BIOPHILIC HEADQUARTER FOR MICROSOFT AT हैदराबाद

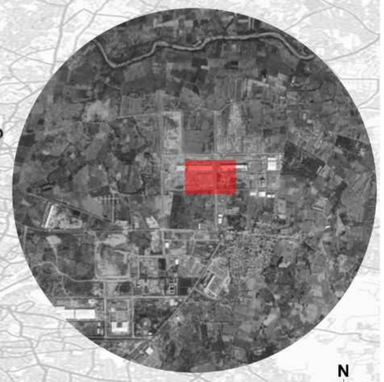
हैदराबाद

Reddy Ranga District, Hyderabad

INTRODUCTION

SITE LOCATION
Site is located on about 7.5 acre land near Hayatabad Region The plot size is Required to be 207.47m x 145.79m in dimensios.

Cordinates - 17°13'53.4"N 78°11'29.5"E
TOTAL AREA - 30,247 sqm
DISTRICT - REDDY-RANGA
CITY - HYDERABAD
STATE - TELANGANA
CURRENT LAND USE - BARREN LAND
NEW PURPOSE - MICROSOFT HEADQUARTER

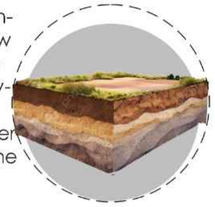


KEY PLAN OF SITE
NTS

N

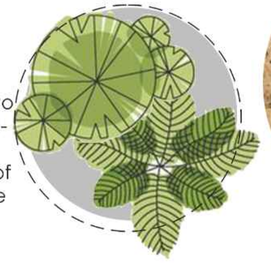
TOPOGRAPHY

Rocky terrain with an abundant quantity of stone. Low vegetation, mostly flat surface with medium upheavals, thus making it easy for construction of large conference areas and halls for the convention and meeting areas.



VEGETATION

Wild grass and shrubs. The site is sparsely vegetated, thus it becomes essential to plan a well-designed landscape scheme to reduce the energy consumption of the building and make the environment more habit-



Current Condition

Microsoft has invested 248 crore in hyderabad
and this site is one of the land pocket on which microsoft office has initiated constructional activities

STRENGTH

Active Construction: Microsoft has acquired the land and begun construction.

Strategic Location: Situated on the outskirts, the building will be the tallest in the area, offering prominent visibility and scenic views.

Regional Growth: The project's development will accelerate the overall growth of the precinct.

WEAKNESS

Uncertain Future Developments: The underdeveloped surroundings make it challenging to anticipate future changes.

Limited Basement Construction: Unsuitable terrain requires above-ground parking

Potential Isolation: Unplanned future developments may disconnect the project from its surroundings.

Integration Dependency: Success relies on seamless integration with future pedestrian paths and green networks.

OPPORTUNITY

Unique Terrain: Can enhance architectural expression.

Sustainable Design: Supports green spaces and rainwater collection.

Future Influence: Has the potential to shape upcoming developments.

Strong Connectivity: Three-phase road access enables better integration with movement systems and pedestri-

THREATS

HISTORICAL TIMELINE

The Mughals annexed Golconda in 1687, and later, the Asaf Jahi Nizams (1724–1948) ruled Hyderabad, making it India's richest princely state. They developed Chowmahalla Palace, Osmania University, and a rail network, shaping Hyderabad into a trade and cultural hub.

16 87 YEAR

15 18 YEAR Founded in 1591 by Muhammad Quli Qutb Shah, Hyderabad became a Persian-Turkish influenced city with landmarks like Charminar and Golconda Fort.

19 48 YEAR Infrastructure projects like roads, dams, and hospitals improved public services. He promoted education, arts, and literature while maintaining Hyderabad's cultural heritage. His rule ended with Hyderabad's integration into India in 1948.

With the launch of HITEC City in 1998, Hyderabad emerged as an IT & biotech hub, attracting global firms like Microsoft, Google, and Amazon. The city now blends heritage with modern skyscrapers, metro rail, and sustainable urban planning, evolving into a global smart city.

19 90 YEAR Hyderabad joined India in 1948, became Telangana's capital, and witnessed major infrastructure growth, including Outer Ring Road (ORR) and public sector industries like BHEL and DRDO.

20 24 YEAR

DEMOGRAPHY

According to 2011 c
Males - 3576640
Females - 3416622

Literacy

Yes - 5109293
No - 1051339

Employment

Yes - 2068693
No - 3585564

ACCESSIBLITY

23 km nearest Station kottur

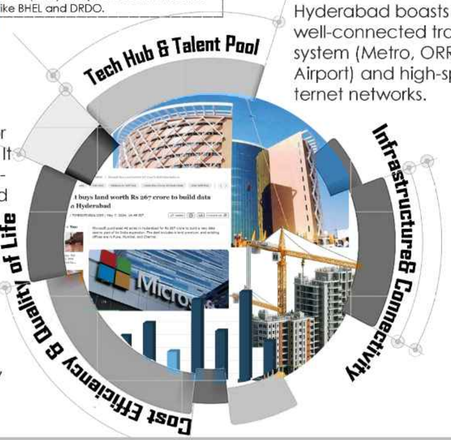
35 km Rajiv Gandhi International airport

23 km nearest Station kottur

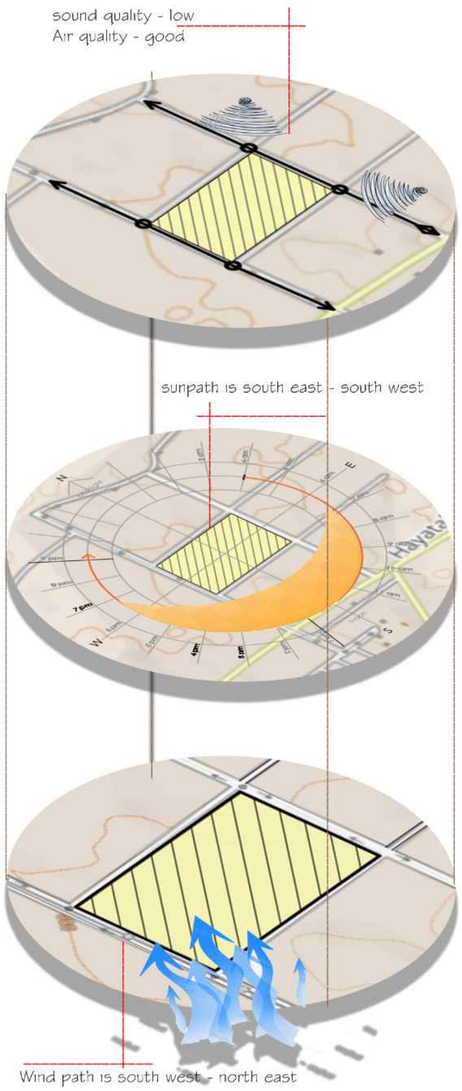
Hyderabad boasts a well-connected transport system (Metro, ORR, RGIA Airport) and high-speed internet networks.

SITE JUSTIFICATION

Hyderabad, known as "Cyberabad," houses HITEC City, a major IT corridor attracting global firms. It offers a skilled workforce with premier institutions like IIT-H, IIIT-H, and ISB.



Cost Efficiency & Quality of Life – Compared to Bengaluru, Hyderabad offers lower operational costs and a better cost-to-quality ratio for employees. Rnaks 138 in global countreis.



On East Phase Industries are located

On North/West Agricltural Land is present

On South we have few Residential Units

SITE CONTEXT

BIOPHILIC PRINCIPLES

Natural Light
Maximizing daylight through windows, skylights, and open layouts to improve mood, productivity, and well-being.

Use of Natural Materials
Incorporating wood, stone, bamboo, and other organic textures to create a calming and sensory-rich environment.

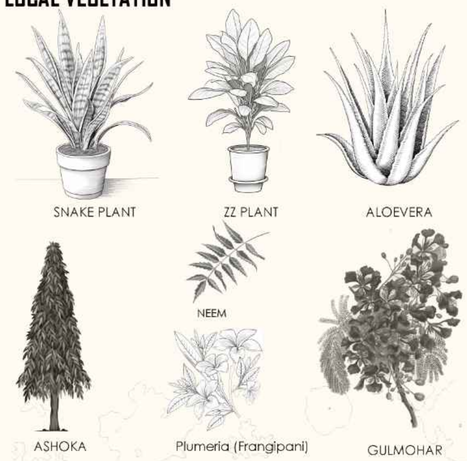
Indoor Greenery
Integrating plants, green walls, or interior gardens to purify air and connect occupants with living systems.

Natural Ventilation
Using passive airflow strategies like cross-ventilation and operable windows to enhance indoor air quality and comfort.

Biomorphic Forms & Patterns
Using shapes, curves, and motifs inspired by nature (like leaves, shells, or waves) in architecture and decor for aesthetic and psychological benefits.

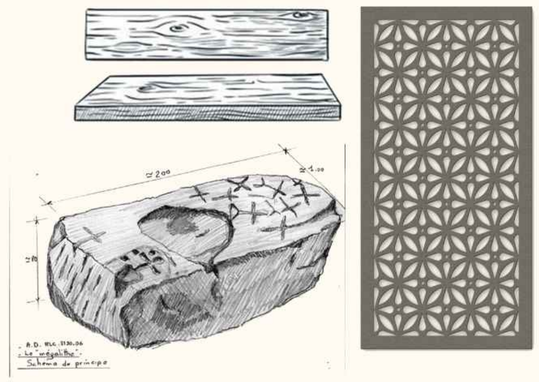
Visual Connection with Nature
Designing views to outdoor landscapes, greenery, or water bodies to reduce stress and support cognitive function.

LOCAL VEGETATION



For my project located in the Hyderabad region, incorporating greenery both indoors and outdoors not only enhances aesthetics but also improves air quality and employee well-being. Indoor spaces can benefit from low-maintenance, air-purifying plants such as Areca Palm, Snake Plant, ZZ Plant, and Peace Lily, which thrive in controlled environments and require minimal sunlight. For outdoor landscaping, native and drought-tolerant trees and shrubs like Neem, Ashoka, Gulmohar, and Plumeria (Frangipani) are ideal due to their resilience to Hyderabad's semi-arid climate. Including a mix of flowering plants and shade-giving trees will create a pleasant, eco-friendly environment conducive to productivity and sustainability.

LOCAL MATERIAL

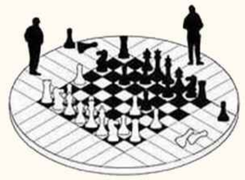


Jali Screens (terracotta or stone)
Use: Facades, internal partitions, aesthetic screens.
Benefits: Diffuses sunlight, promotes air flow, reduces AC load.Vernacular Aspect: Mughal and South Indian architecture influence.

Stone (Deccan Basalt / Granite / Shahabad Stone)
Source: Widely available in Telangana and Andhra Pradesh. Use: Flooring, cladding, foundation, walls, paving.
Benefits: Durable, thermally stable, minimal maintenance.Vernacular Aspect: Used historically in forts and temples (e.g., Golconda Fort)

Local Timber (Neem, Teak, Mango Wood)
Use: Doors, windows, furniture, structural elements (non-load bearing).
Benefits: Aesthetic appeal, long life, natural insulator.
Vernacular Aspect: Found in heritage homes and old wooden struc-

ELEMENTS



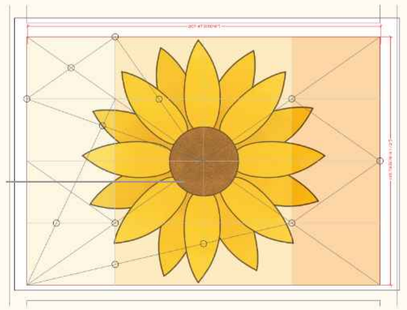
Hardscape
Description: Features a grid-like paving pattern symbolizing interactive public space.
Function: Encourages social engagement, outdoor games, and community gathering.

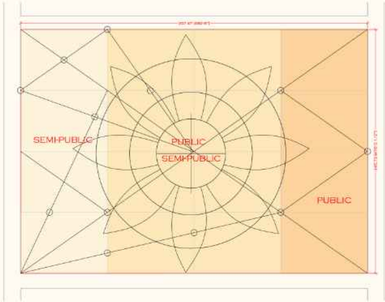
Circulation & Connectivity
Description: Shows a network of paths cutting through green zones with trees.
Design Elements: Tree planting, curved/organic walkways, and zoning for accessibility and shade.

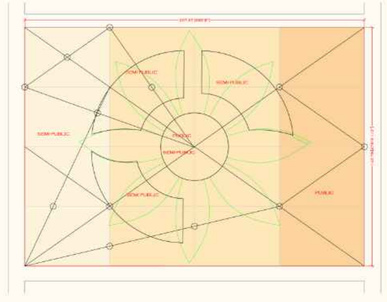
Natural Landscape –
Description: Depicts an open grassy area with birds and plants, inviting exploration.
Features: Native grasses, wildflowers, and habitats for birds/insects – promoting biophilia and sustainability.

CONCEPT

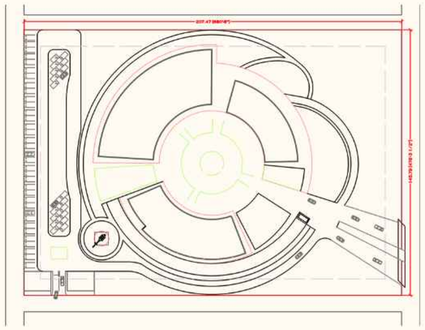
The initial diagrams show geometric mapping of the sunflower's petal and seed arrangement likely using Fibonacci.



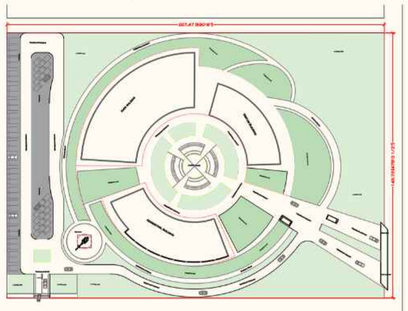


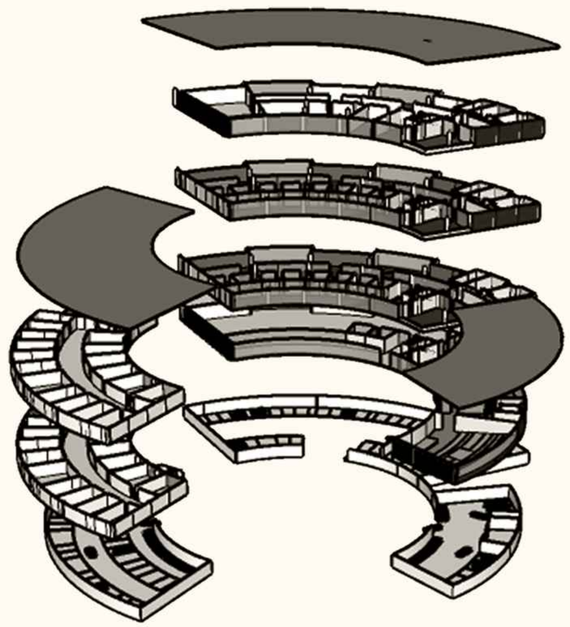


Functional Distribution: Spaces are arranged in arcs or petals around a central core, similar to how sunflower seeds are packed for efficiency and balance



Radial Site Layout:
Site zoning and circulation follow the sunflower's radial pattern, ensuring balanced spatial organization and organic flow.

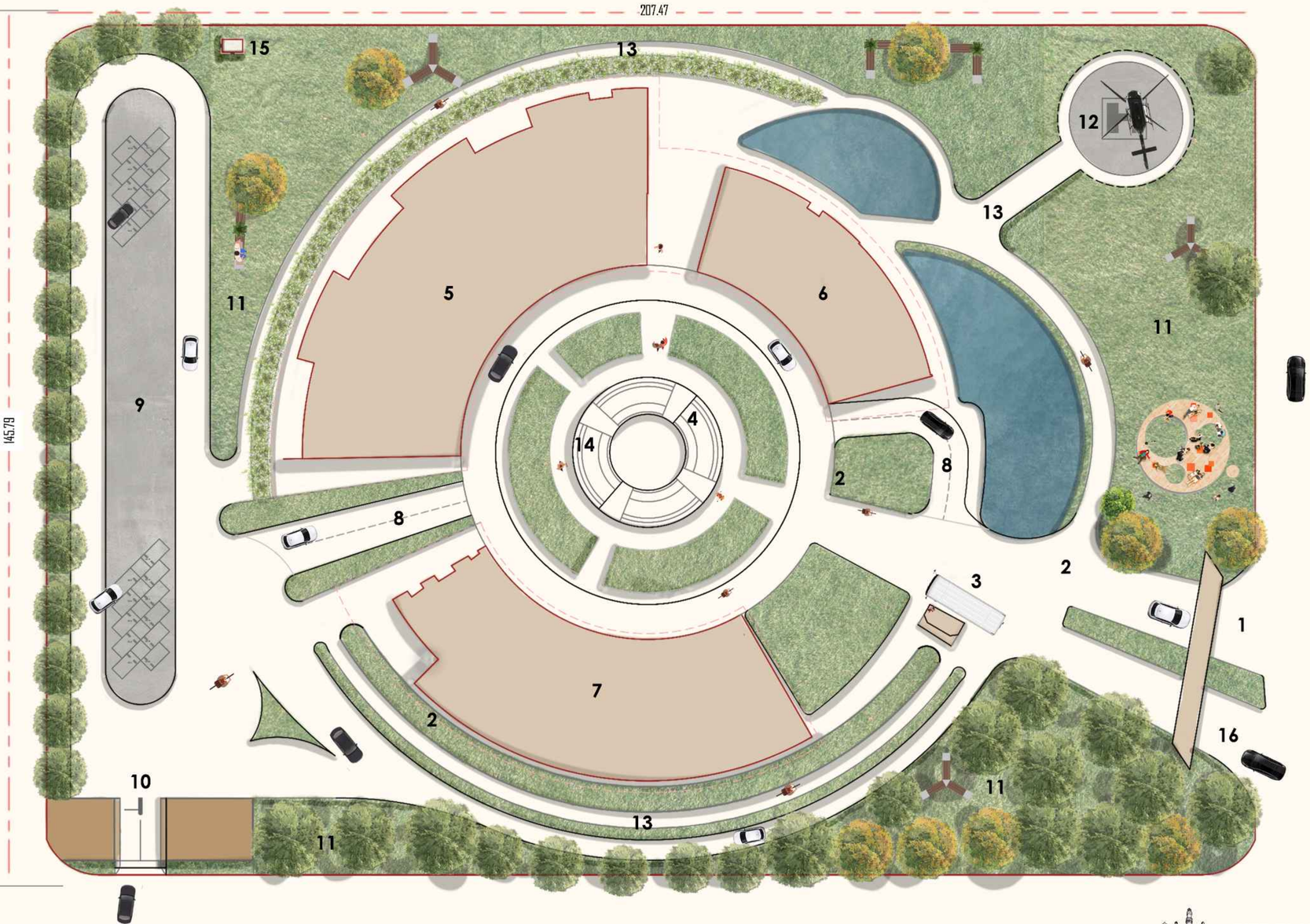




Layered Building Form: The exploded axonometric view shows the building's circular and segmented structure, mirroring the concentric layers of a sunflower.

SITE SECTION

SCALE 1:200



SITE PLAN

SCALE 1:200

LEGENDS

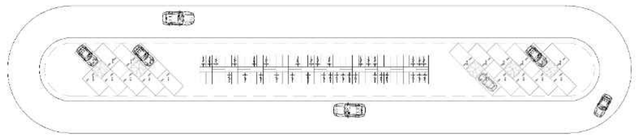
1. ENTRY
2. VEHICLE PATH
3. BUS STOP
4. ACTIVITY SPACE
5. MAIN BUILDING
6. VISITOR BUILDING
7. RESIDENTIAL CORE
8. VEHILCLE RAMP
9. PARKING
10. SERVICE ENTRY
11. LANDSCAPE
12. HELIPAD
13. WALKING/CYCLE TRACK
14. UG WATER TANK
15. STP
16. EXIT

SITE AREA - 7 ACRES -30247sq.m
BUILT UP AREA - 14125.30 Ssq.m

BASEMENT PLAN
SCALE 1:500

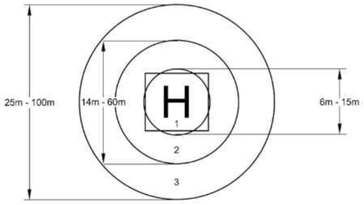
SOLAR PANEL

SETIONAL ELEVATION
SCALE 1:150

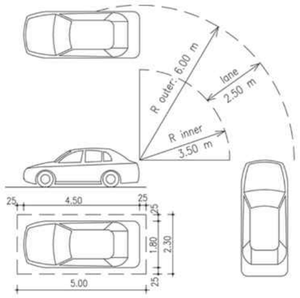


PLAN (COVRED)
SCALE 1:150

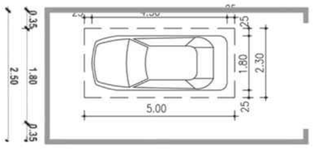
The solar panel canopy over shaded parking at a site in Hyderabad is designed as a climate-responsive and sustainable architectural intervention. Given Hyderabad's high annual temperatures and abundant solar irradiance, the structure serves a dual purpose—generating renewable energy through optimally tilted photovoltaic panels while providing thermal comfort by shading parked vehicles. The canopy, typically constructed using steel or RCC with adequate clearance, is oriented to maximize solar efficiency. This system not only reduces heat buildup in vehicles but also contributes to energy self-sufficiency by powering lighting or EV charging stations.



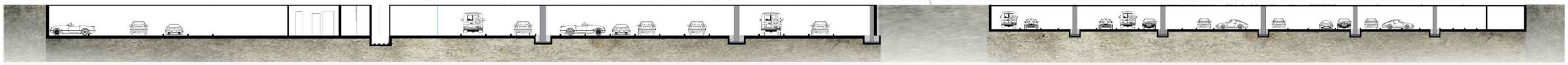
HELIPAD



VEHICLE RAMP



TYPICAL CAR PARKING



SECTION OF BASMENT PARKING

SECTION OF BASMENT PARKING

PARKING DETAILS
04/11

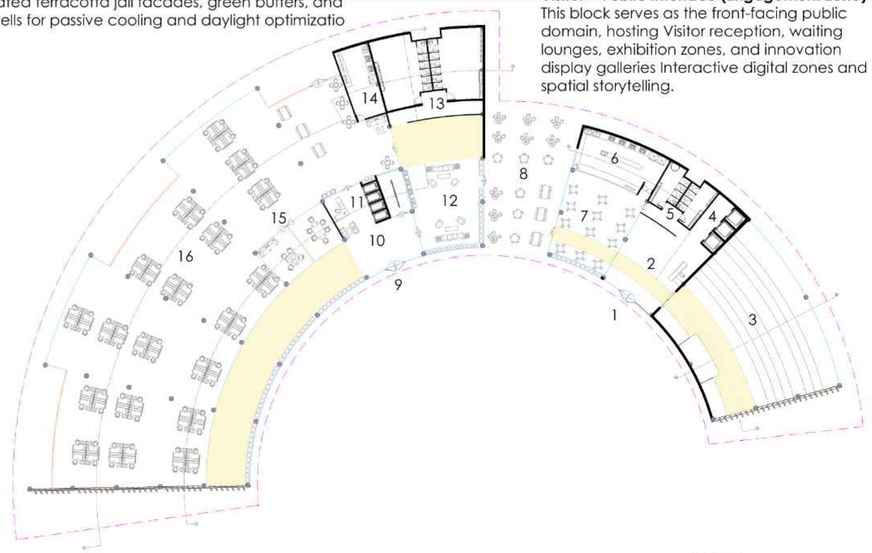
BIOPHILIC FOR MICROSOFT HQ

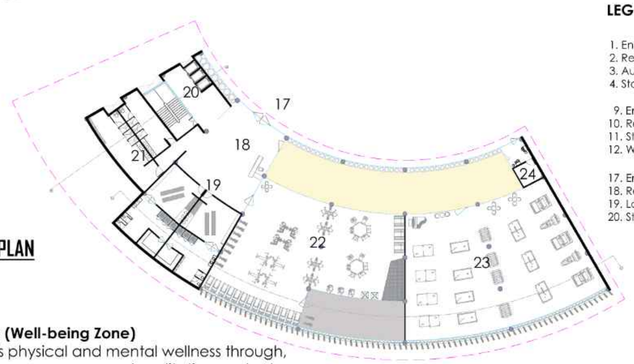
YASH PAWAR
10542
School of Architecture, Kop

SECTION AA'
SCALE 1:250

Work Core (Productivity Zone)
This block houses the primary workspace including open-plan offices, focused zones, huddle pods, collaborative lounges, and maker labs.Designed around modular grids and adaptive partitions for scalability Integrated terracotta jali facades, green buffers, and light wells for passive cooling and daylight optimizatio

Visitor + Public Interface (Engagement Zone)
This block serves as the front-facing public domain, hosting Visitor reception, waiting lounges, exhibition zones, and innovation display galleries Interactive digital zones and spatial storytelling.



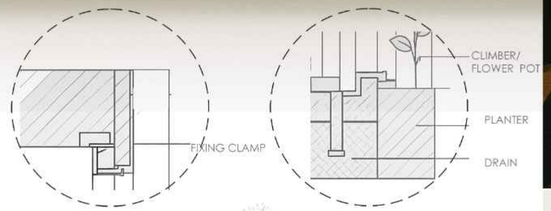


GROUND FLOOR PLAN
SCALE 1:250

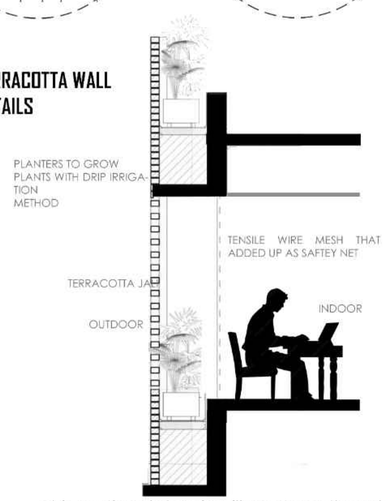
LEGEND

1. Entry (Visitor Building)
2. Reception
3. Auditorium
4. Staircase/ Elevator
5. Toilet (M/F)
6. Kitchen
7. Cafeteria
8. food court
9. Entry (Main Building)
10. Reception
11. Staircase/ Elevator
12. Waiting area
13. Toilet (M/F)
14. Pantry
15. Meeting room
16. Work Space
17. Entry (Residential Building)
18. Reception
19. Locker Room
20. Staircase/ Elevator
21. Toilet (M/F)
22. Gym
23. Activity Space
24. ATM

Activity & Respite (Well-being Zone)
This zone supports physical and mental wellness through, A gym, indoor games arena, yoga/meditation pods.Also houses residential suites for visiting dignitaries or guest researchers, offering privacy.

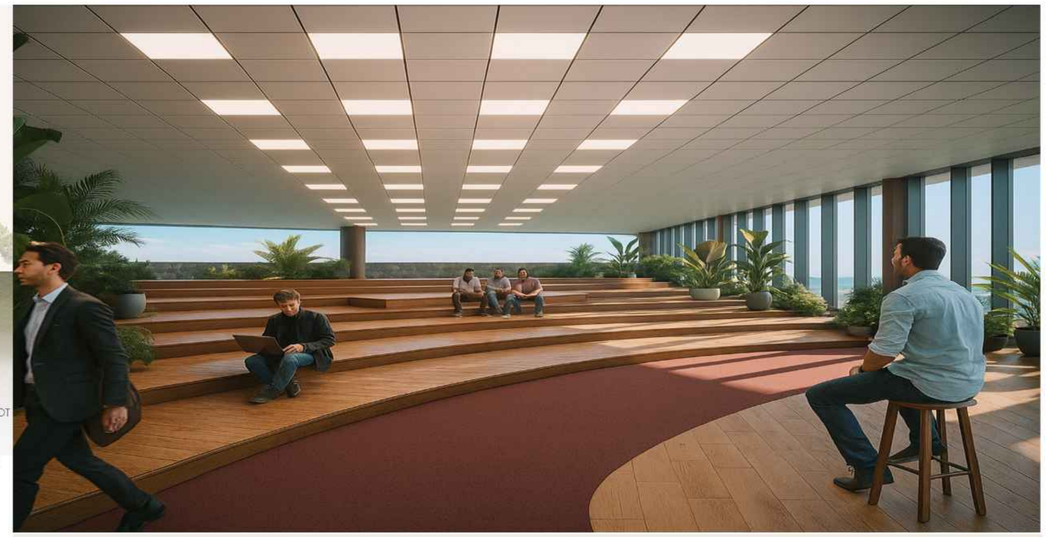


TERRACOTTA WALL DETAILS

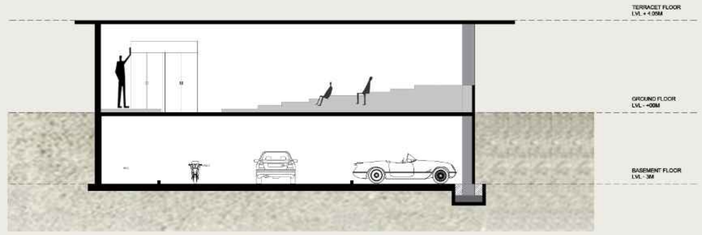


This sectional drawing illustrates a thoughtful integration of terracotta jali, vertical greenery, and passive design strategies within an office space. The jali acts as a breathable facade element, enabling ventilation and light diffusion while providing privacy. In front of the jali, planters with a drip irrigation system support climbers, contributing to microclimate regulation and aesthetic appeal. A tensile wire mesh is introduced between the jali and interior, functioning as a safety net—an innovative feature enhancing security without disrupting visibility or airflow. The section distinctly separates outdoor and indoor zones, showcasing how traditional materials and modern systems blend seamlessly to foster sustainable and biophilic workspace design

SECTION BB'
SCALE 1:250



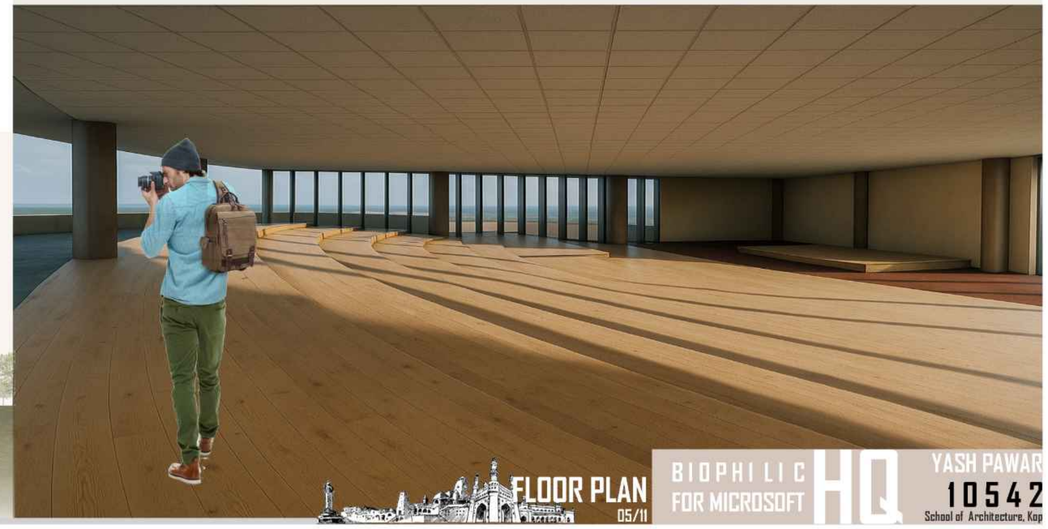
INTERNAL VIEW OF AUDITORIUM

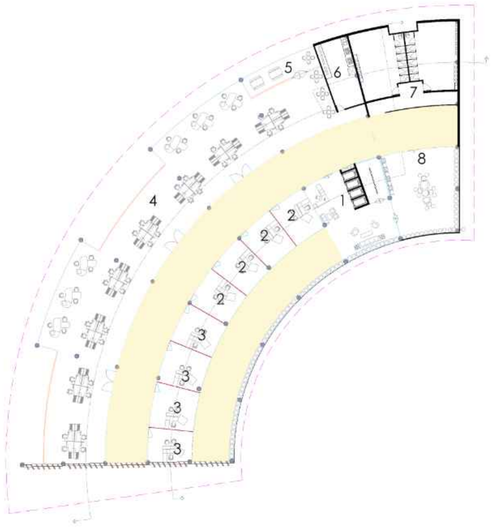


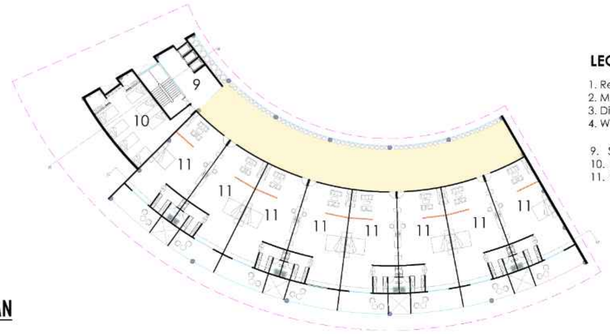
SECTION AA'
SCALE 1:250

SECTION BB'
SCALE 1:250

INTERNAL VIEW OF AUDITORIUM



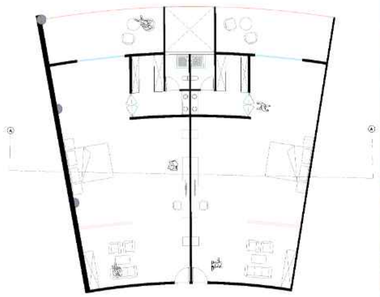




SECOND FLOOR PLAN
SCALE 1:250

GUEST RESIDENCE

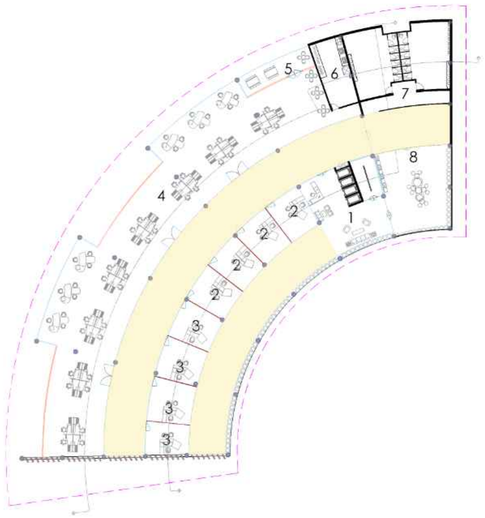
SECTION



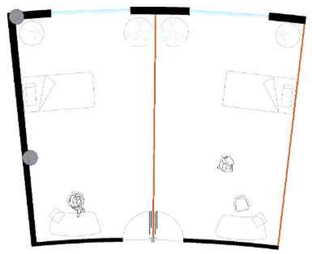
PLAN

LEGEND

1. Reception/ Elevator
2. Manager Cabin
3. Directors cabin
4. Work space
5. Open Dinning space
6. Pantry
7. Toilet (M/F)
8. Recreational space
9. Staircase/ Elevator
10. Toilet (M/F)
11. Guest Suites



PLAN OF PANIC ROOM



PLAN

LEGEND

1. Reception/ Elevator
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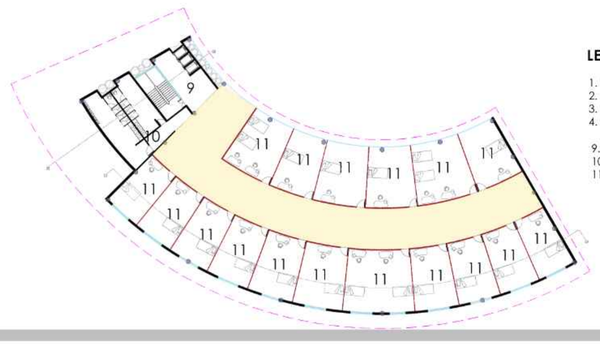
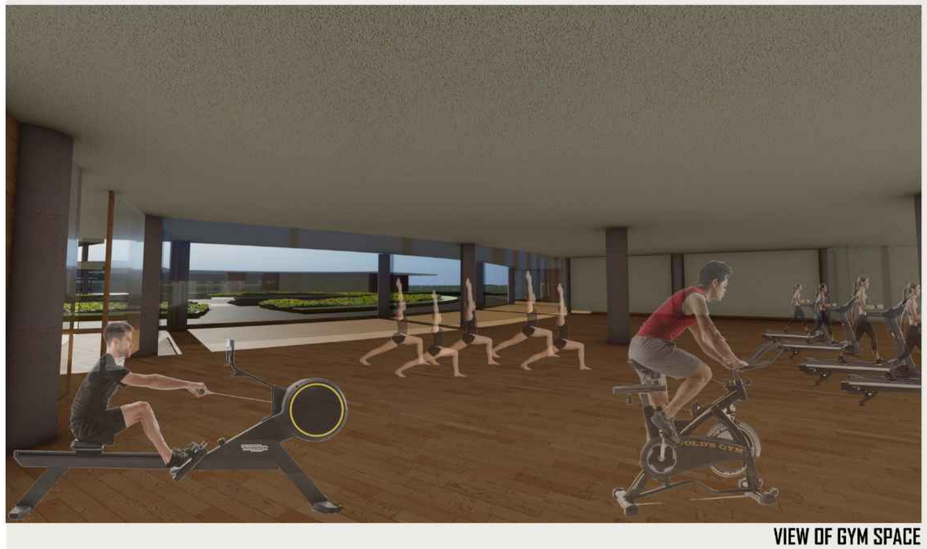
8. Recreational space
9. Staircase/ Elevator
10. Toilet (M/F)
11. Panic/Distress Room



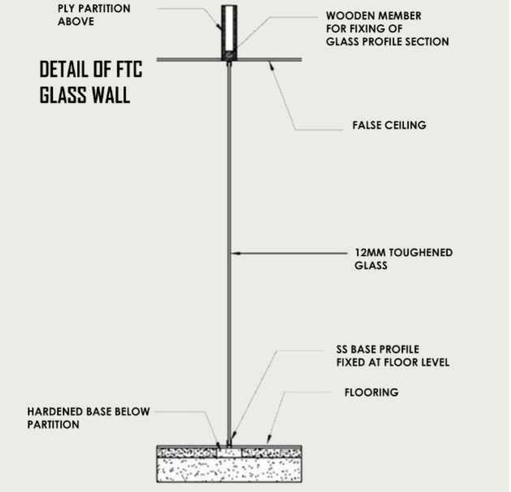
FIRST FLOOR PLAN
SCALE 1:250

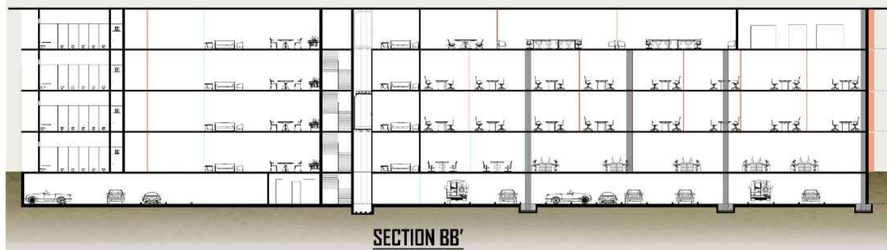
VIEW OF EXTERNAL LOBBY

The glass facade: The most important architectural feature of the office space is the floor-to-ceiling glass partitions with no visible metal trim from top to bottom, which necessitated the soffits being the same size as the office so the glass could recess above the ceiling line. The continuous slab recessing from the grid to the grid is an unlikely candidate

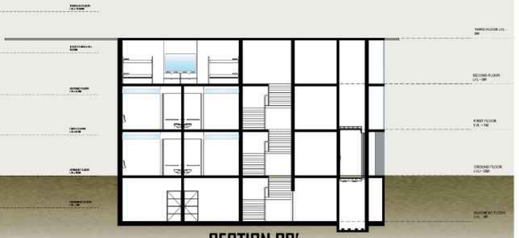


VIEW OF GYM SPACE





SECTION BB'
SCALE 1:250

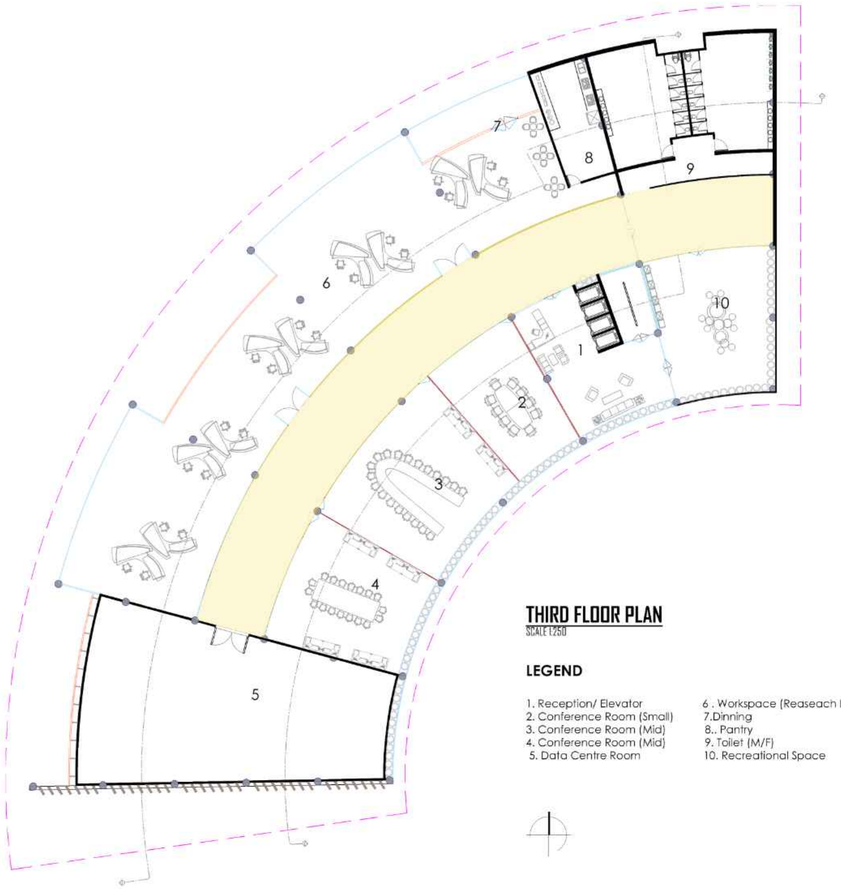


SECTION BB'
SCALE 1:250

FLOOR PLAN
06/1

BIOPHILIC FOR MICROSOFT HQ

YASH PAWAR
10542
School of Architecture, Kap



THIRD FLOOR PLAN

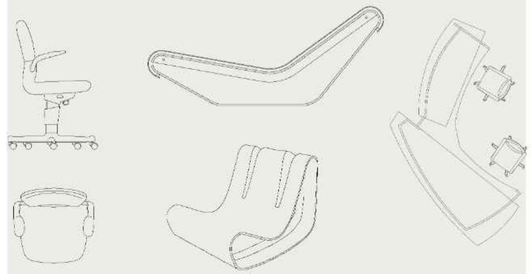
SCALE 1:250

LEGEND

1. Reception/ Elevator
2. Conference Room (Small)
3. Conference Room (Mid)
4. Conference Room (Mid)
5. Data Centre Room
6. Workspace (Reaseach Lab)
7. Dinning
8. Pantry
9. Toilet (M/F)
10. Recreational Space

MODULAR FURNITURE

Furniture plays a vital role in enhancing employee productivity, health, and overall satisfaction at the workplace. Ergonomically designed furniture helps reduce physical strain, prevent common health issues like back pain, and promotes better posture, which leads to increased focus and fewer absences. Providing employees with a comfortable and well-organized workspace improves morale and encourages a more positive work culture. Additionally, offering free workspace and modular furniture adds flexibility, allowing employees to personalize their environment and collaborate more effectively. Modular setups also support changing team sizes and work styles, making them a smart long-term investment for modern offices.



The images demonstrate key principles of biophilic architecture, particularly the visual and physical connection with nature within workspace design. Large glass walls offer expansive views of greenery and natural light, creating a calming and inspiring atmosphere. Interior spaces incorporate natural materials, soft lighting, plants, and organic forms, fostering a closer bond between people and their environment. Outdoor areas and green zones encourage movement, relaxation, and interaction with nature, supporting mental well-being and creativity. These elements together reflect a strong commitment to bringing nature into daily work life, enhancing both productivity and employee satisfaction.

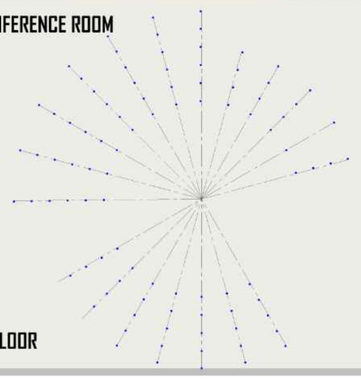
HVAC LAYOUT OF W BUILDING

- Air outlet
- Return Vent
- Supply Vent
- Return Duct
- Supply Duct

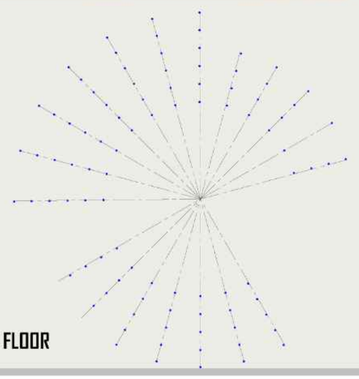
IMAGE OF CONFERENCE ROOM

IMAGE OF WORKSPACE

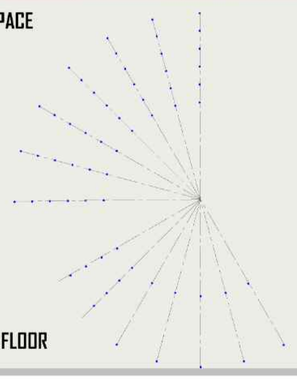
IMAGE OF WORKSPACE



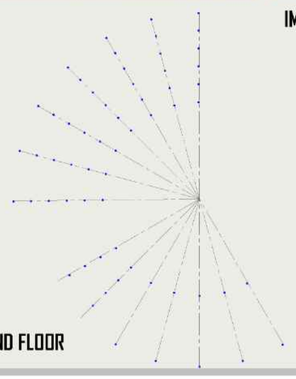
BASEMENT FLOOR



GROUND FLOOR



FIRST FLOOR

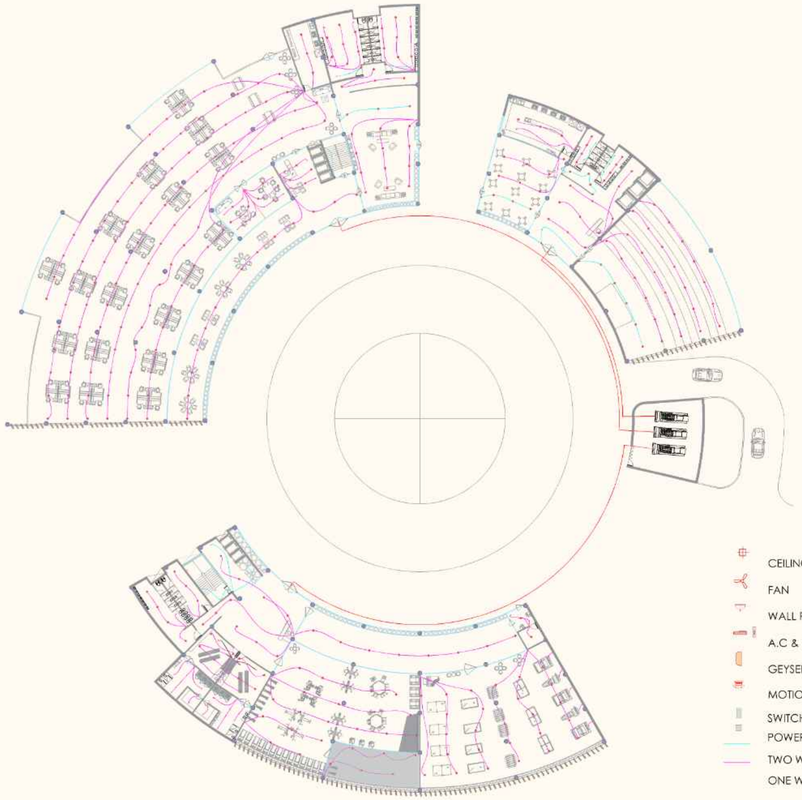


SECOND FLOOR

THIRD FLOOR

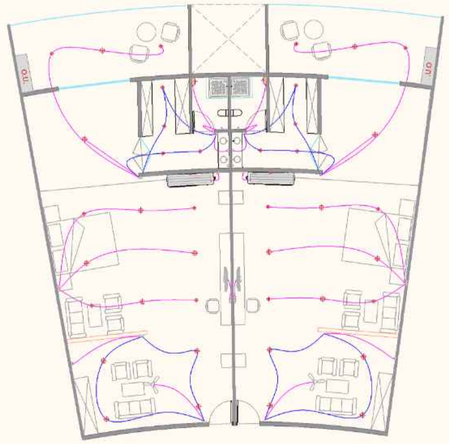
RADIAL COLUMN GRID

The columns are noted to have a diameter of 600 mm, indicating substantial structural capacity suitable for supporting large roof spans or upper floors. The radial grid enhances both structural efficiency and visual harmony, distributing loads symmetrically and allowing for open, dynamic interior spaces.

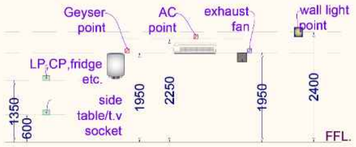


CEILING POINT
FAN
WALL POINT
A.C & OUTLET
GEYSER
MOTION SENSOR
SWITCH BOARD
POWER POINT
TWO WAY
ONE WAY

ELECTRICAL LAYOUT
SCALE 1:250



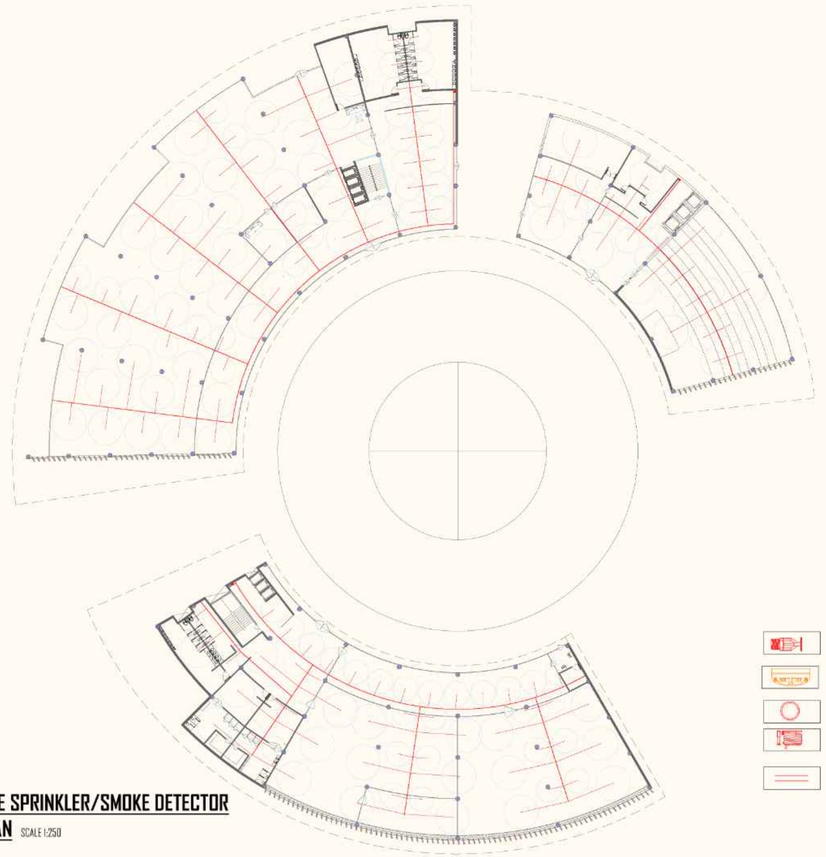
ELECTRICAL LAYOUT OF RESIDENCE UNIT
SCALE 1:50



SECTIONAL ELEVATION

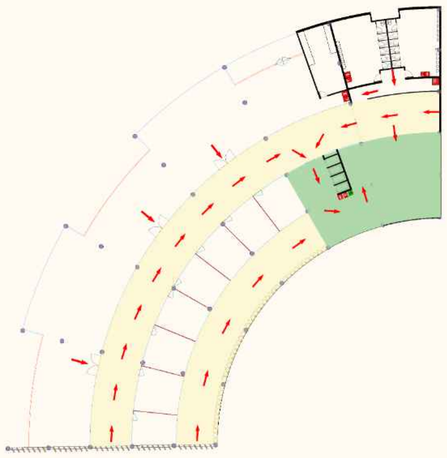
AIR OUTLET
RETURN VENT
SUPPLY VENT
RETURN DUCT
SUPPLY DUCT

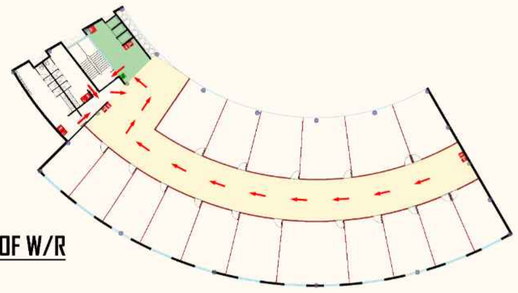
HVAC OF V BUILDING
SCALE 1:150



FIRE SPRINKLER
SMOKE DETECTOR
FIRE WATER PIPR 150 MM
FIRE HOSE AND PIPE
FIRE SPRINKLER PIPE 50M

FIRE SPRINKLER/SMOKE DETECTOR PLAN
SCALE 1:250





FIRE ESCAPE PLAN OF W/R BUILDING
SCALE 1:250

Static (Underground/Terrace) Water Storage Tank (per NBC Part 4 & model bye-laws)
• Must provide at least one static storage tank exclusively for fire-fighting
• Tank(s) can be underground or at terrace level, using concrete, steel, or masonry.
• The effective tank capacity must meet NBC's Table 7 requirements (varies by building area/occupancy). For commercial office buildings, typical sizing is 100,000⊠L + (2,250⊠L/min × 60⊠min) = 235,000⊠L (based on standard design formula)
• Tanks must be split into 2 or more interconnected compartments (to allow maintenance without loss of supply)
• Provide overflow arrangement into domestic supply to prevent stagnation • Top slab requirements:
• Underground tanks cannot exceed 7⊠m below fire service draw-off point, with outlet within 5⊠m of wall.
• Slab must sustain vehicular loads: at least 45⊠t for high-rise, 22⊠t for low-rise
• Must include fire brigade inlet (static supply): four 63⊠mm male inlets via ≥150⊠mm pipe for a flow of 2,250⊠L/min, connected near street level

FIRE EXIT
FIRE EXSTINGUISHER
FIRE HYDRANT
FIRE ALARM
FIRE EVACUATION HORN

SERVICE LAYOUT
08/11

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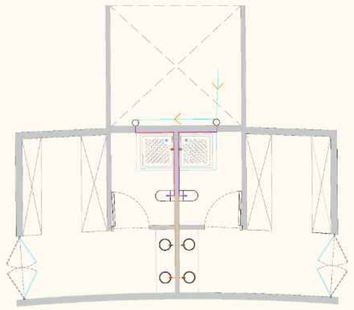
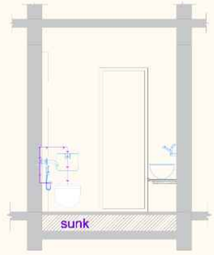
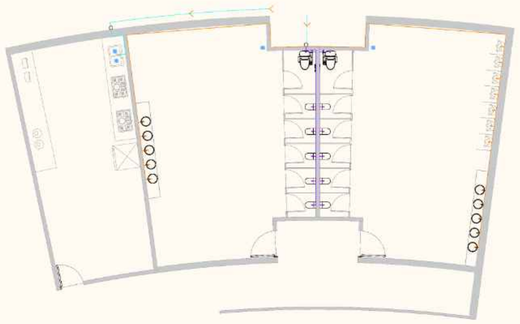


PLAN OF R UNIT TOILET
SCALE 1:50



SECTIONAL ELEVATION
SCALE 1:50



PLAN OF W TOILET
SCALE 1:200

SECTION OF WATER FLOW

WATER CONSUMPTION CALCULATION

4.1 Water Consumption
(Sourced from NBC)

Type of building Consumption/day (in litres)
Offices 45 per head
Hotel (up to 4 star) 180 per head
Restaurants 70 per head
Cinemas, Concert Halls & Theatres 15 per seat
Visitors 15 per head
Table 5 Water consumption based on type of building

Offices
Area/person = 10 sq.m (as per engineeringtoolbox.com)
Approx. total area = 8524 sq.m
No. of occupants = 1,700
People occupying miscellaneous spaces = 160
Total no. of people = 1,860
Total water consumption = 83,700 litres

Guest Accommodation
8 rooms; on full occupancy = 16 people
Total water consumption = 720 litres

Restaurants
50 people in restaurants, 50 people in food courts
Total no. of people = 100
Total water consumption = 4,500 litres

Visitor Centre
500 capacity
Total water consumption = 7500 litres

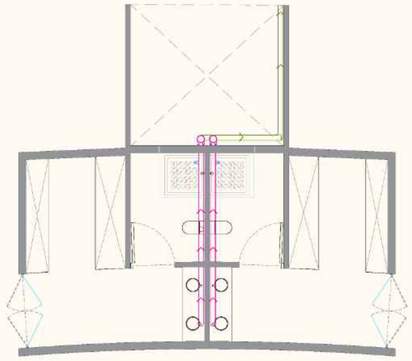
Total water required = 96,420 litres

RAIN WATER HARVESTING CALCULATION

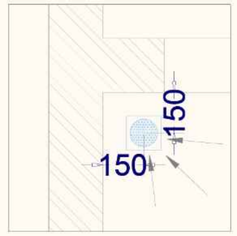
4.2 Rain Water Harvesting

Usable rain water from the Roof
Roof catchment area = 4538 m²
Volume of rainfall = 4538 × 0.828
= 3757.464 m³
= 37, 57,464 litres
For efficiency the roof has a cement flooring, Run off Coefficient = 0.7 – 0.95
Efficient rain water quantity that can be harvested is
= 0.8 × 0.8 × 3757464
= 2,404,776.96 litres

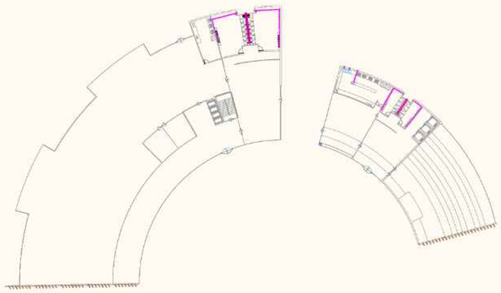
Total Rain water that can be used 2,404,776.96 litres

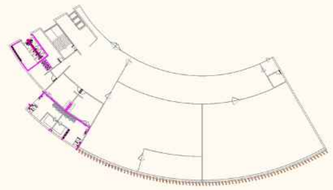


PLAN OF R UNIT TOILET
SCALE 1:50

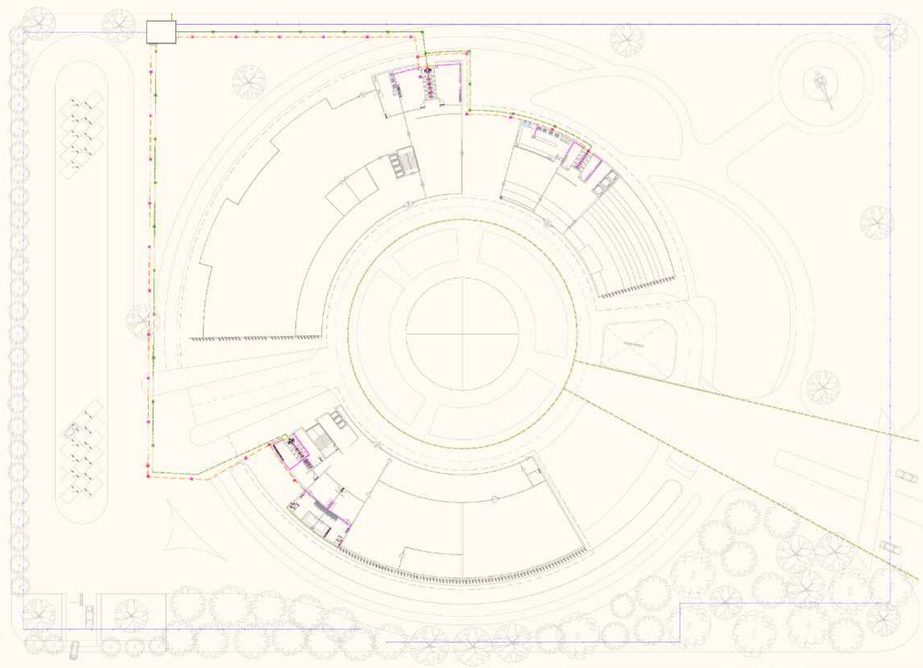


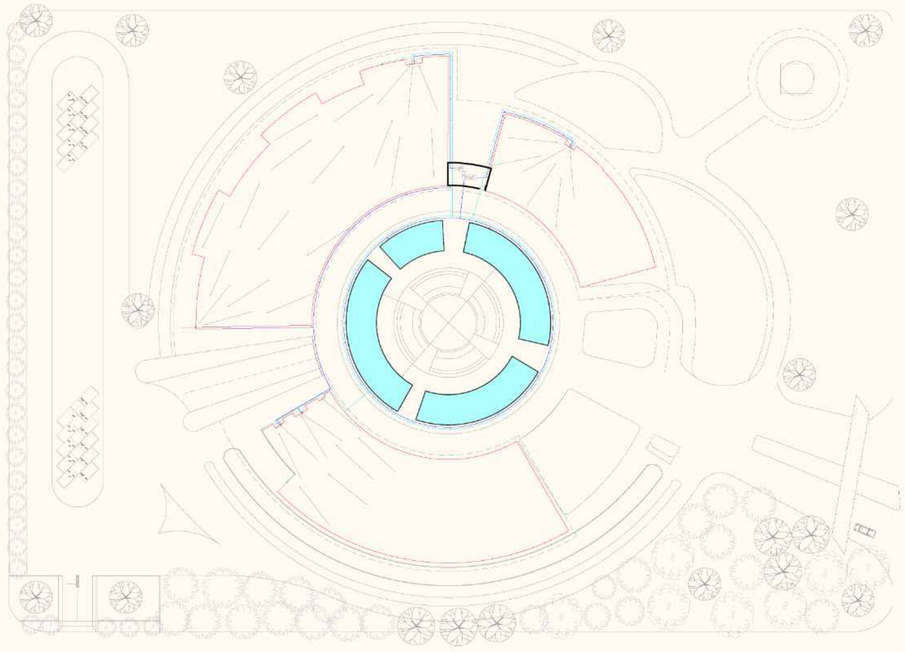
DETAIL OF NAHANI TRAP
SCALE 1:50





KEY PLAN





RAIN WATER HARVESTING LAYOUT
SCALE 1:500

SITE PLUMBING AND DRAINAGE LAYOUT
SCALE 1:500

SERVICE LAYOUT
09/11

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ELECTRICITY REQUIRED

Electricity Requirement for the Building
Built-up Area: 14,125 m²
Building Type: Tech Company

Average Energy Consumption (Commercial Office):
150–250 kWh/m²/year (depends on cooling, lighting, computing)

Assuming **200 kWh/m²/year:**

Annual Requirement
= 14125 × 200
= 2,825,000 kWh/year

Annual Requirement =14125 × 200 = 2,825,000 kWh/year

Electricity Generation from Solar PV Glass
Glass Area available for PV: 1137 m²
Location: Hyderabad (India)

Solar Irradiance (GHI): 5.5 kWh/m²/day (average Global Horizontal Irradiance for Hyd)
Efficiency of PV Glass: ~10% (typical for semi-transparent BIPV glass; can vary from 6–12%)
Performance Ratio (PR): ~0.75 (accounts for system losses)

Formula for Energy Generation (kWh/year):
Annual Energy=A×GHI×η×PR×365

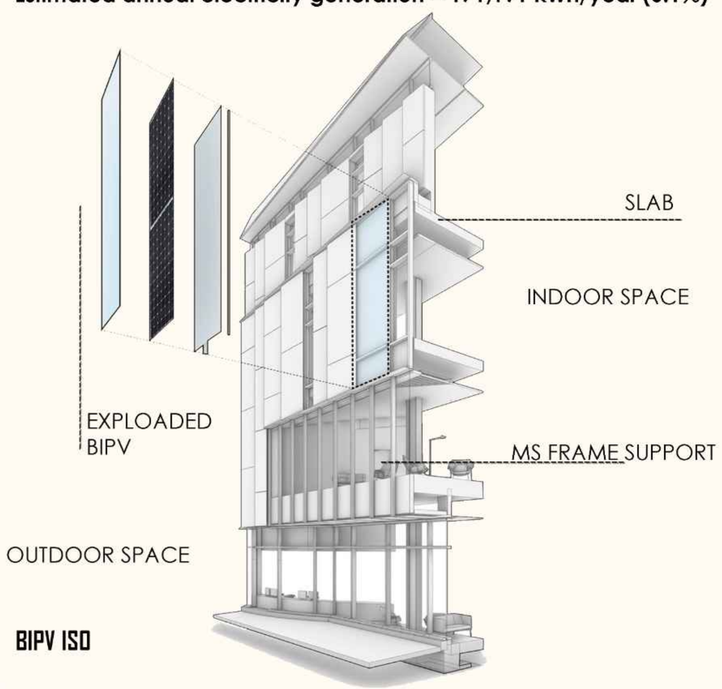
Where:
A = Area of PV glass (m²)
GHI = Global Horizontal Irradiance (kWh/m²/day)
η = Efficiency of PV glass (decimal)
PR = Performance Ratio (decimal)

Calculation:

Annual Energy

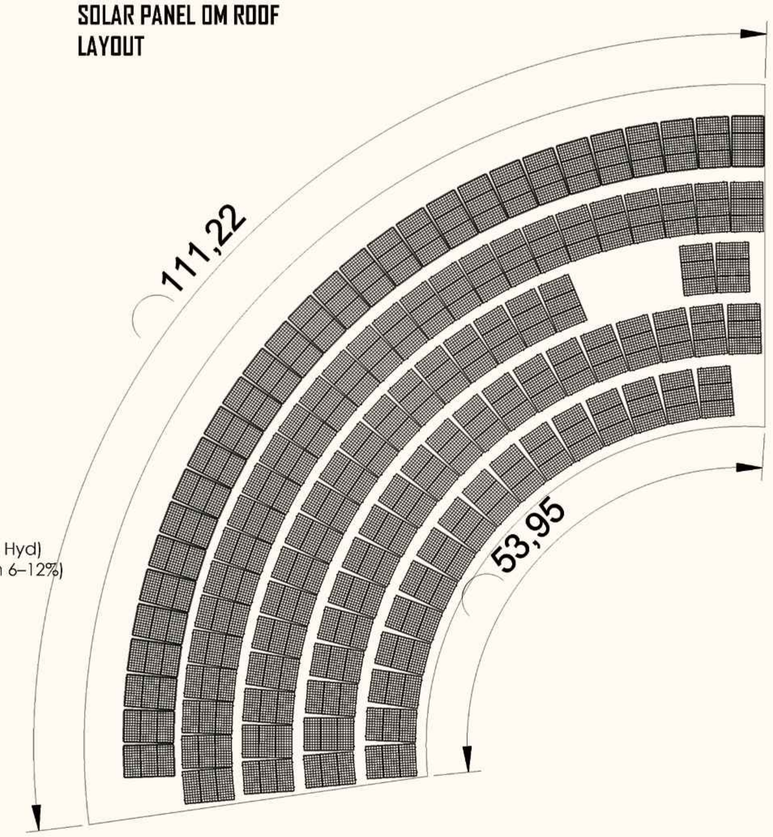
=1137×5.5×0.10×0.75×365
=1137×0.4125×365
=1137×150.56
=171,191 kWh/year

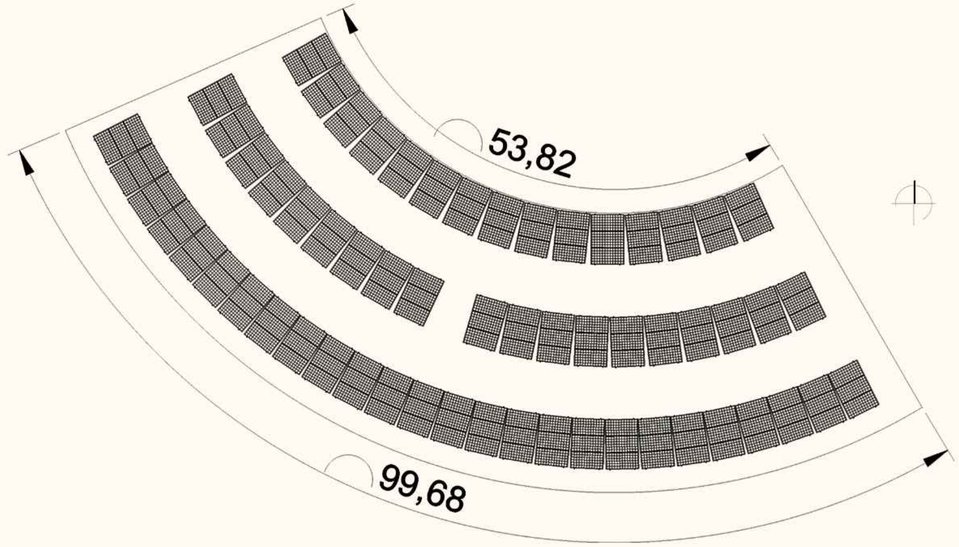
Estimated annual electricity generation = 171,191 kWh/year (6.1%)

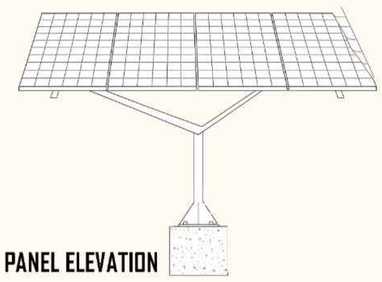


BIPV ISO

SOLAR PANEL OM ROOF LAYOUT

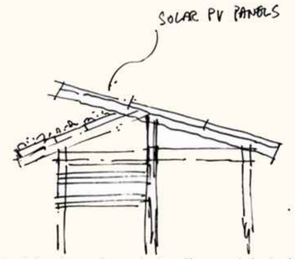






SOLAR PANEL ELEVATION

SOLAR PANEL ISO



In Hyderabad, India, which is in the Northern Hemisphere, solar panels should ideally face true south to receive the maximum sunlight throughout the year.

Key Details:
Direction: True South
Area : 10 sq.m

Tilt Angle: Approximately 17° to 20° (equal to Hyderabad's latitude, ~17.4°) for optimal year-round performance.

Reason: South-facing panels get the most consistent exposure to sunlight from morning to evening.

ELECTRICITY GENRATED

Rooftop area available: 4700 m²

Solar panel type: High-efficiency mono PERC (e.g., 19–21%)

Panel installation efficiency: **75% usable area** after spacing, maintenance, shadows

Solar irradiance (Hyderabad): **5.5 kWh/m²/day**

Performance Ratio (PR): **0.75**

Usable Area for Solar Panels:
Usable Area = 4700 × 0.75 = **3525m²**

Installed Capacity: Assuming 1 kW of panels needs -**10 m²**

Capacity (kWp)= 3525/10 = 352.5 kWp

Annual Energy Generation:
Annual Energy (kWh)= 352.5 × 5.5 × 0.75 × 365
= 352.5 × 150.56
= 53,073 kWh/month
= 636,876kWh/year

Estimated Annual Generation = 636,876 kWh (22.5%)

Combined BIPV + Rooftop System Summary
Component Size (kWp) Annual Generation (kWh) Approx. % of Building Demand

BIPV Glass = 113.7 = 171,191 - 6.1%
Rooftop PV 352.5 = 636,876 -22.5%

Total 466.2808,067 = 28.6%

Rooftop System Cost & Payback

Cost Estimate:
Rooftop PV cost (2025 India): 45–55/W (commercial scale)

Assume 50/W = 50,000/kWp

Cost = 352.5 × 50,000 = 1.76Cr

Annual Savings:
8/kWh × 636,876 = 50.95 lakh/year

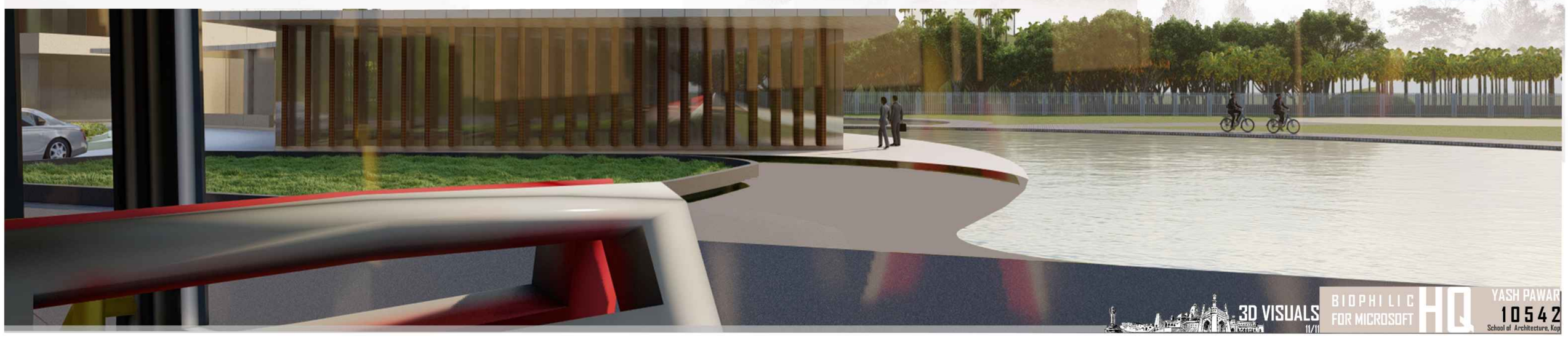
Payback Period:
Payback= 50.95 lakh / 1.76 Cr
=3.45 years

Rooftop system payback: 3.5 years

BIPV + Rooftop total payback: 6.5 –7 years (weighted average)

Final Summary

Parameter	Value
Glass BIPV System Size	= 113.7 kWp
Glass BIPV Annual Gen.	= 171,191 kWh
Rooftop PV System Size	= 352.5 kWp
Rooftop Annual Gen.	= 636,876 kWh
Total Annual Solar Gen.	= 808,067 kWh
Building Annual Demand	= 2,825,000 kWh
% Demand Met by Solar	= 28.6%
Combined System Cost 1.71 Cr (BIPV) + 1.76 Cr	= 3.47 Cr
Weighted Payback	= 6.5 – 7 years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