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THESIS ABSTRACT OF COMPREHENSIVE PRIMARY SCHOOL, ZARIA;

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All over the World today, there is a cry for educational revolution and oalls by educationalists for the dismantling of the educational system that has taken much sweat and efforts to build since the turn of the century; on the ground that it is inappropriate for today's society. In Nigeria, teachers, Student teachers and politicians constitute the vanguard of the movement while educational administrators on the defence have catapulted the blame to the rigidity and inability of School buildings to contain the new systems. The comprehensive Primary School is my attempt to receive the ball now in the 'Architects' court' and is significant for the following reasons:

(a) it's spatial versatility, flexibility and activity orientation

(b) de institutionalized School environment (nearerhome than Sch.)

(c) chronological organization of class bases

(d) intimacy and identity-potential of its structures and spaces.

(e) consideration for communal participation in the School's life.

(f) constructional ease.

Scopes The school is designed for IOI4O children of ages of 4-12 years, comprising of 634 boys and 416 girls. It consists of adminis-trative, and academic blocks and recreational play fields (active and passive).

Focus: Emphasis on the provision of an environment that will encourage progressive, efficient and individualized teaching and learning methods, hence the provision of learning spaces which teachers could organize with minimum strain to suit their programmes.

The project has offered ine opportunity for the reappraisal of architecture as "just a game of space, a view other theoretical class projects have tended to impress on me. The desire to make P.S.right answer for existing problems called for intensive groundwork (interviews, questionnaire opinions etc.) which revealed the dynamic role of the human factor in design; which gives me a renewed view of architecture as a "Spatial and Physiological game of resolving human problems. It also unveiled the need for architects to positively influence clientele briefs wherever possible for the benefit of the user (based on similar groundwork discussed) for the barometer of success or failure of any project lies ultimately in his hands (the user).

D E D I C A T E D T O :

A L M I G H T Y G O D

F O R

T H E A M A Z I N G G I F T O F L I F E .

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P R O L O G U E

Primary School education, the springboard of any educational system like all other sectors of human resources development consumes a gigantic share of the national budget and deserves monitoring to ensure that that large slice of'cake' allocated to it is marginally utilized.

For too long in Nigeria however, one fundamental requisite of good education "the environment" has been neglected in primary schools to the detriment and helplessness of teachers, pupils and the nation at large.

Despite the importance of being one of the earliest activities in formal education, no attention appears to have been given to primary school architecture in Nigeria, despite the fact that the first primary school was built close to a century ago (1845) A Stale, Static and premonitional attitude of what a primary school should be (just an arrangement of punctured boxes round a sports-field or assembly ground) appears to have been developed by designers or educational financiers or both.

To many, the field is one that by virtue of long years of existence and continous turnover of products that has been exhausted and standard solutions arrived at. To a few, especially those in the educational and architectural fields, it has been anything but

progressive. A casual look at most primary schools moves one to feel that architects are guilty of designing schools that conflict with the teaching methods and educational developments of the day, as levelled against them by educationalists, educational administrators and teachers. A harder look tends to reinforce to notice this feeling which has motivated in me looking inside "todays Nigerian primary schools and gauging the extent to which they are geared towards accomodating the curriculum and activities that are programmed to take place in them, and recommending improvements wherever deemed necessary.

The improvemental ideas are ambulated by the design of the comprehensive primary school for the inhabitants of Hanwa Estate (Zaria) whose children have to presently risk all traffic hazards to get to the nearest school at the Government residential quarters.

The thesis has the following goals:

(i) developing a full scale (Comprehensive school environment within the wider school of nature (the site) to reflect the Curriculum (consept of total environment)

(ii) designing a school whose architecture is the translation of activities of pupils, teachers and curriculum, the resulting experience and impression of which will be a symbol of joy of learning to all it's users.

(iii) Emphasising the necessity for making primary schools essential if not compulsory components of our neighbourhoods.

(iv) Experimenting and recommending the partial or total use of schools by the community in entirety during or outside School hours.

It is my fervent belief that the provision of more suitable and humane educational environments for Nigerian children at their very impressionable stages of life will usher into an era of qualitative manpower development.

All primary school environments must leave in the minds of the pupils a memory of hours of stimulus, of mental occupation which was delightful even if sometimes strenuos. The fruits of such an environment being ideal seeds of a life long educative process, I believe are invaluable in comparison to the extra monetary costs that may be involved in providing the "breeding total environment."

S Y N O P S I S

In undertaking the thesis, visits were made to significant and non-significant primary schools in Kaduna, Plateau, Sokoto, Kano and Niger States and problems and attributes. Oral interviews were made with teachers, Headmasters and educational Administrators and three different questionaire formats:

(P1 - " Teachers" opinions, P2 - " Educational Administrators" opinions and P3 - " State of our Schools) were distributed and resulting responses analysed. It was on the strength of such analysis that numerous design decisions were made on the drawing board.

A C K N O W L E D G E M E N T

For the sheer reason of it's length, it is impossible to list all those who have contributed in one way or another to the planning and execution of this thesis. I wish however to acknowledge the scholarly works of authors of primary school Architecture of the past Years.

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HISTORY AND DEVELOPMENT OF PRIMARY EDUCATION IN NIGERIA

The existing system of education in Nigeria can trace it's Origins direct to Christian Missionary Enterprises during the Nineteenth Century.

In 1842, a small group of Wesleyan methodists arrived in Badagry and opened a School in addition to their Mission Station. In 1845 the Church Missionary Society (C.M.S.) opened a boarding School into which was admitted the Children and domestic slaves of Chiefs. It was from this Coastal base of Badagry that the two bodies started thrusting their envangelical and educational work into Lagos, Abeokuta and the rest of Yoruba land. Other Missions like the Sothern Baptist Convention, the Roman Catholic Mission etc. followed suit and reported immense satisfaction at the reponse of the people to their Envangelical and educational efforts. Gradually their products were being turned into newly established higher Schools through their sole efforts. In 1877, the colonial Government came to the aid of the Missions donating the sum of ₦1, 200.00 following a report of neglect to the home Government by a roving Colonel Ord-Ten years later, an ordinance was passed for Nigerian Education and in 1903 and 1910 a department of education was established for Southern and Northern Nigeria respectively. In 1912 with Sir Frederick Lugard as Governor of the two protectorates, there were 59 Government and 91 Assisted Schools in Southern Nigeria with a combined enrolment of 15,716 with a further enrolment of 26,000 by the unassisted schools.

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In the same year there were less than 700 pupils in the 29 Government and Mission Schools in Northern Nigeria. The majority of Northern youths attended Koranic Schools which had an estimated enrolment of 25,000. In fact the introduction of Western education into Northern Nigeria did not begin until more than half a Century after the first Mission School was opened in the South. This late development was due to the greater distance of the North from the Coast and secondly because of the predominant Muslim population who had their own system of formal education. There is no clear record as to when the first school was established but it is probable that it was located at Lokoja, the Confluence town of Rivers Niger and Benue by the Toron to Industrial Mission. Teaching work was also undertaken by the C.M.S. at Chirko near Zaria by the Christian Mission Society and new schools were opened in Bida and Bassa in 1903 with a total intake of 120. In 1906 Government schools were opened in Sokoto and Kontagora. More Missionaries were arriving leading to the opening of more schools namely by the Roman Catholic Mission and the Sudan Interior Mission. In 1909 an education department was established under Vischer Hanns who was mandated to look after the existing schools and newly established ones. One ofthe four was specially set aside for the Sons of Emirs and Chiefs with the sole objective of "GIVING THEM A GOOD GENERAL EDUCATION TO MAKE THEM FITTED TO HOLD RESPONSIBLE EXECUTIVE OFFICES IN THE ADMINISTRATION.

Meanwhile in Zaria, Dr. Miller the Superitendant of the Christian Mission Society, Hausaland Mission Station was working on a detailed plan for education in Northern Nigeria.Zaria proved congenial for his work following his new acceptance by the Koranic Mallams. Some of the most important strong points of his educational plan included the establishment of a school for the sons of Chiefs where pupils would be boarders and would receive a primary education and be trained in the virtues of patriotism, honesty, loyalty to become enlightened Rulers. Secular general primary schools and cantonment schools for the education of children of clerks and other government officials were advocated. With the boarding schools,coastal clerks need no longer send their children away for education - a practice which deterred them from applying for work in the Northern protectorate. Working on this blue print which was accepted by the administration and the Emirs, Dr. Miller started work on the experimental school which consised of A SCHOOLROOM and Huts in which the boys would sleep in 1907. A Steady progress in Miller's work which was later to include new hands was recorded after this initial break through. His concentration on Quality rather than Quantity which was continued by Vischer Hanns resulted in a high sta-ndard of efficiency but this was markedly retarded by the first world war which, resulted in too frequent change in teachers and absorbtion of some into the transport corps of the Army. The populace who were now disturbed by rumours of war and instability developed the tendency of withdrawing their children.

In 1919 came another major break through with the promulgation of the education ordinance culminating in the acceptance of responsibility by the Nigerian Government of education in Northern Nigeria. From then forth, the educational system based on the triangle of education, politics and religion began yielding fruits. Products of the Primary schools were being turned into Colleges in Katsina, Kano, Kabba, Oyo etc. while others took up appointments with the colonial administration.

Between 1938 and 1948, there was a triple increase in the volume of educational activities, 227 Government and 383 voluntary agency schools with a total pupil enrolment of only 25, 067 escalated to 8,827. In native authority schools, there were 10,102 pupils - 22,527 boys and 7,575 girls (1:3 ratio) Voluntary Agency Schools new absorbed 51,723 pupils made up of 40,491 boys and 11,228 girls (1:3.5). Government now taking bold steps to face the educational challenges facing it delved into the Reports of the Ashby Commission and mandated another to understudy it (oldman Commission). The Ashby Commission extrapolated that out of 1,000 children aged 6 to 7 280 should enter primary schools and by 1970, 104,000 children should complete primary education. In a bold attempt to implement the recommendations Mr. J. N. Archer of the U.K. treasury department was appointed to undertake a phasing and costing process of the report. Basing his calculations on various assumptions with regard to population, wastage of pupils etc. he found out that 11, 000 classroom must be built between 1962 and 1967 at an average

cost of ₦600.00 per classroom and that 11,350 boarding places at ₦1,200.00 per place. On the part of the government, it decided that the division between junior and senior primary schools should be phased out and every primary schools should be potentially a full seven year school and in areas where enrolment is low both the building of new schools and the extension of existing ones was to be done simultaneously, there was also a very high tempo for implementing a UNIVERSAL PRIMARY EDUCATION SCHEME. Money was needed to make the scheme a success and out of a total expenditure of ₦198, ₦198 million , some ₦38 million went into education with ₦18 million specifically going into primary education. In 1964/65 ₦600,000 was commit ted to the expansion of primary schools. Altogether ₦9 million stood as the recurrent for primary education as projected for 1970. Other sources of income apart from government included the Native Authorities, Taxes, and school fees. The increasing financial burden arising from primary education is best illustrated by the tables below as estimated by Archer.

YEAR		ESTIMATE
1962/63	-	₦1400.000
1963/64	-	₦1600.000
1964/65	-	₦1400.000
1965/66	-	₦1200.000
1966/67	-	₦1000.000
1967/68	-	₦ 640.000
Total	-	₦7240.000

(Table 1 Government Capital Requirements).

YEAR	-	ESTIMATES
1962/63	-	₦4450.000
1963/64	-	₦5200.000
1964/65	-	₦6000.000
1965/66	-	₦6800.000
1966/67	-	₦7900.000
1967/68	-	₦4900.000
Total	-	₦39250.000

(Table II Recurrent Expenditure) of Primary Education.

Mr. Oldman was then asked by the government to undertake an inquiry into the problems of finance and administration of primary schools. He declared that the government was to be the leading partner in the public system of primary education. The long range of educational objective of primary education was drawn out as:-

(a) to give every child the opportunity of making the most of the talent with which he is naturally endowed.

(b) to create a people who will be able to understand, sustain and support thedevelopment of the country which the government through it is trained officers and servants is trying to carry out.

Oldmans recommendations were accepted by the Northern government and much of the work of the Ministry of education devolved on a new provincial organization which were further divided into inspectorate

divisions. Primary education continued to flourish under this framework for years, but in 1975 came a revolutionary boost for primary education with the inception of the Universal free primary education scheme which led to the rapid expansion and establishment of primary schools in a scope never known in any country in Black Africa. The basic aim was to boost the much needed manpower training for the rapidly developing country. Billions of Naira were sunk into the project by the federal military and state governments who were later to handover the schools to local government reforms. In Kaduna State (then North Central), gigantic efforts were made to make the programme a huge success. In the period 1970 - 1975 the total primary enrolment was 174,500 with a total number of 702. One of the major objectives and policies of the state was the expansion and improvement of primary education to acheive 100% enrolment target in class one by 1978/1979. The re-organisation of primary schools and liberalisation of their curriculum to include trades and elementary science is also to be given a special impetus. To acheive these laudable objectives, 10,242 additional classrooms at a cost of ₦175 million are being constructed. The federal government is responsible for the capital and recurrent expenditure while the local education authorities are now under the jurisdiction of the local governments. The phenomenal demand for new primary schools is dramatised by the primary enrolment table below.

YEAR:	PRIMARY ENROLMENT:	PERCENTAGE OF SCHOOL AGE CHILDREN:
1975/1976	62,751	38%
1976/1977	79,064	47%
1977/1978	99,419	58%
1978/1979	99,799	58%
1979/1980	181,900	100% ?

With this background, it is clearly evident that primary education has from the inceptive Missionary days been growing in leaps and bounds both in demand, curriculum and governmental attitude to it. It is however lamentable that the architectural modus operandi of same has been conservative or immured to these changes. In the earliest days one may bury his reservations considering the poor financial state of the educational pioneers and the difficult social and cultural problems that often accompany new changes and which had to be overcome before considering environmental problems in depth. Today there is no excuse why primary schools buildings or "study cells" which I consider more appropriate should be designed and built in a "Status quo" maintaining manner. While educational Administrators, Architects and Teachers are primarily responsible for this inept approach, other contributing factors of "primary school design conservatism" will be examined in subsequent chapters. One fact which cannot be escaped however is that primary school architecture should move with changes in educational approach, curriculum activities and hence with time.

OBJECTIVES, CURRICULUM AND MACHINERY OF PRIMARY SCHOOL.

Aims and Objectives:

Primary school education is the first leg in the series of stages of learning aimed at opening up the mind, fostering the intellectual curiosity, capacity for wonder, asking questions and developing the will and ability to find the answers through various means and activities. It is geared towards permitting every child that undergoes it, the opportunity of fully developing his or her talents. The ways and means of acheiving these objectives, has over the years been revised, reviewed and the curriculum altered, all in an attempt to reach an'ideal situation'. One of the earliest approaches was based on formal instruction and acquisition of high proportion of ideas that have no bearing on the child's natural activities of body or mind. Today the curriculum of schools are though of in terms of activity and experience rather stored and the child is encouraged to think independently rather than blindly following instructions. In addition to this enlargement and ordering of experience, development of skills and extension information, the school is also concerned with the development of healthy body stimulation of imagination and a sense of wonder and appreciation for beauty. The child is expected to learn from the variety of experiences he is exposed to and to be helped to learn from these experiences and to synthesise from them.

To most teachers, and educationalists, the task of every primary school is to develop fully each childs, physical, intellectual, emotional, and social capacities to produce well rounded personalities each different

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from the other, but fully capable of dealing with the tasks arising from succeeding stages. The specific goals of primary education can thus be summarily considered as:-

(1) Physical Development - which embraces the fostering of physical growth, good health and hygiene.

(2) Intellectual development - the organisation of the numerous and diverse sense stimuli which children receive constantly into meaningful patterns to give them an overall understanding of the sorrounding world.

(3) Emotional development - the encouragement of childrens curiosity, interest, wonder, initiative, drive, growth to independence and appreciation of beauty.

(4) Social Development - the understanding of what good human relationships between individuals, groups, school community and Society at large.

The need for children to acquire essential skills, develop as worthy and constructive citizens of their community, State and nation is of paramount importance. They should be moulded to enter the Community of the World not merely to survive but to contribute for what the school does for the children is in large degree reflected in community, national and world progress.

CURRICULUM

Having outlined the goals and objectives of primary education, it is important to note that the acheivement devolves solely, carefully and deliberately designed ACTIVITIES organised by teachers. While it is difficult to record to the minutest detail all such Activities, some stand out clearly as the backbone of acheiving the educational goals and objectives. The design of the primary school should hence stem from these activities rather than GOALS. The activities and their roles towards acheiving the goals could be summarized as follows:-

1. READING - Using large numbers of supplementary books for various subjects e.g. English, History, Geography etc. Reading materials, written on chalkboards and slates Using Classroom Library and School Library

   REQUIREMENTS: - Book-storage for textbook collections
   - Book-shelving for Class and School Libraries
   - Chalkboard.

2. WRITING: - In books, blackboards and slates.

   REQUIREMENTS: Chalkboard, Furnitures, Writing Materials.

3. SPEECH: - Emphasis is given to development of ease of Speech and poise to individuals and groups.

It is necessary for shyness to be overcome and poise developed.

This may involve telling personal experiences, stories, dramatizing, carrying out pannel discussions or listening to recorded speech.

REQUIREMENTS:

(i) Platform stage in Classroom

(ii) Adudio Visual - . with recording machines etc.

4. (a) . . ART WORK - The introduction of art in primary school curriculum is borne out of the need for children to express themselves in media of color, line and form children are able to illustrate stories they write and graphically illustrate report. It is one of the most effective systems of instruction in the early stage of learning typical Art - activities include.

(a) painting with water paints

(b) using clay.

(c) using crayons, ink and pencil

(d) using, paper and scissors.

Typical Requirements:

(i) sink

(ii) work top with easily clened surface.

(iii) storage for paint, brushes etc.

(iv) storage for different sizes of paper

(v) storage for easels or filting chalkboards

(vi) clay storage (in pottery crocks)

(vii) backboard.

(b) MODELMAKING - *though a form of art itself, it has the* peculiar difference of being'nater and drier' though it's products may consequently require some of the wetter art-treatments • The models may be of trains, boats, cars, caps and houses. Making models involves learning to work together and even attempts to recreate community life some typical activities *in model making include:*

(i) making large models like farm

(ii) houses

(iii) boats

(iv) trains.

Typical Reguirements:

(i) Boards

(ii) large floor space

(iii) clay

(iv) softwood

(v) water

(vi) storage areas

(vii) work bench

(viii) display space.

5. (a) ELEMENTARY SCIENCE:

The study of nature and simple scientific phenomena has become essential because of the endless natural curiosity in the children and the need to broaden and order their experience

about their sorrounding environment. The need to feed and widen this curiosity is the most meaningful means of creating the solid foundation for a technological bread-through especially in a rapidly developing country like Nigeria.

Typical Activities:	Requirements:
(a) Outdoor Nature study	Large open area (farm)
1. growing things	Nature study room
2. collecting plants and insects	Small Zoo and Aquarium
3. raising small domestic animals	Storage area for tools

(b) DOMESTIC SCIENCE:

Although this item has just been recently introduced on a centralised Zonal basis for primary School, it has captured the interests of children, Parents and observers alike. It involves the importment of simple practical modes of diet preparations for the upper class.

The products of the exercise may even be used on such august occasions as house or school parties, Parents day etc.

6. ASSEMBLY : the need for efficient communication, announcements often calls for the assembly of the entire school. In most schools the days routine has to be preceded by such an assembly which takes place usually in an open space and seldom in halls

where available due to unfavourable weather.

7. EXTRA - CURRICULAR ACTIVITIES: - closely aligned to the academic programme of the schools are certain extracurricular activities which take place from time to time. They usually involve the presence of a good proportion of the school and it's wishers. Some of the typical activities are drama, discussions, meetings - school and house parties, sports festivals, parents day and the annual speech and prize giving day. Such activities that revolve around a large populations obviously calls for a large multipupose hall and or flexibility of large spaces.

8. RECREATION (ACTIVE AND PASSIVE): The needs of the primary school community for adequate recreational facilities, both active and passive cannot be over emphasised. Educationists, Psychologists and behavioral analysts agree that play in children develop the physical powers intellectual, emotional and social aspects of the child's personality. They develop their hysical powers through jumping, climbing, running, skipping, sliding, scrambling and a lot of other activities. The coordination of hand and eye movements the practice of large and fine muscle are also improved through play. The emotional responses of children, their fears

and aggression, their constructiveness and destructiveness, feelings of being protective or protected, their curiosity, pleasure and pain mature during their periods of play. Just as their experiments with objects and things improve their emotional developments so too their experiments with fellow beings during play bring social development.

Active recreational processes may be indoor, in the form of organized games like - football, volleyball, table tennis, tenniquot, netball• etc., Younger children in the lower classes are more inclined to being in open playgrounds with amenities for climbing, running, sliding etc.

The Passive recreational processes on the other hand revolve around the principle of relaxation. By virtue of the activity - potentials of children in this stage of development, one cannot rigidly delineate the two forms of recreation but the need for park-like seating areas around primary schools have been identified to be of immense value.

ACADEMIC HIERACHY OF SCHOOL AND SYLLABUS:

As a means of acheiving the objectives of primary education outlined earlier in this chapter, an orderly sequence of classes or grades from 1 to 6 has been designed by the Federal Ministry of

Education with corresponding progress in the subjects taught in the various grades. Similarly the syllabus used in the various states based have been designed by the various State Ministries of Education to suit local Requirements based on a general outline dawn out by the Federal Ministry of Education. The period Allocation for subject for week in Kaduna State primary schools is given below:

SUBJECT	SCHOOL WITH NO SHIFT NO. OF HOURS (PER WEEK)	SCHOOL WITH SHIFT SYSTEM NO. OF HOURS (PER WEEK)
Arabic	2	2
*Bible Knowledge	5+	4+
Cultural and Creative Art.	4	3
English	6	5
Hausa	5	5
Home Economics	3	3
* Islamic R/Knowledge	5+	4+
Mathematics	6	5
Physical and H/Educ	5	4
Elementary Science	3	3
Social Studies	3	3
Music	3	3

* ISLAMIC RELIGIOUS KNOWLEDGE AND BIBLE KNOWLEDGE ARE TO BE TAUGHT SIMULTANEOUSLY.

TABLE ALLOCATION OF HOURS/WEEK IN KADUNA STATE PRIMARY SCHOOLS:

Wheareas, the above table forms a suitable quideline for the teachers, some of them have found it suitable to modify it slightly to suit their own approaches. Nursery reception classes whose service are beginning to be appreciated are not based on such a rigid pattern A lot of the programmes are drawn out by their experienced teachers to suit their pupils. It is therefore treated as a distinct section.

NURSERY AND RECEPTION CLASSES (SPECIAL)

Nursery and reception classes which are special classes, they are intended to serve as a means of introducing young children of 3 - 5 years to the primary school environments through specially designed programmes chosen in line with their psychological and physiological attitude. There is a general atmosphere of freedom.

The activities are generally play orientated and the environment close to the home except for the academic tinting through colouring, elementary writing mixed up with the activities. The reception class comes after the nursery.

* ACTIVITIES:

Coloring, writing, painting play, sleep, toiletting, picture looking, drama of home, shop, city-life etc.

REQUIREMENTS:

Large classroom, cloakroom, nearby toilets, large storeroom, wide chipboards bookcorner,external painting alcove, external hard and soft playgrounds with play gadgets, abandoned vehicle, felled free etc.

* Seperation - while the special classes are intended to serve as a stepping stone to the higher classes, and should therefore logically be integrated into the main school, the young and fragile nature of the users calls for it's meaningful seperation to minimise injuries and bullying by the older kids during games. Secondly, there is a tendency of the younger kids moving to the higher classes at the end of the day to call upon their older brothers, sisters and friends with a lot of chattering, foot dragging, singing in the process. There should therefore, be controlled movement to a waiting area before the older brothers' expire the interval, if they have to go home together.

MACHINERY OF ADMINISTRATIVE AND ANCILLARY STAFF ACTIVITIES.

Much as the degree of success in acheiving the goals and objectives of the primary education can be considered half won with a well drawn curriculum activites, the other half can only be won through the conscientious activities of dynamic staff whose productivity is a function of basic working facilities, amenities and incentives. These then have to be identified and incorporated in any primary school design whose goal is to be acheived. An analysis of the Staff composition and their roles and duties is therefore vital:-

1. HEADMASTER - As the head of the school, he/she is responsible for the effective planning and execution of the School programmes and is responsible to the local government education authority. He/She also serves as the linkage between the authority, school and the public. His office should therefore reflect the spirit of the school, of friendly cooperation and willing service. His office design should therefore take into consideration.

   (i) his/her close liason, communication and control of the administrative staff which shall consist of his assistant, clerk, teachers.

   (ii) his/her close liason with parents and other members of the public who may so wish to see him.

   (iii) his position as the chief accounting officer of the school.

His office should there dispose him to be close to the accounts clerk and the central books, furniture etc. depository.

2. ASSISTANT HEADMASTER: - Responsible to the headmaster for any of the above duties which he/she is so called upon to do. In most cases he/she is on the teaching staff while carrying out the administrative duties from time to time. Close liason with the headmaster and other design considerations for headmaster's office apply favourably to him.

3. QUASI - ADMINISTRATIVE STAFF: - these are the other hands who help in the running of the school and includes:-

    1. typing/reception clerk
    2. accounts clerks
    3. dispensary attendant
    4. storekeeper.

4. TEACHERS - As the vehicles for thedelivery of education, their professional needs and aids need to be given careful thought and provided for in the design process. Such requirements include: -

    1. individual book, materials storage and study rooms linked directly with the classroom.

2. provision of all the infrastructural teaching facilities discussed in the school curriculum

3. commonroom forthe exchange and transmission of ideas and experiences between themselves.

5. Librarian: One may be required to run the school library which constitutes one of the important facets of learning.

6. Security Staff - In an age of increasing inflation, the security of useful gadgets in the face (if nothing else) difficulte replacements, the services of one or two janitors who may serve, other useful purposes in the school will be needed.

E D U C A T I O N A L M E T H O D S:

CLASS ORGANIZATION:

Educational researchers have over the years discovered that the terminal and teaching effectivity of any system or method can be measured on a scale of " one teacher one pupil" relationship, this has led to various formal classroom organizations. A disorganized classroom will result in disorganized lessons. Group Organization has become one of the most effective this method, has become incumbent because of the following reasons:-

(a) the large size of the class limits the ability of the teacher to make contact with individual pupils.

(b) class teaching forces the teacher to direct his teaching at the level of the average pupil and much of what he is teaching will be beyond the reach of some and below the ability of others.

(c) class teaching should try to interest all members of the class but this is clearly an impossibility since even the most experienced teacher cannot interest all his pupils all of the time

(d) frequently there are not enough books or prices or equipment for every member of the and some method of sharing what is available has to be found.

(e) Class teaching, makes the assumption that the teacher is the source of knowledge which he transmits to his pupils. This however is a view that is being challenged by modern discovery techniques. Breaking the class down helps to overcome some of these disadvantages.

GROUP TYPES:

A. Similar ability groups - These are formed when children of roughly the same ability in a subject are placed together so that they can be taught to work appropriately according to their ability. These are used often in language, mathematics and physical education.

B. Mixed ability groups - formed with pupils of different ability. The aim is to create a situation where the stronger ones can help the weaker and in large classes where the teacher cannot pay attention to all pupils individually.

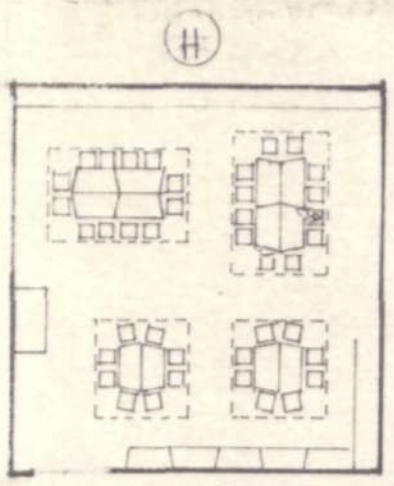
C. Interest groups - Groups created mostly to gather information in say history or geopraphy according to their interest in the various topics.

D. Random groups - These are formed when pupils are put into groups simply on the basis of the geography of the class, two pupils sitting, next to each other forming an obvious pair. Such groupings are often required to share limited material and form suitable tuition units.

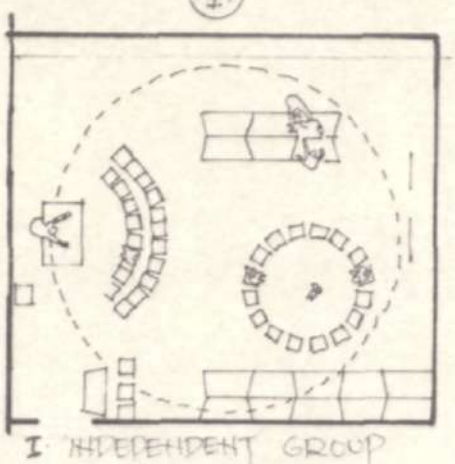
CLASS ORGANIZATION SYSTEMS.

A. FORMAL SEATING ARRANGEMENT (1)
B. " " " (2)
C. " " " (3)
D. BOOK CORNER ARRANGEMENT.
E. DEMONSTRATION ARRANGEMENT.
F. SMALL GROUP ENTERTAIN LARGE GROUP.
G. SMALL GROUP ACTIVITIES.
H. LARGE GROUP ACTIVITIES.
I. INDEPENDENT GROUP ACTIVITIES.
J. DRAMA SING-SONG ARRANGEMENT.

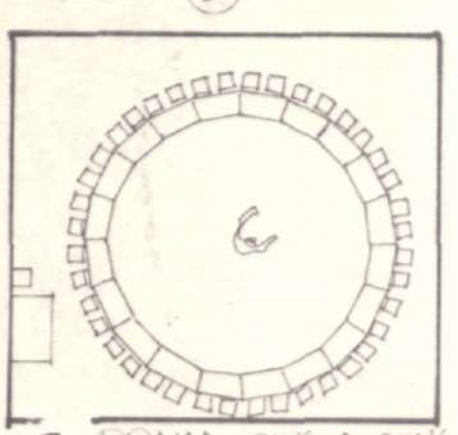
* CLASSES A & C IF ADJACENT CAN BE COMBINED FOR TEAM TEACHING.



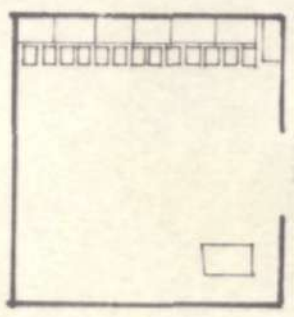
H. LARGE GROUP ACTIVITIES.



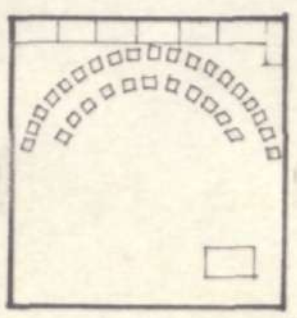
I. INDEPENDENT GROUP ACTIVITIES.



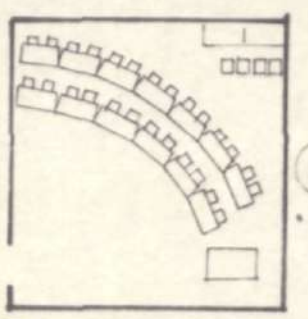
J. DRAMA SING-A-SONG ARRANGEMENT.



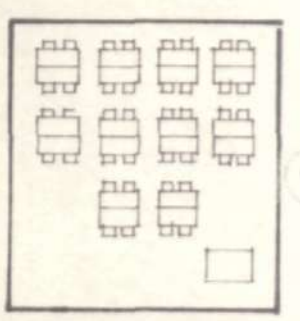
D. BOOK CORNER ARRANGEMENT.



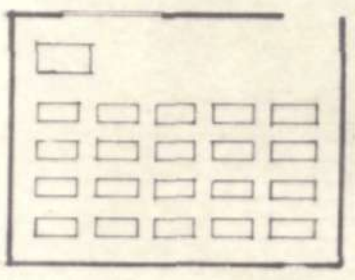
E. DEMONSTRATION ARRANGEMENT.



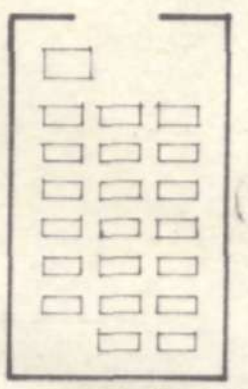
F. SMALL GROUP ENTERTAIN LARGE GROUP.



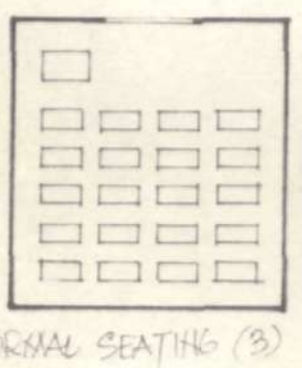
G. SMALL GROUP ACTIVITIES.



A. FORMAL SEATING (1)



B. FORMAL SEATING (2)



C. FORMAL SEATING (3)

F. Social Groups - formed when comrades are allowed to form their groups in say an Art lesson leading to pleasurable experiences.

One very useful offshoot of group work is the satisfaction derived from group projects, forming the bedrock of the vital team - working spirit that is vital in any organization. A Geographical group working on say the East African railways" may find the simi-group or individual contribution of it's members as an interesting jigsaw - solution when all are compiled, given them a warm feeling of satisfaction. Such products also serve as interesting wall space materials and decorations. As illustrated by the figure:

TEAM TEACHING

This is another modern form of teaching that educationists have adopted. The most common form of team teaching is where classes are combined into larger groups for instruction on a large scale by one or more teachers; two or more teachers could participate taking various stages or aspects of the lesson. One teacher may take the active part of the lesson and others the

the passive, just listening in order to take the follow up groups. In such situations the classes is broken up into groups possibly the original class groups or smaller groups under the direction of the rest of the team of teachers. Some of the advantages of team teaching include:-

(a) Possibility of one teacher(s) serving the dual purpose of teaching other streams of his class in addition to his normal class in the event of SHORTAGE OF TEACHERS, which is a CRITICAL problem in the country today or in the event of un-ceremonial departure of teachers. In certain subject matters, 'Specialist teachers' are employed to provide services to a whole school and they may have to take two streams at a time. Religious Instructions provide a typical example of such a situation.

(b) It offers teachers the possibility of taking the parts of a lesson or subjects that interests them most. Some teachers are better at group follow ups and others in the active teaching itself. One teacher may prefer taking social studies than Mathematics while his colleague may have the converse interest. Team teaching thus offers them a flexible way of delivering only the best to their pupils with due respects to their interests.

(c) Team teaching offers the pupils of different streams of the same class the opportunity of coming under the same umbrellas of teachers, breaking that Psychological barrier of class 'A' being better than 'B' or the other way round while still evoking the spirit of healthy competition and exchange of ideas.

DESIGN IMPLICATIONS OF CLASS ORGANIZATION

Group Organization - this calls for the provision of ADEQUATE SPACE to enable the class to be divided into suitable entities with enough CIRCULATION and communication space for the teacher and the pupils when the need so arises.

An OUTDOOR TEACHING SPACE or ALCOVE for occasional additional study for the very fast-learning pupils to occupy them while the teacher concentrates on the average and slower pupils can. This Space can also
/also be used as an observatory by, inquisitive and cooperative Parents/guardians who are increasingly being involved in the education of their children. Some of them could even use such spaces for aiding in the teaching. TEAM TEACHING - the team teaching concept requires a lot of space, usually as much as combining two teaching spaces at a time. The Manoeuverability of class spaces will thus enhance this modern teaching approach.

THE PRESENT STATE OF OUR SCHOOLS

Those who refuse to learn the Lessons of History are condemned to repeat it - Santayana.

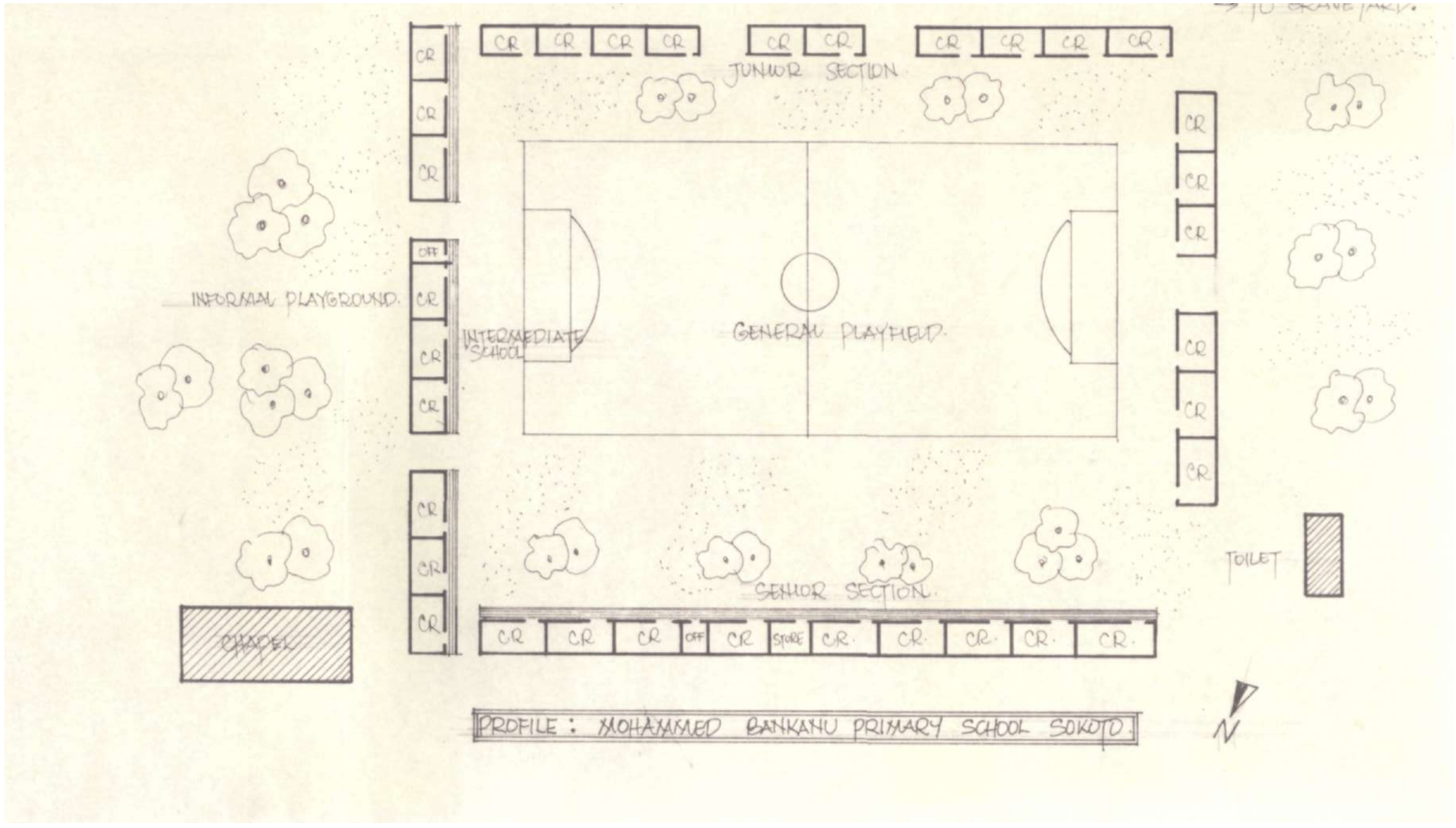
Having discussed the goals objectives and curriculum of school in the previous Chapters, this one will be devoted to the systematic analysis of the spatial and environmental states of exis--ting primary Schools in three (3) States of the Federation with a view to highlighting those aspects that are considered possitive of negative to acheiving the goals of the schools. Some of these aspects have been noted as a result of acclamations by various teachers during interviews and others through observations by the Author based on A Standard format. An attempt to draw out a Relationship between the 'quality of the environment' and the success of the school academically will be made A Hypothetical 2 grade (I and II categorication of each school environment is made at end of each format.

SOKOTO STATE CASE STUDIES:

SCHOOL: MOHAMMED BANKANU PRIMARY SCHOOL, SOKOTO:

OWNERSHIP: LOCAL GOVERNMENT.

POPULATION: 1,854 (975 BOYS AND 879 GIRLS of various Nationalities and social classes (fewer Children of high income Parentage).


JUNIOR SECTION
CR
INFORMAL PLAYGROUND
INTERMEDIATE SCHOOL
GENERAL PLAYFIELD
OFF
SENIOR SECTION
CHAPEL
TOILET
STORE
PROFILE : MOHAMMED BANKANU PRIMARY SCHOOL SOKOTO.



• MUHAMMED BAHKANU PRIMARY SCHOOL SOKOTO
.... WHERE A CLASSROOM BECOMES A "FURNITURE" STORE."



.... THE SHOCKING VIEW OF highly unsuitable AND ISOLATED SCHOOL toilets.



.... The fate of a one-time Central School Square — Turaki Primary School Sokoto.



..... The remains of the appalling toilets of Turaki Primary School Sokoto.

CLASS STREAMS: CLASS ONE (6) CLASS TWO (6) CLASS THREE (6)

CLASS FOUR (6) CLASS FIVE (6) CLASS SIX (5)

CLASS SEVEN (FOUR - CASTSET)

SYSTEM OF OPERATION - DAY SCHOOL ONLY OPERATING ON MORNING AND AFTERNOON SESSIONS.

AVERAGE NUMBER OF PUPILS PER CLASS - 46

SAPTIAL AND RECREATIONAL FACILITIES - CLASSROOMS, Headmasters Office. Staff Common Room, Toilets, (Football field, under-fined open spaces.

FORMAT REPORT (P3 - STATE OF SCHOOLS)

- Variation in Classroom designs : There are 3 different types of classrooms elevationally with no functional difference No. Classroom has a store. Each classroom is just a built up rectangle.
- Number of storeys - ground floor only
- Fenestration design - timber framed, Zinc filled top living windows opening outside above desk level. Inadequate lighting and Darkness in evitable should window be shut during rains.

No provision for antificail lighting.

- Orientation and shading devices - Orientation is arbitrary and and there are no shading devices except for the covered walkway on one side whose size is reduced by opening of windows.
- floor finish - easy-wearing cement screed finish
- ceiling - chipboard ceiling (white)
- wall finish and colour - cement plastering white or pink colour with green skirting
- Main entrance to school - Undefined approach with possibilities of entering school from all directions and no defined parking space.
- Visual Character - with the numerous forms standing side by side as classrooms, and ununiform fenestration the visual character of the school can be said to be silent. The views on all sides from the central sports field are to the forth (4) main classroom blocks.
- Partitions - All partitions seperating classrooms are of hollow block construction.
- Height of classrooms - 3.0 M.
- Corridors - 1.5M wide and carried by mighty columns.
- Sound - Absorbtion quality of partitions: Good
- Flexibility of classroom - means of increasing or decreasing classroom space.
- Availability of display pinboard - None

PROBLEM: SCHOOL CATEGORY - 1 GRADE II. Growth arbitrary and no sign of of Pre-construction planning.

2. MODEL PRIMARY SHCOOL SOKOTO.

OWNERSHIP - GOVERNMENT

POPULATION - 350 of about four nationalities. Mostly of middle and high income parentage who pay fees in addition to government subvention.

STAFF - GRADE II TEACHERS.

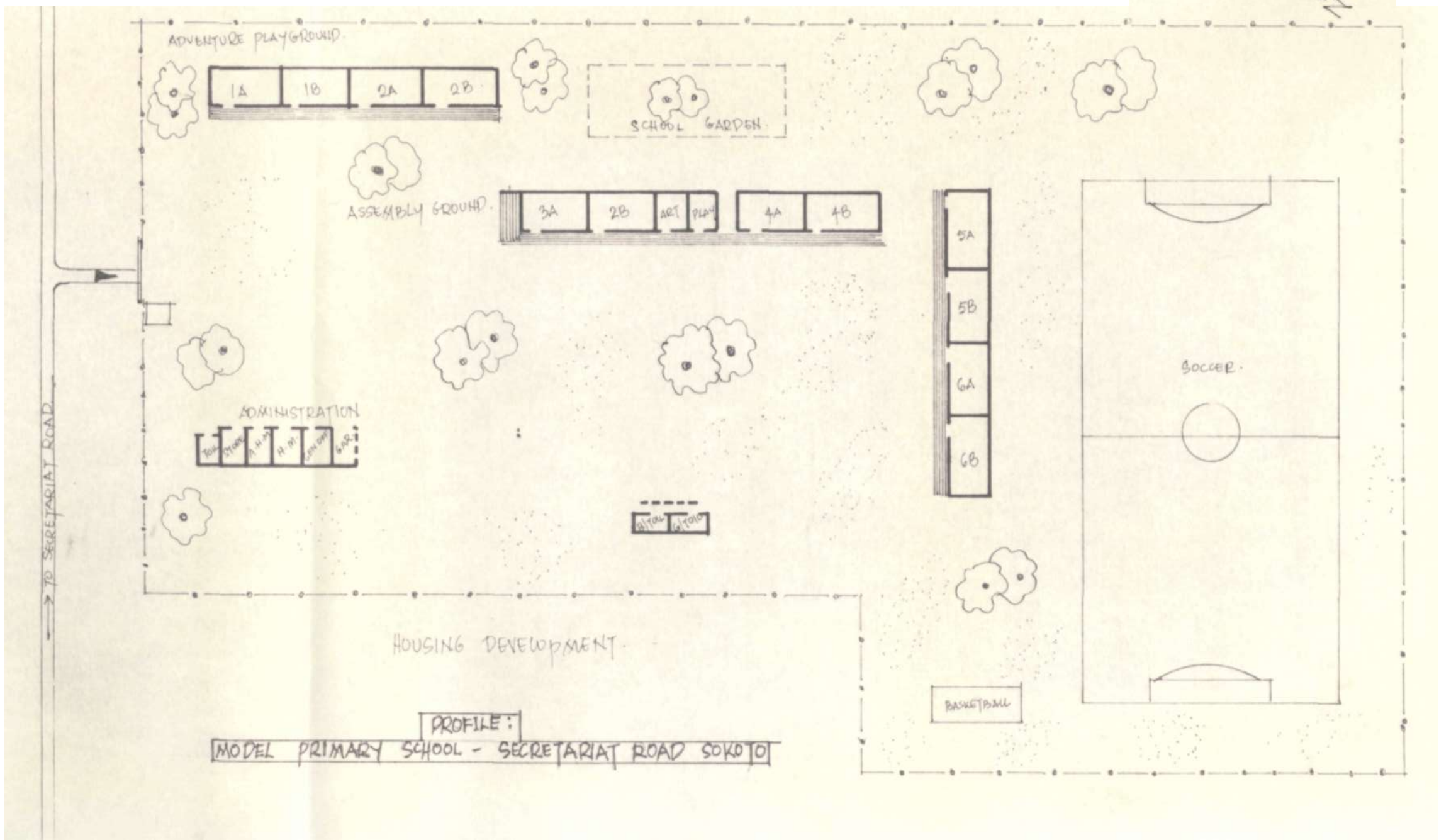
System - Day School only

AVERAGE NUMBER OF PUPILS PER CLASS: 35

STREAMS : CLASS ONE (2) CLASS TWO (2) CLASS THREE (1) CLASS FOUR (1) CLASS FIVE (1) CLASS SIX (1)

SPATIAL AND RECREATIONAL PROVISIONS: CLASSROOMS, HEADMASTERS, OFFICE, CLERICAL OFFICE/CLINIC, FOOTBALL NETBALL PICHES, SCHOOL FARM/MICROCOC

- Number of storeys - Ground floor only fenestration: Standand NACO louvre windows from 90cm above, the around with small window cill Natural/Arficial lighting although the natural provision is fair. Shading devices: none except for Corridors (1.5.m) wide shading windows on one side.
- floor finish: cement screed finish
- ceiling: Asbestolux ceiling board
- Wall finish: dirty green finish
- Entrance to school: Because the school is fenced all round the two entrances are obvious and defined, although no provision was made for parking.



PROFILE:

MODEL PRIMARY SCHOOL - SECRETARIAT ROAD SOKOTO



• MODEL PRIMARY SCHOOL SOKOTO
.... A NEW classroom - block



... the school playground.

- VISUAL CHARACTER - Pleasant pink colour and layout suggests pre-construction planning, although there is no suggestion of 'Excitement from the site.
- Partitions - hollow block constructions.
- Height of Classrooms - 3m
- Corridor - Covered and horne on 'Steel pipe' columns. 1.5m wide.
- Sound absorbtion quality of partition walls: By virtue of it's thickness, the hollow block partition wall absorbs interfacial sounds adequately and satisfactorily.
- Flexibility of Classroom space - Classroom space is constant due to the immovable partions.
- Availability of pin up boards and display areas - this is adequately provided for at the back and at the sides.
- Growth - the neighbouring residentail houses on two sides and street on a third leaves a small strip of land on the fourth for expansion, making the football ground vulnerable to being built up sooner or later.
- School Environment Category - Grade I

3. CAPITAL SCHOOL SOKOTO:

- Ownership - State government with subventions from Parents.
- Population 400 with cosmopolitan composition and middle/upper income classes.

- STAFF OF GRADES II, I AND N.C.E. TEACHERS
- Average number of pupils per class - 35
- System - Day classes only
- Curriculum - State Government designed
- Spatial and recreational provisions:

  Administrative block (comprising Headmasters Office, Staff common Room, Clerical Office, Store, Toilets), Classrooms with Stores, Library, Playgounds, Toilets blocks, Staff quarters.

FORMAT SHEET 3

- Variation in classroom design: All classrooms are the same in size, and fenestration both internally and externally. Internal arrangements however differ depending on the teacher.
- Number of storeys - All buildings in the school are one floor high.
- Fenestration - Standard NACO Louvre windows and Crital Hope two-leaf Windows lighting is adequate.
- Shading devices - fairly massive concrete egg-crate shading masks and
- Visual character - there is nothing spectacular about the site by general standards, the visual character of structures is good with comination of green sandtex and white columns and shading masks.

Covered Walkway:

- Floor finish - well made cement screed floor finish.
- Ceiling finish - Asbestolux - Carboard ceiling
- School Entrance - Well defined double vehicular gates. No provision for pedestrian entrance, leading to closure of one of the two vehicular



CAPITAL SCHOOL SOKOTO (Administrative block)



CAPITAL SCHOOL SOKOTO (CLASSROOMS.)

gates for this purpose. Adequate parking space provided

- o Partitions - All partitions are of hollow block construction.
- o Sound absorbtion quality of partitions - the class to class acoustic relationship is good as sound from one doesn't rise to a level to disturb the programme in the other.
- o Flexibility of use of class Space/size - the flexibility is limited to furniture arrangement only. The size of class cannot be increased or decreased without introducing new elements into the system or demolishing the blockwall partition.
- o Height of classrooms/offices etc. - 3m high
- o Corridors - covered walkways link the various segments of the school. Width is about 1.5m.
- o Availability of pinboard display areas - this has been adequately provided for in all the classes and offices.

SCHOOL CATEGORY GRADE I

B. KADUNA STATE CASE STUDY :

JAFARU PRIMARY SCHOOL SABON GARI ZARIA:

OWNERSHIP: ZARIA LOCAL GOVERNMENT.

POPULATION/STRUCTURE - 1005. Majority of Children are Nigerians of low and medium income Parentage/Guardianship.

- o Staff Structure - Mostly Grade II teachers with fewer grade I's
- o System - The school operates a morning and afternoon sessions and operates only during the day.

- Average number of pupils per Class - 41
- Curriculum - based on uniform State Government designed syllabus
- Spatial and recreational Amenities/Facilities- Storeless Classrooms, Headmasters office, small main Store, far thrown toilet blocks, Central playfield with no activity play grounds

FORMAT SHEET P3

- Variation in Classroom design - All the class-room are the same internally.
- No of storeys - Ground floor only
- Fenestration - timber framed, Zinc filled side hung windows. Classroom is liable to getting dark if windows are closed during rainy periods, since there is no provision for artificial lighting.
- Shading devices - No shading devices whatsoever inspite of arbitrary orientation on buildings. The Corridor however shades some of the openings.

- o floor finish - cement screed finish
- o ceiling - asbestolux - cardboard ceilings
- o wall finish - cement plastering with white wash over
- o School entrance - no defined school entrance as there are openings from all four sides of the school
- o Partitions - hollow block partition walls
- o Flexibility of classroom space/size - there is no possibility of increasing or reducing classroom sizes without the introduction of new component into the system.
- o height of classroom - 3m
- o Corridor - 1.5m
  Concrete columns
- o Sound Absorbtion quality of partition - the acoustic performance of the partitions is good.
- o Availability of pinboard display areas

* SCHOOL CATEGORY - GRADE II

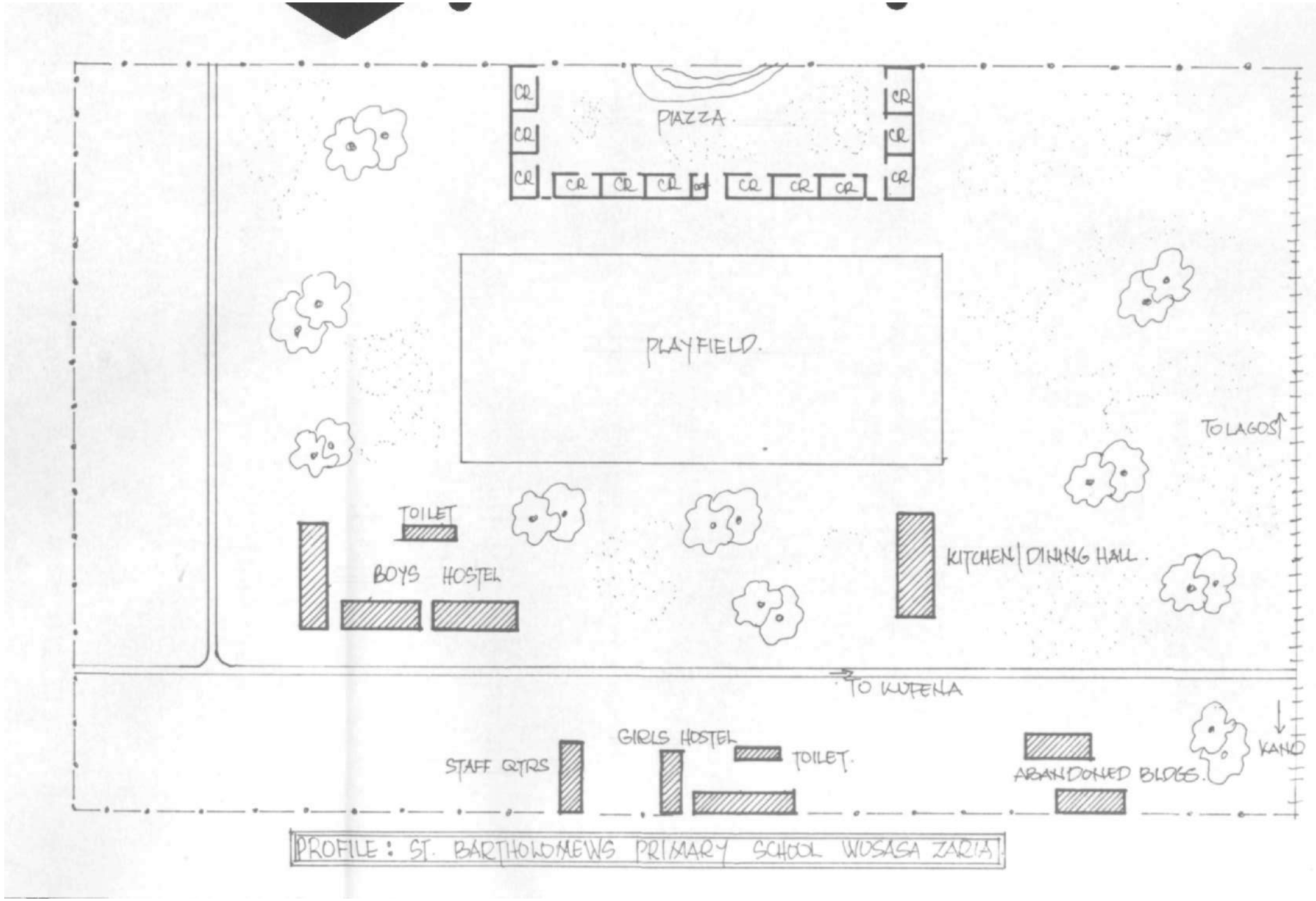
* *

2. SCHOOL - ST. BARTHOLOMEWS PRIMARY SCHOOL, WUSASA, ZARIA

   OWNERSHIP - CHURCH MISSIONARY SOCIETY OF NIGERIA.

   Parents, Government, Subvent Missionary funds.

   POULATION + STRUCTURE - 48 - 265 BOYS AND 153 GIRLS Mostly Nigerians with quite a few expatriates Staff - Grade I and Grade II Teachers.



PROFILE: ST. BARTHOLOMEWS PRIMARY SCHOOL WUSASA ZARIA.

- Average number of pupils per class - 40
- System - Boarding School with morning sessions only
- Spatial and Recreational provisions - Storeless classrooms, Staff common room, Headmasters office, Assembly ground, Dinning Hall, Central football field with no Activity Zones. Boys and Girls Dormitories, toilet blocks, Staff quarters.
- Growth - the academic core has the possibility of growing towards the Rail as does the residential.

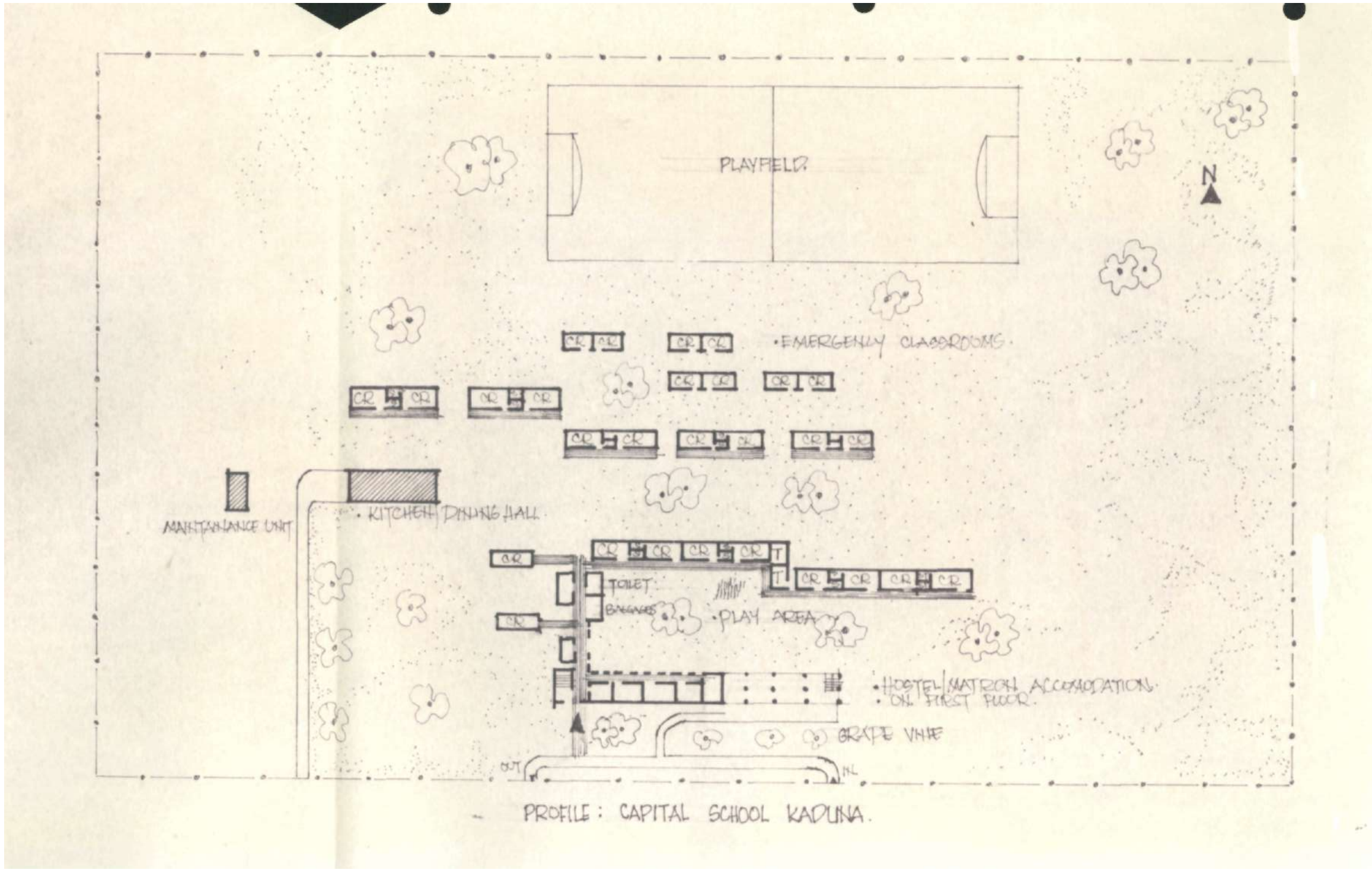
FORMAT SHEET P3

- Variation in Classroom ~~Classrooms~~ design - All the Classrooms are of the same design and structure having been built at the same period.
- No of storeys - ground floor structures All along.
- Fenestration - timber framed ledged and braced windows which can permit only thin Streams of light should they be closed during rains. Windows do not have protective grills for child safety in lower classess.

- Shading devices - Completely absent covered Corrido rsplay the role of shading
- Floor finish - Cement screed.
- Ceiling - Asbestolux Cardboard ceiling.
- Wall finish - white wash on cement plaster.
- Entrance to School - This is not powerfully defined, although pupils, teachers and visitors are drawn into the school by an existing route.
- Partitions - solid hollow block construction.
- Flexibility of Classrooms - size of classrooms cannot be increased or decreased without introducing new components and demolishing solid partition.
- Acoustic performance of partitions - good.
- Height of Classrooms - 3m
- Corridors - 1.2m wide covered walkways linking classrooms.
- Availability of pinboard display areas - available in some classes.
- * School Environment Category - Midway Grade I and II

3. CAPITAL SCHOOL KADUNA.

- Ownership - Kaduna State Government. Parents/Guardians pay fees in addition to government subventions. Most of them are in the high income bracket.



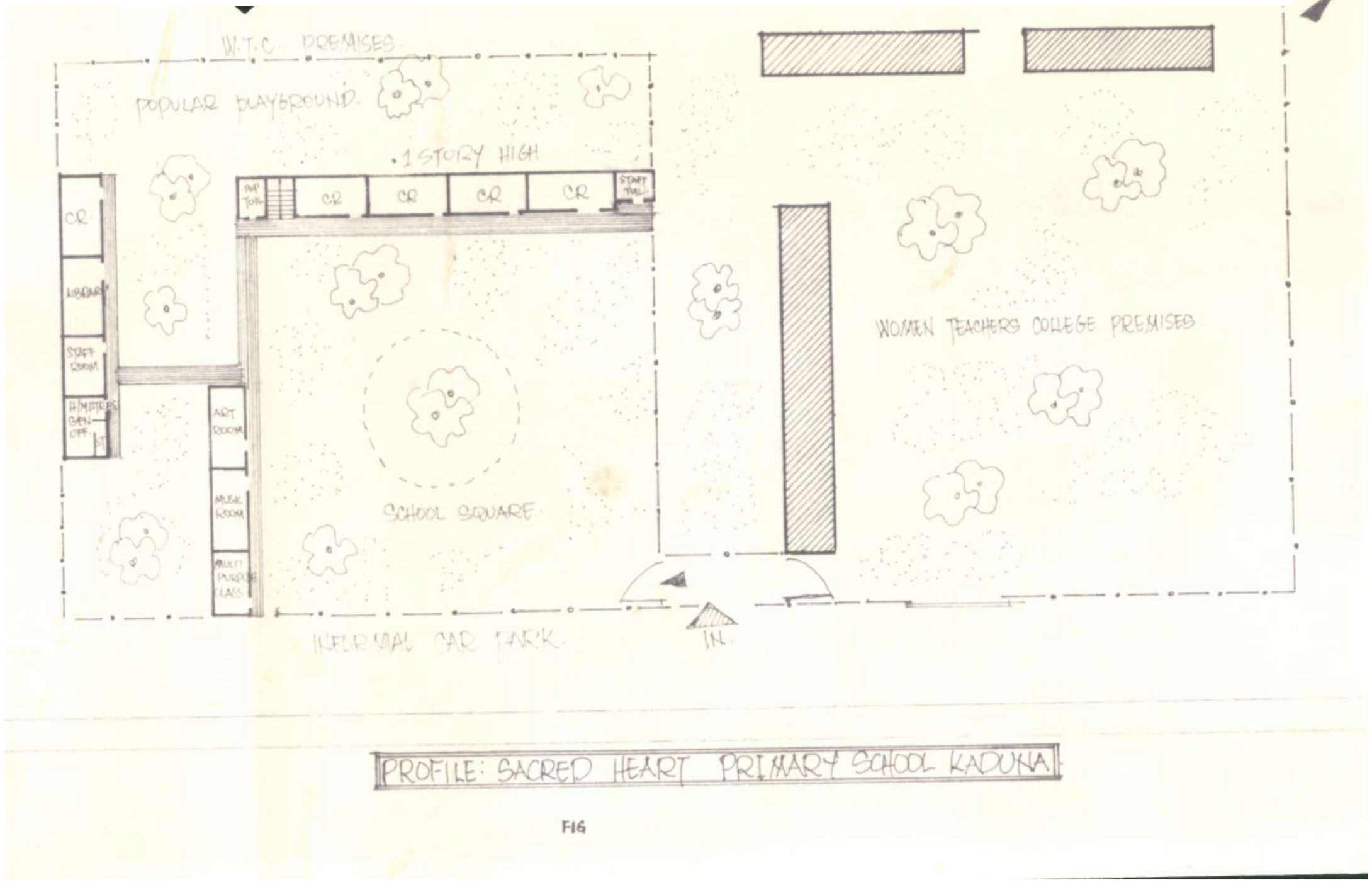
PROFILE: CAPITAL SCHOOL KADUNA.



.... the central playground of:
KENT ACADEMY MIANGO (PLATEAU STATE)



... KENT ACADEMY.



PROFILE: SACRED HEART PRIMARY SCHOOL KADUNA

FIG

- o Population and distribution - 1,050 pupils with 210 in in boarding School. Children are of various nationalities.
- o Average number of pupils per class - 30
- o Staff - N.C.E. Teachers, Grade I probationary teachers.
- o Spatial and Recreational provisions - Headmasters office, Clerical office, Store, Clinic, Classrooms, School Library toilet blocks, during hall, play grounds, hostels.
  Growth - the School which show an element of architectural planning is expanding but is faced with a future problem of EXPANSION SPACE.

FORMAT SHEET P3

- o Variation from Classroom to Classroom design - All the Classes in the old block are based on same principle externally and internally
  The new ones exhibit a difference in fenestration with introduction

of Crital hope Windors.

- o Number of Storeys - ground floor in academic core and one floor high in administrative bloock.
- o Fenestration - large glass paned Aluminimum mullioned windows in old Classrooms, Critall Hope and NACO Houvres in new blocks. Adequate lighting but no Grills.
- o Shading devices - none in School area.
- o Floor finish - terrazo floor finish
- o Wall finish - cream colour on plaster.
- o Entrance to School - Obvious and imposing.
- o Visual Character - A massive administrative block combined with a pleasant School environment.
- o Height of Classrooms - 2¼m
- o Corridors - covered walkways and 1.5.m wide.
- o Partitions - Hollow block Construction.
- o Acoustic performance of Partitions - good
- o Availability of pinboards - No provision in most cases.

SCHOOL ENVIRONMENT CATEGORY I

SCHOOL - USER-CLASS-PERFORMANCE ANALYSIS

School	Grade	User-Class	Academic and Extracurricular Colours (Average of 4 Years
Mohammed Bankano Primary School, Sokoto.	II	All social class and many nationalities are resented. Majority of pupils of Low and medium income Parents/Guardianship. School depends full on Govt. grants.	85% success in National Common entrance examination with 30% of Candidates going to Post Primary schools of their choice which due usually the most reputed and Established good performance in sports.
Model Primary (Secretariate) Road, Sokoto.	I	Multinational School with Children of upper intermediate and high income Parentage of Guardianship. School depends on Govt grants and Parental subrentions.	100% average score in National Common Entrance Examination with average 2nd highest individual grades in Sokoto State. Over 80% of pupils get to Post Primary Schools of their choice which are usually most reputed. Competes dynamically in sports and excells in extracurricular activities like concerts.

SCHOOL - USER CLASS - PERFORMANCE ANALYSIS

School	Grade	User-Class	Academic and Extracurricular Colours (Average of 4 Years)
Capital School, Sokoto.	I	Multinational Primary School. 35% of pupils of high income Prontage/Guardianship. Depends Primarily in Government grants with some Parental subrentives.	97% average score in national Common Entrance Examination. Has 2nd highest individual grades in the State. Over 80% of pupils as to post primary Schools of their choice which are usually the most reputable competes dynamically with other Schools in sports and excells in extracurricular activities - TV appearance, concert etc.
Jafaru Primary School, Zaria.	II	99% of pupils are Nigerians and of low and intermediate income homes. Depends surely on Government grants.	75% success in national Common Entrance Examinations. About 30 - 35% of Candidates finally gain admission to Schools of their choice (reputable Post Primary schools) by virtue of grades.

SCHOOL - USER CLASS - PERFORMANCE ANALYSIS

School	Grade	User-Class	Academic and Extracurricular Colours (Average of 4 Years)
St. Bartholomews Prim. School.	Between Grade I & II	All classes and may Nationalities represented although most are of intermediate income homes depends on grants from Church Missionary Society and Parental Subventions.	86% Score in National Common Entrance Examination with 60% of Candidates finally going to schools of their choices (the most reputable and established) Very dynamic sports activities and extracurricular activities.
Zaria Children School	I	A Privately run fully equipped school with most children of from upper income homes. Multinational compostion. Maximum of 24 pupils for Class.	100% Score in National Common Entrance Examination for the past four years. 95-100% of Candidates go to Post Primary Schools of their choice by virtue of their high grades. Heavy Premium on sports, which such extracurriculars as concerts, interhouse sports and elections.
Capital School, Kaduna.		Multinational composition with majority of Nigerian Nationality Most children of upper income homes. Functions on Government Grants and some Parental Subventions	98% success in National Common Entrance Exam. for the Past four years with 75-80% of Candidates going to reputed and well established post Primary schs. by virtue of their high grades. A premium placed on sports with interhouse competitions, interschool, duels. Organizes concerts Parents day, debates Radio and Television programmes.

ENTRANCE REGISTRATION EXAMINATION ABSENCE TABLE

(Average over 4 Years)

	Schools	Number Registered for Examination	Number Absent due to transfer
1.	Capital School	30	2
2.	Model - Primary Sch. Wurno Road	26	5
3.	Model Prim. Sch.(Secretariat Road)	21	5
4.	Army Barracks Prim. School.	119	43
5.	Muhammed Bankamu Primary School	178	58
6.	Turaki Primary School	123	25

CONCLUSIONS ARISING FROM ANALYSIS

A Synthesis of the analytic table above for individual School case studies reveals the following facts.

- o the superior academic successes scored by the Grade I schools whose environments are of higher quality:
- o A tendency of the grade II schools having majority of its users of low and intermediate income bracket and the Grade I of the higher.
- o the financing of all the schools in Grade II and most in Grade I by a common sponsor - Government.
- o a fairly high number of pupils failing to sit for National Common Entrance after Registering for it mainly due to change of Stations by their Parents. This phenomenon extends to other classes in addition to the final year class.
- o the concentration of some of the best teachers in the 1st grade school which may have to do with 'higher status' accorded to the Schools.

ARCHITECTURAL RESOLUTION OF DOUBLE STANDARD OF PRIMARY EDUCATION IN NIGERIA SOCIETY

...../...

The facts borne out of the above conclusions link up to form a clear picture that points to a dangerous trend of development in the educational system in particular and the society in general. If the policy of free education is to be upheld, a uniform system has to be evolved and this implies one of the followings:

(a) Upgrading all schools to the level of Grade I

(b) Planning all new schools to the standard of Grade I

Either of these steps will involve a lot of finance to be carried out, the strongest defence put up by educational administrators. A more prudent austere activity orientated architectural approach to primary school design with a few more Naira can produce invaluable high standard Grade I Schools for all Nigerian Children like others in the world and avert the potential dangers of social pandemonium and discord, the seeds of which the present double standard system is planting.

VOICES OF REASON

.... Incline your ear and hear the words of the wise and apply your mind to knowledge. - King Solomon (Proverb 22)

Having outlined the curriculum of schools and their practical applications trends and results in some existing schools, in the previous two chapters, this one will be devoted to synthesizing the opinions of various groups involved in the Planning, Financing, Running, advising, and using of Primary Schools with a view to striking a balance and streamlining the Course of my Architectural - redemption of a Socio Educational problem at the Bed-rock of the System. These groups include educational administrators, teachers, pupils, architects, building economists whose views have been put across through questionaires, (P,1 and P 2) discussions and books and journals.

TEACHERS: Most teachers interviewed were of the opinion that good teachers can teach anywhere but their work is much more difficult in a bad building than a good one because their skills are likely to be stretched to the greatest advantage in buildings that are designed to provide maximum flexibility. Most of them admitted not being consulted and have therefore, little knowledge of the range of building provision possible, despite their intimate contact with buildings and children. The response to questions by this group revealed that teachers could make immense contributions in the review of design briefs of new school buildings by virtue of their 'grassroot experience' Notable amongst their environmental grievances are:

- o inadequate storage areas
- o inadequate classroom spaces
- o lack of activity spaces : both indoor and outdoor.
- o unorganised playgrounds
- o lack of 'outside classroom books' - Library.

ADMINISTRATORS: This group has been identified to have the greatest influence on provisions to be made in School environments. It is wholly it's responsibility to outline the educational facilities that schools should have. The practice now with local Governments however, is one of building standard prototype schools irrespective of the site for which the standard plan has been made. It has become almost unthinkable to consider the possibilities of designing new Schools based on Requirements other than those in the standard Schools which originated mostly in the early Sixties. Even with the few new model schools, the architectural briefing has taken the form of provision of a certain number of classes, toilets etc. rather than the outline of the educational activities, number of users etc. Thus limiting the design freedom and initiative of the project architects. The greatest factor which has impeded educational administrators from venturing into the search for a new and better educational environment for primary schools has been that of Cost. The fear seems to lurk in their minds that, any alternative design approach to the standard classroom type in the tag modern attached to it is going to overstretch the expenditure, which may however not be the case.

The following recommen'ations are with reference to administrators and a better school environment are suggested:

- o giveing design briefs that define activities to go on within a school, time and number of users rather than the pre-conceived required spaces to enable the architect to arrive at the spaces himself.
- o Joint visitation of existing schools by architects and administrators, to see the problem of existing school environments with a view to improving them where possible.
- o Involvement of experienced teachers in the briefing teams.

ARCHITECTS:

Various architects who have worked in primary schools have identified the intermarriage of the 'School environment' and many subsidiary factors that influence it. These a large extent determine and influence the criterion for design - notably.

- o Constructional Adequacy - These usually have to do with badly detailed window - wall constructions and flat felt roofs laid to inadequate slopes.
- o Adaptability: Changing social conditions and some technical innovations among other factors have the tendency of subjecting use of buildings to change. School buildings are liable to meeting change in about three ways namely -

(1) through the manner of their use. Due to development of new practices in primary education, a large number of old buildings have proved a hindrance to educational development. It is necessary that school buildings both old and new should make concessions in their design to newer concepts of teaching and technological changes; otherwise their inflexibility may be transfered to the teaching methods used in them. School Architecture should endorse the new and emerging teaching methods namely -

- o individuals in a class rather than the expository traditional approach.
- o group teaching system.

(2) Through Extent of use: the density of use or the number of hours during which schools one used may to a great extent call for adaptability interms of its growth rate.

(3) Change of User - Although this rarely happens, Certain situations where communities have jointly used school spaces for communal purposes have been recorded. This trend is expected to continue hence, some danger lies in tailoring school briefs to unique design concepts where subsequent modifications for other uses (outside the brief) prove difficult.

C Level of Economy in construction and Use.

D Compliance with legislation, other official Regulations, related safety factors and five protection.

WHAT THE EDUCATIONALISTS SAY

- An analysis of questionnaire responses (See questionnaires P1, P2, P3 on page ------)
- On School Entrances: Most teachers and educationalists are of the opinion that there should be a maximum of two well defined gates into the school for easy identification, security and control reasons. The view was endorsed.
- On Playgrounds:- Most responses showed the need to give as much premium to the provision of Playgrounds as academic spaces for play is a natural form learning they contend. The view was endorsed.
- On Communal Utility:- Many consider schools as underutilized institutions whose use factor could be raised by encouraging communal participation and utility of facilities provided. This also has advantage of getting parents and guardians more involved in the education of their children the view was endorsed and an adult study booth added to the library.

On Books Supply - Most teachers and educational administraters expressed their satisfaction on the supply of required textbooks and materials from local Governments thus shelving my idea of a small book stalls. Many teachers however regretted the inadequacy of Audio-Visual aids which influence my decision to centralise the section in the special classroom block.

On Pupils Storage: - Teachers observed the hardship in manipulating classroom desks due to the present practice of pupils storing their books under desks. Provision was therefore made for storage of books not being used during any lesson inside "Pigeon holes".

On outdoor Teaching Space: There was a general consensus about the increasing need for outdoor teaching spaces, especially for use during the hot periods of the year and for practical lessons. This view was endorsed.

On Midday Meals: Most teachers were of the view that school authorities should employ cooks to prepare and sell midday meals to the pupils on health grounds. Educational Administrators on the other hand feel that the authorities already have more than enough responsibilities to shoulder. Taking the middle Course, others still felt that school central authorities should organise crash programme hygienic seminars for selected food hawkers who could then be posted to various schools to be supervised by food Committees comprising teachers. The last view seemed to be the most rational and was therefore upheld. Thus no provision was made for a Kitchen or Dinning Hall since suitable green Courtyards are available.

On Library Provision: - If the child is to be taught the Art of enjoying independent reading, all teachers and educational administrators contend, then the provision of a library is indispensable in addition to class book corners. The view was upheld and one provided.

On frequent change of schools - Those parents or guardians whose jobs have frquent transfer potentials should send their children to boarding schools for the sake of educational contuinity, recommended most teachers. Although we share the teachers' opinion, Government does not have enough money to implement the idea and is even resorting to day Secondary Schools" retorted most educational administrators on the other hand. My idea of a boarding Primary School was therefore grounded due to it's financial unavibility.

On Flexibility of Teaching Spaces - Most teachers said they were restricted to their class spaces for most activities. Some, frequently feel like having their classrooms flowing out to contain the "practice and principles of education" like group approach team teaching concept but don't realise it. The need was carefully considered in the design.

On General State of our Schools: Some frank educational administrators were of the opinion that the Universal Primary Education (UPE) took off haphazardly. They feel school layouts should be made in such a way as to develop in Stages, the lack of which is presently

affecting UPE consolidation plans of the 1980s. The view was accepted and considered in the overall planning of C.P.S.

On environmental Academic performance Relationship: (See Chapter three (3) page..42.) Based on the analysis in chapter 3, Schools in so called Grade I environments seemed to perform better in entrance Examinations . Although this to some extent has to do with quality of teachers, the overall output of the latter and the pupils is a function of the environmental component.

'THE SCHOOL ENVIRONMENTS'

A THE EXTERNAL ENVIRONMENT:

The Site on which a building stands ranks only next to it's users and this applies even more to a School. The main environmental requirements for a primary school revolve around facilities for health, for pleasure and specific educational functions. These relate to the following site conditions:-

- o Space: Needed to produce the most effective plan form for the educational function.
- o Vegetation: provide visual interest and are of educational importance
- o Break up the abrupt hard edges of handplay areas (of asphalt, tar etc.)
- o Good views of site from within a building influence the response of the observer to the structure in which he is.
- o Level
- o Variations in site levels can give a School environment variety and interest although it is often avoided for safety reasons.
- o Buildings:
- o External facades of buildings give a lot of impressions about the school environment and should be made to leave a good lasting impression on it's users.

VISUAL ENVIRONMENT

* There are four that are never content ..... the apes' (hand .. and the eyes or man .. kipling).

Visual environment comprises both quantitative and qualitative matters and in a school has as it's objective criterion the provision of facilities that allow for the visual tasks of READING AND INSPECTION.

Qualitative - these have to do with APPEARANCE and refinements of comfort. They influence functional performance to obvious quantitative factors as illumination level.

It is desirable to illuminate the school effectively by daylight and this is easily acheived by wall to wall or ceiling to cill glazing, in order to acheive the minimum 2% (per-cent) daylight factor on any working plane.

Where lighting from windows is insufficien+ rooflights or clerestory windows may be incorporated or coupled with artificial lighting. The essence is to arrive at the cheapest and most qualitative lighting cominations.

Whatever combination is made, the idea is to maximise omni-directional lighting (not necessary from the left) with evenness of distribution on the working plane whether horizontal or inclined and reduction of glare, reflection and shadows.

Rooflights and clereatory windows have the disadvantages of being difficult to clean, when dirty to shade in periods when internal darkness is needed in classrooms (e.g. for slice show) and produce uncomfortable glare. Although the latter can be solved by use of diffusing glass the former are more difficult to accomodate.

VIEWS:

Views from within a building to the outside generally influences the response of the observer to the internal environment. Whereas some teachers are ofththe opinion that good views distract the attention of their pupils, research has shown that Children whose class windows are above their eye levels tend to focus their attention on temselves when bored with the teacher. Hence good and selected news should be exploited and utilized where

possible and poor ones screened.

COLOURS:

Colour is both an artistic medium to be viewed under daylight and electric light as well as a functional aid to the lighting design.

Except in pollution prone places where light colours aan become dirty, they (especially white or near white) provide.. about the best background for the normally bright school coulours, uniforms, book pages, pictures etc.

FLOORS:

Light coloured flöors create an impression of freshness and also assist in the interreflection of light. School floors should have a minimum reflectivity of 6/20 (30%) the lighter the floor finish; the more costly and the better.

WALLS:

Brighter colours are much better for walls because of the feeling of 'freshness' they have and the good background against bright school colours.

Textured finishes are more unusual and call for higher costs of maintainance.

Pinup boards where installed should cover whole walls or limits defined by the major features of wall design for aesthetic purposes. Ceilings being the largest unbroken surfaces in classrooms need to be properly finished jointed and bright.

THE AURAL ENVIRONMENT

The degree of acoustic comfort is a function of some individual standards borne out of expectations, attitudes, subjective impressions of the experienced noise levels sound quality and facilities to perform Aural activities.

Proper choice of site and the relative location of different space, and the detailed design of the apaces constitute a good criterion for arriving at a comfortable aural environment. Planning is the most fundamental means for creating acoustic solutions. Noice producers are rimoved from areas where noise is unacceptable. Playground are remored far from teaching spaces.

Detailed design involves studies of volume, shape and the way one space is seperated from another. The sound insulation properties of floors, partitions need to be considered along with the reflective or absorbtive cahracteristics of the surfaces. Parts of furniture in contact with floors and walls need to be carefully detailed through use of rubber tips on their legs.

The principles discussed for the Crux of acoustic solutions to noise problems in schools and are facilititated, by the principle of selective in attention whereby pupils who are interested in what they are doing unconsciously

stray sights and sounds that might otherwise impinge. This is especially true when the sights and sounds are familiar and expected. Relatively high level of background noise like the generalized hum of activity heard in open teaching space can help to cover up individual writating sounds.

"SOCIO - HUMAN ENVIRONMENT"

The responsibility of the architect to the users of his building in terms of their civic importance, cultural impact and unplaaned social interactions is considered greater than any other of his responsibilities. A primary school may be used as a social or community center or even a polling station.

Interaction between people and buildings may result into various consequences depending on design decisions. Isolated classes may result into the isolation of it's users and consequently limited opportunities for contact with others while in tegration may result into the concerse. It is desirable to arrive at an environment that can give multiple forms of group interactions from small to big.

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Circulation spaces such as Corridors and stairs in terms of shape, size and location can promote or negate social interaction and therefore, need to be sensitively designed.

The informal qualities of a school as a social catalyst can be maximized through seeking an environment that stimulates both the imagination of the teachers and children. Exploitable opportunities for users need to be mazimized while minimizing the number of limitations that restrict.

A School environment in more than anything else shelter for education where a conscious aesthetic manifestations have their own merits, the appraisal of a school that counts first is it's effectiveness as an environment for education.

THE PLAY ENVIRONMENT

The toys of a child and the old men's reasons are the fruit of two seasons - W. Blake.

Play being the opposite of work can simply be regarded as a child's way of learning. Whereas a popular school of thought considers play as just a means of relaxing after work, another (which is becoming widely accepted) regards it as inseperable with intelligence. This class beleives that intelligence is a special form of adaptation consisting of a continous creative interaction between the organism and the environment.

Based on this theory, children react to and thus learn from their environment through two complomentary processes; assimulation and accomodation.

Assimulation donates seeing and dealing with a new situation in relationship to something familiar. It demands the master of familiar or new skills through repetition and practice.

Accomodation donetes modification pattern of behavior in the face of changes in the environment. The anvironment influences the organism to make response outside his previous experience.

The rate of comination of the two processes of accomodation varies as children grow from one age-group to another and it is therefore, necessary to see how and to what extent these changes occur with respect to school - age groups as a means of adopting a design criteria for maximization of use of playgrounds.

Below 2 Years (Sensorimotor stage) Born with instinctual reflexes like suckling, the child begins to learn of permanence of objects, seeks to understand depth and space with a tendecy to manoevre it. He begins to learn through realising the possibility of his activities changing his environment. Through observation and imitation of other people actions, he learns to go through a series of simple ends to realise enticipated results.

2 - 4 Years (preconceptual stage)

At this stage is characterised by the development of ability for symbol creation, imitation of other and language. The child can thus differentiate between symbols and what they symbolize. His immediate environment widen with his ability to create situations, where all his needs which are unattainable or unlearnt in the real world are act in his own world of fantasy.

Play is primarily individual at this stage although there is some degree of social interaction, which is important in preparing the child for greater Socialization in later years.

4 - 8 Years (Intuitive phase)

Children begin to conceptualize and organise their experiences into logical concepts. In an attempt to relate his experiences to reality he becomes highly inquisitive. His ; Social world expends becoming aware of other chidlren activities. He begins to apply to his play games although they have different interpretations by different children.

This stage is thus transition between the world of fantasy and the world of reality, the world of intuition and that of logical thinking the world of individual play and world of individual play and social co-operation.

8 - 12 Years (Concrete Operations stage)

At this stage the child is able to organise his experience into groupings of class, relation and number.

He develops immense interest in playing games with rules as result of more systmatic thinking which enables him to enter into social relationship with others. His inquisitiveness about how things work in concrete terms multiplies, through wanting to personally participate in activities.

It is a stage where the gap between the world of fantasy and that of reality is intensively narrowed.

PLAYGROUND DESIGN PRINCIPLES

Playgrounds should procide it's users with an adequate range of experience and should allow for some measure of control by them. These factors of experience and control of experience are based on the concepts of assimilation and accomodation. Adequacy in fange of experience can be acheived by provision of experinces for every sense- soft and hard surfaces, rough and smooth surfaces for the sense of feeling, bright and dull objects for the eye, wet and dry objects etc.

Control of experience may be acheived by encouraging the interaction of the child with the things in his environment. Such things should respond to the children in their forms and structures. Such material may be carried, sifted,

collected, burrowed, piled in heaps, or rearranged.

Movement of things in the environment is another way of control for instance, swings are moveble within rigid bounds while the other predictability of motions of some equipments depending on number and degree of participation of each of the collective users provides a social lesson of group participation. Other forms of control of experience are the ability to move over, under or round objects thus changing user - equipment space relationship at will.

A playground should exhibit graduated challenge through providing a series of challenges ranging from the simplest todder games to ones that the oldest users will enjoy. The playground should provide a systematic continuity whereby no user is left idle on mastering some other games.

Playgrounds should give children a variety of choices. Users should be in a position to decide whether to play alone in a small group or a large one solitarily or actively depending on their mood, hence the need for such herachy of spaces. Children should reserve the right to change their minds about what they consider as risky activities and post-pone such until such a safe thime is reached".

EXPRESSIVE PLAY:

A properly designed playground can be a good means of helping children with special problems. Consideration should therefore, be given to the unconscious feelings - physical or emotional that a child's play may reflect right from the design stage.

The design criteria discussed above difficult as they may be to acheive consititute the goals of any playground design and yardstick for the evaluation of existing ones. Summarily, every playground should provide for assimilation, accomodation and control of experiences.

CHAPTER 5

THE SITE AND CLIMATIC ANALYSIS

* For every site there is an ideal used and for every use there is an ideal site* - ORMSBEE

* * * *

The proposed site for the comprehensive primary School is in Hanwa Area of Zaria. Zaria itself is located on an alttitude of 660m and is 640cm. from the nearest Sea ($11^{\circ}3'N$, 7° 42'E) and falls within the Climatic and vegetational zone known as Guinea Savanna.

JUSTIFICATION FOR LOCATION:

Re-cognition of the unique industry that education has become to Zaria, with the existence of all atrats of educational institution in Zaria, one quickly recognises the absence of a unique primary school that Oscillates at the same frquency with the spirit of the town. In climatic terms, the town is conducive for Academic work (As the Climatic Analysis will reveal).

Ease of securing human rescources and educational aids be virtue of the annual turnout of teachers within and at the peripherios of the town.

THE SITE:

The Site lies to the South-West of the Hanwa residential Estate. It is a wide stretch of flat land bounded to the North-West by the School of Aviation, to the South East by the Kaduna bye pass and to the south-west by Knoll (Hanwa knoll) the slope of the site is generally less than 3%.

GEOLOGICAL STUDY:

The Site generally has a good topsoil judging from the farming activities on it. It is classified under the undifferentiated older alluvium and youngerlaterites (after Patricia McCurry) the water table depth is estimated at between 3 and 6 metres, which is reasonable for safe structural foundations.

ECOLOGICAL STUDIES:

Vegetation - On the unfarmed strip of land, the vegetation consists of scattered trees of the species Pakkia Clappertoniana (Locust bean) and isoberlinadoka with a ground cover of audropogonce shrubs through which there is clear visibility. The locust bean trees are of economicaly value and bear edible fruits which will serve as fun for the pupils. The seeds too can be useful for elementary counting lessons.

They also offer good shelter virtues of heavily spread out branches and will therefore be preserved wherever possible.

Fauna: (Animal life) At the time of solitude on the site, no wildlife was observed. There are however various species of beautifully singing birds and insects, some of which reside on the trees. Special anti tsetse fly insecticides to immunize the existing cattle ranches is necessary.

CULTURAL STUDIES. Existing Land use.

The site is presently predominantly used as

(i) a farmland - for the growth of millet and Guinea corn as the stacks of dried millet sticks on the farm indicate. Cotton also thrives well on a portion of the site (it was being harvested at the time of reconsissance in January).

(ii) Seasonal Cattle ranch : one of the three sizeable cattle ranches owned by the settlement in which I propose to be shifted falls on the site and will have to be sprayed against tsetse fly infestation.

o..



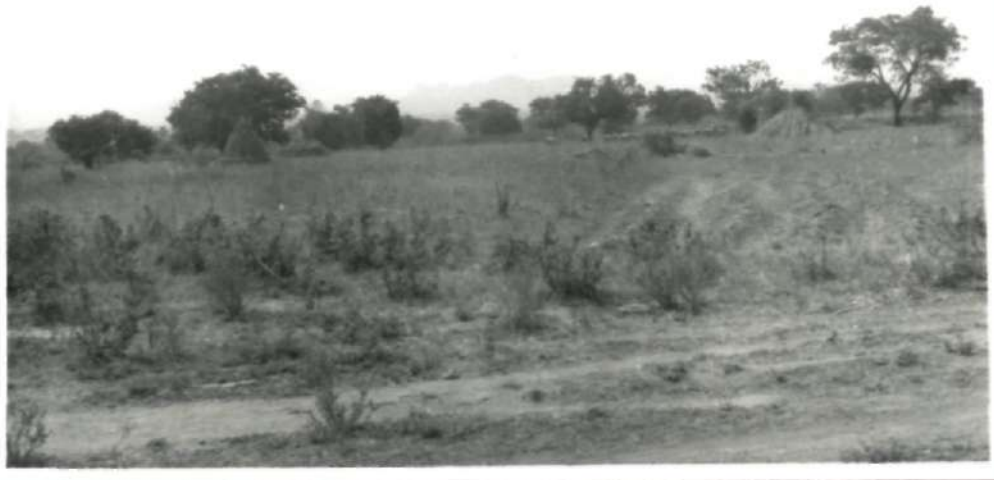
..... the site has a good topsoil judging from the farming activities on it.



.... SCATTERED SPECIES of PARKIA CLAPPERTONIANA, ISOBERLINA DOKA AND ANDROPOGONAE.



.... the site's strongest asset is doubtlessly it's scenic endowments.



... • the impressional view of distant Kufena hills.

In view of the proximity of the area to the Main Campus, and school of Aviation and fiffusion of educational values into the employed workers who reside there,my proposal of a school cr the site to some inhabitants was wlcome despit the stake at which their farmlands are pilt. They fully realise the implications and advantages attached to, the project. The estate has a cusmopolitant compósition and are infact disturbed about the lack of a school in such a settlement.

Linkages - there is an existing road within the estate which has the possibility of being extended to the site. Another untarred presently used by homes involved in soil excavation passes through the Southern end of the site linking the Kaduna bye- pass with River Kubani.

Paths - two prominent paths which are used especially in morning and evening hours pass-through the Site. The first which meanders round the quarry links Unguwar Sidi and the small settlement where 15 meets the second which links Hanwa, and Anguwar Makera and extending to meet Samary Sabongari road just after the Vehicle Inspector's Office.

Quarrying - the inselbers on the south-western portion of the Site is presently being blasted by a Contractor for wor aggregate - production. The Kaduna State Housing Authority which is the owner of the Hanwa Estate and lesse hold of the Site reserves the right and is in fact studying the legalities (in liason with the Ministry of Lands and Survey) involved in promulgating an edict rendering rock blasting around the growing residential areas ilegal; (as it has done on soil excavation) Paper use will be found for it in the design proposal.

OFF SITE MUISANCAE:

Rock - blasting: Although the blasting is done about once a week, the daily activities of hammer hitting rocks and per-splitting yells of excited workers is a nuisance to the quietness required in a school environment and the neighbours residential areas.

Traffic noise: There is the problem on noise from vehicular traffic on the intercity highway to the south eastern interface of the site which needs to be solved though proper site planning and secreening the untarred road which links the intercity high and the main Campus throush the water is another possible source of noice which will have to be taken care of.

A. Deep gorge: A deep gorge which lies to the south and of the site, and which is the result of blasting is a possible source of danger to the pupils of my school and will therefore have to be forced and sprayed at the turn of the rain season to safeguard the problem of mosquito-bleeding.

MAN MADE STRUCTURES: There is a building structure on the site - proper. It is however bounded to the North by the Zaria Hotel and Lowcost Residential Hanwa Estate which presently stand at about 136 2-Bedroom bungalows with plans for an additional 50 in the near future.

To the West lies a small fulani settlement which operates seaonal cattle ranches are of which falls on the site to the south-west in a deep gorge, the result of incessent human soil excavation . Across the inter-city highway is the new senior staff quarters of the Kaduna Housing Authority, Hanwa village proper makes a village and Ungwar sidi. The population ofthe site environs is put at about 300.

All the inhabitants of the estate are belong to working class while these in the Hanwa village proper are uplled mostly self employed businessmen, and workers. The people of Makera are mostly farmers, Iron metters as applies to Unguwar-Sidi.



.... RESPONSIBLE FOR THESE highly impressional EXPERIENCE ARE THE HANWA hills which BEAR THE cylindrical WATER tanks .....



.... HANWA ESTATE .... THE catchment TERRITORY

USERS: The School is expected to be open to all Children inrespective of their class, spread religion, beliefs, ethnicity or nationality. The organization and running of certain facilities in the school may however require aids, and sacrifices on part of Parents and children financially or in kind a means of making them involved.

(i) Utilities: There is a transformer which supplies the Hanwa Estate with electricity power and this line could easily be linked with the proposed school. There are two possibilities supplying water to the proposed school - directly from the Ahmadu Bello University water works or by connection to the main waterline feeding the Estate from the water tank borne on Hanwa hill which is cheaper and assier.

The telephone line for the proposed school will emanate from tast of Zaria Hotel, with whose permission swimming lessons may also be given to the pupils at special time if need be.

Density and coming: As at the moment one may consider the site environments as low-medium density zone (II families/hectare bewed on Estate standard.

AESTHETIC FACTORS:

*....Everthing we have to do to live nature helps us to do with lust and pleasure!

The sites strongest assets is doubtlessly it's naturalscenic endowments, in terms of - Views - - From the east to the south east and swinging an arc to the south, one is carried through a scenic panoroma of natural views and vistas. Responsible for these strongly impresseional experience are the Hanwa hills which bear the cylindrical water tank serving as landmard, the Makera and Kufena hills to the etc.

Vista - to the south East of the site extending byond the wide panoromic view of natural landscape (with Kufena to the West) is a strong visual vista of the dist ntly diminishing and rising intercity highway apparently sinking into the Gabari hills.

CLIMATE: Zaria has a tropical continental (dry-subhumid) climate. The continentality is highly pronounced in december and january. The mean daily maximum temperature shows a peak in april and minimum in octobor. The dail mean maximum temperature rises from january and reaches the highest value in August. The mean minimum temperature has it's highest value in July - August. It has distinct wet and dry seasons , the mean annual rainfall being 111.76 an. This low and seasonal character of rainfall leads to grasses having various shade of green colour

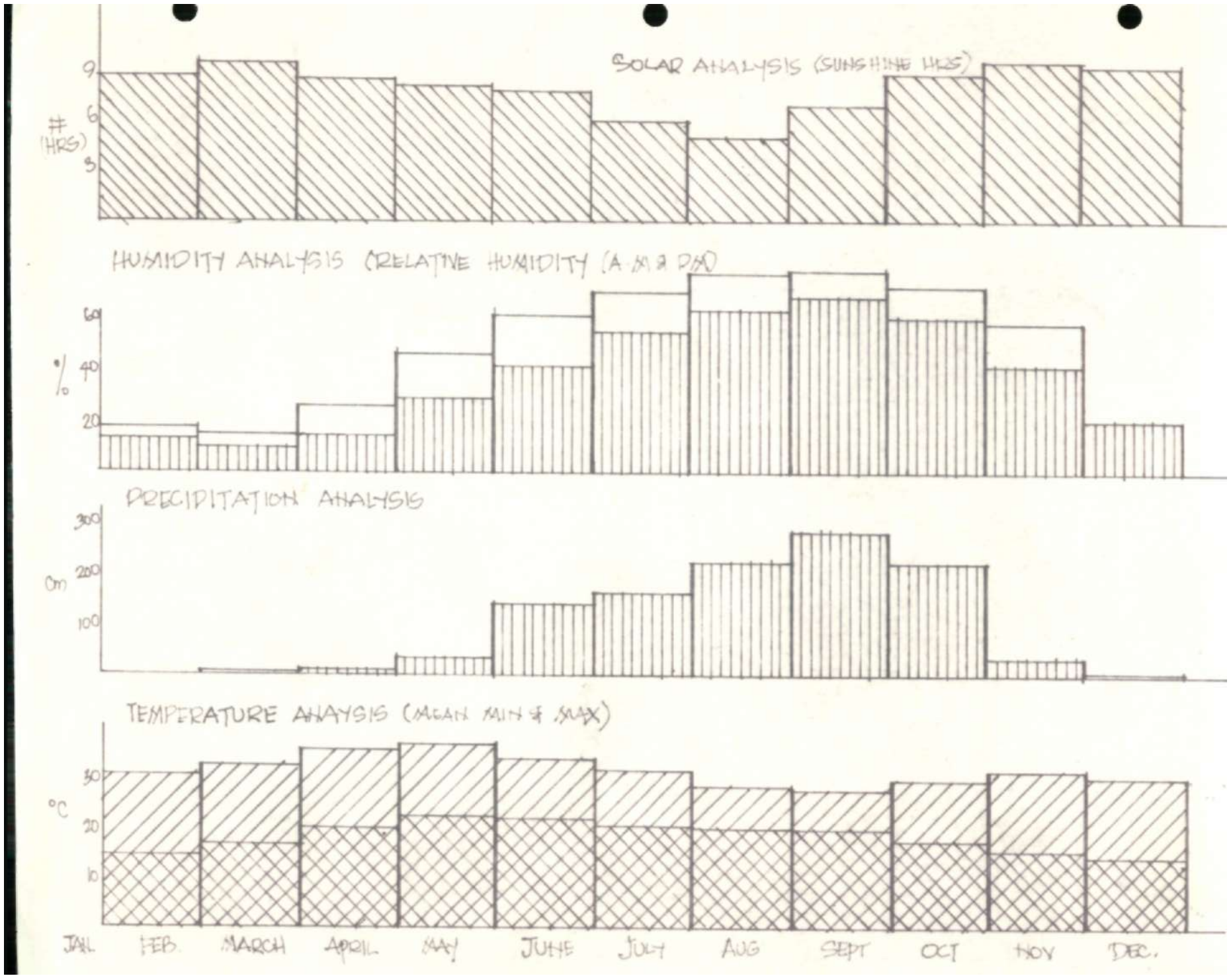
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VIEWS:

Views from within a building to the outside generally influences the response of the observer to the internal environment. Whereas some teachers are ofththe opinion that good views distract the attention of their pupils, research has shown that Children whose class windows are above their eye levels tend to focus their attention on temselves when bored with the teacher. Hence good and selected news should be exploited and utilized where


SOLAR ANALYSIS (SUNSHINE HRS)
9
6
3
(HRS)
HUMIDITY ANALYSIS (RELATIVE HUMIDITY (A.M & P.M)
60
40
20
%
PRECIPITATION ANALYSIS
300
200
100
cm
TEMPERATURE ANAYSIS (MEAN MIN & MAX)
30
20
10
°C
JAN. FEB. MARCH APRIL MAY JUNE JULY AUG SEPT OCT NOV DEC.

HOT SEASON: (March - April) At this period the intercontinental discontinuity is on it's North bound movement and is characterised by:

- Increase in diurnal, maximum and minimum temperatures. Maximum daily screen temperature may hit 100°F (37.7°C more.
- Increase in relative humidity from 15-20%) to 50-60% due to south westerlies with the movement of ITD.
- Occasiona thunderstorms with consequent local lowering of temperatur (10°F) the weather around this period is hot and humid.

SEASON OF SQUALLS AND THUNDERSTORMS: (MAY - JUNE)

Around this season the ITD moves further north and establishes itself. The season has the following characteristics:-

- reduced maximum, minimum and diurnal temperatures.
- reduced relative humidity (65-75%) - increase in cloud amount and shorter sunshine duration of 6-8 hours per day averagely.
- extreme windy conditions due to disturbance lines.

WET SEASON: (July - October) During this period ITD moves further North resulting in- less aqually winds.

- increased relative humidity to the tune of 70-80% in August.
- Reduced diurnal, maximum and minimum temperatures. Diurnal temperature falls to about 15-20°F and the mean daily maximum to about 80-84°F (26 - 29°C).

- maximum cloudiuess (resulting in minimum sunshine hours (3-6 hours in August).
- more indespread rain with longer duration.

In October daily maximum temperatures rise and rainfall is very little in form of scattered thunderstorms and showers. Relative humidity is still fairly high (60-65%) making unpleasant sticky weather. By the end of October, the ITD moves south and the North Easterly dry winds set in again hevalding the start of another dry season.

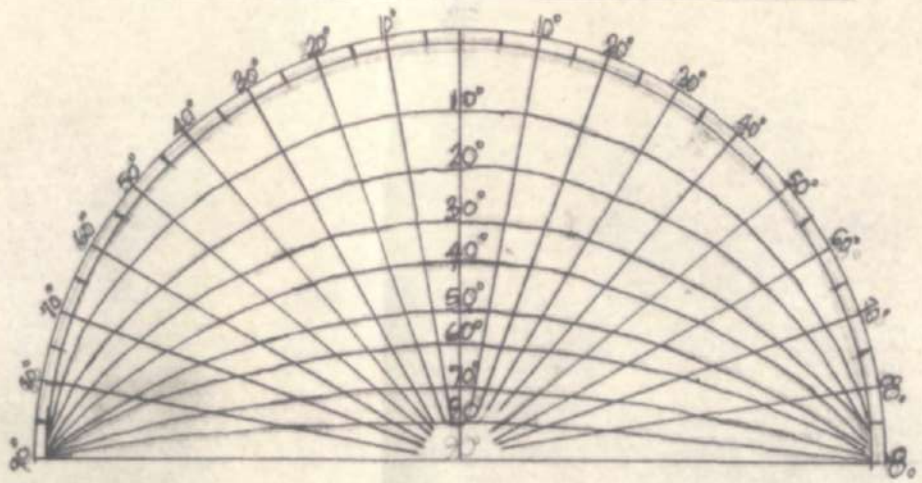
CLIMATIC DESIGN CONSIDERATIONS: * ... Fitness is our adaptation to our environment! The most vital element of any educational system is it's efficiency, but the tropical climate to a large extent acts as as constraint in terms of comfort and therefore necessitates special design steps to check this. This implies designing the school. Structure to minimize solar insolation during the hot humid periods of the year (march - April) while promoting wind flow and letting in solar insolation during the cold harmattan period (November - February) and minimizing the effect of winds during the periods of squally thunderstorms. Proper orientation, wind-breaks and shading devices with the right shading angles have to be made to avert all adverse climatic elements.

SUNSHADING ANGLES:

For maximum officiency, it is necessary that no sunshine penetrates the external openings of habitable rooms during certain periods and classrooms during working hours. The combination of the proper shading angles and proper choice of materials for the screens are vital though expensive. To ensure value for money invested in shading, the appropriate angles for Zaria ($11^{\circ}.3$) have been arrived at through the use of solar chart for 12°XI and the appropriate protactor. The maximum vertical and horizontal shading angles for the openings in various orientations are indicated in the table below with derivative, and illustrative diagrams.

Orientation of Opening	Maximum Vertical Shading Angle (V°)	Horizontal shading Angle (H°)
S	55°	70°
SSW	50°	45°
SSE	45°	-
N	75°	45°
NNW	65°	45°
NNE	65°	45°
E	15°	-
W	0°	0°

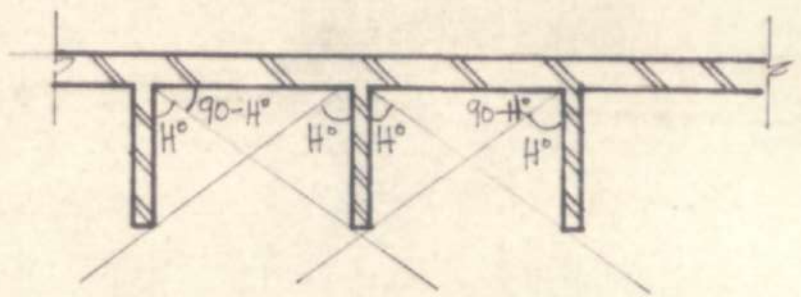
SHADOW ANGLE PROTACTOR.



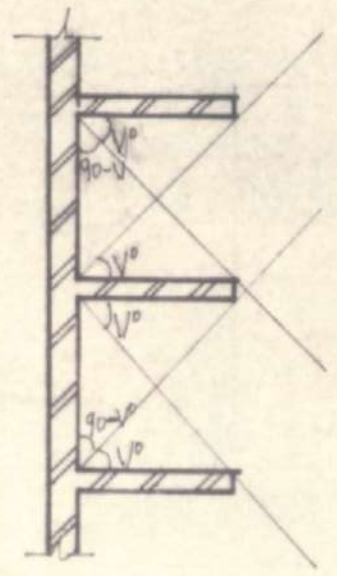
SUNSHADING ANGLES.

ORIENTATION OF OPENING	MAXIMUM VERTICAL SHADING ANGLE (V°)	MAXIMUM HORIZONTAL SHADING ANGLE (H°)
S	55°	70°
SSW	50°	45°
SSE	45°	–
N	75°	45°
NNW	65°	45°
NNE	65°	45°
E	15°	–
W	0°	0°

DESIGN OF VERTICAL SHADING DEVICES.



DESIGN OF HORIZONTAL SHADING DEVICES



ANGULAR APPLICATION:	Vertical Shading Device determined by Horizontal Shading Angle H^{o}
HORIZONTAL SHADING	Vertical Shading Determined by Vertical Shading Angle V^{o}

Further climatic design considerations include - the use of building Fabric capable of reflecting solar radiation affectively.

- having as much as possible large openings on the North and South wales because they receive the least radiation.

having massive east and west walls with as few openings as possible, with north and south being preferrably of light-weight construction.

o having external spaces well shaded where required for external activities.

o laying out of buildings to allow for free circulation of air while being resonably compact to reduce heat gain during the day and heat loss at night.

o Orientating buildings to take the best possible advantage of the prevailing winds while catering for the rather strong squalls during the March - April squally storms.

o Wind protection can also be provided by windbreaks.

o Natural ventilation can be acheived by :

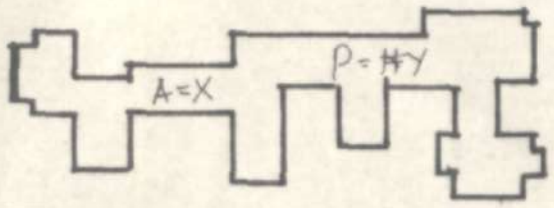
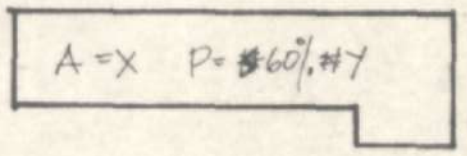
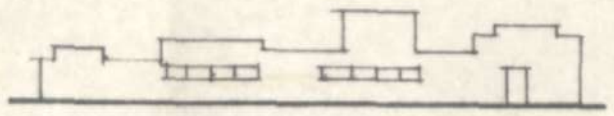
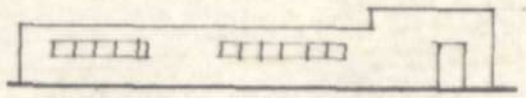
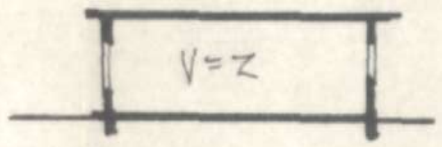
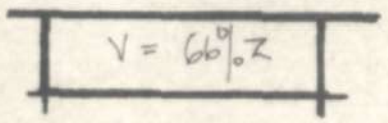
- use of sorroundings to create low and high pressure zones.
- locating inlets in high, outlets in low pressure areas.
- small inlets and large outlets with the inlets directing the flow to living or activity zones.
- undisturbed inside flow or open planning.

ECONOMY AND COST CONTROL

A School can only be considered good if it acheives the trilateral balance among three factors of planning - education, environment and economy. The first step for acheiving an economical school design is the setting up of cost controls, geared towards making the most for the pupil and his education process with the available rescourses. With the setting of cost limits, the designer is challenged with the task of taking decisions whose results will financially correspond as near as possible with the limits set. Such decisions may require intensive liasoning with the educator and should necessarily not lower the quality of the educational process. Other modes of architectural economy include can be acheived through:

I. Geometry of the Envelope and Cost:

Outside walls cost more than partitions because they are heavier, more complex because they have toilet in light and air and they require better materials to withstand the weather. By cutting down the area of the outside walls, one will be, slashing down the overall cost if the envelope. Lower perimeter schools have lower long range maintainance cost. Economical school buildings are [illegible] rectangular, nearly as square as square as possible with a minimum umber of breaks and corners.

PLAN			INCREASED EXTERNAL WALLING PERIMETER LEADS TO INCREASED COSTS. A = AREA P = COST.
ELEVATION			INCREASED ROOF BREAKS LEADS TO RISE IN COSTS DUE TO ADDITIONAL FLASHINGS.
SECTION			UNNECESSARY AIR VOLUME LEADS TO COST RISE.

"STRUCTURE COST RELATIONSHIPS"

Breaks in roof construction also add to the costs of the school buildings due to increased number and costs of flashings and should therefore be minimized.

Exessive room heights that serve no educational purpose need to be avoided, even though they are sometimes sactified by building codes. A reduction of room heigh from 12 feets to 8 feets as a typical situation leads to 44% cost reduction if the same construction system is used.

Building Fabric and Cost:

The choice of cheaper building fabrics on short run basis can lead to overall slash in the cost of construction, the degree of the phenomenon depending on the scope which which the material is used as a fraction if the overall structure. The cost of matintainance of cheaper materials on the long run however offsets the cost advantage derived from them initially. Hence it is sometimes more advantageous to go for the more qualitative materials or lay them off until such a time when funds are adequate for their provisions.

Structure, Construction and Costs:

The structural system of a school building is the framework on which the enclosing envelope is draped. The building it self takes the form shape and mass of the framework. It consists of (1) vertical supporting members (column or load bearing walls) (2) horizontal supporting members

joists, beams trusses and foundations, (3) decking floor and slabs sheathing and roof decks.

For proper economy, it is essential to know the per-cent of the overall construction cost taken over by the structure. Once this is known and broken down into details it may be possible to make savings by chipping down the costs of the various structural elements, materials and methods, which accumulatively turn out to be considerable. labour costs can be cut down by imaginative structural designs; for instance structures that have repetitive units are easily erected by workmen more easily and in shorter time. Repetitive structures also have the effect of lowering the unit cost of production and wastage of material.

Structural Economy can also be acheived by making use of larger and fewer units of building materials. This has the effect of saving erection time, and labour cast, labour costs economy may also be acheived by having fewer cradts on the construction job. Whenever possible craftsmen should not be made to wait for one another on the site. Details which require fewer crafts should be maximized. Economy may also be acheived by the use of modular coordination which takes advantage of standard shapes and sizes of building materials and minimizes waste through cutting and fitting of these materials on the site. In other words, modular coordination connotes the use of building materials which have been tailored to be integral parts of a modular floor, wall or roof.

FLOOR SPACE AND COST:

In acheiving a meaningful school design economy, Educational Spaces are classified as either being "productive" or improductive. Productive spaces are those which are used for teaching and learning and includes class-bases, Laboratories, craft rooms, music rooms etc. or "unproductive" like circulation spaces Emphasis is placed on the first category in the use of school building rescources, hence cominging spaces within the school plant does not interfers too much with the educational programmes, it may be done at the design stage. This may save funds and the provision of other facilities. Circulation spaces where provided may also be modified into work corners to render them educationally productive. Maintainance and Cost: In general, most cheap building materials have shorter life spaces than the high duality ones. They also rquire more frequent maitainance. It is therefore necessary to weigh the life span and maintainance

cost of any material or elements in relationship to the life span of the building before deciding on it's choice or otherwise. Abuilding designed to be easily maintained over its life span on one hand upsets any initial cost, advantages acquired at the intial construction stage with cheaper materials as the other hand.

Efficient maintaince pre-supposes:

(a) the employment of trained staff with facilities in the form of space and tools to carry out their dutics.

(b) the provision of a realistic maintaince budget designed in a sliding scale regulated to the life of the component parts of the structure.

Maintainance routines should cover:-

(a) the building fabric

(b) building services

(c) equipment and furniture.

Furniture:

The choice of the right furniture for any age group plays a big role in determining the degree of comfort enjoyed by the user. The criteria for comfort includes the material of which the furniture is made, specifications in terms of height, width and lenght. The latter varies from age group to age group and calls

for choice of anatomically recoomende dimensions for comfort. The dual nature of the proposed users of the comprehensive primary school may call for the use of adjustable furniture- both working and seating surfaces. Whatever materials are used for the furnitures, the following conditions for comfort and good posture should be necessarily satisfied:

(1) feet must be flat on the floor

(2) there should be no pressure be tween the leg and underside table or desk

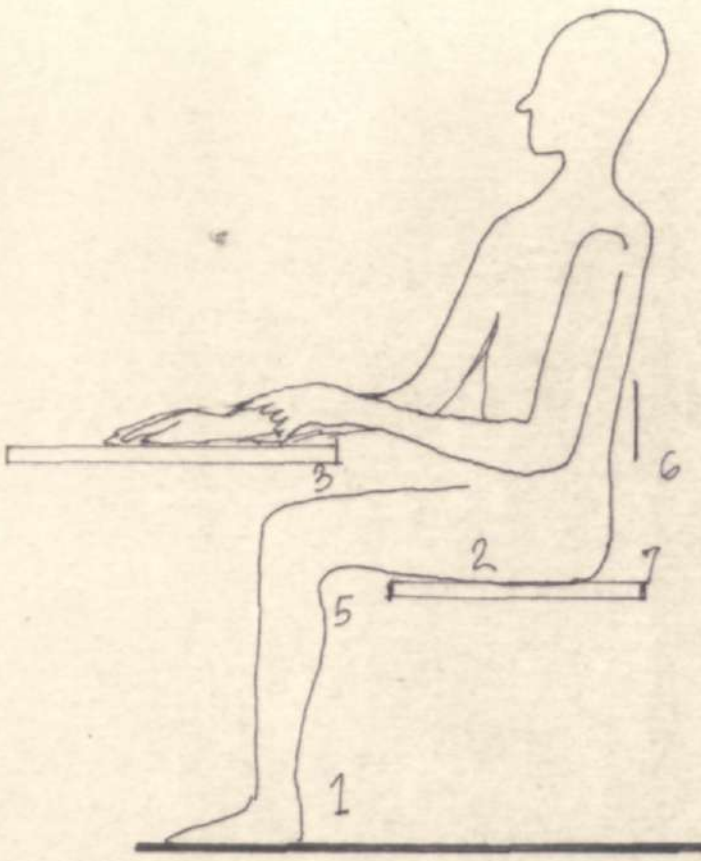
(3) there should be clearance between the leg and underside of table or desk top.

(5) there should be clearance between the back of the legs and front.of the seat.

(6) the back should be in contact with backrest

(7) there should be clearance between backrest supports for buttocks.

ANATOMICAL SEATED COMFORT POINTS (AFTER CAUDILL.)



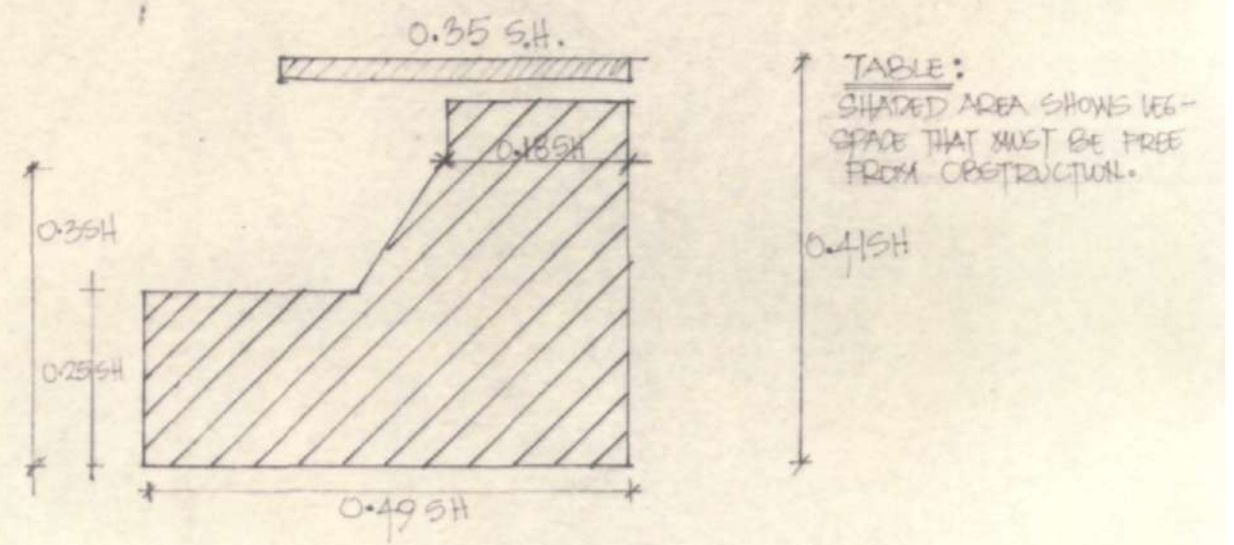
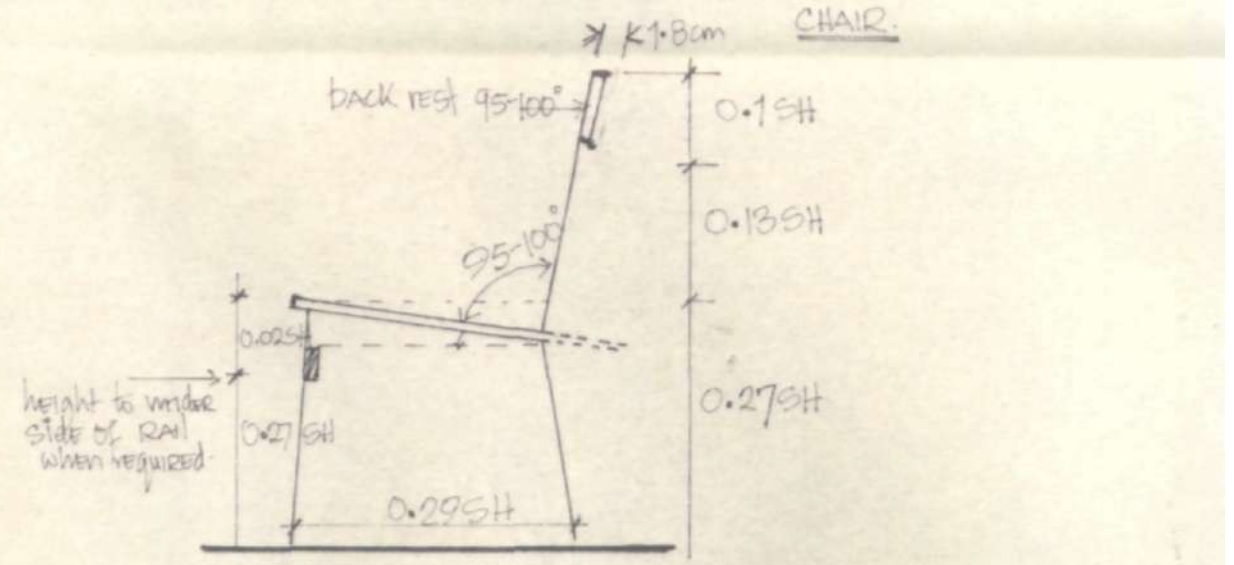


TABLE:
SHADED AREA SHOWS LEG-SPACE THAT MUST BE FREE FROM OBSTRUCTION.

0.41SH



S.H = MEAN STANDING HEIGHT (SEE FIG:)

Library:

Shelving in the library should be designed to suit the height of the children and be adjustable and varying depending on the functions they perform.

Shelving Details:

- height - 175 cms high supported at 90 cms. centres.
- Fastening of free standing shelves to the floor is recommended.
- depth generally 22.5 cms deep although a minimum of 13.5 m of 30cm deep shelving for display printings or drawing papers is recommended.

Controal Furniture:

- 1.8m long, 25cm high, 60 cm wide with 138cm - 15cm wide card drawer with 3-5 compartments.

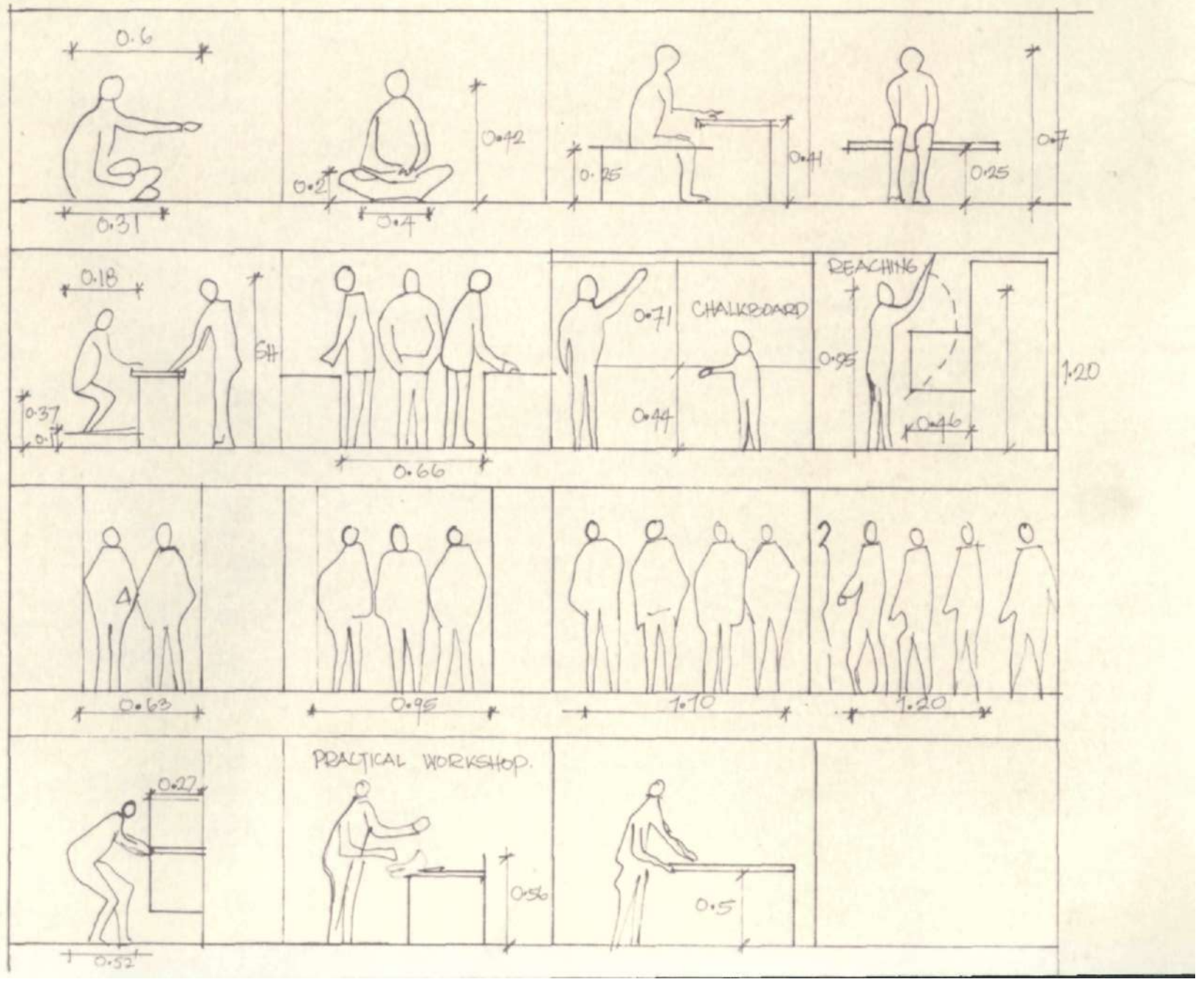
Workroom Furniture:

- 60 cm wide worktop 85 cm high, 1.8m long for work on unclassified or damaged books.

Art and Crafts Room: As the centre of creative expression in the school, there is need for proper storage of materials and finished products. The display area for childrens' works (Arts models good carving, etc.) to develope childrens sense of satisfaction and acheivement and the stimulation of their creative instincts.

CRITICAL DIMENSIONS AND THEIR RATIOS TO STANDING HEIGHTS.

MEAN STANDING HEIGHT PER AGE GROUP (CMS)		
AGE (YRS)	BOYS	GIRLS
4	100	104
5	107	111
6	113	116
7	119	120
8	124	124
9	129	131
10	132	137
11	140	141
12	146	146
13	150	152
14	158	155
15	163	158
16	168	160
17	168	160
18	168	160
19	168	160
20	170	160
21	170	160
22	170	160
23	170	160
24	170	160
25	170	160
26	170	160



Furniture Requirements - Art table - 1.5m long, 90cm wide, 65cm high. This dimension is suitable for both standing and sitting positions.

Stools - 38 cms. This is easily movable for sketching purposes, and gives room for free circulation within the room, such free, movement may include water fetching, studies of other pupils works or arranging displays.

Pin Up Boards:

Should be 75 cm from the ground level to the door and Window heights. Pin up boards should flush with other horizontal elements on the internal facades.

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CHAPTER 6

DESIGN BRIEF AND CONCEPT

Having surveyed the problems and attributés of our Schools in earlier chapters, this one will be devoted to the practical task of explaining the components and strataegies utilized in overcoming the problems in the design of the comprehensive primary School.

The brief has been prepared with the Nanwa Estate as the main catchment area on the short run but with the realization that the neighbourhood has a potential for growth in the near future. With 260 units presently, the school will initially absorb about 780 pupils from the estate at it's inception (3 children/unit) the design itself is based on an intake of 1040 pupils comprising 624 Boys and 416 Girls of the ages of 4 - 12 years. The School shall consist of three main segments namely: administrative, Academic and precreational. The breakdown of the spatial requirements of the various components of each are as follows.

- Entrance Hall - 20 m^2
- Clerical Office - 50 - 60m^2
- Headmasters Office - 20m^2
- Assistant Headmasters Office - 20m"
- First Aid room - 12"
- Furniture Storage - 40m"
- Books/equipment Storeage - 40m^2
- Staff Common Room - 50"
- Staff Toilets - 15"

ACADEMIC:

Library	-	90	m^2
Teachers Rescource Room	-	18	"
Library Work Room	-	9	"
Adult Study Area	-	36	"
Class Bass	-	72	"
Activity Room	-	18	"
Outdoor Teaching Space	-	27	"
Audio-Visual Class	-	80	"
Domestic Science	-	40	"
Home Economics	-	40	"
Primary Science Room	-	80	"
Multipurpose Hall	-	200	"
Toilets - Boys Iwc - I Class -		9	"
Girls " - ½ Class -		9	"
Iwc - I Class.			"

PLAYGROUNDS:

Football	-	66	x	104m
Athletics	-	174	x	90m
Volleyball	-	18	x	9m
Basket/Netball	-	26	x	14m

Reporter -

School: -

1 . Any veriations from classroom to classroom design?

A. Yes- - - - - - B. No- - - - - - - -

2. Number of Storeys: -

3. Fenestration:- -

4. Shading devices:- -

Finishes:	Material I Colour:
Floor - - - - - - - - - -	1
Ceiling - - - - - - - - -	1
Wall - - - - - - - - - - -	1

5. Entrance into School:

A. Obvious . . . B. Undefined. . -

6 . Visual Character -

7. Partition -

8. Height of Classroom -

9. Corridor: -

10. Sound Absorbtion quality of materials - - - - - - - - - - - -

11. Availability of Pin up tackboards - - - - - - - - - - - - - -

12. Layout of School:- -

13. Layout of Classroom -

Class	No of Streams A, B, C, etc.	Average Age of Pupils	No of Boys	No of Girls
1				
2				
3				
4				
5				
6				
7				

C LEAST POPULATED SCHOOL:

Name of School:

Population:

No. of Boys:

No of Girls:

ENTRANCE EXAMINATION RESULTS

Year	Per-cent (%) Pass
1974	
1975	
1976	
1977	

Building Costs (of Available)

Number of Classes per Block

Average Cost of I Block: ₦.....

Class	No of Streams (A,B,C, etc.)	Average Age of Pupils	No. of Boys	No of Girls
1				
2				
3				
4				
5				
6				
7				

B. CAPITAL/MODEL SCHOOL.

Name of School:

Total Population of School:

No of Boys:

No of Girls:

ENTRANCE EXAMINATION RESULTS:

Year	Per-cent (%) Pass
1974	
1975	
1976	
1977	

B. They should be left in boarding schools if the syllabi of the old and new schools are different.

C. They should be left in boarding schools if the syllabi are the same or not.

23. Have any activity or lesson the effect of making you feel like combining the spaces of two classrooms for proper effect?

A. Yes ------ B. No. -----

24. Do you have A staff commom room?

A. Yes -------- B. No. ----

25. Outline the subjects/activities carried out during the week and number of hours spent on each (State Class)

26. Indicate any special requirements you will need in aiding you to teach effectively.

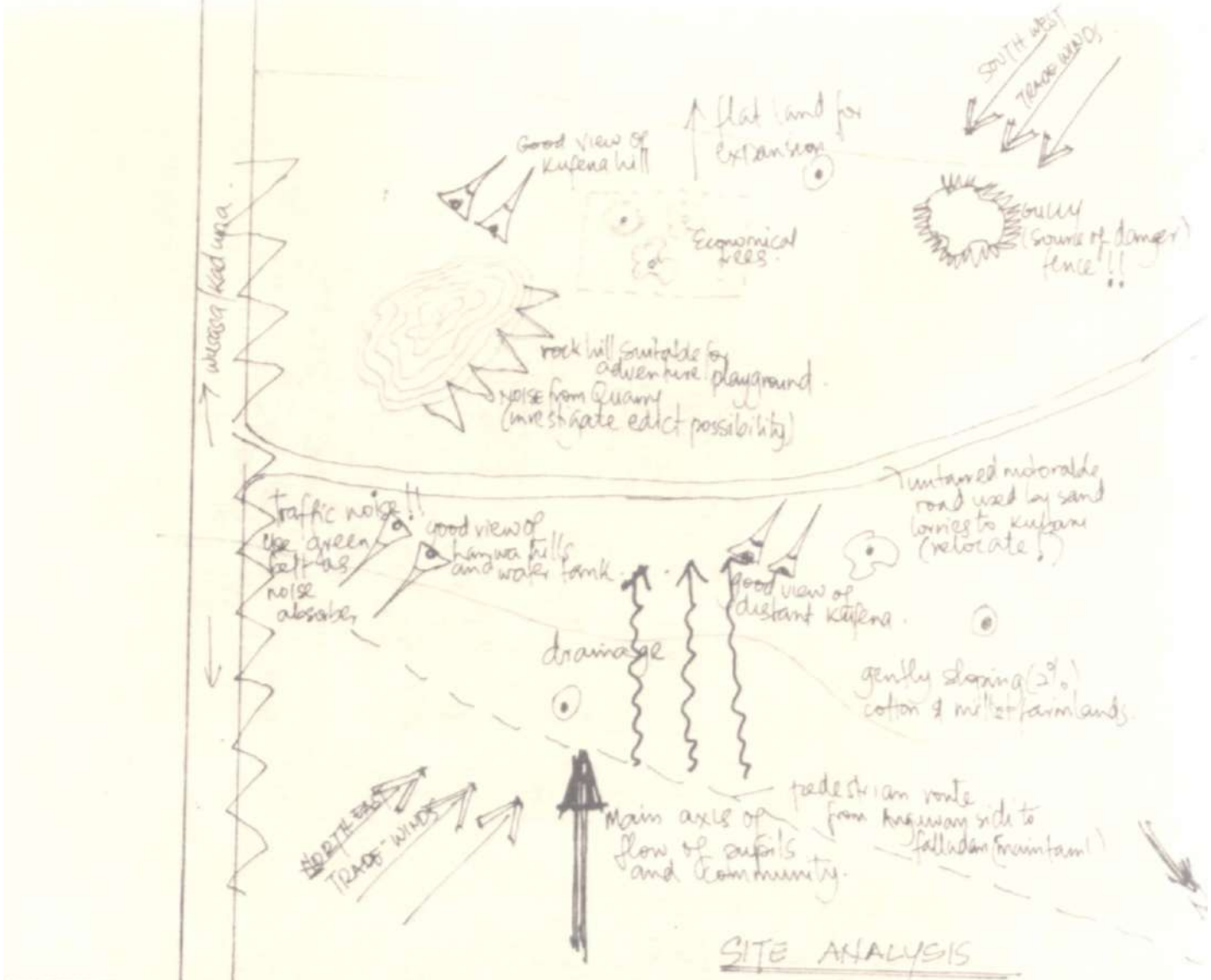
CLASS :	NUMBER OF STREAMS
- Reception Class	- 2
- Nursery Class	- 2
- Class 1	- 4
- Class 2	- 4
- Class 3	- 4
- Class 4	- 4
- Class 5	- 4
- Class 6	- 4
- Class 7	- 4
- Class 8	- 4

DESIGN CONSIDERATIONS AND CONCEPT:

The design is borne out of numerous site, architectural, educational constructional and ecomomic considerations.

Topography: The occurence of the flattest stretch of land on the South eastern wing -- called for it's use as the games area. It's interiorness from the main highway gave it the added advantage of safety.

Acoustics: Secondly there was an uncompromising urge to utilize the rock body which personifies the site, and this dictated the use of it's vicinity as the adventure playground with the additional advantage of noise insulation, the South eastern edge of the rock being about 55m from the road. It was consequently decided to have


SOUTH WEST TRADE WINDS
flat land for expansion
Good view of Kufena hill
Economical trees.
GULLY (source of danger) fence!!
rock hill suitable for adventure playground.
noise from Quarry (investigate edict possibility)
untarred motorable road used by sand lorries to kufana (relocate)
traffic noise!! use green belting, noise absorber
good view of hanawa hills and water tank.
good view of distant kufena.
drainage
gently sloping (2%) cotton & millet farmlands.
pedestrian route from hanawan side to fallujan (mountain)
NORTH EAST TRADE WINDS
Main axis of flow of activities and community.
KADUNA
SITE ANALYSIS
expansion
SCHOOL CORE
playground
sport ground (football)
administration
car park.
pedestrian flow.
SITE - STRUCTURE DIAGRAM.

the central body of the School between the two wings whose functions have been decided upon.

Safety: The paramount need for the safety of the pupils in arriving to and from their homes to the school called for a vehicular free pedestrian linkage from the estate, to main catchment area. Although parking spaces have been provided for teachers, visitors or equipment bringing vans, these are way out of the pedestrian access into the School.

Zoning: The semi-public functions the administration of the School performs dictated it's frontal position in the school layout. The Nursery school has been placed close to the entrance because of it's school day which ends before the rest of the school . With this approach, they can easily flow out of their section without the temptation of calling through the window on a senior brother, sister or friend while shuffling their feet through the Corridor, as often happens. Parents and guardians will find it much easier to find their Kids at such times. Thirdly, the provision of seperate playgrounds for the Nursery and "high" schools will have the likely effect of encouraging full participation by all children with minimized incidences of bullying, overshadowing or injuries.

The special classrooms block (audio-visual, science etc) has been isolated with consideration to the relatively higher noise level of the functions that take place in them. It's proximity to the "High" School has been determined by the higher frequency of use by the latter.

Identity:

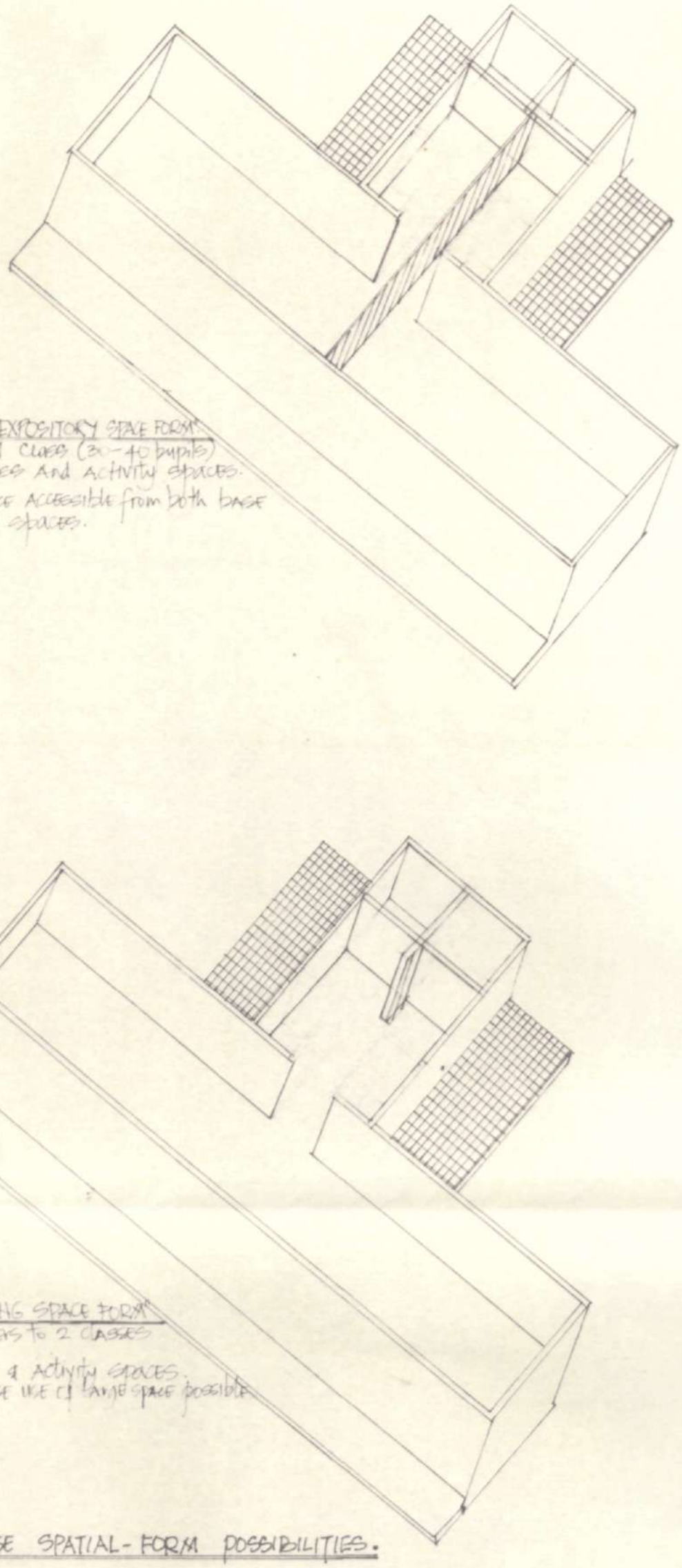
The system also gives each child a sense of identity with his immediate environment and this is reinforced by distrinct variations in each of the school courtyards. The numerous active and passive recreational spaces linked to the whole school has been provided with consideration to the fluctuating temperaments of different children at different times and their potentialities as areas of social interaction.

Scale:

The scale of the buildings and open spaces have been designed to suit that of the child as a means of giving him a sense of comfort, ease and security as well as pleasing his eyes and uplifting his spirit.

Use factor:

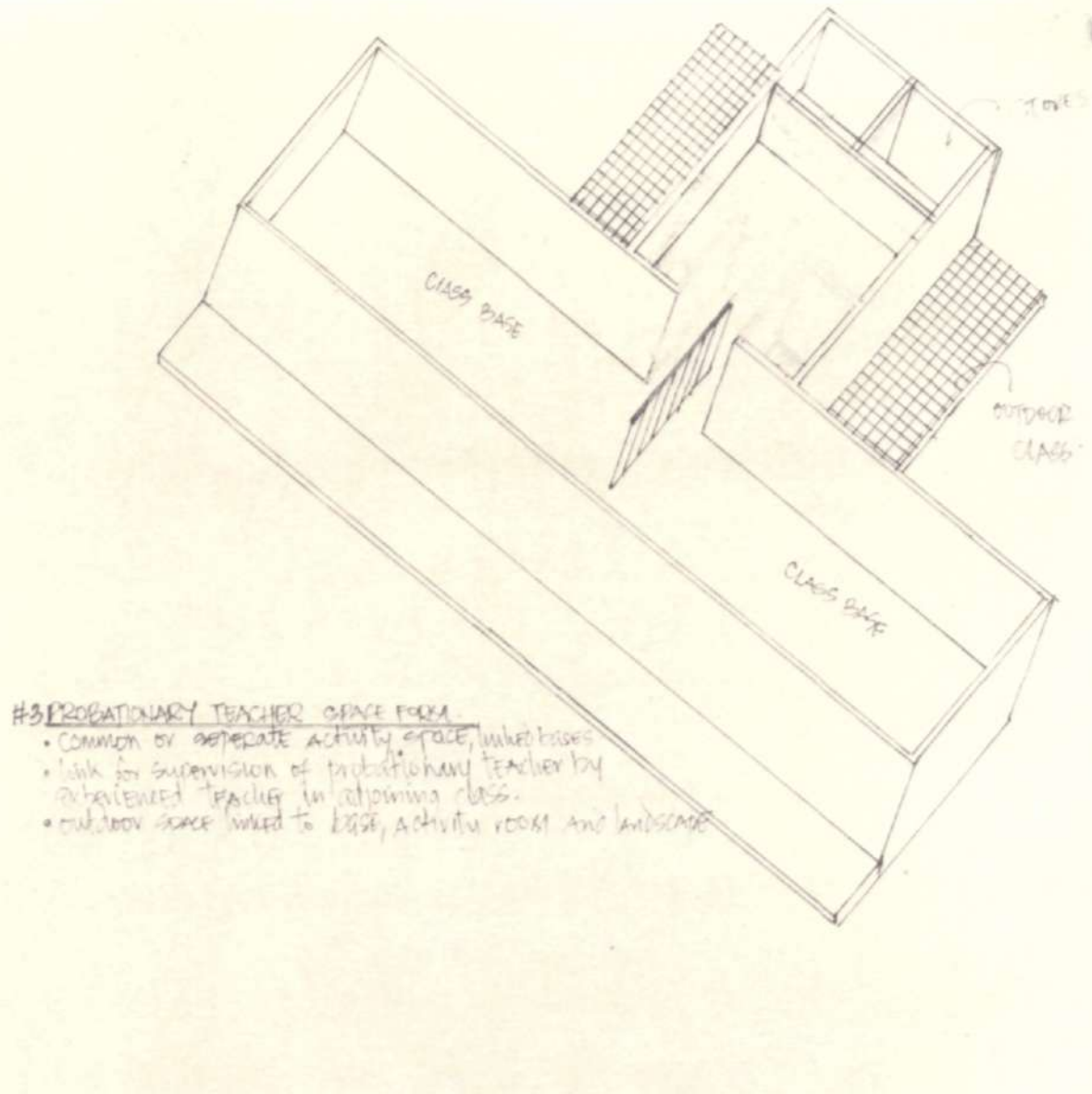
The School is designed with the entire community in mind. It is visualized that Classrooms, library multipurpose hall, School piazza and sports fields will be immensely used for adult education, hence there is a direct access to the sports field and provision for adult study terrace outside the library. The provision of adjustable furniture to suit both age groups is therefore recommended.



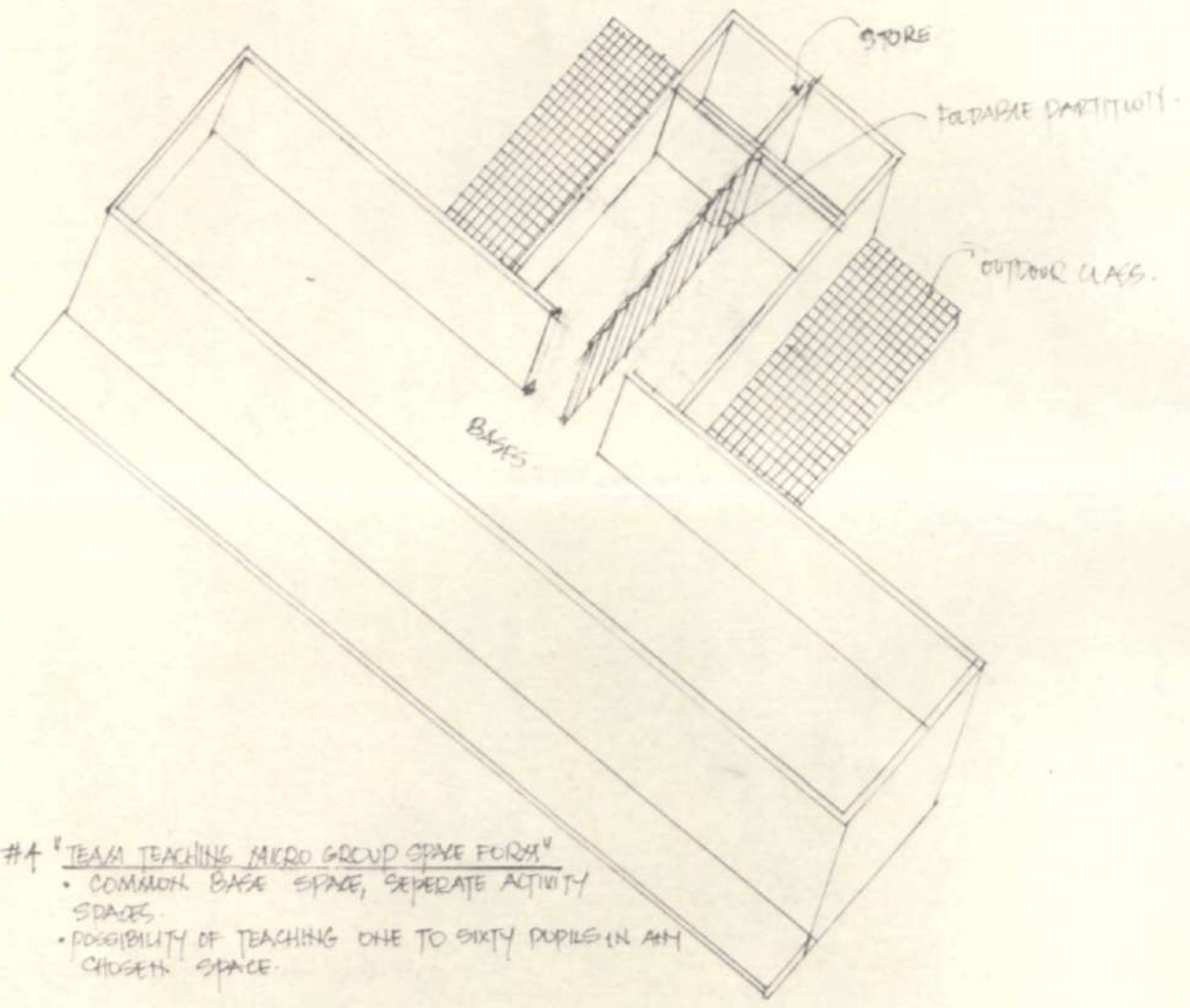
#1 "TRADITIONAL EXPOSITORY SPACE FORM"
- 1 Teacher to 1 CLASS (30-40 pupils)
- SEPERATE CLASS AND ACTIVITY SPACES.
- OUTDOOR SPACE ACCESSIBLE FROM BOTH BASE AND ACTIVITY SPACES.

#2 "TEAM TEACHING SPACE FORM"
- 1 OR 2 TEACHERS to 2 CLASSES COMBINED.
COMMON BASE & ACTIVITY SPACES.
- MULTI-PURPOSE USE OF SAME SPACE POSSIBLE

• CLASS BASE SPATIAL-FORM POSSIBILITIES •



#3 PROBATIONARY TEACHER SPACE FORM.
- COMMON OR SEPERATE ACTIVITY SPACE, LINKED BASES.
- LINK for SUPERVISION of PROBATIONARY TEACHER by ACHIEVEMENT TEACHER in ADJOINING CLASS.
- OUTDOOR SPACE LINKED to BASE, ACTIVITY ROOM and LANDSCAPE



#4 "TEAM TEACHING MICRO GROUP SPACE FORM."
- COMMON BASE SPACE, SEPERATE ACTIVITY SPACES.
- POSSIBILITY OF TEACHING ONE TO SIXTY PUPILS IN ANY CHOSEN SPACE.

• CLASS BASE SPATIAL-FORM POSSIBILITIES.

the various teaching methods in practice in mind. This ranges from the outgoing expository method to the group and team teaching concepts. It is possible to teach any number of children from one to sixty in either seperate or common indoor or outdoor spaces by the use of foldable partitions within the main Class basses and activity rooms. The 3m structural grid enables the shifting of partitions at such intervals to correspond with the number of pupils in each class at any material time. The unit is also designed to contain numerous seating arrangements ranging from the traditional expositery - - row seating, the U shaped story felling, random group to the ring arrangement as may suit the activity taking place.

Construction:

The overall structural scheme is based on a 3m grid. The foundation is expected to be either strip or slab foundation with the flooring of concrete slab and varying finishes ranging from linoleum, ceramic files to terrazo depending on the space function. The table below shows materials specificable for block and brickwork construction. The floor finishes are applicable to other forms of construction discussed later in the chapter.

DESIGN ATTRIBUTES:

The concept of total environment which hinges on design consideration and utility of every rescource on the site for enhancing a stimulative environment for education is the uniting umbrella in the design. There has been absolute need for detailed consideration of both built up and opeen spaces, internally and externally.

The Classroom design concept has been based on a block courtyard system for classes whose members are of the same age which advantage has been enumerated earlier. This system apart from drawing it's inspiration from the dominant forms of the regions, has numerous climatic advantages - such as the air pooling function it serves. The interiorised nature of the blocks serves as an effective envelope against the climate.

Deinstitutionalization:

The Courtyard approach has the desired effect of deinstitutionalization of the school environment towards the domestic scale. This will definitely narrow the sharp environeet and space scale difference that exists between the school and the home and furthermore ease the problems of adaptation, familiarization. The unit is designed with:

FLOOR FINISHES

FUNCTIONAL SPACE	SPECIFICABLE MATERIALS
Staff toilets	Ceramictiles/Terraco
Art-Room	Asphalt tile
Audio-Visual Aids Room	Linoleum/Asphalt Tile
Class Bases	Linoleum/Asphalt Tile
Activity Rooms	Ceramic/Asphalt Tiles.
Corridors	Linoleum
Domestic Science/Home Economics	Linoleum
Entrance portal	Terraco
Entrance Hall	Terraco
Furniture Storage	Cement Screed
General/Clerical Office	Linoleum
Library	Asphalt Tile/Terraco
Library workroom	Asphalt Tile
Multipurpos Hall	Asphalt tile
Headmaster Office	Terraco/Linoleum Tile
Pupils toilets	Ceramic tiles
Science room	Asphalt tile
Staff Common Room	Terraco
Stage and Wings	Plywood finish.

WALL FINISHES

FUNCTUONAL SPACE	MATERIALS SPECIFIED
Staff toilets	Plaster
Art Room	Plaster
Audi Visual Aids	Exposed - block/brick
Class bases	Plaster/exposed block/brick
Activity Rooms	Plaster/exposed block/brick
Borridors	Steel pipe as columns
Domistic Science/Home Economics	Plaster/exposed block or brick
Entrance portal	Plaster
Furniture Storage	Cement screed or rough plaster
Genral /Clerical Officer off.	Cement plaster
Library	Cement plaster
Library Workroom	Plaster/exposed block or brick
Multipurpose Hall	Plaster/exposed block or brick
Headmasters Office	Plaster
Pupils toilets	Ceramic Tile (up to 1.5m)and Plaster
Staff Common Room	Plaster
Science Room	Plaster/exposed blockwork
Stage and Wings	Plaster/exposed Blockwork.

CEILING FINISHES

FUNCTIONAL SPACE	MATERIALS SPECIFIED
Staff toilets	Asbestolux Ceiling
Art Room	Asbestolux Ceiling
Audio Visuals Room	Acoustical Tile
Class Bases	Asbestolux Tile
Activity Rooms	Asbestolux Tile
Corridors	Asbestolux Tile
Domestic Science/Home Economics	Acoustical Tile
Entrance Portal	Cement Asbestolux Tile
Entrance Hall	Cement plaster
Furniture Storage	Asbestolux
General/Clerical Office	Asbestolux
Library	Acoustical Tile
Library Workroom	Acoustical Tile
Multipurpose Hall	Acoustical Tile
Headmasters Office	Acoustical Tile
Pupils Toilets	Asbestolux
Science Room	Acoustical Tile
Staff Common Room	Asbestolux.

With the modular coordination in the system, it is possible to specify numerous other materials for construction. The load bearing columns may be of concrete, steel stanchions or timber, the trussess of timber, lightweight steel aluminium or even local Azara. The wall claddings may be of playground aluminium, Zinc or Asbestos cement panels, which are cheaper, lighter and of dry construction.

The simple structural solution has been adopted with consideration to the high vulnerability of primary schools to prototype repetition. In addition most of the components can be industrially repetitively produced in large sizes to enable quick and cheap construction with minimization of labour costs. The system does not require a sophisticated technical manpower (in view of their shortage) for erection and can therefore be built using available local manpower. The components can be easily and readily produced in standardized sizes, transported, assembled or dismantled as the case may be. Construction can be done in stages and expansion of class base spaces is possible longitudinally with structural safety of the roof structure.

E P I L O G U E

The quest for the provision of "total environments in our primary schools has revealed the existence at the turn of this Century of numerous unarticulated schools that ruthlessly ignore the temperaments and minds of growing children which need to be checked and their growth halted. Whereas several new developments have takenplace in the educational field, primary school architecture in Nigeria has been static.

School environments should flexibly promote efficient teaching and learning methods, social interaction and development of the body and mind and accomodate new educational developments, reforms, and research findings. The goals of this thesis would only have been acheived if the comprehensive primary school does just this.

QUESTIONNAIRE P1 (TEACHERS)

The following questions are designed to reveal a Cross-section of the opinions of teachers and society in general about the present state of primary schools and possible rooms for their improvement. Such opinion should be expressed by ticking the chosen answer and commenting where necessary. Those involving statistical date that are not available may be ignored.

Name (voluntary only) -

Occupation: -

1 . School: - - - - - - - - - - - - Class - - - - - - - - - - - - -

2 . Populations of School: -

3 . Number of Boys: - - - - - - - - Number of Girls: - - - - - -

4.

Class	Number of Streams (A,B,C, etc)	Average Age of Pupil
1		
2		
3		
4		
5		
6		
7		

5. How many shifts operate in the school. -

A 1 B2

6. Should number of entrances in schools be limited to a certain number?

A1 B2 C3 D more than 3

Why:

- .... -

Seperation:

7. Does of classroom blocks increase or decrease exchange if ideas between pupils and staff.

A. Increase - - - - - - - B. Decrease - - - - - - - - - -

How?

8. Do you think provision of adequate playgrounds can aid in the development of the child and should be given importance as Classwork?

A. Yes - - - - - - - - - - B. No - - - - - - - - -

9. How many pupils do you consider as maximumly convenient for a teacher to pay attention to?

A.30 B. 40. C.50. D?

10. What is the maximum number of storeys you consider safe for Primary School children (seven pupuls)

A1, B2, C3, D4, E greater than 4

11. Are Classrooms used for any other activities other than reading writing after school hours (eg. by communities)

A. Yes - - - - - - - - - B. No - - - - - - - - - -

12. What activities require the congregation of whole School and/or visitors.

1.

2.

3.

4.

13. i Where do such ceremonies take place.

ii Please state if it is adequate or not

i A. In classrooms B. Outside C. Hall

ii A. Adequate B. Not Adequate.

14. Do pupils encounter difficulties in getting recommended text books

A. Yes - - - - - - - - B. No. - - - - - - - - - -

15. If yes (last question) will you suggest that the school should stock the books for sale to the pupils

A Yes - - - - - - - - - - B. No. - - - - - - - -

16. Where do Pupils store some of their books at the end of the day?

A. In desks B. Special store C. No place - - - - -

17.

17. Do you encounter any difficulties in arranging the class into groups due to weight of desks ets?.

18. Are there subjects that require you to teach outside the class.

A. Yes- - - - - - - - B. No. - - - - - -

19. Which of these atternatives suits you best with regards to pupils feeding?

A Food hawkers preparing food at home and selling within School premisses in open air.

B Food sellers preparing food with School premises under supervision (teachers) and serving pupils in built up dining space.

20. Do you think that provision of Libraries in primary schools will broaden the childrens mind and reduce problems of pupils from poor homes.

A. Yes - - - - - - B. No. - - - - - - - - -

21. Does the active nature of pupils call for a fiirst Aid dispensary?

A. Yes - - - - - - - - B. No. - - - - - - -

22. Which of the following alternatives do you consider best for children of workers who experience changes of station often.

A They should change schools as many times as their parents change stations if the syllabi of the old and new schools are the same.

QUESTIONNAIRE P2 (EDUCATIONAL ADMINISTRATORS)

The following questions are designed to produce A Cross Sectional opinion of educational Administrators about the present State of primary Schools and possible means of improving them. Questions should be answered by ticking or commenting where necessary. If the space provided is inadequate please use the back of the page for commenting and the question number should be indicated in such cases.

Name: (not compulsory) - - - - - - - - - - - - - - - - - -

Occupation: -

Address: -

1. In your view, is the present rate of establishment of primary Schools equal to the demand for them?

A. Yes - - - - - B. No. - - - -

2. Can existing and primary Schools be said to be satisfactorily building and facility wise in relationship to modern educational development?

A. Yes - - - - - B. No. - - - - -

Why? - - - - - - - - - - - -

3. What is the maximum number of floors you consider safe for Children (Senior pupils)

A1, B2, C3, D4, E Infinite

4. Does your Ministry/Local Government supply all books to Pupils?

A. Yes. - - - - B. No. - - - - -

5. If pupils encounter difficulties in getting recommended textbooks can the authorities in your view purchase the books and sell to the pupils through their schools?

A. Yes. - - - - - B. No. - - - - -

Why? -

6. Which of these alternatives do you consider best for the Children of workers who experience changes of stations often?

A they should change schools as many times as their Parents change stations if the syllabus is the same in all Stations.

B they should be left in boarding schools if the syllabus in the former and new schools are different.

C they should be left in boarding schools if the syllabus are the same or not.

7. Given the following choices which do you recomment?

A Building fewer but well facilitated primary schools operating in 2 or more shifts with promising future for both pupils and the country.

B. Building many underfacilitated primary schools with lower productivity of both pupils and the country.

8. Please state any, useful suggestions or problems which aid / or restrain the provision of the best learning enviornment for pupils.

STATISTICAL DATA

A. Most populated primary school in State/Local Government.

Name of School:

Total Population:

No of Boys:

No of Girls:

Entrance Examination performance:

Year	Per-cent (%)Pass
1974	
1975	
1976	
1977	

B I B L I O G R A P H Y

I. UNESCO - Anthropometric data for Students.

2. Unesco Projects - Architecture and educational Space Paris I972

3. Profiles of Significent Schools: Belaire Elementary School New York I960.

4. Derek Bickerstaffe - And so to teach

5. Dattner Richard - Design for Play.

6. N.L. Engelhardt, N.L. Engelhardt Fr, Stanton Leggett- Elementary School Buildings.

7. Godwin John - Standard Setting for I.D.A. Project in Nig.

8. Harold Houghton and Peter treasur - Community Schools in Developing Countries.

9. Manning Peter - Primary School.

I0. Neuffert - Architects Data

II. Oddie Guy - School Building resources and their Effective use.

I2. Olgay Victor, Olgay Aladar - Design with Climate

I3. R.I.B.A. - the Coordination of dimensions for Buildings

I4. T. Le Roux - Planning of Primary Schools

I5. Simonds John Orsapee - Lanoscape Architecture

I6. Soni Saina - School Bulilding and Educational revolution (Ahmadu Bello University Seminar I975)

I7. Educational Facilities Laboratories - S.C.S.D. an interim Report: School construction Systems Development New York I960

I8. U.I.A. Seminar - School and Community integration in Africa - An Approach to the problem of increasing the impact of education Vienna I970

I9. V.I.A. Seminar - The Social role of the School.

20. Educational Buildings - Space and Cost norms for the Education Planner.