POST GRADUATE HALL OF RESIDENCE
AHMADU BELLO UNIVERSITY, ZARIA.

by

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

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JUNE 1983

DECLARATION

I hereby declare that this thesis has been written by me and that it is a record of my own research work. It has not been presented in any previous applciation for a higher degree.

All quotations are indicated and the sources of information are specifically acknowledge by means of references.

ODUTOLA, Ademoia Olowole

DATE 7/6/83

DEDICATION

This work is specially dedicated to my Parents, my father, Mr. A.A.Odutola and mother, Dr(Mrs) T.A. Odutola who have given me so much support and continuously prayed for my success.

ACKNOWLEDGEMENT

During the course of this work many people were of immense valve to me in terms of help rendered towards the successful completion of the thesis.

- My profound gratitute goes especially to my thesis supervisor, Prof. (Mrs.) M.B.A.Urbanowicz who helped me tremendously during the course of this work. Words alone are not enough to express my sincere apprciation towards her.

- Also, Prof. E. A. Adeyemi, the Head of Department, who has been like a father to me and more so to all students of Architecture.

- Also, Arc. Adesina, who although was very busy, still alway found time to see me through any problem I had.

- Also, to all members of Staff, who one time or another offered me helpful suggestions.

The number of friends and colleagues who contributed one form of help or another would almost fill a chapter of this book. None the less gratitudes to Ayo, Bank-Osunloye, Koya Kamson, Dolapo Balogun, Gbenga Ademulegun, Kayode Onabowale, Yomi Awoniyi, Ugo Nwokudu, Inuwa Ibrahim Mohammed, Alhaji Abba, Sanusi Mauzu, Hadiza Isma, Fauzia Adedokun, Ibrahim Kabir, Tayo Shasanya, Tola Oyesiku, Laja Balogun, Dele Odediran, Arinola Kawu, Kris Okojie, Tunbosun Alo, Sunny Owoyale, Halima Talib, Abdullahi Bayi, Sanusi Daggash, Temi Jemide, Femi Peters, Biodun Gbadamosi and the beat goes on.

Finally, but most of all, my gratitute to the Almighty for the great gift of life.

Ademola O. Odutola

(1983)

ABSRACT

Topic: Post-graduate hall of residence for the Ahmadu Bello University, Zaria.

Purpose: The main aim of this thesis is to evolve a desing for a post-graduate hall complex for A.B.U.

Up to date such a facility has been non existent in the University, unlike other Unverities of its standing which all have post-graduate halls, This has resulted in the accommodation of post-graduate students in the same hostel blocks with pre-degree and under-graduate students, whose live styles are must times too boistrous to afford the post-graduate students the matured and ideal enviroment necessary to enhance the pursuit of their academic goals to the highest optimum.

Brief: The hall complex is designed to accommodate 840 students (640 male, 200 female). The accommodation units are broken up into ten pairs of hostel blocks, one block in a pair accommodating 44 students while the other 40, Each pair inclcuses an open courtyard.

Other associated faciliteis include, the dinning hall/kitchen, Administration building and boat jetty.

Site: The site for the complex as defined by the A.B.U. master plan is an area next to the "Extension to the main campus" and bordered on the South by the A.B.U. reservoir (Kubani lake.)

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CHAPTER ONE

1.1 INTRODUCTION

The ultimate goal of this thesis is to evolue a design for a desirable, condusive and practical habitat for the post-graduate students of the Ahmadu Bello University Zaria.

The concept Governing the design is based on. INDUVIDUAL PRIVACY/GROUP COMMUNALISM.

Through some error or deliberate oversight the post-Graudate students of the Ahmadu Bello University, unlike their collegues in other universities of its calibre have been unfortunately deprived to this day of a well defined hall of their own, resulting in their being housed in the same hostel blocks as pre-degree and undergraduate students, whose life styles are most times too boistrous. In this way post-graduate students are deprived of the matured and ideal enviroment necessary to enhance the persuit of their academic goals to the highest optimum. It is in this light that the author has been motivated to tackle and solve this problem as best seen possible.

1.2 The Problems of Student Housing in Nigerian Universties

Students housing is an aspect of design where first priority and great emphasis lies with the accommodating of large numbers in the cheapest possible manner. The induvidual needs of students is usually relegated to the near, and what usually results for the sake of "economy" are hostel blocks that are both unathractive and inadequately functional.

However unlike aspects of feeding where students have been known to express their views in often roitous manners, accommodation problems are usually borne out in silence for in most cases it is even a privaledge to aquire hostel accommodation at all. It is probably in this light that more and more offending accommodation types continue to spring up all over campuses in Nigerian Universities. The problem off insufficient on campus hostel accommodation with regards to the ever increasing student population is not a new phenomenom, and a solution to this could be the provision of off-campus accommodation during a stage of every students academic life on campus. However where on campus accommodation is provided, it essential that such accommodation suit the mental, physical and comfort requirement of the users (The students).

1.3 The [illegible] University [illegible]

1.3 The Ahmadu Bello University - A brief.

1.3.1 Historical:

The University was offically established in 1962 after two years of negotiations between the then Ashby Commission, the former Northern Nigerian Government and a delegation from the Inter-University Council for Higher Education Overseas (U.K.). It was named after the late Alhaji Sir Ahmadu Bello (1910-1966) Sardauna of Sokoto and Premier of Northern Nigeria. Sir Ahmadu Bello was the first Chancellor of the University and performed the opening ceremony on October 4 that year. From the day when the first 400 students registered it was expected that there would be about 1,200 under graduates by 1968 and the whole student population would reach 4000-5000.

By the year 1968 there were already 1,600 undergraduates and by 1972 the number of students registered in the University was 11 times as large as the year 1962. Today the student population stands at more than 14,000 and more than 8,000 students are concentrated on the main campus alone.

Most of the facilities of A.B.U. have been developed out of the departments of the now defunct Nigerian College of Arts, Science and Technology, the Institute of Administration and the Institute of Agricultural Research (I.A.R.).

The existing University comprises of 11 Faculties, 6 Colleges, 4 Institutes, 6 Specialist Teaching support Centres, and a School of Basic Studies. A large proportion of the forementional are direct teaching units whereas ohers

are research or support centres. Although the first degree Courses were introduced during the 1962/63 academic year, when the University was officially established, teaching and research have operated from the main Campus site at Samaru for over 50 years, similarly, courses of study have been provided on the Institute of Administration site in Zaria since 1957. The following section identifies the various locations of A.B.U., teaching and research facilities.

1.3.2 Location of A.B.U. Facilities

The teaching and research facilities of A.B.U. are distributed over 18 different locations throughout north and Central Nigeria. The level of Academic interrelationship between these units is reflected to a large extent by the location of each facility. 3 broad categories can be identified.

(a) The 11 faculties of the University and other teaching and research units located on the main campus in Samaru, the Administration (Kongo) campus, and the University teaching hospital.

(b) Teaching support facilities and research outstations location outside the Samaru-Zaria region, at various sites throughout Nigeria.

(c) The 2 Advanced Teachers Colleges at Kano and Zaria, whcih are self-contained in terms of both academic programmes and physical facilities.

Table 1.3.2 LOCATION OF ABU FACILITIES

1. Main Campus Samaru

Faculty of Science

Faculty of Engineering

Faculty of Env. Design

Faculty of Arts and Social Sciences

Faculty of Education

Institute of Education

School of Basic Studies

Faculty of Medicine

Faculty of Vet. Med.

Faculty of Pharm. Sc.

Institute of Health HQ

Centre for Nig. Cult. Studies

Centre for Adult Education

Centre for Educ. Techn.

Centre for Soc. & Econ. Res.

Computer Centre

Central Administration

Student Services

University Services

2. Agricultural Campus, Samaru

Faculty of Agriculture

Inst. for Agric. Research

Agric. Ext. and Research Liaison Service

Division of Agriculture College

College of Agriculture (Samaru)

Agricultural Engineering (Fac. of Eng.)

Estate Dept. HQ

Student Services

3. Administration Campus, Zaria

Faculty of Administration

Faculty of Law

Centre for Islamic Legal Studies

Institute of Administration (Gen.)

University Services

4. Faculty of Medicine (clinical), Zaria

5. Inst. of Health, Zaria

6. National Animal Prod. Unit, Shika

7. Advanced Teachers' College, Zaria

8. Advanced Teachers' College, Kano

9. Division of Agriculture College, Bakura

10. Division of Agriculture College, Kabba

11. Div. of Agriculture Coll. Kaduna

12. Institute of Health, Kaduna

13. Institute of Health, Kano

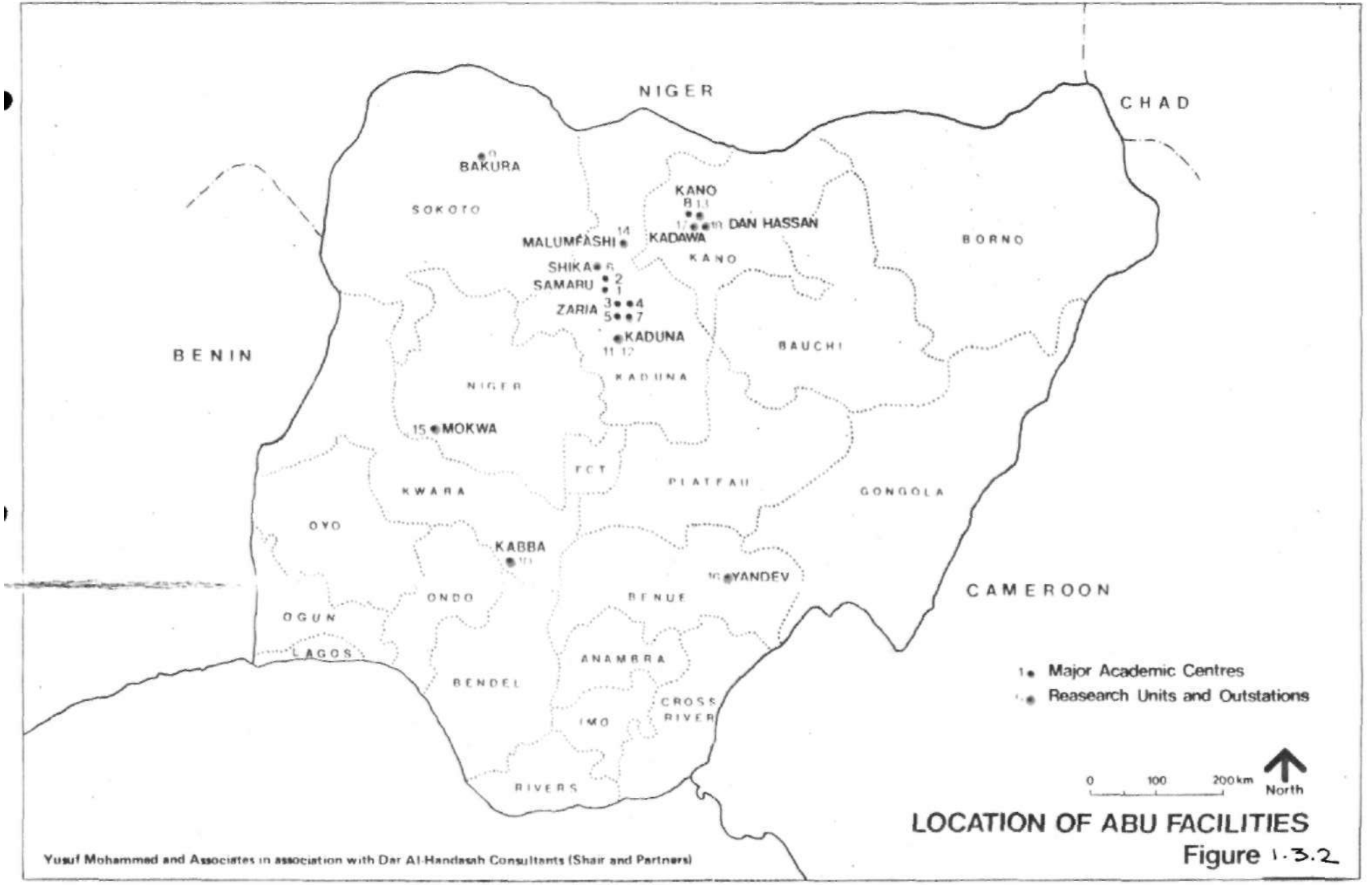
14. Institute of Health, Malumfashi

15. Institute for Agric. Research, Mokwa

16. Institute for Agric. Research, Yandev

17. Institute for Agric. Research, Kadawa

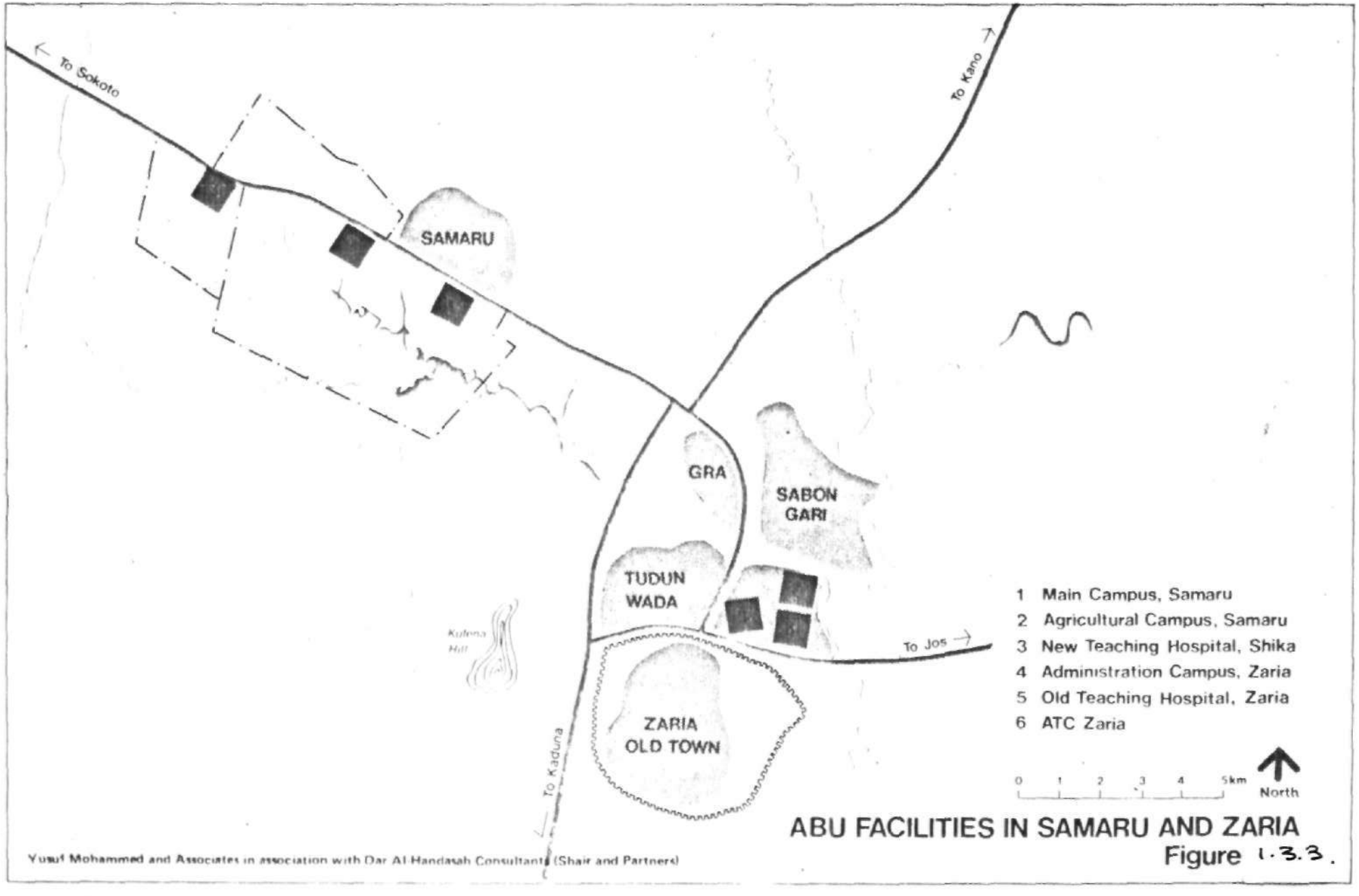
18. Institute for Agric. Res., Dan Hassan



LOCATION OF ABU FACILITIES

Figure 1.3.2

Yusuf Mohammad and Associates in association with Dar Al-Handasah Consultants (Shair and Partners)



Yusuf Mohammed and Associates in association with Dar Al Handasah Consultants (Shair and Partners)

ABU FACILITIES IN SAMARU AND ZARIA

Figure 1.3.3.

1.3.3 Location of Main Campus, Ahmadu Bello University

Zaria town is situated at a latitude 10°10' North and longitude 7o 38' East. The town is almost centrally located in Northern Nigeria and is well connected by roads and rail with other regions of the country and with state capitals. Distances from Kaduna, Kano, Jos and Sokoto are 78km, 240km, 387km respectively.

The main campus itself is located in Samaru 15km from Zaria Old City. The Institute of Agricultural Research and New Teaching Hospital are situated in adjacent areas along the Zaria-Sokoto highway. The main campus lies on an elevated plain at an altitude of 670metres, above mean sea level. The plain is gently sloping down towards Kubani River and is cut by numerous valleys and streams. These streams are generally widely spaced with virtually gullied banks and marshy alluviated beds.

1.3.4 Geology:

The campus area is largely underlain by indifferentiated Pre cambrian Basement complex formations, and comprise of both Igneous and metamorphic rocks. The Igneous rocks are mainly Biotite Gneisses and older Granites, while metamorphic sediments include Quartzites and schists found mainly in stream valleys. Alluxial deposits of laterite overlie most of the area.

...

1.3.5 Soil:

The soil is part of the "Zaria Soil Group" which is known to have covering material of up to 14 feet in depth. The soil material consists of several feet of doposited silty sand overlying sedimentry decomposed rock. Most of the soils allow good moisture retension due to their high proportion of clay content and hence cannot sustain intensive agriculture for long periods without the use of fertilizers. The Alluvial soil occuring in low lying area adjacent to Kubani River are used for cultivation of sugar-cane and vegetables.

The bearing Capacity of the main campus soils varies signiticantly from place to place and is strongly affected by the fluctuation of the ground water level. Therefore it is recommended to carry out full scale soil investigation for each new construction located within the campus area.

1.3.6 Water Systems

Zaria area including the main campus is part of an important watershed that divides Sokoto and the chad basins. From this watershed numerous rivers and streams flow out in radical pattern and this include Kubani River. During the dry season however, Kubani river contains only small dis - continuous pools, along its course. The main source of water for human consumption are the rainfalls. Therefore, the dam on the Kubani River and water reservoir have been built to store water for A.B.U.

1.3.7. Climate:

Oweing to its location on the elevated plateau, Zaria enjoys reasonable good tropical savanna climate with distinct wet and dry seasons. During the dry season the dust-laden harmattan winds blow from the North East straight from the Sahara regions. From May to October the prevailing rain bearing winds blow from the South-West.

The daily mean maximum temperature is as high as $38^{o}c$ in April and as low as $10^{o}c$ in December and January.

The mean annual rainfall in Zaria region is 1100 mm. The relative humidity is very low during the dry season and changes greatly in August when monthly mean humidity goes up to over 85% . More detailed information can be obtained in chapter 4.

1.4. Students Accommodation in A.B.U.

Population wise the Ahmadu Bello University is the largest in west Africa with a population of 20, 169+. Table 1.4. shows the populations from the time of the Universities inception to the projected year 1995.
On the main campus, Samaru there are eight (8) halls of residence namely.

(i) Akenzue-Male/Female-232 Double rooms(40 female/192male)
(ii) Alexander- Male-264 Triple rooms/175 singlerooms
(iii) Amina- Female -180 single rooms/288 doublerooms/20triple rooms
(iv) [illegible] Hall
(v) [illegible] ,243 [illegible]
(vi) [illegible] Double rooms [illegible] rooms
(vii) [illegible] - Male - [illegible] rooms/72 [illegible] rooms

(iv) Ribadu-Male-part of Alexander hall

(v) Umar Suleiman[x]- Male-480 Double rooms/283 single rooms

(vi) Ramat -male-276 Double rooms/24 triple rooms

(vii) I.C.S.A. - Male-100 Double rooms/72 triple rooms

(viii) Danfodio-male-168 triple rooms/260 double rooms

On the "Kongo" Campus all hostel blocks both male and female fall under the common appellation, Tafawa Balewa Hall[xx] while in the Medical campus in Tudun Wada, Zaria , the hall is know as the Barau Dikko Hall. Other research or teaching units also in most cases have one form of hostel accommodation or the other, usually the block nomenclature system is employed in these cases e.g. Block "A" or Block one e.tc.

Footnotes:-

xx- This includes Sandauna, Bedde, Hostels 1,2,3&4 blocks

x- Halls that accommodate p.g. students (in single rooms)

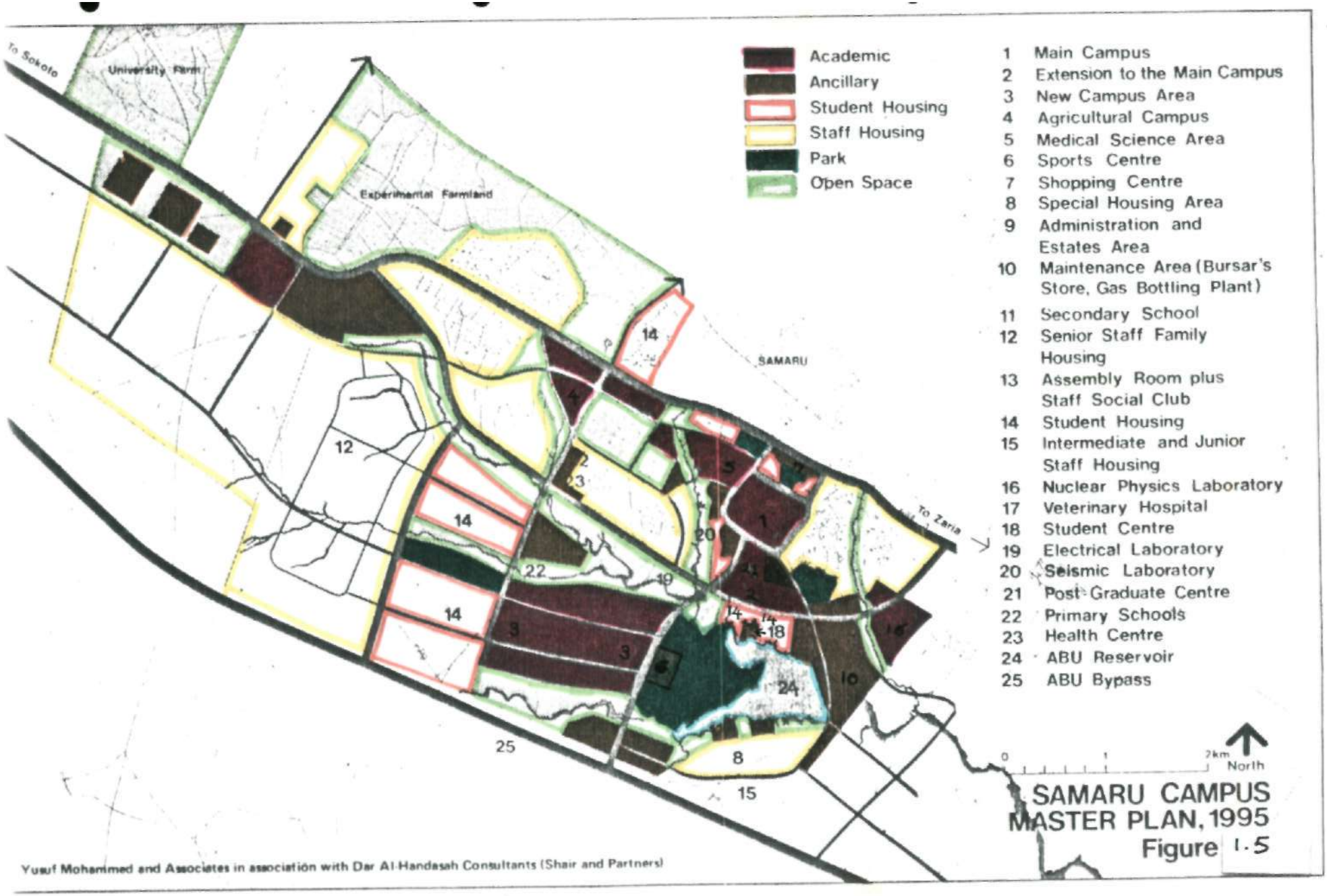
TABLE - 1.4

Summary of Student Population for the Eleven Faculties and School of Basic Studies(S.B.S.) 1962/63 - 1994/95

SESSION	STUDENT ENROLMENT
1962/63	425
1963/64	558
1964/65	719
1965/66	956
1966/67	914
1967/68	1,366
1968/69	1,745
*1969/70	2,351
1970/71	2,820
1971/72	3,840
1972/73	5,052
1973/74	6,050
1974/75	6,739
1975/76	7,651
1976/77	7,321
1977/78	7,327
1978/79	7,672
1979/80	8,419
1980/81	9,382
1981/82	10,478

1982/83	11,973
1983/84	13,690
1984/85	15,667
1980/90	20,024
1994/95	29,351

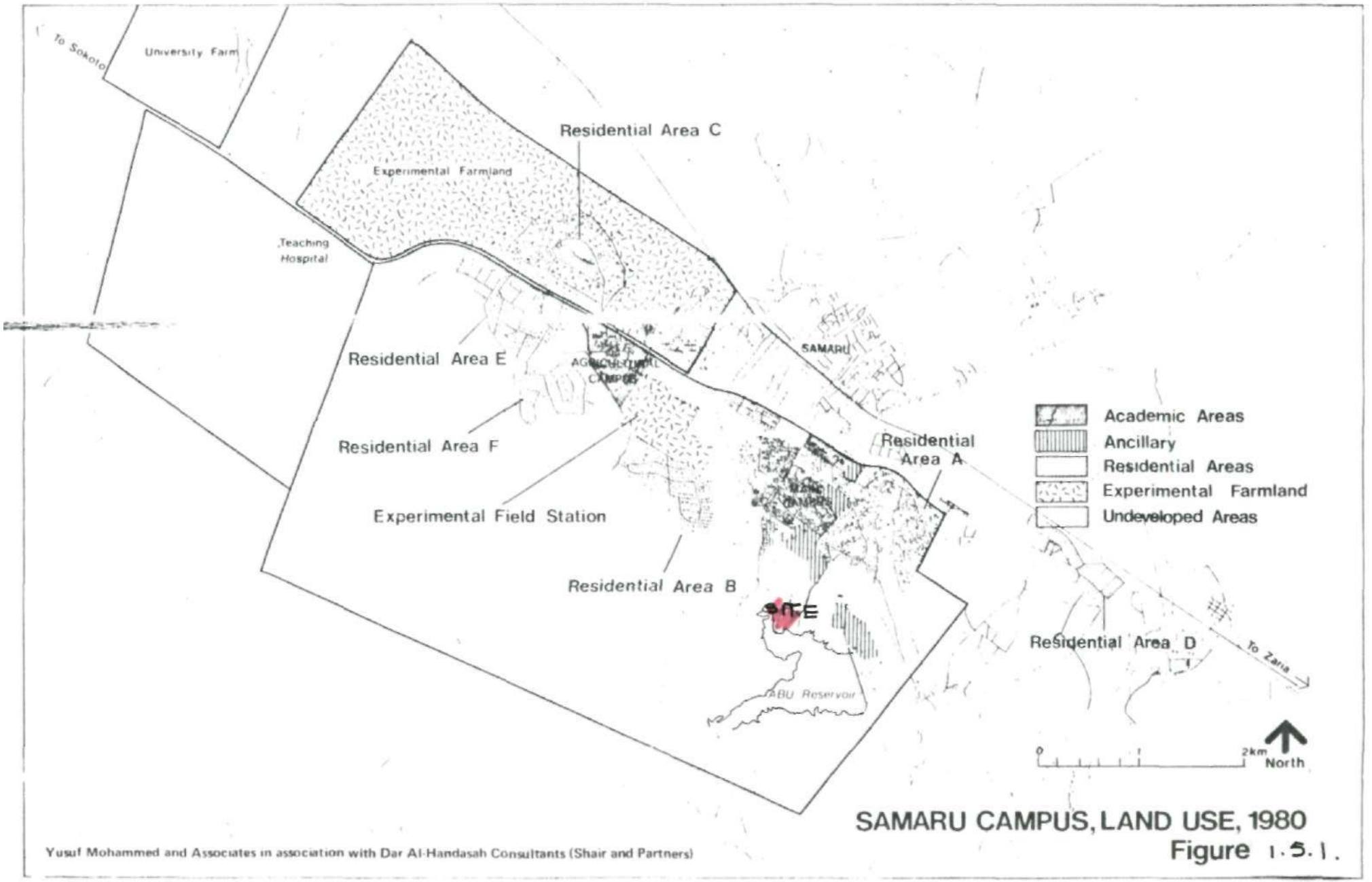
*S.B.S. Created.



SAMARU CAMPUS MASTER PLAN, 1995

Figure 1.5

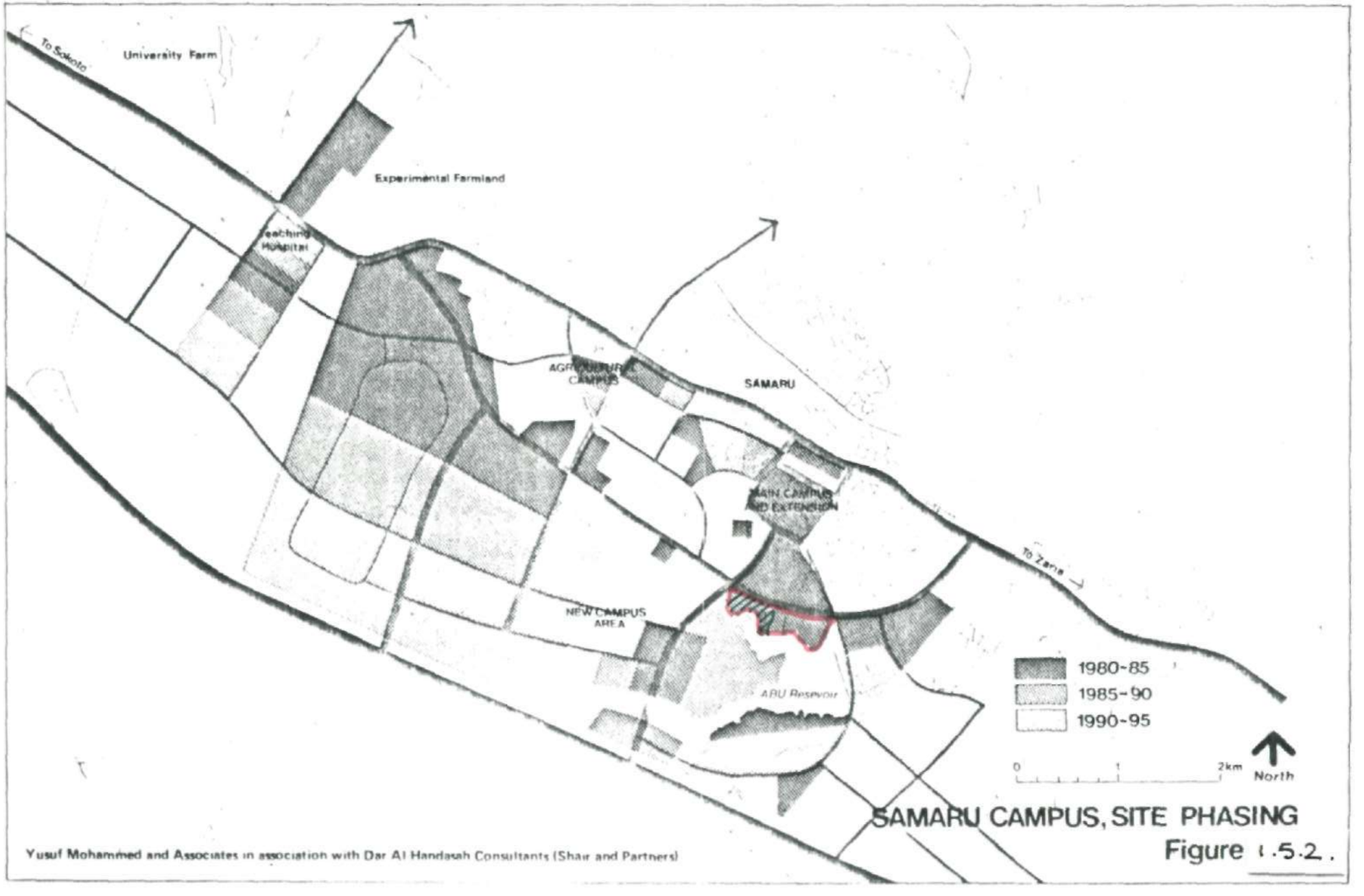
Yusuf Mohammed and Associates in association with Dar Al-Handasah Consultants (Shair and Partners)



SAMARU CAMPUS, LAND USE, 1980

Figure 1.5.1.

Yusuf Mohammed and Associates in association with Dar Al-Handasah Consultants (Shair and Partners)



SAMARU CAMPUS, SITE PHASING

Figure 1.5.2.

Yusuf Mohammed and Associates in association with Dar Al Handasah Consultants (Shaw and Partners)

1.5. Future Proposals for student Accommodation on A.B.U. Main Capus:

The master plan of A.B.U. proposes to accommodate up to 100% of students enrolled in the Samaru Campus (i.e.30, 565beds) Two new areas are planned immediately to the West of the "New Campus area", and which should be developed around a part and sports field in the later programme. The 1981-85 proposals include an additional student housing area next to the "Extension to the main Campus Area", which could be constructed quickly and would be more convenient to students in the early plan phasing. Although certain student halls are temporary buildings, no demolition should take place during the 1981-85 development programme. These areas can be seen on the A.B.U. master plan fig---

1.6. Post-Graduate Accommodation in A.B.U. Main Campus.

The Ahmadu Bello University ofers accommodation facilities to post-graduate students in three (3) halls of residence. Common to all three is, the accommodating of both post-graduate, undergraduate and pre-degree students in the same hostel blocks.

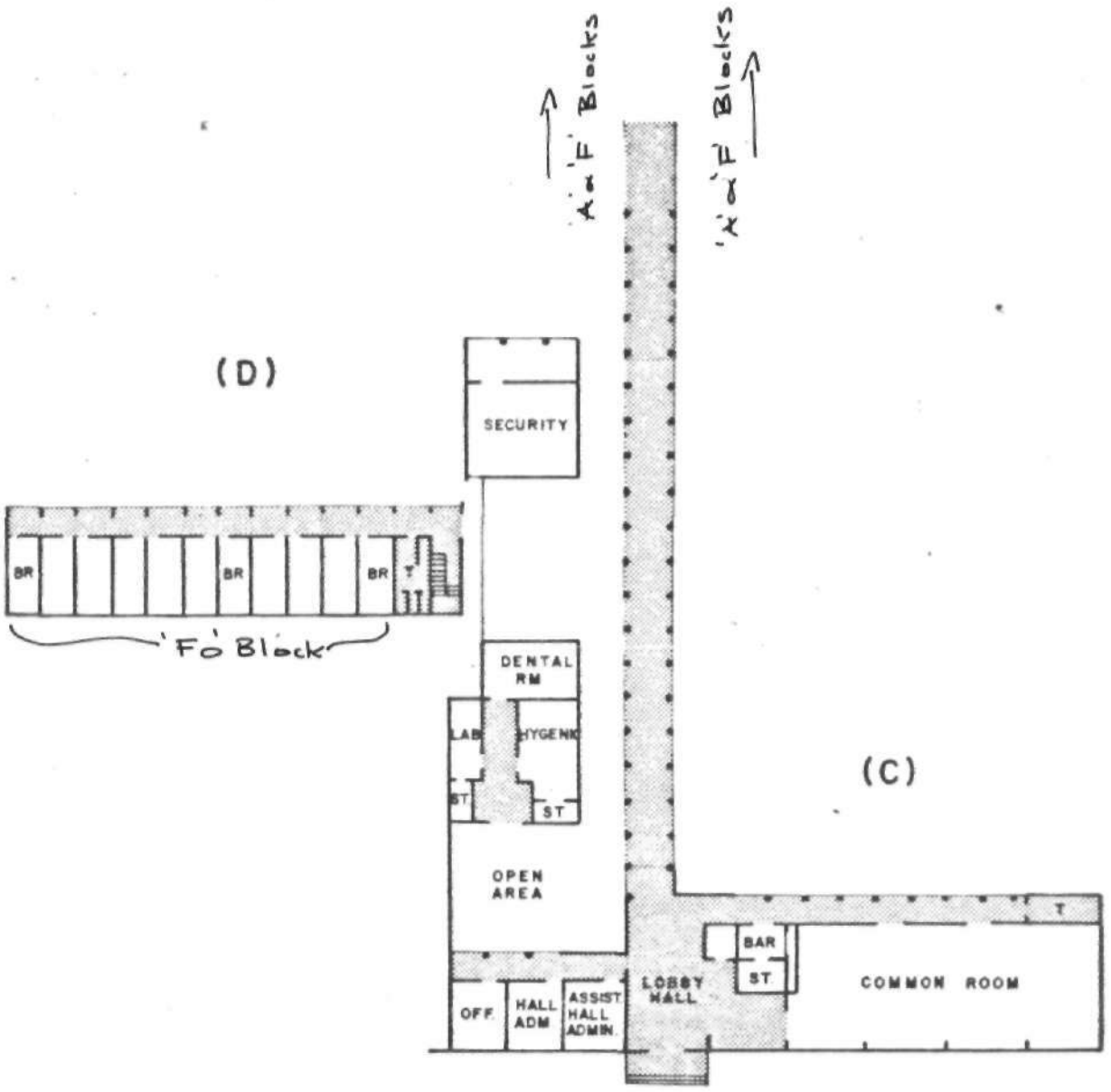
The various halls are as follows:

(1) Umar Suleiman Hall (Male only)

In this case there are three different types of blocks for accommodation.

(a) The"FO block", which is a single block of three (3) floors, each floor having eleven (11) single rooms arranged in a row. Bathroom and toilet facilities are placed at one end close to the staircase. This gives a total of thirty-three (33) rooms.

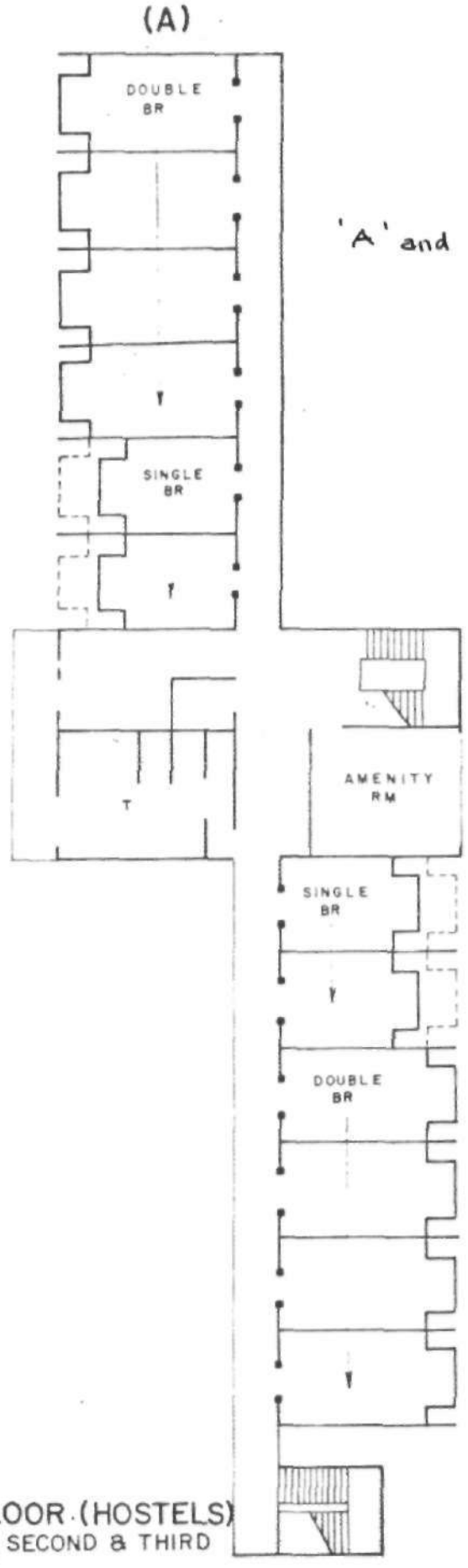
HOSTELS - SULEIMAN HALL Fig 1.6.1.1.



GROUND FLOOR PLAN
SCALE 1/400

Fig 1.6.1.2.

HOSTELS - AMINA HALL / SULEIMAN HALL



TYPICAL FLOOR (HOSTELS)
GROUND, FIRST, SECOND & THIRD FLOOR PLANS
SCALE 1/200

(b) The "A" and 'F' blocks which constitute the majority of block types in the hall. 'A' and'F' blocks are identical in design and differ only in nomenclature. 'A blocks'total at nine (9) while 'F blocks total at six (6) bringing a grand total of fiteen (15). Each block comprises of four(4) floors consisting of twelve (12) rooms per floor. Utilities including three(3) toilets, tow showers, a laundry with two sinks, three ironing slabs and drying area of approximately $5m^2$, and staircase are placed in the middle. Thus six(6) rooms are placed on each side of the utility rooms. The first two rooms on each side are of smaller floor area than the remaining four on each side and these are allocated to post-graduate students as single rooms, while the others serve as double rooms for undergradaute students.

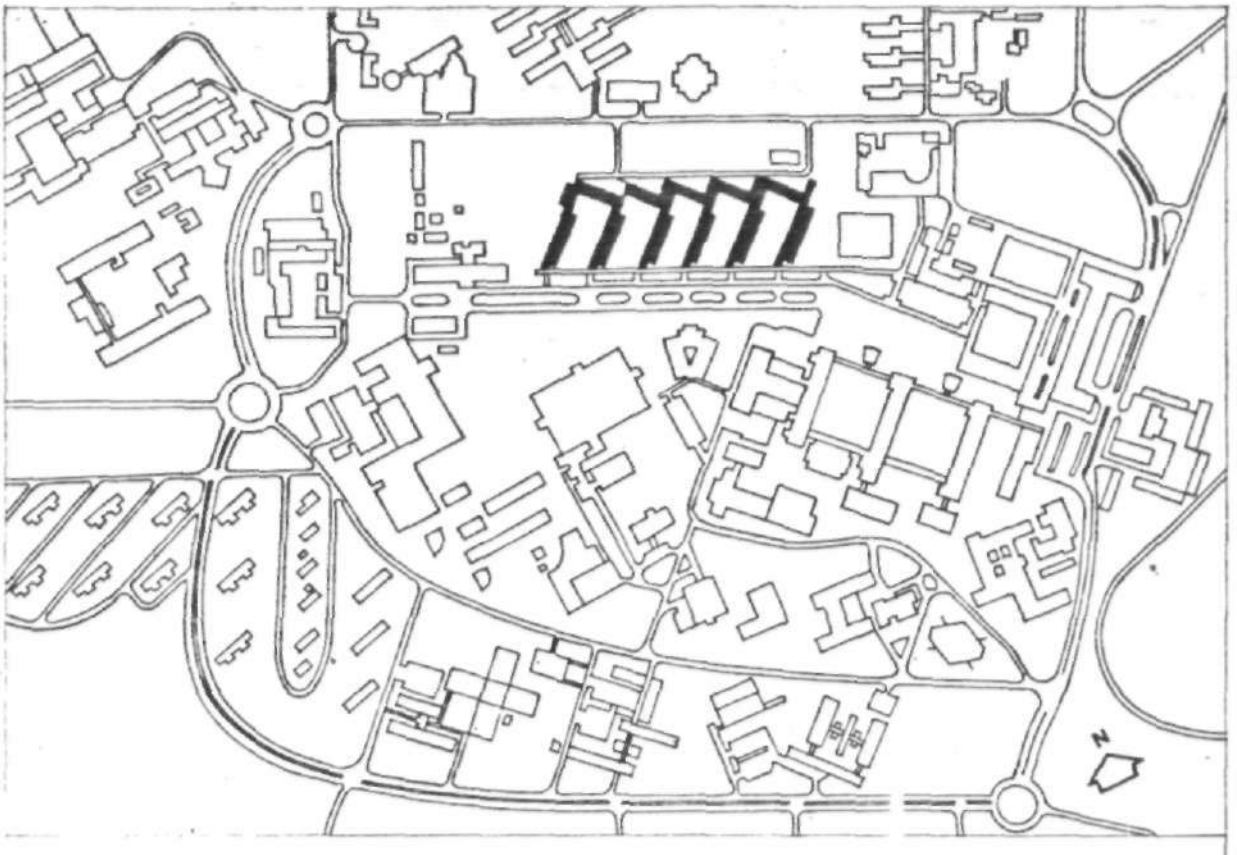
Thus for every block there are sixteen(16) single rooms for post-graduate students, which gives a total of 240 rooms for all fifteen (15) blocks.

(c) The cappa block, which is nothing more than a ten(10) room bungalow. All rooms are single.

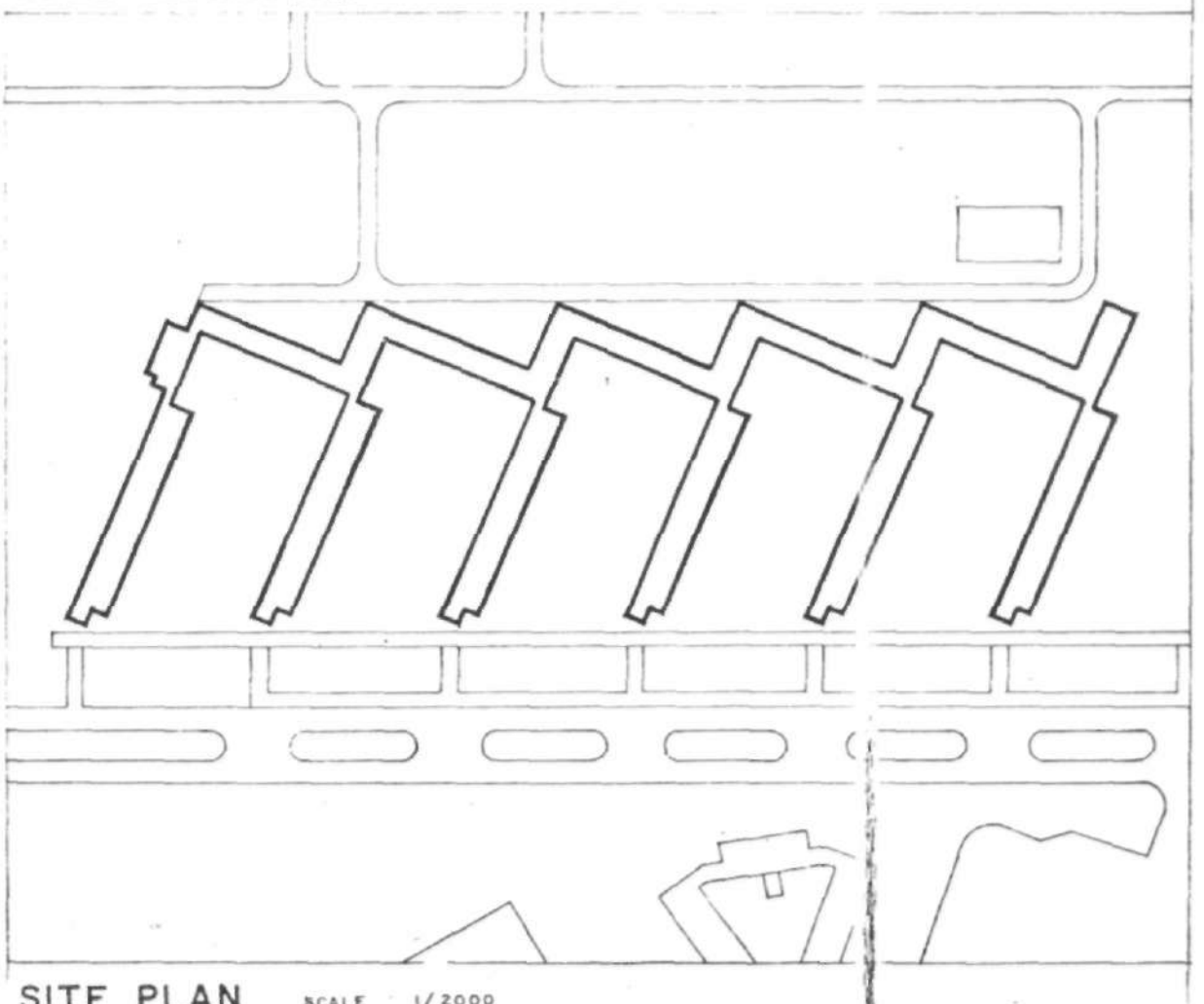
Addition brings the grand total of rooms provided for post-graduate students in Suleiman hall to 283.

(2) Alexander/Ribadu Hall (Male only)

In this case the hall comprises of two types of differently designed hostel blocks.



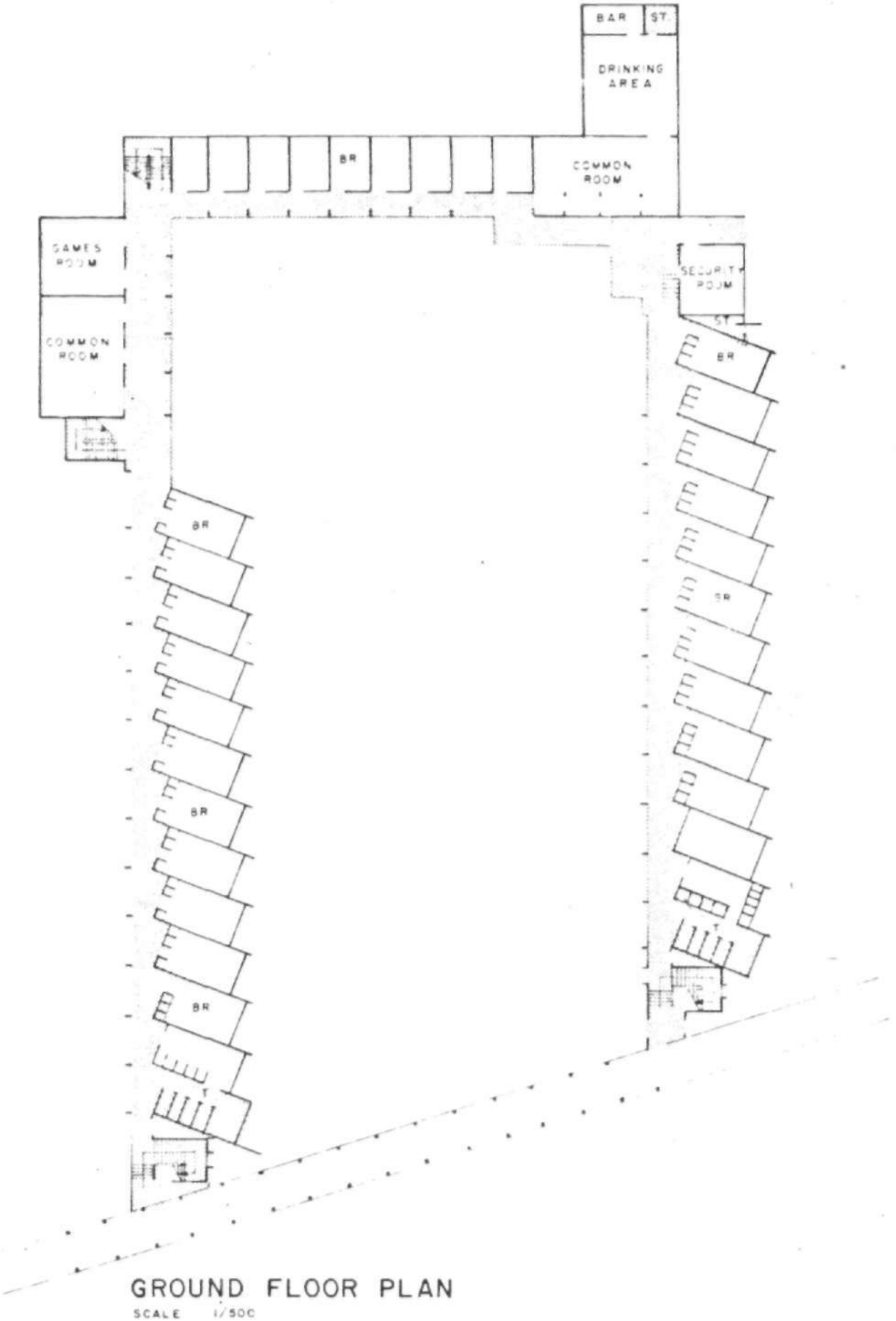
SITE LOCATION SCALE 1/6000



SITE PLAN SCALE 1/2000

ABU MASTER PLAN ZARIA – NIGERIA N8011 – July 1980

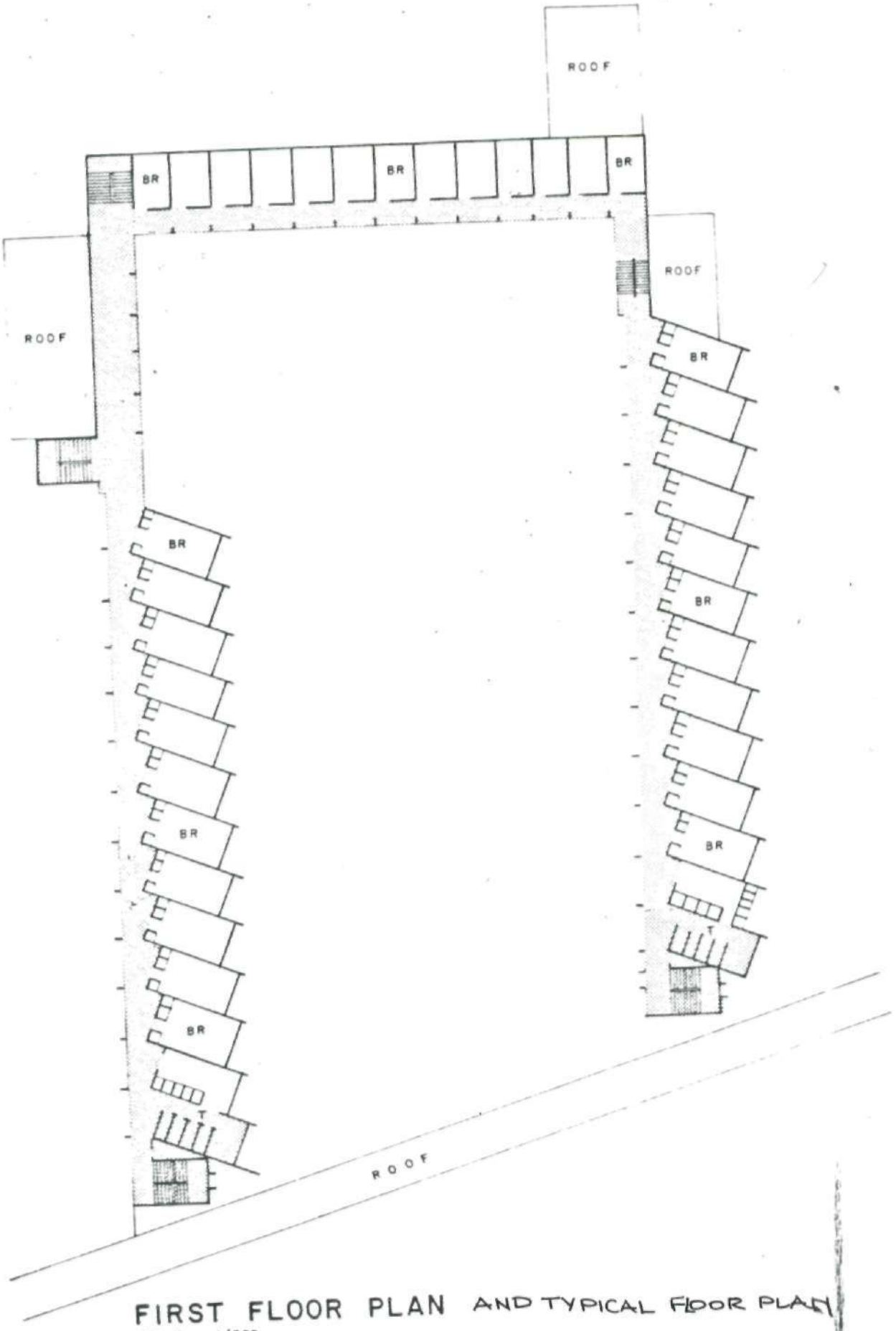
ALEXANDER HALL Fig 1.6.2.2.



GROUND FLOOR PLAN

SCALE 1/500

ALEXANDER HALL Fig. 1.6.2.3



FIRST FLOOR PLAN AND TYPICAL FLOOR PLAN

SCALE 1/500

(a) 6 paralled blocks each having four (4) floors and eelven (11) triple rooms per floor, these rooms are for the undergraduate and Pre-degree students.

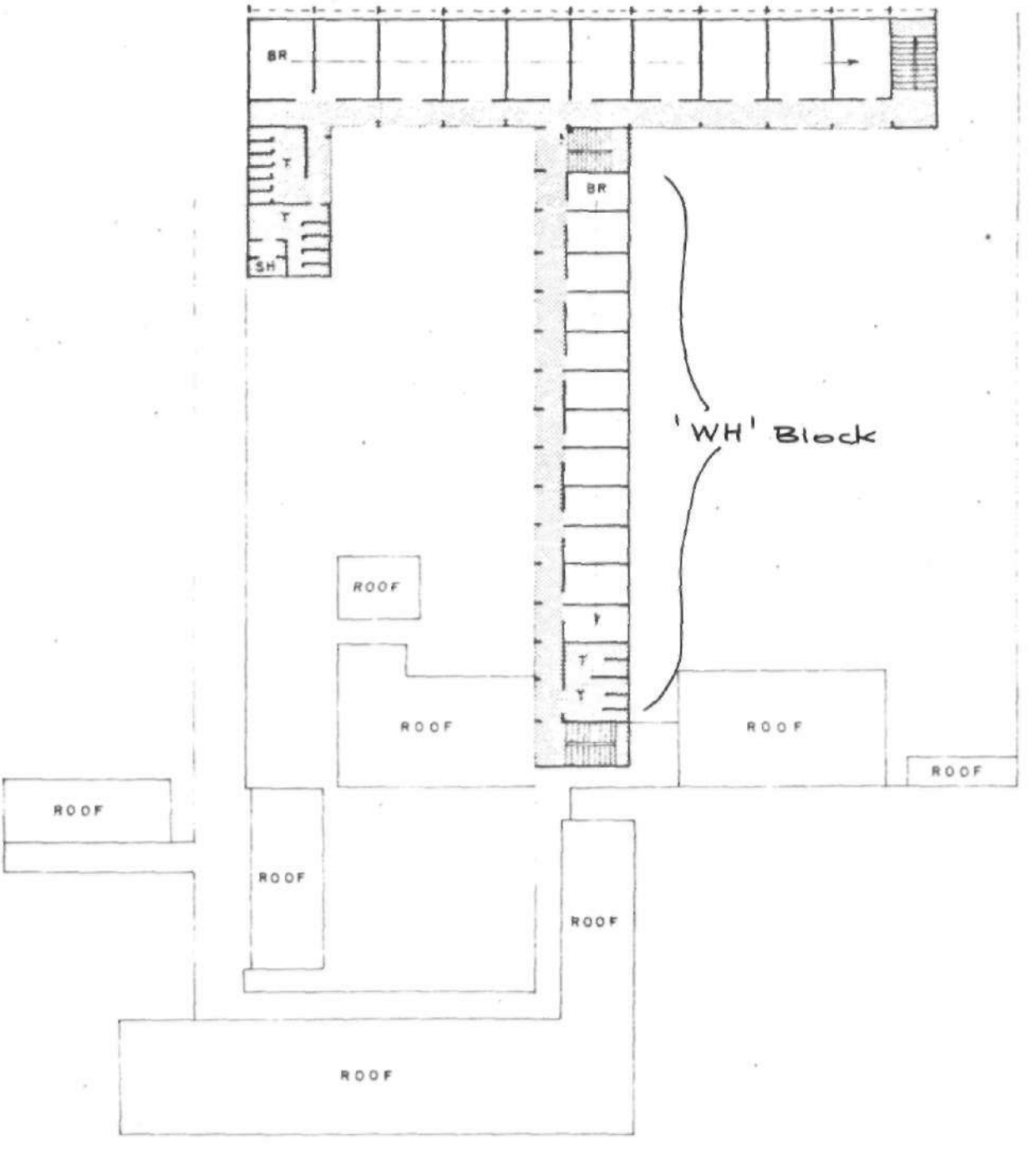
(b) 5 'Link' blocks which form links between the 6 paralled blocks and are actually of very similar design to the FO block mentioned earlier in the case of Suleiman Hall. However though having three floors also the number of rooms per floor differs. The ground floor has nine (9) single rooms and a common room while the two upper floors consist of thirteen (13) single rooms. This gives a total of 175 rooms. However in recent years, to meet the rising demand for undergraduate accommodation the ground and second floors of these hostel blocks have been allocated to undergraduate students while the first floor remains for post-graduate students. It is hoped when extra undergraduate accommodation is provided, postgraduate students will move back into them as the rooms are really far to small to accommodate two (2) students conveniently and what usually happens is that one student has to steep on the floor as their is hardly any space to accommodate an extra metal bed frame which A.B.U. provides its students.

(3) Amina Hall (Female only)

In this case there are two different types of blocks for accommodation.

HOSTELS - AMINA HALL Fig 1.6.3.1.

(C)



FIRST FLOOR PLAN AND TYPICAL FLOOR PLAN.

SCALE : 1/400

(a) The 'A' blocks, which are identical to the 'A' and 'F' blocks in Umar Suleiman hall in design. A blocks in Amina hall total at nine (9), thus giving a total of 144 rooms designed for post-graduate students.

(b) The womens Hostel (WH) block.

In this case the design is also identical to the to block of Suleiman Hall, the only difference also lies with the number of rooms per floor which in this case totals at twelve (12) Thus bringing the number to 36 rooms for the whole block of three floors.

Thus for Amina Hall the total number of rooms designed for post-graduate student totals at 180.

Combining all three Halls, the total number of rooms designed for post-graduate students totals at 638.

This number catered very well in the past in the accommodating of post-graduate students whose population in the 1978/80 session stood at 694† (635 men, 59 women) but with the present trend where great increases in

the 1981/82 session the number stood at 1048 and the 1982/83 session number is estimated at approximately 1,500[xx]. These high increases are attibuted to the present poor economy of the country, where fresh graduates find good jobs or even the possibility of securing a job extremely difficult and therefore return to School to persue a higher

† - Figure for students registered in the 11 Faculties only.

degree with the hope of standing a better chance armed with it. The A. B. U. Master plan preducts the number to be 6649 in 1995 and of this number 5096 will be on the main campus alone. Thus if the present trend of accommodation system is to be enyoloyed the University will have to provide at least ten (10) times the present accommodation facilities in order to accommodate all post-graduate students. In its plan to accommodate up to 100% of students on the Samaru main campus. This of course is highly unpracticable as the student population is expected to sie to only about 2½ time from its present population of 11,973* to 29,351*. With this in view a logical solution would be to provide seperate post-graduate accommodation facilities hence a post-graduate hall.

1.7.

The post-graduate student.

With the mode of approach to the design it is necessary to aquaint readers with the groups of people in question.

The post-graduate student is one who on obtaining a first degree (e.g. B.Sc.,BA etc.) returns to University to aquire a higher degree.(e.g. M.Sc.MA etc). Post Graduate students can be subdiuided into three categories

(1) Those who on obtaining their first degrees proceed immediately without a break to aquire a higher degree. (e.g. Architecture)

x- Figure obtained from Nigerian Universities commission (NUC)
xx- Figure obtained from post-graduate School A.B.U.
*- Figure for students registered in the 11 faculties only.

(2) Those who on obtaining their first degrees proceed to undertake the one calender year National Yourth Service Corps (N.Y.S.C) Scheme and on completion return immediately to University to pursue a higher degree.

(3) Those who on going through the stages of obtaining their first degrees and completing the N.Y.S.C. scheme opt to work in the field for a number of years before finally deciding to return to University for a higher degree.

The usual phenomenom associated with these there categories on aquiring first degree is the feeling of achievement bringing about the induviduals readiness to 'start life'; such things as getting married and starting to raise a family, being common occurence. This is a noticable distinction between post-graduate students and their undergraduate and pre-degree counter-parts.

An example of this can be observed in the Department of Architecture (1983) where observations from students files show that not a single undergraduate was married whereas in the case of post-graduates a noticable change in trend was observed. This shows that whereby several post-graduates whom other wise during their undergraduate days were single have in the course of completion become married men. This shows the degree of maturity the 'induvidual has attained to accept the responsibilities of raising a family. This feeling of maturity does not rest solely with the student

alone, the University authority also recognises it to the extent that quite a number of post-graduate students are employed as lecturers and graduates assistants to impart their knowledge on the up and coming under graduates through various teaching methods. In this respect one arquement for the justification of a proposed post-graduate have would be in the maintaining of respect for authority between the students and lecturers which is not fully guaranteed when both parties are able to have a deep insight into the private and personal lives of each other broughtabout being housed under the same roof.

Another aspect of importance in this arguement is the academic life-slyles of postgraduates as against undergraduates. More often than not the undergraduate academic programme is based almost entirely on coursework with the usual termly or sessional exams on the other hand however course work mau or may not be an intergral part of a postgrauates academic programme but more so (it is mainly based) on induvidual research carried out with minimum supervision. This results in clashes of interst, for when the undergraduate finishes lectures and comes back to residence to let off steam the post-graduate student is trying to work but finds it extremely difficult with all the boistrous activities going around him. due to the fact that he is in the same hall, block.

From all said above it can be seen that not only is it required to have a seperate hall of residence for post-graduate students but the induvidual units themselves should be designed based on the needs and desires of users.

1.8. Choice of Site:

The Ahmadu Bello University has the main campus samaru as the Administrative centre and nine(9) of the eleven (11) faculties are situated here, thus in logic the main campus should be the site of the proposed post-graduate hall. This has also been proposed in the A. B.U. master plan 1980-1995 which states that "Additional post-graduate housing could be developed as part of the student housing project adjacent to "the Extension to the main campus". Thus the choice of site was greatly influenced by points enumerated above. Reasons for the choice of site are:

(a) Proximity to the campus Academic facilities with the extension to the main campus in mind the proposed post-graduate hall will be within close proximity to campus academic facilities thus saving time for students to reach their destinations on campus. Also to the existing main campus core the distance falls within a region of only one kilometre a distance of approximately 10-15 minutes walk.

(b) The presence of large water body (ie. ABU reservoir (Kubani lake) which will induce a pleasant microclimate around the site all the year round. Also the recreational potential of the site similar to all sites which border large water bodies, the possibilities for boating, fishing are a strong asset.

(c) Promimity to the new student centre.

The new student centre which occupies the area east of the site has great advantages for the site. Facilities of the student centre can be semi intergrated to those of the post-graduate hall and secondly its, location will allow for intermingling of post-graduate students with their undergraduate and pre-degree counter parts when desirable.

(d) The good views of the site to the lake and the Kufena hill approximately 6 km south east from the site. The view is extremely beautiful especially when observed in the late evening sun.

(e) Proximity to proposed Auditorium and Assembly hall, Convocation stadium, sports centre and swimming complex (1980-1995 master plan)

The site chosen is the nearest tothesc three facilities which are located south west across the reservoir from the site, and are easily accessible by the road which cuts accross the one that divides the extension to the main campus from the areas allocated to student's housing.

With all ennumerated above it can be seem that the site choice is justificable. The possibilities of recration influenced by the reservoir and student centre, the excellent views of the reservoir and Kufena hill accross the lake, the proximity and central location to all mentioned facilities support this fact to the highest optimum.

CHAPTER TWO

CASE STUDIES

2.1. Introduction

During the course of such research it becomes necessary to aquaint aneself with existing examples of buildings with similar programme to those which have to be designed.

These are referred to as case studies and for the purpose of this thesis the following have been taken from the various listed Nigerian universities

(i) Tafawa Balewa Hall - University of Ibadan

(ii) New Post-Graduate Hall- University of Ibadan

(iii) Kwarne Nkrumah Hall- University of Nigeria,Enugu Campus.

(iv) Nkrumah Hall-University of Nigeria,Nsukka Campus

(v) Post Graduate Hall- University of Ife.

Three additional case studies from foreign universities have also beenadded to the chapter they are:

(i) Womens residence- University of Pennsyluania

(ii) University hostels, urbino, Italy

(iii) Mcmohon hall- University of Washington

2.2.

2.2.

Case Studies of Post-graduate Halls in Nigerian Universities

The University of Ibadan-Tafawa Balewa Hall (Case Studies No.1.)

The Tafawa Balewa Hall comprises of five (5) blocks (A,B,C,D,E) linked together by covered walkways on the ground floor. In addition to this there is also a dinning hall which can sit 230 students at one time, and has adjoined to it a bar/buffet. There is also a large circular common room centrally located and a games room which is situated on the ground floor of the entrance block A.

Three(3) of the five (5) blocks are of identical design and are occupied by male post-graduate students only. While the other two (blocks A &E) are some what similar, but with certain variations and accommodate the female Post-graduate students only.

Hostel Block Type I (Blocks B,C,D,)

These three (3) blocks are of identical design. Each comprises of 3 floors, with 14 rooms arranged in one line along a corridor on each floor. This gives a total of 42 rooms per block. Staircases and utitily rooms are situated at both ends of each block. Utilities on each side comprise of, a kitchenette which condtains three (3) sinks and work-top which is a continuous concrete slab around three (3) sides of the room; and a wash room which contains two (2) W/C's, two showers, and one wash hand basin.

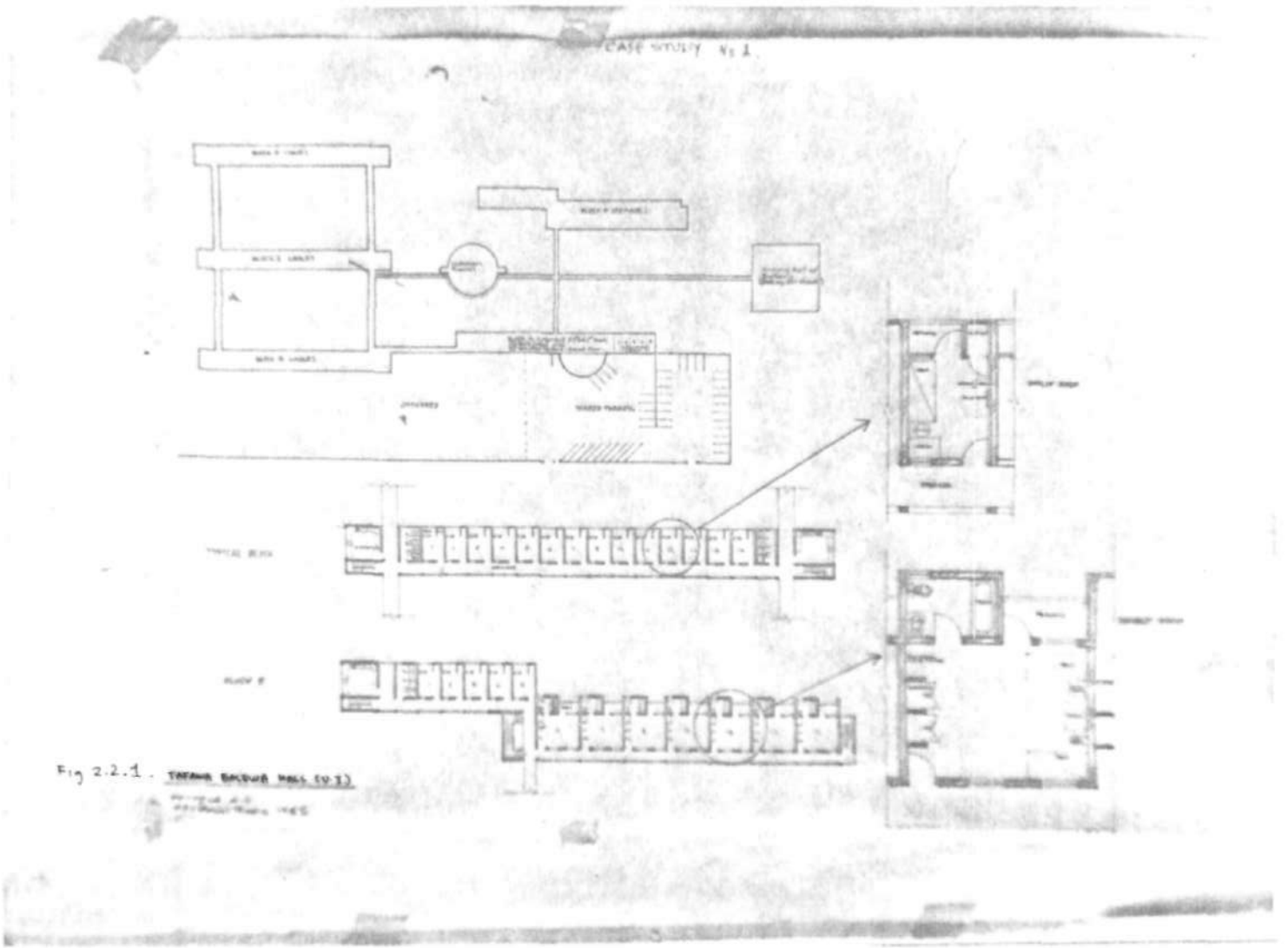


Fig 2.2.1. TATARA BALOUR HALL (U.S.)

Room Types

All rooms in these blocks are single rooms. They are all quite smal approximately and each has a built in cupboard, projecting outwards. The recess formed by so doing is used to create a small private balcony for each room. Thus each balcony is seperated from the next by an adjacent cupboard. Standardfurniture in each room includes a small metal bed, a wooden table, chair, towel rack and book shelf, the two latter being suspended to the right hand side wall of the room. Major complaint and disadvantage is the small size of the room. The reason may be that the University of Ibadan does not offer courses like architecture. A student of such a discipline would hardly find enough space for his or her drawing board in it. However the inclusion of the private balcony, though small is quite advantageous as it could be used as a resting area during periods of excessive heat.

Hostel block type 2 (Block A)

This block is of identical design to the forementioned type on the first and second floors, however the ground floor is reserved for offices, porters lodge/reception, games room and some parking facilities. The reason is that it serves as the entrance block to the hall. Complex. Another variation is the extensive seceening of the corridors on the front facade non existent in all other blocks. This ensures privacy for the female students resident here.

This [illegible] for the first [illegible].

Room Types:

as mentioned earlier the design of the rooms on the first and second floors is identical to the previous example, however due to the absence of rooms on the ground floor the number of rooms in this block totals at only 28.

Hostel Block Type 3 (Block F)

This hostel block has half being of identical design to the first example, however the other half which is seperated by a bent corridor and staircase, is of a different concept. In this block there are twelve rooms on each of the three (3) floors. The first five rooms on each floor as stated before are of identical design to the first example, however the remaining seven rooms are double rooms. Thus rooms 1-5, 13-17 and 25-29 are single rooms while rooms 6-12 18-24 and 30-36 are double rooms.

Room Types

The single rooms are of identical design to the first example.

The double rooms however are quite interesting. They are "self contained", that is to say the rooms have conveniences placed right inside the room. The convenience rooms consist of a bath-tub toilet and sink, the convenience rooms are designed so that they from a projection outwards from the main room. The recess formed by the convenience room is used to create a balcony for each room.

Two large cupboards project inwards to the room on the left hand side wall. The recess created on the right hand side of the cupboards has been used to create a small "Kitchenette" and this is actually a concrete work-top and shelf. Most female students occupying these rooms feel that this is the ideal arrangement, however the problem of induvidual privacy when so desired was also voiced out. It was however understood that they were initially designed for married post-graduate students who wished to reside on campus with members of their families.

Case Study No.2

The University of Ibadan-New Post-graduate Hall, Students Village

To meet the increasing numbers of students in the Unversity of Ibadan the University Authorities decided to build what is termed as a "Student Village" deep into the heart of the campus. The student village is designed to cater for the accommodation needs of both Post-graduate and undergraduate students. A number of multistorey blocks arranged in a 'c' shape have been constructed for this purpose. One of such type 'c' shaped blocks has been allocated to post-graduate students. It is however interesting to note that the design of the rooms in the undergraduate type differs from that of the post-graduate. In a nutshell the rooms for the undergraduate type are all double, while on the other hand the post-graduate type has single rooms,

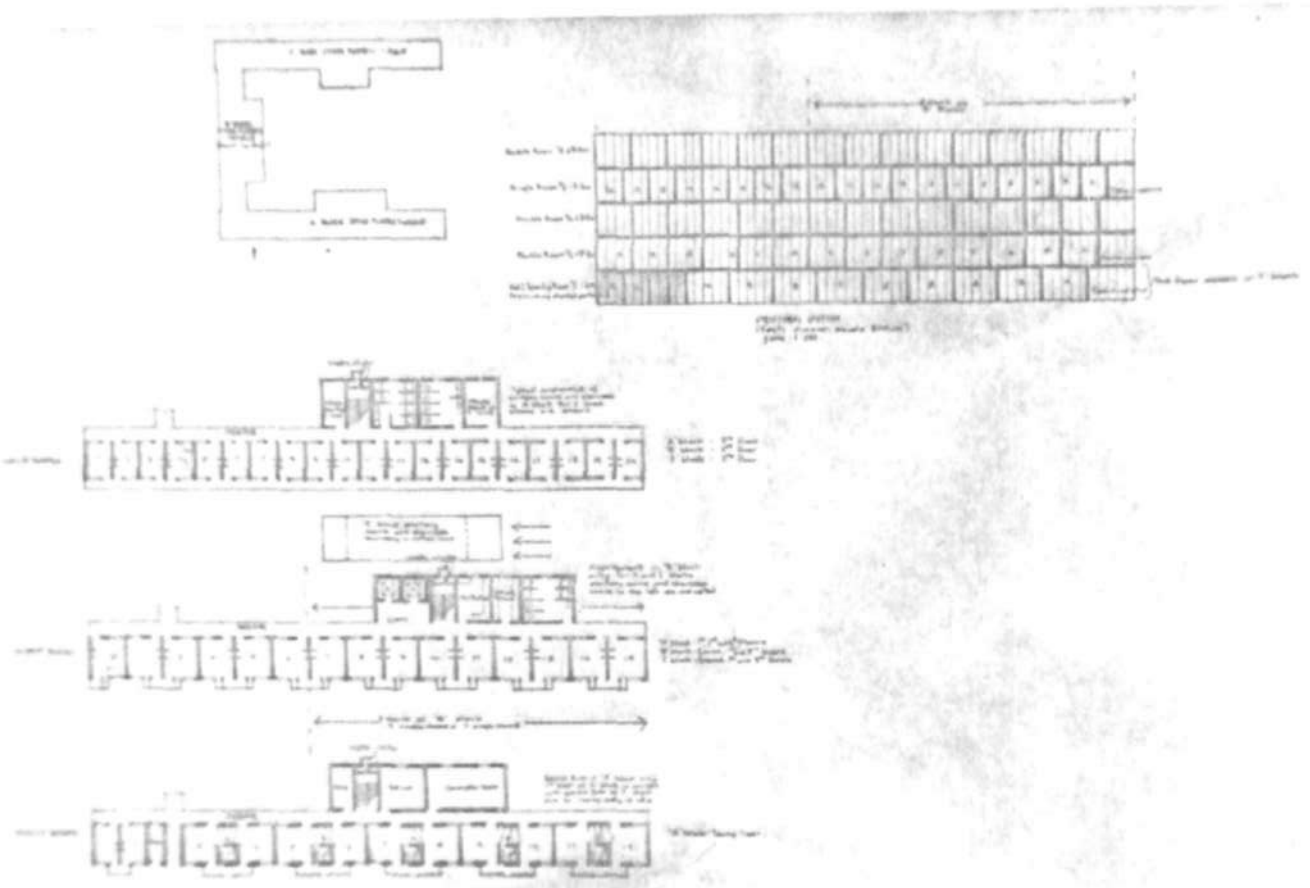


Fig 2.2.2.

double rooms and what could be termed as "family rooms. Double rooms in both post-graduate and undrgraduate halls are identical and this room type will be elaborated on later.

The post-graduate hall as mentioned earlier takes on a 'c' shape, each of the three arms of the "c" being a seperate block namely 'A', 'B' and 'C'which are connected on all floors. Blocks 'A' and 'C' are for male post-graduate students only.while block 'B' has all floor except the top floor, reserved for female students, the top floor being for male. It is also interesting to note that waste chutes have been provided in all blocks, and are situated on the rear wall of the three walls which encompass the stairwell at the half landing level.

Block 'A'

This block consists of 5(five) floors. The number of rooms per floor varies according to the type of room. All the rooms on all floors are arranged along a corridor, The utility rooms are located on the other side of the corridor on the ground floor the utility rooms comprise of a store, office and engine room. A staircase seperates the store from the two other rooms. On other floors above this however the utility rooms consist of two stores, a shower room and a toilet room, the utilities are arranged in the following sequence, a store, staircase, showever room, toilet room, and, store. The shower room consists of six shower cubicles and four sinks, while the toilet room contains four toilet cubicles, two sinks and two urinals.

Room Types

Single Rooms: are located on the third floor, there are twenty in number. Cupboards are in built and project into the room. A common balcony runs along the rear side of all rooms in addition to the main corridor balcony at the front. The rooms however are quite small and this again is its main disadvantage.

Double rooms:-are situated on the first, second and forth floors (Top most) and are fifteen (15) in number. This room is one-third the width of a single room larger on its breadth, just the space necessary for an extra bed space. Thus it can be seen that these rooms are quite small for two students. The cupboards in this room are situated as follows, one projects inside to the room from the wall that seperates the adjacent room, wile the other projects outwards . The recess formed by two cupboards projecting outwards serves as a balcony space which is shared by the two rooms on the other two sides of the cupboard however, a void is created by this recess, thus on plan what obtains is, a void, a cupboard, a balcony, a cupboard, a void and a repetition of this sequence. Since there are fifteen (15) rooms forteen (14) share balconies while the odd fifteenth one has a small private balcony at the far end of the block.

"Family Rooms":- are located on the ground floor only, They are in fact two rooms seperated by a "bathroom on one side and three single cupboards on the other. A door is placed at one end of the small passage formed by the space between the bathroom and cupboards. The bathroom consists of a shower, wash hand basin and toilet and is accessible through a wooden flush door which opens inwards to the bathroom. These "rooms" could be allocated to married post-graduate students who wish to reside with members of their families on campus, orcould be allocated to two seperate induviduals. Behind the bathroom, and accessible from two doors on either side of it, is a large balcony. Both rooms are also accessible via an opening in the middle of the balcony.

Block 'B'

This block consist of four (4) floors, There are only two types of rooms in this block, single rooms and double rooms. The convenience block in this hostel block is designed differently. It comprises of two lilf shafts, one staircase, utility room, Ironing room and bathroom. Both ironing and utility room are equiped with work tops only. The absense of sinks in these rooms was a general complaint of the female students who occupy this block. The bathroom however contained. Four (4) showever cubicles, two (2) toilet cubicles and one (1) wash hand basin. This layout is repitious on all four floors.

Room types

Single rooms:- These are exactly identical to those in block 'A' except instead of being twenty in number there are twelve.

Double rooms: These also are identical to double rooms in block 'A' but as the case is, due to the smaller lenght of this block, there are only nine in number.

Block 'C'

This block is identical to block 'A' on all other floors excepte the ground floor. The ground floor of 'C' block coincides with the first floor of 'A' block due to the topography of the site which slopes towards 'A' block hence the "family room" type accommodation of the ground floor in 'A'block is non-existent in 'C' block. Thus the first floor of 'A' block is identical to the ground floor of 'C' block, the second floor of 'A' block is identical to the first floor of 'C' block and so on. Another difference is in the ommission of the two stores in the convenience blocks, thus the sequence that entails is, the staircase, the shower room and the toilet room respectively.

Room Types

As earlier mentioned, the rooms in 'C' block are identical in design and number to that of 'A' block with the exception of the ground floor in 'A' which is non-existent in 'C'

Case Study No. 3

The University Nigeria Enugu Campus-Kwame Nkrumah Hall.

The Kwame Nkrumah hall comprises of three blocks namely the 'N','NH', and 'H' blocks respectively. The 'N' and 'H' blocks house male students only while the 'NH' block is mixed. The convenience rooms of the blocks except the 'NH' block are situated on the right hand side of the front farcade. The NH block has offices, a buffet and common room on its right wing and these are seperated from the rooms by a corridor which leads along the front of the 'N' block. All blocks have corridors running along the front and these corridors are screended from the outside.

The 'N'block

This block consists of 4 floors, the ground floor having only 4 rooms at the right wing due to the topography of the side which slopes in their direction on the first and subsequent floors there are 14 rooms. On the first floor the first ten (10) rooms on the left side are actually on the ground floor level while the remaining four (4) are on the first floor as explained by the topography. Two staircases are situated at both ends, the staircase on the right being inbetween the convenience room. The convenience room contains three shower cubicles, three toilet cubicles, four sinks and three urinals and this is repeated on all four floors.

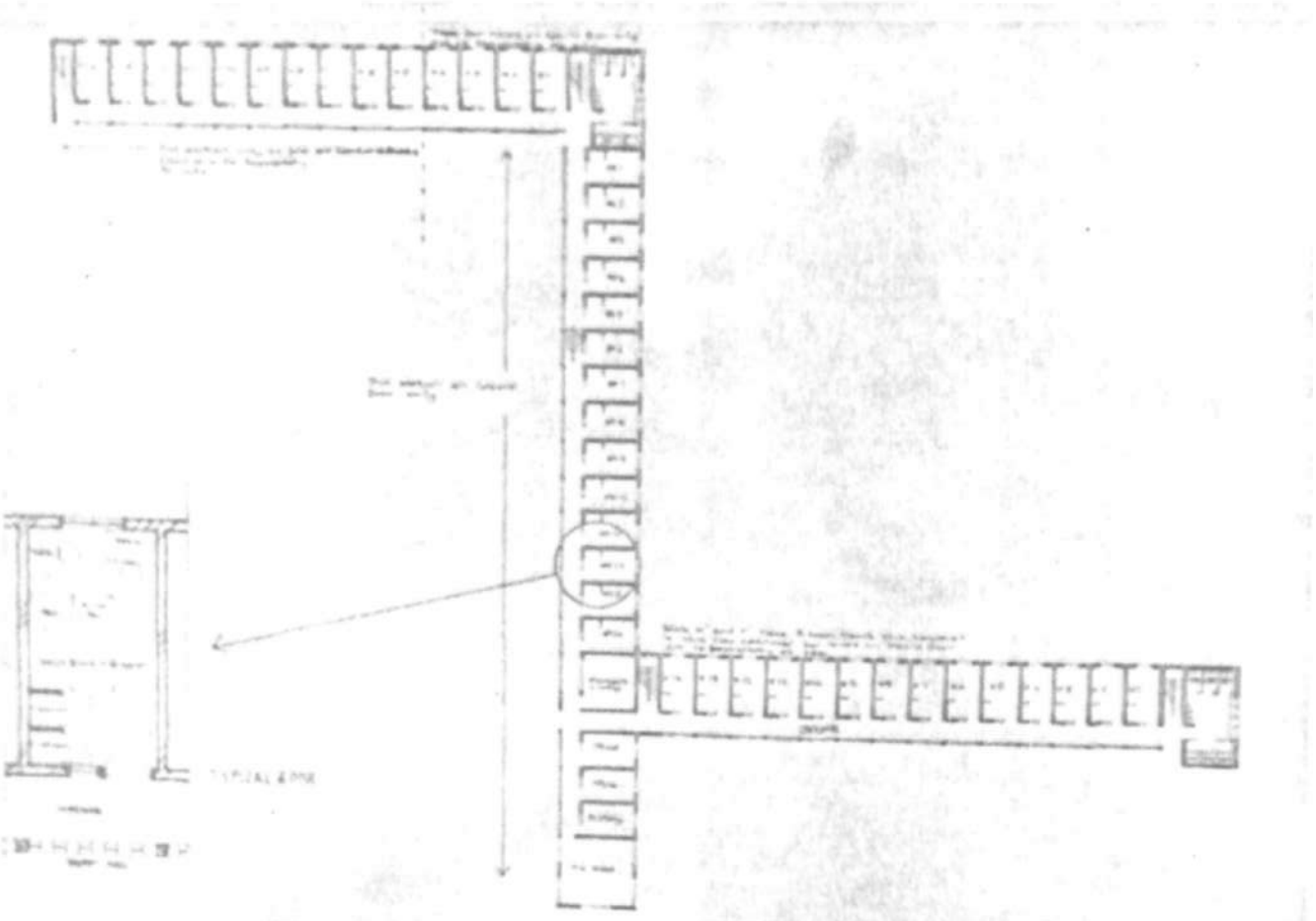


Fig 2.2.3 . KWAME NKROMAH HALL (UNEC)

Room Types

All rooms are identical, A concrete 'built in ' two leaved cupboard is situated at the near lelt hand side wall and it projects into the room. The recess along the left hand side wall is used as a bedspace. Windows are of the lauvre type and two 60cm by 90cm ones are located at the near wall, while a 60cm by 60cm one is located next to the door at eye level. The door is located at the extreme right hand side of the room and opens inside to lie paralled to the right side wall. All rooms are single.

The 'H' block

This block is identical to the 'N' block except the absence of the four extra rooms on the "ground floor" as in this case the topography is relatively flat thus amounting to equal number of rooms on the three floors (i.e. forteen(14).

Room Typea

These are identical to the 'N' block.

The 'NH' block

This block forms a perpendicular link between the right wing of the 'N' block and left wing of the 'N' block. This block is only on one floor, the ground floor and has the left wing when viewed from the front farcade stepped down to concide with the four ground floor rooms of the 'N' block. The first five rooms are on this lower level while the remaining are on the higher level conciding with the ground floor rooms of the 'N' block.

The first five rooms are occupied by female students while the others by male. This block forms the main entrance to the hall. On entering the block, the porters lodge and rooms are situated on the left while an office, small buffet and common room are located on the right. Since the 'NH' block does not have its own conveniences the convenience room on the "ground floor" of the 'N' block are utilised and reserved for female students only while male students of this block have to utilise those on the ground floor of 'N' block. The distance of these rooms from convenience rooms is the major disadvantage in this instance.

Room Types

As in 'N' and 'H' blocks.

Case Study No. 4

The University of Nigeria Nsukka Campus-Kwame Nkrumah Hall

This hall comprises of two very long blocks devided by a large courtyard. Each block is four floors high and are exactly identical in design. At the front of the hall inbetween the front ends of the blocks are situated the administrative and communal facilities of the hall. These include, an entrance lobby, a reception placed in between two pairs of offices, the space created in between on both sides of the reception serves as an access to another lobby, lounge, letter collection area and porters lodge

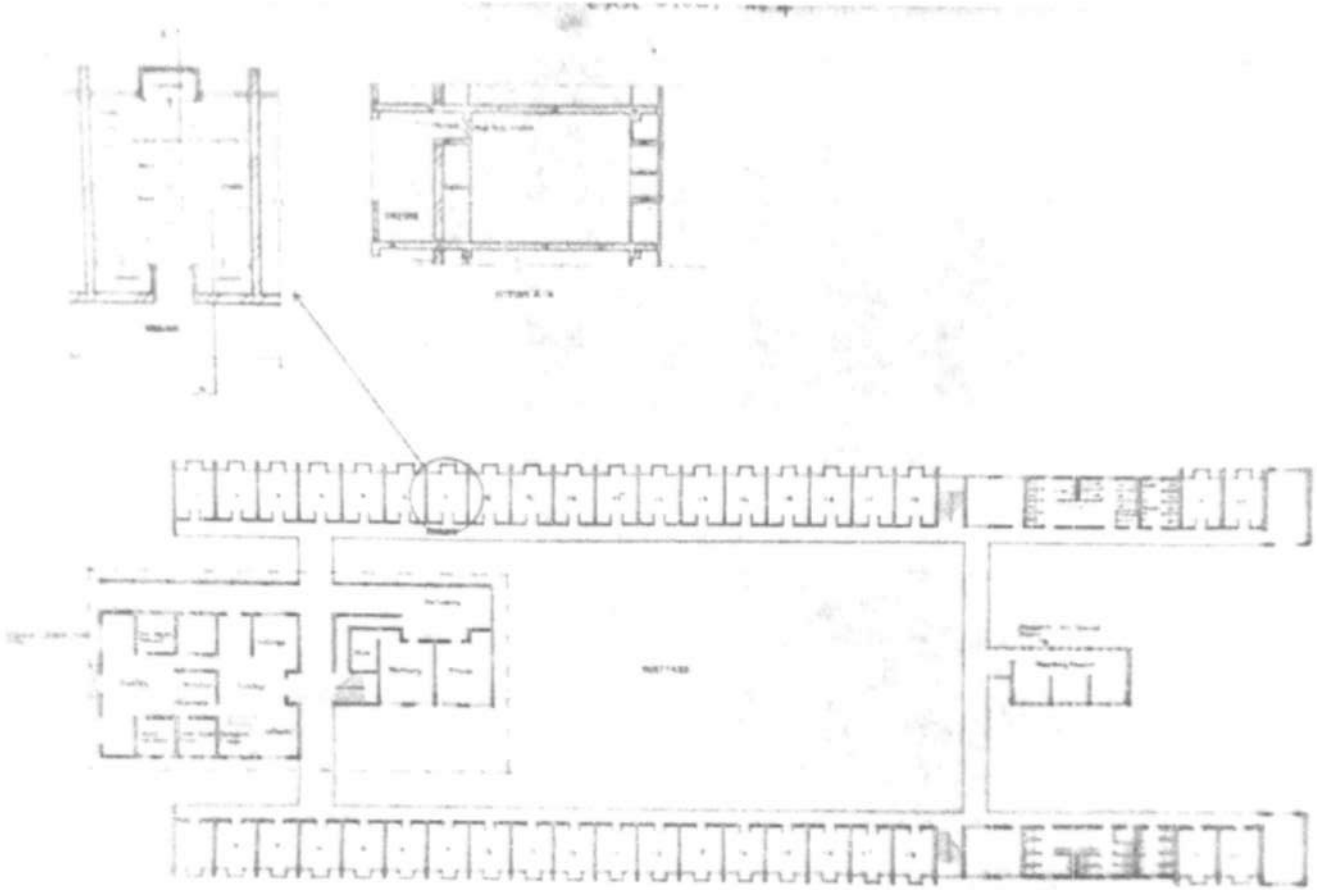


Fig 2.2.4. [illegible]

The near lobby opens into a corridor which links the two front ends of the blocks. Directly in front of this exit is a staircase which is surrounded by a buttery and small shop. A drive-in for delivery purposes is also located on the left hand side of this administrative and communal area and this goes right into to a space adjoining both the small shop and buttery. A the the rear farcade of the hall there exists reading rooms on all levels except the ground floor and these are connected to the rooms by a corridor perpendicular to them. There is however no access from one reading room to another due to the absence of a staircase in this region. Adjacent to the hall is a cafeteria strictly for post-graduate students only and this has a seating capacity for 270 students.

Hostel block type

The hostel blocks are both of four floors each and twenty rooms are arranged in a row along a corridor. There is a break between the first eighteen rooms and the other two. At this intersection the following are situated, a staircase, "dripping" room and convenience rooms respectively. A bulk storage room brings up the rear of the whole sequence (including rooms 19 and 20). The dripping room is designed so that students can hang their wet clothes here instead of on the balconies.

The convenience rooms are divided into two the first being the larger contains four (4) showers, five(5) toilets, 6 sinks three (3) urinals and a small storage space for the cleaner. The second contains four showers, four urinals and three sinks. The major problem in this block arrangement is the distance the students in the first few rooms have to travel to reach conveniences, this leads to students prefering to wash clothes on the balconies instead of in the bathrooms, the absence of well defined laundries could also be a reason for this.

Room Types

All rooms are double rooms which gives rise to complaints from students as their collegues on the Enugu campus all have single rooms and the common view shared in most instances is the need for personal privacy. The rooms are equiped with three in built cupboards, two which project outwards to the front corridor of the room and the recess created in the middle is used as a door way. The third is situated at the middle of the rear wall and the two receesses on either side of it are used to create window openings of approximately 60cm each. High level windows are situated above the cupboards on the front wall and the recess on the outside above these cupboards are used by most students as storage space for invalvable things such as empty boxes e.t.c.

Case Study No.5

The University of Ife-Postgraduate Hall

This hall comprises of eight (8) blocks in all the first four(4) and older blocks all contain single rooms while the other four (4) contain triple rooms. The design of the blocks are basically the same, the difference is that the partition between each pair of single rooms, has been removed to form a triple room. Each pair of blocks are arranged. In a staggered line with one block being the mirror image of the other. A large courtyard is placed inbetween each pair of staggered blocks and spanned by an uncovered walway on the ground level to link each pair. A staircase is located at the intersection of each pair of staggered blocks.

Hostel block type I (single room type)

Each hostel block has three (3) floors and there twenty (20) single rooms arranged along a covered corridor on the front farcade. Convenience rooms are situated at the left side of the front farcade of each block, Thus since each pair of blocks are mirror images, all convenience rooms are centrally located between each pair of blocks. On the far end of each block an additional staircase has been provided in case of emergencies. Convenience rooms consist of a small kitchenette and Bathroom/laundry room. The kitchenette is a continuation of the rooms while the bathroom/laundry room is seperated by a corridor.

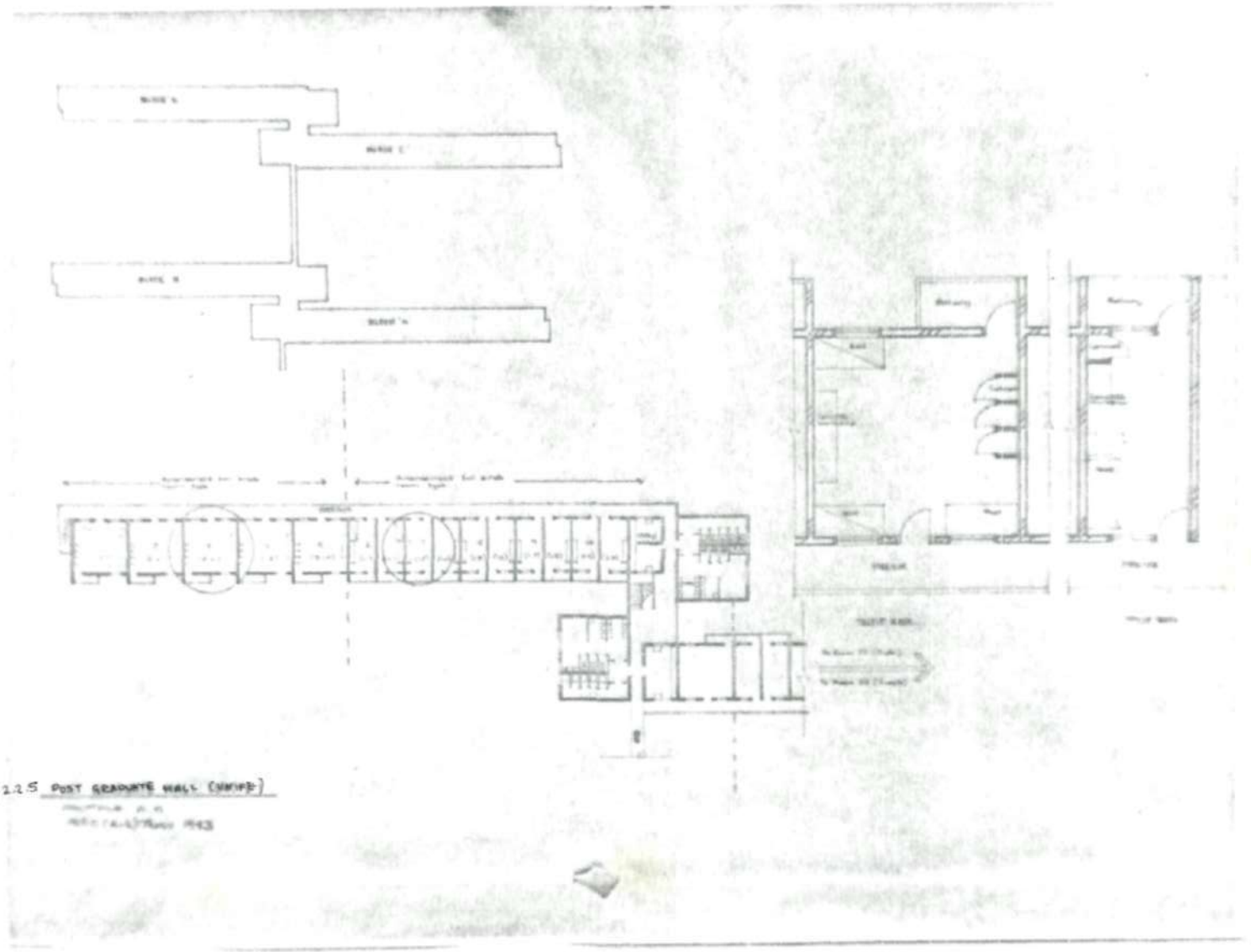


Fig 2.2.5 POST GRADUATE HALL (UNIFIL)

The kitchenette consists of a concrete worktop at the far wall and two sinks, one on the left, and the other in the right side walls. The bathroom/laundry room, consists of five (5) shower aubicles, three(3) toilet cubicles, three(3) urinals, six wash hand basins, four laundry sinks, and four laundry tables.

Room Type

As mentioned earlier all rooms are single rooms and each room has an outward extension forming a balcony. Balconies are seperated from each other by the projection of the partitioning wallbetween each room. Rooms are equiped with a built in cupboard, concrete work top and a wooden bed. In addition to this there is a reading table, chair and book shelf the latter being suspended to one of the walls.

Hostel block type 2 (Triple room type)

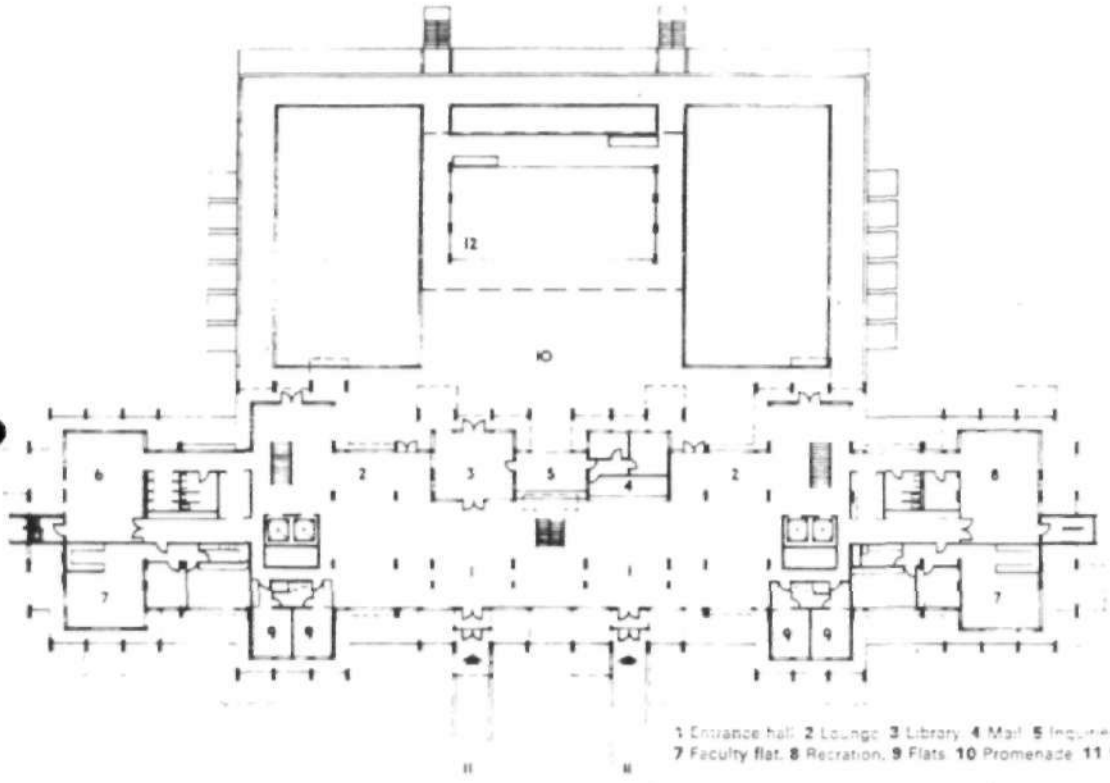
This block type is identical to the previous example, the only difference in this case being to number of rooms per floor. As mentioned earlier two single rooms equals one triple, thus there are ten (10) rooms per floor in this case.

Room Type

The rooms are a combination of two single rooms without the partition, however in this case, the outward extension forming the balcony is only one half of the room width. Standard furniture is tripled, however there remains only one long concrete work top. Majority of students are highly disatisfied with this arrangement and would prefer single rooms as expected.

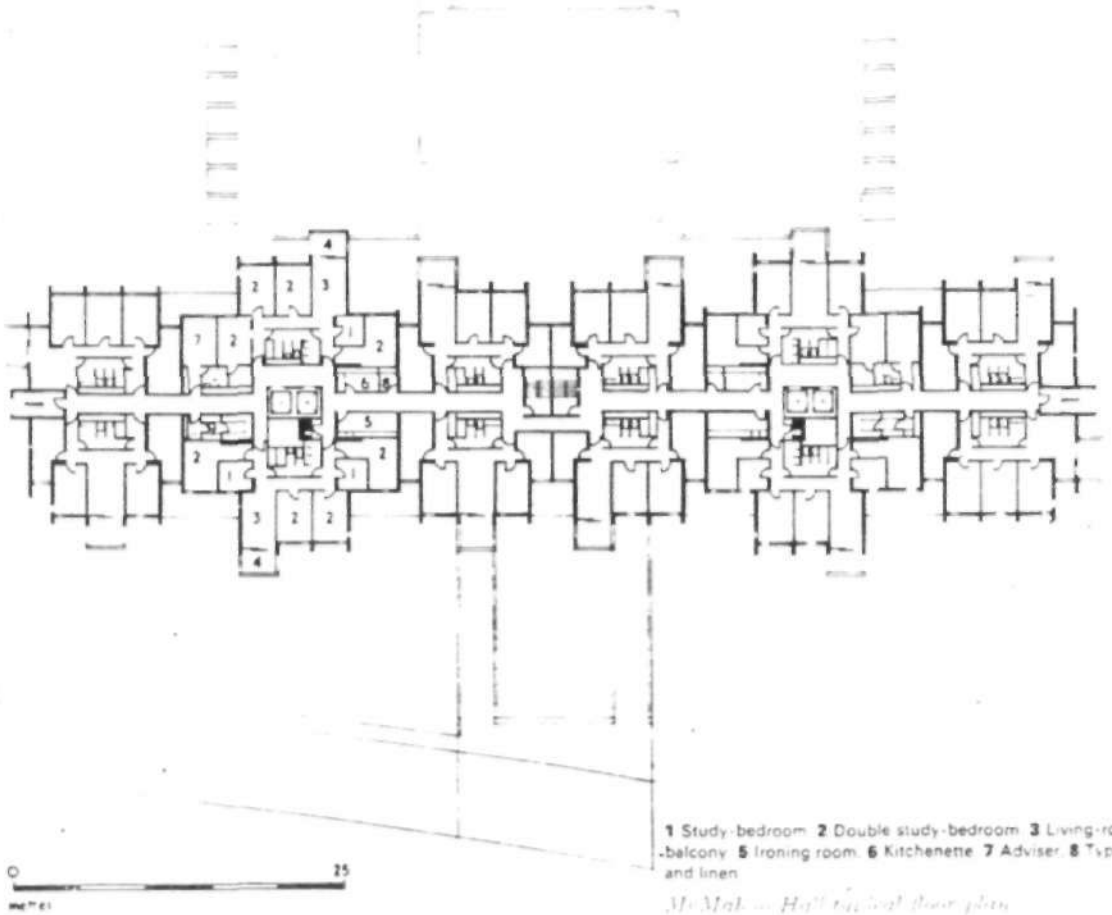
The social unit of McMahon Hall is a close group of eight to ten students living in small bedrooms, usually shared and clustered around a communal living-room. There are twelve clusters per floor, plus an adviser's flat, small typing closets, laundry and kitchenette facilities.

The living-rooms all have large cantilevered balconies staggered to add variation to the cluster arrangement. The balconies are the most important elements in that they give the building its external pattern and form. Extending out over the hillside is a composite platform containing three levels of parking and one of dining-rooms. The 'platform' level under the main building contains the main entrance with lobbies, reception, lounges, television room, small library and so on.



1 Entrance hall 2 Lounge 3 Library 4 Mail 5 Inquiries 6 Television 7 Faculty flat 8 Recration 9 Flats 10 Promenade 11 Bridge 12 Roof-light

McMahon Hall ground floor plan



1 Study-bedroom 2 Double study-bedroom 3 Living-room 4 Communal balcony 5 Ironing room 6 Kitchenette 7 Adviser 8 Typing room 9 Cleaners and linen

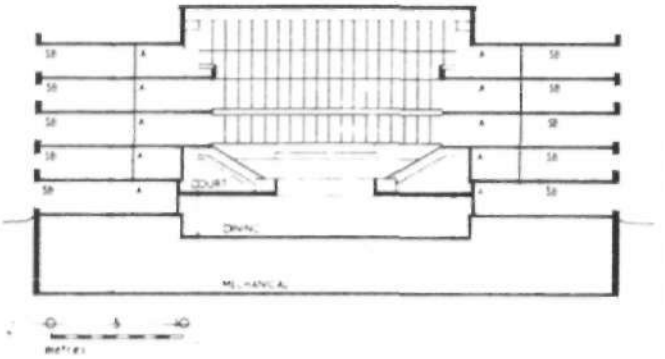
McMahon Hall typical floor plan

University of Pennsylvania *Architect: Eero Saarinen, 1960*

This women's residence for 656 students consists of four separate L-shaped halls, joined to share a central court. The students' rooms are on the perimeter, each with its own window. Social and public rooms surround the court and face into it. Each hall is divided into suites for sixteen to twenty-four students. Each suite has its own private entrance from the main stairs and a student sitting-room with a small kitchenette where students can prepare food and drinks for themselves. Each hall has its own laundry and ironing-room for student use.

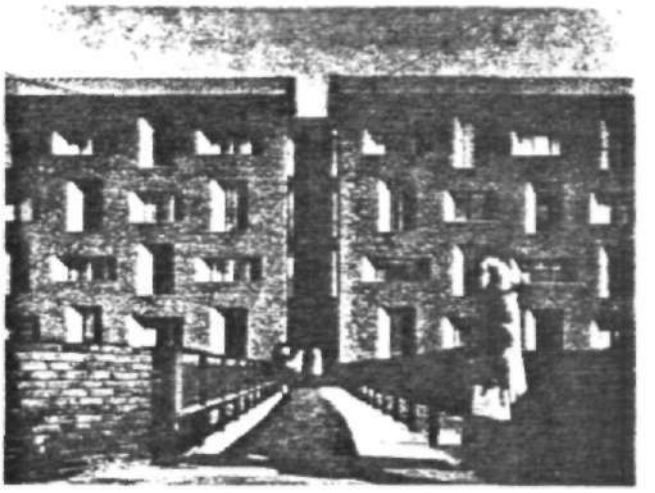
The main entrance to the building is at the first floor level of the court. The court is the hub and social centre of the scheme providing access to all the other areas. There are views down to the cafeteria below, or up to the lounges and their balconies above. As at Bryn Mawr there has been a complete acceptance of an internal environment for the main spaces.

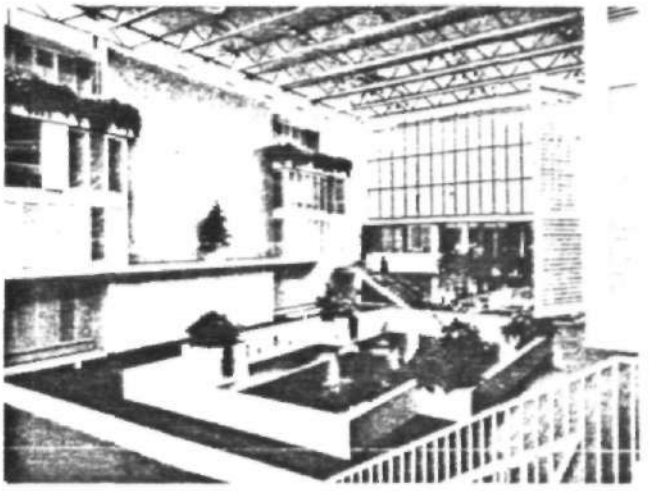
By day the court with the form and busyness of a town square is filled with natural light from the top: by night its artificial lighting gives it a glamorous look.



SB Study-bedroom **A** Activity room

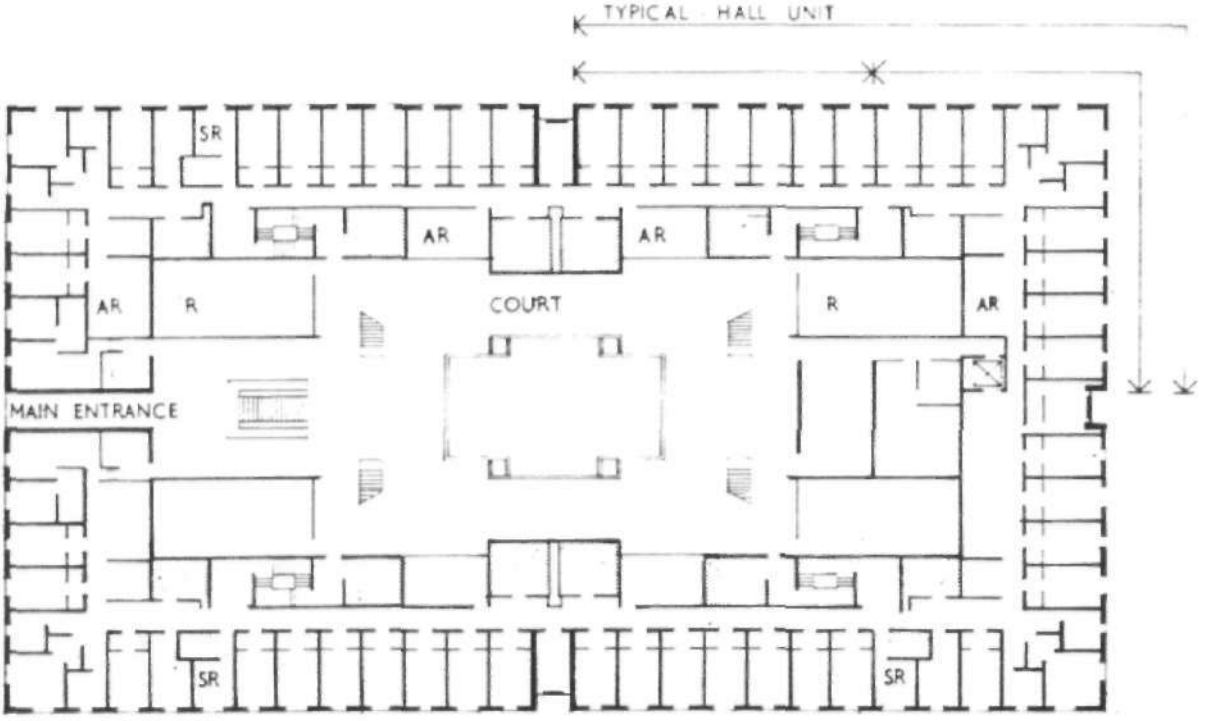
University of Pennsylvania women's residence section





6 *Main entrance to women's dormitory of the University of Pennsylvania at first floor level*

7 *By day the central court has something of the form and busyness of a town square (Pennsylvania)*



STUDY BEDROOMS

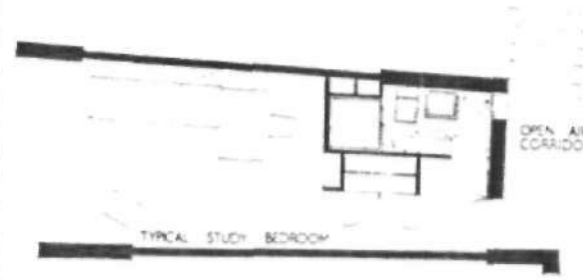
AR Activity room **R** Recreation room **SR** Staff room

University of Pennsylvania women's residence first floor plan

University hostels, Urbino, Italy *Architect: Giancarlo de Carlo. 1966*

Urbino is a small town in central Italy, with a university for 8000 students, for whom hostels have been sited on a hill outside the historic town centre and away from the other university buildings.

The building shown has accommodation for 150 students in single rooms, and every room is the same. Linked to them at the top of the hill, on different levels are a refectory, kitchens, library, reading-rooms, the principal's rooms and a conference hall. The students' rooms are arranged in staggered groups around the contours and joined by open air balconies, corridors, ramps and staircases. The siting and complex circulation pattern creates a variety of outdoor spaces and the sensitive use of the steep slopes integrates the buildings with the hillside. For the students there are alternative and interesting routes around the scheme. Although every room is basically the same in plan the building should by virtue of its circulation and form secure for each student a feeling of personal identity with his room that would not be felt in an insensitively designed slab block.



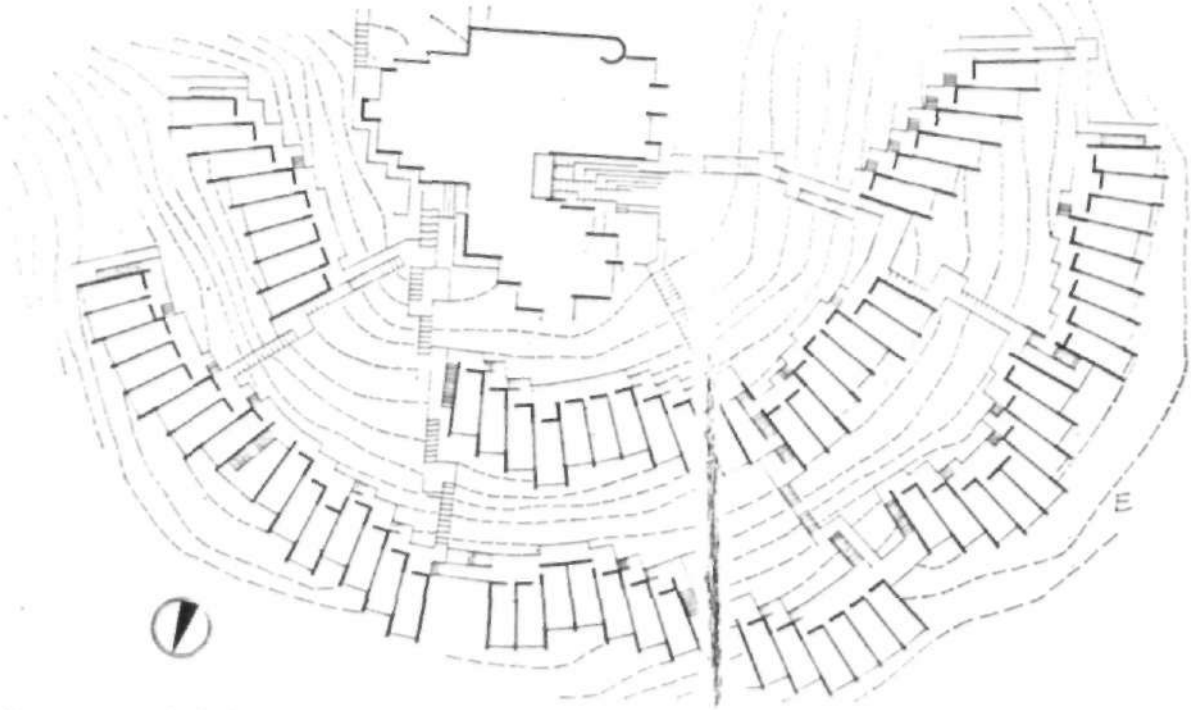
University hostels, Urbino, typical room plan





1. *Students' rooms of the university hostel at Urbino, Italy, are arranged in staggered groups along the contours of the land*

1a *An external staircase runs down the slope like a medieval Urbino street*



CHAPTER THREE

CONCLUSIONS FROM INTERVIEWS, DISCUSSIONS AND OBSERVATIONS

3.1 Introduction:

A major integral part in the design methodology was to incooperate the views of the group of people being designed for.

This was carried out by sending out questionaires, observations and verbal discussions on the subject.

This mode of approach to design is extremely necessary, as opposed to what is termed in Rober B. Bechtel's book - Enclosing Behaviour, as the paternalistic attitude of desingers towards their clients. The paternalistic attitude can be briefly described as a situation where the professional does not deem it necessary to consult the views of his client on matters of the service that he the professional is providing for the client simiply because he is assumed to be an expert on such matters and thus knows everything there is to know about the elients needs. However what usually results from this type of approach is that even though the designs might incorparat what might be described as an "artistic swoon" factor on paper, they are disasters from the point of view of clients who live in them, students housing in Nigerian, Universities is no exception. In order to avoid mistakes in the past it is necessary to take into serious consideration the opinons of those affected and to use findings as a basis for the design famework.

TOPIC: Post-Graduate Hall of Residence for A. B. U.

N/B Tick as appropiate

A. O. Odutola
M. Sc. II (Arch.)

QUESTIONAIRE

Single Married

1. Are you Married or Single? ☐ ☐

2. If so how many children? ----------

3. Are you resident on Campus? Yes; ☐ No.; ☐

4. If not why?
   (a) Prefer to stay off Campus ☐
   (b) Not allocated Campus Accomodation ☐

YES NO

5. Do you like the existing accomodation structure on Campus ☐ ☐ or would you prefer a seperate hall of residence for post-graduate students only: Yes; ☐; No.; ☐

6. What facilities do you think should be provided in a post-graduate hall please specify:----------
   ---
   ---

7. Do you own any of the following:
   (a) Fridge? ☐
   (b) Sound-System? ☐
   (c) Television? ☐
   (d) Fan? ☐

8. Do you prefer:
   (a) Single Rooms? ☐
   (b) Donble Rooms? ☐
   (c) Triple Rooms? ☐

9. Would you like staying on;
   (a) Ground Floor? ☐
   (b) 1st Floor? ☐
   (c) 2nd Floor? ☐
   (d) 3rd Floor? ☐
   (e) Above 3rd Floor? ☐

3.2. Conclusions From Interviews

Eighty (80) Questionaires were dispatched randomly to post-graduate students in the various faculties, out of this number fifly (50) were for male students and thirty (30) for female. Conclusions drawn from the questionaires are as follows.

(a) Out of all eighty (80) students interviewed, fifteen(15) were married this is equivalent to approximately 19% .

(b) 85% of students interviewed were resident on campus. While the remaining 15% were off campus. 15% represents the number (12) twelve, and of this number nine (9) preferred to stay off campus while the remaining three(3) were not allocated hostel acommodation.

(c) Approximately 11% of students preferred the existing accommodation structure being openated while 89% preferred having a seperate hall of residence for post-graduate students only.

(d) (i) 63.75% of studens owned fridges
(ii) 70% of students owned sound systems
(iii) 42.5 % of students owned Television sets
(iv) 73.75% of students owned electric fans

(e) (i) 96% male students prefer to occupy single rooms
(ii) 4% male students prefer to share double rooms
(iii) 80% female students prefer to occupy single rooms
(iv) 20% female students prefer to share double rooms
(v) Both male and female students do not want to occupy triple rooms

Many female students prefer to share a double room with a roommate for security reasons, especially at night. The same induviduals are concerned however with privacy within a shared room. A balcance has to be achieved to resolve these conflicting desires.

(f) (i) 10% male studets preferred staying on the ground floor

(ii) 52% male students preferred staying on the first floor

(iii) 10% male students preferred staying on the second floor

(iv) 18% male students preferred staying on the third floor

(v) (v) 8% Male students preferred staying above the third floor

(vi) 3.3% Female students preferred staying on the ground floor

(vii) 63.3% Female students preferred staying on the first floor

(viii) 26.6% Female students preferred staying on the second floor

(ix) 0% Female students preferred staying on the third floor

(x) 6.7% Female students preferred staying above the third floor.

Complaints arising from staying on the ground floor were due to the open nature of the corridors which were susceptible to flooding during the raining season and th noise generated by passers by which exists in the present situation. Students wishing to stay above the third floor level desired to do so if elevators were provided in the design scheme.

(g) (i) 52% Male students preferred not to share utilities such as toilets, showers e.t.c

(ii) 58% Male students do not mind sharing utilies

(iii) 43.3% Female students preferred not to share utilities

(iv) 56.6% Female students do not mind sharing utilities

In majority of the male cases, it was expressed from those who did mind sharing utilities the willingness to share with others if the number was not as large as the present situation in whichcase twenty (20) students per floor share two (2) showers and (3)three toilets. Half this number, most expressed as acceptable. However on the otherhand in the female response, those who did mind sharing, preferred nothing better than private showers and toilets.

(h) Of the students interviewed,

(i) none were below twenty years of age

(ii) 25% were between the ages of twenty and twenty-three

(iii) 60% were between the ages of twenty-four and twenty-seven

(iv) 10% were between the ages of twenty-seven and thirty

(v) 5% were above thirty years of age.

(i)

(i) Of married students interviewed

26.7% preferred having members of their families resident with them on campus. While 73.3% preferred staying alone.

(j) (i) 39% Male students ate in the dinning halls

(ii) 14% Male students cooked in their rooms

(iii) 62% Male students preferred to eat out.

(iv) 16.7% Female students ate in the dinning halls

(v) 73.3% Female students cooked in their rooms

(iv) 30% Female students preferred to eat out

(vii) 28.75% of all students took their meals in the dinning halls.

The reason for room cooking was attributed to the absence of Kitchens where such activities could be carried out. While the reason for such a large percentage prefeering to eat out was due to the poor quality of meals served in the dinning halls.

(k) 88.75% of all students considered it necessary to have private balconies in the rooms.

(L) 31.25% of all students interviewed possessed cars on on campus.

2.5% owned motorcycles

1.25% owned bicycles.

It should be noted at this stage that the A.B.U. Master plan predicts that car parking facilities should be provided for 30% of residents student population one can immediately see that this figure tallies quite well with the one obtained from the research into this project.

3.3 Conclusions from discussions and observations

From discussions and observations with students the following facilities were expressed as necessary.

The rooms should be-equiped with:-

(i) Small washbasins

(ii) Dressing mirrors

(iii)Flourescent lamps

(iv) Bedside lamps

(v) Burgulary proofing on windows

(vi) Mosquito proofing on doors and windows

(vii)Half upholtered chairs.

Hostel blocks should contain:

(i) Laundries

(ii) Kitchenettes with cookers and fridges

(iii) Air conditioned reading rooms

(iv) Large storage space

(v) Courtyards with effective planting

(vi) Open air sleeping space.

Communal facilities should include.

(i) Common Room with T.V. sets, sound system and fans

(ii) Phone booth

(iii) Shops (i.e Grocery, magazine, cobbler etc)

(iv) Games room

(v) Buffet/bar

(vi) Postal services

The whole hall complex inclusive of the fore-mentioned should also include:-

(i) Porters lodge seperated from hostel blocks

(ii) Bus stop

(iii) Seperated hostel blocks

(iv) Receation Garden

(v) Post-graduate Centre.

3.4 Design Considerations derived from conclusions from interviews, observations and discussions:-

Will serve as an in integral part of the design process in the evolution of the proposed post-graduate hall facilities that to be provided are as follows.

3.4.1

The rooms

(i) All rooms will have private or semi-private outdoor sleeping areas in the form of balconies.

(ii) Rooms will be large enough to accommodate the following small refridgerators, electric,fans sound systems and Television sets.

(iii) Rooms will be large and flexible enough to allow the the induvidual to arrange his or her own basic furniture in any way he or she so chooses.

(vi) Flourescent lamps, bedside lamps, mosquito proofing will be among design specifications of handware systems.

(vii) Small washhand basins with mirrors will be placed in all rooms.

(vii) Two types of rooms will be provided. Single rooms for male, and single and double rooms for female. The double rooms will be desinged so as to be flexible enough to be convented to two seperate single rooms when the need arises. Also these rooms could serve as family rooms for married post-graduates wishing to reside with members of their families on campus.

3.4.2

The Hostel Blocks:

(i) Shall have more than ten students sharing facilities per floor

(ii) Shall have utilities comprising of toilets, showers stores and laundries with adjacent drying areas for female students provision for kitchenettes and bidets in the washrooms will be made. The kitehenette will be equiped with electric cookers and refridgerators

(iii) Reading Rooms will be provided ajacent each block.

(iv) Hostel blocks will be arranged around well land scaped courtyards which will allow provision for outdoor relaxation.

(v) Male students will be accommodated on four floor levels namely ground, first second and third as against female students whole will not be accommodated above the second floor level.

3.4.3

Communal Facilities

A student centre adjacent to the site is already under construction.

In order to avoid the unecessary duplicating of the facilities, the project provides only those that are not included down there.

Faculities included the new student centre are as follows:

(i) Theatre

(ii) Barber's Room

(iii) Mini Market

(iv) Games Rooms

(v) Buffet/Bar

(vi) Offices

(vii) Guest Bedrooms

(viii) Hair Dressing Salon.

Facilities which are deemed necessary and absent are

(i) Postal Agenecy

(ii) Phone booth

(iii) Cafeteria/Dinning Hall

These facilities will be incorporated in the design of the hall complex.

It is also proposed that the whole complex be made up a several well landscaped open areas, which should enhance good courtyard effects.

CHAPTER FOUR

SITE AND CLIMATIC ANALYSIS

4.1 Climatic

4.1.1 Back Ground

The A.B.U. Samaru site expeviences the typical seasonal climate of Northern Nigeria. The relative simple climatic regime is primarily a function of the position of interopical convenence zone (I T C Z) when the ITCZ is north of the area, from may to October, the site cames under the influence of moist South Westerly winds. During October, however, the site expereences a more complex wind pattern an indication of the Southerly movement of the ITCZ over the site. From November to May dry North Easterly winds dominate.

Most of the data given below is devided from the Samaru meteorological station, the details of which are longitude $7^{o}4'$E latitude $11^{o}1'$W

Altitude 685 metres.

4.1.2. Temperature

Table given the monthly mean maximum and minimum air temperature for the Samaru site for the year 1930 to 1980.

Maximum air temperatures occur in the febuary to June period peaking in April at 35.7^{o}C. However daily maximum air temperatures in excess of mean monthly minimum air temperature of 13.8 and 13.9^{o}C are recorded for December and January respectively, through actual daily temperature frequently fall below 10^{o}C from December to Febuary.

Table 4.1.2

MEAN MONTHLY MAXIMUM AND MINIMUM AIR TEMPERATURES AND MONTHLY MEAN RANGES: SAMARU 1938-80

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Monthly Maximum ^{o}C	30.3	32.7	35.3	35.7	32.9	36.7	28.4	27.7	29.3	31.4	31.6	30.3
Mean Monthly Minimum ^{o}C	13.9	16.0	19.5	21.7	21.2	19.9	19.5	19.3	19.1	17.7	15.4	13.8
Mean Monthly Range ^{o}C	16.4	16.7	15.8	14.0	11.7	10.8	8.9	8.4	10.2	13.7	16.2	16.5

(Source: Meteorological Observations: Samaru Station 1938-80)

Table 4.1.3.

MEAN MONTHLY PERCENTAGE RELATIVE HUMIDITY LEVELS, SAMARU, 1954-1980

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AM		15.2	25.6	47.9	63.6	72.6	79.5	81.7	75.9	60.6	29.2	21.1
PM		10.8	14.2	29.0	43.4	57.3	66.2	69.7	62.9	43.1	21.4	16.4

(Source: Meteorological Observations, Samaru Station, 1954-1980)

Table 4.1.4.

AVERAGE MAXIMUM WIND SPEED BY MONTH 1979-80 AND PREVAILING WIND DIRECTIONS

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Wind Speeds	M/Sec	1.61	1.98	1.57	2.06	2.52	2.32	1.65	1.38	1.1	1.13	1.1	1.59
Wind direction:prevailing	1979/80	NE	NE	NE	SW	SW	SW	SW	SW	SW	SW	NE	NE
Wind direction:secondary				SW	NE						NE NW		

Table 4.1.5.

MEAN MONTHLY RAINFALL (MM) FOR 1980 and 1928-80 AND RAINDAYS PER MONTH, 1980 AND 1928-80

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Rainfall (mm) 1980	0	0	0	3.7	154.4	116.4	268.9	215.8	71.9	16.3	0	0
Mean Rainfall (mm) 1928-80	0.2	0.9	7.1	36.2	121.1	161.6	225.7	280.4	221.4	37.0	1.2	0.1
Rain Days 1980	0	0	0	2.0	9.0	9.0	19.0	20.0	11.0	3.0	0	0
Rain Days 1928-80	0.1	0.2	0.9	3.9	10.0	12.8	16.4	20.2	16.3	4.0	0.2	0

(Source: Meteorological Observations, Samaru Station 1928-1980)

Table 4.1.6.

MEAN DAILY SUNSHINE HOURS 1980 and 1954-80 AND MEAN DAILY GLOBAL RADIATION LEVELS, SAMARU

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Sunshine Hours 1980	9.5	7.9	8.5	7.3	7.1	8.3	6.5	6.1	7.6	8.6	8.9	7.6
Mean Sunshine Hours 1954-80	8.7	9.3	8.4	8.0	8.2	7.8	6.1	5.2	7.0	8.8	9.4	9.1
Mean Global Radiation Cal cm-2 day 1954-80	440.6	503.6	509.0	481.0	484.0	453.6	392.6	351.0	430.6	506.6	487.0	443.6

(Source: Meteorological Observations, Samaru Station 1954-1980)

Maximum mean monthly air temperature ranges occur in Febuary (16.7°C) although diurnal air temperature ranges are frequently much greater, ranges of 20°C plus were recorded for 7 and 5 days for January 1979 and 1980 respectively.

4.1.3 Humidity

Mean monthly percentage relative humidity figures for 0900 and 1500 GMT reading for the period 1954-1980 are given in table.

Mean percentage of relative humidity (%R H) levels of more than 10 are recorded for the July to September period peaking at 81.7 in August. Actual A.M recordings of 100 per cent relative humidity are not uncommon for August and in August 1980 17 AM recordings exceeding 80 percent relative humidity.

Minimum relative humidity levels occur in December and January.

4.1.4 Winds

The Samaru sites have two dominant winds, the dry North Eastherly and the moist South Westerly during the November to Febuary period the dry North Easterly winds frequently carry considerable quantities of dust (Harmattan). Winds speed in this period rarely exceed 2m/s and generally peak in Febuary. The Harmattan has a very considerable muisance value, both in terms of human confort and physical effects.

The moist Sout Westerlies are associated with rain season. These winds tend to precede storms and are generally strong but short lived gusts exceeding 3m/s occur, but mean speeds exceed 2.5 M/s only in May.

Rainfall. 4.1.5

Samaru has a rain period of approximately 210 days (May to October) and a mean annual rainfall (1928-80) of 1092.8mm.

Much of the rainfall occurs as storms of a short duration but high intensity the Institute of Agricultural Research estimate the 15 years, I day rainfall maximum to be in the order of 150mm. Unfortunately no hard intensity data exists nor are there any suitable run-off coefficient from which to determine hard and fast engineering standards.

Sunshine hours/Global radiation levels

Global radiation levels peak in Febuary, March and October at levels in exces of 500 cal cm^2 perday.

Conclusion 4.1.6

For design purposes the climate of the November to May period is the most taxing for the Samaru site. It is the period of greatest diurnal temperature range, highest and lowest actual temperatures, high Global radiation and sunshine hours and the period which suffers from the dust laden harmattan wind. From May to October the major problems for designers are in alleviating the discomfort caused by the very high percentage relative humidity levels.

4.1.7 Climatic Design Peformance Specifications

(a) Layout

Orientation of buildings should be facing north and Sourth with the long axis east-west.

(b) Spacing:

Open spacing will be necessary for breeze penetation but with some screering protection from the prevailing south westerly and North Easterly winds.

Buildings should be moderately compact and lowrise. Courtyard development would be suitable. The courtyards could be reasonably large.

(c) Openings:

Window and door openings should be in the North and South walls at body height on the wind ward sides.

Similar openings should also be provided in the corresponding internal walls. The total area for external openings should be approximately 15 to 25% of the total wall area.

(d) Air Movement:

Rooms can be double banked but there should be suitable provision for adjusting air flow across the building.

(e) Protection of Openings:

Openings should be designed to exlude direct sunlight and to provide protection from driving rain.

(f) Walls and Floors:

Both external and internal walls and any intermediate floors should be of heavy construction with an insulation time-lag exceeding 8 hours.

(g) Roofs:

Roof should also be of heavy constuction with a time-lag which must exceed 8 hours.

(h) External features:

Space for outdoor resting and sleeping would be desirable and adequate provision must be made for rainwater drainage. The use of verandans, covered passages and roof over spaces would also be appropriate.

4.18. The Effect of Micro-Climate Indoced By Presence At Large Water Body On The Post-Graduate Hall Site

The presence of a large water body i.e. Kubani Reservoir, will, however, moderate extreme temperature variations, as explained by the followings process. In the hot season, during the daytime, the earth heats up considerably in comparison with the water; the hot air mixes and cool air must flow in to replace it.

Thus the areas of land with proximity to water benefit from a daytime breeze, blowing from the water to the land.

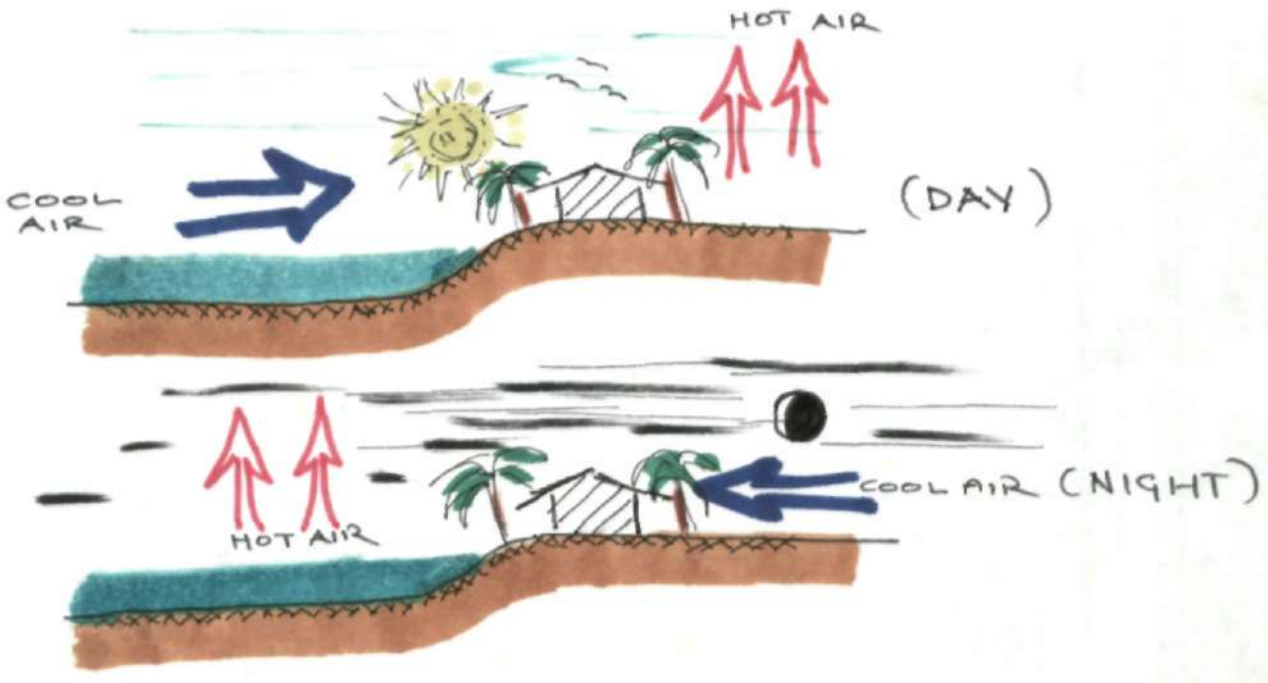
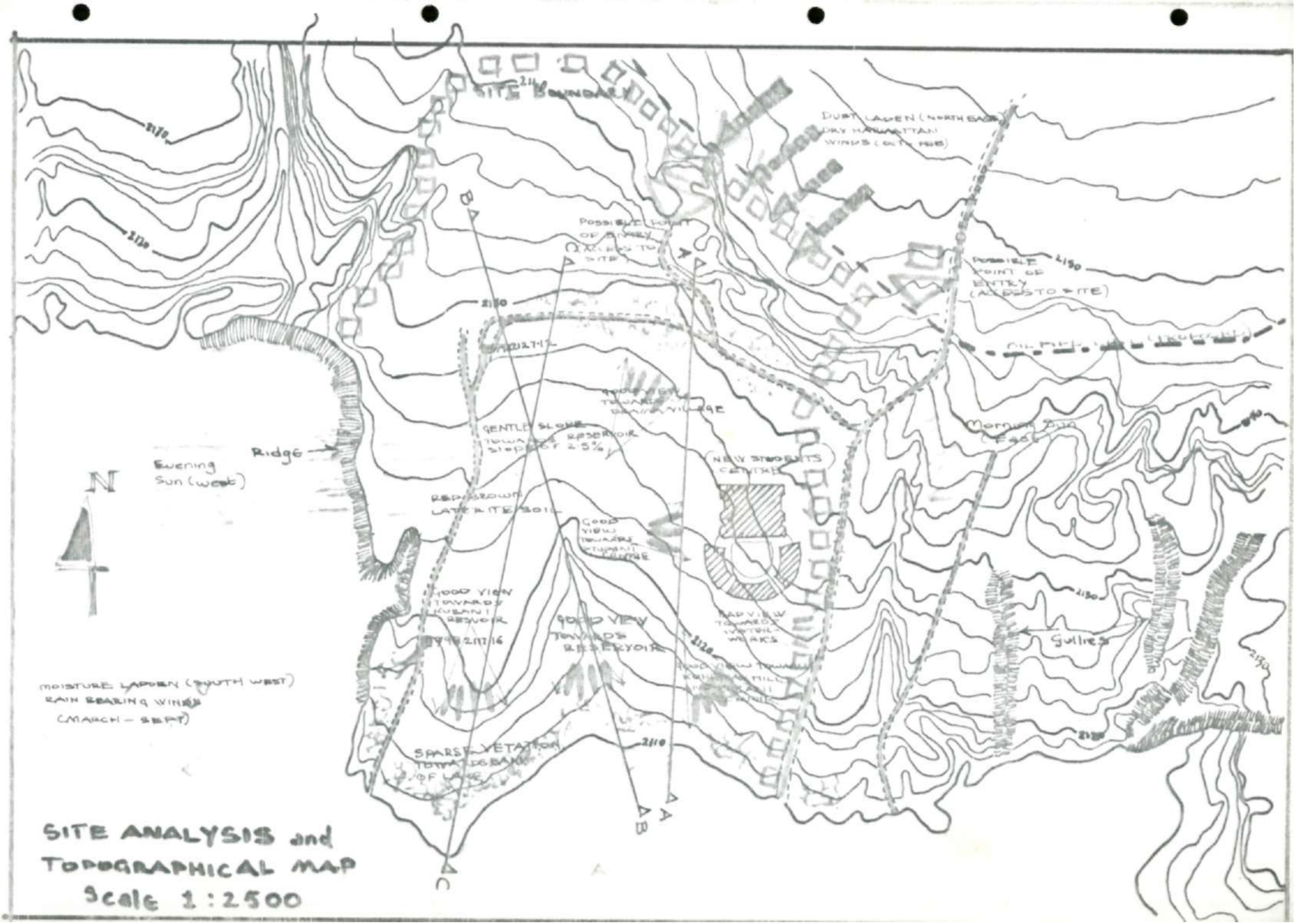


Fig 4.1.8.

At night the air over land cools faster than that over water and the process is reversed.

4.2. Topography/Soil Condition

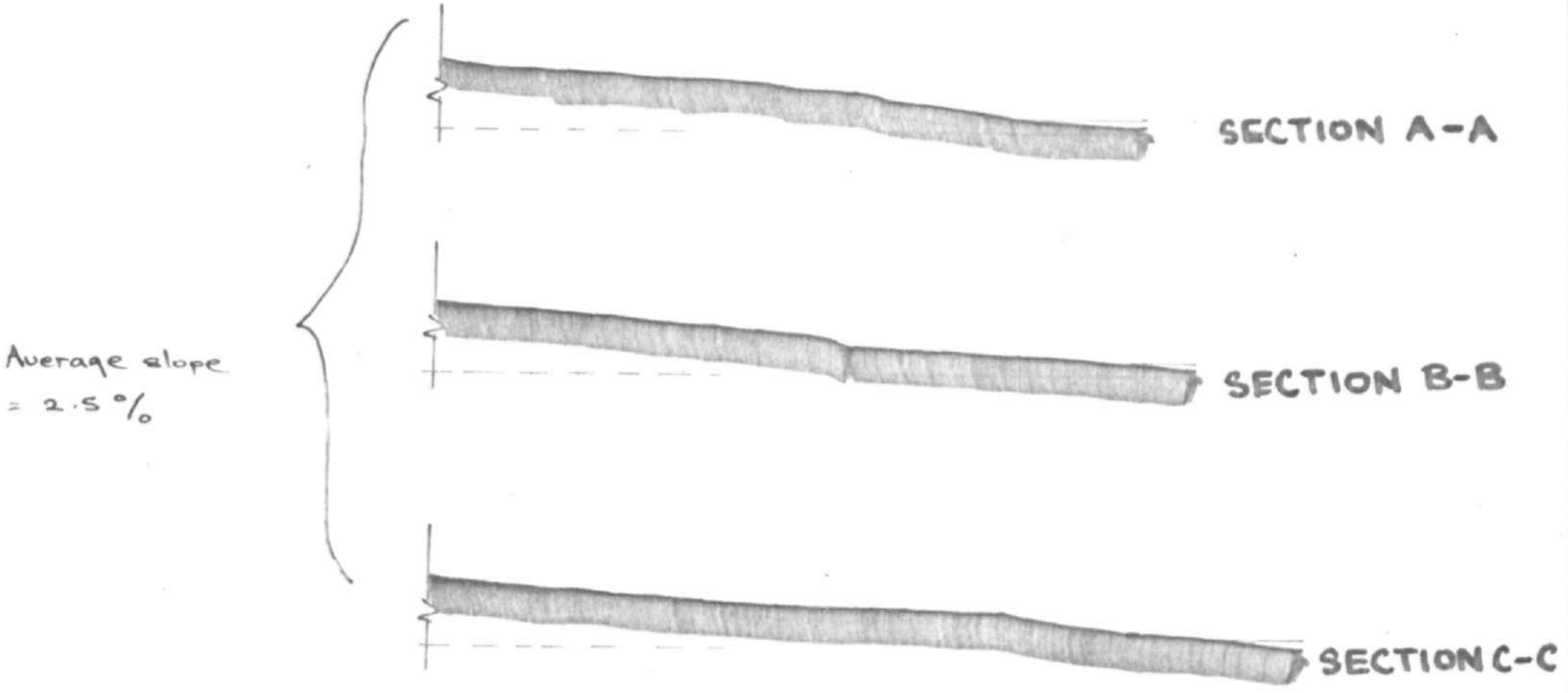
The site for the proposed post-graduate hall covers an area of approximately 5.9 hectars. This is the westermost portion of this area designated for student housing, the student centre being the buffer between it and the easternmost portion. The westermost portion was chosen because of excessive erosion in the form of deep gullies on the easternmost part.



SITE ANALYSIS and TOPOGRAPHICAL MAP

Scale 1:2500

SITE SECTIONS SCALE 1:2500



Average slope
= 2.5 %

The land here(i.e. The site chosen) slopes gently towards the reseruior with an average gradient of 2.5%. The land between contour lines 2120' and 2140' is reasonable flat while that between 2120' and 2110' the slope is noticable in parts having a slope as high as 6.25%. The soil has been identified to be of low load bearing capacity in parts, especially with close proximity to the reseruior. As such it is recommended that structural engineers should pay special attention to this aspect. The use of pile foundation is recommended. The site has a high ground water level as most parts in the Samaru Campus site and this is expected to rise even more during the raing season. [illegible]. This aspect should also be a major factor in the foundation and structural design.

4.3. Natural Features

The site is frec from rock out-crops, however sparsely scattered vegetation of the sudan Savannah type is present on site, in the form of trees and shrubs. There is very little grass cn site as most of the site is covered by laterite soil. Most trees are present at the fringes of the site boundary and as such will be preserved. Extensive land-sceping will be necssary for aesthetie purposes.

Spatial Pattern 4.4.

There are a number of significant and a attractive views from the site these are as follows;

(1) The view to the Kufena hills which lies some 6km south east of the site.

(2) The reseruoir which lies to the south of the site.

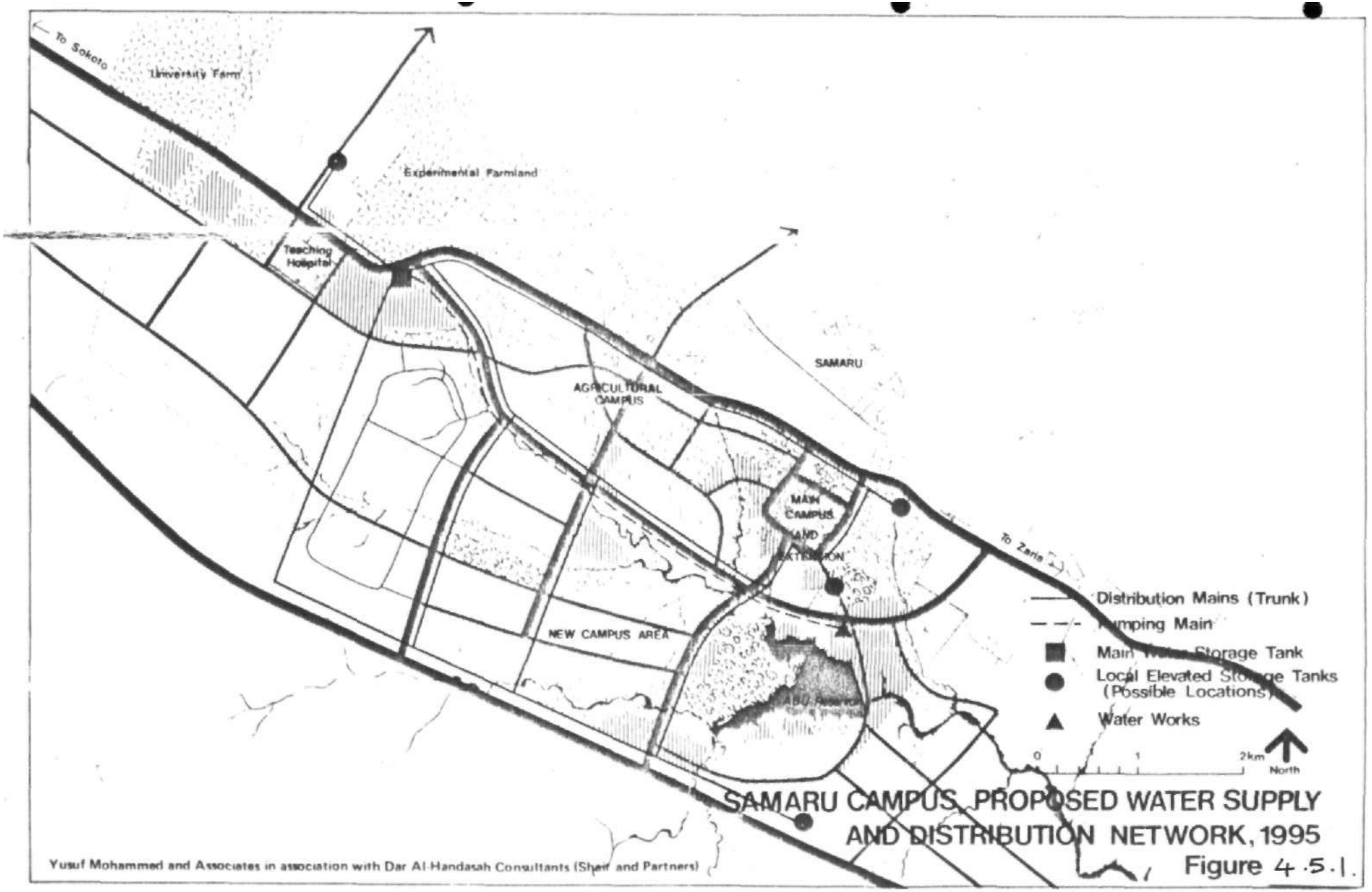
(3) The view to the student centre which when completed should be an interesting architectural edfice. This is situated to the east of the site.

Buildings will be orientated so as to benefit as much as possible from these significent views.

Services 4.5

4.5.1 Water Supply/Distribution to the Site:-

At present, ABU is experiencing water shortages due to the limited water supply it receives from the Kaduna water board. However, the independent water supply scheme based on Kubani (ABU) Reservior initiated by the University in 1970 is soon due for completion. This will be able to meet the demands of the University population. The capacities of the storage reservior and water treatment plant are more than adequate to meet the water demand of the existing University population. Figure------ shows the proposed water supply and distribution network in relation to the site. The supply to the site will be tapped from the distribution mains that runs along the western side of the site.



SAMARU CAMPUS, PROPOSED WATER SUPPLY AND DISTRIBUTION NETWORK, 1995

Figure 4.5.1.

Yusuf Mohammed and Associates in association with Dar Al-Handasah Consultants (Shair and Partners)

In addition small storage tanks will be mcooperated in the design to meet expected peak demands when necessary.

Parameters of ABU Reseruoir

Catchment area	=	575 sq km
Area of storage basin	=	83.4 h_o
Storage capacity	=	2.6 $x10^6 m^3$
Top water level	=	644.81m
Gest level	=	646.34m

4.5.2 Sewerage and Sewage Treatment

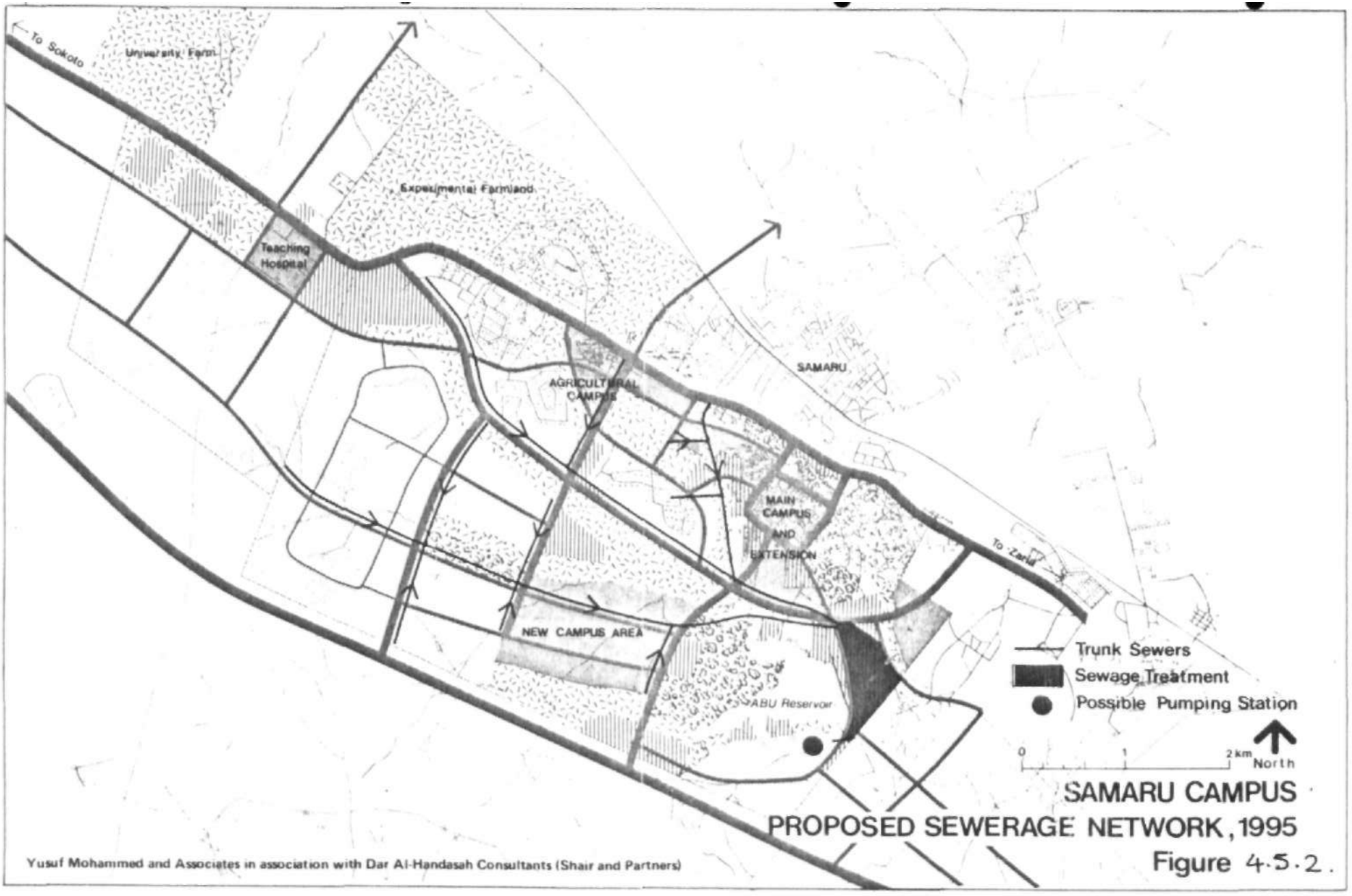
Existing A.B.U. Sewerage Network: This consists of the following components:-

(i) I main collector sewer of 375mm connected to a chamber

(ii) 3 secondary sewer lines of 300mm diameter serving Amina Hall, Ribadu-Alexander Hall, Suleiman Hall and all academic buildings within the campus except the Adminstration block

(iii) I recently laid sewer line of 200mm serving the Agriculture buildings.

(iv) I secondary sewer line of 300mm connecting the septic tank of the Akenzua Hall to the stabilization ponds.


To Sokoto
University Farm
Experimental Farmland
Teaching Hospital
AGRICULTURAL CAMPUS
SAMARU
MAIN CAMPUS AND EXTENSION
To Zaria
NEW CAMPUS AREA
ABU Reservoir
Trunk Sewers
Sewage Treatment
Possible Pumping Station
0
1
2 km
North
SAMARU CAMPUS
PROPOSED SEWERAGE NETWORK, 1995
Figure 4.5.2.
Yusuf Mohammed and Associates in association with Dar Al-Handasah Consultants (Shair and Partners)

In residential areas A,B,C, E and F the individual houses are connected to septic tanks which serve as a disposal system.

From the main collection chamber sewage flows by gravity to the treatment plant via 2 trunk sewers of 450 and 300

Existing Sewage Treatment Methods:

Sewage Generated by the main acadmic area is treated by 2 methods, namely activited sludge and photosynthesis in waste stabilization ponds. This is earried out at the the treatment plant about a kilometre east of the site.

Proposed Sewerage Network:

The existing sewarage network appears to be working quite satisfactorily but will obviously require substantial enlargement.

A seperate sewerage system for the collection and conveyance of sewage from the new areas to be developed between 1981 and 1985 will be required as the existing system has no additional capacity. Similarly, the sewage collected from the new areas will name to be treated at a seperate treatment plant, because the capacity of the existing treatment plant is not adequate.

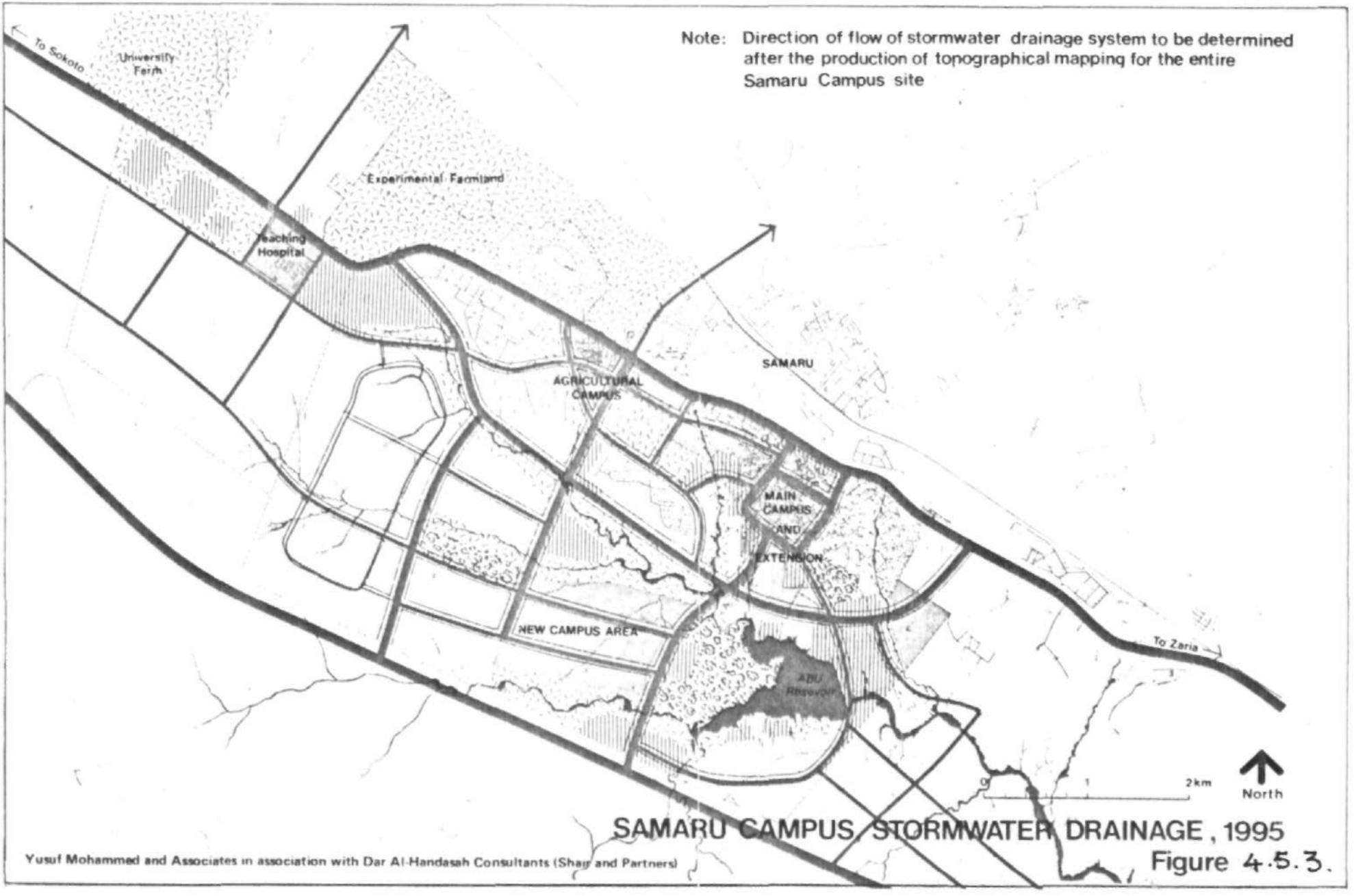
Proposed Sewerage Treatment Plant:

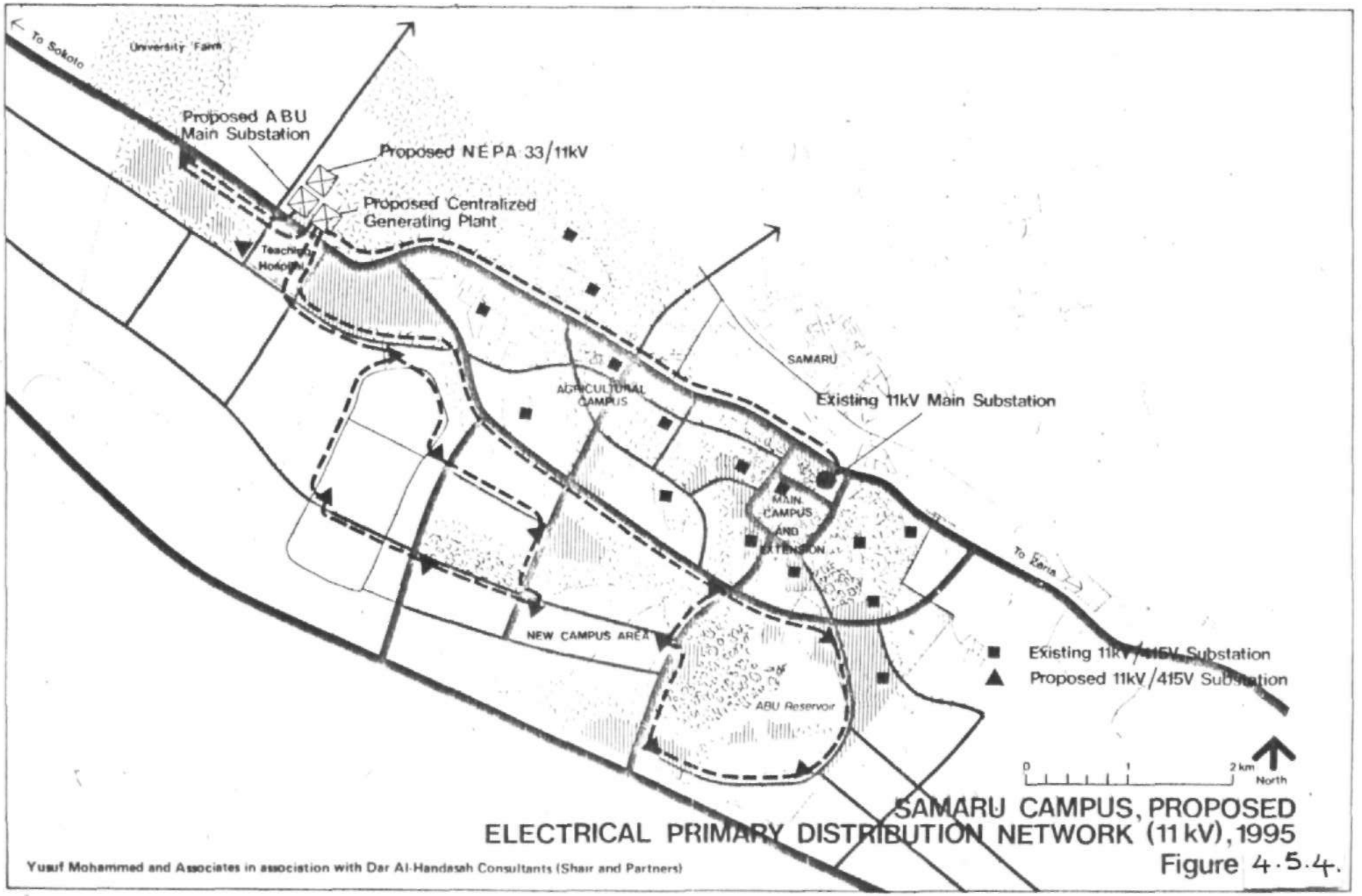
It is proposed that the new treatment plant should be of the oxidation stabilization pond type which is economical in capital, maintenance and operation. It would require a large land area for its constuction, but this should pose no problem as sufficient land is available close to the existing treatment plants. It is estimated that 20 hactares of land will be required for the stabilization ponds to cater for the projected 1995 population of the main campus.

4.5.3.

Storm water Drainage:

The topography of the site is such that it is eminently suitable for a gravity stormwater drainage system. However, field reconnaissance has indicated that the earth channels with steep gradients are not suitable as a means of stormwater drainage as they are easily eroded during peak flows. The site east of the new student centre (under construction) is badly eroded by gullies caused by ecessive stormwater run off. It is therefore recommended that the new water drainage channel system to tbe provided be lined with a suitable material (such as cast in-site or pre-cast concrete slabs) to prevent erosion.

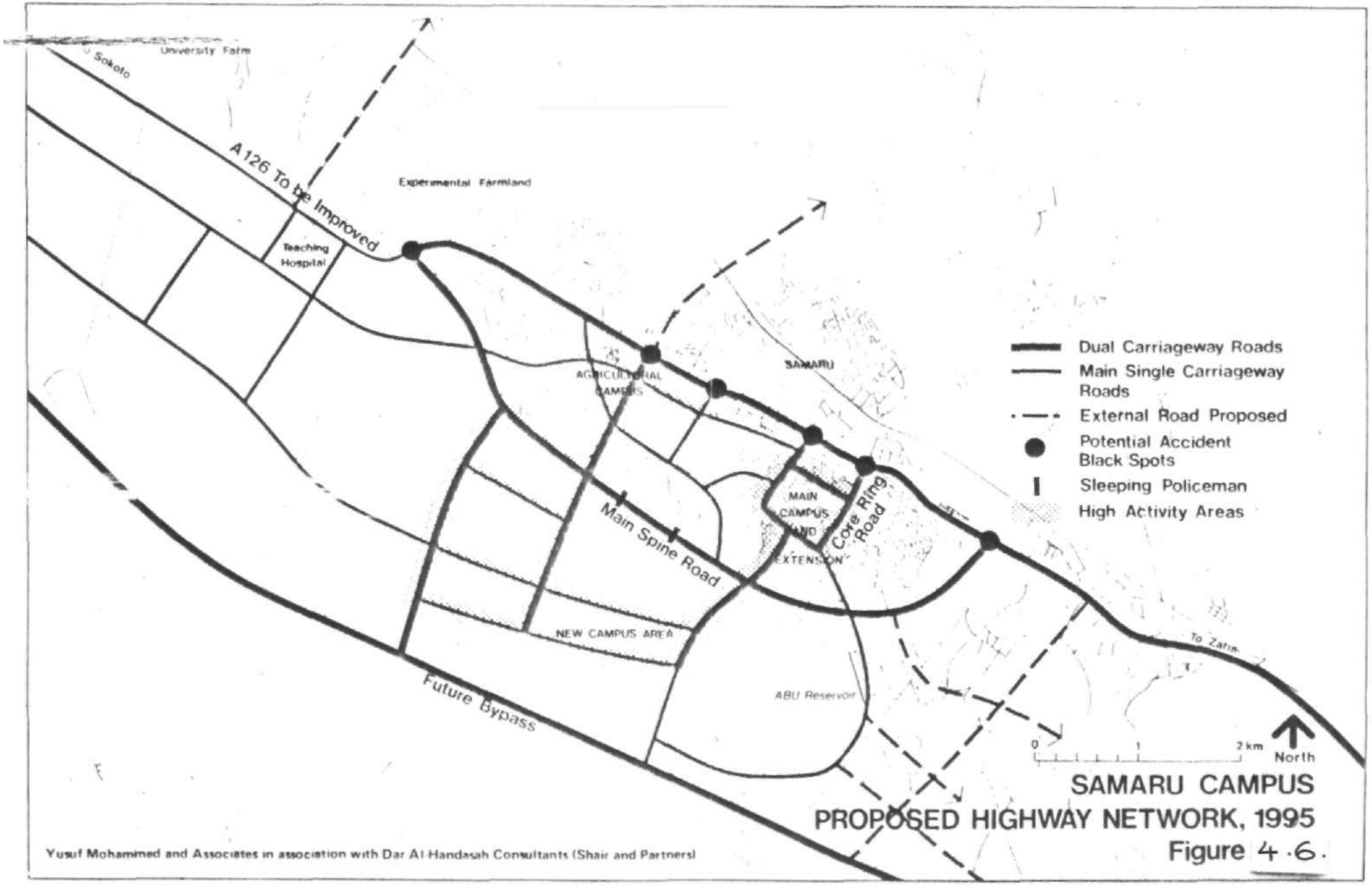

Note: Direction of flow of stormwater drainage system to be determined after the production of topographical mapping for the entire Samaru Campus site
To Sokoto
University Farm
Experimental Farmland
Teaching Hospital
SAMARU
AGRICULTURAL CAMPUS
MAIN CAMPUS AND EXTENSION
NEW CAMPUS AREA
ABU Reservoir
To Zaria
0
1
2km
North
SAMARU CAMPUS, STORMWATER DRAINAGE, 1995
Figure 4.5.3.
Yusuf Mohammed and Associates in association with Dar Al-Handasah Consultants (Shair and Partners)



SAMARU CAMPUS, PROPOSED ELECTRICAL PRIMARY DISTRIBUTION NETWORK (11 kV), 1995

Figure 4.5.4.

Yusuf Mohammed and Associates in association with Dar Al-Handasah Consultants (Shair and Partners)



SAMARU CAMPUS
PROPOSED HIGHWAY NETWORK, 1995
Figure 4.6.

Yusuf Mohammed and Associates in association with Dar Al Handasah Consultants (Shair and Partners)

4.5.3.

Electricity Supply;-

A 11KV/425V substation is proposed adjacent to the site and could easily be tapped to supply the power needs of the proposed post-graduate hall. Fig [illegible] shows the proposed electrical primary distribution network.

Vehicular Circulation Pattern 4.6;

An existing laterite road originates from the fringes of the main campus core and terminates at the new student centre which is adjacent to the site. In addition to this, a proposed 'Main Spine Dual Eeamiage-way is expected to pass along the northern boundary of the site. It would be very easy to 'top' any of these two roads to make the site accessible to vehicular traffic. The first alternative being a better solution so as not to have too direct an access of the busy main road traffic to the site.

Ahmadu Bello University Zaria
Kashim Ibrahim Library

CHAPTER FIVE

DESIGN

5.1 Introduction:

As mentioned earlier the aim of this thesis is to evolve a design for a Post-Graduate hall of residence for the Ahmadu Bello University Zaria. This Chapter now deals with the design in details.

A nember of assumptions were taken into consideration before arriving at the number of students being designed for. The A.B.U. masterplan predicts the population of post-Graduate students registered in the faculties to be 6649 in 1995. Of this number 5096 will come from the nie faculties of the main campus while the remaining will be from the Adminstration Campus Kongo. Other assumptions are as follows

(i)* The administration campus Kongo will continue to house its own Post-Graduate Students as being done in the past.

This means that the design numbers will deal directly with the main campus alone.

(ii)* Post-Graduates will comprise twentyfive per-cent of the total enrolment in the faculties except in medicine where none are expected, and the Department of Urban and Regional Planning which is solely Post-Graudate.

(iii)* Ph.D. Students will be kept to a minimum, since the present trend of Ph.D. researchers becoming members of staff is expected to continue. Thus for this category of Post-graduates staff housing should be provided.

289992

(iv) Federal Government policy on education states that in campus accommodation be provided for a minimum of thirty per cent of the student population in any one University. Hence Post-graduates forming a particular kind of student body being different from under-graduates and others, will be treated as a seperate entity, thus accommodation will be provided for thirty percent of estimated 5096 population, this give 1529.

(v) Existing post-graduate rooms will be fully utilised, as extra under-graduate accommodation is expected to be built to cater for undergraduate students As of present there are 638 rooms designed for post-graduate's in some of the halls of residence. This implies a shortfall of 891 rooms to cater for the accommodation requirements of post-graduates in 1995, taking into consideration federal government policies minimum.

(vi) It is proposed that the Senior Staff Club should move southwards to a new premises as part of the special housing area for senior staff. The existing self catering flats, dinning room, club and swimming pool will form a post-graduate centre, as part of A.B.U.'s emphasis on post-graduate study.
There are forty catering flats, with an additional twelve single self contained rooms in the 'club poper.

This gives an additional total of fifty-two extra post-graduate accommodation types. Subtracting this from 891 the figure 839 is obtained. Thus the hall complex will be designed to accommodate 840 students.

(vii) It is assumed the female students will not exceed twenty-four per-cent of the total post-graduate student population. This gives a total of 200 female student accommodation types which need to be designed to cater for this percentage.

5.2. The Brief

The brief, is to produce a design for a co-educational post-graduate hall complex at the Samaru site of the Ahmadu Bello University to accommodate eight hundred and forty students of this figure, six hundred and forty are male while the remaining two hundred are female.

The brief includes provision for a dinning hall and kitechen, and hall administration building the later which will comprise of offices for the hall staff, telephone exchange room, postal agency, first aid room, stores, security office and toilets.

Due to the recreational potential of the site influenced by the presence of the lake, it is proposed that a small boat yetty be incorperated in the design to further enhance this this potential. The jetty will comprise of storage area, boat rental area, and common room.

* Based on the A.B.U. master plan.

◆ Federal Government policy on education

x Each Catering flat may if necessary accommodate a maximum of two students.

5.3. The site and site plannig.

The site is as mentioned earlier located south of the area designated-"Extension to the main campus". The site is the western portion of the area designated for additional student housing in the 1980-85 plan programme, the whole area being divided into west and east by the presence of a student centre which is centrally located on the site. The western portion, as mentioned earlier was chosen in preference to the easten one due to its being free from gullies which are very predoninant on the eastern portion. The site for the hall complex covers an area of approximately 5.9 hectares and is on a gentle slopes of 2.5% on the average. It is easily accessible from a laterite road which originates at the existing staff School which in turn is situated at the fringe of the main campus core. The site should also be accessible from the main spine dual carriage-way which is proposed by the A.B.U. master plan, via this same road which will be upgraded in the plan programme.

The buildings have been located in such a way as to minimise any adverse effect of the slope on the structures. The hostel blocks have been grouped into pairs and are located all along the site from top to bottom. The dinning hall and Administration building have been located near the proposed student centre to incooperate its functions into the design scheme. Therefore all three of these communal facilities have been somewhat grouped together into what could be described as

the high communal zone. The jetty is of course situated at the lakeside, and is accessible, to vehicular traffic via the proposed minor access road which runs through the residential area and terminates here.

5.4. Orientation:

The hostel blocks and dinning hall have all been sited in such a way as to avoid any direct East/West solar penetration into any of the rooms. This has been achieved by having openningss such as windows on the north and southsides while only auxilliary facilities such as toilets or laundry and drying areas have opening on the East/West faces. The Administrative building which is basically an 'X' shape has the buildings orientated along North West-South East and Southwest Northeast plans. The buildings which are arranged around a large courtyard should help to effect cross ventilation in all rooms.

5.5. Planning:

There are two slightly different block types each type numbering ten; thus giving a total of twenty blocks in all. The blocks are arraged in pairs,each pair being the combination of two different blocks types forming an internal semi private courtyard. Each pair of blocks are in turn placed in such a way that they form semi-private courtyards between each other, and they are linked to each other, the dinning hall, student centre and administration building by a series of

walkways which are covered wherever thought necessary. Each pair of blocks is arranged such that the pair preceeding or coming after it are invented"images" of it on plan. This gives rise to a natural meandering movement pattern through the blocks from top to bottom. This arrangement has been done on both sides of a minor access road which has been diliberately meandered to follow building line patterns and much more important to ensure reduction of the speed of vehicles within the residential area. Parking has been provided for thirty per-cent of the resident population (two hundred a fifty-two parking bays) in the form of eight car parks adjacent to the blocks situated at the "near side" with respect to this road. The number of bays in each car park and they are orientated along the direction of the slope to facilitate easier parking. Also several green areas or strips have been introduced between parking spaces to allow for the planting of trees and shrubs in order to afford such spaces the benefit of good sun shading, while at the same time being usually reduced in scale.

The Administration buildings is located such that is the first building encourtered when coming into the complex. There is a parking provision for cars and bus stop, the latter being part of the proposed campus bus service.

A short distance behind the administration buildings lies the student centre, which is direcrly accessible by a a road which comes straight down to it from the proposed main spine dual carriage-way.

It is from this same road that an access road was tapped off to feed the residential area of the complex. The student centre road is branched right to terminate in a bay between the centre and the dinning hall which lies adjacent the student centre. Thus this bay serves as delivery area for both the dinning hall and the mini-market, the later being part of the student centre.

Landscaping:

The two block types for the purpose at convenience will be referred to as 'A' and 'B' types respectively. A pair is formed by grouping an 'A' and 'B' block so that they face one another, and enclose an open space between them.

This space forms a semi-private courtyard and is landscaped with trees and other plantings. The larger trees in the courtyards will have conecrete seats around them, and all the covered walkyays will have hedges along-side them to further enhance the courtyard effect.

The landscaping will in relation to the whole complex emphasize the idea of the hierarchy of spaces- the flow of spaces from small, enclosed into larger open ones. Elements of landscape for this purpose will include tress, shrubs, flower pots and sculptures. (The inspiration for the concept arrived from Prof. Alexander's book "Patern Language" Chapter: Hierarchy of spaces in particular.)

The hostel blocks:- 5.7

Hostel block type 'A':- 5.7.1

For the typical floor, the block can be divided into five sections namely, male auxilliary facilities, male rooms, main staircase and lobby, female rooms, female auxilliary facilities. On the ground and third floor levels however, the female wing experiences changes in this sequence.

The first and second sections which make up the male wing, lie on the same east-west axis. The fourth section which is made up of the female rooms being part of the female wing, is rotated through an angle of forty-five degrees in the clockwise direction. The third section which consists of main staircase and cobly, has the lobby occupying the 'wedge' shape formed by the angle between first/second and fourth sections The fifth section which houses female auxilliary facilities is rotated a further forty-five degrees, thus giving the whole block a 'c' like shape in plan. Each block is made up of four floors. On the ground floor, the first and second sections, comprise of male rooms and auxilliary facilites respectively the third section contains the lobby and main staircase which is common to all floors. The fourth and fifth sections are reserved for parking (nine cars). On the first and second floors. Sections one/two and four/five consist of male auzilliary facilities male/rooms and female rooms/ female auzilliary facilities respectively. On the third and last floor section one and two is identical to previous floors.

Section four however accommodates a roof terie and adjacent kiosk serving the whole block. Section five is fnished with Reinforced concrete roof slabs.

Rooms:-

There are eight rooms per floor in the male wing as against six in the female wing. This gives a total of forty-four rooms in the block.

Male Rooms:-

Have an approximate floor area of 11.75m^2 which however does not include the loggia (recessed balcony space) The loggia has an approximate area of 2m^2. This provides the possibility of outdoor sleeping which at the moment is a very prodoninant activity during the dry season when sleeping indoors becomes unbearable. Up to date such provision is still absent in existing halls of residence, resulting in students sleeping on the corridors, thereby creating a hinderance to free passage. Other provisions include 1.2 mx.6m built in cupboard, small wash-hand basin and mirror.

Female Rooms:-

Are arranged in a "saw tooth" staggered pattern allowing each induvidual room to lie on a north-south axis, there-by benefitting from the prevailing wind at all times. All rooms have an approximate floor area of 11.65m^2 excluding balconies are large enough to be used for outdoor sleeping, and are screened from intense glare and heat from the east-west axis. Other provisions are identical to those included in the male rooms.

Auxilliary Facilities:-

On each floor of the male wing consist of, abathroom laundry, cleaners store and general store.

(i) Bathroom:- Two W/C's, two showers, four wash-hand-basins and urinal.

(ii) Laundry:- Two sinks, 2.4X0.45 metre ironing slab and adjacent 8.5m^2 drying area.

(iii) Cleaners store:- Occupies an area of 3.15 m^2 and equiped with small sink.

(iv) General store:- Occupies an area of 10.4m^2 and will cater for storage of items such as big boxes, empty trunk boxes which students will not need for most of the year round.

The female wing has similar provisions to that of the male, except in the bathrooms, where a bidet cubicle replaces the urinal. A kitchenette has also been provided to serve each floor of this wing and will be equiped with two sinks, worktop, refridgerator and two cookers.

Corridors:-

Considerable thought has gone into the corridor design in order not to only provide only thorough fare through the blocks but also to serve as semi-private balconies.

The corridors have a 2m projection, the balustrates have then been recessed 80cm at alternate intervals to form a series of concave alcoves leaving an effective corridor walking space of 1.2m. The spaces created between each pair of alloves has then been filled with potted plants to bring some landscaping effect to the various floors.

Reading Room/Lounge Block:

Each hostel block has an adjacent reading room/lounge block attached to it. This block basically takes on a rectangular shape, but three corners have been sheared off thus giving it a kind of polygonal shape 2m x 80cm deep projections have been made centrally on the North and South walls to accomodate shelf layers.

The block has three floor levels, the ground seroing as lounge, while the first and second floors take on the role of reading rooms. A toilet compr sing of two W/C's (one male, one female) has been located adjacent to the lounge on the ground floor.

A fan shaped recess has been created on all flo rs on the West facade to act as a bal ong.

Access to each block is via corridors which exist on all three floors which furthur continue to link each pair of hostel blocks on these same levels.

Hostel Block Type 'B':

This block can similarly be sub-divided into five sections. The only difference in the design of this block is in the forth and fifth sections. The forth section is made up of double rooms as against single rooms in the type 'A' blocks.

In the fifth section the only difference is in certain ommissions that have been made within the auxilliary facilities. The bath-room containing showers, bidets and W/C's have been removed and these elements have been placed in the rooms. Two of such double rooms exist on the first and second floors.

The Rooms

Each double room is in reality a comination of two single rooms seperated by a bathroom and small passage way linking both rooms and being adjacent to the bathroom. Thus allowing both rooms the opportunity to share this facility. The rooms have been designed in this way to afford its occupants maximum privacy when so desired, all they have to do is shut the two adjoining doors which link these two rooms. Secondly, there is the possibility for a married student who wishes to reside on campus with certain members of his/her family, to utilise both rooms and create a kind of flat-let. One room could be used as the living room while the other as the bedroom. Therefore in reality this toom could be used in three ways, first as a double room, secondly as two seperate single rooms in which case the doors adjoining the passage leading into the bathroom are opened by each occupant only when the desire to utilize facilities arises, and lastly as a flat let for married students who wish to reside with members of the families on campus. All other auxiliary facilities except those mentioned as being omitted exist as in type 'A' block.

The Administration building:

The main purpose of this building is to serve the Administrative and to some extent social and communal needs of the hall complex.

It has been sited in such a way to be easily accessible to public while at the same time being within convenient walking distance from any residential unit.

Acoommodation in this building consists of the following:

Administrative-

(a) Porters lodge (with lobby)

(b) Caretakers office and adjoining store

(c) Hall Administrators office (with Secretary and waiting area.

(d) Assistant hall administrators office (with Secretary and waiting area)

(e) General office.

(f) Security office

(g) Male and female toilets.

Social and Communal:-

(h) Postal Agency

(i) Telephone exchange

(j) First aid room.

The administrative spaces have been zoned in one half of the building to facilitate convenient and quick communications between the various members of staff. The social and communal spaces on the other hand have been zoned in the other half which is closet to the residential units. These facilities are accessible via a side entrance being on the west side of the building. The main entrance is located on the north side adjacent to the parking area. Provision has been made for a bus stop, which will form part of the proposed campus bus service system. All the various rooms have been arranged around a central courtyard which has been designed to let in daylight and to help cros ventilation across all spaces. The toilets have been located on the east side and have been recessed to minimise bad smells and odours. The secuity office has been located on the south side to allow for the viewing of people coming in and out of the building through the two entrances, while at the same time keeping an eye on all rooms, within the building.

The building itself has an interesting elevational character brought about by projecting and slanting the side walls and two intermediate columns which are all placed at four metre centres.

5.9 THE DINNING HALL/KITCHEN

This building will partially cater for the feeding requirements of the hall. It has been designed to seat 252 students at one time, this number being 30% of the resident hall population.

This percentage was chosen due to the fact that the majority of Post-graduates either prefer to eat out or cook for themselves (as in the case of female students.)

The dinning hall has been sited close to the new student centre so that delivery bay and access can be shared by both facilities.

The building has been given very interesting elevational character by the use of concrete folded frames which are five metres high. The walls of the building are thus independent of the frame that forms the roof structure. The walls have been built up to a level of only 2.1m in the dinning area to form a series of openings on the side facade which should further enhance ventilation and the passage of day-light into the building besides what comes in from the windows. Also the inclusion of flower beds and a sculpture piece are used to further highlighten the aesthetic valves of the facades.

5.10 BOAT JETTY

Due to the nature of the water body available here, (dammed water) it is impossible to use engine boats due to subsequent oil pollution of the water.

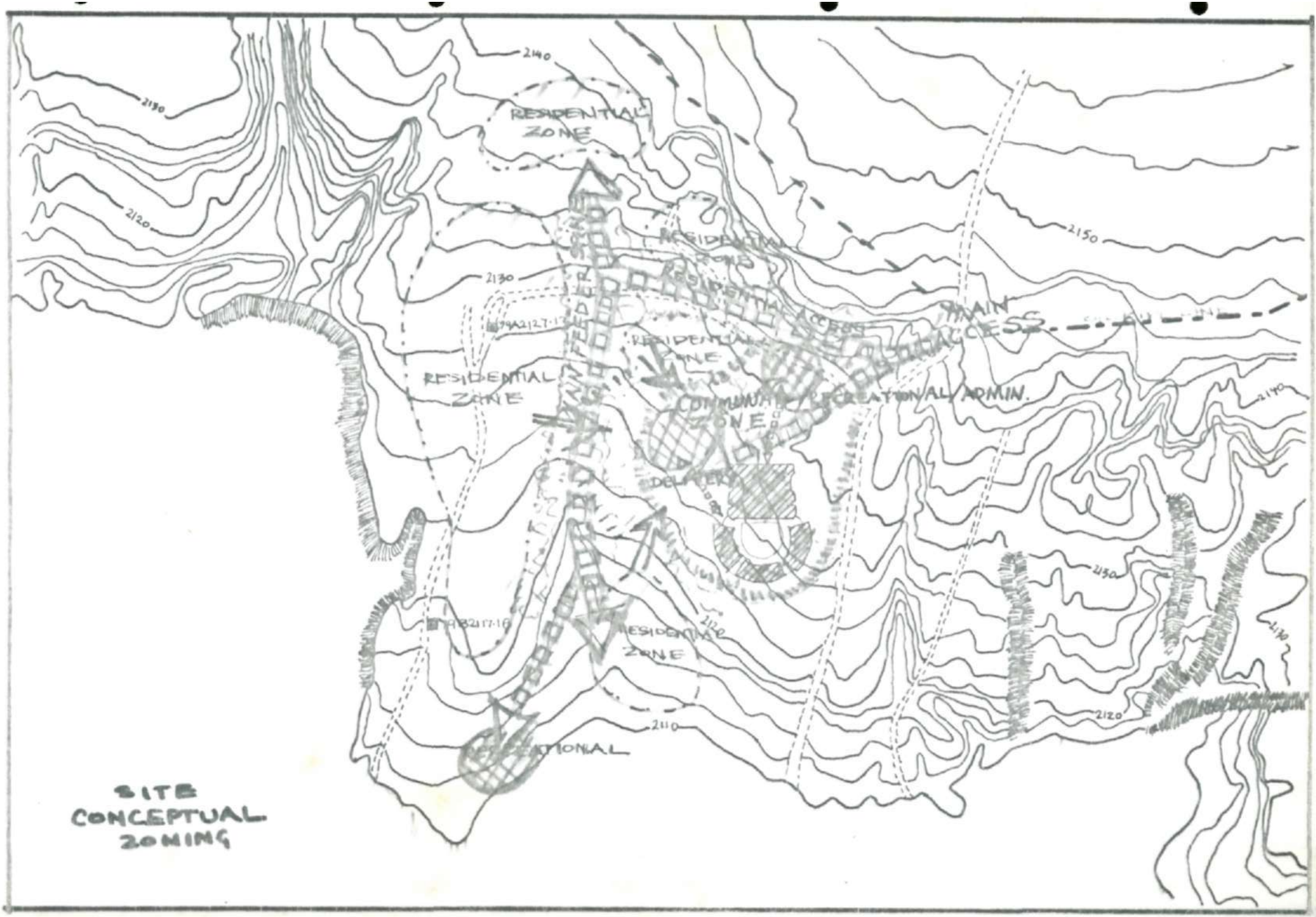
The boat house is designed to serve both a shelter for the boats and the patrons of the Marine recretion.

Space provided includes, the boat store which takes into consideration the removal of humid air which is bad for the shell of the boat. Ample clearance in terms of height of the store is provided to allow the stacking of the boats in two layers.

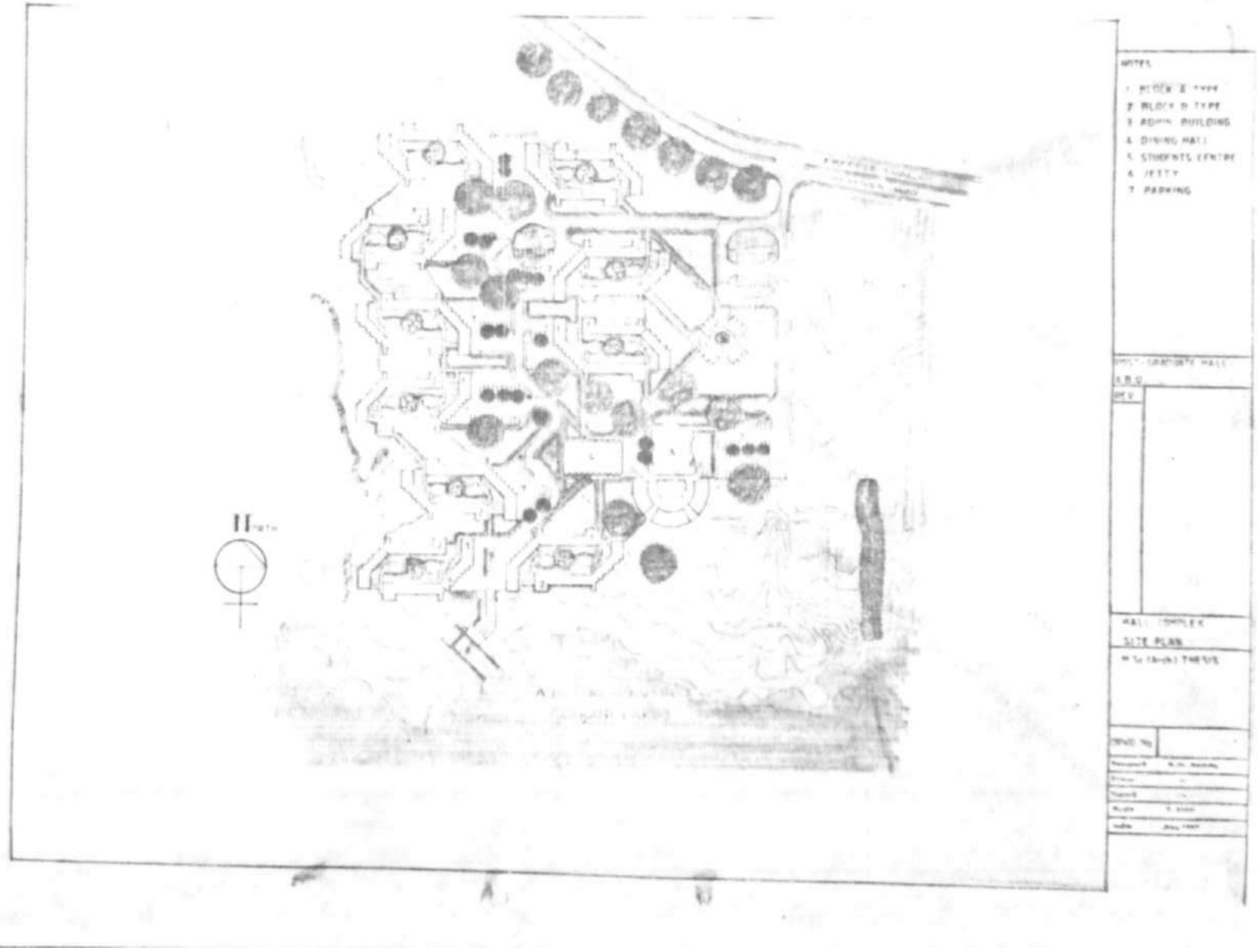
A common room is provided for the general utilities of the students. This is principally created to serve as a transition zone between the boating activity and the residential zone.

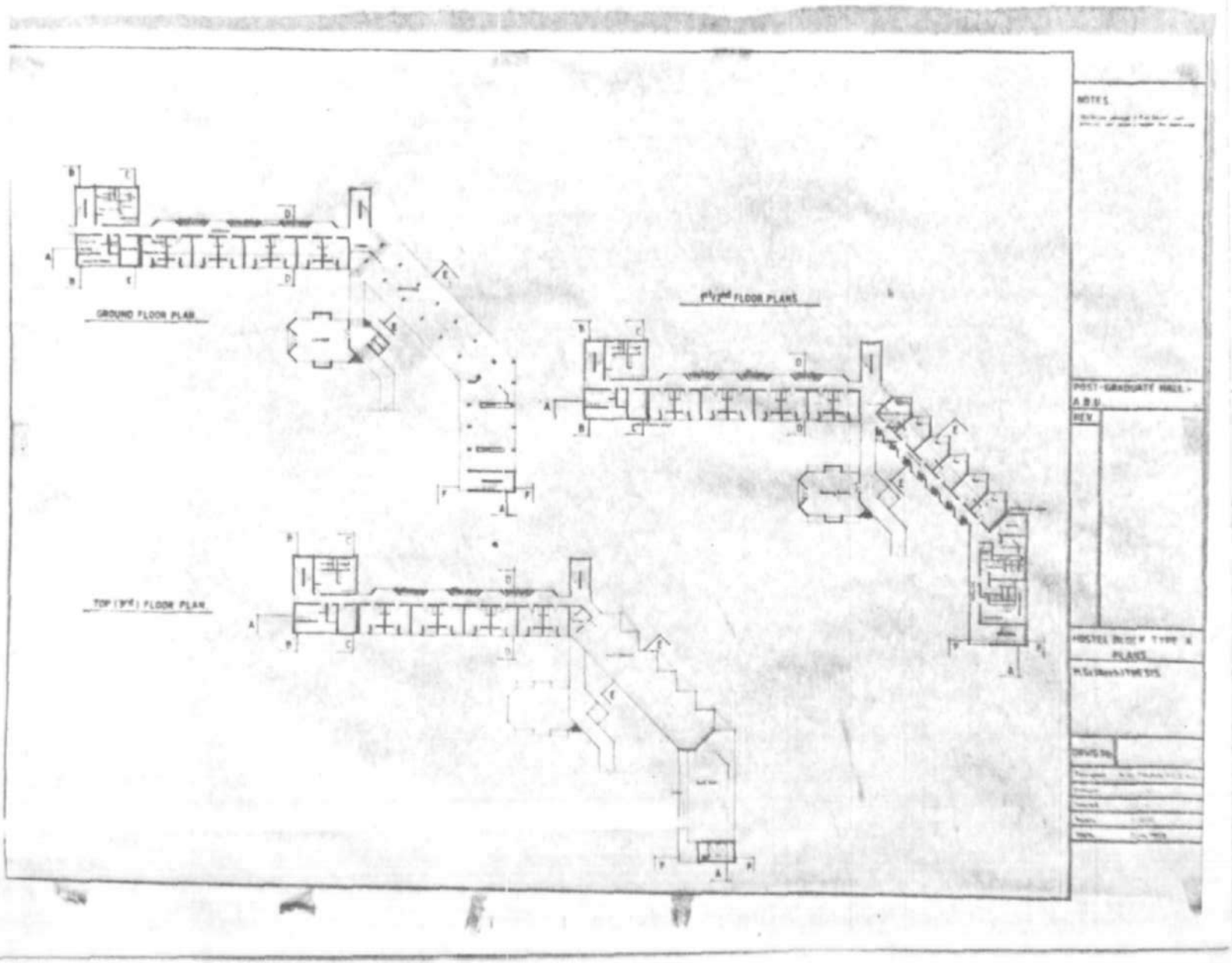
Little refreshments are available here since it would serve as a mini-recreational zone. Large reveal-windows, are providing ample fenestration and general good view to the water.

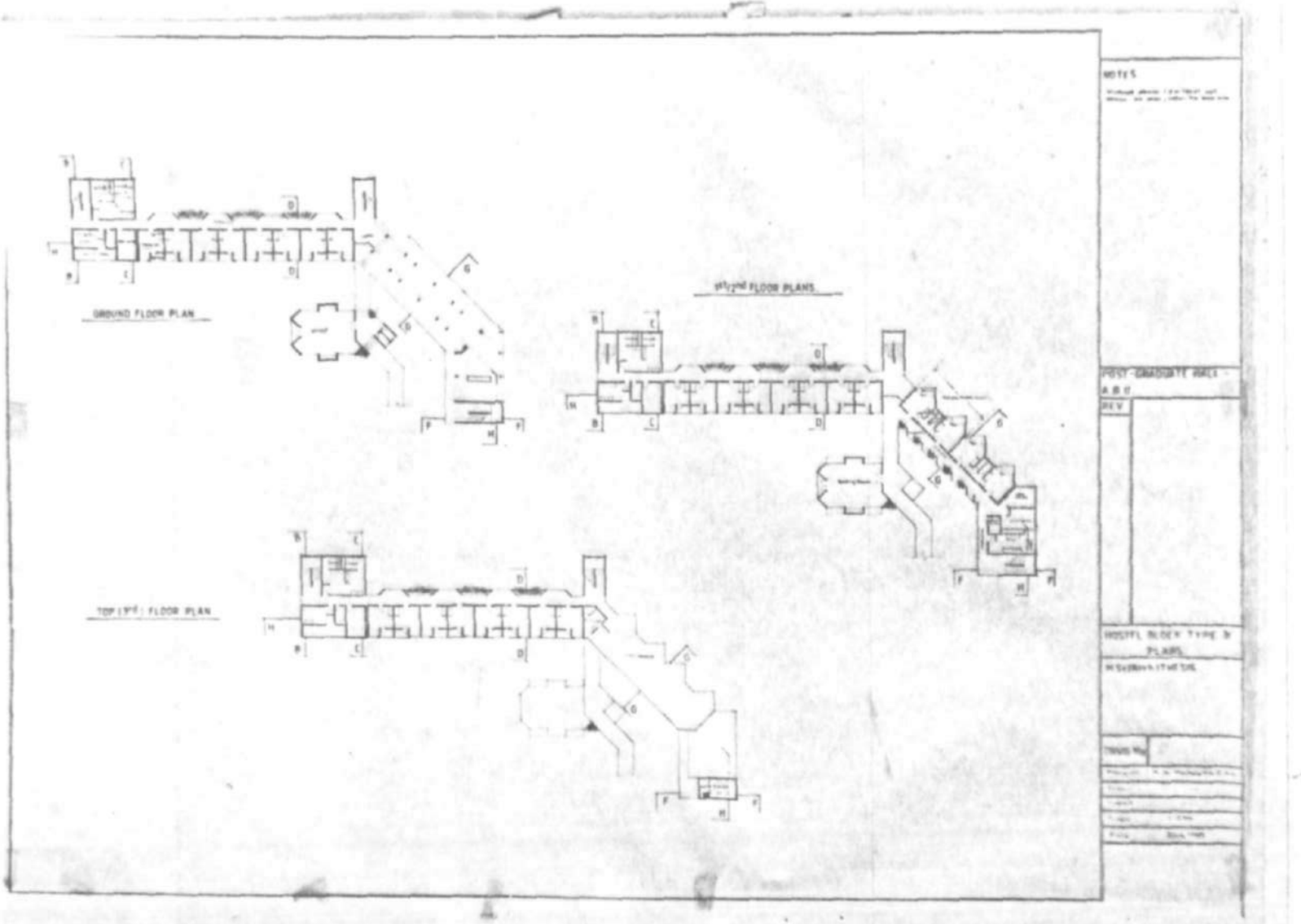
A pier, serving as an extension of the boat house into the water, is provided so as to make the mooring to boats in this area possible.

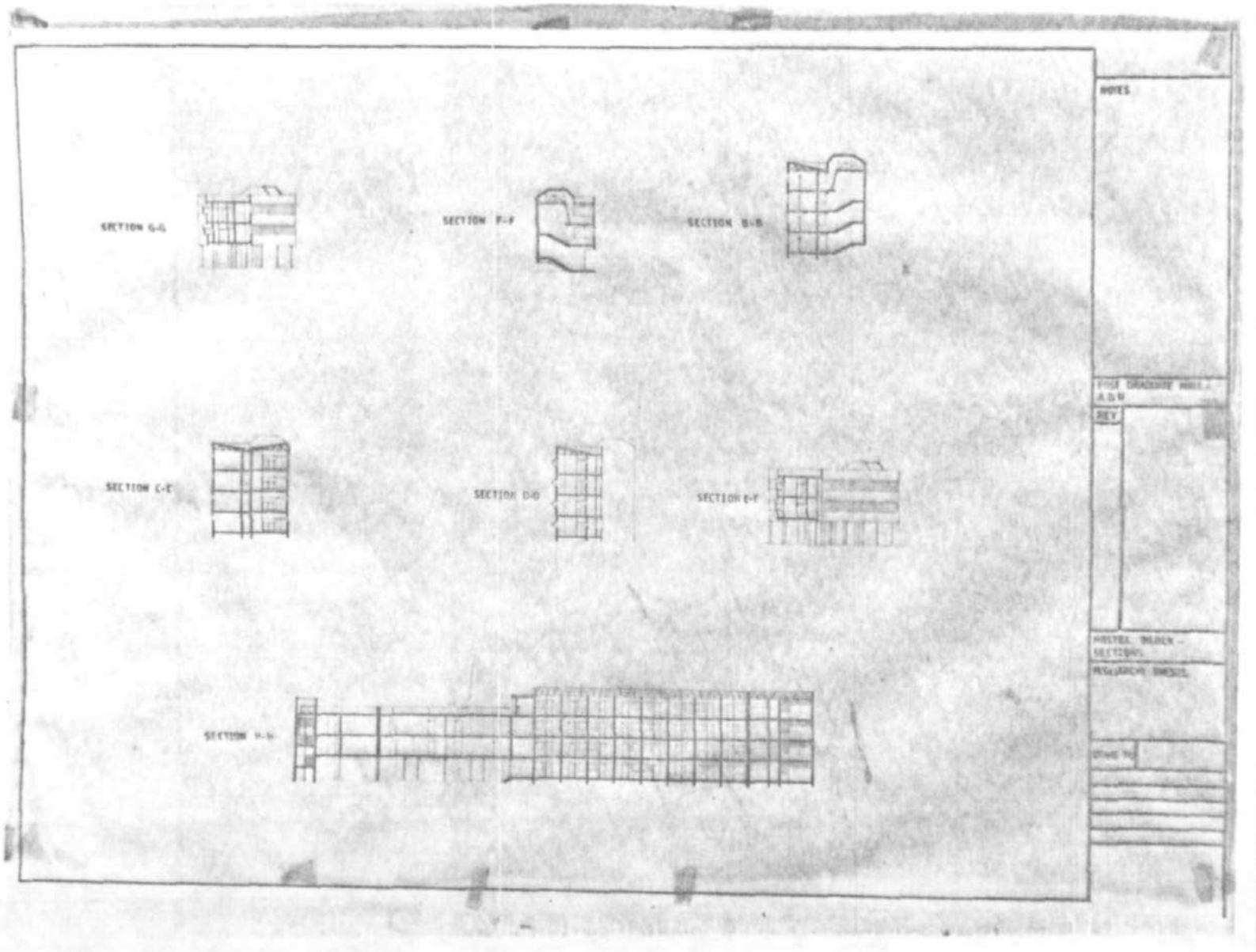


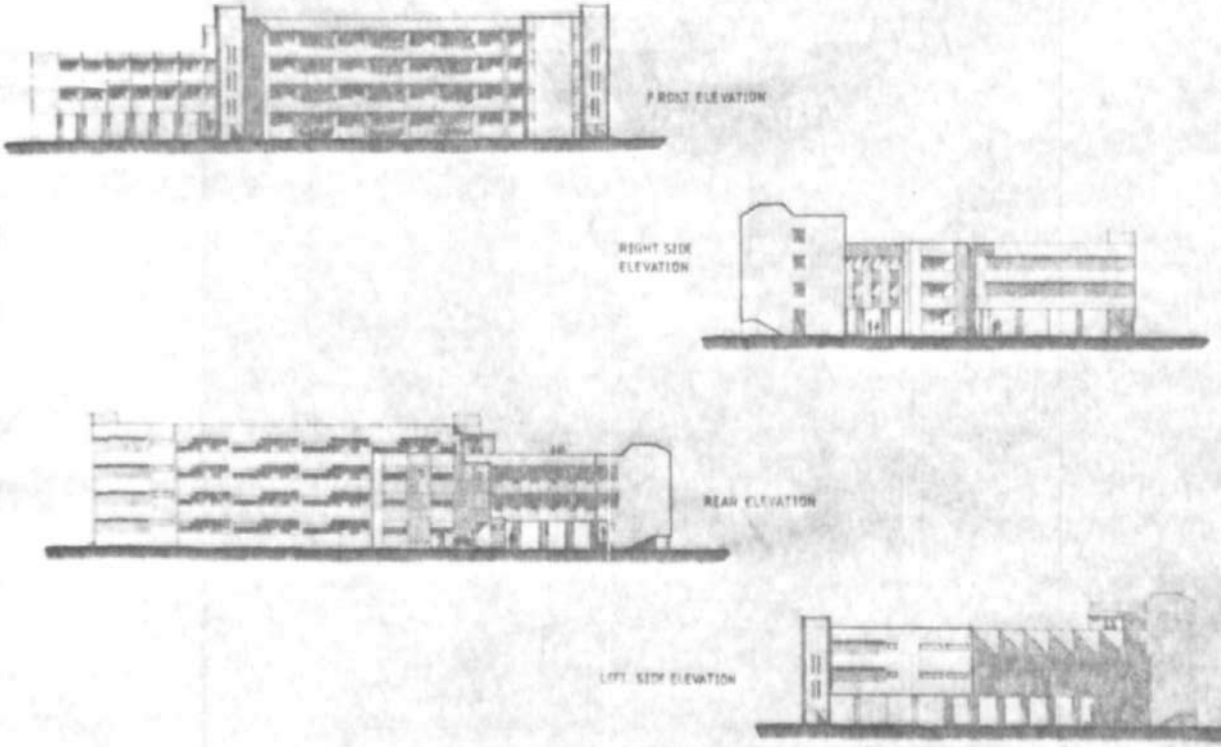
SITE CONCEPTUAL ZONING

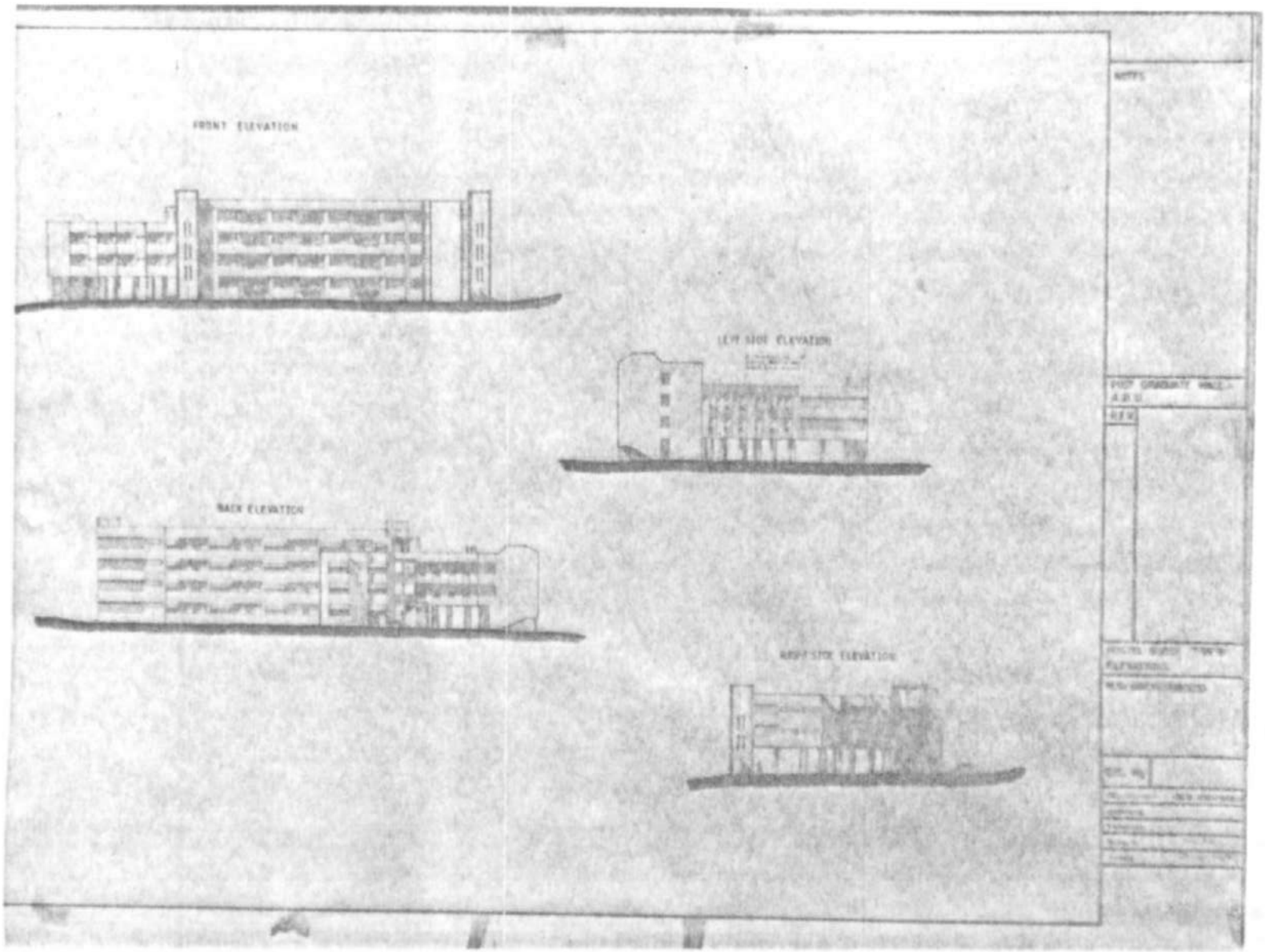

NOTES
1 BLOCK A TYPE
2 BLOCK B TYPE
3 ADMIN BUILDING
4 DINING HALL
5 STUDENTS CENTRE
6 JETTY
7 PARKING
SITE PLAN

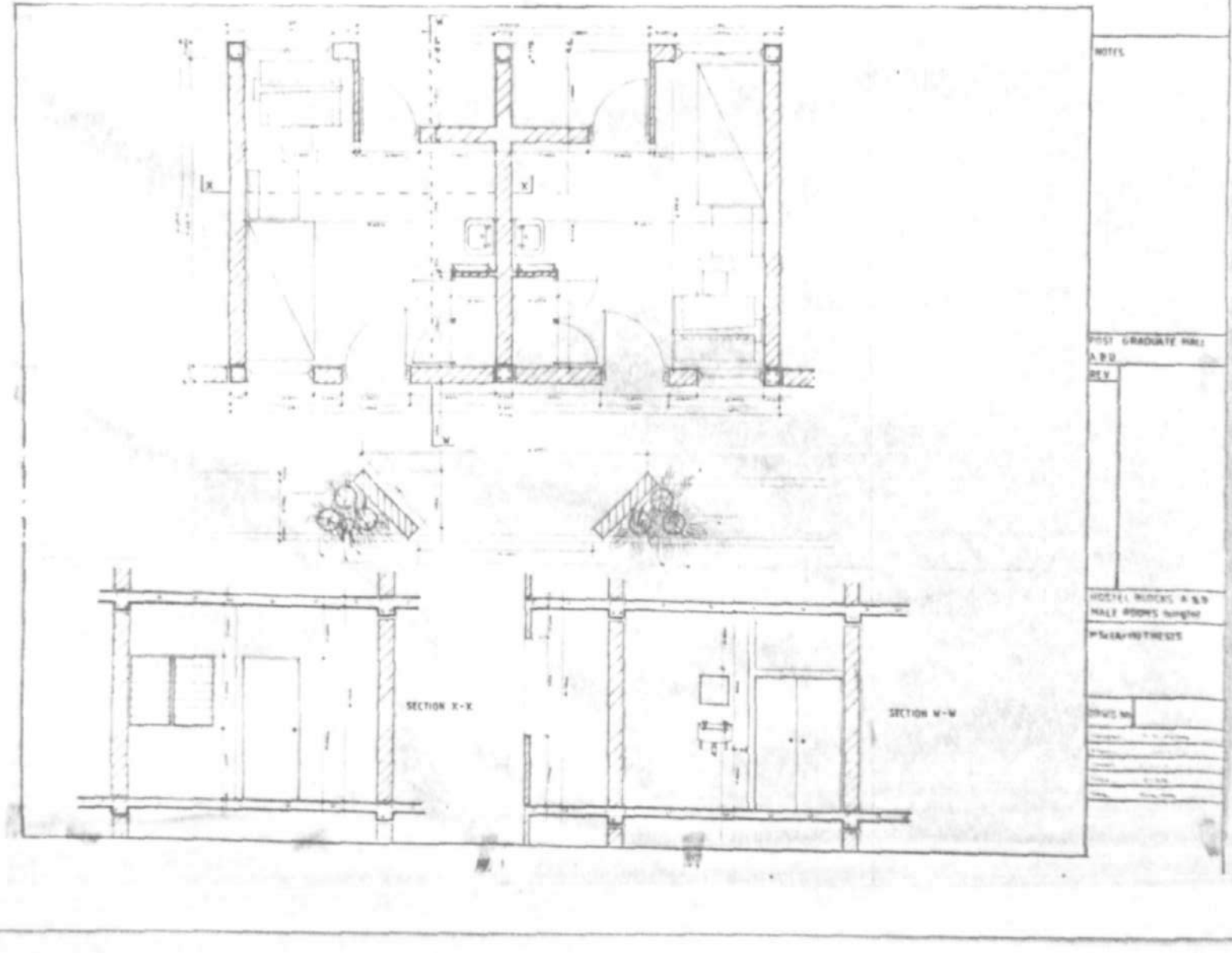

GROUND FLOOR PLAN
1ST/2ND FLOOR PLANS
TOP (3RD) FLOOR PLAN
NOTES
POST-GRADUATE HALL
REV
PLANS

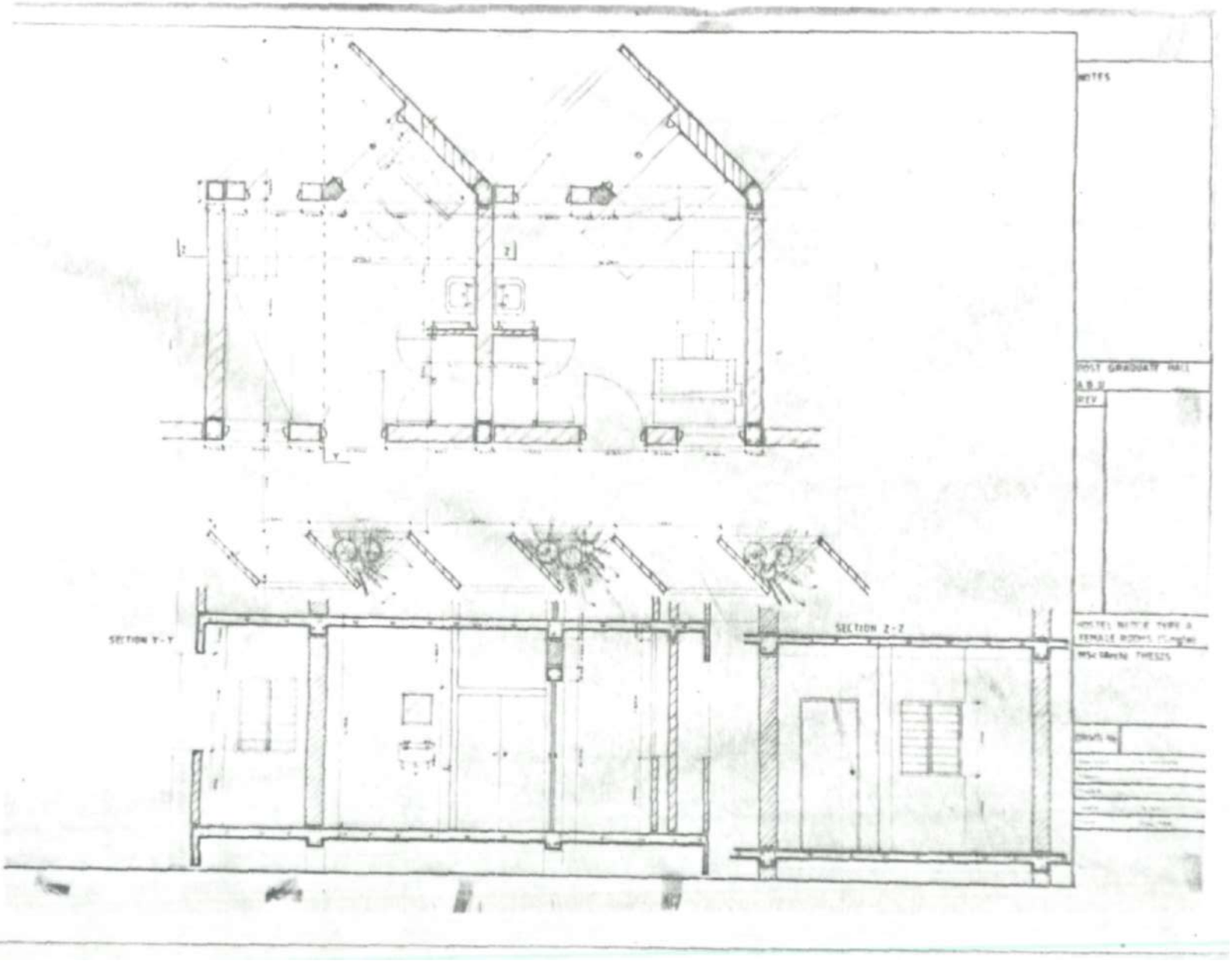

GROUND FLOOR PLAN
1ST/2ND FLOOR PLANS
TOP (3RD) FLOOR PLAN
NOTES
POST-GRADUATE AREA
HOSTEL BLOCK TYPE 'B'
PLANS

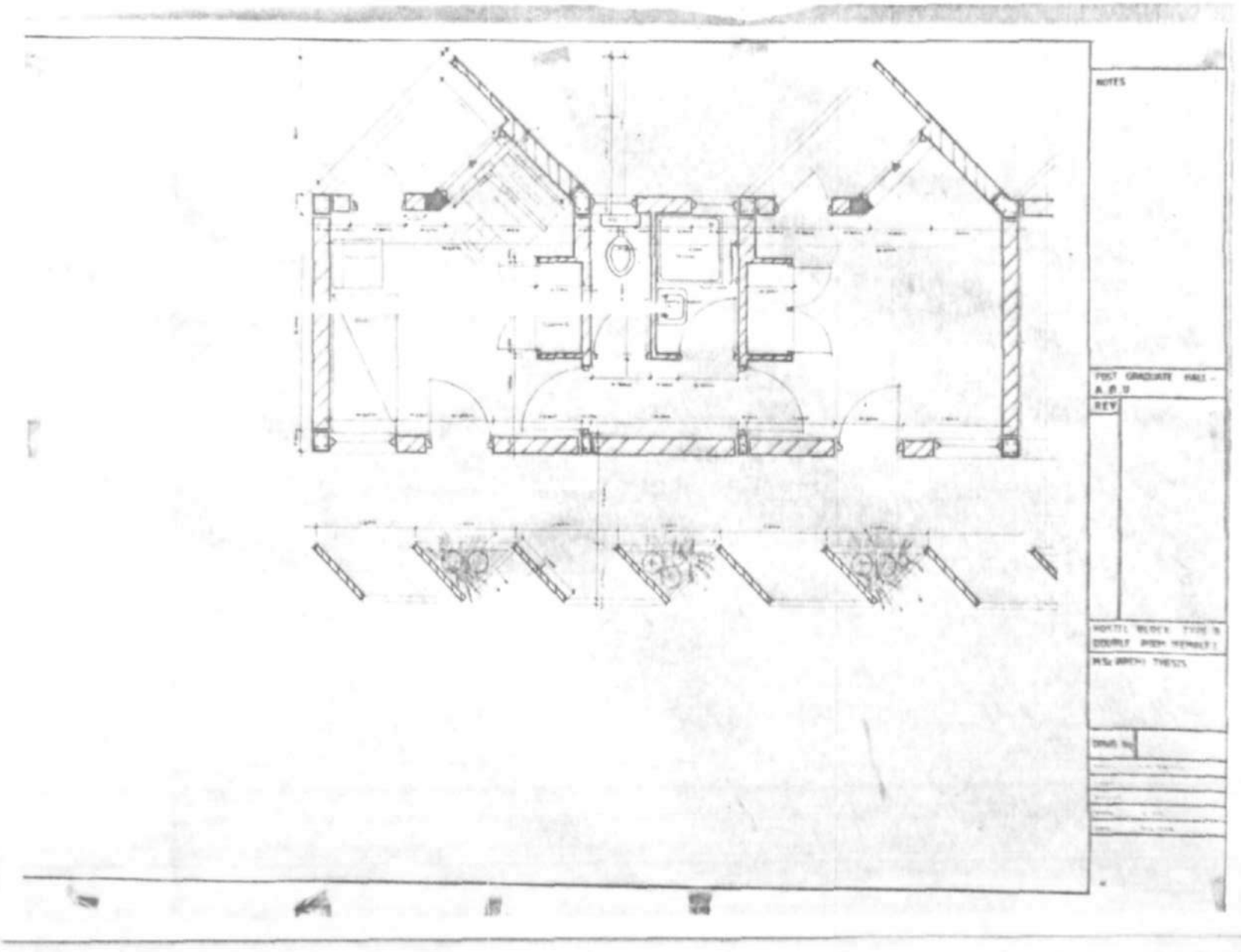

SECTION G-G
SECTION F-F
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION A-A
NOTES
REV

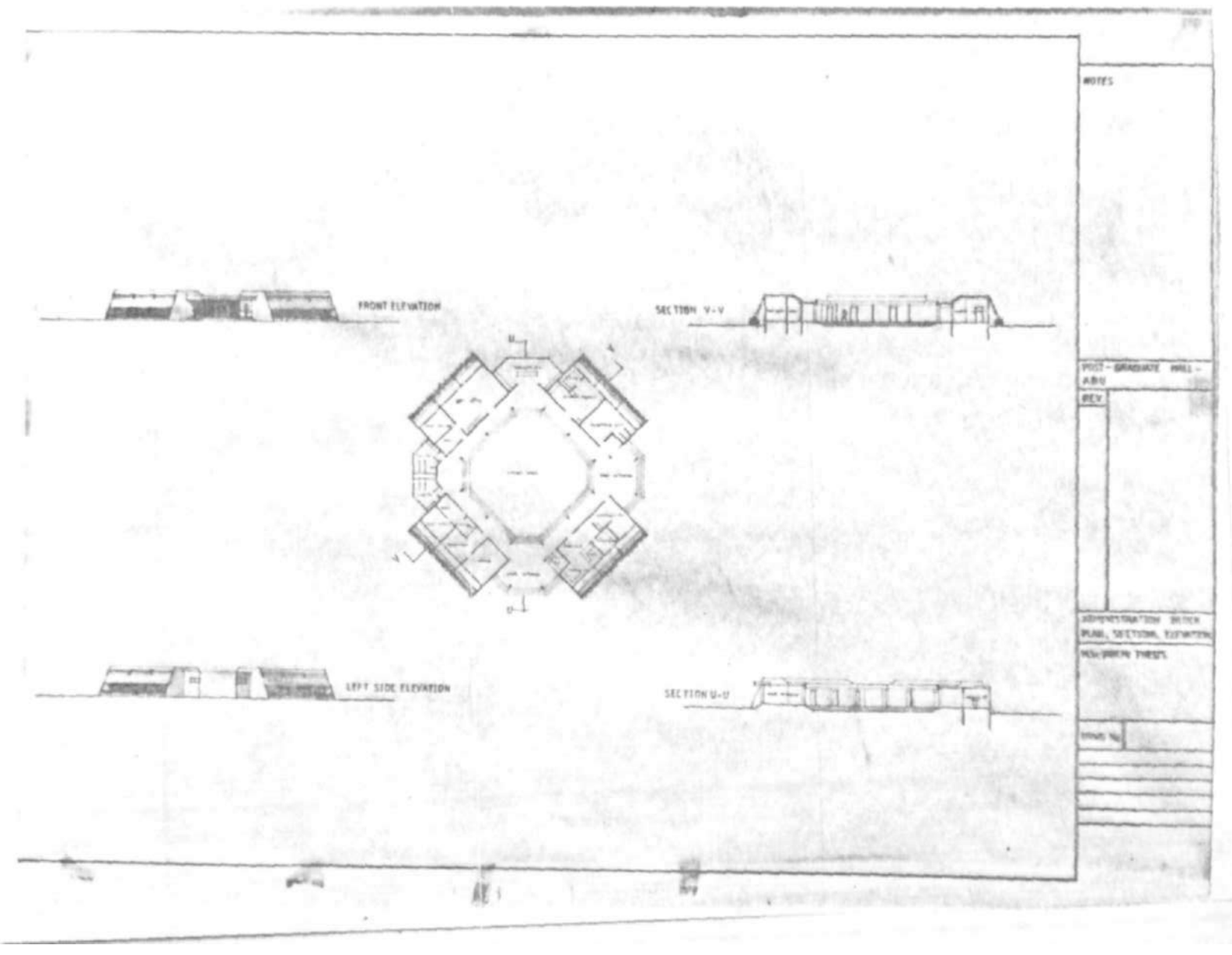

FRONT ELEVATION
RIGHT SIDE ELEVATION
REAR ELEVATION
LEFT SIDE ELEVATION

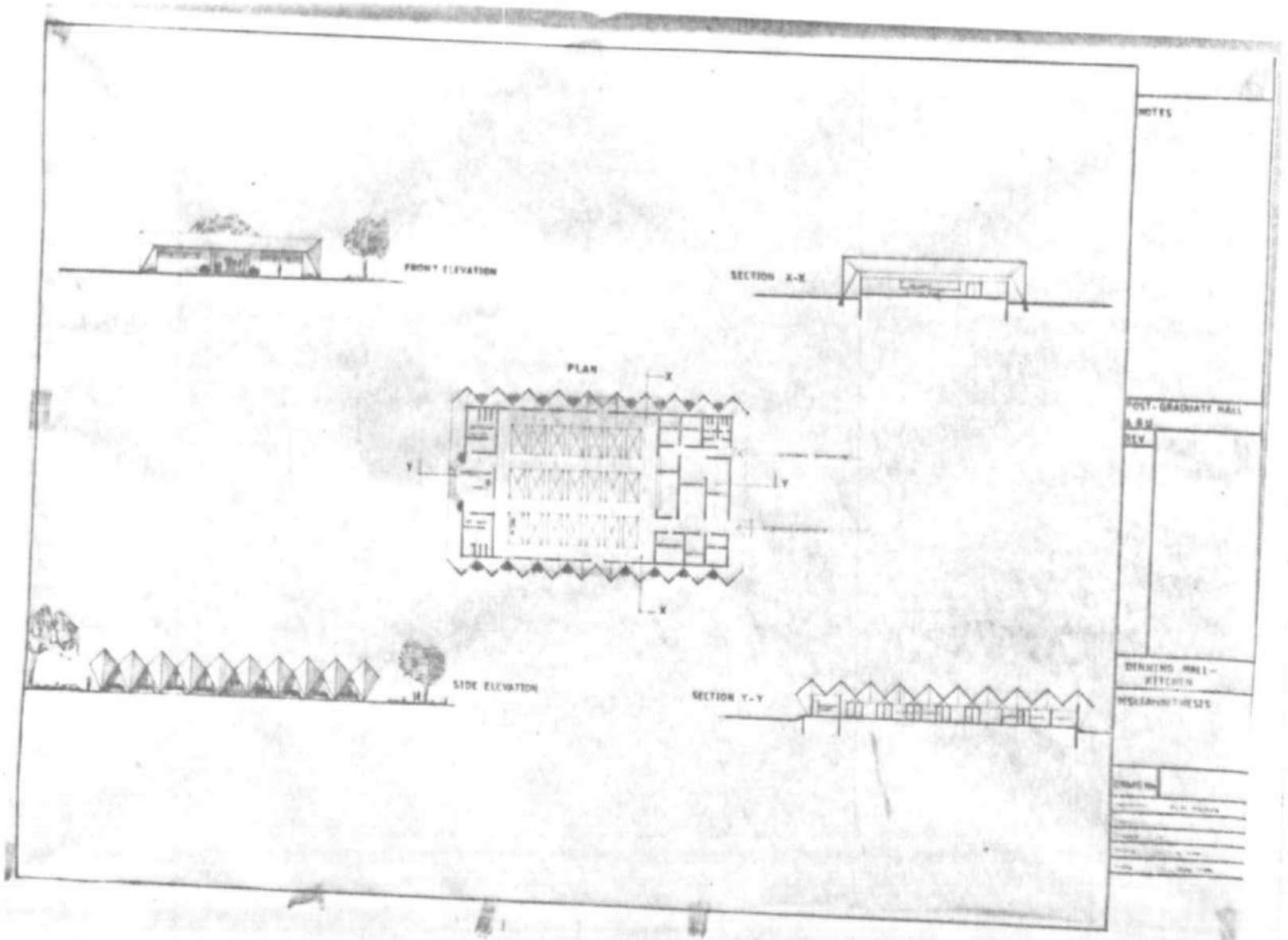

FRONT ELEVATION
LEFT SIDE ELEVATION
BACK ELEVATION
RIGHT SIDE ELEVATION

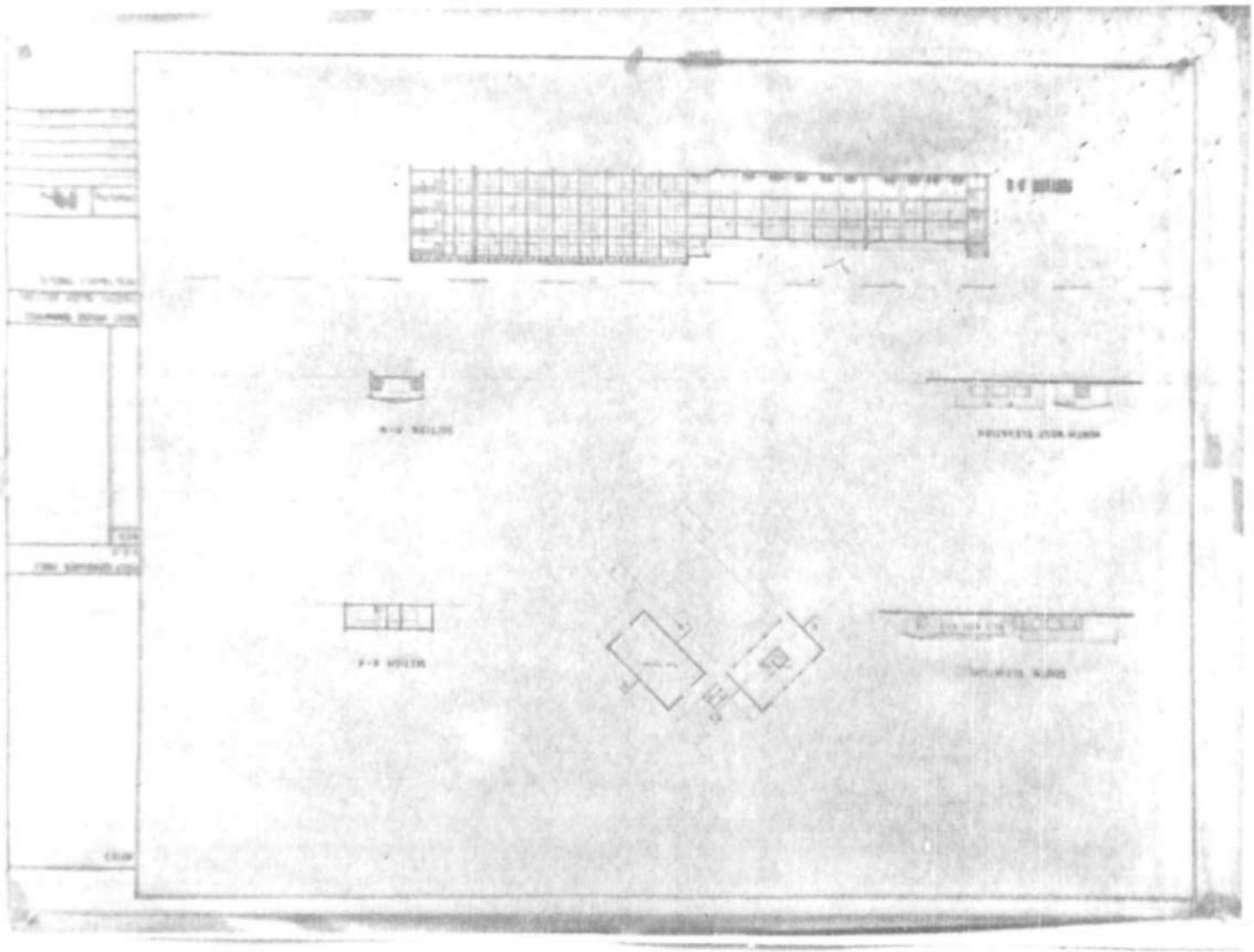

SECTION X-X
SECTION W-W


SECTION Y-Y
SECTION Z-Z


NOTES
REV


FRONT ELEVATION
SECTION V-V
LEFT SIDE ELEVATION
SECTION U-U
NOTES


FRONT ELEVATION
SECTION X-X
PLAN
X
Y
Y
X
SIDE ELEVATION
SECTION Y-Y
NOTES
POST-GRADUATE HALL
DENNIS HALL-
KITCHEN



CHAPTER - SIX

SCHEDULE OF ACCOMODATION

HOSTEL BLOCKS	AREA
TYPE - 'A'	
Male Wing:	
Room	13.75m^2
Bathroom	27.5 m^2
Store	10.4 m^2
Laundry/Drying Area	19.85m^2
Cleaners Store	3.15m^2
Female Wing:	
Rooms	13.45m^2
Store	10.4 m^2
Kitchenette	11.00m^2
Bathroom	27.69m^2
Laundry/Drying Area	21.00m^2
Cleaners Store	3.15m^2
Reading Room	45.5 m^2

HOSTEL BLOCKS	AREA
TYPE - 'B'	
Male Wing:	
Rooms	13.75m^2
Bathroom	27.5 m^2
Store	10.4 m^2
Laundry/Drying Area	19.85m^2
Cleaners Store	3.15m^2
Female Wing:	
Double Room/Bathroom	33.3 m^2
Store	10.4 m^2
Laundry/Drying Area	16.64m^2
Cleaners Store	2.94m^2
Kitchenette	11.00m^2

Dinning Hall:	AREA
Entrance Lobby/toilets	80.00m^2
Dinning Area	440.00m^2
Kitchen Area	200.00m^2

Boat House:	AREA
Common Room	84.00m^2
Boat Storage	84.00m^2

HALL ADMINISTRATION BUILDING	AREA
Hall Administrators Office (with Secretary and Waiting)	24.00m^2
Assistant Hall Administrators Office(with Secretary and Waiting)	20.00mm^2
General Office	40.00m^2
Caretakers Office	16.00m^2
Store	20.00m^2
Porters/Reception	5.00m^2
Security Office	28.00m^2
First Aid Room	55.00m^2
Telephone Exchange Room	30.00m^2
Postal Agency	30.00m^2
Male and Female Toilets	28.00m^2

C O N C L U S I O N

After copious analysis and subsquent synthesis of all social and technical data collected, an architectural solution has been involved with the ethos of architectural dictates and the discussions in previous chapters of this thesis.

Several problems encountered in the existing post-graduate halls have been solved. These problems are in the realms of ventilation, lighting, sanitation, inadequate recreational facilities, poor parking space, hazardous walkway, poor linkage between blocks and the harmonization of pcst-graduate students of both sex in an ambience healthy for scholarstic exertion and recreational enjoyments.

The water body has been harnessed to provide marine recreation which is a very promising but undevelopment sport in Zaria.

By and large the thesis has satisfied my own creative ingenuity in as much as many design constraints existed.

BIBLOGRAPHY

(1) National Policy on Education

(2) The future of main campus A.B.U. - Kawka .S.

(3) The geology of parts of Niger and Zaria Provinces, Northern Nigera
- J.H. Truswel Ph.D. and, R.N.Cope Ph. D.

(4) A pattern Language. Towns. Buildings. Construction
- Christopher Alexander, Sara Ishikawa, Murray Siluerstein with Max Jascobson Ingrid Fiksdahi-king,Shlomo Angel

(5) Standard Guide for Universties-
- Nigerian Universities Commission(N.U.C.)

(6) Architects Data-
Ernst Neufert

(7) A.B.U. Master Plan-
Yusuf Mohammed and Associates in association with Dar Al-Handasah consultants (Shair & partners)

(8) A guide to the site and Environmental Planning
- H.M. Rubinstein

(9) Design Primer for Hot Climates
- Allan Konyo

(10) [illegible]
- [illegible]

(11) [illegible]
- [illegible] Robert Smell

[illegible]

(12) [illegible]
- [illegible]

(10) Enclosing Behavior

- Robert .B. Bechtel

(11) Site Planning for Cluster Housing

- Richard Untermann and Rober Small

(12) Journal of Tropical Architecture Vol.1. No. 7 Feb/March.

(13) Site Planning - Kevin Lynch

(14) New Metric Handbook

- Edited by Patrica Tutt and David Alder

(15) Time Saver Standards for Building Types 2nd Edition

- Joseph Dechiora and John Hancock Callender.

(16) Structural Systems in Architecture

- J.S. Gniadzik (1980)