

CHENNAI TRADE CENTRE

[EXPANSION]

A THESIS

Submitted in partial fulfillment of the requirements for the award of

Bachelor of Architecture degree

By

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SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY) Accredited

With Grade “A” by NAAC

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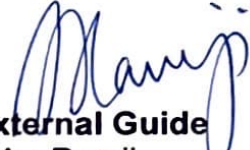
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BONAFIDE CERTIFICATE

This is to certify that the Thesis Report is the bonafide work of **SATHYAMOORTHY M (39210079)** who carried out the Thesis entitled “ **CHENNAI TRADE CENTRE (Expansion) ”** under our supervision from December 2023 to May 2024.


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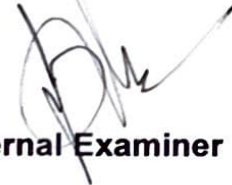

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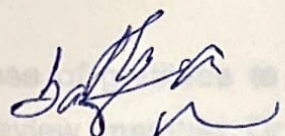


AC DECLARATION

I am pleased to acknowledge my sincere thanks to the Board of Management of
I, **SATHYAMOORTHY M (39210079)** hereby declare that the Thesis Report entitled
“**CHENNAI TRADE CENTRE (Expansion)**” done by me under the guidance of Ar.
Ramkumar SSSR (Internal Guide), Dr. Arulmalar Ramaraj (Internal Review Member) and
Ar.Ramji (External Guide) Sathyabama Institute of Science and Technology is submitted
in partial fulfilment of the requirements for the award of a Bachelor of Architecture Degree.

DATE: 20.05.24.

PLACE: CHENNAI


SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to the Board of Management of **Sathyabama Institute of Science and Technology** for their kind encouragement in doing this Thesis and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr.Devyani Gangopadhyay**, Dean and Head of the Department, School of Building and Environment, Our Design Chair Ar. Sarath C.kanth, Thesis Coordinator **Ar.Mohana Gopiraj** for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Thesis Internal guide Ar. Ramkumar SSSR, Internal Review member Dr. Arulmalar Ramaraj and External Guide Ar.Ramji their guidance, suggestions and constant encouragement which paved the way for the successful completion of my Thesis work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Architecture** helpful in many ways for completion of the Thesis.

SATHYAMOORTHY

THESIS SYNOPSIS

The thesis delves into the redesign and redevelopment of the Chennai Trade Centre (CTC) in Ramapuram, Chennai, Tamil Nadu. The goal of the project is to transform CTC into a dynamic mixed-use hub that promotes public interaction, cultural exchange, and economic growth. Through the integration of various functions and spaces, the revamped CTC aims to accommodate diverse user groups and activities, encouraging collaboration, knowledge sharing, and community involvement.

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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

The architectural thesis explores the transformation of traditional trade fair centers into mixed-use hubs to enhance social engagement, cultural exchange, and economic development. Focused on the Chennai Trade Centre (CTC) in Ramapuram, Chennai, Tamil Nadu, the project aims to reimagine the center as a dynamic environment that goes beyond the conventional trade fair model.

1.2 NEED OF THE PROJECT

Trade centers play a crucial role in shaping civic identity by promoting community engagement and unity. However, traditional trade centers may not be specifically designed to accommodate various functions. As a result, there is an increasing demand to revamp and transform these spaces into mixed-use hubs that can cater to a wide range of user groups and activities.

1.3 AIM AND OBJECTIVE

The aim is to transform CTC into a hotspot for public interaction by integrating various functions and spaces, with objectives including promoting collaboration, cross-learning, and community engagement through innovative design strategies.

CHAPTER 2: LITERATURE CASE STUDIES

2.1 BIC

2.1.1 INTRODUCTION

BIC is a non-profit, member, and donor-supported public institution founded to enhance dialogue and foster ideas across cultures, religions, regions, societies, and economies. It offers diverse programs in a 185-seat auditorium, two seminar rooms, an art gallery, a library, and a restaurant, serving as a flexible space for congregation, performances, and art exhibitions.



Figure 1; BIC PLAN

2.1.2 PLANNING DETAILS

The public space, organized behind a glass facade and framed by three-story concrete portals, serves as both a spill-out/pre-function area and a place for various activities.

Design Principles: Public function expressed in architectural expression. Scale addressed by breaking up the building with a void along the second floor. Distinct massing for various program components. Landscape strategies used to mitigate odors from the nearby stormwater drain.

Landscape Features: Ample gardens on the ground floor and a terrace with additional spaces for gathering under a large solar roof.

Landscape strategies aimed at functioning as a public amenity and contributing to environmental remediation.

Certification: The building has been submitted for a GRIHA 5 Star certification, focusing on environmental sustainability

2.1.3 STRUCTURAL DETAILS

The BIC exemplifies how thoughtful design can create spaces that transcend physical boundaries, fostering dialogue, cultural exchange, and environmental stewardship. Through its innovative approach to mixed-use programming, contextual sensitivity, and sustainable design strategies, BIC stands as a model for architectural excellence and community engagement.

The type of joinery that is used is mechanical joinery and bolted connection. The insulation materials are also bolted to the containers and they use turnbuckles and stacking cones for the structural support. These are the most common kinds of support used in containers. They used ISO containers for the construction so that they would not have any kind of illegal or construction issues. The container that was used should be according to the International Standards to avoid building issues. The structure is composed of 24 shipping containers stacked on three levels, shifted to create internal outdoor spaces, large overhangs, and terraces.

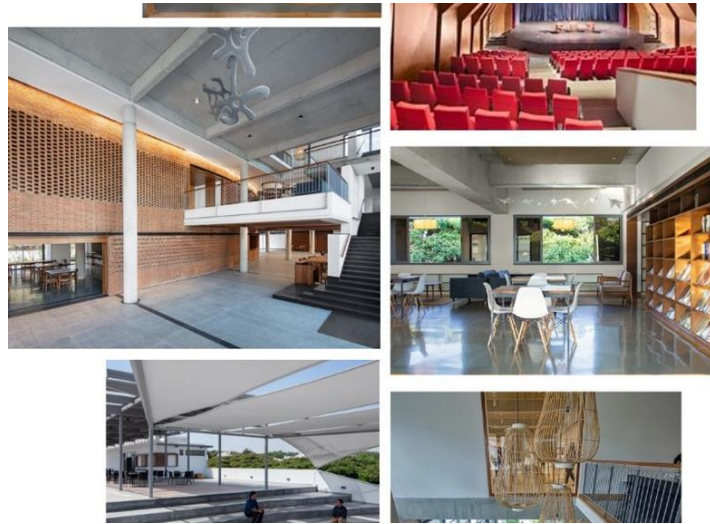


Figure 2; BIC PICS

The building uses 40-foot-long shipping containers as well as several existing container connectors to join and secure containers both horizontally and vertically. They use cranes for the moving of containers which will take less time. They use ships and heavy trucks for the transportation of the containers to different places. These are the main structural details that they have mentioned. The floor of the shipping containers is already done using plywood and it is also fixed or joined using bolted connections.



Figure 3; SECTION DETAILS

2.2 PREET VIHAR COMMUNITY CENTER, NEW DELHI

2.2.1 INTRODUCTION

Location: Preet Vihar, Delhi

*Site Area: 37,000 sqm

Built-up Area: 20,000 sqm

Ground Coverage: 45%

Number of Visitors: 300-400 per day

Figure 4; PVC PLAN



2.2.2 PLANNING DETAILS

Context and Challenges:

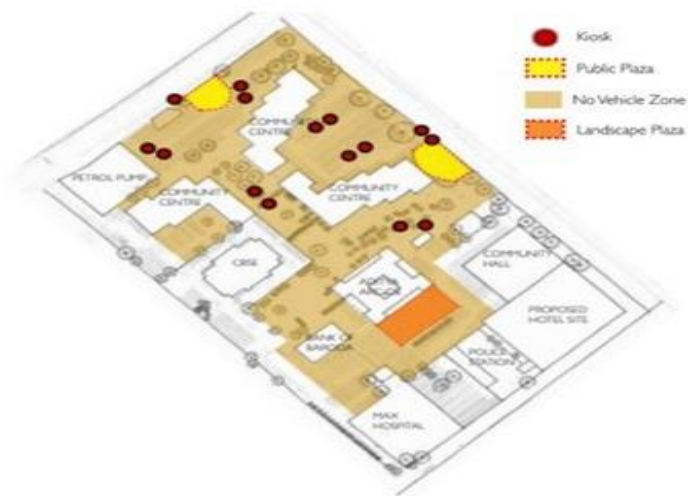
- Preet Vihar Community Center is located in a bustling area experiencing high traffic volume, particularly on Vikas Marg.
- Surface parking by shop owners and encroachment by vendors further compromise traffic flow and pedestrian movement.
- Connectivity via Karkardooma Flyover to Noida and ITO junction to Laxmi Nagar District Centre facilitates access.

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Figure 5; CIRCULATION OF PVC



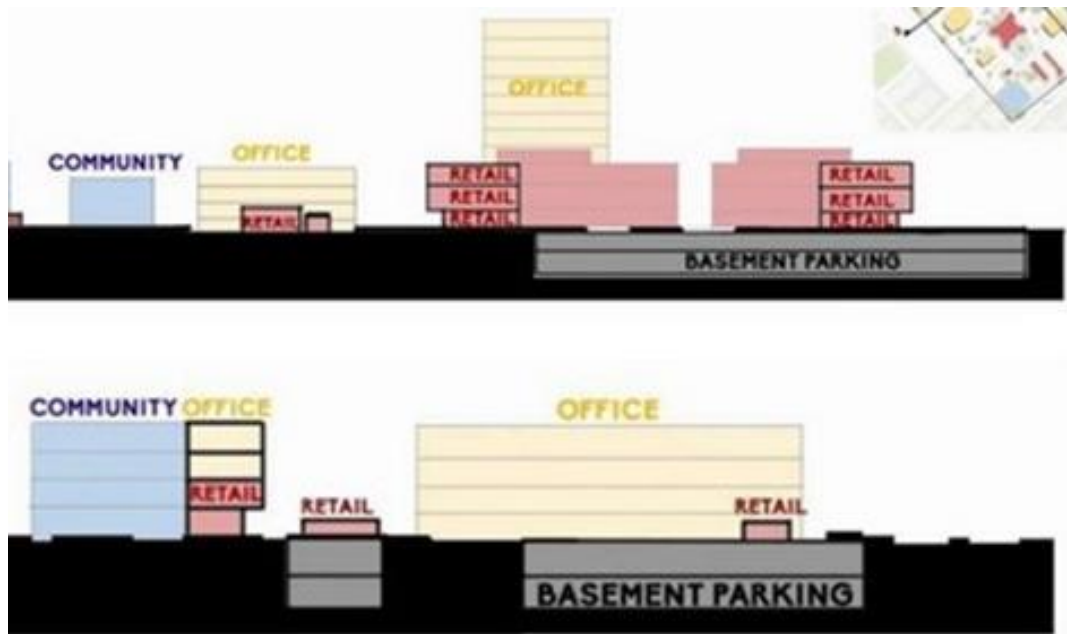


Figure 6; Spatial arrangement of PVC

2.2.3 STRUCTURAL DETAILS

Challenges and Solutions:

- Addressing traffic congestion and pedestrian safety through thoughtful urban design and traffic management measures.
- Maximizing the use of available space while maintaining a balance between built-up areas and open spaces.
- Incorporating greenery and landscaping to improve the aesthetic appeal and environmental quality of the site.

Lessons Learned:

- Importance of holistic planning that considers both functional and aesthetic aspects of urban design.
- Need for active community engagement to understand and address local needs and concerns.
- Integration of sustainable design principles to enhance the resilience and longevity of urban infrastructure.

2.3 New Friends Colony Community Center, New Delhi

2.3.1 INTRODUCTION

Location: New Friends Colony, South Delhi

Site Area: 31,000 sqm

Built-up Area: 15,000 sqm

Permissible FAR: 100

Achieved FAR: 55

Ground Coverage* 55%



Figure 7; MOVEMENT IN NCCC

2.3.2 PLANNING DETAILS

Context and Challenges:

- New Friends Colony Community Center is situated in a strategic location in South-Delhi, near a busy intersection.
- The unique town center development approach deviates from conventional community center layouts.
- Connectivity via major roads and proximity to Sukhdev Vihar metro station enhance accessibility.



Figure 8; NCCC PLAN AND CIRCULATION

2.3.3 STRUCTURAL DETAILING

Design Features:

- The community center adopts a town center development approach, integrating with the surrounding urban fabric.
- Emphasis on mixed-use programming to cater to diverse commercial, entertainment, and community needs.
- Strategic placement of public open spaces to enhance usability and pedestrian connectivity.



Figure 9 ZONING OF ZCCC

Challenges and Solutions:

- Balancing permissible FAR with community needs and site constraints to optimize land use.
- Designing a cohesive and vibrant urban space that fosters social interaction and economic activity.
- Implementing sustainable design strategies to minimize environmental impact and enhance user experience.

Lessons Learned:

- Flexibility and adaptability are key considerations in designing urban spaces that can evolve with changing needs and trends.
- Collaboration between stakeholders, including local communities, government agencies, and developers, is essential for successful urban development projects.
- Continuous monitoring and evaluation are necessary to assess the effectiveness of design interventions and make necessary adjustments over time.

Climate: Humid subtropical with hot summers, cold winters, and monsoon rains.

Connectivity: Accessible from multiple sides, 1 km from the main road connecting I.T.O. and A.I.I.M.S. Metro station nearby.

Spatial Organization:

Organized as a series of four to seven-storey blocks around linked shaded courtyards.

Built forms grouped around climate-tempered courts with overhead sunscreens and vertical gardens.

Spaces segregated based on public access levels, with offices accessed from courtyards.

Response to Site:

Inward-looking complex with limited engagement with the surrounding urban fabric.

Divided into North and South Blocks, with the North Block housing office spaces and the South Block hosting public functions.

Height decreases progressively from North to South Block in response to housing.

Features like blue sunshades, trees, fountains, and strategic planning maximize sunlight and maintain a comfortable environment.

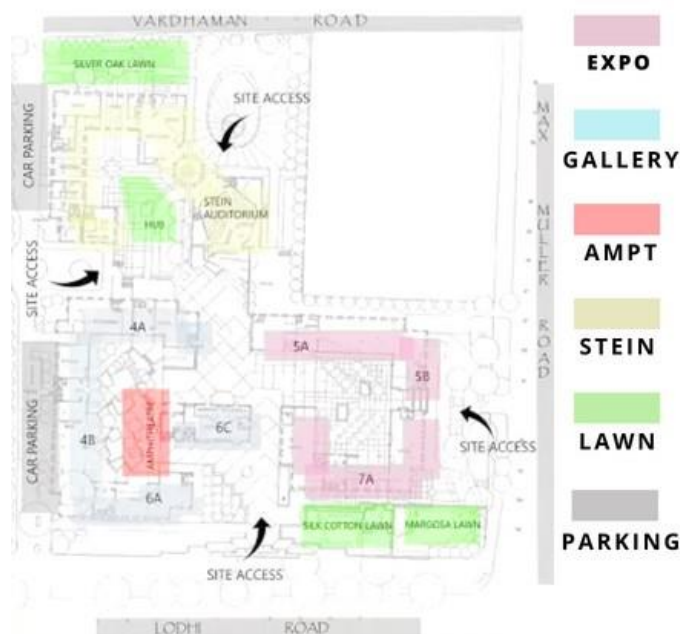


Figure 12 ZONING

ASPECT	BIC	PVCC	NFCC	IHC
LOCATION	Bengalore	Preet vihar, East Delhi	New friends colony, South Delhi	Delhi
SITE AREA	4420 sq m	37000 sq m	31,000 sq m	4 ha
BUILD-UP AREA	5000 sq m	20000 sq m	17,000 sq m	53000 sq m
SPACES	Restaurant, seminar, gallery, auditorium, rooftop - amphitheatre and meeting room	Community hall, public plaza, offices, retail shops, kiosks, food court	Community hall, offices, retail shops, kiosks, food court	Offices Convention centre Guest rooms Exhibition space Auditorium & theatre Library & resource centre
AREA DISTRIBUTION	—			
ACCESS AND LINKAGE				
CONNECTIVITY	 connects with purple line metro and air port in a straight road	 connected to major metro station & easy modes of access	 major metro connectivity & other modes	 1 km from the main road, A.I.I.M.S. 200m Bus Stop, 1km from J N S Metro Station
COMFORT AND IMAGE				
OPEN-BUILD RELATIONSHIP	 90% build up & 10% open	 40% build up & 60% open	 70% build up & 30% open	 70% build up & 30% open
PEDESTRAIN WALKABILITY				
CLEANLINESS AND MAINTENANCE	—			
USE AND ACTIVITIES				
PUBLIC SPACE AMENITIES				
ACTIVITY HOUR				

Figure 13 INFERENCE

CHAPTER 3: SITE STUDY AND ANALYSIS

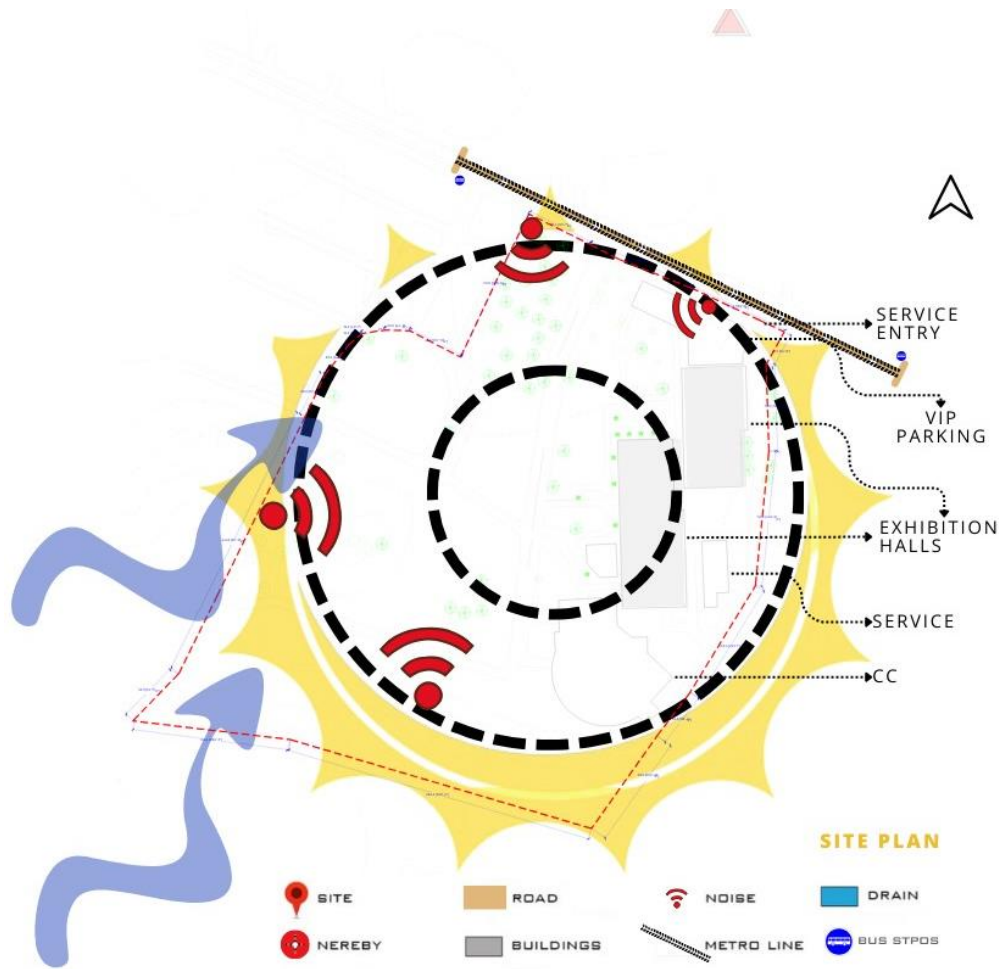


Figure 14 SITE ANALYSIS

3.1 SITE STUDY

Latitude & Longitude:

9°59'33"N 76°16'10"E

Location:

CHENNAI TRADE CENTRE, RAMAPURAM, CHENNAI, TAMIL NADU

Area:

42 ACRE

Pros: Strategically located for easy access from Chennai city and major international business hubs.

Promoters: Jointly promoted by the India Trade Promotion Organisation and Tamil Nadu Industrial Development Corporation.

Purpose: Positioned as an ideal destination for industrial and trade exhibitions, conferences, conventions, and business promotion activities.

Site Analysis- Design Inferences More service functions can be placed on the site edges where the noise levels are more. Building should be oriented in the direction of wind- The prevailing wind direction is from SW to NE direction Only one access road flanks the site limiting the access points to the site. Retail, hotel and offices can be placed along offset edge for easy servicing and public access. Longer face of the building should face north to get maximum diffused light. The site is near to the Airport road, L&T and DLF expose these to high pedestrian footfall. A cluster of trees exist at the core of the site, the open space thus created can be used as an interactive space to maximize the interaction within the site. The major green is formed at one of the quieter site edges and thus, can be utilized as an extended outdoor space for workshops and exhibitions.

Vegetation and Shading/Ventilation: Given the average level of vegetation around the site and the shading effect from existing trees, prioritize incorporating greenery and shading elements within the trade fair center's design. Explore innovative strategies for natural ventilation and passive cooling to enhance comfort levels within the indoor spaces, reducing reliance on mechanical systems and promoting sustainability. Sustainability and Resilience: Integrate sustainable design principles and technologies into the trade fair center's infrastructure to minimize environmental impact and enhance resilience to climate change. Consider incorporating renewable energy sources, water conservation measures, and green building materials to achieve energy efficiency and environmental sustainability goals.

Anticipated Growth and Development: Given the diverse community surrounding the site and the daily public movement, the trade fair center should be designed to accommodate potential growth and development in the area. Flexibility in the design to adapt to changing needs and demographics of the community should be prioritized. Existing Infrastructure and Collaboration: Analyze the existing infrastructure surrounding the site to identify areas for improvement or enhancement to support the anticipated growth. Collaborate with local authorities and stakeholders to coordinate necessary infrastructure enhancements, such as transportation, utilities, and public amenities, to support the trade fair center and its visitors. Strategic Location and Accessibility; Leverage the strategic location and accessibility of the site, particularly its proximity to Chennai International Airport and major business hubs like L&T and DLF, to attract national and international visitors. Ensure that the trade fair center is easily accessible

from Chennai city and other key locations, facilitating seamless connectivity for visitors and exhibitors.

3.2 SITE JUSTIFICATION

CHENNAI: Tamil Na du **Trade** Promotion Organisation (TNTPO), which owns and operates the Chennai Trade **Centre** (CTC) at Nandambakkam, is in the process of doubling the facility’s capacity at an estimated cost of Rs 300 core. The move to expand the trade centre from about 20,000sqm to 40,000sqm will help the city attract international exhibitions that require larger space.



Figure 15 news of ctc expansion

Facilities	- Three large interconnected Exhibition Halls - Convention Centre with two halls (A and B) - Total seating capacity of 2000 delegates - Exhibition Halls over 10560 sq. meters of air-conditioned space
Exhibition Hall Features	- Advanced ventilation and air-conditioning system- Multiple entry and exit doors for public and freight- Custom seating arrangements for large-scale meetings
Convention Centre Features	- Conference Seating Capacity: 2000 Seats- Exhibition Hall A&B Area: 1900 sq.m- Grand view of Permanent stage with Sound-proof Conference Hall

Additional Amenities	- Centralized air-conditioning - Sophisticated sound-proof Conference Halls - No intermediate pillars or columns - Bar facility during Event days
Accessibility	Strategically located for easy access from Chennai city and major international business hubs
Site Area	25.48 acres
Coordinates	13.0145835 / 80.1890376



Figure 16 site plan

3.3 SITE ANALYSIS

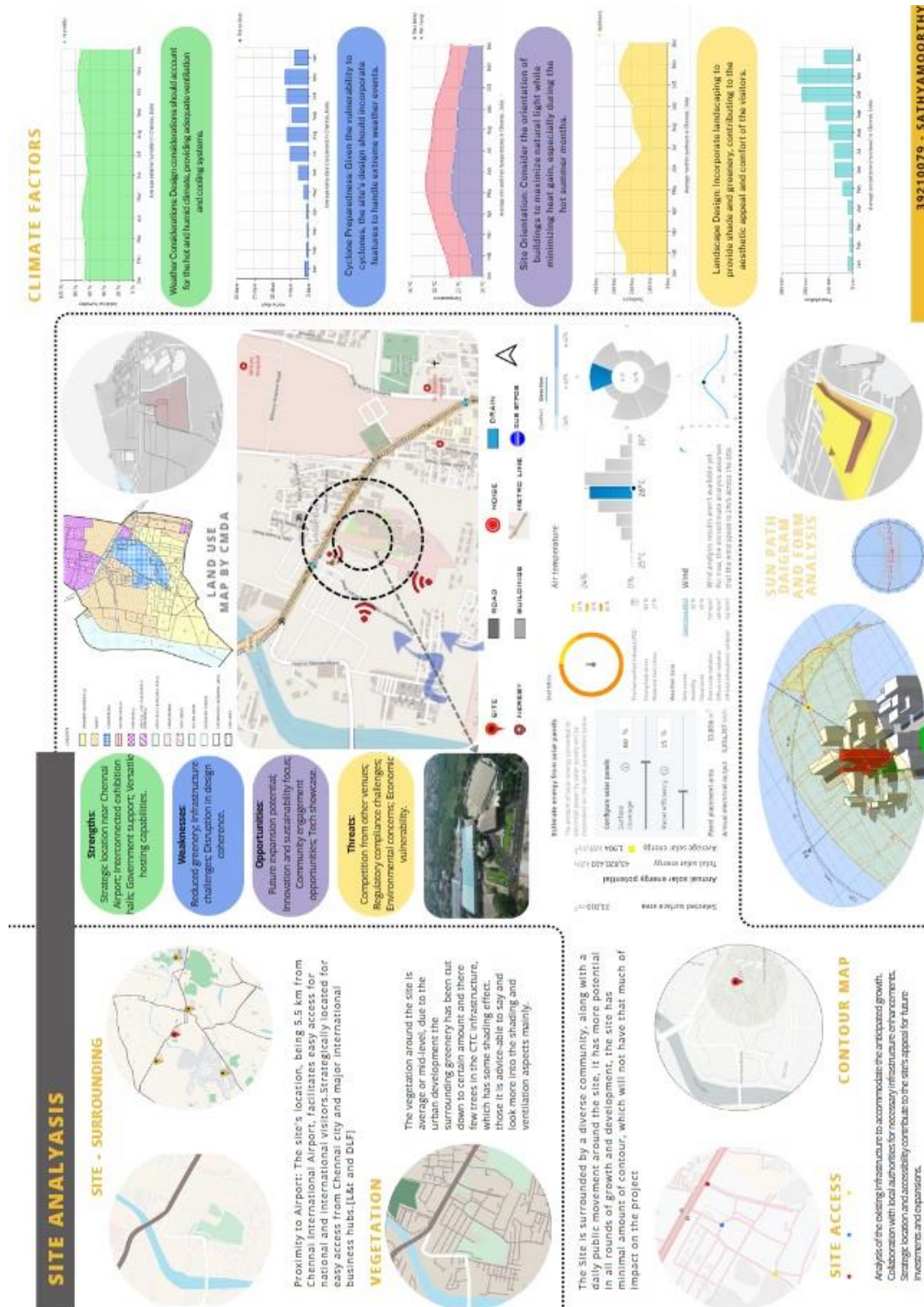


Plate 1; Site Analysis

CHAPTER 4: ARCHITECTURAL DESIGN

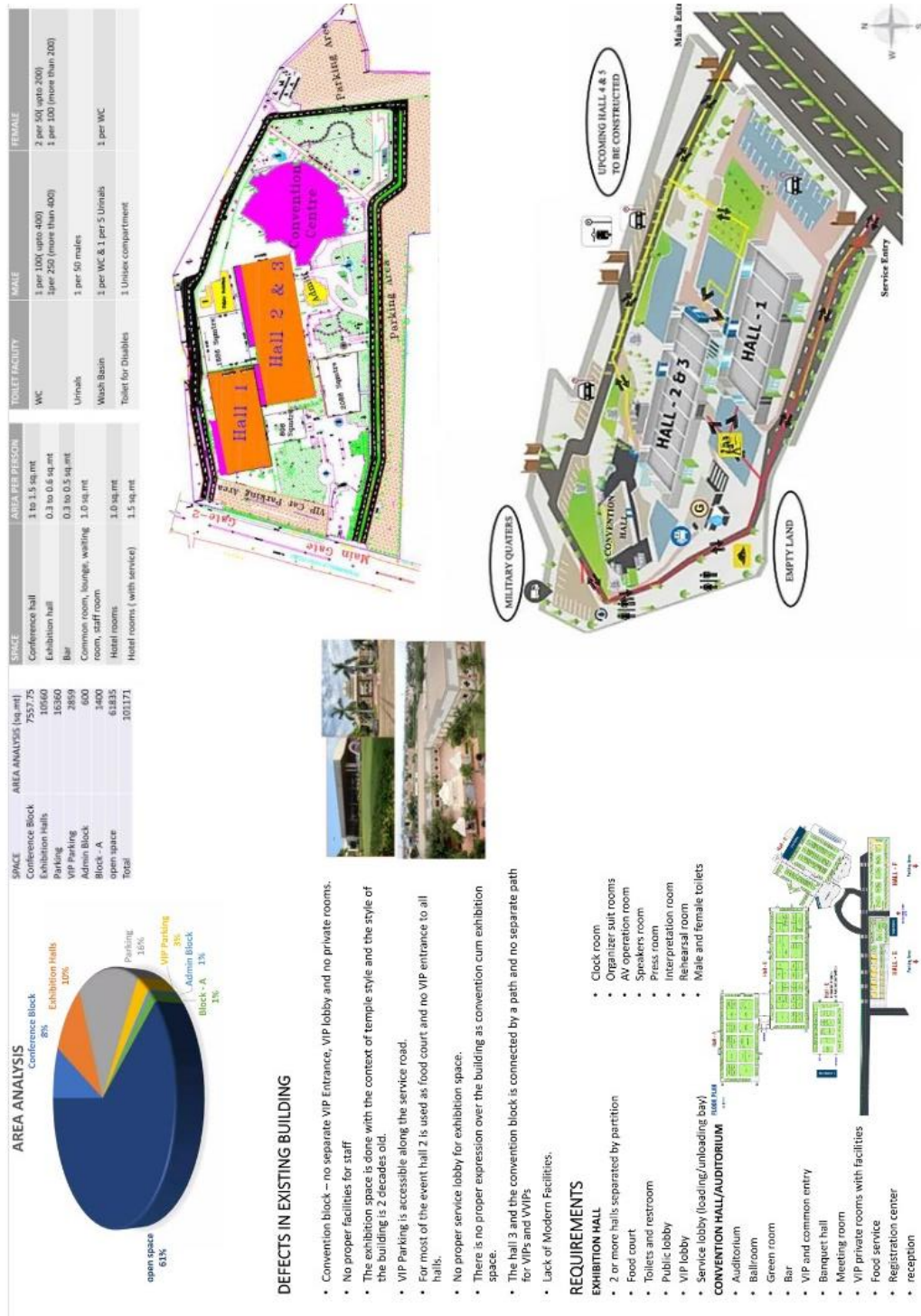


Figure 17; Area requirements

4.1 Design

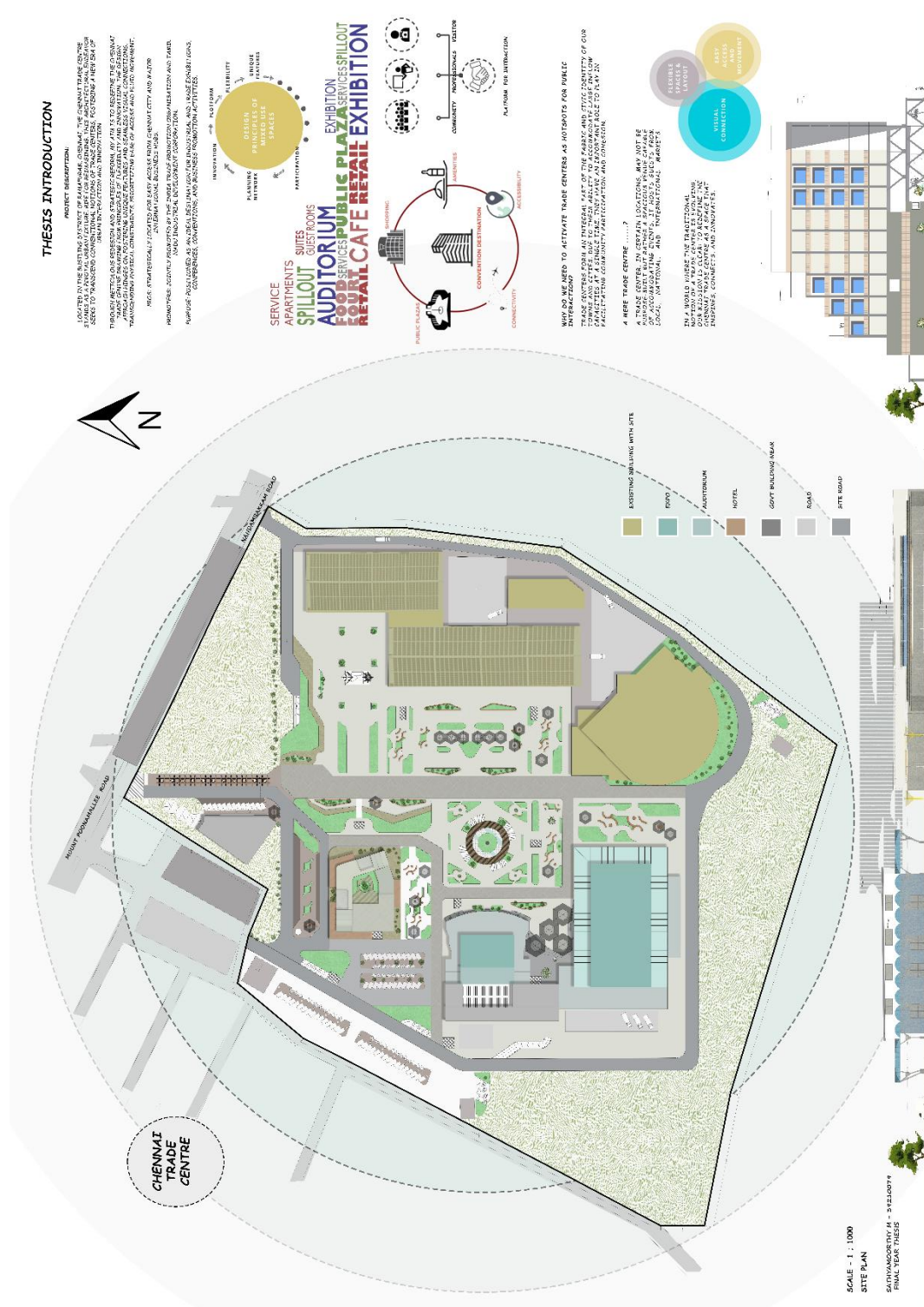


Plate 2; Master plan of site

HOTEL DESIGN & DETAILS



DESIGN EVALUATION



The design follows the site geometry and conventional hotel design principles.

The building is tilted to provide larger zones on the sides.

Green zones are incorporated through the use of courtyards.

The building is divided into public, private, and restricted zones.

Stepped terraces are introduced to increase green space.

One side of the building is tilted to make it appear welcoming and to expand the courtyard, adding to the dynamic form of the building.

The front block is also tilted, but this resulted in chaotic drop-off movement. To resolve this, the final schematic form is developed by stepping up alternate floors and placing public areas at the bottom.

The final plan satisfies both the vertical movement and opens up the courtyard, adding to the dynamics of the building. The stepped floors also add to the hierarchy of rooms in the hotel.

Creating Cascading Built Forms: Near open spaces to reduce the massive scale of the built.

Transitioning Spaces: Transitioning from public to semi-public to private spaces as we move up.

Creating Visual Connections: Creating visual connections between different floors through atriums and staggering of floors.

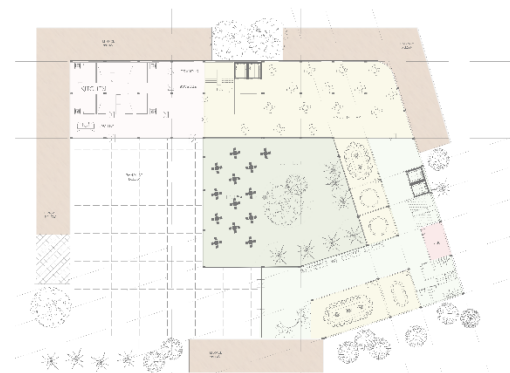
Thrusting Large Scale Blocks: Thrusting in large scale blocks such as convention hall and auditorium with a green buffer in front to create a clear sense of entry from the rest of the blocks.

Building Around Greens: Building around greens foster interaction as well as create a calm environment.

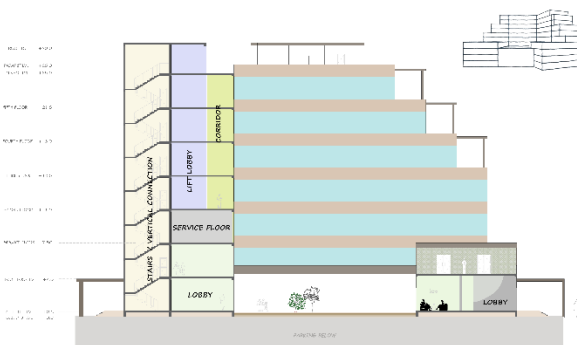
Placing Complementary Functions Together: The hotel and convention facilities need to be located adjacent. Similarly, offices & retail stores should be located in proximity to each other.



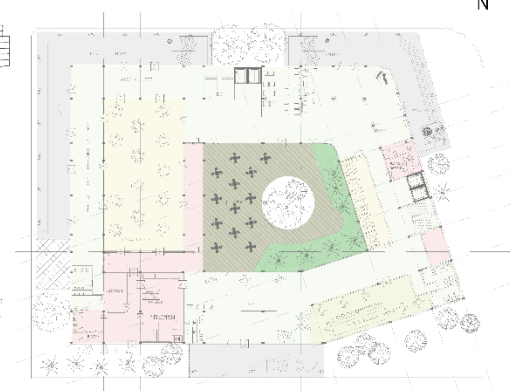
EAST SIDE ELEVATION



FIRST FLOOR PLAN



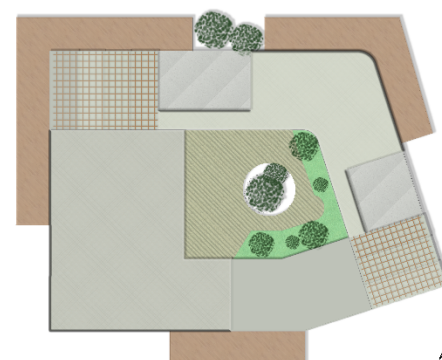
SECTION AA'



GROUND FLOOR PLAN



SERVICE FLOOR SPACING



HOTEL BLOCK TOP VIEW

SATHYAMOORTHY M - 34250079
FINAL YEAR THESIS

HOTEL BLOCK SCALE - 1 : 200

Plate 3; hotel floor plan of site

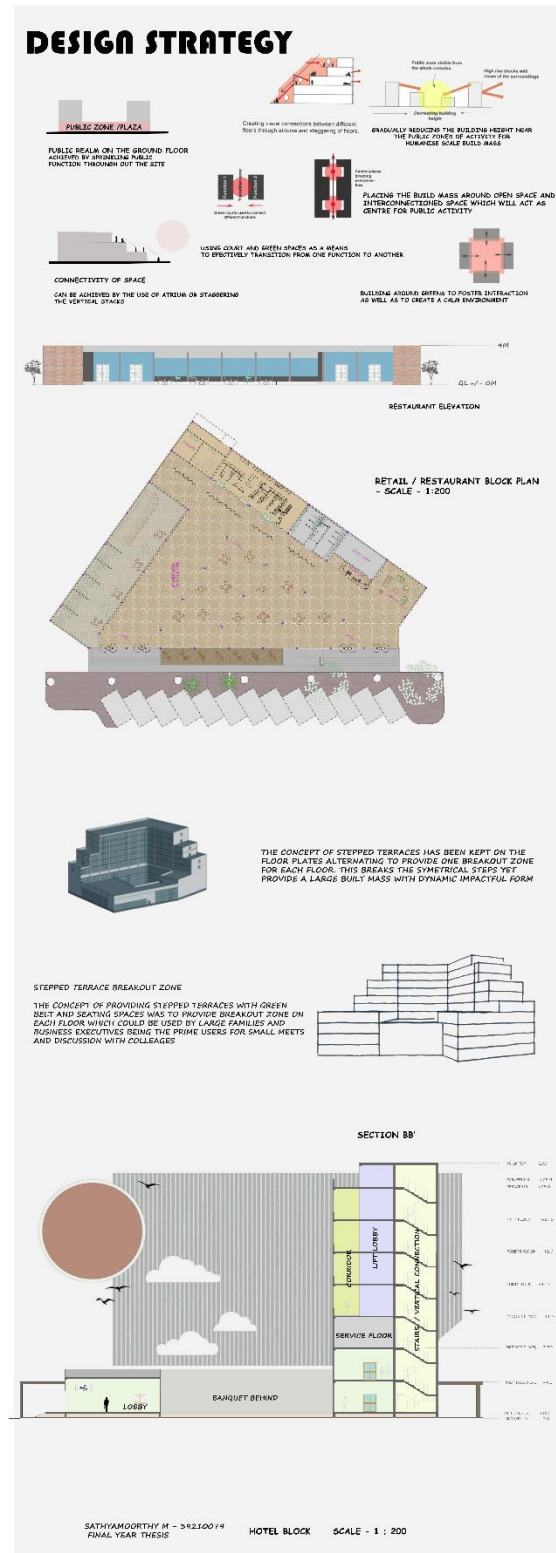


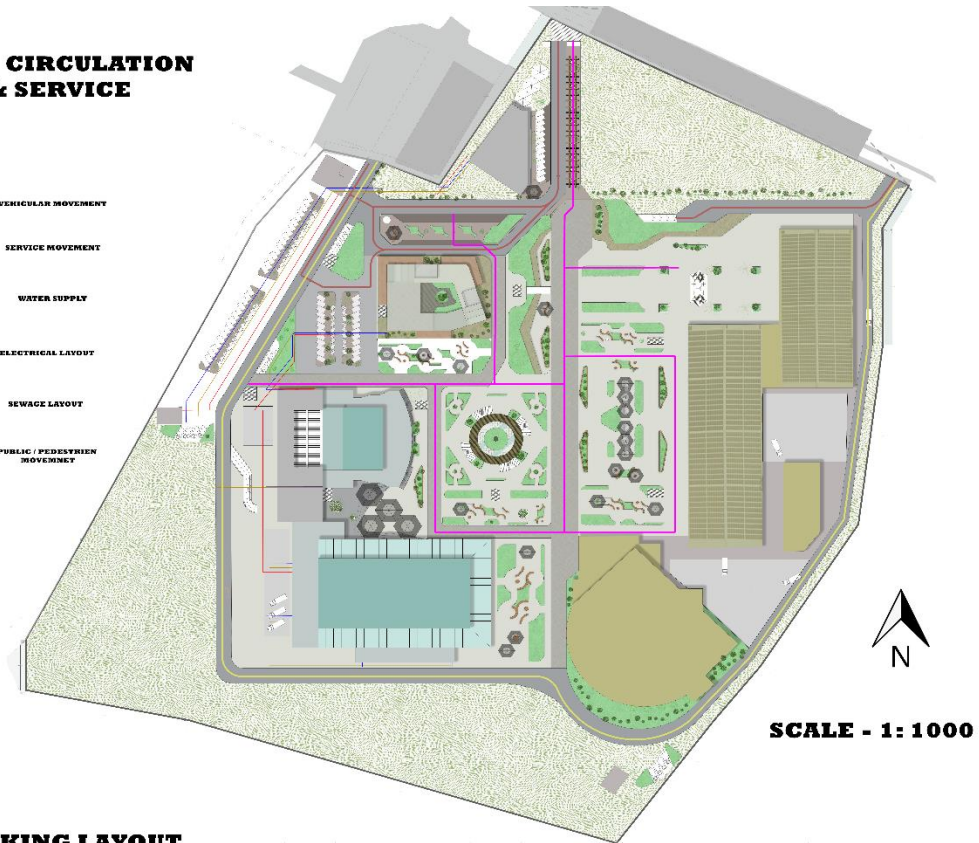
Plate 4; hotel floor plan



Plate 5; expo and auditorium plan

SITE CIRCULATION & SERVICE

- VEHICULAR MOVEMENT
- SERVICE MOVEMENT
- WATER SUPPLY
- ELECTRICAL LAYOUT
- SEWAGE LAYOUT
- PUBLIC / PEDESTRIAN MOVEMENT



PARKING LAYOUT

SCALE - 1:200

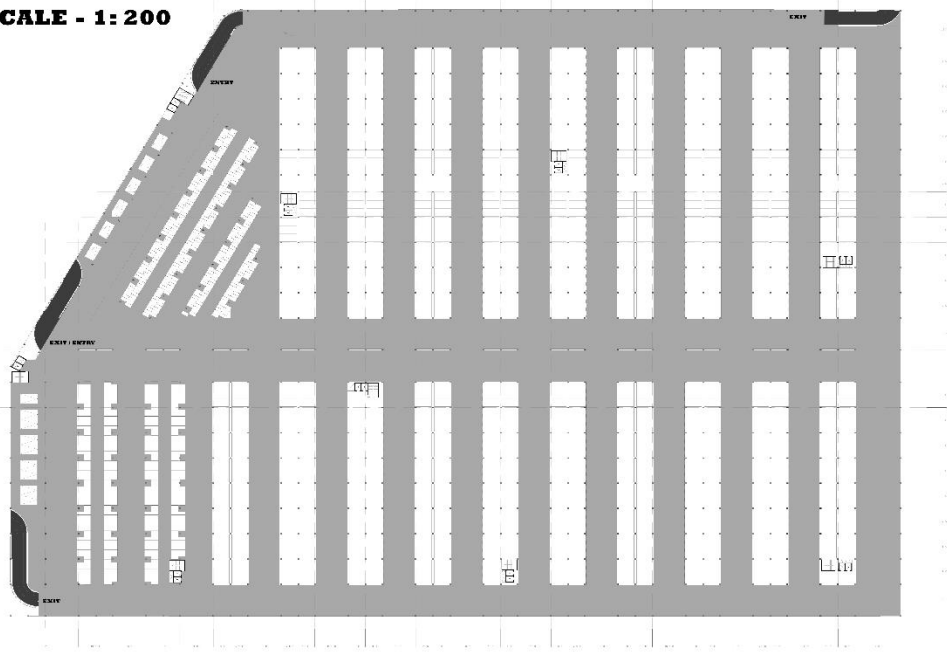


Plate 6; circulation of site and parking

CHAPTER 6: REFERENCE

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