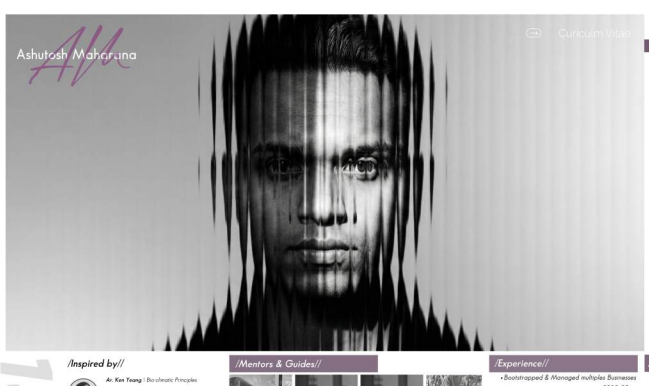
/CurrriculumVitae//



Hello!

I am Ashutosh Maharana Final year Architecture Student.I view the buildings not as a static monument, but as a metabolistic system that must breathe and adapt. My design methodology is rooted in bioclimatic logic, where I replace decorative sustainability with performative geometry. *I aspire to become a green architect who moves beyond 'efficiency' toward a symbiotic model of architecture, where biomimetic forms and high-performance facades actively restore the urban environment.*

During my professional training at Architect Hafeez Contractor, I applied this lens to large-scale projects, focusing on how environmental simulations can dictate structural form. I am driven by the challenge of solving high-density urban issues through passive cooling and carbon-conscious engineering. My goal is to leverage digital precision and technical rigor to design the next generation of resilient, climate-responsive landmarks that harmonize the skyline with the natural ecosystem.

Software Skills

AutoCAD – Drafting	3D Modeling	Rhino – Render Engine	3D Modeling	Simulation
Ai – Illustrations	Ps – Presentation	Ae – Walkthrough Post-production	Pr – Walkthrough Post-production	Id – Composition
Dlubal – Wind Simulations	Wind Simulations	Mapping	CINEALITY – 3D Printing	Microsoft Office Tools

/Inspired by//

- **Ar. Ken Yeang** | Bio-climatic Principles
  Focus: Ecology and the 'Living' Skyscraper
  'We should design the built environment as a living system, not just as a set of inanimate objects.'
- **Ar. Hafeez Contractor** | Urban Scale & Form
  Focus: Urban Ambition and Skyscrapers
  'I want to change the skyline of the city... give it a new face, a new life.'
- **Ar. Moshe Safdie** | Vertical Urbanism
  Focus: Nature and High-Density Living
  'For everyone a garden... we must find a way to make the high rise a more human environment.'

/Mentors & Guides//

/Experience//

- Bootstrapped & Managed multiples Businesses 2018-23

Skillset acquired -
- Negotiations
- Business tactics
- Time management
- Strategy & Analytics
- Accounting
- Marketing
- Client & Publics Relationships
- Cash Flow Management
- Administration
- Market Analysis

- Freelance Interior work with Firms 2024-25

Skillset acquired -
- Interior details
- Costings & Documentation
- Site supervision
- Visualisation skills

- Internship at Ar. Hafeez Contractor firm 2025-25

Skillset acquired -
- Technical drawings
- 3D Modelling (Large Scale)
- Rendering (Large scale)
- Post production
- Site Supervisions
- Time-management

/Hands-on Project Experiences//

Residential & Redevelopment
- MHADA, Malad Malvani SRA, Malad, Maharashtra
- Residential Development at Ambivali, Ambivali, Maharashtra
- Sugee Siddheshwar, Siddheshwar, Maharashtra
- Vashi Redevelopment House, Maharashtra
- Juhu Gali Gilbert Hill Redevelopment, Juhu, Maharashtra
- ***MP. MLA Housing_CIDCO,*** Maharashtra
- Runwal Dombivali, Dombivali, Maharashtra
- Residential Development at Calicut, Calicut, Kerala
- Dharavi Redevelopment, Dharavi, Mumbai
- ***IM Buildcon 212m,*** Borivali, Maharashtra
- Mahapret at Thane URC, Thane, Maharashtra
- CIDCO, Thane
- Park Mansion, Apeejay, Kolkata

Institutional & Public Infrastructure
- ***High Court of Bombay, Bandra, Maharashtra***
- BKC, HSRC, BKC, Maharashtra
- MSRTC Naloseapora, Maharashtra
- Mahalaxmi Racecourse, Mumbai, Maharashtra

Educational & Healthcare
- Evreschool Dombivali, Dombivali, Maharashtra
- Apeejay School, Thane, Maharashtra

Hospitality & Cultural
- Meditation Center, Apeejay Groups, Thane, Maharashtra
- Venkatesh Hospitality, Varanasi

/Competitions//
- INDIAG
- Transparence
- Solar Decathalon
- CTBUH International Student Tall Building Design Competition
- ANDC

/Details//

- Ashutosh Maharana
- 14th April 2002
- Odisha, India
- +91-9111066665
- ar.ashutoshmaharana@gmail.com

/Languages

- English
- Hindi
- Odia
- Bengali

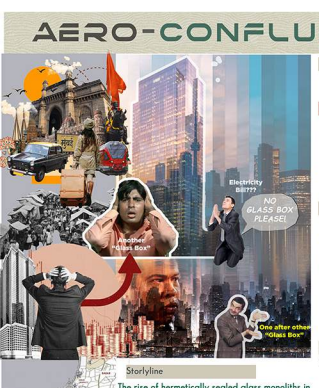
/Educational Qualification//

2006 - 2020	10th	Delhi Public School Damanjodi
2006 - 2020	12th	Delhi Public School Damanjodi
2021 - 2026	B.arch	Piloo Mody College of Architecture, Cuttack

/Interests//
- Skyscrapers
- Vertical Urbanism
- Rendering
- Art & Music
- Perfumes
- Cooking
- Pool production

/Ideologies//
- Performance oriented design.
- Nature takes its own Form.
- Innovation is always the best option.

1140402



Storyline

The rise of hermetically sealed glass monoliths in Asian megacities, particularly in a coastal metropolis like Mumbai, represents an architectural paradox: the transplanting of a temperate-climate aesthetic into a tropical reality. These 'glass boxes' are thermally transparent, allowing short-wave solar radiation to penetrate the interior effortlessly. Once inside, this energy is absorbed by floors and ceilings and re-radiated as long-wave heat, which the glass then traps. This creates a relentless 'greenhouse effect' that keeps internal temperatures soaring far above the outdoor ambient. To counteract this, developers install massive HVAC systems that work around the clock—often on the sun-facade—to remove the heat that the building's own envelope invites. This cycle of energy into the building at a rate that traditional masonry or stone simply wouldn't allow.

Thermal mismanagement triggers a catastrophic chain reaction in urban infrastructure. To maintain a habitable indoor environment of 24C against a humid 34°C exterior, these buildings rely on massive HVAC (Heating, Ventilation, and Air Conditioning) plants that operate 24/7. These systems are the primary drivers of Mumbai's electricity shortage, often consuming over 60% of a high-rise's total energy budget. Because the buildings are 'hermetically sealed,' there is zero natural ventilation; the moment the power fails, the indoor temperature can spike by 5°C to 10°C within an hour, turning luxury residences into uninhabitable glass ovens. Furthermore, these cooling systems require immense volumes of water for their cooling towers to dissipate heat. In a city where water is already a precious commodity, high-rises often divert municipal supplies or rely on a thermoelectric 'water metro' to sustain their depleting flood water table.

The environmental toll extends beyond the building's footprint. These monoliths are **thermal polluters**, releasing massive amounts of waste heat directly into the narrow street canyons below. This contributes heavily to the **Urban Heat Island** (UHI) effect, where the city's center becomes significantly hotter than its rural surroundings. In a hot and humid marine climate, this is compounded by the 'wind shadow' effect. High-rises built in dense clusters block the life-giving land and sea breezes that historically cooled Mumbai. This lack of airflow traps humidity and vehicular pollutants (PM2.5 and NO2) at the pedestrian level, creating a stagnant, unhealthy microclimate.

Ultimately, these buildings are responsible for nearly half of a city's carbon emissions through operational energy. The **'monolith' design ignores the local vernacular**—which traditionally utilized deep overhangs, verandas, and porous envelopes in favor of a globalized image of 'progress.' For a coastal city already grappling with rising sea levels and extreme humidity, the reliance on sealed glass is not just an aesthetic choice; it is an ecological liability that threatens the long-term resilience of the urban fabric.

Worli is a premier seaside neighborhood in South Mumbai, famous for its upscale high-rises and the iconic Bandra-Worli Sea Link. It blends modernity with history, featuring the 17th-century Worli Fort, the traditional Koli fishing village, and a picturesque promenade offering breathtaking views of the Arabian Sea sunset.

Project Overview

This thesis aims to design a Bio-climatic Mixed-use Skyscraper.

Design Objectives

i. To design thermally comfortable & well ventilated spaces.
ii. To design a facade to minimize cooling loads on building.
iii. To design fastest means of Vertical transport in a mixed-use medium.
iv. To design form of skyscraper which minimizes effects from turbulence, gusts & Vortex shedding.

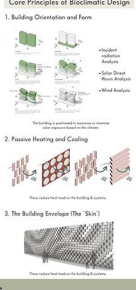
What's a Bio-climatic Building?

Unlike modern 'sealed' monoliths that rely on mechanical power to fight the environment, **bioclimatic architecture** works with the environment to minimize energy consumption and reduce CO2 emissions.

Bioclimatic building is a structure designed based on the local climate to provide thermal comfort by making use of natural environmental resources.

Core Principles of Bioclimatic Design

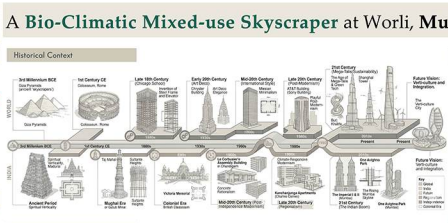
1. Building Orientation and Form



2. Passive Heating and Cooling

3. The Building Envelope (The 'Skin')

Historical Context



Population Analysis of Mumbai

Issues Identified (for skyscrapers)

1. Total Dependence on HVAC causing extreme Energy Demands
2. No proper Analysis & utilisation of Sun & Wind.
3. Inefficient & Slow Vertical Transportation Network
4. Poor water management & Grey water recycling
5. Sealed Glass Monolith host the urbanscape.

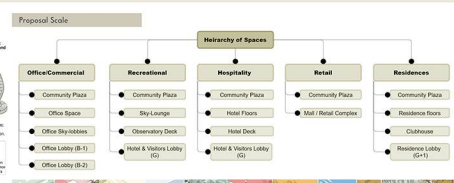
4W-1H Aspect

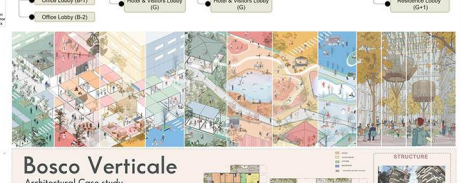
What?	Why?	Where?	Who?	How?
Its a Prototype of a Bio-climatic Mixed-use Skyscraper which could exist in the Coastal Hot & Humid Climatic Conditions like in Mumbai.	Its to reduce the Building Heating & Cooling loads. Maximise energy generation, reduce complete dependance on HVAC-mechanical systems.	Its located in Worli, Mumbai. Specifically in the Worli Seaface promenade connecting Coastal Road. This project works on the lands of Worli Dairy.	It caters to mixed variety of users. Commercial & Residential activity interacted users, for hospitality sector & ultra-luxurious residences.	Its possible through Bio-climatic & sustainable practices like Solar energy generation, heat soaking & porous facade, Maximise ventilation, Maximise ventilation for cooling.

Issues Identified (In Mumbai)

1. Hot & Humid Coastal climate makes dependent on HVAC.
2. Rain-water Harvesting & Rain absorbing designs are inefficient.
3. Inefficient & Slow Vertical Transportation Network
4. Water issues on supply, demand & regeneration.
5. Sealed Glass Monolith host the urbanscape & surroundings.

Proposal Scale

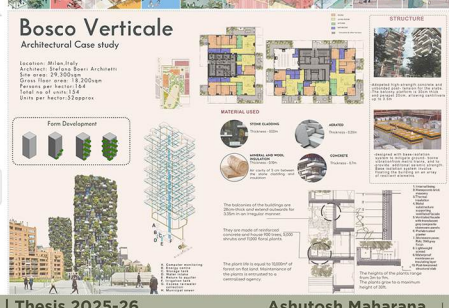




Bosco Verticale

Architectural Case study

Location: Milan,Italy
Architect: Stefano Boeri Architetti
Site area: 29,300sqm
Built area: 1,10,000sqm approx
Persons per hector:164
Total no of units:334
Units per hector:32approx



Shanghai Tower

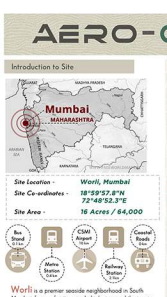
2015 Gensler 128 Floors 632 m Height

Inferences Drawn

1. To use Central core as Spine of the building.
2. To use Perimeter columns with outriggers & belt trusses for stability.
3. To use atrium level as ventilating spaces for the tower.
4. To use facade in a Tube-in-Tube design way to tackle wind load & heat-gain.
5. Plantation can be done at high rises with adequate structural needs.
6. All the terrace gardening must be done with Water proofing & root inhibitors .
7. There are multiples lifts of multiple hangaries going to different blocks for faster vertical transportation.
8. Seismic zoning along with its precautions are a must.
9. Fire zoning & evacuation is a must.
10. Water can be reused within the tower for more efficiency.

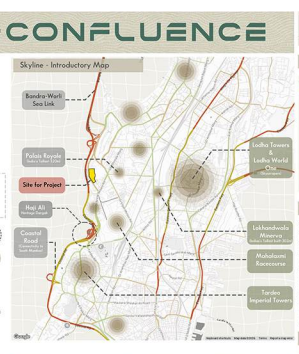
Literature, Data Collection & Analysis | ABIT-Piloo Mody College of Architecture, Cuttack | Thesis 2025-26 | Ashutosh Maharana | Guide - Chinmay Ku. Mohanta | Regd no. 2102295015 | 10th Sem

Introduction to Site



Site Location - Worli, Mumbai
Site Co-ordinates - 18°59'57.8"N 72°48'52.3"E
Site Area - 16 Acres / 64,000

Skyline - Introductory Map



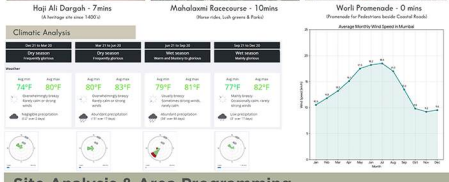
Places Near the Site

Haji Ali Dargah - 7 mins (A heritage site since 1400's)

Mahalaxmi Racecourse - 10mins (Horse rides, Lush greens & Parks)

Worli Promenade - 0 mins (Promenade for Pedestrians beside Coastal Roads)

Climatic Analysis



Skyscraper Morphology

Development Plan 2034

The site comes under Government Reserved Land for Govt. Purposes.

MMRDA proposes to build a 'ICONIC WORLI' for Mixed-use purpose by redeveloping the abandoned Worli dairy site.

RR Rates (As listed under division 13/96A-
1. Commercial - Rs. 5,54,500
2. Retail - Rs. 5,92,100
3. Residential - Rs. 4,10,630

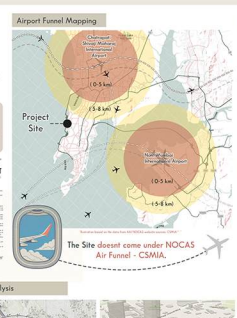
Coastal Regulations

The site comes under CRZ-II

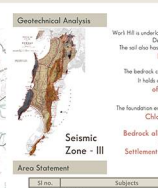
भारत का राजपत्र
The Gazette of India

As to Amendment-2019 of CRZ as of 18th January 2019, the site comes under the Locals Byelaws of the Island City.

Airport Funnel Mapping



Geotechnical Analysis



Worli Hill is underlain by Basalt Rock specifically part of Deccan Trap Basalt flows.
The soil also has Sedimentary bedrock, but mainly has Breccia Bedrock.
The bedrock can be found just 20-25m below GL
It holds a Compressive strength of 40-2173 kg/cm3
The foundation encounters Class1 for Sulphate & Chlorine Concentrations.
Bedrock allowable bearing capacity - 300 tonnes/sqm
Settlement max - 5.2 mm & min -2mm

Detailed Area Program

Area Programme Split — Mixed-Use Skyscraper
Total BUA: 29,00,000 sqm

Level / Split	Sub-zone	Area (sqm)	% of Total BUA
Commercial	Offices	3,25,000	30%
Commercial	Retail	21,500	15%
Commercial	Recreational	21,500	15%
Commercial	Retail	21,500	15%
Residential	Residences & luxury apartments	19,500	15%
Total		2,19,000	100%

Total Recreational BUA: 21,500 sqm

Recreational — Detailed Breakdown

Recreational Component Group	Detailed Component	Area (sqm)	% of Recreational BUA
Entertainment	Multiplex (cinema) with 4 screening zone	7,150	15%
Entertainment	Gaming zone (VR, arcade, gaming zone	3,225	15%
Fitness & wellness	Gym & fitness centre	3,225	15%
Fitness & wellness	Yoga & dance studio	3,225	15%
Fitness & wellness	Spa & wellness centre	3,225	15%
Food & world cuisine	Restaurant / multicuisine food hall	3,225	15%
Food & world cuisine	Cafe & quick bites	3,225	15%
Public circulation & lobby	Entrance lobby & atrium	3,225	15%
Public circulation & lobby	Concourse, lobbies & galleries	3,225	15%
Public circulation & lobby	Circulation & corridors	3,225	15%
Arts & culture	Art gallery / exhibition space	3,225	15%
Arts & culture	Multi-purpose recreational space	3,225	15%
Arts & culture	Amphitheatre	3,225	15%
Shared residential amenities	Clubhouse (indoor lounge, party, multipurpose hall)	7,150	15%
Shared residential amenities	Fitness centre & wellness zone	3,225	15%
Shared residential amenities	Swimming pool & deck	3,225	15%
Shared residential amenities	Children's play area & creche	3,225	15%
Total recreational		21,500	100%

Residential — Detailed Breakdown

Total Residential BUA: 19,500 sqm

Residential Component Group	Detailed Component	Area (sqm)	% of Residential BUA
Apartment clusters	Apartment clusters (2, 3BHK mix)	11,700	60%
Apartment clusters	Apartment clusters (4BHK)	3,900	20%
Apartment clusters	Penthouses & duplex units	1,950	10%
Apartment clusters	Serviced & extended stay units	1,950	10%
Horizontal circulation (low rise)	Residential corridors & lobbies	390	10%
Horizontal circulation (low rise)	Lift lobbies (residential levels)	195	5%
Vertical circulation & services	Residential lifts (passenger + service)	390	10%
Vertical circulation & services	Fire staircases (residential)	195	5%
Vertical circulation & services	Service shafts (MEP, water, gas)	390	10%
Shared residential amenities	Clubhouse (indoor lounge, gym, multipurpose hall)	975	5%
Shared residential amenities	Pool deck & facilities	390	10%
Shared residential amenities	Children's play area & creche	390	10%
Parking support (low rise)	Services (plant room) serving residential	390	10%
Parking support (low rise)	Residential parking (2 levels)	1,950	50%
Total residential		19,500	100%

Hotel — Detailed Breakdown

Total Hotel BUA: 28,080 sqm

Hotel Component Group	Detailed Component	Area (sqm)	% of Hotel BUA
Guest room clusters	Standard rooms (2 queen)	8,424	30%
Guest room clusters	Suites & executive rooms	5,616	20%
Guest room clusters	Presidential suite	1,404	5%
Public areas (F&B)	Lobby & reception	1,404	5%
Public areas (F&B)	Specialty restaurants (2 nos.)	1,404	5%
Public areas (F&B)	All-day dining restaurant	1,404	5%
Public areas (F&B)	Bars, pubs, and lounge	1,404	5%
Public areas (F&B)	Banquet halls & meeting rooms	1,404	5%
Spa & wellness	Spa & wellness centre	1,404	5%
Spa & wellness	Gym & fitness centre	1,404	5%
Spa & wellness	Swimming pool & deck	1,404	5%
Back-of-house & service	Kitchens & food preparation	1,404	5%
Back-of-house & service	Staff facilities & back-of-house offices	1,404	5%
Total hotel		28,080	100%

Retail — Detailed Breakdown

Total Retail BUA: 28,080 sqm

Retail Component Group	Detailed Component	Area (sqm)	% of Retail BUA
Retail circulation	Retail corridors & lobbies	2,808	10%
Retail circulation	Retail lifts & escalators	2,808	10%
Retail circulation	Retail staircases	2,808	10%
Retail circulation	Retail service corridors	2,808	10%
Retail circulation	Retail back-of-house (BOH)	2,808	10%
Retail circulation	Loading docks & service yard	2,808	10%
Total retail		28,080	100%

Office / Commercial Activity - Detailed Breakdown

Total Office BUA: 1,95,000 sqm

Office Component Group	Detailed Component	Area (sqm)	% of Office BUA
Office circulation	Office lobbies & reception	19,500	10%
Office circulation	Corporate lobbies & reception	19,500	10%
Office circulation	Office corridors & lobbies	19,500	10%
Office circulation	Office lifts & escalators	19,500	10%
Office circulation	Office staircases	19,500	10%
Office circulation	Lift zones (passenger & service)	19,500	10%
Office circulation	Service corridors	19,500	10%
Office circulation	Loading docks & service yard	19,500	10%
Office circulation	Office service corridors (offices)	19,500	10%
Office circulation	Office service lifts (offices)	19,500	10%
Total office		1,95,000	100%

Site Analysis & Area Programming | ABIT-Piloo Mody College of Architecture, Cuttack | Thesis 2025-26 | Ashutosh Maharana | Guide - Chinmay Ku. Mohanta | Regd no. 2102295015 | 10th Sem

Concept - Literature

Mumbai was born as an archipelago of shifting creeks, yet its modern skyline has hardened into a wall of inert concrete that ignores its watery origins. **This project seeks to dissolve that rigidity by channeling the ecological intelligence of Thane Creek.** In this coastal wilderness, mangroves and flamingos coexist within a fluid, adaptive boundary—a masterclass in surviving the tide.

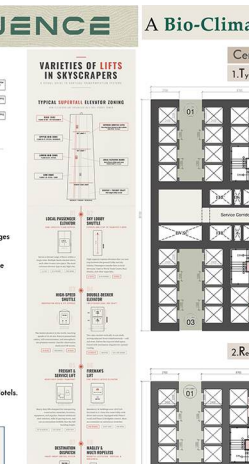
By translating these biological strategies into the built environment, **the project reimagines the skyscraper no**t as a **static monument, but as a breathing.**

Vertical Estuary.

Concept for Project

Vertical Estuary

'Mumbai's skyline is currently defined by static, hermetically sealed glass monoliths that reject their tropical context. The Vertical Estuary challenges this paradigm by reimagining the skyscraper not as an inert object, but as a living metabolic system. The project draws a critical parallel between ecological and urban survival.

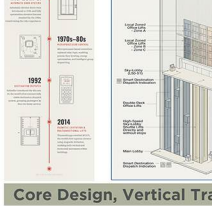


"Just as a mangrove thrives in the volatile interface of land and sea, this tower is designed to thrive in the harsh interface of the metropolis—negotiating heat, density, and pollution through *Quantified Environmental* data."

Simulations to Architectural decisions.

'By analysing daylight hours and solar impact, we refined the building's articulation to mitigate heat gain and maximize natural light & ventilation, ensuring a truly bio-climatic approach.'

'Solar analysis informed the facade strategy, transforming the structure into a bio-climatic design tailored to its environment.'

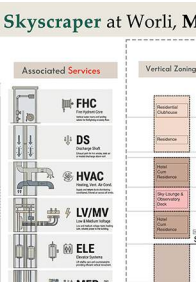


Form Development

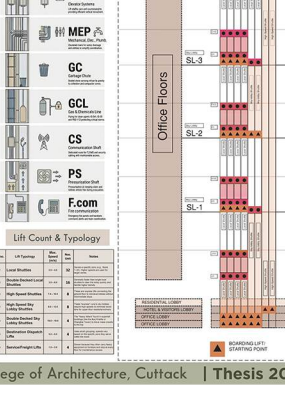
Strategies of Concept Application

1. For the creation of Facade, which doesn't only protect from Sun heat but also keeps the spaces ventilated.
2. For the creation of Site plan & landscaping purposes.
3. For taking architectural decision for Form of buildings.
4. For taking Architectural decisions for internal plannings.

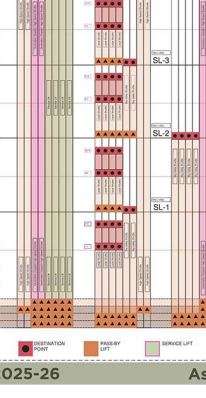
1. Orientation



2. Wind Velocity Factor CFD Simulations



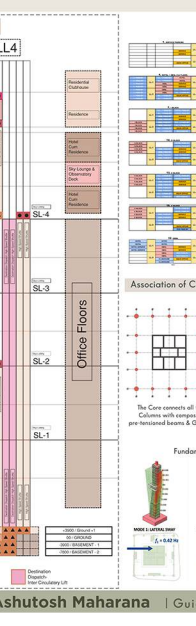
3. Visibility Factor

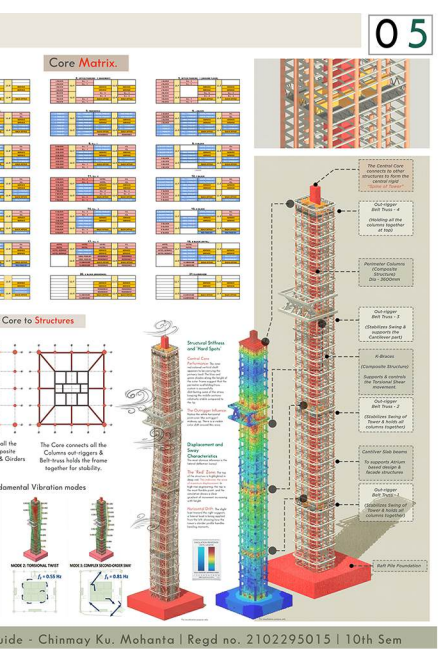


4. Aero-confluence Tower CFD Simulations (Surface Pressure)

The CFD analysis for Aero-Confluence shows peak positive pressure (870 Pa) on windward faces and significant negative pressure (-1870 Pa) on leeward faces, indicating strong wind loads. The tapered, aerodynamic design lowers drag, reducing overall drag and mitigating vortex shedding, which is critical for a 515 m supertall structure.

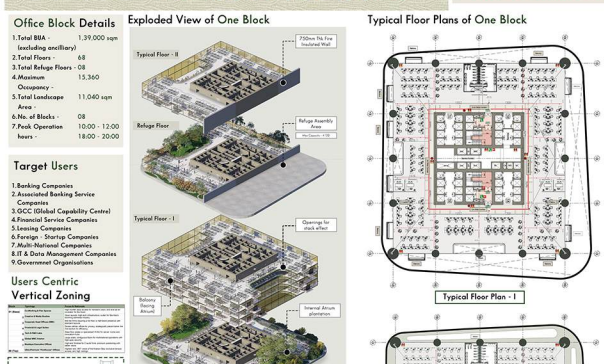
Solar Heat Gain Analysis (SHG)



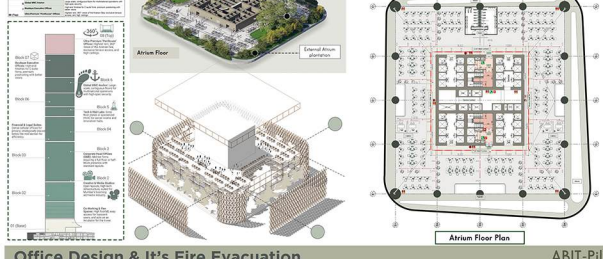


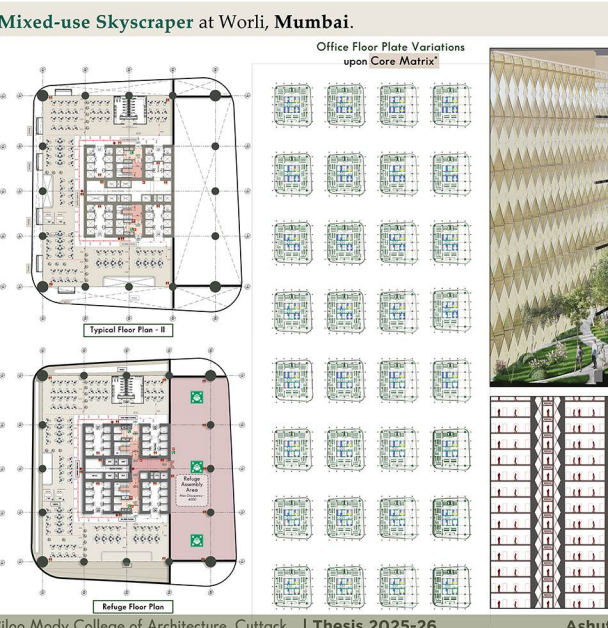
Conceptual Development, CFD & Solar Simulation Analysis | ABIT-Piloo Mody College of Architecture, Cuttack | Thesis 2025-26 | Ashutosh Maharana | Guide - Chinmay Ku. Mohanta | Regd no. 2102295015 | 10th Sem

Isometric illustration of Plaza level with color codes

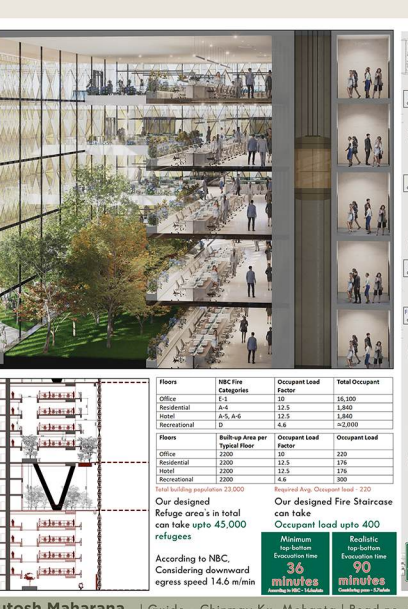


Sectional Diagram - User-wise Entry to Central Core / Lobby



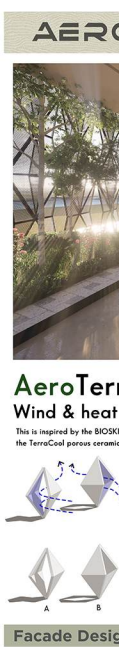


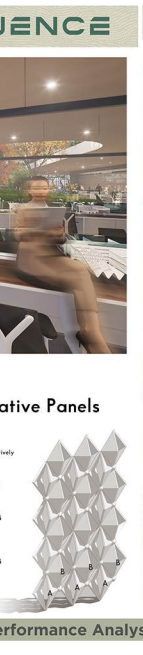
Area Statement
1. Total Site Area - 64,000 sqm
2. Total Ground Coverage - 31,000 sqm
3. Total Balance Area - 32,000 sqm
4. Area for Roads - 8680 sqm
5. Area for Water Bodies - 320 Sqm
6. Area for Site services - 4600 Sqm
7. Proposed FAR - 4.05
8. Permissible BUA - 2,59,200 Sqm
9. Total BUA - 2,59,000 Sqm
10. Achieved FAR - 4.046 Sqm
11. Landscaped Area - 12,200 Sqm



Site Analysis & Area Programming | ABIT-Piloo Mody College of Architecture, Cuttack | Thesis 2025-26 | Ashutosh Maharana | Guide - Chinmay Ku. Mohanta | Regd no. 2102295015 | 10th Sem

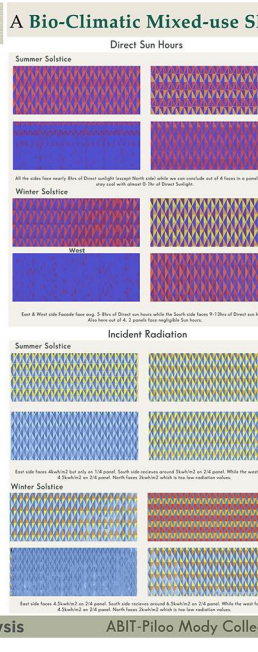
HISTORY OF THE LIFTING INDUSTRY





Central Core.

1. Typical Core Plate



2. Refuge Core Plate

Associated Services

Lift Count & Typology

Sr.no.	Lift Typology	Max. Speed (m/s)	Nos.	Notes
1	Local Shuttles	10 m/s	32	Serves Sky-lobby 1
2	Double Decked Local Shuttles	10 m/s	8	Serves Sky-lobby 2
3	High Speed Shuttles	16 m/s	8	Serves Sky-lobby 3
4	High Speed Sky Lobby Shuttles	16 m/s	8	Serves Sky-lobby 4
5	Double Decked Sky Lobby Shuttles	16 m/s	8	Serves Sky-lobby 4
6	Destination Dispatch Lifts	10 m/s	8	Serves Sky-lobby 4
7	Service/Freight Lifts	10 m/s	4	Serves Sky-lobby 4

Vertical Transportation Mapping Chart

Vertical Z