

**SCHOOL OF ENVIRONMENTAL
TECHNOLOGY OLABISI ONABANJO
UNIVERSITY
IBOGUN CAMPUS**

Effective Accommodation and Circulation for Learning

BY

ELEMIDE OLUDAISI OLUSEGUN

(ARC/99/3557)

**Being a thesis submitted to the School of Post Graduate Studies,
Federal University of Technology, Akure in partial fulfillment of the
Degree of Master of Technology(M. Tech) in Architecture.**

MARCH , 2007.

**SCHOOL OF ENVIRONMENTAL TECHNOLOGY
OLABISI ONABANJO UNIVERSITY
IBOGUN CAMPUS**

Effective Accommodation and Circulation for Learning

BY

ELEMIDE OLUDAISI OLUSEGUN

(ARC/99/3557)

Being a thesis submitted to the School of Post Graduate Studies,
Federal University of Technology, Akure
in partial fulfillment of the Degree of Master of Technology
(M. Tech) in Architecture

SEPTEMBER, 2006

CERTIFICATION

This thesis entitled School of Environmental Technology Olabisi Onabanjo University Ibogun campus. An Effective Accommodation and Circulation for Learning by Elemide Oladaisi Olusegun meets the regulation governing the award of a professional degree of MASTER OF TECHNOLOGY IN ARCHITECTURE (M.TECH) of Federal University of Technology, Akure and is approved for its contribution to knowledge and literary presentation.

.....
Supervisor



.....
DATE

.....
Member Supervisory Committee

.....
DATE

.....
Head of Department

.....
DATE



DEPARTMENT OF ARCHITECTURE
THE FED. UNIVERSITY OF TECHNOLOGY
AKURE.

DECLARATION

I ELEMIDE OLUDAISI OLUSEGUN of the Department of Architecture, School of Environmental Technology, Federal University of Technology, Akure, Ondo State, hereby declare that this thesis work has been a personal academic exercise executed under the supervision of my supervisors, Professor O.O Ogunsote and Arc. J.J Adam of the Department of Architecture, Federal University of Technology Akure, Ondo State. The thesis work has not been presented wholly or partially for any degree or award elsewhere.

All sources of information have been duly acknowledged.



Signed

ELEMIDE OLUDAISI OLUSEGUN

DEDICATION

God made it possible and unto Him my praises shall go for everything He has done. He gave me a wife after His own will and for my companion, thank you **Dr. Olayinka 'Nike Elemide**.

AKNOWLEDGEMENT

Man is not an oasis of ideas, for the success of this work, my profound gratitude goes to my supervisor **Prof. O.O. Ogunsote**, my co-supervisor **Arc J.J. Adam** for sparing their limited time to supervise and contribute to this thesis. Their corrections and advice led to the success of this project. I also acknowledge the fatherly input of the coordinator of the Department on this project **Dr J.A Fadamiro**. I really appreciate him. Great kudos to the Head of Department and other lecturers i.e. **Arc A.A. Taiwo** who spared their time to put me through the project.

Appreciation also goes to the entire staff of the college of Engineering and Environmental sciences Olabisi Onabanjo University Ibogun Campus, Ogun State especially **Arc. Oriola**.

Departmental of Meteorological service; **Double "E" Business Venture** and other agencies that contributed to the success of this job.

I also wish to acknowledge the great contributions of my friends, Uncles, Nieces, Nephews Ministers etc. for their total and full support even when the going was tough, they inspired, assisted and supported me and got me going. I thank you all.

My children **Jedidah** and **Joshua**. I thank you for paying part of my school fees.

TABLE OF CONTENTS

PAGE

Title Page	i
Certification	ii
Declaration	iii
Dedication	iv
Acknowledgement	v
Table of Contents	vi
List of Figures	xii
List of Tables	xiii
Abstract	xv

CHAPTER ONE BACKGROUND TO THE STUDY

1.0 Introduction	1
1.1 Aim and Objectives	2
1.2 Justification of the Study	2
1.3 Research Methodology	3
1.4 Limitation of The Study	4
1.5 Problem Statements	4
1.6 Scope of the Project	5
1.7 Contribution to Knowledge	5

CHAPTER TWO	LITERATURE REVIEW	
2.0 School		6
2.1 Brief History of Modern University		6
2.2 University System In Nigeria		7
2.3 History of Environmental Design Education In Nigeria		9
2.4 History of Faculty of Environmental Science In Nigeria		11
2.5 Establishment Of Olabisi Onabanjo University, Ago-Iwoye In Ogun State		12
2.6 Environmental Science Education in Olabisi Onabanjo University		14
2.6.1 Administrative Pattern		14
2.6.2 Faculty Curriculum		15
2.7 Modern Planning Concept		15
2.8 Building Types		15
CHAPTER THREE	CASE STUDY ANALYSIS	
3.0 Case Study		17
3.1 Faculty Of Environmental Design, Ahmadu Bello University Zaria		17
3.1.1 Architecture Block		19
3.1.2 Building And Urban And Regional Department Block		22
3.1.3 Department Of Industrial design And Fine Art Block		24
3.1.4 Administrative Block		26

3.2 Faculty Of Environmental Design, University of Lagos [Proposal]	27
3.3 Faculty of Environmental Design, University of Lagos [Existing]	30
3.4 College of Architecture, University of Nebraska Lincoln	33
3.5 Faculty of Environmental Design and Management Obafemi Awolowo University, Ile-Ife	35
3.6 School of Environmental Technology, Federal University of Technology, Akure	40

CHAPTER FOUR PROJECT SITE APPRAISIAL

4.0 Site Location	45
4.1 physical Layout Description	46
4.1.1 Site Topography	47
4.1.2 Landscape	48
4.1.3 Hydrology	48
4.1.4 Subsoil And Bearing Capacity	49
4.1.5 Vegetation	49
4.2 Climatic Data	49
4.2.1 Rainfall	50
4.2.2 Air Masses	51
4.2.3 Temperature	52
4.2.4 Humidity	52
4.2.5 Solar Effect	53
4.3 Climatic Control	53

4.4	Site Analysis	54
4.4.1	<i>Physical Site Analysis</i>	54
4.4.2	Infrastructural Site Analysis	54
4.4.3	Cultural Site Analysis	55
4.4.4	Aesthetics Site Analysis	55
4.4.5	Acoustics Site Analysis	56
4.5	Constraints	56
4.6	Potential Development Areas	56
4.7	Circulation	56
4.7.1	Access Control System	57
4.7.2	Stairs	57
4.7.3	Ramps	57
4.7.4	Plants And Landscaping	57
4.8	Elements Of Circulation	58
4.8.1	Building Approach	58
4.8.2	Building Entrances (From Outside To Inside)	59
4.8.3	Configuration Of The Path (Sequences Of Space)	59
4.8.4	Path Space Relationships (Edge Nodes And Termination Of The Path)	60
4.8.5	Form of Circulation Space	61
4.9	Spaces And General Planning Considerations	62
4.9.1	Modeling Workshops	62
4.9.2	Design Studio	62
4.9.3	Fine Art Studio	63

4.9.4 Administration Suites	63
4.9.5 Dean's Office	63
4.9.6 Lecturers' Office	63
4.9.7 Storage	63
4.9.8 Car Parking	64
4.9.9 Conference and Seminar Rooms	64
4.9.10 Classrooms	64
4.9.11 Library and Data Rooms	65
4.9.12 Workshop (S)	65
4.10 General Planning Considerations	65
4.10.1 Site Accessibility	66
4.10.2 Planning For Growth	66
4.10.3 Departmental Interdependence	88
4.10.4 Service And Fire Prevention	67

CHAPTER FIVE PROJECT ANALYSIS

5.0 Project Consideration And Zoning	68
5.1 Concepts	70
5.1.1 Site Zoning Concept	71
5.1.2 Design Concept	72
5.2 Explanation Of Form	73
5.3 Design Brief	73
5.4 Design Note	74

5.5 Schedule Of Accommodation	75
5.6 Analysis Of Space Allocation	81
CHAPTER SIX SUMMARY, RECOMMENDATIONS AND CONCLUSION	
6.0 Summary	83
6.1 Recommendations	84
6.2 Conclusion	85
References	86
Appendix	

LIST OF FIGURES

Figure 3.1- Site Layout of Faculty of Environmental Studies (A.B.U)	18
Figure 3.2- Approach Elevation Department of Architecture (A.B.U)	19
Figure 3.3- Plan of Roof top Cafeteria and Studios (A.B.U)	20
Figure 3.4- Ground Floor Plan of U.R.P and Building Departments	22
Figure 3.5- Elevations of U.R.P and Building Departments	23
Figure 3.6- Ground floor plan of IDD and Fine Art Departments	25
Figure 3.7 – Approach Elevation of IDD and Fine Art Departments	25
Figure 3.8- Typical Section of the Proposed school of Environmental Design UNILAG	27
Figure 3.9- Ground Floor Plan (of 3.8)	29
Figure 3.10- Approach view of the faculty of Environmental Design (of 3.8)	30
Figure 3.11 Site Layout of the Department (of 3.10)	31
Figure 3.12 Part Elevation of the New ETF Building (of 3.10)	33
Figure 3.13 Ground Floor Plan College of Architecture, University of Nebraska, Lincoln	34
Figure 3.14 Faculty Building of Environmental Design and Management O.A.U	36
Figure 3.15 QTS/URP Departments (of 3.14)	37
Figure 3.16 Departmental Restaurant (of 3.14)	38
Figure 3.17 Floor Plan of the Faculty Office (3.14)	39
Figure 3.18 Floor Plan of QTS/URP Departmental (of 3.14)	39
Figure 3.19 Approach view School of Environmental Technology, FUTA	40
Figure 3.20 Part of the Face Two Showing Single Loaded Corridors	41

Figure 3.21 First Floor Plan SET FUTA	42
Figure 3.22 Site Layout of First and Second Phase SET FUTA	42
Figure 3.23 Link Between First and Second Phase	44
Figure 4.1 Site Location on Maps	45
Figure 4.2 Present Faculty of Environmental Tech. O.O.U	46
Figure 4.3 Entrance into the school	47
Figure 4.4 Temporary Structure on the Site for General Use	48
Figure 4.5 Administrative Building	54
Figure 4.6 A Typical Building Approach used in the Design work	58
Figure 4.7 Main Entrance into the Building	59
Figure 4.8 Grid, Spiral, and Radial forms of paths configuration	60
Figure 4.9 Pass By Space use along the Corridors	60
Figure 4.10 Paths Way passing through the Central Exhibition Areas	61
Figure 4.11 Paths Way Terminate in a Classroom	61
Figure 5.1 Site Zonning Structure of the Proposal	68
Figure 5.2 Bubble Diagram	71

LIST OF TABLES

1 Abeokuta Monthly Rainfall (mm) (2006)	51
2. Abeokuta Average Monthly Temperature (%) (2006)	52
3. Abeokuta Average Monthly Relative Humidity (%) (2006)	53
4. Abeokuta Average Monthly Sunshine (hours) (2006)	53
5 Schedule of Accommodation	75
6. Data Sheet	81

ABSTRACT

The need for school arose in the olden days when there was need to gain, transfer, improve and devise knowledge. Soon, spaces were erected and these erected spaces have continually been transformed to suit the trend of time and civilization. Due to rapid increase in population vis a vis population increase in student enrollment the available spaces soon become inadequate and unsuitable for learning as apparent in Olabisi Onabanjo University. Hence, the need for provision of purpose built structures bearing in mind the peculiar nature and characteristic of activities to be carried out in them

The School of Environmental Technology of Olabisi Onabanjo University which is a young college presently making use of recycled structures for its academic activities and of which there is need for permanent and purpose built structures that will suit the peculiarity of a school of Environmental Technology.

The analysis and synthesis of data collected and visits to sites for case studies were documented. Research methods used include gathering of information from primary and secondary sources. All collected data were critically analyzed and synthesized to get necessary information that is used in the proposed design brief to achieve effective integration of space. The comfort of the students is given positive consideration by providing comfortable learning spaces and making the environment attractive and suitable for learning using nature and man made enrichment items.

CHAPTER ONE

BACKGROUND TO THE STUDY

1.0 INTRODUCTION

A school is a place of education... Longman, (1977) and a nation hoping for greatness cannot but pay prompt and adequate attention to Education and training, thus the concern for the upliftment and the well being of students in all levels of learning cannot be over emphasized. As the nation's population grows so is the population of her youths and precisely those at school age i.e. between the ages of (12-25) yrs. This has brought about a sharp increase in the number of students being enrolled in various schools in Nigeria and particularly in our tertiary institutions.

This drive mentioned above has led to the thriving of education as a business at various levels with less attention paid to the complimentary infrastructures needed. This led to haphazard enrollment of students first followed by the establishment of facilities. In most cases, the inadequate facilities provided are soon overstretched and vandalized with students who are bent on getting western education at all cost being subjected to harsh environments and atmosphere that is not conducive for learning.

On many occasions, policies and political factors of Government at all levels do not help matters. These in fact played a prominent role in the establishment of Olabisi Onabanjo University and the change from a single campus institution to a multi campus institution and this has been altered on two or more occasions, thus when the present administration decided to start the campus under review they had only the building earlier donated to the institution by the host community. Therefore the school had to take off with the adaptation of structures that were not built for the purpose they are being put to and the attendant problems can best be imagined.

The environment is the complex of physical, chemical and biological factors and processes that sustain life and a School of Environmental Technology is a school where all the courses and disciplines that has to do with this definition are run. One of such schools includes Olabisi Onabanjo University a state owned institution in Ogun State.

An environment that is educationally friendly is thus proposed to create a forum whereby students undergo their training in their chosen career with less hardship and rigours so as to maintain maximum concentration and optimal opportunities for them.

1.1 AIM AND OBJECTIVES

The aim of this research is to create a good, appealing and active environment for learning.

OBJECTIVES

- To create space with mechanism that will foster good relationship between users of the building, through effective circulation system, good space integration and blending of interior and exterior spaces.
- To create an active and attractive environment for learning, through utilization of natural materials and integrate the building into it's setting for effective planning.
- To create out door leisure and recreational facilities to achieve a relaxed but serious environment for learning
- To enhance and control classrooms' planning with reference to circulation.

1.2 JUSTIFICATION OF THE STUDY

In educational institutions the students population is neither static nor courses run, when those obvious changes occur, the result is that accommodation space has to

be found elsewhere. This consequently results in the de-unification of such a faculty, if the buildings are not purpose built.

The present situation in the College of Environmental Technology of Olabisi Onabanjo University is tending towards the above statement. The reason being that the building presently used as the school of Environmental Technology is an adapted structure which was built as students hostel donated to the institution by the host community.

This structure is not suitable for the reason stated below:

- ❖ Inadequate space for academic activities, which is responsible for the partial take off of the school i.e. only three departments are currently in operation.
- ❖ Unsuitability of the adapted spaces for the unique form of education required in the school of Environmental Technology.

As a young developing faculty, this study will prepare it for future growth. According to Lewis Mumford (1963) "Each growing institution be it a factory, hospital or school must handle the problem of quantitative growth and seek to establish a dynamic equilibrium and controlled method of growth".

1.3 RESEARCH METHODOLOGY

Planning must be based upon knowledge, which depends on information that comes as a result of survey. Therefore the methodology through which this thesis is carried out is based on primary and secondary mode of gathering data or source of information. The primary source of information is basically field investigations, which include interviews and observation of physical traces.

Interview: This involves talking to people who are in positions to volunteer needed information. This method was extensively used in the course of finding out the

structure of the school of Environmental Technology of Olabisi Onabanjo University. Also conducting interviews with students, lecturers and other staffs so as to know their feelings and reaction to the community and other facilities provided in the environment.

Observation Of Physical Traces: This entails going to places that are under study and making observations and taking notes. This method was employed while carrying out the case studies of existing schools and colleges of Environmental Technology in Nigeria and abroad.

The secondary sources of information involve desk research or information from the archives basically for intensive review. This involves making extensive use of libraries and other related literatures to obtain the histories and background of the study.

1.4 LIMITATIONS OF THE STUDY

(I) Time had to be shared between lecture, other assignments, traveling for collection of data and library research.

(ii) Due to the multi-campus system of the institution, and frequent movement of documents to and from the main campus, the location of some documents was hard to determine.

1.5 PROBLEM STATEMENTS

The aim of education will not be completely realized if the tools which include good facilities, learning aids, lecturers, effective instrument of control in a conducive atmosphere for learning are not put in place.

Most learning environment are not responsive to the users and as such academic excellence will be greatly reduced. A dull environment will no doubt affect

learning process seriously. Intellectual development, responsibility to oneself and to the community at large, liberation of one's mind and soul are major reasons for establishing schools and training institutions

Therefore an academic environment that is devoid of qualities, psychological as well as the physical welfare of every participant in education delivery is not worth it. All these must be done borne in mind under the good economic considerations of the edifice i.e. bringing out the all round best from a scarce resources and limited opportunity.

1.6 SCOPE OF THE PROJECT

As a result of the existing situation in the school, the scope of this project or the design solution will be toward the creation of a School of Environmental Technology that will actively and effectively satisfied the functions of the education it intend to serve and which not only accommodates but present a very conducive environment for learning for both short and long term usage.

1.7 CONTRIBUTION TO KNOWLEDGE

The proposal provides in road and in depth solution to the problem of purpose built academic spaces, the problem of circulation in rushing period and deviation from the normal corridor system as classroom openings do not open directly into long corridors but are recessed and spaces separate them from the connecting corridors. This serves as buffers for noise and for definition.

CHAPTER TWO

LITERATURE REVIEW

2.0 SCHOOL

The term school according to Longman's Dictionary of Contemporary English is defined as a place of education while a faculty is defined as a branch or division of learning especially in a University. Environment has a variety of definitions depending on the perspective and professional background of those who have attempted to define it i.e. Environment, as an element of ecology, is seen as the science of the organism in relation to other organisms of different species, and to those of its own kind. But the environment can be more broadly defined as the complex of physical, chemical and biological factors and processes that sustain life.

The school of Environmental Science or Technology or Studies is that school or faculty that offers courses and disciplines that has to do with the environment either as sciences, Arts or Technology.

2.1 BRIEF HISTORY OF MODERN UNIVERSITY

Modern Universities had their beginning in the institution started by the Christ's Church in Europe during the middle ages. European universities were not the first in the world. However, the university of Al- Azhar founded in Cairo in the 10th century is the oldest that is still in existence and full time operation. Some of the early European Universities were brought about by group of students brought together by common interest. These students employed scholars to teach them. The University of Bologna, which began in Italy in the 11th century, was organized in this manner. Other universities such as the University of Paris, which began in the 12th century, were started by group of masters or teachers. The masters collected fees from

their students and controlled the policies of the University. The plan of organization that was developed at the University of Paris became the model for England's Oxford and Cambridge. Oxford and Cambridge in turn greatly influenced the universities of the United States and other parts of the world.

2.2 UNIVERSITY SYSTEM IN NIGERIA

A University is an institution of higher learning established for the purpose of awarding a degree or its equivalent in the multifaceted field of human endeavour. A university usually comprises of different schools, colleges, faculties and other center of specialized training. A true university is a group of colleges or faculties under the same administration. All these subdivisions of a university (faculty, colleges) are academic centers which train, prepare students (undergraduate and post graduate) for professions like Engineering, Architecture, Medicine, Law, Pharmacy and a host of others courses in the arts, basic science and social science. A typical faculty / college offers a four to five years course that culminates, albeit successfully, with the award of a bachelor degree,

A University system has at least two divisions. Namely; a four to five years liberal faculty for undergraduates and; a graduate school (school of post graduates) for students who already possessed a bachelor degree and are seeking an advance (master and doctorate degree).

Accredited colleges, faculties and universities in general are those school that are certified by certain regulatory bodies as meeting certain standards with regards to such matters as curriculum, staff libraries, and equipment. The bodies or agencies that do the accreditation include regional association of schools, state officials and professional societies. Each university determines the requirement that entering

student must meet.

University Education in Nigeria started with the establishment of a University College, Ibadan in 1948. It had an initial student's enrolment of 210. The admission continued to be limited to small numbers and the student's population did not reach 2,500 until at independence in 1960; about 12 years after its establishment, Ibadan with such a limited scope of operation and a relative buoyant economy sustained by the export of crops like cocoas, timber, ground nut etc. the financial demands of Ibadan hardly attracted the attention of the Nigeria public. The University College Ibadan (UCI) also benefited from overseas financial assistance. The report of the Ashby commission on Higher Education in Nigeria led to the establishment of new universities in the early 1960's. Each of the three regional governments established a University; Ahmadu Bello University (ABU), in the North, Obafemi Awolowo University (OAU), Ile Ife in the West and University of Nigeria, Nsukka (UNN) in the East. The Federal Government also established a University in Lagos. The four universities were founded between 1960 and 1962. ABU, IFE (now OAU) and UNN, were largely funded by the regional government, while the federal governments, founded University of Lagos. The new universities enjoy a period of steady growth and development until 1966. During the period of the civil war finances like those of other sectors of the economy, were severely curtailed. This was at a period when the universities, particularly the new ones were increasing their enrolment and establishing new faculties. By the end of the civil war staff and students numbers had out stripped available facilities. The end of the civil war coincided with the oil boom and vastly increased resources became available to the federal government. Grants to universities were increase and the universities enjoyed another period of steady growth until 1975. In that year, the federal military government decided to take over

the state universities, which were ABU, OAU, NSUKKA and BENIN, which had been newly established by the Midwest government in 1973. At the same time, the federal government decided to establish seven additional universities to correct an apparent imbalance in the geographical spread of these institutions. The new institutions were Ilorin, Port Harcourt, Calarba, Kano, Sokoto, Maiduguri and Jos.

At first, gap between the universities demands and government grants was not large and government's initial response for more funds was that there was mismanagement of fund as a result of extravagance by the universities. It was partly because of these allegations and partly to be able to justify its recommendations to government on funding level that the National University Commission (NUC) in 1977 set up a committee under Late Brigadier General Ogundeko to examine the finances of the Universities.

2.3 HISTORY OF ENVIRONMENTAL DESIGN EDUCATION IN NIGERIA

Environmental Design is concerned with the interaction between the physical and biological environment and human activity. It examines and model ecosystem dynamics involving the atmosphere, the biosphere and the hydrosphere and the dynamic interrelations between the natural environment and human resources use and conservation. Because land and resource use places severe strain on ecosystems, much emphasis is divided towards developing knowledge, models and techniques to help ameliorate such strains, often through regulatory policies. The beginning of Environmental Education a conglomeration of the Departments of Architecture, Urban and Regional Planning, Estate Management, Quantity, Surveying, Building Department, Industrial Design and Fine art etc. In Nigeria defer from one department to the other, however the Nations dependency on a few graduates trained in foreign

institutions and on massive importation of foreign personnel for the efficient operations of the construction industry and ordered planning of our physical environment led to the release of the first ten year development plan of post world war era in 1946, which gave birth to the training of personnel to deal with problems of human settlements in colonial Africa.

There came for the first time the selection of Africans in the public works department (PWD- as it was then called) for special training in England. This paved the way for the setting up of formal institutions for indigenous staff. It must be mentioned that the initial intention was not to train them to become professionals but commonly to assist colonial masters in technical works. These were the circumstances, which surrounded the establishment of technical institutions in colonial Africa-Nigeria in particular and eventually opened the way to professionalism in environmental science and design.

Such indigenous institutions grow under the cover and tutelage of Royal Institute of British Architects and other such Institutions, for they were their only means of international recognition. Such Schools include the then Nigeria school of Arts, Science and Technology in Zaria and others in Khartoum, Kumase, Nairobi and so forth.

Up to 1971, there were only four institutions, which offered degree courses in Environmental Design in Nigeria. These are Architecture - offered in University of Lagos (UNILAG), Ahmadu Bello University (ABU), Zaria, and University of Nigeria Nzuka. Town Planning (ABU); Building ABU, UNILAG; Quantity Surveying (ABU) and Estate Management (Nzukka and Ife). This number increased later to five with the commencement of programmes in Environmental Design by University of Jos and Ife. By 1990, the number has increased to about eleven with the inception of

the Federal Universities of Technology on one hand and State Universities on the other hand. Among the new Schools that run programmes in Environmental Designs are Federal University of Technology Akure, Minna and Owerri. The River State University of Science and Technology, the Anambra State University of Technology, the Abia State University, Edo State University, and Olabisi Onabanjo University Ago-Iwoye, Ogun State.

2.4 HISTORY OF FACULTY OF ENVIRONMENTAL SCIENCE IN NIGERIA

Faculty of Environmental Science in Nigeria began in 1952 when it was first introduced at the then Nigeria College of Arts, Science and Technology, of the then University College Ibadan, and later transferred to the Zaria campus in 1955.

In 1962, the Zaria campus became a full-fledged University (Ahamadu Bello University) with a faculty of Architecture, awarding B.Arch. (RIBA) degree in place of former diploma of architecture (RIBA) certificate. In 1963, the University of Nigeria, Nsukka established a faculty of environmental Studies. And in 1970, the faculty of environmental Science of the University of Lagos was established and enjoined others to become one of the three premier schools in Nigeria.

There are twenty-five universities that have Faculties of Environmental Science, Technology or Design. They are: -

Ahamadu Bello University Zaria

University of Nigeria, Enugu Campus, Enugu,

University of Lagos, Akoka.

Obafemi Awolowo University, Ile Ife.

University of Jos, Jos.

River State University of Science and Technology, Port Harcourt.

Federal University of Technology, Akure.

Ambrose Ali University, Ekpoma, Edo State.

Federal University of Technology, Minna.

Federal University of Technology, Yola.

Enugu State University of Technology, Enugu.

University of Uyo, Uyo.

Ladoke Akintola University of Technology, Ogbomosho.

Abia State University, Uturu.

Olabisi Onabanjo University, Ago-Iwoye.

Abubakar Tafawa Balewa University, Bauchi.

Imo State University, Oweri

Cross River University of Technology, Calabar.

Covenant University Cannan Land, Ota.

Nnamdi Azikwe University, Awka.

Anambra State University of Science and Tech Uli.

Federal University of Technology, Owerri.

Kano University of Technology, Wudi.

Niger Delta University, Bayelsa

2.5 ESTABLISHMENT OF OLABISI ONABANJO UNIVERSITY, AGO-IWOYE IN OGUN STATE

In 1979, the first civilian Government of Ogun State under the leadership of the then state governor, late Bisi Onabanjo expressed its determination not only to establish more Polytechnics and Colleges of Education in the state but also to found a University for the state during his first term in office.

Consequently, by a letter dated 9th January 1982, the then Honourable state Commissioner for Education, Chief Akin Ogunpola convened the planning committee for the Establishment of the Ogun state University now Olabisi Onabanjo University.

On the 16th day of March, 1982, the planning committee submitted to the Honourable State Commissioner for Education a report which given the comprehensiveness of its coverage, the insights, the clarity and the imports of its ideas, constituted a veritable seven weeks 'wonder'.

Early in July 1982, that Honourable House passed a bill sponsored by the then chairman of the Education Committee of the Ogun State House of Assembly. With the ASSENT of the then civilian Governor of Ogun State, on 7th July, 1982 it became the law TO PROVIDE FOR THE ESTABLISHMENT, INCORPORATION, CONSTITUTION, POWER AND FUNCTIONS OF A PROVISIONAL COUNCIL OF THE OGUN STATE UNIVERSITY AND FOR OTHER MATTERS INCIDENTAL THERETO OR CONNECTED THEREWITH.

In April 1983, the Ago Iwoye community voluntary donated some 3.141 hectares of land at the outskirts of the town to Ogun State Government for the permanent site of the Ijebu campus of the university. The site is flanked on the East by a road linking Ijebu Ode with Ago-Iwoye through Oru Ago-Iwoye or Ijesha Ijebu or Ilishan road. On the West the site is bounded by river Erigba. The Southern boundary lies about 1 kilometer, South of the flood plain of River Oni. The 3.141 hectares of land earlier donated for the Ijebu Campus of the State University, thus becomes the permanent site of the then single Campus of the institution.

2.6 ENVIRONMENTAL SCIENCE EDUCATION IN OLABISI ONABANJO UNIVERSITY

Following the Establishment of Ogun state University in 1983, the University operated on a mono campus basis though it had the intention of opening up the faculties until year 2004 when the present civilian administration decided to open them up.

The present college of Engineering and Environmental technology situated at Ibogun came into existence and began full operation during the 2003/2004 academic session with their first intake of students drawn basically from direct entry form of admission and the school is currently operating in her 4th academic year of studies in the following courses, Architecture, Urban and regional planning and Fine and applied Arts with the intention of introducing other courses as soon as there is sufficient infrastructure for the purpose.

Hitherto what is known as the school of Environmental Technology was lumped up with the school of Social Sciences with courses run in Geography, and Regional planning, transportation Studies e.t.c. at their Ago-Iwoye Campus while the school of post graduate Studies is located at Abusi Edumare Academy in Ijebu-Igbo.

2.6.1 ADMINISTRATIVE PATTERN

At the highest level of the Administration in the University are the two executive Authorities (1) the Governing Council, responsible for the general control and supervision of policy, finances and property of the University (2) The Senate is responsible for the organization and control of teaching, admission and discipline of students. The vice chancellor is the Chief Academics and Administrative officer of the University.

At the next level of the University Administration and the day to day running of the college are the Rector who is responsible to the Vice Chancellor and the Dean of the schools. They are also the chief academic and administrative officers of the school. He or She is assisted in his or her duties by full administrative officers. The school also have board of studies chaired by the Dean but having the Vice Chancellor, the Deputy Vice Chancellor and the Rector as ex-officio members.

Under the various school are departments which constitute the basic unit of academic organization, at the apex is the head of department and also supported in his duties by clerks, typists and other non academic staff.

2.6.2 FACULTY CURRICULUM: The undergraduate programme is a four-year programme and this includes a six month industrial experience leading to the award of Bachelor degrees in the various courses.

2.7 MODERN PLANNING CONCEPTS: The planning of a School of Environmental Design and Management is best done through investigation into the educational and practical; requirement of the function to be provided as it is usually large and complex. However, before any detailed planning arrangement can be considered, the main building type must be in relation to the site selected. It is obvious that the size, location and physical nature of the site will have considerable influences on the final choice and that functional requirements, circulation need and economic will also be deciding factors.

2.8 BUILDING TYPES: There are three main alternative building types, which should be considered.

Where land is cheap and plentiful, and the building budget is low, an arrangement of separate single storey building can be employed. This type of building structure can be most economical to erect, but this saving in cost is offset by higher cost of

excessive pipe runs and cable for service, wasted space, unnecessary distance between department and difficulties in control and organization.

Where site are expensive and building must be erected in heavily populated areas; multistory structures are inevitable, but for a building of this nature (school building) such arrangement has disadvantages. Building of four storey and over will need goods and passenger lifts, provision of staircases and other like route become more elaborate. They are expensive to build, difficult to expand and tend to emphasize problems of organization and management.

When a mixture of single and multistory unit is planned, it is possible to use both type of structure to the best advantage. Basically, upper floors should be used for purpose, which require only light structural loading with a small, relatively static population minimum service and reasonably dimensioned clear structural span. Such accommodation would include offices, classrooms, studios, drawing offices etc. ground floor accommodation should normally be used for areas which have considerable population movement, heavy floor loadings or bulky plant and equipment, and which require large clear spans, high level natural lighting and considerable service runs, particularly drainage. These areas would include workshops, heavy laboratories, large lecture theatres etc.

CHAPTER THREE CASE STUDY ANALYSIS

3.0 CASE STUDY

The goal of case studying is to see how certain problems have been solved and how certain relationships have been achieved.

Case study is the critical analysis of design project from where ideals, inspiration and experiences are derived. It is the study of existing projects, which to a large would help in the design of the proposal.

To achieve this a study of the external views of the building, planning, orientation on the site in relation to climatic element, space arrangement, location of functions, types of building materials used in the construction techniques and finishing, among others were adequately looked into.

The above mentioned considerations can be described as the primary objectives of a researcher while collecting data, but some unforeseen circumstances may not allow for full achievement. The data collected are mainly represented by means of architectural drawings and photographs.

3.1 FACULTY OF ENVIRONMENTAL DESIGN, A. B. U.

ZARIA

The Faculty of Environmental Design, Ahmadu Bello University, Zaria, is one of the thirteen faculties of the University. It comprises of five departments, which includes, Department of Architecture, Building, Fine Arts, Industrial Design and Urban and Regional Planning.

The faculty is located to the North – West of the University's Senate Building; in the North it is bounded by the faculty of Engineering, in the East by Kashin Ibrahim Library (K. I. L.); in the South by Chemical Engineering Department, and in the West

by the School of General and Remedial Studies (SGRS).

CLIENT: AHAMADU BELLO UNIVERSITY ZARIA

ARCHITECTS: DR. J. S. GNIAZIKI, PROFESSOR A. E. ADEYEMI,
DR. DABROWSKI AND OTHERS

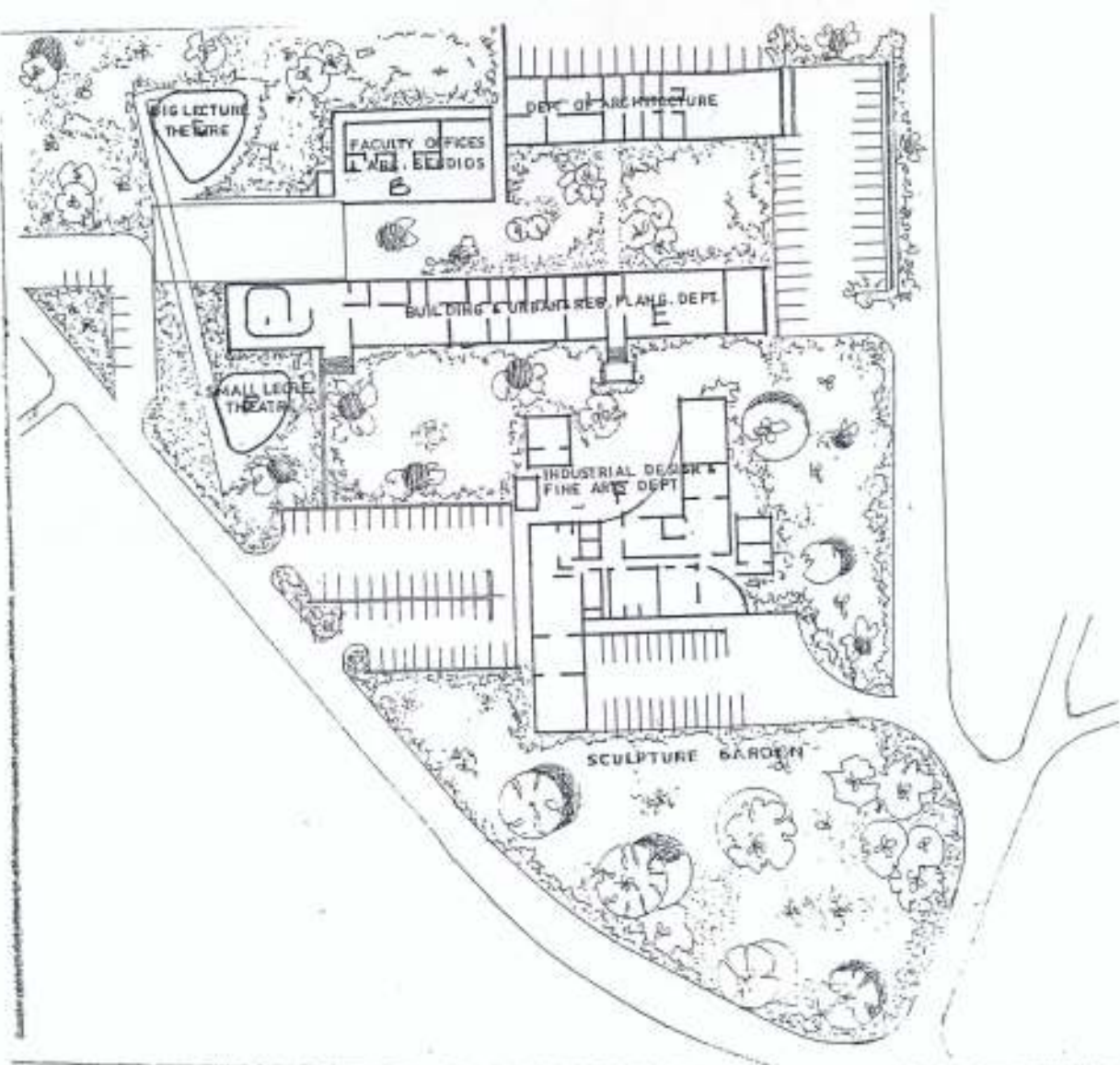


FIGURE 3.1 Site layout of School of Environmental Studies ABU

GENERAL DESCRIPTION

The complex consists essentially of three blocks linked at the end to two lecture theatres. The three buildings are placed parallel to each other coming from the

east (by K. I. L.) the first block is occupied by Architecture Department, second block is occupied by Urban and Regional Planning and Building Department while the third is been occupied by Design and Fine Arts Departments.

The faculty is accessible from all directions; the serenity is loose which account for pilfering of electrical fittings from studio, lecture theatres and classrooms etc.

Parking spaces and pedestrian way, the absence of flower hedges to act as buffers but the incorporation of sitting arrangement under tree canopies is commendable.

The design of some of the buildings, e.g administrative block of Department of Architecture lack aesthetic quality and visual harmony.

(A) FACILITIES:

Each of the Departments in the faculty has the following learning and training facilities among others Studio, Lecture rooms, Laboratory, Departmental library, Administrative offices, Gallery, Workshops Printing units, Store, Toilets, and others ancillary facilities. It also has two (large and small) lecture theatres for the whole faculty.

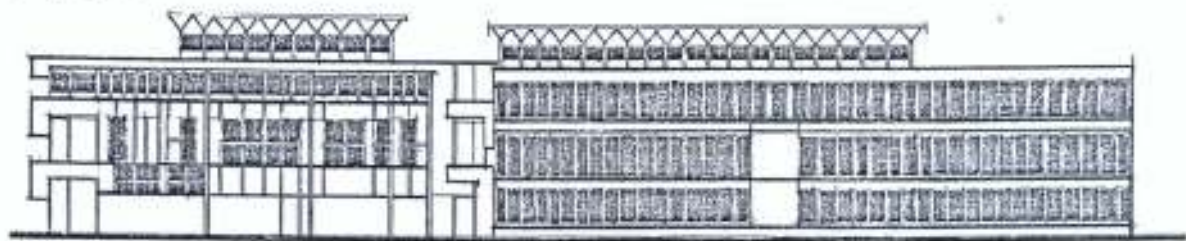


FIGURE 3.2 Approach Elevation Department of Architecture ABU

3.1.1 ARCHITECTURE BLOCK

This is actually two blocks linked by a flight of steps; one of these blocks houses the studios while the other is the administrative block. The studios comprises of three floors capped on the top with a light structure on the roof. The ground floor

accommodates the Deans Office, the Security Unit and Conference Room, while the first and second floors constitute the studio spaces for second and third year architecture students respectively. A unique feature in the special layout is the hole cut off from the floor, this hole creates a kind of gallery over the preceding floor. A spiral staircase goes to the right through the floor up to the rooftop restaurant.

(A) FORM AND STRUCTURE

The employment of advanced building system and unique structural technique is commendable as this encourages on the spot learning. Such building system includes space frame roofing for roof decking cable structure for the roof of the lecture theatres, waffle-grid floors for studios, double cantilever system used in the administrative block, over-head walkways linking various facilities, spiral staircases. Form and Structure of the lecture theater is flexible, though, the overhead walkways linking them are under utilized. Entrance into the buildings is not architecturally

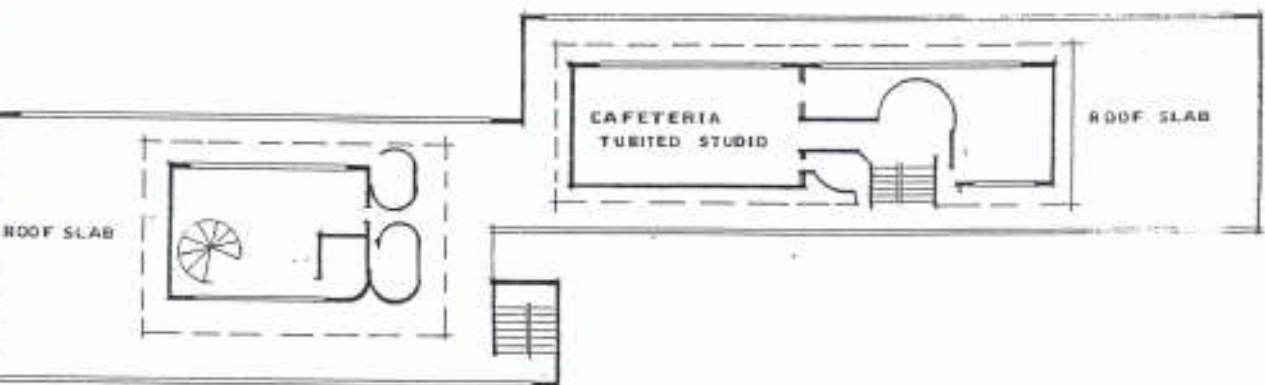


FIGURE 3.3 Plan Showing Rooftop Cafeteria and Studio

(B) DESIGN STUDIOS

All the design studios in the faculty were stacked vertically in which circulation and movement proved to be unsatisfactory. The studios are connected together with the use of staircases externally and internally. A spiral staircase was introduced for maximum interaction between B.sc.2, 3 and roof top cafeteria. The studios in the

department of architecture are designed to accommodate specific number of students but as a result of increase in the number of student intake, the studio becomes congested and underutilized. The M. Sc. studio, which was designed for 30 students, but due to increase in the number it, is now used by M. Sc. II, and I because of this the studio is deserted by students. And to encourage students to work in it, the studio is converted into the cubicle type, but still students hate to work in it due to lack of equipments and proper day- lighting.

(C) SPACE UTILISATION: - The individual work area varies according to the number of students each studio accommodates. All the individual space utilization area is below the established standard utilization area per person, which is calculated to be 5.0m² person for postgraduate students.

APPRAISAL

MERITS:

The following itemized appraisal can be regarded as some of the good merits of the Architecture block.

- (i) The design is a successful one, in which all the necessary design parameters orientation, day lighting, circulation etc. were achieved.
- (ii) Vertical circulation is staircase that goes right through the floors creates a kind of Gallery over the preceding floor that is both interesting and inspiring.
- (iii) The employment of advance building construction systems and unique structural techniques like space frame, cable structures for the roofs of the lecture theatres etc. encourages on the spot learning.

DEMERITS:

The under listed appraisal were noticed as the demerits of the building:

- (I) Inadequate cross-ventilation in the administrative block, due to double banking of

corridors.

(II) Inadequate studio facilities such as basins, seat and toilet facilities.

(III) Modeling workshops and slide rooms are absent.

(IV) The studios in the department of Architecture are congested.

(V) No good storage facilities.

3.1.2 BUILDING AND URBAN AND REGIONAL DEPARTMENT BLOCKS

This is situated 10 metres in front of the Architecture Department block. It has four (4) floors altogether, while its main circulation pattern is the double loaded corridors (see fig.). The ground floor consists of the following: faculty lounge at the right hand side of the circulation corridor. There is also the building laboratory at the other end. Other spaces on the ground floor are the Urban and Regional Planning Library, and Lecture Rooms. Head of department office are at the opposite end of the floor.

The first floor accommodates Urban and Regional Planning studio, instead of the expected double loaded corridor there is a large (4.5m. wide) single loaded corridor, which is normally used for juries. The floor also contains lecture rooms and two

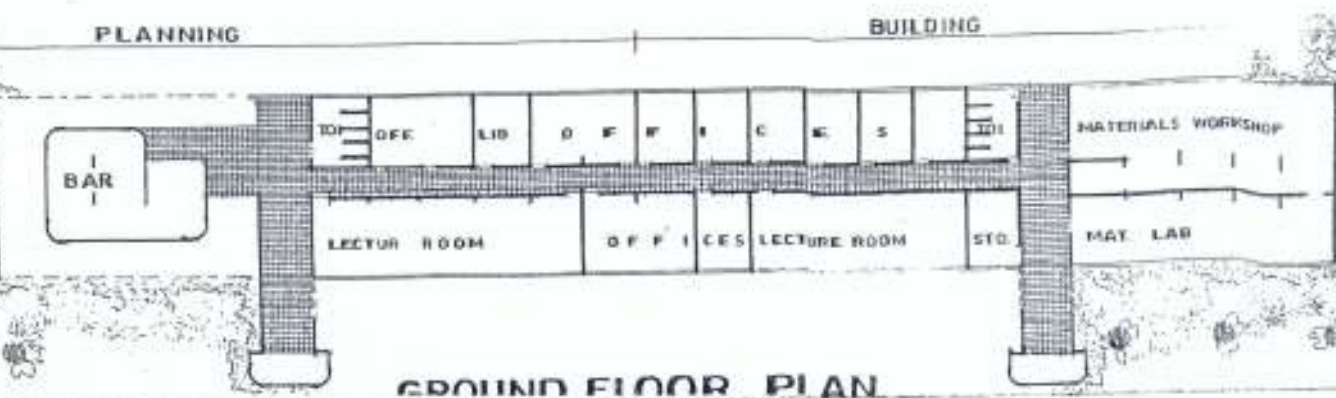


FIGURE 3.4 Ground Floor Plan URP and Building Departments

(A) STRUCTURE

The structure system is the grid system of columns and beams with reinforced concrete. The roof is constructed with steel frames, which are left exposed for all to see.

(B) LIGHTING

To solve the lighting problems, full-length sliding doors cover almost half the wall area. Ventilation starts 600mm from the floor level.

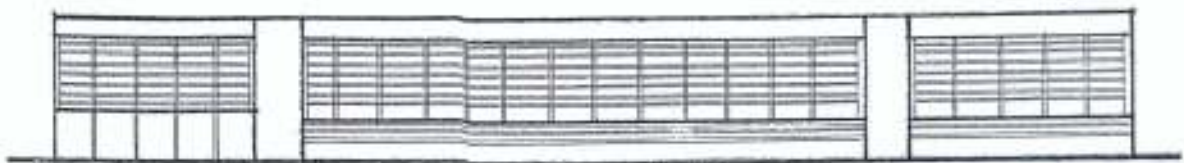


FIGURE 3.5 Elevation of URP and Building Department

APPRAISAL

MERITS

- (I) The studios have adequate day lighting and cross ventilation.
- (II) Multi-entrance is good for circulation.
- (III) Structural system, which is the grid type, allow for flexibility in use.
- (IV) Exposed steel frame is both interesting and inspiring.

DEMERITS

- (I) Main circulation is double loaded corridor without breaks for natural light and ventilation
- (II) No cross ventilation in the offices.
- (III) Storage facility not adequate for the studios.
- (IV) No aesthetic quality inherent in the building, except for the employment of sun shading fins.
- (V) Main entrance is not defined.

3.1.3 DEPARTMENT OF INDUSTRIAL DESIGN AND FINE ART BLOCK

The department of Industrial Design is located south of the department of URP building. The ground floor contains all the ceramics studios and the accessories. This is because ceramics work involves the movement of raw materials (e.g. cement, clay etc.) in and out of the studios/workshop. The accessories include a damp room, which unfortunately has been converted into an office, kiln and storage spaces. The damp room was for storing clay works in moist state and allowing them to cool and dry gradually, while the kilns are for drying the finished products.

There are also the sculpture studios for specializing students. One of the studios has a chain hoist running from one end of the studio to the other, its function is to lift heavy logs to and fro within the studio. There is also an art gallery which does not serve the purpose for which it is meant for i.e. Exhibition.

The first floor contains the administrative unit. There are offices on all floors, which are occupied by lecturers involved in the courses on those floors for easy supervision.

The lecture theatre with its entrance on the first floor and emergency exits leading in to the gallery (a poor escape route) is used for theory lecture.

All the textiles studios have flexible partition on the third floor. The advantage would be that the studio spaces could be converted into large exhibition halls.

The painting studios on the top floor would have been better if the high level window (4.5m high) had been on at least two opposing sides. However, the advantage of this is that the direct light will bring out the true colour of the painting being used and especially when the sides of the canvas or drawing board is more or less parallel to the light rays. The balconies are used for landscape painting.



FIGURE 3.6 Ground Floor Plan of IDD and fine art Departments

(A) STRUCTURE

Post and beam construction method was used with cement block used as wall panels; the cross-column taper towards the top - there are series of cantilevers.

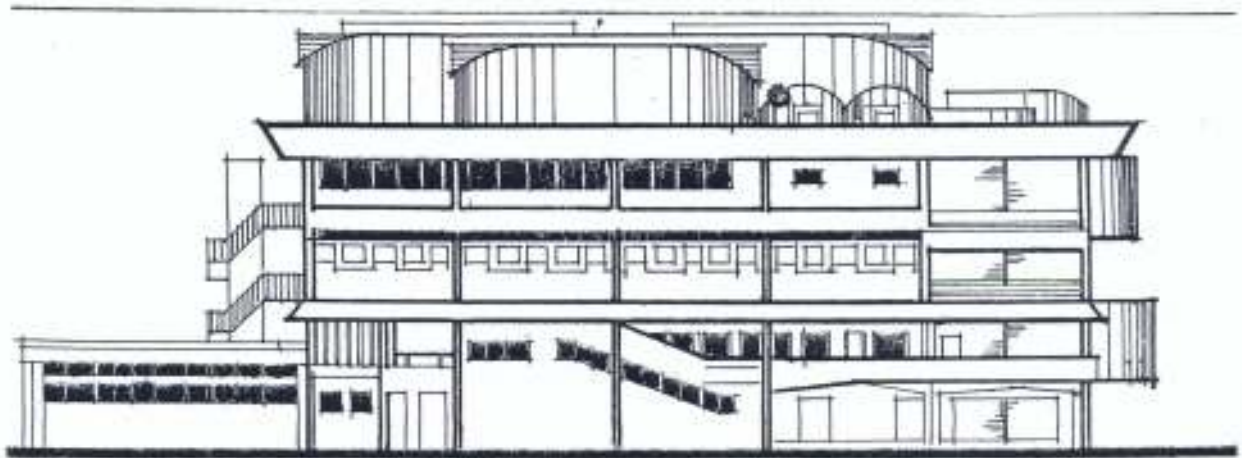


FIGURE 3.7 Approach Elevation IDD and Fine Art Departments

APPRAISAL

The onlookers may criticize certain spaces like dark corridor non-functional spaces etc. but to the artist they are aesthetic phenomena. Well the corridors would have been better lighted naturally to save the cost on mechanical lighting.

MERITS

- Lecturer's Offices were spread on all floors, enabling supervision.

- The direct lights that come in from one side to the painting studios will help
- To bring out the colour of the paint.
- The textile and graphic studios are without partition hence can be converted into big exhibition hall.
- The long balcony on top can be used for landscape painting.
- Post and Beam construction make the spaces flexible and simple.

DEMERITS

- Inadequate lighting in the offices.
- The art gallery does not serve its purpose well because, of its location
- The offices lack cross ventilation
- The lecture theatre has a poor escape route – the exit lead to the art gallery.
- There is no service yard for the delivery of raw materials for sculpture and ceramic studios.
- There are a lot of dark corridors in the building.

3.1.4 ADMINISTRATIVE BLOCK

This house spaces for studio instructors, offices, library and seminar rooms. This block also has a roof house on top. On the ground floor and to the left of the entrance are lecturers' offices, underground storage, printing room and a lecture hall. To the right are researches and photocopy laboratory plus more offices for lectures. The corridor is double loaded. The second floor houses the conference room; offices post graduate (M. Sc. I) Studio whose single space are divided into cubicles for groups of 4 to 5 students.

The space on the roof of this block is formally a model-making workshop but has now been converted to a drawing studio for the students.

(A) LIGHTING: - The orientation of the building indicates good planning to

achieve adequate day lighting. The studios of the faculty were properly positioned to receive sufficient daylight.

(B) **DEMERIT:** - There is no adequate cross-ventilation within the building due to the double banking system of design which employs long corridors surrounded by offices on both sides. Expansion joint in all the building could become a source of leakage due to poor finishing.

3.2 FACULTY OF ENVIRONMENTAL DESIGN, UNILAG S (PROPOSALS)

CLIENT: UNIVERSITY OF LAGOS

ARCHITECTS: DEJI OYENUGA & PARTNERS

USERS: Staff and Students of the Faculty of Environmental Design
University of Lagos.

GENERAL DISCRIPTION

This proposal can be split into two: -

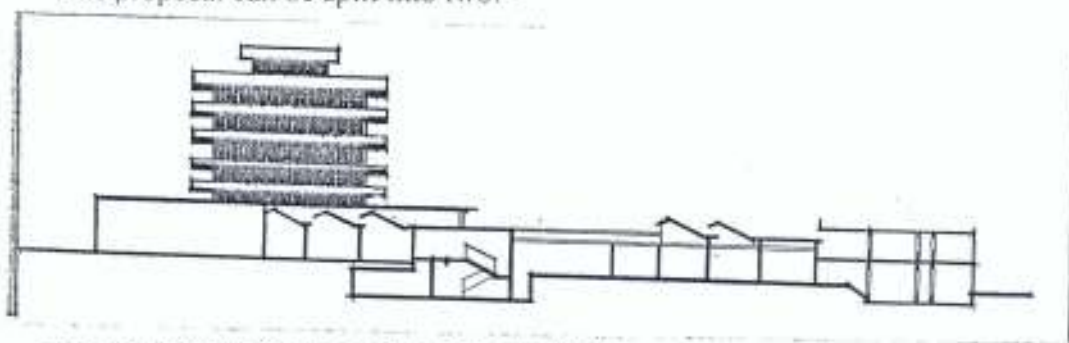


FIGURE 3.8 typical section of the building

- a. Administrative block and,
- b. Teaching or Academic area

The main entrance is located between the two areas.

(A) THE ADMINISTRATIVE AREA.

The administrative block is the first building reached from the main entrance. It is six floors high with exhibition space and information point on the ground floor. Approach to the ground floor is through a plaza, which leads from a parking lot

through glass doors into a lobby, the exhibition area and two seminar rooms. The four floors are identical incorporating lecturers and administrative office. These are arranged round a rectangular circulation space having a lift and a staircase on either side of a void that overlooks the exhibition space below.

(B) LECTURE THEATRE /AUDITORIUM

The lecture theatre is a 21 x 28m. Hall seating 350 People it has facilities for the viewing of slide, storage. There are two entrance into the Hall, one from the main entrance to the faculty while the other form a circulation point that comes from the teaching area (studio and classrooms).

(C) LIBRARY

The library, distributed into two floors, it has two major areas; the general section on the lower floor, which can seat 128 people and a shelving area of 400m². The reference section is located on the upper floor and seats 56 students.

(D) TEACHING AREA

Three studios spaces are provided for Architecture Department, each measuring 21 x 28 m, the studio spaces has a total capacity of 218 students at a time. Each studio has a classroom attached to it.

The art studio is on a single floor to cater for the lighting requirements of the space, roof lightning is provided. Provision is made for modeling and sculpture workshops in the proposal. This lies north of the building, supporting facilities like toilets; changing rooms and store are located on the ground floor.

The basement under the classroom is used for storage purpose. The workshops, library, exhibition, art studios and auditorium are all double volume spaces (8m high) while the Studios, Classroom, lecture rooms and offices are single volume spaces.

(E) STRUCTURE

The structural system is a system of reinforced concrete beams and columns.



FIGURE 3.9 Ground Floor Plan

APPRAISAL

MERITS

- Natural lighting is adequate.
- The orientation of offices ensures a good view of the surrounding environment.
- The exhibition space being near the security point assures safety of the exhibits.
- The main entrance being between the administrative and academic areas in a good circulation pattern.

DEMERITS

- Inadequate natural lighting in the exhibition space due to deep over hangs.

- The studios have a view only to the internal corridor and adjacent courtyard.
- Natural lighting to the studio through a courtyard and roof light will not be enough.
- Natural lighting to internal corridor will be poor.
- There will be distractions from the main circulation route of the university to the library.
- Use of double loaded corridor in the teaching area is a poor circulation pattern.

3.3 FACULTY OF ENVIRONMENTAL DESIGN, UNILAG [EXISTING]

CLIENT: UNIVERSITY OF LAGOS

ARCHITECTS: PROF. D. ARADEON and PROF. OKEDELE

USERS: Staff and Students of the Faculty

of Environmental Design University of Lagos.



FIGURE 3.10 Approach view of the faculty

GENERAL DESCRIPTION- The faculty site, which is now located close to the first Entrance Gate to the University opposite the five thousand capacity multipurpose Hall. It is a good location due to the fact that there is room for further

expansion and the students in the faculty can also have a good percentage view of the University and its environs from the faculty site.

The Building which is reasonably large comprises of offices lecture rooms, lecture theatre and studios which can be used by all the departments of the faculty without waiting for each other.

The design concept of the old block is a simple functional corridor system, which has two stair halls, linking the ground floor and the first floor. In the new block, the introduction of a stair hall of the center of the building breaks the long boring corridor thereby creating a more interesting lobby. The lecture rooms and studios are a lot more bigger, well lighted and well ventilated and the concept creates room for interrelationship between the users of the building e.g. Students, Lecturers and Staffs.



FIGURE 3.11 Site Layout of the Department

(A) THE ADMINISTRATIVE AREA

The administrative building is approximately 100 x 20m, it is 6 floors high and two basements floor, housing all administrative offices (Head of Department, Faculty Officer and Dean) and all lecturers' offices.

All working spaces- studio, Sculpture court and services were placed in the basements with offices on the upper floors. The first floor houses the faculty and Dean's offices, while each of the upper floor cater for one or more departments (Head of Department and Lecturers).

There are three different office size depending on the lecturer's status:

Lecturer 1.6m x 4m.

Senior lecturer / Assistant professor 8m x 4m.

Professor 7m x 5m

Circulation is by a double loaded corridor.

(B) TEACHING AREA

This part of 'L' shaped block accommodates the library, am phi-theater and lecture rooms.

A slide room is in the basement; single loaded corridor connected all spaces. There are three studio spaces on each floor with those on the first and second floors exclusively for architectural students. Each floor has a foyer for informal gathering and is bound to be popular with students.

Ventilation and lighting is adequate in the studio where two opposite walls are blank while the other two have glass running the full length of the wall. For storage, students are expected to store their materials either in the drawers of their drafting tables or in the student's locker room in the basement of the administrative block.



FIGURE 3.12 Showing part of the new ETF Building (UNILAG)

APPRAISAL

The design is very straightforward. The separation of the teaching area and studios may pose supervision problems.

The provision of central locker room makes security easier.

3.4 COLLEGE OF ARCHITECTURE, UNIVERSITY OF NEBRASKA LINCOLN

U. S. A.

CLIENT: COLLEGE OF ARCHITECTURE, UNIVERSITY OF NEBRASKA LINCOLN U. S. A.

ARCHITECTS: BAHB VERNEER AND HAEKER

USERS: Staff and Students of Nebraska College

of Architecture

The choice of Nebraska College of Architecture, as a case study is due to the similarities in curriculum content with Nigeria Schools.

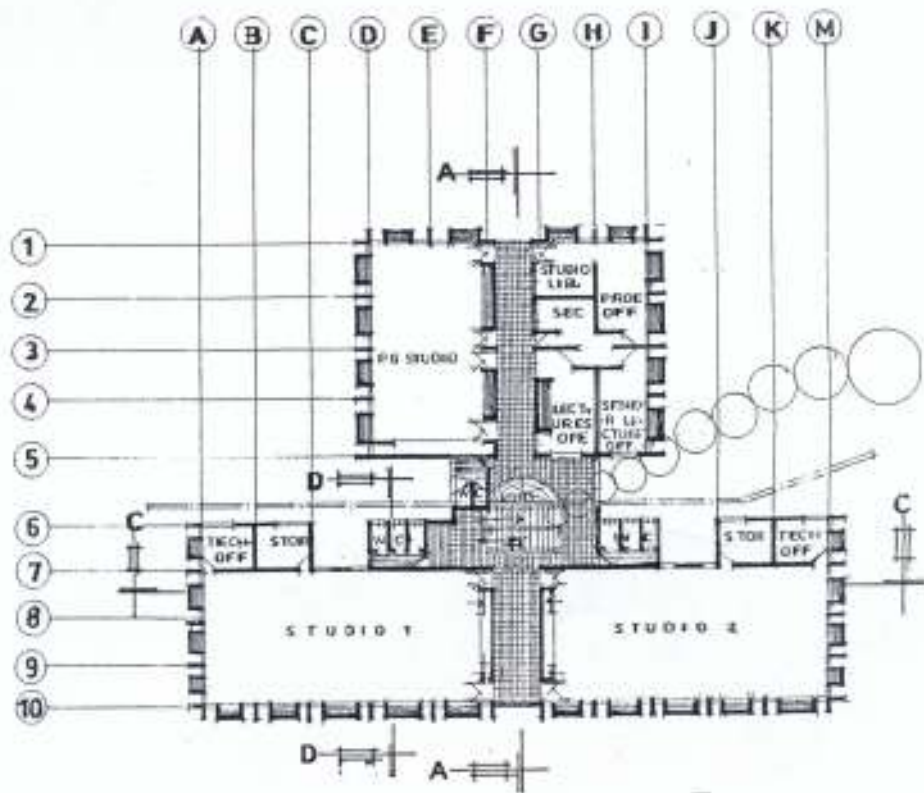


FIGURE 3.13 Showing the Ground Floor Plan

GENERAL DESCRIPTION

The site is very tight and surrounded by buildings and distribution roads on two sides. The site is accessible from all directions to pedestrians through a network of pavements and well marked out vehicular parking. The site is broken into well-kept lawns and one is arcaded-series of arches supported by columns. The restriction of vehicular parking to one side of the site is good as it reduces noise pollution.

(A) FORM AND STRUCTURE

In terms of aesthetics and visual harmony the buildings can be said to be lacking in a modernist sense. There is a touch of gothic architecture and the general composition is far from the international style to harmonize appearance with existing buildings; However this project which is in the heart of America illustrate that in which fast form standardized can become standard one, even such a vast country as U.S.A. An idea originally developed by such architects as Charles Moore and

Ronaldo Guirgola on the East Coast, Bahr Verneer and Haecker, a firm of architects in Nebraska, has used these device or method very effectively.

The idea of the atrium (Sky lighted central area) is good as it perpetuates the flow of interior space unto exterior. The plan is a composition of rectangles with plain walls and window punched out at intervals in the form of vertical slits.

The employment of sky lighting in the studios is good since good day lighting is very important for studio activities (drawing etc.)

(B) STRUCTURES

Bricks, steel frames and reinforced concrete are the materials employed. The architects have dealt with a very tight site; they have fulfilled or satisfied major design parameters within the restricted site (Progressive Architecture, January 1979).

3.5 FACULTY OF ENVIRONMENTAL, DESIGN AND MANAGEMENT

CLIENT: - OBAFEMI AWOLowo UNIVERSITY, ILE IFE

USERS: - Staff and students of the faculty of Environmental Design and Management Obafemi Awolowo University Ile-Ife

Obafemi Awolowo University Ile-Ife, Osun state was founded in 1962. There are various schools and faculties put in place since the inception, among the school is the Faculty of Environment Design and Management. The faculty comprises of five Departments. They are, Department of Architecture, Urban and Regional Planning, Estate Management Department, Quantity Surveying Department and Building Department.



FIGURE 3.14 Faculty Building

GENERAL DESCRIPTION- The Building earlier constructed to serve as the faculty was found to be structurally unstable then, this led to the adaptation of available utility buildings for the faculty. Due to this fact the blocks are arranged in linear form and all has the same floor plans with various adaptations to suit the various academic activities of the department. The blocks are all arranged in linear forms except the department of Architecture, which is housed in the building designed to serve as cafeteria for the University.

The Architecture department is an open plan structure with a central courtyard and connecting lobbies forming a cross with the central courtyard in the middle while movable partition divide the studios. These studios were further separated by offices, and the computer center. The roof is a unique Architectural form with the use of concrete barrel vaults put in place on the connecting lobbies and the entire building has a four polygonal shaped steel roof system that drain to all the sides with a pyramidal projection at the center.



FIGURE 3.15 QTS / URP Departments

(B) STRUCTURE- The structure of most of the buildings is load-bearing walls of hollow sand/cement blocks. Only the department of Architecture is based on columns and Beams method.

(C) LIGHTING: - Due to the open planning system of the Department of Architecture, one can say that the structure is suitable as for Architecture of as most of the external walls are screen walling which allows for maximum light penetration. Large overhangs and landscaping (plants) reduced the occurrence of glare to the minimum.



FIGURE 3.16 Departmental Restaurant

APPRAISAL

MERIT

- Simple design work, easy to understand
- Roof overhangs effectively shade the windows
- Set back between buildings are adequate
- Effective use of landscape to curtail erosion
- Use of local materials employed e.g. canes, stones and bricks
- Beautiful environment will enhance learning

DEMERITS

- Walkways around the buildings are not well defined, this results into footpaths on the lawns
- No proper landscape organization
- Poor interdepartmental relationship
- Lack of cohesion among the Departments due to the staggered nature of the Buildings
- Buildings are not purpose built

- Studio headroom is too low.

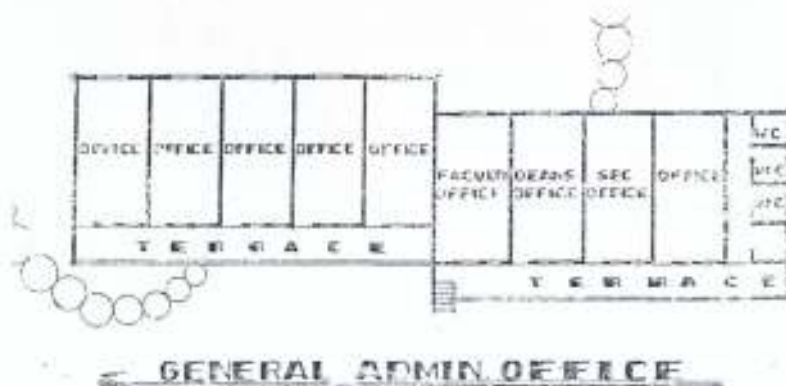


FIGURE 3.17 Floor Plan of the Faculty Office

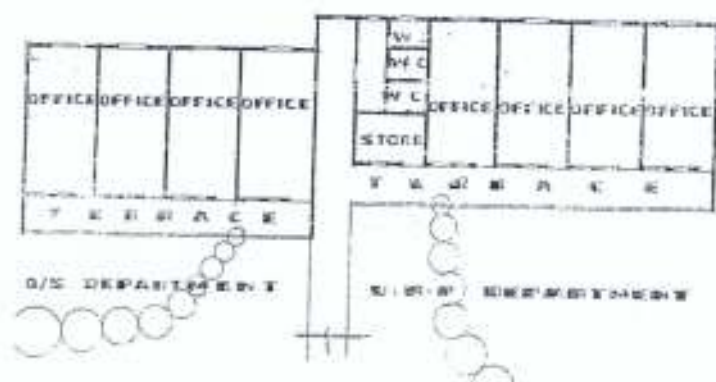


FIGURE 3.18 Floor Plan of QTS/URP Departments

3.6 SCHOOL OF ENVIRONMENTAL TECHNOLOGY, FUTA

CLIENT: FEDERAL UNIVERSITY OF TECHNOLOGY AKURE

ARCHITECT: DR.A.O. OLUTUAH

USER: Staff and students of the School of Environmental
Technology Federal University of Technology, Akure.



FIGURE 3.19 Approach View SET, FUTA

GENERAL DESCRIPTION

The school of Environmental Technology, Federal University of Technology, Akure is one of the faculties of the University. It comprises of four departments, which are Departments of Architecture, Industrial Design Urban and Regional Planning and Quantity surveying .It located opposite almost the newly constructed school of Mines and Earth sciences building. It is bounded in front by a road, which branched off in front of the senate building and joins the main road from the school of Engineering Technology.

The complex is a single building designed and built in phases with expansion joints at appropriate places. The structure in the 1st phases is a two storey structure with the ground and first floor housing the various lecture areas i.e. studios,

classrooms exhibition areas e.t.c. The second floor has the Administrative area i.e. offices Deans office, Administrative offices, conference room, common room Buttery e,t,c

The form is an A shaped edifice with entrance and exit in three areas of the building. As at the time of writing this report, the external landscaping and parking layout are just been put in place.

(A) FACILITIES- Each of the departments in the school has the following learning and training facilities among others, studios, lecture rooms, conveniences, workshops, conference room, departmental library, Administrative offices, Exhibition rooms, stores, toilets and other ancillary facilities. There are no lecture theaters in the school.



FIGURE 3.20 Part of phase two showing single loaded corridors

(B) STRUCTURE- The structure system is a grid system of columns and beams with reinforced concrete. The roof is constructed with long span aluminum roofing sheets.

CASE
S.E.T.

STUDY 01
FUTA



FIGURE 3.21 First Floor Plan SET, FUTA

(C) LIGHTING- To solve lighting and ventilation problems, the courtyard system and single banking corridor systems were used while in the administrative area, extensive use of double loaded corridors inhibits adequate penetration of light and effective ventilation. Ventilation state from 900mm from the floor level.

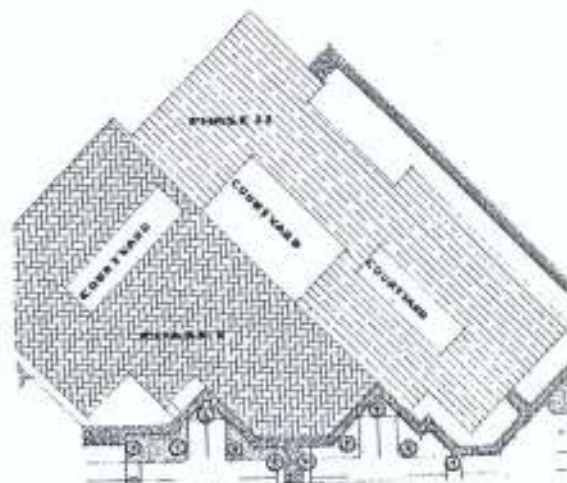


FIGURE 3.22 Site Layout of Phase One and Two



APPRAISAL

MERITS

The building is well harnessed with the sites topography. The design also enhances good interdepartmental relationship

- Building orientation prevents penetration of sun glare for most part of the day
- Use of shading devices to prevent glare and sun penetration
- The location enable a wider view of the campus
- The courtyard in phase (II) is large, thus enabling proper ventilation into the building.
- Most corridors are singly loaded, thus provide means of good ventilation and sunlight penetration.
- The exterior of the building when fully landscaped will boast of good scenery.
- Separate parking lot for the Dean and some other officers.

DEMERIT

- Hard pavings at courtyard, which makes the surface less aesthetically pleasing and promote glare though easy to maintain.
- Structurally, load distribution could have been better resolved to pave way for less columns and beams, which would have enhanced aesthetics in the building.
- Some corridors are too narrow thus inhibiting effective circulation.
- Lobbies links e.t .c. are not directional, clumsy and dark in some area e.g. the link to the exhibition hall.
- It was discovered that the building was not built to Architect's specifications



FIGURE 3.23 Showing the Link between the First and Second Phase

From the cases studied, the following point have been observed:

In layout, the schools are usually split into two, one part for administration and the other for lecture and studios instruction in most of them the principal access into the school is between the two sections.

Some studio spaces feature open plans, that is students of more than one class are expected to share a single space while in other a class is assigned to each of study. It should however be noted that the use of open plans did not always result to a successful use of studios, due to acoustical, psychological and social problems.

CHAPTER FOUR PROJECT SITE APPRAISAL

4.0 THE SITE LOCATION

The proposed school of Environmental Technology building is to be located within the Ibogun Campus, Of Olabisi Onabanjo University. The campus is located on longitude $6^{\circ}45'$ east of the Greenwich and Latitude $3^{\circ}15'$ north of the equator. In Egbeda Ibogun a village on the West side of Ifo local Government area of Ogun State.



FIGURE 4.1 Showing Site Location on Maps

Into the site is through a secondary road (tarred) that branched off from Ibogun Egbeda, a community that presently host the institution and the site is about 150m from this junction on the right side of the road.

Since the college is a new one, there are five existing buildings being currently used temporarily, they are (i) Administrative building, school of Engineering Technology (ii) School of Environmental Technology (iii) The I.C.T building and the Engineering workshop currently donated to the school by chief Olusegun Obasanjo. All flanking the main access Entering the site to the right side of the road is the site

proposed for the school of Engineering Technology followed by the proposed site for the school of Environmental Technology.

The site is bounded on the Eastern side by the main access into the school. On the East by the proposed site for the school of Engineering Tech, on the Western side by a proposed road which will lead into the proposed administrative area of the school.

4.1 PHYSICAL LAYOUT DESCRIPTION

Physical development is scanty and linearly spread along the main access road into the site. Entering the site from the main access is thorough for means of circulation as there is no gate or structure to define the entrance into the Institution. This may be due to the fact that the site is still young.

Most of the existing buildings are spread to the left of the main road and linked by access roads branching off from the main access. The buildings are the Administrative block followed by the school of Engineering Technology and the school of Environmental Technology. All these buildings are adopted for these uses as they were initially designed and built as student hostels by the host community.



FIGURE 4.2 Buildings currently in use for the faculty

On the right side of the main road is the Engineering workshop donated to the school by Chief Olusegun Obasanjo and it is sited on the boundary between the proposed sites for the school of Engineering and Environmental Technology. The next and the last building is the ICT building built by the civilian administration between 2003 and 2004.



FIGURE 4.3 Entrance into the school

The main access road leads continuously into the site and terminates by some temporary structures, which presently serve as business centres and some other services.

4.1.1 SITE TOPOGRAPHY

Landform the profile of the campus indicates that the landform is composed of loamy soil and a combination of Sandy Soil, shale and limestone in some areas.



FIGURE 4.4 showing temporary structures on the site for general use

4.1.2 LANDSCAPE

The site is fairly flat with a slight slope outward towards the access road into the Campus. The landscape is basically of secondary vegetation i.e. shrubs, grasses and undergrowths because the primary vegetation and landscape has been altered and destroyed by massive leveling and grading which could have been done in anticipation for the developmental projects it may witness. The site drainage is naturally towards the access road.

4.1.3 HYDROLOGY

Soil tests came out to determine the hydrological characteristics of the Campus indicates that water is present within the crystallite rocks in fissures faultiness and associated fissures in metamorphic rocks constitute lines of weakness which might offer little resistance to erosion and weathering. Water bearing fissure systems lie along valley bottoms where ground water recharge is high and weathering is deepest. Also, temperature variation throughout the season is marginal; the warmest months are January-March with an average of 33% while the coolest months are July and August also with an average of 22%. Average humidity is 89.0% but hourly changes

are not uncommon. The distribution and circulation of ground water is to a large extent controlled by hydrological and metrological factors such as stream flow and rainfall.

4.1.4 SUBSOIL AND BEARING CAPACITY

Result of Soil test documented shows that generally the safe bearing capacity around the Campus and the environ ranges from (200-250 kn/m²) with slight exceptions in generally weak and swampy area both are absent in the site area of this study.

4.1.5 VEGETATION

The original vegetation was predominantly rain forest but for increasing man's action through intensive farming and grazing, the vegetation has been reduced to guinea Savannah which is a combination of Shrubs and tall grasses. There are patches of luxuriant type of dense vegetation comprising of evergreen trees that yield tropical hardwood e.g. Mahogany, Iroko, Ebony e.t.c.

The site of the building has been stripped of its virgin vegetation but is now covered with grasses, small trees and shrubs seasonal farming is practiced on the site from time to time either by the host community or some staff members of the college.

4.2 CLIMATIC DATA

Data on climatic condition in Abeokuta and its environ becomes one of the indispensable determinants which should be employed for effective execution of all development projects on the Campus. The data must be considered when selection of materials for construction is being made and when plant species are being proposed for landscaping.

The climate in the site area is determined by two air masses, the tropical continental and equatorial maritime determine the climate in the site area. The tropical continental has the dry North East harmattan wind which moves from North to South

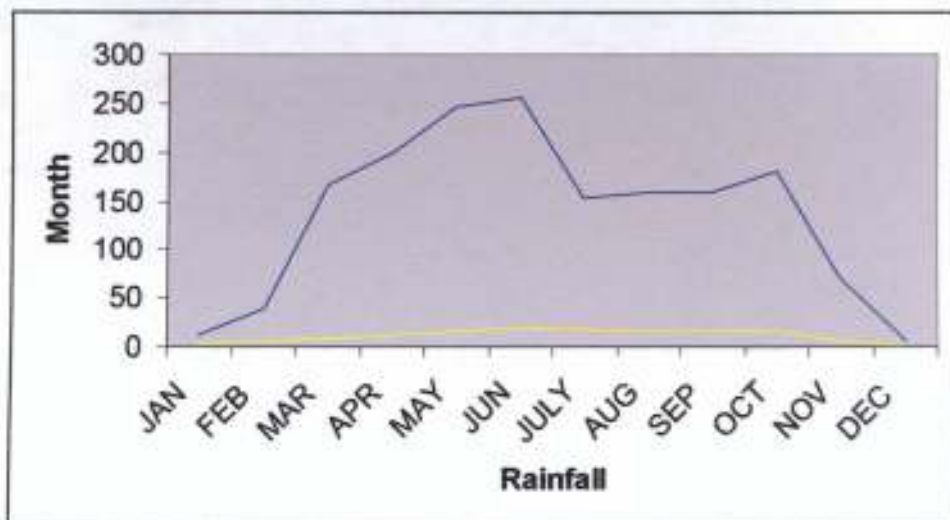
mostly over inland area. It is prevalent between the months of November and February. Evaporation is quick during this period and it is usual to experience thick haze and reduced visibility at high altitudes.

The equatorial maritime is a wet South Westerly wind prevalent between March and October. This is usually the rainy season and the annual average rainfall is about 1647.69mm

4.2.1 RAINFALL: - Abeokuta experiences the condition, which is typical of tropical belts. The prevailing type of rainfall in Ifo area is the conventional rain often accompanied by lightings and thunder and the rains always torrential especially during the rainy seasons. The thunder effects, which occur frequently during heavy conventional rains are caused by the expansion and contraction of air, the wet season spreads from April to October and the dry season spreads from November to early March. The local meteorological records of average rainfall pattern of Ifo area for years 2002-2005 are shown below

Month	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC
Rainmm	12.05	38.74	166.40	199.86	245.46	255.48	152.48	159.50	159.50	180.50	70.50	6.1
Rain days	1.40	5.00	7.40	10.80	14.80	18.60	16.80	15.60	16.00	14.80	6.00	0.0

Graph Showing Abeokuta Monthly Rainfall (mm)



Source: Federal Metrological Agency, Abeokuta (2003-2005)

4.2.2 AIR MASSES: -The variation of climate in West African Zone is a result of the seasonal migration and pulsation of the major air masses, which is caused by difference in air pressures. The two major prevailing winds are:

(i) The warm and dusty tropical continental air (ii) The warm and humid tropical equatorial maritime air.

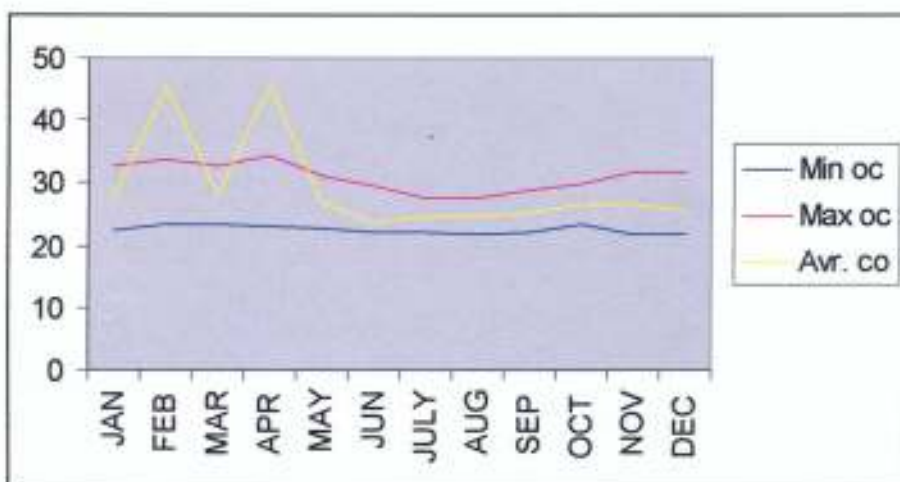
The earlier mentioned prevailing wind are resultants of these air masses, the tropical continental air is North Westerly and the tropical equatorial maritime air is known as the South Westerly. The difference in air density puts the tropical maritime air under the tropical continental.

Ifo experiences these variations with the depth of warm and moist air varying daily and rains appear to be associated with such changes. Thus encourages a lot of persistent light winds with little cloud and the fine weather Ifo enjoys a favourable climate since it does not have extreme cases of climatic factors that influences the environment and the people. The air masses controlled by the south Westerlies and the North east trade winds are generally considered in planning in this site area.

4.2.3 TEMPERATURE: - The key factors that affect the temperature pattern of Ifo are the sun energy, which is known as insolation, latitude, distance from the sea, altitude, and wind and day lengths. The town enjoys three basic period of temperature changes, the lowest towards the end, of the rainy season into the harmattan season, the average during the beginning and the early end period of the rainy season and the highest during the dry season. The daytime temperature ranges between 33.7⁰c, While the night temperature ranges between 21.72⁰c to 23.18⁰c in the dry season (November-March) the rainy season average temperature ranges from 21.72⁰c to 29.85⁰c, and the yearly average temperature is 32⁰c.

Month	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC
Min °c	22.34	23.40	23.48	23.18	22.72	22.24	21.98	21.72	22.04	23.32	21.66	21.66
Max °c	32.68	33.70	32.82	34.40	31.14	29.48	27.58	27.60	28.80	29.88	31.84	31.86
Avr. °c	27.51	28.15	28.15	28.15	26.93	23.86	24.78	24.66	25.42	26.6	26.75	25.76

Graph Showing Abeokuta Monthly Temperature

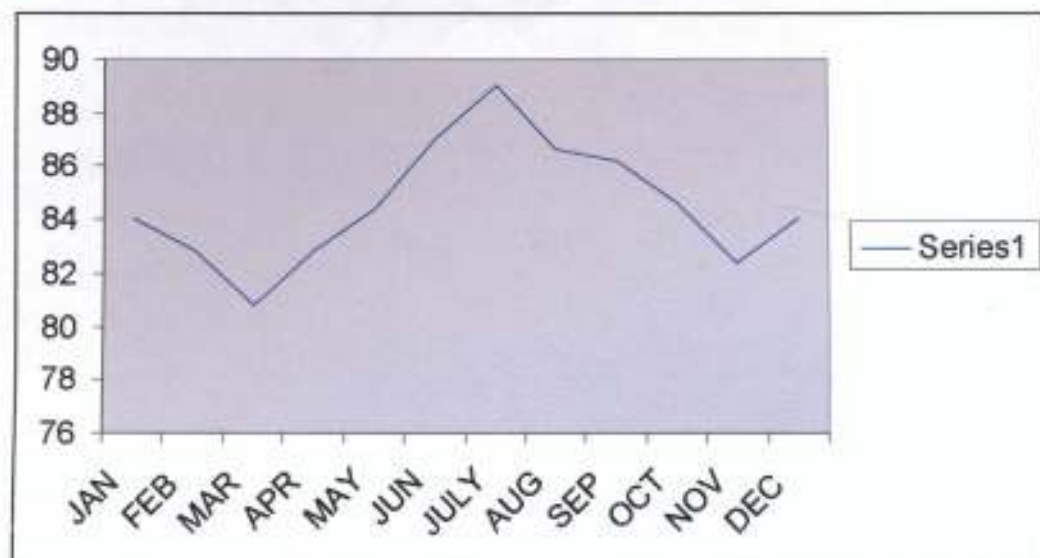


Source: Federal Metrological Agency, Abeokuta (2003-2005)

4.2.4 HUMIDITY: - Like most tropical savannah belts, Abeokuta and its environment enjoys a good level of humidity. This high humidity is quite commensurate with the relative humidity associated with the fluctuating temperature pattern. Humidity is high

throughout the year the highest humidity is about 89%, this is attained during the wet season and mid-day relative humidity rarely falls below 80%.

Graph Showing Abeokuta Average Monthly Relative Humidity



Source: Federal Metrological Agency, Abeokuta (2003-2005)

4.2.5 SOLAR EFFECT: - High Solar radiation is experienced in Abeokuta, high sun angles and high reflectivity throughout most of the year. The solar radiation reaches its peak in April and May and then fluctuates to rise to a considerable high degree in October to November. Attached is a table of mean hours of sunshine in Abeokuta.

Month	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC
Hours	5.42	5.50	4.38	5.38	5.31	4.08	2.42	1.82	2.80	4.00	3.66	5.42

4.3 CLIMATIC CONTROL

Day Lighting: - On a bright day, concrete and similar light coloured surface will reflect from 25-35% of the incident light, while grasses reflect only about 10-15% of the incident light.

An effective daylight will add to the Natural look of the proposed hotel as well as disturbing/affecting the whole enclosure if the building is not well orientated.

4.4 SITE ANALYSIS

Site analysis is an integral part of pre-design analysis and it may involve the followings.

Physical site analysis, Infrastructure, Ecological, Cultural, Aesthetics, Acoustics and Climatic site analysis

4.4.1 PHYSICAL SITE ANALYSIS: -The proposed site for the school which lies immediately on the left side of the main access into the college is about 5000m².It is bounded on three sides by roads both existing and proposed and on the left hand side (SW) by the Engineering workshop built on the site for the school of Engineering technology.



FIGURE 4.5 The present Administrative block

4.4.2 INFRASTRUCTURAL SITE ANALYSIS

(A) The Administrative Building: - The Administrative Block is the first building to the left of the main access road that run through the site, it is about 20m from the main access and link by a road which terminate unto a parking space in front of the

building. It is a single building with the longer axis orientation along Southern Western axis.

(B) The School of Engineering and Environmental Technology: These are two buildings connected by a tangential building to form a U shape singular entity. It is aligned with the administrative building and linked to the main access by a 20m road that terminates unto two parking areas on both flanks of the road.

(C) The ICT Building: - It was recently built sighted on the site for the proposed school of Engineering technology and a bit close to the engineering workshop and on the Southern side of it.

(D) Engineering Workshop: - This is a massive structure built on the right side of the site for school of Engineering and linked to the main road and has parking and delivery spaces in front.

(E) Characteristics of the Buildings

All three buildings i.e. Administrative Environmental and Engineering Technology have many things in common, colour, design, orientation and structures. The two remaining buildings are not giving the campus a harmonious look.

4.4.3 CULTURAL SITE ANALYSIS

Predominantly the people living in the site area are Yorubas mainly Owus a division in Egba land and they live in a secular village setting. The sighting of the campus in this community is a long awaited hope to see the area being developed and inhabited, as most of the natives are predominantly farmers.

4.4.4 AESTHETICS SITE ANALYSIS: - This is a study of the character of the site i.e. view points and rhythm of visual sequences. Since the college is just taking off and the site is almost a virgin area except the host community (Egbeda Village); view around the site is quite pleasing and has not been polluted in many ways. Pleasant

views include the beautiful guinea savannah, with all the animals and birds, which have the site presently as their habitats.

4.4.5 ACOUSTICS SITE ANALYSIS: - The main source of noise on the site are the roads connecting the structures on the site and will be diffused by buffers planned around the proposed structure zoning on the master plan has taken care of this as low- mid- and noisy areas are to be located in such as to have maximum comfort.

4.5 CONSTRAINTS

To play with level on the site is somehow difficult because the whole site has been graded to have a flat surface. As Doing this may be economically expensive. Natural slope would have been cheaper and more interesting.

The stripping of the site of its virgin vegetation has left the site bare, therefore landscaping will have to be planned wholly instead of making use of existing landforms and vegetation.

4.6 POTENTIAL DEVELOPMENT AREAS

The Northern side of the site would be reserved for future development and the Western site will be developed with planted elements to serve as outdoor relaxation area for staff and students of the college.

4.7 CIRCULATION

Special emphasis on this project is mainly on Circulation and space formation. Here it will be broadly treated in two folds i.e. Interior circulation and Exterior Circulation routes and spaces.

INTERIOR: The essence of this is to make the journey in the building (i) eventful, (ii) entertaining (iii) Unambiguous and captivating.

To this effect series of pass through, pass by, Terminate in space methods of path configuration has been employed. This was done principally to enable the building

perform its intended function with utmost comfortabilty, ease and eventful so that even at the peak period of Academic activities, adequate and effective circulation means are ensured, obtained and maintained.

Architecture may be used as a means of checking, regulating and controlling circulation in a building. The basis for the subtopic is to harmonize in the design high consideration for space allocation and general movement in and outside the building.

Circulation comes in horizontal and vertical movements. Various measures can be employed to avoid a chaotic situation at the peak period of academic exercise.

Corridors, Lobbies And Walkways: Corridors not monotonous

- Difference in level should not be obstructive or sudden
- Walkways (external) which may be defined by using enrichment items i.e. shrubs, hedges, stones and change in level

4.7.1 ACCESS CONTROL SYSTEM: These are devices, which in combination with a mechanical barrier only allow free access to any areas by means of an identified check. Access is only given after authorization e.g. library, computer laboratories, data rooms, photography darkroom etc.

4.7.2 STAIRS: Consideration given to the types, size and construction of stairs goes a long way in determining movement pattern and evacuation. The time required for complete evacuation must be calculated for stair widths in public building or theaters. Such staircases are often climbed slowly so they can have a more gradual ascent.

4.7.3 RAMPS: This provides easy accessibility for handicapped students either on wheel chairs or crutches, also it enhance ease of carriage of heavy equipments, as may be needed by some of the departments.

4.7.4 PLANTS AND LANDSCAPING: Both soft, hard, natural and man-made means of landscaping if well blended may be used to define spaces, and for the

followings: Traffic control, Providing background, Screening, Focalization, Boarder line, Reduction of wind velocity etc

4.8 ELEMENTS OF CIRCULATION

Movement through space- the circulation path can be conceived as the perceptual that link the space of a building or any series of interior spaces together. We move in time, through a sequence of spaces in relation to where we've been, and where we are anticipating joining. This work presents the principal components of buildings forms, circulation and spaces.

4.8.1 BUILDING APPROACH (The distance view): Approach say more about a building Prior to actually entering a buildings interior, we approach its entrance along a path. This is the first phase of the circulation system, during which we are prepared to see, experience and use the building's spaces.

The approach to a building and its entrances may vary in duration from a few paces through a compressed to a length and circuitous route. It can be frontal to a buildings face, oblique to it or spiral. The nature of the approach may contrast with what is confronted as its termination, or it may be continued on into the building's interior sequence of spaces, obscuring the distinction between inside and outside.

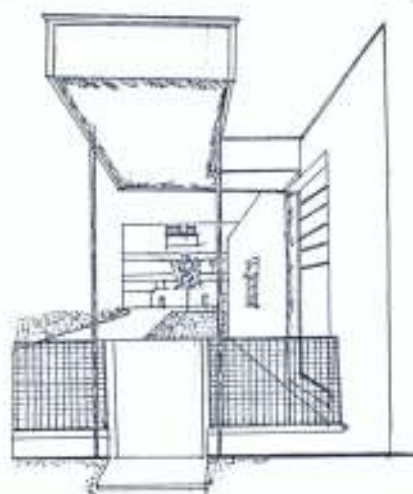


FIGURE 4.6 A Typical Building Approach used in the Design Work

4.8.2 BUILDING ENTRANCES (From outside to inside): Entering a building, a room within a building, or a defined field of exterior space, involves the act of penetrating a vertical plane that distinguishes one space from another, separated "here". Regardless of the form of the spaces being entered or the form of its enclosure, the entrance into the space is best signified by establishing a real or implied plane, perpendicular to the path of the approach. Three categories of entrance were used in this work i.e. flush, recessed and projected.

The notion of an entrance can be visually reinforced by

1. Making the opening lower, wider, or narrower than anticipated
2. Making the entrance extra deep or circuitous
3. Articulating the opening with ornamentation or decorative embellishment

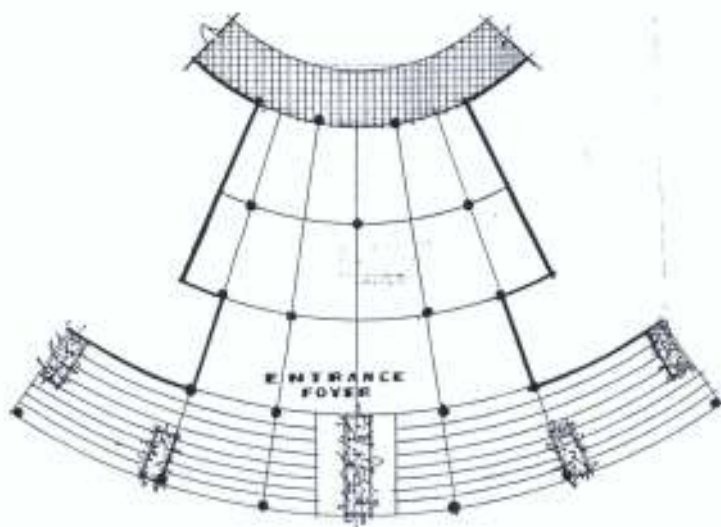
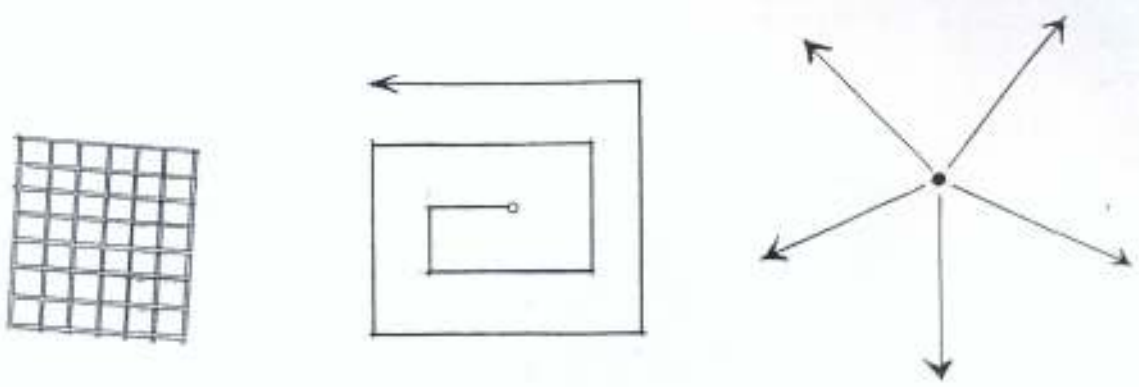


FIGURE 4.7 Main Entrance into the Building.

4.8.3 CONFIGURATION OF THE PATH (Sequences of space): The nature of a path configuration influences, or is influenced by, the organization pattern of the spaces it links. The configuration of a path may reinforce a spatial organization by paralleling pattern. Or configuration can contrast with the form of the spatial organization, and

serve as a visual counter-point to it once we can map our minds the overall configuration of the paths in a building, or orientation within the building and one's understanding of its spatial layout will be clear. Configuration of the path can be; Linear, Radial, Grid, Network, Composite.



Grid System

Spiral System

Radial System

FIGURE 4.8 Showing Configurations of Paths

4.8.4 PATH SPACE RELATIONSHIPS (Edge nodes and termination of the path):

Paths may be related to the spaces they links in the following ways:

Pass By Spaces- The integrity of each space can be used to link the path with the spaces.

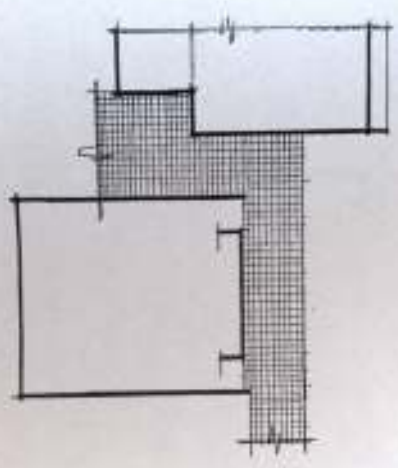


FIGURE 4.9 Pass By Space used along the Corridors

(a) *Pass Through Space*: The path passes through a space axially, obliquely or along its edge. In cutting through a space, the path created patterns of rest and movement within it.

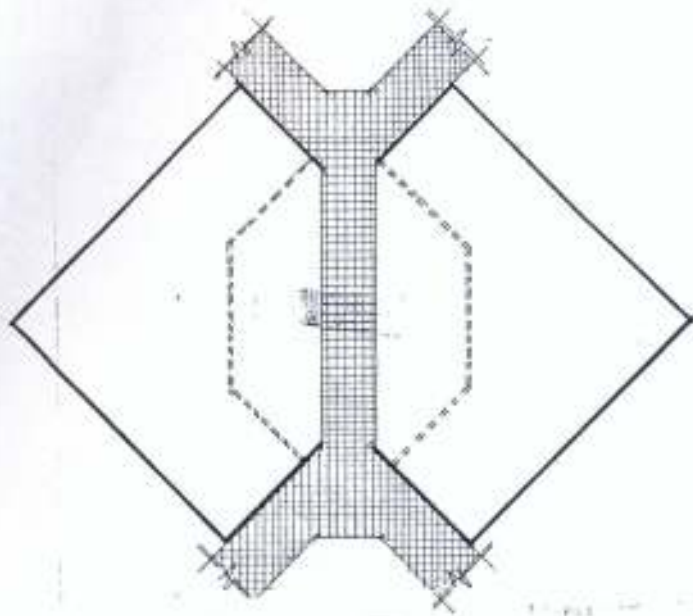


FIGURE 4.10 Path Way passing through the Central Exhibition Area

(b) *Terminate In A Space*- The location of the space establishes the path. The path spaces relationship is used to approach and enter functionally or symbolically important spaces.

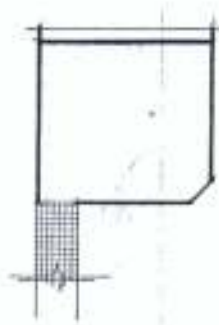


FIGURE 4.11 Path Way terminating in a Classroom

4.8 5 FORM OF THE CIRCULATION SPACE: Circulation spaces form an integral part of any building organization, and occupy a significant amount of space within the building volume. If considered merely as functional linking devices, then circulation space. However, must accommodate the movement of people as they

promenade, pause, rest, or take a view along its path. The forms of a circulation space can vary according to how: - Its boundaries are defined. Its form related to the form of the spaces it links. Its qualities of scale, proportion, light and view are articulated. Entrances open into it. It handles change in level with stairs and ramps

A circulation space may be:

Enclosed: - Forming a corridor that relates to the space it links through entrance in the wall plane.

Open One Side: - To provide visual and spatial continuity with the spaces it links

Open On Both Sides: - To become a physical extension of the spaces it passes through. The width, height of a circulation space should be proportionate with the type and amount of traffic it must handle. A narrow enclosed path will encourage movement. A path can be widened not only to accommodate more traffic but also to create spaces for pausing, resting, or viewing. It can be enlarged by merging with the spaces it pass through. Within a large space, a path can be random, without form or definition, and determined by the activities within the spaces.

4.9 SPACES AND GENERAL PLANNING CONSIDERATIONS

4.9.1 MODELING WORKSHOPS: These are rooms where models are made- Ceiling should be between 4 to 4.5 metres high. Lighting should be adequate and hard floor finished. Tools for modeling include, knives, rasps, drills tweezers, planes, stripers, scissors and clamps.

4.9.2 DESIGN STUDIO: Design studio should be next to appropriate workshops, lecture rooms etc. consider exclusion of noise and dust, storage spaces for plain

sheets, ward robes or cloth locker, reference books and models should be included together with equipment for copying drawings and documents, although such

equipment for copying or printing may be centralized. Good lighting both natural and artificial is essential.

4.9.3 FINE ART STUDIO: Studio for painting and sculpture require large areas, must have good day light with window, equal to at least 25 – 33% of floor areas with North or East aspect.

4.9.4 ADMINISTRATION SUITES: The administration space for a school is the control center for the school and contact point for students, visitors and faculty alike. Here the school are kept or reviewed, budget developed, books kept, and counseling

4.9.5 DEAN OFFICE: This is the administrative nerve center of the whole school. It is most situated near the main entrance for the conveniences of visitor and student's care must be taken to avoid disturbance from noise and traffic inevitability associated with the entrance to a large building. The office of the Dean, the school officer should be given special attention in terms of interior finishes ample provision should be made from the proper storage of files and document.

4.9.6 LECTURERS OFFICE: Single occupant space should as far as possible be provided for the senior staff in the school office. The office should have cross ventilation and adequate natural lighting so as to have conducive internal environment for private works,

Acoustic privacy should be given consideration especially in relation to office adjacent to typing pool where noise from equipment could turn out to be a nuisance. Must have adequate storage facilities, consideration should also be given to office equipment and their special requirements.

4.9.7 STORAGE: Storage space should be placed within the general floor area and properly surrounded by wire mesh screen and should be accessible from workshop. Storage space for each group using the class should be provided with locks. Storage is

needed for the following items: supplies, such as paper and pencils, books and magazines; special equipments for the subjects taught in the rooms or studios. A standard storage closet, either of metal or wood, is recommended for all students and workshops.

4.9.8 CAR PARKING: This is often neglected but important part of the total space requirement. There should be adequate parking space. The number of parking slots to be provided should be proportional to the staff population and the overall population of the school

4.9.9 CONFERENCE AND SEMINAR ROOMS: Here the style of seating arrangement is very important and this will be determined by user population. There should be consideration to flexibility to accommodate different uses. An ideal conference room will have its seats arrangement horse shoe-wise or U with square corners, and the chairman sitting at the head of the table.

There is need to make provision in the design, for the use of special equipment or other materials. For example, desks, blackboards or flip chart, slides and television set etc.

4.9.10 CLASSROOMS: In recent years, square, or rectangular classrooms have been proving more satisfactory. The size of classrooms should be large to accommodate growth. Classrooms should generally satisfy the following requirement.

Sufficient space is needed near the front of the room for setting up audio-visual equipment, such as projector screen and charts.

Light from window should, if possible come over a pupil left shoulder; Ceilings and or walls should be acoustically treated. Floor should have a cushioning material.

Classrooms should have as quiet a location as possible, away from noisy outdoor

areas. Ease of access to specialized facilities outside the academic unit should be ensured in class rooms, provision should be made for audio-visual teaching aids in lecture rooms seating up to fifty, close-spaced seating with facilities for note taking is essential.

4.9.11 LIBRARY AND DATA ROOMS: This must be designed as a quiet area where private study can be pursued. Special attention should be paid to the circulation factor inside the library. It must be planned so that it can be expanded without difficulty. For population of 150 to 200, about 100m² should be provided.

4.9.12 WORKSHOP (S): Easy access to workshops is required. Workshop should be planned in the noisy zone of the complex preferably on the basement or ground floor. It should be adjacent to a good service road, space must be provided within the workshop where students can gather for instruction or for discussion. This should be equipped with blackboard and other teaching aids.

4.10 GENERAL PLANNING CONSIDERATIONS

Efficient planning is not, only the basis of good architecture, it can greatly influence the organization and the efficiency of the school and also the well being of its users, the fact that within one building complex a wide variety of different activities will be pursued, often at the same time make the problem a complicated one each activity will have a series of widely different requirement and without careful planning this result in unnecessary tension and conflict.

Two of the most important consideration is NOISE LEVEL AND ACCESS. Some areas in the complex will be noisy, while some will have intensive population movement while other require very little. It is therefore important that a zoning pattern should be established to form a basis for physical planning. First, the accommodation required must be arranged in functional groups teaching,

administrative and communal. Secondly, the arrangement must satisfy the two important physical conditions mentioned earlier which is access and sound levels.

Within each functional areas, the various subdivisions will each have special requirements. Those of similar functions which require similar conditions should be grouped together for example, teaching areas can be divided as follows: -

- ❖ Classrooms, lecture rooms and seminar rooms.
- ❖ Studio and drawing offices.
- ❖ Light Laboratories and
- ❖ Workshops.

4.10.1 SITE ACCESSIBILITY: The main entrance to the school must be clearly defined and easily recognizable by all users. Access and parking arrangements for vehicles and clear pedestrian access from the street is essential. Consideration must also be given to the traffic flows along the adjacent street and feeder highway and the possible congestion, which may arise from access to the premises. Separate entrance, roads and parking are essential for the vehicle delivering goods and providing services to the premises. Service areas must be screened from other areas to reduce noise.

4.10.2 PLANNING FOR GROWTH: Arrangement for future expansion must be envisaged at the initial planning stages. To this end, educational buildings should always be designed, making allowance for some degree of flexibility and expansion. Expansion should preferably be lateral or in the case of workshops and similar building, by means of additional separate blocks the construction of which will cause the least in-convenience to staff and students.

4.10 3 DEPARTMENTAL INTERDEPENDENCE: Complete independence of Department within a school is rarely possible for economic reasons. The problem of interdepartmental relationship needs to be studied when the accommodation schedule

for the building complex is being prepared. There are often elements, which are common to two or more specialist departments and by careful timetabling, these can become interdepartmental facilities so that they do not remain idle for long periods. The element must be considered at an early stage in planning, they typically include classrooms, lecture, theaters, studio and projector rooms etc.

4.10.4 SERVICE AND FIRE PREVENTION:(Services:) Four basic distribution system and the variations were identified by Nuffield foundation study. These general types of system are however, only diagrammatic, and must be understood to demonstrate simply the various possible ways of routing service through the building, not how each individual service should be laid out. They represent in fact the systems of ducting through the buildings. The actual layout of the service will depend among other things, on the location of the rooms to be served within the building and the position of the outlets within the rooms.

Fire Prevention: - The classification of this type of buildings falls under the external Light Hazard (ELH). The workshops and laboratories should be designed in such a way as to provide for the easy and rapid evacuation in case of fire. Provision should be made for the installation of hand-operated fire extinguisher hydrants in addition to an automatic fire detection system. Metal hose reel should be sited such that the whole of each floor is protected and that no part is more than 6 metres from the hose when fully extended.

CHAPTER 5 PROJECT ANALYSIS

5.0 PROJECT CONSIDERATIONS AND ZONING

The master plan has been designated into different zones reflecting different functions the zones bear different relationship to one another and to the extent mind system, which will influence their locations. The school of environmental Technology will be located very close to the school of Engineering Technology along the main access into the school and almost adjacent to the present administrative building which is to serve as students hostel when all the structures has been completed. The location of the building will be in harmony with all functions to which it is interrelated or to those that have something in common with it.

In the design, the location of the zones will reflect the function and nature of each zone. (See Fig. 5.1) The roads layout will control all future developments, particularly as it will provide the routes for services (i.e. Mechanical electricity, Telephone, drains) and effectively reduce many of the limits to the zones. The road layout must therefore provide for all foreseeable expansions.

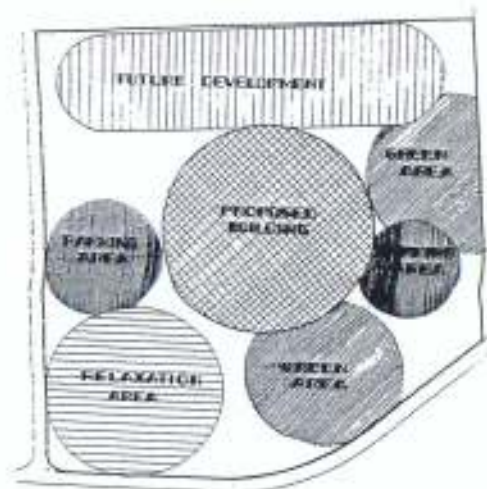


Fig. 5.1 Showing Site Zonning Structure of the Proposal

Suitable access, links and covered walkways will be provided to all functions since the building though multiple is to function as one entity, which is the school of Environmental technology.

Apart from these functional aspects the system, will be kept simple and easily comprehensible in order to aid the orientation of the users i.e. students, lecturers, non-Academic staffs and visitors.

(A) COMMON FACILITIES: - It is important both functionally and psychologically that the school has an identifiable center. This will be in form of lecture theatre, central relaxation (indoor) center, Administrative building and general services. In this case, the pedestrian will prevail it will provide a focus for the activities of staff, students and an assembly point for visitors.

(B) SECURITY: - The method of access control system will play important role in many areas of the complex while spaces will be provided for internal security arrangement and design will go a long way in putting the security points in vantage and relevant positions

(C) SERVICES: - Mostly services in the building will follow the pattern arranged by the whole college and structures are linked or connected one to another, but consideration will be given to the followings.

Water will be piped unto every necessary areas of the buildings via the mains that run across the main access road in a way that maintenance will be easy and more economical.

(D) ELECTRICITY: - NEPA mains will be connected and distribution will be underground outside the building while internally it will be full conduit system.

(E) DRAINAGE: - Surface water will be carried to suitable water courses in concrete lined channels, P.V.C. Pipes and covered where necessary. This will be channeled to the central drainage sewage and sewerage control system in the college.

(F) MECHANICAL: - Air-conditioning; All buildings will be designed for cross ventilation to give comfort conditions in the event of electrical or mechanical breakdown. Despite the above, some room spaces because of the nature of equipments handled will need adequate air conditioning. This was borne in mind for accessibility and ease during installation and maintenance the piping will be conduit embedded in the walls channeled through specific areas in the building and covered by mechanized drainage of the building.

(G) FLEXIBILITY: - The design (site) will provide for future expansion and flexibility as far as they can be foreseen and estimated, but it should not be regarded as a static and rigid set of rules. Use of temporary building should be avoided as they are often developed against the general concept. The provision for future expansion will be in such a way as to minimise the negative interference with existing functions.

(H) LANDSCAPING: - The landscaping of the developed area of the site will be both functional (providing shade and preventing erosion and decorative providing colour and form). The colour and texture of all paving materials will be carefully considered so that with all the external "furniture" (i.e. seats, lights etc) a fully integrated landscape can be achieved.

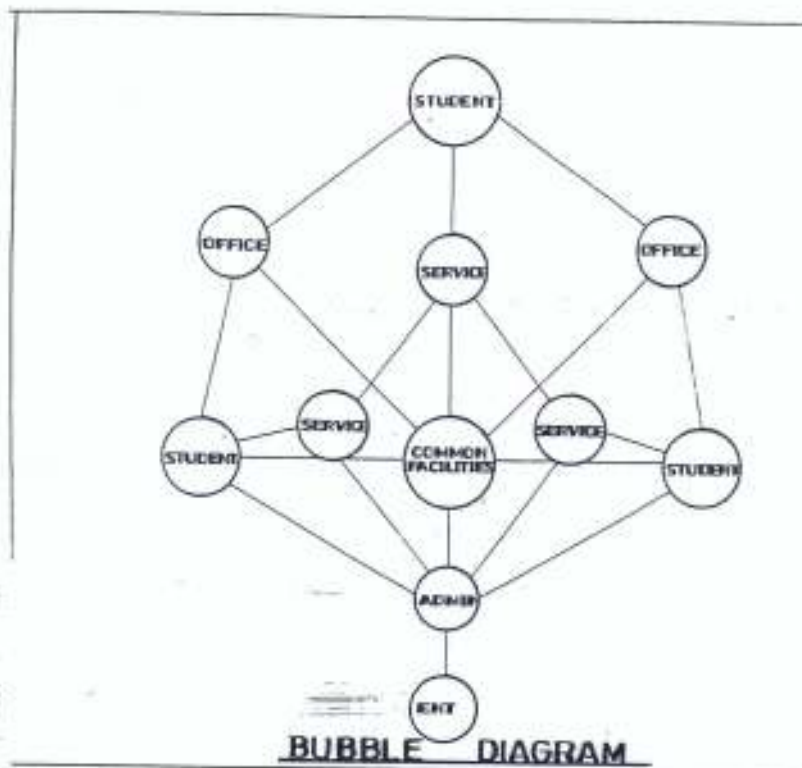
5.1 CONCEPTS: are ideas derived from specific instances, a thought or notion capable of integrating various elements into a whole. In architecture, five main types of concepts have been identified; these include analogies (looking at other things), Metaphors (looking at abstraction.), Essences looking beyond the pragmatic needs and Ideal concepts are those that the Architect brings into problem.

5.1.1 SITE ZONING CONCEPT: - The site zoning is a direct consequent of the facilities and features in and around the site, the prevailing climatic conditions, with the aim of achieving effective circulation and a conducive environmental for learning.

There are two major entrances to the site, the main entrance on the south Eastern side and the other from the North Eastern side. These were however informed by the existing road pattern and the direction of students and lecturers movement.

The road entering from the South Eastern side of the site forms a roundabout (distribution point) and this flanks the two car parks with one on either side of the round about. The parking on the right side links the road entering from the North Eastern side which can also form a means of exit at peak periods.

With the aid of landscaping materials and planning, the building has been positioned on site in a manner that it is being protected from noise also to prevent noise generated from it from being a source of discomfort to other facilities around it, most especially the administrative block. See (Fig 5.2)



5.1.2 DESIGN CONCEPT: - Having carefully studied the case examined in the preceding chapter coupled with interactions with users, an essence and ideals form of concept approach is adopted.

In this phenomenon I have viewed the activities in a school of higher learning as one, which involved three basic groups, i.e. the academic staffs, the students, and the non-academic staff. In the essence conceptual approach these are represented with three rings (circles) and three geometrical shapes (rectangles). Focal point represents the teacher to whom students look up to for knowledge and his advancement. Strokes represents the students round the teacher. Three rings representing the 3 basic groups prominent in a school society i.e. student, tutors and services. Three equiangular strokes from a focal point now to form a two dimensional shape as from i.e. relationship between point, line, shape and form.

The design concept would be focused to creating an impression of well arranged, co-coordinated building though for different Educational needs yet working together as a school with all emphasis paid to providing a conducive, attractive and active environment for learning.

This was used together with the derivation of forms i.e. circle and rectangle with and joining principle to come out with a form that whatever the nature of specialization and functional needs the building will still function excellently and perfectly integrate with existing structures on the site.

Determination of forms: The form is simply an overlap of three rings and an inverted Y shape with the focal point at the centre i.e. radial concept. The form when fully adapted transformed into six clusters of building round a central polygon which form a focal point for all the clusters and houses some of the most important common facilities e.g.. Exhibition center and the central data center.

5.2 EXPLANATION OF FORM

In a school setting i.e. higher institution, there are 3 basic sectors, they are the students, the Academic staffs (lecturers) and the non- academic staffs i.e. administrative officers, maintenance and other services. The school Environment revolves round the student and his lecturer while others are support services. The students look up to the teacher or lecturer for impartation of knowledge. Therefore he is the FOCAL point and this was used to denote a center on whom all activities revolves hence the choice of the form and concept of rings and rectangular shape revolving round the central shape and the three whichever way it appears represent the student, teacher (lecturer) and the non academic staffs to form what is now known as a school.

5.3 DESIGN BRIEF

The decision to build a permanent site for the school of Environmental Studies was borne out of the reason that the present building being used is not suitable for the following reasons

- It was built to serve as a hostel for the students therefore not purpose built and not suitable for the present use.
- The need to accommodate the students as the acute increase in admission is now overstressing the accommodation capacity of the host community and this has led to financial hardship on the student and their parents as rent is now on the increase in the community.
- The need for a purpose built structure for conducive academic activities.
- The current increase in the number of students intake currently the students are at 400 level of their Bachelor of Technology.

The following are the facilities required in the school

- Six Departmental spaces
- Lecture theaters
- Administrative block
- Exhibition centre
- Relaxation facilities
- Support services like Bookshops, Business centre, Photograph centre, Cafeteria and Snacks bar e.t.c.
- Departmental offices
- Libraries
- Computer rooms (departmental)
- Stores
- Security centre

5.4 DESIGN NOTE

The facilities to be provided in the school can be grouped under the following:

Administrative

Recreational

Support services

Maintenance

Outdoor activities

Lecture theatre

Academic spaces

(A) Administrative spaces: this has the offices for the Dean who is the official head of the school, his secretary, the school officers, and other administrative offices. It forms a control fulcrum, on which the school rotates.

(B) Academic spaces: this includes various spaces for academic activities depending on the specialization of the departments e.g. Studios, Class rooms, Stores, Offices, Moulding rooms and other spaces for specialization. Exhibition centre, Bookshops, Stationeries points, Buttery and Security offices.

A maintenance services area is to be provided. This will also contain the technical staffs, for fire equipments and store officers. A theatre is required for common use, demonstration lectures, meeting activities and other academic uses.

(C) Outdoors spaces: this includes relaxation area, outdoor work centre, parking lots and delivery bay.

5.5 SCHEDULE OF ACCOMMODATION

(A) ADMINISTRATIVE BLOCK

SPACE	NO	AREA (M ²)
Deans office	1	72.0
Secretary office	1	42.3
School officer	1	32.0
S.O. Secretary	1	26.5
General office	3	87.9
Seminar room	1	157.56
General store	1	30.0
Printing Studio/Photography	1	53.0
Office toilets	5	10.0

(B) ARCHITECTURE DEPARTMENT

SPACE	NO	AREA M²
HOD'S Secretary/ Waiting Room	1	17.6
HOD'S Office	1	42.0
Senior Lecturer's Office	7	160.16
Lecturers Office	9	145.0
Technologists	6	93.8
Office (Library)	1	12.0
B Tech studios	5	590.0
M Tech studios	2	242
Ref 1 Photocopy	1	16
Workshop Store	1	19
Modeling room/Workshop	1	186
Dept library	1	90
Computer room	1	78.0
Stores (Studios)	6	105
Toilets	11	22
Business center	1	16
Control Room (Library)	1	12
Central Store	1	46

© URBAN AND REGIONAL PLANNING

SPACE	NO	AREA M²
HOD'S Secretary/ Waiting Room	1	17.6
HOD'S Office	1	42.0

Senior Lecturer's Office	4	96.0
Lecturers Office	9	145.0
Technologists	6	93.8
Office (Library)	1	12.0
B Tech studios	5	590.0
M Tech studios	2	242.0
Ref 1 Photocopy	1	16.0
Workshop Store	1	19.0
Modeling room/Workshop	1	186.0
Dept library	1	102.0
Computer room	1	78.0
Stores (Studios)	6	105.0
Toilets	11	22.0
Business center	1	16.0
Central Store	1	46.0

(D) LAND SURVEYING DEPARTMENT

SPACE	NO	AREA (M ²)
HOD'S Secretary/ Waiting Room	1	17.6
HOD	1	41.08
Store	1	21.0
Studio (M Tech)	2	189.0
Classroom	7	378.0

Equipment room	1	24.0
Library	1	79.0
Offices (Senior Lecturers)	3	72.0
Lecturers office	9	145.0
Technologists	7	112.0
Cartography	1	181.0
Computer room	1	45.0
Toilet	8	16.0

(E) FINE AND APPLIED ARTS

SPACE	NO	AREA (M²)
HOD'S Secretary/ Waiting Room	1	15.0
HOD	1	24.0
Senior Lecturers	2	51.0
Lecturers	7	84.0
Technologists	4	56.0
Kiln	1	12.0
Exhibition	1	72.0
Library	1	72.0
Ceramic computer	1	49.0
Moulding room	1	40.0
Plaster	1	40.0
Modeling	1	108.0
Studio	3	232.0

Class rooms	4	112.0
Stores	2	32.0
Toilet	12	24.0

(F) QUANTITY SURVEYING DEPARTMENT

SPACE	NO	AREA (M ²)
HOD'S Secretary/ Waiting Room	1	15.0
HOD	1	24.0
Senior Lecturer	2	51.0
Lecturers	7	84.0
Technologists	4	56.0
Studio	2	87.2
Store	4	56.9
Computer Room	1	38.0
Library	1	56.0
Class rooms	7	501.92
Toilet	12	24.0

(G) ESTATE MANAGEMENT DEPARTMENT

SPACE	NO	AREA (M ²)
HOD'S Secretary/ Waiting Room	1	17.6
HOD	1	41.08
Senior Lecturers	3	72.0

Lecturers	9	145.0
Technologists	4	64.0
Studio	2	162.0
M Tech	2	162.0
Class rooms	4	297.0
Stores	3	48.0
Computer	1	57.0
Library	1	63.0
Stationeries	1	16.0
Business centre	1	16.0
Toilet	12	24.0

(H) GENERAL SPACES

SPACE	NO	AREA (M ²)
Security spaces	1	23.0
Slide room	1	23.52
Toilets	8	16.0
General Store	1	22.0
Business center	4	64.0
Exhibition	1	198.0
Data room	1	198.0
Cafeteria	2	180.0
Stationeries	2	32.0
Lecture theatre & related spaces	2	1608.70
Bookshop	1	36.0

Buttery	1	23.0
Printing	1	45.0
Snacks bar	2	32.0
Maintenance	2	32.0
Seminar room	1	157.56
Offices	4	57.54

5.6 ANALYSIS OF SPACE ALLOCATION

ADMINISTRATIVE AREA

Typists..... 15m²

Cleaner 9m²-12m²

ACADEMICS

Professor..... 24m²-30m²

Lecturer 15m²-20m²

Assistants 20m²

Technologists 12m²-15m²

Space/student 3.5m² 4.5m² (studio)

Space/student 0.6m² (theatre)

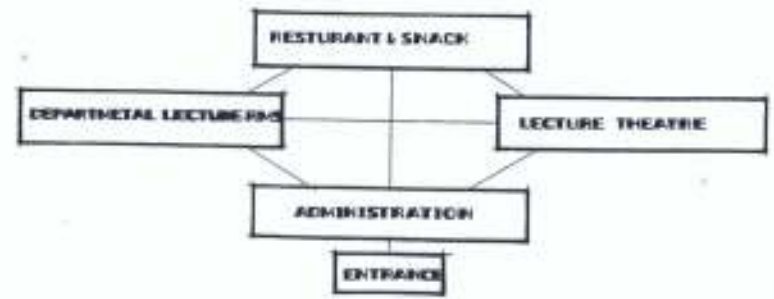
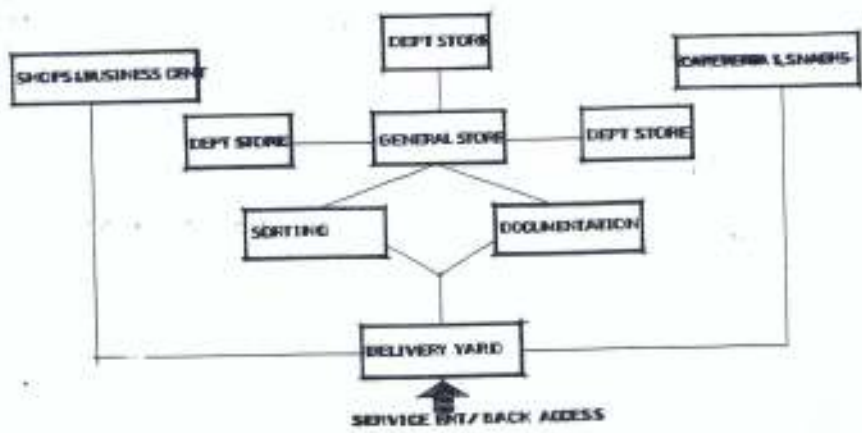
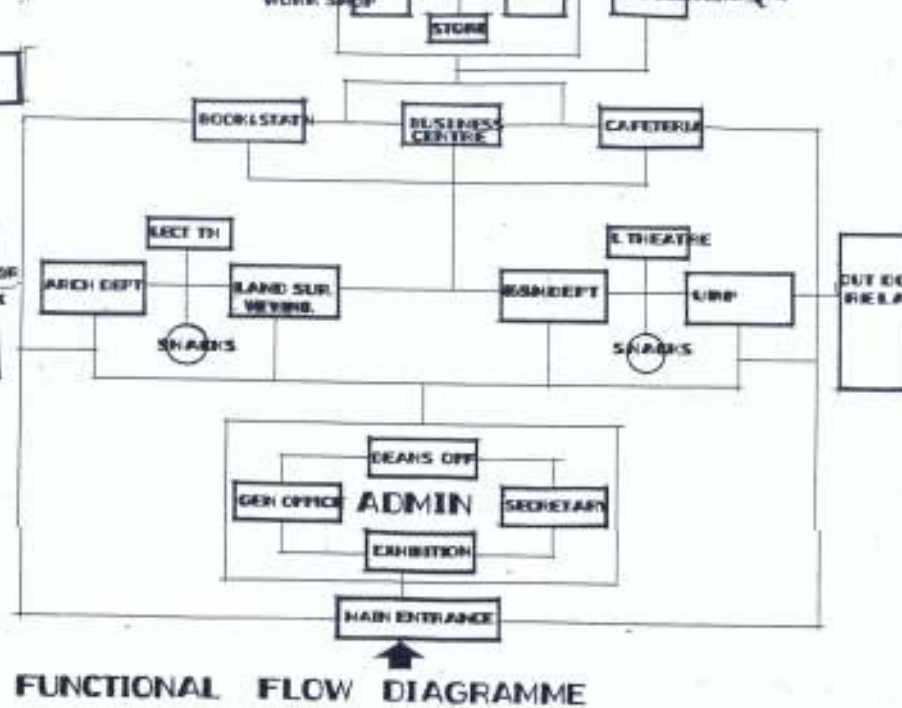
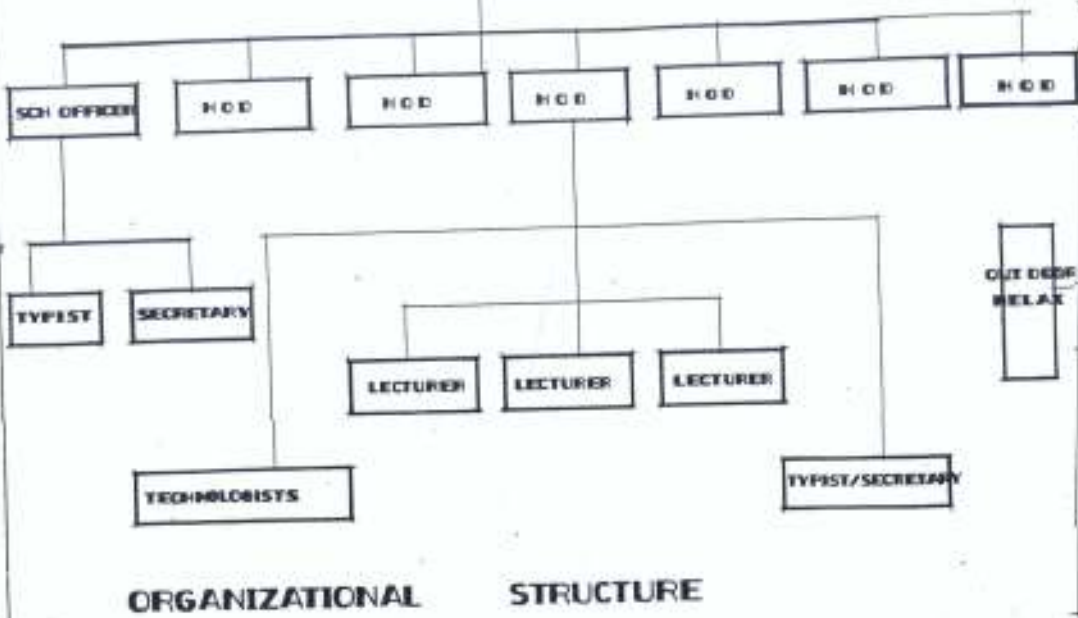
Space/student 0.35m² (classroom)

CIRCULATION ROUTE ANALYSIS

Stair 2 going 1 coming (vice versa)

Lobby 2 going 2 coming

Corridors 2 going 2 coming



CHAPTER SIX

SUMMARY, RECOMMENDATIONS AND CONCLUSION

6.0 SUMMARY

The school of Environmental Technology for Olabisi Onabanjo University Ibogun Campus that ensures adequate circulation system is thus proposed to ensure an active and attractive academic environment where students undergo training programme in their chosen fields that will make them learn with focus, peace of mind, emotionally balanced psychologically fit and academically stable.

The case studies data are analyzed and synthesized to achieve a design whereby an educational friendly environment is created for students. This reflects in organization of space for interdepartmental relationship, ease of administration, integration of both external and interior spaces balance of circulation in and around the building to ensure a fulfilled career in the school. This is also achieved through the introduction of natural and man-made enrichment items for landscaping.

The facilities are arranged in such a way that there is room for expansion in case of increase in students intake and serve as a basis in the training of Environmental Technology students.

The thesis work seeks to analyze the design process of academic activities in the school of Environmental Technology in particular and an academic environment in general and the problems identified in the development of an active and attractive academic Environment via circulation to achieve an effective, integration and organization of spaces. Also focusing on creating an impression of well arranged, coordinated and synthesized building which will derive its relationship from the existing buildings and natural environment and design criteria.

6.1 RECOMMENDATIONS

This research study shed more light on the Architecture of space integration and the essence of purpose built structures that will improve on the learning standards in schools of Environmental studies and generally tertiary institutions. It dwelt on the integration of the proposed building to the existing structures bearing in mind the concept of interdepartmental relationship and the relationship of the various buildings on the site both existing and others to be erected later.

Therefore adequate measures has been employed via Architecture principle i.e. Orientation, Site zoning, spatial organization e.t.c. All these will help to achieve a meaningful and workable design without any conflict in the effective integration of the spaces.

However creating a friendly environment for education, which is of an active and attractive design implementation that will ensure adequate circulation, system both vertically and horizontally without any conflict, some of the following recommendations are necessary.

- (i) Provide an active and attractive purpose built building for academic exercise.
- (ii) Provide good lecture theatres that is conscious of both illumination and acoustics requirements in an academic environment
- (iii) Design of a befitting administrative block to run the administration of the school and other school activities.
- (iv) Provision of purpose built spaces that will meet various space use requirement in diverse academic fields
- (v) Within the environment of the school relaxation facilities to be provided.
- (vi) Provide adequate spaces for other support services required in such buildings.

(vii) Design conducive and convenient office spaces for both Academic and non-academic staff needs and recognition of their cadres.

(viii) Adequate blending of various buildings through effective Circulation system.

6.2 CONCLUSION

It is expected that the result of this exercise if applied toward the realization of a very functional and enduring school of Environmental Technology, will satisfy academic psychological and social needs that can foster among students, cohesion interrelationship and the spirit of professional unity both for the school and the industry in general.

The proposal has taken cognizance of the facilities for professional academic purposes. The structure has an element of simplicity and dramatization of geometrical forms and aesthetics. The total arrangement is designed to achieve maximum comfort, avoid boredom and maximum impartation of knowledge.

Finally a project like this will serve as a basis for future studies in this direction for students of Architecture and allied professions and can serve some other curricular purpose for the school and even the community at large.

REFERENCES

- AFOLABI S.A.M. (2001): An Unpublished Thesis on *Post Graduate Hall of Residence Federal University of Technology, Akure*, submitted to the Department of Architecture, FUTA.
- AKINGBOHUNGBE D.O. (2006): An Unpublished Thesis on *Deeper Life Leadership Training Center*. Submitted to the Department of Architecture, FUTA.
- BARRY R. (1982): *The Construction of Buildings, Volume I-V Third edition*; Canada Publishing Limited, London.
- CHING D.K. (1979): *Architecture: Form, Space and Order*. Van Nostrand Company, New York.
- Colin Boyne and Lance Wrint (1982): *Best of Architects Working Details, Volume 2*; Wrint Architectural Press Limited, London.
- ERNST AND NEUFERT (2000): *Architects Data, Third Edition*
- FADAMIRO J.A. (1998): *Landscape Design and the Environment*; Alfad Publications Limited, Akure.
- HARRIS C.M. (1977): *Historic Architecture Sourcebook*; Von Hoffman Press, New York.
- LINDE W. & LEIBING RALPH (1990): *Architectural Working Drawings. Third Edition*; John Willey and Sons Incorporation, New York.
- LINDE W. (1984): *The professional Practice of Architectural Working Drawings*; John Willey and Sons Incorporation, New York.
- OBERMEYER T. (1976): *Architectural Technology*; MCGraw-Hill Incorporation, New York.
- ODOEMENE O.R.N. (1998): An Unpublished Thesis on *School of Environmental*

Technology Building, Federal University of Technology, Akure, Submitted to the Department of Architecture, FUTA, 1998.

OLOTUAH A.O. *Space Structures: A Monograph on Structure in Architecture*, Department of Architecture, FUTA.Akure.

OGUNSOTE O.O. (1993): *Introduction to Building climatologic*, (A basic course For Architecture students); Ahamdu Bello University press Zaria

REDSTONE L.G. (1976): *Institutional Buildings: Architecture of Controlled Environment*; MCGraw -Hill Book Company, New York.



OLABISI ONABANJO UNIVERSITY COLLEGE OF ENGINEERING AND TECHNOLOGY
IBOGUN IFO LOCAL GOVERNMENT AREA OGUN STATE

MASTERPLAN



ANCE FROM
S ABERCROMBIA
(1970)

FROM LAND

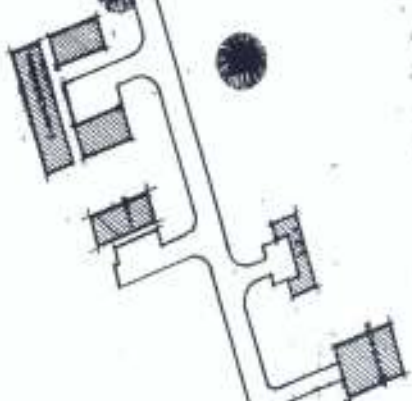


150 ROWS



LOCALITY MAP

WATER BRIDGE



MAIN ENTRANCE
FROM THE SITE

PROPOSED ROAD

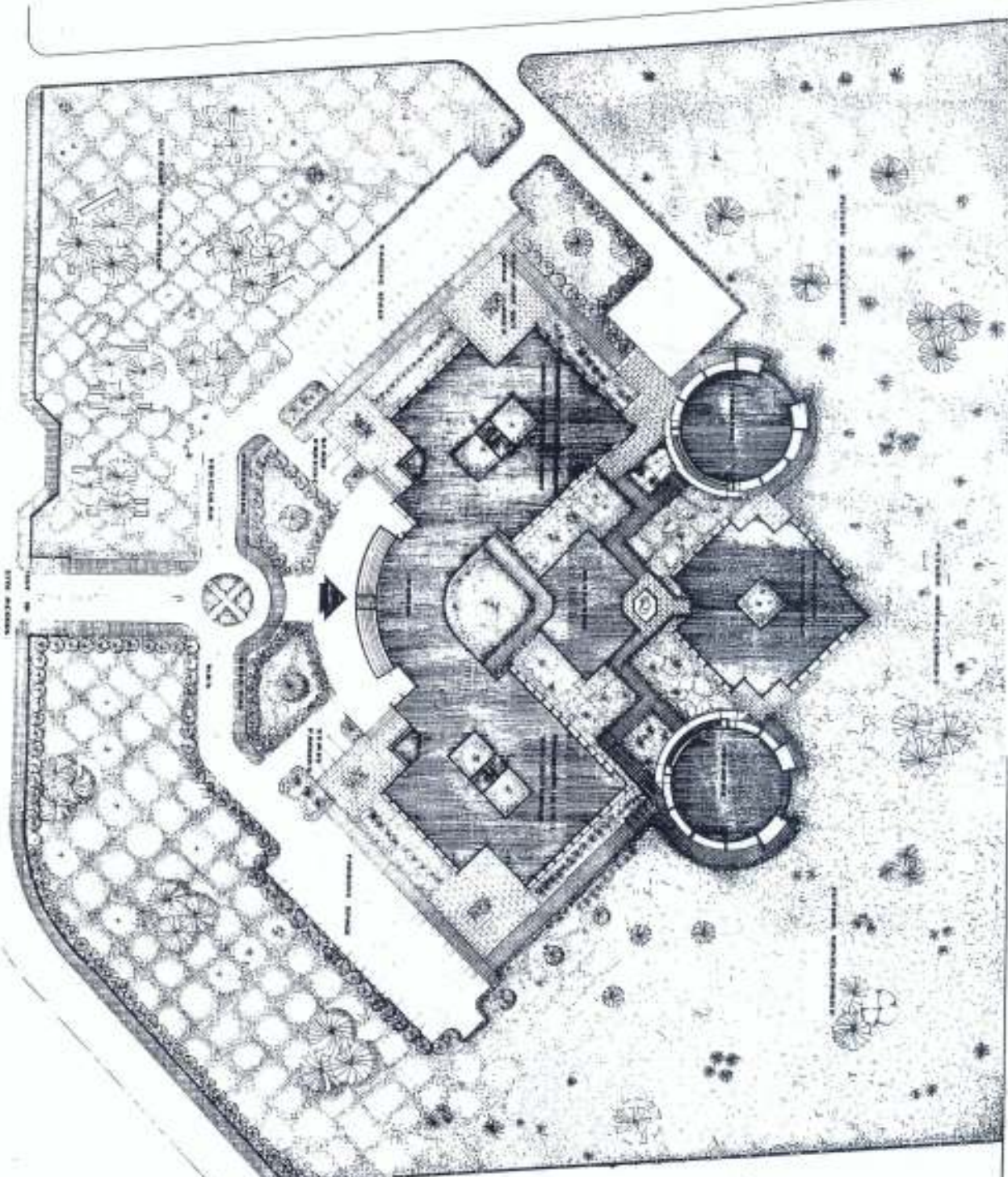


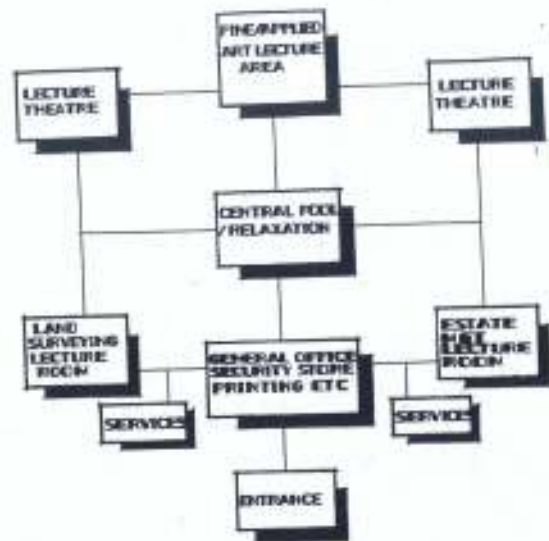
JUNCTION OF THE
ARRIVAGE AREA
TO THE SITE



JUNCTION OF THE
EGEDA IN THE
CAMPUS. EGEDA
THE IMMEDIATE
NITY HOUSING
STUDENTS



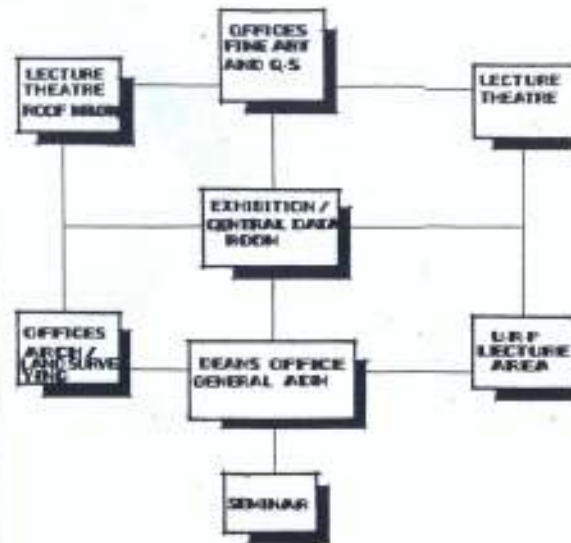




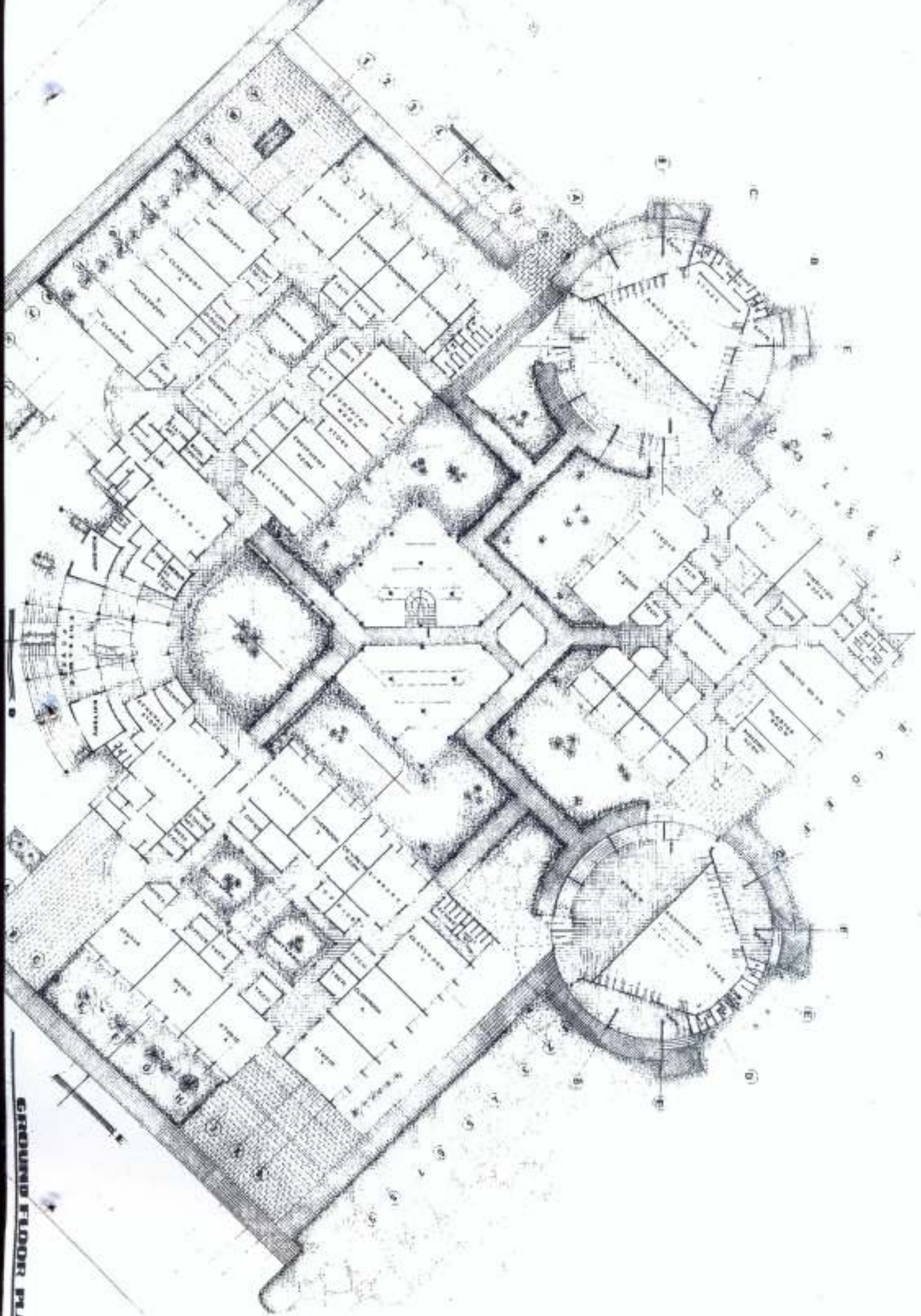
GROUND FLOOR



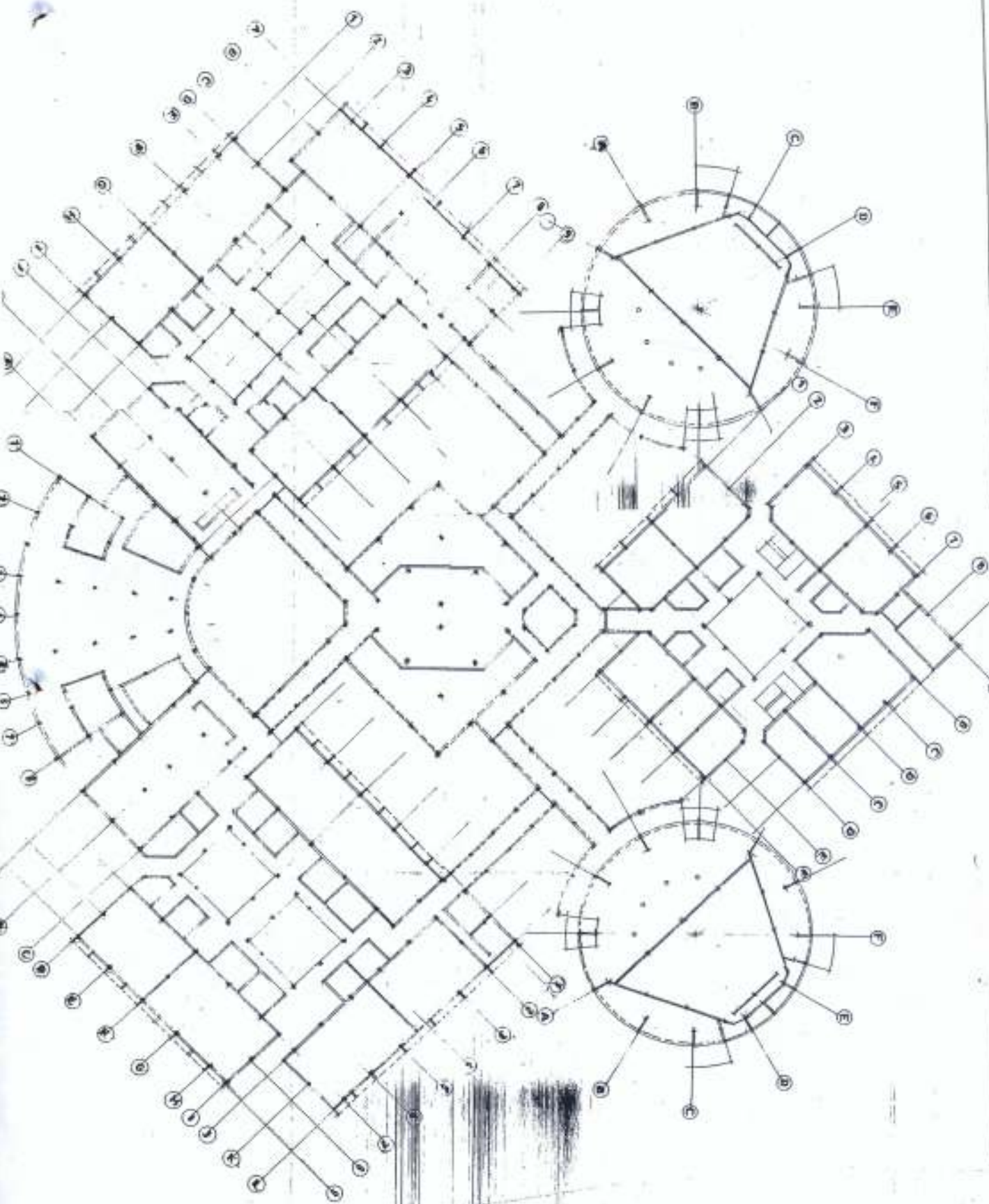
FIRST FLOOR

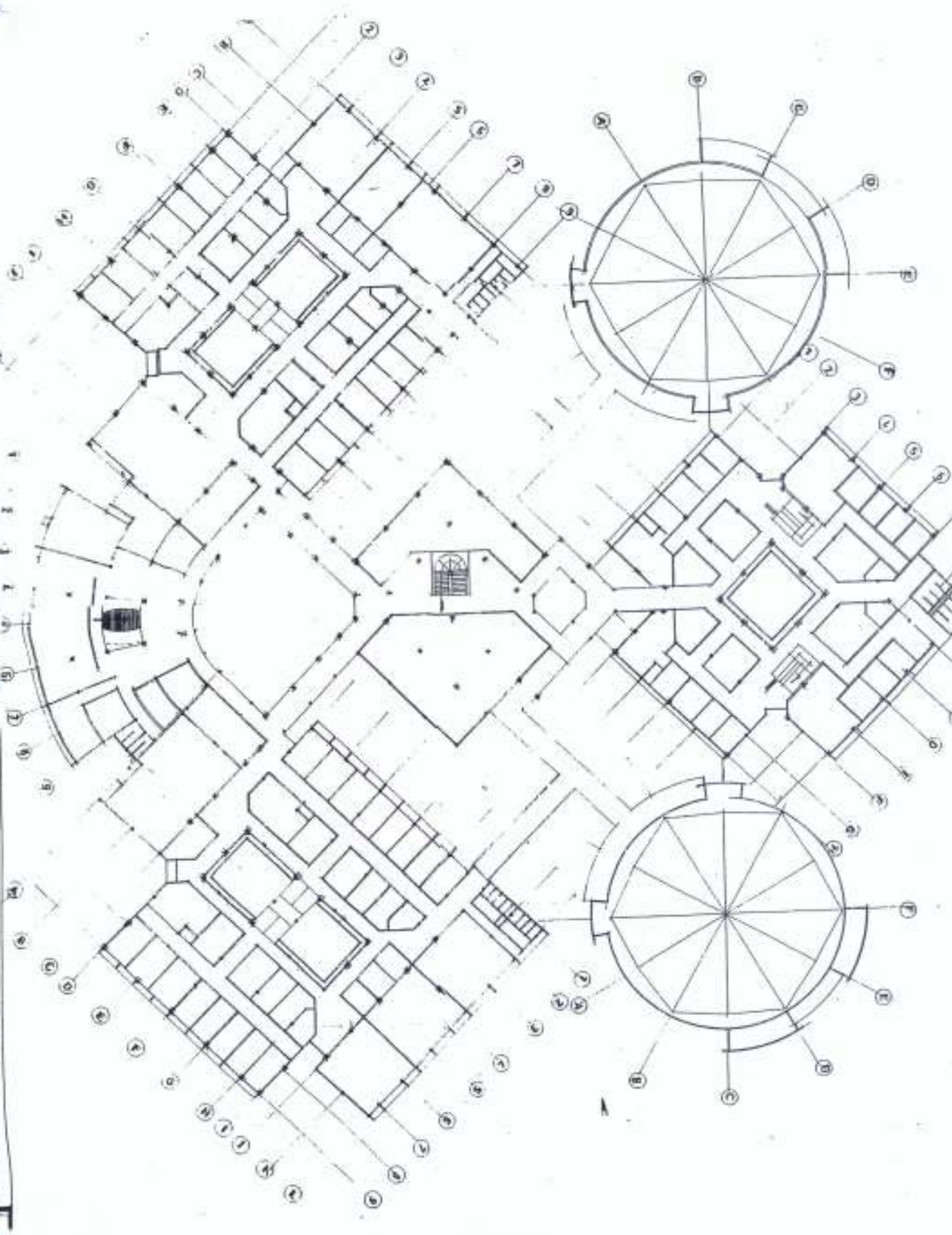


SECOND FLOOR



GROUND FLOOR PLAN





SECTION E-E

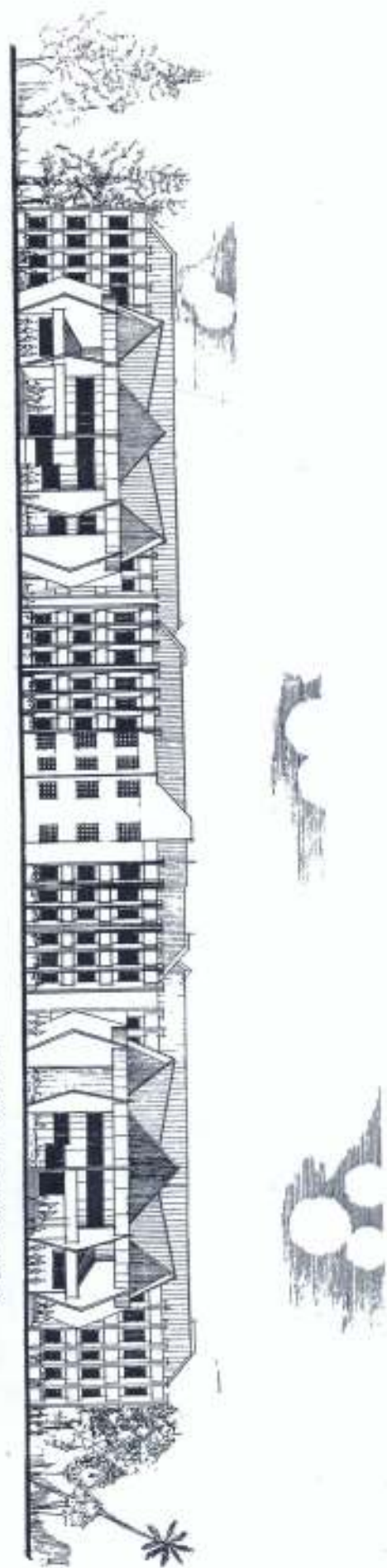


SECTION G-G





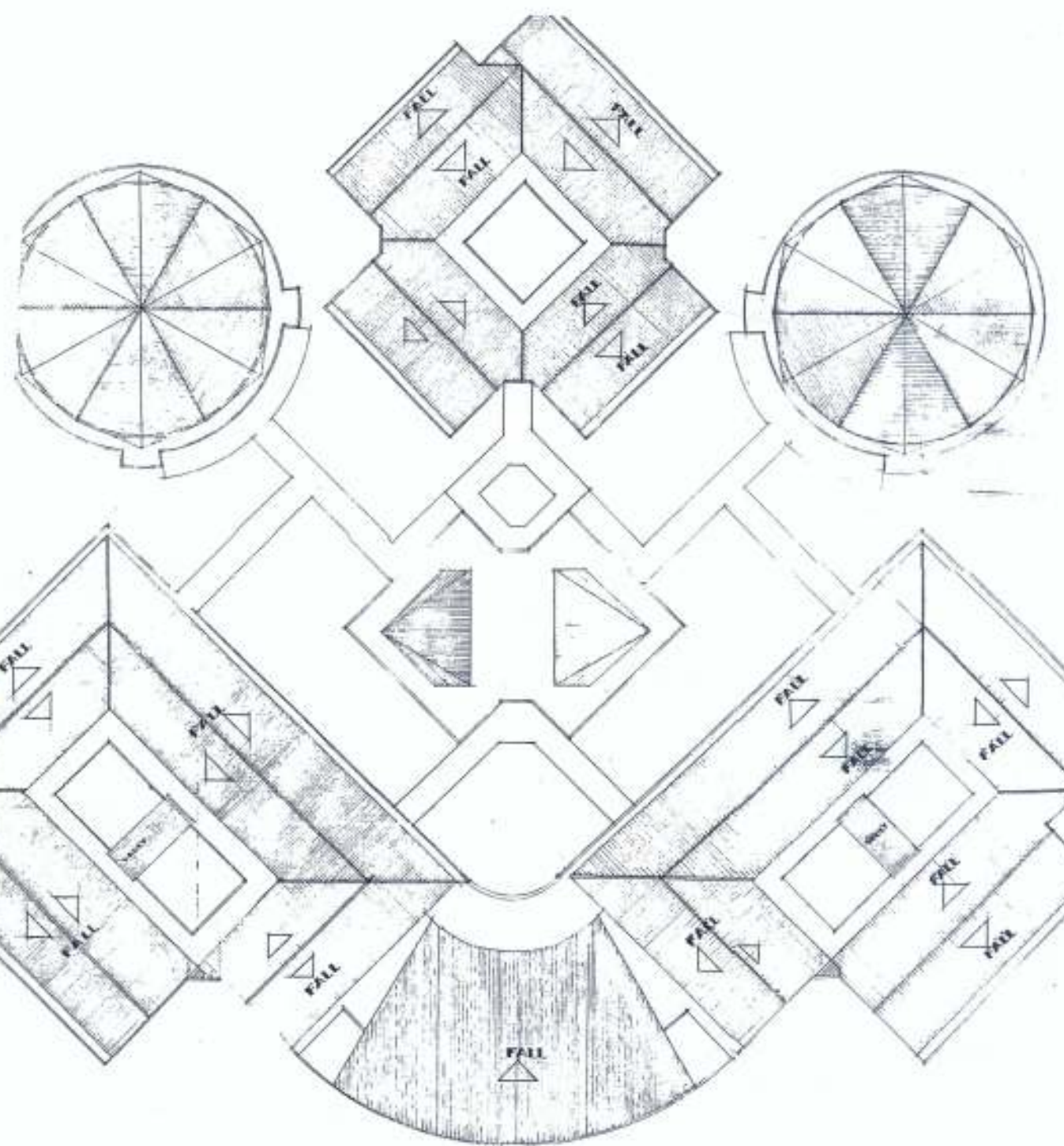
TYPICAL SIDE ELEVATION

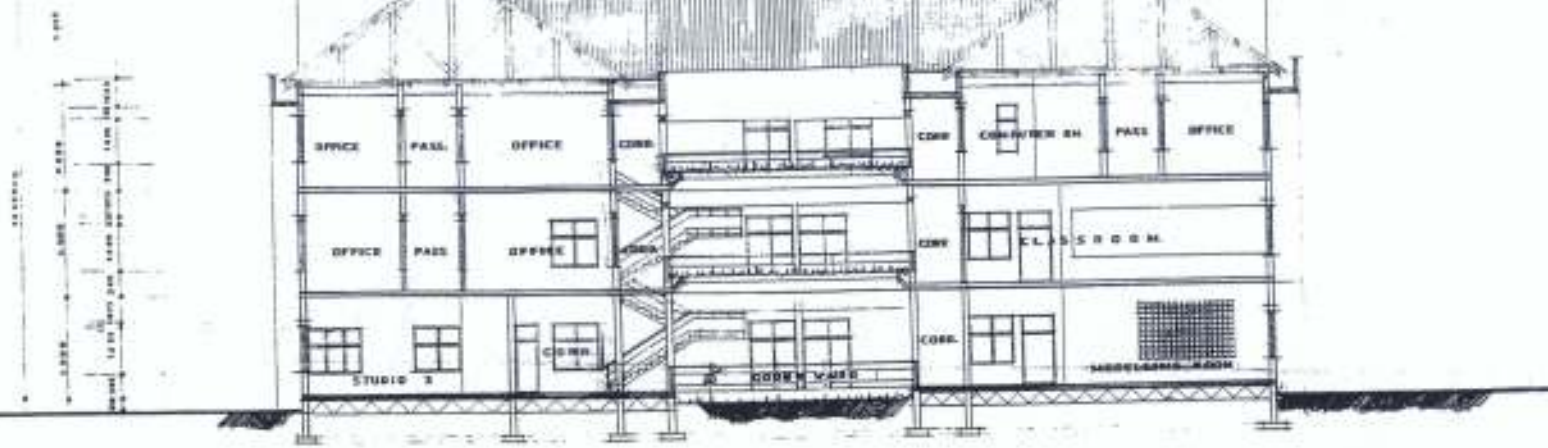


BACK ELEVATION

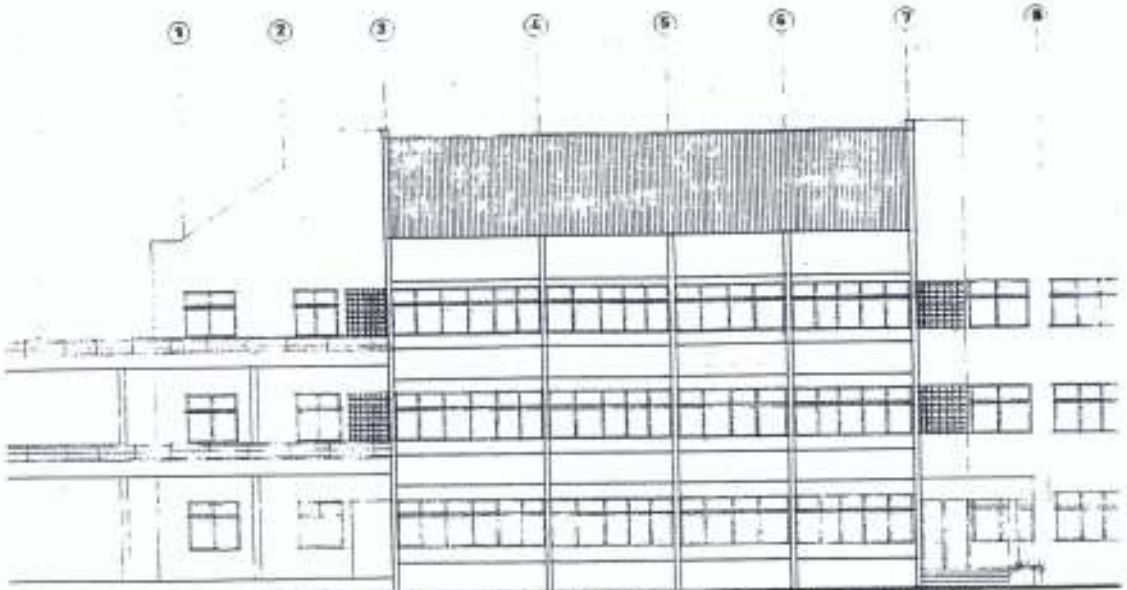


APPROACH ELEVATION





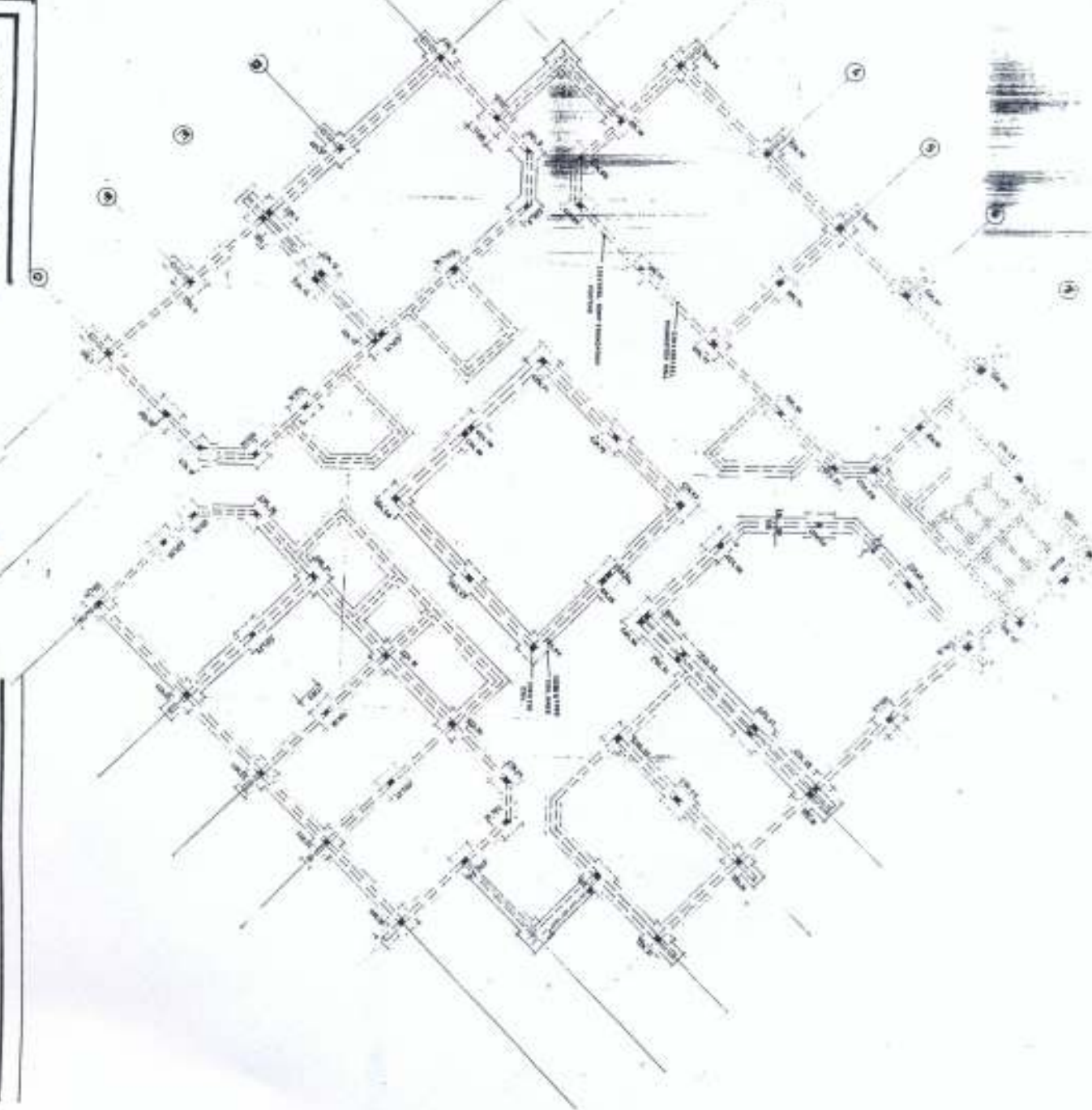
SECTION D

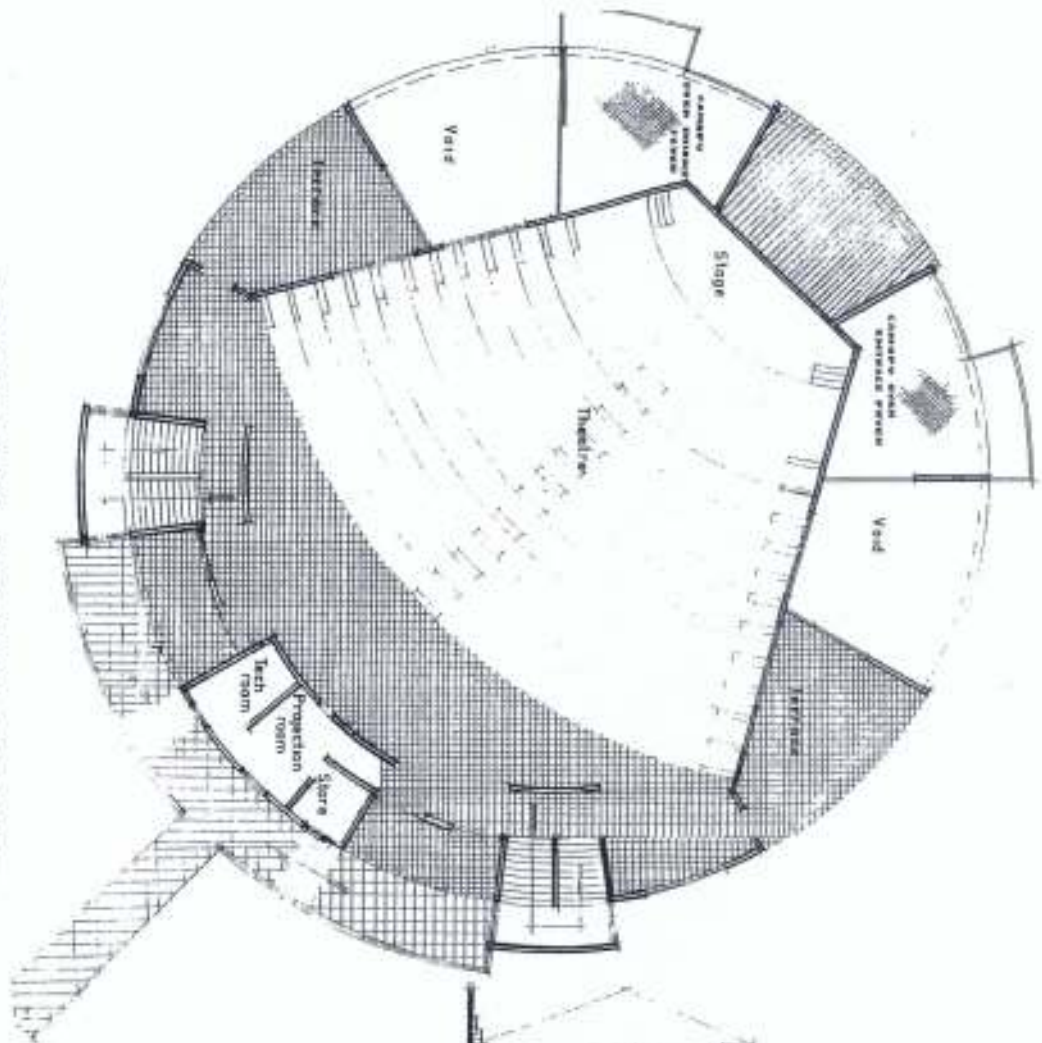


PART ELEVATION (FINE ART / O.S. DEPARTMENT)

**PROPOSED SCHOOL OF ENVIRONMENTAL TECHNOLOGY
 CLARKE OBARANG UNIVERSITY - BOGUN (CAMPUS)
 ENSURING ADEQUATE CIRCULATION SYSTEM**

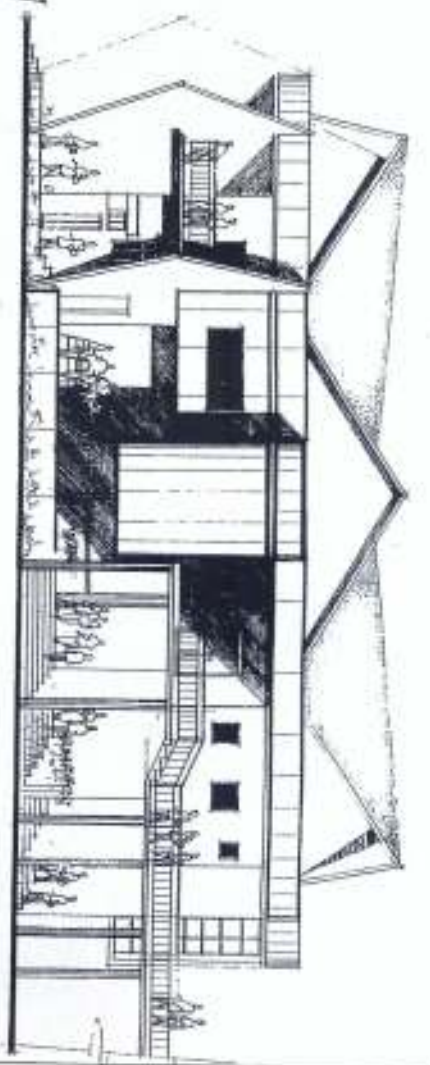
ELEVATION OF





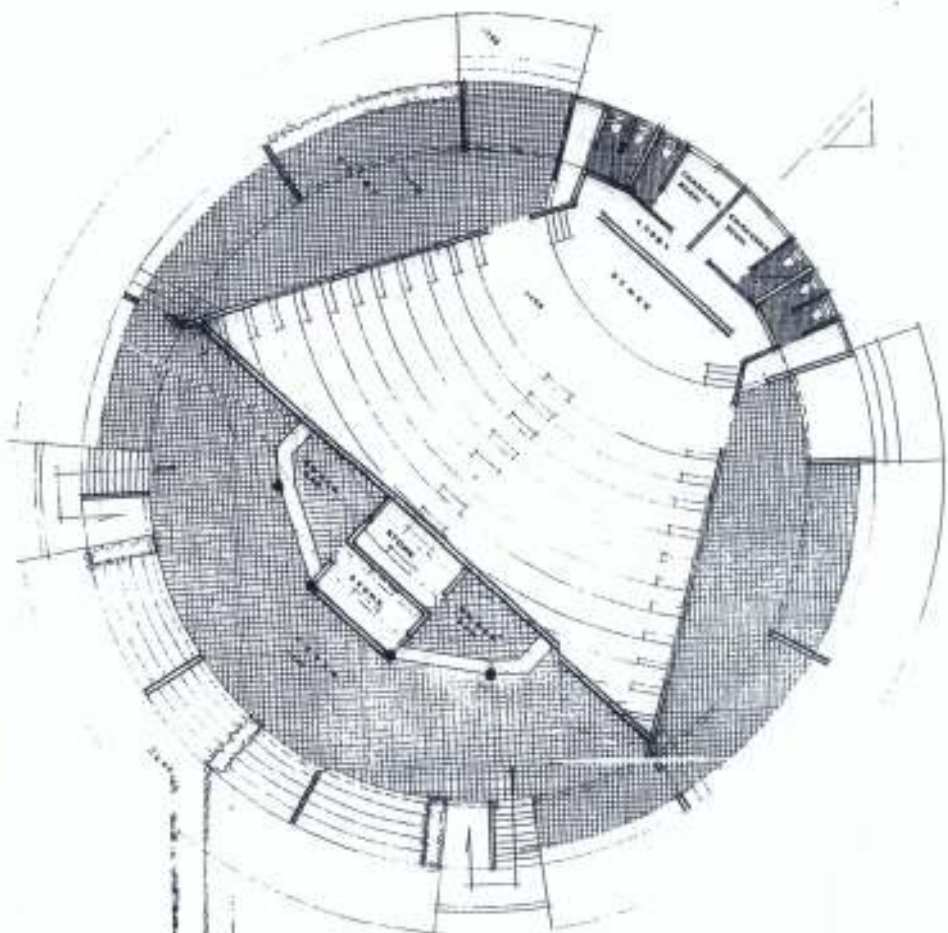
FLOOR PLAN LECTURE THEATRE

E O O

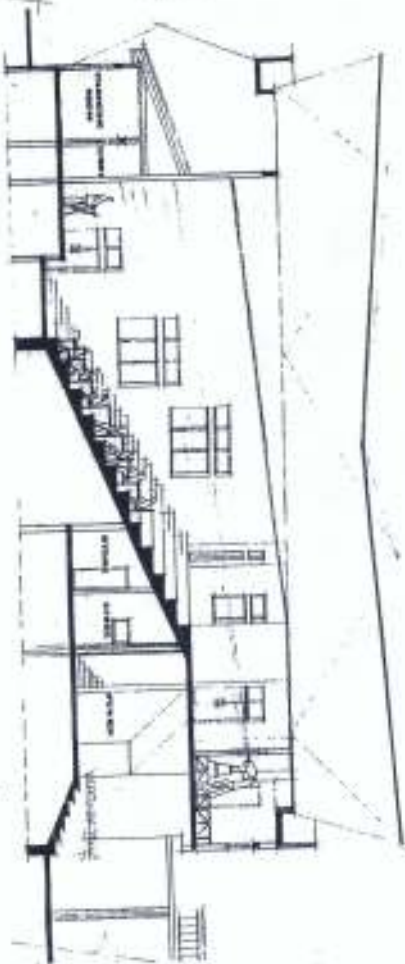


ELEVATION

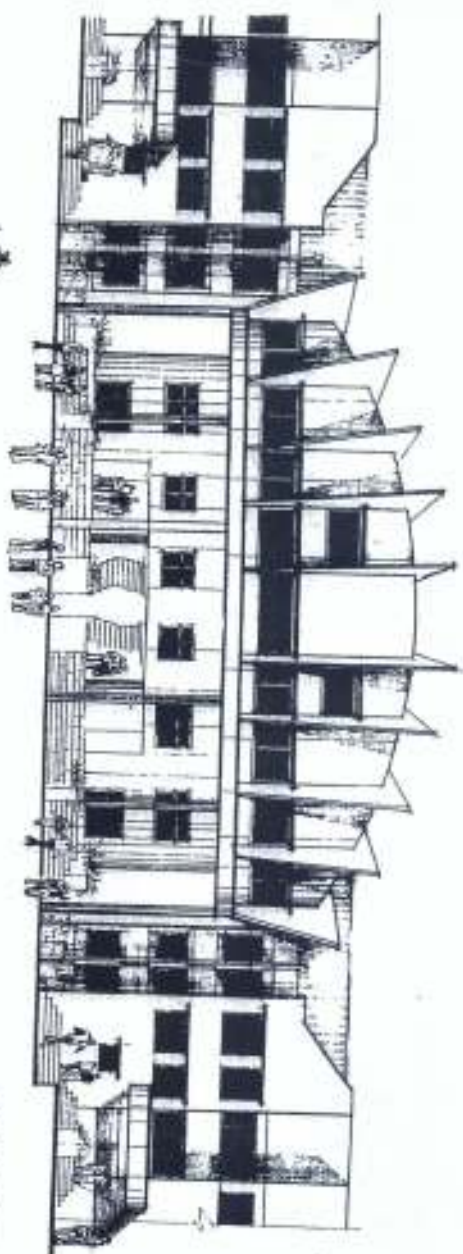
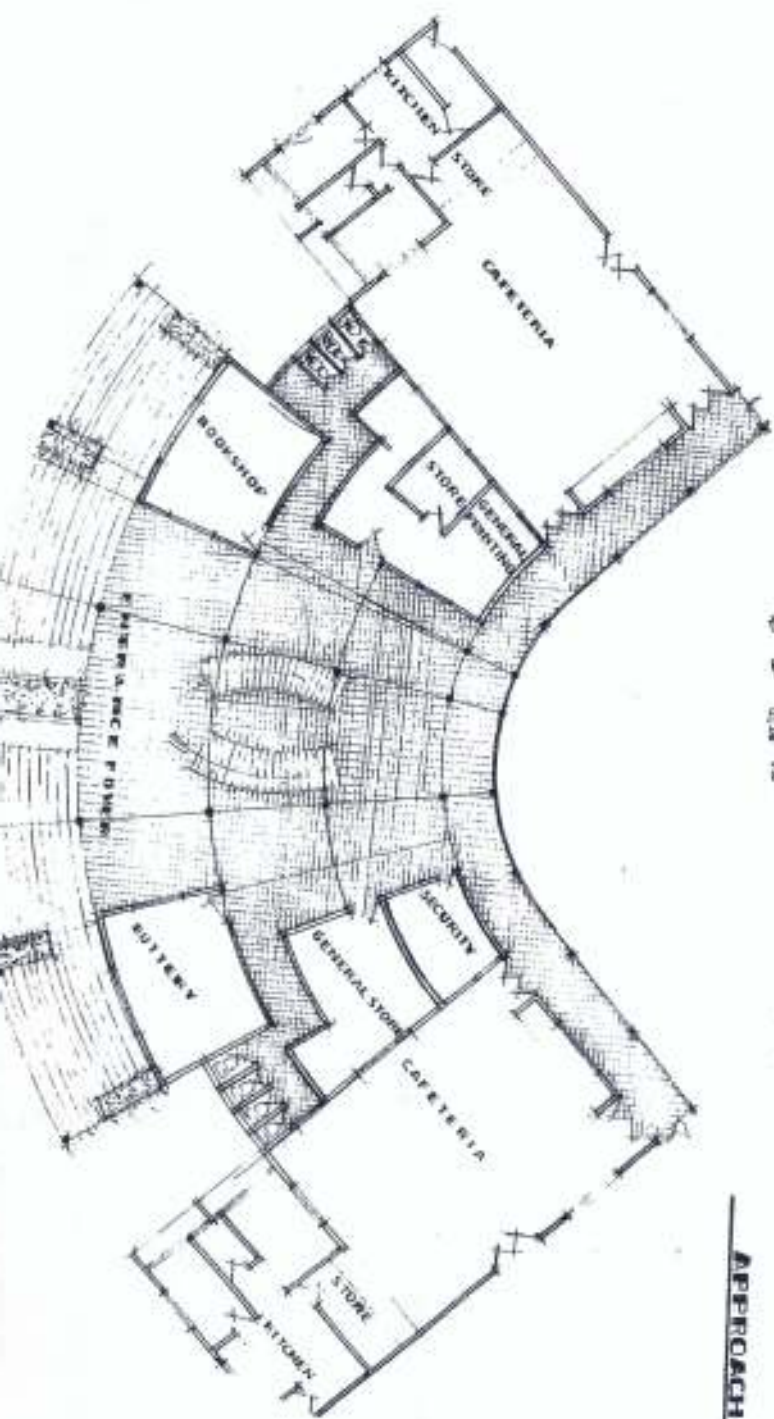
[Handwritten signature]



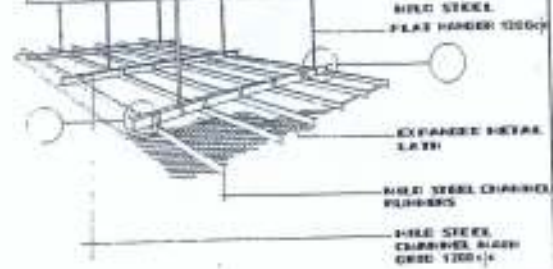
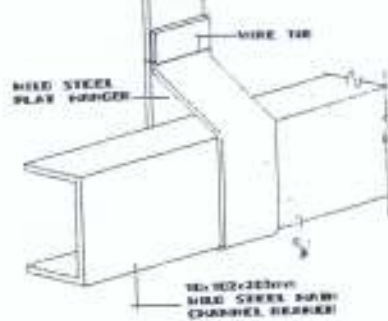
FLOOR PLAN SECURE THEATRE



SECTION

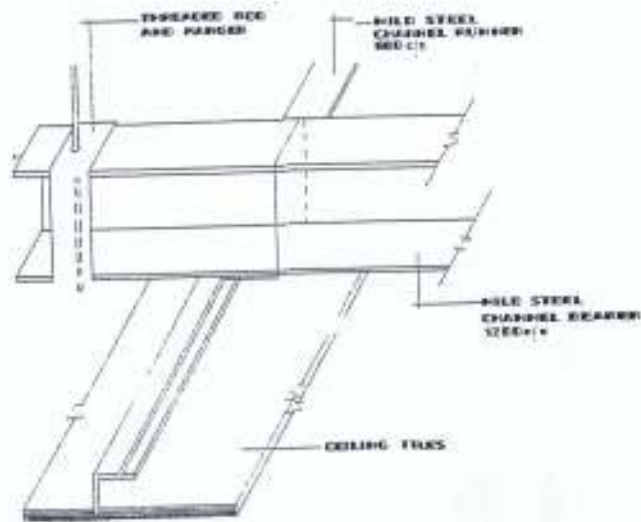
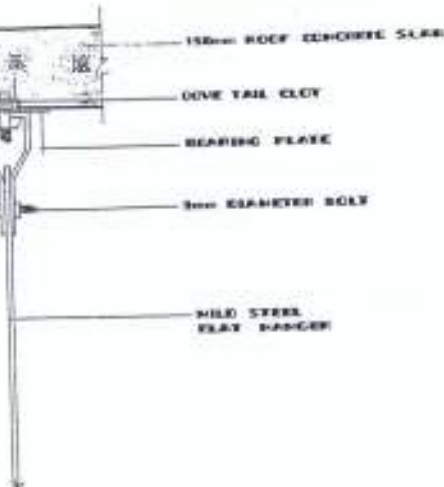


APPROACH VIEW

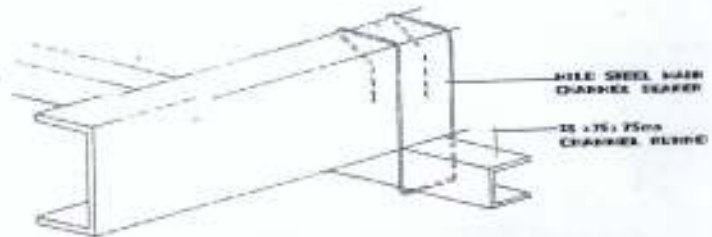


DETAIL OF HANGER CRADLE

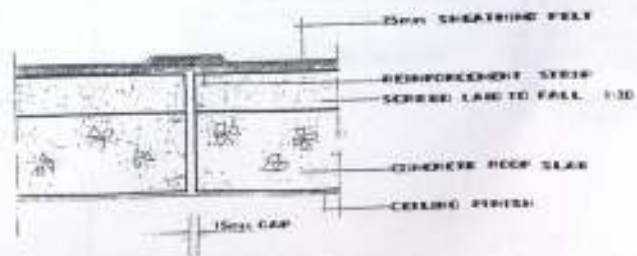
IN LAYOUT



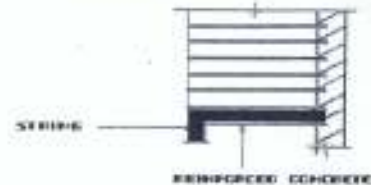
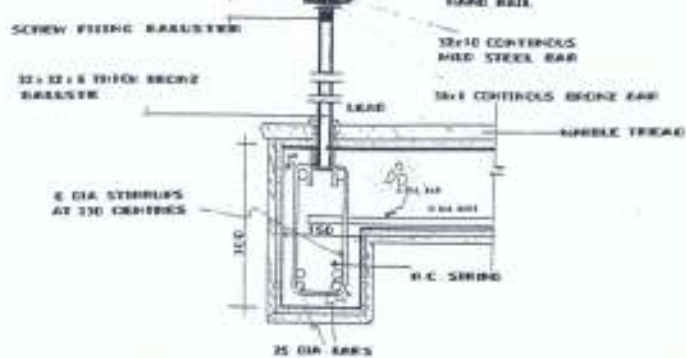
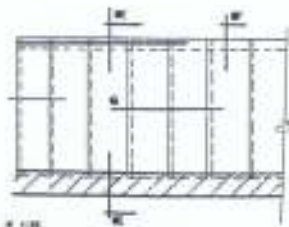
FIXING OF SUSPENDED CEILING TILES CONCEALED FIXING



DETAIL OF MILD STEEL RI CLIP



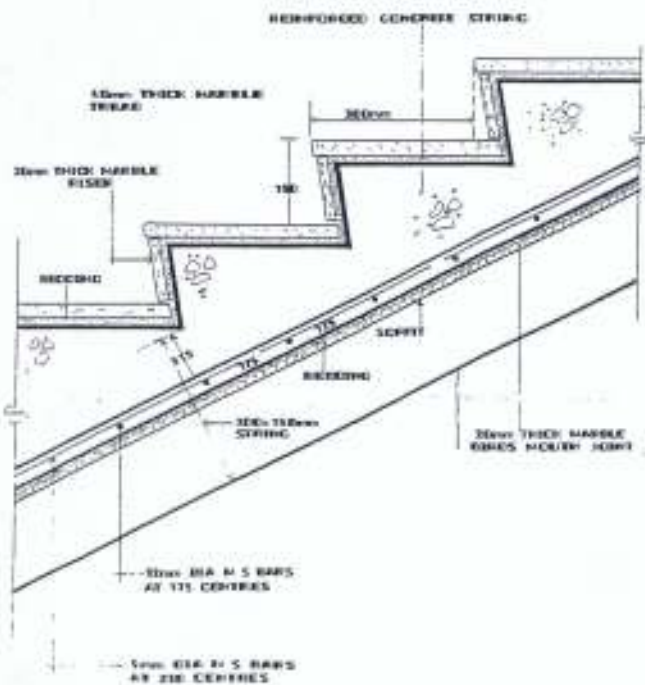
EXPANSION JOINT



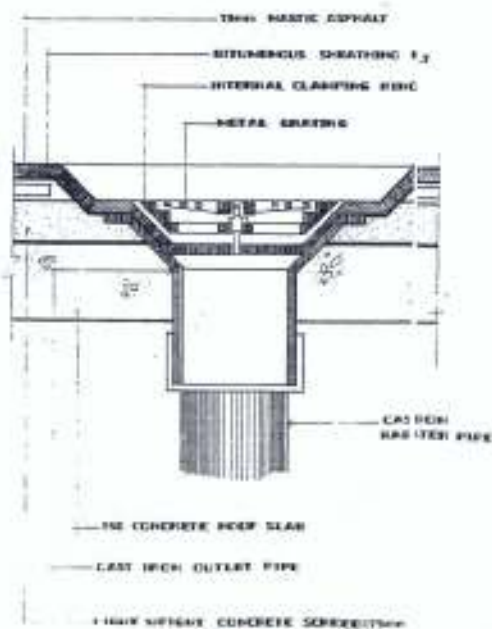
4b **DETAIL AT 'F'**
 BALUSTERS
 SCALE 1:1

STAIRS CASE DETAILS

DETAIL AT 'G'
 SCALE 1:1

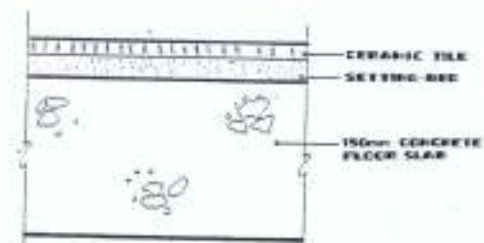


5 ROOF DRAIN PIPE
 SCALE 1:1

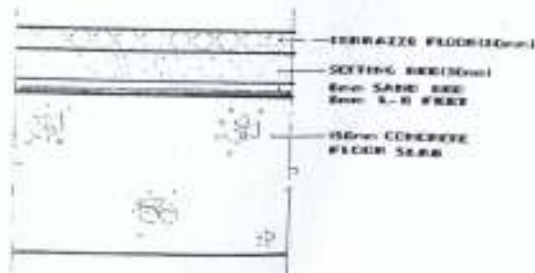


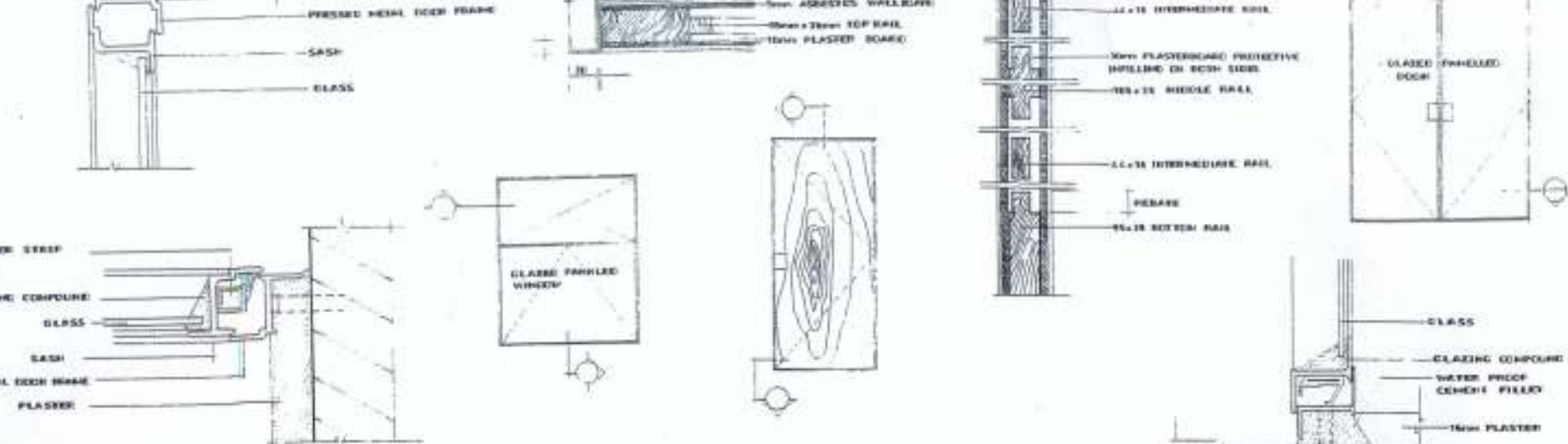
6. FLOOR DETAILS

6a. CERAMIC TILE ON CONCRETE
 SCALE 1:1



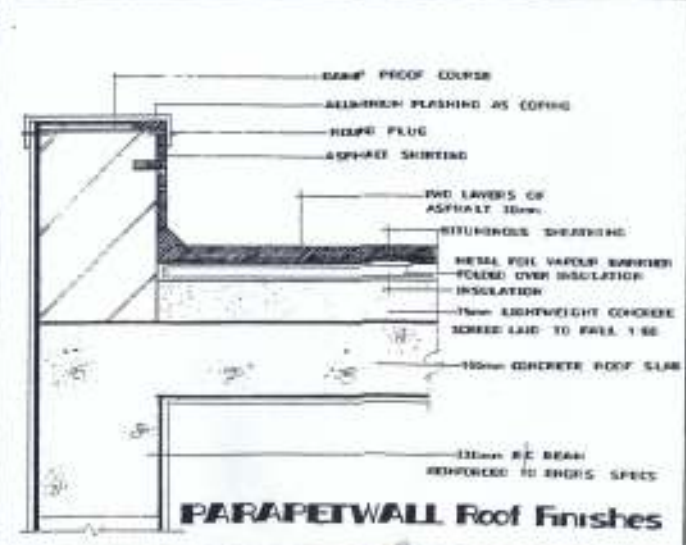
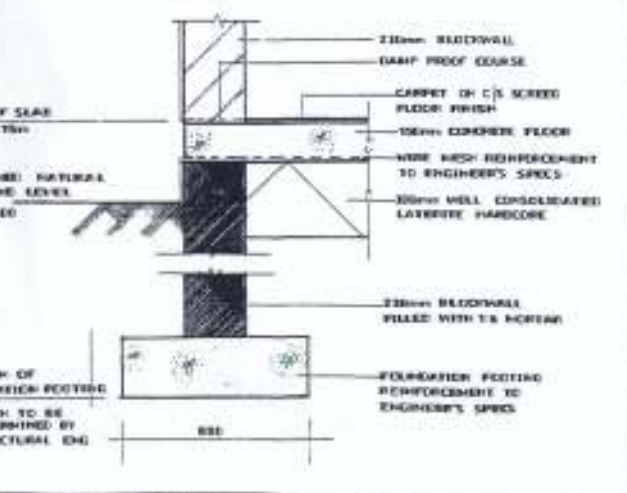
6b TERRAZZO ON CONCRETE
 SCALE 1:1



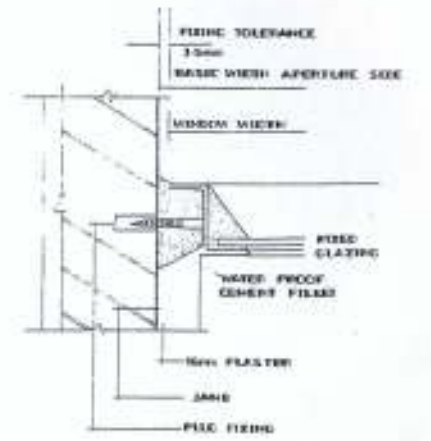


DOOR DETAILS

INTERNAL WALL FLOOR JUNCTION



PARAPET WALL Roof Finishes



UNIVERSITY OF
1997

PROPOSED SCHOOL OF ENVIRONMENTAL TECHNOLOGY
OLABISI ONABANJO UNIVERSITY (IGODUN/CAMPUS)
ENSURING ADEQUATE EDUCATIONAL SERVICES

SHEET	
DATE	
SCALE	
CONTENT	