CONFERENCE CENTRE FOR MINA

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D E D I C A T I O N

This project is dedicated to my father
Alhaji Mohammed Bawa

&

Hassana Muhammad Danlami.

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CONFERENCE CENTRES NOW ABSORB MUCH OF THE CIVIC PRIDE DEVOTED TO THEATRES A DECADE AGO. BUT ESCALATING BUILDING COSTS HAVE PUT A PREMIUM ON MULTIPLE USE OF SPACE.

- MARTIN SPRING -

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CHAPTER ONE

CONFERENCE CENTRE FOR MINNA

INTRODUCTION

Niger State as we are all aware is one of the infant States created in 1976, having been carved out of the former North Western State. It is an open secret that during the almost nine years operation of the former North Western State government, not much development was achieved in this part of the state. Therefore, when in 1976 the Niger State came into being, the deployed civil servants were confronted with the difficult task of elevating the social and economic services to a stuatus required of an autonomous geographical entity.

Faced with acute manpower problems in qualitative terms, the Niger State manpower committee suggested among other things the establishment of a centre for seminars and conferences. The establishment of a conference centre in Minna, the state capital which is suppose to cater for both local and national seminars and conferences with necessary facilities is one of the ways it set to achieve its objectives.

I believe the most efficient and probably the most widely accepted means of impacting know-how is by face-to-face communication. I believe by inviting personnels from organisation, governmental or non-governmental who

have thorough knowledge and experience and who are ready to impact on us the basic system for the development of the state, the development of the state will really go smoothly. One could see that conferences and seminars are on the increase nowadays for two main reasons:-

(a) large scale national and international jamborees of non-commercial organisations;

(b) small scale business seminars and product launches by companies to instruct their staff or to impress their client. Wrokshops and seminars could be organised in the conference centre and specialists or consultants invited to lay a helping hand in areas where the government is deficient.

The centre will among other things:

(a) Act as a forum for academic, political, busine business and social interaction.

(b) Provide employment facilities to the Niger State indigenes.

(c) Attract private organisations to invest in the State.

(d) Provide Hotel accommodation.

In the light of this, coupled with the ingensive desire to participate in the development of my State that I propose to design a conference centre for MINNA.

The scope of the thesis will be limited to the design of (1) Auditorium for lectures and seminars.

(2) Hotel Accommodation.

(3) Administrative facilities (office block).

(4) Meeting rooms.

All these are capable of functioning individually.

DEVELOPMENT OF CONFERENCES IN AFRICA

It has been postulated that the first attempt to hold international conferences can be traced back to the Seventeenth Century, although the modern concept came into existence in the Nineteenth Centurt. International congress has grown, in a relatively short period, to become an important part of international relations which in turn can be said to have feature prominently in contemporary world politics. It could be realised that cultural diplomacy has been viewed as the forth dimension of foreign policy in international relations. The development of a congress industry can be traced back to the increasing awareness of universal interdependence in all fields of life. Technological developments particularly in more recent years has shown the need for facilitated means of communication which is an automatic prerequisite for the international nature of congress.

Back home to Africa, it could be clearly seen that the very idea and existence of congress industry is a very young phenomenon. The African countries most of which got their independence recently in the last 20 years, 23 in the case of Nigeria to be precise has a very short history of development as interdependent

states and have as such recently began to play a major role in world politics of today. Nigeria can be assumed to have taken the leading role in contemporary African politics, by virtue of her influence. The influence brought about by the fact that every seventh Africa is a Nigerian and secondly because of Nigeria's immense wealth and abundant natural resources. These two factors give Nigeria a high bargaining power with the western metropolis. This is also the reason why the technologically advanced countries like Russia and United States and even the technologically less advanced countries would not hesitate to come to conference table to discuss issues with and preferable in Nigeria, which are aimed at strengthening the ties between them. This alone sufficiently qualifies Nigeria as a suitable internal congress host.

Several other factors or prerequisite for potential international congress host however, apart from this, can be identified. There are factors that have mainly affected the development of congress industry universally and only few African countries have been able to meet the standard required to be considered regular venues. Among these include good, if not excellent tourism attraction, easy accessibility to host country, in this case, air, rail and road connections, the availability of accommodation to congress delegates

and guest and the provision of conference facilities to meet the required standard. Presently the only few African countries that have now met these requirements are Kenya, Senegal, Sierra Leone and to some extent Nigeria. Nigeria should realise the need for a conference centre in order to enhance and provide a good atmosphere of international standard.

CONFERENCE CENTRE FOR MINNA

Conferences form one of the major functions of a conference centre. It is therefore necessary to analyse what a conference is and its characteristics. It is very interesting to find that what a person understands to be a conference might mean a different thing to another. All the same, one thing without any doubt is the fact that a conference is a meeting of individuals called together to engage in discussions with the aim of accomplishing a limited task within a restricted period of time. Conferences are of special interest to all organisations, being a productive method of organising research, and research results. Conferences also acts as a setting of transnational and international cooperation. As a formal means of validating social programs, as a method of inducing change in individuals and as limited, observable group situations that are suitable for the study of group processes. The conference is also an area of action (where the) within which the interplay of theory, data gathering and practice has been very productive. The increasingly wide spread adoption of conference form is creating a demand for a new set of professionals who are skilled in conference management.

A conference form may be modified in various ways. A conference may bring together three specialists for consultation. It may bring together all the personnel who have a permanent working relationship to one another in an on going organisation, such as a psychiatric clinic, a governmental bureau or an industry. It may bring together periodically, individuals whose diverse professional interest overlap through their concern with a common problem. In its most expanded version, it may bring together thousands of delegates and observers as for example in the National Assembly or an international gathering of experts to consider a wide range of problems in a very large field of interest. In its core form however, a conference is a gathering that is small enough so that its members, meeting in one room, can take part in open-ended discussions.

Interchange at conferences is intended to be less formally structured than are the deliberations of parliamentry body. At a very large conference that discharge such multiple functions as the discussion of substantive matters, the establishment of a new climate opinion, the orientation of its members to a new view point, the validation of a proposed program or the preparation of a set of resolutions and recommendations, several types of seminars are held. There

are plenary sessions in which the entire body participates and formal parliamentary procedure are followed. There are also smaller sessions, designated as discussion groups, working groups, buzz sessions and so on, the organisation of which is intended to encourage a more informal and active interchange among the participants. Ideally, the arrangement of a small conference is such that all its members sit facing one another around a table and their interchange is mediated, but not dominated by a chairman.

Conferences in their many different forms draw on the pattern that is characteristics of group deliberations for special or periodic purposes at all level of social complexity. In its more familiar modern versions, however, the conference is a Euro-American invention, the development of which has been vastly accelerated both by the need for and by the possibilities of rapid communication in the twentieth century. Although large conferences, governmental and non-governmental rely particularly heavily on traditional western European parliamentary procedures, the format and style of the modern conference have other derivations as well. One important format or source is the format of the scientific meeting as exemplified by the meetings of the Royal Society of London, at which substantive matters are presented to a group of peers. Another is the format of

the ecclesiastical councils called together to issue validating pronouncements on matters of moment. Modern conferences form and style also have been influenced by the long tradition of intellectual controvesy within eastern European judaism, by the procedures through which humble people meeting together, have attempted to arrive at concensus, and by the procedures the quake business meetings with its emphasis on a search for the "sense of the meeting". Residues of these and other historical forms may still be discerned in contemporary conference organisation.

A conference is formal in certain well-defined respect. It must have a scheduel beginning and end, identifiable sessions, and a designated membership. Its subject-matter specified. The conference plan must include, as a final step, a projected outcome, whether this takes the form of a report, a set of recommendations or resolutions, a pronouncement about some program, or the formulation of a new insight. Modern conference method have developed in response to the need for forms thatwill permit a group to transcend, through face to face discussions, various barriers to good communication. Today communication may be greatly hindered by the divisions that result from bureaucratic arrangement or the compartmentalization of specialize subject matter. It may be reduced to insignificance by

difficulties arising from differences in nationalities, status, race, caste, class or ideology. Especially in the new fields, where the quantity of information and the lag in publication make it difficult for research workers and practitioners to keep abreast of developments, the conference provides means of rapid dissemination of new knowledge. But the conference group atmosphere may also be used to thaw stereotyped antagonism an aim that may conflict with other conference goals.

The small substantive conference specifically has made one unique contribution to inter disciplinary, intradisciplinary, domestic and transnational communication. It is simultaneously of participation. In place of the older linear system of publications, written rejoinder and written rebuttal, there is immediacy of challenge, correction and redefinition in the actual presence of all participants to a discusion. Moreover, everyone present, whether or not he speaks, takes part in the conference process. Intrinsic to this type of conference is a form of communication that is not one-to-one, but many-to-many, visible, audible and sensible to all those sitting around a table. Each member, not only as he speaks but also as he remains silent or moves restlessly is part of what is happening. And in their subsequent work, individual

members draw on the whole, not merely on the conclusions, or even the transcribed proceedings. Participation in small substantive conference resembles the great apprenticeship learning experience gained by work in a laboratory under a great experimentalist, or in the atelies of a great painter. In its purest form, such a conference is self contained. Its members are not required for example to meet the demands made on committee, with definite purpose to serve. At its best, it is the source of new ideas that otherwise would have developed only much later or, sometimes not at all.

ECONOMICS OF A CONFERENCE CENTRE

Projects in capacity of a conference centre is a large one. Any undertaking of its magnitude must first be naturally examined against its economic implications and not delegated to background of rational discussion. The neccessity for a good economic base will be apparent after a closer look into the aspect of a conference centre is taken.

Normally conferences do not take place as often as we assume. They take place at intervals. So how do we make the centre lively putting into consideration the tremendous amount of money put into its construction. Analysis has shown that there is no any noticeable area, land or a piece of structure or building set aside for

the purpose of multiple function in Minna, the State capital. Activities ranging from cultural shows, drama and concerts, debates, seminars and small conferences are only held in Schools assembly halls and even in some instances in classrooms. The construction of Shiroro Hotel in Minna has helped to lessen the problem at hand especially because of the provision of a small convention room. But this is not enough to some extent because, there are instances where the hall cannot take the huge number of participants.

Having this in mind, I decided that the best way to get a good feedback (say within 10-20 years) of the money spent on the building is to consider hiring out the conference hall on some paid activities to organisations and people, who needed it at a fixed and reasonable rate in a way making it multi-purpose. One excellent and interesting method I conceived is to hire the building in form of person per hour. This could be more appropriate for activities requiring a large number of participants. Where an organisation take it at a number of hours per day for some period of time, then the rate might be in cost per hour or per day as seen appropriate. In this way, and considering the fact that places are required to house the activities mentioned with average comfort, a lot of money will be realised and will surely compensate for the time lapse

when conference or seminars are not holding.

It is clear that the University of Technology, Minna is on its way. Many close conference and meetings will be held in Minna to see it take up smoothly. When the University is fully functional, the conference centre will serve as a forum for arranging workshops, and lectures on researches and findings of the University. The same thing goes to other higher institutions not only in Minna but also in the State. Conventions and business meetings and conferences are very prominent in the country nowadays. Tranquil and comfortable atmosphere is required for these activities, and the conference centre in Minna can well render the services.

It has been calculated that the average expenditure for an overseas visitor at a conference in London in 1976 was ₦54 - ₦72 compared with only ₦23 for domestic delegates. The attraction for any situation of a conference centre can be seen from a breakdown of delegates spendings. 45% goes to hotel accomodation, 13% on restaurant, 14? on shopping with the balance on drinks and enterbainments; it is base on this findings that I decided to merge these interdependent facilities which (as I've mentioned in the subsequent note) I intended to be a multiple-use or function hall: the hotel accommodation which in its own case can house and accommodate

not only conference delegates but also people in the form of tourist or travellers throughout the year and this will really bring large returns of money and thereby enhancing good feedback: Some shops and boutique to allow participants and other people around to make their shoping easily and in comfort and the provision of good catering services. This will serve a large number ofpopulation in the conference centre with good food and therefore enhance good coordination of activities there.

In conclusion it might be right in saying that the provision of a conference centre has given rise to the power to raise other collateral services, in this case, the hotel and catering service. Therefore the Conference Centre in Minna should be envisaged in collaboration with other collateral facilities.

CHAPTER TWO

CASE STUDIES - KONGO CONFERENCE HOTEL A.B.U. ZARIA

The Kongo Conference Hotel was commissioned in 1981 by the University in an effort to boost its academic needs. It also serve as a centre through which the know-how or researches undertaken by the University can be made public. The centre serves in essence, the University and the growing number of users, ranging from professional seminars and workshops to Business discussions, meetings and conference. Occasionally, the hall complex is hired for other activities such as parties, cinema and so on.

The centre is sited in Kongo Campus of the University along the old Jos road, after the main gate. It is bounded by the old Jos road, Estate Department and the Institute of Administration Staff quarters. The functions within the Conference Centre included a large hall complex for 500 users with demountable partitions used as a demarcation, both for visual and accoustical seperation in the case where the hall is used for smaller sessions, Seminar rooms, Audio visual and offices. Others include Restaurant and the lodging accommodation.

The general layout of the site is commendable, this is due to the fact that there is a proper zoning of the

three main facilities viz:- HOTEL, MAIN HALL and the LODGING accommodation. The zoning also makes possible the location of the lodging accommodation near the staff residential area. This is a deserved solitude because of the tranquil and noise-free nature of the area. The conference hall is situated just by the first gate, and this will enable the visitors to find it easily without having to go through the whole complex. The use of sculptural piece by the hall complex to attract a curiors observer can be noticed as one of the design weapons of the architect. The sculptural piece situated by the hall is not clearly visible from the gate. In an attempt to get a closer look at it, the observer is led to the parking space and the lodging unit is revealed. Since the Estate Department of the Institute of Administration does not make a good view from the entrance of the hall complex, a buffer zone would not have been a bad idea.

The conference hall complex is rectangular in shape with some rooms, seminar rooms, toilets and offices around it bringing about a roughly hexagonal shape. One rather peculiar thing the eye might not fail to notice is the fact that, all auxillary rooms around the hall including the seminar rooms, and offices seems to be an incidence of design or form. In other words, they seem to have been allocated when the architects

design form was revealed. Some service pipes can be seen as you walk around the passage dividing the hall and its subordinates. Special structural consideration such as the use of voids for services should have been taken to arrest this. In a place where ones goal is a comfortable space to confer, this could be distracting.

The other section of the Centre is the accommodation unit which house more than two hundred rooms. A first glance will reveal the terraced floors which, though aesthetically presentable have given rise to numerous problems. The wastage of floor space especially on the first floor where it is used for nothing other than passage. Another problem is that of terraced roof decking. This is a dead space and creat in itself problems due to the use of sand screed finish on it. As the sun rays shines on it, the rays are diversed and reflected and this produce glare. The solution to this could have been a roof garden, but the lack of access might hinder its complete case. I gathered from one of the caretaker that the roof of the restaurant gives them problems when it comes to cleaning and maintenance because of its enamors height. Another dominant form can easily be observed as one approaches the hall complex. This is the gutter fascia which seems to compete with the size of the room around the ahll. In as much as the hall needs larger gutter fascia because

of the roofs surface area, this is a little too big, therefore credit goes to its esthetic values. In conclusion, I believe the architect has in his own way uphold the treasure of architecture.

CONFERENCE CENTRE

LUZERNE COUNTY COMMUNITY COLLEGE. NEAR WILKES BARRE, PENNSYLVANIA.

In an effort to satisfy their own expanding academic needs, and at the same time serve a growing number and variety of reginal users, administrators at Luzerne County Community College commissioned a 21,000 square foot conference centre for their campus at Nanticoke, Pennsylvania. The existing campus core rises from land reclaimed mining operations there, but no more building sites around the core were easily reclaimable. The new centre, as a result; occupies a broad, flat site to the southwest of the campus centre and is separated from it by a woodland undisturbed by trails. In this detached, semi-secluded location, the centre asserts its independence while establishing itself clearly as a formal gateway to the next area of campus expansion.

The latter seemed a task with celebrating. The architects, therefore, thrust the entry to the centre forward in the form of an exterior portal, if largely

sybolic, nevertheless guides arriving visitors gently but firmly from the parking area to the main vestibule. From the design (view point) standpoint, the projecting portal sets up a long axis through the whole, an axis left unterminated but arranged with conspicuous care to unite all the building functions in a coherent, linear composition that extends, east to west, more than sixty metres. These functions include auditoria for 100 and 300 users, seminar rooms that accommodate from twelve to forty users, a fully equipped kitchen and dining space that are used both for outside conferences and as a teaching tool by the colleges culinary arts classes. A prototypical hotel room in similar fashion, serves hotel management classes but doubles as an accommodation for visiting lecturers. Administrative and service spaces complete the building program.

The axial spine is, of course, an explicit expression of circulation, and its simplicity is appreciated by those using the centre for the first time. It is lined along both its long walls with small service spaces that act both as visual and accoustic buffers. The spine is framed in tubular steel sections and day lighted by south facing clerestory windoems of translucant, insulated acrylic. The remainder of the structure also steel frame, is clad in split face concrete

block used in two colours to give the exteriors a pleasant and unexpected polychromy. The concrete block, in this particular application, clearly takes on the character of stone masonry both in texture and coursing. The other principal finsih materials, the architects have selected include quarry tile for floors, gypsum board for interior partitions, and a factory painted metal roof.

But it is what the design achieves in terms of form and contour that is most remarkable. In spite of a restrictive budget the interior spaces are modelled with complete sympathy for the functions they enclose, and brought together into a united, convincing, and altogether appealing composition. In the design of the centre, the ends have been perfectly matched to the means. The structure's straighforward and unassuming message is intentionally carried into practically every detail, and the choice of finish materials underscores this design intention from first to last. The architect resist any temptation to do anything slick or outwardly facile for this rural Pennsylvania campus.

Instead and without the slightest sense of false modesty - they found the most direct and eloquent expression of regional values and embodied them in a design of simple but enduring quality. The building is by no means unsophisticated, but it achieves it ends without pomp, without pretense, and most importantly without any sense of begrudging concession to either budget or function.

CHAPTER THREE

ACCOUSTICAL DESIGN OF A MULTI-PURPOSE AUDITORIA

Holding conferences, seminars and workshops are the main characteristics of a conference centre. It is however obvious that at times when these are not holding, the hall complex or auditoria might be hired for some important, though different activities and this calls for special design to conform to the change. Concerts, debates, cinema and what have you, may constitue one of the activities and this warrant a special accoustical consideration, especially since the accoustical requirement of speech differ from that of music. The multipurpose hall pose a wide range of relevant accoustical problems. It is suppose to be accoustically suitable for conventions, lectures, debates and even music. It is quite an order even with the help of first rate theatre and accoustical consultants, to design a multi-purpose hall for these many diverse functions.

The required accoustical condition for the hearing of speech in an auditorium is relatively simple. Therefore, the accoustical designing of a multi-purpose hall must provide the required conditions for the satisfactory hearing of speech for two good reasons:-

(a) Because the multi-purpose auditorium is always

used more frequently for speech than for music.
(b) Because the accoustical conditions that affect the hearing, and consequently the understanding of the lyrics of a song are similar to those that affect the learning of speech. The problems of (speech) Accoustical design becomes more complicated by the fact that the number of people in the Audience can vary greatly, from a small number to a capacity audience. Consequently it is difficult to set up rules which are generally applicable; nevertheless the problem can be summarized to some extent.

During large conference sessions, the hall will usually be full and alarge area will be COVERED (3 - 5m^3/seat). This automatically produces good speech accoustics and also useful conditions for string ochestras and soloists. However, it produces too short a reverberation time for large orchestras and choirs in particular though orchestras are not prominent in this part of the country. These conditions at a given volume cannot be altered systematically by constructional measures. It must be ensured that additional absorbent surfaces are avoided as much as possible so that, for example - no absorbent tiles must be used. Thus, the hall complex when empty or partially occupied becomes quite resonant. This disadvantage can be moderated in the main by large diffusion. Consequently, it is

recommended that a very asymetrical room be used and that it be supplied with surfaces with an open-work structure, sloping ceilings, projecting beams etc. It is known that the different users of such rooms react very definitely to relatively small variations in absorbtion and appreciate this possible control of reverberation. It is also possible, by using special arrangements, to build in a fairly variable absorbtion, for example an in-built panel (hinged), one side is covered with a porous, absorbent layer, the other side is hard. In spite of their accoustically indisputable advantages, these measures have, however not been carried out very often, as they render architecturally satisfactory solutions more difficult. Moreover they are expensive.

INFLUENCE OF REVERBERATION AND INTELLIGIBILITY

Reverberation isthe prolongation of audible sound after the sound source has been switched off, and for every room or hall, there is a optimum reverberation time, which is practically equal throughout the room. It is dependent on the volume of the room as well as on the purpose for which it is to be used. In many cases, it is also dependent on the form and in particular on the diffusion of the hall, though it is however, very difficult to comprehend this latter relation quantitatively. It can merely be said that in a room

with poor diffusion, the reverberation time must generally be smaller than that in a room with an accoustically favourable shape. In determining the optimum reverberation time, it must first be decided whether the hall is to be used for speech or music. In a conference centre hall complex, it is believed and is surely is that activities which requires the domination of speech are more likely to take place more often than music, and some of the accoustical requirements of speech need to be more prominent and expressed. It is even clear from the foregoing paragraph that the accoustical conditions that affects the hearing and consequently the understanding of song are similar to those that affects the hearing of speech.

The accoustical requirement of the multi-purpose hall complex must therefore provide the required conditions for the satisfactory hearing of speech. Good speech accoustics are determined primarily by intelligibility. Intelligibility is total amount of speech heard by the listerner to that from the speaker. It is an objective concept which can be measured specifically. SABINE who was a professor of Physics at Harvard University conducted a series of researches and experiments the result of which are as follows:

(i) The reverberation time, that is the duration of audibility after the sound source has been switched

off, is practically equal throughout the room.

(ii) The reverberation time is, in practice, independent of the position of sound source in the room.

(iii) The influence of the absorbent surfaces reverberation time is practically independent of its position in the room. Furthermore, Sabine defined as reverberation time that time which elapse from the moment the sound source is switched off until the average energy density in the room has fallen by 60 dB to 10^{-6} of its steady value. For the relationship between this reverberation time t, absorption A, and room volume V, Sabine discovered the following empirical relationship:-

$$t = 0.16 \frac{V}{A}$$

Where t in seconds, V in volume m^3 and A in m^2. To calculate the reverberation time, the volume and absoption must be known.

Geometrical and statistical room accoustics as wel as room accoustics using wave theory, all lead to results and conclusions which can be used in the construction of a room. A grouping of all the practical and important factors shows that the following three parameters completely determine the accoustical

behaviour of a room:-

- volume of the room.
- form of room
- reverberation time of the room.

VOLUME

When the volume of a room increases, then its surface areas and the total absorption also increases. As we are dealing with a defined sound source power P, the nergy density W which exists in the room also falls as the absorption A increases. The following relationship applies:

$$W = \frac{4P}{cA}$$

The sound power P is denpendent on the sound source. The energy density necessary is determined by the loudness level desired in the room, thus it is dependent on the characteristics of the human ear. By assuming average numerical values, room volumes are obtained which are common to the many practical experiences.

MAXIMUM ROOM VOLUME ACCORDING TO THE TYPE OF SOUND SOURCE WITHIN IT.

TYPE OF SOUND SOURCE	MAXIMUM ROOM VOLUME (m^3)
Average speaker	3,000
Experienced speaker	6,000
Instrumental or vocal soloist	10,000
Large symphony orchestra	20,000
Massed choirs	50,000

FORM

In determining the form of a room, the first question which arises is that of the relationship between the length, width and height. Modern theory shows that it is completely unncecessary to keep closely to any hard and fast role, though in older literature, it is found that this question was considered to be the cardinal principle in Room Accoustics.

To sum up, the following principles apply to the planning of room form.

- sound path for all audience seats must be as short and as direct as possible.

- sound path must be as unobstructed and direct as possible. This leads to the neccessity for a sufficient rake.

- in order to attain equal distribution of all seat, sound focusing by using concave surfaces must be avoided. This applies in particular to the shape of the ceiling and also to the rear wall.

- the room must be shaped in such a way that no path differences greater than 12 - 15m can arise.

- in order to attain sufficient diffusion, parallel surfaces must be avoided. In addition large flat surfaces must be broken up in such a way that they reflect as diffusely as possible. The irregularities must have dimensions with an order of magnitude of at least one metre (m).

ABSORPTION BY PERSONS AND SEAT IN AN AUDITORIUM

ELEMENT	ABSORPTION (m^2/unit)		
	125 c/s	250 c/s	500 c/s
Audience standing or seated on wooden seats	0.15	0.3	0.5
Audience seated on upholstered seat	0.2	0.4	0.55
SEATS - wooden	0.01	0.01	0.02
upholstered in fabric	0.1	0.3	0.35
upholstered in leather	0.1	0.25	0.35

ACCOUSTIC ABSORPTION

One of the requirments of hall or room for speech is that large reflections arriving later than 35 m/s should be avoided, directed away or absorbed. Every surface of a room will absorb sound in some degree. This is due to the frictional resistance as the air moves along or through the materials. The principle is as follows:-

When a progressive sound wave strikes a wall, in most cases a part of this wave is reflected and the rest of the sound wave is absorbed by absorbed. By absorption, it is meant the removal of sound energy, that is, its conversion into heat. The same process as in braking a motor vehicle when its kinetic energy is converted into heat detectable on the brake drum. The reflection coefficient r is defined as the ratio of the amplitude of the reflected wave to the amplitude of the incident wave. The absorption coefficient is defined as the ratio of the absorbed sound energy to the incident sound energy. As the sound energy is pr proportional to the square of the amplitude, the relationship between these two coefficients is:-

$$= 1 - r^2$$

The absorption coefficient of a material basically depends on the impinging sound waves angle of incidence. In order to avoid this difficulty, calculations are carried out employing absorption coefficient as assumed in the Sabine reverberation formula previously mentioned in this chapter.

One can carefully differentiate between five different types of absorption, amongst the materials cheaply used in construction, in which there are systematic differences in the dependence of the

absorption coefficient on the frequency.

(a) Freely vibrating membrane or pane. This is an impervious panel, which is fastened to a wall but at a certain distance from it and can be easily set or excited into vibrations by an incident sound wave. Thus the mass of the panel, together with the elasticity of the air cushion, form a system which is free to vibrate, and which at its lowest resonance frequency, absorbs a maximum of the incident sound energy. The resonance accuracy by the mass of the panel itself and the thickness of air cushion. The elastic qualities of the material of the panel are usually negligible.

$$f_o = 600 \sqrt{\frac{1}{md}} \text{ c/s}$$

Where f_o = resonance frequency; m = mass of panel in kg/m^2; d = thickness of the air cushion in cm. Porous materials form another class of absorbers. The absorption characteristics for a porous absorber shows that " " increases with frequency. (1) Because the absorbers are usually in panel or fabric form and placed near the walls, because the wall is a nodal point, at low frequencies, it follows that the absorber is at a position of low particle velocity and therefore no frictional dissipation. At high frequencies, the position of the absorber tends to coincide with point of large particle velocity, hence large functional

dessipation. At very high frequences, the dimension of the absorber becomes comparable with the wave length and there is almost total absorption of the sound within the pores of the materials.

The Third type is the resonance type. The basic structure of the absorber consist of Heln Holtz resonator. It is used as an absorbent element in construction, however, it is usually restricted to special cases, as for example is broadcasting studios. In the case of the resonator, one is dealing with a freely vibrating system which shows high absorption power at its resonance frequency. The following applies:-

$$fo = \frac{C}{2\pi} \sqrt{\frac{\pi R^2}{V\,(l + (\pi/2)R}}$$

C = Sound velocity; R = radius of neck; l = length of resonator neck; V = volume.

SOUND LEVELS OF MISCELLANEOUS NOISES IN ROOMS

SOURCE	SOUND LEVEL
Loud speech (at 1m distance)	70 - 80 dB
Normal speech (at 1m distance)	68 dB
Quiet speech	50 - 60 dB
Average noise in working room	
- 3 people	55 dB
-10 people	60 dB
-50 people	65 dB
Normal Breathing sound at distance of 30 cm.	10 dB.

ACCEPTANCE SOUND LEVELS FOR VARIOUS BUILDINGS

BUILDING	SOUND LEVEL
Broadcasting and television Studios	25 - 30 dB
Concert halls, theatres, Hospital, cinemas, auditoria apartments, Hotels.	30 - 35 dB 35 - 40 dB
Conference rooms, offices,	
Courtrooms, libraries	40 - 45 dB
Ticket offices, banks, shops	45 - 55 dB
Restaurants	50 - 55 dB

NOISE PROBLEMS IN BUILDINGS.

Noise, which has been defined as unwanted sound, is inevitable in everyday life. Paradoxically, noise is known to be increasing in many spheres as the result of progress. For a conference centre, where a certain low level of sound should be maintained, say 40 - 45 dB, any noise transmitted with a sound level above the one given above can be termed as

disturbing and distracting and so must be avoided.

Sound absorption as discussed earlier is usually achieved by deploying over hard surfaces perforated panels with fibrous backing, or a material that is merely fibrous or cellular. Incident sound waves penetrate such materials and dessipate their energy, instead of being reflected back into the space whence they came. The build up of noise by reverberation in (reduced) the space is thereby reduced. In general materials that effectively absorb noise will also transmit noise. They are therefore not suited to impede the transmission of noise through construction. The ability of construction to impede the transmission of noise increases with the superficial weight of the construction, and depends on virtual freedom of the construction from openings. Effective noise berrier usually have hard surfaces and in consequence are not noise absorbent. When noise must pass from space or reverberate in it, the space must first be enclosed by construction that is an adequate sound barrier, and then be lined with sound absorbent material. Neither treatment along will achieve the required result.

In noise problems, it is important to identify clearly the source of any troublesome noise before adopting design or remedial measures for its abatement.

Outdoor noises are consistently severe in cities and industrial areas. Therefore in conference centres it is important to device a means of reducing the noise or curtailing it totally. One of the ways is by siting it away from the noisy area of obstructions in the form of heavy construction to reduce its effect and consequent transmission to building.

Other factors that bring about noise within the building are noise from plumbing and this is not largely controllable by the occupants so it is imperative that during construction of building or structure, sound absorbent materials be used to treat the area around the pipes used for plumbing to break the contact between it and the construction wall. Many complaint of noise arise because of ventilation openings. Noise will pass freely through any openings which are intended to pass considerable quantities of air. In a room designed to be norminally soundproof like the hall of the conference centre, privacy of speach cannot be maintained if the access door is luvred to permit the discharge of ventilating air. Such a luvre needs to be part of a simple system, designed to have a relatively heavy weight casing and sound-absorbent lining that will impede sound and yet permit the passage of air.

SOUND ABSORBENT CEILING

Rooms are quieter when provided with sound-absorbent ceilings because noise originating in the space then has less opportunity in build up by reflection from the building surfaces. The loudness of the noise produced is not affected by the absorptive treatment, but noise or speech, may become more audible in the absence of reverberation. When for reasons of natural ventilation, partitions are not permitted to rise to ceiling height, the resultant sound reflection from ceiling may cause lose of speech privacy between adjoining spaces. Sound absorbent ceiling will greatly alleviate this condition by reducing the reflection, but the overall arrangement is not so good as having full-height partitions possessing adequate noise resistance. Some noise will always find its way through these partitions.

One area to explore as regard to noise transmission is that of impact noise. Freedom from the impact noise is not normally obtainable with timbre or concrete floors that are bare or covered with tiles of dense materials. When such floors are walked upon or used to support equipment that vibrates, they vibrate sympathetically and the vibrations travel far through the structure. Sectional isolation of a structure limits the extent to which impact noise will travel,

but only rarely is the technique practicable. Further, it will provide only limited relief when the affected space is immediately below the surface that is energized. Footwears with soles and heels of rubber or other resilient material will cushion foot steps and minimize their impact noise on floors, but general use of foot wear is unlikely. The necessary cushioning effect is obtained alternatively by the use of carpets, thick rubber or other soft underlays to conventional floor - surfacing materials. The latter course has the potential disability that settlement of the soft underlay under heavy point loads of furniture may lead to disfiguring indention of the floor covering.

In general the following can be used when dealing with noise problems.

- Establish the source of the noise;
- Endeavour to reduce the noise at its source;
- Failing success with (2), determine how the noise is transmitted to the affected space;
- Seek to impede the transmisssion of the noise, or to absorb it, as may be appropriate from all that has been discussed in this chapter.

In conclusion, there are difficulties and cost factors that operate against the provision of sound insulation in excess of that inherent in particular

forms of construction. It is therefore important to foresee noiseproblems and to minimize them along the lines suggested in this chapter.

SEATING AND SIGHT LINES

The fact of auditorium seating derives from the obvious; the human body is more comfortable, the mind is more receptive and the sensitivity to optical and aural stimuli is much improved for extended period of time if the body remains relaxed and quiescent in a position between erect and prone. The conference centre is a pl ce where full concentration of the participant is needed, which means in essence, all things being equal, the seat design, orientation and fixing should be as comfortable for him as the condition requires. The posi'ion of the seating participants in relation to the other participants is very important. All in all, a man is inclined to be less restive when seated than when standing and his mind is more alert. Modern studies in education psychology show conclusively that attention span of the seated adult is greatly lengthened beyond that of the standing adult, because concentration is maximized as physical discomfort or distraction due to muscular and nervous fatigue is minimized.

SIGHT LINES

A sight line is defined as the path of vision from the position of a spectator in an auditorium (usually seated) to the speaker or performer. The provision of good sight line is very important in order to enhance good vision. Seat should be arranged in such a way as not to obstruct ones view, because this can bring about strain on ones neck thereby causing discomfort on the path of the participant.

A vertical sight line is defined as the angle of vision in the vertical plane over or under impediments if any between a sight point and the performance or speaker area. This should be up to about 12.7 cm. The horizontal sight line is defined as the angle of vision in the horizontal plane between or around intervening obstructions if any between a sight point and the speaker or performance area. There are u usually, the heads of spectators in the row or rows immediately in front or building components such as box divisions, columns etc. The best angle given for excellent horizontal sight line is 27°.

LIGHTING

It is indesputable that light is a necessary condition for living and that it needs to be an integral part of any design process. That is people in

most societies rely more on visual perception than on other perceptual systems to obtain information about the environment and their relationship to it. Such a state of affairs has significant consequence for a design process. For example the quality and quantity of light available in any setting lends structure and has a strong effect on human emotions, communication, and behavior. It is also significant that the effective use of light has been the traditional hallmark for aesthetic experience in Architecture. The use of natural and artificial light should certainly be considered or regarded as an integral part of design and not something which is considered once the shell has been designed. It should form an integral part of programmatic, schematic, preliminary and final design development. Evaluation and testing of environmental effects taking place should be conducted at each stage to monitor the potential success of the products and process. The development of requirements for a lighting scheme should grow from the needs of the people and activities to be accommodated. Such lighting scheme requirement can beconsidered as the beginning of a performance specification which would include the following:-

- The analysis of activities and tasks.
- The desirable spatial illumination (including relationship with other spatial variables such

as forms, texture, colour and direction.

- Illumination for variety and novelty if not disfunctional to design objective nor to the need of people in particular settings.
- Provision for regulations and control of the scheme by individuals.

Lighting could be broken down into two brood ways and that includes (a) the natural and (b) the artificial light. Though more emphasis will be laid on the artificial lighting of conference hall, a lot will be discussed of the natural lighting, since it forms a vital part in the perception of the environment hence clear consideration in design process. It is clear that in total darkness, we cannot see. A source of light, such as theflame of a candle becomes visible when rays of light travels straight from the source to the eyes. Most objects are not self-luminous. We see them only by reflected light. The amount and the colour ofthe light which reaches our eyes from such an object depend both on the sources which illuminate it. - They may have different spectra, different intensities, and on the texture and reflective properties of the object itself.

A dark object under strong illumination may reflect the same amount of light as does a white object

under weak illumination. If so the light reaching our eyes will be the same in each case and if our eye behaved like a television camera we would presumable be unable to distinguish between the two objects. Daylight in a building has the primary function of enabling people to see. However, designer is also confronted and concerned with the way in which the solution to this lighting problem interacts with other aspects of the building. The visual character of the interior is primarily dependent upon the means by which daylight is brought into the building and the way in which the interplay of light and shade is used to reveal form, surface and space. The most important task in lighting is to achieve the necessary level of illumination to enable work to be done easily and without visual strain. In practice however, it is not easy to achieve the necessary level of illumination without introducing some form of glare. Glare arises when some parts of the field of view are bright in relation to the general level. Glare have two manifestations:-

(a) It can actually reduce the ability to see. When this happens we say there is DISABILITY GLARE. Glare disability is due to excessive amount of light reaching the yee and causing scattering of light inside the eye.

(b) The other common form of glare in building interiors that can cause direct discomfort is called Discomfort glare. It can be present without any degree of disability. This is particularly true in bright surroundings which result from the liberal display of bright lighting fittings. Little or no disability may be caused, but the degree of discomfort may be most marked. Glare discomfort can also arise from natural lighting, when the work is wrongly placed in relation to the window through which the bright sky can be seen. Glare discomfort is a function of both the brightness and the size of the source which causes it. The brighter the light source or the larger it may be, the more discomfort it may cause. On the other hand glared can be buffered by bright surroundings.

A light which may cause intense discomfort in dull surroundings may be quite innocuous in bright surroundings. Glare discomfort is avoided by reducing the contrast between the sources of light, whether artificial or natural, and the surroundings if the whole environment is bright, and the sources of light are limited in brightness and area (as seen by the observer) and made to merge into that surroundings, little or no glare will result.

In designing lighting provision for a conference hall, three important aspect of distribution of light from fitting must be considered. This include, (1) direct lighting in which all, or most, of the light is concentrated on the working plane. (2) General lighting in which the lighting is distributed in all directions, as from a bare lamp or an opal globe and (3) indirect lighting in which all the light is directed to the ceiling and only reaches the working plane after reflection. Each of this different types of distribution has its own special purpose. Totally indirect light has as its purpose the complete elimination of any risk of glare discomfort.

CAUSE OF LIGHT SOURCES

The range of available light sources for interior lighting includes uncorrected sodium or mercury vapour discharge lamps, but this have no point in their favour except high efficiency in terms of lumens of light flux per watt of available energy. The chief sources of interior lighting are incandescent filament lamps, still the most commonly used light source, hot cathode flourescent lamps, and flourescent mercury vapour bulbs.

LIGHTING DESIGN

Perhaps the first decision that has to be made

is whether the lighting is merely to supply a uniform level of working illumination over the whole of the Hall; consistent with freedom from glare and visual discomfort, or whether it is to create an environment of particular character. For an auditorium of a conference centre where a uniform form of lighting is required for clear visibility of participants and work area or surrounding environment, the former will be considered. In general, at the moment, lighting schemes employing a number of lighting fittings are most common, although the use of large sources, such as lay lights is gaining ground, and the use of lighting integrated with the building, where no actual independent "fittings" are employed. I believe for a conference hall, and from the great majority of lighting schemes observed, a semi-direct, general or semi-indirect type of distribution will be found most suitable. Such schemes permit a sharing of the available light between the work itself, and the general surroundings which create the character of the hall. The possibility of control of the brightness graduation should also be considered, especially since the hall is multi-function, and a particular activity might require a varied amount of lighting.

Other important factors to be considered are Depreciation and maintenance. A new installation in

in a new building will gradually deteriorate. The lamps will lose their efficiency and will give less light for the same electrical energy. The surface of the walls, ceiling, floor etc, will gradually get dirty. The lighting fitting themselves, unless regularly cleaned will become coated with dust and will absorb light from the lamps. All these factors working together cause a serious deterioration in the efficiency of the installation. It is therefore customary to design an installation to give, initially, more light than the specification requires, on the assumption that the light available on the average throughout the accepted life of the installation will be in accordance with the specification. It is usual to allow a 'maintenance factor' the value of which depends on the situation.

NOMINAL AVERAGE LIGHT FLUX (LUMENS) THROUGHOUT LIFE FOR FILAMENT LAMPS

LAMP WATTAGE	LIGHT OUTPUT (LUMENS)
25	200
40	325
60	575
75	780
100	1160
150	1960
200	2720
300	4300

"LIGHTING IN ARCHITECTURE"

FIRE IN BUILDINGS

The project in capacity of a conference centre is a large one, therefore all necessary precaution should be taken in both the design and the aftermath maintenance to subguard it against fire and fire engulfment and spread. Although there are many situations in buildings where a fire would be unlikely to develop, experience has shown that there are a few where it cannot do so. To this effect I have choosen some areas to explore to help as guide to solving some fire problems in design. In parallel, buildings are not proof against fire, though the construction might not burn or otherwise contribute fuel to a fire, the contents of the buildings commonly support and spread, and thereby to some degree subject the structure to fire damage. Few types of building construction will withstand the burn out of its contents, hence fire damage can be high and structural failure likely in many circumstances. It is not necessary for all construction to be fully protected. Infact it would be onerous to require it to be so. However there are good reasons why large buildings in the inner areas of the cities should be fully protected construction. Full protection in regulation to internal occupancies alone will not necessarily protect a building against external fire. A four hour fire resistant rating is

conservatively required for walls which are external; and careful design and attention is to be maintained to avoid the spread of fire to other parts of the strucutre.

Another important aspect is to make sure that paritions bounding public corridors are non-combustible. Further, they should have a fire resistance rating for their full height, and doors within them should be accredited fire-resisting doors. An implication is thus that clear glass, unless of an approved wired type, should be disallowed in these situations. Any opening in a wall of a building is a potential fire hazard, unless it is fitted with a fire door or fire shutter, or effective like device. However it is not practicable to protect all openings thus, especially windows in the external walls of a building, hence the associated hazard must be accepted as a considered risk. Construction should be so designed that the efficacy of the fire barrier between windows is not impaired by possible early failure of the window framing (or the like) in the event of fire, or by the passage of head from floor to floor via cavities exposed in such a contingency. Unavoidable openings in fire walls and other fire barriers, for the passage of ventilating ducts, are customarily protected by automatice fire dampers fired in the ductwork

within the thickness of the wall or barrier. Clearly the ductwork passing through the opening, along with its linning, should be non-combustible, and the ductwork of material capable of maintaining its form at high temperatures.

Exit ways, which include door ways, passage ways, stair ways, ramps and so forth, are planned and proportioned to reflect the needs of the likely population of a building in relation to the class of occupancy and the type of construction in which it is housed. When the likely population of a building cannot be forecast, it is usually computed from the usable floor area of the building, by allocating for each occupant a prescribed area commensurate with the needs of the particular class of occupancy.

The principal structural materials used in building construction are timber, brick, steel and concrete.

A LOOK AT STRUCTURAL MATERIALS

TIMBER - Although there have been occasions where timber structures have demonstrated their ability to resist severe fires, timber is not yet widely used in construction that is required to be fire resisting. A probable explanation is that timber, once ignited, will continue to burn and timber structure can there-

fore be considered as self distructive in the absence of prompt and effective fire control. When it is desired to improve the fire resistance of timber construction it is usual to impregnate it with fire resistance of timber construction it is usual to impregnate it with fire retardant chemicals such as mono-ammonium phosphate, or the paint the surface of the individual timber members with fire retardant paints.

BRICKS - Clay bricks are produced by the burning of mixtures of clay and shale in kilns at temperatures comparable with those experienced in building fires. Consequently, when claybrick work is exposed to building fires, it is not greatly affected other than to undergo thermal expansion and the partial calcining of the mortar joints single-lead walls of 11cm brick work have qualified for 1¼ hour rating. Solid walls of 22.5cm have qualified for 4 hour ratings.

STEEL - Because of relatively low specific heat and high thermal conductivity of steel, it undergoes very rapid thermal expansion when exposed to building fires. Ordinary mild steel used for structural purpose demonstrate an increase in strength as it is heated to temperatures in the vacinity of 500°F, but as it is heated beyond this temperature, its tensile

strength is progressively reduced. It appears essential that if a steel structure is to be satisfactorily rendered resistant to fire, all load bearing steel members should be thermally protected by an adequate layer of a suitable insulating material.

CONCRETE - Concrete is a variabe material consisting of cement matrix, free water, aggregates of various sizes, possible other ingredients such as additives and usually steel reinforcement in some form. Cement matrix is a complex mixture of silicates formed by the hydration of calcined cement. Research has shown that the matrix of a Portland cement can be expected to retain less than 50? of its cold compressive strength when heated to 1000°F.

In general, fire-protecting materials, such as asbestos, gypsum plaster and concrete are materials that are applied to structural elements of buildings to afford these elements protection from the destructive thermal effects of fire. These materials are able to resist the passage of heat because of properties such as great capacity to absorb heat, or extremely low thermal conductivity.

ENGINEERING SERVICES AND EQUIPMENT

Air conditioning and ventition are some of the important engineering services to be considered, when designing a conference centre, more especially the hall where the removal of air at an appreciable rate is required to enhance a comfortable environment within it. Design standards for air floor are based on two criteria, namely fresh air ventilation and the air change required to maintain suitable conditions. The air change is affected by heating or cooling requirements, exhausting of impurities (smoke, steam, fumes, odours), the extentof centralisation and the degree of adjustment afforded in individual rooms. Standards may be described by the volumetric rates of air change per hour or rates of air flow per unit area or per person.

FRESH AND REQUIREMENTS FOR FULLY AIR-CONDITIONED ROOMS

Room	Per Person litre/sec	cfm	minimum litre/sec
Hotel rooms	12	30	8
Restaurants	18	15	12
Cafeterias	12	15	8
Meeting and function rooms	25	40	18
Offices	12	-	8
Shops	12	20	8

Hotels, Motels, Condominiums
(Fred Lawson)

The amount of fresh air introduced into air-conditioned spaces should not normally be less than 8 litres/sec (17 cfm) per person. In the case of a large conference hall with high ceiling which makes volumetric standards in appropriate, an alternative standard of 15.45 litre/sec/m^2 may be adopted.

Two kinds of air-conditioning installations are visible depending on the capital at hand. These include:

(a) - UNITARY EQUIPMENT

(b) - CENTRAL STATION SYSTEM.

UNITARY Equipment provides the advantage of lower cost, simplicity of installation and individual operation, and is appropriate small houses, hotels and motels. Package units tends to be noisy (compressor and fan noise) large and difficult to integrate with the architecture of the building.

THE CENTRAL STATION SYSTEM are more flexible, less noisy and provide better condition with lower installed load and energy requirements because of the diversity in use. Central maintenance and regulation is also facilitated and such systems are more cost-efficient in medium to large space requirements. Energy Reclamation should be introduced where nece-

AVERAGE HEAT OUTPUT PR PERSON FOR DESIGN CALCULATION PURPOSES

	Watts/Person	Btu/hr
Restaurant, Meeting rooms	145	500
Offices	145	500
Lobby, Main circulation, Bars	205	700
Kitchen & Laundry	410	1400

From the on going pages, it can be concluded that the best air condition installation in large buildings (such as large halls) and those with varied and diverse building occupancy is the centralized station system. The principle of the centralize system is as follows: The condenser is cooled by water circulated to an outdoor cooling tower and evaporator produces chilled water. The latter is then pumped to wherever it is needed in the building.

VENTILATION

Fresh air is generally introduced into occupied buildings or space for the purpose of reducing odours. Only occasionally when one sees a shaft of sunlight cross a room is it obvious how many small particles are continually floating in the air despite modern sanitation, vacuum cleaning and air filteration. Many of these particles cause an unpleasant odour as they settle on clothing, furniture and other absorbent materials. Fresh air displaces some of these sources of odour and reduces the effect of the others. Some

srewd observvers have suggested that with the increase in air pollution, outdoor air may not for long afford a freshening influence. Others say we may soon face the mandatory conditioning of the air that we exhaust in addition to using our presumably limitless "fresh" air supply to provide local freshness. Ventilation rates are usually regulated by occupancy because people even more than furnishings contribute odours through respiration, clothing and body odour. When the space occupied is large with respect to the population relatively less fresh air is considered necessary. The outdoor air usually joins the circulated air stream ahead of the conditioning system, so that the room knows no difference except for freshness. Obviously the amount of air in the system is increased and therefore an amount equal to the outdoor air must be centinously exhausted.

The beneficial effectsof careful control of the temperature and humidity of air can be destroyed if one is seated in an area of sluggish and motion that permits local body heat to build-up and create an uncomfortable and essentially non-conditioned region. Similarly one can be trapped in a theatre seat in the exact trajectory of an improperly aimed air register or one that is blowing too hard. The latter condition can also add sufficient noise to mask out any other sound that one

would like to hear. The difficulties peculiar to the design of large halls and theatres can be summarized as follows:

a - conflict between the architecture of the hall and the necessary air openings;

b - physical difficulty of finding space and routing for ducts;

c - air distribution problems;

d - control of sound in the hall caused by the mechanical equipment and by moving air.

The volume occupied per person is smaller in theatres than in office buildings. The deceptive large bulk of the hall, when divided by the large number of closely positioned occupants results in an index that poses difficult problems as given in items 'a' and 'c' above. Air if admitted through the side walls, must centre at such a low velocity (to avoid audible sound) that it does not efficiently reach the centre of the seated group (the controlling limit is noise coefficient NC 20).

One other important aspect to be considered is the Distribution system. The success of the design of the mechanical facilities will depend on how well the mechanical distribution is organised as related to the structural system. The distribution system

affects the planning of the space inside the building, the facade, the appearnace of the ceiling spaces and the space occupied by the mechanical facilities. There are two basic scheme for the distribution system:

a - Vertical distribution. Small local vertical risers modularly spaces to serve designated modular spaces with no, or limited, horizontal distribution.

b - Horizontal distribution. Extensive horizontal, originating from few, but large, vertical risers.

(a) When vertical distribution is employed, the risers can be integrated with the structural elements (the columns), or with elements with fixed planning, such as the core or fixed partitions. The vertical risers can also be located on the exterior of the structure in which case, the building facade will be affected by the placement and size of risers. With completely vertical distribution, horizontal distribution is eliminated or reduced to a point where the only interaction in the ceiling space is that of structural elements and lighting system. These two important elements of the ceiling can now be synthesized with relative ease. Purely vertical distribution is limited by the type of services to be distributed.

In the case of air distribution, the limiting width from the exterior to the vertical elements on the interior will be 12 metres, assuming that the vertical ditribution shafts are also located at the exterior.

(b) Horizontal distribution. If the distance from the exterior to the core of the building exceeds 12 metres, or if the space is subdivided into more than two areas, it will be essential to introduce a horizontal system. A completely horizontal system will have to be synthesized with the horizontal structure or floor system. When a horizontal system is used, the location of the main vertical risers is very critical for proper organisation of the total system.

RECOMMENDED MINIMUM RATES OF FRESH AIR SUPPLY TO BUILDING FOR HUMAN HABITATION.

TYPE OF BUILDINGS	RECOMMENDED MINIMUM RATES OF FRESH AIR SUPPLY TO BUILDINGS.
Assembly halls	$28m^3$ per hour per person.
Canteens	$28m^3$ per hour per person.
Factories and Workshops	$22.6m^3$ per hour per person.
Lavatories & WC	2 air changes per hour
Places of entertainment	$28m^3$ per hour per person.
Restaurants	$28m^3$ per hour per person.
Cloakrooms	3 air changes per person.
Kitchen	$56m^3$ per hour.

COMMUNICATION AND CONTROL EQUIPMENT.

The range of systems to be considered in terms of communication and control include among other things three systems. These include:-

(a) - The telephone system.

(b) - The Television and radio system.

(c) - The Audio-visual aid equipment.

All these systems serve in one way or the other a very important functions which are indespensable in a conference centre with its collateral facilities. Moreso, they enhance good systematic coordination within the centre.

The requirements for television reception and distribution depend on local conditions for leasing and installation of the equipment, especially since the conference centre has among its collateral services hotel accommodation. Generally a master antenna television system should be installed with specific channel antennae, signal amplification in stages and coaxial cable distribution outlets, in guest rooms, lounges, bars and staff rest rooms. Close circuit television distribution may also be provided to the same outlets through a VHF channel. Radio broadcasting is normally through a central sound transmission system.

Audio-visual aid equipment for conferences and conventions: The range of equipment provision may include:

- Close circuit television camera, screen display, recording, playback, and transmission to other areas.
- Slide projection with remote control and linked sound transmission.
- Overhead screen projection.
- Music, taped speech, microphone announcements and paging through local sound systems.
- Tape recording facilities.
- Telephone connections and projection booth.

The telephone system should be distributed to the main subscribing areas of the conference centre. These include: - Guest lines.

- Administrative lines.
- Auditorium.
- Service lines.

In the case of the Guest facilities, matching telephone extension and room numbers (in case of the hotel accommodation) should be used.

e.g. - Room 12 on 3rd floor - 0312

- Room 15 on 18th floor - 1815.

An indication panel should be provided on the operator's desk for identification of calls. Message waiting indicator lights may be provided on the extension set and on a central panel. In addition, local phone facilities should be provided for emergency and maintenance use, located at: Elevators and escalators; Elevator motor house; Engineering plant rooms; kitchen; servery; restaurant, bar, pantries, store, Radio and Television room and lastly at every 3rd/4th landing of emergency fire stairways..

CHAPTER FOUR

GEOGRAPHICAL LOCATION OF SITE!

The conference centre complex is to be situated or located in MINNA, the State capital of Niger State. A town which lies at a latitude 9° 37' North and longitude 6° 33' East on a geological base of indifferentiated basement complex of mainly manganese and magnetite. To the North-east of the town a more or less continous steep outerors of granite occurs limiting any urban development in that direction. The town's mean annual rainfall of 1334 mm, and a very healthy and safe temperature (of) range of 30.5°C highest and 25.1°C lowest makes it a comfortable if not a suitable area to confer. The wrinkling topography and the beautiful landscape provides an air bursting experience.

HISTORICAL BACKGROUND OF MINNA.

Minna is basically a Gwari town and got its name from a ritual performed yearly by the Gwari founders of the town to observe the beginning of the new year. The word itself in Gwari means "to spread fire". It came into existence because the Gwaris used to put out every bit of fire in the area, even in all the kitchens in the town, on the last day of a new year. About three days to the last day of every year,

the chief of the town together with his chief priest and some members of the traditional council would travel to Lafiyagi, a village on the boundary between Bida emirate and Paiko district about 60 kilometres away, to bring fire to MINNA. Lafiyagi, itself is a Gwari speaking village in the Nupe emirate. The journey was usally calculated so that their return wi h the fire fell in the last day of the old year. In the night of the new year, the people of the town would gather to lay plenty of firewood together and later light it up with the new fire from Lafiyagi. On the morning of the new year, everybody would then take his fire out of the public fire to go and light it again in their respective houses to mark the beginning of the new year. This ceremony eventually became synonymous with the town and consequently gave it the present name.

The original name of the settlement on the hill top was PAIDA and surrounding villages like Dabo, Fadi, Tempina, Nayi, Dnayi Pasin and Shakwo were all under its domain. Every new year their inhabitants would all come to get their new fire from the MINNA house in Paida. The early settlers and founder of the town lived on top of the range of hills which line with the eastern and northern sides of the present Minna. Evidence of early settlement on the hilltop remains in

the form of dilapidated foundations, broken pots and many baobab trees that characterised ancient towns in the North, most conspicously at MINNA house, in front of which the yearly ceremony was observed. However before the town became the modern city it is now, it went through four metamorphoses.

The first was in 1905 when the construction work of the rail line got to the area. As there was no local labour at that time, the construction workers were the Gwari's, Nupe's and Hausas. The various groups were accommodated in different camps to ensure easy access and to prevent desertion. The Gwaris camp was situated in the areas of the present Keterengwari, while the Nupes had their camps at the present Kwangila and the Hausas at Kasuwar Zamfara or Limawa. These camps later became permanent settlements and eventually formed some of the present wards of the town. But before they became settlement areas, the chief of Paida on the hill top, was asked by the railway authority to provide an arbiter who would settle the constant disputes that arouse between the labourers. The late Cheif of Bosso, Mallam Abubakar Zarmai became the choice with one Muazu Paiko as his secretary. He transfered from the hill top to settle near the camps as the administrator while his father Mallam Godeyize who was still on the throne as the

chief of Bosso remained on the hill.

In 1908, the second face life for the town took place when an Alkali (Judge) was provided for the camps. A permanent house for the Alkali was built and within the compound there was a provision for a prison. Later, the first contingent of police was introduced. The third matamorphosis was in 1910 when the Gwari inhabitants decided to move from the hill top to settle down on the areas of the present Paida, one of the wards of Minna and thus the abode of the founders of the town. In 1911, the construction of the main railway line within Minna has been completed and the first locomotive engine - "Wushishi" - arrived in the town. One of the first in Nigeria, it is now preserved at MINNA railway station by the Nigerian Railway Corporation. As the railway workers' camp started developing into permanent settlements and gradually over shadowed the influence of the indigenes, the Minna town council was established (in 1934) comprising as members, distinguished representatives of the various settle tribes. This however was short lived and the Gwari Federation Native Authority was soon formed. By November 1950, a Chief for the whole of the new Minna area comprising all settlers was enthroned. He was Alhaji Ahmadu Bahago I who is still on throne today.

Other significant events that took place include the building of the present Aerodrome in 1929 as one of the first three aerodrome in Nigeria. The Bosso dam was constructed in 1945 and serve as the sole piped water supply to the town until the late sixties when the Chanchaga water works was built to extract water from river Chanchaga, and in 1962 the National Electricity Power Authority (known as the ECN) was established. The forth change of status of the town came in February 1976 when it was made the state capital of the newly created Niger State. Since then the Government has been battling hard to give Minna a face lift and a look befitting a state capital.

THE TOWN BODY

Minna is a town which is located in the interior part of Nigeria. Although it is geographically centrally located, until recently, it is not as easily accessible as other state capitals in Northern Nigeria. There is a railway system which joins it to Kaduna and Kano in the North and by the main line to Ilorin and Lagos to the south and by a branch line to Baro on the Niger River. Minna town as a whole is made up of a high density core areas: Three main peripheral villages and the low density government residential area (GRA)

Bosso village form the Northern approach to the town, while Maitumbi is to the east. Tudun wada is the Southern end of the town and the G.R.A. is the housing and institutional area on the western side of the core area.

Minna is a town of migrants and has a higher than average proportion of its population in the working age group. Nine in ten of the house-hold heads in the town have migrated to the town. Half of these have come within the last 5-6 years.

DEVELOPMENT OF THE FEDERAL CAPITAL

The view has often been expressed that the development of Abuja as the federal capital will naturally encourage the development of Minna. There's bound to be a spin up effect. But is not necessarily going to be very great. There are many economic and geopgraphical forces working against Minna and it is important to identify them and see how they may be overcomed. What kind of development, initially attracted by Abuja, would like to develope in Minna instead? Certainly it would not be the headquarters of the federal ministies and parastatals. By definition they will go to Abuja only. They are the reason for Abuja, they will not develop in Minna. The headquarters of the

private sector firms will, for the same reason only wish to develop in Abuja. But manufacturers and suppliers of service are a different matter. These investors and particularly the early ones, may wish to hedge their bets on the ultimate success of Abuja.

So they may want to invest close by where there is a ready market for their service or product so that their staff will not feel that they are being exiled. But the place must be close enough to take advantage of the federal capital market if it does take up.

Minna is only 130 kms away from the new Abuja town centre. It is a rapidly developing state capital with an immediate potential market for many products and/or services. Its location gives it a transport cost advantage in many industries with dense raw materials but bulky end products. Its potentially good supply of water gives it and edge over many other locations. The road connection between Minna and Abuja which has been recently concluded puts Minna atleast an hour or so driving time from the proposed Abuja town centre. The A2 route from Abuja to Kaduna has been completed

and that has placed Kaduna at almost an equivalent driving time from Abuja to Minna. So the potential investor who want the federal capital market but does not want to invest there now has a choice. Minna or Kaduna.

The big advantage for Minna, even above those already mentioned, is its potential for growth and the fact that there is little competition in many fields. Kaduna by contrast, has a much larger immediate market but the established competition is really very strong. Minna should exploit this situation and that is why it is trying by all means to make investment very attractive to potential investors, and summarize one of the reasons for the establishment of a conference centre in Minna.

SITE AND SITE ANALYSIS

Choice of site especially for a conference centre is controversial in the very sense that one has to put many factors into consideration. Decisive factors for the selection, evaluation and acquisition of the site should have significant effect on the choice. The first instinct I had was to site the conference centre within the town centre. But on careful analysis, it was found unsuitable. The main factors which lead to its rejection include among other things:-

a - The town centre is a very noisy part of the town where almost all the commercial activities are concentrated. Noise has psychological effect on, not only human beings but animals, who are within the area, and there is yet to be a definite measure taken to control it. Since a conference centre is a place where maximum concentration is needed to effect full participation of delegates, it should be sited in an area which has a tranquil atmosphere and free from any form of distraction.

b - Congestion is another factor which led to the rejection of the site. It is very easy to notice the unhealthy of people and buildings within the town centre. Should a conference centre be sited within the area, a lot of problems might be encountered when it comes to future expansion. I believe that it is incumbent on an architect or designer to consider the feasibility of expansion, when he is confronted with the design of a building site. For buildings like conference centre with collateral facilities, one need to consider the increasing number of people and the trend of development to facilitate the necessity of expansion.

c - It is my aim to design the conference centre in such a way that the participants or delegates to the centre be able to find it easily. Traffic

congestion is rampan within the to n centre and this might cause a hitch or more specifically a delay in reaching the centre.

d - The provision of a hotel accommodation also crippled the decision to site it within the town centre, since guests should be made as comfortable as can be achieved. To attract people to the centre, (since the hotel functions to serve not only the delegates but other people who might seek hotel accommodation including tourists), it must be sited in a very quiet zone.

Based on these facts which led to the rejection of the first site, I decided to locate my conference centre along Bosso Road. Bosso is about one and half to two kilometres away from the distant noise of the town centre. It is a sub-urban settlement and so most of the buildings are spatially designed and arranged to meet the environental conditions except along the main spine or route on which one finds a concentration of petty traders and some commercial activists. The specific site itself is situated further north to Bosso, alon the road to the new airport, the construction of which is now in progress. The site is bounded on the north (infact far north) by some residential buildings. On the south by Bosso (though can not be clearly viewed because of the vegetation), and on the

east and west by low lying hills and vegetation respectively. As earlier mentioned, many factors have been considered and together with the sites good characteristics, it was choosen. This can be dispensed as follows:

a - VISUAL AND PSYCHOLOGICAL CHARACTERISTICS. As earlier mentioned, the conference centre should be situated in an area where there is utmost comfort and tranquil atmosphere. This site is bestowed with excellent distant views in all directions and since a conference centre has to sell its services, services that are in no way essential commodities, unlike hospitals and schools, etc, it was found suitable to design and locate it in this area where it can advertise itself, to compel buyers to seek for its services so that their experiences should be a living memory to those who come in contact with them. Furthermore, the building can be extremely visible especially since it will form a sort of "sculpture in the garden" and this can cast an inquisitive feeling on an observer.

b - SERVICE TO SITE AND TRAFFIC. This site has the advantage of not situated along the main spine or route which has maximum load. To get to the site, there is a primary road tapped from the main spine and this ease the danger of driving directly into

a large dual carriage way, which in so many instance might and have caused series of accidents and lost of lives. Because of the need to bring about an integration of the hotel and the conference machine a large parking space shall be provided for both. Another factor which led to the choice of the site is the possibility of transport of building materials. The primary road has light traffic and will no way disturb the flow of materials and other services to the site.

c - VEGETATION AND SHADE. Since Minna falls on the savannah zone of vegetation, it is in no way surprising to find beautiful but ornamental trees e.g. Delonix Regia (flamboyant tree), Eucalyptus and some Parkia, which can be retained to give shade and add to the beauty of the whole environment. Beautiful trees as they are, will surely provide visual and psychological satisfaction to the users.

d - UTILITIES AND SUPPLIES. The existence of fresh water and electricity supplies, and drainage cannot be taken for granted. This site has the advantage of being located only 3 kilometres away from the main Bosso Dam. Since a large project like that of a conference centre cannot do without

en enarmous supply of good water, fresh water will be tapped from the main distribution pipes to the site. Bosso Water Works was commissioned about three years ago with the capacity of 1150m^3/day. The reservoir has the capacity of 900m^3. Electricity supply can be easily tapped from the distribution lines (overhead) in Bosso. Already, there is a large transmission line which passes en-route from Jebba to Kaduna via Shiroro. This has the capacity of 132kv. It is then stepped down to 33kv for distribution in Minna town and its environment. After making observation on the site profile, I found the possible direction for drainage system flow and disposal is to the south, because the site slightly slopes to that direction.

e - NEARNESS TO THE NEW AIRPORT. The new airport when completed will serve to bring not only delegates for conferences, but will also enhance the trooping of tourist because of the tourist attractions provided in Minna. The site is only about 5 kms away and this will enable them to find the centre easily.

f - SECURITY OF THE SITE. Incidently and probably unconciously, there exist a police station before the turn to the primary road leading to the site

along the main carriage way. This will ensure law and order within the area.

g - NATURAL VENTILATION. Another important factor is the desirability of natural ventilation. This site has a very gentle slope and since there's air circulation even on small sloping sites, the site is found to be most suitable. The possibility of soil erosion by wind has been solved by the presence of large cover trees within the site.

h - Services like gas stations and car service are located along the main spine but close enough to render services to guests and the conference centre.

i - In conclusion, the master plan has shown and confirmed that the development of Minna will follow along the main spine to Bosso and this will add to the environmental awareness and control of the site.

SITE CONSTRAINTS.

a - The primary road leading to the site is an untarred road. During rainy season, it is possible that cars might be stucked in it and this can cause detrimental effect, if not a blow on the conference

centre situated this beautiful site. It is therefore advisable if not necessary to up grade the road to a condition befitting a road which carries the function of directing delegates and tourists to the conference centre.

b - I also found that, while there are so many trees, beautiful ornamental trees within the site which can be retained for the good and comfort of guest within the centre landscape, some of the trees must be removed and this surely means an increase of work load, and therefore costs might increase.

CHAPTER FIVE

ARCHITECTS BRIEF

5.1.1 PARTIONABLE CONFERENCE HALL.

The main conference hall is to be designed for a target number of delegates of about four hundred. Special features to be incorporated in the design includes sound absorbent materials on the walls of the conference hall. Others includes the use of loud speakers when a certain noise level is to be achieved. The conference hall is to be a multiple use hall, so it must be designed to accommodat other functions apart from conferences and seminars. It will also be equipped with special lighting and control, so that the lighting intensity can be varied depending on the particular activity taking place. All in all lighting has to be visualize during the preliminary design process so that the final evolution of the design will consist of a conference hall with the essential lighting coverage and required by a hall of its capacity.

One special feature that is required of this conference hall is its capacity to be partitioned or demarcated when small conferences are being held. Moreso, other activities not requiring the whole volume of the ball can be opportuned to have it reduced

design and lighting to enable viewers to appreciate what is exhibited.

5.1.3 SEMINAR AND COMMITTEE ROOM.

It has been found that large conferences especially profession and/or business conferences are sometimes broken down into "buzz" sessions, or smaller sessions designated as discussion groups, working groups, panels and workshops. These are suppose to discuss and deliberate on specific professional themes with the aim of solving problems at hand or discussing points of professional interest. Two or more of these sessions could occur during large conferences of these nature and this calls for special design consideration.

The seminar and committee rooms will cater for these small sessions, and will be equipped with the necessary facilities to help these sessions through successfully.

5.1.4. LIBRARY.

Libraries are now becoming very vital in conference centres. It provides records of conferences held in the conference centre and other valuable documents of professional interest. Moreso, journals (weeklies and dailies) can be found for ready use. Books and

pamphlets on the activities of the conference could easily be found there. The library should therefore be located where it could be accessible to delegates and the public. Slides room and films should be provided to serve as documentation rooms for the preparation of conference papers.

5.1.5 DELEGATES LOUNGE.

This passive space is the resting area of the delegates and relaxation when conferences are not in session. The lounge which is intended to be an intermediary area should be provided with coffee/ snack bar as an entertainment and refreshment procedure. The decor should be inviting and relaxing but must not clash with that of the restaurant in style and flamboyance. Lighting should be intermediate intensity to facilitate efficient operation. The lighting is used as a design component, to draw attention to features, create interest and personalization of different areas.

5.1.6 ADMINISTRATION.

Conference centre is a big institution, therefore a competent body of personnels is required to administer the activities that flourish within it. In realisation of these and other factors, including a good network of coordination of functions in the centre, it has been

advocated that the administrative area/section be located in close vicinity to the main conference hall and other collateral facilities. The Administrative force will include the manger/director, assistant director and secretaries, conference manager and general office/typing pool.

5.1.7 INFORMATION AND DOCUMENTATION.

This should be provided within the lobby area to enable conference delegates to register and obtain valuable information on or about the conference.

5.1.8 GUEST ROOMS.

Analysis has shown and past records has confirmed that about 50% of the conference delegates should be provided with hotel accommodation within the centre. So a hotel accommodation consisting of single bedrooms, double bedrooms and suites for about two hundred people should be provided.

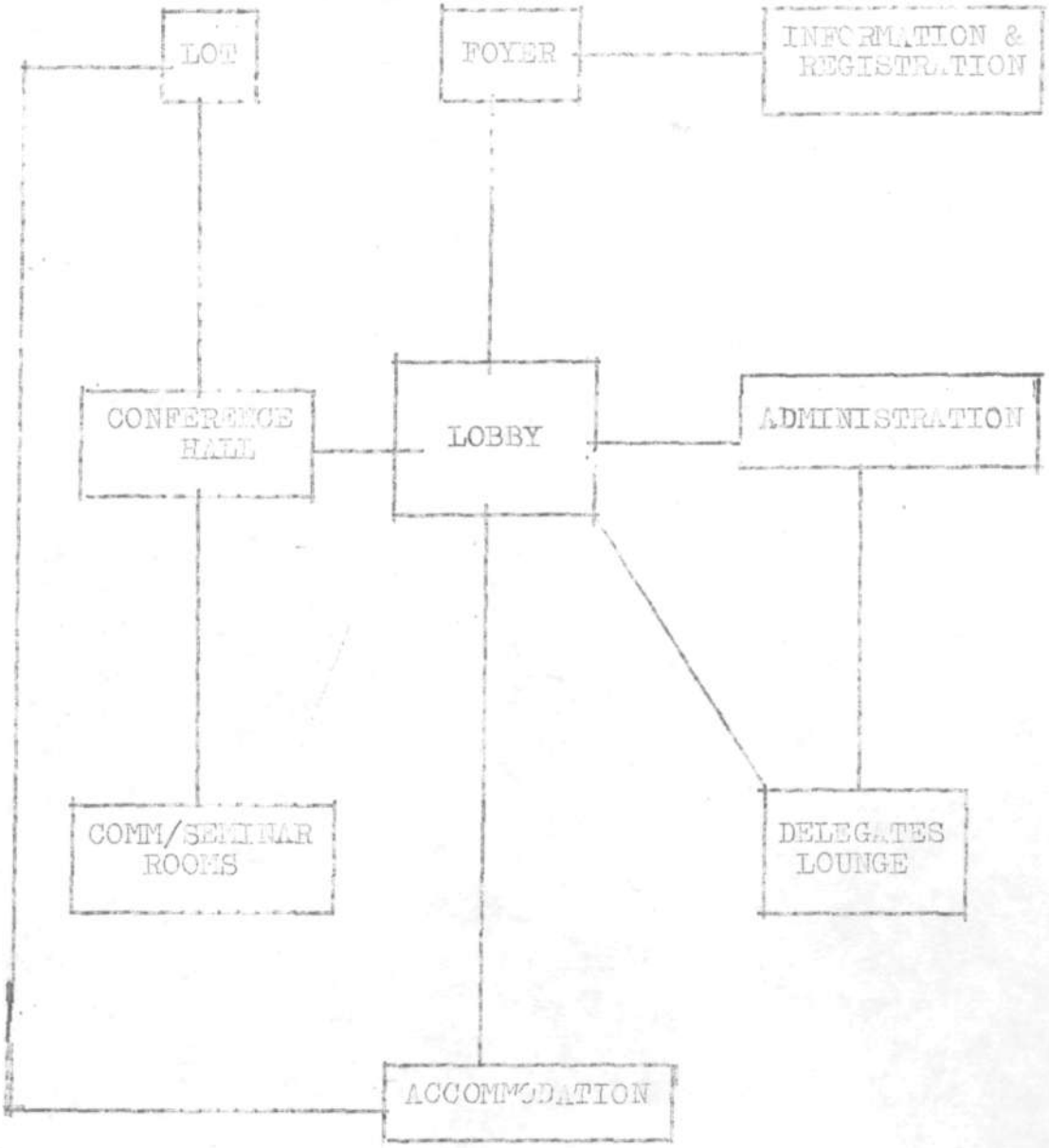
5.1.9 RECREATION AREA.

Recreation spaces should be provided for both active outdoor and passive indoor games which are for the use of those in the hotel guest rooms.

5.2.1 SCHEDULE OF ACCOMMODATION AND SPACE REQUIREMENTS.

BRIEF CONFERENCE MONUMENT	ESTIMATED MINIMUM AREAS (m^2).
Partitionable Conference hall	(300 - 400 people).
Committee/Seminar rooms	60
Delegates lounge	150
Coffee/snack bar	30
Information and Registration	40
Slides/films	30
ADMINISTRATION & SERVICES.	
Director and Secretary	50
Assistant Director/secretary	40
General office	50
Conference officer	20
Library	50
Store	100
Plant room	70
Reception	70
CATERING	
Restaurant	60
Lounge	150
GUEST HOUSE.	
Single rooms	(90 rooms)
Double rooms	(90 rooms)
Suites	(30 rooms).

5.3.1 FUNCTIONAL DIAGRAM



FUNCTIONAL DIAGRAM OF CONFERENCE CENTRE.

CHAPTER SIX

CONCEPT DEVELOPMENT

CONCEPT DEVELOPMENT SEQUENCE AS VIEWED BY THE ARCHITECT.

When the environmental designer is confronted by a design problem his initial solving process involves a visualization of potential solutions. His creative image triggers a concept which is imagined ("seen") as a flashing, dimensionless image with the minds eye images formed from his creative leap into the proposed environment. These can result from or be subject to, his prejudices, intritions or a systematic analysis or reduction of criteria. Such a neutral picture is a photographic impression - incomplete, in a state of flux and somewhat vague. It has originated from many forces at work within his mind including the nature of the immediate problem, his personality traits and past experience, many of these latter influences lying beyond any concious control. These factors continue to have some bearing on his decision-making throughout the ensuring and evolving sequence of design.

It might be possible to generate and develop images from concepts in the mind alone. But spatial ideas can become so extensive and complex that they can no longer be contained within the mind and have to be externalized. Representation in some tangible form is needed so that they can be clarified, assessed and articulated.

At this point the idea has to pass through space and (depending on designer) be translated into two or three dimensions, as a descriptive model which allows the designer to experience the nature of his idea and develop its conception. This preceived experience, newly represented, of a form - space acts as the basis for further development inspiring his creative imagination on to other mental images which are, is turn realized in representational form for person or group evaluation. This two - way language of design is a continuous dialogue between conept and mode of expression - alternating until the creative process is exhausted. (Tom PORTER).

Through the use of graphics, the architect has traditionally learned to transfer the shifting images of his mind's eye on to the drawing board. This kind of visualization technique has been commonly accepted as an invaluable design tool and considered as having little effect on final appearnace of architectural form. For example, in addressing students in the 1930s, Le Corbusier explained that architectural form and space is first a concept of the brain, being conceived with the eye shut. Paper was the only means of transmitting spatial ideas back to the designer and to others. If we observe the initial conversion of design concepts into graphic marks we find, more often than not, a use of embryonic ideograms - flow or bubble diagrams and

doodled plans. These are simply intended to explore early concepts as patterns of spatial relationships - the cross-section and elevation being introduced as a check on this diagrammatic planning stage.

The moment an idea is transferred from a designer's mind to an external form is a critical point in the life of any architectural design concept. In order to give birth to the idea, he must adopt some form of abstraction which represents or reflects the pictures in his mind. The process of abstraction usuallly involves the use of descriptive symbols or annotation - images and words which combine to chart the potential relationships between concepts and reality. The diagram appears most useful in these crucial moments for, in functioning as a constructive doodle, it is clearly more concerned with the essence of ideas, than a prediction of apperance.

(TOM PORTER, OXFORD POLYTECHNIC'S SCHOOL OF ARCHITECTURE).

In an attempt to evolve a design concept, I have tried to consider the environmental adaptation of the conference centre as well as its functional requirements. My concept is to bring a unification of the major arms of the centre (Conference Machine, Hotel Accommodation and Administrative set-up), to enhance good coordination

and harmony and therefore effective interaction of conference delegates with the Administrative personnel. This form of interaction I believe, will also enhance good consition of service and will therefore be a form of attraction in the public eye.

Since conferences bring people from different works of life together in the form of social interaction, I have tried to evolve a visual concept by the use of twin stairs ending on a unit landing leading to the entrance of the conference hall. These twin stairs can be visualize as hands involve in a handshake. Handshakes in any society represents peace, and friendliness and can be identified as one of the well established norms around this area.

CHAPTER SEVEN

DESIGN

It is very interesting to know that, in Architectural design, the architect or designer tend to create in his own way a scheme of problems and a sequence of solutions to the given problems in which, one finds its way through successfully. The success of the solution depends on the designers maximum utilization of his knowledge of sociology of the people or group of people and their behaviour to a built space. Moreso, his thorough knowledge of the geography of the site, structural system and materials are of significant importance.

I believe the right approach to thedesign of a room or an enclosure is, first to define what activities are likely to take place in it, then to access the furniture and equipment necessary for these activities and then to design around those needs - These depend on the way of life of the prospective occupiers.

During the process of my design, I was first of all faced with theproblem of design circulation. My project consist of three arms, these includes, Conference machine, Hotel Accommodation and Administration. I wanted a unit linkage between these arms as well as providing a separate entrance for the Conference Hall, yet not distracting

and putting a visitor into confusion of where the main entrance to the complex is. The solution to this problem was achieved by creating a sort of vista - using trees to direct a visitor from the road to the prominent main entrance. The second entrance to the Conference hall can only be viewed directly from the main parking lot.

In general harmony has been achieved within the conference centre complex. A visitor to the complex will first of all park his car in the parking lot and walk himself to the entrance. Important guest can be driven to the drive-in, where he steps off his car and the driver drives to the nearest parking space. The visitor now on walking through the entrance finds himself face-to-face with the receptionist in the grand lobby which has no strong physical separation from the lounge. Enquiries can be made and visitorsfor accommodation move directly to the lift corridor where they are driven to their respective floors. Alternatively a grand staircase is provided for those on lower floors or rather persons who intent to thst their physical fitness. The administrative set-up is directly linked to the lounge.

Directly linked to the lounge are the flying Restaurant and on the opposite side, the goods shops

and boutique. Visitors to the restaurant can therefore find it with ease. The shops are situated strategically to attract the human beings within the lounge. Linked to the grand lobby also is the conference machine, and visitors can move to a small lounge, around which are situated the exhibition hall (also used seminars) the library and committee rooms.

An escalator is provided which can life a large amount of people to the main conference floor. On this floor is situated the grand conference hall, seminar rooms and pressroom and also audio visual aid. This floor is connected to the parking lot by low-rising twin stairs, thereby achieving a unique unifying circulation.

CONCLUSIONS:-

It is very clear that an architect helps to shape people's behaviour by the environment he creates. At all stages of the design development, he makes assumptions about human behaviour and the successes or otherwise of his work depends on his ability to predict human behaviour with reasonable accuracy. Specifically, three basic activities are prominent in a conference centre; they are talking - hearing showing - seeing and relaxing. I have tried as much as possible to give

these activities the maximum prominence required of a realistic project.

Economically, it will bring a yearly turnover of revenue to the state government. In general the centre will bring together the people of Niger State and outside closer to governmental and academic activities.

It can then be concluded that while the Conference Centre complex is a contribution to the people of Niger State, it has also been projected and aim at increasing the treasures of Architecture.

BIBLIOGRAPHY

1. ALBERT O. H. (1972) Architectural Rendering, pp 84 - 143.

2. DEOCHIARA and CALLENDER (1980), Time saver standards. Building types and Architectural types.

3. FRED LAWSON (1979), Hotels, Motels and Condominiums. Design planning and maintenance. Architectural Press Ltd., London. pp 100 - 106; 196 - 200.

4. LESLIE, D. (1977) Environmental Accoustics.

5. LEWIS, U. (1979). A Conference Centre in Makurdi. M.Sc (ARCH) Thesis.

6. MAX Lock Group (1980) Minna: Masterplan. pp 1.1.1 - 1.1.9

7. PARKIN P.H. and HUMPHREYS H.R. (1976) Accoustics, Noise and Buildings.

8. RODERICK, H. Theatre planning.

9. TOM, P. (1979), How Architects Vizualize, Studio Vista, pp. 61 - 70 .

10. WILLI, F. (1978). Room and building accoustics and Noise abatement. London Butter worths. pp 58 - 75.

JOURNALS.

1. Architectural Record (1982) Conference Centre Luzerne County Community College, Pennsylvania.

2. Architectural Record Oct. 1978.

3. Architects Journal 22nd November, 1978.

4. Architects Journal 28th September, 1977.

ARTICLES.

1. Commonwealth Experimental B.5 (1960). N.S.B. No. 60, Fire in buildings.

2. Commonwealth Experiment Building (1960) station. N.S.B. No. 90, Materials for fire - resisting construction.

CONFERENCE CENTRE FOR MINNA
THESIS ABSTRACT.

INTRODUCTION.

A conference centre is a place where people and organisations come together, (and who have diverse professional interest overlap through their concern with a common problem) to discuss issues (business and academic) in a way of impacting knowledge or know-how to those concerned and generality.

Niger State as we are all aware is one of the infant states created in 1976 having been carved out of the former North Western State region. It is an open secret that during the almost nine years operation of the former North Western government, not much development was achieved in this past of the state. The provision of a conference centre in Minna will act as a forum for the government to invite professionals to discuss and give intelligent advice on the development of the state.

OBJECTIVES:

(1) To provide large conference hall and seminar rooms to enhance discussions in a tranquil atmosphere.

(2) Since the University of Technology Minna will soon be a reality, it will provide spa ce and

act also as a forum for making research discussions and other academic activities.

(3) To bring people from different works of life to discuss common problems.

(4) To ensure efficient operation and flexibility of space within the conference centre.

AIMS:- The Conference Centre among other things will:-

(a) Act as a forum for social interactions.

(b) Provide employment facilities to the indigenes.

(c) Attract private organisations to invest in the State.

(d) Ease out the problem of Hotel accommodation.

SCOPE:- The scope will be limited to the design of:

(a) Conference Hall.

(b) Hotel accommodation for two hundred people.

(c) Seminar/Committee rooms.

(d) Administrative block.

In the light of this coupled with the intensive desire to participate in the development of my state and Nigeria that I propose a conference centre for Minna.

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82/83 SESSION.