THESIS REPORT ON

INFORMATION TECHNOLOGY PARK, SEC -101 ALPHA , MOHALI

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

BACHELOR OF ARCHITECTURE
BY

ANANYA KUMARI

(1170101004)

THESIS GUIDE

(AR. SATYAM SHRIVASTV)

SESSION

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SCHOOL OF ARCHITECTURE AND PLANNING

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

CERTIFICATE

I hereby recommend that the thesis entitled "**INFORMATION TECHNOLOGY PARK , SEC-101 ALPHA , MOHALI** "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
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Recommendation

Accepted

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Name: ANANYA KUMARI
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CONTENTS

1.A INTRODUCTION

- THE **INFORMATION TECHNOLOGY** SECTOR IS A FIELD WHICH IS UNDERGOING RAPID EVOLUTION AND IS CHANGING THE SHAPE OF INDIAN BUSINESS STANDARDS.
- THIS SECTOR INCLUDES SOFTWARE DEVELOPMENT, CONSULTANCIES, SOFTWARE MANAGEMENT, ONLINE SERVICES AND BUSINESS PROCESS OUTSOURCING (BPO).
- IT INDUSTRY IS BASED ON FIVE FACTORS - ABUNDANT TALENT, CREATION OF URBAN INFRASTRUCTURE, OPERATIONAL EXCELLENCE, CONDUCIVE BUSINESS ENVIRONMENT AND FINALLY, CONTINUED GROWTH IN THE DOMESTIC IT SECTOR.
- THE IT INDUSTRY IS HEAVILY INFLUENCED BY FACTORS LIKE THE GLOBAL MARKET AND SUSTENANCE OF ITS RATE OF GROWTH. THE RECESSION IN THE UNITED STATES ALSO IMPACTED THE IT COMMUNITY IN INDIA NEGATIVELY. THIS SEGMENT IS PROMISING AND HAS VAST POTENTIAL, BUT THERE ARE CONCERNS REGARDING THE DEMAND-SUPPLY GAP, WHICH IS WIDENING. SOME CHALLENGES WHICH THE INDUSTRY IS FACING ARE INADEQUATE INFRASTRUCTURE, TAX ISSUES AND LIMITED PREFERENTIAL ACCESS FOR LOCAL FIRMS.
- THE IT INDUSTRY IS ONE WHICH IS NOT LIMITED TO SOFTWARE DEVELOPMENT ALONE. TECHNOLOGY CAN BE APPLIED IN LIBRARIES, HOSPITALS, BANKS, SHOPS, PRISONS, HOTELS, AIRPORTS, TRAIN STATIONS AND MANY OTHER PLACES THROUGH DATABASE MANAGEMENT SYSTEMS, OR THROUGH CUSTOM-MADE SOFTWARE AS SEEN FIT.

NEED OF TOPIC

- BY AIDING THE GROWTH OF TENANT COMPANIES, TECHNOLOGY PARKS PLAY A SIGNIFICANT ROLE IN THE DEVELOPMENT OF LOCAL ECONOMIES. THEY HELP CREATE NEW JOBS, ATTRACT FOREIGN CAPITAL, AND **INCREASE LOCAL AND NATIONAL COMPETITIVENESS**. THIS DEVELOPMENTAL ROLE IS PARTICULARLY IMPORTANT IN TRANSITION ECONOMIES, WHICH MUST ABSORB A GREAT DEAL OF STRUCTURAL.

- TECHNOLOGY PARKS ENABLE INTERACTION OF GROUPS OF ACADEMIC AND RESEARCH INSTITUTIONS AND GROUPS OF INDUSTRIES AND FINANCIAL INSTITUTIONS TO WORK IN HARMONY TO EVOLVE NEW TECHNOLOGIES STARTING FROM INVENTIONS.

AIM OF THE PROJECT

- THE AIM IS TO DESIGN IT PROJECT WHICH IS SUSTAINABLE TO THE ENVIRONMENT (ONLY ON DESIGN BASIS), I.E., IT DOES NOT HARM THE ENVIRONMENT.

- TO CREATE A BUILDING THAT HAS A CLOSE CONNECTION WITH NATURAL SURROUNDING AND STAND OUT AS AN ICONIC BUILDING.

- STUDY OF BASIC TECHNICAL FUNCTIONS OF THE SPACES AND THEIR INTERRELATIONSHIP IN A GREEN BUILDING.

- TO STUDY ABOUT THE BASIC KNOWLEDGE OF THE TECHNOLOGICAL MEASURE IN REGARDS WITH SPACES WHICH WOULD HELP IN CREATING A SUSTAINABLE AND ENERGY EFFICIENT ENVELOP OF THE IT PROJECT.

- THE AIM IS TO PROVIDE A SUSTAINABLE BUILDING WHICH WILL HAVE MAXIMUM OF THE NATURAL LIGHTING AND VENTILATION AND MOST OF THE ENERGY AND FUELS WILL BE SAVED.

1.A INTRODUCTION

OBJECTIVES OF THE PROJECT

- TO GIVE THE KNOWLEDGE OF SUSTAINABLE BUILDING.
- ALSO SHARE THE KNOWLEDGE HOW SUSTAINABLE BUILDING IS DIFFERENT FROM THE NORMAL BUILDING.
- HOW IT CAN BE IMPLEMENT IN MY DESIGN BY GETTING KNOWLEDGE BY CASE STUDY, NET STUDY, & LIBRARY STUDY.

SCOPE

- WE ALL KNOW THAT THE WORLD HAD BECOME IMPOSSIBLE TO MOVE WITHOUT INFORMATION TECHNOLOGY. THE TECHNOLOGIES ARE DEVELOPING DAY BY DAY. THE FAST GROWTH IN TECHNOLOGICAL FIELD HAD MADE THE WORLD A BETTER AND FAST MOVING PLACE.

- IT ALSO HELP A PROFESSIONAL TO GET FIXED HIS MEETINGS ABROAD, THIS HELP HIM TO **GET JOB OPPORTUNITIES IN MANY FOREIGN COMPANIES** AND IT WILL DEFINITELY MAKE HIS WORLD IMMENSE. IT ALSO HELPS IN INCREASING ONE'S TALENT AND PERSONALITY.

LIMITATION

- FINANCIAL ASPECT OF THE PROJECT WILL NOT BE CONSIDERED, HOWEVER A ROUGH ESTIMATE BE PROVIDED.

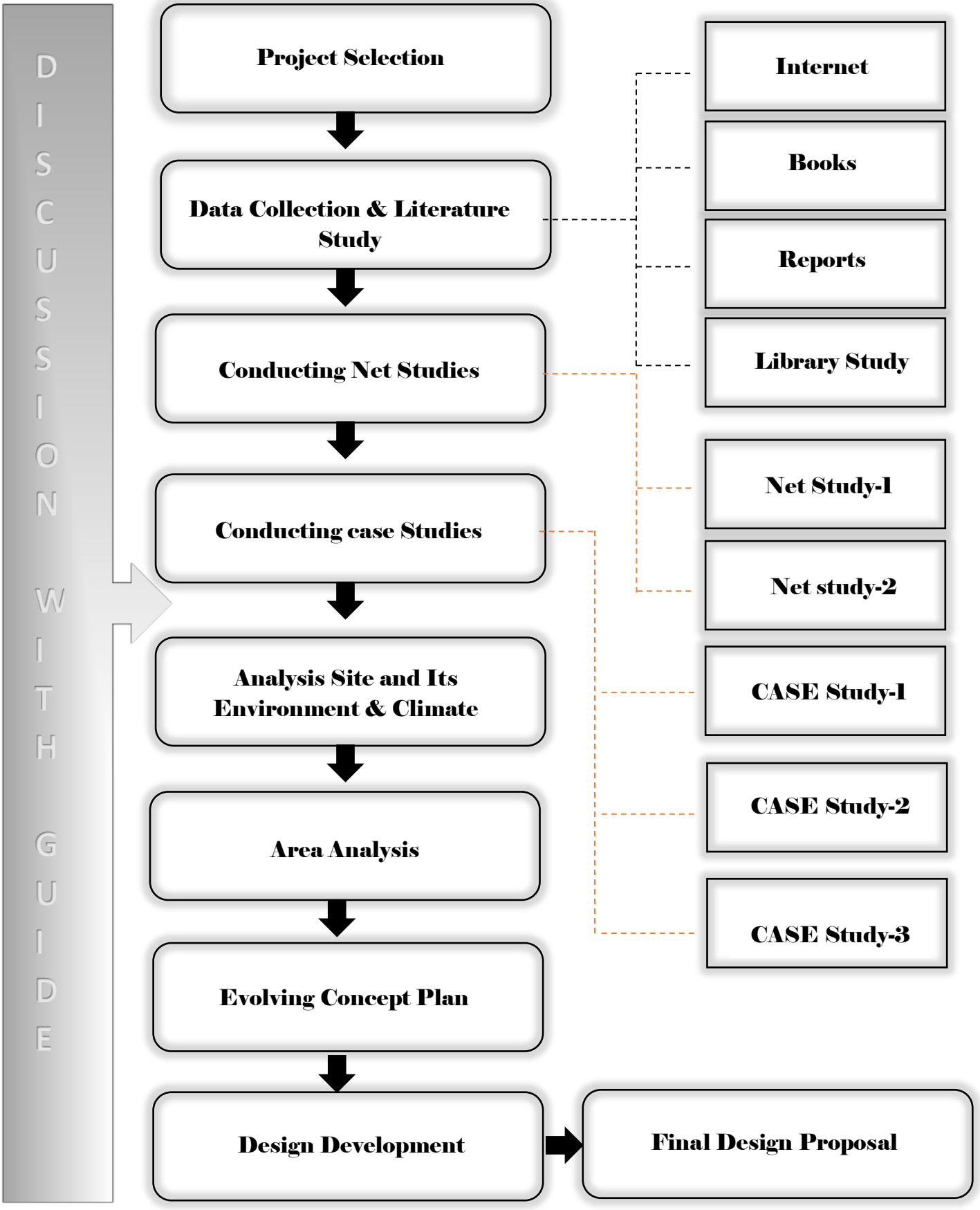
- WORK MAINLY FOCUSES ON DESIGN, FUNCTIONALITY, SERVICES AND UNDER SUSTAINABLE.

- THE PROJECT WILL BE DESIGN ORIENTED AND DETAILING OF STRUCTURAL ELEMENTS AND SERVICES DETAILING COMES UNDER **GMADA AUTHORITY**

TENTATIVE REQUIREMENTS :-

- SPACE OF OFFICE BUILDINGS
- WAREHOUSE
- ASSEMBLY UNIT
- FOOD COURT, CONVENIENCE STORE, BANK, ATMS, OPEN AREA CAFÉ.
- ENERGY EFFICIENCY LATEST ECO-FRIENDLY EQUIPMENTS.
- PROVISION OF RAIN WATER HARVESTING.
- FITNESS GYMS, NURSERIES AND SIMILAR AMENITIES.
- SMALLER OUTDOOR SPACES OFFER SIMPLER FUNCTIONS SUCH INFORMAL MEETING AND GREETING AREAS.
- RESIDENTIAL BUILDINGS.
- PARKING AS PER ECS.

1.B METHODOLOGY

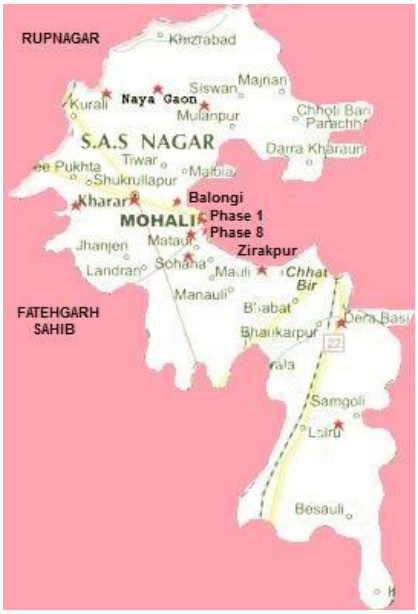


2. SITE ANALYSIS

A. ABOUT THE SITE

A. (1). SITE LOCATION

Punjab Map



Mohali Map

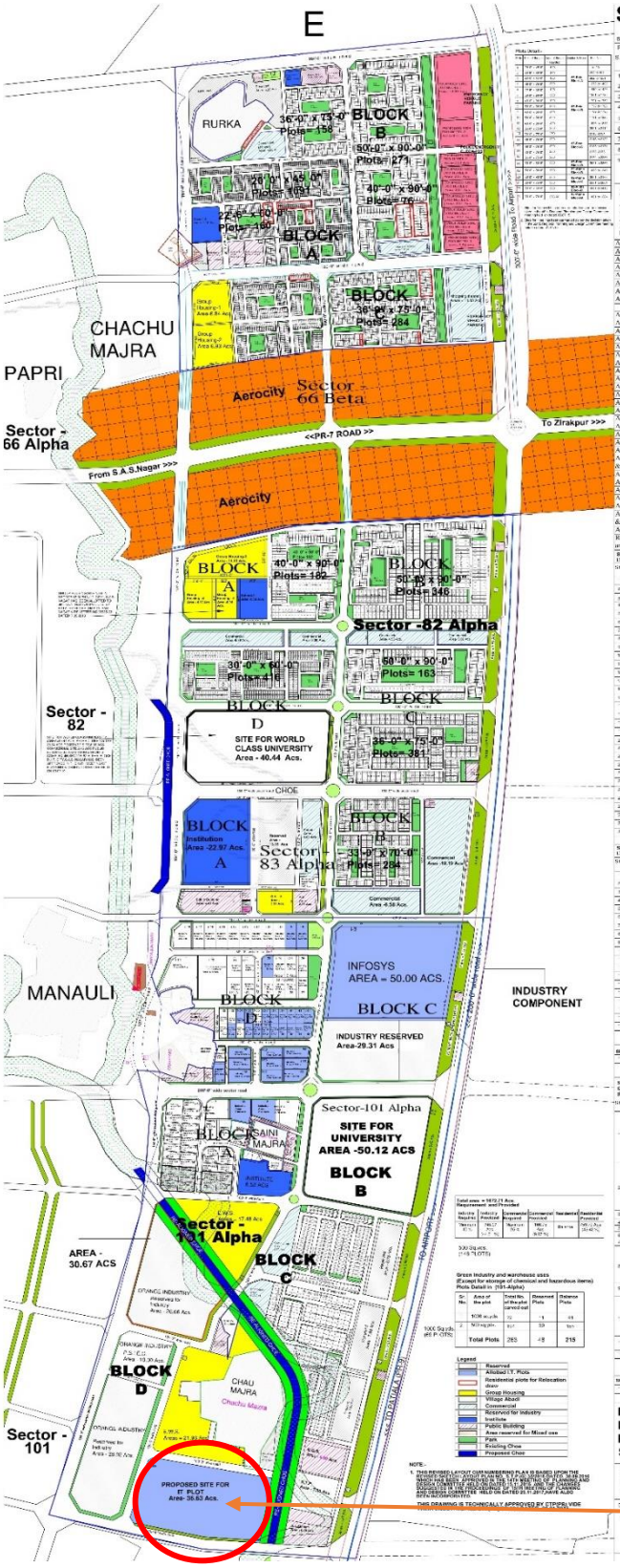
Sector-101 Alpha

Site Location

A. (2). SITE

- The Site Is Proposed by PUDA (PUNJAB URBAN DEVELOPMENT AUTHORITY) For IT Park.
- The Site Is on A Flat Topography, Located In Sector 101-Alpha MOHALI.
- Total Area Of The Plot Is 36.63acre.
- The Site Shape Is Almost Rectangular In Shape
- Site Is Plain, No Visible Contours.
- Well Connected Three Sides 100',100',40mt Wide Carriage Way Road.
- Ground Coverage – 65%
- F.A.R – 2.25
- ECS – 2/100sq.m.

2.
SITE ANALYSIS



PROPOSED SITE FOR IT PARK

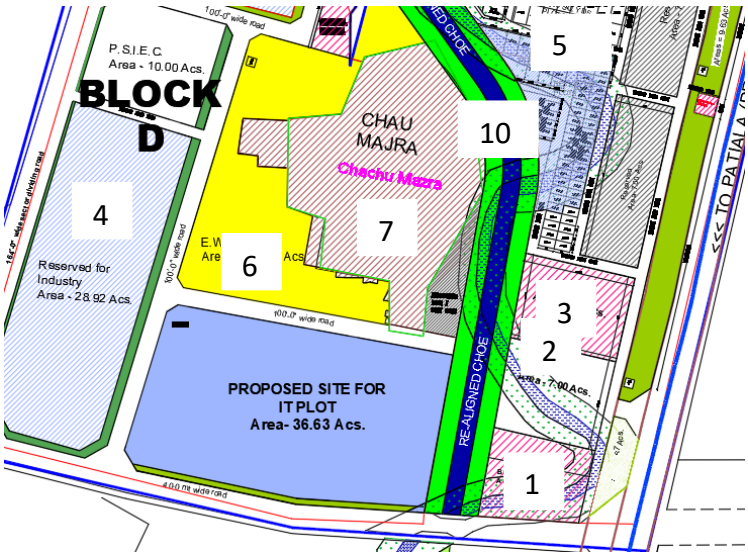
B. (1). ACCESSIBILITY OF THE SITE

- Bus Stand Sector 43, Distance from Site Approximate 15km.
- Gurdwara Sahib, Distance from Site Approximate 2km.
- Airport, distance from site approximate 13km.
- Fortis hospital, distance from site approximate 11km.

B. (2). LANDMARK NEAR THE SITE

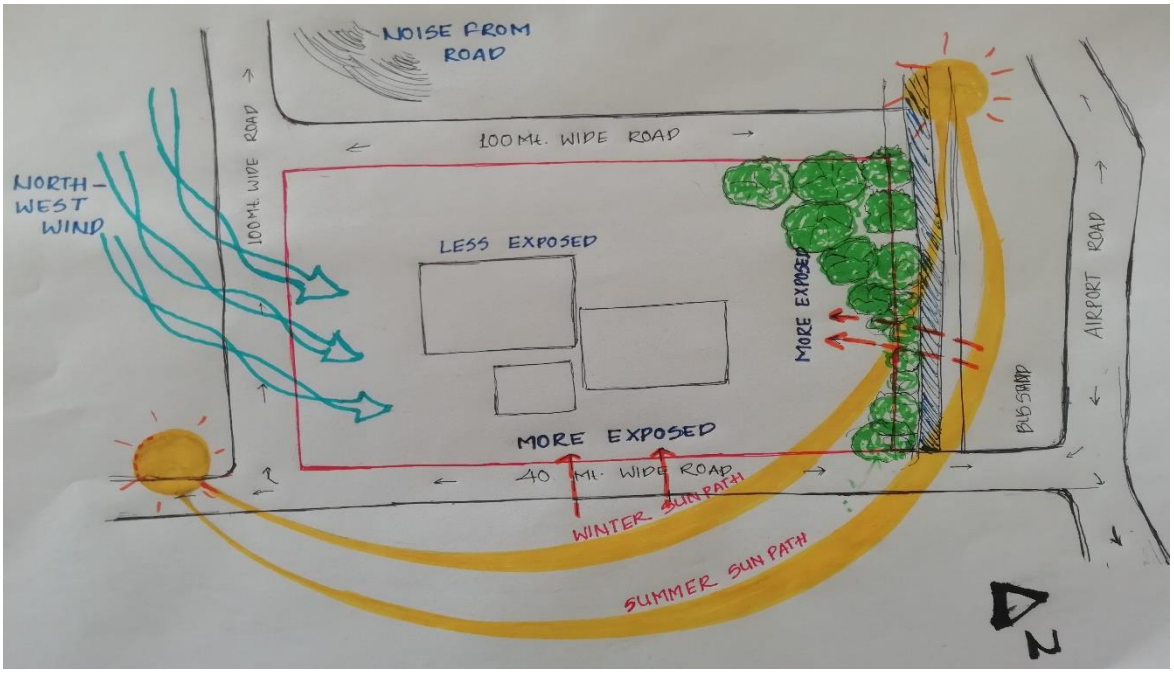
- Fortis hospital, distance from site approximate 11km.
- INFOSYS Building.
- IT City Plot GMADA.
- Plaksha University S.A.S Nagar.
- Park Sec-83 ALPHA IT City.

C. (1). SURROUNDING OF SITE



1. BUS STAND
2. S.T.P
3. E.G.S
4. RESERVED FOR INDUSTRY
5. RESERVED PLOT FOR RESIDENCE
6. E.W.S. HOUSING
7. VILLAGE ABADI (CHAU MAJRA)
8. RESERVED FOR ORANGE INDUSTRY
9. GREEN AREA
10. RE-ALENGED CHOE.
11. OTHER SECTOR RESERVED PLOT.

C. (2). ORIANTATION OF SITE



D. CLIMATE STUDY

- In Mohali, The Summers Are Short, Sweltering, And Clear And The Winters Are Short, Cool, Dry, And Mostly Clear. Over The Course Of The Year, The Temperature Typically Varies From 48°F To 106°F And Is Rarely Below 43°F Or Above 113°F.
- Based On The Beach/Pool Score, The Best Times Of Year To Visit Mohali For Hot-Weather Activities Are From Mid April To Mid May And From Mid September To Mid October.

- In Summer, The Maximum Temperature Is 42o C And Minimum 35°C.
- In Winter, The Maximum Temperature Is 7 To 15o C And Minimum -2 To 5°C.
- Average Annual Rainfall, 940mm / 37.0”.
- Wind Direction, North-West.

3.A. SOLARIS SINGAPORE

Project type | Office Building

Location | Fusionopolis, One North, Singapore

Architect | Hamzang and Yeang

Project Area | 7 Acres

Built up Area | 37,160 sq.m

No. of Storeys | G + 7

Orientation | North- west

F.A.R | 1.3

3.A.1. INTRODUCTION

Solaris is an office building situated in Fusionopolis hub in One - North Center in Singapore which operates as a research and development hub for info - communication technology, media, physical sciences and engineering industries.

3.A.2. SITE CONTEXT AND PLANNING:

The site for Solaris is a part of the One - North master plan in Singapore. The project, along with Biopolis and Mediapolis on its adjacent lands aims at becoming incubators for biomedical research facilities and high tech software development in Singapore and South East Aisa.

Figure 3.A.2.1:*Site Context, Solaris, Singapore (source:https://www.slideshare.net/estherlau798/report-singapore-bsc)*

The site was originally a military base and therefore, lacked original ecological systems. Therefore, the design aim was to save whatever little biodiversity site had and therefore, development that would cause least environmental damage.

Figure 3.A.2.2: Site Plan, Solaris, Singapore
(source:https://www.slideshare.net/estherlau798/report-singapore-bsc)

Figure 3.A.2.3: *Circulation Plan, Solaris, Singapore*
(source:https://issuu.com/hardeepsingh8/docs/1)

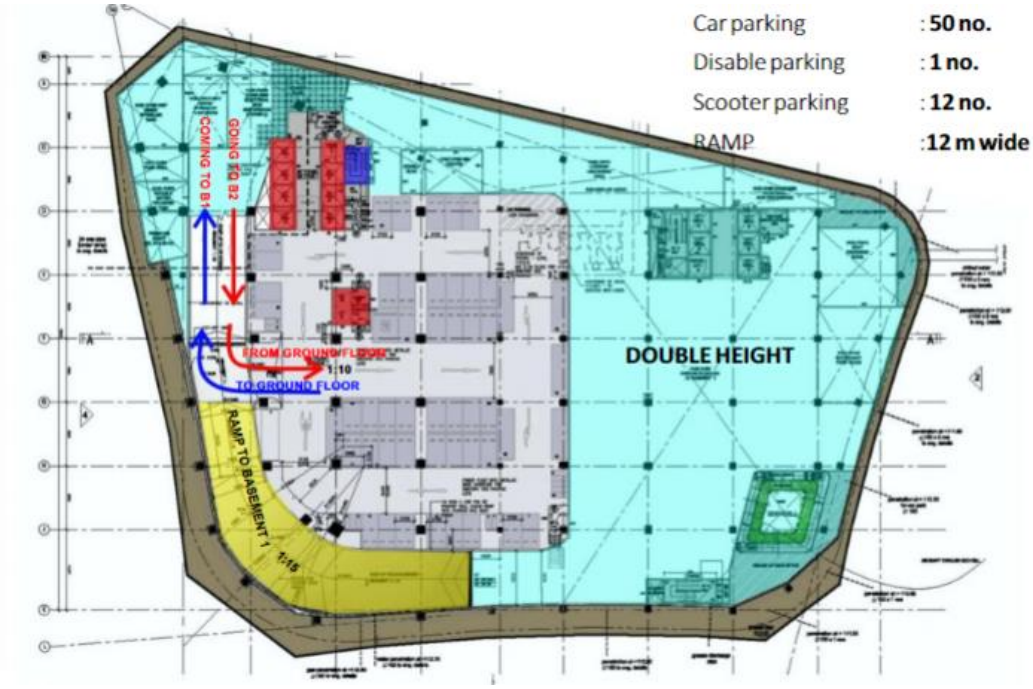


Figure 3.A.2.4: *Level Basement 1 - Mezzanine Floor, Solaris, Singapore*

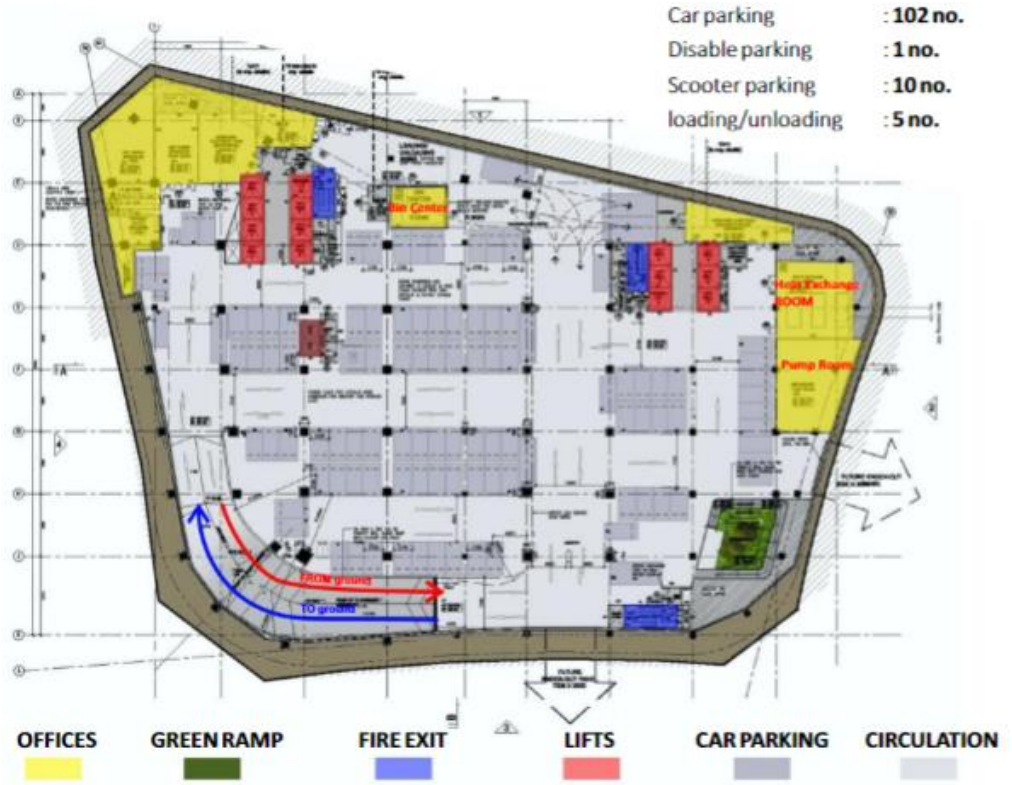


Figure 3.A.2.5: *Level Basement 1 Floor Plan, Solaris, Singapore (source:https://issuu.com/hardeepsingh8/docs/1)*

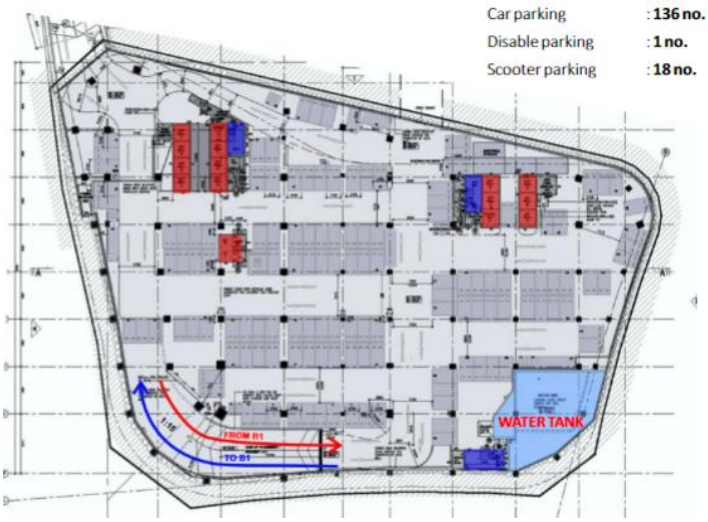


Figure 3.A.2.6: *Level Basement 2 Floor Plan, Solaris, Singapore (source:https://issuu.com/hardeepsingh8/docs/1)*

The site for Solaris is a part of the One - North master plan in Singapore. The project, along with Biopolis and Mediapolis on its adjacent lands aims at becoming incubators for biomedical research facilities and high tech software development in Singapore and South East Aisa.

sustainable design features, Solaris aims to enhance the ecosystem of the site rather than replace it.

Figure 3.A.2.7: *Level Basement 2 Floor Plan, Solaris, Singapore (source:https://issuu.com/hardeepsingh8/docs/1)*

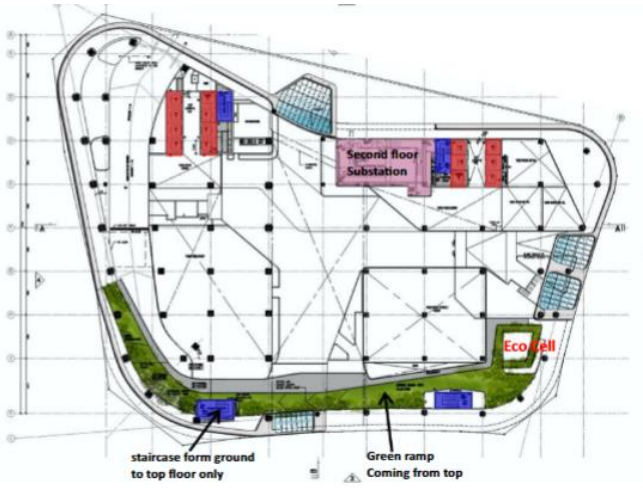


Figure 3.A.2.8: *Plan at Level 2, Solaris, Singapore (source:https://issuu.com/hardeepsingh8/docs/1)*

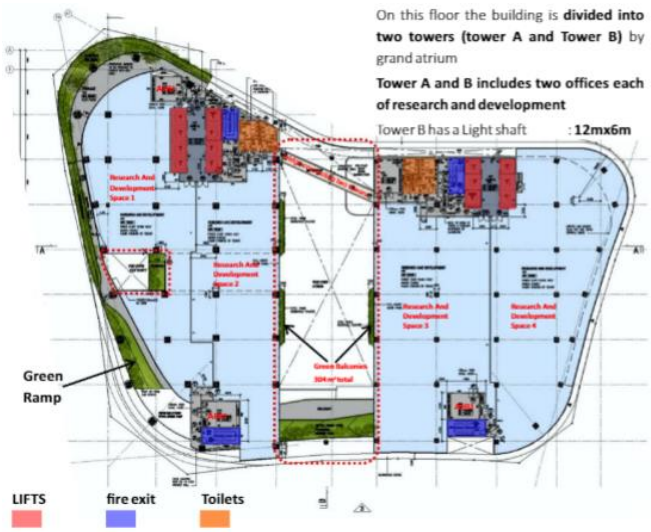


Figure 3.A.2.9: *Plan at Level 3, Solaris, Singapore*
(source:https://issuu.com/hardeepsingh8/docs/1)

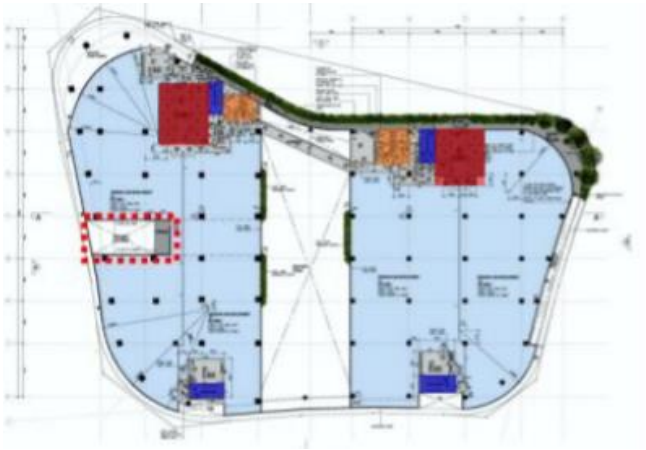


Figure 3.A.2.10: *Plan at Level 4 and 5, Solaris, Singapore*
(source:https://issuu.com/hardeepsingh8/docs/1)

Figure 3.A.2.11: *Plan at Level 6 and 7, Solaris, Singapore*
(source:https://issuu.com/hardeepsingh8/docs/1)

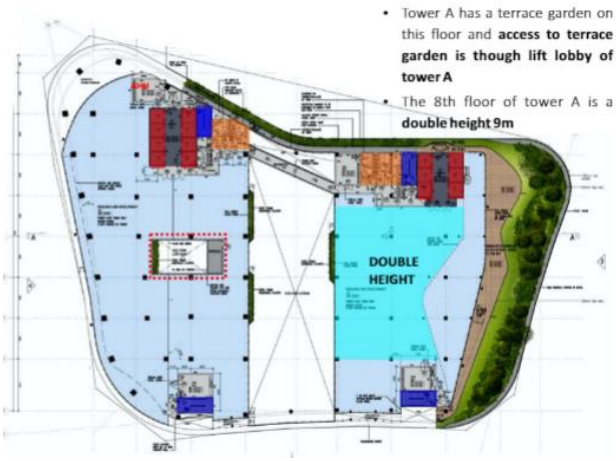


Figure 3.A.2.12: *Plan at Level 8, Solaris, Singapore*
(source:https://issuu.com/hardeepsingh8/docs/1)

Figure 3.A.2.13: *Plan at Level 10, Solaris, Singapore*

(source:https://issuu.com/hardeepsingh8/docs/1)

Figure 3.A.2.14: *Plan at Level 11, Solaris, Singapore*

(source:https://issuu.com/hardeepsingh8/docs/1)

Figure 3.A.2.15: *Plan at Level 12, Solaris, Singapore*

(source:https://issuu.com/hardeepsingh8/docs/1)

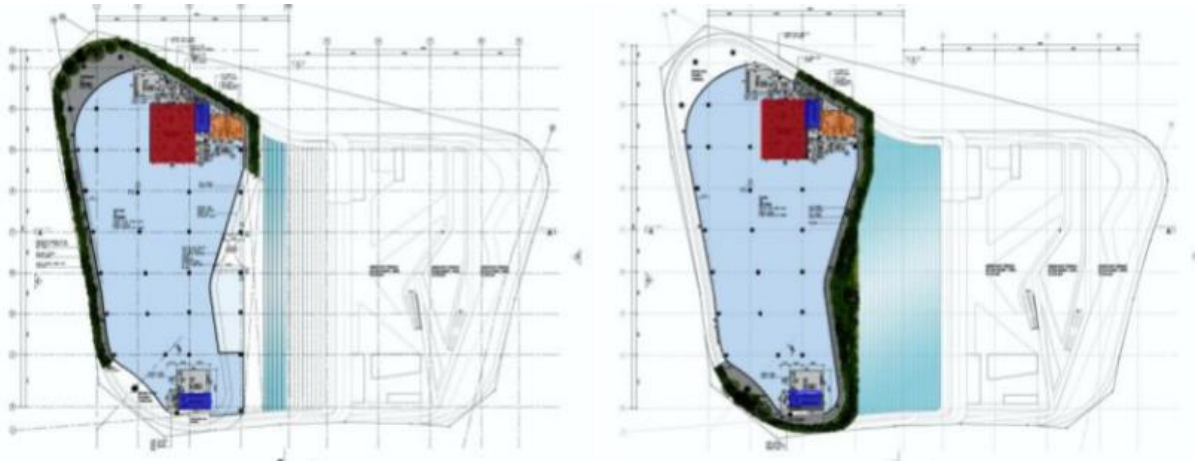


Figure 3.A.2.16: *Plan at Level 13 and 14,*

Solaris, Singapore

(source:https://issuu.com/hardeepsingh8/docs/1)

Figure 3.A.2.17: *Plan at Level 15 and Roof Plan,*

Solaris, Singapore

(source:https://issuu.com/hardeepsingh8/docs/1)

Figure 3.A.2.18: *Building Section, Solaris, Singapore*

(source:https://issuu.com/hardeepsingh8/docs/1)

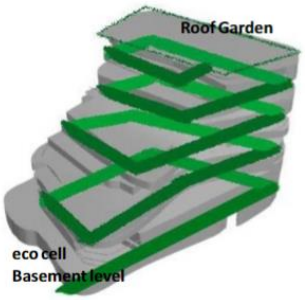
The 1.5 kms long spiral ramp around the building is maintained via a parallel pathway which allows for the servicing of the planters without requiring access from the internal rented spaces. The pathway also serves as a linear park which stretches all the way from the ground plane to the uppermost roof level.

Figure 3.A.2.19: *Detail of Green Ramp, Solaris, Singapore*

(source:https://issuu.com/hardeepsingh8/docs/1)

3.A.3. SUSTAINABLE ASPECTS:

The project's design aims at lowering operational and maintenance cost of the building throughout its life cycle. To achieve this, various elements along with selection and use of Singapore's native plants and materials were decided responding to the local climate of the city.

S no.	Factors		Images
1	Continuous Landscaped Ramp:	• An uninterrupted 1.5 kms long and 3 meter wide green ramp connects the ground floor level to the roof level of the site. • It is paired a pathway running parallel to it, which allows for its servicing and also creates a vertical park. • The ramp with its deep overhangs and large concentration of shade plants is also one element in a comprehensive strategy for ambient cooling of the building façade.	 *Green*  *The Peripheral Ramp, Solaris, Singapore* *(source:https://issuu.com/hardeepsingh8/docs/1)* *(source:https://issuu.com/hardeepsingh8/docs/1)*
2	Solar Shaft:	• A diagonal shaft cuts through the Tower B allowing for extra light and ventilation deep into building's interior. • The interior lights run on daylight and occupancy sensors, thus automatically switching off lights when enough daylight is available and reducing energy. • The addition of the planters on the south west of the solar shaft acted as solar screens to reduce the heat gains into the units. • It also acts as a stack well and providing adequate ventilation to the adjacent interiors.	 *The Solar Shaft, Solaris, Singapore* *(source:https://issuu.com/hardeepsingh8/docs/1)*

3.B. KRISP IT PARK, CHENNAI.

- NAME : KRISP IT PARK
- CLIENT : KRISHNAN SIVAKAMI PRIVATE TRUST (KRISP)
- ARCHITECT : PADGRO.
- SITE AREA : 3.70 ACRE
- lOCATION : 942 , Vandalur-kelambakkam Road , Kizhakottayur , Chennai India.
- From VANDALUR ZOO - 9.7km.
- From KELAMBAKKAM - 9.5km.
- Nearest railway station - 11.7km.
- Bus stop-opposite to site .

- Site Orientation – South
- Building Frontage -85m
- Building Height – 28m
- The Setback Is Used For Landscaping.
- Typography – The Site Was Originally Flat. The Building Is Elevated To An Height Of 4.4m From Ground Level As To Give A Clear View To The Site.

- Built up area – 10904.81sq.m
- Plot coverage – 42%
- FSI Allowed – 1.75
- FSI Achieved - 1.07
- Entrance road width – 16m

3.B.1. INTRODUCTION

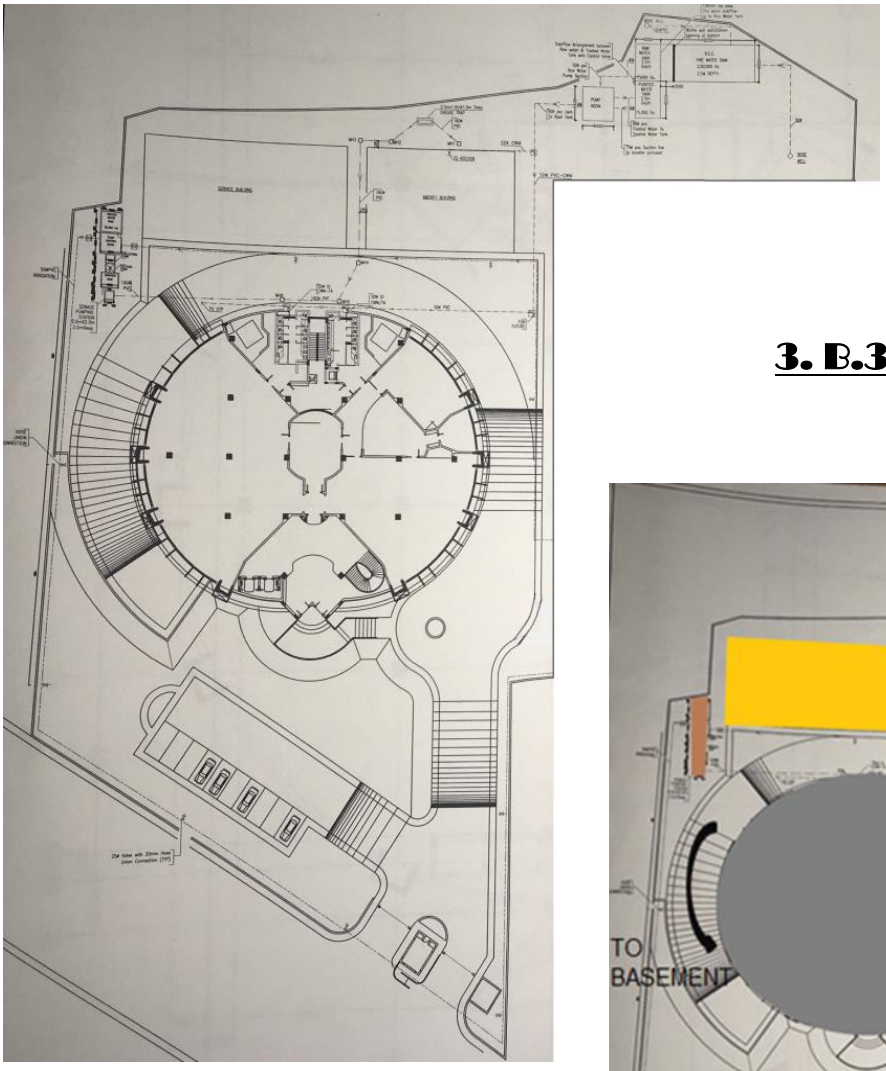
- KRISP IT Park is Chennai leading and most modern business space designed for companies that require a work environment that inspires their employees.
- The building is stilted to stand a distance of 4.4m above the ground.
  The landscaping gives an attractive environment for entertaining and relaxing.
- The ground level is used for parking.
- The park has facility to accommodate 800 employees with all facility furnished. Presently two floors of office space have been occupied by Kaavian Systems, Post Digital Dreams, STi Technologies and VIT Chennai Chapter. We are working closely with the realtors of Chennai for leasing the balance two floors of office space.

THE IT PARK

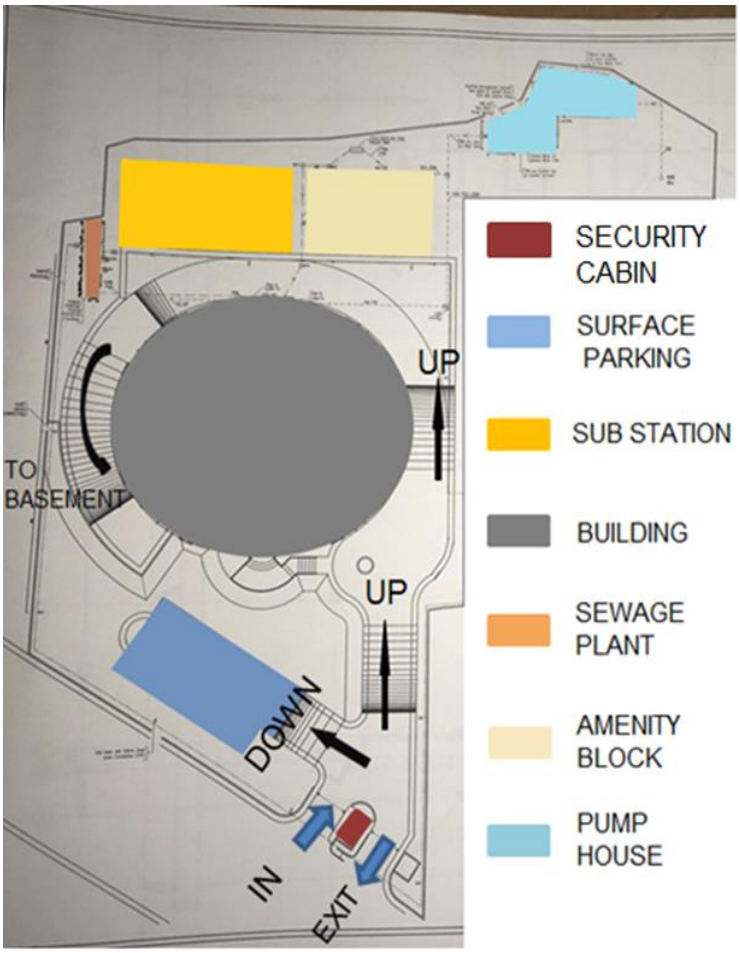
The IT Park consists of three buildings :-

I. Main Office Building,
II. Service Building,
III. Amenity Building and other utilities Building.

3. B.2 SITE PLAN



3. B.3. SITE ZONING



3. B. 4. MAIN BUILDING

Description	Area in Sq. M	Area in Sq. Ft
Lower Basement	1,809.94	19,443.74
Upper Basement	1,809.94	19,443.74
Ground Floor	1,736.88	18,658.87
First Floor	1,665.31	17,890.01
Second Floor	1,655.67	17,786.4
Third Floor	1,646.02	17,682.79
Fourth Floor	581.05	6,242.08
Sub Total (a)	**10,904.81**	**117,378.39**

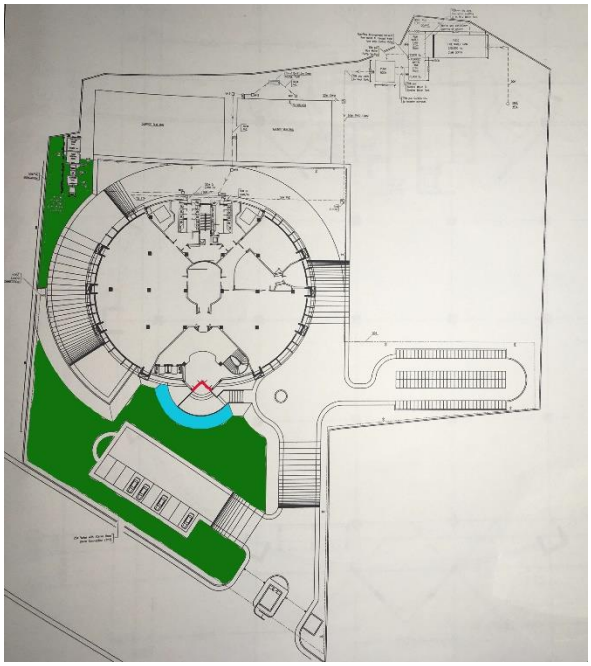
3. B. 4. AMENITY BUILDING & OTHER UTILITIES BUILDING

TOTAL AREA:706sqm

- KITCHEN
- DINING
- GYM
- LOBBY
- PATIO
- LAWN

- Workstation is split into two equal components in east wing to navigate different spaces in each component.
- In ground floor the entry terminate to two lobby spaces (lobby 1&2) were lobby 2 split radially into sub spaces in order to bring movement in circulation.
- In fourth floor, the entire space is alloted for foreign visitors.
- Service core is placed in north wing- average capacity 150 people in each floor.

3. B. 6. SITE FEATURES



- The blowing wind is cooled by the waterbody in front of the entrance before it enters the building.
- This results in the natural cooling of the building interior.
- The light green landscapes reflect the heat back thus cooling the surrounding site and reducing the heat.

3. B. 7. ROOF GARDEN

- Rooftop gardening can help improve the quality of the atmosphere.
- The plants absorb carbon dioxide in the air and convert it into oxygen reducing the air pollution.
- The rooftop plants provide natural insulation to rooftops by reflecting light and heat thus reducing the need for heating or cooling mechanisms.

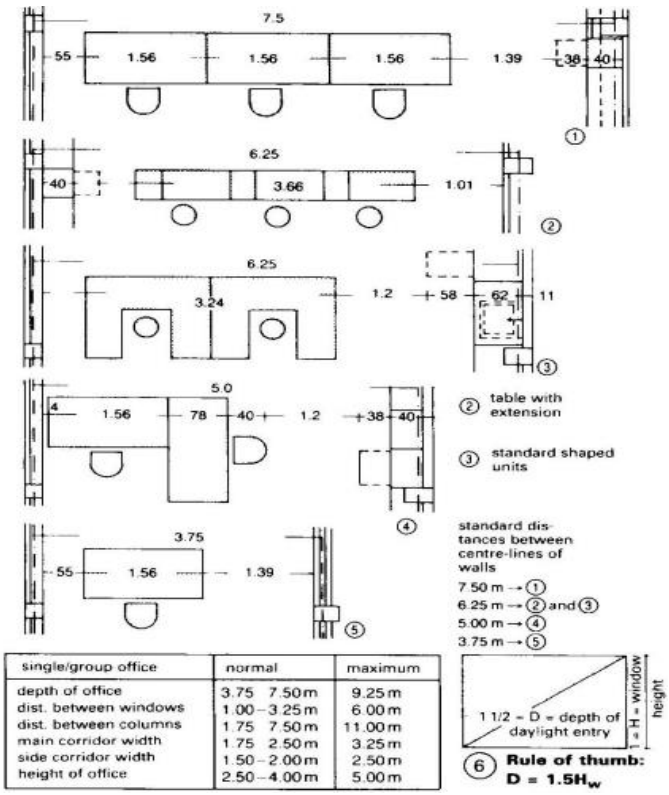
- The insulation from rooftop gardens can also block outdoor noises.
- They can potentially protect rooftops from damage and deterioration.
- The plants in rooftop gardens can aid in reducing “the heat island effect”.
- Prolongs the life of waterproofing membranes

4.A. STANDARD

1 MANDATORY BUILDING SPECIFICATIONS FOR IT OFFICE SPACE:

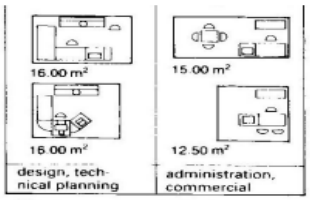
1) **Land Title:** a) Clear & unencumbered Title b) Undertaking to obtain Building Occupancy Certificate within three months of completion of construction.
2) **MinimumArea:**
   a) Minimum area required for IT Park is 15,000 sq. mtrs
   b) The area allotted to for IT activities should be 75% of the allocatable area .
3) **Power & Power-Back-up:**
   a) On site uninterrupted 100% Power Back-up must be provided (Diesel Generators, etc.,) to support office equipment, lighting and for airconditioning.
   b) Additional power Back-up for Emergency Lighting & Critical Facilities to be provided.
4) **Air-Conditioning:**
   a) Central Air-Conditioning Provided OR
   b) Provision made (AC Ducts, AHU Rooms)
5) **Telecommunication Infrastructure**:
   a) Provision for False Flooring and Structured Cabling in the Building
   b) Availability of Adequate Telephone lines (For Example – In-house Telephone Exchange (EPABX)
   c) Optic Fiber Connectivity (Local Loop Network) d) Accessibility to the VSNL Earth Station
   e) STPI Link / Space for installation of Dish Antenna / Microwave Tower .
6) Concealed cabling Provision for concealed ducting for Power, Telecom and Data Cables in each hall in the Building.
7) **Parking:** In accordance with the rules of Local municipal authority .
8) **Security & Access Control:**
   a) Central Security Measures like 24 Hrs Security
   b) Provision for Access Control Systems to be installed as required by Tenant Companies.
9) **Fire-Protection Measures** –
   As per NBC (National Building Code)
   a) Integrated Fire Alarm System
   b) Fire Sprinkler System
   c) Required number of staircases as per the National Fire Prevention Code.
10) Greenery, Landscaping & tree plantation.

FLOOR AREA REQUIREMENTS:-

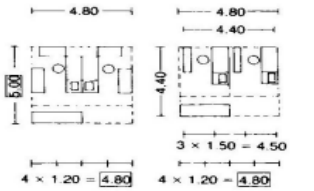


single/group office	normal	maximum
depth of office	3.75 – 7.50 m	9.25 m
dist. between windows	1.00 – 3.25 m	6.00 m
dist. between columns	1.75 – 7.50 m	11.00 m
main corridor width	1.75 – 2.50 m	3.25 m
side corridor width	1.50 – 2.00 m	2.50 m
height of office	2.50 – 4.00 m	5.00 m

⑥ **Rule of thumb: $D = 1.5H_w$**



⑦ **Examples of ideal workstations**



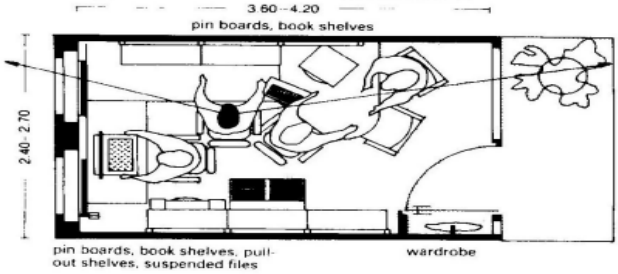
⑧ **Minimum dimensions for two-person office**

general lighting only	average level (lux)	at work-station
corridors, toilets, ancillary rooms	30	–
stairs	60	–
archives	120	250
clerical work, post room, kitchen	250	500
tech. drawing laboratory	600	1.000 4.000

⑨ **Light levels in office buildings**

fresh air m^3/h/person	to VDI requirements	to ASHRAE guideline
10	non-smoking; heated air when < 0°C outside	
10 27		office space
20 30	non-smoking	
26 34		
30 40	smoking	
34 - 51		smoking exec. office
51 68		

⑩ **Typical ventilation requirements**



⑪ **Possible layout of a small room in a combined office (perhaps, home-based)**

SPATIAL STANDARDS

1.1 GENERAL REQUIREMENTS:

- The **floor to ceiling heights** recommended are as follows:
  upto 50 sqm - 2.50 M
  over 50 sqm - 2.75 M.
  over 100 sqm - over 100 sqm
  250 to 2000 sqm - 3.25 M
- **Illumination** should be between 300 - 500 lux. The reflection factor (approx.) should be as follows:
  Equipments close to user i.e. on the desk top - 20-25%
  Matt surfaces in the room - 70%
  Walls - 50%
  Movable Partitions - 20-50%

Daylight can be used up to a distance of 7 meters from the window. Workstations can use daylight illumination up to 4.5 meters from the window. Post that, artificial lighting is required.

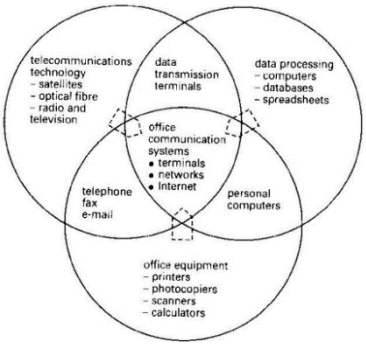
- The **ceiling height** of the offices should be as per following requirements:

Very little service equipment and no suspended ceilings - 3.0 - 3.1 M
Ducts for electricity and water but no ventilation - 3.4 M
Offices using ventilation equipment - 3.7 M

(Air - conditioning ducts require a height of at least 500 mm)

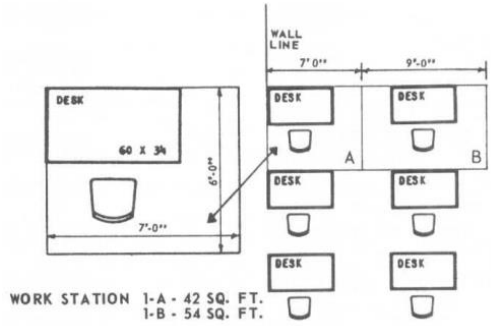
Open plan offices need a clear ceiling height of 3 meters. However, the ceiling height should be 4.2 meters if the ventilation ducts are to be installed.

MAJOR COMPONENTS OF A IT BUILDING



- Sufficient width of aisle should be given for circulation.
- Cubicles should be so designed to achieve desired privacy for the employees.

1.2 WORKSTATIONS:



Module 1: Workstations

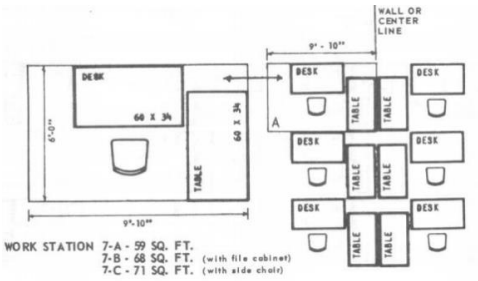
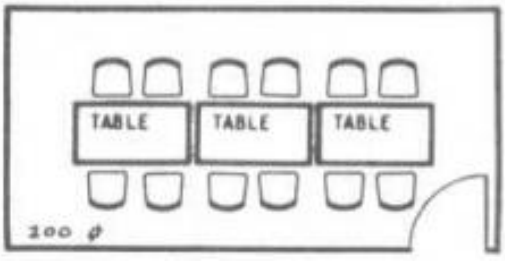
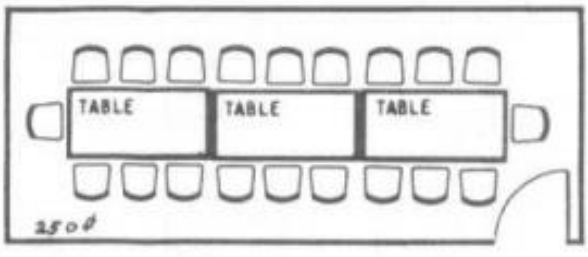


Figure 2: Standard modules of workstations (source: Timesaver*)*

1.4 CONFERENCE ROOMS :



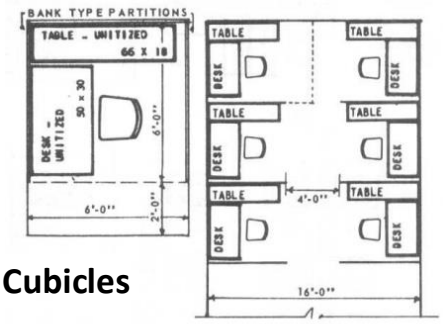


Module 1: Conference Rooms

Module 2: Conference Rooms

- The module of workstations can be opted and modified according to the needs of the users.
- The workstations can be modified to have maximum utilization within minimum space.

1.3 CUBICLE LAYOUTS:



Module 1: Cubicles

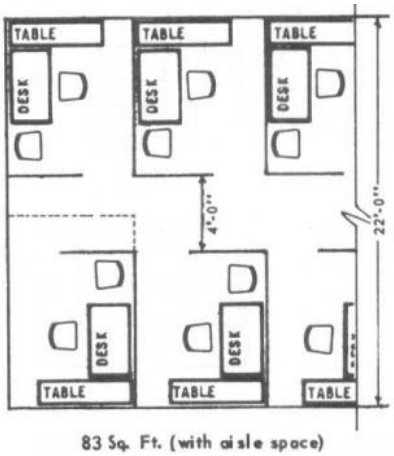


Figure 3: Standard module of Cubicles *(source: Timesaver)*

Module 2: Cubicles

- The space for conference rooms is decided on the basis of number of people using it at a time.
- The conference rooms shall have adequate acoustic and visual privacy.

1.5 CLEARANCES IN GENERAL OFFICES:

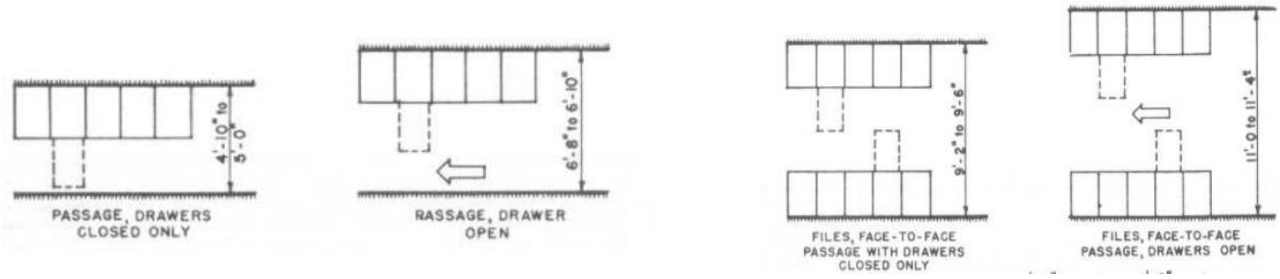


Figure 5: Clearances Required in an Office

(source: Timesaver)

- The aisles should promote at least one person space for circulation when drawers are open.

1.6 RETAIL SHOPS:

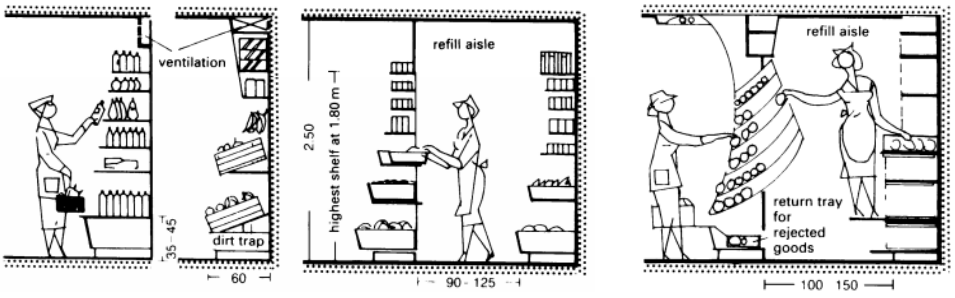


Figure 6: Standards for Shelving
(source:Earnst and Young Neufert)

- The shelving units shall have a minimum height of 0.3 meters and a maximum height of 1.8 meters.
- The partition between shelves and refill aisle shall allow replacement of containers from the refill aisle.
- It is even better to have a return tray between shelves and refill aisle for discarded products.

1.7 RESTAURANTS / CAFETERIAS:

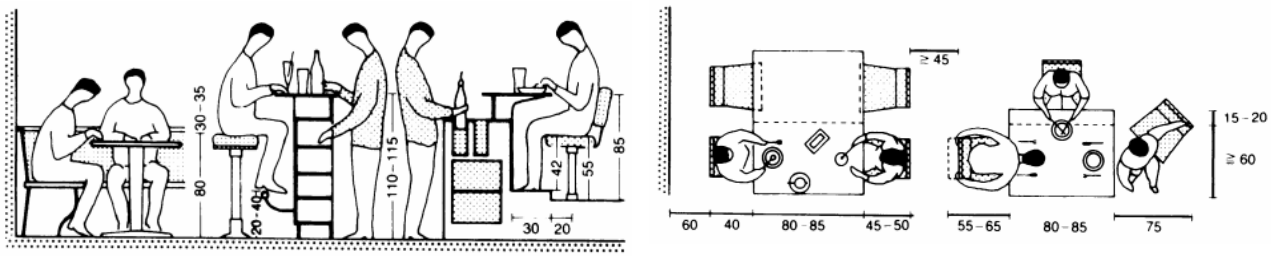


Figure 7: *Standards for Restaurant seating*

(source:Earnst and YoungNeufert)

- For a comfortable environment between the diners, a table of minimum width 600 mm and depth 40 mm is sufficient. An additional width of 20 mm is suggested to provide the space for cutleries and utensils on the table.
- A diameter of about 900 - 1200 mm for a round table for four people is sufficient and can accommodate 1 - 2 people extra.
- The window area should be more than 1/10th of the room area.

dining floor area	walkway width
up to 100 m²	≥ 1.10 m
up to 250 m²	≥ 1.30 m
up to 500 m²	≥ 1.65m
up to 1000 m²	≥ 1.80 m
over 1000 m²	≥ 2.10 m

Width of walkways required

main aisles	min 2.00 m wide
intermediate aisles	min 0.90 m wide
side aisles	min 1.20 m wide

Minimum width of aisles

- The minimum width of escape routes is 1 M for 150 people. General walkways should 10be at least 1.1 M with a clear height more than 2.1 M.

customer places	toilets men	toilets women	urinal bowls	urinals (m)
50	1	1	2	2
50–200	2	2	3	3
200–400	3	4	6	4
400	– determine in individual case –			

Table 2: *Toilet requirement in a restaurant (source: Neufert)*

1.8 TOILETS :

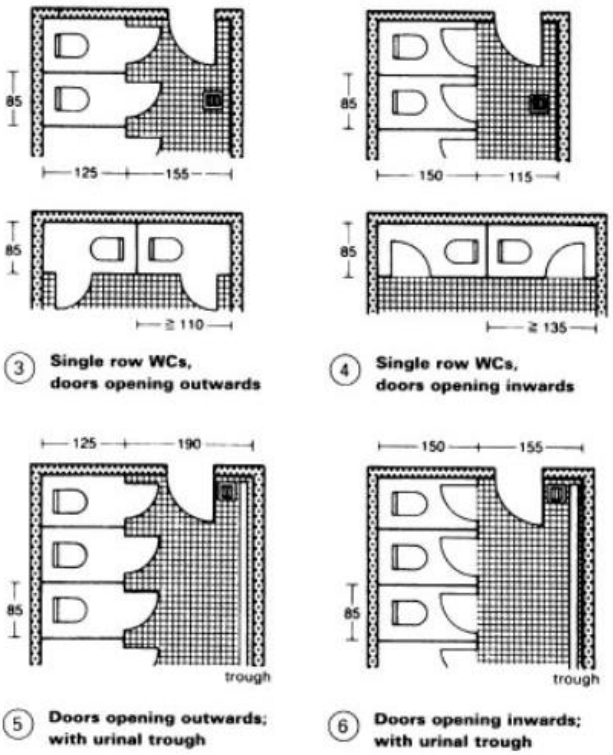
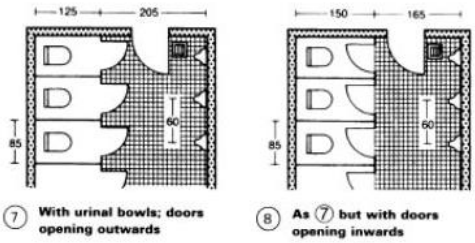
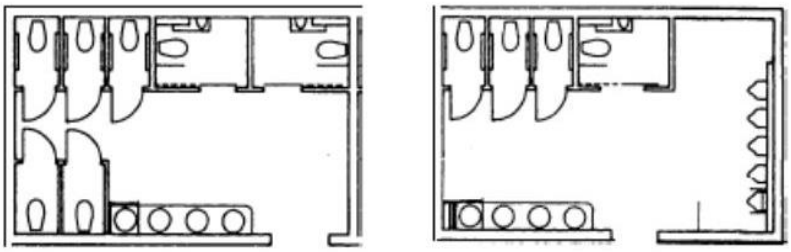


Fig.10 Layout of public toilet
Source ; nufert

1.9.1 HANDICAPPED TOILET



layout of toilet with handicapped toilet
Source- neufert



- One special W.C. in a set of toilet shall be provided for the use of handicapped with essential provision of wash basin near the entrance for the handicapped.
- The minimum size shall be 1500 x 1750 mm.
- Minimum clear opening of the door shall be 900 mm. and the door shall swing out.
- Suitable arrangement of vertical/horizontal handrails with 50 mm. clearance from wall shall be made in the toilet.

The W.C. seat shall be 500 mm. from the floor

PARKING STANDARDS:

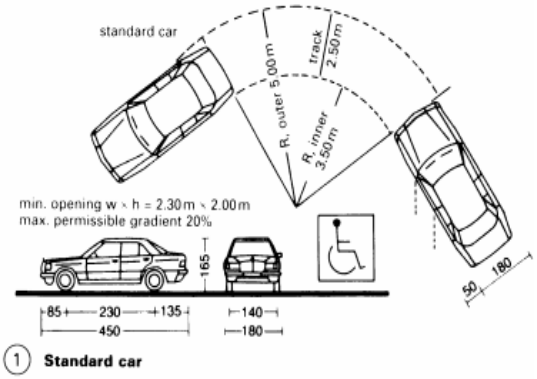


Figure 14: A standard car size
(source: Earnst and Young Neufert*)*

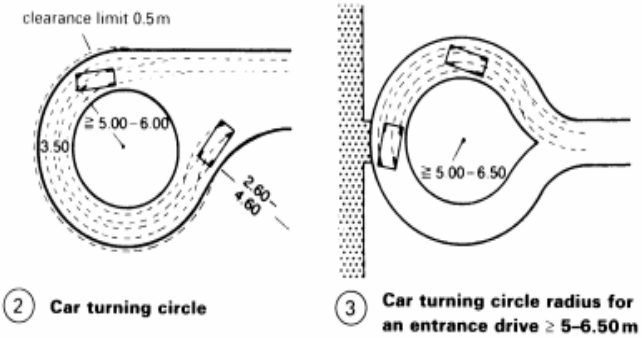
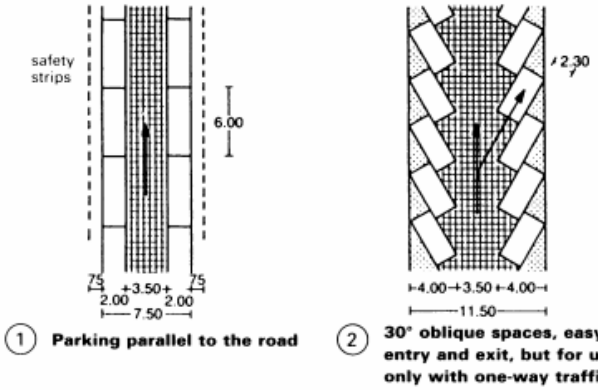


Figure 15: Turning Radius for Cars
(source: Earnst and Young Neufert*)*



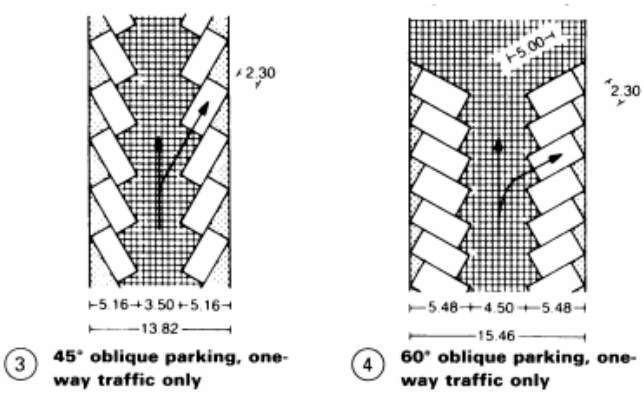


Figure 4.16: Parking configurations for One - Way Traffic
(source: Earnst and Young Neufert)

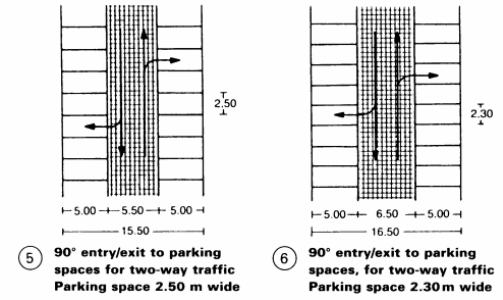


Figure 17: Parking configurations for Two - Way Traffic
(source: Earnst and Young Neufert)

- Parking spaces are usually outlined by 12 - 20 mm wide yellow or white painted bands. When the parking is facing a wall, these bands are painted up to a height of 1M to improve visibility. Guide rails on floors can also be used to demarcate parking limits and can be about 500 - 600 mm long, 200 mm wide and 100 mm high.

FIRE STAIRCASES:

- The minimum width of tread without nosing shall be 300 mm for assembly, hotels, educational, institutional, business and other buildings. The treads shall be constructed and maintained in a manner to prevent slipping. The maximum height of riser shall be 150 mm. The number of risers shall be limited to 12 per flight.
- A staircase shall not be arranged round a lift shaft.
- The minimum width should be at least 2 meters.
- A handrail shall be provided on both sides of the staircase of width 1500 mm and more.
- The minimum headroom in a passage under the landing of a staircase and under the staircase shall be 2.2 meters.
- No living space, store or other fire risk shall open directly into staircases.
- The exit (including staircases) shall be continuous from refuge floors or terrace level, as applicable, to the level of exit discharge.
- No electrical shafts/air conditioning ducts or gas pipes, etc, shall pass through or open in the staircases.
- Lifts shall not open in staircase.
- All staircase shall terminate at the level of exit discharge. The access to the basement shall be by a separate staircase.

5. A. DLF CYBER CITY , GURUGRAM

- **Project type |** Corporate park
  Location | Dlf, Gurugram
  Architect | Hafeez Contractor and Mohit Gujral
  Client | Dlf
- **Project Area |**128 Acres
- **Average Footfall |** 1.5 Lacs
- **No. of Storeys |** G + 20 (for Commercial Buildings)
- **Orientation -** North – west.

5. A.1. INTRODUCTION

- DLF Cyber City is a corporate park in Gurugram, India, home to some of the top 500 IT & Fortune companies. A "futuristic commercial centre" has been coined to describe it. It's right next to NH 8 on the Delhi-Gurgaon border. It consists of a shopping and entertainment area surrounded by the offices of the IT Building.

5. A.2. SITE PLANNING AND DEVELOPMENT:

- The site is long and linear with multiple entrances and viewing points well connected by Rapid Metro from all the sides.
- Buildings are connected by walkways known as cyber walks.

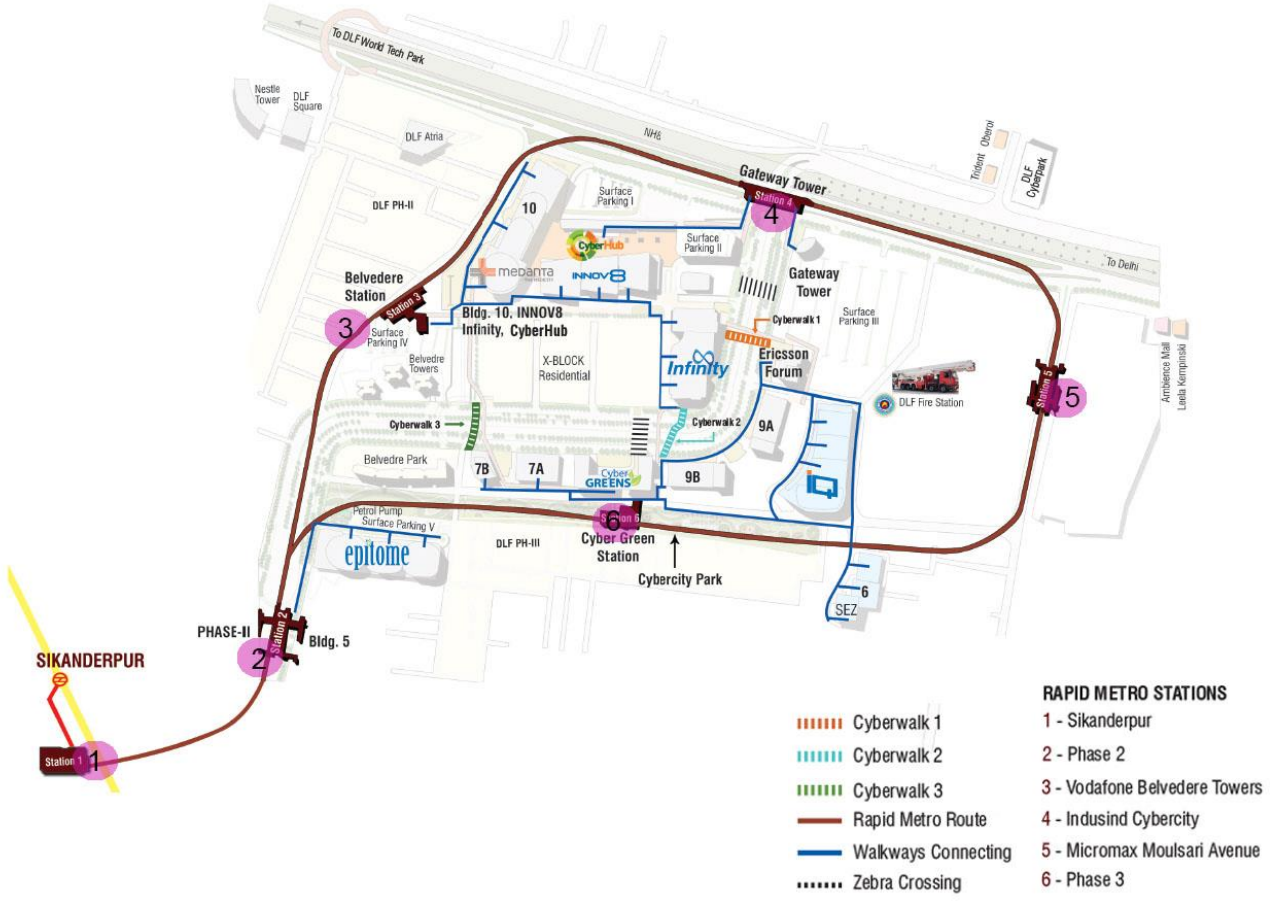


Figure 6.1.2: *Master Plan, DLF Cyber City, Gurugram*

(source:Google) Modified by author

5. A.3. SITE ZONING

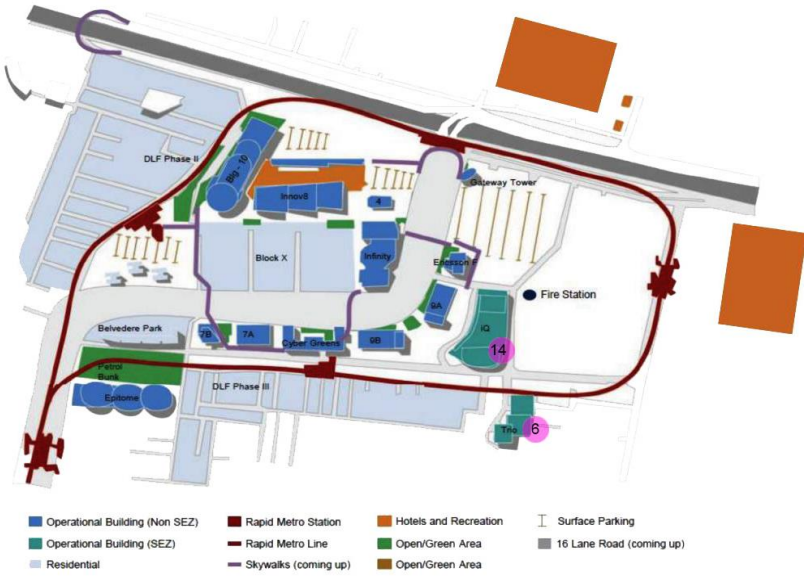


Figure :*Site zoning, DLF Cyber City, Gurugram*

(source:Google) Modified by author

Figure :*Buildings in DLF Cyber City, Gurugram*

(source:Google) Modified by author

5. A.3. CIRCULATION

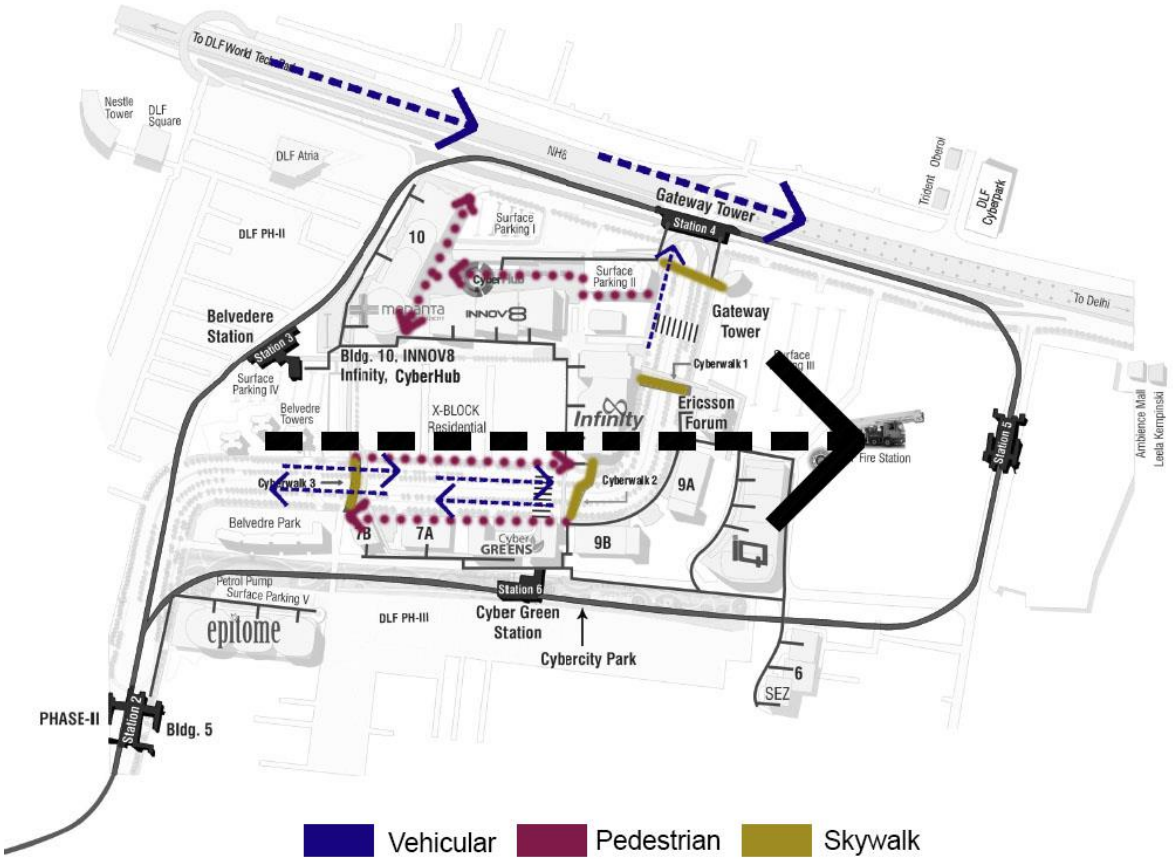


Figure :*Circulation , Ciber city, DLF*
(source:Author

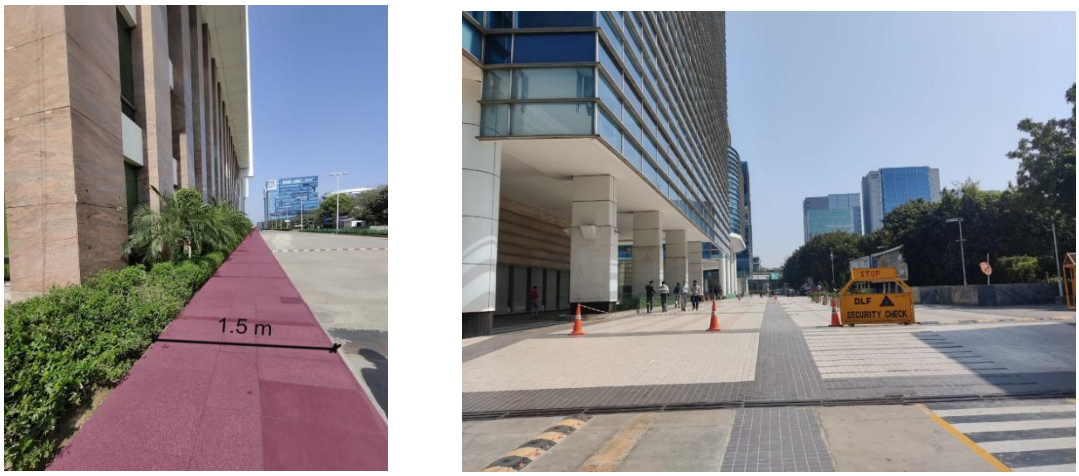


Figure : *a amd b ,Pedestrian and vehicular movement*
Source- Author

5. A.4. SECURITY

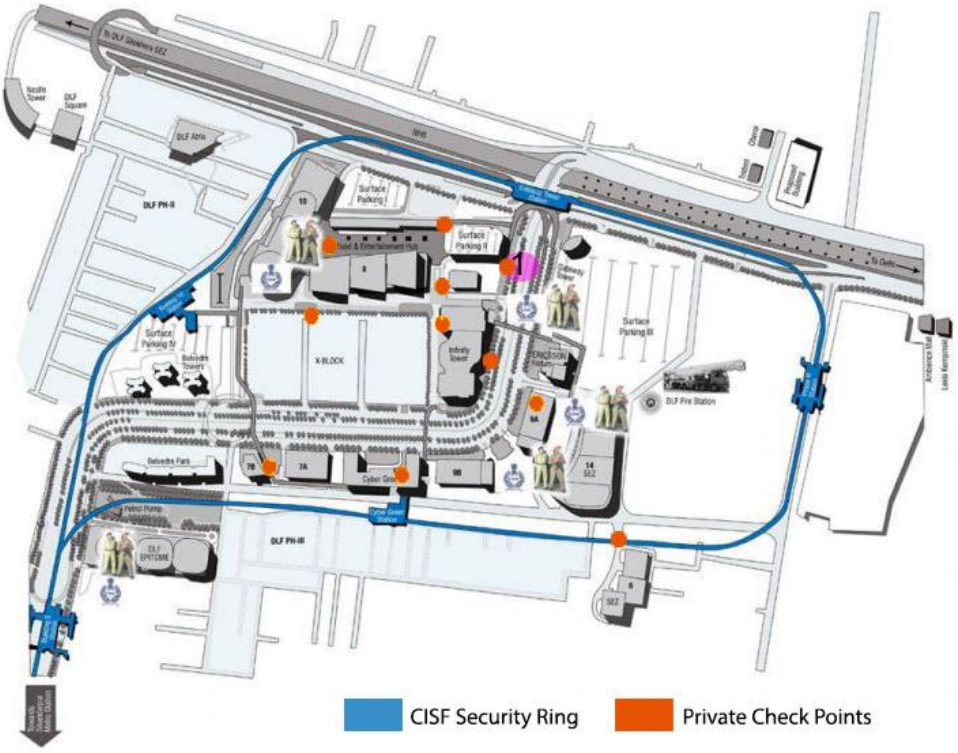


***Figure** : Security and vehicular movement*

Image Source- Author

5. A.5. OFFICE

- Building 10, a LEED Platinum Certified building, an integrated technology Park offering modern workspace to IT/ITES companies. Offering a world- class contemporary structure,Bldg. 10 is a beautiful complex with a multitude of modern facilities that work together to create the immersive atmosphere that new age IT professionals need. The total IT Space constitutes of 3 Blocks.
- **Block A** (Ground + 5 floors); Area- 381,998 sq. ft.
- **Retail Upper Ground**- 60,091 sq. ft.
- **Block B** (Ground + 14 floors); Area- 705,026 sq. ft.
- **Retail Upper Ground**- 31,269 sq. ft.
- **Block C** (Ground + 20 floors); Area- 1,191,813 sq. ft.
- **Retail Upper Ground**- 50,723 sq. ft.
- **Total Area** (sq.ft.) 2,420,920

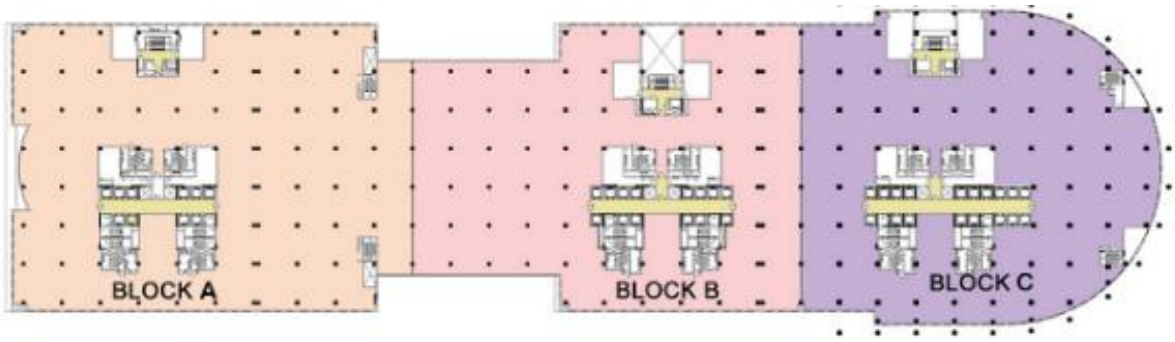


Figure : : *Layout Plan of Building 10, DLF Cyber City, Gurugram*
(source:Google)

- The Tower C consists of 3 fire, staircases, 20 lifts integrated in a single lift core, and refuge areas at 7th, 13th and 19th floors of the building.

- **Total Area** (sq.ft.) 2,420,920

5. A.6. MATERIAL

- Energy-efficient glasses are used, which have the advantage of minimising the amount of heat obtained in the building without compromising the amount of natural light that enters the structure.
- Aluminium composite panels are used for external cladding because, despite their light weight, they are very rigid and solid. They can also be decorated in any colour. It also comes in a number of colours and designs, both metallic and non-metallic.

5. A.7. INFERENCES

- Site accessible through all modes of transport.
- The first two floors of an office building are assigned for retail purpose.
- Pedestrian walkways are shaded with the help of tensile structures
- Increases social and physical interaction
- Use of glass and ACP panel on façade.

5 .B. VATIKA MINDSCAPE, FARIDABAD

- **Project type |** IT/ITes **C**ommercial complex
  Location | Sector 26 Faridabad
  Architect | WOW Architects, Singapore
  Client | Mindscape
- **Project Area |** 8.7 Acres
- **Covered Area** | 86513.895 Sq m
- **No. of Storeys |** G + 12
- **Orientation -** East - west
- **Basement** | upto 3

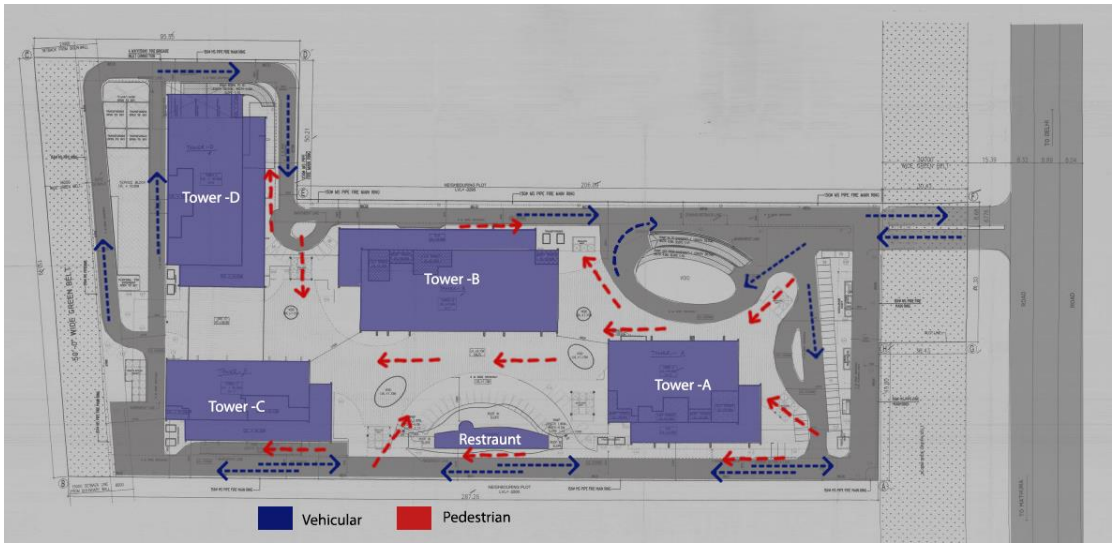
- **Vatika Mindscape** is a Grade A IT/ ITes park designed by Wanger WOn architects. In contrast to the typical office park development, this project folds the existing ground plane to create a double-layer ground plane for green spaces and tucking commercial components into the fold in the earth to protect against hot conditions in Delhi. Coupled with this folded ground plan concept, there are sky gardens and terraces that provide a breakout area in the upper floors of the building.

5. B. 2. SITE PLANNING AND DEVELOPMENT

- The site is long and linear with single entrances and exit with nearness to the Sarai Khwaja metro station. It is also in proximity to the Delhi Badarpur border.

5. B.3. SITE ZONING

5. B.4. CIRCULATION



- Separate drop off areas for all the blocks with dedicated entrance lobbies.

5. B.5. PARKING & SECURITY

- Multi level basements to accommodate approximately 1600 cars
- Provision for surface parking and drop off area

5. B.6. OFFICES

- Office modules are of various sizes.
- Offices designed around central core areas as well as side cores to ensure excellent quality of natural light and views all round.

Tower-A
G+13

- **Floor area-** 2,84,426 Sq m
- 2 staircase- 1 Fire, 1 internal
- A.H.U on every floor for separate office space
- Lift core- 6 Passenger lifts(2 m wide corridor)

Figure : : *Tower A, Typical 1st-5th floor plan*

(source:Author)

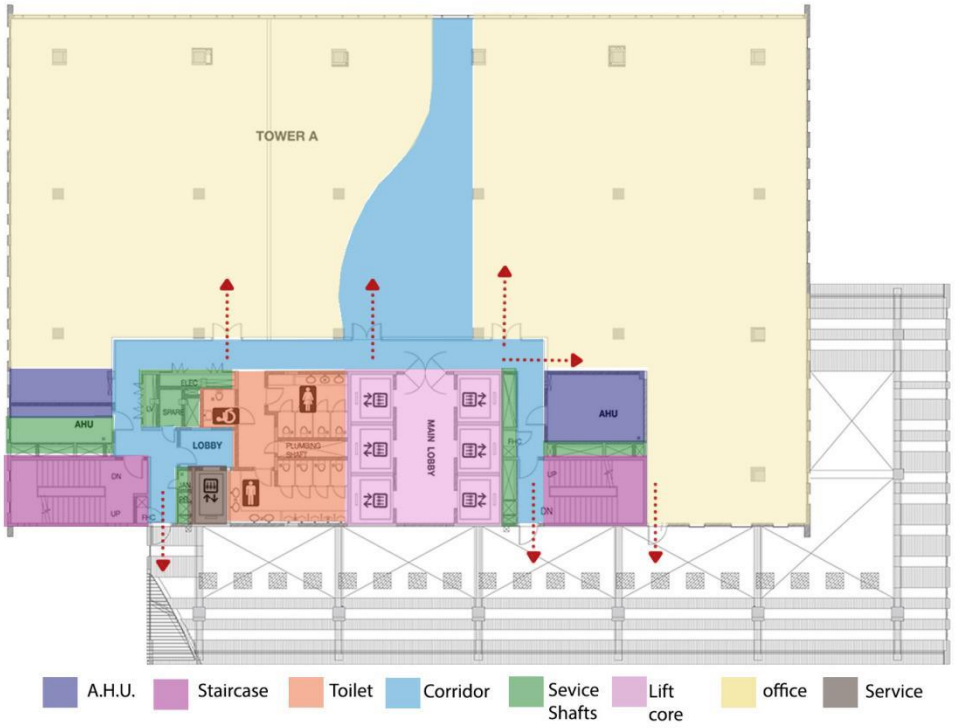


Figure : : *Tower A, 6 to 13th floor plan*
(source:Author)

- **<u>Tower-B</u>**
- G+12
- Floor Area- 32084.01 Sq m

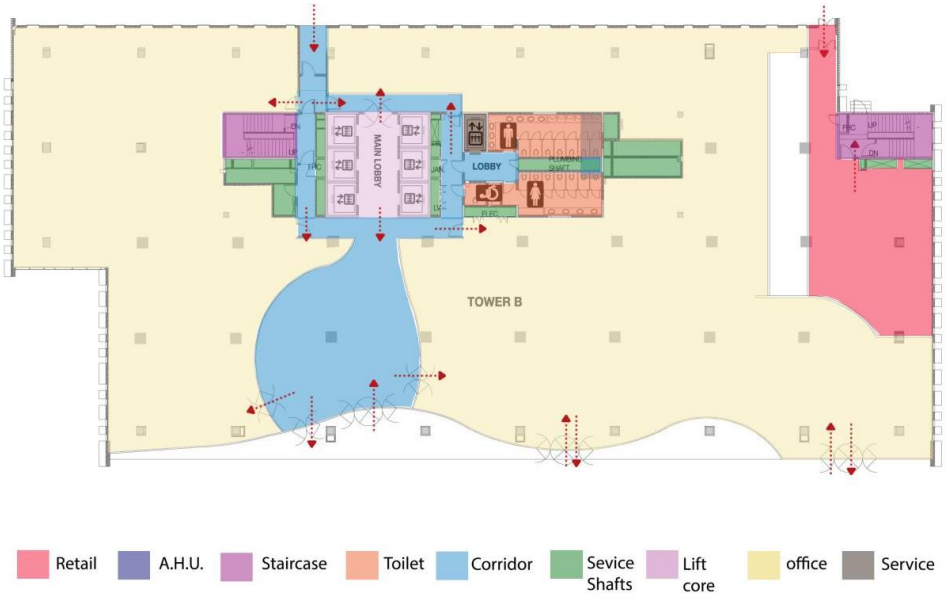


Figure : : *Tower B, Ground floor plan*
(source:Author)

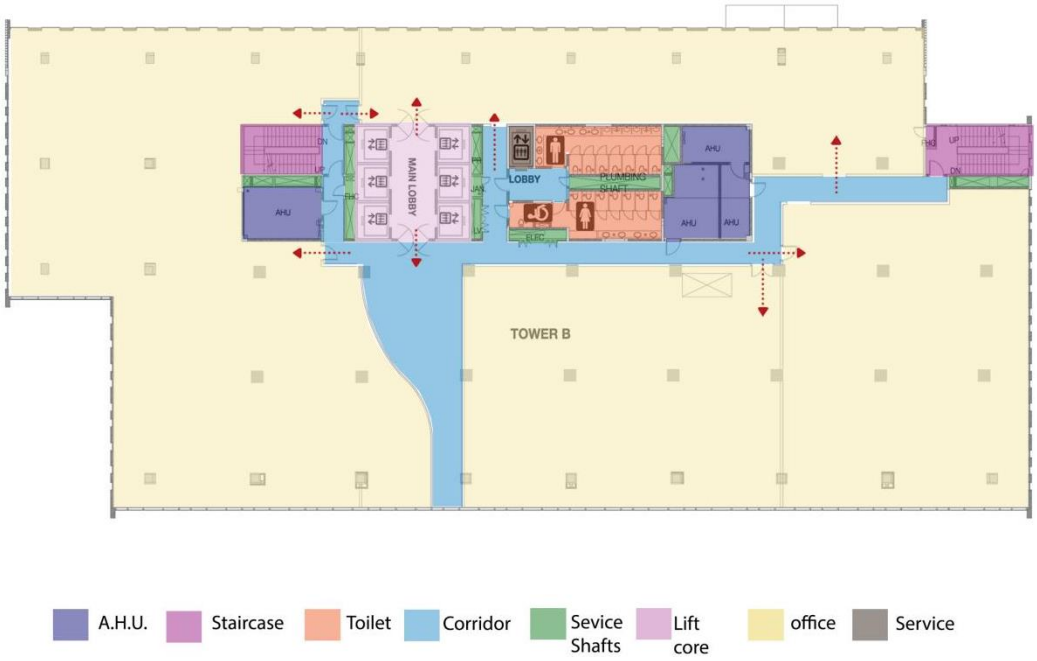


Figure : : *Tower B, 1st to 5th floor plan*
(source:Author)

Figure : : *Tower B, 1st to 5th floor plan*
(source:Author)

5. B.7. STRUCTURE AND ELEVATION

- Isolated and Combined Foundations
- Floor to Floor: Ground floor 5.000 m
- Typical floor :3.850 m
- Basements : 2.850 m
- Ground floor main area 4.750 m (floor to soffit of slabs)

- Typical floor main area 3.570 m (floor to soffit of slabs)
- Typical Column Sizes:500x500, 600x600, 700x700, 800x800
- Capital slab arrangement in office floors with clear height of **3.6 meters**.

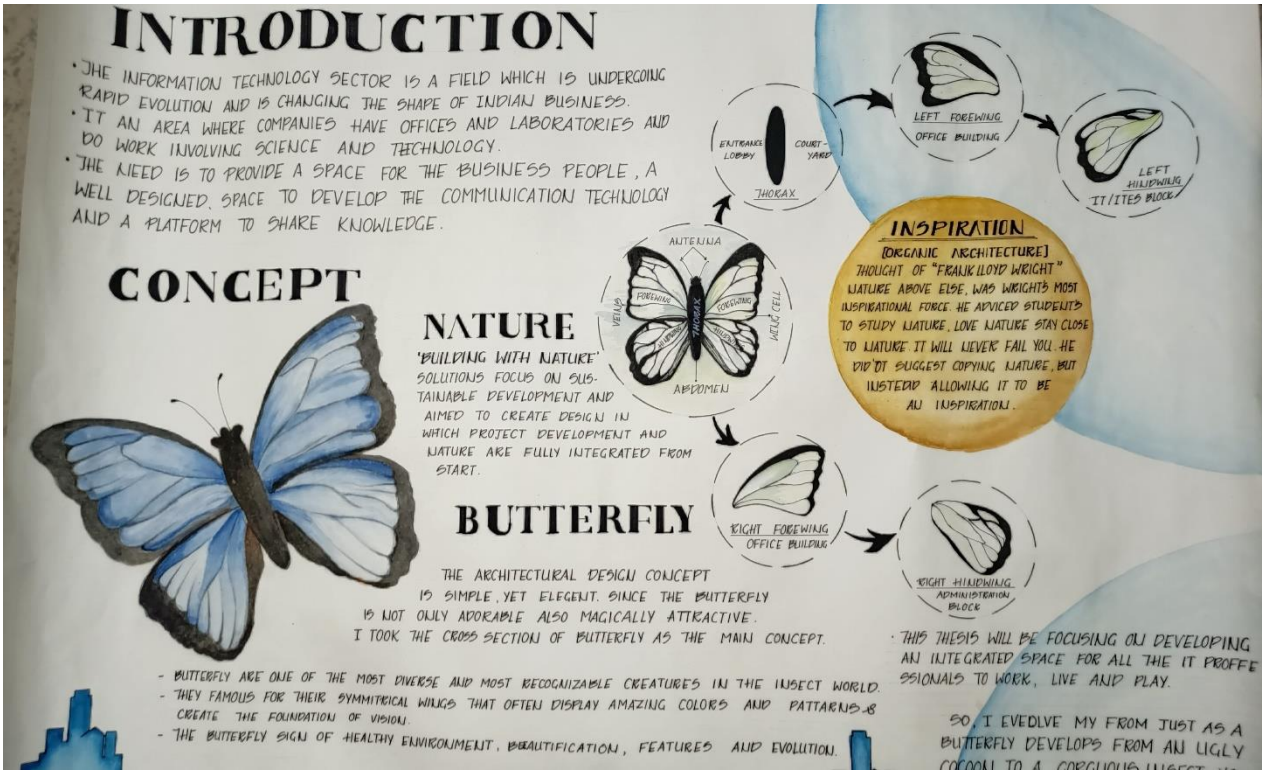
RCC structure built in full accordance with all seismic zone 4 standards as laid out in the Indian Standard Code.

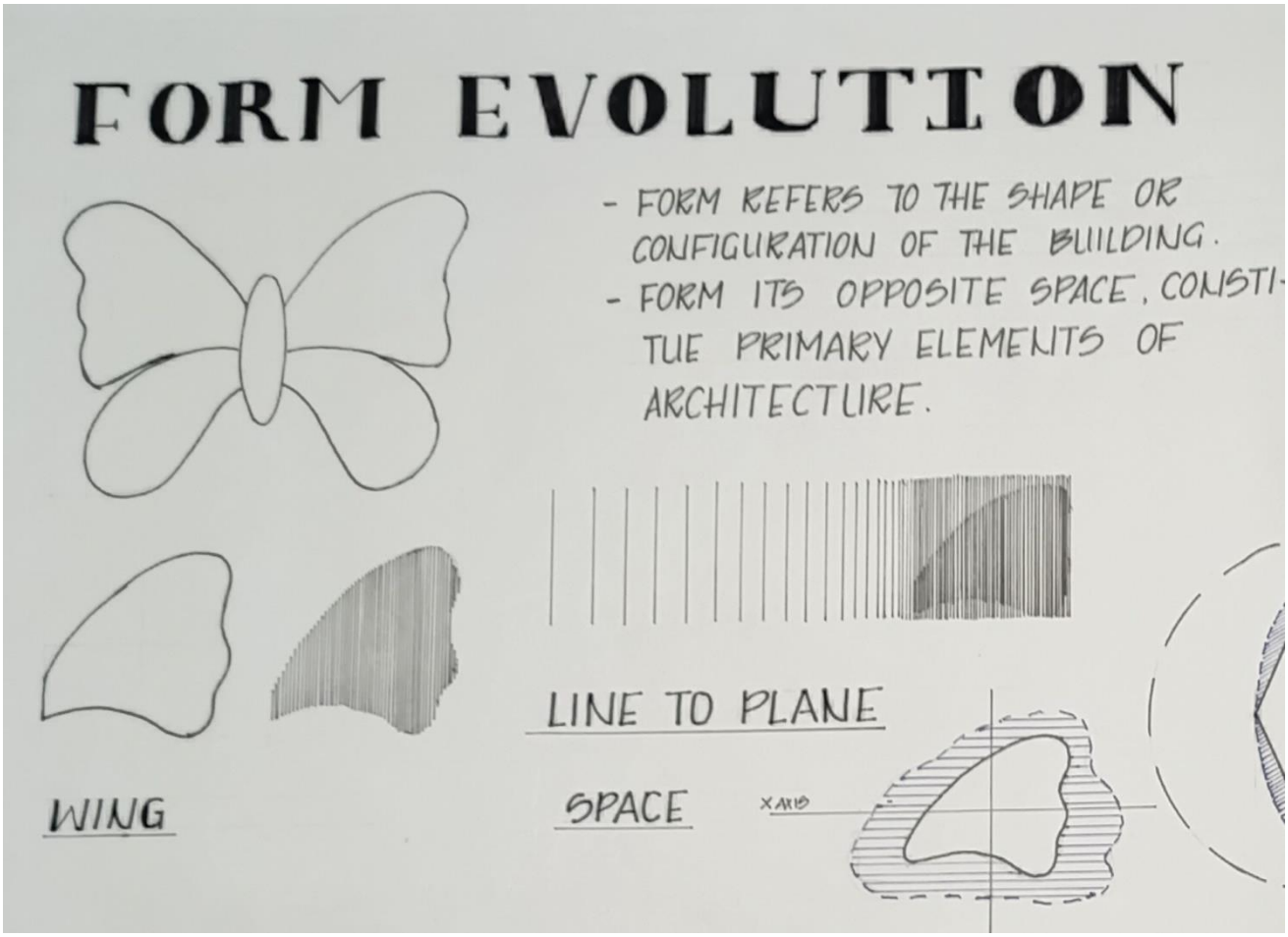
5. B.8 materials

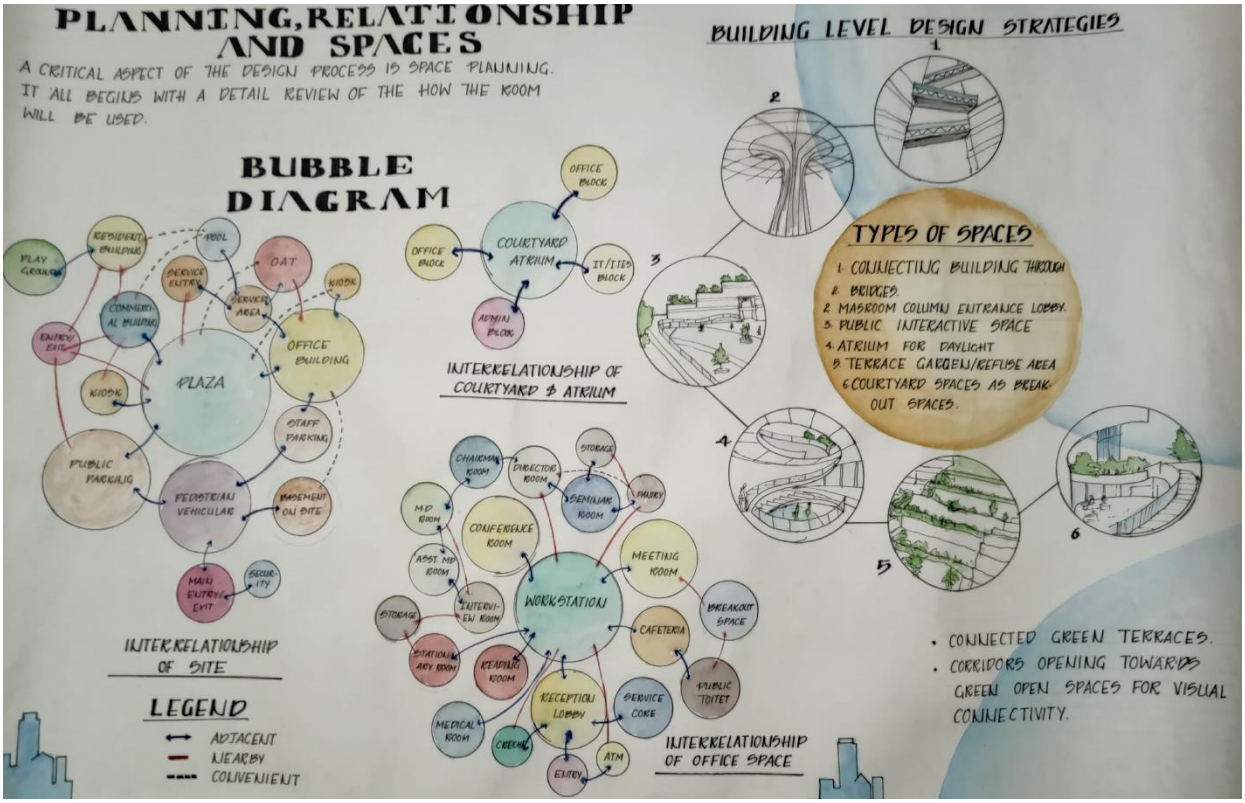
Double glazed aluminium windows and fenestration along with curtain glass in locations according to elevation requirements

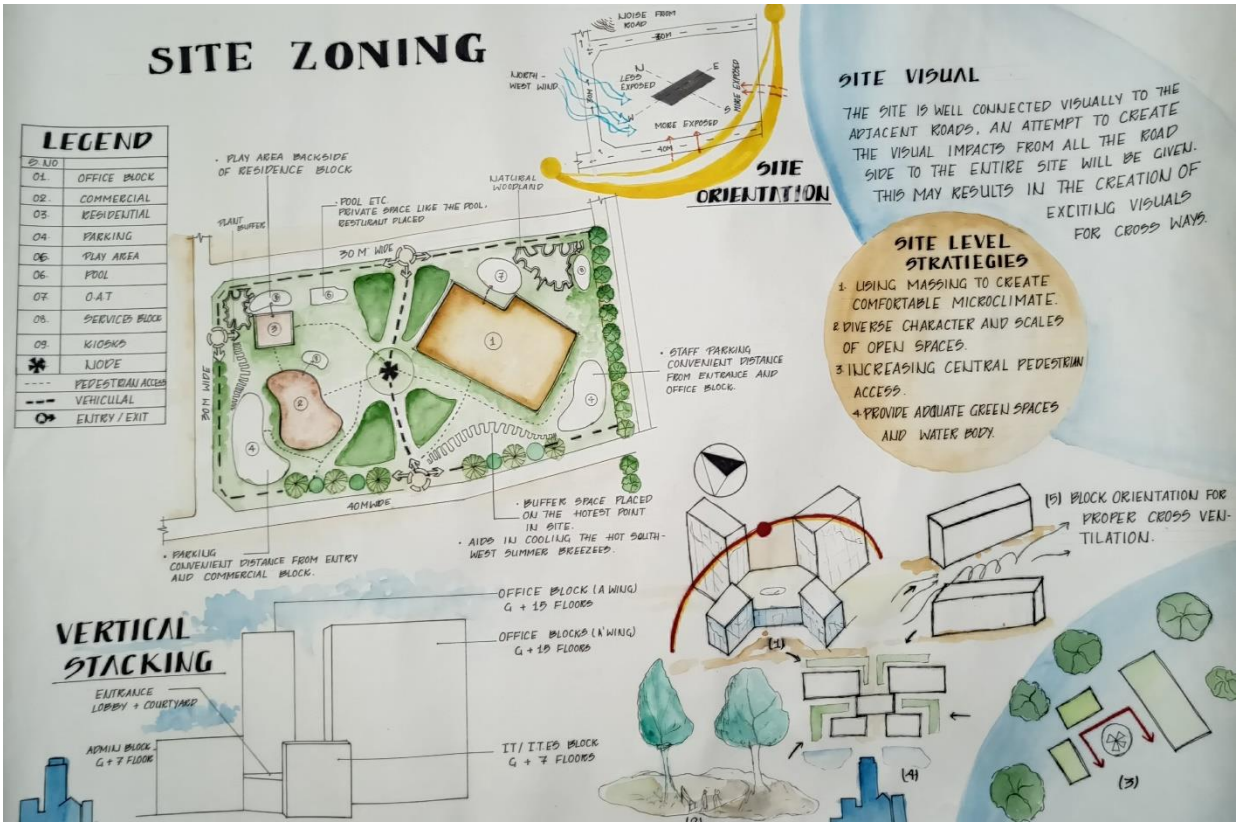
5 .A. COMPARATIVE CHART

CRITERIAS	DLF Cyber City(casestudy-1)	Vatika Mindscape (casestudy-2)	solaris, Singapore (lit.study-1)	KRISP, IT park(lit.study-2)
Architect	HAFEEZ CONTRACTOR AND MOHIT GUJRAL	Warner Wong	Hamzang And Yeang	Padgro.
Client	DLF	Mindscape	Solaris	KRISHNAN SIVAKAMI PRIVATE TRUST (KRISP)
Location	DLF, GURUGRAM	Sector 26 Faridabad	FUSIONOPOLIS, ONE NORTH, SINGAPORE	942 , Vandalur-kelambakkam Road , Kizhakottayur , Chennai India.
Orientation	NORTH - WEST	East - west	NORTH- WEST	South
Site Area	128 Acres(A-G+5,B-G+14,C-G+20)	8.7Acres(G+12)	7 Acres(G+15)	3.70 ACRE(G+4)
Built-up Area	2,420,920sqft.	316510.01sqft	316510.01sqft	117,378.39sqft.
Site Detail	SITE IS FLAT	SITE IS FLAT	SITE IS FLAT	SITE IS FLAT
Land Use	CORPORATE PARK	IT/ITes Commercial complex	OFFICE BUILDING	OFFICE BUILDING
Materials	Modern materials - glass, composite panels, steel, tensile fabric	Modern Material- glazed glass, concrete	Modern yet locally available materials.	Modern Material- glazed glass, concrete
Parking	Surface: 3000 Cars And More	Surface Parking-1792 Cars + 87 Two-wheedlers + 11 Coaches Basement- Up-to 3 Level	3 Level Basement Car Parking	B+1,surface Parking


INTRODUCTION
• THE INFORMATION TECHNOLOGY SECTOR IS A FIELD WHICH IS UNDERGOING RAPID EVOLUTION AND IS CHANGING THE SHAPE OF INDIAN BUSINESS.
• IT AN AREA WHERE COMPANIES HAVE OFFICES AND LABORATORIES AND DO WORK INVOLVING SCIENCE AND TECHNOLOGY.
• THE NEED IS TO PROVIDE A SPACE FOR THE BUSINESS PEOPLE, A WELL DESIGNED SPACE TO DEVELOP THE COMMUNICATION TECHNOLOGY AND A PLATFORM TO SHARE KNOWLEDGE.
CONCEPT
NATURE
'BUILDING WITH NATURE'
SOLUTIONS FOCUS ON SUSTAINABLE DEVELOPMENT AND AIMED TO CREATE DESIGN IN WHICH PROJECT DEVELOPMENT AND NATURE ARE FULLY INTEGRATED FROM START.
BUTTERFLY
THE ARCHITECTURAL DESIGN CONCEPT IS SIMPLE, YET ELEGENT. SINCE THE BUTTERFLY IS NOT ONLY ADORABLE ALSO MAGICALLY ATTRACTIVE. I TOOK THE CROSS SECTION OF BUTTERFLY AS THE MAIN CONCEPT.
- BUTTERFLY ARE ONE OF THE MOST DIVERSE AND MOST RECOGNIZABLE CREATURES IN THE INSECT WORLD.
- THEY FAMOUS FOR THEIR SYMMITRICAL WINGS THAT OFTEN DISPLAY AMAZING COLORS AND PATTARNS.IS CREATE THE FOUNDATION OF VISION.
- THE BUTTERFLY SIGN OF HEALTHY ENVIRONMENT, BEAUTIFICATION, FEATURES AND EVOLUTION.
ANTENNA
FOREWING
HINDWING
THORAX
ABDOMEN
VEINS
ANTENNA CELL
ENTRANCE LOBBY
COURT-YARD
THORAX
LEFT FOREWING
OFFICE BUILDING
LEFT HINDWING
IT/ITES BLOCK
INSPIRATION
[ORGANIC ARCHITECTURE]
THOUGHT OF "FRANK LLOYD WRIGHT" NATURE ABOVE ELSE, WAS WRIGHT'S MOST INSPIRATIONAL FORCE. HE ADVICED STUDENTS TO STUDY NATURE, LOVE NATURE STAY CLOSE TO NATURE IT WILL NEVER FAIL YOU. HE DID'DT SUGGEST COPYING NATURE, BUT INSTEAD ALLOWING IT TO BE AN INSPIRATION.
RIGHT FOREWING
OFFICE BUILDING
RIGHT HINDWING
ADMINISTRATION BLOCK
• THIS THESIS WILL BE FOCUSING ON DEVELOPING AN INTEGRATED SPACE FOR ALL THE IT PROFFESSIONALS TO WORK, LIVE AND PLAY.
SO, I EVEDLVE MY FROM JUST AS A BUTTERFLY DEVELOPS FROM AN UGLY


FORM EVOLUTION
- FORM REFERS TO THE SHAPE OR CONFIGURATION OF THE BUILDING.
- FORM ITS OPPOSITE SPACE, CONSTITUE PRIMARY ELEMENTS OF ARCHITECTURE.
LINE TO PLANE
WING
SPACE
XAXIS


PLANNING, RELATIONSHIP AND SPACES
A CRITICAL ASPECT OF THE DESIGN PROCESS IS SPACE PLANNING. IT ALL BEGINS WITH A DETAIL REVIEW OF THE HOW THE ROOM WILL BE USED.
BUBBLE DIAGRAM
PLAZA
OFFICE BUILDING
COURTYARD ATRIUM
INTERRELATIONSHIP OF COURTYARD & ATRIUM
WORKSTATION
INTERRELATIONSHIP OF OFFICE SPACE
INTERRELATIONSHIP OF SITE
LEGEND
ADJACENT
NEARBY
CONVENIENT
BUILDING LEVEL DESIGN STRATEGIES
TYPES OF SPACES
1. CONNECTING BUILDING THROUGH
2. BRIDGES.
3. MASSROOM COLUMN ENTRANCE LOBBY.
4. PUBLIC INTERACTIVE SPACE
5. ATRIUM FOR DAYLIGHT
6. TERRACE GARDEN/REFUSE AREA
7. COURTYARD SPACES AS BREAK-OUT SPACES.
• CONNECTED GREEN TERRACES.
• CORRIDORS OPENING TOWARDS GREEN OPEN SPACES FOR VISUAL CONNECTIVITY.


SITE ZONING
LEGEND
01. OFFICE BLOCK
02. COMMERCIAL
03. RESIDENTIAL
04. PARKING
05. PLAY AREA
06. POOL
07. OAT
08. SERVICES BLOCK
09. KIOSKS
NOISE
PEDESTRIAN ACCESS
VEHICULAR
ENTRY / EXIT
SITE ORIENTATION
SITE VISUAL
THE SITE IS WELL CONNECTED VISUALLY TO THE ADJACENT ROADS, AN ATTEMPT TO CREATE THE VISUAL IMPACTS FROM ALL THE ROAD SIDE TO THE ENTIRE SITE WILL BE GIVEN. THIS MAY RESULTS IN THE CREATION OF EXCITING VISUALS FOR CROSS WAYS.
SITE LEVEL STRATIEGIES
1. USING MASSING TO CREATE COMFORTABLE MICROCLIMATE.
2. DIVERSE CHARACTER AND SCALES OF OPEN SPACES.
3. INCREASING CENTRAL PEDESTRIAN ACCESS.
4. PROVIDE ADEQUATE GREEN SPACES AND WATER BODY.
VERTICAL STACKING
OFFICE BLOCK (A WING) G + 15 FLOORS
OFFICE BLOCKS (N WING) G + 15 FLOORS
IT/ ITES BLOCK G + 7 FLOORS
ENTRANCE LOBBY + COURTYARD
ADMIN BLOCK G + 7 FLOOR
(5) BLOCK ORIENTATION FOR PROPER CROSS VENTILATION.

8.
DESIGN