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International Convention Centre

Madikonda , Warangal , Telangana

Dec, 2025

International Convention Centre

Madikonda, Warangal, Telangana

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DEPARTMENT OF ARCHITECTURE AND PLANNING

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL

DEC 2025

ARC 511 – Thesis Project

International Convention Centre

Madikonda, Warangal, Telangana

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9th Semester, 5th Year

UNDER THE GUIDANCE OF

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BHOPAL (MP)-462003

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DEPARTMENT OF ARCHITECTURE AND PLANNING

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL

CANDIDATE DECLARATION

The Thesis Project in the subject ARC 511, entitled "**International Convention Centre, Warangal, Telangana, India"**, is being submitted in partial fulfilment of the requirement for the award of degree of Bachelor of Architecture by the undersigned for evaluation.
The matter embodied in this project is a record of my own work. If, in future, it is found that the above statement is false, then I have no objection in withdrawal of Bachelor of Architecture Degree awarded to me by the Institute.

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RECOMMENDATION

Based on the above declaration of the student, the undersigned recommends that the work submitted by the candidate may be considered for the final end term examination of the subject ARC-511, Thesis Project.

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CERTIFICATION OF EXAMINATION

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ABSTRACT

The design of an **International Convention Centre** in Warangal aims to create a multifunctional hub that fosters cultural, social, and educational exchange while responding to critical architectural challenges. The project addresses key issues such as the effective planning of large-scale event and exhibition spaces, visitor circulation, lighting conditions, and the integration of advanced architectural systems to ensure functional efficiency and experiential quality. Consideration is given to the contextual character of Warangal, incorporating its cultural heritage and physical site features into the overall design strategy. The proposal emphasizes a coherent spatial organization with flexible layouts, sustainable materials, and modern structural solutions to accommodate diverse programmatic needs including conferences, exhibitions, performances, and community gatherings. Special attention is directed towards natural and artificial lighting design, circulation patterns, and accessibility, ensuring inclusivity for a wide spectrum of users. By drawing parallels from international case studies and integrating them with regional identity, the design envisions a convention centre that not only enhances visibility and usability of spaces but also promotes cultural exchange, knowledge sharing, and community interaction. Ultimately, the project aspires to establish Warangal as a significant destination for global conventions while celebrating its local heritage through contemporary architectural expression.

Keywords: International Convention Centre, Warangal, exhibition planning, visitor circulation, architectural lighting, cultural integration, sustainable design.

ACKNOWLEDGMENT

I would like to give my deepest appreciation to my guide **Ar.Savita Raje** for her contribution, inputs and comments during the Thesis and formation of the Design is concerned. I would like also to express my gratitude to the authorities, officials, teachers and the rest of people who unhesitatingly provided me help in the conduct of the study and analysis. For friends' opinions that might contribute the improvements of my work, thank you and for the never ceasing support and efforts for me, thank you, family.

Sravan S

Sem-9th

Manit -Bhopal

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CHAPTER I

INTRODUCTION

INTRODUCTION

The Telangana State Industrial Infrastructure Corporation (TSIIC), under its objective of providing integrated industrial infrastructure development, envisages the need to undertake the development of the Warangal International Convention Centre (WICC) cum 3-Star Hotel at IT Park Madikonda, Warangal, Telangana on Public Private Partnership (PPP) mode under IALA Warangal. The project is proposed on approximately 10 acres (40,468 sq.m.) of land and includes a convention centre, a business hotel, entertainment and F&B facilities, and surface parking. The total built-up area is approximately 250,000 sq.ft. The project aims to provide comprehensive facilities for conventions, exhibitions, meetings, and hospitality in an integrated manner.

1.1 AIM

To design a comprehensive, inclusive, and culturally responsive convention centre and business hotel complex in Warangal that caters to diverse professional, cultural, and social needs, while harmonizing contemporary architecture with regional identity.

1.2 OBJECTIVE

- To analyze the spatial and functional requirements of a modern convention centre integrated with hospitality, including convention halls, breakout spaces, business hubs, and supporting infrastructure.
- To design a flexible and sustainable built environment that facilitates large-scale gatherings, exhibitions, and conferences without compromising user comfort, accessibility, or environmental responsiveness.
- To establish a meaningful architectural language that draws inspiration from Warangal's cultural and historic context, especially the Kakatiya heritage, while addressing present and future urban dynamics.
- To explore efficient circulation, security, and service strategies within the complex to ensure a smooth user experience for varied stakeholder groups—organizers, delegates, staff, and the public.
- To assess and apply smart urban infrastructure models, energy-efficient design strategies, and environmentally responsive technologies suited for Telangana's climatic and urban context.

- To respond to the PPP framework of development by proposing a design that is not only architecturally significant but also financially viable and adaptable for phased implementation.

1.3 PROPOSING AGENCY

The Telangana State Industrial Infrastructure Corporation Limited, envisages the need to undertake development of Warangal International Convention Centre (WICC) cum 3-Star Hotel @ IT Park Madikonda, Warangal, Telangana on Public Private Partnership (PPP) Mode Under IALA Warangal.

1.4 DETAILS OF SPACES

The Minimum Development Obligations (Build-Up) for the Project:

Sl. No.	Description	Area In sq.ft	
A	**Convention Centre cum Exhibition Centre (2,500 Pax)**	**50,000**	sq. ft.
I	Convention Centre	30,000	sq. ft.
II	Small Meeting rooms	2,000	sq. ft.
III	Large Meeting rooms	5,000	sq. ft.
IV	Business Centre	5,000	sq. ft.
V	Pre-function and Circulation Spaces	8,000	sq. ft.
B	**Business Hotel (150 Keys)**	**150,000**	sq.ft
C	**Entertainment and F&B**	**50,000**	sq. ft.
	Total	**250,000**	sq. ft.
D	**Parking**	As per GO 168	Surface Parking

Table 1 minimum build-up area

SITE DETAILS

Project Site Attributes	
Location	Sy. No. 1791/ 1 of Madikonda (V) Warangal (U) District
Site Area	~ 10 acres (40,468 sq. m.)
Primary Access	NH 163
Visibility & Frontage	Excellent Visibility and Frontage along abutting roads ; contiguous site
Shape, Terrain	Regular and mostly flat
Project Site Boundary	
North	Vacant land
South	Vacant land
East	NH 163 Access road
West	Dharmasagar Canal

Table 2 site attributes

LOCATION

The Project Site is located in Sy. No. 1791/ 1 of Madikonda (V) in Warangal, Telangana, India. The site is located opposite to the Textile Park. Following map shows the location of the Project Site with respect to Warangal.

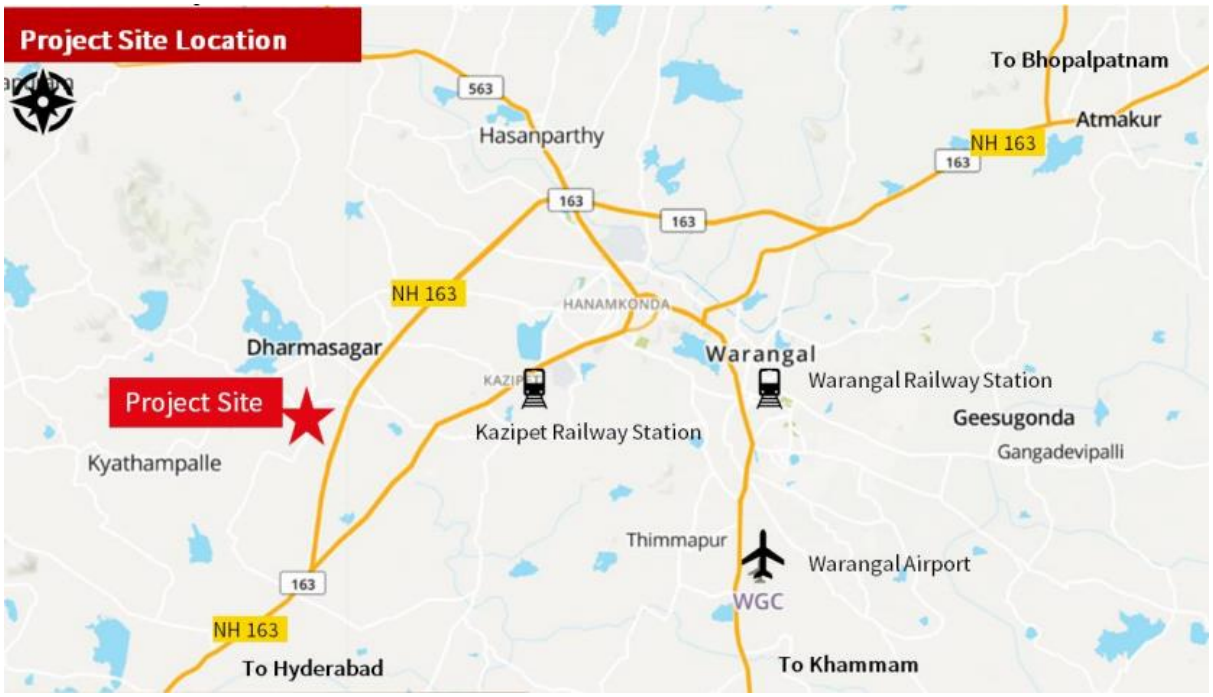


Figure 1 project site

1.5 PROXIMITY

The table below provides distance of the Project Site with respect to few key landmarks.

Details of Landmark Distances from project Site.

Location / Landmark	Approximate Distance from the Project Site
Textile Park	Opposite (Immediate Neighborhood)
V City Madikonda	~3.7 Km
Kazipet Junction	~9 Km
Warangal Railway Station	~20 Km
Hyderabad City	~140 Km
Hyderabad International Airport	~ 161 Km

Table 3 proximity

1.6 SITE SURROUNDING

The East side of the site is with large area of Textile Park and having NH 163 Infront of site for access towards site.

The West side and South side of the site is vacant land.

The North side of the site is allocated for IT park development.



Figure 2 site location

1.7 LANDMARK

Infront of Site there is TGIIC (Telangana Government Industrial Infrastructure Corporation Limited) Flatted factory complex.



Figure 3 TGIIC flatted factory complex

1.8 PROPOSED LAND USE ZONE

Land is zoned to the category of Industrial Zone (I)

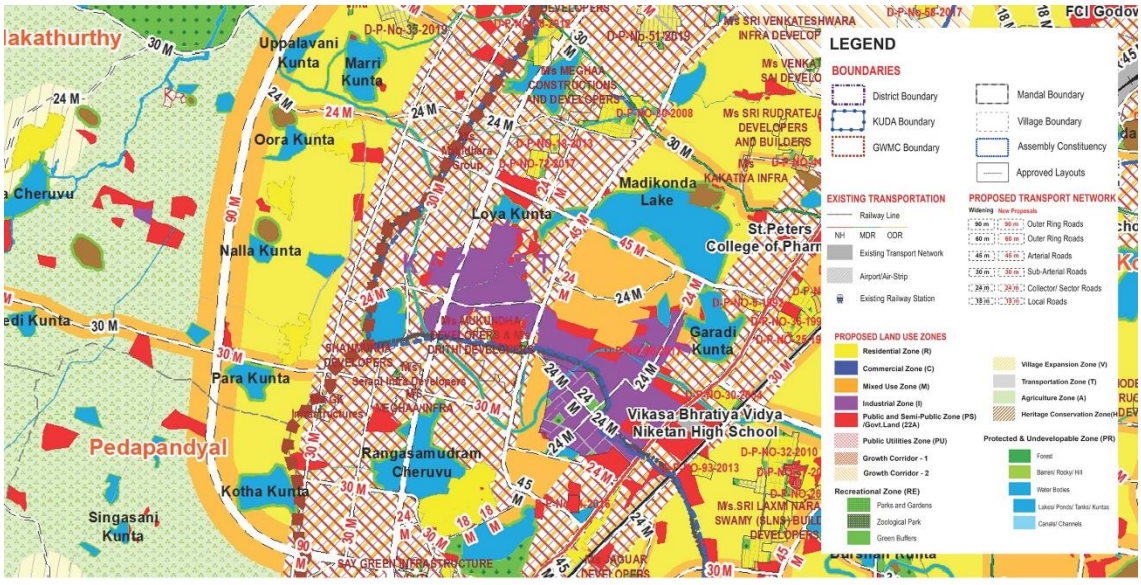


Figure 4 zoning map

1.9 DEVELOPMENT PARAMETERS

According to G.O. Ms. No. 423 (Government of Andhra Pradesh)

Site Area	10 acres (40,468 sq.m.)
Total Build up Area	250,000 sq.ft
F.A. R	2
Ground Coverage	40%
Front Setback	9m
Side Setback	6m
Rear Setback	6m
Minimum Frontage	9m
Internal Road	Varies

Table 4 parameters

1.10 PARKING DETAILS

Category	**Build up Area**	**ECS Per 100 Sq.m**	**Total ECS Required**
Convention Center	50,000 Sq.ft	2.0 ECS/100 sq,m	46
Hotel	150,000 Sq.ft	3.0 ECS/100 sq,m	139
Entertainment and F&B	50,000 Sq.ft	2.0 ECS/100 sq,m	46
Total	250,000 Sq.ft		**231**

Table 5 parking details

According to G.O. Ms. No. 168 (Government of Andhra Pradesh), Table- V below:

2	Shopping Malls (above 4000 sq.m), Information Technology Enabling Services Complexes	60	50	50	40	40	30
3	Hotels, Restaurants, Lodges, Cinema halls, Business buildings, Other Commercial buildings, Kalyana Mandapams, Offices, & High-Rise Buildings / Complexes of Non Residential Category	40	30	30	25	25	25
4	Residential Apartment Complexes, Hospitals, Institutional buildings, Industrial buildings, Schools, Colleges, Other Educational Buildings & Godowns & Others	30	20	20	20	20	20

Table 6

1.11 PROJECT COST ESTIMATE

The project cost (excluding upfront development premium and annual rent during construction payable to TSIIC) is estimated to be ~ Rs. 175 Crores. The table below provides indicative break-up of the estimated Project Cost:

Estimated Project Cost

Particulars	Unit Cost (Rs. per sq. ft.)	Total Project Cost (Rs. Crores)
MICE (International Standard Convention Centre)	~ 6,430	~ 32.15
Business Hotel (150 Keys)	~ 6,607	~ 99.10
Entertainment and F&B	~ 4,620	~ 23.10
Total Development Cost		**~ 154.35**
Interest Cost		~ 20.65
Total Project Cost		**~175.00**

Table 7 project cost

1.12 SITE LAYOUT

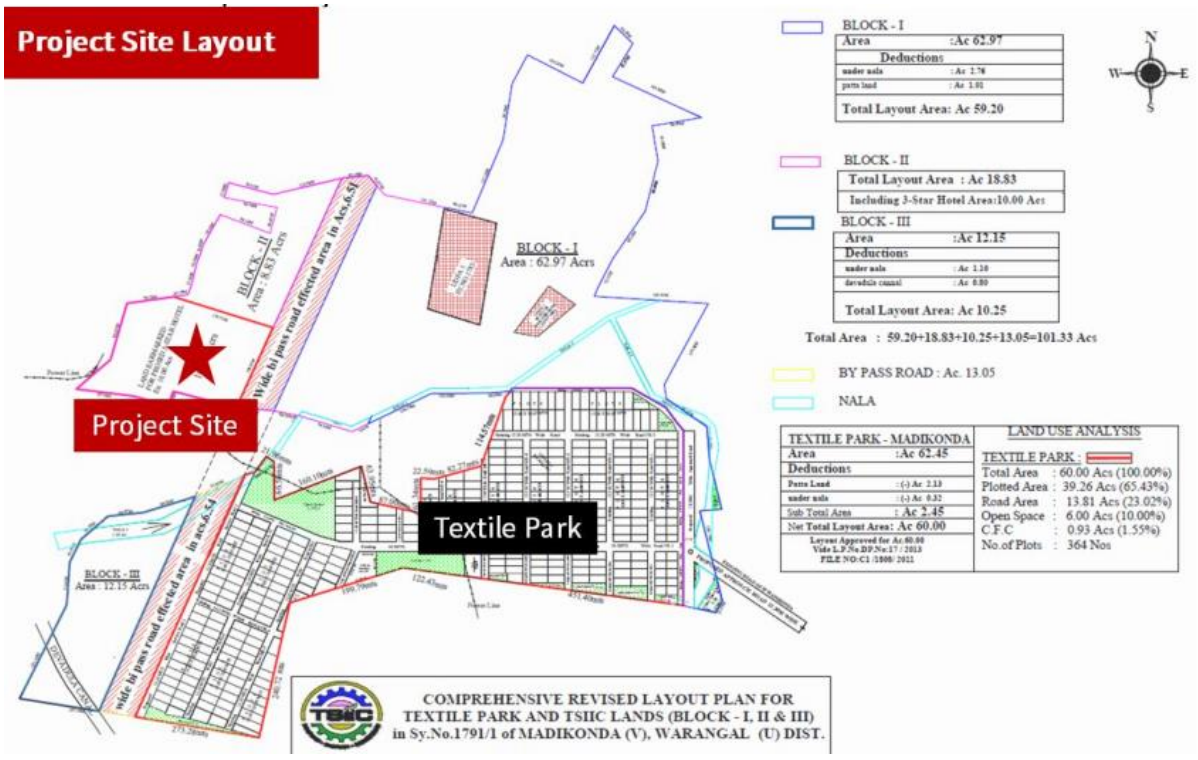


Figure 5 site layout

1.13 SITE PLAN

Latitude: 17.957690 N

Longitude: 79.447151 E



Figure 7 site

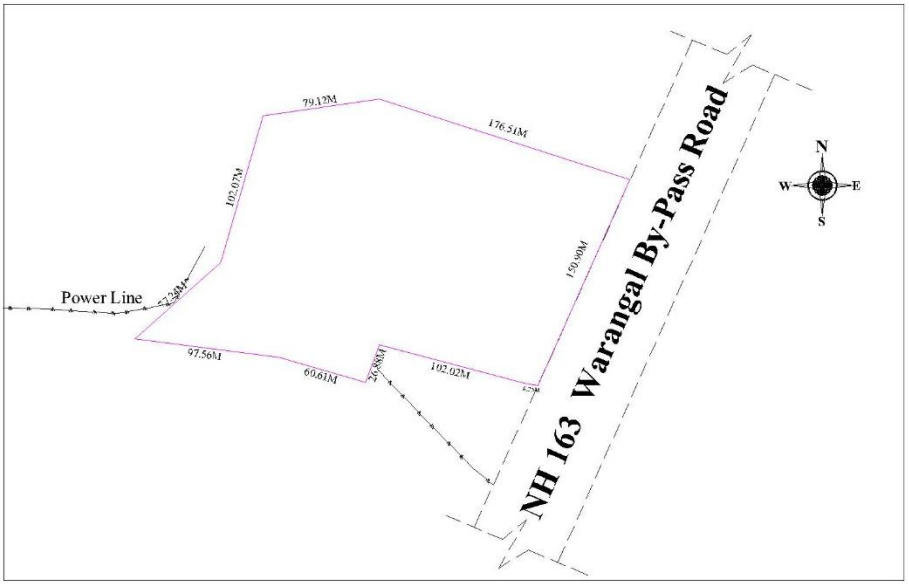


Figure 6 site dimensions

1.14 TENDER DOCUMENT

LETTER OF INVITATION

To:

<Name and Address of the Purchaser of the Request for Proposal Document>

Subject: **Invitation for Submission of Bid for 'Warangal International Convention Centre (WICC) cum 3-Star Hotel @ IT Park Madikonda, Warangal, Telangana on Public Private Partnership (PPP) Mode Under IALA Warangal'.**

Dear Madam / Sir,

We, the Telangana State Industrial Infrastructure Corporation Limited under our core objective of providing integrated infrastructure development for the state of Telangana, envisage the need to undertake development of Warangal International Convention Centre (WICC) on approximately 10 acres (40,468 sq. m.) of land located at Madikonda, Warangal, Telangana, India, on PPP Mode.

The Project is envisaged to be a Warangal International Convention Centre (WICC) cum 3-Star Hotel @ IT Park Madikonda, which is proposed to be developed at Madikonda, Warangal, Telangana, involving private developers.

We have earmarked about 10 acres (40,468 sq. m.)of land for the Project, which is envisaged to be an Warangal International Convention Centre (WICC) cum 3-Star Hotel @ IT Park Madikonda along with other support facilities. This Request for Proposal (the "RFP") document is for the Project, which is being proposed on approximately 10 acres (40,468 sq. m.) of land with about 200,000 sq. ft. of built-up area and corresponding car parking area.

We are pleased to invite you to participate in the bidding process and partner with the Government of Telangana in developing the proposed Warangal International Convention Centre (WICC) cum 3-Star Hotel @ IT Park Madikonda, Warangal, Telangana on Public Private Partnership (PPP) Mode Under IALA Warangal and contribute to the growth of the State of Telangana. This RFP document comprises of three volumes:

1. Volume 1: Instruction to the Bidders
2. Volume 2: Development Agreement
3. Volume 3: Project Information Memorandum

Please feel free to contact us if you need any clarifications and/or additional information.

Yours faithfully,
for Telangana State Industrial Infrastructure Corporation Limited

Vice Chairman & Managing Director

Figure 8 tender document

CHAPTER 2: LITERATURE SURVEY

1.1 INTRODUCTION

This literature survey delves into the rich artistic, artisanal, and cultural heritage of Warangal, Telangana, aiming to provide a foundational understanding for an architectural design project focused on a convention center. As a city steeped in the legacy of the Kakatiya dynasty, Warangal boasts a distinctive cultural identity expressed through its visual and performing arts, intricate crafts, vibrant festivals, and unique architectural lexicon. While traditional knowledge systems and historical influences offer a profound wellspring of inspiration, the integration of these elements into contemporary architectural forms, particularly large-scale public infrastructure like convention centers, presents a nuanced design challenge. This survey synthesizes information on Warangal's prominent traditional and burgeoning contemporary art forms, the intricate details of its renowned crafts such as Warangal Durries and Pembarthi Metal Crafts, and the profound influence of its cultural heritage, including significant festivals and the enduring impact of the Kakatiya era. Furthermore, it meticulously examines the distinctive architectural styles, motifs, and decorative elements characteristic of the region, alongside the application of locally sourced materials and traditional construction methods. Although explicit examples of the direct incorporation of these specific cultural narratives into modern convention center architecture within Warangal or comparable regions remain less documented, this comprehensive overview aims to equip designers with the necessary insights to respectfully and innovatively weave Warangal's unique cultural tapestry into a contemporary architectural statement.

1.2 HISTORICAL OVERVIEW

Warangal, also recognized as Orugallu, served as the capital of the Kakatiya dynasty from 1163 to 1323 CE. The reign of King Pratap Rudradeva II (1289-1309 AD) is widely regarded as a "golden age" for the region. During the Kakatiya period, Warangal was lauded as the "foremost city within the Telugu region."The Kakatiyas played a pivotal role in unifying Telugu cultures, evidenced by the construction of approximately 5,000 irrigation tanks, a significant number of which remain operational today. Furthermore, they developed a distinctive architectural style.Currently, Warangal's historical landmarks, including Warangal Fort, Thousand Pillar Temple, and Ramappa Temple, hold designations as UNESCO World Heritage Sites or are on the tentative list, thereby establishing it as a prominent cultural and tourist destination. It is also integrated into India's HRIDAY scheme.Warangal's historical standing as the Kakatiya capital,

its characterization as a "golden age," and the adoption of the Kakatiya Kala Thoranam as Telangana's emblem underscore its central importance to the state's cultural and political identity. This rich historical legacy provides a unique foundational narrative for the WICC, distinguishing it and fostering a profound sense of cultural pride

1.3 STRATEGIC IMPORTANCE FOR WARANGAL

The WICC in Madikonda IT Park is vital for Warangal's IT and tourism growth, addressing a shortage of high-quality hospitality infrastructure. Its location in an existing IT SEZ, home to companies like Cyient and Tech Mahindra, positions it as a crucial asset for supporting the tech industry and diversifying Warangal's economy. The WICC is a strategic urban development tool designed to stimulate and sustain economic diversification, with its success tied to Warangal's ambition to become a globally recognized IT and tourism destination. Its architectural design should reflect this catalytic role, projecting progress and connectivity while remaining culturally relevant.

1.4 DISTINCTIVE ARCHITECTURAL MONUMENTS & FEATURES

The Kakatiya dynasty left an indelible mark on Warangal's landscape through its distinctive architectural monuments, which showcase a fusion of Dravidian and Nagara Bhumija styles, often influenced by Vesara or Chalukya architecture

Warangal Fort: Built between the 13th and 15th centuries AD, this formidable fort features a unique, multilayered defense system of earthen embankment, mud, and stone walls. The central zone contains the ruins of the grand Swayambhusiva temple, known for its four monumental, 10-meter-high (33 ft) Kakatiya Kala Thoranam or Warangal Gates. Each gate has twin pillars with angled brackets supporting a large lintel, intricately carved with "lotus buds, looped garlands, mythical animals, and birds with foliated tails." The absence of religious symbols is thought to have aided their preservation. The fort's defensive walls, made of large granite stones fitted without mortar, were exceptionally difficult to breach.

Thousand Pillar Temple (Rudreswara Temple): Constructed in 1163 AD by Rudra Deva on the slopes of Hanamakonda hill, this temple exemplifies Kakatiya architecture. Originally named 'Trikuta' for its dedication to Lord Shiva, Lord Vishnu, and Lord Sun, only the Shivalinga remains. It is renowned for the ornate workmanship on its *garbhagruha* doorways,

artistic pillar detailing, and charming ceiling. A highlight is the monolithic Nandi, a granite masterpiece noted for its ornamentation, intricate patterns, precise workmanship, and unique velvet-like polish. The temple's star-shaped base and richly carved pillars also show Chalukyan and Hoysala influences.

Ramappa Temple (Rudreswara Temple): The 13th-century Kakatiya-style Hindu temple in Palampet, a UNESCO World Heritage Site since July 25, 2021, was constructed over 40 years starting in 1213 AD. Renowned for its intricate carvings, ornate shrines, and a unique "sandbox technique" foundation, it notably survived a 17th-century earthquake. Its lightweight *gopura* bricks float on water, demonstrating advanced scientific ingenuity. The temple's figurines depict a "kaleidoscopic pattern of life" through human, animal, and celestial forms. It is potentially India's only temple named after its chief sculptor, Ramappa.

1.5 TRADITIONAL BUILDING MATERIALS, TECHNIQUES & ENVIRONMENTAL ADAPTATIONS

The Kakatiyas demonstrated remarkable adaptability in their construction, utilizing both stone and bricks depending on the geographical location and specific structural requirements. Their architectural practices incorporated sophisticated techniques and inherent environmental adaptations that remain relevant for contemporary sustainable design.

Sandbox Technology: A hallmark of Kakatiya engineering, this unique foundation technique was notably employed in the Ramappa Temple. It involved stacking stones on a deep sand foundation (3m deep), which provided exceptional structural stability and remarkable resilience against seismic activity, allowing the temple to survive a 17th-century earthquake with minor damages.

Floating Bricks: Used for the *Vimana* (tower) of the Ramappa Temple, these bricks possess an incredibly low density (0.9g/cu.cm), less than that of water, achieved by incorporating lightweight materials like sawdust. This innovation speaks volumes about their scientific ingenuity in creating lightweight yet durable construction elements.

Black Basalt: Despite being one of the hardest stones to carve, black basalt was extensively used for the intricate sculptures and detailing in Kakatiya temples, showcasing the extraordinary mastery and craftsmanship of the artisans of that era.

1.6 PREVAILING ARTS & CRAFT

Warangal and the broader Telangana region are known for several distinct art and craft forms that can be infused into the convention center's interior and exterior design.

1.6.1 Warangal Dhurries:

History: Traces its origins to the Mughal era, inspired by Jainamaaz (prayer rugs). Primarily woven by the Padmasali community.

Characteristics: Known for geometric and angular patterns, though floral and tribal motifs are also common. Red and blue are dominant colors, balanced with neutral hues.

Materials: Primarily cotton, with occasional use of wool, jute, linen, viscose, or polyester.

Application:

- **Flooring:** Commission custom-designed Warangal dhurries for specific areas, or integrate their patterns into floor tiling or carpet designs.
- **Wall Coverings/Art:** Large-scale dhurrie-inspired textile art can adorn walls.
- **Textile Elements:** Use dhurrie patterns and color palettes for upholstery, cushions, or room dividers in lounges and breakout areas.

1.6.2 Nirmal Paintings:

Location: Nirmal town, though influenced by Mughal patronage and later brought to Hyderabad.

Characteristics: Traditional art scenes from Hindu epics (Ramayana, Mahabharata). Influenced by Ajanta, Kangra, and Mughal miniatures. Uses indigenous colors derived from herbs, gum, vegetable dyes, and minerals, with a familiar gold color.

Application:

Fine Art Displays: Feature Nirmal paintings in art galleries or prominent display areas.

Accent Panels: Use smaller, framed Nirmal art pieces as decorative accents in meeting rooms or VIP lounges.

1.6.3 Bidri Craft

(While more associated with Bidar, Karnataka, it has historical ties to Deccan region and is sometimes mentioned in Warangal context):

Characteristics: A metal handicraft from Bidar, Karnataka. Involves inlaying silver or brass on a black-coated zinc-copper alloy.

Application (if deemed appropriate for regional connection):

Tableware/Decor: Showcase bidriware as decorative items in dining areas or gift shops.

Architectural Accents: Using bidri-inspired patterns in metal screens or decorative inserts.

1.7 CULTURE & PERFORMING ARTS

Warangal's cultural landscape extends to various performing arts and traditions that can be reflected in the convention center's programming and atmosphere.

1.7.1 Perini Sivatandavam:

History: An ancient dance form that emerged during the Kakatiya rule, known as the 'dance of warriors.' Revived by Nataraja Ramakrishna, inspired by sculptures in Ramappa Temple.

Application:

Performance Space: Design flexible performance spaces (e.g., in the main auditorium or outdoor amphitheatres) suitable for traditional dance forms.

Artistic Interpretations: Commission sculptures or artistic interpretations of Perini dancers for lobbies or outdoor plazas.

1.7.2 Storytelling Traditions (Oggu Kathalu, Burra Katha, Patam Katha):

Characteristics: Oral narrative traditions, often accompanied by music and simple props. They convey mythological, folk, or contemporary stories.

Application:

Acoustics and Seating: Design spaces that facilitate intimate storytelling sessions or public performances, focusing on good acoustics and comfortable, perhaps tiered, seating.

Informal Gathering Spaces: Create informal "storytelling corners" with traditional seating arrangements.

Interactive Displays: Digital or static displays explaining these art forms, perhaps with audio snippets.

Bathukamma Festival:

- **Characteristics:** A vibrant floral festival celebrated by women in Telangana, particularly during Navaratri. Women create floral arrangements (Bathukamma) and sing traditional hymns.

- **Application:**
- **Landscaping:** Incorporate local flowering plants and design gardens that evoke the spirit of Bathukamma.

Art Installations: Commission contemporary art pieces inspired by the floral motifs and geometric patterns of Bathukamma.

1.8 CONVENTION CENTRE

A convention centre (also known as a conference centre or exhibition hall) is a large public building or complex specifically designed to host events, such as: Conferences, Conventions, Seminars, Exhibitions, Trade shows, Cultural programs, Business meetings.

1.8.1 Key Features of a Convention Centre:

Large Halls or Auditoriums – For keynote speeches, performances, or big gatherings.

Breakout Rooms/Meeting Rooms – Smaller spaces for workshops or group discussions.

Exhibition Areas – Open or partitioned spaces for displaying products or stalls.

Pre-function Areas – For registration, refreshments, networking, etc.

Back-of-House Facilities – Service corridors, green rooms, kitchens, storage.

Resorts or Hotels – for accommodation for attendees.

Technical Infrastructure – Audio-visual systems, internet, lighting, air-conditioning.

Parking and Accessibility – Ample vehicle parking and easy access for attendees.

1.9 CONVENTION CENTRE HOTEL

Convention Hotel means a hotel with 50 rooms or greater that provides facilities and services designed to host meetings or gatherings within or upon the same premises of the hotel or within a facility (for example: convention centres, auditoriums, outdoor venues, etc.) that is in close proximity of the hotel.

1.10 TYPES OF CONVENTION CENTRES

1. Convention Centers (without lodging): These are dedicated large buildings primarily designed for conventions, trade shows, exhibitions, and conferences. They typically offer extensive floor areas, often accommodating thousands of attendees. They usually contain:

Exhibit Halls: Large open spaces for trade shows and exhibitions.

Auditoriums/Plenary Halls: For large keynote speeches, presentations, or performances.

Meeting Rooms & Conference Rooms: Smaller, flexible spaces for breakout sessions, workshops, and business meetings.

Support Facilities: Registration areas, food and beverage services, business centers, press lounges, VIP lounges, and parking. These centers are often located adjacent to or near hotels to provide accommodation for attendees.

2. Convention Hotels (with lodging): These are hotels that integrate significant convention and meeting spaces within their own facilities, in addition to providing accommodation and other hotel amenities (restaurants, fitness centers, etc.). They offer the convenience of having everything under one roof, making them popular for events where attendees also need lodging.

3. **Conference Centres:** Similar to convention centres, but often smaller in scale and with a stronger focus on meetings and educational programs rather than large-scale exhibitions. They tend to offer higher levels of service and specialized amenities for focused discussions and learning.

4. Exhibition Halls/Trade Show Venues: While often part of larger convention centers, some venues are primarily designed as standalone exhibition halls, focusing specifically on hosting trade shows and large product displays.

5. Venues with Convention Capabilities: Other types of venues can host conventions or events with similar characteristics, though they may not be purpose-built convention centres:

Business Centres: Offer amenities like cutting-edge technology, multimedia facilities, and specialized rooms for business meetings and smaller conferences.

6. Unique and Special Venues:

Museums and Art Galleries: Provide a distinct and often culturally rich backdrop for events.

Historical Buildings: Offer a unique ambiance and charm.

Educational Venues:

Universities and Colleges: Often have lecture halls, auditoriums, classrooms, and sometimes even residential halls that can be rented for corporate gatherings, academic conferences, and workshops, often at a lower cost.

Sports Venues (Stadiums/Arenas): Can accommodate very large numbers of people for major events, concerts, or large-scale product launches.

Banquet Halls: Primarily used for formal events like weddings and proms, but can also host smaller conferences or corporate dinners.

Community Centres: Offer low-cost multi-purpose rooms for various gatherings.

Theatres and Auditoriums: Ideal for events requiring a stage and audience setup, such as presentations, performances, or large lectures.

1.11 IMPORTANCE OF CONVENTION CENTRE

Convention centres are crucial for economic development and city branding. They attract business travellers who spend on hotels, restaurants, and local services, creating jobs and generating tax revenue. Beyond direct economic impact, they foster knowledge exchange, promote innovation, and enhance a city's international reputation by hosting major events. They also serve as important community gathering places for local events, enriching social and cultural life.

1.12 EVOLUTION AND HISTORY OF CONVENTION CENTRE

The evolution of convention centers reflects a fascinating journey from rudimentary gathering spaces to the sophisticated, technologically advanced, and often sustainable hubs we see today.

Early Forms of Gathering Spaces:

Ancient Times: The concept of large gatherings for trade, political discourse, or religious ceremonies dates back to ancient marketplaces (like Greek Agoras and Roman Forums), castles, and palaces. Halls in castles, for instance, were designed to accommodate large groups for important meetings with the king, serving as early "convention halls." A notable historical example is the "Tennis Court Oath" during the French Revolution in 1789, where a makeshift meeting in an indoor tennis court became a pivotal moment in history.

- **Medieval Fairs:** In the Middle Ages, fairs were common across Europe, primarily for promoting agricultural products, arts, crafts, and other handmade goods. These can be seen as precursors to modern trade shows.

1. **The Birth of Purpose-Built Exhibition Halls (19th Century):**

- **Industrial Revolution:** The Industrial Revolution, with its mass production and advancements in transportation and communication, spurred the need for dedicated spaces to showcase new technologies and products.
- **The Crystal Palace (1851, London):** This iconic structure, built specifically for the Great Exhibition, is often cited as a landmark in the history of exhibition halls. It provided an unprecedented amount of exhibition space and showcased the world's industrial and cultural achievements.

- **Bingley Hall (1850, Birmingham, England):** Considered one of the first purpose-built exhibition halls in Great Britain, it was constructed from surplus materials and hosted a variety of public gatherings.
- **Other 19th-Century Halls:** Throughout the latter half of the 19th century, many cities around the world began building dedicated halls for large meetings and exhibitions, such as Memorial Hall in Philadelphia (1876) and Exhibition Place in Toronto (1878).

2. **20th Century: Modern Convention Centers Emerge:**

- **Post-WWI Growth:** As industries and trades grew and sought more suitable venues, cities began investing in modern facilities to attract business, development, and tourism. These often took the form of new municipal halls that could host both professional conventions and popular entertainment.
- **Increased Size and Scope:** The late 1920s saw the appearance of modern, multipurpose convention centers that grew in size and scope. Examples include Atlantic City's Boardwalk Hall (1929), known for its massive clear-span space.
- **Post-WWII Boom and Specialization:** The mid-20th century witnessed a significant boom in convention center construction, especially in the U.S. Places like McCormick Place in Chicago (1955) and the Las Vegas Convention Center (1959) emphasized abundant exhibition space, becoming anchors for local economies. These facilities began to offer more than just exhibition space, incorporating auditoriums, concert halls, lecture halls, and meeting rooms.
- **Rise of the MICE Industry:** The growth of the Meetings, Incentives, Conferences, and Exhibitions (MICE) industry further fueled the development of dedicated convention centers, recognizing the economic significance of business tourism.

3. **21st Century: Technology, Flexibility, and Sustainability:**

- **Multifaceted and Technology-Driven:** Today's convention centers are far from simple utilitarian halls. They are multifaceted, technology-driven spaces designed to accommodate a diverse array of events, blurring the lines between physical and virtual interaction.
- **Hybrid Events:** The rise of hybrid events (combining in-person and digital attendees) has redefined the role of convention centers, leading to increased focus on robust Wi-Fi, seamless streaming capabilities, and interactive setups.
- **Flexible and Adaptive Spaces:** Modern designs prioritize flexibility and adaptability, with modular layouts, airwall configurations, and customizable spaces to suit various event sizes and themes.
- **Enhanced Networking:** Convention centers are incorporating dedicated networking zones, often with technology to facilitate connections and digital information exchange.
- **Sustainability:** Environmental consciousness is a major driver, with venues adopting green building materials, renewable energy sources, waste reduction programs, and eco-friendly event setups.
- **Experiential Design:** There's a growing emphasis on creating dynamic and engaging experiences for attendees, moving beyond mere content delivery to foster human connection and a sense of place. This includes incorporating natural light, outdoor meeting spaces (like rooftop gardens), and integration with the surrounding urban environment.

- **Economic Drivers:** Convention centers continue to be crucial for attracting business, driving tourism, and spearheading urban revitalization projects.

1.13 GUIDELINES FOR APPROVAL OF CONVENTION CENTRES BY GOVERNMENT OF INDIA

General Features:

It is very essential that the proposed convention centre should contain at least one convention hall, two mini convention halls, one exhibition hall, one restaurant and parking facilities as per details given below:-

1. Convention Hall- Convention hall as the name suggests should have audio Visual conferencing equipment, facility for high fidelity recording, video projection/ video graphs etc. and skilled manpower at various levels.

The seating capacity in the hall may be in a classroom style in the following category:- Above 1500pax or 1200-1500 pax or 800-1200 pax or 300-800 pax

2. Mini Convention Halls: Mini Convention halls are equally important in Convention Centers as these halls are required for various seminars, committees, meetings etc. the seating capacity therefore, may be in a theatrical or classroom style to seat as follows:-. 200-300 pax or 100-200 pax or 50-100 pax or 20-50 pax

3. Exhibition Hall: Exhibition Hall is another important feature in convention centre. Delegates to the convention as well as trade relative promoters take part in trade shows to promote their products during conventions. As such, it is essential that such exhibition hall should have a capacity to accommodate at least 20 booths of 3 mts by 3 mts in size excluding passages in between the booths.

4. Restaurants: Restaurants in the convention centers should confirm to the existing guidelines of HRACC laid down by the Ministry.

5. Parking: Parking facility for not less than 50 cars and five coaches.

6. Residential Accommodation For Delegates/ Participants: applicable only if, promoters, desire to have residential accommodation in the convention complex and the guidelines laid down by the Ministry in respect of star category hotels will apply.

7. Infrastructural Facilities:-

1. Landscaped forefront
2. Exhibition Management Centre
3. Administrative facilities for corporate office including IITTM/ Internet etc.
4. Trade Show/ Fair Facilities such as Tourist Office, Bank and Money Changing facilities, Travel Desk, STD/ISD, Press Lounge, VIP Lounges etc.
5. Technical facilities such as plant room, electric substation, stores, electric power back-up-system, fire hydrant etc.
6. Gate complex for stipulating entry and exit.
7. Information booths.
8. Public Convenience.
9. Stationary Shops and Kiosks.
10. Public Address System.
11. First aid with doctor on call facilities.
12. Security office and booths for security arrangements.
13. Storage complex for custom storage and handling etc.
14. Fire safety arrangements.
15. Locker facilities.
16. Handicraft shops, souvenir shop.
17. Facility for the physically disabled person.
18. Other facility for enhancing costumer satisfaction.

1.14 LOCAL NORMS

6. INSTITUTIONAL (medical), ASSEMBLY PUBLIC BUILDINGS AND PUBLIC OFFICE COMPLEXES:

1. Maximum permissible FAR : Refer relevant statement.
2. Building Requirements and setbacks upto 10 mtrs. building height.

Plot area (Sq.mts.)	Max. Cov	Setbacks for Office buildings		Setbacks for Other buildings	
		Front	Remaining sides	Front	Remaining sides
a) Below 500	As per min.building setbacks	6.00	4.50	9.00	6.00
b) 500 – 2000	50%	6.00	4.50	9.00	6.00
c) 2000 & above	1000 sq.mts. or 40% whichever is higher	6.00	4.50	9.00	6.00

(3) for above category of buildings above 10 mtrs. height:
In addition to the setbacks prescribed above there shall be an increase of 1.0 mtrs. on all sides for every increase of 3.0 mtrs. height of building above 10 mtrs.

4. PARKING:

Type of Building	One vehicular parking space of 20 sq.mts. area for every
a) Institutional (Medical)	20 beds
b) Government or semi-public buildings	100 sq.mts. builtup area or fraction thereof

Figure 10 MOS and Ground Coverage

4. SITE AND BUILDINGS REQUIREMENTS:

4.1 MAXIMUM PERMISSIBLE FLOOR AREA RATIO (F.A.R.)

For Residential, Commercial, Institutional and other non-industrial buildings, and for different areas are as follows:
TABLE FOR F.A.R.

Statement	**Plot Size Sq.mts**	**Proposed Road Width as per Notified Master Plan Plan/Zonal Development Plan**			
		Below 12 mts.	**12 to 18 mts.**	**18 mts. and above**	**Max.height in mts.**
For Hyd,VSP Mpl.Corp. & Gaddiannaram G.P.	Below 200	1.00	1.25	1.25	10 (no stilt)
	200 to below 1000	1.00	1.25	1.33	15 *
	1000 to below 2000	1.25	1.33	1.50	**
	2000 & above	1.25	1.50	1.75	**
Statement	**Plot Size Sq.mts**	**Proposed Road Width as per Notified Master Plan Plan/Zonal Development Plan**			
		Below 12 mts.	**12 to 18 mts.**	**18 mts. and above**	**Max.height in mts.**
For Municipalities within UDA areas of HUDA, TUDA,KUDA,VUDA, VGTUDA, SSUDA	200 to below 1000	1.25	1.33	1.50	15 *
	1000 to below 2000	1.33	1.40	1.60	**
	2000 & above	1.40	1.50	1.75	**
For Gram Panchayats falling within UDA areas of HUDA, TUDA,KUDA,VUDA, VGTUDA, SSSUDA	Below 200	1.25	1.25	1.33	10 (no stilt)
	200 to below 1000	1.40	1.50	1.60	15 *
	1000 to below 2000	1.50	1.60	1.70	**
	2000 & above	1.75	1.85	2.00	**

Figure 9 F.A.R

13. PARKING REQUIREMENTS:

(a) In all Buildings provision shall be made for parking spaces as per the following requirements:

TABLE – V

Sl. No	Category of building/ activity	Parking area to be provided as percentage of total built up area					
		HMDA Area		All Municipal Corporations & UDA Areas		Municipalities/ N.Ps/ G.Ps. other than UDA Areas	
		GHMC	Municipalities/ N.Ps/ G.Ps. in HMDA Area	All Municipal Corporations	Municipalities/ N.Ps/ G.Ps. in UDA Areas	Selection & Special Grade Municipalities	Other Municipalities/ N.Ps/ G.Ps.
1	2	3	4	5	6	7	8
1	Multiplexes	60	50	60	50	60	50
2	Shopping Malls (above 4000 sq.m), Information Technology Enabling Services Complexes	60	50	50	40	40	30
3	Hotels, Restaurants, Lodges, Cinema halls, Business buildings, Other Commercial buildings, Kalyana Mandapams, Offices, & High-Rise Buildings / Complexes of Non Residential Category	40	30	30	25	25	25

Figure 11 Parking

(c) **Electrical Lines**

(i) In case of sites in the vicinity of High Tension Electricity Transmission Lines besides taking other safety precautions, a minimum safety distance (both vertical and horizontal) of 3m shall be maintained between the building and the High Tension Electricity Lines and 1.5m shall be maintained between the building and the Low Tension Electricity Lines.

(ii) In case of Electricity Tower lines, the land all along below the tower line shall be developed as green belt to an extent of the width of tower base and on either side of green belt there shall be a minimum of 10m wide roads or as defined in the Master Plan.

Figure 12 Electrical lines

12. BUILDINGS WITH CENTRAL COURTYARD FOR COMMERCIAL USE:

(a) 'U' type commercial buildings with central courtyard are allowed with a minimum plot area of 2000sq.m with the following conditions:

(b) The Front setback shall be as per Table-III of rule-5 & Table-IV of rule-7 for Non High Rise & High Rise buildings respectively.

(c) The minimum open space / setback on sides and rear except front, shall be

(i) 2m for building height up to 15m;

(ii) 3m for building height up to 18m;

(iii) 7m in case of high rise buildings up to 30m height and buildings coming under purview of Andhra Pradesh Fire Services Act-1999.

(d) The area so saved is transferred to the central area / space or court yard;

Figure 13 Central couryard

(x) The minimum abutting road width and all round open space / setback for High Rise Building / Complex shall be as follows:

TABLE – IV

Height of building (in meters)		Minimum abutting road width required (in meters)	Minimum all-round open space on remaining sides (in meters) *
above	**Up to**		
1	**2**	**3**	**4**
-	21	12	7
21	24	12	8
24	27	18	9
27	30	18	10
30	35	24	11
35	40	24	12
40	45	24	13
45	50	30	14
50	55	30	16
After 55m 0.5m additional setback for every 5m of height shall be insisted			

Figure 16 Abutting road width

7. REQUIREMENTS FOR HIGH RISE BUILDINGS:

(a) **High Rise Buildings / Complexes**

(i) High Rise Buildings / Complexes shall be permissible only in areas other than those given in Annexure - I & II.

(ii) The minimum size of plot for High Rise building shall be 2000sq.m.

(iii) In respect of sites proposed for high rise buildings and affected in road widening where there is shortfall of the net plot size, up to 10% of such shortfall in net plot area would be considered with the proposed height and corresponding minimum all round setbacks.

(vii) In every high rise building site, an organized open space shall be utilized as greenery, tot lot or soft landscaping, etc. shall be provided over and above the mandatory setbacks to be left in and around the building. This space shall be at least 10% of total site area at ground level open to sky and shall be a minimum width of 3m. This may be in one or more pockets with minimum area of 50sq.m at each location.

(viii) In addition to the above, a minimum of 2m wide green planting strip in the periphery on all sides within the setbacks are required to be developed and maintained.

(ix) Buildings abutting major road of 30m and above width shall be permitted only after providing black-topped service roads of minimum 7m width with minimum 2 Lane carriageway with in the defined right of way. It will be the responsibility of the developer / builder / owner to provide the above service road of the standards fixed by the Sanctioning Authority at his own cost. The Sanctioning Authority may consider sanctioning building permission if the developer / builder / owner deposits the full cost for laying such service road to the Sanctioning Authority. The amount so levied and collected shall be maintained in a separate exclusive account by the Sanctioning Authority and utilized only for this purpose.

Figure 15 Requirments for High rise buildings

35% of the prescribed F.A.R.

Common areas shall include:

(a) Air-conditioning plant room, electrical transformer cabin, pump house.

(b) Watchman booth, garbage shaft

(c) Corridors, Staircase, lift blocks

(d) Balconies

Figure 14 F.A.R

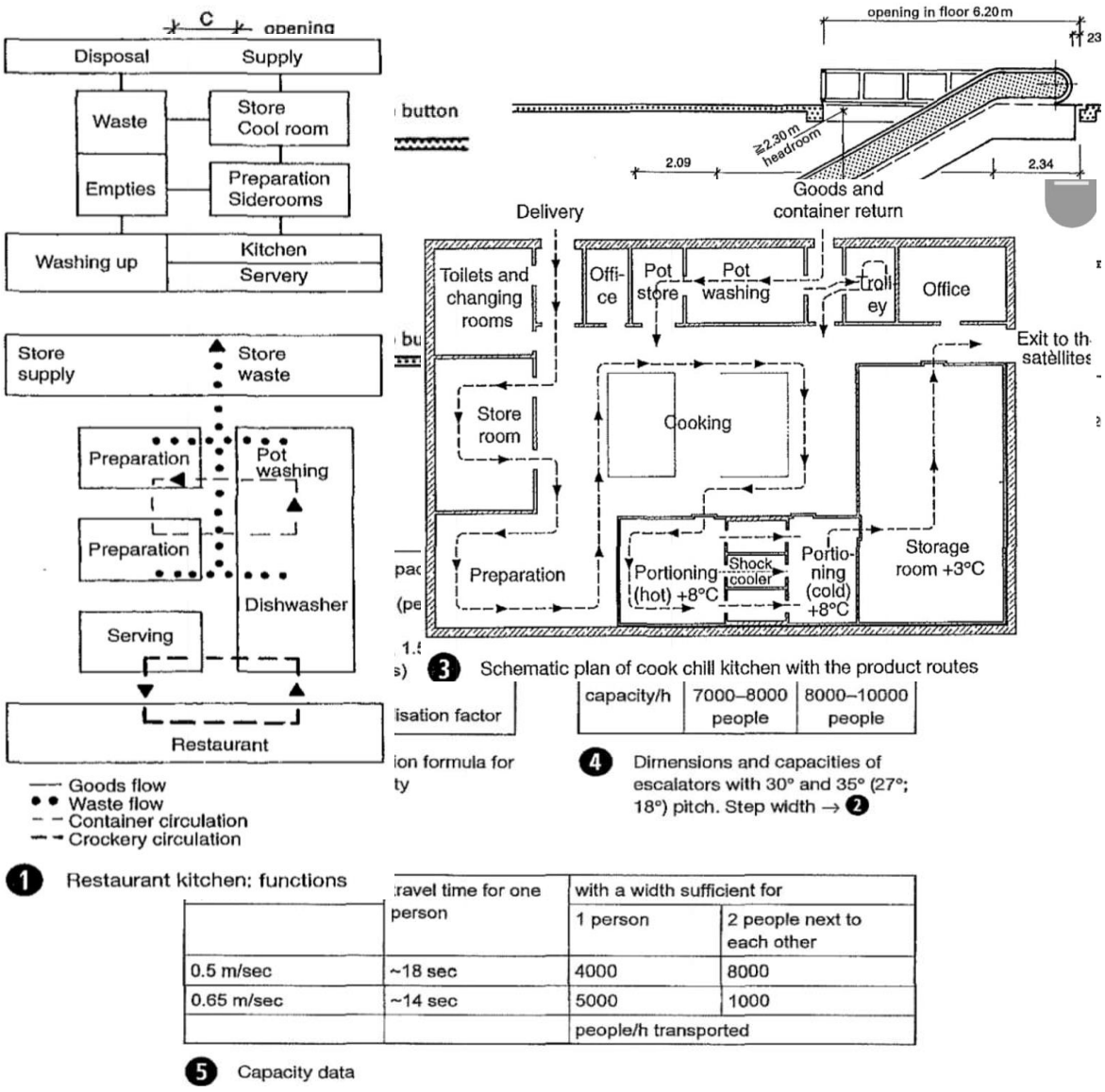
building set back is 5 mtrs. and above the maximum width can be 1.5 metres.

1.15 **URDPFI**

Socio-Cultural Facilities	
Community Hall	Parking standard @ 3.0 ECS /100 sq.m.
Recreational Club	Parking standard @ 2.0 ECS /100 sq.m. of floor area
Auditorium, music, dance & drama center	Parking standard @ 2.0 ECS /100 sq.m. of floor area
Science Center	Parking standard @ 2.0 ECS /100 sq.m.
International Convention Center	Parking standard @ 2.0 ECS /100 sq.m.
Old Age Home / Care Center for physically / Mentally challenged / Working Women / Men Hostel	Parking standard @ 1.8 ECS /100 sq.m. floor area
Sport Facility for international Sports Event	2 ECS / 100 sq.m. of floor area

1.16 **STANDARDS- NEUFRT**

1.16.1 Escalators



❸ Schematic plan of cook chill kitchen with the product routes

capacity/h	7000–8000 people	8000–10000 people

❹ Dimensions and capacities of escalators with 30° and 35° (27°; 18°) pitch. Step width → ❷

❶ Restaurant kitchen: functions

	travel time for one person	with a width sufficient for	
		1 person	2 people next to each other
0.5 m/sec	~18 sec	4000	8000
0.65 m/sec	~14 sec	5000	1000
		people/h transported	

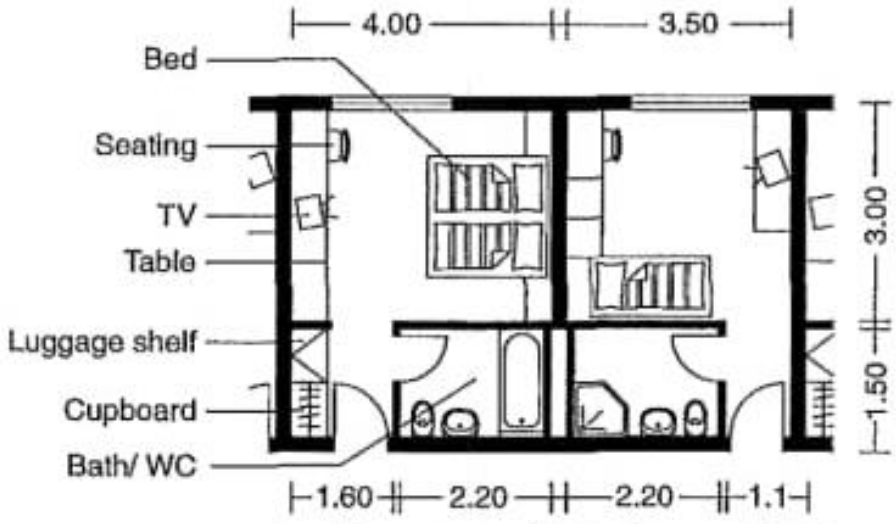
❺ Capacity data

Figure 17 Escalator

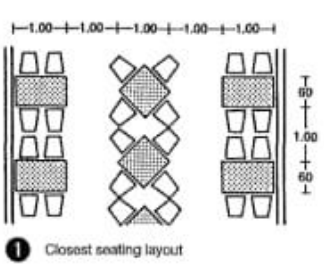
1.16.2 Kitchen

1.16.3 Dinning

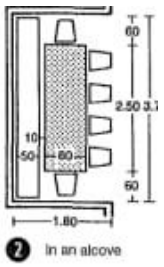
1.16.4 Hotel



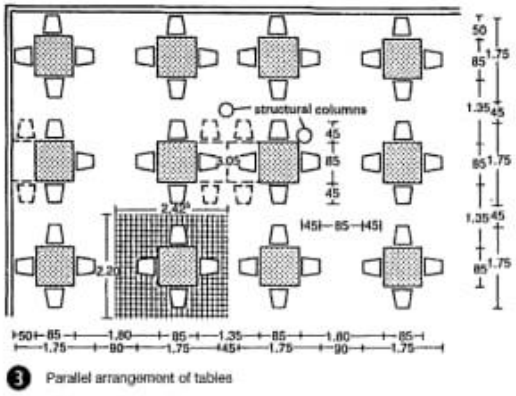
1 3-star hotel rooms showing features and main dimensions (according to DEHOGA classification, single room slightly enlarged)



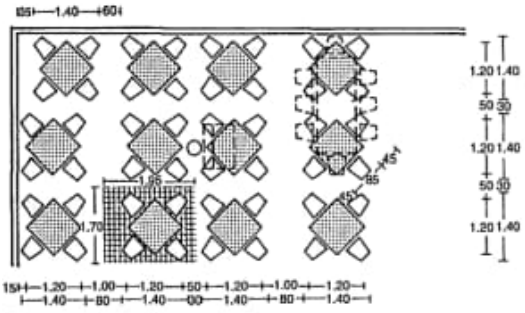
1 Closest seating layout



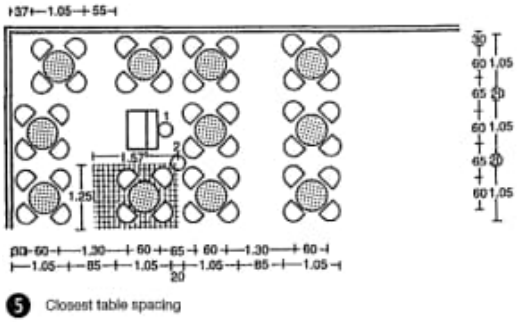
2 In an alcove



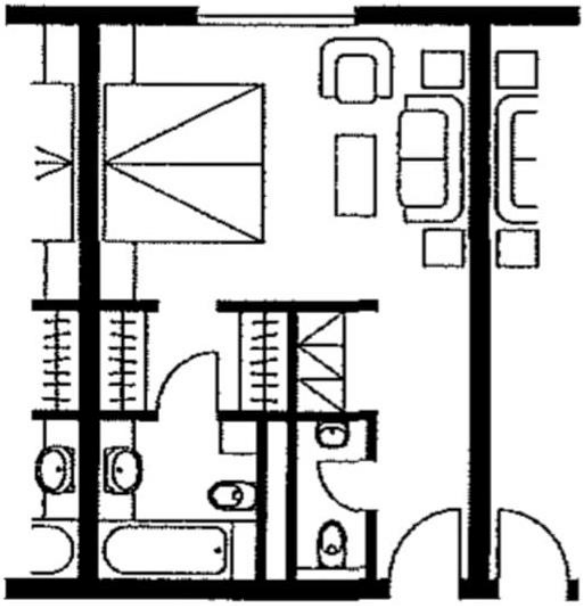
3 Parallel arrangement of tables



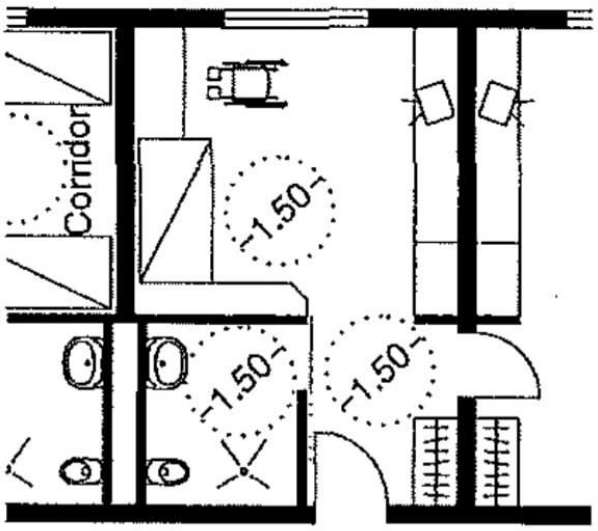
4 Diagonal arrangement of tables



5 Closest table spacing



4 Hotel room with extra WC



6 Hotel room accessible for a disabled person with space for accompanying person → p. 21

❸ Laws, guidelines, provisions and regulations for the design of businesses offering accommodation and catering (excerpt)

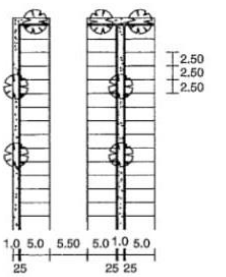
1.	guest rooms, bathrooms, corridors, room service	50–60%
2.	public areas, lobby, reception etc.	4–7%
3.	catering	4–8%
4.	events, ballroom, seminar rooms	4–12%
5.	wellness/ fitness area	5–10%
6.	other areas, cosmetics, hairdresser	1–2%
7.	management, administration	1–2%
8.	service area, kitchen, staff rooms, stores	9–14%
9.	building services	5–10%

Parking and garage areas and special areas (e.g. wellness and bathing area) are also to be taken into account (and can vary widely according to the range of services)

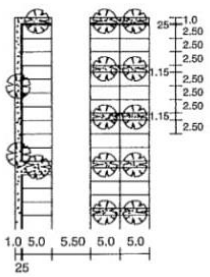
	Hotel type	m^2/room
1.	luxury	90–110
2.	first class	60–70
3.	comfort	50–60
4.	standard (holiday hotel, motel)	40–60
5.	tourist (low-budget)	15–20

❹ Guideline values for (above) shares of hotel surface area taken by each function and (below) gross areas per room in various categories of hotel

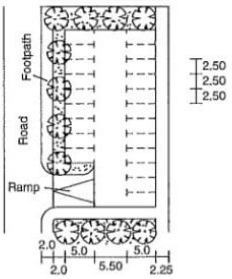
1.16.5 Parking



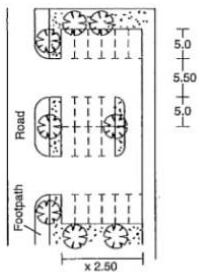
❾ Car park with planting



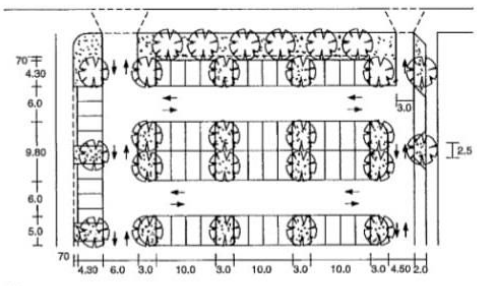
❿ Planting at right angles to the access passage



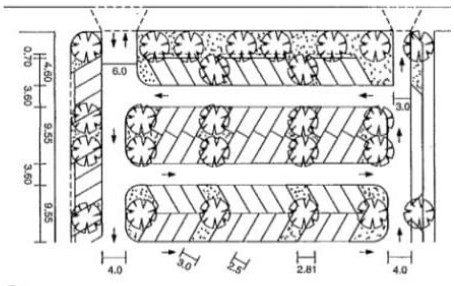
⓫ Lowered parking area → ❺ – ❻



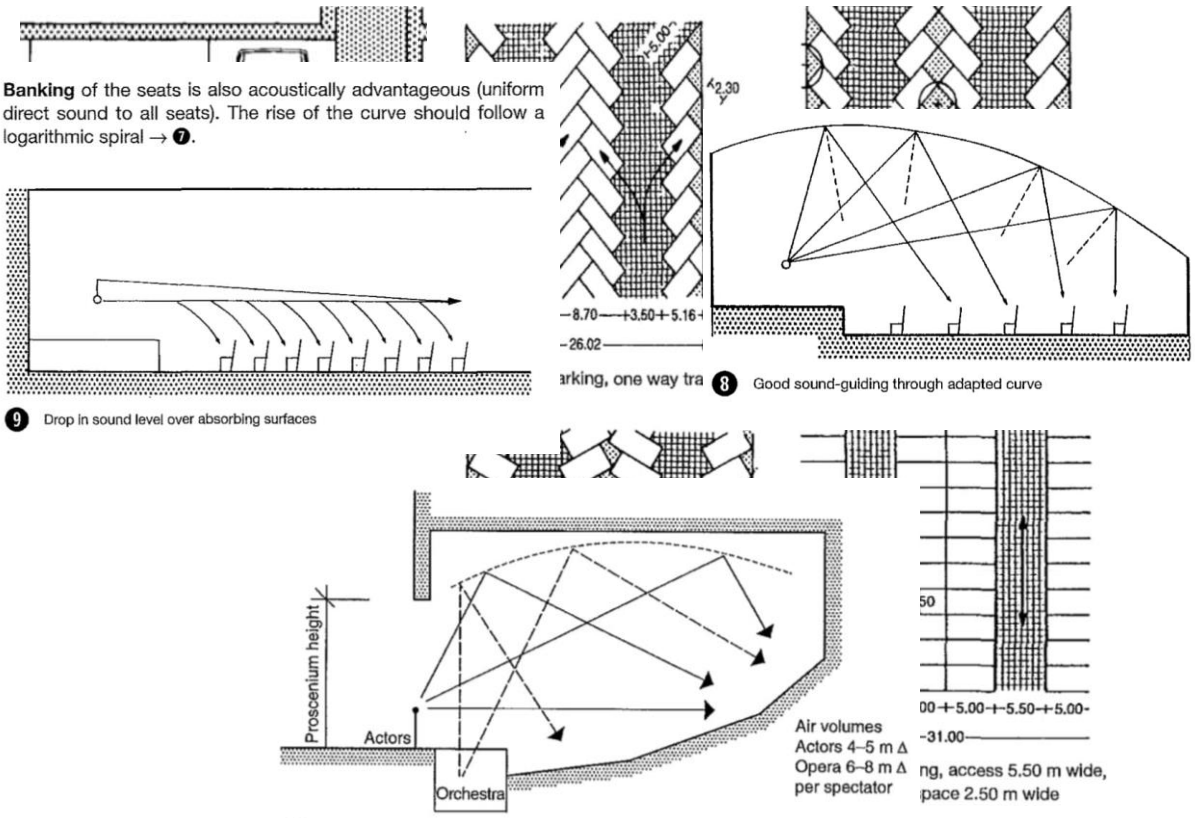
⓬ Parking next to the road



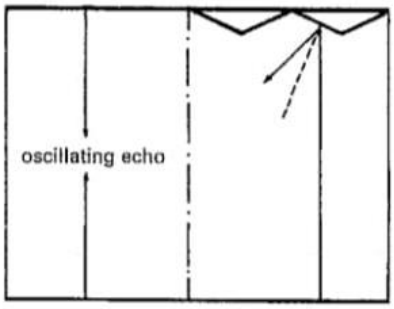
⓭ Example: car park



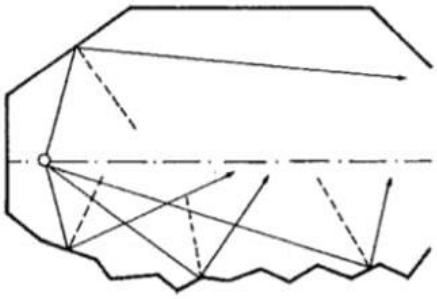
⓮ Variant: oblique layout in car park



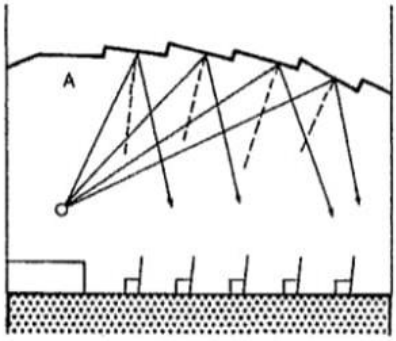
1.16.6 Acoustic



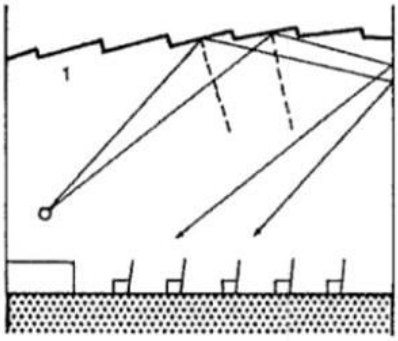
3 Flutter echo from parallel unstructured walls



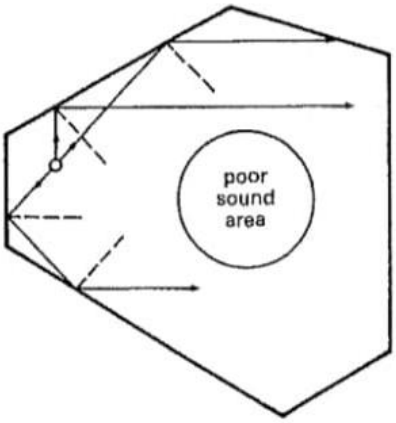
4 Diffused reflections created through folds in the wall surface



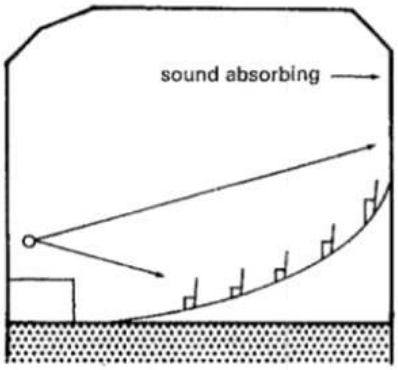
5 Ceiling shape flat for music, sloping to the back for speech



6 Unfavourable ceiling shapes



7 Folding of the wall surface



8 Uniform direct sound to all places through banking the rows of seats. The curve should follow a logarithmic spiral

1.1.1 Space Requirements **(NBC Vol. 2, Part 3)**

Assembly Halls / Convention Halls:

- **Area per person**: 1.2 to 1.5 sq.m (seating), up to 1.8–2.0 sq.m (if dining involved).
- **Main convention hall**: Depends on capacity—e.g., for 2500 PAX, approx. 3750–4500 sq.m needed.

- **Pre-function / Lobby areas**:
  - 30–50% of the main hall area.
- **Support spaces**:
  - Green rooms, control rooms, AV rooms, storage, interpretation booths, press rooms, and VIP lounges.
- **Toilets**:
  - 1 WC per 100 males, 1 WC per 50 females (plus urinals for males).

ACCESSIBILITY**: MUST FOLLOW ACCESSIBILITY NORMS (IS 4963), WITH RAMPS, LIFTS, AND ACCESSIBLE TOILETS.**

1.15 CEILING HEIGHTS**:ASSEMBLY HALLS: MINIMUM 4.5 M CLEAR HEIGHT.**

1.1.2 Fire Safety & Exits**:**

- Minimum 2 staircases for halls.
- Travel distance to exit: ≤30 m.
- 1 exit per 500 persons; exit width = 1 m per 100 persons.

Parking Norms**:1 car per 50–75 sq.m of built-up area (depends on local authority norms).**

1.1.3 3-Star Hotel Design Requirements

Room Configuration (As per HRACC / NBC Vol. 2, Part 3)**:**

Min. rooms: 30 guest rooms.

Room size:

- Single room: 9.0 sq.m (min).
- Double room: 18–22 sq.m.
- Attached toilet: 4.5 sq.m (minimum).

Facilities**:**

- Reception lobby, restaurant (min. 1), room service, staff facilities, guest lounges.
- Banquet/meeting rooms (can be shared with the convention space).
- Parking: 1 car per 2 rooms (min.).

Service Areas**:Laundry, housekeeping, staff locker rooms, administration, HVAC areas.**

Height & FAR Norms**:**

FAR and height as per local Development Control Regulations.

Typical 3-star hotel: 2–4 floors; GFA ~ 150–200 sq.ft/room.

1.1.4 Shared Infrastructure Guidelines

Access & Circulation: Common vehicular drop-offs with separation for hotel guests and convention attendees.

Vertical transportation: Elevators and service lifts per NBC norms.

Fire and Emergency: Integrated fire detection, alarm and suppression systems across both functions.

1.1.5 Lifts

Passenger and service lift

Table 12 — (*Concluded*)

Sl No.	No. of Passengers	Rated Load	Car Size		COPD Door	Passenger and Service Lifts with Machine Room: Shaft Sizes											
						Rated speed < 1 m/s		1.0 m/s ≤ Rated Speed ≤ 2.5 m/s		3.0 m/s ≤ Rated Speed ≤ 3.5 m/s		4.0 m/s ≤ Rated Speed ≤ 5.0 m/s		Rated Speed = 6.0 m/s		7.0 m/s ≤ Rated Speed ≤ 8.0 m/s		9.0 m/s ≤ Rated Speed ≤ 10.0 m/s	
						Shaft Size		Shaft Size		Shaft Size		Shaft Size		Shaft Size		Shaft Size		Shaft Size	
(1)	(2)	kg (3)	Width (4)	Depth (5)	Width (6)	Width (7)	Depth (8)	Width (9)	Depth (10)	Width (11)	Depth (12)	Width (13)	Depth (14)	Width (15)	Depth (16)	Width (17)	Depth (18)	Width (19)	Depth (20)
i)	4	272	1 100	700	800	1 900	1 300	1 900	1 300										
ii)	6	408	1 100	1 000	800	1 900	1 700	1 900	1 700										
iii)	8	544	1 300	1 100	800	1 900	1 900	1 900	1 900										
iv)	10	680	1 300	1 350	800	1 900	2 150	1 900	2 150										
v)	13	884	2 000	1 100	900	2 600	1 900	2 600	1 900										
vi)	14	952	1 600	1 400	900	2 200	2 100	2 200	2 100	2 200	2 150	2 250	2 150	2 250	2 250	2 300	2 300	2 300	2 450
vii)	16	1 088	1 600	1 600	1 000	2 300	2 300	2 300	2 300	2 300	2 350	2 300	2 350	2 300	2 450	2 300	2 500	2 300	2 650
viii)	18	1 224	2 000	1 400	1 100			2 600	2 100	2 600	2 150	2 600	2 150	2 600	2 250	2 700	2 300	2 700	2 450
ix)	20	1 360	2 000	1 500	1 100			2 600	2 100	2 600	2 250	2 600	2 250	2 600	2 350	2 700	2 400	2 700	2 550
x)	22	1 496	2 100	1 600	1 100			2 700	2 300	2 700	2 350	2 700	2 350	2 700	2 450	2 800	2 500	2 800	2 550
xi)	26	1 768	2 350	1 600	1 200			3 000	2 300	3 000	2 350	3 000	2 350	3 000	2 450	3 050	2 550	3 050	2 550
xii)	29	1 972	2 350	1 700	1 200					3 000	2 500	3 000	2 500	3 000	2 550	3 050	2 600	3 050	2 700

NOTES

1 All dimensions given above for lifts having centre opening power operated doors (COPD) with counterweight at rear, are recommended dimensions primarily for architects and building planners. Any variations mutually agreed between the manufacturer and the purchaser are permitted. However, variation in,

a) car inside dimensions shall be within the minimum and maximum area limits specified in accordance with accepted standards [8-5A(6)].

b) entrance width on higher side is permitted.

c) entrance width on lower side is permitted up to 100 mm subject to minimum of 700 mm.

2 The minimum size of the lift car and all other requirements relating to accessibility, in all public buildings shall be in accordance with 13 of Part 3 'Development Control Rules and General Building Requirements' of the Code.

Figure 19 Passenger and service lift dimentions

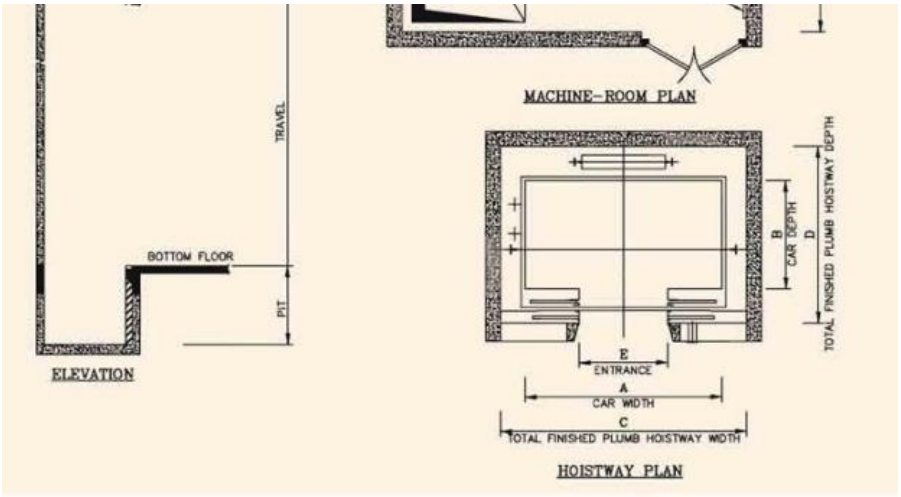


Figure 18 Passenger and service lift

Fire-fighting Lifts

The special provisions for firefighting lifts are as follows:

- Minimum duty load of 630 kg.
- Minimum internal dimensions of 1.1 m wide X 1.4 m deep X 2.0 m high.

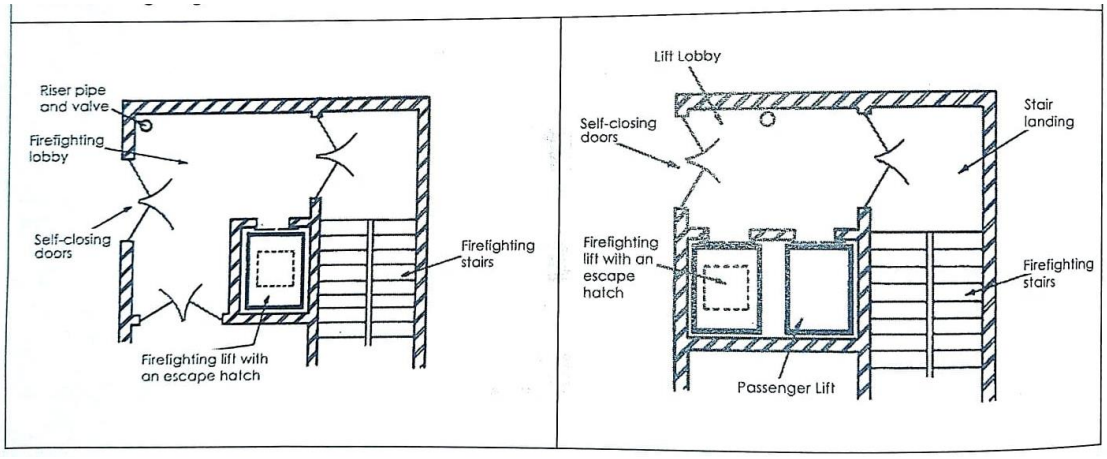


Figure 20 Fire-fighting Lifts layout

- Provision of an emergency escape hatch in the car roof.
- Top floor access time- maximum 60 seconds.
- Manufactured from non-combustible material.
- A two-way intercommunications system installed.
- Door dimensions at least 0.8 m wide X 2.0 m high of fire resisting construction.
- Two power supplies- mains and emergency generator.

Building Regulations for firefighting lift

Structures with floors at a height greater than 18 m above fire service vehicle access (usually ground level), or with a basement, greater than 10 m below fire service vehicle access, should have accessibility from a purpose-made firefighting lift. All intermediate floors should be served by the lift.

1.1.6 Escalators

Escalators are moving stairs used to convey people between floor levels. They are usually arranged in pain for opposing directional travel to transport up to 12000 persons per hour between them. The maximum carrying capacity depends on the step width and conveyor speed. Standard steps widths are 600, 800 and 1000 mm, with speeds of 0.5 and 0.65 m/s. Control gear a less complex than that required for lifts as the motor runs continuously with less load variations. In high rise buildings space for an escalator is unjustified for the full height and the high speed of modern lifts provides for a better service.

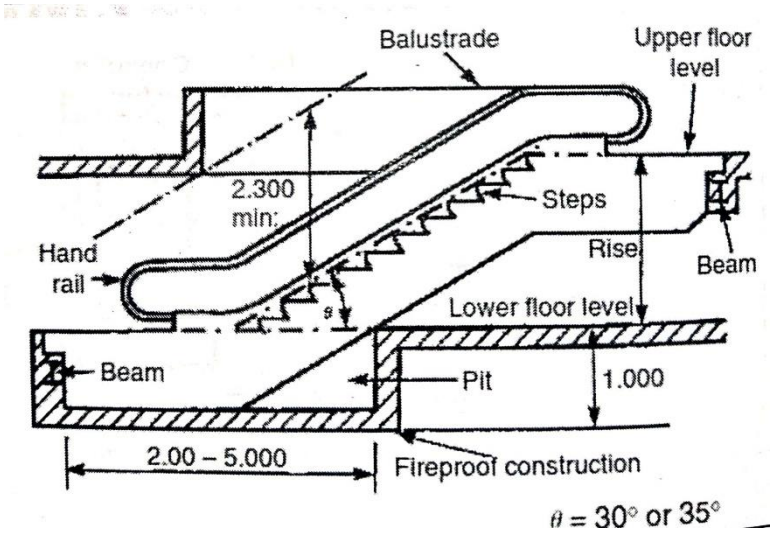


Figure 21 Escalator section view

The recommendations of NBC about Escalators & Elevators are as follows:

- The recommended angle with the horizontal for escalators should be in the range of 30-35 degree
- As per Indian Standards the width of escalator step tread shall be not more than 1020/1050 mm
- As per NBC for bullding having height of 15.0 m or more at least one fire man's lift shall be given

Arrangements of Escalators

Escalator configurations vary depending on the required level of service. The one-directional single bank avoids interruption of traffic, but occupies more floor space than other arrangements. A criss-cross or cross-over arrangement is used for moving traffic in both directions.

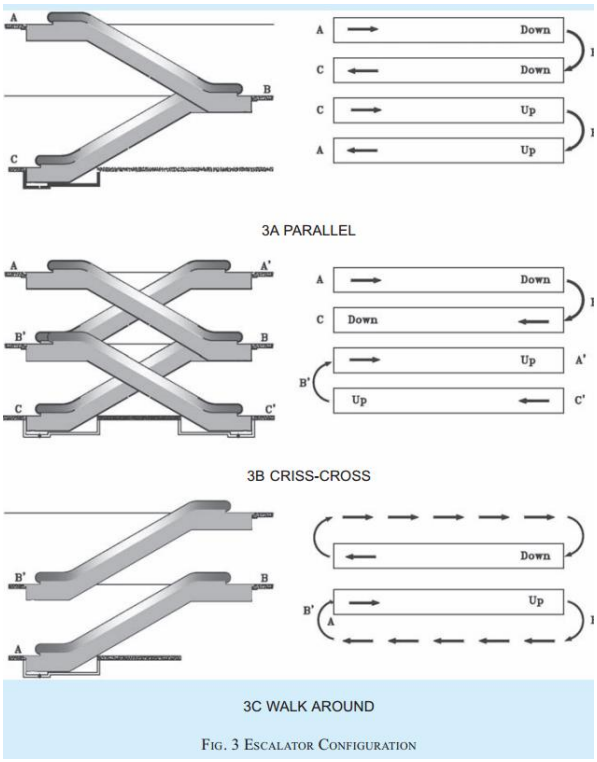


FIG. 3 ESCALATOR CONFIGURATION

Figure 22 Types of escalators

1.1.7 Emergency Power Backup System

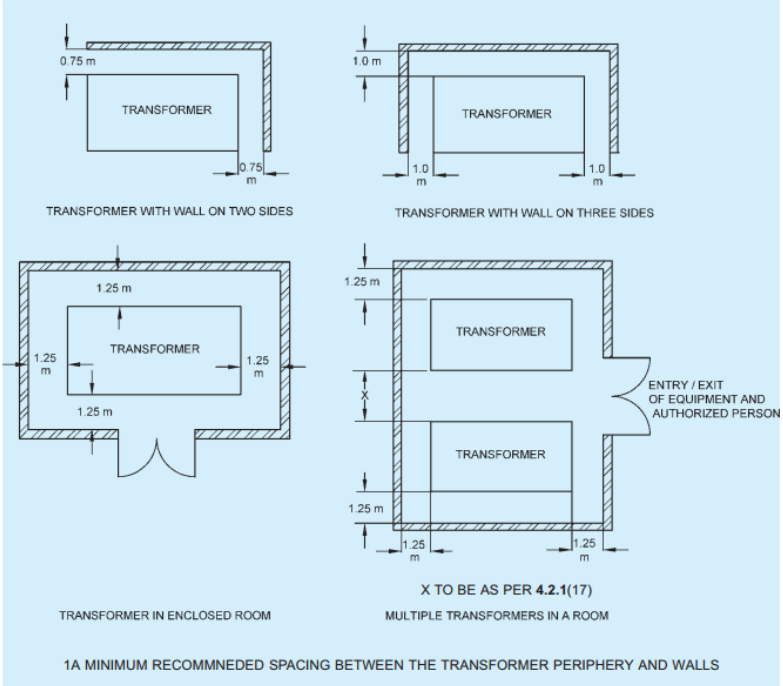


Figure 23 Transformer layout

Location

The emergency power supply (such as generating sets) should not be allowed to be installed above ground floor or below the first basement level of the building. In case of DG set located in basement, the ceiling of the DG room shall be the ground floor slab.

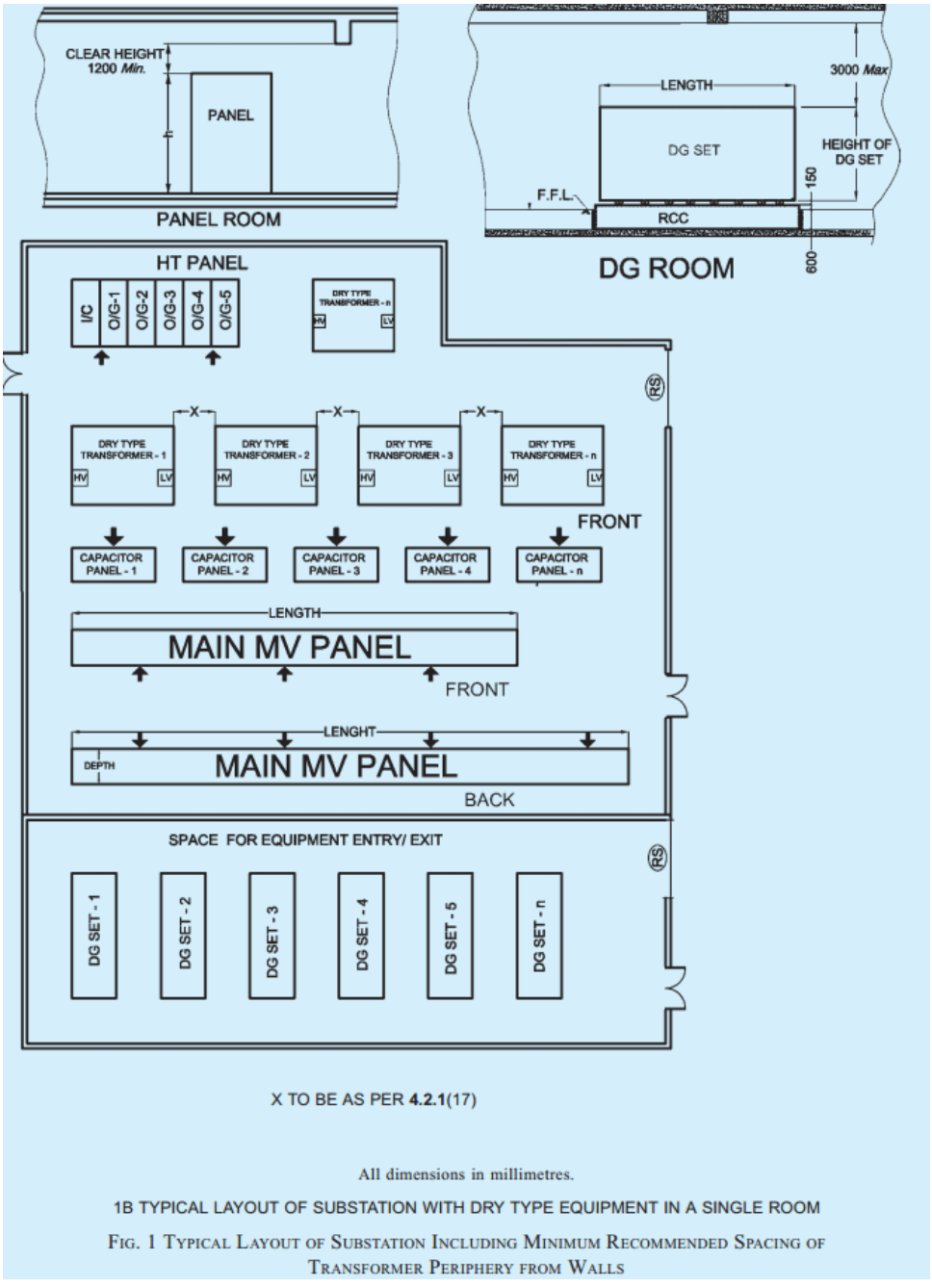


Figure 24 Substation layout

1.1.8 HVAC

The central air conditioning plants or the systems are used when large buildings, hotels, theatres, airports, shopping malls etc., are to be air conditioned completely, in the central air conditioning systems, there is a plant room where large compressor, condenser, thermostatic expansion valve and the evaporator are kept in the large plant room. They perform all the functions as usual similar to a typical refrigeration system. However, all these parts are larger in size and have higher capacities. The chilled air is passed via the ducts to all the rooms, halls and other spaces that are to be air conditioned. Thus, in all the rooms there is only the duct passing the chilled air and there are no individual cooling coils, and other parts of the refrigeration system in the rooms. We get completely silent and highly effective air in the

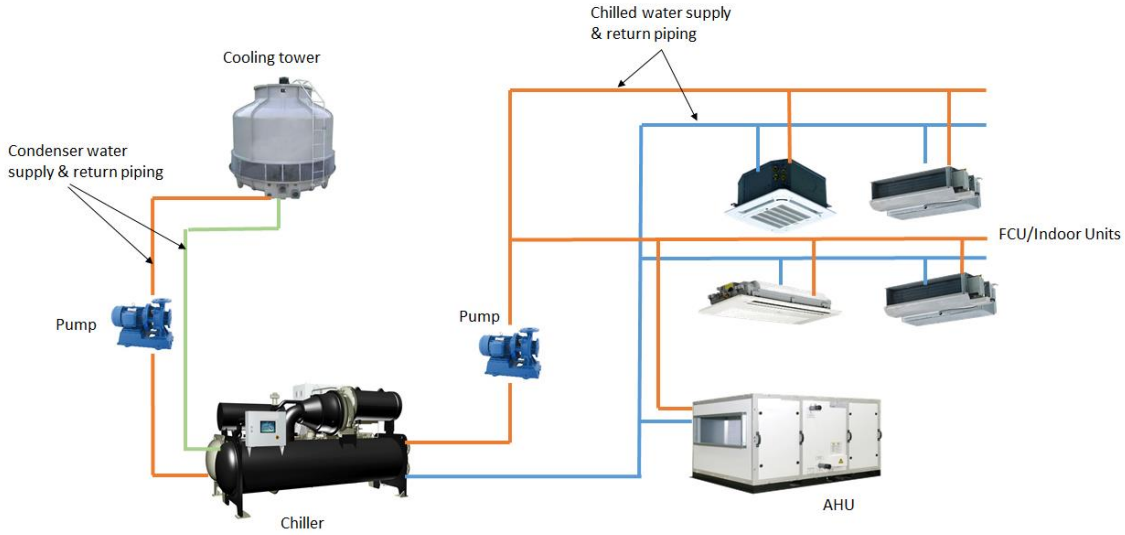


Figure 25 HVAC layout

room. Further, the amount of chilled air that is needed in the room can be controlled by the openings depending on the fatal heat load inside the room.

There are two types of Central Air Conditioning plants or systems:

1) Direct expansion or DX central air conditioning plant

2) **Chilled water central air conditioning plant**

This type of system is more useful for large buildings comprising of a number of floors.It has the plant room where all the important units like the compressor, condenser, throttling valve and the evaporator are housed. The evaporator is a shell and tube. On the tube side the Freon fluid passes at extremely low temperature, while on the shell side the brine solution is passed

After passing through the evaporator, the brine solution gels chilled and is pumped to the various air handling units installed at different floors of the building.

The air handling units comprise the cooling coil through which the chilled brine flows. The blower sucks hot return air from the room via ducts and blows it over the cooling coll.The cool air is then supplied to the space to be cooled through the ducts. The brine solution which has absorbed the room heat comes back to the evaporator, gets chilled and is again pumped back to the air handling unit.

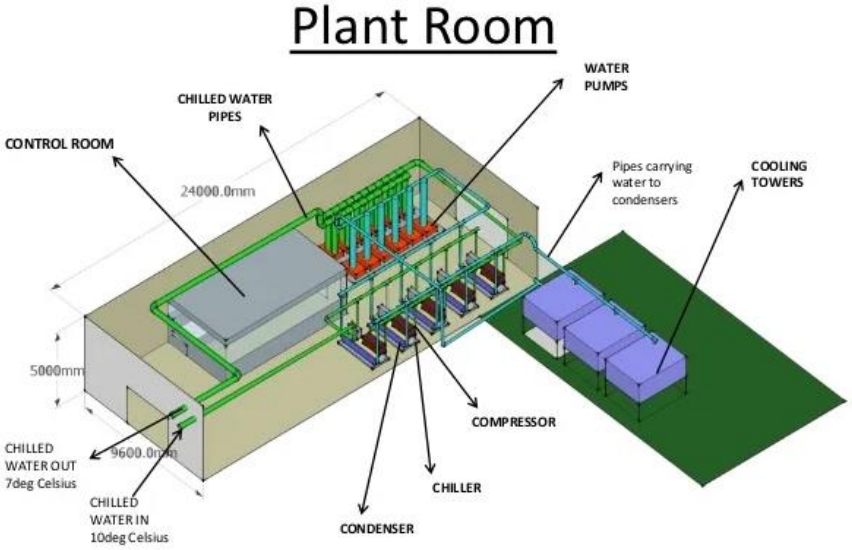


Figure 26 Plant room

The following four environmental parameters are important while designing the HVAC system because these are directly controllable by an HVAC system:

a) Air temperature (ºC),

b) Radiant temperature (ºC),

c) Air speed (m/s), and

d) Relative humidity (percent).

In addition to the above four environmental parameters, there are two personal or behavioural parameters that also affect thermal comfort but are not controllable by the HVAC system and they are as follows:

1) Activity rate (W/m2) and Clothing insulation (m^2.K/W).

Equipment Room for Air Handling Units and Package Units

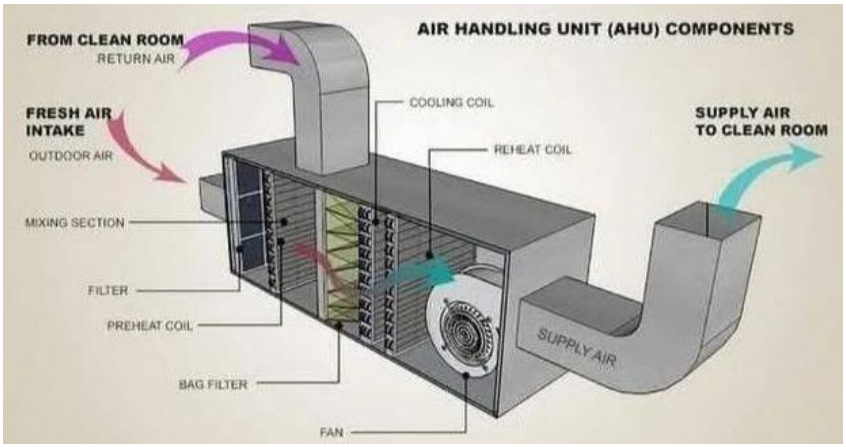


Figure 27 AHU unit

This shall be located as centrally as possible to the conditioned area and contiguous to the corridors or other service areas for carrying air ducts in ceiling spaces. In case of special and high-rise buildings, air handling units shall be provided in accordance with. Air handling unit rooms should preferably be located vertically one above the other.

Cooling tower

Water is commonly used as a heat transfer medium to remove heat from the refrigerant vapour in condenser. Cooling tower is used to dissipate the heat from the air conditioning system.

Minimum cooling tower efficiency shall be as follows:

1) 350 litre per minute/HP for 24×7 facilities.

2) 300 litre per minute/HP for all others.

1.1.9 Water Requirements

Table 1 Water Requirements for Buildings Other than Residences
(*Clause* 4.1.2)

Sl No.	Type of Building	Domestic Per Day litre	Flushing Per Day litre	Total Consumption Per Day litre
(1)	(2)	(3)	(4)	(5)
i)	Factories including canteen where bath rooms are required to be provided	30 per head	15 per head	45 per head
ii)	Factories including canteen where no bath rooms are required to be provided	20 per head	10 per head	30 per head
iii)	Hospital (excluding laundry and kitchen) (*see* Note 2):			
	a) Number of beds not exceeding 100	230 per head	110 per head	340 per head
	b) Number of beds exceeding 100	300 per head	150 per head	450 per head
	c) Out patient department (OPD)	10 per head	5 per head	15 per head
iv)	Nurses' homes and medical quarters	90 per head	45 per head	135 per head
v)	Hostels	90 per head	45 per head	135 per head
vi)	Hotel (up to 3 star) excluding laundry, kitchen, staff and water bodies	120 per head	60 per head	180 per head
vii)	Hotel (4 star and above) excluding laundry, kitchen, staff and water bodies	260 per head	60 per head	320 per head
viii)	Offices (including canteen)	25 per head	20 per head	45 per head
ix)	Restaurants and food court including water requirement for kitchen:			
	a) Restaurants	55 per seat	15 per seat	70 per seat
	b) Food court	25 per seat	10 per seat	35 per seat
x)	Clubhouse	25 per head	20 per head	45 per head
xi)	Stadiums	4 per head	6 per head	10 per head
xii)	Cinemas, concert halls and theatres and multiplex	5 per seat	10 per seat	15 per seat
xiii)	Schools/Educational institutions:			
	a) Without boarding facilities	25 per head	20 per head	45 per head
	b) With boarding facilities	90 per head	45 per head	135 per head
xiv)	Shopping and retail (mall)			
	a) Staff	25 per head	20 per head	45 per head
	b) Visitors	5 per head	10 per head	15 per head
xv)	Traffic terminal stations (*see* Notes 3 and 4)			
	a) Airports	40 per head	30 per head	70 per head
	b) Railway stations (Junctions) with bathing facility	40 per head	30 per head	70 per head
	c) Railway stations (Junctions) without bathing facility	30 per head	15 per head	45 per head
	d) Railway Stations (Intermediate) with bathing facility	25 per head	20 per head	45 per head
	e) Railway Stations (Intermediate) without bathing facility	15 per head	10 per head	25 per head
	f) Interstate bus terminals	25 per head	20 per head	45 per head
	g) Intrastate Bus Terminals/Metro Stations	10 per head	5 per head	15 per head

NOTES

1 For calculating water demand for visitors, consumption of 15 litre per head per day may be taken.

2 The water demand includes requirement of patients, attendants, visitors and staff. Additional water demand for kitchen, laundry and clinical water shall be computed as per actual requirements.

3 The number of persons shall be determined by average number of passengers handled by stations, with due considerations given to the staff and vendors who are using these facilities.

4 Consideration should be given for seasonal average peak requirements.

5 The hospitals may be categorized as Category A (25 to 50 beds), Category B (51 to 100 beds), Category C (101 to 300 beds), Category D (301 to 500) and Category E (501 to 750 beds).

Figure 28 Water requirments

1.1.10 Water Requirements for Fire safety

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2)	10 m and above but not exceeding 15 m in height	R	R	R	NR	R	R (*see* Note 4)	R	R	100 000	5 000 (5 000) (*see* Note 6)	(*see* Note 10)	NR
3)	15 m and above but not exceeding 24 m in height	R	R	R	NR	R	R	R	R	150 000	10 000	(*see* Note 11)	NR
4)	24 m and above but not exceeding 30 m in height	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 11)	NR
ASSEMBLY BUILDINGS (D) (*see* Note 16)													
a)	**Buildings (D-1 to D-5)**												
1)	Less than 10 m in height												
	i) Up to 300 persons	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	20 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
	ii) More than 300 persons	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	25 000 (5 000) (*see* Note 6)	NR	900 (450) (*see* Note 6)
2)	Above 10 m but not exceeding 15 m in height	R	R	R	NR	NR	R (*see* Note 4)	R (*see* Note 1)	R	100 000	5 000 (5 000) (*see* Note 6)	(*see* Note 10)	450 (450) (*see* Note 6)
3)	Above 15 m but not exceeding 24 m in height	R	R	R	NR	R	R	R	R	150 000	10 000	(*see* Note 10)	NR
4)	Above 24 m but not exceeding 30 m in height	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 11)	NR
b)	**D-6**	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 12)	NR
c)	**D-7**	For details *see* **6.4.4**											

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2)	15 m and above but not exceeding 30 m	R	R	R	NR	R	R	R	R	150 000	20 000	(*see* Note 11)	NR
3)	Above 30 m in height	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 11)	NR
e)	**Hotels (A-6)**	R	R	R	NR	R	R	R	R	250 000	20 000	(*see* Note 12)	NR

Figure 29 Water requirement for fire fightning

1.1.11 Occupancy load

1.1.12 No. of Fixtures required

Table 3 Cinema, Multiplex Cinema, Concert and Convention Halls, Theatres and Stadia
(*Clause* 4.2.5.1)

Sl No.	Fixtures	Public		Staff	
		Males	Females	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
i)	Water closets	1 per 100 up to 400 Over 400 add at 1 per 250 or part thereof	3 per 100 up to 200 Over 200 add at 2 per 100 or part thereof	1 for up to 15 2 for 16 to 35	1 for up to 12 2 for 13 to 25
ii)	Ablution tap	1 in each water closet	1 in each water closet	1 in each water closet	1 in each water closet
		1 water tap with draining arrangements shall be provided for every 50 persons or part thereof in the vicinity of water closets and urinals			
iii)	Urinals	1 per 25 or part thereof	—	Nil up to 6 1 for 7 to 20 2 for 21 to 45	—
iv)	Wash basins	1 per 200 or part thereof		1 for up to 15 2 for 16 to 35	1 for up to 12 2 for 13 to 25
v)	Drinking water fountain	1 per 100 persons or part thereof			
vi)	Cleaner's sink	1 per floor			
vii)	Showers/bathing rooms	As per trade requirements			

NOTES
1 Some WCs may be Indian style, if desired.
2 Male population may be assumed as two-third and female population as one-third.

Figure 32 Convention hall Fixtures details

Sl No.	Fixtures	Public Rooms		Non Residential Staff	
		Males	Females	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
i)					
ii)					for up to 12
					for 13 to 25
					for 26 to 40
					for 41 to 57
					for 58 to 77
					for 78 to 100
iii)					One in each
					water closet
					sons or part
iv)					—
v)					for up to 12
					for 13 to 25
					for 26 to 40
					for 41 to 57
vi)					—
vii)					
viii)					
N					

Table 3 Occupant Load
(*Clauses* 4.3 *and* 4.4.2.1)

Sl No.	Group of Occupancy	Occupant Load Factor (m^2/person) (*see* Note 1)
(1)	(2)	(3)
i)	Group A: Residential	12.50
ii)	Group B: Educational	4.00
iii)	Group C: Institutional (*see* Note 2):	
	a) Indoor patients area	15.00
	b) Outdoor patients area	10.0
iv)	Group D: Assembly:	
	a) Concentrated use without fixed seating	0.65
	b) Less concentrated use without fixed seating (*see* Note 3)	1.40
	c) Fixed seating	*see* Note 4
	d) Dining areas and restaurants with seating and table	1.80
v)	Group F: Mercantile:	
	a) Street floor and sales basement	3.00
	b) Upper sales floor	6.00
	c) Storage/warehouse, receiving and the like	20.00
vi)	Group E: Business	10.00
vii)	Group G: Industrial	10.00
viii)	Group H: Storage (*see* Note 5)	30.00
ix)	Group J: Hazardous	10.00

NOTES
1 Gross area shall be the floor area as defined in **2.35.** All factors expressed are in gross area unless marked net.
2 Occupant load in dormitory portions of homes for the aged, orphanages, insane asylums, etc, where sleeping accommodation is provided, shall be calculated at not less than 7.5 m^2 gross floor area/person.
3 These shall include gymnasium, table tennis room, billiard room and other gaming rooms, library, swimming pool and like.
4 In case of assembly occupancy having fixed seats, the occupant load shall be determined by multiplying the number of seats by 1.2.
5 Car parking areas under occupancy other than storage shall also be 30 m^2 per person.

Figure 30 Occupancy load

Table 10 Restaurants
(*Clause* 4.2.5.1)

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

NOTES
1 Some WCs may be Indian style, if desired.
2 Male population may be assumed as two-third and female population as one-third.
3 Provision for additional and special fittings where required shall be made.

Figure 33 Restaurants Fixtures details

1.1.13 street Furniture

The design elements for outdoor spaces may be classified under the following categories:

a) Pavement and other pedestrian movement spaces, covering

1) Footpath with heavy pedestrian traffic,

2) Footpath with light pedestrian traffic,

3) Plaza and public assembly spaces,

4) Kerb to footpath, and

5) Steps and ramps.

b) Parking and vehicular movement corridor, covering

1) Parking unit,

2) Median and road divider,

3) Road marking, and

4) Speed breaker.

c) Traffic management units, covering

1) Bollards,

2) Barriers,

3) Crash guard,

4) Gate/Access control,

5) Vehicular height restrictors, and

6) Traffic separators.

d) Outdoor public conveniences, covering

1) Seating,

2) Drinking fountains, and

3) Toilet/Wash rooms.

e) Shelter and kiosks, covering

1) Bus shelters,

2) Police booth,

3) Telephone booth,

4) Milk booth/food stall,

5) Florist,

6) Information desk, and

7) Snack and coffee stall.

f) Outdoor illumination, covering

1) Street light,

2) Façade light, and

3) Ambient light.

g) Tree protection units, covering

1) Tree guard,

2) Tree grate, and

3) Planter.

h) Garbage collection units, covering

1) Litter bin, and

2) Spittoons.

j) Service utilities, relating to

1) Water supply network,

2) Stormwater network,

3) Sewerage network,

4) Electrical network,

5) Telephone lines,

6) Cable e-net,

7) Gas, and

8) Irrigation network.

k) Display and signage location of the street furniture shall be coordinated with the traffic flow pattern of vehicles and pedestrians and external services.

1.1.14 Retractable chair

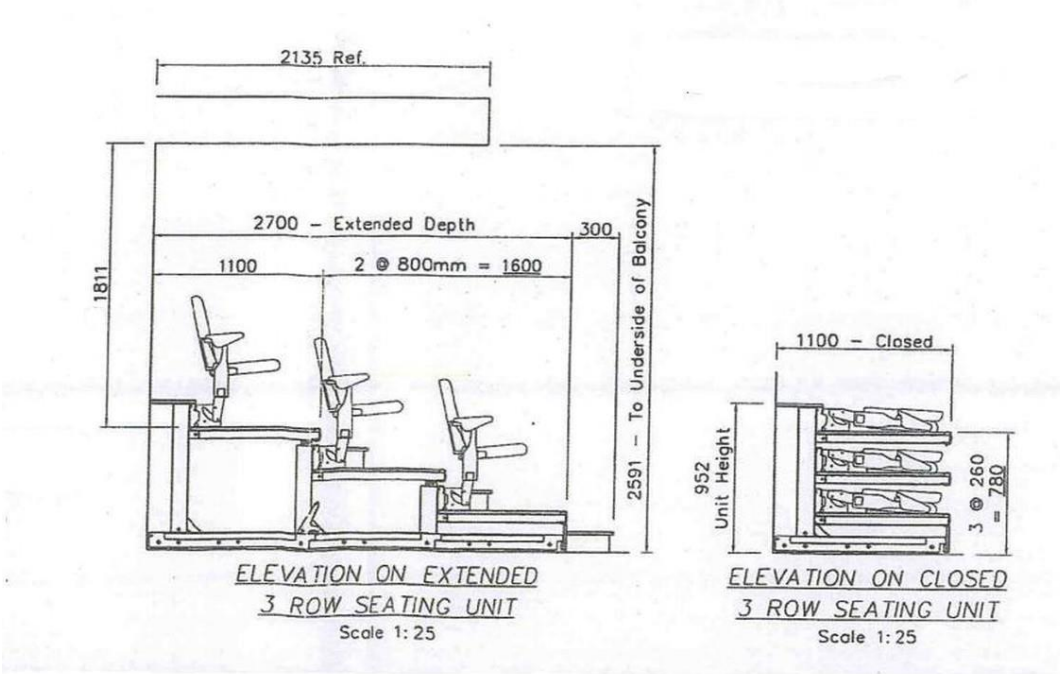


Figure 34 Retractable chair section

1.1.15 Space Planning & Layout

- **Minimum Area (for seating + circulation):**
  - Approximately **1.2–1.5 m² per seat** (including aisles and circulation).
  - For example, 500 seats → ~750 m².
- **Retractable Seating Dimensions:**
  - Typical depth when retracted: **0.8–1.2 m**
  - Depth when extended (with seat & row): **1–1.1 m per row**
- **Stage Placement:**
  - Raised platform with clear sightlines from the last row.
  - Minimum height: 0.9 m; Width: 10–12 m; Depth: 6–8 m (flexible per use).

1.1.16 Retractable Seating System

- **Types:**
  - **Manual**: Folded/stowed by hand.
  - **Motorized**: Automated folding, ideal for larger venues.
- **Frame Material:** Steel or aluminum.
- **Seat Material:** Molded plastic, fabric-upholstered, or cushioned.
- **Mounting Options:** Floor-mounted or wall-attached.

1.1.17 Shapes of Auditoriums

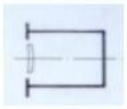
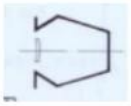
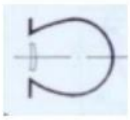
Name	Draft	Advantage	Shortcoming	Example
Rectangle		The plane is regular, the structure is simple, and the sound energy distribution is uniform. It can effectively use the first reflection of the side wall	When the length exceeds 30 meters, hair. Have a severe echo	Boston Concert Hall
Bell-shaped		It helps to adjust the sound field distribution, weaken the frame sense of the platform mouth, and is an improvement of the rectangular plane	The construction cost of curved partition wall is high, Large space between auditoriums	Shanghai Grand Theatre
Sector		At a certain capacity, its maximum distance of sight is short	The span before and after changes greatly, and the structure layout and construction are more complicated	Great Hall of Carajas, Venezuela
Hexagon		The sound field distribution is more uniform, and many remote seats are reduced	The body shape is more complex, and may increase the auxiliary area, and the central anterior area may echo	The Barbican Concert Hall, London, England
Curviline		Good sight line, magnificent momentum	Acoustic processing is more troublesome, easy to cause reflection along the edge, and even sound focusing, so that the sound	Chongqing Grand Theatre

Figure 35 Auditorium shapes

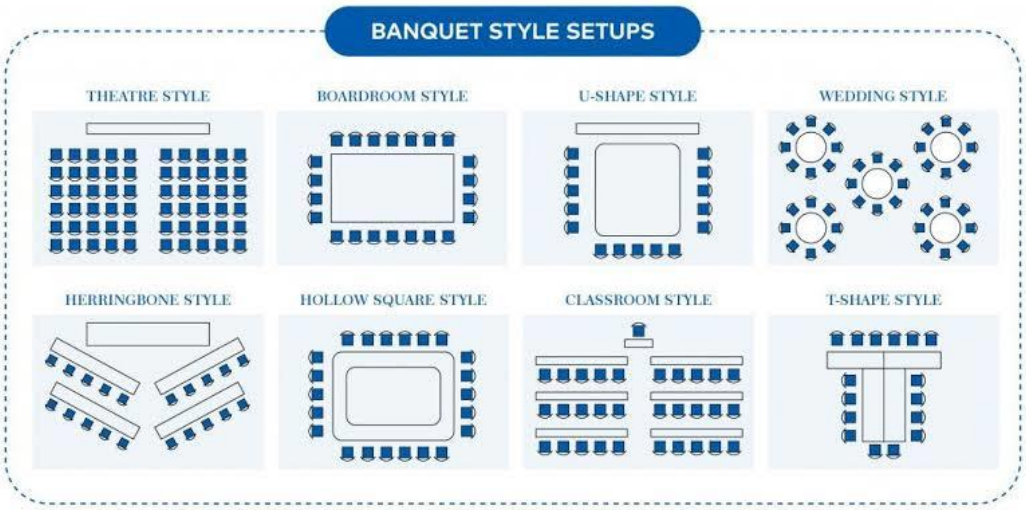


Figure 36 Banquet hall layout

CHAPTER 3: SITE INVENTORY



Figure 37 Site visit

1.17 SITE DETAILS

Location	Madikonda - Warangal, Telangana
Site Area	10 Acres
Ground Coverage	40%
FAR	2
Total Build up Area	23225.7 Sq.m
Land Use Zone	Industrial Zone (I)
Height restriction	No Limits
Land Ownership	Telangana Government Industrial Infrastructure Corporation Limited (TGIIC)
Access to Site	From East of site (NH 163)

1.18 **CONNECTIVITY**

Nearest Railway station	Kazipet railway station - 14 km
Nearest Airport	Warangal International Airport - 31 km
Nearest Bus station	Kazipet railway station - 14 km
Nearest Town	Kazipet - 14 km
Nearest City	Warangal - 27 km

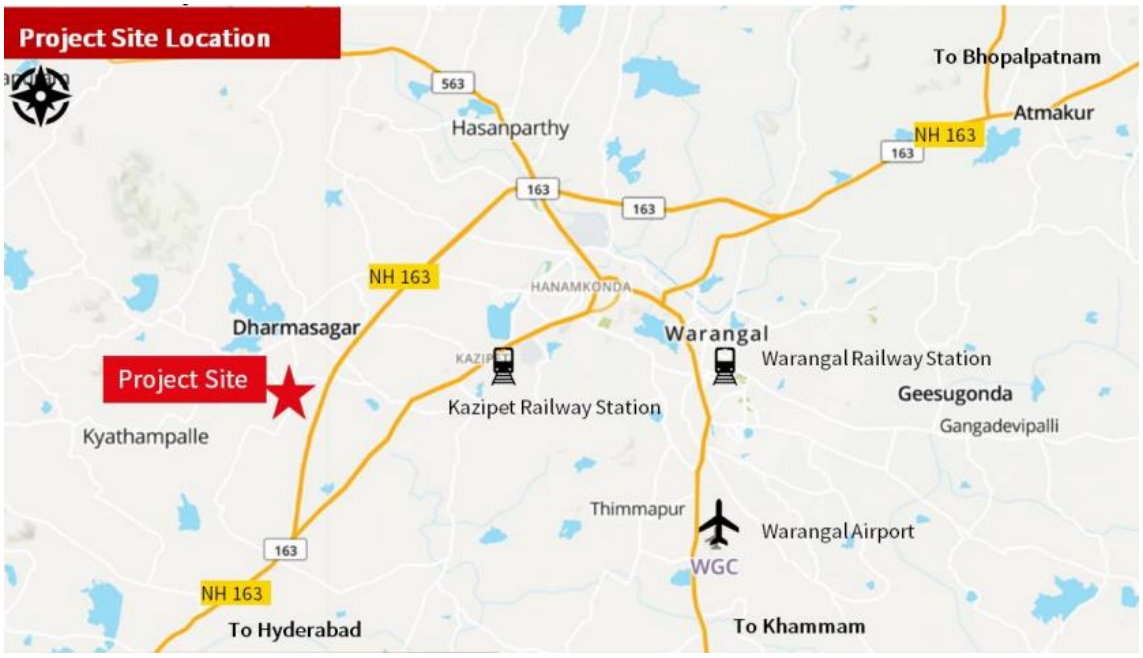


Figure 38 Site location

1.19 **ACCESIBILITY**

Primary access to the site is from east side of site from national highway NH 163(Warangal Byp Road) with width of 24m.



Figure 39 Site accessibility

1.20 **SITE DIMENSIONS**

SITE AREA= 10 Acre = 49.169 m.Sq

SITE PERIMETER = 861.21 m

1.21 **SITE PLAN**

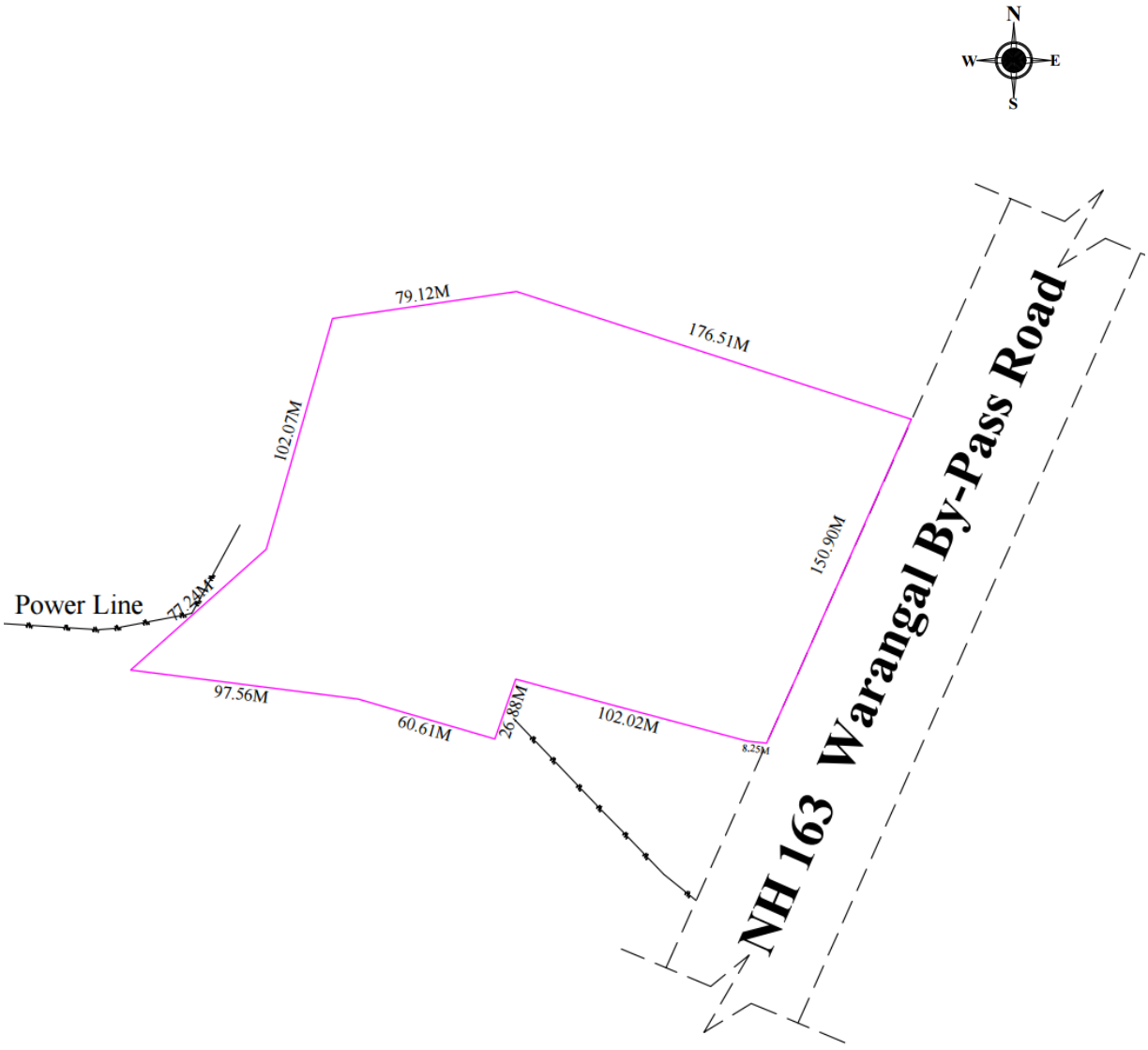


Figure 40 Site plan with Dimensions

1.22 **EXISTING LAND USE**

The land area has zoned into the category of Industial Zone (I) by TGIIC.

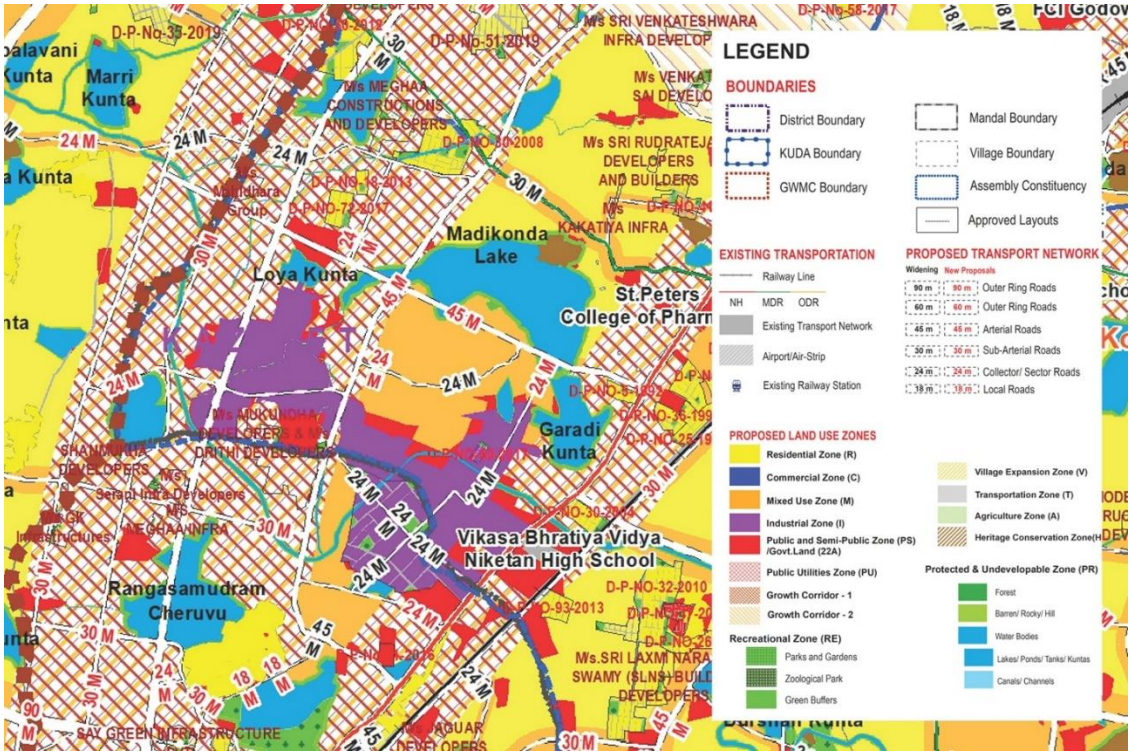


Figure 41 Existing land use

1.23 UTILITIES & INFRASTRUCTURE

1.23.1 Electricity

The site have a low tension electric line passing at west and south corner of the site which



help to take electricity to the site.

Figure 42 Electricity line

1.23.2 Drainage



Figure 43 Drainage

The site have a drainage pathway in front of the site near to NH. and beneficially the site have slope towards the east which means towards the entrance of the site where drainage pathway is located.

1.23.3 Water Supply



Figure 44 Daramsagar canal

The site have a canal named Daramsagar canal which come from Darsmsagar lake which is 14 km away from the site passing through the back side of the site at distance of 150m which can be utilised for water supply to the site.

1.24 SITE SURROUNDINGS

The immediate surroundings of the site are shown within a 500 m radial distance in the images below.at the front side of site NH road is passing through which give a easy accessibility towards the site. and behind the site at northwest direction of site the IT park construction is going on. And all other side of the site are full of agricultural land. The10 Acres of land is filled with greenery landscape of plants, trees and shrubs, mostly with neem

trees and some of the local palm trees. A canal named Daramsagar canal from Daramsagar Lake is passed through behind the site.

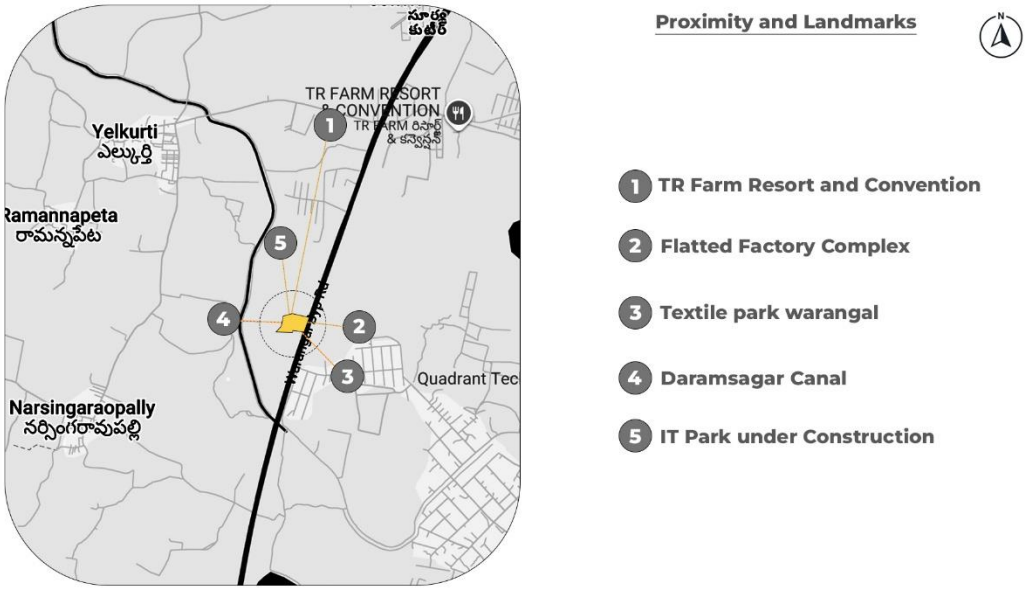


Figure 45 Adjacent site landmarks



Figure 46 Agricultural land on south side of site



Figure 47 NH road in front of the site



Figure 48 Textile park



Figure 50 Agricultural land on north side of site



Figure 49 IT park under construction

1.25 NOICES TOWARDS THE SITE

The have Noise disturbance chances which may come from near construction site , textile industry, and the NH road passing in front of the site

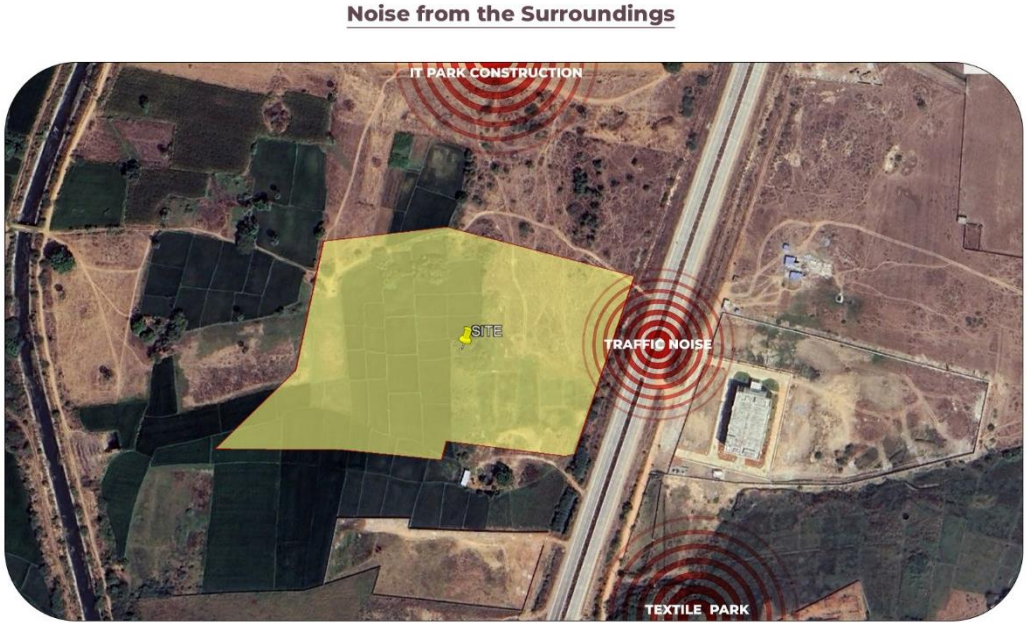


Figure 51 Surrounding noise

1.26 **STREET VIEW**



Figure 53 Road View

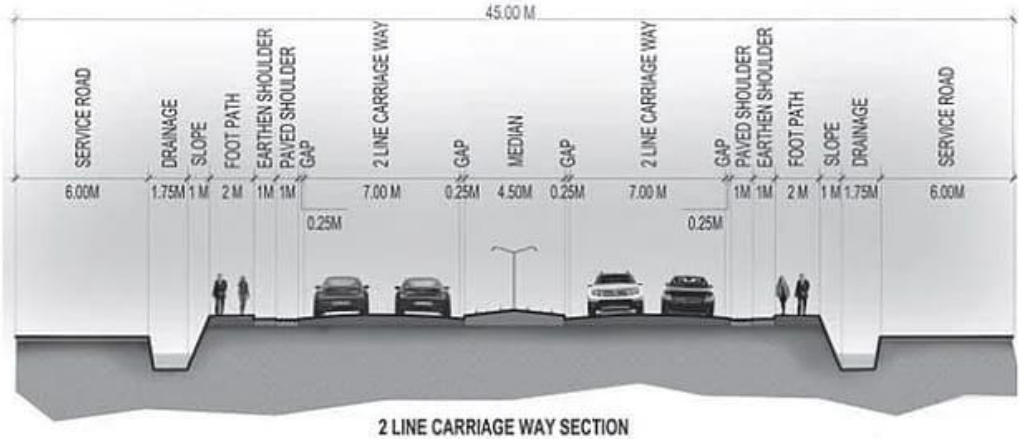


Figure 52 Road section

1.27 **TYPOGRAPHY**

Moslty flat land and Slopes towards east side of the site



Figure 54 Topography

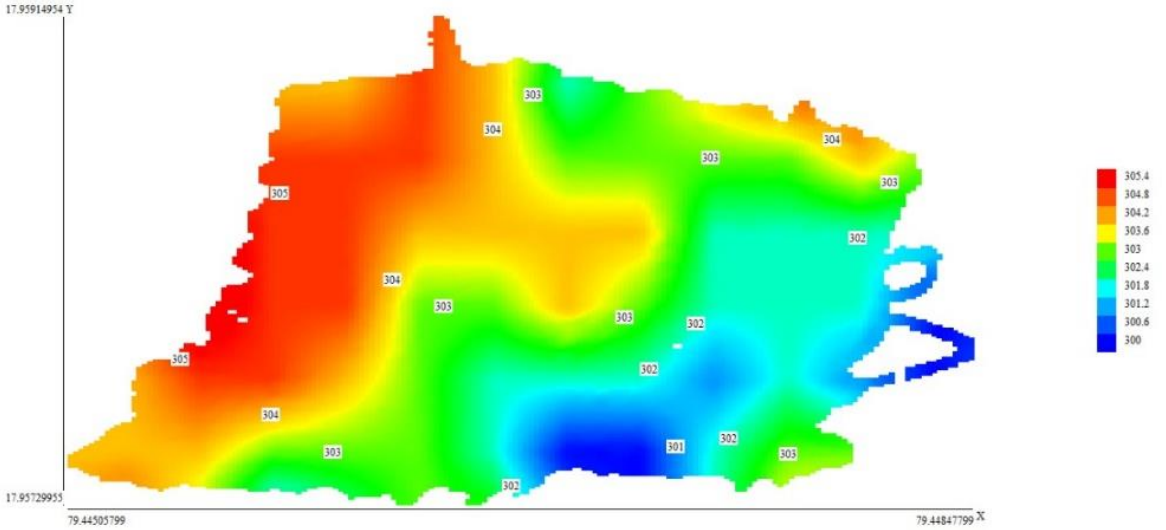


Figure 56 Contour

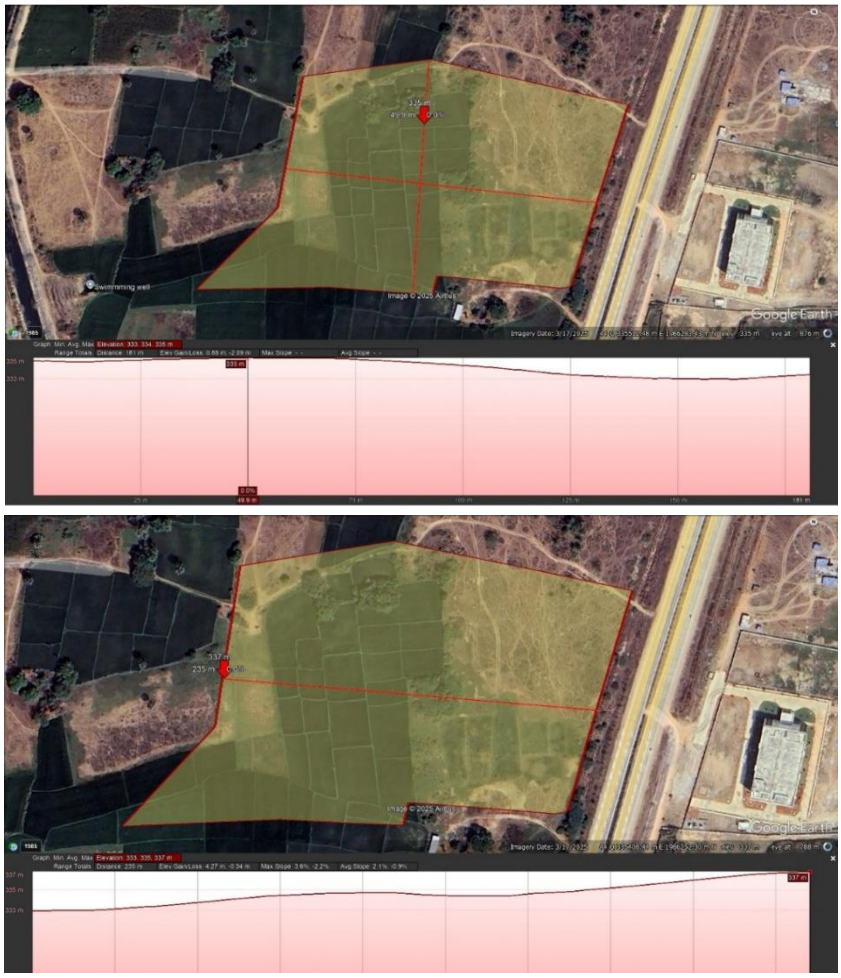


Figure 55 Slope analysis

1.28 **VEGETATION**

	**Common Name:** Asian Palmyra Palm / Toddy Palm / Ice Apple Tree **Scientific Name:** *B*orassus flabellifer	**Average Height:** **Typical Range:** 20–30 meters **Mature Height:** Up to 30 meters in ideal conditions **Foliage Type:** **Type:** Evergreen **Leaf Shape:** Fan-shaped
	**Common Name:** Neem Tree **Scientific Name:** *Azadirachta indica*	**Trunk Radius**: ~30 to 45 cm (diameter ~60–90 cm) **Height**: Around 15–20 m in mature local specimens **Foliage**: Evergreen compound leaves, occasionally shedding in severe drought **Crown Spread**: Dense, rounded canopy 10–15 m wide under open growth

1.29 SOIL TYPE



Figure 57 Soil

The Soil Condition of the Site is Sandy Loam Soil. **Sandy loam soil,** the most suitable **type of foundation** depends on several factors like the **load of the structure, water table level,** and **depth of the stable strata.** Sandy loam soils are **moderately stable** and **drain well.**

1.29.1 Type of Foundation can be Used:

Pile Foundation
When used: If the **sandy loam is shallow** and **underlain by weak strata or high water table.**

Why: Transfers the load to deeper, stable soil layers.

Type: Driven or bored piles (depending on equipment and depth).

Considerations for Foundation in Sandy Loam:

Compaction is essential to reduce settlement. Water table must be checked — high water can weaken soil strength. Proper drainage around the foundation is crucial to avoid erosion.

1.30 VIEWS FROM SITE



Figure 58 Site views

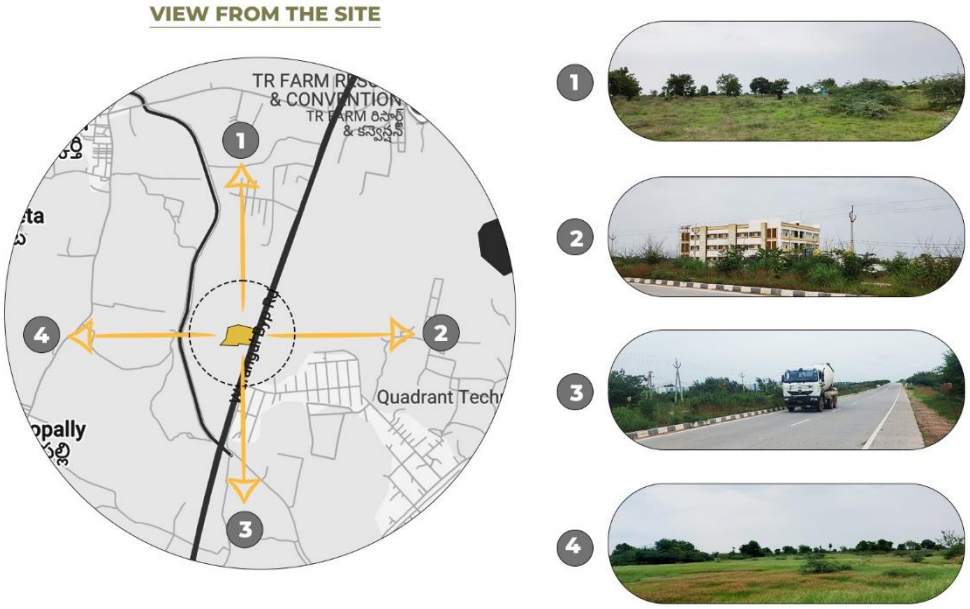


Figure 59 Views from the site

1. CLIMATIC DATA'S:

1.30.1 Climate

Warangal, located in the state of Telangana, India, experiences a tropical climate characterized by hot summers, moderate monsoons, and mild winters. The city falls under the semi-arid climatic zone according to the Köppen climate classification. Climatic data plays a crucial role in urban planning, architecture, agriculture, and infrastructure development in Warangal, as it helps design systems and structures that are environmentally responsive and sustainable.

Warangal experiences a tropical climate with distinct seasonal variations in temperature, rainfall, humidity, and wind patterns. Summers are extremely hot, with temperatures often exceeding 40°C, particularly in April and May. In contrast, winters are relatively mild, with average minimum temperatures ranging between 15°C and 20°C during December and January. The region receives the majority of its annual rainfall during the southwest monsoon season, from June to September, with an average annual precipitation of about 900 to 1,100 mm. Humidity levels are generally high during the monsoon months, while the summer and winter seasons remain relatively dry. The wind direction varies seasonally, and moderate breezes are commonly experienced during both the summer and monsoon periods.

Sun

1.30.2 Average Temperature in Warangal

The hot season lasts for 2.1 months, from April 2 to June 5, with an average daily high temperature above 101°F. The hottest month of the year in Warangal is May, with an average high of 105°F and low of 84°F.

The cool season lasts for 3.4 months, from October 18 to February 1, with an average daily high temperature below 88°F. The coldest month of the year in Warangal is December, with

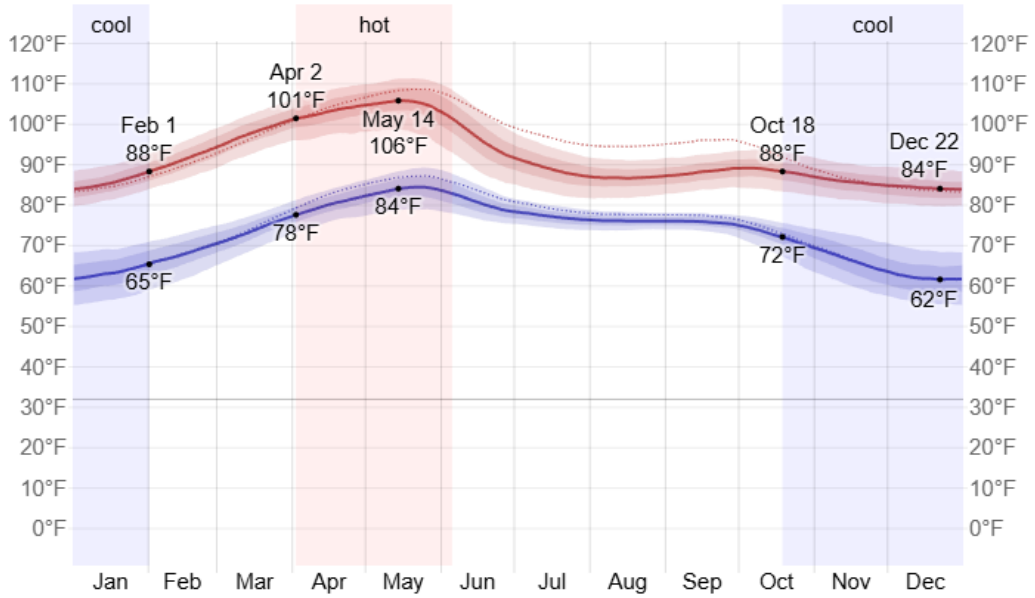


Figure 60 Average temperature

an average low of 62°F and high of 84°F.

Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High	86°F	91°F	98°F	103°F	105°F	97°F	89°F	87°F	88°F	88°F	86°F	84°F
Temp.	75°F	80°F	87°F	92°F	95°F	88°F	83°F	81°F	82°F	81°F	77°F	74°F
Low	63°F	68°F	74°F	80°F	84°F	81°F	77°F	76°F	76°F	72°F	66°F	62°F

1.30.3 Average Hourly Temperature in Warangal

The figure below shows you a compact characterization of the entire year of hourly average temperatures. The horizontal axis is the day of the year, the vertical axis is the

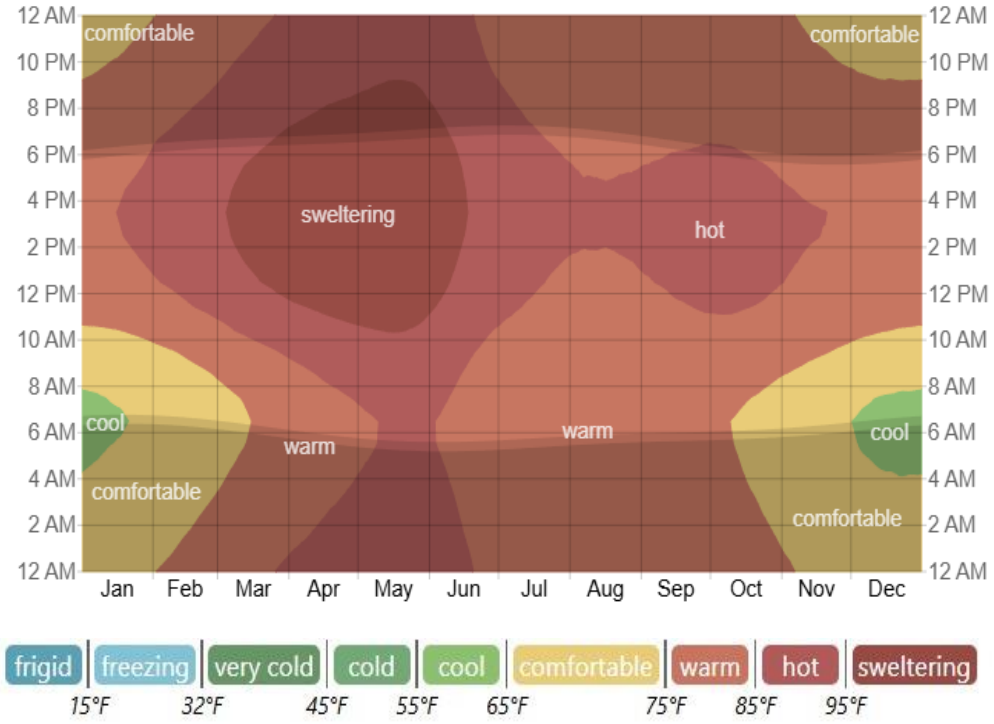


Figure 61 1.33.13 Average Hourly Temperature

hour of the day, and the color is the average temperature for that hour and day.

1.30.1 Cloud

The clearer part of the year in Warangal begins around October 11 and lasts for 7.1 months, ending around May 15.The clearest month of the year in Warangal is February, during which on average the sky is clear, mostly clear, or partly cloudy 78% of the time.The cloudier part of the year begins around May 15 and lasts for 4.9 months, ending around October 11.The cloudiest

month of the year in Warangal is July, during which on average the sky is overcast or mostly

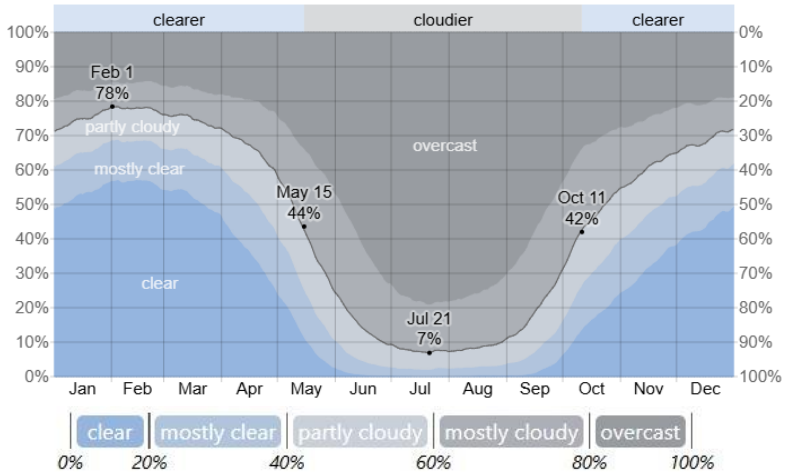


Figure 62 Cloud

cloudy 92% of the time.

Fraction	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cloudier	25%	22%	26%	34%	60%	85%	92%	91%	80%	54%	39%	31%
Clearer	75%	78%	74%	66%	40%	15%	8%	9%	20%	46%	61%	69%

1.30.2 Precipitation

The wetter season lasts 3.8 months, from June 8 to October 2, with a greater than 29% chance of a given day being a wet day. The month with the most wet days in Warangal is July, with an average of 16.2 days with at least 0.04 inches of precipitation.

The drier season lasts 8.2 months, from October 2 to June 8. The month with the fewest wet days in Warangal is December, with an average of 0.7 days with at least 0.04 inches of

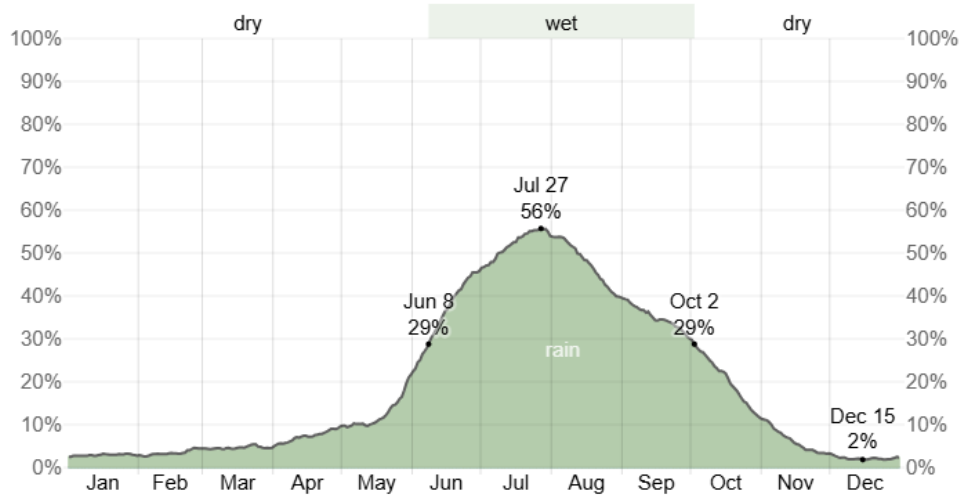


Figure 63 Precipitation

precipitation.

Days of	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rain	0.9d	1.0d	1.4d	2.2d	4.0d	11.0d	16.2d	14.6d	10.4d	6.2d	1.8d	0.7d

1.30.3 Solar analysis

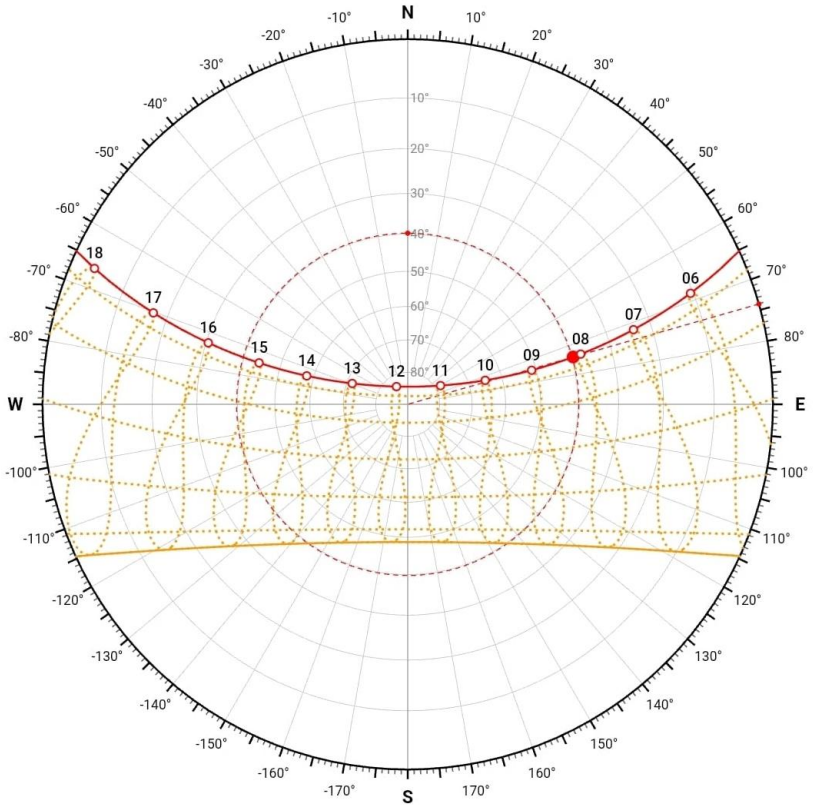


Figure 64 Sun path diagram of Warangal

1.30.4 Rainfall

The rainy period of the year lasts for 7.4 months, from April 9 to November 21, with a sliding 31-day rainfall of at least 0.5 inches. The month with the most rain in Warangal is July, with an average rainfall of 7.4 inches.The rainless period of the year lasts for 4.6 months, from November 21 to April 9. The month with the least rain in Warangal is December, with

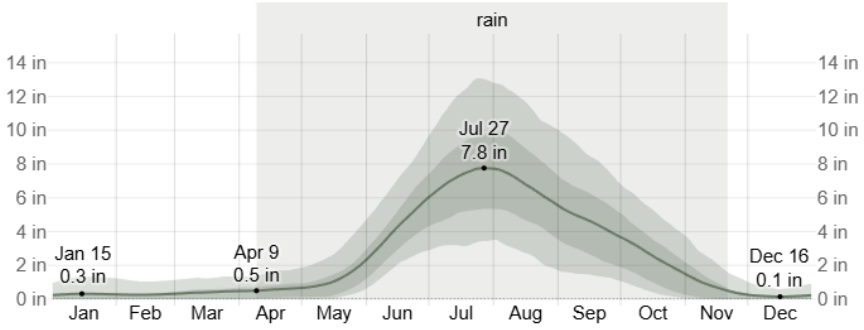


Figure 65 Rainfall

an average rainfall of 0.1 inches.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall	0.3″	0.3″	0.4″	0.6″	1.1″	4.2″	7.4″	6.8″	4.7″	2.6″	0.7″	0.1″

1.30.5 Humidity

Warangal experiences extreme seasonal variation in the perceived humidity.The muggier period of the year lasts for 7.8 months, from March 25 to November 17, during which time the comfort level is muggy, oppressive, or miserable at least 34% of the time. The month with the most muggy days in Warangal is August, with 30.8 days that are muggy or worse.The month with the fewest muggy days in Warangal is December, with 4.2 days that

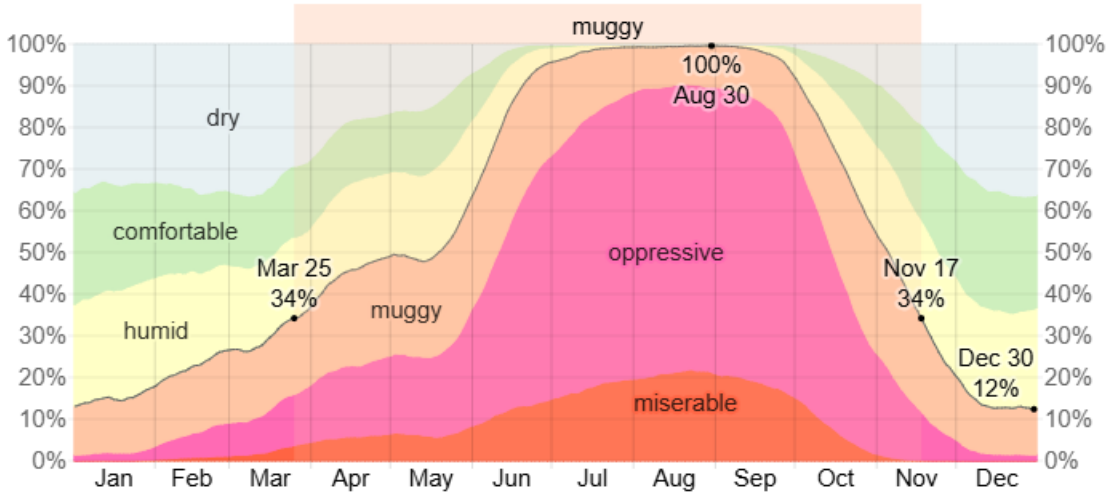


Figure 66 Humidity

are muggy or worse.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Muggy days	4.7 d	6.3 d	9.5 d	13.6 d	16.1 d	25.3 d	30.4 d	30.8 d	29.3 d	22.5 d	10.7 d	4.2 d

1.30.6 Wind

The windier part of the year lasts for 4.4 months, from April 19 to August 31, with average wind speeds of more than 8.0 miles per hour. The windiest month of the year in Warangal is June, with an average hourly wind speed of 10.4 miles per hour. The calmer time of year lasts for 7.6 months, from August 31 to April 19. The calmest month of the year in Warangal

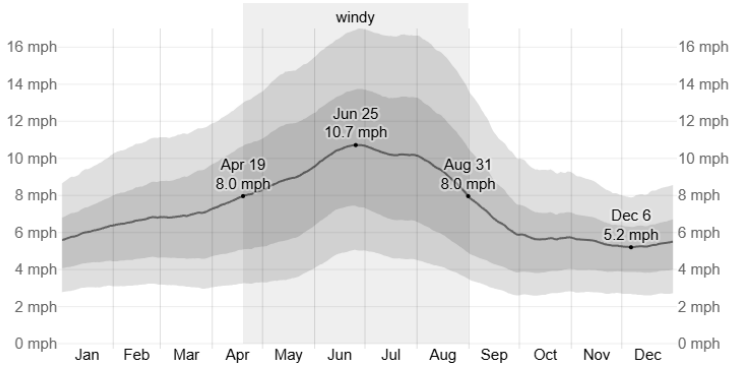


Figure 67 Wind

is December, with an average hourly wind speed of 5.3 miles per hour.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed (mph)	6.0	6.6	7.0	7.8	8.9	10.4	10.3	9.1	6.7	5.7	5.5	5.3

1.30.7 Wind Direction in Warangal

The wind is most often from the west for 4.0 months, from May 25 to September 26, with a peak percentage of 86% on August 1. The wind is most often from the east for 1.8 months, from November 2 to December 28, with a peak percentage of 48% on November 21. The wind is most often from the south for 4.9 months, from December 28 to May 25, with a peak

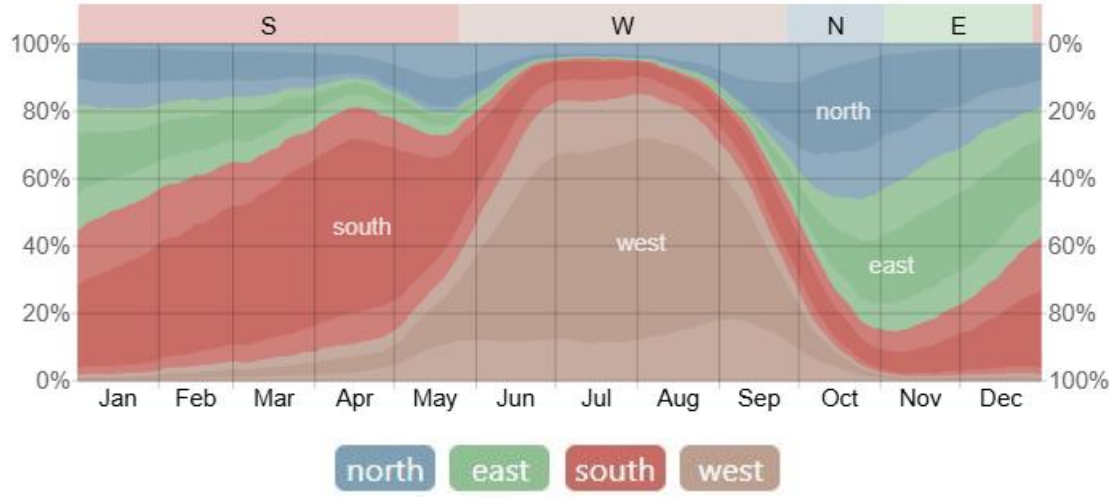


Figure 68 Wind direction

percentage of 43% on January 1.

1.30.8 Mahoneys Table

HI	H2	H3	A1	A2	A3
4		1	8		

Layout								
			0-10			X	1	Orientation north and south (long axis east-west)
			11,12		5 to 12			
					0-4		2	Compact courtyard planning
Spacing								
11,12							3	Open spacing for breezw penetration
2 to 10						X	4	As 3, but protection from hot and cold wind
0,1							5	Compact layout of estates
Air movement								
3 to 12						X	6	Rooms single banked, permanent provision for air movement
1,2			0 to 5					
	2 to 12		6 to 12				7	Double banked room
0	0,1						8	No air movement requirement
Openings								

			0,1		0		9	Large openings 40-80%
							10	Very small openings 10-20%
Any other condition						X	11	Medium openings 20-40%
Walls								
			0,2				12	Light walls, short time lag
			3 to 12			X	13	Heavy external amd internal wall
Roofs								
			0 to 5				14	Light insulated roofs
			6 to 12			X	15	Heavy roofs, over 8 h time lag
Outdoor sleeping								
				2 to 12			16	Space for outdoor sleeping required
Rain protection								
		3 to 12					17	Protection from heavy rain necessary
Size of opening								
					0		1	Large 40 to 80%
			0,1		1 to 12		2	Medium 25 to 40%
			2 to 5					
			6 to 10			X	3	Small 15 to 25%
					0 to 3		4	Very small 10 to 20%
			11,12		4 to 12		5	Medium 25 to 40%
Position of openings								
3 to 12							6	In north and south walls at body height on windward side
			0 to 5					
1 to 2			6 to 12			X	7	As above, openings also in internal wall
0	2 to 12							
Protection of openings								
					0 to 2	X	8	Exclude direct sunlight
		2 to 12					9	Provide protection from rain
Walls and floors								
			0 to 2				10	Light, low thermal capacity
			3 to 12			X	11	Heavy over 8 h time-lag
Roofs								
			0 to 2				12	Light, reflective surface, cavity
10 to 12			3 to 12				13	Light, wall insulated
			0 to 5					
0 to 9			6 to 12			X	14	Heavy over 8 h time-lag
External feature								
				1 to 12			15	Space for outdoor sleeping
		1 to 12				X	16	Adequate rainwater drainage

Figure 69 Mahoneys table

1.16 SWOT ANALYSIS

Category	Details
Strengths	- Prime location with direct access from NH-163 (24m wide). - Land owned by Telangana Govt (TGIIC) ensures clear legal titles and planning control. - Flat terrain with eastward slope

	beneficial for drainage. - Proximity to essential utilities: electric lines, Daramsagar canal for water. - Presence of existing vegetation (Neem, Palmyra) offers scope for ecological landscaping. - Located in Industrial Zone – suitable for large-scale developments.
Weaknesses	- Zoned as Industrial Land may need rezoning for mixed or commercial use. - Close proximity to noise sources (NH-163, textile industry, IT construction). - High summer temperatures (>40°C) and extreme humidity during monsoon. - Foundation may need pile system due to sandy loam and possible high water table.
Opportunities	- Upcoming IT Park next to the site can enhance land value and employment. - Flat site with clear access is ideal for phased large-scale development. - Scope for sustainable water use via Daramsagar canal. - Potential for integration with regional urban plans and infrastructure.
Threats	- Risk of flooding if proper drainage not maintained. - Environmental impact due to industrial surroundings. - Risk of rezoning delay or approval barriers from TGIIC. - High heat index in summer could challenge passive design strategies.

1.17 ARCHITECTURAL INFERENCES

Aspect	Inference
Site Potential	The 10-acre plot with flat topography, accessible roadways, and nearby water

	and electricity resources is well-suited for institutional, convention center, or tech park development.
Zoning & Legal	Industrial zoning provides flexibility for large built-up area (FAR 2), but care must be taken regarding permissible building types or rezoning for commercial/civic use.
Climate-Responsive Design	Orientation and passive strategies (shading, ventilation) are critical due to hot summers and muggy monsoons. Light-colored materials, courtyards, and water features would enhance thermal comfort.
Foundation Strategy	Sandy loam soil requires proper compaction and possibly pile foundations depending on structural load; integrate drainage to manage water table variations.
Sustainability Potential	Use existing vegetation (Neem for shade, Palmyra for aesthetics) to enhance microclimate. Leverage canal water for landscaping/secondary usage. Integrate solar and rainwater harvesting due to clear skies in most months.
Landscape & Ecology	Preserve green pockets; design with native species. Create buffers using plantation along NH to reduce noise and dust impact.
Urban Integration	The site benefits from proximity to IT Park and NH access; well-placed for a knowledge hub, skill center, or integrated convention campus.

CHAPTER 4 -LIVE CASE STUDY/ DESK APPRAISAL

1.18 BASE ELEVEN CONVENTION CENTRE

Location: Pala,Kottayam

Architect: M.M Jose (Mindspace architects)

Site area: 10 acres

Architectural Style: Modern contemporary

Seating Capacity: 2500

Built up Area: 75,00 sqft

Parking capcity:1000

Year :2024



Figure 70 View from the parking space

1.19 INTRODUCTION

Base Eleven Convention Centre in Pala, Kottayam, is not merely built—it is composed. Designed by Ar. M.M. Jose of Mindscape Architects, this 75,000 sq. ft. structure redefines the typology of convention spaces in India, offering an architectural language that speaks in curves, context, and crafted spatial experiences.

The convention centre offers 11 main event spaces, including seven AC halls and 4 gardens. One of the most distinctive aspects of the project is the integration of an ancestral home, the "Tharavadu."

1.20 ACCESSIBILITY AND PROXIMITY

• Cochin International Airport - 72 kms

• Kottayam Railway Station - 25 Kms

• Ernakulam - 62Kms

• Fort Kochi - 70Kms

• Kumarakom Back Waters - 38Kms• Alleppey – 60Kms



Figure 71 Tharavadu

1.21 CONCEPT AND APPROACH

The Base Eleven Convention Centre is rooted in two distinct concepts: heritage and fluidity. "Base Eleven" is inspired by the revered 200-year-old Kerala tradition of "Tharavadu," symbolizing the 11 spaces within the centre.

The fluidic design concept is a nod to the flowing waters of Kerala's backwaters, manifesting in curved edges and lines throughout the building, including furniture, to create a seamless and organic experience. This harmonious blend of tradition and innovative design philosophy makes the Base Eleven Convention Centre a unique and captivating destination.

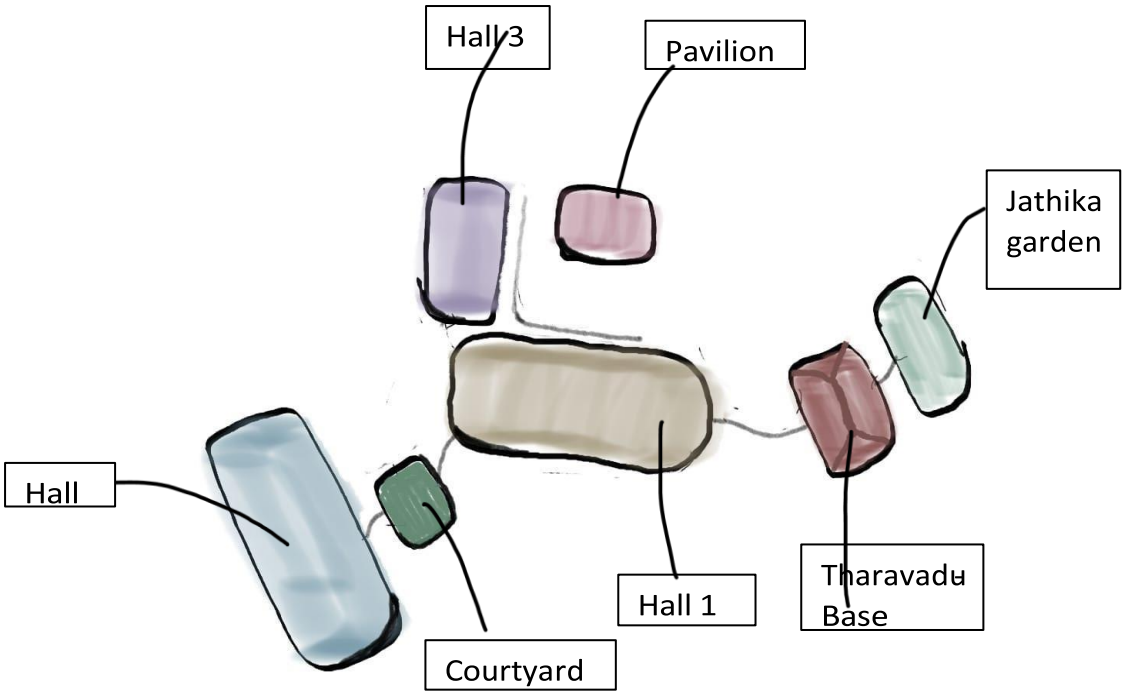


Figure 72 Fluid design layout

The Base Eleven Convention Centre's approach is characterized by a thoughtful blend with its surroundings, achieved through the strategic use of local materials and landscaping.



- Notably, yellow rocks sourced from the cow shelter of a 200-year-old Tharavadu have been repurposed as steps for artificial mounts and landscaping elements, creating a unique and contextual connection to the heritage site.
- The fluidic design concept, inspired by Kerala's serene backwaters, is intricately woven into the Centre's aesthetic, with curvaceous motifs evident in lobby furniture and ceiling designs.
- Furthermore, the Centre prioritizes universal accessibility, with major halls situated at ground level to minimize steps and facilitate effortless movement, thereby ensuring a barrier-free environment that welcomes all visitors.
- The interior's feature pillar free halls and neutral color palettes that created serene.

1.22 PLAN AND DETAILS

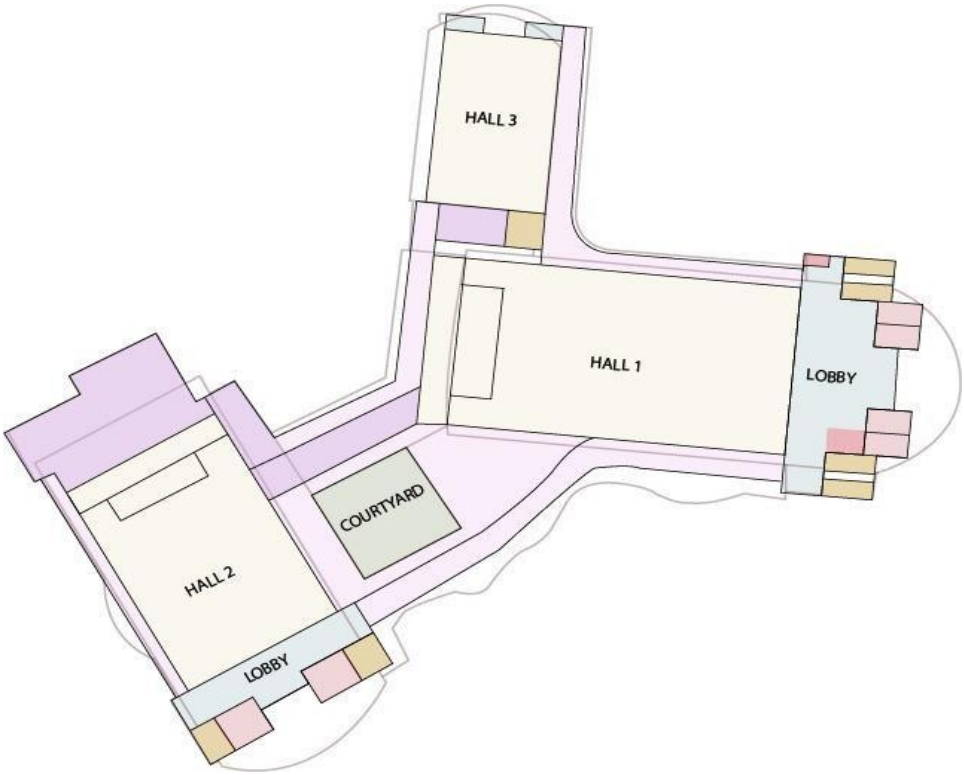


Figure 73 Plan

1.23 HALL 1

Hall 1 is an expansive and sophisticated event space, boasting a substantial seating capacity of 1,300 guests. The hall's design embodies a fluidic concept, with a wave-inspired theme that

elegantly extends to its entrance, creating a visually striking first impression. To ensure a consistently comfortable environment, the hall is equipped with strategically positioned jet blowers throughout, maintaining a perfectly balanced temperature.

The wave design motif is thoughtfully carried through to the hall's interior, with the undulating patterns on the roof beautifully mirrored in the carpet, creating a harmonious and immersive experience for occupants.



Figure 74 HAll 1

The seating arrangement is highly flexible, allowing clients to customize the layout according to their specific needs and preferences Additionally, the hall's acoustic design incorporates PET panels to optimize sound quality, ensuring exceptional auditory experiences for events and performances.

1.24 HALL 2

Hall 2 has a seating capacity of 700 pax and boasts an elegant arch design concept, which is consistently reflected in its entrance. The hall is equipped with strategically placed jet blowers





Figure 75- Hall 2

throughout to maintain a balanced temperature. Additionally, Hall 2 features a dual-level lighting system on its ceiling, providing optimal illumination. The hall is also fully equipped with acoustic panels to ensure superior sound quality. Furthermore, Hall 2 has five conveniently located exits.

1.25 HALLL 3

Hall 3 has a seating capacity of **350 pax** and features a distinctive **capsule design concept**, which is also reflected in its entrance. The overall design theme is oval in nature, creating a unique ambiance. The ceiling is designed in a capsule shape, adding to the hall's aesthetic appeal. Hall 3 is fully equipped with acoustic panels to ensure superior sound quality. The



Figure 76-HALL 3

furniture in the hall is flexible and can be rearranged according to specific needs. Additionally, Hall 3 has three conveniently located exits.

1.26 BANQUET HALL

There is a large banquet hall that can be divided into three different event spaces using partition panels, with a total capacity of 300 pax. Despite its L-shaped layout, each of the three halls has

its own entrance. The hall offers a scenic view of the base of the Convention Centre, which is the 200-year-old tharavadu.

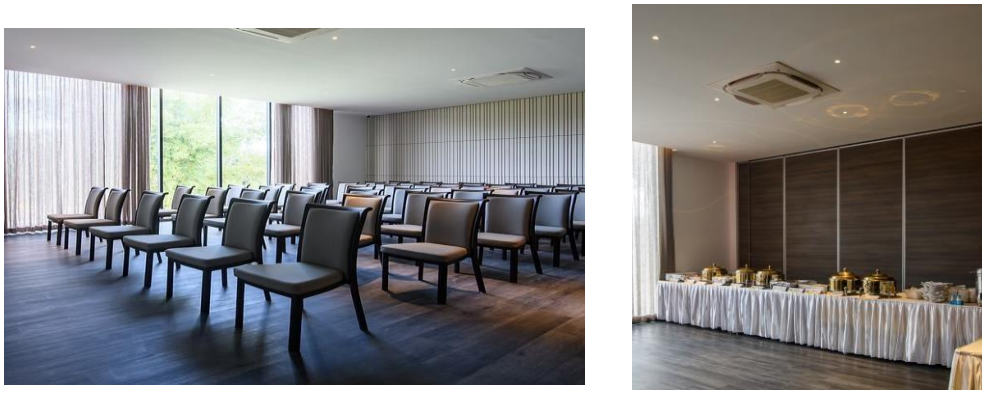


Figure 77-Banquet Hall

1.27 COURTYARD

The courtyard is the heart of the Convention Centre. The three main halls are connected to the courtyard in a seamless manner. It is a fully open space where visitors can enjoy the experience of rain. A dance hall is located just behind the courtyard, featuring a ceiling beautifully decorated with cloth, with embedded lighting that creates a soft, ambient glow.

Seating in the courtyard is designed in the form of natural rock formations. Although it is an open space, rainwater is effectively absorbed by the pebbles placed at the center of the



Figure 78-Courtyard Space

courtyard.

1.28 THARAVADU-BASE

The tharavadu serves as the foundation of the convention centre, which is why it is referred to as the "base." It is a 200-year-old traditional ancestral home. The entire area has been designed with the tharavadu as its central inspiration. The Tharavadu's presence infuses the convention centre with a rich heritage element, making it an ideal venue for events that seek to incorporate a traditional touch.

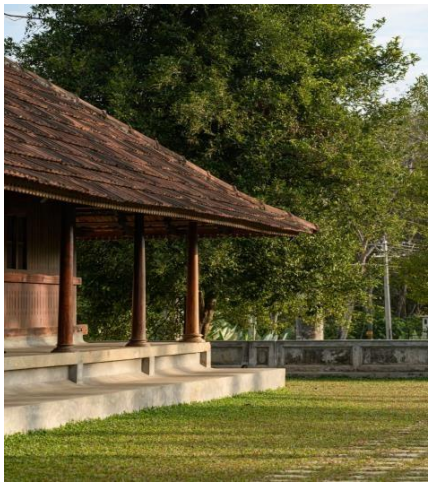




Figure 79-Tharavadu -Base

1.29 PAVELLION

The pavilion is located in the garden area and is designed to appear as if it stands on two pillars. One of the walls is finished with textured paint. Although it is an outdoor event space, it includes a washroom for convenience. The roof is V-shaped, allowing rainwater to flow through the two pillars, which are connected to the ground for proper drainage. Natural stones are placed around the pavilion, adding to its aesthetic appeal.



Figure 80-Pavilion

1.30 JATHIKA GARDEN

Jathikka thottam is a 45-year-old garden in the tharavadu. It is often used for taking aesthetic photographs.

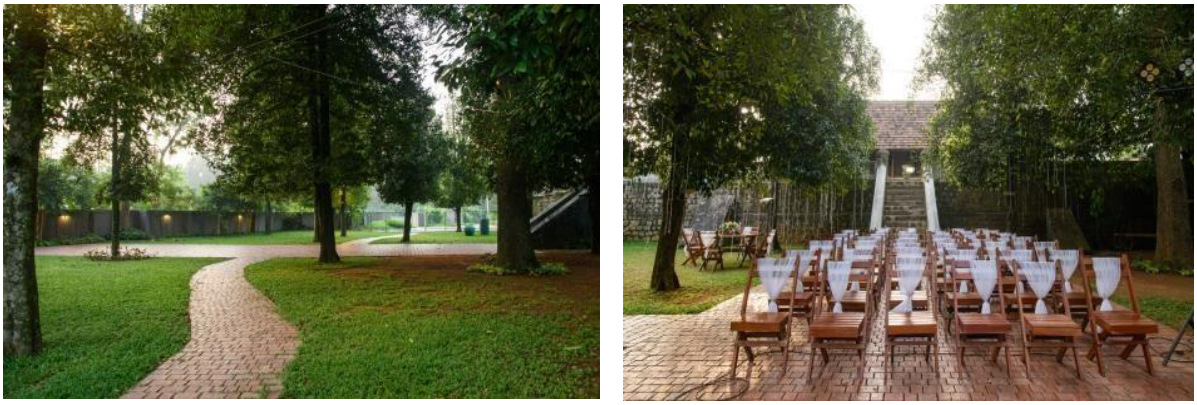


Figure 81-Jathika Garden

1.31 LANDSCAPING

- The areas prone to waterlogging have been beautifully constructed as parking spaces
- Stones from the old cow shelter have been used to enhance the beauty of the landscape
- The existing trees were not cut for the landscape design, and a 200-year-old bamboo tree near the pavilion has been beautifully preserved and highlighted.
- Artificial mound was created in the pavilion area to enhance the beauty of the space.




Figure 82-Exterior Spaces

1.32 INFERENCE

Base Eleven Convention Centre seamlessly blends traditional Kerala vernacular with contemporary architectural fluidity. Its design concept is rooted in the symbolism of the "Tharavadu" (ancestral home), which serves as both a literal and metaphorical base of the layout. Architect M.M. Jose employs curvilinear forms inspired by Kerala's backwaters, lending organic coherence to the built forms and interior elements. The use of local yellow stones and preserved bamboo reflects a deep sensitivity to site context and sustainability. The planning emphasizes flexibility and flow, with interconnected halls and a central courtyard fostering spatial connectivity. The architecture prioritizes user comfort, incorporating barrier-free design with ground-level halls and universal accessibility. The absence of structural columns within halls enhances visual fluidity and functional adaptability, while acoustic treatments ensure high performance. Integration of the Tharavadu into the plan adds cultural depth and authenticity, making it more than a convention space—it's an experiential journey. Landscaping respects existing vegetation, and the artificial mounds and pavilion areas showcase thoughtful place-making. Overall, the project achieves architectural excellence through a fusion of heritage, spatial storytelling, and organic forms that are both inviting and emotionally resonant.

LULU BOLGATTY INTERNATIONAL CONVENTION CENTRE (LBICC)

Location: Bolgatty Island, Kochi, Ernakulam, Kerala

Architect: Sanjay Puri (Sanjay Puri Architects)

Site area: 24 Acres

Architecture style: Modern architecture

Seating Capacity:3000

Area of convention centre:1,00,000 sq. ft of indoor and outdoor meetings



Figure 83-Night View From front Side

spaces.

1.33 INTRODUCTION

LBICC - Lulu Bolgatty International Convention Centre, adjacent to Grand Hyatt Kochi Bolgatty is located on the historic Bolgatty Island and offers 1,00,000 sqft of indoor and outdoor meetings spaces. Events can be spread across 30 flexible event venues. The building

has a modern architecture style, with a unique blend of functionality and aesthetics. it has world-class facility that can accommodate over 3,000 guests at a time. The building's design is characterized by a massive, pillar-less structure with a total area of 10 lakh square feet, making it one of the largest convention centers in India. The convention Centre is located on the waterfront of Bolgatty Island, offering stunning views of the backwaters and the city skyline.

CONCEPT AND APPROACH

Lulu Convention Centre is a part of hotel Grand Hyatt which offers lake and city views. Grand Hyatt Kochi Bolgatty features 264 luxurious rooms, including 38 suites and four villas with plunge pools and private access. Also, spa (santata spa) (1000 sq. m), fitness centre, laundry room, restaurants, dining spaces and bar, outdoor and indoor pools.

	Spaces of Convention Centre	**Area (sqm)**	**Seating capacity**
1	Vembanad-Ballroom	1800	2000
2	Grand Ballroom	700	800
3	The Liwa Ballroom	2419	3000
4	Living room	60	50
5	Atelier I	74	60
6	Atelier II	40	<30
7	Atelier III	60	50
8	Grand Salon I and Grand Salon II	110	120
9	Library	50	50

Table 8-Spaces and Seating Capacity

SPACES

1.34 VEMBANAD- BALLROOM



Figure 84-Foyer Space



Figure 85-Vembanad

The pillar-less Vembanad Ballroom measures 1,800 Sq.m, with a pre-function area of 1,110 Sq.m and can accommodate around 2,000 guests. It can be divided into three separate banquet spaces, and has wash areas comfortable placed at one side. The large foyer space is perfect for live stations and elevated buffets.

1.35 GRAND BALLROOM



Figure 86-Grand Ballroom

The Grand Ballroom measures 700 sq.m, with a pre-function area of 500 sq.m. The ballroom's luxurious setting is the perfect place for awe-inspiring events and get-togethers.

Grand Salon, which is the largest of the 8 meeting rooms in The Residence, offers two flexible spaces each featuring 110 sq.m. of space

The customizable settings can be used for working sessions, intimate cocktail receptions, small trunk shows or conferences of up to 120 people. Bold and compelling works of art, architectural elements inspired by the Tantrasamuchaya temples and traditional houseboats of Kerala.

1.36 THE LIWA BALLROOM



Figure 87 Liwa Ballroom

The Liwa ballroom features 2,419 sq m of flexible space, with a pre-function area of 875 sq m. The venue also offers a separate green room, a bridal room and VIP meeting rooms Liwa is the largest space among all the spaces. it has retractable chairs. The stage height is 150 cm. green room is at the backside and a space called diwan for guests.

The venue also offers a separate green room, a bridal suite and VIP meeting rooms. Liwa is the perfect choice for opulent weddings, theatre-style presentations and classy cocktail receptions. The 219-square-foot large Nattika and the smaller Diwan are ideal as accompanying venues or for small meetings.

1.37 LIVING ROOM



Figure 88-Living Room

A relaxed residential-style space, Living Room offers 60 Sq m of space that can accommodate around 50 guests. The Living Room is perfect for working lunches, coffee breaks or breakout sessions from larger events.

ATELIER I



Figure 89-Atelier 1

The residential-style Atelier I offers 74 Sq m of space that can host up to 60 attendees in theatre style seating. The space is perfect for intimate meetings, small celebrations or breakout sessions from larger events.

1.38 ATELIER II AND ATELIER III



Figure 91-Atelier 2



Figure 90-Atlelier 3

For private parties and dinner events.

1.39 GRAND SALON I AND GRAND SALON II

These two flexible spaces each feature 110 Sq m of space, offering customizable settings that can be used for working sessions, intimate cocktail receptions, small trunk shows or small conferences of up to 120 peopl



Figure 92-Grand Salon

This 50 Sq m space residential style, is perfect for intimate cocktail gatherings, private business meetings or brainstorming sessions for up to 50 guests.

1.40 EXTERIOR SPACES AND LANDSCAPING

Elegant landscaping with green lawns, garden, seating areas, gazebo and outdoor pools. Adjacent to the Convention Centre, the expansive palm lawns set the mood for tropical celebrations. The beautifully manicured lawns, set against Kochi's backwaters transform in to a dreamy wedding venue.



Figure 93-Exterior Space

1.41 ACCESSIBILITY AND PROXIMITIES

The Lulu Bolgatty International Convention Centre is well-connected and easily accessible by various modes of transportation, making it a convenient venue for events and conferences in Kochi. It is,

- 4.5 Kms from Kochi metro station
- 5-6 Kms from Ernakulam railway station
- 32 Kms from Cochin International Airport
- Bus services are available within 1km distance. Also, regular bus services connect the convention Centre to major parts of the city.
- Taxi and auto-rickshaw services are available from the airport, railway stations etc.
- The convention Centre is also accessible by boat, with a private jetty and ferry services available.

- The convention Centre is wheelchair-friendly, with ramps, elevators, and accessible restrooms.
- Designated areas for drop-off and pick-up of attendees, including taxi and ride-hailing services.

1.42 PARKING

- Total parking capacity: approx.1500 cars
- It has multi-level parking
- valet parking services for attendees, providing a convenient and hassle-free parking experience.
- There are designated parking areas for different types of vehicles, including cars, buses, and taxis.
- The convention centre has reserved parking spaces for people with disabilities, located near the entrance of the building.
- Also, there is parking guidance system, electrical vehicle charging stations.

1.43 KEY FEATURES AND SPECIALITIES

The convention Centre incorporates a comprehensive vertical circulation and service infrastructure designed to support operational efficiency and user convenience. A total of six service lifts are strategically placed to manage logistics and back-of-house functions, while eight guest lifts, primarily located at the building's core, ensure smooth vertical movement for visitors. Additionally, two express lifts provide direct access to high-end facilities such as the rooftop bar and restaurant, enhancing the experience for premium guests. Dedicated staff areas are supported by two elevators, and two machine room lifts further contribute to the technical and maintenance operations of the facility. All building systems are centrally controlled and monitored through an advanced Building Management System (BMS), which streamlines the management of energy use, security, and mechanical operations. The facility has achieved IGBC certification, reflecting its adherence to sustainable design and construction principles. Furthermore, the inclusion of retractable seating within the Liwa Ballroom, along with flexible partition systems, allows for dynamic spatial reconfiguration to accommodate diverse event requirements. To support high-level accessibility and emergency response readiness, the site is also equipped with three helipads, catering to VIP arrivals and critical operations when necessary.

1.44 ENTRY AND EXITS

There are 7 entries to the site.

Gate-1- for water tankers and other heavy vehicles

Gate- 2- service gate, also visitor enquiries

Gate 3- entry to big car parking

Gate 4 –Centre gate-to the lobby

Gate 5-at corner, for fire brigade. It runs all around the building

Gate 6- VIP entry

Gate 7- entry for the guests coming by helicopter.

1.45 INFERENCES

Designed by Sanjay Puri Architects, LBICC is a large-scale modern convention centre that masterfully balances scale, function, and aesthetics. Located on Bolgatty Island, the project leverages its waterfront context, offering panoramic views while presenting an urban retreat embedded in nature. The architecture is characterized by bold geometric massing and a seamless flow between indoor and outdoor spaces. Its spatial planning prioritizes flexibility with 30 configurable venues, including pillar-less ballrooms like the Vembanad and Liwa. These spaces accommodate varied event types, from intimate meetings to grand celebrations. Material choices, neutral palettes, and custom lighting enhance visual sophistication, while features like retractable seating and movable partitions allow high adaptability. Vertical circulation is efficiently handled through strategically placed lifts and BMS-managed operations, contributing to an optimized user experience. Sustainability is embedded through IGBC certification and EV charging stations. Integration with the adjacent Grand Hyatt hotel provides a holistic hospitality experience, while extensive landscaping transforms the venue into a wedding and event destination. LBICC exemplifies contemporary architecture's capacity to fuse scale with intimacy, delivering a civic landmark that’s both highly functional and contextually aware.

HYDERABAD INTERNATIONAL CONVENTION CENTRE

Location: Izzat Nagar, Kothaguda, Hyderabad

Architect: Emaar Group

Site Area: 15 acres

Architecture style: Modern architecture

Seating Capacity:6500

Built up Area: 344038 sqm

Year:2006



Figure 94-Night view from front side

INTRODUCTION

An award-winning Centre for outstanding events. Managed by Accor, the Hyderabad International Convention Centre is the first of its kind in India. Offering state-of-the-art facilities, it features a vast main hall that can be divided into six smaller venues.

This impressive facility in Hyderabad's IT district was designed to easily accommodate up to 6,000 guests in its pillarless internal hall. A spacious pre-function foyer area and 37 breakout rooms allow for endless possibilities. VIP rooms, conference halls, press rooms, prep rooms… all equipped with cutting-edge technology.

Novotel Hyderabad Convention Centre, adjacent to HICC, is a 5-star 287 room hotel.

1.46 ACCESSIBILITY AND PROXIMITY

- Hyderabad International Airport- 20 Kms
- Secunderabad Railway Station-35Kms
- Miyapur Bust stand NH-9-7.1 Kms
- Rajiv Gandhi International Airport-35 Kms
- Madhapur Metro Station-15Kms

1.47 CONCEPT

The HICC is built around the idea of providing a flexible and functional space for various events, with a focus on comfort, security, and cutting-edge technology. Its design incorporates modern aesthetics and expansive spaces, making it an ideal choice for business professionals and tourists alike.

1.48 FACILITIES H.I.C.C

- Custom built to handle versatile events - be it an international conference for 5000 delegates, a cocktail dinner for 4000 guests, a corporate party for 2000 people or even a board meeting for just 15.
- 32 breakout rooms, including specialized. meeting rooms, speaker preparatory rooms, boardrooms and VIP lounge. 16-seater registration area.
- Pillar-free internal hall of net 6,480 sqm that can hold a 5,000-delegate plenary and can be partitioned into 6 halls.



Figure 95-View

- A spacious pre-function foyer area of over 6,000 sq. meters of lobby space
- In house Event Management and Audio-Visual team.
- Cutting edge design features including environmentally sustainable practices.

- 12.5 meters free ceiling height with catwalks and truss to withhold heavy suspension and mobile operable walls.
- Service pits every 6 meters, with power, water and internet.
- Private workspace for organizers and their guests.
- In-built 100% power back-up generation capability.
- 1000+ car parking base
- Automated telescopic tiered seating for 2600.
- Connected to 287-room Novotel Hyderabad, a 5-star hotel.

PLAN AND DETAILS

AREA STATEMENT

VENUE	AREA IN SQM	CEILING HEIGHT IN METERS	LXB IN METERS
GROUND FLOOR			
Registration centre	429	3.2	33x13
Convention Hall 1	442	12.5	15x29.5
Hall 2	442	12.5	15x29.5
Hall 3	1914	12.5	33x58
Hall 4	1914	12.5	33x58
Hall 5	442	12.5	15x29.5
Hall 6	442	12.5	15x29.5
Corridor A/B	283	12.5	4.8X59
Organizers suite 1	56	2.9	
Organizers suite 2	62	2.9	
Convention hall 1-6	6177	12.5	106.5x58
Meeting room G01	125	2.9	8.75x13.1
Meeting room G02	127	2.9	8.9x13.1
Meeting room G03	125	2.9	8.9x13.1
Meeting room G04	125	2.9	8.9x13.1

Meeting room G05	125	2.9	8.9x13.1
Meeting room G06	125	2.9	8.9x13.1
Meeting room G07	75	2.9	12.2x6.2
FIRST FLOOR			
Meeting room 1.01	127	2.3	8.7x13.1
Meeting room 1.02	125	2.3	8.9x13.1
Meeting room 1.03	127	2.3	8.9x13.1
Meeting room 1.04	125	2.3	8.9x13.1
Meeting room 1.05	127	2.3	8.9x13.1
Meeting room 1.06	125	2.3	8.75x13.1
Meeting room 1.07	46	2.3	5.8x8
Meeting room 1.05	88	2.3	9.2x9.6
Meeting room 1.09	88	2.3	9.2x9.6
Meeting room 1.10	46	2.3	5.8
SECOND FLOOR			
Meeting room 2.01	125	2.3	8.75X13.1
Meeting room 2.02	127	2.3	8.9X13.3
Meeting room 2.03&2.04	274	2.3	17.9X15.3

Meeting room 2.05	125	2.3	8.9X13.1
Meeting room 2.06	127	2.3	8.75X13.1
VIP lounge	115.8	2	
Speaker preparation booth 1,2,3 or 4	23.7	2.3	4.1x5.8

Figure 96- Venue and their measurements

1.49 COMBINED HALLS (1–6)

The event infrastructure features elegant, sound-proof mobile partition walls crafted from teak and silk, along with service pits spaced every 6 meters to support utilities. Complementing this is a vast pre-function foyer spanning approximately 6,500 square

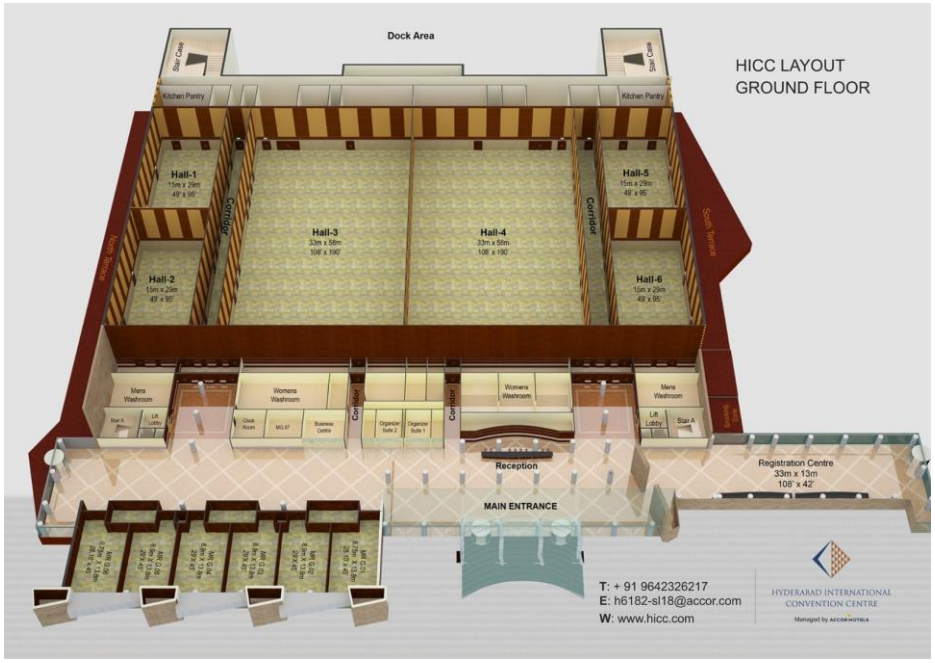


Figure 97-Ground Floor

meters—ideal for registrations, networking, and catering activities.

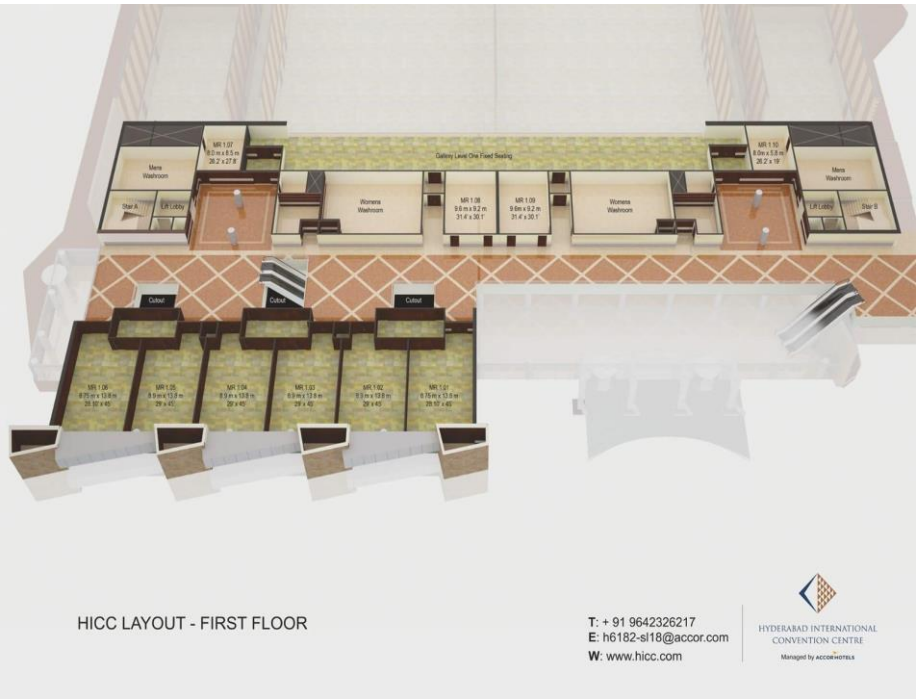


Figure 98First Floor



Figure 99- Second Floor

CAPACITY AND DETAILS

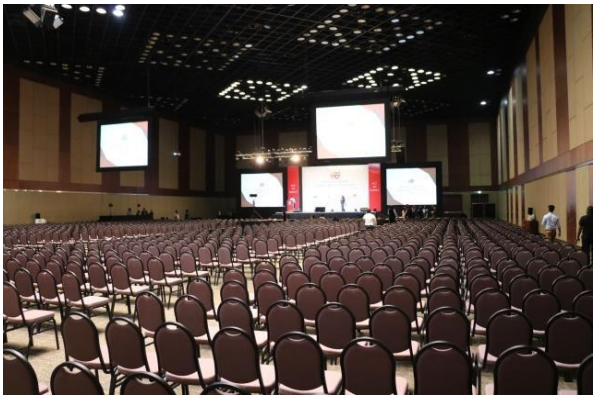
VENUE	STAGE SIZE IN FT	CAPCITY				IDEAL USE
		ROUND TABLE	THEATRE	CLASSROOM	CABARET	
Hall 1	20X16	120	240	105	96	Breakouts, mid-level sessions
Hall 2	20x16	120	240	105	96	Workshops, small seminars
Hall 3	40x24	560	1056	534	448	Large plenaries, exhibitions
Hall 4	40x24	560	1056	534	448	Classroom-style large meetings
Hall 5	20x16	120	240	105	96	Breakouts, mid-level sessions
Hall 6	20x16	120	240	105	96	Workshops, small seminars

Table 9-Venue and Capacity

1.50 AMENITIES

- Business Centre with Internet facility, dual plasma screens for easy venue viewing
- 38 CCTVs for easy security – convenient for event organizers and operations team
- Stunning glass board room overlooking a lake
- Exhibition center with indoor and outdoor options
- private access to the meeting space within Novotel Hotel
- Six additional boardrooms and meeting rooms
- Four separate speaker preparation rooms and breakout rooms on level-2
- Equipment Private Limited – a leading service provider for conventions, conferences, social events, live shows and trade shows at HICC & Novotel Hyderabad Convention Centre.

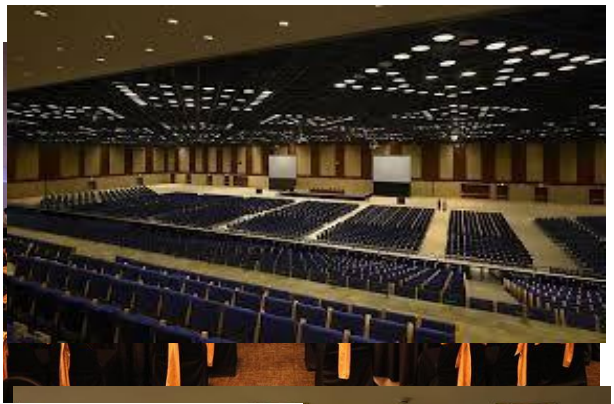




1.51 KEY FEATURES

- Rigging Beam-Each beam has a suspension capacity of one tone.
- Service Pits & Power Supply-Service pits at every six meters with power, water, and internet supply. 100% power back-up.
- Breakout venues and registration area-37 breakout venues come with 16-seater registration area.
- Loading Dock-Secure and managed loading dock with tailor-made capacities.
- VIP Lounge and Organizer Suite-Separate lounge for VIP delegates and suites with private workspace for event organizers.
- Ceiling Height-Clear ceiling height of 12.5m with rooftop catwalk and truss to withhold heavy suspension.







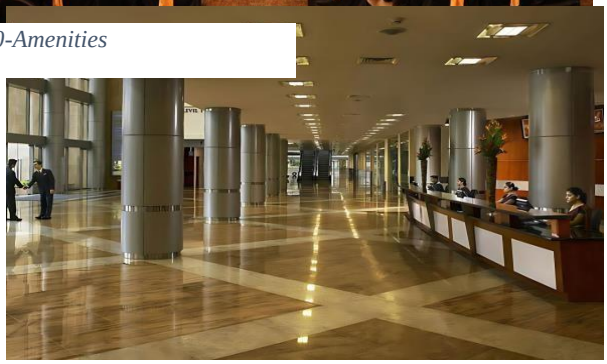


Figure 100-Amenities

1.52 BARRIER ENVIORNMENT

The Hyderabad International Convention Centre (HICC) is equipped to accommodate visitors with disabilities, ensuring a smoother experience for everyone. Obstacle-free ramps are installed at the rear of the convention center, offering barrier-free access to the main hall. The adjacent Novotel has level-ground lobby access (no ramp needed), with a ramp installed near the swimming pool area. Manual wheelchairs are available for use at both the Novotel lobby and the main entry to the convention Centre. While general parking is ample and open-air, there are designated parking bays closer to the venue for better drop-off access.





Figure 101-Exterior Views

1.53 INFERENCES

The HICC, a flagship project by Emaar Group, stands as a pioneering example of technologically advanced architecture in India's events infrastructure. With a modern design ethos, the centre emphasizes volumetric clarity, structural efficiency, and operational

flexibility. Its hallmark is a 6,480 sqm pillar-less hall with 12.5m clear height, enabling seamless visual experiences and accommodating a vast range of functions. The facility's modularity, supported by movable partitions, service pits at regular intervals, and automated tiered seating, allows effortless reconfiguration. The architectural language remains understated yet powerful, relying on proportions, circulation efficiency, and environmental controls rather than ornamentation. The planning integrates a spacious pre-function area, breakout rooms, VIP lounges, and an attached luxury hotel (Novotel), offering a one-stop solution for global events. The project also ensures accessibility with ramped entries and wheelchair provisions, setting standards in inclusive design. With robust back-end infrastructure, including dedicated service lifts and power backup systems, HICC positions itself as a resilient, tech-forward venue. The overall design balances form with high utility, offering a strong architectural response to large-format conferencing while aligning with the urban fabric of Hyderabad’s IT corridor.

HONG KONG CONVENTION AND EXHIBITION CENTRE (HKCEC)

Location: 1 Expo Drive, Wan Chai North, Hong Kong Island, Hong Kong

Architect: Skidmore, Owings & Merrill (SOM) with Wong & Ouyang (HK) Ltd.

Site Area: Approximately 157,000 m²

Architecture style: Modern / High-tech

Seating Capacity: 7,100

Built up Area: 306,000 m²

Parking capacity: Approximately 1,300 vehicles

Year 1988 (Phase I), 1997 (Phase II), 2009 (Atrium Link Expansion)



Figure 102-Hong Kong Convention And Exhibition Centre

1.54 INTRODUCTION

The Hong Kong Convention and Exhibition Centre (HKCEC) is a large-scale, multifunctional venue strategically located in Wan Chai North, designed to accommodate high visitor volumes with exceptional spatial flexibility. With a total built-up area exceeding 306,000 m², the centre offers over 91,500 m² of rentable space, including exhibition halls, convention theatres, meeting rooms, and a grand ballroom. Its main Grand Hall seats approximately 3,800 people, while the overall venue can host up to 140,000 visitors per day. The facility includes six exhibition halls, two large theatres, 52 meeting rooms, and extensive back-of-house support areas, all arranged to support concurrent large-scale events. (krishnan, 2020)This architectural layout emphasizes efficient crowd circulation, functional zoning, and the ability to adapt to diverse event formats ranging from trade shows to international summits.

1.55 ACCESSIBILITY AND PROXIMITY

- Exhibition Centre Station (MTR East Rail Line)- Directly beneath the HKCEC
- Wan Chai Station (MTR Island Line)- ~650 meters
- Wan Chai Ferry Pier - ~400 meters, Route: Ferry connection to Tsim Sha Tsui (Kowloon side)
- Bus Stops (Harbor Road / Convention Avenue)- Within 100–300 meters
- Hong Kong International Airport (HKG)- ~40 km
- Cross-Harbor Tunnel – ~1.2 km

1.56 CONCEPT AND APPROACH

- The hallmark Phase II roof, clad in roughly 40,000 m² of sculpted aluminium panels, is designed to evoke a seabird in flight—a dynamic, aerodynamic form that contributes to a strong visual identity against the waterfront skyline.

- The undulating roof is more than symbolic—it allows for a 75-foot-high vaulted convention hall with column-free spans up to 80 m. This form maximizes flexible interior use while creating dramatic spatial and visual effect

- The urban strategy used is the concept of City within City-The Phase I design, led by Dennis Lau & Ng Chun Man (DLN), aimed to create a self-sustaining urban center—integrating exhibition facilities, hotels, serviced apartments, and office buildings. This mixed-use composition allows HKCEC to function as its own urban ecosystem, bolstering synergy with the surrounding community and business context.

- The 2006–2009 expansion introduced the Atrium Link, which connects Phase I and Phase II without occupying the seabed beneath. Utilizing five mega-trusses spanning over 90 m, the entire exhibition space is suspended—allowing for expansion without interfering with harbor reclamation and future transport development.

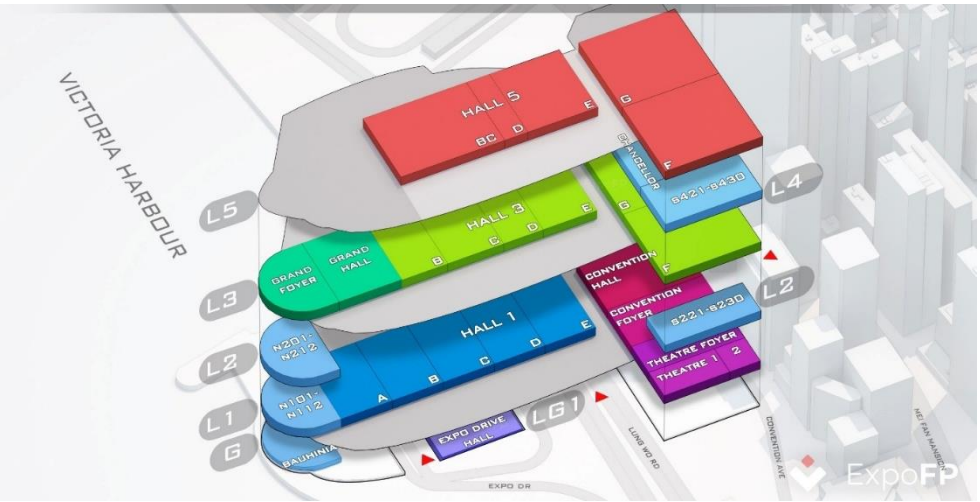


Figure 103-Floor levels

AREA STATEMENT AND CAPACITY

1.57 EXHIBITION HALL

HALL 1

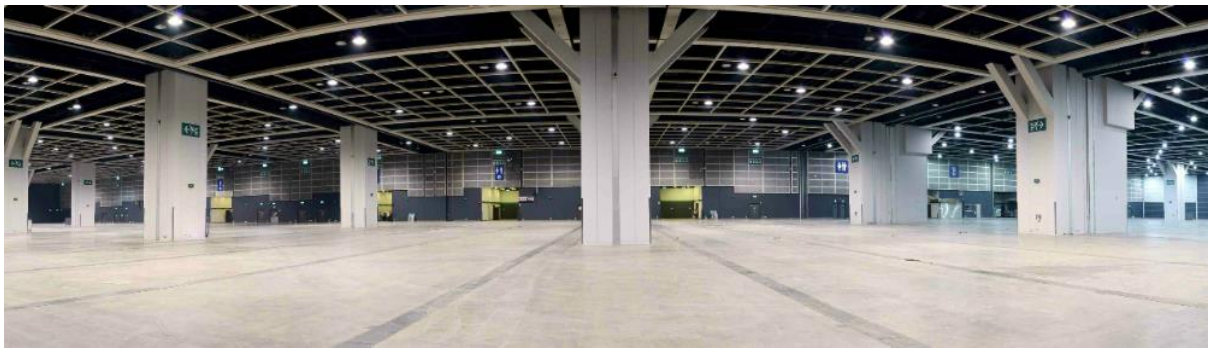


Figure 104-Hall 1

Dimension :255m (L) X 78m (W) X 10.5m (H)
Gross Floor Area: 19,890 sqm
Divisions: divisible into 5 independent halls (Hall 1A, 1B, 1C, 1D & 1E)
Capacity:

Venue/ Hall	Capacity

Hall 1A-E	1312
Hall 1A-C	770
Hall 1AB/1BC	515
Hall 1DE	415
Hall 1A	255
Hall 1B	260
Hall 1C	255
Hall 1D	166
Hall 1E	245

Table 10-Venue and Capacity H1

HALL 3B-3E

Dimension: 192m (L) X 78m (W) X 10.5m (H)
Gross Floor Area: 14,982 sqm
Divisions: divisible into 4 independent halls (Hall 3B, 3C, 3D & 3E)
Capacity

Venue/ Hall	Capacity
Hall 3B - E	983
Hall 3BC	464
Hall 3DE	396
Hall 3B	212
Hall 3C	252
Hall 3D	166
Hall 3E	229

Table 11Venue and Capacity 3B, 3C, 3D & 3E HALL 3F-3G



Figure 105-Hall 3B, 3C, 3D & 3E

Dimension: 120m (L) X 72.6m (W) X 8.25m (H)
Gross Floor Area: 8,917 sqm
Divisions: divisible into 2 independent halls (Hall 3F & 3G)

Venue/ Hall	Capacity
Hall 3FG	542
Hall 3F	250
Hall 3G	264

Table 12 -HALL 3F-3G



Figure 106HALL 3F-3G

HALL 5BC



Figure 107-HALL 5BC

Dimension: 104m (L) X 78m (W) X 10.5m (H)
Gross Floor Area: 8410 sqm
Capacity:498

HALL 5DE

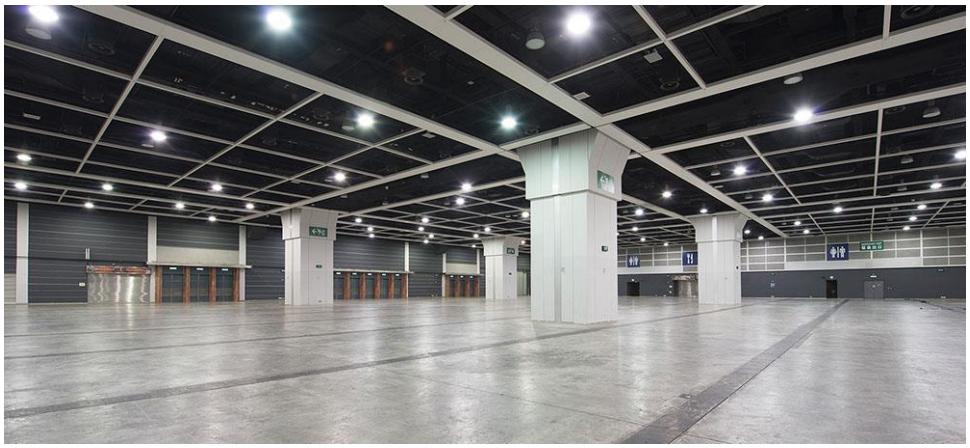


Figure 108-HALL 5DE

Hall 5D is a concourse between Hall 5BC and Hall 5E

Venue	Gross Floor Area	Dimension (L X W X H)	Capacity

Hall 5D	1185	47 x 24 x 5	30
Hall 5E	5070	65 x 78 x 8.25	294

Table 13- HALL 5D,5E

HALL 5F

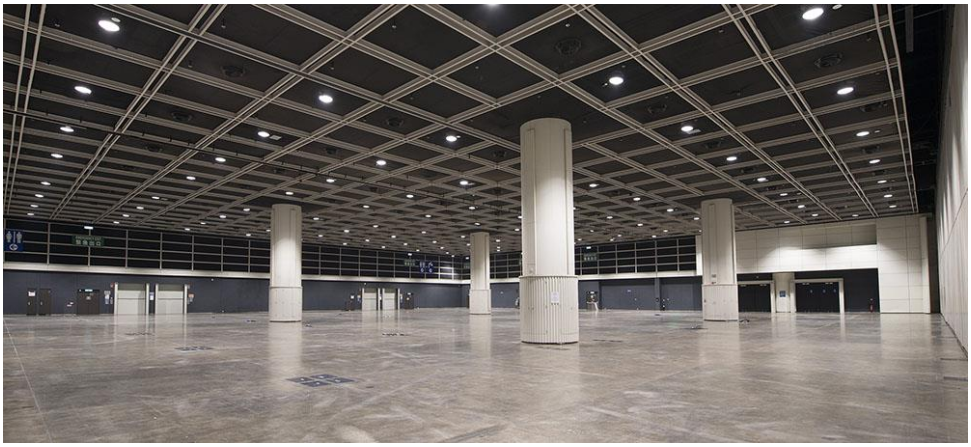


Figure 109-Hall 5F

Dimension: 60 (L) x 72.6 (W) x 8.25 (H)
Gross Floor Area: 4,456 sqm
Capacity: 250

HALL 5G

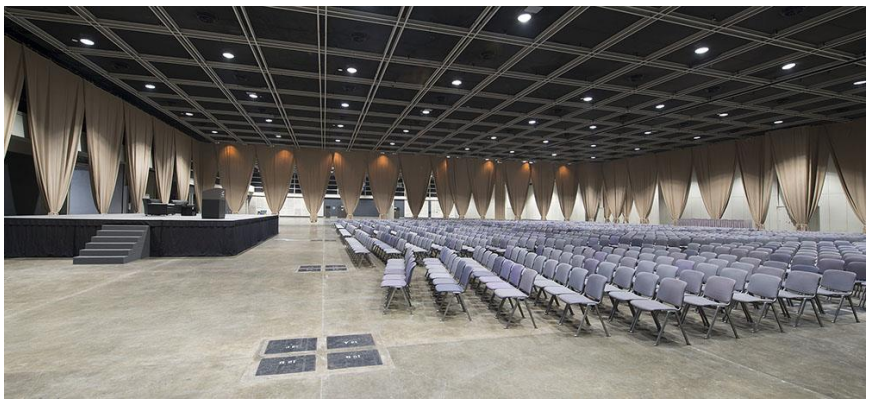


Figure 110Hall 5G

Dimension: 60 (L) x 72.6 (W) x 8.25 (H)
Gross Floor Area: 4,456 sqm
Capacity: 264

1.58 MEETING ROOM

Venue	Details	**Gross Floor Area**	**Theatre (max. capacity)**	**Classroom (max. capacity)**	**Banquet (max. capacity)**	**Cocktail (max. capacity)**
Meeting Rooms S421 - S430 	10 meeting rooms accommodating 28 to 380 people. S421 is equipped with permanent stage with 9m(W) x 2.5m(H) built-in LED Wall	42-433 sqm	28-380 persons	18-198 persons	12-240 persons, 1-20 tables	25-285 persons
Meeting Rooms S221 - S230 	10 meeting rooms accommodating 28 to 506 people. S221 is equipped with 7m(W) x 3m(H) built-in LED Wall. 7sqm is reserved for built-in LED Wall if S221 is licensed for	42-581 sqm	28-506 persons	18-284 persons	12-264 persons, 1-22 tables	25-375 persons

	meetings or banquets					
Meeting Rooms N201 - N212 	13 meeting rooms accommodating 28 to 600 people. N201 is equipped with 12m(W) x 3m(H) built-in LED Wall. 12sqm is reserved for built-in LED Wall if N201 is licensed for meetings or banquets	38-740	28-600 persons	11-296 persons	12-384 persons/ 1 - 32 tables	25-508 persons
Meeting Rooms N101 - N112 	13 meeting rooms accommodating 28 to 600 people. N101 is equipped with 12m(W) x 3m(H) built-in LED Wall. 12sqm is reserved for built-in LED Wall if N101 is licensed for meetings or banquets	38-740	28 - 600 persons	11-296 persons	12-384 persons/ 1 - 32 tables	25-508 persons

Table 14Meeting Room Capacity

1.59 THEATRE

Venue / Details	Gross Floor Area sqm.	Maximum Capacity
Theatre 1 	507	637 persons
Theatre Foyer 	457	300 persons for cocktail
Theatre 2 	293	336 persons

Table 15 Theatre Capacity

1.60 MULTIPURPOSE HALL

Grand Hall



Figure 111-Grand Hall

Area: 3,880sqm

ceiling height: 27m

A premier ballroom style venue, with a permanent stage of 408sqm with 20m(W) x 5.5m(H) built-in LED Wall

32sqm stage area is reserved for built-in LED Wall.

Grand Foyer

Area: 2,094sqm

ceiling height: 33m

Pre-function area with a panoramic view of Victoria Harbor



Figure 112-Grand Foyer

Venue / Details	Gross Floor Area sqm.	Theatre (max. capacity)	Classroom (max. capacity)	Banquet	Cocktail (max. capacity)
Grand Hall	3,880	3,800 persons	1,890 persons	2,160 persons/ 180 tables	3,800 persons
Grand Foyer	2,094	-	-	-	1,400 persons

Table 16-Venue Details and Capacity

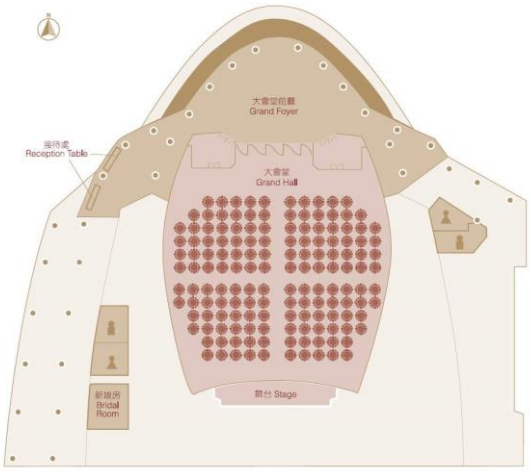


Figure 113-Grand Foyer Plan

CONVENTION HALL

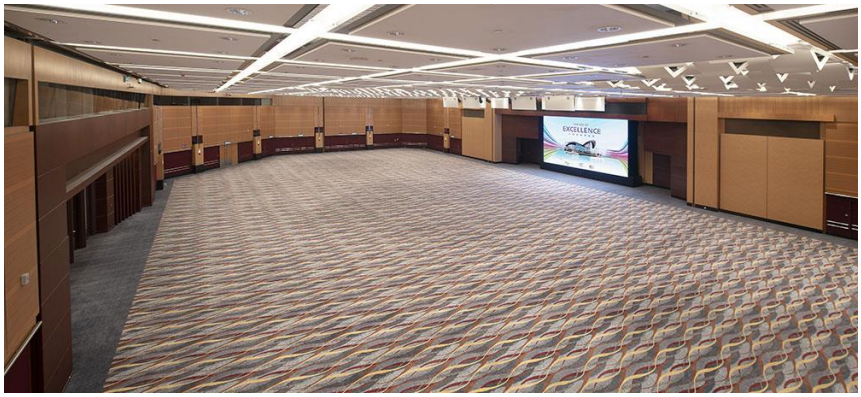


Figure 114-Convention Hall

Dimension: 56.5m (L) x 32.5m(W) x 7.7m(H)

Area:1,819sqm

A ballroom style venue, divisible into 3 halls (A, B & C)

18sqm is reserved for built-in LED Wall if Convention Hall is licensed for meetings or banquets

Convention Foyer: Pre-function area supporting the Convention Hall

Venue / Details	Gross Floor Area sqm.	Theatre (max. capacity)	Classroom (max. capacity)	Banquet (max. capacity)	Cocktail (max. capacity)
Convention Hall A-C	1,819	1,700 persons	891 persons	960 persons/80 tables	1,480 persons
Convention Hall AB/BC	1,289	1,046 persons	603 persons	636 persons/53 tables	1,030 persons
Convention Hall B	764	611 persons	315 persons	396 persons/33 tables	480 persons

Venue / Details	Gross Floor Area sqm.	Theatre (max. capacity)	Classroom (max. capacity)	Banquet (max. capacity)	Cocktail (max. capacity)
Convention Hall A/C	525	344 persons	183 persons	204 persons/17 tables	350 persons
Convention Foyer	1,740	-	-	-	1,150 persons

Table 17 Venue Hall and Capacity

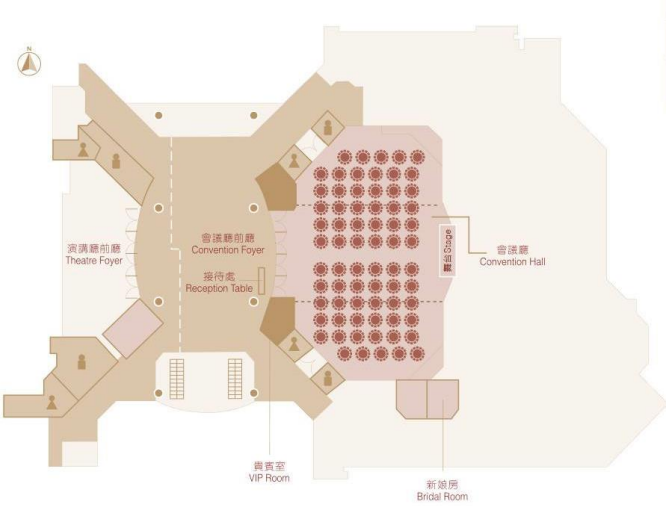


Figure 115-Convention Foyer Plan

1.61 MULTI-FUNCTIONAL ROOM

CHANCELLOR ROOM



Figure 116-Chancellor Room

Dimension: 47.3m(L) X 16.9m(W) X 3.6(H)

Area: 818sqm

Capacity: 442 people

Equipped with 12m(W) x 3m(H) built-in LED Wall
12 sqm is reserved for built-in LED Wall if licensed for meetings or banquets

Venue / Details	**Gross Floor Area sqm**	**Banquet (max. capacity)**	**Cocktail (max. capacity)**
Chancellor Room	818	432 persons/36 tables	556 persons
Chancellor Room 1	164	72 persons/6 tables	-
Chancellor Room 2	410	192 persons/16 tables	-
Chancellor Room 3	244	84 persons/7 tables	-
Chancellor Room Foyer	322	-	-

Figure 117- Venue and Capacity of Chancellor room

BAUHINIA ROOM



Figure 118- BAUHINIA ROOM

The Bauhinia Room sits just beside the Victoria Harbor and the Golden Bauhinia Square, offers a dazzling night view along the coasts of the Victoria Harbor.

Area: 699 m^2

Capacity: 300 guests.

Venue / Details	**Gross Floor Area sqm**	**Banquet (max. capacity)**	**Cocktail (max. capacity)**
Bauhinia Room (1+2+3)	699	300 persons/ 25 tables	500 persons
Bauhinia Room 1	217	84 persons/ 7 tables	-
Bauhinia Room 2	262	120 persons/ 10 tables	-
Bauhinia Room 3	220	84 persons/ 7 tables	-

Table 18-Venue and Capacity of Bauhinia Room

PLAN AND DETAILS

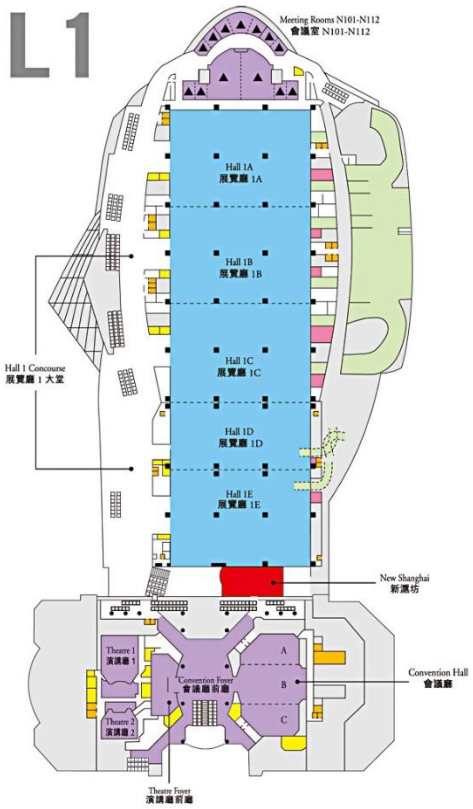






Figure 119-Plan and Details

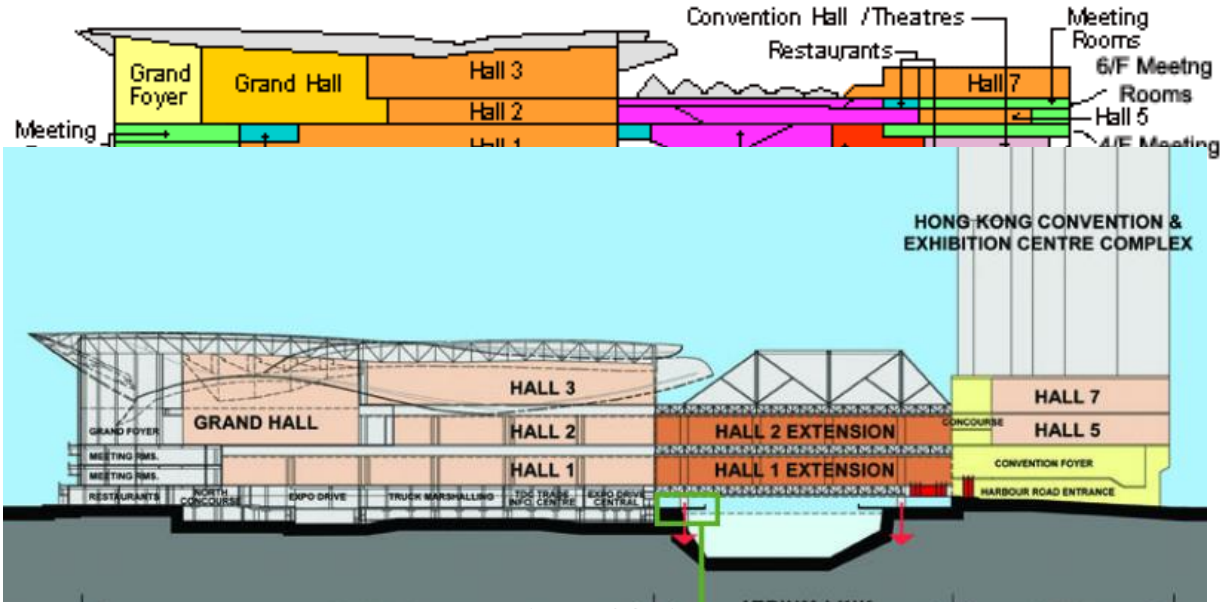


Figure 120-Section

1.62 FACILITIES

- 3 floors of Exhibition Halls (6 exhibition halls), 66,000 sqm in total
- 2 Multi-Purpose Halls, 5,700 sqm in total, with seating for 5,600
- 2 world-class Podiums
- 2 Theatres, 800 sqm with seating for 1,000
- 52 Meeting Rooms, 6,000 sqm
- 2 Banquets Halls, including Chancellor Room and Bauhinia Room
- 7 restaurants with seating for 1,340, including Congress Plus, Golden Bauhinia, Harbour Kitchen, Harbour Road Café, New Shanghai, Port Café, and Traders
- Related Facilities including shopping arcade, banks, and business centers.
- 4-Star Renaissance Hong Kong Harbor View Hotel, with 800 rooms in total
- 5-Star Grand Hyatt Hong Kong, with 542 rooms in total
- Grade A Convention Plaza Office Tower
- Serviced apartment tower Convention Plaza Apartments
- Over 1,300 parking bays

STRUCTURAL AND CONSTRUCTION

Structural Type	Steel-frame with reinforced concrete cores
Roof	Curved, wave-like roof supported by steel trusses (spanning up to 80–90 meters)
Atrium Link Structure	Suspended steel mega-trusses (over 90 meters span) without seabed foundation
Materials	Structural steel, reinforced concrete, aluminum panels (roof), glass curtain walls
Clear Spans	Up to 80 meters, allowing column-free exhibition halls
Foundation	Deep pile and caisson foundations, especially over reclaimed land
Roof Cladding	40,000 m^2 of aluminum cladding over arched steel trusses
Construction Techniques	Pre-fabrication, strand-jacking for trusses, aerial construction for bridge over existing roads

Wind Resistance	Designed to withstand typhoon-force winds using tied-down trusses and reinforced connections
Construction Challenges	Built over harbor, tight schedules, maintaining operations during expansion

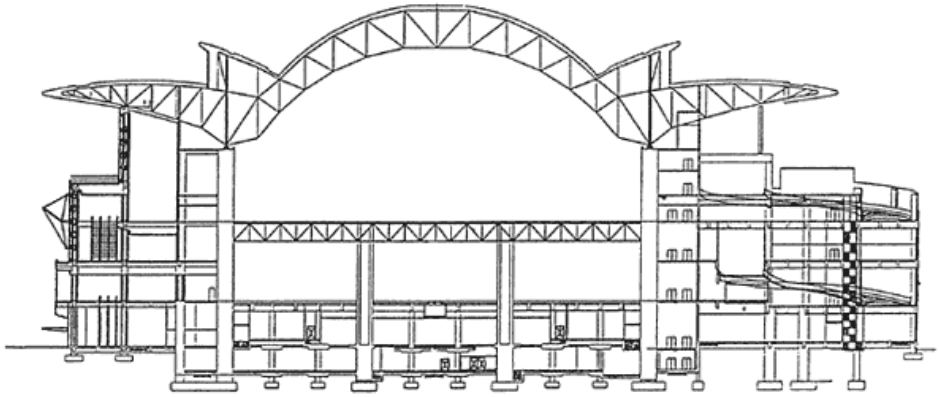


Figure 121-Building Structure

1.63 INFERENCES

The HKCEC, designed by SOM and Wong & Ouyang, exemplifies high-tech modern architecture that prioritizes spatial dynamism, structural innovation, and urban integration. The iconic roof, resembling a seabird in flight, not only defines its aesthetic but also facilitates vast column-free interiors spanning up to 80 meters. Built on reclaimed land, its structure employs steel mega-trusses, deep foundations, and prefabrication techniques, showcasing advanced engineering capabilities. The "City within a City" concept is achieved through mixed-use integration exhibition halls, theatres, banquet venues, hotels, offices, and retail supporting continuous urban life. Its layout enables parallel large-scale events without functional overlap, reflecting precision in spatial zoning. The Atrium Link expansion suspended over the sea highlights architectural ingenuity while addressing environmental constraints. HKCEC is optimized for both user experience and back-of-house operations, with efficient vertical/horizontal circulation and service cores. Extensive use of aluminum panels and curtain walls enhances its sleek, modern identity. Internally, the use of LED-integrated halls and adaptable meeting rooms ensures relevance across scales and formats. As a landmark on the Hong Kong skyline, HKCEC represents the pinnacle of multipurpose civic architecture that fuses iconic form with meticulous planning and technical mastery.

1.64 COMPARISON OF FOUR CONVENTION CENTRES

Aspect	Base Eleven Convention Centre	LBICC, Kochi	HICC, Hyderabad	HKCEC, Hong Kong
Architectural Style	Modern contemporary with Kerala vernacular influence	Contemporary modern with functional luxury	Modern functional with tech-forward design	High-tech modern with sculptural form
Design Philosophy	Tradition meets fluidity (Tharavadu & curves of backwaters)	Flexible, luxury-oriented, seamless indoor-outdoor transitions	Versatile, modular, and tech-integrated spaces	Iconic identity, structural boldness, “City within a City” concept
Spatial Planning	11 themed spaces around a central courtyard	30 flexible venues; ballrooms and breakout rooms	Main hall divided into 6, with breakout rooms and VIP lounges	Multiple large halls, theatres, and ballrooms for concurrent events
Structural Strategy	Curved forms, pillar-free halls, yellow stone integration	Large clear-span halls, retractable seating	12.5 m ceiling with catwalks and truss systems	Mega-truss roof spans (up to 80–90 m), suspended atrium expansion
User Experience	Immersive, rooted in heritage, universally accessible	High-end ambiance, tech-rich, valet, helipads	Barrier-free, integrated Novotel, dedicated lounges	Panoramic waterfront views, seamless access and civic landmark
Contextual Integration	Deeply tied to Kerala’s history and	Waterfront location with	Integrated with Hyderabad IT	Urban node linked to

	natural elements	lush landscaping	corridor and hotel	metro, ferry, hotel, offices
Sustainability & Materials	Local stone reuse, preserved trees, rain-absorbing courtyard	IGBC certified, EV charging, BMS-managed systems	Sustainable infrastructure, service pits with utilities	Aluminum roof cladding, no seabed disruption in expansion
Unique Features	200-year-old Tharavadu as design anchor, fluidic furniture & interiors	Lake-view pavilions, rooftop dining, Grand Hyatt synergy	Automated telescopic seating, 100% power backup, speaker prep zones	Bird-inspired roof, massive ballrooms, suspended bridge structure

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FINAL YEAR THESIS PROJECT - 2025

వరంగల్
ORUGALLU.

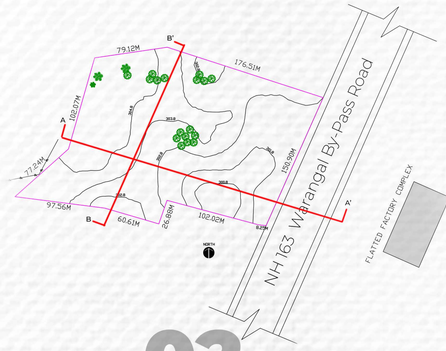
INTERNATIONAL CONVENTION CENTRE

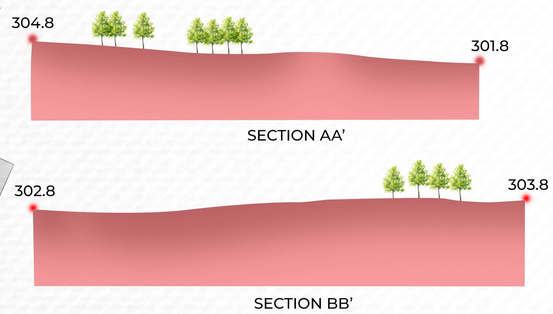
SRAVAN S , 211110239
FINAL YEAR , 9TH SEM
ARCHITECTURE , SEC B
MANIT BHOPAL

Location	Madikonda - Warangal, Telangana
Site Area	10 Acres
Ground Coverage	40%
FAR	2
Total Build up Area	23225.7 Sq.m
Land Use Zone	Industrial Zone (I)
Height restriction	No Limits
Land Ownership	Telangana Government Industrial Infrastructure Corporation Limited (TGIIC)
Access to Site	From East of site (NH 163)



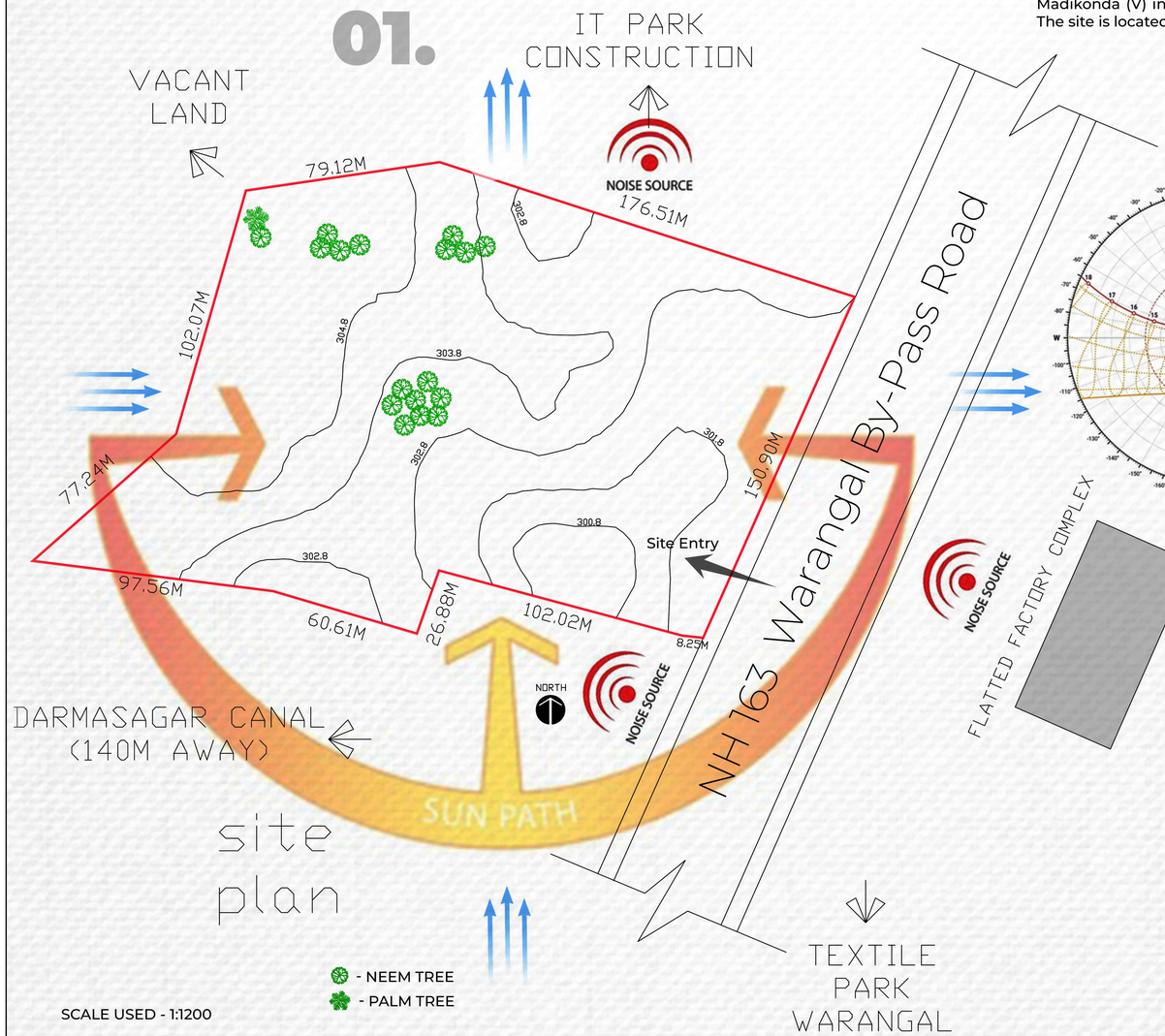
The Project Site is located in Sy. No. 1791/ 1 of Madikonda (V) in Warangal, Telangana, India. The site is located opposite to the Textile Park.





Site sections

01.



site plan

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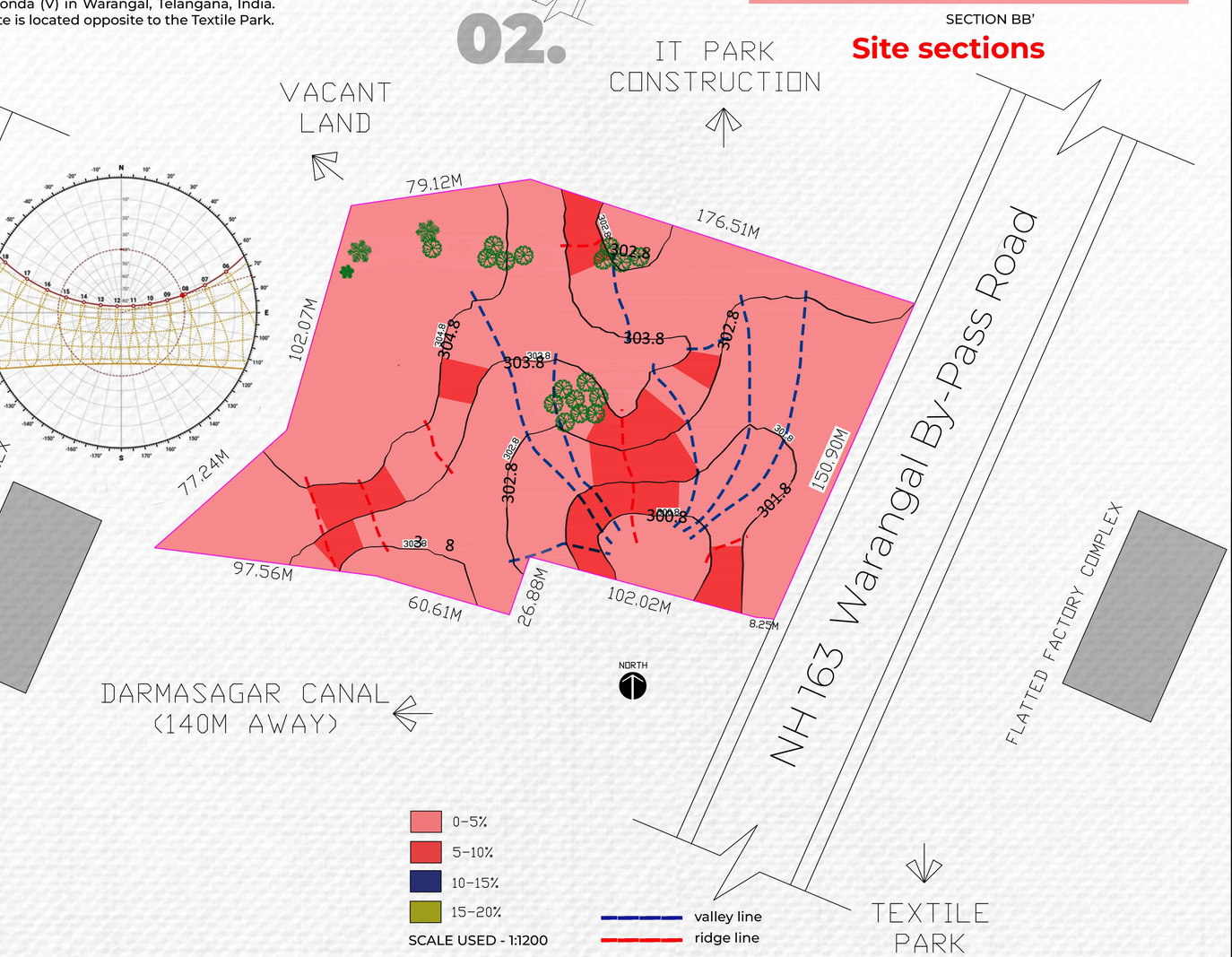
Existing Site Plan

The proposed site for the International Convention Center is located at Madikonda, Warangal, Telangana, with a total area of approximately 10 acres (40,468 sq. m). The land falls under Industrial Zone (I) and is owned by the Telangana Government Industrial Infrastructure Corporation Limited (TGIIC). With a ground coverage of 40% and an FAR of 2, the site allows for a total build-up area of 23,225.7 sq. m, making it suitable for large-scale institutional development. The terrain is regular and mostly flat, with contours ranging gently, ensuring ease of construction and natural drainage. The site is bounded by vacant land to the north and south, NH 163 road to the east providing excellent visibility and primary access, and Dharmasagar Canal to the west. Strategically located, it lies near major landmarks including V City Madikonda (3.7 km), Kazipet Junction (9 km), Warangal Railway Station (20 km), and is well-connected to Hyderabad city (140 km) and Hyderabad International Airport (161 km).

02.



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Slope Analysis

The site demonstrates a mild slope ranging from 0–5%, with the highest contour marked at 304.8 meters towards the north-western edge and the lowest contour recorded at 300.8 meters on the south-eastern side. This creates a total elevation difference of approximately four meters across the site. However, since the variation is spread across the entire area, the gradient is gentle and the land can be regarded as almost flat. Such topography is advantageous for development as it minimizes grading and earthwork requirements while still allowing for natural surface drainage to flow in the south-eastern direction. The absence of steep slopes ensures stability, accessibility, and ease of circulation, making it highly suitable for large-scale architectural programs. Furthermore, the near-flat terrain offers flexibility in designing building layouts, roads, open spaces, and landscaping without the need for extensive retaining structures or stepped formations. Overall, the site conditions support efficient, economical, and adaptable planning.

01 **ORUGALLU**
INTERNATIONAL CONVENTION CENTRE

SITE ANALYSIS

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MANIT BHOPAL

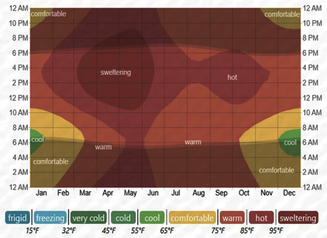
Thesis Guide : Savita Raje

Climate of Warangal

Warangal has a hot semi-arid climate with scorching summers, heavy monsoon rains, and mild winters. Summers (March–June) often exceed 40 °C. Monsoon (June–September) brings most annual rainfall with high humidity. Winters (October–February) are pleasant and dry, making them ideal for tourism and outdoor activities.

Average hourly temperature in warangal

The figure below shows compact characterization of the entire year of hourly average temperatures. The horizontal axis is the day of the year, the vertical axis is the hour of the day, and the color is the average temperature for that hour and day.



	**Common Name:** Asian Palmyra Palm / Toddy Palm / Ice Apple Tree **Scientific Name:** *Borassus flabellifer*	**Average Height:** **Typical Range:** 20–30 meters **Mature Height:** Up to 30 meters in ideal conditions **Foliage Type:** **Type:** Evergreen **Leaf Shape:** Fan-shaped
	**Common Name:** Neem Tree **Scientific Name:** *Azadirachta indica*	**Trunk Radius**: ~30 to 45 cm (diameter ~60–90 cm) **Height**: Around 15–20 m in mature local specimens **Foliage**: Evergreen compound leaves, occasionally shedding in severe drought **Crown Spread**: Dense, rounded canopy 10–15 m wide under open growth

Vegetation



View from the site







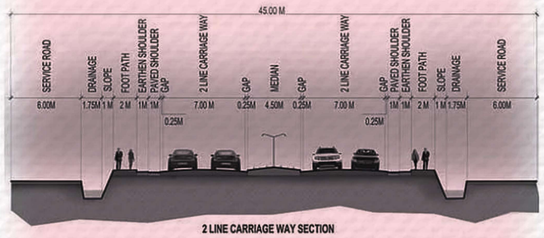


Site Details



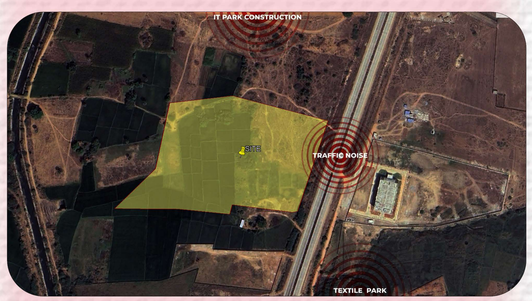
The Project Site is located in Sy. No. 1791/ 1 of Madikonda (V) in Warangal, Telangana, India. The site is located opposite to the Textile Park.

Project Site Attributes	
Location	Sy. No. 1791/ 1 of Madikonda (V) Warangal (U) District
Site Area	~ 10 acres (40,468 sq. m.)
Primary Access	NH 163
Visibility & Frontage	Excellent Visibility and Frontage along abutting roads ; contiguous site
Shape, Terrain	Regular and mostly flat
Project Site Boundary	
North	Vacant land
South	Vacant land
East	NH 163 Access road
West	Dharmasagar Canal

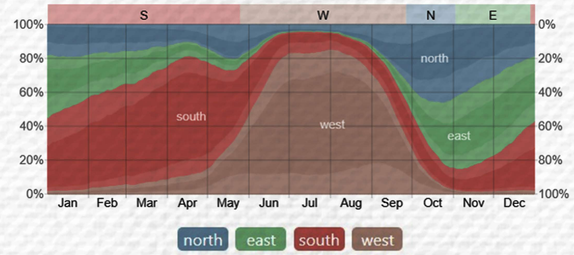


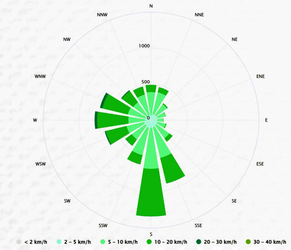
Location / Landmark	Approximate Distance from the Project Site
Textile Park	Opposite (Immediate Neighborhood)
V City Madikonda	~3.7 Km
Kazipet Junction	~9 Km
Warangal Railway Station	~20 Km
Hyderabad City	~140 Km
Hyderabad International Airport	~ 161 Km

Noise from the surrounding



Wind Analysis





The wind is most often from the west for 4.0 months, from May 25 to September 26, with a peak percentage of 86% on August 1. The wind is most often from the east for 1.8 months, from November 2 to December 28, with a peak percentage of 48% on November 21. The wind is most often from the south for 4.9 months, from December 28 to May 25, with a peak percentage of 43% on January 1.

Rainfall

The rainy period of the year lasts for 7.4 months, from April 9 to November 21, with a sliding 31-day rainfall of at least 0.5 inches. The month with the most rain in Warangal is July, with an average rainfall of 7.4 inches.The rainless period of the year lasts for 4.6 months, from November 21 to April 9. The month with the least rain in Warangal is December, with an average rainfall of 0.1 inches.

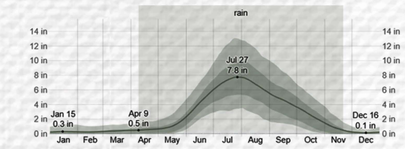


Figure 65 Rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall	0.3″	0.3″	0.4″	0.6″	1.1″	4.2″	7.4″	6.8″	4.7″	2.6″	0.7″	0.1″

SWOT Analysis

Category	Details
Strengths	- Prime location with direct access from NH-163 (24m wide). - Land owned by Telangana Govt (TGIIC) ensures clear legal titles and planning control. - Flat terrain with eastward slope beneficial for drainage. - Proximity to essential utilities: electric lines, Daramsagar canal for water. - Presence of existing vegetation (Neem, Palmyra) offers scope for ecological landscaping. - Located in Industrial Zone – suitable for large-scale developments.
Weaknesses	- Zoned as Industrial Land may need rezoning for mixed or commercial use. - Close proximity to noise sources (NH-163, textile industry, IT construction). - High summer temperatures (>40°C) and extreme humidity during monsoon. - Foundation may need pile system due to sandy loam and possible high water table.
Opportunities	- Upcoming IT Park next to the site can enhance land value and employment. - Flat site with clear access is ideal for phased large-scale development. - Scope for sustainable water use via Daramsagar canal. - Potential for integration with regional urban plans and infrastructure.
Threats	- Risk of flooding if proper drainage not maintained. - Environmental impact due to industrial surroundings. - Risk of rezoning delay or approval barriers from TGIIC. - High heat index in summer could challenge passive design strategies.

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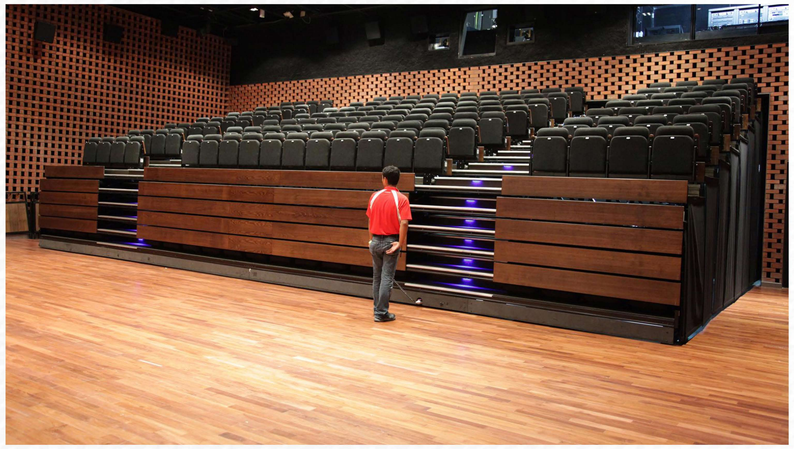
Parameter	Base Eleven Convention Centre	Lulu Bolgatty International Convention Centre (LBICC)	Hyderabad International Convention Centre (HICC)	Hong Kong Convention and Exhibition Centre (HKCEC)	Inferences
Location	Pala, Kottayam, Kerala	Bolgatty Island, Kochi, Ernakulam, Kerala	Izzat Nagar, Kothaguda, Hyderabad	1 Expo Drive, Wan Chai North, Hong Kong Island, Hong Kong	
Climate Analysis	Located in a tropical monsoon climate.	Located in a tropical coastal climate.	Located in a tropical wet and dry climate.	Located in a humid subtropical climate.	Building designed and oriented based on their climatic characters
Site Analysis	Integrates an ancestral home and a 45-year-old garden. A central courtyard acts as a nucleus.	Located on a waterfront island, offering views of backwaters and the city skyline.	Located in Hyderabad's IT district, on a site of 60,000 sqm.	Located on reclaimed land on the waterfront, designed as a "City within a City" with hotels and offices.	All buildings are easily accessible from the main areas.
Architectural Style	Modern contemporary with fluid, parametric forms.	Modern architecture.	Modern, state-of-the-art, purpose-built facility.	Modern/high-tech with a bird-like, multi-curved steel roof.	following modern contemporary architecture style
Site area	10 acres	24 Acres	15 acres	38.79 acre	Site area range from 10 -40 acres based on requirements
Height of building	15 m.	10 m	Main hall has a 12.5m clear ceiling height.	Grand Hall has a 27m ceiling height. Exhibition halls have a 10.5m ceiling height. The main entrance foyer has a clear headroom of about 60 meters.	celing height range from 10- 21 meters
Total Area	75,000 sqft	10 lakh sqft total area, with 100,000 sqft of indoor and outdoor meeting space. The total area of the convention center is 15 acres.	344,038 sqm. Main hall is 6,480 sqm.	306,000 m² built-up area. Over 140,000 sq m of rentable space.	
Main Hall Capacity	2,500 total seating capacity, with Hall 1 seating 1,300 guests. Can also accommodate up to 4000 guests (floating).	Over 3,000 guests in the facility. Liwa Ballroom seats 3,000. Can host up to 10,000 guests.	The pillar-free internal hall can hold 5,000 delegates.	The Grand Hall seats approximately 3,800 people.	1.1 sqm required for per person
Number of Halls	11 main event spaces, including seven AC halls and 4 gardens.	30 flexible event venues.	Can be partitioned into 6 halls. It also has 37 breakout venues.	Six exhibition halls, two large theatres, and 52 meeting rooms.	number of halls distributed on the basis of capacity , halls can be club each other
Landscape Design	Uses local yellow rocks and preserves existing trees. Artificial mounds were created.	Extensive landscaping is used to make it a wedding and event destination.	Environmentally sustainable practices are part of the design, including a roof garden covering 60% of the area and large vegetative open spaces.	integrates waterfront promenades, plazas, and green buffers that enhance its iconic harbourfront setting while supporting public accessibility.	maintained the natural features on the site,
Material Usage	Local yellow rocks are used for landscaping. Simpolo's Impato and Saga collections of tiles.	luxurious, warm-toned finishes, such as polished marble or engineered stone flooring, complemented by rich wood-paneled walls. Soft, layered lighting enhances the glossy surfaces and adds to the grandeur.	Acoustic panels made of teak and silk fabric, carpet tiles, and granite and marble slabs.	Multi-curved steel roof, granite slabs, and glazed walls for the exterior.	modern meterials are widely used ,less expencive, less harm to the nature
Technology Integration	Acoustic design with PET panels.	Building Management System (BMS) for central control.	Service pits with power, water, and internet every 6m, and automated telescopic tiered seating.	Built-in LED walls in some meeting rooms and the Grand Hall. Also uses digitization in construction.	wide range of acoustic pannels are used for noice cancellation
Sustainability Features	Strategic use of local materials and preservation of existing vegetation.	IGBC certification and electrical vehicle charging stations.	Green Globe certified, zero water discharge building, with a rainwater harvesting system, and a solar power system.	Working towards LEED and BEAM Plus certification. Initiatives include mechanical ventilation refurbishment, water fitment refurbishment, and waste management optimization.	building should follow the national guidelines and sustainal building to be designed
Facilities & Services	Flexible seating, barrier-free design with ground-level halls, acoustic treatments, pet-friendly, wheelchair-accessible restrooms, and play area.	Part of the Grand Hyatt hotel, with multiple lifts, a private jetty, and three helipads.	Connected to a 5-star Novotel hotel and features a business center, VIP lounge, organizer suites, and CCTVs.	Includes exhibition halls, theaters, meeting rooms, a grand ballroom, and a grand foyer with a panoramic view of Victoria Harbor.	Combination of spaces for multiple uses , clubing of spaces , multiple entries and exits provided
Average Daily Footfall (Event Days)	3000	6000	6000	8900	Range from 1000-10000
Number of Entry & Exit Gates	2	7 entries to the site.	2		
Circulation & Wayfinding	Prioritizes universal accessibility with major halls at ground level.	A comprehensive vertical circulation and service infrastructure with multiple lifts.	Ramps for accessibility and designated parking bays for drop-off.	Emphasizes efficient crowd circulation and functional zoning.	Efficient circulation spaces are provided ,multiple entry and exits
Site Services (Parking, Utilities, Logistics)	Waterlogging-prone areas were constructed as parking spaces.	Multi-level parking, valet services, parking guidance system, and EV charging stations.	100% power back-up, a loading dock, and service pits with utilities.	HKCEC provides ~1,300 parking spaces, extensive utility support, and a 20,900 m² logistics area with 187 loading bays for efficient event operations.	
No. of car parking	400+	Approximately 1500 cars	1000+ car parking base	Approximately 1,300 vehicles	
Type of car parkings	Surface parking	Multi-level, valet, and designated parking for various vehicles and people with disabilities. Offers smart valet parking.	On-site self-parking, valet parking, wheelchair-accessible parking, and electric vehicle charging points.	Integrated into the venue.	

Inferences from literature review

An inclusive convention centre is designed so that everyone, regardless of age, ability, or background, can use and enjoy it. It includes step-free access, ramps, lifts, clear signs, and spaces for wheelchairs so people can move around easily. Flexible halls, retractable seating, and quiet zones make the centre adaptable for different needs, while facilities like prayer rooms, nursing rooms, and gender-neutral restrooms support social and cultural diversity. Safety is ensured through accessible emergency exits and safe pedestrian movement, and comfort is improved with good lighting, acoustics, and climate control. Technology such as hearing loops, captioning, and digital wayfinding helps people with different needs, while sustainable design with natural light and green spaces creates a welcoming environment. Together, these features make the convention centre a place where everyone feels included and comfortable.



Retractable chairs (also called telescopic seating or bleacher seating) are seating systems that can be folded, stacked, or slid into a compact form when not in use, and extended when needed. They are commonly used in convention centres, auditoriums, stadiums, and multipurpose halls where space flexibility is important.

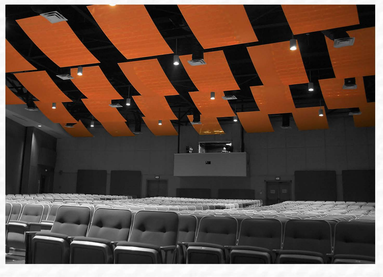
Advantages of Retractable Chairs

1. Space Efficiency :Can be folded or retracted to free up floor space for exhibitions, banquets, or other events.
2.Flexibility : Allows the same hall to be used for multiple functions – from conferences to cultural shows.
3.Time-Saving : Quick and easy to set up or retract, often with semi-automatic or motorized systems.
4.Cost-Effective : Reduces the need for separate halls by making one space serve many purposes.
5.Improved User Experience : Provides comfortable, tiered seating with good visibility for all spectators.
6. Aesthetic Appeal : Modern retractable systems integrate well with interiors and maintain a neat look when stored.

6–8 well-distributed entry and exit gates for smooth circulation.
Separate access for pedestrians , vehicles.
Digital wayfinding systems for easy navigation.



should provide acoustic materials to sound absorbsion and providing better sound experiences.



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MANIT BHOPAL

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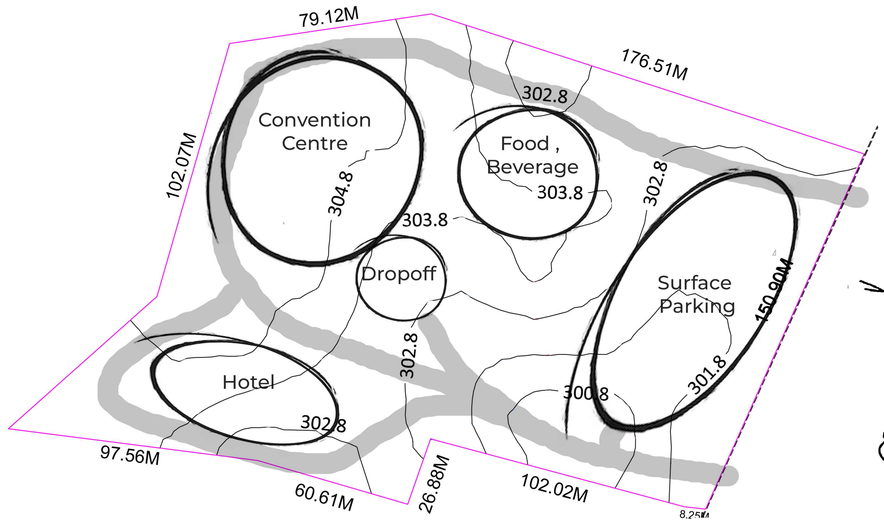
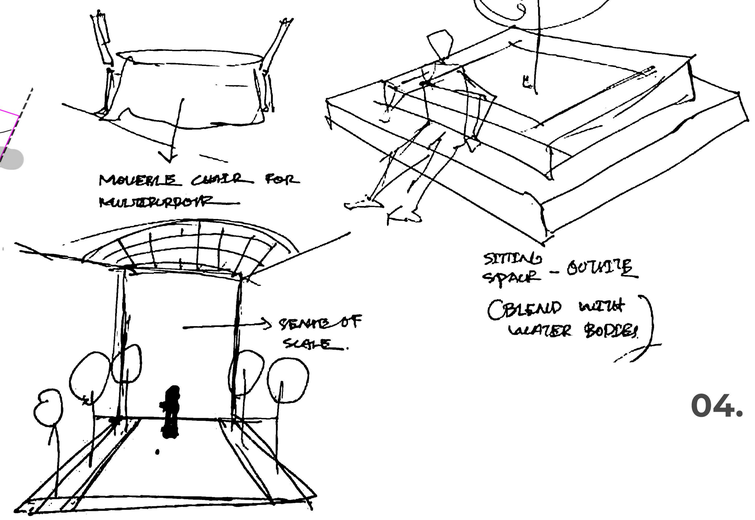
Concept

Concept: Flexible Spatial Design
- Flexibility of spaces for multiple functions
- Flexible and highly functional spatial layouts
- Movable walls and partitions for reconfiguration
- Modular and adaptable furniture elements
- High ceilings and large windows to enhance openness
- Open lobbies that encourage fluid movement and visual connectivity

Site Zoning





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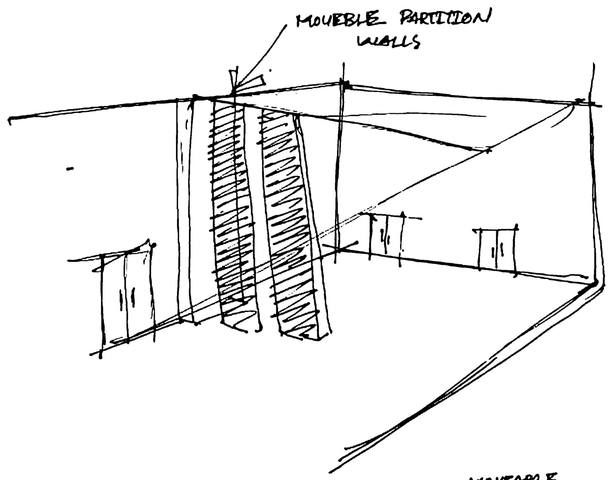
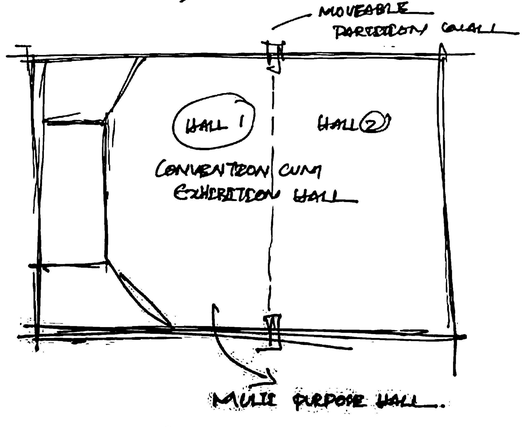
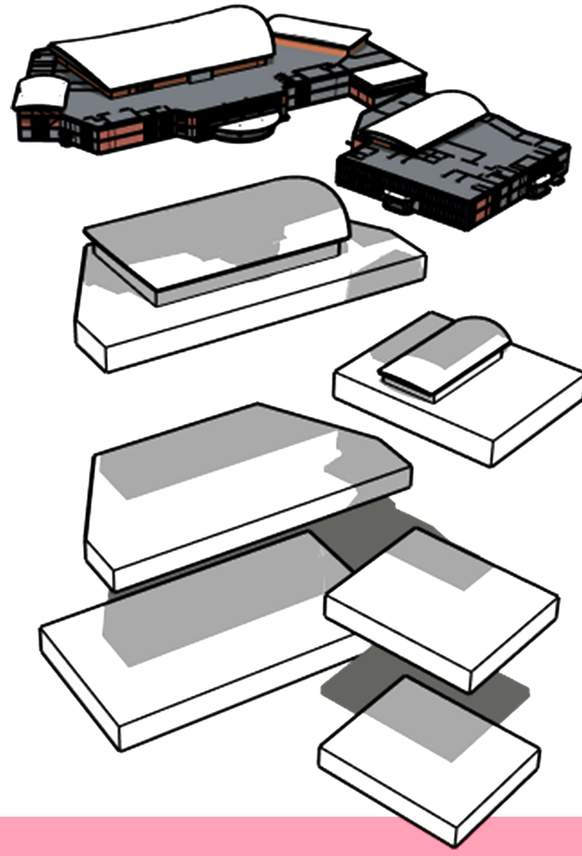
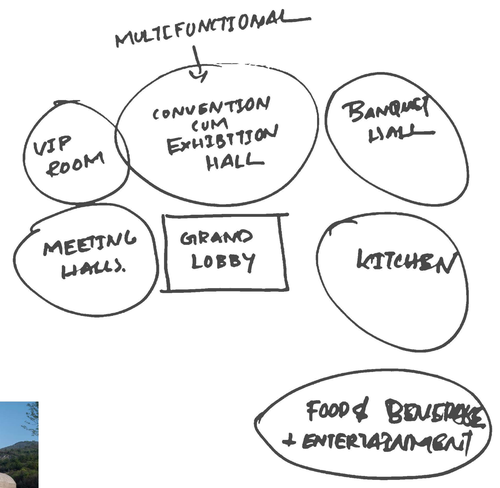




Form Development



Zoning



03.

02.

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Materials

Exposed material architecture is a design approach where the building's structural elements like concrete, steel, brick, wood, and stone are left uncovered, celebrating their raw texture, color, and imperfections instead of concealing them with finishes

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Orugallu

International convention centre , warangal

Location	Madikonda - Warangal, Telangana
Site Area	10 Acres
Ground Coverage	40%
FAR	2
Total Build up Area	23225.7 Sq.m
Land Use Zone	Industrial Zone (I)
Height restriction	No Limits
Land Ownership	Telangana Government Industrial Infrastructure Corporation Limited (TGIIC)
Access to Site	From East of site (NH 163)



Vegetation

- Palmyra palm
- Sheena's Gold
- Lantana Camara
- Bamboo
- Neem Tree
- Pongamia

G1 - SERVICE ENTRY
G2- BUS PARKING ENTRY
G3- MAIN ENTRY EXIT
G4- PARKING ENTRY EXIT
G5- SERVICE ENTRY

SCALE USED - 1:600

Parking consideration

Sl. No.	Category	Build up Area(SQ.M)	ECS Per 100 Sq.m	Total ECS Required	Parking Area (1 Car Space-12.5 sq.m)
A	Convention Center	**3858**	2.0 ECS/100 sq.m	77	962.5
B	Hotel	**13635**	2.0 ECS/100 sq.m	272	3400
C	Entertainment and F&B	**3877**	2.0 ECS/100 sq.m	77	962.5
C	Total	**23225.7**		**426**	**5325**

Site Area calculation

Business Hotel (150 Keys) – 13,935.4 sq.m		
Space	**Area (sq.m)**	**Notes**
Guest Rooms (150 keys @ ~35 sq.m)	5250	Room + ensuite
Guest Room Corridors/Stairs/Lifts	1200	20-25% of gross floor
Reception + Lobby + Lounge	300	Front of house
Admin / Back Office	300	GM, Accounts, HR
All-day Dining Restaurant	400	Includes seating, buffet
Kitchen & Dishwashing	300	Main kitchen
Banquet / Conference Room	500	Small-scale events
Housekeeping + Linen + Laundry	400	Service area
Gym + Spa + Wellness	300	Guest amenities
Staff Area (Canteen, Locker, Dorms)	600	Depends on staffing scale
Engineering + HVAC + Utility Room	300	MEP services
Toilets (Common areas)	150	Public use
Parking (Basement if any)	*Not included*	Separate from above
Circulation, Walls, etc. (30%)	3635.4	Vertical/horizontal

Convention Centre cum Exhibition Centre(2500 Pax) - 4645.1 sq.m			
Space Description	**Area (sq.m)**	**No. of Units**	**Remarks**
Convention Hall (Main)	2000	1	For 1800 pax (approx. 1.1 sq.m/pax)
Small Meeting Rooms	185.8	2–4	~46–90 sq.m each
Large Meeting Rooms	464.5	1–2	~230–464 sq.m each
Business Centre	464.5	1	With workstations, booths
Pre-function & Circulation	743.2	—	Lobby, foyer, corridors
Total	**3858**		

Entertainment and F&B- 4645.1 sq.m			
Space Description	**Area (sq.m)**	**No. of Units**	**Remarks**
Restaurants	1600	2	Includes fine dining and casual restaurants
Food Court Area (Multiple Counters)	816	1	Shared seating for multiple vendors
Gaming & Entertainment Zone	816	1	Arcade, VR zone, bowling alley
Vertical & Horizontal Circulation	395.1	—	Corridors, staircases, lifts
Toilets & Service Core	250	—	Restrooms and service shafts
Total	**3877.1**		
Banquet hall - – 3065 sq.m (added extra to the facilities)			

05 ORUGALLU
INTERNATIONAL CONVENTION CENTRE

SITE PLAN

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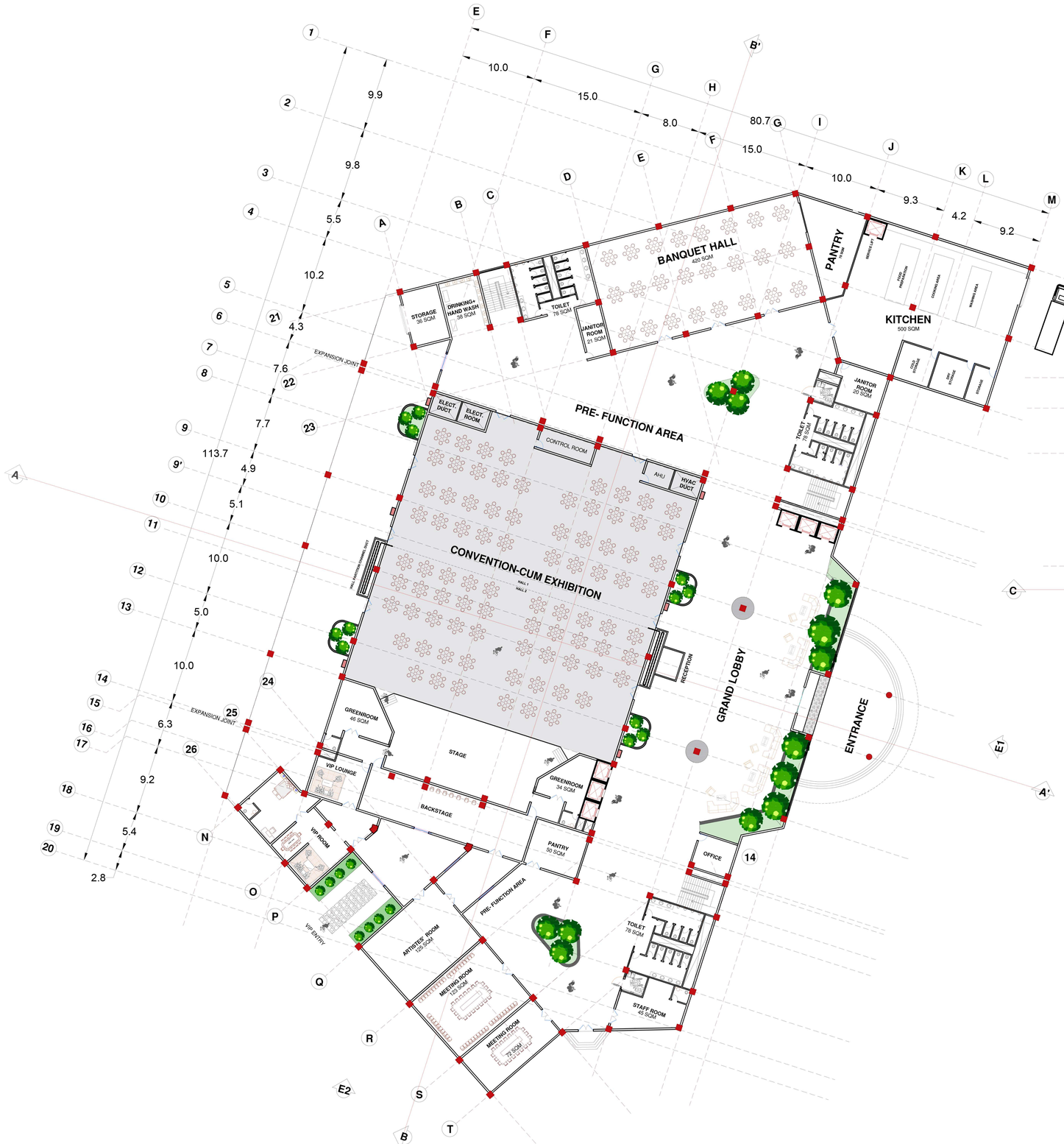



F AND B

ALL DIMENSIONS ARE IN METER

SCALE USED - 1:300

06 ORUGALLU
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GROUND FLOOR PLAN

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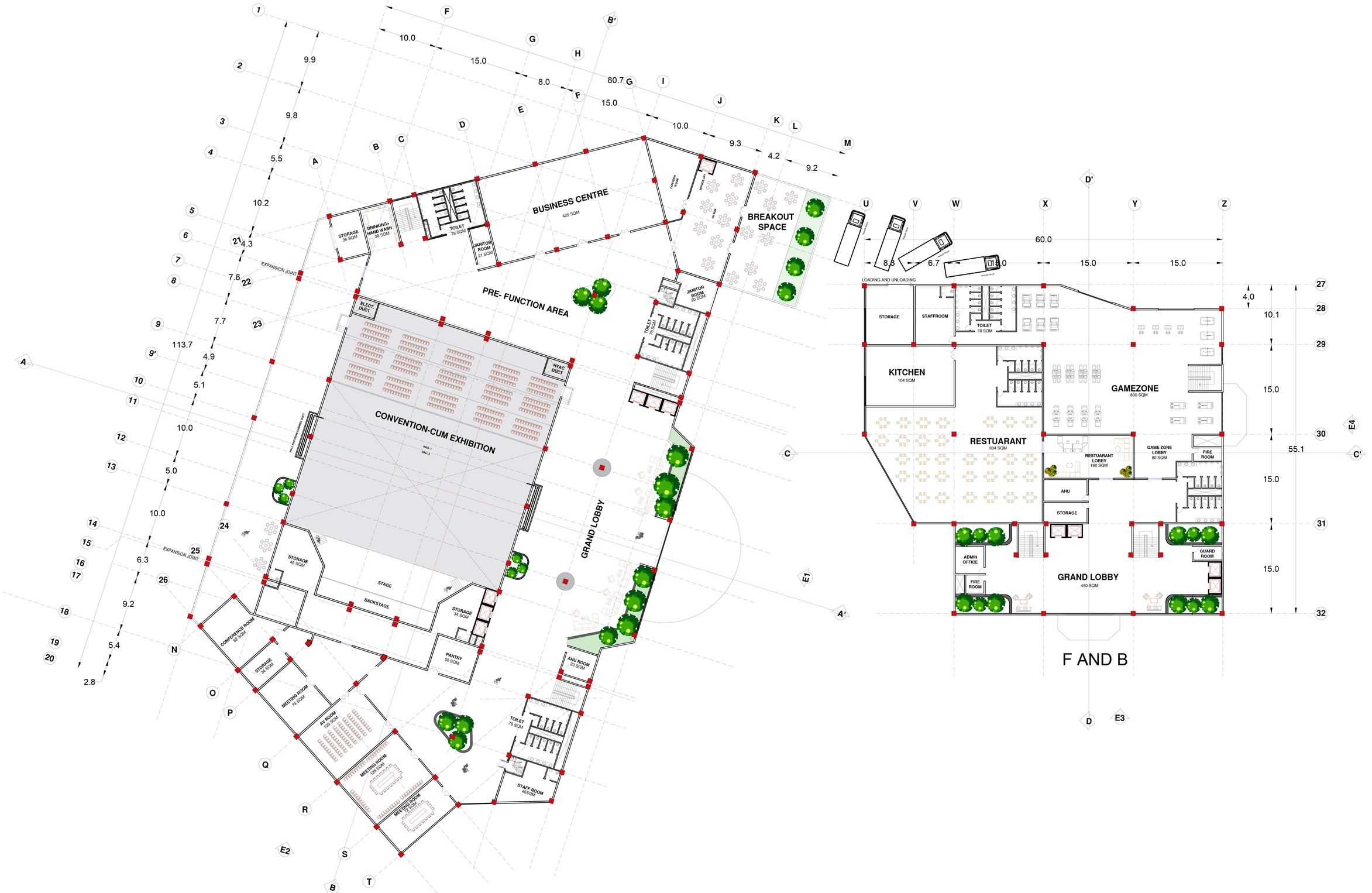

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07 ORUGALLU
INTERNATIONAL CONVENTION CENTRE

FIRST FLOOR PLAN

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08 ORUGALLU
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BASEMENT PARKING

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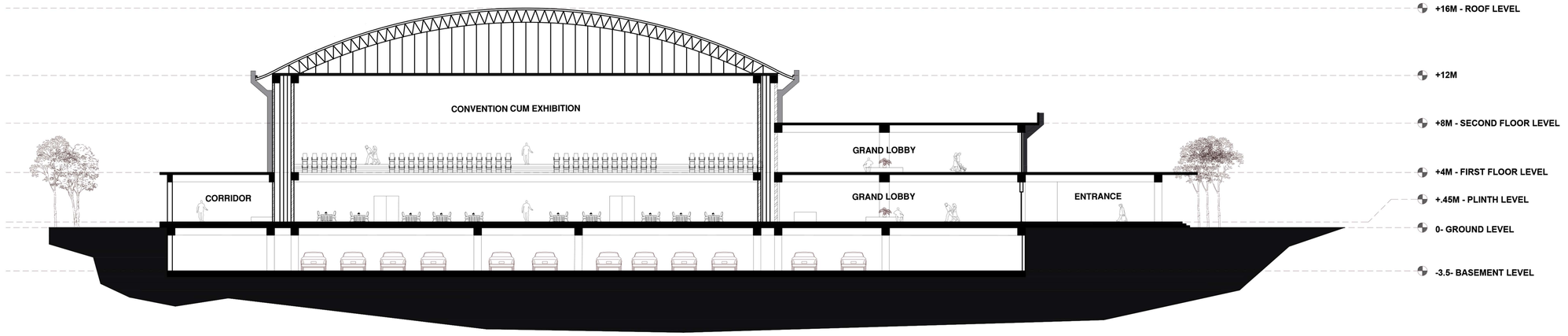

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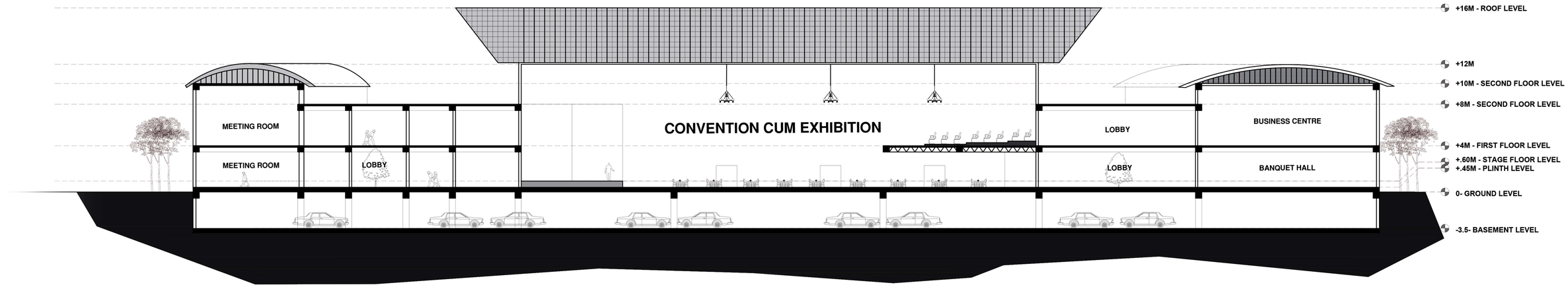

SECTION BB'

ALL DIMENSIONS ARE IN METER

SCALE USED - 1:200

09 ORUGALLU
INTERNATIONAL CONVENTION CENTRE

SECTIONS

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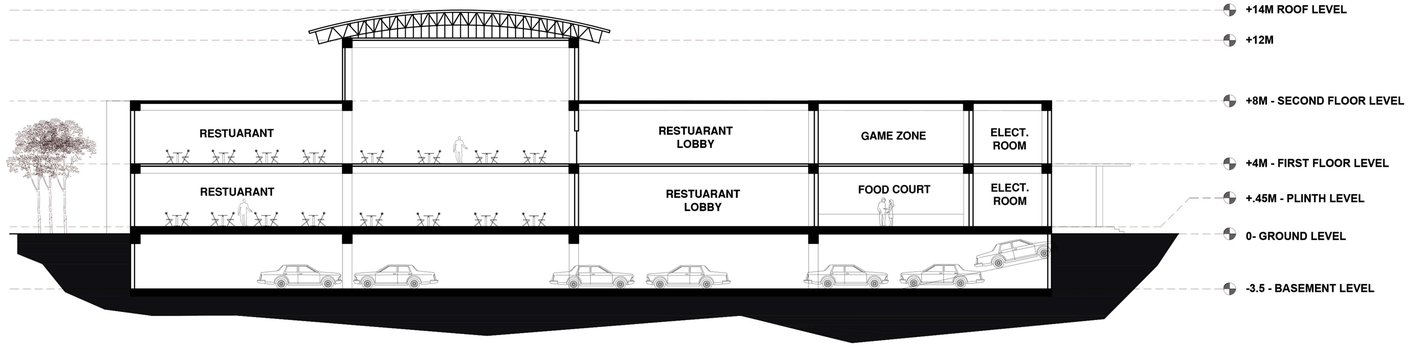

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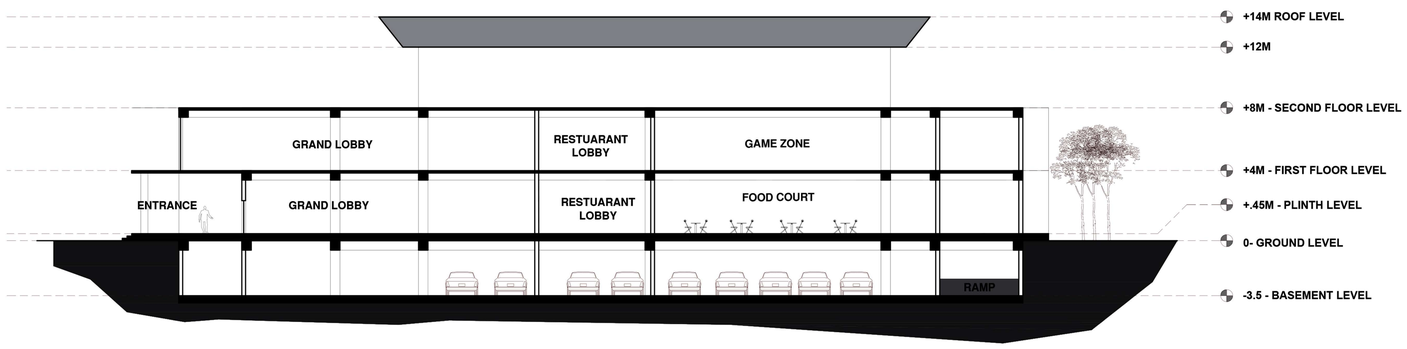

SECTION DD'

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SCALE USED - 1:200

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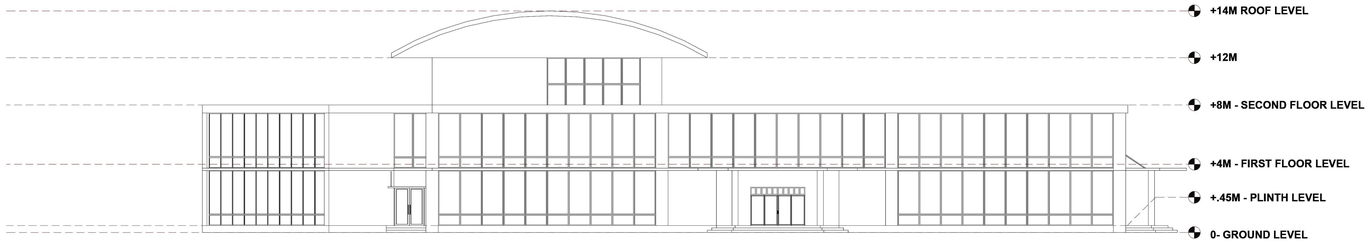
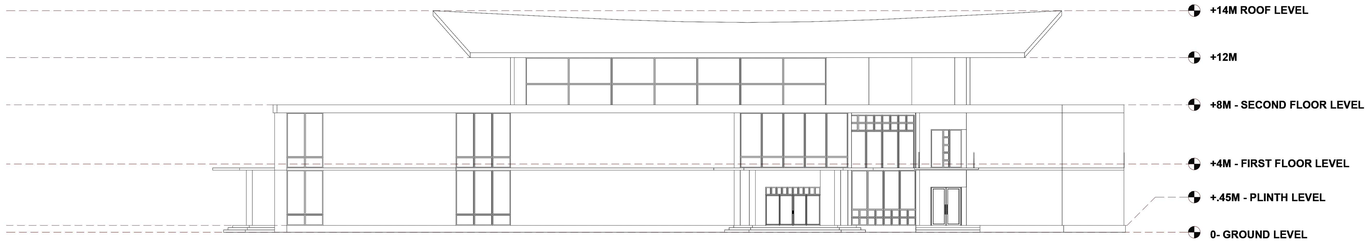


ELEVATION 1



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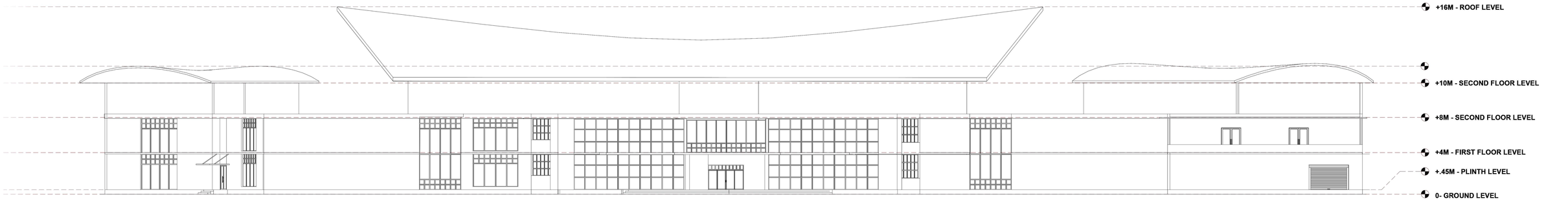
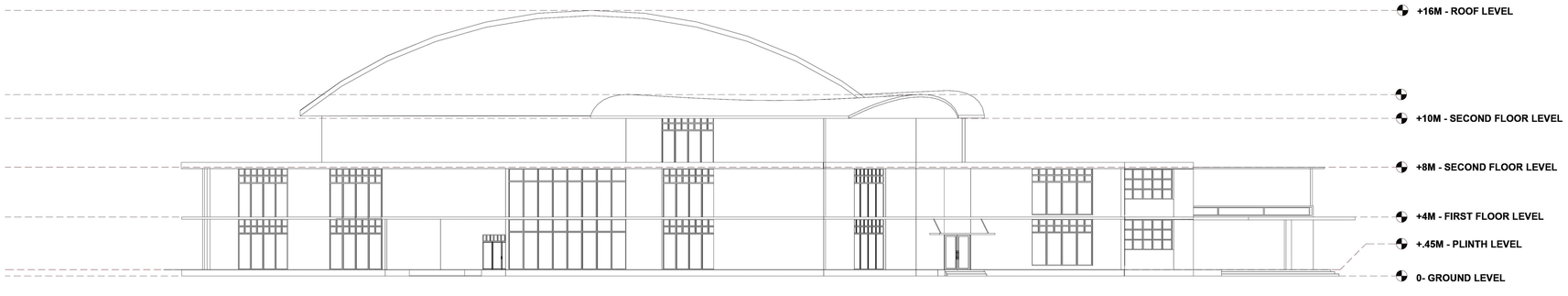


ELEVATION 3



ELEVATION 4

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ELEVATIONS

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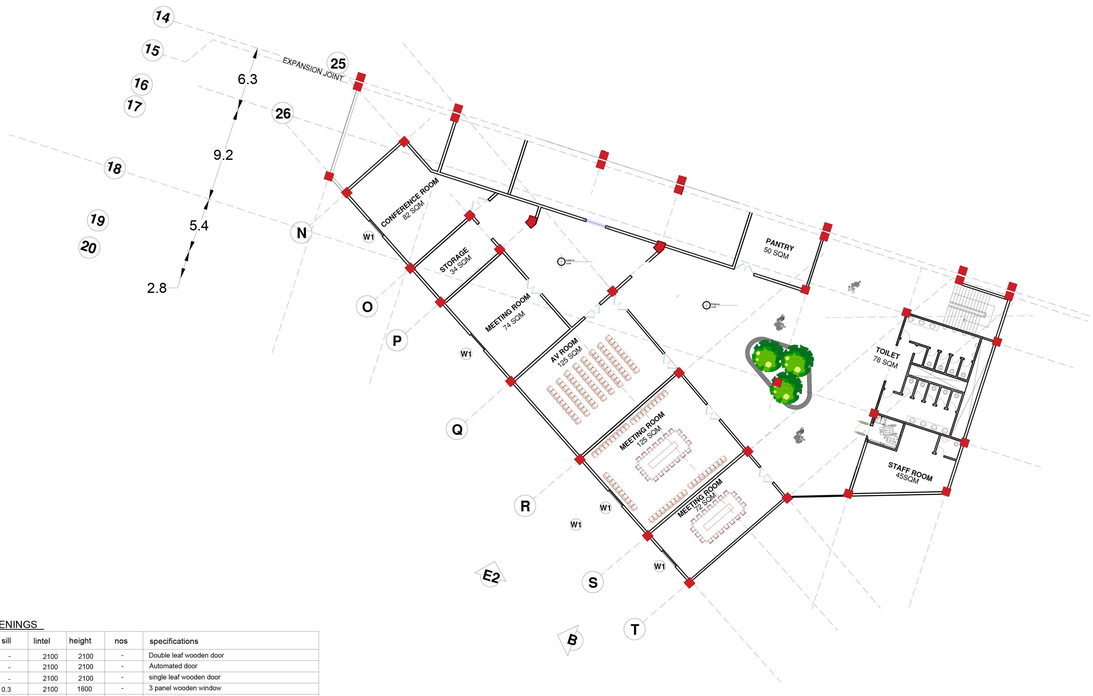
GROUND FLOOR PLAN

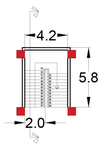


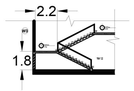
FIRST FLOOR PLAN

SHEDULE OF OPENINGS

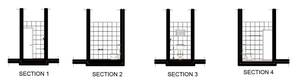
Name	width	sill	lintel	height	nos	specifications
D1	1.5	-	2100	2100	-	Double leaf wooden door
D2	2.3	-	2100	2100	-	Automated door
D3	1	-	2100	2100	-	single leaf wooden door
W1	2	0.3	2100	1800	-	3 panel wooden window
W2	3.8	0.3	2100	1000	-	double leaf window
W3	4	0.3	-	1500	-	3 panel wooden window

STAIRCASE DETAILS





TOILET DETAILS



SCALE USED - 1:300

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WORKING DRAWING

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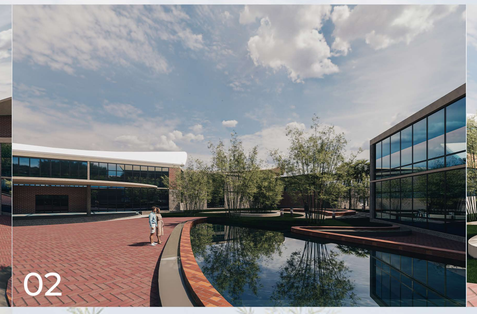
Hardscape











Hardscaping and softscaping work together to create a functional and inviting environment. Hardscaping elements such as pathways, plazas, seating zones, pergolas, and paved drop-off areas provide structure, durability, and smooth circulation for large crowds. Softscaping, including lawns, shaded tree belts, flowering shrubs, and native plantings, adds visual appeal, enhances microclimate comfort, and improves environmental quality. Together, they create a balanced outdoor space that supports usability, aesthetics, and the overall visitor experience.

- Palmyra palm
- Sheena's Gold
- Lantana Camara
- Neem Tree
- Bamboo
- Pongamia

Softscape

Bamboo



lantana camara



Neem tree





Sheena's Gold



Palmyra palm

06

After parking people can use the pedestrian to the convention centre and food and beverage

Common Name	Scientific Name	Plant Type	Typical Height	Approx. Canopy Radius
Palmyra Palm	Borassus flabellifer	Tree	20–30 m	3–5 m
Sheena's Gold	Duranta erecta 'Sheena's Gold'	Shrub	1–2 m	0.5–1 m
Lantana Camara	Lantana camara	Shrub	1–2 m	0.5–1 m
Bamboo	Bambusa vulgaris / Bambusa balcooa	Clumping Bamboo	10–20 m	2–4 m
Neem Tree	Azadirachta indica	Tree	15–20 m	4–6 m
Pongamia	Pongamia pinnata / Millettia pinnata	Tree	12–18 m	3–5 m

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LANDSCAPE

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F AND B

HVAC Calculation for Convention Centre

(Considering area to be sqm or sq ft for all 2 floors)

Ideal BTU	216 BTU / SQ.M for Height more than2.4 ft 1000 BTU is added for every 0.3 M
For extra heating for Ground Floor	377 BTU /SQ.M
First Floor	485 BTU /SQ.M
Second Floor	592 BTU /SQ.M
Extra BTU for each person	600

BTUs for each floor - [Convention Centre]

Floor No.	Area (sq.m)	BTU required	Area x BTU	BTU for People	Extra BTU for ceiling height	Total BTU = (Areax BTU) + BTU for peope + ceiling btu	In Tons (12000 btu = 1 ton)	consideration
G	6662	377	2511574	600,000.00	12000	**3,111,574**	**259.2978333**	**388.94675**
1	4805	485	2330425	600,000.00	24500	**2,930,425**	**244.2020833**	**366.303125**
B1	7407	377	2792439	600,000.00	12000	**3,392,439**	**282.70325**	**424.054875**
Total	18874							1179.30475

BTUs for each floor - [Food And Beverage + Entertainment]

Floor No.	Area (sq.m)	BTU required	Area x BTU	BTU for People	Extra BTU for ceiling height	Total BTU = (Areax BTU) + BTU for peope + ceiling btu	In Tons (12000 btu = 1 ton)	consideration
G	2900	377	1093300	600,000.00	12000	**1,693,300**	**141.1083333**	**211.6625**
1	2900	485	1406500	600,000.00	24500	**2,006,500**	**167.2083333**	**250.8125**
B1	2900	377	1093300	600,000.00	12000	**1,693,300**	**141.1083333**	**211.6625**
Total	8700							674.1375

DIFFUSER SIZE-60CM X 60CM

GAP B/W DIFFUSER- 6 M

- AIR SUPPLY DUCT
- AIR RETURN DUCT
- CHILLED WATER SUPPLY
- CHILLED WATER RETURN
- FCU — FAN COIL UNIT
- AIR SUPPLY DIFFUSER
- AIR RETURN DIFFUSER
- EXHAUST FAN

ALL DIMENSIONS ARE IN METER

SCALE USED - 1:300

15 ORUGALLU
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HVAC LAYOUT

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Seating space provided near to the waterbody.

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3D-VIEWS

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convention centre

Food And Beverages +entertainment

Common Dropoff

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Food And Beverages +entertainment

Car parking

16 **ORUGALLU**
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3D-VIEWS

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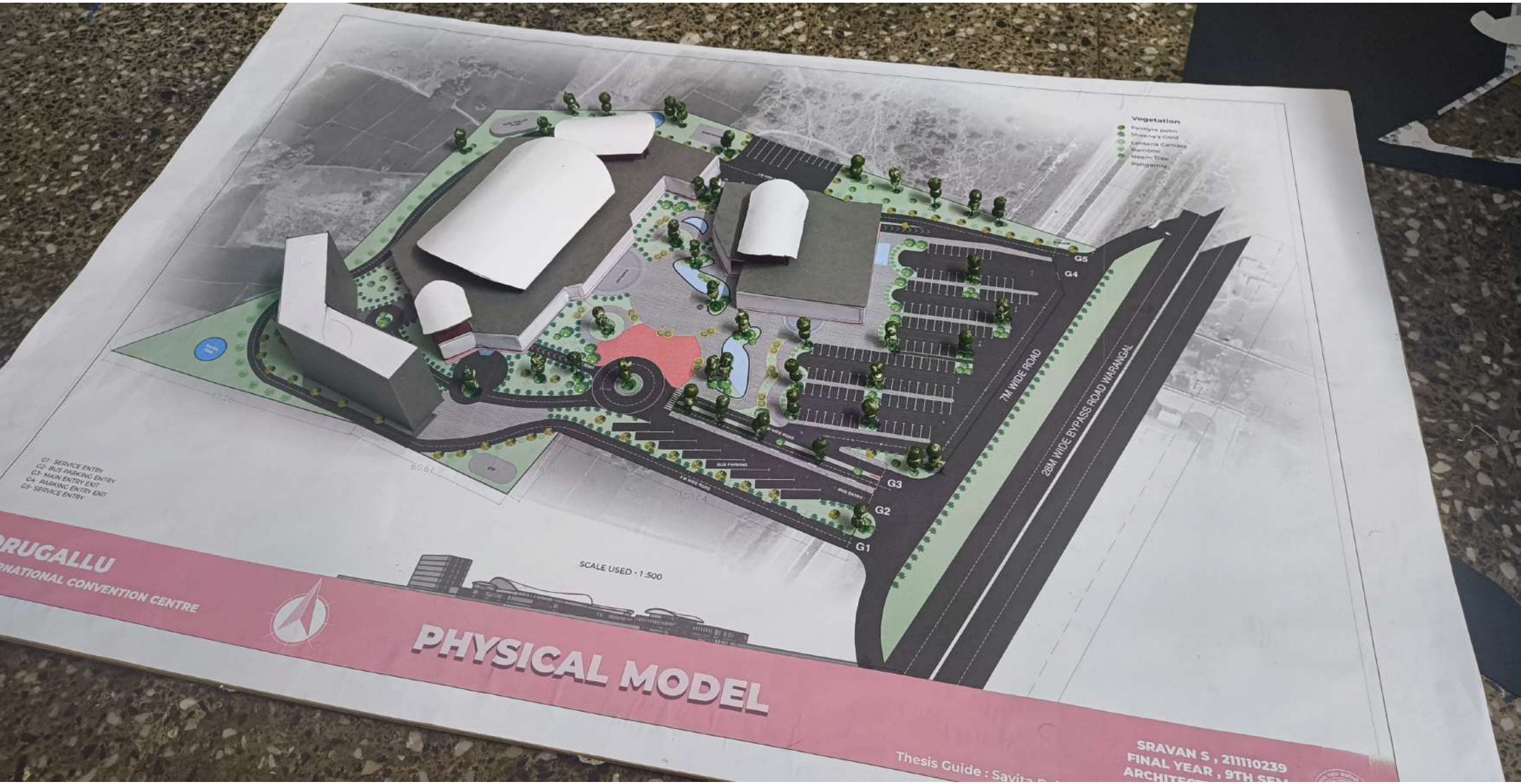
Vegetation
Peltophorum pterocarpum
Syzygium cumini
Lantana Camara
Bamboo
Neem Tree
Pongamia
G1 : SERVICE ENTRY
G2: BUS PARKING ENTRY
G3: MAIN ENTRY EXIT
G4: PARKING ENTRY EXIT
G5: SERVICE ENTRY
G1
G2
G3
G4
G5
7M WIDE ROAD
28M WIDE BYPASS ROAD WARANGAL
BUS PARKING
BUS ENTRY
SCALE USED - 1:500
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