# JIGAWA STATE PRIMARY EDUCATION BOARD HEADQUARTERS, DUTSE:

## WIND DAMAGF, CONTROL ON INSTITUTIONAI, BUILDING IN JIGAWA STATE

BY

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A thesis submitted to the Post-Graduate School in partial fulfilment of the requirements for the award of degree of Master of Science in Architecture. Department of Architecture, Ahmadu Bello University, Zaria.

October. 1998

# DECLARATION

I hereby declare that this thesis is original, authentic and the result of my keen effort and intense research and has not to the best of my knowledge, been accepted in any previous publication anywhere. That all quotations are distinguished by quotation marks and the sources of information are specifically acknowledged.

Suleiman Hussaini H.

# CERTIFICATION

This thesis entitled "State Primary Education Board, Headquarters, Dutse, Jigawa State, Wind Damage Control On Institutional Building In Jigawa State", met the regulation governing the award of the degree of Masters of Science in Architecture of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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# DEDICATION

This work is dedicated to Almighty Allah the most beneficent the most merciful and to my father Suleiman Adamu

# ACKNOWLEDGEMENT

The choice of a suitable topic and subtopic is the first experience in the thesis. In retrospect, it has been a challenge and effort of our lecturers in the department. I therefore, acknowledge with gratitude and appreciation the contribution of my supervisor who is also the Chairman of my thesis Supervisory Committee, Arc. S.S. Tulpule for his keen interest and valuable assistance. I also thank all other supervisory team for their probing questions and suggestions. I also acknowledge the contribution made by Arc. Sagada.

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# ABSTRACT

The National Calamity Falling Standards that beset education in the country at all levels made it expedient for both people and government in the country to look out for the solution in order to restore education to its lost glories of the late 1950s and early 1960s.

The issue of the restoring of education in Jigawa state has been disturbing the minds of its people and government since the creation of the state on August 27, 1991. After the dissolution of the former Primary School Management Board at the end of 1990. primary education found itself in another sorry situation. The situation for that period to 1993 was characterised by non-payment or delayed payment of teachers' salaries and allowances by a large number of local government councils including those owing teachers up-to nine months salaries. There was also the lack of everything that could make the teaching/1earning atmosphere in primary school conducive. Also teachers welfare package for necessary encouragement was non-existence. Even regular training embarked upon by the former State Primary Education Board were left to die a natural death.

The federal government decided to answer the yearning of the people by the establishing of National Primary Education Commission (NPEC) at federal level and State Primary Education Board (SPEB) at state level with the object of revita1ization

of primary education for desired quality improvement.

Since the take-off of the State Primary Education Board in the middle 1994 the issue of non-payment or delayed payment become history. The board is able to achieve welfare package for their staff which include promotion, revival of staff loans, and various training, programmes, seminars, workshops, etc. that are aimed at improving the staff performance in and outside the classroom. The board needs a conducive environment to carry out the function effectively.

The wind damages is also serious in the state, therefore, there is a need to look out this problem of wind damage and control it in all public buildings to safeguard the economic situation.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 PREAMBLE

Education is defined as a physical, mental, social training given to a person to develop him soundly. It can be defined as the training of mind and the ability of an individual in a specified direction. It is the basic rudiment of a nation's progress and development, standing as an upliftment of the cultural, social, technological and political stability of the nation.

Education was brought to Nigeria by the first Christian Missionaries in which Christian knowledge was the main objective. They also aimed at having many converts, teaching them Bible knowledge and Christian hymns. This was done both orally and in written through local and English language which Missionaries realised very important in a training programme.

Culturally, northern part of Nigeria tended to resist western education for a variety inter-related reasons, prominent amongst which was the fact that western education was associated with "NASARANCI" (Christianity) and that was a threat to the very fabric of Islam. In addition, Islam boasted of an organised and sophisticated Education System through its Quranic schools. It was estimated that by 1914 there were at least 25,000 Quranic schools scattered throughout Nigeria with population of 218,618 pupils called "ALMAJIRAI".

Children were taught to memorize chapters of the Quran, Arabic alphabets and eventually to read and write at the age of four and upward. Therefore, there was Islamic education before western education in Nigeria.

Presently, Primary Education is not as it was 70 years ago. When Primary Education was started there were few schools and there was demand for scribes, tax collectors, court scribes, clerks, shopkeepers, catechist, etc. Everyone who knew how to read and write could get paid employment. For this reason many people regarded an ability to read and write in the European alphabets as a license for getting employment and regarded manual work as the occupation of illiterate people. Many people retain this idea.

Although in these days there is a demand for qualified people, yet the qualification required is more than mere ability to read and write. Primary Education is not enough. After Primary Education, pupils have to go to secondary school or other specialised training institutions before they can get regular and well paid employment.

For any system to function properly, education inclusive, it has to be adequately planned for and fully implemented, as said by Ellis (1971) when he says "The creation of any approach to the education of children must consider the immediate and long range objectives". Education planning must be an integral part of the whole process of educational administration. State Primary Education Board Headquarters,

Dutse, Jigawa State is involved in educational planning as well as administration. It is imperative that this role be carried out in a conducive environment.

## 1.2 MOTIVATION

The ramified nature of work in office building and serious wind damages in institutional buildings in Jigawa state due to lack of some architectural elements provisions. The need to solve these problems and create a conducive environment from which it will effectively carry out its functions has motivated this thesis proposal.

## 1.3 AIMS AND OBJECTIVES

i) To use architectural means to enhance state policy on education by synthesising an architectural design that will incorporate the structure functionally and foster maximum output from people working within SPEB Headquarters.

ii) Reform of design concept is to be implemented, instead of scattered plan, a group or combined plan is more economical.

iii) To integrate the building to the environmental context of the site and climatic context of the region to control wind, ventilation and natural lighting.

iv) Outline performance standard for materials and

workmanship.

## 1.4 SCOPE AND LIMITATION

The site plan contains the whole secretariat complex with effectively landscaped surrounding with parking space.

The detail sketch plan includes:

i) Administrative offices.

ii) Conference facilities.

iii) Seminar/Training facilities.

iv) Welfare and ancillary facilities.

v) Library.

## 1.5 ARCHITECTURAL GOAL

The ultimate goal of the design is the prescription of the control for wind damage to be incorporated in the design of a secretariat building and institutional building to create a conducive environment that will solve the spatial, planning and productivity problems associated with the institutional buildings.

## 1.6 RESEARCH SUBJECT

Wind is one of the essential climatic data required in architectural design. It plays an important role in determining the air flow pattern within the building.

This thesis intends to study the nature of wind pressure/velocities which causes damages to institutional

buildings to avoid blowing off of the roof and total collapse of the walls. The determination of the wind loads on roofs and walls should reflect maximum values to avoid damage recommendations of the control wind loads on institutional buildings is proposed.

## 1.7 METHODOLOGY

Case studies on some existing institutional buildings were carried out. This helped in analyzing the problems encountered and how they are tackled. Unresolved problems are highlighted with a view of improving on them in the proposed design.

Observations were also made as a means of a field stage of this project.

## 1.8 USER/CLIENT

The users of the building are the staff of the headquarters of SPEB, Dutse and the client is the SPEB Jigawa state.

## 1.9 REFERENCES


1. Annual Report (1994 & 1995): Jigawa State Primary Education Board, Zafam Ventures and Printing Kano, pp 1-2.

2. First Annual Report (1987): Kano State Primary School Management Board, pp 1-5.

3. Ibrahim, A. (1978): Primary Education Curricula For Primary School Teachers, Herneman Educational Books (Nig.) Ltd, pp 1-6.

4. Ogogo, L.A (1990): National Primary Education Commission Headquarters, Abuja, pp 1-4.

# CHAPTER TWO

## STATE PRIMARY EDUCATION BOARD, DUTSE JIGAWA STATE

### 2.1 PREAMBLE

The National Calamity of Falling Standards that beset education in the country at all levels made it expedient for both the people and government in the country to look out for solution in order to restore education to its lost glories of late 1950s and early 1960s.

After the demise of the former National Primary School Commission at federal level and Primary School Management Board at state level at the end of 1990, primary education found itself in another sorry situation. The situation from that period to 1993 was characterised by non or delayed payment of teachers' salaries and allowances by a large number of local government councils including those owing teachers up-to nine months salaries, inadequate teaching and learning materials, dilapidated buildings, lukewarm attitude of parents towards western education among others. Even regular training embarked upon by a former PSMB were left to die a natural death.

The foresight of the present administration on this matter the federal government answer the yearning of people which necessitated the re-establishment of the NPEC and SPEB by the federal government and state government respectively with the objective of revitalisation of primary education for

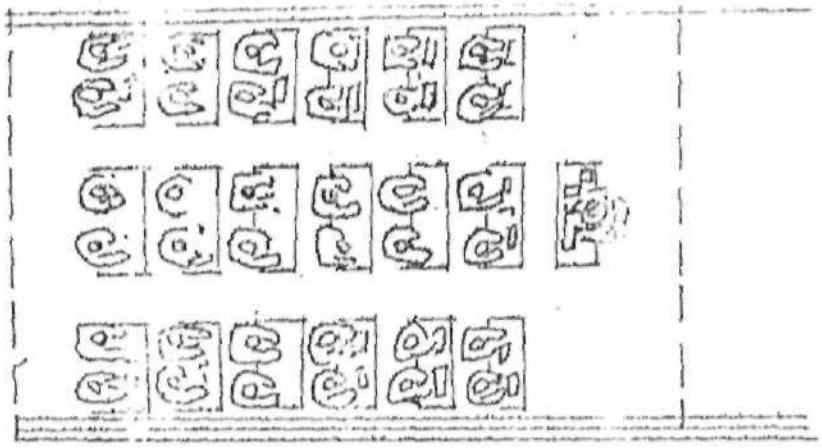
desired quality improvement.

These bodies (NPEC and SPEB) were to shoulder the herculean task of regaining the lost glory of primary education, so as to ensure that a well planned, industrious and dedicated citizens are trained for the rapid development of the nation.

## 2.2 PRIMARY EDUCATION IN JIGAWA STATE

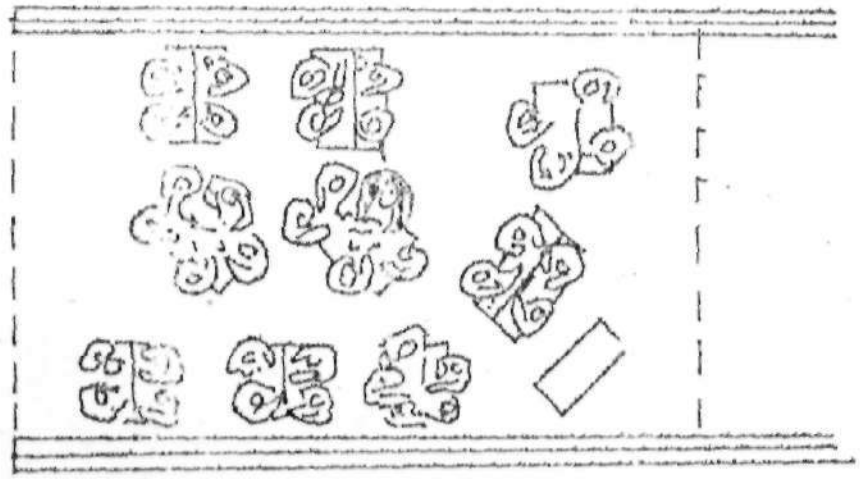
After the re-establishment of NPEC and SPEB by the Federal Military Government in 1993, edict on Primary School Education Board was enacted in Jigawa state by the then Military Administrator, Colonel Ibrahim Aliyu in early 1994, authorising the board to draw policy decisions and run the affairs of primary education. Among its responsibilities are establishment of Education Fund Committee, Local Education Committee, Local Government Areas and Education Committees in twenty-seven local government areas. The board has four departments i.e Schools Services, Finance and Supplies, Planning, Research and Statistics and Personnel Management.

Since the take-off of the SPEB in Jigawa state, the problem of delayed/non-payment of teachers' salaries became history. The board is able to achieve welfare package for its staff which include promotion, revival of staff loans and various training programmes, seminars, workshops, etc, that are aimed at improving the staff performance in and outside the classroom.



A FORMAL METHOD OF TEACHING
- THE CHILDREN WATCHING AND COPYING
A DEMONSTRATION BY THE TEACHER

FIG. 2.0



PUPIL CENTRED WORK
- A LESS FORMAL APPROACH
THE TEACHER ACTING AS A
CO-WORKER.

FIGURE 2.D

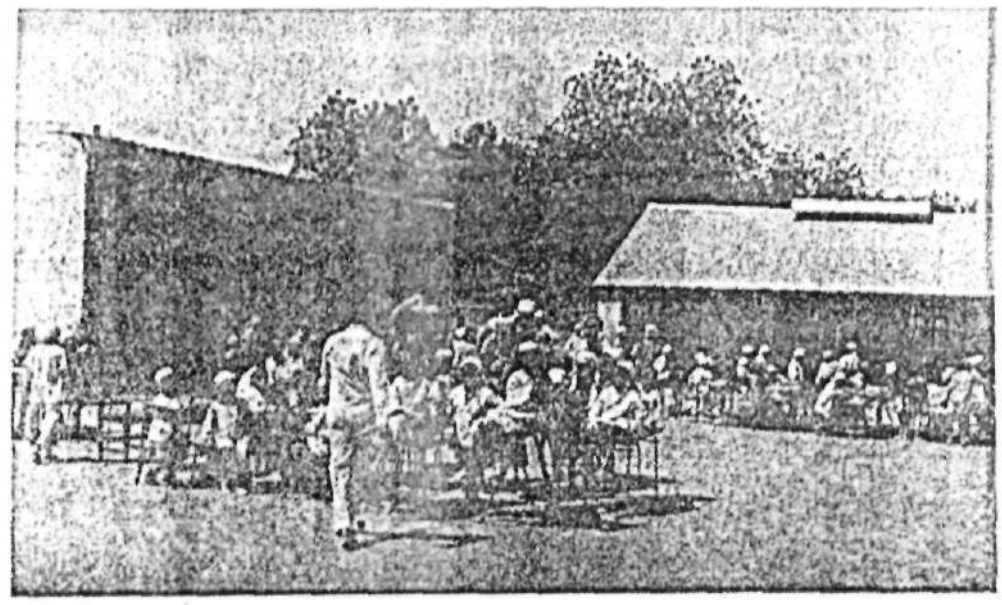


FIG. 2.2



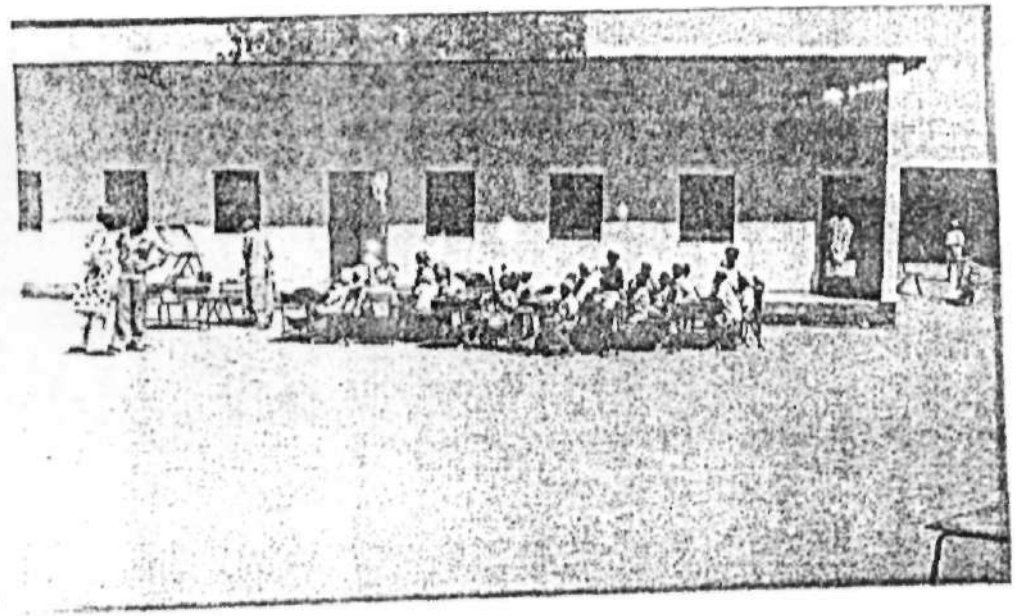


FIG. 2.3
OUT-DOOR TEACHING DUE TO SHORTAGE OF CLASSROOM

## DATA ON STAFF ADVANCEMENT, PROMOTION, TRAINING AND DISCIPLINE IN THE LGEAs IN 1995

| S/NO | LGEA | STAFF STRENGTH | ADVANCEMENT | PROMOTION | TRAINING | DISCIPLINE |
|---|---|---|---|---|---|---|
| 1. | BABURA | 1000 | 29 | 272 | 102 | 45 |
| 2. | B / KUDU | 779 | 15 | 395 | 93 | 3 |
| 3. | BIRNIWA | 480 | 2 | - | 76 | - |
| 4. | DUTSE | 871 | 10 | 248 | 1105 | 20 |
| 5. | GARKI | 673 | 15 | 182 | 52 | 2 |
| 6. | GUMEL | 936 | 32 | 465 | 141 | 1 |
| 7. | GWARAM | 691 | 18 | 179 | 64 | 1 |
| 8. | GWIWA | 371 | 11 | 65 | 25 | 4 |
| 9. | HADEJIA | 743 | 25 | 629 | 90 | 9 |
| 10. | JAHUN | 900 | - - | 6 | 152 | - |
| 11. | K / HAUSA | 1,008 | 65 | 358 | 120 | 4 |
| 12. | KAUGAMA | 639 | 16 | 196 | 65 | 9 |
| 13. | KAZAURE | 650 | 13 | 131 | 35 | - |
| 14. | K/KASSAMMA | 639 | 7 | 350 | 89 | 5 |
| 15. | KIYAWA | 824 | 25 | 207 | 64 | 10 |
| 16. | MAIGATARI | 703 | 16 | 146 | 76 | 18 |
| 17. | M/MADORI | 549 | 10 | 120 | 45 | 10 |
| 18. | RINGIM | 651 | 18 | 136 | 82 | 16 |
| 19. | RONI | 427 | 4 | 52 | 16 | 1 |
| 20. | S/TANKARKAR | 780 | 2 | 228 | 71 | 12 |
| 21. | TAURA | 450 | 20 | 121 | 69 | |
| | TOTAL | 14,408 | 267 | 4,491 | 1,510 | 154 |

TABLE 1.0

## DATA ON NUMBER OF TEACHING AND NON-TEACHING STAFF LGEA BY LGEA 1995

| S/NO | LGEA | NO OF TEACHING STAFF | NO OF NON-TEACHING STAFF | TOTAL |
|---|---|---|---|---|
| 1. | BABURA | 749 | 251 | 1000 |
| 2. | B / KUDU | 594 | 185 | 779 |
| 3. | BIRNIWA | 346 | 134 | 490 |
| 4. | DUTSE | 627 | 244 | 871 |
| 5. | GARKI | 559 | 114 | 673 |
| 6. | GUMEL | 722 | 214 | 936 |
| 7. | GWARAM | 492 | 201 | 693 |
| 8. | GWIWA | 243 | 130 | 373 |
| 9. | HADEJIA | 578 | 205 | 193 |
| 10. | JAHUN | 717 | 183 | 900 |
| 11. | K / HAUSA | 599 | 409 | 1,008 |
| 12. | KAUGAMA | 472 | 167 | 639 |
| 13. | KAZAURE | 469 | 181 | 650 |
| 14. | K/KASSAMMA | 481 | 158 | 639 |
| 15. | KIYAWA | 665 | 159 | 924 |
| 16. | MAIGATARI | 533 | 170 | 703 |
| 17. | M/MADORI | 394 | 155 | 549 |
| 18. | RINGIM | 498 | 153 | 651 |
| 19. | RONI | 279 | 148 | 427 |
| 20. | S /TANKARKAR | 622 | 158 | 780 |
| 21. | TAURA | 350 | 100 | 450 |
| | TOTAL | 10,989 | 3,819 | 14,408 |

TABLE 1·1

# DATA ON NUMBER OF SCHOOLS, ENROLMENT AND STAFF THE LGEAs IN 1995

| S/NO | LGEA | NO SCHOOLS | TOTAL ENROLMENT | TOTAL NO. OF STAFF |
|---|---|---|---|---|
| 1. | BABURA | 78 | 21,664 | 1000 |
| 2. | B / KUDU | 96 | 29,864 | 779 |
| 3. | BIRNIWA | 62 | 21,688 | 480 |
| 4. | DUTSE | 99 | 22,841 | 971 |
| 5. | GARKI | 70 | 15,797 | 673 |
| 6. | GUMEL | 70 | 19,812 | 936 |
| 7. | GWARAM | 61 | 20,228 | 693 |
| 8. | GWIWA | 28 | 8,913 | 373 |
| 9. | HADEJIA | 57 | 32,927 | 783 |
| 10. | JAHUN | 71 | 25,692 | 900 |
| 11. | K / HAUSA | 100 | 18,832 | 1,008 |
| 12. | KAUGAMA | 54 | 16,774 | 639 |
| 13. | KAZAURE | 50 | 17,204 | 650 |
| 14. | K/KASSAMMA | 91 | 28,601 | 639 |
| 15. | KIYAWA | 76 | 17,739 | |
| 16. | MAIGATARI | 76 | 13,711 | 03 |
| 17. | M/MADORI | 50 | 13,201 | 549 |
| 18. | RINGIM | 73 | 25,934 | 651 |
| 19. | RONI | 35 | 10,081 | 427 |
| 20. | S /TANKARKAR | 108 | 18,622 | 780 |
| 21. | TAURA | 43 | 11,872 | 450 |
| | TOTAL | 1,447 | 412,000 | 14,408 |

TABLE 1·2

## DATA ON NUMBER OF TEACHING STAFF BY THEIR QUALIFICATIONS LGEA BY LGEA

| S/N | LGEAs | NO OF SCHOOLS | NO OF TEACHERS | NO OF TEACH. STAFF | TOTAL | GRA-DUATE | | N.C.E | | GRADE II PASSED | | GRADE II REF. | | OTHERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M | F | | M | F | M | F | M | F | M | F | M | F |
| 1. | Babura | 78 | 742 | 7 | 749 | 4 | - | 23 | - | 264 | 1 | 303 | 3 | 148 | 2 |
| 2 | Birnin Kudu | 96 | 569 | 25 | 594 | 4 | - | 31 | 2 | 212 | 3 | 202 | 5 | 130 | 15 |
| 3. | Birniwa | 62 | 343 | 3 | 346 | - | - | 10 | - | - | 132 | 142 | 1 | 74 | 74 |
| 4. | Dutse | 98 | 614 | 13 | 627 | - | - | 30 | 2 | 178 | 1 | 253 | - | 133 | - |
| 5. | Garki | 70 | 584 | 5 | 589 | - | - | 13 | - | 251 | 1 | 167 | 4 | 123 | - |
| 6. | Gumel | 70 | 657 | 65 | 722 | 1 | - | 50 | 12 | 331 | 20 | 138 | 13 | 137 | 19 |
| 7. | Gwaram | 61 | 488 | 4 | 492 | 2 | - | 57 | | 125 | 1 | 163 | 3 | 141 | 1 |
| 8. | Gwiwa | 28 | 238 | 5 | 243 | | - | 4 | - | 63 | 2 | 67 | 3 | 104 | - |
| 9. | Hadejia | 57 | 540 | 38 | 578 | - | - | 58 | 2 | 355 | 22 | 70 | 26 | 71 | - |
| 10. | Jahun | 71 | 711 | 6 | 717 | - | - | 31 | 1 | 216 | - | 201 | 5 | 263 | - |
| 11. | Kafin Hausa | 100 | 577 | 22 | 599 | - | - | 41 | - | 93 | 5 | 288 | 10 | 160 | 7 |
| 12. | Kaugama | 54 | 456 | 16 | 472 | - | - | 11 | 1 | 246 | - | 148 | 5 | 51 | 10 |
| 13. | Kazaure | 50 | 432 | 37 | 469 | - | - | 25 | 5 | 188 | 2 1 | 142 | 12 | 77 | - |
| 14. | K/Kasamma | 91 | 481 | - | 481 | - | - | 56 | - | 204 | - | 145 | - | 76 | - |
| 15. | Kiyawa | 76 | 664 | 1 | 665 | - | - | 3 | - | 243 | - | 246 | - | 172 | 1 |
| 16. | Maigatari | 76 | 530 | 3 | 533 | - | - | 23 | - | 320 | - | 78 | 3 | 109 | - |
| 17. | M/ Madori | 50 | 374 | 20 | 394 | - | - | 35 | 3 | 200 | 4 | 74 | 13 | 57 | - |
| 18. | Ringim | 73 | 476 | 22 | 498 | - | - | 25 | 1 | 171 | 14 | 150 | 12 | 130 | 5 |
| 19. | Roni | 35 | 275 | 4 | 279 | - | - | 4 | - | 107 | 1 | 98 | 3 | 66 | - |
| 20. | S/Tankarkar | 108 | 618 | 4 | 622 | - | - | 22 | - | 254 | - | 212 | 4 | 130 | - |
| 21. | Taura | 43 | 348 | 2 | 350 | - | - | 37 | - | 119 | 1 | 54 | 1 | 138 | - |
| | TOTAL | 1,[illegible] | [illegible]087 | 302 | 10,989 | [illegible] | - | 587 | 30 | 4,282 | 86 | 3,321 | 126 | 2,486 | 60 |

TABLE 1.3

## PURCHASE & DISTRIBUTION OF CLASSROOM FURNITURE

| S/NO | PROJECT TITLE | Location | QUANTITY |
|---|---|---|---|
| 1. | Supply of Primary Schools Pupils 3 Seater Desk and Bench to LGEAs | Babura LGEA | 160 |
| 2. | | Birnin Kudu LGEA | 90 |
| 3. | | Birnin Kudu LGEA | 90 |
| 4. | | Birniwa LGEA | 60 |
| 5. | | Birniwa LGEA | 120 |
| 6. | | K/Kasamma LGEA | 200 |
| 7. | | Jahun LGEA | 180 |
| 8. | | Kafin Hausa LGEA | 180 |
| 9. | | Hadejia LGEA | 180 |
| 10. | | Mallam Madori LGEA | 180 |
| 11. | | Garki LGEA | 180 |
| 12. | | Gumel LGEA | 180 |
| 13. | | Maigatari LGEA | 160 |
| 14. | | Sule Tankarkar LGEA | 180 |
| 15. | | Maigatari LGEA | 20 |
| 16. | | Ringim LGEA | 180 |
| 17. | | Kiyawa LGEAa | 180 |
| 18. | | Dutse LGEA | 140 |
| 19. | | Dutse LGEA | 30 |
| 20. | | Gwaram LGEA | 180 |
| 21. | | Kazaure LGEA | 50 |
| 22. | | Kazaure LGEA | 100 |
| 23. | | Gwiwa LGEA | 140 |
| 24. | | Gwiwa LGEA | 20 |
| 25. | | Roni LGEA | 140 |
| 26. | | Roni LGEA | 40 |
| 27. | | Kaugama LGEA | 80 |
| 28. | | Kaugama LGEA | 40 |
| 29. | | Kaugama LGEA | 60 |
| 30. | | Dutse LGEA | 40 |
| 31. | | Taura LGEA | 100 |
| 32. | | Taura LGEA | 30 |
| 33. | | Taura LGEA | 40 |
| | | TOTAL | 3,780 |

TABLE 1.4

Funds are released from the board to local government areas meant to providing infrastructural improvement and provision of instructional materials to schools.

## 2.3 STATE PRIMARY EDUCATION BOARD

The Jigawa State Government in 1994 inaugurated the State Primary Education Board (SPEB) by edict signed on June 8, 1995 by the state Military Administrator, Colonel Ibrahim Aliyu.

## 2.4 FUNCTION OF THE BOARD

Not withstanding anything to the contrary on any other enactment, the function of the board shall be:

a) To manage all primary schools in the state.

b) To set up an effective and functional inspectorate unit to supervise and inspect primary schools including private and voluntary agency primary schools.

c) To appoint, post to Local Government Education Authorities, confirm appointments, promotion, transfer, dismissal and discipline all teaching and non-teaching staff on grade level-07 and above in all state primary schools.

d) To draw up scheme of service, pension scheme and other conditions of service including provisions of vehicles as well as housing loans for teaching and non-teaching staff as and when practicable.

e) To assess and fund salaries and all allowances of teaching and non-teaching staff subject to guidelines formulated by the State Ministry of Education.

f) To disburse funds from both Federal and State sources to Local Government Education Authorities.

g) To supervise the local government areas.

h) To ensure annual reports are tendered by Heads of Schools on teachers service under them.

i) To prepare annual estimate and establish proposals.

j) To ensure annual auditing of its accounts.

k) To train and retain teaching and non-teaching staff.

l) To retire and re-absorb teachers

m) To undertake capital projects.

n) To prepare certificates and testimonials of service for teaching and non-teaching staff where necessary.

o) To deal with leave matters, including annual vocations.

p) To perform such other functions as may from time to time be conferred upon the board by the Military Administrator or the NPEC.

## 2.5 GENERAL STRUCTURE OF THE BOARD

To have objectives and goals in the approach to any

system there must be a control and starting point. The success of any system is hinged on proper planning, efficient administration and adequate financing. Administration includes organisation and structure, proprietorship and control, inspection and supervision.

a) The structure of the board consists of the Executive Chairman who is the Chief Executive and Accounting Officer being supported by two permanent members.

b) The Secretary for the board coordinates and keeps records of all proceedings of the board. He also oversees the functions of the four establishments namely:

   i) Schools Services.

   ii) Planning, Research and Statistics.

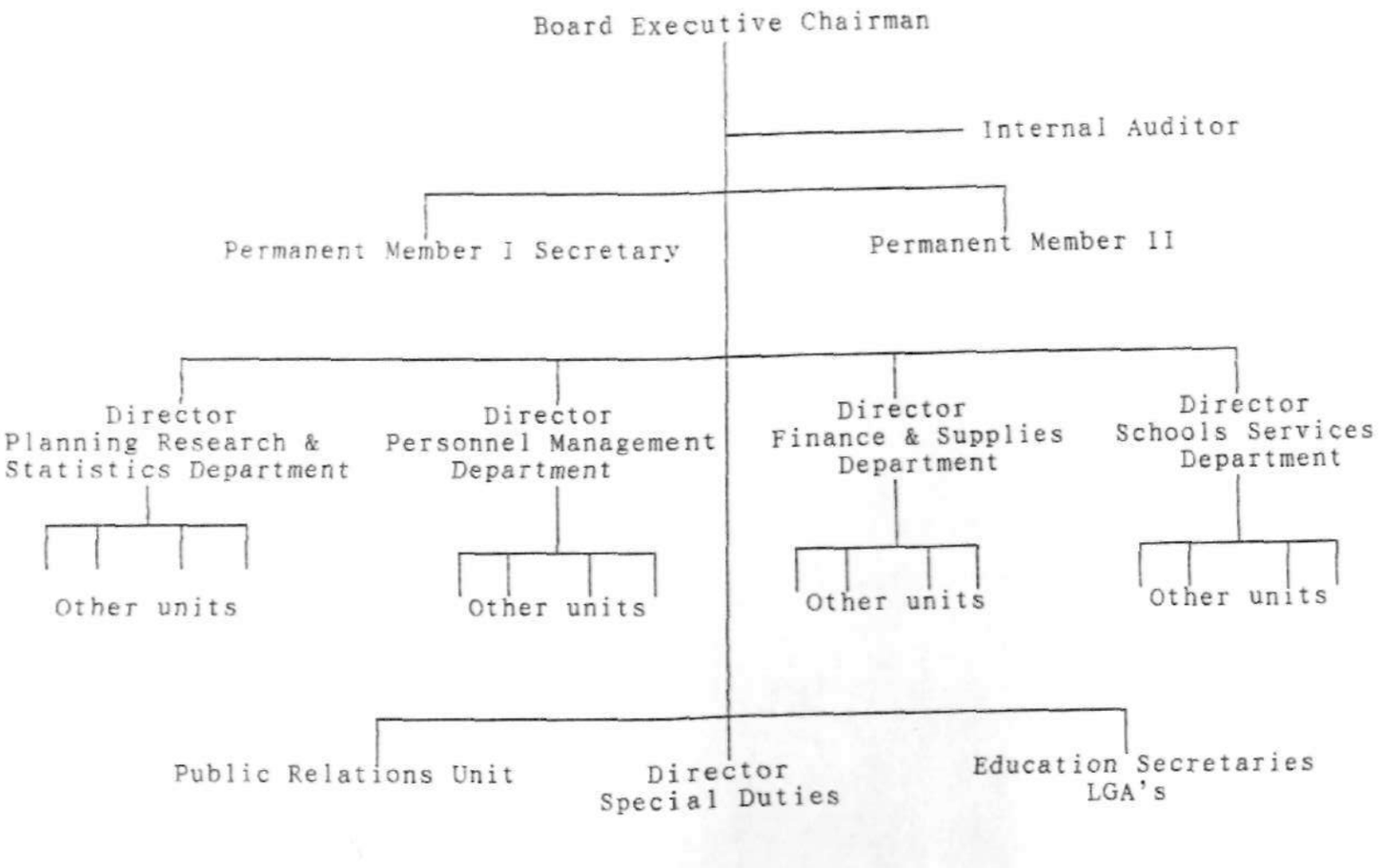
   iii) Personnel Management.

   iv) Finance and Supplies.

c) Each department is headed by a Director and is fragmented into various divisions/sections for administrative convenience.

d) The public Relations Unit, the Special Duties and all 27 Local Government Education Authorities are directly answerable to the board through the office of the Secretary.

2.6.1 STATE PRIMARY EDUCATION BOARD, DUTSE ORGANISATIONAL CHART



2.6.1 DEPARTMENTS IN HEADQUARTERS

The board is the main body which comprises of the following departments:

a) School Services Department

This department is in charge of the quality and control of primary education curricular in schools through inspections of all the state primary schools, coordination of seminar/workshops, promotion and encouragement of community participation in education activities and the ensurance of full enrolment and retention of pupils within 27 local government areas in the state.

The department has 6 units under its supervision, viz: Nomadic Education, Model Schools, Arabic/IRK/Tajweed, Project Schools, Special Services and UNICEF Coordination Unit.

i) Nomadic Education Unit: The unit is charge with the promotion and encouragement of Nomadic Education Programme in areas with Fulani concentrations within 27 local government areas. Many local government areas have already established such schools and the attendance have been encouraging.

ii) Model Primary School: These schools are to serve as models of emulation of how best primary

education should be provided and administered. The board has established such schools in all the 27 local government headquarters of the state. It has been observed that the Model Schools have been setting the pace in the areas of academic achievements for other primary schools to emulate, as there is a wide public acceptance of their existence as well as strong and growing PTA participation in their activities.

iii) Arabic/IRK/Tajweed: This unit is responsible for the conduct of Islamic activities in primary schools throughout the state. Such activities include Quranic Recitation Competitions, Islamic Examination, Islamic Quiz and symposia in primary schools, etc.

The unit is concerned with the implementation and compliance with Arabic and Islamic Studies curriculum in schools. All Arabic and Islamic Studies textbooks for use in primary schools are being recommended by this unit.

iv) Project Schools: This unit coordinates activities of all science/projects that are available in the 27 local government areas. It oversees the conduct of National Mathematics Examinations, Gifted Children Examination and the execution of any science policy as it affects primary schools in the

state. It coordinates and conducts both National and State Entrance Examinations.

v) Special Services Unit: This unit deals with functions and activities of PTA's in primary schools with 27 local government areas. It is also responsible for organising guidance and counselling sessions, sporting activities among schools and health education policies in schools.

vi) UNICEF Programme Unit: The unit is responsible for coordinating UNICEF-Assisted Programme on basic education as they relate to child survival, protection and development. It also serve as a liaison in organising seminars/workshops that are jointly sponsored by the UNICEF and the board. The unit has several positive moves, some of which are as follows:

1) Organising and conducting workshops for Education secretaries, Inspectors/Supervisors as well as providing opportunity to staff to attend "Teach the trainer" workshop.

2) Seeing to the successful and smooth take-off of all Model Schools in the local government areas.

Further to the above, the department would like to see some of the underlisted problems considered for the overall progress of primary

education in the state:

1) Large number of unqualified and untrained teachers.
2) Dilapidation of a good number of school buildings.
3) Shortage of pupils and teachers furniture.
4) Pupils poor attendance and enrolment especially in the rural schools.

b) Planning, Research and Statistics Department

This department takes charge of planning aspect of primary education in the state. Its plans encompasses all the policies and guidelines as outlined by the state government and National Primary Education Commission. It consists of:

i) Planning Unit.
ii) Physical Planning Unit.
iii) Research and Statistics Unit.
iv) Land Matters.

Each unit is headed by a Deputy Director with the exception of Land Matters which is headed by a Coordinator.

i) Planning Unit: This unit is responsible for the preparation of the board's development plan which includes rolling plan, monitoring and implementation of all the development plans in

conjunction with other units within the department. It organises seminars and workshops.

ii) Physical Planning Unit: This unit, also known as Works Unit is responsible for the preparation, monitoring and execution of all types of capital projects of the board. The unit designed, constructed, supervised and maintained the infrastructures of the board and those at local government areas in the state.

iii) Research and Statistics Unit: The main function of this unit is collection, collation and up-dating of educational data on primary education in the state for planning purposes. It is also responsible for the research purposes such as contained in the UNESCO?UNICEF and FME project on monitoring learning achievement of primary IV pupils. In collaboration with Finance and Supplies Department, the unit assisted in budget preparation of the board.

iv) Land Matters: The main function of this unit is the acquisition of land for new school site, payment of compensation, custody of all records pertaining to school sites and guards against land encroachment upon school site in the state. The unit is also responsible for tree planting in the schools. Similarly, it liaises with other

organisations such as Ministry of Agriculture, Afforestation Unit, FOA, etc to organise the launch campaign on tree planting in the schools.

c) Personnel Management Department

The main functions of this department are promotion, advancement, recruitment, retirement, discipline, training and staff welfare. It consists of 3 units which are:

i) Staff Welfare Unit: This unit is responsible for promotion, advancement of staff, security and settlement of medical bills.

ii) Staff Matters Unit: Its main functions are retirement, posting, transfer, secondment and granting of loans to staff.

iii) Training Unit: Its main tasks are in-service training of staff, organising workshops and seminars as well as manpower development.

Personnel Management Department constitutes responsible determination and consideration of personnel matters of staff for rectification by the board.

d) Finance and Supplies Department

The department is responsible foe managing financial resources of the board. It had the following units:

i) Accounts unit.

ii) Finance Unit.

iii) The Store.

Its main function is keeping records of all financial transactions of the board such as disbursement of funds to local government areas; issuance of authority to incur expenditure, payment of staff salaries and allowances, payment of contracts and collection of revenues. It also prepares monthly returns for submission to NPEC. Market survey of prices, collects quotations for purchases of materials, issuance of local purchase order (LPO), jobbing order and the supervision and control of stores form part of the departmental functions.

2.6.3 OTHER PRINCIPAL UNITS

a) Internal Audit

This unit is under the office of the Executive Chairman of the board. It is headed by a Principal Internal Auditor and supposed to have a staff in each of the twenty-seven local government areas.

The units established plans and prepared audit programmes. Policies and procedures are drawn up in order to guide the audit staff on the effective preparation. Checking and monitoring of budget. It is also responsible for guiding the management on all matters relating to budget and budget control.

The unit also made pre-payment audit for vouchers to

check and ensure that all payments submitted for audit are supported with the original documents. It also carried out a monthly detailed payroll audit.

b) Public Relations Unit

The unit's key function is promoting public relations with regards to the activities and performance of the board. it organises the relevance of media organisations towards disseminating information on the role of the board to the public.

The SPEB Public Enlightenment and Public Campaigns Committee organises press briefing from time to time to make the public aware of the board's activities. Similarly, programmes on electronic and print media with special features are aired and published respectively. One of such programmes is the Jigawa State Radio weekly education programme in Hausa **"Fitila Maganin Duhu"**.

c) Special Duties Unit

The main responsibilities of this unit includes:

i) To serve as Secretary Tenders Board, Management and Budget Committees.

ii) Distribution of teaching and learning materials to local government areas in liaison with Planning, Research and Statistics Department.

2.6.4 DETAIL STAFF BREAKDOWN

The detail staff breakdown in the board is as follows:

a) Executive Chairman

i) Executive Chairman

ii) Permanent Member I

iii) Permanent Member II

iv) Secretary

v) Chief Internal Auditor

vi) Senior Typist

vii) Clerical Assistant

b) Planning, Research and Statistics

i) Director

ii) Deputy Director (Research. Planning & Statistics)

iii) Deputy Director (Works)

iv) Assistant Director (Statistics)

v) Assistant Director (Planning)

vi) Assistant Director (New Project)

vii) Assistant Director (Maintenance)

Viii) Coordinator (Land Matters)

ix) Coordinator (Budget. Monitoring & Evaluation)

x) General Office

xi Library

c) Personnel Management

i) Director

ii) Chief Personnel Officer

iii) Senior Personnel Officer I

iv) Senior Personnel Officer II

v) Principal Personnel Officer I

vi) Principal Personnel Officer II

vii) Principal Personnel Assistant

viii) P.O.I

d) Finance and Supplies

i) Director

ii) Deputy Director (Accounts)

iii) Deputy Director (Finance & Supplies)

iv) Senior Executive Officer I

v) Senior Executive Officer II

vi) H.E.O (Accounts)

vii) E.O and A.E.O (Accounts)

viii) P.S.O (Finance & Supplies)

ix) S.O (Finance & Supplies)

x) F.O (Finance & Supplies)

e) School Services

i) Director

ii) Deputy Director (Secular)

iii) Deputy Director (IRK/Arabic Curr. Devt.)

iv) Deputy Director (Project Primary School)

v) Coordinator (Special Services)

vi) Coordinator (Primary School)

vii) Coordinator (Nomadic)

viii) Assistant Coordinator (School Services)

ix) P.E.O (Secular, Curriculum & Examinations)

x) P.E.O (IRK/Arabic/Tajweed)

xi Acc Unit

xii) Coordinator (Works)

xiii) Inspect. (School)

xiv) Inspec. (IRK/Arabic)

xv) Inspec. (Tajweed)

xvi) Inspec. (Nomadic)

xvii) Senior Officer.

f) <u>Special Services</u>

i) P.R.O

ii) P.E.O (Special Duties)

iii) In-Charge of Local Government Education Authority Secretaries

iv) Computer Analyst

## 2.7 REFERENCES


1. Annual Report (1995): Jigawa State Primary Education Board, Afam Ventures and Printing, pp 3-9.

2. First Annual Report (1987): Kano State Primary School Education Management Board, pp. 6-13.

3. National Primary Education Commission (1989): Know More About It, NPEC Press, Kaduna, Nigeria, pp. 1-14.

4. National Primary Education Commission (1996): News Letters, NPEC, Kaduna, pp. 1-5.

5. National Policy On Education (1981): NERC Press, Lagos, Nigeria, pp. 5-9, 12-15.

6. Teachers' News (1997): NPEC/UNICEF Quarterly Teachers News, NPEC, Kaduna, pp. 3-5.

# CHAPTER THREE

## WIND DAMAGE CONTROL IN INSTITUTIONAL BUILDINGS

### 3.1 PREAMBLE

Every climatic zone has its own specific atmospheric agencies. Also geographical characteristics lend local peculiarities to the prevailing wind. This chapter deals with the causes and how to solve the problem of wind damage in institutional buildings.

Wind is the air movement as a result of natural forces which flows around a building creating a pressure on the windward-side and suction on the leeward side which is deflected over the roof and around the building, creating suction.

Builders in the past have used protection measures against wind damage. Therefore, there is a need to protect buildings against damages.

Architecture is herein to contribute to the solution to this problem in Jigawa state, as Jigawa state lies in Savannah Zone which covers a large portion of this country. There is no doubt that wind damage is very serious in Jigawa and there is the need to hasten its control for economic reason. Therefore, this chapter examines the concept of wind damage in view of producing a proposal for its control.

## 3.2 WIND ANALYSIS

Wind is one of the essential climatic data required for architectural design. Wind creates pressure on the windward-side of the building and suction on the leeward side. This creates air movement within the building in the general direction of the wind. The wind is deflected over the roof and around the sides of the building creating suction. For a wind acting at an angle to a rectangular building, pressure is experienced on a two windward sides while suction is experienced on the other two. Suction and pressure on an L-shape building follow the same principles.

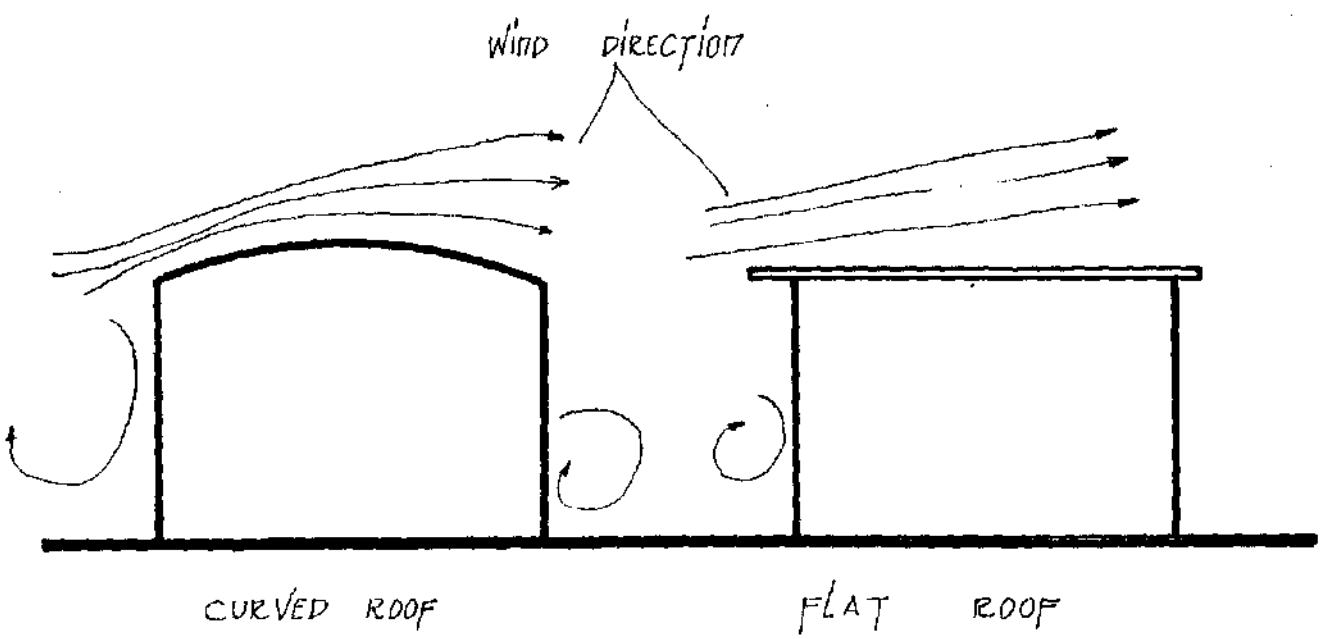
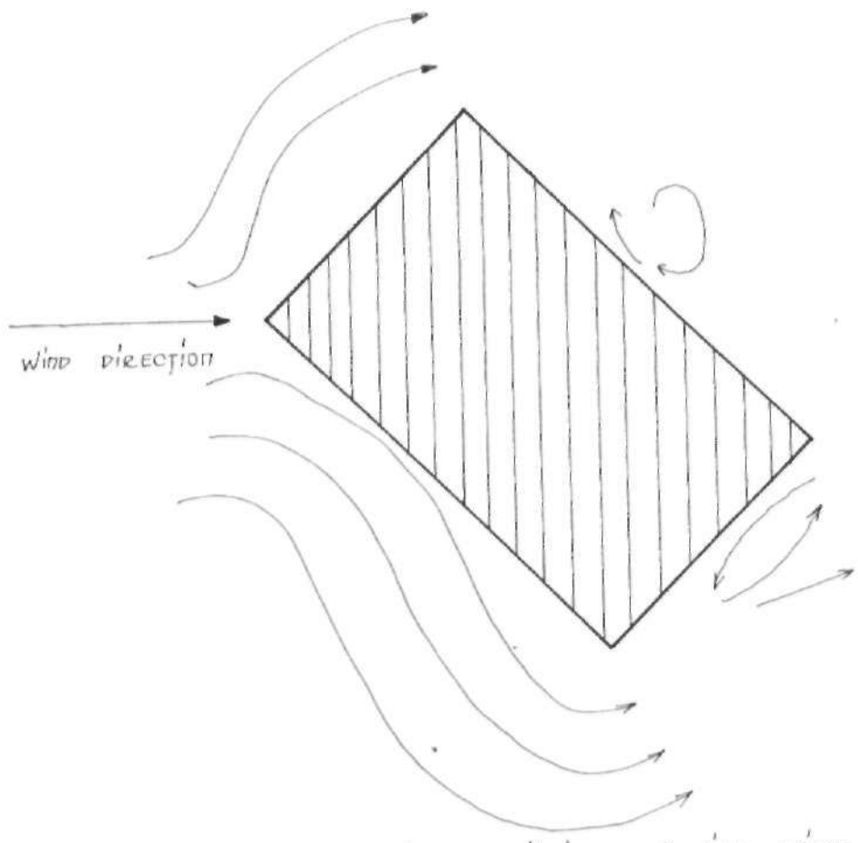
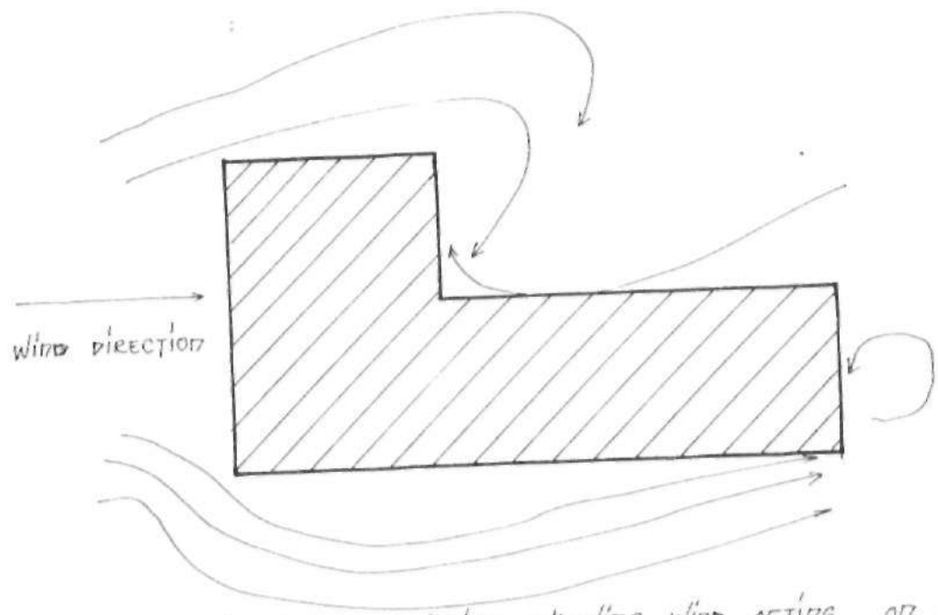
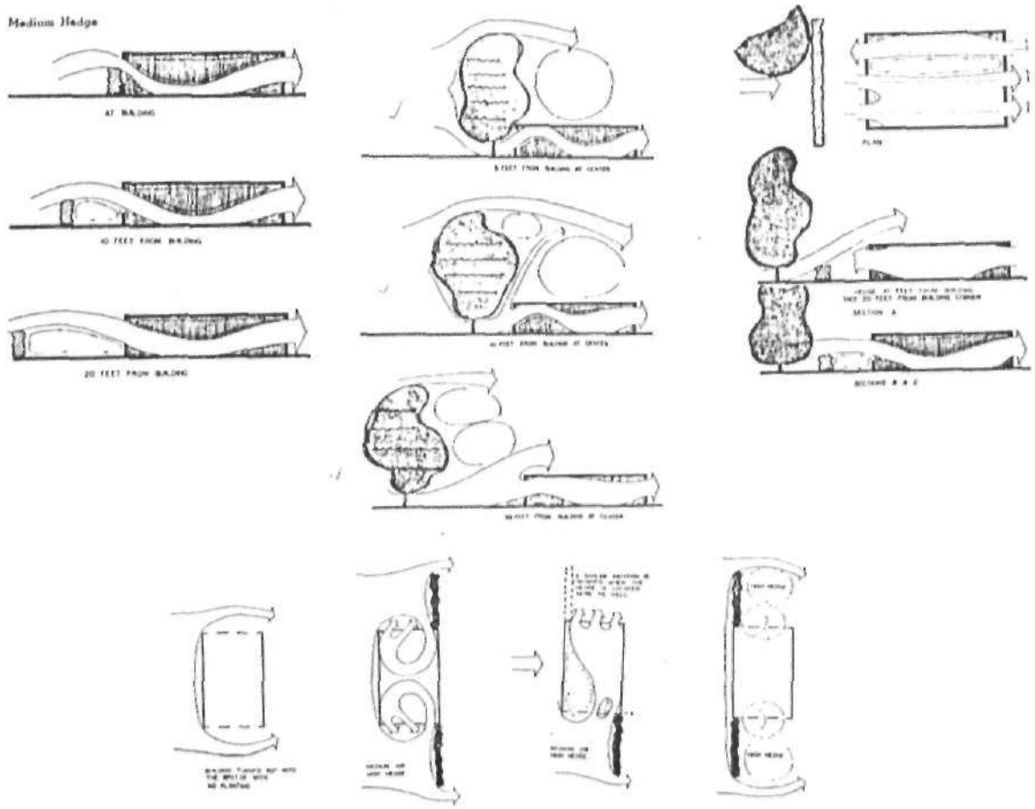



FIG. 3.0



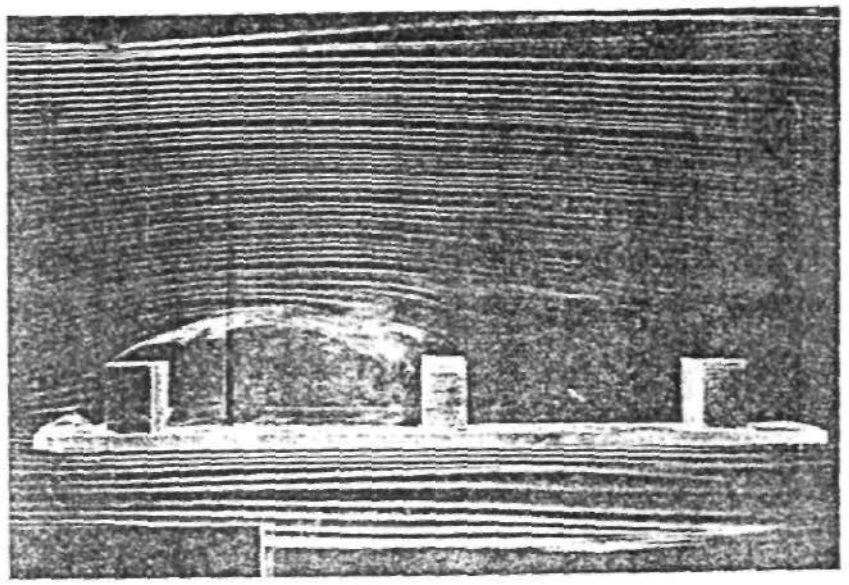

RECTANGULAR BUILDING SHOWING WIND ACTING ON CORNER





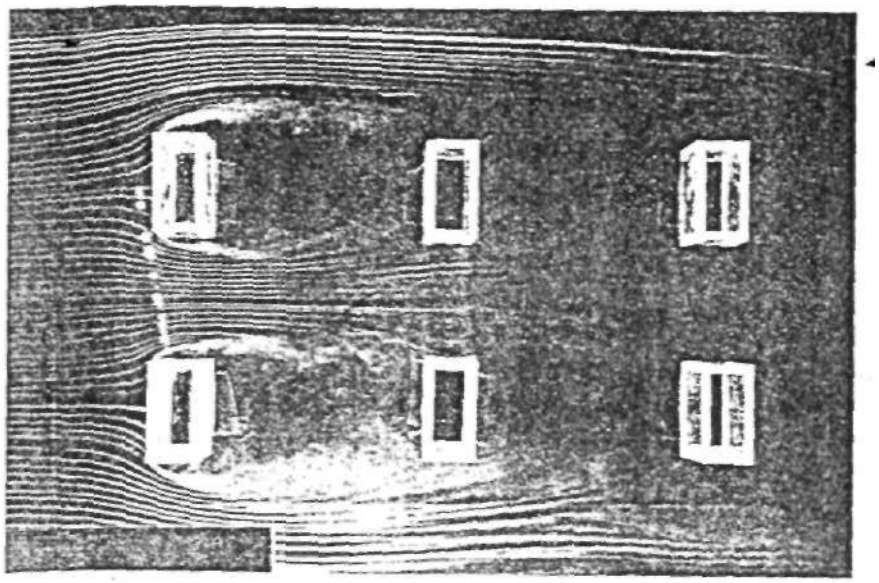

Air flow pattern modification with landscaping.

FIG. 3.2



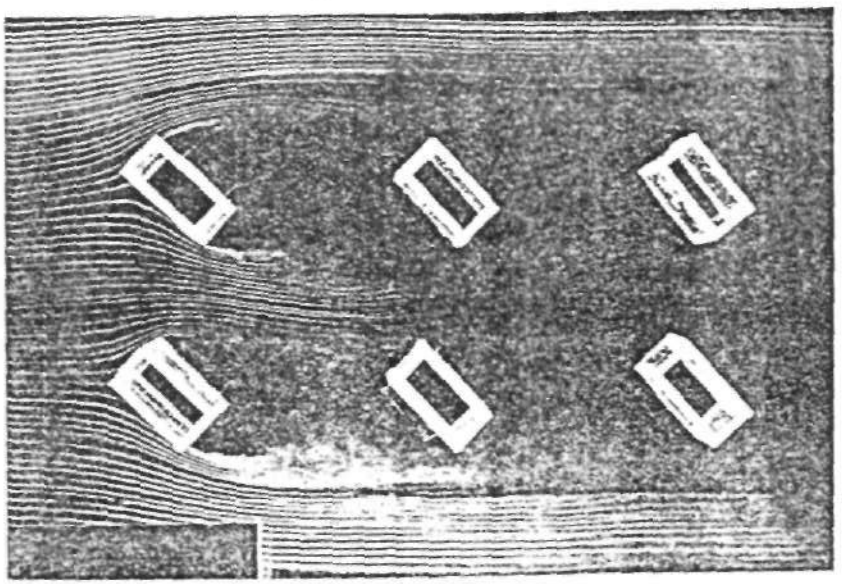
Wind shadow effect at parallel rows.

FIG. 3.3



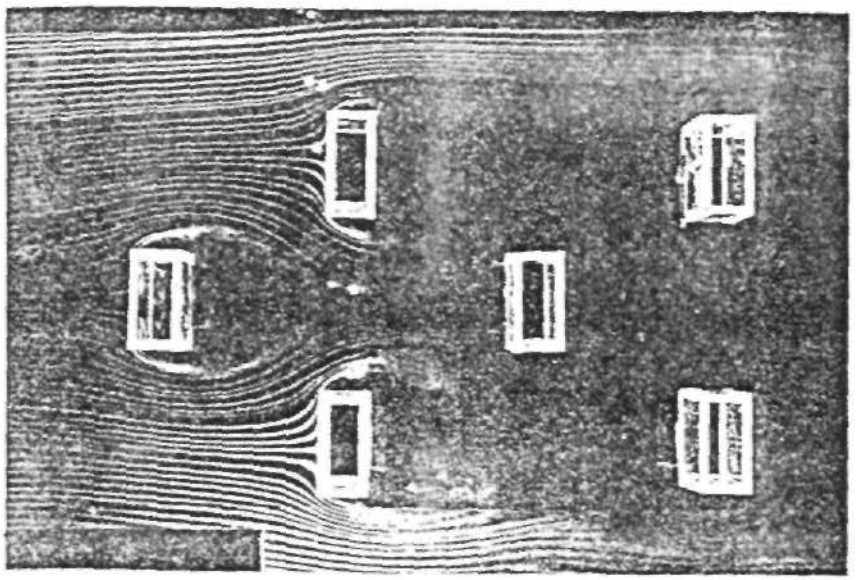
Wind protection with linear housing arrangement.

FIG. 3.4



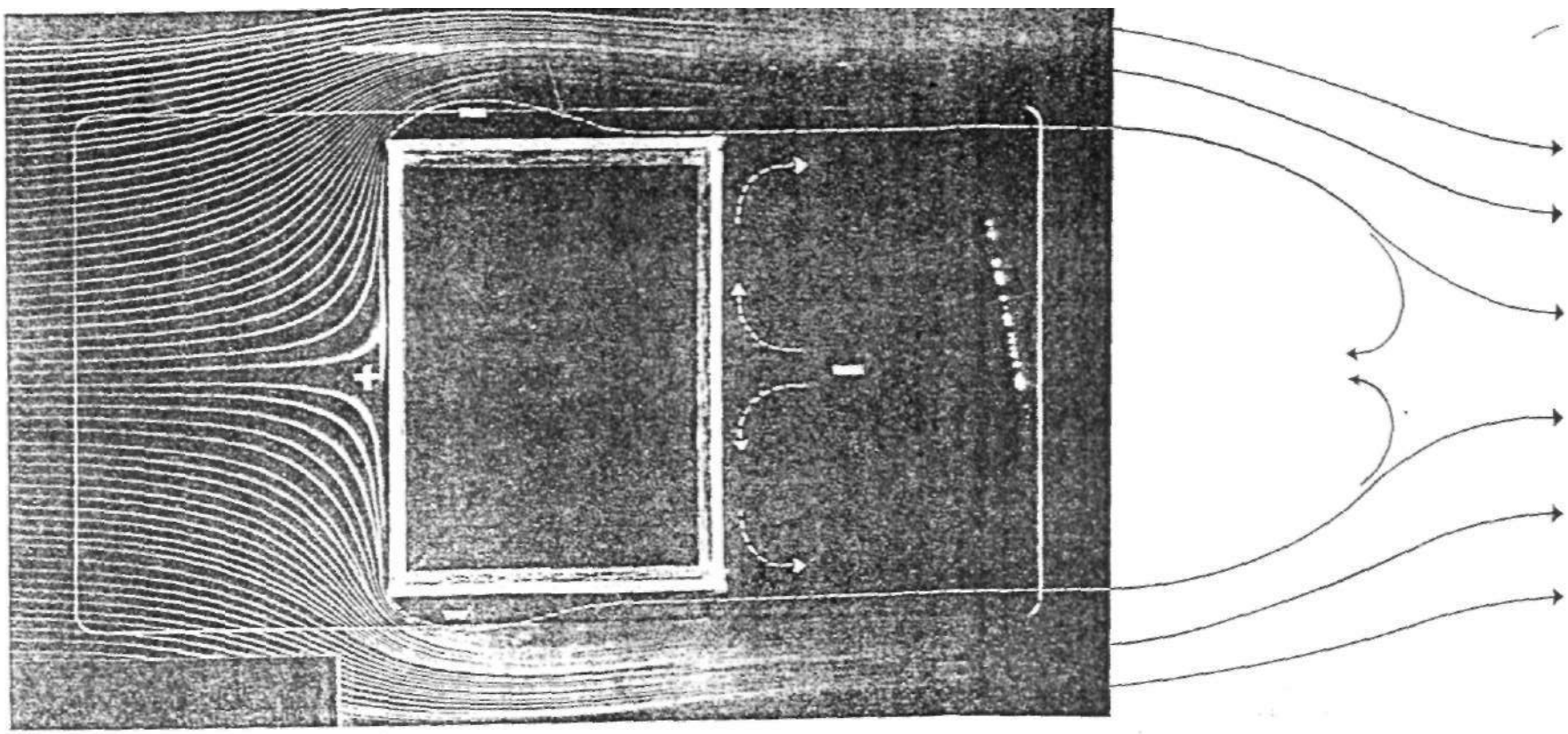
Wind protection effect in housing layout.

FIG. 3.5



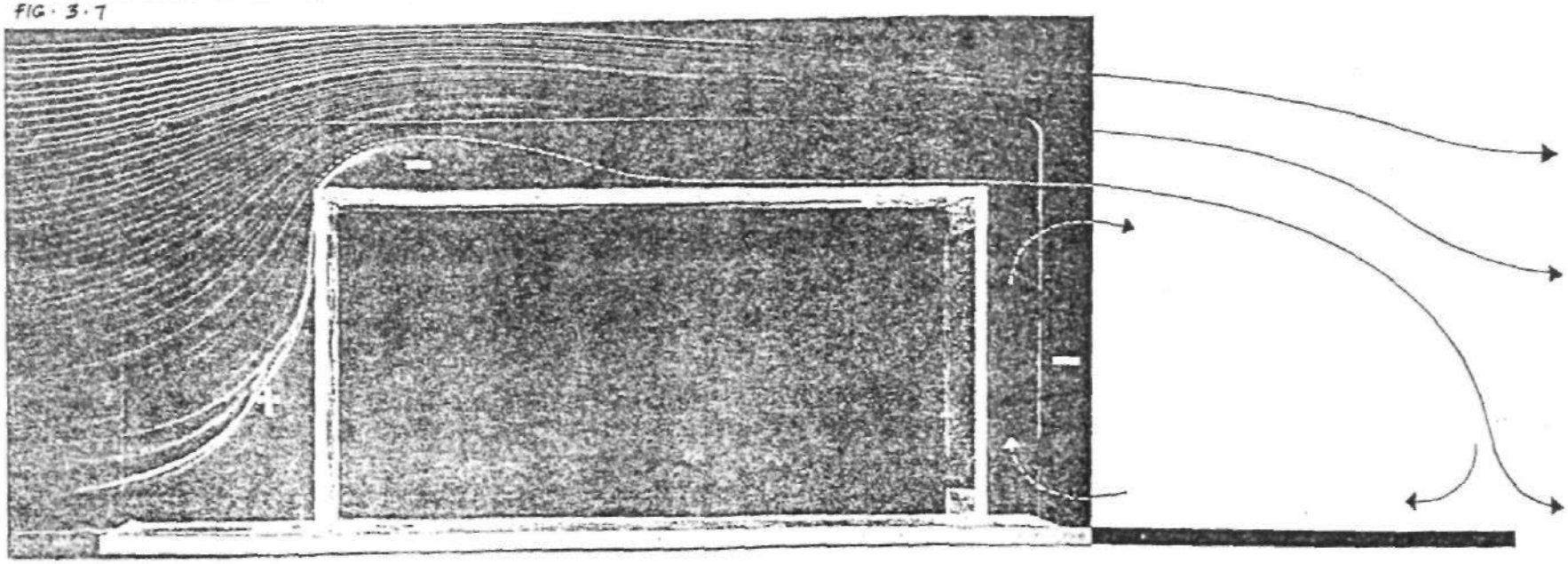
Utilization of summer breezes.

FIG. 3.6



. Pattern of air flow surrounding a building.

FIG · 3·7



. Pattern of air movement at the section of building.

FIG. 3·8

Wind that flow around a building plays an important role in determining the air flow pattern within the building. The wind pressure which is proportional to wind velocity is used in ventilation.

Buildings positioned perpendicular to the wind direction receive on their exposed side the full sweep of the velocities. Therefore, the determination of wind loads for roof design should reflect maximum values to avoid blown off of roofs.

Building rows spaced at a distance equal to seven times respective height, secure satisfactory ventilation effect for such unit, but the wind has tendency to leap-frog along parallel unit arrangements. Building planned in row arrangements cause a wing shadow over subsequent units, which reinforced for the wind to channel through free spaces and pass by the later units. Also staggered arrangement takes advantage of direct flow to subsequent structures built causes damage to the roofs.

### 3.3 LOCAL FACTORS IN WIND

As mentioned before, Jigawa state lies in Savannah Zone which covers a large portion of this country. The state is divided into three, i.e Southern, North-Eastern and Northern Jigawa. Southern Jigawa is unlaid by the basement complex which is characterised by a thin discontinuous mantle of weather rock with a thickness of about 15ms; thus comprising

poor source of ground.

North-Eastern and Northern Jigawa are affected areas of wind damage because of their regional siting, topography, climate and vegetation.

### 3.3.1 REGIONAL SETTING

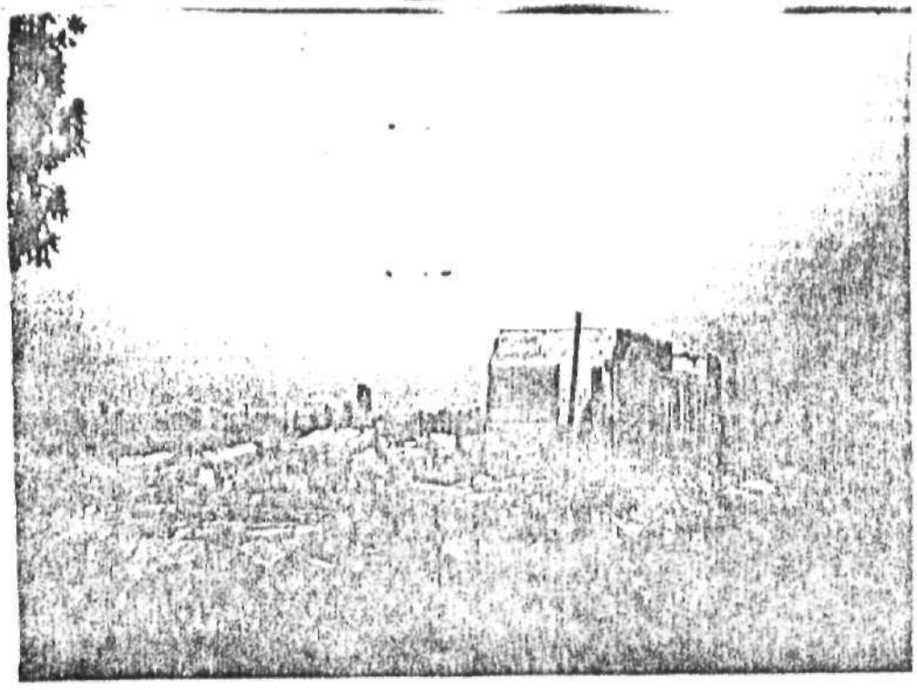
Such areas of Jigawa include Auyo, Kafin Hausa, Kaugama, Mallam Madori, Birniwa, Kirikasamma, Guri, Jahun, Miga, Gagarawa, Suletankarkar, Buabura and Garki areas are affected areas of wind damage because of their nearness to Sahara where wind moves at a high speed especially during harmattan and rainy season. Definitely the factor of regional setting of an area has an effect on wind.

### 3.3.2 TOPOGRAPHY

One of the most phenomenal problems of landform of the majority of towns in Jigawa is the bad land topography. For example in Dutse (the capital) there is a gully erosion due largely to the effect of running water on the loose soil down hill. Areas most affected are in the South-Eastern Jigawa. Northern Jigawa has almost a flat land where drain water stays for long on loose soil which affects building structure that receives wind damage easily.

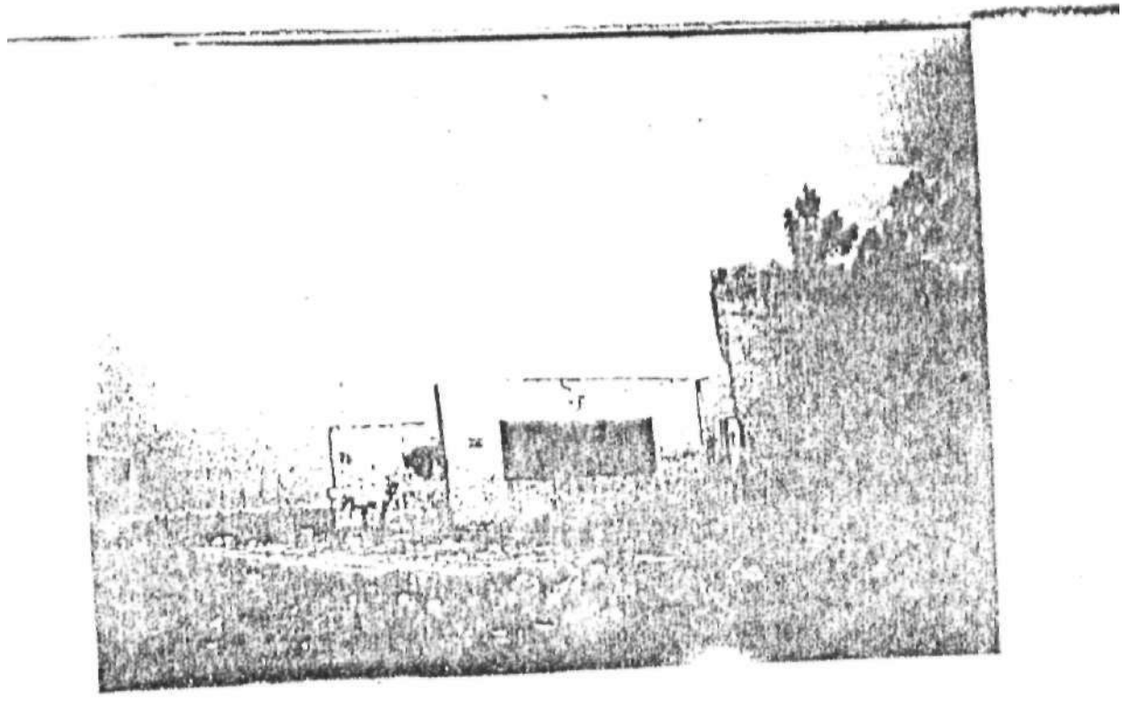
### 3.3.3 CLIMATE AND VEGETATION

More than 70% of Jigawa is covered by Sudan Savannah



TOTAL COLLAPSE DUE TO WIND PRESSURE

FIG. 3.93



TOTAL COLLAPSE DUE TO WIND PRESSURE

FIG. 3.96

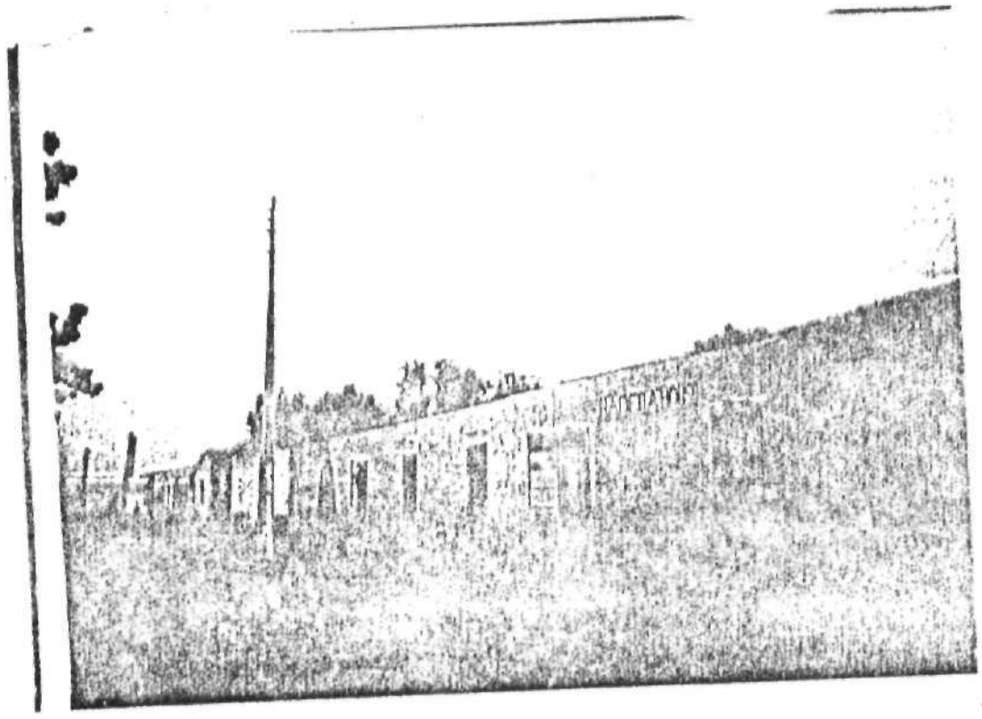


FIG. 3.10a

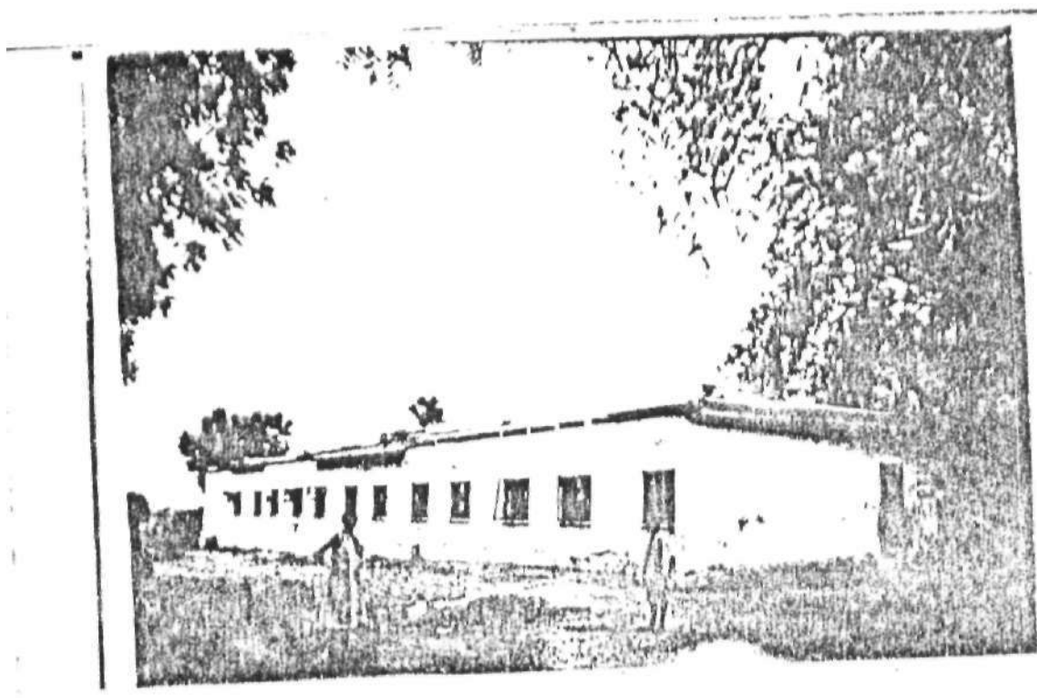


FIG. 3.10b COMPLETE SWEEP OF THE ROOF BY THE WIND

vegetation type which consists of scattered trees and shrubs in a matrix of short grasses that grow in turfs which give chance to wind damage. This is associated with the hot and dry climate lasting for greater part of the year and a short rainy season. The rainy season is associated with equatorial maritime, south-western trade wind and dry season with the tropical continental air mass (north-eastern trade wind). The latter is cold and dust-bearing, blowing from the Sahara desert during December to February.

## 3.4 WIND CONTROL PROPOSAL

Large air masses cannot be altered in their motion which is dictated by differences of air pressure. However, velocities near the existing structures or ground level can be controlled to a certain extent. The friction drag of vegetation and the resistance and obstruction created by trees can cause diversions in the air flow which may be utilized beneficially. Besides their aesthetic and shade giving properties, the value of tree windbreaks lies in their ability to reduce wind velocities. This mechanical effect bring perception changes and in the temperature and humidity of the air.

A windbreak diverts the air current upward and while they soon turn back and again sweep the ground, an area of relative calm is created near the ground. The most protected part of this area is fairly close to the windbreaks on the leeward

side; it become more exposed as the distance increases until a point is reached where the air has again reached full velocity. There is a smaller calm area on the windward side; especially if the windbreak is quite dense. It is open, so that the wind can sweep under the trees, the windward side has little protection. On the leeward side such openness will result in a smaller protected area located further from the windbreak.

The type of windbreak used has a definite effect on the resultant air flow pattern and on the area of protection. Therefore wind protection/control can be provided by WIND-BREAKS and positioning of buildings.

### 3.4.1 LANDSCAPING

The immediate surrounding near building structure has a definite effect on wind velocities. This frees the building to a certain extent from rigid orientation requirements. The landscape design elements, including plant materials, trees and shrubs, walls and fences create low pressure which diverse the high wind velocity to a low speed. Care should be taken that arrangement and orientation do not eliminate the desirable cooling breeze during over-heated periods, as orientation for ventilation might bot be suitable for wind control and planting should be designed to direct and accelerate beneficial air movements into the building. When placing wind barriers on one or both leeward sides of a

building the wind pressure causes flow within the structure.

### 3.4.2 STANDARD MATERIALS AND WORKMANSHIP

Lack of standard materials used in building and workmanship also affect the strength of the building structure in general. Workmanship also affects the strength of the structure. The materials cannot resist wind pressure which causes suction and eventually blown off or collapse completely.

Where there is a high wind velocity, the spaces between roof members, such as rafters, purlins, etc should be reduced to a minimum so as to make the roof system strong enough to prevent wind damage. Materials also used in building should be of standard value to increase the strength of the structure. Therefore, walls, floors and roofs should be heavy with high thermal capacity to prevent damage caused by wind velocities.

### 3.4.3 ORIENTATION

Is one of the factors that control wind damage. The prominal involves that building oriented or positioned at $45^0$ reduces wind velocity by 50%. Building arrangement should also not be more than seven times the height of the buildings to avoid leap-frog along parallel units.

### 3.4.4 PARAPET WALLS

This is another means of protecting building element that

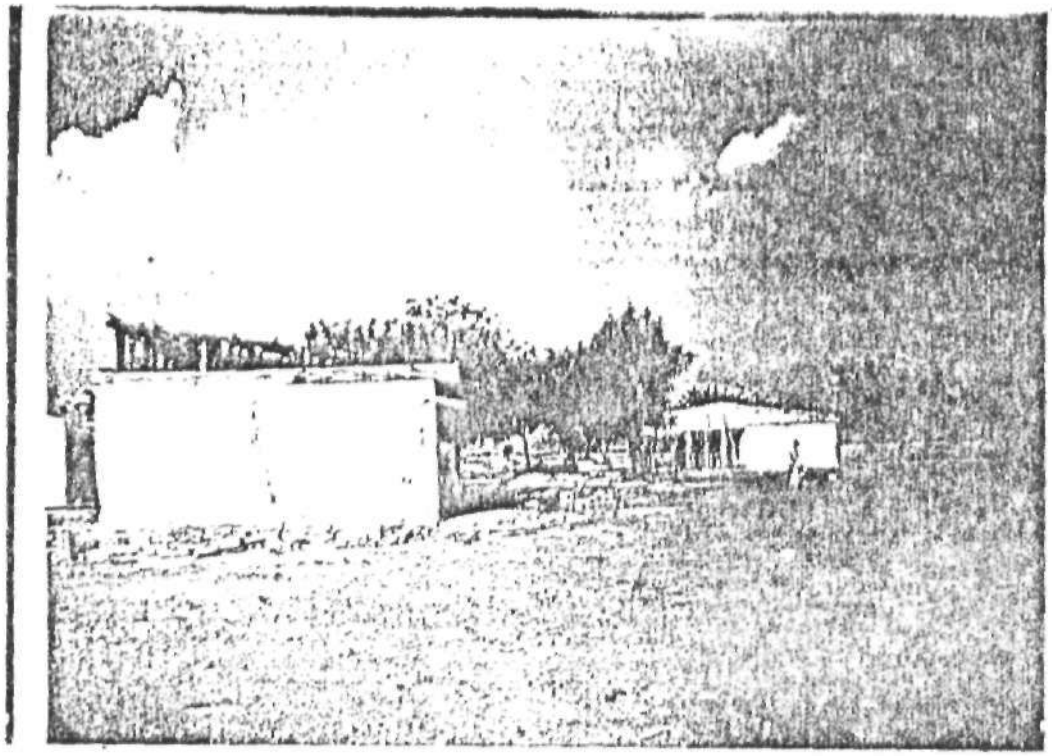


FIG. 3.11 a

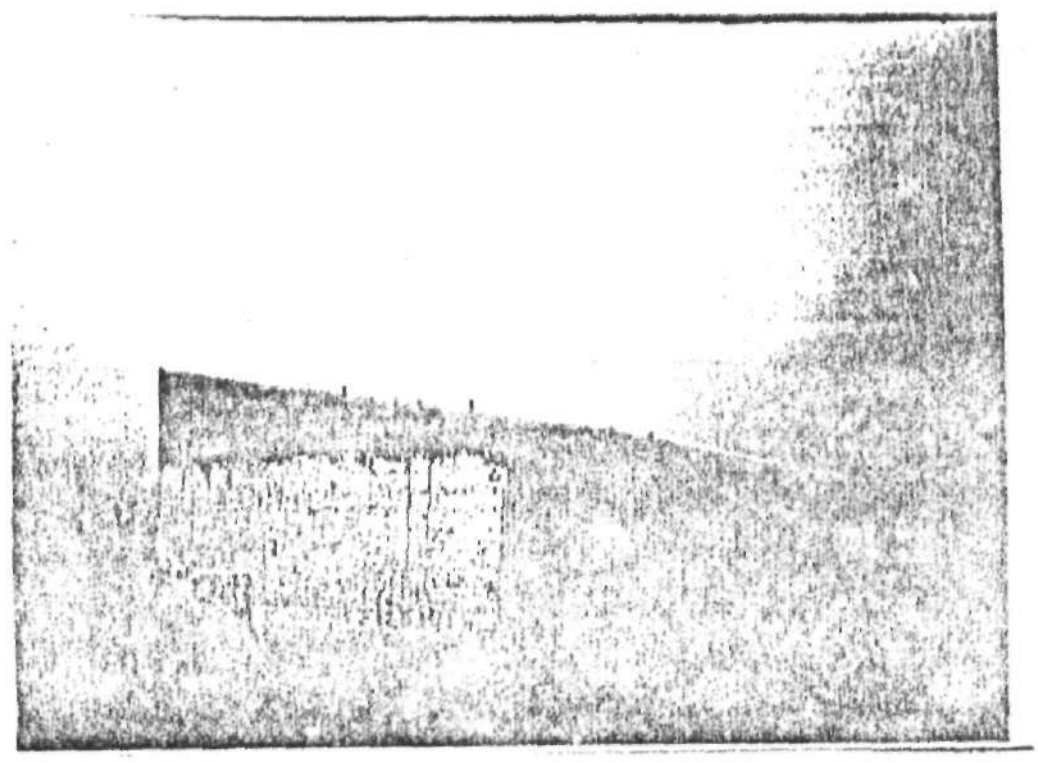


FIG. 3.11b MONOPITCH IN THE DIRECTION OF THE WIND

reduces wind velocities to roofs by diversion. The wind being diverged in different direction, thus reducing loads on roof by wind pressure. Where the roof is exposed to wind without any obstruction around the building, parapet wall prevents roof from being exposed to wind but increases loads to the building structure.

In a situation whereby economics is considered because of the cost of concrete gutter, a monopitch can be used with parapet along three sides with sloping in the direction of windward.

### 3.4.5 EFFECT OF THE SURROUNDING STRUCTURES

The proximity and the height of neighbouring buildings also affect wind flow patterns. If two buildings are arranged across the direction of wind flow, the wind is channelled between them, creating stronger suction than for free-standing buildings. When the buildings are arranged in the direction of wind flow, the second building experiences suction from all sides. When the second building is taller, a wind pressure may be experienced on upper floors. In the presence of open space, there may occur a wind flow under the second building.

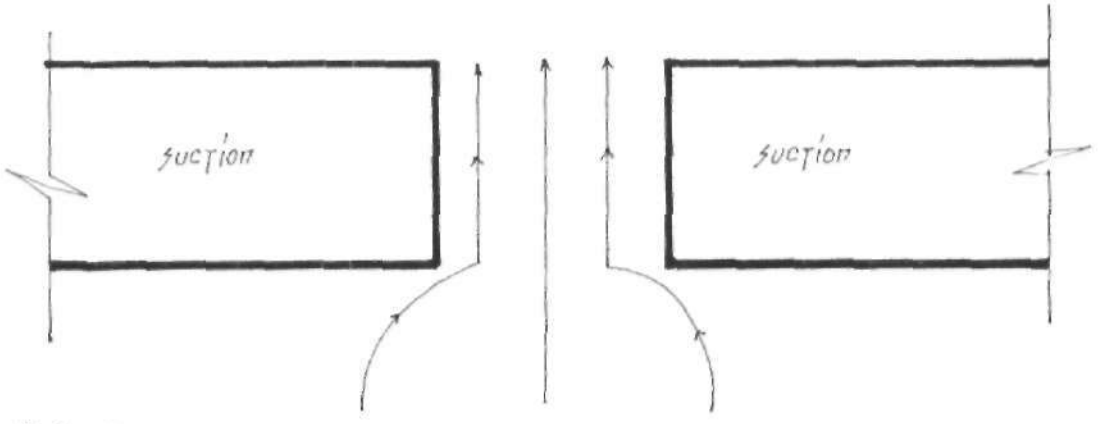



FIG. 3.12

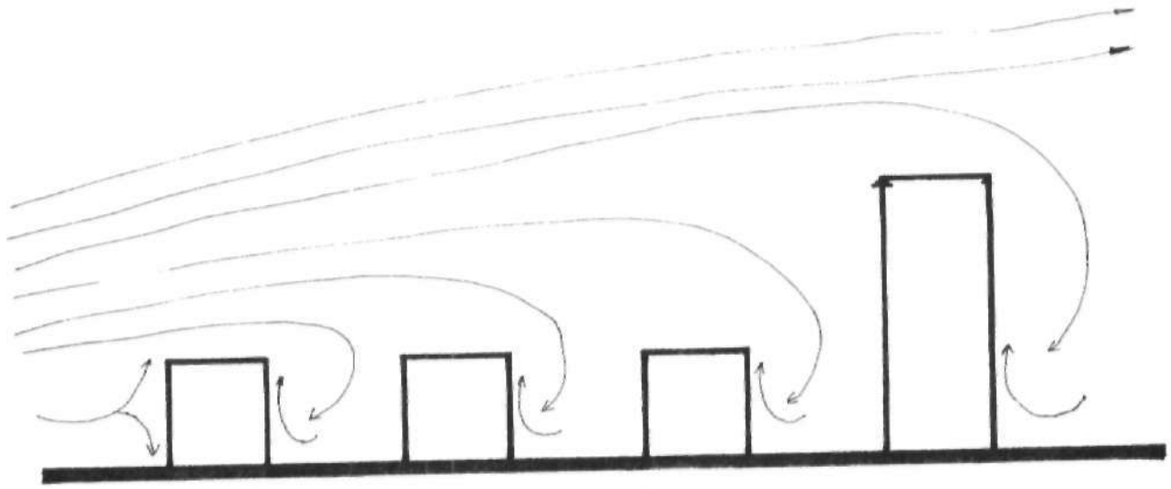


FIG. 3·13 INTERSECTION OF LOW AND HIGH-RISE BUILDINGS

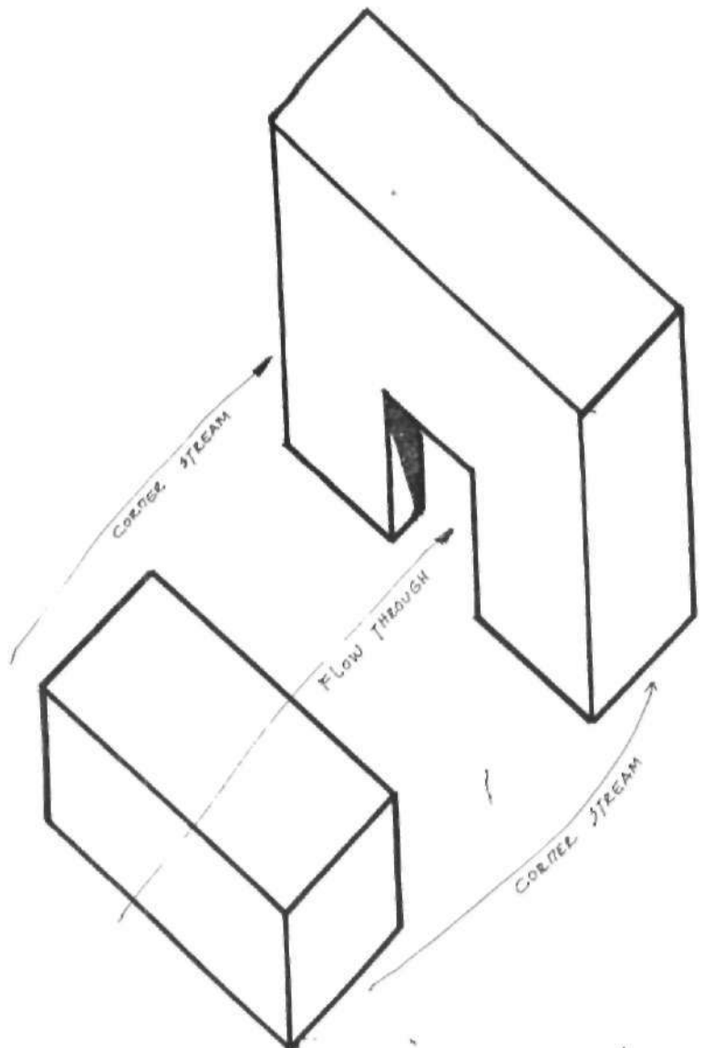




FIG. 3.152

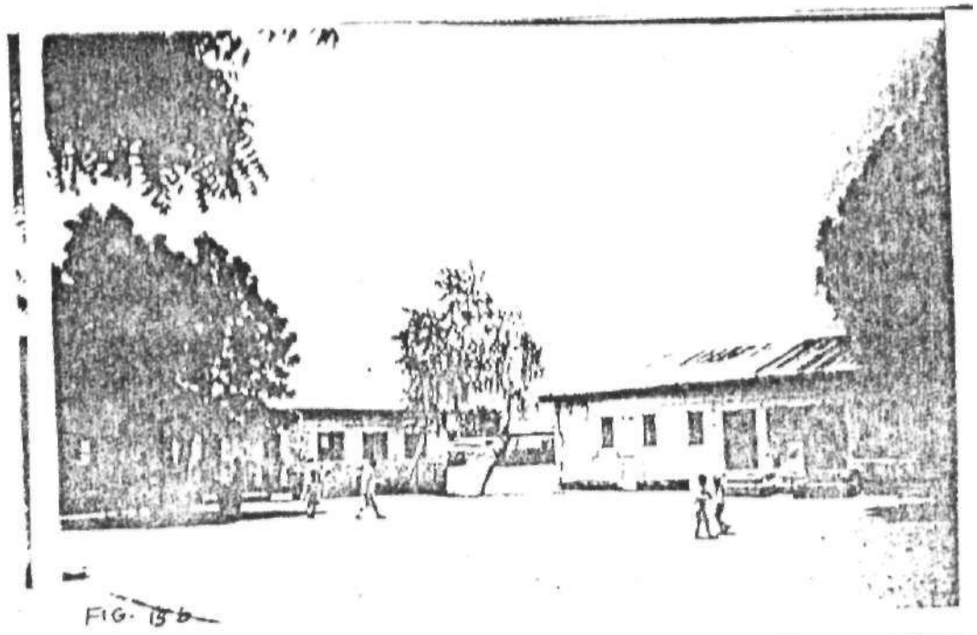


FIG. 15b

EFFECT OF THE SURROUNDING STRUCTURES ON WIND

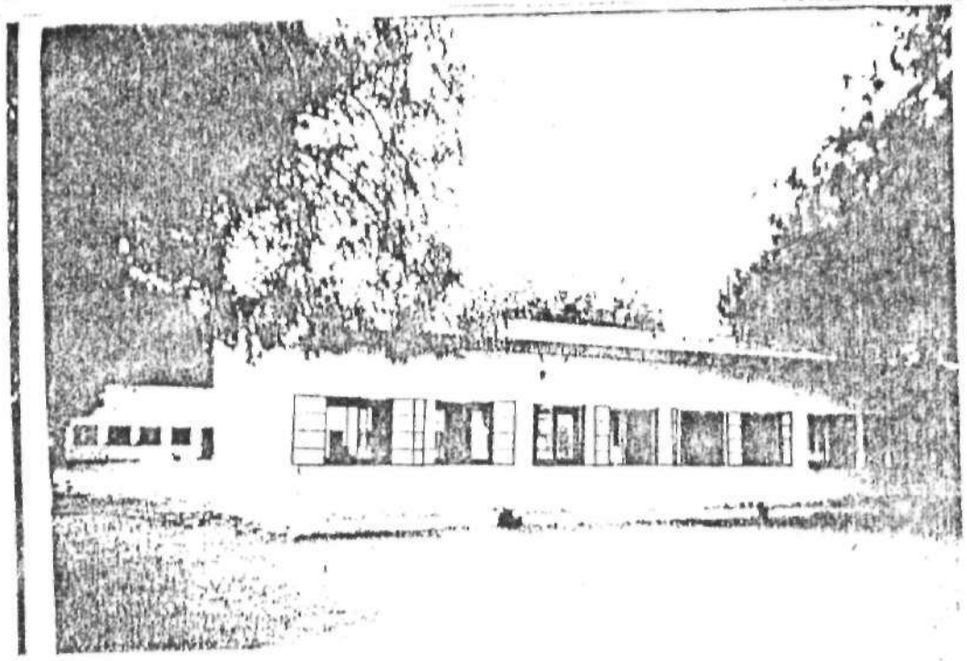


FIG. 3.16a



FIG. 3.16b

EFFECT OF LANDSCAPE ON WIND

## 3.5 CONCLUSION

Numerous case studies were taken to examine how and why damages some public/institutional buildings in the areas of the case studies. It has been observed that most of the wind damages are caused by one or both of the following:

i) poor orientation.

ii) poor landscaping.

iii) un-standardised materials.

iv) poor workmanship.

These are the major causes of wind damages in the area of case studies and to overcome these problem is to examine and analyze these problems. Therefore emphasis should be placed upon the design to see that buildings are:

i) Carefully oriented against wind pressure/suction.

ii) Carefully landscaped in a standard form.

iii) Located in a suitable site.

iv) Constructed of good materials and workmanship.

v) Employ parapet walls where necessary.

## 3.6 REFERENCES


1. De la Rue, E. Aubert (1955): Man And The Wind, Philosophical Library, New York, Chapter 1.

2. Olusumo, O.O (1946): Introduction To Building Climatology, A Basic Course For Architectural Students, pp.**

3. Victor, O. (1963): Design With Climate, Bioclimatic Approach To Architectural Regionalism, Princeton, New Jersey, Princeton University Press, pp. 94-112.

4. White, robert F. (1945): Effect of Landscape Development On The Natural Ventilation Of Buildings And Their Adjacent Area. Texas Engineering Experiment Station, Research Report 45.

5. Wiener, S.I (1955): Solar Orientation, Application of Local Wind Factors, Progressive Architecture, February, pp. 114-118.

# CHAPTER FOUR

## CASE STUDIES

### 4.1 PREAMBLE

Case studies of existing buildings are necessary to form a guide from which a brief for the design can be developed. A knowledge of the existing structure with its merits and inadequacies is a good point to start planning for the future. Three administrative buildings, one in Kaduna, one in Kano and the other in Dutse were studies. One primary school and one secondary school in Hadejia Jigawa state were also studied.

### 4.2 SPEB HEADQUARTERS, DUTSE

The pathetic condition the primary education found itself, inadequate teaching and learning materials; dilapidated buildings, lukewarm attitudes of parents towards western education among others, necessitated the re-establishment of SPEB by the Jigawa state government in 1994. The board is to shoulder the herculean task of regaining the lost glory of primary education, so as to ensure the well planned, industrious and dedicated citizens are trained for the rapid development of the nation.

#### 4.2.1 LOCATION

The SPEB Headquarters, Dutse is located in the old Jigawa state Secretariat along Takur Shiwarun road. The main access

road from the gate leads directly to the SPEB by the left near former State House of Assembly before CSC block. There are few staff parking within the main complex. The traffic density is very low and there is no congestion.

4.2.2 THE DESIGN

There are three blocks, one of which is the one for Assembly Hall for the former WTC Dutse, the other one is the former dining Hall for the school and the last one is the Chairman's block which is nearly constructed after the re-establishment of SPEB. The new block is singly banked with verandah at the facade of the building. It consists of the Chairman's office, Confidential Secretary to Chairman, Secretary of the board, Personnel Members I and II and Main Store.

The second block (former Dining Hall) is doubly banked which consists of Internal Auditor, Account Clerks, Accountant on one side, on the other side it consists of four Directors offices.

The third block is also doubly banked which consists of Transport Officer, Training Officer, Deputy Director Works Inspectorate Division, and Store.

4.2.3 CRITIQUE

Office accommodation is not adequate as three to five officers manage one office and the partitioned office spaces

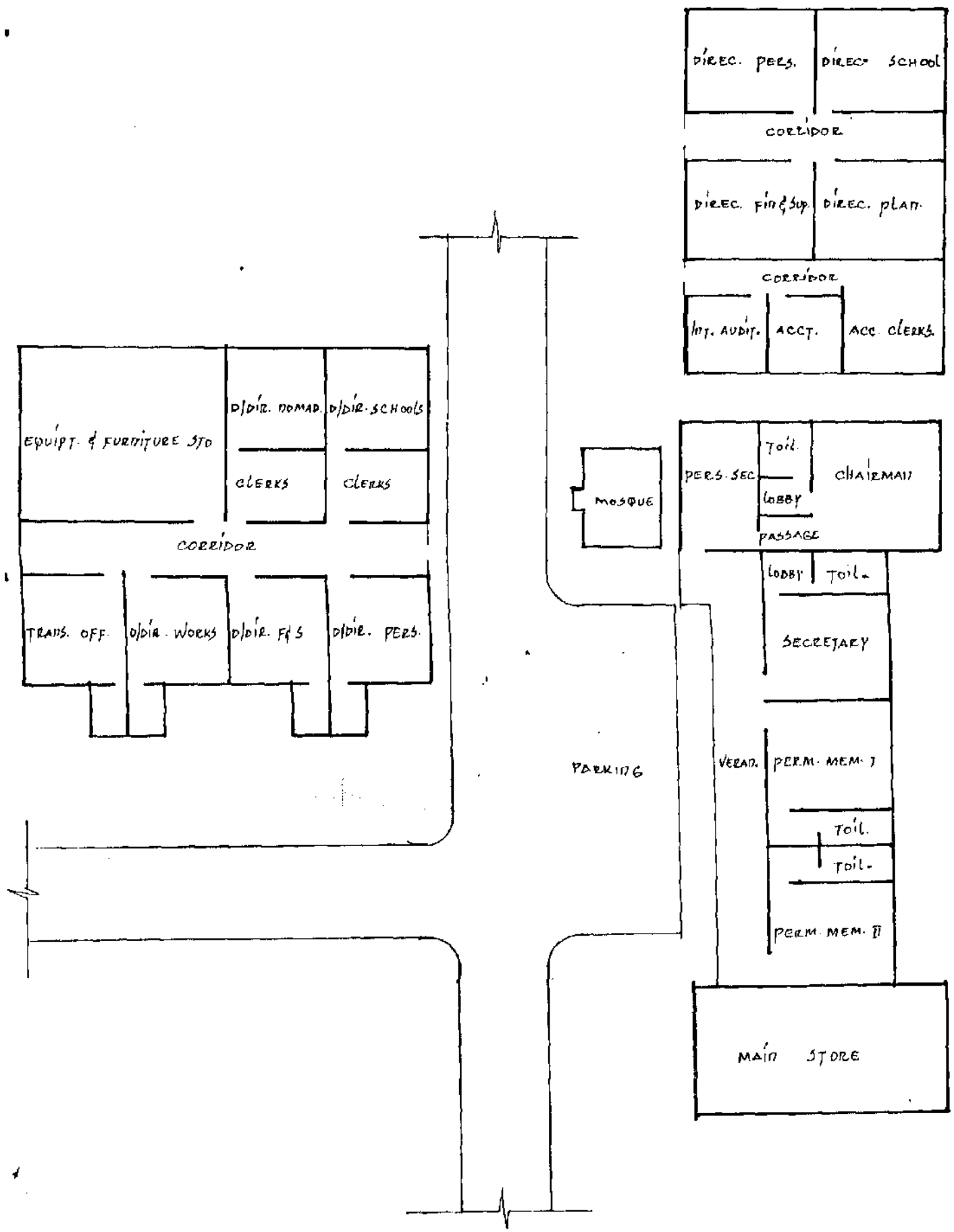
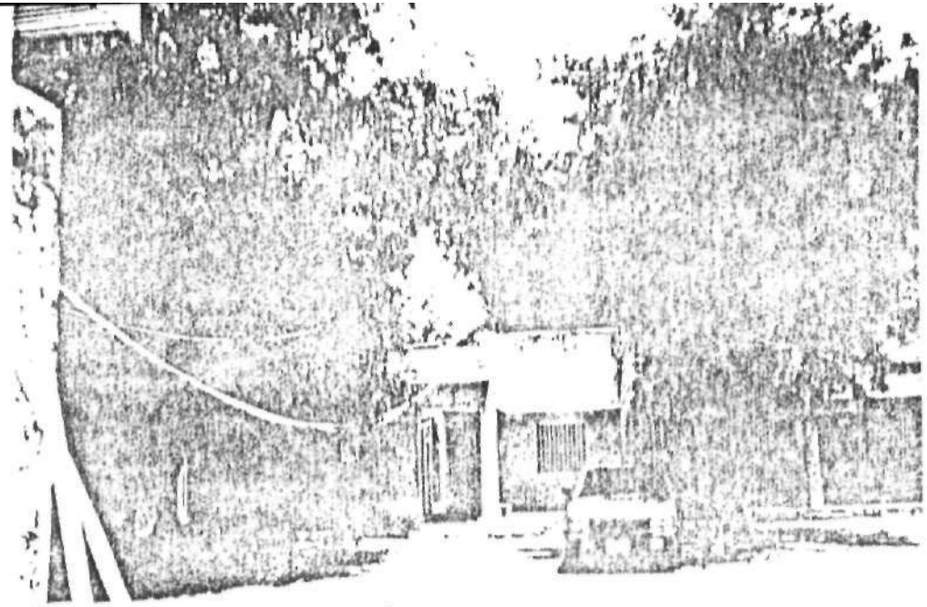
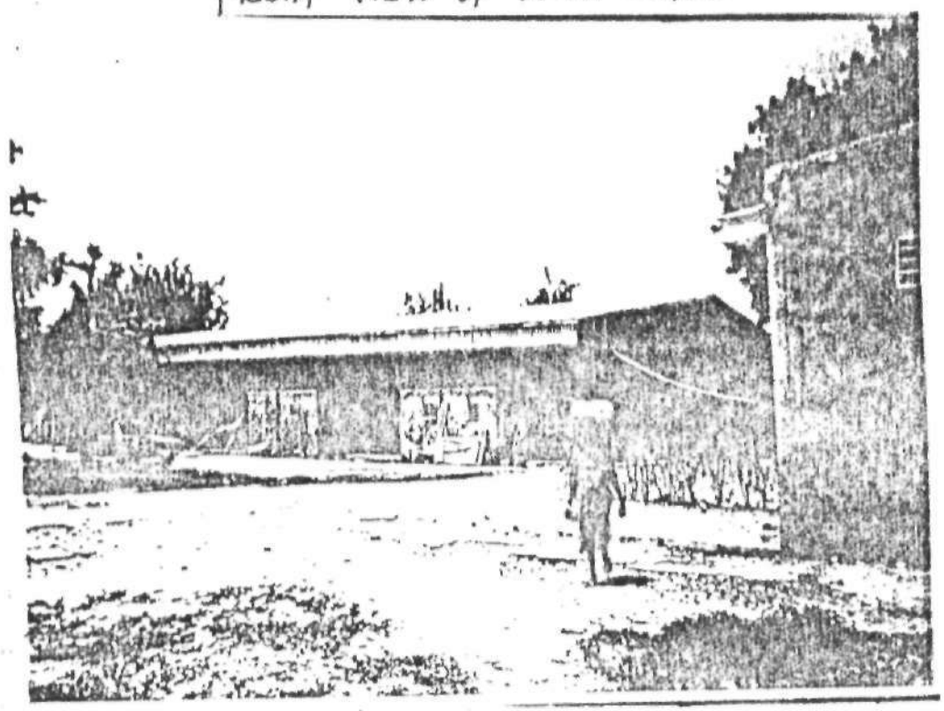



FIG. 4.0

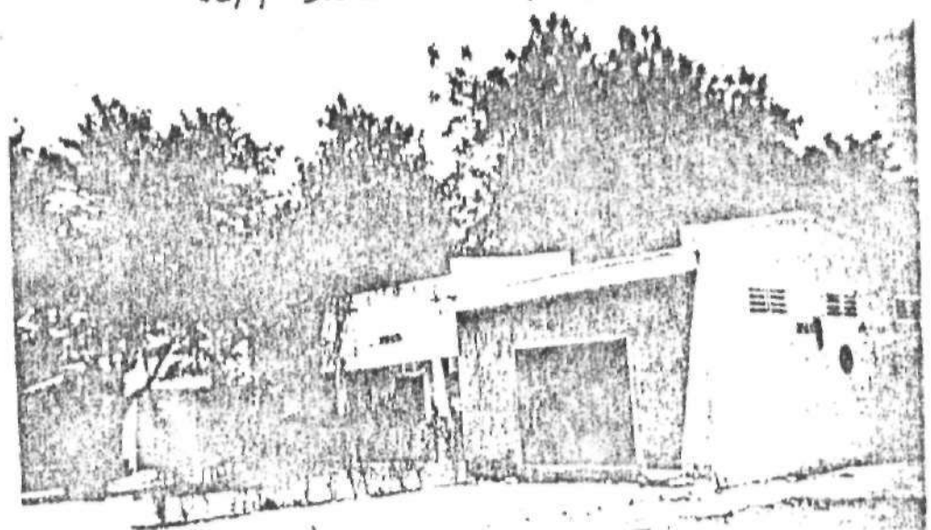
TYPICAL PLAN OF SPEB, HQTRS. DUTSE



FRONT VIEW OF SPEB DUTSE



LEFT-SIDE VIEW OF SPEB DUTSE



and newly constructed offices are too small. Storage spaces for the board are adequate. Parking spaces are also inadequate on site as they are not specified. The corridor space of one metre for the second block is quite small. There is direct link between the blocks which are staggered as if they are not serving the same function. Therefore, all the buildings on the site do not form an integrated whole. Landscaping is very poor.

#### 4.2.4 WIND CONTROL

The new block is designed to control wind damage as the block is carefully oriented and parapet walls are employed in the direction of high wind velocities. There are enough trees to control/reduce the speed of wind before reaching the structure. The second block is also carefully oriented but the roof is exposed to wind. The tendency for wind damage is too small. The third block is poorly oriented against wind velocity but due to the presence of enough trees, the tendency for wind damage is also rare.

### 4.3 SPEB HEADQUARTERS, KANO

The historical backgrounds of SPEB Kano and Jigawa states are almost the same, the only difference is the month in which the edict on SPEB was enacted. SPEB Kano edict was enacted in June, 1994 while Jigawa Edict was enacted in November, 1994.

4.3.1 LOCATION

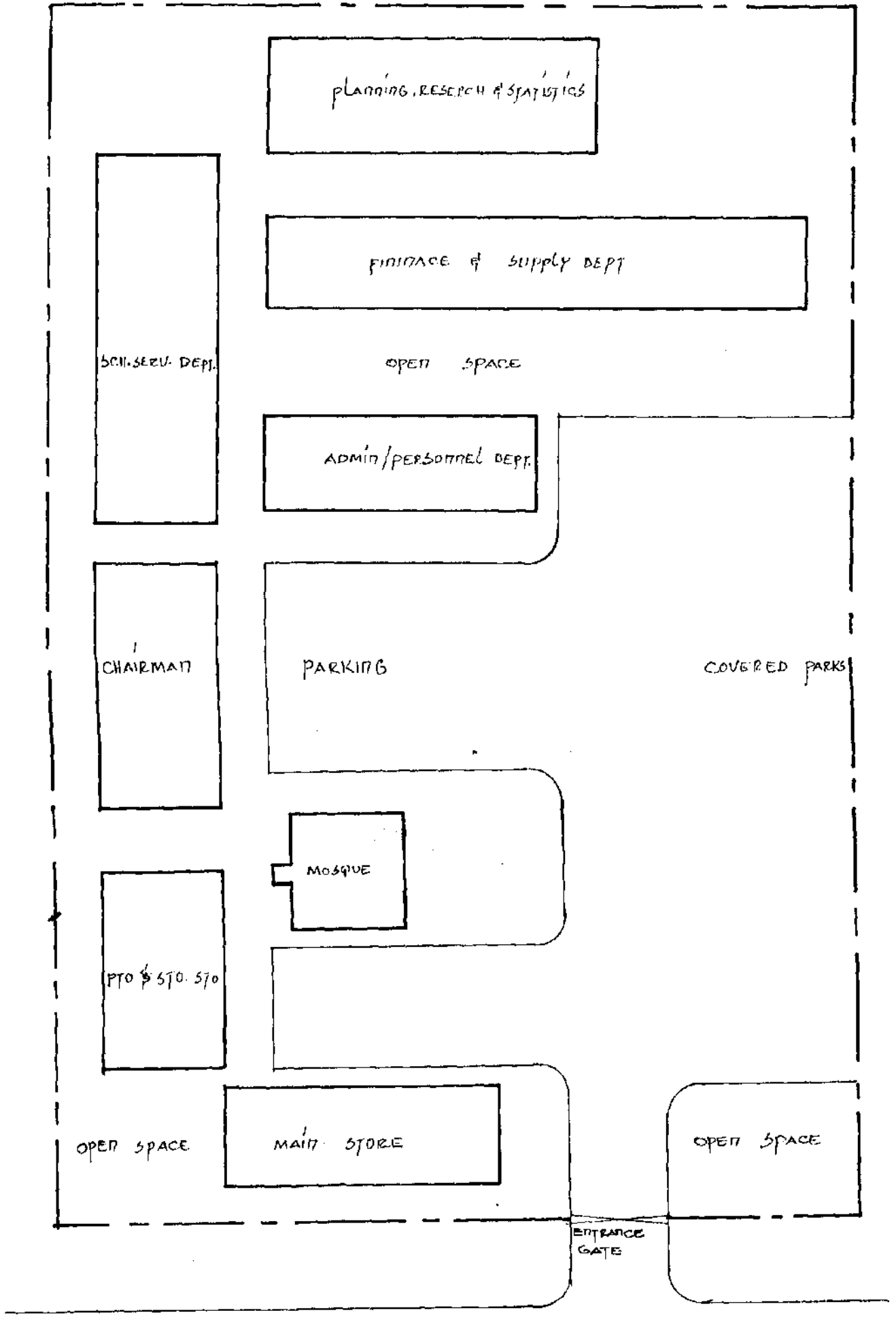
SPEB Kano is located along BUK road between Gidan Murtala and Rumfa College, adjacent to Sabuwar Kofa S.S and School of Hygiene Kano, just opposite to Sabuwar Kofa City gate. The site is highly developed in which about 80% of the land is built up.

4.3.2 THE DESIGN

There is one entrance gate into the board's site which serves as air entrance and exit gate. Staff parking is done randomly within the site and is inadequate. The first block nearest to the gate is the main store and its staff. The next block is the mosque and behind it is the block for Chairman, Permanent Member I and II and Board Room. When you go further is the personnel/administrative block which is one storey and behind it is the School Services Department. The next block is the Finance and Supplies Department facing the gate. Behind this department is the Planning. Research and Statistics Department. Both interior and exterior walls are furnished in cement-mortar plastering. There is a very good landscaping, that makes a very good view to the open spaces.

4.3.3 CRITIQUE

In the view that the number of officers are adequate, but most of the office spaces are not to standard, too small, there is no easy circulation as the blocks are staggered and


PLANNING, RESEARCH & STATISTICS
FINANCE & SUPPLY DEPT
SCH. SERV. DEPT.
OPEN SPACE
ADMIN/PERSONNEL DEPT.
CHAIRMAN
PARKING
COVERED PARKS
MOSQUE
PTO & STO. STO
OPEN SPACE
MAIN STORE
OPEN SPACE
ENTRANCE GATE
B.U.K. ROAD

no corridor that links between the blocks. Parking spaces are not adequate on site. Personnel Management Department is doubly banked, the corridor space of 1.0m is also quite small. The building on the site do not form an integrated whole.

### 4.3.4 WIND CONTROL

Design is very compact in view of the fact that the site is too small and manage to accommodate such member of block/building. There is a wall fence at all sides and very good landscaping which reduces wind velocity. As the site is neighbours to Sabuwar Kofa from the right and School of Hygiene from the left, it takes an advantage of obstruction by surrounding structures which also reduce the wind velocity. The roofs are not exposed to wind as parapet walls were employed and the orientation is 90% satisfactory.

## 4.4 NBTE HEADQUARTERS, KADUNA

The function of the board is primarily to advice the Federal Government on and coordinate all aspects of technical and vocational education falling outside the universities and to make recommendations on national policy necessary for the training of technicians, craftsmen and other middle level and skilled manpower. The present building was opened in 1986.

### 4.4.1 LOCATION

The building is located along Bida Road, Kaduna and is

bounded on the left and right by many developed plots and opposite across the road is the Library Board Headquarters for Kaduna state.

4.4.2 THE DESIGN

The building is three-storey which is accessible from the road by two gates with security post on each side. There are parking lots for 20 cars in front of the building. The entrance of the building complex is cantilevered out and the side ramp leads to the partial basement which contains a car park, canteen and archives. The basement took advantage of the slope on side.

The entrance hall opens into an atrium that extends the entrance of the building. The front wing of the complex is occupied by the Library, Conference Room and the Board Room. Adjacent to this wing are two parallel blocks that are connected by the atrium which has facilities on both sides. It contains offices spaces. The offices are arranged along a doubly loaded corridor.

The ground floor contains the Administrative, Finance and Audit Sections. First floor contains office of the Executive Secretary and second is occupied by the Programming Section.

The floor finished in terrazzo in all areas and the ceiling is suspended on the corridors and furnished with luxalon ceiling finished. The interior walls are painted with light brown emulsion paint while the outer surfaces are

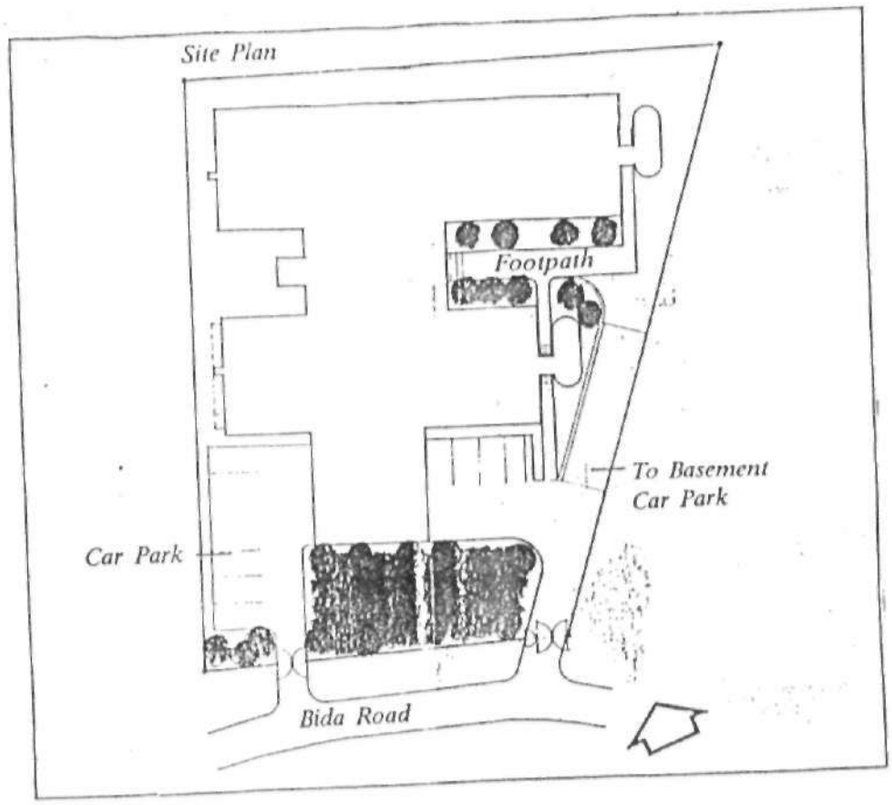
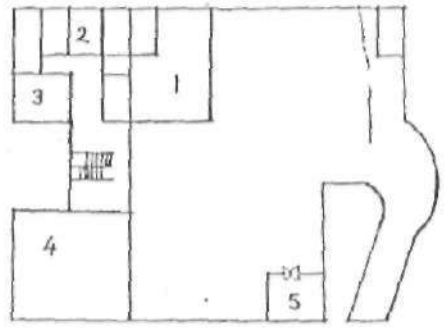


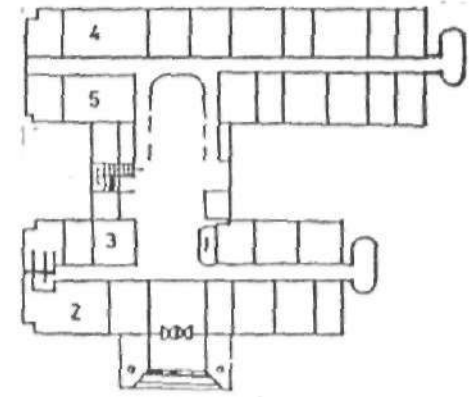

FIG.4.3-SITE PLAN OF N.B.T.E. HQS., KADUNA,NIGERIA



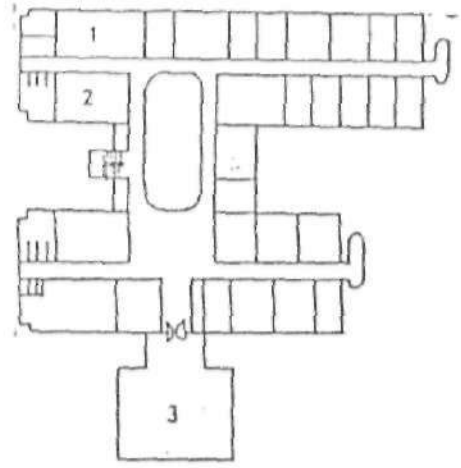
PLATE 4.4-VIEW OF N.B.T.E. HQS. KADUNA, NIGERIA



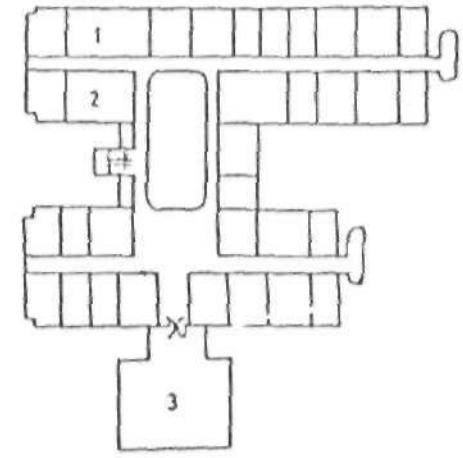

BASEMENT PLAN



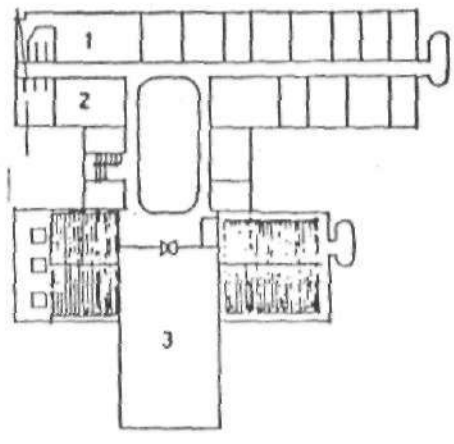

GROUND FLOOR PLAN




FIRST FLOOR PLAN




SECOND FLOOR PLAN

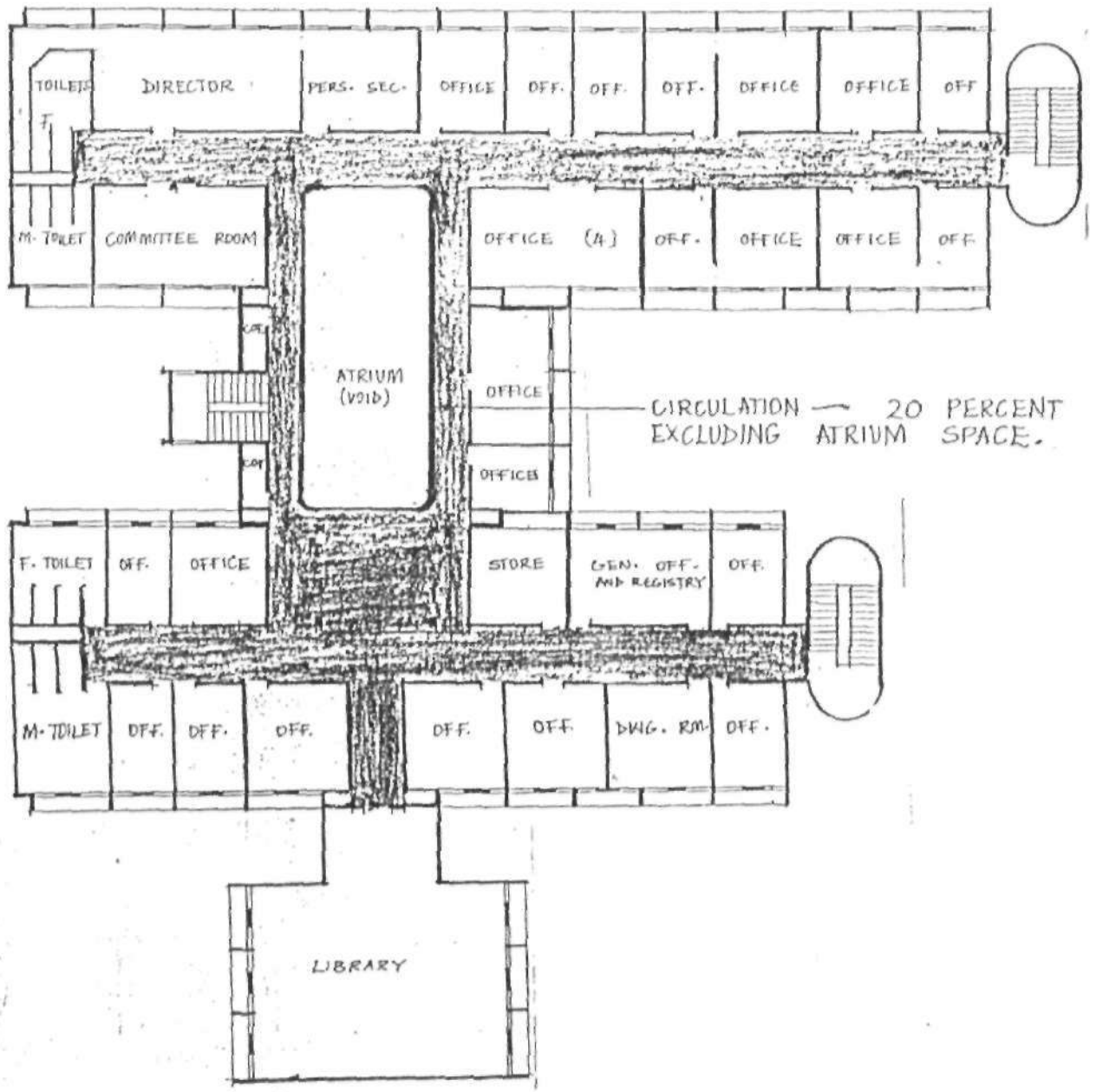



THIRD FLOOR PLAN

## KEY

1 – RESTAURANT
2 – RADIO ROOM
3 – GENERAL OFFICE
4 – GENERAL STORE
5 – SWITCH ROOM
6 – RECEPTION
7 – DIRECTOR OF ADMINISTRATION
8 – COMMITTEE ROOM
9 – DIRECTOR OF FINANCE
10 – COMMITTEE ROOM
11 – OFFICE OF THE EXECUTIVE SEC.
12 – COMMITTEE ROOM
13 – BOARDROOM
14 – DIRECTOR OF PROGRAMMES
15 – COMMITTEE ROOM
16 – LIBRARY
17 – DIRECTOR OF PLANNING
18 – COMMITTEE ROOM
19 – CONFERENCE HALL

FIG.4.4-FLOOR PLANS OF N.B.T.E. HQS. KADUNA




PROGRAMMES DEPARTMENT

FIG. 4.5-TYPICAL FLOOR PLAN ON FLOORS, N.B.T.E.HQS.

rendered in light brown and grey texcote paint.

4.4.3 CRITIQUE

Though the design is commendable and office spaces are still adequate for present functions. The design does not use mechanical devices for vertical movement. Unitary system of air-conditioning is also applied in the building. The design does not show any conscious effort of security provision because all parts of the building are easily accessible to the public.

4.4.4 WIND CONTROL

The three-storey building is carefully oriented against wind velocity and parapet walls are employed. The area is landscaped though the trees are not as high as the building, but still they control the wind speed. The building also has an advantage of obstruction by surrounding structures.

4.5 CONCLUSION

4.5.1 DESIGN

From the previous case studies, it has been observed that attention is not given to landscaping of site therefore more consideration should be on landscaping as effective landscaping integrates the building to the site, creates a conducive environment and control wind velocity.

Also not much consideration has been given to the facade

of the building while people expect more from Architecture more than a mere satisfaction of functional requirements. Therefore, there should be an aesthetic appeal in the building to give a humane architecture.

### 4.5.2 MECHANIZATION

There is still a failure in mechanization of buildings in Nigeria. This should be considered in terms of management rather than architectural design. However, architecture is a complex art embracing form and function, symbol and social purpose, technique and belief. The architect to make design in the context of his contemporary society. He should try as much as he can to avoid proposals for central Ac system and elevators, instead traditional courtyard concept should be adopted in the design.

### 4.5.3 WIND CONTROL

Most of the designs were done without climatic data of the site being studied. This creates serious problems such as wind damage, rain penetration, sunlight into the interior and other climatic elements.

Most of the roofs exposed to wind suffered wind damage without obstruction made either by natural or artificial features. Therefore climatic data should be well studied and understood and their effect should be taken into consideration from the initial stage of the design.

## 4.6 REFERENCES


1. All Sopp, B. (1977): A Modern Theory Of Architecture. Rovoteledge and Kegan Paul Ltd. London, England. p. 47.

2. Annual Report (1986/87): National Board For Technical Education, Kaduna, Nigeria.

3. Annual Report (1987): Kano State Primary School Management Board, pp. 16-20.

4. Annual Report (1995): Jigawa State Primary Education Board. Afam Ventures and Printing, Kano, pp. 10-12.

5. Interdesign Partnership, Kaduna. Project Book?

6. Ogogo, L.A. (1990): National Primary Education Commission Headquarters, Abuja, M.Sc. Thesis.

# CHAPTER FIVE

## THE SITE

### 5.1 PREAMBLE

The State Primary Education Board Headquarters, Jigawa State is to be located in Dutse, the state capital, like other SPEB in the country. Dutse was a small town located some 25 kilometres to the north of Kwanar Juguma (a junction village off the Kano-Maidiguri highway). However, it is now an important link to Damaturu and Potiskum in Yobe state, Jama'are and Azare in Bauchi state.

The town itself now serves as modal point to its satellite and other neighbouring settlements. This is more pronounced on week days and market days when people troupe into Dutse for employment and commercial activities.

In planning an office development, suitable location for the project is considered to select most appropriate site. After this, it is mandatory to make a detailed research on the site and its environs by enquiries, survey and inspection of the site. This enables the architect to propose a design that will harmonize the environment.

### 5.2 SITE SELECTION CRITERIA

The SPEB is a parastatal at the State Ministry of Education and it is essential that it should be near residential and the ministry. The site should be easily

accessible to both staff and users. The site is allocated to the SPEB by the State Government and already in the layout survey plan of the existing landuse.

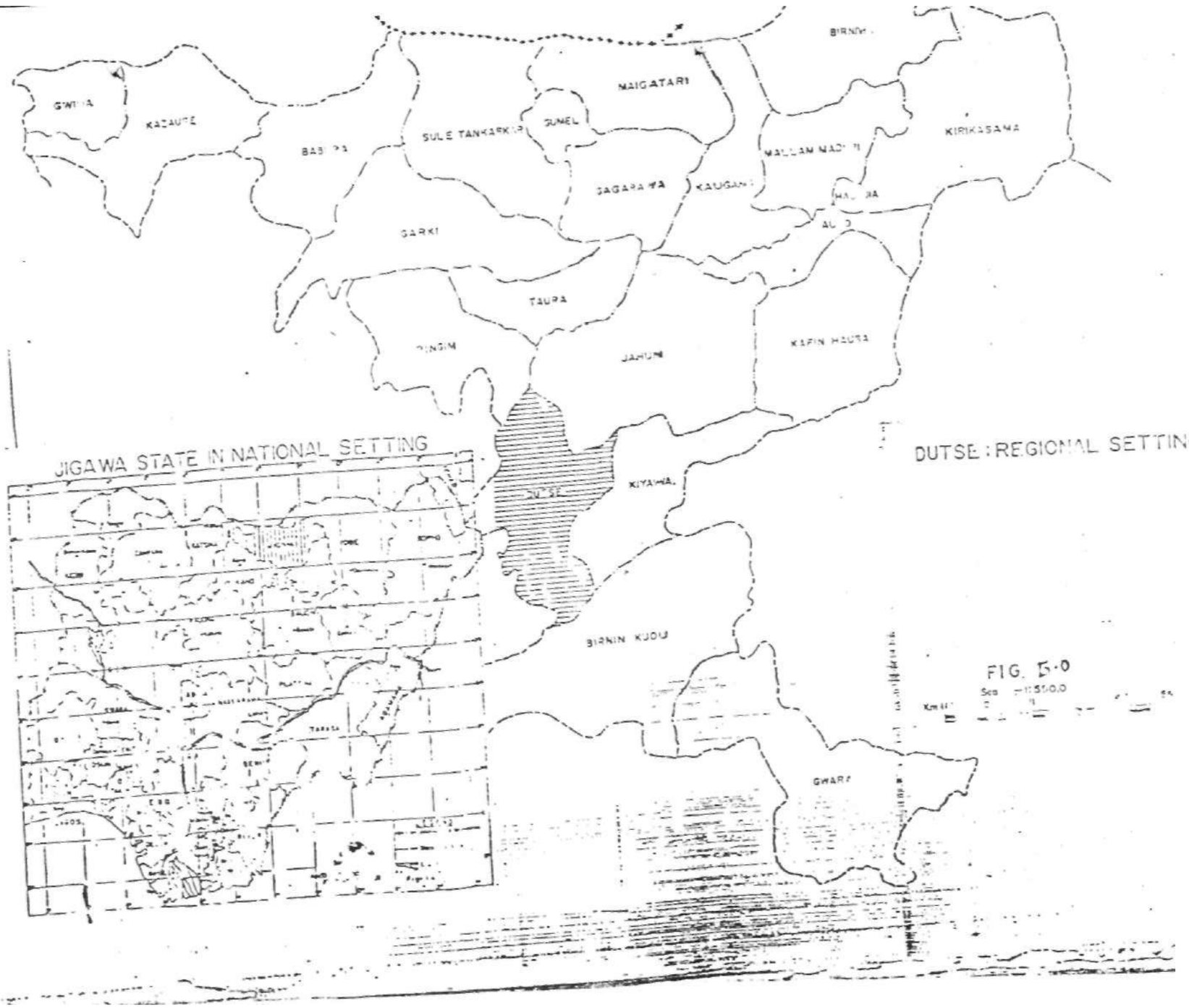
## 5.3 SITE LOCATION

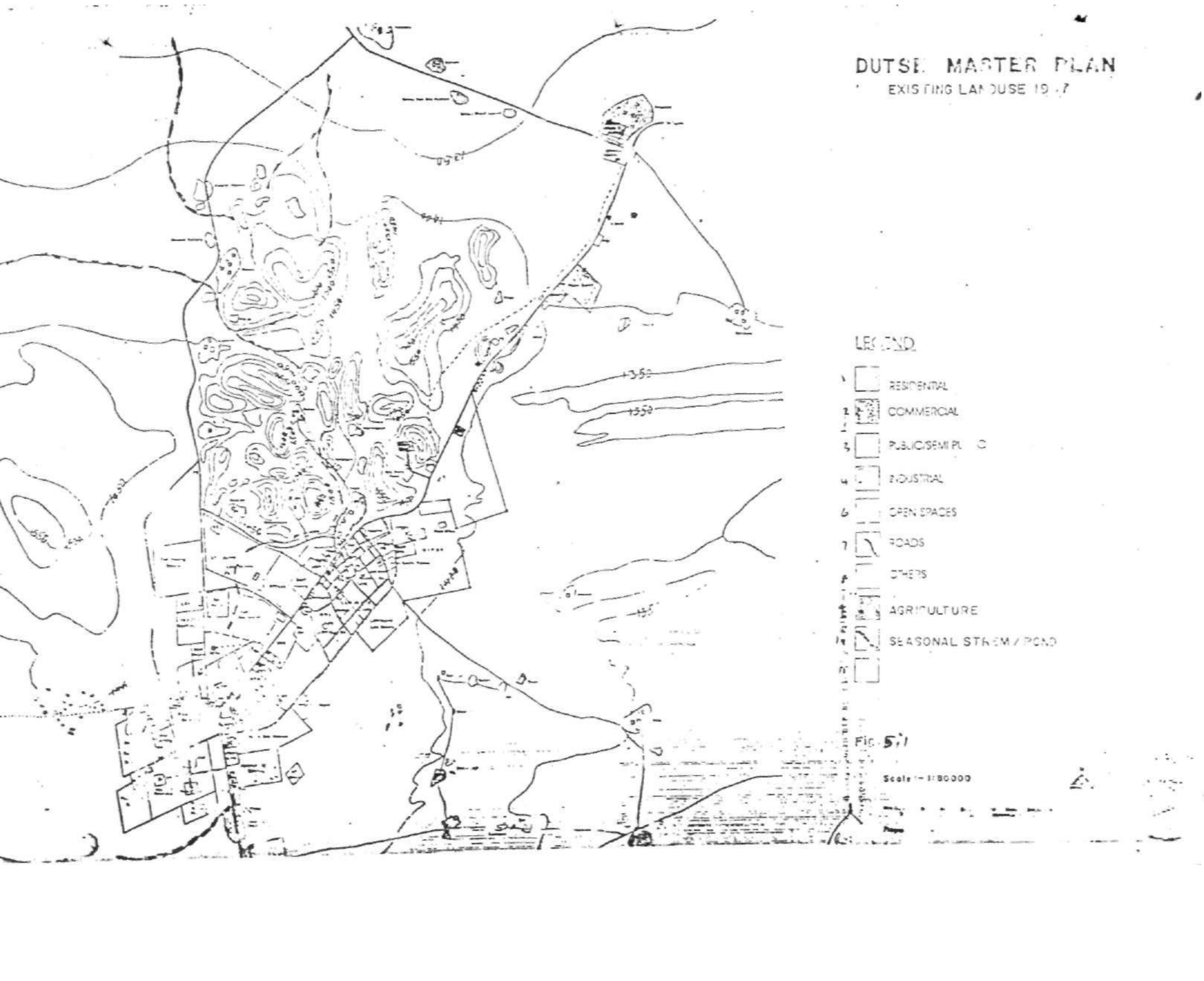
Most cities reflect contemporary realities in their configuration, such as religious beliefs, economic power, political awareness, opinion of rulers, among others. In Nigeria this fact is very evident as there are urban settlements with scattered high-rise buildings, scattered or sometimes compact low-rise buildings and monuments here and there. This work scene is laced with traffic and cars parked everywhere. It is on this ground that Jigawa state proposed a new landuse map which was designed by Department of Urban and Regional Planning, Ahmadu Bello University, Zaria.

The site is located along Shiwarun Takur road directly opposite old State Secretariat. It is bound by Radio Jigawa and Elf Filling Station by the right and proposed NACB and Union Bank Building Complex by the left.

## 5.4 THE SITE

The site located near Takur, the 7,000m$^2$ area of land is trapezoidal in shape and is within the parastatal zone of the town. It is bounded by the access road by the right and the main/highway along the medium side. A prominent view from the site is the Union Bank of Nigeria, Elf Filling Station, Radio


JIGAWA STATE IN NATIONAL SETTING
DUTSE : REGIONAL SETTING
GWIWA
KAZAURE
BABURA
SULE TANKARKAR
SUMEL
MAIGATARI
BIRNIN
KIRIKASAMA
MALLAM MADORI
SAGARAWA
KAUGAMA
GARKI
TAURA
RINGIM
JAHUN
KAFIN HAUSA
KIYAWA
BIRNIN KUDU
GWARA
FIG. 5·0


DUTSE MASTER PLAN
EXISTING LAND USE 19 - 7
LEGEND
1 RESIDENTIAL
2 COMMERCIAL
3 PUBLIC/SEMI PUBLIC
4 INDUSTRIAL
6 OPEN SPACES
7 ROADS
OTHERS
AGRICULTURE
SEASONAL STREAM / POND
Fig. 5.1
Scale 1 : 1:50000
1350
1350

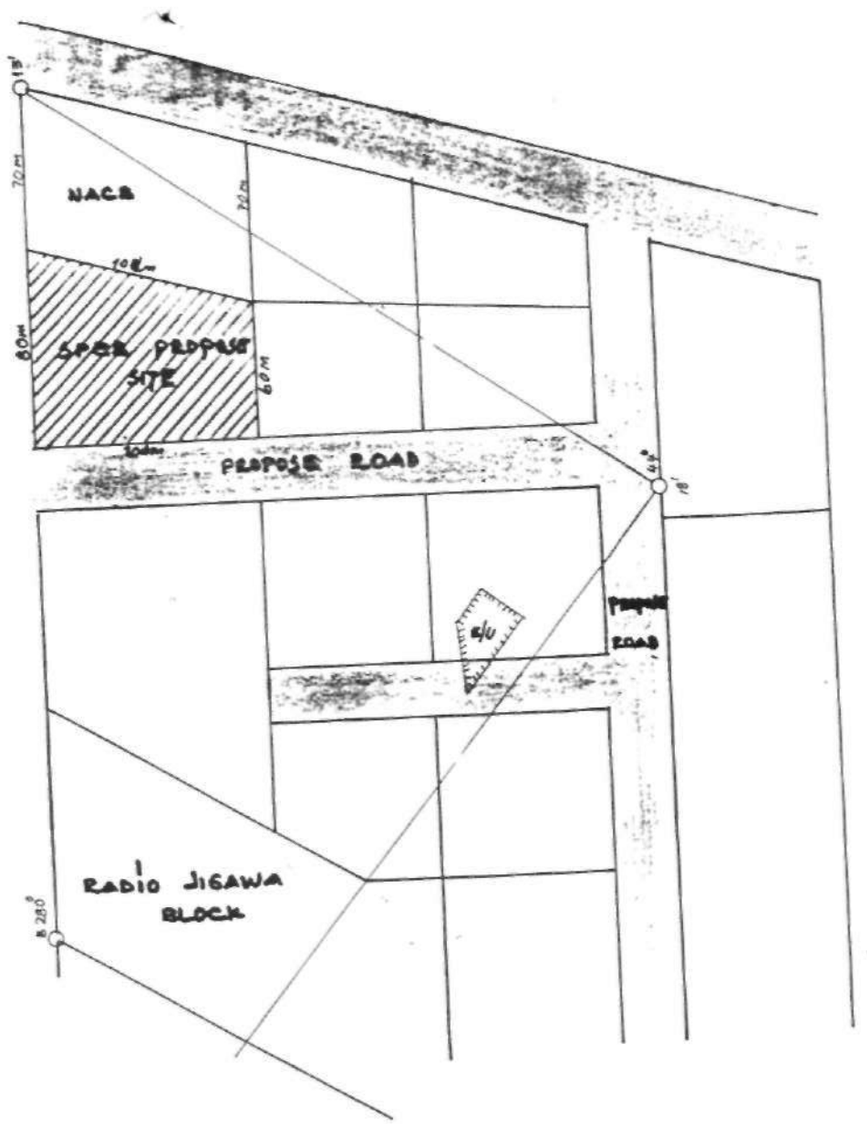



FIG. 5.2

## DESCRIPTION

THE PROPOSE SITE FOR THE JIGAWA STATE EDUCATION BOARD IS TO BE LOCATED IN DUTSE, THE STATE CAPITAL ALONG HUGUMA KIYAWA ROAD DIRECTLY OPPOSITE TO OLD JIGAWA STATE SECRETARIAT, ADJACENT TO RADIO JIGAWA BLOCK AND UNION BANK OF NIGERIA MAIN BRANCH

THE SITE HAS A EURIC COMBISOL SOIL WHICH IS COVERED WITH FEW TREES AND SHRUBS WITH A MATRIX SHORTAGE OF GRASS THAT GROWN IN TUFFS.

THE SITE LAYOUT IS NOT STANDARD SITE FOR INSTITUTIONAL BUILDING WHICH IS ALMOST 100m X 80m AND IT HAS A TRAPEZOIDAL SHAPE.

DESIGN SHOULD GUIDE TO SOLVE THE PROBLEM OF LANDSCAPING, VENTILATION, CIRCULATION AND PARKING WITHIN THE GIVEN SITE. THEREFORE THE DESIGN HAS TO BE COMPACTED SO AS TO CARRY ALL THE PROJECT REQUIREMENTS.

## MERIT

- EASILY ACCESSIBLE
- AVAILABILITY OF INFRASTRUCTURE
  - WATER
  - ELECTRICITY
  - ROADS
- AVAILABILITY OF LABOUR

Jigawa, old State Secretariat, etc.

## 5.5 SITE ANALYSIS

### 5.5.1 TOPOLOGY

Dutse is about 130km from Kano. It lies between 11°30'N and 12°00'N latitude and 9°00'E longitude. The landscape is rocky in the northern part where the old Dutse is located, and characterised by undulating plains of poorly drained soils. Some of the prominent hills include Takur, Garu, Galadimawa, Kamfa, etc. The small and scattered settlement in the vicinity are named after those hills. Other than those prominent hills include Bila (Kachi), Jugurgur (Makajuya), Bariki, Jirgai (Falamawa), Fagoji, Kunu, Jigawar Sarki and Kankwace (Zai).

One of the landform of Dutse is the bad land topologyogy owing to gully erosion due largely to the effect of running water on the loose soils down hill. Weathering and wind erosion have also been important factors in the devastated large tracts of derelict land.

The area concerned (the site) is almost flat with gentle slope.

### 5.5.2 HYDROLOGY

Dutse is located in the boundary or transitional zone between the basement complex of Chad formation comprising mainly granites of Jurassic age that provide a source of gravel for construction purposes. Other deposits include

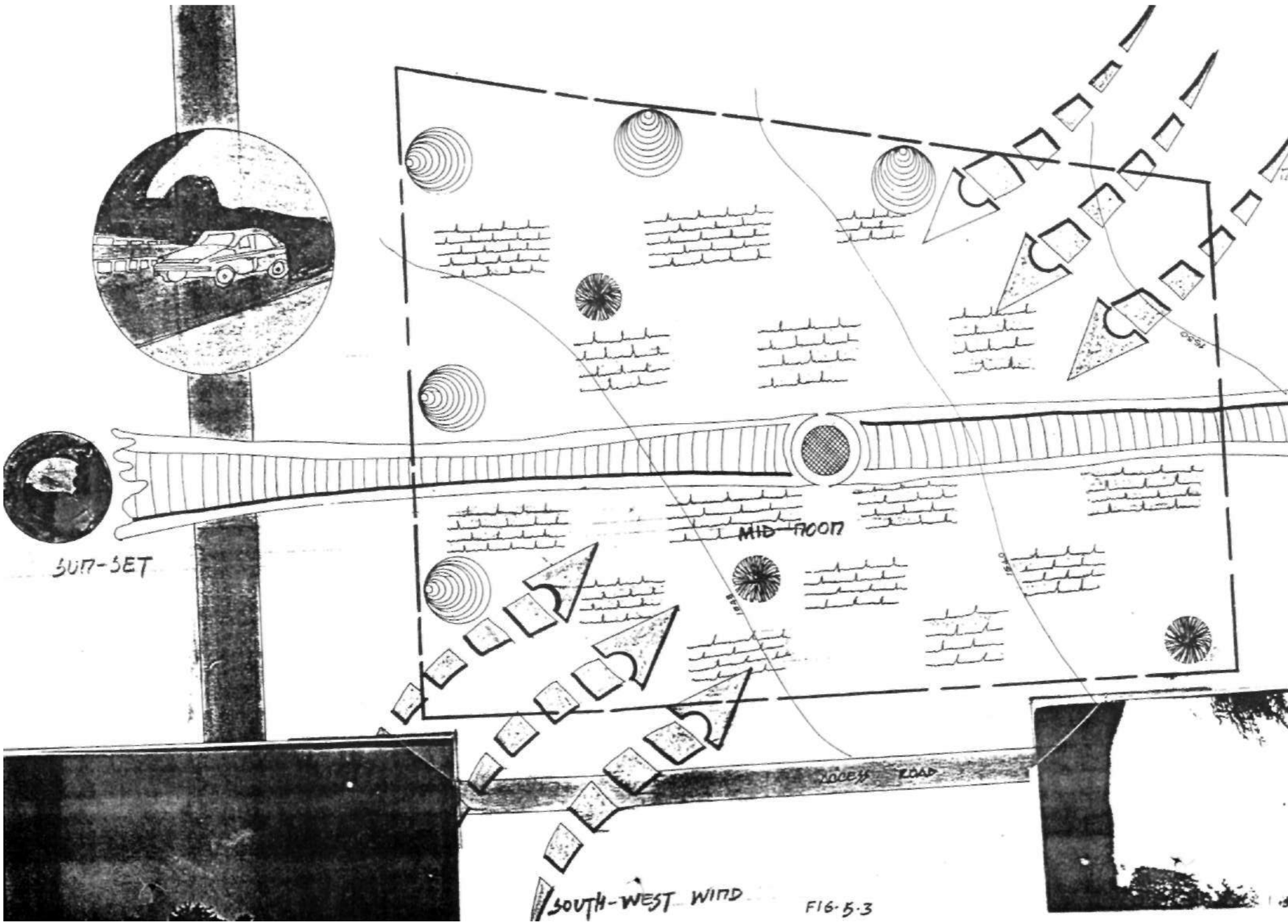
Kaoline used for ceramics and related uses. Traces of gold are also speculated.

Most of the areas underlain by the basement complex is characterised by a thin, discontinuous mantle of weathered rock with thickness of about 15m. thus comprising a poor source of ground water. Water is sourced in areas covered by the Chad formation towards Shuwarun in the north-east (along Kiyawa road) where the depth of wells reaches up to 6m. The water used in Dutse is sourced from this area using pipelines. However, unreliable water supply in the dry season coupled with the town's growth calls for a viable alternative. This is to be harvesting of surface water such as the Warwade Dam located 20km to the south-east of Dutse.

### 5.5.3 CLIMATE AND VEGETATION

The area is covered by Sudan Sahara vegetation type which consists of scattered trees and shrubs in a matrix of shortage grasses that grow in turfs. This is associated with hot and dry climate lasting for the greater part of the year and a short rainy season.

The vegetation of the site does not present any development constraints to the site. Landscaping with existing trees may not be effective. Trees that are foreign to the land but which grow can be adopted for the landscaping of the site.




FIG·5·3



FIG. 5.4 SITE GEOLOGY



FIG. 5.5 SITE VEGETATION COVER

5.5.4 SOILS

The soil type in the area is largely Eutric Combisol which is generally coarse and moderately coarse-textured. They somewhat excessively well drained but in some cases with finer textured and poorly drained. It occurs with iron stone.

5.5.5 TEMPERATURE AND HUMIDITY

Day temperature are often as high as 33°C (110°F) in the dry season and could be as low as 21°C (65°F) during the harmattan period (December - February).

Human sensitivity to temperature is greatly altered by relative humidity. In Dutse, the relative humidity varies with the season. In the dry season, when temperatures are very high, the relative humidity is very low. Relative humidity during rainy reason is higher.

5.5.6 RAINFALL

Rainy season is cold and dust bearing, blowing from the Sahara desert during May/June to September. The south-west erlies are rain-bearing and are dominant in Dutse area accounting for the rainfall peak in July and August. The average rainfall in the area is 762mm per year.

The concentration of rainfall within certain periods implies the need for drainage system both in the structures and on the site that can handle large volumes of water very quickly. The roof members should firmly be fixed to the

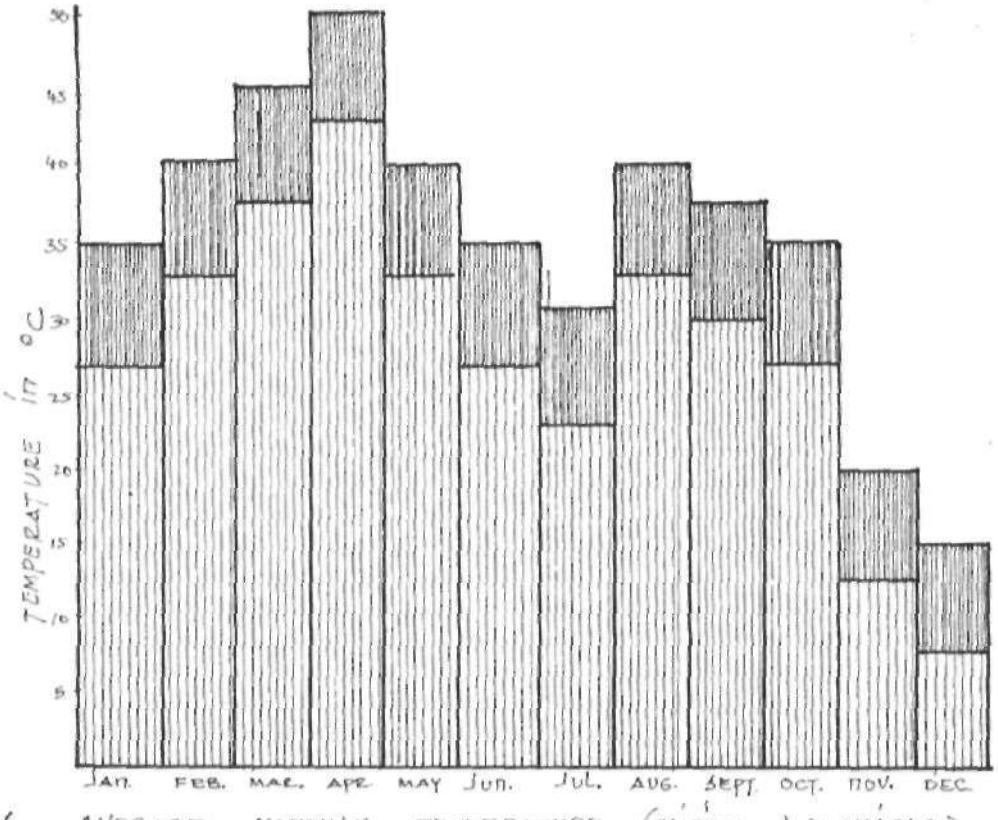



FIG. 5.6 AVERAGE MONTHLY TEMPERATURE (MINIMA & MAXIMA)

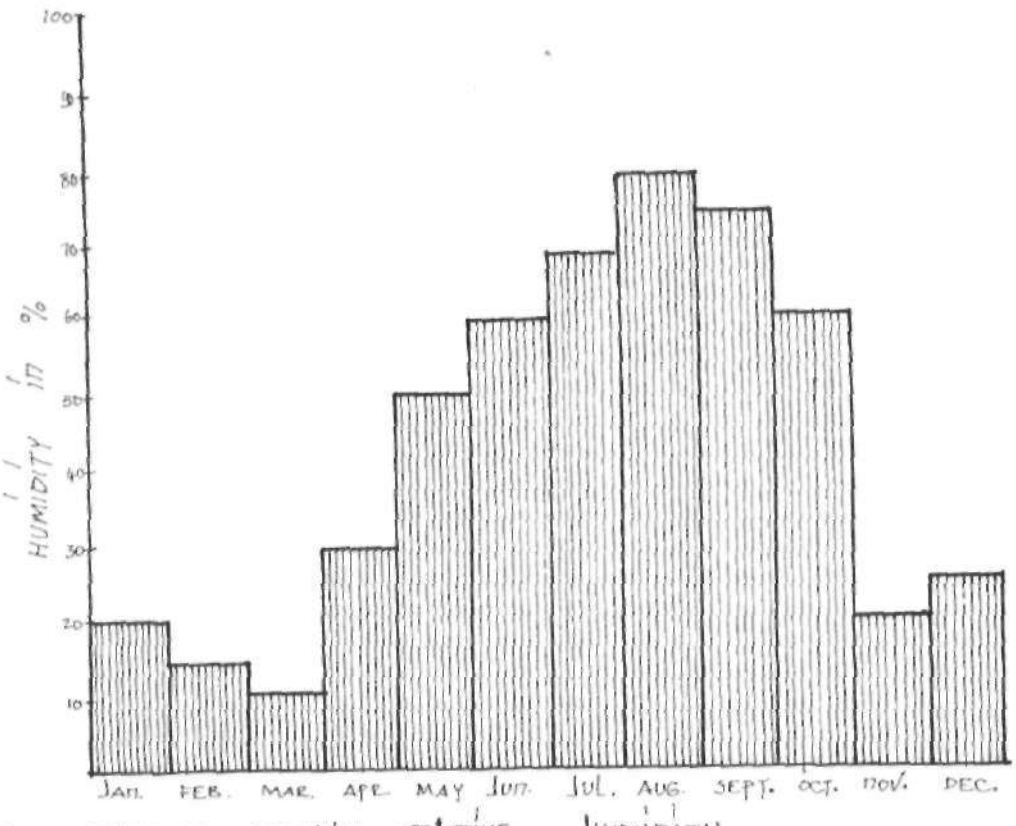



FIG. 5.7 AVERAGE MONTHLY RELATIVE HUMIDITY

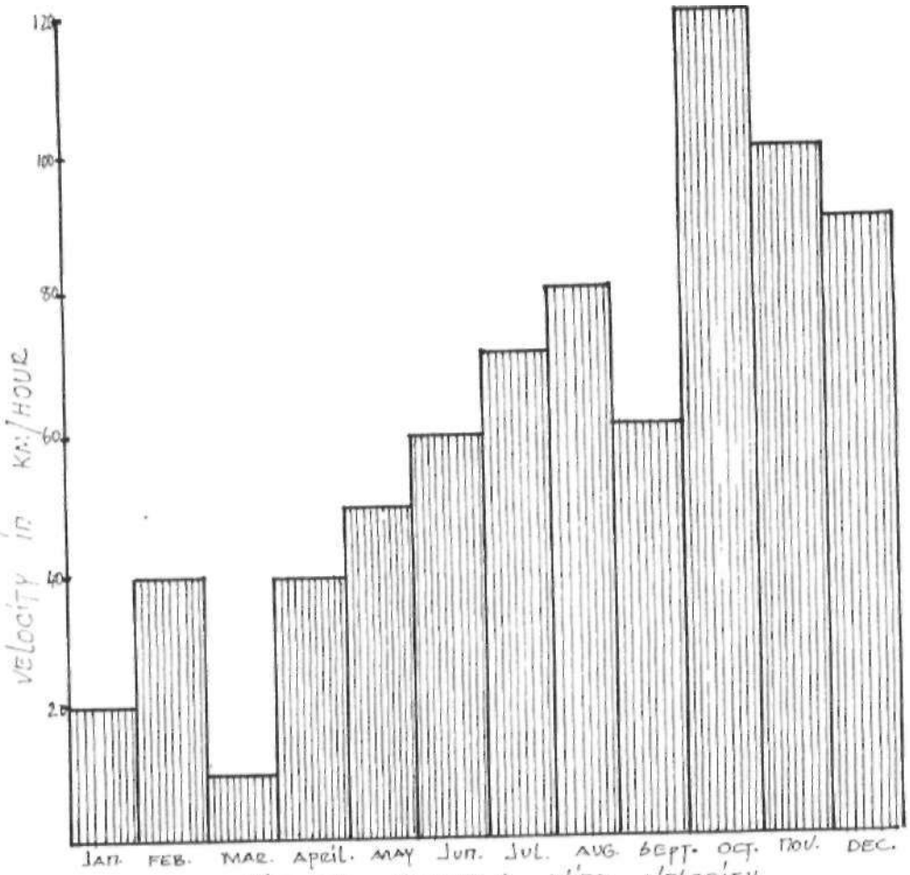



FIG. 5·8 AVERAGE MONTHLY WIND VELOCITY

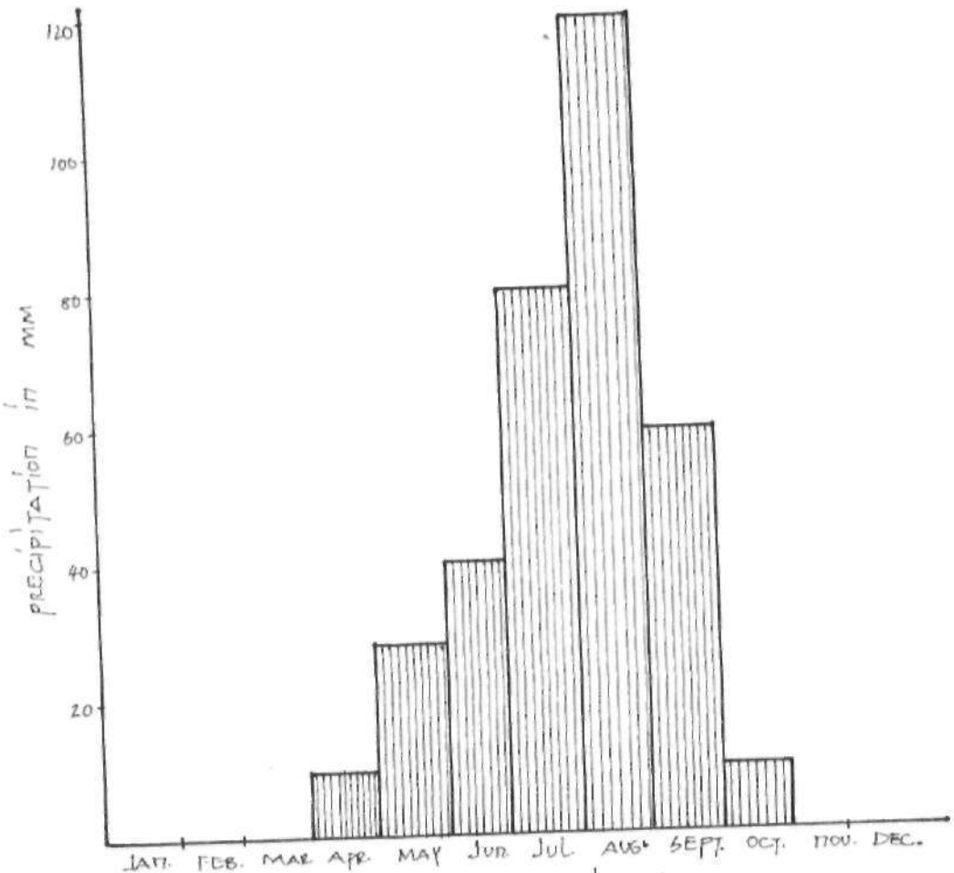



FIG. 5·9 AVERAGE MONTHLY RAINFALL

building structure to avoid any damage. A slight slope of the site can impair damage. The creation of an artificial terrain to enhance quick and easy run-off is a solution to this problem.

5.5.7 WIND-DUST

The climate of the site is dominated by the tropical continental air mass which is developed over the Sahara desert and therefore is warm and dry and blows in the north-east to south-west direction which is associated with the north-east trade winds.

In June, northerly flow of air has weakened and the southerly flow predominates. Moisture laden bring a lot of rain. The north-east trade winds becomes the dominant wind from October to March, bringing with it the harmattan. There is also settlement of dust particles which may reduce visibility to a hundred metres.

Building orientation should take advantage of the maritime. Positive control method could be used for the control of winds and their accompaniments. Landscaping of the site could be used to reduce the intensity of wind as a filter of dust particles. Shading devices can also perform a dual purpose protecting interior from wind and dust.

5.5.6 DESIGN IMPLICATION

Thermal comfort is dependent on temperature, humidity,

radiation and air movement as well as type of activity and degree of acclimatization: the building envelope is thought of as a barrier between internal, controlled environment and the external, perhaps undesirable conditions. The task of the designer of this project is to create the best possible indoor climate since it is feasible to regulate the outdoor conditions. A design should take advantage of the favourable conditions and mitigate the adverse characteristics of the site and its climatic features.

## 5.6 REFERENCES


1. Aminu, S. (1976): Primary School As A Community Centre. M.Sc Thesis, Department of Architecture, A.B.U., Zaria.

2. Existing and proposed master plan for Dutse (1998). URP Department, A.B.U., Zaria, pp. 5-10.

3. Maboguye (1977): Planning Studying Programme, University of Ibadan Press, Nigeria.

4. Ogogo, L.A. (1990): National Primary Education Commission, Headquarters, Abuja, unpublished thesis, Department of Architecture, A.B.U., Zaria, Nigeria.

5. Olusumo, O.O(1990): Introduction To Building Climatology: A Basic Course for Architectural Students.

# CHAPTER SIX

## DESIGN CONCEPTUALISATION

### 6.1 PREAMBLE

Jigawa State Primary Education Board is still at its infancy but is growing every day. This success is as a result of collective contribution of both state government, National Primary Education Commission (NPEC), Local Government Councils, National Teachers' Institute, staff of the board, individuals and other establishments who ensured the achievement of the board.

To assess the functional requirement of the design, maximum requirement of the client at full growth must be taken into consideration. The design should also be flexible to accommodate a change in organisational structure of the board so as to couple with the client's requirement.

### 6.2 BRIEF AND USER REQUIREMENT

#### 6.2.1 ENTRANCE

The entrance of the complex should be of imposing structure that will direct the vehicular and pedestrian traffic on the site. Immediately after the entrance, the next element is the entrance fore-court for cars to pass and park. Therefore, the entrance should also have a port-coacher (an entrance fore-court).

A) Entrance Canopy

This is part of the building complex which is employed to welcome the visitor/user before reaching the entrance lobby.

B) Entrance Lobby

Is another element which is also part of the structure and is a public service. It provides a forum for interaction. When adequately planned, it can be a focus of whole complex. The environment can be stimulated with landscaping and exhibition to acquaint visitors with the role and functions of the board as well as with the information on its activities.

6.2.2 RECEPTION

This is one of the activities that is carried out in the lobby to control the movement of the people to the building for security purposes. Such activities in the reception include waiting, inquiry, etc.

6.2.3 OFFICES

To carry out managerial duties effectively, there should be enough and conducive spaces for maximum personnel output. Therefore the proposal should comply with the requirement and environmental factors. Offices are either open-plan or box-plan (cell), both of which have their proponents. Open-plan

offices being said to be flexible, discourage fruitlessness and encourages interaction. The disadvantage in open-plan offices is not in terms of the worker efficiency but in terms of worker comfort or satisfaction. Most problems in open-plan offices are acoustics ventilation, lighting, privacy and the claustrophobic effect of the enclosure, which cannot be adjusted to suit everyone in the room.

On the other hand, box-type offices offer the greatest opportunities for arranging surrounding, lighting and ventilation to suit individuals requirement. Nase is reduced and privacy increased. No doubt, the box-type office is the acceptable working base for the single executive. It is therefore against the open-plan office in this thesis.

The offices are divided into four namely the executive office, the intermediate office, the junior office and the general office. Office space constitutes about 55% of the total area to be provided and the rest left for landscaping to control wind and parking.

i) The Executive Office: These are the office space for the most senior officials in the board. They are accessed through a Secretary/waiting room. They are planned near the Committee Rooms as the executives frequently leave their offices for meetings with or briefing from the junior officials. These offices have the largest space area because the function of the executive is varied and

more intense. It is also attached with toilet as self contain with lobby to avoid odour whenever there is a blockage.

ii) Intermediate Office: These are offices for the intermediate/higher officials. They are normally private and large enough for the occupant to conduct his normal functions with a reasonable degree of dignity.

iii) Junior Office: Is an office space occupied by a junior official. Sometimes, it is necessary to house members of a team assigned to common task. It can accommodate two or more individuals. Depending on the number of occupants, the size of junior office is normally small.

iv) General Office: This is the open office space occupied by a number of employees, officials, furnishings, equipments and circulation area. The large open area should permit flexibility and effective utilization. In coordinating general office works, facilities that facilitate modern practice technique is proposed. A storage space for files and records is attached to the general office.

### 6.2.4 CONFERENCE ROOM

All cadre of personnel dealing or directly with primary

education in the state are expected to come to the board at regular intervals for briefings, instructions, seminars and other activities. A Conference Room with seating capacity for 80 persons and back up facilities is proposed.

### 6.2.5 BOARD ROOM

The Board Room is another conference space for the Board Members which are 17 in number. Therefore, provision is made for 17 seats and 8 extra seats in case of the increase in number in future making 25 seats.

### 6.2.6 TRAINING FACILITIES

There is a need for illustration and demonstration during seminar and workshops. Therefore, two Lecture Halls are provided to serve as model classroom for seminars and workshops to be incorporated in the training facilities as a guide to the implementers.

### 6.2.7 ANCILLARY FACILITIES

These are the facilities that will contribute to the effective function of the complex is also proposed on the micro level/ground of the design. Such facilities include a maintenance workshop, security post, water tank, generator, etc.

### 6.2.8 LIBRARY

A library is proposed as a result as a reserve for the conservation of relevant information on education, both past and present. It will be useful for the education officers and others who come for conference, seminar, workshop or training at the board as well as the official of the board. The reading facilities is expected to accommodate 40 persons.

### 6.2.9 CAFETERIA

*Is proposed to reduce the time officials and staff of the* board spend outside the complex. It also reduces the time spent outside by those coming to the Board Room from other governmental areas. It is to serve the workers and visitors to the complex. It is located on the ground floor and at a convenient point to the Lecture Halls. Back up facilities such as kitchen, stores, servery and changing room will be provided.

## 6.3 SCHEDULE OF ACCOMMODATION

A detailed list of the space requirement for each office or function is attached and the criteria for the space selected is also shown:

| ACCOMMODATION | AREA ($m^2$) | REMARKS |
|---|---|---|
| Chairman. | 64 | Large working space, 15 visitors, sofar around a coffee table, 2 file cabinets, book shelf, toilet and circulation. |
| Secretary to Chairman. | 48 | Working space, 12 visitors chairs, 1 typist, 2 file cabinets and circulation. |
| Board room. | 96 | Large conference table for 45 people at a seating, coffee room and circulation. |
| Directors, Deputy Directors, Permanent Members. | 35 | Working space, 2 visitors chairs, 2 file cabinets and toilets. |
| Secretary to the board and In-Charge of Education Secretaries. | 40 | Large working space, 12 visitors, file cabinets and circulation space. |
| Admin Offices. | 20 | Office for 1 or 2 Admin Officers, 2 visitors chairs, 2 cabinets and circulation space. |
| Architect. | 48 | Large working space, 1 drawing board,2 visitors chairs, 2 cabinet and circulation space. |
| Drawing Room. | 72 | Large working space, 4 drawing tables, 4 cabinets and circulation space. |
| Library. | 225 | 60 persons sitting and enough circulation space. |
| Conference Hall. | 225 | 60 persons sitting and enough circulation space. |
| Lecture Hall. | 225 | 60 persons sitting and enough circulation space. |
| Restaurant. | 272 | 60 persons sitting, servery, kitchen, changing food store, cold store, lobby facilities. |
| Main Store. | 90 | Shelves and large space for parking. |
| Maintenance. | 122 | Large space for machine equipments and circulation space. |
| Lobby. | 120 | Working space for receptionist, waiting area and enough circulation space. |
| TOTAL | 1,700 | |

## 6.4 PLANNING PRINCIPLES

Building does not exist in isolation, but exist in spatial, behavioral and per perceptual concept. Therefore the architect/designer should as much as he can focus on the relationship between building and the site as well as within the building.

### 6.4.1 SITE CONCEPT

The site is relatively flat with no permanent features. This allows for flexibility in the planning within the site. Site constraints include micro-climate and topography of the site are taken into consideration. This will not affect the site conceptualization but the design concept. The permanent feature from the site is Radio Jigawa, old State Secretariat and Union Bank of Nigeria. The site can be accessed from Huguma-Kiyawa highway through an access road.

i) **Site Concept** I: The access into the site is directly/tapped from the access road. The road is less busy and has the advantage of direct link to the Business District through the highway that leads to Shiwarun-Kiyawa. One entrance is to be proposed to direct traffic on the site. In this layout, the admin is the first block and adjacent are the training facilities and behind are the ancillaries.

ii) Site Concept II: This concept has also an access tapped from the access road. The units are arranged in a linear form. The ancillary is easy accessible, however the admin offices are bounded by the noisy zones of the conference and ancillary facilities.

iii) Site Concept III: This concept has the ancillary and conference in the front and to the sides, while administrative offices are to the left side corner. This arrangement has the advantage of a short distance route for the service bay and also a quiet zone for the administrative offices. This concept is to be adopted as the most appropriate for the design proposal.

### 6.4.2 DESIGN CONCEPT

In designing the proposed State Primary Education Board Headquarters, Dutse, Jigawa State, the following considerations were analyzed and resolved.

i) A functional approach is best for the design of the different units. The reception and central lobby should be able to serve all parts of the complex.

ii) Another consideration in the design is the avoidance of mechanical movement systems and central air-conditioning systems because subsequent

power failure in the state capital. As much as possible, natural lighting and ventilation should be derived to the structure than mechanical means.

iii) In avoidance of mechanical circulation pattern, the building should be composed on the site to allow the function of landscaping and parking to be enough.

iv) The perception of the building should be of aesthetics value and well integrated to the site.

## 6.5 REFERENCES


1. Neufert, E. (1990): Architect's Data, Halsted Press, New York, pp. 225-244.

2. Ogogo, L.A. (1990): National Primary Education Commission Headquarters, Abuja, M.Sc Arch. Thesis, pp. 91-103.

3. Snyder, J.C. and Catanese,A.J(1979) Introduction To Architecture, McGraw Hill Press, U.S.A., p. 422.

4. State Primary Education Board (1995): Annual Report, SPEB, Jigawa State

5. Tutt, P, and Adler, D.(1979): New Metric Handbook, Architectural Press, London, pp. 114-130.

# CHAPTER SEVEN

## DESIGN REPORT

### 7.1 PREAMBLE

The main objective of this thesis is to provide spaces or office accommodation for the headquarters of the Jigawa State Primary Education Board, Dutse that will be conducive, thereby stimulating an efficient performance.

### 7.2 SITE PLAN

The entrance to the site is through an access road that leads to the Huguwa-Kiyawa highway. There is one entrance gate to the site that leads to all the units and also serves as an exit. Therefore there is one control for security purposes.

As the visitor enters the site, he drives straight to the parking lots and moves along the walkways to the entrance. The staff and visitors drive in through the same entrance gate.

Staff parking of 36 cars is provided and visitors parking of 45 parking is provided while conference parking of 44 is provided. The whole site is landscaped with trees and hedges as well as walkways for pedestrians.

### 7.3 THE DESIGN

The complex comprises of three units, the Ancillary, the Training and the third is the Office Complex.

Entrance into the main lobby is through the main canopy.

The receptionist:s desk and waiting area are adjacent the main entrance while the staircase is adjacent the entrance to the right.

The Main Store, Maintenance and in-charge of these units are to the right and restaurant is to the left. The Lecture Halls are at the back and escape stairs are at strategic places. The two Lecture Halls can serve as demonstration classrooms for training. There is moderate volume of atrium at the centre.

The first floor is accessed from the staircase in the lobby which is clearly accesible from ground floor. The office environment must be able to meet basic utilitarian functions yet have a natural appeal to the workers within. The scheme therefore has the offices arranged around an atrium. Workers have direct access and view to each office through corridor. School Services Department, Conference Room and Library occupy the first floor. Finance and Supplies and Planning, Research and Statistics Department occupy the second floor. The third floor is occupied by the Chairman, Permanent Members, Secretary and Personnel Department.

## 7.4 STRUCTURAL SYSTEM

The design is based on a modular grid of 4m by 4m. The structure is of beams and columns which are positioned at regular intervals. The Restaurant, Store and Maintenance are decked while the other units are rooted with steel trusses.

## 7.5 SERVICES

All the service lines run parallel to the site along the access road. They utilize on the site in the following ways.

### 7.5.1 WATER SUPPLY

This is tapped to the Ancillary Unit where the water tank is situated and distributed to the point where they are needed, preferably toilets and kitchen.

### 7.5.2 SEWER AND SEWERAGE

The waste collected from the complex is directed to the main septic tank through pipes with inspection chambers at intervals of intersections.

### 7.5.3 STORM WATER DRAINAGE

Water collected on the roof gutters are connected to the underground drainage lines which are further connected to the complex storm sewer to the central storm sewer along the road down to the large reservoir. The arrangement is done along the contours.

### 7.5.4 ELECTRICITY

Is tapped from the main grid line to the switch control from where it is distributed to all floors round the whole complex. The generating plant located near the security post to supplement the main supply.

### 7.5.5 TELECOMMUNICATION

It is needed to facilitate communication within and outside the board. Exchange room/radio room is located adjacent the receptionist. The telephone line is tapped from the service line along the road.

## 7.6 FACADE

The irregular height of the buildings in the complex (though dictated by function) makes the composition of the complex produce a floating effect. The continuous penetration on the office facade are punctuated by the projected columns. Shading devices serving a dual function of sun protection and shielding of the unitary air-conditioners are also continuous. Curvilinear forms have been adopted in the treatment of the elevators to give the building an aesthetic value.

## 7.7 CONCLUSION AND RECOMMENDATION

### 7.7.1 CONCLUSION

Most office buildings lack adequate space for the performance of its functions. Wind control is also found to be unsuitable for the building structures. These constitute hindrances and damage to the effective role of the offices and structures respectively.

The office spaces documented were compared with standard requirements in some Architectural Handbooks which adopted the most appropriate space area. Wind control factors also have

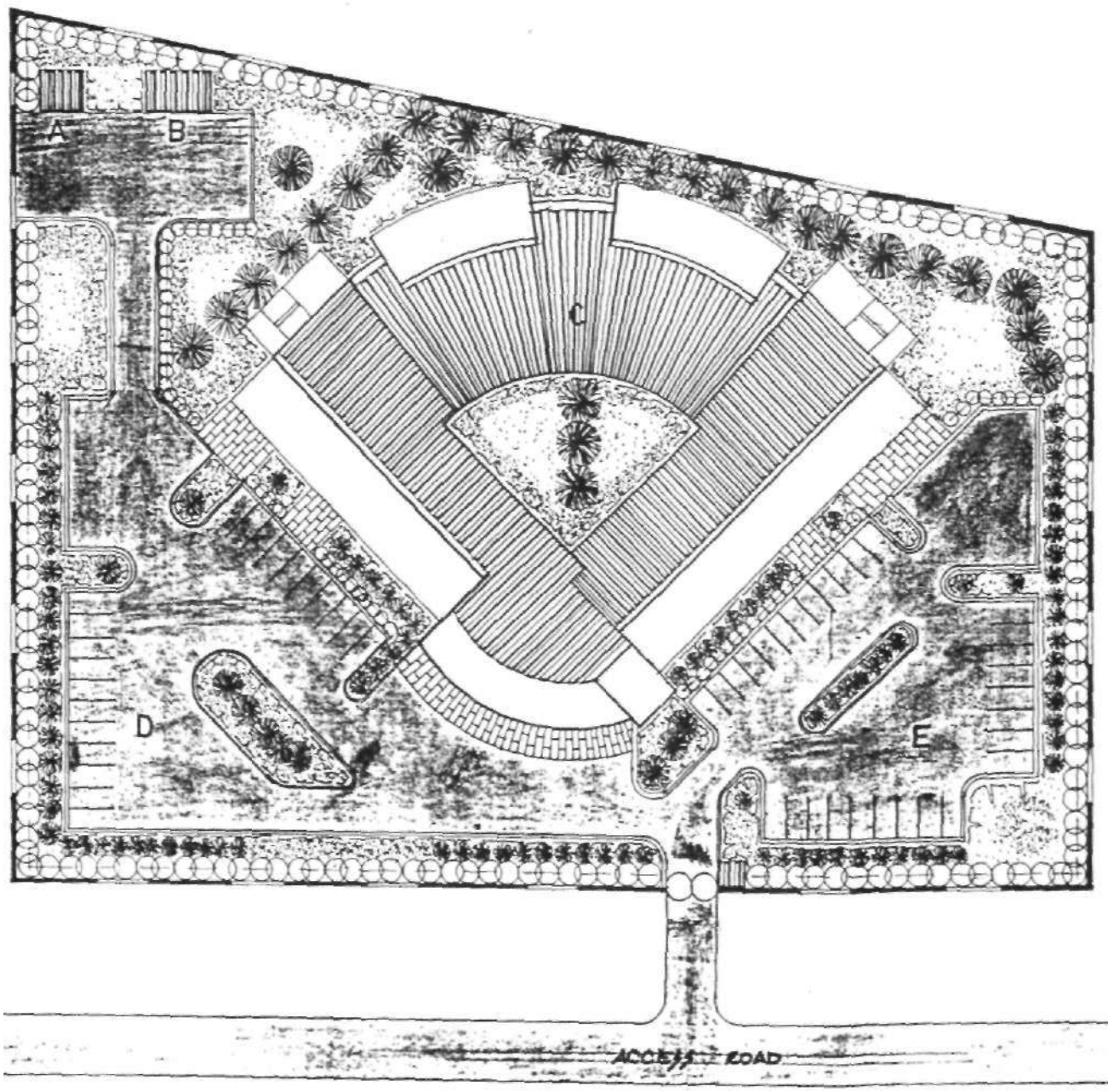
standard dimension that have been neglected in most buildings.

This thesis has effectively achieved an efficiently wind damage control in institutional buildings and this could be used in other buildings. Wind damage results in loss of convenience and effective functioning of the building.

### 7.7.2 RECOMMENDATIONS

Office workers spend most productive part of the day in their offices. The design has tried for the different need of the office workers by providing adequate spaces and aesthetically, pleasing environment. This will enhance the planning and monitoring of Primary Education in Jigawa state as the state seeks to become improved educationally.

Factors of wind control have to be employed to prevent serious wind damages to the building structure for effective function, convenience and economy.




N

LEGEND

- A WATER TANK
- B GENERATOR HOUSE
- C MAIN BUILDING
- D STAFF PARKING
- E VISITORS PARKING

FIG. 7.0

SITE PLAN

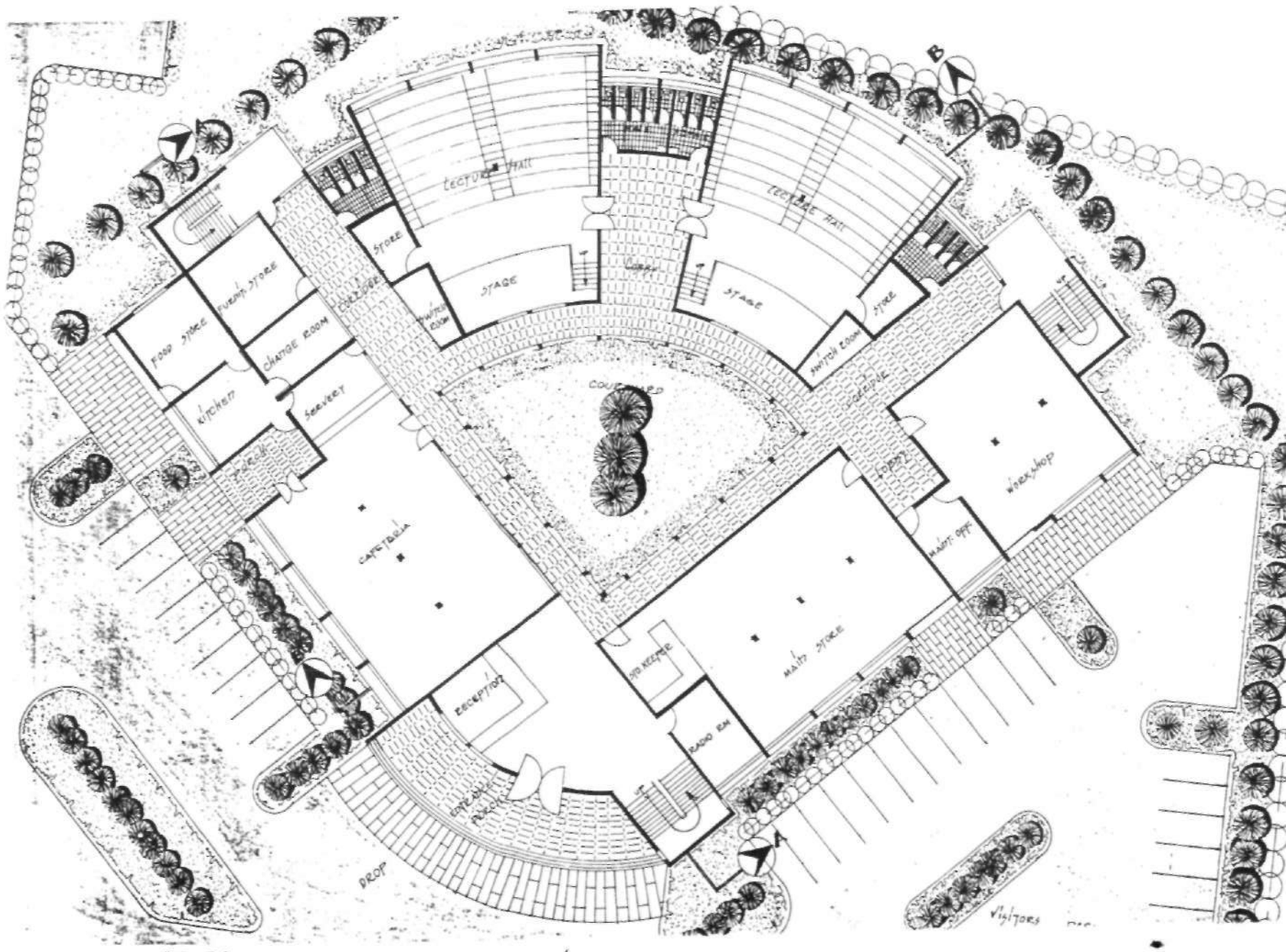



FIG. 7.1 GROUND FLOOR PLAN

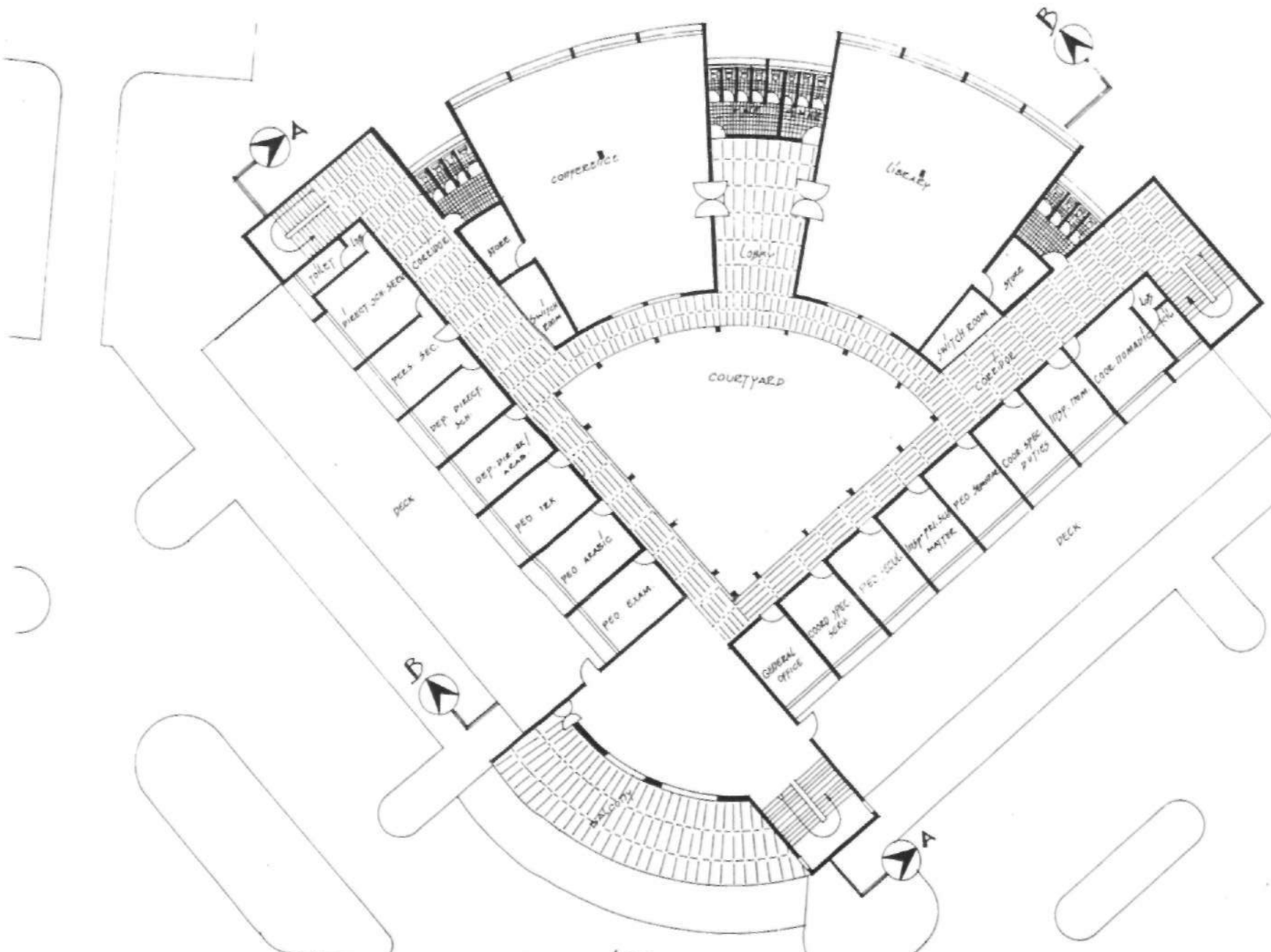



FIG. 7.2 FIRST Floor PLAN

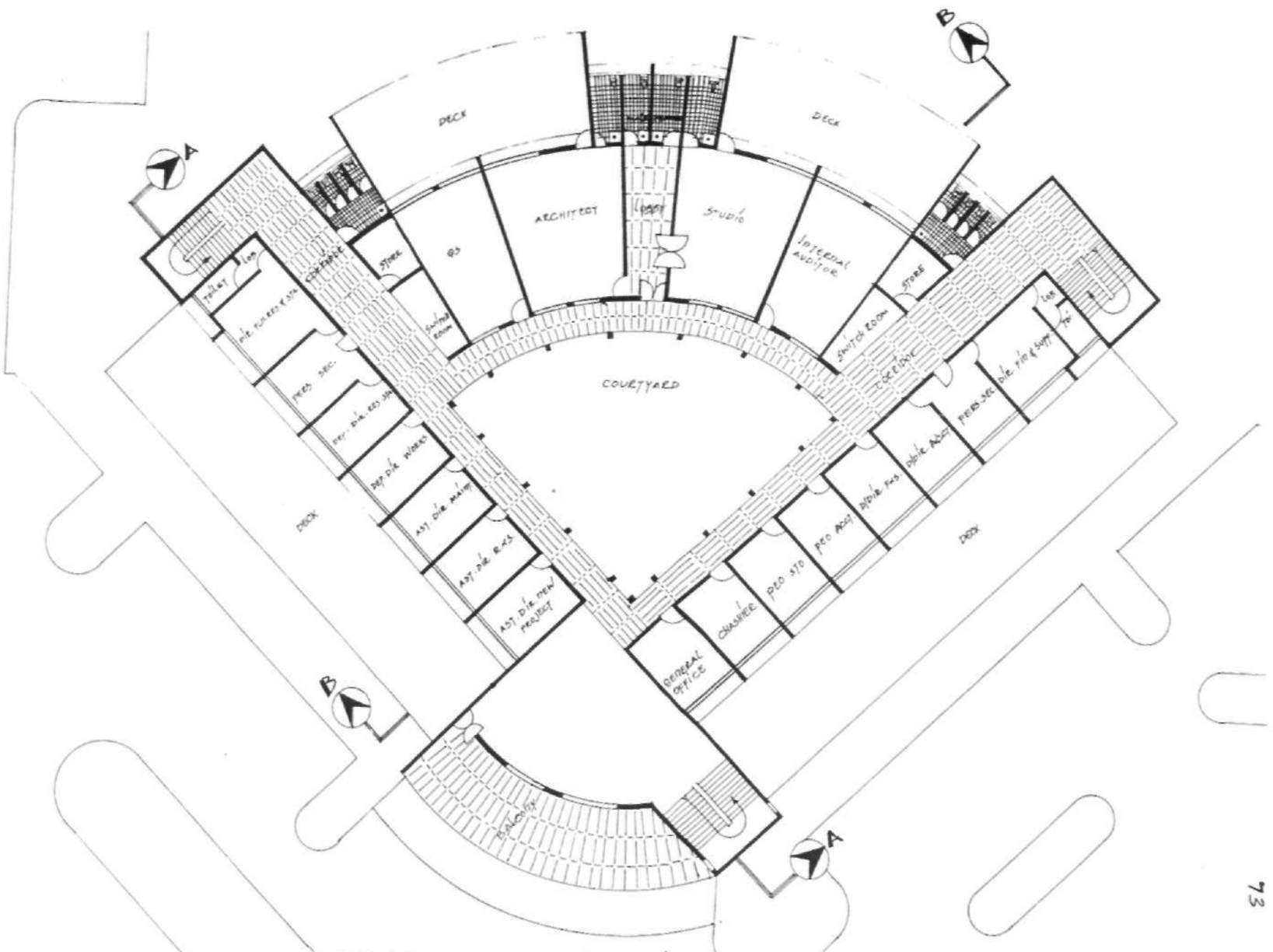



FIG 7.3 SECOND FLOOR PLAN

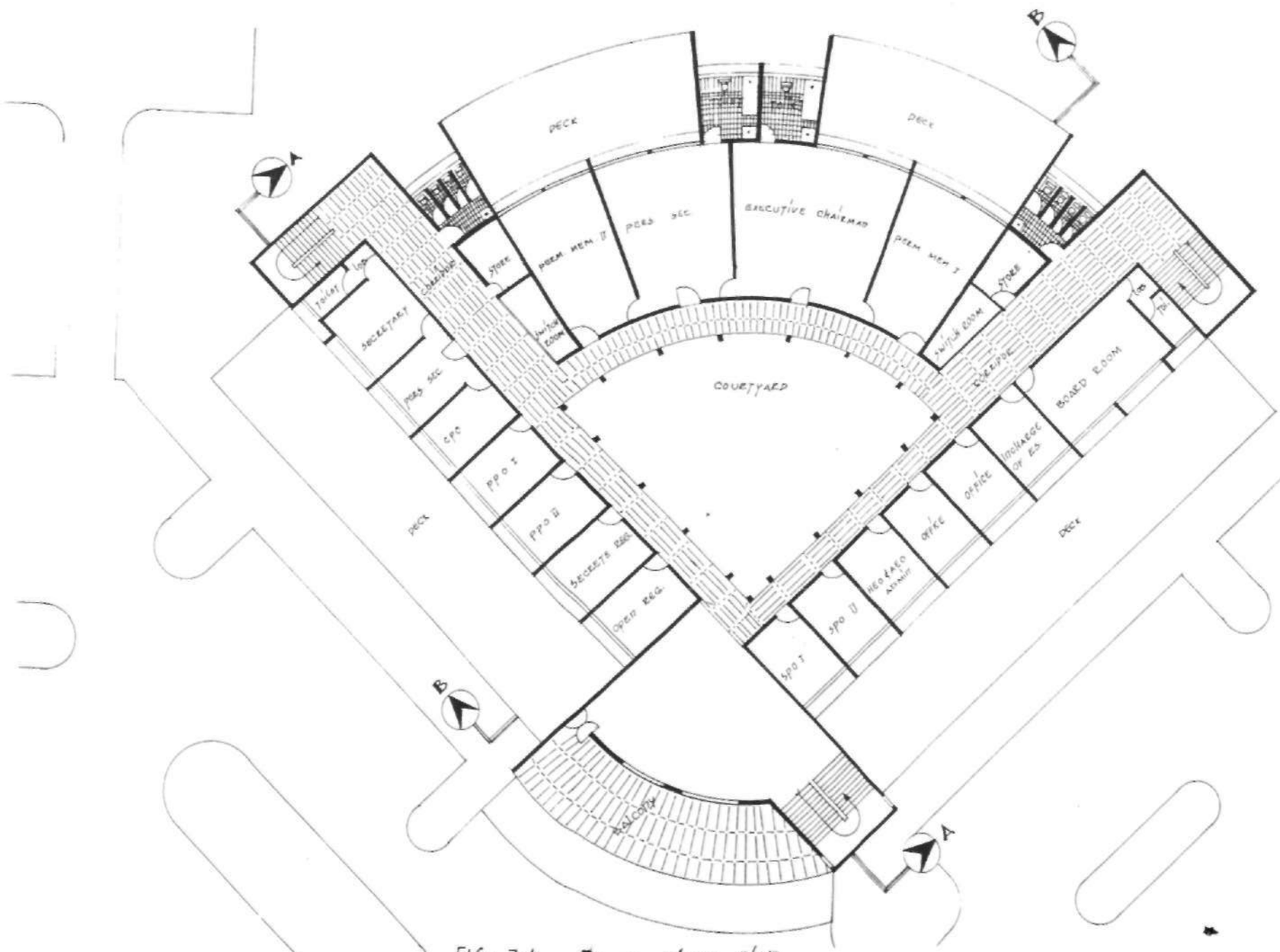



FIG. 7-4, THIRD FLOOR PLAN

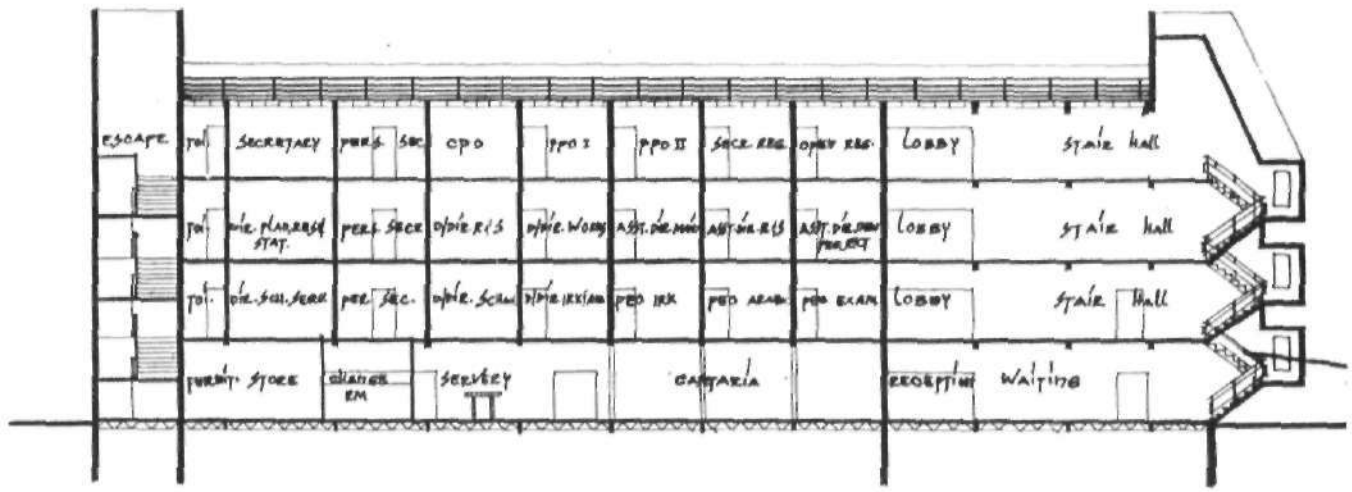



FIG. 7.58 SECTION A-A

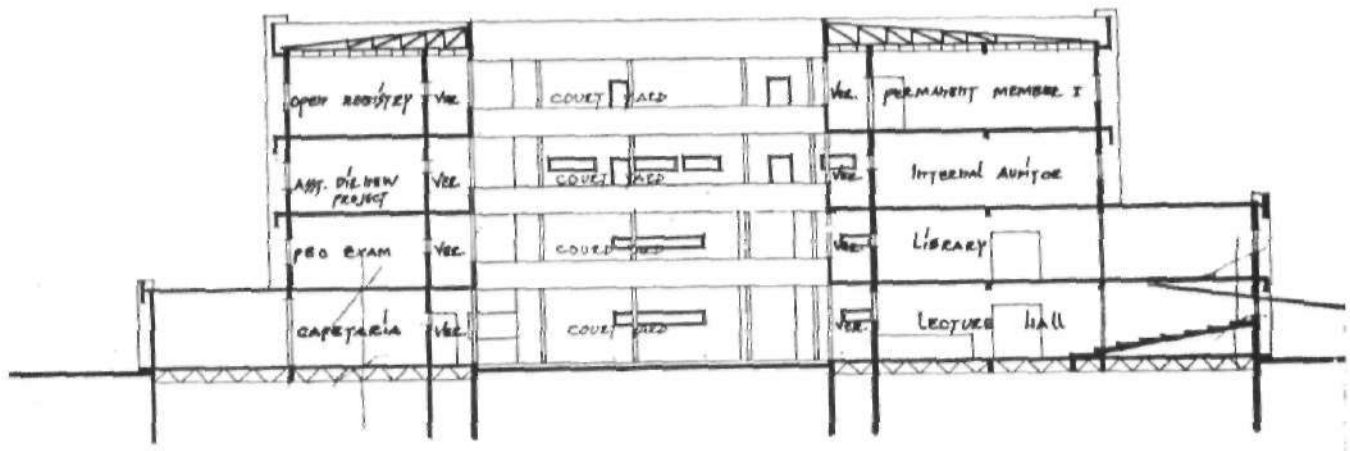



FIG. 7.5b SECTION B-B

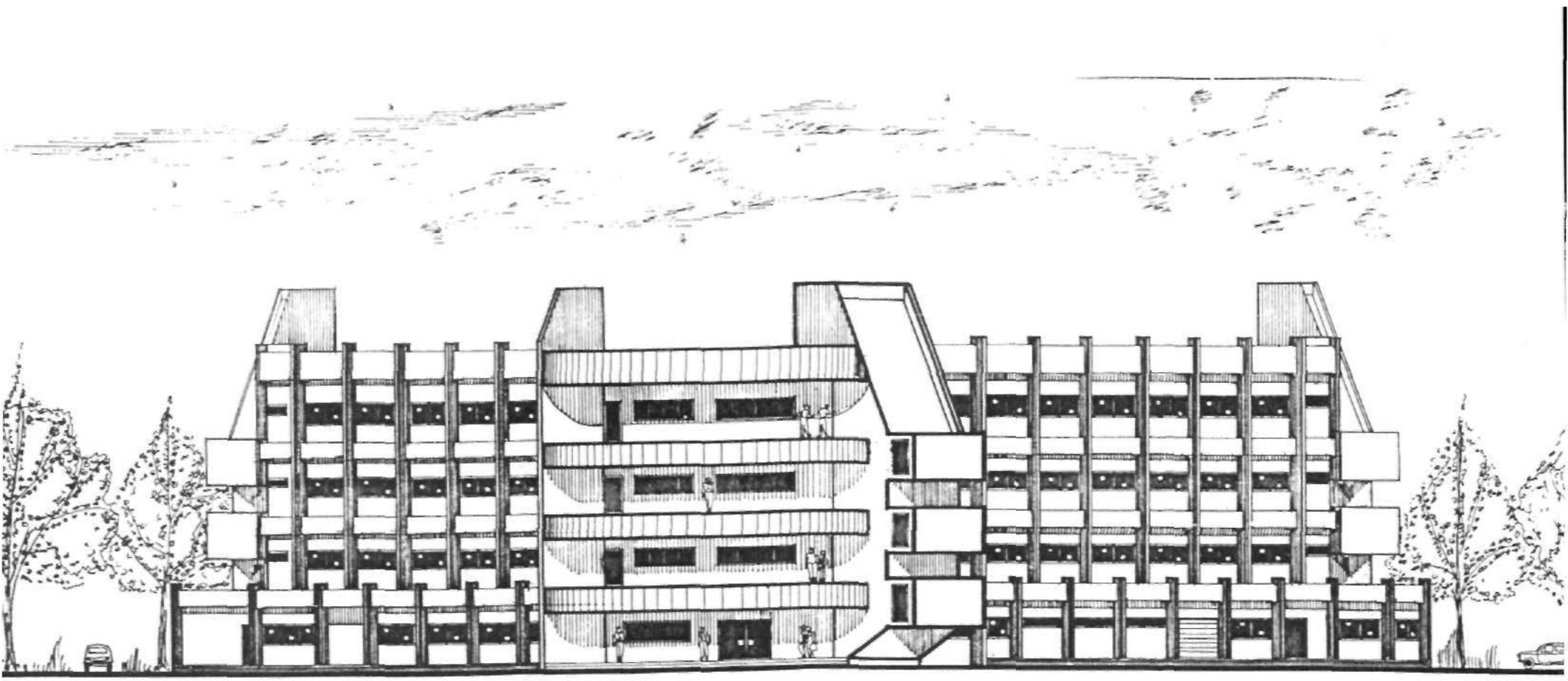


FIG. 7.6 NORTH ELEVATION

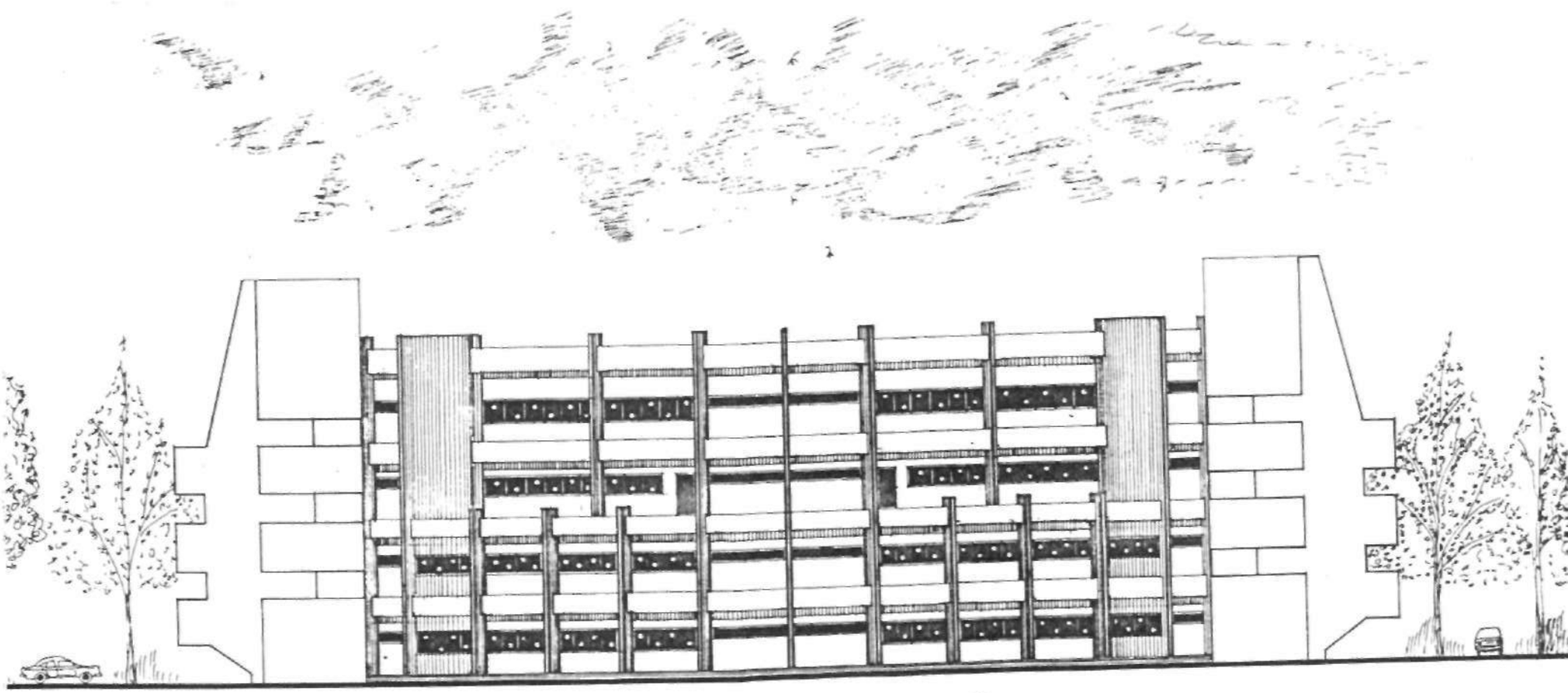


FIG. 7·7 SOUTH ELEVATION

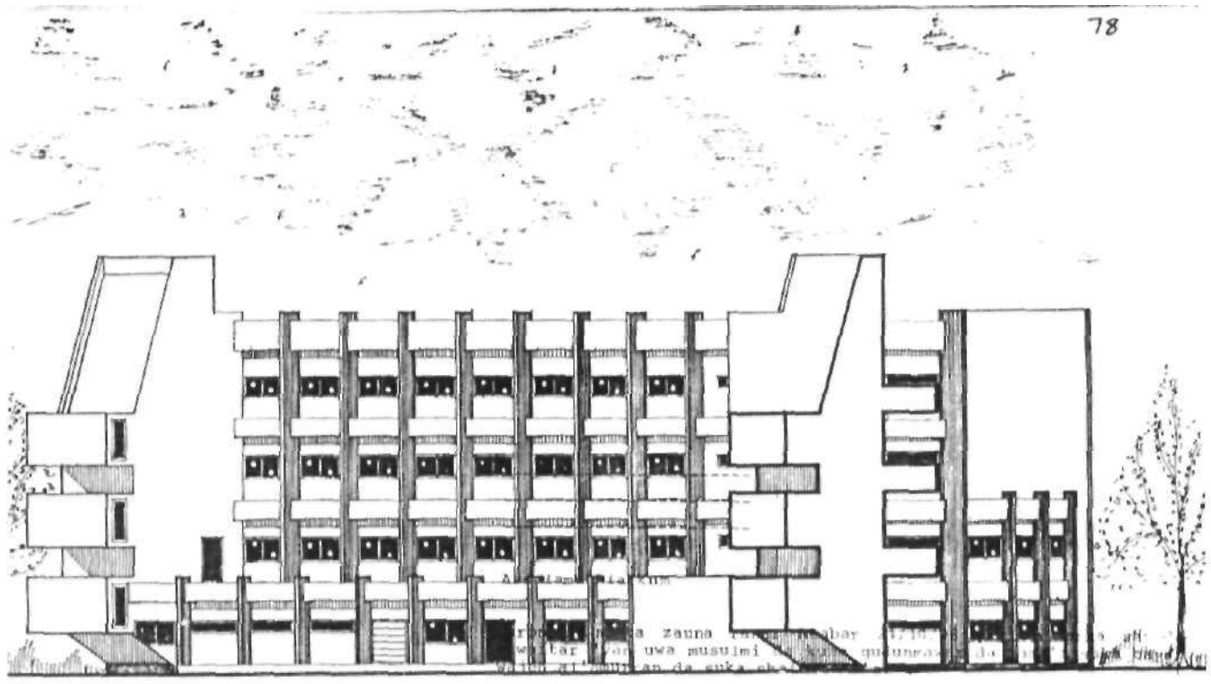


FIG. 7.85 EAST ELEVATION

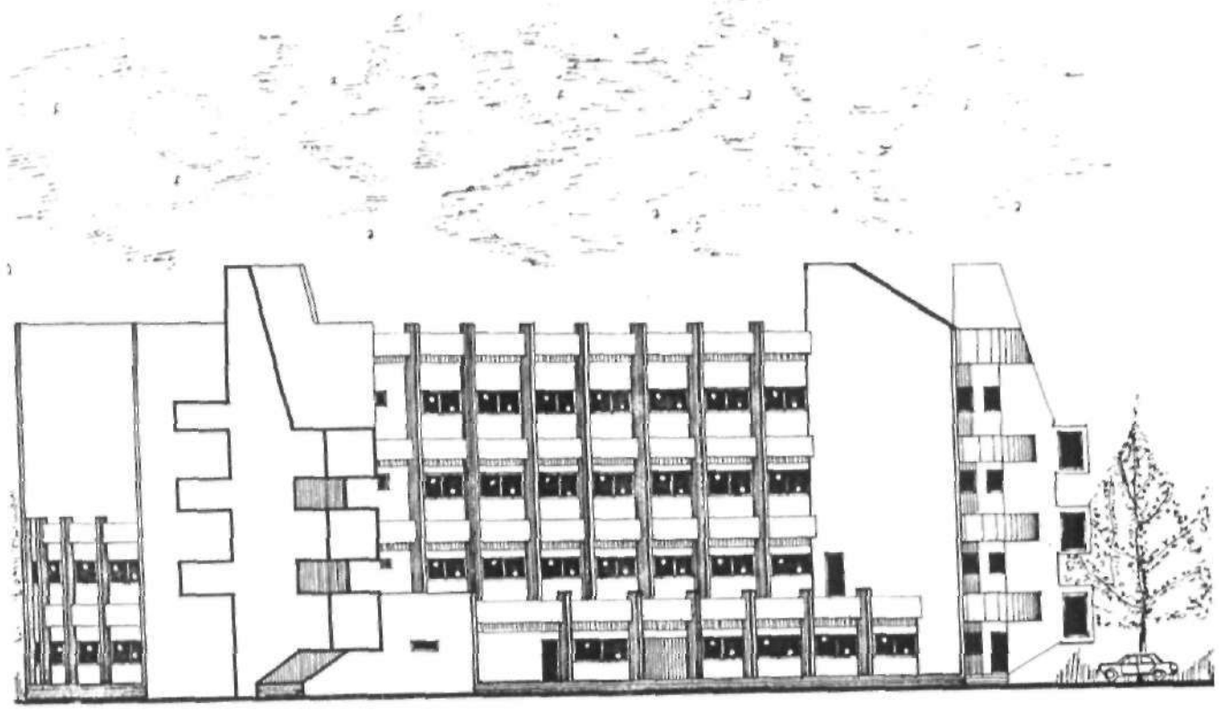


FIG. 7.86 WEST ELEVATION