PROPOSED
HAM CULTURAL CENTRE KWOI;
KADUNA STATE.

(A FOCUS ON ACOUSTICS)

BY

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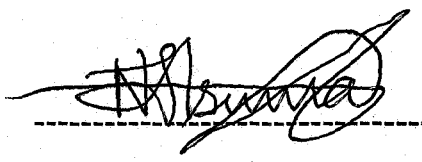
M.TECH/SET/2004/1201

A THESIS SUBMITTED TO THE POSTGRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTERS OF TECHNOLOGY (M.TECH) DEGREE IN ARCHITECTURE.

SEPTEMBER, 2008.

DECLARATION

I, **JEB ESAU** hereby declare that this M.Tech thesis is an original work based on research wholly carried out and done by me, and submitted to the Department of Architecture, Post Graduate Schools, Federal University of Technology, Minna. This thesis has not been submitted in part or in whole for the award of a degree or diploma in any other institution. All data gathered from published and unpublished works have been duly acknowledged.



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CERTIFICATION

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DEDICATION

This piece of work is dedicated to Almighty God for being with me throughout the years of my studies until this day and to all the members of Nyomo family for their love, support and understanding throughout the years of my study.

ACKNOWLEDGEMENT

My profound gratitude goes to Almighty God who granted me the grace to carry out this work. I am very grateful to the entire Nyomo's family, most especially my brother Mr. David J. Nyomo, for his moral and financial support.

My utmost appreciation goes to Prof. O. Solanke (Dean, School of Environmental), my supervisor who gave himself completely to guiding me through this work.

I will never forget people for all their support: Mr. Joseph Magaji of national council for Arts and Culture, Garki – Abuja, the staff of Kaduna Culture and Tourism Centre, Kaduna, Kaduna State, Mrs. Julie (Esau) S. Baka, a graduate of Federal Polytechnic, Nasarawa, Estate Department, and the staff of U.K. Bello Art Theatre, Minna , Niger S tate. Finally to my friends, I thank you all for being my friends. You are special and dear to me. Thank you for your support.

ABSTACT

It has been generally accepted that culture is a people's scheme of life and is very vital in any human society. It is people's way of life to be learned and shared for without this, there will be no human society. The level of sophistication of culture differs from one society to the other. In tropical Africa, one of the most highly developed and well-known culture is the NOK Culture. Infact, that is obvious, because it is one of the cultures that have attracted much attention owing to its credibility to the physical environment and its tradition of origin. The impacts of western techniques on our culture have resulted in some fundamental changes in our life style. Cultural components and their importance to human kind cannot be over emphasized, as the evident of main use of cultural components dares back to pre-history. This project has and efficient and reliable form of understanding of the relevance of culture components. The introduction deals with general idea of the cultural centre, the second chapter has a on the cultural life of the people of Ham. The knowledge of this trend is indispensable in order to create a harmonious environment for both the Ham culture and its environ. The next chapter discussed existing case studies, data collection and site analysis. All the necessary requirement s, standards and design consideration, services are then considered. This project provides and efficient and cost effective design of a cultural centre.

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DEFINITION OF TERMS

Culture:- Culture is the pattern of behavior acquired by man through social learning. The culture of a people is the people's entire way of life. Culture includes economic, technological and scientific methods of dealing with the physical environment, rules for regulating political and social life and Language as well as moral values, religious believes and practices. 1

Vestibules :- An entrance hall of a large building. 14

Auditorium :- A large building or room in which public meetings, concerts etc, are held. 15

Stage :- This is a raised area usually in a theatre where dancers, actors perform. 15

Sightlines :- Line of sight. 15

Rise R:- Difference in height between adjacent seating plat forms floor sloop. 15

Arrival Point Of Site (APS): - Intersection of highest sightline at focal plane positioned 50 above stage plat form. 15

Distance:- Horizontal distance from eye of seated spectator to APS. 15

Acoustics:- This is the study of he production, transmission, reception and effects of sound waves, whose frequencies do not fall within the audibly range. 18

Acoustics control :- This is the arrangement of shape and surface, by reflection or absorption of sound, noise insulation, artificial amplification and distribution of sound. 18

Frequency of sound:- The frequency of sound waves is simply the number of complete vibrations occurring per unit of time (second) Musicians refer to this as itch and this basic or rate of repetition of the vibration defines its character. 19

Wavelength of sound :- This is the distance within which the complete cycle of disturbance takes place. 19

Magnitude of Sound :- This is the intensity or magnitude of acoustic energy contained in the room how it is propagated throughout typical building spaces, and how it is influenced by various building materials and construction system. 19

Reflection of Sound:- This is the action that shows the sending back of sound. 27

Early Reflection:-This are those reflection that bounce off nearly objects. 28

Late Reflection: - Late reflections are those reflections that are distinguishable as separate acoustic events from the direct signal. Late reflection ruins listening to speech. 28

Reverberation:- This is the persistence of sound in a room after source has stopped. 28

Amphi Theatre :- This is a circular unroof building with tiers of seats surrounding Central. 35

CHAPTER ONE

1.0 INTRODUCTION

1.1 PREAMBLE

Culture is the pattern of behavior acquired by man through social learning. The culture of a people is the people's entire way of life. Culture includes economic, technological and scientific methods of dealing with the physical environment, rules for regulating political and social life and Language as well as moral values, religious believes and practices. Collins build English language dictionary defined culture as "a particular society or civilization especially one considered in relation to its ideas, its arts or way of life." The term culture has two principal usages. Firstly, it can be used to refer to the product of high civilization such as literature, Arts and philosophy, secondly it is used by anthropologists to describe the distinctive characteristic of human history and existence which involves creating ideas, costume and material objects, all of which tend to accumulate and to provide a complex adaptation to the natural environment. For the purpose of this project, the second usage of culture, which relate culture with ideology, social organization and technology will be adopted.

A cultural centre is a place in which all the elements and for parameters defining culture are found to flourish, respond adequately to the intellectual, practical and emotional demands of the people. In line with this project it shall be aimed at facilitating a periodic return to the people's origin through the preservation of the cultural heritage and values. Promotions and propagation in the centre shall be of paramount importance.

1.2 STATEMENT OF PROBLEM

The Tuk Ham (Ham Day) cultural festival is celebrated by the Ham people to commemorate the rich ancient culture of the Ham people. The uniqueness of festival celebration in Ham Chiefdom – Jaba local Government of Kaduna State can be said to be stimulating and inspiring. The festival celebration takes place annually every Easter Saturday of each year. These annually events are cultural festivals, which serve as a means of preserving the people culture heritage. During this occasion, the ham people displayed their cultural dances, arts and crafts. This occasion is to bring all the Ham people together both young and old. This sequence of Ham festival starts with Gala night i.e. the celebration and appointment of the Miss Ham (Tir Ham) beauty pageant on the Good Friday night of each Easter every year. This is then followed by a courtesy match-passed by various wards or cultural dancers on Saturday morning and followed with different cultural dances, symposium and end with cultural dancers throughout the day.

During most of the events, people have suffered unnecessary embarrassment and disappointment due to excessive sun heat, dust, lack of seats, lack of car parks and rainfall. All these result to dissatisfaction on the festival day and the festival is demoralized because of these problems which need to be addressed.

1.3 AIM AND OBJECTIVES OF THE STUDY

1.3.1 AIM OF THE STUDY

The primary aim of this project is to propose a cultural centre that will serve as a place for preservation and propagation of the people's cultural heritage and values as well as entertainment, development and unity of the people both locally and globally giving them distinguished of characters as manifested in the centre.

1.3.2 THE OBJECTIVE OF THE STUDY

The objective of the study includes:

i. To provide a befitting design of a cultural centre for the Ham people.

ii. To provide well articulated study for acquisition, documentation, preservation and propagation of the cultural values heritage and monument, and to revive and create awareness in the mine of their People with a view to disseminating their cultural heritage and identity and identity.

ii. To create job opportunity for the people of Ham and outsiders and to fish out young talents and promote their creativity.

1.4 SCOPE AND LIMITATION

1.4.1 THE SCOPE OF THE PROJECT

The scope of the project comprises of the following:-

i. The administrative block.

ii. Restaurant and shops.

iii. Theatre art hall.

iv. Conference hall.

v. Cinema hall.

vi. Musical concert.

vii. Museum and gallery.

1.4.2 LMITATION OF THE STUDY.

Some of the section in the cultural centres visited were not allowed to go

because those in charge of such sections were not available. In addition, there were no light in some of the theatres halls, which makes photography difficult.

1.5 JUSTIFICATION

Cultural activities in Nigeria range from the highest standard of professional performance to enthusiastic support and participation of the populace. Private organizations and individual had advocated on various occasions on the need for a unified language - WAZOBIA, which will serve as one of the major tools in our quest for promoting and preserving our culture heritage.

Apart from Nigeria leading role as Africa's centre for drama, music and dance, culture festival usually attract a lot of interest and generates revenue. It is also a well-known fact that many Nigerians are playwrights, composers, filmmakers, sculptors, artist an actors. Thus cultural centre generally helps in fishing out young talents.

1.6 IMPORTANCE OF STUDY :

The importance of a cultural centres in our society today cannot be overemphasis as cultural centres plays a vital role in our society both in terms of revenue generation, entertainment and also in fishing out young talents as well, Acoustic control in cultural centres therefore has to be put into consideration as one of the must important factors in the course of this study, The acoustic environment in and around building is influence numerous interrelated and interdependent factors associated with building, planning, design and construction processes. From the very outset of any building development, the selection of the site, the location of the buildings on the site and even the arrangement of spaces within the building can, and often does influence the extent of the acoustic problems involved. The materials and finished spaces will also determined how sound will be perceived in that space as well as how they will be transmitted to adjacent spaces, "We know that it does not do any good

to have a pallet of acoustic material and not knowing what to do with it, you have to take the stuff of the pallet and put in the right places. Depending on where you place the products in the room, the sound of the room changes", (Noxon, 2004). The architect, the engineer, the building technologist and the constructor all play a part in the control of the acoustic environment. With some fundamental understanding of the basis acoustic principles, how, materials and structures control sound, many problems can be avoided altogether or at least, involved in the early stages of the project at a greatly reduced cost. "corrective" measures after the fact are inevitably most costly after the building is finished and occupied, if indeed a solution is possible at all.

CHAPTER TWO

2.0. LITERATURE REVIEW

2.1 THE CONCEPT OF CULTURE

Sociologists, anthropologists and social psychologists hold different views and definitions of culture. In whichever way it is viewed or defined, when analyzed, maintained the element of its original definition of an advanced development of the human powers.

Zygnut Bahman (1973) viewed culture as "the conscious and prolonged effort to attain the ideal, to bring to actual like process in line with the highest potential of human vocation". According to and Donald and Stuart (1975) culture was defined by Taylor (1875) as that complex whole which includes knowledge, belief, arts, moral, laws, customs and other habits capabilities acquired by members of the society". Malinowski (1943) also defined culture as an organic unity with four dimensions of social organisation, belief, material outfit and language". This definition views society as that which is in constant change, yet harmonious. The change is of transformation of the existing order, in terms of social, spiritual and material civilization from one type into another. It can be within the community (evolution) or through contact of different cultures, (diffusion). Culture therefore is transmitted down to the younger generations through socialization as their behavior internalize.

2.1.1 CULTURE AREAS

A culture area is what human geographers call uniform or homogeneous region. Similar concepts and ideas are found in anthropology and history actual term "civilization". From historical analysis, the idea if not the term reaches back into antiquity and typically involves three components:

i. A socially and culturally identifiable population.

ii. A natural environment, and;

iii. Some postulated, implied or identified interaction between the two.

The idea that each ethnic nation constitutes a definite culture area varies with time . During the medieval periods, infrequent contacts among different ethnic groups constitute to a considerable extent distinct culturеareas. Such culture areas commonly shared the same historical background, language, religion, philosophy, political, institutions and economy in addition to other things. The increase diffusion of ideas and contacts among the inhabitants of ethnic nations, boundaries of cultural areas were being gradually removed, this included mode of dressing. Presently there exists an admixture of styles of dress used by inhabitants of different culture areas. In Nigeria situation, these styles could be from the Hausa's, Igbo, Yoruba, Nupe, Jaba or other culture areas. A person could change from one ethnic style to another;

This has been because of agents of modernization such as religion, education and technology, culture helps us to understand an individual, a social group or an entire society. It is possession that can be acquired, manipulated, transformed, shaped and framed. It can also be left attended, raw and of course growing wild. The mind being the medium through which the wilderness of nature is forced to fit human needs.

2.2 COMPONENTS OF CULTURE

Culture has three components; ideology, technology and social organization. Ideology is of ideas, beliefs and values shared by the society, i.e. human groupings; while technology involves skills and material items for the satisfaction of food, clothing and shelter requirements of the people, Social organization is the network of rules, roles and relationships that create

a patterned ways of life within the environment.

2.3 NIGERIA'S CULTURAL PROFILE

Nigeria as a nation belongs to the Negro culture. Which had literature as our history was mostly compare to the younger generations orally. This made it easy for the Europeans to influence and alter our culture through addition, elimination, substitution of traits and complexes that led to a hybridized culture. It is said that pre-colonial Nigeria engaged herself in activities that boosted her culture and prolonged its lifespan. Little wonder that the Portuguese were astonished by the splendor of the arts of Benin Kingdom when they came in 1494.

In the African continent, Nigeria is mostly seen to be in the forefront of cultural revival in Africa. An impressive National theater was built in 1977 to host the festival of arts and culture "FESTAC: 77". Which is yet another role Nigeria is playing in cultural revival. States government are also giving full encouragement and banking for establishment and running of cultural contrast with special grants from federal government. The degree of response has also been varied and versatile when compared to other people in African countries. These positive responses depended on various

reasons as follows:

i. Reluctant response

ii Partial response

iii Enthusiastic responses

2.3.1 PROMOTING CULTURE IN NIGERIA

Cultural activities in Nigeria range from the highest standard of professional performance to enthusiastic support and participation of the populace. Private organizations and individual had advocated on various occasions on the need for a unified language - WAZOBIA, which will serve as one of the major tools in our quest for promoting and preserving our culture heritage.

Apart from Nigeria leading role as Africa's centre for drama, music and dance, culture festival usually attract a lot of interest and generates revenue. It is also a well-known fact that many Nigerians are playwrights, composers, filmmakers, sculptors, artist an actors.

2.3.2 THE STATES COUNCIL FOR ARTS AND CULTURE

The States Councils for Art and Culture were established by Edict No. 14 of 1977. The States Councils are the main channels for Federal Government's aid to performing and visual arts. The aim is to develop and improve the knowledge understanding and practice of the performing and visual arts. They are easily accessible to the public, advice and co-operate with government department, local authorities and other government and private organisation in quest to foster and preserve their cultural heritage.

Financial assistance and advice to organisations could be obtained from these State Councils ranging from dances and drama to festival of arts and culture of people and small touring theatres and experimental groups. Forms of professional creative writing and choreographers, composers, art works, exhibitions and tours of dances and drama groups, through a variety of schemes receive assistance. Forms are also provided for some specialist courses in arts, crafts and culture.

2.3.3 PROBLEM EVOLUTION

The move to build cultural Centres in all the states arose from the need for such Centres to be used for several culture activities, in which the transmission, revival and preservation of culture will be carried out safely and conveniently. The arts and cultural festivals (especially the annual cultural festivals) were organised by various traditional/socio-cultural organisations in different parts of the country with government support. Through these annual cultural events, various artists as well as dancers have gained national and international recognition. At the local level, talents and resources abound and there is an increasing number of people with vested interest in all forms of cultural activities. Pottery, weaving, woodwork have been prominent art of the past and present generation. Government policies aimed at assisting in the promotion and development of forming and visual arts in Nigeria includes the maintenances and collecting of literary materials, encouraging and supporting private organisations and individuals with necessary funds and sponsorships.

The management and administration of cultural activities in the responsibility of the ministry of information and culture which deals with external and domestic policies and issues concerning culture, copyright, research, planning,

maintenance and preservation of cultural heritage for proper implementation of cultural activities, it was zone into the follow

i. National Council for Arts and Culture (NAAC)

Centres for Black African Arts and Civilization (CBAAC)

iii. National Commission for Museum and Monument (NCMM)

iii. National Commission for Museum and Monument (NCMM)

iv. National Theatres Management Board (NTMB).

Interest and enthusiasm has been shown for arts and cultural festivals, which take place annually. Prominent among such festival is the National festival for arts and culture (NAFEST) which serves as the National fair for the display of the Nation's creativity here done in open spaces; such as stadia, polo grounds etc. In these cases, the stage takes the larger proportion of the arena and the audience forming an arena. Unlike the traditional theatrical form, the audience cannot just participate in the festival. Those open spaces were found to be inadequate and thereby the more the need to build cultural centre as an architectural edifice by each state government. At the national level, the national Arts theatre was built and was the avenue of the 2nd World Blank Arts Festival (Ogun,1985).

2.3.4 FUNCTIONS OF A CULTURAL CENTRE

The primary function of a cultural centre to any conl1nunity is the rendering of services such as social, education and exhibiting of cultural inheritance. It is reveals to the visitors, human activity in his natural, cultural and social environment.

2.3.4.1 SOCIAL ROLES

The social roles are reflected by the ways of people's life. This includes their daily

activities, clothing, social interactions, and social status. According to Kusimo (1989), "it serves as a mirror through which the various interests of a learned society most especially in countries of Europe where it serves as a store houses frequently visited by tourists. It also serves as a cultural monument to the glory of a town. It is the place where the present, the past are established as regards arts, natural history, theatre arts and others are marked out for the public as a heritage in recognition of their importance to cultural continuity.

Cultural centres, through their social functions encourage the artists to be self-employed by creating avenue for the.ir works to be exhibited and sold. In a cultural centre, values like morals, religions, cultural inheritance and aesthetics are exemplified for the visitors and researcher as a reminding factor of the forgotten values and ideas

2.3.4.2 EDUCATIONAL ROLE

Through cultural Centres educational role, new ideas and values could be imparted into people especially the- users. This is because plays (dealing with morals) series of seminars, lectures and symposia in close cooperation with educational and cultural institution can be organized within the centre and these are forms of education. It might not be valued, foreigners that come to this country yearly especially the tourists learnt a lot of our culture women tourist are at least educated and fascinate with our indigenous women's way of dressing likewise their male counter parts.

Since the cultural centre is a research centre that encourages nearly all aspects of culture to be exposed, therefore in no small way of serving a great function as an educational centre. The advent of audio-visual methods makes presentation of programmes on films more interesting and understandable place where the present, the past are established as regards arts, natural history, theatre arts and others are marked out for the public as a heritage in recognition of their importance to cultural continuity.

Cultural centres, through their social functions encourage the artists to be self- employed by creating avenue for the.ir works to be exhibited and sold. In a cultural centre, values like morals, religions, cultural inheritance and aesthetics are exemplified for the visitors and researcher as a reminding factor of the forgotten values and ideas .

2.4 THEATRES: Theatres may be divided into three:

a. Reception, Entrance, booking hall, foyer, clocks et

b. Auditorium

C . Stage, main stage wings, back of stage, scenery, stores, workshops, dressing room, rehearsal room.

2.4.1 COMMUNITY THEATRES

The community theatres usually contain 500 to 1,000 seats and serves amateurs, semi-professionals and visiting professional groups. A proper selected site offers.

1. Accessibility by normal means of transportation.

ii. Sufficient separation from bus and street car lines, principal highway and other sources of noise.

111. Parking space.

IV. Convenience to complementary community activities, education on recreational in order to reduce inter-building traffic and minimize supervision and maintenance.

2.4.2 ARRANGEMENT

"Front" or public areas and "back stage" or work groups-constitute the two major element the spectators should find everything to their needs accessible from the foyer once they have presented tickets such as toilets, cloak rooms, drinking fountains, lounges and smoking areas.

2.4.3 GENERAL REQUIREMENTS

Requirements for community theatres although derived from the same sources and from the same historical background as those of commercial or "professional ". Two general typed of creative community activity, directly related to the theatre required special provision.

a. Audience Activity.

Audience and actors may intem1ingle and for this reason, a combination of lounge and rehearsal room is needed also space for lounging, talking smoking are all necessary.

b. Production Activities

These consist of preparation for and presentation of the performance in a community theatres, sceneries, costumes and properties are mostly prepared within the plant.

2.5 TYPE OF SPACE

(a) **Vestibule:** The lighting in the vestibule adjoining the street should quite brilliant. Telephone booth should be provided accessible to the vestibule. Other features like bookshops should be added to attract the public to the theatre. The space requirement for vestibule and gallery is 1,200sgft.

(b) **Ticket Office:** This should be if possible both commands the entrance to the main lobby and the same time permit the line to form without obstructing. The space requirement for ticket off ice is50sgft minimum and maximum 80sgft.

(c) **Lounge:** The space requirement is 750sgft minimum size equal to acting rehearsal room area of stage, mechanical ventilation needed.

(d) **Administration:** 350sgft minimum areas varies, outside light and air needed.

(e) **Men's and Female's Toilets:** Space require is 250sgft (consult code: either mechanical ventilation or outside light and air needed).

(f) **Auditorium:** This should be about 5,600sgft minimum for conventional seating and may increase to 7,000-8,000sgft.

(g) **Radio studio:** Space required is 300sgft and can be reduced to 200sgft. No outside light, mechanical ventilation needed.

(h) **Control Room:** Space required is 70sqft mini mechanical ventilation needed.

(I) **Director's Room:** Space require is 20sqft Minimum but adequate.

(j) **Projection Room:** space requires. Is 200sqft ample, includes toilets and lavatories.

(k) **STAGE:** Space 'require is 3500sqft ample: 2800sqft minimum, 3500 usually average for encircling stage. Top of stage, house louvered (consult code) If conventional stage minimum height floor to guide is 70sqf1.

(1) **Stage Workshop:** Is 1,500sqf1. It is sometimes reduced to 1.200sqft outside light if clear glass, preferably from north' if obscure orientation unimportant.

2.5.1 SIGHT LINES

- For typical seated spectators:
- Eye height: 1120 + -100
- Tread of seating tier (row spacing) T: 80-1150.
- Head clearance C:
- G = 65: minimum clearance/row, assuming spectators will see, between. Heads

row in front (every-other-row-vision)

- C2 = 130 allows average specter see over head average specter in front (every-row-vision):- .

Rise R: Difference in height between adjacent seating plat forms floor sloop.

Arrival Point Of Site (APS): Intersection of highest sightline at focal plane positioned 50 above stage plat form.

Distance: Horizontal distance from eye of seated spectator to APS.

Dl = distance from eye of first row to APS.

Dn = distance from eye of given row n to APS.

Elevation: vertical height of eye seated spectator above focal plane.

El = vertical height of eye of first row above Focal plane

En = vertical height of eye of given row n above focal plane.

El = 0 establishes maximum stage height allowable; i.e. 1060.

Constant Rise Floor Slope: Sight lines from rows parallel; APS determined by intersection of sight lines from last or highest row at focal

plane; R=T/Dl [E+(N-l)+C]

where, *D1=T/R-C[EI +(N-I)C)*

EI=DI/T(R-C) -C(N-I)

N=Number of rows in seat bank

SIGHT LINES

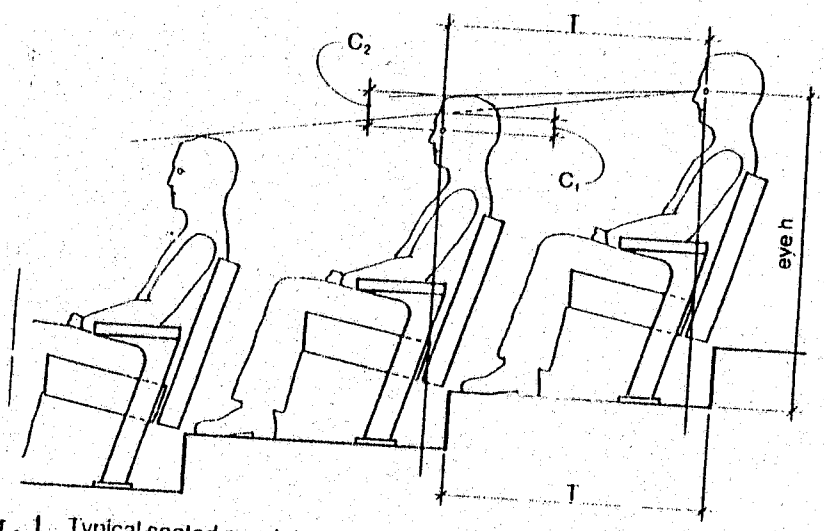


Fig. 1 Typical seated spectator

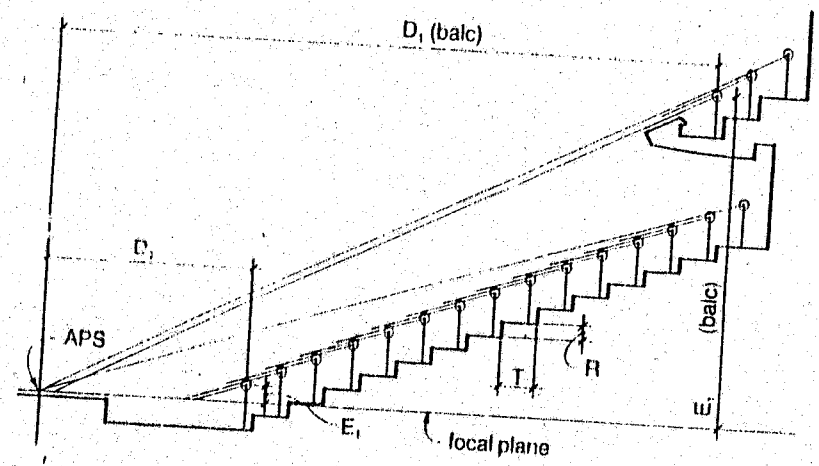


Fig 2a Constant rise floor slopes

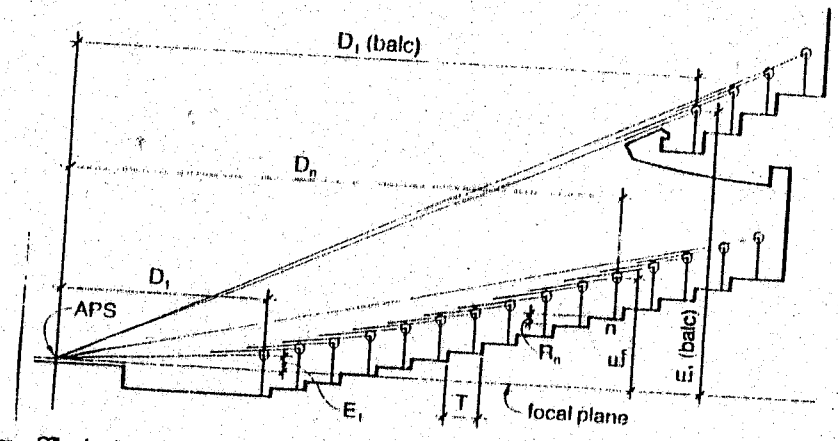


Fig 2b Iscidomal floor slopes

SOURCE:TIME SAVER STANDARD FOR BUILDING TYPE.

Iscidomal Floor Slope: exponential shape of floor sloop result, from single focal point or APS; Iscidomal floor slope makes more efficient use of given total rise. En=D[El/Dl +C(l/Dl +l/D2 =1/D3 + +l/D(n -l)]Rn = En-EN-I.

Fig. 1a and 1b-c shows the sight lines for typical seated spectator.

2.6 THE ROLE OF ACOUSTICS IN CULTURAL CENTRE

The acoustic environment in and around building is influence numerous interrelated and interdependent factors associated with building, planning, design and construction processes. From the very outset of any building development, the selection of the site, the location of the buildings on the site and even the arrangement of spaces within the building can, and often does influence the extent of the acoustic problems . involved. The materials and finished spaces will also determined how sound will be perceived in that space as well as how they will be transmitted to adjacent spaces, "We know that it does not do any good to have a pallet of acoustic material and not knowing what to do with it, you have to take the stuff of the pallet and put in the right places. Depending on where you place the products in the room, the sound of the room changes", (Noxon, 2004). The architect, the engineer, the building technologist and the constructor all play a part in the control of the acoustic environment. With some fundamental understanding of the basis acoustic principles, how, materials and structures control sound, many problems can be avoided altogether or at least, involved in the early stages of the project at a greatly reduced cost. "corrective" measures after the fact are inevitably most costly after the building is finished and occupied, if indeed a solution is possible at all.

2.6.1 DEFINITION OF ACOUSTIC

There are many branches of acoustics which is basically; the study of The production, transmission, reception and effects of sound waves, whose frequencies do not fall within the audibly range. Acoustics control in architecture is obtained by arrangement of shape and surface, by reflection or absorption of sound, noise insulation, artificial amplification and distribution of sound source (Colliers Encyclopedia Vol. 1).

2.6.2 THE BASIC CONCEPTS OF SOUND

In the first century B.C. the Roman architect, Vitruvius, explained in De-Architectural that sound moves in an endless number of circular rounds, like the innumerably increasing circular waves, which appear when a stone is thrown into smooth water but will in the case of water, the circle moves horizontally on a plane surface, the sound not only proceeds horizontally, but also ascends vertically by regular stages". While vietorious did not understand everything about sound, he was correct about this point. In general, sound radiates in waves in all directions from a point source until it encounter obstacles like walls or ceiling.

Every building acoustics consideration can be thought of as a system of source, paths and receivers of sound. Even the most complex problem can brake down into one or more sources to be studied along with the paths over which the sound will be transmitted to eventual receptors of the sound. Whether the source is one we want to hear or undesired source of the system.

For the most part, effective control of the acoustic environment in building involves at least a conceptual understanding of the basic properties of sound, which is

passed onto the adjacent molecules and thus travels outward from the source. The pressure disturbance created by the turning fork cannot see by the naked eye but the ultimately the sound waves may reach human ear, causing the eardrum to vibrate and through a marvelously complex mechanisms finally produce the sensation of hearing in the persons brain. There are two measurable quantities of interest, the frequency of the sound and its magnitude.

2.6.3 FREQUENCY OF SOUND

The frequency of sound waves is simply the number of complete vibrations occurring per unit of time (second) Musicians refer to this as pitch and this basic or rate of repetition of the vibration defines its character. The unit of measure is Hertz (Hz) (in some textbook it may be cycles per second or CPS).

2.6.4 WAVE LENGTH OF SOUND

Another fundamental of sound waves that is related to its frequency is wavelength. This is the distance within which the complete cycle of disturbance takes place. There is a basic relationship between velocity of sound in a medium (e.g. air, concrete, etc) and its frequency and wavelength

given by the expression: C=FA,

where; C=Velocity of sound, F= frequency, A,=wavelength.

2.6.5 THE MAGNITUDE OF SOUND

In addition to the character (i.e. frequency) of a sound also of concern is the intensity or magnitude of acoustic energy contained in the room how it is propagated throughout typical building spaces, and how it is influenced by various building materials and construction system. In addition, just as with the numerous other

isciplines involves in the overall building environment, etc. The solution to the acoustic problem requires no small measure of experienced judgment and just plain common sense. After all, people do not respond to just one aspect of environment, acoustic therefore is a significant part of that environment and its effective control will help produced good buildings." (Cavanaugh 1981).

2.6.6 FUNDAMENTALS OF SOUND AND ITS CONTROL

Sound has certain measurable physical attributes that must be understood, at least in conceptual way; in order to understand the basic procedures for controlling sound in building. Sound is generated whenever there is disturbance of an elastic medium. Once this disturbance occurs, whether it is in air by vibrating string of a musical instrument or in solid floor surface by the impact of a dropped object; the sound wave will be propagated away from the source at some rate depending on the elastic properties of the medium. Sound perhaps in its simplest form1, can be generated by striking a turning fork (as illustrated in figure 3.0) set into vibration on the air molecules immediately adjacent to the vibrating surface are alternatively compressed and rarified as the surface goes through each complete to and fro movement. This cyclical disturbance (compression and rarefaction of air molecules) is the sound wave. Sound intensity is proportional to the amplitude of the pressure disturbance above or below the undisturbed atmospheric pressure. The pressure fluctuations may be minutes, yet a healthy ear has the ability to detect very faint sound pressure differences down to as-little as 0.000000003psi. A measurement unit called the decibel is used for sound level measurements. The unit is abbreviated dB.

2.6.7 THE DECIBEL SCALE

The decibel scale starts at 0 for some chosen reference value and compares others intensity or pressure level measurements, a reference value of 0.00002 new tons/square metre ($2x10^{-5}N/m^2$) is chosen. This is threshold of hearing for a typical health young person. The sound pressure level in decibel for any sound for which the pressure is known is given by the following expressions '

LP=2010gP/PO *where;*

LP=the sound pressure in decibels (dB).

P=the measured sound pressure of concerned.

PO=the reference sound pressure usually taken to $2xlO^{-5}$ N/m^2.

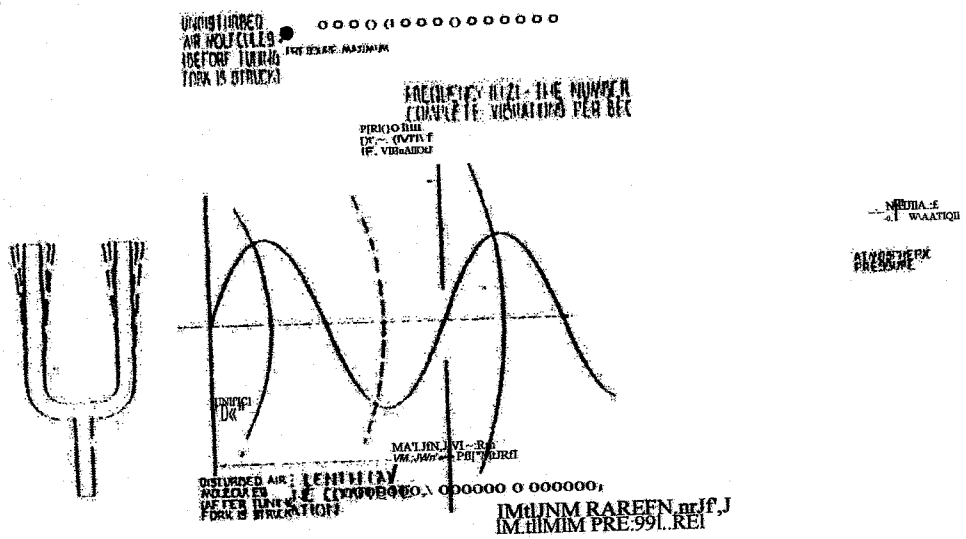


FIGURE 2.1 A simple tuning fork illustrates how a pure tone develops.

SOURCE: WILLIAM CAVANAUGH (1981).

Sound out doors

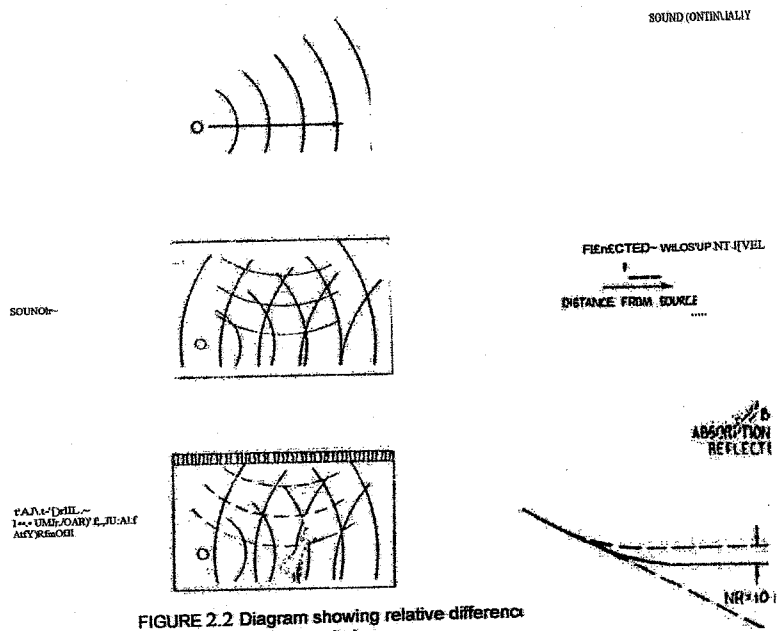


FIGURE 2.2 Diagram showing relative difference source outdoors versus indoors,

SOURCE: WILLIAM CAVANAUGH (1981).

2.6.8 OUTDOOR VERSUS INDOOR SOUND

In order to fully appreciate how sound behaves inside room and is transmitted from space to space within buildings, it is helpful to consider first how sound behaves outdoors, with a simple non-directive source, the sound intensity will fall off as the distance from the source is increased. The sound waves moving outward from the source spread its energy over and over increasing spherical area for simple point sources, the fall up rate is 6dB per doubling distance from the source. If the source is a long narrow radiator of sound, (as might be with the steady stream of road traffic). The rate of fall up will be reduced to 3dB per doubling. In any case, typical sources outdoors generally fall within the 6 or 3dB per doubling of distance fall of rate.

In doors on the order hand, sound intensity will fall off with distance only very near the source (in most building situations, with several feet). As floor, walls, and ceiling of the room begins to overwhelm the direct sound component that continuous to be omitted from the source. The sound level remain generally constant throughout the room no matter how far away from the source a listener is located. Figure 3.1 is a diagram showing the relative differences with sound source··outdoor versus indoors

2.6.9 SOUND TRANSMISSION BETWEEN ROOMS

When greater reduction of sound than is possible by room sound absorbing treatment is required, full enclosure of the receiver by means of separate room may be necessary. Figure 2.3 illustrate schematically the simple case of sound transmission between adjacent enclosed rooms, In essence, a sound source will develop a reverberant sound filled in one room (The source sound) and its sound pressure will depend on the

total absorption provided by the source room boundary surfaces if the sound travels to the receiving room only via the common wall the transmitted common sound level will depends on the three factors.

i. The sound isolating properties of the wall (i.e. sound transmission loss).

ii. The total surface area of the common wall that radiates sound into adjacent receiving room

iii. The total sound absorption present in the receiving room. The reduction of sound between room is given by the expression:

$$L1\text{-}L2 = TL + \text{Log } A2/S$$

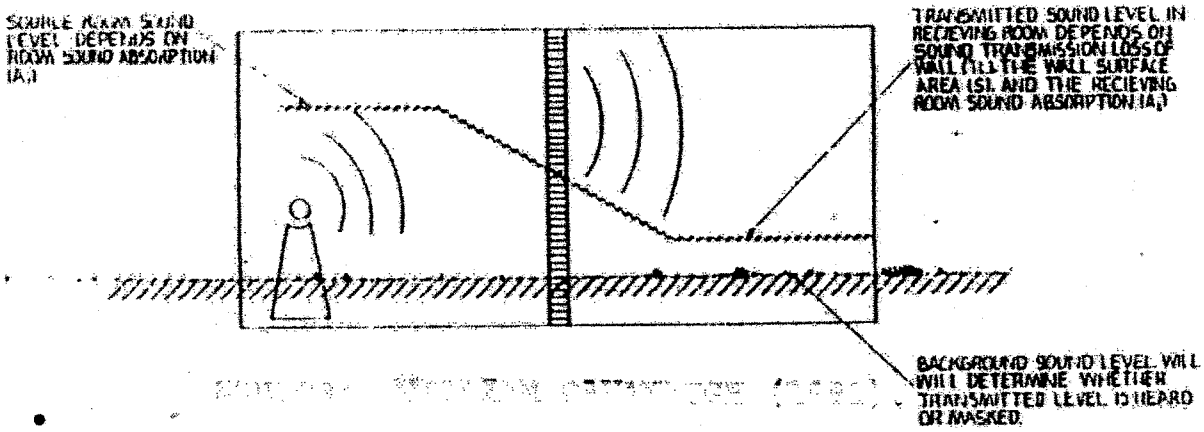


FIGURE 2.3 The essential elements in sound transmission between rooms.

SOURCE: WILLIAM CAVANAUGH (1981)

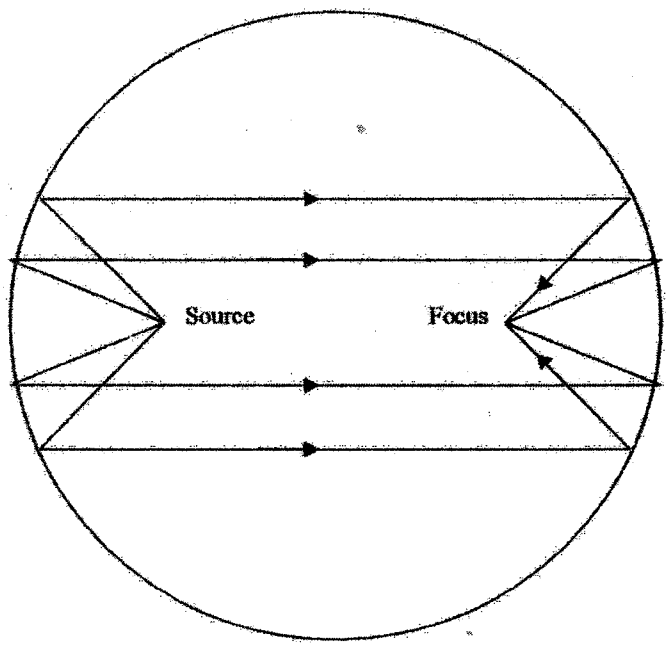


Fig. 2.4: Focusing Of Sound. The diagram shows Imw sound focusing in a circular room is focused at a point symmetrical with the sound source. it can be seen that a room with circular walls is acoustically poor, because sound is not evenly distributed throughout. Source: Colliers Encyclopedia, Vo\. I.

SOURCE: WILLIAM CAVANAUGH (1981).

2.6.10 SOUND TRANSMISSION LOSS (TL.)

A basic acoustical property of sound isolating wall or floor/ceiling system is then its ability to resist being set into vibration by impinging sound waves and thus to dissipate significant amounts of sound energy. The heavier the more complex the construction the greater its ability to reduce sound transmission from one side to the other. The sound reducing capacity of a construction is measured by its sound transmission loss (TL) and it is a logarithmic ratio of the transmitted sound power incident on the source room of the construction. A construction that let through only small amount of the incident sound energy will have a high mid frequency sound transmission loss of about 40dB. This means that only 1/10,000 of the incident sound energy is transmitted. Reductions in room to room sound level of 20 to 50 or more are generally needed to effectively isolate typical activities from one another.

2.7 EFFECTS OF ROOM SIZE AND SHAPE

A listener receives sound directly from its source and by reflection wall and extended surfaces of the room the acoustical character of a room is determined by controlling these reflections and diffusion, good listening requires that sound arriver by other than the direct path. Its also requires that the sound pressure levels be as uniform as possible throughout the seating area. There are certain commonly occurring effects, which are discussed below.

2.7.1 STANDING WAVES IN ROOM In a rectangular room with - hard walls standing waves can be set up across parallel pairs of walls, very much as if the room where three dimensional organ pipe. The consequence is that the room is resonant to certain frequencies. If the sound of a wide Varity of be accentuated and die out at a much slower rate than other frequencies. Hard parallel wall also may produce "flutter" echo, which is a

multiple echo that occurs between parallel walls with a sharp impulsive sound

2.7.2 SOUND FOCUSING

If the walls or ceiling are concave in shape reflection results focusing of sound. For example a room with circular walls will produces a very undesirable concentration of sound as shown in Fig. 2.3 one way to

over come this effect is to undulate the interior wall. Domed ceiling also may cause undesirable focusing. This may be avoided and good diffusion of sound from the ceiling may be obtained by, distributing large convex or irregular shape surface over the interior of the dome.

2.8 REFLECTION IN LARGE ROOMS

Most of the sound we hear in a hall (e.g. auditorium) is reflected sound, the amount of direct sound reflected depend on the nature of the reflective surface; concrete floor reflects all the sound, softer surfaces such as a carpet floor absorb the treble range of frequencies and reflects the bases range, a glass window will reflects the treble range sound and let the bass leak right out of the hall. The direct sound left in the hall reflecting off one surface after another, remaining audible to the listener until it finally disappears, having been absorbed and leaked out of the room as shown in Fig. 2.5.

2.8.1 TYPES OF REFLECTION

There are three types of reflection that people hear in a hall:-

a. Early reflection is good, it helps people to understand speech. Adding early reflection raises the apparent loudness of the direct sound in a comfortable natural way rather than increasing the volume. Early reflections are those that bounce off nearly

objects. Nevertheless, when the object is located some distance away, the situation changes, you can hear the reflection of it and we call this acoustic event an "echo". An echo can be great fun at times, makes listening very difficult, and are good example of late reflection as shown in Fig. 2.5.

b.Late Reflection: - Late reflections are those reflections that are distinguishable as separate acoustic events from the direct signal. Late reflection ruins listening to speech. Echoes are late reflection, echoes in a very large room. It may happen that an extended hard surface may reflect (or even worse, focus) sound to a listener so that it arrived considerably later than the direct sound. This appears as an echo, or separate sound if the sound following the second path traveled more than 50 or 60 feet further than the original sound as shown in the Fig. 2.6. Late reflection can results to noise and can be converted to early reflection. There are two ways to get rid of late reflection (including echoes). These are absorbed, the loudness of the subsequent reverberation is markedly reduced. If late reflections are diffused or scattered above, they are not removed from the some place and the reverberation is loud.

Reverberation:- This type of sound is no longer made up of a distinct set of reflection. Reverberation is the persistence of sound in a room after source has

stopped. The time taken for the sound pressure level at this listener to fall 60dB) is called reverberation time as shown in Fig. 2.7. The reverberation period (time in second for the sound level to decay 60dB after the second source is turned off) is directly proportional to

the cubic volume of the space and inversely proportional to the total sound absorption present:

T=O.05V/A,

where;

T= reverberation time,

V=volume of the room in cubic feet.

A = Total absorption in square feet, (sum of the room surfaces times their sound absorption coefficients plus the sound absorption provided by furnishing or audience etc).

2.8.2 POSSIBLE WAYS OF ACHIEVING EARLY REFLECTION

The distance from the loud speaker to the surface proving the early reflection and then back dawn to the listener cannot be more than 50ft longer than the direct distance between the loud speaker and the listener:

i. Balcony facing and ceiling can provide substantial early reflection. Pillars (especially big, hollow 'and fake ones) can be placed in special locations along the sidewall to cause early reflection. "It is easier to hear an early reflection coming in from an area in front of us above us or to the side of us than if the reflection comes in from behind us due to the way our ears are shape",(Noxon, 2002). Flying wings (suspended acoustical cloud) in auditorium and music

halls are positioned and shaped to intercept upward bound sound and re- scatter it back into the audience ,this occurs during the early reflection time period.

ii. Early reflection can be faked (stimulated) by adding a distributed sound system. The speaker is played at a low sound level about 50dB below the strength of the direct signal to achieve early reflections.

2.9 ACOUSTICS MATERIALS AND CONSTRUCTION METHOD

2.9.1 SOUND ABSORBING MATERIAL

Sound absorbing material, carpeting, acoustical files, and other specially fabricated absorbing products can absorb appreciable amounts of sound energy. The sound absorbing efficiency of materials is given by its absorption coefficient (X). The sound absorption coefficient is a ratio of the incident sound and may vary from 0 (no absorption, or perfect reflection). Figure 2.8 illustrate the typical sound absorbing materials porous material account for most of the prefabricated factory finished products available. The surface applied to or on the porous materials for architecture finish reasons (durability, light reflectance appearance etc) influence the high frequency absorption of the assembly. The more porous and acoustically transparent the assembly, the least will be the effect on the mid and high frequency sound absorption coefficient sound reflection from the solid areas between the openings, perforation or fissures of a surface facing materials at high frequencies volume, or cavity "type absorbers and thin panel membranes absorbers

2.9.2 SOUND ABSORPTION FOR COMMON BUILDING MATERIAL

Table 1 indicates sound absorption data for a number of common building materials. In general, effective sound absorption is provided by materials when the sound absorption coefficient exceed about 0.5, material with e.g. or greater are considered as very efficient absorbers (i.e. 90% of the incident sound is absorbed with only 10% reflected back into room and such includes -

a. SINGLE HOMOGENEOUS WALLS

Figure 3.9a helps to illustrate the general effects of mass in sound transmission loss performance of constructions. For single homogeneous construction, the average sound transmission loss (average from 125hz to 4,000hz) increases with increasing weight (and thickness) to 3.5psf (4 in) would increase the average sound

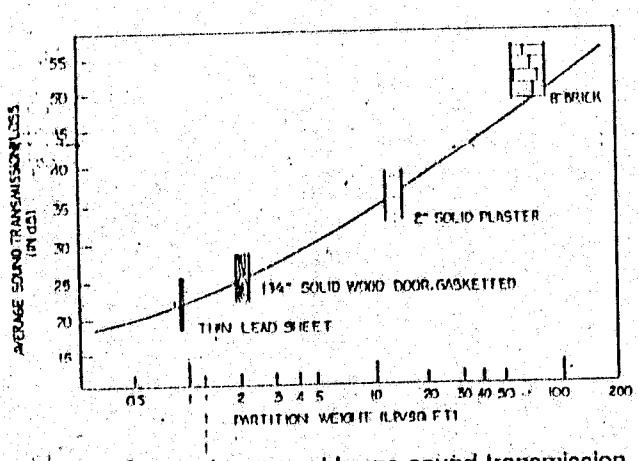


FIGURE 3-8: Average airborne sound transmission loss—single homogeneous partitions.

SOURCE: WILLIAM CAVANAUGH (1981).

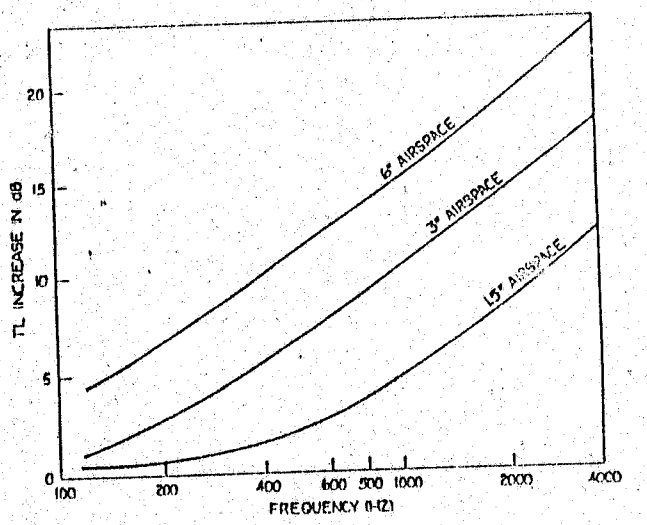


FIGURE 3-9: Increase in airborne sound transmission loss of double construction with airspace (weight of two leaves equal).

SOURCE: WILLIAM CAVANAUGH (1981)

transmission loss to 40dB. Another doubling to 60 psf would mean 3-in. Thick solid constructions quickly reach a point of diminishing returns where increased weight and thickness are no longer practices.

b. DOUBLE WALL

Figure 2.9b shows the advantage of complexity rather than just increasing the weight of the sound isolating construction. The 0.0508m solid plaster partition discussed above yielded an average TL of 35dB without any overall increase in weight, if the 0.0508m plaster were split into two depending 0.0254m leaves and separated by a 0.0762m air space an average increase of about 8dB would result (from figure 3.9b the increase would be 2dB at 125 h2 and 17dB at 9,OOOhz) in other word, double layer construction is one way to beat the "Mass Law" limits of a homogeneous partition materials. Many construction, such as sheet metal or gypsum board stud wall system, or wood joist floor system with gypsum board ceiling, fall somewhere between ideal mass .law performance and ideal double construction performance.

TABLE 3.0ABSORPTION COEFFICIENTS OF VARIOUS BUILDING MATERIALS AND FURNISIDNGS

MATERIALS	COEFFICIENTS					
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Bricks, glazed	.03	.03	.03	.04	.05	.07
Carpel. heavy, on concrete	.02	.06	.14	.37	.60	.65
Carpet. heavy. on concrete hair felt or foam rubber	.08	.24	.57	.69	.71	.73
Concrete block, coarse	.36	.44	.31	.29	.39	.25
Concrete block. painted	.10	.05	.06	.07	.09	.08
Fabric. medium velour. 14 ounces per square yard. draped to half of its flat, undraped area	.07	.31	.49	.75	.70	.06
Floors						
Concrete terrazzo	.01	.01	.015	.02	.02	.02
Linoleum, asphalt, rubber, Dr cork tile on concrete	.02	.03	.03	.03	.03	.02
Wood	.15	.11	.10	.07	.06	.07
Glasss						
Large Danes of heavy plates glass	.18	.06	.04	.03	.02	.02
Ordinary window glass	.35	.25	.18	.12	.07	.04
Gypsum board, half inch, nailed to 2 inch by 4 inch lumber, centres 16 inches apart	.29	.10	.05	.04	.07	.09
Marble or glazed tile	.01	.01	.01	.01	.02	.02
Plaster, gypsum or lime, rough finish on lath	.02	.03	.04	.05	.04	.03
Plywood paneling, inch thick	.28	.22	.17	.09	.10	.11
Water surface. as in a swimming 0001	.008	.008	.13	.015	.07	.025

TYPES OF SPACE OR ACTIVITIES	RECOMMENDED NC CURVE	CRITERIA SOUND LEVEL (In dBA)
Work space in which continuous speech communications and telephone use are not required	NC 60-70	66-80 dBA
Shops, garages, contract equipments rooms	NC 45-60	52-66 dBA
Kitchens, laundries	NC 45-60	52-66 dBA
Light maintenance shops, computer rooms	NC 45-55	52-61 dBA
Drafting rooms, shop classrooms	NC 40-50	47-56 dBA
General business and secretarial offices	NC 40-50	47-56 dBA
Laboratories, clinics, patient waiting spaces	NC 40-50	47-56 dBA
Public lobbies, corridors, circulation spaces	NC 40-50	47-56 dBA
Retail shop, stores, restaurant,cafeterials	NC 35-45	42-52 dBA
Large offices, secretarial, relaxation areas	NC 35-45	42-52 dBA
Residential living, dining rooms	NC 30-40	38-47 dBA
General classrooms, libraries	NC 30-40	38-47 dBA
Private, semiprivate offices	NC 30-40	38-47 dBA
Bedrooms, hotels, apartments with air conditioning	NC 30-40	38-47 dBA
Bedrooms, private residence, hospitals	NC 25-35	34-42 dBA
Executive offices, conference spaces	NC 25-35	34-42 dBA
Small general purpose auditoria(less than about 500 seats), conference function rooms	NC 35(Max.)	42 dBA(Max.)
Small churches and synagogues	NC 35(Max.)	42 Dba(Max.)
Radio, TV and recording studios(Close Mic pickup)	NC 25(Max.)	38 Dba(Max.)
Churches synagogues (For serious liturgical music)	NC 25(Max.)	38 dBA(Max)
Large auditoria for unamplified music and drama	NC 25 (Max.)	38 dBA(Max.)
Radio, recording studios(Remote Mic pickup	NC 20(Max.)	30 dBA(Max.)
Opera performance halls	NC 20(Max.)	30 dBA(Max.)
Music performance and recital halls	NC 20(Max.)	30 dBA(Max.)

TABLE 3.1 RECOMMENDED CRITERIA FOR STEADY BACKGROUNID SOUND IN TYPICAL BUILDING SPACES

SOURCE: WILLIAM CAVANAUGH 1981

c. CAVITY ABSORPTION IN DOUBLE CONSTRUCTIONS

When the full advantage of the both mass and complexity have been utilized in double -leaf construction by further improvement in performance can be realized by sound absorbing material within the cavity of the construction. Fibrous, mineral wool-type insulation materials can reduce the sound energy through the cavity volume and this increase the overall sound energy loss through the construction.

2.10 AMPHITHEATRES

No fixed specifications have yet been drawn which are applicable to out- door theatres everywhere. The following suggestions are recommended to suit particular local needs and available facilities.

2.10.1 THE SIZE OF THE THEATRE:

Outdoor theatres can be planned to seat as many as 3,000 spectators without the used of amplification for the actor's voices. What is recommended, however as an upper limit for the seating is about 2,500; the suggestion in this outline are scale for structure of between 1,500 - 3000 seats, which is nearest the ideal.

2.10.2 OUTSIDE THE THEATRE:

i. **Parking lot:-** should be large enough to handle one car for every three spectators

- Designed to permit convenient and speedy exit following the performance.
- Surface with gravel or asphalt and provided with good drainage
- Locate near the noises and lights of late-arriving cars will not disturb the

performance and be well Mark with sign.

i. **A Business Office:** The manager office should be in the theatre if the theatre is on or near a main traffic route if not, it should be in the centre of one of the main town - where it is readily accessible to patrons stopping at hotels, motels and should have an information centre and display space.

ii. **A Box Office:** Convenience to both the parking lots and the entrance to the theatres with shelter for

Patrons buying tickets inn bad weather, and should a telephone connection to the business office and toilet and near a toilet facilities and water fountain.

iv. **Other facilities:** Compulsory a first aid station, a nursery for patrons children, a pay telephone and concession stand or house should be desirable.

i. Well marked simple and attractive and should be near parking lot.

ii. Far enough away from the lot, let patrons loose the sound of traffic and fall under the quite spell of the general setting before stepping into the theatre

iii. A separate parking forecast and crew.

2.11 THE AUDITORIUM

One of the first aid to god side lines is an effective slope. Seat may be set on rising parabolic curve, or on two different inclines, a fairly mild for the lower halve of the auditorium (The halve near the main stage) and steeper slope for the upper portion (rear halve). The slope recommended for the lower portion is 12O (i.e. a rise of about 1miute in 7) and for the upper is 24o (about 1 minute in three and half, or steeper. There should be at least five aisles) a comfortable width seat is 0.5334 m. The toilet facilities should be at both side but not noisy.

2.11.1 THE STAGE: The usual arrangement of acting areas in an outdoor theatre is a large main stage and two smaller side stages in front of proscenium and to the right and left of the stage.

These features are recommended for the central stage.

i. A proscenium opening of about 21.33m

ii. A depth of12.19m from the line of the proscenium

iii. A level ground, well drained and preferably surface with either cement asphalt.

iv. Electrical outlet for stage lighting, e.t.c.

2.11.2 THE BACK OF STAGE

i. There should be plenty of free space for the assemble of actors, the organizing of groups and the massing of crowd voices for off stage effects

ii. Property tables should be place (in locations convenient to both sides of the theatres.

iii. There should be efficient intercommunication system over which messages could be sent from one side of the stage to the other, and e.t.c. Other features necessary in an out door theatre include the dressing rooms, shower, lavatories and toilet facilities, offices and shops .

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 THE PROPOSED SITE

The proposed site is located at Quarri Kwoi, along Kwoi Kafanchan Road in Jaba LGA Kaduna State of Nigria. The topography of the site is gently sloping and the vegetation type is guinea savannah and it has a sandy loamy soil and is boarded with a river at the extreme end known as river Sambam Gidalo which can serves as a source of water to the proposed cultural centre. The proposed site has good access road leading to the site and that is Kwoi Kafanchan road, the site is located at the outskate of the Town with less traffic flow.

3.2 RESEARCH METHOD

3.2.1 METHODS OF DATA COLLECTION

To be able to carry out the study effectively, various methods of data collection were employed. These are:

a DESCRIPTIVE SURVEY

This involves field examination and study for the existing structures as follows:

i. **Case Study Conducted:** This includes determination and knowing the extent of work carried out in the area of study, identifying the architectural problems encountered and correcting them in this study.

ii. **Conducting Interviews with Relevant Persons:** visits were paid to relevant cultural centre, it entails asking questions from members of staff of the various cultural Centres visited who have knowledge required to culturalcentre

b. LITERATURE SEARCH

This involves the used of libraries to get information about this areas of study to have a sound and genuine theoretical base. This includes the use of textbooks, journals, newspapers, encyclopedia and internet as sources of information.

3.3 INTRODUCTION TO CASE STUDY

The essence of case studies in a design of this dimension is very essential. This exercise led to the critical study and appraisal through personal visits, interview and extracts from publications of existing project of this nature. The objectives of case studies are:

- To ammane the basis of the development of the existing similar cases.
- To identify problems areas existing in the cases studied.
- To proffer suggestion based on the effects and problems identified

The case studies are as follow:

a. National Centre for Arts and Culture, Abuja.

b. Culture and Tourism Centre Kaduna, Kaduna State.

c. U.K Bello Art Theatre Minna Niger State.

3.3.1 NATIONAL CENTRE FOR ARTS AND CULTURE ABUJA

This centre is strategically located at area 10 Garki Abuja. It is located along festival road and post office to the east; Agura hotel to the south and area 10 shopping centre to the north. The cultural centre is a two storey building comprising of four blocks: A, B, C and D.

Block A: This is the commercial wing of the complex. It houses a restaurant andbar on the ground floor. The first floor houses a restaurant, two firms of professional artists while the second floor houses a restaurant; an office for Nigeria youth movement and has a rentable office space just as is with the it ground and first floor.

Block B: - This is the administrative block because most administrative issues are coordinated from the various offices in this block. The ground floor houses some other offices of the finance and supply division. Art and design division and studies. The second floor houses the offices of assistance director personnel and the personnel division offices.

Block C: - The ground floor houses the offices of the Assistant Director arts and design, art gallery, head public relations, planning and statistics offices. Exhibition hall, films and festival, ceramic unit and studio. The first floor houses the Office of the Director, Deputy Director, Assistant Director Performing Arts Cultural Centre Management Offices, Museum, Head of Museum Offices, National Festival of Arts and Culture (NAFEST)

exhibition hall. The second floor houses the library, tourism and Archaeological Research Offices. Head of Research and Documentation and

Head of Publication/Copyright Offices.

Block D: - This is the only bock that has a basement. The basement houses, the Music Band, the Audio Visual Unit and Recording Studio. The ground floor houses the Dressing/Changing Rooms, Costume Room, Stores for Canopies and Chairs. It also houses the Theatre, which occupies ground to first floor in the inner wing and the theatre management offices. The first floor is wholly rented by the National Council for Arts and Culture. The second floor houses the Graphics Unit, Painting Unit, Textiles Unit, performing Arts Office and the Store. Fig. 4.0 and plate la - ld shows the sketch site plan and elevations of the National Council for Arts and Culture Abuja respectively.

3.3.1a MATERIALS USED

The material used for the roof of gift shops is thatched. The walls are

constructed with burn bricks made by centre or earth studies Jos museum.

3.3.1b MERITS OF THE DESIGN

i. There is adequate allocation of functional spaces.

ii. The courtyard is very large and suitable for out door exhibition.

iii. It is accessible.

3.3.1c DEMERITS OF THE DESIGN

i. There is no element of traditional Architecture depicted on any part of the main building.

ii. The traditional arcade is not easily accessible

iii. There is inconsistency in the use of roofing material for building constructed with locally made bricks some were thatch roofed, some others roofed with corrugated roofing sheets

3.3.2 CULTURE AND TOURISM CENTRE KADUNA, KADUNA STATE

The centre is strategically located at Warf road Kaduna. It is opposite Murtala Square and adjacent to Hamdala Hotel Kaduna. The cultural centre is located the same place with the main Art theatre. The main Art theatre is located at Gamji Gate Kabala Doki. The cultural centre comprises of the administrative block, shops, open theatre, and Aliyu Wada exhibition hall and conveniences, and has some relaxing huts. Figure 4.1, Plates 2a - 2d, show the site plan and the elevations of the Culture and Tourism Centre, Kaduna respectively.

3.3.2.a MATERIALS USED

The walls are built with concrete blocks, and have iron doors and windows, aluminum roofing sheets used for the roofing, and the theatre

movable screen projection room as on centre line. The interior is made of marble and wood finishes which gives a cool and comfortable interior lighting pure artificial except when doors are opened. However, the design possesses some loopholes like the use of high level windows which does not gives enough lighting. The U.K art theatre is also composed of restaurant (not used as of now), and shops.

3.3.3.b MERITS OF THE DESIGN

The entire complex blended with the natural landscape:

i. There is an appreciable symphony in the general floor or basic function in the centre

ii. Adequate parking spaces provided

ii. It is strategically located and accessible

3.3.3.c DEMERITS OF THE DESIGN

i. Limited number of arts and crafts are considered.

ii. Lack of adequate craft equipment and tools.

iii. It has no restaurant or the designated restaurant is not in used.

iv. Poor security work.

v. Inadequate manpower due to non -existent incentives leading to closure of some of the units.

3.4 DATA COLLECTION

3.4.1 THE BACKGROUND OF THE LOCATION

The location of the proposed Ham cultural centre which is known as Quari is a very large land which is predominantly used for agriculture activities and since when Ham people

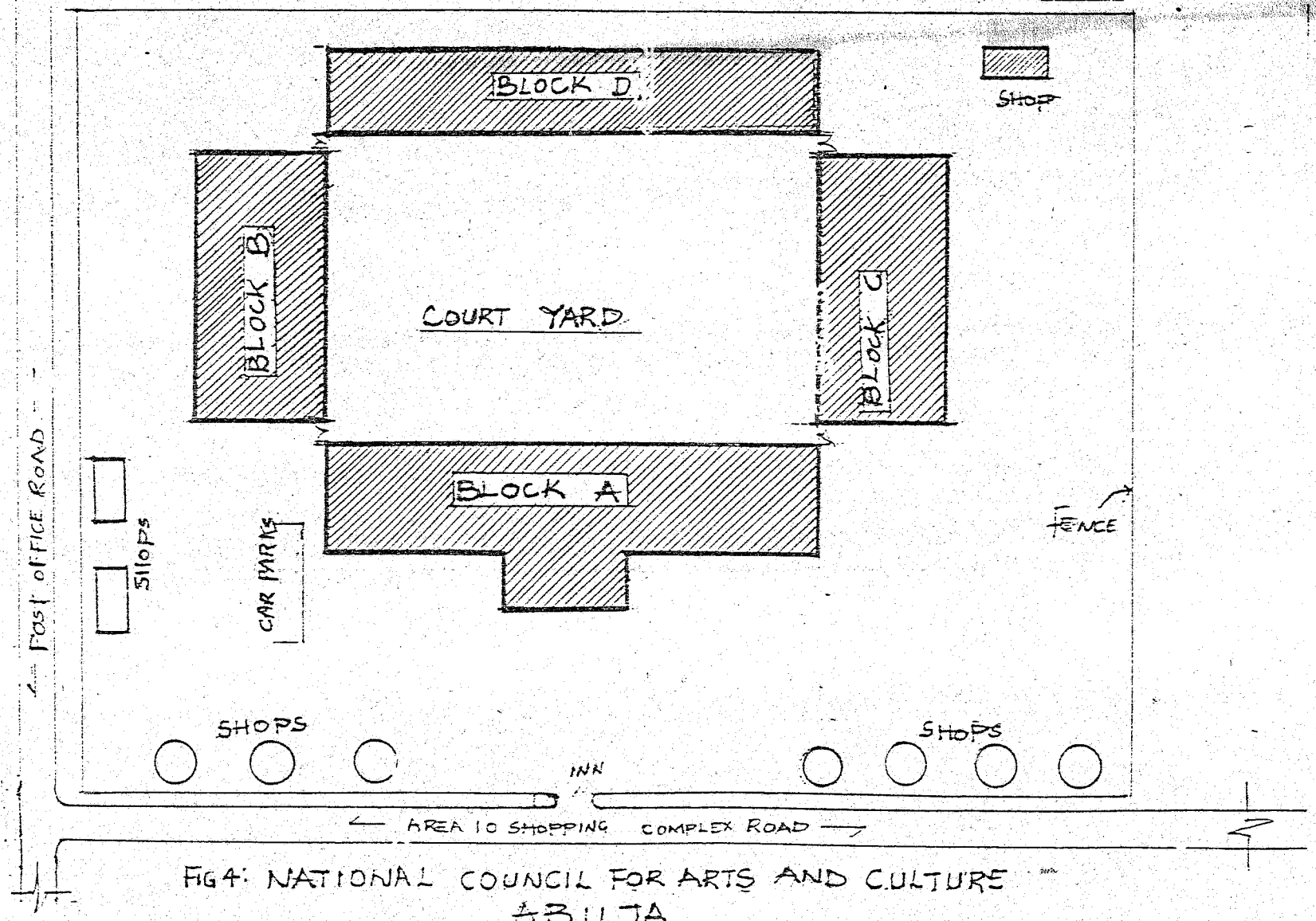


FIG 4: NATIONAL COUNCIL FOR ARTS AND CULTURE ABUJA

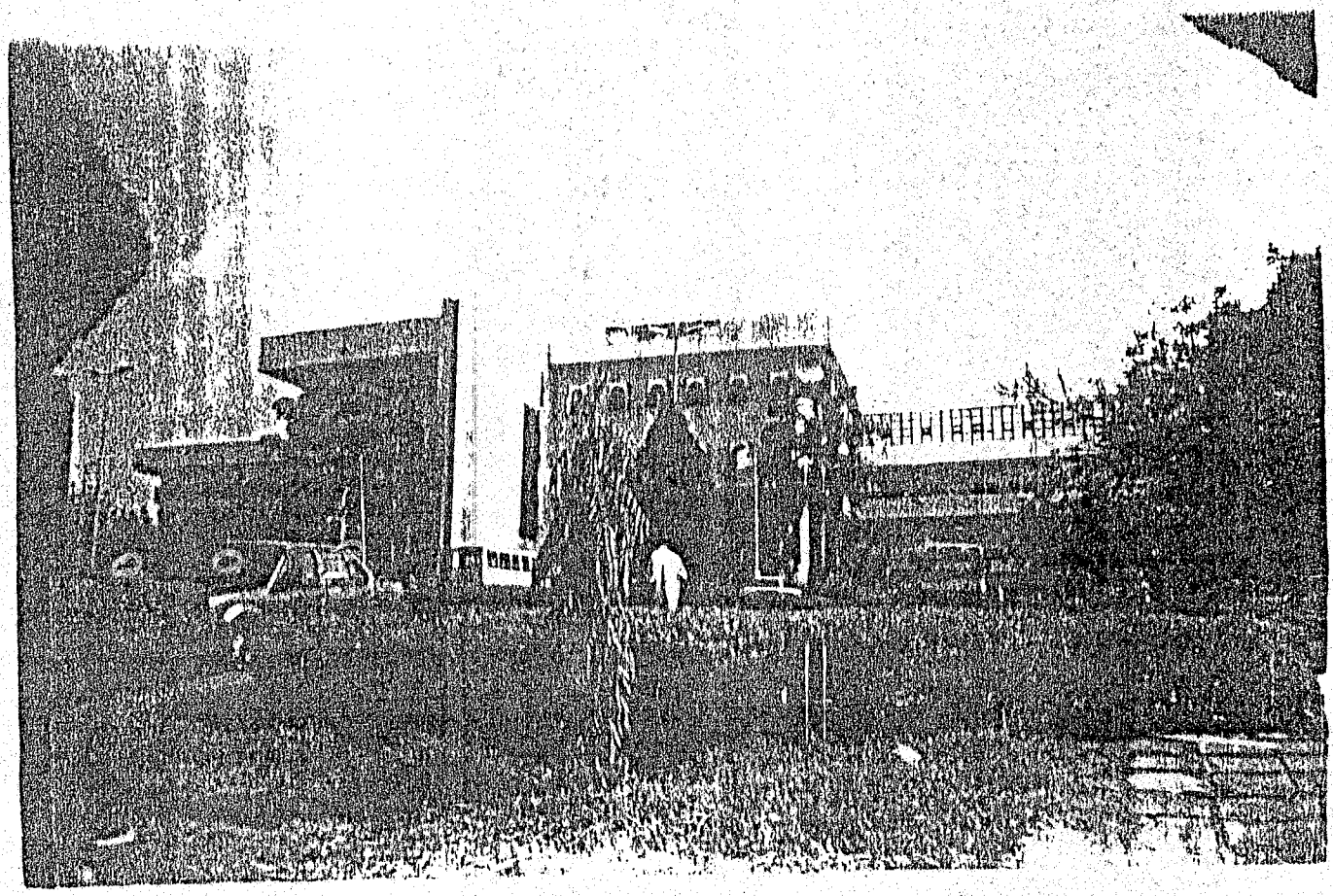


PLATE 1 ARTS AND CULTURE ABUJA FRONT VIEW.

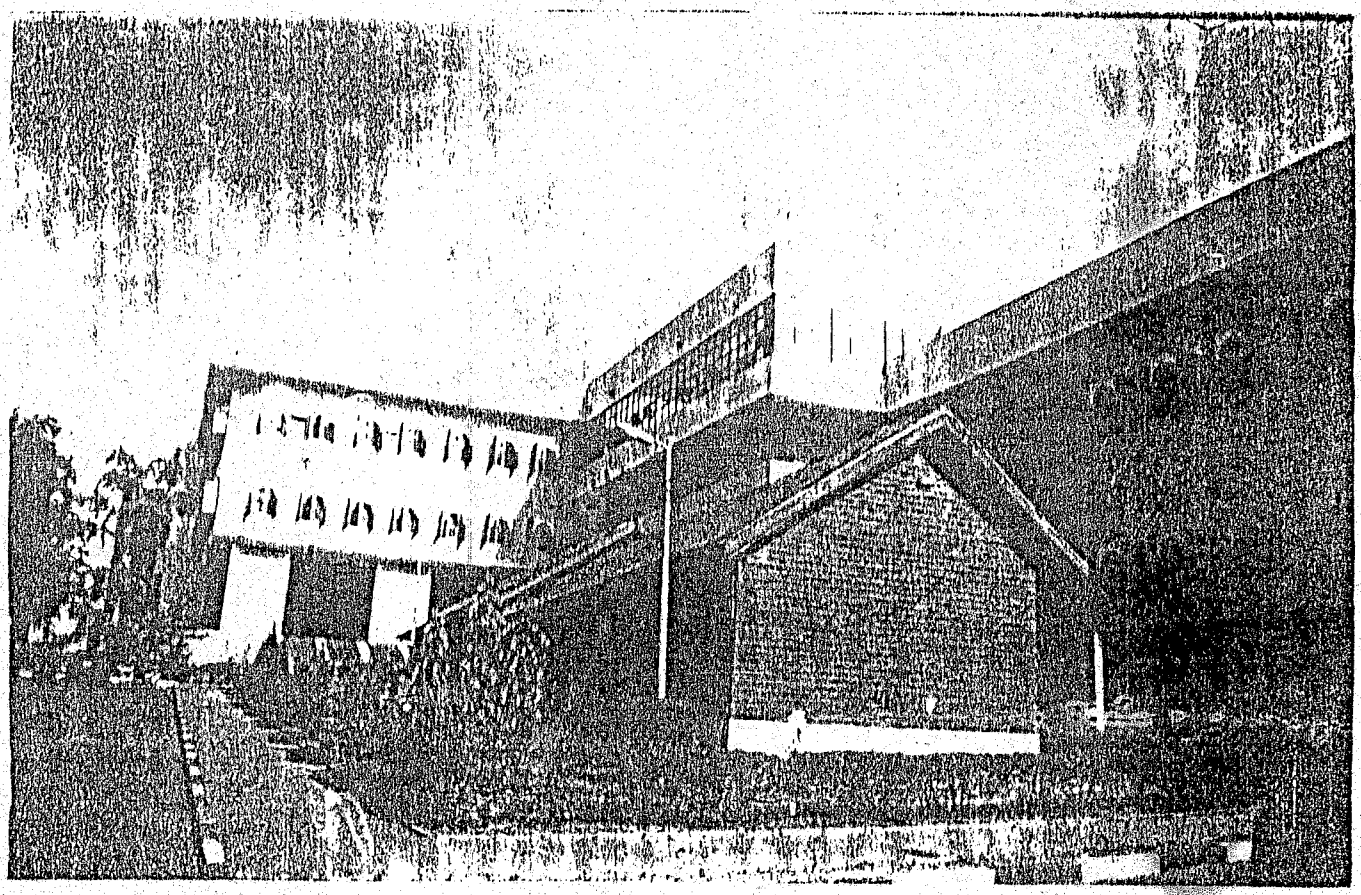


PLATE. 1 ARTS AND CULTURE ABUJA RIGHT SIDE VIEW

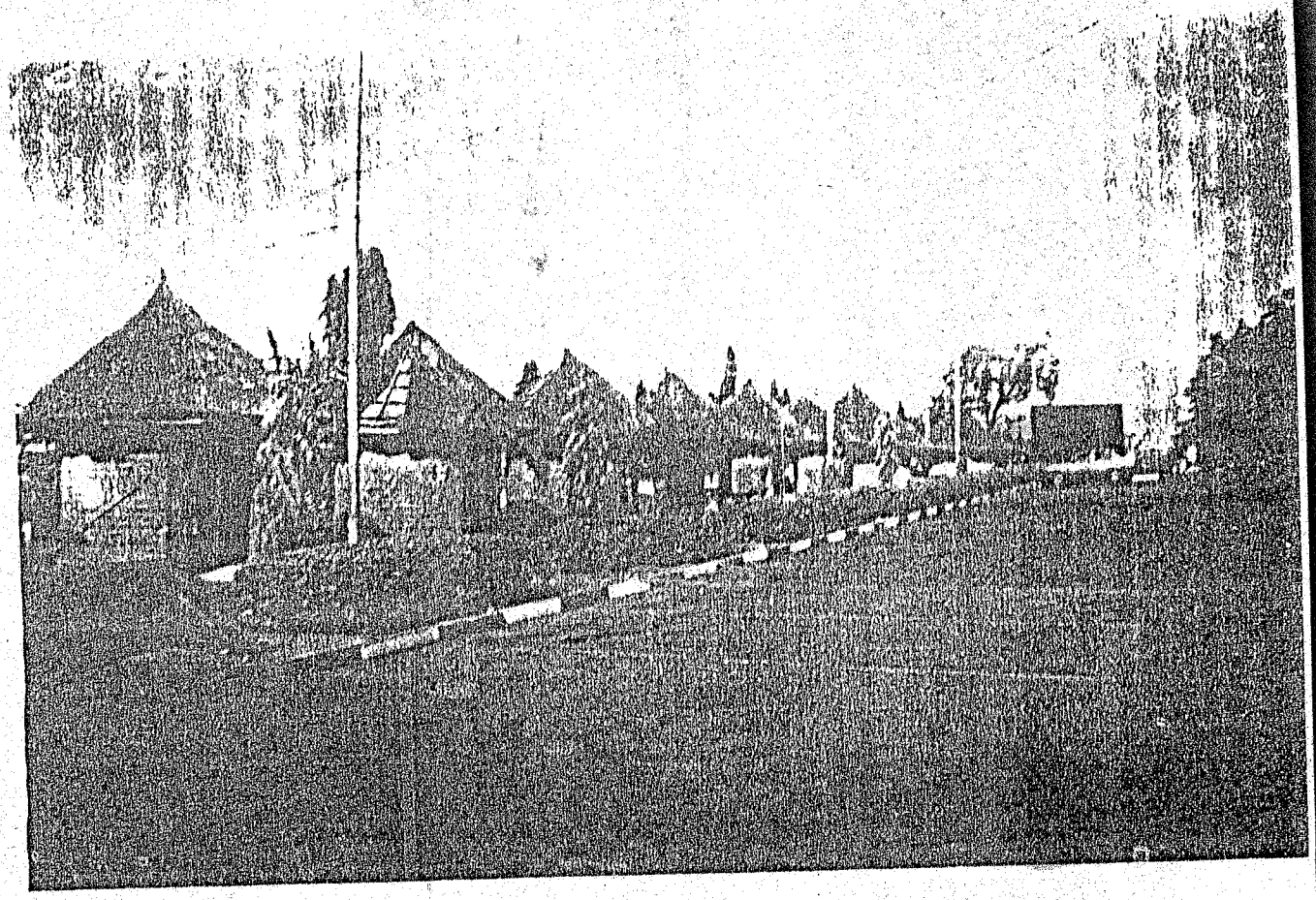


PLATE. 1c ARTS AND CULTURE ABUJA SHOPS VIEW

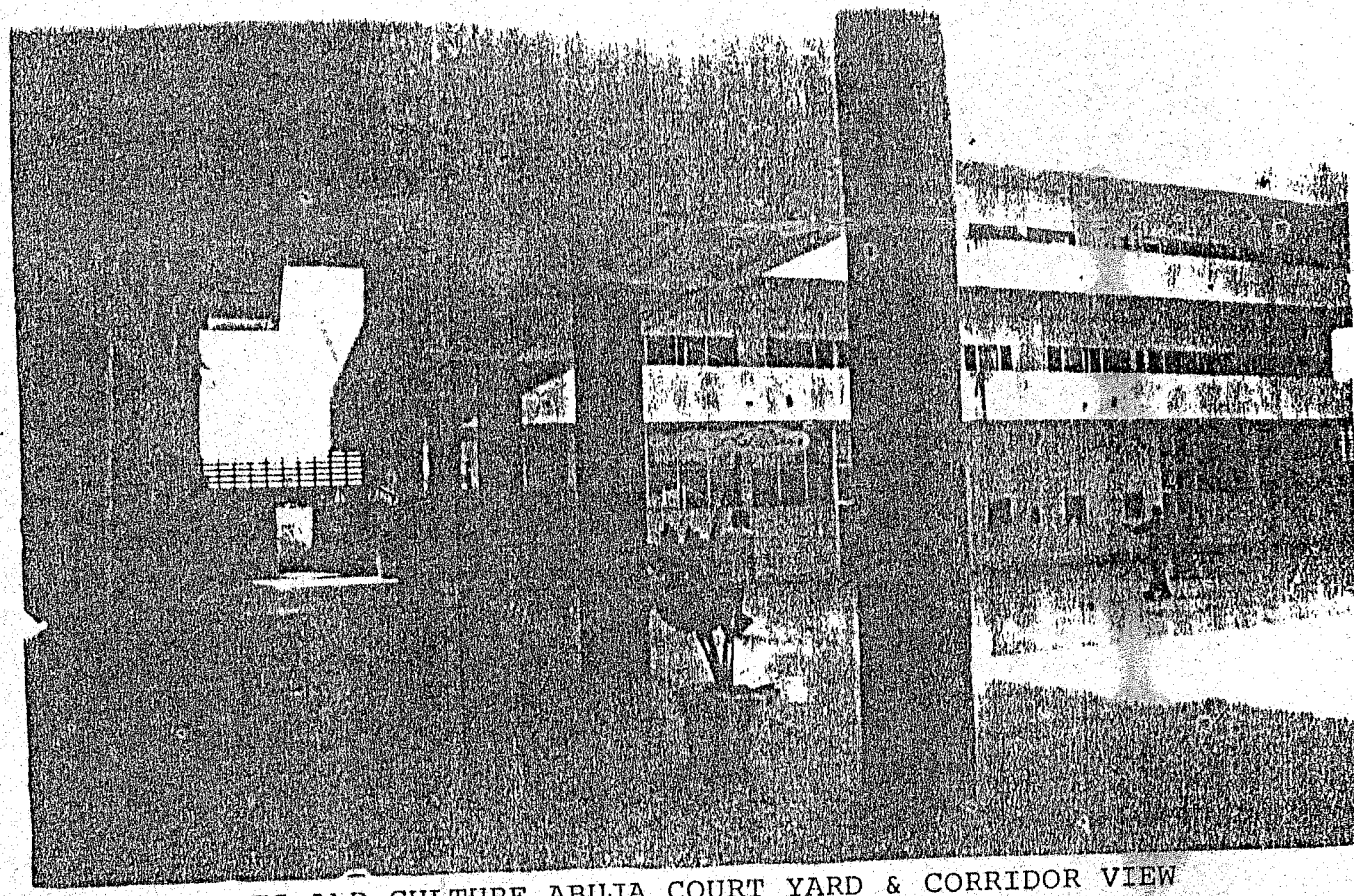


PLATE. 1d ARTS AND CULTURE ABUJA COURT YARD & CORRIDOR VIEW

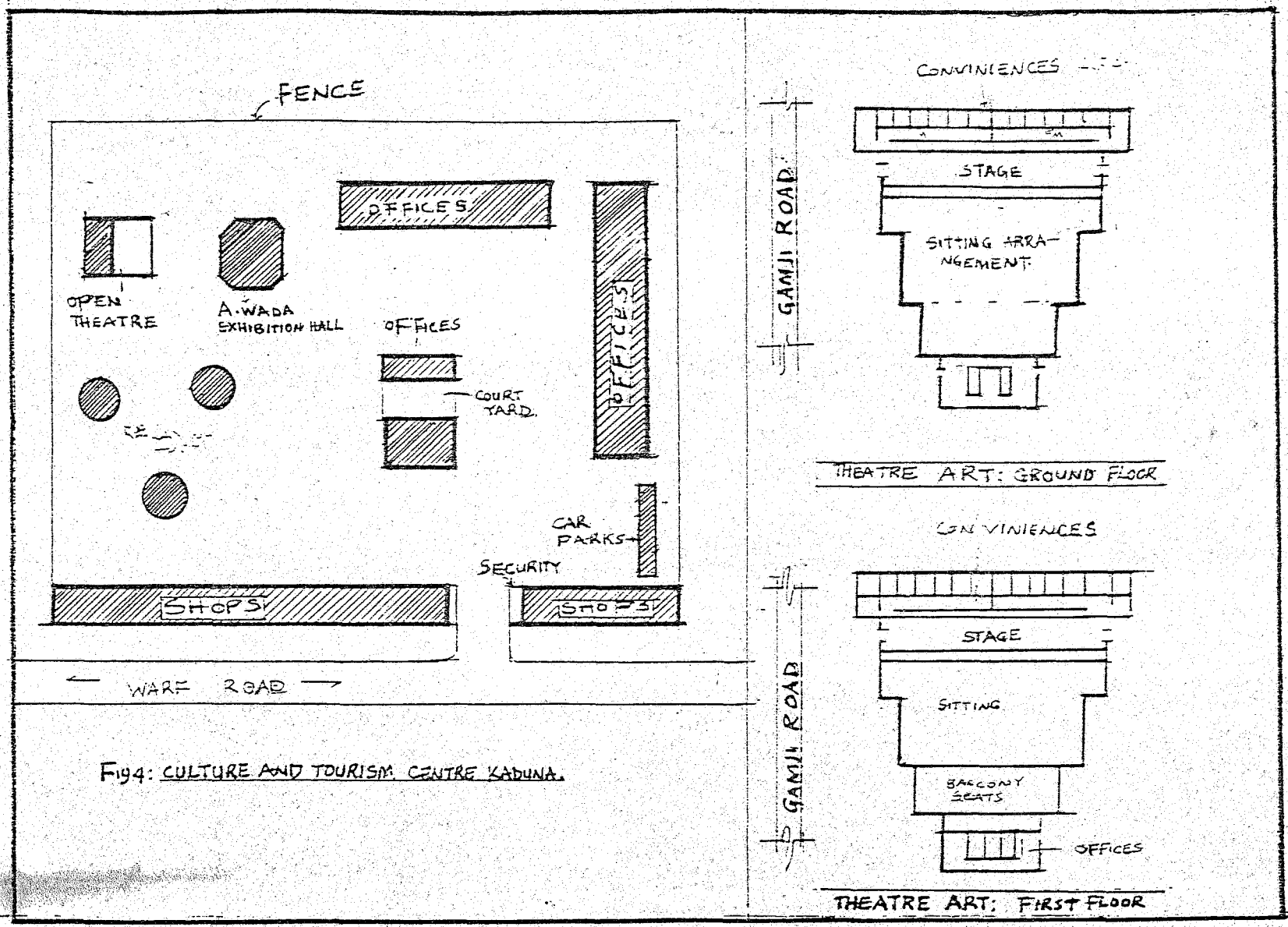


Fig4: CULTURE AND TOURISM CENTRE KADUNA.

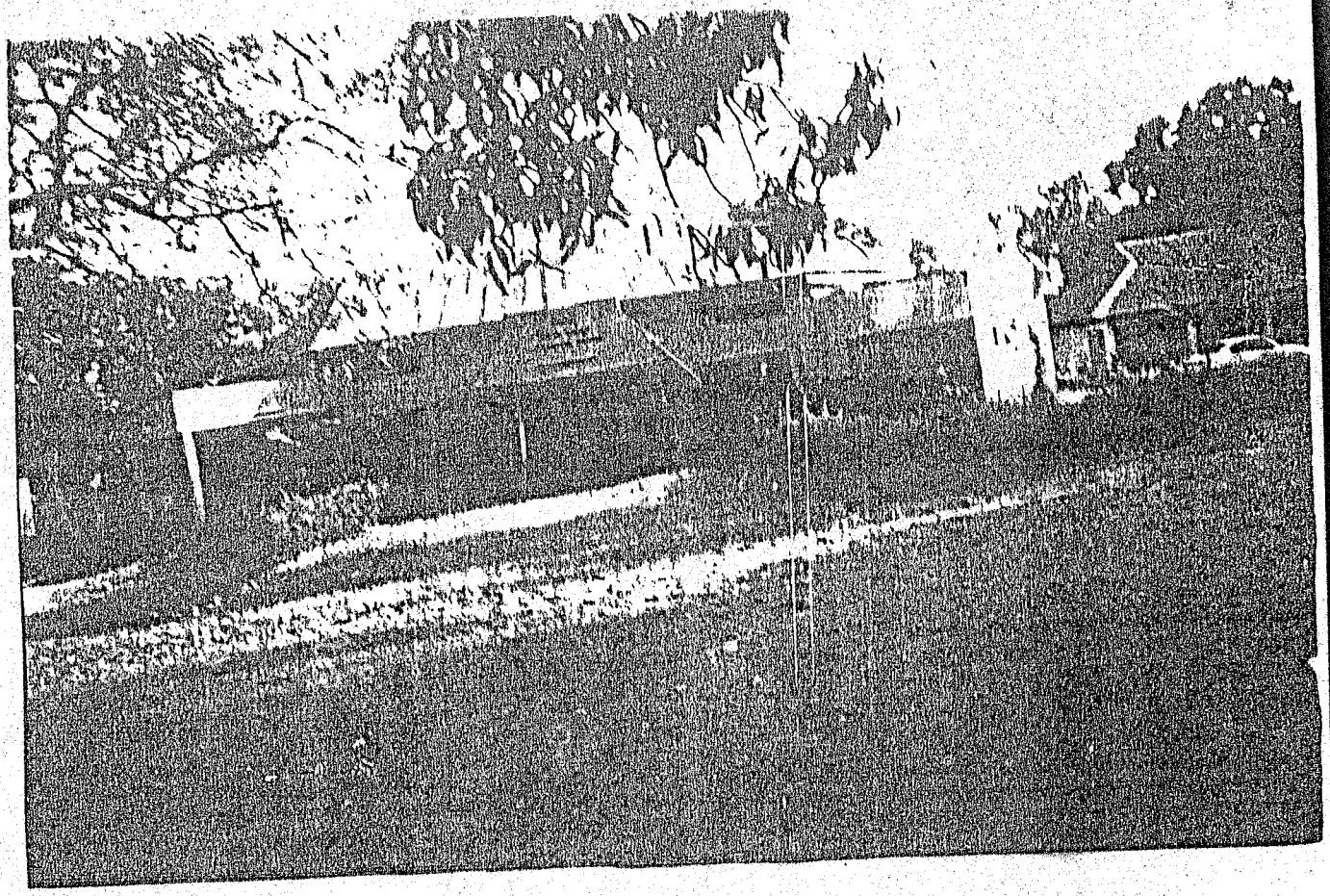


PLATE. 2a CULTURE AND TOURISM KADUNA. EXHIBITION HALL

PLATE. 2b CULTURE AND TOURISM KADUNA. DIRECTOR OFFICE.

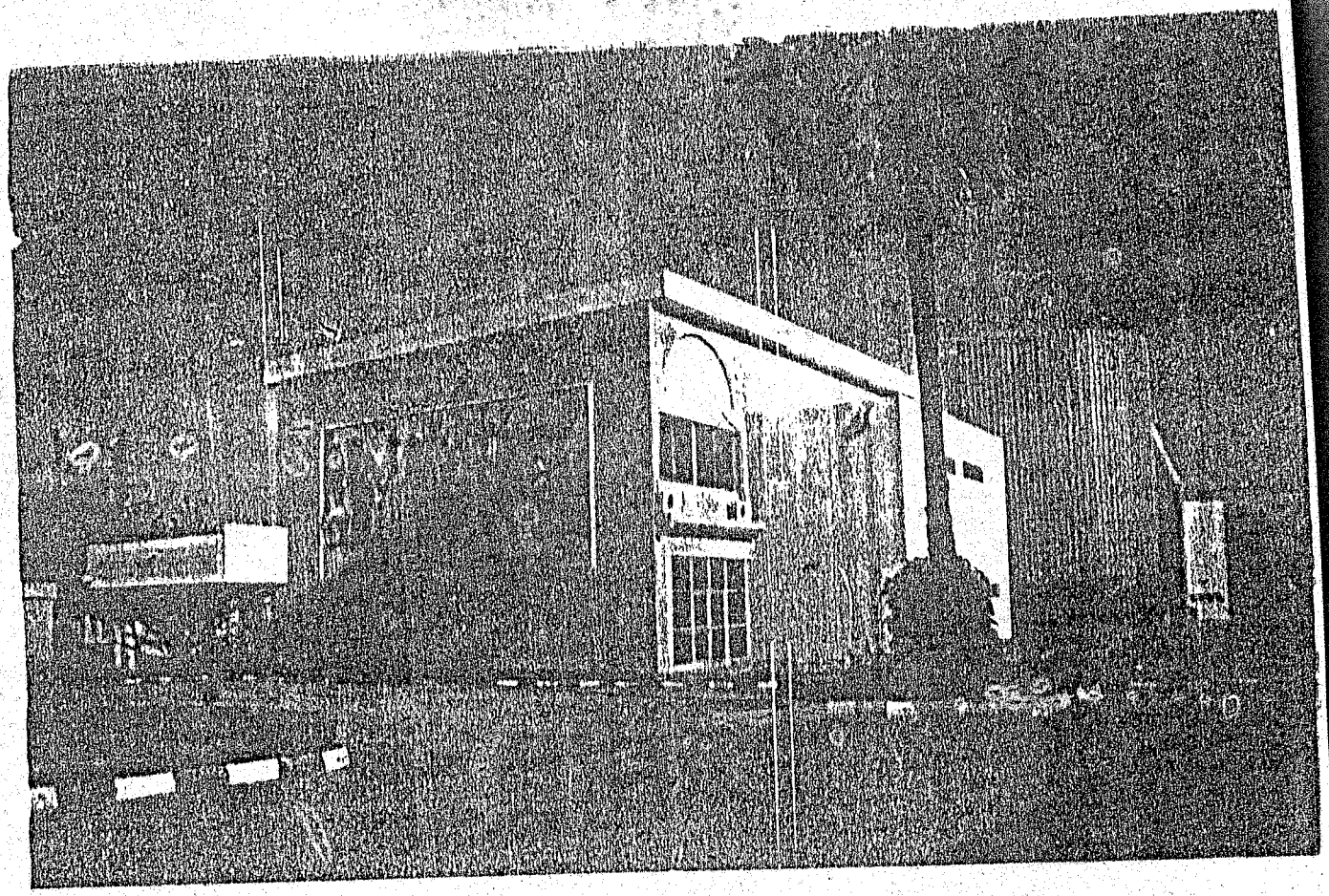


PLATE. 2 CULTURE & TOURISM KADUNA. THREATRE ART, FRONT VIEW.

PLATE. 2 CULTURE AND TOURISM KADUNA: THREATRE ART, SIDE VIEW.

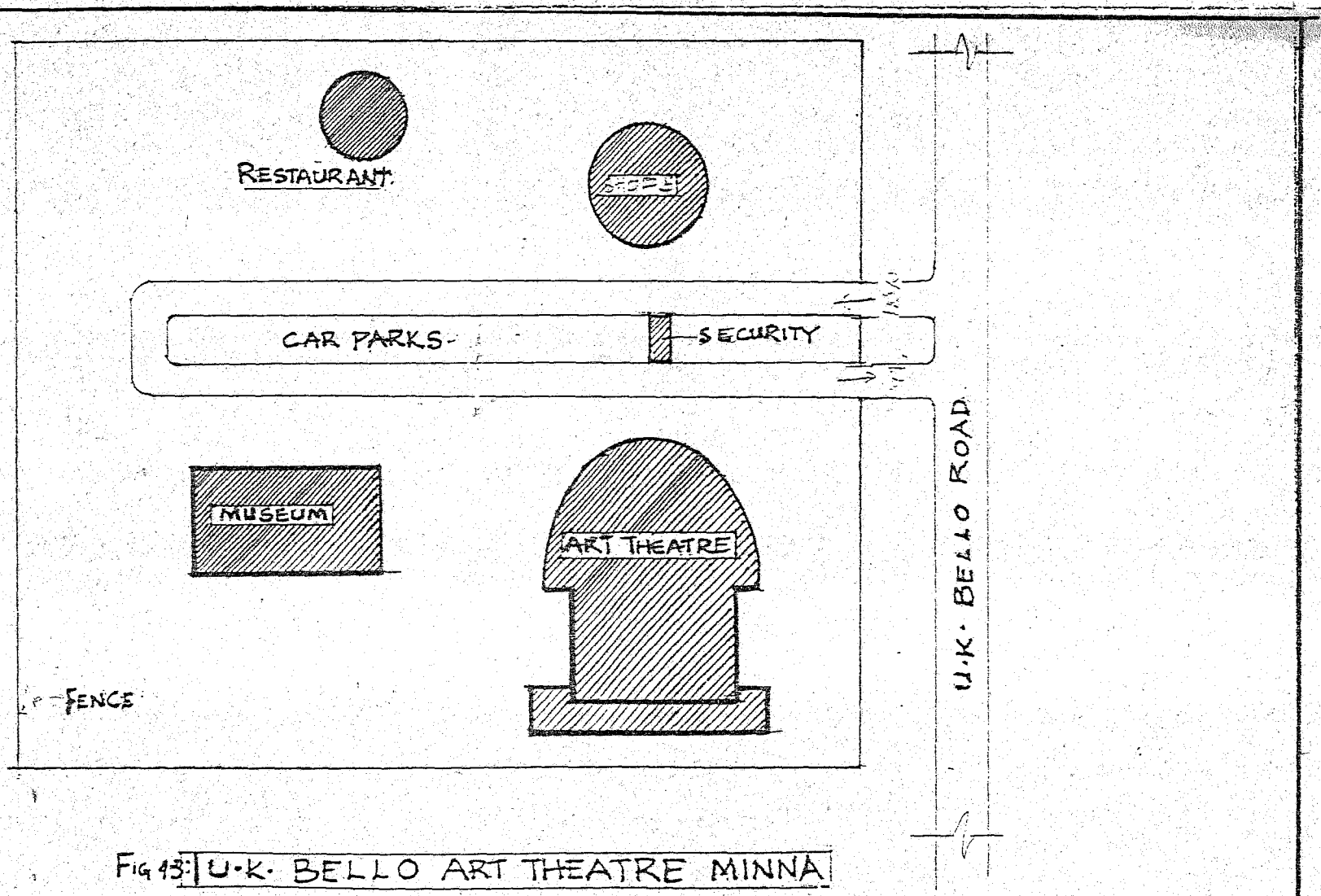


FIG 13: U.K. BELLO ART THEATRE MINNA

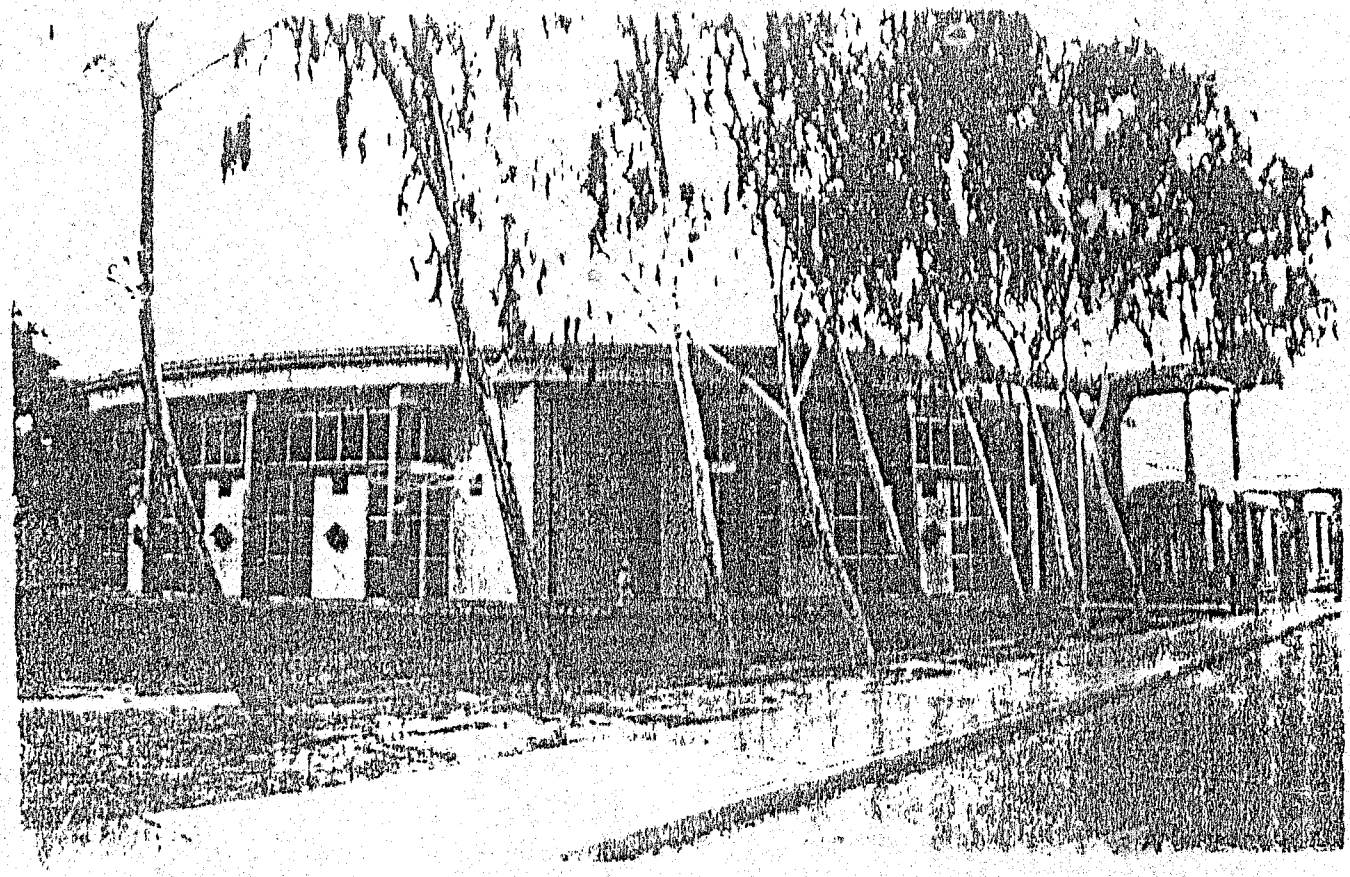


PLATE.3a U.K BELLO ART THREATRE: PERSPECTIVE VIEW.

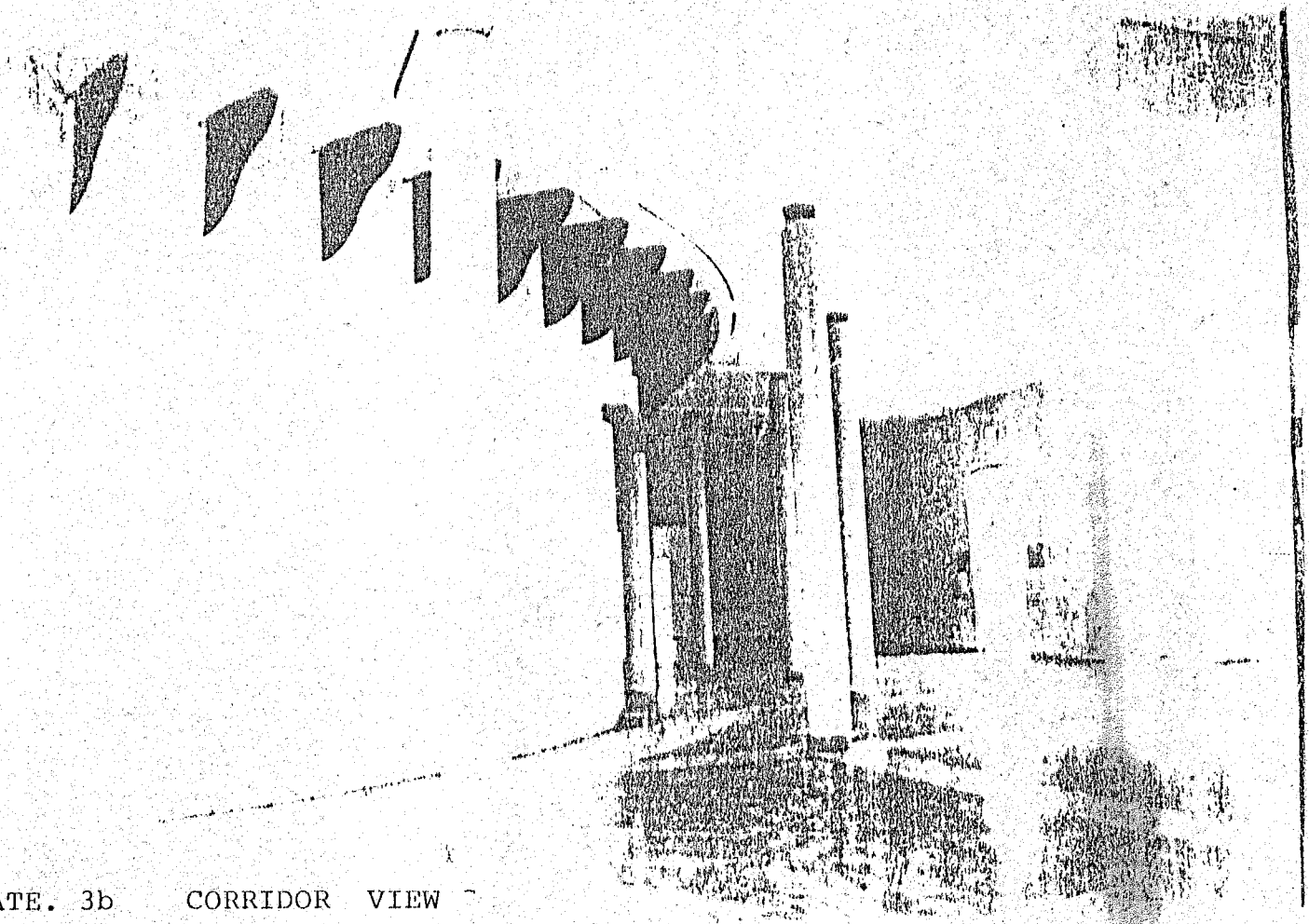


PLATE. 3b CORRIDOR VIEW

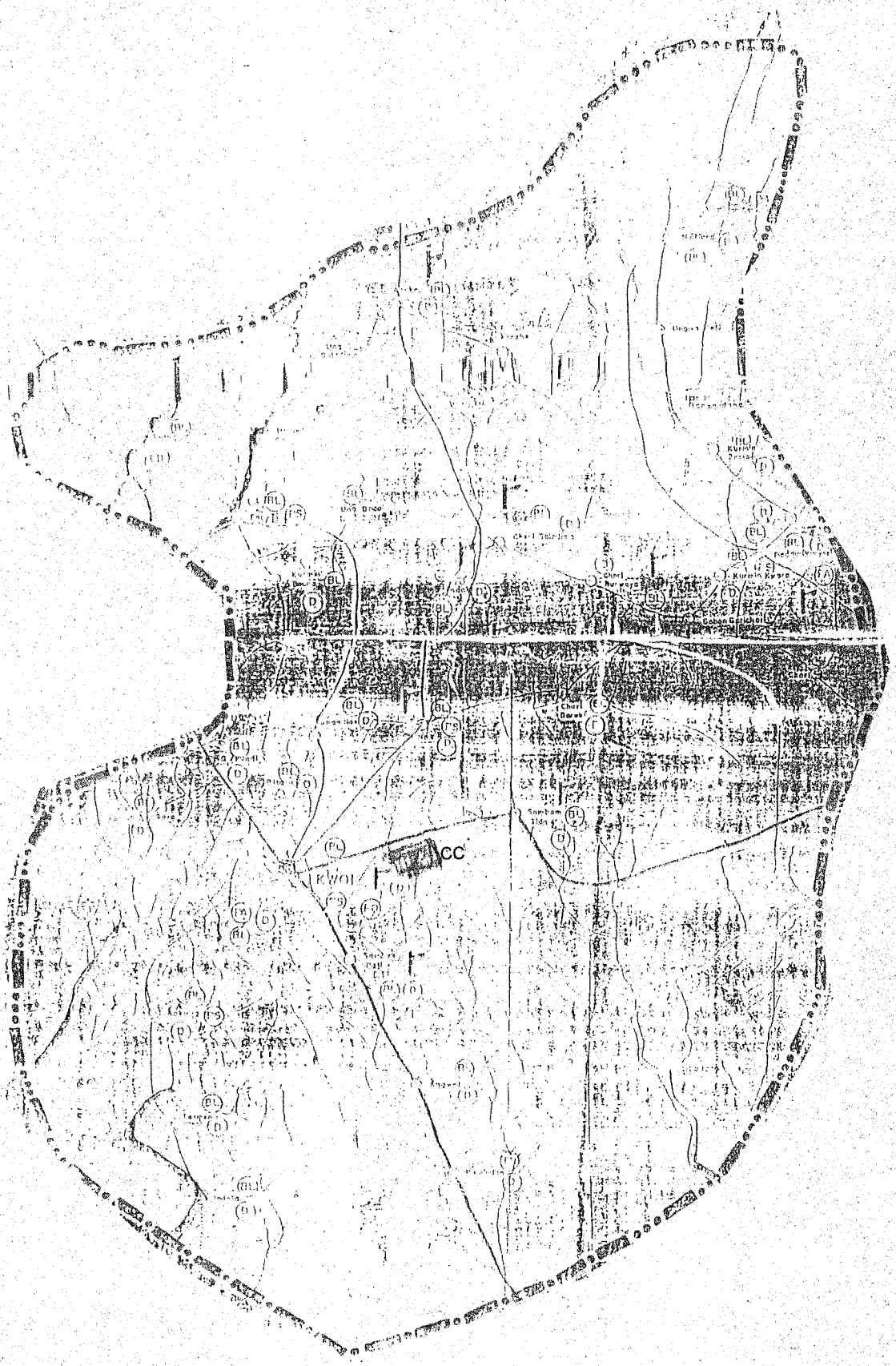


PLATE 5.0 MAP OF JABA L.G.A SHOWING THE LOCATION OF THE PROPOSED CULTURAL CENTRE (CC)

originate in that area, the soil is a sandy loamy soil and has a guinea savannah vegetation which retain its value up to this present dispensation except in some areas in Which the top soil has being used as borrowed pit for road construction. Fig shows the map of Jaba LGA showing the location of the proposed Cultural Centre.

3.4.2 TOPOGRAPHY AND ECOLOGY

The topography of the area consists of rolling part-like terrain with little relief all round the solid "inselberge" rise sporadically and dramatically like great domes as much as a thousand feet above the general level of the escarpment to the Jos Plateau. The whole area is crossed by mature wooded streams flowing broad. Shallow valleys separated by inconspicuous water shed. The basic geographical structure is magmatic of mixed streaky rock, granite in parts with darker softer bands and much varied.

3.4.3 VEGETATION

Jaba land lies in the Guinea savannah vegetation, which is made up of Sparsely dusted trees joined by shrubs and grasses. The sand is the reddish laterite soil of tropical areas, in some parts the land is sandy loamy or a mixture of loamy and literate. Thus this combination enables growth of most plants comfortable most especially Ginger.

3.4.4 CLIMATIC CONDITIONS

Though Jaba is situated in southern part of Kaduna State, its climate is slightly different from other parts of the southern Kaduna and far different from that of the northern part of Kaduna. The climate of Jaba is the nearest equivalent of a temperature climate of jos, Plateau State and perhaps account for why its weather is not too hot and no too much cold. The weather is moderate and conducive for human habitation. During the dry season from November to march, the dust latter harmattan wind, dry, cold and often strong blows parching from the north-east towards the south-west zone. On the arrival of the first rain in March ending, the prevailing wind veers to the south-

west and continues .from April to October. Other climatic features of interesting significance are as follows:

3.4.5 RAINFALL

In Ham Land the rainfall usually started at early month of March and end at the early month of November. The highest rainfall experience in each year is at August as shown in fig. 3.1

3.4.6 TEMPERATURE

The highest temperature is in April between 24°C - 30°C and the lowest are in January between 15°C - 21°C. The mean temperature was recorded as *25.5°C.*

3.4.7 SUNSHINE SOLAR DATA

The weather found in this area is neither too hot nor too cold. This implies that the weather is almost fairly cold throughout the day and night. In other words no

sharp difference between night and day temperatures. The main sunshine hour is 8.5 hours.

The sunshine duration is longer between the months of November to February with peaks of 10.5 hours as shown in Fig. 3.2

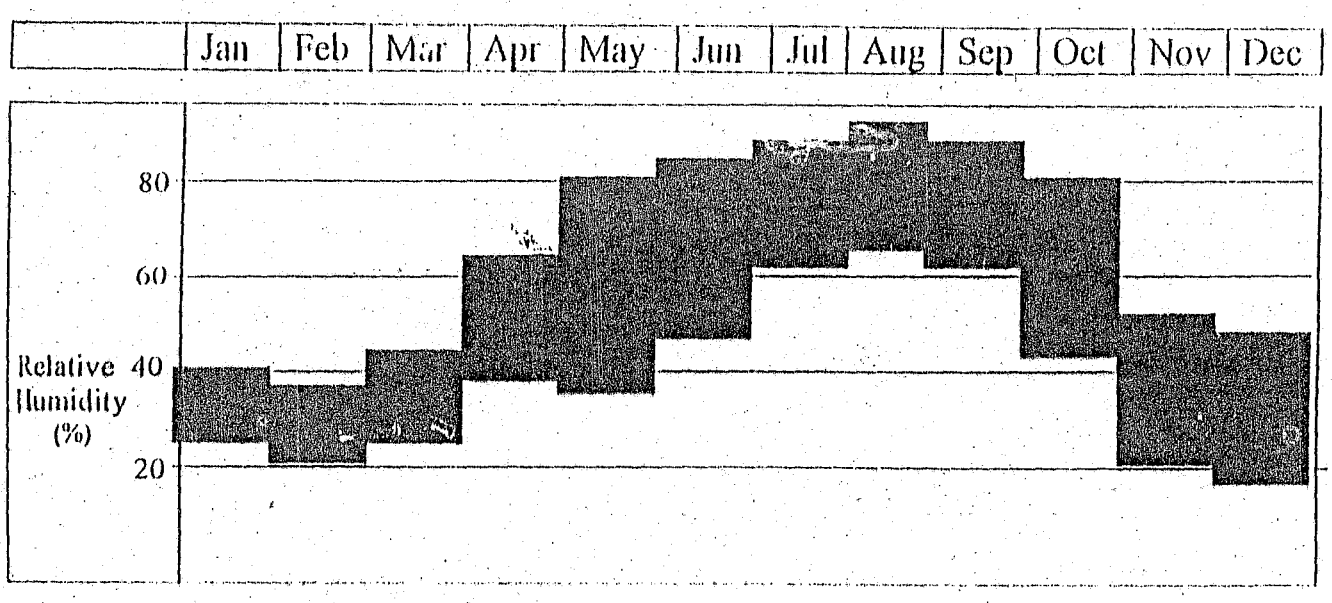


FIG 52: RELATIVE HUMIDITY SOURCE GGSS KWOI GEOGRAPHY DEPARTMENT.

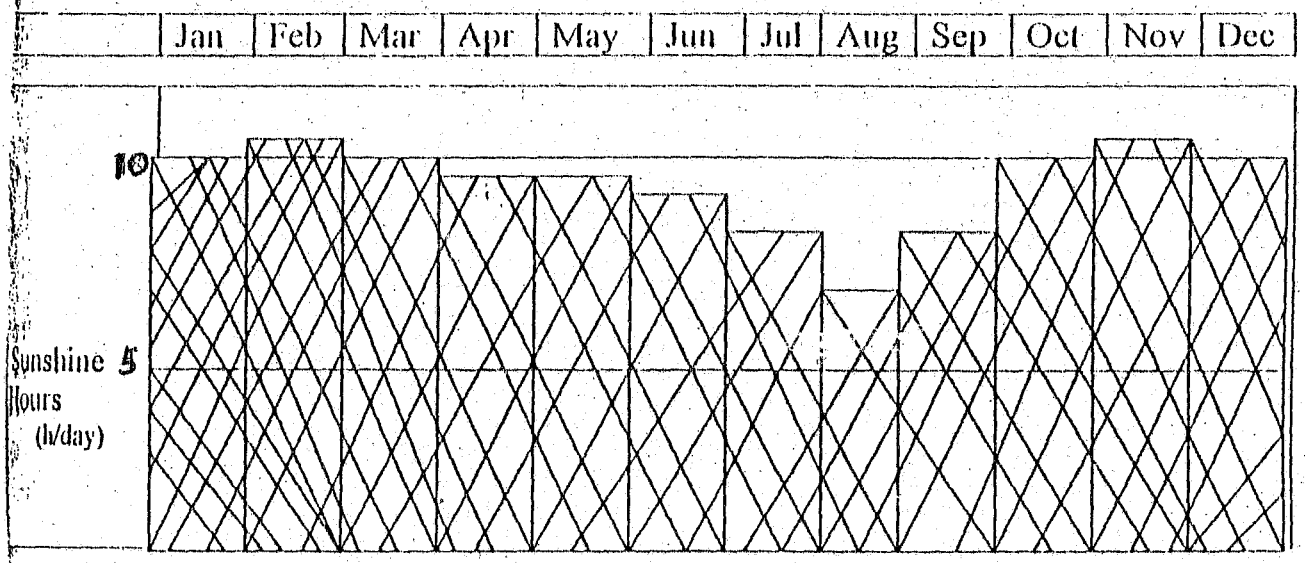
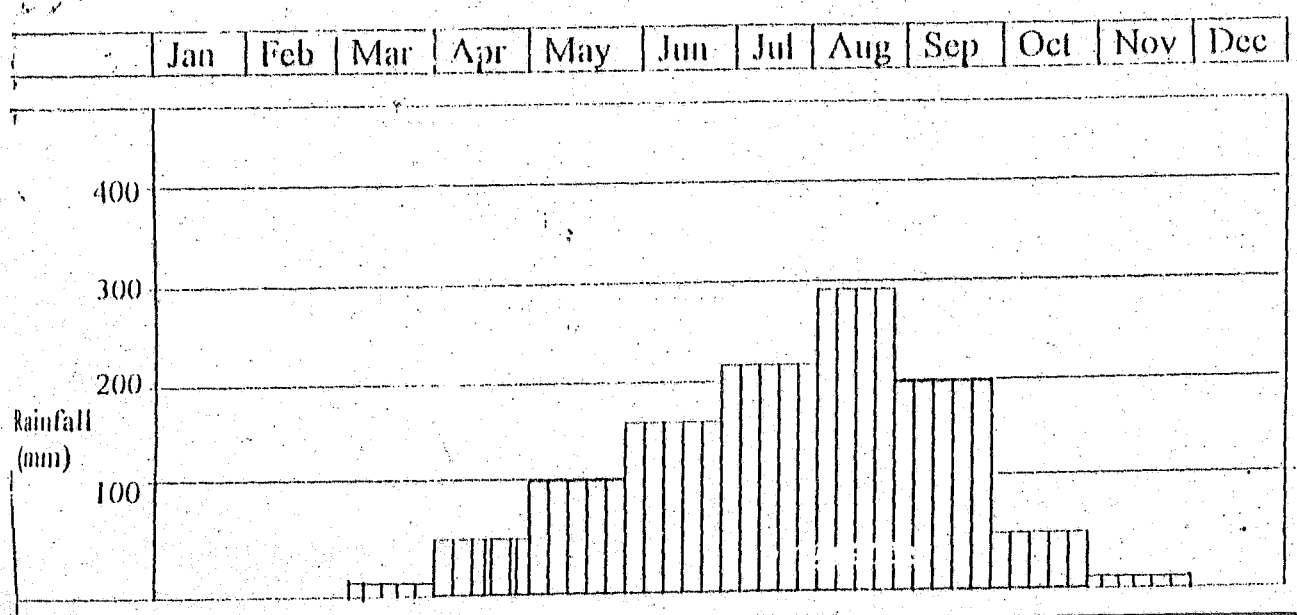


FIG 53: SUNSHINE HOURS (H/DAY)



3.4.8 ECONOMIC AND COMMERCE

Agriculture continues to be the dominant economic activity in Ham land despite the enormous developments of recent times. The indigenes of Jaba earn a living by farming. The main crops which are grown are ginger, maize, millet, guinea com, rice, beans (achi -shuru), acha (hungry rice), cocoyam, etc. Other notable occupations of the people are wood and craft work, black smiting, hunting and fishing.

3.4.9 DEMOGRAPHIC DATA

The population of Ham (Jaba) people, according to the Nigerian population census of 1963 was 200,000 and the population was said to have increased from 200,000 in 1963 to 300,964 in 1993. Source: National Population Commission, Jaba L. G. A. Branch 'Office, Kwoi.

3.4.10 HUMIDITY

Human sensitivity to temperature is greatly affected by relative humidity during the dry season, which is between *50 - 65%.* The humidity is moderate by the dry season and this coupled with low afternoon temperature. However, during the raining season the relative humidity is very high about 80-120%. The humidity increases over the six month and gradually decreases as the year runs out. Fig *3.3* shows the relative humidity of the area.

3.4.11 WIND GUST

The two principal wind pattern experienced in the other parts of the country applies also to the state. The north east trade wind and south west trade wind brings dry, dusty and harsh wind between November and March and cool, moisture laden air from the Atlantic Ocean between the months of April and October respectively. The

mean wind speed is 2-5 knots (1-2m/sec) during the rainy season and it could be as high as 5-10 knots or 2.5m/sec during the dry season.

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
1997	2.7	4.1	3.7	3.0	2.3	3.3	2.4	2.0	2.0	3.8	3.0	3.1
1998	2.8	3.3	3.4	4.1	4.4	4.2	4.1	4.3	4.2	4.0	4.0	3.9
1999	2.4	3.2	4.5	5.6	4.7	4.5	5.0	4.8	3.9	3.7	3.7	3.8
2000	2.9	3.7	3.5	5.0	4.9	4.7	3.7	4.2	4.1	3.3	3.3	3.1
2001	2.8	3.4	3.6	4.6	4.6	3.9	3.8	4.2	3.8	3.1	3.1	4.2

Table 3.4: Mean monthly values of wind speed in knots (2 knots = 1 mile) (1997-2001)

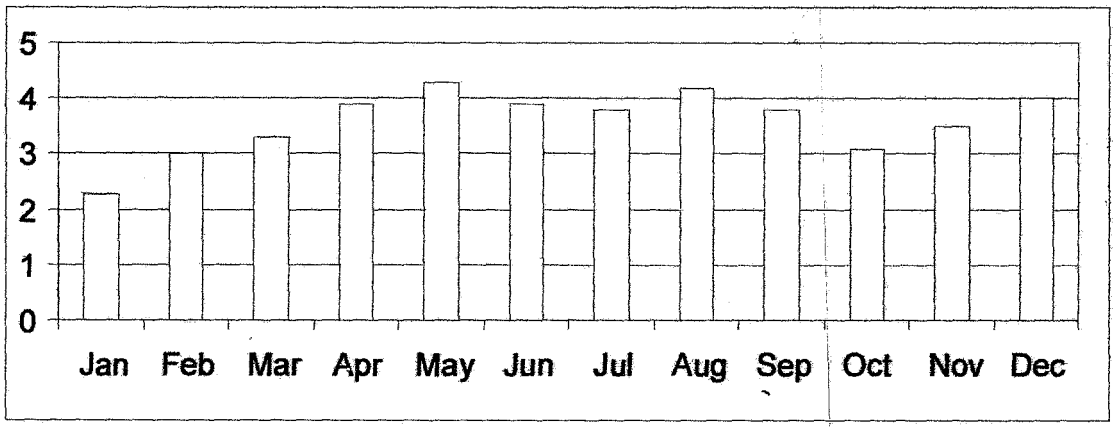


Fig 3.4: Monthly Wind Speed Chart
Source: kwoi girls special science school Kaduna state.

3.4.12 SOCIO CULTURAL LIFE

The Ham people are predominantly in Jaba Local Government Area of Kaduna State. The Jaba Ketare (in Kachia Local government) who live across the tributary of Gurara River were under the Zaria Emirate, while those in Jaba local government had an

independent chiefdom. However, in 1996, the Ketare were united with their kith and kin in Jaba local government under one chiefdom - the Jaba (Ham) Chiefdom. Fig. 5.0 shows map of Jaba LGA.

3.4.12 .1 ANCIENT CUSTOMS AND TRADITIONS

The most important ones included the initiation rite, burial ceremony, marriage and 'Ku' (masquerade) - a festival that takes place one in four years. The initiation and 'Ku' were part of their religion, and were therefore important. While initiation rite was a part of the religion, it was also mainly used for training and discipline. Only boys took part in these rites, which took place almost yearly, either during a 'Ku' Festival, or when there was a 'fain' Festival (an occasion for celebrating punishment for wrong doing).

3.4.12.2 MARRIAGE

There were mainly two ways by which a young man could take a wife which are now out of date, and are not practiced at all.

The first one, is that which was arranged by the parents of both and the girl. When a parent had a friend whose wife was expecting a baby, they would inform that friend that if the child was a girl, she would be his son's wife. From the time she was born, up until the time she was old enough to be married, gifts of various kinds such as acha and some cowries are taken to the girls' parents every year. If it happened that the girl should refuse to marry the boy or the parents decide to give her to someone else, the boy would thendemand the bride price, which he had paid over the years. He would take to them a bag about six feet by eight feet. If the girl's parents were able to fill the bag with acha, then the girl was free to marry anyone she wished, but this was not usually possible, and the girl had no choice but to marry the both second way was more fascinating than the first. When a young man saw a girl who

suited his fancy, all he had to do was to tell his friends to go and bring her, even if by force. The girl would then stay in his home with his mother for a week or two. During this period the young man would have to let the parents know about it and at the end of her stay, he and his friends would accompany her home taking along some gifts for her parents. Afterwards the two were m arried. Other customs include Gbogbara festival, which was celebrated just before or after Christmas, meant for enjoyment of the girls. They learnt to cook for themselves and to take some responsibilities. There were also wrestling matches, held every year towards the end of September or the beginning of October and continued for two or three weeks.

3.4.12.3 ARTS AND CRAFTS

a. Iron Smelting: Before the importation of iron into the country, iron smelting had been practiced by the people of Jaba from time immemorial. Evidences show that iron smelting lasted a very long time. One thing that may not be sure about is the fact that there had been two types of smelting- furnaces. The earlier type that was used seemed to have built on the surface of the earth, was circular in shape, and was much wider at the base than the one used much later. The walls might have been shaped more or less like that of Meroe or the Egyptians. The only evidence that now exists of this kind of smelting furnace are circular remains of broken down walls evidently having been burnt with very hot fire and a lot of slug at the bottom of each circular remains of a furnace. The second type of iron smelting furnace is the pit furnace, of which are still in good condition and can be found in places like Kwoi, Nok, Fai, Chori Sambam and many others.

b. **Pottery:** The Ham used to be very good at making pots and other

southern Kaduna. From here, the missionaries spread to places like Kagoro, Kurmin Musa, etc. As a result of their activities, the Ham people were able to adopt the western system of education with S. 1. M. Primary School, Kwoi (Mallam Moude Primary School) and S. 1. M. Girls' Secondary School as being the earliest established schools in the southern part of Kaduna. Gyagaik best known as Mallam Moude offered to help them lean1 Jaba. While he was helping them, they also preached to him and he soon accv.gted the Lord and was the first convert. Others followed his example. Among them were Gaiya Dow (Paul), Kwabau (Peter) and Haigh Yah (Yusufu).

3.4.12.6 THE NOK CULTURE

The skeletal brief of Ham culture cannot be completed without introducing the reader to the fascinating ancient Nok culture, which has earned world acclaim as the oldest in Africa - south of the Sahara. Dated consecutively to between 500 BC and AD 200, although dates have shown that Nok may have started as early as 900 BC *(Ekpo Eyo: Treasures of Ancient Nigeria p.77/* The Nok culture, which is highly sophisticated, produced the earliest known terracotta sculptures south of the Sahara. The mining activity in the Nok village in the 1940s brought about the discovery of the famous Nok Terracotta Head, Among other historical facts found there was the thriving iron smelting activity estimated to have lasted from 500 B.C. Detailed analysis of these important historical findings revealed striking similarities between the Nok culture and that of the Merois in Supper Nile in Egypt, which also thrived at around 500 B.C. The discovery has put forward arguments as to the possibility that iron smelting started in Africa, specifically in Nok Village found in Jaba Local Government Area of Kaduna State. Source: *(Treasures of Ancient Nigeria Text by Ekpo Eyo & Frank Willet. PP 50* & 51). Figure 3.1 shows the Nok Terracotta head.

The Nok Culture

Fig. 5.1 This Nok Terracota Head dates back to c.500 B.C./c.A.D. 200. From Rafin Kuri, Nok (National Museum, Lagos) 79.R.1)

Source: Treasures of Ancient Nigeria
Text by Ekpo Eyo & Frank Willett, pp. 50 & 51

3.4.12.7 THE POP HAM INSTITUTION

3.4.12.8 THE POP-KUS

In those days, the fetish priest called Pop-ku was the head of the tribe, just as the chief is now the head. He had other priests (Clan Priest) who assisted him in running the affairs of the town, clan priests were helped by houses heads or compound heads. The government was more or less theocratic in outlook, though it was not entirely based on religion. Decisions were not unilaterally taken by the pop-ku, but usually in consultation with other pop- kus after each had met and decided on what should be done meetings were held from time to time to discuss matters affecting the whole town or tribe as the case may be. At such occasion, each clan sends its representatives, its pop-ku as their mouth piece. At the meeting, the senior pop-ku presided.

3.4.13 TRANSPORTATION AND TRAFFIC FLOW

The unique location of Kwoi makes it accessible through the three major means of road transportation namely Jos, Nasarawa, Abuja and the main route to Kaduna main town, the LGA is easily accessible from other States in Nigeria. Kwoi sits at the edge of the huge Kaduna market in such areas as huge revenue generation in ginger production and marketing a house for tourism, food production and and cattle reaaring. The LGA has a good road network that adequately links the rural to the urban communities. The road development in Kwoi is of low quality and most of the roads within the town and those linking other towns and villages are rehabilitated from time to time and the major road from kwoi via kafanchan through Kaduna main city is asphalt laid by the state government. The traffic flow is very high on Fridays because that is the market day in Kwoi town and people all over the federation and abroad come to the market because of its popularity in ginger, that is the only

source of good ginger we have in Nigeria.

3.4.14 EXISTING LAND USE AND FUTURE TREND

The Ham concept of land ownership is of the same type as that being experienced in the western Nigeria as well as government land use policy The Ham people belief, is that, the land belongs to gods. Land then remains a vital asset to Ham people since it is believed to have been given to man to grow food, inhabit and bury the dead. In Kwoi particularly, land forms the basic foundation of their economic activity and farming. Various forms of land ownership on the family basis, land ownership based on compound. The compounds headhod and work it jointly with his sons, brothers and servants. Above all land is passed on by inheritance. The existing land use in Kwoi includes:

i. Land for agricultural uses, which is at all the outskirt of the town.

ii. At the heart of the town is predominantly residential as well as the administrative area found at the entrances of the town along the western side of the town.

iii. Fishing activities take place at the surrounding rivers which are found within the area; such rivers include Lang Sabano, Ungwa Kifi river, etc. Rock Quarry activities take place within the Quari and Tandaar and S/Gari outcrops where some igneous rocks are found. The most busy day in Kwoi on Friday (main market day) in which many surrounding villages and people from different towns and cities come to the town (Kwoi) for buying and selling. Thus make the day to be very congested with people and the traffic flow is very tough.

3.5 SITE ANALYSIS

3.5.1 INTRODUCTION

The proposed site for the Ham cultural centre is known as quari and is along Kwoi –Kafanchan road, the site has a gentle slope in nature and has shrubs and trees scattered all over the land, and is surrounded with rocks at the extreme end of which is boardered with a river and some parts of the land has been used as borrowed pit for road construction.

3.5.2 CRITERIA FOR SITE SELECTION

The criteria used for the selection of the proposed Ham cultural centre are as follows:-

a. **ACCESSIBILITY:** The site is easily accessible because of its proximity to the main road that is Kwoi – Kafanchan road

b. **TOPOGRAPHY:** The site is gently sloping with a good soil for construction, the rocks found at extreme side attracts the site for tourism.

c. **TRAFFIC FLOW:** The location of the site for the proposed Ham cultural centre is at the outskate of the town in which the traffic is very low which makes the area to be less busy and less noise which is a good criteria for site selection of a cultural centre.

d. **PROXIMATY TO THE TOWN:** The site is about 1km away from the main Kwoi town in which the issue of accommodation would not be a problem for people patronizing the cultural centre.

f. **SOURCE OF WATER:** There is pipe born water in Kwoi town and the site is very close a river which can also serve as a source of water to the site.

3.6 LOCATION OF SITE

The site is located at the eastern-bypass of the town along Kwoi – Kafanchan road which is about 1km away from the main kwoi town.

3.6.1 SITE CHARACTERISTIC SURVEYS

The terrain of the site is characterized by gentle slope gradient of less than 2%, which is almost a flat land with good drainage feature as water will always find its level. This very gentle slope will allow for proper construction of the cultural centre and other facilities which is desirable taking into consideration that each building should be properly orientated to avoid problems associated with structures. The site drains into the nearby river(R. Sambang Gida) due to its gentle sloping in nature.

3.6.2 VEGETATION

The vegetation of any given site deals primarily with the micro-climatic conditions, its different views and travels. The vegetative cover of the site are grass cover, shrubs, few and sparsely distributed trees, and small outcrops of rocks. Most of the trees will be felled during the construction stage while some will be preserved with many more planted where and when necessary to complement the existing ones to act mainly as buffer zones against odour and noise, to provide shade without obstructing airflow, and to serve as screen and sun breakers for the people in hot weather.

3.6.3 DRAINAGE

As the terrain of the site is characterized by gentle slope gradient of less than 2%, which almost characterize it a very flat land, the site provides a very good ground for pipe laying and for any method of drainage to be employed artificially. Erosion and any problem of runoff water are equally checked. The researcher inspires to have all the waste generated on the farm gathered in a cesspool for easy collection of droppings for the

generation of biogas and for further treatment of water.

3.6.4 SOIL

The soil on the site is predominantly sandy loamy and clay soil in some areas with tropical subsoil which is very good for agriculture and some parts of the soil contains some small rocks.

3.6.5 SUN

The sun rises from the eastern part with mild heat and glare; it reaches overhead at noon and sets in the western part with more heat but later giving way to cool evening breeze to take effect. The cultural centre must be oriented away from the glare of the sun as to reduce much heat and humidity .

3.6.6 WIND

On site, there basically two distinct prevailing winds. The South – West Trade Wind, which is characterized by cool and moist air, humid, breezy and stormy rain winds blows from the Atlantic Ocean. It is characterized by torrential down pour; it is wet, cool and comfortable. The North - East Trade Wind is characterized by its hotness and dryness. It causes harmattan, it is dusty and windy. It is consistent from November to March. To control the prevailing winds on site, windbreakers both natural and artificial such as planting of trees were introduced and buildings were also properly orientated.

3.6.7 LAND USE

Presently, a large portion is being used for planting crops such as cassava, maize, ginger pending the time money will be available to the researcher to start developing the site.

3.7 ACCESS AND CIRCULATION

3.7.1 Access

The site is strategically located close to the residential quarters of Kaduna state water

board quarters kwoi. The main access is through Kwoi - Kafanchan Road. It is easily accessible from the express road as motorable way has been provided by the state government.

3.7.2 Circulation

The site for the proposed cultural centre can be easily accessed from the expressway through:

(a) PEDESTRIAN ACCESS: This means access routes for pedestrian traffic

(b) VEHICULAR ACCESS: All roads leading in and out of the site has already thru the main express road. There are graded untared motor able roads within the site which can be serves both services and public accesses.

3.7.3 UTILITIES

All possible social amenities in the form of electricity, cables running along the site, water pipelines, and largely because of the residential houses, Government day secondary school and Kaduna state water board quarters that are closed by.

3.8 SCENERY/MAN MADE FEATURES

Power lines and electric poles transmitting electricity serving the village and the nearby of Kaduna state water board quarters and water pipe lines passing to the neighboring village, and with the large expanse of land serving as a borrowed pit are just some of the scenery/man made features that are pleasing to the eyes and all in all make the area very feasible and conducive for the sitting proposed Ham cultural centre.

3.9 PLANNING LAWS AND REGULATIONS

As can be seen from the background of the Ham people the economic and commerce of the Ham people and Kaduna state in general is mainly agricultural. In this light, the Planning Laws and Regulations of the State have marked out some areas for particular

purposes. Kwoi town in Jaba Local Government Area of Kaduna State where the proposed Ham cultural centre has been earmarked as a purely agricultural area. By virtue of this, a lot of farming activities and cattle farming are being operated on a large scale there.

3.10 DEDUCTIONS

The philosophy behind the design is to achieve a multidimensional environment where a dynamic blend is achieved between the natural and man made elements. This philosophy has to touch on every component unit of the complex since arts, craft and culture is a spiritual exercise that involves the whole being of a man. It is creativity and every form of creative work has to be appraised in one way or the other so as to influence further output of the artist.

For effective management of cultural canters, perhaps the most viable planning have to be adopted to achieves a best management practice. Proper orientation of the cultural centre in accordance to the prevailing wind prevents undesirable disturbances on the site, planting of tall trees, proper disposal of waist and generally maintaining a clean environment go a long way in helping us achieve this goal.

However, well designed, constructed and maintained drainage systems will not only provide comfort for the people, but will also prolong the usefulness and durability of the buildings. In the planning process a large and well designated parking spaces to be put into consideration since large number of people will patronize the centre each day due to its various importance functions. Periodic checking should also be carried out on all the drains so that any blockage can be detected early before the cultural centre is faced with its attendant problems.

Coupled with these, government agencies should rise up to the challenge. Laws and regulations should be laid down as guidelines for all cultural centers . If all the aforementioned points can be considered seriously, our cultural centre's will not only be environmental friendly, but also will compete with the best cultural centre in the word.

CHAPTER FOUR

4.0 RESULTS

4.1 DESIGN BRIEF

The design is proposed for Ham people (Jaba) in Jaba Local Government Council in Kaduna State. It is to be developed to uplift the awareness of the people's socio-cultural and revive cultural heritage in order to prepare for the future challenges. It is in realization of the rich cultural heritage of the state and in particular that of the Jaba local government council combined with the policies of the Federal and State Governments concerning culture that the brief will follow.

To achieve the desired effect, it is inevitable that improved facilities have to be provided to make a new innovation to cultural centre designs in Nigeria. The centre is also expected to generate revenue to help maintain it and to pay some permanent staff that would be employed there.

To achieve a good and functional cultural centre the list of functional spaces as needed should be investigated by involving experts on cultural studies. They are to help in drawing of programmes in adherence with other professionals to its purpose and functions. However, the functional space to be incorporated in the centre is the followings: Administration department, Exhibition Halls, Restaurants, Craft shops, Theatre/ Auditorium, Recreational, park including Kiosks, giftshop

Seminar/Conference hall, Amphitheatre and parking lots.

4.1.1 COMPONENTS OF CULTURAL CENTRE

4.1.1.a ADMINISTRATION DEPARTMENT:- The department is to see to the day-to-day running of the centre. However, each department has its staff to organize and prepare for any show or exhibition. The administrative department facilities include provision of office spaces for staff, including the public relation office, convenience and store.

4.1.1.b EXHIBITION HALLS: This is one of the most important units of the complex and calls for careful handling. Here the collections are displayed, at times individual exhibitors do involve in exhibitions, all for the public viewing. Lighting is the most important factor here because it facilitates vision. In addition, it must have direct access to the public.

4.1.1.c THREATRE: These are spaces where performing artists are to engage in their business. The theatre must include the auditorium, stage, back stage, rehearsal rooms, workshops and the convenience both for the spectators and the performers. The acoustic, lighting and air circulation are the most considerations that must be put into any theatre design. This is also "a place for lectures, seminars and conferences. It is used for educational purposes involving large groups. The facility must include a hall, stage and convenience. The acoustic performances inside the hall should be excellent.

4.1.1.d RESTAURANT: To accommodate visitors who have intention to eat something, mostly indigenous food. The space will be provided to accommodate seats, tables including the circulation spaces. In addition, the preparation and servery section will be provided.

4.1.1.e THE WORKSHOP: This section is very important but in many existing cultural centres, it had not been given the best treatment. It will be part of the complex since the tourists are curious about them so also the artists or the craft men are willing to expose their works. Each shop will be divided into two parts, the outer area for display and the inner space for production. Other components are production centre, museum and guest chalet.

4.1.1.f SHOPS: This section is intended for the purpose of generation of revenue for the administration/maintenance of the complex. In addition, it is essential to have spaces for the display of cultural materials by individual sellers to the visitors. The centre is proposed to welcome tourists who are always interested in buying items of their choice.

4.2 SCHEDULE OF ACCOMMODATION (SPAC NALYSIS/ALLOCATION)

ADMINISTRATIVE BLOCK

(sq.m)

	AREA
Head of planning, Research and Statistics	8.40
Head of Performing Art	8.40
Head of Technical Art	8.4

Head of Protocol and Exhibition	8.4
General Manage	13.44
Secretary (Administration)	8.40
Accounting	14.40
Computer/Records	28.80
Reception/Waiting Area	61.20
Board Room	53.30
Supervision	10.20
Minishow Room	24.48
General Office	66.30
Audit Room	9.06
Store	24.00

AUDITORIUM	**AREA (sq.m)**
Booking Room	138.00
Sitting Area	600.00
Rehearsal Room	60.00
Changing Room,	45.60
Projecting Room	12.00
Stage	45.00
Costume Room	20.80

MUSEUM HALL ACCOMMODATION	AREA (sq.m)
Museum Hall	800.00
Library Storage	150.00
Archive	25.00
Conveniences	73.92
Lobby	16.00

RESEARCH CENTRE ACCOMMODATION	AREA (sq.m)
Traditional School	90.00
Modem School	90.00
Library	180.00
Head of Schools	23.76

EXHIBITION CENTRE ACCOMMODATION	AREA (sq.m)
Exhibition Hall (Temporary)	70.40
Exhibition Hall (Permanent)	184.00
Control Room	12.00
Store	26.00
Toilet	6.48
Lobby	66.00
Craft Shop	248.00
Tie and Dye Shop Weaving	60.00
Shop	60.00

Gift Shop	60.00
Store	14.40
Toilet	17.28
Entrance Lobby	81.20
Convenience	64.00
AMPHI-THREATRE UNIT	**AREA (sq.m)**
Entrance Lobby	128.00
Auditorium	594.40
Stage	30.60
Rehearsal/Costume	36.10
Changing Room	17.28
Toilet	43.20
Lobby	28.00

4.3 DESIGN BRIEF

The design is proposed for Ham people (Jaba) in Jaba Local Government Council in Kaduna State. It is to be developed to uplift the awareness of the people's socio-cultural and revive cultural heritage in order to prepare for the future challenges. It is in realization of the rich cultural heritage of the state and in particular that of the Jaba local government council combined with the policies of the Federal and State Governments concerning culture that the brief will follow. To achieve the desired effect, it is inevitable that improved facilities have to be provided to make a new innovation to cultural centre .

The philosophy behind the design is to achieve a multidimensional environment where a dynamic blend is achieved between the natural and man made elements. This philosophy

has to touch on every component unit of the complex since arts, craft and culture is a spiritual exercise that involves the whole being of a man. It is creativity and every form of creative work has to be appraised in one way or the other so as to influence further output of the artist.

4.4 MATERIALS AND CONSTRUCTION TECHNIQUE

"We must aim at the fixing of stand3rds in order to face the problem of perfection" Le Corbusier. "Construction and services specification is a very vital aspect of every successful design. The essence of every preliminary step taking towards achieving this design proposed is to aid in the construction and detail analysis".

4.4.1 CONSTRUCTION

"Future architects, even if they can entrust the final calculation of a structure to specialist must themselves first be able to invent it and to give it correct proportions only then will a structure be born healthy, vital and

possible beautiful" Nvervi (1991). The structure will be subdivided into substructure and the super structure.

(i) **Substructure** will include the foundation, the foundation wall and floor.

(ii) **Superstructure** will include the frame structure, walls' and the roof.

The Substructure: - The foundations are made of combination of strip and

isolated pad foundation, the foundation walls shall be concrete hollow block (C.R.B.), well the floor shall be mass-concrete. Finishes in the corridors and walk ways on the red brick floor tiles. The finishes to other functional spaces are terrazzo flooring.

The Superstructure: The frame systems reinforced concrete column And beam with the

external and internal partitioning walls of concrete hollow blocks. The roof is steel frame structure with light aluminum roofing sheets. Reinforced concrete roof deck are employed in some place as found convenient.

4.4.2 MA TERIALS

the choice of materials for the arts and crafts complex are carefully done with their maintenance potentials fully considered along with five resistivity, durability and aesthetic qualities. Advancement in building construction has shown that most building defects area voidable from the design stage. Some defects occur in general not through lack of basic knowledge but by non-application or mis-applicatiol1 of materials. Juxtaposition of materials and components must especially through the use of some building materials in proximity to each other often leads to weathering effects with consequent maintenance expenditure. Reinforcing for concrete in this design is steel because the two materials have an almost identical expansion and concrete. Though strong in compression is weak in tension. Whereas steel is exceptionally strong in tension a combination of these two therefore produce ideal materials for construction.

The reinforcement bar should be clean and free from mud, oil paint or loose dried mortar, loose rust or mill scale will be automatically removed in handling and placing. The number, sizes and placement of reinforcement bars in the varied point of construction are strictly to the structural engineer's details and specifications. However, any reinforcement that projects above concrete should not be carelessly handled for at least seven days lest the bond be impaired. Laminated glass with specially treated or pigmented plastic sandwiched between glass layers is specified. This is because when this type of glass receives a sharp impact and breaks, the adhesive holds the glass from shattering and flying about and this keeps it within the frame. This is employed most especially in the restaurant and multi-purpose hall so as to reduce accident from glass cut during accidental breakages.

4.4.2.1 ROOFING MATERIALS

Roofing materials are reinforced concrete and corrugated aluminum sheet with considerable pitch. The choice of the later is due to:

a. Require no painting.

b. Reflective insulating value.

c. Light weight.

d. High fire resistance.

e. Highly durable for about 20 years.

4.4.2.2 FLOORING MATERIALS

a. Floors in the technology of this project are one of the finishes within building, upon which people walk, furniture and specialized equipment are placed. In addition, materials such as gravel, crushed rock, clean concrete rubble and quarry wastes and free from soluble sulphate attached concrete floors. Five basic criteria were considered for selecting a flooring material for the different functional spaces in the complex. These are: The substance upon which the flooring is to be applied must be of a type suitable to receive the flooring.

b. The expansion and construction of the substance and of the flooring materials itself must be considered in the selection of the flooring materials.

c. Various types of flooring require different depths changes in levels of the substance must be checked in each particular case.

d. The maintenance requirements for each of the flooring selected are determined and the client is to be duly informed of this.

e. Where different types of flooring materials meet, the treatment of these joints are carefully checked.

Reinforced concrete stone paving and concrete pavement are used in conjunction with each other for the external finishes (walk ways and paths). While cement plastering to walls and paint finishes are also used for internal space. Durability and easy maintenance potentials form the yardstick for the choice.

4.4.2.3 AESTHETIC FINISHES

Paintings are used for aesthetic finishing of the cultural centre. The internal and external spaces are painted with textcote, gloss and emulsion paints as the case may be. Abstract painting depicting cultural centre are designed at vintage locations in the centre using bead media. The parapet walls covering mostly in the elevations are finished with mosaic bead painting. The whole idea on materials choice could summarized by the quotation below written by a novelist and poet who saw glass as the material of the future. "We live in the most part in close room. This forms the environment from which our culture grows. Our culture is to a certain extent the product of our architecture. If we want our culture to rise to a higher level we are obliged, for better or for worse, to change our architecture. And this only become possible if we take away the close character from the room in which we live. We can only do that by introducing glass architecture, which lets in the light of the sun, the moon and the starts not merely through a few windows, but through every possible will, which will be made entirely of glass – coloured glass. The new environment which we thus create must bring us a new culture" Scheerbait P (1980).

Reinforced concrete stone paving and concrete pavement are used in conjunction with each other for the external finishes (walk ways and paths).

While cement plastering to walls and paint finishes are also used for internal space. Durability and easy maintenance potentials form the yardstick for the choice. Reinforced concrete stone paving and concrete pavement are used in conjunction with each other for the external finishes (walk ways and paths).While cement plastering to walls and paint finishes are also used for internal space. Durability and easy maintenance potentials form the yardstick for the choice.

4.5 LANDSCAPE AND EXTERNAL WORKS

External works for cultural centre needs special attention. This is because the interior of the cultural centre should be built with acoustic materials to prevent unwanted sound within the centre.

Access road to the centre should be designed in such a way that there is a buffer zone between the main cultural centre and the other buildings. Such a buffer zone can be created by keeping gardens of both flowering plants and non flowering plants within the centre.

Fruit bearing trees have adverse effects on the environment and their capacity to attract insects and flies have to be taken into consideration. On the whole, any environmental condition that will cause pollution should be avoided in the external work and landscaping of the centre.

Trees particularly ones of good specimens would be preserved if possible, any tree which have a commercial value such as hardwood would be utilized in the construction of the cultural centre at reasonable distance away from the buildings. Vehicular traffic should be clearly defined away from pedestrian traffic by the use of cabs and by raising the level of the walkway.

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4.6 DESIGN SERVICES

Whatever the methods available to man, the environment and services designer must attempt to take part in the basic development of the design of buildings with which he is concerned. He must realize that balances have to be made between the various aspects involved. It is rarely possible, within the constraints of practical design and finance, to achieve the ideal solution to all the problems presented. Some, indeed, may be mutually opposed, improvement of one resulting inevitably in deterioration of the other. A specialist consultant must be able, not only to advocate the best solution from his point of view, but also to take a constructive part in reaching an optimum overall solution which, while not perfect from many specialists' viewpoints, gives nevertheless the best result for the building as a whole.

Design services refer to systems inculcated into a built environment to make the building and its environment comfortable for living; amongst them are drainages, electricity, refuse disposal system, cooling and ventilation, water supply, acoustics, fire safety, security, maintenance and fire control.

At the design stage, these services are considered so that adequate planning, space and fixtures are provided for each of them. Well planned, skillfully imputed and frequently maintained services keeps the environment in a state whereby effects of changes in environmental factors such as wind, sun and rain does not affect life within the buildings.

4.6.1 ELECTRICITY AND LIGHTING

Electrical system provides light and energy to run building equipments. Since the main source of electric power supply to the site is from the Power Holdings Company of Nigeria (PHCN), through a three phase network distribution of electric transmission, electricity will be tapped from the nearest mains from the substation to the site. For minimum disruption of operations on the farm, due to the interruption in power supply by PHCN, an alternative power source is to be provided for on site by means of a 1500KVA generator for a maximum of two years before the farm can adequately cater for its own power generation by use of poultry droppings.

The electrical wiring system is conduit and only light features, apparatus, equipments and switches are the most visible parts of the electrical system and they will be located for easy access and convenience.In terms of lighting, the advantages of both natural and artificial lighting shall be effectively utilized. Natural daylight is used in all building units during the day through simplicity of form, good orientation, as well as the placement of large window openings to the outside. At night, special effect is created in and around the different buildings using varying lighting system such as sodium lighting.

4.6.2 VENTILATION AND AIR CONDITIONING

Heating, cooling and ventilation are related phenomena whose variation can affect the thermal comfort of the birds in the enclosed environment.Ventilation prevents the accumulation of dust, odours and spent air etc. Adequate ventilation will be provided through the provision of adjacent and opposite openings that allow free flow of air within the buildings. Cooling systems is provided in the form of ACs that brings cool air into the interior. Special provision will be made for all the buildings during extreme weather condition, heat extractors, fans and general cooling systems will be installed in the necessary rooms, offices for the removal of excessive heat.

Provision of soft landscape such as planting of trees and shrubs also boost the supply of fresh air into the surrounding and to enhance heat and cold moderation of the centres.

4.6.3 DRAINAGE AND SEWAGE DISPOSAL.

Effective drainage sewage disposal within and around the farm is very important for maintaining a high degree of cleanliness and for eliminating the spread of flies and odour. Pitched roofs are provided to fall to gutters which in turn pass water out to the ground through spouts and pipes. The provision of surface drainage enhances the easy flow of runaway rainwater and sewage drainage by means of sewage duct shall be linked to that provided for in the area. In term of sewage disposal, arrangement is made to dispose of foul waste through the common conventional method i.e. form of sewage treatment where foul is retained on the site and periodically removed. Because of this ready access, most especially vehicular access for cleaning and emptying of the foul from the septic tanks and the soak away pits.

4.6.4 WATER SUPPLY

Water is essential for human consumption, sustenance, sanitation and comfort. Water is of a primary essence for this project as it is a major life saver. The provision of good pipe –borne water is very important for hygiene purposes. Water supply to the cultural centre would be tapped from the public mains around the site and from the river that is very closed to the site.

4.6.5 REFUSE DISPOSAL

To maintain a clean environment, refuse disposal is necessary waste management is very important in any organization, in the course of this study refuse disposal must be done

often in order to keep the entire centre clean in order to make the centre free from bad odours and abstinence from flies.

4.6.6 FIRE SAFETY

Due to the inadequacies, negligence and errors of man, it is generally acknowledged that it is impossible to construct absolutely fireproof building, as all building materials are affected in one way or the other when subjected to a sufficiently high temperature degree. However, this project will seek to safeguard live and properties. This will be achieved by:

1. Reducing fire incidences
2. Controlling fire propagation and spread by locating buildings at considerable
3. distance from each other for prevention of spread of fire.
4. Providing adequate fire protection throughout the centre by escape routes.
5. Providing adequate fire protection throughout the centre by ensuring that there are fire safety fire fighting equipments installed at strategic locations in and around the farm. Some of the measures to be taken are by providing:

a) Fire alarms

b) Fire detectors

c) Smoke detectors Fire extinguishers and extinguishing systems

d) Water hydrants and sprinklers

Moreover, ready access and escape routes are provided at strategic areas. Another method of fire prevention mechanism is the creation of large cover area during the site planning.

4.6.7 SECURITY

The presence of security or lack of it in any building plays a very role in the general success of any building as occupants need to have a sense of security to ensure maximum

productivity. And of great importance is security for this project as it was deducted from the case studies carried out that both birds and eggs are stolen without mercy by the workers. The proposed perimeter fence of the site will be corroborated by the provision of a gate house with security men to ensure adequate control of movements as well as securing cars parked. Moreover, all units on the centre will be connected to an alarm which triggers off automatically at the security post. The security network of the centre will also be connected to the district police post in the case of serious burglar. The security of the centre has to be tight so as to reduce loss of resources due to theft that is preventable.

4.6.8 MAINTENANCE

Although, the choice of materials must satisfy low maintenance cost, good maintenance culture must be cultivated for the building components to last for a longer period of time. Plants and trees are to be maintained by regular pruning and cutting. The grasses should be trimmed and be well cut at regular intervals. The services such as lighting, plumbing and electricity shall be carried out periodically. In order to reduce running cost of maintenance, the materials will be well chosen at the construction stage such that it requires little maintenance and provisions will be made during construction that all parts of the buildings should be easily reached for maintenance works to be carried out on them especially the roofs, slabs, the toilets and the kitchen water systems. A maintenance department will however be created within the centre to oversee the maintenance of the centre. The function of the maintenance department would entail the smooth functioning on a day to day basis of the facilities, utilities and services within the cultural centre.

4.6.9 SOLAR CONTROL

This infers to the reduction or increment in the amount of sunlight entering the poultry houses in particular by its effective utilization. Direful consideration of form,

fenestration and orientation in relation to sunshine are vital factors in the planning and designing of the buildings t prevent the birds from dying in their hundreds. These are supplemented with the use of screens and blinds where necessary to control the degree of sun penetration. Trees will also be planted to provide shades for the building.

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 DISCUSSION

"Living architecture is that which faithfully expresses its time. We shall seek it in all domains of construction. We shall choose works that strictly subordinated to their use and realized by judicious use of materials, attain beauty by disposition and hanllonious proportions of the necessary elements of which they are made up." (Perret 1923). Architecture has a tripartite ability of satisfying the functional, structural and aesthetic aspiration of any commission. The proposed cultural centre in Kwoi (Headquarter of Jaba Local Government Council) has been fully conceived, conceptualized and packaged as an edifice for aesthetic excellence. Articulated landscape has been consciously elevated to the level of being a functional unit even at the preliminary conceptual stage to achieve its full integration to the whole design.

Architecture cannot be divorced from beauty, it then normally flows that a structure is never a work of architecture until it belongs to its environment. The environment of this project 'is to the human and physical. The human aspects of the environment are the people for which the design is aimed at. The construction site is heavily blessed with trees and shrubs.

This landscaping element has been organically considered in the design and site zoning to highlight the architectural edifice. The aesthetic appreciation of the complex is further expressed in the choice of materials, finish, and colour scheme both internally and externally. The interior finishes of the theatre ceiling is consciously done to enhance the structural framework and details of the waffle ceiling system.

5.2 CONCLUSION

The research has exposed the Ham's people way of life. The changes and trends of things especially adaptation of foreign lifestyles in our society nowadays is becoming terrible and one of the basic causes of this is the lack of cultural sense of belong. It is rather sympathetic because it is not the wish of the youths to follow the same trend of life but this is what they grew into. The reason being that we have not effectively utilized the opportunities available in our various cultural inheritances, instead we dogmatically adopted the foreign culture. It is not too late to revive and promote our cultural and that is why my proposal is focused towards that direction i.e. building cultural centres alone could not solve this problem, but a total retrace of our cultural backgrounds and urgent steps taken.

In this proposal, it had clearly opened up opportunities for various inter-cultura exchange programmes such as cultural plays, seminars/conference, film, exhibitions (display of cultural wealth), etc. These are considered among others as effective tools for the revival and promotion of our culture. In addition, I have shown clearly the significance of our cultural promotion as a stepping stone towards a united society and future development.

5.3 RECOMMENDATION

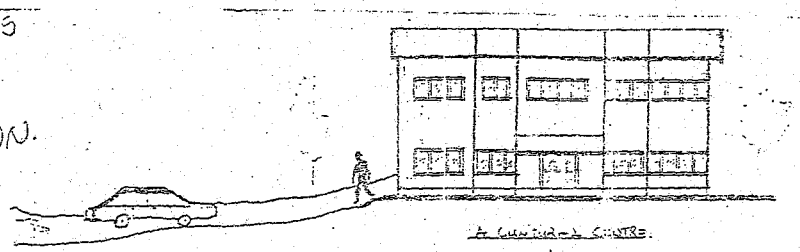
The cultural centre is a multi -dimensional environment where a dynamic blend is achieved between the natural and synthetic elements through the provision of effective socio-cultural amenities which influence the behavioral pattern of the dwellers. The idea of this complex is such that afford the conscious culture of the people of Kaduna State and ample opportunity to constantly exhibit their cultural heritage as well as conll11une with life and nature.

The potentials of the town to become a highly urban centre within the shortest space of time is quite impressive. The character of a town depends on its inhabitants as individuals, the development of the individual depends on the environment and the amenities present. An effective cultural environment such as this complex influences the behavioural pattern of the people as a result of interaction between its physical environment and the user. A town like Kwoi is undergoing a metamorphic change, name: ginger and population explosion and quest for cultural changing with it, everybody is becoming very conscious of the restoration of culture identity.

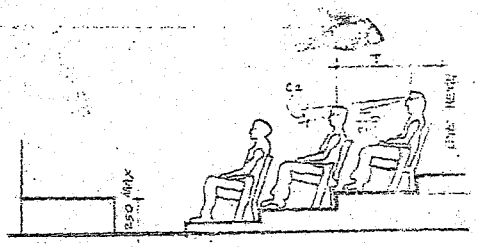
Nigeria easily posses one of the world's most attractive change in arts and cultural potentials and these in essence are amply reflected in the geographical in the state could be variously classified .as natural, historical and man-made. Virtually all the local government areas in the state have a range of attraction to offer the foreign and local visitor alike. The proposed cultural centre is definitely cut out to fill a vacuum and compliment the aspiration and culture evolved in realizing the basic objective of the centre which are fostering, publizing, encouraging, developing and promoting our cultural heritage in the area within an aura of oneness.

RESEARCH FINDINGS

ACCESSIBILITY IS BY NORMAL MEANS OF TRANSPORTATION.
BUT NOT TO BE LOCATED IN A BUSY AREA.

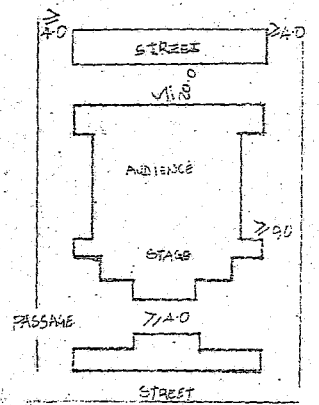


A CULTURAL CENTRE.

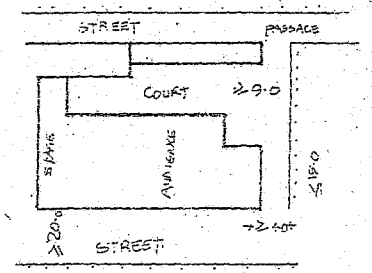


STAGE AND SEATING ARRANGEMENT

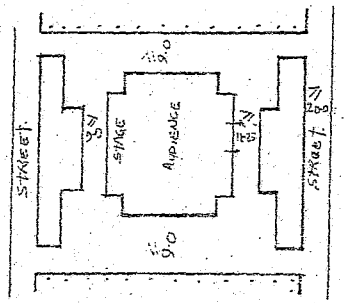
EYE HEIGHT : 1120 ± 100
TREAD OF SEATING TIER (ROW SPACING) (T = 800 - 1150).
HEAD CLEARANCE C:
C1 = 65: MIN CLEARANCE / ROW
C2 = 130: ALLOWS AVERAGE SEE OVER HEAD AT SPECTATOR INFR RONT



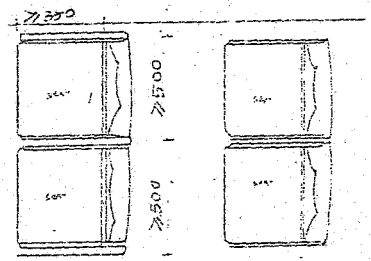
DISTANCE TO ADJOINING BLDGS. F THEATRE ⊥ TO STREET

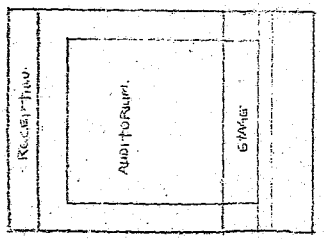


DISTANCE IF THEATRES PARALLEL TO STREET



DISTANCE IF THEATRES LIES B/W BLOCKS

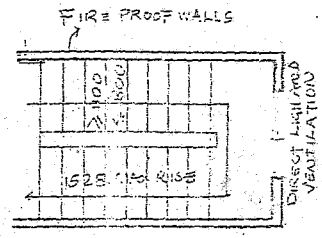




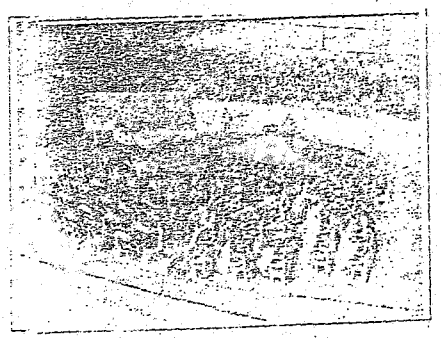
THEATRE MAY BE DIVIDED INTO THREE:
(A) RECEPTION: ENTRANCE, BOOKING HALL, FOYER, CLOAKRM, SOUVENIRS, SHOPS ETC.

(B). AUDITORIUM.

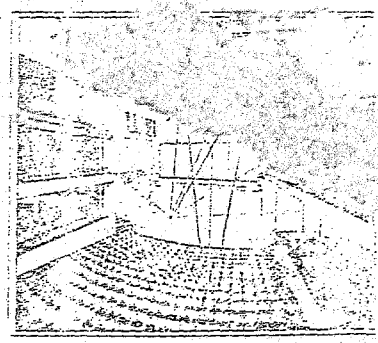
C. STAGE: MAIN STAGE, WINGS, BACK OF STAGE, SCENERY, STORES, WORKSHOP DRESSING ROOM, COSTUMES, TOILETS AND SMOKER ETC.



MAIN STAIRS

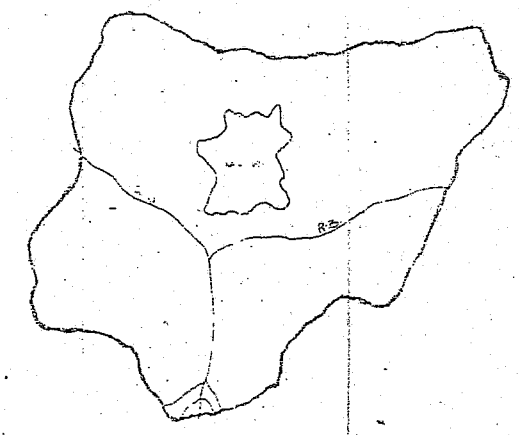


SEATING ARRANGEMENT IN A CIRCULAR ROOM

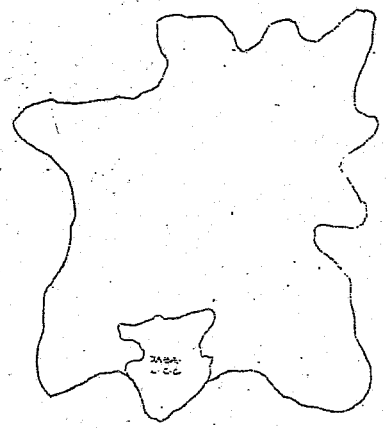


REFLECTION IN A ROOM (E CIRCULAR / RECTANGULAR)

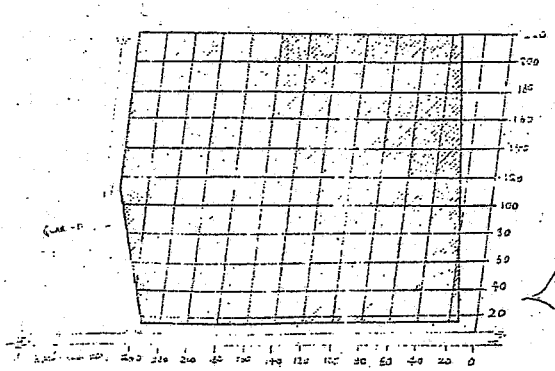
SITE LOCATION

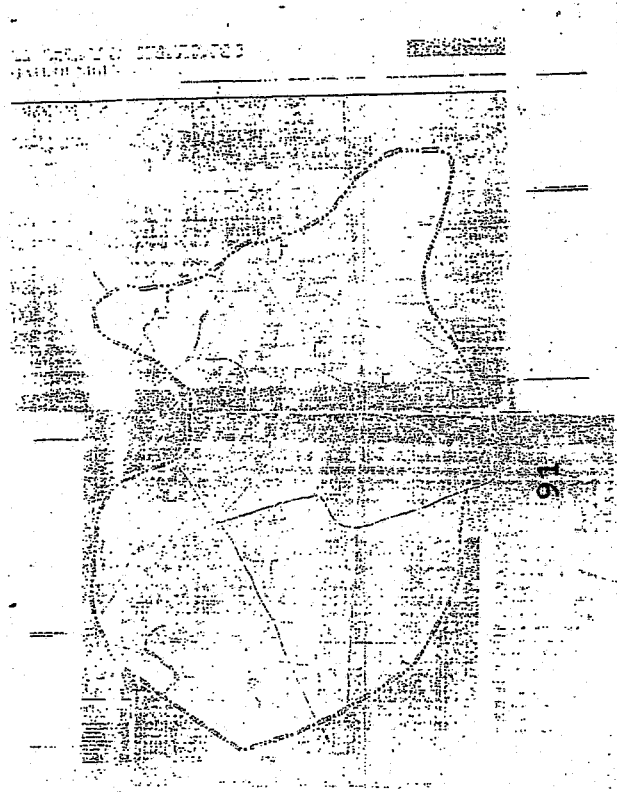


MAP OF NIGERIA SHOWING KADUNA STATE

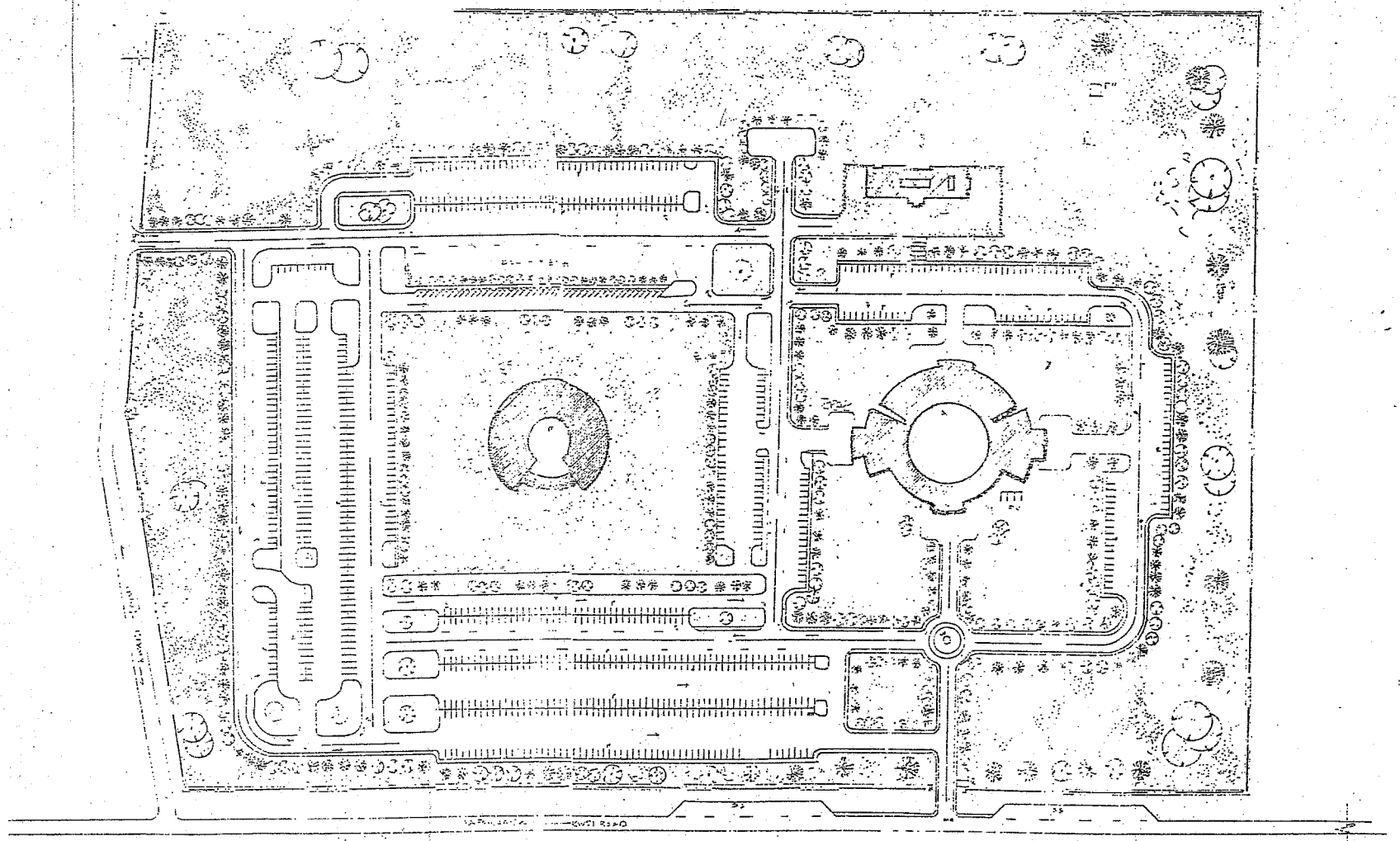


MAP OF KADUNA STATE SHOWING JABA LOCAL GOVT COUNCIL





MAP OF JABA L.G.C. SHOWING THE PROPOSED SITE



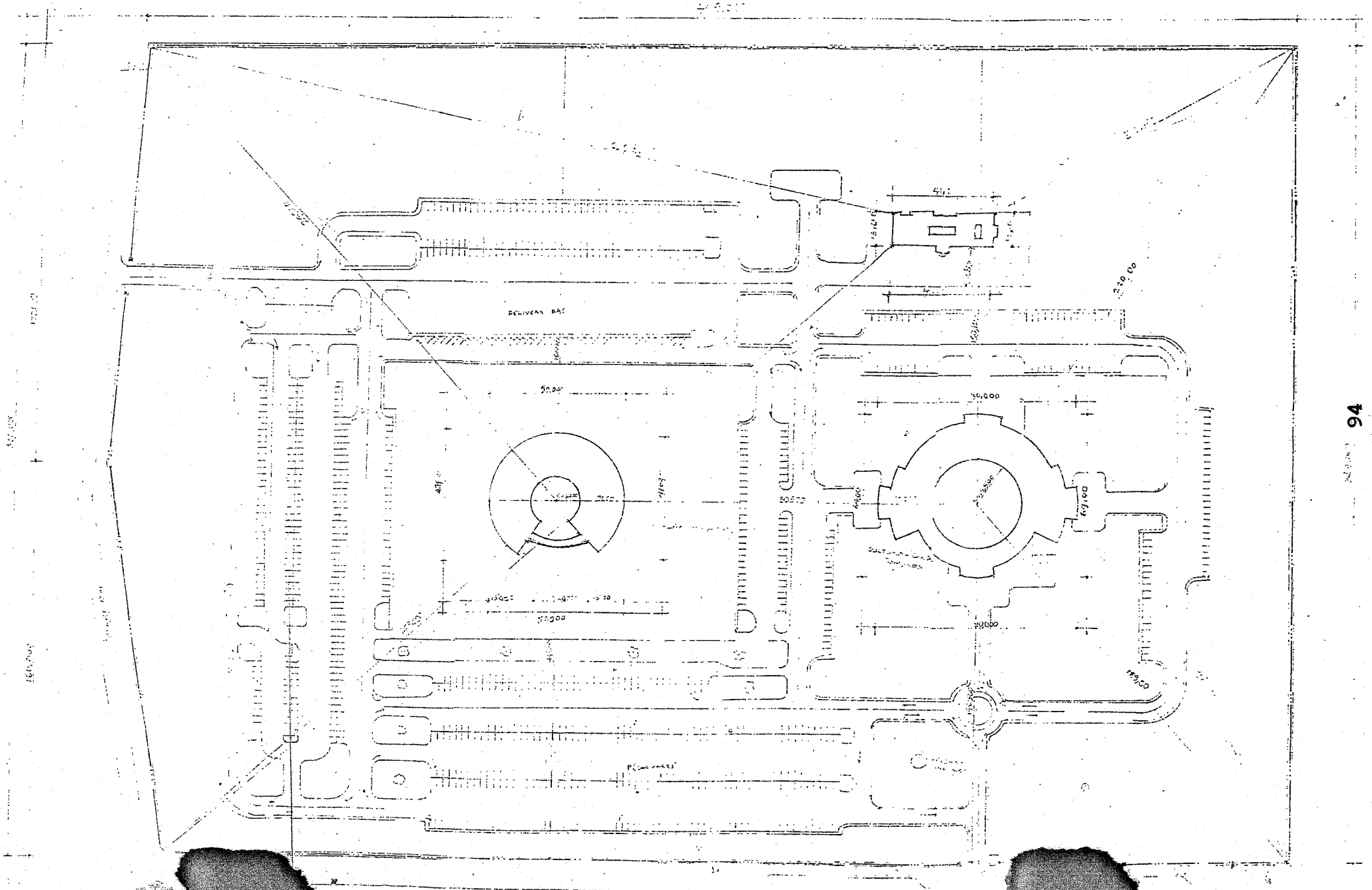
SITE PLAN

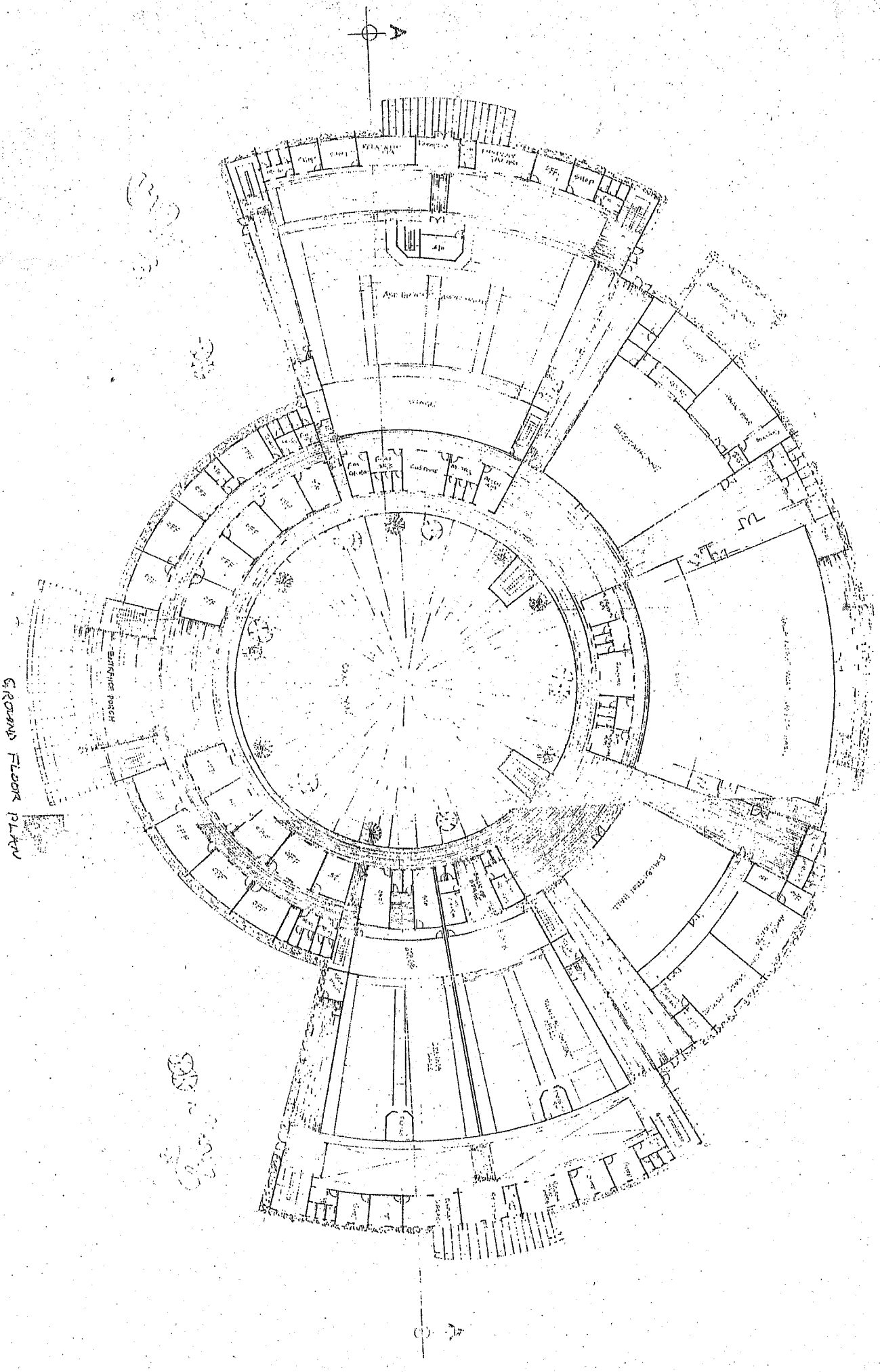
LEGENDS

A - THE MAIN CULTURAL CENTER COMPLEX.
B - AMPHI THEATRE
C - WORKER'S FACILITIES
G - GATE HOUSE.
P - PARKING LOTS.
PH - POWER HOUSE.
W - WATER FOUNTAIN.
T - TREES, SHRUBS, FLOWERS AND GRASSES.
R - THE KNOPPIN PARKING SPACE.
SA - SERVICE GATE
VIP - V.I.P. PARKINGS
BS - BUS STOP.

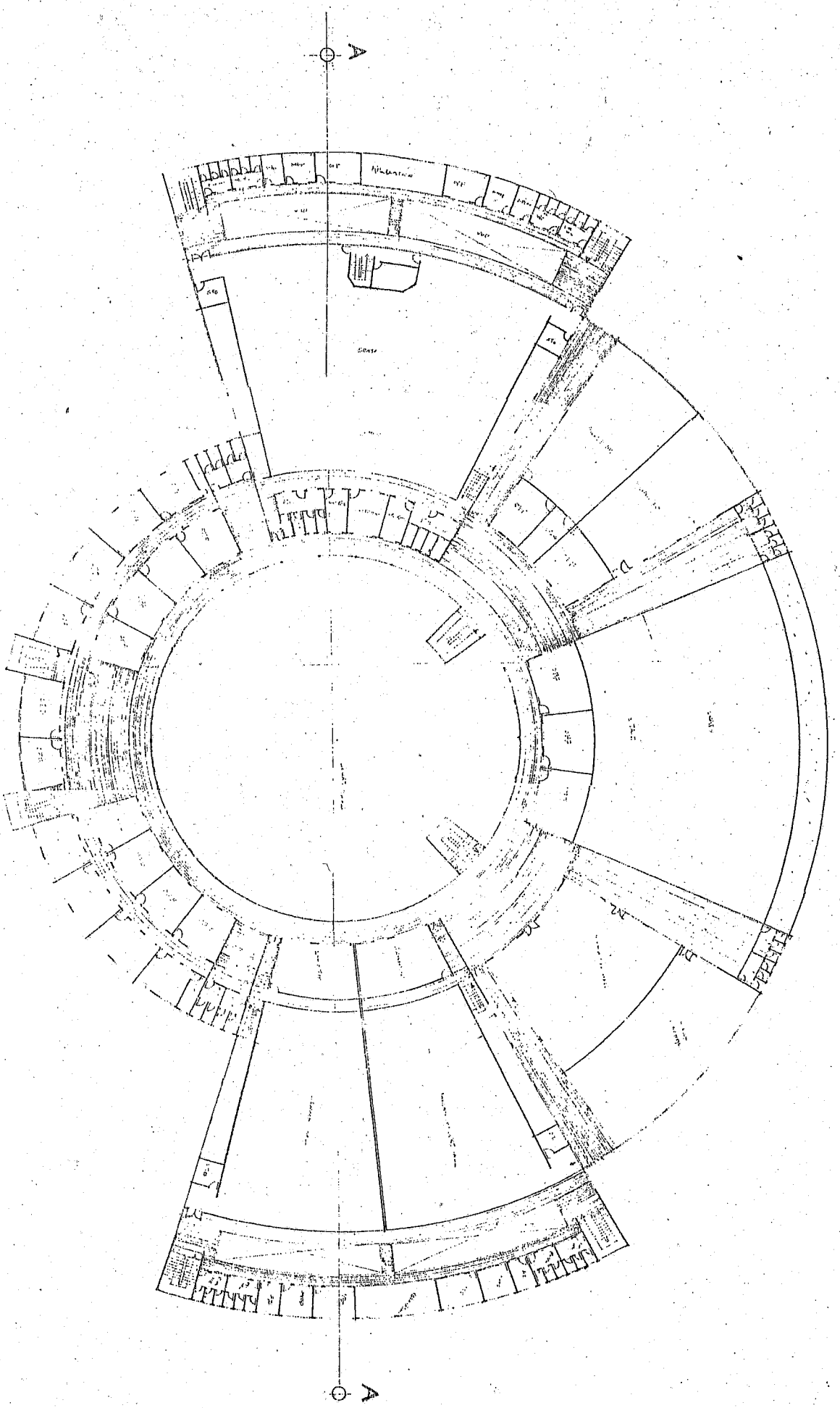
WORKING DRAWING

SITE PLAN

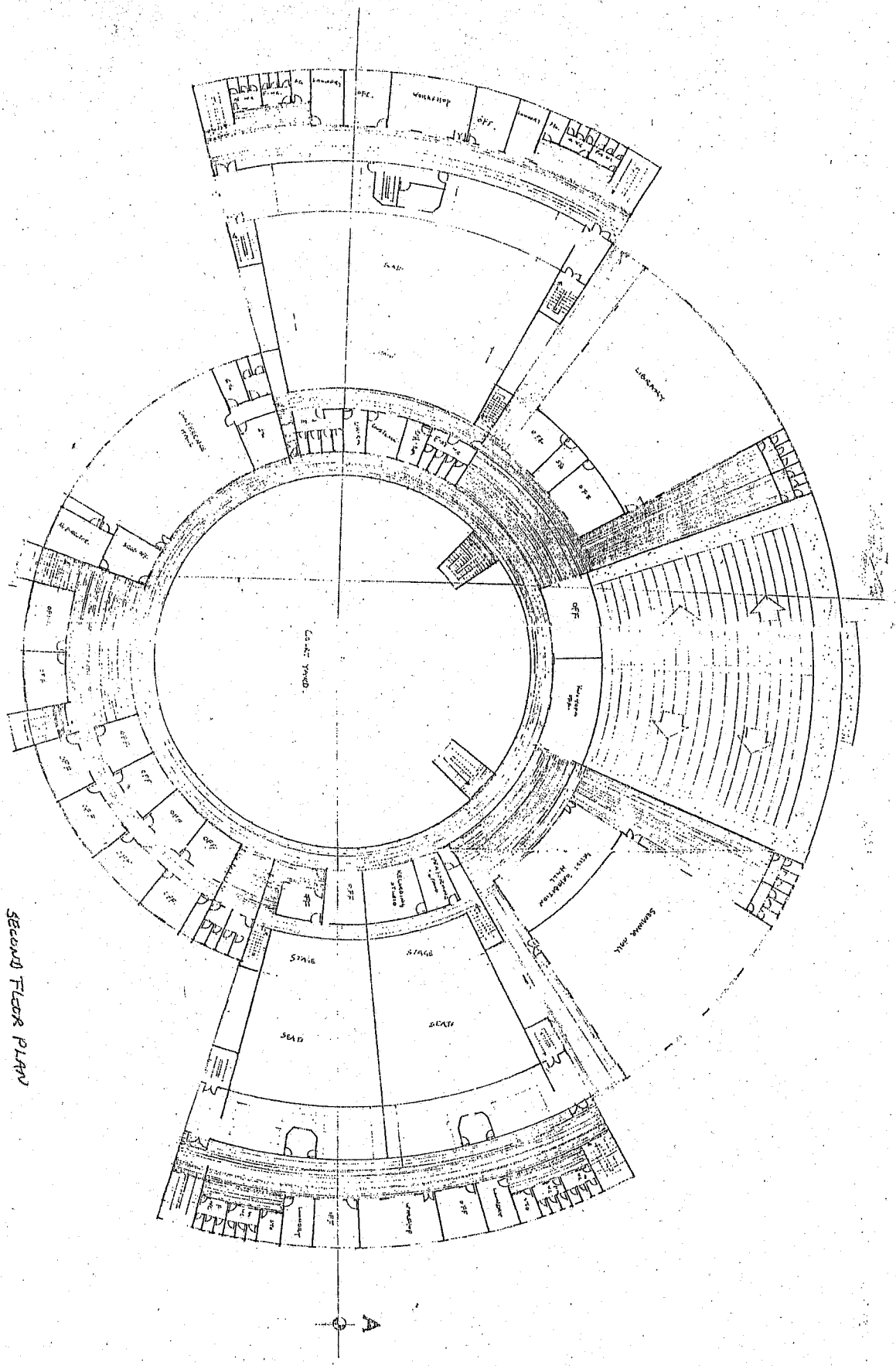




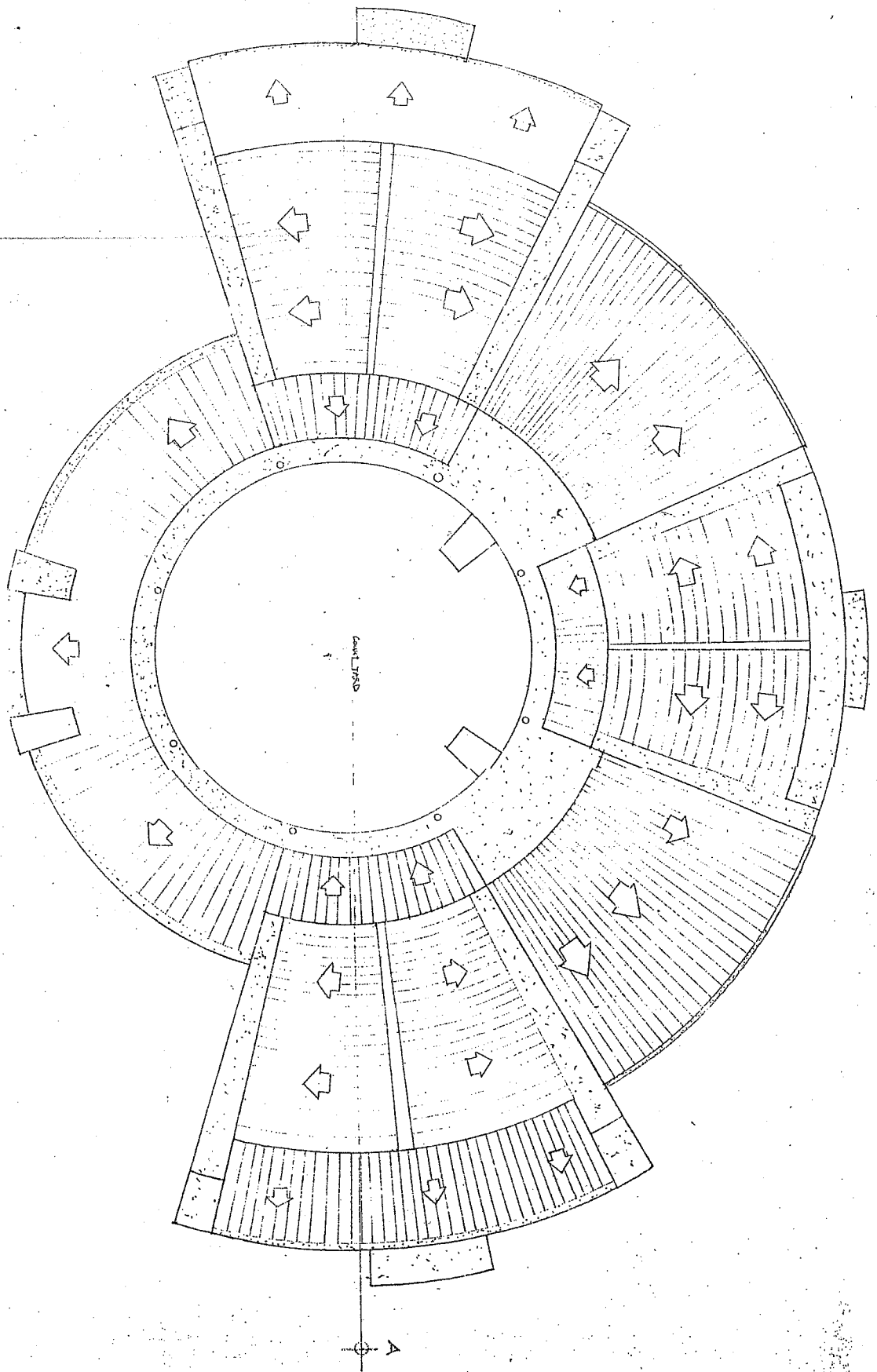
GROUND FLOOR PLAN



1st FLOOR PLAN

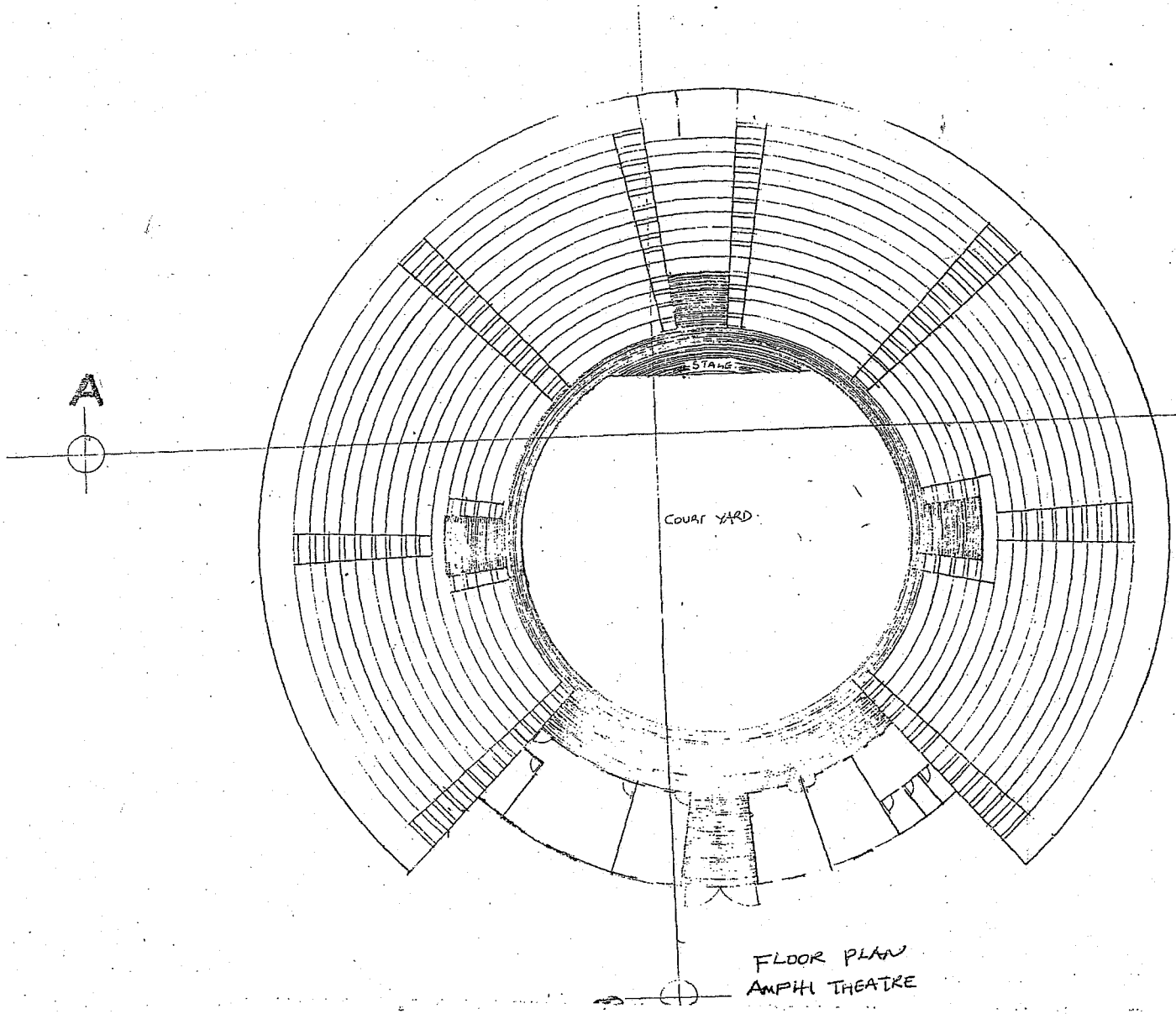


SECOND FLOOR PLAN

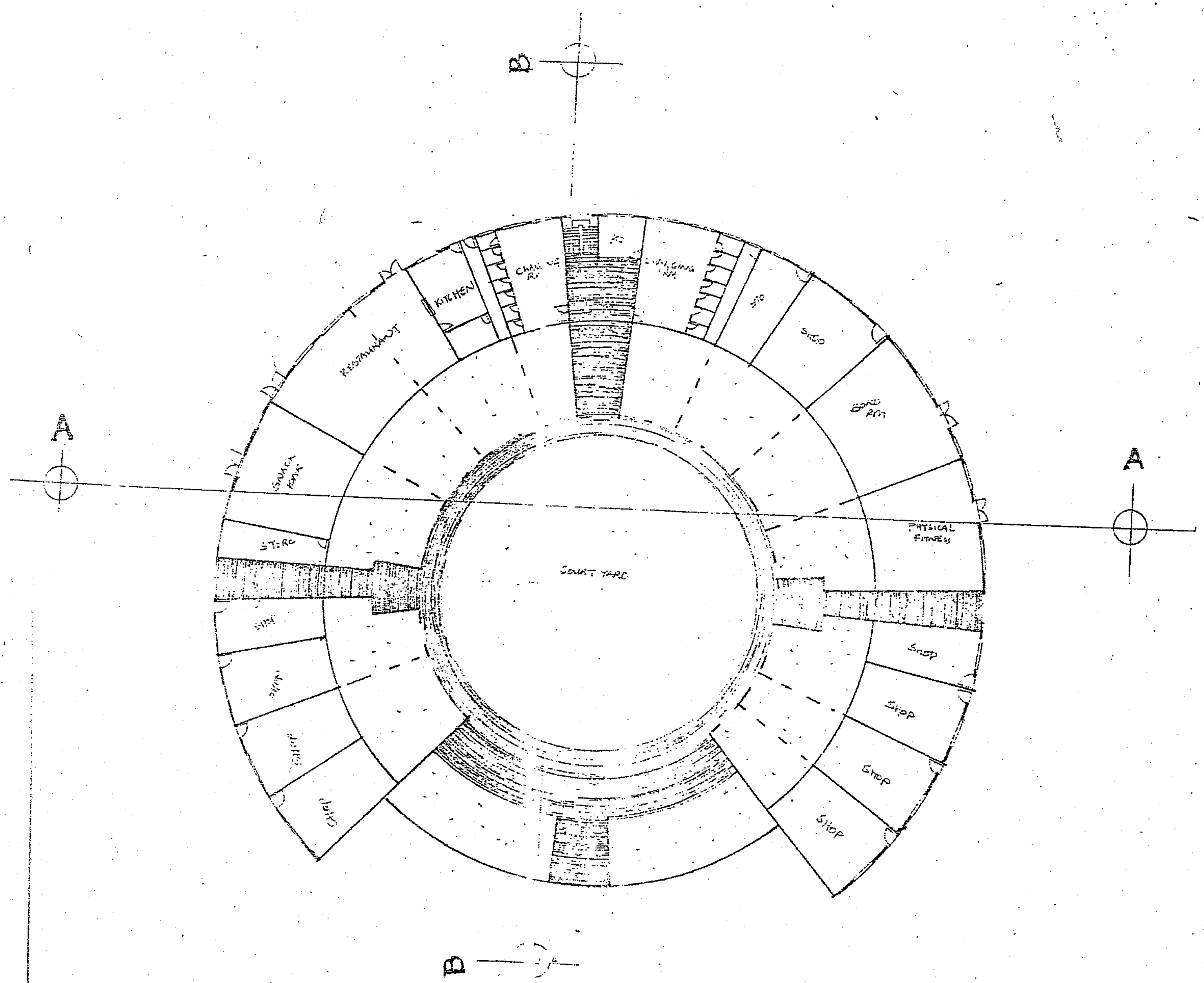


ROOF PLAN

FRONT VIEW
BACK VIEW



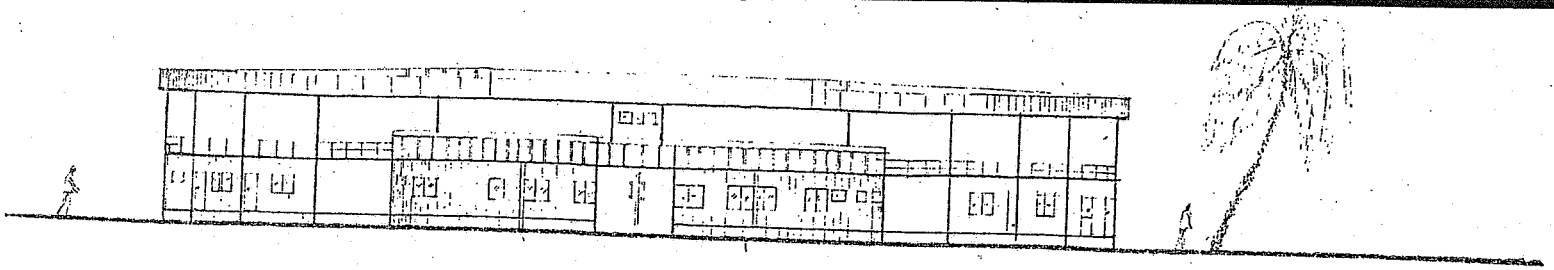
FLOOR PLAN
AMPHI THEATRE



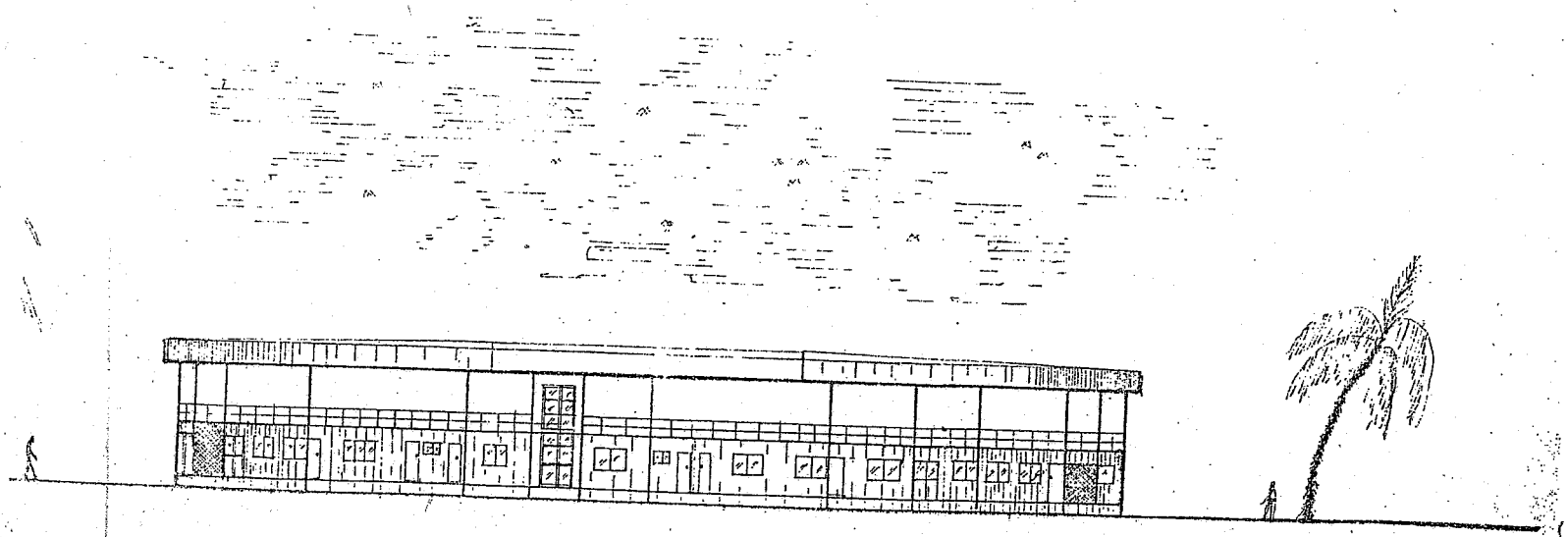
BASEMENT FLOOR PLAN
(AMPHI THEATRE)

SECTION B'B
G.L

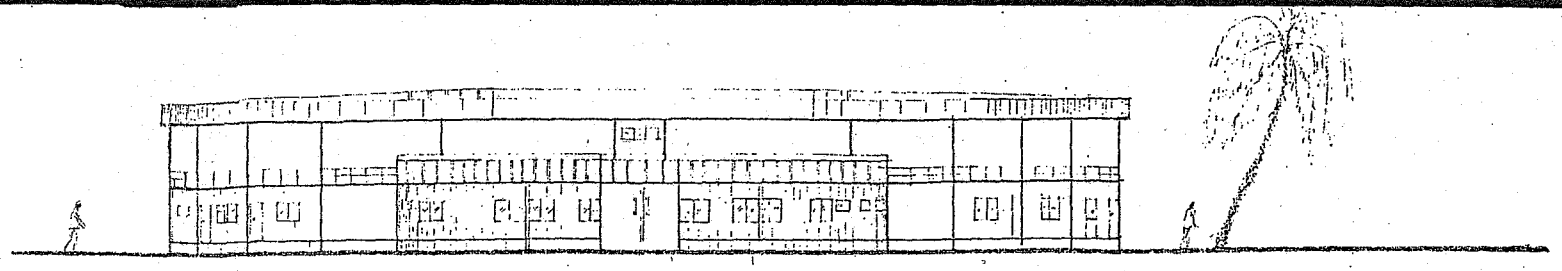
SECTION A'A
G.L



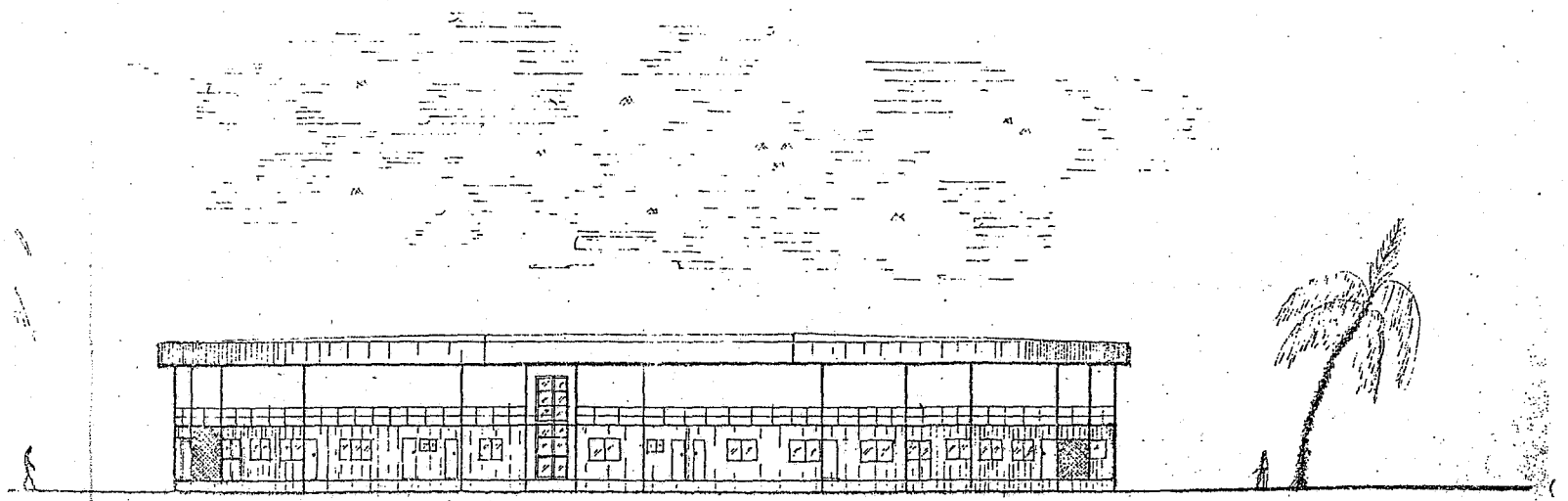
FRONT VIEW



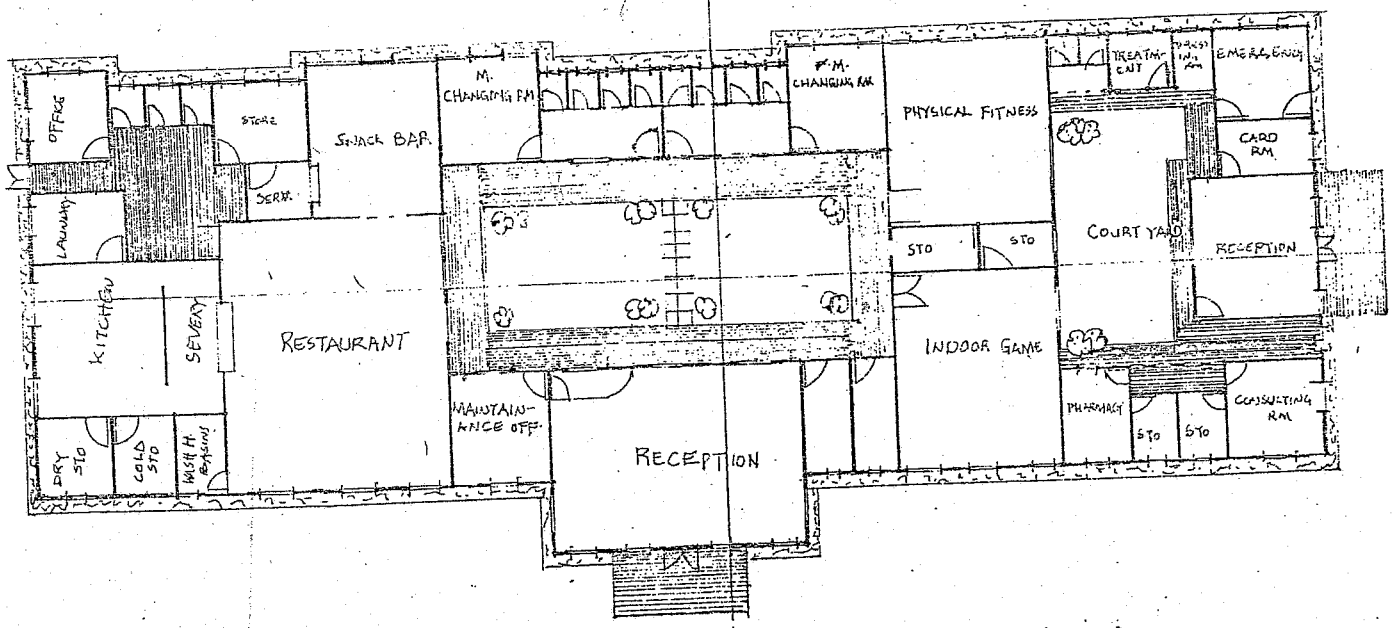
BACK VIEW



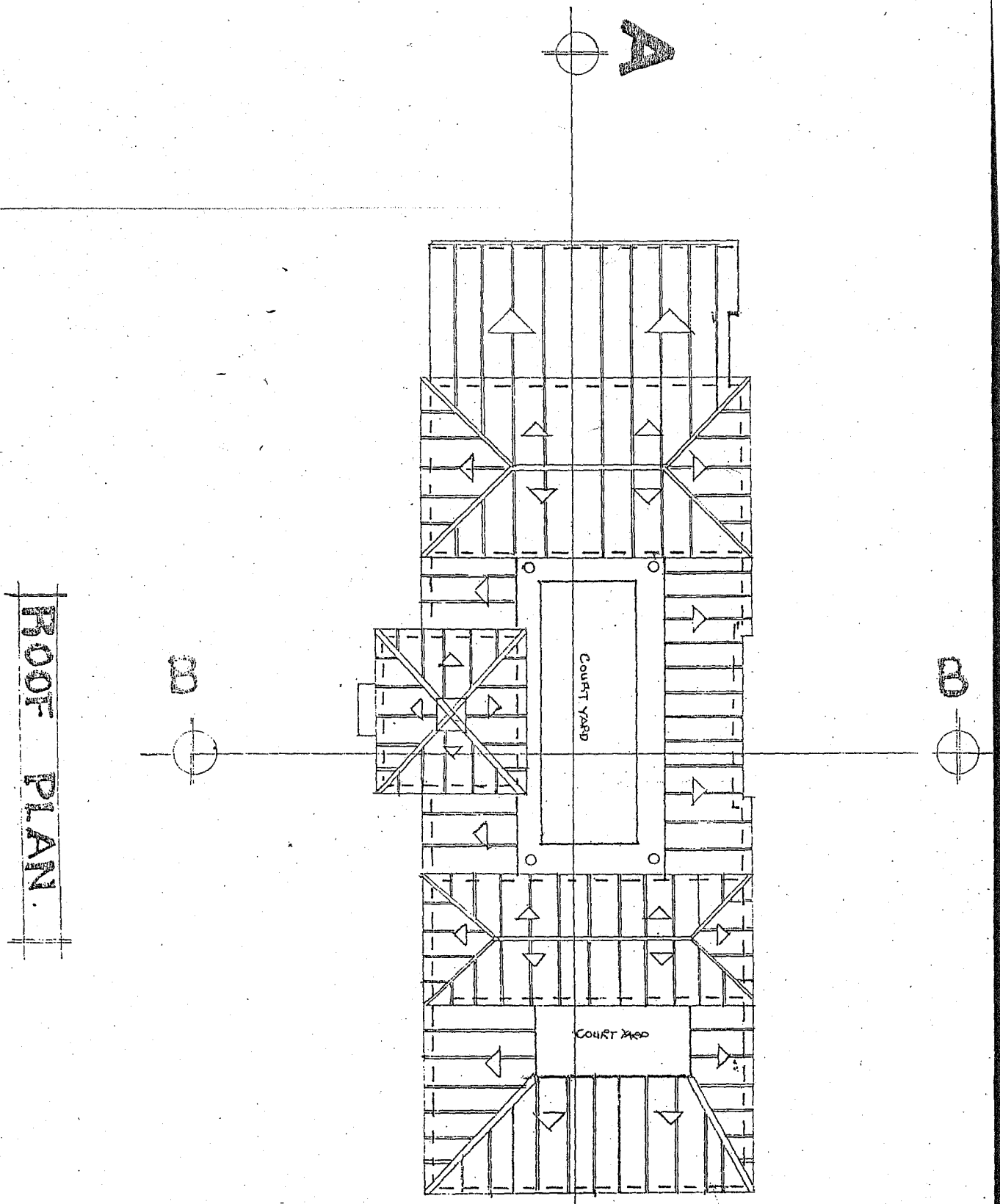
FRONT VIEW



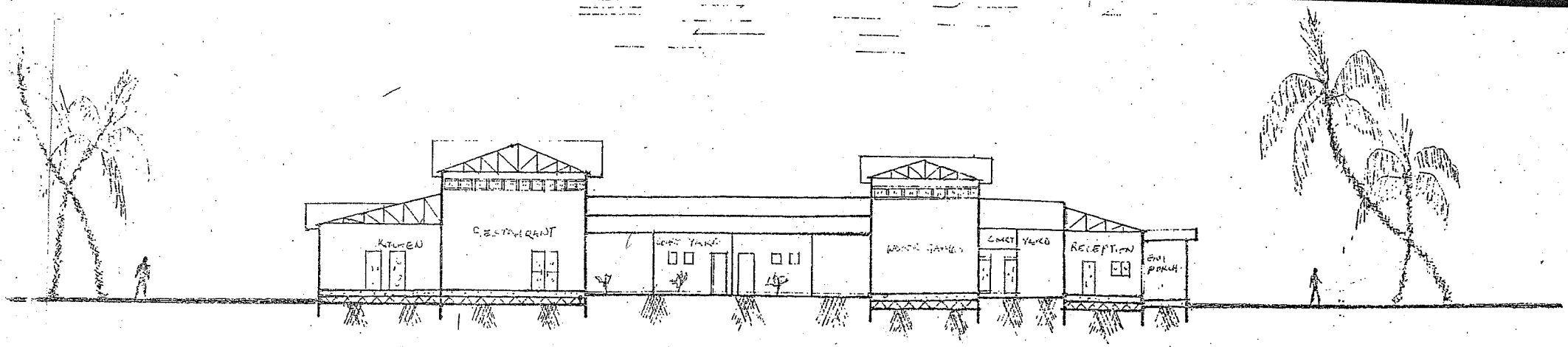
BACK VIEW



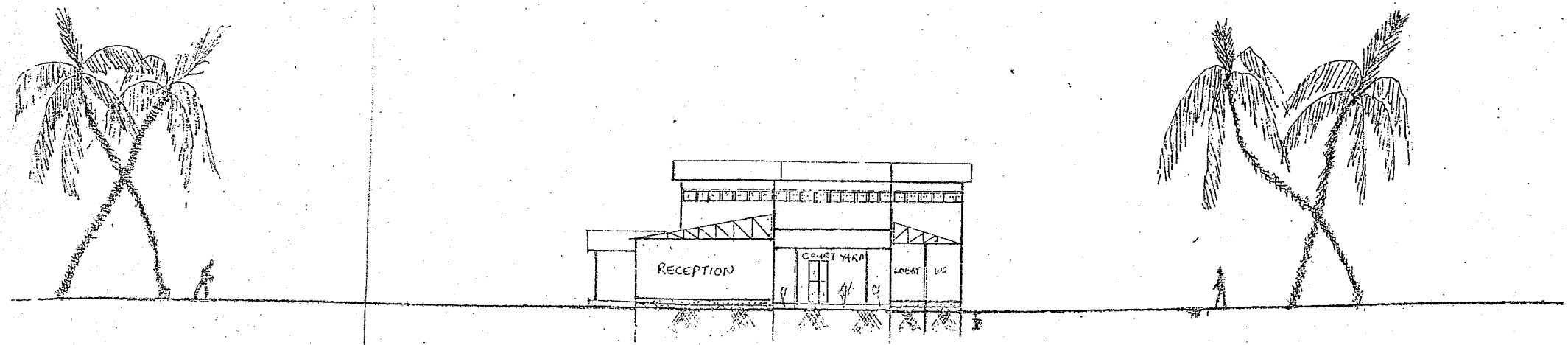
FLOOR PLAN. (WORKER'S FACILITIES)



ROOF PLAN



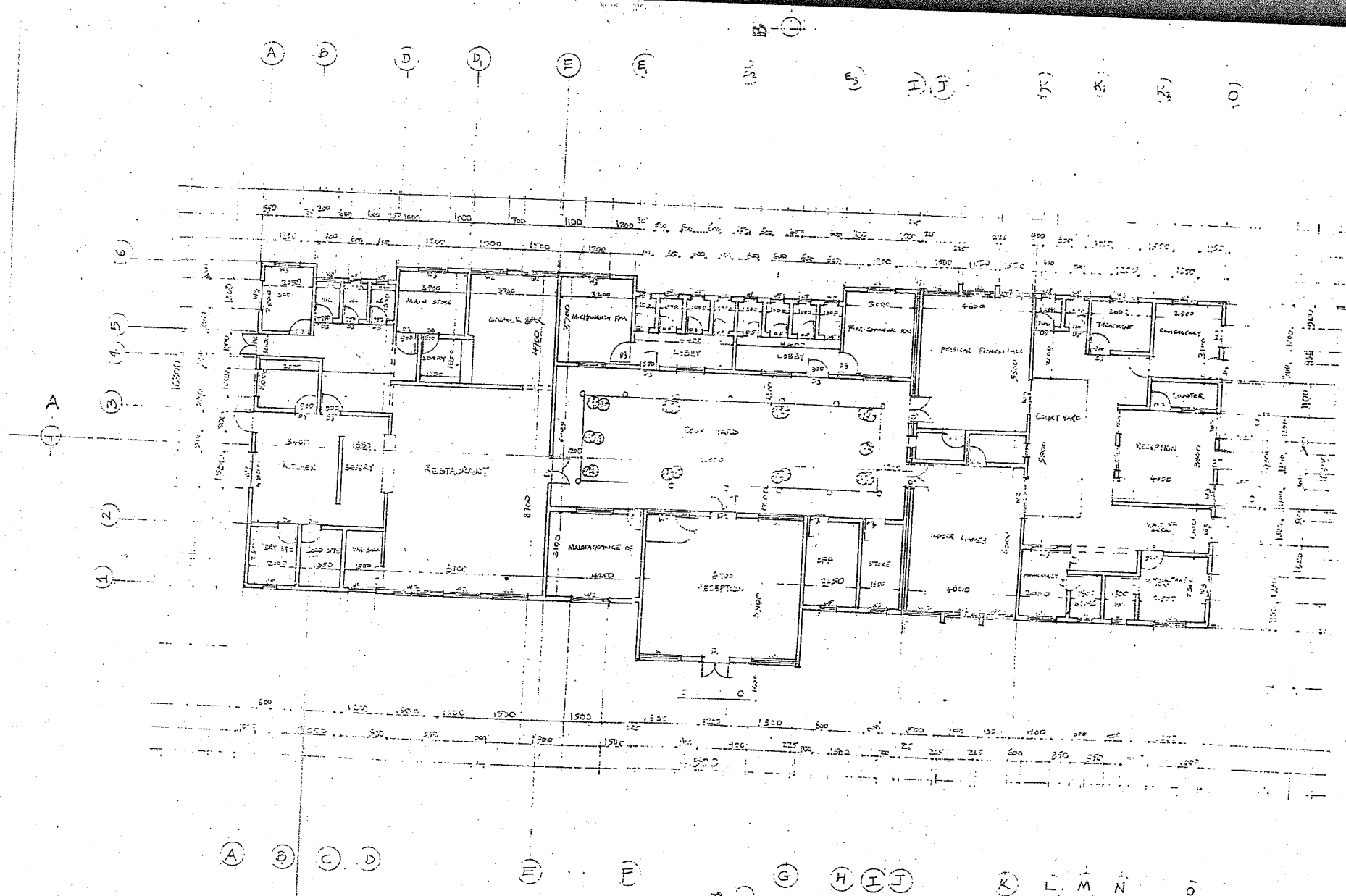
SECTION A'A'



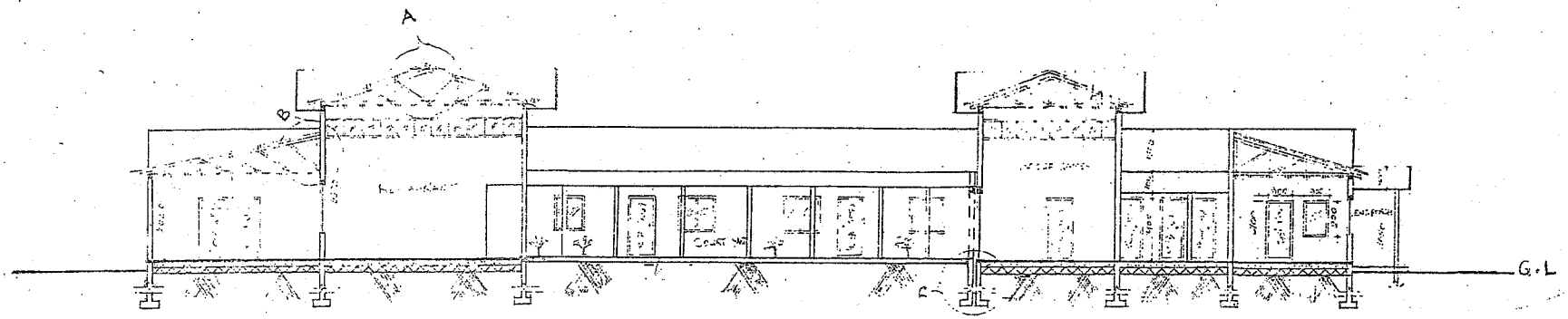
SECTION B'B'

BACK VIEW

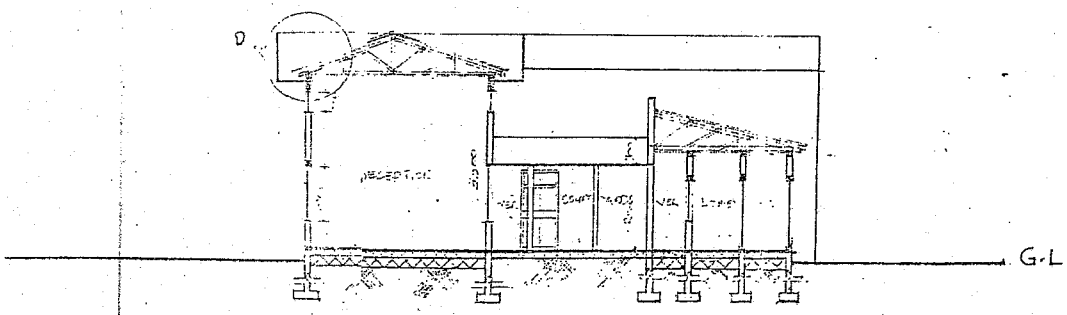
FRONT VIEW



FLOOR PLAN WORKER'S FACILITIES
(WORKING DRAWING)



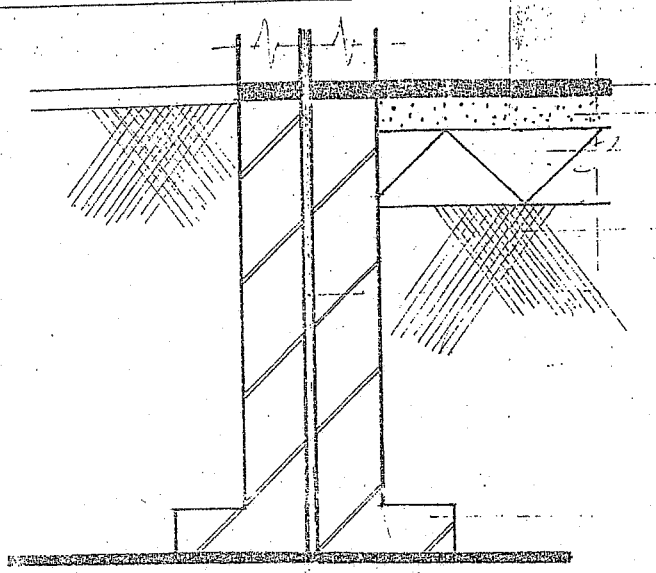
SECTION A'A'



SECTION B'B'

BACK VIEW
3500
1500
1200

FRONT VIEW
3000
12.00
1500



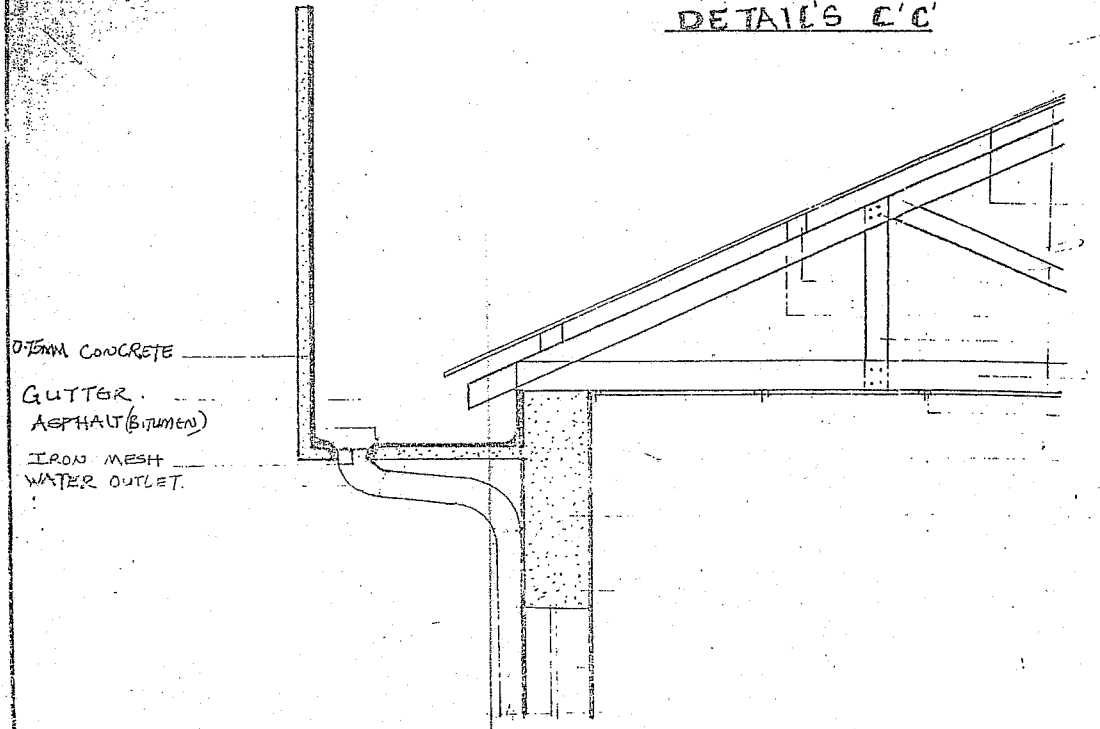
75MM FLOOR FINISHED.
100MM CONCRETE
250-300MM HARD CORE

EARTH FILLED (LATERITE)

0·75MM CEILING BOARD.

FOUNDATION FOOTINGS.

DETAILS C'C'



LONG SPAN ALUMINIUM ROOFING SHEETS.

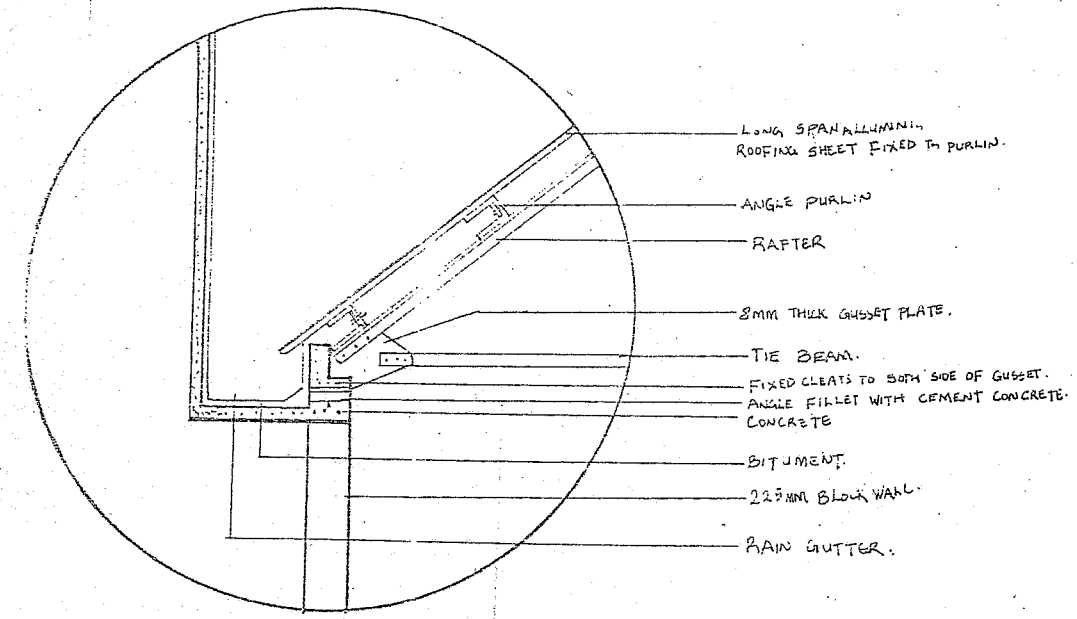
50X75MM HARDWOOD PURLINS AT 900MM INTERVAL.
75X100MM HARDWOOD RAFTERS AT 1000MM INTERVAL.
50X75MM HARD WOOD STRUSSES.
75X100MM HARD WOOD TIE BEAMS AT 1000MM INTERVAL
50X50MM SOFTWOOD CEILING NUGGINS AT 500MM INTERVALS.
220MM THICKNESS OF HEADCOACH.

225MM BLOCK WORK.

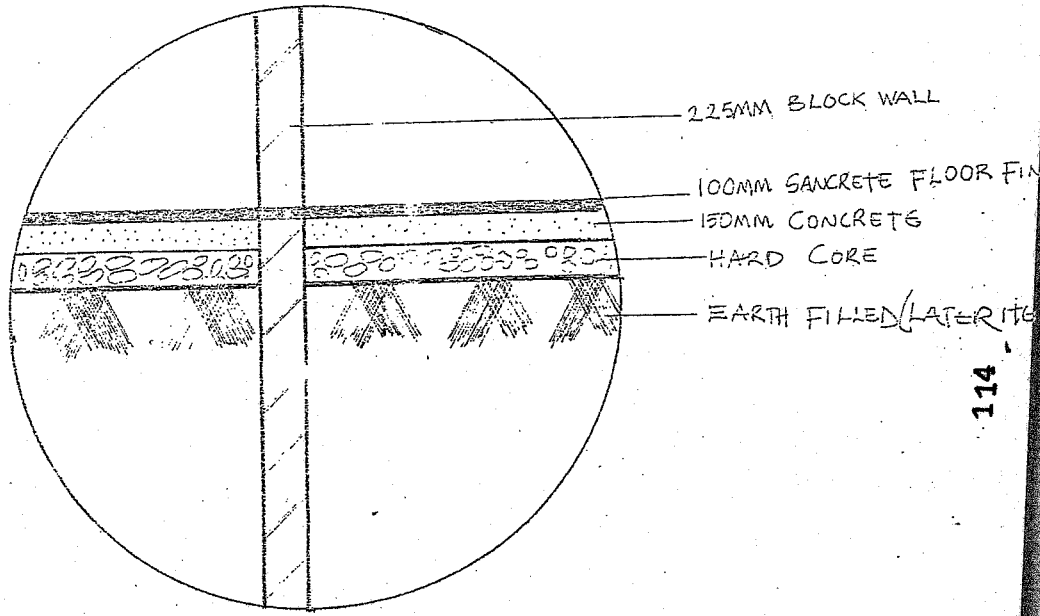
220MM WINDOW LINTHEL.

WINDOW.

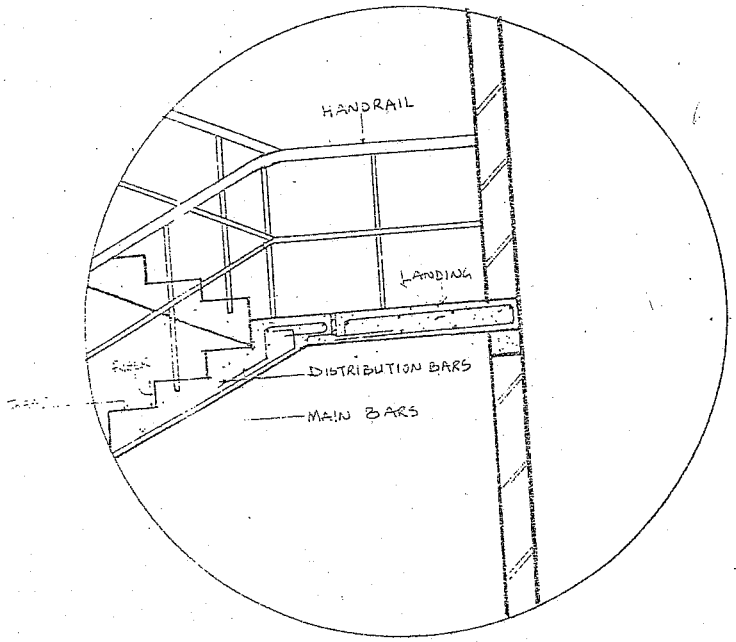
DETAILS B'B'



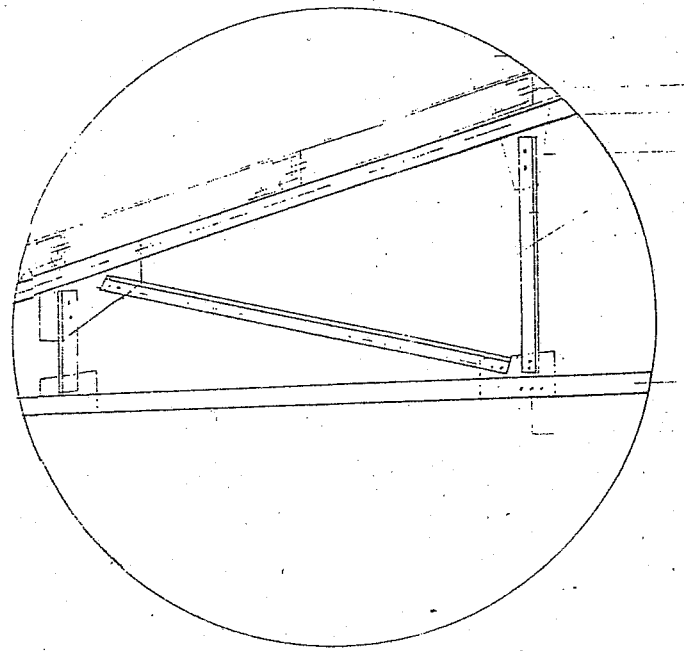
DETAILS A



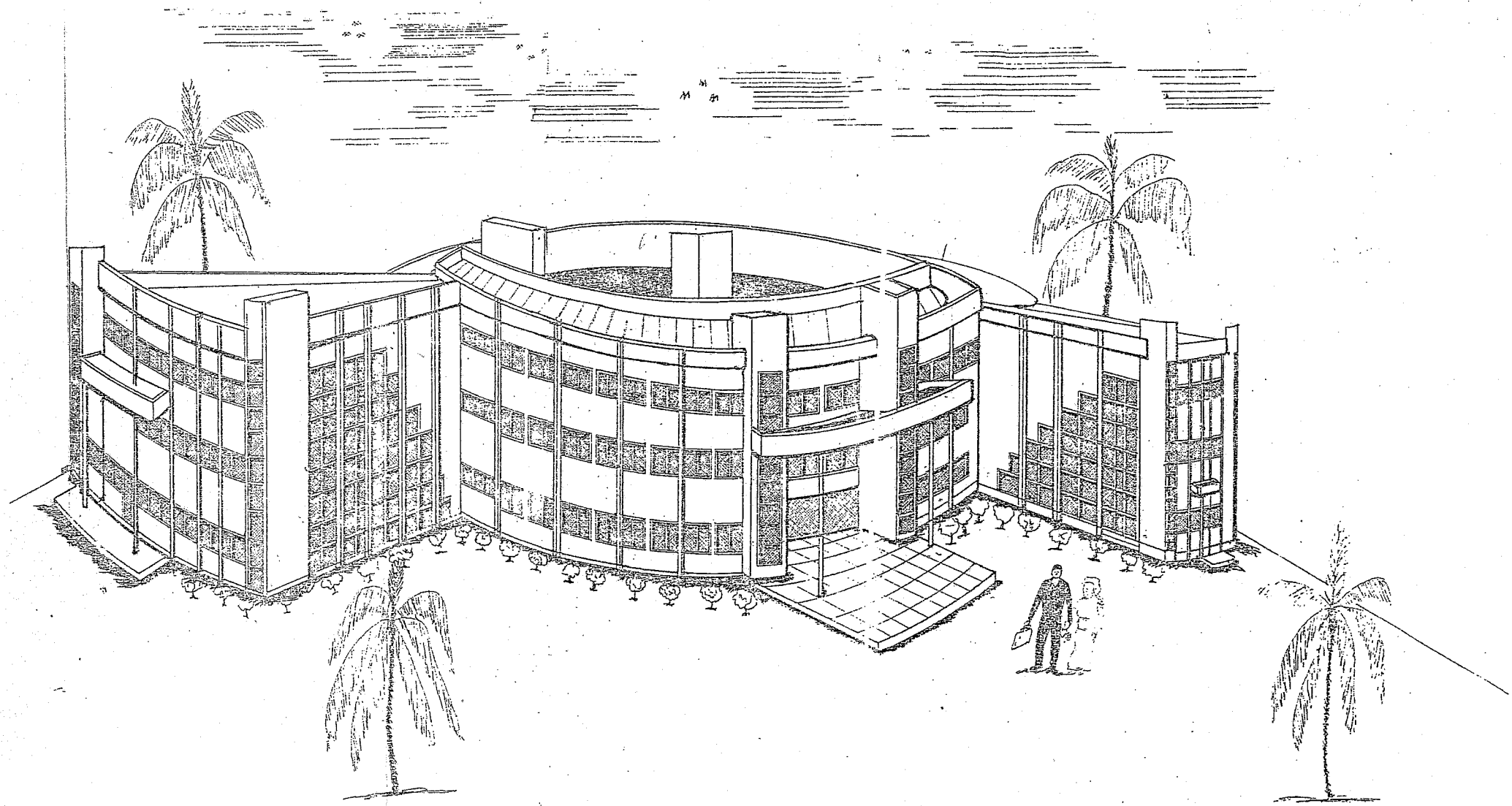
DETAILS B



DETAIL'S C



DETAIL'S D



EXTERNAL PERSPECTIVE