

**DESIGN PROPOSAL FOR NIGER STATE SCHOOL OF  
REMEDIAL STUDIES, MINNA NIGERIA  
WITH EMPHASIS ON GOOD LANDSCAPING**

*BY*

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**M.TECH/SET/897/2001/2002**

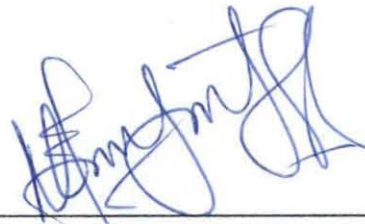
**A THESIS SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE,  
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FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA  
IN PARTIAL FULFIMENT OF THE REQUIREMENTS FOR THE  
AWARD OF M.TECH. DEGREE IN ARGHITECTURE**

**AUGUST, 2003.**

## DECLARATION

I, *Galadima, Nathan Danladi* hereby declare that this thesis titled Design Proposal Niger State School of Remedial Studies Minna, Nigeria is an original product of my own research work under the Supervision of

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# CERTIFICATION

This is to certify that this thesis titled: Design Proposal for Niger State School of Remedial Studies, Minna Nigeria is an original work undertaken by:

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## DEDICATION

GOD: You have continually proved yourself strong on my behalf despite my shortcomings.

MY PARENTS: I have come to realise that they are the gods God has given us to see. I have wandered of you don't ever get tired. May you live to reap the fruits of your labour.

JAMILA: The one I love and for all that I have wished would come to pass between us.

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Snr. Master, School of Remedial Studies, Gulu (2002).

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## ABSTRACT

To be educated is to be knowledgeable or learned. Sight, touch, taste, hearing and mainly reading and studying are all elements of learning. Every school targets to instill these attitudes of self reading and studying into its students while attempting to ensure they equally explore every given and available opportunity to get knowledge or learn.

Quite unfortunate that given the same environment and facilities, people do not perform the same when tested under the same atmosphere.

A remedial or corrective school is the best alternative to this problem.

The aim/objectives of any is to:

1. Find knowledge or skill area of a student.
2. Remove deficiency areas.
3. Motivate students to perform better and
4. Create confidence in them.

These are basically what are lacking in most secondary schools, especially the public owned. This has led to the backdrop in terminal and subsequently WAEC, GCE, NECO, and JAMB examination results.

The proposed Niger State School of Remedial Studies, Minna would address these lacks and make them available to students who after a year programme will be ready and fit to stand a better chance of relatively competing with their equals.

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## CHAPTER ONE

### 1.1 INTRODUCTION

The joy of every beginner is to reach the finish line and so with Education. The world we live today has made the quest for knowledge not only the order of the day, but also with the desire to attain the peak of this knowledge seeking, especially in a chosen field of interest.

No specialized knowledge is attained though without one passing through various teachings, readings, training's, tests and examinations at different

It is quite unfortunate that one fact is, not every beginner always fulfill the standard requirements to pursue and attain their area of interest or reach the next level. But since problems associated to such cases cannot be attributed to classroom factors, such people must be given other chances through a better study environment, rigorous training, better habits of learning and proper guidance and counseling.

Kindergarten is the lowest level of Formal Education followed by nursery school, then primary school, before one proceeds to secondary school and later to tertiary institution, which seems to be the peak of every formal education. One is expected to do excellently well or averesly well before he/she is passed into the next level of educational hierarchy. It also goes that the way upwards this level is more demanding than any former. This is because specialization and professionalism overtakes general knowledge. Since specialization and

professionalism manifest the peak, that makes it inevitable for better standards to be achieved.

Many Nigeria students of secondary education have always found their legs handcuffed on their journey upwards the ladder of education, especially after their secondary education.

The need for these set of students to be encouraged with a second chance has made remedial studies one of the best option. This is because remedial serves to help persons with difficulty in reading, understanding and passing examinations do better under a guided environment of corrective reading and writing. Specialized methods are usually sort and different from the regular pattern. More attention is given to areas(s) of deficiency(ies). Such kind of corrective reading is contracted in the classroom at the elementary, secondary even college level. Remedial materials of high interest for the ground is

Punishment is not given too much attention but only used as a very last resort.

The introduction of remedial at every level has often receive a warm welcome from both parents and success determining students who are ready to exploit avenues for proceeding in their educational. A proof of this is the frequent positive results of both its admission requests and performance at any level it is introduced, especially where the environment is both conducive and challenging.



The need for remedial is not as a replica to any educational standard of qualification but that a particular school's admission or entrance requirement(s) is attained by the student in particular.

Remedial programme are also time framed of not more than a year in most cases unless if other parameters are specially set to meet a very particular minimum standards where student(s) deficiencies is very much.

### **AIM OF THE STUDY.**

create a conducive and challenging environment for secondary school who have tried and failed to meet up qualification standards into any institution.

### **OBJECTIVES OF THE STUDY.**

that student with similar problems will together in similar environment meet up the challenges of doing better academically.

that specially trained teachers will be accessed by the students.

have an effective guidance and counseling to encourage and boost the morale of the said students.

students who get discouraged and turned out to be street nuisance will be minimized or even eradicated.

### 1.3. RESEARCH METHODOLOGY.

The methods depended upon for this project was based on the following.

- A. Case studies of existing schools to make physical assessment and equally discuss with students and teachers alike.
- B. Other discussion with remedial specialists.
- C. Historical materials on remedial schools.
- D. Both inductive and deductive reasoning – especially in the planning and designing aspect of the project.

### 1.4. SCOPE AND LIMITATION OF STUDY.

The general performance of every school is based on needed material in relation to available ones. This is because any given system could be handicapped without been given adequate attention, and resources placed in the hands of professionals.

Existing elements which aids better performances will be adapted and others not available will be inculcated in both the unit design of the project and site planning.

Projected students population will also go a long way in determining the sizes of building units.

It is worthy to note that while some building elements will be designed individually, others will only be shown on site.

Those to be designed singularly are:

At the moment, students who do poorly in the Senior Secondary Certificate Examinations are always been faced with psychological fear and shame to go back and retake.

Today the backbone of every society lies unarguably on the shoulders of its teeming youths without the power of education, every dream, wish is hope is dashed. The economy of such a society has no future in way.

There is need for everyone to show concern because many students end secondary school and even gain admission into tertiary institution without the sound ability to read and comprehend what they are been taught, talk more of applying them.

Educators believe that initial instruction in reading is of basic importance in developing later reading dependent skills.

While we must progress as a society, we must ensure that our secondary school leavers would cope with academic expectations and demands that comes with been in any higher institution they may want to get themselves into.

## 1.6 DEFINATION OF TERMS

REMEDIAL: A system of corrective reading for disable student.

SCHOOL: A place where learning takes place.

FORMAL EDUCATION: Learning with a curriculum

INFORMAL EDUCATION: Learning without strict curriculum

## CHAPTER TWO

### 2.1 LITERATURE REVIEW.

### 2.2 INTRODUCTION.

The things that one has known, is knowing and will all know is very dependent on established facts of what others must have written or put down out of either experiences or proven knowledge. This therefore usually becomes a basis for future planning and development.

The literature review of this write up is mostly Nigeria based with little reference to the European schools evolutionary system.

#### 2.2.0 ORIGIN OF EDUCATION.

The beginning of mankind's existence rally education. Man began by naming the animals and plants of the earth.

This form of education was family principle based; where the parents teach their children good moral values, art work, wrestling and general human behaviour. This is called Informal Education.

The Formal Education which involve training in a particular pattern with the goal targeted at having a learned person was based mostly on research, discoveries and inventions. Any student coming to learn under this student had to do it through apprenticeship system.

With time the apprenticeship gave way to formal education with curriculum and clearly defined subjects to be learned under teachers who had knowledge about different subjects.

There are basically three (3) educational system that have existed and are still in existence.

These actually form the evolutionary changes and introduction of formal education in both word, Africa and Nigeria. They are:

- A. Native or Traditional system of education.
- B. Islamic education system and
- C. Christian or missionary western education system.

### 2.2.1 NATIVE OR TRADITIONAL SYSTEM IN NIGERIA.

The term Native or Traditional Education could be seem as the educational system before the advent of western education and Islamic education. Nigeria has many ways of understanding their culture by applying technology to suite their daily activities.

The Nigeria native education had its standards varying from one community to another and is passed in from generation to generations”

- Education. Afolabi Justine Eesuola 2001.

“With this kind of education a man with specific skill in wall adjudged to be well educated and well integrated citizen of his community. It was mostly done as a means to end and not an end in itself. Education was for immediate induction into the society and preparation for adulthood. It cold be as a hunter, warrior, nobleman or man of character. Africa education emphasized on social responsibility job orientation, political participation or spiritual.

Children learnt during ceremonies, or trials, imitation and recitation or demonstration”.

- History of education in Nigeria, A Babs Fafuwa. 1974. NPS

Educational publishing limited.

### 2.3.2. ISLAMIC EDUCATION SYSTEM IN NIGERIA.

“Islam means peace literally. It is a religion that began in the kingdom of Saudi Arabia in the 7<sup>th</sup> century”.

Islam is a religion and Arabic as its language has contributed substantially to world civilization and culture. It revived the human pursuit of science and it was through the Arabs and not the Romans that the world achieved light and power through science. In 9<sup>th</sup> and 10<sup>th</sup> century, the Muslim compiled great lexicons and developed philological learning in Islam.

The Islamic religion reached the Savannah regions of the West Africa in the 8<sup>th</sup> century A.D. through conquering of towns.

In Nigeria, Arabic was learnt to read Quran (their holy book). It began advancing when its teachers depended on Sadaqah (free will offering) to meet ends. Moslems were equally encouraged to make offerings to the teachers also known as Mallams”.

- History of Education in Nigeria, A Baba Fafuwa, 1974 pgs. 50,51 and 55 NPS Educational Publishing Limited.

### 2.2.3. CHRISTIAN OR MISSIONARY WESTERN EDUCATION SYSTEM.

“...It must be kept in mind that the church undertook the business of education not because it regarded education as good in itself, but because it found that it could not do its own proper work without giving its adherent, and especially its clergy, as much of the formal learning as was required for the study of the sacred writings and for the performance of their religious duties” - William Boyd.

“The history of western – oriented cum Christian education in Nigeria was intimately bound up with the history of western education in Europe during and after the Dark Ages. After the fall of the Roman Empire in the 5<sup>th</sup> century, the old literacy and rhetorical education of the Romans era was completely destroyed because it was considered pagan spirit.

The church was therefore not at all enthusiastic to revive it, and because indifferent to education for sometime. Soon however, the church saw that it could not do its on work effectively unless its adherents were able to read and write. In no time at all it realizes the advantages of an education that was tailored to its needs, for unlike the Roman schools, which were secular. The

church schools were religiously biased. With the transfer of educational authority from state to church and its curriculum too. Ultimate reason for faith.

Church's monopoly of education lasted for more than 1000 years. This had a tremendous effect on the intellectual life of Europe and America and later on the British colonial territories in Asia and Africa.

The first Europeans to Nigeria were Portuguese in 15<sup>th</sup> century. Commercial interaction was not possible without education they soon discovered. The Catholics through the Portuguese influence introduced their first missionaries. They established a seminary on the Island of Sao Tome of Nigeria in 1571 for church work and priests.

The first English – Speaking Christian Mission was in Badagry in September 1842. It established and named “Nursery of the infant church” by Mr and Mrs. de Graft”.

- History of Education in Nigeria. A Babs

Fafunwa. 1974. pgs 73 & 74. NPS

Educational Publishing Limited.

This marked the period when missionaries from other church groups entered Nigeria competing for converts while building schools for them in the southern Nigeria.

This continued until between 1955– 965 when post – primary schools were properly defined and introduced and called secondary schools. During this period the following existed.



SECONDARY SCHOOL	1955	1960	1965
A. Secondary Grammar School	167	315	1240
B. Vocational, Technical and Commercial school	9	28	63
C. Teacher Training School	?	280	195

From then and up till now six (6) types of post primary school have existed.

### 3.3.0. SECONDARY GRAMMAR SCHOOL.

It is the most populated and sought after. Pattern on the English grammar School with its classical orientation. Its original aim was to train catechist for the church and clerks for government and commercial houses. The aims of education during the colonial era was aptly summed by Lord Macaulay in his *Minutes on Education* stating that "the goal was to train atleast a class of persons India in blood but English in opinion, in moral and intellect. He also believed that a single shelf of good European library was worth the whole native literature of India and Arabia". Nigeria pupils sat for the same examinations with their English counterparts. In 1956, the examinations system was West Africanized and a West Africa Examinations Council replaced the Oxford and Cambridge examination syndicate. In 1956 in order to conform to English charges, its duration was reduced from 6 to 5 years.

### 2.3.1. SECONDARY MODERN SCHOOLS.

Offered a 3 year terminal course for those children who were unable to pursue a normal grammar school course or too young to enter the labour market. The Secondary Modern Schools was introduced by the Old West Regional Government in 1955, at the same time as the introduction of free primary education. The course offered was of a general and practical nature includes the following Arithmetic, English, Geography, Rural Science, Physical Education, Music, Religion and Art. Between 1955 and 1962 success completion ranked as an entry qualification into junior clerical position, in the Civil Service and in commercial houses, teacher-training colleges and as teachers in nursery.

Demand and raise in requirements by government and industry has left the present day Secondary Modern School leavers without such priviledges.

### 2.3.2. CRAFT SCHOOLS.

Principally in Northern Nigeria and were designed to cater for the pre-vocational needs of the pupils in woodwork, building, metal work, mathematics, science and technical drawing. It ran for a period of 3 years. Their graduants sought semi-skills employment in commerce and industry. Others entered trade centres and technical institute for further training.

#### **2.4.0 GOALS OF ESTABLISHING SECONDARY SCHOOLS**

- A. To develop abilities, attitudes and other forms of behaviour of positive and meaningful value in the society in which a child lives.
- B. To educate a child out of his environment especially in boarding schools
- C. To enhance social, economy and political advancement

- History of Education in Nigeria. A. Babs Fafunwa 1974

Pgs 190 – 192. NPS Educational Publishing Limited

#### **2.5.0 ESTABLISHMENT OF SECONDARY SCHOOL IN NIGER STATE**

Before the creation of Niger State, the province occupied by Niger State had these secondary schools, namely: Government Secondary School, (then Abuja) now Suleja in January 1956 and Government College, Bida in 1905, others came up after the creation of Niger State in 1976.

#### **2.6.0 OTHER EXPECTATIONS OF SECONDARY SCHOOL**

Reading is the process of recognizing and understanding the meaning written (including printed) symbols. In a broad sense, their process is applied to musical notes, scientific formula and equation, shorthand, and Braille symbol for the blind. Reading is one of the language arts and is closely related to the others; speaking, listening to speech, and writing.

Reading takes 80% of the unlimited avenues a child of secondary school can learn, study and remember all what he has been taught.

A secondary school pupil must therefore possess a sound ability to read what he has been taught or wishes to learn on his own.

### 2.6.1 IMPORTANCE OF READING

“The ability to read is one of the most important of human accomplishment. Through reading, it is possible to learn not only about what is nearby and in the present time, but about faraway events and those long past.

Nations with a high illiteracy rate are handicapped economically and politically. Individuals, to find themselves handicapped if they cannot read well enough to gain practical information or to amuse themselves and enrich their lives.

Another important reason is for information. Every one's daily life cannot be made or properly diversified without reading; from bedroom, offices and public places.

Some more number of people read for recreation. This is mostly in economically advanced countries and wherever students or study population are high. Pictorial books and magazines form [part of these.

## 2.6.2 METHODS AND APPROACHES

Because of the complexity of the reading process and the irregularity of the English Language, few reading programs in some countries use only one reading method. Usually, a combination of methods, approaches and techniques is used, although one may be emphasized. The following are among others.

**A BASIC READER METHOD** (whole-word approach or look-and say approach).

The pupil is given a few simple words to look at, pronounce, and memorize. Meaning is stressed, often by showing a picture of an object along with the word that represent it.

For example, pupils are taught that *bat* and *bolt* start with the same sound, and led to apply this knowledge to the words, such as *bird* and *boat*.

**B SYNTHETIC METHOD** (sensitive phonics method)

This method introduces symbol-sound relationship first. A word is not given for reading until the pupil knows the name of each letter in the word and the sound represented by each letter or combination of letters.

**C. STRUCTURAL LINGUISTIC METHOD**

In this method, emphasis is in clusters of sound as related to patterns of letters. For example, the pupil is taught at in *cat* and *rat*. He is then led to recognize *an* pattern as in *cap* and *ran*, and the *ap* pattern of *cap* and *rap*.

## LANGUAGE EXPERIENCE METHOD

This method makes use of pupil's words and language pattern to help him learn to read. The pupil dictates an idea or anecdote to the teacher, who writes it on a chalk board or chart. The teacher then reads the message aloud, helping the pupil understand the relationships among the sounds, appearance, and meaning of words. Later, the pupil writes down his own material and reads it.

## INDIVIDUALIZED APPROACH

Recognition of the great difference among the children as regards their mental and physical condition, intelligence, interests, and social background has led some educators to advocate individualized teaching. Pupils select their own reading material from a wide variety made available to them. Instruction is given on an individual basis, or to small groups formed temporarily to pursue some mutual interest.

## OTHER METHODS

The English Language causes special problems in reading and spelling because one letter of the Roman Alphabet may represent by more than one letter or combination of letters.

These others include phonetic alphabets and Pitman. Initial teaching is done in the Pitman Alphabet.

## 2.7 CORRECTIVE AND REMEDIAL READING

The person whose reading skills lag or more years behind his intellectual development is said to have a reading disability.

The result in performance of such students is not usually the same with mates who do not have such problem(s)

For simple reading difficulties; a program of corrective reading is conducted in the classroom at the elementary, secondary and even college level. Reading materials of high interest for the group in used. The teacher may employ word games and the methods of intensive practice in reading skills.

More complex and severe reading difficulties required the help of teachers specially trained in remedial reading. Instruction is given to one pupil or to a small group in a special classroom in the school, in a clinic or in the pupil's or teacher's home. As in corrective reading, motivation is increased by use of high-interest reading material, recognition and praise for success and by avoidance of censure and punishment.

- New Standard Encyclopedia pages. 104-1-6

Vol. 12 Standard Educational Corporation.

## 2.8 REMEDIAL SCHOOL IN NIGER STATE

Niger State is amongst the Joint Admissions and Matriculation Board's called Educationally Disadvantage States. This means that majority percentage of the expected number of students applying for admission into Nigeria tertiary

## CHAPTER THREE

### 3.0. RESEARCH AREA

#### (GOOD LANDSCAPING)

#### 3.1.0. SITE PLANNING

“Landscape Architecture is primarily a fine art and as such its most important function is to create and preserve beauty in the surrounding of human habitations and in the broader natural scenery of the country; but it is also concerned with promoting the comfort, convenience and health of urban populations, which have scanty access to rural scenery and urgently need to have their hurrying workday lives refreshed and calmed by the beautiful and reposeful sights and sounds which nature, aided by the landscape art, can abundantly provide”.

*C.W. Eliot 1910. Encyclopedia America, Vol.16.*

*Grolier International, Inc.. 1981 Reprint.*

The service which a landscape architect can render his client rests on his ability to apply spaces. This entails in addition basic design ability, a knowledge of the materials of landscape, that is land, water and organic life. He must understand the interaction between these materials, climate in which they function and the human use to which they are being adapted. These factors together make up the ecology of a landscape and it is the landscape architect's function to arrange, develop and adapt them serve the particular use for which the land space is designed. The extent



often be required for projects in which other elements are already completed or planned beyond the possibilities of major adjustment. A site plan for a completed or completely planned project will usually be more rigid and detailed than those referred to initially.

The materials required at master plan stage may include:

- A. PLANS: Site analysis use analysis, small-scale location plan showing the influence of the environment on the new project and the project's influence on the environment. Contoured site plan showing design solution.
- B. Illustrations, sections, model.
- C. Report: The report will state the problem, the reasons for the solution, the phasing, the costs and the means of maintenance

#### **3.1.4. INFORMATIONS NEEDED FOR PREPARATION OF SITE PLAN**

- A. Contour surveys (of site and surroundings to the scope and scale appropriate to the project).
- B. Site appreciation.
- C. Planning implications.
- D. Client requirements.
- E. Functions.
- F. Intensity of use.

- G. Timing.
- H. Costs.
- I. Means of maintenance.

### **3.2.0. SITE FACTORS**

#### **3.2.1. CLIMATE**

The creation of a favourable microclimate is one of the major reasons for site manipulation and in attaining this, placing of shelter belts is often the first step in preparing the plan. Since a certain minimum width is required according to site conditions, they may influence all other element of the plan, including the site of building. The basic pattern of the plan will also be influence by the need for minimum sun in cool climates and shade in hot ones.

#### **3.2.2. SITE CONTOURS**

Contours of a site will provide the first line of thought on how a site should be developed. They will suggest the positions for buildings, for views, for shelter. The use must be made of level areas of the site for large elements such as playing fields.

The siting of roads will depend on their gradient in relation to the site gradients. If traffic separation is to be served by over and under passes, the site contours will tell the most economic siting for these. A

road sited along to the contours will give an opportunity to run road and footpath at different level. If the required minimum road gradient is less than the site gradient between the road's of entry and destination, the road have to take a suitably extended course.

Elements such as car parks, which it is desired to conceal, should be sited to the lower contours.

Normally trees will be sited on the cover contours. From the representative sketch onwards all design should be carried on a contoured plan.

### **3.2.3. EXISTING VEGETATION**

Where any part of the site can remain undisturbed, the existing ground should be examined to see if it is suitable for retention. If so, it must be both protected and maintained for the duration of site works. Hedges and fences may sometimes be used in the new development particularly on exposed sites their value as shelter to new planting may be considerable. Healthy trees should always be preserved where possible. Their position in spread and the ground level at their base must be known on the surveys, as the need to retain approximately on same level over their root area may determine the shaping and levelling of the site. Any existing features which are to be kept must be protected by fencing before the first construction machinery reaches the site.

#### **3.2.4. SOIL CONDITIONS**

In some cases, these may be a determining factor. Overall lack of soil may dictate the same type of pattern which would result from extreme aridity, that is, a pattern of localized areas where growing conditions are artificially induced, on a background of inert material or of poverty plants.

Modern techniques of soil improvement have made it possible to obtain growth on areas, which would at one time have been considered infertile. The possibilities and cost of this should be ascertained in difficult cases, before the plan is evolved. But in normal cases the soil conditions should be reflected in the plan and marked differentiation of soil quality within the site will influence the siting of different elements.

The nature of the subsoil will also influence the site plan from the first. In projects where there is any question of undergrounding structures or putting roads in cutting the nature of the subsoil may be decisive. The practicability and cost of contouring and levelling will equally be affected. In considering both these operations the level of the water-table must also be ascertained.

#### **3.2.5. SITE SURROUNDINGS**

These will influence the visual pattern of the development which must relate the site to the surroundings; the position of screen planting,

this may be needed as a visual barrier or to reduce noise or pollution; the access or prevention of access- for instant adjacent areas of public resort, such as commons, should influence the pedestrian way system in urban development, and equally fast traffic roads should be insulated from uncontrolled pedestrian access.

Views seen from the site will influence the sitting of buildings, and the arrangement of plantings. Views into the site may be considered from viewpoints some distance from the site. The importance of these will depend on distance, which will determine not only whether an object is seen at all, but also whether it is identifiable, or blurred by atmospheric perspective, on contours, or on intervening objects such as trees. Taking out sections along a number of lines should attain the effect of new structures on distant views.

Montage on photographic, or a scale study model can also be used. In using the latter, the viewpoint, even some miles away can be scaled out and fixed at the contour level. The visibility of proposed structures on the montage can then be ascertained. Contoured ordnance maps on scale if  $2^{1/2}$  in to 1 mile will be found useful in assessing the interplay between a site and its surroundings.

### **3.3.0. EARTHWORKS AND GROUND MODELLING**

They can be best describe under the following sub-topics:

### **3.3.1. CLEARING**

Earthworks and ground modelling operations will involve on many sites the clearance of vegetation, and this may constitute an element in the total cost. If the site is well covered with trees, a record should be made of the number per acre, whether they have any value for timber purposes, or whether the tree debris must be disposed of by burning. Also a record should be made of the ground level around trees to be retained. Information should also be obtained on the extent of the operations necessary to remove the root system of the trees.

Two tractors moving in parallel and dragging a heavy chain between them can achieve general clearance of tree-covered areas with negligible timber value. There are also special fitments, which can be mounted on tractors for this purpose. These methods may also uproot the root system, but where this does not happen or the stumps of felled trees remain, there are other attachments, which are usually effective.

### **3.3.2. SURVEYING AND LEVELLING**

The provision of an accurate record of the dimensions and position of the different surface elements of the site is essential, and the degree of detail to which this should be carried out will be dependent on the scale and nature of the proposed earthworks and ground modeling operations. The objective of leveling operation should be the preparation of a contour

plan of the site related to a reliable datum, preferably an O.S. benchmark..  
The contour intervals will again depend upon the proposals and or the  
existing topography of the site, but 1 ft intervals.

### **3.3.3. WATER BODIES AND OTHER RELATED**

The levels of the water in pools and streams during drought,  
normal and high rainfall periods is desirable, also the contouring of the  
pool or streambed if filling is envisaged. In any event, the maximum  
depth of the water should be recorded. It is also very desirable that the  
water table levels under different conditions should be noted, and this  
may require the excavation of several trial pits in fact, the more  
information can be obtained an underground water and springs, the better.

### **3.3.4. SOIL AND SUBSOIL**

The depths and nature of the topsoil and the subsoil should be  
noted, and this information should be related to the latest information  
available from the Geological Survey. Where rock is suspected, it is  
important that a geological investigation is made.

### **3.3.5. ACCESS**

Information on the accessibility of the site to earthmoving machines and on the room available for maneuvering is necessary at the design stage.

#### 3.4.0. **HARD SURFACES**

Hard surfaces are important elements in landscape design especially in our increasing urbanized civilization. The emphasis here will be on pavings for pedestrians in courtyards and squares rather than on footpaths.

It is though important to note that what is discussed here may relate well or not to different locations.

The functions of pavings/hard surfaces include:

- A. To provide hard, dry, non-slip surface, which will carry the required load for pedestrian or vehicular traffics.
- B. **DIRECTION:** Which can be suggested by the use of smooth flags on which people naturally walk to lead them across a grassed or graveled courtyard, or by use of cobbles to deter people from wondering off route.
- C. **HAZARD:** Where vehicles cross a pedestrian path, a change in the paving material for either or both routes will indicate change of function. A charge in paving material is sometime



### 5.3.0 VEGETATION

Minna lies in the Savannah Belt and hence it is characterized by grassland, scattered trees and shrubs. The vegetation type of Minna has however been slightly influenced by planned development of orchards and forests.

Orchards are shown in two places as a control to development. The first is the area between the arms of the Lagos and Baro lines. It is bonded by the southern by-pass.

There are also two categories of forest use in Minna. The first, to put to use land that cannot be used for urban development nor for agriculture. While the second area is where development is prohibited. Such areas include Rafin-Yashi after Tudun-Fulani, on the crest of the hill between Bosso and Maikunkele.

### 5.4.0 SOCIO-CULTURAL FACTORS

#### 5.4.1. HISTORY

Minna is basically a Gbagyi (Gwari) town and its name was derived from a ritual performed yearly by the Gbagyi founders of the town to observe the beginning of the New Year. The word "Minna" in Gbagyi means to spread fire.

The early settlers and founders of Minna lived atop the ranger of hills that line the eastern and northern sides of the present Minna. Evidence of early settlement on the hill top remains in the form of dilapidated foundations, broken

pots and many baobab trees that characterizes ancient towns in the northern part of the country.

#### **5.4.2. SOCIO-CULTURAL LIFE AND SETTLEMENT**

Minna possesses a higher than average proportion in the working age and school age group. Males dominate the population to an exceptionally degree. For every five (5) females there are six (6) males living in the town.

Minna has also a fair share of migrants who are attracted by work. Without the migrant population, some of the skilled and unskilled service and trades for instance would not have been effective.

The Minna urban area can be categorized as follows:

- I. Residential.
- II. Government institutions
- III. Educational institutions.
- IV. Law and Order institutions.
- V. Commercial and industrial institutions.
- VI. Public utilities and
- VII. Controlled open spaces.

#### **5.4.3. DEMOGRAPHIC DATA**

Minna has a typically growing population. The 1962 census figures show that Niger State has a population of 1,194,508 with an annual growth

rate of 5 % for local government headquarters and 2.5 % for other towns and villages. The population density as at 1963 was put at 16 persons per square kilometer. This figure has been nearly doubled as at present (2003). The population itself shows by the 1991 census figures still at 2,421,581, which is about 92 % increase of the 1963 figures. The population of Minna is influenced by its proximity with the Federal Capital Territory, Abuja.

It must be noted that there has been an increase in the mortality rate which were based on the 1962 population census figure as shown by a United Nations (UN) survey in 1988 and the National Population Commission survey of 1986.

#### **5.5.0. ECONOMY AND COMMERCE.**

Land is the major asset of Niger State. In fact it has the largest of all other states in the country. Internally generated revenue is very low due to the absence of large-scale industries. Small-scale industries are however on the increase like food processing, plastic repair and service workshops.

Agriculture is the major livelihood means of a large proportion of the people. But this is done manually and is only been changed with the efforts by the government to inculcate a culture of mechanized farming, though slowly.

The greater percentage of the working population is employed by the public sector as compared to the private sector. This makes them dependent upon government for their pay pocket.

The major commercial centres in Minna are the central and Gwari Markets. There are complimented by the Gwadabe (Saturday) Market. Roadside stalls, shopping malls and super markets together with Obasanjo Commercial Centre all add up to the commercial value of Minna town.

#### 5.6.0. TRANSPORTATION AND TRAFFIC FLOW.

Minna town is characterized by a widely despaired dual carriageway, which serves the major road that, runs from Chanchaga in the south to Maikunkele in the north running approximately 16 kilometres.

There are other smaller accompanying roads which branches off from Paiko, these include Northern and Southern Bye-Passes, Shiroro Road, David Mark Road, IBB Road, and branches off AbdulSalam Abubakar Way (formerly Bosso Road) are Western Bye-Pass, Keteren-Gwari Road, Kuta Road, Airport Road and Eastern Bye-Pass. A greater percentage of the traffic flow is on AbdulSalam Abubakar Way. a major worth mentioning problem is in the city which usually experiences serious traffic hold ups and go slows at rush hours between 7.00am – 8.30am (mornings) and between 4.00pm – 9.00pm (evening s). This is due to largely the central market, which is served by only a one-way road.

A railway line runs from the east to west separating the Tudun-Wada and Tunga Housing area from Bosso, Limawa, Makera, and Kwangila in the north. This however create a traffic conflict between the train and motor vehicles,

which is solved by the provision of level crossing at the urban centre (Mobil) and Maitumbi a cross Kuta Road.

#### **5.7.0. EXISTING LAND USE**

At the moment, Minna Land Use can be classified into five (5) major groups in view of their existing functional use. These are Commercial, Agricultural, Residential, Roads and Institutional

#### **5.7.1. COMMERCIAL**

The components of these include retail establishments, warehousing, light, heavy and extractive industries. These account for about 20% of the existing land use.

#### **5.7.2. AGRICULTURAL**

In view of the fact that there exists vacant lands beside some outskirts located residential areas, proposed industrial; areas, and future planned areas, the people have use all these for agricultural purposes to add to the area allocated for such purpose.

#### **5.7.3. RESIDENTIAL**

What actually make up towns are unarguably their inhabitants. Residential structures are not laid in an arranged manner for old settlements.

Only in the settlement and proposed expansions are building regulations followed as laid down by the Niger State Urban Development Board (NUDB). This accounts for about 45% of the land use.

#### **5.7.4. ROADS**

Accessibility and smooth traffic coordination cannot be achieved unless there is proper road network within and around a settlement. Minna has these to serve the group demand. It accounts for about 13% of land use.

#### **5.7.5. INSTITUTIONAL**

These include Hospitals, Administrative, Educational and Social Institutions. Virtually all aspects of daily living in Minna town and its environs feel their contributing role. 15% of the existing land use is composed of it.

#### **5.8.0. FUTURE LAND USES.**

The future land use has already been planned and defined. Changes do not seem to occur unless if unforeseen circumstances arise.

These future land uses include roads, industries, residential and commercial centres.

## CHAPTER SIX

### 6.0. SITE ANALYSIS

#### 6.1.0. CRITERIA FOR SITE SELECTION

The word school goes with learning. Learning is an intentional act of attempting to know how to do something or how something works.

In view of the fact that learning must be done in a very quiet and conducive atmosphere, an environment where this is intended to take place must either be readily available (only in few cases) or be made so to suit whatever kind of learning is intended.

The research area discussed in chapter three is a purposely attempt at ensuring that this learning is not only maximally achieved, but also done for a long time and enjoyable.

Noise and learning do not agree, and for that, a site for school is adviseably away from public traffic and activities that are readily elements of noise pollution.

The eastern bye-pass is one of the three in Minna town and its function as an alternative route out of the town drastically reduces traffic and even public attention. In fact until of recent after the Niger State legislators began residing in their quarters, on a part of the road has made other residents of the town began dwelling there. This proves why up till now no definite name is known with the area.

## **6.2.0. LOCATION OF SITE**

The site is located on the eastern part of Minna town. It is along the eastern bye pass, off Minna-Paiko road that leads into the town from that direction.

## **6.3.0. SITE CHARACTERISTIC (INVENTORY)**

### **6.3.1. SIZE**

The site has a total land area mass of about 15,000 m<sup>2</sup>.

### **6.3.2. VEGETATION**

The land has few trees but with much grasses. This thus gives rise to the reason why it is at the moment used for agricultural purpose.

### **6.3.3. ADJOINING OWNERS**

Presently, the land has no district adjoining owners, unless those that may occupy it in the future.

### **6.3.4. ON GROUND SURVEY**

Access road, seasonal stream and sloppy topography is a manifest of the on ground features.



### **6.3.5. ABOVE GROUND SURVEY**

High tension cables, low tension cables and light bird movements are characterized above the site.

### **6.3.6. BELOW GROUND SURVEY**

Below the ground are underground water, water pipes and telephone cables that passes by the site is edge parallel to the major dual carriage way.

### **6.3.7. SOIL TYPE**

The surface soil is loan, which is followed by day and laterite before other bigger sized soil types and subsequent stores.

A manifest of the soil type is proven by the farming practice both on and around the site.

### **6.4.0. ACCESS AND CIRCULATION**

#### **6.4.1. ACCESS**

Access to the site could be from many sides. These include from the city gate beside Doko International Hotels just at the town's city gate. Another is from Maitumbi with the road coming just after Niger State Agricultural Development Program.

Should are not come from these ends, Tudun Wada (Tunga) has a road through the popular Inuwa Musa Road (Top Medical Road) which bursts out adjacent to the site.

Circulation within the site is well defined and influenced by the arrangement of the facilities on site and how they relate in function and to the visitors' purpose.

The need for restriction to visitors and noise control also contributes to the units' arrangement, which will affects movement within the site.

#### **6.4.2. CIRCULATION**

Circulation within the site is well defined and influenced by the arrangement of the structures on site and how they relate in function and to the visitor's purpose on site.

The need for restriction to the visitors and noise control also contributes to the units' arrangement, which affects movement within the site.

#### **6.5.0. UTILITIES**

##### **6.5.1. WATER**

Portable water can be obtained from the major service pipe passing by the site. Others would be from stored or underground (bore-hole or well) water.

### **6.5.2. ELECTRICITY**

It will be tapped from the high tension over head cable passing by the site. Other would be from generator(s).

### **6.5.3. TELEPHONE**

It is unfortunate that since it has no other dwellers presently and the few are far of from the site are hamlets and villages that do not need or cannot afford the cost of bringing telephone services to their houses.

It is hoped that the siting of such an educational institution would make the government make some positive efforts towards having much of this on site

At the moment, the newly introduced Global Satellite Mobile (GSM) communication system would be the best alternative. Or other available and maintainable mobile and telecommunication service providers.

### **6.6.0. SCENERY – MAN MADE FEATURES**

In view of the fact that the area is yet to be properly occupied, except for the utilities mentioned above, other residential settlements are very far off the site. Another may just be make shift shed made on farm sites.

### **6.7.0. ENVIRONMENTAL PROBLEMS**

There are no none visible environmental threat or hazard on site to make the school students and staff alike at risk.

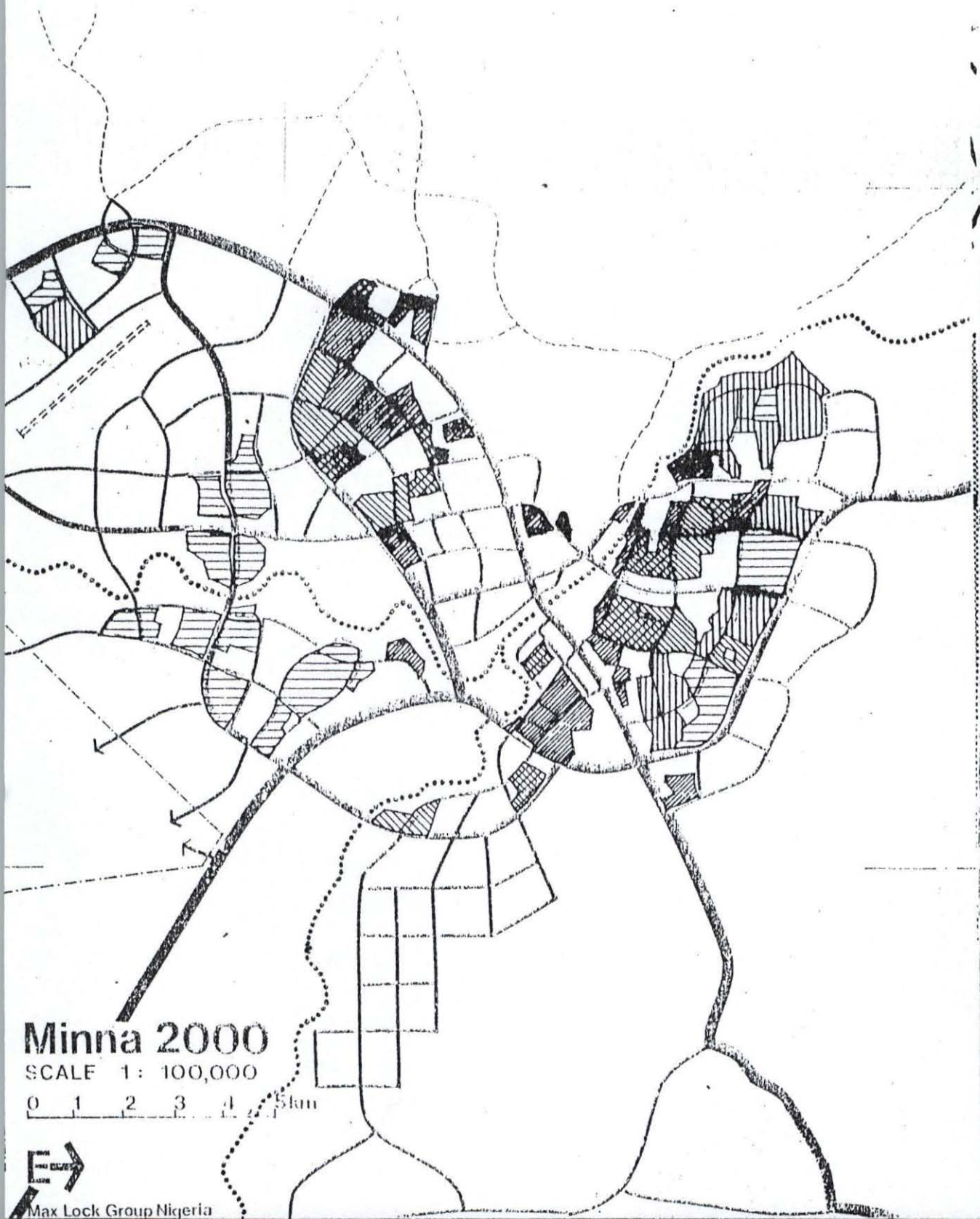
The proposed project does not have any activity that would pose any danger to its environment and its dwellers alike. It is therefore environmentally friendly.

#### 6.8.0. DEDUCTIONS

It would be necessary for other facilities and services absent on site to be provided for the full and smooth running of the school. Except for such few mentioned earlier. There exists no major obstacle to the immediate taken off of the project immediately.

The need for the project to be in Minna is basically to ensure that virtually all intending students into the school in Niger State have almost the same access and distance to it since it is in the state's capital.

Other students from outside the state would equally get there without much trouble.



**Minna 2000**

SCALE 1: 100,000

0 1 2 3 4 5 km



Max Lock Group Nigeria

**Phasing**

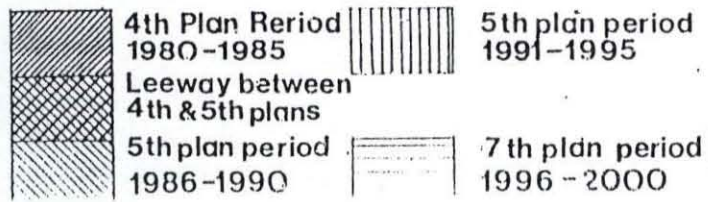


FIG 5.2

Minna 1.2.5.

Retail Establishments  
 Commercial with Residential  
 Warehousing  
 Light Industry  
 Heavy Industry  
 Extractive Industry



# Commercial Uses

Fig 5.4.



LONG TERM

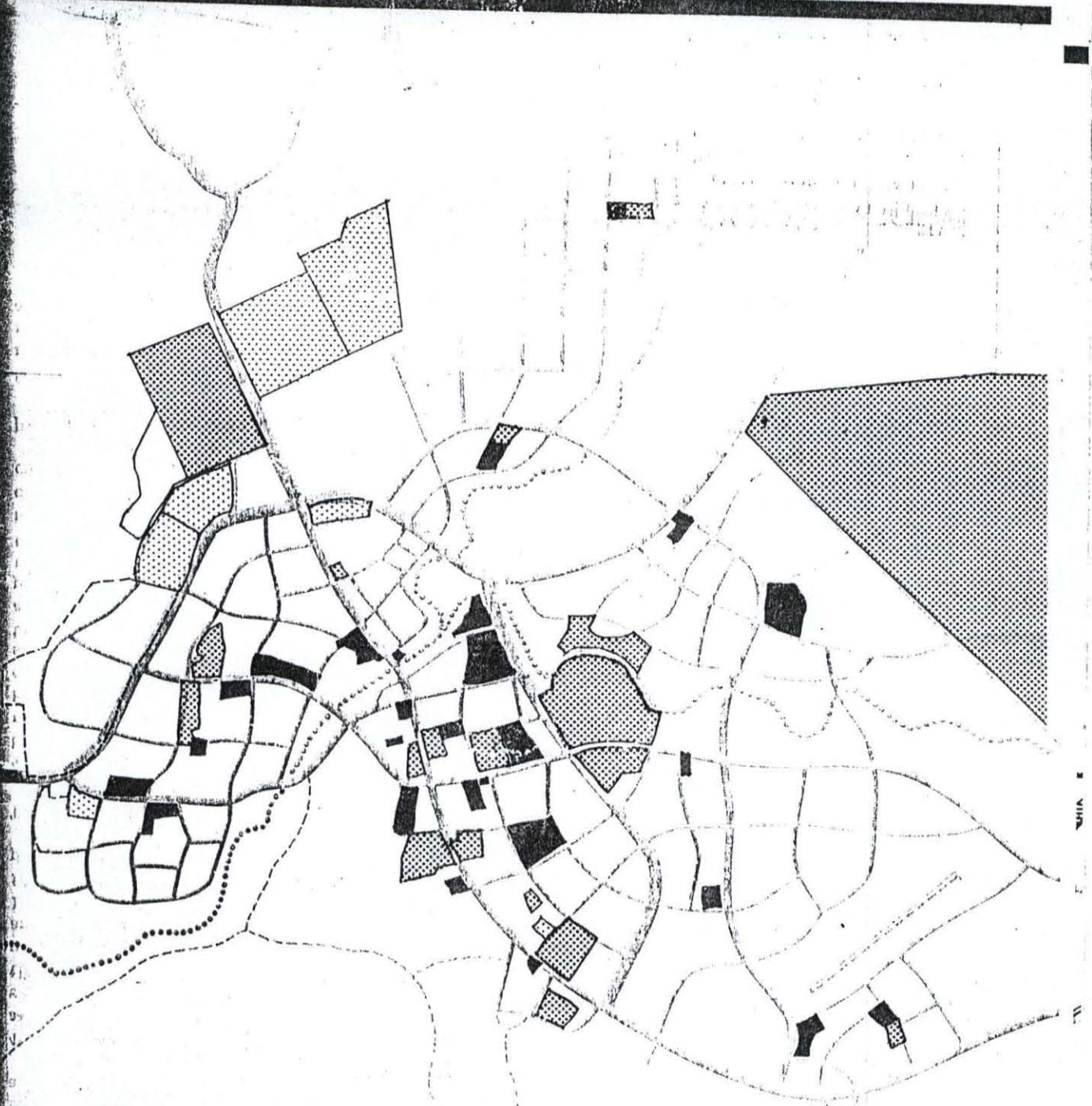
LAW & ORDER

EDUCATION

GOVERNMENT & HEALTH

Fig. 615.

# Institutions



## CHAPTER SEVEN

### 7.0 DESIGN CONCEPT AND CONSTRUCTION.

#### 7.1 DESIGN CONCEPT.

Design as defined by Webster Dictionary of English language, is an outline or graphic presentation of a pre-conceived idea, or plan meant to be Built/created/made. Bringing out an idea from the mind to paper for the purpose of implementing or bringing to reality such idea.

Concept is the manner within which these ideas are arranged to achieve a form.

Then form of leisure and recreations a building are normally guided by elements of functionality because of the use of the building.

The concept is that of a bookshelf. The first thing that readily comes to any one's mind on mentioning the words "school" is a book. These books are shelved so as they can be easily handpicked and read. The administrative building is used to show this in order to allow the most centrally functional building aesthetically speak for the school.

#### 7.1.0 MATERIAL AND CONSTRUCTION

##### 7.1.1 MATERIAL

In the design of schools, varieties of materials are employed in the construction. The following materials would be employed in the course of this design: Concrete, steel, aluminium, roofing sheets, bitumen, asphalt, paints and tars glass, blocks, bricks, bituminous felt, terrazzo, and ceramic tiles.



### 7.1.2 CONCRETE

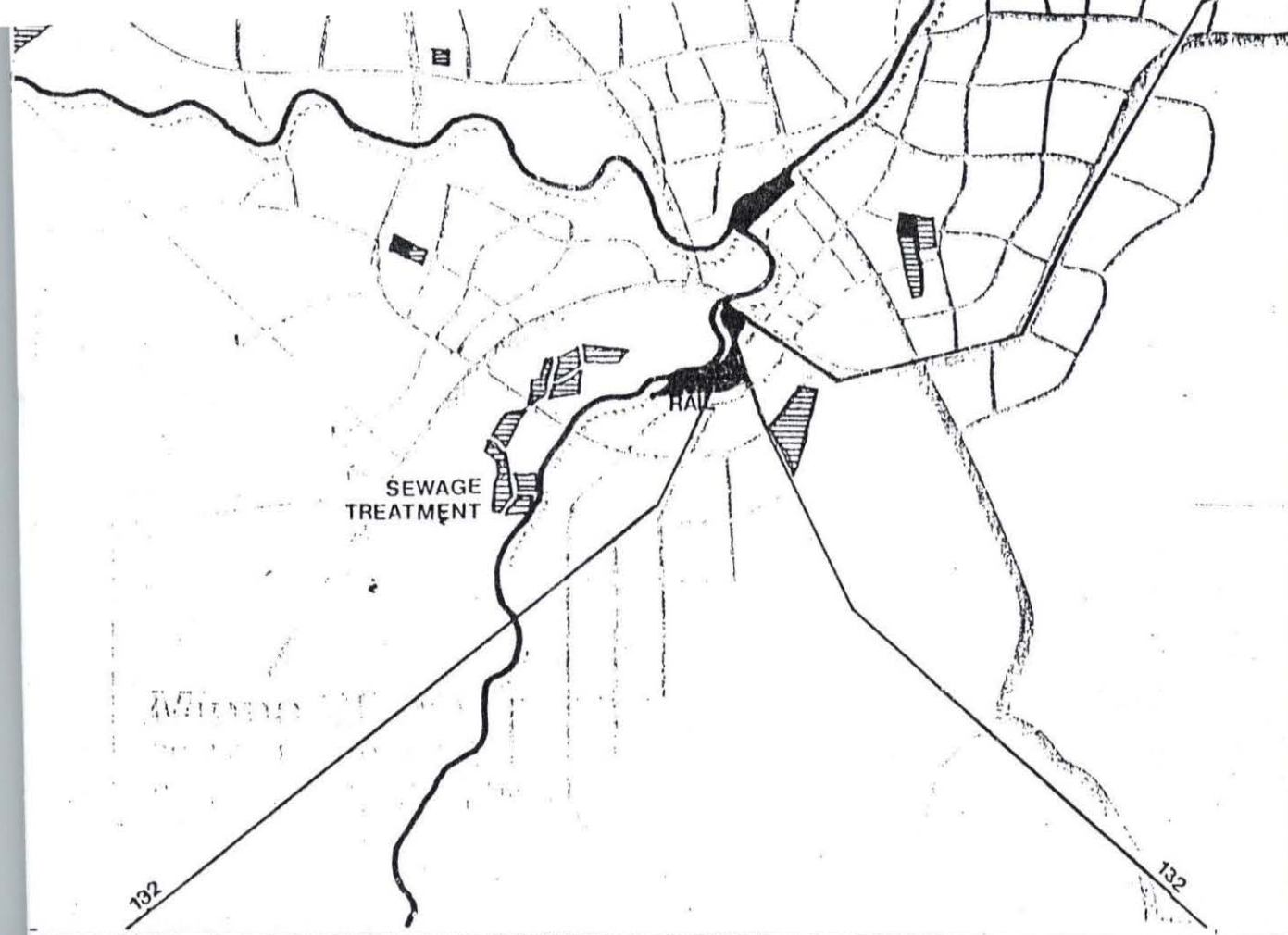
This is an artificial material made from an ultimate, carefully proportioned mixture of binders (as a rule, use is made of material binders, organic and combined binders being employed on some very occasions), water, fine and coarse aggregates and admixtures (if any) which hardens to a stone - like nature.

Concrete is a material that tends to set whenever in contact with moisture or water, the rate of hardening can be appreciably increased by using steam curing, autocuring or electrical heat.

The incorporation of steel-bar or mesh reinforcement result into reinforced concrete the produce a better effect of rigidity. Today, it is the most used structural material of the building. Like any other material of its kind, reinforced concrete has a heterogeneous structure. Any reinforced material consists of matrix and reinforcement. The matrix of reinforced concrete is the concrete, which is strong in compression and weak in tension, but on the other hand the reinforcement of the concrete takes care of the tensile load.

### 7.1.3 STEELS

Most structural members in an industrial set up are steel. Steels used in the building industry can be classified according to their quality, manner of manufacture, treatment, and purpose. Hot rolling, cold drawing, pressing, forging and some combination methods generally work structural steel. It involves various shapes (for instance joists, beams, channels, angles, box, sections and rails).



## Utilities

Fig. 5-3.



Minna 1,2.10.

93

process is called ANNEALING, to relieve the strains, which would otherwise result.

Glass has the following properties:-

- i. Appearance - transparent, translucent, and opaque due to painting.
- ii. Density - Glass weighs 2.5kg/m<sup>2</sup>/mm thickness
- iii. Melting point - 500oc approx.
- iv. Visible Light Transmission - The refractive index of glass is about 11.52.

- v. Sound installation
- vi. Thermal movement and insulation

The tube of glass to be used in my design is the solar control glasses that would be use to reduce solar heat transmission and allow for improved comfort for occupants. Heat resistant glass could also serve as alternative due to the high level of temperature of the area.

Sheets, plates and tubing. Steel for reinforced concrete structures comes in form of bars and wires. Reinforcing steel is placed where concrete is expected to suffer considerable tensile stresses hence, it must have appreciable tensile and yield strength.

#### **(v) ALUMINIUM ROOFING**

It is a fact already known that the use of aluminium roofing sheets has a long far-reaching effect in terms of durability and long lasting. The most important raw material used in the manufacture of various sheets and shapes serving different purposes in construction industry today are aluminium alloys.

Long span aluminium is so called because of its long lasting effects. Some of the sheets may be even up to 1.6 metres wide and can cover up to 30 metres span. It is widely used for three layered filler structures, exterior facing, roof panels up to 30 meters in span.

#### **(vi) PAINT.**

Paint is always in liquid form and consist of pigments and binders which are applied to a surface in the coats in order to produce a decorative finish on the base

material. It also serves as protection to the base materials against decay (timber) and corrosion (metal). A good paint should have the following qualities.

- (a) It should form a hard and durable surface
- (b) It should be attractive in appearance
- (c) The spreading capacity should be high It must dry after application
- (d) It must dry after application
- (e) Hair cracks should not appear on the surface after drying.
- (f) The colour must be uniform on drying.
- (g) It should not be easily affected by atmospheric conditions.

Paint could have the following compositions

- (i) Base - It is the portion of the paint which provides the opaque coating to hide the surface being painted.
- (ii) Vehicle or carrier: - The vehicle influences the spreading capacity of the paint as well as the even spread of the paint on a surface.
- (iii) Drier: - This is what hastens the process of drying and hardening of the paint. E.g. cobalt. Lead, manganese.
- (iv) Pigment: - This is added to the base to produce different colours.
- (v) Thinner or solvent: - This is applied to make the paint thin for application and also for the paint to be able to penetrate into the fabric of the surface on which it is to be applied.

The most popular paints used in Nigeria are emulsions and glass (oil) paints other varieties of paints used in special conditions. Some of them are aluminium

paints, asbestos paints, bronze paints, enamel paints, plastic paints bituminous paints among others.

**(xii) TIMBER.**

The wood that is suitable for building or other engineering purposes is called timber. As a part of a living tree, it is called standing timber and drought timber when felled. When sawn into various market forms like beams, battens and planks etc. It is called converted timber.

Basic structure of the wood are cambium and sap wood which is light in colour and contains about 22-30 percent of the wood while cambium is the inner surface of the bark. The heartwood provides the mechanical support for the tree. However, after seasoning when the moisture of both the sapwood and heartwood are reduced to almost the same value, the differences in density and strength becomes very negligible.

Wood is easily classified under two broad headings namely, hardwood and softwood. Hardwoods have broad leaves, which are usually shed during the dry season while softwoods have needle-like leaves, which remain green all the year round.

The fact that hardwood is also of higher quality than softwood makes it more expensive.

Conversion of timber is known as wood processing, basically trees are felled and cut into logs and sizes convenient to seasoning and marketing. These are manageable sizes transported from the farm to the sawmills where the trees are

converted into marketable sizes and uses such as plants, battens, plywood etc.

Common sizes are:

- (i) 25 x 300x 3600 mm (1"x12"12')
- (ii) 50x50x3600mm (2"x2"x12')
- (iii) 50x150x3600mm (2"6"12')
- (iv) 25x50x33600mm (1"2"12')
- (v) 75x100x3600 (2"x4"112')
- (vi) 100x100x3600 (4"x4"x12')

The four main types of conversion are ordinary sawing, Tangential sawing, Radial sawing and quarter sawing.

A method whereby the rough timber is dried to bring the moisture content of the wood into the same range as that of the anticipated service condition i.e. about 15% is called seasoning of timbers. There are three categories of seasoning:

- i. Natural/Air seasoning: - This entails stacking the wood outside using the air movement to move through the wood.
- ii. Water seasoning: - This involves totally immersing timber in a running stream soon after felling for about a month.
- iii. Artificial seasoning: - This is the kiln seasoning. The kiln is an oven where heat is produced air is blown through the hot temperature until such a time the wood will be seasoned enough for the purposes.

Timber may be painted and sprayed or impregnated with liquid preservatives in order to render the timber resistant to saturation by water, to render the timber

resistant to saturation by water, to render the timber resistant to all form of attacks such as fungi and insects.

Timber could pass through the following tests: -

- (a) Bending strength
- (b) Compressive test
- (c) Tensile test
- (d) Shear strength
- (e) Hardness test
- (f) Cleavage test
- (g) Toughness test

The defects in timber could include heart-shakes, star-shakes, cup-shakes or ring-shake, grind-galls, upsets or rupture and knots.

**(vii) BRICK/SANCRETE BLOCK.**

Bricks are still popular in our local and domestic construction. Their limited size and availability make them an early choice in the local setting. The standard size of brick is 215mmx102.5mmx65mm. However, types produced in Nigeria are usually hollow bricks of size 215mmx225mmx225mm, 225mmx150mmx225mm and 225mm x 100mmx75mm.

Sandcrete block may be solid or hollow blocks produced from cement and sand mix of about 1 part of cement of 8 parts of sand. Common sizes of blocks produced in Nigeria are 50mm x 225mm x 225mm; 450mm x 150mm x 225mm and 450mm x 100mm x 225mm.

#### **(iv) TERRAZZO**

This is composed of white or coloured Portland cement and crushed marble aggregate (of different colours) to a mix of 1:1 or 1.2. Before laying, the entire area can be divided into suitable panels of predetermined size and shape using ebonite strips. It can be laid in situ or pre cast. After proper lying of the mixture and curing, the grinding takes place using a grinding machine with carborundum stones and plenty of water.

The surface is finally polished using a fine abrasive stone so as to expose the beauty of the finish. The final finish is very decorative with good hardware properties.

### **7.2.1 CONSTRUCTION**

#### **(i) FOUNDATION.**

A foundation is that of building which is indirect contact with the ground and its primary aim is to transmit and spread the loads (dead and live) from the building over a sufficient area of soil top to avoid undue settlement because of the failure of the underlying soil. A good foundation is this the one that would be able to safely sustain and transmit to the ground the combined dead and wind load in such a way as not to cause damage to the whole or any part of the building or any adjoining buildings or both. Also, the materials used should be able to resist any attack by acids, sulphate or other chemicals present in the subsoil. There are many types of foundations, but the choice of foundation depends on the soil type, site conditions, the type of construction and the magnitude of the load and intensity.



In this design, after careful considerations of those factors, the choice has been limited to strip.

### **STRIP FOUNDATION**

Strip foundation is made up of continuous reinforced or plain concrete under load bearing walls. This foundation spread loads to an area of subsoil capable of supporting the load without undue compacting. The foundation would be employed in the construction of administrative, classrooms and hostels units with appropriate damp proof course.

Foundations with bolt fitted with plates under the head to provide resistance to upward pull. The base plate of the stanchion is edged up with tapered wedges to the current level and the bolts are grouted into the holes provided while the gap between the steel base plate and the concrete is solidly packed with cement and sand mortars. The foundation would be employed in the construction of the workshops and laboratories.

### **(II) FLOORS**

Floors are the structural part of horizontal supporting elements as distinct from the wearing surface and it is expected to meet the following functional requirements.

- (a) To withstand the loads that will be imposed upon it, which could be persons, furniture, machinery or equipment (factory).
- (b) To prevent the growth of vegetable matter inside the building by providing concrete over site.
- (c) To prevent damp penetration, by inserting damp proof membrane.
- (d) To meet the prescribed heat and sound insulation standards.

- (e) To be reasonable and thus reduce the amount of maintenance or replacement work to the minimum.
- (f) To provide an acceptable floor finish to meet the needs of users with regard to appearance, comfort, safety, cleanliness and other associated matters.

German types of construction would be employed in constructing the ground floor of the administrative, classrooms and hostel buildings and some parts of the workshops and laboratories. This will consist of concrete of about 150mm thick laid on a hard-core of about 300mm, which is a compacted in layer. The compacting provides a good and solid base for the concrete floor.

### **(iii) WALLS**

Walls generally define the outside of a building structure. They contribute more than any other element to the image and appearance of a building thereby creating the street scope and town scope to the observer of ground level. The primary function of the wall is to enclose or divide space, offer privacy and specially to provide support to different kinds of loads (live, dead, wind etc.); to protect against wind, dust and animals, and aesthetic provision in terms of finishes.

For wall to function efficiently, then it must possess adequate strength, stability, resistance to dampness, thermal insulation and fire resistance. Walls can be to dampness, thermal insulation and non-loading bearing walls.

### **LOAD-BEARING WALLS**

These are walls which carry vertical imposed loads from roofs and floors. Most external walls are load bearing. Materials such as plastics, glass or asbestos cement cannot be used here.

## **NON-LOAD BEARING WALLS.**

They carry only their self-weight and are normally used as dividing walls, partition and dwarf walls.

### **(iv) ROOFING SYSTEM**

A roof is usually the uppermost part of a building which protects it from weather i.e. rain, sun, wind, etc. It consists of the structural elements constructed of concrete, timber or steel, which support the roof coverings. Roofs are expected to meet the following functional requirements of strength and stability, weather resistance, durability, fire resistance, thermal insulation, sound insulation, lighting, ventilation and appearance.

Roofs may generally be classified under three categories namely shape, span and structural design. Lattice truss roof and portal frame would be employed in the construction of the factory building; Gable roofing system would be employed in the administrative building while the welfare building would be roofed during folded plate made of concrete material.

### **ROOF COVERING**

Roof covering is a complement of the roof structure to protect it from rain, sun, wind and other atmospheric and environmental agencies. Corrugated aluminium sheets would be employed in part of the farmhouse, caddies yard and maintenance unit.

## **DOORS AND WINDOWS**

### **(a) DOORS**

A door may be defined as a movable barrier secured into a wall opening. Its main purpose is to provide access into or the building. The functional requirements of a door depend on whether it is an internal or external door and they include the following: strength and durability, security, weather protection, Fire resistance, privacy, thermal and sound insulation and operation, steel roller shutters are considered satisfactory for fertilizer store.

### **(b) WINDOWS**

The purpose of a window is to admit day-light, provide natural ventilation, exclude rainwater and to give a view to the outside. Building regulations stipulate minimum window sizes of at least one-eighth of the floor area of the room for adequate ventilation and natural lighting. However, the use of a room will further determine the sizes and positions of its windows.

The selection of size, shape, location and number of window openings in a room depends upon the size of the room, location of the room, utility of the room, direction of the wall, direction of the wind, climatic conditions, requirements of exterior view and architectural treatment to the exterior of the building.

## SPACE REQUIREMENTS ADMINISTRATIVE UNIT

### GROUND FLOOR PLAN.

FUNCTION OF SPACE		AREA (M2)
1. Reception/Entrance lobby	-	50
2. Drivers' office	-	25
3. Security offices	-	25
4. Arts Staff room	-	180
5. H.O.D Arts	-	35
6. Waiting	-	16
7. Secretary	-	24
8. H.O.D Technical	-	35
9. Waiting	-	16
10. Secretary	-	24
11. Technical Staffroom	-	180
12 Stair well	-	25
13. Delivery Bay	-	25
14. Commerce Staffroom	-	180
15. H.O.D. Commerce	-	35
16. Waiting	-	16
17. Courtyard	-	325
18. Secretary	-	24
19. Science Staffroom	-	180
20. Stair well	-	25
21. Toilets	-	40

## FIRST FLOOR

1. Stairwell		
2. Arts subject examination marking hall		280
3. Secretary		
4. Forms officer	-	35
5. Attendants	-	35
6. Forms store	-	45
7. Clerks and typists	-	180
8. Computer laboratory	-	240
9. Waiting room	-	16
10. Secretary	-	24
11. Examinations officer	-	35
12. Assistant examinations officer	-	35
13. Waiting	-	16
14. Secretary	-	24
15. Science subjects examinations marking Hall		180

## SECOND FLOOR

1. Stairwell	-	25
2. Commercial subjects examination marking hall		280
3. Waiting	-	16
4. Secretary	-	24
5. Vice Principal II (Academics)	-	35
6. Vice Principal I (Administration)	-	35
7. Waiting	-	16
8. Secretary	-	24

9.	-	180
10. Stairwell	-	25
11. Store	-	15
12. Kitchen	-	25
13. Staff conference Hall	-	280
14. Waiting	-	25
15. Secretary	-	24
16. Principal	-	35
17. Senior master	-	35
18. Waiting	-	16
19. Secretary	-	24
20. Technical subjects examination marking hall	-	180

### TYPICAL CLASS ROOMS FLOOR

(Ground –Second Floor)

1. Classroom	-	180
2. Classroom	-	180
3. Classroom	-	180
4. Classroom	-	180

### LABORATORY/WORKSHOP

1. Laboratory/Workshop hall	-	180
2. Store	-	15.75
3. Office	-	20
4. Toilets	-	12
5. Courtyard	-	64
6. Verandah	-	43.2

## HOSTEL

### GROUND-SECOND FLOOR

1. Room	-	10x 60 Nos.
2. Stairwell	-	40
3. Courtyard	-	160
4. Toilets	-	15x120 Nos.
5. Bathrooms	-	15x12No.

### GROUND FLOOR

1. Laundries	-	200
2. Common Rooms	-	180
3. Potters	-	16
4. Changing Rooms	-	57.6



## CHAPTER EIGHT

### 8.0 BUILDING SERVICES

#### 8.1 ELECTRICAL INSTALLATIONS AND LIGHTING

Electricity is usually supplied by the National Electric Power Authority (N.E.P.A.) and in case of power failure, it would be augmented by a stand-by generator. However, the poultry farm receives the three-phase electricity supply from an area electricity grid to a rating of 240 volts and a frequency of 50 Hertz each. Each line or phase is tapped in turn together with the neutral to provide the single phase 240V supply.

The arrangement of electrical service to the farm is with the service conductors first terminating at the meter. The incoming service may be overhead or underground. The current from the service head to the meter and into the distribution board. The size of the cable depends on the size of service entrance equipment to be used in the factory and the amperage supplied by the electric power authority. The use of accurate size of cable is necessary to guard against fire outbreak or wastage of electricity.

The conductors from the meter terminate at the distribution board where the circuit breaker is usually located. This switch disconnects all current to the factory and should be located as close to the incoming service as possible. The meter records the electricity consumed in units of kilowatt per hour. The circuit breaker is the most common type of over current protection device, while the central point of the system is the individual branch circuit breakers, because they are safe, reliable and easy to use.

## LIGHTING.

Light is the Electro magnetic radiation with wavelength capable of causing the sensation of vision. In other words, it is the radiant energy sensed by the optical nerves. The sun is the highest producer of radiant energy.

The major objective of the lighting design is to provide a specified illuminant on task (flat working plane). The natural daylight furnishes adequate illumination for only 10 to 25 percent of the total work time. Artificial illumination is installed primarily for seeing, but it could also serve architectural purpose.

Light design will ascertain the ratio of window/roof lights areas to floor areas. Although the ratio of 1/8 to 1/10 is conducive for residential and human occupancy, this is inadequate for industrial buildings. The lighting design for this project is based on the day light design factor of 5%.

The permanent supplementary artificial lighting index (PSALI) demands a uniform and complete blending of the artificial light with the natural lighting. The colour of the fluorescence light must blend acceptably with the lighting, which represents and ensures good colour scheme for the school interiors.

The design of lighting is here based on:

- i. Integration of both natural and day lighting and PSALI.
- ii. PSALI providing the entire lighting during the dark (night) or dull weather as needed during the daytime.

## ESTIMATING THE NUMBER OF LAMPS/FLOURESCENTS

Using the formula  $N = \frac{E.A}{FUM}$

Where  $N$  = Number of lamps required per flat area of the floor, area to be lighted.

$E$  = Amount of luminous flux falling and circuit area of the surface or illuminant.

$F$  = LUMINOUS FLUX, which is the radiant power emitted from the source valued in term of its visual effectiveness in converting input power. (Measured in watts) to lumen is called the efficacy expressed in lumen/watts.

$M$  = Maintenance factor (state of cleanliness of the interior).

$U$  = Utilization factor- The proportion of the luminous flux of light sources which fall on horizontal working plane in an interior.

$A$  = Area of reference surface.

From the above, at 5 percent daylight factor, a 65 watts natural and light colour rendering (white) fluorescent lamp lights 8 square metre task area of the classrooms, laboratories and workshops. While at 2 percent day light factor, the same lamp will light 10 square meter for the offices and classrooms.

## VENTILATION

Ventilation of the building has to do with the quality of the air in and around the building. The main constituents of fresh air include nitrogen, oxygen, water vapour and small amount of other mortgages. Due to human activities contaminants are introduced into the fresh air polluting it:

- i. Controlling the production of contaminants
- ii. Ventilating and residue to open air and diluting contaminants by providing fans in the club house and by also bringing in outdoor air through the windows and courtyards.

- iii. Replacing the used and contaminated air mechanically through system of air conditioning.

The general massing buildings conceptualizes the country and approach. By proper spacing of the various building in the layout functional air movement is achieved, more light and ventilation suitable for tropical elements are created for comfort and light efficiency of the occupants.

### **8.3 WATER SUPPLY**

Water supplied by the Niger State Water Board is purified to remove organic and inorganic impurities and to reduce the hardness of the water. The board carries out three operations by the system of screening sedimentation, filtration, chlorinating, aversion and fluoridation to make the water fit for human consumption before allowing it to enter the mains.

The water board who normally drills and taps the mains by laying communication pipes makes the water mains. The pipe which is often 13mm size is laid up to the boundary of the site, finishing with a stop valve or stop cock in a suitable box or chamber fitted with a hinged cast iron cover. The supply pipe in turn is laid from the stop valve into the farmer.

All other cold water drawn off points are supplied indirectly from a storage tank which would be positioned at the side of each units.

Materials suitable for the pipes used in the system include threaded galvanised steel lead, plastic or copper.

Water supply is very important for artificial irrigation on the golf course for proper turf maintenance.

## **8.4 DRAINAGE AND SEWAGE DISPOSAL**

### **(a) DRAINAGE**

In the layout of drainage systems, drains should run in straight lines with a few changes of direction, gradient and junctions as practical to minimise blockages which generally occur at changes of direction, changes of gradient, junctions and pipe joints and to economise in the expense of junction fittings and man holes.

Obviously the layout of this school drainage system will be affected by the discharge of foul water, rain water and surface into it so that a rational grouping of foul water fittings discharging to one soil pipe instead of two which will effect economics in both drains above and below ground. Likewise rational disposition of rainwater pipes and yard gathers will effect economics in drain layouts.

### **(b) SEWAGE DISPOSAL**

Sewage disposal is achieved in this school by the use of sanitary appliances. The building regulations require that any sanitary accommodation (room or space) containing water dose or urinal fittings shall not open directly into habitable room, kitchen or office or business spaces. It must however have a window or means of ventilation opening directly on the external wall.

Sanitary appliance can be classified into soil figments and wastewater figments. The soil figments are those appliances used to soil waste, water and human excreta such as water closets and urinals. While the waste water figments are those

which are used to remove the waste water from washing and food preparations such as wash basins, baths, showers and sinks.

Sanitary appliances should be made from impervious materials. They must be easily cleaned durable to withstand wear, quiet speedy and reliable in height and economical in initial and maintenance costs. Some of the available that can be used for these include vitreous china and enamel, glaze fire clay, plastic and stainless steel.

(i) **Water closet:**

The water closet arrangement consists a set of pan seat, flush pipe and flushing cistern. The cistern can be fixed at a high or low level, or closed couple. However they function to remove the solid and liquid human wastes in a smooth and readily cleansed non-absorbent surface discharging through an effective and suitably dimensioned trap to a soil pipe or drain.

(ii) **Urinals:**

Urinals for the removal of human liquid wets shall have one or more slabs, stalls, troughs, bowls or other suitable receptacles. They can be formed of ceramic materials, stain has steel or prospect (acrylic resin).

(iii) **Bidets:**

These are used in cleansing the lower excretory organs of the body in a thorough and convenient manner by sitting as tried the appliance.

(iv) **Wash basins:**

Wash basins provide facilities for personal ablutions in bathrooms, dressing rooms, bedrooms and cloakrooms. They are usually made from a ceramic material but metal basins are also available. A wide variety of shapes, size types and colours

are available with the choice usually based on personal preference. The basins are a one-pipe fitment or appliance having integral overflows, separate waste outlet and generally pillar taps.

(v) **Baths:**

Baths are available in a wide variety of design colours, and made from variety of materials such as porcelain enamelled cistern, cost acrylic sheet reinforced with a polyester resin, vitreous enamelled, pressed steel, hardboard, as bestows cement, ceramics and plastics. Most bath designs are rectangular in plan and made us flat buttoned with sufficient fall to allow for emptying with gravity and resealing of the trap.

(vi) **Showers:**

They enable washing to be performed quickly in limited space, with minimum quantity of water and adequate hygiene since the water used is continuously discharged. A shower appliance consists of the shower tray with a waste outlet, the shower spray, the imperious cubicle and a door. The materials used for the production are similar to that of bath.

(vii) **Sinks:**

Sinks are used for culinary laundry and other industrial purpose, and are usually positioned at the drinking water outlet. They are made of enamelled causation, white glazed fire clay or asbestos cement with the design similar to that of basins except that they are larger in area and deeper.

(viii) **Waste disposes:**

They are fitted to sinks and are designed to dispose organic or industrial waste quickly, hygienically and Electro mechanically, and to flush the residue into the drains.

### **8.5.0 REFUSE DISPOSAL**

Refuse disposal is achieved using the dustbins, waste collection bins and finally gathering it in the centrally located collection points where the Niger State Urban Development Board ( the body that treats the state's wastes) now collects for onward treatment.

**Fire safety:-**

Fire is a destructive agent of any valuable thing, before going far I would like to classify fire into various classes that exist and the possible extinguishers to be used:

- (a) Class 'A' Fire: These are fires in ordinary combustible materials such as wood, cloth, paper, rubber and grasses. Extinguishers for such fire outbreak should be foam, water, or dry chemical.
- (b) Class 'B' Fire: These are fires in flammable liquids, gasses and greases. Halon gas carbon dioxide or dry chemical could be used as extinguishers.
- (c) Class 'C' Fire: These are fires, which involve energized electrical equipment where the electrical non-conductivity of extinguishing media is of importance. Extinguishers to be used are Halon gas, carbon dioxide and dry chemical. However when the electrical equipment is de-energized, extinguisher for class 'A' fire may be used safely.



(d) Class 'D' fire: Fires in combustible metal such as magnesium, titanium, zirconium, sodium and potassium. Extinguishers of this class shall be approved for use on the specific combustible metal hazard.

Others types of fire protection devices also include stand pipe and hose system in which water outlets are provided at strategic positions to which hose are attached for the purposes of extinguishing fire.

Sprinkler system is a type of fire protection devices, which is an integrated system of underground and overhead piping design in accordance with fire protection in engineering standard.

Fire alarm systems are installed to automatically detect fires in the incipient stage as to signalise this occurrence. The fire alarm system is basically composed of the fire detector, fire control panel, power supply and accessories.

Fire prevention involves the use of materials (fire rrating) planning of the site and building and the use of means of escape route and finally public enlightenment.

Fuel, heat and availability of oxygen are required to start or ignite and maintain a fire. Removing all combustible materials can eliminate fire.

According to Ayers (1984) fire can be controlled by:

- i. Pouring water on a fire cools the fuel below combustible temperature.
- ii. Pouring foams prevents oxygen from reaching the fuel and smothers the fire.

The best method of extinguishing fire is by the use of an extinguisher loaded with carbon dioxide. The building is constructed to provide sufficient resistance to fire of the occupants. This concept actualise measures to limit the spread of fire

within and outside the building by partitions, detection devices, sprinkles and the choice of materials for the structure.

Well accessible and identifiable escape routes are provided in the structure. At the entrances and exits, fire escape smoke free materials are used. It has also been ensured that the materials used for this construction meet or fall within the minimum regulations or requirements of 1/2 to 6 hours rating.

Fire insurance covers are vital and cost effective. The factory is encouraged to cover for fire protection

### **8.6.0 SECURITY PLANNING AND CIRCULATION**

The safety of the assets and people of the school is rested in the strategic security design, proper execution determines internal and external vandals, thieves and people of the underworld from attempting at the school.

It is proposed that the whole site be fenced to entrance security and discourage trespassers into the property.

A security outpost at the school's entrance checks those entering and exiting the school. Security men are to be positioned strategically in the school as a whole.

Vehicular circulation is restricted to the administrative building, staff quarters, maintenance unit and rental shops. Movement to other buildings is restricted to walking in order to ensure the peoples' safety and moving in calmness. External security best served by good lighting and visibility. The accesses into the site are properly lighted and adequate spaces are provided.

### **8.7.0. COMMUNITY**

This is partially community friendly, as it is not opened to all and sundry at all times. Only people specific tasks are permitted entry and visitors.

### **8.8.0 MAINTENANCE.**

This school has been designed for easy maintenance of certain components of the buildings for work to be undertaken in order to keep, restore or improve every facility, that is, every part of a building its services and surroundings to a currently acceptable standard and to sustain the utility and value of the facility.

Maintenance exercise is carried out in this factory is to ensure the safety of occupants, visitors and the general public by making sure during design and construction that works are done to a professional standard. For example doors are hinged on properly, roof coverings are properly overlapped to prevent leakage, among others.

## CONCLUSION

The Niger State School of Remedial Studies, Minna is an architectural based, based on its responsiveness to microclimatic factors in a way which achieves comfort, delight, energy deficiency and provide comfortable and alternative schooling conditions and environment.

The school reflects a clear architectural effect created by the external and internal expressions.

The school has been provided with virtually all facilities to smoothen its running and give room for future expansion as the buildings are to be erected in its response to increase in population and other factors that comes with that.

The design also goes a long way to prove why design and construction should be done with the client and not for them. This gives more reason why architects should put themselves in their clients' shoes. It further means purposeful buildings should be designed and not adopted as the clear case of the existing Niger state school of Remedial, Gulu and that run by Niger State Polytechnic, Zungeru which has given rise to the need of this project.

The execution of this design would bring to one and more functional than the two both run by the same state government.

The cost of running two schools of the same type is equally uncalled for a situation where both school share facilities with other schools will grossly affect students' performance with respect in the availability of facilities and even equipment (s) ratio.

The location of Gulu and Zungeru does not make it centrally accessible to students of from some parts of the state. The poor provision of basic social amenities in these existing schools does not make matter better either. Their locations also does not make it easier and convenient for settlement of willing teachers.

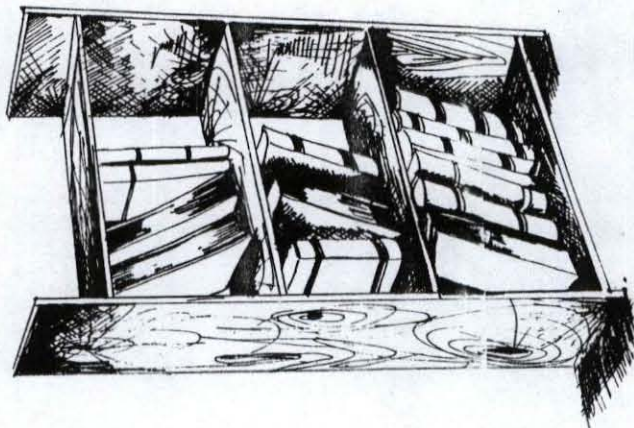
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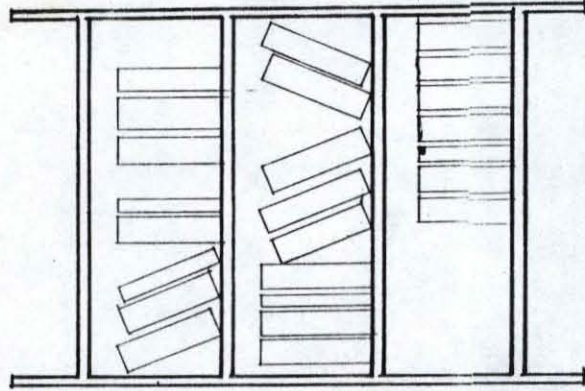
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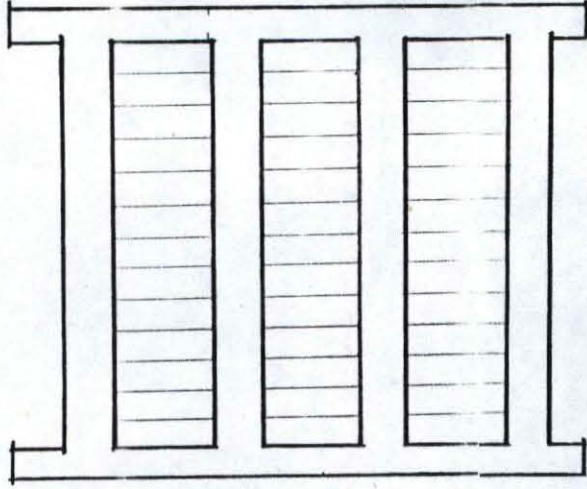
# conceptual analysis



**STAGE 1:** "Back to Books" - In symbols  
 The primary aim of the project and site facilities  
 that will be added to effectively enhance its  
 success.



**STAGE 2:** "The Book Shelf Series A"  
 Stages into a more rigid and structured  
 form for the basic function during what the structure  
 stands, made for the most complete.



**STAGE 3:** "It further evolves into what can be  
 said to be stages in evolution. It is more rigid and structured  
 to what the center administrative block would later look  
 like when the schools succeed."

A Design Proposal For

Name: GALADIMA D.N.

Reg. No: M.Tech/191/01/02

Dept: ARCHITECTURE

Course: ARC 621

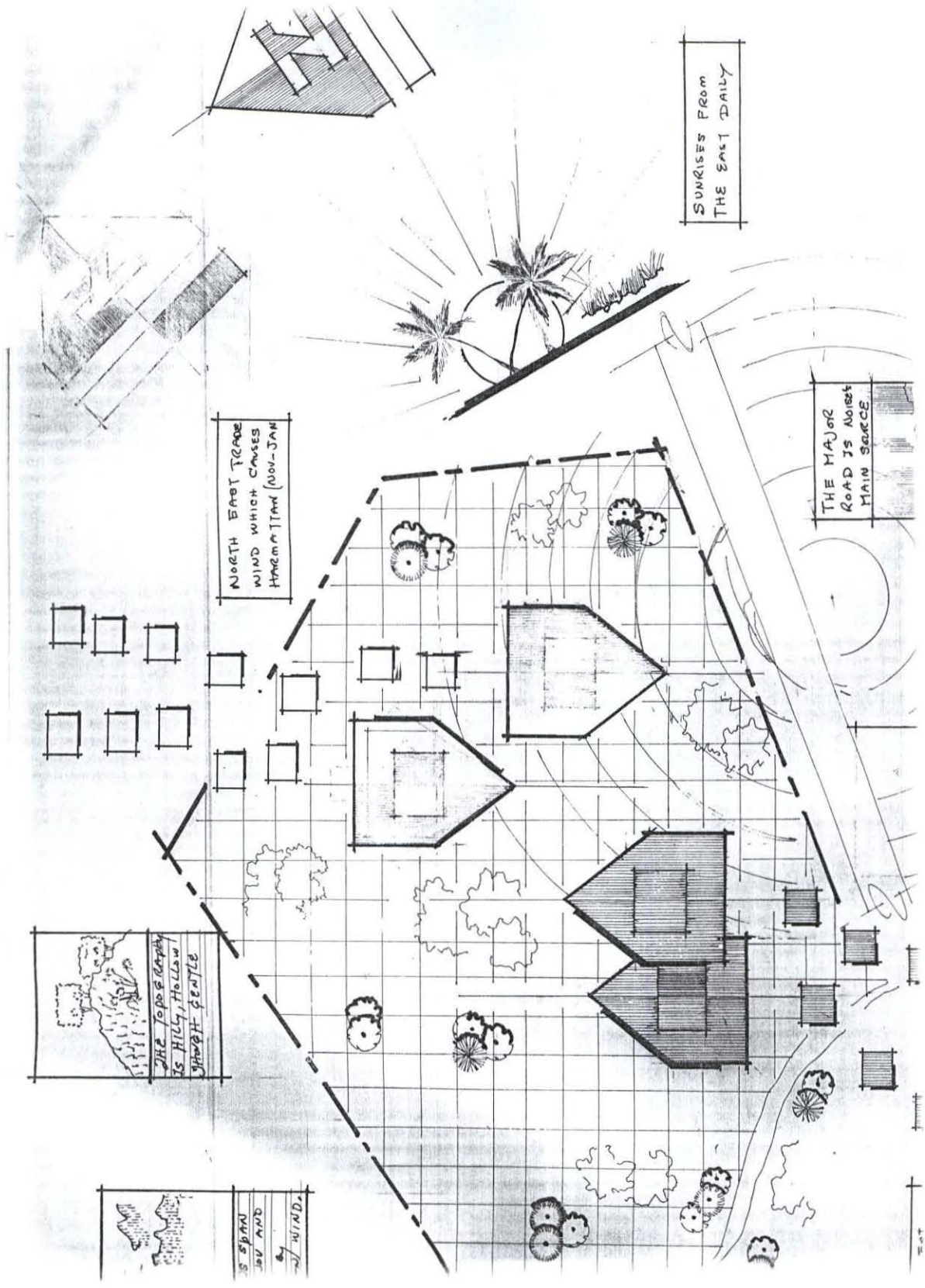
Matr: ACC. MOUN063 T. (NEM)

Date: AUGUST, 2003.

8

**NIGER STATE SCHOOL OF REMEDIAL STUDIES,  
 MINNA, NIGERIA** With Emphasis on Good Landscaping.





SUNRISES FROM  
THE EAST DAILY

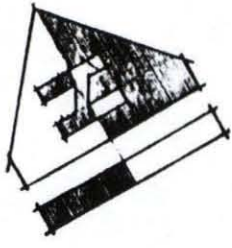
NORTH EAST TRADE  
WIND WHICH CAUSES  
HANGING JAM (NOV-JAN)

THE MAJOR  
ROAD IS MOIST  
MAIN SOURCE

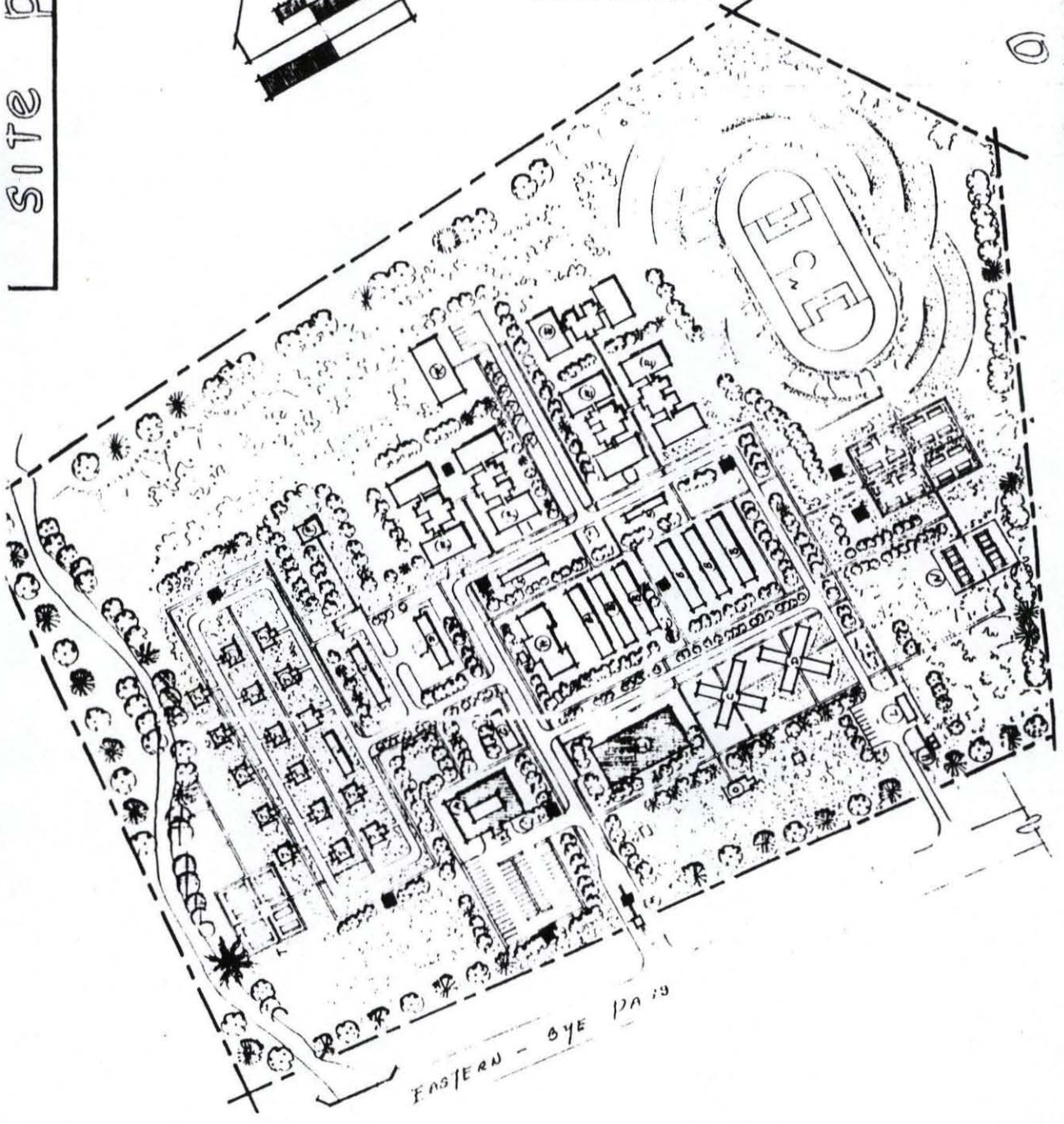
THE TOPS OF  
IS HIGH, HOLLOW  
SHARP GENTLE

IS SPAN  
BY AND  
WIND.

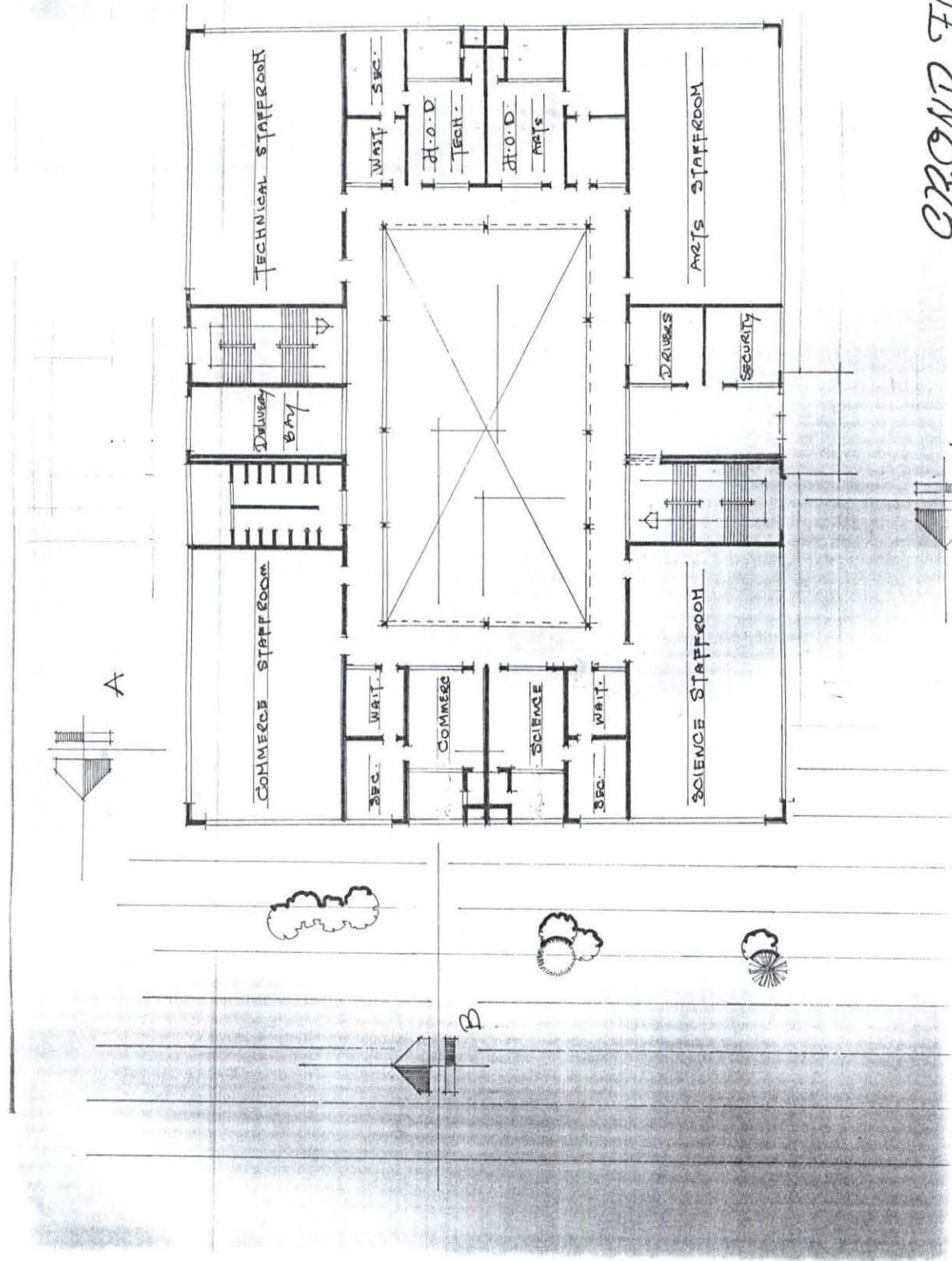
# SITE PLAN



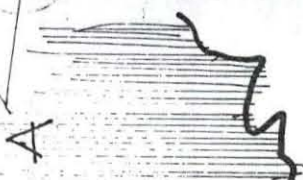
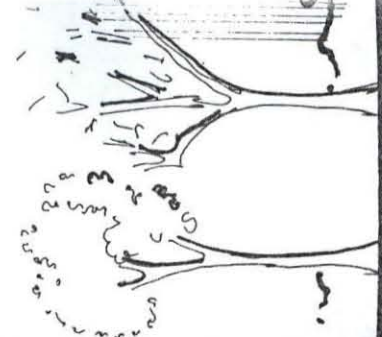
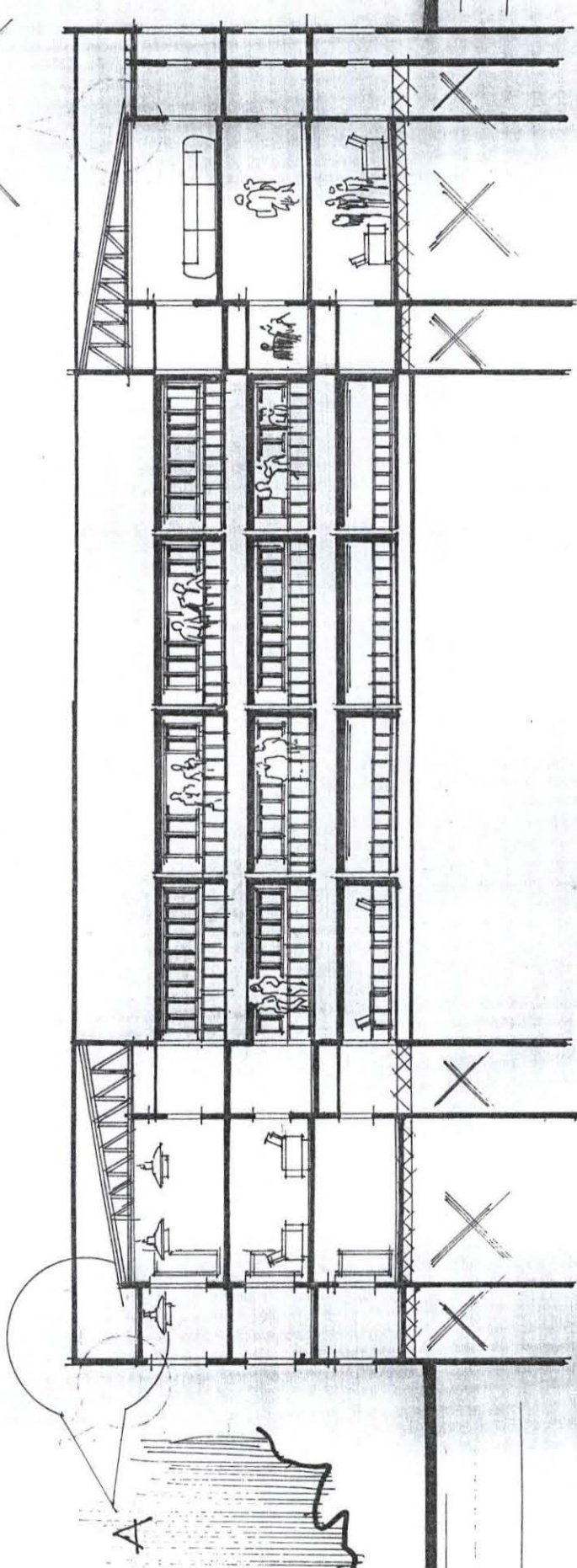
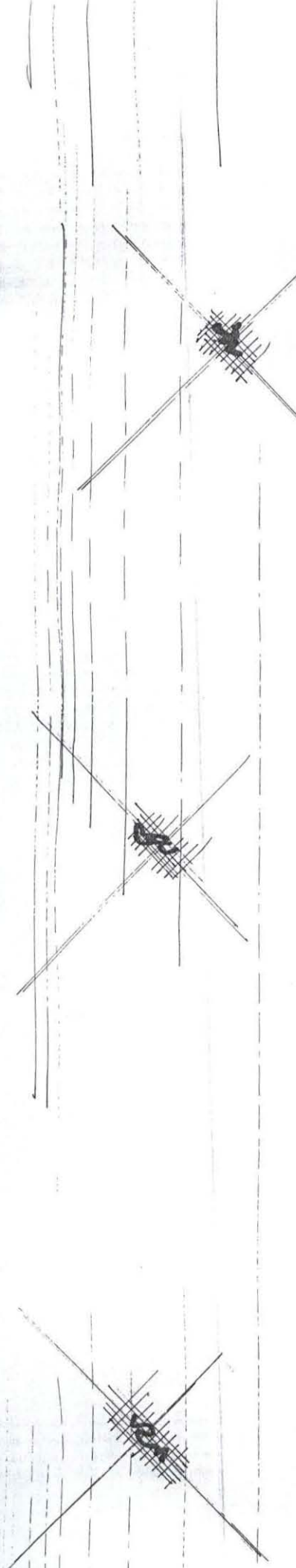
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LEGEND	
A	ADMIN BLDG
B	CLASSROOMS
C	LABORATORIES
D	WORKSHOPS
E	MALE HOSTELS
F	FEMALE HOSTELS
G	STUDENT ARMS
H	LIBRARY
I	ASSEMBLY HALL
J	STAFF LOYER
K	RENTAL SHOPS
L	MAINTENANCE
M	SECURITY
N	SPORTS
O	MOSQUE
P	CHURCH
Q	CAMP PARK

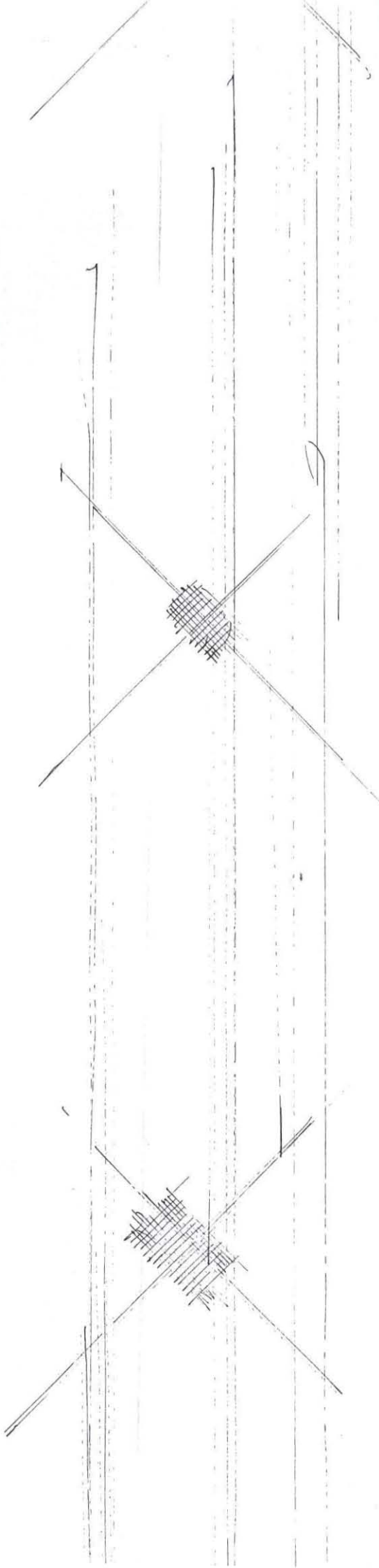
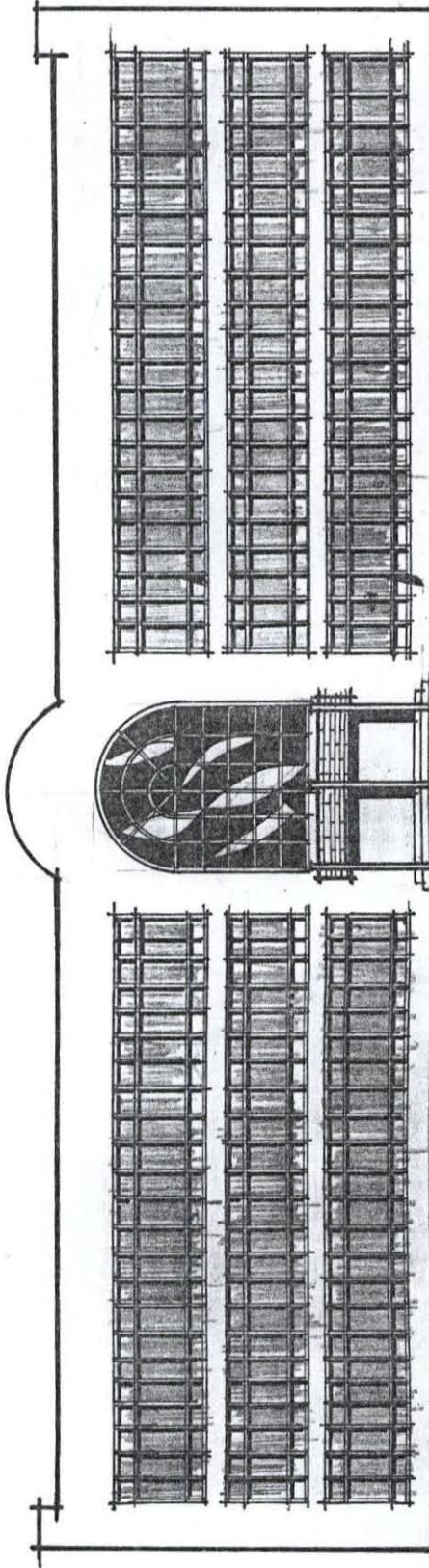
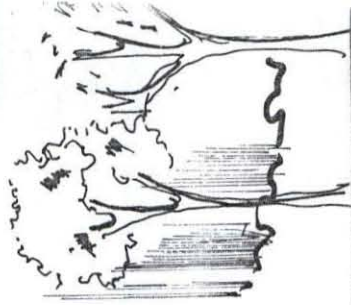
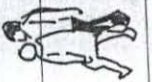


GROUND FLOOR

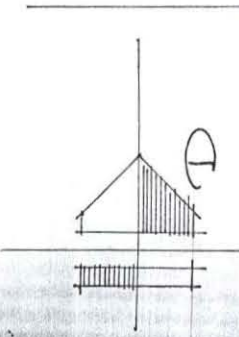
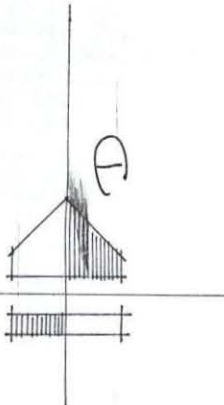
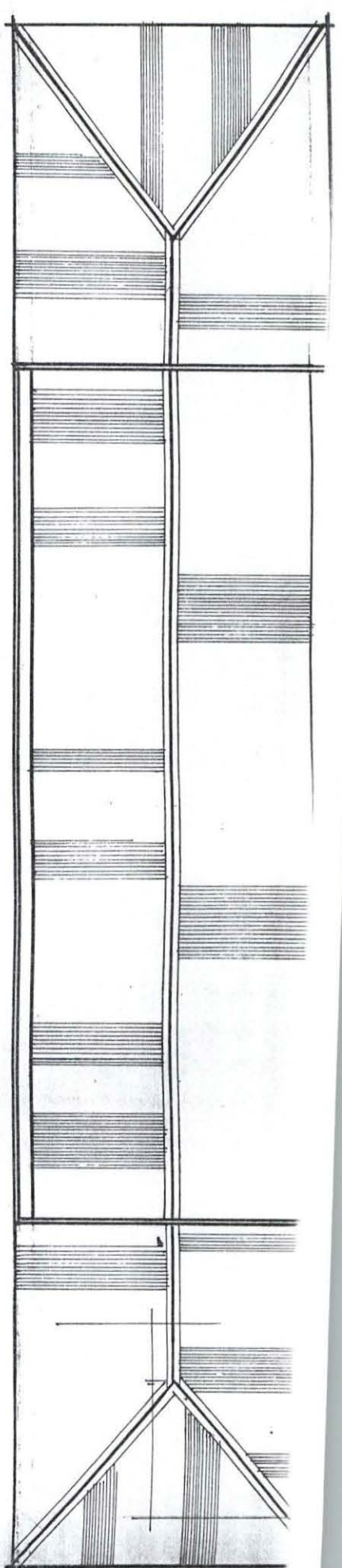
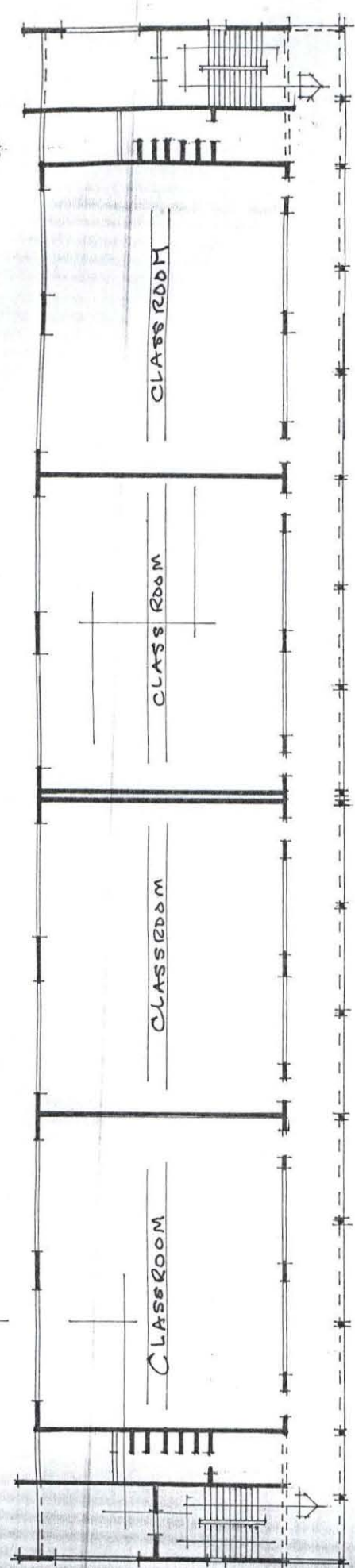


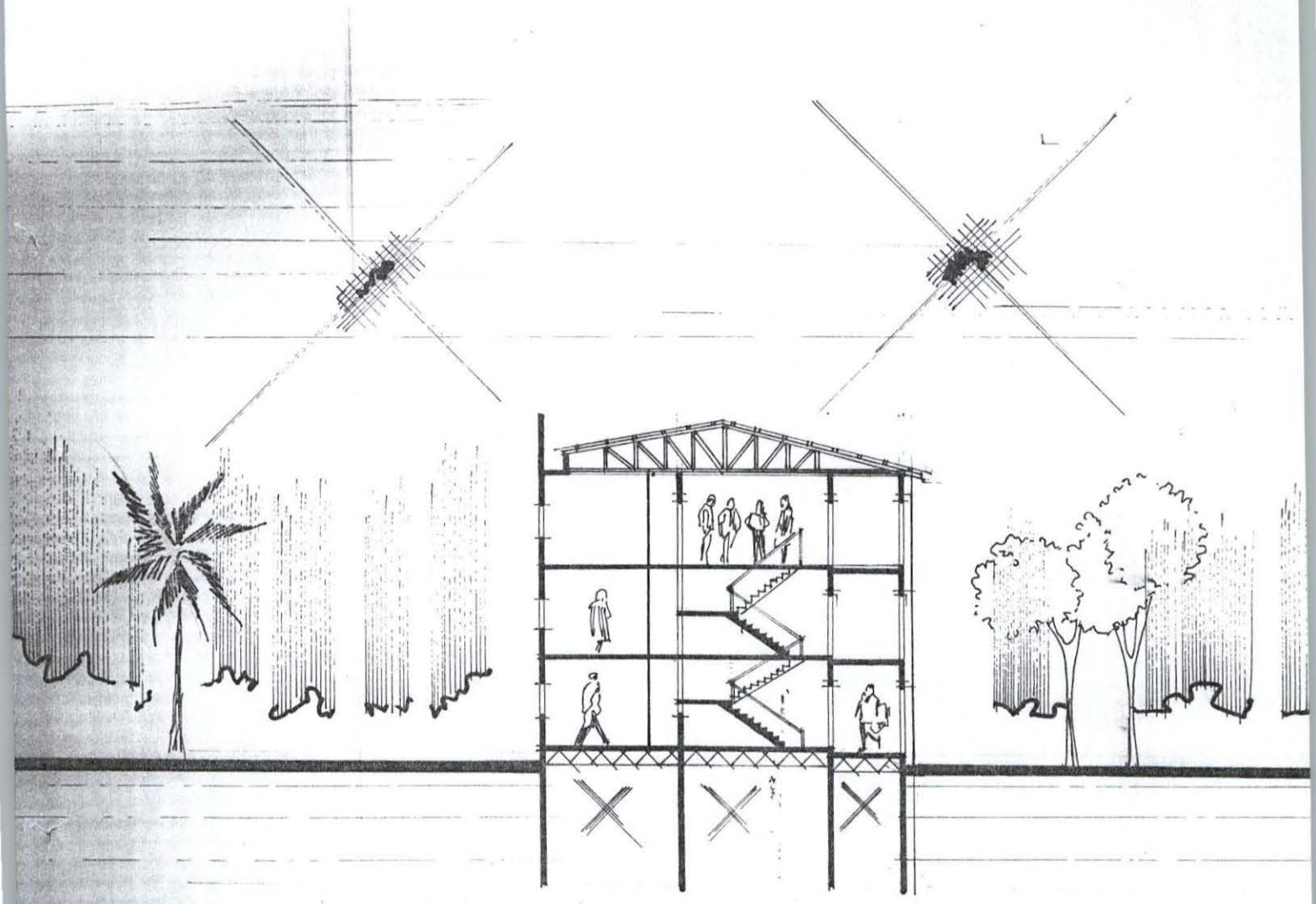


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(7th grade)  
WALL ROOMS





SECTION D-D

*A Design Proposal For*

**NIGER STATE SCHOOL**

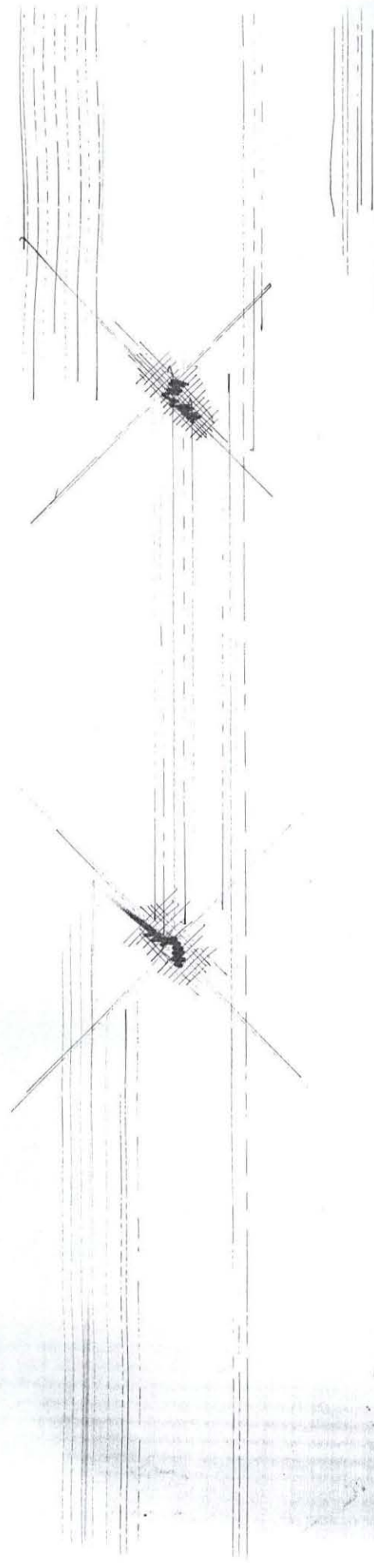
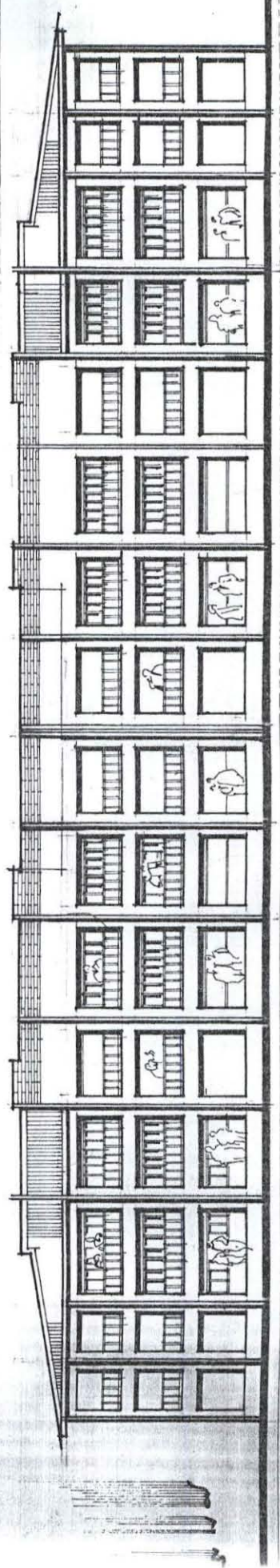
**MINNA NIGERIA**

GALADIMA D.N.

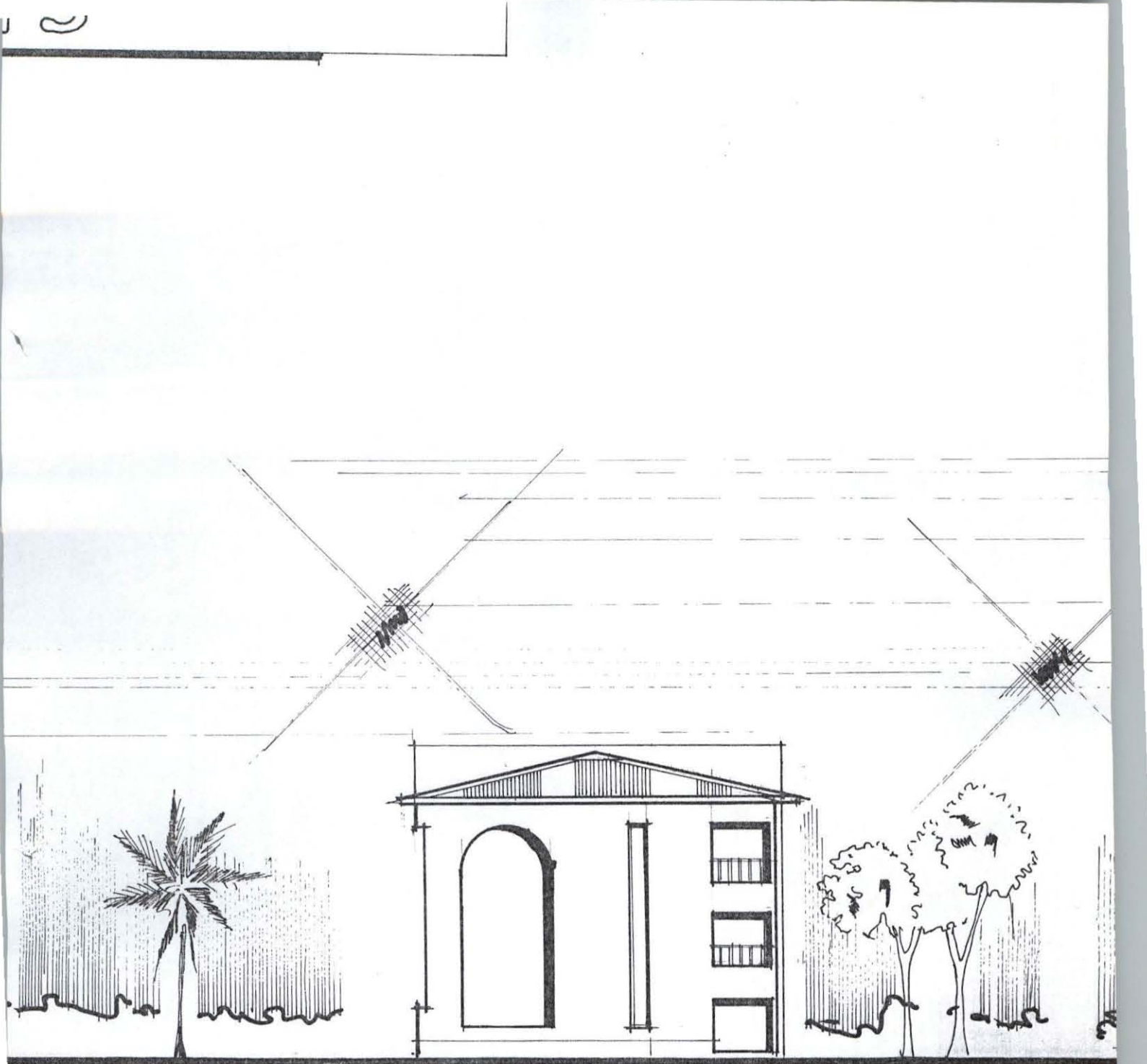
M.TECH / SET / 897 / 01 / 02

ARCHITECTURE

ЖОЗІДІА

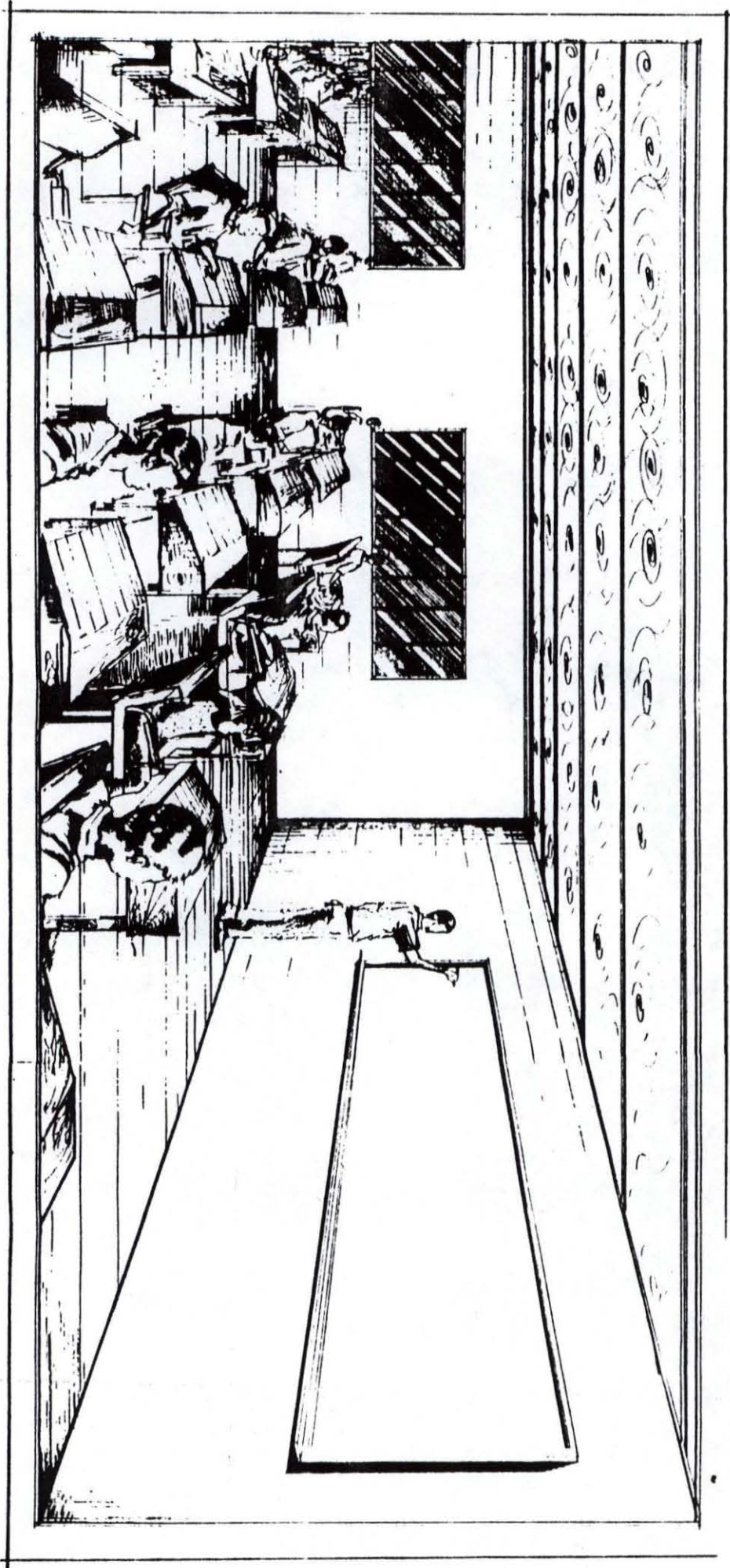


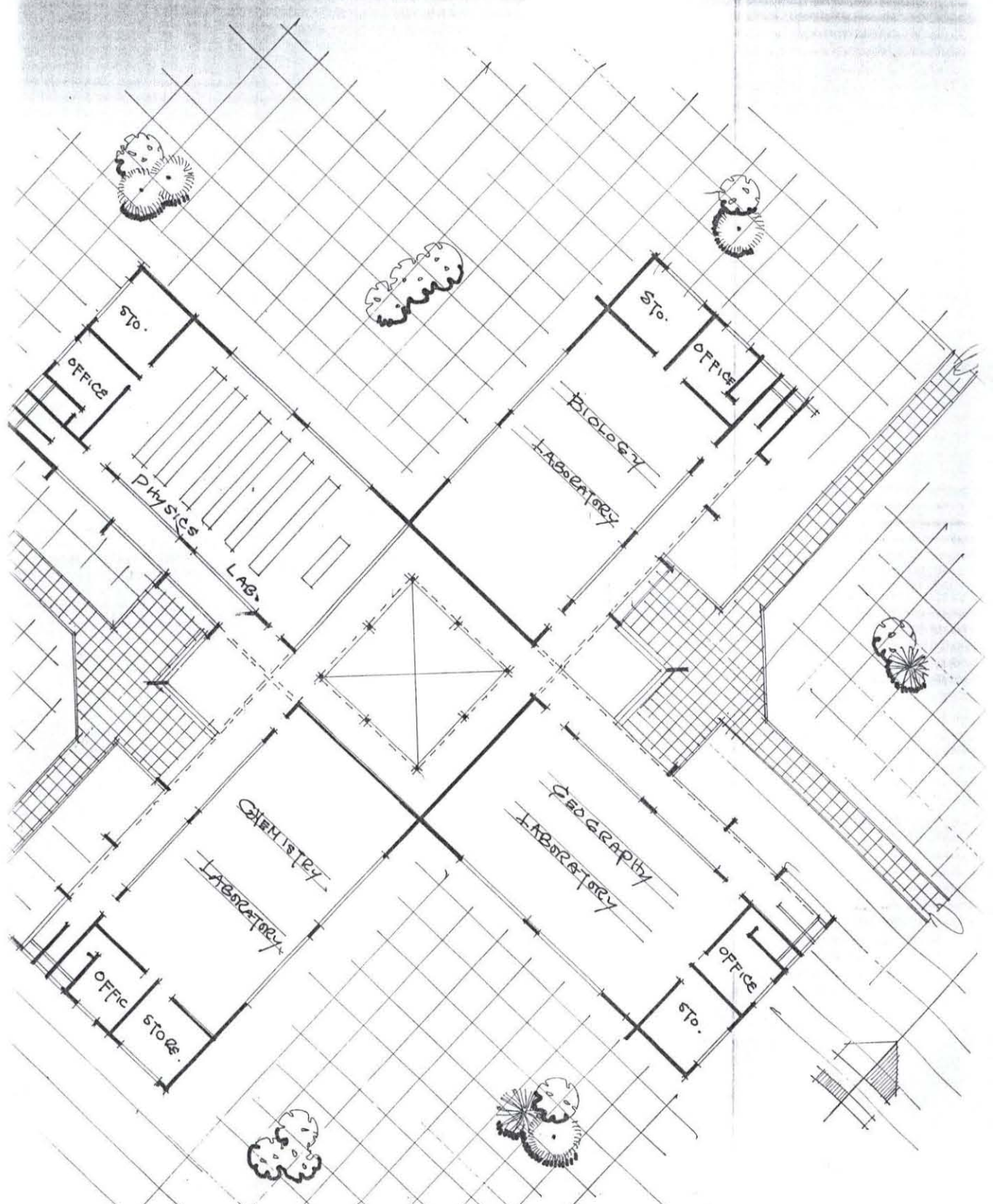


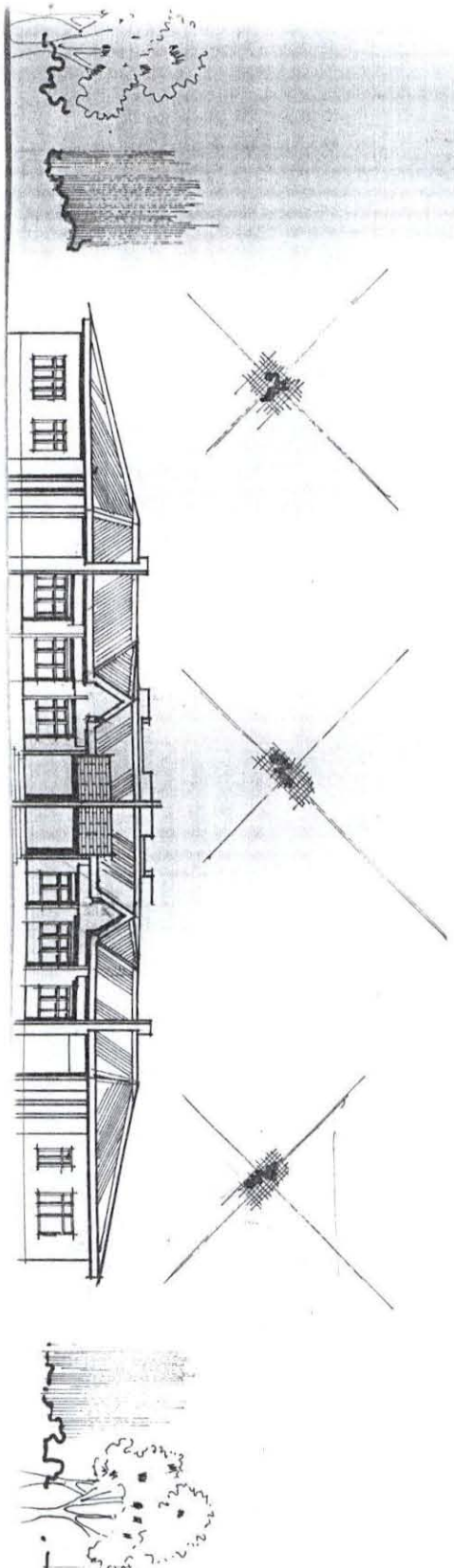


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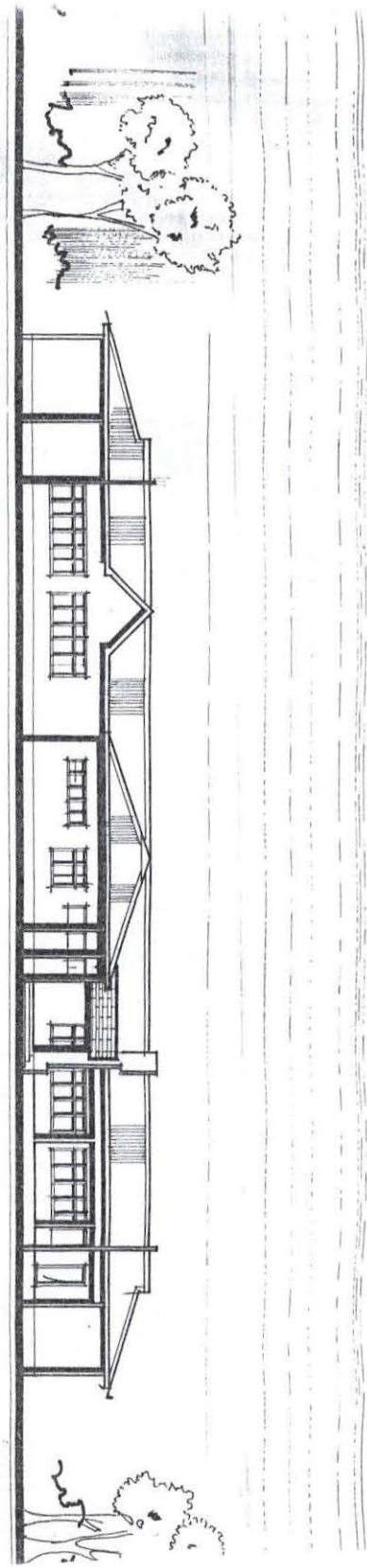




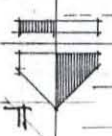
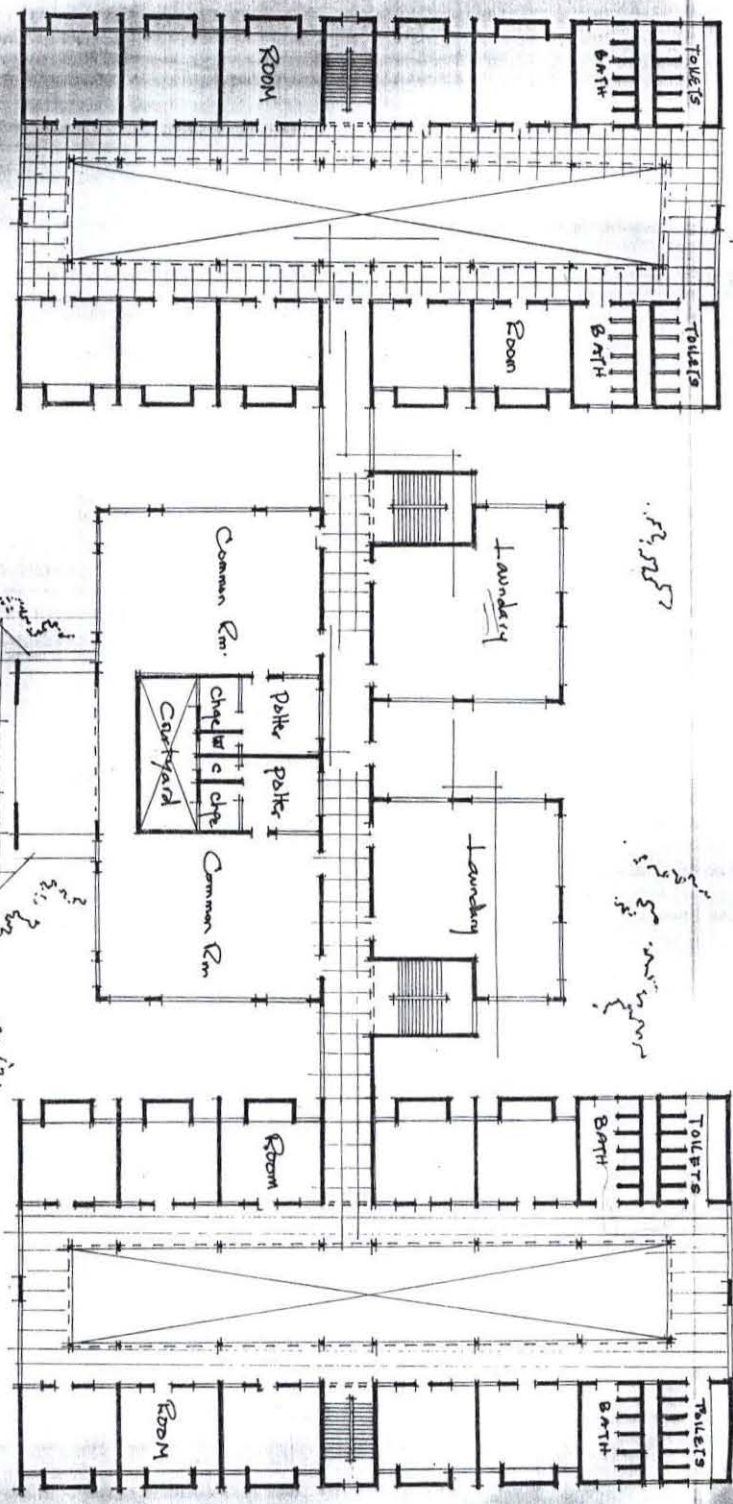
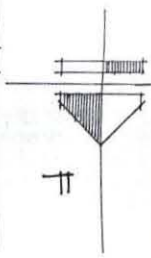




3005

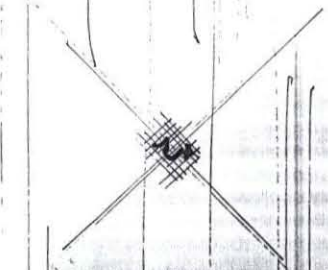
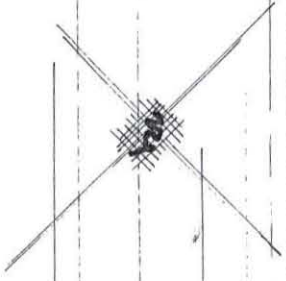
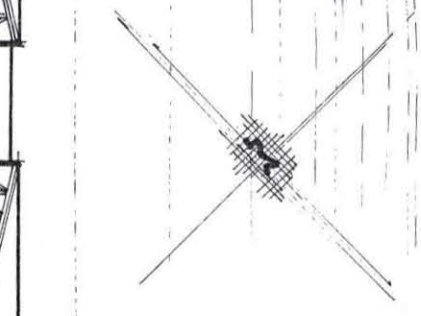
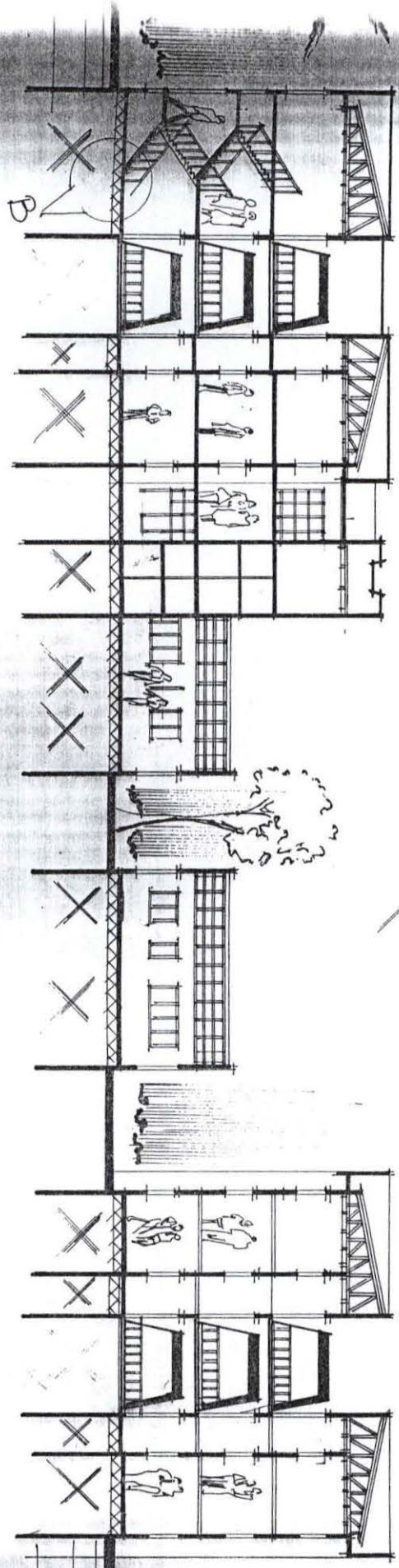


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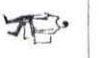
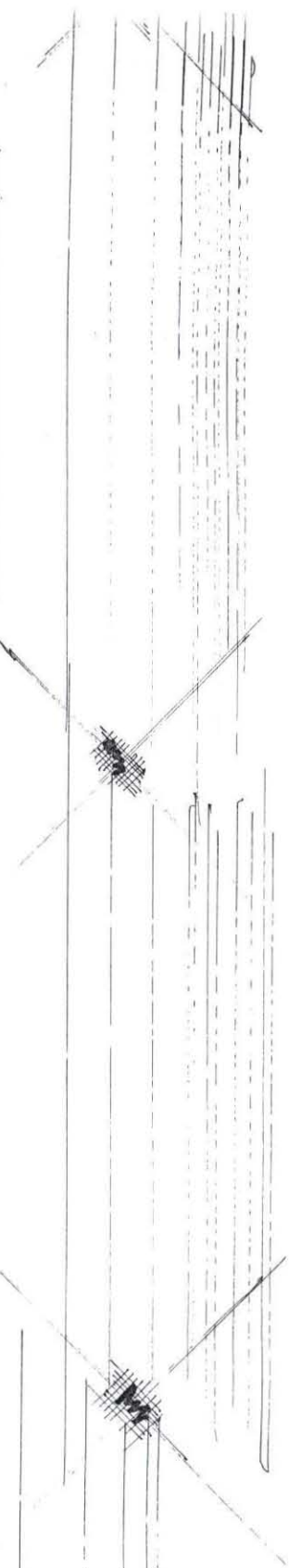
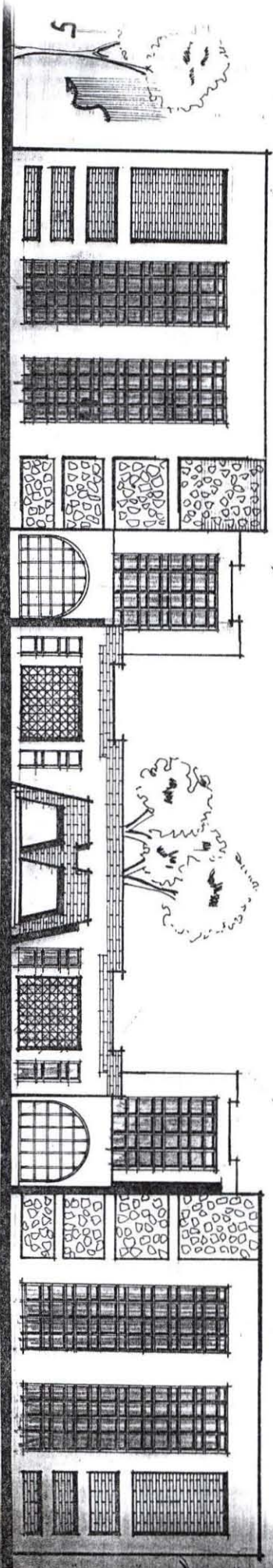


MAIN ENTRANCE

STAIRCASE



100+000



100

APP

