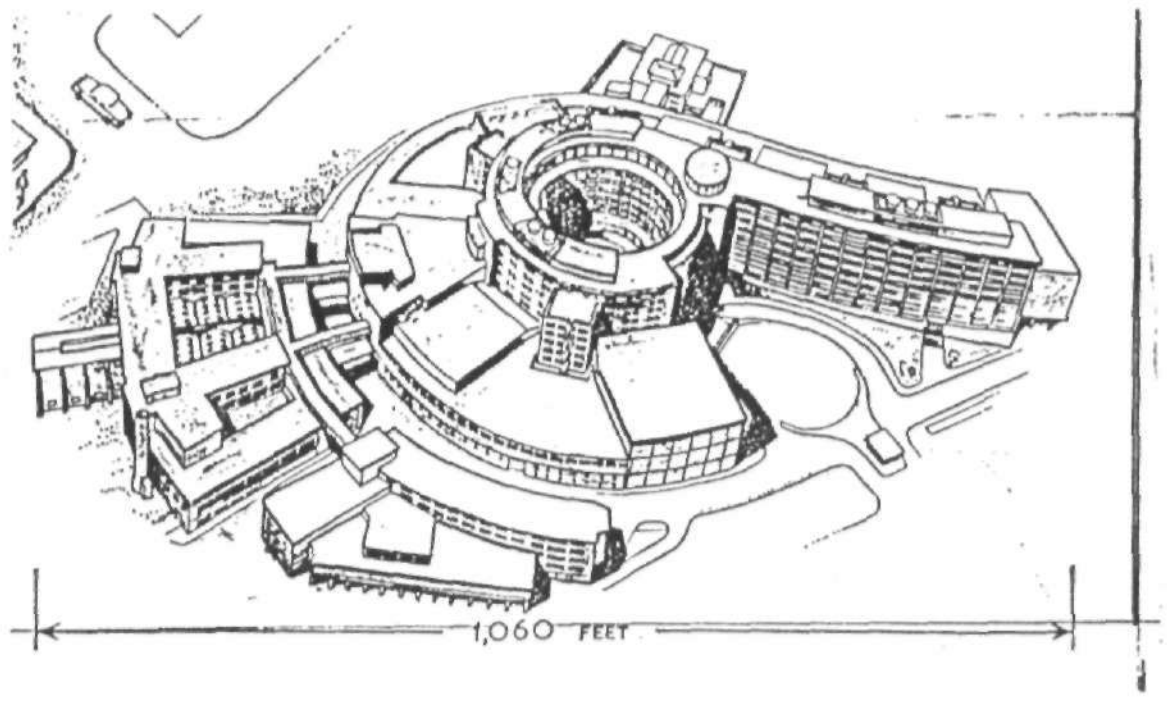


FIG. 4.7 THREE DIMENSIONAL VIEW

The first floor is for television engineering control rooms arranged at the end of each studio. The second floor has the equipment stores, technical maintainance workshops. The third floor accommodates music and wardrobe department. The fourth floor has offices, club and garden. The fifth and sixth floor comprises of the conference rooms and offices. The seventh and eight floor accommodates the exhibition and services plants and also the water tank.

Merits:

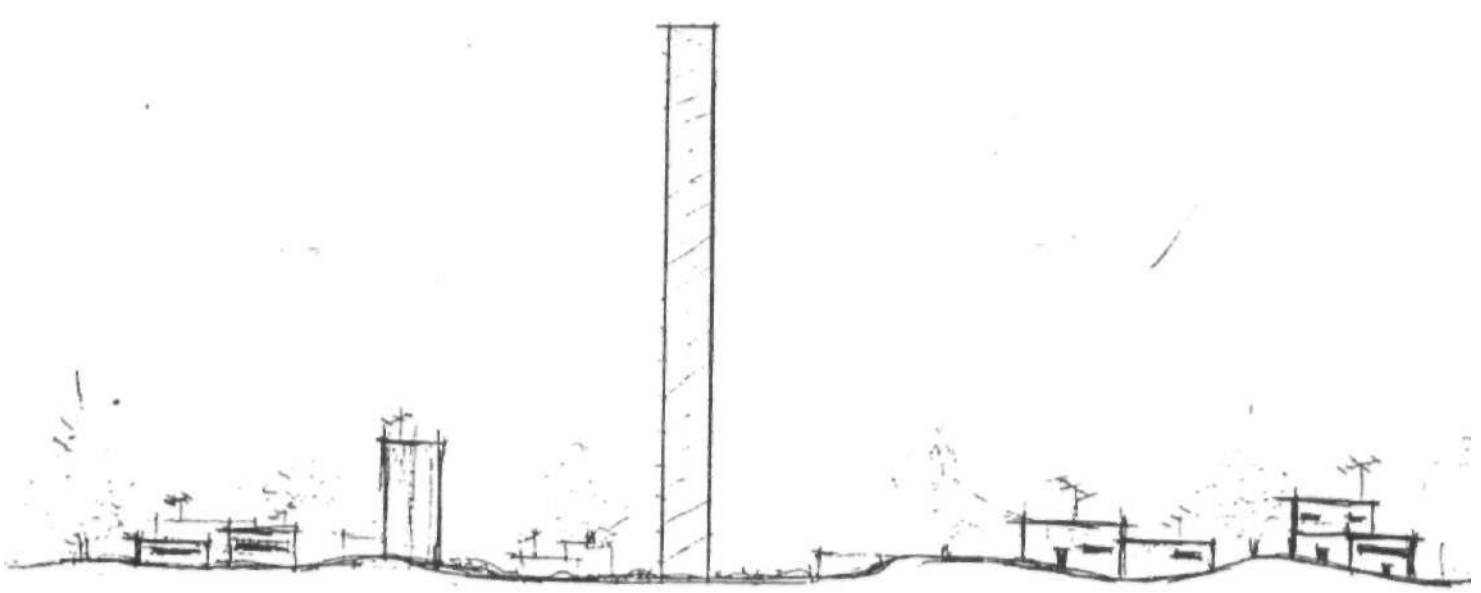
There is a provision for a central control apparatus which is close to the studio, this is where the final checking of television signals is being done before transmission. The studios are accessible from runway which is where sets are designed and carried to the studio with forklifts. The studio is also in close proximity with the artistes meeting room, green room, refreshment bar, telephones, lavatories, etc. Within the studios are storage areas for technical equipments such as cameras, microphone booms, etc. Quick changing rooms are also provided near the studio to save time between acts in the studio.

The external finishes on cavity block or brick work made easy for maintainance. The space provided for scenic studio is big enough for painting large boards.

Demerits:

The restuarant block is not centralised, some areas such as the works and maintainance block is at some distance from the restuarant block.

Chapter : 5

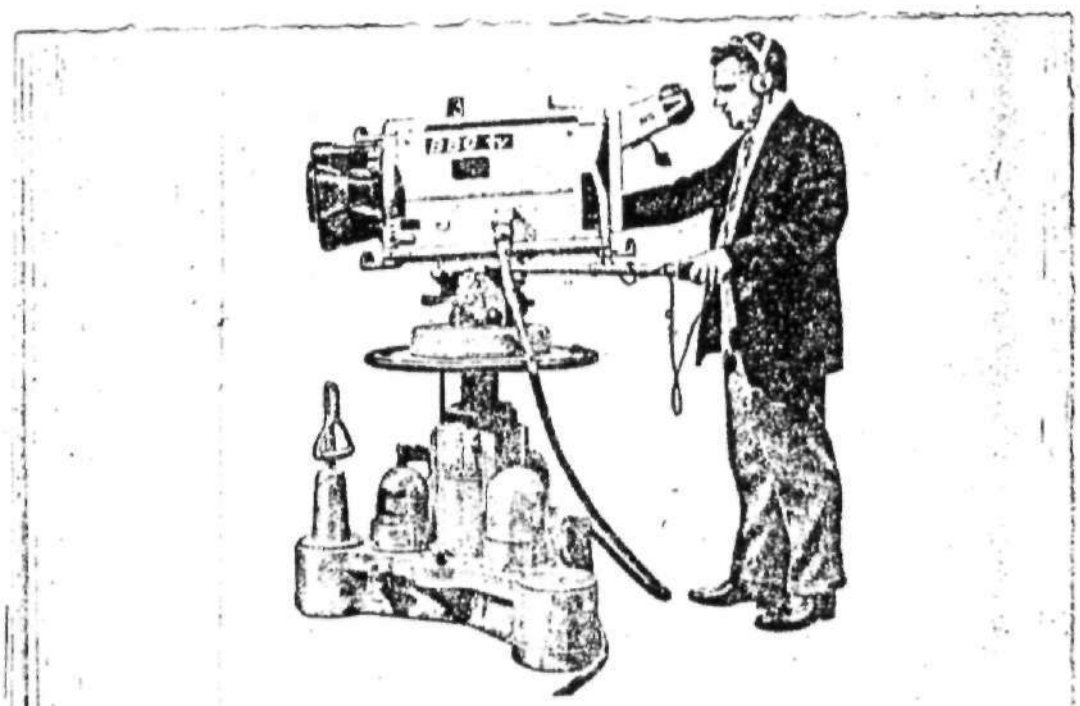


CHAPTER FIVE

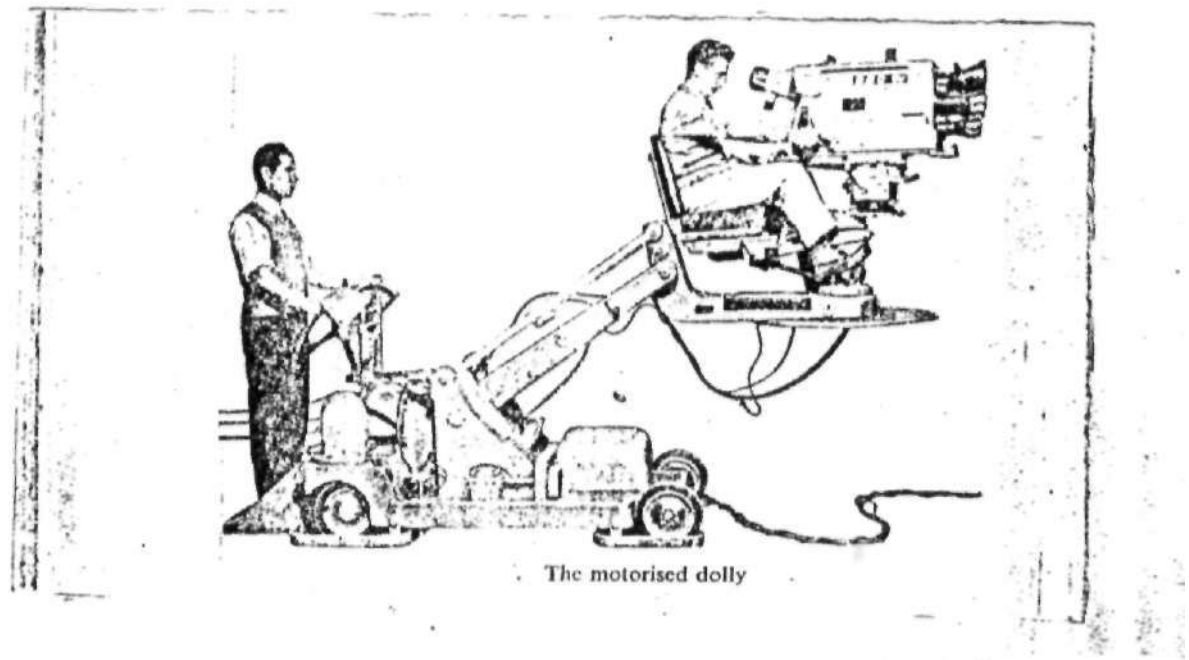
5.0 TELEVISION PRODUCTION TECHNIQUES

5.1 The Broadcasting Line:

From the study of television production process, the origin of the television programme broadcast is the studio. Here, a number of camera are used to scan the images of performers in the stage sets in the studio. The television cameras are moved around in the studio on dollies to capture scenes from the sets on studio floors. The type of dollies over which the cameras are mounted include the pedestal dolly and the motorized dolly Figure 5.1. Also, the microphones are directed to the movement or positions of artistes by the use of extending and retractable microphone boom. The image captured by the television cameras are monitored by the vision control units. The sound produced is also monitored at the sound control units. The camera output passes from the vision control room to the vision mixer in the production control room where the picture produced from each camera can be seen and monitored. After the processes mentioned above, the production signals are directed to the telerecording room to record the programmes originating from the studio on magnetic tapes using video tape recorders. Programmes already recorded on tape are played back in the central apparatus room. Those recorded on films are also provided for with the use of telecine machines. All signals from vision, sound and production room are passed through the central apparatus room to the central control room where the distribution of the signals for camera channels, telecines and recording are ensured. Continuity (that is, insertions of announcements and commercials), sound and picture qualities are checked in the central control room before transmission.



The pedestal dolly



The motorised dolly

FIG. 5.1 - TYPES OF TELEVISION CAMERA DOLLIES

SOURCE: K.R. STURLEY (1961)

Finally, the sound and vision signals are sent from the central apparatus room to the transmitter. The programmes are transmitted in a particular frequency waves which are picked by television sets tuned to this frequency. Figure 5.2 shows a schematic diagram of the television programme production process.

5.2 The Television Studio:

It is important at this point to describe a television studio with its basic requirements. The television studio is the space totally dependent on artificial lighting and ventilation, used for the production, recording and broadcasting of programmes. It could also be described as the space from which television programmes originate.

Due to the nature of the television studio output, its activities involves the use of several equipments and working space. The television studios differ in size depending on the use to which they are put. This is because studios of a certain size particularly large ones have to be kept as fully used as possible during operation in the interest of economy. For example, a very large studio used for big programme activities would not be economical for use as news or small interviews because it would require the treatment of a much larger surface area of the studio interior which are not necessarily in use. Thus, there is need for studios for particular specialized purpose mentioned as follows.

(a) Announcement and news

(b) General purposes, including entertainment with provision for audience participation.

(c) Major programme productions, including drama.

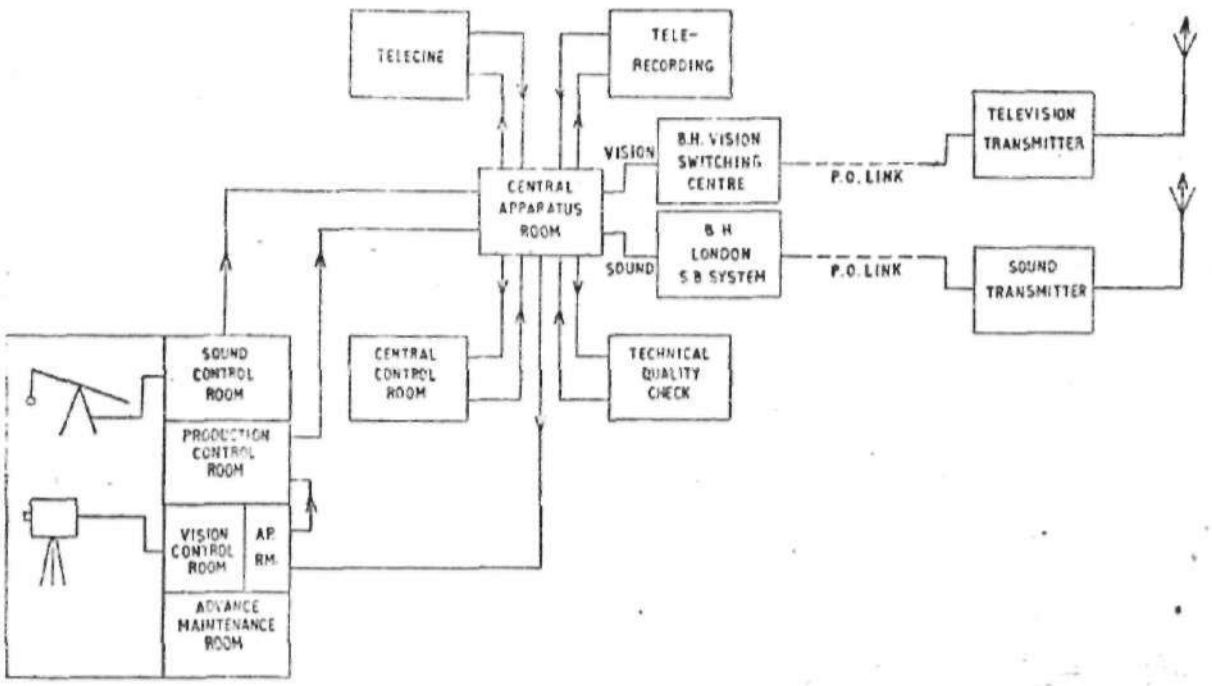


FIG. 5.2 - SCHEMATIC DIAGRAM OF THE TELEVISION PROGRAMMES

SOURCE: K.R. STURLEY (1961)

Moreover, for a television station to be self sufficient in programme production and output, the different types of studios mentioned above are necessary. However, for successful programme production, the studio require such facilities as those for vision, sound and lighting with their controls for quality production.

5.2.1 General Requirements:

Apart from small news and announcement studios where there is little elaborate lighting requirement and camera movement, the larger ones require complex provisions for lighting, camera and microphones' movements, acoustic treatment of interior surfaces and a large assembly of studio equipment operators and performers. A corresponding size of sceneny props and stage sets for the required visual background is also involved. Because of the movement of cameras and adjustment of lightings, the studio requires plenty of space and a considerable height above to accommodate the lighting suspension and yet leaves enough room height for the studio operations. Figure 5.3.

Large television studios has to be kept fully used for any programme desired and also has to be considerably less reverberant or made "very dead". The reasons for this is stated in the following.

(a) For many programme types in the television studio, the microphones aree usually kept out of vision which means it has to be at some distance from the speaker (performers). This picks up any reverberant sound around the studio. Therefore the studio has to be treated to have a lower reverberation time.

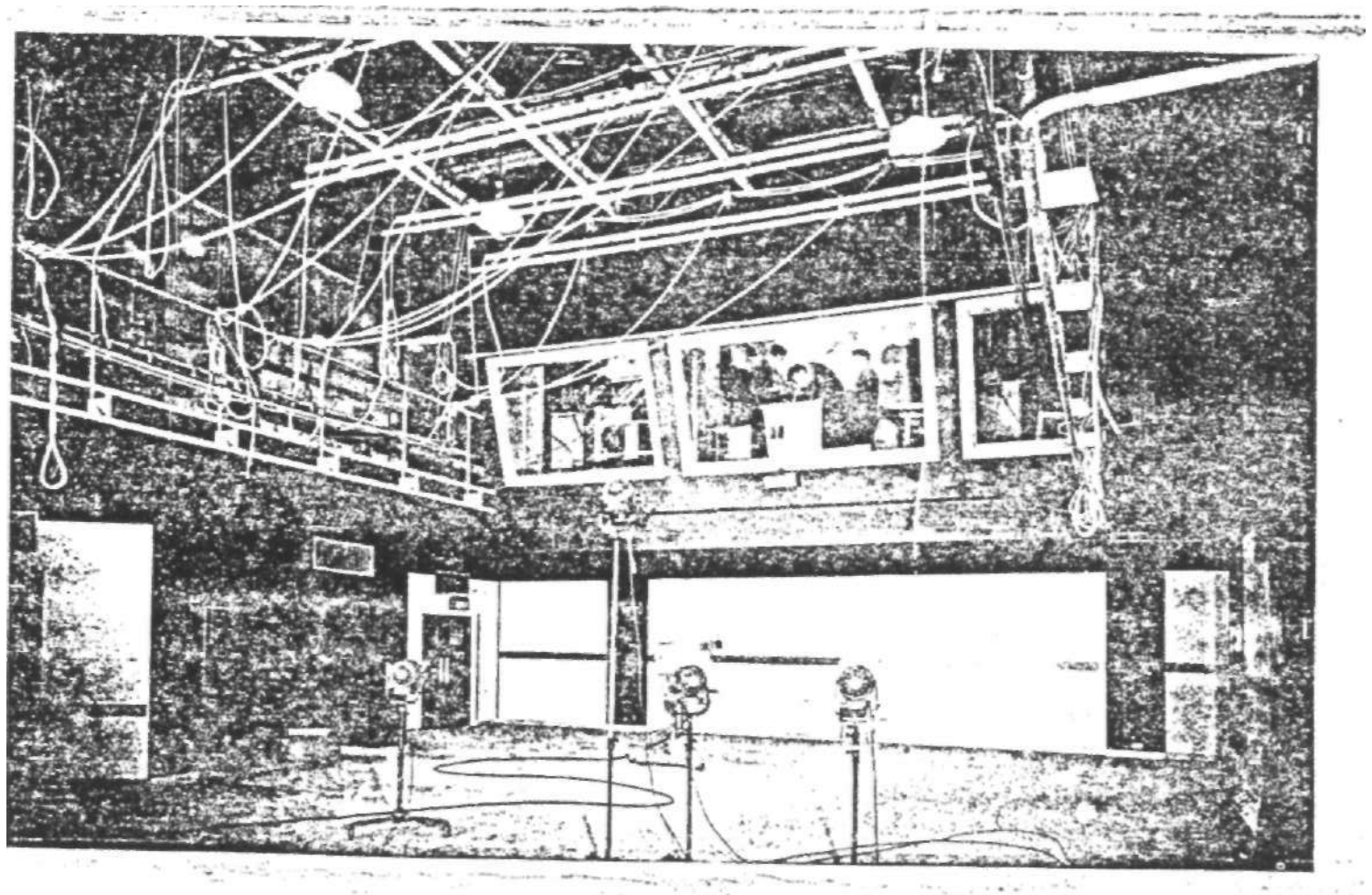


FIG. 5.3 - TELEVISION STUDIO SHOWING THE CONTROL ROOMS

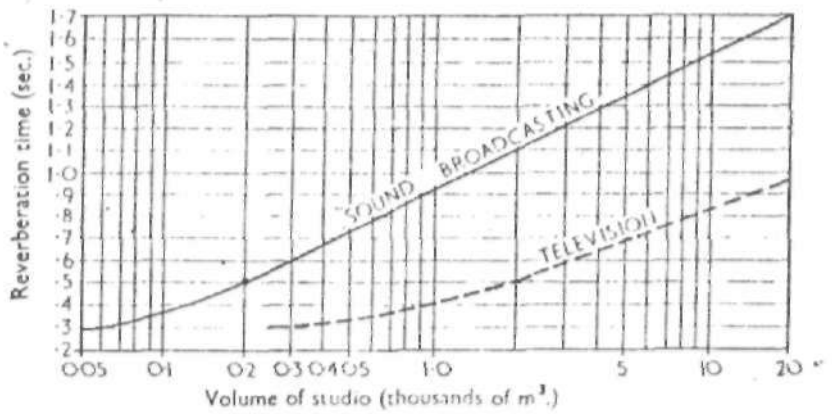
SOURCE: P.H. PARKINS AND H.R. HUMPHERYS (1969)

(b) Large studios used for drame production has to be able to give an acoustic effect similar to that of a small living room. Therefore the studio have to be adequately treated enough to take care of the reverberant sounds that could occur due to the size of the studio.

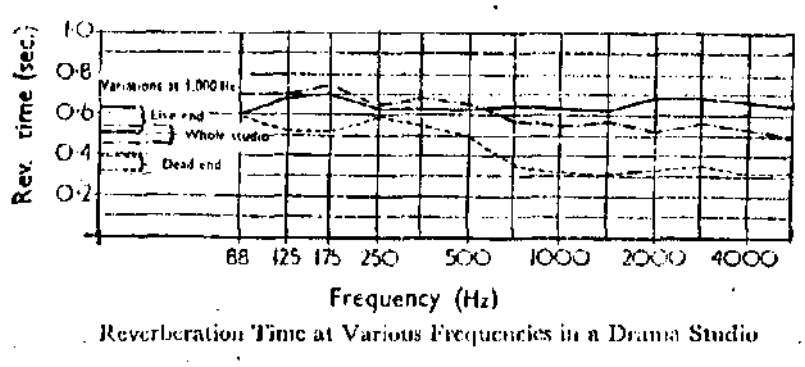
(c) The various activities such as camera movement, lights and sceneny constitute an amount of background noise most of which originate at some distance, from the microphones but are enhanced by the studio reverberation.

5.2.2 Acoustic Requirements:

The reverberation times for television studios are usually adjusted to values depending on the volume of the room. Figure 5.4. For frequencies of operation between 100HZ and 4000HZ, the reverberation time should be kept constant as much as possible. Due to the verbal communication links between studio floor technical operators (Camera, microphone boom, etc) over intercommunicating telephone or radio telephone with the producer and director, the studio must be provided with acoustically dead conditions to ensure that the communication sounds are kept to an extent not to interfere with studio programme production. Therefore, an average reverberation time of not more than 0.25 seconds has been found suitable for the studio.



. Recommended Reverberation Time for Broadcast and Television Studios



Reverberation Time at Various Frequencies in a Drama Studio

FIG. 5.4 - GRAPHS SHOWING THE EFFECT OF STUDIO CHARACTERISTICS ON REVERBERATION TIME

SOURCE: P.H. PARKINS AND H.R. HUMPHREYS (1969)

5.3 Technical Parameters:

This section explains some technical parameters considered in the design of a television studio complex. This include the basic shape of the studio, its height and other considerations.

5.3.1 Shape of Studio:

The shape of the studio affects the technical and the acoustic function and efficiency of the studio. It is therefore necessary to have function in mind when choosing a convenient shap for the studio. There are several types of shapes which could be adopted in the design of studios. Each has their advantages and disadvantages. The variety of shapes include:-

(a) The square

(b) The circular

(c) The rectangular

(d) The trapezoidal

(e) The polygonal

The rectangular shape for the studio has been found to be particularly suitable. This is because this type of shape allows for easy co-ordination of the studio activities. This is partly because the trapezoidal shape is particularly suited for large audience theatres and that the television studio which is required for variety of programmes which most often exclude audience participation (e.g. major dramas) requires a definite shape which could be manipulated to give desired arrangement.

5.3.2 Size of Studio:

The size of a studio depends on the kind of use it is put. It is only logical that news, talks and interviews studio be small in size. It is also important to note that it is economical to have studios for specialized uses for reasons explained earlier in this chapter. Therefore, a drama studio is expected to be large due to the requirement of space for stage construction and sceneny for different scenes of a drama production and the working space for the television studio operators of cameras, microphone hooms and so on.

Small studio size particularly for news and announcements can be of about 6m x 6m floor area for convenient movement of cameras background and fixed lighting position. Large studios can be placed in size of about 25m x 15m floor area for maximum manouvreability of camera dollies, microphone booms, props and lighting equipments.

5.3.3 Height of Studio:

The height of studio is also related to its floor area, size and use. For example, asmall studio such as the one described in section 5.3.2 above requires a height just above normal room height, above 4m. This is because such small studio does not require high angle shot. The lightings can also be fixed directly above or on opposite walls to the stage set.

Larger studios however have more flexible height requirement. This is illustrated in the table below.

Table 2 - Studio height requirement.

Heights	Remarks
5.40m	Absolute minimum with some disadvantage
6.60m	Prefered
7.50m	Desired
10.50m	For studios designed to permit high angle shot

Generally, large studios are required to have at least 8m high working height just below the ceiling grid for lighting purposes and sceneny props.

6.5.3 Floors:

The floor specification depends on the influence of noise and vibration asting on it. For example a floor which is liable to vibrate and cause noise which originate from other parts of the building structure are often controlled by isolating the floor completely from the structural floor. Figure 6.1. This is referred to as discontinuous construction. The floor is suspended on vibration isolating mountings. Other specifications for floors include those floors to be designed for good impact and sound isolation. These floors include soft floor finish, concrete construction; medium-hard floor finish, concrete construction and a variation of others. But timber floor construction are usually avoided in the television studio. Figure 6.4

6.4 Conclusion:

The conclusions arrived at in this study of the control of noise for television studio shall be lined out as follows:-

(a) Land use and site selection: Land use zonning is important in the location of a television studio centre. It is important that the studios are located away from noise producing areas such as industrial areas, airports, rail stations or routes and commercial areas. Thus the site for a television studio could be located within residential area and public official buildings where noise generation is very low. The site should not also be located close to major highways. Figure 6.5

(b) Site zonning: The zonning of the site is necessary in separating noisy areas from the quiet studio areas. The zonning should also consider the use of building blocks where noise is tolerable to shield or screen the quiet area from noise. The use of landscape as buffer zones could also be introduced.

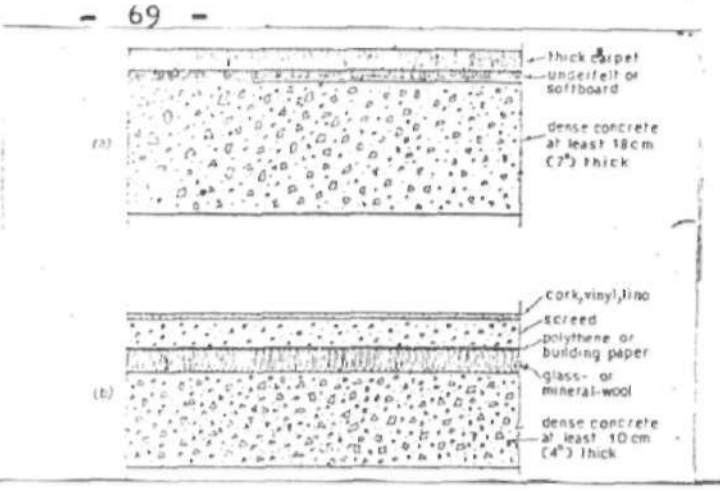


FIG. 6.4 - FLOORS DESIGNED FOR GOOD IMPACT SOUND ISOLATION:
a. Soft floor finish, concrete construction,
b. Medium-hard floor finish, concrete construction.

SOURCE: ANITA LAWRENCE (1970)

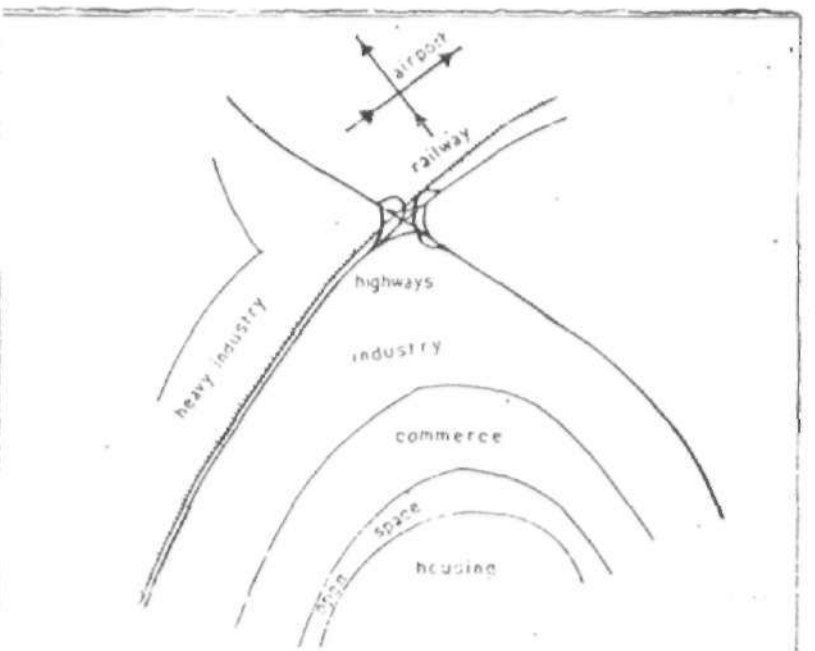


FIG. 6.5 - TOWN PLANNING AND COMMUNITY NOISE: PLACEMENT OF NOISE TOLERANT ZONES BETWEEN MAJOR NOISE SOURCES AND RESIDENTIAL AREAS

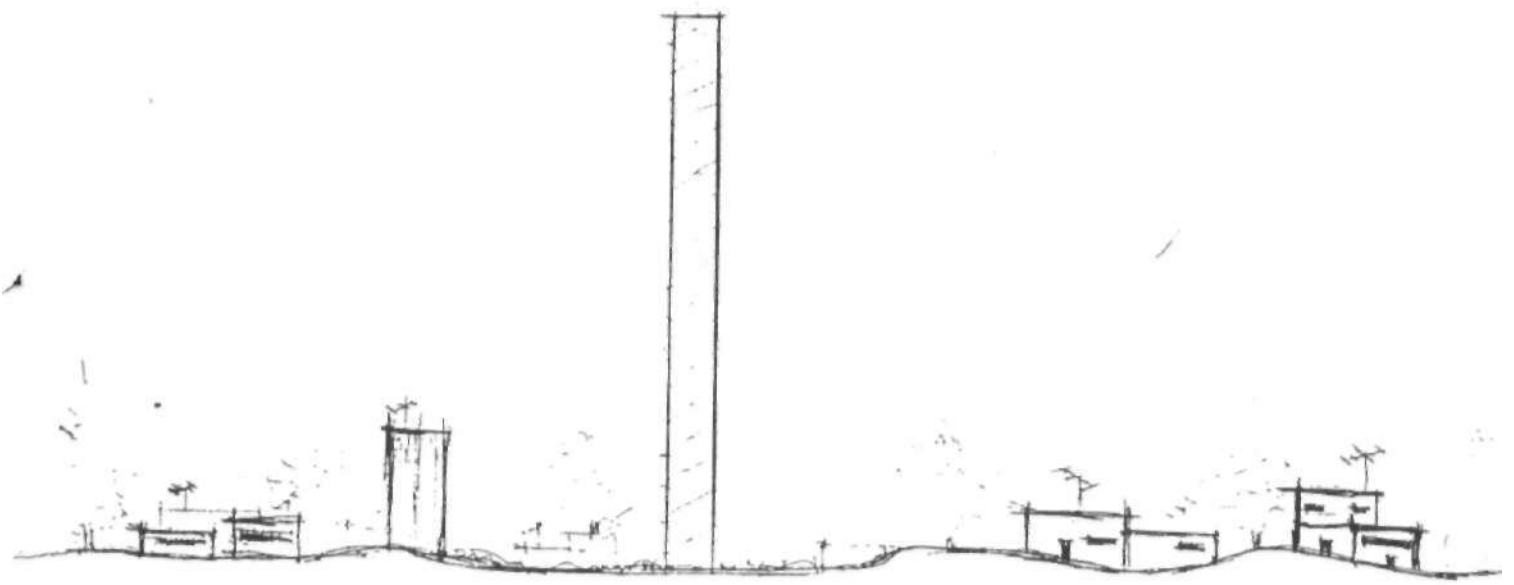
SOURCE: ANITA LAWRENCE (1970)

(c) Planning: The planning should take care of those areas which are noisy but need to be close to the studio.

(d) Construction: Construction, particularly of the external walls and roof of the studio should ensure maximum sound insulation and isolation against noise. External wall surfaces of studio should be sound reflective.

(e) Other Requirements: These include the adequate treatment of the internal surfaces with suitable sound absorbers. Others include the details of doors, windows, floors and ceiling to ensure effective noise control in the television studio.

Chapter : 7



CHAPTER SEVEN

7.0 THE DESIGN PROPOSAL

7.1 The Site:

In choosing a suitable site for the television station, some criteria for selecting the site are stated below.

7.1.1 Selection Criteria:

The following criteria were considered in the selection of a suitable site for the television station. These criteria aims primarily to control noise in the television studio. These are:-

(a) Television studios are preferably required to be sited away from heavy noise sources. Therefore they are usually located in quiet areas of a town. Heavy commercial and industrial areas are generally avoided to check the incidence of noise.

(b) Accessibility to the site is also important. For effective usage, a site must be easily accessible from parts of the town, that is,to be located where the people can easily reach it.

(c) Topography of land is used as an advantage for television transmission. This is because the television transmitter mast is often required to be located on a relatively higher topography than the area where it is servicing. Thus this would reduce the obstruction of the television signals which travels in a straight line by any solid mast along its path such as mountains, high rise buildings, etc. Therefore, it is generally required that the television transmitter mast be high enough for its waves to reach far and wide without any obstruction.

7.1.2 Location:

The site is located on the near outskirt of Kaduna town in the Unguwan Munchi area of the town. The site is accessible from Dawaki road extention into the Unguwan Rimi area through Kinshasha road where the National Youth Service Corps office building is located. Therefore it is accessible directly from the Unguwan Rimi area, and also close enough to the city centre. Figure 7.1

7.1.3 Environmental Analysis:

Presently, the site is vacant but only used to plant crops during the rainy season. The buildings within the vicivity of the site are official and used for different administrative purposes. These include the office buildings for the National Provident Fund (NPF). The Federal Department of Agricultural and rural development and the Federal Agricultural Co-ordinating Unit (F.A.C.U). The site is also bounded on the northern part by the Nigerian Television Authority (NTA), post production centre and the National Institute of Public Information. To the western and southern part of the site is the distant valley of the river Kaduna. These are shown in the plates and figure 7.2. The climatic and vegetation conditions have already been discussed in chapter six.

7.1.4 Site Concept/Zonning:

The concept of the site is primarily based on the issue of noise control and physical conditions of the site such as road accessibility and physical developments around the site. The site is bounded on two sides by roads. These are potential sources of noise which affects the concept/zonning of the site. Generally,



FIG. 7.1 - SITE LOCATION MAP



THE SITE SHOWING THE NORTHERN BOUNDARY IN THE BACKGROUND (N.T.A. POST PRODUCTION CENTRE)



THE SITE SHOWING THE NATIONAL PROVIDENT FUND (NPF) BUILDING IN THE BACKGROUND.

FIG. 7.2 - SITE SHOWING THE NORTHERN BOUNDARY AND NPT BUILDING

the studios, which are areas where the incidence of noise is required to be minimal, are located away from the roads and also using other building blocks which do not require straingent noise control to further shield the studio away from the noisy areas. Thus, the noisy areas and those of the traffic access are located close to these roads for easy access and away from the studios Figure 7.3.

7.2 Design Evolution:

This involves the gradual process towards the main television station design.

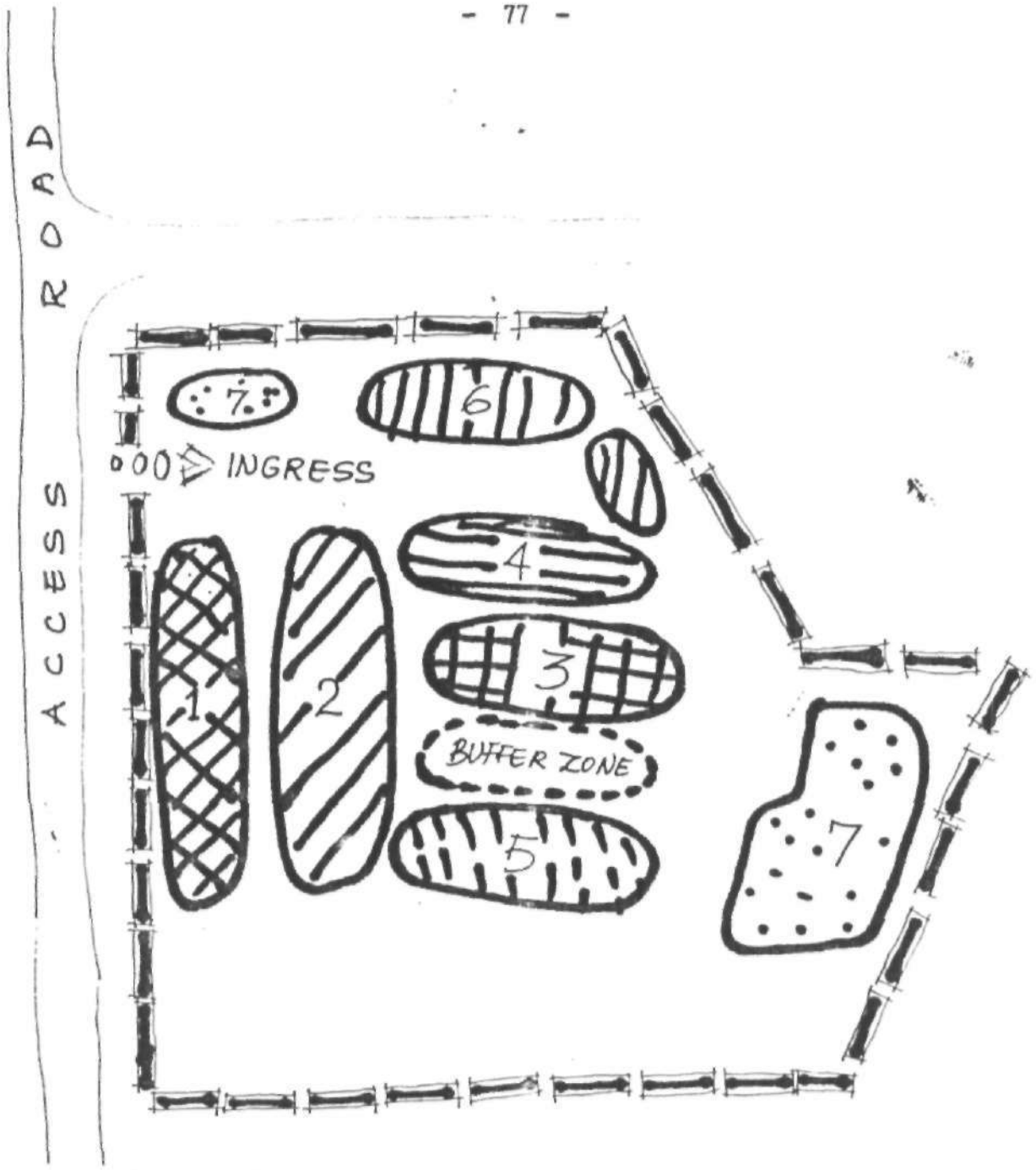
7.2.1 Design Concept:

The concept adopted in the design is as a result of a combination of the consideration mentioned below. These are:-

(a) The studio being the main core of the television station complex must be easily accessed from all other parts of the complex.

(b) The consideration for the control of noise as it affects the studio and other recording areas. This stems off directly from the zonning concept.

The studio block is surrounded by the studio supporting facilities, that is the kitchen, the sceneny workshop, electronic repairs workshop and the graphic studio on one side and the main office block on another side adjacent to the workshops. The main office block houses the programmes department and the administrative section. The studio is also bounded on another side by the block housing the rehearsal hall and the news department. The fourth side is bounded by the open area which accommodates the transmitter mast.



1. PARKING ZONE
2. MAIN BUILDING BLOCK
3. STUDIO BLOCK
4. STUDIO SUPPORT FACILITIES
5. REHEARSAL AND NEWS AREA
6. SERVICE AREA
7. OUT-DOOR ACTIVITIES

FIG. 7.3 - SITE CONCEPT/ZONNING

7.3 Schedule of Accommodation:

The schedule of accommodation for the television station is tabulated under the section listed below:-

Accommodation	Area	Unit	Total Area
A. Main Entrance and Artistes Facilities:-			
Reception and waiting area	108m^2	1	108m^2
Artiste Lounge	144m^2	1	144m^2
Artiste Registry	24m^2	1	24m^2
Games room	30m^2	1	30m^2
Constume store	72m^2	1	72m^2
Plays and Drama books Store	72m^2	1	72m^2
Shelve and reading space	121m^2	1	121m^2
Translator room	30m^2	1	30m^2
Script writer	30m^2	1	30m^2
Rehearsal hall	432m^2	1	432m^2
Dressing room	12m^2	6	72m^2
B. Administration:-			
General Manager	60m^2	1	60m^2
Secretary	36m^2	1	36m^2
Boardroom	110m^2	1	110m^2
Admin. Officer	18m^2	1	18m^2
Staff Registry	15m^2	1	15m^2
Commercial Officer	18m^2	1	18m^2

Accommodation	Area	Unit	Total Area
Control of Commercial	18m^2	1	18m^2
Public Relation Officer	18m^2	1	18m^2
General office	35m^2	1	35m^2
Typing pool	42m^2	1	42m^2
Coffee room	12m^2	1	12m^2
Principal Accountant	20m^2	1	20m^2
Controller of Finance	20m^2	1	20m^2
Principal Auditor	20m^2	1	20m^2
Accountant	20m^2	1	20m^2
Accounts and Audits hall	132m^2	1	132m^2
C. Programmes:			
Manager of Programmes	25m^2	1	25m^2
Control of Programmes	25m^2	1	25m^2
Control of Production Services	30m^2	1	30m^2
Head of Studio Operations	20m^2	1	20m^2
Floor Manager	20m^2	1	20m^2
Chief Camera man	20m^2	1	20m^2
Studio Engineer	25m^2	1	25m^2
Cassette library	18m^2	1	18m^2
Chief Director	25m^2	1	25m^2
Reference library	25m^2	1	25m^2
Librarian	18m^2	1	18m^2
Manager News and Current Affairs	25m^2	1	25m^2
News presenter	18m^2	1	18m^2

Accommodation	Area	Unit	Total Area
Preview room	$16m^2$	2	$32m^2$
News reporter	$29m^2$	1	$29m^2$
Advertisement booking	$25m^2$	1	$25m^2$
D. News And Current Affairs:-			
Chief Editor	$54m^2$	1	$54m^2$
Secretary	$36m^2$	1	$36m^2$
Assistant Editor	$36m^2$	1	$36m^2$
Telephone/Radio room	$54m^2$	1	$54m^2$
News Hall	$378m^2$	1	$378m^2$
E. Studio And Support Facilities:-			
News/Current Affairs Studio	$121m^2$	1	$121m^2$
Drama/Interview studio	$529m^2$	1	$529m^2$
Variety programme studio	$667m^2$	1	$667m^2$
Production control room	$30m^3$	2	$60m^2$
Visual control room	$30m^2$	2	$60m^2$
Sound control room	$30m^2$	2	$60m^2$
Central apparatus room	$108m^2$	1	$108m^2$
Master control room	$72m^2$	1	$72m^2$
Video tape recording room	$36m^2$	2	$72m^2$
F. Outdoor Recording:-			
Seating space	$204m^2$	1	$204m^2$
Stage platform	$110m^2$	1	$110m^2$
Changing room, green room Toilet, store	$65m^2$	1	$65m^2$

Accommodation	Area	Unit	Total Area
G. Service And Technical area:			
Scenery workshop	216m^2	1	216m^2
Electronics repairs workshop	180m^2	1	180m^2
Graphics studio	72m^2	1	72m^2
Transmitter room	144m^2	1	144m^2
Ventilation plant room	60m^2	1	60m^2
Sattelite stand	81m^2	1	81m^2
Generator house	135m^2	1	135m^2
Switch room	18m^2	1	18m^2
Transport room	36m^2	1	36m^2
Mechanical workshop	36m^2	1	36m^2
Mechanical Garage	54m^2	1	54m^2
Station vehicles	72m^2	1	72m^2
Drivers and changing room	18m^2	1	18m^2
H. Workers Facilities:			
Kitchen	48m^2	1	48m^2
Store	36m^2	1	36m^2
Canteen	120m^2	1	120m^2
J. Other Facilities:			
Transmitter mast			
Parking spaces			
Staff parking	14m^2	20	280m^2
Visitor parking	14m^2	18	252m^2
Other parking	14m^2	8	112m^2
Service bay	1440m^2	1	1440m^2

7.4 Design Report:

The basic approach towards this thesis design is simplicity of form of the building. Therefore the use of planar grid is adopted in the design. The structural elements such as the columns are placed at 6m x 6m intervals of grid. The design report shall be divided into five parts. They include the following:

(a) The main building: This houses the programmes department, administrative department, artistes facilities and the canteen. The canteen is located on the ground floor on one wing of the main building. On the upper floor of the same wing is located the programmes department offices. The other wing of the main building consists of the artist facilities on the ground floor. These are the artistes lounge, registry, toilets, costume storage, drama and plays' books library with the controlling personnel. The reception and waiting hall separates the two wings mentioned above and serves as the main control into the station complex

(b) The Service Area: This include the workshops supporting the studios and the general service and maintainance facilities, such as the generator house, mechanical workshops, satellite stand and the accompanying maintainance offices, together with a service bay for the supply and evacuation of materials and instrument. The workshops supporting the studios include those for sceneny construction and for the repairs of electronic instruments used in the studio. Also included in the service area is the transmitter house and the ventilation plant room.

(c) Rehearsal And News Hall: This is located on the opposite wing of the workshops across the studio block. It houses the rehearsal hall on one side close to the artiste area and the news department on the other side.

(d) The studio Block: This block comprises of the three studios, the news and current affairs studio, the drama and interview studio and the variety programme studio together with their control units and supporting facilities such as the master control room and the central apparatus room. This block is located in the space enclosed by the three main parts described above and also adequately accessed from the different parts.

(e) Outdoor Recording: The outdoor recording includes the open air theatre recording and the outdoor drama recordings. The outdoor drama area is also located in close proximity to the studio and can be easily accessed from the studio technical areas. The open air theatre recording is located at the access area into the site, away from the studio in order to check the incidence of noise.

Other areas of the site include the parking spaces area and those allocated for the transmitter mast. The main parking space is located close to the only access entrance into the site just before the main building. The transmitter mast is located close to the service areas.

7.4.1 Planning:

The planning based on the design concept is in such a way that the studio is easily accessible from many parts of the complex and that there exist no friction in circulation from one part to the other, thus there is functional relationship between the functional spaces. The planning also set to achieve some measure of noise control as regards the studio. For example, the technical workshops which include those of the scenery construction and electronic equipment reapirs are required to be close to the studio. But these workshops are sources of unwanted sounds, therefore the design employs the technique of separation of the studio from these area and also introducing a functional space in between the two. These spaces include the scenery docks which are directly supplied by the scenery workshop through the corridor alley separating the two building blocks. Other spaces used in separation include those provided for stage crews and stair wall to link the control rooms and central apparatus room on the upper floors. Access from the studio to the spaces mentioned above is through sound lobbies.

The rehearsal hall and the news room from where noise also originate is separated from the studio by creating large courtyards thus putting distance between them. The planning however ensures easy linkage between the two areas

The reception and waiting areas which is centrally placed in the main building is made large enough to be able to accommodate large visitors to the complex. This space also provide a link to all the other parts of the station complex.

7.4.2 Construction Techniques:

The techniques of construction particularly for the studio aim at controlling the noise getting to the studio. These include:

(a) The use of windowless double walls around the studios. The news and current affairs studio is made to have triple walling particularly on the sides adjacent to the studios on both sides of the news studio.

(b) There is also the use of double leaf glass sheet for the observation windows from the control rooms in to the studios.

(c) For access into the studio space where noise is required to be minimal, double doors are provided which encloses a sound lobby.

7.4.3 Material Requirements:

The material requirement to be discussed here include those of the finishes for the studio interior walls and the interiors of the sound lobbies.

The studios shall have the ceilings and walls treated with sound absorbing materials. The material chosen are from the basic types of absorbers mentioned in chapter four. These are:-

(a) Panel absorbers

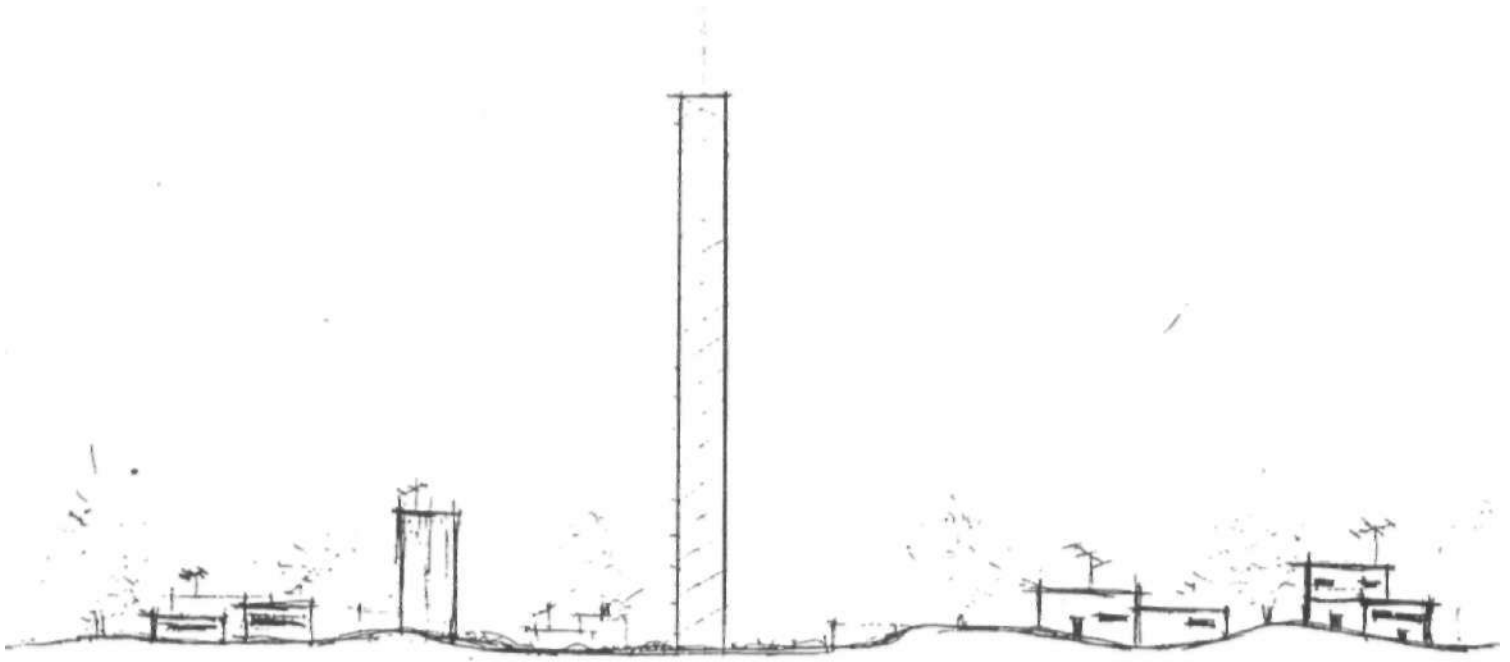
(b) Porous absorbers and

(c) Resonance absorbers.

The combination of these materials could be used to achieve the desired degree of absorption of sound of various frequency to completely eliminate the reverberation of sound in the studio.

Other surface treatment include those of the stairs particularly the stair wall adjacent to the news and current affairs studio. The steps are covered with resilient materials such as soft carpet to reduce the impact noise which could be transmitted from the stairs structure to the studio interior. Moreover, the construction of the studio walls are in such a way that the inner wall is independent of the outer wall, that is, there is no structural linkage between the two.

Chapter : 8



CHAPTER EIGHT

8.0 SUMMARY AND CONCLUSION

8.1 Summary:

In summarizing this write up; this thesis has introduced the desire of the people of Kaduna State and the government to acquire a state owned television particularly when the general consensus has it, according to some newspaper dailies, that the services of the only television station in the state is not adequate enough and that the establishment of an indigenous television station would create a forum for competitiveness and thereby improve the general service. This assertion forms part of the motivation for carrying out this particular thesis project.

In the course of the research, the development of television technology, its importance and the role it plays in transforming the society was studied. After this, steps were taken towards providing a television station by studying the techniques and activities involved in television production. The problems associated with television programme transmission was also studied. This involves the issue of noise as it affects the studio and a study was carried out to understand this problem and ways in which it could be tackled taking into consideration the functional relationship betwenn the different parts of the television station.

To further enhance the understanding of the working of the television station and understand the functional requirements, four cases of existing stations were looked into. Two of these stations are local ones found in the country while the other two are foreign.

Towards the final design, the state of affairs in Kaduna as regards the issue of an indigenous television station was documented. The physical conditions of the town was also documented. Furthermore, the choice of site was arrived at after looking into some c criteria for selecting a site particularly for a television station. These criteria are basically oriented towards the control of noise and other technical requirements.

With a suitable site, the design of the station was conceived also taking into consideration noise source within the television station and utilizing proper control methods through zonning, planning, constructional techniques and requirements, and materials requirement for the studio interior treatment.

8.2 Conclusion:

After the study of the control of noise as regards television studio, it is being concluded that for the effective control of noise for television studios, the following factors have to be considered. They are:-

1. Site location
2. Site xonning
3. General planning
4. Constructional techniques and requirement
5. Material requirement for interior treatment.

It is however understood that where the site is located in a relatively noisy area, the other factors takes precedence in controlling the incidence of noise.

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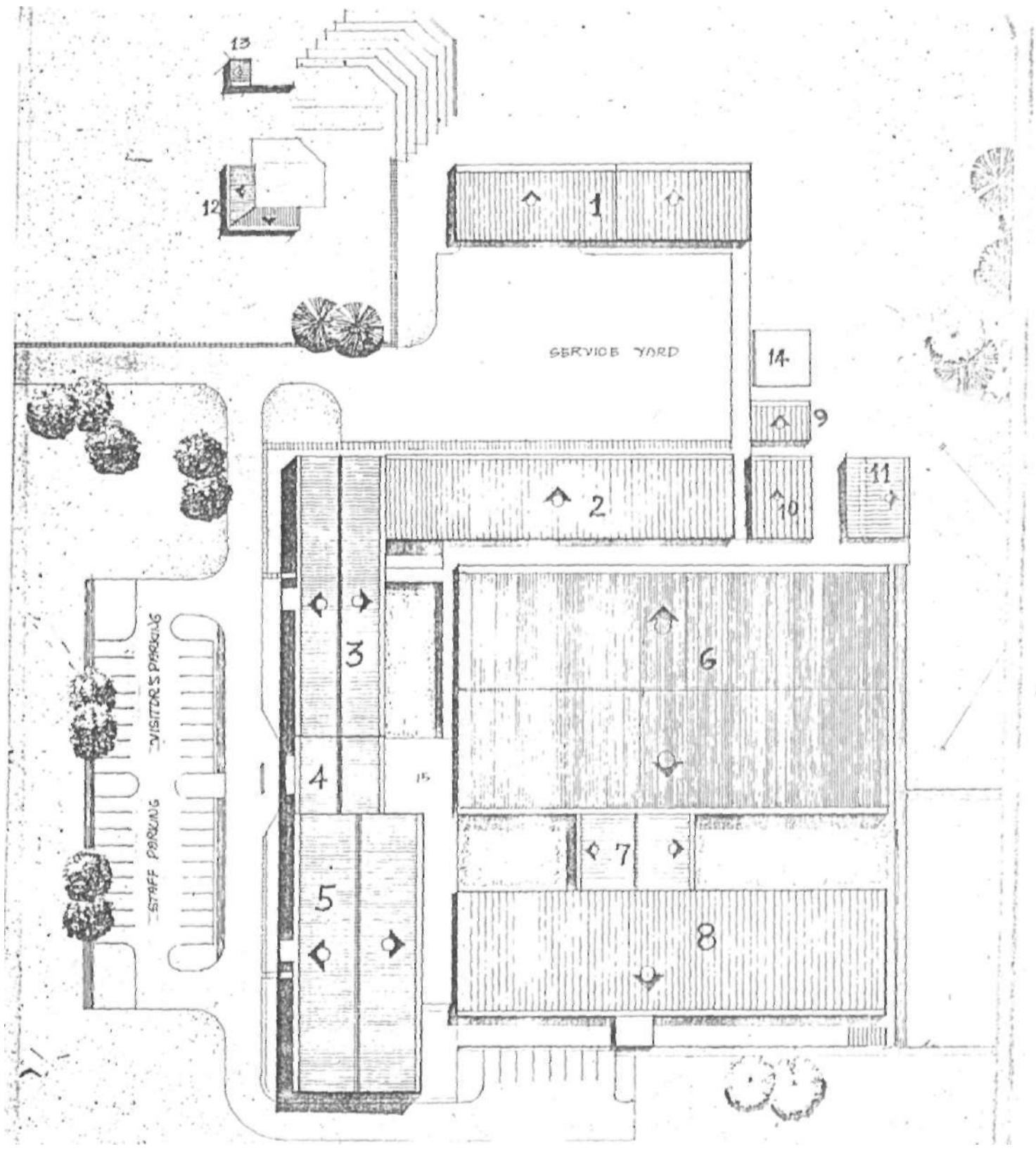
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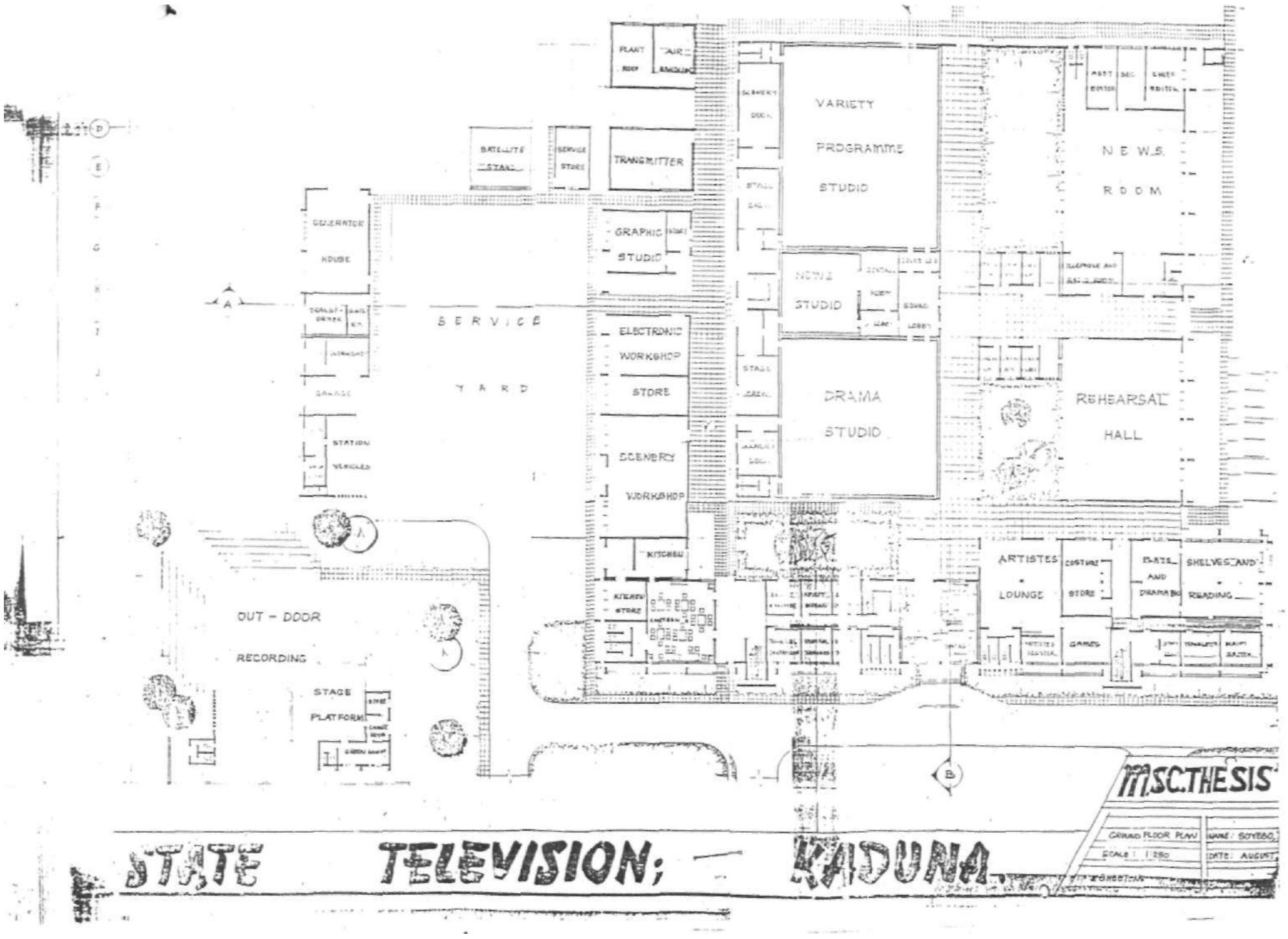
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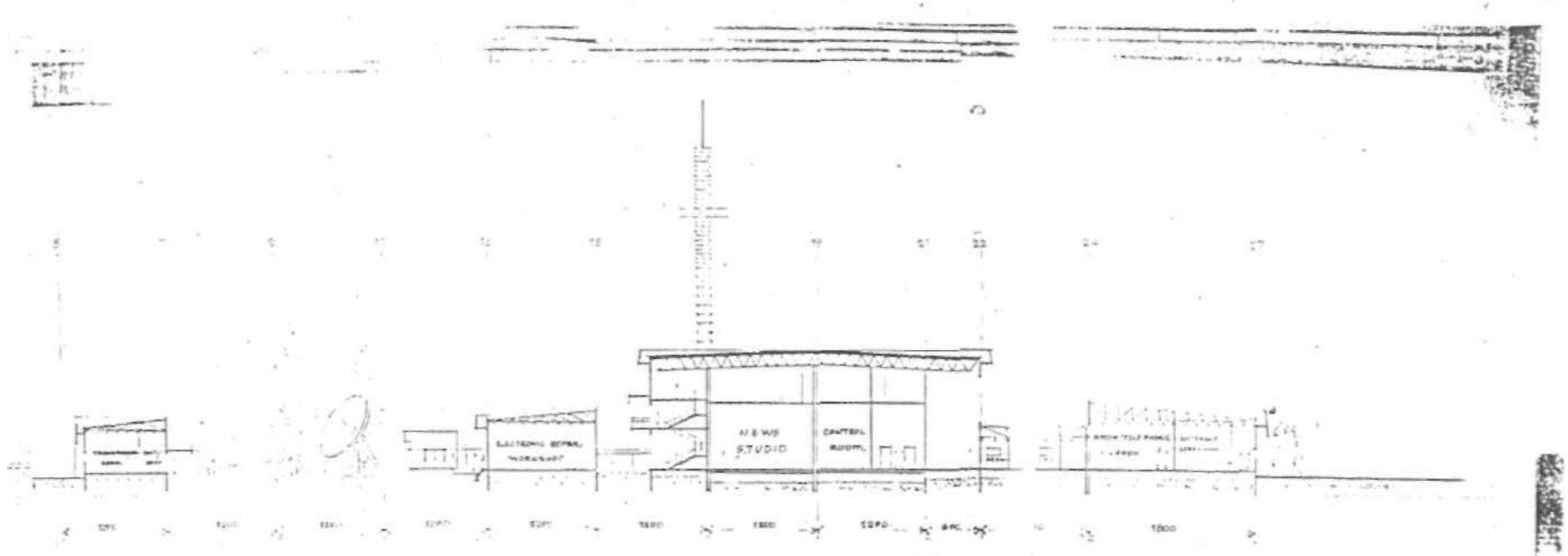
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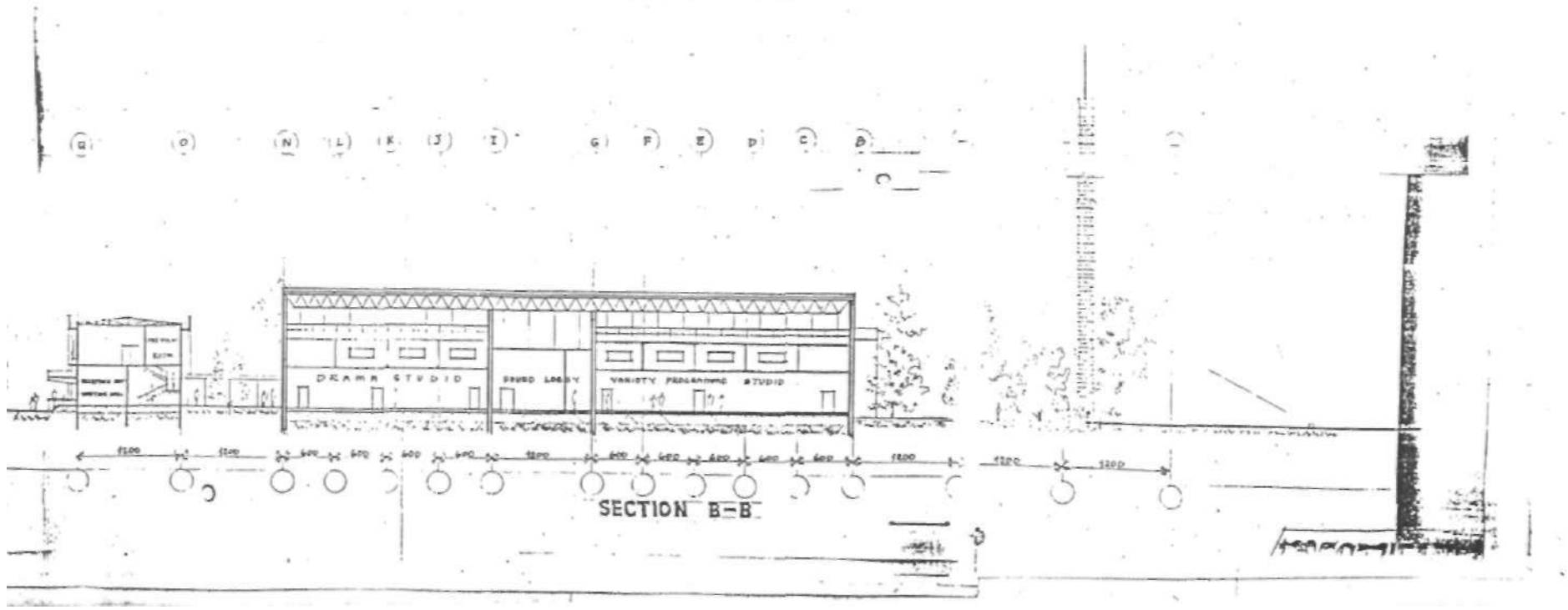
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SERVICE YARD
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STAFF PARKING
VISITOR'S PARKING

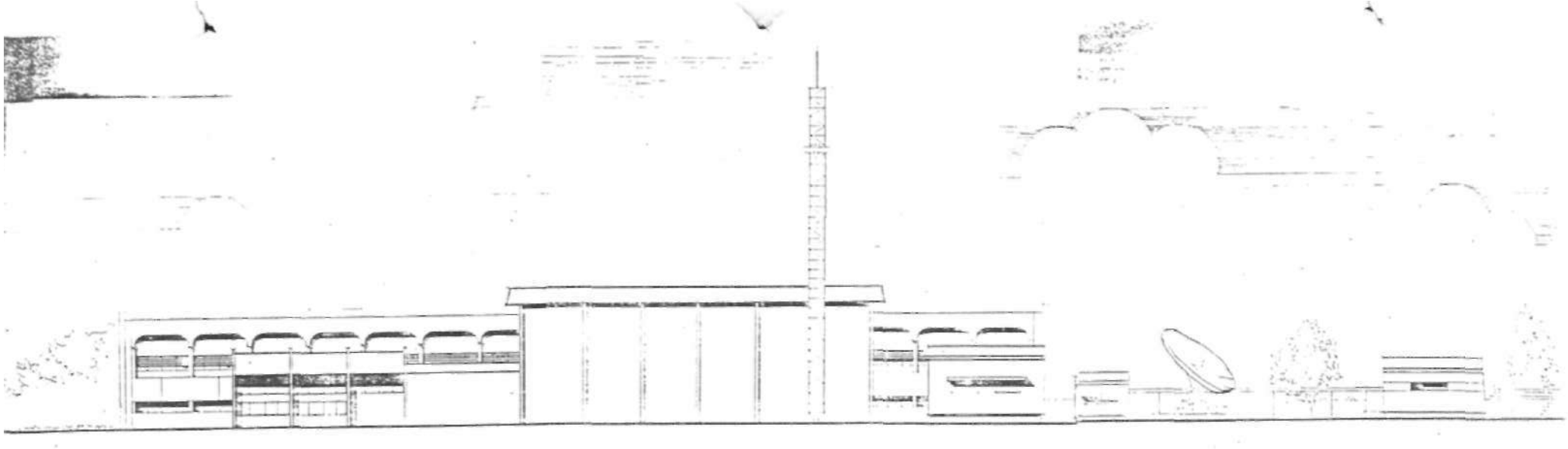

PLANT ROOM
AIR CONDITIONING
SATELLITE STATION
SERVICE STORE
TRANSMITTER
GENERATOR HOUSE
TOILET + DRESS
WORKSHOP
GARAGE
STATION VEHICLES
SERVICE YARD
GRAPHIC STUDIO
ELECTRONIC WORKSHOP
STORE
SCENERY WORKSHOP
KITCHEN
KITCHEN STORE
SCENERY DOCK
STAFF CAR
VARIETY PROGRAMME STUDIO
NEWS STUDIO
DRAMA STUDIO
NEWS ROOM
REHEARSAL HALL
ARTISTES LOUNGE
COSTUME STORE
PROPS AND DRAPERIES
SHELVES AND READING
GAMES
OUT - DOOR RECORDING
STAGE PLATFORM
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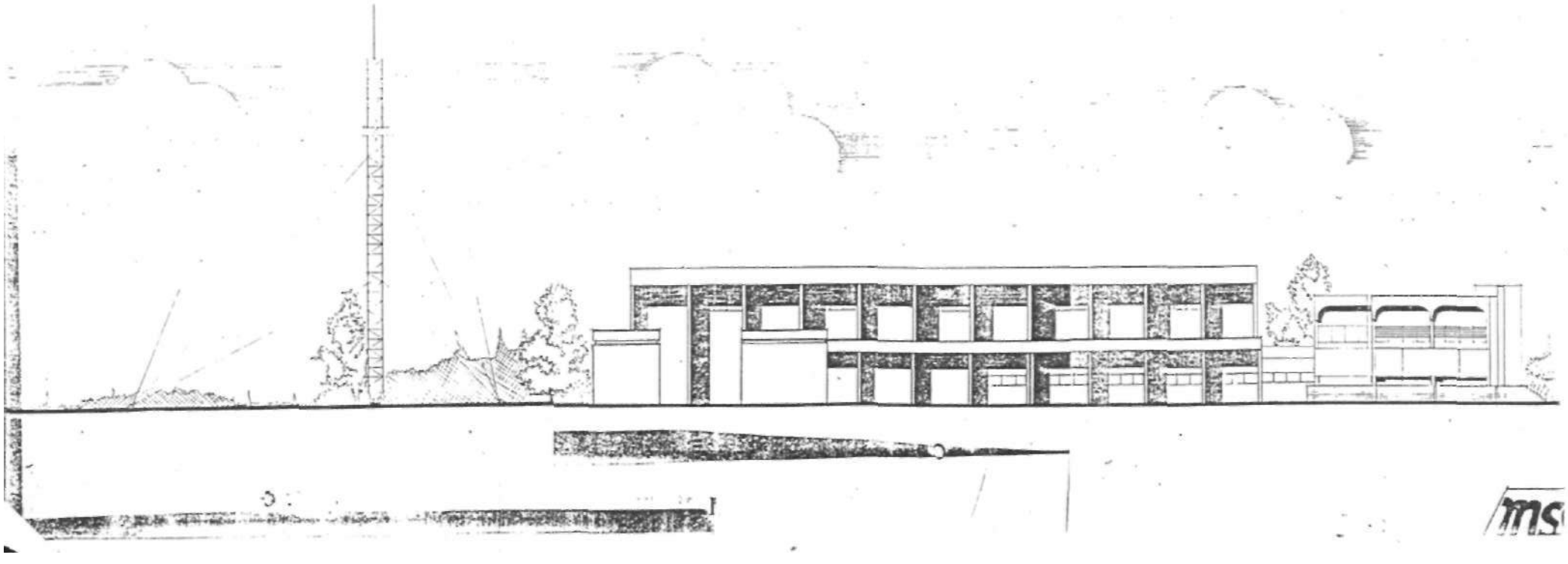
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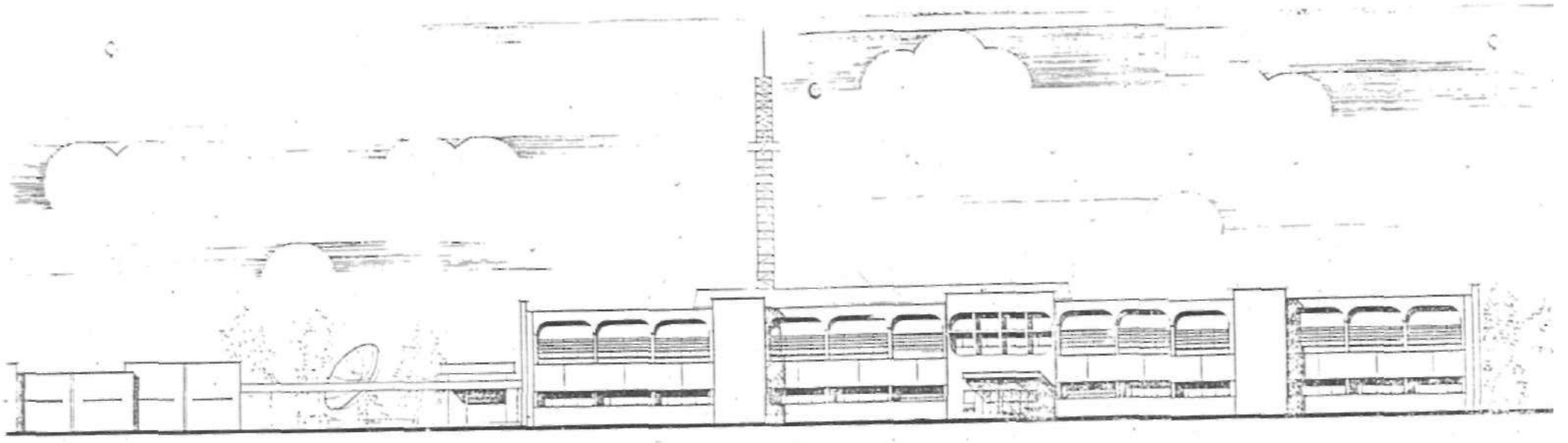


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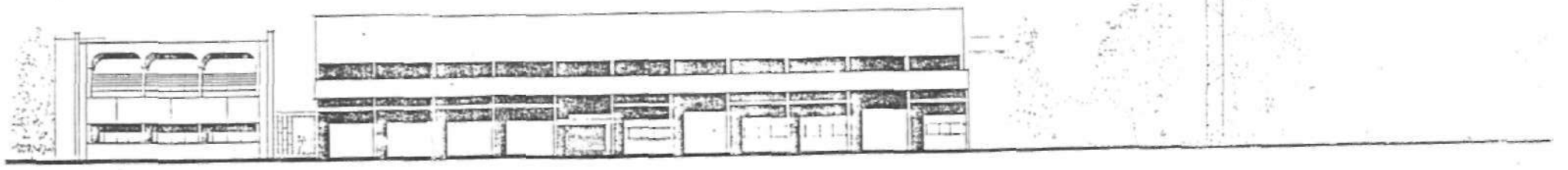


NORTH EAST ELEVATION





SOUTH WEST ELEVATION



SOUTH EAST ELEVATION

