THESIS REPORT ON

"UP STATE INSTITUTE OF FORENSIC SCIENCES(UPSIFS), LUCKNOW"

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF:

BACHELOR OF ARCHITECTURE

BY

FALGUNI AGARWAL

1180101018

THESIS GUIDE

PROF. (AR) KESHAV KUMAR

SESSION

2022-2023

TO THE

SCHOOL OF ARCHITECTURE AND PLANNING

BABU BANARASI DAS UNIVERSITY

LUCKNOW.

SCHOOL OF ARCHITECTURE AND PLANNING
BABU BANARASI DAS UNIVERSITY, LUCKNOW (U.P.).

CERTIFICATE

I hereby recommend that the thesis entitled "UP STATE INSTITUTE OF FORENSIC SCIENCES, LUCKNOW" under the supervision, is the bonafide work of the students and can be accepted as partial fulfillment of the requirement for the degree of Bachelor's degree in architecture, School of Architecture and Planning, BBDU, Lucknow.

Prof. Mohit Kumar Agarwal Dean of Department	Prof. Sangeeta Sharma Head of Department

Recommendation Accepted

Not Accepted

External Examiner	External Examiner

BABU BANARASI DAS UNIVERSITY, LUCKNOW (U.P.).

Certificate of thesis submission for evaluation

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4. **Degree for which the thesis is submitted: Bachelor of Architecture (B.ARCH)**
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9. **The thesis has been prepared without resorting to plagiarism Yes / No**
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- CAMPUS DESIGN IN INDIA BY Achyut Kavinde
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- LUCKNOW DEVELOPMENT AUTHORITY BYELAWS
- CITY DEVELOPMENT PLAN OF LUCKNOW

The following website references have been used in this thesis –

- Weatherspark.com
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- Google earth
- Times of India newsletter
- Census2011
- Issu.com

CONTENTS

GET TO THE TRUTH

CHAPTER – 1
INTRODUCTION

INTRODUCTION TO FORENSIC SCIENCE

Forensic science, sometimes referred to as criminalistics, applies the knowledge of science to the definition and enforcement of laws. Criminalistics is a branch of forensic science that is involved in the collection, analysis, and interpretation of physical evidence produced by criminal activity. Forensic Science is a multidisciplinary subject, drawing principally from chemistry, biology, physics, geology, psychology, social sciences etc.

Forensic science (in hindi: nyayalik vigyan)is a combination of two different Latin words: forensic and science.

The former, forensic, relates to a discussion or examination performed in public. Because trials in the ancient world were typically held in public, it carries a strong judicial connotation. The second is science, which is derived from the Latin word for 'knowledge' and is today closely tied to the scientific method, a systematic way of acquiring knowledge.

SIGNIFICANCE OF FORENSIC SCIENCE

- The legal system widely recognizes the role of forensic evidence in the trial of criminal offenders. This is because when scientific techniques and methods are used, there is not much scope for bias or injustice.
- It is the duty of the state to create a crime-free atmosphere by keeping a check on the increasing crime and punishing the offenders. This will create a safe space for the residents of the state and feeling secure is one of the primary rights that a citizen of any state deserves.
- Provide training to police, prosecution, forensic, scientific and judicial officers, which will increase the professional efficiency of the officers of the police and justice department of the state and ease the work of the court.

NEED OF PROJECT

- A formal training is required in this field and thus the establishment of an institute in the state of Uttar Pradesh is required.
- The legal system widely recognizes the role of forensic evidence in the trial of criminal offenders. This is because when scientific techniques and methods are used, there is not much scope for bias or injustice.
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- provide training to police, prosecution, forensic, scientific and judicial officers, which will increase the professional efficiency of the officers of the police and justice department of the state and ease the work of the court.

AIMS AND OBJECTIVES

To provide good infrastructure of the institute to promote better education in the field of forensics. Provide a secure environment which is confidential for forensic proceedings and research to take place.

- Promote better-built environment
- Encourage excellence in research
- To carefully design spaces so as to bring about interaction among the students and teachers and make the building an ideal place for education.
- It should ensure an environment suitable for moulding forensic science of good quality.

SCOPE AND LIMITATIONS

The scope of my design would basically concentrate on the overall master planning of the campus of Administrative, Academic, hostels, Auditorium, guest house & recreational area.

- Forensic Science University is a big institute and developing a campus in itself is a big task.
- Functional requirements of scientific disciplines, equipment, and instrumentation are just a few of the variables that generate space, dimension, and adjacency requirements that affect the overall design. There is not one universally correct plan for a forensic laboratory design, as individual cases will differ according to the needs of the users.
- Flexibility should be a key element in driving a forensic laboratory's design and configuration.
- Issues such as site access, the proximity of secured and unsecured parking areas, and even landscaping have implications regarding the efficiency and security of the overall site and building design.

METHODOLOGY

- Site study
- Literature study & Case study
- Analysis and inferences
- Formulation of concept & design concept
- Activities and interpretation of space requirements
- Concept and initialization of design
- Design development
- Final design

HISTORY OF FORENSIC SCIENCE

- The word “forensic” has its roots in the Latin word “forenses” which means a FORUM. Back in early Rome around 500 BC, a forum referred to a public place where judicial proceedings and debates were held.
- the FIRST FORENSIC TECHNIQUE ever used involving finger and palm print identification dates back to the Chinese (650 A.D.).
- IN INDIA, The history of forensic science is very old, about 2300 years ago in Kautilya's Arthashastra, there is mention of taking thumb impressions in case of property and money transactions.
- The first PRE-INDEPENDENCE chemical examiner laboratory in India was established in the health department of Madras Residency in 1847.
- POST INDEPENDENCE, Directorate of Forensic Science Services DFSS, the apex institution of forensic science, is located in New Delhi was established.

Source:Google images

WHAT IS PHYSICAL EVIDENCE?

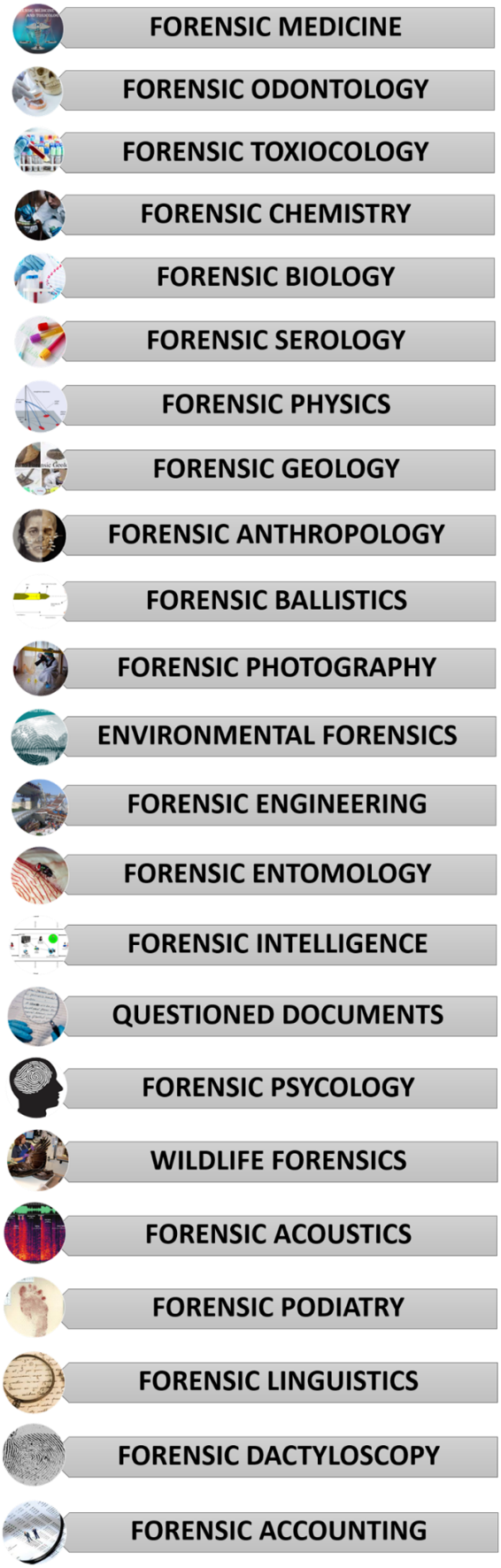
Evidence is the object with the help of which an incident is proved in the course of research. Any evidence that has a physical form ie. solid, liquid or gas is called physical evidence.

Sources of physical evidence-

- Crime scene
- Victim
- Criminal and his environment

Source:Google images

BRANCHES OF FORENSIC SCIENCES



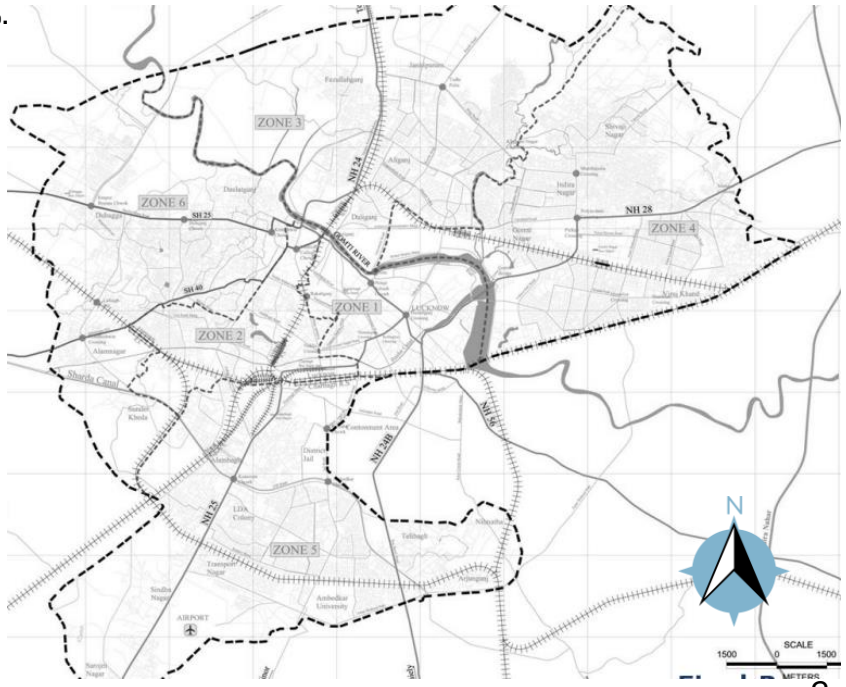
Source: AUTHOR

CHAPTER – 2
ABOUT THE CITY

ABOUT THE CITY

Lucknow is the capital city of the Indian state of Uttar Pradesh, It is the fourteenth-most populous city. Lucknow has always been a multicultural city that flourished as a North Indian cultural and artistic hub. City had an area of 402 km2 till Dec 2019. When 88 villages were added to the municipal limits, the area increased to 631 km2.

The district forms a part of Ganga basin with flat alluvial terrain. General elevation varies from 103 m to 130 metres above the main sea level. The general slope of the district is southeast. The literacy rate of Lucknow is 81.91%.



MAP OF LUCKNOW *Source: CDP*

PIPRASAND VILLAGE, SAROJINI NAGAR *Source: google maps*

WHY LUCKNOW?

There are 5 forensic laboratories (Lucknow, Agra, Varanasi, Ghaziabad & Moradabad) present in Uttar Pradesh and 18 more are proposed by the govt. of UP to speed up testing process due to increasing pending cases. To establish these laboratories more experts are required hence, formal training is required in this field and thus the establishment of an institute in the state of Uttar Pradesh is required. The crime rate of UP (2021) is 252.39 crimes/100km^2 & conviction rate is 63.4%.

STRUCTURE OF FORENSICS IN UTTAR PRADESH

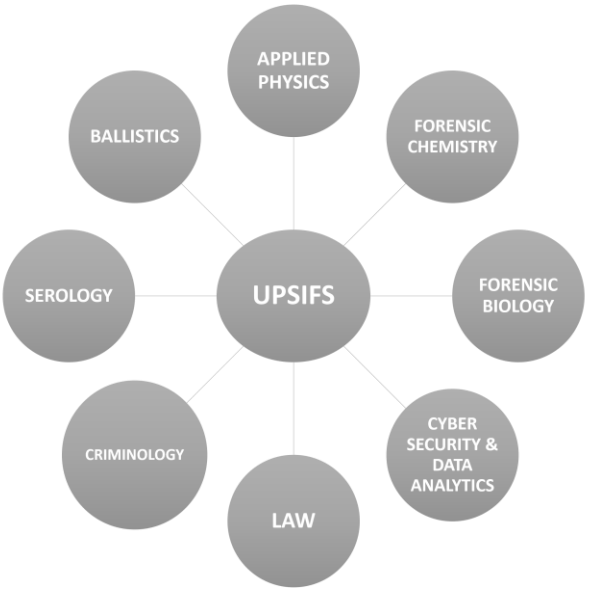
- Earlier to establishment of Forensic Science Laboratory in U.P. the cases related to crime exhibits were examined in Scientific section of Criminal Investigation Department (C.I.D.), U.P.
- In February 1969, a Government order was issued to convert Scientific Section of Criminal Investigation Department into a Forensic Science Laboratory.
- A Govt. order was issued in the year 1979 for the merger of the Chemical Examiner's Laboratory, Agra and the Forensic Science Laboratory, Lucknow and to develop these two laboratories as full-fledged Forensic Science Laboratories, having all the modern types of equipment necessary for different divisions.

ABOUT THE PROJECT

LOCATION: Piparsand village, Sarojini Nagar, Lucknow, UP
TYPOLOGY: Institutional building *(group C as per NBC)*
CLIENT: Home department, UP Government
AUTHORITY: Directorate of Forensic Science Services(DFSS)
Ministry of Home Affairs
UPPolice

The institute will consist of 8 departments and 14 laboratories. Some other departments will include behavioral sciences and police administration.

Lab facilities:-
- Ballistics
- Serology
- Cyber lab
- Brain mapping
- Lie-detection
- Narco-analysis
- Firing range



- Instrument lab
- Document lab
- Explosive lab
- DNA lab
- Acoustics lab
- Behavioral lab
- Biology
- Toxicology

COURSES OFFERED

It will be designed to accommodate 500 students admitted through an exam All India Forensic Science Entrance Test (AIFSET). The institute will work under the National Forensic Science Institute (NFSU), Gandhinagar.

- B.Sc in forensic sciences (with specialization)
- M.Sc in forensic sciences (with specialization)
- Diploma courses (for specializations)
- Certificate courses
- M.Phil
- PhD

REQUIREMENTS

- ACADEMIC BLOCK - 8 DEPT
- ADMINISTRATIVE BLOCK
- GIRLS HOSTEL- 168 CAPACITY
- BOYS HOSTEL – 168 CAPACITY
- MULTIPURPOSE (auditorium, library, health center, information center etc.)
- ESSENTIAL COMMODITY BLOCK
- GUEST HOUSE
- CANTEEN- 112 CAPACITY
- DIRECTOR'S RESIDENCE
- DY DIRECTOR'S RESIDENCE
- AD. DIRECTOR'S RESIDENCE
- TYPE II RESIDENCIAL TOWERS
- TYPE III RESIDENCE TOWERS
- FUTURE EXTENSION – CENTERS FOR TRAINING, RESEARCH AND EXCELLENCE, FORENSIC LABS AND DEPARTMENTS

GOAL OF THE PROJECT

To provide a built environment for the institute to promote better education and excellence in research in the field of forensics. Provide a secure environment that maintains confidentiality for forensic proceedings and research to take place.

A university campus is the physical expression of the collective purpose of the people who live and study within, or it is but a jumble of uninspired structures seemingly at odds with one another and depressing to its occupants.

-Campus Design in India by Achyut Kavinde

VIABILITY OF THE PROJECT

Being the core urban city, Lucknow generates employment and people migrate to the city in large numbers. Being a hub of numerous top institutes of the country, this project will further add to the growth of the city as well as the state. Neighboring the proposed site police training academy and female battalion headquarters are also proposed this will make sure that the students get practical experience. It is located at the periphery of the city hence maintaining its privacy and confidentiality.

ABSTRACT : CAMPUS DESIGN AND EDUCATION

The quality of education imparted by a particular institution directly depends on the quality of each of these four elements and their interactions a major objective of campus design is to delineate the interdependent relationships among the quality of Campus environment(physical facilities), the quality of educational experience and ultimately the quality of the graduate. It is granted that quality of academic content is most important but it depends on the quality of social-living-work-study environment of a college or University Campus

"We shape our buildings and afterwards they shape us."
-Winston Churchill

CHAPTER – 3
LITERATURE CASE STUDY

LITERATURE CASE STUDY
UP STATE INSTITUTE OF FORENSIC SCIENCES, LUCKNOW

INTRODUCTION

Uttar Pradesh State Institute of Forensic Science (UPSIFS) set up under the ministry of home affairs in Lucknow will have eight departments and 14 laboratories. The institute, which will begin classes with 150 students, will offer BSc, MSc, MPhil, PhD and diplomas and certificate courses. It will be governed by Gujarat-based National Forensic Sciences University (NFSU). the institute will not only train policemen and those in the prosecution department, but also educate students and propel research in forensic science. It will also enable students to explore new career avenues and the state will get its best forensic scientists

Source: google images

ABOUT THE INSTITUTE

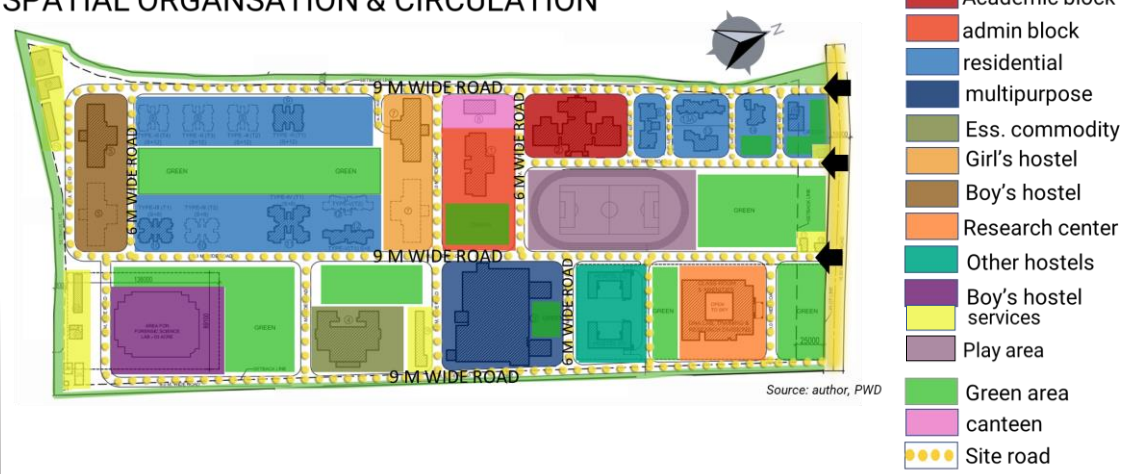
LOCATION: Piparsand village, Sarojini Nagar, Lucknow, UP
TYPOLOGY: Institutional building
COORDINATES: 26° 43' 30" N , 80 ° 50' 05" E
AREA/DIMENSIONS: 50.13 acre/ 660×336 sqm(approx.)
ARCHITECT: CP Kukreja
PROPOSED IN: 2019
EARTHQUAKE ZONE: zone III
CLIMATE: composite climate

ACCESSIBILITY AND APPROACH

The site can be approached easily through Lucknow-Kanpur highway NH 27. It is distanced at 950 meters from the main Highway. Access road is 3.75m wide and NH27 is 26m wide.

- 8.0km from CCS airport
- 8.5km from Amausi metro station
- 19.1km from Charbagh railway station
- 15km from Alambagh bus station

SPATIAL ORGANSATION & CIRCULATION



BUILDING PROGRAM

The institute will consist of **8 departments and 14 laboratories**. Some other departments will include behavioral sciences and police administration**. The site consist of main road 9m wide and sub roads 6m wide.** It has blocks which require privacy located at the back of site such as residential, services and forensic lab area. Front of the site consist of important buildings like admin, academic and multipurpose blocks.

It has 775 car parking spaces and landscaping area of 17600sqm. Services include HT panel room, garbage compost plant, STP, guard room etc.

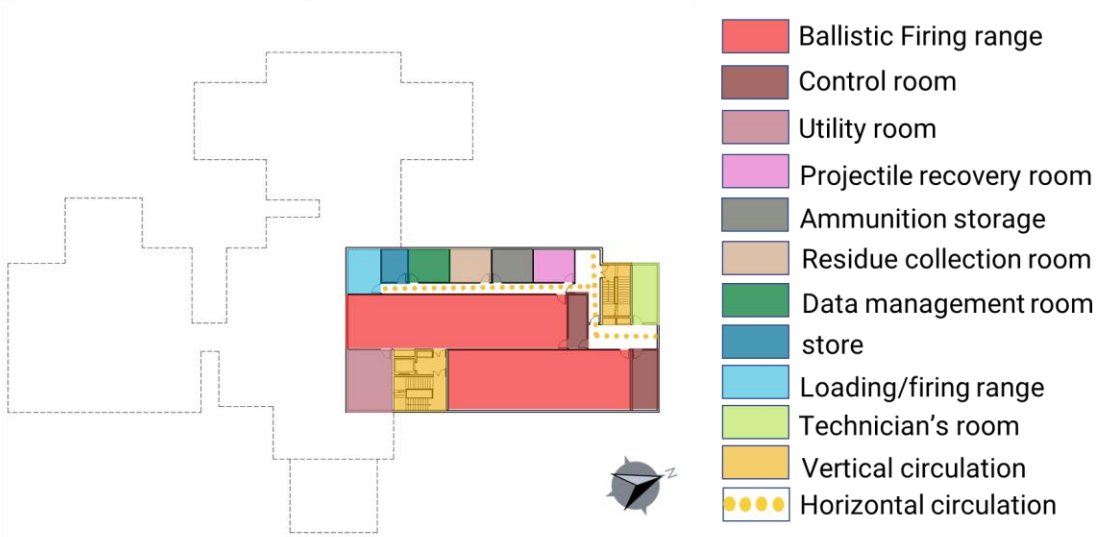
BLOCK NAME	HEIGHT	CAPACITY	APPROX. BUILT UP AREA (SQM)
ADMINISTRATION	S+4	-	5222.28
ACADEMIC	B+G+5	-	13154.97
MULTIPURPOSE	G+1	1000(auditorium)	9024.3
ESSENTIAL COMMODITY BLOCK	G	-	3637.49
BOY'S HOSTEL	G+3	168 students	2913.76
GUEST HOUSE	G+2	12 single rooms+ 6 suite rooms	1380.88
GIRL'S HOSTEL	G+3	168 students	2913.76
CANTEEN	G	112 seating	368.94
ADDITIONAL DIRECTOR'S RESIDENCE	G	-	373
DEPUTY DIRECTOR'S RESIDENCE	G	-	488.24
DIRECTOR'S REDIENCE	G+1	-	416.27
TYPE II (2BHK)	S+9	36 UNITS	4459.16
TYPE III (2BHK)	S+8	30 UNITS	3969.25
TYPE IV (3BHK)	S+8	54 UNITS	5515.4
TYPE V (3BHK)	S+8	32 UNITS	3786.1

Source: author, PWD

SPECIFICATIONS OF ACADEMIC BLOCK

- Basement has ballistic department, under department of applied physics.
- **Ground floor plan has department of applied physics** with instrument, document, physics etc.
- **Block contains B+G+5 floors with typical floor plans from G to 5.**
- **First floor - forensic chemistry department** with labs specialized in toxicology, explosive, chemistry etc.
- **Second floor - forensic biology department** with labs specialized in serology, biology and DNA.
- **Third floor - department of cyber security and data analytics** with labs specialized in computer forensics, forensic acoustic, data analytics etc.
- **Fourth floor - department of law** with labs specialized in behavioral science.
- **Fifth floor - examination hall, department of criminology** with specialized lecture hall and behavioral lab.
- It consists of 3m wide corridors
- Floor to floor height is 4200mm.
- Consists of separate entry /exit for each laboratory.
- **Capacity of the classroom is 80 students**.
- **Each laboratory consists its ancillary services.**

ACADEMIC BLOCK



BASEMENT PLAN

Source: author, PWD

ACADEMIC BLOCK

GROUND FLOOR PLAN

SPECIFICATIONS OF MULTIPURPOSE BLOCK

- **It has ground floor and first floor with a common library, dispensary and auditoriums.**
- **Consists of 2 auditoriums of capacities 300 and 500.**
- It has a media center, green rooms, electrical rooms, pre-function area, VIP rooms and lounges.
- Meeting rooms and board rooms are also present.
- Library consist of a common area, librarians office digital library and reading areas
- Dispensary consists of dr's cabins, treatment areas, admit areas, pharmacy etc
- Cabins of supporting staff also present in this block.
- **First floor consists of a common hall, conference room, pantry, spare room and AHU room.**
- It also consists of several open terrace areas on first floor for outdoor reading area.
- Floor to floor height is 4500mm.
- Consists of 3000m wide corridors.

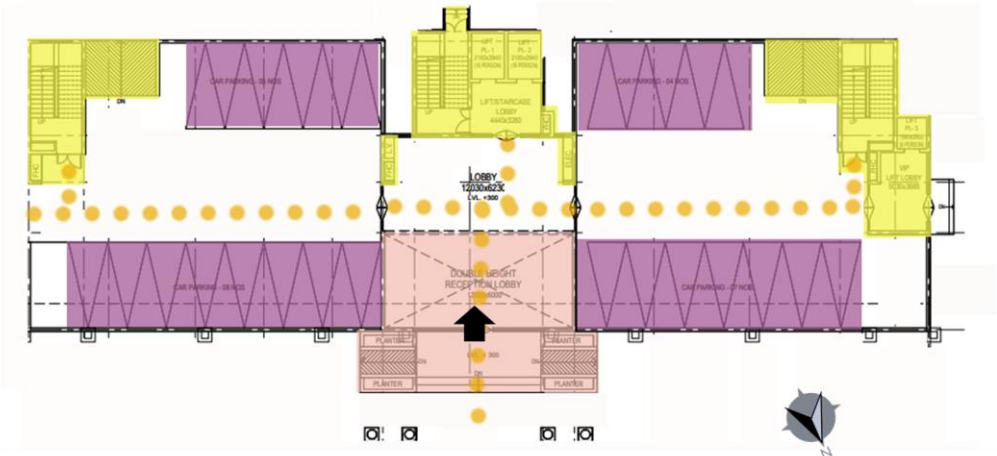
SPECIFICATIONS OF ADMINISTRATIVE BLOCK

- It consists of S+5 floors with almost typical floor plans from FF to 4F.
- Stilt floor consists of 24 car parking spaces
- Circulation includes lift and staircase, fire exit and a VIP stair and lift.
- First floor - administrative floor, consists of record rooms, committee rooms, computer and examination sections, stenographer's workstation, strong rooms etc.

Source: author, PWD

- **Second floor - finance department**, consists of finance controller's room, account officer's rooms, invigilation halls, store rooms and record rooms.
- **Third floor - deputy director's floor**, consists of offices of 2 deputy directors, conference rooms, record rooms, waiting lounge, store etc
- **Fourth floor - directors floor**, consists of director's office, vvip waiting lounge, board rooms, PA rooms, additional directors rooms and staff rooms.
- Floor to floor height is 4200mm
- Plinth is +600mm
- Corridors are 3000mm wide.

ADMINISTRATIVE BLOCK



STILT FOOR PLAN

Source: author, PWD

Entrance lobby | parking spaces | vertical circulation

FIRST FLOOR PLAN

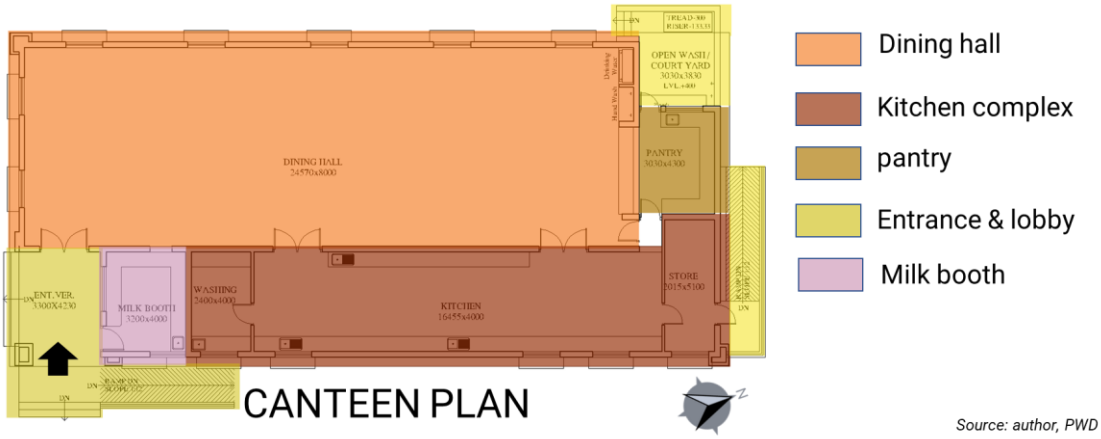
lobby | Admin offices | Exam section | pantry | conference | washroom | circulation | Computer section | Exam cell | horizontal circulation

ESSENTIAL COMMODITY BLOCK

- **It consists of 16 shops.**
- It also has central police canteen with kitchen, store and washrooms.
- The **capacity of the canteen is 400 people**.
- It has a corridor of 4.25 m width.
- Floor to floor height is 4.2 m.

CANTEEN

- It has a milk booth, commom kitchen with store and wash area.
- It also has a pantry and a open wash area
- The dining area consists of 170 seating spaces for students.
- Floor to floor height is 4.2 m and consists of only ground floor

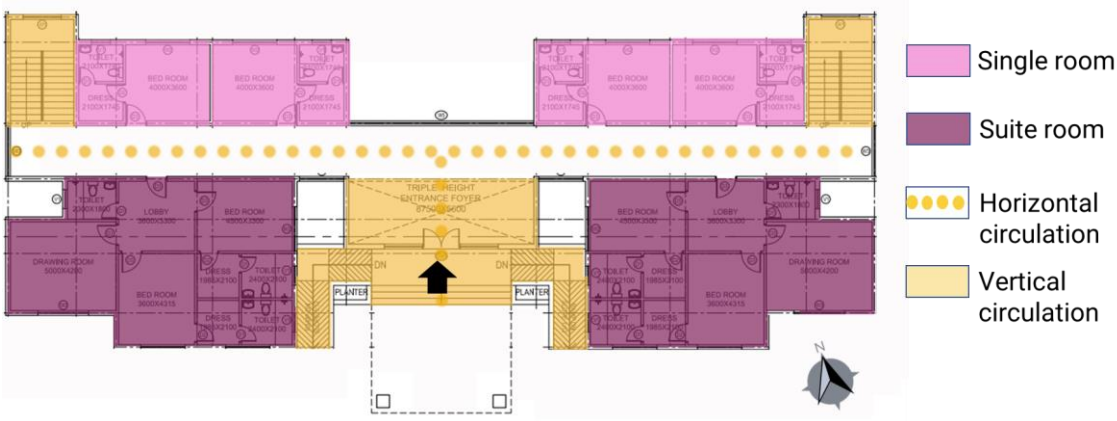


CANTEEN PLAN

Source: author, PWD

GUEST HOUSE

- It consists of G+2 floors with typical floor plans.
- It has 2 suite rooms and 4 single rooms on each floor
- 2.4 m wide corridor.
- Floor to floor height is 4.2 m.



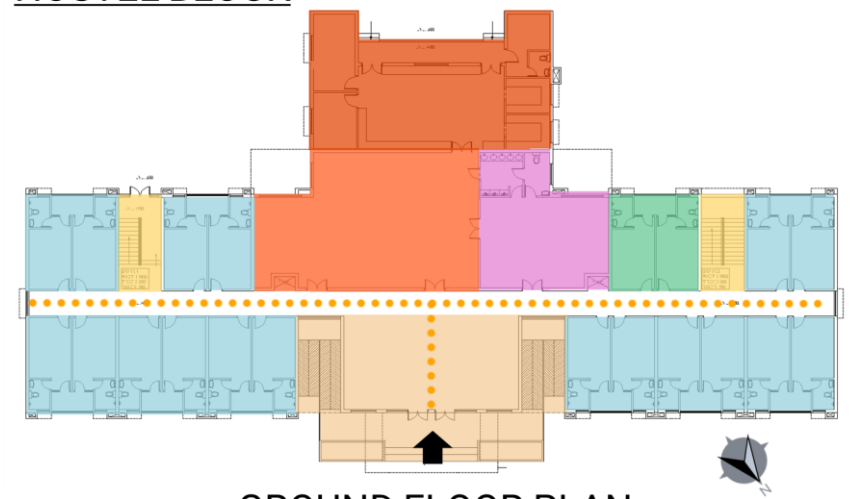
GUEST HOUSE PLAN

Source: author, PWD

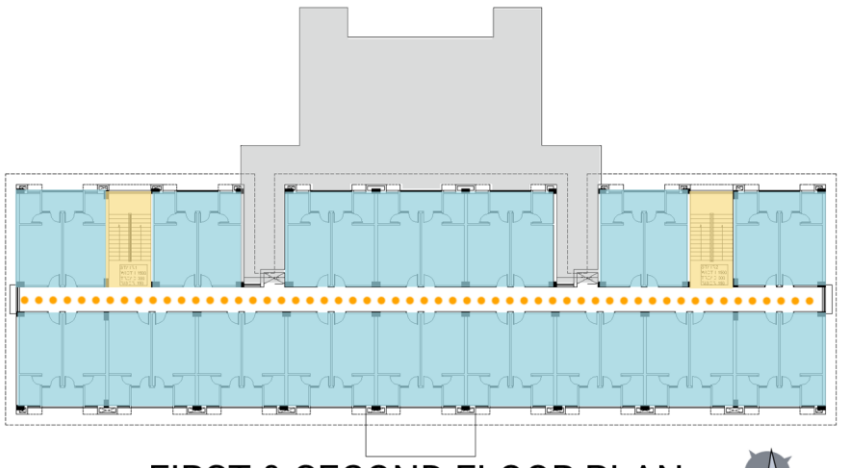
SPECIFICATIONS OF HOSTEL BLOCKS

- It consists of G+2 floors with typical floor plans on first and second floor.
- It has 18 hostel rooms on ground floor and 32 rooms each on first and second floors
- It has a mess, kitchen and common room on ground floor.
- The corridor width is 1.8m.
- Floor to floor height is 3150mm.
- The rooms are double seater with attached balcony and toilets.
- The dimension of each room is 3m by 4.5m.
- Mess seating capacity is 130 person.

HOSTEL BLOCK



GROUND FLOOR PLAN



FIRST & SECOND FLOOR PLAN

Entrance lobby
Dining hall
Common room
kitchen
Visitors room
Hostel room
terrace
Horizontal circulation
Vertical circulation

Source: author, PWD

RESIDENTIAL BLOCKS

- Residential blocks are single house and tower structures.
- Individual housing includes additional director, deputy director and directors resiences.
- For staff housing type II (2bhk) , type III (2bhk), type IV (3bhk) & type V (3bhk) towers are proposed.
- Floor to floor height is 3150mm.

SERVICES

- Energy storage systems
- Extra low voltage (ELV) room
- HTVCB panel room
- Guard rooms
- Under ground water tank(460 KLD)
- Garbage compost plant
- Sewage treatment plant(350KLD)

Source: author, PWD

CHAPTER – 4
LIVE CASE STUDY

CASE STUDY- 1
NATIONAL FORENSIC SCIENCE UNIVERSITY, GANDHINAGAR, GUJARAT

INTRODUCTION

Gujarat Forensic Sciences University elevated as the National Forensic Sciences University with the status of an Institution of National Importance is the world's first and only University dedicated to Forensic, behavioural, cybersecurity, digital forensics, and allied Sciences. It aims to fulfill the acute shortage of Forensic Experts in the Country and the World and to make the World a Better and Safer place to live.

ABOUT THE INSTITUTE

LOCATION: Sector 9, Gandhinagar, Gujarat
TYPOLOGY: Institutional building
ESTABLISHED IN: 2009
ARCHITECT: Kishore N. Trivedi
COORDINATES: 23° 12' 35.56" N ,
72° 39' 42.82" E
AREA: 17 Acre (approx.)
EARTHQUAKE ZONE: zone III
CLIMATE: tropical wet and dry climate

Source: NFSU website

Source: author

APPROACH TO THE SITE

Sardar Vallabbhai Patel Airport is 18Km

Ahmedabad railway station is 27Km

Nearest bus station is 2 Km.

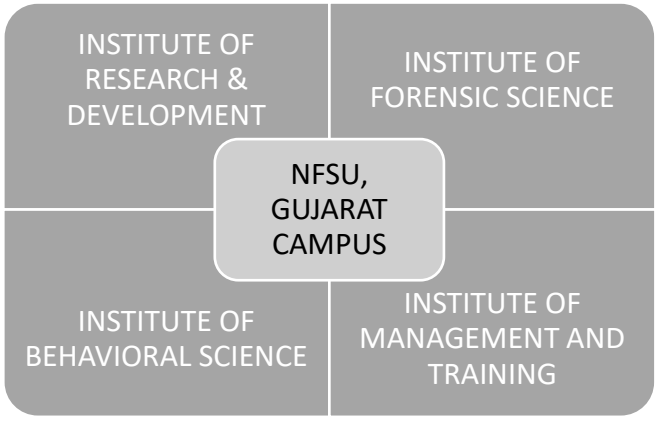
The Site is approached on 2 sides by Police Bhawan road 18m wide roads on NE and NW sides. NH 147 runs on the SE of the site.

Source: author

SITE SURROUNDINGS

POLICE BHAVAN CIRCLE
POLICE BHAVAN
DIRECTORATE OF FORENSIC SCIENCES
PROPOSED LAND FOR INSTITUTE EXTENSION
SOUTH WESTERN AIR COMMAND HEADQUARTERS
RESIDENTIAL AREA
PANDIT DEENDAYAL PARK
AFSB SCHOOL

Source: author, Gearth



Source: author

DEPARTMENTS	COURSES OFFERED	INTAKE
SCHOOL OF DOCTORAL STUDIES AND RESEARCH	P.Hd(2)	-
SCHOOL OF FORENSIC SCIENCE	M.SC(3), B.SC, PG diploma(3)	200
SCHOOL OF CYBER SECURITY AND DIGITAL FORENSICS	B.Tech, M.Tech, M.SC(2)	190
SCHOOL OF MANAGEMENT STUDIES	MBA(5), BBA+MBA, PG Diploma	200
SCHOOL OF PHARMACY	M.Pharm(2), M.SC(3), PG diploma	92
SCHOOL OF ENGINEERING AND TECHNOLOGY	M.Tech(civil), M.sc(food), M.sc(nanotech-2)	60
SCHOOL OF BEHAVIORAL SCIENCE	M.Phil, M.Sc, Phd(2)	120
SCHOOL OF OPEN LEARNING	-	-
SCHOOL OF POLICE SCIENCE AND SECURITY STUDIES	M.sc, MA, PG diploma	80
SCHOOL OF MEDICO LEGAL STUDIES	M.SC(3), PG diploma(2)	100
SCHOOL OF LAW, FORENSIC JUSTICE AND POLICY STUDIES	BSc LLB(hons.), LLB(hons.), LLM, PG diploma	180
SCHOOL OF FORENSIC PSYCOLOGY	M.Sc, MA, PG Diploma	-

SITE CONDITION

The site is 8ft above the road level and gradually contours down when moving from the entrance towards the library building. The architect has preserved the character of the site by providing ramps and staircases while playing with levels on the site.

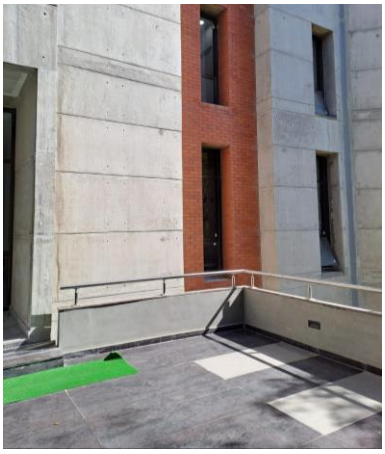
ARCHITECTURAL STYLE

- The architectural style is modern and the skyline integrates well with the surrounding buildings of that area.
- Use of RCC wall and exposed brickwork in the campus .
- The movement through several open and semi-covered corridors surrounded by courtyards give a contrasting light and shade to indoor spaces.
- All the blocks are well integrated with the site, merge onto the overall Landscape, and are connected through walkways.
- Each building typology has its unique shape.

Source: author

CONSTRUCTION & MATERIAL

- Kota stone and tile floorings
- RCC wall and brickwork
- Concrete paved roads
- Travertine pavers
- Grid false ceilings
- Trabeated structure



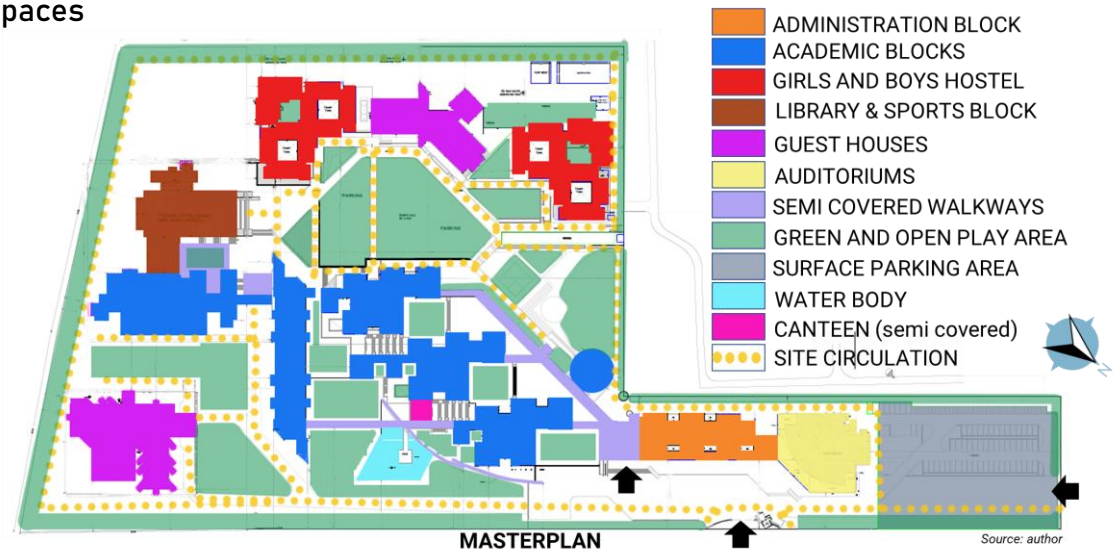
Source: author

BUILDING PROGRAM

BLOCK NAME	HEIGHT	BUILT-UP AREA(SQM)
SECURITY CABIN	G	43.18
AUDITORIUM	B+G+1	2605.08
ADMIN+RESOURCE AREA	G+2	2701.22
RESEARCH AND DEVELOPMENT INSTITUTE	G+2	2912.68
FORENSIC SCIENCE INSTITUTE	G+2	4021.04
BEHAVIORAL SCIENCE INSTITUTE	G+2	2775.17
GUEST HOUSE + STUDIO APARTMENT	G+2	2906.6
GIRLS HOSTEL	G+3	3714.94
BOYS HOSTEL	G+3	3714.94
INTELLIGENT LAB	B+G	42.12
BALLISTIC REASEARCH LAB	B+G+3	7218.86
VVIP GUEST HOUSE	B+G+5	6418.50
TRAINING CENTER + LIBRARY+SPORTS COMPLEX	G+5	12627.97
SUBSTATION	G	231.69
OH WATER TANK	G+1	83.98
PUMP ROOM	G	86.58

SPATIAL ORGANISATION AND CIRCULATION

Each zone is well connected to the other through the walkways and internal roads. Public areas are given in the front while private study/play areas and hostels are given at the back to maintain its privacy. All the desire lines are taken care of while movement across spaces to reduce travel distance. Separate entrances and pathways provided for parking, public and private spaces

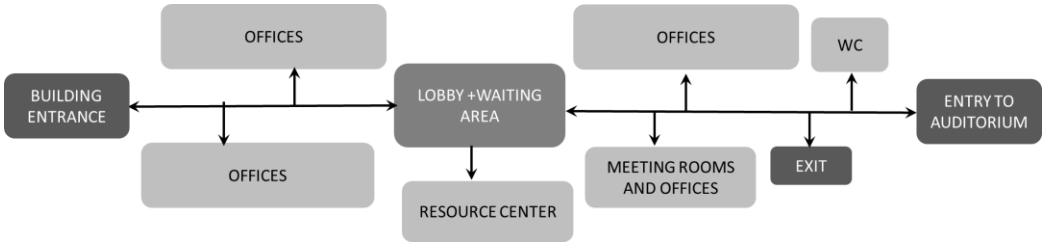


MASTERPLAN

Source: author

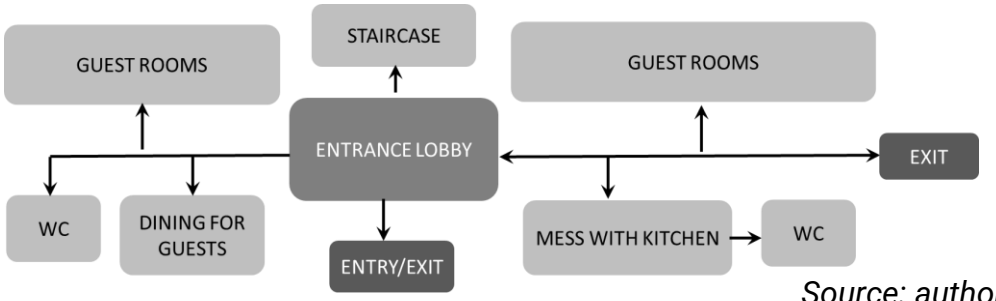
CIRCULATION OF ADMINISTRATION BLOCK

It consists of 15 rooms on ground floor and VC, directors's , deans offices and conference rooms, guest lounge on first floor. Whole block consists of doubly loaded corridors.



CIRCULATION OF GUEST HOUSE

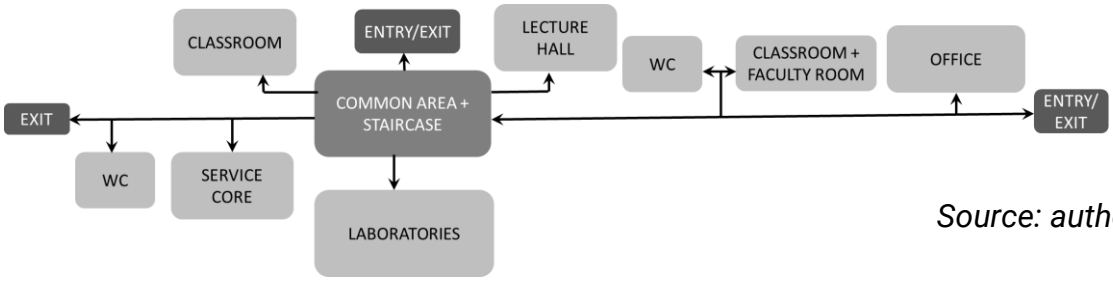
It has total of 45 guest rooms and studio apartments. It has simple floor plan in grid with doubly loaded corridors.



Source: author

HORIZONTAL CIRCULATION OF ACADEMIC BLOCK

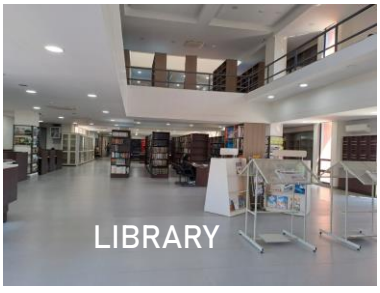
It consists of 2 classrooms and 3 laboratories.it has typical floor plans on all floors with some temporary partitions as per requirements



Source: author

SOCIAL INFRASTRUCTURE

- 2 floor hi-tech library with 11000 books and reading area is present.
- 2 indoor badminton courts, 1 volleyball court, indoor games and open play field is present.
- 2 auditoriums upper(550 capacity) and lower(270) capacity is present.
- 1 small amphitheater present
- Area for outdoor experiments present



Source: author

SERVICES & AMENITIES

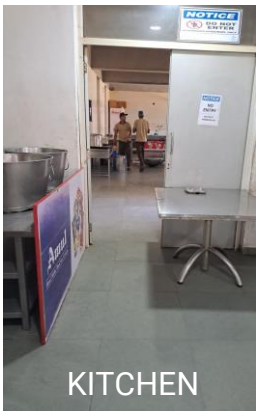
- Water tank, substation, fire fighting, solar panels, security rooms and 13 rain water harvesting units are present.
- First aid, and student resource center is present
- VIP guest house and VVIP guest house is present.
- Transport facility like college bus is present.
- Girls and boys hostel with a capacity of 95 rooms in each
- High-quality machinery for labs with gas and water supply
- hostel is present.
- CCTV monitored campus.
- Air-conditioned campus.
- Gym present in each hostel in the basement.


GAS PIPELINE

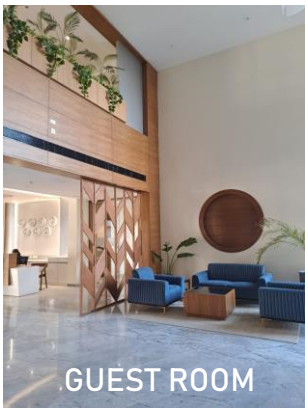

HOSTEL ROOM


LABORATORY


LABORATORY



KITCHEN


GUEST ROOM

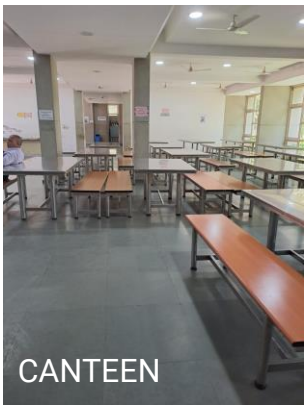

HOSTEL

PARKING & LANDSCAPING

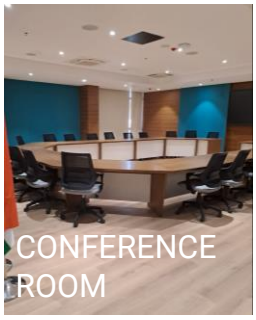
- 250 car parking spaces
- 10 forensic van parking spaces
- Lush green campus, all negative spaces utilized for greenery.
- Common Indian varieties of trees and shurbs like neem, palm, plumeria, bottle brush, ixora etc are present.

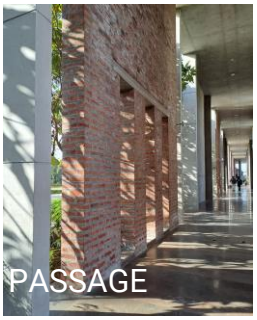
Source: author

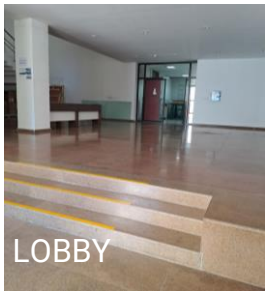
OBSERVATIONS

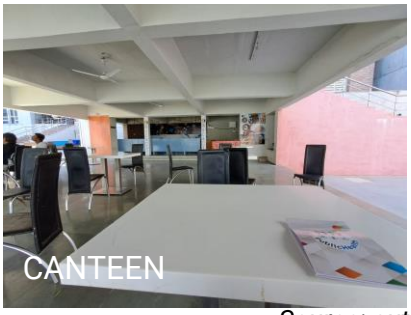


- Plot area is 68022.32 sqm
- Achieved FAR is 0.75
- Built-up rea is 51187.07 sqm
- Plinth level is 1200mm
- Avg floor-to-floor height is 3600
- Over 30 special laboratories are present
- World-class research laboratories present
- Animal house present
- Approx classroom sizes are 60-100sqm
- Approx area of the library is 200 sqm
- Approx Laboratory sizes are 40sqm, 81sqm and 108 sqm.
- Mess area for 200 students
- Special labs with soundproofing, dark room and temperature requirements are present.
- Ballastic shooting range present in basement.
- Climate oriented design approach helps in making spaces well lit.
- Variations in site levels and building heights create a rhythmic pattern.









Source: author

MERITS

- Green and Environment friendly campus where 70% of electricity is generated by Solar Panels.
- Provision of Rain water harvesting.
- Highly secured campus with 256 CCTV Cameras
- Uninterrupted power supply in campus along with DG Sets with various power capacities
- Ultra-Modern Auditorium, Hostel Facilities for Girls and Boys, Mess and fully furnished guest house with Studio Apartments.
- It has some of the most hi-tech imported machines.
- Student-friendly atmosphere for all round development of students.
- Presence of DFS and police bhavan adds to the training of students.
- This campus has successfully created balance between extrovert and introvert spaces.


SPECIAL LAB


BEHAVIOURAL LAB

Source: author

ISSUES (USER FEEDBACK)

- All labs with heavy machinery should have separate entry/ exits.
- Atleast 4.5 m headroom should be given
- Structural lab should have pcc flooring and shed structure
- Structure chemistry and toxicology labs should not have air conditioning.
- Small cabin for lab assistent with viewing glass should be present with each lab.
- Working tops should be of adjustable heights.
- Fire hydrant and fuming hoods should be present in all labs
- Working tables should be vibration free
- Separate waste disposal for wet hazardous and dry waste (pits should be constructed)
- Hand held wash required
- Separate instrument rooms and machine required.
- Extra Rooms that can be modified as per purpose of temperate and pressure control are required.
- Dark rooms required for forensic psychology.
- Space for computer system required with each instrument
- Standard types of cupboards required for specific chemicals and apparatus.
- Sound proofing required in BEOS lab.
- A subject room is required with conference room in forensic psychology.
- Parking area should have trees or sheds for shading vehicles

Source: author

CASE STUDY- 2
STATE FORENSIC SCIENCE LABORATORY, LUCKNOW

INTRODUCTION

Established in 1960, with two other labs in agra and Varanasi with all the modern facilities. Main function of the building is to help the CBI and police department of UP in detecting crimes. It also records the convicted persons of Uttar Pradesh.


MAIN BUILDING

ABOUT THE INSTITUTE

LOCATION: mahanagar, near wireless chauraha lucknow
TYPOLOGY: Institutional building
ESTABLISHED IN: 1960
COORDINATES: 26° 52' 57" N ,
80° 57' 31" E
AREA: 3.25 Acre (approx.)
EARTHQUAKE ZONE: zone III
CLIMATE: composite climate

ENTRANCE

Source: author

APPROACH TO THE SITE

Nearby landmarks are office, BSNL office, Geeta Vastralaya. It is approached by 15m wide picnic spot road.
Alambagh bus stand is 10km away
Charbagh railway station is 7.5km away

DEPARTMENTS

- intrumental analysis division
- lie-detection analysis division
- forensic acoustics division
- cyber security division
- physics division
- documents division
- ballistics division
- chemistry division
- toxicology division
- biology division
- explosive division
- medico-legal division

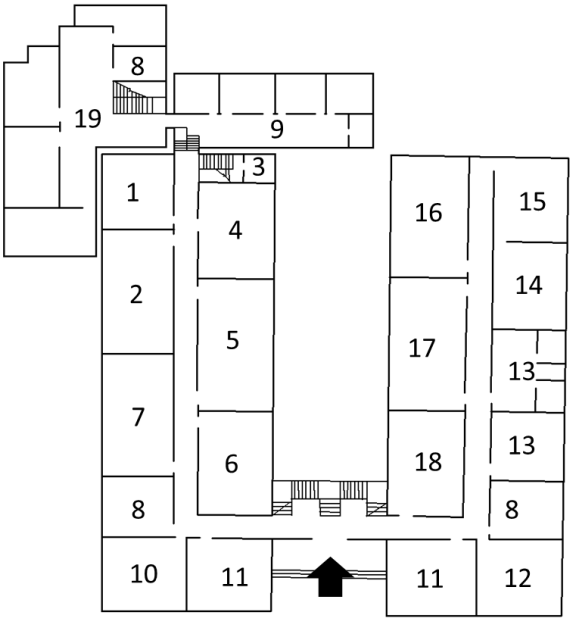

CORRIDOR

SPATIAL ORGANISATION AND CIRCULATION

- ADMIN & LABORATORIES
- DNA & NARCO ANALYSIS
- CHEMISTRY & TOXICOLOGY
- RESIDENCE
- WORKER QUARTER
- GUARD ROOM
- OH WATER TANK
- GREEN AREA
- SITE CIRCULATION

Source: author

GROUND FLOOR PLAN

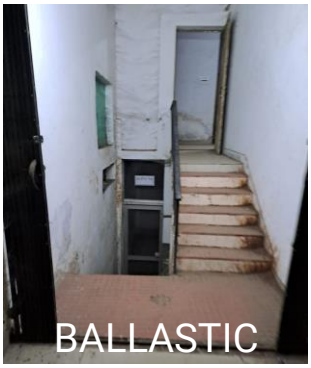


1. CHEMISTRY STORE
2. DOCUMENTS ROOM
3. TOILET
4. LIBRARY
5. MUSEUM
6. FORENSIC ACOUSTICS
7. COMPUTER FORENSICS
8. HODS ROOMS
9. BALLASTICS DIVISION
10. MICROSCOPE ROOM
11. OFFICERS ROOM
12. LIE-DETECTION
13. PHOTO SECTION
14. PHYSICS LAB
15. PHYSICS STORE
16. GENERAL STORE
17. SEROLOGY
18. ACCOUNTING
19. CHEMISTRY

Source: author

OTHER FACILITIES

- The main building is U-shaped double storey. It has labs on GF & administration on FF.
- For security reasons there is only one entrance.
- All buildings have typical floor plans.
- The ballistic division has a firing range in the basement.



AREA PROGRAM

BLOCK NAME	HEIGHT	APPROX. GROUND COVERAGE(SQM)
ADMIN+ LABS	G+1	2075
DNA + NARCO +FINGERPRINT	G+2	645.18
CHEMISTRY +TOXICOLOGY	G+2	261.74
RESIDENCE	G	362.37
WORKER QUARTER	G	85.88
OH WATER TANK	G+2	62.13

OBSERVATIONS

- Doubly loaded corridors of width is 6ft.
- Building is simple trabeated structure with plastered walls and tile flooring.
- Climate is considered in building design.
- Services include air-conditioning, geysers, waste disposal, fire fighting and water tank.
- The FSL alone is not sufficient to cater the number of case due to the inadequate spaces as per the modern requirements.
- Unorganised parking spaces, usually 25 cars & 60 2-wheeler are parked. Site road is 6m wide.
- Contains a lot of green area but unorganized growth of trees, only front garden in maintained.

Source: author

COMPARATIVE ANALYSIS

PARTICULARS	CASE STUDY – I (NFSU, GUJARAT)	CASE STUDY – II (FSL, LKO)	CASE STUDY – III (UPSIFS, LKO)	AREA AS PER NORMS
STUDENT STRENGTH	1200	-	500	-
TOTAL PLOT AREA	17 ACRE	3.25 ACRE	50 ACRE	7.2 ACRE
TOTAL BUILT UP AREA	52000 SQM	7502.4 SQM	57600 SQM	-
ADMIN SECTION	2701.22 SQM	-	5222.28SQM	-
LECTURE HALL/CLASSROOMS	70 HALLS 60-100 SQM EACH	-	14 HALLS 100 & 120 SQM	-
LIBRARY	324 SQM	110 SQM	600SQM	-
TEACHING DEPARTMENTS	12	-	8	-
LABORATORIES	40	25	22	-
CANTEEN	40 PERSON	-	300 PERSON	--
RESIDENTIAL AREA	15%	3%	9.3%	25%
SPORTS AND CULTURAL	10%	-	10%	15%
GREEN ZONE	22%	20%	8.6%	15%
PARKING	250 CARS	25 CARS	775 CARS	1 ECS PER 100SQM FLOOR AREA
STAIR WIDTH	1.5M	1.2M	1.8M & 2M	2M
RESOURCE GENERATION AND CONSERVATION	YES	NO	YES	REQUIRED
MAX. BUILDING HEIGHT	24M	10.8M	32M	36M

Source: author

CHAPTER – 5
SITE ANALYSIS

ABOUT THE SITE

LOCATION: Piparsand village, Sarojini Nagar, Lucknow, UP
CLIENT: UP Government (home department)
TYPOLOGY: Institutional building (group C)
COORDINATES: 26° 43' 30" N , 80 ° 50' 05" E
AREA/DIMENSIONS: 50.13 acre/ 660×336 sqm(approx.)
SHAPE: rectangular shape
ELEVATION: 123m above sea level
EARTHQUAKE ZONE: zone III

SITE LOCATION

Source: CDP, Google earth,

APPROACH TO THE SITE

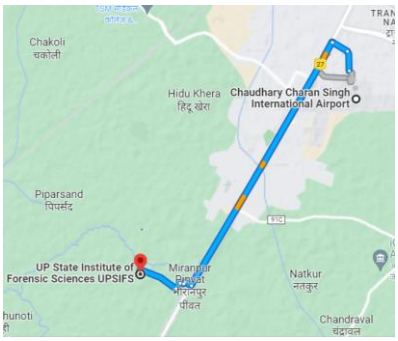
The site can be approached easily **through Lucknow-Kanpur highway NH 27.** It is distanced at 950 meters from the main Highway.
Access road is 3.75m wide and NH27 is26m wide.

ACCESS ROAD

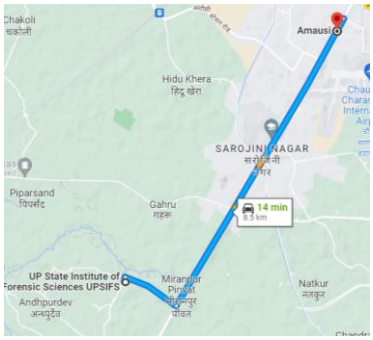
NH27

Source: Author

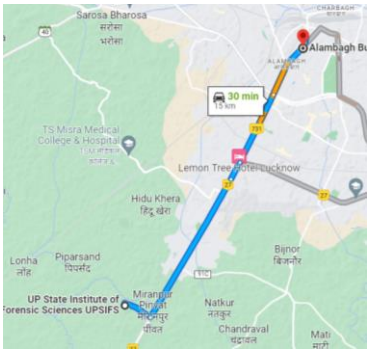
8.0km from CCS airport



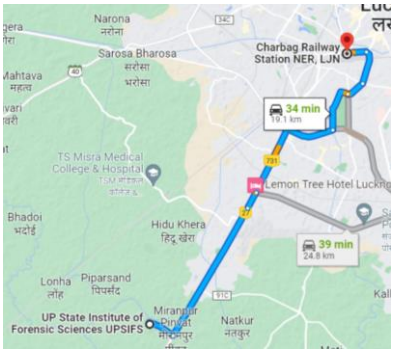
8.5km from Amausi metro station



15km from Alambagh bus station



19.1km from Charbagh railway station



Source: Google maps

NEARBY LANDMARKS

CCS AIRPORT

AMAUSI METRO STATION

UP SAINIK SCHOOL

GURUDWARA SAROJINI NAGAR

SAROJINI NAGAR POLICE STATION

HAJJ HOUSE

GREEN GAS LIMITED CNG STATION

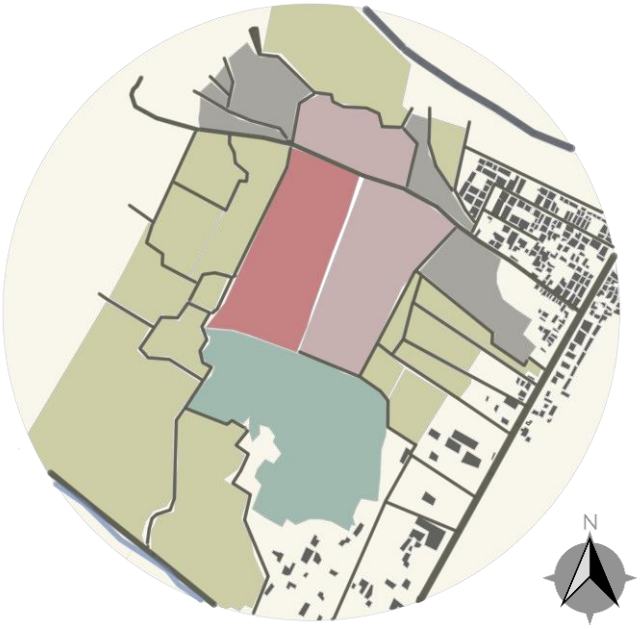
SKY PUBLIC SCHOOL

Source: google images

LANDUSE

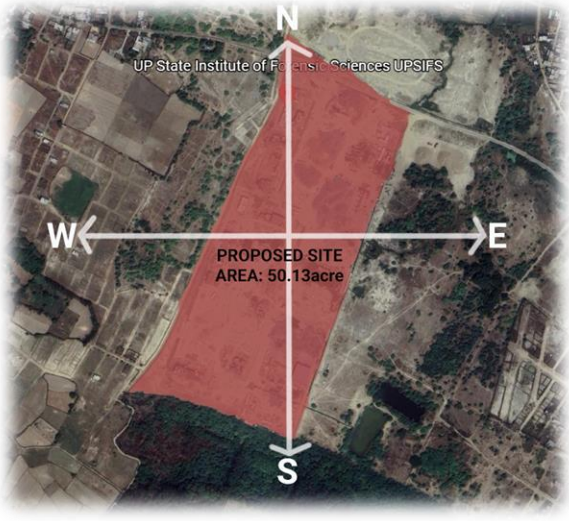
Earlier, the Piparsand village was purely a rural area having agricultural lands but due to the urban sprawl of Lucknow, the **area has now come under peri-urban areas and is fast developing**. The land here is mostly residential either plotted or vertical group housing. **Most lands are private owned** except for the site & police training center, since they are owned by govt.

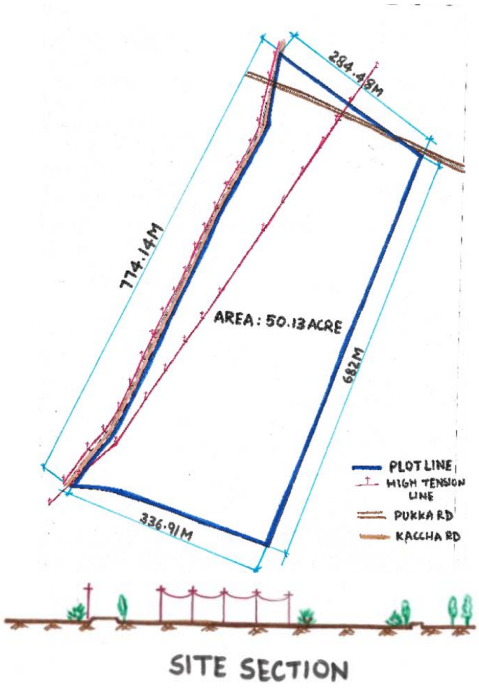
- Proposed Site
- Green area
- Barren land
- Residences
- Police training center
- Plotted residential land



SITE ORIENTATION

The longer side is on the N-S axis and shorter side is on the E-W axis. Access road is on N-E side.





Source: Google earth, Author

BYELAWS (LDA NORMS)

- FLOOR AREA RATIO – 1.5
- GROUND COVERAGE - 35%
- ECS – 1 per 100sqm of floor space
- LANDSCAPE - 125 trees per ha of open space or 20% of plot area
- SETBACK – 15m (front) , 9m (on all sides)
- HEIGHT – 36m max. (AAI norms)

TOPOGRAPHY

Mostly flat surface with gentle slope towards east and north

Source: Author

HYDROLOGY

The groundwater is at 15-20 meter below ground level. Due to high groundwater table, soil liquefaction due to seismic activity needs to be prevented.

SOIL PROFILE

Bearing capacity of soil **is 11-13 T/m2**. Soil type is **mainly alluvial** with sub-type Bhur, Dumat and Matiyar. It has good water retaining capacity.

Source: Author

WATER SUPPLY & DRAINAGE

The main source of water is groundwater extracted through tube wells. Major drainage of this area is through Sai river, sever lines are not present.

ELECTRICITY

Electricity supply subdivision Sarojini Nagar is located at Nadarganj industrial area road. Electric supply lines are passing through the site with 13 electric poles within the site.

ROADS AND SERVICES

Site has roads on 2 sides that is 3.75 m wide pukka road in the front (proposed to be 60 m as per LIDA masterplan) & 2.75 m wide kaccha road on the west side is present. All major services like LPG, ATMs, banks, petrol pumps, public transport etc are present within 5km radius on NH27.

Turn from NH27 towards site

View from North corner of site

Kaccha road on West side

Source: Author

Source: Author

VEGETATION

Very scarce vegetation on site, mostly tall grasses and some Babool trees present mostly on the south corner of the plot. The dense area of Babool trees is located behind the site i.e. on the south of the site. That vegetation area is under van vibhag.

Green space on south corner

Source: Author

NEARBY AMENITIES

- Defence career academy is located 6.8km from the site.
- UCO bank is located 1.3km from the site.
- HP petrol pump is located 2.9km from the site.
- NK cinemas located at 5.3km from the site.
- Lucknow surgical hospital located 6.8km from the site.
- S.S. filling station CNG is located 3.6km from the site.

S

- good accessibility
- flat terrain
- Good groundwater level
- Basic amenities available within reach.

W

- Narrow access road
- Natural vegetation is very less on site
- 13 electric poles with high tension line within the site.
- Municipal water supply and sewer line not available

O

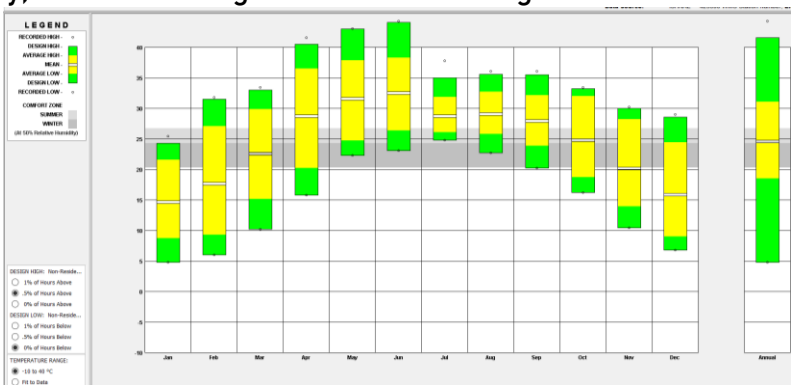
- Road widening will improve value of area.
- Potential to use urban services.
- Connected yet segregated from core city.
- Employment generation.

T

- Located in airport zone which will restrict construction.
- Noise due to plane movement.
- Future construction nearby may cause disturbance.

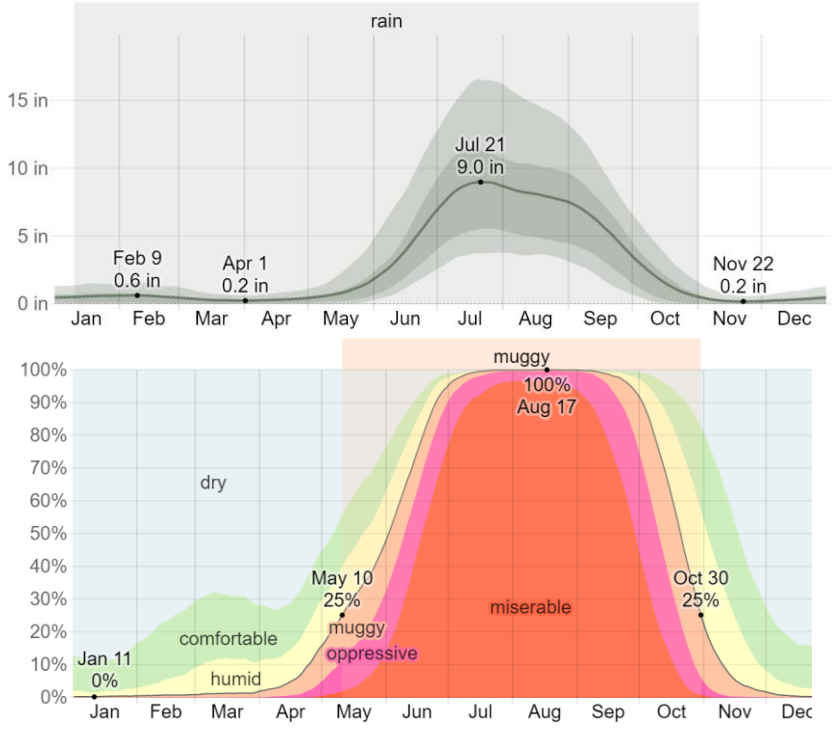
GENERAL CLIMATIC DATA

The hot season lasts from April to June, with an average daily high temperature above 36°C. The hottest month of the year is June, with an average high of 37°C and low of 27°C.
The cool season lasts from December to February, with an average daily high temperature below 24°C. The coldest month of the year in Lucknow is January, with an average low of 8°C and high of 21°C.



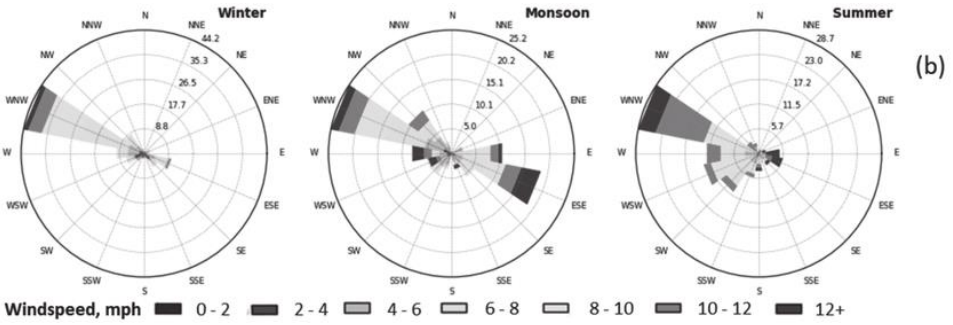
Source: climate consultant 6.0

The month with the most rain is July, with an avg rainfall of 8.9 inches. The rainless period of the year lasts for 2.3 months from November to January 10. The month with the least rain in Lucknow is November.
The month with the muggiest days in Lucknow is August, The month with the fewest muggy days in Lucknow is January, with 0.1 days .



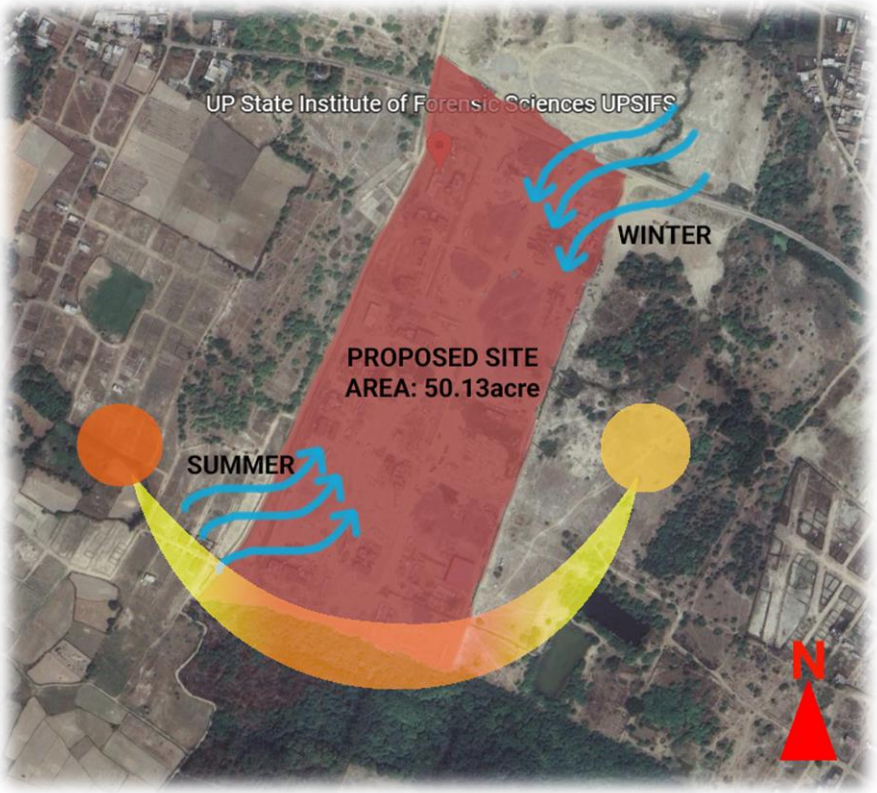
Source: weatherspark.com

The wind is most often from the east for 3.8 months, with a peak percentage of 56% in August. The wind is most often from the west. The windier part of the year lasts for 7.8 months, from January to September, with avg wind speeds of more than 6.2 miles per hour. The windiest month of the year in Lucknow is June.
The calmer time of year lasts from September to January. The calmest month of the year in Lucknow is October.



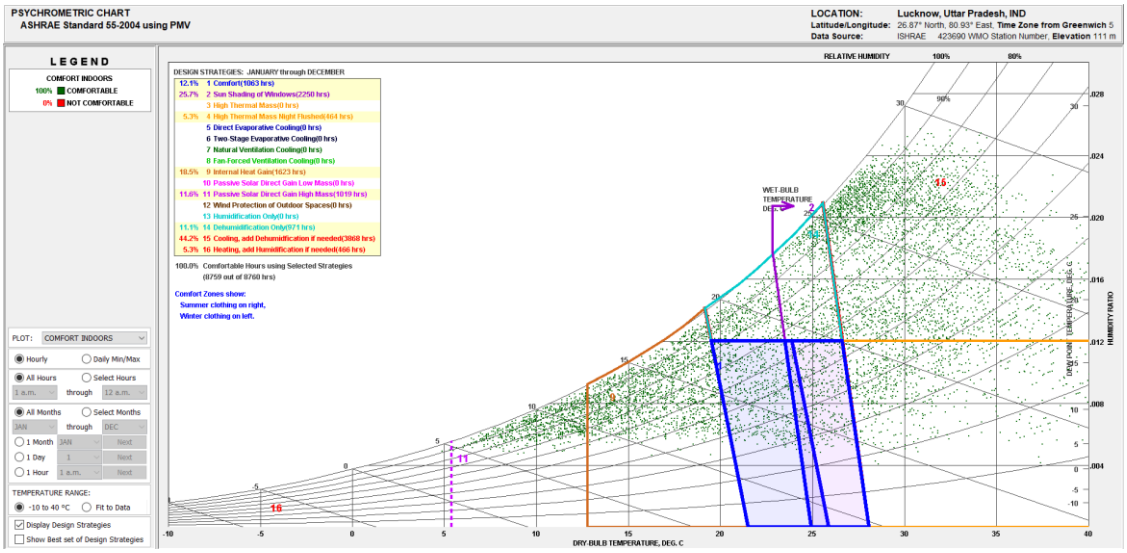
Source: researchgate.net

SITE ORIENTATION



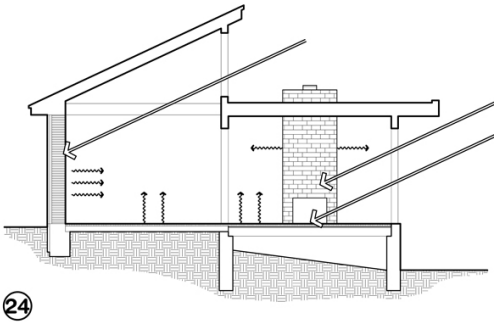
Source: google earth, Author

PSYCHOMETRIC CHART



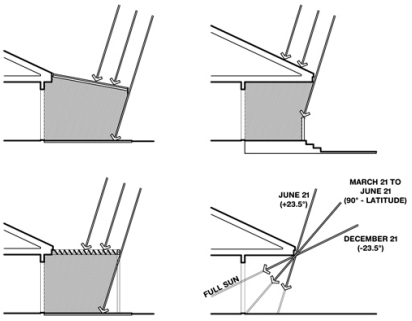
Source: climate consultant 6.0

SOME DESIGN STRATEGIES



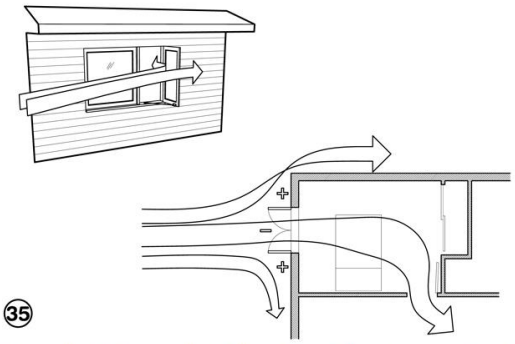
24

Use high mass interior surfaces like slab floors, high mass walls, and a stone fireplace to store winter passive heat and summer night 'coolth'



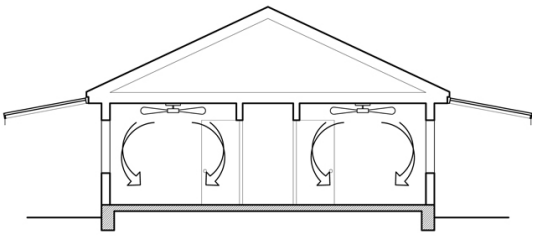
37

Window overhangs (designed for this latitude) or operable sunshades (awnings that extend in summer) can reduce or eliminate air conditioning



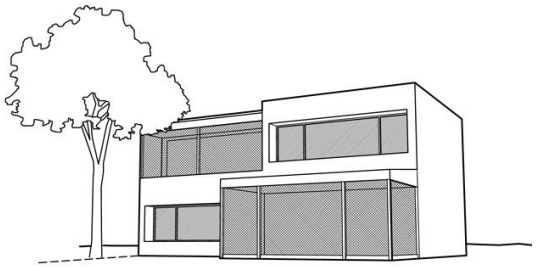
35

Good natural ventilation can reduce or eliminate air conditioning in warm weather, if windows are well shaded and oriented to prevailing breezes



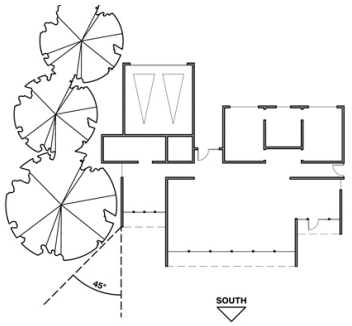
42

On hot days ceiling fans or indoor air motion can make it seem cooler by 5 degrees I (2.8C) or more, thus less air conditioning is needed



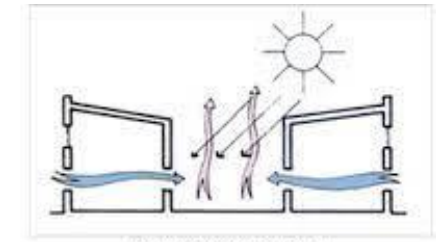
56

Screened porches and patios can provide passive comfort cooling by ventilation in warm weather and can prevent insect problems

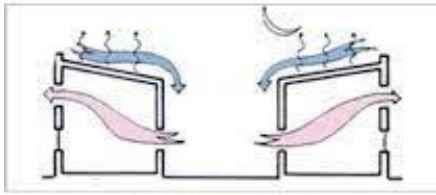


17

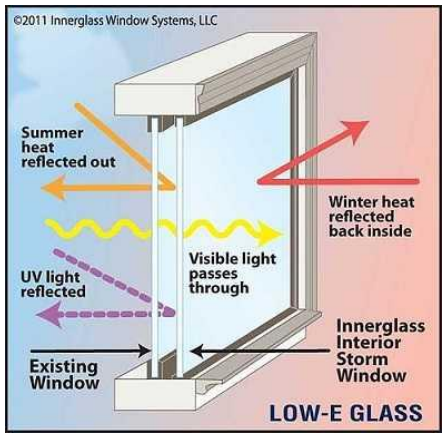
Use plant materials (bushes, trees, ivy-covered walls) especially on the west to minimize heat gain (if summer rains support native plant growth)



Courtyard effect (day)



Courtyard effect (Night)



Source: climate consultant 6.0

INFERENCE

- Lucknow region belongs to a composite climate, hence, it has a variety of seasons all year long and each season has its peak uncomfortable periods.
- The building should be located preferably in the North-East and South-West directions. This helps in receiving less radiation and more natural light & ventilation.
- Active design strategies like the use of air conditioning systems such as heaters, humidifiers, etc and artificial lighting is required during peak seasonal temperatures. This can work with passive strategies to reduce energy consumption.

"Comprehending the character and qualities of the site is essential. Only then can the planning process be a scientific and truly creative process be a scientific and truly creative process leading to the ideal university environment desired."

-Campus Design in India by Achyut Kavinde

CHAPTER – 6
RESEARCH
&
AREA ANALYSIS

US DEPT OF JUSTICE : HANDBOOK OF FACILITY PLANNING

- Main controlled substance section – 4.57m bench space per analyst
- Supervisor's office : 11.48m^2
- Analyst's administrative workstation – 5.95m^2 per analyst
- Toxicology section – 4.57m bench space per analyst
- Radioimmunoassay room- 11.48m^2
- Ballistic /fire arms section- 4.57m bench space/analyst
- Comparison microscope room- 1.524 lin m per microscope
- Fire range →min width (2.438m) opt. width (6.096m)
  Min length (12.192m) opt. length (22.86m)
- 2.438 lin m bench for weapon layout
- Trace analysis section – 4.57m bench space/ analysis
  - Instrumentation room
  - Microscopy room – 1.524 lin m bench space / microscope
  - scanning electron microscope room - 11.48m^2
  - evidence examination room – 13.935M2
  - 2.438 lin m bench space With sink
  - admin work space – 11.98m^2
- Forensic biology/DNA section
  - 4.57m bench space per analyst
  - Evidence examination room min 13.935m^2
  - 2.438 lin m bench layout space with sink
  - Wet blood preparation – 9.29m^2 min
  - Refrigerated storage
  - Evidence drying room
  - Reagent preparation room
  - Photo room – 1.83 lin m bench space per photo station
  - X-ray processing room – 13.935m^2 min
  - PCR preparation room – 11.48m^2
  - PCR ampliphication /detection room – 9.29m^2/analyst
  - Mitochondrial DNA room – 18.581m^2 min
  - Research and development – 18.581m^2 min
  - Computer's lab – 1.524 lin m bench space
- Latent Prints section (fingerprint)
  - 3.048 lin m bench space /analyst
  - Laser room – 13.935m^2
  - All light source room – 11.48m^2
  - Photo room – 1.83 lin m bench space / photo station
  - Automated fingerprint identification system – 1.524 lin m per computer workstation

➢ Questioned document section

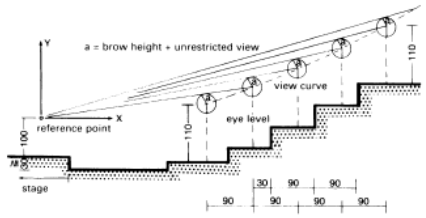
- Evidence storage room and main lab
- Chemical processing room – 11.48m^2 min
- Admin work space – 13.935m^2
- Computer evidence section
- Analyst laboratory workstation – 7.62 lin m / analyst
- Evidence room – 9.29m^2/ analyst
- Equipment room – 9.29m^2 /analyst
- Admin work space – 13.935m^2

There is not one universally correct plan for forensic laboratory design. Design will vary with each laboratory's specific needs. Functional requirements of specific scientific disciplines, equipment, and instrumentation are a few of the variables that generate space, dimension, and adjacency requirements that impact the overall design. Hazardous materials handling and preservation of evidence are just two of the many variables that need to be considered. The future also needs to be considered. A forensic laboratory must be designed with the flexibility to change along with the needs of its occupants, technology, or scientific methodologies.

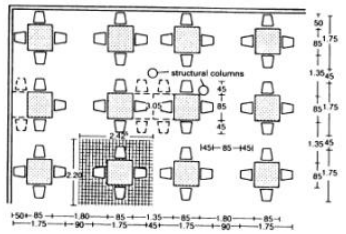
- Separate entry/exit should be provided for emergencies and maintenance of the lab.
- Exterior wall of the building should be bullet resistant such as concrete or masonry.
- On windows, bullet-resistant glass should be used.
- Minimum corridor width should be 1.37m
- Lab doors should be at least 1.2m wide for equipment movement.
- Emergency showers and eyewashes in lab spaces should be given.
- For cooling and differential pressure, spaces should be made separately.
- Hydrogen, nitrogen, helium, air, and argon should be supplied in laboratories.
- Natural lighting should be 25% of the floor area.
- Epoxy resin countertops may be used.
- General space of 5.95 sqm per analyst should be given in each lab
- Supervisor's office space should be atleast 11.48 sqm
- Ballastic dept. should be acoustically designed fo absorbtion of sound and should have exhausts
- Document room should have north light exposure

Source: U.S. dept. of justice handbook

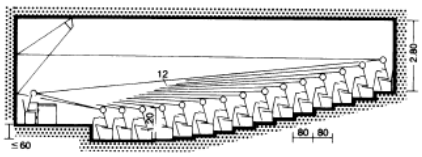
NEUFERT ANTHROPOMETRIC STANDARDS



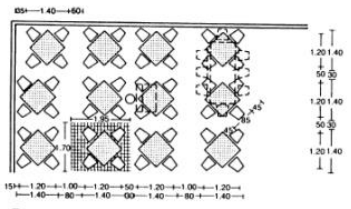
② Drawing for calculating view curve



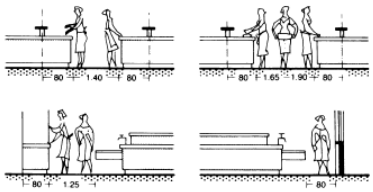
③ Parallel table arrangement



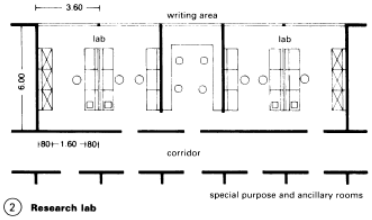
AUDITORIUM



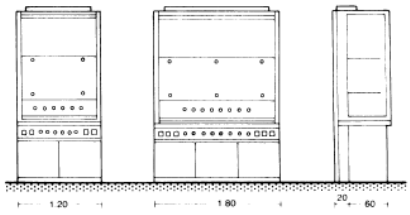
CANTEEN



① Minimum passage width between workstations

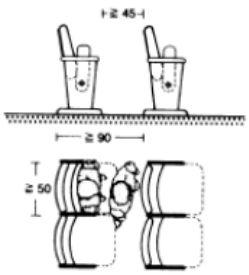


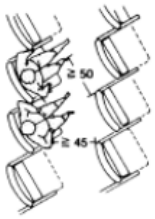
② Research lab

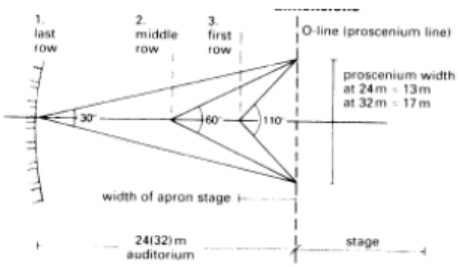


⑦ Digestors (fume cupboards)

LABORARTORY







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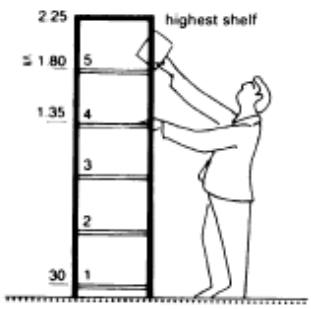
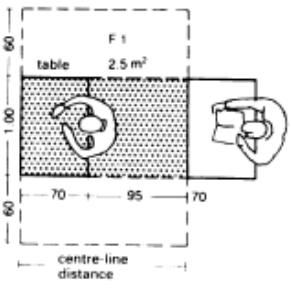
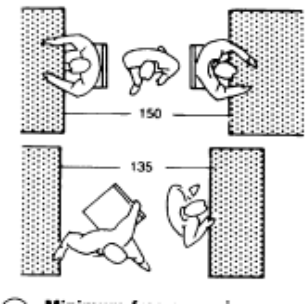






LIBRARY

Source: neufert

NBC STANDARDS

- Open spaces around the building shall be atleast 6m.
- Staircase width – 2m
- Occupant load for institutional building – 7.5 sqm/person
- Water consumption for hostels is 135 lpcd.
- Green spaces should be atleast 15% of site area
- Atleast 25% of plot area can be residential.
- Atleast 15% of plot area can be used for cultural and sports activities.

Table 11 Schools and Educational Institutions
(*Clause* 4.2.5.1)

Sl No.	Fixtures	Nursery School	Non-Residential		Residential	
			Boys	Girls	Boys	Girls
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Water closets	1 per 15 pupils or part thereof	1 per 40 pupils or part thereof	1 per 25 pupils or part thereof	1 per 8 pupils or part thereof	1 per 6 pupils or part thereof
ii)	Ablution tap	One in each water closet	One in each water closet	One in each water closet	One in each water closet	One in each water closet
		1 water tap with draining arrangements shall be provided for every 50 persons or part thereof in the vicinity of water closets and urinals				
iii)	Urinals	—	1 per 20 pupils or part thereof	—	1 per 25 pupils or part thereof	—
iv)	Wash basins	1 per 15 pupils or part thereof	1 per 60 pupils or part thereof	1 per 40 pupils or part thereof	1 per 8 pupils or part thereof	1 per 6 pupils or part thereof
v)	Bath/showers	1 per 40 pupils or part thereof	—	—	1 per 8 pupils or part thereof	1 per 6 pupils or part thereof
vi)	Drinking water fountain or taps	1 per 50 pupils or part thereof	1 per 50 pupils or part thereof	1 per 50 pupils or part thereof	1 per 50 pupils or part thereof	1 per 50 pupils or part thereof
vii)	Cleaner's sink	← 1 per each floor →				

Table 12 Hostels
(*Clause* 4.2.5.1)

Sl No.	Fixtures	Resident		Non-Resident		Visitor/Common Rooms	
		Males	Females	Males	Females	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Water closets	1 per 8 or part thereof	1 per 6 or part thereof	1 for up to 15 2 for 16 to 35 3 for 36 to 65 4 for 66 to 100	1 for up to 12 2 for 13 to 25 3 for 26 to 40 4 for 41 to 57 5 for 58 to 77 6 for 78 to 100	1 per 100 up to 400 Over 400 add at 1 per 250	2 per 100 up to 200 Over 200 add at 1 per 100
ii)	Ablution tap	One in each water closet	One in each water closet	One in each water closet	One in each water closet	One in each water closet	One in each water closet
		1 water tap with draining arrangements shall be provided for every 50 persons or part thereof in the vicinity of water closets and urinals					
iii)	Urinals	1 per 25 or part thereof	—	Nil up to 6 1 for 7 to 20 2 for 21 to 45 3 for 46 to 70 4 for 71 to 100	—	1 per 50 or part thereof	—
iv)	Wash basins	1 per 8 persons or part thereof	1 per 6 persons or part thereof	1 for up to 15 2 for 16 to 35 3 for 36 to 65 4 for 66 to 100	1 for up to 12 2 for 13 to 25 3 for 26 to 40 4 for 41 to 57 5 for 58 to 77 6 for 78 to 100	1 per WC/ Urinal	1 per WC
v)	Bath/showers	1 per 8 persons or part thereof	1 per 6 persons or part thereof	—	—	—	—
vi)	Cleaner's sink	← 1 per each floor →					

Source: national building code 2016

COVERED AREA DETAIL

ADMINISTRATIVE BLOCK		
FACILITY	NO.	AREA(SQM)
RECEPTION + LOBBY	1	72
ADMIN OFFICE	1	60
PROCTOR'S OFFICE	1	45
STRONG ROOM	2	20
COMPUTER SECTION	1	30
DEGREE SECTION	1	30
EXAM SECTION	1	50
STENOGRAPHER'S OFFICE	1	45
RECORD ROOM	2	15
CONFERENCE ROOM	3	60
WAITING LOUNGE	4	22
PANTRY	4	9
PEON'S ROOM	2	8
ACCOUNT'S OFFICE	1	21
INVIGILATION HALL	1	120
FINANCE CONTROLLER'S OFFICE	1	80
ASST. ACCOUNTANT'S OFFICE	1	11
DIRECTOR'S OFFICE	1	80
DEPT. DIRECTOR'S OFFICE	1	80
VVIP LOUNGE	1	80
KITCHEN	1	16

GUEST HOUSE		
FACILITY	NO.	AREA(SQM)
RECEPTION + LOBBY	1	72
ADMIN OFFICE	1	60
SUITE ROOM	12	85
SINGLE ROOM	6	25
KITCHEN	1	40
DINING	1	60

ACADEMIC – PHYSICS DEPARTMENT		
FACILITY	NO.	AREA(SQM)
FIRING RANGE 1	1	26.9×6.65
FIRING RANGE 2	1	22.3×7.4
CONTROL ROOM	2	22
UTILITY ROOM	1	40
TECHNICIAN'S ROOM	1	21
LOADING/FIRING RANGE	1	21
STORE	2	15
DATA COLLECTION ROOM	1	20
RESIDUE COLLECTION ROOM	1	20
AMMO STORAGE	1	20
PROJECTILE RECOVERY ROOM	1	20
HOD OFFICE	2	40
CONFERENCE ROOM	1	22
ASSO. PROFESSOR'S ROOM	4	22
CLASSROOM/LECTURE HALL	2	100
DEPARTMENTAL LIBRARY	1	30
RESEARCH SCHOLAR'S ROOM	1	80
DOCUMENT LAB	1	134
PHYSICS LAB	1	134
INSTRUMENT LAB	1	134
BALLASTIC LAB	1	180

ACADEMIC – CHEMISTRY DEPARTMENT		
FACILITY	NO.	AREA(SQM)
TUTORIAL ROOM	1	22
STORE	1	20
HOD OFFICE	2	40
CONFERENCE ROOM	1	22
ASSO. PROFESSOR'S ROOM	4	22
CLASSROOM/LECTURE HALL	2	100
DEPARTMENTAL LIBRARY	1	30
RESEARCH SCHOLAR'S ROOM	2	80
TOXICOLOGY LAB	1	134
EXPLOSIVES LAB	1	134
CHEMISTRY LAB 1	1	134
CHEMISTRY LAB 2	1	134

AUDITORIUM		
FACILITY	NO.	AREA(SQM)
ENTRANCE LOBBY	1	-
SEATING HALL	1	500-800 seater
GREEN ROOM	2	34
SECONDARY ROOM	2	25
VIP ROOM/STAFF AREA	1	50
MEDIA CENTER	1	200
VVIP LOUNGE	1	80
STORE/ELECTRICAL/PANTRY/ SPARE ROOM/ AHU ROOM	-	-
TOILET	2	-

ACADEMIC – BIOLOGY DEPARTMENT

FACILITY	NO.	AREA(SQM)
TUTORIAL ROOM	1	22
STORE	1	20
HOD OFFICE	2	40
CONFERENCE ROOM	1	22
ASSO. PROFESSOR'S ROOM	4	22
CLASSROOM/LECTURE HALL	2	100
DEPARTMENTAL LIBRARY	1	30
RESEARCH SCHOLAR'S ROOM	2	80
SEROLOGY LAB	1	134
DNA LAB	1	134
BIOLOGY LAB 1	1	134
BIOLOGY LAB 2	1	134

DISPENSARY

FACILITY	NO.	AREA(SQM)
RECEPTION/WAITING	1	40
DOCTOR'S ROOM	2	30
CABINS	4	14
MEDICAL STORE	1	20
MINOR OT	6	58
ADMITTING ROOM	1	80
TOILET	2	-
PANTRY	1	9

ACADEMIC – CYBER SECURITY & DATA ANALYTICS DEPARTMENT		
FACILITY	NO.	AREA(SQM)
TUTORIAL ROOM	1	22
STORE	1	20
HOD OFFICE	2	40
CONFERENCE ROOM	1	22
ASSO. PROFESSOR'S ROOM	4	22
CLASSROOM	2	100
DEPARTMENTAL LIBRARY	1	30
RESEARCH SCHOLAR'S ROOM	2	80
COMPUTER FORENSIC LAB	1	134
DATA ANALYTICS LAB	1	134
LECTURE HALL	1	182

ACADEMIC – LAW & CRIMINOLOGY DEPARTMENT		
FACILITY	NO.	AREA(SQM)
TUTORIAL ROOM	1	22
STORE	1	20
HOD OFFICE	2	40
CONFERENCE ROOM	1	22
ASSO. PROFESSOR'S ROOM	4	22
CLASSROOM	2	100
DEPARTMENTAL LIBRARY	1	30
RESEARCH SCHOLAR'S ROOM	2	80
BEHAVIORAL LAB	1	134
BEOS LAB	1	134
CLINICAL PSYCOLOGY CENTER	1	134
LECTURE HALL	1	182

CENTRAL LIBRARY

FACILITY	NO.	AREA(SQM)
RECEPTION + LOBBY	1	24
LIBRARIAN'S OFFICE	1	24
MEETING ROOM	1	50
PRIVATE READING ROOM	1	50
STACKING AREA	1	145
COMPUTER ROOM	1	280
STAFF READING AREA	1	62
COMMON READING AREA	4	280
CONFERENCE HALL	1	168
LECTURE HALL	1	240
OPEN READING AREA	1	200
TOILET	2	-

MULTIPURPOSE BLOCK

FACILITY	NO.	AREA(SQM)
CENTRAL KITCHEN	1	135
SEATING AREA	1	680
WASH	1	45
STORE	1	45
MULTIPURPOSE SHOPS	10	20
NON- TECH STAFF OFFICE	5	60
TOILET	2	-

STUDENT CANTEEN		
FACILITY	NO.	AREA(SQM)
KITCHEN	1	66
DINING	1	196
WASH	1	9.6
STORE	1	10
MILK BOOTH	1	13
PANTRY	1	13
TOILET	1	-

HOSTEL		
FACILITY	NO.	AREA(SQM)
KITCHEN+STORE+WASH	2	80
DINING	2	154
COMMON ROOM	2	94
WARDEN'S ROOM	2	22
2- SEATER HOSTEL ROOM+TOILET	250	22
VISITOR'S ROOM	4	22

ANCIALLARY FACILITIES (EACH DEPT.)		
FACILITY	NO.	AREA(SQM)
SERVER ROOM	1	8
ELECTRICAL ROOM	1	8
PANTRY	1	9
TOILETS	2	25
ANTE ROOM	1	9
JANITOR	1	8

Source: AUTHOR

ISLAND OF EXECELLENCE

CHAPTER – 7
DESIGN PROPOSITION

IDEA- Nothing is 'tidied up' or kept hidden beneath the mask

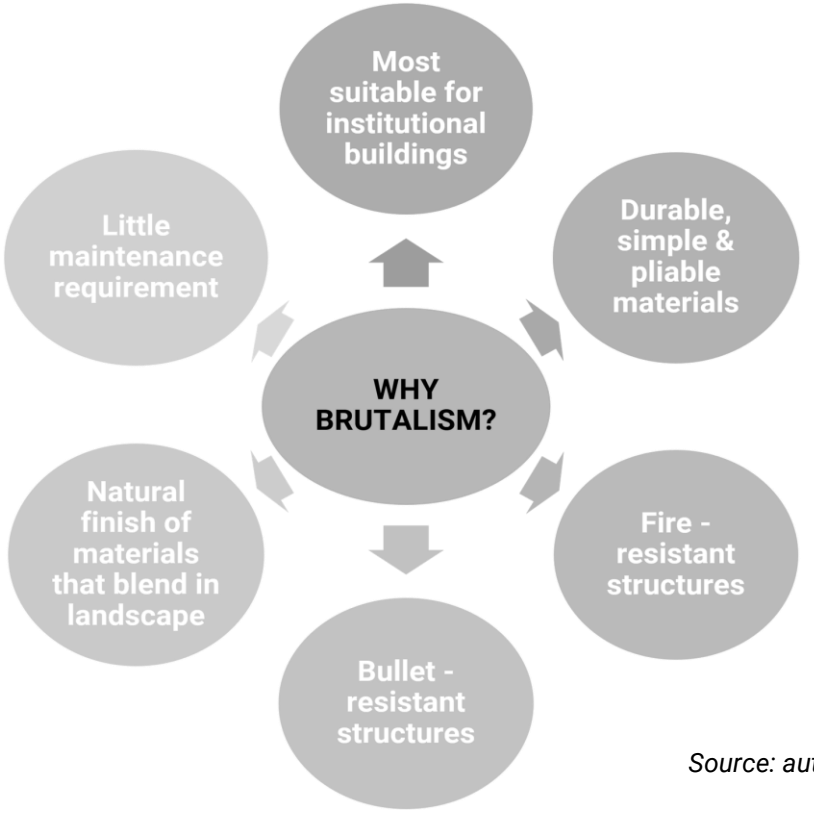
BRUTALISM

- The uncovered exposed building material represents the truths that are uncovered using forensic science.
- The heaviness/boldness of brutalist architecture represents the power of science and technology in all walks of life.
- Raw surfaces straightforwardly conveys honesty.
- Brutalism is minimalist to extreme- PRIORITISING FUNCTION OVER FORM

DUDHSAGAR DAIRY, MEHSANA, GUJARAT

CHANDIGARH HIGH COURT, PUNJAB

Source: google images



Source: author

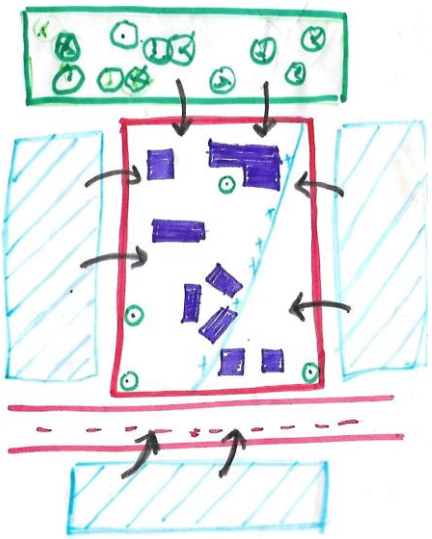
ORGANIC

- blend in with their natural surroundings to create harmony and unity.
- Use of soft landscape elements like trees are used in their natural form (without topiary)

Source: google images

CONSERVATIVE SURGERY

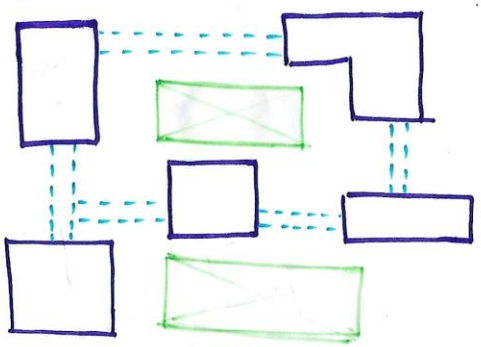
- To check on the site that what is to be removed and what is to be retained so as to get the better idea of resources on site, to avoid any chance of accidents.
- In this case, surroundings buildings are taken into consideration.
- The existing high tension line is to be shifted outside the site to prevent any hinderance.



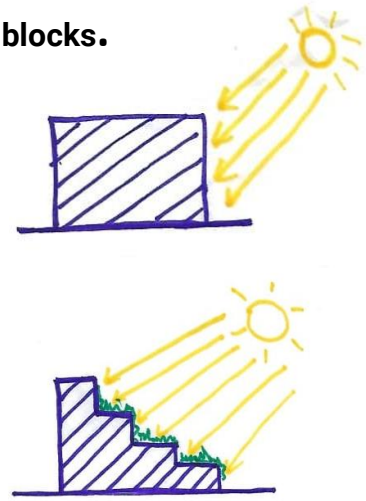
Source: author

CLIMATE-ORIENTED DESIGN

- **Semi-covered spaces** in and around the buildings.
- Use of semi-covered spaces like **skywalks for walkways**
- Maximum use **of north light in academic blocks.**



WALKWAYS



MAX. LIGHT GAIN

Source: author

HIERARCHY OF SPACES

- Expanding building design for flexibility and better cone of vision.
- Segregation of spaces in public, semi-public and private spaces horizontally and vertically.
- Gradual movement in between different spaces.

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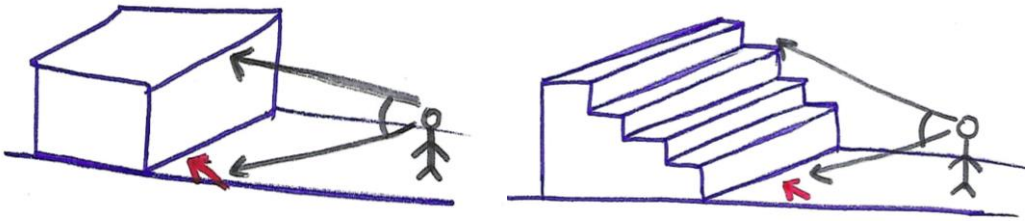
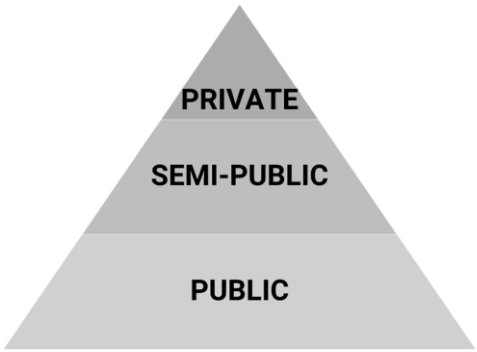
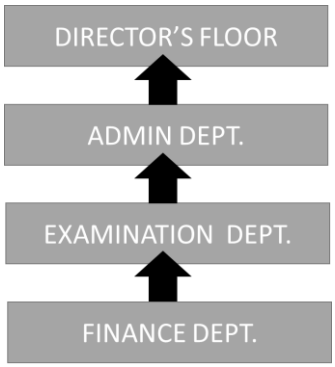


CONE OF VISION



VERTICAL HIERARCHY

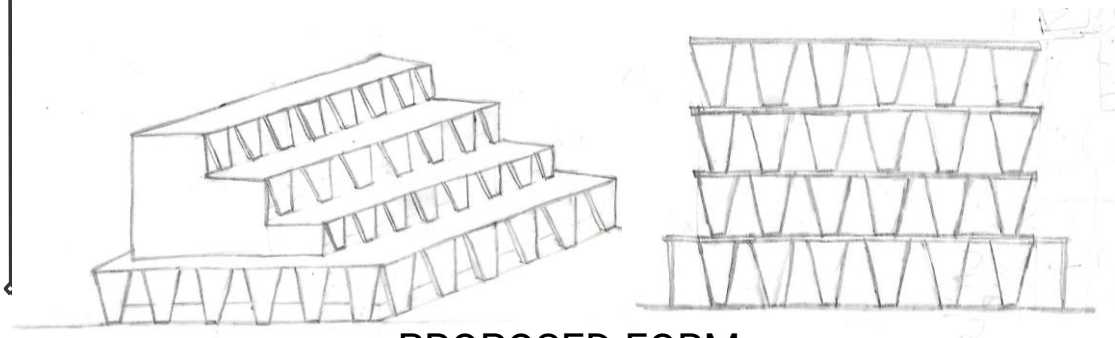


ADMIN HIERARCHY

Source: author

FORM AND SHAPE.

- Broad heavy columns to depict the heaviness and boldness of the structure.
- Wedge-shaped columns representing clenched jaws which means ' nothing can be prevented from the power of science and law'.
- Columns around the corridor create an aesthetic light and shadow effect and work as brise-soleil to prevent sun from penetrating the façade.



PROPOSED FORM

Source: author

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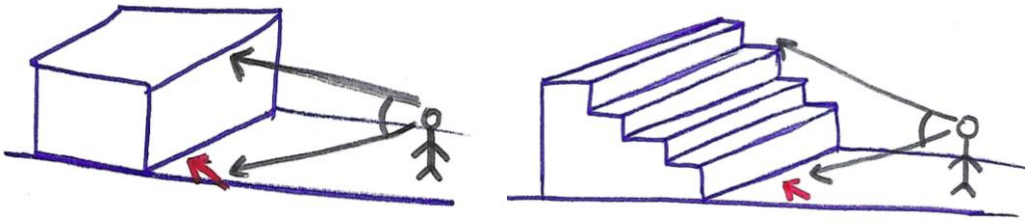
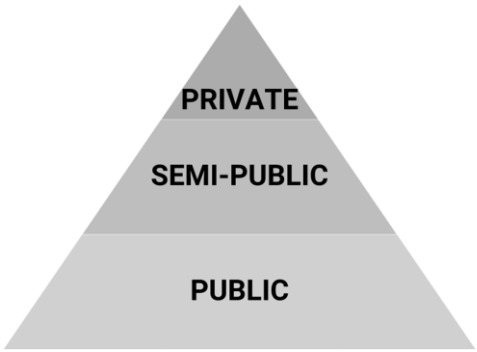


CONE OF VISION



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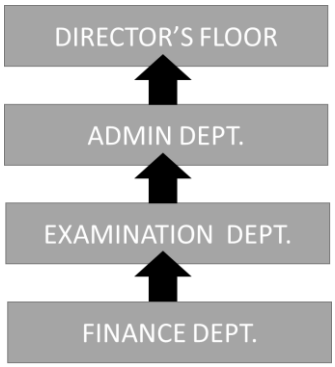

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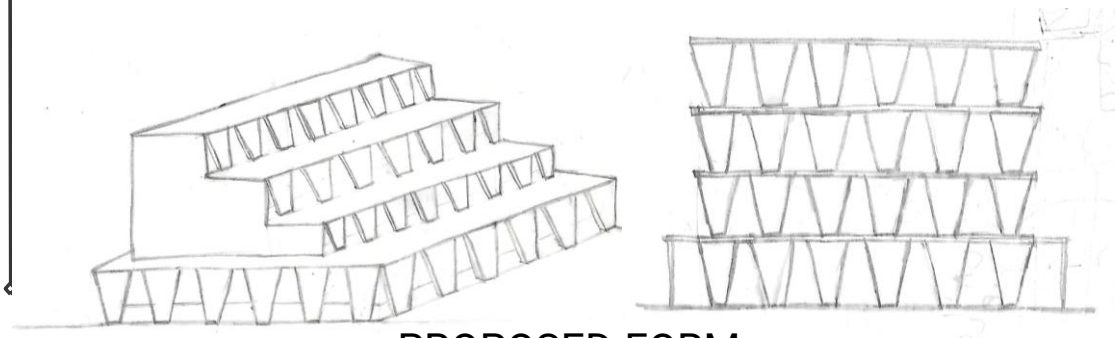
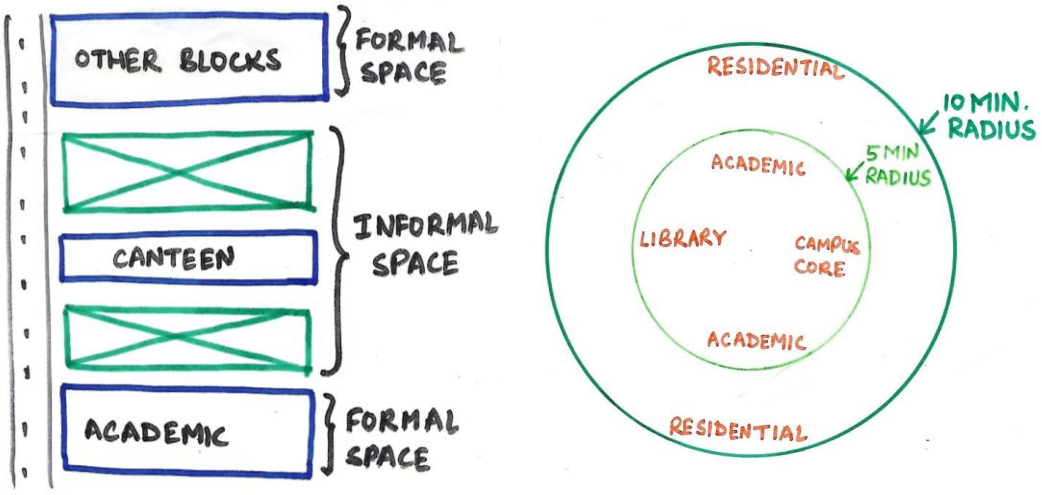


PROPOSED FORM

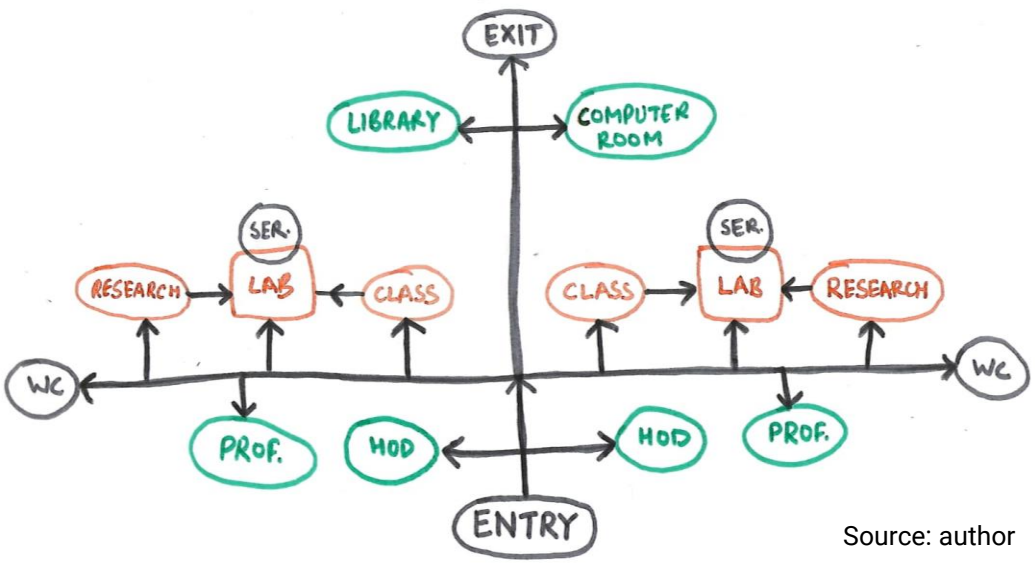
Source: author

CAMPUS DESIGN.

- A university campus has been compared to a city on a small scale because it provides most of the needs for the university community.
- Campus is a closely knit, unified cluster of buildings with intimate pedestrian open spaces.
- The spaces between university buildings, if properly designed, provide areas where students may congregate informally between classes for discussion and rest or they can gather in large number to watch or participate in social events.
- 10 mins from hostel to classroom is considered a maximum allowable walking distance. 3-5 min is optimum.
- A university is a dynamic organism continually growing, therefore planning for change is essential. Guiding principle - FLEXIBILITY



REF. – Campus Design in India by Achyut Kavinde



Source: author

ECOBRUTALISM

In Eco brutalism, vegetation is often integrated into the design to enhance the environmental and aesthetic aspects of the structure. This can include incorporating green roofs, living walls, or vertical gardens. These additions not only soften the harshness of the brutalist forms but also bring nature into the built environment, improving air quality, providing insulation, and reducing the urban heat island effect.

They act as an additional layer of insulation, reducing the heating and cooling needs of the building. They also manage stormwater runoff by absorbing rainwater, reducing pressure on drainage systems. Living walls, or vertical gardens, are form of vegetation integration. These walls are covered with plants, which can improve air quality by filtering pollutants and CO2. They also add visual interest and provide insulation to the building envelope.

Vegetation in eco brutalist design goes beyond mere decoration. It plays a fundamental role in achieving sustainability goals by improving energy efficiency, reducing environmental impacts, and enhancing the well-being of occupants.

Ref. image of ecobrutalism

Source: google images

SITE PLAN ZONING

Source: author

CHAPTER – 8
PLANNING & DESIGN