UNIVERSITY OF NAIROBI
DEPARTMENT OF ARCHITECTURE
THESIS REPORT

POPULATION CENTRE

CHIROMO CAMPUS.

KIKO. S
B. ARCH. 5
AUGUST 1980

CONTENTS

DECLARATION

This report is my original work and has not been presented in any other University. The report is part of the fulfilment for the degree of Bachelor of ARCHITECTURE of the University of Nairobi.

KIKO, S.

25/8/80

This report has been presented for examination with our authority as University supervisors.

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ACKNOWLEDGEMENTS

I acknowledge the guidance given to me in the development of this thesis report by the following:-

1. MR. JIM ARCHER

2. PROFESSOR ERICH MEFFERT

3. MR. BRUCE CREAGER (My Tutor).

INTRODUCTION

It is the Government policy to reduce the nation's rate of population growth.

To succeed in its efforts, there must be properly educated demographers who can:-

(i) Educate the masses on the importance of family planning and birth control.

(ii) Carry out demographic research

(iii) Enable free dessemination of demographic information

(iv) Supply up to date demographic data.

It is with this in mind that the Kenya Government decided to finance the construction and running of the population centre at the Chiromo Campus of the University of Nairobi.

2. THE BRIEF

A SCOPE

(i). Providing information on demography.

(ii). Conducting promoting and facilitating demography studies and research.

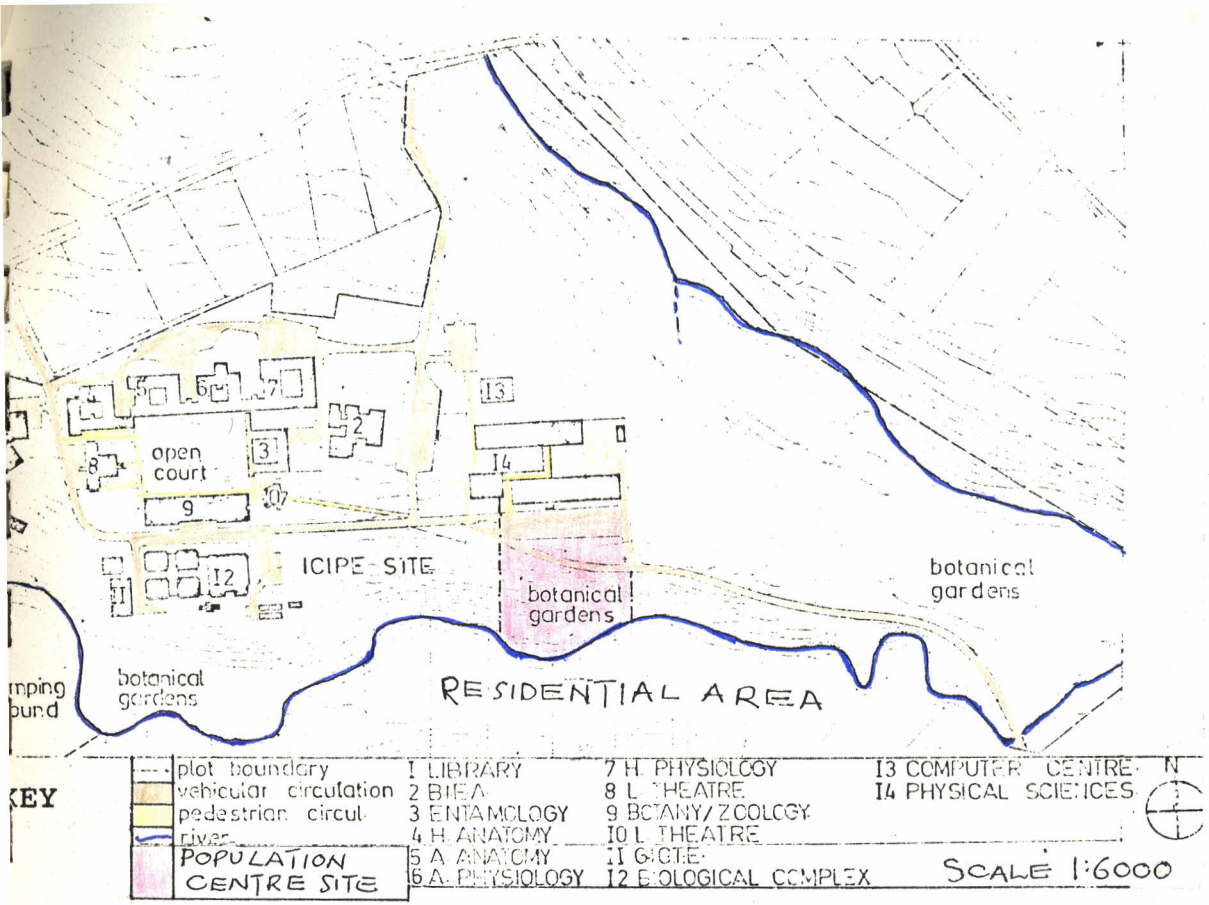
(iii). Publishing the results achieved.

(iv). Establishing relations with bodies having the same ends in view.
e.g. the Family Planning Association of Kenya.

(v). Acting as a link between all related faculties: e.g.

- Medicine (family health)
- Science (human ecology)
- Arts (Geography and Economics)

(vi). Providing the Ministry of Planning with up to date demographic data and asisting the government in preaching the message of Family Planning and birth control.



CHIROMO CAMPUS

B. THE SITE

The population centre site is located at the Chiromo Campus of the University of Nairobi.

C. Facilities — Area

C.1. Lecture theatre

Capacity 250 with projection facilities — 300m^2

C.2. Two small seminar rooms.

Capacity 60 and 25 persons each with projection facilities — 120m^2

C.3. Library

(i) Total stacking capacity 25000 volumes.

(ii) Reading area

(iii) Control area

(iv) Private property storage

(v) Referene

) 1500m^2

(vi)	Sorting and indexing room	$25m^2$
(vii)	Storage facility	$12m^2$
(viii)	Newspaper binding	$10m^2$
(ix)	Librarians office	$10m^2$
(x)	28 in no. study carrels $3m^2$ each	$84m^2$
(xi)	Cleaners cupboard	$4m^2$.

C.4. Entrance hall

Receptionist/telephone operator

Large enough to allow a flow

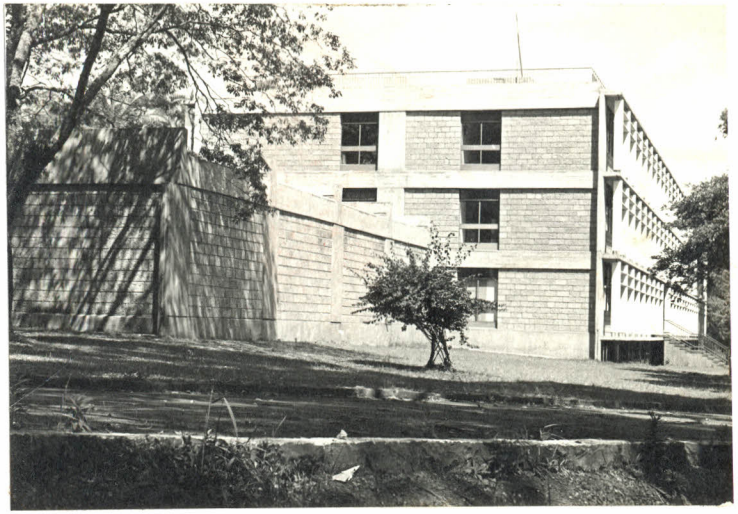
of people in and out of the building.

C.5. Offices

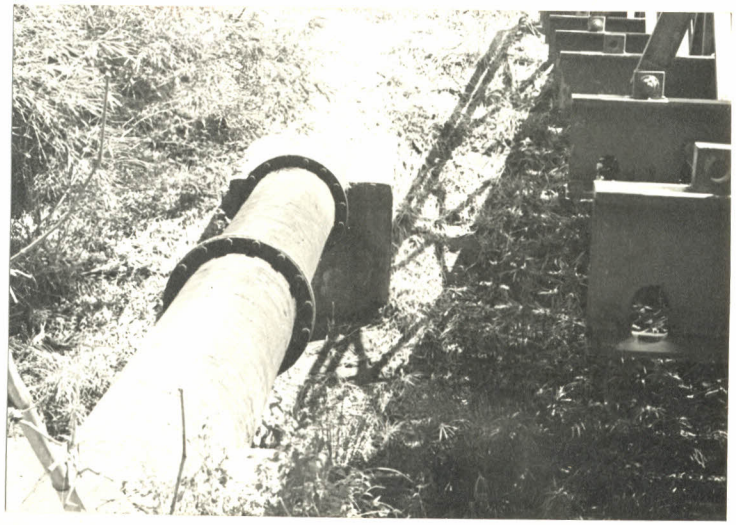
(i)	Administrative assistant	$12m^2$
(ii)	Chief technician	$12m^2$
(iii)	Cartographic unit	$60m^2$
(iv)	Statistical machine room	$20m^2$
(v)	Tape/card storage	$20m^2$

(vi)	Staff room with tea facilities	$60m^2$
(vii)	Office of Director	$20m^2$
(viii)	Secretary/filling	$12m^2$
(ix)	Office of executive Officer	$20m^2$
(x)	Two typing offices $10m^2$ each	$20m^2$
(xi)	Board room	$25m^2$
(xii)	Staff seminar room	$20m^2$
(xiii)	8 offices for assistant research fellows. $8m^2$ each	$64m^2$
(xiv)	8 offices for research fellows $12m^2$ each	$94m^2$
(xv)	6 offices for senior research fellows. $16m^2$ each	$96m^2$
(xvi)	Storage facilities	$24m^2$

C.6.	Exhibition spaces	$360m^2$
C.7.	Utilities	
	(i) Toilets	)
	(ii) Cleaners cupboards	)
	(iii) Entrance lobbies	)
	(iv) Stores	) $100lm^2$
	(v) Stair Cases	)
	(vi) Corridors.	)
C.8.	Total Area	$4005m^2$

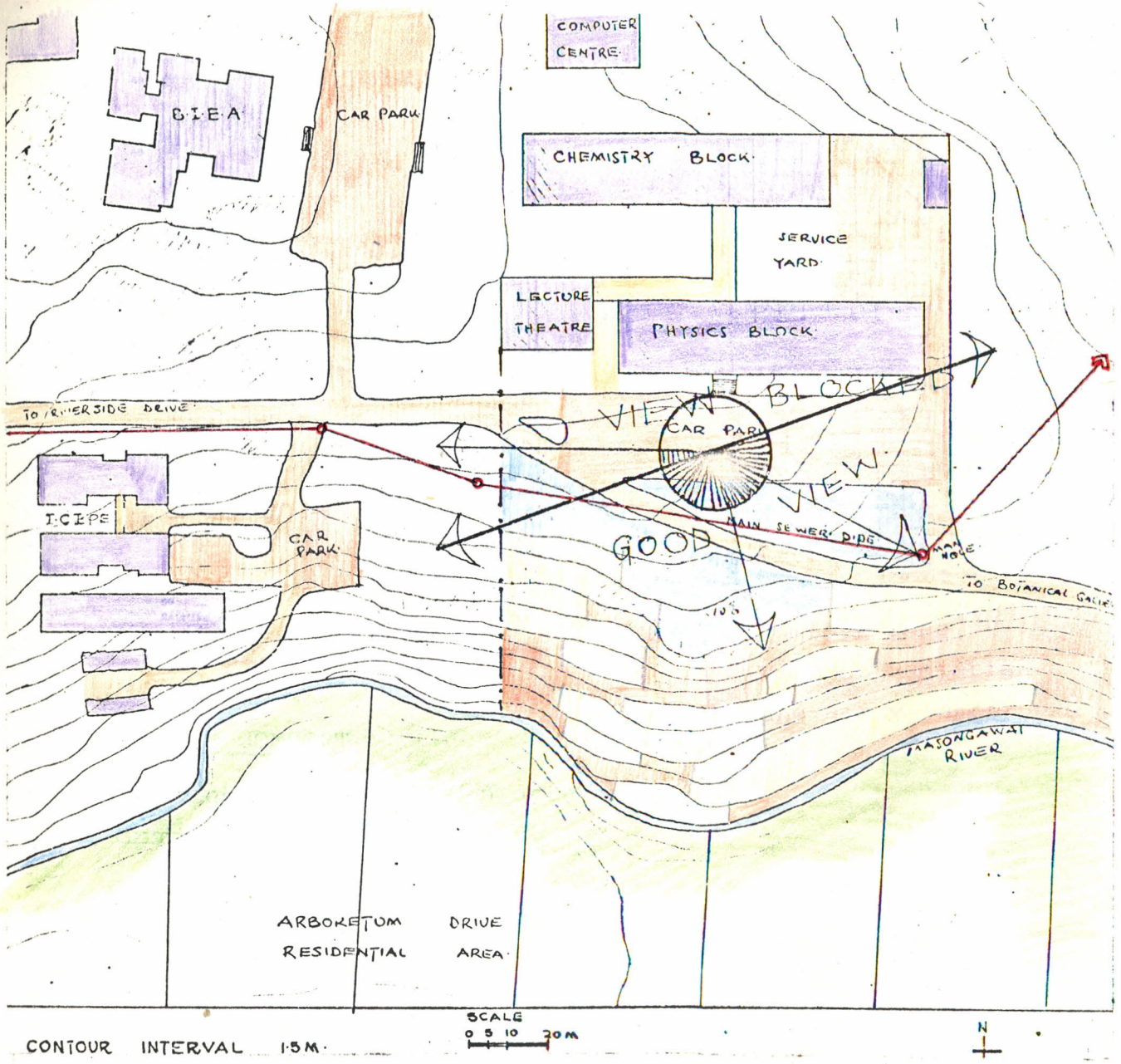


EXISTING PHYSICS BLOCK.



9"ϕ MAIN SEWER PIPE ACROSS THE MASONGAWAI RIVER.

EXISTING I.C.I.P.E. BUILDING.



3. SITE ANALYSIS

3.1. TOPOGRAPHY

Key

	RESIDENTIAL AREAS
	Plot Boundary
	MASONGAWAI RIVER
	CAR PARKS &
	ROADS
	WALKWAYS
	SLOPE:
	5% - 10%
	10% - 20%
	30% - 50%
	EXISTING BUILDINGS.
	MAIN SEWER LINE

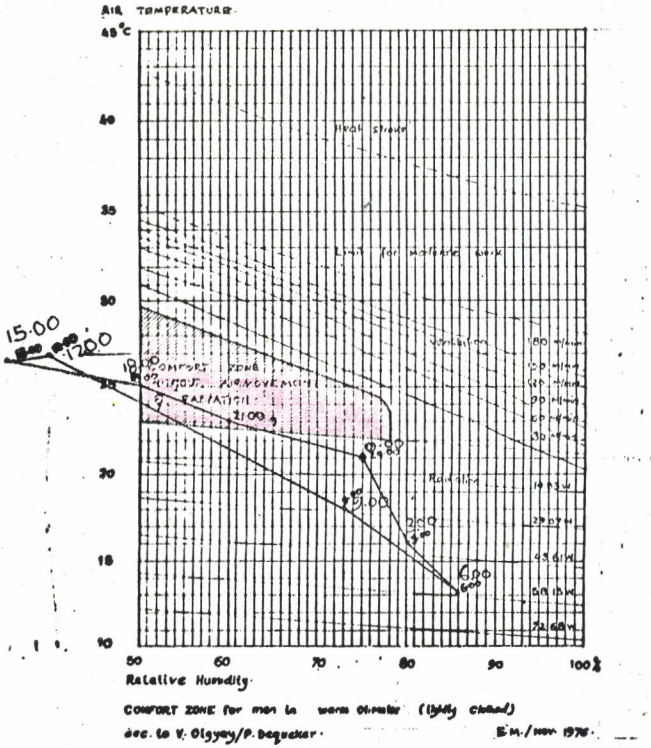
Surface Soil

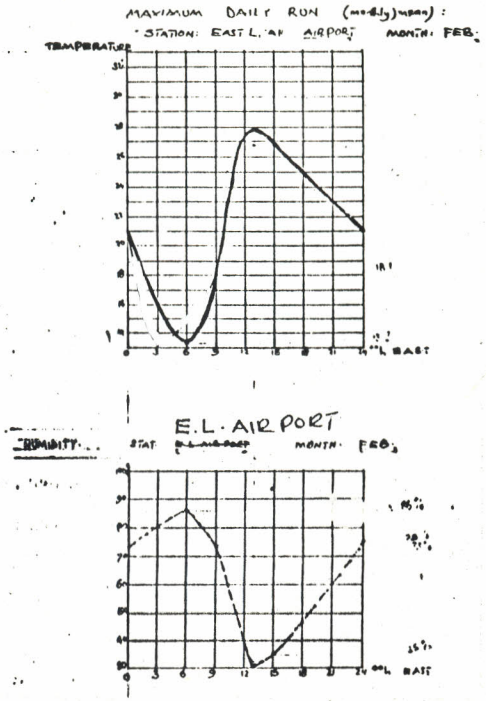
Red soil

Vegetation

Many different types of

Mature trees.





KEY: Comfort Zone Without Radiation and air Movement.

THERMAL COMFORT

Eastleah Airport station data used.
Critical Month is February.

3.2. THERMAL COMFORT

Conclusions:

a. Radiation is necessary in the hours of

i. 000 G.M.T.

ii. 03000 G.M.T.

iii. 0600 G.M.T.

iv. 0900 G.M.T.

This can be achieved by partially sun shading the east facade.

b. Radiation is not necessary at the times:

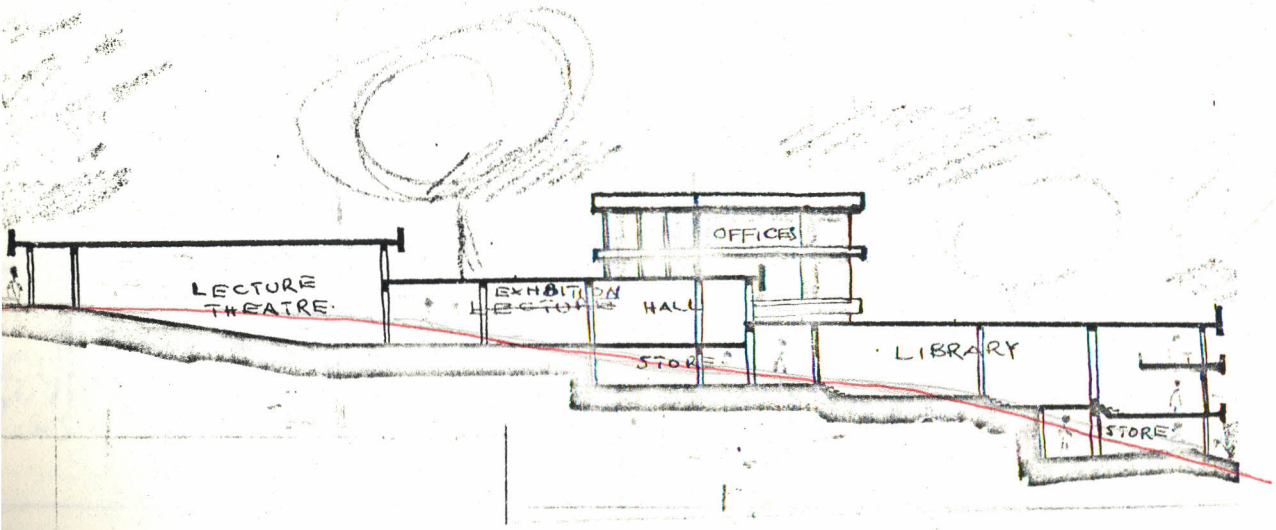
i. 1200 G.M.T.

ii. 1500 G.M.T.

iii. 1800 G.M.T.

iv. 2100 G.M.T.

Thus 100% sun shading in the west facade.



Conceptual Sketch

Scale: 1:500

Key Ground line

Note

Change of level determined by site slope.

4. CONCEPT DEVELOPMENT

The concept of this population centre is based on a number of design paremeters which include:-

(i) The slope of the site

(ii) The views

(iii) The existing vegetation

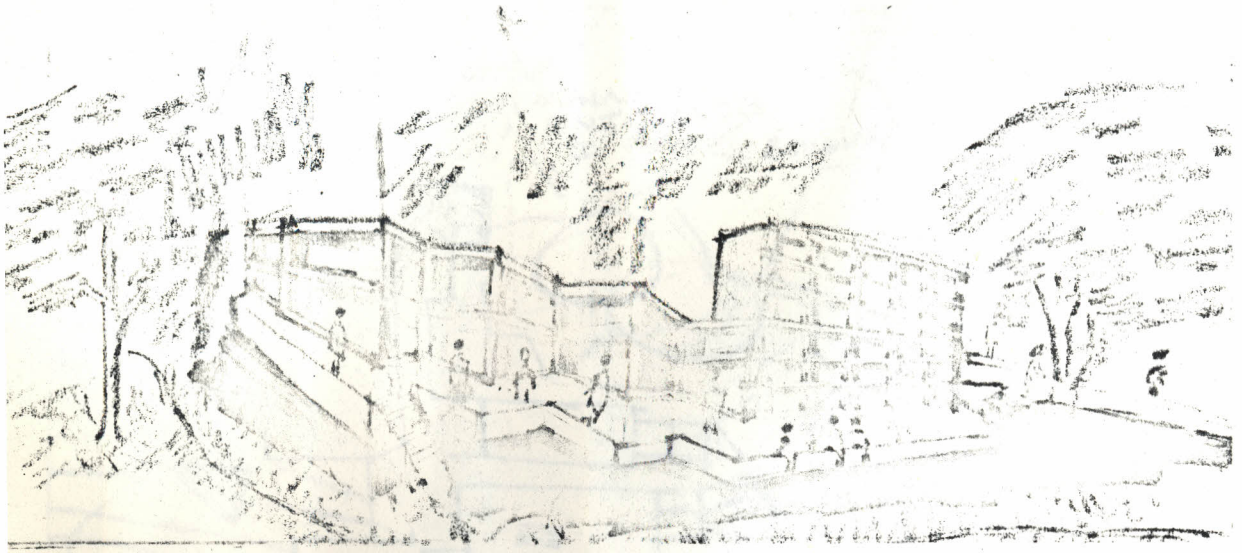
(iv) The main pedestrian route of movement.

(v) Existing buildings

(vi) Existing vehicular circulation.

4.1. THE SLOPE

As shown in the site analysis the slope of the population centre site varies from 8% to 50%. For it to be accommodated there must be a properly planned change of levels within and out side the building. The building should cut across contours only where invitable.



Conceptual Sketch.

Attitude to View.

4.2. VIEWS

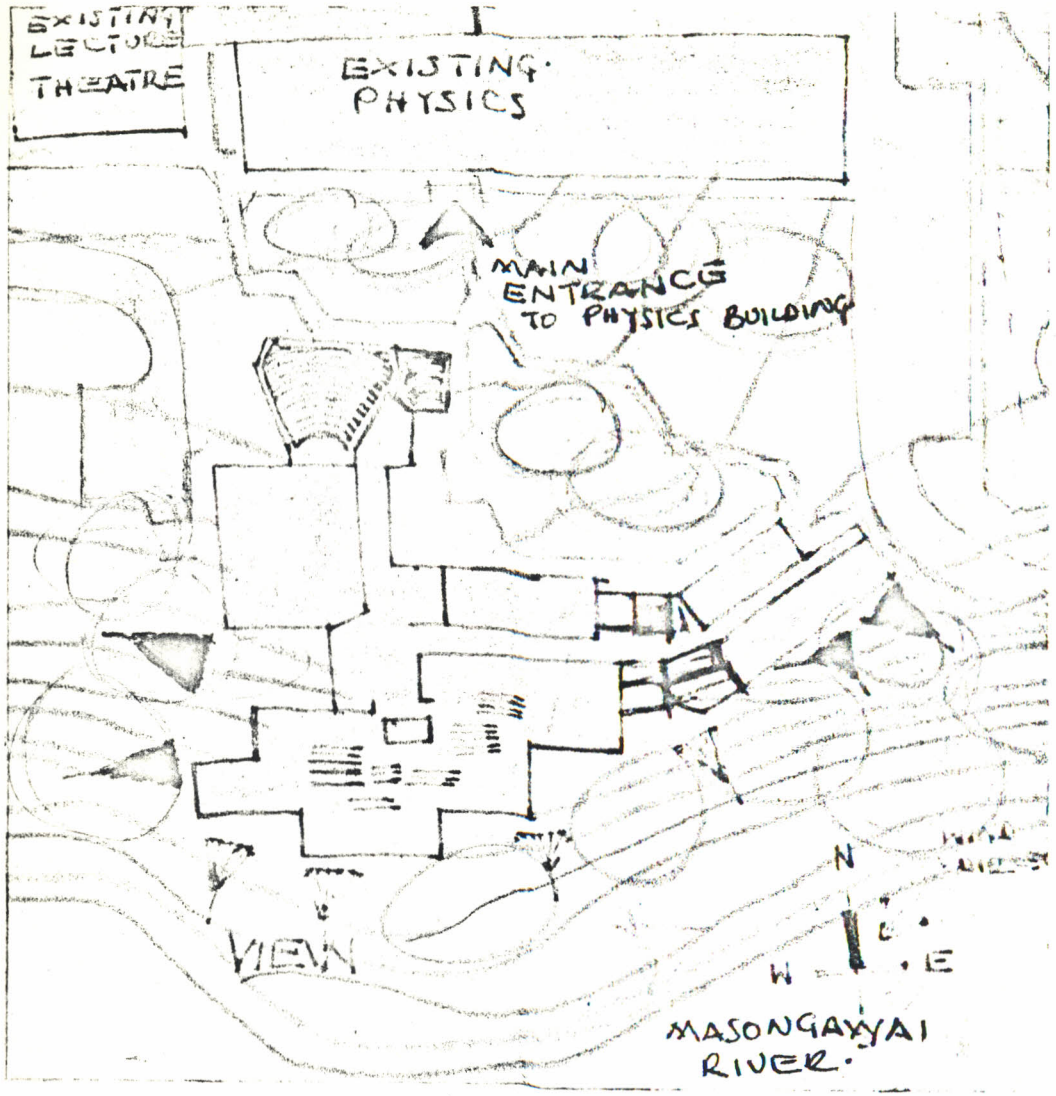
There is a very good view almost all round the site; getting deepest to the east, towards the University playing fields and to the west toward the Arboretum.

This calls for a special attension to eastern and western facades of the proposed population centre, as the good views cannot be utilised unless an effective sun shading system is achieved.

4.3. EXISTING TREES

Like other undeveloped parts of the Chiromo Campus site, there are many mature trees.

Such trees give the campus scape a sense of character and belonging as the surrounding developments are characterised by evergreen mature trees.



Conceptual Sketch.

Attitude to View.

Scale:
1:1000

This calls for a development that integrates with the landscape penetrating into the trees yet maintaining as many of them as possible.

4.4. SURROUNDING BUILDINGS

Presently, there is no sense of entry into the Chiromo Campus particularly along the main pedestrian spine from the sports ground.

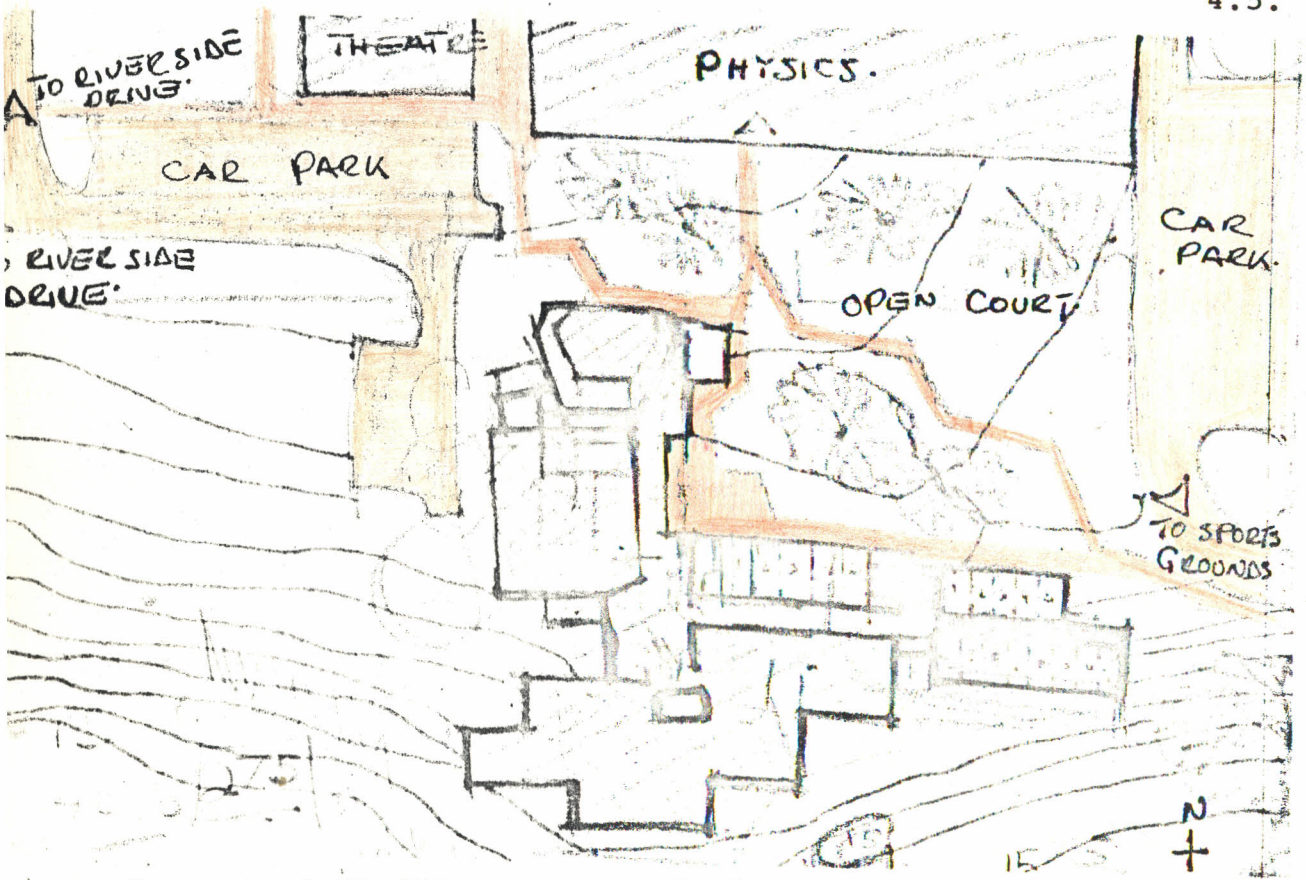
The first building along this route and the nearst to the site of the proposed population centre is the physical sciences complex.

This complex has an entrance addressed to a large tarmacked car park. This car park makes this entrance less effective as it lacks that welcoming and entrance containing space necessary for a labby to have its sense of place.

Attitude to Existing Pedestrian and vehicular circulation.

Note: Vehicular link between the two car parks blocked.

4.5.



Conceptual Sketch. Scale: 1:1000

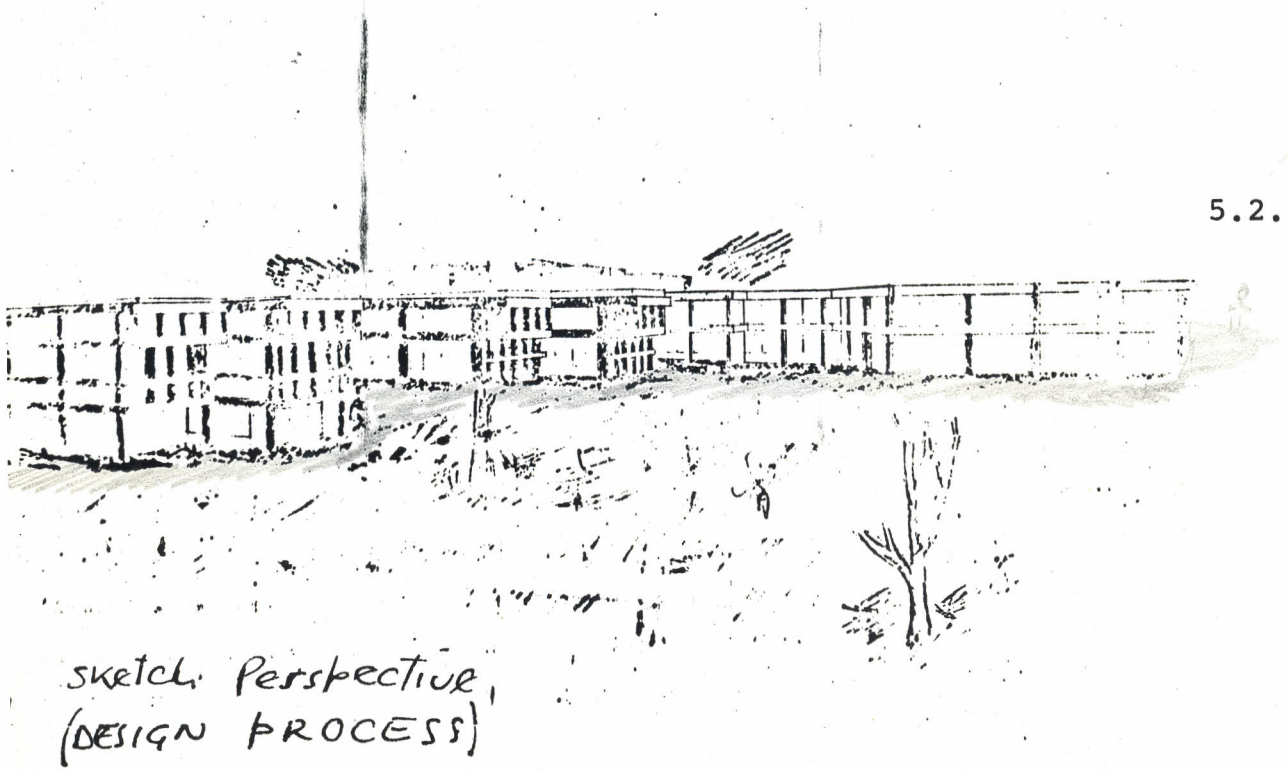
The proposed development should integrate the entrance of the physical sciences complex giving it that sense of space necessary for an effective entrance.

PEDESTRIAN & VEHICULAR ACCESS

Presently, vehicals charge through the campus to the botanical gardens boundaring the University sports grounds.

To avoid a possible future shortcut by the public from the riverside drive through the campus, the proposed development should incorperate a break of the vehicular system.

Overall the pedestrians should be given a priority within the development. The existing pedestrian route of movement should be respected with improvements where necessary.



VIEW FROM RIVER.

5. DESIGN PROCESS

DESIGN MEDIA

(i) Two dimensional sketches

(ii) Three dimensional sketches

(iii) Models.

5.2. FIRST PROPOSAL

This is a response to the active formative forces or design parameters explained in the concept development. In this proposal, all the facilities are accommodated in one building located to the south of the physical sciences complex.

It is absorbed in the slope with the library nearest to the Masongawai river. The offices are tilled northwards off the East West axis due to the fellowing reasons.

BLOCK MODEL

VIEW FROM DOWN SLOPE.

(i) To avoid cutting across the contours at this point.

(ii) To help enclose the court to the north.

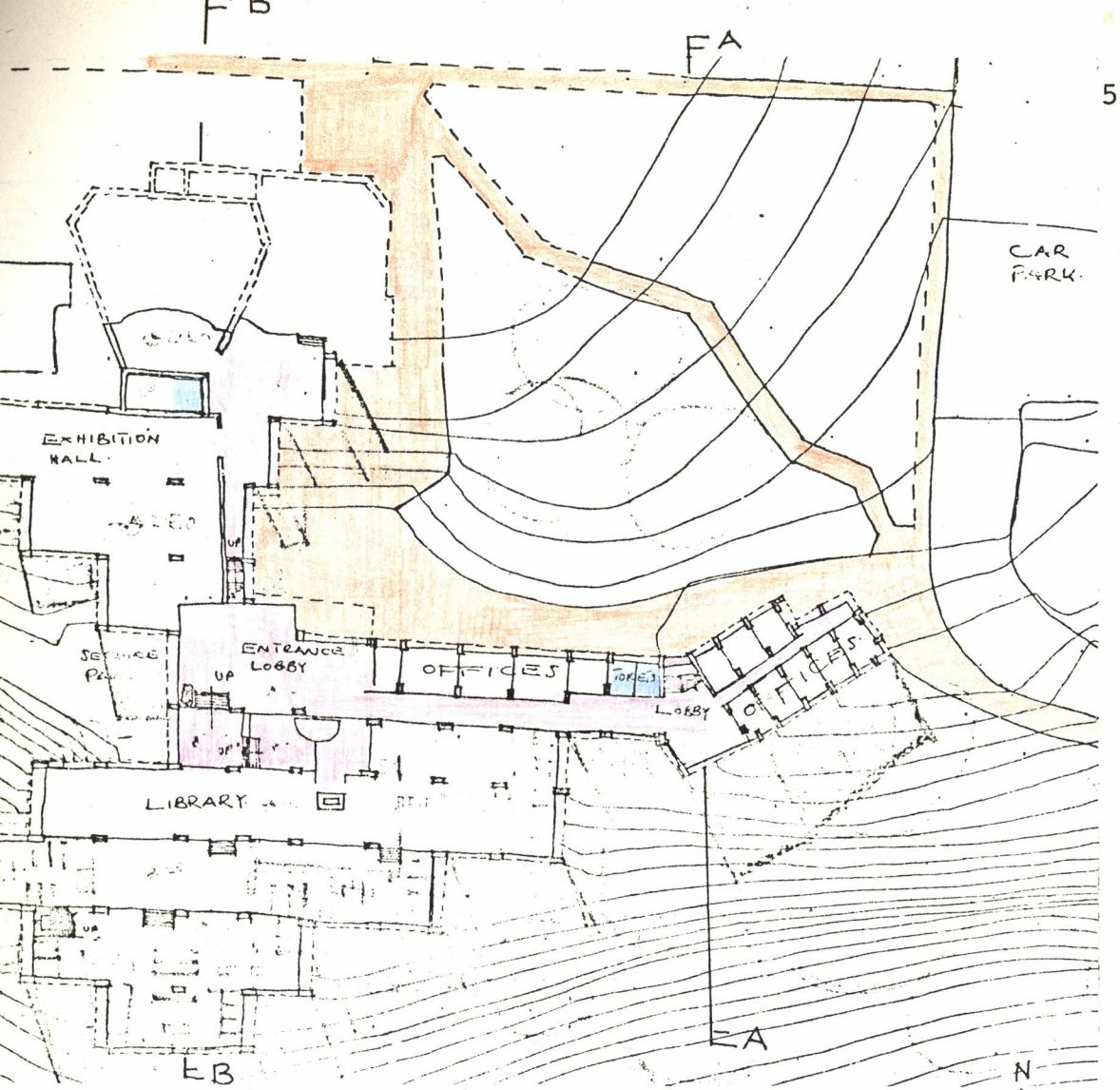
(iii) To allow optimum utilisation of the view which deepens south east wards towards the University sports grounds.

5.3. GOOD QUALITIES

This proposal has the following qualities.

(i) The different facilities are absorbed by the slope integrating with nature very effectively.

(ii) Views are utilised to the optimum by having glazing in all facades including the east and west.



First Project

Scale: 1:600

Key:
- Internal Circulation
- Toilets
- Pedestrian Circulation

5.4. BAD QUALITIES

The following are the bad qualities of this proposal.

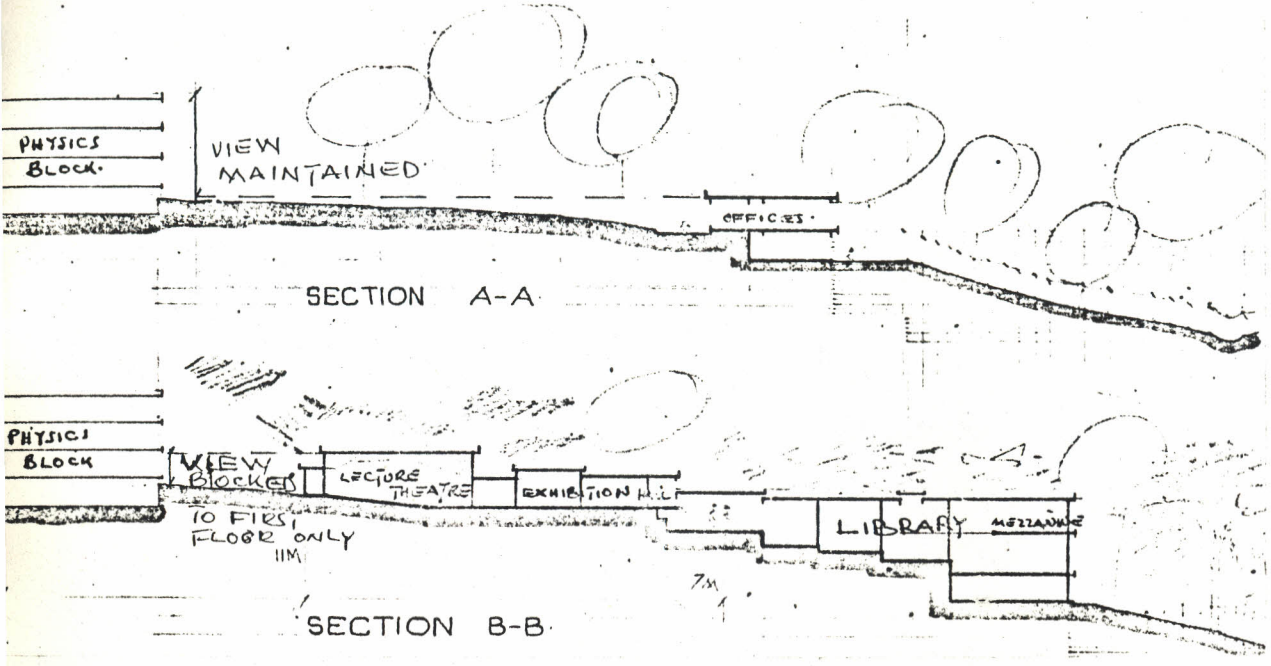
(i) Offices lack on entrance forcing them to remain closed when the main entrance is closed.

(ii) They look forced to link up with the library.

(iii) Link between main Lobby and secondary lobby of lecture theatre is too weak and undefined.

(iv) Lecture theatre and large seminar room seem forced together.

(v) Walkway from car park to main entrance is too close to the offices.



First Project.

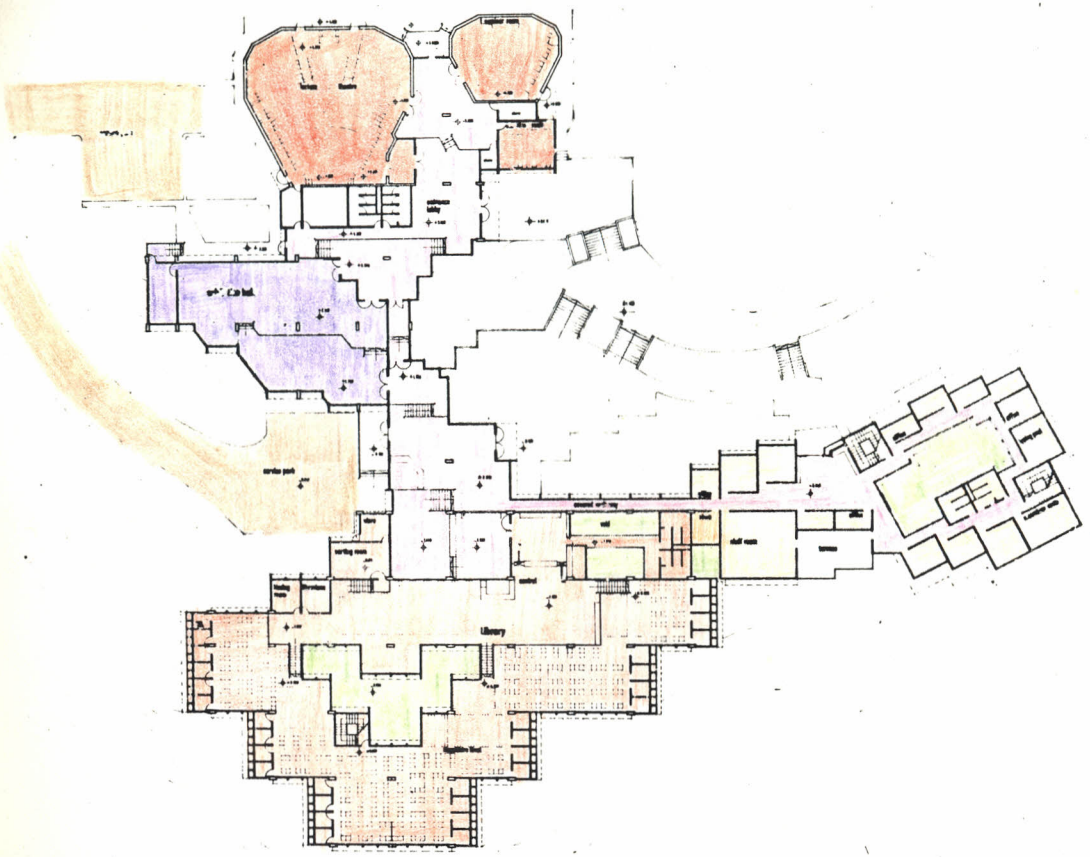
Scale: 1:900.

Note:i. There is a level change of 11 M absorbed in the whole project.

ii. View of existing building blocked only to first floor at worst.

(vi) Library toilets are too far from the main body of the library.

(vii) Library is too deep for natural lighting and ventilation.



ENTRANCE LEVEL PLAN:

KEY:

- Library
- Offices
- Internal Circulation
- Exhibition Hall
- Lecture Facilities
- Service Yards
- Internal Courts.

N

SCALE:
1:750

6. THE FINAL PROJECT

In pronciple, the final project is development of the first proposal. It maintains the same location point and orientation.

At this level, the project is in four major elements within one building.

This include:

(i) The library

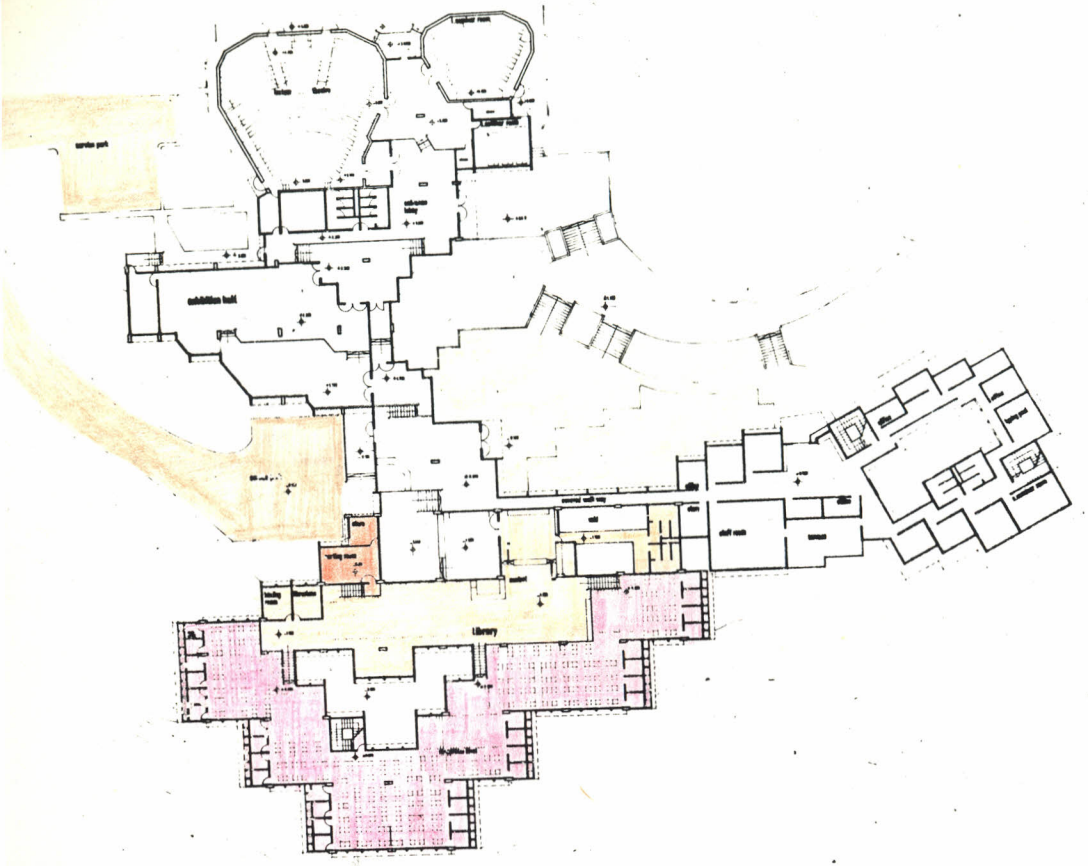
(ii) The offices

(iii) The lecture theatre and seminar rooms.

(iv) The exhibition hall.

6.1. THE LIBRARY

This is the heart of the project; in size, location and character. It is located at the most withdrawn part of the site. This is due to the following



Scale 1:750

Entrance Level Plan. ($\pm$ 0.000)

Key:
- Mezzanine Level $\pm$ 0.000.
- Control Level - 1.920
- Store Level - 0.480
- Entrance Court - 0.160
- Service Yard - 0.640

reasons:

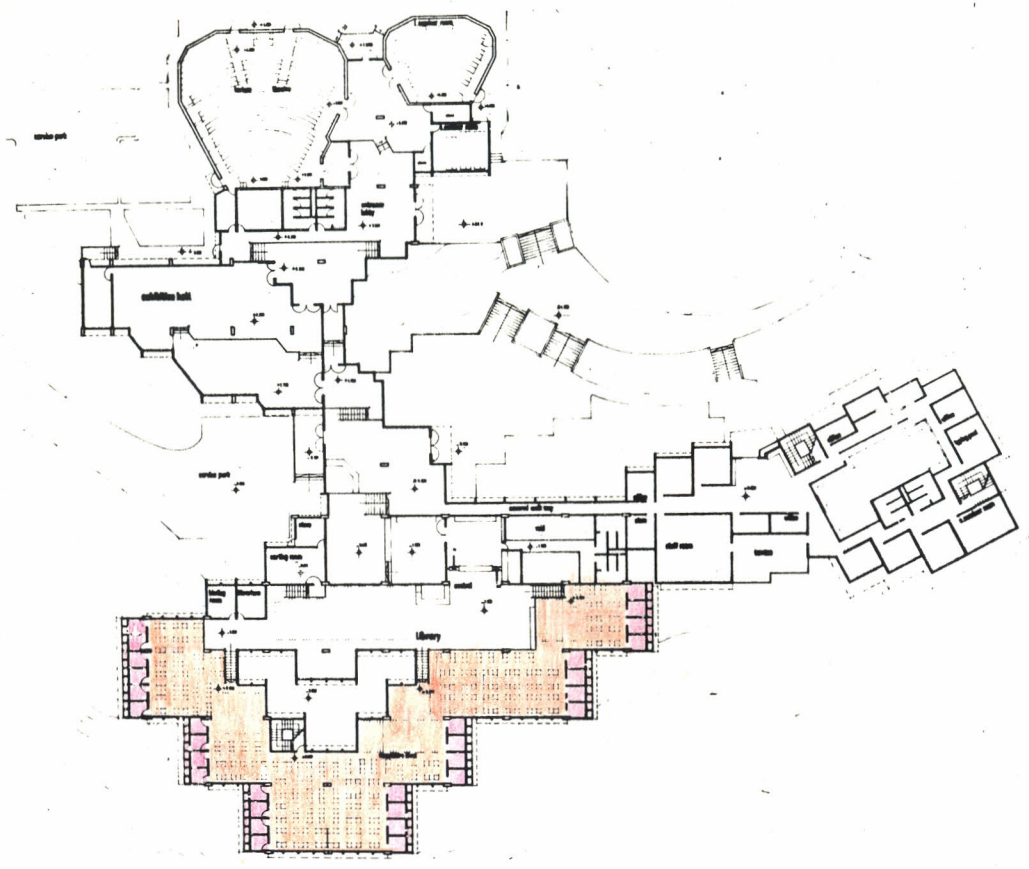
(i) Due to its size and character as a place to read in, it has the capacity to contain the great slope at this part of the site.

(ii) Internally generated campus noise is minimum at this parts of the site.

6.12. LEVELS

The library has the greatest level changes in the whole proposed centre.

Using the main entrance lobby as a reference point, ($\pm$0.000m) the lowest level of the library is (-8.000m.) This means that 8.000m of slope are absorbed in the library. The library store and sorting office are at the level - 0.480m. This is for easy



Scale 1:750

Entrance Level Plan.

Key: STUDY CARRELS.

General Study Area

Note: i. Structural Module : 720 x 640 determined by width of carrels.

ii. Structural System is R.C. Beam & Columns.

service from the service park which is at the level - 0.640. i.e. a step below the store.

The mezzanine floor is at the level ± 0.000.

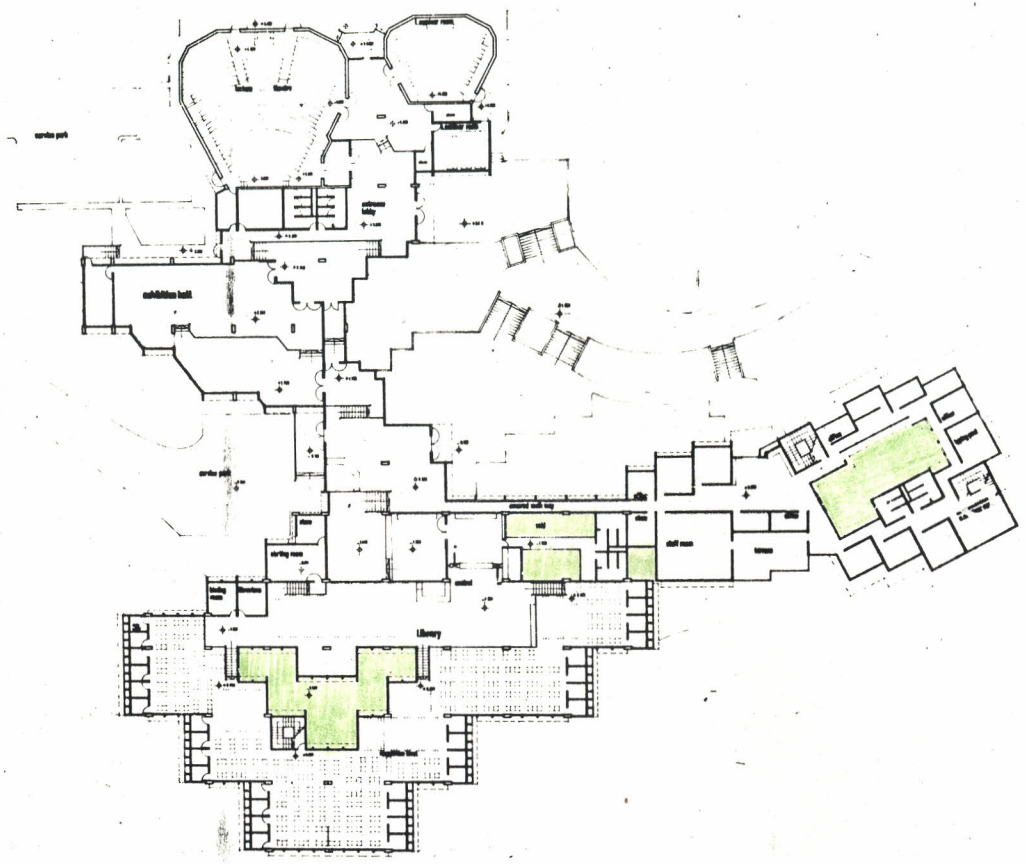
6.13. UTILISATION OF VIEWS

In this library there a two users.

a. The postgraduate student in the carrels.

b. The undergraduate using the general study area of the library.

There is a conflict in the utilisation of views in this case as the carrels, if located at the pheriphery would block the view. This is resolved by



Entrance Level Plan.

Key: ☐ OPEN COURTS

cantilevering the study carrel in the eastern and western facades with general study space below them.

(i). Both the undergraduate and postgraduate students enjoy the good view.

(ii) The carrels are used to sunshade the space below it.

(iii) This location of the carrels has the psychological effect of making the undergraduate student work hard towards the study carrels above.

6.14. NATURAL VENTILATION AND LIGHTING

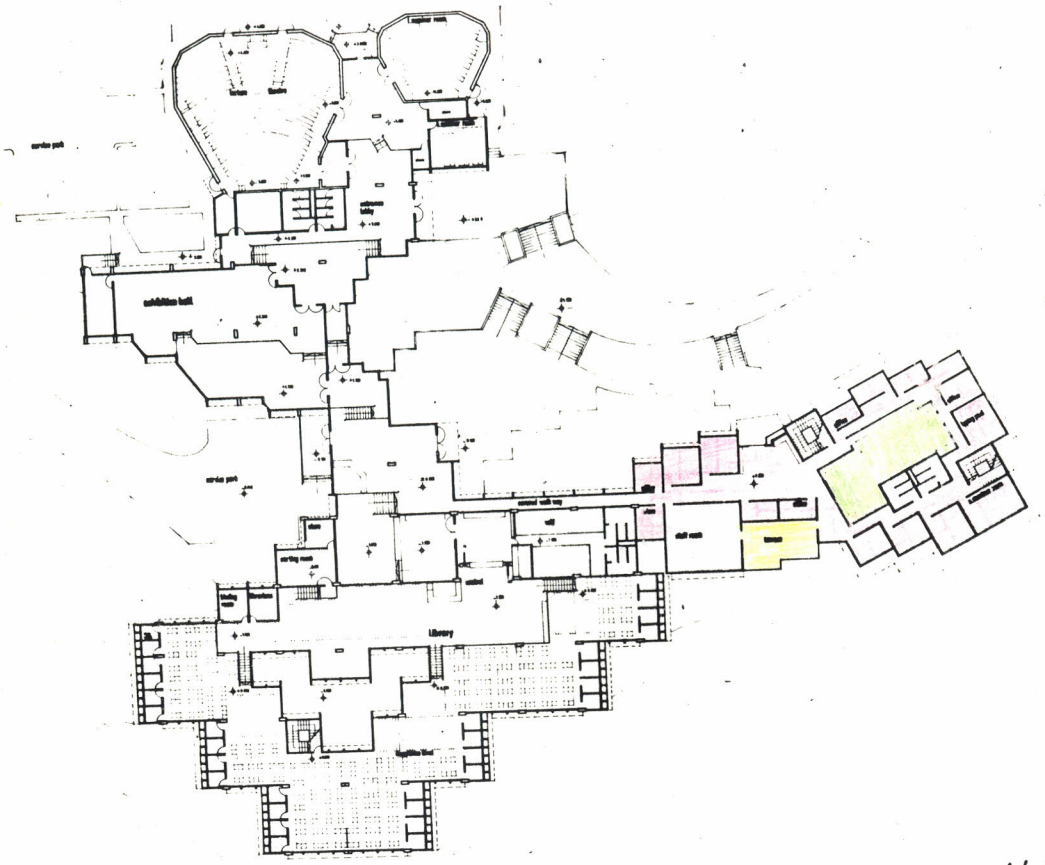
Security requirements in a library conflict with the principles of

natural ventilation. To resolve this, a void is created at the centre of the library that is accessible only from the control point.

Big openable windows are used in this void giving it the qualities of a fresh air source. It is also used as a light well.

Permanent ventilation is achieved by having fixed glass louvres at a level too high for any body to drop a book through.

The same void is also used to light the lowest floor of the library by roof light.



ENTRANCE LEVEL PLAN

KEY
- OFFICES
- STAFF TERRACE
- OPEN COURT

NOTE Structural System

R. C. Load Bearing Walls.

6.2. THE OFFICES:

This is basically the heart of research in the centre. The office users have the following responsibilities:

(i) Conducting demographic research.

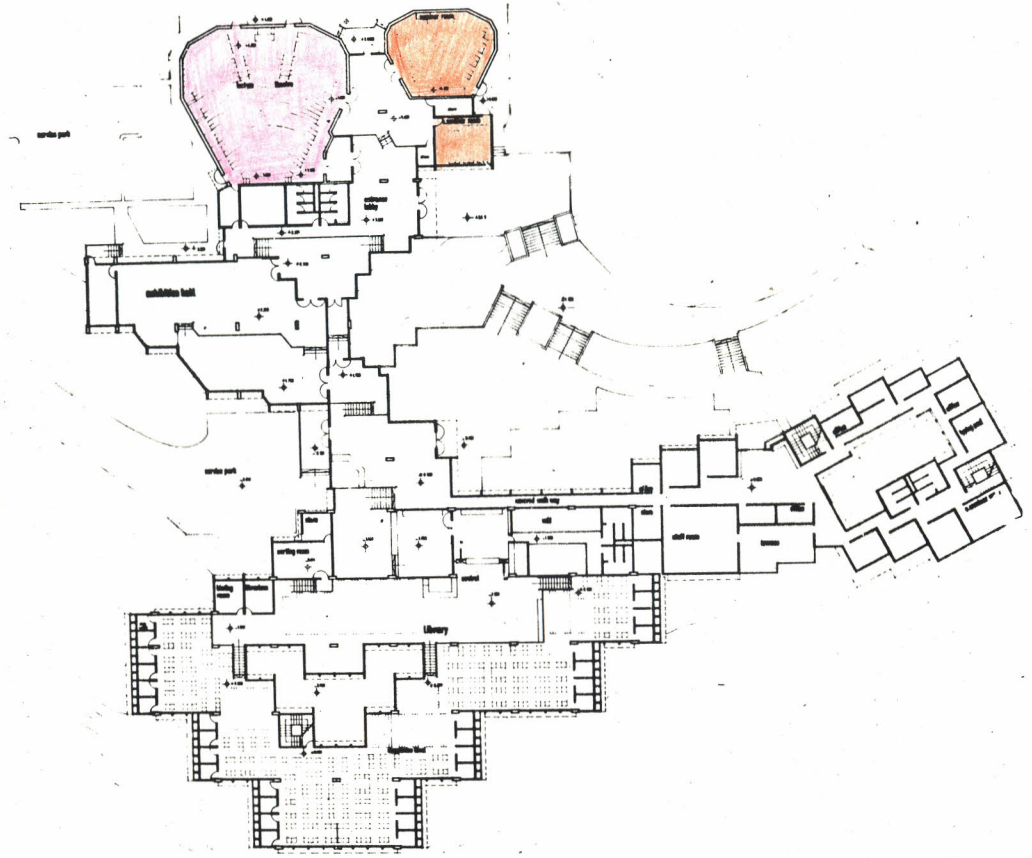
(ii) Analysing and publishing the data.

(iii) Communicating the data to the relevant authorities effectively.

Thus this is the core of the centre. These offices are developed around a court that has enough privacy for the officers to sit around and discuss any issue.

This small court also gives visual continuity within the offices tying them together.

There is a secondary lobby that is also accessible from the main lobby.



SCALE 1:750

N

Entrance Level Plan

Key;: Lecture Theatre
Seminar Rooms

Note: Structural System:
R.C. Load Bearing Wall;
Brick Cladding as both internal & External Finish.

This enables the researchers to use the offices at noneworking hours without inconveniences.

6.3. THE LECTURE FACILITIES

This include:

(i) The lecture theatre.

(ii) The large seminar room

(iii) The small seminar room.

This facilities are located just off the physical sciences complex. This is due to the following reasons.

(i) To make it easily accessible to both general students of Chiromo Campus and the Public.

(ii) Is used as a buffer zone for noise from other parts of the

Campus; the main beneficiary being the library.

(iii) It gives way for other facilities to utilise the view.

It also has a secondary lobby, that gives it the following qualities.

a. it enables it to be used at odd hours when other facilities are closed

b. students can move out of lectures with minimum disturbance to the rest of the facilities.

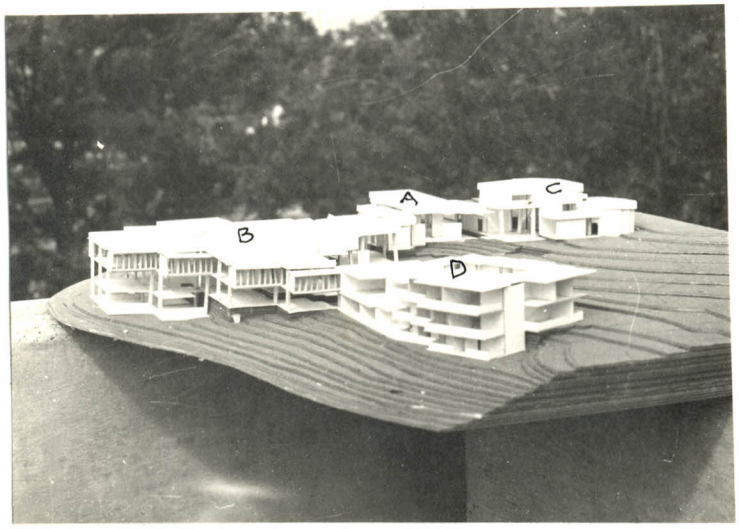
6.4. EXHIBITION HALL:

This is a facility to help the researchers communicate their results to the public; free disemination of information as opposed to the archive; which is only

for archivist.

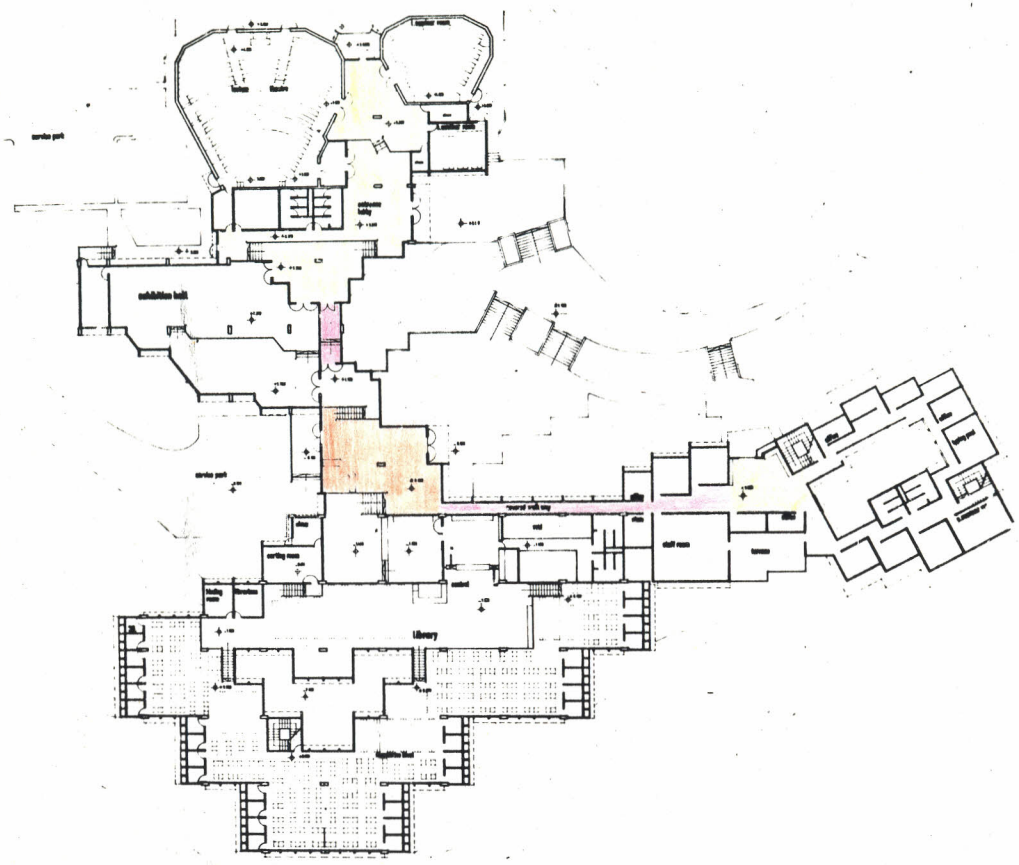
In addition to exhibitions it can also be used as an examination hall.

Physically, it is planned as a link between the library and the lecture facilities.



FINAL MODEL

A – EXHIBITION HALL
B – LIBRARY
C – LECTURE THEATRE
D – OFFICES.



SCALE 1:750

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ENTRANCE LEVEL PLAN:

Key: INTERNAL CIRCULATION

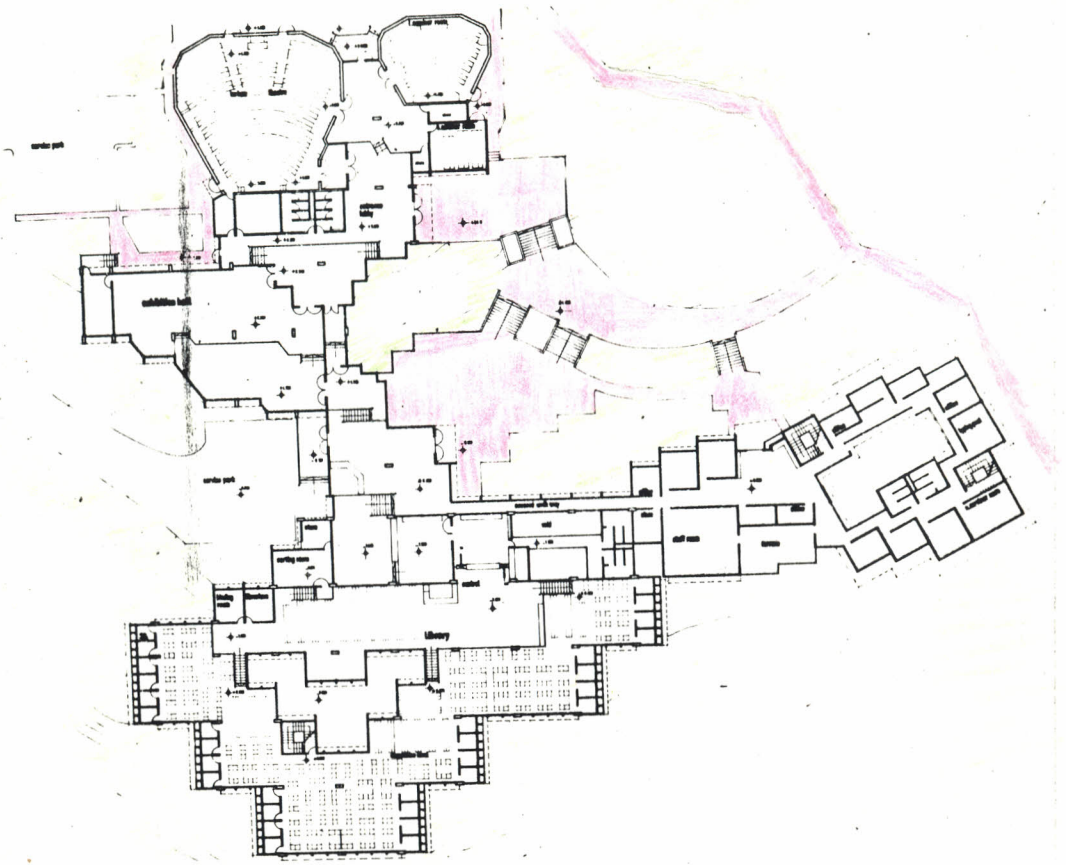
SECONDARY LOBBIES.

MAIN ENTRANCE LOBBY.

7. INTERNAL CIRCULATION

As stated before, there are three lobbies each of which is accessible from the great court.

Linking them is an internal circulation system at the periphery facing the court.



SCALE 1:750

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ENTRANCE LEVEL PLAN:

KEY: External Circulation

Open Spaces.

8. EXTERNAL CIRCULATION

External pedestrian circulation in this proposed centre is basically a walkway off the main pedestrian route to the campus.

It is at the level +1.600 so there are a series of steps down to the main lobby (level +0.000) or up to the lecture facilities lobby - (level +3.040). Vehicular circulation is maintained within the periphery.

9. OPEN SPACES:

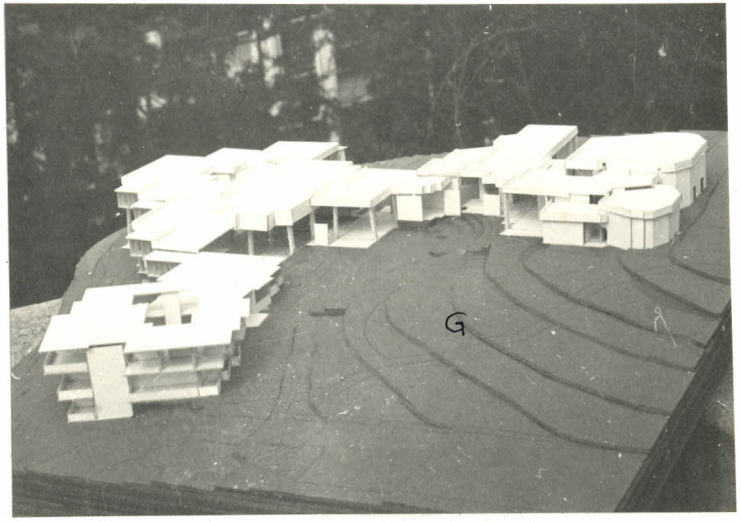
There is only one major open space. This is the court between the centre and the existing physical sciences building.

This has the following qualities:

(i) It acts as an entrance lobby into the campus a facility that has been lacking.

(ii) Vehicular circulation is maintained off the court.

(iii) It ties the new centre to the existing physical sciences complex; giving the science complex a sense of belonging.



FINAL MODEL

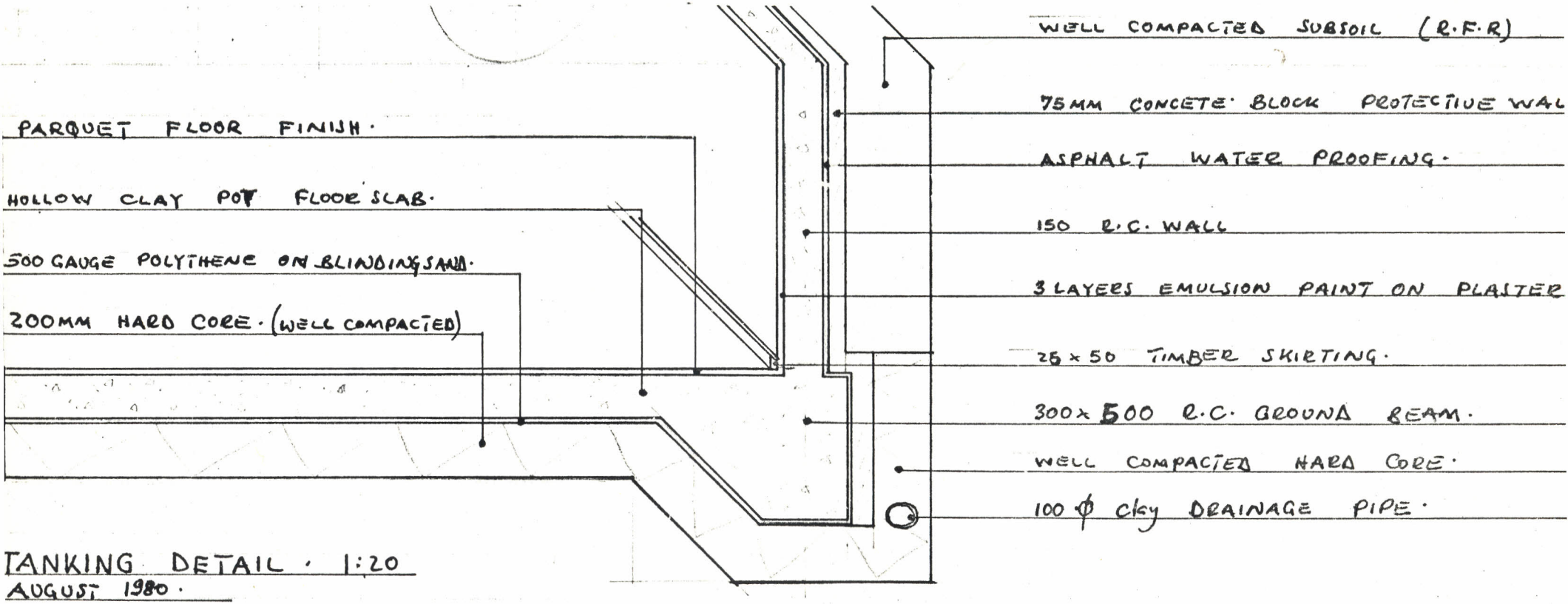
G- THE GREAT COURT

(iv) It contains the entrance of this complex giving it a sense of place.

(v) It is to scale.

The zone between the centre and the Masongawai river down the slope is left intact. The undergrowth and the trees help the centre integrate with nature giving it that necessary visual continuity.

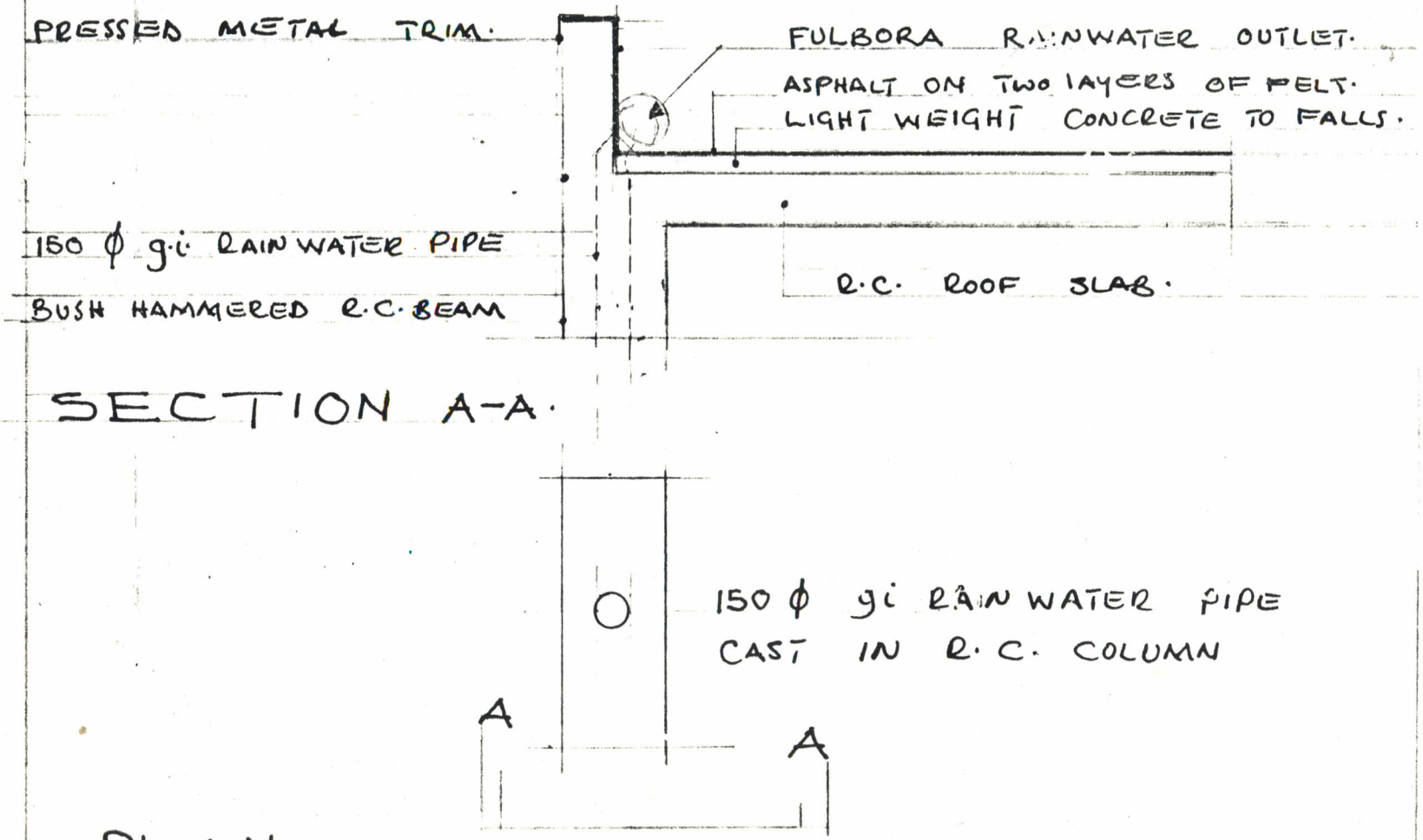
10. CONSTRUCTION DETAILS



TANKING DETAIL. 1:20
AUGUST 1980.

10.1 TANKING DETAIL

The internal change of levels calls for well designed tanking details, otherwise the whole project will be a disaster.


PRESSED METAL TRIM.
FULBORA RAINWATER OUTLET.
ASPHALT ON TWO LAYERS OF FELT.
LIGHT WEIGHT CONCRETE TO FALLS.
150 ϕ g.i RAIN WATER PIPE
BUSH HAMMERED R.C. BEAM
R.C. ROOF SLAB.
SECTION A-A.
150 ϕ gi RAIN WATER PIPE
CAST IN R.C. COLUMN
A
A
PLAN.

SCALE 1:20

SCHEDULE OF FINISHES

SPACE	FLOOR FINISH	INTERNAL WALL FINISH	CEILING	EXTERNAL FINISHES	NOTES
ENTRANCE LOBBIES	End grain timber block. Timber skirting	Brick facing	Suspended timber ceiling	Brick facing	End grain timber blocks used due to their durability and resistance to wears.
LIBRARY	Wood block on reading area. End grain timber block on main circulation area timber skirting.	Brick facing. Vertical timber strips on internal columns dado.	Suspended timber ceiling.	Brick facing on wall. Bush hammering on columns & sun breakers.	Course and fine aggregate replaced with crushed brick, Where bush harmmering is done; for uniformity with brick facing.
LECTURE THEATRE	Wood block. Timber skirting.	Brick facing. Acoustical tiles at back of theatre. $R_1 + R_2 - D \leq 14$	Timber reflectors, on 80% of ceiling. Acoustical tiles on remaining 20%.	Brick facing.	Acoustical tiles and on ceiling where $R_1 + R_2 - D \leq 14$ R_1 R_2 = reflected sound. D = Direct Sound
SEMINAR ROOMS	Wood block. Timber skirting.	Brick facing.	Timber ceiling	Brick facing.	
EXHIBITION HALL	Wood block. Timber skirting.	Brick facing. Vertical timber strips on internal columns dado.	Timber ceiling	Brick facing, Bush hammering on columns.	
OFFICES	Wood block Timber skirting	Brick facing	Timber ceiling	Brick facing.	
TOILETS	Mart glazzed Ceramic tiles	Glossy glazzed Ceramic tiles dado.	Timber ceiling	Brick facing	