

**ABUJA PRINTING PRESS, ABUJA**  
**"IMPROVING ON PEDESTRIAN AND VEHICULAR**  
**CIRCULATION"**

**BY**  
**LAWAL SARAFI**  
**92/2881**  
**B.TECH ARCH**

**A thesis submitted to the Department of Architecture**  
**Federal University of Technology,**  
**Minna**

**IN PARTIAL FULFILMENT OF REQUIREMENTS FOR THE**  
**AWARD OF THE DEGREE OF MASTER TECHNOLOGY IN**  
**ARCHITECTURE M. TECH (ARCH)**

**DEPARTMENT OF ARCHITECTURE**  
**SCHOOL OF ENVIRONMENTAL TECHNOLOGY**  
**SCHOOL OF POST GRADUATE STUDIES**  
**FEDERAL UNIVERSITY OF TECHNOLOGY**

**MINNA**

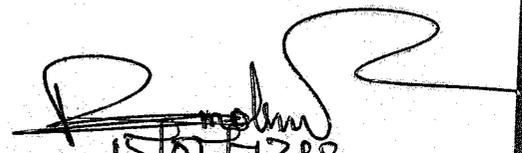
**MARCH 2000**

## CERTIFICATION

This thesis report entitled "Abuja Printing Press, Abuja by Lawal Sarafa meets the requirements and regulations governing the award of degree of Master of Technology in Architecture and approved for its contribution to knowledge and literacy presentation.

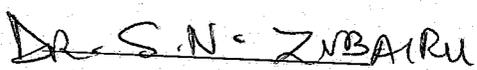


SUPERVISOR

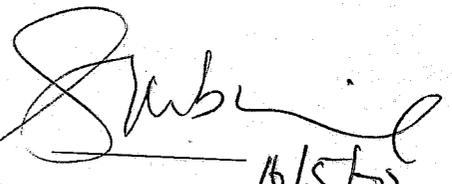
  
15/05/20  
SIGNATURE

\_\_\_\_\_  
EXTERNAL EXAMINER

\_\_\_\_\_  
SIGNATURE



HEAD OF DEPARTMENT

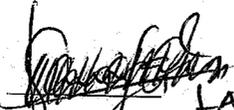
  
16/5/20  
SIGNATURE

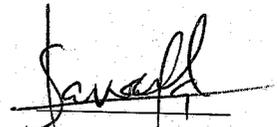
\_\_\_\_\_  
DEAN SCHOOL OF POST GRADUATE

\_\_\_\_\_  
SIGNATURE

# DECLARATION

I do hereby declare that the work present in this thesis for the Master of Technology, Architecture has not been presented either wholly or partially for any other degree.

  
LAWAL SARAFI  
(92/2881)  
STUDENT

  
SIGNATURE

---

HEAD OF DEPARTMENT  
(ARCHITECTURE)

---

SIGNATURE

  
SUPERVISOR  
(ARCHITECTURE)

  
SIGNATURE

## **DEDICATION**

**This thesis report is dedicated with due respect and honour to the whole family of LAWAL. Mr and Mrs S.A. LAWAL, HALIRAT, TAJUDEEN, WASIU, SHERIFAT AND FAUSAT.**

## **ACKNOWLEDGEMENT**

Although I must be held wholly responsible for the contents of this write-up, I would like to seize this opportunity to express my gratitude to some of those who have assisted me in various capacities during the six years period which led up to the writing of this my final thesis.

First of all, my special acknowledgement goes to almighty God for his guidance, protection and blessing all through my life. And for wisdom granted me to carry out this work. My unalloyed gratitude goes to Arc. Mohammed Bello Nasir, my supervisor who gave himself completely to guiding me throughout this work. Sincere gratitude also goes to Prof. S.O. Solanke, the dean of School of Environmental Technology, Arc. Mrs Zubairu, the head of department of Architecture, Arc. Mrs Adeshina, Arc. Tony Anunobi, Arc. Aniya Jonathan, Arc. Paul Haruna, Arc. Olagunju, Arc. Mukoro, Mallam Bashir Lawal and Mallam Alfa for the vital role each of them played in the course of studying, shaping and improving my architecture.

This acknowledgement would not however been completed without mentioning the valiant roles my brother, Tajudeen has played in my life. If not for his choice, financial and moral support, studying architecture today would not have been possible, though his counsels

which sometimes result in argument have been very useful in shaping my life. I must not also forget the brotherly role played by my other brother, Wasiu in the course of my education his constant encouragement I can not forget. My lovely sisters, Halirat, Sherifat and Fausat have also been there when it matters most. May God almighty be with every one of us (amen).

Finally, I am extremely grateful to the entire students of ASO STUDIO, a.k.a Studio-le-Cartel especially my room mate, Mustapha Tajudeen (Musty Jandu), Shehu Uthman Yahaya, Ayodele Olukoya, Adeoye Oladiran, Olukayode David Adeyemo, Omotosho Oluwatoyin (Small Toyin), Fabunmi Oluwatoyin (Big Toyin), Adegorite Adeyemi (Campus Satellite), Uncle Akeem, Paul Akaluzia, Abdullai Zakari, Are Johnson. Others are Adamu Lemu, Otadaferua Efe, Ajayi Titus, Olumide Oloruntoba, bukar, Ayuba Philip, Suleiman Abdulwahab, Habila Babe, Olawolu Emmanuel (My Pastor), Idholo Oro Ata, Rhahor Micheal, Yusuf Fatima, Kazim Shuaibu (Papa Kazime) Emilemo Akhidime, Tima Nmakwe, Peter Yisa, Bawo Mohammed Kabir (My first friend in F.U.T), Ibrahim Lola Talatu, Bello Olufemi, Jeb Esau, Adedoyin Teriba, Edicha Joseph, Tanko Ahmed, Barry, Mabadeje Funsho, Abubakar Ramatu (President daughter), Abu Hassana, Offie

Emmanuel (Bebeto), Dasuki Idris (Malo Idrisu) Adamu Aliyu (Footprints) and last but not the least my special friend, Adenike Ologunagba who recently lost her mother and her sister , may their gentle souls rest in peace (amen).

Thanks to you all.

## **ABSTRACT**

Abuja is undergoing a process of rapid urban growth. The need to know the pivotal importance of manufacturing sector in the process of development and as a generator of national economic growth and integration should be recognised. This is due to the fact that the vast development taking place in Abuja (FCT) today are geared towards residential buildings, Office buildings, Hotels, Governmental parastatal buildings and so on and so fort thereby creating a wide gap in the development of manufacturing sector.

The write-up begins by giving a general overview or information of what printing press entails. It goes further to stress the meaning and importance of printing press to mankind. A good deal of work and extensive research has been done on every chapter that makes up this write -up. Some of the chapters are wide ranging, compressive in nature and encompassing as it does a discussion of the myriad problems and obvious solution that are inherent to printing press in Nigeria. Chapter one for instance introduces us to the thesis topic. Chapter two discusses the literature review, basic process that takes place in the industry while chapter three highlight the improving circulation, its

effect, causes and so on and so fort. Others chapter include chapter  
four, five, six, seven, and eight; each with its own purview.

## **LIST OF FIGURES**

**Figure I – MONTHLY TEMPERATURE AND HUMIDITY**

**Figure II – MEAN MONTHLY TEMPERATURE AND HUMIDITY**

**Figure III – MEAN MONTHLY RAINFALL**

**Figure IV – MEAN MONTHLY SUNSHINE DURATION**

**Figure V – SEASONAL WIND PATTERN**

## **LIST OF ILLUSTRATIONS**

**Illustration I-PRODUCT FLOW CHART**

**Illustration II-ORGANISATION CHART (ACADEMY PRESS PLC)**

**Illustration III-SITE LAYOUT OF ACADEMY PRESS PLC**

**Illustration IV-ORGANISATION CHART (GOVERNMENT  
PRINTING PRESS, MINNA)**

**Illustration V- SITE LAYOUT OF GOVERNMENT PRINTING  
PRESS, MINNA**

**Illustration VI-SITE LAYOUT OF JEROEL ASSOCIATES LTD,  
LAGOS**

## TABLE OF CONTENTS

	PAGES
TITLE PAGE	I
CERTIFICATION	III
DECLARATION	IV
DEDICATION	V
ACKNOWLEDGEMENT	VI
ABSTRACT	IX
LIST OF FIGURES	XI
LISTS OF ILLUSTRATIONS	XII
TABLE OF CONTENTS	XIII
<b>CHAPTER ONE</b>	
1.0 INTRODUCTION	1
1.1 AIMS AND OBJECTIVES OF THE STUDY	7
1.2 ARCHITECTURAL MOTIVATION	8
1.3 RESEARCH METHODOLOGY	9
1.4 SCOPE OF STUDY	10
1.5 LIMITATION OF THE STUDY	13
1.6 IMPORTANCE OF THE STUDY	13
1.7 DEFINITION OF SOME OF THE COMMON TERMS	14
<b>CHAPTER TWO</b>	
2.0 LITERATURE REVIEW	15
2.1 HISTORICAL DEVELOPMENT OF PRINTING	16
2.2 DIAMOND SUTRA	16
2.3 CHINESE/KOREA INVENTION	17
2.4 GUTHERBERG'S CONTRIBUTION	18
2.5 EARLY PRINTING PRESS	19
2.6 FURTHER DEVELOPMENTS	20
2.7 THE NIGERIAN PERSPECTIVES	21
2.8 PRODUCTION PROCESS	23
2.9 PROBLEMS FACING PRINTING PRESS IN NIGERIA	25
2.10 SOLUTIONS	27

## **CHAPTER THREE**

<b>3.0 RESEARCH AREA: "IMPROVING ON PEDESTRIAN AND VEHICULAR CIRCULATION IN INDUSTRY"</b>	<b>29</b>
<b>3.1 PEDESTRIAN CIRCULATION</b>	<b>30</b>
<b>3.2 VEHICULAR CIRCULATION</b>	<b>33</b>
<b>3.3 FACTORS TO BE CONSIDERED WHEN PLANNING CIRCULATION</b>	<b>35</b>
<b>3.3.0 HUMAN FACTORS</b>	<b>35</b>
<b>3.3.1 PLANT/MACHINE FACTORS</b>	<b>36</b>
<b>3.3.2 EXPECTED TRAFFIC (VEHICLES)</b>	<b>37</b>
<b>3.4 IMPORTANCE OF CIRCULATION</b>	<b>38</b>
<b>3.4.0 SAFETY</b>	<b>38</b>
<b>3.4.1 HEALTH</b>	<b>39</b>
<b>3.4.2 ECONOMICAL</b>	<b>39</b>
<b>3.4.3 AESTHETICS</b>	<b>40</b>

## **CHAPTER FOUR**

<b>CASE STUDY</b>	
<b>4.0 CASE STUDY ONE :ACADEMY PRESS PLC, LAGOS</b>	<b>43</b>
<b>ORGANISATION STRUCTURE</b>	
<b>DESCRIPTIONS</b>	
<b>MATERIALS AND CONSTRUCTION</b>	
<b>MERITS AND DEMERITS</b>	
<b>4.1 CASE STUDY TWO: GOVERNMENT PRINTING PRESS, MINNA</b>	<b>47</b>
<b>ORGANISATION STRUCTURE</b>	
<b>DESCRIPTIONS</b>	
<b>MATERIALS AND CONSTRUCTION</b>	
<b>MERITS AND DEMERITS</b>	

<b>4.2</b>	<b>CASE STUDY THREE: JEROEL ASSOCIATES LIMITED, LAGOS</b>	<b>52</b>
	<b>ORGANISATION STRUCTURE</b>	
	<b>DESCRIPTIONS</b>	
	<b>MATERIALS AND CONSTRUCTION</b>	
	<b>MERITS AND DEMERITS</b>	

## **CHAPTER FIVE**

<b>5.0</b>	<b>PHYSICAL AND SOCIO-CULTURAL BACKGROUND</b>	<b>58</b>
	<b>5.1 CLIMATE:-</b>	<b>59</b>
	<b>5.1:0 TEMPERATURE</b>	<b>59</b>
	<b>5.1:1 HUMIDITY</b>	<b>60</b>
	<b>5.1:2 RAINFALL</b>	<b>61</b>
	<b>5.1:3 WIND DUST</b>	<b>62</b>
	<b>5.1:4 SUN AND CLOUD COVER</b>	<b>63</b>
<b>5.2</b>	<b>VEGETATION</b>	<b>64</b>
<b>5.3</b>	<b>TOPOGRAPHY</b>	<b>65</b>
<b>5.4</b>	<b>GEOLOGY</b>	<b>65</b>
<b>5.5</b>	<b>SOCIO-CULTURAL LIFE</b>	<b>67</b>
<b>5.6</b>	<b>TRANSPORTATION AND TRAFFIC FLOW</b>	<b>68</b>
<b>5.7</b>	<b>EXISTING LAND USE AND FUTURE GROWTH</b>	<b>69</b>

## **CHAPTER SIX**

<b>6.0</b>	<b>SITE ANALYSIS</b>	<b>71</b>
<b>6.1</b>	<b>SITE SELECTION</b>	<b>71</b>
<b>6.2</b>	<b>LOCATION</b>	<b>73</b>
<b>6.3</b>	<b>ACCESS AND LOCATION</b>	<b>74</b>
<b>6.4</b>	<b>SITE PLANNING</b>	<b>75</b>
<b>6.5</b>	<b>SPACE REQUIREMENT</b>	<b>76</b>

## **CHAPTER SEVEN**

<b>7.0</b>	<b>DESIGN PHILOSHOPY AND CONCEPT</b>	<b>84</b>
<b>7.1</b>	<b>MATERIAL AND CONSTRUCTION</b>	<b>86</b>
<b>7.2</b>	<b>DESIGN SERVICES</b>	<b>97</b>

**CHAPTER EIGHT**

<b>8.0</b>	<b>AESTHETICS</b>	<b>104</b>
<b>8.1</b>	<b>GENERAL APPRAISALS</b>	<b>105</b>
<b>8.2</b>	<b>CONCLUSION</b>	<b>109</b>

	<b>BIBLIOGRAPHY</b>	<b>110</b>
--	---------------------	------------

## **CHAPTER ONE**

### **1.0 INTRODUCTION**

### **1.1 AIMS AND OBJECTIVES OF THE STUDY**

### **1.2 ARCHITECTURAL MOTIVATION**

### **1.3 RESEARCH METHODOLOGY**

### **1.4 SCOPE OF THE STUDY**

### **1.5 LIMITATION OF THE STUDY**

### **1.6 IMPORTANCE OF THE STUDY**

### **1.7 DEFINITION OF SOME OF THE COMMON TERMS**

# CHAPTER ONE

## 1.0 INTRODUCTION

Abuja can be seen as one the fastest growing city in the world today; going at its rate of development and the enormosity of wealth and material resources committed to its development. However if one takes a critical look at the vast development taking place in Abuja, one would be surprised to find out that the majority of the government commitments are geared toward accommodations, offices and hotels without given much attentions or concerns to the manufacturing sector. It is also disturbing to note however, that Abuja the seat of federal capital territory does not have its own government printing press. Hence government jobs are taken to the federal government printing corporation in Lagos who at present find it very difficult to contend with this is because of the enormosity of job brought daily coupled with the fact that machines are old and in which case needs either replacement or maintenance.

Nevertheless, at its inception, it is stressed that the importance of the manufacturing sector in the overall development of the federal capital

territory (F.C.T) cannot be overemphasized as the sub-sector is expected to provide the much needed employment outside the civil service in the territory. The sector is also expected to produce the necessary goods and services required to support the fast growing population of the city. It is against this background that the design of "ABUJA PRINTING PRESS" was conceived.

However it is paramount at this junction to discuss what printing press entails. PRINTING for instance can be defined as the art and technology of reproducing words and pictures on paper, cloth or other surfaces while PRESS on the other hand can be defined as an instrument or machine by which a substance or material is shaped, smoothed, stamped, compressed etc by the force of pressure. Although there is considerable variation in printing methods, printing typically involves a printing press that transfer an image from a printing plate or similar image-bearing surface to the material being printed. A printing machine carries out three functions. It applies ink to a printing surface, it applies pressure to transfer the ink from the printing surface to paper or some other material, and it moves and holds the material so that every printed image

is positioned accurately. Almost all printing is done by one of four major printing methods-letter press, lithography, gravure and screen-printing.

### **LETTER PRESS PRINTING**

In letter press printing, the image area of the printing surface stands in relief, raised above the surrounding non-image areas. Ink is applied to the image areas with a roller and is transferred to paper under pressure.

Letterpress is a highly versatile process. It is adaptable to both short and long printing runs from a few hundreds to several millions of printed impressions.

### **OFFSET PRINTING**

This is a printing process based on the principle that grease and water do not mix. The image areas of the printing plate are on the same plane or level as the background area, which do not print. This is in contrast to a letter press plate whose image areas are raised above the background areas. Lithographic plates are generally less expensive and easier to correct than letter press or gravure plates.

## **GRAVURE PRINTING**

In gravure printing the material to be printed is reproduced on the printing plate as a pattern of tiny wells or depressions. All the depressions have the same area, but their depth varies according to the tone of the original copy. Because gravure ink is translucent the varying depths of ink deposited on the paper from the wells reproduced continuous tones. The translucency of the ink over one another, thus producing mixed colours.

## **SCREEN PRINTING**

Screen or serigraphic printing is accomplished by forcing ink through a fine screen directly onto the surface to be printed. The screen is covered by a stencil, or the mesh is blocked in the non-image areas. Screen printing can be used for almost any surface – glass wood, plastic metal and cloth as well as for the whole range of paper and cardboard. It is also used for printing on cylindrical surfaces such as bottles. A wide variety of inks may be used including metallic inks that conduct electricity.

## **TYPES OF PRINTING PRESS**

All presses belong to one of three basic types namely – the platen press, the cylinder press and the rotary press.

### **THE PLATEN PRESS**

The platen press is the simplest type of press. It prints by bringing two flat surfaces together. Gutenberg's press was a platen press made of wood. It had a platen that was pushed down on to the type by turning of screw. Latter presses of this kind were made of iron and a lever lowered the platen. They are used in small printshops for job work- the printing of letterhead, order forms and other small jobs.

### **THE CYLINDER PRESS**

This is much larger than the platen press. It is used for printing books and catalog with many pages or with many pages job with very large pages. The sheet of paper to be printed is hold to the cylinders by metal fringers called gripers. The type is in a typed form. The printing is done on one side of the paper as it is rolled over the typed form. The cylinder revolves continously while the typed form is moved back and forth

beneath it. As the form moves forward the cylinder presses the sheet of paper against the type and then delivers the printed sheet.

## **THE ROTARY PRESS**

The rotary press has a revolving cylinder to which the printing plates are fastened. The plates carrying the words and pictures to be printed must be curved to fit around the cylinder. Printing is done on every revolution, or full turn of the cylinder. Rotary presses are made very accurately and therefore can run at high speeds and produce fine work.

### **1.1 AIMS AND OBJECTIVES OF THE STUDY**

- ❖ The proposed design is basically aimed at increasing the employment opportunity in order to stem the rising and alarming rate of unemployment in F.C.T.
- ❖ It has been stressed that no meaningful development can take place in a nation without adequate and proper education, therefore the design is also geared towards enhancing the quality of information disseminated. For instance the quality of printed materials like books, journals, magazines, periodicals, brochures, dairies, newspapers e.t.c

- ❖ To architecturally document on the basic procedure and the design consideration in relation to printing press planned buildings.
- ❖ The proposed design will also amongst other things, expressed architecturally a desire to promote a functioning design with geometrical simplicity, spaciousness which tries to further emphasize smooth surfaces, regular outline, primary colours married with modern materials.
- ❖ To create a printing press that would compete on equal footing with the best-known high quality printers/publishers anywhere in the world.
- ❖ To specifically see to the improvement of Traffic circulation in and around the factory.

## 1.2 ARCHITECTURAL MOTIVATION

The thesis topic is principally motivated out of the zeal or quest to design a structure, which will augment the living standard (INFORMATION AWARENESS) of people in F.C.T and environs. This is further encouraged by the F.C.T's policy objective on manufacturing and craft sector with the strong motive of stimulating the establishment and

growth of small and medium scale industries, which will contribute directly, and indirectly to the building of the city the overall development of the Territory.

### **1.3 RESEARCH METHODOLOGY**

This involves various methods of getting research information and collating data that would be of immense contribution to the development of the thesis topics. This includes

#### **A) LITERATURE REVIEW**

This will help one to have a sound and genuine theoretical base. It involves finding out information in the libraries about the thesis topic.

#### **B) CASE STUDIES**

This involves visiting the existing and relevant area of the thesis topic to determine the mode of operation, existing facilities and identifying the architectural design problems encountered and correcting them in this thesis.

#### **C) INTERVIEWS**

This entails asking questions from the members of the staff of the existing area of study who is knowledgeable as regards to printing press industry.

## **D) PERSONAL OBSERVATIONS**

**This is in the form of familiarization with nature and general characteristics of the topic.**

### **1.4 SCOPE OF THE STUDY**

**As a matter of fact, the scope of Abuja Printing Press will be divided into two parts-namely the write-up aspect and the design aspect. The write-up include the documentation of the design process, problems, solutions, improvements literature review of the existing printing press and area of research topics. The design aspects encompass the actual drawings with emphasis on both architectural and landscape design.**

### **ADMINISTRATIVE BLOCK**

**This is considered the head and most important of all blocks available in any industry. It forms a co-ordination center where final decision of all activities of the various departments and blocks takes place. Among other things, the block is expected to house most of the great personnel of the industry. Offices of the chief executive, managing director, chief accountants, the various department heads, board room, exhibition**

room, and other departments directly under administration. Others include accounts department, human resources department, computer room, purchasing department e.t.c

### **WELFARE BLOCK**

This is another block on which the success of the proposed design stands. It is the truth that one of the three basic needs of human being is food. In this wise, the block is required to give a clean and hygienic surrounding as well as conducive atmosphere necessary for cooking, eating and relaxation. Also, it is also expected that for maximum output and efficiency, on the part of the workers/ staffs required sound health. This block shall also have clinic which will be monitored by a qualified nurse or doctor and coupled with adequate drug store, rest room e.t.c . Among other things, relaxation area during break time cards games, table tennis, common room as well as conveniences.

### **ENGINEERING BLOCK**

In other to ensure continuity in the production or printing, there is the need for maintenance crew to sustain the life span of the machines, tools, vehicles and buildings. This block is charged with stated responsibilities.

room, and other departments directly under administration. Others include accounts department, human resources department, computer room, purchasing department e.t.c

### **WELFARE BLOCK**

This is another block on which the success of the proposed design stands. It is the truth that one of the three basic needs of human being is food. In this wise, the block is required to give a clean and hygienic surrounding as well as conducive atmosphere necessary for cooking, eating and relaxation. Also, it is also expected that for maximum output and efficiency, on the part of the workers/ staffs required sound health. This block shall also have clinic which will be monitored by a qualified nurse or doctor and coupled with adequate drug store, rest room e.t.c . Among other things, relation area during break time cards games, table tennis, common room as well as conveniences.

### **ENGINEERING BLOCK**

In other to ensure continuity in the production or printing, there is the need for maintenance crew to sustain the life span of the machines, tools, vehicles and buildings. This block is charged with stated responsibilities.

The block is expected to house electrical, mechanical and the automobile department. This includes electrical workshop, mechanical workshop, automobile workshop, carpentry workshop, stores, and general maintenance workshop, refrigeration and air conditioning unit.

### **PRINTING / PRODUCTION BLOCK**

This is the pivot of the printing press. The main job of the printing press is carried out here. It is usually wide-ranging and encompassing as it does the discussion of the myriad problems associated to printing, printing materials and jobs. For instance, films for printing, work dummies, colour guides, different type of plates, ozalid copy, works ticket, its trim size, type of paper to use, nature of stitching and folding patching and plate making e.t.c. the different departments here include, production planning, printing down, press room, print finishing, bindery unit, stores (finished and raw materials)

### **OTHER FACILITIES**

- Warehouse
- Generator House

- Security gates
- Water tank
- Bore hole
- Parking lots
- Truck bays
- Fencing e.t.c

### **1.5 LIMITATION OF THE STUDY**

Frankly speaking, a project of this nature is bound to have limitation. The limiting tendency is accentuated by a number of other factors notably little time, wider scope and the simplicity nature of some of the ancillary facilities: for instance – gate house, fence, and generator house e.t.c

### **1.6 IMPORTANCE OF THE STUDY**

It is very important because it constitutes the first attempt in department and it is hoped that it will proved useful to all those wishing to conduct further research into the printing press industry.

**ABUJA PRINTING PRESS, ABUJA**  
**"IMPROVING ON PEDESTRIAN AND VEHICULAR**  
**CIRCULATION"**

**BY**  
**LAWAL SARAFA**  
**92/2881**  
**M.TECH ARCH**

**DEPARTMENT OF ARCHITECTURE**  
**SCHOOL OF ENVIRONMENTAL TECHNOLOGY**  
**SCHOOL OF POST GRADUATE STUDIES**  
**FEDERAL UNIVERSITY OF TECHNOLOGY**  
**MINNA**

**MARCH 2000**

## **1.7 DEFINITIONS OF SOME OF THE COMMON TERMS IN PRINTING INDUSTRY**

**PRINTING:-**The art and technology of reproducing words and pictures on paper cloth or other surfaces.

**PRESS:-**Is an instrument or machine by which a substance or material is shaped, smoothed, stamped, compress e.t.c

**WORKS TICKET:-**Is a type-out document which summarises all the required particulars of the job in question e.g its trim size, type of paper to use, nature of stitching and folding e.t.c

**PLATE:-**Is an exact copy of the type that has been molded from liquid or softened metal, plastic or rubber.

**GALLEY:-**Is a tray on which type is placed and made into pages.

**TYPE SETTING:-**This is the assembly of letters into words and words into lines, in a form suitable for multiple reproduction.

**WORKS DUMMY:-** Is a trial or test procedure, which is carried out in order to see if the printed jobs are alright

## **CHAPTER TWO**

### **LITERATURE REVIEW**

- 2.1 HISTORICAL DEVELOPMENT OF PRINTING**
- 2.2 DIAMOND SUTRA**
- 2.3 CHINESE/KOREA INVENTION**
- 2.4 GUTENBERG'S CONTRIBUTION**
- 2.5 EARLY PRINTING PRESS**
- 2.6 FURTHER DEVELOPMENTS**
- 2.7 THE NIGERIAN PERSPECTIVES**
- 2.8 PRODUCTION PROCESS**
- 2.9 PROBLEMS FACING PRINTING PRESS IN NIGERIA**
- 2.10 SOLUTIONS**

## **CHAPTER TWO**

### **2.1 HISTORICAL DEVELOPMENT OF PRINTING**

**“Printing is a human achievement that has demonstrated far greater power to shape the world than all the forces of modern weaponry”**

**President John F. Kennedy.**

**Printing is one of the most important single aspects of civilization. It has been the principal vehicle of communication for 500 years; the emergence of radio, television and other means of mass communication has not diminished its importance as a cultural force.**

### **2.2 DIAMOND SUTRA**

**The oldest printed book is a Chinese religious book, the Diamond Sutra. It was printed from wood blocks on mulberry-bark paper in 868. The letters, or images, were carved on a block of wood. After ink had been put on the block was printed onto the front of the paper. This book was printed in India. It consists of six pages of text and a woodcut illustration, pasted together in a roll.**

### **2.3 CHINESE/KOREA INVENTION**

Actually, the invention of printing can not be attributed to any single person, and even the date of its beginning cannot be fixed definitely. The Chinese invented paper in the 2<sup>nd</sup> century A.D and sometime there after began experimenting with block printing. Probably the first wide spread use was for playing cards. Block printing continued to be used for playing cards for many centuries, and the practice of block printing spread to the West.

Movable type was also invented in China between 1041 and 1049. The interior Pi Sheng , employed types made of baked clay. These did not take well to the water based inks then available. Later, types cut from a wood block and types casts in tin were employed. However, printing with movable type was not generally adopted in the East, probably, because of the large number of characters in the Chinese written language.

In Korea in the early 15<sup>th</sup> century, movable type once again came into use. A department of printing for “the casting of type and the printing of books” were established there in 1392. Type was cast from metal in sand molds. A number of different styles and sizes were developed and Korean

annuals record that by 1402 several hundred thousands types had been cast.

While it is reasonably certain that block printing techniques were brought to the West from Asia, there seems to be no indication that the technique of printing from movable type was not independently discovered in Europe. There is considerably controversy about who first employed movable type in Europe. Some credit Laurens Koster of Holland, and others believe that it was Gutenberg.

#### 2.4 GUTENBERG'S CONTRIBUTION

At least two inventions vital to printing can definitely be attributed to Gutenberg. The first was a procedure for casting types of uniform size and height and a reliably flat printing surface. Gutenberg used an accurate mold for the type body and capped this with a matrix for the letter or character to be cast. His second invention was an ink that adhere to be metal type. Lampblack formed the pigment and lin seed oil was the base of Gutenberg's ink; which remained the standard printers ink for more than 400 years.

In 1455, Gutenberg printed a Bible that is now very famous. It is the oldest full-length volume printed with movable type that has been found in Europe. There are several copies of this beautiful book in libraries and museums. It is the most valuable book in the world.

From Gutenberg's press in Mainz, Germany, printing spread all over Europe. Rome had a printing press in 1465. Venice had a press about 1470. The first printing plant in France was started at the Sorbonne university in Paris in 1470. Printing was done in Holland in 1470. In 1474 the first Spanish shop started in Valencia. William Caxton (1422-1491) produced the first book printed in English in 1475.

## **2.5 EARLY PRINTING PRESSES**

All early presses, including Gutenberg's, were adapted from wine presses or linen presses. The type form was locked into the horizontal bed of the press and inked. The paper was set on it at first by hand and with mechanical assistance. The platen of the press was driven downward by a screw mechanism until sufficient pressure was applied to make an impression. The platen was then raised and the paper removed. The entire operation had to be repeated for each impression.

Improvement in the printing press came slowly. In 1625, the so-called Dutch press was equipped to move the press bed and to guide the platen in a straight stroke. In 1798 the stanhope press had a cast iron frame and a system of levers to work the screw. In 1816, George Clymer, an American, dispensed with the screw and used a simple lever mechanism to make the impression. Finally, the Washinton Hand press, developed in 1822 superceeded all other hand presses.

## 2.6 FURTHER DEVELOPMENTS

The first cylinder press was built in England in 1810 by Friedrich Koenig, a German clockmaker. Koenig was also the first man to use steam to power a printing press. Steam power began to be widely used, and by 1827 the London Times had presses that printed about 5000 sheets an hour.

In 1846, Robert Hoe, an American built the first of Hoe-type revolving presses. These presses carried type on a large revolving cylinder, around which smaller impression cylinders were grouped. A separate sheet was printed from each impression cylinder.

Rotary printing presses that print both sides of the paper at once began with a web-fed press built in 1865 by William Bullock of Philadelphia curved stereotype plates were first used on a newspaper press built by Hoe in 1861. In 1875 a mechanism that would fold and cut the web as it came off the press was developed. The combination of stereotype plates, web fed rotary presses, and folding mechanisms led to high-speed multi-unit presses. Today presses are large, accurate, fast and largely automatic, but they are not basically different from the presses of the late 19th century.

Presses using the lithographic principle were built as early as 1868, but the first modern offset press, which used the rubber, offset cylinder, was built in 1904. The gravure process was invented in 1852 and gravure printing of illustrations came into use at the end of the 19 century.

## 2.7 THE NIGERIAN PERSPECTIVES

It was little realised that first professional taught to Nigerians was printing by the British missionaries who loved the art of communication and wished to spread information of good news amongst the citizens, and also have something to take back home through the art of printing.

Therefore, in 1846 the Presbyterian missionaries established the first printing press in Calabar. Eight years later, Rev. Henry Townsend of the Church Missionary Society popularly called, established a printing press and set up a printing school in the mission premises at Abeokuta. In 1859, Rev. Townsend began printing of the first newspaper called "Iwe Irohin fun Awon ara Egba ati Yoruba" at Abeokuta through the help of his trained Nigerians. It was this linkage that brought the idea of establishing Lagos CMS Grammar School, the oldest educational institution in Nigeria.

Rev. Townsend was the only printer-editor in Nigeria before Robert Campbell came in 1863 and established the "Anglo African".

By early 1930, private printing presses sprang up, amongst them were: Andrew Thomas Samadu press, the Karaole press, Tika-Tore press, Tanimola press, the Ife-olu printing works.

However, Tika-Tore press, which was established in 1910 by Mr. Akintunde Adeshigbin, brought more awareness into the printing profession more especially through its re-organisation of the press right from 1918. West African Pilot was established in 1937 and increase in

newspaper production emerged. Nigerian Tribune came into being early 50's.

As the development and expansion of printing became more notable as early as 1933 in Nigeria, government considered it necessary as any other profession to enact the printing presses regulations ordinance. Therefore, law was made enforceable on the contravention of libel, sedition, copyright and newspaper registration Decree No 4 of 1984 spelt out the relations between journalism.

## **2.8 PRODUCTION PROCESS**

Jobs from customers are received at the customer services section for preliminary examination and studies. The next stage is the technical processing section where the job passed from customer services section are prepared into works ticket. This works ticket is a typed-out document which summarises all the required particulars of the job in question for instance its trim size, type of paper to use, nature of stitching and folding, etc. Also at this technical processing section efforts are made to ensure quality output and according to customer's request. The works tickets are then passed to printing down section for ozalid copy to be

made. At the printing down section is a quality control desk which ensure a good output by checking the ozalid copy brought from the printing down noting areas of correction, deletion and assuring conformity with customer's taste. In the printing down, two basic mini-sections are recognised – namely patching and plate making sections. In patching section for instance, the functions include reading of art work and folding methods, studying the works ticket and preparation of the dummy, drawing of layout sheet/imposition, assembly of films, arrangement of registration marks, cut marks, side lay marks and preparation of the ozalid/exposure to ultraviolet light. The other section, the plate-making section involves studying of the patching at least to ensure conformity. These are followed by plate punching according to specification and the films are exposed onto the plate. This is then taking for development where ink is applied on them. After inking, the process of deleting the unwanted images, spots are removed by means of deleting fluid and this is preceeded by rinsing the plates with water. The plate can then be taken to the pressroom for printing to start. Before the major printing, works dummy are then produced. The dummy is first produced in the pressroom to ensure conformity and approved by the planning office.

# PRODUCTION LAYOUT

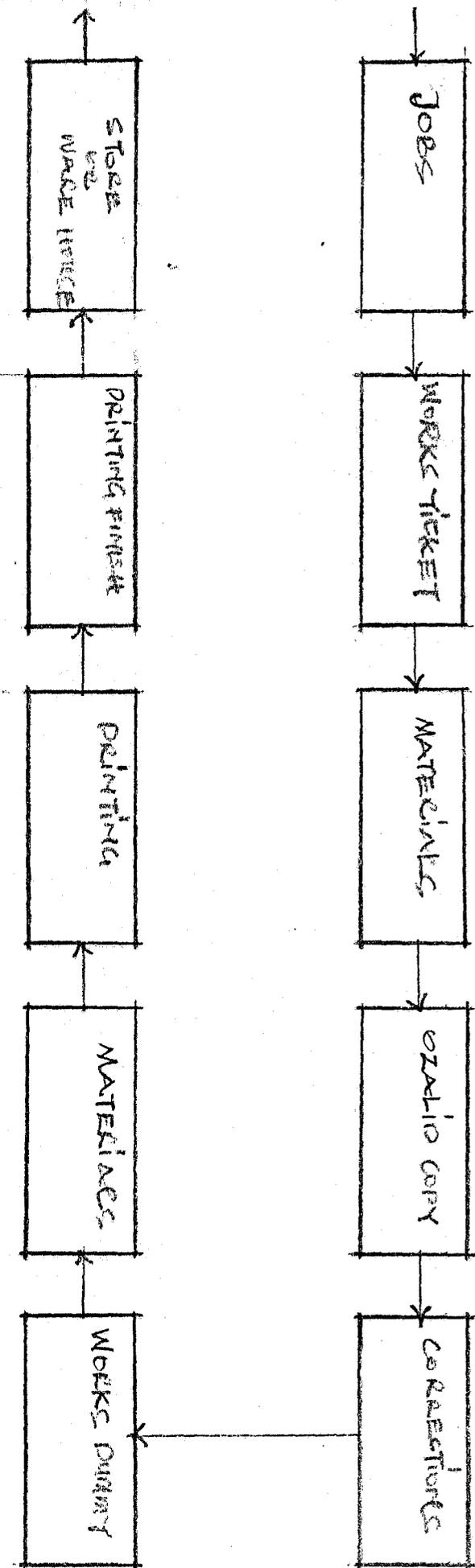


Illustration I

The dummy can be described as a prototype of the final printed job with all the required specification in place. They are used in the pressroom for matching as well as comparison of the job colour while on machine. The next stage and the last in printing process is print finishing which can be further divided into series of mini – sections – folding and guillotine, case making, stitching and book binding. The production layout plan is indicate in the illustration.

## 2.9 PROBLEMS FACING PRINTING PRESS IN NIGERIA

Many of the problems that printing press especially government own confronts today is of such inordinate complexity that it takes the greatest dedications and zeal for them to pull through in their present situations. The avalanche of problems ranging from bad economy, raw materials, shortages of manpower, government attitude, poor training facilities are some of the factors envisaged to have eaten deep or almost completely ruined some of the government own printing presses. For instance, non-functioning of Kwara State government printing press, partial working Niger State printing press are some of the few.

Certainly, the effect of bad economy in any sector can not be under emphasised. This is because nothing seems to work, sell in any badly battered economy. Bad economy can result into so many things, such as not able to feed oneself properly, clothing (poor), bad shelter, living standards becomes so low, foreign countries are scared of trading with your countries. In short there is relatively low sales and so on.

Government lackadaisical attitude towards funding is another major factor since government is the sole sponsor and owner. The ripple effect of infidelity caused to these printing presses are in no way; small. In fact, some government boycotted then and awards contract of printing out because of the kick backs gotten from these contractors. Some of the machines used by these government printing presses are old fashion, out dated and in most cases are worn out and needs replacement.

Another important factors that led to the set backs of these industry include poor training facilities. There is virtually non training facilities to train workers so that their knowledge could be enriched, up dated and acquire more skills as well as learn new techniques which are needed to become more proficient, effective and efficient in the performance of their jobs in the present and future operations.

## **2.10 SOLUTIONS**

**In spite of the avalanche of problems mentioned above, the major solutions rest on the shoulder of the government to reincarnate and recuperate the sick government printing presses. To be candid the first strategy is to set up a committee to look into the problems confronting these press aside the problems mentioned above.**

**Secondly, government should fund these printing presses so that they would be able to up date their existing facilities to meet the challenges of time. There is the need to invest on the staff by constant updating of their skills, increase their salary, as well as other bonuses (improvement in staff welfare).**

**Government should also stop awarding junk contracts, government calendars, gazette e.t.c should be given to these printing presses. If there are no equipments, machines, they should buy and realise they are investing and definitely the profit would come.**

## **CHAPTER THREE**

**3.0 RESEARCH AREA: "IMPROVING ON PEDESTRIAN AND  
VEHICULAR CIRCULATION IN INDUSTRY"**

**3.1 PEDESTRIAN CIRCULATION**

**3.2 VEHICULAR CIRCULATION**

**3.3 FACTORS TO BE CONSIDERED WHEN PLANNING  
CIRCULATION**

**3.3.0 HUMAN FACTORS**

**3.3.1 PLANT/MACHINE FACTORS**

**3.3.2 EXPECTED TRAFFIC (VEHICLES)**

**3.4 IMPORTANCE OF CIRCULATION**

**3.4.0 SAFETY**

**3.4.1 HEALTH**

**3.4.2 ECONOMICAL**

**3.4.3. AESTHETICS**

## **CHAPTER THREE**

### **3.0 RESEARCH AREA: "IMPROVING ON PEDESTRIAN AND VEHICULAR CIRCULATION IN INDUSTRY"**

The word **CIRCULATION** in the context of an industry can be likened to the flow, movement of people, trolleys or cars servicing of machine within and around industry taking into cognizance the easement of flow or movement, safety, convenience, continuity, coherence, comfort topic. This is ascentuated by the fact that it cuts across so many other disciplines for instance anthropometrics, ventilation, access just to mention a few.

Anthropometry however, is the name used for science of human body and its movement in architectural design remains largely about man and his spatial needs. The aim of any architects is to bring together in convenient form dimensional and spartial planning information relating to most human activities. Some of these activities involve taken a fresh look at user requirements and their dimensional framework, people by reason of age; sex, physique and possibly disability show wide range of body and reach of dimensions. In such dimensional systems, human body has been measured in terms of hand, foot, arm or head.

**Below are some of the relevance dimensions and space requirements that will be useful to the thesis topic.**

**As earlier mentioned in this chapter that ventilation and access are an integral part of circulation. This is true as circulation encompasses both ventilation and access. Aside this fact requirements and space allocation. It is this in wise that it pre-empt the needed conditions for good ventilation and access.**

### **3.1 PEDESTRIAN CIRCULATION**

**The primary objectives of a designer for improving circulation in an industrial sector are safety, security, convenience, continuity, coherence, comfort and aesthetics. Fulfilling one of those objectives generally increases the opportunity for meeting or improving the others.**

**Ease of pedestrian circulation within and around the industrial sectors with safety from pedestrians, plants, trucks or carts and vehicles. Conflict is arguably one of the primary purposes of choosing circulation as my research topic. Two methods of reducing between pedestrians, plants, trucks and vehicles are time separation and space separation.**

These are still conflicts however because or due to vehicular turning movement which if the planning is not carefully done or in which case the maximum turning radii are not taken into consideration can result in accident. Space separation in industry can be achieved by creating walkways footpaths at both side of the driveways so that there is reduction in obstacles or impediment to people movement and at the same time people (staff) are generated free walking which at the same time is safe and convenience.

Most pedestrians trips are relatively short only a few metres, probably walking from blocks to blocks, sections to sections. This is because pedestrian always seeks parking spaces within 600 feet of their destinations. There is the need to understand the pedestrian trips including the functions, activities, actions associated with the trips so that better pedestrian's facilities can be developed. Pedestrian trip purposes are closely related to the types of land use associated with trip origin or destination. The number of trips attracted or generated by an activity depends on it size and type. For instance production building (printing block) which is put to use always will attract or generate more trips than

**any other blocks in this factory. For instance, take the case of warehouse, which is used once in a bloom moon.**

**For the purpose of this study, three pedestrian trips can be distinguished within and around industry namely, terminal trips, functional trips and the last but not the least recreational trips.**

### **TERMINAL TRIPS**

**These are trips associated with the transportation mode arrears. It includes the packing lots loading bay and offloading bay, servicing area e.t.c.**

### **FUNCTIONAL TRIPS**

**This form of trips is the most common or prevalent. They are made to carry out a specific function such as business trips, which are either related to work, or personal business trips.**

### **RECREATIONAL TRIPS**

**These types of trips are really prevalent in an industrial sector that is business oriented. But it is very obvious one can hardly do without them.**

Workers or the staffs obviously need to relax, eat, while a way time to be able to work efficiently. So these trips for relaxation, changing rooms for resting as well as their activities in which walking is one of the primary purpose.

### **3.2 VEHICULAR CIRCULATION**

Circulation can be designed as a pleasant experience especially when walking or riding special effects either they are in order at the beginning or at the end of the journey. Convenience suggests speed when desired. Although in this types of environment (industrial setting), the questions of speed are totally out of it. This owing to short distances around. Also there is the need for a good reasonable protection from acoustical and visual nuisances vehicle can produce. The glare effect arising from the sources of light, sun must be adequately taken care off to reduce accident. Special trees will have to be planted along the driveways. Safety is another vital issue one can not forget. This is because it is a commitment to friction – free traffic flows. These include adequate road capacity, discourage proper acceleration drive-ways and promote deceleration drive-ways, make sure the corners and bends comforts to

standard turning radii, accident –proof lighting and signalisation, a logical sequence in lighting all traffic channels are very vital and important. Aesthetic is also necessary in circulation. It implies a coupling of functional requirement with designed opportunities. A well –planned and designed circulation create a beautiful environment, which gives a very good and boost the image of the industry.

For instance, the terminal points of any part of the driveways should be marked; getting there should be half the fun. Site, landscape, buildings, space channels of movement can be organized to please the senses and not to stun them.

In circulation and as regards to industry, attention should be given to services and emergency access is a major functional consideration. Services vehicle include trucks for deliveries, fork lift for loading and off-loading, refuse removal and emergency vehicles such as ambulances, police cars and fire brigade vehicle. In order that or to enhance a very good and easy circulation. The designer should aimed at reducing any unnecessary curve, corner bend, so that the big trucks will be able to manoeuvre well without difficulties. Also there is the need to separate or segregate the main access from the services access. The aim of this is to

forestall delay or accident. Servicing access are always constructed in such a way to enable long truck ply easily.

### **3.3 FACTORS TO BE CONSIDERED WHEN PLANNING CIRCULATION**

There are varieties of factors to be considered when planning circulation. Although they can be grouped under these three heading namely (a) human factors, (b) plant/machine factors and expected volumes of traffic/vehicles. These three factors can be interlinked because of the diverse ways in which they cut across themselves.

#### **3.3. 0 HUMAN FACTOR**

This factor is very vital when planning circulation, because they are going to be the main user. So therefore care must be taken when considering human factors. However the study of anthropometrics is necessary to be able to determine the various dimensions of human being in different posture for instance, space requirement for human being when climbing stairs is quite different to when walking on a flat ground. Also the issues of space utilization, access for utilizing a particular

operation is all vital things associated to human factors. Aside this volume of human being needed in a particular space or at a particular point should be noted. To exemplified this, Administrative blocks especially reception where the number of human figure is expected to be higher than the other place must be provided with enough space to be able to accommodate the large number of people and also avoiding collision. Further more the activity determined which, how and when spaces are probably required.

### **3.3.1 PLANT /MACHINE FACTORS**

These machines always perform the production activity of any industry. So therefore care must be taken to adhere strictly to the manufacturers instructions. It is not a mere saying in Nigeria today that most people preferred to set aside these manuals from the manufacturers of these machines. This may be due to shortage of space, thinking of the designer who always sees these instruction as too extravagant when it comes to the used of space. Take for instance, Some of these small printers around, the basic thing is just to get a shop, mount your machine without given due

concerns to space. Access to the machine for servicing becomes very difficult.

Positioning of machine, wiring of machine, space requirement for machine, space required to utilize it are all vital things a designer should concentrate on if he/she wish to maintain cleanliness as well reduction in accidents.

### **3.3.2. EXPECTED TRAFFIC (VEHICLE)**

These cover the various types of vehicles that will be needed in this factory. Trucks, delivery van, cars – both for customers and workers, ambulance for the clinic and all these cart and trolley. The rate at which these vehicles will be put to use should be documented so that adequate road capacity shall be provided. The dimension of the likely used vehicle should be noted so those standard turning radii are given. Also as part of circulation that shall be need to consider whether to segregate small vehicle from big vehicle, main access from services entrance.

### **BULDING POSITION**

Also one other factors that should equally receive attention is the building positioning in respect to drive ways, park or garage. Orientation

of building should be done in such a way to permit easy accessibility. Store; ware house should very close to truck park, offloading bay should be far away from work clinic. Access for servicing should be very close to maintenance and other sections servicing is paramount such as waste disposal and so on and so fort.

### **3.4 IMPORTATANCE OF CIRCULATION**

Circulation is very important in any environment be it industries zone, residential zone, institutional or any other environment you can think of. The result of effective circulation can be under – emphasized, as some of its important shall be analyzed here after.

#### **3.4.0 SAFETY**

A well-planned and effective circulation ensures safety. It reduces accident since adequate provision is provided for space. It also reduces collision in that control of movement is ensured. Among other thing worthy of note is the reduction in over – crowding and ensures strict orderliness.

### **3.4.1 HEALTH**

**Good circulation brings about reduction in heat rise hazard. This with strict adherence to machine manual ensures that adequate spaces are provided taking into consideration the servicing and human working relationship. With the number of working personnel noted and this adequate ventilation is sort for. This is effect reduce the burden of body odour and reduction in the rate of air exchange.**

### **3.4.2 ECONOMICAL**

**On the part of the industrialist wastage is minimize there by having a profound positive effect on the cost, which might have being done to waste. Wastage here mean unnecessary spacing arising out of the negligence (resulting in accident, inadequate in space provided for machine which can reduce its working ratio collision resulting from trolley and machine owing to little space)**

### **3.4.3. AESTHETICS**

**With adequate and genuine and sound circulation planning, pleasant working conditions are achieved coupled with good and beautiful surrounding**

## **CHAPTER FOUR**

### **CASE STUDY**

#### **4.0 CASE STUDY ONE :ACADEMY PRESS PLC, LAGOS**

##### **ORGANISATION STRUCTURE**

##### **DESCRIPTIONS**

##### **MATERIALS AND CONSTRUCTION**

##### **MERITS AND DEMERITS**

#### **4.1 CASE STUDY TWO: GOVERNMENT PRINTING PRESS,**

##### **MINNA**

##### **ORGANISATION STRUCTURE**

##### **DESCRIPTIONS**

##### **MATERIALS AND CONSTRUCTION**

##### **MERITS AND DEMERITS**

#### **4.2 CASE STUDY THREE: JEROEL ASSOCIATES LIMITED, LAGOS**

##### **ORGANISATION STRUCTURE**

**DESCRIPTIONS**

**MATERIALS AND CONSTRUCTION**

**MERITS AND DEMERITS**

## CHAPTER FOUR

### 4.0 CASE STUDY ONE: ACADEMY PRESS PLC, LAGOS

Academy press limited was known as the "Quality Printers" for the first 25 years of its existence during which period it was adjudged to be the biggest and the best printing house in this part of Africa. This company was incorporated on 28<sup>th</sup> July, 1964 and located along Oshodi - Ilupeju Industrial Avenue. Historically, in 1968, Mr Richard Gamble formed Enterprises Development Company (Nigeria) Ltd. (EDCON) with the goal of joining with Nigerians in the development, financing and management of medium-sized businesses. This was 1957 when he led a group of 12 American students on an Experiment in International Living to Nigeria. As a result of his venture someness, Mr Idris Alade Animashaun in 1961 relinquished his exalted office as Assistant Secretary in the Federal Ministry of Labour to join EDCON. Between 1963 and 1964, EDCON found out that the market for printed materials in Nigeria was yet untapped. Consequently, a printing company-Academy Press limited was incorporated.

The company can boast of 500 highly- skilled and well-trained workforce. It is committed to leadership and excellence in the printing field. It has introduced into the country high capacity and high quality printing and has lifted the standard of printing in Nigeria. Confirming this assessment, the Nigeria Book foundation at its 1994 inaugural conference in Lagos honoured Academy Press PLC for

- Its role as pioneer and foremost book printer in Nigeria;
- Sponsoring the Academy Visual Arts Competition for tertiary institutions;
- Enhancing the image of book; and
- Maintaining high quality output regardless of the print volume and pressure from customer while charging reasonable rates.

## **ORGANISATION STRUCTURE**

Academy Press Plc recognises two strategic business units (SBU)- namely corporate services and works. Each unit is further sub divided into functional divisions. For instance, Work services comprises of Engineering and Production while Corporate services

comprised of Human resources, Marketing and Finance. The whole structure is shown in the organisational chart shown in figure.

### **DESCRIPTION**

The company is characterised by a series of buildings interlinked by either paved ways or footpaths. It is fenced round with two main access – with one open to customers and visitors while the other access is clearly and indicated to be for the staff and service route. The visitors access is tarred while the access for staff and service is left untarred. It has three number gatehouses, all in a bid to ensure maximum security. The only story building is the administrative block, which stands tall above other buildings in the company. And at the right side of the administrative block is the production hall, which include stores both for raw materials and finished goods. Also along this same right side is the bindery unit/security check point (staff entrance only), Generator house, Snacks bar. At the northern- side of this elegant administrative building stands the maintenance section /engineering section and directly at the right side are waste section and store for oil and the

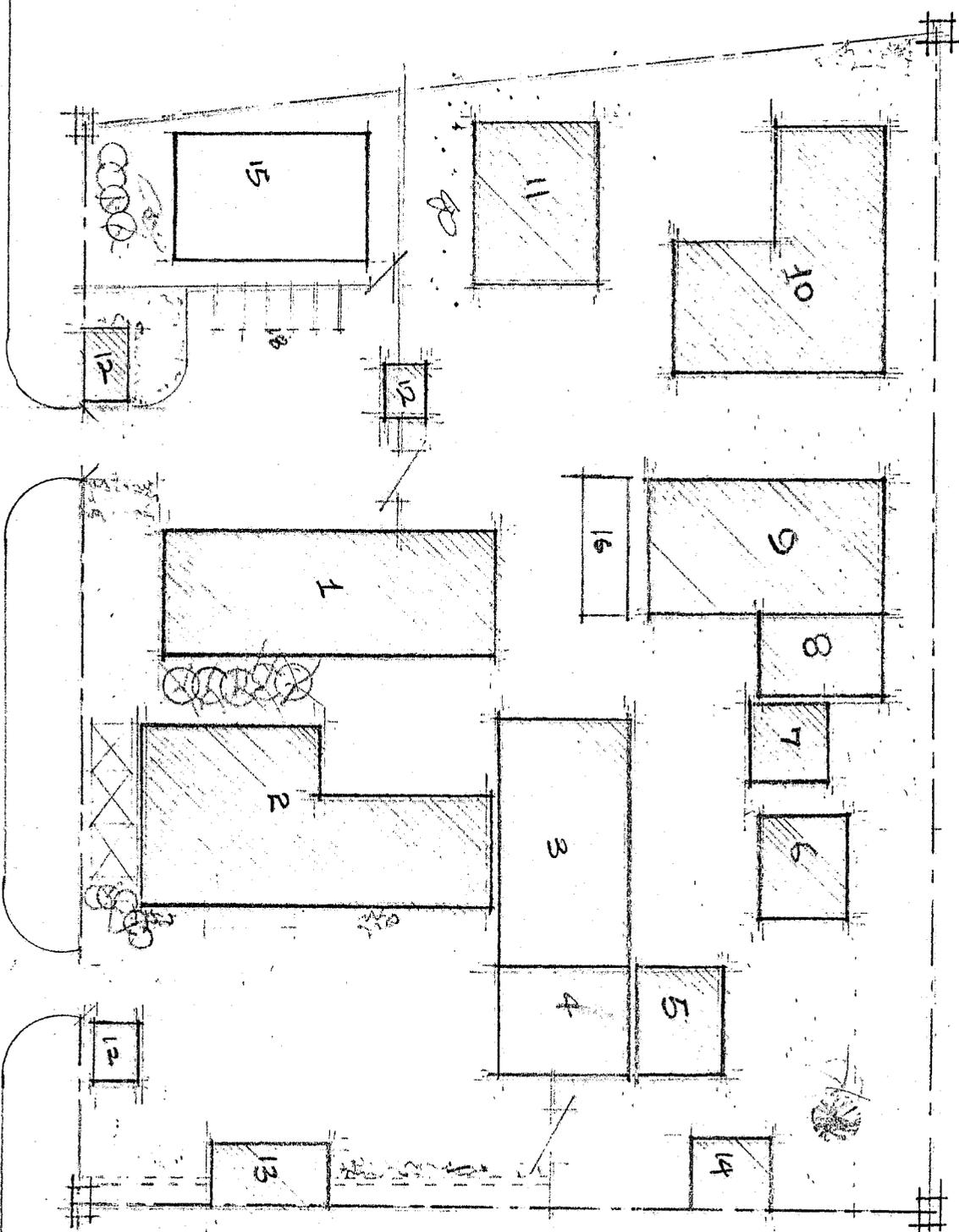
left side is the warehouse and the warehouse frontage stand the little but adequate staff canteen. The sketch layout for Academy Press Plc is shown in diagram.

### **CONSTRUCTION AND MATERIALS**

The predominant construction method used is hanged on the principles of simple structural element of 230mm thick sandcrete block and reinforced concrete column for support. The non-structurals wall such as partitioning wall is 150mm thick sandcrete block. In the production hall, engineering section, warehouse, e.t.c steel column of I-sections is used as structural element anchored to the ground by pad type of foundation.

### **MERITS**

- **Buildings are built of solid constructions with beautiful finishes**
- **Good maintenance culture**
- **Security network commended**
- **Good and well connected access road**
- **Good and well connected drainage control**
- **It as an unobstructed traffic flow.**



**LEGEND**

1	ADMIN BLDG
2	RECEPTION
3	BINDING
4	SECURITY CHECK
5	GENERATOR BLDG
6	STORAGE FOR OIL
7	WASTE
8	OFF
9	MAINTENANCE
10	WASH HOUSE
11	CAMPBENT
12	GATE HOUSE
13	TENTS
14	SHADE
15	AMPHITHEATRE

KODI-LUREDU INDUSTRIAL AVENUE ROAD

Illustration III

SITE LAYOUT FOR COMMUNITY CENTER - CASE STUDY I

- **It has a works clinic for emergency / accident cases**

#### **DEMERITS**

- **Warehouse located far from the production hall**
- **Landscape not adequately done**
- **80% of the site not tarred**
- **Road network (drive-ways) within the factory is bad**
- **Poor site planning**
- **No room for future expansion**
- **The available walkways are not covered**

#### **4.1 CASE STUDY TWO: GOVERNMENT PRINTING PRESS, MINNA**

**As the development and expansion of printing became more and more notable as early as 1933 in Nigeria, the federal government considered it necessary to established its own printing press to publish its own gazette, calendar, year book, budget e.t.c. And hence in 1976, the government of Niger state under governor Murtala Nyako created its own printing press formerly known as**

government printer. Ever since the creation of this the then one block printing press, it has moved from one ladder to the other. And not until recently, due to unstable government and the careless government attitude which led to the closure of many government printing press across the country. The wind of closure does not however got to Minna but the printing press are seriously underfund and sort staffed which incapacitated the company from performing its traditional role. At present the company still use its old and first generation of printing machine, which are rather outdated and old fashion. This couple with other problems could not make it compete with other printing press.

The company can only boast of 86 staffs, which are neither highly skilled nor vice-versa. The recent visit by the Chief Liberian of the federation shows that the company is the only government printing press functioning to day apart from that of Lagos.

## **ORGANISATIONAL STRUCTURE**

The director of printing heads the government printing press, Minna and to be assisted by the deputy director of printing followed by the production officer. There are about 5 departments, which are headed by each chief of superintendent of press and directly reporting to production officer. For detail explanation on organisational structure. See figure

## **DESCRIPTION**

The government printing press, Minna is located along Keterigwari/Kpakungun/old secretariat road, established in 1976. The site of this government company is accessed through only one gate. This means that only one entrance are provided be it for servicing customer staff, emergency and so on and so fort. Also like, Academy press Plc, it is fenced round only that part is collapsed already due to poor maintenance. The driveway within this factory is untarred and is gradually leading to erosion of the part being plied by vehicles and human being. It has just only two blocks. Each blocks is a one- storey building. The first block



comprised of a little bit of administration (i.e office for director, deputy director, production officer, reception), compugraphic section, lithographic section, bindery section and maintenance department. The other block is divided into two by a court yard. The (a) part for old machine and administration and the (b) part for yet to commission machine. For this (a) part, it is the letter press section and the rest offices of administration.

At the frontage of this other block stands a giant generator house and closely follow is the newly constructed mosque. Also directly at the back of this block is an old incinerator built during Buhari-Idiagbon regime which is no more in use. This is because the only waste (paper) of this company are being sold out. On entering this site stands a water tank and a spoilt vehicle.

## **CONSTRUCTION AND MATERIALS**

Basically, the construction method employed is the primarily structural element of 230mm thick sandcrete block and reinforced column for the major support. The fence are constructed of 230mm thick sandcrete block wall with red perforated blocks with

A	ADMIN SECTION
B	COMPARATORS SECTION
C	LITHO SECTION
D	LETTER BINDERY
E	MAINTENANCE
F	LETTER CASE
G	YET TO COMPLETION BLDG
H	INCINERATOR
I	GENERATOR HOUSE
J	MOTOR PUMP
K	WATER TANK
L	SPOILT TRUCK
M	

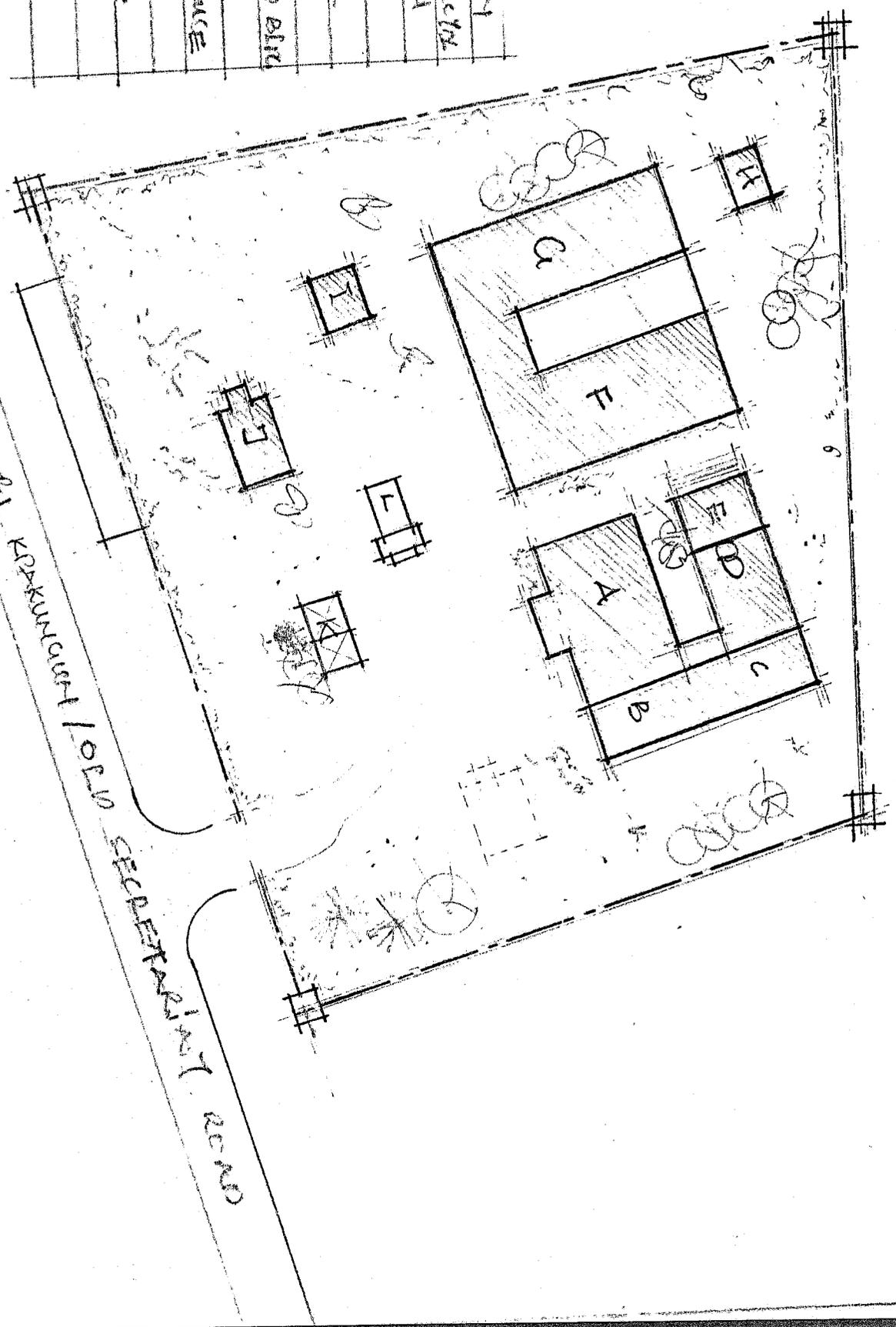


Illustration X

GOVERNMENT PRINTING PRESS, MINNA: CASE STUDY 2

occasional support retaining wall. The roofs are constructed with timbers with roof gutter round. The floors are finished in granolithics.

#### **MERITS**

- **Very large and spacious reception room**
- **Large site which thus enable / permit future expansion**
- **Presence of water tank for storage and public tap around and where necessary.**

#### **DEMERITS**

- **Dilapidated building structure due to poor maintenance**
- **No exhibition or display room for their printed jobs**
- **No security gate**
- **Drive-ways in the premises are not tarred leading to erosion**
- **Absence of parking jobs**
- **Absence of works clinic in case of emergency**
- **\*Nothing like walkway except foot path**

- **Poor site planning (improper landscape)**
- **Only one entrance**

#### **4.2 CASE STUDY THREE: JEROEL ASSOCIATES LIMITED, LAGOS**

**Jeroel Associates Limited is strictly a one man business owned by Mr. Jerome Elaiho. This company though very small in size had really gone far ahead of other printers of the same size. This company as small as it is used to be the printer to West African Examination Council (WAEC) and Joint Admission and Matriculation Board (JAMB) in the early 80s. it was established many years ago but moved to the present location which of course their permanent site in 1985.**

**Mr Jerome Elaiho is a re-known printer with repute character. And this attribute is also likened to his company in which case the jobs collected are handled carefully and always completed before time given for the job elapse. The company has moved from one ladder to the other. The company can boast of 155 highly skilled and well-trained workforce. They have been known to maintain**

high quality output regardless of the print volume and pressure from customers while charging reasonable rates.

### **ORGANISATION STRUCTURE**

Jeroel Associates Limited is headed by Mr Jerome Elaiho as the chief executive of the company. Closely followed is the Managing director who is the administrative head of the company. There are three departments all together headed by their respective controllers. The three departments include engineering department, accounts department, and production department. Each is being headed by a controller.

### **DESCRIPTION**

Jeroel Associates Limited, Ikeja-Lagos is located at No 77 along Opebi-Allen Avenue road opposite Bell view Airline Plaza. It is a four storey building complex which can be accessed through only one gate. It is fenced round in block wall occasionally supported by retaining walls. The whole compound or premises of this enviable

company is floored with line mark to indicate the position of car parks. The facilities provided are mainly

in the main building living only the warehouse, Gate house/ Security/Waiting and covered and uncovered parking lots.

The building is a four storey building complex finished in red bricks block living only the last top floor unfinished. The basement is used as the service floor, archive and the lift house. The ground floor plan is basically for warehouse only while the first floor plan is the press where printing of all sorts are carried out. The third floor plan is store and the second floor plan housed the finishing. The finished jobs are taken to the next floor for storage via lift. The last floor is the accommodation, which sometimes are needed for a security job. For instance WAEC job where all those involve are not allowed out until the whole job is finished.

## **CONSTRUCTION AND MATERIALS**

The construction method employed here is reinforced column for major structural supporting element while the block walls of 230mm thick are used as non-load bearing wall and partitioning walls. The fence is constructed using 230mm thick sandcrete block wall with plastering coupled with occasional support of retaining wall. The building is finished i.e finished in red bricks given it a colourful finishes. The roofs are constructed using timbers of standard and higher performance. The floors are finished in granolith.

## **MERITS**

- The company premises was floored and slopes to the outside drainage control
- The built structures are solidly and massively constructed
- Located in a very suitable environment
- The building finishes especially bricks block makes it colourful and beautiful

## **DEMERITS**

- **The whole site had been used completely and leaving no room for future expansion**
- **It is unfortunate that in case of fire outbreak, the whole site and the building could be easily engulfed in fire**
- **Poor planning which results in location of store relatives to finishing and press**
- **Nothing like works clinic which can be proved useful in case of accident**
- **Servicing of machines becomes very problematic because of its location (2<sup>nd</sup> floor) compared to if it were to be on ground**
- **Inadequate parking for both workers and visitors.**

## **CHAPTER FIVE**

### **5.0 PHYSICAL AND SOCIO-CULTURAL BACKGROUND**

#### **5.1 CLIMATE:-**

##### **5.1:0 TEMPERATURE**

##### **5.1:1 HUMIDITY**

##### **5.1:2 RAINFALL**

##### **5.1:3 WIND DUST**

##### **5.1:4 SUN AND CLOUD COVER**

#### **5.2 VEGETATION**

#### **5.3 TOPOGRAPHY**

#### **5.4 GEOLOGY**

#### **5.5 SOCIO-CULTURAL LIFE**

#### **5.6 TRANSPORTATION AND TRAFFIC FLOW**

#### **5.7 EXISTING LAND USE AND FUTURE GROWTH**

## CHAPTER FIVE

### 5.0 PHYSICAL AND SOCIO – CULTURAL BACKGROUND

Abuja, FCT covers an area of 8,000sq. kms. This makes it more than twice the area of Lagos state, the former federal capital territory. According to the Aguda panel, this vast areas was considered necessary in order to allow room not just for the capital city but also for a city region that will provide most of the needs of the city including water, forestry, industrial, agricultural, open spaces, defense air transport and other needs. As at now the Federal capital city (FCC) is planned to cover an area of about 250 sq. kms. While the rest of the territory or the city region covers about 7,750sq. kms.

The territory is located between longitude 66047.5”- 7020” East and latitude 80 30” – 90 15” north; Ethnically, it is compose of Gwari (64.9%), koro (8.3%), Gandara (7.9%) Gada (6.5%), Hausa (4.6%), Fulani (4.6%) and the other groups totaling (2.9%). The philosophy of the establishment of the new capital city has as promised by the late General Murtala Mohammed, an area that is not within the control of

any ethnic group in the country, a virgin land, for all Nigerians a symbol of oneness and unity.

Abuja is very slow or can I say is yet to pick a defined character in the commerce and economic sector presentently, it is a place of safety for construction companies hotels, government buildings and other little industries.

## **5.1 CLIMATE**

The federal capital territory, Abuja has a tropical climate characterized by dry and wet seasons. Local variations originate from the peculiar meteorological and geographical influence of the area in question.

### **5.1.0 TEMPERATURE**

The federal capital territory, like other parts of the country, records its highest temperatures during the dry season months, which are generally cloudless. During the dry season, the typical month being March, the temperature could be as high as 37C in the south –west and about 30C in the higher northeast. This period is characterized by high diurnal ranges when drops of as high as 17C may be recorded between the highest and

lowest temperatures in a day. During the rainy season, temperature drop considerably due to dense cloud cover. The diurnal range also drops to around 7C especially between July and August.

### **5.1.1 HUMIDITY**

In the case of humidity, the Federal capital territory records relative humidity, in dry season of some 20 percent in the afternoon at higher elevations and at more northern locations but about 30 percent in the extreme south. This rather low relative humidity coupled with the high afternoon temperature accounts for the desiccating effects of the dry season, which is also marked by the presence of the harmattan haze. During the rainy season, the afternoon relative humidity rises everywhere to above 50 percent. In terms of physiological comfort, the higher relative humidity in the extreme south of the territory gives the area a heat trap effect, which makes people uncomfortably hot. For maximum human comfort, northern locations are better, especially locations to the northeast where the FCC is being built.

rainfall respectively compared with Suleja and Jos, just north of FCT, which have higher annual rainfall of 1632mm and 1403mm respectively.

### 5.1.3 WIND DUST

Abuja is dominated by two major air masses. These are the tropical maritime air mass and the tropical continental air mass. The tropical maritime is formed over the Atlantic Ocean to the south of the country, and is warm and moist. It moves in a southwest to the northeast direction. The tropical continental air mass is developed over the Sahara desert and is warm and dry. It blows in the highly seasonal between those two air masses produces the highly seasonal characteristics of weather conditions in the dry season, while the maritime mass is associated with wet season. The two masses are characterized by the presence of the prevailing winds. The tropical continental mass is associated with the northeast trade winds while that of the tropical maritime are the southwest monsoon winds. There is variation in the intensity and duration of each type of wind in a particular place due to interface of these two masses.

# CLIMATIC DATA

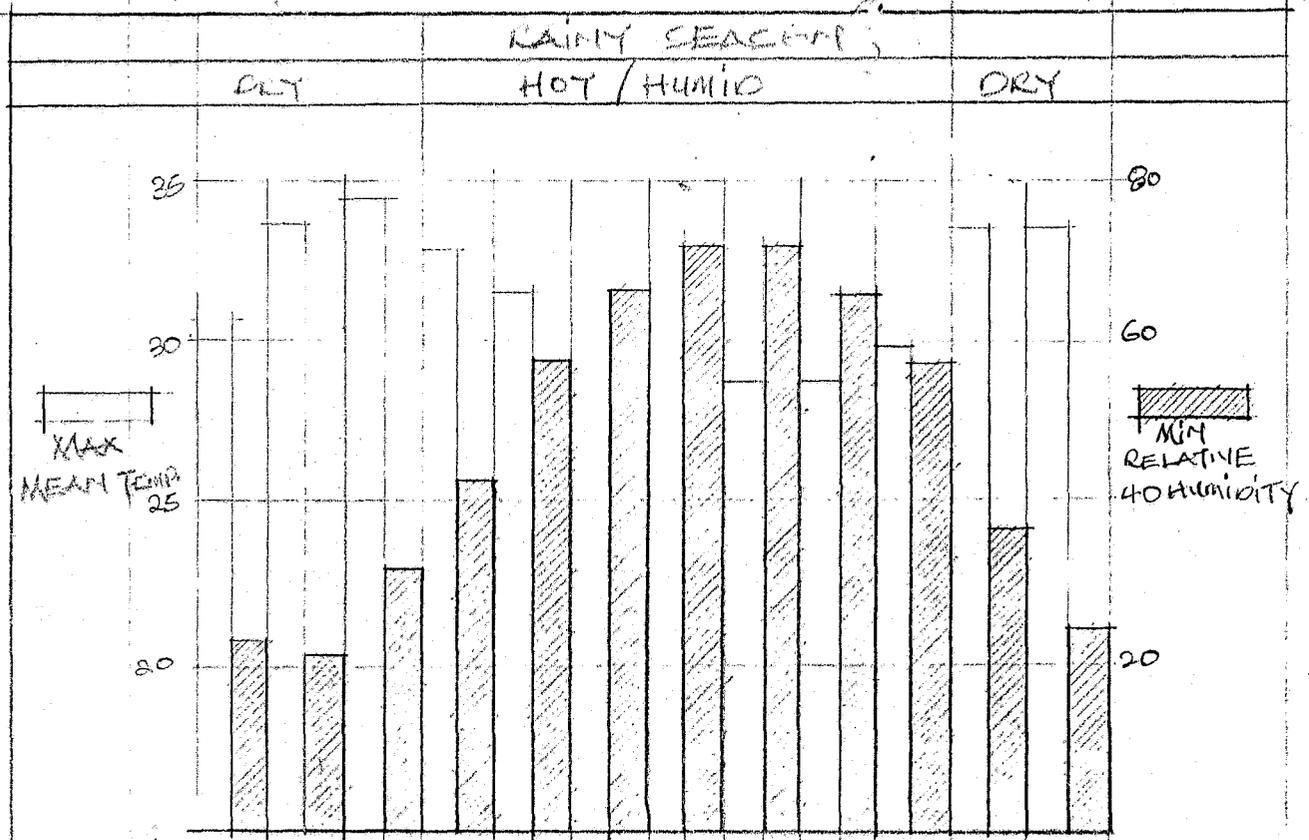


Figure I

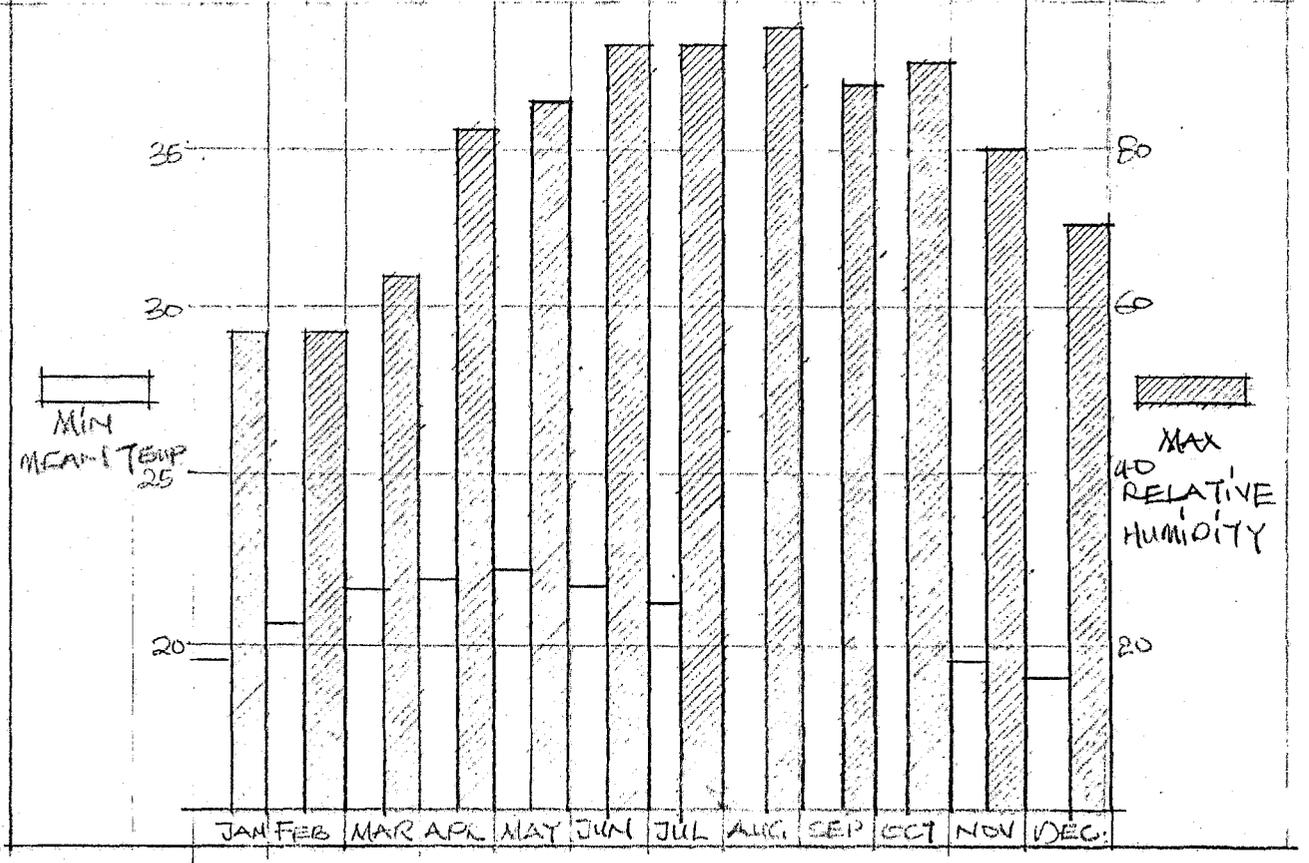


Figure II

MEAN MONTHLY TEMPERATURE AND HUMIDITY :

In June, only the southerly flow of air component predominates while that of northerly flow weakened. It brings lot of rain, being moisture-laden. However, in September, the tropical continental begin to intensify over the city and the north east trades become the dominant wind between October and March bringing with it dry, cloudless but dust-laden conditions which is associated with harmattan.

#### 5.1.4. SUN AND CLOUD COVER

During the dry months (November-April), the monthly variation in the amount of sunshine follows the general trend of an increase from over 275 hours on the city. As the rainy season approaches, the cloudiness increased. The city site is exposed to 2500 sunshine hours becomes more intense as the rainy season progresses and it got to its lowest values in August. At this period, there is an inversion in the city where there is less sunshine hours compared to southern parts of the territory.

## 5.2. VEGETATION

The city's vegetation is characterized by park savanna. This is a typical stratified community with a discontinuous canopy, shrubs and grass layer. Park savanna includes a thick, tall grass layer consisting of an opogon and Hyparrhemia species and most common shrub layer such as Terminalia, Piliostigma, Amona, Nuadea and Bombax. The shrub savanna vegetation occurs on flatter plains and undulating terrain.

The Wuye and Usuman River valleys in the vicinity of the capital city are characterized by riverine complex vegetation lying at their stream tanks.

The forest varies from high forest to a mixture of woodlands gallery forest, and dense thicket. A preserved riverine and rainy season; there would be reduction in the erosive potential of flood flows. Hence water quality is maintained, care must be obtained in ensuring clearance operations, since these areas are habitats for disease-bearing pests. Also, must be taken when utilizing rain forests and riverine areas, not to eliminate the essential top stabilization of stream bank.

Efforts should be taken to preserve woodland areas for their value as a recreation resource and for aesthetic purposes.

### **5.3 TOPOGRAPHY**

The area is typified by gently undulating terrain interlaced by river-rine depression. The height variation from crest of hill to watercourse varies around 50 meters, more or less. In the immediate vicinity of someone on the visual scale is intended to be used as design focal point to convey the sense of the larger scale of the city.

The city site consists of uplands and plains with numerous inselbergs, whalebacks, and other rock outcrops of various sizes. Inselbergs and other granite clusters occupy about 8% of the total plains areas, and are generally bare and rocky, varying in size, and occurring as isolated mass or in groups rising from the plains.

### **5.4 GEOLOGY**

The major rocks units underlying the Federal capital Territory, Abuja itself are described in three categories below.

#### **a) Metamorphic Rock**

This include Biolite Muscovite schist, limited to four narrow outcrip bands along ridge tops at the eastern edge of the site: migmatite, underlying the Usuman River valley in the northwest portion of the city: and granitic cinesis.

#### **b) Igneous Rock**

**This include Biotite Granite, large intrusive masses commonly elliptical in shape forming dissected zones of the Zuma-Bwari-Aso hills and the outcrops of the Gwagwa plains: Biotite Granite forms ridgelines trending northeast-suothwest through the city site: rhyolite, forming small round intrusives surrounded by porphyritic gnesis in the Usuman valley in the northwest portion of the city.**

#### **b) Sedimentary Rock**

**This includes alluvium, located in streambeds throughout the territory consisting largely sand, with rare gravel beds and local deposits of clay. The above rock structure has not presented any major geotechnical constraint to the type of structure proposed for the new city over most of the site. Magnite gneiss's, and biotite granite underlying the majority of the city site are rocks of medium to higher strength. The rocks are expected to present a minimum of engineering problems and should provide suitable locations for engineering structure.**

## **5.5 SOCIO-CULTURAL LIFE**

Since 1980 when physical development of the city and other parts of the territory commenced; the city has been witnessing large streams of migrants seeking employment in the construction companies operating in the Territory.

Recent projections of the population of the territory were put at 600,000. This demonstrates the exert influx of the people into the Territory during the recent times. The patterns of migration trends are likely to continue in the forceable future having regard to the on-going programme of moving the seat of Government from Lagos to Abuja.

In terms of urbanisation, there was no settlement with a total population of 5,000 in 1963. Abuja, kuje, Karshi, Rubochi, Kwali, Karu and Nganya have gained so much migrant population that they can justifiably be referred to as medium size urban areas today. Abuja Capital City itself has a population of 75,000 at moment and it is expected to witness rapid growth as the movement of the seat government progresses.

With regard to socio-economic characteristics, the indigenous population of the Territory has very low literacy levels and is largely farmers by occupation. However, the influx of migrants from different parts of the

Territory since 1980 is expected to have tremendous impacts on the culture, occupational structure, and general life-style of the people in the years ahead.

## **5.6 TRANSPORTATION AND TRAFFIC FLOW**

The dominant structural element of the capital city plan is the transport system. The major element of this system consists of a series of peripheral and transverse freeways and parkways forming a highway grid system bounding the major development sector and four radial transit spines connecting the centers of all development sector to the central area; as well as to each other. This combination of peripheral roadways and penetrating transit is directed towards the achievement of several specific objectives.

**Maximize public transportation mobility for those residents who do not own cars.**

**Maximize the utilization of public transportation for those residents who do not have cars.**

**Maximize traffic movements passing through the various developments sectors.**

**Provide multiple highway paths between developments sectors. Thereby avoiding network bottlenecks.**

**Achieve maximum self-containment within the outlying sectors.**

## **5.7 EXISTING LAND USES AND FUTURE GROWTH**

**The national assembly building and its supporting legislation offices, official ministerial residence, the National monument and National Botanical Gardens are located on a promontory at the axis with Aso Hill over looking the body of central Area.**

**A central square is created on a knoll where the axis and the central parkway intersect. Buildings housing the presidential Residents' the Supreme Court and the Municipal Administrative center surround this National Square. This central square is connected to the National Assembly Complex visually by a large informal landscaped mall. Ministerial building flank this mall on both sides. Four square are located in the central Area to serve as locations for future public functions and support amenities.**

## **CHAPTER SIX**

**6:0 SITE ANALYSIS**

**6:1 SITE SELECTION CRITERIA**

**6:2 LOCATION OF SITE**

**6:3 ACCESS AND CIRCULATION**

**6:4 SITE PLANNING**

**6:5 SPACE REQUIREMENT**

## **CHAPTER SIX**

### **6.0 SITE ANALYSIS**

Site analysis involves thorough investigation and the analysis of the project site. Not only the specific site contained within the property boundaries, but the total site, which includes the site environs to the horizon and beyond. In the site, analysis diagram of the proposed industry climatic factors and solar orientation was given thorough consideration. The topography of the site which include the analysis of the slope, soil analysis, drainage (sewage system). Other features in the site analysis diagram include rock outcrops, vegetation analysis of the tree shrubs, and ground cover those to be preserved and those to be destroyed or removed.

### **6.2 SELECTION CRITERIA**

Over the years, general criteria for selection of sites for different kinds of uses have evolved from a variety of sources. These criteria encompass the total environment, both regional and local. With such a guide or

checklist, it is possible to evaluate most proposed sites and determine their suitability for proposed uses.

Having said all these, the site proposed for the project was considered suitable because of number of factors. These include – capital availability, availability of water, nearness to market, police protection e.t.c.

**Capital availability:** - For the fact that the project is for the federal government and being sited in Abuja, it is relatively easy to acquire capital for construction, expansion and other needs. Aside this, the important of the project to the federal government can not be emphases and more so a high capital generating investment.

**Availability of power:** - The power supply in this particular is constant with absolute non-interruptions. The power supply so far was able meet the present needs and the 90% of future needs.

**Climate:** - The climatic conditions provide a pleasant atmosphere for employee to live and work.

**Availability of water:** - the water supply presently in Abuja is in sufficient amounts and pressure to meet drinking, heating dealing and sprinkler system requirements.

**Fire protection:** - There are adequate facilities available for protection plants and employees against the hazard of fire, thereby allowing reduced insurance rates.

**Police protection:** - This project site is very closed to the headquarters of Nigeria police force, Abuja. In this view there is adequate protection to prevent harm from theft or destruction of property.

## **6.2 LOCATION OF SITE**

The proposed project is located in Garki Area 11 Abuja the Federal Capital Territory. It is sited along Muhammed Buhari way, directly opposite the Nigeria security Minting and Printing Company, which at present under construction. Also very close to this site are the Central Bank of Nigeria headquarters, Nigeria police Force headquarters and Bantata and Sawoe Construction Company. In actual facts, the project site stood at the end of the Muhammadu Buhari Way and faced by the

Murtala Muhammed Express way south at the eastern end. At the site there are two uncompleted bungalows burnt and marked for demolition just at the northern corner of the site.

### **6.3 ACCESS AND CIRCULATION**

The site is accessible by good roads namely – Muhammadu Buhari Way, Samuel Akintola Boulevard and Murtala Muhammed Expressway south. Access to the site could either be tapped from Muhammadu Buhari way and Murtala Muhammed Expressway south. This is consider suitable because neither of them is facing east which ordinarily would have being a problem resulting from solar reflection. The driveways would be constructed in such a away to avoid facing east. And if it any rate there is likelihood of such, trees would be planted to shadow the driveways from the rays of sun.

As per circulation, which invariably is the research area of this particular topic. Traffic circulation of this Garki Area II is very okay in the sense that there is no any traffic hold up from my personal observation and oral interview conducted. Aside these accessible roads,

the service lanes are provided to ease transportation problems probably in the future, which fortunately lies at the front of the site. In order to ease circulation problem and access to the site, it is better that the driveways to the site be tapped from Muhammadu Buhari Way. This because the other Murtala Muhammed Way, a dual – carriage highway has its junction very far to the site.

#### **6.4 SITE PLANNING**

In planning the site of industry, many factors have to be considered to be able to have appreciable, pleasance and effective design. People who will occupy it must think of site planning as the organisation of the total land area and air space of the site for the best use. There should be an integrated concept in which building construction, open space and materials are planned together to form a complete balanced and pleasant unity. Site plan involves building organisation of the project – open space.

The planning approach to this design is zoning principles. The site is divided into four zones namely – public, private, services and semi private area. Zone 1 which includes the Administrative blocks and

gatehouse partly welfare block. Zone 2, which is strictly private, includes the production block, waste section, ware house. Zone 3 includes place like works clinic, production block, waste section, engineering section and zone 4 production

## 6.5 SPACE REQUIREMENTS

### ADMINISTRATIVE BLOCK

GROUND FLOOR PLAN	L X B	AREA M
TERRACE	12X4	48
RECEPTION	12X8	96
DISPLAY / WAITING	10X8	80
SECURITY POINT	6X4	24
RADIO ROOM	7X8	56
COMPUTER ROOM	8X8	64
LOBBY	2X44	88
SECURITY CONTROL ROOM	8X8	64
TOILETS (16)	1.2X1.8	34.56

<b>STAIRWELL (8)</b>	<b>12X8</b>	<b>96</b>
<b>STORE</b>	<b>5X6</b>	<b>50</b>
<b>GENERAL OFFICE / WAITING</b>	<b>14X4</b>	<b>56</b>
<b>SECRETARY</b>	<b>7X4</b>	<b>28</b>
<b>PURCHASE</b>	<b>7X4</b>	<b>28</b>
<b>SALES</b>	<b>6X7</b>	<b>42</b>
<b>SECRETARY</b>	<b>5X6</b>	<b>30</b>
<b>ACCOUNTANTS</b>	<b>10X6</b>	<b>60</b>
<b>SENIOR STAFFS</b>	<b>12X7</b>	<b>84</b>
<b>JUNIOR STAFFS</b>	<b>10X8</b>	<b>80</b>
<b>CASHIER</b>	<b>6X8</b>	<b>48</b>
<b>MINI LAB</b>	<b>11X7</b>	<b>77</b>
<b>CLASS ROOM</b>	<b>18X16</b>	<b>288</b>

#### **FIRST FLOOR PLAN**

<b>LIBRARY</b>	<b>12X8</b>	<b>96</b>
<b>SECRETARYS/ WAITINGS (4)</b>	<b>9X7</b>	<b>63</b>
<b>DIRECTOR OF FINANCE</b>	<b>10X8</b>	<b>80</b>

<b>DIRECTOR OF ENGINEERING</b>	<b>10X8</b>	<b>80</b>
<b>DIRECTOR OF MARKETING</b>	<b>10X8</b>	<b>80</b>
<b>DIRECTOR OF PRODUCTION</b>	<b>10X8</b>	<b>80</b>
<b>TOILETS (17)</b>	<b>1.2X1.8</b>	<b>36.72</b>
<b>LOBBY</b>	<b>32X2</b>	<b>64</b>
<b>SECRETARY</b>	<b>7X6</b>	<b>42</b>
<b>STAIRWELL (3)</b>	<b>12X8</b>	<b>96</b>
<b>PREMISES MANAGER</b>	<b>10X6</b>	<b>60</b>
<b>SENIOR STAFFS</b>	<b>12X7</b>	<b>84</b>
<b>JUNIOR STAFFS</b>	<b>10X8</b>	<b>80</b>
<b>PERSONNEL MANAGER</b>	<b>6X8</b>	<b>48</b>
<b>CLASSROOM</b>	<b>18X16</b>	<b>288</b>
<b>MINI - LAB</b>	<b>11X7</b>	<b>77</b>

#### **SECOND FLOOR PLAN**

<b>EXHIBITION ROOM</b>	<b>12X12</b>	<b>144</b>
<b>BOARD ROOM</b>	<b>19X8</b>	<b>152</b>
<b>AUDITING DEPT</b>	<b>16X10</b>	<b>160</b>

STORE MAN	4X3	12
TERRACE	4X2+4X2 -	16

**PRODUCTION BLOCK**

**GROUNG FLOOR PLAN**

TERRACE	9X4	36
WAITING	6X4	24
DISPLAY	6X4	24
PLANNING OFFICE	9X5	45
TECHNICAL PROGRESS SECTION	6X4	24
MINILITHO STORE	6X4	24
STORE MAN	7X6	42
GENERAL STORE	26X16	416
DELETE	16X7	112
SARK ROOM	4X5	20
LIGHT ROOM	6X6	36
COMPUTER SECTION	12X8	96
PLATE MAKING SECTION	6X6	36

PRINT FINISHING	36X14	504
DAIRY PRODUCTION	12X12	144
PRESS ROOM	28X24	672
WASTE SECTION	12X8	96
STAIR WELL	7X2.4	14.8
STORE	4X12	48

#### DOUBLE VOLUME PLAN

STAIRWELL	7X2.4	14.8
STORES FOR CHEMICAL INKS & SPARE PARTS	16X15	340
WELFARE BLOCK		
TERRACE	15.5X4.8	74.40
EATING HALL (1&2)	25X17	425
SERVERY (2)	10X2	20
PREPARATION	7X7	49
SANITARY	3X2.5	7.5
COLD STORE	6.5X4	26
DRY STORE	6.5X4	26

<b>KITCHEN</b>	<b>9X9</b>	<b>81</b>
<b>CHANGING ROOM (2)</b>	<b>3.5X2.2</b>	<b>7.7</b>
<b>FOOD INSPECTOR</b>	<b>4X3.3</b>	<b>14.2</b>
<b>COMMON ROOM</b>	<b>10X9.7</b>	<b>97</b>
<b>SNACKS</b>	<b>4X6.5</b>	<b>26.0</b>
<b>GAMES</b>	<b>4X6.5</b>	<b>26.0</b>
<b>STORE</b>	<b>4X6.5</b>	<b>26.0</b>
<b>WAITING</b>	<b>6X10</b>	<b>60</b>
<b>REST ROOM</b>	<b>4X9</b>	<b>36</b>
<b>CONSULTANT</b>	<b>5X4</b>	<b>20</b>
<b>INJECTION</b>	<b>5X4</b>	<b>20</b>
<b>DRUG STORE</b>	<b>5X5</b>	<b>25</b>
<b>LABORATORY</b>	<b>4X8</b>	<b>32</b>
<b>LAUNDRY</b>	<b>4.6X4.6</b>	<b>21.16</b>
<b>AMBULANCE BAY</b>	<b>5.6X4.8</b>	<b>26.88</b>
<b>LOBBY</b>	<b>22X18</b>	<b>396</b>

## **CHAPTER SEVEN**

**7:0 DESIGN PHILOSOPHY AND CONCEPT**

**7:1 MATERIALS AND CONSTRUCTION**

**7:2 DESIGN SERVICES**

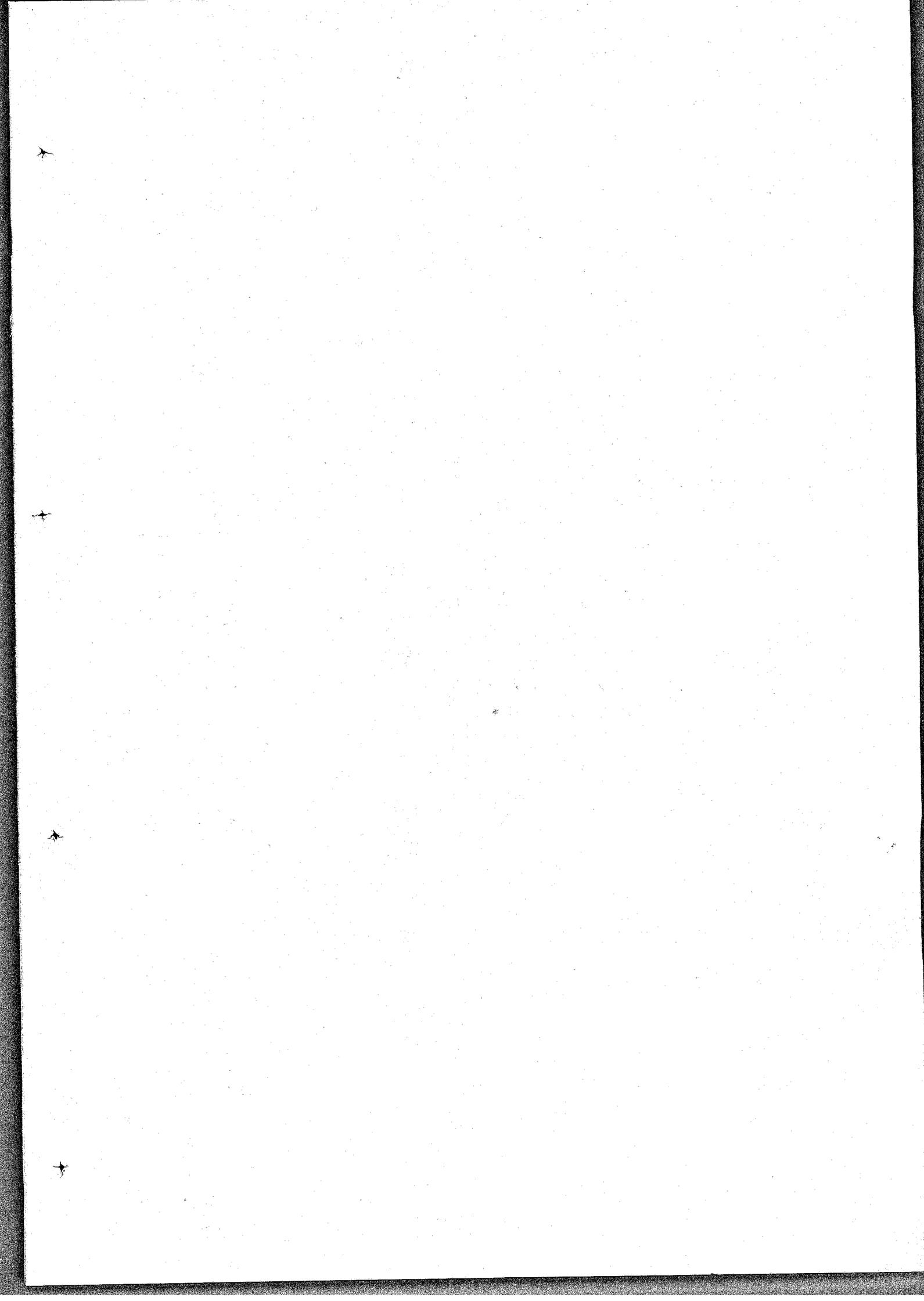
## **CHAPTER SEVEN**

### **7.0 DESIGN CONCEPT AND PHILOSOPHY**

#### **DESIGN PHILOSOPHY**

Basically, the philosophical approach employed in this design proposal revolves round two principles - namely Architectural Functionalism and Organic architecture. Although they are quite different in reasoning but in this design they seems to go hand in hand as the first ensures a well functioning, organized and flexible design and the latter emphasized on exterior characters with matching forms, the use of local materials that ensures an enabling beautiful environment that would appeal to people.

However, Architectural Functionalism is a design principle that first considers function before form. It combines many options of orderliness, conformity and functionality in the use and control of spaces. It goes further by given a design its necessary qualities to be able to perform within its set objectives, maintains a very good relationship with other functions that can make up the whole. This can be likened to the fact that



prior to the planning of any design, a lot of wishful thoughtful and careful architectural thinking must have gone by before any plan is put in place. Ideally, functionalism strongly believes that the function of a building must determine its design.

Organic Architecture which believes that there is inherent logic in the nature structure and composition of matters i.e it believes in the conservation of nature and betterment of man's condition as much as they depend on the creation of efficient and human societies. However this design proposal would also employ organic architectural and it sets of guiding principles to achieve the visual and psychological contact with nature to provide appropriate conditions for the Abuja Printing Press.

#### **DESIGN CONCEPT**

Having discussed earlier on in this chapter and recognizing the issue of functions before forms. It became obvious that the analogy of the conceptual development for this proposal lies on the actualization of the functionality of the design. This is made possible by the application of canonic approach to design and zooming principles. The arms of these

two approaches takes into cognizance various influencing factors as well as careful analysis of these factors which is known and believed to have far – reaching Architectural solution to the problem usually generated by the use of space.

Canonic approach to design employ three parameters with which it works – namely furniture space, utilization space and circulation space.

Now, after establishing all these in a single function, the next stages involve relating functions to functions. This is shown on illustrations - zoning principles is applied to complement the effort of economic the whole site facilities falls into four zones. These include

#### **7.1. MATERIALS AND CONSTRUCTION**

##### **MATERIALS**

The material underlisted here have been considered suitable for the construction of the proposed factory having taking into account some its expected performance (e.g. durability, strength, easy to maintain, aesthetic value e.t.c). The materials include concrete, still steel, sheet

aluminum roofing sheets, bitumen, asphalt and fars, glass, block, bricks, ceramic files and marble.

## **CONCRETE**

An artificial material made from an ultimate, carefully proportioned mixture of binders – called aggregates. The aggregate includes sand, stone or graves and cement plus water. The mix as well as the manner, in which the concrete is placed, finished and cured affects the quilt. Concrete though very strong in compression is weak in tension, to compensate for the results in reinforced concrete which is an ideal material used extensively in this project for Columns, beams and linted.

## **STEELS**

Steel are used extensively in this design proposal especially in the production hall, engineering section, ware house, waste section and so on for heavy and light structural framing. The used of steel structural framing would check the vibration generated by the printing machines. Also in the framing for windows and some doors, steel shall be used extensively for this purpose. As a structural material steel combine's high

strength and stiffness with elasticity and it is one of the stronger low – cost materials available. All structural steel to be used in either tube, bars and plate forms depending on the area of usage.

### **STEEL ALUMINUM ROOFING SHEET**

Aluminum alloys are used in the manufacture of various sheets and shapes servicing different purposes in construction. It is a relatively soft, yet strong, light weight and workable metal. It is corrosion resistant due to the transparent film of natural oxide it forms on its surface. Its combination with alloy such as steel proves very durable, high strength, ability to cover long span and many more. Care must be taken when installing this material as it result in galvanic action when in contact with either other materials and reacts too with alkaline materials such as met concrete, mortar and plaster.

### **STONE**

Stone is an aggregate or combination of minerals, it is composed of inorganic chemical substance. To qualify as a construction material, stone should have the following qualities: strength, hardness, durability

and workability. Stones may be classified according to geological origin into the following types: igneous, sedimentary and metamorphic. Therefore, in this proposal stone is used primarily as aggregate in concrete products as crushed rock and for flooring in form of flagstone.

### **SANDCRETE BLOCK**

Blocks are man made units, which are formed and hardened into modular building units. They are made from a mixture of sand and cement with water. All blocks used in this proposal are non-load-bearing wall. They are merely used to fill space between structural members and as well as for partitioning.

### **BRICKS**

Bricks are chiefly made from clay and shale and are molded either by hand or machinery. Bricks clay may also contain varying proportions of lime stone, iron, magnesium salts such as magnesium sulphate, sodium sulphate e.t.c in addition to organic matters and water. However, the red brick nature would be used to achieve the aims of the organic architecture.

## **GLASS**

A building material that can be described as an inorganic product of fusion, which has been cooled to a rigid condition without crystallization. However, a building without an opening is said to be psychologically unbalanced in nature. Therefore, glasses are going to be used extensively to achieve aesthetics, psychological comfort. Sheet glass for windows, plate glass for doors structural high level window for production unit.

## **PAINTS**

Paint is always in liquid form and consist of primmest and binders which are applied to a surface in this coat in order to produce a decorative furnish on the base materials against decay (timber) and corrosion (metal). Paint is made up of base, vehicle drier mignetand solvent. The most popular paints needs in this country are emulsion complex buildings colourful.

## **TILES**

Tiles flooring are preferred to sheet flooring due to ease of laying and economic materials. Tiles are of different types and they come in different shape and size and colour. This particular building material especially the ceramic tiles would be resistant to water; oil and greases ceramic tiles are made of marble, arranged in different patterns. They are applying mortar bed on the wall surface and the paper washed off after drying to expose the tiles.

## **WOOD**

As a building material, wood offers in addition to its strength durability, light weight, easy workability, natural and worth to site and touch. They are too major classes the relative hardness, softness comes from deciduous or broad leaf trees. For the porpoise of this study, softwoods shall be used for all form – work while hard woods are used as roofing members and for furniture including interior trim.

## **CONSTRUCTION**

### **SITE INVESTIGATION**

**This is the first step taken prior to any construction. It involves taking stock of what is on the ground, above and below the ground. This includes numerous facilities present on the soil for instance water pipe, electricity cable, and drainage control e.t.c. The staining can be used to reveal the nature of soil as well as the geological composition. And for the purpose of this study, the site investigation would capacity, determine the depth and type of foundation, the soil bearing capacity, determination of water level of the soil, to be able predict settlement of the selected foundation and lastly provision against constructional difficulties.**

### **FOUNDATION**

**A foundation is that part of building which in direct contact with the ground and its primary aim is to transmits and spread the loads (dead and live) from building over a sufficient area of soil top avoid undue settlement because of the failure of the underlying soil. A good foundation is the one that would be able to safely sustain and transmit to the ground the combine dead wind load in such a way as not to cause**

damage to the whole or any part of the building or any adjoining building or both. There are many types of foundations but the choice depends on the soil types, site conditions, the types of construction and the magnitude criteria the choice of foundation for the design is limited strip and pad foundations.

### **STRIP**

Is made up of continuous reinforced or plain concrete under load bearing walls. This foundation spreads load to an area of subsoil capable of supporting for the construction of administrative blocks, welfare blocks this shall be complemented with a well damp proof course for basement.

### **PAD**

This is a foundation suitable to accommodate the steel structural system of the production blocks, engineering blocks, warehouse, and waste section. It is an isolated foundation constructed of reinforced concrete to support columns. In addition to this pad foundation steel stanchion was proposed to withstand the stress generated by the vibration of various machinery in the industry.

## **FLOORS**

Floors are the structural part of horizontal supporting elements as distinct from the wearing surface. In this content, floor could be regarded as basement floor, ground floor and upper floor. For the basement, raft foundation is the most appropriate and the floor of about 500x200mm down beam with 29mm horizontal asphalt thinking in three layers follow by 100mm concrete with rammed hardcore or laetrile filling.

Ground floor otherwise known as "German Floor" in Nigeria is the most appropriate. It consists of concrete not less than 150mm thickness lay on a hard core bed of at least 250mm compacted in layers of 50 – 75mm. To prevent cement grout loss from the super propose concrete layer, or protect the damp proof membrane from factor the hard core is blinded with a 25mm layer of sand or ashes. The damp proof membrane should be placed below the over site concrete, which laid on it to a thickness of not less than 19mm.

Upper floor – These are otherwise refereed to as suspended floor sand for the purpose of this project are constructed based on space system. The

space system implored is the waffle grid system. The system consists of effectiveness structure that is able to resist tensile, compressive and shear stresses.

## **WALLS**

Walls generally define the outside and inside space of a building structured. They contribute more than element to the image and appearance of a building. Its primary function is to enclose or divide space, offer privacy and provide support for different kinds of load. The material used for wall constructed is generally sandcrete block in Nigeria. These may be solid or hollow blocks produced from cement and sand mix of about 1 part of cement to 8 parts of sand. For wall to perform efficiently, then it must possess adequate strength, resistance to dampness, thermal insulation and above all fire resistance. These are two categories of wall load bearing and non-bearing wall.

## **ROOF**

A roof is usually the uppermost part of a building which protects it from weather i.e. rain, sun, wind e.t.c. In this proposal three roof types have

been selected. It includes roof deck, steel aluminum roofing and aluminum long span roofing. Roof deck by its description is that portion of the roof constructed to which the roof covering or roofing is applied and through which the loads on the roof are transmitted to the principal supporting members. This types of roof would be suitable for part of administrative blocks. A three layered bituminous vapour seal or felt prevents the accumulation of moisture from the air on the interior of the building in the insulation.

#### **CEILING**

Generally, suspended ceiling of aluminum railing with paper puly sheets are used in the proposal. This product has an advantage of smooth, flame resistant and good acoustic value.

#### **DOORS**

A door may be defined as movable barrier secured into the wall opening. Its main purpose is to provide access into or out of a building and between various compartment within the building. In specifying types of doors, the numbers of people expected to pass through are considered

with the control desirable. Glazed doors in aluminum frame are provided in the reception, public hall, and common room e.t.c. Production blocks entrances, kitchen, workshop, warehouse are however specified with doors that posses high fire rating.

## **WINDOWS**

The purpose of a window is to admit day – light, provide natural ventilation, and exclude rainwater and to give a view to the outside. Building regulations stipulate minimum window size of at least one – eighth of the floor area of the room for adequate ventilation and natural lighting. 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 the exterior of the building.

## **7.2 DESIGN SERVICES**

### **ELECTRICAL SYSTEM**

To be candid, no industry can function without electrical power even for the short period of time. A supply of electricity is very necessary and compulsory in industry to be able to provide lighting to the various

facilities present on the site and to also provide the power to drive small and large items of plants. However, there are two sources of electrical supply to the site – namely (1) electricity supply from N.E.P.A board and (2) portable self – powered generators. The latter is always provided to augment the former, which is becoming something else in Nigeria.

The main incoming service into industry must be fed from two different sources if at all possible, with an automatic transfer switch between two feeders. It is preferable to bring the power in through underground services if possible because of the phase line directly from National Electric Power Authority board. This design would eliminate the necessity of providing a ground fault circuit interrupter; a device has created problems for some installations with nuisance tripping.

The design proposal of the electrical services of Abuja printing press have been given a careful thought with a prepare balance established between space requirement, service continuity, flexibility, regulation, efficiency maintenance and operations cost and initial investment. All panel boards and swath boards must be metal – enclosed with hinged doors and good latches. Suitable working space must also be provided

and maintained around switch boards a panel boards. Panel board must be located brand; circuit runs to feet 100 less. Automatic circuit breakers must be provided for used for all power and lighting feeders and receptacle branch Feeders. The breakers must be so designed that when one is tripped anyone can easily see which breaker is tripped without having to try each one. It is important to properly label each breaker so that most people can readily determine which area each breaker controls. Each panel must be marked so as to indicate where the panel is fed from. All breaker panels must be designed with at least 25 percent spare capacity for future expansion.

Generally the use of copper wire is preferred for industrial use because it does not combine or react easily. And as a general rule, all the industrial wiring must be carefully and correctly done so as to minimize loose connections.

#### **PLUMBING SYSTEM.**

Plumbing service enhances efficiently and smooth functioning of the facilities provided on site. Industrial / domestic metal pipes are connected to the various blocks of the proposed industry and areas requiring water

supply from major water source. Plastic pipes are used for connecting water closets, sinks, baths and so on to the soakaway. Roof gutters are drained to the ground gutters through PVC pipes fro. However, for complex structures like other mechanical or electrical design is usually done by competent engineers-frequently specialists. This is because, these systems are often complicated, involving the action and control of water and air within pipes, and engineers must be well qualified in the fields of hydraulics and pneumatics. The water service entry pipes is valued at three locations-at the water mains, below the curb box and inside the house. The pressure at the street main is usually about 50psi, which is enough to raise the water to upper levels, overcome friction in the tubing and to assure proper flow at the fixtures.

#### **DRAINAGE SYSTEM**

Is a system of pipes, generally underground used to convey the discharge from roofs, paved areas and sanitary and to a point of discharge or treatment. The discharges of rainwater and font water can be conveyed together in a single drain or in separate drains to the public sewers. According to local authority directions based on their treatment. The

drainage systems of Abuja printing press was designed within the limits of the terrain, even though the site is relatively flat, so that the discharges can flow by gravity from the point of origin to the point of discharge. In addition to this the pipe sizes and gradients are selected to provide enough capacity for maximum expected flow to prevent deposits.

### **SEWAGE DISPOSAL SYSTEM**

This can be defined as a system as a means of conveying waste, soil or rainwater below the ground that has been collected from the drains and conveying it to the disposal point. Sewer can be classified into two- public sewer and private sewer. The sewer owned by the local authority does a single person own called public sewer while the one or groups of people are called private sewer. In planning the connection of buildings to the main or public sewer, one method is to consider each block in isolation but important economies in design can be achieved by the use of a private sewer.

## **FIRE SERVICES**

The aftermath effect of fire in any building can never be overemphasized, so care must be taken when handling design right from the sketching stage up to the choice of materials and construction stage. For instance the planning of this proposed Abuja printing press had been fashioned out in such a way to reduce spreading of fire by segregating the facilities all around the site. Nevertheless fire extinguishers are placed at strategic point to all buildings and hose-reels sourced from the mains water storage are installed close to buildings. The materials selected up to the roofing level have been proved to have high fire rating capacity.

However, this industry falls under categories of building where there is extra hazard of fire (petrol station, pharmaceutical e.t.c). This is because the raw materials and finished materials are highly combusted and so in this view a greater number of fire extinguishers will be needed.

## **CHAPTER EIGHT**

**8.0 AESTHETICS**

**8.1 GENERAL APPRAISALS**

**8.2 CONCLUSION**

**BIBLIOGRAPHY**

## CHAPTER EIGHT

### 8.0 AESTHETICS

Aesthetics can be defined as that part of philosophy, which deals with the perception of beautiful as distinguished from the moral or useful. It is also the branch of psychology which deals with sensations and emotions evoked by beauty. Now having said this, there is this general believes that aesthetics is a very subjective phenomenon. This habitual saying "beauty is in the eye of the bidder" proves this. Yes these of course still holds but I am of the view that a carefully planned design most times wins the applause of the sundry. So in this regards Abuja Printing Press is a modern design which evolved owing to thorough consultations. There is an immediate sense of variation and richness throughout the whole proposals which was made possible by the juxtaposition of avalanche of materials ranging from variable roof forms; terraces; external wall treatments, grandiose combination of numerous landscape elements. e.t.c

In this proposal (design), I acknowledge the theory of space and light, which have positive psychological, health and energy saving benefits. This is shown by the fact that positive exposure to full spectrum light

results in less truancy; better dental health increased concentration levels as well as encouraging more positive moods. Also as part of the proposals, the aesthetics of the interior decoration is reinforced by the use of specially designed furniture system, the generously proportioned tables in various offices, board room, reception e.t.c all in a bid to encourage positive attitudes, moods and high performance. In addition, the proposed design with its apparent simplicity conceals a deep understanding of various factors necessary for smooth running of the industry.

#### **8.1 GENERAL APPRAISALS**

In appraising a project of this magnitude, it becomes very imperative to hard press some of the appreciable qualities the proposed design possessed. Nevertheless, it is a proposal committed to recognizing the need for future expansion (expanded innovations), permit flexibility of all kind if the need arise in future.

## **EASY ACCESSIBILITY**

The proposed design is going to be housed in Abuja. Abuja as we all know remains the seat of the Federal Capital Territory. It has a well-linked and good road network. The ideal site is easily accessible, infact the question of easy accessibility should be put off. This is because Abuja road network remains the best in this country as at today and coupled with fact-that problem of traffic-hold –up is hardly noticed.

## **PLANNING**

The basic principles guiding this proposed design i.e. the canonic approach to design and zoning principles. Although the site layout was done to reflect the hierarchy of the traditional industrial pattern which is also the zoning principles. The facilities are spaced in such a way to allow for easy circulation. In addition to canonic design and zoning principles, the design permits flexibility and spaces for future expansion. The planning conspicuously defy curve type of driveways within the site, this is to avoid maneuvering for heavy trucks who usually form curve ways difficult.

## **LANDSCAPE**

The proposed design is landscaped in such a way that as you drive into the site you could have a possible appreciation of a panoramic view of the beautiful but simple serenity. This is made possible by the grandiose combination of numerous landscape elements such as trees, shrubs, grasses, flowers, lighting fixture round the site, water pool, fountain e.t.c. Undoubtedly such type of site enhanced pleasant environment conducive for business transaction and the main job in this particular industry.

## **PARKING, LOADING AND OFF-LOADING BAYS**

As part of the requirement for this industry and for it to excel, enough parking spaces were provided for staffs and visitors. Loading and off loading bays was also provided for trucks, lorries and van. Ambulance bay was provided and even located in close proximity to the works clinic. In addition to these requirements, the security must be provided.

## **FACILITIES**

**All necessary facilities for “operation excellence” of the proposed Abuja Printing Press were provided. They include administrative block, welfare block, maintenance/engineering block, production block, warehouse, waste section and a host of others that are merely included in the site plan.**

## **8.2 CONCLUSION**

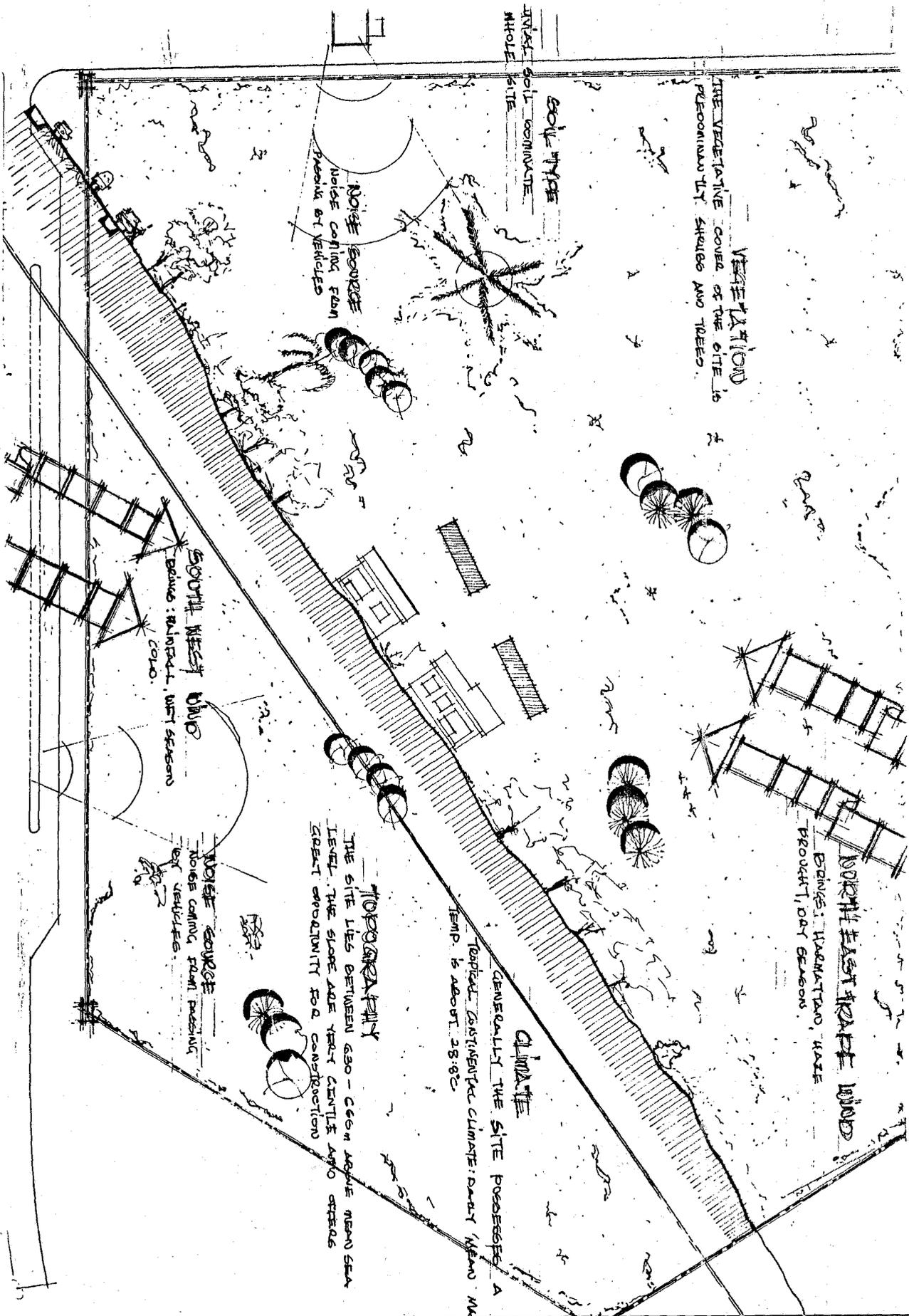
It is arguably agreed among people that the world is becoming a global village as a result of electronic interdependence in today business world. Also education, the acronyms on the lips of everybody still maintains that without it no meaningful development can takes place. One thing we have come to realize however is that through education events, issues and ideas have and can still been communicated to us and possibly passed on to the next generation and those yet unborn. In this wise human sense of awareness becomes more sharpened. Centuries have gone by when Francis Bacon opined that “reading makes a man”. His pre-supposition was that reading of course education affect us at all levels of our development.

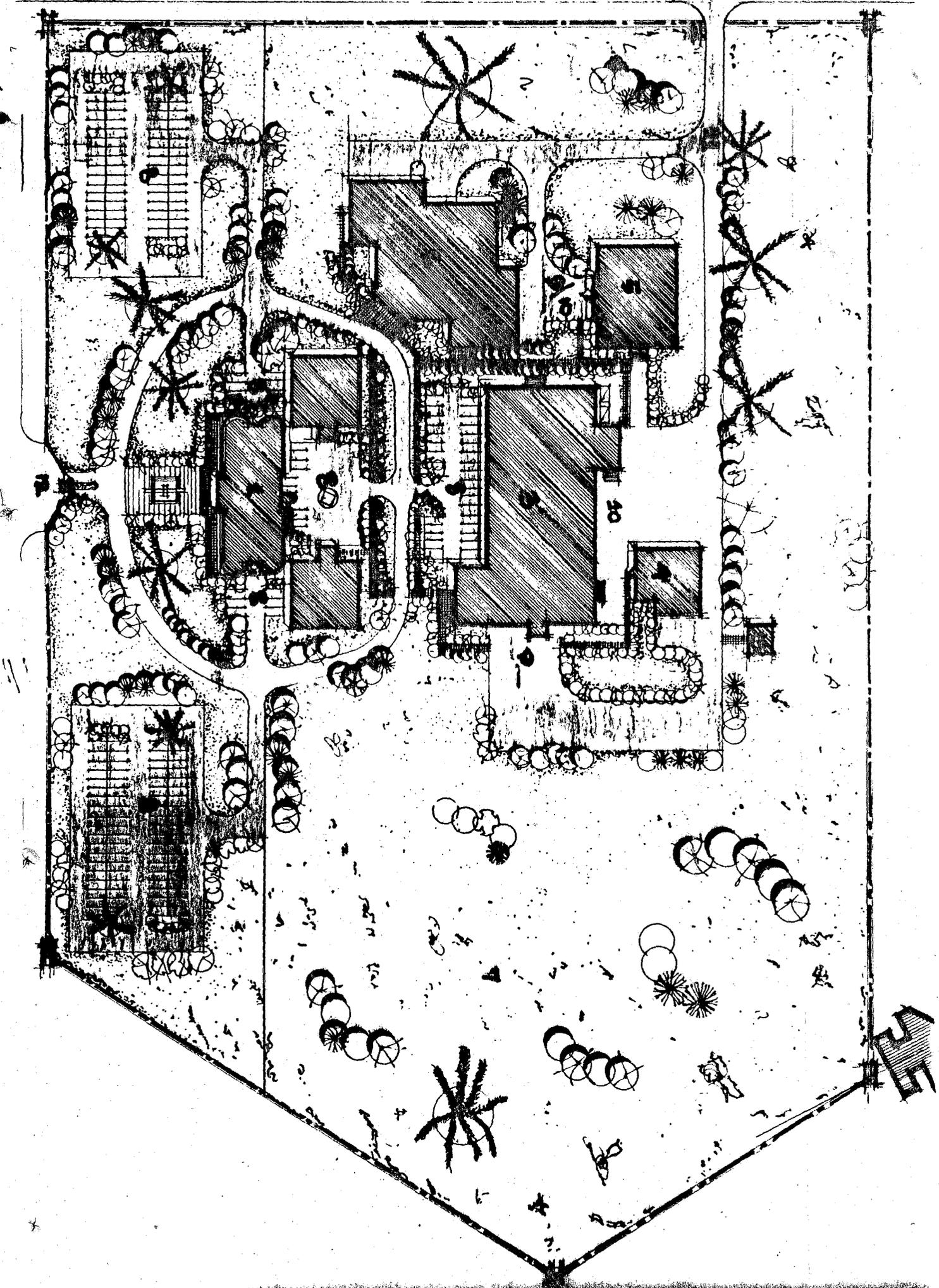
In spite of these remarkable achievements of education which led up to the increasing demands for printed jobs like textbooks, periodicals, journals, newspapers, magazines and a host of others. At this point in time one cannot but agree to the fact that the job of printing press is such a huge and Herculean tasks that requires an articulate, well carefully and thoughtful planned design like the proposed Abuja Printing Press.

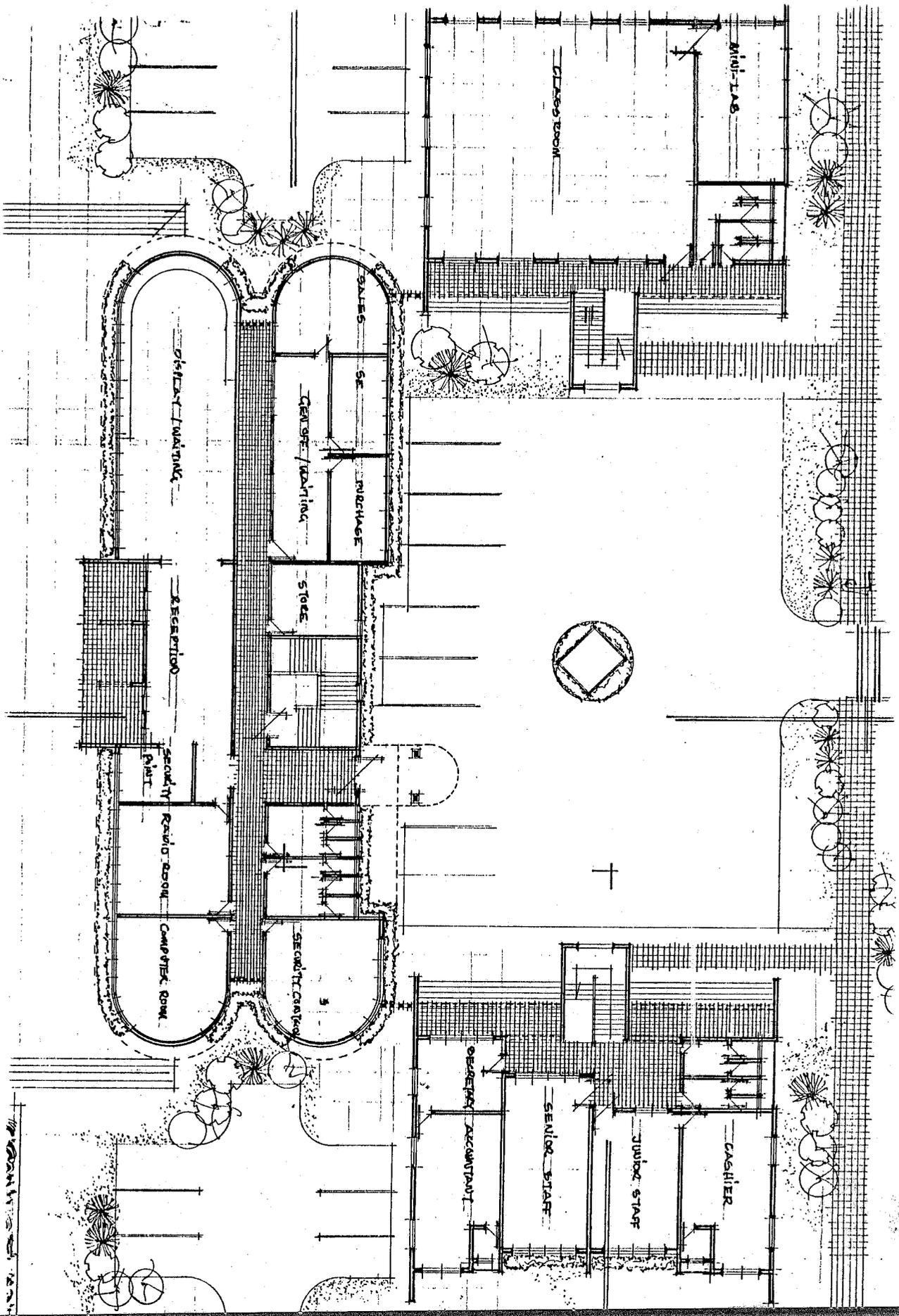
## **BIBLIOGRAPHY**

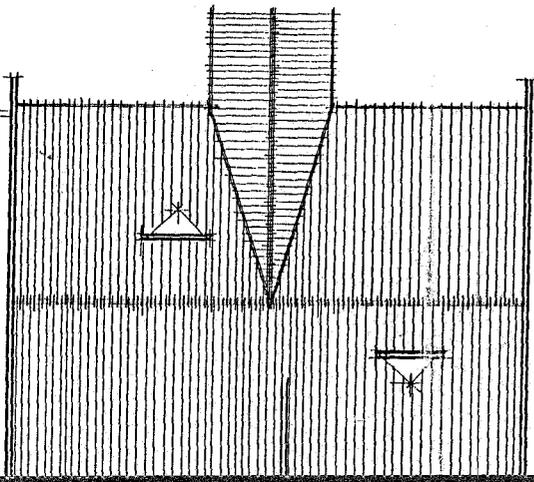
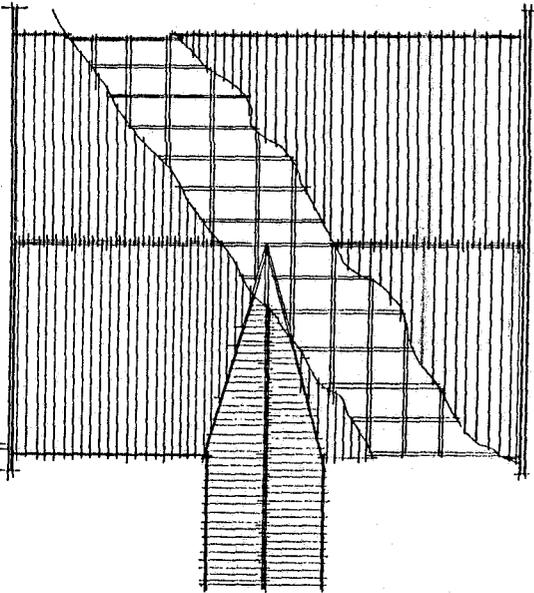
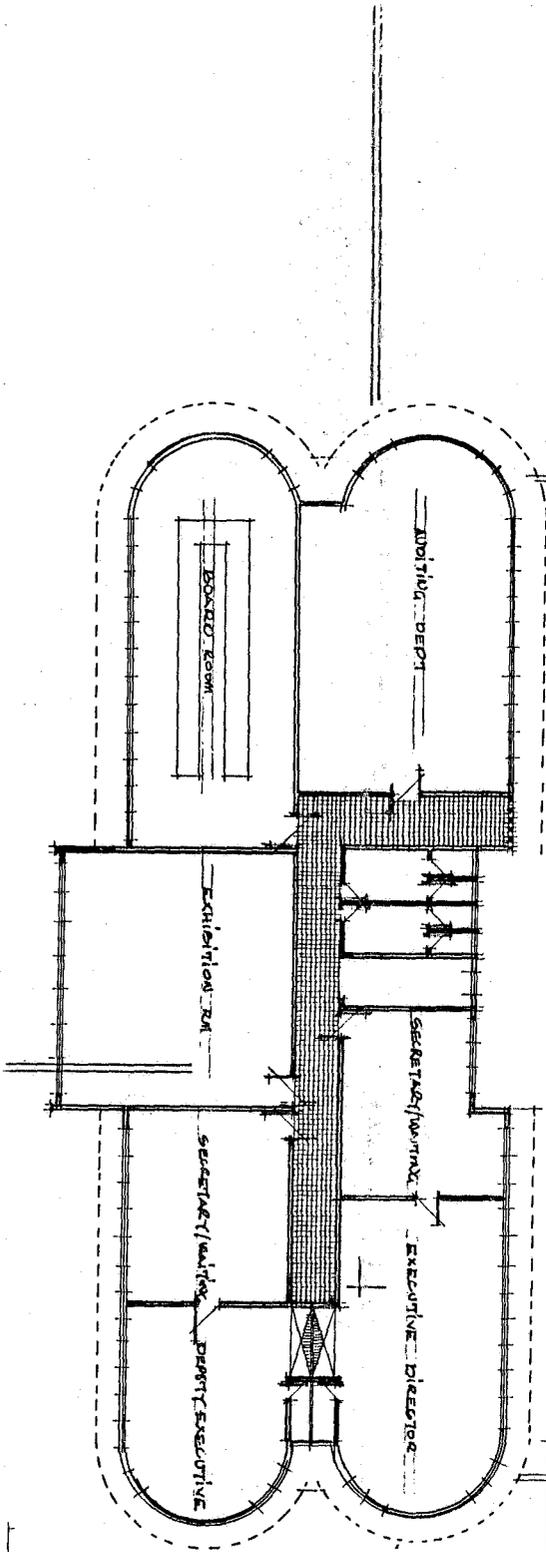
- **Calendar Et Al 1984 "The Time Savers Standards For Building Types" Third Edition Mc Graw – Hill Inc U.S.A. Arcitectual Design Data.**
- **Collier's Encyclopaedia, Volume Macmillan Publiser, New York 1981.**
- **Edward J. Muller 1967 "Architctural Drawing And Light Construction" Prentice Hall Inc New Jersey.**
- **Encyclopaedia Britannica, Volume U.S.A**
- **Francis D.F. China 1975. "The Building Construction Illustrated" V.N.R Publisers, New York.**
- **Gary Hack Et Al 1984 "Site Planning" Mit Press England.**
- **Harvey M.R. 1992 "Pedestrian Malls Streetscapes And Urban Spaces Copyright Edition, John Willey And Sons Inc U.S.A.**
- **Joseph Dechiara Et Al 1984 "Time Savers Standards For Site Planning Third Edition Mc Graw – Hill Inc U.S.A.**
- **New Standard Encyclopaedia, Volume Sec Publishers, Chicago.**
- **Oladayo Odeniyin "Giant Strides" Volume 1 V.B.O International Limited, Nigeria.**

- Peter J. Curven 1981 "The Uk Publishing Industry 1st Edition Pergamon, England.
- R. Barry 1984 "The Construction Of Building Volume 3 3<sup>rd</sup> Edition Elbs, Britain.
- Reuben K. Udo, Et Al 1993 "Nigeria : Giant In Tropics Volume 2 Gabumo Publishing Co. Ltd, Nigeria.
- The Encyclopaedia Americana, Volume Grolier Incorporated U.S.A. 1980.
- The Master Plan For FCDA February, 1979.



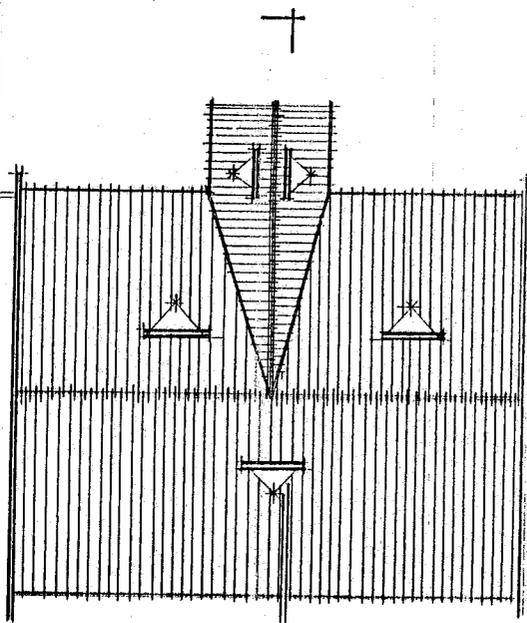
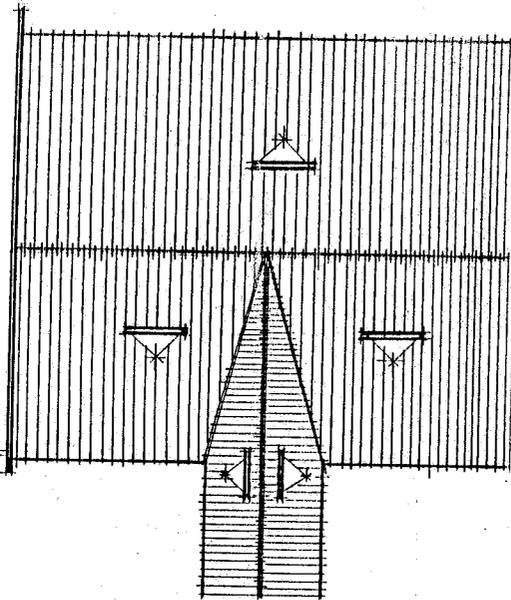
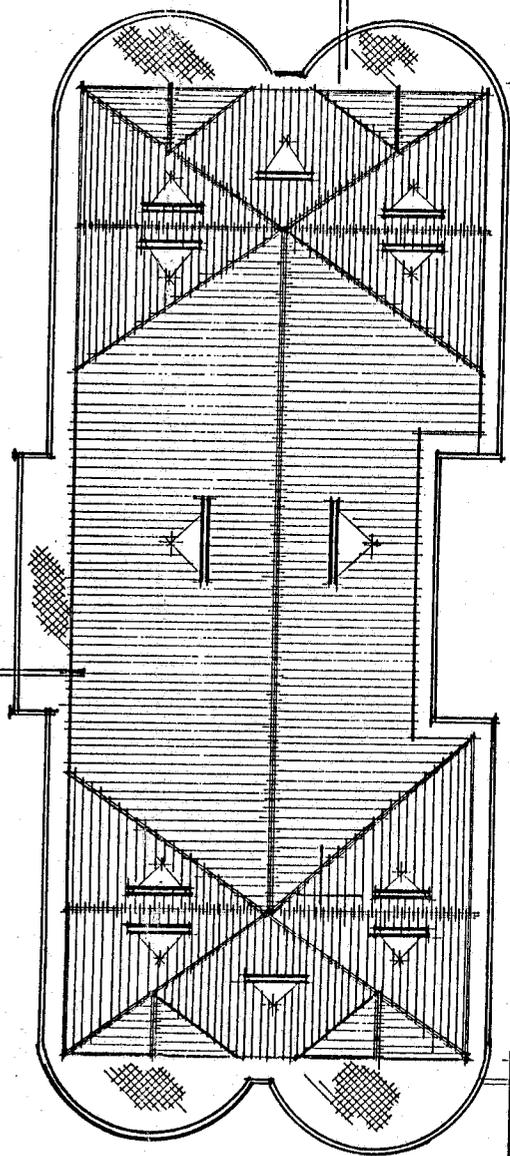




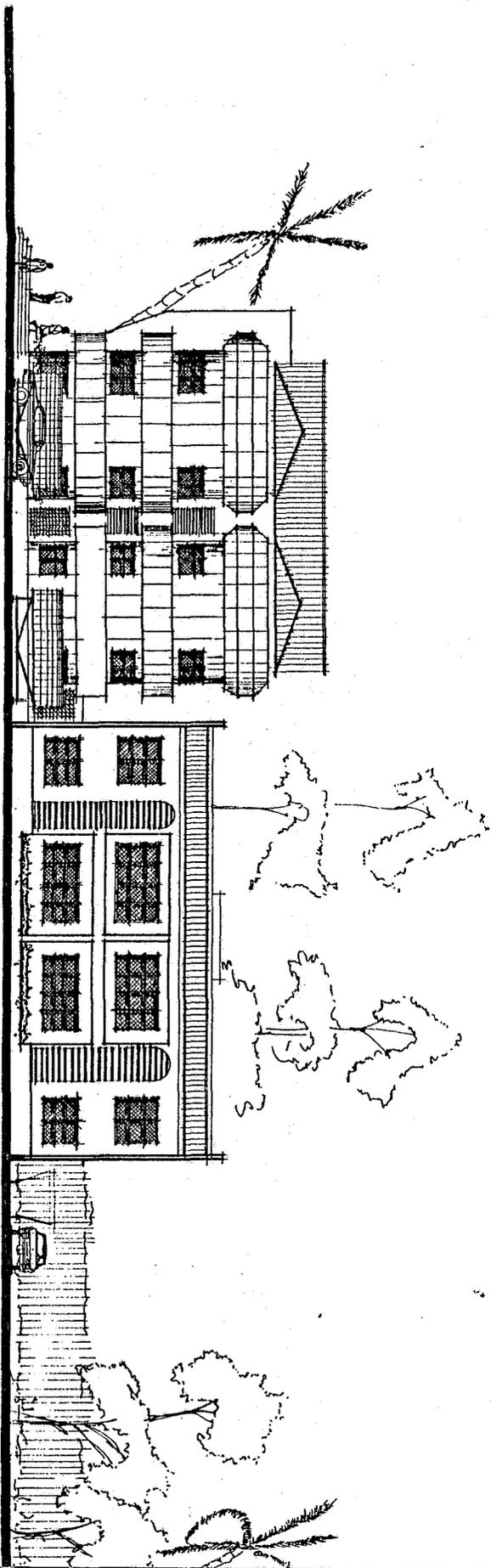


J

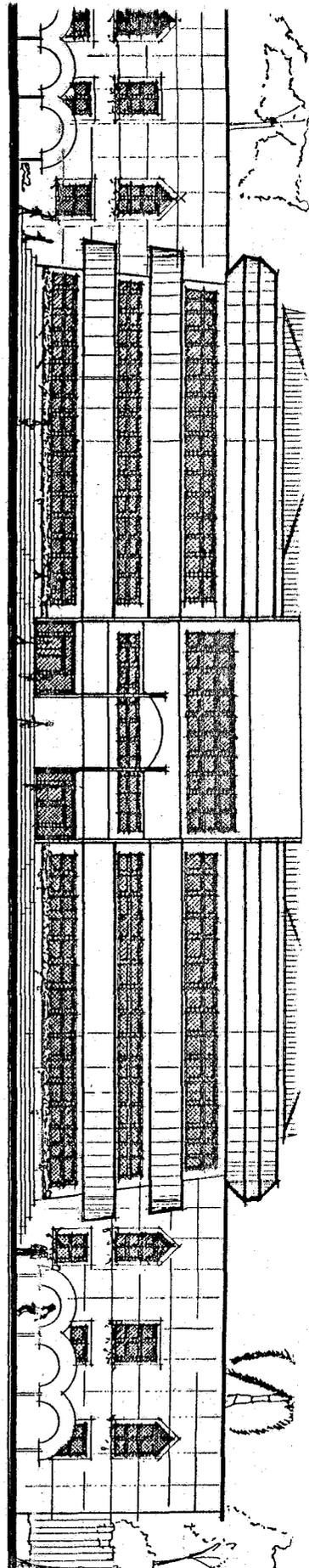
ROOF PLAN



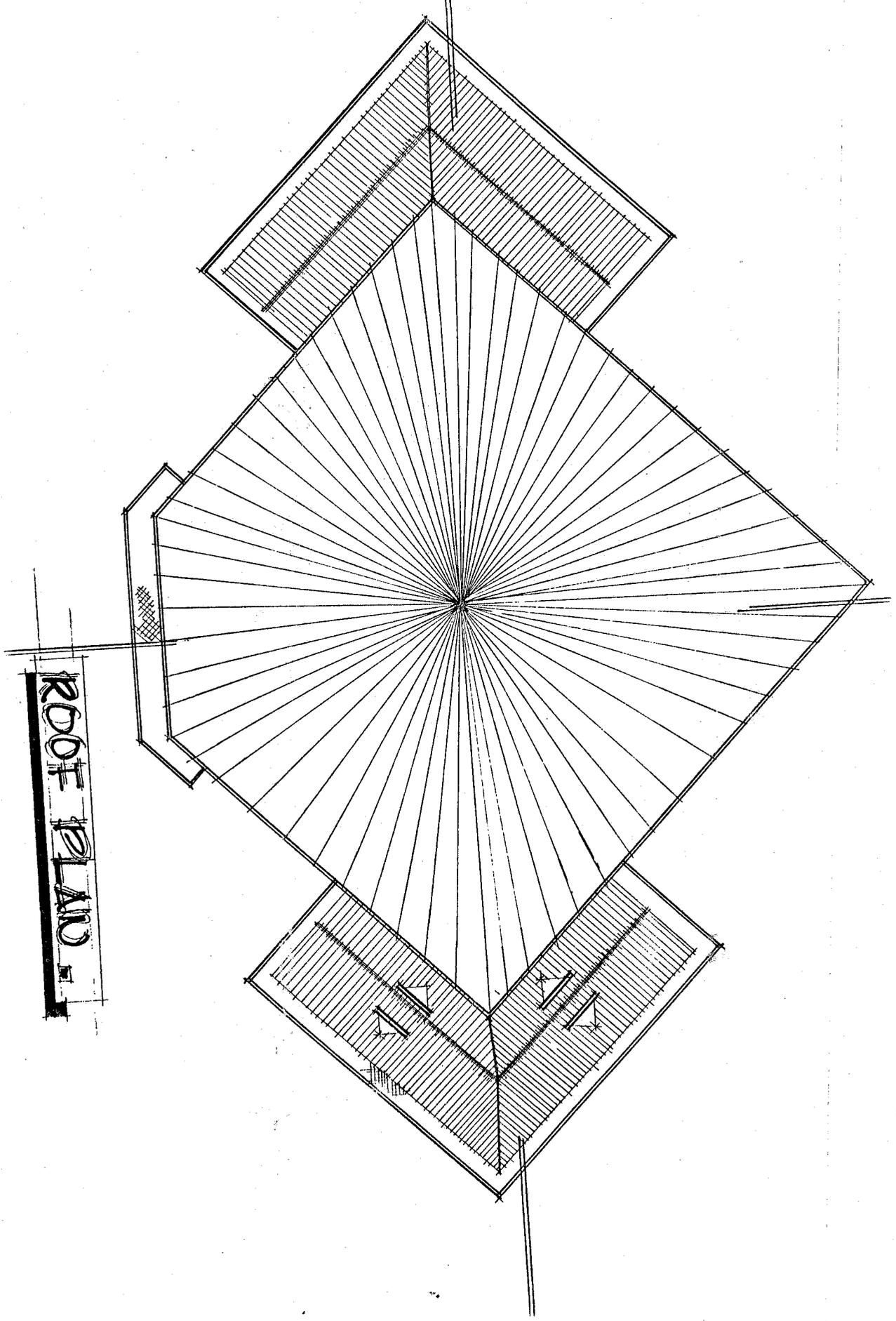




APPROACH ELEVATION

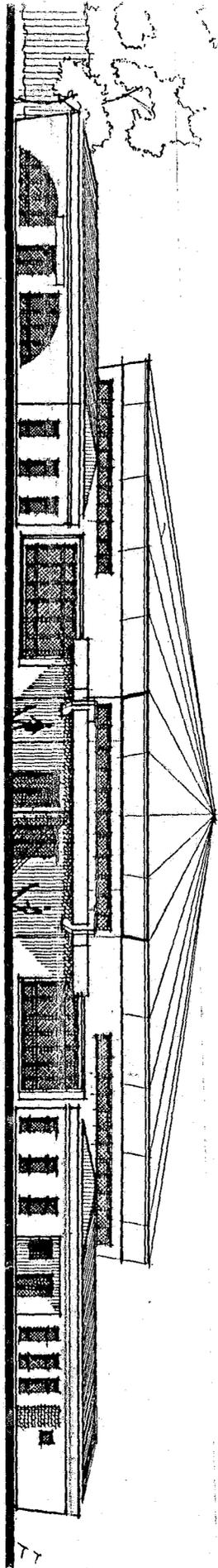




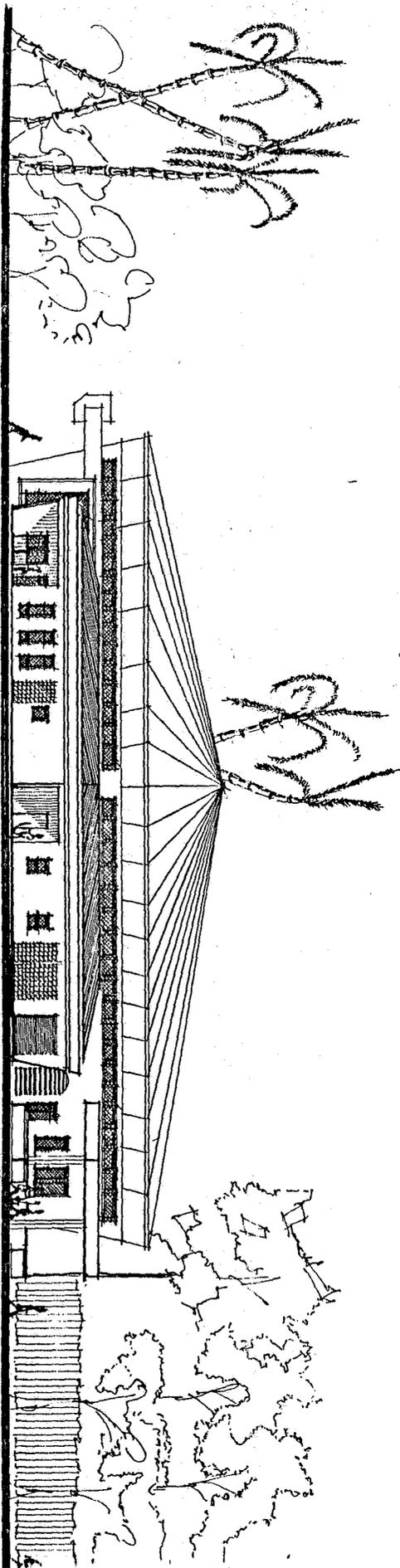


ROOF PLAN

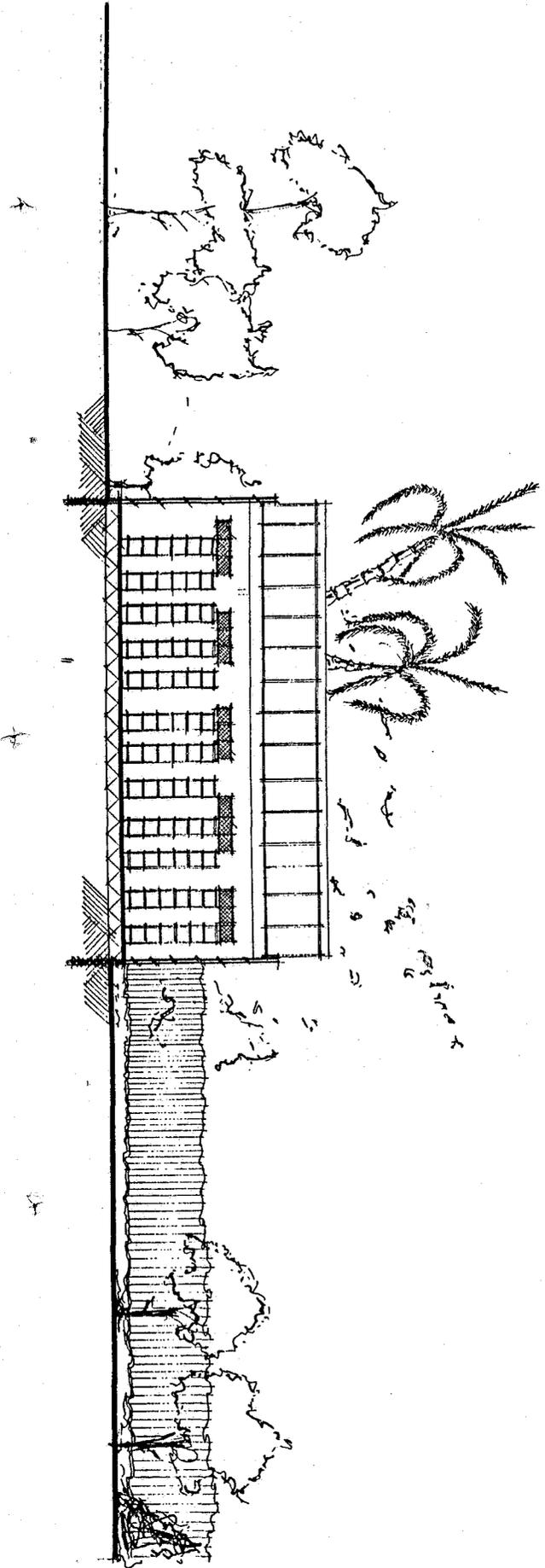




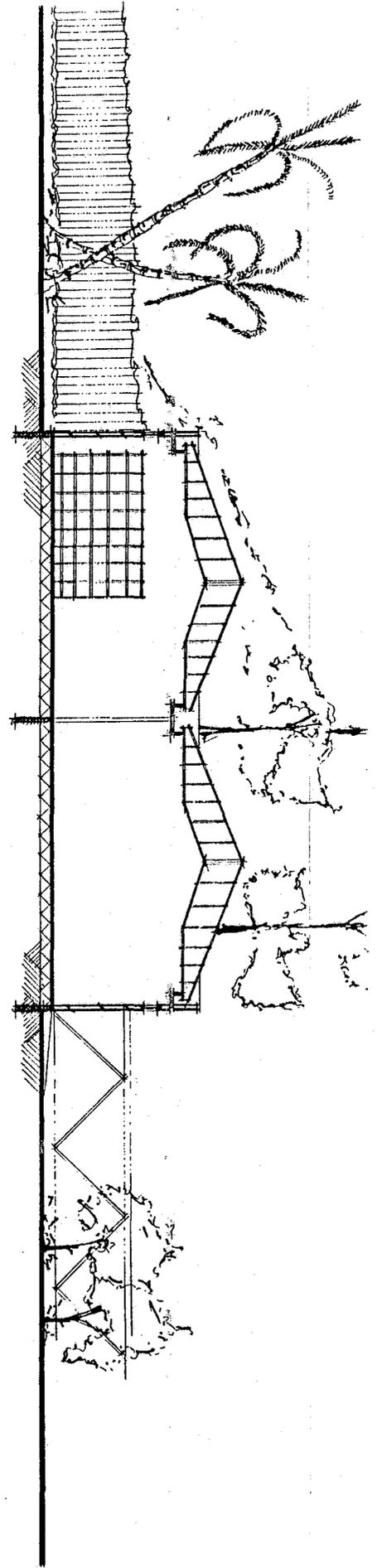
APPROACH ELEVATION



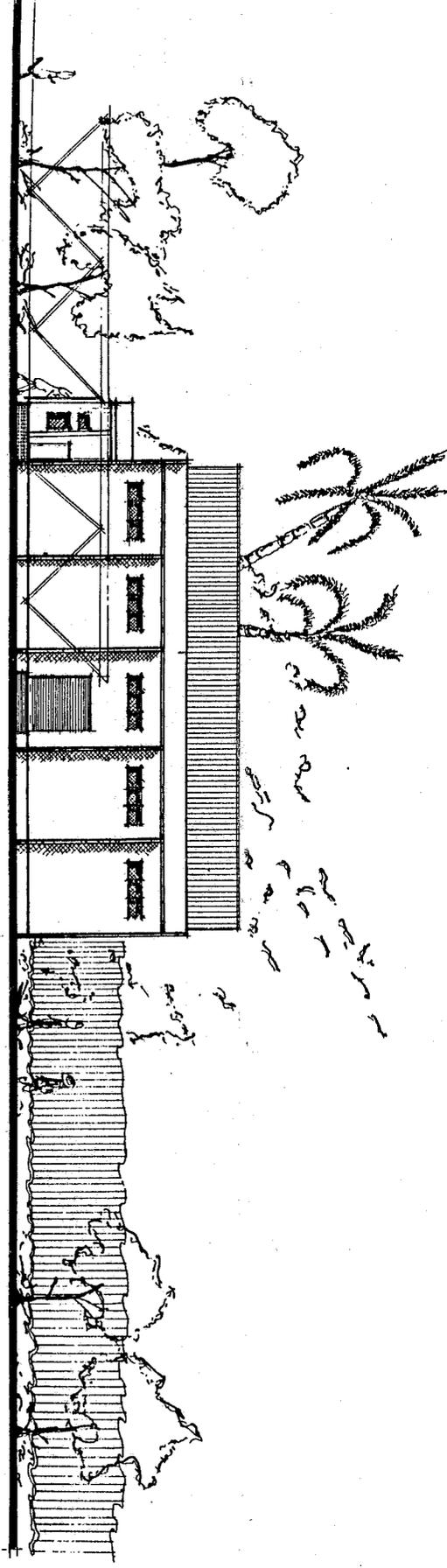
SIDE ELEVATION



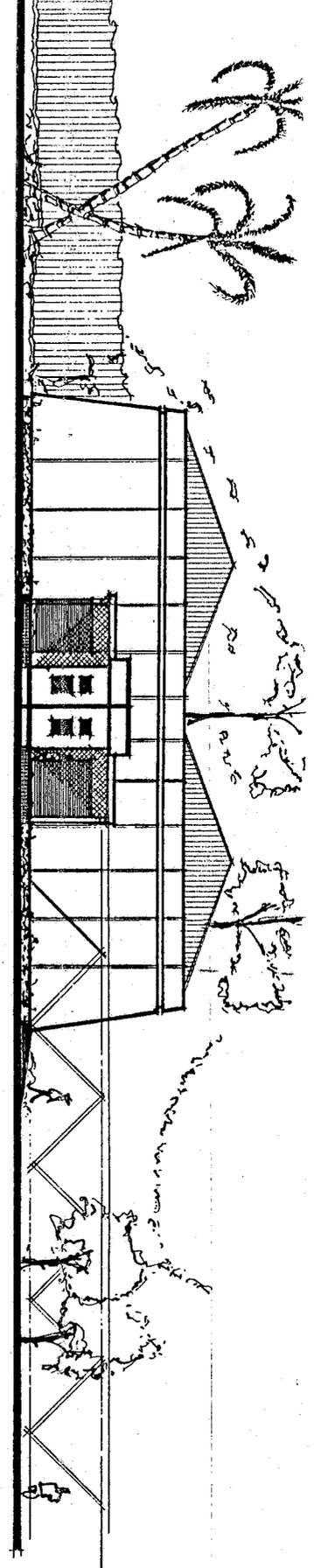
SECTION A-A

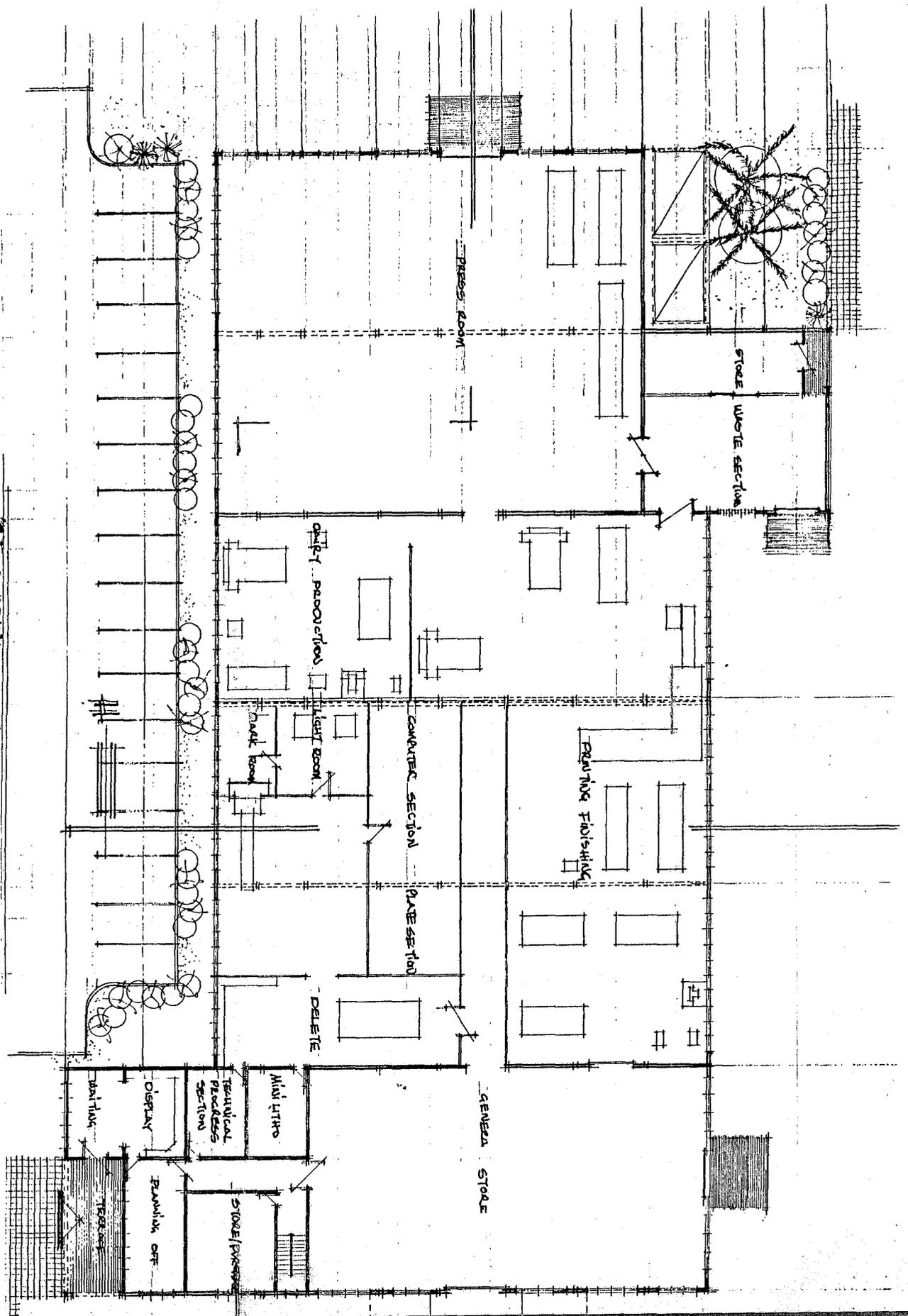


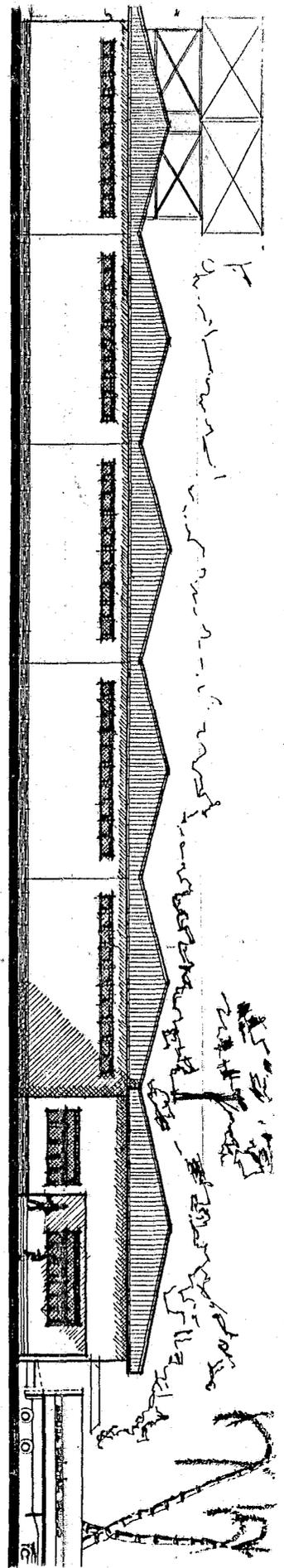
LEFT SIDE ELEVATION



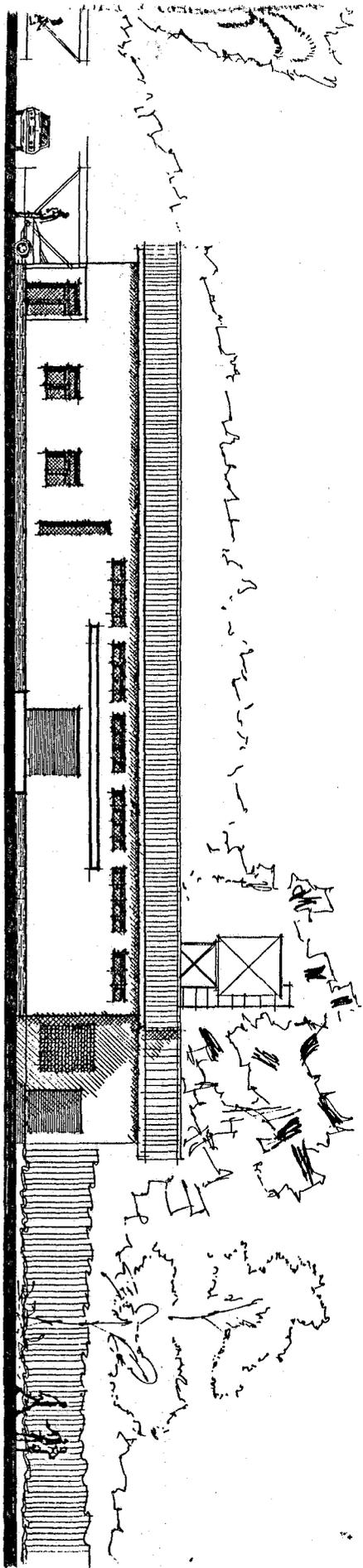
APPROACH ELEVATION





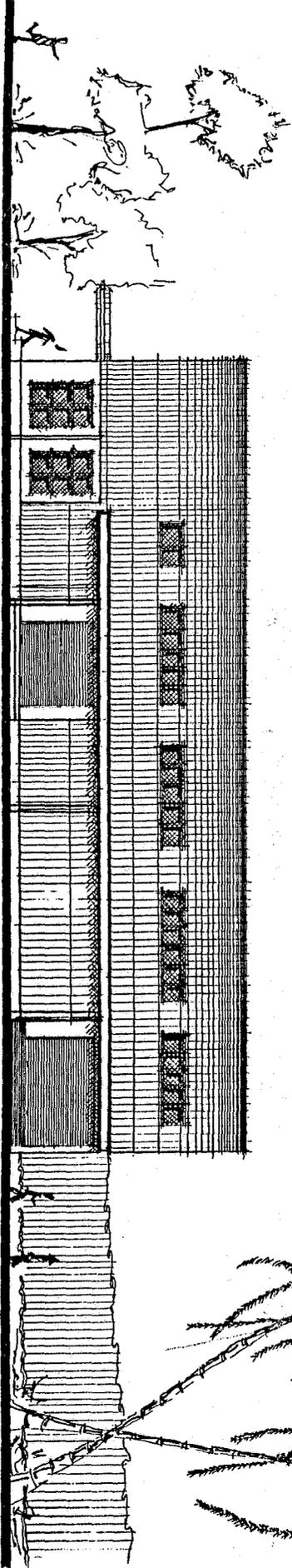


APPROACH ELEVATION

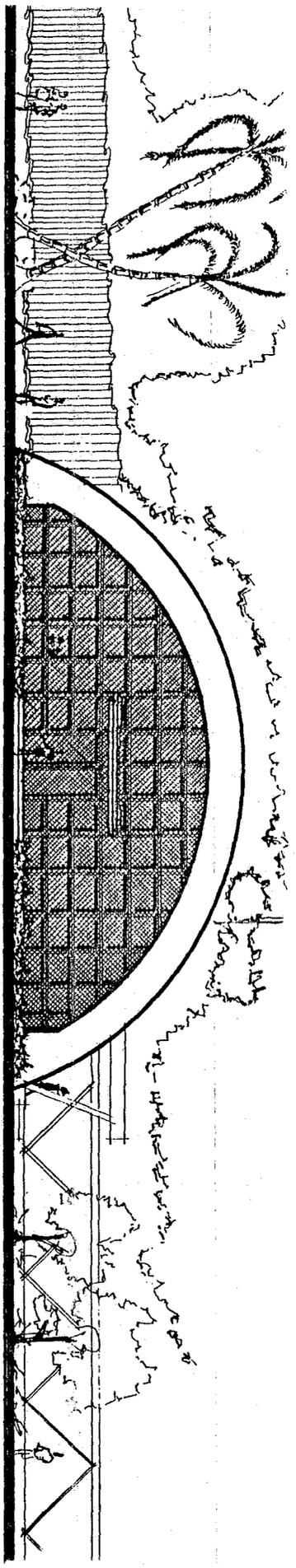


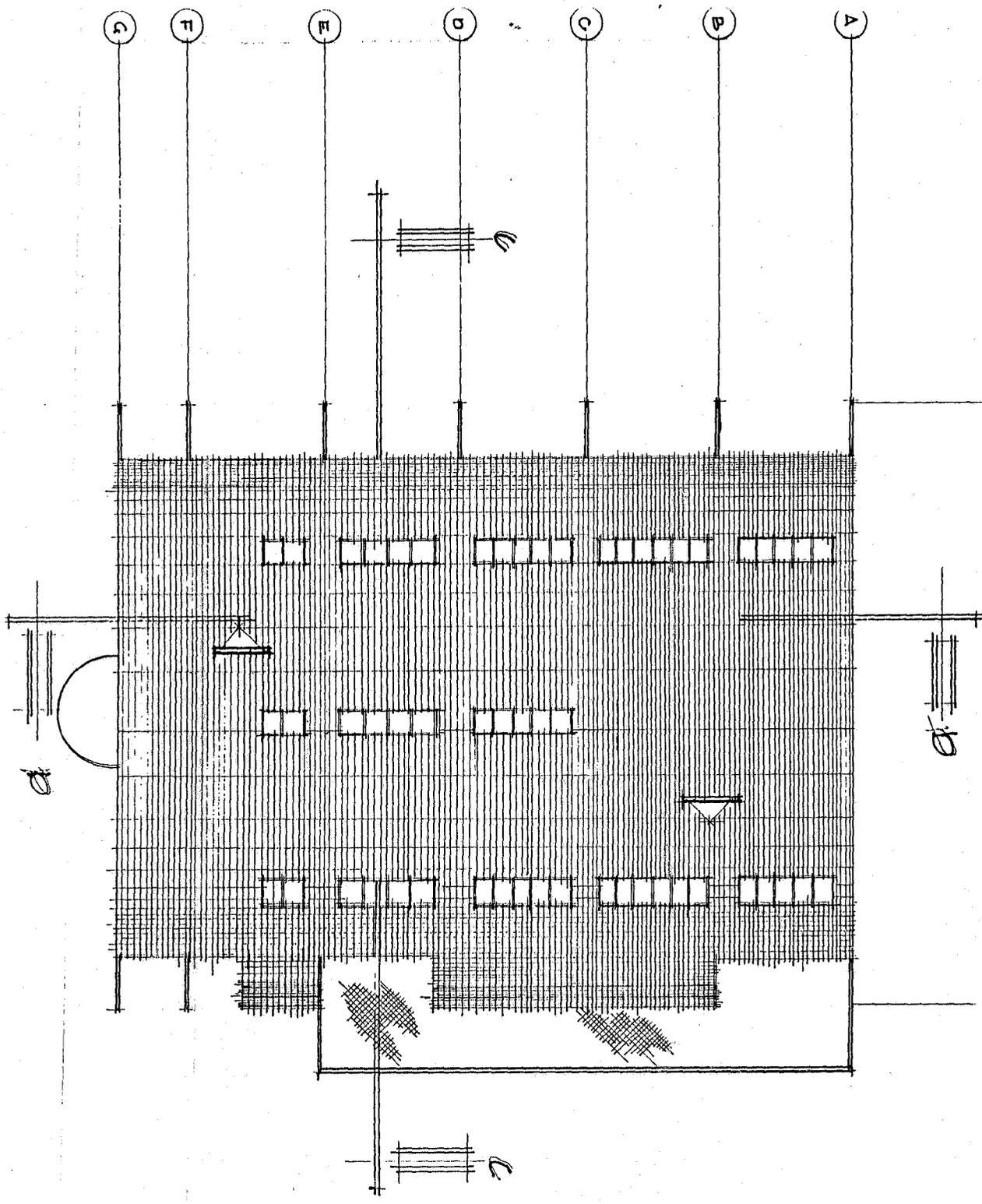
LEFT SIDE ELEVATION

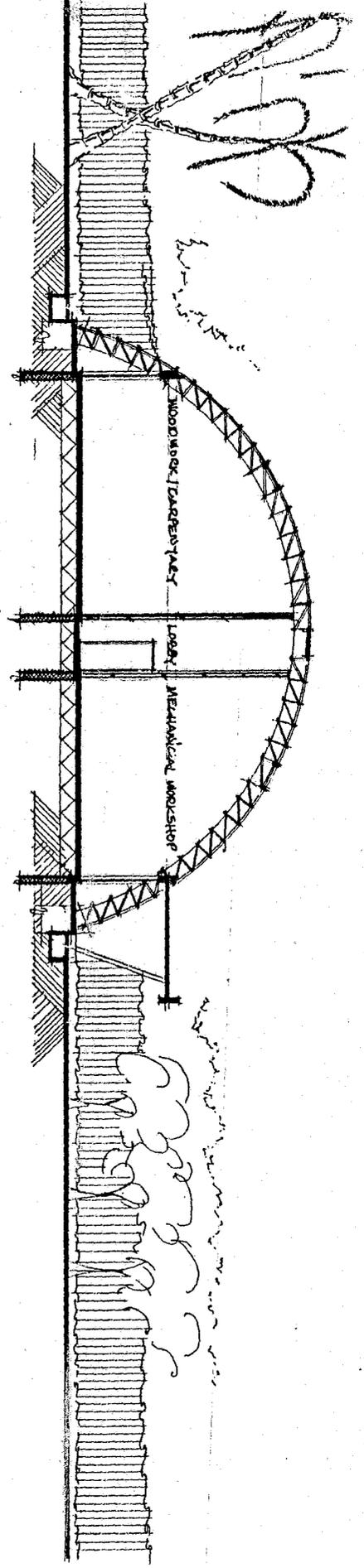
1-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100



APPROXIMATE ELEVATION







**SECTION C-C**

