A THESIS

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By

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on

State Library for Bauchi

in

June, 1981.

| | |
|---|---|
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# THESIS ABSTRACT

**Topic:** A State Public Library Complex

**State:** The new Bauchi City-centre proposed by Maxlock group of planners.

**Sponsors:,** Bauchi State Government

**Client's Brief:** A modern public library building large enough to accommodate 100,000 volumes of books, with all necessary facilities required in modern public libraries. These include an auditorium to seat at least 200 people, a snack bar, space for outside reading and adequate provision for future expansion.

**Organisation:** Proper noise segregation - the noisier departments should be kept away from the departments that require high concentration and quietness. Traffic routes for materials and for readers should be separate.

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I also wish to offer my thanks to the following people: Malam Haruna Saidu, acting state librarian in Bauchi State; Malam Shehu Mukhtar, Deputy State Librarian in Kano State; Mr. S.A. Zemo, a library Officer at Kaduna State Library; Mr. Khalid Mohmud, the University Librarian at A.B.U. for all the asistance they offered me when I visited them in the course of my data collection.

Finally I wish to thank all my friends and relatives who offered me moral and practical support during the development of this work, and to whom I sincerely apologise for the inability to mention individual names.

## Dedication

This thesis is dedicated to my dearest sister,

Laraba for what she is to me!

"The public library offers free access to works of knowledge, information and the imagination, which is vital for the maintenance of a civilized and democratic society and the development of initiative by the individual. The public library is a principal agency of education as a continuing and lifelong process, encouraging literacy and protecting against illiteracy. The public library is of crucial importance in attracting children to the joys and benefits to be obtained from the world of books. The public library encourages and supports the positive use of leisure".

- L. A. R.
September, 1979.

# CHAPTER 1

## INTRODUCTION

The key to any form of development is education. Without education, and indeed, the spread of the knowledge among individuals, no development could be feasible. The most developed countries in the world today have all reached this status due to the high level of education and specialisation their peoples have been able to attain. The converse is equally true, that the so-called underdeveloped countries are so behind because most of their populations are yet uneducated.

Nigeria with a population of over 80 million people today has over 70% of this number uneducated. Most of the progress, achievements and developments feld are performed by this small proportion of the educated ones. To quench this thirst for education successive governments of the federation have been establishing more schools including adult-education classes. But all these efforts will be incomplete without adequate provision of a means through which the people (particularly the adult) could learn about all happenings, be they current or of ancient origin, because education does not end in the classroom.

One of the basic means of spreading knowledge and information, and also storing important facts for future reference is the LIBRARY SYSTEM. M. Mevissen, in his book "Public Library Building" observes that: "It is one of the essential assumptions for the functioning of the highly civilised life of present-day mankind that every insight, every fact, every method, be they of modern or ancient origin, should, through reproduction (in print and in other tenhnical media) be always without difficulty accessible to all those to whom they might be useful. The most comprehensive and most accessible presentation can only be guaranteed by the establishment of libraries and archives which individually or in a suitably organised or systematic cooperation attempt to be complete, and to make their collections well arranged and accessible".[1]

There are many types of libraries, ranging from Academic libraries, home libraries, libraries of organisations, archives, municipal libraries to general public libraries. The public library among all others, is the main medium for the spread of knowledge among various categories of the population. Its objectives do not end at providing a place for individuals to go and read books, as can be seen in the list below.

Aims and Objectives of a Public Library

i) To provide necessary support for intellectual efforts in all activities directed at progress and development.

ii) To preserve and store important documents and facts for reference in the future.

iii) To facilitate the flow of knowledge between different places at all times, this could be in form of periodicals, newspapers and the like.

iv) To provide a means of general education and learning in a similar manner to schools.

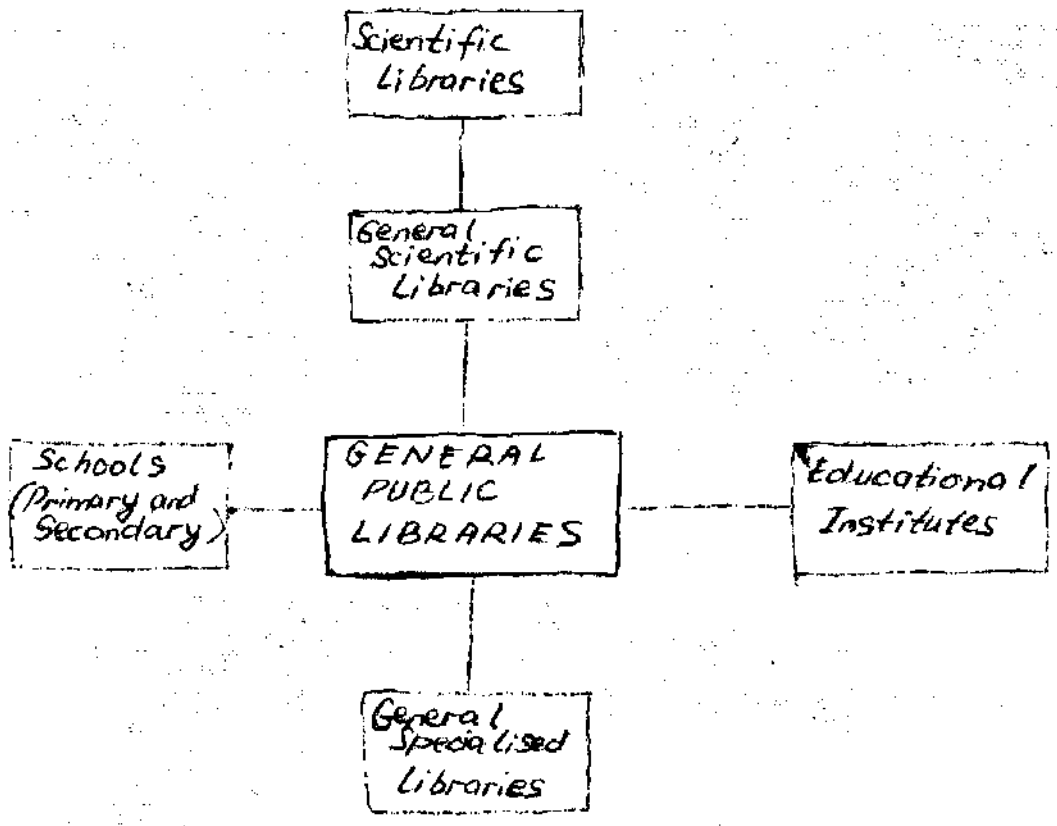
v) Means of bringing different categories of people, belonging to different disciplines together at a common place for a common purpose.

vi) To help in character forming and instilling the feeling of citizenship in many individuals.

vii) To provide a place conducive for holding public discussions, conferences, and performing many social functions.

The social life of our day gives the public library two dominant aspects, i.e. (i) its aims make it an indispensable institution in general education; (ii) its medium, the book, makes it an important link in the general book and library system.

This character can be visualised by menns of a diagram which shows the various types of libraries vertically and various institutes of general education horizontally. The focal point in which both systems meet is the public library.




Unfortunately, uptill now most Nigerian governments have either not realise the importance of public library system or have deliberately refused to accord it the amount of attention necessary to enable it perform the desired functions. For instance only few states can boast of a single standard library each in

their state capitals. In the course of data collection, the author observed that even those states (among the northern states visited) that have libraries, these have not been designed well enough to serve the users efficiently. Nor have the libraries got sufficient availability of reading and other materials including facilities for the users. Qualified staff to operate the various units of the libraries are also lacking.

In making a proposal (consisting of a set of architectural drawings and this written report) for a state library complex for Bauchi. The author has taken note of most of the problems and deficiencies in the existing libraries, and consequently has made efforts to solve these. Examples of such problems inherent in most existing library buildings in Nigeria today are:

i) Provision for adequate ventilation - Most now library buildings have been designed in line with those in temperate climates, hence natural ventilation is completely not given any provision for. A good example of this is Kashim Ibrahim Library of Ahmadu Bello University, this building always gets too hot for comfortable reading since the breakdown of the central air-conditioning system, this is mainly because the rooms are so compacted that air cannot go through and ventilate the building naturally. To curb this

problem the author has designed a courtyard building with adequate possibility for natural ventilation, so air-conditioners are not even required.

(ii) Lack of sufficient qualified staff to operate the libraries. For example, the Kano State Library currently accommodating 80,000 volumes has only 35 qualified staff. To alleviate this problem, the author has provided teaching facilities including a classroom, so that unqualified employees could be given short but basic training to be able to understand the basic library processes and duties.

(iii) Provision of space for holding social activities like public lectures, symposia or drama. An auditorium has been proposed for these.

These are some of the many things lacking in most public libraries in Nigeria, which the author has proposed for the Bauchi State Library.

The chapters that follow discuss the basic planning principles and design requirements of public libraries. The last chapter in particular deals with the particular scheme at hand, giving all necessary details of how the design is finally achieved.

## CHAPTER 2

## OUTLINE PLANNING AND BASIC REQUIREMENTS

Before embarking on such a scheme as designing a state public library complex, it is essential to obtain and indeed realise the basic requirements of such a project. These basic requirements could then direct the pattern of or lay down some form of guideline for the project. Among others such requirements include:

i) Functions of such a public library.
ii) Size of the collection to be housed in the library.
iii) Population of readers anticipated to use the library.
iv) Staff requirements to operate the library;
v) Physical size of the library which is consequence of points (i) to (iii) above.
vi) Flexibility, adaptability and expansion requirements.

These points are properly analysed below for adequate clarity and understanding.

### Functions of the Public Library

The main functions of the public library have already been explained in chapter one - Introduction. So for fear of repitition, they will not be listed again here. It suffices to say that, in a nutshell, the function of the public library

is to facilitate the spread of knowledge (verbally, in print or in tapes) among people, and also to provide a means of storing important information, data and facts for use in the future.

Size of the Collection to be Accommodated

The volume of the collection to be housed in a public library depends on so many factors, and these include: the population to be served by the library; the possible size of the building to house this collection - noting cost restraints if any; and the ability of the financing body (in this the State Government) to provide sufficient funds for the purpose.

Before coming to an acceptable figure to work upon, the author had to visit a number of existing public libraries to note their capacities, and then later hold discussions with some of the policy makers. Among the state public libraries visited were the Kano and Kaduna State public libraries. The Kano State library has presently a total of slightly over 80,000 volumes, they are currently expecting around 20,000 volumes this financial year. Nonetheless, the libarians are bitterly complaining of the inability or refusal of previous governments to provide them with sufficient funds to obtain sufficient number of volumes and also render adequate services. The Kaduna State

library, a good building with distinct departments, and sufficient qualified staff, has only 36,000 volumes. These volumes without any reservation are indeed too small to meet the desired goals. So with this data the author met the governing authorities of the Bauchi State Library (which is currently operating in a dilapidated old town hall, and houses around 23,000 volumes) and held some discussions and evaluations. Ultimately a figure of 100,000 volumes was accepted as a reasonable size of the collection when the proposed library becomes fully operational.

Population of Users

While in the developed countries with a high percentage of educated people, it is easy to estimate the possible size of the library users from the total population of the area; this is not possible in a society where the percentage of those who can read is quite small. For instance from various researches, it has been ascertained that at least 20% of the population in the developed countries use public libraries. But in the case of Bauchi, the site for the scheme at hand, perhaps not more than this percentage of the population in the area is even educated enough to visit the library building. So in effect it is not possible to say what will be the number of users in the library. Nonetheless, we can safely assume

that the number will be increasing exponentially due to the various efforts of the government in educating people particularly the coming generation. Consequently, adequate flexibility and possibility for expansion should be made in the design to be produced.

Staff Force Required to Operate the Library

The number of staff required to operate the library efficiently is also difficult to be set out in concrete terms. This is mainly because, there are no sufficient qualified people to be employed, particularly the middle cadre of staff. Most existing libraries (both academic and public ones) in Nigeria are lacking in staff requirements. A good example of such a case is Kashim Ibrahim Library of Ahmadu Bello University, with a book population of 275,000 volumes as at now (when fully operational can accommodate 500,000 volumes) has only thirty-five qualified staff to operate it. Similarly, the Kano State library with a book population of 80,000 volumes has only twenty-five (25) qualified staff to operate it. In the light of this, making any estimation of the required number of staff to man the library will be unimportant. The best the author has done is to propose means through which this difficulty can be alleviated. First at the inception stage all departments and units of the library should be supervised by at least one

qualified staff (see chapter on number of departments and units). Secondly, a classroom and other teaching facilities are proposed within the library building so that unqualified staff can be given basic training here, to enable them operate well. Through this the library can gradually be self-sufficient in terms of staff requirements.

Size of the Library

The size of the library depends upon the size of collection to be accommodated and the number of units and departments (including satellite libraries) under its governance.

Many distinguished library consultants have given guidelines for determining the size of libraries based on the size of the collection to be housed. For instance, W. Merissen, in his book - "Public Library Buildings" gave a breakdown of space requirements for various departments of a library according to the number of volumes to be housed. The estimate excludes spaces required for corridors, stairs, outside reading, seminar, lectures and surrounding landscape. He says for a library to house 100,000 volumes the following spaces are required:

| | | |
|---|---|---|
| Book selection/information | .. | 1,841 $m^2$ |
| Study work section .. | .. | 200 $m^2$ |
| Public auxilliary services | .. | 200 $m^2$ |
| Internal Library Services | .. | 108 $m^2$ |
| Loans, Contro, Exhibitions, Catalogues | | 450 $m^2$ |
| | Total | 2,907 $m^2$ |

Similarly, Ashburner, in his book "New Library Buildings" gave his own estimates. According to him for a library to house 100,000 volumes, each 10 volumes require 1 $ft^2$ of space - (note that this space is not only for book shelves but for the whole library services). So from this we can calculate the required space for the 100,000 volumes in our case:

10 volumes require 1 $ft^2$

$\therefore$ 100,000 volumes require $\frac{100,000}{10}$ = 10,000 $ft^2$

= 3,300 $m^2$.

From these one can roughly persive the total amount of space required. Though these estimates excludes some few other services.

The author is also proposing a form of library board to be formed in the State (similar to what happens in Kaduna State).

This board headed by the State Chief Librarian could then co-ordinate the activities of all satellite libraries in the local governments, for efficient functioning. The State Library headquarters can then use such an opportunity to loan some books to any local government on request. Moreover, the supply of the books to the local government libraries is from the State Library

Another proposal is the introduction of mobile libraries These could include librarians carrying library materials in buses to rural areas particularly on market days, for the people in such places to use. Such library materials may not necessarily be books alone, audio visuals could also be taken to such places for the benefit of illitrates. Hence the mobile libraries can show educative films or play some tapes to the people.

Flexibility, Adaptability and Expansion Requirements

Due to the continuous increase in the number of educated people, and indeed the number of publications themselves, libraries become outdated and insufficient for their purposes

within shortimes. Not only these new furnitures arrangement, and techniques of seating and shelving are invented daily. Consequently, it is imperative that whenever designing a library such things should be taken into account, and the building should be as flexible as possible so that if need be, different departments or functions can interchange spaces to meet new modern requirements of the time. Partitions should as much as possible be demountable easily. Thanks to the coming of modular design, if the building is made as a multiple of a single module it will be fairly easy at anytime to make alterations or adjustments if required. In effect, it can be said that each department or unit should be adaptable for any other library function.

As already stated, the library is constantly expanding and is continuously acquiring new functions. Hence the library building will after some time be too small to house the increased contents. In his book "Planning Academic and Research Library Buildings" Metcalf notes that "libraries until they become what may be called mature institutions, tend to grow at the

rate of 4 to 5 percent a year, doubling in perhaps sixteen or seventeen years. This has been true in America at least for two centuries". Due to these facts any library building to be built should be given adequate provision for expansion. Expansion of the building could be vertically or horizontally, though the latter is preferred in this part of the country where land is not a problem to be given much consideration.

# CHAPTER 3

## MAIN OPERATIONAL REQUIREMENTS

### Activities taking place in the Library

The activities that take place in the library can be classified into three. These are: (1) Users' activities, (ii) Staff activities and (iii) storage of materials.

i) Users' Activities

These activities are the main core of the library system, because they are the actual functioning of the library. Normally, people visit the public library for one reason or the other ranging from reading to seminars or symposia, hence the users' activities can be listed as:

- Request for information;
- Reference reading;
- Loans of library materials;
- Watching displays and exhibitions;
- Purchase of library materials
- Attending lectures, conferences, seminars, dramas, or film shows.

In practice, usually a user who comes for onething might be attracted to participate in another activity also.

ii) Staff Activities

The staff in the public library also have various activities in operating the library system. It is noteworthy that "staff" here refers to both senior and junior staff. The staff activities can be categorized into the following:

- Readers Services - these include supervising and conducting reference services; information services; photocopying services; organising exhibitions and displays; conducting seminars, symposia, dramas and other social functions; control of the entrance and exists.

- Technical services - these include acquisitions; cataloguing and processing; general maintenance of old and damaged materials; clearning services.

- Administration and Management - These cover overall co-ordination of activities in the library, supervision of all staff, co-operation with other sister State Libraries; making policies and co-ordinating the activities of all other satellite libraries under the State Library.

iii) Storage of Materials

Materials stored in the library are normally in form of printed graphics or non-graphics. The non-graphics are often referred to as audio-visuals consisting of microforms, microfilms, tapes and records. These are stored in the audio-visual unit inside envelopes, files or boxes in catalogue cabinets for easy reference.

The printed graphics, which form the main bulk of the library consist of books, periodicals, documents, newspapers, etc. There are three ways in which these materials are shelved according to the desired usage, these include:

a) Access Stalk - this is used for shelving current collections of the library, so that readers can be attracted to come and browse around them casually and informally. The shelves are arranged far apart with possible seating between shelves. This shelving usually occurs near the entrance, so as to attract all incoming readers.

b) Open Access Stalk - The books in the general reference areas are all shelved in this way. Readers can go around the shelves and choose the books they wish. As a result adequate circulation space is required between

shelves, so that people can pass freely while others might be standing along the passage searching for books; old collections and special documents are kept in this category. Readers are not allowed to go and search for materials themselves. So all requests are made to the staff who can go in and bring the desired materials for short term reference to the users. Consequently the shelving here is more compact, since only staff enter the area.

iv) Activity Areas in the Library

The library complex consists of several areas where various activities take place. Below is the list of the major areas that form the public library.

1. Extrance - at the entrance or near it are the following:
   - control desk
   - main information desk
   - notice boards
   - access to toilets
   - access to exhibitions
   - stairs
   - access to catalogues.

2. Current documentations areas (access stalk) - these should be close to the entrance so as to attract attention of readers while entering. The current documentations include:

   - New books,
   - Periodicals and Documents,
   - Newspapers and Magazines.

3. Children's Library - children upto about 14 years of age need their unit separated from other reading and reference areas for the adults, mainly because it they are allowed to mix with the adults, they can make a lot of disturbance to serious readers. Childrens library could consist of reading room(s), creative activity rooms (if needed) and possibly some space for open air exercises and activities. Ashburns in his book, "Modern Public Libraries" asserts that "Effort should be made to create an attractive homely interior (within the children's library) which children will not be afraid to enter, and from which they will be encouraged to cultivate, at their most impressionable age, the habits of reference and ordered study".

4. General Reference areas (open-access stalk) - This is the major section of the Public Library. If there are many rooms, these can be divided according to subjects like:

(i) arts and social sciences, (ii) Law, Business and accountancy, (iii) Sciences and technology (as the author has done in the project at hand).

5. Study areas - These areas are for serious readers and researchers. Facilities here include reading-room(s), carrels for researchers and provision for outside reading during hot seasons.

6. Special Reference areas (closed-access stalk). These consist of such materials like rare books, bounded periodicals documents, maps and audio visuals.

7. Facilities for both users and staff - These include :

   - snack bar so that serious readers do not have to go back home just to eat and return to the library.
   - smoking room(s).
   - Auditorium for lectures, films, symposia and drama.
   - Conference room which could be used by both the staff and outsiders.
   - Photocopying and photographic rooms (close to entrance)
   - lavatories.
   - Parking: this should be provided sufficiently for staff and users. If possible staff parking should be separated from main parking lot for users.

8. Staff Areas:

- Offices for heads of each department close to the departments.
- Acquisition, cataloguing and classifying areas.
- Bindery and repairs room.
- Offices for State, Deputy State Librarians and Secretary.
- General Office,
- Staff common room and first aid room.
- Staff training unit
- Cleaning equipment room

Expert library consultants have given a rough idea of the proportions in terms of space requirements in the library. Below is a breakdown of space requirement for different areas in percent of total library area. (From Newfert end Edition Pg. 145 - 147).

| | | |
|---|---|---|
| Adult lending department | - | 27% |
| Reference departments | - | 20% |
| Children's Library | - | 13% |
| Circulation, Services and ancilliaries | - | 40% |

Relationships between areas

Some of the areas listed above are supposed to be closer to others, while some are supposed to be as far apart as possible from one another. To produce an efficient design, the architect needs to know these relationships properly. The diagram below gives vhe variation of relationship between various areas in a public library.

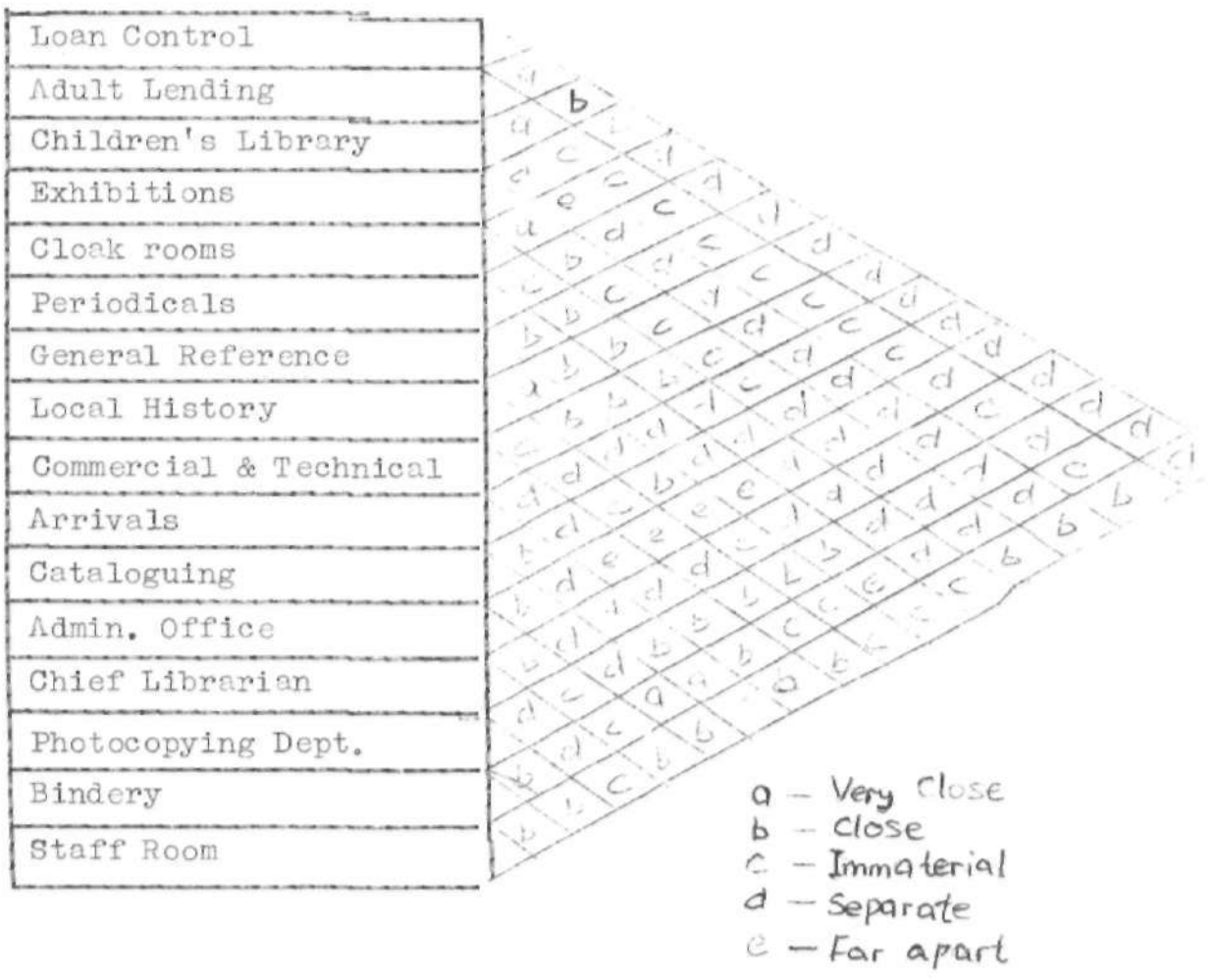
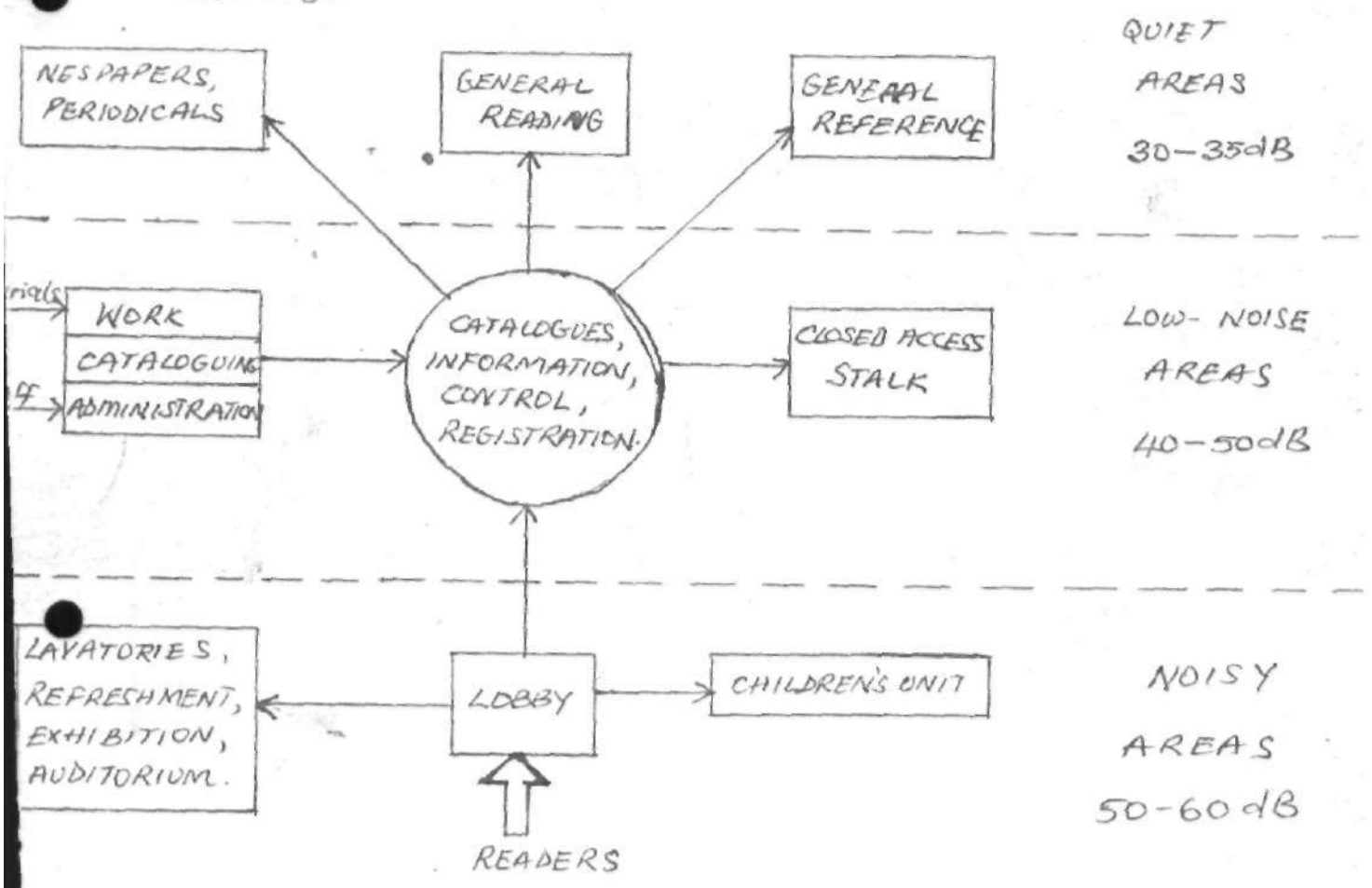


Diagram showing General relationships between various areas :

~~FROM Page~~




When the library is obviously going to consist of more than one storey, it is imperative to know not only which areas need to be close to others, but also which had to be on the same level. Adequate attention should be given to the ground floor because it is obvious that areas most used by readers should

be closest to the entrance. Some of the factors to be considered in placing activities in a multi-storey library building are given below in order of priority:

Same floor as main entrance

i) Exhibition area
ii) Loan control
iii) Adult lending
iv) Childrens library
v) Cloak rooms
vi) Current documentations.

Same floor as goods entrance

i) Unpacking area
ii) Accessions area
iii) Bindery.

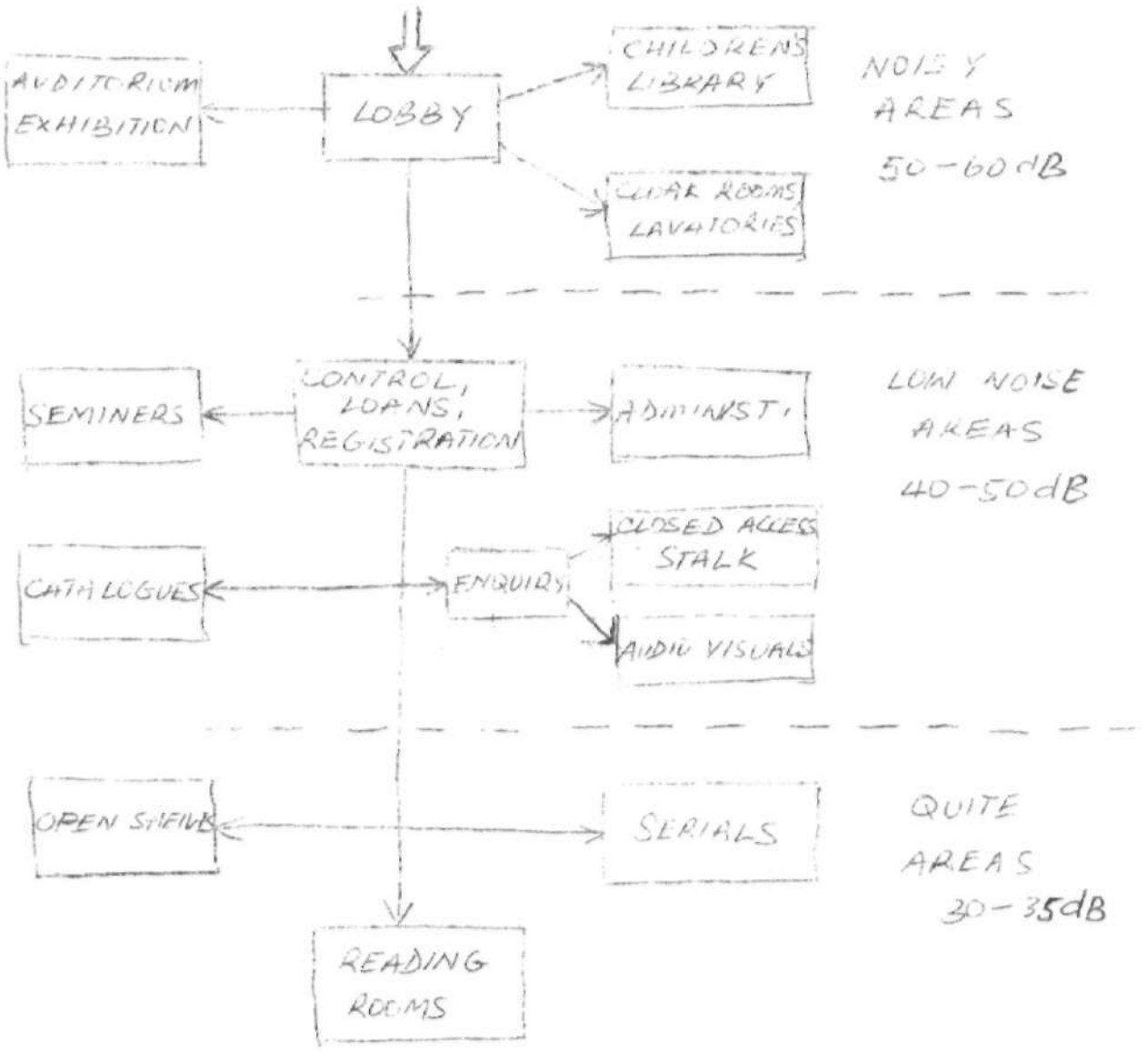
Same floor as general reference library:

i) Local History library
ii) Science and Technical Library

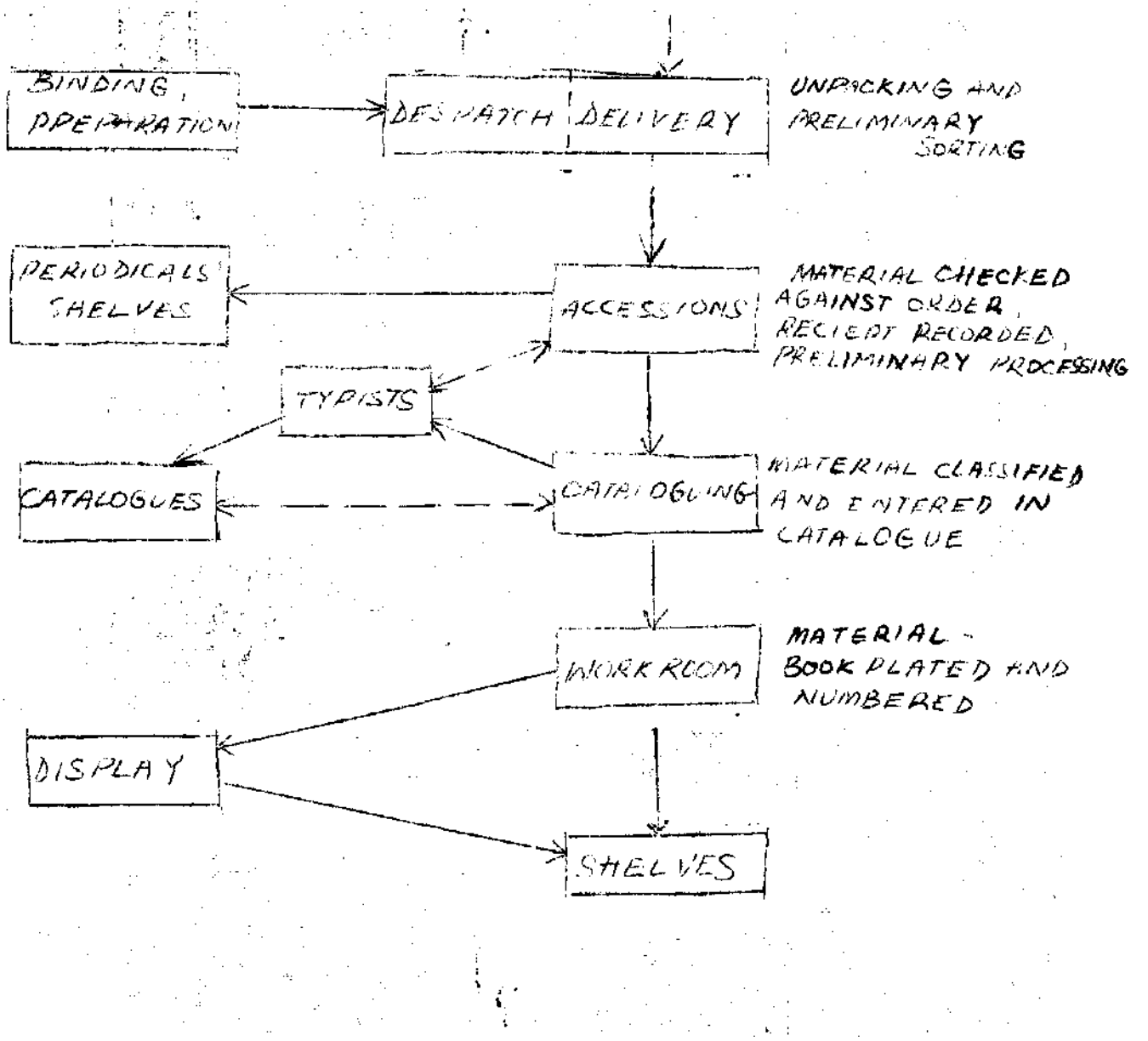
Access routes for readers and materials

For the library to operate efficiently, it should be planned in such a way that there is minimum interference with main routes through the building of both readers and

materials. This could best be shown by means of diagrams showing notional areas linked by arrows. The diagram below explain this.

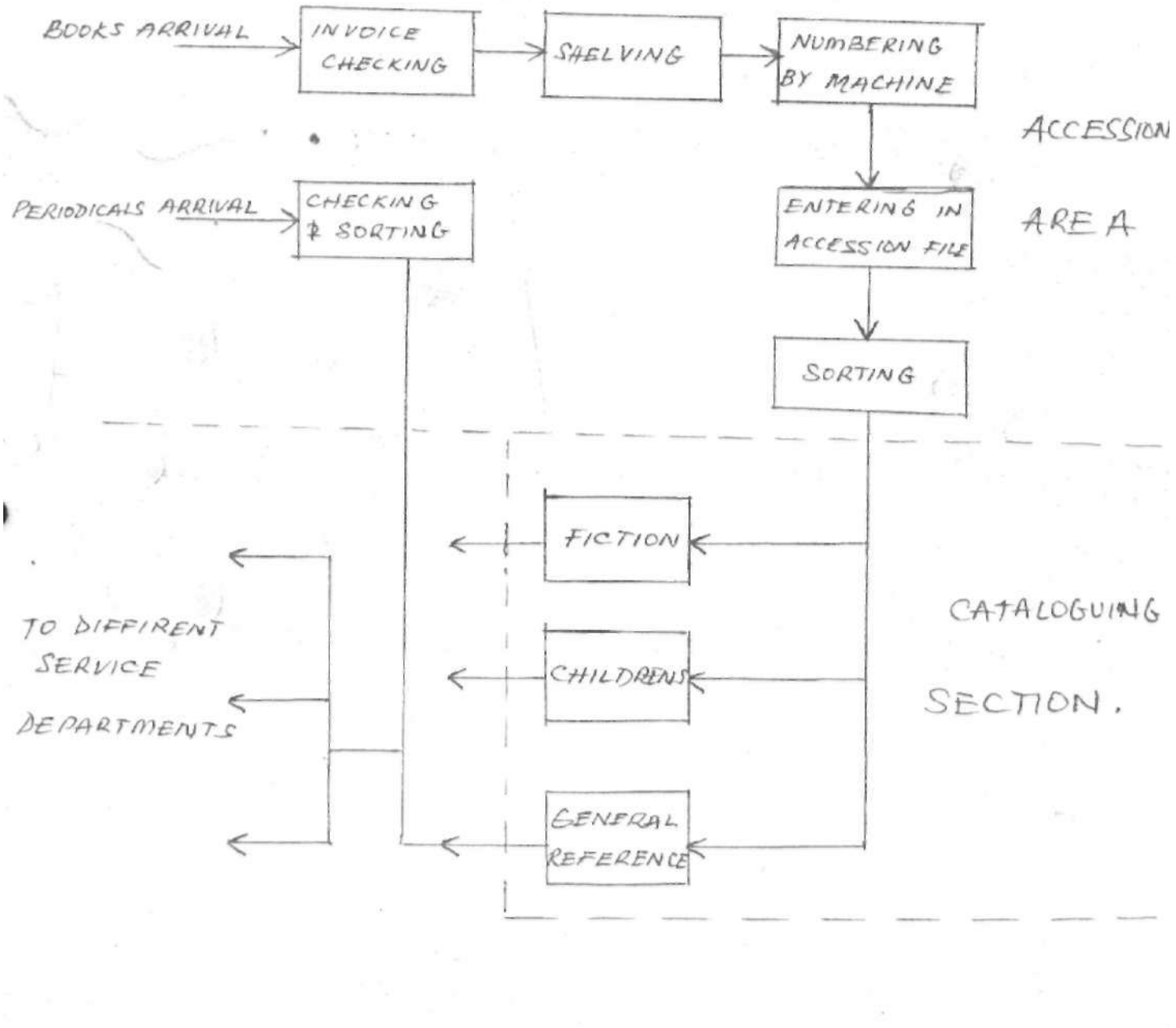


(ii) Diagram showing progress of materials through a public library:



MATERIALS INTAKE TROUGH –

PROCESSING SECTIONS:



# CHAPTER 4

## SPECIAL REQUIREMENTS

### Microform Technology

Microform (as used in libraries) refers to any form of primting either on film or paper which contains micro-images. Some micro materials are on 35 mm film, some on 16 mm film, others on 24 x fiche, 42 x or 48 x com fiche and some on 75 x ultra fiche. With the use of these micro materials, many old books dilapidated books, and books not in much need that otherwise will block the shelves, could be reduced and kept safely for future use. Hence library space is greatly saved. For example, voluminous serials of say, more than 4,000 volumes which would have taken some 600 linear feet of shlf space, could be contained in 1106 35 mm microfilm reels, about only 3 cabinets.

Microfiche is a sheet of microfilm in form of a card of 3" x 5" or 4" x 6". It contains multiple microimages which can be read by the naked eye. Microfiche can contain about 60 to 98 pages on 4" x 6" card, depending on the reduction. Ultrafiche can contain as many as 1600 micro-image pages on a 4" x 6" fiche.

Photocopying and Photography:

Provision for these two is very essential in public libraries. Often readers come across certain important information which they would like to carry away, but if such information is on non-loan materials they cannot go with it. With photocopying and photographic services in the library, such readers can easily get photocopies of such materials.

In the developed countries such photocopying and photographic facilities always operate use-yourself system, where the user operates the machine to make the photocopying himself. Unfortunately this is difficult (or impossible as at now) to be provided in Nigeria, because computer technology is still new and too costly in the country. As a result what most new libraries have is a photocopying and photographic department to be supervised by library staff.

Book Transportation

With the impact of new technology on library systems, materials have ceased to be carried manually between the various areas of the library. Lifts, mechanical conveyor belts and pnewmatic tubes are already been used for this purpose. Recent developments, however, include bibliophone system and the rantriever conveyor system. These need not be explained further here, because their application is still new even in the developed countries that invented them.

Modular Planning

Modular construction is a system in which the floor area is divided into equal rectangles defined by structural at the corners, instead of by load-bearing walls. Each of the rectangular units is called a module or bay. In modular library designs, this basic module is derived from either stack width, stack centre to centre dimension or space required for readers. Since the bays are similarly repeated throughout the building, then it means at any point in time if need be one department could be interchanged with another by moving the furnitures. Similarly, some ares could expand into others at any required moment. In effect it can be said that modular construction ensures adequate flexibility and adaptability in buildings, and

hence is very essential in library buildings where functions and activities are constantly changing in character and also expanding.

Ventilation

Ventilation is one of the major necessary requirements in library designs. The reading and other activity rooms should be well ventilated so that readers could work in comfortable conditions. This is more serious in this climate (hot tropical climate with eastern and western suns at quite low angles). For ease of design as well as provision of adequate ventilation, most libraries in Nigeria have been designed as compact boxes with central air conditioning system. But due to the fact that this system of air conditioning has to be imported - indeed even the technology for installing it or repairs has to be imported from Europe or America, this has been an awful failure. A typical example is the Kashim Ibrahim Library of Ahmadu Bello University, Zaria. Since the breakdown of the airconditioning system about six months after installation, the rooms have become too hot and too uncomfortable for readers because they are too congested and ventilation is absent.

In view of the above problems that go along with mechanical system of ventilation, the author has proposed a naturally ventilating building, so that air-conditioning is not even required.

A large courtyard is provided to aid cross-ventilation and also to provide ample space for outside reading during hot season. Surrounding the courtyard on the upper floors, spaceous corridor, reading spaces have also been provided, so as to give the feeling of open-reading.

Lighting

Lighting in Libraries could be classified into two. Natural lighting or day-light and artificial lighting of interiors by means of electricity. Lighting in libraries performs the following functions: facilitating comfortable reading and writing activities, providing various aesthetic effects in form of light colours etc. and also making an impact externally on passers-by.

Modern library designers mostly tend to exploit the advantages of natural lighting in the day time, and hence the buildings are designed to be capable of catching natural light. This is most important in the tropics where natural lighting is abundant due to the availability of sunlight at throughout the year. The main disadvantage of sunlight is that it is damaging books and many other library materials. As a result, books stacks are better located in the centre of reference rooms where sun rays cannot reach directly, while reading tables can be

arranged around the perimeter walls. Moreover, the reading tables required more amount of light than the book stalks. Nonetheless to reduce the effect of direct sunlight, adjustable sunshader are recommended, so that the sunlight intensity can be regulated at will.

Artificial light is necessary for activities at night or when and where natrual light is not sufficient. The intensity of artificial light is easier to control through switches, Artificial lighting is usually not relied upon in Nigeria for the main fact that, electricity supply is not quite reliable, due to constant power failures.

The various sections of the library, require different intensity of light according to the nature of functions taking place in the areas, as can be seen in the table below.

| Area of Library | Required Light Intensity |
|---|---|
| Control and Enquiry | 600 lx |
| Reading tables | 600 lx |
| Loans area | 400 lx |
| Cataloguing and work area | 400 lx |
| Book stalk areas | 100 lx |

Fluorescent lighting is recommended in most library areas, both because it is cheap to maintain and because of the intensity that can easily be achieved. Additional tungstein lighting could be used for reading tables, and also to indicate changes of function and add sparkle or interest.

Acoustic Requirements

Noise is one of the most serious problems to be considered in library design, because the principal activities in a library require extreme quiteness and concentration.

Noise could be external, in form of air-borne noise, which could be due to the nature of the surrounding areas on the site. For example a lot of noise is usually expected from busy roads with heavy traffic, or from a market.

Noise could also be generated internally inside the library. This could result from conversation, movement, typewriters, dropped books to mention a few.

There are several steps that could be taken to check the noise problem, and these include:

i. The choice of a quite site, though not at the expense of a central location where more people could come across and consequently use the library.

ii. Internal arrangement of departments within the library on the basis of noise levels. Quite areas like reading rooms should be sited far away from noisy areas like main entrance and exhibitions. Low noise areas could be used in between as buffers.

iii. Low noise typewriters, copying equipments etc. should be used instead of the conventional noisy ones.

iv. Proper construction and acoustic treatment of external elements to exclude external noise.

For walls:

- A structure of nonhomogeneous materials containing air cells should be used.
- A hard reflecting surface on the outside of external walls.
- Sound-absorbent surfaces on the inside of external walls.

For Windows:

- Setting glass in felt instead of putty.
- Using thick glass (at least 0.31 cm) for single glazing.
- Using double glazing if possible (the best method so far).

v. Use of sound absorbent materials for floors and ceilings in quiet areas of the library. For flooring, vinyl tiles are recommended and in some place carpets (though too costly) could be used. For ceiling, acoustictiles are recommended.

The maximum amount of noise levels permissible in the various areas is given below:

| | | |
|---|---|---|
| Quiet areas | : Reading rooms | - 30 - 35 dB |
| Low noise areas | : Service areas/work rooms | - 45 - 50 dB |
| Noisy areas | : Stairs,corridors,childrens library | - 50 - 60 dB |

Hazards and Protections:

Proper attention should be given to causes of possible hazards, during library design process. Hazards in libraries could be grouped into two (i) Natural hazards, and (ii) Reader hazards.

Natural hazards include fire, water (through leakage of drainage pipes or leaky roofs), acts of God (including lightning or wind). Fire hazard is the most serious threat in libraries and indeed it is also the most common. Fires are mostly caused as a result of:

i) Faulty electrical wiring.
ii) Careless smoking habits and use of matches.
iii) Outside intervention, such as lightning, arson or fire originating somewhere.

Fire protection in libraries is necessary so as to save human life and also save the materials including important and rare documents housed in the buildings. Several fire

protection measures can be taken to reduce the occurrence and spread of fire in libraries. These include:

1. Staff and Readers descipline in connection to smoking should be enhanced. Smoking should be restricted to smoking rooms provided, and these should be given adequate supervision by staff.

2. Localising possible fires: This could be achieved by use of fire proof walls, fire check doors.

3. Provision of automatic water curtains as deviding elements to prevent the spread of fire before the arrival of fire brigade.

4. Detection - Automatic detection systems should be installed locally, so that any possible fire could be detected immediately. These systems detect either rises in temperature or presence of smoke. Manually operated alarms could also help to draw attention to possible fires.

5. Suppression - Automatic sprinkler systems are the major means of suppression of fires in libraries, though their use is being disregarded due to possibility of damage to tools by water, since they do not have any automatic shut-off.

Protection against water leakage from roofs or drainage pipes solely lies upon efficient construction and use of high quality materials for the construction.

Reader hazards are mainly book theft and mutilation of books. These two are hazards that have been difficult to eliminate even with the modern techniques of checking etc. The main methods of protection against these Reader hazards, include:

- Effective supervision of the exists.
- Adequate supervision of all reference areas by attendants.
- Compulsory deposition of bags and cases in cloak rooms.
- Using strip-silvered (venetian) glass in doors of staff rooms to act as deterrent to potential mutilators.
- Using closed-circuit television or convex mirrors to keep readers under supervision.

## CHAPTER 5

## CASE STUDIES ON SOME EXISTING LIBRARIES

Before embarking on the design process for the Bauchi State Library, the author found it necessary to visit some existing state public libraries, to note how they operate, response of users to the building and the problems of limitations (if any) of the building. The libraries visited include the State Libraries at Kano, Kaduna, Plateau and Borno. The Kashim Ibrahim Library of A.B.U. Zaria (though an academic library) was also studied to note some basic matters which are common to all library buildings. For reasons of lack of space and fear of repitition, reports will only be made on the Kano and Kaduna State public libraries, and to some extent the Kashim Ibrahim Library (K.I.L.), ABU, Zaria.

### The Kano State Library

Among all the northern states, Kano State has one of the largest libraries in terms of number of books, and services offered to the public. Located within walking distance from Nasarawa gate in the old city, the Kano State library is sited in a fairly quiet area where only a small percentage of the potential library users can even know of its existence. In relation to the other parts of Kano, this area is relatively

quieter since most of the business, commercial and other major areas which attract most people are located around Sabon Gari and Bompai. Hence, it could be said that the library has a relatively poor location.

Built since early 1960's, the Kano State Library building is an old structure, designed with no ideas of modern library requirements. It consists of only a large reading room, with book stacks combined with a few adjoining buildings for other library activities. Nonetheless, thanks to the State government, because the library has a book population of nearly 80,000, as a result the readership (ranging from students, people pursuing home studies, employees of both private and public sector) is quite large.

Due to the low level of education in Kano State generally (as is the case with nearly all the northern states of Nigeria), the Kano State library can only boast of 14 qualified staff (these include the State Librarian and Deputy State Librarian whose duties are mainly administrative). Indeed, this number of staff is too small to operate a whole State Library with several branches to maintain, and several functions to perform. Nonetheless, due to the level of commitment and indeed determination of these people, things are moving quite smooth at least according to the available resources. Beside the main library being maintained by these staff, eight other

branch libraries within the state are also under their care and co-ordination. Also a number of social functions are been organised and sponsored by the library occasionally. Such functions include educative dramas, film shows, sumpossia and exhibitions.

The Kaduna State Library

Unlike the Kano State Library, the one at Kaduna, has a fairly well designed building with several departments well categorised. The Kaduna State Library is sited in one of the busiest areas of Kaduna township on Bida road. Within walking distance from the library are most of the Banks, post-office, State Sub-treasury, some state ministries and other important places that attract a large population on week days.

Compared to other existing state libraries visited by the author, the Kaduna State library is by far better staffed, because it has 35 qualified staff to man the various departments. The staff range from the Director of the Library board, Deputy Director, Libarians to Library Officers. With this staff force most functions required of a public library of its nature can be performed, as long as sufficient funds are available for the purpose.

Unfortunately the main problem the Kaduna State Library has, is lack of sufficient volumes of books and other materials. As at now the total number of books in all departments, including the children's library (which has about 11,000 volumes) stands at nearly 36,000. This number is quite small, considering the percentage of educated people and hence potential library users in Kaduna. Infact even these few books are mainly for secondary school students or fiction books with very few ones on specialised subjects.

Nevertheless, the new government in the State is making all efforts to improve library services in the state. The first step taken is the formation of the State Librari . In addition to the main State Library at Kaduna there are 10 branch libraries in various local governments all under the State Library board.

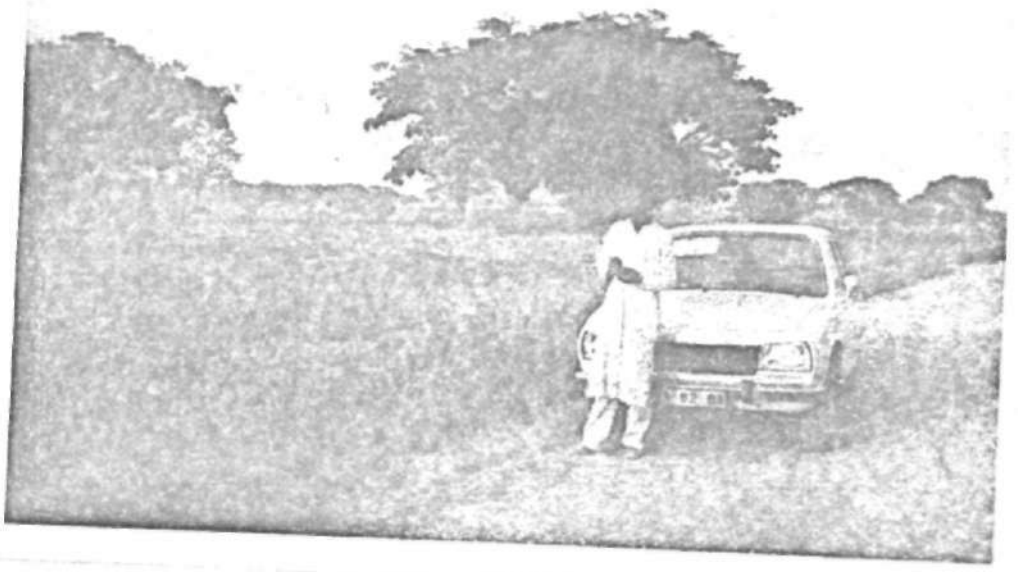
The Kashim Ibrahim Library of Ahmadu Bello University, Zaria

Since this is an academic library, unlike a public library, its function is only to provide an atmosphere for reading and research by students and faculty members, and no effort is is made at organising other social activities beside exhibitions. With this in mind only basic library requirements that are common to all libraries will be considered.

The Kashim Ibrahim Library is a large three-storey rectangular building with a capacity of 500,000 volumes of books and 2,000 readers. At present the collection consists of 175,000 volumes of books, 2,000 microfilm items and 35,000 bound volumes of periodicals. The staff consists of 35 qualified and 150 unqualified ones. The building which is modern in every sense, has all the necessary departments well catered for.

The main problem or defect of the building is the system of ventilation. The designers proposed a central air-conditioning system to ventilate the building. But the air-conditioner broke down not long after installation, and repairs have not been possible since then due to lack of funds, and the fact that the parts have to be imported from Europe. But since the building was designed to operate with air-conditioning i.e. rooms are compacted (with some rooms having no windows opening to the outside), the room cannot be ventilated naturally. The rooms often get unbearably hot and some areas have to be deserted during hot seasons.


Bauchi



The site is relatively flat, with few trees and shrubs dispersed around ~~the site~~.

The pictures here (one above and one below) illustrate the nature of the site.



# CHAPTER 6

## GENERAL CONDITIONS OF THE LOCATION

Before embarking on the design of any building, it is imperative on the designers to make a thorough study of the general conditions (mainly geographical) of the site. As a result the author has conducted some research on the nature of the area - the climatic and other considerations inclusive, as explained below.

### Location:

Bacuhi, the capital of Bauchi State is the site for the proposed State Public Linrary. It is located at latitude $10^{\circ}$ 17' North and longitude $9^{\circ}49'$ E. It lies in the northern part of Nigeria and hence in the hot dry climatic zone of the tropics.

### Population

Since the creation of Bauchi State, when Bauchi town became a State Capital the once agrarian population has been tremendously increasing both in size and in the level of education and fields of specialisations. The estimated population in 1980 was 130,000, more than half of which engages in several professions other than farming. The level of education and awareness is also fast increasing, with the

establishment of more schools and other educational institutions. For instance, while in 1976 when Bauchi State was created, Bauchi town had only four institutions, i.e. Boys Secondary School, Girls Secondary School, Teachers College and Schools of Midwifery; there are now (in 1981) over twelve institutions including a University, College of Arts and Science, Advanced Teachers College, School of Nursing, School of Health Technology, Technical College, Federal Polytechnic and School of Agriculture. Besides, numerous adult education classes exist in several parts of the town.

Climate:

Bauchi lies within the hot arid climatic zone of Nigeria. There are two distinct seasons: the hot rainy season which stretches from May to September and the Cold-dry season - often called Harmattan which streches from October to April. Mean annual rainfall is 1075 mm (43 inches); while the hottest month has average temperatures of 30°C (90°F), with 49°C in the day and 15°C at night. The table below gives details of amount of rainfall, winds and temperatures and how they vary through the year.

Table showing Climatic Data for Bauchi in 1980

| M O N T H | Rainfall | Wind | Temperatures (°C) | |
|---|---|---|---|---|
| | mm | Km | Max | Min |
| January | - | 101.37 | 32.3 | 13.9 |
| February | - | 118.94 | 33.1 | 17.1 |
| March | 0.1 | 128.06 | 36.6 | 20.8 |
| April | 0.5 | 135.1 | 37.8 | 23.8 |
| May | 111.6 | 164.09 | 34.6 | 23.1 |
| June | 121.3 | 119.93 | 31.5 | 22.0 |
| July | 314.1 | 105.69 | 29.2 | 20.8 |
| August | 317.9 | 95.66 | 29.1 | 20.1 |
| September | 82.5 | 83.97 | 30.1 | 19.4 |
| October | 40.3 | 84.9 | 32.8 | 19.5 |
| November | 0.1 | 86.07 | 31.1 | 15.4 |
| December | - | | 29.8 | 13.6 |

Vegetation, Relief and Soils

Bauchi lies in the Sudan Savannah vegetation zone of Nigeria, which is characterised by high grassland with few trees scattered around.

Bauchi town is nearly 2000 ft abóve sea level, on the Bauchi/Jos plateau. The town is located in the midst of hills

that composed this plateau. These hills significantly affect the climate of the area, producing a milder micro-climate with more rains and higher relative humidity than other areas in the same climatic zone.

The soil is mainly reddish in colour and lateritic in character with good bearing capacity.

# CHAPTER 4

# THE SCHEME

Having completed all necessary studies about the requirements and internal dynamics of a public library, the next stage is to come back to the main project and try to use all necessary data and research to produce a workable design to serve the purpose required. In doing this, the first thing is to choose a convenient or suitable site, analyse it properly and then go on to make design proposals. Below is a brief account of how this has been undertaken by the author.

## Choice and Analysis of Site

Since this project is a live project, that has been proposed by the State Government, the town planning authorities have already proposed a site for the purpose. The task ahead then is to analyse this site and see whether it can be adopted or otherwise.

The site proposed by the planning authorities, 1.9 hectares in size, is a relatively flat piece of land (with a gentle slope to the South-east), with few trees and shrubs and no existing structure on it. It lies in the new town centre (proposed by Maxlock group of planners) is bordered by a commercial area to

the north, the state secretariat to the south, the Federal Secretariat and other office buildings to the west and green park to the east (see map No.3). On considering this location, it can be seen that, the site lies in a place where people from all walks of life visit quite frequently. Indeed, this is what a public library requires - a place where people can see it, not its existence and consequently visit it not necessarily with prior intention. On this, W. Mevissen, in his book "Public Library Buildings" notes that "the best location for the public library is the place visited by the greatest number of inhabitants on weekdays. Usually, this is the market place or main business street. Hence, a public library has to be sited in neighbourhoods where rents and rates are highest...." This is more suitable because it lies virtually in centre of the town, while the walled city is to the east, the Government residential area (G.R.A.), most higher institutions and office buildings are to the west and south, towards the north are most business centres (mainly hotels, night clubs and shopping complexes).

Development of Concept from the Site Analysis

After getting an acceptable site, the next stage is to develop a site concept. The site is separated from the surrounding buildings by roads on all three sides except on

the east where the green park exists. Hence it means there are three possible points of entry. The possibility from the north is chosen, because it faces the commercial area where more people are expected to come from.

Recalling the site analysis, it can be observed that, there is relatively much more noise coming into the site from the commercial area to the north, than from all the sides where the neighbouring buildings are either offices or a park. Accordingly, in developing the site concept, areas of the library that are noisiest should be located closest to this area, and the further away one moves from this area the lesser should be the noise permissible. This gives a rough idea of the horizontal relationships. (Reference should be made to chapter 4, so as to find out variations in noise requirements of different areas of the library). The sketches attached explain this horizontal concept further.

On the vertical plane, a similar concept is developed. This time based not only on the level of permissible noise, but also on the frequency of use of the various areas - the most used areas are on the ground floor, and hence are the noisiest. The lesser used areas like audio-visuals unit, reading carrels and the like are on the upper floor. The middle floor (since three floors have been chosen as most

appropriate) consists of the medium rated areas, both in terms visit and in terms noise levels permissible.

Development of Form:

After getting a site structure - allocation of spaces for various activities on the site, the next stage is to adopt a form for the building. The possibility of using rectangular shapes for all rooms is deemed most appropriate due to the fact that all furnitures and the blocks themselves to be housed in the library are rectangular. Moreover, use of funny shapes like circles, can only lead to unnecessary waste of space, or making special orders for furnitures to be used.

A large courtyard is proposed, to break the large span that could result, and also to facilitate effective natural ventialation of all rooms.

Choice of Structure

Column and beam construction has been chosen. This gives advantages of flexibility and adaptability already explained in chapter 5, in addition to the provision of large unobstructed space required in most departments of a library.

Furniture and Equipments

After completing the architectural design, it is necessary for the architect to design the type of furnitures to be used in the library. In an effort to do this, the author conducted some research in to this. Below is a report on this.

- Book Sizes and Shelf Depths

It has been established that over 90 percent of the books in adult libraries are less than 230 mm (9 ins) deep. Metcalf noted that "97 percent of all books would go without difficulty on 230 mm nominal shelves in a 508 mm (20 ins) wide double-sided stalk". The exception of course is in childrens libraries and music libraries.

Manufacturers provide shelves of various depths. So for the sake of flexibility, deeper shelves could be used, particularly when held on brackets from wall strips. For instance one large manufacturer, Terrapin Reska, produces shelves 200 mm, 250 mm, 300 mm and 350 mm deep.

- Shelf Length

Several manufacturers of systems offer 750 mm, 1m, 1.5 m shelf lengths for ease of fitting to many modules. Longer shelves save space, that is why the use of 900 mm shelves (which has been the standard) size for long) is been discarded.

- Shelf Height:

In most libraries for general reading, the majority of books can be housed at 280 mm centres: this with 20 mm for shelf-thickness, means 260 mm clear and, allowing 13 mm for fingers to be inserted above the top of the book, will accommodate a 240 mm book comfortably and a 255 mm one without much trouble. For the sake of large books that can not go into 280 mm shelves, a conventional expedient has been to allow one deeper shelf per tier - such a shelf could be 300 mm. For quick reference collection like encyclopedias, it is more economical to house them in special tiers at 330 mm centres.

In an open access library, wall shelving should never be higher than 2.0 m to the very top and 1.8 m is usually better. Height of an island case depends on its position: where a vista is called for 1.375 m is a good height and 1.5 m is the maximum. No shelf for use by public should be less than 300 mm from the floor, while for island cases a 400 mm space at the bottom gives a suprisingly large increase in lightness of appearance. The table below gives a list of alternative shelving sizes.

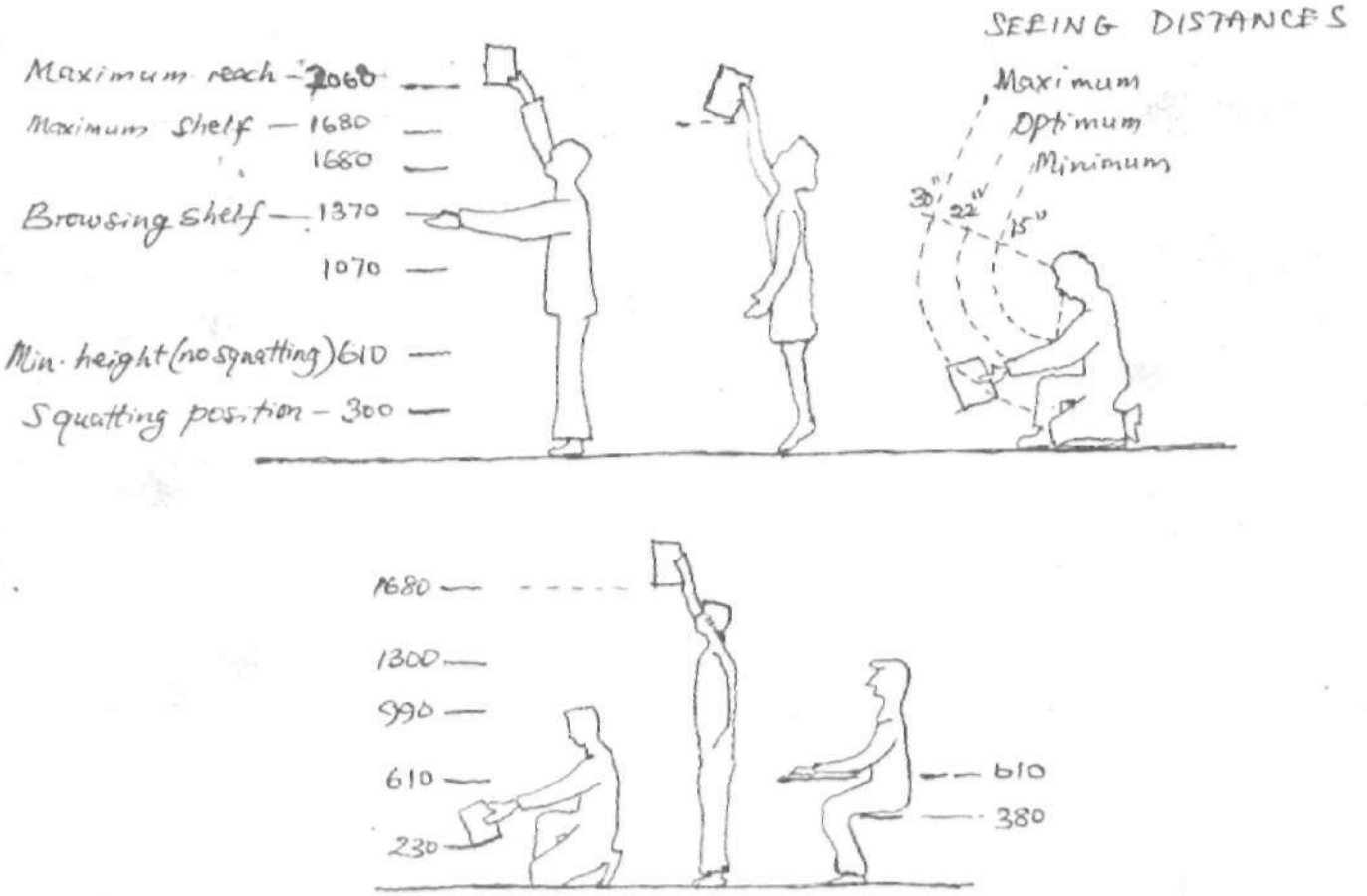
| Bottom Space | 300 mm | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Fascia | 50 mm | | | 75 mm | | | 100 mm | | |
| No. of Shelves at 280 mm C to C | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 |
| Overall Height (mm) | 1475 | 1750 | 2030 | 1500 | 1775 | 2050 | 1525 | 1800 | 2085 |
| | | | | | | | | | |
| Bottom Space | 400 mm | | | | | | | | |
| Fascia | 50 mm | | | 75 mm | | | 100 mm | | |
| No. of Shelves at 280mm C to C | 4 | 5 | 6 | 4 | 5 | 6 | 4 | 5 | 6 |
| Overall Height (mm) | 1550 | 1830 | 2110 | 1575 | 1850 | 2135 | 1600 | 1880 | 2160 |

(See Diagrams of Optimum Shelving Conditions on the Next Page -- Photostat copy attached)

Shelf Loading:

As observed by Poole - "All standard Book shelves are presently designed to withstand loads of 2 $KN/m^2$ with no permanent deflection and with no temporary deflection exceeding 20 mm.

OPTIMUM SHELVING CONDITIONS FOR ADULTS (TOP), TEENAGERS (CENTRE) AND CHILDREN (BOTTOM):




— Obtained from G. THOMPSON: Planning and Design of Library Buildings Pg. 81.

Books per Shelf:

This is usually quite difficult to determine or even to approximate due to the fact that books have no standard size. Moreover, shelves cannot be completely filled with books, due to the continuous need of expansion of the stocks. Only in closed access conditions with a completely finite stock, o' serials section can the shelves be filled. In open-access stalk where books are continually removed from shelves, a fifth to a quarter of the staff should be left empty, at least to make it easy for staff inserting returned books.

A generally accepted estimate for shelves three-quarters full is given in the table below:

| Type of Book | No. Per 300 run of Shelf | No. per 900 mm run of shelf |
|---|---|---|
| Children's book | 10 - 12 | 30 - 36 |
| Loan and Fiction Stalks | 8 | 24 - 25 |
| Literature, History, Politics, Econs | 7 | 21 |
| Science, Technology | 6 | 18 |
| Medicine, Documents, Periodicals | 5 | 15 |
| Law | 4 | 12 |
| Averages | 7 | 21 |

Layout of Shelving:

The main aim in shelving layout is to house as many books as possible in conditions convenient to both staff and readers. The only exception to this been in open-access rooms like browsing rooms where the book shelving plays an important visual part in the internal environment. It is therefore, necessary to consider the human engineering elements seriously.

Where large numbers of books have to be accommodated in stalk conditions, the positioning of columns is perhaps the most important factor of all, and will have very close relation to the structural grid.

Closed Stalk:

The shelving here is usually arranged to make the maximum use of space, this will usually mean double-sided . stacks with single sided stacks along walls. Distance between stacks i.e. aisle, could be as small as possible since the traffic in this areas is highly limited. The minimum between stack width is 685 mm , allowing for passage of trolley.

Shelves could be fitted close to the floor, leaving only a very small space to keep the books clear of dust. The shelves may run close to the ceiling, but shelving to an overall height of 2.3 m will mean the highest book shelf is about 1.9 m from floor, hence staff have to use stools to reach these. One cross-aisle per every other grid square will suffice.

Open Stack

This form of shelving takes up more space than closed stack because more space must be left between stacks for readers to choose their books and for others to pass by. Minimum between stack distance is 900 mm i.e. 1375 mm centres, and where heavy use is expected 1225 mm between stacks i.e. 1680 mm could be better.

Because of heavy use, it is preferable to have one cross-aisle for each grid-square.

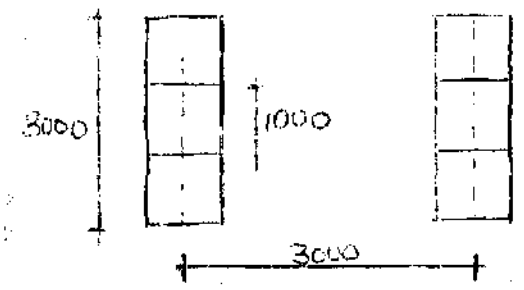
The table below gives the relation of grids to number of books.

| Grid Size (m) | Stack Centres (m) | No. of Sided Stacks | Books/Grid$^2$ (One aisle per sq. | Books per m$^2$ (One per sq.) |
|---|---|---|---|---|
| 5.6 | 1.4 | 3 | 5,012 | 160 |
| 6 | 1.5 | 3 | 5,460 | 152 |
| 7.25 | 1.45 | 4 | 8,610 | 164 |
| 7 | 1.55 | 4 | 9,310 | 155 |
| 7.8 | 1.56 | 4 | 9,380 | 154 |
| 8.4 | 1.68 | 4 | 10,220 | 145 |

Open Access:

This is the most space consuming method of all, because in this area books are spread out widely, attracting readers, to browse round them. The shelving here does not only serve as a means of housing books, but is itself one of the most important elements in the interior design of a room. Hence the shelving is arranged informally and its relationship with the reading areas will be very much a matter of individual design.

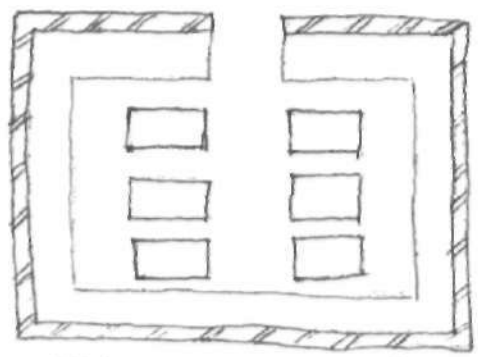
The sketch below show recommended minimum space between facing bookshelves:



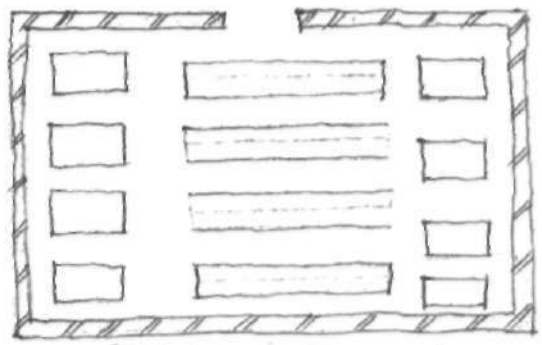

Study Areas

These form the major part of the library, since it is here that various study and references to various subject-books are made. Various forms of layouts could be possible. The layout that give the most economical use of space are those of study tables in the centre of a room with shelving along

the walls, or free standing stacks in the centre of a room with seats by the windows. The latter has been chosen by the author because it has the advantages of providing natural lighting and ventilation to the readers and also keeping the book stacks away from direct sun rays. (See sketch below).



Shelving around wall



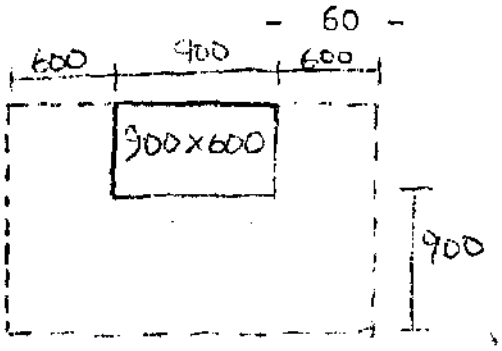
Shelving in the centre

Tables:

An acceptable figure for the size of table is 600 x 900 mm A reasonable space allowance for a reader at a table in addition to the table itself is 1.35 $m^2$. Besides, each reader takes up a share of the main access aisles and passage spaces within the room and these make up the normal allowance of 2.3 $m^2$ per reader.

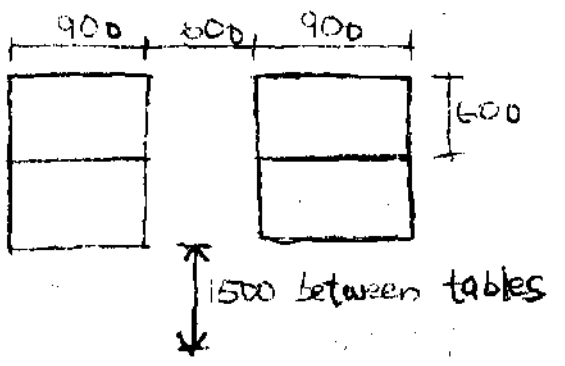
Individual Table:

This takes up most space and the stability of the table is limited. It is acceptable at right angles to the wall. Recommended minimum dimensions for a reader on an individual table are:




Dual Tables:

These type of tables require accentral division to avoid the possibility of one reader expanding his influence to the other's area, and also to provide some feeling of privacy to the reader. The sketch below gives minimum dimensions for dual reading tables.



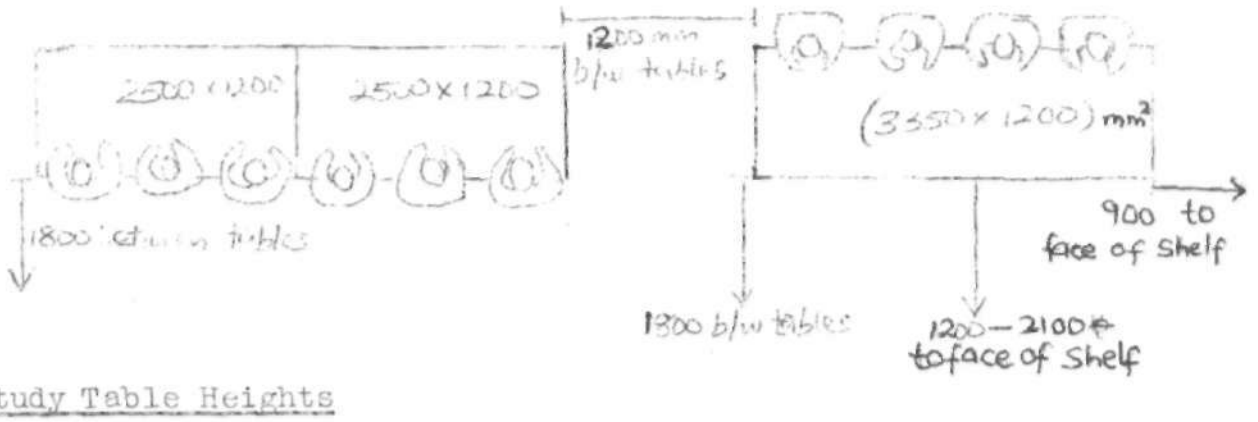

Long Tables:

These are most economical in space use, though access aisles between them need to be wider. They can accommodate four to twelve readers. Their advantages include, the possibility of readers spreading their books into unused spaces when tables are not full, and the fact that they are normally solidly constructed and steadier than individual or dual tables. Disadvantages include the obvious disturbance of reader by

arrival or departure of other readers, and also lack of privacy. The widthe of long tables should not be less than 1200 mm, and lateral space between readers never less than 900 mm. Space between tables is 1800 mm, (See sketch below).




Long tables can have centre divisions, or even side divisions, so as to provide privacy and individual concentration. Examples of such type of tables are shown above.




Study Table Heights

A table-top height of between 710 mm and 760 mm is recommended for adults and 635 mm to 700 mm for children.

Carrels:

These are individual study rooms where serious workers like Researchers can work undisturbed, and keep certain books for long periods uninterrupted. Such rooms can be reserved for individual readers for a certain length of time on request Readers may bring their own machines like typewriters, T.V. receivers or tape recorders.

The carrel is provided with a cupboard for keeping books, and possibly wash-hand basin (in case manuscript searches take place there). An inspection window or a glass door is desirable so that staff can check on the occupant's activities. The sixd of carrels very, according to type of use, from 1500 mm x 1225 mm to 2450 mm x 2650 mm.

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