MUHAMMED ARSHAD M

International Convention Centre

Warangal, Telangana, India

Dec, 2025

International Convention Centre

Warangal, Telangana, India

BACHELOR OF ARCHITECTURE

BY

MUHAMMED ARSHAD M

211110027

DEPARTMENT OF ARCHITECTURE AND PLANNING

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL

DEC 2025

ARC 511 – Thesis Project

International Convention Centre

Warangal, Telangana, India

Submitted by:

Muhammed Arshad M
211110027
B. ARCH
9th Semester, 5th Year

UNDER THE GUIDANCE OF

Dr. Charumitra Kapshe

DEPARTMENT OF ARCHITECTURE AND PLANNING

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY

BHOPAL (MP)-462003

© MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL – 2025
ALL RIGHTS RSERVED

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.

Date: 1st – 2nd Dec, 2025

Muhammed Arshad M
211110027

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.

Date: 1st – 2nd Dec, 2025

Dr.Charumitra Kapshe
Thesis Guide

CERTIFICATION OF EXAMINATION

The Bachelor of Architecture Thesis Viva-Voce examination of Mr/Ms Muhammed Arshad M Scholar No.211110027, was held on 1/12/2025 to 2/12/25.

Dr. Nakul Dhagat
Head of Department

Dr. Vicky Lalramsangi
Thesis Coordinator

ABSTRACT

The International Convention Centre at Warangal is envisioned as a landmark facility that caters to the growing demand for large-scale conferences, exhibitions, cultural events, and business gatherings in the region. Situated in proximity to the Madikonda industrial and growth corridor, the project aims to integrate Warangal's rich cultural heritage with its emerging role as a hub for trade and industry. The design emphasizes functionality, modernity, and sustainability, incorporating multipurpose convention halls, banquet facilities, 3 star hotel, business centres, and supporting infrastructres such as F & B. Special focus is given to efficient circulation, acoustics, energy optimization, and contextual sensitivity, ensuring the complex serves both local communities and global participants. By blending modern contemperory architectural practices with energy efficent building design strategies, the centre aspires to become a regional landmark that strengthens Warangal's identity as a destination for international conventions and cultural exchange.

ACKNOWLEDGMENT

First and foremost, I wish to acknowledge with gratitude my indebtedness to like to the following individuals who have played a significant role in the completion of this architectural thesis report. I am deeply thankful to Dr Charumitra Kapshe, my thesis guide, for her unwavering support, guidance, and invaluable insights throughout this journey. Her mentorship and expertise were instrumental in shaping the outcome of this thesis. I extend my thanks to the faculties including Dr. Nakul Dhagat (\HOD), Thesis Coordinator Ar. Vicky Lalramsangi, Dr. Bulbul Shukla and PHD Scholars of Department of Architecture Maulana Azad National Institute of Technology, who provided me with a conducive academic environment and resources that allowed me to pursue this research. I would like to acknowledge my fellow students, colleagues, Seniors, Juniors and project collaborators who have shared their knowledge, ideas, and experiences. The discussions and interactions with them have enriched my understanding and perspective on architecture. My heartfelt gratitude goes to my family for their unconditional love, encouragement, and support. Their belief in my abilities has been a constant source of motivation. I am also grateful to my friends for their understanding, patience, and the occasional distraction from the demands of this thesis. I would like to acknowledge the individuals who participated in interviews, surveys, and research studies, without whom the empirical data and insights in this thesis would not have been possible. I am appreciative of the broader architectural community, which continues to inspire me with innovative design ideas and a commitment to the built environment.

Muhammed Arshad M

TABLE OF CONTENTS

..... i
CANDIDATE DECLARATION iii
ABSTRACT iv
ACKNOWLEDGMENT v
LIST OF FIGURES xii
LIST OF TABLES xvi
CHAPTER 1 1
DESIGN BRIEF 1
1.1 OVERVIEW 1
1.2 Aim 1
1.3 Objective 1
1.4 Proposing Agency 1
1.5 Details of Spaces 1
1.5 Site Details 2
1.6 Location 2
1.7 Proximity 3
1.8 Site Surrounding 3
1.9 Landmark 3
1.10 Proposed land use Zone 4
1.11 Development Parameters 4
1.12 Parking details 5
1.13 Project Cost Estimate 5
1.14 Site Layout 6
1.15 Site Plan 6
1.16 Area statement 7
CHAPTER 2 13
LITERATURE SURVEY 13
2.1 Introduction 13
2.2 Historical Overview 13
2.3 Strategic Importance for Warangal 13
2.4 Distinctive Architectural Monuments & Features 14
2.5 Traditional Building Materials, Techniques & Environmental Adaptations 14
2.6 Prevailing Arts & Craft 15

2.6.1 Warangal Dhurries: 15
2.6.2 Nirmal Paintings: 15
2.7 Convention Centre 15
2.7.1 Key Features of a Convention Centre: 15
2.8 Convention centre hotel 16
2.9 Types of Convention Centres 16
2.10 Importance of Convention Centre 17
2.11 Evolution and history of convention centre 17
2.12 Guidelines for Approval of Convention Centres by Government of India 18
2.13 Local Byelaws of Warangal 20
2.14 URDPFI 23
2.15 Standards- Neufert 23
2.15.1 Escalators 23
2.15.2 Kitchen 24
2.15.3 Dinning 24
2.15.4 Hotel 25
2.15.5 Parking 26
2.15.6 Acoustics 27
2.16 NBC 29
2.16.2 3-Star Hotel Design Requirements 29
2.16.3 Shared Infrastructure Guidelines 30
2.16.4 Lifts 31
2.16.5 Escalators 32
2.16.6 Emergency Power Backup System 34
2.16.7 HVAC 36
2.16.8 Lighting 38
2.16.9 Water Requirements 40
2.16.10 Water Requirements for Fire safety 40
2.16.11 Occupancy load 41
2.16.12 No. of Fixtures required 41
2.16.13 Street Furniture 43
2.17 Retractable chair 45
2.17.2 Shapes of Auditoriums 46
CHAPTER 3 47
SITE INVENTORY 47
3.1 Site Details 47

3.2 Connectivity 47
3.3 Accesibility 48
3.4 Site Dimensions 49
3.5 Site plan 49
3.6 Existing Land Use 50
3.7 Utilities & Infrastructure 50
3.7.1 Electricity 50
3.7.2 Drainage 51
3.7.3 Water Supply 51
3.8 Site Surroundings 51
3.9 Noices towards the site 53
3.10 Street view 54
3.11 Typography 54
3.12 Vegetation 56
3.13 Soil Type 56
3.13.1 Type of Foundation can be Used: 56
3.13.2 Pile Foundation 56
3.14 Views from Site 57
3.15 Climatic Data's: 58
3.15.1 Climate 58
3.15.2 Average Temperature in Warangal 58
3.15.3 Average Hourly Temperature in Warangal 59
3.15.4 Cloud 59
3.15.5 Precipitation 60
3.15.6 Solar analysis 61
3.15.7 Rainfall 61
3.15.8 Humidity 62
3.15.9 Wind 62
3.15.10 Wind Direction in Warangal 63
3.15.11 Mahoney's Table 63
3.16 SWOT Analysis 64
3.17 Inferences 66
CHAPTER 4 67
CASE STUDIES AND DESK APPRAISAL 67
CASE STUDY 67
4.1 BASE ELEVEN CONVENTION CENTRE, KOTTAYAM 67

4.1.1 Introduction 67
4.1.2 Site Plan 68
4.1.3 Context & Surroundings 68
4.1.4 Access & Approach 69
4.1.5 Site Topography & Ecology 69
4.1.6 Architectural Style (Context) 70
4.1.7 Spatial Planning 70
4.1.8 Form & Languages 70
4.1.9 Circulation 71
4.1.10 Building Features & Facilities 72
4.1.11 Architectural Details 77
4.1.12 Interiors: 77
4.1.13 Landscape Design 78
4.1.14 Design Concept 78
4.1.15 Materials Used 79
4.1.16 Construction Techniques 80
4.1.17 Building Services & Engineering Innovations 80
4.1.18 Sustainability 81
4.1.19 Inferences 81
4.2 LULU BOLGATTY INTERNATIONAL CONVENTION CENTRE 83
4.2.1 Introduction 83
4.2.2 Site Plan 84
4.2.3 Context & Surroundings 84
4.2.4 Access and Approach 85
4.2.5 Site Topography & Ecology 85
4.2.6 Architectural Style (Contextual) 85
4.2.7 Form & Language 86
4.2.8 Spatial Planning 86
4.2.9 Circulation 86
4.2.10 Building Features 87
4.2.11 Facilities 87
4.2.12 Architectural Details 97
4.2.13 Design Concept 97
4.2.14 Construction Techniques 97
4.2.15 Landscape Design 97
4.2.16 Materials Used 98

4.2.17 Engineering Innovations 98
4.2.18 Building Services 98
4.2.19 Sustainability 101
4.2.20 Inferences 102
DESK APPRAISAL 103
4.3 CAPITAL INTERNATIONAL EXHIBITION AND CONVENTION CENTRE 103
4.3.1 Introduction 103
4.3.2 Site Plan 104
4.3.3 Context and Surrounding 104
4.3.4 Access and approach 104
4.3.5 Architectural Style 105
4.3.6 Form & Languages 105
4.3.7 Circulation 106
4.3.8 Building Features 106
4.3.9 Facilities 106
4.3.10 Architectural details 107
4.3.11 Design Concept 109
4.3.12 Construction Techniques and Materials 109
4.3.13 Sustainability 110
4.3.14 Inferences 110
4.4 BHARAT MANDAPAM 111
4.4.1 Introduction 111
4.4.2 Site Plan 112
4.4.3 Context and Surrounding 112
4.4.4 Access and approach 112
4.4.5 Architectural Style (Context) 113
4.4.6 Facilities 113
4.4.7 Architectural details 119
4.4.8 Design Concept 121
4.4.9 Sustainability 121
4.4.10 Inferences 121
4.5 Comparative Analysis 122
REFERENCES 124
CHAPTER 5 125
DESIGN PROPOSAL 125
5.1 CONCEPT 125

5.1.1 Design Evolution 125
5.1.2 Form & Massing Inspired by the Leaf 125
5.1.3 Material Influence 126
5.1.4 Area Utlisation 127
5.1.5 Zoning 127
5.1.6 Form Development 128
5.2 DESIGN DRAWINGS 128

LIST OF FIGURES

Figure 1 Site details.....**Error! Bookmark not defined.**
Figure 2 Site locationFigure 3 Site details .....**Error! Bookmark not defined.**
Figure 4 Site location 2
Figure 5 ProximityFigure 6 Site location.....**Error! Bookmark not defined.**
Figure 7 Proximity 3
Figure 8 Site surroundingFigure 9 Proximity.....**Error! Bookmark not defined.**
Figure 10 Site surrounding..... 3
Figure 11 Parking normsFigure 12 Site surrounding .....**Error! Bookmark not defined.**
Figure 13 Land Zoning..... 4
Figure 14 Parking norms..... 5
Figure 15 Site layout..... 6
Figure 16 Site marking..... 6
Figure 17 Tender document .....**Error! Bookmark not defined.**
Figure 18 Convention centre area statement..... 8
Figure 19 Entertainment, F&B area statement..... 12
Figure 20 Banquet hall area statement..... 12
Figure 21 F.A.R..... 20
Figure 22 MOS and Ground Coverage 20
Figure 23 Parking..... 21
Figure 24 Electrical lines..... 21
Figure 25 Central couryard 21
Figure 26 F.A.R..... 22
Figure 27 Requirments for High rise buildings..... 22
Figure 28 Abutting road width..... 22
Figure 29 Escalator 23
Figure 30 kitchen functions..... 24
Figure 31 Seating layout 24
Figure 32 Hotel room layout..... 25
Figure 33 Area Programes in hotel 26
Figure 34 Parking..... 26
Figure 35 Acousticaly advantage seating..... 27
Figure 36 Disabled parking..... 27
Figure 37 Parking in angles..... 27
Figure 38 Acousticaly advantage shapes 28
Figure 39 Passenger and service lift..... 31
Figure 40 Passenger and service lift dimentions..... 31
Figure 41 Fire-fighting Lifts layout 32
Figure 42 Escalator section view 33
Figure 43 Types of escalators..... 34
Figure 44 Transformer layout 34
Figure 45 Substation layout..... 35
Figure 46 HVAC layout..... 36

Figure 47 Plant room 37
Figure 48 AHU unit 37
Figure 49 Water requirments 40
Figure 50 Water requirement for fire fightning 40
Figure 51 Occupancy load 41
Figure 52 Convention hall Fixtures details 41
Figure 53 Restaurants Fixtures details 42
Figure 54 Hotels Fixtures details 42
Figure 55 Retractable chair section 45
Figure 56 Auditorium shapes 46
Figure 57 Banquet hall layout 46
Figure 58 Site visit 47
Figure 59 Site location 48
Figure 60 Site accessibility 48
Figure 61 Site plan with Dimensions 49
Figure 62 Existing land use 50
Figure 63 Electricity line 50
Figure 64 Drainage 51
Figure 65 Daramsagar canal 51
Figure 66 Adjacent site landmarks 52
Figure 67 Agricultural land on south side of site 52
Figure 68 NH road in front of the site 52
Figure 69 Textile park 52
Figure 70 IT park under construction 53
Figure 71 Agricultural land on north side of site 53
Figure 72 Surrounding noise 53
Figure 73 Road section 54
Figure 74 Road View 54
Figure 75 Topography 54
Figure 76 Slope analysis 55
Figure 77 Contour 55
Figure 78 Soil 56
Figure 79 Site views 57
Figure 80 Views from the site 57
Figure 81 Average temperature 58
Figure 82 1.33.13 Average Hourly Temperature 59
Figure 83 Cloud 60
Figure 84 Precipitation 60
Figure 85 Sun path diagram of Warangal 61
Figure 86 Rainfall 61
Figure 87 Humidity 62
Figure 88 Wind 62
Figure 89 Wind direction 63
Figure 90 Mahoney’s table 64
Figure 91 Base 11 convention Centre 67
Figure 92 Site plan 68
Figure 93 Site surroundings 68
Figure 94 Main entrance 69
Figure 95 Site top view 69

Figure 96 Heritage home 70
Figure 97 Building form 71
Figure 98 Drop off area 71
Figure 99 Varandha 71
Figure 100 Lift 72
Figure 101 Hall 3 73
Figure 102 Hall 2 73
Figure 103 Hall 1 73
Figure 104 Administration office 74
Figure 105 Banquet hall 74
Figure 106 Courtyard 74
Figure 107 VIP Lounge 75
Figure 108 Toilet 75
Figure 109 Pavilion 75
Figure 110 Heritage house 76
Figure 111 Parking view 76
Figure 112 Plan 77
Figure 113 Interior hall 1 77
Figure 114 Lobby view 78
Figure 115 Landscaped design 78
Figure 116 Concept 79
Figure 117 Carpet 79
Figure 118 Ceiling & wall panels 80
Figure 119 Diesel generators 80
Figure 120 Service room 81
Figure 121 Fire Hose 81
Figure 122 Fabric ceiling 81
Figure 123 Lulu international convention centre 83
Figure 124 Site plan 84
Figure 125 Site surroundings 84
Figure 126 Site topography 85
Figure 127 Lulu bolgatty international convention centre 86
Figure 128 Hall LIWA 87
Figure 129 Vembanad ballroom 88
Figure 130 Grand ballroom 88
Figure 131 Floor plan- GF 89
Figure 132 Floor plan- FF 89
Figure 133 Seating Capacity 90
Figure 134 Colony restaurant 90
Figure 135 Colony bar 91
Figure 136 Malabar cafe 91
Figure 137 Thai restaurant 92
Figure 138 Lawn 92
Figure 139 Indoor pool 93
Figure 140 Outdoor pool 93
Figure 141 Surface parking 93
Figure 142 Basement parking 94
Figure 143 Rooms 94
Figure 144 Villa room 95

Figure 145 Spa 96
Figure 146 Water boat 96
Figure 147 Gym 96
Figure 148 Landscape 97
Figure 149 HVAC room 98
Figure 150 Electrical room 99
Figure 151 Fire room 99
Figure 152 Storage capacities 100
Figure 153 water tank chart 100
Figure 154 Gas yard 101
Figure 155 Diesel yard 101
Figure 156 Capital International Exhibition and Convention Centre 103
Figure 157 Site plan 104
Figure 158 Architectural style 105
Figure 159 Form 105
Figure 160 Building features 106
Figure 161 Plan 107
Figure 162 Sections 107
Figure 163 Elevations 107
Figure 164 First Floor plan 108
Figure 165 Second Floor plan 108
Figure 166 Ground Floor plan 108
Figure 167 Sections 108
Figure 168 Elevations 108
Figure 169 Third floor 108
Figure 170 Building materials used 109
Figure 171 Facade materials 109
Figure 172 Bharat Mandapam 111
Figure 173 Site plan 112
Figure 174 Site context 113
Figure 175 Plenary hall 114
Figure 176 Multi purpose hall 114
Figure 177 Summit room 115
Figure 178 Leaders lounge 115
Figure 179 Auditorium 1 116
Figure 180 Auditorium 2 116
Figure 181 Amphitheatre 117
Figure 182 Meeting room 117
Figure 183 Meeting room 118
Figure 184 Meeting room 118
Figure 185 Premium meeting room 119
Figure 186 Floor plan - GF 119
Figure 187 Floor plan - FF 120
Figure 188 Floor plan - SF 120

LIST OF TABLES

Table 1 Details of spaces 2
Table 2 Development parameters 4
Table 3 Parking details 5
Table 4 Site details 47
Table 5 Proximity 48
Table 6 Base 11 introduction 67
Table 7 LULU ICC Introduction 83
Table 8 CIECC Introduction 103
Table 9 Barath mandapam Introduction 111
Table 10 Case study comparitive analysis 123

CHAPTER 1

DESIGN BRIEF

1.1 OVERVIEW

The Telangana State Industrial Infrastructure Corporation Limited (hereinafter referred to as the 'Authority') under its core objective of providing integrated industrial infrastructure development for the state of Telangana, 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 (hereinafter referred to as the 'Project') on approximately 10 acres (40,468 sq.m.) of land (hereinafter referred to as the 'Project Site') located at Madikonda, Warangal, Telangana, India, on PPP mode.

1.2 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.

1.3 Objective

- **To analyse 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.

1.4 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.

1.5 Details of Spaces

No.	Description	Area in sq.ft	Area in sq.m
A	**Convention Centre cum Exhibition Centre(2500 Pax)**	**50,000**	**4645.1**
I	Convention Centre	30,000	2787

II	Small Meeting Room	2,000	185.8
III	Large Meeting Room	5,000	464.5
IV	Bussiness Centre	5,000	464.5
V	Pre-function and Circulation Spaces	8,000	743.2
B	**Business Hotel(150 Keys)**	**150,000**	**13935.4**
C	**Entertainment and F&B**	**50,000**	**4646.1**
	Total	**250,000**	**23225.7**
D	**Parking**	As per GO 168	Surface parking

Table 1 Details of spaces

1.5 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

Figure 1 Site details

1.6 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. Latitude: 17.957690 Longitude: 79.447151 E

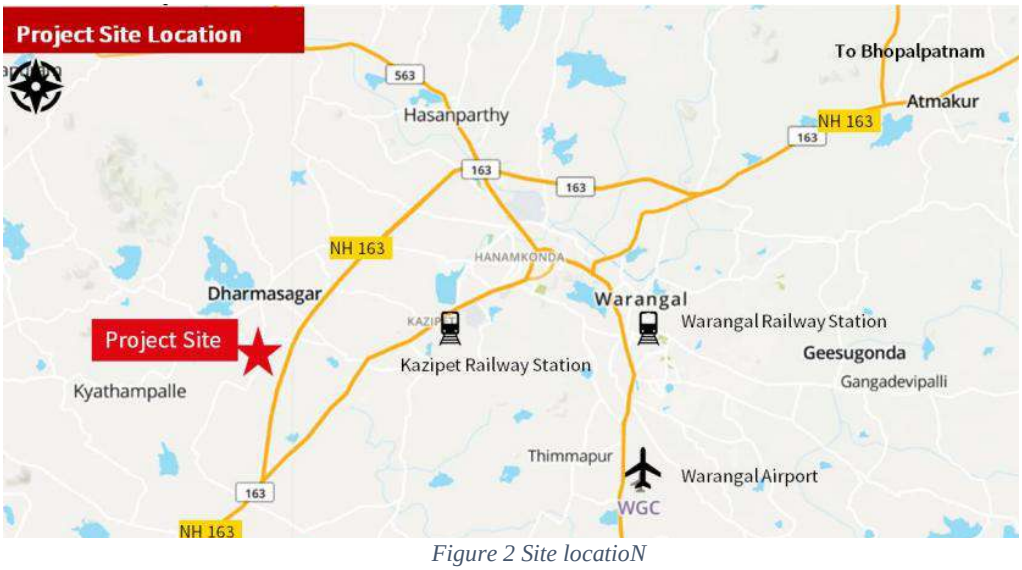


Figure 2 Site locatioN

1.7 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

Figure 3 Proximity

1.8 Site Surrounding

The East side of the site is with large area of Textile Park and having NH 163 Infront of site for access towars 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 4 Site surrounding

1.9 Landmark

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



1.10 Proposed land use Zone

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

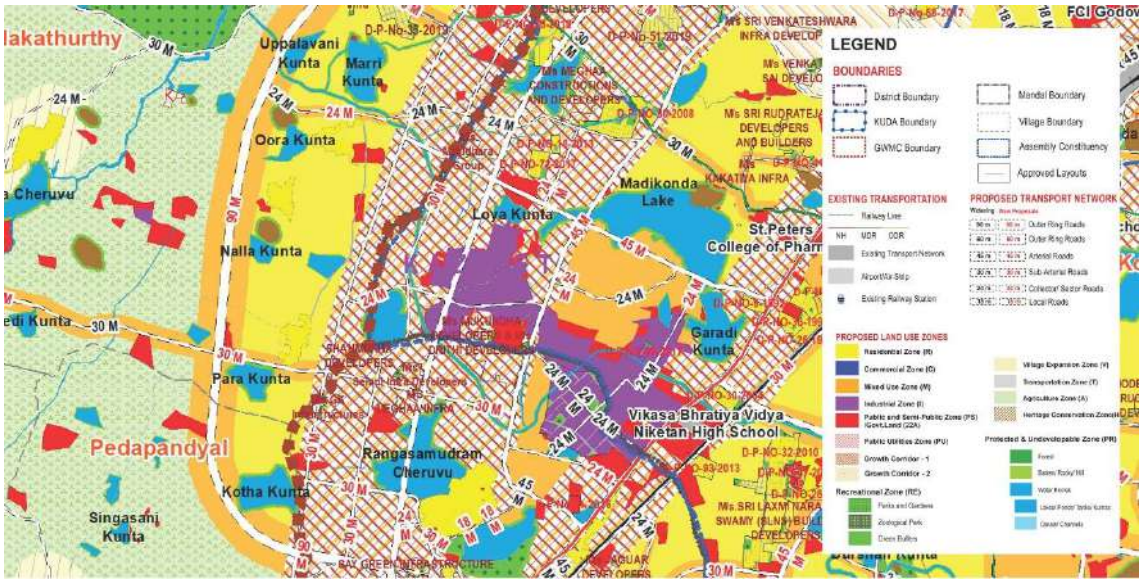


Figure 5 Land Zoning

1.11 Development Parameters

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

Table 2 Development parameters

1.12 Parking details

As per URDPFI Guidlines

Category	Build up Area	2.0 ECS Per 100 Sq.m	Total ECS Required
Convention Center	50,000 Sq.ft	2.0 ECS/100 sq,m	93
Hotel	150,000 Sq.ft	2.0 ECS/100 sq,m	279
Entertainment and F&B	50,000 Sq.ft	2.0 ECS/100 sq,m	93
Banquet halll	33000 Sq.ft	2.0 ECS/100 sq,m	61
Total	283,000 Sq.ft	2.0 ECS/100 sq,m	**526**

Table 3 Parking details

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

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
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 6 Parking norms

1.13 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

1.14 Site Layout

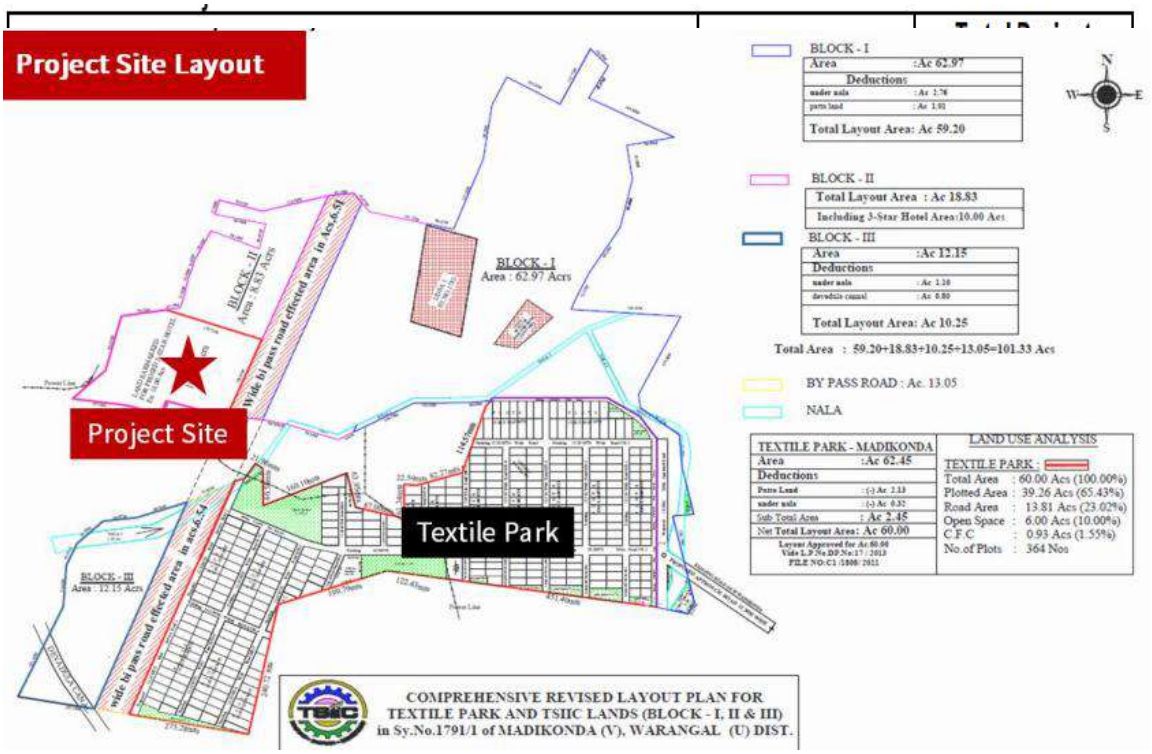


Figure 7 Site layout

1.15 Site Plan

Latitude: 17.957690 N Longitude: 79.447151 E



Figure 8 Site marking

1.16 Area statement

Sl. No.	Description	Area in sq.ft	Area in sq.m
A	**Convention Centre cum Exhibition Centre(2500 Pax)**	**50,000**	**4646.1**
I	Convention Centre	30,000	2787
II	Small Meeting Room	2,000	185.8
III	Large Meeting Room	5,000	464.5
IV	Bussiness Centre	5,000	464.5
V	Pre-function and Circulation Spaces	8,000	743.2
B	**Business Hotel(150 Keys)**	**1,50,000**	**13935.4**
C	**Entertainment and F&B**	**50,000**	**4646.1**
	Total	**2,50,000**	**23225.7**
D	**Parking**	As per GO 168	Surface parking

Table 4 parking area statement

OCCUPANCY LOAD		
ASSEMBLY BUILDINGS		
1	Concentrated use witout fixed seating	0.65 m2 / person
2	Less concentrated use witout fixed seating	1.40 m2 / person
3	Fixed seating(mounted seating)	amount of seat X 1.2
4	Dinning, Restuarants	1.80 m2 / person

Sl. No.	Description	Buildup Area in sq.m	G.C (SQ.M)	G.C in %
A	**Convention Centre (2500 Pax)**	**22878.3**	**4893.8**	**12**
B	**Business Hotel(150 Keys)**	**13935.4**	**1783**	**4.4**
C	Entertainment and F&B	**8544.6**	**2848.2**	7
	Total	**45358.3**	**9525**	**23.4**

Sl. No.	Description	Details
1	SITE AREA	10 ACRE (40468.5 SQ.M)
2	TOTAL BUILDUP AREA	80937 SQ.M
3	F. A. R	2
4	G.C	**23.5**

Sl. No.	Category	Build up Area(SQ.M)	ECS Per 100 Sq.m	Total ECS Required
A	Convention Center	**22878.3**	2.0 ECS/100 sq.m	457
B	Hotel	**13935.4**	2.0 ECS/100 sq.m	279
C	Entertainment and F&B	**8544.6**	2.0 ECS/100 sq.m	170

Convention Centre cum Exhibition Centre (2500 Pax) – 22878.3 sq.m				
GROUND FLOOR (4893.8 SQ.M)				
Sl. No.	**Space**	**No. of Units**	**Area (sq.m)**	**REMARK**
1	FRESKING AREA		**49**	
2	LOBBY		811	
3	CCTV ROOM		48	
4	ADMINISTRATION OFFICE		87	
5	LOUNGE		86	
6	CLOCK ROOM		68	
7	MEDICAL ROOM		25	
8	ATM		25	
9	RECEPTION		34	
10	MEETING ROOM 1		71	
11	MEETING ROOM 2		27	
12	MEETING ROOM 3		32	
13	MEETING ROOM 4		90	
14	MEETING ROOM 5		139	
15	TRAINING ROOM		139	
16	WAITING AREA		293	
17	PANTRY		179	
18	RESTING AREA		267	
19	AUDITORIUM		388	
	GREEN ROOM		12	
	ARTIST LOUNGE		12	
	BACK STAGE		24	
	STAGE		44	
	SEATING		269	
20	FURNITURE STORAGE		192	
21	STAFF OFFICE		14	
22	AHU ROOM		14	
23	FIRE EXIT	6 (EACH 35 SQ.M)	210	
	FIRE STAIRCASE	6 (EACH 33.5 SQ.M)	33.5	
	FIRE LIFT	6 (EACH 1.5 SQ.M)	9	
24	SERVICE LIFT	2 (EACH 5.5 SQ.M)	11	
25	PASSANGER LIFT	8 (EACH 5.5 SQ.M)	44	
26	ESCALATORS	4	41	
27	CORRIDORS		1598.4	
28	TOILETS		151	
	MALE TOILET	4 (EACH 14 SQ.M)	56	1 WC/ 250 P, 1 URINAL / 25 P, 1 WASH BASIN / 200 P
	FEMALE TOILET	4 (EACH 15 SQ.M)	60	2 WC/ 100 P, 1 WASH BASIN / 200 P
	DISABLED TOILET	2 (EACH 3 SQ.M)	6	
	JANITOR ROOM	2 (EACH 3 SQ.M)	6	
	HAND WASH AREA	4 (EACH 15 6 Q.M)	62.4	
29	DRINKING WATER AREA	2 (EACH 11.5 SQ.M)	23	
FIRST FLOOR (4893.8 SQ.M)				
Sl. No.	**Space**	**No. of Units**	**Area (sq.m)**	**REMARK**
1	FRESKING AREA		**49**	
	LOBBY		811	
2	CLOCK ROOM		68	
3	VIP LOUNGE		86	
4	BUSSINESS LOUNGE		89	
5	ORGANISOR OFFICE		47	
6	CAFÉ		25	
7	SECURITY ROOM		25	
8	BUSSINESS CENTRE		631.2	
9	RESTAURANT		469.2	
	DINNING		341.5	
	OPEN BAR		37	
	COLD STORAGE		17.2	
	STORAGE		15.6	

Figure 9 Convention centre area statement

	KITCHEN		46.8	
10	AUDITORIUM			
	SEATING		100.7	
	CONTROL ROOM		10	
11	MALE STAFF ROOM		12	
12	FEMALE STAFF ROOM		12	
13	FURNITURE STORAGE		192	
14	STAFF OFFICE		14	
15	AHU ROOM		14	
16	FIRE EXIT	6 (EACH 35 SQ.M)	210	
	FIRE STAIRCASE	6 (EACH 33.5 SQ.M)	33.5	
	FIRE LIFT	6 (EACH 1.5 SQ.M)	9	
17	SERVICE LIFT	2 (EACH 5.5 SQ.M)	11	
18	PASSANGER LIFT	8 (EACH 5.5 SQ.M)	44	
19	ESCALATORS	4	41	
20	CORRIDORS		1598.4	
21	TOILETS			
	MALE TOILET	4 (EACH 14 SQ.M)	56	1 WC/ 250 P, 1 URINAL / 25 P, 1 WASH BASIN / 200 P
	FEMALE TOILET	4 (EACH 15 SQ.M)	60	2 WC/ 100 P, 1 WASH BASIN / 200 P
	DISABLED TOILET	2 (EACH 3 SQ.M)	6	
	JANITOR ROOM	2 (EACH 3 SQ.M)	6	
	HAND WASH AREA	4 (EACH 15 6 Q.M)	62.4	
22	DRINKING WATER AREA	2 (EACH 11.5 SQ.M)	23	
	SECOND FLOOR (4893.8 SQ.M)			
Sl. No.	**Space**	**No. of Units**	**Area (sq.m)**	**REMARK**
1	LOBBY		811	
2	VIP LOUNGE		145.9	
3	PUBLIC LOUNGE		195.7	
4	CAFÉ		25	
5	SECURITY ROOM		25	
6	BANQUET HALL		631.2	
7	OPEN DINNING		469	
8	KITCHEN			
	OFFICE		12	
	STAFFROOM		12	
	COLD STORAGE		126.8	
	STORAGE		42.2	
	COOKING AREA		148.5	
	POT STORE		6.9	
	POT WASHING		17.1	
	TROLLEY		6.3	
9	FURNITURE STORAGE		192	
10	AHU ROOM		14	
11	STAFF OFFICE		14	
12	FIRE EXIT	6 (EACH 35 SQ.M)	210	
	FIRE STAIRCASE	6 (EACH 33.5 SQ.M)	33.5	
	FIRE LIFT	6 (EACH 1.5 SQ.M)	9	
13	SERVICE LIFT	2 (EACH 5.5 SQ.M)	11	
14	PASSANGER LIFT	8 (EACH 5.5 SQ.M)	44	
15	ESCALATORS	4	41	
16	CORRIDORS		1598.4	
17	TOILETS			
	MALE TOILET	4 (EACH 14 SQ.M)	56	1 WC/ 250 P, 1 URINAL / 25 P, 1 WASH BASIN / 200 P
	FEMALE TOILET	4 (EACH 15 SQ.M)	60	2 WC/ 100 P, 1 WASH BASIN / 200 P
	DISABLED TOILET	2 (EACH 3 SQ.M)	6	
	JANITOR ROOM	2 (EACH 3 SQ.M)	6	
	HAND WASH AREA	4 (EACH 15 6 Q.M)	62.4	
18	DRINKING WATER AREA	2 (EACH 11.5 SQ.M)	23	
	THIRD FLOOR(851.3 SQ.M)			

Sl. No.	Space	No. of Units	Area (sq.m)	REMARK
1	FURNITURE STORAGE ROOM		571.4	
2	MALE STAFF ROOM		12	
3	FEMALE STAFF ROOM		12	
4	STAFF OFFICE		14	
5	FIRE EXIT	2 (EACH 35 SQ.M)	70	
	FIRE STAIRCASE	2 (EACH 33.5 SQ.M)	67	
	FIRE LIFT	2 (EACH 1.5 SQ.M)	3	
6	SERVICE LIFT		5.5	
7	ESCALATORS	4	41	
16	CORRIDORS		70.48	
	FOURTH FLOOR (4893.8 SQ.M)			
Sl. No.	Space	No. of Units	Area (sq.m)	REMARK
1	LOUNGE		344	
2	FRE FUNCTION LOBBY		811	
3	CONVENTION CUM EXHIBITION HALL		1469	1722 SEATING
	STAGE		197.6	
	GREEN ROOM		11.9	
	BACK STAGE		47.6	
	CONTROL ROOM		17.18	
4	FURNITURE STORAGE		192	
5	AHU ROOM		14	
6	STAFF OFFICE		14	
7	FIRE EXIT	6 (EACH 35 SQ.M)	210	
	FIRE STAIRCASE	6 (EACH 33.5 SQ.M)	33.5	
	FIRE LIFT	6 (EACH 1.5 SQ.M)	9	
8	SERVICE LIFT	2 (EACH 5.5 SQ.M)	11	
9	PASSANGER LIFT	8 (EACH 5.5 SQ.M)	44	
10	ESCALATORS	4	41	
11	CORRIDORS		966.4	
12	TOILETS			
	MALE TOILET	4 (EACH 14 SQ.M)	56	1 WC/ 250 P, 1 URINAL / 25 P, 1 WASH BASIN / 200 P
	FEMALE TOILET	4 (EACH 15 SQ.M)	60	2 WC/ 100 P, 1 WASH BASIN / 200 P
	DISABLED TOILET	2 (EACH 3 SQ.M)	6	
	JANITOR ROOM	2 (EACH 3 SQ.M)	6	
	HAND WASH AREA	4 (EACH 15 6 Q.M)	62.4	
13	DRINKING WATER AREA	2 (EACH 11.5 SQ.M)	23	
	FIFTH FLOOR (2451.8 SQ.M)			
Sl. No.	Space	No. of Units	Area (sq.m)	REMARK
1	FRE FUNCTION LOBBY		811	
2	CONVENTION HALL		638.5	778 SEATING
3	FIRE EXIT	4 (EACH 35 SQ.M)	140	
	FIRE STAIRCASE	4 (EACH 33.5 SQ.M)	134	
	FIRE LIFT	4 (EACH 1.5 SQ.M)	6	
4	SERVICE LIFT	1 (EACH 5.5 SQ.M)	5.5	
5	PASSANGER LIFT	6 (EACH 5.5 SQ.M)	33	
6	ESCALATORS	4	41	
7	CORRIDORS		436.2	
8	TOILETS			
	MALE TOILET	2 (EACH 14 SQ.M)	28	1 WC/ 250 P, 1 URINAL / 25 P, 1 WASH BASIN / 200 P
	FEMALE TOILET	2 (EACH 15 SQ.M)	30	2 WC/ 100 P, 1 WASH BASIN / 200 P
	DISABLED TOILET	1 (EACH 3 SQ.M)	3	
	JANITOR ROOM	1 (EACH 3 SQ.M)	3	
	HAND WASH AREA	2 (EACH 15 6 Q.M)	31.2	
9	DRINKING WATER AREA	2 (EACH 11.5 SQ.M)	23	
	BASEMENT (4893.8 SQ.M)			
1	FIRE WATER TANK		30.5	
2	PUMP ROOM		40.1	
3	DOMESTIC WATER TANK		24	

4	AHU ROOM		14	
5	ELECTRICAL ROOM		14	
6	FIRE EXIT	6 (EACH 35 SQ.M)	210	
	FIRE STAIRCASE	6 (EACH 33.5 SQ.M)	33.5	
	FIRE LIFT	6 (EACH 1.5 SQ.M)	9	
7	SERVICE LIFT	2 (EACH 5.5 SQ.M)	11	
8	PASSANGER LIFT	8 (EACH 5.5 SQ.M)	44	
9	SECURITY ROOM		12.9	

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
Total	**13,935.40**	As per file

Table 5 hotel Area statement

Entertainment & F&B – 4646.1 sq.m						
Sl. No.	Space	Function / Use	Area (sq.m)		No. of Units	Remarks
1	Food Court (Multi-cuisine)	Casual dining, counters + shared seating	700		1	Shared tables for ~250 pax
2	Individual Food Stalls	Quick service outlets / kiosks	200		8	Avg. 25 sq.m each
3	Cafe / Coffee Lounge	Beverages, pastries, informal seating	205		1	Near entry or circulation
4	Bar / Pub	Drinks and snacks with live music/DJ	173		1	With counter and seating
5	Fine Dining Restaurant	Formal restaurant for groups or events	208		1	Seating capacity for 80–100
6	Retail Shops	Branded retail, souvenirs, essentials	780		10–12	40–80 sq.m each; mixed size
7	Multiplex / Mini Theatre	Movie shows, live screenings	600		2 Screens	100–120 pax per screen
8	Gaming Zone / Arcade	VR games, console setups, bowling	252		1	Flexible planning for crowd flow
11	Toilets (M/F/Accessible)	Public washrooms	150		2+1	Gender-neutral or separate
12	Staff Changing + Toilets	For retail, F&B, cleaning staff	50		1	Separate male/female with lockers
15	Vertical Circulation	Staircases, lifts, ramps (if multi-storey)	56		Multiple	NBC-compliant fire escape and movement
16	Verandas, Corridors & Lobbies	Covered walkways, internal circulation	1272.1		Distributed	Includes front and interior access zones
	TOTAL Built-up Area	Entertainment + F&B + Retail	**4646.1**			

Figure 10 Entertainment, F&B area statement

Banquet hall (1250 Pax) – 3065 sq.m						
S. No	Space	Function	Area (sq.m)		No. of Units	Remarks
A	Main Functional Spaces					
1	Main Banquet Hall	Seating for 1250 people (round tables + stage)	1875		1	1.5sq.m/person for banquet seating; includes circulation
2	Pre-function Area / Foyer	Waiting, registration, networking, lounge	300		1	20–25% of hall capacity; essential for crowd management
3	Stage Area + Backstage (Green Room)	Podium, performances, speeches, bride/groom room, preparation	150		1 stage + 1 GR	Modular stage (100 sq.m) + 1 green room (50 sq.m)
B	Washrooms (As per NBC for 1250 pax)					
4	Male Toilets	~4.5 sq.m per person	55		6 washbasin+13 WC + 13 urinal	With 6 washbasins and 30% circulation
5	Female Toilets	~2.0 sq.m per person	75		6 washbasin+25 WC	With 6 washbasins and waiting area
6	Accessible/Universal Toilet	5 sq.m per toilet	10		2	As per accessibility standards
			140			
C	Service & Support Areas					
7	Kitchen / Pantry	Food preparation, plating, warming	240		1	Semi-industrial kitchen with dry & cold storage
8	Service Corridor	Movement of staff, F&B, waste	100		Continuous	Connected to kitchen, hall, and utility zones
9	Buffet Service Corridor		60		1	Linear or island layout counters
10	Storage Rooms (chairs/tables/equipment)	Furniture, AV, décor equipment	100		1	Located near stage/back end
11	VIP Lounge / Holding Room	For chief guests, event organizers	75		1	Optional but recommended
12	Admin Room / Event Control Room	AV control, security coordination, admin	50		1	With view of hall or AV feed access
13	Cloak Room / Luggage Room	Guest belongings storage	30		1	Optional but common in international convention venues
14	Electrical & HVAC Services	DG panel, AC AHUs, electrical distribution	100		1	Could be split into subrooms; rooftop HVAC not included here
15	Waste Disposal / Service Yard	Dry + wet waste handling, staff entry	50		1	Adjacent to kitchen
16	Janitor Room / Housekeeping		6		1	Cleaning supplies and access
17	Staff Room / Change & Toilets	Staff facilities, locker, washrooms	50		1	For catering + housekeeping
D	Circulation area	10% of Total Area	334			For verandas, passages, corridors, stair, lifts,porches etc.
TOTAL			**3660**			

Figure 11 Banquet hall area statement

CHAPTER 2

LITERATURE SURVEY

2.1 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.

2.2 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

2.3 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.

2.4 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.

2.5 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.

2.6 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.

2.6.1 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.

2.6.2 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.

2.7 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.

2.7.1 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.

2.8 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.

2.9 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.

2.10 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.

2.11 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.

2.12 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.

2.13 Local Byelaws of Warangal

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 13 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 12 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 14 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 15 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;

(e) The depth of such courtyard shall be at least 50% of the average building depth and the minimum width shall be 10m.

Figure 16 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 19 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 18 Requirments for High rise buildings

In the case of Commercial / Institutional buildings the gross F.A.R. shall be calculated by adding 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

The width of Balcony shall not be more than 1.2 mtrs if the building set back is 4 mtrs. If building set back is 5 mtrs. and above the maximum width can be 1.5 metres.

Figure 17 F.A.R

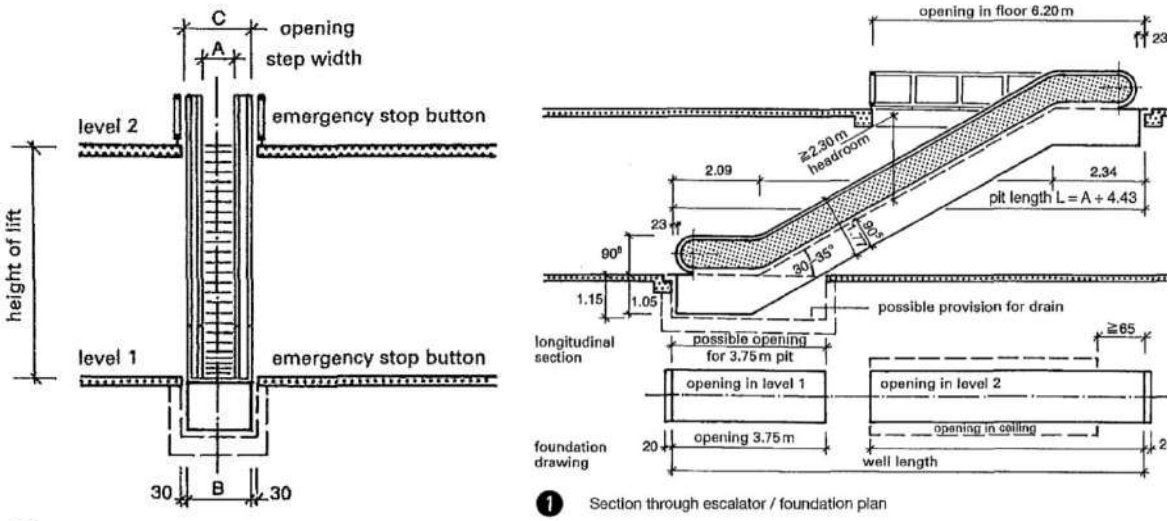
Socio-Cultural Facilities	
Community Hall	Parking standard @ 3.0 ECS /100 sq.m.
Recreational Club	Parking standard @ 2.0 ECS /100 sq.m. of floor area
Auditorium, music, dance & drama center	Parking standard @ 2.0 ECS /100 sq.m. of floor area
Science Center	Parking standard @ 2.0 ECS /100 sq.m.
International 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

Equation 1 Parking ECS details

2.14 URDPFI

2.15 Standards- Neufert

2.15.1 Escalators



❶ Section through escalator / foundation plan

❷ Width of steps

transportation capacity

$$Q = 3600 \times \frac{G_p \times v}{t} \times f \text{ (people/h)}$$

where
G_p = people per step (1, 1.5, 2)
v = conveyor speed (m/s)
t = tread (m)
f = 0.5–0.8 escalator utilisation factor

❸ General calculation formula for transport capacity

step width	800	1000
A	80–820	1005–1020
B	1320–1420	1570–1620
C	1480	1680
capacity/h	7000–8000 people	8000–10000 people

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

speed	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	

Figure 20 Escalator

2.15.2 Kitchen

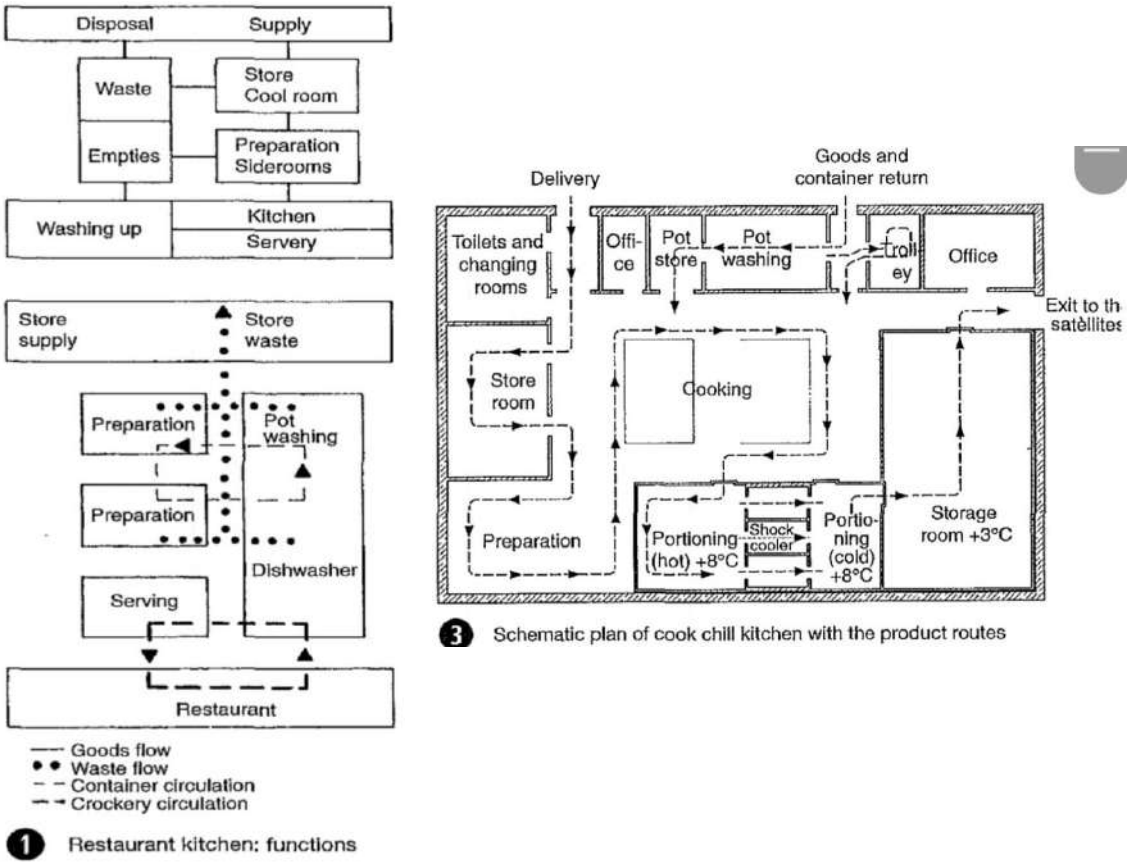


Figure 21 kitchen functions

2.15.3 Dinning

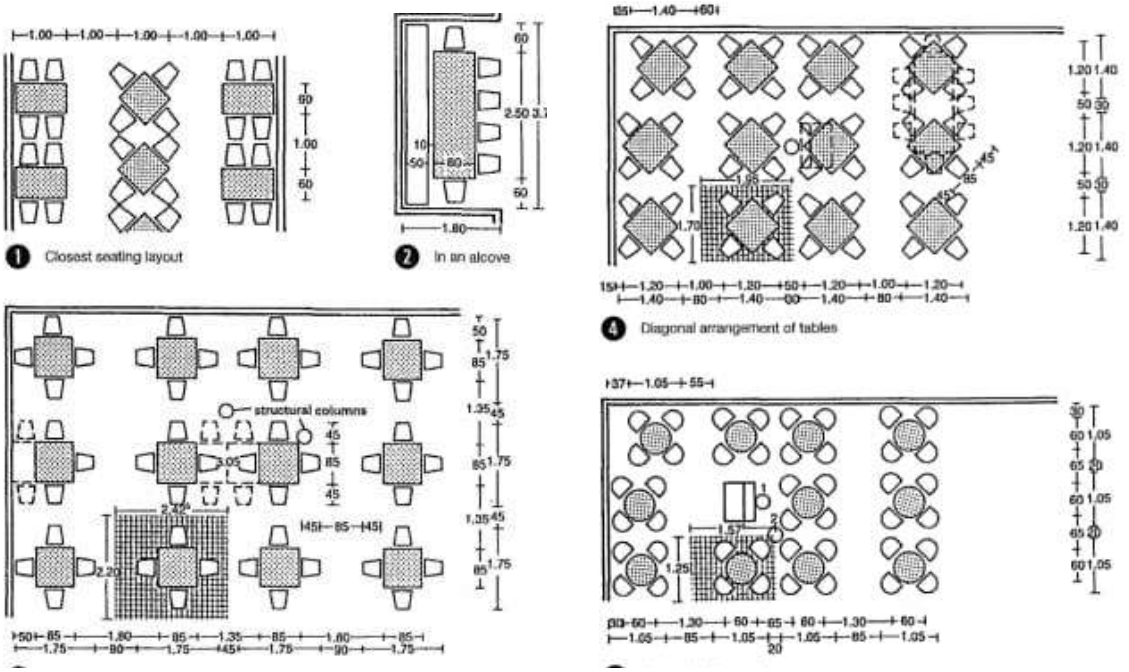
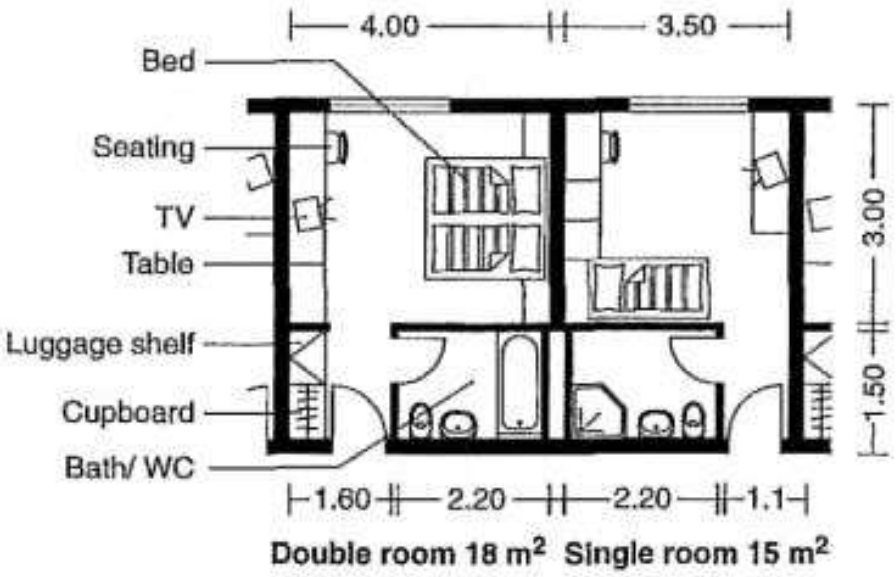
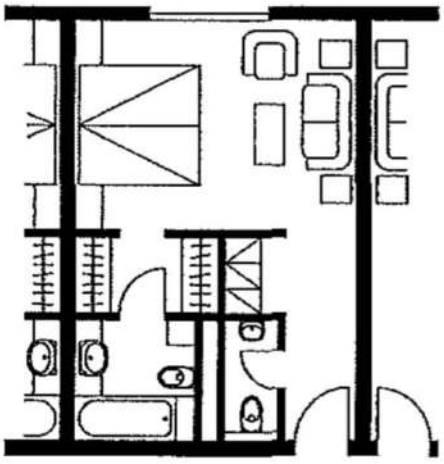


Figure 22 Seating layout

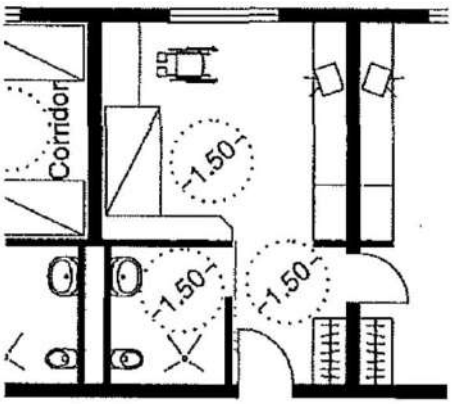
2.15.4 Hotel



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



4 Hotel room with extra WC



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

Figure 23 Hotel room layout

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

Figure 24 Area Programes in hotel

2.15.5 Parking

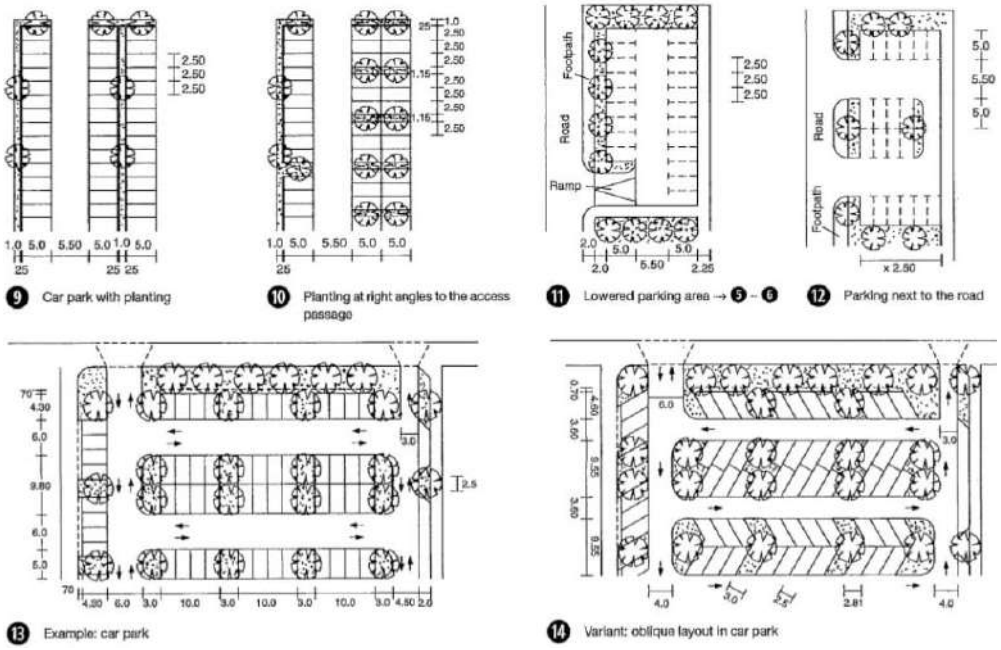


Figure 25 Parking

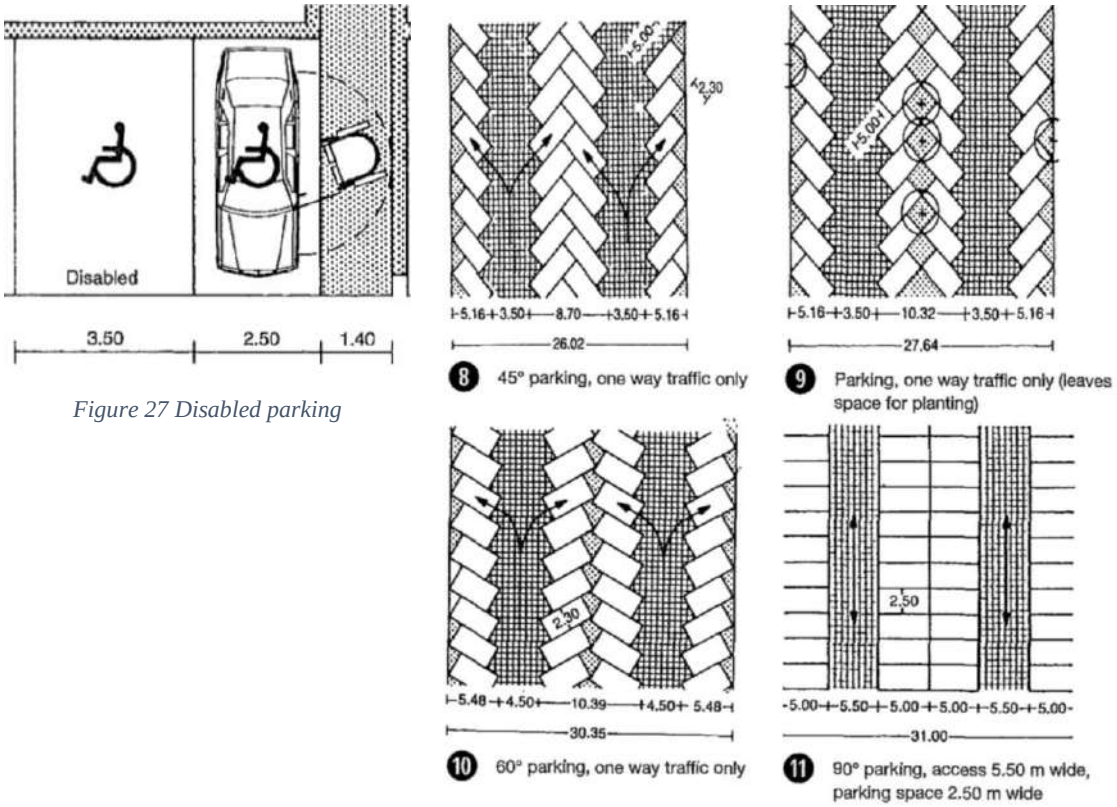


Figure 27 Disabled parking

Figure 28 Parking in angles

2.15.6 Acoustics

Banking of the seats is also acoustically advantageous (uniform direct sound to all seats). The rise of the curve should follow a logarithmic spiral → ❼.

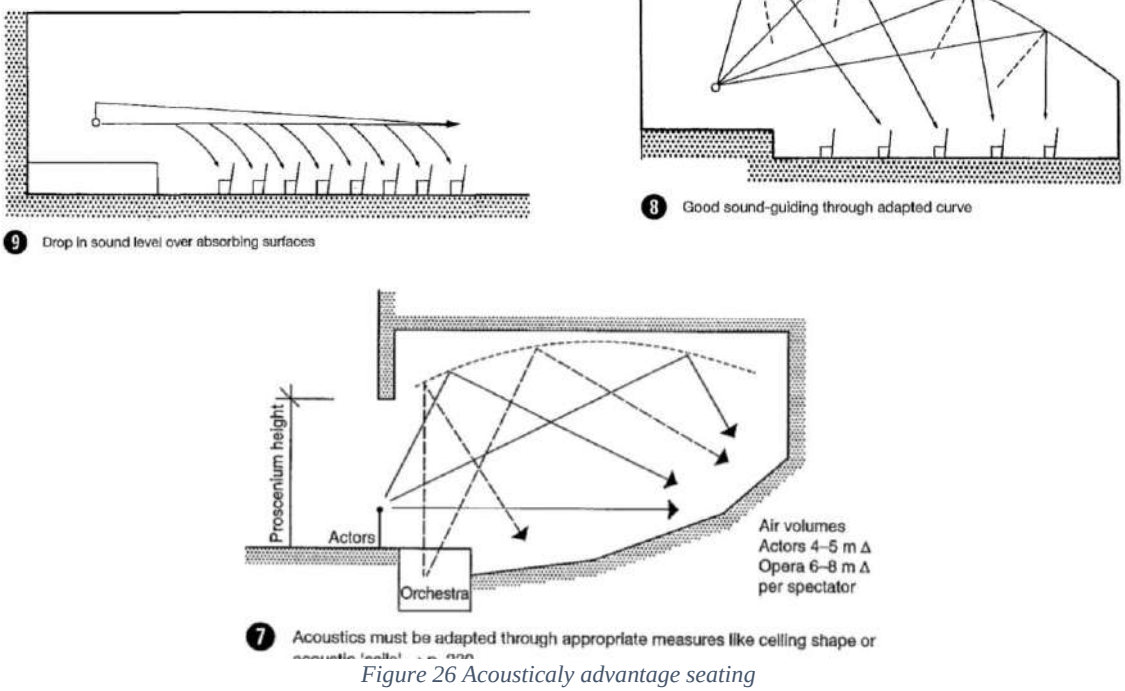


Figure 26 Acousticaly advantage seating

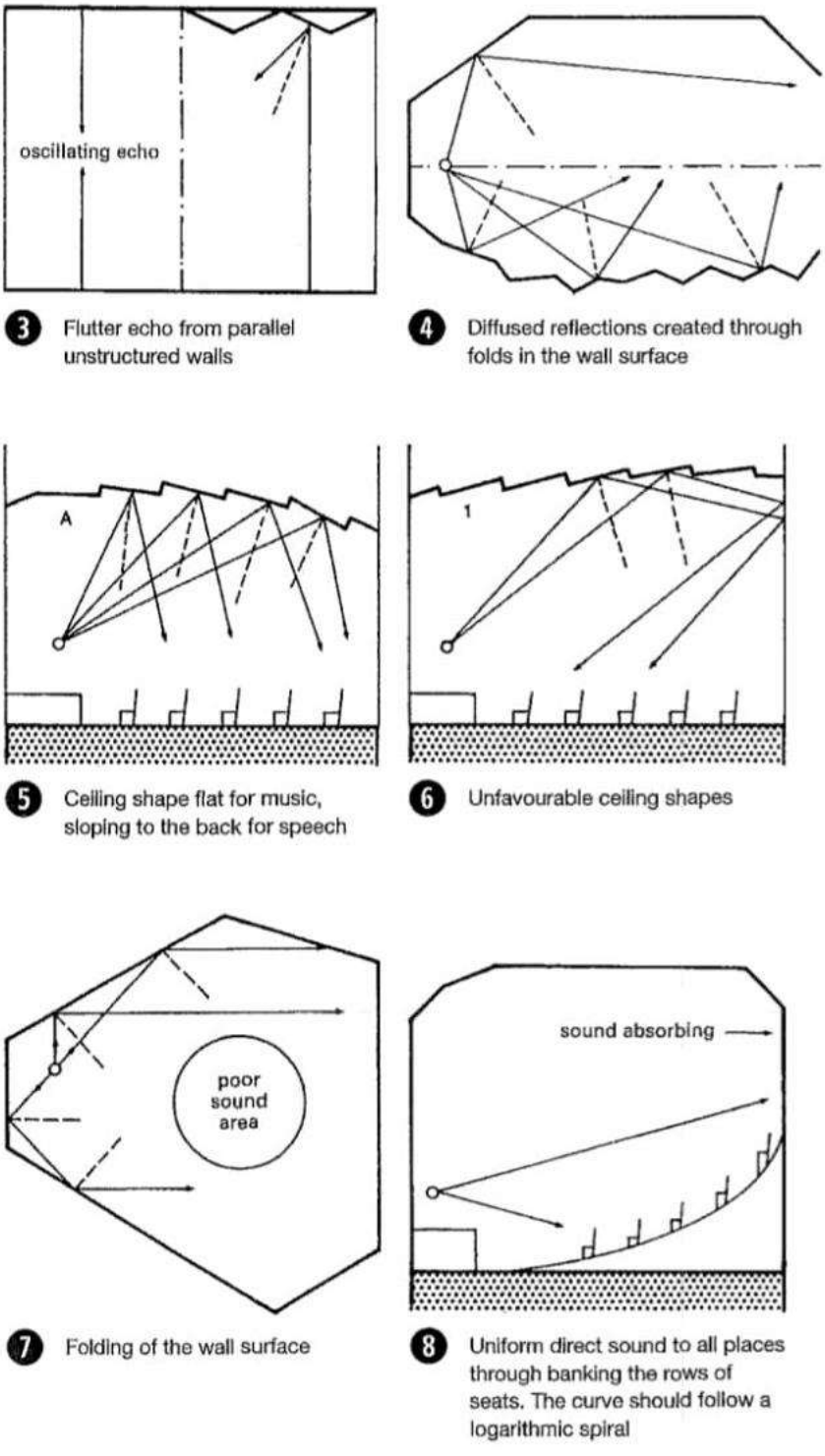


Figure 29 Acousticaly advantage shapes

2.16 NBC

2.16.1.11. 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.

Ceiling Heights: Assembly halls: Minimum 4.5 m clear height.

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).

2.16.2 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.

2.16.3 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.

2.16.4 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 Shaft Size		1.0 m/s ≤ Rated Speed ≤ 2.5 m/s Shaft Size		3.0 m/s ≤ Rated Speed ≤ 3.5 m/s Shaft Size		4.0 m/s ≤ Rated Speed ≤ 5.0 m/s Shaft Size		Rated Speed = 6.0 m/s Shaft Size		7.0 m/s ≤ Rated Speed ≤ 8.0 m/s Shaft Size		9.0 m/s ≤ Rated Speed ≤ 10.0 m/s Shaft Size	
		kg	Width	Depth	Width	Width	Depth	Width	Depth	Width	Depth	Width	Depth	Width	Depth	Width	Depth	Width	Depth
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(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 31 Passenger and service lift dimentions

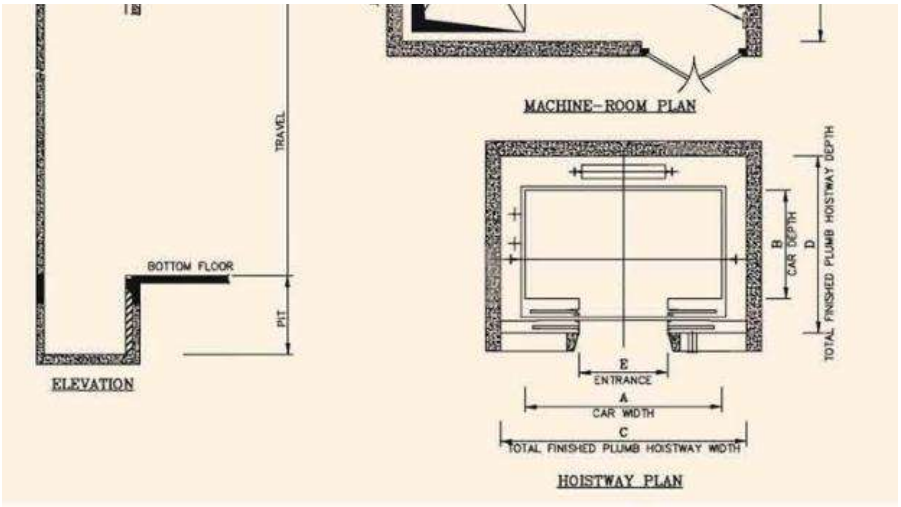


Figure 30 Passenger and service lift

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.

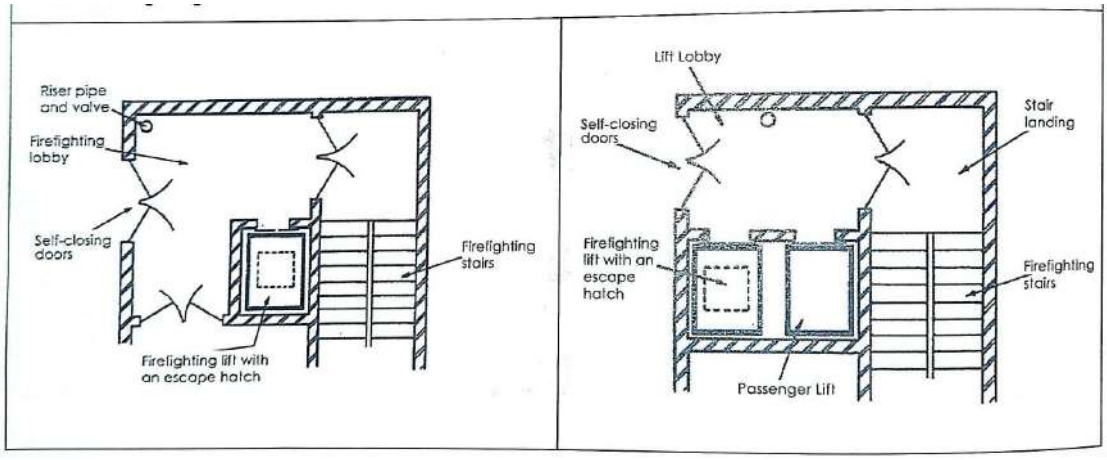


Figure 32 Fire-fighting Lifts layout

- 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.

2.16.5 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.

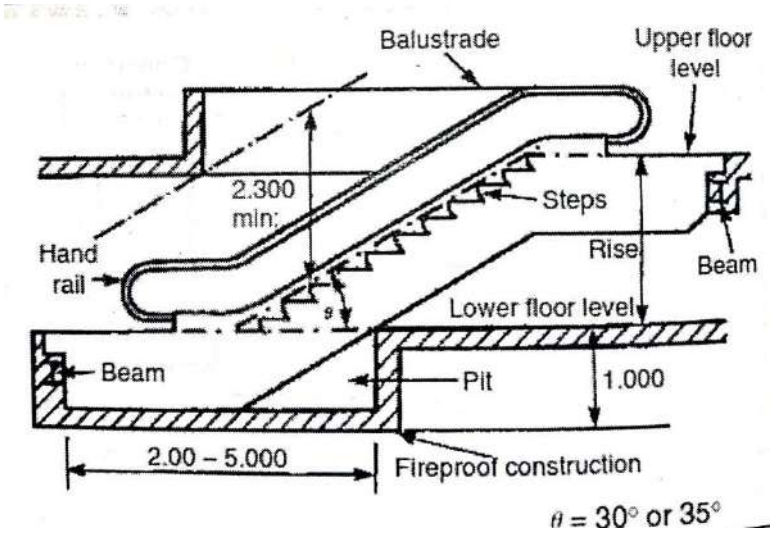


Figure 33 Escalator section view

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.

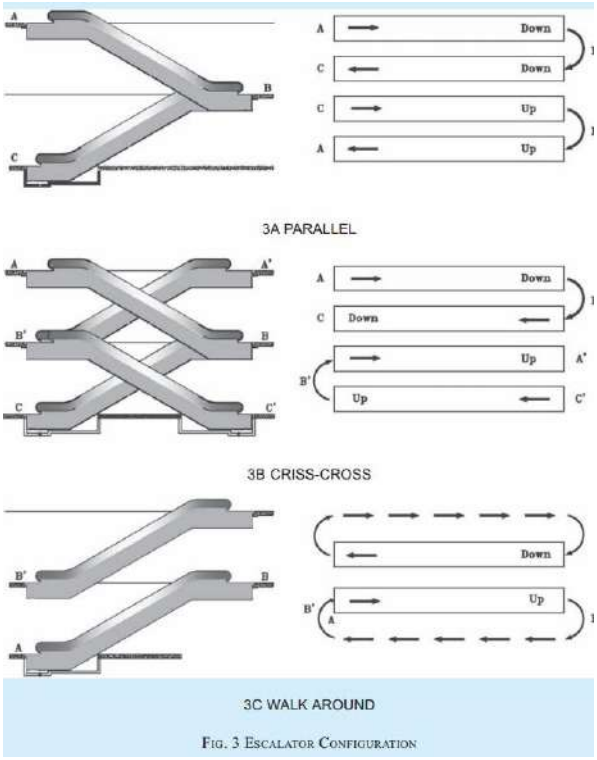


Figure 34 Types of escalators

2.16.6 Emergency Power Backup System

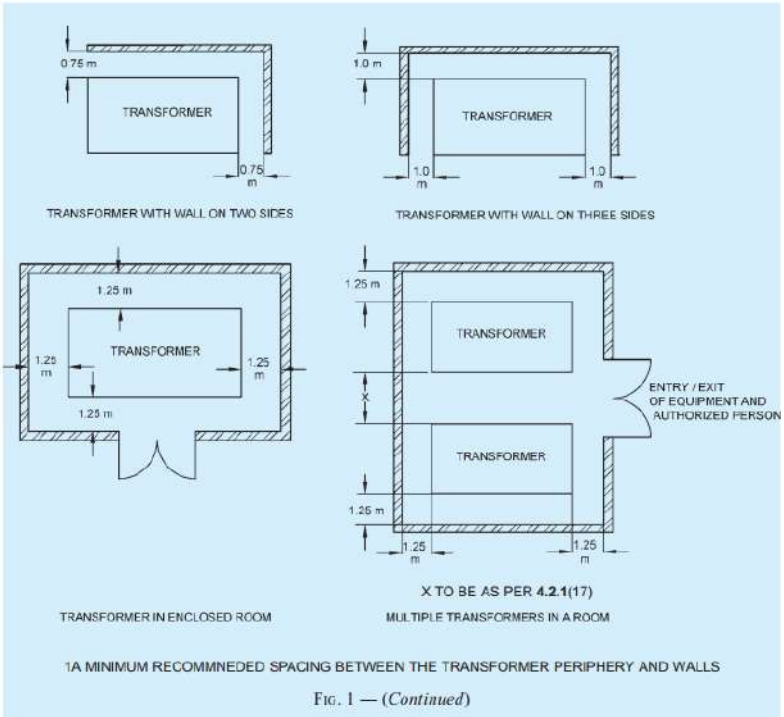


Figure 35 Transformer layout

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.

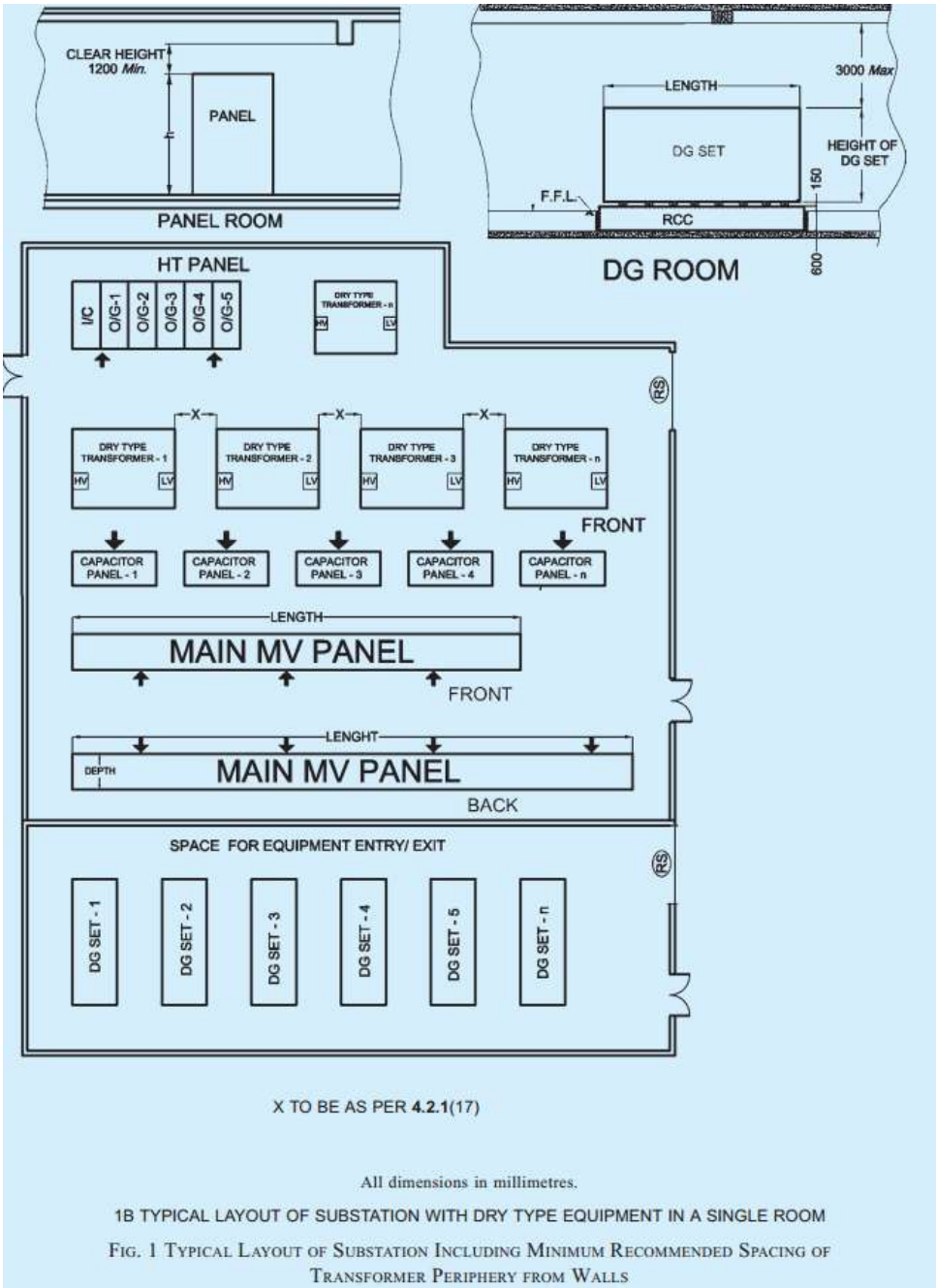


Figure 36 Substation layout

2.16.7 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 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.

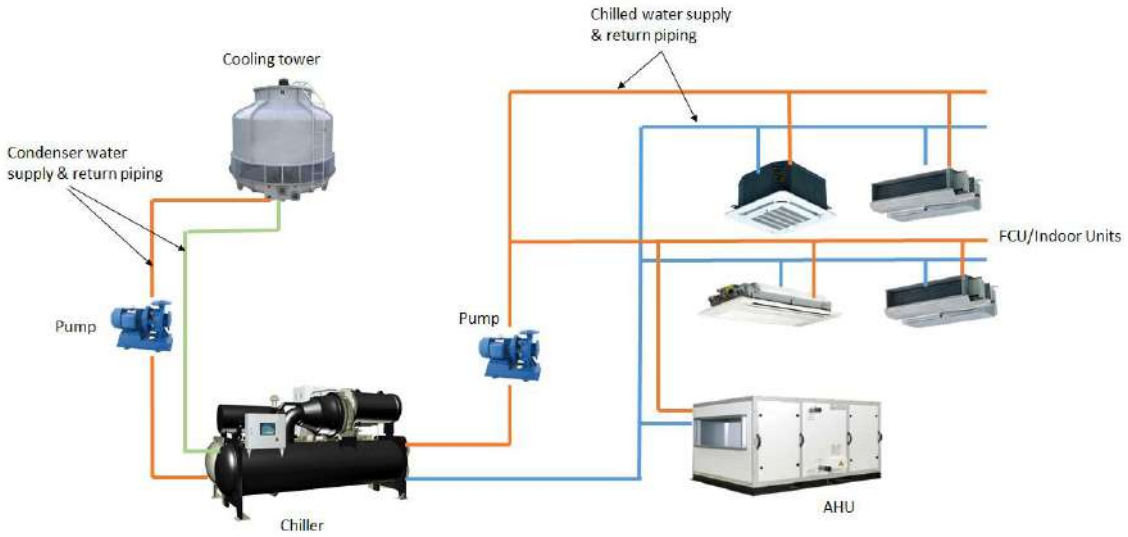


Figure 37 HVAC layout

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.

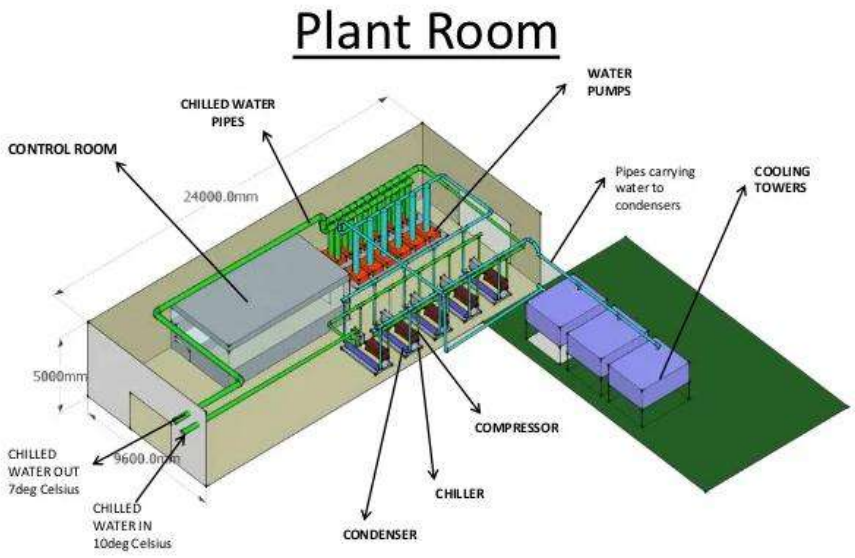


Figure 38 Plant room

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 (m².K/W).

Equipment Room for Air Handling Units and Package Units

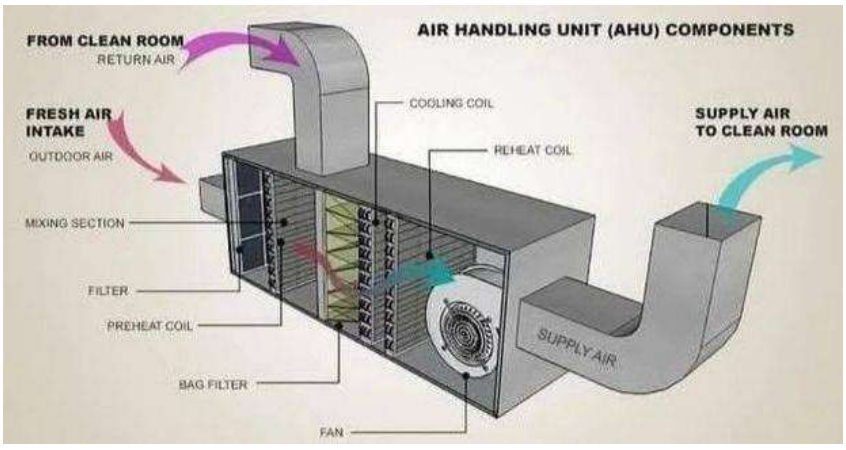


Figure 39 AHU unit

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.

2.16.8 Lighting

Lighting industry plays a significant role in modern infrastructural developments. It lends a fresh lease of life to the building design. Nowadays major events, meeting, trade related interactions are taking place in convention centres, which boasts of world class facilities. International summits, conferences are also a major part of such centers.

The display lighting mantra' detailed shows the balance that is needed between visibility, aesthetic, preservation and environmental considerations.The major activities of a convention centre are performed at indoor where daylight is important.

To design an energy efficient convention centre lux of spaces to be considered.

Auditorium Hall/ Conference Hall/ Seminar Rooms/ Lecture Hall

The place require 50-100-150 lux light level according to National Building Code (NBC): 2016.Conference halls require 300-500- 750 lux light level according to NBC: 2016. Unified glare rating of 19. It is recommended that the color rendering index should be 80 or higher. Seminar Rooms require 300-500-750 lux lighting level according to NBC: 2016. It is recommended that the color rendering index should be 80 or higher.

Conference Hall: Gallery type conference hall used for product launch presentation to make the product visible to all delegates.

Required Average Illumination Level: 300 lux (as per IS: 3646 & NBC-2016)

Maximum LPD (Lighting Power Density) Limit: 11.5W/m² (as per ECBC-2017)

Luminaire applied: LED 24-Watt spot light Downlight.

Stage Area: Stage is defined as to present or exhibit something that also combines music, spoken dialogue, and dance.

Required Average Illumination Level: 300 lux (as per IS: 3646 & NBC-2016).

Maximum LPD Limit: 11.5W/m² (as per ECBC-2017).

Luminaire applied: LED 24-Watt spot light Downlight

Green Room: The green room is the place for waiting of lounge -performers.

Required Average Illumination Level: 150 lux (as per IS: 3646 & NBC-2016).

Maximum LPD Limit: 7.7W/m² (as per ECBC-2017).

Luminaire applied: LED 18-Watt Downlight

Seminar Room: A place where meetings are arranged to deliver some information to a group of people about a specific topic.

Required Average Illumination Level: 300 lux (as per IS:3646 & NBC-2016).

Maximum LPD Limit: 9.2W/m² (as per ECBC-2017).

Luminaire applied: LED 36-Watt tile Downlight.

Exhibition Space: A place where various products, etc. are displayed for specific interest.

Required Average Illumination Level: 400 lux (as per IS: 3646 & NBC-2016).

Maximum LPD Limit: 14W/m² (as per ECBC-2017).

Luminaire applied: LED 36-Watt tile Downlight and LED 36-watt suspended linear Downlight.

Cafeteria:

Required Average Illumination Level: 300 lux (as per IS:3646 & NBC-2016).

Maximum LPD Limit: 11.5W/m² (as per ECBC-2017).

Luminaire applied: LED 36-Watt tile Downlight.

Admin Office: Aplace where administration works happens

Required Average Illumination Level: 300 lux (as per IS:3646 & NBC-2016).

Maximum LPD Limit: 10W/m² (as per ECBC-2017

uminaire applied: LED 36-Watt tile Downlight

Workshop: Workshops typically comprises of a general session together with face-to-face groups of participants training together to distribute new knowledge, skills, etc.

Required Average Illumination Level: 300 lux (as per IS:3646 & NBC-2016).

Maximum LPD Limit: 14W/m² (as per ECBC-2017).

Luminaire applied: LED 36-Watt tile Downlight

LED lighting

A crucial aspect of LED lighting is its energy efficiency. Compared with traditional incandescent or fluorescent bulbs, LEDs consume significantly less energy, resulting in lower operating costs for convention centers.

LED lighting also, with its ability to provide even, flicker-free light, helps reduce eye fatigue**,** which helps ensure that participants maintain an optimal level of attention and engagement during meetings.

Smart Lighting Controls

Occupancy sensors can detect when a room or area is empty and automatically turn off the lights to conserve energy. Similarly, daylight harvesting systems can adjust the brightness of artificial lighting based on the amount of natural light coming into the space, ensuring that energy is not wasted when sufficient daylight is available.

2.16.9 Water Requirements

2.16.10 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 Extinguisher	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/cm² at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm²
(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 Extinguisher	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/cm² at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm²
(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
x)	Clubhouse										25 per head	20 per head	45 per head

Figure 41 Water requirement for fire fightning

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 40 Water requirments

2.16.11 Occupancy load

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 42 Occupancy load

2.16.12 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 43 Convention hall Fixtures details

Table 9 Hotels
(*Clause* 4.2.5.1)

Sl No.	Fixtures	Public Rooms		Non Residential Staff	
		Males	Females	Males	Females
(1)	(2)	(3)	(4)	(5)	(6)
i)	Toilet suite comprising one WC, wash basin with shower or a bath tub	Individual guest rooms with attached toilets		—	
	Guest Rooms with Common Facilities				
ii)	Water closets	1 per 100 persons up to 400 Over 400 add at 1 per 250 or part thereof	2 per 100 persons 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
iii)	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			
iv)	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	—
v)	Wash basins	1 per WC/Urinal	1 per WC	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
vi)	Bath (showers)	1 per 10 persons or part thereof		—	—
vii)	Cleaner's sink	1 per 30 rooms, *Min* 1 per floor			
viii)	Kitchen sink	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 45 Hotels Fixtures details

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 44 Restaurants Fixtures details

2.16.13 Street Furniture

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.

2.17 Retractable chair

2.17.1.1Space 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).

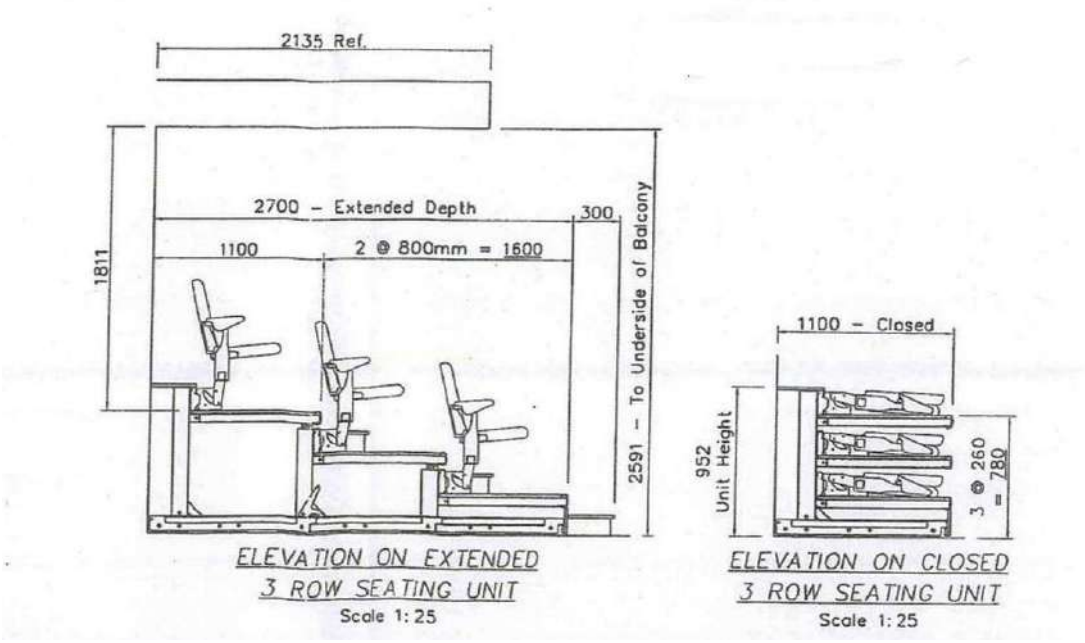


Figure 46 Retractable chair section

2.17.1.2Retractable 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.

2.17.2 Shapes of Auditoriums

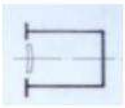
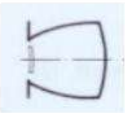
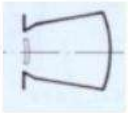
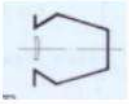
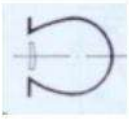
Name	Draft	Advantage	Shortcoming	Example
Rectangle		The plane is regular, the structure is simple, and the sound energy distribution is uniform. It can effectively use the first reflection of the side wall	When the length exceeds 30 meters, hair. Have a severe echo	Boston Concert Hall
Bell-shaped		It 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 47 Auditorium shapes

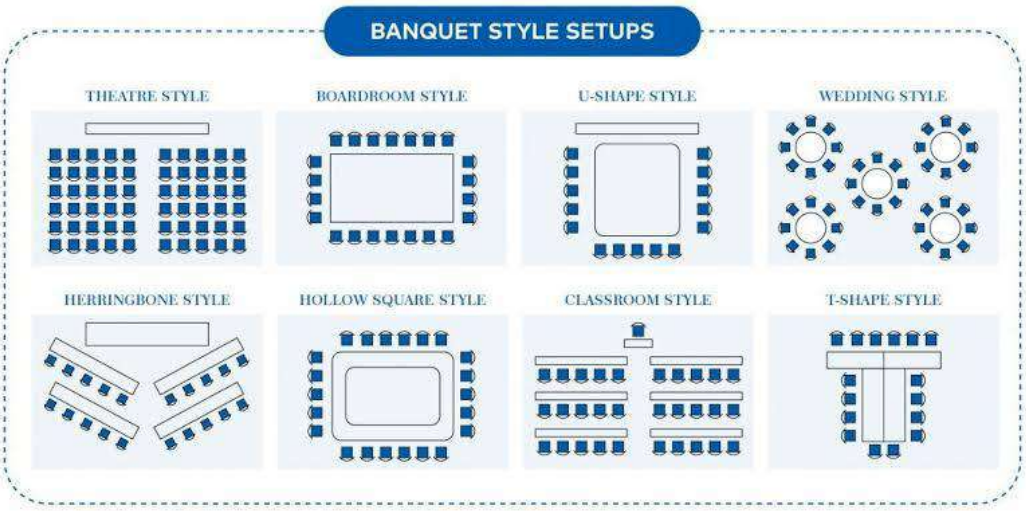


Figure 48 Banquet hall layout

CHAPTER 3
SITE INVENTORY

3.1 Site Details



Figure 49 Site visit

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)

Table 6 Site details

3.2 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

Table 7 Proximity

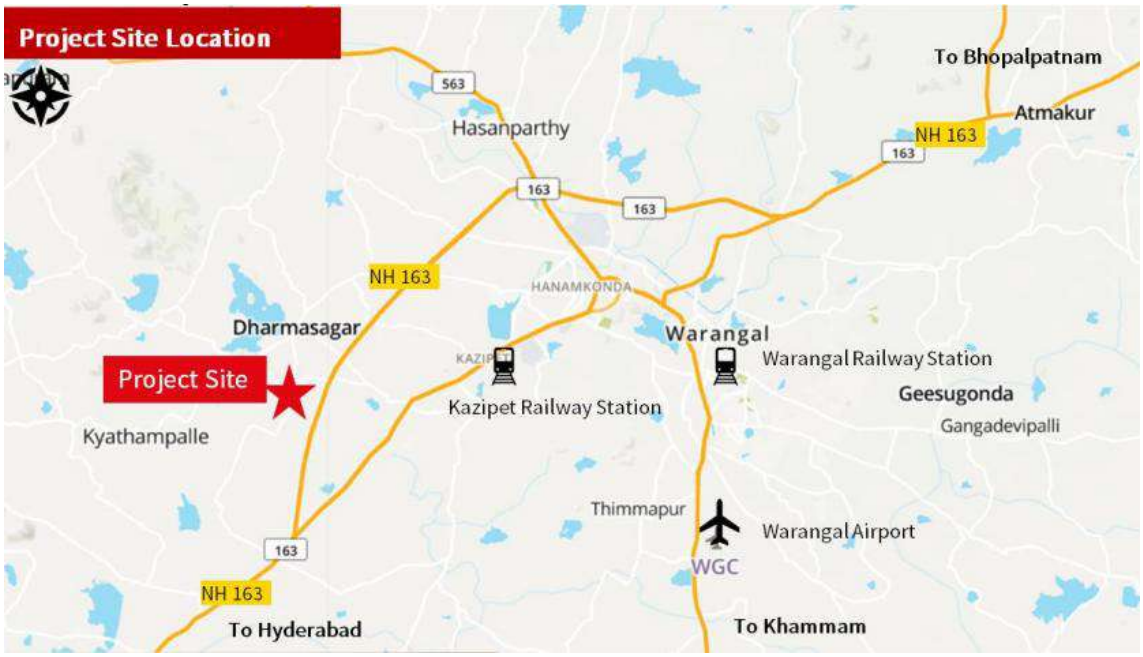


Figure 50 Site location

3.3 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 51 Site accessibility

3.4 Site Dimensions

SITE AREA= 10 Acre = 49.169 m.Sq

SITE PERIMETER = 861.21 m

3.5 Site plan

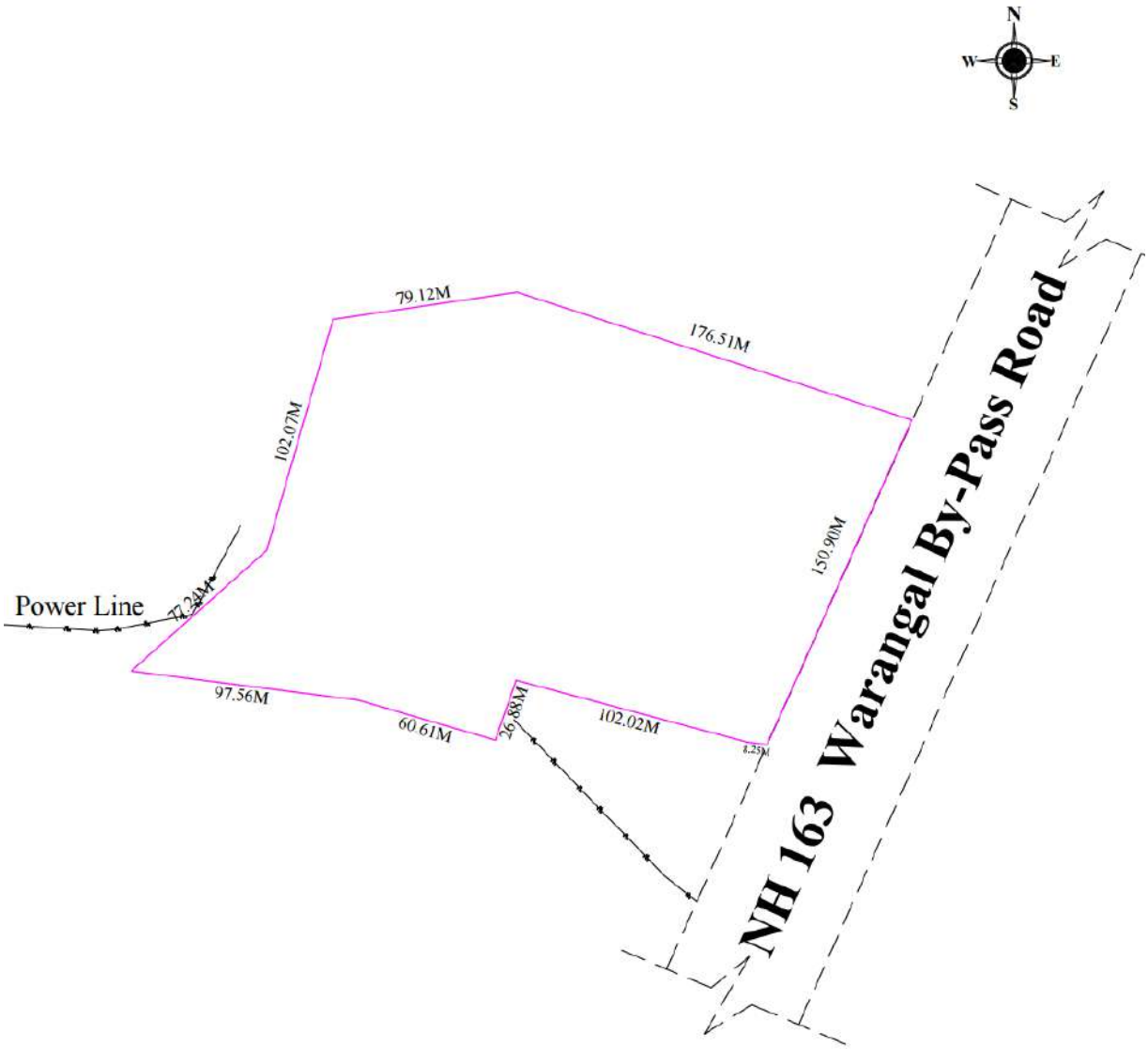


Figure 52 Site plan with Dimensions

3.6 Existing Land Use

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

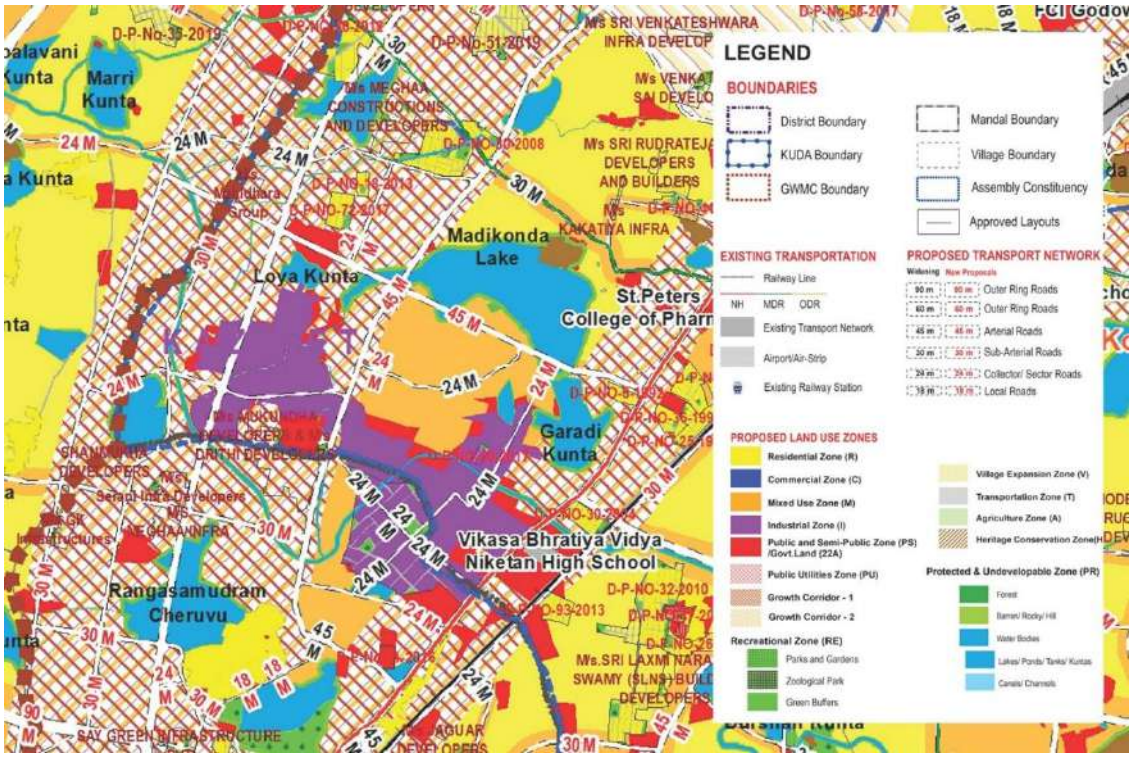


Figure 53 Existing land use

3.7 Utilities & Infrastructure

3.7.1 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 54 Electricity line

3.7.2 Drainage



Figure 55 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.

3.7.3 Water Supply



Figure 56 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.

3.8 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.

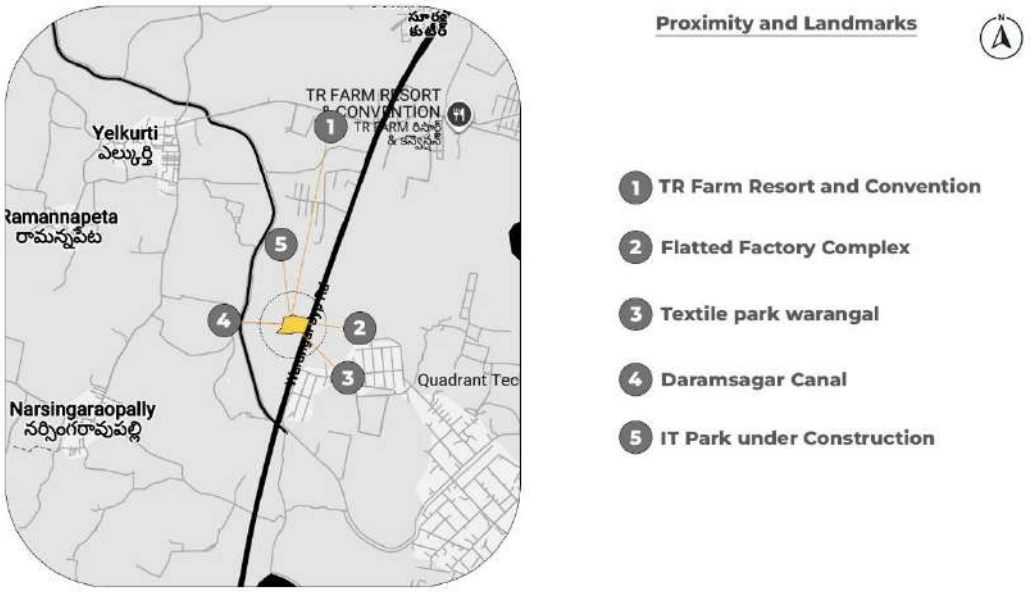


Figure 57 Adjacent site landmarks



Figure 58 Agricultural land on south side of site



Figure 59 NH road in front of the site



Figure 60 Textile park



Figure 62 Agricultural land on north side of site



Figure 61 IT park under construction

3.9 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.

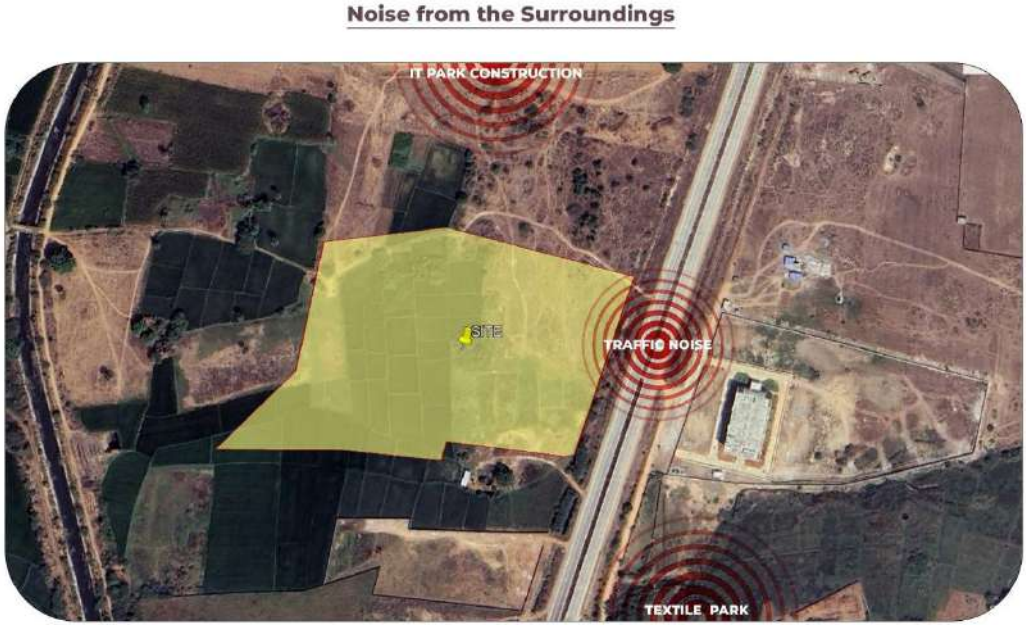


Figure 63 Surrounding noise

3.10 Street view



Figure 65 Road View

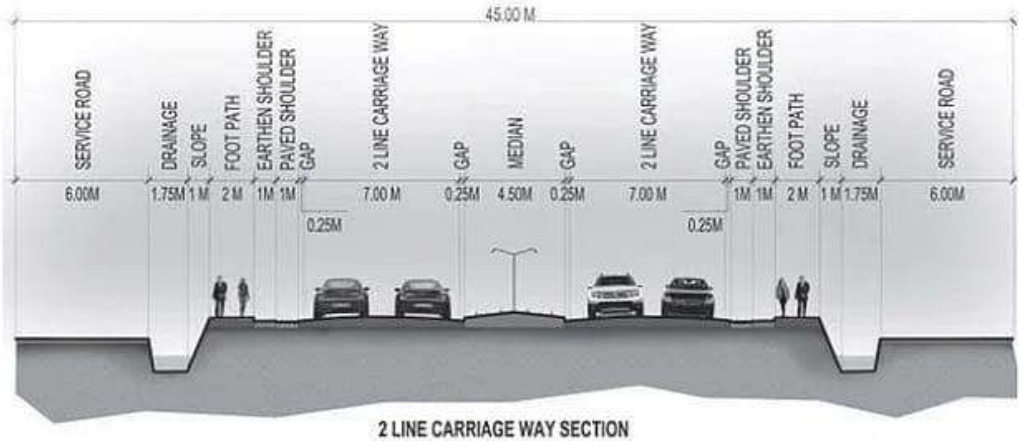


Figure 64 Road section

3.11 Typography

Moslty flat land and Slopes towards east side of the site



Figure 66 Topography

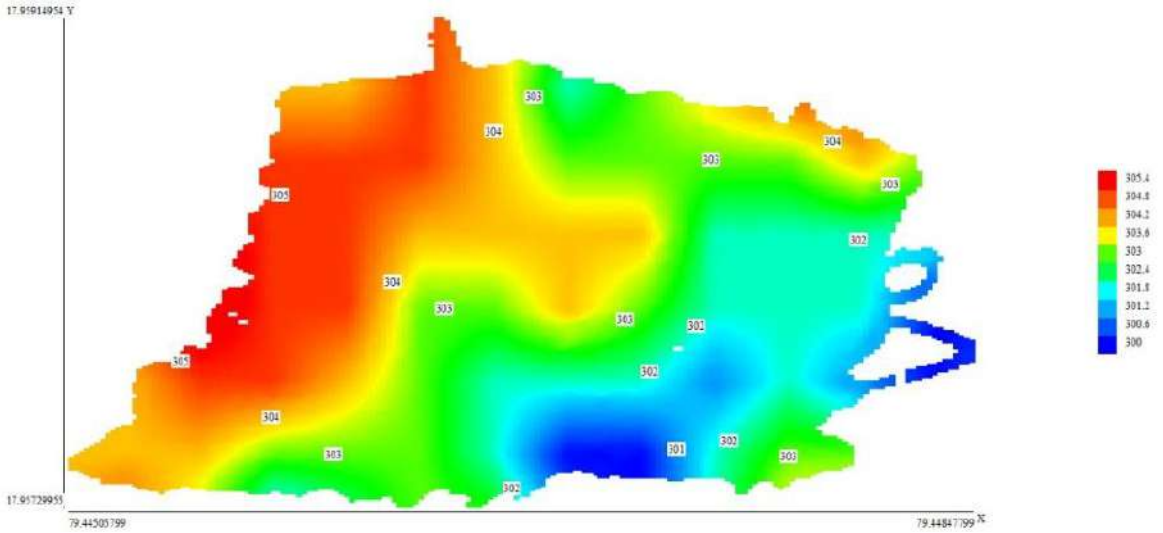


Figure 68 Contour

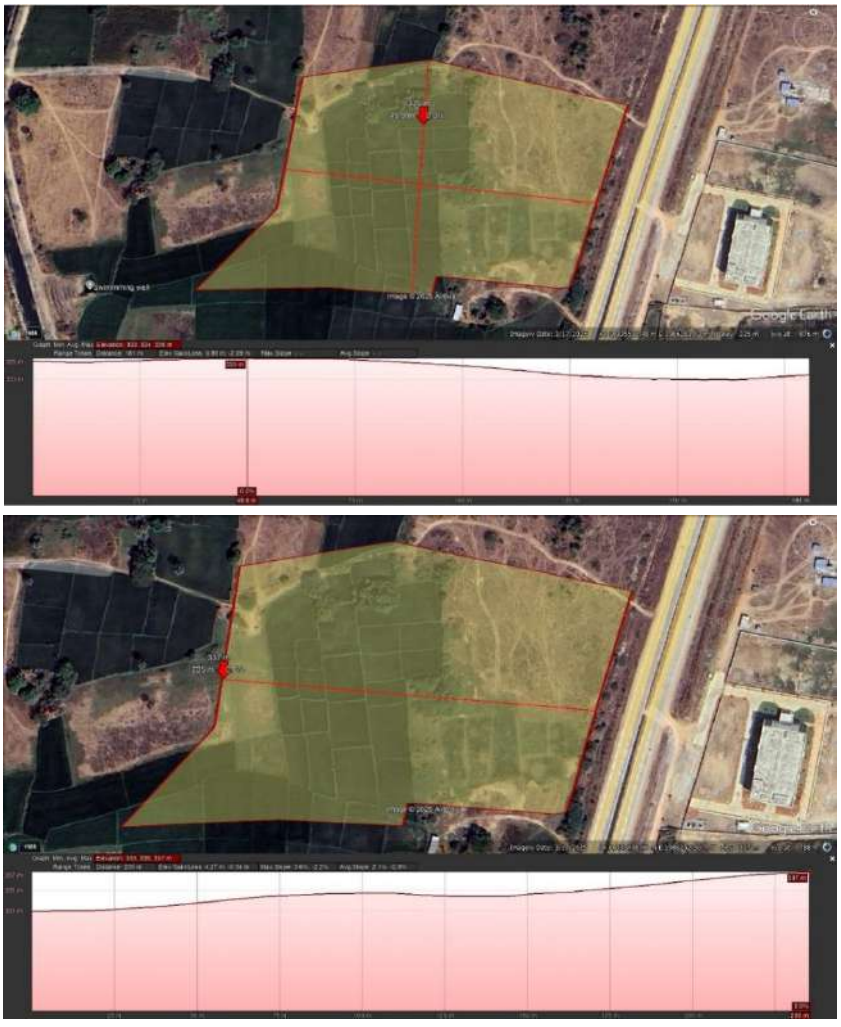


Figure 67 Slope analysis

3.12 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

3.13 Soil Type



Figure 69 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.

3.13.1 Type of Foundation can be Used:

3.13.2 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.

3.14 Views from Site



Figure 70 Site views

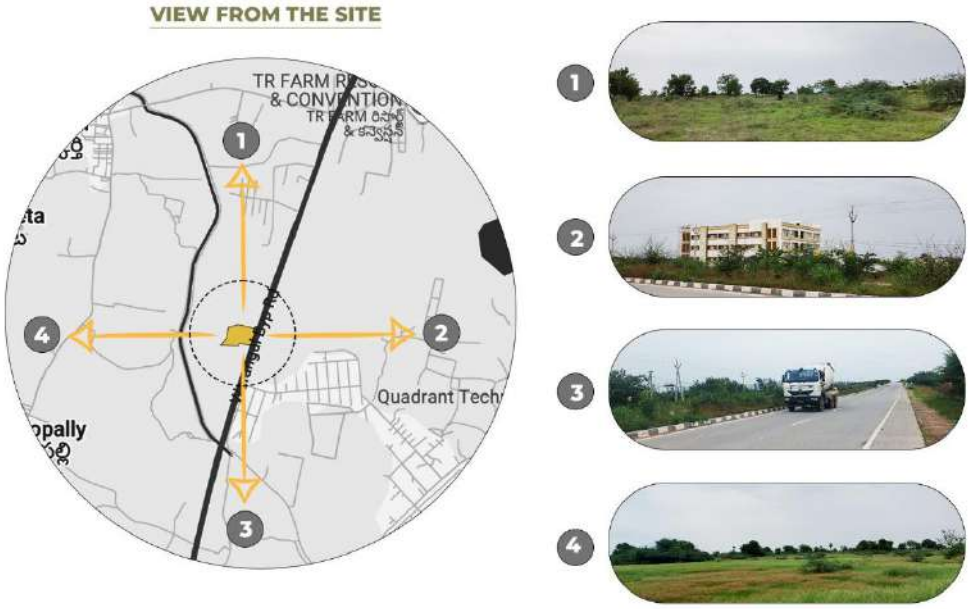


Figure 71 Views from the site

3.15 Climatic Data's:

3.15.1 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.

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

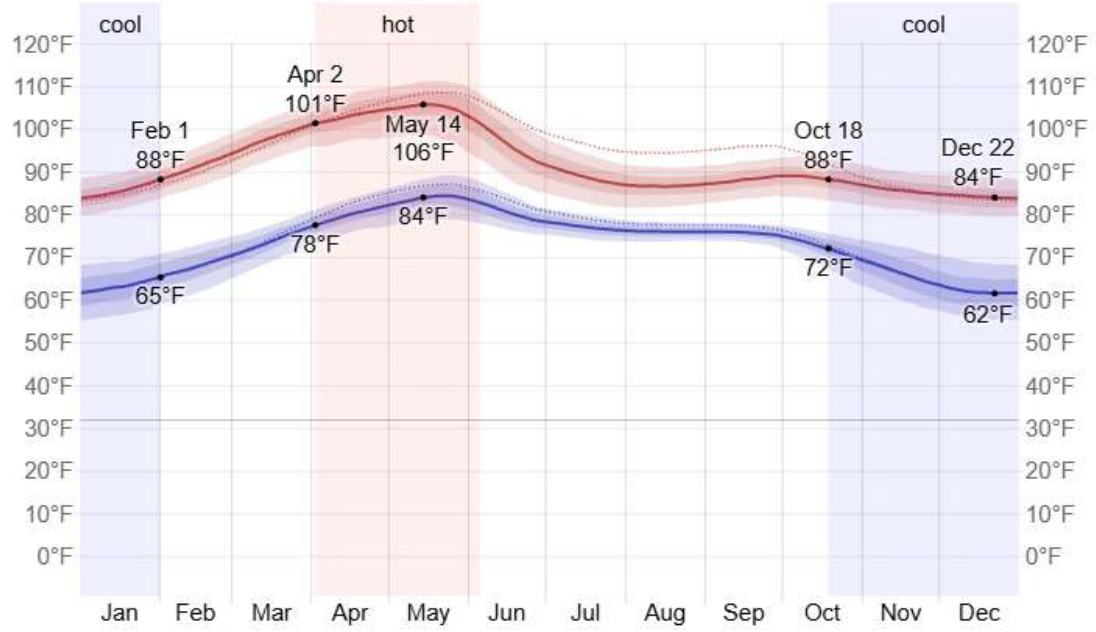


Figure 72 Average temperature

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

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

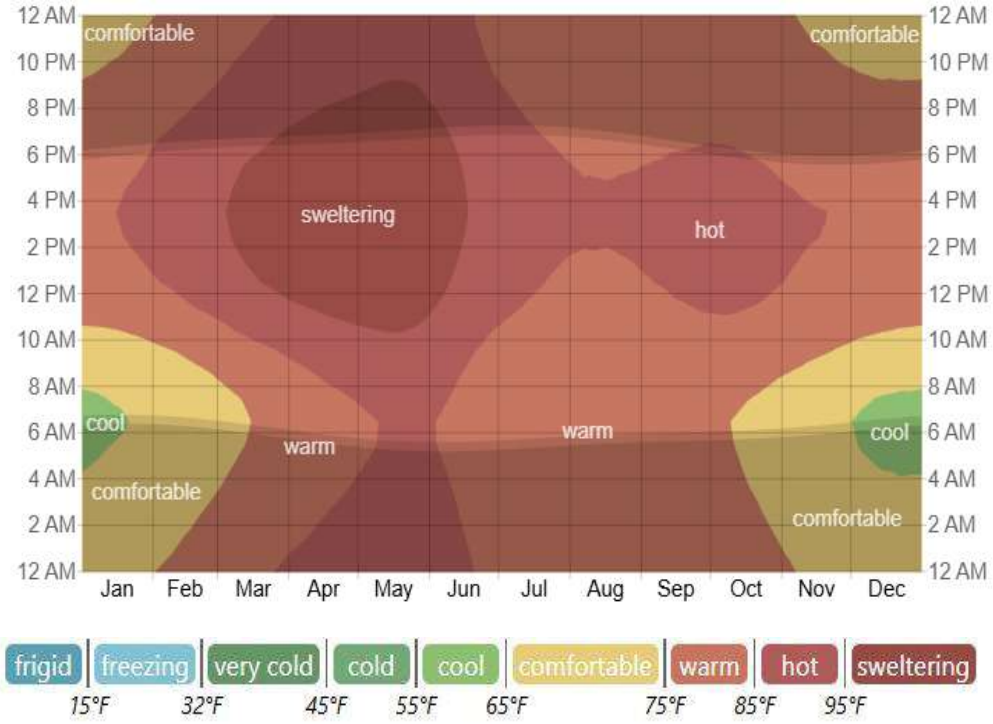


Figure 73 1.33.13 Average Hourly Temperature

3.15.4 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

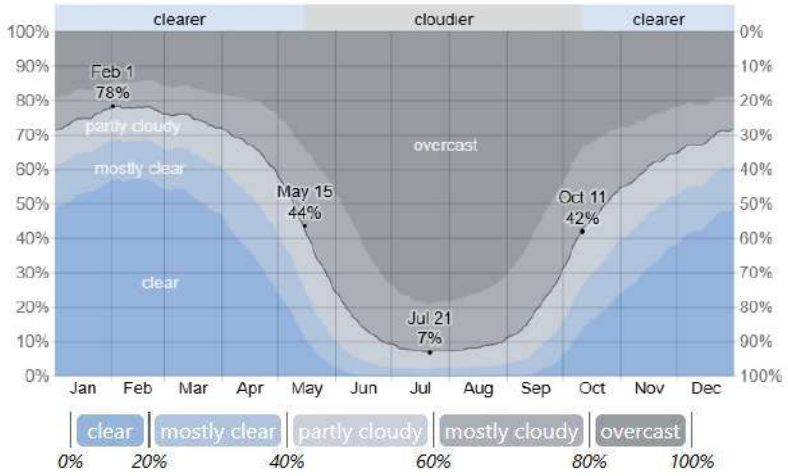


Figure 74 Cloud

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%

3.15.5 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 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 precipitation.

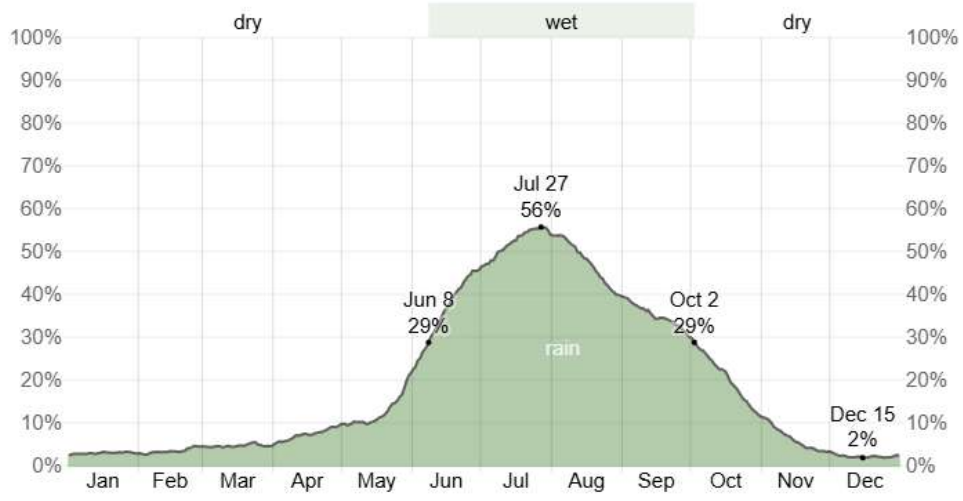


Figure 75 Precipitation

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

3.15.6 Solar analysis

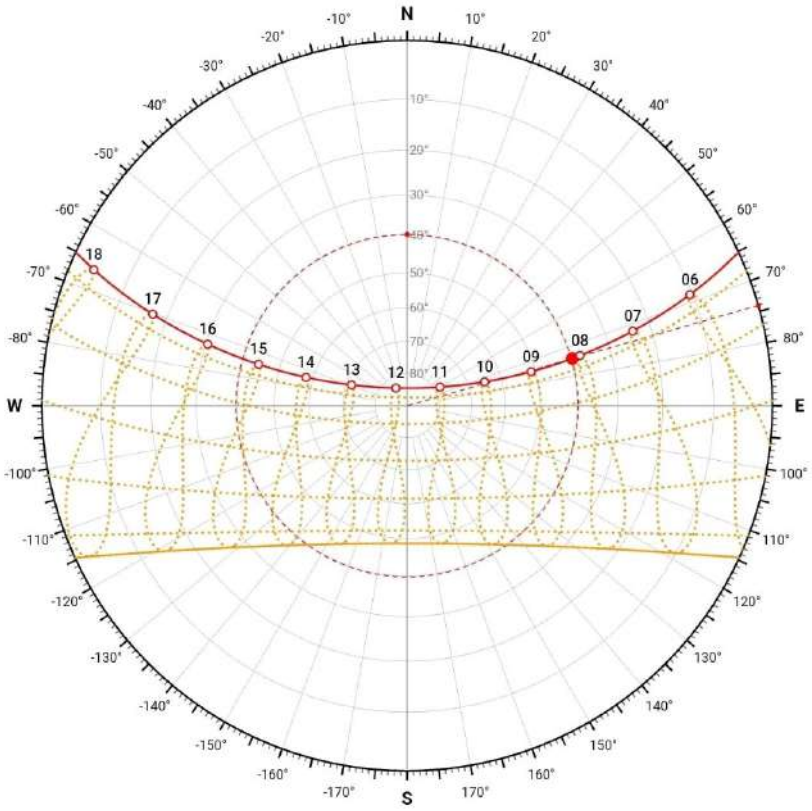


Figure 76 Sun path diagram of Warangal

3.15.7 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.

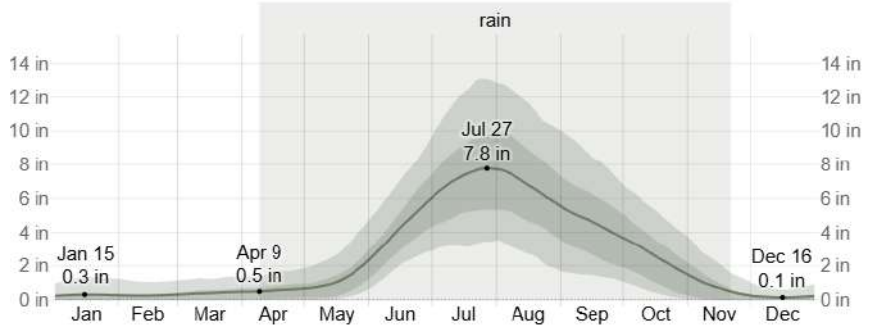


Figure 77 Rainfall

	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″

3.15.8 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 are muggy or worse.

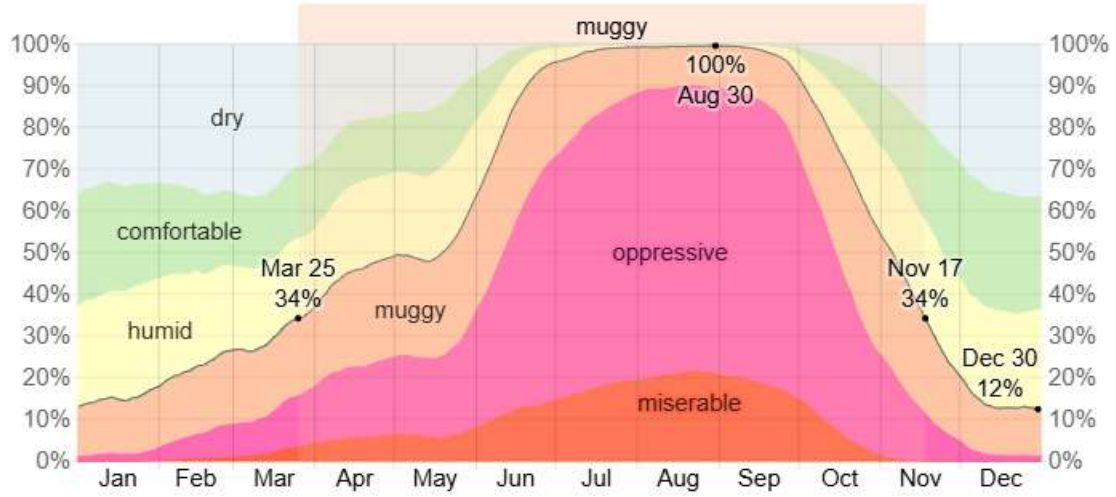


Figure 78 Humidity

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

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

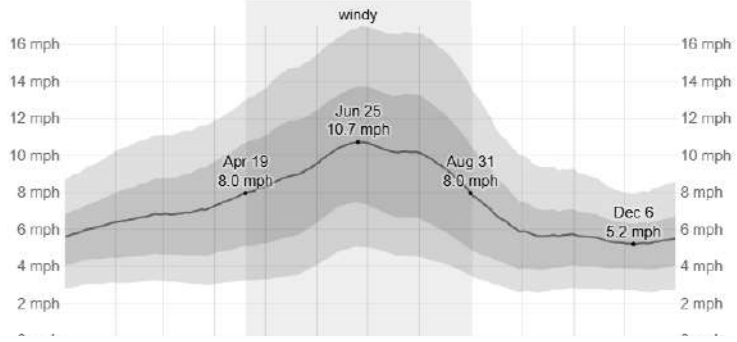


Figure 79 Wind

	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

3.15.10 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 percentage of 43% on January 1.

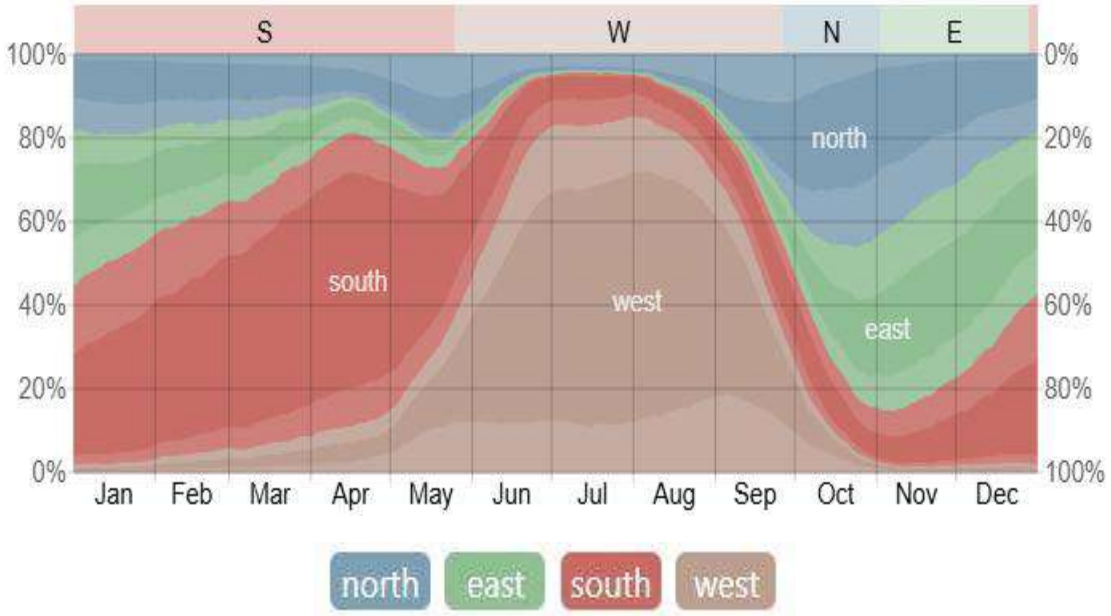


Figure 80 Wind direction

3.15.11 Mahoney's Table

HI	H2	H3	A1	A2	A3
4		1	8		

Layout								
			0-10			X	1	Orientation north and south (long axis east-west)
					5 to 12			
			11,12		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
			0 to 5					
1,2			6 to 12				7	Double banked room
	2 to 12							
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 81 Mahoney's table

3.16 SWOT Analysis

Strengths

Site have a strategic location along NH 163, with excellent primary access from the east side (24m wide road).

Proximity to good infrastructures is very near such as IT Park (under construction), availability of electricity (low tension line on site), nearby drainage path, and water source (Daramsagar canal).

Naturally vegetated with neem and palm trees, offering ecological value and landscape advantages.

Topography: is favourable not necessary to cut and fill the land . Mostly flat land with gentle slope towards the entrance, supports drainage.

No specified height limits offers freedom for vertical expansion.

Land owned by Telangana Government Industrial Infrastructure Corporation (TGIIC) may ease regulatory approvals.

Weaknesses

Noise Pollution from adjacent construction, Textile Park, and NH traffic.

Summers are intensely hot (above 40°C), affecting building cooling loads and comfort.

The site have sandy loam soil which may require pile foundation and careful treatment due to high water table concerns.

Opportunities

Upcoming IT and Textile Parks Can attract businesses and create demand for support infrastructure like hotels, convention centres, and retail.

Rich existing vegetation and canal nearby allow for biophilic and sustainable design opportunities.

Proximity to Kazipet (railway & town), Warangal (city & airport) boosts regional accessibility and tourism potential.

Threats

Monsoon Impact due to high rainfall in July–August (up to 7.4 inches/month) requires strong storm water design.

High humidity and strong seasonal winds may affect material durability and building performance.

Even through canal proximity, depend upon a single source may be risky during dry months.

3.17 Inferences

The proximity to an under-construction IT park and location within an industrial zone suggest suitability for technology hubs, training institutes, convention centres,.

Slope towards the east and a drainage path along NH 163 enables effective storm water disposal, critical for heavy monsoon months gives natural drainage advantage.

Existing native vegetation (neem, palm) and nearby canal support the creation of green buffers, natural cooling zones, and sustainable water reuse systems.

The site's integration with road, rail, and air connectivity opens it to diverse user groups—from textile industrial workers to tourists.

Sandy loam soil needs pile foundations and high attention to drainage and soil compaction to avoid structural instability.

Climatic considerations are crucial, need to address the building orientation, materials, and ventilation systems due to Warangal’s extreme heat, monsoon rains, and seasonal wind patterns.

CHAPTER 4
CASE STUDIES AND DESK APPRAISAL

CASE STUDY
4.1 BASE ELEVEN CONVENTION CENTRE, KOTTAYAM



Figure 82 Base 11 convention Centre

Attribute	Details
Architect	Mindscape Architects
Area	10 Acres
Built in	2024
Height	Double-height (~15–20 m)
Floors	G+1 floors
Built-up Area	75000 Sq.ft
Facade	Contemporary design with curved forms and parametric elements.
Location	Kottayam,Kerala

Table 8 Base 11 introduction

4.1.1 Introduction

The Base 11 Convention Centre is a contemporary event space designed to host conferences, exhibitions, and large gatherings in an area of 75000 sq. ft. Its architecture blends modern minimalism with fluidic designs and functional spatial planning, characterized by clean lines, large open interiors, and a flexible layout. The structure emphasizes natural lighting, efficient circulation, and state-of-the-art facilities. With a focus on accessibility and technology integration, the design ensures comfort and convenience for both organizers and attendees. The centre's visual language is sleek and professional, reflecting its purpose as a hub for business and innovation.

4.1.2 Site Plan



Figure 83 Site plan

4.1.3 Context & Surroundings

Situated in Pala Town ,in Kottayam nestled between scenic backwaters and nearby hill stations , offering lush greenery and cultural ambience Event Managments.Close to notable temples and churches, making it a favorable venue for traditional celebrations weddings, Exhibitions. Site is

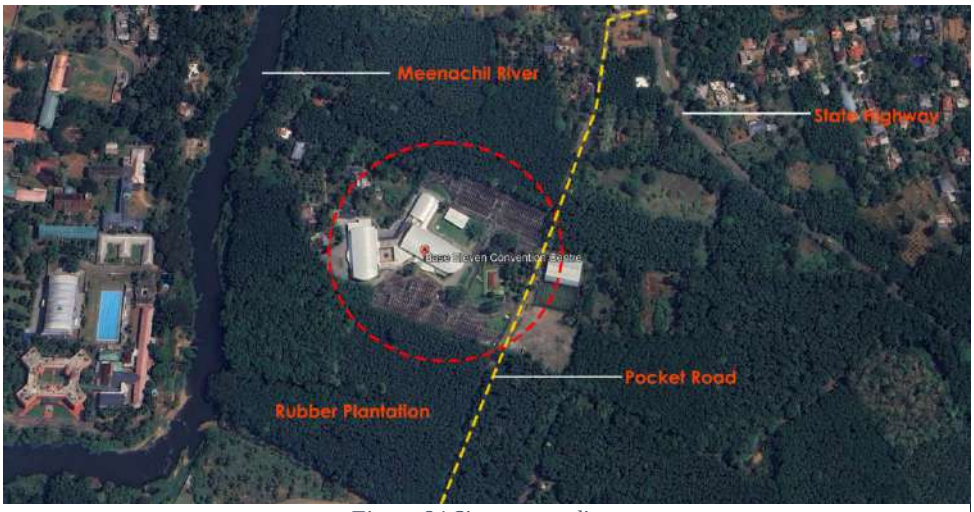


Figure 84 Site surroundings

surrounded with lush greenery with rubber plantations.and a River is passe\ing behind through the site.

4.1.4 Access & Approach

Located off the Kadappattoor–Velliappally Road, about 300 m from highway; access roads is somewhat narrower in parts.



Figure 85 Main entrance

Entry to the site is from East having Separate 2 entry and 2 exits.

Dedicated drop-off areas at each hall entrance ensure smooth guest arrival and segregation which have different drop off for each Hall.

Accessible for all age category people

4.1.5 Site Topography & Ecology



Figure 86 Site top view

Embedded in a tropical Kerala setting with landscaped lawns and mature vegetation. Open greens surround the built form, enabling natural shading and ecological integration.

Constructed 2 m height from normal ground level except parking areas considering the issue of flooding from the nearest river due to heavy monsoon climatic situation in kerala.

4.1.6 Architectural Style (Context)

Clean, Contemporary design with neutral tones, large expanses, and minimal pillars, reflecting modern Kerala architecture blending with traditional architecture influence offering a versatile space for coporate meetings majorly Christian weddings, cultural programs and grand celebrations.



Figure 87 Heritage home

One of the most heartwarming and unique elements of the project is the thoughtful integration of a 200 year old traditional Kerala Tharavadu—an ancestral home that carries generations of history. This charming wooden structure, complete with a classic clay-tiled roof, has been lovingly restored and now forms an integral part of the convention centre's design. Nestled within a lush nutmeg plantation, the house and its surroundings have been transformed into a beautiful, culturally rich event space. It's a space where tradition meets celebration, offering guests not just a venue, but an experience steeped in heritage and local identity.

4.1.7 Spatial Planning

Comprises 11 main event spaces ,including 3 main halls, a banquet hall,and a boardroom, central courtyard connecting 3 main halls, Amphitheatre, a pavilion, Traditional house using as a mini hall for various purposes plus outdoor lawns . Pillar-free configurations allow flexibility. Private waiting areas and a luxury lobby zone support arrivals and pre-function gatherings.

4.1.8 Form & Languages

The primary form comprises eleven spaces, independent, arranged within an open site, with unified facade language—simple, neutral, elegant interiors, and substantial roof overhangs.

4.1.9 Circulation



Figure 88 Building form

Each hall offers dedicated entry/drop-off, allowing parallel simultaneous events.



Figure 89 Drop off area

Pathways are barrier free environment with wheelchair-friendly and wide considering the accessibility of all group age category, enabling easy movements for event attendees.



Figure 90 Varandha

All halls are surrounded by verandas helps to connect with nature as a feel of outside with inside blending with nature.



Figure 91 Lift

Have 1 lift to reach banquet hall at 1st floor above the main lobby at entrance

4.1.10 Building Features & Facilities

- Lobby
- VIP Lounge
- Hall 1- can accommodate 1300 guests
- Hall 2 can accommodate 700 guests
- Hall 3 can accommodate 350-360 guests
- Administration Office
- 3 Banquet Hall
- Storage House
- Kitchen
- Courtyard
- Nut meg gardens
- Amphitheatre
- Pavilion
- Kerala Traditional Style House used as Meeting Room
- Parking facilities of 400+ Vehicles

Capacity: up to 5,000 guests overall, or 3,000 seated / 3,500 floating depending on arrangement.with hall one capacity of 1300 P and Hall 2 with 700 P and Hall 3 with 350-360 P which these halls are designed as multi purpose hall which can be used for different purposes.



Figure 94 Hall 1



Figure 93 Hall 2



Figure 92 Hall 3

Separate room are provided for administration works near to entrance.

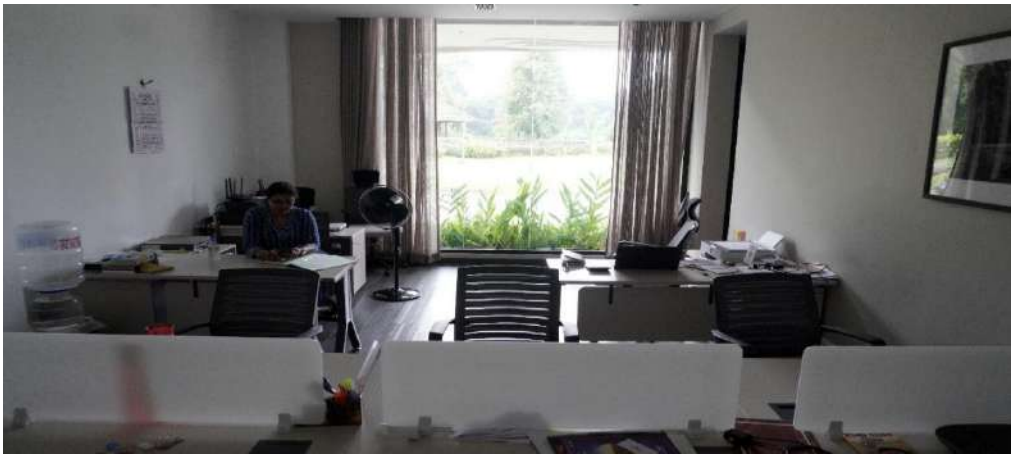


Figure 95 Administration office

*GG*Banquet hall provided with capacity of 150 P total and 50 p at each hall which located at 1st



Figure 96 Banquet hall

floor level above the office and VIP lounge which is separated with foldable doors.

Courtyard Integrating 3 hall which helps to use all the halls at a time and separately too which makes movements between halls very easy.



Figure 97 Courtyard

VIP Lounge given near to the entrance in front of the lobby for the special guests .



Figure 98 VIP Lounge

Separate toilets provided for men's, women's and disabled people.

Toilets are provided with proper service area for easy maintaince of pluming services.

5 Wash basins are provided at each toilets and 4 urinals in men's toilets and 3 European toilet.



Figure 99 Toilet

A Pavilion and a Amphitheatre is provided with attached toilets for outdoor events.



Figure 100 Pavilion

Nut meg gardens developed behind the traditional house for small outdoor events functions which also can be used for kids as a kids park



Figure 101 Heritage house

Traditional house of 200 year old heritage space is provided for photoshoots and small meetings

Parking: space provided for 400+ vehicular capacity which is common parking space for staffs ,2 wheelers and heavy buses.



Figure 102 Parking view

Features include valet parking, service staff support, and power back-up.

4.1.11 Architectural Details

Detailed Plan:

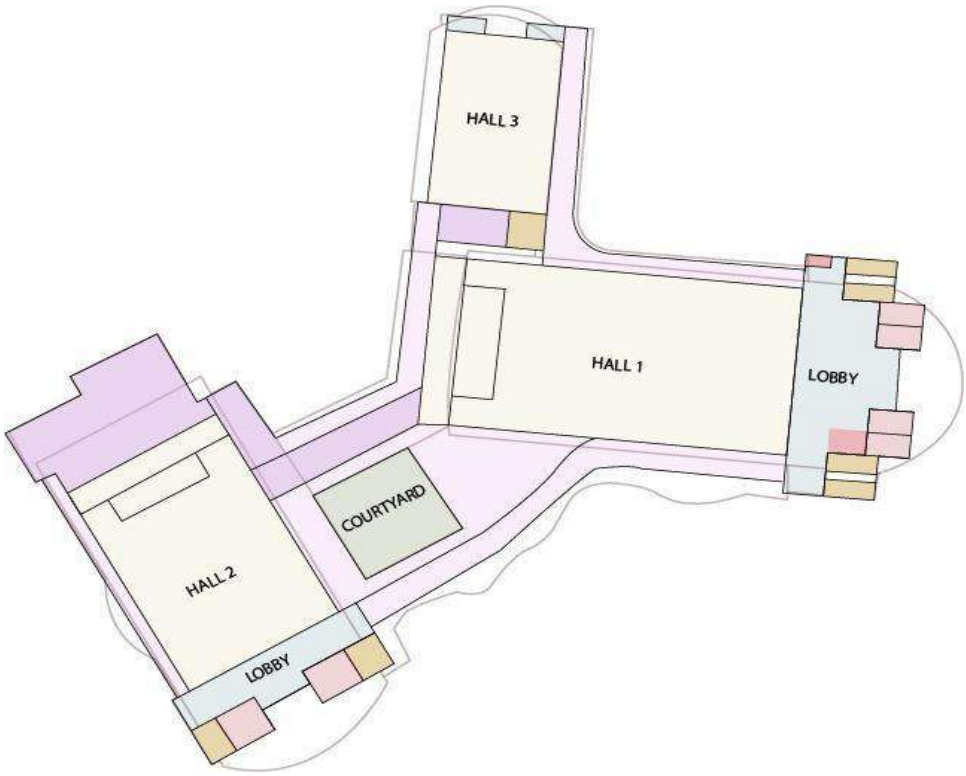


Figure 103 Plan

4.1.12 Interiors:

Soft, neutral finishes with uncluttered design lines. Lobby space offers upscale ambience. Exteriors appear clad with beige rendered finish; wide overhangs and deep recesses help climate adaptation.



Figure 104 Interior hall 1



Figure 105 Lobby view

4.1.13 Landscape Design

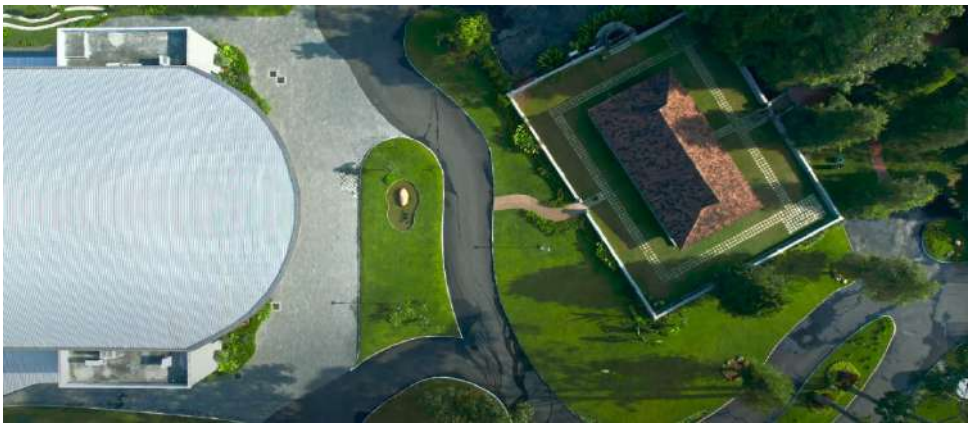


Figure 106 Landscaped design

Groundcover and lawns strategically placed around built elements, with mature trees retained or added. Green lawns serve as outdoor event zones. Planting buffers create scenic vistas and microclimate benefits. even street light have designed in a way that blend with fluidic design flow of building

4.1.14 Design Concept

The whole design is based on a 200 years old heritage house integrated with new contemporary design ideas with fluidic themes integrating in landscape and interior designs of the buildings to create a movements feels for users make exiting and attractive.

All main 3 hall connected with a courtyard makes a seamless connection with greenery, and easy movement between the halls.

A pillar-free, neutral aesthetic supports different event typologies while blending with Kerala's verdant setting.

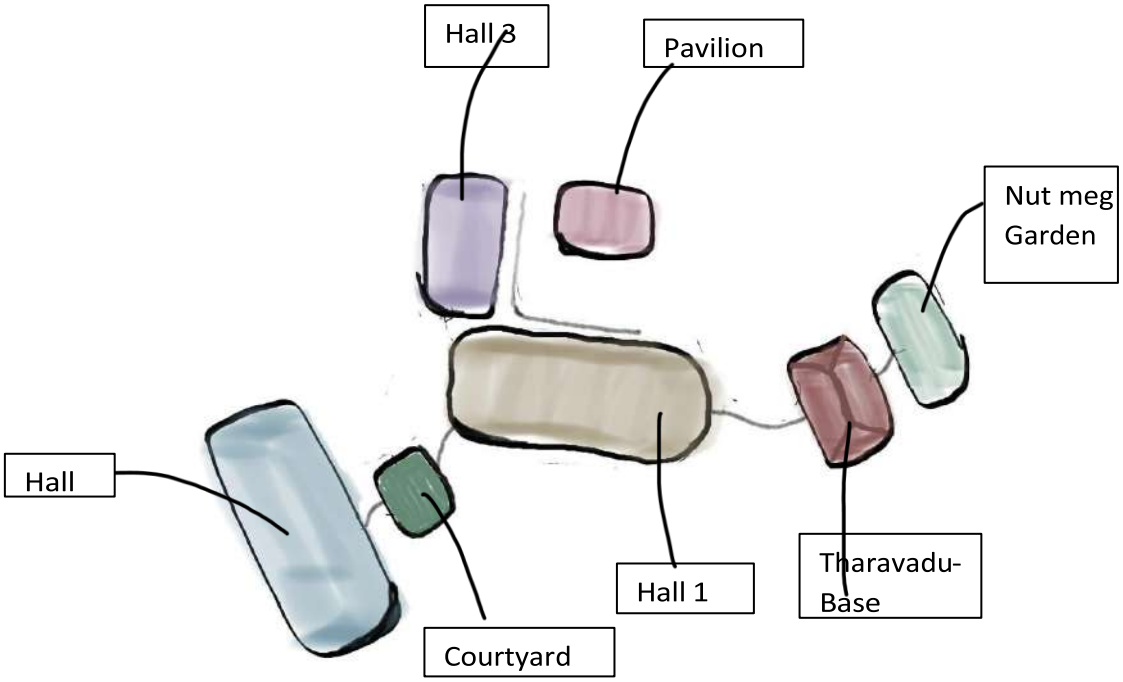


Figure 107 Concept

4.1.15 Materials Used

Used curved truss roof structure for span-free halls covering with GI sheets and ACP Sheets at roof borders and parametric design elements enhance the centre's contemporary yet contextually relevant appeal.. Textured painted external walls.

Fluidic designed carpets are used to match the theme of design.

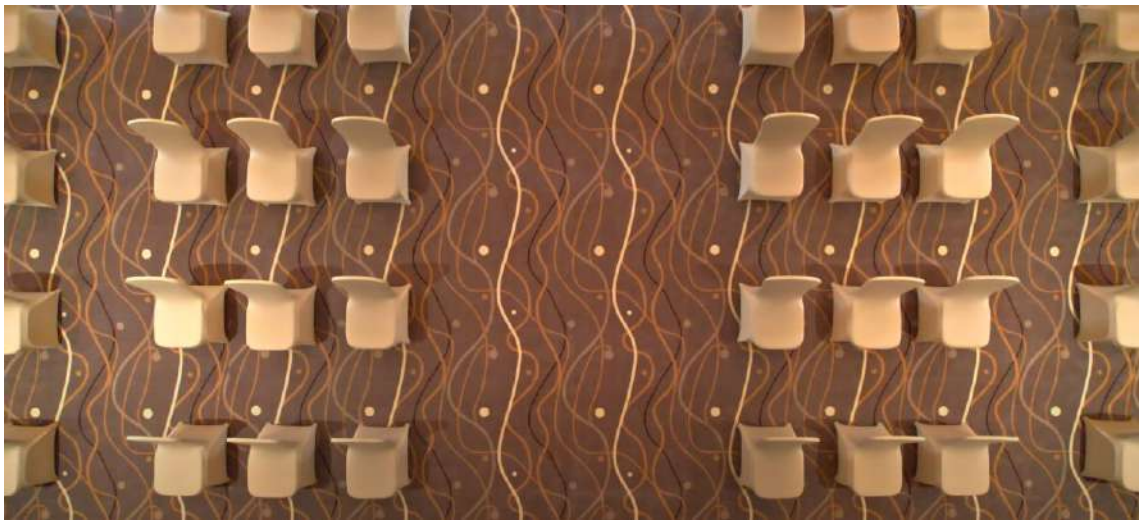


Figure 108 Carpet

Interior ceilings are designed with Gypsum board in custom fluidic designs.

Acoustic finishes in interior are done with texture paints at the wall of stages and board made with Coconut husk covered with pet panel fabric used as acoustic material in halls.

These materials are durable, climate-aware, and suited to high occupancy loads.



Figure 109 Ceiling & wall panels

4.1.16 Construction Techniques

Large-span hall construction—steel trusses frame to maintain pillar-free interiors. Prefabricated elements may speed up build time and maintain precision.

4.1.17 Building Services & Engineering Innovations

Smooth accessible circulation and drop-off logistics. Power back-up ensures uninterrupted services. Ventilation and HVAC systems serve large enclosed spaces efficiently (though specifics not published). Amenities include separate green rooms, bridal suites, staff support spaces. Foldable doors to separate banquet hall into 3 separate spaces. 1.5 lakh litre capacity rain harvesting tank and 3 diesel generators are placed behind the site near to the kitchen.



Figure 110 Diesel generators

Ceiling with Fabrics integrated with small motor fans to create a movement feel on ceilings.



Figure 113 Fabric ceiling

Separate service rooms have provided for Pluming services near to the washrooms.Fire



Figure 111 Service room



Figure 112 Fire Hose

Hose system is Hidden with transparent glass door fixed near to the columns.

4.1.18 Sustainability

Passive design via orientation, overhangs, landscaped greenery help reduce solar gain and moderate temperature. Natural shading and airflow are key. Outside catering permitted—reducing on-site load. Accessible design reduces necessity for mechanized movement systems. Power backup ensures resilience. Having 1.5 lakh litre capacity rain harvesting tank. Solar panels placed at minor scape on roof.

4.1.19 Inferences

Lighting features are done in a way which is hidden and not visible .which are in a warm tone gives aesthetic appeal to eyes of users.

There was no proper green room behind the stages.

Lack of storage area for keeping the things safely.

The chairs are not fixed or retractable thus we can use the hall for various purposes.

Not have any separate entrys or spaces created for VVIPs.

There was no proper security rooms or CCTV rooms provided.

No separate parking areas for 2 wheelers ,Staffs, Buses which can be used during wedding celebrations,VIP parking areas.

All spaces where accessible to all age category people by levelling the ground to the building for easy accessibility.

Given value for 200 year old heritage traditional house and major big trees without destroying its and integrated with the landscape.

No proper STP was provided

Separate place provided for recycling and decomposition of plastic wastes .

No separate rooms to accommodate workers

No separate entry to back house/kitchen

4.2 LULU BOLGATTY INTERNATIONAL CONVENTION CENTRE



Figure 114 Lulu international convention centre

Attribute	Details
Architect	Wimberly Allison Tong & Goo (WATG)
Area	26 Acres
Built in	April 2018
Floors	convention center is a single-storey structure.
Built-up Area	69,000 m² (~743,000 sq ft)
Facade	contemporary waterfront aesthetic design with large glass facades, expansive fenestration
Location	Cochin,Kerala
Architect	Wimberly Allison Tong & Goo (WATG)

Table 9 LULU ICC Introduction

4.2.1 Introduction

Lulu international convention centre is located on Bolgatty Island in cochin, Kerala. One of the largest convention centre with site area of 26 acres and 1,000,000 sq. ft. of customizable indoor and outdoor event spaces. And it can accommodate more than 12300 People at a time in total. Largest hall have 20000 sqft which can accomadate 10000 Peoples. The convention centre is spread across an area of 18 acres (73,000 m2) with a built-up area of 160,000 square feet (15,000 m2) with dinning facilities more than 2000 people at a time. The convention centre is attached with a 5 star hotel for accommodation purposes of guests which have 264 rooms and 4 luxury villas and 2 house boat with facilities including beautiful landscaped lawn and 4 multi cuisine restaurants, gym, Pools, Spa, Sauna etc. and have parking facilities which can accommodate 2000+ vehicles and 3 helicopters.

4.2.2 Site Plan



Figure 115 Site plan

Site area of 26 acres having ground coverage area of 5 acre

4.2.3 Context & Surroundings



Figure 116 Site surroundings

Location: Bolgatty Island, Kochi, Kerala, India.

Surroundings: Surrounded by the backwaters of Vembanad Lake, the site is rich in natural beauty and offers scenic waterfront views. Adjacent to the Grand Hyatt Hotel and Bolgatty Palace, it sits in a quiet, green island setting yet is close to Kochi city.



Urban Context: The area is a mix of heritage and urban development. LBICC integrates modern infrastructure with Kerala's cultural and environmental backdrop.
Quiet, scenic site with panoramic views of Kochi city skyline.
Positioned as a hub for MICE tourism (Meetings, Incentives, Conferences, Exhibitions).

4.2.4 Access and Approach

Primary Access: Connected via Goshree bridges from the city center (Ernakulam mainland).

Helipad access: Nearby for VVIP events

Waterway Access: Dedicated **jetty** for boat arrivals which have dedicated 2 boarding points for boats

Transport Connectivity: Accessible by road (30 min from Cochin International Airport), waterway (jetty access), and 3.7 km to Kochi Metro stations, 4.9 km to way station, 4.4 km to bus station .

Approach Drive: Landscaped drive leading to drop-off zones and dedicated entrances for different user groups (VIPs, delegates, logistics).

Entry Points: Segregated entries for guests, VIPs, and service vehicles, Have total 7 entry/exit gates to the convention centre which one entry is dedicated to services and VIPs.

4.2.5 Site Topography & Ecology

Topography: Relatively flat site on reclaimed island land.

Ecology: Surrounded by water bodies, the site integrates well with its sensitive ecology using buffer landscaping and water management systems.

Natural Features: Retains some native vegetation and incorporates water-sensitive design principles.

4.2.6 Architectural Style (Contextual)

Stylistic Blend: Contemporary architectural style with subtle references to traditional Kerala architecture in materiality and climate responsiveness.

Figure 117 Site topography

Contextual Response: Reflects a balance between modern international standards and the cultural context of Kochi.

4.2.7 Form & Language

Form: Modular rectilinear blocks with wide spans, sleek horizontal lines, and fluid internal spaces.



Figure 118 Lulu bolgatty international convention centre

Architectural Language: Use of glass, concrete, metal panels with clean facades. Grand volumes and curved roof elements reflect maritime and coastal influence.

4.2.8 Spatial Planning

Main Zones:

- Grand Ballroom
- Convention areas
- Pre-function lobby
- 6+ Breakout / Meeting Rooms
- Banquet areas
- Outdoor waterfront lawn for events
- Hotel

Zoning: Public, semi-public, private (VIP + service)

Integration: Seamless link to Grand Hyatt hotel for accommodation and shared services

4.2.9 Circulation

Horizontal Circulation: Wide corridors, pre-function areas, separate movement for service and delegates.

Vertical Circulation: 6 Service lifts, 8 guest lifts, 2 escalators and staircases provided for efficient and barrier-free access.

Vehicle Movement: Segregated vehicular zones for VIPs, service, and guest arrivals.

Entry and Exits

There are 7 entries to the site.

Gate-1- For heavy vehicles especially for water tankers

Gate- 2- Service gate to back in house of hotel and VIP villas entry

Gate 3- Entry to car parking area in front of convention centre

Gate 4 –To the hotel entrance

Gate 5- for fire brigade services

Gate 6- VIP access

Gate 7- Entry for helicopter access.

4.2.10 Building Features

- **Main Hall Capacity:** Up to 10000 people (column-free). With retractable chairs can divide into 3 separate halls, having column-free span with divisible acoustic partitions
- **Plenary Halls:** Divisible into 3 smaller units, can accommodate 2000 people
- **Grand Ballroom:** Soundproof and acoustically treated. Divisible into 2 smaller units can accommodate 300 people, have 10 meters height ceiling
- **Pre-function Areas:** Large, glass-lined with views of the backwaters.
- **Acoustics:** High-performance sound insulation and AV systems
- **Lighting:** Adjustable ambient and event-focused systems
- Have meeting rooms and special villas in 2 private boats
- Roof top bar and colony restaurant

4.2.11 Facilities

1. **Convention halls** (Liwa-10000 P, Vembanad- 2000 P, Grand ballroom- 300 P)



Figure 119 Hall LIWA

The Liwa Ballroom offers an expansive 2,419 sq. m. of beautifully designed, flexible event space, making it ideal for everything from grand weddings to elegant corporate gatherings. Welcoming guests in style, the venue also includes a spacious 875 sq.m. pre-function area — perfect for guest arrivals, casual mingling, or stylish cocktail receptions.

Thoughtfully planned for comfort and convenience, Liwa also features a private green room, a luxurious bridal suite, and exclusive VIP meeting rooms, ensuring every moment — from behind the scenes to center stage — runs smoothly.



Figure 120 Vembanad ballroom

Vembanad Ballroom is a spacious, pillar-less hall with beautiful backwater views, covering 1,800 sq. m. It includes a large pre-function area of 1,110 sq. m and can host up to **2**,000 guests**.** The hall can be divided into three smaller spaces, with washrooms conveniently placed on one side. A wide foyer area is perfect for live food stations and buffet setups, making it ideal for both grand and intimate events.

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 of less than 800 guests.



Figure 121 Grand ballroom

4.2.11.1Convention Centre Layout

Ground Floor

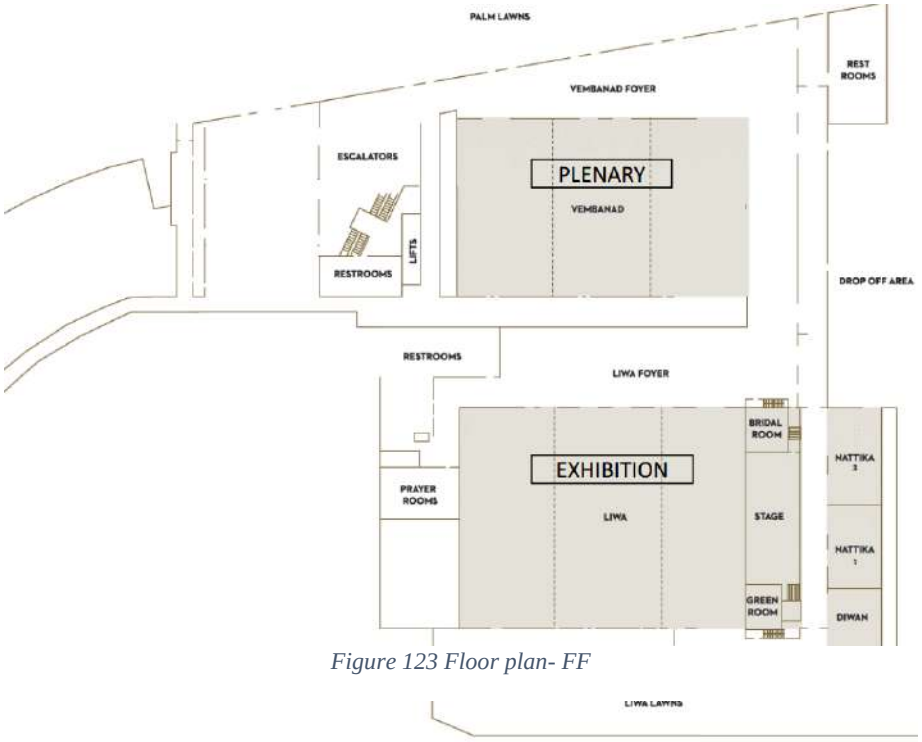
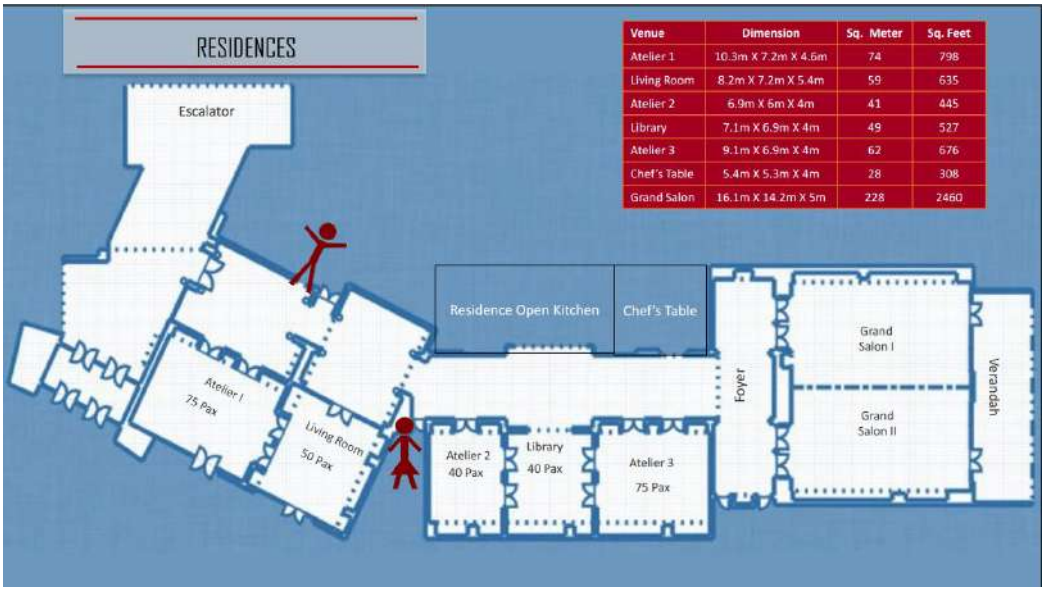


Figure 123 Floor plan- FF

First Floor

4.2.11.2Seating Capacity

2. Restaurants



Venue	Dimension	Sq. Meter	Sq. Feet
Atelier 1	10.3m X 7.2m X 4.6m	74	798
Living Room	8.2m X 7.2m X 5.4m	59	635
Atelier 2	6.9m X 6m X 4m	41	445
Library	7.1m X 6.9m X 4m	49	527
Atelier 3	9.1m X 6.9m X 4m	62	676
Chef's Table	5.4m X 5.3m X 4m	28	308
Grand Salon	16.1m X 14.2m X 5m	228	2460

Figure 122 Floor plan- GF

ROOM NAME	ROOM DIMENSIONS L X W X H	ROOM SIZE SQM / SQFT	BANQUET	RECEPTION	THEATRE	CLASSROOM
GROUND LEVEL						
LIWA	59m x 41m x 8m	2419 26028	1300	3000	2800	1200
LIWA I	59m x 41m x 8m	779 8382	400	950	800	350
LIWA II	16m x 41m x 8m	656 7059	330	750	700	300
LIWA III	17.5m x 41m x 8m	718 7720	390	875	750	325
LIWA FOYER	52.7m x 12m	632.4 6805	-	750	-	-
LIWA LAWNS	64m x 18m	1152 12396	300	700	-	-
DIWAN	9m x 9.1m	81.9 881	-	270	-	-
NATTIKA	26.7m x 8.2m x 5m	218.94 2356	120	130	220	100
NATTIKA I	14.4m x 8.2m x 5m	118.08 1271	60	120	120	50
NATTIKA II	12.1 x 8.2 x 5	1782 1068	50	2200	100	45
VEMBANAD	54m x 33m x 8m	1824 19174	950	660	2200	850
VEMBANAD I	17.5m x 33m x 8m	577.5 6214	300	740	600	260
VEMBANAD II	18.5m x 33m x 8m	610.5 6569	330	740	650	270
VEMBANAD III	18m x 33m x 8m	594 6391	330	1100	620	260
VEMBANAD FOYER	100m x 10m	1000 10760	-	-	-	-

Figure 124 Seating Capacity

a. **Colony Clubhouse & Grill:** Located on the rooftop, this classic old world grill room with just a hint of local flavor. With colonial and Arab influences and an emphasis on seafood.



Figure 125 Colony restaurant

b. **Colony bar**: Luxury at The Colony Bar with breath-taking waterfront views, bar offers a refined atmosphere, harmonizing modern design with local charm.



Figure 126 Colony bar

c. **Malabar Cafe :** located at first floor level Drawing on the city's culinary and cultural legacies, fired with Malabar spices, Malabar Cafe offers a relaxed and quintessentially South Indian experience.



Figure 127 Malabar cafe

d. **Thai Soul:** located at ground floor inspired by the vibrant streets of Bangkok, Thai Soul is a casual poolside dining space. The aroma of fresh Thai herbs and flavours comes alive in the live kitchen, creating a multi-sensorial experience for guests.



Figure 128 Thai restaurant

3. Outdoor event lawns

Adjacent to Lulu Bolgatty International Convention Centre, expansive palm lawns set the mood for tropical celebrations. The beautifully lanscaped lawns, set against Kochi's backwaters transform in to a dreamy wedding venue.



Figure 129 Lawn

4. Pool

2 Pools provided at indoor and outdoor. Outdoor pool designed according to the landscape design. Indoor pool have water capacity of 1.5 lakh cum. And temperature maintained at 30 degree Celsius.



Figure 131 Outdoor pool



Figure 130 Indoor pool

5. **Parking:** 2000+ vehicles, 3 helicopter and 2 boats, basement parking 450 vehicles for staffs.



Figure 132 Surface parking

6. Rooms (264 rooms)

Rooms categorised into the following:



Figure 134 Rooms

1. **Grand Rooms:** 41 sq. m room are equipped with a plush king/twin bed, modern décor and a luxurious bathroom.



Figure 133 Basement parking

2. **Grand Suite:** The suite is elegant in its décor and is luxuriously decorated. These 82 sq. m. (875 Sq. Ft) suites come with a lounge area and magnificent glass windows offering views of the Vembanad Lake.

3. **Grand Executive Suite:** This superior category suites measure 240 sq. mt (2585 Sq. Ft) and has a panoramic Vembanad lake view. This luxurious suite has a living and a dining room, the kitchenette is well furnished with a coffee machine, refrigerator, microwave oven, toaster, built-in induction hob with a built-in hood. There is also a powder room, luggage area and a separate entertainment area with a private balcony.

4. **Presidential Suite:** his suite redefines luxury in a whole new perspective. Located on the 7th floor this exclusive suite has an unparalleled view of the Vembanad Lake. A 318 sq. m. (3420 Sq. Ft) is elegance personified. This category of suite also has two bedrooms with bathroom and walk-in-closet, an entertainment area, living and dining room with balcony, a powder room and a well-furnished kitchenette with a coffee machine, refrigerator, microwave oven, toaster, a built in induction hob, a built in hood. Elegance and style with comfort is the idea behind the spaciously done bathrooms. The suite has an adjoining Grand View room and the entire area can be converted in to a single private area if required.

7. Villas

The essence of the Villas is in its blissful serenity. As you will see the villas are a rare combination of style meets purpose. The villas are named after spices and offers luxurious rooms with modern furnishings, plunge pool and a private balcony overlooking the Vembanad lake. The villas also offers a library, walk-in-wardrobe and dining space equipped with microwave and dishwasher. All villas also have a maid's room with separate washroom.



Figure 135 Villa room

We have two categories of Villas –

• 2 BHK villa offers214 sq. m. (2300 sq. ft.) space

• 3 BHK Villa offers287 sq. m. (3100 sq. ft.) space

8. Spa



Figure 136 Spa

Set on the backdrop of serene backwaters of Kochi, the santata spa at Grand Hyatt Kochi Bolgatty is an International spa offering a modern wellness experience with traditional Ayurveda treatments.

9. Boats with meeting hall and bedroom facilities



Figure 137 Water boat

10. Gym



Figure 138 Gym

4.2.12 Architectural Details

Roofing: Long-span steel trusses and concrete slabs for large column-free spaces.

Facade: Glazed curtain walls with shading elements.

Structure: RCC with steel trusses (for long spans)

Interior Finishes: veneer panellings and acoustic ceilings

Acoustics: Sound insulation with high-performance materials in auditorium spaces.

4.2.13 Design Concept

Theme: "Global meets Local" – The design merges international functionality with Kerala's coastal vernacular.

Experience Driven: Prioritizes user comfort, scenic views, and large uninterrupted spaces.

Flexible Use: Designed to host international events, weddings, exhibitions, and conferences with reconfigurable halls.

4.2.14 Construction Techniques

Modular Construction: Precast elements and modular units used for speed and efficiency.

Long-Span Technology: Steel trusses used for creating large column-free halls.

Glass Facade: Double-glazed units with thermal insulation

4.2.15 Landscape Design



Figure 139 Landscape

Design: Lush, tropical landscaping with native species.

Features: Water bodies, walkways, outdoor seating zones, courtyards.

Integration: Landscaping buffers surrounding the building and along approach roads help in microclimate control and noise reduction.

4.2.16 Materials Used

RCC Structure

Structural Steel Trusses (for long spans)

Glass and Aluminium Composite Panels

Polished stone and vitrified tiles

Timber (for interior panelling and detailing)

Acoustic Panels and Insulation.

4.2.17 Engineering Innovations

Column-Free Span: Engineering of large halls with no internal supports for unobstructed views.

Smart Controls: Building Management System (BMS) for lighting, HVAC, and safety.

Floating Foundation: To counter high water table due to backwater location.

4.2.18 Building Services

ICT: High-speed internet, audio-visual infrastructure, control rooms.

HVAC: Centralized air-conditioning with VAV systems.70% electricity is utilised for HVAC,MS pipe used for HVAC ducts



Figure 140 HVAC room

Electrical: Smart lighting controls, backup generators, UPS systems. 2 Air cod transformer is used which the speciality is it can be kept indoor environment having capacity of DG head- 2000 KVA. And 1500 KVA capacity for 4 diesel generator.



Figure 141 Electrical room

Fire Safety: Sprinkler system, fire exits, smoke detection, hydrant network. 11 bar pressure used for fire hydrant.

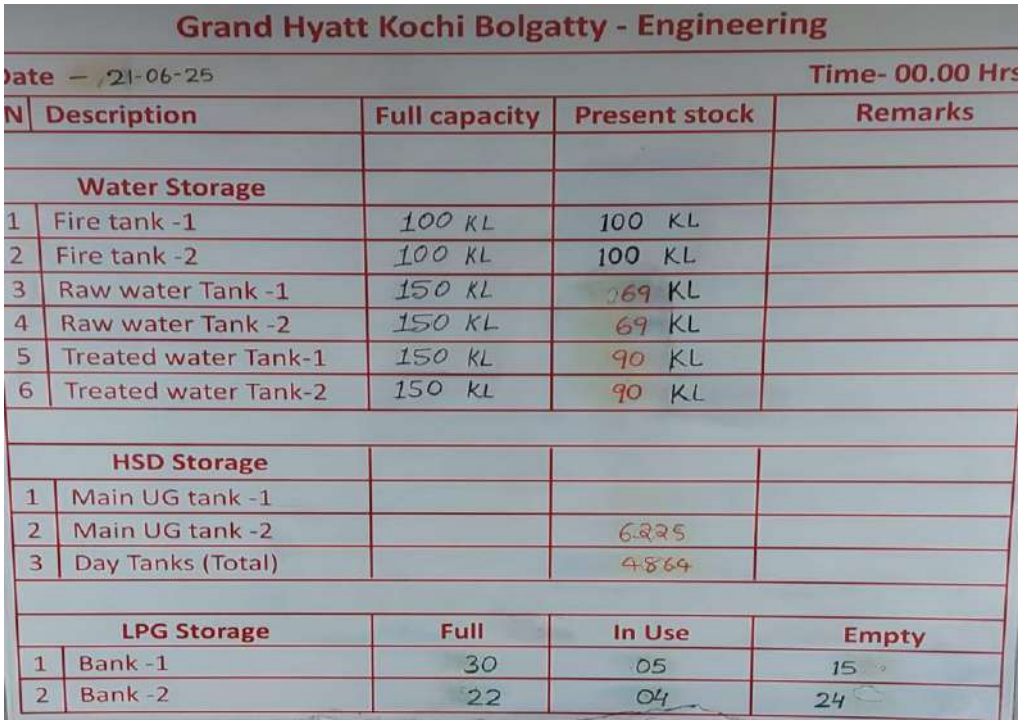
Have provided 2 fire tank with tank capacity of 100 KL.



Figure 142 Fire room

Water Supply & Drainage: Rainwater harvesting, sewage treatment plant (STP) provided.

Water from STP used for landscape maintaince.



Grand Hyatt Kochi Bolgatty - Engineering

Date – 21-06-25 Time- 00.00 Hrs

N	Description	Full capacity	Present stock	Remarks
	Water Storage			
1	Fire tank -1	100 KL	100 KL	
2	Fire tank -2	100 KL	100 KL	
3	Raw water Tank -1	150 KL	069 KL	
4	Raw water Tank -2	150 KL	69 KL	
5	Treated water Tank-1	150 KL	90 KL	
6	Treated water Tank-2	150 KL	90 KL	
	HSD Storage			
1	Main UG tank -1			
2	Main UG tank -2		6.225	
3	Day Tanks (Total)		4864	
	LPG Storage	**Full**	**In Use**	**Empty**
1	Bank -1	30	05	15
2	Bank -2	22	04	24

Figure 143 Storage capacities

2 tanks with capacity of 150 kl provided to store the treated water and raw water separately

Mainly 3 purposes water tanks are used. 1 Raw water tank having capacity of 150 cum and 2 domestic water tank and 3 for common purposes with capacity of 150 cum.

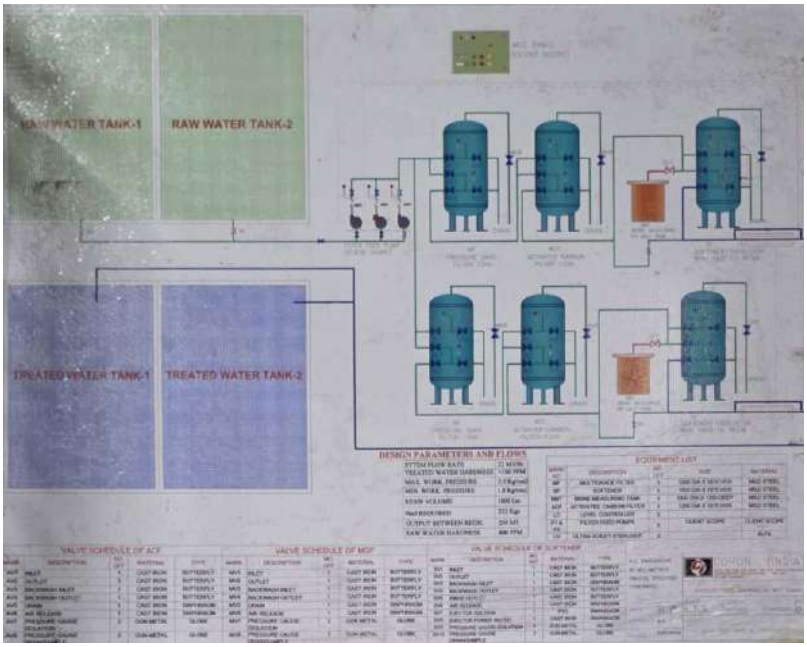


Figure 144 water tank chart

Gas system: 2 gas bank provided with storage capacity of 30kg sand 22 kg.



Figure 145 Gas yard

Diesel storage: diesel yard is provided at ground level near to the service entry



Figure 146 Diesel yard

4.2.19 Sustainability

Have achieved green building IGBC certification.

Rainwater Harvesting have tank capacity of 1.5 lakh litre capacity

STP for Greywater Recycling reused for watering garden

Energy-Efficient Lighting by using LED lightings, smart energy management

Natural Lighting through Skylights & Glass Facades.

Landscape Cooling and Microclimate Improvement using local climatic suitable plants.

Low VOC paints and other Materials Used in Interiors used for walls and furniture.

Waste Management Systems are efficiently used

4.2.20 Inferences

The site is of 26 acres and for travelling with the there is no any shuttle services arranged

The entry for VIPs and services given at one single gate only

The inclusion of landscaped outdoor areas and waterfront views enhances the experiential quality of events, blending built and natural environments. And Landscape design blend with curved form of building.

The convention centre also reflects sustainable design practices**,** achieving IGBC Gold certification**,** through energy-efficient systems, eco-friendly materials, and effective water management

DESK APPRAISAL

4.3 CAPITAL INTERNATIONAL EXHIBITION AND CONVENTION CENTRE



Figure 147 Capital International Exhibition and Convention Centre

4.3.1 Introduction

The Capital International Exhibition and Convention Centre (CIECC), designed by Zaha hadid Architects represent a futuristic approach in convention centre design. CIECC is the largest single-building comprehensive exhibition venue with the most perfect functions and the most advanced technology in Beijing. This is a project which expanded the existing infrastructure to 611,000 square meters which integrated with technology, sustainability, architectural fluidity which became a landmark for large scale exhibition cum convention venue. It has achieving the highest certification under China's Green Building Program. CIECC includes one convention centre, one hotel, nine pavilions, and three entry halls, with indoor exhibition area of approximately 210,000 square meters and an outdoor exhibition area of 50,000 square meters. The convention centre has floor area of 50,000 square.

4.3.2 Site Plan

4.3.3 Context and Surrounding

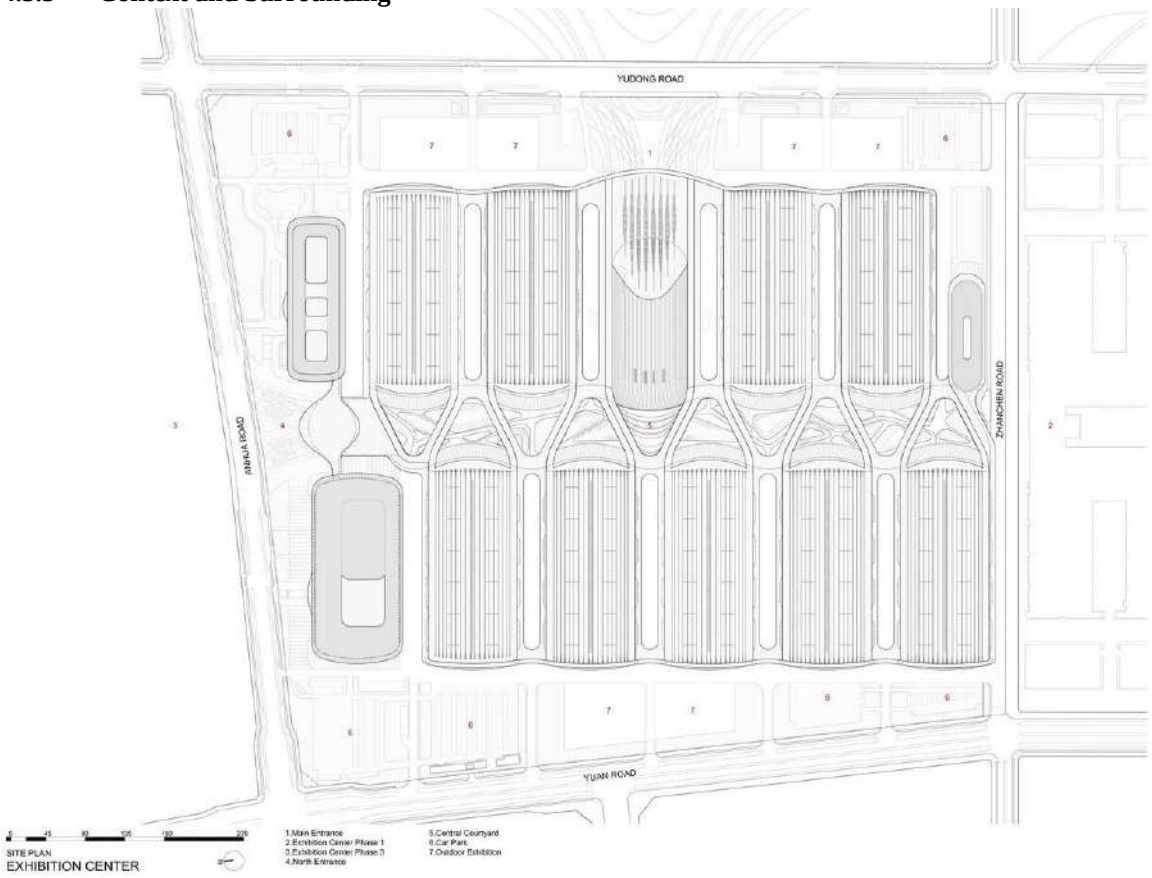


Figure 148 Site plan

A leading centre of commerce, culture and government, Beijing has seen significant growth in the city's service and digital technology industries. This continued expansion of Beijing's corporate sectors has increased demand for the city to host conventions, international conferences and industry expos attended by delegates from throughout China and around the world.

Located in Beijing's Shunyi District. It is strategically located in the heart of a city of major economic and cultural influence, a veritable crossroads for business in Asia. Its proximity to key infrastructures such as international hotels, business centres, innovation hubs and cultural sites further enhances its appeal to event organisers.

4.3.4 Access and approach

The Capital International Exhibition Convention Centre is in close proximity to major transport routes and just 2 km from Beijing International Airport, providing easy access for both domestic and international visitors.

Just 2km from Beijing International Airport
Direct access to the metro: via line 15 of the Beijing metro
Mainly 2 entrances to the site, main entrance from east and second one from north side.

4.3.5 Architectural Style



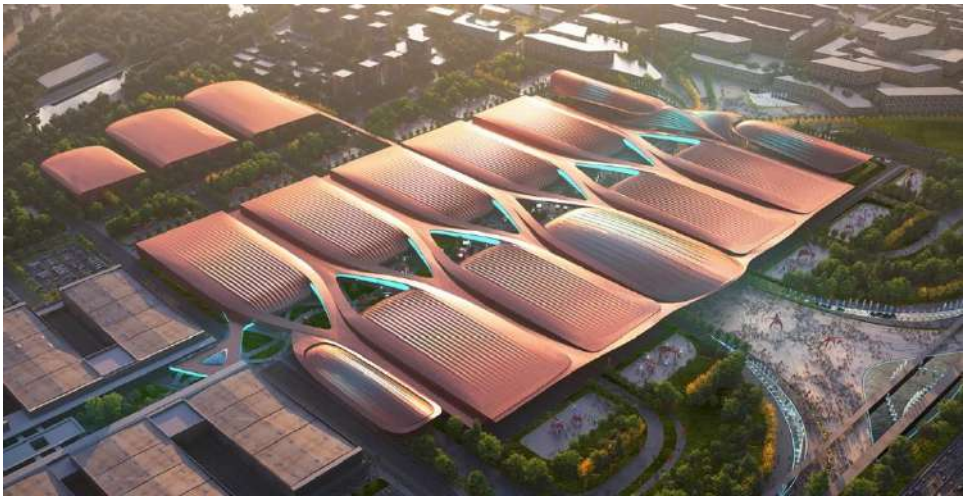
Figure 149 Architectural style

The Capital International Exhibition and Convention Center is a paradigm of futuristic exhibition center design, setting new standards in architectural fluidity, operational efficiency, and environmental responsibility.

This distinctive exterior design enhances the building's identity while optimizing natural light penetration. The interplay of materials and geometric precision reflects Zaha Hadid Architects' signature style, merging sculptural aesthetics with advanced engineering solutions.

4.3.6 Form & Languages

A Dynamic Architectural Language Inspired by Movement which is designed as an interwoven system of 'ribbons' that connect various facilities. Elevated bridges facilitate indoor circulation



between exhibition halls, the conference center, and the hotel, creating a fluid transition between spaces.

Figure 150 Form

4.3.7 Circulation

The Capital International Exhibition and Convention Centre (CIECC) is thoughtfully designed around a central courtyard, where ribbon-like bridges connect the exhibition halls, conference centre, and hotel—allowing smooth indoor movement across all facilities. Located on the north side, the hotel and conference centre frame a public square ideal for exhibitions and gatherings. Circulation is smartly organized with separate routes for people, goods, and vehicles to ensure seamless flow and minimal disruption during events. A clear north-south axis links all nine halls, offering intuitive navigation, flexibility, and vibrant outdoor spaces for interaction.

4.3.8 Building Features

The centre's fluid architectural language and pleated, deep copper-coloured facade incorporating large, recessed windows, have been designed to balance the CIECC's immense industrial scale and materiality.



Figure 151 Building features

4.3.9 Facilities

- **Exhibition areas**: 346,500 sq.m including **9 exhibition halls**: 23,000 sq.m each and **22 meetings rooms**
- **Convention Center:** 15,000 sq.m including **35 meeting rooms**
- **Conference Centre:** area: 44,000 sq. m
- **Hotel:** 410 rooms – area: 48,000 sq. m
- **Outdoor esplanade:** 50, 000 sq.m
- **Basements:** 205,200 sq. m

Types of Events Hosted in the convention centre are Exhibitions, conferences, trade fairs, sports events, concerts, shows, seminars

4.3.10 Architectural details

Exhibition centre:

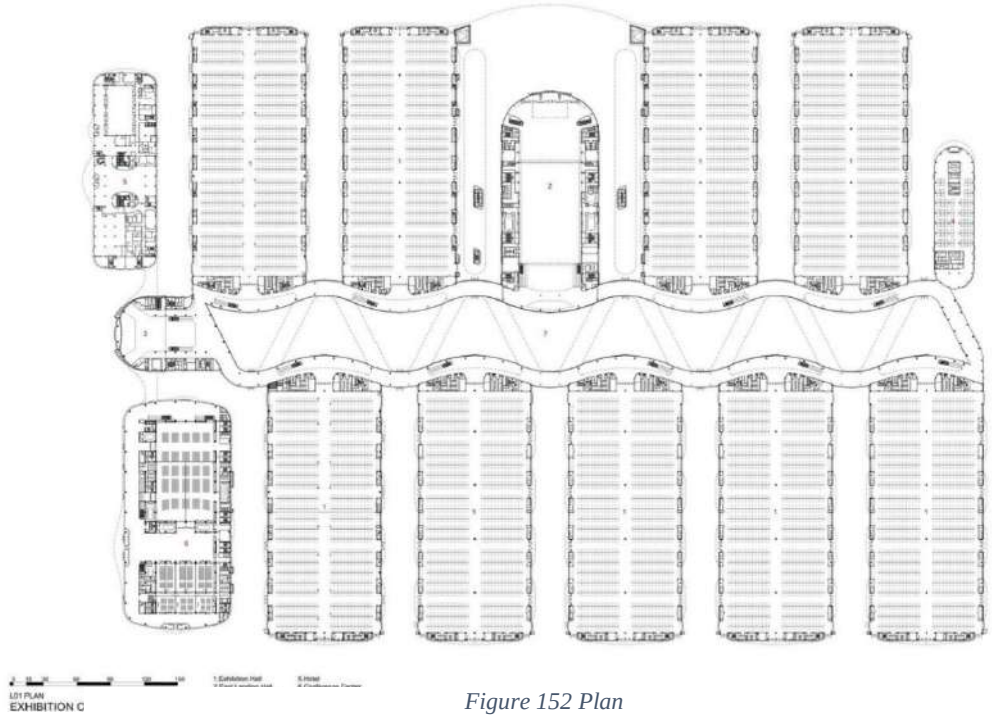


Figure 152 Plan

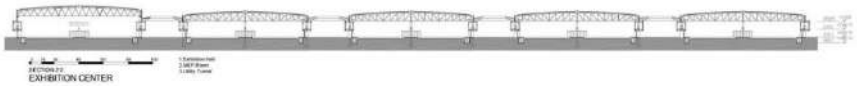


Figure 154 Elevations

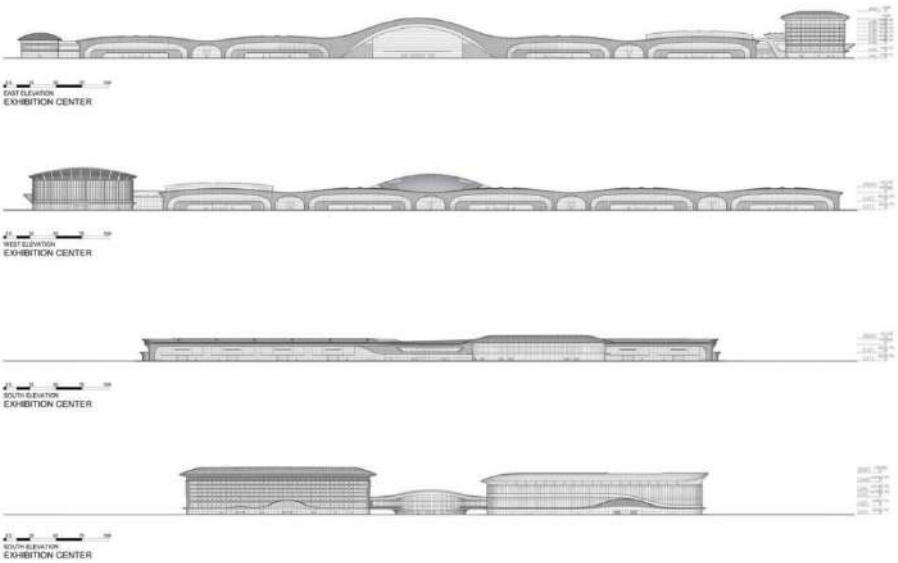


Figure 153 Sections

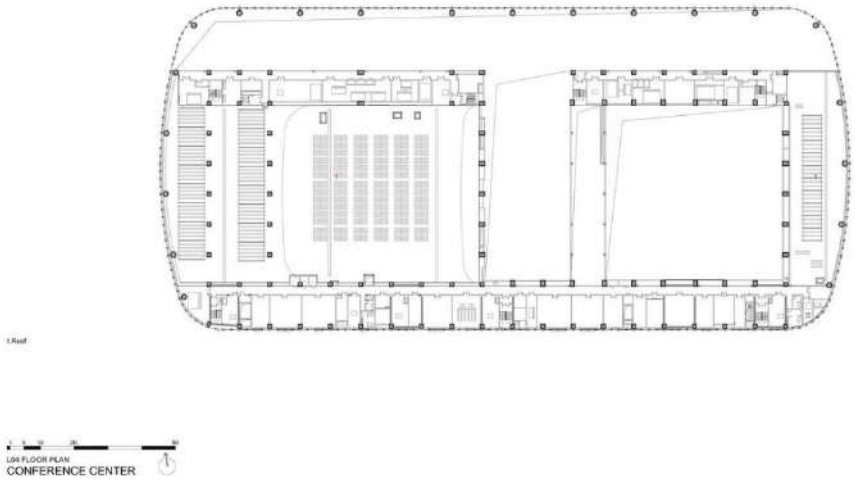


Figure 160 Third floor



Figure 157 Ground Floor plan

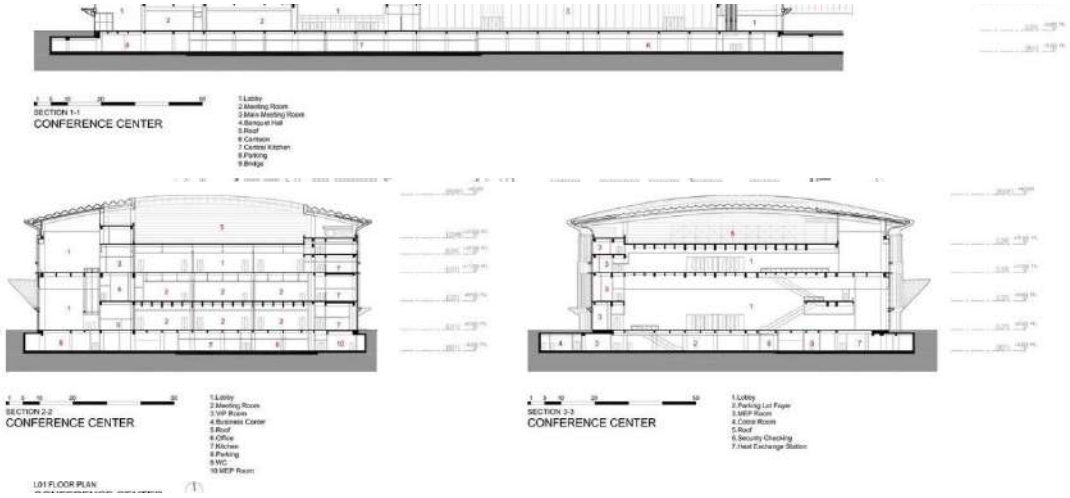


Figure 158 Sections

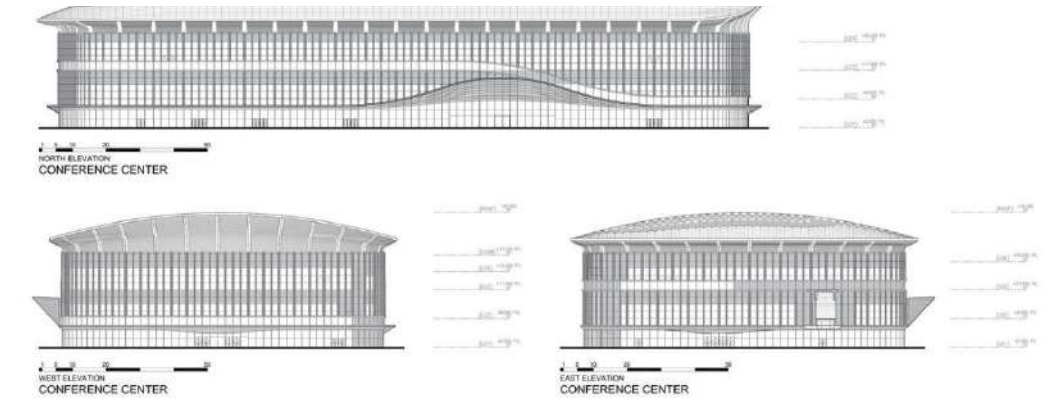


Figure 159 Elevations



Figure 156 Second Floor plan

Conference centre:

4.3.11 Design Concept

The design of convention cum exhibition centre is inspired by traditional Chinese elements, in particular the glazed tiles emblematic of the Imperial Palace.

4.3.12 Construction Techniques and Materials

CIECC's roof system incorporates symmetric geometries that create an insulated, lightweight, and large-span structure, allowing for column-free exhibition spaces. This innovative structural approach enables the venue to adapt rapidly to changing exhibition requirements, maximizing functional flexibility. The modular construction methodology not only reduces development time and investment costs but also ensures an efficient and scalable expansion model for future growth.

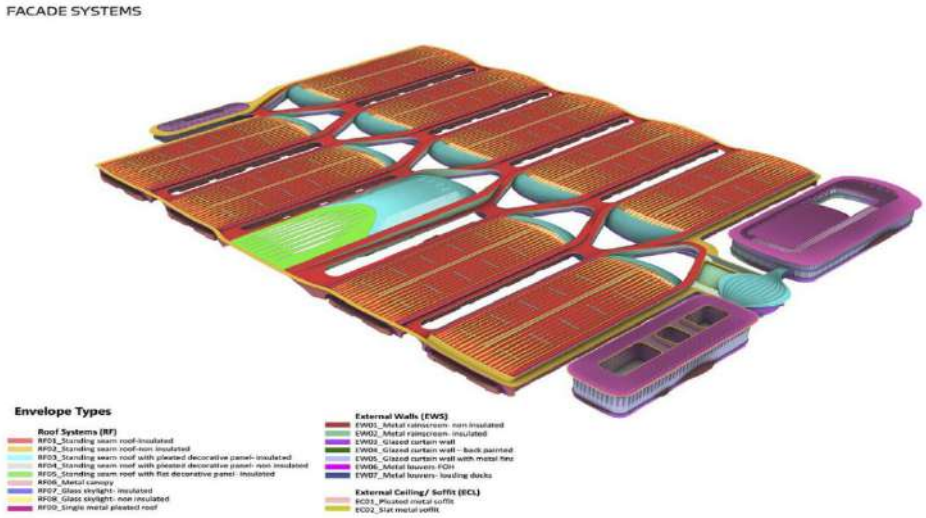


Figure 161 Building materials used

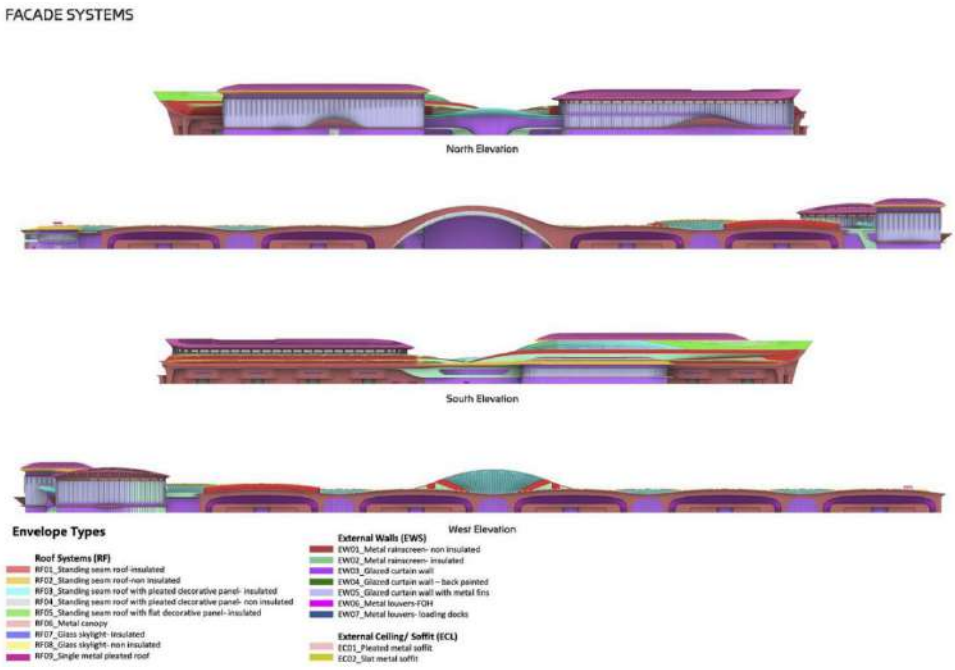


Figure 162 Facade materials

4.3.13 Sustainability

The CIECC sets a benchmark in sustainability, earning China's highest green building certification. The centre uses smart building management systems with hybrid ventilation, ensuring optimum natural ventilation supported by high efficiency HVAC equipment to enhance indoor air quality and minimise energy consumption. Rainwater collection throughout CIECC's extensive footprint, grey water recycling, and photovoltaics for on-site energy generation will reduce water and energy demand from the city's municipal supply.

4.3.14 Inferences

The clear north-south axis and bridge connections between exhibition halls, hotel, and conference centre allow smooth circulation and easy navigation across the site.

Fluidic design in ribbon design create a sense of motion to the spaces while moving through the spaces.

Minimum accessibility to the site makes traffic flow difficult

A courtyard designed makes a central space to connect all the spaces together and surrounding gardens offers well-designed outdoor event spaces that encourage social interaction and flexibility.

Features like smart HVAC systems, hybrid ventilation, solar panels, rainwater harvesting, and greywater recycling show a strong commitment to environmental sustainability.

Segregated routes for pedestrians, goods, and vehicles improve safety, logistics, and operational efficiency.

High-performance technologies requires consistent technical upkeep and skilled facility management, potentially increasing operational costs.

High construction costs and complexity, which may affect long-term maintenance and budget efficiency.

4.4 BHARAT MANDAPAM



Figure 163 Bharat Mandapam

Attribute	Details
Architect	*NBCC (India) Ltd.* in collaboration with architect *Suresh Goel* (CPWD)
Area	123 Acres
Built in	July 2023
Height	36 meters
Floors	G+3 floors (including basement levels)
Built-up Area	Approximately 120,000 sq.m.
Facade	Inspired by the Ashoka Chakra and Sanchi Stupa, it incorporates *jali work*, stone cladding, and LED-illuminated surfaces
Location	Pragati Maidan, New Delhi, India

Table 11 Barath mandapam Introduction

4.4.1 Introduction

Bharat Mandapam is an exhibition hall located within the confines of the Pragati Maidan complex in New Delhi, India. It is one of the largest convention centres of India. The term Bharat Mandapam derives its root from Lord Basaveshwara's idea of Anubhav Mandapam, which was a pavilion for public ceremonies. it stands on the site of the former Hall of Nations, a distinct architectural addition to the Pragati Maidan project.

4.4.2 Site Plan

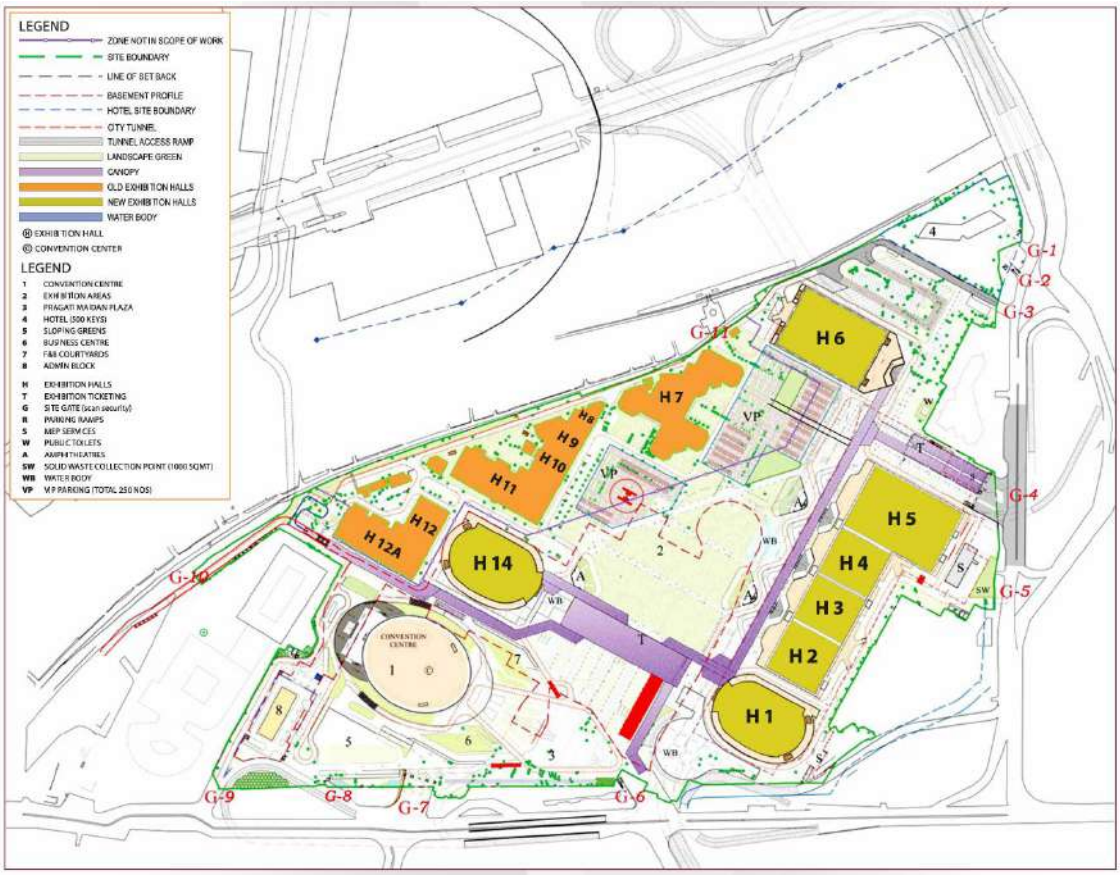


Figure 164 Site plan

4.4.3 Context and Surrounding

Situated along Mathura Road, Bharat Mandapam benefits from excellent connectivity to major roads, railways, and metro networks. It lies in close proximity to several national landmarks, including India Gate, Rashtrapati Bhavan (President's House), Purana Qila (Old Fort),Supreme Court of India the site is part of Central Delhi's institutional and cultural district, making it symbolically important as a venue for both international and national events, including the G20 Summit. Surrounding Built Environment are mixed-Use Urban Fabric surroundings include government buildings, museums, cultural institutions, and commercial spaces. And Lush Green Spaces such as Lutyens' Delhi, with tree-lined avenues, gardens, and lawns that enhance the ecological setting. And site is located not far from the eastern edge of the city near the Yamuna, allowing for good air circulation and natural ventilation. and in the perspective of Cultural and Social Context Bharat Mandapam is located within a heritage-rich zone, surrounded by Mughal and Colonial-era architecture. It stands as a symbol of India's identity and progress, bridging tradition and modernity. The site has historically hosted trade fairs, exhibitions, and diplomatic events, positioning it as a cultural melting pot

4.4.4 Access and approach

It have 11 Entries and Exits
Gate 4, 5,10 and 7 is used for visitors with shuttle service
Gate 1 and 2 used for hotel entry

Gate 3 used as service entry
Pragati Maidan is accessible via the Supreme Court station of Delhi Metro. It is located adjacent to Gate 10 of the complex. Hazrat Nizamuddin railway station of the Indian Railways network is about three kilometres away. When exhibitions and events are underway, visitors can also enter through Gate number 4, located on Bhairon Marg.

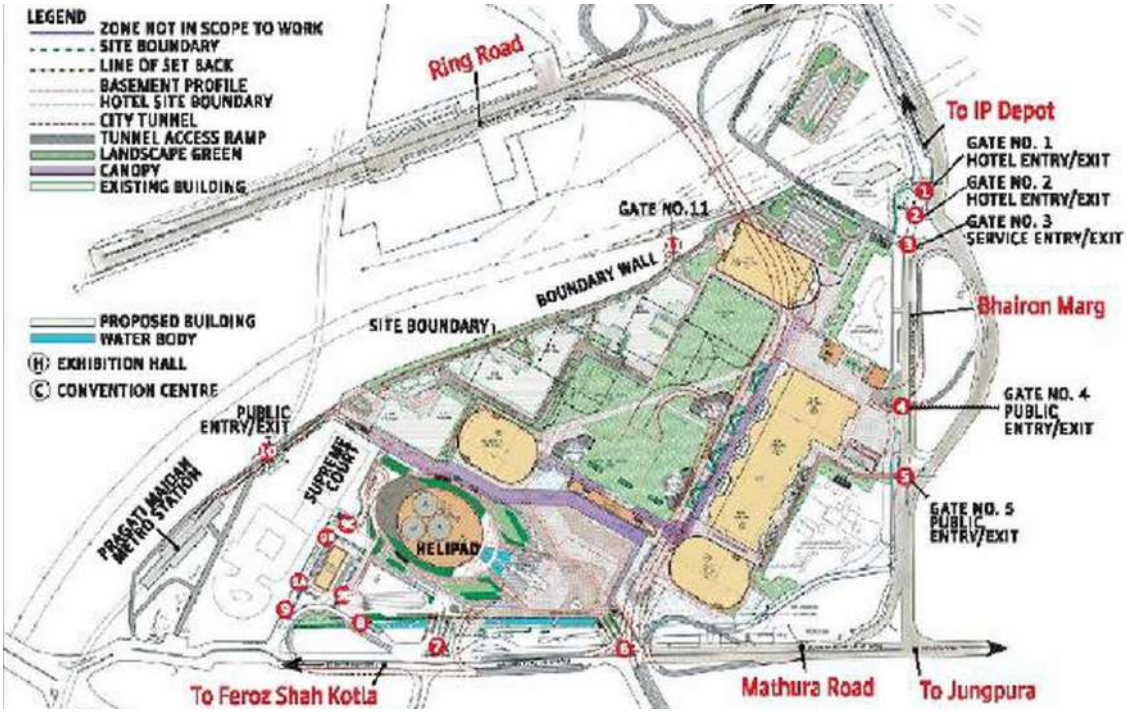


Figure 165 Site context

4.4.5 Architectural Style (Context)

The "Bharat Mandapam" is a beautiful work of architecture that uses elements from many different times. The domes, which look like those in Mughal architecture, give the building a sense of grandeur and elegance. They remind me of the timeless beauty of monuments like the Taj Mahal, which connects the present with India's past. The walls are covered in beautiful jali, which is a type of intricate lattice work. It creates beautiful patterns of light and shadow that are similar to those found in old forts and palaces.

The columns, which are another important part of the Mandapam, take ideas from many different parts of India. The intricately carved pillars are inspired by temples in the South, palaces in the North, and monasteries in the East. Together, they make a visual symphony that celebrates the country's architectural diversity.

4.4.6 Facilities

1. **Plenary Hall (Level 3)**

Capacity: 3000 persons

Floor area: 1,985 Square Meters



Figure 166 Plenary hall

1. Multi-Purpose Hall (Level 3)

Capacity: 4000 persons

Floor area: 4,884 Square Meters



Figure 167 Multi purpose hall

Level 2 houses the grand G20 Summit Room and Leader's Lounge, along with two large auditoriums suitable for conferences and summits. It also connects to a spacious and well-lit open-air amphitheatre which is ideal for hosting cultural events and musical performances.

2. Summit Room (Level 2)

Capacity: 165 persons

Floor area: 1,153 Square Meters.



Figure 168 Summit room

3. Leader's Lounge (Level 2)

Floor area: 702 Square Meters



Figure 169 Leaders lounge

4. Auditorium 1 (Level 2)



Figure 170 Auditorium 1

Capacity: 600 persons

Floor area: 793 Square Meters

5. Auditorium 2 (Level 2)

Capacity: 900 persons

Floor area: 992 Square Meters



Figure 171 Auditorium 2

6. Open Air Amphitheatre (Level 2)

Capacity: 3000 persons

Floor area: 2250 Square Meters



Figure 172 Amphitheatre

Level 1 comprises of 20 meeting rooms of different seating capacities, enabled with modern IT systems, 5G connectivity, integrated audio-video systems, and video conferencing facilities. These rooms have flexible seating layouts suitable for hosting meetings, workshops, and seminars in different formats. It also hosts Premium Meeting Rooms suitable for bilateral meetings and events.

7. Meeting Room-50 persons (Level 1)

Capacity: 50 persons

Number of rooms: 6

Floor Area: 60/64/72 Square Meters



Figure 173 Meeting room

8. Meeting Room-100 persons (Level 1)

Capacity: 100 persons

Number of rooms: 6

Floor Area: 111/115/119/121 Square Meters



Figure 174 Meeting room

9. Meeting Room-200 persons (Level 1)

Capacity: 200 persons

Number of rooms: 4

Floor Area: 258/273/276 Square Meters



Figure 175 Meeting room

10. Premium Meeting Rooms (Level 1)

Capacity: 50 persons

Number of rooms: 4

Floor Area: 61/121/197 Square Meters



Figure 176 Premium meeting room

4.4.7 Architectural details

1.LEVEL-1

Level 1 comprises of 20 meeting rooms of different seating capacities, enabled with modern IT These rooms have flexible seating layouts suitable for hosting meetings, workshops, and seminars in different formats. It also hosts Premium Meeting Rooms suitable for bilateral meetings and events.

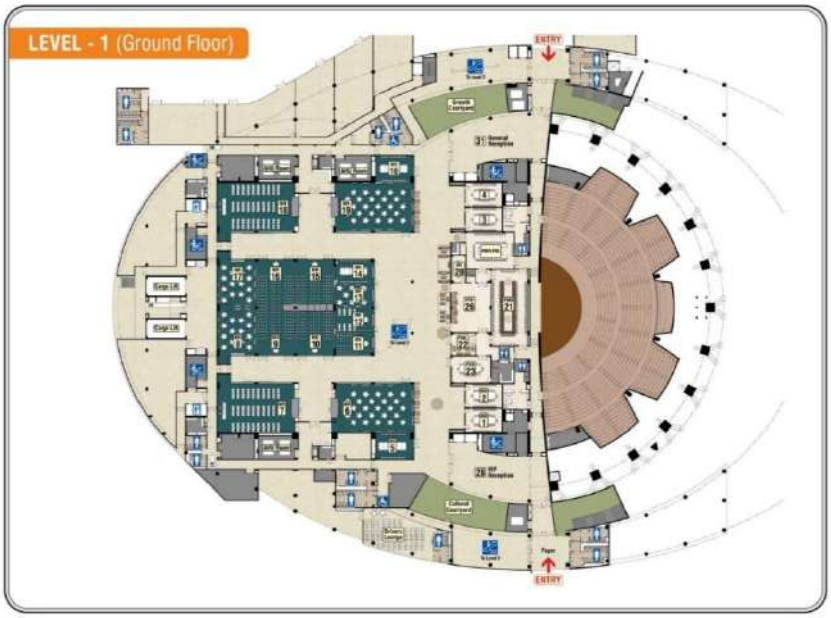


Figure 177 Floor plan - GF

2.LEVEL-2

Level 2 houses the grand G20 Summit Room and Leader's Lounge, along with two large auditoriums suitable for conferences and summits. It also connects to a spacious and well-lit open-air amphitheatre which is ideal for hosting cultural events and musical performances.



Figure 178 Floor plan - FF

3.LEVEL-3



Figure 179 Floor plan - SF

Air-conditioned Plenary and Multi-Purpose Halls are equipped with all modern AV and IT systems suitable for hosting large events and gatherings of upto 7000 persons in a combined

format. They also come with hydraulic stage, live audience polling facility, and 16 interpreter rooms for multilingual events.

4.4.8 Design Concept

The shape of the building is derived from the Shankha (conch shell). The different walls and facades of the centre depict several elements of India's traditional art and culture including 'Surya Shakti', 'Zero to ISRO' and Pancha Mahabhuta. Pancha Mahabhuta significs the building blocks of universal foundation – Aakash (Sky), Vayu (Air), Agni (Fire), Jal (Water), Prithvi (Earth).

4.4.9 Sustainability

Bharat mandapam sets a great example for sustainability integration in a building**.** The architects have thoughtfully added features like energy-saving lights, natural ventilation, and rainwater harvesting systems. These efforts show India's growing concern for the environment and its dedication to building a greener, more sustainable future.

4.4.10 Inferences

The design successfully blends traditional Indian elements (domes, jali work, carved columns) with modern construction, showcasing India's rich heritage in a contemporary context.

Offers a flexible and modular spatial layout, ideal for exhibitions, conventions, and cultural programs, with easy circulation and large open areas

Incorporated eco-friendly elements like energy-efficient lighting, rainwater harvesting, and natural ventilation.

Large no of entries and exits gives smooth traffic circulation flow within the site.

Use of premium materials and large-scale elements likely results in high costs for construction and upkeep, which may not be economically efficient long-term.

4.5 Comparative Analysis

Aspect	Base 11 Convention Centre	Lulu International Convention Centre	Capital Int'l Exhibition & Convention Centre	Bharat Mandapam
Location	Kottayam, Kerala	Cochin, Kerala (Bolgatty Island)	Beijing, China	Pragati Maidan, New Delhi
Site Area	10 Acres	26 Acres	157.5 Acres	123 Acres
Built-up Area	7,500 m²	69,000 m²	438,500 m²	120,000 m²
Architect	Mindscape Architects	WATG	Zaha Hadid Architects	NBCC + CPWD (Suresh Goel)
Year Built	2024	2018	2025	2023
Floors	G+1	Single-storey hotel tower (G+6)	G+2	G+2
Height	~15–20 m	20 m	45 m	36 m
Design Style	Contemporary + Heritage Tharavadu	Coastal Contemporary	Futuristic/Fluidic	Cultural-Modern blend
Context	Rural-Town; riverside	Urban island with resort & backwaters	Metropolitan/ Urban tech hub	Central Delhi heritage zone
Main Facilities	2 Main halls, courtyard, banquet hall, amphitheatre, heritage house.	3 halls, hotel, 4 villas, landscaped lawns, 4 restaurants,	9 halls, hotel, conference centre, bridges, courtyards	Plenary, 2 auditoriums, G20 rooms, amphitheatre, lounges, meeting rooms
Capacity	~5,000 guests total	10,000 (main hall); 12,300 total	210,000 m² exhibition; 44,000 m² conference	Plenary: 3,000; Multi-purpose: 4,000
Special Features	200-yr old Kerala house	Hotel integration	Ribbon bridges; segregated people/goods circulation	Shankha-inspired form
No. of Entries/ Exits	4	7	Main 2 entries, total 15 entries/exits	11

Parking capacitiy	400 (surface parking)	2000 vehicles, 3 helipads, 2 boat jetty' (surface + basement parking)	3000 (surface parking)	4,800(Basement) 200 (Surface parking)
Sustainability	Rainwater harvesting (1.5 lakh L), solar panels	IGBC-certified, RWH, STP, microclimate planting	China's highest green rating; hybrid HVAC, solar, greywater reuse	Natural ventilation, energy-efficient lights, rainwater harvesting
Landscape Integration	Tropical landscaping, maintained nutmeg garden	Waterfront lawns with palms, native flora.	Courtyard garden + outdoor esplanade	Heritage-rich zone
Structural System	Steel trusses,prefabricated	Steel + RCC, curtain walls	Modular + steel spans; column-free	RCC, LED-integrated façade,hydraulic stage.
Technology	Acoustic walls with coconut husk boards	BMS, smart lighting, HVAC, STP, AV systems	Smart BMS, hybrid ventilation, photovoltaic panels	5G, IT-integrated rooms, AV, LED walls, hydraulic stage
Weaknesses/Issues	Lacks VVIP access, CCTV/security room, STP,No lodging facilities	No shuttle service, limited VIP gate separation	High cost, complex upkeep	High maintenance cost, long-term budget inefficiency

Table 12 Case study comparitive analysis

REFERENCES

1. https://www.scribd.com/document/366251249/building-construction-permission-procedure-g-o-ms-no-423-dt-31-7-98-doc?utm_source=chatgpt.com
2. https://tgiic.telangana.gov.in/filePreview/custom/GOMsNo168?fileName=CMS/File_27072022015918938858778 4.GOMsNo168.pdf
3. https://archive.org/details/NBC2016VOL.2.pdf/page/n109/mode/2up
4. https://tourism.gov.in/sites/default/files/2020-02/053120111252649.pdf
5. https://www.academia.edu/20056889/Planning_and_Programming_a_Hotel
6. https://www.iasbook.com/bharat-mandapam/
7. https://thearchitectsdiary.com/wp-content/uploads/2023/08/Bharat-Mandapam-Convention-Center-1-scaled.webp
8. https://www.rprealtyplus.com/projects/yashobhoomi-convention-centre-inspired-by-indian-art-and-architecture-115556.html#:~:text=With%20a%20site%20area%20of,India%20for%20the%20first%20time
9. https://www.hyatt.com/grand-hyatt/en-US/cokgh-grand-hyatt-kochi-bolgatty/weddings
10. https://uni.xyz/journal/futuristic-exhibition-center-design-capi
11. https://indiatradefair.com/bharatmandapam-halls
12. https://www.archidust.com/blog/2023/08/17/bharat-mandapam-at-the-india-trade-promotion-organisation-itpo-complex-a-marvel-of-architectural-ingenuity/
13. https://indiatradefair.com/uploads/kms/IECC_Brochure_29-06-2021.pdf

CHAPTER 5
DESIGN PROPOSAL

5.1 CONCEPT

5.1.1 Design Evolution

The International Convention Centre derives its architectural expression from the **Borassus flabellifer** (palmyra) leaf—an iconic element in the landscape and cultural memory of Warangal. The leaf's **fan-shaped, tapering geometry** becomes the guiding motif for the building's overall **configuration, structural rhythm.**

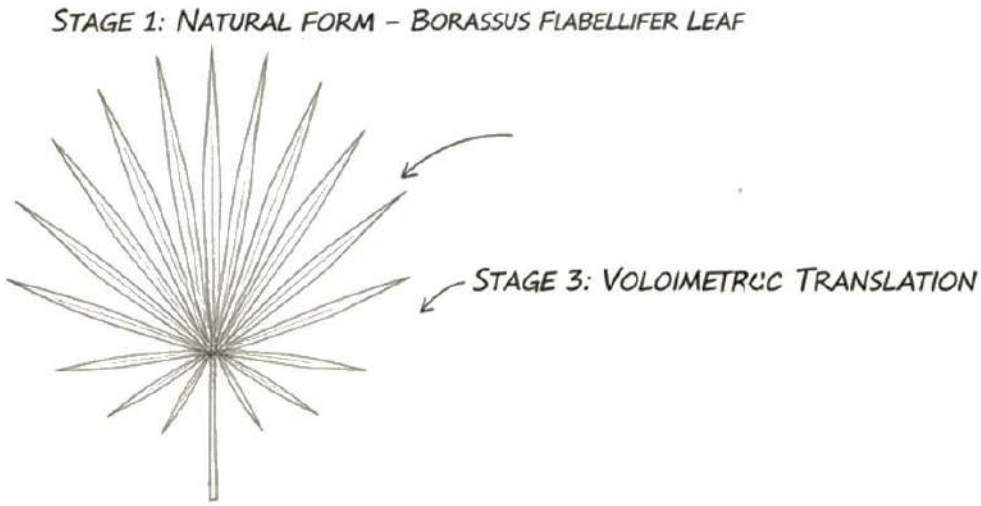


Figure 180 Concept evolution

5.1.2 Form & Massing Inspired by the Leaf

The Borassus leaf spreads outward in a sequence of slender, tapering fins.These fins transform into architectural volumes that sweep across the site, creating a sense of fluid movement.The edges taper upward and outward, producing a dynamic skyline reminiscent of a fan caught in gentle motion.Light, Shade & Environmental Response will be by natural overlapping of leaf segments is reimagined as layered shading fins roof.The play of light and shadow changes through the day, creating a rhythmic visual experience similar to standing under a palm influenced roof design.

Spatial Experience will be in Inside achieved by , the flowing geometry opens into large volumetric spaces shaped by the curvature of the fins.Circulation paths follow these arcs, producing a sense of movement and continuity.

Cultural & Ecological Integration in design integrated by the design harmonizes modern architectural language with the region's ecological identity.By embedding a native natural form into its structure, the Convention Centre becomes a cultural landmark that acknowledges Warangal's heritage while projecting a contemporary vision.

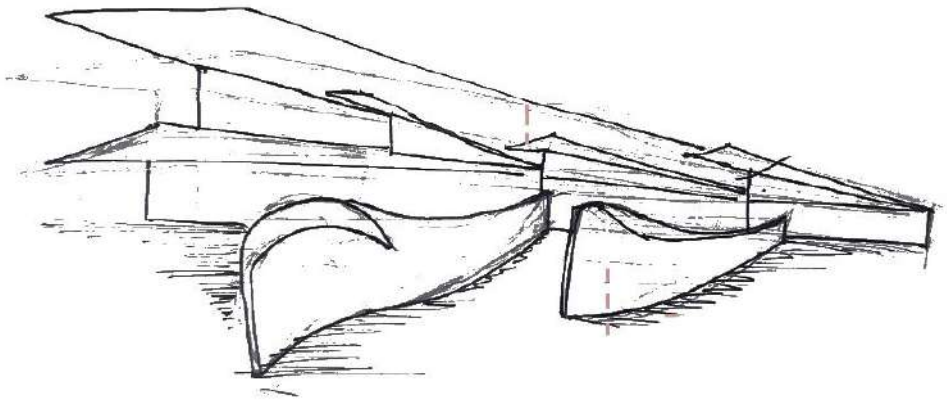


Figure 181 initial idea

5.1.3 Material Influence

A durrie is a handwoven rug or flat-woven carpet, traditionally made by locals in warangal region will be used for wall parametric patterns of building facades, as well as diffuser of walls of convention hall.

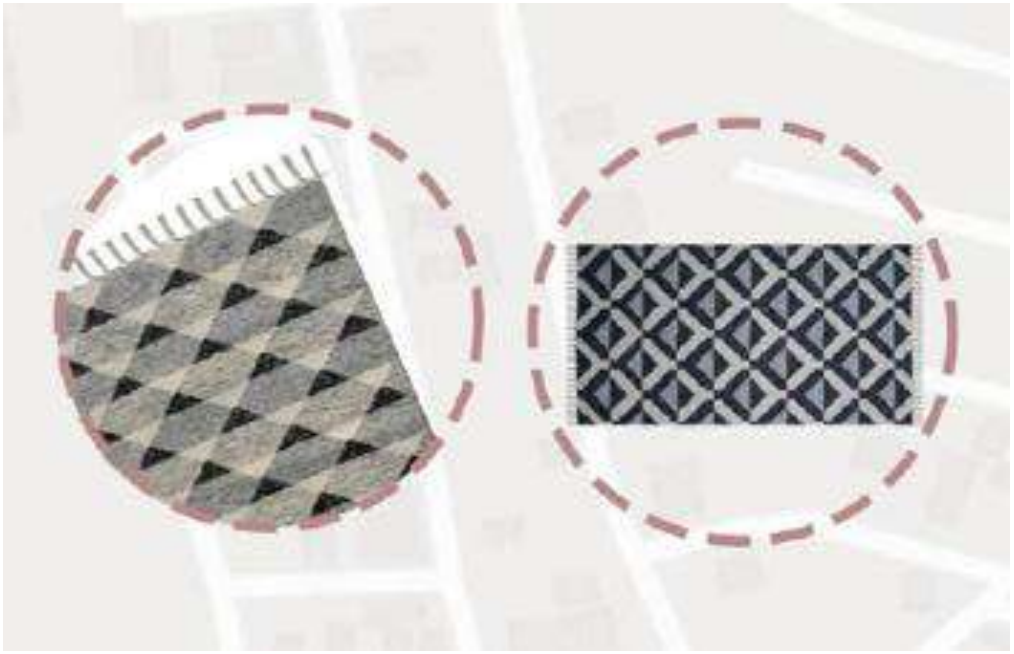


Figure 182 durrie patterns

5.1.4 Area Utlisation

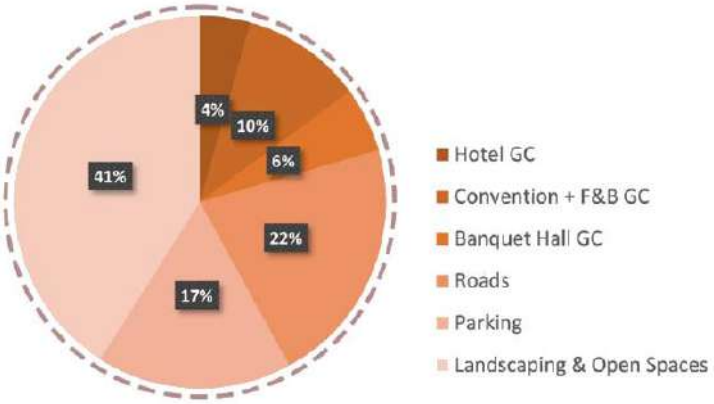


Figure 183 Area seggregation

5.1.5 Zoning

Site zoning has mainly categorised into 3 volumetric spaces such as Hotel,Convention centre, F&B,

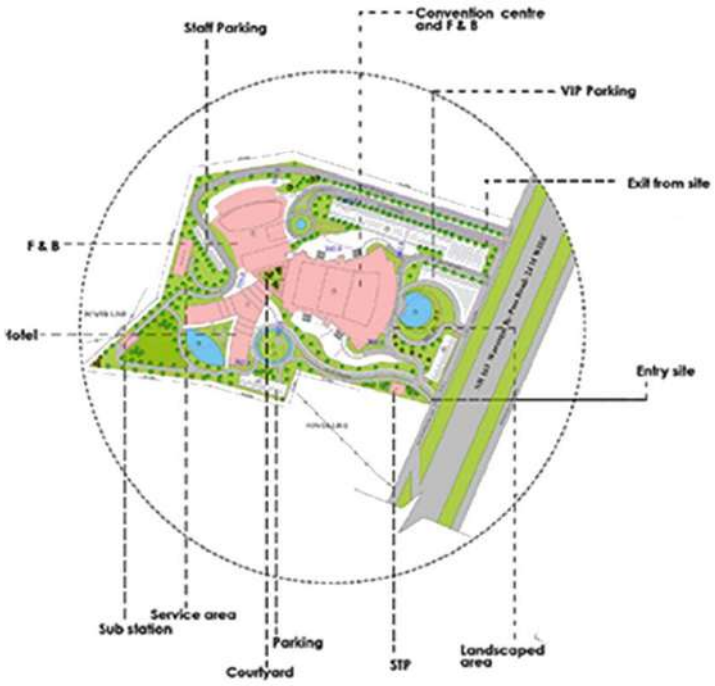
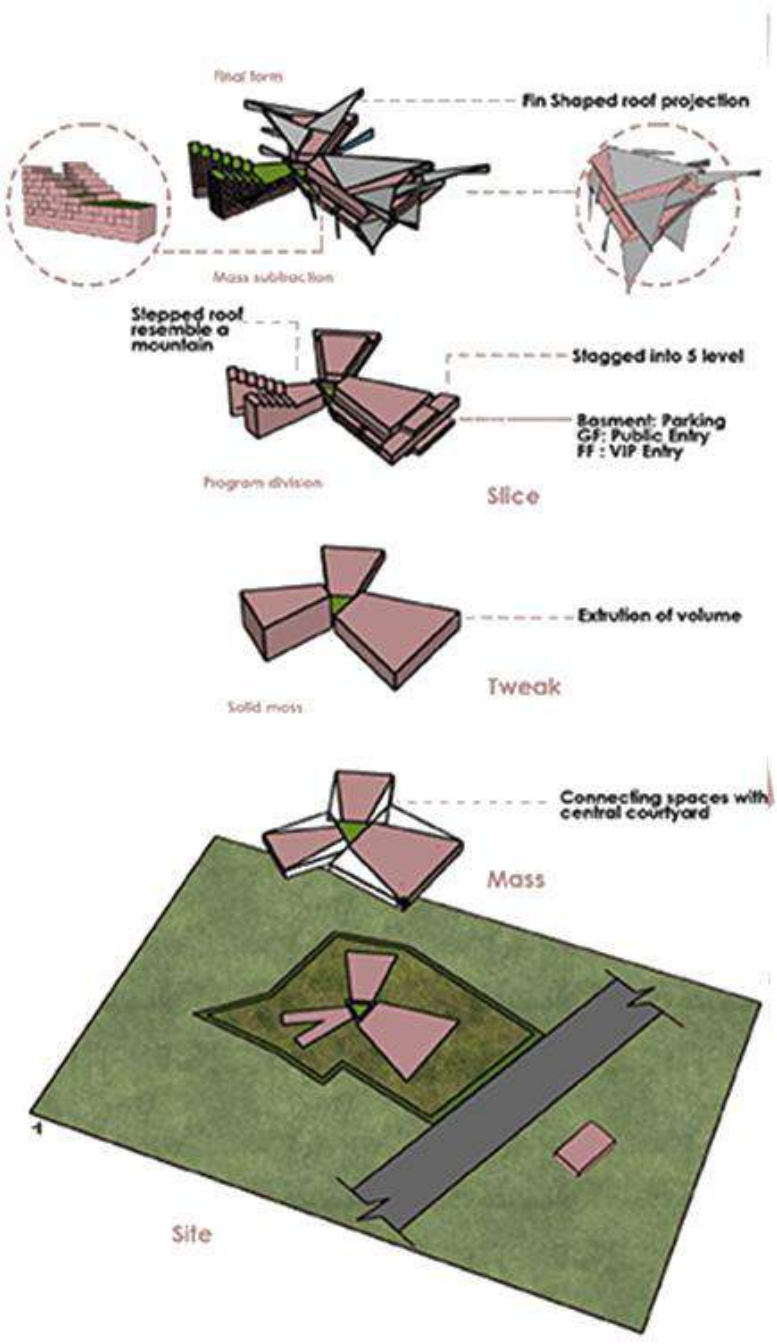


Figure 184 Zoning

5.1.6 Form Development



5.2 DESIGN DRAWINGS

VERTEX INTERNATIONAL CONVENTION CENTRE



NAME : MUHAMMED ARSHAD M
SCHOLAR NO. : 211110027
GUIDED BY : DR.CHARUMITRA KAPSHE

Location

Following map shows the location of the Project Site with respect to Warangal.
Latitude: 17.957690 Longitude: 79.447151 E

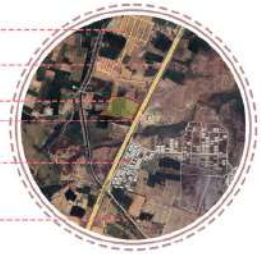


Geographic Location:

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.

Aerial Photographs And Maps:

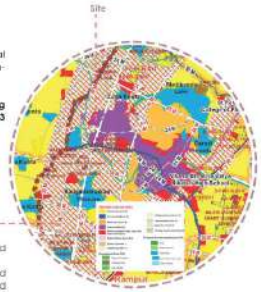
Photographs and maps of the site, suburb, and surrounding areas.



Authorities

Land ownership:

The Telangana State Industrial Infrastructure Corporation Limited
Site Area: 10 acres
As per Andra Pradesh Building bye laws- G. O. Ms. No.423 M.A :
F.A.R: 2
Ground Coverage: 40%
Front setback-9m
Side setback-6m
Rear setback-6m



Zoning plans

Site is located in the zoned area of Industrial Zone (II) Neighbouring size are zoned into Growth corridor I and public & semi public zone

Neighbourhood context



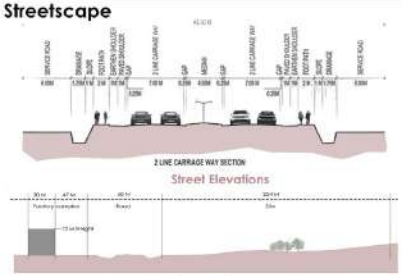
1. Land Uses neighboring land uses are zoned into industrial zone (II),Public & semi public zone and Growth corridor-1.
Footpaths, entrances, and roadways adjacent to the site well as site is connected with NH 163.

2. Distances between the site and its neighboring construction site as well as textile park is within 200 meters.

3. Height of the adjacent construction site of IT park is levelled at same level of NH road and all other adjacent site are same level of the project site, and neighbourhood structures have height of G+2 which is almost 12 meters.

4. Neighbouring site other than IT park construction site and textile park are being used for agricultural purposes,styles of neighboring sites structures modern structures and pre engineering factory sheds mostly used in textile park.

Streetscape



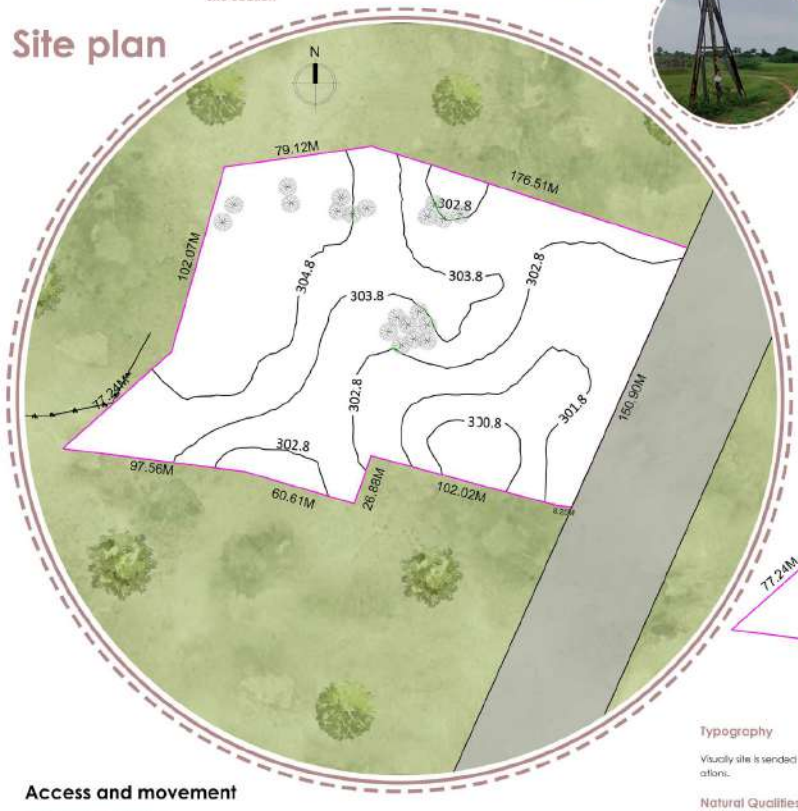
Site Section

Street View :

The site main entry is from the NH 163 road having total width of 60-m includes 45 m NH road width with proposed drinage line and service road.



Site plan



Access and movement

Pedestrians & Vehicles :

Access to and around the site is from 35 m wide National Highway 163 road located at the east side of the site;



Public Transport Links:



Site History And Significance

Previous Use/s: Earlier the site was used for agricultural purposes.
Contamination: Manufacturing, Industrial, or other processes or operations of textile park that may have caused or are currently causing contamination on the site.
Historical Significance: Place is famouse for temple tourisms and granite quories
Site's Cultural Significance: site is located in context of textile industry the traditional handwoven carpet "durries" are much famous.

Man-made Features

Electricity

The site have a low tension electric line passing at west and southeast corner of the site which help to take electricity to the site.

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.



Water supply

Behind the site a canal is passing named Dharamsagar canal which come from Dharamsagar lake which is 14 km away at distance of 150m from site can be utilised for water supply .

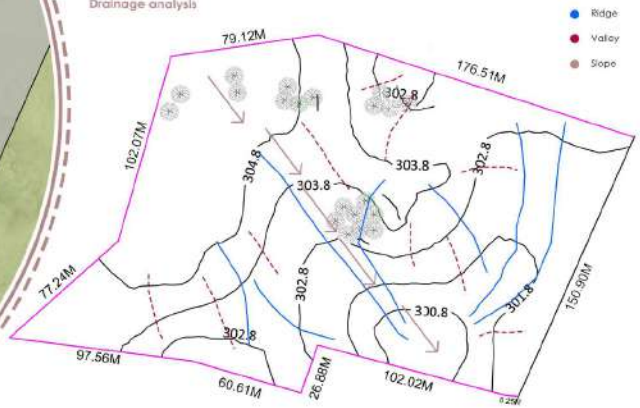


Nautral Features

Slope analysis

Slope Percentage calculation:
G=D/L X 100
G= Gradient/ Slope %
D= distance between 2 contours(304.8-300.8=4)
L=Horizontal distance b/w 2 ends of land(258 m)
G=4/258 X 100=1.5% as the slope % which is less than 5% , so the site can be considered as flat land

Drainage analysis



Typography

Visually site is sended as flat land with minimal vegitations.

Natural Qualities And Characteristics

Site is usually seened with a yellowish shiny sand texture.



Vegitation

mainly 2 types of vegitation has observed. Neem trees and Toddy palm trees

Common Name: Neem Tree
Scientific Name: Azadirachta indica

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: Asian Palmyra Palm / Toddy Palm / Ice Apple Tree
Scientific Name: Borassus flabellifer

Trunk Radius: ~30 to 45cm (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 10-15m wide under open growth



Geology, Soil Type

The Soil is Sandy Loam Soil. Sandy loam soils are moderately stable and drain well.



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.

VERTEX INTERNATIONAL CONVENTION CENTRE

THESIS PROJECT

PROJECT : **Vertex** International convention centre
LOCATION : Warangal,Telugana

AREA
Site : 10 Acres

SCALE- 1:1000
ALL DIMENSIONS ARE IN M

DWG FILE :
SITE ANALYSIS

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

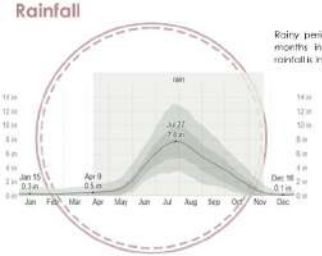
DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :
1

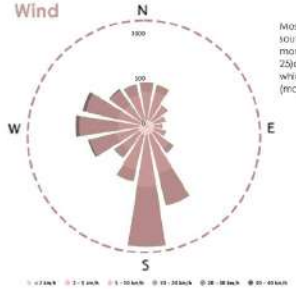
Climatic datas

Rainfall



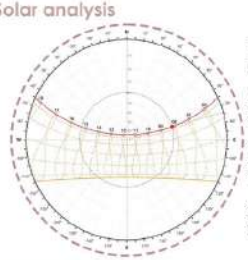
Rainy period last for 7.5 months in a year, most rainfall is in july month

Wind



Mostly wind is from south last for 4.9 months (Dec 28- may 25)and then from west which last for 4 month (may 25-sept 26)

Solar analysis



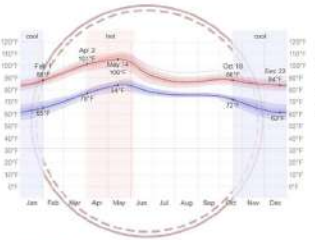
East-facing facades receive strong radiation from 7:00–11:00 AM.

West-facing facades get harsh sun from 2:00–6:00 PM.

North-facing facades are mostly shaded except in early mornings

South-facing facades receive balanced radiation.

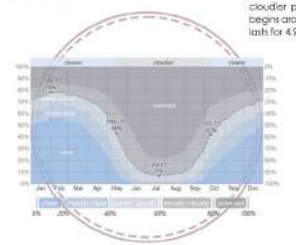
Average Temp.



Height temp. 40 degree celcius.

lowst temp. 16 degree celcius.

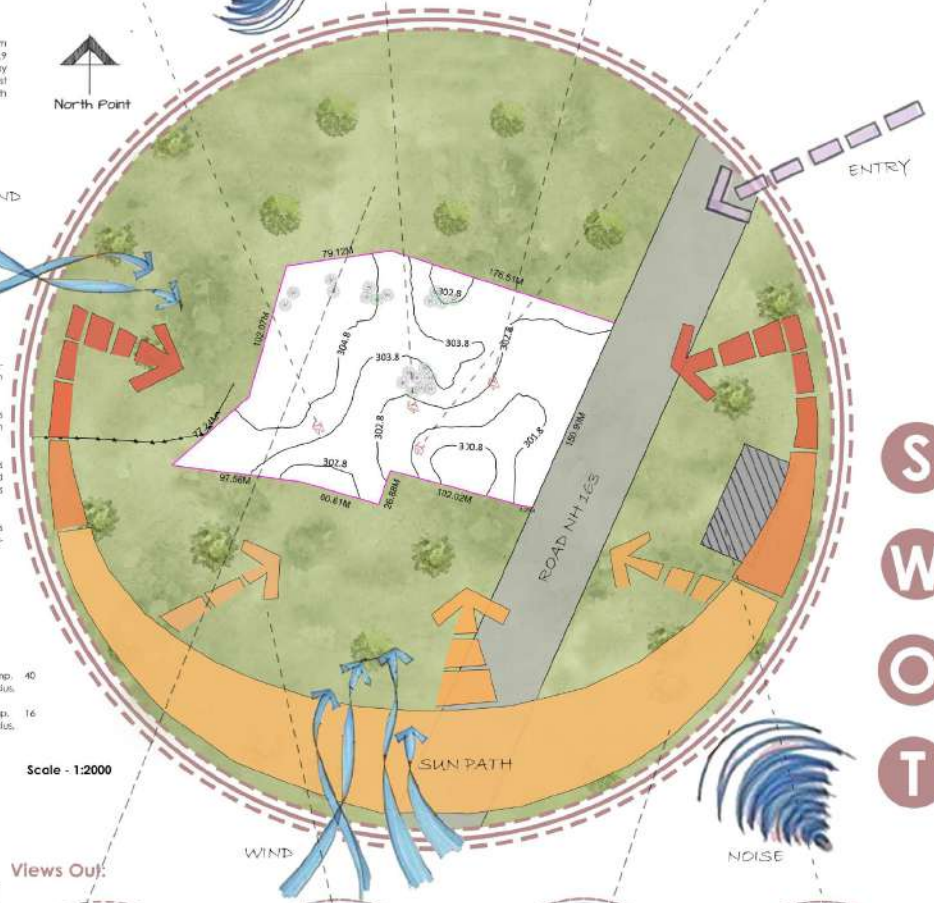
Cloud



cloudier part of the year begins around May to oct, lasts for 4.9 months

Views In:





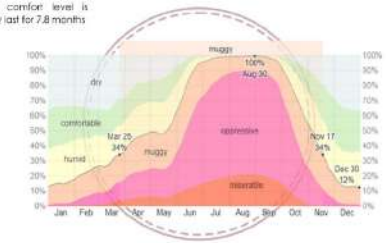
Scale - 1:2000

Views Out:



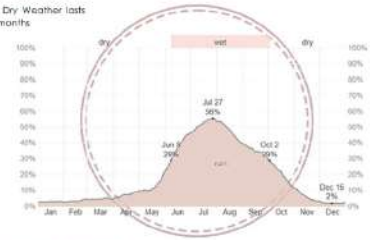
Humidity

Mostly comfort level is Muggy last for 7.8 months



Precipitation

Mostly Dry Weather lasts for 8.2 months



Sound And Noise

Noise pollution is produced from adjacent construction site which is temperory and from the NH road and textile foactory have compartively higher noise polution

SWOT Analysis

S
W
O
T

Strengths

Proximity to good infrastructures is very near such as IT Park (under construction), availability of electricity (low tension line on site), nearby drainage path, and water source (Dharmsagar canal).
Naturally vegetated with neem and palm trees, offering ecological value and landscape advantages.
Topography: is favourable not necessary to cut and fill the land . Mostly flat land with gentle slope towards the entrance, supports drainage.
No specified height limits offers freedom for vertical expansion.

Weaknesses

Noise Pollution from adjacent construction, Textile Park, and NH traffic.
Summers are intensely hot (above 40°C), affecting building cooling loads and comfort.
The site have sandy loam soil which may require pile foundation and careful treatment due to high water table concerns.

Opportunities

Upcoming IT and Textile Parks Can attract businesses and create demand for support infrastructure like hotels, convention centres, and retail.
Rich existing vegetation and canal nearby allow for biophilic and sustainable design opportunities.
Proximity to Kazipet (railway & town), Warangal (city & airport) boosts regional accessibility and tourism potential

Threats

Monsoon impact due to high rainfall in July–August (up to 7.4 inches/month) requires strong storm water design.
High humidity and strong seasonal winds may affect material durability and building performance.
Even through canal proximity, depend upon a single source may be risky during dry months.

Design Consideration

Building orientation : As per Solar analysis maximum fast shoul be good to be elongated towards north and south direction.

As there is no height limitation helps to makes staging of volumes at max. potential level.

Implimentation of efective Storm water managment due to chances of heavy rain fal and flooding Placement of spaces such as courtyard reduce the fel of muggy and humidity from the building.

The main entry to the site is only from one NH road so multiple entries shoul be provided within the site by considering traffic flow and vehicular circulation.

Site required well designed landscape to creqate god micro climatic benifits and to avoid noise polution towards the site.

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : Vertex International convention centre

LOCATION : Warangal,Telugana

AREA
Site : 10 Acres

SCALE - 1:2000

ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :

SITE ANALYSIS

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :

2

Aspects	Base 11 Convention Centre	Lulu Bolgatty International Convention Centre	Capital International Exhibition &Convention Centre	Bharath Mandapam
Image				
Location	Kottayam, Kerala	Cochin, Kerala (Bolgatty Island)	Beijing, China	Pragati Maidan, New Delhi
Site Area	10 Acres	26 Acres	157.5 Acres	123 Acres
Build up Area	7,500 m² (75,000 sq.ft)	69,000 m² (743,000 sq.ft)	438,500 m²	120,000 m²
Architect	Mindscape Architects	WATG	Zaha Hadid Architects	NBCC + CPWD (Suresh Goel)
Year Build	2024	2018	2025	2023
Floors	G+1	Single-storey + hotel tower	G+2	G+2
Height	15M	20 m	45 m	36 m
Design Style	Contemporary + Heritage Tharavadu	Coastal Contemporary	Futuristic/Fluidic	Cultural-Modern blend
Context	Rural-Town; riverside	Urban island with resort & backwaters	Metropolitan/Urban tech hub	Central Delhi heritage zone
Main Facilities	1.Lobby with VIP Lounge 2.Hall 1- can accommodate 1300 Pax 3.Hall 2 can accommodate 700 Pax 4.Hall 3 can accommodate 360 Pax 5.Administration Office 6.Banquet Hall- 3 No.(50 Pax each) 7.Storage House 8.Kitchen 9.Courtyard 10. Nut meg gardens 11.Amphitheatre&.Pavilion 12.Kerala Traditional Style House	1.Convention halls:(Liwa-10000 Pax, Vembanad- 2000 Pax, Grand ballroom-300 Pax) 2.Restaurants(4 No.s) 3. Outdoor event areas 4. Hotel 264 keys 5. Villas(4 No.s)	1.Exhibition areas: 346,500 sq.m (9 exhibition halls: 23,000 sq.m each and 22 meetings rooms). 2.Convention Center: 15,000 sq.m (including 35 meeting rooms) 3.Conference Centre: area: 44,000 sq.m 4.Hotel: 410 rooms – area: 48,000 sq. m 5.Outdoor esplanade: 50, 000 sq.m 6.Basements: 205,200 sq. m	**(Level 1)** 1.Premium Meeting Rooms-50Pax(4 No.) 2.Meeting Room-200Pax(4 No.),100Pax(6 No.),50 Pax(6 No.) **(Level 2)** 3.Open Air Amphitheatre-3000Pax 4.Auditorium 1-600Pax 5.Auditorium 2-900Pax 6.Leaders Lounge 7.Summit ro0m-165Pax **(Level 3)** 8.Multipurpose hall-4000Pax 9.Plenary hal-3000Pax
Capacity	3000 People	12300 People	9000 People	14000 People
Parking	400+ Surface parking	2000+ vehicles, 3 helicopter and 2 boats, basement-450 vehicles	3000+Vehicles	4000- Basment ,1000- Surface
Special Features	20-yr Kerala house, Nutmeg garden	5 star Hotel integration, boats, 3 helipads.	Ribbon bridges, largest indoor area.	Shankha-inspired form
Sustainability	Rainwater harvesting (1.5 lakh L), solar panels	IGBC-certified, RWH, STP, microclimate planting	China's highest green rating; hybrid HVAC, solar, grey water reuse	Natural ventilation, energy-efficient lights, rainwater harvesting
Landscape Integration	Tropical landscaping,nutmeg garden, amphitheatre	Waterfront lawns with native flora	Garden courtyard + outdoor walkways within waterfront and park	Urban green zone
Circulation	Dedicated hall drop-offs; courtyard connectivity	7 gates, segregated VIP/service /guest zones	Ribbon bridges, segregated people/goods circulation	11 gates; shuttle system for guests, metro/bus/train access
Structural system	Steel trusses, prefabricated	Steel + RCC, curtain walls	Modular + steel spans, column free,	RCC
Technology	Acoustic walls with coconut husk boards	BMS, smart lighting, HVAC, STP, AV systems,Retractable Seating,	Smart BMS, hybrid ventilation, photovoltaic panels	5G, IT-integrated rooms, hydraulic stage ,LED walls
Weakness	Lacks VVIP access, CCTV/security room, STP,No lodging facilities	No shuttle service	High cost, complex upkeep	High maintenance cost,

Inference

1.Minmum height of A large venue can me taken as 15m

2.Modern design with cultural blends gives a heritage value

3.Rural areas give smooth traffic from over crowd

4.Traditional elements (patterns, jali work) with modern construction, showcasing India's rich heritage in a contemporary context.

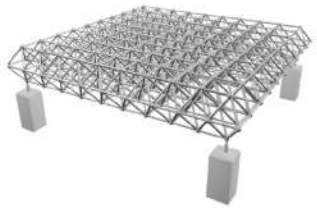
5.Integration of natoral ventilation and rain water system, solar,Micro climate planning, STP,Grey water use helps to make the building energy

6.Integration of waterfront lawns and gardens with native floras influence microclimate

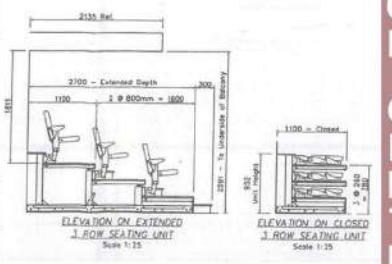


7.Multiple no of entries and exits gives smooth traffic circulation.

8.Space frame & trusses can create large column free spaces



9.Hydraulic stages and rectractable seating helps to use the spaces multipurposes.



10.Security & servailences lacks create problems for VIP presences and public saftey

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : International convention centre

LOCATION : Warangal,Telugana

SCALE - NTS
ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :

CASE STUDY ANALYSIS

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

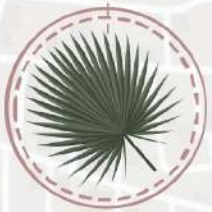
DATE : 22/08/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :
3

Design Root

The International Convention Centre draws inspiration from the elegant fin-like geometry of the Borassus flabellifer leaf, a familiar presence in Warangal's landscape. Its sweeping, tapering forms translate into dynamic volumetric spaces that filter light and create rhythmic shade, evoking a sense of movement while harmonizing contemporary design with the local natural heritage



Inspiration from casestudies

Courtyard as common connectiong space betweeen various blocks gives a inddor outoor connection.

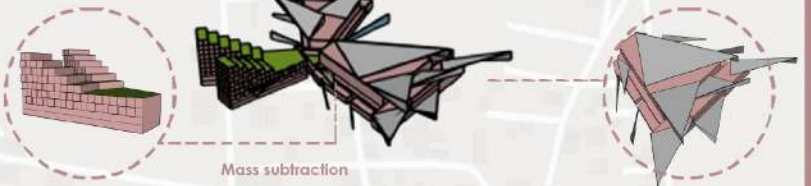
Ciculation:Multiple entries gives smoth traffic movments within the site.

Scale:Variation in scale of volumes and fluidic patterns in interior bring a feel of movment within the spaces.

Landscaping: water fountains at entrance make spaces more welcoming.

Space frame / truses creante large column free spaces.

Mass Evolution





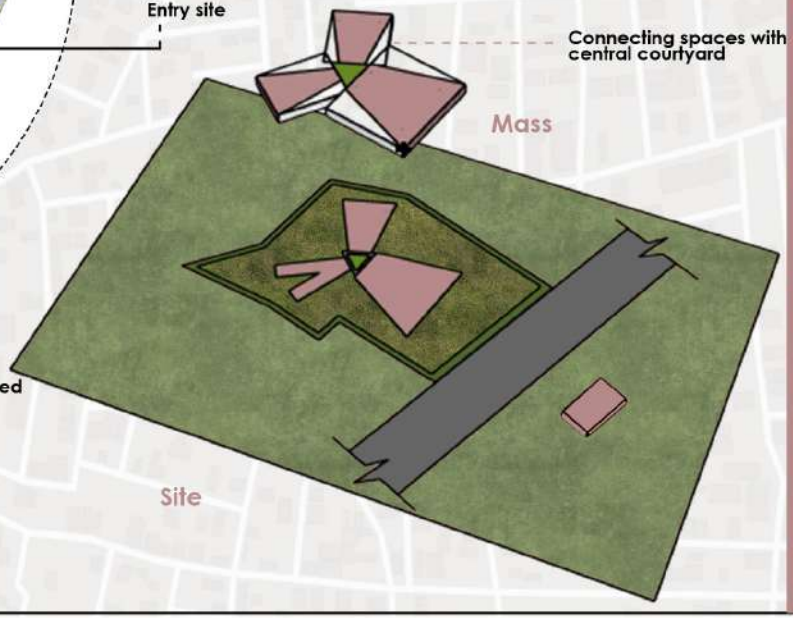
Program division

Slice



Tweak

Solid mass

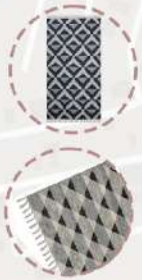


Site Zoning

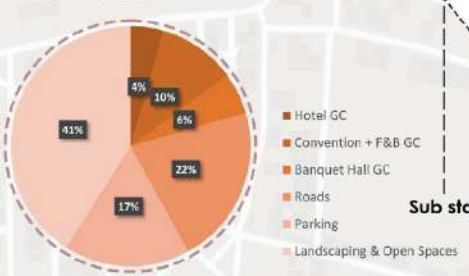


Material Influence

A durrie is a handwoven rug or flat-woven carpet, traditionally made by locals in warangal region will be used for wall parametric patterns of building facades, as well as diffuser of walls of convention hall



Area Utilised



List of major activities

Convention Centre cum Exhibition Centre (2500 Pax)
Convention hall
Small & big meeting rooms
Bussiness centre
Banquet hall (1250 Pax)
Business Hotel (150 Keys)

Entertainment and F&B
Food Court (Multi-cuisine)
Cafe / Coffee Lounge
Bar / Pub
Fine Dining Restaurant
Retail Shops
Multiplex
Gaming Zone

Gate 1 - Convention hall & Hotel
Gate 2 - Convention hall VIP Entry
Gate 3 - Convention exit
Gate 4 - Service entry

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : Vertex
International convention centre
LOCATION : Warangal,Telugana

AREA
Site : 10 Acres

SCALE - 1:1200
ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :
CONCEPT

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :
4

1- HOTEL
2- F&B AND ENTERTAINMENT
3- CONVENTION CENTRE
4- HOTEL PARKING
5- FOUNTAIN
6- VIP PARKING
7- CONVENTION PARKING
8- STAFF PARKING
9- POOL



Sl. No.	Description	Buildup Area in sq.m	G.C (SQ.M)	G.C in %
A	Convention Centre (2500 Pax)	22878.3	4893.8	12
B	Business Hotel(150 Keys)	13935.4	1783	4.4
C	Entertainment and F&B	8544.6	2848.2	7
	Total	45358.3	9525	23.4

Sl. No.	Description	Details
1	SITE AREA	
2	TOTAL BUILDUP AREA	
3	F. A. R	2
4	G.C	23.5

Sl. No.	Category	Build up Area(SQ.M)	ECS Per 100 Sq.m	Total ECS Required
A	Convention Center	22878.3	2.0 ECS/100 sq.m	457
B	Hotel	13935.4	2.0 ECS/100 sq.m	279
C	Entertainment and F&B	8544.6	2.0 ECS/100 sq.m	170

NO OF SURFACE CAR PARKING

HOTEL PARKING- 15
STAFF PARKING- 16
CONVENTION PARKING- 58 + 9 COACHES
VIP PARKING- 11

GATE 1 - HOTEL/CONVENTION ENTRY
GATE 2 - VIP ENTRY
GATE 3 - CONVENTION CENTER EXIT
GATE 4 - F&B, ENTERTAINMENT
GATE 5 - SERVICE ROAD

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention centre

LOCATION : Warangal, Telugana

AREA

Site : 10 Acres (40468.5 SQ.M)

FAR - 2
G.C -40%

SCALE - 1:600

ALL DIMENSIONS ARE IN M

THESIS PROJECT

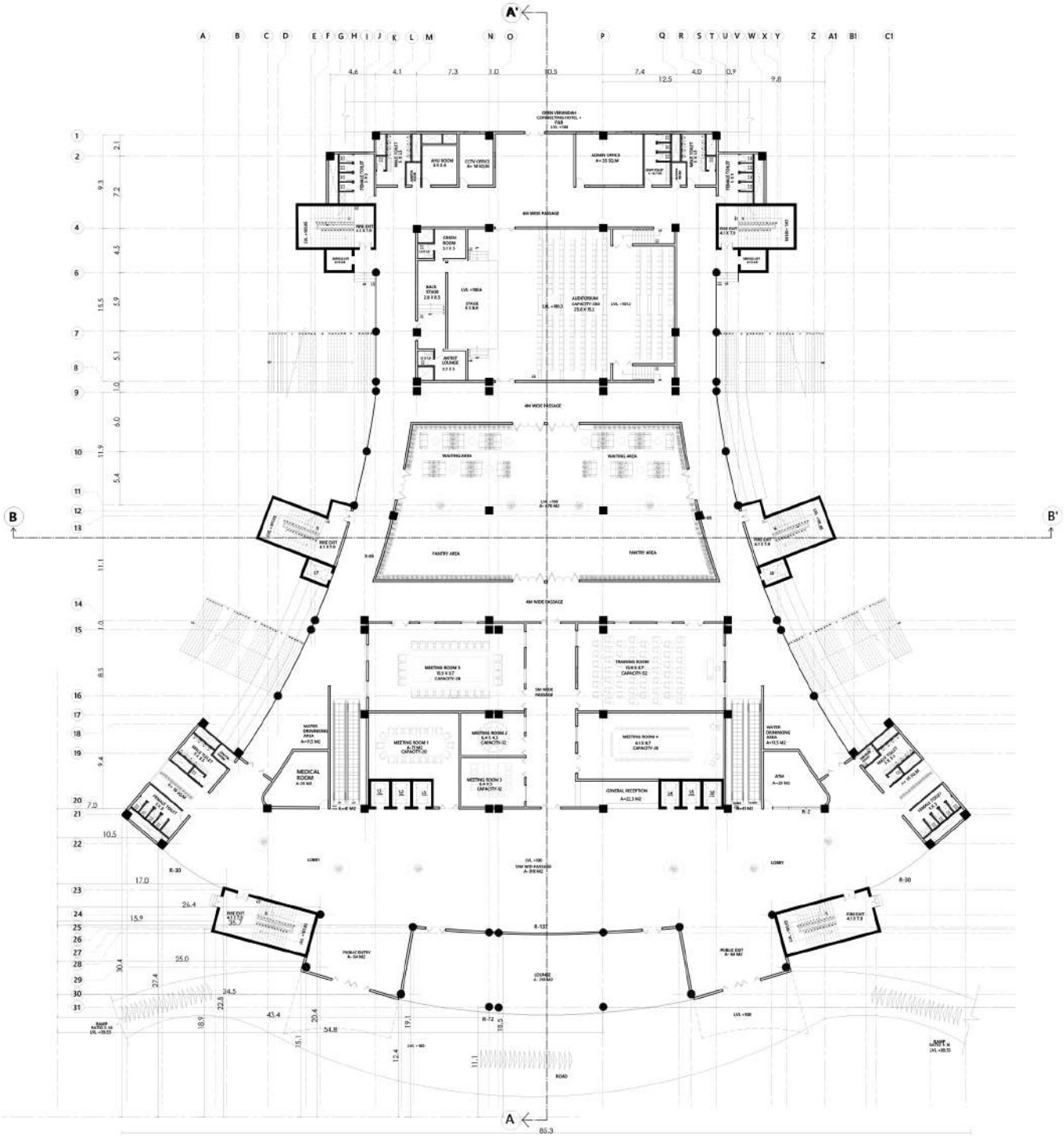
DWG. TITLE :
SITE PLAN

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : S9 SEC A
SUBJECT : DESIGN IX
DATE : 01/12/2025

GUIDED BY:
DR. CHARUMITHRA KAPSHE

SHEET NO:
5



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE- GROUND FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

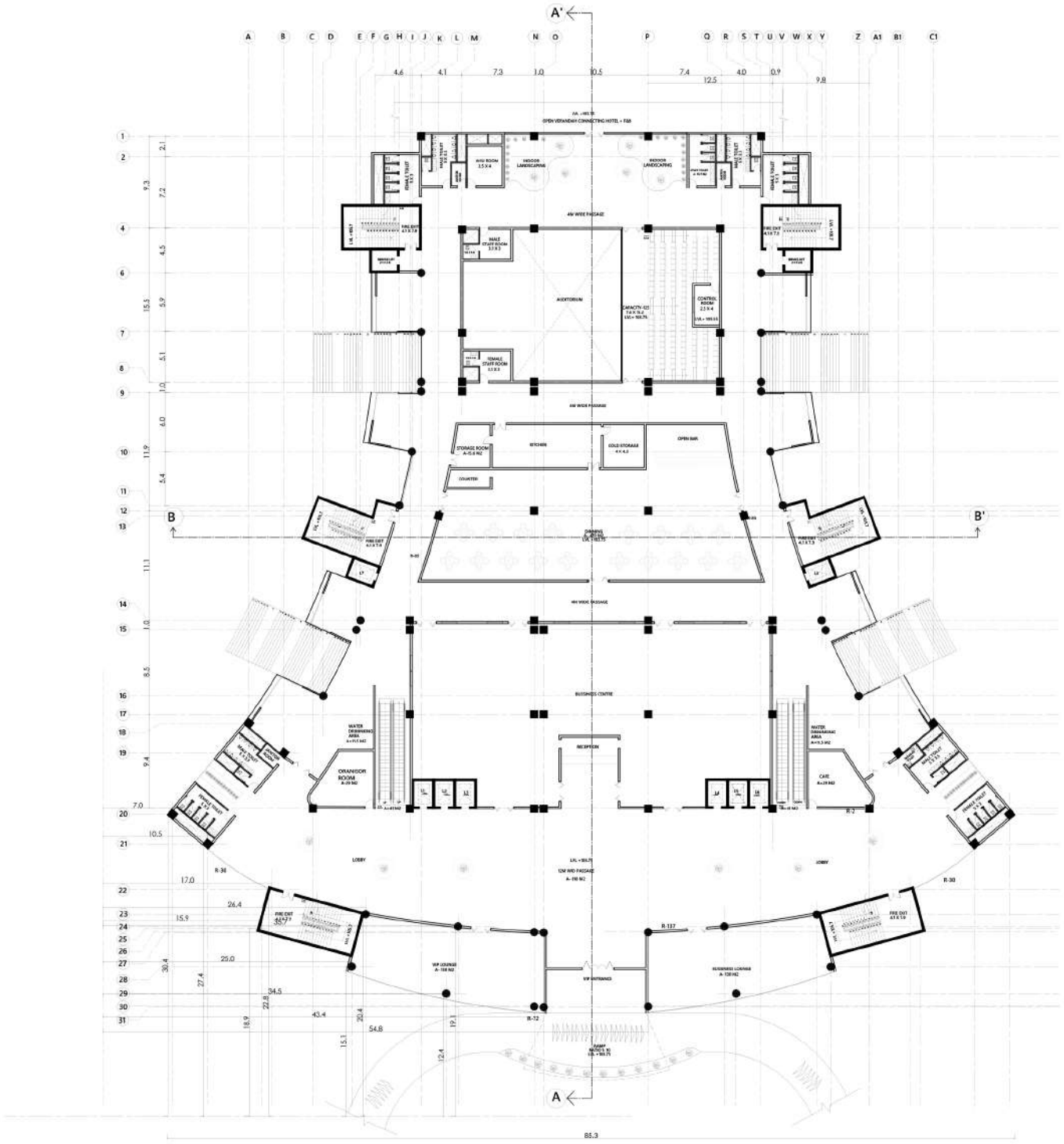
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

6



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE- FIRST FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

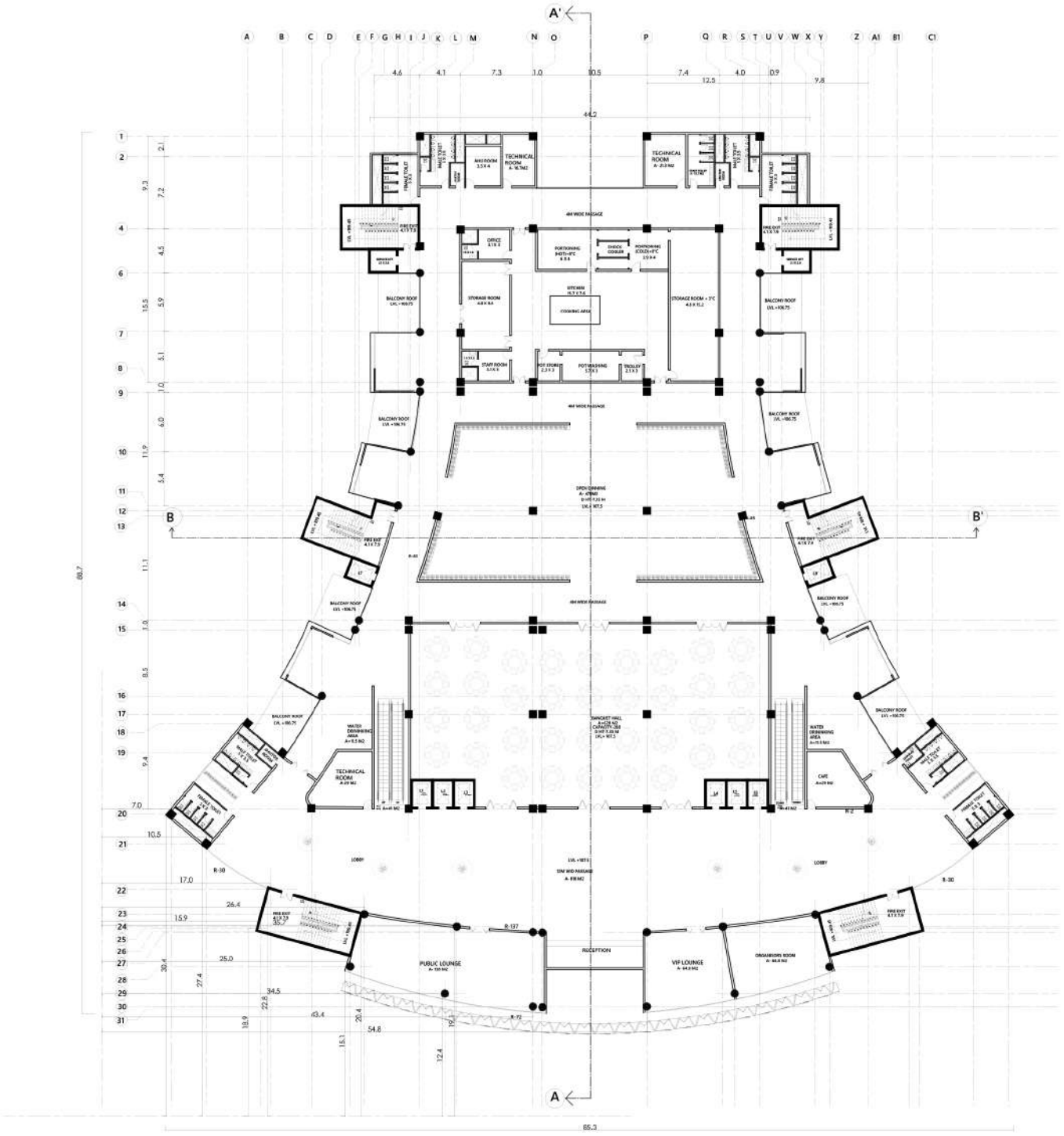
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

7



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

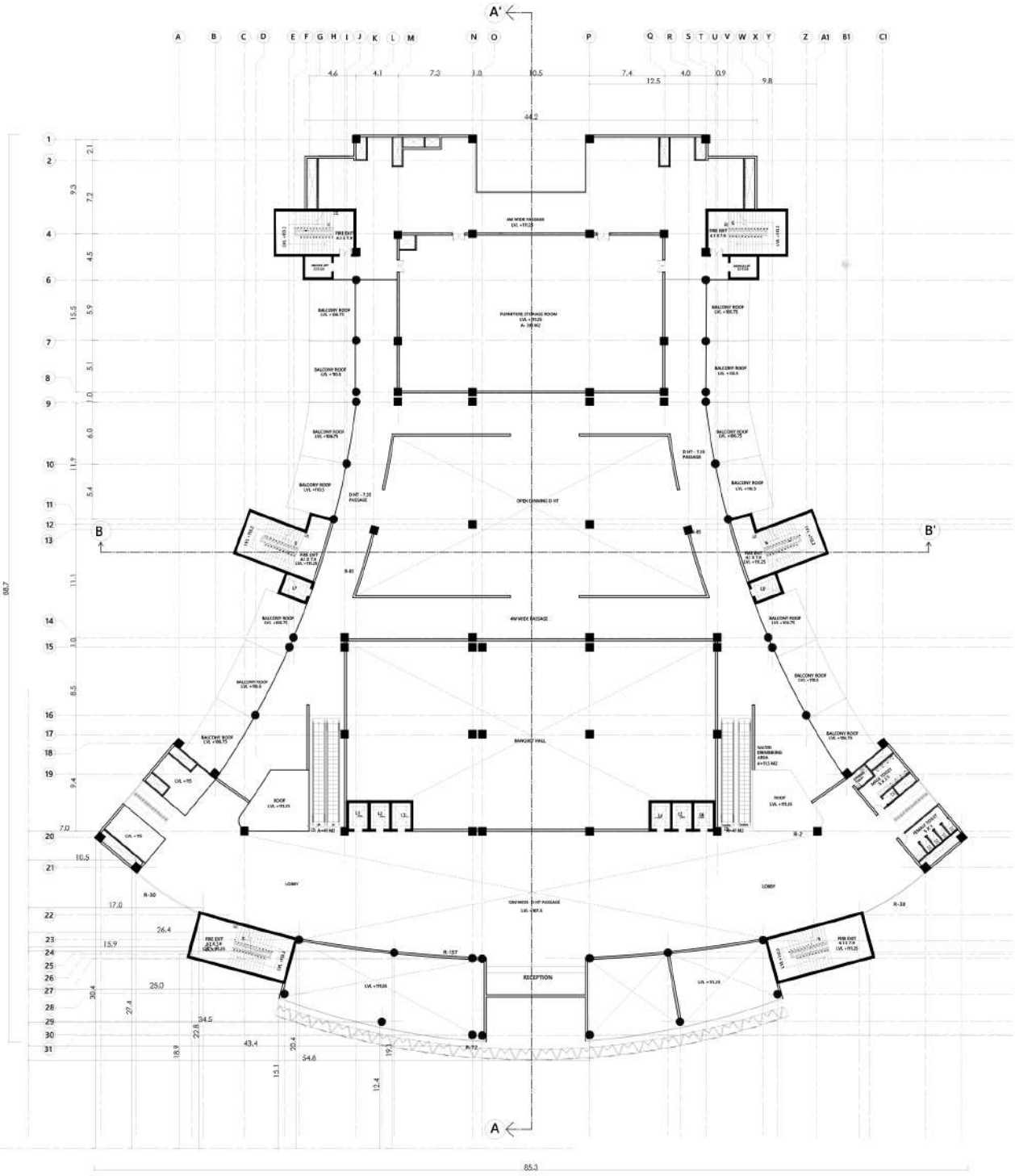
CONVENTION CENTRE-
SECOND FLOOR PLAN

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:

8



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 851.3 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE-THIRD FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

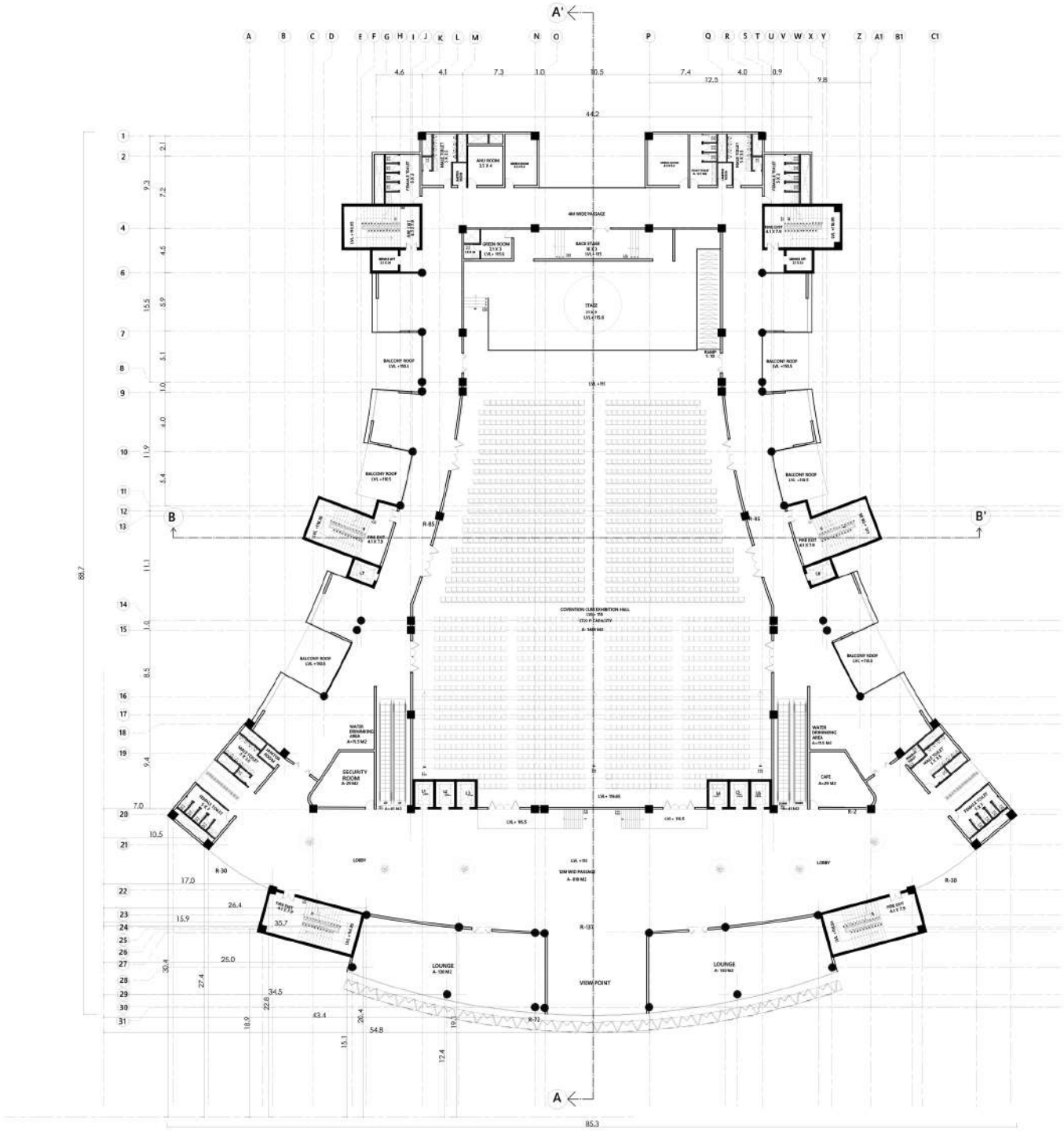
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

9



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE- FOURTH FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

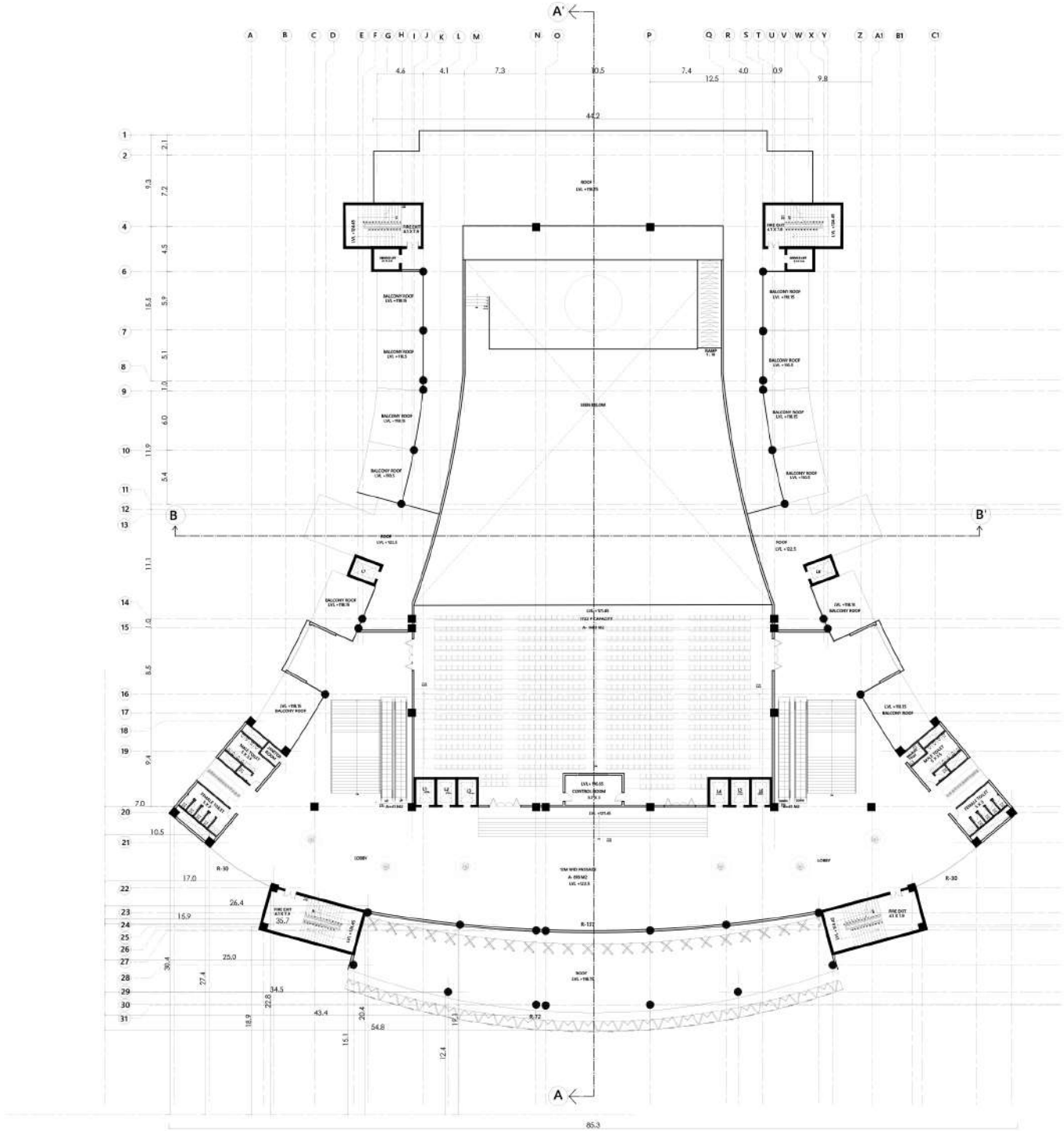
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

10



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2451.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

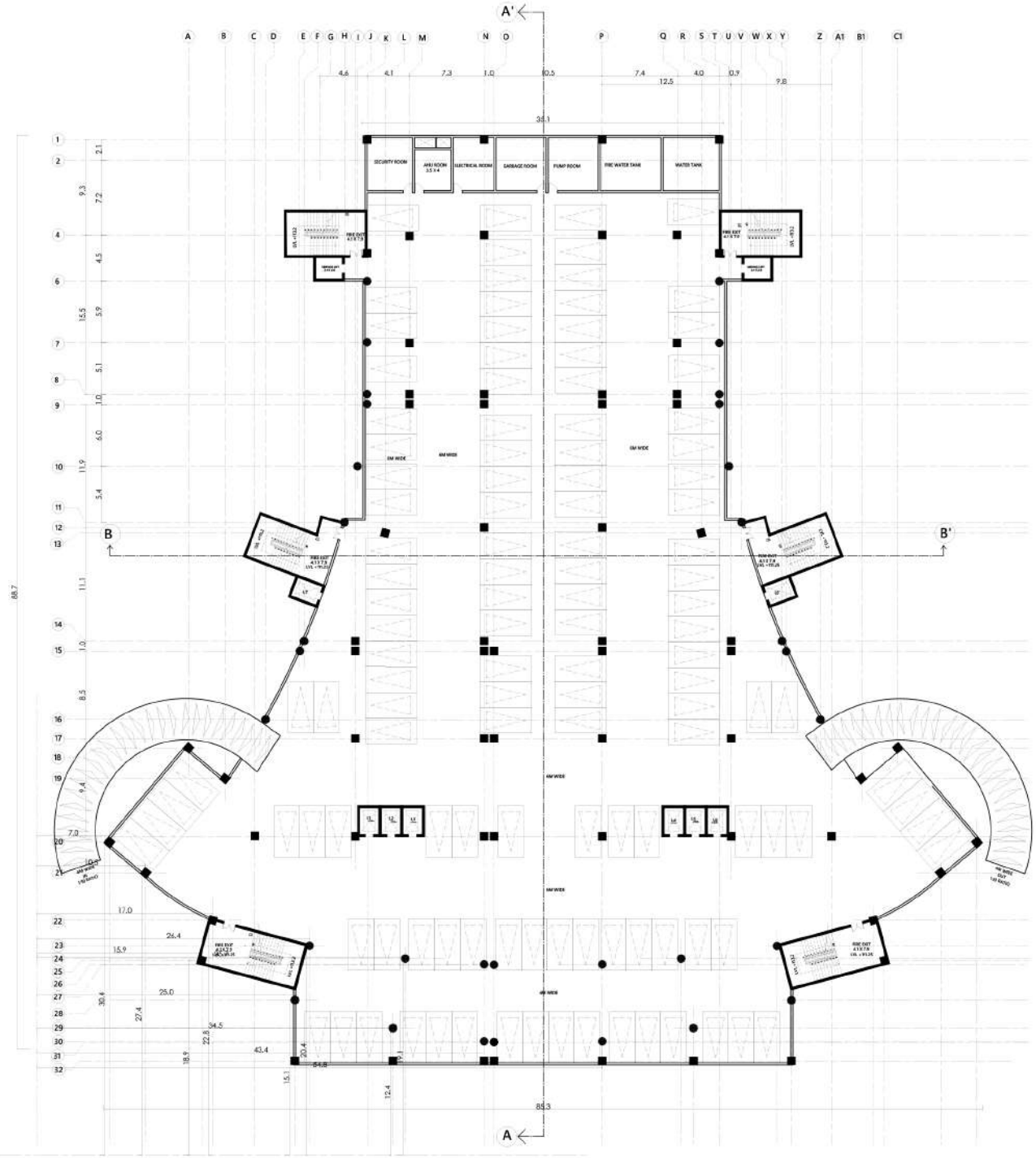
CONVENTION CENTRE-
FIFTH FLOOR PLAN

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:

11



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

NO. OF CARS PER FLOOR : 105

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE-BASEMENT 1 FLOOR PLAN

NO. OF PARKING CAPACITY= 125 CARS PER FLOOR

NAME : MUHAMMED ARSHAD.M

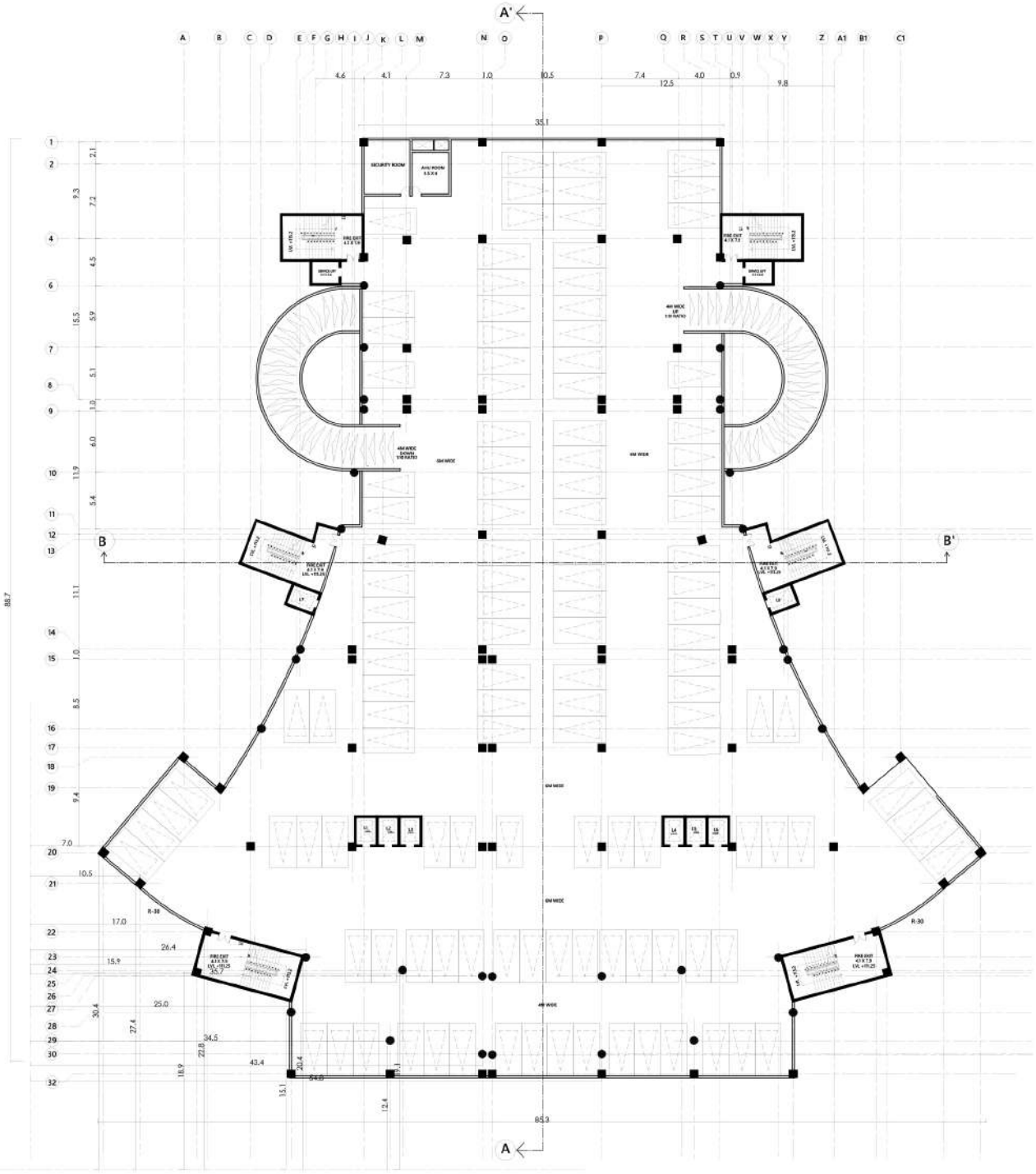
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

12



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

NO. OF CARS PER FLOOR : 105

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE-
BASEMENT 2 & 3 FLOOR PLAN

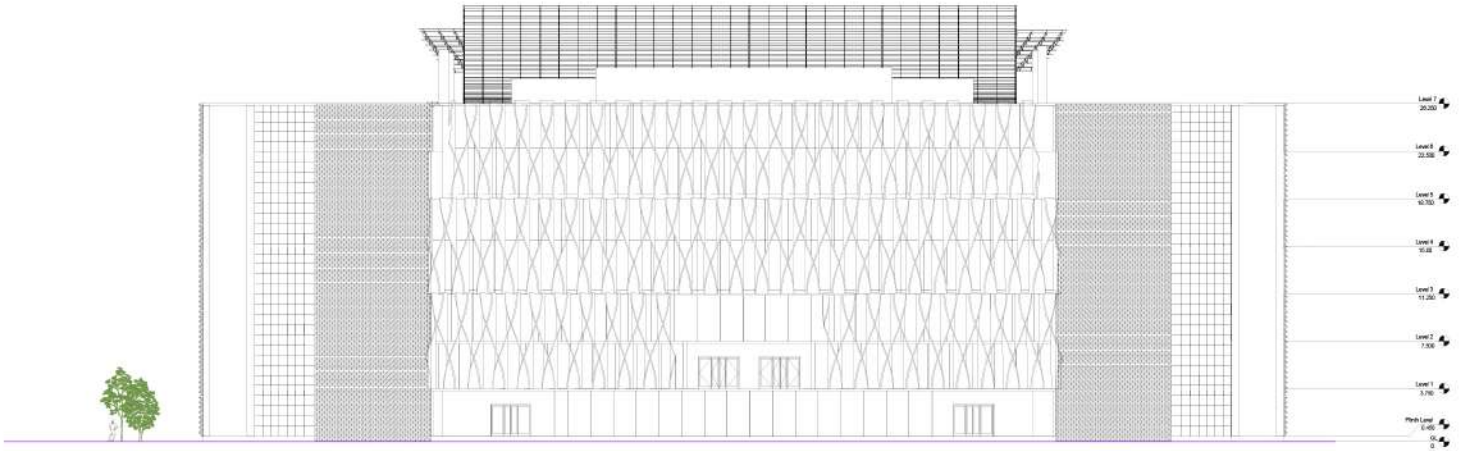
NO. OF PARKING CAPACITY=
125 CARS PER FLOOR

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:

13



FRONT ELEVATION



SIDE ELEVATION

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE-ELEVATIONS

NAME : MUHAMMED ARSHAD.M

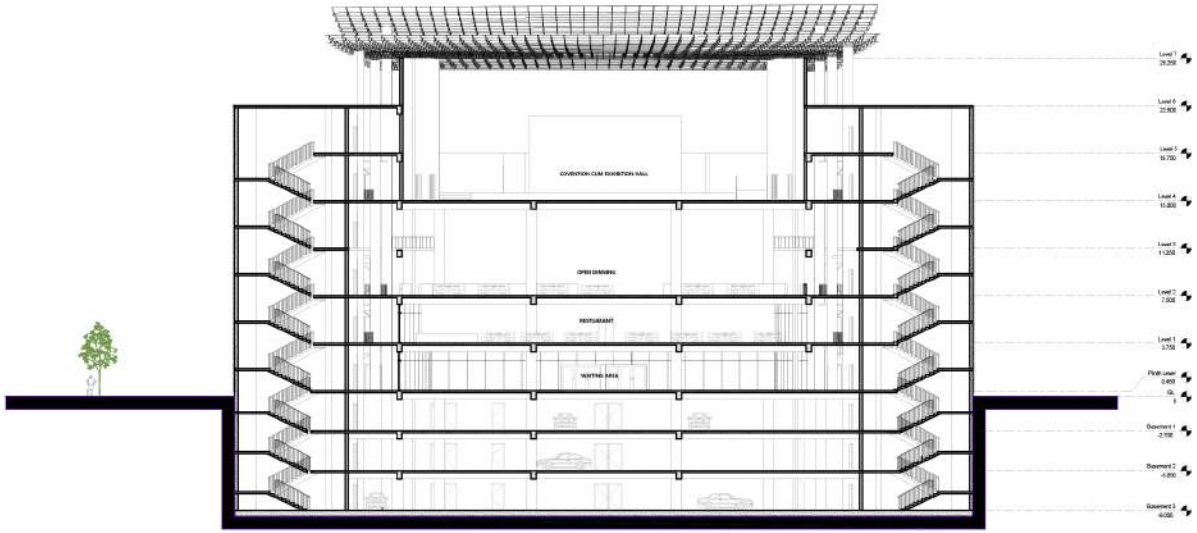
SCHOLAR NO : 211110027

GUIDED BY:

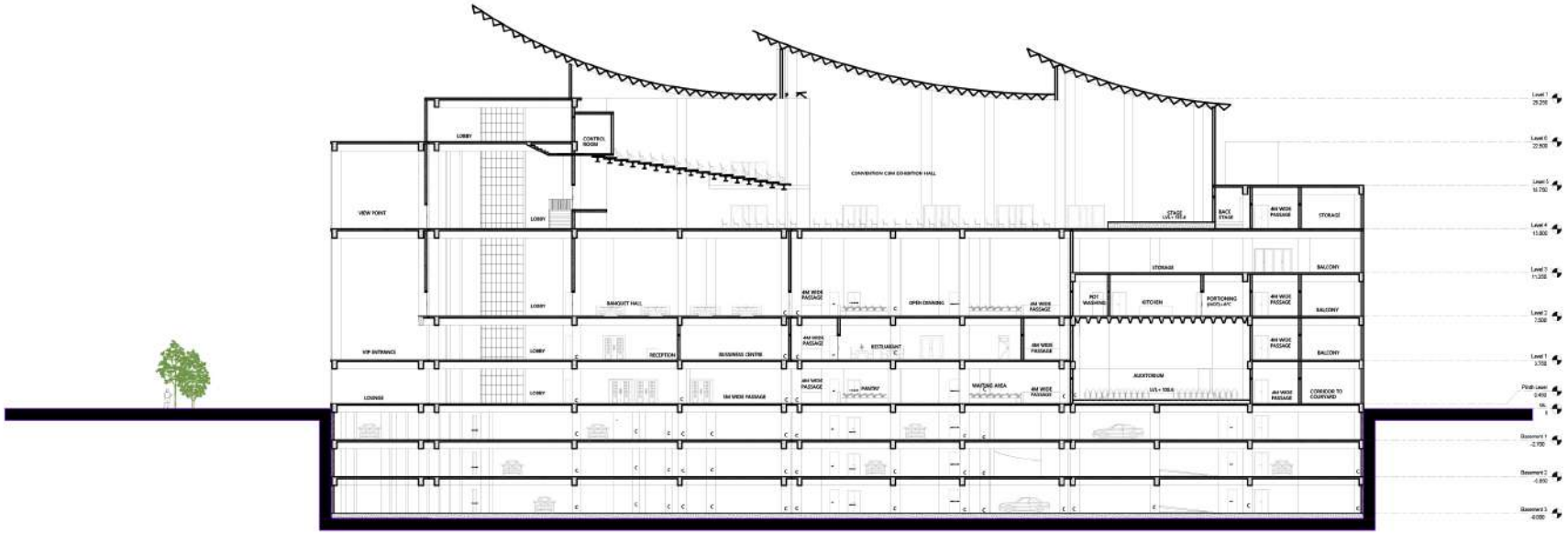
DR.CHARUMITRA KAPSHE

SHEET NO:

14



SECTION BB'



SECTION AA'

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE-SECTIONS

NAME : MUHAMMED ARSHAD.M

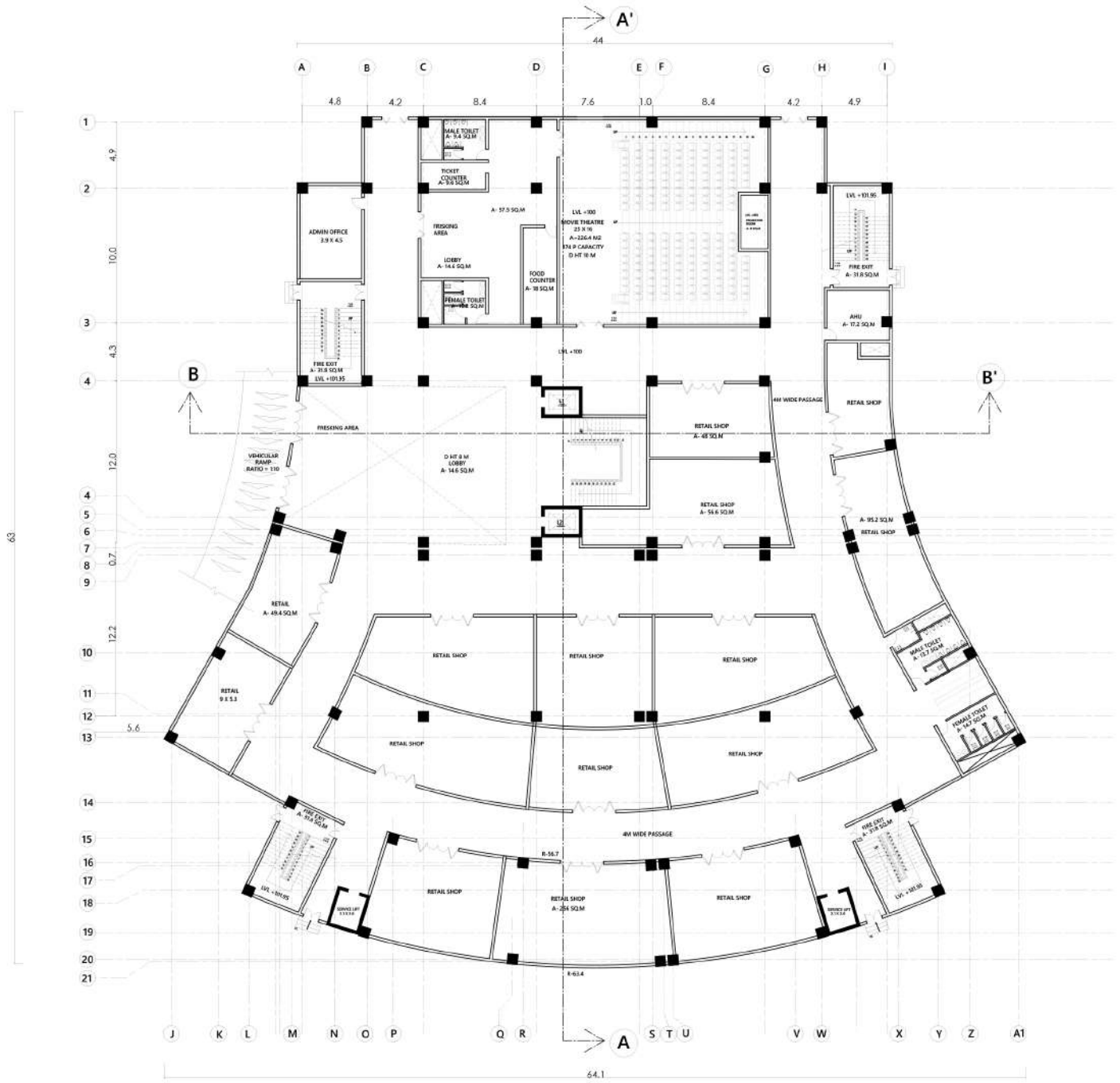
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

15



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT-GROUND FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

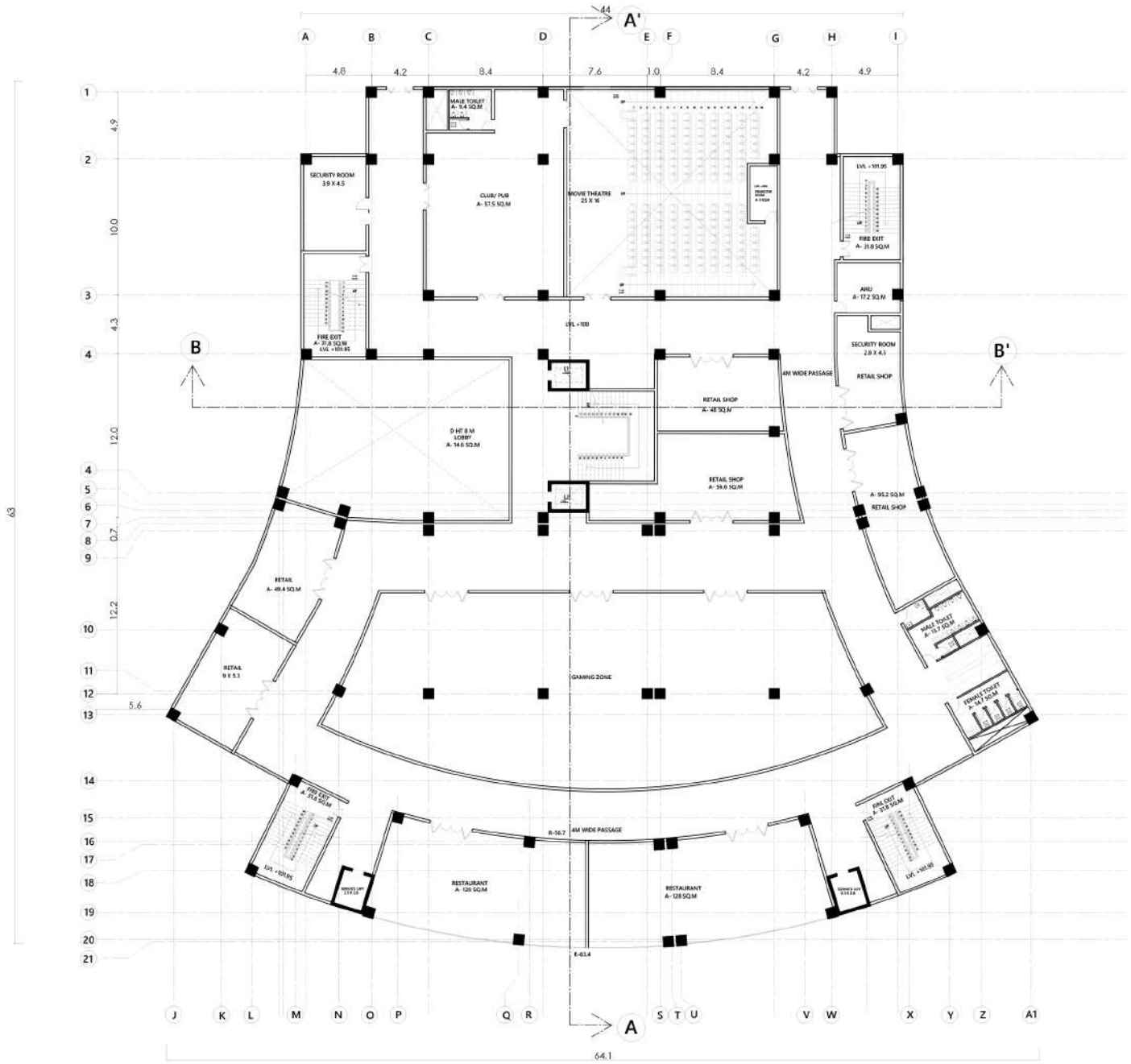
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

16



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT- FIRST FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

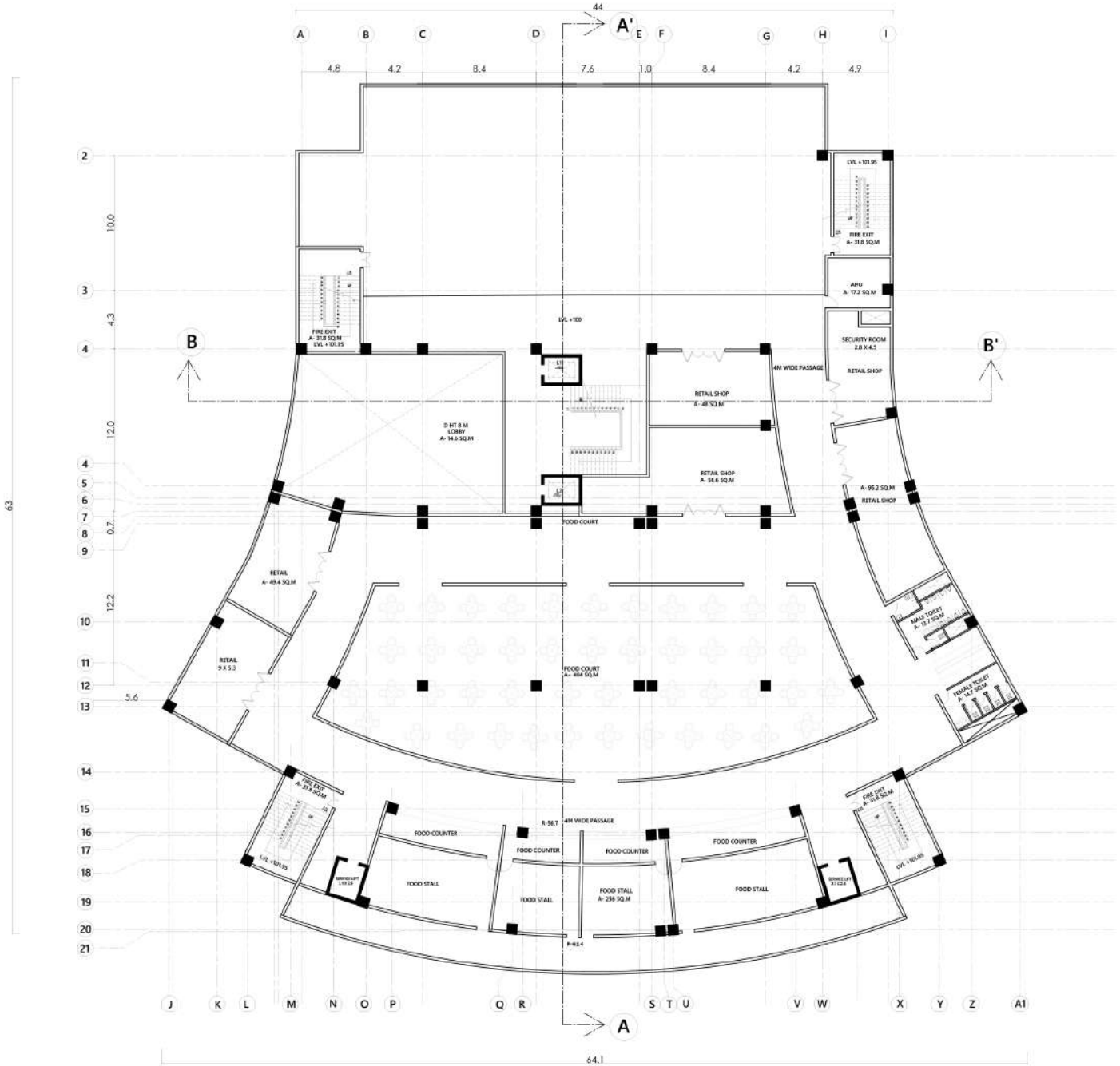
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

17



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT- SECOND FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

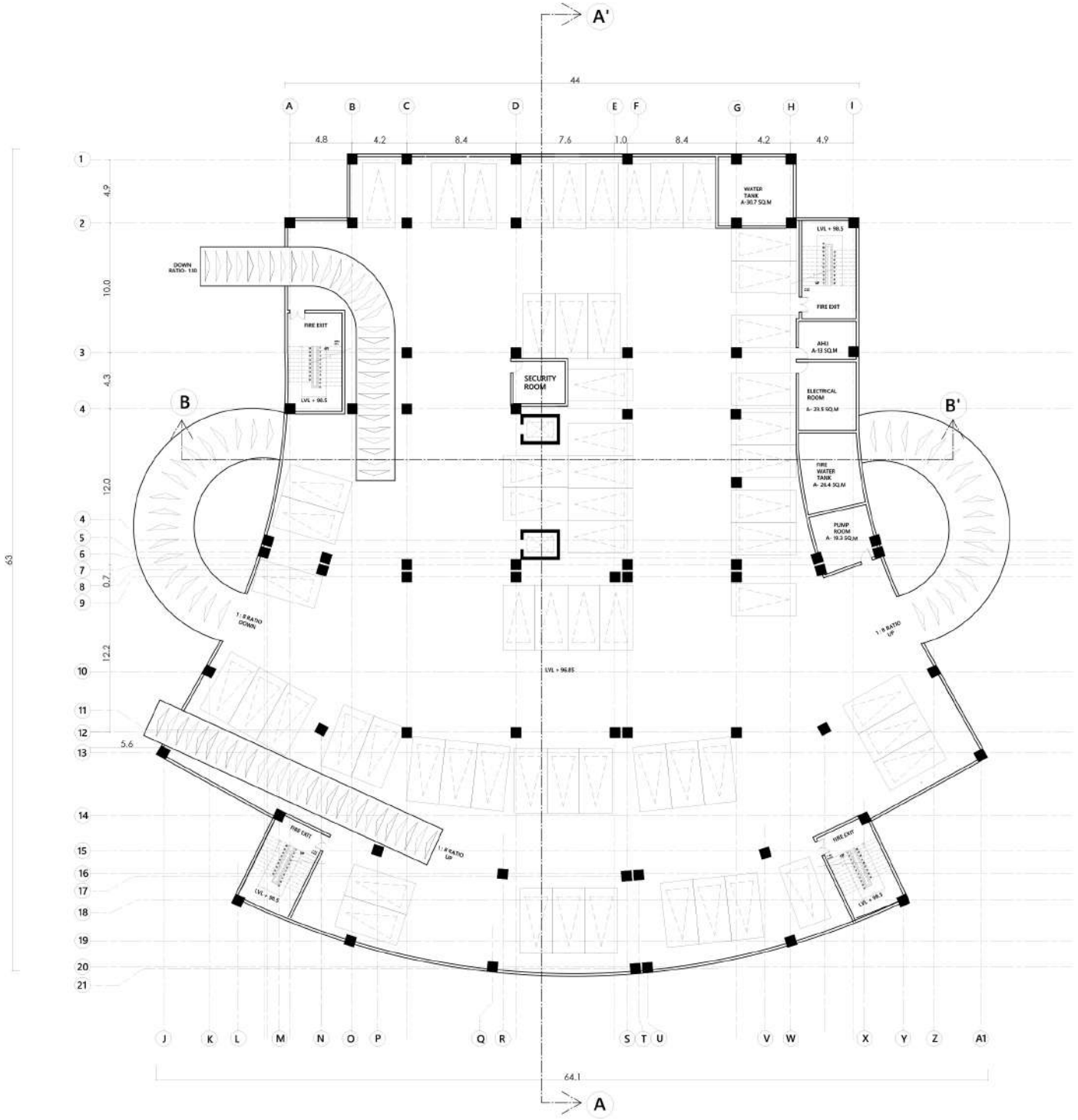
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

18



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

NO. OF PARKING CAPACITY= 72 CARS PER FLOOR

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT- BASEMENT 1 PLAN

NAME : MUHAMMED ARSHAD.M

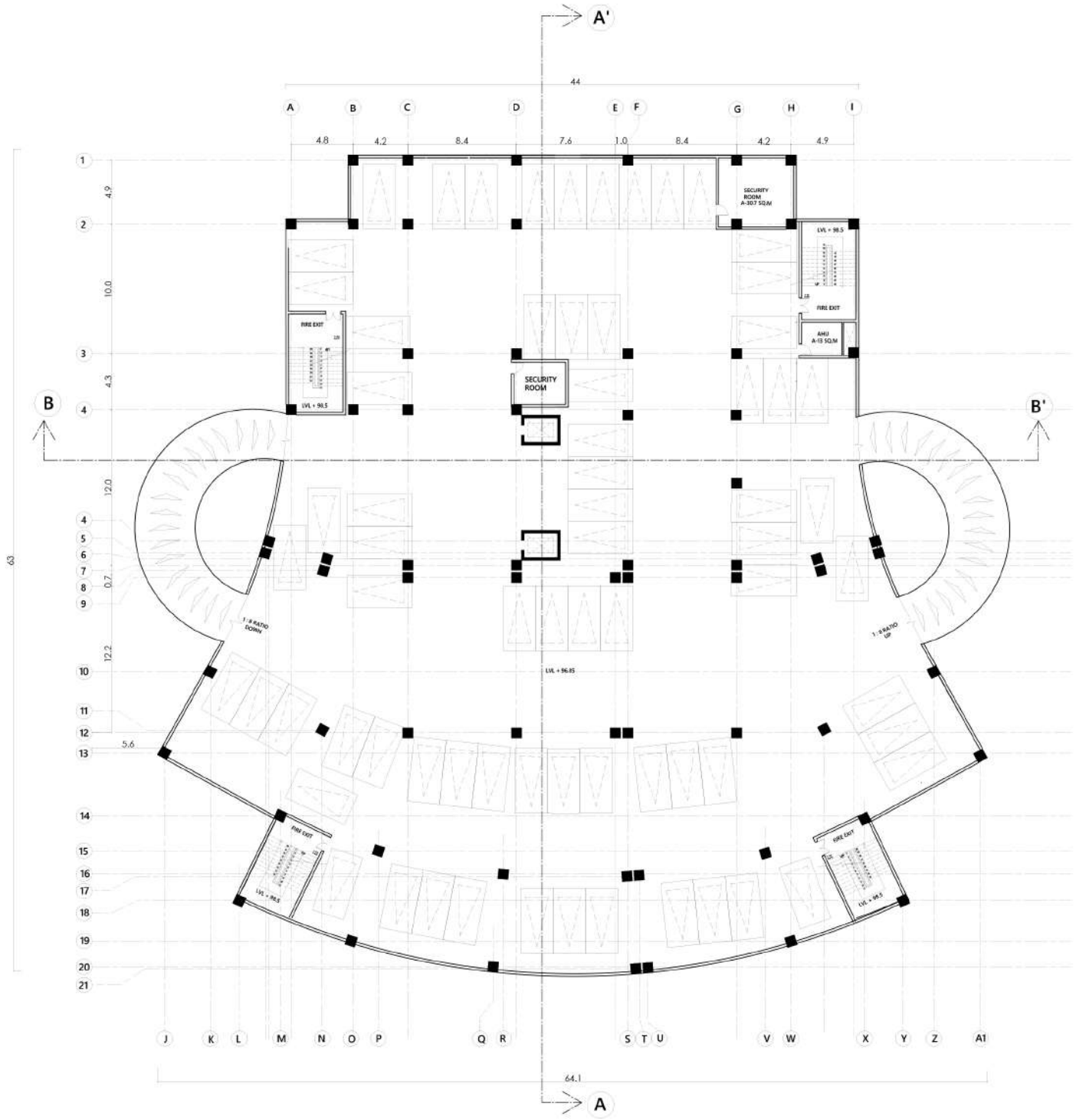
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

19



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

NO. OF PARKING CAPACITY= 72 CARS PER FLOOR

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

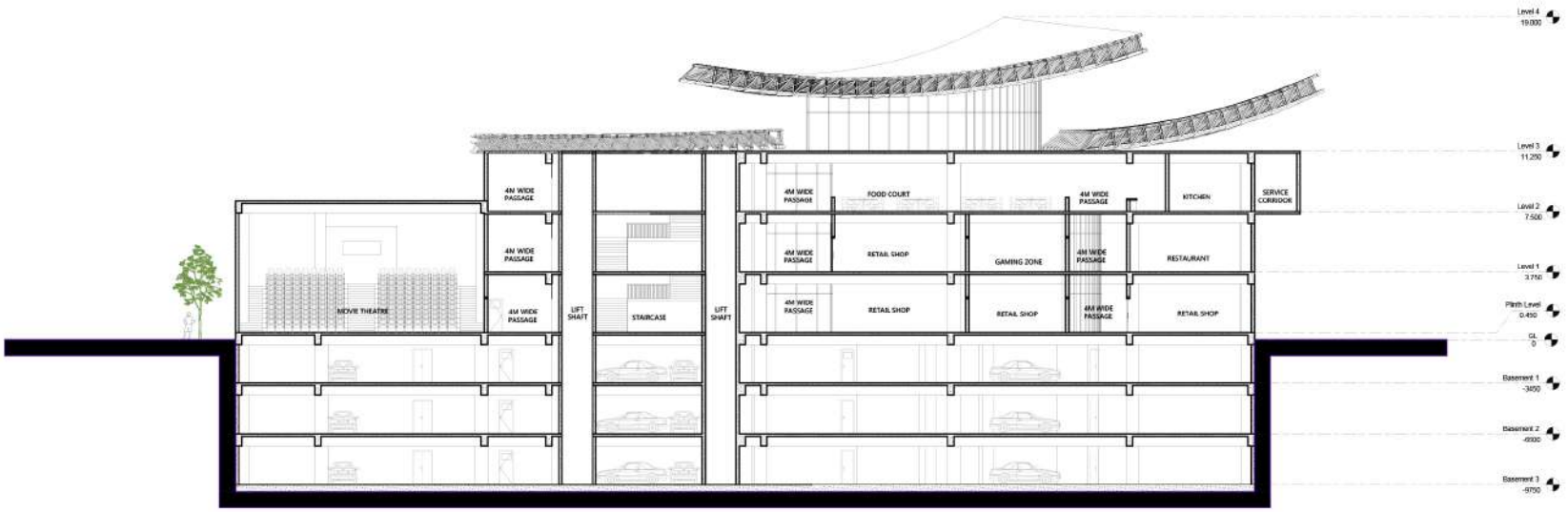
F&B AND ENTERTAINMENT- BASEMENT 2 & 3 PLAN

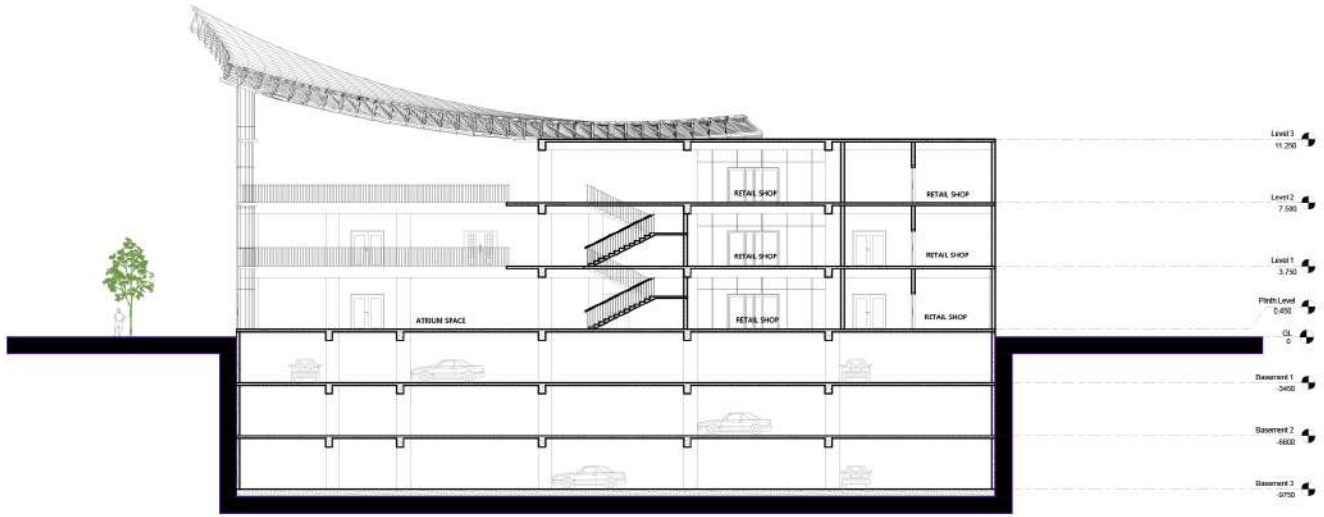
NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:

20





PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

NO. OF CARS : 77

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT-SECTIONS

NAME : MUHAMMED ARSHAD.M

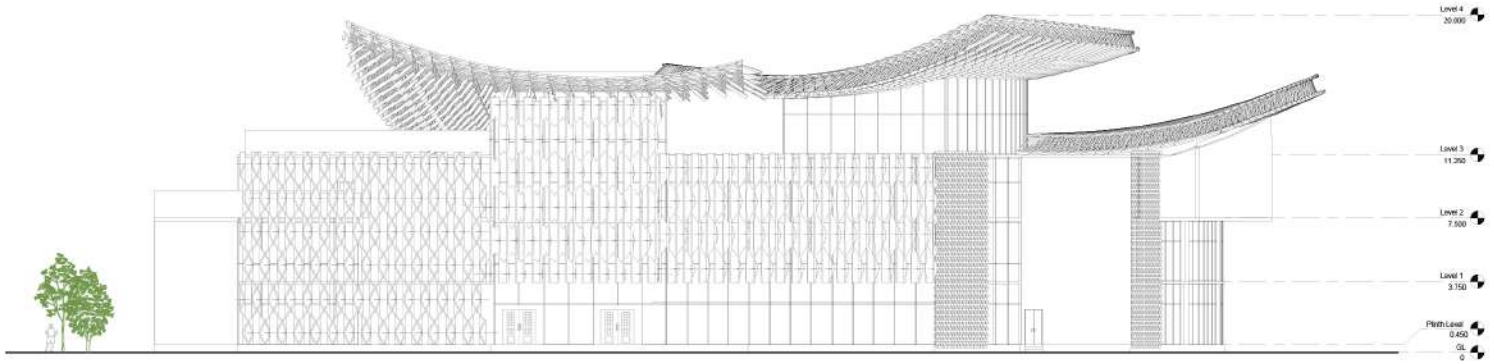
SCHOLAR NO : 211110027

GUIDED BY:

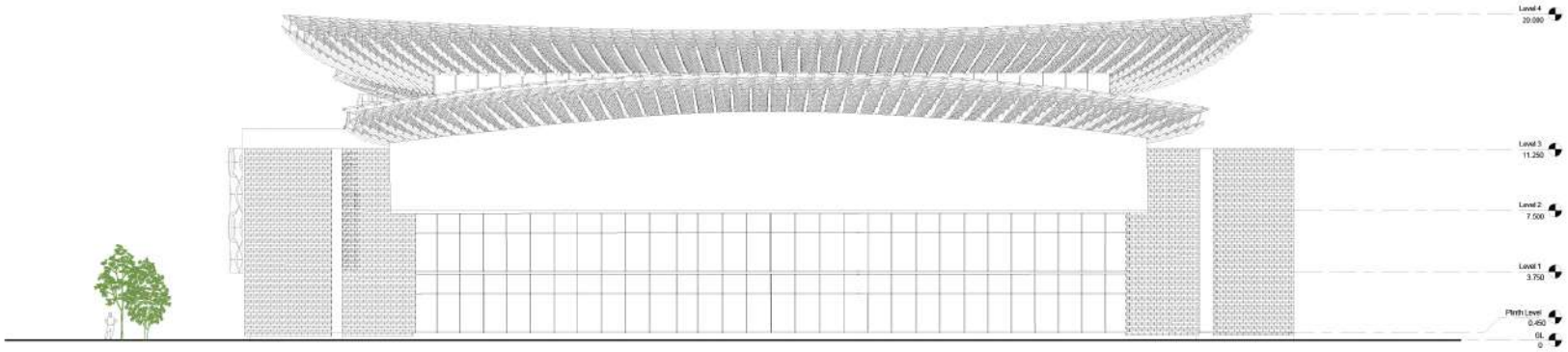
DR.CHARUMITRA KAPSHE

SHEET NO:

21



FRONT ELEVATION



SIDE ELEVATION

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT-ELEVATIONS

NAME : MUHAMMED ARSHAD.M

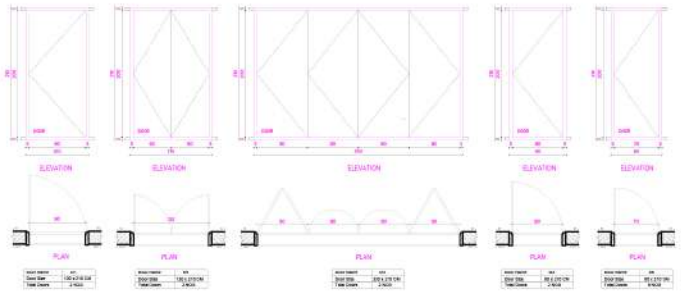
SCHOLAR NO : 211110027

GUIDED BY:

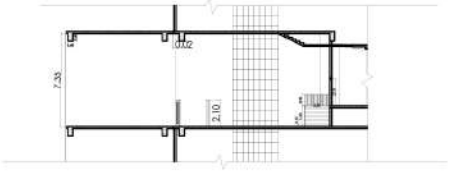
DR.CHARUMITRA KAPSHE

SHEET NO:

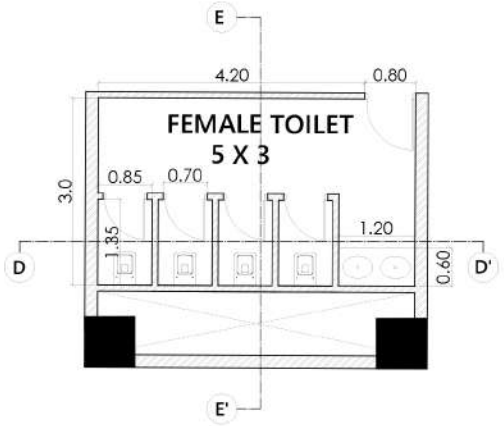
22



SCALE - 1:20
ALL DIMENSIONS ARE IN CM
JOINERY DETAILS

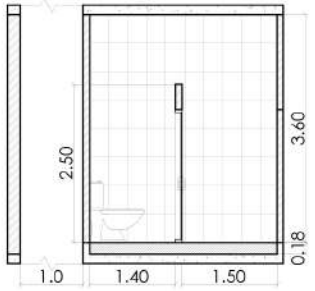


SECTION AA'

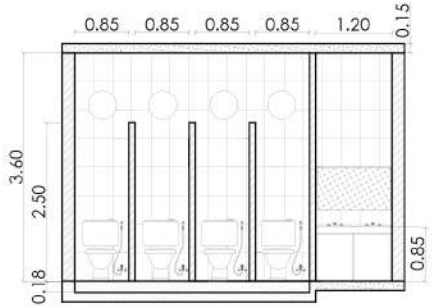


PLAN

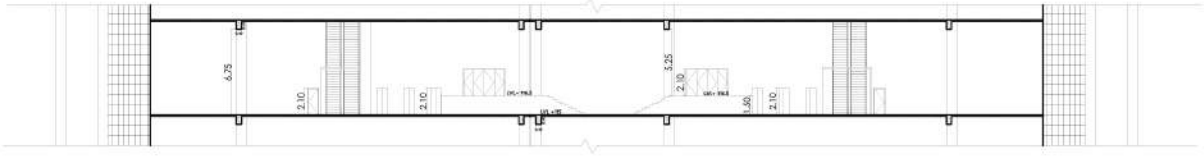
SCALE - 1:20



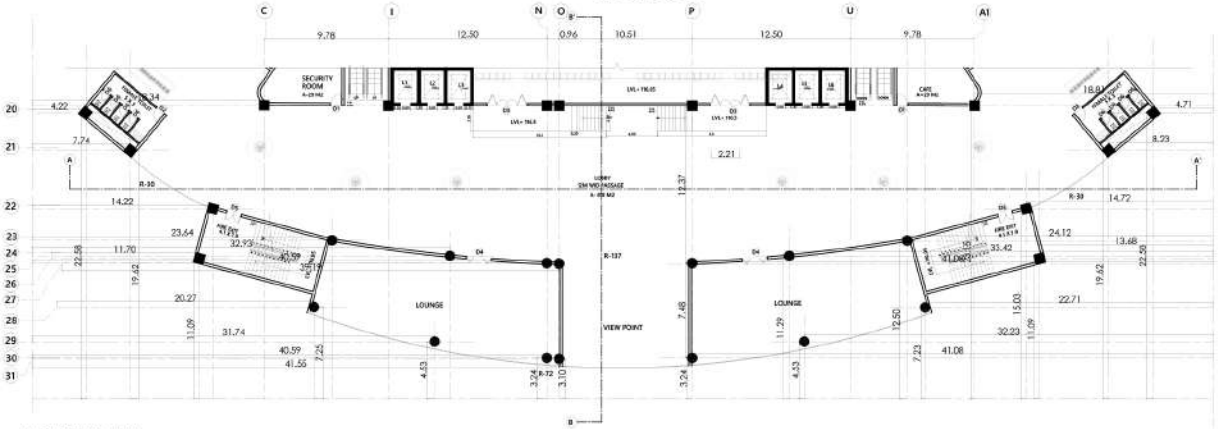
SECTION EE'



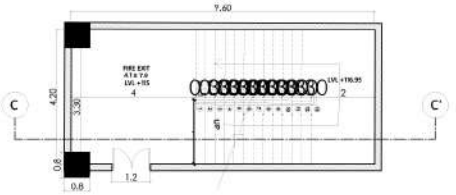
SECTION DD'

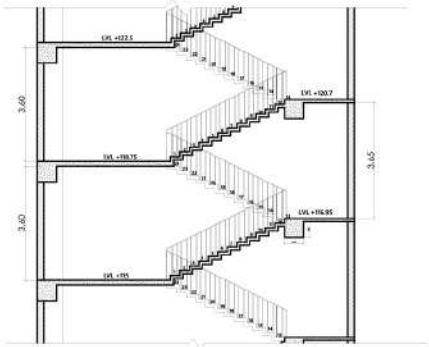


SECTION BB'



LOBBY PLAN
SCALE - 1:200





STAIRCASE DETAILS
SCALE - 1:40

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres
FLOOR AREA : 851.3 Sq.m

SITE AREA : 10 Acres
FAR : 2
GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :
CONVENTION CENTRE-
WORKING DRAWING

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:
23

1- HOTEL
2- F&B AND ENTERTAINMENT
3- CONVENTION CENTRE
4- HOTEL PARKING
5- FOUNTAIN
6- VIP PARKING
7- CONVENTION PARKING
8- STAFF PARKING
9- POOL





NEEM TREE

79.05M
176.45M
102.00M
76.95M
97.50M
60.60M
52.50M
27.00M

304.8
302.8
303.8
300.8
301.8

SERVICE ROAD 6M WIDE
ROAD 7.5M WIDE
ROAD 4M WIDE
ROAD 7.5M WIDE
SERVICE ROAD 7M WIDE
SERVICE ROAD 7M WIDE

GATE 5
GATE 6
GATE 4
GATE 3
GATE 2
GATE 1

NH 163 Warangal By-Pass Road- 24 M WIDE

COURTYARD
GIRLS HOSTEL
SUB STATION
STP

POWER LINE
POWER LINE

BORASSUS FLABELLIFER

INDIAN LAURIEL FIG



MONDA GRASS





HARDSCAPE BY GRASS PAVER



PARKING PAVMENTS



FOOTPATH PAVMENTS



STREET LIGHT AT EVERY 30M DISTANCE

Road
Parking
Fountain/Pool
Footpath
Hardscape
Softscape

Plant Image	Plant Name	Scientific Name	Max. Size (Height x Spread)	Climatic Feasibility (Warangal)	Type	Deciduous/ Evergreen	Key Landscaping Use
			I. Shade/Feature Trees (Large)				
	Neem Tree	Azadirachta indica	15-20m x 15-15m	Excellent (Native, Drought-tolerant)	Tree	Evergreen	Large shade, medicinal, avenue planting, buffer zones.
	Indian Laurel Fig	Ficus microcarpa	15-25m x 15-22m	Excellent (Hardy, tolerant of urban stresses)	Tree	Evergreen	Formal hedges (when pruned), specimen tree for entry points
			II. Medium Ornamental Shrubs For Borders, Screens, and Foundation Planting				
	Oleander	Nerium oleander	2-4m x 1-3m	Excellent (Withstands intense heat)	Shrub	Evergreen	Hedging, screening, or border planting along roadsides.
	Bush Allamanda	Allamanda schottii	1.2m X 1.5m	Good, needs some watering	Shrub	Evergreen	Large, bright yellow, trumpet-shaped flowers, very showy.
	Plumeria (Frangipani)	Plumeria rubra	3m X 3m (small tree/large shrub)	Excellent, highly drought-tolerant	Shrub/Tree	Deciduous	Iconic, highly fragrant white, pink, or yellow flowers.
	Hibiscus	Hibiscus rosa-sinensis	1.5-3m x 1-2m	Good (Needs moderate water in extreme heat)	Shrub	Evergreen	Mixed flood-color, near entrances/patios.
			III. Ground Covers/Borders (Small) For Defining Paths and Large Beds				
	Duranta	Duranta erecta (Cultivars)	1-2m x 1-2m	Excellent; Hardy, can be pruned into shapes/	Shrub/Hedge	Evergreen	Low border, manicured hedges, or topiary.
	Lantana	Lantana camara (Dwarf/Trailing var.)	0.5m X 1m	Excellent, very hardy, drought-tolerant	Shrub/Ground Shrub	Evergreen	Clusters of small, colorful flowers (yellow, orange, red); attracts butterflies.
	Elephant Bush	Portulacaria afra	0.5m X 0.5m	Excellent, highly drought-tolerant	Succulent Shrub	Evergreen	Small, round, fleshy green leaves; very low water need; modern look.
	Periwinkle (Vinca)	Catharanthus roseus	0.2m X 0.3m	Excellent, low-maintenance	Annual/Perennial	Evergreen	Continuous pink or white flowers; ideal for mass planting.
	Mondo Grass	Ophiopogon japonicus	0.2m X 0.3m	Good, prefers partial shade	Grass/Ground cover	Evergreen	Dark green, tufted, grass-like foliage, formal look for shaded areas.

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : Vertex International convention centre
LOCATION : Warangal,Telugana

AREA
Site : 10 Acres

SCALE - 1:600
ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :
LANDSCAPE

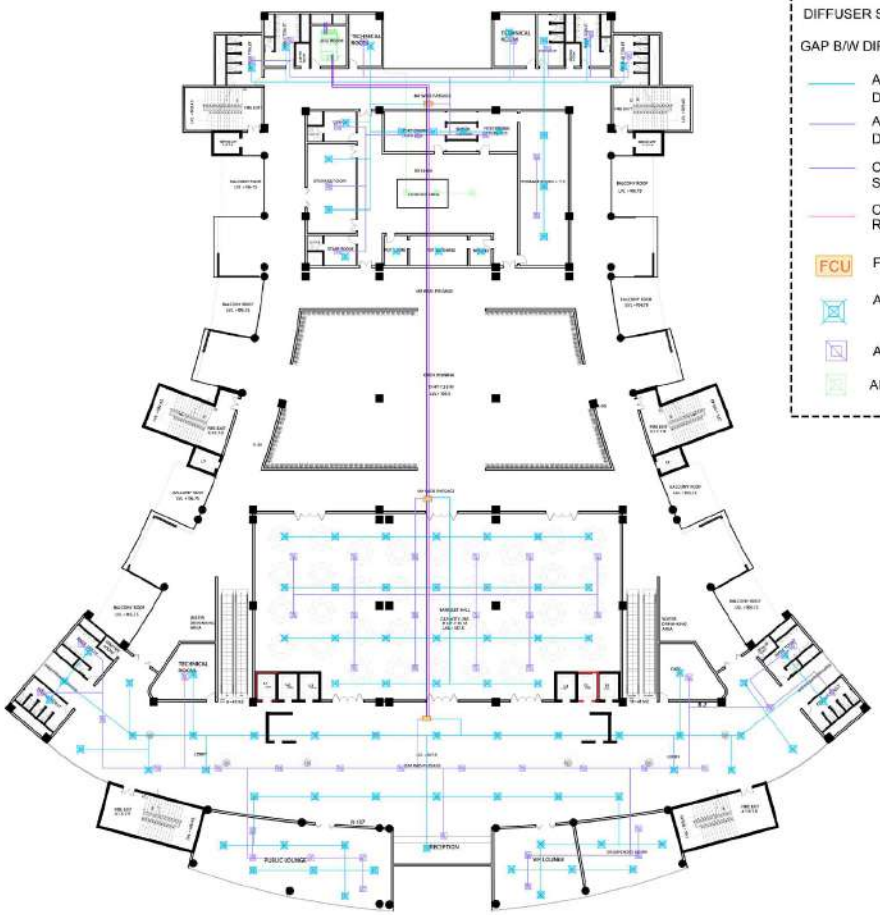
NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :
24

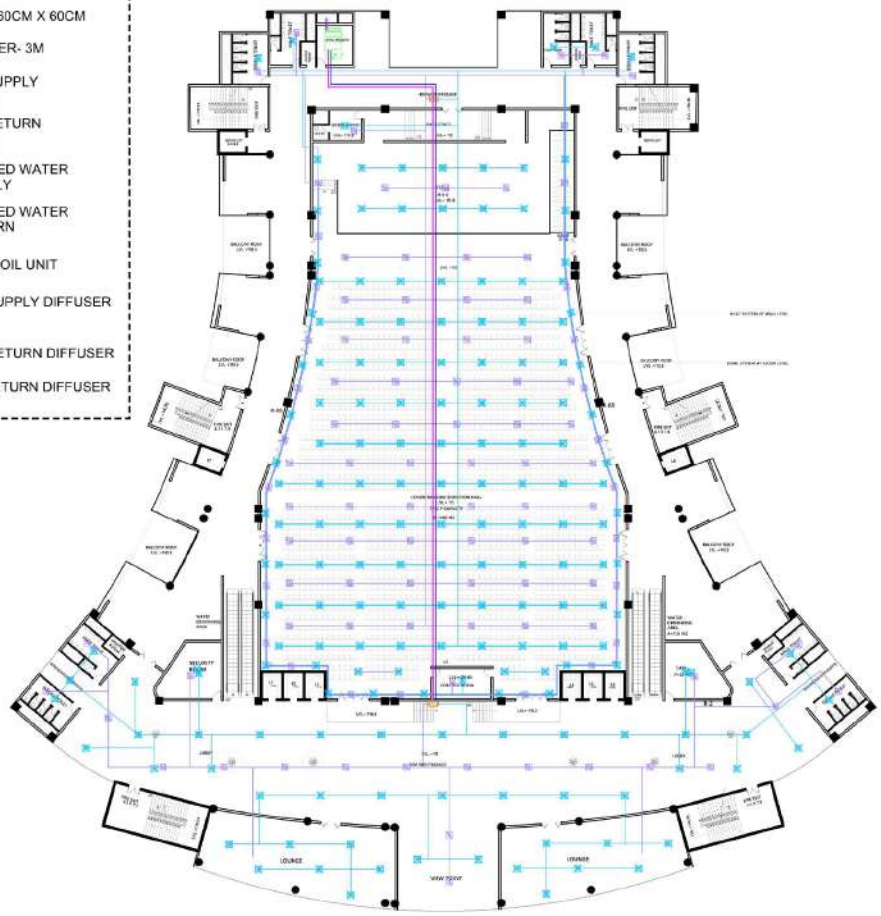


CONVENTION CENTRE- SECOND FLOOR

DIFFUSER SIZE-60CM X 60CM

GAP B/W DIFFUSER- 3M

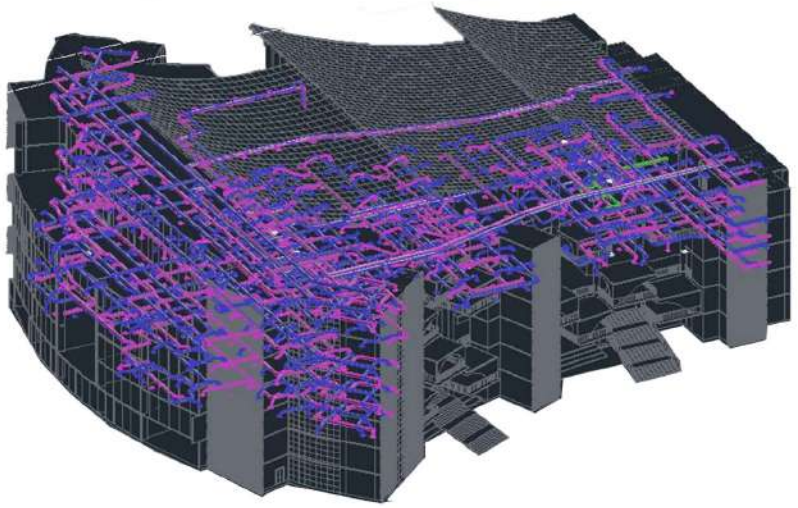
- AIR SUPPLY DUCT
- AIR RETURN DUCT
- CHILLED WATER SUPPLY
- CHILLED WATER RETURN
- FCU — FAN COIL UNIT
- AIR SUPPLY DIFFUSER
- AIR RETURN DIFFUSER
- AIR RETURN DIFFUSER



CONVENTION CENTRE- FOURTH FLOOR

HVAC Calculation FOR Convention Centre	
(Considering area to be sqm or sq ft for all 7 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								
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 +	In Tons (12000 btu = 1 ton)	consideration
G	2432	377	916864	6,00,000.00	12000	15,16,864	126.4053333	189.608
1	2578	485	1250330	6,00,000.00	12000	18,50,330	154.1941667	231.29125
2	2712	592	1605504	6,00,000.00	24500	22,05,504	183.792	275.688
3	391	700	273700	6,00,000.00	12000	8,73,700	72.80833333	109.2125
4	3164	807	2553348	10,80,000.00	37000	36,33,348	302.779	454.1685
5	1605	915	1468575	6,00,000.00	24500	20,68,575	172.38125	258.571875
B1	4228	377	1593956	6,00,000.00	12000	21,93,956	182.8296667	274.2445
B2	4228	377	1593956	6,00,000.00	12000	21,93,956	182.8296667	274.2445
B3	4228	377	1593956	6,00,000.00	12000	21,93,956	182.8296667	274.2445
Total	25566							2341.273625



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : Vertex International convention centre

LOCATION : Warangal,Telugana

SITE AREA: 10 Acres

FLOOR AREA: 4893.8 Sq.m

FAR : 2

GC : 40%

SCALE - 1:250
ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :

CONVENTION CENTE-HVAC LAYOUT

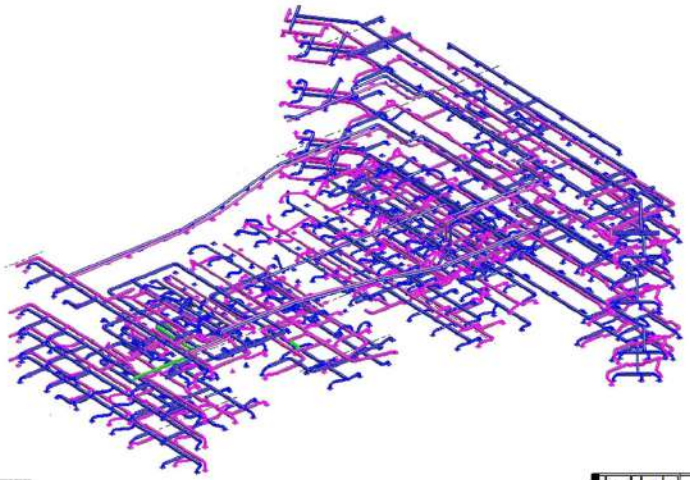
NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 21110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

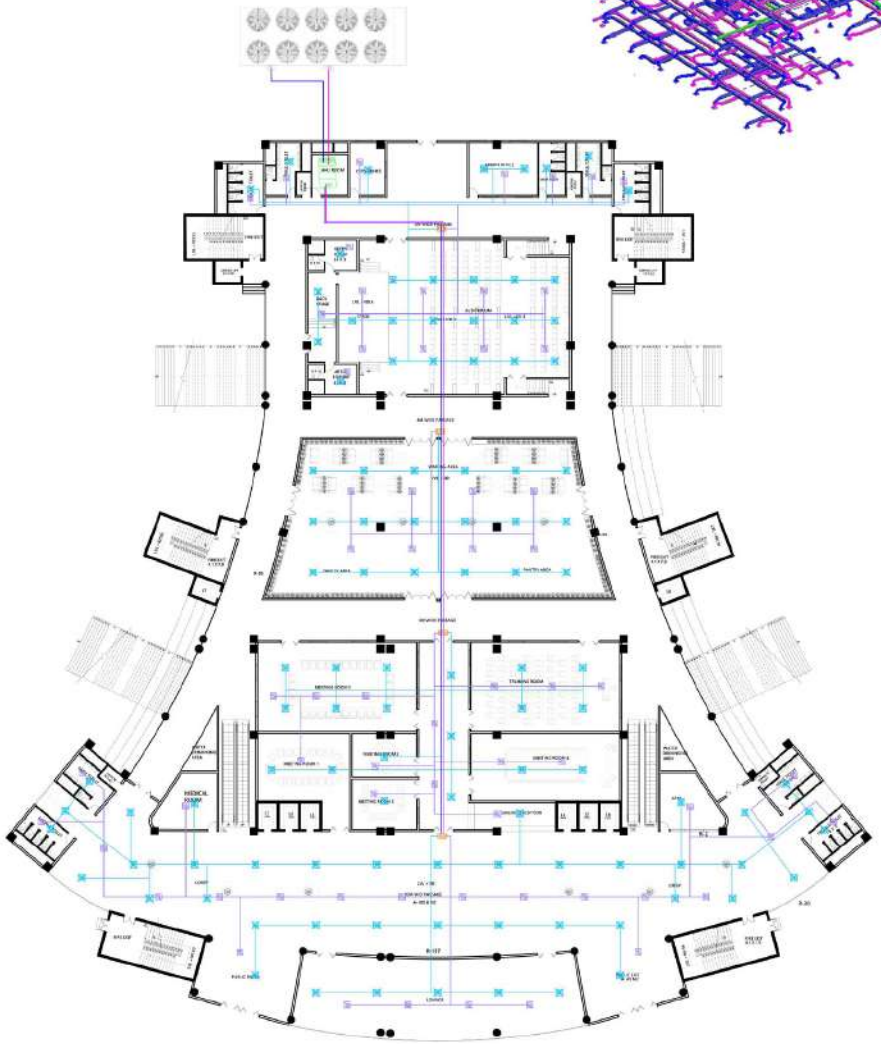
SHEET NO :
25



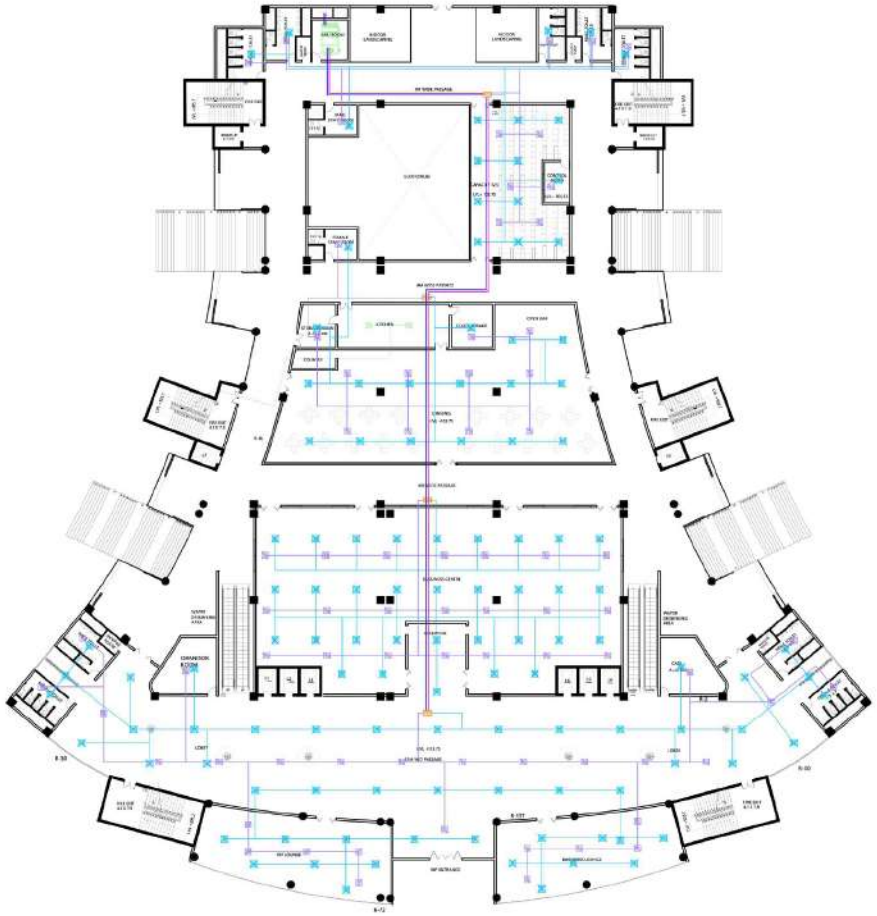
DIFFUSER SIZE-60CM X 60CM

GAP B/W DIFFUSER- 3M

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



CONVENTION CENTRE- GROUND FLOOR



CONVENTION CENTRE- FIRST FLOOR

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT :
Vertex
International convention centre

LOCATION : Warangal,Telugana

SITE AREA: 10 Acres

FLOOR AREA: 4893.8 Sq.m

FAR : 2

GC : 40%

SCALE - 1:250
ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :

CONVENTION CENTE-HVAC LAYOUT

NAME : MUHAMMED ARSHAD.M

SCHOLAR NO : 211110027

SEM : 9TH

SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :

26











VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : **Vertex**
International convention centre

LOCATION : Warangal,Telugana

AREA

Site : 10 Acres

SCALE - 1:1000

ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :

VIEWS

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

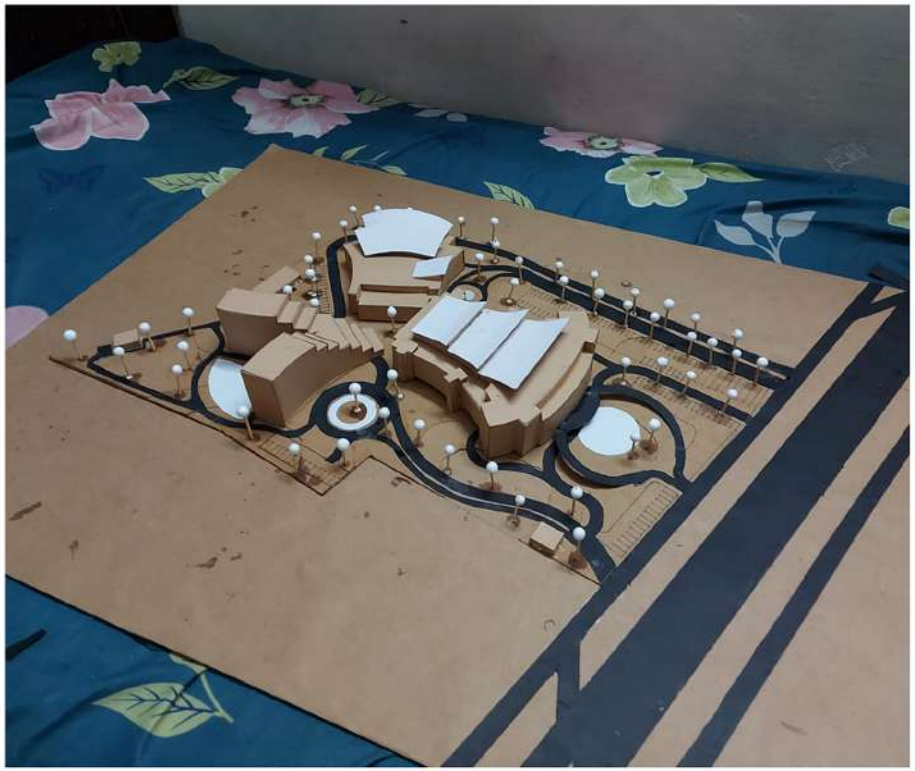
SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

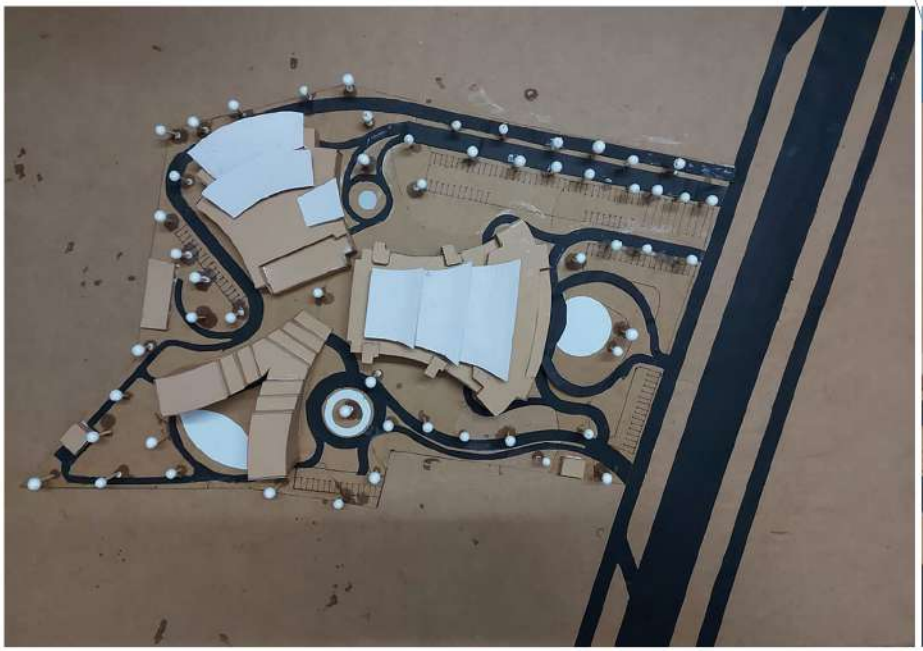
GUIDED BY:
DR.CHARUMITRA KAPSHE

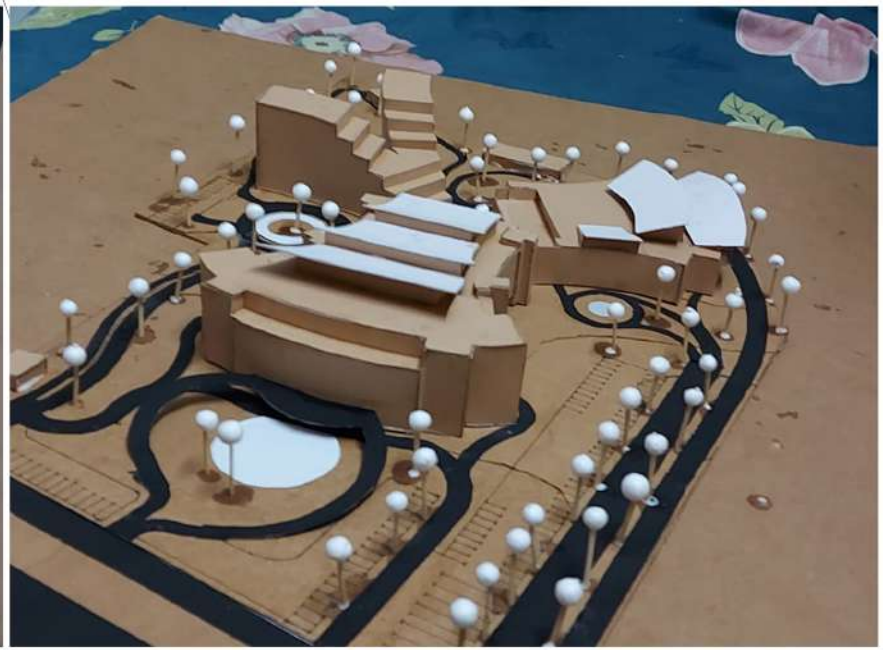
SHEET NO :

27









VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : Vertex
International convention centre

LOCATION : Warangal,Telugana

AREA

Site : 10 Acres

SCALE - 1:600

ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :

PHYSICAL MODEL

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :

28

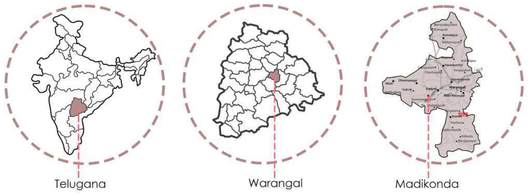
VERTEX INTERNATIONAL CONVENTION CENTRE



NAME : MUHAMMED ARSHAD M
SCHOLAR NO. : 211110027
GUIDED BY : DR.CHARUMITRA KAPSHE

Location

Following map shows the location of the Project Site with respect to Warangal.
Latitude: 17.957690 Longitude: 79.447151 E

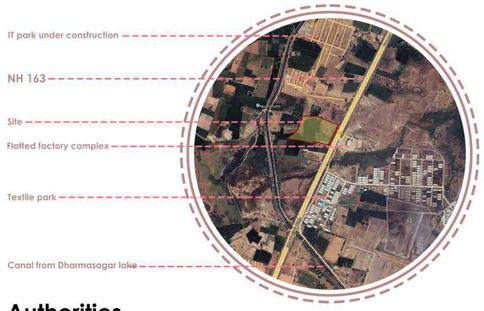


Geographic Location:

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.

Aerial Photographs And Maps:

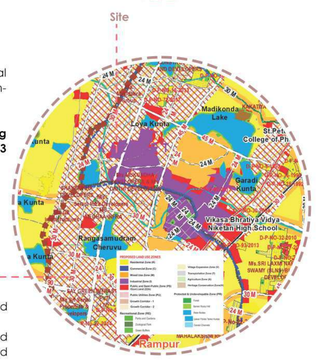
Photographs and maps of the site, suburb, and surrounding areas.



Authorities

Land ownership:

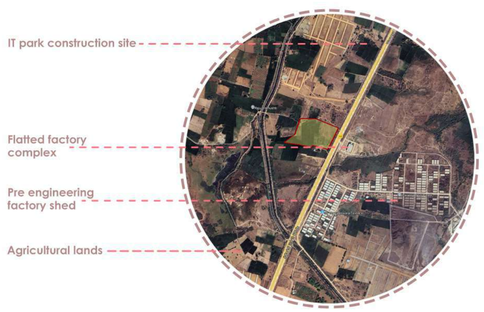
The Telangana State Industrial Infrastructure Corporation Limited
Site Area: 10 acres
As per Andra Pradesh Building bye laws- G. O. Ms. No.423 M.A :
F.A.R: 2
Ground Coverage: 40%
Front setback-9m
Side setback-6m
Rear setback-6m



Zoning plans

Site is located in the zoned area of Industrial Zone (II)
Neighbouring size are zoned into Growth corridor 1 and public & semi public zone

Neighbourhood context



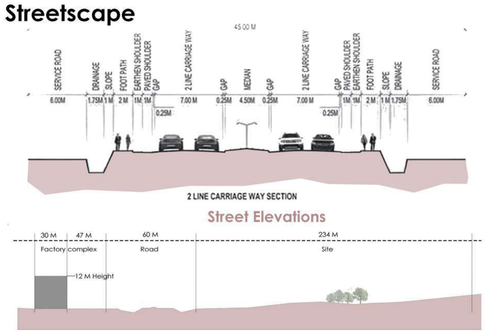
1. Land Uses neighboring land uses are zoned into industrial zone (II),Public & semi public zone and Growth coridor-1.
Footpaths, entrances, and roadways adjacent to the site well as site is connected with NH 163.

2. Distances between the site and its neighboring construction site as well as textile park is within 200 meters.

3. Height of the adjacent construction site of It park is leveled at same level of NH road and all other adjacent site are same level of the project site. and neighbourhood structures have height of G+2 which is almost 12 meters.

4. Neighbourining site other than IT park construction site and textile park are being used for agricultural purposes,styles of neighboring sites structures modern structures and pre engineering factory sheds mostly used in textile park.

Streetscape

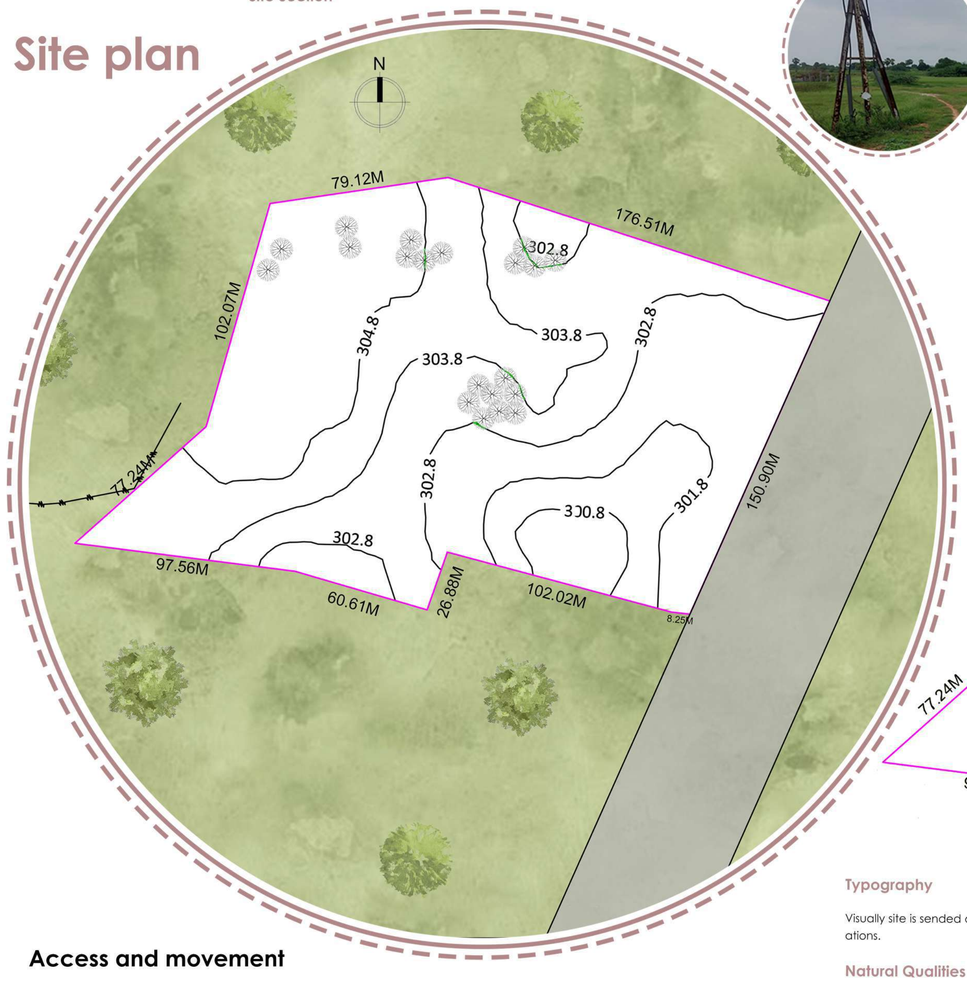


Street View :

The site main entry is from the NH 163 road having total width of 60 m includes 45 m NH road width with proposed drinage line and service road.



Site plan



Site History And Significance

Previous Use/s: Earlier the site was used for agricultural purposes.
Contamination: Manufacturing, industrial, or other processes or operations of Textile park that may have caused or are currently causing contamination on the site.
Historical Significance: Place is famouse for temple tourisms and granate quorries
Site's Cultural Significance: site is located in context of textile industry the traditional handwoven carpet 'durries' are much famous.

Man-made Features

Electricity

The site have a low tension electric line passing at west and southeast corner of the site which help to take electricity to the site.

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.



Water supply

Behind the site a canal is passing named Dharamasagar canal which come from Dharamasagar lake which is 14 km away at distance of 150m from site can be utilised for water supply .

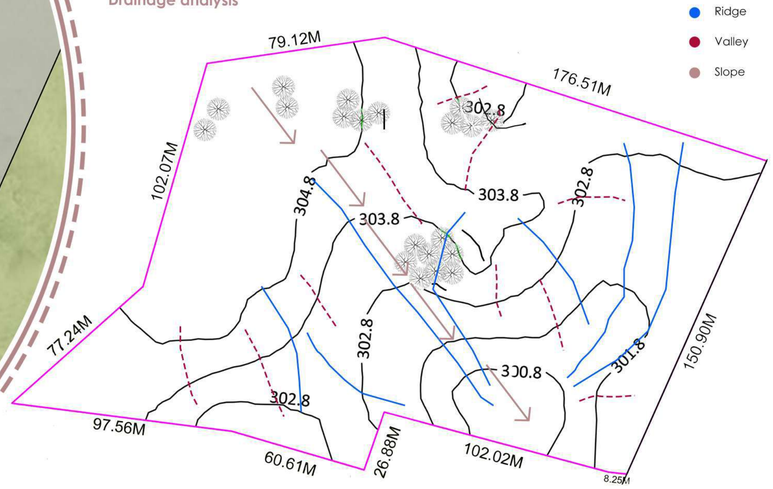


Nautral Features

Slope analysis

Slope Percentage calculation:
G=D/L X 100
G= Gradient/ Slope %
D= distance between 2 contours(304.8-300.8=4)
L=Horizontal distance b/w 2 ends of land(258 m)
G=4/258 X 100=1.5% as the slope % which is less than 5% , so the site can be considered as flat land

Drainage analysis



Typography

Visually site is sended as flat land with minimal vegitations.

Natural Qualities And Characteristics

Site is usually seened with a yellowish shiny sand texture.



Vegitation

mainly 2 types of vegitation has observed. Neem trees and Toddy palm trees

Common Name: Neem Tree
Scientific Name: Azadirachta indica

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: Asian Palmyra Palm / Toddy Palm / Ice Apple Tree
Scientific Name: Borassus flabellifer

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



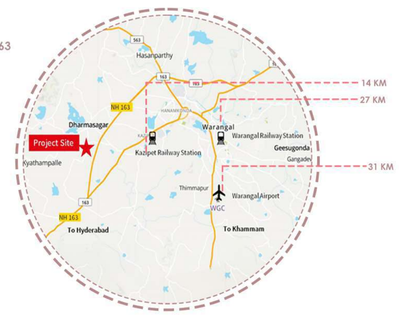
Access and movement

Pedestrians & Vehicles :

Access to and around the site is from 35 m wide National highway 163 road located at the east side of the site;



Public Transport Links:



Geology, Soil Type

The Soil is Sandy Loam Soil. Sandy loam soils are moderately stable and drain well.



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.

VERTEX INTERNATIONAL CONVENTION CENTRE

THESIS PROJECT

PROJECT : Vertex
International convention centre

LOCATION : Warangal,Telugana

AREA
Site : 10 Acres

SCALE - 1:1000

ALL DIMENSIONS ARE IN M

DWG FILE :

SITE ANALYSIS

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

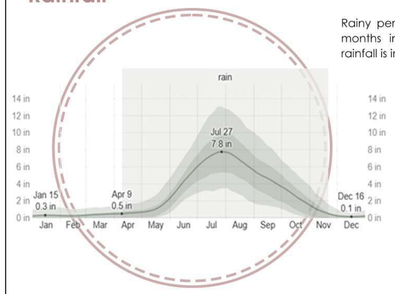
DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :
1

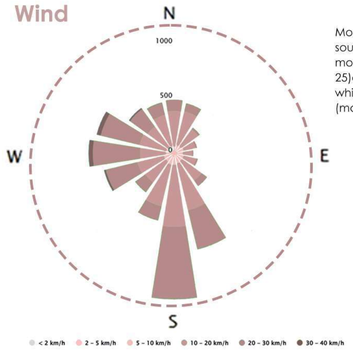
Climatic datas

Rainfall



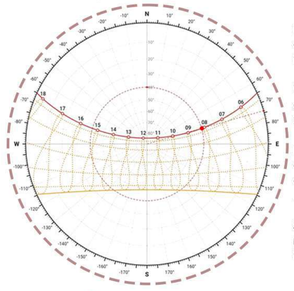
Rainy period last for 7.5 months in a year. most rainfall is in july month

Wind



Mostly wind is from south last for 4.9 months (Dec 28- may 25)and then from west which last for 4 month (may 25-sept 26)

Solar analysis



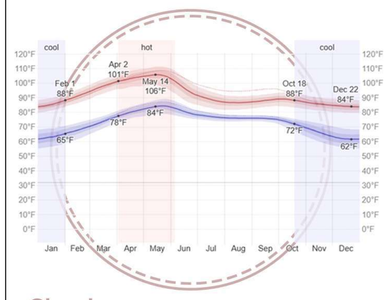
East-facing facades receive strong radiation from 7:00–11:00 AM.

West-facing facades get harsh sun from 2:00–6:00 PM.

North-facing facades are mostly shaded except in early mornings .

South-facing facades receive balanced radiation.

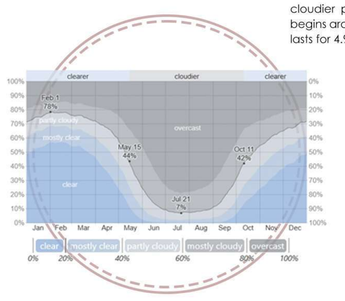
Average Temp.



Height temp. 40 degree celcius.

lowst temp. 16 degree celcius.

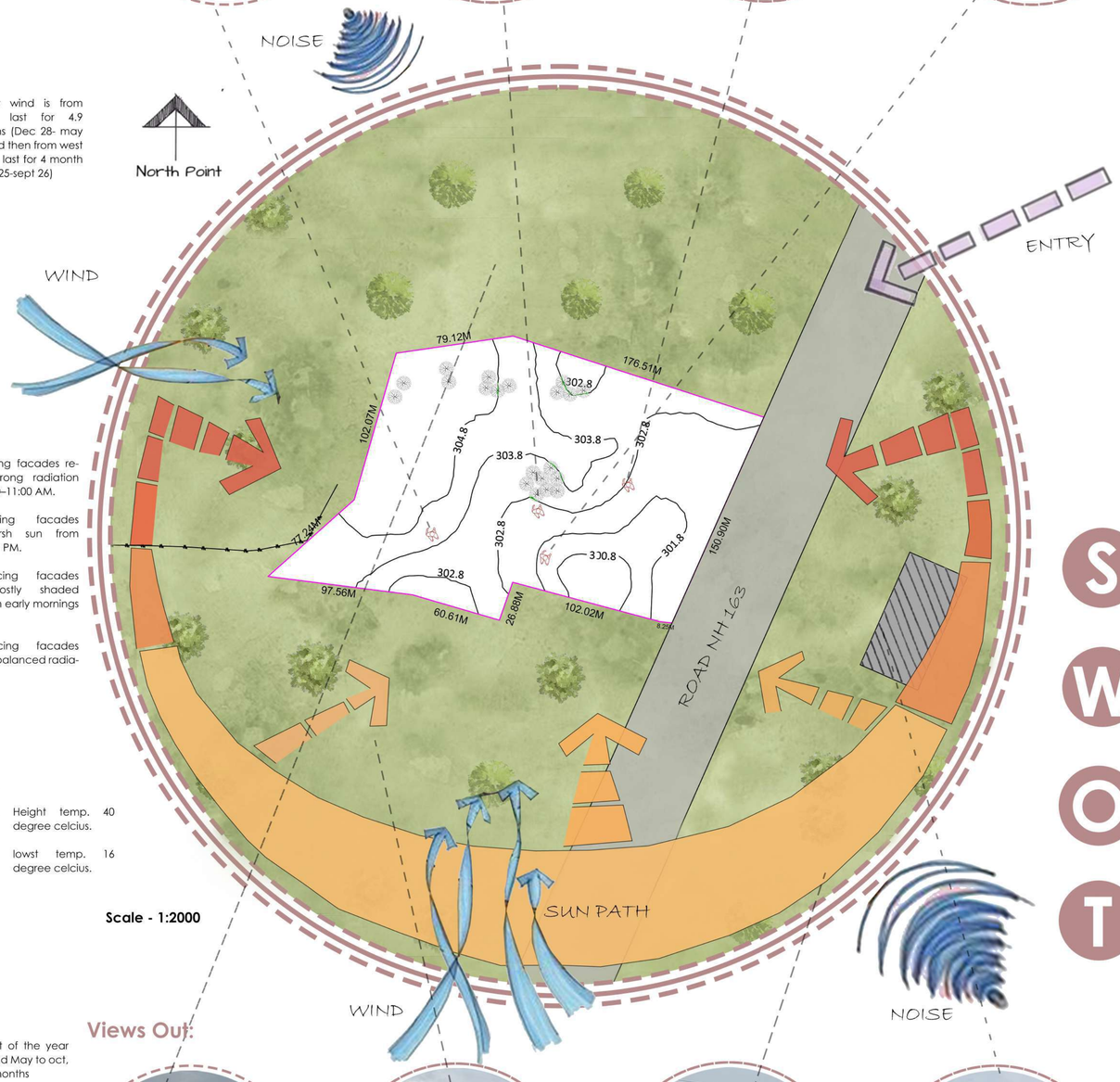
Cloud



cloudier part of the year begins around May to oct, lasts for 4.9 months

Views In:





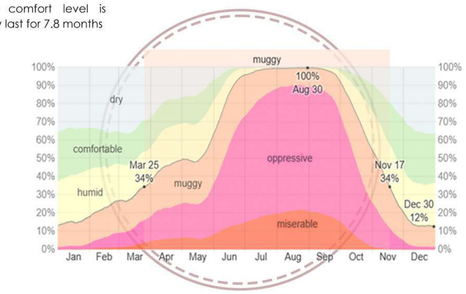
Scale - 1:2000

Views Out:



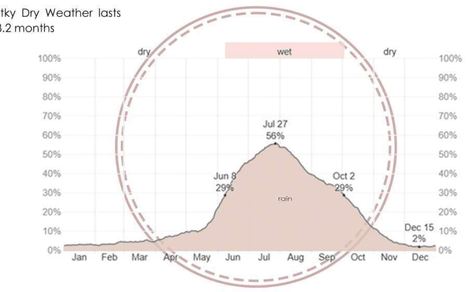
Humidity

Mostly comfort level is Muggy last for 7.8 months



Precipitation

Mostky Dry Weather lasts for 8.2 months



Sound And Noise

Noise pollution is produced from adjacent construction site which is temperory and from the NH road and textile foactory have comparitively higher noise polution

SWOT Analysis

Strengths

Proximity to good infrastructures is very near such as IT Park (under construction), availability of electricity (low tension line on site), nearby drainage path, and water source (Daramsagar canal).
Naturally vegetated with neem and palm trees, offering ecological value and landscape advantages.
Topography: is favourable not necessary to cut and fill the land . Mostly flat land with gentle slope towards the entrance, supports drainage.
No specified height limits offers freedom for vertical expansion.

Weaknesses

Noise Pollution from adjacent construction, Textile Park, and NH traffic.
Summers are intensely hot (above 40°C), affecting building cooling loads and comfort.
The site have sandy loam soil which may require pile foundation and careful treatment due to high water table concerns.

Opportunities

Upcoming IT and Textile Parks Can attract businesses and create demand for support infrastructure like hotels, convention centres, and retail.
Rich existing vegetation and canal nearby allow for biophilic and sustainable design opportunities.
Proximity to Kazipet (railway & town), Warangal (city & airport) boosts regional accessibility and tourism potential.

Threats

Monsoon Impact due to high rainfall in July–August (up to 7.4 inches/month) requires strong storm water design.
High humidity and strong seasonal winds may affect material durability and building performance.
Even through canal proximity, depend upon a single source may be risky during dry months.

Design Consideration

Building orentation : As per Solar analysis maximum fast shoul be good to be elongated towards north and south direction.

As there is no height limitation helps to makes staging of volumes at max. potential level.

Implimentation of efective Storm water managment due to chances of heavy rain fal and flooding Placement of spaces such as courtyard reduce the fel of muggy and humdity from the building.

The main entry to the site is only from one NH road so multiple entries shoul be provided within the site by considering traffic flow and vehicular circulation.

Site required wel designed landscape to creqate god micro climatic benifits and to avoid noise pollution towards the site.

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : Vertex
International convention centre

LOCATION : Warangal,Telugana

AREA
Site : 10 Acres

SCALE - 1:2000

ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :
SITE ANALYSIS

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :
2

Aspects	Base 11 Convention Centre	Lulu Bolgatty International Convention Centre	Capital International Exhibition &Convention Centre	Bharath Mandapam
Image				
Location	Kottayam, Kerala	Cochin, Kerala (Bolgatty Island)	Beijing, China	Pragati Maidan, New Delhi
Site Area	10 Acres	26 Acres	157.5 Acres	123 Acres
Build up Area	7,500 m² (75,000 sq.ft)	69,000 m² (743,000 sq.ft)	438,500 m²	120,000 m²
Architect	Mindscape Architects	WATG	Zaha Hadid Architects	NBCC + CPWD (Suresh Goel)
Year Build	2024	2018	2025	2023
Floors	G+1	Single-storey + hotel tower	G+2	G+2
Height	15M	20 m	45 m	36 m
Design Style	Contemporary + Heritage Tharavadu	Coastal Contemporary	Futuristic/Fluidic	Cultural-Modern blend
Context	Rural-Town; riverside	Urban island with resort & backwaters	Metropolitan/Urban tech hub	Central Delhi heritage zone
Main Facilities	1.Lobby with VIP Lounge 2.Hall 1- can accommodate 1300 Pax 3.Hall 2 can accommodate 700 Pax 4.Hall 3 can accommodate 360 Pax 5.Administration Office 6.Banquet Hall- 3 No.(50 Pax each) 7.Storage House 8.Kitchen 9.Courtyard 10. Nut meg gardens 11.Amphitheatre&.Pavilion 12.Kerala Traditional Style House	1.Convention halls:(Liwa-10000 Pax, Vembanad- 2000 Pax, Grand ballroom-300 Pax) 2.Restaurants(4 No,s) 3. Outdoor event areas 4. Hotel 264 keys 5. Villas(4 No.s)	1.Exhibition areas: 346,500 sq.m (9 exhibition halls: 23,000 sq.m each and 22 meetings rooms). 2.Convention Center: 15,000 sq.m (including 35 meeting rooms) 3.Conference Centre: area: 44,000 sq.m 4.Hotel: 410 rooms – area: 48,000 sq. m 5.Outdoor esplanade: 50, 000 sq.m 6.Basements: 205,200 sq. m	**(Level 1)** 1.Premium Meeting Rooms-50Pax(4 No.) 2.Meeting Room-200Pax(4 No.),100Pax(6 No.),50 Pax(6 No.) **(Level 2)** 3.Open Air Amphitheatre-3000Pax 4.Auditorium 1-600Pax 5.Auditorium 2-900Pax 6.Leaders Lounge 7.Summit ro0m-165Pax **(Level 3)** 8.Multipurpose hall-4000Pax 9.Plenary hal-3000Pax
Capacity	3000 People	12300 People	9000 People	14000 People
Parking	400+ Surface parking	2000+ vehicles, 3 helicopter and 2 boats, basement-450 vehicles	3000+Vehicles	4000- Basment ,1000- Surface
Special Features	20-yr Kerala house, Nutmeg garden	5 star Hotel integration, boats, 3 helipads.	Ribbon bridges, largest indoor area.	Shankha-inspired form
Sustainability	Rainwater harvesting (1.5 lakh L), solar panels	IGBC-certified, RWH, STP, microclimate planting	China's highest green rating; hybrid HVAC, solar, grey water reuse	Natural ventilation, energy-efficient lights, rainwater harvesting
Landscape Integration	Tropical landscaping,nutmeg garden, amphitheatre	Waterfront lawns with native flora	Garden courtyard + outdoor walkways within waterfront and park	Urban green zone
Circulation	Dedicated hall drop-offs; courtyard connectivity	7 gates, segregated VIP/service /guest zones	Ribbon bridges, segregated people/goods circulation	11 gates; shuttle system for guests, metro/bus/train access
Structural system	Steel trusses, prefabricated	Steel + RCC, curtain walls	Modular + steel spans, column free,	RCC
Technology	Acoustic walls with coconut husk boards	BMS, smart lighting, HVAC, STP, AV systems,Retractable Seating.	Smart BMS, hybrid ventilation, photovoltaic panels	5G, IT-integrated rooms, hydraulic stage ,LED walls
Weakness	Lacks VVIP access, CCTV/security room, STP,No lodging facilities	No shuttle service	High cost, complex upkeep	High maintenance cost,

Inference

1.Minmum height of A large venue can me taken as 15m

2.Modern design with cultural blends gives a heritage value

3.Rural areas give smooth traffic from over crowd

4.Traditional elements (patterns, jali work) with modern construction, showcasing India's rich heritage in a contemporary context.

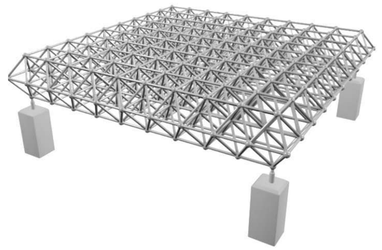
5.Integration of natoral ventilation and rain water system, solar,Micro climate planning, STP,Grey water use helps to make the building energy

6.Integration of waterfront lawns and gardens with native floras influence microclimate

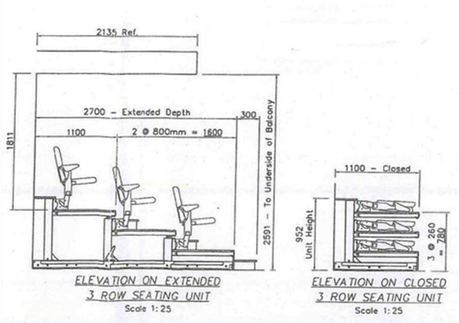


7.Multiple no of entries and exits gives smooth traffic circulation.

8.Space frame & trusses can create large column free spaces



9.Hydraulic stages and rectractable seating helps to use the spaces multipurposes.



10.Security & servailences lacks create problems for VIP presences and public saftey

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : International convention centre

LOCATION : Warangal,Telugana

SCALE - NTS
ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :

CASE STUDY ANALYSIS

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 22/08/2025

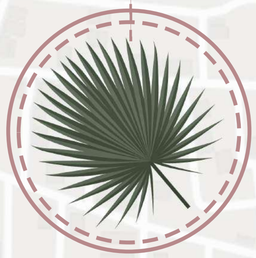
GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :

3

Design Root

The International Convention Centre draws inspiration from the elegant fin-like geometry of the Borassus flabellifer leaf, a familiar presence in Warangal's landscape. Its sweeping, tapering forms translate into dynamic volumetric spaces that filter light and create rhythmic shade, evoking a sense of movement while harmonizing contemporary design with the local natural heritage



Inspiration from casestudies

Courtyard as common connectiong space betweeen various blocks gives a inddor outoor connection.

Ciculation:Multiple entries gives smoth traffic movments within the site.

Scale:Variation in scale of volumes and fluidic patterns in interior bring a feel of movment within the spaces.

Landscaping: water fountains at entrance make spaces more welcoming.

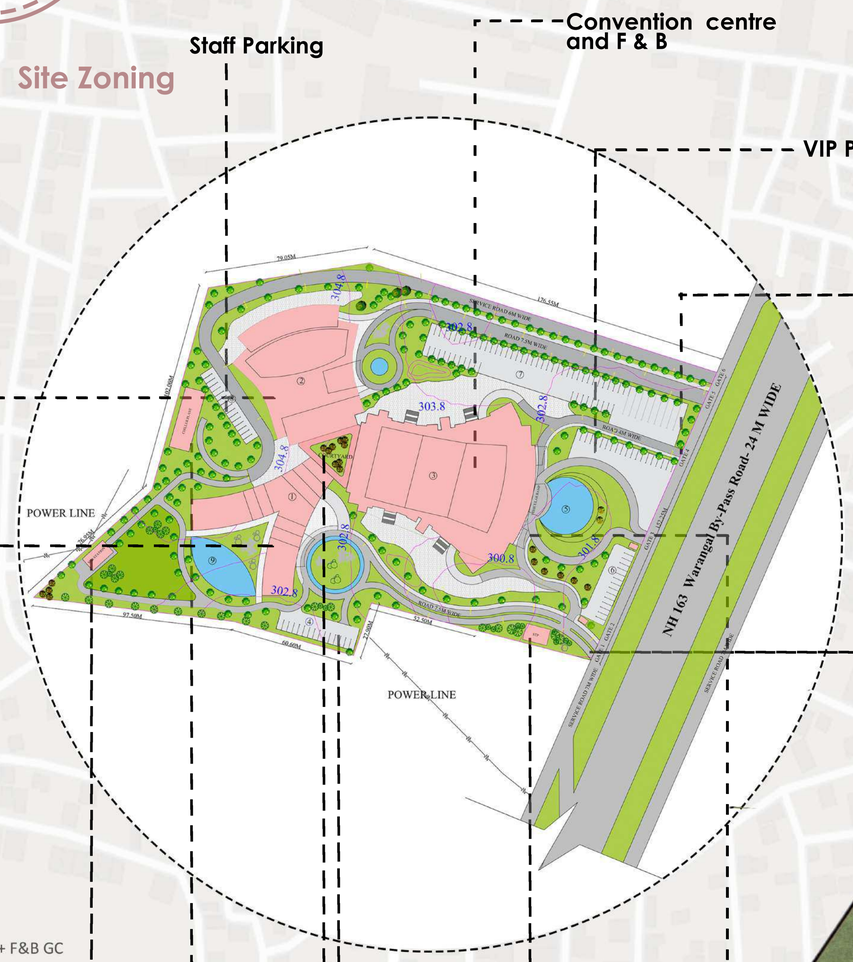
Space frame / truses creante large column free spaces.

Material Influence

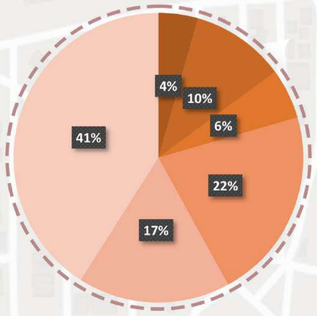
A durrie is a handwoven rug or flat-woven carpet, traditionally made by locals in warangal region will be used for wall parametric patterns of building facades, as well as diffuser of walls of convention hall



Site Zoning



Area Utilised



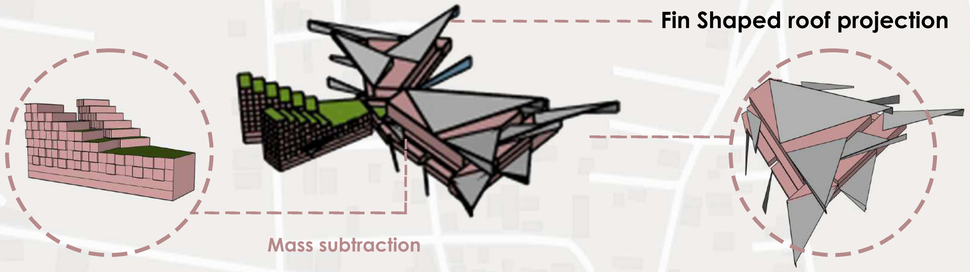
List of major activities

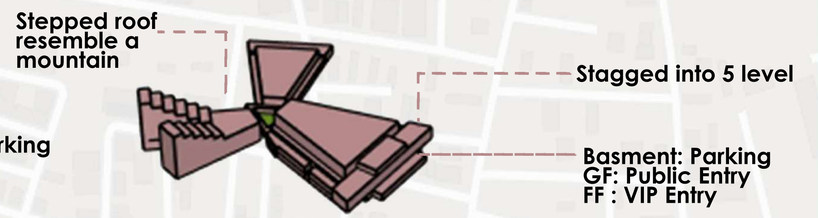
Convention Centre cum Exhibition Centre (2500 Pax)
Convention hall
Small & big meeting rooms
Bussiness centre
Banquet hall (1250 Pax)
Business Hotel (150 Keys)

Entertainment and F&B
Food Court (Multi-cuisine)
Cafe / Coffee Lounge
Bar / Pub
Fine Dining Restaurant
Retail Shops
Multiplex
Gaming Zone

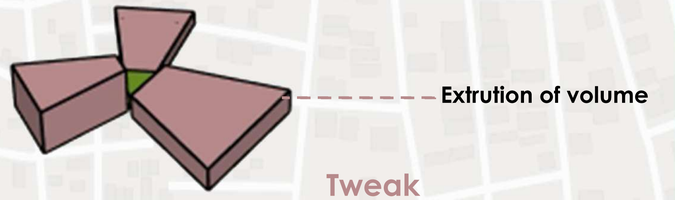
Gate 1 - Convention hall & Hotel
Gate 2 - Convention hall VIP Entry
Gate 3 - Convention exit
Gate 4 - Service entry

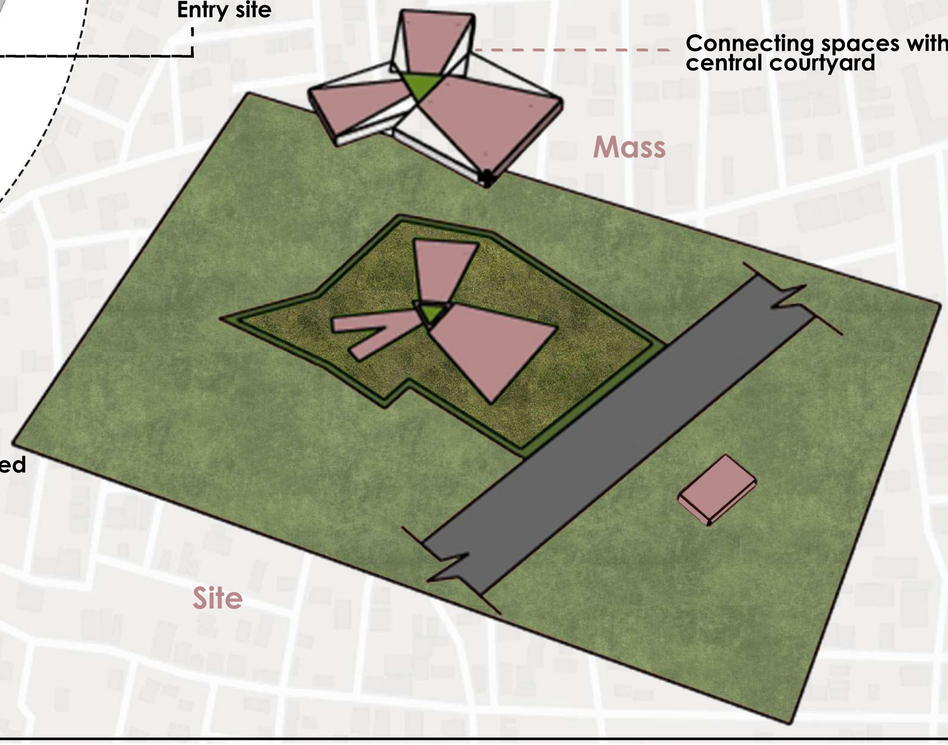
Mass Evolution





Slice





VERTEX INTERNATIONAL CONVENTION CENTRE

THESIS PROJECT

PROJECT : Vertex
International convention centre

LOCATION : Warangal,Telugana

AREA
Site : 10 Acres

SCALE - 1:1200
ALL DIMENSIONS ARE IN M

DWG FILE :
CONCEPT

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :
4

1- HOTEL
2- F&B AND ENTERTAINMENT
3- CONVENTION CENTRE
4- HOTEL PARKING
5- FOUNTAIN
6- VIP PARKING
7- CONVENTION PARKING
8- STAFF PARKING
9- POOL



Sl. No.	Description	Buildup Area in sq.m	G.C (SQ.M)	G.C in %
A	Convention Centre (2500 Pax)	22878.3	4893.8	12
B	Business Hotel(150 Keys)	13935.4	1783	4.4
C	Entertainment and F&B	8544.6	2848.2	7
	Total	45358.3	9525	23.5

Sl. No.	Description	Details
1	SITE AREA	10 acre
2	TOTAL BUILDUP AREA	45358.3
3	F. A. R	2
4	G.C	23.5

Sl. No.	Category	Build up Area(SQ.M)	ECS Per 100 Sq.m	Total ECS Required
A	Convention Center	22878.3	2.0 ECS/100 sq,m	457
B	Hotel	13935.4	2.0 ECS/100 sq,m	279
C	Entertainment and F&B	8544.6	2.0 ECS/100 sq,m	170

NO OF SURFACE CAR PARKING

HOTEL PARKING- 15
STAFF PARKING- 16
CONVENTION PARKING- 58 + 9 COACHES
VIP PARKING- 11

GATE 1 - HOTEL/CONVENTION ENTRY
GATE 2 - VIP ENTRY
GATE 3 - CONVENTION CENTER EXIT
GATE 4 - F&B, ENTERTAINMENT
GATE 5 - SERVICE ROAD

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention centre

LOCATION : Warangal, Telugana

AREA

Site : **10 Acres (40468.5 SQ.M)**

FAR - 2
G.C -40%

SCALE - 1:600

ALL DIMENSIONS ARE IN M

THESIS PROJECT

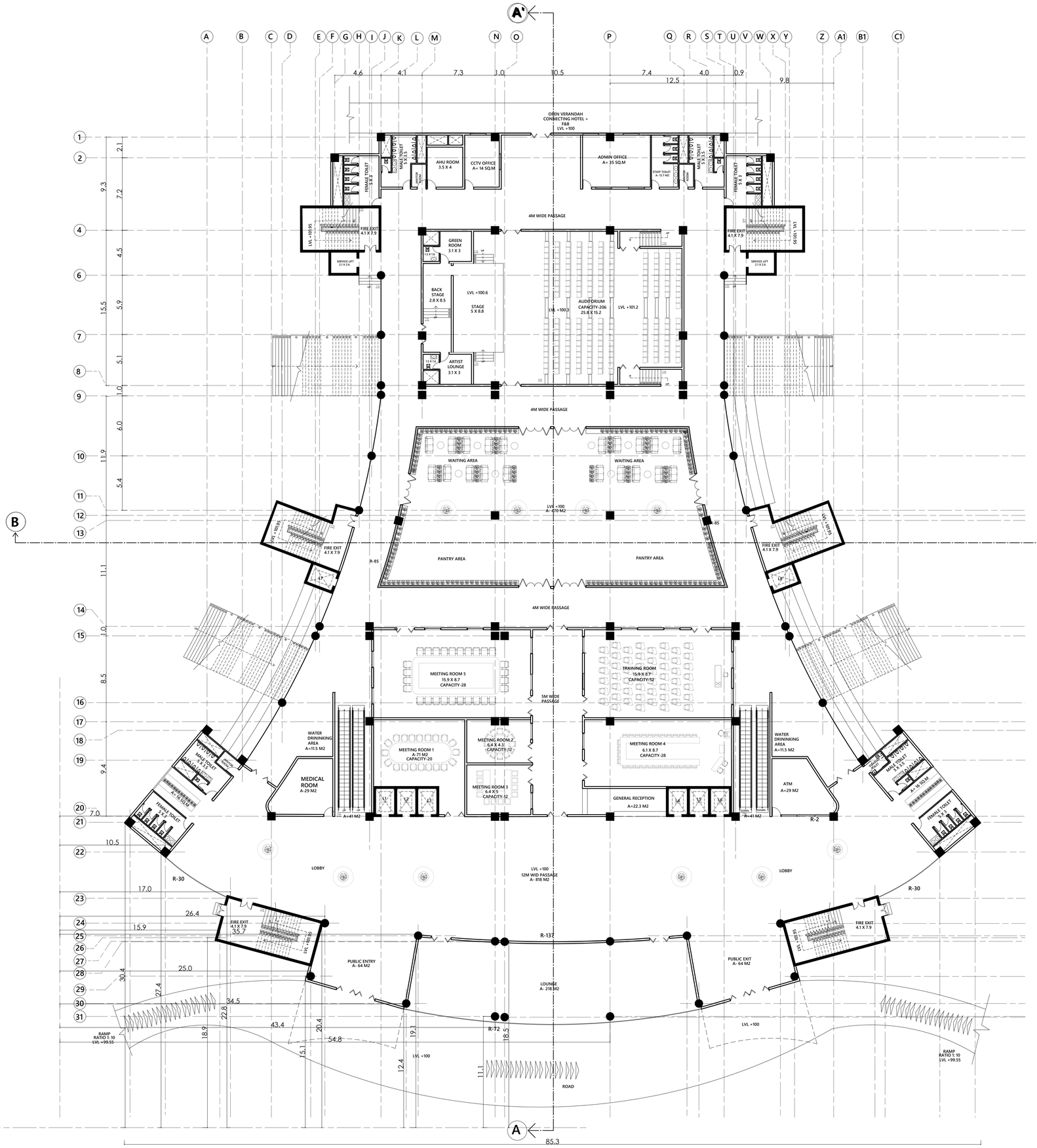
DWG. TITLE :
SITE PLAN

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : S9 SEC A
SUBJECT : DESIGN IX
DATE : 01/12/2025

GUIDED BY:
DR. CHARUMITHRA KAPSHE

SHEET NO:
5



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE- GROUND FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

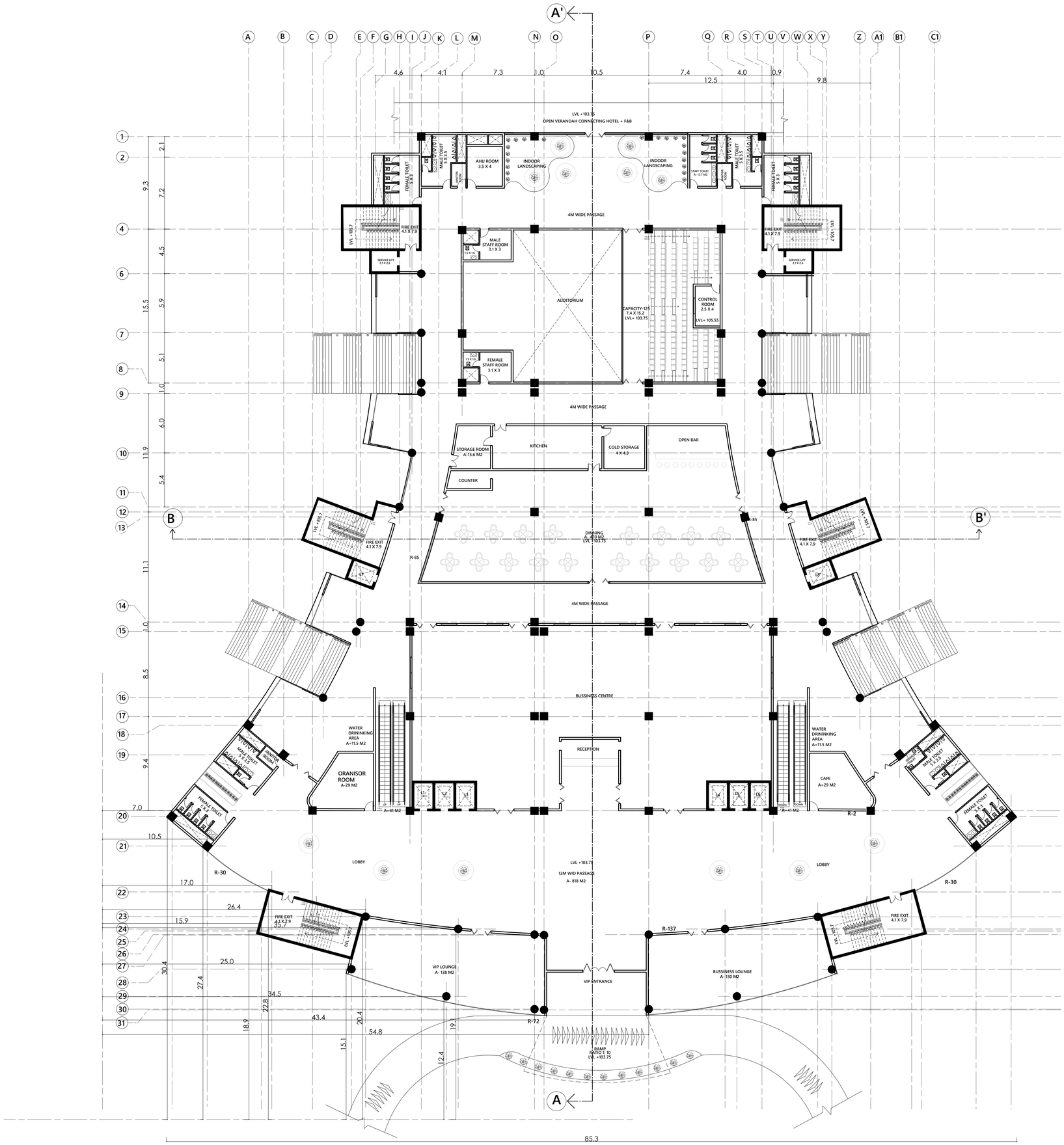
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

6



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

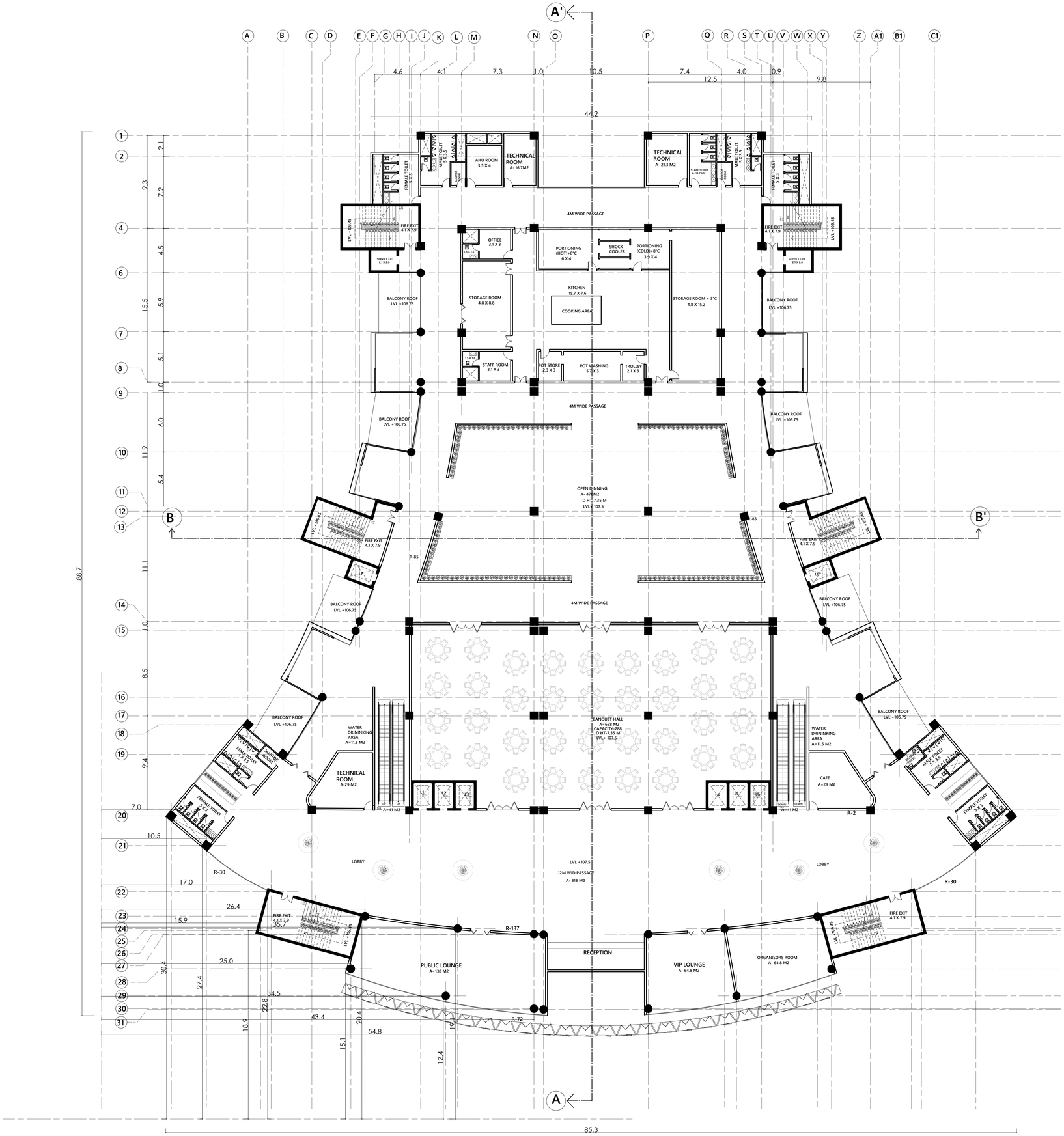
CONVENTION CENTRE-
FIRST FLOOR PLAN

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:

7



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE- SECOND FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

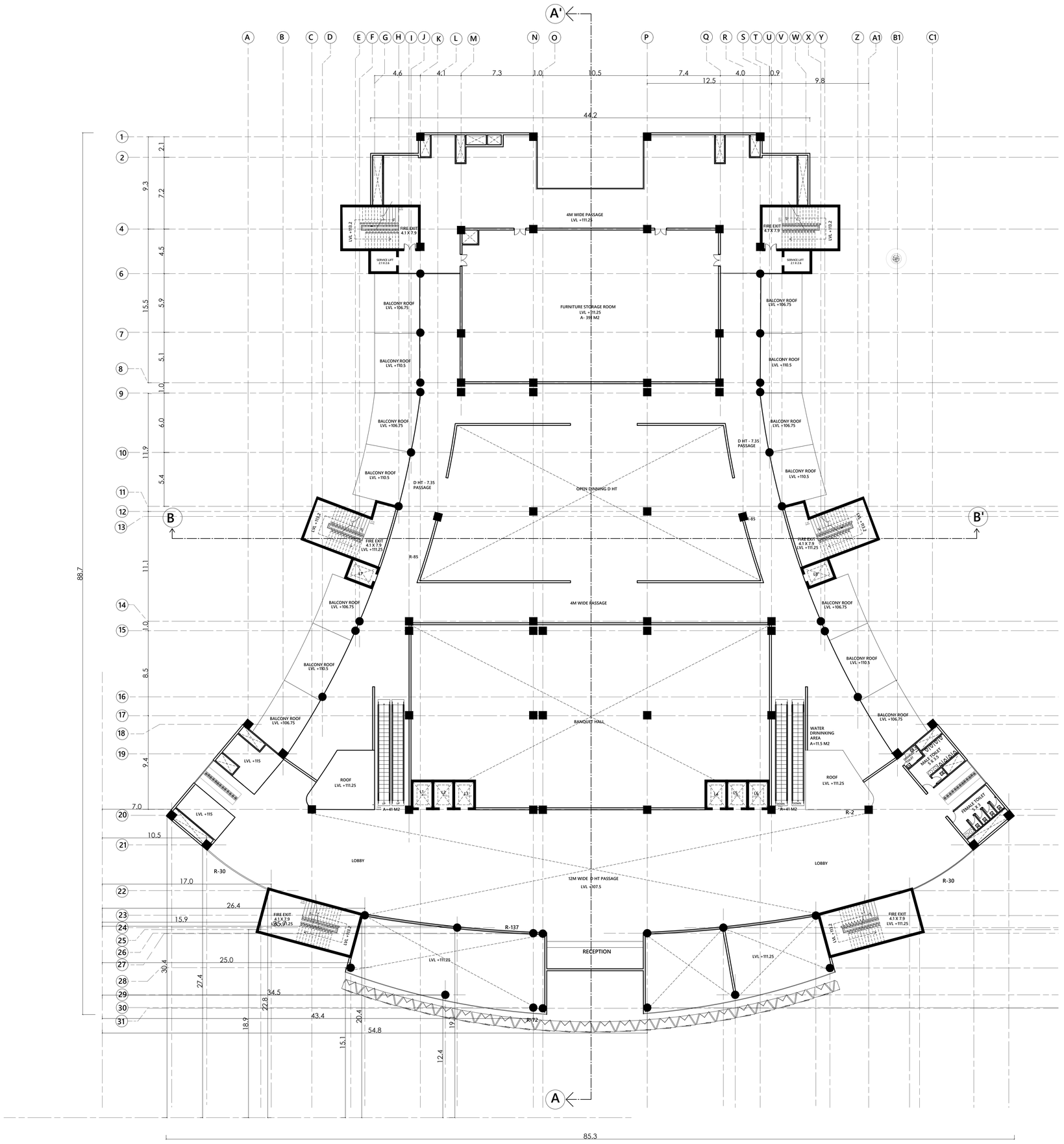
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

8



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 851.3 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

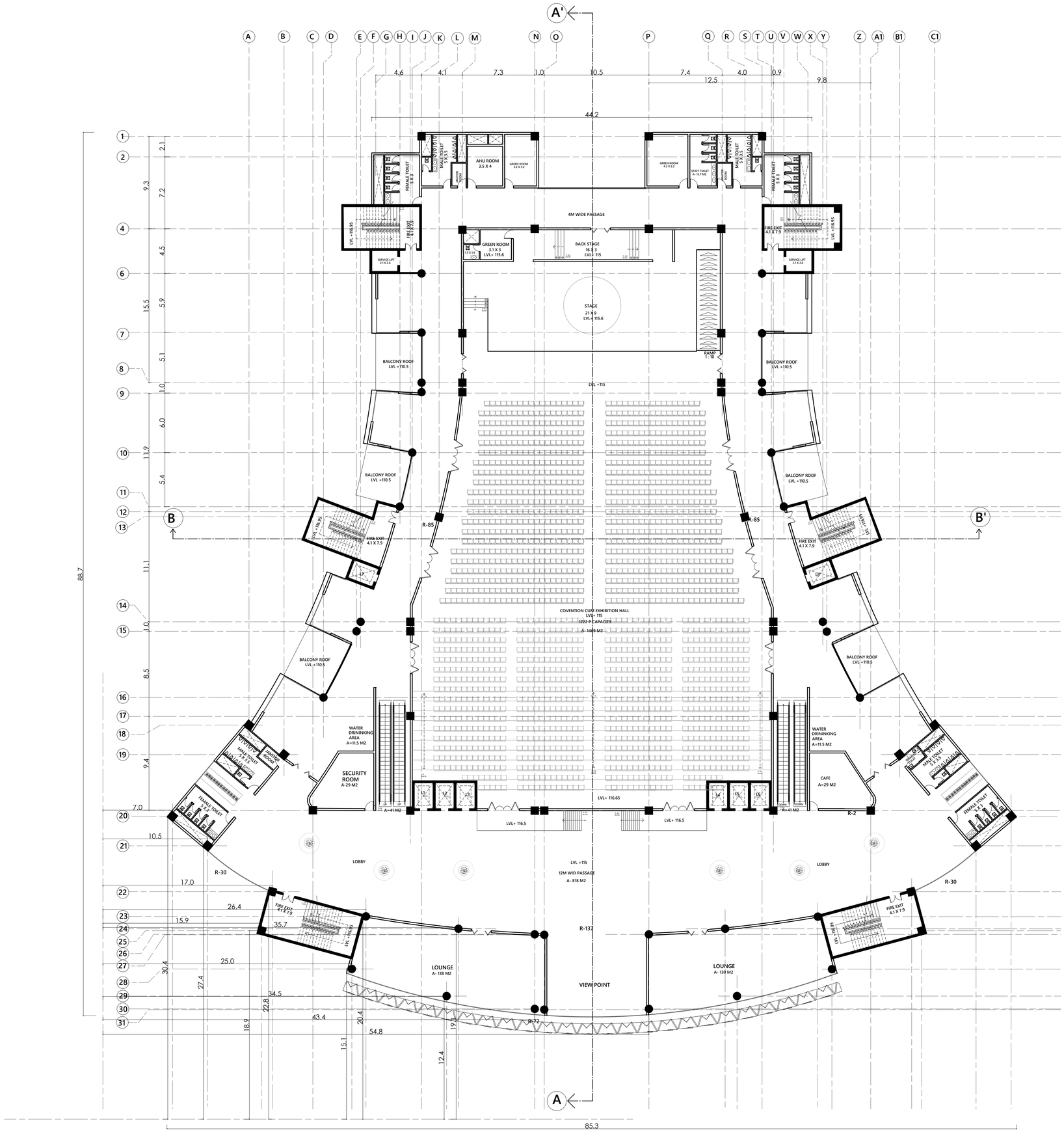
CONVENTION CENTRE-
THIRD FLOOR PLAN

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:

9



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE- FOURTH FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

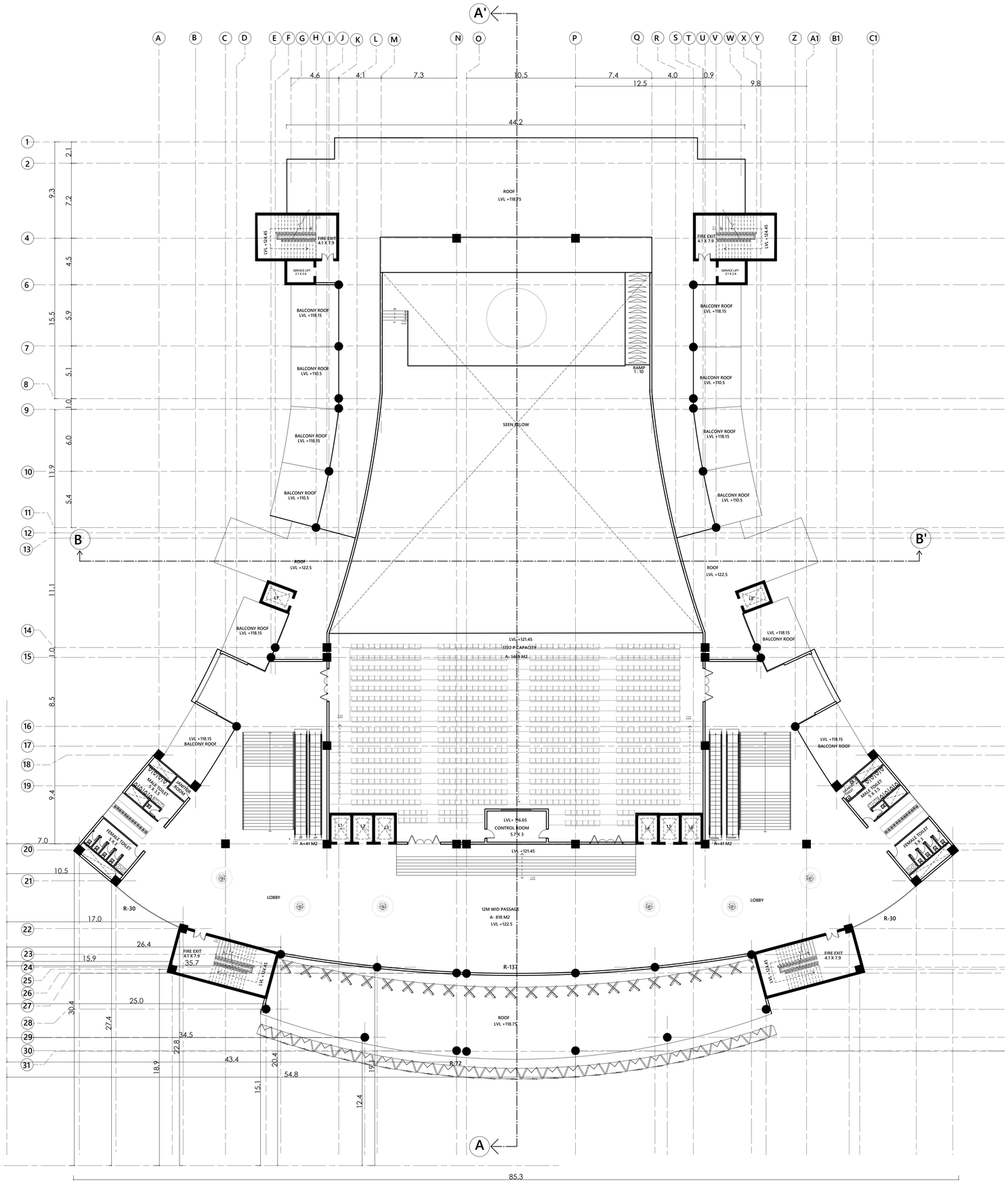
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

10



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2451.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

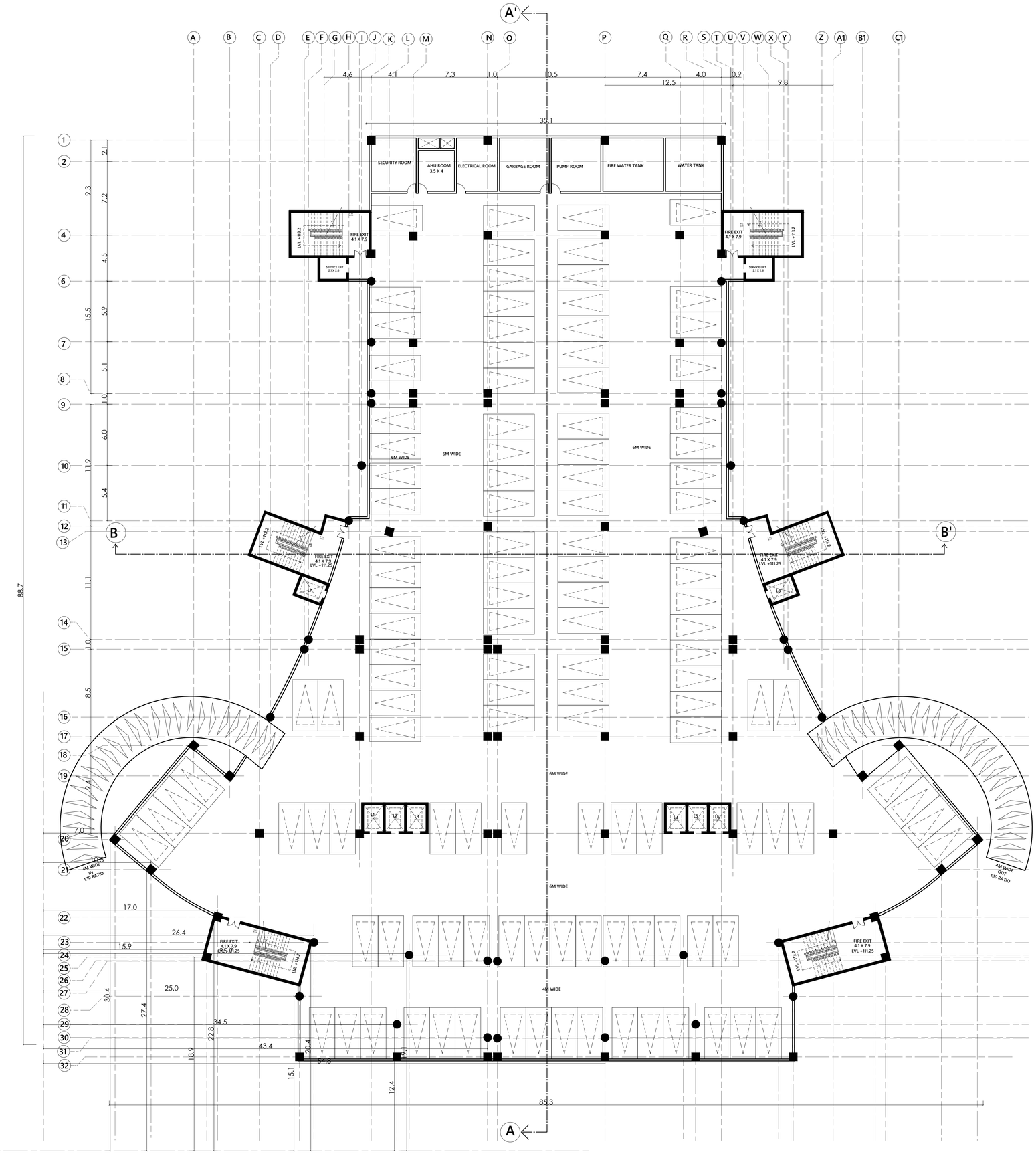
CONVENTION CENTRE-
FIFTH FLOOR PLAN

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:

11



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

NO. OF CARS PER FLOOR : 105

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE-
BASEMENT 1 FLOOR PLAN

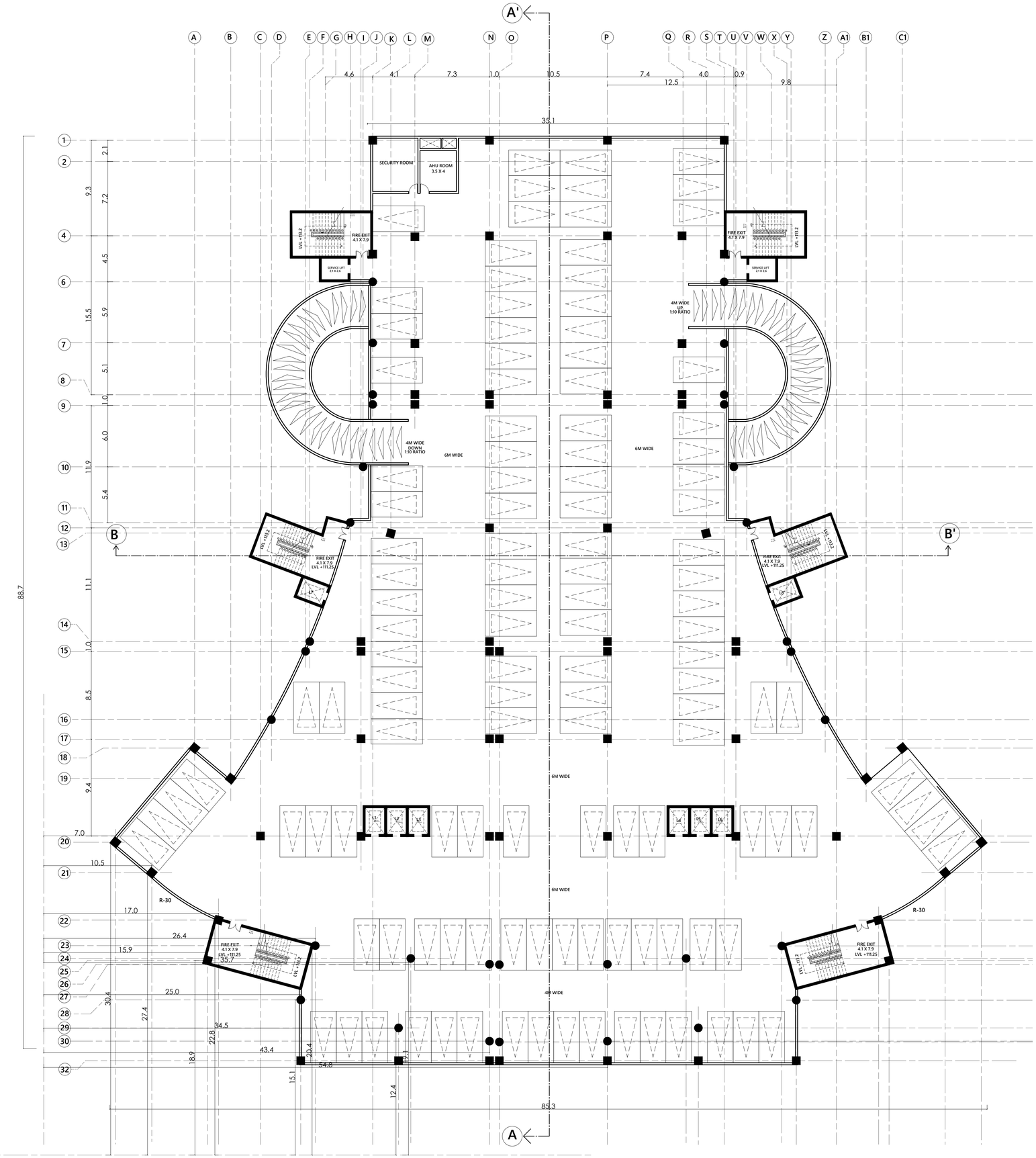
NO. OF PARKING CAPACITY=
125 CARS PER FLOOR

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:

12



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

NO. OF CARS PER FLOOR : 105

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE-
BASEMENT 2 & 3 FLOOR PLAN

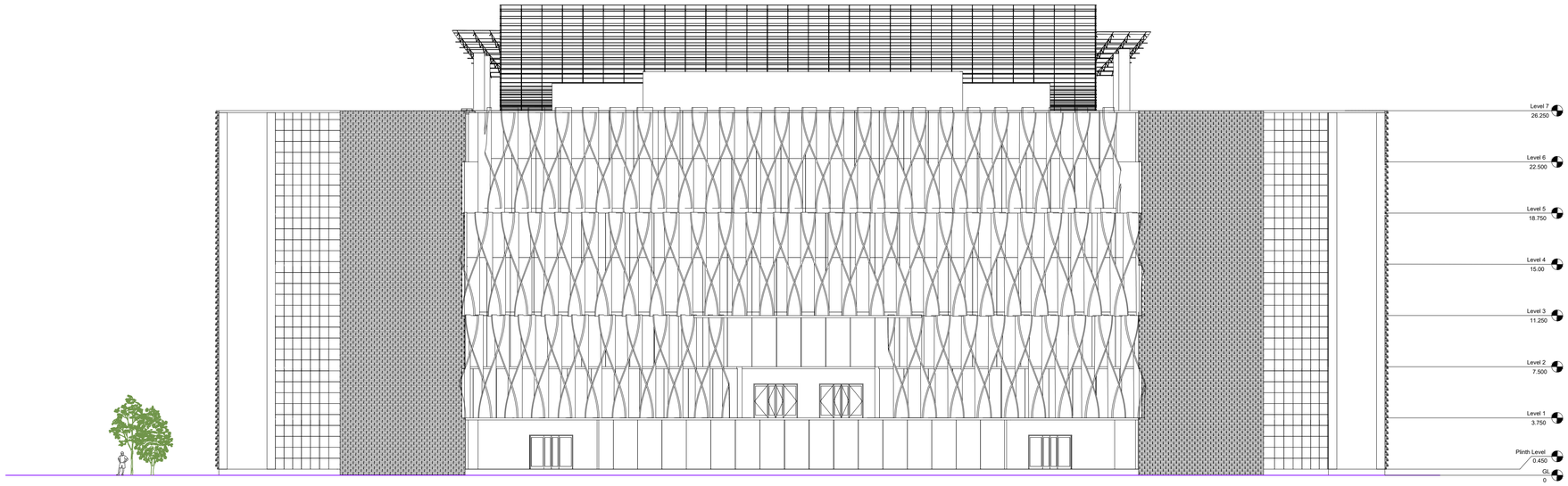
NO. OF PARKING CAPACITY=
125 CARS PER FLOOR

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO:

13



FRONT ELEVATION



SIDE ELEVATION

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE- ELEVATIONS

NAME : MUHAMMED ARSHAD.M

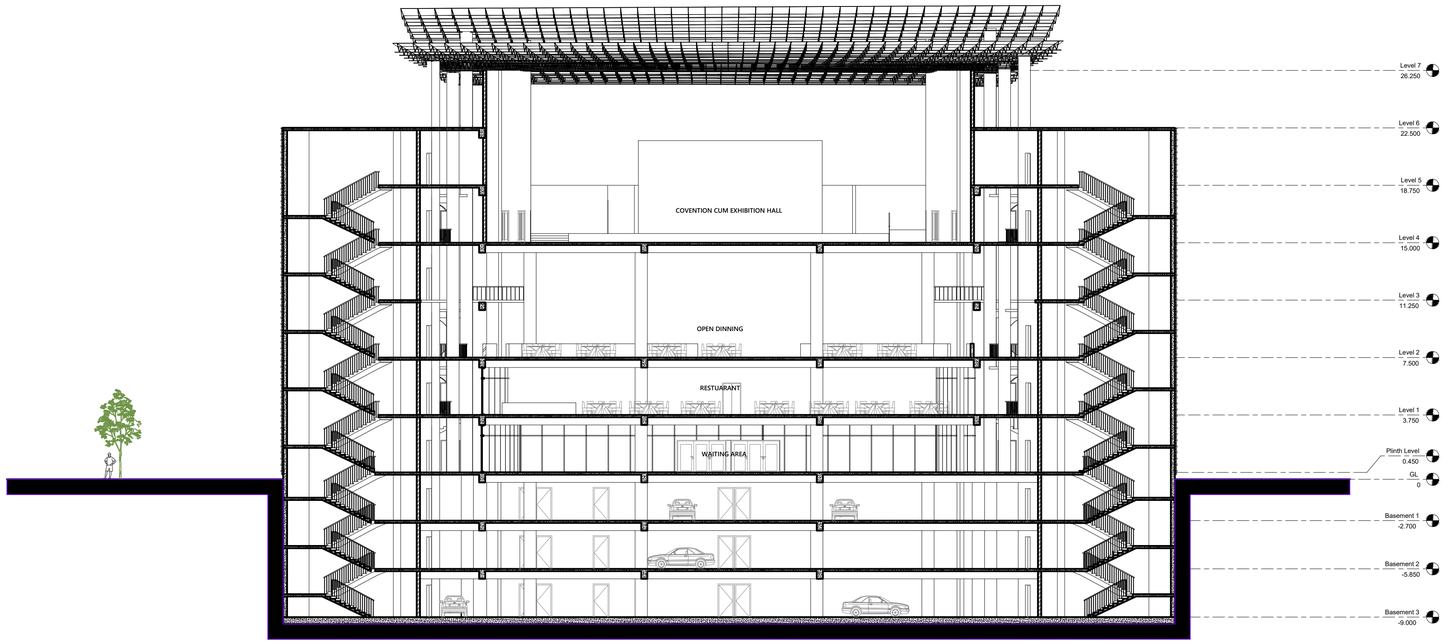
SCHOLAR NO : 211110027

GUIDED BY:

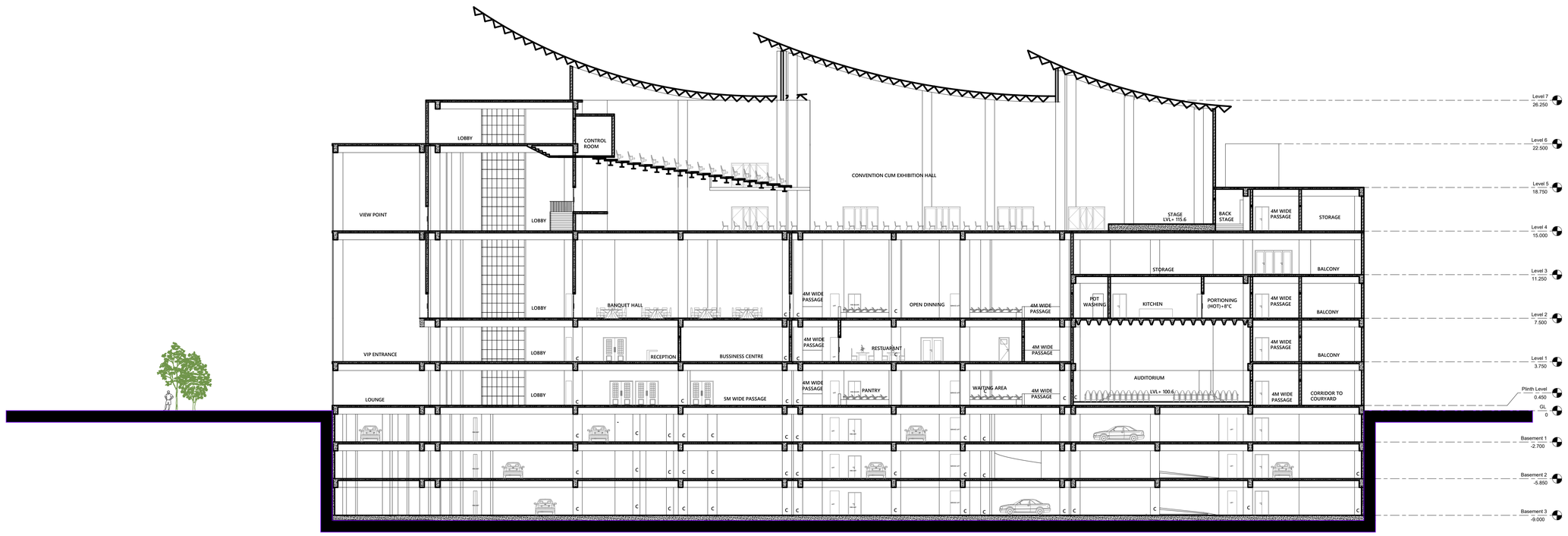
DR.CHARUMITRA KAPSHE

SHEET NO:

14



SECTION BB'



SECTION AA'

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 4893.8 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE- SECTIONS

NAME : MUHAMMED ARSHAD.M

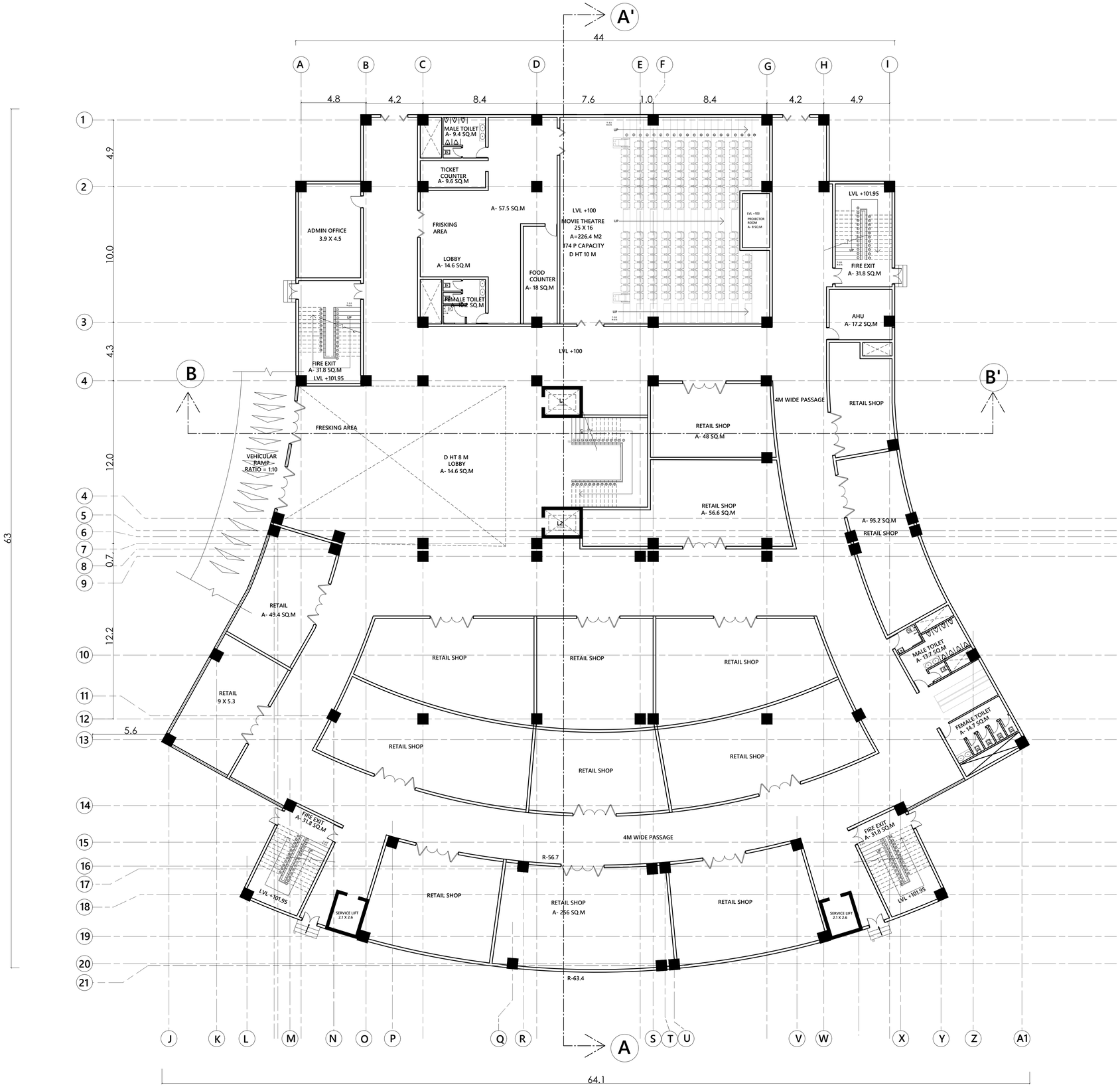
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

15



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT- GROUND FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

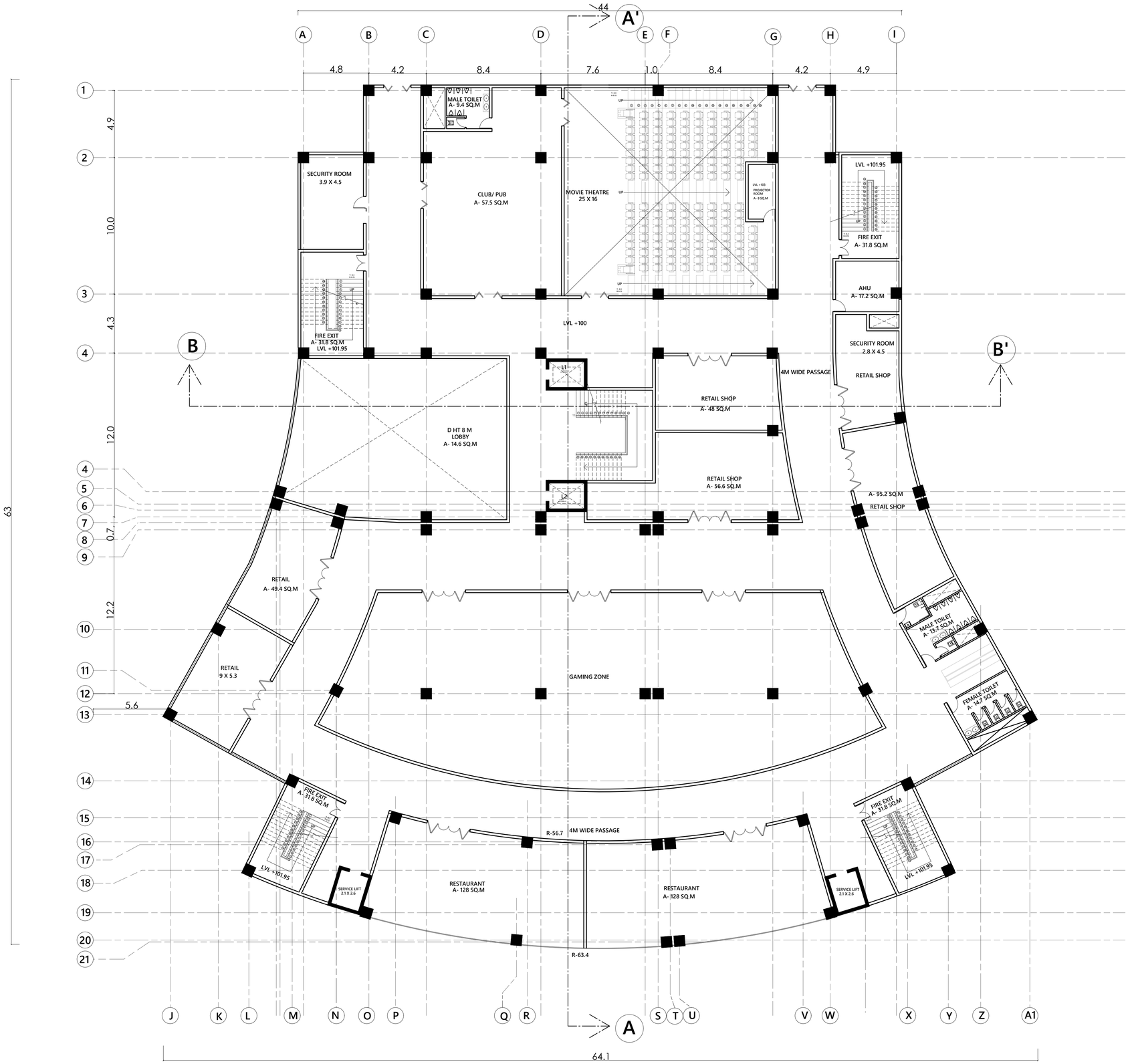
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

16



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT- FIRST FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

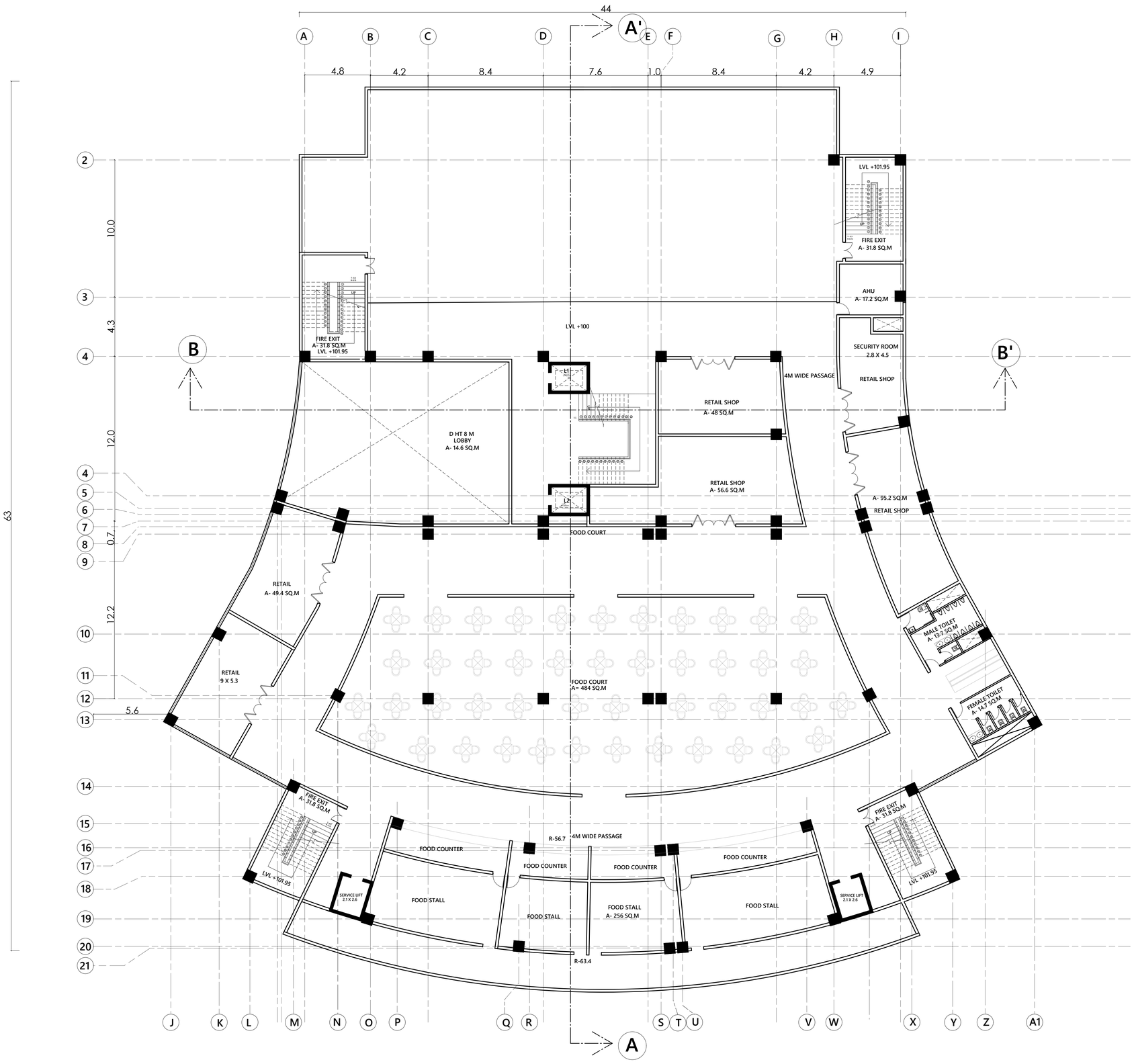
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

17



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT- SECOND FLOOR PLAN

NAME : MUHAMMED ARSHAD.M

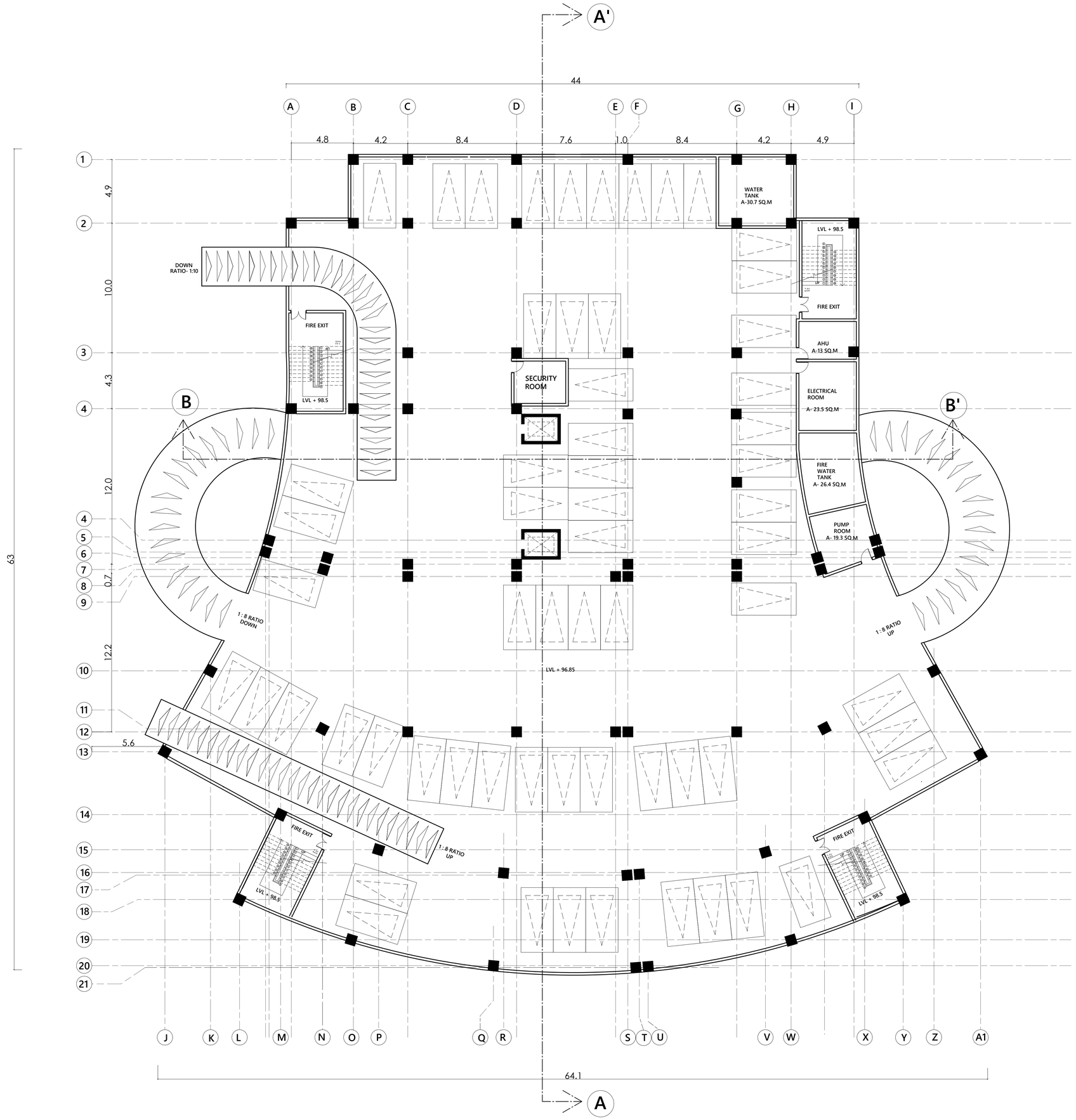
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

18



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

NO. OF PARKING CAPACITY= 72 CARS PER FLOOR

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT- BASEMENT 1 PLAN

NAME : MUHAMMED ARSHAD.M

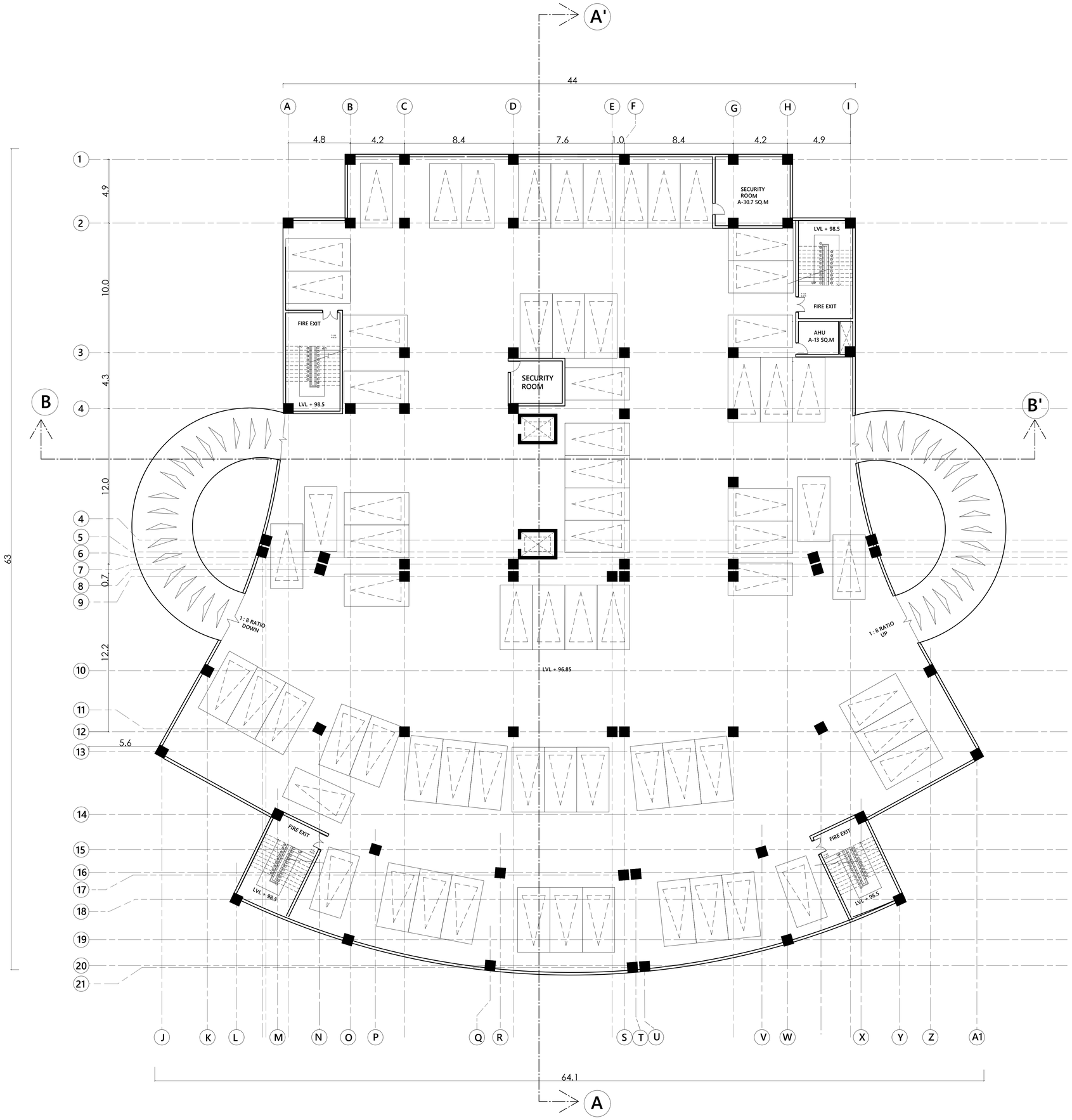
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

19



VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

NO. OF PARKING CAPACITY= 72 CARS PER FLOOR

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT-BASEMENT 2 & 3 PLAN

NAME : MUHAMMED ARSHAD.M

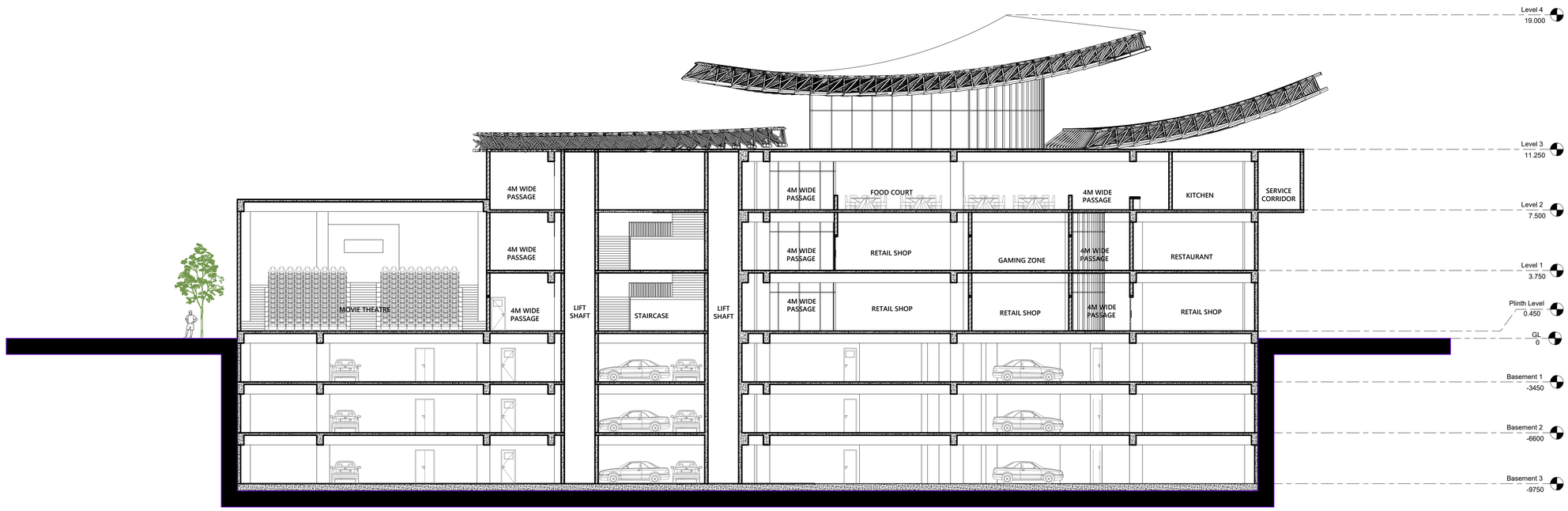
SCHOLAR NO : 211110027

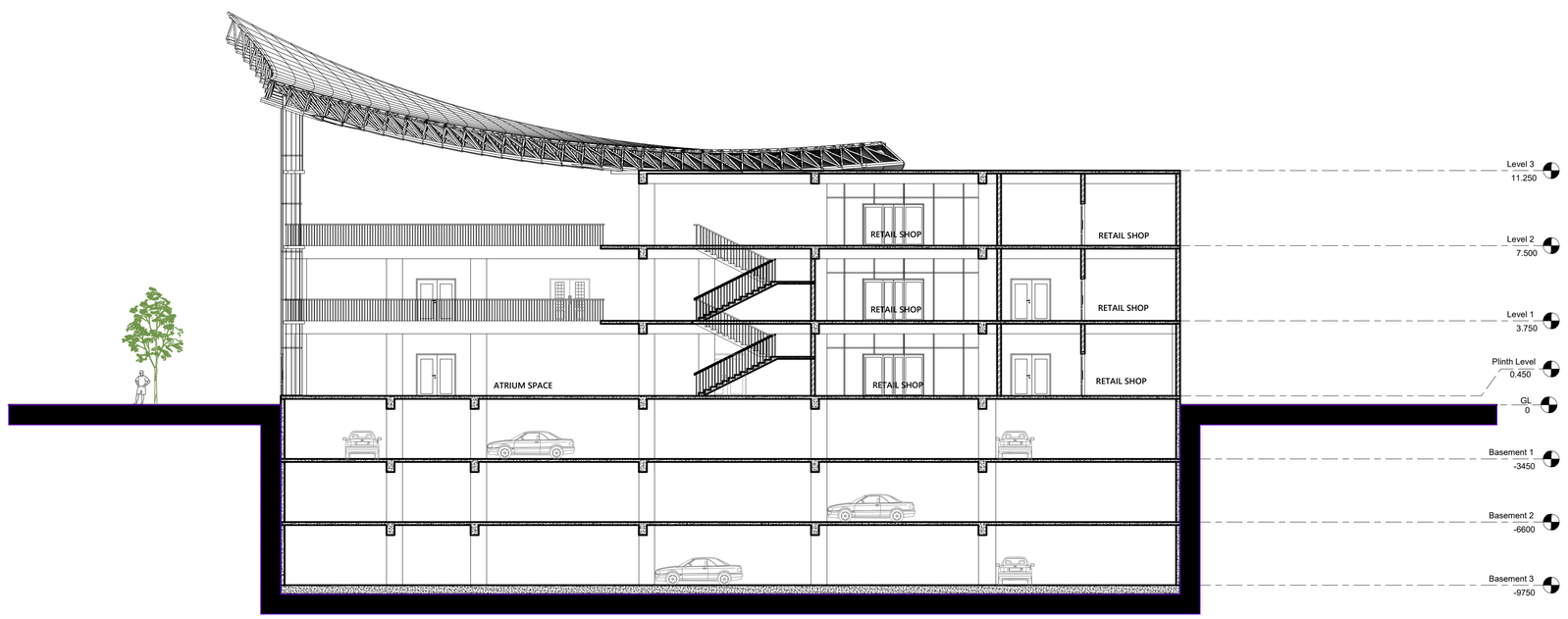
GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

20





PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

NO. OF CARS : 77

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT-SECTIONS

NAME : MUHAMMED ARSHAD.M

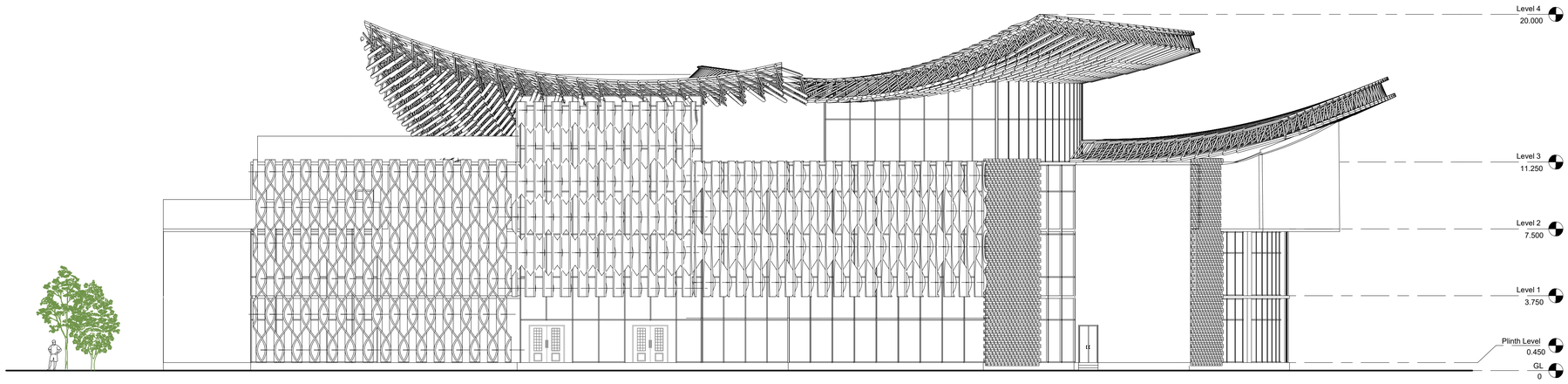
SCHOLAR NO : 211110027

GUIDED BY:

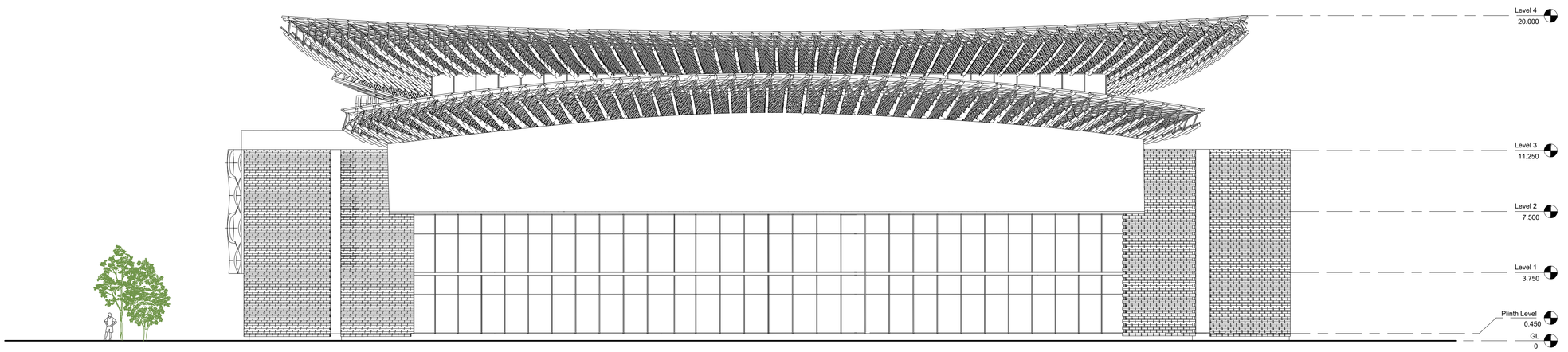
DR.CHARUMITRA KAPSHE

SHEET NO:

21



FRONT ELEVATION



SIDE ELEVATION

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 2848.2 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:150

ALL DIMENSIONS ARE IN M

DWG. TITLE :

F&B AND ENTERTAINMENT-ELEVATIONS

NAME : MUHAMMED ARSHAD.M

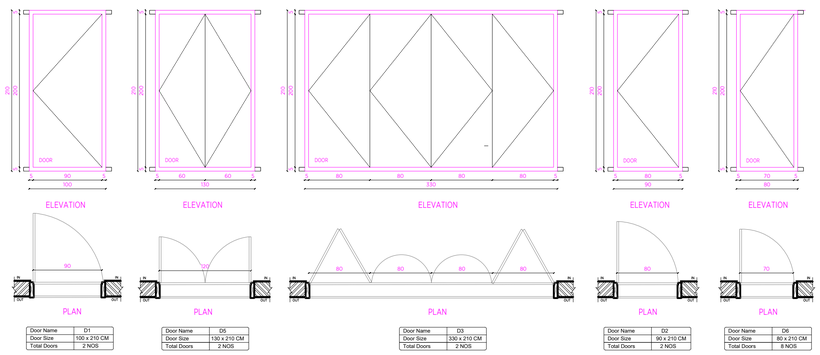
SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

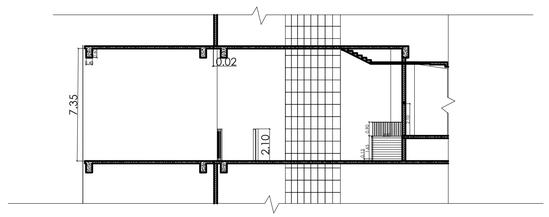
22



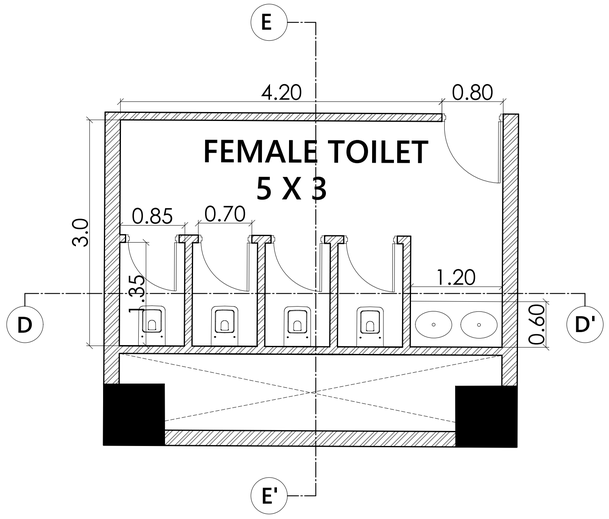
SCALE - 1:20

ALL DIMENSIONS ARE IN CM

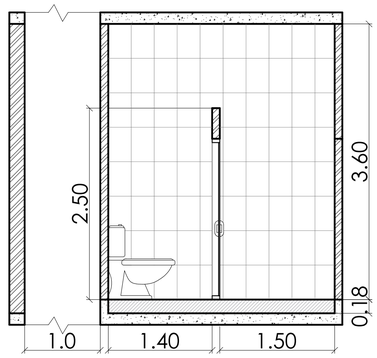
JOINERY DETAILS



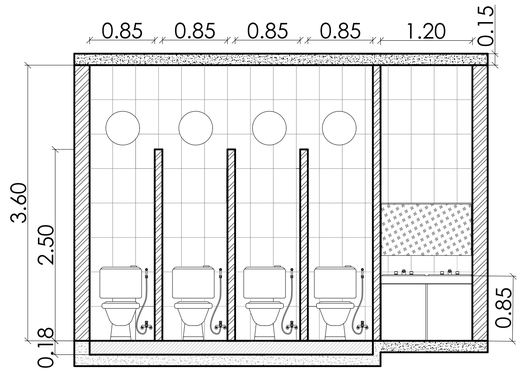
SECTION AA'



PLAN

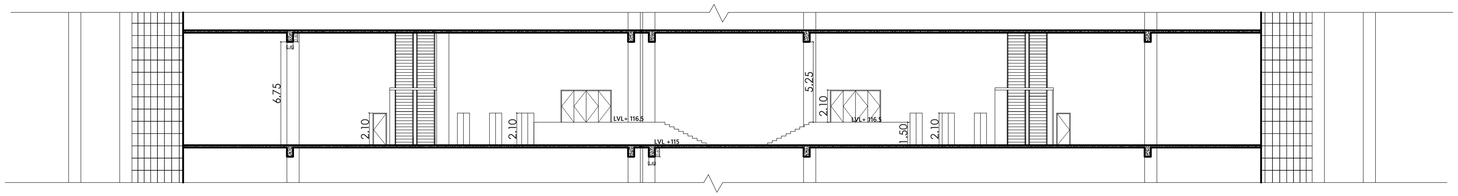


SECTION EE'

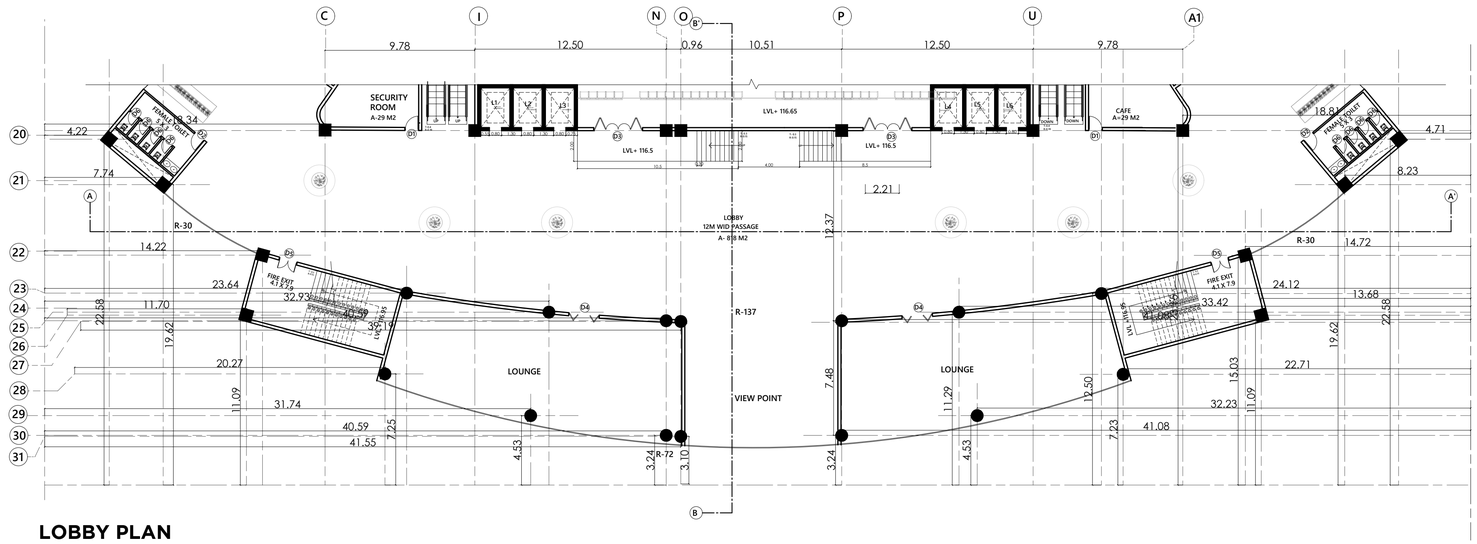


SECTION DD'

SCALE - 1:20

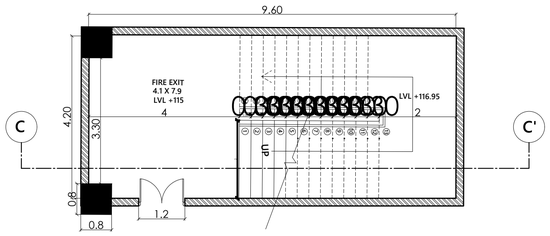


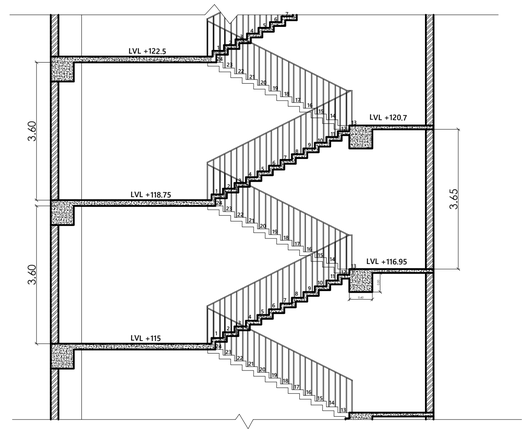
SECTION BB'



LOBBY PLAN

SCALE - 1:200





STAIRCASE DETAILS

SCALE - 1:40

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT : VERTEX International Convention Centre

LOCATION : Warangal, Telugana

SITE AREA : 10 Acres

FLOOR AREA : 851.3 Sq.m

SITE AREA : 10 Acres

FAR : 2

GC : 40%

THESIS PROJECT

SCALE - 1:200

ALL DIMENSIONS ARE IN M

DWG. TITLE :

CONVENTION CENTRE-WORKING DRAWING

NAME : MUHAMMED ARSHAD.M

SCHOLAR NO : 211110027

GUIDED BY:

DR.CHARUMITRA KAPSHE

SHEET NO:

23

1- HOTEL
2- F&B AND ENTERTAINMENT
3- CONVENTION CENTRE
4- HOTEL PARKING
5- FOUNTAIN
6- VIP PARKING
7- CONVENTION PARKING
8- STAFF PARKING
9- POOL





NEEM TREE

79.05M
304.8
176.55M
SERVICE ROAD 6M WIDE
302.8
ROAD 7.5M WIDE
102.00M
CHILLER PLANT
303.8
302.8
ROAD 4M WIDE
GATE 4
GATE 5
GATE 3
COURTYARD
304.8
VEHICULAR RAMP
152.25M
GATE 2
NH 163 Warangal By-Pass Road- 24 M WIDE
76.95M
SUB STATION
302.8
300.8
301.8
ROAD 7.5M WIDE
52.50M
97.50M
27.90M
60.60M
STP
GATE 1
SERVICE ROAD 7M WIDE
SERVICE ROAD 7M WIDE

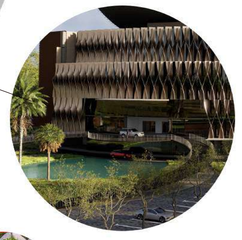
BORASSUS FLABELLIFER

INDIAN LAURIEL FIG



MONDA GRASS







HARDSCAPE BY GRASS PAVER



PARKING PAVMENTS



FOOTPATH PAVMENTS



STREET LIGHT AT EVERY 30M DISTANCE

Road
Parking
Fountain/Pool
Footpath
Hardscape
Softscape

Plant Image	Plant Name	Scientific Name	Max. Size (Height x Spread)	Climatic Feasibility (Warangal)	Type	Deciduous/ Evergreen	Key Landscaping Use
	Borassus flabellifer			I. Shade/Feature Trees (Large)			
	Neem Tree	*Azadirachta Indica*	15-20m x 10-15m	Excellent (Native, Drought-tolerant)	Tree	Evergreen	Large shade, medicinal, avenue planting, buffer zones.
	Indian Laurel Fig	*Ficus microcarpa*	15-20m x 15-20m	Excellent (Hardy, tolerant of urban stresses)	Tree	Evergreen	Formal hedges (when pruned), specimen tree for entry points.
	II. Medium Ornamental Shrubs For Borders, Screens, and Foundation Planting						
	Oleander	*Nerium oleander*	2-4m x 1-3m	Excellent (Withstands intense heat)	Shrub	Evergreen	Hedging, screening, or border planting along roadsides.
	Bush Allamanda	*Allamanda schottii*	1.5m X 1.5m	Good, needs some watering	Shrub	Evergreen	Large, bright yellow, trumpet-shaped flowers; very showy.
	Plumeria (Frangipani)	*Plumeria rubra*	3m X 3m (small tree/large shrub)	Excellent, highly drought-tolerant	Shrub/Tree	Deciduous	Iconic, highly fragrant white, pink, or yellow flowers.
	Hibiscus	*Hibiscus rosa-sinensis*	1.5-3m x 1-2m	Good (Needs moderate water in extreme heat)	Shrub	Evergreen	Vibrant focal color near entrances/patios.
	III. Ground Covers/Borders (Small) For Defining Paths and Large Beds						
	Duranta	*Duranta erecta* (Cultivars)	1-2m x 1-2m	Excellent (Hardy, can be pruned into shapes)	Shrub/Hedge	Evergreen	Low border, manicured hedges, or topiary.
	Lantana	*Lantana camara* (Dwarf/Trailing var.)	0.5m X 1m	Excellent, very hardy, drought-tolerant	Groundcover/ Shrub	Evergreen	Clusters of small, colorful flowers (yellow, orange, red); attracts butterflies.
	Elephant Bush	*Portulacaria afra*	0.5m X 0.5m	Excellent, highly drought-tolerant	Succulent Shrub	Evergreen	Small, round, fleshy green leaves; very low water need; modern look.
	Periwinkle (Vinca)	*Catharanthus roseus*	0.3m X 0.3m	Excellent, low-maintenance	Annual/Perennial	Evergreen	Continuous pink or white flowers; ideal for mass planting.
	Mondo Grass	*Ophiopogon japonicus*	0.2m X 0.3m	Good, prefers partial shade	Grass/Ground cover	Evergreen	Dark green, tufted, grass-like foliage; formal look for shaded areas.

VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT :
Vertex
International convention centre

LOCATION : Warangal,Telugana

AREA
Site : 10 Acres

SCALE - 1:600
ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :
LANDSCAPE

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

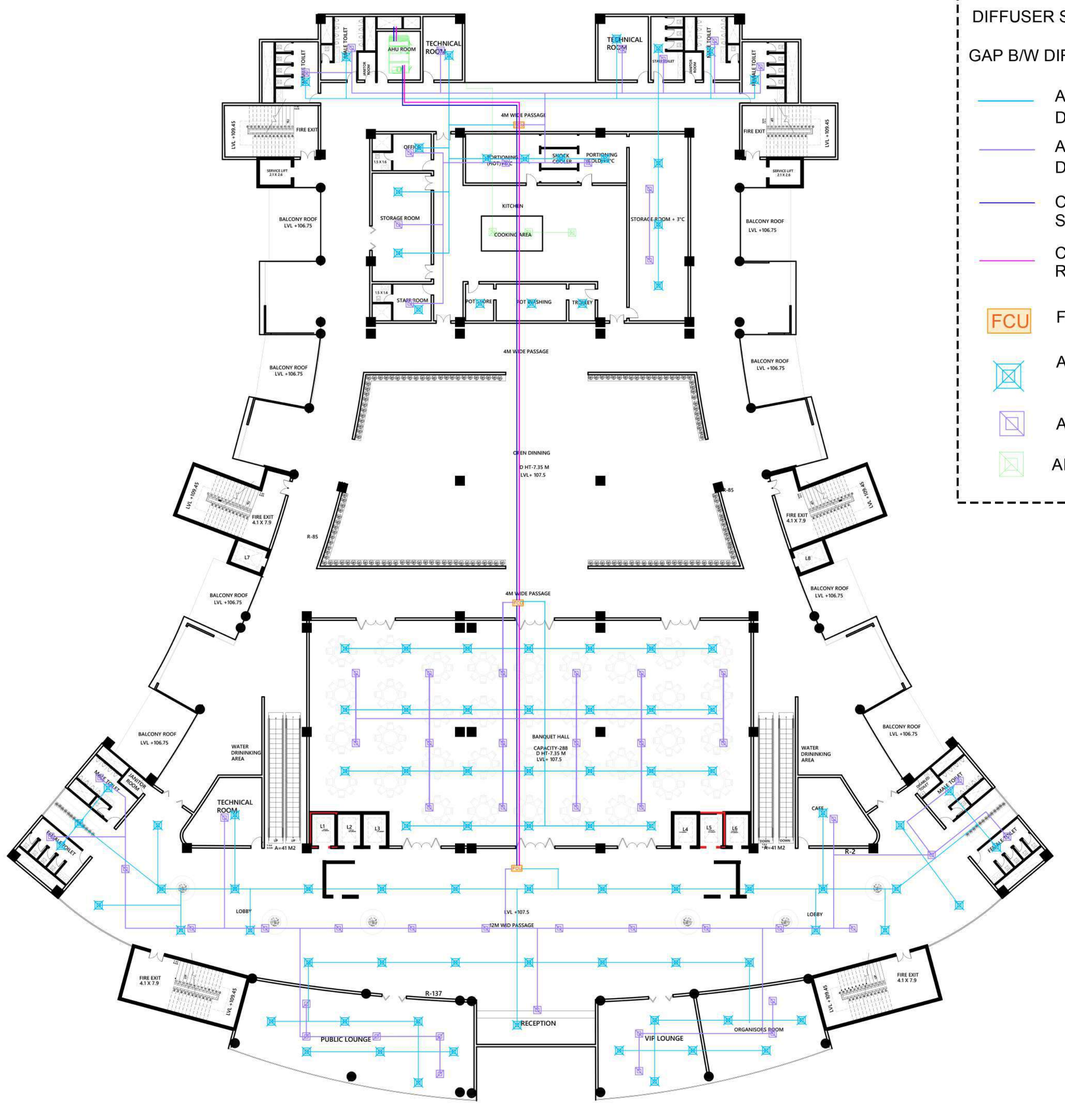
GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :
24

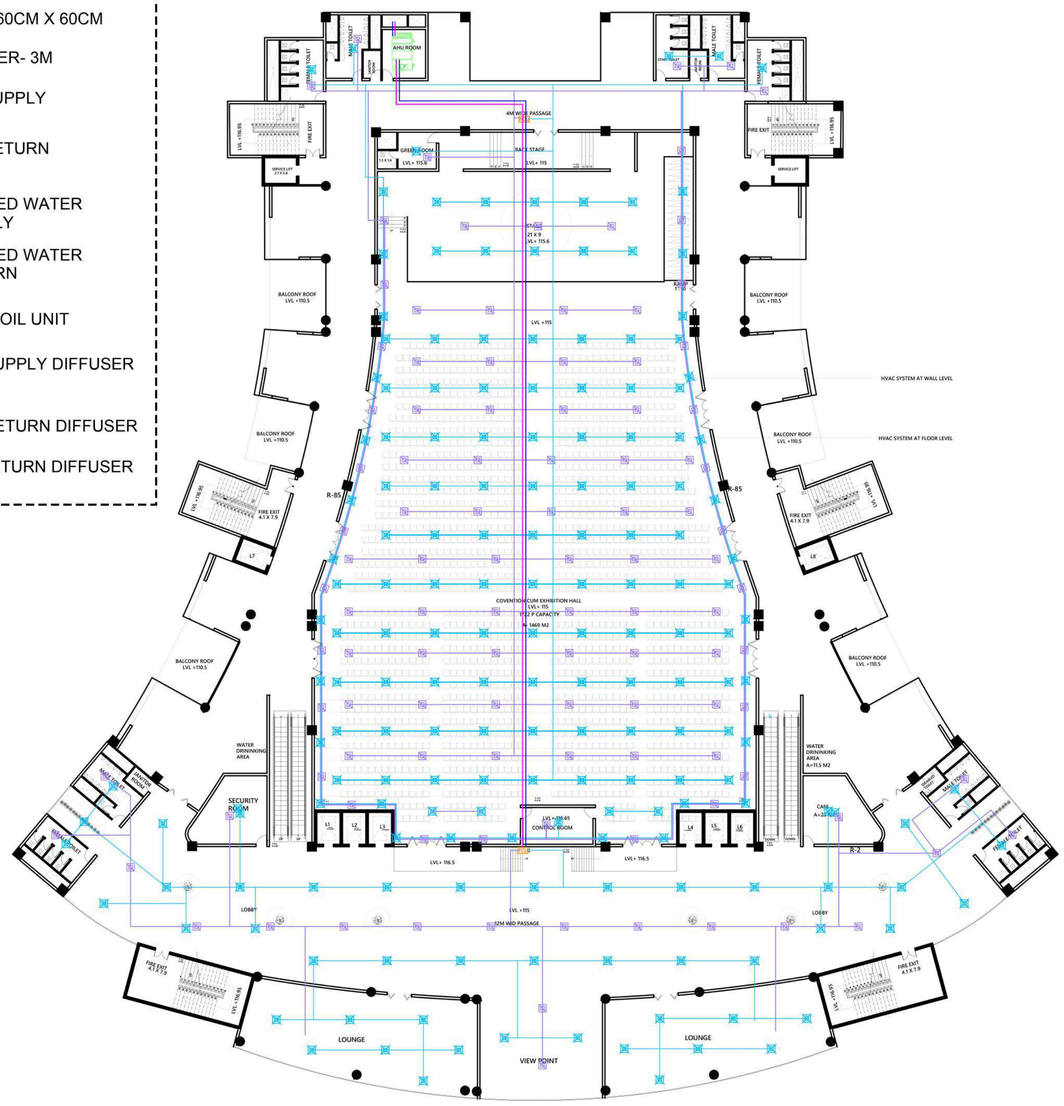
DIFFUSER SIZE-60CM X 60CM

GAP B/W DIFFUSER- 3M

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

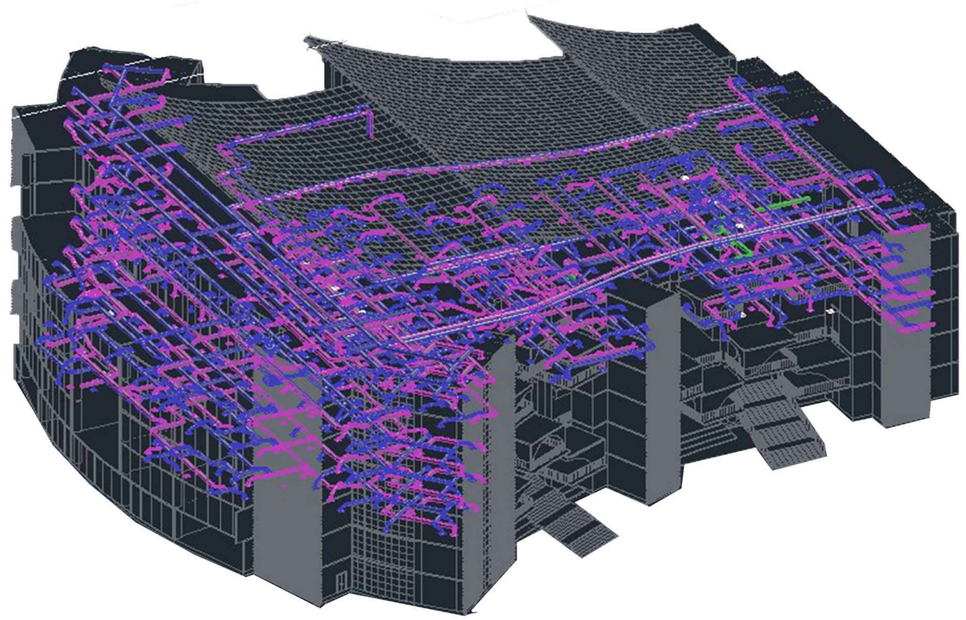


CONVENTION CENTRE- SECOND FLOOR



CONVENTION CENTRE- FOURTH FLOOR

HVAC Calculation FOR Convention Centre								
(Considering area to be sqm or sq ft for all 7 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								
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 +	In Tons (12000 btu = 1 ton)	consideration
G	2432	377	916864	6,00,000.00	12000	15,16,864	126.4053333	189.608
1	2578	485	1250330	6,00,000.00	12000	18,50,330	154.1941667	231.29125
2	2712	592	1605504	6,00,000.00	24500	22,05,504	183.792	275.688
3	391	700	273700	6,00,000.00	12000	8,73,700	72.80833333	109.2125
4	3164	807	2553348	10,80,000.00	37000	36,33,348	302.779	454.1685
5	1605	915	1468575	6,00,000.00	24500	20,68,575	172.38125	258.571875
B1	4228	377	1593956	6,00,000.00	12000	21,93,956	182.8296667	274.2445
B2	4228	377	1593956	6,00,000.00	12000	21,93,956	182.8296667	274.2445
B3	4228	377	1593956	6,00,000.00	12000	21,93,956	182.8296667	274.2445
Total	25566							2341.273625



VERTEX INTERNATIONAL CONVENTION CENTRE

THESIS PROJECT

PROJECT :
Vertex
International convention centre

LOCATION : Warangal,Telugana

SITE AREA: 10 Acres

FLOOR AREA: 4893.8 Sq.m

FAR : 2

GC : 40%

SCALE - 1:250
ALL DIMENSIONS ARE IN M

DWG FILE :

CONVENTION CENTE-HVAC LAYOUT

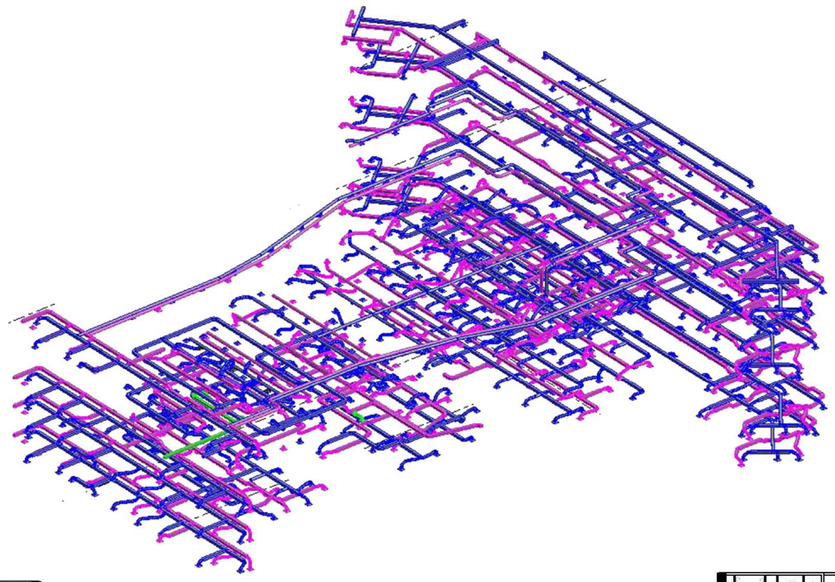
NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

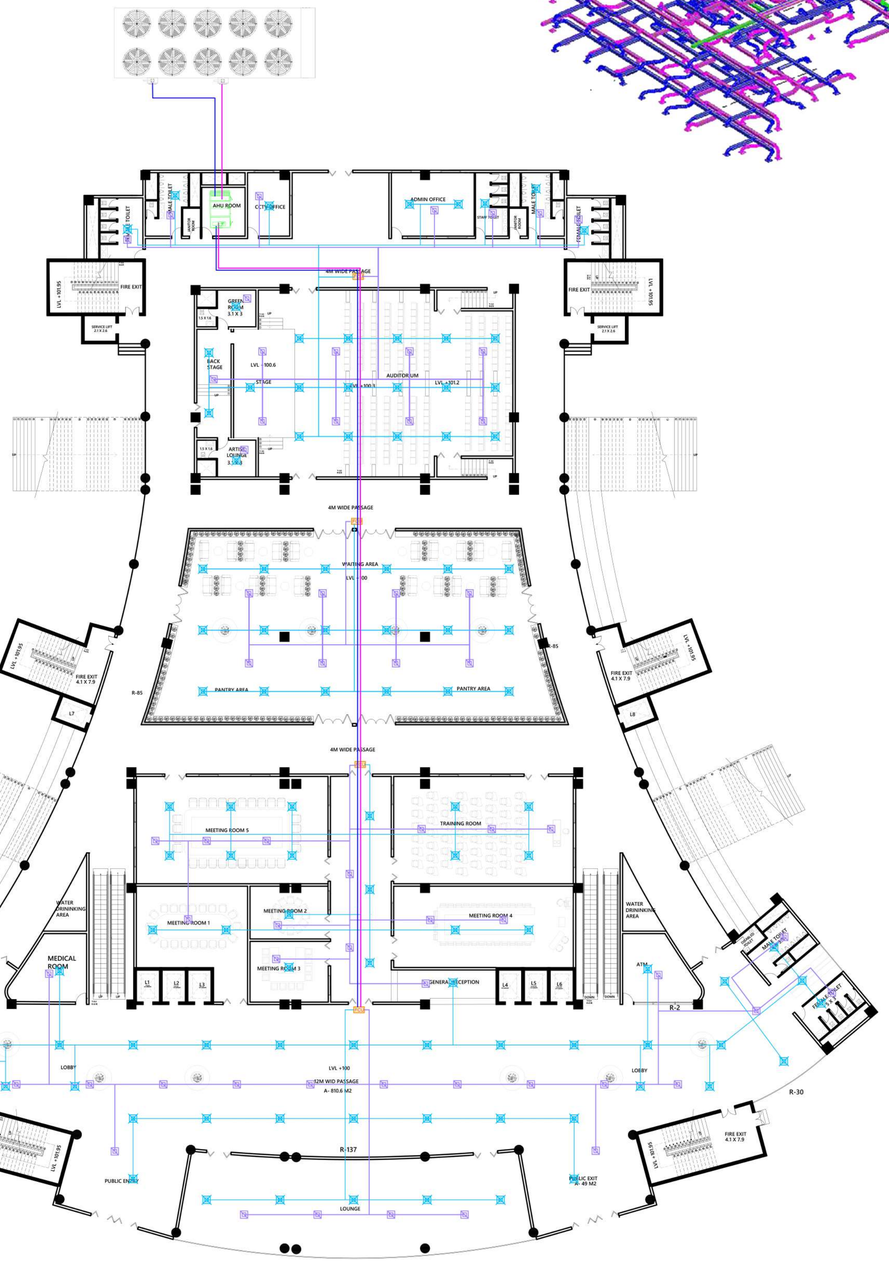
SHEET NO :
25



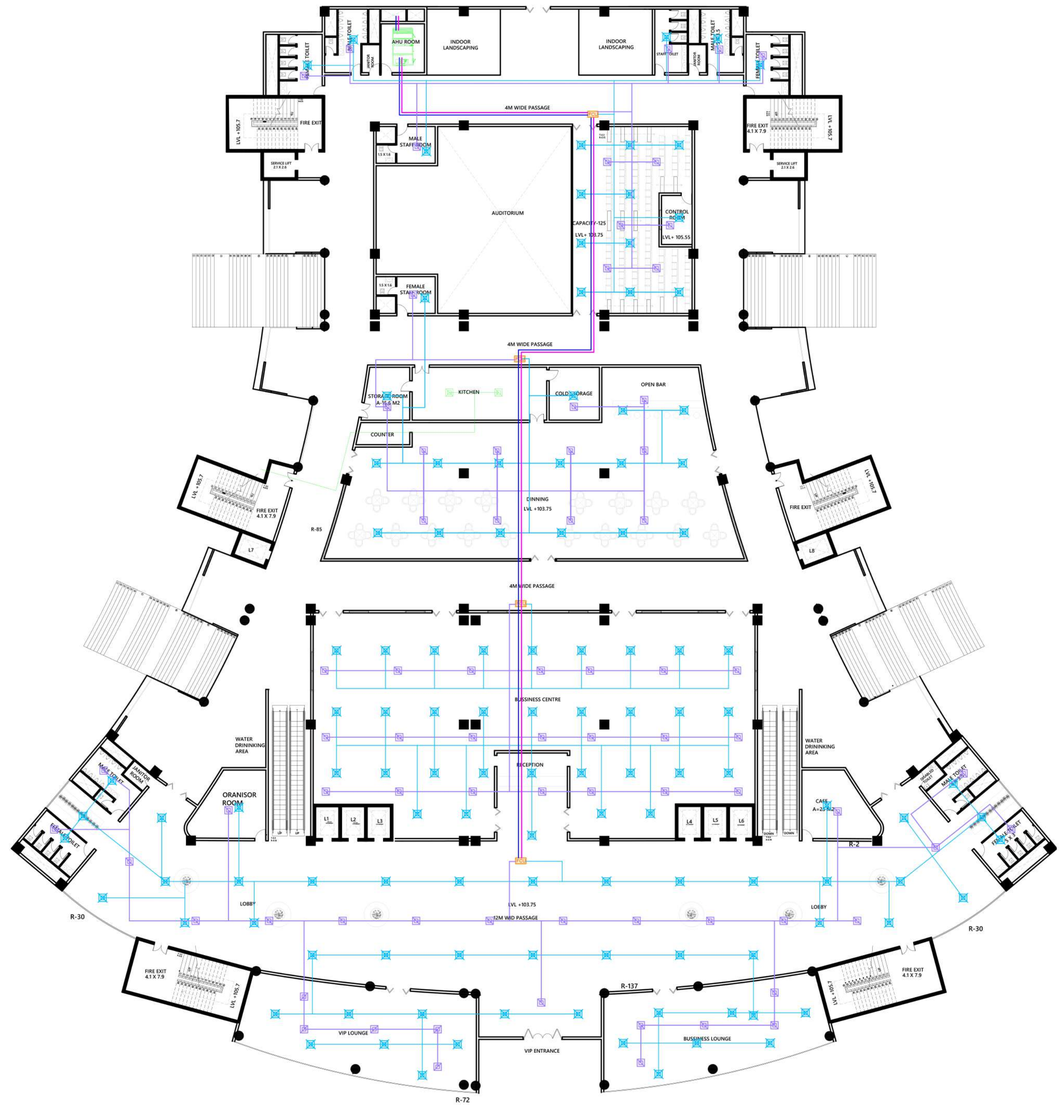
DIFFUSER SIZE-60CM X 60CM

GAP B/W DIFFUSER- 3M

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



CONVENTION CENTRE- GROUND FLOOR



CONVENTION CENTRE- FIRST FLOOR

VERTEX INTERNATIONAL CONVENTION CENTRE

THESIS PROJECT

PROJECT :
Vertex
International convention centre

LOCATION : Warangal,Telugana

SITE AREA: 10 Acres

FLOOR AREA: 4893.8 Sq.m

FAR : 2

GC : 40%

SCALE - 1:250
ALL DIMENSIONS ARE IN M

DWG FILE :

CONVENTION CENTE-HVAC LAYOUT

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :
26



















VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT :
Vertex
International convention centre

LOCATION : Warangal,Telugana

AREA

Site : 10 Acres

SCALE - 1:1000

ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :

VIEWS

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

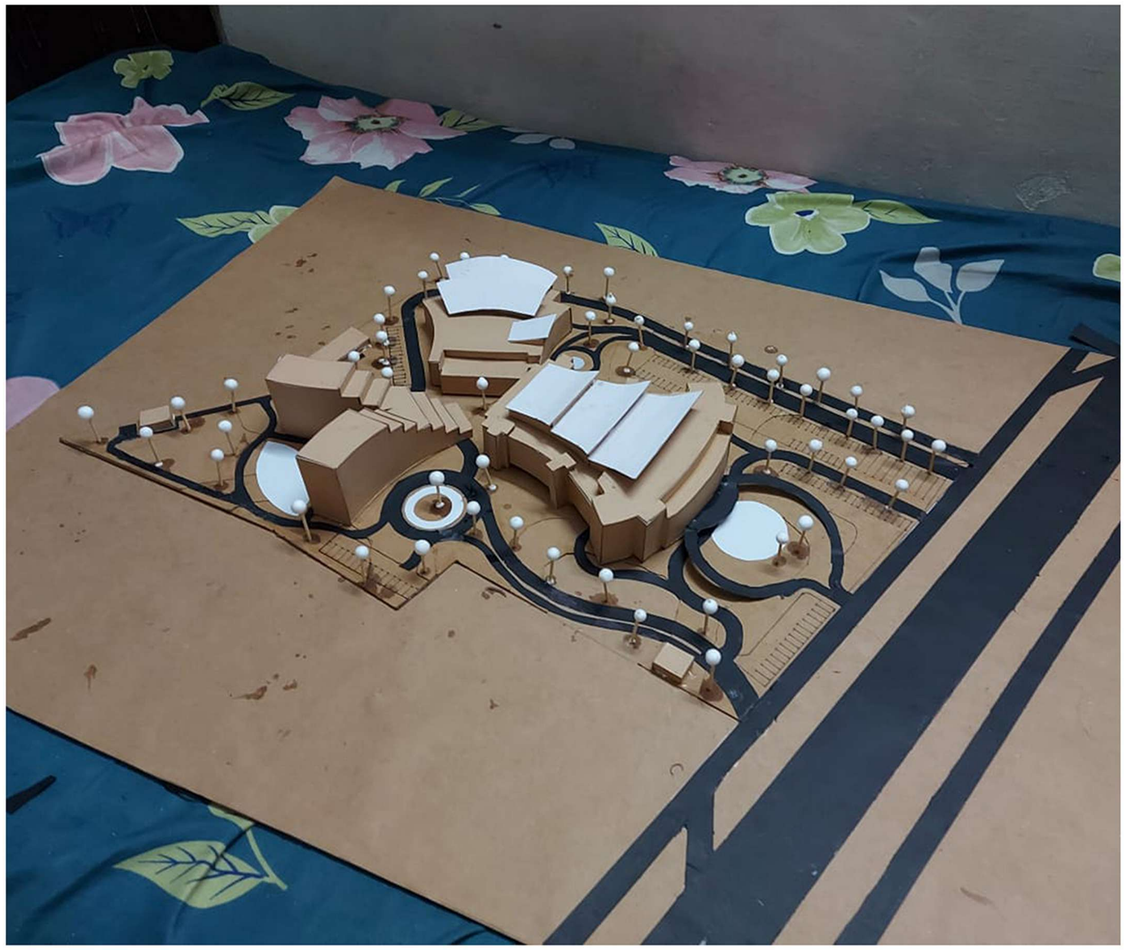
SEM : 9TH
SUBJECT : DESIGN IX

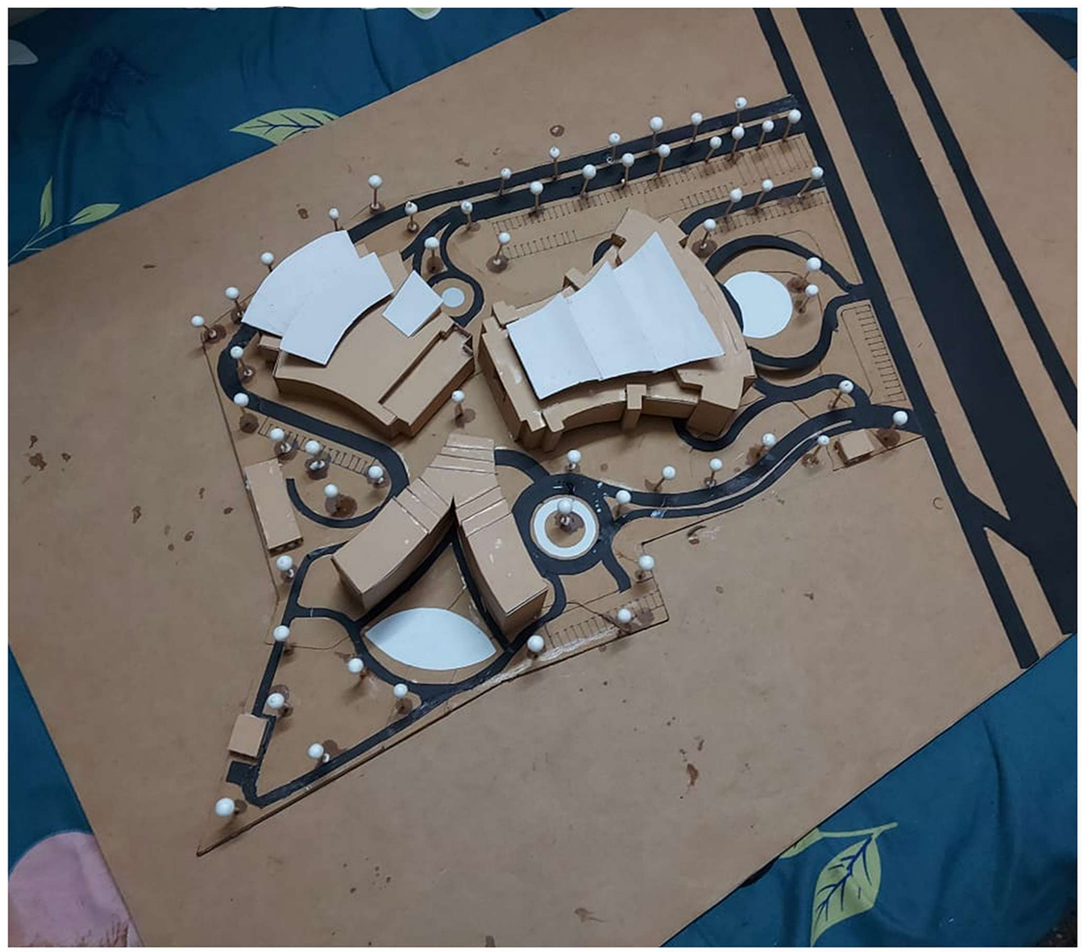
DATE : 01/12/2025

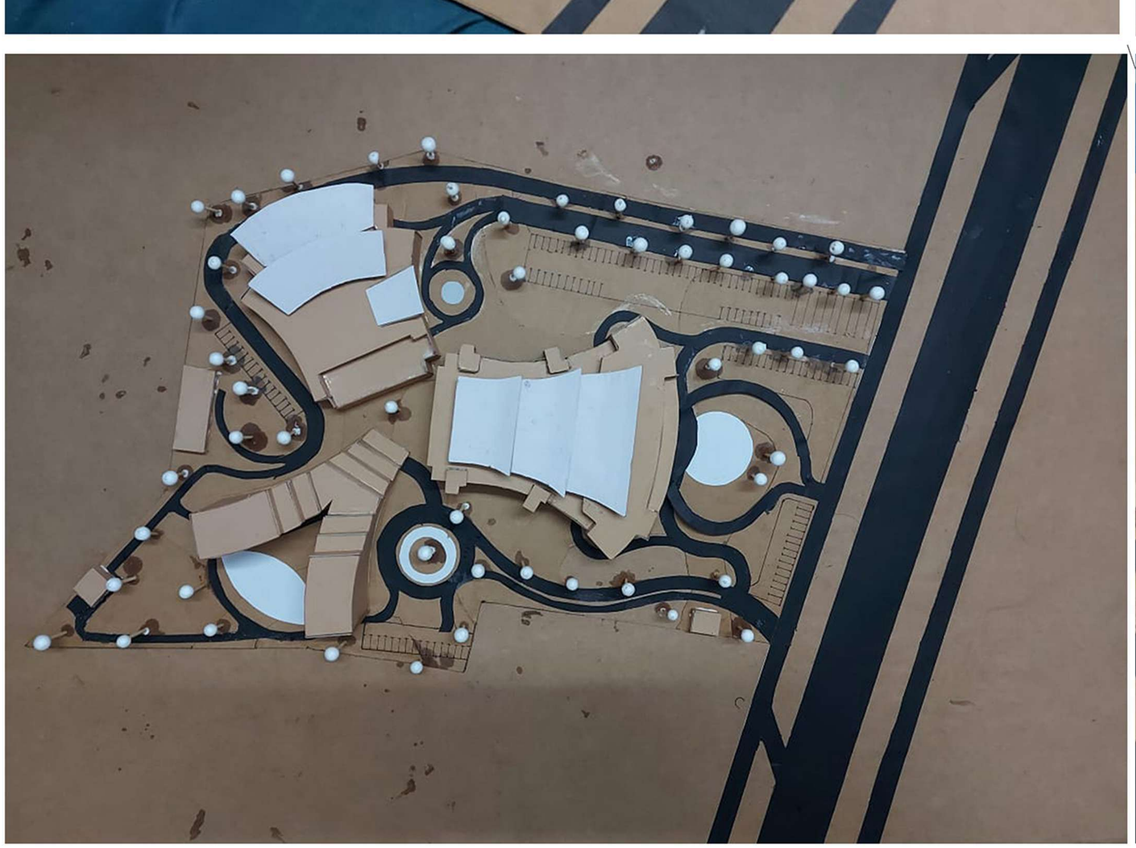
GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :

27









VERTEX INTERNATIONAL CONVENTION CENTRE

PROJECT :
Vertex
International convention centre

LOCATION : Warangal,Telugana

AREA

Site : 10 Acres

SCALE - 1:600

ALL DIMENSIONS ARE IN M

THESIS PROJECT

DWG FILE :

PHYSICAL MODEL

NAME : MUHAMMED ARSHAD.M
SCHOLAR NO : 211110027

SEM : 9TH
SUBJECT : DESIGN IX

DATE : 01/12/2025

GUIDED BY:
DR.CHARUMITRA KAPSHE

SHEET NO :

28