5 Star Hotel & Convention Centre

Vishakapatnam, Andhra Pradesh, India

BACHELOR OF ARCHITECTURE

BY

VIJAYARAGAVAN S

211110052

DEPARTMENT OF ARCHITECTURE AND PLANNING

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL

DEC 2025

VIJAYARAGAVAN S

5 Star Hotel & Convention Centre

Vishakapatnam, Andhra Pradesh, India

Dec, 2025

ARC 511 – Thesis Project

5 Star Hotel & Convention Centre

Vishakapatnam, Andhra Pradesh, India

Submitted by:

Vijayaragavan S
211110052
B. Arch
9th Semester, 5th Year

Under the Guidance of

Dr. Manmohan Kapshe

Department Of Architecture

Maulana Azad National Institute of Technology

Bhopal (MP) – 462003

© MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL – 2025

ALL RIGHTS RESERVED

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL
DEPARTMENT OF ARCHITECTURE AND PLANNING

CANDIDATE'S DECLARATION

The Thesis Project in the subject ARC 511, entitled "5 Star Hotel & Convention Centre, Vishakapatnam, Adhra Pradesh, 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 December, 2025

Vijayaragavan S

211110052

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 December, 2025

Dr. Manmohan Kapshe

Thesis Guide

CERTIFICATION OF EXAMINATION

The Bachelor of Architecture Thesis Viva-Voce examination of Mr. Vijayaragavan S, Scholar No.211110052, was held on 1/12/2025 to 2/12/25.

Dr. Nakul Dhagat
Head of Department

Dr. Vicky Lalramsangi
Thesis Coordinator

ABSTRACT

This thesis report presents a detailed project analysis for a 5-star hotel integrated with a convention center in Visakhapatnam, Andhra Pradesh, focusing on site-specific planning, regulatory compliance, and functional design to deliver a premium hospitality destination. The study encompasses comprehensive literature on Ministry of Tourism guidelines, Time Saver Standards for hotels, restaurants, kitchens, and convention spaces, alongside Andhra Pradesh Building Byelaws, Coastal Regulation Zone norms, and URDPFI standards for urban development, ensuring adherence to accessibility, fire safety, sustainability, and spatial efficiencies.

Site inventory highlights Visakhapatnam's coastal topography, demographics, climate data, vegetation trends post-Cyclone Hudhud, and strategic proximity to RK Beach, railway station, and tourism nodes, informing a design responsive to local ecosystems and urban growth. Live and desk case studies including Novotel Visakhapatnam, Taj Lakefront Bhopal, Yashobhoomi IICC Dwarka, Goldfinch Mumbai, and Vivanta Bangalore provide comparative insights into spatial zoning, banquet flexibility, guest room typologies, services integration, and sustainability features like infinity pools and green certifications.

The proposed design aims to create an iconic waterfront landmark blending luxury accommodations (~200 rooms), pillar-less convention halls, banqueting, MICE facilities, and eco-conscious elements to boost tourism, business events, and regional economy while optimizing circulation, views, and CRZ-compliant landscaping.

ACKNOWLEDGEMENT

The completion of this thesis report on the 5-star hotel and convention center in Visakhapatnam has been a pivotal milestone in my architectural journey. I extend my deepest gratitude to everyone who contributed directly or indirectly to its realization.

First and foremost, I express sincere thanks to my Thesis Guide, ***Dr. Manmohan Kapshe****, and Thesis Coordinator,* ***Prof. Vicky Lalramsangi****, for their unwavering guidance, insightful feedback, and constant encouragement. Their expertise in design, planning, and regulatory compliance shaped this work profoundly, helping me navigate throughout the design process.*

I am also thankful to the faculty and staff at Maulana Azad National Institute of Technology's Department of Architecture for their support, including access to resources. Special thanks to the General Managers and staff at Novotel Visakhapatnam Varun Beach, Taj Lakefront Bhopal, Yashobhoomi Delhi and other case study sites for permitting documentation and sharing operational insights.Also special thanks to ***Dr. Neha Pranav Kohle*** *and* ***Ar. Bhaskaran Kolathu*** *sir for their help in conducting the case studies and guidance on hotel design.*

My heartfelt thanks go to fellow batchmates, seniors, family, and friends for their motivation, discussions and support throughout intensive phases of the project. Above all, I am grateful to my parents for their enduring love, sacrifices, and belief in my pursuit of excellence in architecture.

Date**: 1st December, 2025** **Vijayaragavan S**

211110052

TABLE OF CONTENTS

CANDIDATE'S DECLARATION iii
RECOMMENDATION iii
ABSTRACT iv
ACKNOWLEDGEMENT v
TABLE OF FIGURES 8
LIST OF TABLES 13
Part 1: Design Brief 14
1.1 Introduction 14
1.2 Site Location 14
1.3 Site Plan 16
1.4 Site Location on Master Plan 17
1.5 Site Context 18
1.6 Design Brief 18
Part 2: Literature Survey 21
2.1 Ministry of Tourism Guidelines 21
2.1.1 For Approval 21
2.1.2 Classification / Reclassification of Operational Hotels 22
2.1.3 EXTERNAL ACCESS OF CONTROL 33
2.1.4 MATERIAL ACCESS CONTROL 33
2.1.5 PEOPLE ACCESS CONTROL 33
2.1.6 INTERNAL ACCESS CONTROL 34
2.1.7 OTHER SECURITY MEASURES 34
2.1.8 CRISIS MANAGEMENT PLAN 34
2.3. TIMESAVERS STANDARDS (BUILDING TYPES) HOTEL 35
2.3.1 BACK OF THE HOUSE 35
2.3.2 LAUNDARY FACILITIES 36
2.3.3 HOUSE KEEPING DEPARTMENT 37
2.3.4 FOOD AND BEVERAGE SERVICES 37
2.3.5 MECHANICAL SERVICES 39
2.3.6. FRONT OF THE HOUSE 40
2.3.7 GUEST REGISTRATION 40
2.3.8 MAIL AND KEYS 40

2.3.9 CASHIOR 40
2.3.10 ADMINISTRATIVE AREA 41
2.3.11 RESTAURANTFACILITIES 41
2.3.12. LOBBIES 42
2.3.13 ELEVATORS 42
2.3.14 GUEST FLOOR CORRIDORS 42
2.3.15 GUESTROOMS 43
2.3.16 GUEST BATH ROOMS 48
2.3.17 GUEST CLOSETS 48
2.3.18 GUEST FLOOR SERVICE SPACES 49
2.3.19 BANQUETING FACILITIES 49
2.4. TIME SAVER STANDARDS (BUILDING TYPES)-RESTAURANTS 50
2.4.1 SPACE REQUIREMENTS 50
2.4.2 DINING ROOMS 50
2.4.3 REFRIGERATED AND LOW TEMPERATURE STORAGE 61
2.4.4 SANITATION AREAS 61
2.4.5 EMPLOYEE FACILITIES 62
2.4.6 GUEST FACILITIES 62
2.4.7 CASHIER & COAT CHECKING 62
2.5 TIME SAVER STANDARDS (BUILDING TYPES)-KITCHENS 63
2.6. TIME SAVER STANDARDS (INTERIOR DESIGN) 65
2.6.1 ROOM ARRANGEMENTS 66
2.6.2 SNACK BAR 67
2.6.3 CAFE, RESTAURANT & KITCHEN 67
2.6.4 BASIC SCHEMES OF HOTEL 74
2.7. URBAN AND REGIONAL DEVELOPMENT PLANS FORMULATION AND IMPLEMENTATION GUIDELINES (URDPFI) 79
2.7.1 MEANS OF ACCESS 79
2.7.2 PARKING 79
2.7.3 MINIMUM SETBACKS 80
2.7.4 SETBACKS WITH RESPECT TO ABUTTING ROAD WIDTH 80
2.7.5 GROUND COVERAGE & FAR 81
2.7.6 WATER SUPPLY 82
2.7.7 FIRE FIGHTING 82
2.7.8 SOLID WASTE MANAGEMENT 83

2.8 INDIAN STANDARD CODE FOR HOTELS AND RESTAURANTS 83
2.8.1 BUILDING 83
2.8.2 FLOORS 84
2.8.3 WALLS 84
2.8.4 CEILING 84
2.8.5 DOOR AND WINDOWS 84
2.8.6 LIGHTING 85
2.8.7 VENTILATION 85
2.8.8 WATERSUPPLY 86
2.8.9 DRAINAGE 86
2.8.10 KITCHEN 87
2.8.11 STORAGE AND HANDLING EQUIPMENT 88
2.8.12 ACOUSTICS 88
2.8.13 FIRE SAFETY REQUIREMENTS 88
2.9 ANDHRA PRADESH BUILDING BYELAWS - 2017 89
2.9.1 FLOOR AREA RATIO (FAR) & HEIGHT RESTRICTIONS 89
2.9.2 SETBACKS & BUILT-UP AREA 89
2.9.3 BASEMENT AND PARKING 90
2.9.4 FIRE SAFETY 90
2.9.5 WATER SUPPLY 90
2.9.6 BANQUET AND RESTAURANT 90
2.9.7 HVAC REQUIREMENTS 91
2.9.8 LIGHTING & ELECTRICAL 91
2.9.9 BACK-OF-HOUSE (BOH) & SERVICES 91
2.10 COASTAL REGION ZONE-NORMS II 93
2.11 CONVENTION CENTRE 94
2.11.1 AUDITORIUM DESIGN 95
2.11.2 AUDIENCE REQUIREMENTS 95
2.11.3 SEATING 98
2.11.4 SIGHTLINES 100
2.11.5 Other Spaces 101
2.11.6 Frequency and flexibility of change 101
Part 3: Site Inventory 104
3.1 Demographics of Vishakapatnam 104
3.2 Topography 104

3.3 Proximity of Site 105
3.3.1 Immediate Location and Adjacency 105
3.3.2 Distances to Major City Nodes 108
3.3.3 Transport and Access 108
3.3.4 Proximity to Events, Festivals, and Tourism Infrastructure 108
3.3.5 Urban Context and Mapping 108
3.4 Site Contour Analysis 110
3.5 Site Section/Slope 111
3.6 Vegetation & landscaping 115
3.6.1 Vegetation Types & Ecosystem Zones 116
3.6.2 Tropical Moist Deciduous Forests 116
3.6.3 Tropical Dry Deciduous Forests 116
3.6.4 Dry Evergreen Scrub Forests 117
3.6.6 Grasslands and Open Savannah Zones 118
3.6.7 Plantation & Urban Greening Vegetation 118
3.7 Land Use & Vegetation Trends (2000–2025) 119
3.7.1 Overview of Land Use Dynamics in Visakhapatnam 119
3.7.2 Decline in Forest and Agricultural Land 120
3.7.3 Urban and Industrial Expansion 120
3.7.4 Impact of Cyclone Hudhud (2014) 121
3.7.5 Vegetation Replacement and Landscaping Trends 121
3.7.6 Summary of Trends (2000–2025) 121
3.8 Urban Landscaping in Visakhapatnam 122
3.8.1 Role of GVMC in Urban Landscaping 122
3.9 Landscape Planning Strategies in Visakhapatnam 122
3.9.1 Core Principles of Landscape Planning 122
3.10 Site Vegetation 123
3.11 Climatic Data Analysis 125
3.11.1 Geographic Context 125
3.11.2 Climate Classification – Visakhapatnam 125
3.11.3 Temperature Data – Visakhapatnam 129
3.11.4 Rainfall Patterns – Visakhapatnam 130
3.11.5 Wind Patterns – Visakhapatnam 131
3.11.6 Psychrometric Data – Visakhapatnam 133
3.11.7 Design Guidelines (Visakhapatnam – Title 24 Adaptation) 134

3.12 Site Photographs 135
Part 4: Case study/ Desk Appraisal 137
4.1 Novotel Visakhapatnam Varun Beach, Andhra Pradesh (Live Case Study) 137
4.1.1 Introduction 137
4.1.2 Location 138
4.1.3 Accessibility 140
4.1.4 Design philosophy 141
4.1.5 Internal Spaces 144
4.1.6 Floors and spaces 145
4.1.7 Facilities and Infrastructure 153
4.1.8 Recreation & Wellness 159
4.1.9 Other Leisure Facilities 161
4.1.10 Wellness & Safety Features 161
4.1.11 Unique Experiences 161
4.1.12 Banquets, Events, and Conference Infrastructure 161
4.1.13 Accessibility Features 163
4.1.14 Additional Amenities 164
4.1.15 Iconic Features At-a-Glance 164
4.1.16 Sustainability & Awards 165
4.1.17 SWOT Analysis 166
4.1.18 Inferences 167
4.2 The Taj Lakefront, Bhopal, Madhya Pradesh (Live Case Study) 168
4.2.1 Introduction 168
4.2.2 Location 169
4.2.3 Site Accessibility 169
4.2.4 Site Boundary and Characteristics 170
4.2.4 Design Philosophy 170
4.2.4 Facilities 171
4.2.5 Area Statement 172
4.2.6 Vertical Zoning 179
4.2.7 Floor Plans 180
4.2.8 Guest rooms and their typology 188
4.2.9 Interior views of Spaces 194
4.2.10 Services 195
4.1.12 Inferences 198

4.3 Yashobhoomi India International Expo Convention Centre - IICC Dwarka (Live Case Study) 199
4.3.1 Introduction 199
4.3.2 Concept And Approach 199
4.3.3 Proximity And Accessibility 200
4.3.4 Site and internal Planning 201
4.3.5 Architectural Elements at Yashobhoomi: Materials and Key Features 219
4.3.6 Inferences 222
4.4 Goldfinch Hotel, Mumbai (Desk Appraisal) 225
4.4.1 Introduction 225
4.4.2 Design Philosophy 226
4.4.3 LOCATION AND CONNECTIVITY 226
4.4.4 Floor plans 227
4.4.5 SECTION 230
4.4.6 Room typology and Area Statement 231
4.5 Vivanta by Taj, Whitefield, Bangalore (Desk Appraisal) 233
4.5.1 About 233
4.5.2 Connectivity 233
4.5.3 Site plan and google earth view 234
4.5.4 Concept 235
4.5.5 Rooms and Suites 236
4.5.6 Facilities and views 237
4.5.7 Interior and Curtain walls 240
4.5.8 Floor plans 240
4.5.9 Elevations and Sections 242
4.6 Comparative Analysis 244
Part 5: Concept 247
5.1 Concept 247
5.1.1 The Painting 247
5.1.2 Why this concept 247
5.1.3 Application 248
5.2 Zoning 249
5.2.1 Site Zoning 249
5.2.2 Vertical Zoning 249
Part 6: References 250
6.1 Government Guidelines and Codes 250

6.2 Technical Standards and Codes 250
6.3 Design References and Standards 250
6.4 Hospitality Industry References 250
6.5 Climate and Environmental Data 250
6.6 Case Study References 251
6.7 Urban Planning and Development 251
6.8 Sustainability and Green Building 251
6.9 Technical Journals and Publications 251
6.10 International Standards 251
6.11 Online Resources and Databases 251

TABLE OF FIGURES

Figure 1 Site Location; Source – APUIAML 15
Figure 2Site Drone view; Source – VMRDA 15
Figure 3 Existing Site features; Source: VMRDA 16
Figure 4 Site Plan; Source: VMRDA 16
Figure 5 VMRDA Master Plan; Source: VMRDA 17
Figure 6 Flow Diagram of Service Area (ITC Hotel Manual) 36
Figure 7 Flow diagram of Service Areas (ITC Hotel Manual) 38
Figure 8 Admin Plan, Churchhill Hotel London 40
Figure 9 Guest room details (ITC Hotel Manual) 45
Figure 10 Guest room details (ITC Hotel Manual) 46
Figure 11 Guest room details (ITC Hotel Manual) 47
Figure 12 Flow Diagram Showing Functional Relationships (TSS) 52
Figure 13 Seating Arrangements (TSS) 55
Figure 14 Table & Chair Units (TSS) 56
Figure 15 tables and chair units 56
Figure 16 (continued) table and chair units 56
Figure 17 Table & Units (TSS) 57
Figure 18 Booths (TSS) 58
Figure 19 food bars 58
Figure 20 Food Bars (TSS) 59
Figure 21 Serving Units (TSS) 60
Figure 22 Nondining Spaces (TSS) 61
Figure 23 liquor bars 61
Figure 24 nondining spaces 61
Figure 25 Traffic movement through aisle side 63
Figure 26 Kitchen for 100-200 Persons 63
Figure 27 Kitchen for 400 Persons (Up), and 800 persons (Down) 64
Figure 28 Kitchen for Excursion Restaurants 65
Figure 29 Kitchen for 600 persons, fourfold occupancy of 150 personsz 65
Figure 30 Snack Bar 65
Figure 31 Kitchen for 1000 Persons 65
Figure 32 snack bar 65
Figure 33 self service kitchen detailsFigure 34 snack bar 65
Figure 35 self service kitchen details 65
Figure 36 self service kitchen details 65
Figure 37 Room arrangements with 12, 13 & 14 ft bay spacing 66
Figure 38 Room Arrangements with 16 & 15 ft Bay Spacing 66
Figure 39 guest room plans 67
Figure 40 guest room plans 67
Figure 41 Cafe-restaurant Arrangement 67
Figure 42 Snack Bar Arrangements 67
Figure 43 Large Hotel Restaurant Kitchen 68
Figure 44 Restaurant with buffet and vending machine 68
Figure 45 Self Service restaurant 69

Figure 46 Separate preparation for Meat & vegetables 69
Figure 47 Restaurant Kitchen; Functions & Restaurant kitchen; Organisation 70
Figure 48 Funtionality of Kitchen Areas 72
Figure 49 Organization of Kitchen Spaces 72
Figure 50 Functionality of Kitchen spaces through flow diagrams 73
Figure 51 Route relationship between spaces 74
Figure 522 Arrangements of dining tables 76
Figure 53 Dining Table arrangements in different eating spaces 78
Figure 54 Dining table arrangements in different eating spaces with an example of self-service restaurant 78
Figure 55 Flow diagram of waste disposal 83
Figure 56 Auditorium design 95
Figure 57 Audience req 96
Figure 58 Auditorium reflectors 96
Figure 59 Seating for auditorium 97
Figure 60 Auditorium seating arrangement 98
Figure 61 Seating 99
Figure 62 Visual limitations 100
Figure 63 Sightlines 100
Figure 64 Flexibility of change 102
Figure 65 Visual standards 102
Figure 66 OAT 103
Figure 67 Vishakapatnam Topography 104
Figure 68 Site Topography 105
Figure 69 Site proximity 109
Figure 70 Typical traffic analysis 109
Figure 71 Site Contours 111
Figure 72 Site sections 114
Figure 73 Vishakapatnam CRZ map 114
Figure 74 Site location in CRZ map 115
Figure 75 Vizag weather data summary 127
Figure 76 Temperature range 129
Figure 77Monthly Diurnal Averages 131
Figure 78 Wind wheel 132
Figure 79 Psychometric chart 133
Figure 80 Site photographs 136
Figure 81 Novotel Visakhapatnam Varun Beach 137
Figure 82 Lice case study at Novotel 138
Figure 83 Novotel Location 139
Figure 84 Typical room layout 142
Figure 85 The Infinity Pool 143
Figure 86 Services at P1 Lvl. 145
Figure 87 Plumbing chute drawing 146
Figure 88 Exhaust fans for Excess Co2 Removal 146
Figure 89 Lower basement floor plan 146
Figure 90Convention Figure 91 Movable sound insulated partition walls 147
Figure 92 Pre event space Figure 93 Pearl – meeting rooms 148

Figure 94 Banquet Level floor plan 148
Figure 95 Laundry 149
Figure 96 Mezzanine Floor plan 149
Figure 97 Kitchen Figure 98 Lobby 150
Figure 99 Bar Interior Figure 100 Zaffran Restaurant 150
Figure 101 The Square restaurant 150
Figure 102 Nautica Hall Figure 103 Summit meeting room 151
Figure 104 Eureka meeting room Figure 105 Gym 151
Figure 106 Service Entry Figure 107 LPG Storage 152
Figure 108 Garbage composting area Figure 109 Receiving dock 152
Figure 110 Fifth floor plan 152
Figure 111 Avenue 153
Figure 112 Room interior 154
Figure 113 Suite room 155
Figure 114 Suite room interiors 156
Figure 115 The Square 156
Figure 116 Zaffran 157
Figure 117 Red Bowl 157
Figure 118 Bar interiors 158
Figure 119 Infinity pool 160
Figure 120 V Convention 162
Figure 121 The Taj Lakefront, Bhopal 168
Figure 122 Taj Lakefront Location 169
Figure 123 Site Boundary 170
Figure 124 Taj Facilities 171
Figure 125 Taj Vertical Zoning 179
Figure 126 Basement 2 Plan 180
Figure 127 STP at B2 Lvl. 181
Figure 128 Basement 1 Plan 181
Figure 129 B1 Lvl. Services and spaces 182
Figure 130 Ground floor plan 183
Figure 131 First floor plan 183
Figure 132 AHU at First floor 184
Figure 133 Second floor plan 184
Figure 134 Lightning conductors provided in corners at 2nd floor open area 185
Figure 135 HVAC Systems Figure 136 Electrical Shaft Figure 137
Balcony area with Exhausts + Ducting 185
Figure 138 Plumbing Shaft Figure 139 Pipelines at Service floor 186
Figure 140 Typical floor plan (3rd - 7th Floor) 186
Figure 141 8th floor plan 187
Figure 142 9th floor plan 187
Figure 143 10th floor plan Figure 144 10th floor Lounge area 188
Figure 145 Executive Suite Interior photos 189
Figure 146 Executive suite unit plan 189
Figure 147 Twin room photos 190
Figure 148 Twin room unit plan 190
Figure 149 King room 191

Figure 150 King room unit plan 191
Figure 151 Presidential suite photos 192
Figure 152 Presidential suite plan 193
Figure 153 Interior views 194
Figure 154 LT Panel room - 60 sqm 195
Figure 155 LT and HT panel room 195
Figure 156 LT and HT panel room; Height - 3.9 m 195
Figure 157 Fire fighting 195
Figure 158 Fire fighting 195
Figure 159 Electrical tray 195
Figure 160 HT Panel room - 20 sqm 195
Figure 161 Chiller plant150 sqm Area; Access width – 1.8 m 196
Figure 162 Control panel for fire room - 70 sqm 196
Figure 163 Water storage 20,00,000 L 196
Figure 164 Swimming pool tank 196
Figure 165 Water Storage Tank - Raw - 90 sqm 196
Figure 166 Boiler room with pump and heat exchange 197
Figure 167 Overhead tank 197
Figure 168 Cooling towers 197
Figure 169 STP 197
Figure 170 Waste disposal 198
Figure 171 Laundry 198
Figure 172 Yashoboomi Convention Centre 199
Figure 173 Site Proximity 200
Figure 174 Metro connectivity 200
Figure 175 Yashobhoomi complex site planning 201
Figure 176 Site information plan 201
Figure 177 Typology of spaces 202
Figure 178 HVAC air supply tower like structures in the central area for cooling 202
Figure 179 Exhibition Halls 1 and 2 203
Figure 180 Exhibition halls details 203
Figure 181 Detailed plans for exhibition hall 1 204
Figure 182 Ground floor plan : Exhibition hall 1 204
Figure 183 First floor plans : exhibition hall 2 205
Figure 184 Exhibiton halls 205
Figure 185Retractable ducts for fire fighting 206
Figure 186Kites in the exhibition hall to anchor hangables 206
Figure 187 Partition to divide the exhibition hall entries when used separately 207
Figure 188 Convention center Area statement 207
Figure 189 Room typology 208
Figure 190 Floor plans - Convention center 214
Figure 191 AC vents behind seats and on floors 215
Figure 192 Ceiling panels 215
Figure 193LARGEST PILLARLESS HALL ON THE TOP FLOOR 216
Figure 194 Meeting rooms with furniture 216
Figure 195 OAT FOR PERFORMANCES AND REFUGE AREA IN CASE OF FIRE EMERGENCY 217

Figure 196 POINT SUPPPORTED GLASS CURTAIN 217
Figure 197Av and control booth behind the walls concealed via single on way see through mirror 218
Figure 198 Facade elements 219
Figure 199 Ceiling elements 220
Figure 200 Audi lighting 221
Figure 201 Solar control glass 221
Figure 202 Jali 223
Figure 203 Goldfinch Mumbai 225
Figure 204 Locaiton on Google maps 226
Figure 205 Design strategies 227
Figure 206 Basement 1 floor plan 227
Figure 207 Ground Floor plan 228
Figure 208 First floor plan with area statement 228
Figure 209 Second floor plan with area statement 229
Figure 210 Sixth floor plan 229
Figure 211 6th Floor plan & terrace plan with area statement 230
Figure 212 Longitudinal Section 230
Figure 213 Guest room layout 231
Figure 214 Rooms typology 231
Figure 215 Area statement 232
Figure 216 Site plan 234
Figure 217 G Earth view 234
Figure 218 Room typology 236
Figure 219 Interior room views 237
Figure 220 Facilities 238
Figure 221 Exterior views 238
Figure 222 Interior Views 239
Figure 223 Facade views 239
Figure 224 Ground floor + First floor plans 240
Figure 225 2nd , 3rd,4th floor plans 241
Figure 226 Elevations 242
Figure 227 Sections 243
Figure 228 The Great wave off Kanagawa by Hokusai 247
Figure 229 Initial Conceptual Development Sketches 248
Figure 230 Initial Conceptual Zoning 249

LIST OF TABLES

Table 1 Design Brief as per RFP 20
Table 2: Space classification (Nueferts Data) 22
Table 3: Checklist for facilities for Classification/ Reclassification of hotels (Ministry of Tourism) 23
Table 4 Area Specifications (TSS) 50
Table 5 square feet pwe seat used for various types of food operations 50
Table 6 Vatiations in Space needs in Relation to numbers Served 53
Table 7 Square Feet Of Kitchen Space Per Meal For Food Facilities Of Different Type And Size 54
Table 8 Kitchen Areas: space required (sqm/seat) 71
Table 9 Basis for dimensions and space requirements 72
Table 10 Percentage of hotel area required 75
Table 11 Means of Access (NBC, 2005) 79
Table 12 ECS requirement 79
Table 13 Minimum setbacks 80
Table 14 Front setback w.r.t. abutting road width 80
Table 15 Side & Rare setback w.r.t. abutting road width 80
Table 16 Ground Coverage & FAR 81
Table 17 Water supply requirement in LCD 82
Table 18 Waste generation 83
Table 19 Recommended values of illumination – IS Codes 85
Table 20 Ventilation Requirements - IS Codes 85
Table 21 Water requirement in hotel 86
Table 22 Drainage & Sanitation fitments in hotels- IS Codes 86
Table 23 Drainage & Sanitation fitments in Restaurants- IS Codes 87
Table 24 Storage temperatures for food 88
Table 25 Classification of structural components – IS Codes 89
Table 26 AP building byelaws 92
Table 27 Case studies Comparison table 244

Part 1: Design Brief

1.1 Introduction

The proposed development project envisions the creation of a **Convention Centre with a 5-Star Category Hotel/Resort and Waterfront Entertainment Facilities** on a prime coastal land parcel along **Beach Road in Visakhapatnam, Andhra Pradesh, India**. This landmark project is being undertaken on a **Public-Private Partnership (PPP)** basis under the authority of the **Visakhapatnam Metropolitan Regional Development Authority (VMRDA)**.

Spanning approximately **7.97 acres**, the strategically located site offers immense potential to boost tourism, business, and leisure activities in the region. The project aims to develop high-end hospitality and convention infrastructure along with vibrant, accessible waterfront amenities, aligning with both the regional vision and the **Andhra Pradesh Tourism Policy 2020–2025**.

As part of the **Minimum Development Obligations (MDOs)**, the project shall include:

1. **Convention Centre and 5-Star Category Hotel/Resort:**
    - A **multi-purpose Convention Hall** with a minimum seating capacity of **2,500 persons in theatre-style** configuration, and a ceiling height of at least 15 feet. The hall will feature **modular, non-fixed partitions** for flexibility to host multiple events simultaneously and accommodate **national and international level meetings, exhibitions, and events**.
    - A **5-Star category Hotel/Resort** comprising **not less than 200 guest rooms**, which must secure classification from the **Hotel and Restaurant Association Classification Committee (HRACC)**, Ministry of Tourism, Government of India, within **180 days of operations**.
2. **Waterfront Entertainment Facilities:**
    - To be developed in accordance with applicable **Coastal Regulation Zone (CRZ) norms**, the project shall include:
        - **Shack Restaurants and Cafés** with temporary structures or canopies
        - **Party lawns**, **landscaping/hardscaping**, and open-air **amphitheatres** for outdoor events
        - A **Flea Market**
        - **Exhibition venues** for cultural and commercial activities

1.2 Site Location

The proposed site located at along beach road, Visakhapatnam is strategically located, spreading across approx. 7.97 acres. The Site is well connected with the road network and all major modes of transportation. The site is flanked by **Beach Road to its West** and lies in close proximity to the **Bay of Bengal** on the East, offering direct waterfront access. Located in the heart of **Visakhapatnam**, the site enjoys excellent connectivity to key city landmarks such as **RK Beach, INS Kursura Submarine**

Museum, and **Kailasagiri Hill Park**. Major city roads including **VUDA Park Road and Pandurangapuram Road** provide seamless approach to the site. **Visakhapatnam Railway Station** is located approximately **5 km** away, and the site is well-served by the **city's public bus network and auto-rickshaws**. The site also benefits from its proximity to **Visakhapatnam Airport**, which is about **13 km** away, ensuring regional and national connectivity.



Figure 1 Site Location; Source – APUIAML



Figure 2Site Drone view; Source – VMRDA

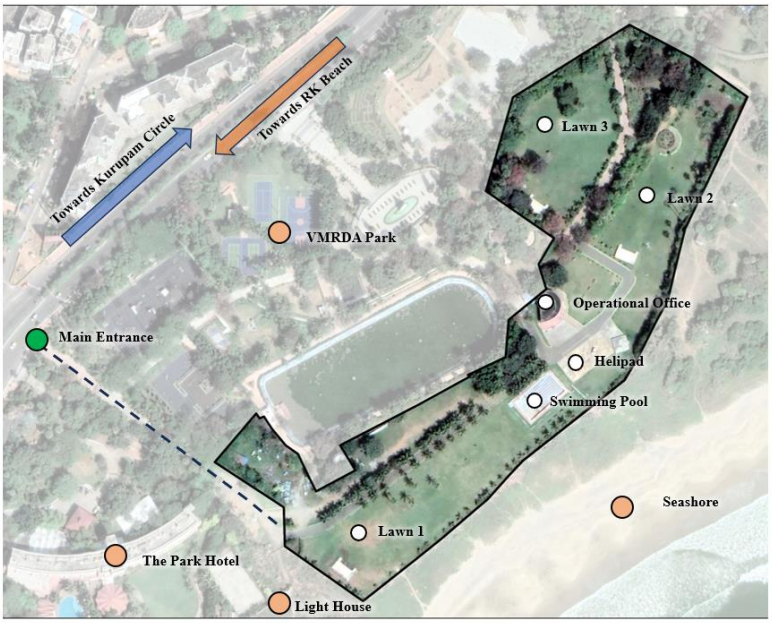


Figure 3 Existing Site features; Source: VMRDA

1.3 Site Plan

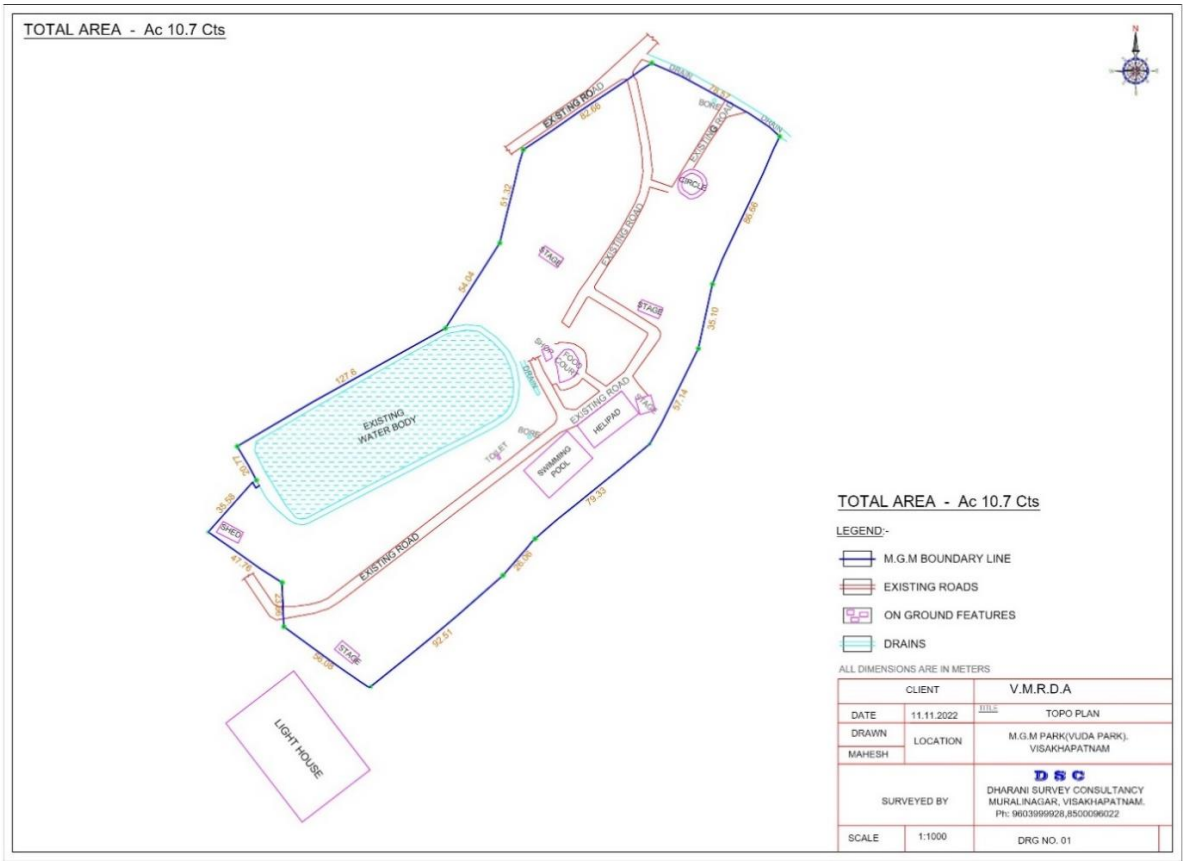


Figure 4 Site Plan; Source: VMRDA

1.4 Site Location on Master Plan

The Project Site falls under Visakhapatnam Urban Mandal i.e., Part of Visakhapatnam Metropolitan Regional Development Authority (VMRDA). VMRDA Master plan 2041 is approved under by the Government Vide G.O. Ms No:136 Ma Dt. 08-11-2021. Holiday Resorts are permissible under the allowed activities of Proposed Recreation land use Zone. The type of Permissible Developments on the Site shall be limited to VMRDA Master Plan.

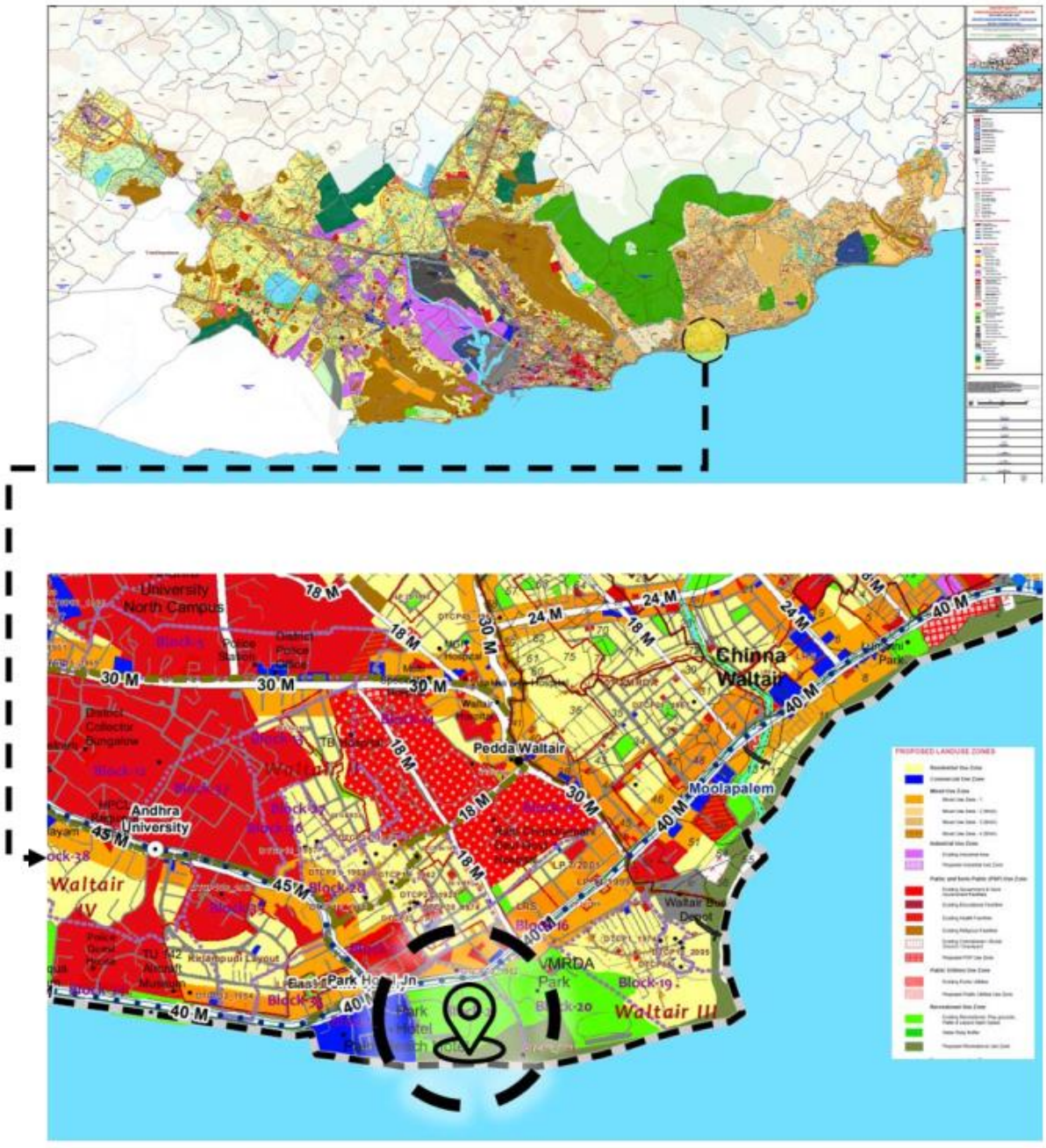


Figure 5 VMRDA Master Plan; Source: VMRDA

1.5 Site Context

The proposed project site is a prime land parcel located along **Beach Road**, one of the most prestigious and scenic stretches in **Visakhapatnam, Andhra Pradesh**. The site is in very close proximity to **RK Beach**, a major tourist attraction and recreational zone in the city. Around the site lie prominent destinations such as the **INS Kursura Submarine Museum**, **VUDA Park**, and various upscale **hotels, resorts, and eateries**, making it a vibrant and active urban waterfront.

This area is considered a **premium and high-value zone** due to its natural waterfront setting, touristic footfall, and proximity to key city landmarks. The site spans approximately **10.7 acres** and is roughly rectangular in shape, with **road access along its western edge via Beach Road** and **open views towards the Bay of Bengal to the east**. Its location, connectivity, and surrounding activity offer immense scope for tourism, hospitality, and entertainment-based development.

1.6 Design Brief

Attached below are project information as per the "CONVENTION CENTRE & 5 STAR HOTEL /RESORT WITH WATER FRONT ENTERTAINMENT, AT VISAKHAPATNAM ON PPP BASIS RFP: Volume 1"

S. No	Key Information	Details
Project Details		
1	**Project Title**	Development of a Convention Centre with not less than 5 Star Category Hotel / Resort & other Waterfront Entertainment Facilities on prime land along Beach Road at Visakhapatnam, Andhra Pradesh, India on Public Private Partnership (PPP) Basis
2	**Authority**	Visakhapatnam Metropolitan Regional Development Authority (VMRDA), Visakhapatnam, Andhra Pradesh.
3	**Project Site**	7.97 Acres (approx.) of land along Beach Road at Visakhapatnam, Andhra Pradesh
4	**Minimum Development Obligations (MDOs)**	**1. Convention Centre & 5 Star Category Hotel / Resort** Within Thirty Six (36) months* of the Agreement date, following shall be implemented: **(i) <u>A Convention Centre comprising:</u>** a) Multi-purpose Convention Hall, air-conditioned Main Hall (with the ceiling of minimum 15 feet high; area to accommodate minimum 2500 persons in theatre-style seating) b) This multi-purpose hall shall have no fixed seating and shall be with partitions for flexibility in conducting multiple events simultaneously c) The multi-purpose hall must be capable of hosting and catering to Meetings, Events, Exhibitions of National & International level.

		(ii) <u>5 Star category Hotel / Resort comprising:</u> a) Not less than 200 guest rooms b) Obtain not less than 5 Star category certification from the Hotel and Restaurant Association Classification Committee (HRACC), Ministry of Tourism, India, within 180 days of commencement of operations **2. <u>Other Water Front Entertainment Facilities:</u>** Within Thirty Six (36) months* of the Agreement date, following shall be implemented:

S. No	Key Information	Details
		(i) Water Front Entertainment Facilities (in the form and manner as permissible under the applicable CRZ Norms) such as: a) Shack Restaurant(s), Café(s) (with temporary structures / canopies, etc.) b) Party Lawns with landscaping / hardscaping (including Amphitheatre, etc) for outdoor events c) Flea Market d) Exhibition Venue The above specified MDOs are subject to the Applicable Development Control Regulations as applicable from time to time. Further, in addition to the MDOs, the Concessionaire shall be permitted to develop any other additional tourism facilities as listed in the Andhra Pradesh Tourism Policy 2020-2025 (in the form and manner as permissible under the applicable CRZ Notification) *In case any of the MDOs that are currently not permissible as per the currently applicable Development Control Regulations / applicable CRZ Notification, the timeline for the implementation of the same shall commence from the date of such amendment / notification permitting the same.

5	**Other Obligations / Conditions**	**a.** Adopt water conservation, water recycling & reuse, rainwater harvesting, if possible, zero discharge of wastewater; and also incorporate Energy efficient designs & utilities. **b.** The Project shall be user friendly and provide eased access to differently able persons to all the project facilities in accordance with "Persons with Disabilities Act, 1995" with subsequent amendments and 'UN Convention for Rights of Persons with Disabilities (UNCRPD)'. **c.** Obtaining all the applicable statutory approvals, licenses and clearances shall be the responsibility of the

Table 1 Design Brief as per RFP

Part 2: Literature Survey

The word hotel is derived from the French hotel (coming from hotel meaning host), which referred to a French version of a townhouse or any other building seeing frequent visitors, rather than a place offering accommodation. In contemporary French usage, hotel now has the same meaning as the English term, and hotel particular is used for the old meaning.

2.1 Ministry of Tourism Guidelines

With the aim of providing contemporary standards of facilities and services available in the hotels, the Ministry of Tourism has formulated a voluntary scheme for classification of operational hotels which will be applicable to the following categories:

I. Star Category Hotels: - 5 Star Deluxe, 5 Star, 4 Star, 3 Star, 2 Star & 1 Star
II. Heritage Category Hotels: - Heritage Grand, Heritage Classic & Heritage Basic

2.1.1 For Approval

Application Form should have the following details:

1. Proposed name of the Hotel.
2. Name of the promoters with a note on the business antecedents in not more than 60 words.
3. Complete postal address of the promoter with Telephone, Fax and Email address.
4. Status of the owner/promoter:
    a) If Public/private limited company with copies of Memorandum and Articles of Association.
    b) If Partnership, a copy of Partnership Deed and Certificate of Registration.
    c) If proprietary concern, name and address of proprietor/certificate of Registration.

5. Location of hotel site with postal address.
6. Details of the site .
    a) Area (in sq. meters).
    b) Title – owned / leased with copies of sale / lease deed.
    c) Copy of Land Use Permit to construct Hotel from local authorities.
    d) Distance (in Kms) from (a) Railway station (b) airport (c) main shopping center.

7. Details of the project:
    a) Copy of Feasibility Report
    b) Star category planned
    c) Number of rooms (with attached bathrooms) and size for each type of room (in sq.ft.)
    d) Size of bathrooms (in sq.ft.)
    e) Details of public areas with size in sq. ft. – Lobby / lounge; restaurants; bar; shopping; banquet/conference halls; business center; health club; swimming pool; parking facilities (no. of vehicles)
    f) Facilities for the differently abled guests (room with attached bathroom earmarked for this purpose, designated parking, ramps for free accessibility in public areas and to at least one restaurant, designated toilet (unisex) at the lobby level etc.).
    g) Eco-friendly Practices
        (a) Sewage Treatment Plant
        (b) rain water harvesting

(c) waste management
(d) pollution control method for air, water and light
(e) introduction of non-CFC equipment for refrigeration and air conditioning.

h) Energy / water conservation (use of CFL lamps, solar energy, water saving devices / taps)
i) Details of Fire Fighting Measures/ Hydrants etc.
j) Date by which project is expected to be completed and become operational
k) Any other additional facilities
l) Security related features
m) The architecture of the hotel building in hilly and ecologically fragile areas should incorporate creative architecture keeping in mind sustainability and energy efficiency and as far as possible in conformity with local art and architecture with use of local materials.

2.1.2 Classification / Reclassification of Operational Hotels

1. The application should indicate whether a few rooms or all rooms are to be let out on a Time Share basis. Hotels which propose to let out part of or all its rooms on time-share basis will not be eligible for Classification under this scheme.

2. The application fees payable for classification/reclassification are as follows. The Demand Draft may be payable to "Pay & Accounts Officer, Department of Tourism, New Delhi"

3. Star Category Classification/Reclassification fees in Rs.

- 5- Star 20,000
- 5- Star Deluxe 25,000

AREA OF HOTELS

Table 2: Space classification (Nueferts Data)

S. No.	Public Areas	Private Areas (Staff)	Private Areas (Guests)	Semi-Private Areas
1	Lobby and Reception Area	Administrative Offices	Standard Guest Room	Banquet Hall
2	Restaurant and Dining Facilities	Accounting Office	Double Occupancy Guest Room	Formal Dining Hall
3	Retail Outlets and Shops	Technical/Mechanical Rooms	Deluxe Guest Room	Multipurpose Hall
4	Lounge and Bar	Staff Bedrooms	Suite Guest Room	Banquet Area
5	Cloakroom and Storage Area	Laundry and Storage Facilities	Steam Room and Spa Services	
6	Parking Facilities	Kitchen and Food Storage Area	Guest Lounge and Bar	
7	Recreational Outdoor Areas (e.g., Parks)	Lockers and Staff Washrooms	Recreational Facilities (Swimming Pool, Gym)	
8	Banquet Hall	Waste Disposal Area	Guest Reading Room	
9		Control Room		
10		Pantry		

Checklist of Facilities for Classification/Re-classification of Hotels:

Table 3: Checklist for facilities for Classification/ Reclassification of hotels (Ministry of Tourism)

CHECKLIST FOR FACILITIES & SERVICES	1*	2*	3*	4*	5*/ 5* D	Yes / No	COMMENTS
General							
Full time operation 7 days a week in season	N	N	N	N	N		
Establishment to have all necessary trading licenses	N	N	N	N	N		Documents as detailed in General Terms and Conditions.
Establishment to have public liability insurance	D	D	D	D	D		
24 hr. lifts for buildings higher than ground plus two floors	N	N	N	N	N		Mandatory for all hotels. Local laws may require a relaxation of this condition. Easy access for the differently abled guests.
Bedrooms, Bathroom, Public areas and kitchen fully serviced daily	N	N	N	N	N		
All floor surfaces clean and in good repair	N	N	N	N	N		Floor may be of any type.
Guest Room							
Minimum 10 lettable rooms, all rooms with outside windows / ventilation.	N	N	N	N	N		
Minimum size of bedroom excluding bathroom in sq. ft	120	120	140	140	200		Single occupancy rooms may be 20 sq ft less. Rooms should not be less than the specified size.
Air-conditioning	25%	25%	50%	100%	100 %		Air-conditioning/ heating depends on climatic conditions & architecture. Room temp. should be between 20 & 28 Degrees C. For 4, 5 and 5 Star Deluxe (the percentage is of the total no. of rooms).
A clean change of bed and bath linen daily & between check– in 's	N	N	N	N	N		Definitely required between each Check – In. On alternate days for 1 & 2 Star hotels.
Suites				N	N		2% of room block with a minimum of 1.
Bathroom							
Number of rooms with attached bathrooms	All	All	All	All	All		It will be mandatory w.e.f. 01.09.2010 for all 1 and 2 Star category hotels to have attached bathrooms. All bathrooms to have sanitary bin with lid.

Minimum size of bathroom in square feet	30	30	36	36	45		25% of bathroom in 1 & 2 Star hotels to have western style WC. No higher ceiling/cap on the maximum size.
1 bath towel and 1 hand towel to be provided per guest	N	N	N	N	N		
Bath mat	D	D	N	N	N		
Guest toiletries to be provided- minimum 1 new soap per guest	N	N	N	N	N		Quality products depending on the star category.
A clothes – hook in each bath/shower room	N	N	N	N	N		
A sanitary bin	N	N	N	N	N		These must be covered.
Each western WC toilet to have a seat with lid and toilet paper	N	N	N	N	N		
Floors and walls to have non – porous surfaces	N	N	N	N	N		
Hot and cold running water available 24 hours	N	N	N	N	N		It will be mandatory w.e.f. 01.09. 2010 for all 1 and 2 Star category hotels to provide hot & cold running water.
Shower cabin	N	N	N	N	N		Where shower cabin is not available, a shower with shower curtain will suffice.
Bath tubs				D	D		In 4 Star and above hotels, some rooms should offer this option to guests.
Water saving taps / shower	N	N	N	N	N		
Energy saving lighting	N	N	N	N	N		
Hairdryers	D	D	D	N	N		Where not provided in bathroom, must be available on request.
Safe keeping / in room safe				N	N		1, 2 & 3 Star hotels to have facilities for safe keeping in the reception.
Minibar / Fridge				N	N		Contents must conform to local laws.
Drinking water	N	N	N	N	N		All category hotels to provide one sealed bottle of branded bottled water of minimum 500 ml. per person per day. Ultra violet treated water will not be acceptable.
Guest Linen							Good quality linen to be provided.

Linen room	N	N	N	N	N		Well ventilated
Paid transportation on call	D	D	N	N	N		Guest should be able to travel from hotel.
Shoe cleaning service	D	D	D	N	N		Free facility to be provided for in house guests.
Ice (from drinking water) on demand	D	D	N	N	N		Complimentary on request.
Acceptance of common credit cards	D	D	N	N	N		
Assistance with luggage on request	N	N	N	N	N		
A public telephone on premises. Unit charges made known	D	D	N	N	N		There should be at least one telephone no higher than 24" from floor level in 5 and 5 Star Deluxe (to also cater to differently abled guests).
Wake – up call service on request	N	N	N	N	N		
Messages for guests to be recorded and delivered	N	N	N	N	N		A prominently displayed message board will suffice for 1 & 2 Star categories.
Name Address and telephone numbers of doctors with front desk	N	N	N	N	N		Doctor on call in 3, 4, 5 & 5 Star Deluxe.
Stamps and mailing facilities	D	D	N	N	N		
Newspapers available	D	D	D	N	N		This may be placed in the lounge for 1, 2 & 3 Star hotels.
Access to travel desk facilities	N	N	N	N	N		This need not be on the premise for 1, 2 & 3 Star categories.
Left luggage facilities	D	D	N	N	N		This must be in a well secured room / 24 hour manned area.
Provision for emergency supplies toiletries / first aid kit	D	D	N	N	N		May be chargeable.
Health / Fitness facilities	D	D	D	D	N		Indian system of treatments should preferably be offered.
Beauty saloon and barber's shop			D	D	D		
Florist				D	D		

Crockery & Glassware	N	N	N	N	N		Plastic ware accepted in pool area.
Cutlery to be at least stainless steel	N	N	N	N	N		All categories should use good quality metal cutlery. Aluminum cutlery prohibited.
Bar			N	N	N		
Kitchens							
Refrigerator with deep freeze	N	N	N	N	N		Capacity based on size of F & B service.
Segregated storage of meat , fish and vegetables	N	N	N	N	N		Meat, fish and vegetables in separate freezers.
Colour coded synthetic chopping boards	N	N	N	N	N		Wooden chopping boards prohibited.
Tiled walls non –slip floors	N	N	N	N	N		
Head covering for production staff	N	N	N	N	N		
Daily germicidal cleaning of floors	N	N	N	N	N		
Good quality cooking vessels / utensils	N	N	N	N	N		Use of aluminum vessels prohibited except for bakery.
All food grade equipment containers	N	N	N	N	N		
Ventilation system	N	N	N	N	N		
Garbage to be segregated – wet and dry	N	N	N	N	N		To encourage recycling.
Wet garbage area to be air-conditioned			N	N	N		
Receiving areas and stores to be clean and distinct from garbage area	N	N	N	N	N		
Six monthly medical checks for production staff	N	N	N	N	N		
First – aid training for all kitchen staff	N	N	N	N	N		
Pest control	N	N	N	N	N		
Staff							
Staff uniforms for front of the house	N	N	N	N	N		Uniforms to be clean and in good condition.

Shelves / drawer space	N	N	N	N	N		Necessary for hotels of 1, 2 & 3 Star category to have a wardrobe.
Room and facilities for the differently abled guests							
At least one room for the differently abled guest	N	N	N	N	N		Minimum door width should be one metre to allow wheelchair access with suitable low height furniture, low peep hole, cupboard to have sliding doors with low clothe hangers etc. Room to have audible and visible (blinking light) alarm system. All hotels should be fully compliant by 01.09.2010.
Ramps with anti-slip floors at the entrance. Minimum door width should be one metre to allow wheelchair access.	N	N	N	N	N		To be provided in all public areas. Free accessibility in all public areas and at least one restaurant in 5 Star and 5 Star Deluxe. All hotels should be fully compliant by 01.09.2010.
Bathroom	N	N	N	N	N		Minimum door width should be one metre. Bathroom to be wheelchair accessible with sliding door, suitable fixtures like low wash basin, low height toilet, grab bars etc. No bath tub required. All hotels should be fully compliant by 01.09.2010.
Public restrooms	N	N	N	N	N		Unisex. To be wheelchair accessible with low height urinal (24" maximum) with grab bars. Minimum door width should be one metre. To be introduced by 01.09.2010 in 1, 2 & 3 Star hotels also.
Public Areas							
Lounge or seating area in the lobby	N	N	N	N	N		Doorman on duty. Lobby shall have furniture and fittings which shall include chairs/arm chairs, sofa, tables and fresh floral display.
Reception facility	N	N	N	N	N		Manned minimum 16 hours a day. Call service 24 hrs. Local directions to hotel including city / street maps to be available.
Availability of room, F& B and other tariff	N	N	N	N	N		
Heating and cooling to be provided in public areas				N	N		Temperatures to be between 20-28 degrees Celsius.

							provided on a permanent basis, it will be mandatory for all Star hotels to provide multi-socket adapter plugs on request.
A telephone for incoming & outgoing calls in the room	D	N	N	N	N		4 star and above should have direct dialing and STD / ISD facilities. 1,2 and 3 Star category hotels may go through a telephone exchange.
PC available for guest use with internet access	D	D	N	N	N		This can be a paid service. Upto 3 Star, PC can be in the executive offices, Internet subject to local access being available.
E-mail service	D	D	N	N	N		Subject to local internet access being available.
Fax, photocopy and printing Services.	N	N	N	N	N		
In room Internet / wi-fi connection	D	D	D	N	N		Subject to local internet access being available. Wi-Fi wherever possible.
Business Centre	D	D	D	N	N		This should be a dedicated area. (This provision may be relaxed for resort destinations, tourist and pilgrimage centers).
Swimming Pool	D	D	D	D	N		This can be relaxed for hill destinations. Mandatory to have trained Life Guard, Board containing Do's and Don'ts, No Diving sign, pool depth etc. should be displayed at a strategic location in the pool area. All 4 Star, 5 Star and 5 Star Deluxe hotels shall provide a luminous LED wall clock with numerals of three inches or more on display near their swimming pools
Parking Facilities	D	D	N	N	N		Should be adequate in relation to the number of rooms & banquet / convention hall capacity. Exclusively earmarked accessible parking nearest to the entrance for differently abled guest.
Conference Facilities.	D	D	D	D	N		
ECO FRIENDLY PRACTICES							
Sewage Treatment Plant	N	N	N	N	N		A Sewage Treatment Plant will not be a mandatory condition for hotels which have obtained completion certificate for construction before 01.04.2012.

English speaking front office staff	D	D	N	N	N		This may be relaxed outside the metros / sub-metros for 1 and 2 Star category hotels.
Percentage of Supervisory staff	20%	20%	40%	40%	80%		Hotels of 4 Star category and above should have formally qualified Heads of Departments. The supervisory or the skilled staff may have training or skill certification as follows: Degree / diploma from Central or state IHM's / FCI's or from NCHMCT affiliated IHM's or from other reputed Hospitality schools.
Percentage of Skilled staff	20%	20%	30%	30%	60%		The supervisory or the skilled staff may have training or skill certification as follows: i. Degree / diploma from Central or state IHM's / FCI's or from NCHMCT affiliated IHM's or from other reputed Hospitality schools. ii. Skill training certificate issued under the guidelines and scheme of the Ministry of Tourism.
Staff welfare / facilities							
Staff rest room	D	D	N	N	N		Separate for male and female employees with bunk beds, well lighted and ventilated.
Staff locker room	D	D	N	N	N		
Toilet facilities	N	N	N	N	N		Full length mirror, hand dryer with liquid soap dispenser.
Dining area	D	D	N	N	N		
Guest Services							
Provision of wheelchair for the differently abled guest	N	N	N	N	N		Wheel chair to be available on a complimentary basis in hotels of all categories
Valet (parking) services to be available	D	D	N	N	N		
Dry- cleaning /laundry	D	D	D	D	N		In house for 5 star Deluxe hotels. For 5 Star category and below, maybe outsourced.
Iron and iron board				N	N		Iron and iron board to made available on request in 1 to 4 Star category hotels on complimentary basis. For 5 and 5 Star Deluxe categories, to be available in the room.

Shop / kiosk	D	D	D	N	N		5 and 5 Star Deluxe category hotels to have one utility and one souvenir shop. 4 Star to have minimum one utility shop.
Money changing facilities	D	D	D	D	D		Money changing facility to be made available.
Bookshop	D	D	D	D	N		
Safety & Security							
Metal detectors (door frame or hand held)			N	N	N		
CCTV at strategic locations	N	N	N	N	N		
X-Ray Machine					N		For 5 Star Deluxe category, it would be 'Necessary' to have an X-Ray Machine at the guest entrance for screening of baggage. Manual checks may be conducted for staff and suppliers at designated entry points.
Under belly scanners to screen vehicles				N	N		
Verification	N	N	N	N	N		All hotels should conduct a verification of their staff and suppliers by the Police / private security agencies.
Staff trained in fire fighting drill	N	N	N	N	N		All hotels to conduct periodic fire drills and maintain 'Manuals' for Disaster Management, First Aid and Fire Safety. Quarterly drill or as per law.
Security arrangements for all hotel entrances	N	N	N	N	N		
Each bedroom door fitted with lock and key, viewport / peephole & internal securing device			N	N	N		A safety chain / wishbone latch is acceptable in place of viewport / peephole.
Smoke detectors	N	N	N	N`	N		These can be battery operated.
Fire and emergency procedure notices displayed in room behind door	N	N	N	N	N		
Fire and emergency alarms should have visual & audible signals	N	N	N	N	N		
First aid kit with over the counter medicines with front desk	N	N	N	N	N		

5 Star category							<u>Grade A cities:</u> One Multi cuisine Restaurant cum 24 hr. coffee shop / all day diner, one Specialty Restaurant and 24 hr. room service. <u>Grade B cities:</u> One Multi cuisine Restaurant cum coffee shop open from 7 a.m. to 11 p.m., one Speciality restaurant and 24 hr. room service.
5 Star deluxe category							<u>Grade A cities:</u> One Multi cuisine Restaurant cum 24 hr. coffee shop/ all day diner, one Speciality restaurant and 24 hr. room service. <u>Grade B cities:</u> One Multi cuisine Restaurant cum coffee shop open from 7 a.m. to 11 p.m., one Speciality restaurant and 24 hr. room service.
<u>Grade- A:</u> Delhi * Mumbai, Kolkata, Chennai, Bangalore, Pune, Hyderabad/ Secunderabad. <u>Grade– B</u>: Cities in the rest of the country excluding Grade 'A' cities.			<u>Note</u>: The Ministry of Tourism may review and revise the cities falling under the Grade 'A' & Grade 'B' from time to time. • Delhi would include the hotels falling in Gurgaon, Faridabad, Ghaziabad, NOIDA and Greater NOIDA.				

Rain Water Harvesting	N	N	N	N	N		
Waste management	N	N	N	N	N		
Pollution control methods for air, water and light	N	N	N	N	N		
Introduction of non CFC equipment for refrigeration and air conditioning and other Eco-friendly measures / initiatives.	N	N	N	N	N		

Checklist of Services and Facilities (Annexure III)

D Desirable

N Necessary

There is no relaxation in the **'Necessary'** criteria of the Checklist of Services and Facilities (Annexure II), except as specified in the comments column of said checklist.

Note1.

All hotels should clearly indicate on their websites the facilities and amenities provided to guests "free of cost" like complimentary breakfast (indicating broad classification like Indian breakfast, Continental breakfast or American breakfast), iron and iron board facility, shoe cleaning facility, shoe horn and slippers, other "free" facilities like dental kit, shaving kit etc.

If any facility is provided only 'on request' but is included in the room rent, this should be mentioned on the hotel's website under the head **'Facilities and Amenities Provided on complimentary basis'** and also be mentioned to the guest when the hotel staff introduce the room to him / her on arrival. In case the 'complimentary breakfast' is not a buffet, the guest must be shown a list stating in English the name of all complimentary items.

(All hotels shall submit a compliance of Note 1 in the form of a screen shot of their website showing the "Facilities & Amentias provided on complimentary basis")

Note 2.

It will be mandatory for all the hotels classified under all category to display their classification status prominently on their websites under a separate icon on the opening page, which on the click will display the order of classification issued by the Ministry of Tourism, Government of India, and at the reception.

Note 3.

All the hotels shall be required to submit an affidavit with respect to clearances along with their applications for approval of Hotel at the Project Stage and for Classification / Re-classification of Operational Hotels, as given in **Annexure V and VI respectively**.

Note 4:

a. If any hotel is found to obtain classification on a false pretext or on the basis of misrepresentation of facts, or is found to display wrong classification status, or found to promote / market the hotel on the basis of wrongful claims pertaining to hotel classification, then the unit / hotel will stand declassified with immediate effect and it shall be debarred from applying for classification under any category for a minimum period of two years from the date of debarment by the competent authority i.e. the Chairman, HRACC.

b. If a hotel which has applied for classification under any category to the Ministry of Tourism is found to display false classification status, or found promote / market the hotel on the basis of wrongful claims pertaining to hotel classification, then the application for classification of the unit / hotel will stand summarily rejected and it shall be debarred from applying for classification under any category for a minimum period of two years from the date of debarment by the competent authority i.e. the Chairman, HRACC.

c. In case of debarment, a hotel, which is found to otherwise fulfil to the satisfaction of the inspection committee, all criteria pertaining to the classification parameters of the star / heritage category under which it was found to wrongfully promote itself, will have the one-time opportunity for revocation of the debarment by paying a penalty prescribed below. Such observation of the committee, if any, will

2.1.3 EXTERNAL ACCESS OF CONTROL

1. Limiting Access Points

The number of access points needs to be reduced to a minimum of two or three and entry of persons regulated and monitored through CCTV cameras placed at such points.

2. Perimeter Security System

A three-tier security system should be put in place-

(a) At the perimeter, on the outside of the hotel itself, cars must be stopped, boots checked and mirrors put under the car chassis to detect explosives.

(b) Vehicles driving up to the hotel door should be discouraged. Vehicles should not be allowed to go right up to the door. Guests must alight at some distance away and walk-up.

(c) There should be closed circuit TVs installed in all public areas of the hotel, especially at the alighting point and entrance door for scanning people coming into the hotel.

3. Road Barriers

Premium hotels could consider installing devices like hydraulically operated road barriers or retractable bollards that can stop vehicles coming at high speed. Short humps can be raised from ground level to slow down/stop vehicles.

4. Shrubs and Vines

Heavy shrubs and vines should preferably be kept away from the hotel building and trimmed close to the ground to reduce their potential to conceal criminals or bombs.

5. Patrolling

Increasing the number of Security Guards and stepping up patrolling can be an effective deterrent to criminals.

2.1.4 MATERIAL ACCESS CONTROL

1. Guest Baggage Check

(a) Baggage should be taken to a drop point, away from the lobby and passed through baggage scanners which can detect the shape and density of the objects with a high degree of clarity

(b) Handheld bags must be checked at the entry point.

2.1.5 PEOPLE ACCESS CONTROL

1. Walk-In Guests

Hotels should not entertain Walk-in guests' (without reference or pre-bookings)

2. Guest Profiling

Hotels should put in place a computer linked guest profiling system to zero in on persons of suspicious antecedents whose names figure in the Ministry of Home Affairs' Watch List. The information would include details such as full name of the guest, date of birth; nationality, sex; passport number, country issuing the passport; country of residence; visa number, date and place of issue.

3. Employee Verification

Internal security must be ensured through background checks and antecedent verification of employees and service providers. Temporary staff should be hired from reputed contractors who maintain up-to-date database.

4. Visitor Management System

A visitor management system is essential. All visitors must be given a 'Visitor Pass'.

2.1.6 INTERNAL ACCESS CONTROL

1. Within the hotel there should be restriction on access to different parts of the hotel.

2. Access of staff to various departments in the hotel can also be regulated through proximity cards with magnetic inter locks.

3. Entrances to areas such as Boiler Rooms, Mal Rooms, Computer Rooms, Switch Boards and Control Rooms should remain locked when not in use.

4. It is also necessary to establish a procedure for the accountability of their keys.

5. LIFT USAGE

(a) The practice of people entering the lobby and taking the lift to any floor must be stopped.

(b) Lifts should be programmed so that Guests staying in hotels are able to go only to the guest floor they are on by swiping their room card in the lift and it should only let them get out on the guest floor they are on.

2.1.7 OTHER SECURITY MEASURES

1. Room Key Scanners

The US Department of Energy, through its Oak Ridge National Labs, has developed Mass Spectrometry Scanners which can analyze up to 1000 guest room access cards per hour. These can detect even a billionth of a gram of explosives such as Nitroglycerine or TNT. Even if a tinge of explosive has been touched by the guest it would alert the staff immediately and information flashed to security agencies.

2. Snifex

Snifex is a small handheld device with an ariel. The ariel starts V pointing to the direction where explosive is kept from a distance of a few meters.

3. Trash Management

An explosive device can easily be hidden in the trash. Trash cans need to be managed by trustworthy personnel.

2.1.8 CRISIS MANAGEMENT PLAN

I. Hotels must have a plan of action ready in case of an emergency Staff should be trained by mock drills in evacuations to help people in terror situations.

II. Hotels need to build strong in-house systems to prevent or deal with a crisis; train and motivate staff to respond to an emergency and evacuate guests if there is shooting or a bomb goes off. There should be a designated nodal executive in-charge of the crisis management team.

III. During crisis, calls start pouring from all over the world for news of the welfare and safety of guests and from the media persons who file reports on TV channels and in newspapers. There should be a nodal point and a designated person for information dissemination and to respond to all enquiries during a crisis.

2.3. TIMESAVERS STANDARDS (BUILDING TYPES) HOTEL

- It must be borne in mind that, as far as planned circulation is concerned, there must never be aminglingofthefront-of-the-houseserviceswiththoseofthebackofthehouse.
- The two functions must be kept separate and yet so interrelated that both functions smoothly and efficiently.
- The physical environment becomes an important part of the guest's creature comfort. These factors include color and decor, lighting, proper air temperature, comfortable furnishings and, above all, pleasant and relaxed atmosphere.
- This involves the economics of a new hotel, which will center upon the cost of construction and furnishing. These costs represent, together with the cost of the land, the amount of money that is to be invested.

2.3.1 BACK OF THE HOUSE

- Though rarely seen by a guest, the back of the house is the most crucial part of the plan. It must be laid out with two paramount objectives: control and efficiency. Foodstuffs, housekeeping supplies, and a great many other items must be received out of sight of the hotel guests. Such receiving is usually done at a loading dock, which should be covered so that deliveries can be made regardless of the weather.
- This is usually the function of a receiving department that should be located directly on or adjacent to the loading dock. Tight control must be exercised in two directions. In one direction, it is not uncommon for material to be delivered and, within a short time of its having been left on the dock unchecked, for the management to find that this material has disappeared or that some parts of the shipment have gone astray. The second part of the control is to make sure that, once these shipments have arrived, they go directly to their destination without a chance- of becoming lost on the way.
- A good back-of the- house plan will be worked out in such a way that the flow of supplies is tightly controlled by the security that the architect works into his plan
- Tight, well-planned back of the house will have circulation patterns that will provide the utmost in control.
- In the larger hotels, garbage destructors or compressors may be used, in which case tight surveillance is necessary only in the garbage receiving area. Where garbage is shipped out, it is wise to have the garbage rooms so placed (and, incidentally, refrigerated) that the receiving office has this space in full view.
- A tight control at the point of entry and egress of all employees is highly desirable and can easily be accomplished if it is the same point as that at which food and other hotel supplies are brought

in. Once again, the architect's careful planning will make it possible for employees to reach their various dressing and locker areas with a minimum of travel time lost. It must be borne in mind that there is class distinction in hotels and, as an example, that dishwashers and porters are not placed in the same locker rooms as head waiters and reception clerks.

- Locker rooms should be provided with ample toilet facilities and showers. Once the personnel have changed into their uniforms, the plan of the back of the house will make it possible for the people to get to their work stations with little time lost.

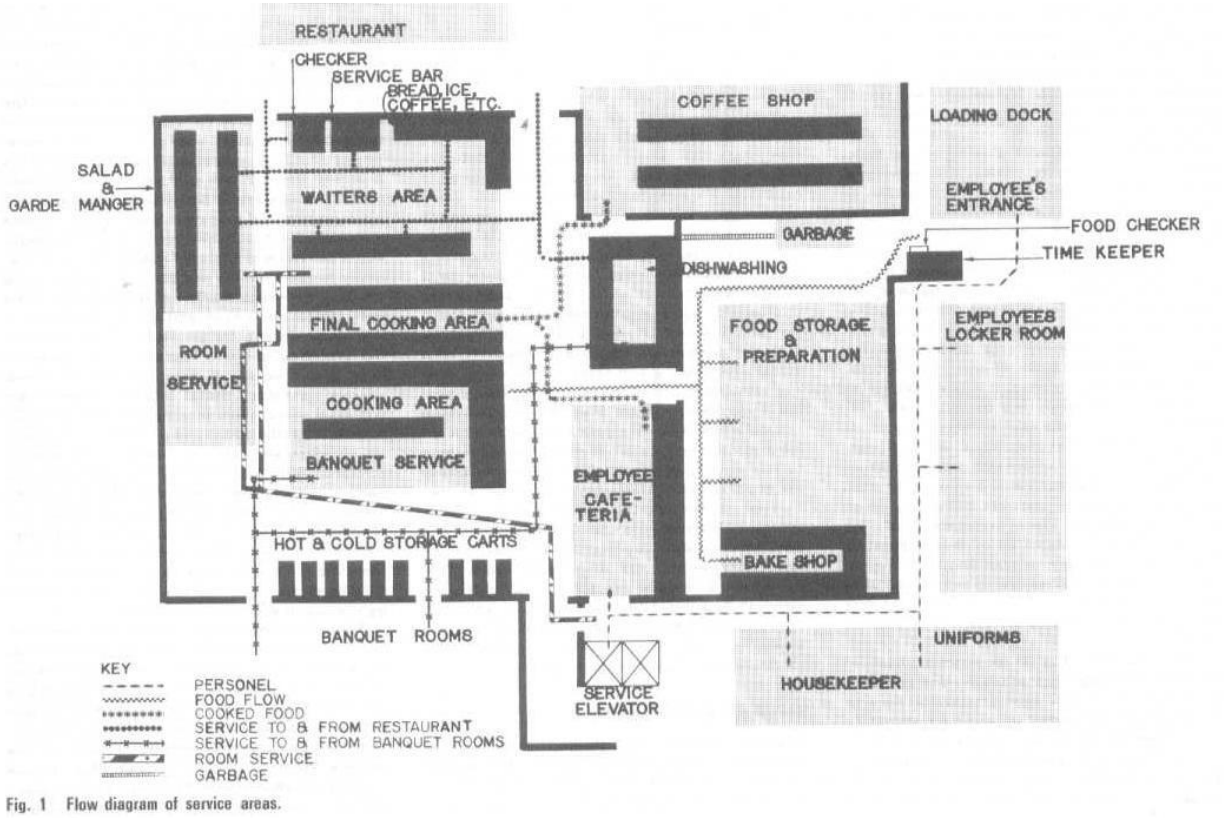


Fig. 1 Flow diagram of service areas.

Figure 6 Flow Diagram of Service Area (ITC Hotel Manual)

Uniform issue is related to the housekeeper, the housekeeper to the laundry room, and the laundry room to the soiled linen room. The soiled linen room connects by vertical linen chute to the service room on every typical floor, and every typical floor is connected by a service elevator that opens to the lower-floor service area convenient to the scrutinizing gaze of the steward and the timekeeper. For convenience, a trash chute, going from every typical floor service area, should be located next to the linen chute

2.3.2 LAUNDARY FACILITIES

- A laundry is a usual adjunct of most good-sized hotels.
- A hotel laundry that does its own uniforms and flatwork (sheets, pillowcases, linens, etc.) requires a good-sized space for washers, dryers, drum ironers, and various pressing machines-each suitable for its own type of flatwork, uniforms and guests' laundry, and men's and women's wearing apparel.

- Larger hotels will maintain their own cleaning department for dry cleaning and pressing of woolens and similar garments. Such a cleaning and valet service is usually a part of or close to the laundry area, and it is definitely under the supervision of the laundry manager.

2.3.3 HOUSE KEEPING DEPARTMENT

- The housekeeping department, having several functions, is the province of the chief housekeeper, who will usually have assistant floor housekeepers. Under the housekeeper's strict control and supervision will be all the maids and porters
- The porters will deliver to the service areas on the guest-room floors all linen and soap as well as facial tissue, toilet paper, matches, room service menus, and ashtrays.
- The housekeeper's area is also a storage area, for here are kept all the supplies that become a part of housekeeping.
- It might be useful for the architect to know how many rooms a maid can make up during her daily tour of duty.
- It rarely goes beyond 15. One porter is usually assigned to each maid. In addition to the regular daytime maid, there will be, in most hotels, a night maid who will make up beds for guests ready to go to sleep.

2.3.4 FOOD AND BEVERAGE SERVICES

- The flow of the raw food from the time it is delivered to the steward until it is finally cooked and ready to be picked up by the waiters or the waitresses.
- After the comestibles have been weighed in, checked, and signed for, they are sent to either dry storage or liquor storage (a room with a big lock on it) or to one of the various cold holding rooms or boxes. Canned food and other bottled or packaged food which does not need refrigeration will be sent to dry-storage rooms. In this storage space will also be kept the various condiments that the chef will need in the preparation of his food. Vegetables will be sent to an area where they will be stored ready for preparation. A refrigerator box of the proper temperature will be needed, as well as work space, sinks, and cutting boards where vegetables will be prepared for the chefs as needed. Vegetable preparation area is needed.
- Dairy products will go to their own cold-storage boxes. Fish, fowl, and meat will go to a separate area where boxes must be arranged with proper temperatures for their storage.
- Freezer, refrigerator, and cold storage boxes require heavy insulation. Slab sinkage in these areas should be provided for.
- The bakery shop should be a separate entity, having its own refrigerator boxes as well as all the pertinent equipment that a baker will use in his art---and an art it is, indeed.
- Here again, one should be reminded that the bakery should be close to the actual food service area so that not too many of these goodies find their way into the locker rooms or out of the hotel entirely.

- KITCHEN- The food from the prep area is brought to the various points where it is to be used. One of the first areas to which a good part of the prepared food will go is the rough cooking area. Here we find the big soup kettles, the vegetable steamers, the ovens, and the hot tops where most of the bulk foods will be prepared.

- Pot washing area close to the rough or preliminary food cooking area. Rough cooking is usually backed up to the finished cooking area.
- Between the chefs' ovens, broilers, and fry- errs, which are aligned in a straight line, there will be an aisle for the chefs. On the other side of this aisle will be the serving tables from which the waiters will pick up the finished food. At the bottom of these tables will be plate. warmers which the waiter picks up and sets on the table so the chef can place the order of the specific dish that is required.
- This entire area is for self-service by the waiters, who will pick up the items they need on their way to the guest waiting for the delivery of his food.

- DINING ROOM- The dishwasher is usually placed close to the Dining room area so that the dishes can be disposed of as soon as the waiter or busboy enters the kitchen. The dishwashing area is, of necessity, not only noisy but also a rather untidy operation, SO it must be kept fairly isolated from the actual cooking and serving area.
- Then, before entering tire. dining room, Ire will usually go by a checker's desk where he presents a check indicating the items that he is taking out of the kitchen to the diner.
- One other space will usually occur in our ideal kitchen--a service bar with a bartender who will prepare tire drinks that the waiter has ordered.
- There will be a chef's office, which is set where the chef can observe all the activities in tire kitchen. His office is usually enclosed with glass to give him aural privacy but complete visual control. Here the chef will prepare and plan menus.
- Room-service area- Here there must be sufficient space for a fairly large number of room service rolling tables, which are set and ready to carry the dishes that have been ordered by the guest via telephone.
- The room-service area is always close to tire cooking and garde manger area.

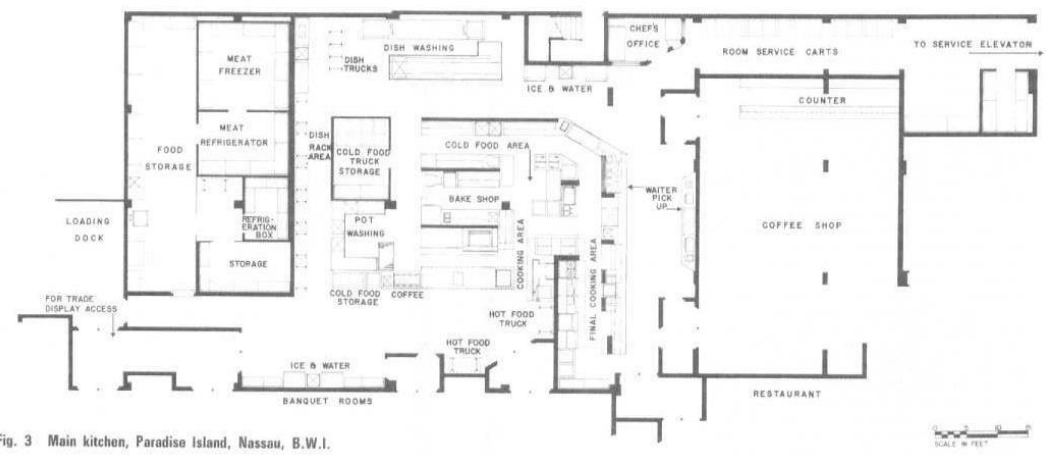


Figure 7 Flow diagram of Service Areas (ITC Hotel Manual)

- The room service area should, of necessity, be as close to the service elevators as possible.
- COOKING AREA- The cooking area, consisting mainly of griddles, will be manned by short-order chefs who are ready to prepare various hot breakfast dishes, and the garde manger section will be manned by a crew who are expert in the preparation of breakfast menus.

- BANQUET HALLS- In the banquet area there will be mobile cabinets that take trays. These are electrified cabinets arranged to keep dishes either hot or cold. Those banquet cabinets can be stocked before a banquet for certain types of manes.
- A large banquet area in a hotel will require a separate banquet kitchen with its own cooking facilities as well as its own dishwashing area.
- One last observation: it is an excellent idea to have toilets and washrooms for kitchen help, so that it isn't necessary for them to return to their locker rooms, which may be at some distance. It is always advisable to keep the kitchen help within the kitchen during their stint of duty. Doors to dining rooms, and there may be several dining rooms serviced by the one kitchen, should be strategically placed and baffled so that the diners do not have a view of what goes on in the kitchen, and, what is more important, do not hear what is going on.
- The ideal plan would be to place the coffee shop backed up to the kitchen, so that certain finished dishes and prepared foods can be delivered to the coffee shop work area directly from the main kitchen under complete control and it passes from prep areas to kitchen to coffee shop.
- At the counter we will usually find a pickup area where the waiters can pick up the food prepared for them without disturbing the diners who are sitting at counters. Dirty dishes will be sent back to the dishwashing area through a pass-through, or they will be carried to the dishwashing area in the main kitchen.
- Employees' cafeteria- This space is usually planned to be close to the help's locker rooms and yet contiguous to the main kitchen.
- Beverage service area- This may be a bar room or a cocktail lounge. In any case, there will be a bar with stools (if local codes permit) and an area for cocktail tables and chairs. A cocktail lounge must be serviced just as the kitchen is serviced. To the bar must be brought not only liquor and bottled goods but also the usual crunchies.
- Ideally, the delivery should be made directly to the back bar through pass-throughs from the kitchen, so that we find once again another unit backed up to the ideal kitchen.

2.3.5 MECHANICAL SERVICES

- Another area that should be considered in designing the back-of-the-house spaces will be the boiler or mechanical room. In this area will be found the various pieces of equipment for heating and cooling as well as all the tanks and pumps to keep all the mechanical systems in operation.
- In this area will also be found all central switch gear that controls electric current for every purpose in the hotel complex. This domain belongs to the house engineer and, naturally, there should be provision for an engineer's office, with a mechanical repair shop close by.
- These would include a carpentry shop, an upholstery shop, and definitely an area for a locksmith. Somewhere in the area, where they are easily accessible, will be storage rooms in which will be kept a multitude of spare parts to service the hotel. be occupied by personnel that very often come in contact with the guests, and the strategic location of these back-of-the-house facilities will be controlled entirely by what happens in the front of the house.
- Included in these areas you will find accounting and bookkeeping offices (which back up the front cashiers); reservations offices (which back up to the front registration desk); and offices for management, which will include a reception area, a manager's office, and an assistant manager's office.
- There is also a mail sorting room.

2.3.6. FRONT OF THE HOUSE

- The guest or the paying customer sees only the front of the house, and this must be all that he desires.
- The front of the house comprises every area that the guest will see; lobbies, dining spaces, rest rooms, passenger elevators, corridors, hotel rooms, etc. These spaces must be handled and planned with one thought in mind: the convenience and continued approbation of the guests.
- The registration desk and the elevators should and must be immediately apparent. The registration area consists of a front desk, behind which is a registration clerk, behind whom is the key and mail rack, and behind that the various administration spaces.

2.3.7 GUEST REGISTRATION

- A hotel registration desk must be located so that it is immediately visible as one enters the hotel lobby. The size of the desk will be determined by the size of the hotel.
- 2,000 rooms might have anywhere from four to six registration clerks, while a hotel of 100 to 200 rooms will have one or at roost two spaces at which guests may register.
- The simplest arrangement will call for a suitable file containing advance reservation cards requesting space, so that the clerk can quickly check what room has been reserved for what particular guest.
- Advance registration counter

2.3.8 MAIL AND KEYS

- There are two other services that the front or registration desk must perform. The first and obvious one is to serve as the place where the room keys are kept.
- If the registration clerk handles the key, then obviously the key rack is directly behind the desk, easily accessible to the registration clerk. If the hotel is large enough to require separate area and separate personnel for handling of keys, this function will usually be alongside the actual registration desk

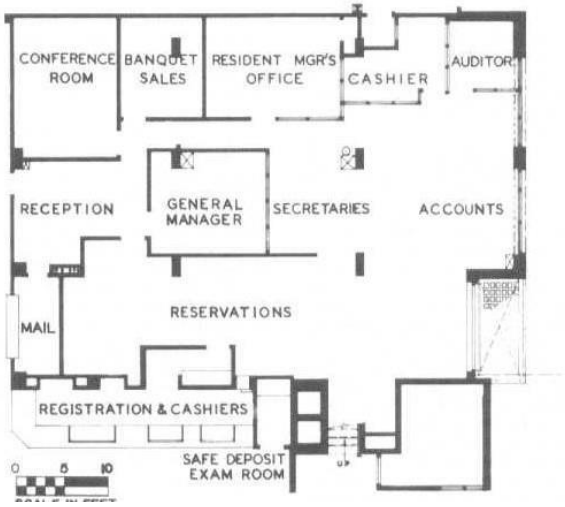


Figure 8 Admin Plan, Churchhill Hotel London

2.3.9 CASHIOR

- The average hotel usually has the cashier's counter located adjacent to the registration desk.
- The larger hotels may place cashiers in the so-called "front desk" area but somewhat remote from the actual registration desk. There are times in large hotels, especially those catering to conventions, where one convention is checking out while another is checking in. This will make for traffic congestion and some confusion. Such a situation can be avoided by planning the registration and

cashier facilities so that lines forming in front of the registration desk do not conflict with lines forming at the cashier's counter.

- Larger hotels will have a complete bookkeeping department. This will require more than just the actual cashiers, who remain at their stations, while the bookkeeping department handles all entries and bookkeeping for the guests. It is obvious that this bookkeeping department should be close to if not backed up to tire front desk cashiers, so that any questions of charges can be quickly checked and adjusted by the cashier, who will contact the bookkeeping department for clarification or corrections in the guests' bills.
- Therefore, a small closed room is normally provided. The guest enters this room and gives the valuables to the cashier through a pass-through window. This pass-through window should have a view of the vault or the safe so that the guest can watch his valuables being deposited properly.
- In large hotels, where there are a number of restaurants and other facilities which entail cash payment, special arrangements should be made for the handling of this cash and, in some instances, safety deposit boxes or vaults are provided so that the money can be stored when it is brought to the cashier space at off hours.

2.3.10 ADMINISTRATIVE AREA

- The administration of a hotel operation depends entirely upon its size.
- A larger, medium-sized hotel will have a manager and an assistant manager and, as a rule, there will be e reception office where one or two typist receptionists will be acting as a buffer between the public and the manager.
- Aside from the manager and the assistant manager, there may be an office for a food and beverage manager and a banquet manager. A larger hotel, with sizable convention facilities, will also have an office for the convention manager and his assistants.

2.3.11 RESTAURANTFACILITIES

- Under normal situations there will be a cocktail lounge or beverage bar even in the smallest dining facility. The larger hotel will have a pleasant coffee shop for quick service and for simpler meals, whereas a restaurant, with its appropriate decor for more leisurely dining, will offer a more varied menu with probably higher cost per meal than in the coffee shop. The cocktail lounge will usually be found close to the dining room so that hotel guests can pause for a cocktail before lunch or dinner, or while waiting, before going to the dining room", to meet friends or other guests. Where convention facilities are offered within a hotel, it is wise to have a bar placed close to the convention facilities.
- Large convention and banquet facilities usually provide a fixed or portable bar arrangement in the pre-assembly or foyer areas to take care of pauses between meetings and seminars and to fill those pauses with a facility that will provide a "pause that refresh." There is no special requirement for the design of hotel restaurants, bars, cocktail lounges, and coffee shops which are in any way different from the standard requirements for any such facility.
- Wherever a rooftop restaurant is created, the architect must bear in mind that there will be increased traffic in the elevators taking diners from both in and outside the hotel to this specialized rooftop facility. And don't forget that, because of public assembly requirements, the stairs must be sized larger. Supper clubs or nightclubs will also be found in the larger hotels with this type of dining and entertainment area along with orchestra dressing rooms.

2.3.12. LOBBIES

- Every hotel, regardless of its size, must have a public lobby. The size of the lobby is largely determined by the number of guest rooms as well as by the type of hotel that is on the architect's drawing boards.
- Furnishings, color, finishing materials, lighting, and decor must create the proper ambience regardless of whether the hotel is large or small, in a city or a resort, moderately priced or expensive.

2.3.13 ELEVATORS

- Except for one- and two-story motels, every hotel and motel will use elevators to take guests from the point at which they have checked in up to the floor where the guest's room is located. Elevators should be located so that they are immediately visible, either from the entrance of the hotel or from the check-in or registration area. Another consideration in the planning of elevators is that of their location on the guest-room floors. It is advisable to place them centrally so that the distance walked by a guest in any direction is reduced to a minimum.
- The number, size, and speed of the required elevators is best determined by the elevator companies themselves.
- Service elevators are separate and apart.
- Each bank of elevators should be strategically located to best service the front of the house (guests) or the back of the house.
- The bell captain's station should be located so there is a commanding view of the hotel entrance, the registration desk, the cashier, and the elevators.
- Somewhere in the lobby there should be a rather large storage spare for luggage which may be left by guests after checking out but prior to departing.

2.3.14 GUEST FLOOR CORRIDORS

- It is wise to remember that no guest-room doors should be placed opposite the elevators. Guests coming or going late at night, coming out or getting into the elevators, may talk loudly or may be too noisy, in which case they would be disturbing guests whose doors open off this area. The foyer should be further demarked from the guest-room corridor by its decor and lighting.
- One of these appurtenances would be a small bench or some type of seat for guests who may want to wait in the foyer for the elevator or who may be waiting to meet someone else on the floor. It is also a thoughtful gesture to have a full-length mirror in this area; men as well as women guests appreciate the chance to have a look at themselves before descending to the main lobby floor.
- There should obviously be a good-sized ash receiver for cigarettes, cigars, and other trash nuisances that the guest may want to get rid of before getting into the elevator.
- Good practice indicates that a corridor should, if at all possible, not be over 100 ft in length.
- There is very little choice in the width of a corridor. Normally, 6 ft is considered an adequate width, although some hotels have made do with only 5 ft.
- Another expedient, which may be used either in a narrow corridor (under 6 ft) or a standard-width corridor, would be the device of recessing the bedroom or guest-room doors. Setting doors back

from the corridor wall 1 ft or even as much as 2 ft gives an apparent width to the corridor and, what is more important, it gives each room entrance its own sense of privacy and individuality.

- A flush panel door is the least expensive but also the least desirable type of door for a guest room. If only a flush door is used, strong color might be helpful,
- The lower portion of the wall, therefore, might well be designed as a dado made of a bruise- and shock-resistant material or merely marked off with a contrasting color or wall covering.

2.3.15 GUESTROOMS

- The length and width are determined by the amount of furniture that is to go into the room and by the degree of luxury that the hotel operator wishes to achieve.
- The most common room in the hotel field today is the twin-bedded room. Then we have the possibility of a single occupancy room, and, lastly, studio rooms or suites.
- The next consideration is the size of the beds themselves. There are single beds which are 3 ft 6 in. wide, a full-sized bed which is 4 ft 6 in., a queen-sized bed which is 5 ft wide, end a king-sized bed which is 6 ft wide. Presently, all beds are still being made in a 6-ft 6-in. length dimension.
- If at all possible, there should be a3-ft aisle and, if no furniture is placed opposite the bed (a very unlikely arrangement), then the width of the room would be a minimum of 10 ft 6 in.
- Where furniture will be placed on the wall opposite the bed, such furniture will most likely consist of a dresser or cupboard with drawers. Such a piece of furniture requires a minimum of 18 in. in width and most likely an optimum width of 24 in.
- The most common arrangement found in most hotels consists of two comfortable armchairs with a cocktail table between them. A comfortable chair will require a depth of least 30 in. and another 30 in. of leg space in front of it, which means that we need at least 5 ft from the wall before we encounter the first piece of furniture, which will probably be a bed.
- In talking of lighting, we must bear in mind that we want not only a lamp or a ceiling fixture over the sitting area but also adequate reading lights for the beds. The most often used arrangement is a twin-headed lamp sitting on the night table between the two beds.
- Another piece of fixed furniture that is desirable is a luggage stand.
- This could be a straight-backed chair or a stool placed in front of the writing-makeup table.
- Between a pair of twin beds, the ubiquitous nightstand with its small storage space below is standard.
- SUITES: Another popular arrangement in hotels is that of the so-called "studio room." Dual sleep pieces have been developed which are comfortable sofas during the day and perfectly comfortable beds at night.
- furnished as a studio room. Thus, the hotel can provide a two-room suite (obviously, connecting doors must be provided between these two accommodations).
- Every hotel should have arrangements for suites of a permanent nature as opposed to a combination of a studio room with a typical guest room. Suites will be furnished like fine sitting rooms. They are used not only by the affluent traveler because he can afford it but also by travelers who do a good deal of entertaining, especially business travelers who entertain clients and customers on their arrival in any given city.
- These suites are also often used by two couples or by a large family, in which case the sitting room of the suite may be used for sleeping at night. In this case, dual sleep pieces will be required, but they will usually be the type that is referred to as a "davenport," or the type of sofa which opens out to become a comfortable double bed (never as comfortable as a true bed). These suites should

have a good-sized dining table with a sufficient number of chairs, provision for an adequate desk (since some business may be carried on in that room), a sufficient number of comfortable lounge chairs, and an accessory table.

- It is a good practice to arrange the sitting room of a suite so that it connects with at least two bedrooms and, if at all possible, three and sometimes even four bedrooms.
- Suites will usually be found in the corner of a building, which makes it possible for the planner to join up several bedrooms.
- There are times when suites are not used, and the hotel should be able to rent each of the rooms in the suite separately.
- A foyer which connects the bedrooms and the sitting area makes this separate keying of rooms possible.
- A complete bathroom should be planned for each of the sitting rooms of a suite to make it possible to rent the rooms out singly.
- Since this room will be used for entertaining (either business or private), a bar with water connection becomes a pleasant adjunct.
- Obviously, these rooms will be placed on the lowest floors so they can be close to the public spaces for the convenience of those who are going to use them for meetings or seminars in connection with a larger convention or meeting taking place in the hotel.

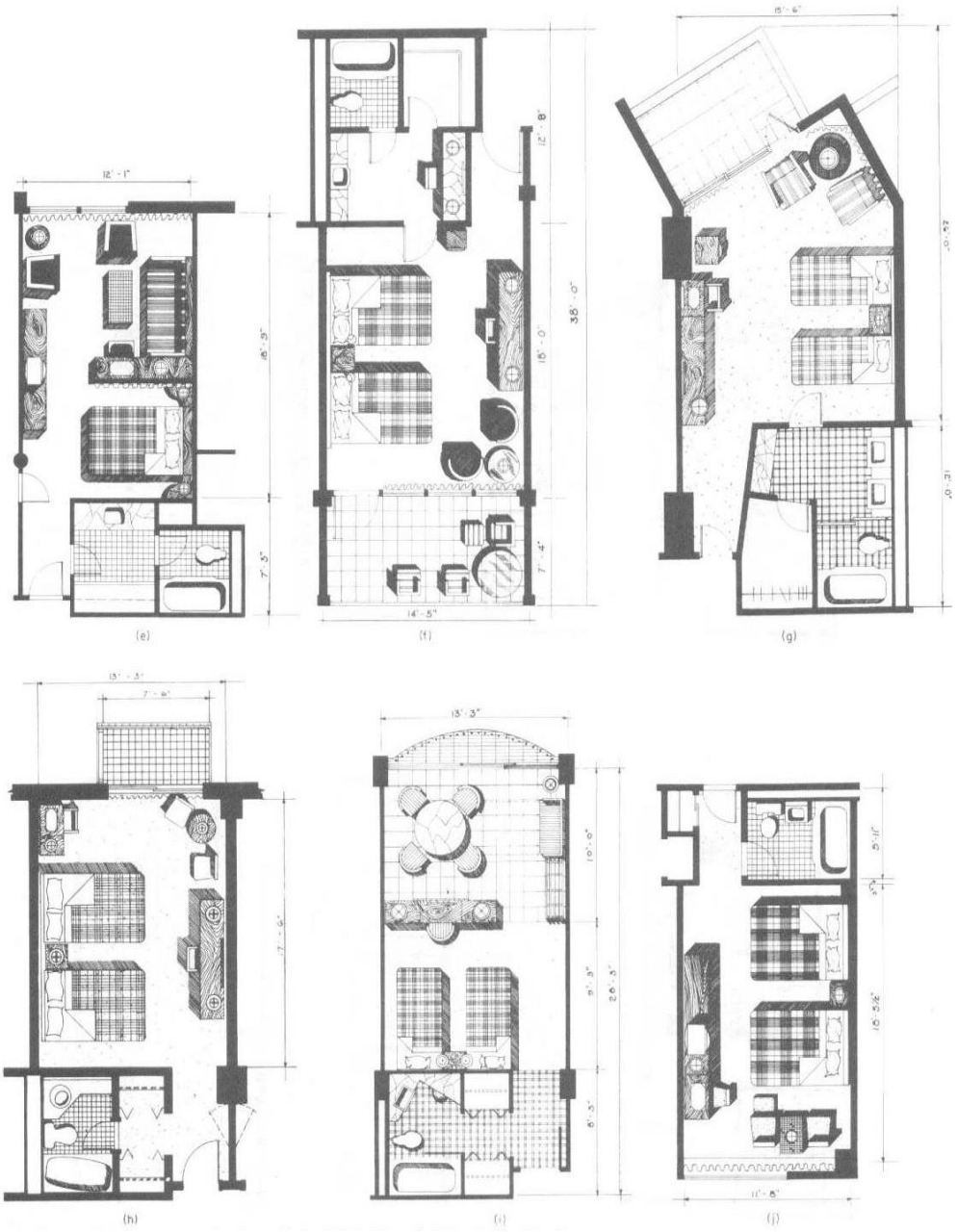


Figure 9 Guest room details (ITC Hotel Manual)

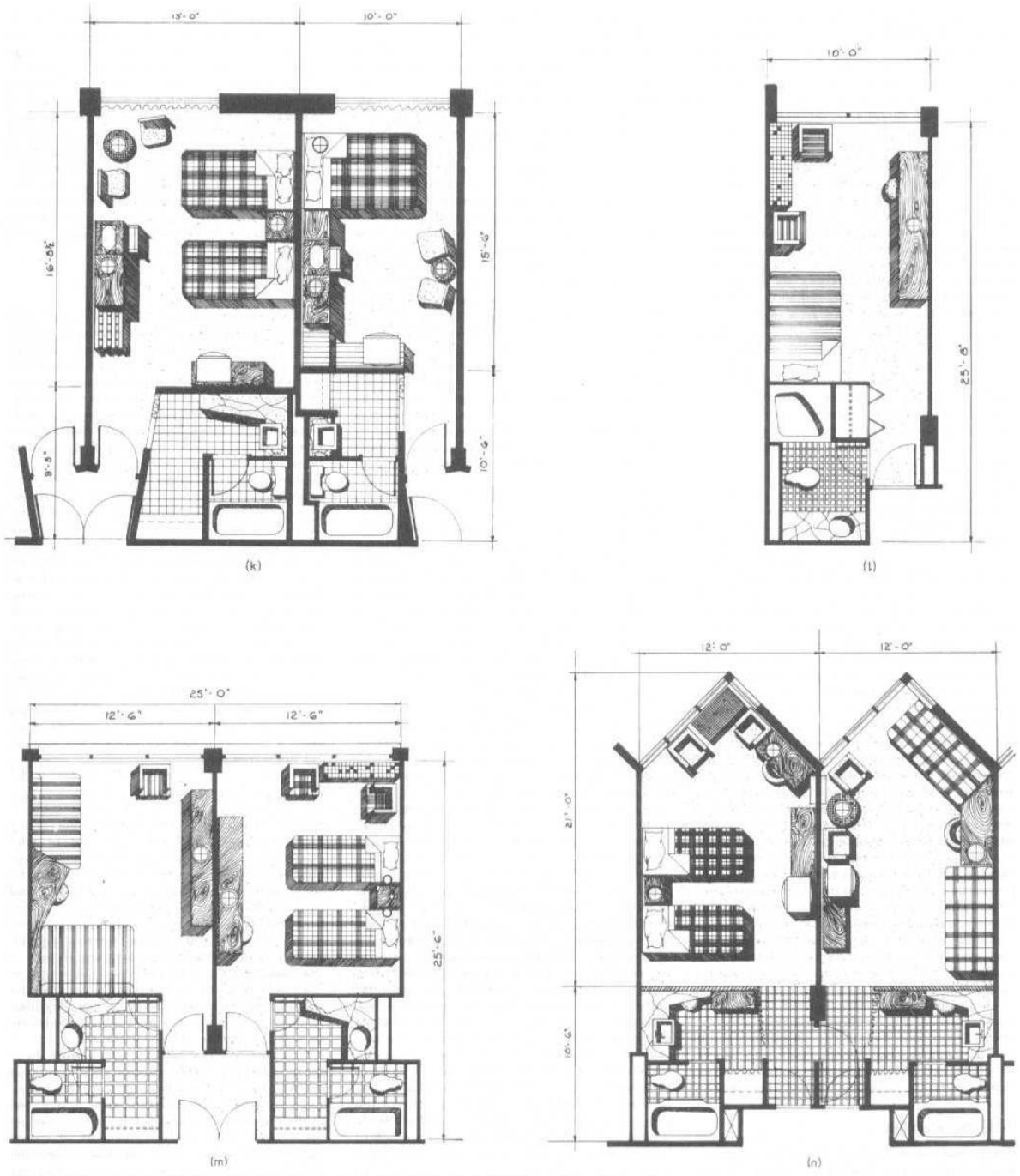


Fig. 5 (cont.) (k) Chicopee Motor Inn, Chicopee, Massachusetts. (l) and (m) Thomas Circle Motor Hotel, Washington, D.C. (n) Riverview Motor Hotel, New York.

Figure 10 Guest room details (ITC Hotel Manual)

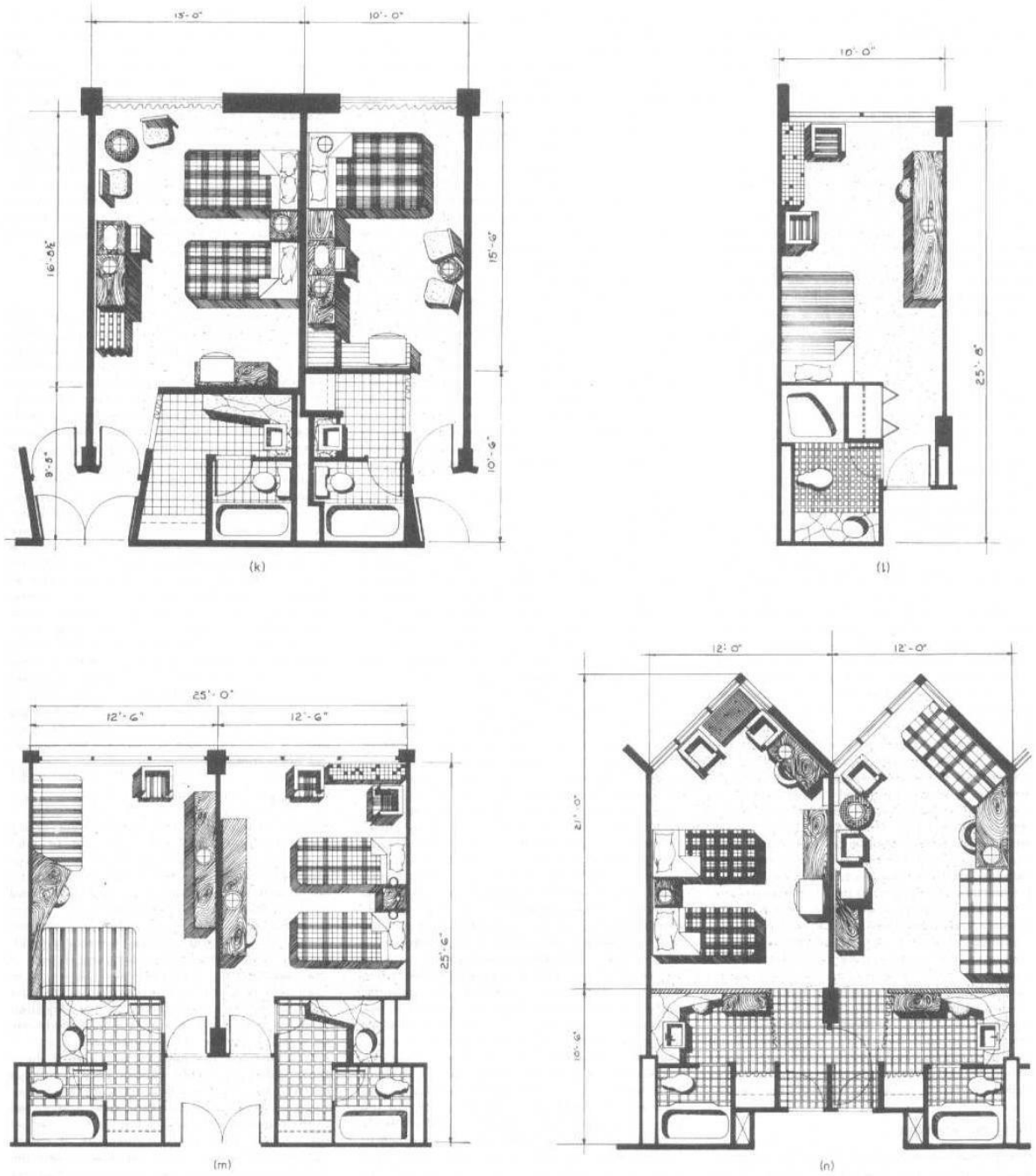


Fig. 5 (cont.) (k) Chicopee Motor Inn, Chicopee, Massachusetts. (l) and (m) Thomas Circle Motor Hotel, Washington, D.C. (n) Riverview Motor Hotel, New York.

Figure 11 Guest room details (ITC Hotel Manual)

2.3.16 GUEST BATH ROOMS

- The minimum bathroom will have a combination tub-shower, a lavatory, and a water closet.
- An innovation devised by the writer's firm was the introduction of two lavatories in the bathroom facilities. These two lavatories may be right in the bathroom itself, they may be pulled out into a dressing area, or one lavatory may be placed in the bathroom and another outside the bathroom.
- Bidet is being introduced. Obviously, this additional feature is found only in the most luxurious hotels.
- A wall-hung unit makes cleaning of hotel bathrooms easier for the maid, but again, its economics will determine whether this fairly expensive type of installation is warranted. The tub in a guest room is normally a 5-ft tub.
- The normal shower head becomes standard in all hotels, although there is a growing tendency to using the so-called "telephone shower head."
- The normal wall shower head, and by using two movable shower-head supports, one at the normal hand level and one at the higher level where a fixed shower head normally would occur, the guest has the option of allowing the hand type shower head to remain in a standard position or to remove it and use it as he pleases.
- It is preferable to have a ledge on which toiletries may be placed, where they are conveniently reached, and where, obviously, they will not be left when the guest checks out.
- If a ledge is used, the toilet tissue holder can be placed within the recess of the ledge, es can be the tumbler holders and the toothbrush holders. Obviously, an electrical convenience outlet must be placed in this area for electric shavers, electric toothbrushes, and other electrical gadgets that today's traveler takes with him. A slot receptacle for used razor blades should not be forgotten. Towel bars must be strategically placed so that the guest can reach for a towel regardless of whether he is stepping out of the tub or whether he is washing or shaving et the lavatory.
- Another nicety which might be provided is some form of clothesline. With today's wash-and-wear apparel, many guests, especially women, like to do their washing at night and hang their garments in the bathroom.
- A number of hotels are installing a wall-hung mirror which is an enlarging mirror on one side and a normal mirror on the other, a very nice touch for both men and women guests.

2.3.17 GUEST CLOSETS

- The size of a closet will be determined by the type of hotel.
- Having the open hanging arrangements obviates this possibility. The longer the guest-room stay that is anticipated, then the larger the closet.
- It should be possible to store the luggage out of sight in the closet without diminishing the available hanging space, the shoe-rack space, or shelf space for hats and other apparel and paraphernalia. Whether the closet is a flat reach-in type or a walk-in type, the door should be such that, when the closet is opened, there are no hidden recesses where clothing may be forgotten because it cannot be readily seen by the departing guest.
- A good closet will have a hang rod with sufficient space to comfortably hold men's and women's clothes, a shelf for packages, hats, etc., and a shoe ledge or rack for placing shoes.

2.3.18 GUEST FLOOR SERVICE SPACES

- Every guest-room floor will have a service area.
- Primarily, it is a place where linen is stored and where the maids' carts are kept. We must bear in mind that each maid will handle anywhere from 12 to 15 rooms and that each maid will need a cart. The number of rooms on the floor will, therefore, determine the number of maids and, in turn, the number of carts.
- A closed storage area should be provided for the storage of linens. In addition to the maids', porters', and linen supplies, sufficient space should be left for the storage of room-service carts.
- They may have to remain on the floor for some time waiting for the service elevator or elevators. Obviously, the service elevators will open out to this service area, so that all this activity takes place out of the sight and hearing of the hotel guests.

2.3.19 BANQUETING FACILITIES

- Larger hotels will have a more diversified arrangement for meetings, luncheons, dinners, and banquets. The largest hotels are usually designed with a full banqueting and convention facility.
- The normal meeting room requirements are rather simple. The rooms will vary in size to accommodate anywhere from 10 to as many as 100 people. In most instances, wherever it is feasible, the meeting rooms will be arranged in a straight line, so that the walls separating one room from the other can be made movable.
- Thus, if two meeting rooms which normally might seat 25 people are thrown open to one, we would have a meeting room to take 50 people; and if another wall is opened, we would be able to seat 75 people, and so on.
- In larger rooms, which normally qualify for conventions or large banquets, it is also possible to subdivide the space by the use of movable walls to create smaller rooms when a large room is not required. A large space which might seat 1,000 people when all folding wells have been moved back can be cut up into anywhere from four to six spaces, allowing for meeting rooms that can accommodate 150 to 250 people.
- Of course, in the really large convention halls, it will not be unusual to seat 3,000 or more people in one large convention banquet hell. Realizing that food must be brought to all these rooms, their juxtaposition to serving kitchens is highly important in arranging the plan.
- For the most part, food should be brought directly from banquet kitchens to the banquet spaces. In subdividing these spaces, the subdivision must be so planned that each space is contiguous to the kitchen and has its own doors to enable waiters to come and go between the banquet spaces and the banquet kitchen.
- Sound isolation is of the greatest importance, and this applies not only to the decibel rating of the panels themselves but also the arrangement of the joints between the sections or panels of the movable wall.
- In fairly large meeting, banquet, and convention facilities, space must be provided which is normally called "preconvention assembly space.'
- Since most of the people who are standing are those who will eventually be seated, the proportions of the preconvention foyer space will be determined by the number of people who will be eventually seated. As a rule of thumb, a person standing in fairly close quarters will take up approximately 5 sq ft. A person seated at a table will take up anywhere from 10 to 15 sq ft. A person seated for a

seminar or a meeting will require 8 or 9 sq ft. It thus becomes apparent that the ideal preconvention, pre-banquet, or assembly space should be at least one-third of the area of tire actual dining and meeting spaces.

- Thus becomes apparent that the ideal preconvention, pre-banquet, or assembly space should be at least one-third of the area of tire actual dining and meeting spaces.

2.4. TIME SAVER STANDARDS (BUILDING TYPES)-RESTAURANTS

2.4.1 SPACE REQUIREMENTS

- Adequacy of space will influence building and operating costs and efficiency. When space is too small, labor time end effort is likely to increase end the volume and quality of output decrease. When itis too large, building and maintenance costs are excessive.
- Calculate area requirements in terms of: (1) volume and type of service, (2) amount and size of equipment to be used, (3) number of workers required, (4) space for needed supplies, and (5) suitable traffic area. The dining area location and space allowance.

2.4.2 DINING ROOMS

- Space for dining areas is usually based on the number of square feet per person seated times. Space requirements:
- The patron's size and the type and quality of service should be considered.
- A banquet seating allowance might be as little as 10sqft per seat and that for a deluxe restaurant as much as 20 sqft.

Table 4 Area Specifications (TSS)

Type of Operation	Square Feet per Seat
Commercial Cafeteria	16-18 sq. ft.
College and Industrial Cafeteria	12-15 sq. ft.
School Cafeteria (Lunchroom)	9-12 sq. ft.
College Residence (Table Service)	12-15 sq. ft.
Counter Service	18-20 sq. ft.
Hotel, Club, or Restaurant (Table Service)	15-18 sq. ft.
Table Service (Minimum Eating)	11-14 sq. ft.
Banquet (Minimum)	10-11 sq. ft.

- Table 5 square feet pwe seat used for various types of food operations
- All of the areas in a dining room used for purposes other than seating are a part of square footage allowed for seating.
- Service stations may be estimated in the proportion of one small one for every 20 seats or a large central one for every 50 to 60 places. The advisability of having a central serving station will be influenced by the distance of the dining area from the serving area.
- Small substations for silver, dishes, napery, beverages ice, butter, and condiments may measure20 to 24 in. square and 36 to 38 in. high. The size of central stations varies from that for a small enclosed room to that of a screened section measuring approximately 8 to 10 ft long by 27 to 30 in.

wide by 6 to 7 ft. high. Table size will influence patron comfort and efficient utilization of spaces. Smell tables, such as24 or 30in. square, are economical for seating but are uncomfortable for large people.

- The width of booths including seats and table is commonly 5h ft. A lunch counter will have a minimum width of 16 in. and a maximum width of 24 to 30 in. The linear feet are calculated on the basis of 20 to 24 in. per seat. The maximum area best served by one waitress is generally 16 U-shaped counters make maximum use of space and reduce travel. Space in depth of 8'/r to 11 ft will be required for every linear foot of counter. This will provide 3 to 4 ft of public aisle, 2j&ft for aisle space for employees. A width of 41h ft is desirable where employees must pass.
- A minimum passage area is 18 in. between chairs and, including chair area, tables should be spaced 4 to 5 ft apart. Aisles on which bus carts or other mobile equipment is to be moved should be sized according to the width of such equipment.
- Diagonal arrangement of square tables utilizes space better then square arrangement and yields a more trouble-free traffic lane.

Number of Persons Allowance:

- The number of persons to be seated at one time is the second point of information needed for calculation of the dining room size. The total number of seats required at one time, multiplied by the space required for each seat, will give the total number of square feet needed in the dining area.
- The number of times a seat is occupied during a given period is commonly referred to as "turnover."
- The turnover per hour, times the number of seats available, gives the total number of patrons who can be served in an hour. If peak loads, or number to be served at one time, are known, the number of seats required can be estimated.
- The table sizes used in the dining room will affect occupancy. It is often desirable to provide for groups varying from two to eight, with a predominance in most dining rooms of those for two people.
- Chairs with a "tablet arm" that will fold at ray have been used for fast turnover in crowded areas.
- One cafeteria line can serve four to eight patrons per minute depending on (1) the speed of the servers, (2) the elaborateness of food selection, (3) convenience of the layout, and (4) the type of patrons.
- Banquet seating requires planning because maximum seating potential means maximum profits. Folding tables 30 in. wide are popular. These are obtained in varying lengths, but 72 and 96 in. are commonly used. The spacing for the legs should be such as to allow for comfortable seating when the tables are joined end to end and place settings are laid on 24-in.centers.

- Separate rooms, folding doors, screens, or other attractive devices can be used to reduce size of an area during slack periods. Sections left open should be those easiest to serve. Balconies, backrooms, or other less desirable space can often be used for overflow numbers that occasionally require service.

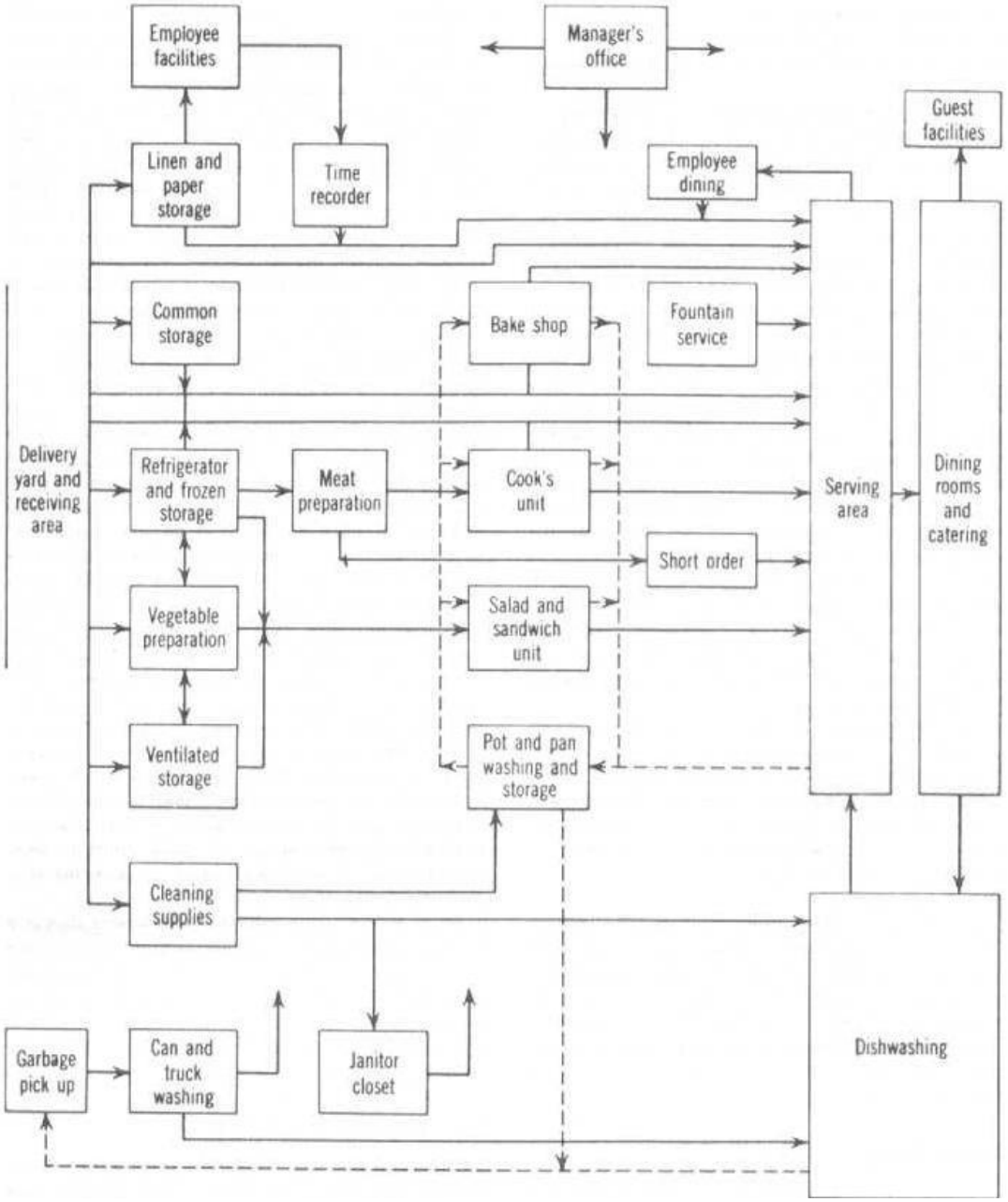


Figure 12 Flow Diagram Showing Functional Relationships (TSS)

Production areas:

- A frequently used rule for allotting a space for the kitchen is that it should be one-third to one-half the area of the dining room.
- An analysis of specific needs is required. Many factors in fluence space requirements, such as:

1. Type of preparation and service
2. Amount of the total production done in the unit
3. Volume in terms of the number of meals serve
4. Variety of foods offered in the menu
5. Elaborateness of preparation and service
6. Amount of individual service given, as in a hospital ltrey service
7. Seating and service plan, whether on one floor or many

Table 6 Vatiations in Space needs in Relation to numbers Served

Meal load	Square feet per meal	Variation in square feet
100-200	5.00	500-1,000
200-400	4.00	800-1,600
400-800	3.50	1,400-2,800
800-1,300	3.00	2,400-3,900
1,300-2,000	2.50	3,250-5,000
2,000-3,000	2.00	4,000-6,000
3,000-5,000	1.85	5,500-9,250

- The equipment provided will affect the space needs. Garbage and refuse, for example, may require a sizable area for storage awaiting pickup. Disposal units for food garbage, incinerator for burnable refuse, and a crusher for tin cans will greatly reduce the amount to be held. Frequency of garbage collection will minimize the space needs.
- The shape of the kitchen, location of ventilation and elevator shafts, support columns and partitions should be considered in relation to an efficient layout for work. The location of entrances and exits for a good flow of traffic, window placement, suitable space, and relationship of sections need consideration. Eliminate partitions whenever possible; this will reduce space needs and also permit easier supervision of production areas.
- The square footage given is to be multiplied by the maximum number of meals estimated per hour of service.
- The width of the table may be 24 to 30 in. unless dishes or food containers are to rest at the back of the table. Tables 36 in. wide are preferable when the back of the area is used for such storage. Where two workers work opposite each other, a table 42in. wide may be used. A work area of 4 to 6 in ft will be within convenient reach of the average person. Tables 8 to 10 ft. long are used if two people are working side by side. A height of 34 in., commonly used as a working height, be evaluated in terms of specific work done and equipment used.

- The minimum width for a lane between equipment where one person works alone is 36 and 42 in. where more than one is employed and where workers must pass each other in the progress of work. Where mobile equipment is used, 48 to 54 in. are recommended. At least 60 in. are needed for main traffic lanes where workers regularly pass each other with mobile equipment.
- Work centers at right angles to traffic lanes are efficient.
- A satisfactory layout may claim less than 30 percent of total space for equipment while work areas, traffic lanes, and space around equipment for easy operatioaning.

Table 7 Square Feet Of Kitchen Space Per Meal For Food Facilities Of Different Type And Size

Type of facility	Estimated maximum meals per hour				
	200 or less	200-400	400-800	800-1,300	1,300-7,500
Cafeterias	7.5-5.0	5.0-4.0	4.0-3.5	3.5-3.0	3.0-1.6
Hospitals	18.0-4.5	12.0-4.5	11.0-4.5	10.0-4.0	8.0-4.0
Hotels	18.0-4.0	7.5-3.0	6.0-3.0	4.0-3.0	4.0-3.0
Industrial lunchrooms	7.5-5.0	4.0-3.2	3.5-2.0	3.0-2.0	2.5-1.7
Lunch counters	7.5-2.0	2.0-1.5			
Railroad dining car	1.6				
Restaurants (service)	7.0-4.0	5.0-3.6	5.0-3.6	5.0-3.0	5.0-3.0
School lunchrooms	4.0-3.3	3.3-2.2	3.0-2.0	2.5-1.6	2.0-1.6

Serving areas:

- In cafeterias the counter length should be regulated by the variety and volume.
- An estimate that may be used for allotting width is 14 ft. This allows for 4 ft as patron lane space,1ft treyelide,2ft counter width, 4'/r ft for workers, and 2'/r ft for back bar.
- Some commercial cafeteria counters may be 70 to 80 ft long, but counters over 50 ft long are frequently considered inefficient. Twenty feet is usually thought of as a minimum but, under special conditions and where a limited menuis served,6 to8 ft may be sufficient.
- Some planners use, as a rough guide, one counter or line for every 250 to 300 patrons served, but arrival rate, speed of service, and turnover are more reliable factors to consider in establishing the number of lines required.

Receiving and storage areas:

- Although the average operation may find a dock 8 ft deep and 12 ft long sufficient for receiving items, this would not be sufficient for a large one. The space requirement in square feet for food storage for 30 days has been calculated by some as approximately one half the total served or, if 1,000 are served,500 sq ft may be used as atentative figure for total food storage needs.
- COMMON STORAGE- The volume of canned food needed to serve 100 persona three meals daily for one month is estimated at approximately 45 cases of 6/10's or equivalent. The maximum stack height will be 8 or 9 cases or approximately72 in.
- Store room aisles may be as narrow as 36 in., but 42 or 48 approximal. are preferred. Wider aisles maybe required if trucks are used.
- Allow 1'/ to 2 in. as free space for ease of positioning. Add thickness of shelving to inter space when stating measurements between centers.

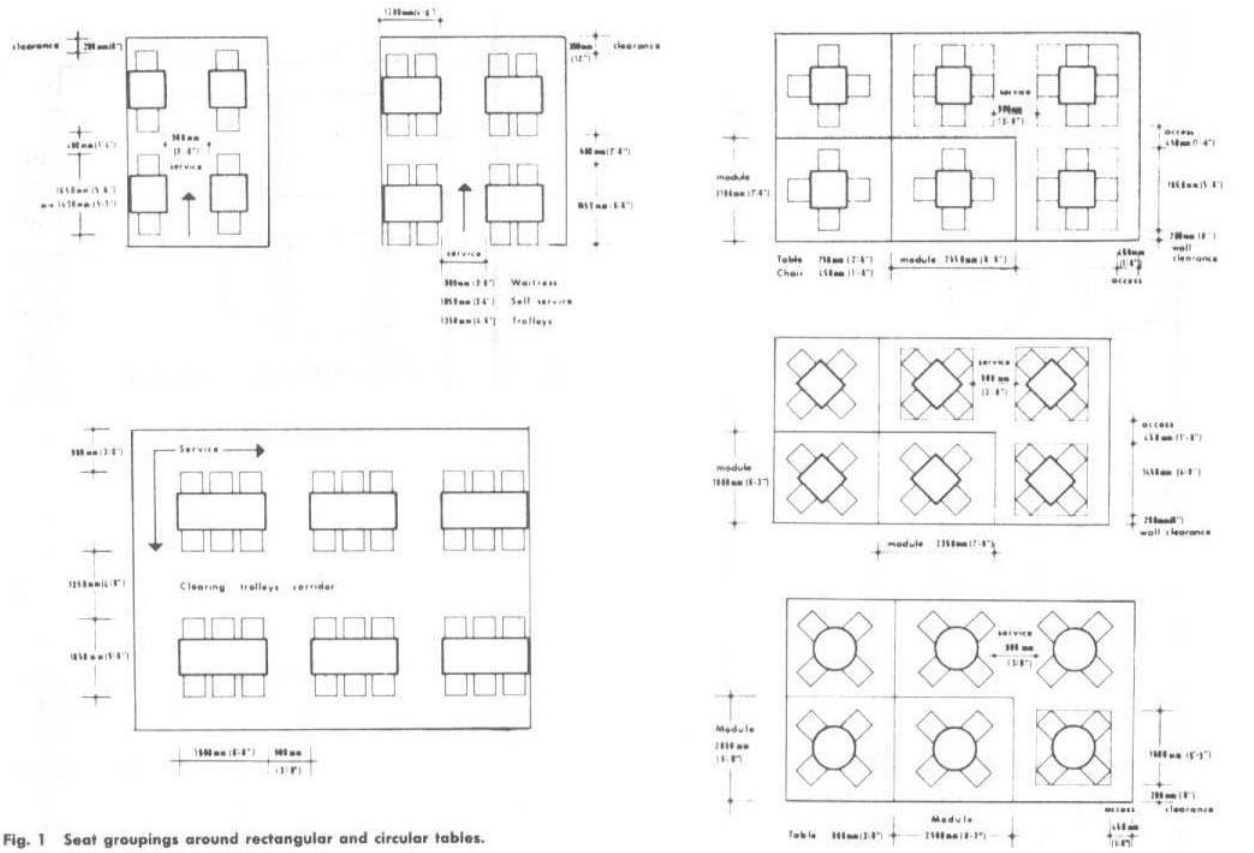


Fig. 1 Seat groupings around rectangular and circular tables.

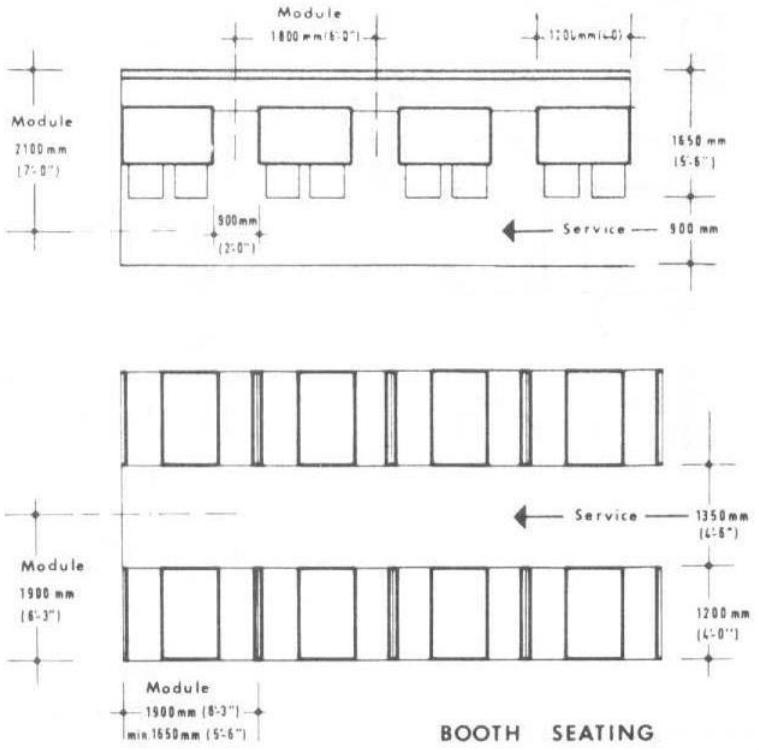
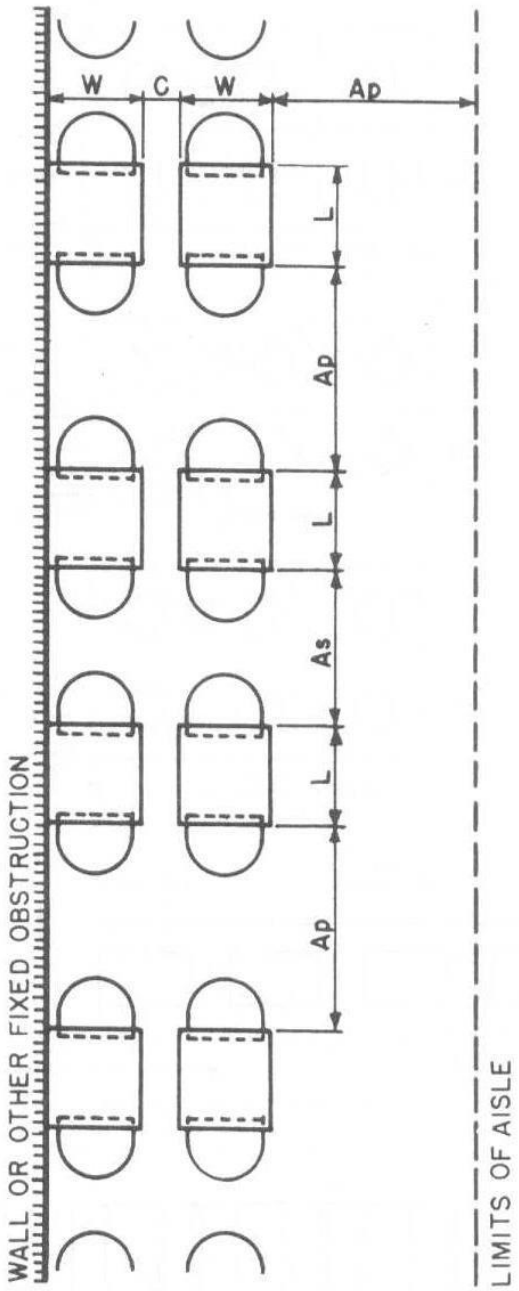
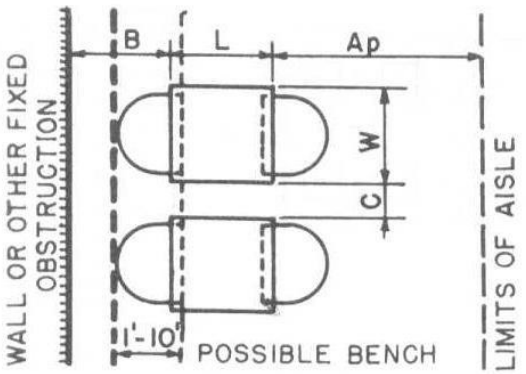


Fig. 2 Banquette seating arrangements and limiting dimensions including space for access and service.

Fred Lawson, *Restaurant Planning and Design*, The Architectural Press, Ltd., London, 1973.

Figure 13 Seating Arrangements (TSS)





		Abs. Min.	Des. Min.	Comfortable
Ap	Public circ'n	3–0 to 4–6	3–6 to 5–0	3–9 to 5–0
As	Service aisle	3–6 to 4–6	4–0 to 5–0	4–0 to 5–6
B	To wall	1–8 to 2–0	2–0 to 2–6	2–0 to 3–0
C	Between units	0 to 8	6 to 1–0	1–0
	Length	1–8 to 2–0	2–3 to 2–4	2–4 to 2–6
	Width	1–8 to 2–0	2–2 to 2–3	2–4 to 2–6

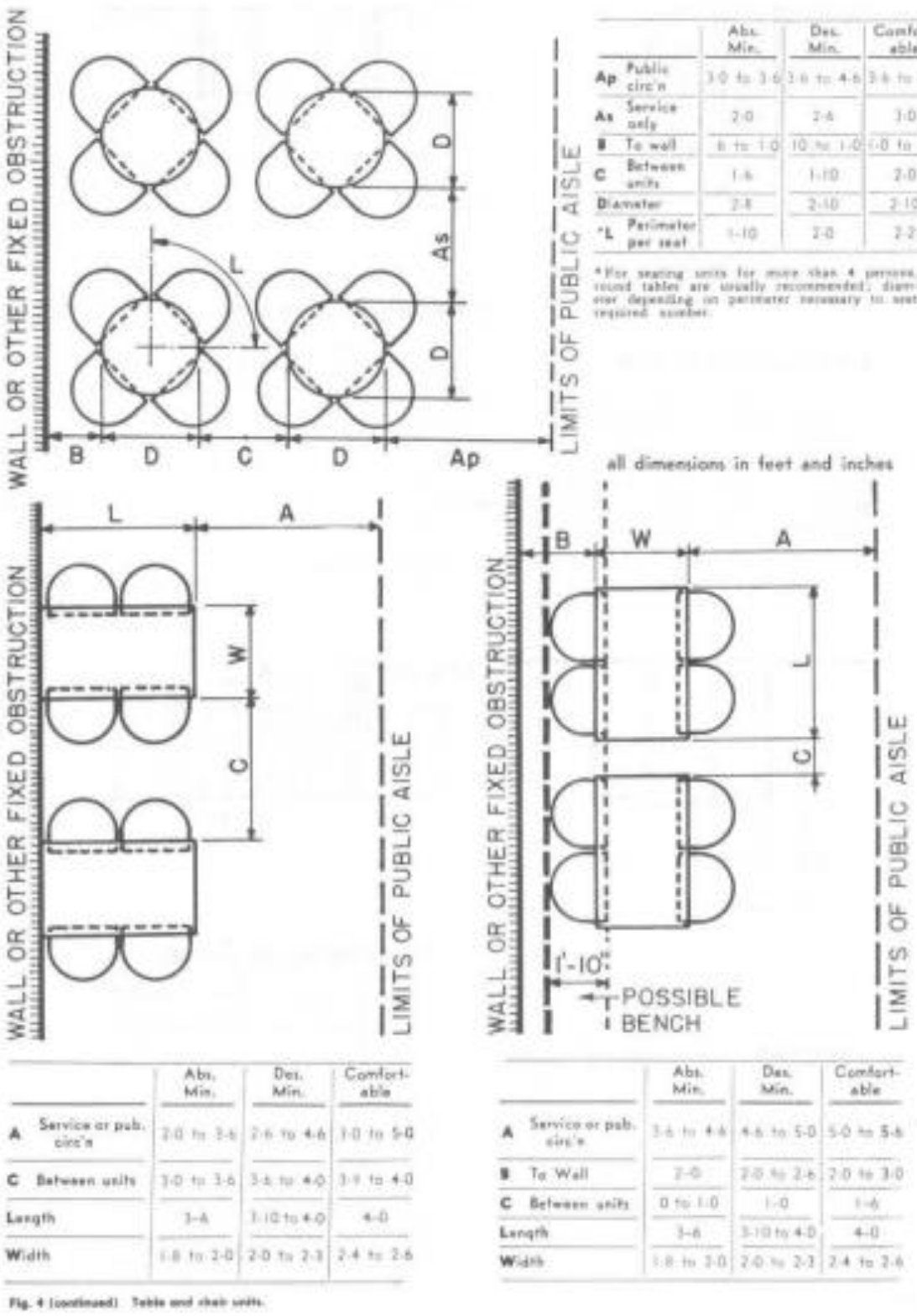
all dimensions in feet and inches

		Abs. Min.	Des. Min.	Comfortable
Ap	Public circ'n	*1–10 to 4–6	2–3 to 5–0	3–0 to 5–0
As	Service aisle	3–0 to 3–6	3–6 to 4–0	3–9 to 4–0
C	Between units	0 to 3	4 to 6	6
	Length	1–8 to 2–0	2–3 to 2–4	2–4 to 2–6
	Width	1–8 to 2–0	2–2 to 2–3	2–4 to 2–6

*Lower range only if chairs, etc., do not project into aisle

Fig. 4 Table and chair units.

Figure 14 Table & Chair Units (TSS)



		Abs. Min.	Des. Min.	Comfortable
Ap	Public circ'n	3-0 to 3-6	3-6 to 4-6	3-6 to 4-6
As	Service only	2-0	2-6	3-0
B	To wall	0 to 1-0	10 to 1-0	1-0 to 1-3
C	Between units	1-6	1-10	2-0
	Diameter	2-8	2-10	2-10
*L	Perimeter per seat	1-10	2-0	2-2

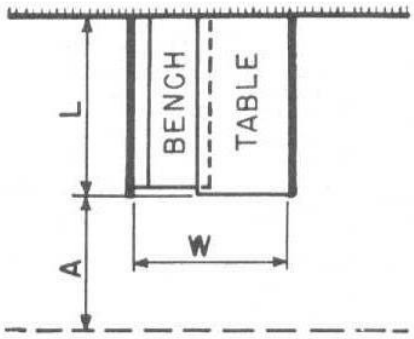
*For seating units for more than 4 persons, round tables are usually recommended; diameter depending on perimeter necessary to seat required number.

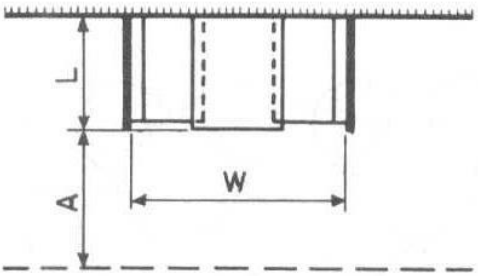
		Abs. Min.	Des. Min.	Comfortable
A	Service or pub. circ'n	2-0 to 3-6	2-6 to 4-6	3-0 to 5-0
C	Between units	3-0 to 3-6	3-6 to 4-0	3-9 to 4-0
	Length	3-6	3-10 to 4-0	4-0
	Width	1-8 to 2-0	2-0 to 2-3	2-4 to 2-6

		Abs. Min.	Des. Min.	Comfortable
A	Service or pub. circ'n	3-6 to 4-6	4-6 to 5-0	5-0 to 5-6
B	To Wall	2-0	2-0 to 2-6	2-0 to 3-0
C	Between units	0 to 1-0	1-0	1-6
	Length	3-6	3-10 to 4-0	4-0
	Width	1-8 to 2-0	2-0 to 2-3	2-4 to 2-6

Fig. 4 (continued) Table and chair units.

Figure 17 Table & Units (TSS)





2 PERSONS SIDE BY SIDE

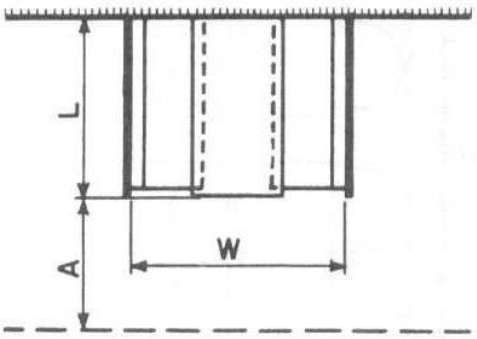
	Abs. Min.	Des. Min.	Comfortable
A Service and pub. circ'n	2–6	3–0	3–6
Length	3–6	3–9	4–0
Width	3–0	3–3	3–6

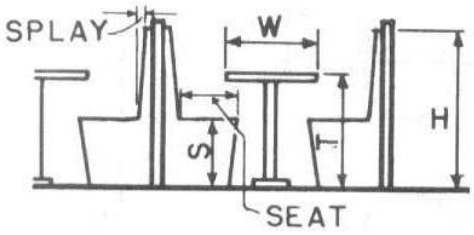
Note: This type not ordinarily recommended.

2 PERSONS FACE TO FACE

	Abs. Min.	Des. Min.	Comfortable
A Service and pub. circ'n	2–6 to 3–0	3–0 to 4–0	3–6 to 5–0
Length	2–0	2–2 to 2–6	2–6
Width	4–10 to 5–6	5–2 to 5–6	5–8 to 5–10

dimensions in feet and inches





4 PERSONS

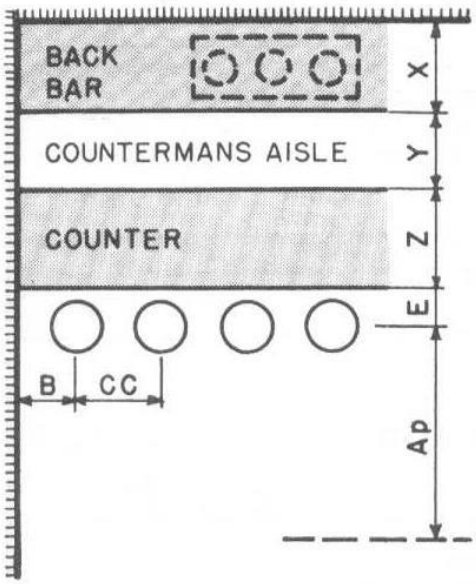
	Abs. Min.	Des. Min.	Comfortable
A Service and pub. circ'n	2–6 to 3–0	3–0 to 4–0	3–6 to 5–0
Length	3–6	3–9 to 4–0	4–0 to 4–2
Width	4–10 to 5–6	5–2 to 5–6	5–8 to 5–10

BOOTH FURNITURE HEIGHTS

	Abs. Min.	Des. Min.	Comfortable
H	3–0 to 3–6	3–6	4–0
S	1–5 to 1–6	1–5 to 1–6	1–6
T	2–5	2–5 to 2–6	2–6
W	1–8 to 2–0	2–0 to 2–2	2–4 to 2–6
Seat	1–4 to 1–5	1–5 to 1–6	1–6 to 1–8
Splay	0 to 0–3	0–2 to 0–3	0–3½ to 0–4

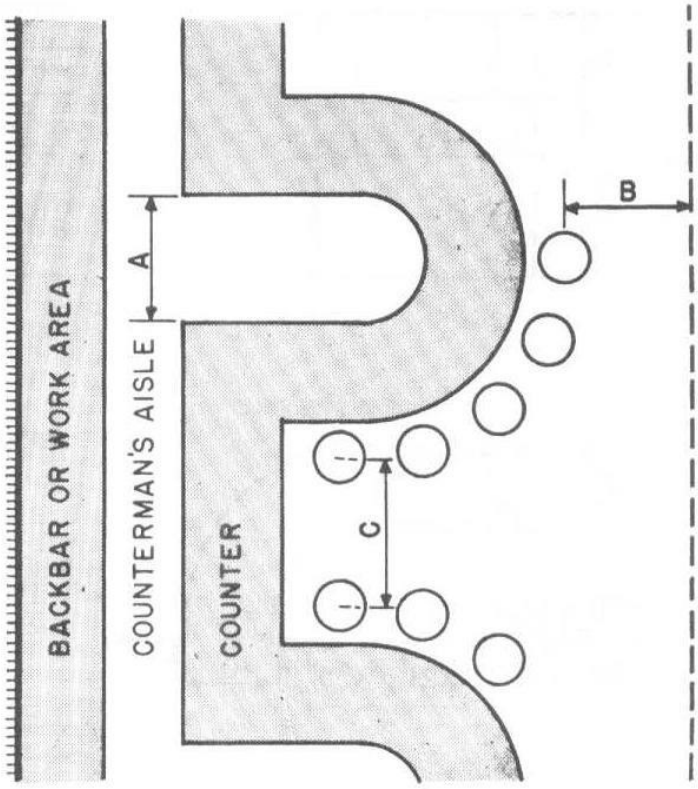
Fig. 5 Booths.

Figure 18 Booths (TSS)



STANDARD (straight) TYPE

		Abs. Min.	Desirable Min.
X	No cooking equipment	1- 6	2-0
X	With cooking equipt.	2- 0	2-6
Y	1 person	2- 0	2-3
Y	2 or more persons	2- 6	2-9
Z		1-10	2-0
E		9	1-2
Ap		3- 6	4-6
B		1- 0	1-2
CC		1-10	2-0

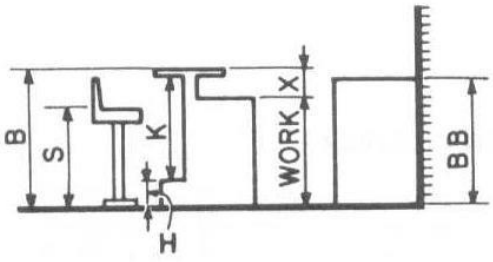


Variations in Shape

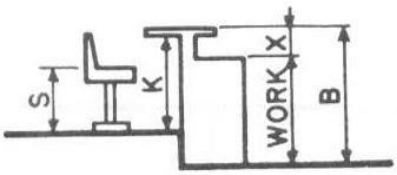
	Usual Minimum
A	2-6 to 3-6
B	2-6 to 4-6
C	2-9 to 5-6

dimensions in feet and inches

HEIGHTS



LEVEL FLOOR



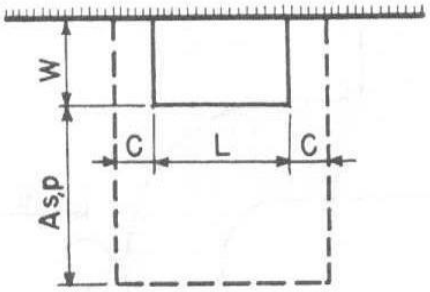
DROPPED FLOOR

	Range of Dimensions		Range of Dimensions
B	2-6 to 3- 6	X	1-2 to 1- 3
BB	3-0 to 3- 6	Work	2-4 to 2- 7
H	7 to 10	S	1-6 to 2- 6
K	2-4 to 2- 8		

	Range of Dimensions
B	3-0 to 3- 6
K	2-4 to 2-10
S	1-6 to 2- 1
X	1-2 to 1- 3
Work	2-4 to 2- 8

Fig. 6 Food bars.

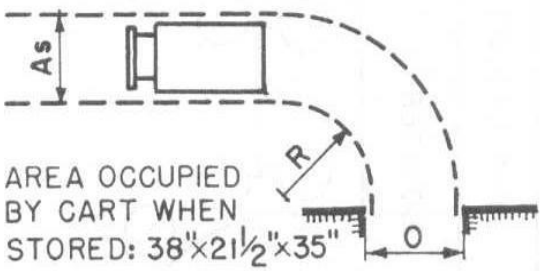
Figure 20 Food Bars (TSS)



SERVING TABLE (& sideboard)

		Abs. Min.	Des. Min.	Comfortable
As	Service only	2-6	3-0	3-6
Ap	Public circ'n	2-0	2-6	3-0
C	Clearance to adjacent units	2-0	2-3	2-6
Length / Width	30" x 20" x 42" is average.			

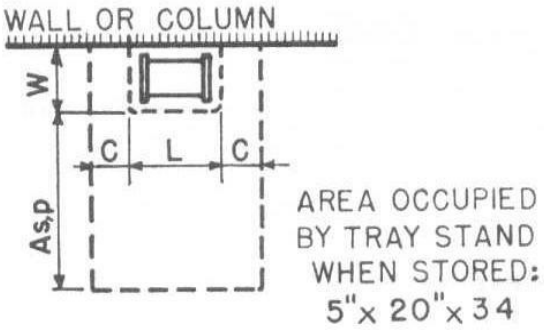
Display tables (hors d'oeuvres, etc.) usually 5' 0" x 2' 0"; (wines), 3' 0" round



SERVING CART

		Abs. Min.	Des. Min.
As	Service only	2-0	2-6
R	Turn radius	3-0	3-6
O	Door, opening width	2-0	2-6

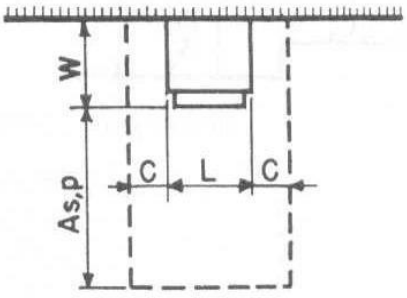
Approx. area when stored: 38" x 21½" x 35"



TRAY STAND

		Abs. Min.	Des. Min.	Comfortable
As	Service only	2-6	3-0	3-6
Ap	Public circ'n	2-0	2-6	3-0
C	Clearance to adjacent units	2-0	2-3	2-6
Length (tray) / Width (tray)	Depends on type of restaurant.			

Approx. area of stand, stored: 5" x 20" x 34"



WATER COOLER

		Abs. Min.	Des. Min.	Comfortable
As	Service only	2-6	3-0	3-6
Ap	Public circ'n	2-0	2-6	3-0
C	Clearance to adjacent units	Can arrange on top or front		
Length / Width	Depends on capacity and if glass storage included.			

Fig. 7 Serving units.

Figure 21 Serving Units (TSS)

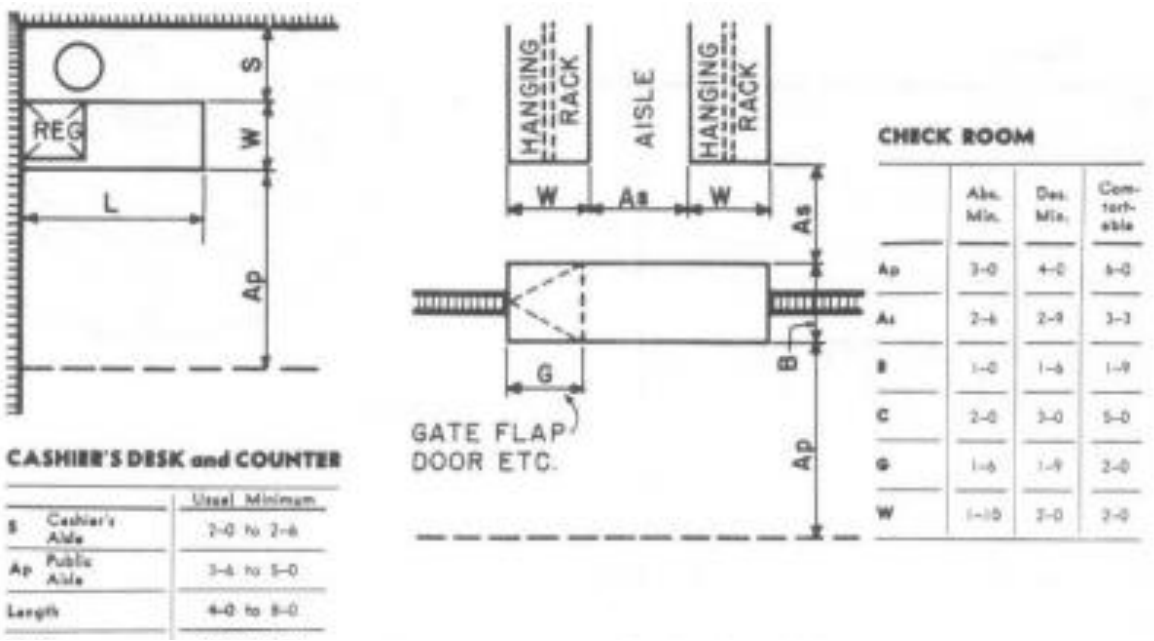


Figure 22 Nondining Spaces (TSS)

2.4.3 REFRIGERATED AND LOW TEMPERATURE STORAGE

- Allocation in preliminary planning may be as follows: 20 to 35 percent for meat (portion ready meats require '/ to '/, less space than carcass or wholesale cuts); 30 to 35 percent for fruits and vegetables; 20 to 25 percent for dairy products, including those in serving areas; 10 to 25 percent for frozen foods; and 5 to 10 percent for carry-over foods, salads, sandwich material, and bakery products. A requirement of 15 to 20 cu ft of refrigeration per 100 complete meals has also been used by some planners.
- Approximately 0.25 to 0.50 cu ft of refrigerated walk-in space was provided per meal served, and frozen walk-in space.
- A walk-in becomes feasible for an operation serving 300 to 400 meals per day, and refrigerated pass-throughs can be added when from 400 to500 meals are served per day
- Aisles of 30 in. are usually too narrow; 42 in. are desirable. If mobile equipment is moved in and out, aisles may have to be wider. Walk-ins that are 8 to 9 ft wide and about 10 ft long are minimum size. This allows for two storage are as 30 in wide with a 3 to4 ft aisle.
- Doors should be a minimum of 42 in. wide to admit large crates and containers or be sized to suit mobile equipment.

2.4.4 SANITATION AREAS

- Dishwashing areas: The dimensions may be only 30 to 36 in. for a single tank machine, 60 to 72in.for sinks, or7 toover30 ft for a conveyor-type machine.
- Pot and pan section: When allowing space for the pot and pan section, 40 sqft is generally regarded as a minimum for the smallest unit. The free work aisle between the sinks and other

equipment should be 4ftwide.The space allowance above the minimum will vary widely depending upon the type equipment used and the volume of pots and pans handled.

2.4.5 EMPLOYEE FACILITIES

- Facilities for employees may include locker and lounge area, toilets, showers, time-recording equipment, hand basins near work areas, and dining rooms. An employee entrance should be so located that the employees may go directly to the dressing rooms without passing through the dining room or production area.
- Locker and lounge area: Whether individual lockers or common cupboard, sufficient space should be allowed for personal clothing to hang without crowding or wrinkling.
- The depth from front to back should be a minimum of 20in.
- Suitable size for an employee lounge depends largely on scheduling of workers and the policies of individual establishments.
- A cotor day bed, 36in. by 6ft, should be provided in the women's room.
- Toilets and showers: They should be separated from food areas by a hallway or double entrance. Supply one wash bowl for every 8 to 10 workers, one toilet stool for every 12 to 15 women, and one urinal and one toilet stool for every15men.Toilet compartments measure approximately3by 41/ ,to 5 ft.
- Time recording management: Provide space for a recorder near and within view of the office. Wall hung card racks of sufficient capacity are recommended for the number of workers, both full and part time, who are likely to be employed during an accounting period. Estimated space for a clock recorder is approximately 18in.wideby12y.in.deepand18in.high, and a rack of 50 cards approximately1 1/2, by 2 1/2 by 34 ½ in.

2.4.6 GUEST FACILITIES

- The size of the area should be based on probable need for waiting, type of service, and number of persons likely to congregate at one time. If there is a lounge or hallway adjacent to the dining room, this may provide some waiting space.

2.4.7 CASHIER & COAT CHECKING

- Preferred location for the cashier's desk or counter, is on the right-hand side of the door when leaving, in order to avoid cross-traffic and resulting congestion.

Coat-checking

- Use of coat trees in dining areas is formed "necessary but never desirable. "These occupy approximately 20 by 20 in., are 72 in. high, and can accommodate 8 garments per costumer. Overshoe racks are considered undesirable; umbrella racks, desirable in check room.

2.5 TIME SAVER STANDARDS (BUILDING TYPES)-KITCHENS

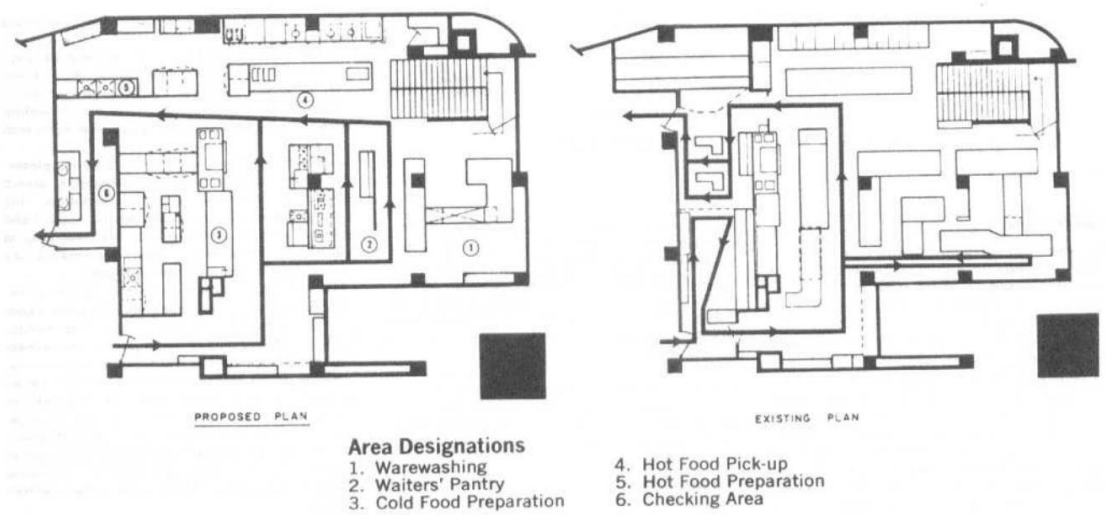


Figure 25 Traffic movement through aisle side

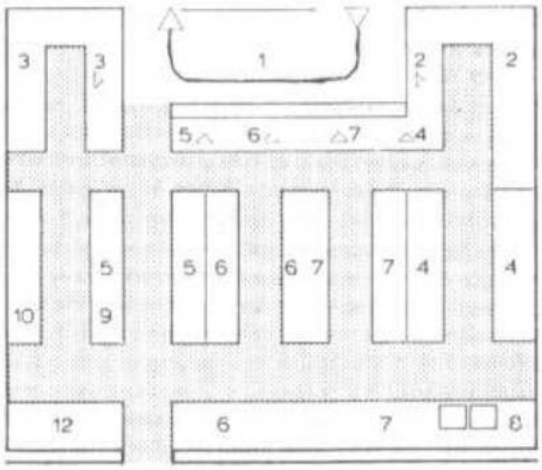


Fig. 1 Hotel or restaurant kitchen or French restaurant of high standard. Capacity for main meals: Hotel—100–200 persons / menu, 100 persons / à la carte. Restaurant—200–300 persons / mealtime from 11:30 to 1:30. Waiters' passageway: tangential. Kitchen: Linear arrangement with large installations in the rear. See Legend for explanation of numbers.

Figure 26 Kitchen for 100-200 Persons

Fig. 2 Hotel or restaurant kitchen. Capacity: With this layout, a 200-seat restaurant will be able to handle three full sittings. This layout can also take care of a hotel with 100 guests and can also accommodate a restaurant open to the general public, an outdoor restaurant, and a private dining area for parties and conferences (altogether, 400 guests). Waiters' passageway: in the center. Kitchen: Linear arrangement with large installations in the rear. See Legend for explanation of numbers.

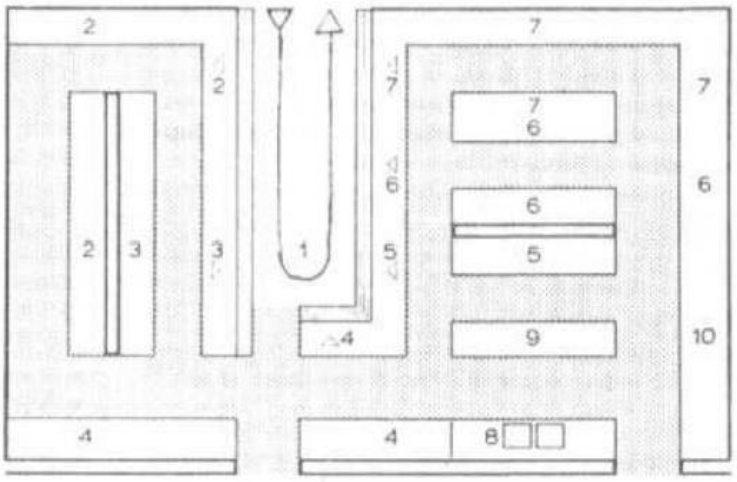


Fig. 3 Large restaurant kitchen for restaurants with many private party and conference facilities or with commissary and catering capacity for other businesses. Suitable also for large hotel with large restaurant for the general public. Capacity: 800–1,000 persons (e.g., 200 seats and fourfold reoccupancy). Waiters' passageway: tangential, with food buffet situated in front. The waiter has access to beverages and other items from the waiters' passageway in the kitchen and from the dining room side as well. The buffet looks over the dining rooms. Kitchen: Linear arrangement with fitted berths for large apparatus. See Legend for explanation of numbers.

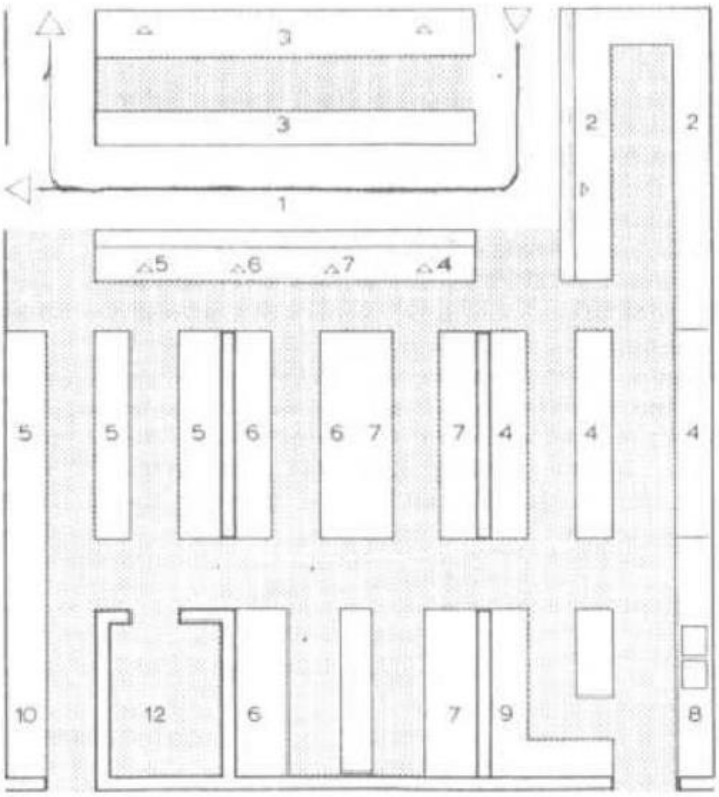


Figure 27 Kitchen for 400 Persons (Up), and 800 persons (Down)

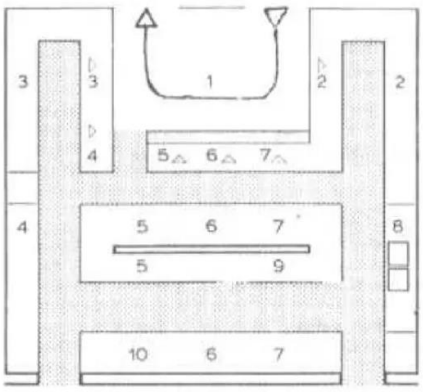


Figure 28 Kitchen for Excursion Restaurants

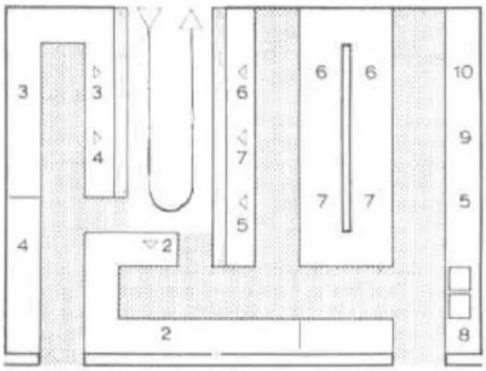


Figure 29 Kitchen for 600 persons, fourfold occupancy of 150 personsz

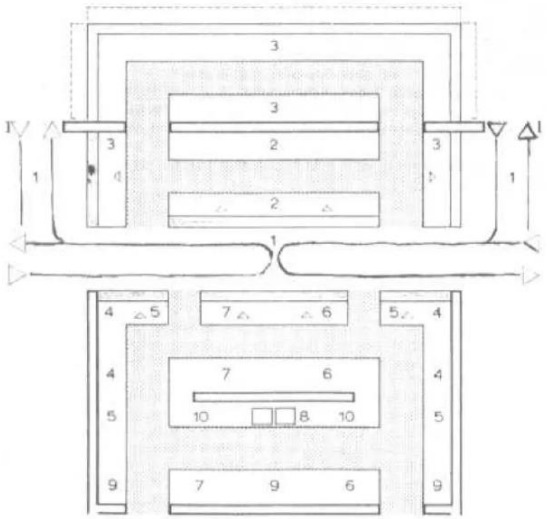


Figure 31 Kitchen for 1000 Persons

Legend for Restaurant and Hotel Kitchen Layouts (Figs. 1 to 6)

(Layouts: Scale 1:300)

1. Waiters' passageway—meal and beverage counter—dish return
2. Dishwashing area (dishes, glasses, silver)
3. Beverages—preparation and serving
4. Pastry (cookies, cakes, ice cream, dessert)—preparation and serving
5. Cold kitchen (cold appetizers, salad, fish)—preparation and serving
6. Warm kitchen—saucier/rôtisseur area (sauces, roasts, grill, fish)—preparation including large apparatus area and serving
7. Warm kitchen—entremétier area (soups, vegetables, entrées)—preparation including large apparatus area and serving
8. Pot and pan washing—casserolier area
9. Vegetable preparation
10. Meat preparation
11. Vegetable cold storage
12. Meat cold storage
13. Economat (dry storage)
14. Beverage cold storage
15. Linen, dish, cleaning supplies storage
16. Staple goods storage
17. Goods acceptance and control
18. Empty goods and garbage collecting rooms

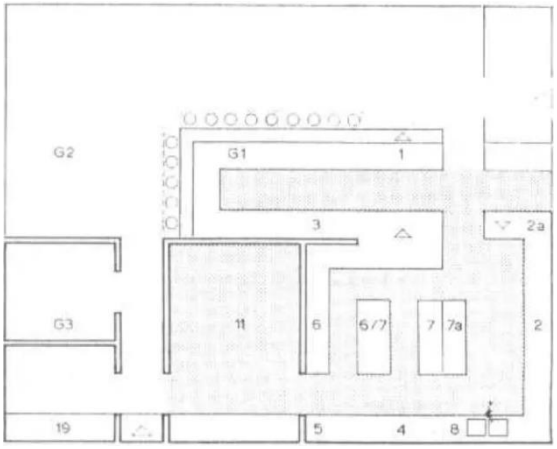


Figure 30 Snack Bar

Legend:

1. Meal and beverage serving counter
2. Dishwasher
2a. Dish return
3. Beverage buffet with mixer, toaster, ice-cream container, etc.
4. Oven and small pastry station
5. Garde-manger
6. Saucier / rôtisseur
6/7. Range
7. Entremétier
7a. Cooking vat and high-performance steam cooker
6/7b. Warming cupboard and warm serving counter with warming lamps
8. Pot and pan washing
11. Storage, empty goods, office; instead of cold storage rooms—cold storage and freezer cupboards
19. Employees' toilets
G1. Bar counter—also for meals
G2. Dining room with table seating
G3. Guests' toilets / make-up room / telephone booths

2.6. TIME SAVER STANDARDS (INTERIOR DESIGN)

2.6.1 ROOM ARRANGEMENTS

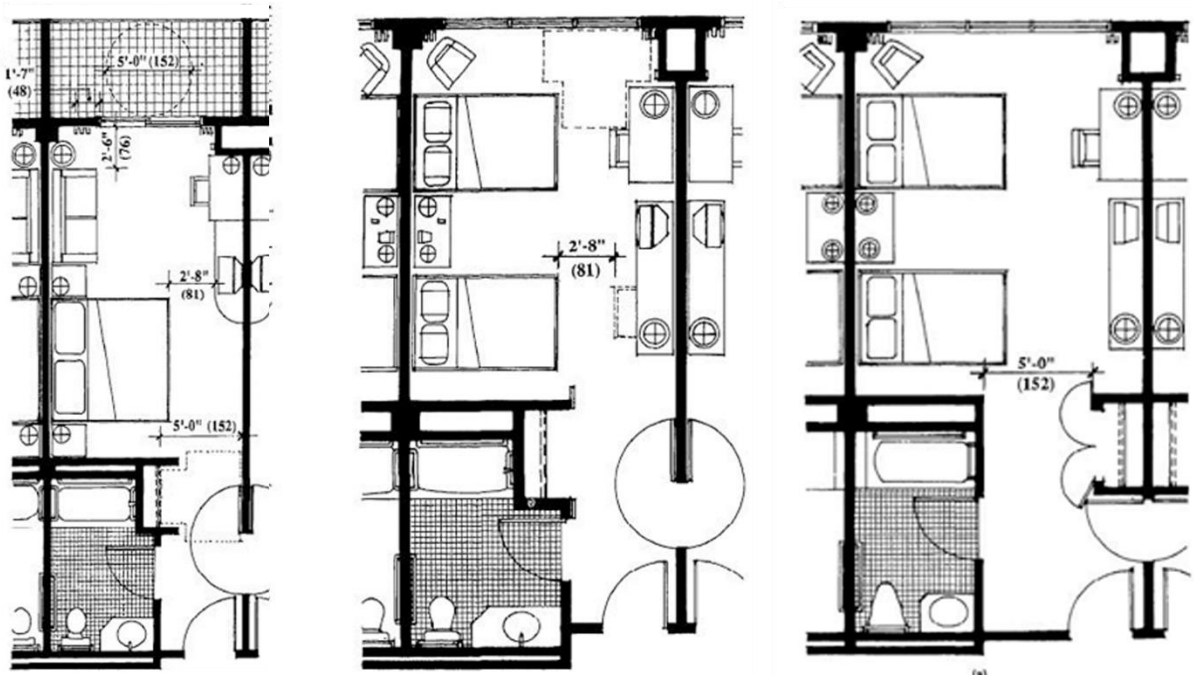


Figure 37 Room arrangements with 12, 13 & 14 ft bay spacing

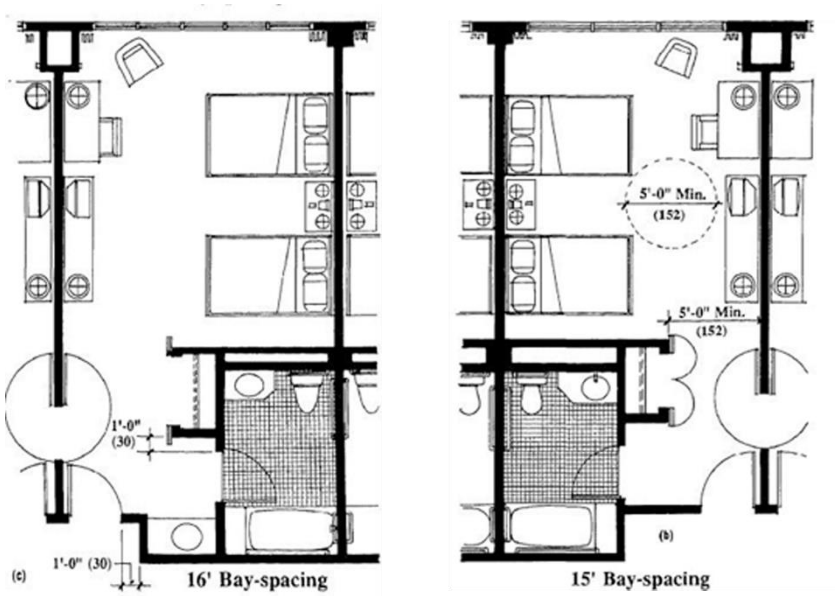
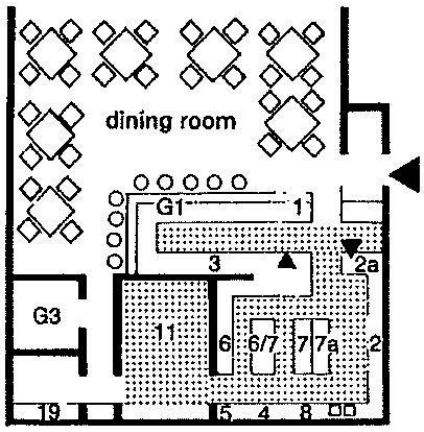


Figure 38 Room Arrangements with 16 & 15 ft Bay Spacing

2.6.2 SNACK BAR

- Corner pub, cafe, restaurant: capacity 55-60 seats (2-4 place turnover at lunch time, 2 in evenings). Between lunch and evening meals: serving coffee, cakes and snacks. Kitchen: supplied predominantly with pre-prepared items. Storeroom need not be particularly large if deliveries are daily.

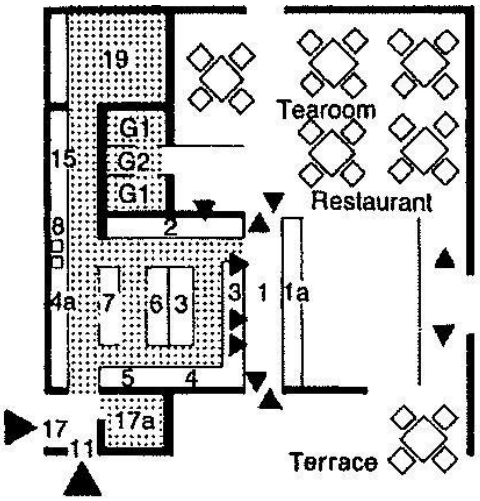


1	meals and drinks servery
2	dishwasher
2a	crockery returns
3	drinks bar with mixer, toaster, food containers etc.
4	oven for small pastry items
5	food storage
6	rotisserie
6/7	cooker rings
7a	water boiler and steam machine
8	pot and pan washer
11	stores/office; catering size refrigerators and freezers instead of cold store
19	staff toilets
G1	bar counter
G3	customer toilets

Figure 42 Snack Bar Arrangements

2.6.3 CAFE, RESTAURANT & KITCHEN

- With tea room. Urban business in heavy traffic location.



1	waiters' walkway
1a	service counter and cash tills
2	dishwasher
3	drinks bar with mixer, toaster, ice cream freezer etc.
4	pastry preparation
4a	pastry oven
5	sandwich preparation
6	reheating equipment (e.g. soup)
7	cooker rings
8	pot and pan washer
11	empties
15	linen store
17	deliveries and (a) store
19	staff toilets and cloakroom
G1	toilets
G2	telephone cubicle

Figure 41 Cafe-restaurant Arrangement

Cafe:

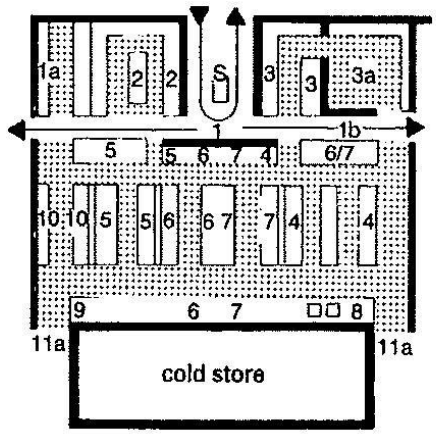
- Alcohol-free drinks, except bottled premium beer, liqueurs etc., patisserie and light food- cold and hot.

Tearoom:

- Alcohol-free drinks, patisserie, sandwiches. Capacity approx.150 seats, continuous operation 6.30-24.00. Kitchen: predominantly pre-prepared items, little storage.

Large hotel restaurant kitchen-

- Also, for large catering establishments with side rooms, external deliveries or production for outside companies. Capacity 800-1000 people. Waiters' walkway: in the center with special service in the garden or also bowling alley and direct access to the side rooms. Kitchen: cell system fronted by the backs of the large appliances.



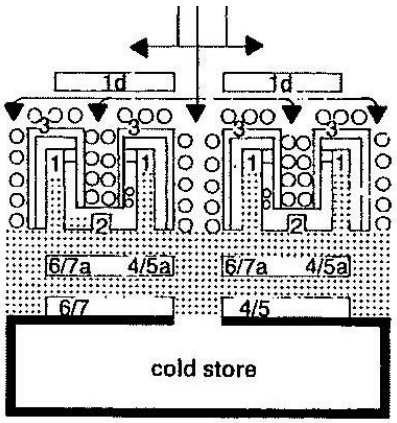
1 waiters' walkway
1a garden service counter
2 dish-washing area
3 drinks counter
3a drinks cellar
4 pastry counter
5 cold dishes
6 hot dishes and sauces
6/7 table with hot store
8 pot and pan washer
9 vegetable preparation
10 meat preparation
11a deliveries, and access to stores, offices, staff cloakrooms and toilets
S service accessories and tills

Figure 43 Large Hotel Restaurant Kitchen

Restaurant with buffet and vending machines:

- For fast midday meals in canteens, department stores and motorway services. Capacity 500 people/h. Kitchen: only warming of preprepared food stuffs, except for salad sand soups.

Self-service restaurant:



1 serving aisles in U-shaped counters
1d vending machines
2 link between two counters with covered dishwashers, operated from both sides, each with two rinsing basins
4/5 cold meal preparation
4/5a cold servery (salads, ices, desserts)
6/7 griddle, soup heater, water boiler etc.
6/7a hot servery (bain-marie, hotplates)

Figure 44 Restaurant with buffet and vending machine

- Suitable for department stores or attached to offices. Kitchen: no in house production. Outside delivery and preparation using deep frozen process.

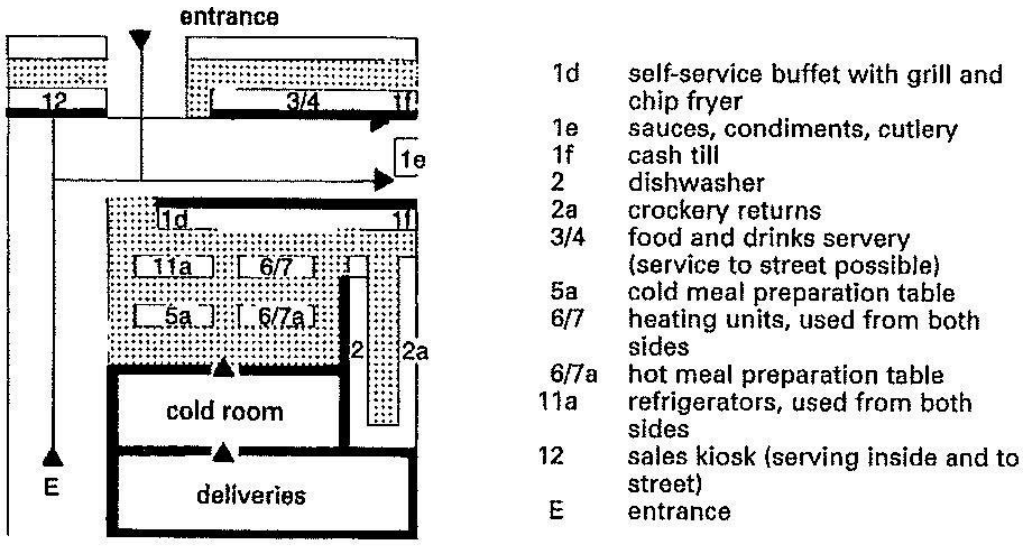


Figure 45 Self Service restaurant

Function and organization of the restaurant kitchen-

- The capacity of the kitchen is primarily dependent on the number of customer seats, customer expectations (type, extent and quality of the meals offered), the proportion of products freshly prepared from raw (in contrast to ready-prepared food) and the rate of customer turnover all day or at meal times (consumer frequency).
- In fast food restaurants the rule of thumb for seat changes is about1-3times per hour, in conventional restaurants about 2. In specialty and evening-based restaurants, the guests stay on average for1.3-2 hours.

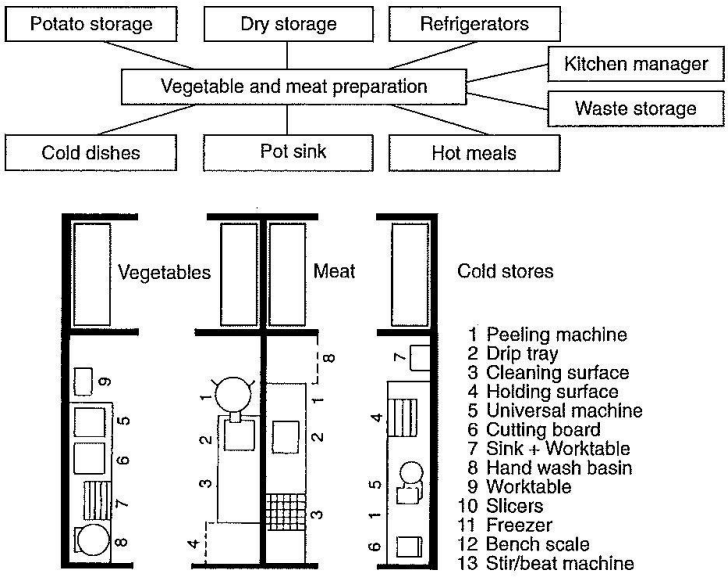


Figure 46 Separate preparation for Meat & vegetables

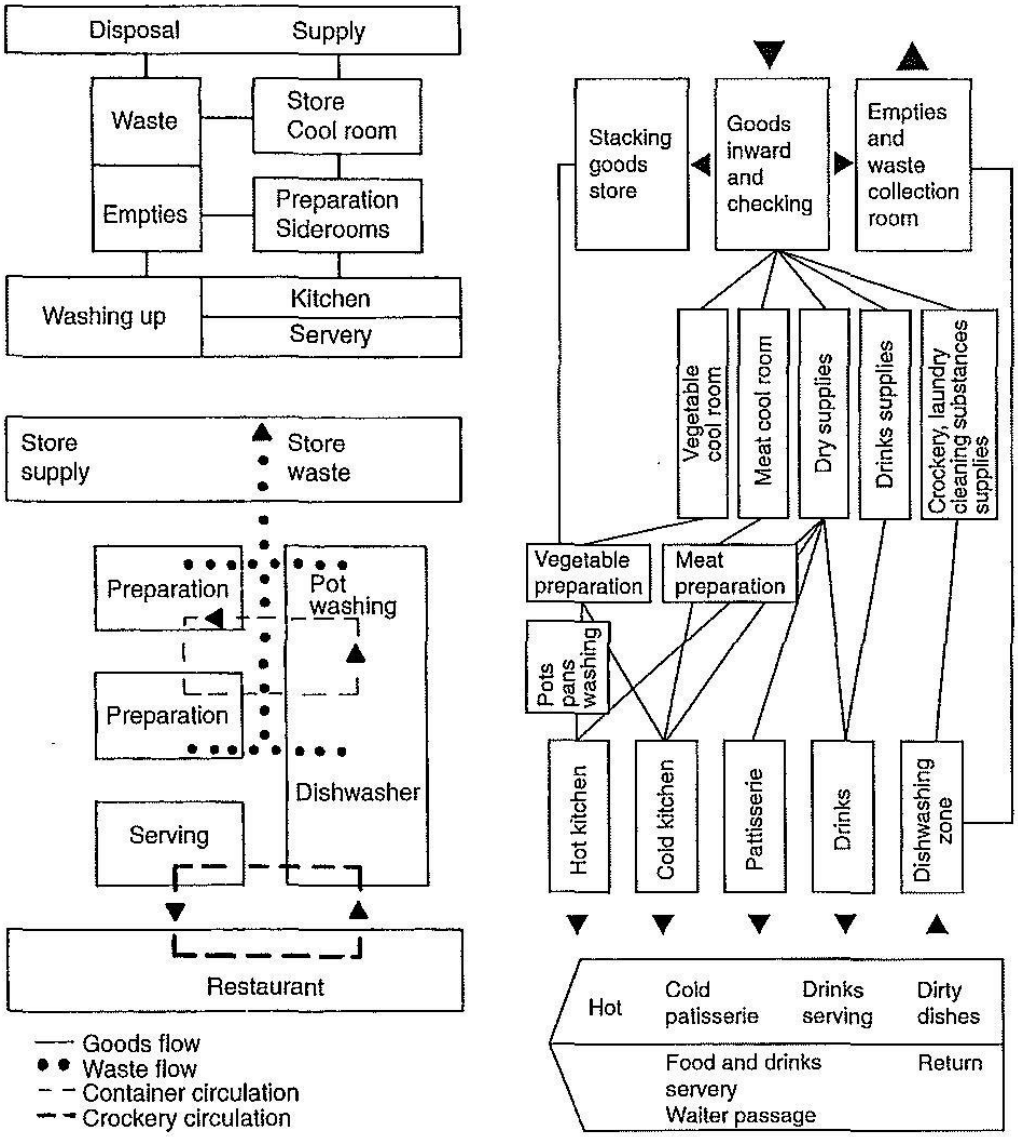


Figure 47 Restaurant Kitchen; Functions & Restaurant kitchen; Organisation

Percentage of total kitchen space requirement-

- Differentiated according to small, medium and large kitchens, floor area values for individual functions are be based on.
- Aisle widths in storage, preparation and production areas differ according to whether they are purely traffic routes or also overlap the service area. Working aisle widths should be 0.90-1.20 m, side traffic routes with (temporary) overlapping use 1.50-1.80 m and main traffic routes (transport and two-way through traffic) 2.10-3.30 m wide. For kitchen areas in small to medium restaurants, aisle widths of 1.00-1.50 m should be sufficient.

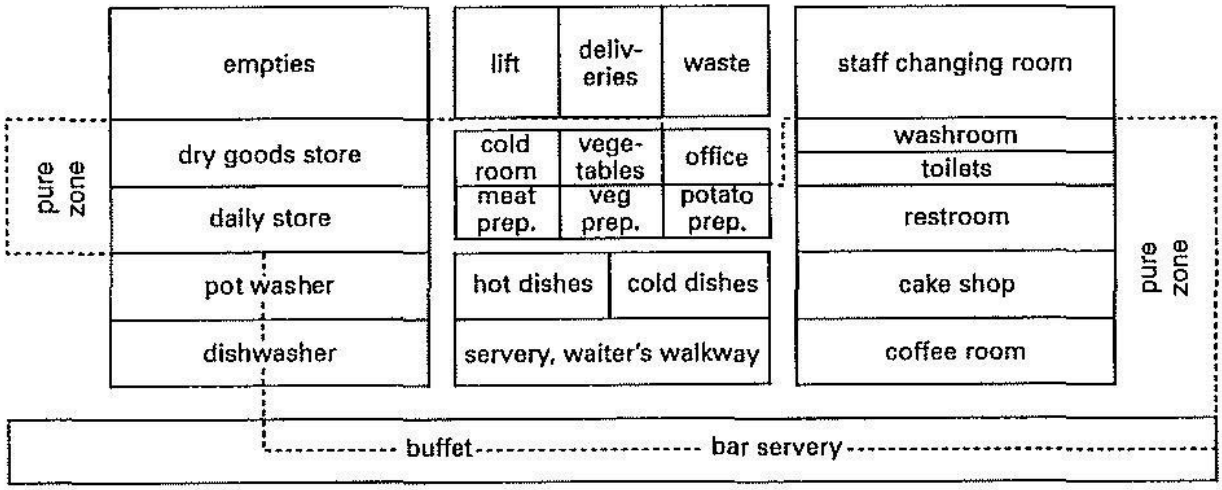
- Bistros, snack bars, small cafes - or specialty restaurants with 40-60 seats- are classified as small operations. Small to medium units (70-1 00 places) require on the other hand carefully zoned and fully equipped kitchen facilities. Large businesses (service areas, fast food restaurants, large hotel kitchens) achieve considerably higher place numbers, often with an integrated eating bar or selfservice areas.

Table 8 Kitchen Areas: space required (sqm/seat)

Seats	80	120	200
goods inward	0.05–0.075	0.05–0.067	0.05–0.06
empties	0.05–0.075	0.05–0.067	0.05–0.06
waste/rubbish	0.05–0.075	0.03–0.050	0.03–0.04
delivery/disposal	0.15–0.225	0.13–0.183	0.13–0.16
cold room meat	0.05–0.075	0.05–0.067	0.04–0.05
cold room fruit and vegetables	0.05–0.075	0.05–0.067	0.04–0.05
cold room dairy products	fridge	0.03–0.05	0.03–0.05
cold room cold service	fridge	fridge	0.02–0.03
cool room drinks	fridge	fridge	0.05–0.07
freezer room	0.05–0.075	0.05–0.067	0.06–0.08
cooled goods delivery	0.15–0.225	0.183–0.25	0.24–0.32
store dry goods	0.15–0.175	0.117–0.13	0.09–0.1
store drinks	0.075–0.1	0.1–0.117	0.08–0.1
store non-food	0.075–0.1	0.067–0.083	0.07–0.08
cooled goods storage	0.3–0.375	0.283–0.33	0.24–0.28
vegetable preparation	0.075–0.1	0.067–0.083	0.04–0.05
meat preparation	0.075–0.1	0.05–0.067	0.04–0.05
fish/poultry preparation	0	0.03–0.05	0.03–0.04
hot kitchen	0.325–0.35	0.217–0.23	0.16–0.18
cold kitchen	0	0.05–0.067	0.04–0.05
patisserie	0	0	0.04–0.05
pot washing	0.05–0.075	0.05–0.067	0.03–0.04
office kitchen manager	0	0	0.03–0.04
kitchen facilities	0.525–0.625	0.47–0.567	0.41–0.5
dishwasher	0.1–0.125	0.1–0.117	0.09–0.1
service/waiter office	0.075–0.1	0.083–0.1	0.07–0.08
dishwasher/office	0.175–0.225	0.183–0.217	0.16–0.18
= Total	1.3–1.675	1.25–1.55	1.18–1.44

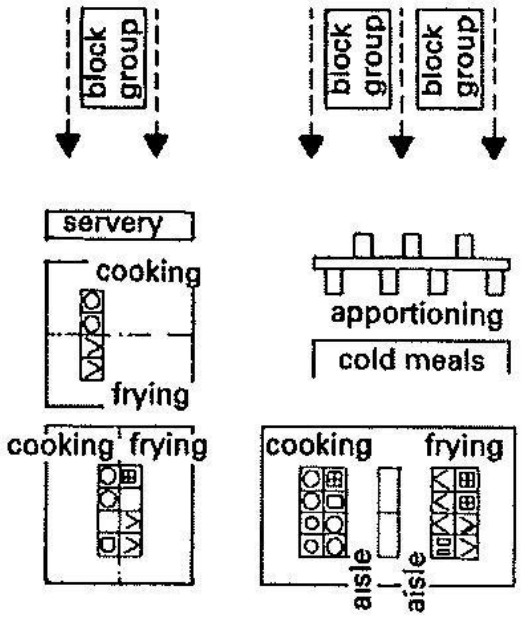
Table 9 Basis for dimensions and space requirements

Area	Proportion (%)
goods delivery including inspection and waste storage	10
storage in freezer, cold and dry rooms	20
daily store	
vegetable and salad preparation area	2
cold dishes, desserts	8
patisseries/cakes	8
meat preparation	2
cooking area	8
washing area	10
traffic area	17
staff rooms and office	15
Total	100

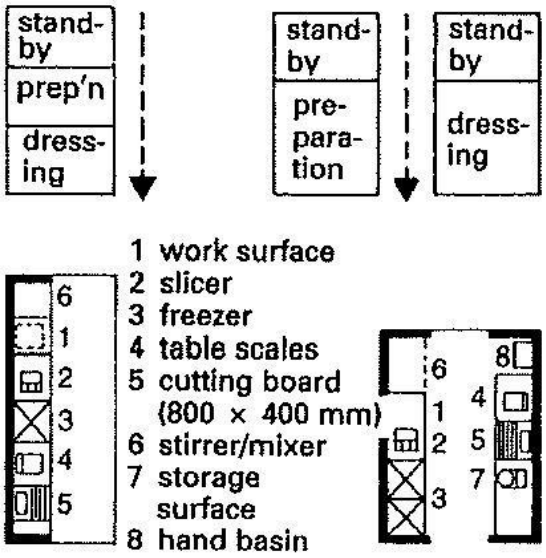


5 Kitchen areas: classification and relationships of functional areas in clean and unclean zones (if earth-covered vegetables are prepared, this must take place in a separate part of the unclean area!)

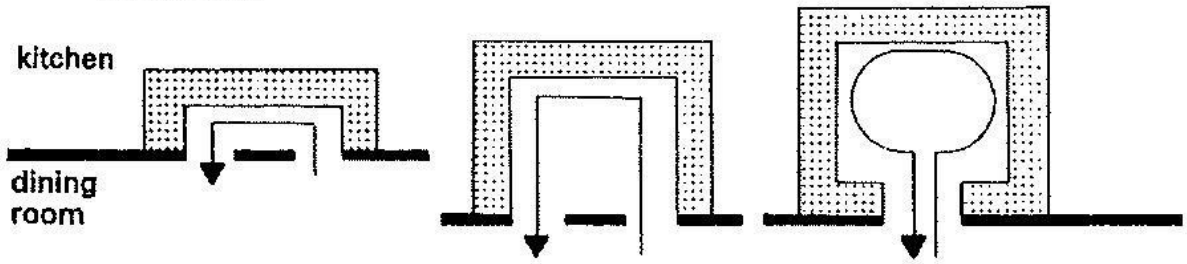
Figure 48 Funtionality of Kitchen Areas



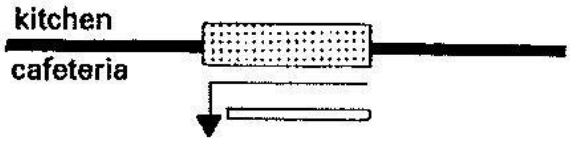
5 Functions and organisation of hot kitchen



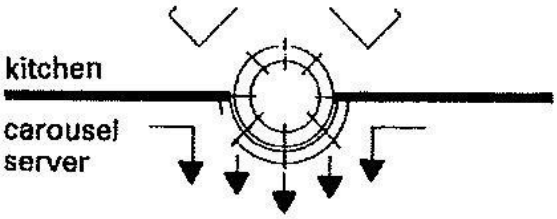
6 Organisation of cold kitchen



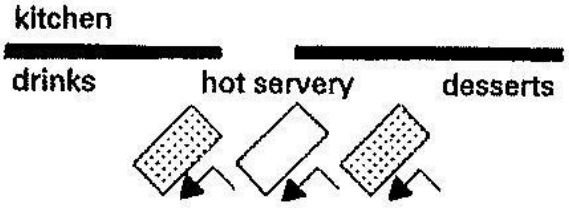
7 Servery, waiter walkway



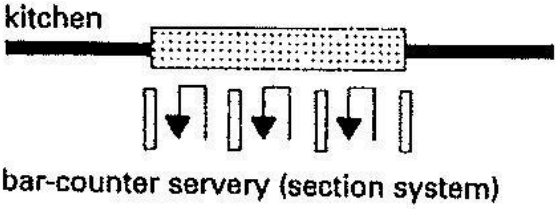
8 Self-service restaurant



9 Self-service restaurant



10 Free-flow restaurant



11 Self-service restaurant

2.6.4 BASIC SCHEMES OF HOTEL

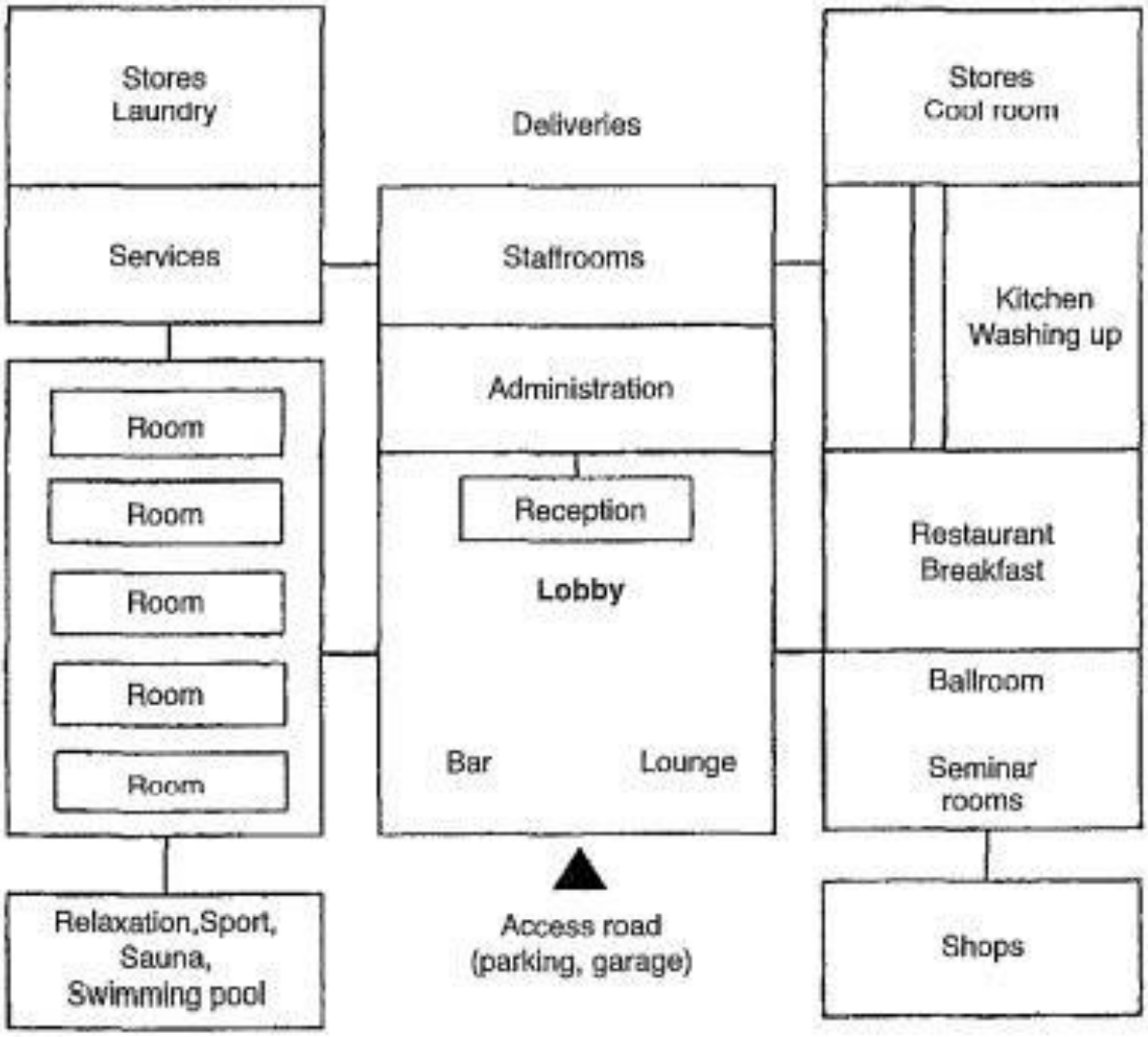


Figure 51 Route relationship between spaces

The percentages of hotels' surface areas required for the various functions are shown below

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

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

Table 10 Percentage of hotel area required

5 Stars (Luxury): as before, but single room 18m2 , double room 26m2, (minimum size, see above), 2% of the hotel rooms as suites (at least two), each with an armchair/sofa per bed, additional washbasin in double rooms and suites, additional colour television in suites, reception lobby.

To be able to eat in comfort, one person requires a table area around 60 cm wide and 30-40 cm deep This provides sufficient distance between adjacent diners. Although an additional 20 cm space in the centre for dishes and large bowls is sometimes desirable, an overall width of 80-85 cm is suitable for a dining table. If the food is served on plates, then 70 cm is sufficient, and for fast food 60 cm table depth.
Distance between table and wall greater than equal to 75 cm because the chair alone requires a space of 50 cm. If the space between table and wall is also used for access, the distance should be greater than 100cm. Round tables need a little more space, a difference of up to50cm.

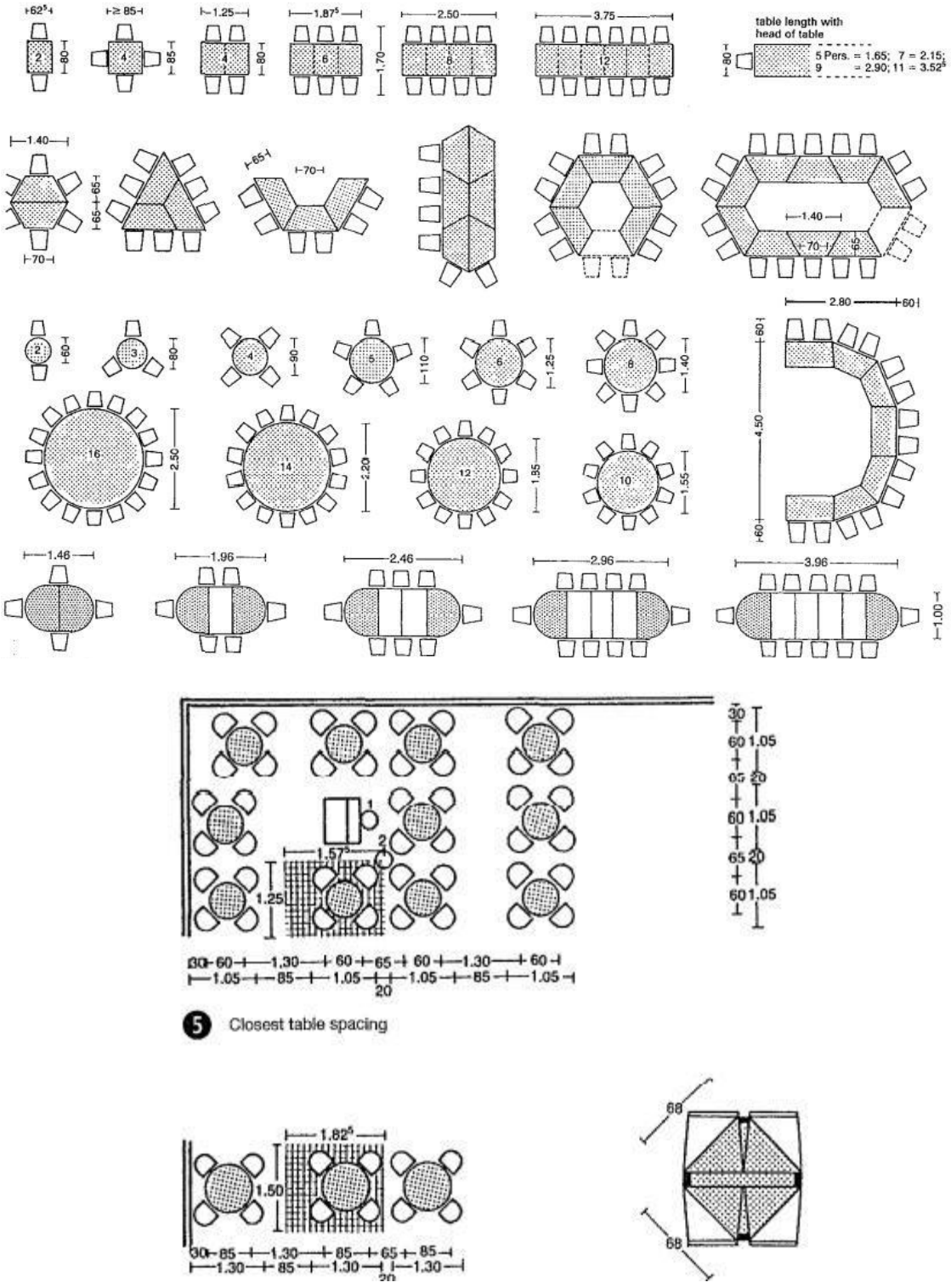


Figure 522 Arrangements of dining tables

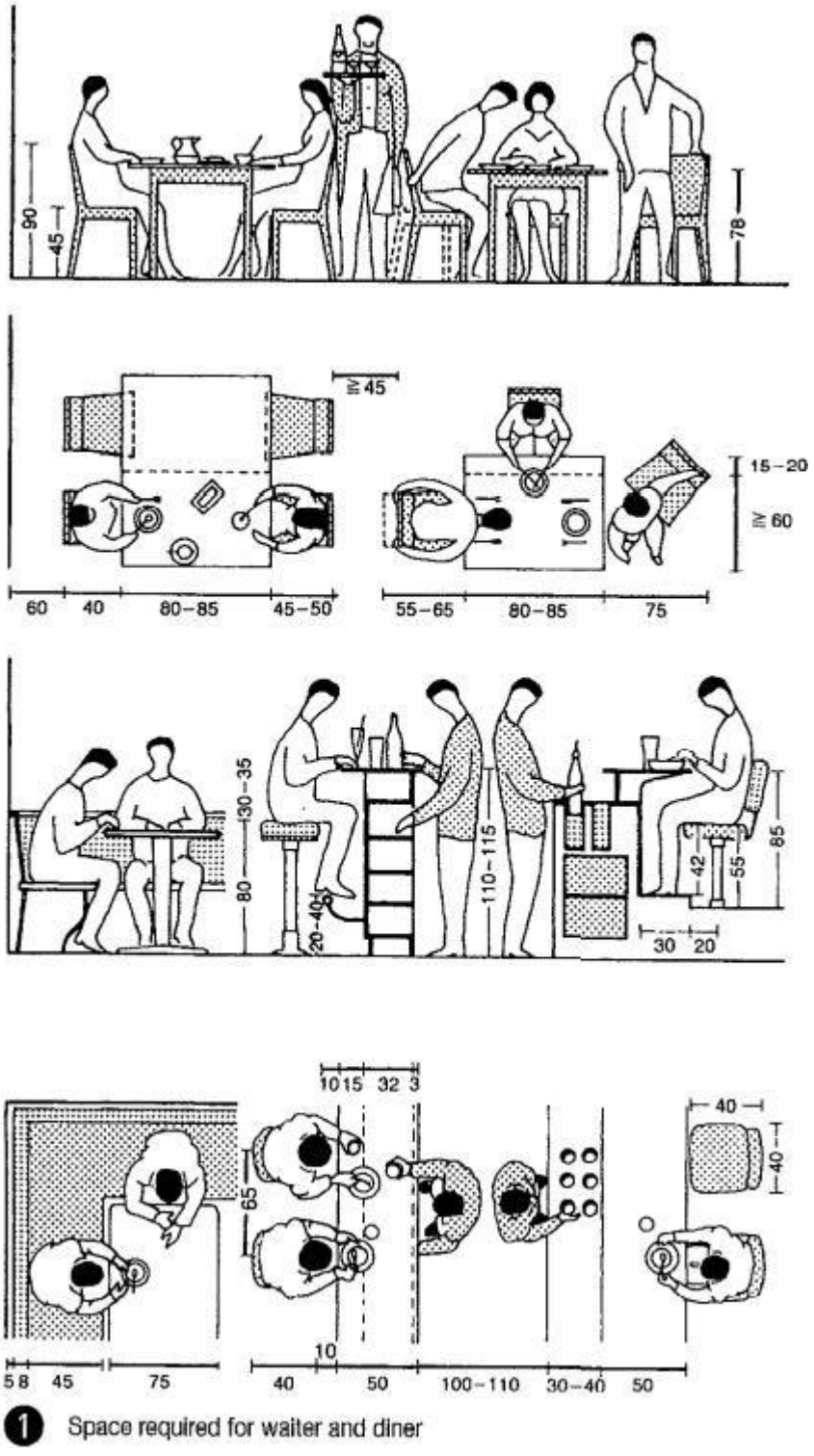


Figure 53 Space required for waiter and diner

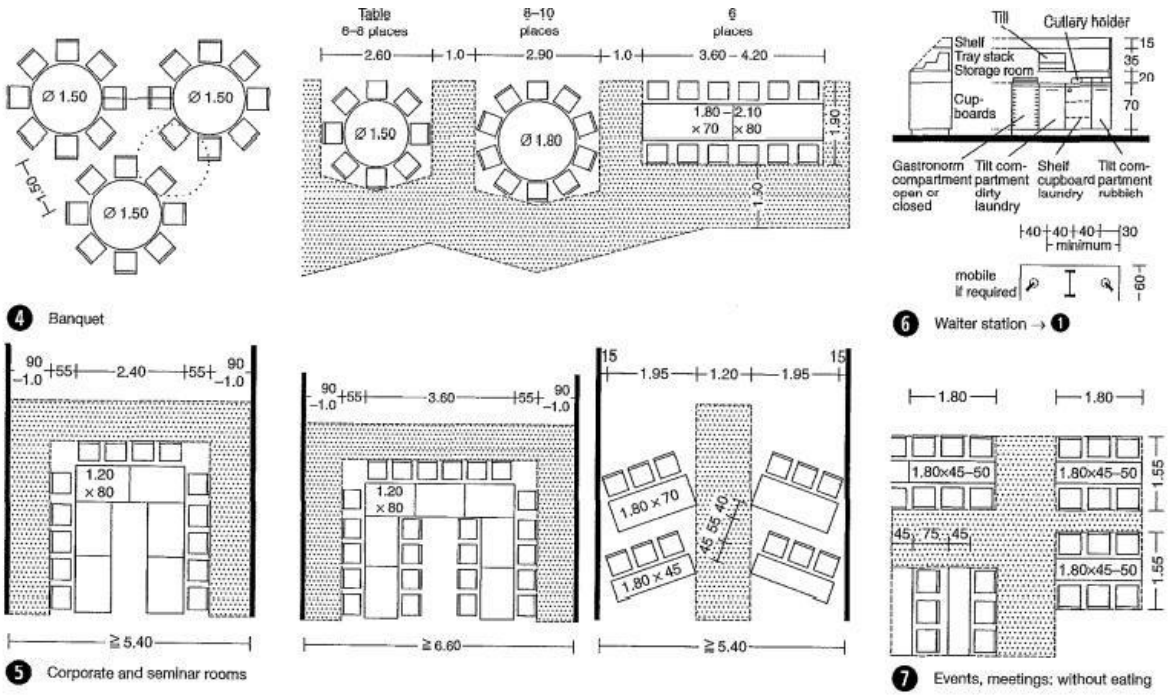


Figure 53 Dining Table arrangements in different eating spaces

Tables and chairs are kept as small as possible and tightly grouped.

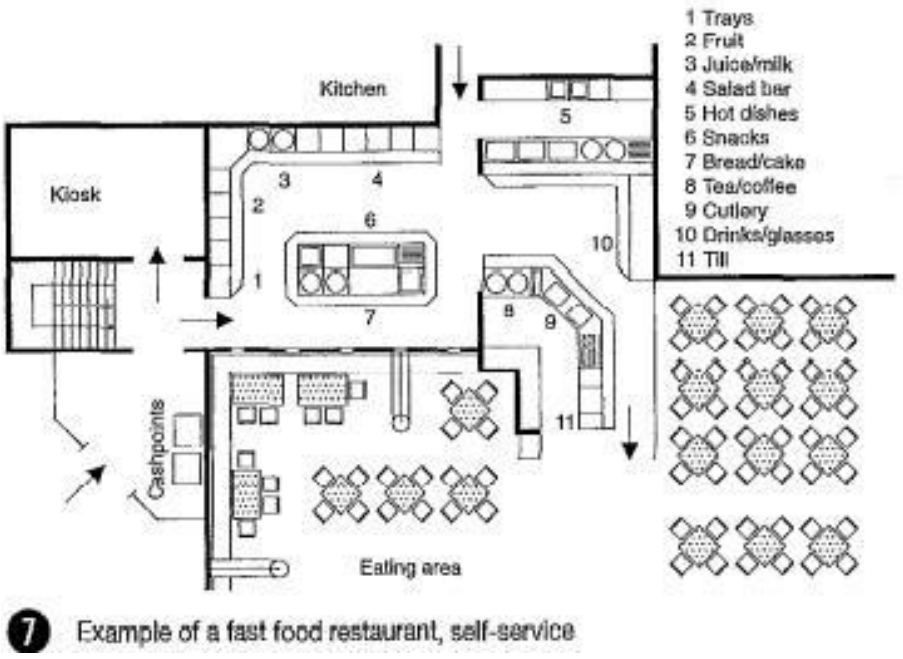


Figure 54 Dining table arrangements in different eating spaces with an example of self-service restaurant

2.7. URBAN AND REGIONAL DEVELOPMENT PLANS FORMULATION AND IMPLEMENTATION GUIDELINES (URDPFI)

2.7.1 MEANS OF ACCESS

For plot development of uses other than residential, the following minimum width corresponding to the length of the means of access shall be followed:

Table 11 Means of Access (NBC, 2005)

Sr. No.	Width of Means of Access (m)	Length of Means of Access (m)	Other Controls
1.	12.0	200	➢ The width of the means of access shall not be less than the internal access ways in layouts and subdivision.
2.	15.0	400	
3.	18.0	600	
4.	24.0	above 600	

Source: NBC, 2005.

For high rise buildings and buildings other than residential, the following additional provisions shall be ensured:

I. The width of the abutting main street shall not be less than 12 m and one end of this street shall join another street not less than 12 m in width.
II. The approach to the building and open spaces on all sides up to 6 m width and the layout shall be done in consultation with Chief Fire Officer of the city.
III. The main entrance to the plot shall be of minimum 6 m width to allow easy access to fire engine.

2.7.2 PARKING

Table 12 ECS requirement

2	Commercial Centres		
	Convenience Shopping Centre/Local Shopping Centre / Local Level Commercial areas	2 ECS / 100 sqm of floor area	For Population between 2- 10 lakh – 1 car parking space for every 4 guest room.
	Service Market	2 ECS / 100 sqm of floor area	
	Community Centre / Non- hierarchical Commercial Centre	3 ECS / 100 sqm of floor area	For Population between 10-50 lakh – 1 car parking space for every 3 guest room.
	District Centre/ Sub-Central Business District/Sub-City Level Commercial areas	3 ECS / 100 sqm of floor area	
	Commercial Plot: Retail & Commerce Metropolitan City Centre	3 ECS / 100 sqm of floor area	For Population more than 50 lakh – 1 car parking space for every 2 guest room[143].
	Hotel	3 ECS / 100 sqm of floor area	

2.7.3 MINIMUM SETBACKS

- Setbacks based on Plot Sizes
- The following table may be referred for deciding the minimum setbacks for different size plots in various use zones. The size of plots should be decided after taking into account the provisions of National Housing Policy and Urban Land (Ceiling and regulation) Act. The setbacks, if necessary, may be changed depending upon the local situations and specified in the Development Plans and Building byelaws.

Table 13 Minimum setbacks

2.7.4 SETBACKS WITH RESPECT TO ABUTTING ROAD WIDTH

Front Setback

Table 14 Front setback w.r.t. abutting road width

Sr. No.	Front Setback (m)	Width of street fronting the plot (m)	Remarks
1.	1.5	Upto 7.5	For buildings upto a maximum height of 7 m
2.	3.0	7.5 to 18	
3.	4.5	18 to 30	
4.	6.0	Above 30	

***Note**: For streets less than 7.5 m in width, the distance of the building (building line) shall be at least 5m from the centre line of the street.*

Rear and Side setback for building heights above 10m

Table 15 Side & Rare setback w.r.t. abutting road width

Sr. No.	Plot Size (in sqm)	Front (m)	Rear (m)		Side (m)	Side (m)
			Plains	Hill Towns	Plains	Hill Towns
1.	Upto 60	0	0	2	0	1.5
2.	Above 60 and upto 150	3	0	2	0	1.5
3.	Above 150 & upto 300	3	3	3	0	1.5
4.	Above 300 & upto 500	3	3	3	3	3
5.	Above 500 & upto 1000	6	3	3	3	3
6.	Above 1000 & upto 2000	9	3	3	3	3
7.	Above 2000 & upto 4000	9	6	6	6	6
8.	Above 4000 & upto 10000	9	6	6	6	6
9.	Above 10000	15	9	9	9	9

Source: UDPFI Guidelines 1996.

The open areas provided in the buildings can be used for the following permissible activities:

- Garden, rockery, water well and well structures, plant nursery, water pool, swimming pool (if un covered), platform around a tree, landscaping, tank, fountain, bench, *chabutra* with open to pandunen closed on sides by walls and the like.
- Drainage culvert, conduit, catch pit, gully pit, chamber, gutter and the like.
- Compound wall, gate, un-storied porch and portico, canopy, slide, swing, uncovered staircase, ramps are as covered by *chajja* and the like.

2.7.5 GROUND COVERAGE & FAR

Table 16 Ground Coverage & FAR

Sr. No.	Hierarchy of Commercial Centre	Maximum Ground Coverage (%)		Maximum FAR		Maximum Height (m)		Other Controls
		Plains	Hills	Plains	Hills	Plains	Hills	
1.	Cluster Centre Convenience Shopping	40	40	60	60	15	6	
2.	Neighbourhood Centre	30	35	100	100	15	9	
3.	Community Centre	25	30	100	100	26	15	
4.	District Centre	25	25	125	125	37	15	Some of the buildings in Plains could be permitted upto 50 m height with the approval of the Government for achieving an urban form.
5.	Sub city centre	--	--	--	--	--	--	Controls to be as per requirement
6.	City Centre	25 (MPD, pg 59)	--	150 (MPD, pg 59)	--	--	--	Other controls to be as per requirement
7.	Hotel	40 (MPD, pg 59)	--	225	--	--	--	Other controls to be as per requirement
8.	Service Apartment	30	--	150	--	--	--	Other controls to be as per requirement
9.	Any other commercial centre	25%	--	100	--	--	--	Other controls to be as per requirement

Source: UDPFI Guidelines 1996, MPD.

2.7.6 WATER SUPPLY

The CPHEEO Manual recommends fire-fighting water demand as a function of population, i.e. water demand for fire-fighting purpose = 100√P, where P stands for forecasted population may be adopted for communities larger than 50,000. It is desirable that one-third of fire-fighting requirements from part of the service storage. The balance requirement may be distributed in several static tanks at strategic points. These static tanks may be filled from nearby ponds, streams or canals by water tankers wherever feasible. The pressure required for fire-fighting would have to be boosted by fire engines.

Table 17 Water supply requirement in LCD

S. No.	Institutions	Litres per head per day
1	Hospital (including laundry) a. no of beds exceeding 100 b. no. of beds not exceeding 100	a. 450 (per bed) b. 340 (per bed)
2	Hotels	180 (per bed)
3	Hostels	135
4	Nurses homes and medical quarters	135
5	Boarding schools/colleges	135
6	Restaurants	70 (per seat)
7	Airport and seaports	70
8	Junction stations and intermediate station where mail or express stoppage (both railway and bus stations) is provided	70
9	Terminal stations	45
10	Intermediate stations (excluding mail and express stops)	45 (could be reduced to 25 where bathing facilities are not provided)
11	Day Schools/colleges	45
12	Offices	45
13	Factories	45(could be reduced to 30 where no bathing rooms are required to be provided)
14	Cinema, concert halls and theatres	15

Source: CPHEEO Manual, 1999.

2.7.7 FIRE FIGHTING

The CPHEEO Manual recommends fire-fighting water demand as a function of population, ie. water demand for fire-fighting purpose = 100√P, where P stands for forecasted population may be adopted for communities larger than 50,000. It is desirable that one-third of fire-fighting requirements from part of the service storage. The balance requirement may be distributed in several static tanks at strategic points. These static tanks may be filled from nearby ponds, streams or canals by water tankers wherever feasible. The pressure required for fire-fighting would have to be boosted by fire engines

2.7.8 SOLID WASTE MANAGEMENT

Municipal Solid Waste (MSW) is the trash or garbage that is discarded day to day ina human settlement. According to MSW Rules 2000 MSW includes commercial and residential wastes generated in a municipal or notified areas in either solid or semisolid form excluding industrial hazardous wastes but including treated bio-medical wastes. Waste generation encompasses activities in which materials are identified as no longer being of value (being in the present form) and are either thrown away or gathered together for disposal. The following table indicates the waste generation per capita per day for estimation and forecast of waste generation for future for planning purposes:

Table 18 Waste generation

S.No.	Land use type	Estimated waste generation
1	Residential refuse	0.3 to 0.6 kg/cap/day
2	Commercial refuse	0.1 to 0.2 kg/cap/day
3	Street sweepings	0.05 to 0.2 kg/cap/day
4	Institutional refuse	0.05 to 0.2 kg/cap/day

Source: Manual on Solid Waste Management, CPHEEO – 2000

2.8 INDIAN STANDARD CODE FOR HOTELS AND RESTAURANTS

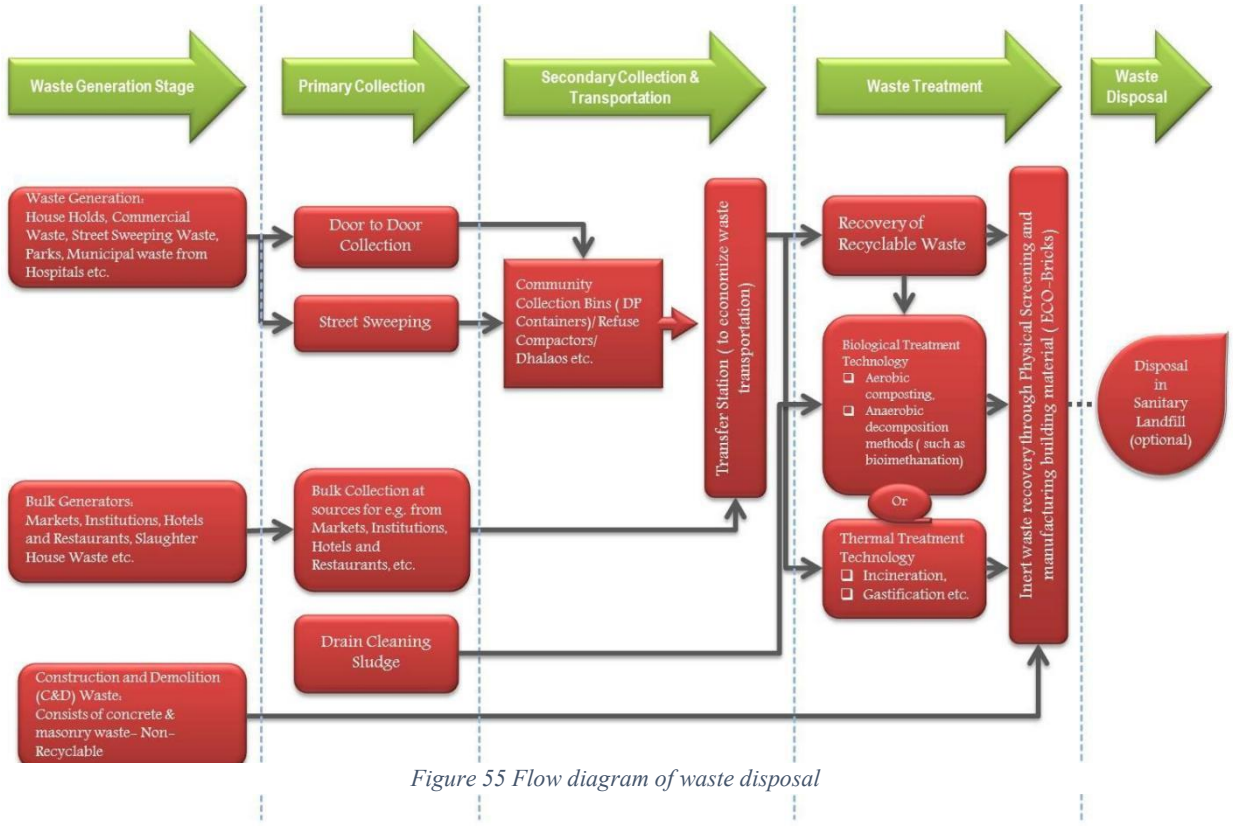


Figure 55 Flow diagram of waste disposal

2.8.1 BUILDING

In addition to the recommendations in the code the building in which food service establishment is located shall also conform to the local building byelaws in force. The building should be of a permanent nature and maintained in a proper state of repair and cleanliness.

2.8.2 FLOORS

The floors of all rooms in which food or drink is stored, prepared or served and of all washing placed shall be of such construction as to be impervious, easily cleansed, smooth and in good repair. All floors shall be kept clean and free from litter. Dustless method of floor cleaning shall be used, ail except emergency floor cleaning shall be done during the period when least amount of food and drink is exposed.

2.8.3 WALLS

The walls shall have a smooth, non-absorbent surface, free from cracks and crevices to facilitate their efficient cleaning.

The walls of all rooms in which food or drink is prepared or utensils are washed shall have a smooth washable surface up to a minimum height of 2-O m from the floor.

2.8.4 CEILING

Ceiling shall be clean, leak-proof and have a smooth non-absorbent surface free from cracks and crevices to facilitate their efficient cleaning. These should be such that they do not harbour vermin.

2.8.5 DOOR AND WINDOWS

In the absence of air-conditioning all openings to the outer air including doors, windows, sky lights shall be effectively screened with tight fitting screens free from holes with wire gauge conforming to IS: 1568-

1960*. The doors when not in use shall be kept in closed position. Self closing screened doors to the outer air shall open outwards. Other methods approved by the authority shall be employed to ensure the absence of flies

2.8.6 LIGHTING

Table 19 Recommended values of illumination – IS Codes

TABLE 1 RECOMMENDED VALUES OF ILLUMINATION

The lighting of some of these locations will be determined primarily by aesthetic considerations and the recommended illumination values as given in IS : 3646 (Part II)-1966* may be taken as a guide only.

Sl No.	Areas	Illumination, Lux
(1)	(2)	(3)
i)	Entrance halls	150
ii)	Reception and accounts	300
iii)	Dining rooms (tables)	100
iv)	Lounges	150
v)	Bedrooms:	
	a) General	100
	b) Dressing tables, bed heads, etc	200
vi)	Writing rooms (tables)	300
vii)	Corridors	70
viii)	Stairs	100
ix)	Laundries	200
x)	Kitchens	†200
xi)	Goods and passenger lifts	70
xii)	Clockrooms and toilets	†200
xiii)	Dining rooms:	
	a) Tables	100
	b) Cash desks	300
xiv)	Self service-counters	300

*Code of practice for interior illumination: Part II Schedule for values of illumination and glare index.

†Supplementary local lighting should be provided over kitchen equipment and mirrors.

2.8.7 VENTILATION

- In case of ran-air-conditioned buildings the minimum standards of mechanical ventilation shall be maintained as given

Table 20 Ventilation Requirements - IS Codes

TABLE 2 VENTILATION REQUIREMENTS FOR NON-AIRCONDITIONED BUILDINGS

Sl No.	Area	Air Changes per Hour
(1)	(2)	(3)
i)	Living rooms	3
ii)	Dining and lounge	2-3
iii)	Big kitchen	12
iv)	Small kitchen	6
v)	Toilets	6

2.8.8 WATERSUPPLY

- There shall be adequate supply of safe and potable water. Running water shall be easily accessible to all rooms in which food is prepared or utensils are washed. Requirements for water supply for hotels and restaurants shall be as given

Table 21 Water requirement in hotel

TABLE 3 WATER SUPPLY REQUIREMENTS FOR HOTELS AND RESTAURANTS

Sl No.	Description	Non-Airconditioned (Litres per Day)	Air Conditioned (Litres per Day)
(1)	(2)	(3)	(4)
i)	Hotels (per bed)	180	275
ii)	Restaurants (per seat)	70	97

Note — In hotels where laundry is provided arrangement for an extra quantity of 120 litres per bed should be made.

Storage of Water

For the storage of water, proper receptacles made of galvanized iron or other suitable material shall be used. Such receptacles shall he kept covered with tight fitting lids and shall have screw caps at the bottom for draining out residual water. The receptacles shall be placed on a stand or a platform rasily accessible for the purpose of maintenance and cleaning, The receptacles shall be examined and cleaned regularly.

2.8.9 DRAINAGE

Adequate arrangements shall be made for satisfactory drainage of all sewage and waste water. Harmful waste water, such as water containing kitchen waste, &all be saticfactorily disposed of. The drainage shall be so designed as to cause no stagnation at the maximum discharge rate fur which the different units are designed. The requirements for firments for drainage and sanitation shall conform to the requirements given

Table 22 Drainage & Sanitation fitments in hotels- IS Codes

TABLE 4 REQUIREMENTS OF DRAINAGE AND SANITATION FITMENTS IN HOTELS

(*Clause* 14.1.1)

Sl No.	Fitments	For Residential Public and Staff	For Public Rooms		For Non-Residential Staff	
			For Males	For Females	For Males	For Females
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Water-closets	1 per 8 persons omitting occupants of the room with attached water-closets; minimum of 2 if both sexes are lodged	1 per 100 persons up to 400 persons; and for over 400, add at the rate of 1 per 250 persons or part thereof	2 per 100 persons up to 200 persons; and for over 200, add at the rate of 1 per 100 persons or part thereof	1 for 1-15 persons 2 for 16-35 persons 3 for 36-65 persons 4 for 66-100 persons	1 for 1-12 persons 2 for 13-25 persons 3 for 26-40 persons 4 for 41-57 persons 5 for 58-77 persons 6 for 78-100 persons
ii)	Ablution taps	1 in each water-closet	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 50 persons or part thereof	—	Nil up to 6 persons 1 for 7-20 persons 2 for 21-45 persons 3 for 46-70 persons 4 for 71-100 persons	—

iv)	Wash basins	1 per 10 persons omitting the wash basins installed in the room suite	1 per water-closet and urinal provided	1 per water-closet provided	1 for 1-15 persons 2 for 16-35 persons 3 for 36-65 persons 4 for 66-100 persons	1 for 1-12 persons 2 for 13-25 persons 3 for 26-40 persons 4 for 41-57 persons 5 for 58-77 persons 6 for 78-100 persons
v)	Baths	1 per 10 persons omitting occupants of the room with bath *en suite*	—	—	—	—
vi)	Slop sinks	1 per 30 bedrooms, minimum 1 per floor	—	—	—	—
vii)	Kitchen sinks and dish washers	← 1 in each kitchen →				

NOTE 1 — Some of the water closets may be of European style if desired.

NOTE 2 — It may be assumed that two-thirds of the number are males and one-third females.

Table 23 Drainage & Sanitation fitments in Restaurants- IS Codes

Sl No.	FITMENTS	FOR MALE PUBLIC	FOR FEMALE PUBLIC	FOR MALE STAFF	FOR FEMALE STAFF
(1)	(2)	(3)	(4)	(5)	(6)
i)	Water-closets	1 for 50 seats up to 200 seats; and for over 200 seats, add at the rate of 1 per 100 seats or part thereof	1 for 50 seats up to 200 seats; and for over 200 seats, add at the rate of 1 per 100 seats or part thereof	1 for 1-15 persons 2 for 16-35 persons 3 for 36-65 persons 4 for 66-100 persons	1 for 1-12 persons 2 for 13-25 persons 3 for 26-40 persons 4 for 41-57 persons 5 for 58-77 persons 6 for 78-100 persons
ii)	Ablution taps	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 50 seats	—	Nil up to 6 persons 1 for 7-20 persons 2 for 21-45 persons 3 for 46-70 persons 4 for 71-100 persons	—
iv)	Wash basins	← 1 for every water-closet provided →			
v)	Kitchen sinks and dish washers	← 1 in each kitchen →			
vi)	Slop or service sinks	← 1 in the restaurant →			

NOTE 1 — Some of the water closets may be of European style, if desired.

NOTE 2 — It may be assumed that two-thirds of the number are males and one-third females.

Septic tanks conforming to IS: 2470 (Part I)- 1963* or IS: 2470 (Part II)-l964 shall be provided if required by the authority. The gradient of the drains should be such that no water stagnates anywhere within the premises. Where no sewerage is provided for the final outfall, soak pits or access pools to the satisfaction of the Authority should be provided

2.8.10 KITCHEN

Kitchen shalt be sufficiently spacious and should be of a size in proportion to the average number of diners catered for at one meal, The floor spice in the kitchen shall be calculated at the rate of0.5 me Min

per diner. In case of snack bars, soda fountains, etc, the service-cum dispensing area shall be treated as part of the kitchen.

The minimum size of the kitchen should not be less than 10 rnp and none of the sides less than 2.4 meter. Exhaust fans should have provisions of grease filters for collecting grease

2.8.11 STORAGE AND HANDLING EQUIPMENT

All containers and utensils shall be stored at a height of not less than. 430 mm above the floor in a clean, dry place protected from flies, splash, dust, overhead leakage, and other contamination

STORAGE OF FOOD STUFF

All perishable food shall be stored at the temperatures as given in

Table 24 Storage temperatures for food

Sl No.	Names of Articles	Storage Temperature °C
(1)	(2)	(3)
i)	Meat, meat products, poultry	0·00 to 1·50
ii)	Fresh fish and sea food	−2·00 ,, −0·50
iii)	Dairy products and eggs	0·50 ,, 2·50
iv)	Fresh fruit and vegetables	2·00 ,, 4·50
v)	Ice-creams	−14·50 ,, −12·00

Note 1 — Potatoes need no refrigeration, but should be stored away from light.

Note 2 — Fish and sea foods shall be stored in separate compartments so as not to affect other materials.

2.8.12 ACOUSTICS

Food service establishments (hotels, restaurants, etc) shall adopt suitable noise control measures to provide adequate sound insulation against various noise sources which would cause disturbance to human comfort and efficiency

2.8.13 FIRE SAFETY REQUIREMENTS

All buildings and particularly buildings having more than one storey shall be provided with liberally demiglace safe-fire-resistant exists or escapes.

The exits shall be so placed that they are always immediately accessible and each is capable of

taking all the persons on that floor as alternative escape routes may be rendered unsuitable and/or

unsafe due to fire.

Escape route shall be well-ventilated as persons using the escapes are likely to be overcome by smoke and/or fumes which may enter from floor.

Basements- It is essential that the fire resistance of the basement conforms to the highest order and all columns for separating the upper structure shall have grading not less than the standards laid down for Grade 3.

Table 25 Classification of structural components – IS Codes

Grade No.	Time in Hours, Minimum Resistance Against Standard Fire	Fire Load and Class of Fire Which Structural Element may Withstand	
		Fire Load in kcal/cm²	Class of Fire
(1)	(2)	(3)	(4)
1	6	1 100 000 and over	Very high
2	4	550 000 to 1 100 000	High
3	2	275 000 to 550 000	Medium
4	1	less than 275 000	Low
5	½	—	Very low

2.9 ANDHRA PRADESH BUILDING BYELAWS - 2017

2.9.1 FLOOR AREA RATIO (FAR) & HEIGHT RESTRICTIONS

FAR depends on road width:

- **9–12 m** road width: FAR = **2.25**
- **12–18 m**: FAR = **2.50**
- **>18 m**: FAR = **3.00**

Height restriction is linked to setbacks and road width. No fixed height cap unless near an airport or restricted zone.

Buildings >15 m must comply with fire safety and open space around = **1/3rd of height**.

2.9.2 SETBACKS & BUILT-UP AREA

For **plots ≥1000 sqm**:

Height of Building	Front	Rear	Side-1	Side-2
≤15 m	4.5 m	3 m	3 m	3 m
>15–18 m	6 m	4.5 m	4.5 m	4.5 m
>18 m	7.5 m	6 m	6 m	6 m

Ground coverage: 50–60% allowed.

Built-up Area: Regulated by FAR × plot size.

2.9.3 BASEMENT AND PARKING

Up to **2 basements** permitted — restricted to parking, MEP, storage (non-habitable).

Parking norms:

- 1 car per 3 guest rooms
- 1 car per 100 sqm banquet area
- 1 two-wheeler per 5 rooms
- Dedicated loading/unloading bay

Ramps: minimum 3.6 m width; slope max 1:8.

2.9.4 FIRE SAFETY

- Fire tender access: **6 m road** width
- Fire lifts and refuge floors (every 24 m)
- Wet risers, hose reels, hydrants, sprinklers
- Smoke detection, fire escapes, emergency lighting
- Fire-resistant materials (Class I) for ceilings, partitions
- Fire drill plan, emergency exit signage
- Annual renewal of fire safety clearance for hotels ≥15 m or above 150 beds

2.9.5 WATER SUPPLY

NBC Part IX Section 1: Specifies per capita water use: hotels may assume ~180 L/day per occupant, plus additional for banquet/restaurant use

- Plumbing systems: flush + potable water supply, hot water, backflow prevention, maintenance access
- Adequate underground + overhead storage based on fixture units and peak demand
- Dual plumbing or reclaimed water reuse encouraged
  AP Rules (Page 14–15): Rainwater harvesting mandatory; recharge pits/trenches for paved areas and rooftops

2.9.6 BANQUET AND RESTAURANT

Banquet halls should:

- Have **minimum ceiling height: 3.6 m**
- **Fire exit doors** at both ends
- Provide **acoustic insulation**
- Attached **pantry and service corridor**

Must plan **dedicated parking**

Ventilation, HVAC, and crowd control layout mandatory

Kitchen: **mechanical ventilation (exhaust hood, grease traps)**, non-combustible finishes, fire-rated walls, slip-resistant flooring

Wastewater: grease interceptors before STP; FSSAI compliance for kitchen hygiene

2.9.7 HVAC REQUIREMENTS

Source: NBC Guidelines (AP Rules indirect reference)

- Centralized air conditioning recommended for:
    - Guest rooms
    - Banquets
    - Restaurant
- **Outdoor Units (OUDs)** should be on terrace or ventilated shafts
- Provide:
    - **Fresh air supply**
    - **Smoke extraction** in corridors/kitchens
    - Duct insulation and acoustic control
- No equipment to discharge hot air into open corridors or adjacent properties

2.9.8 LIGHTING & ELECTRICAL

Source: NBC referenced

- Minimum 300 lux in working/restaurant spaces
- Use of **LED lighting mandatory** in common/public areas
- Solar panels encouraged for:
    - Corridor lighting
    - Water heating
- Emergency lights required at:
    - Exits
    - Fire staircases
    - Corridors

2.9.9 BACK-OF-HOUSE (BOH) & SERVICES

Dedicated circulation for staff/service areas

Facilities include staff lockers/showers, laundry room, housekeeping store, service lifts, waste management

Service corridor width: ≥1.5 m

Waste segregation rooms per SWM rules; direct access for collection and handling

Table 26 AP building byelaws

Parameter	Regulation
Zoning	CRZ-II (urban, developed area) – permits hotels on landward side of existing road with CRZ clearance
FAR (Floor Area Ratio)	Based on abutting road width: • 9–12 m road: 2.25 • 12–18 m: 2.50 • >18 m: 3.00
Height Restriction	No specific CRZ height limit in CRZ-II, but: • Must follow **VMRDA/AP Building Rules** • Fire clearance mandatory if **>18 m** • Airports/Airstrip nearby may impose further limits
Setbacks *(for plots ≥1000 sqm)*	For height **≤15 m**: Front – 4.5 m; Sides/Rear – 3 m For **15–18 m**: Front – 6 m; Sides/Rear – 4.5 m For **>18 m**: Front – 7.5 m; Sides/Rear – 6 mFor **>21 m**: Open space = **1/3rd of building height**
Ground Coverage	Max 50–60% depending on setbacks and height
Basement	Allowed only for: • Parking• Services/utilities (DG, STP, HVAC) • **No habitable rooms** allowed • Maximum 2 basements permitted
Parking Requirements	• 1 car/3 rooms • 1 car/100 sqm of banquet area • 1 two-wheeler/5 rooms • Service vehicle parking as per site plan
Fire Safety (mandatory if >18 m height)	• 6 m wide fire tender path • Fire lift • Wet riser, hose reel, hydrants • Minimum 2 staircases • Refuge area at every 24 m
Rainwater Harvesting	Mandatory for all plots >300 sqm

STP (Sewage Treatment Plant)	Required for hotels (all sizes)
Green/Open Space	Minimum 10% of site area as soft landscaping
Access Road Width	Minimum 12 m road width recommended for hotel use; more if building is high-rise

2.10 COASTAL REGION ZONE-NORMS II

II. CRZ-II,-

(i) buildings shall be permitted only on the landward side of the existing road, or on the landward side of existing authorized structures;

(ii) [**buildings permitted on the landward side of the existing and proposed roads or existing authorised structures shall be subject to the existing local town and country planning regulations as modified from time to time, except the Floor Space Index or Floor Area Ratio, which shall be as per 1991 level :**
Provided that no permission for construction of buildings shall be given on landward side of any new roads which are constructed on the seaward side of an existing road :Provided further that the construction in CRZ-II area of Goa, Kerala and Mumbai shall be governed by the provisions of Clause V of paragraph 8."][47]

(iii) reconstruction of authorized building to be permitted subject with the existing Floor Space Index or Floor Area Ratio Norms and without change in present use;

(iv) facilities for receipt and storage of petroleum products and liquefied natural gas as specified in Annexure-II appended to this notification and facilities for regasification of Liquefied Natural Gas subject to the conditions as mentioned in sub-paragraph (ii) of paragraph 3;

(v) desalination plants and associated facilities;

(vi) storage of non-hazardous cargo, such as edible oil, fertilizers and food grain in notified ports;

(vii) facilities for generating power by non-conventional power sources and associated facilities;

Table 27 CRZ norms II

Regulation	CRZ-II Norm
HTL Buffer Zone	Must obtain HTL demarcation from **authorized agency** (like NCSCM or MoEFCC certified consultants).
FSI/FAR	As per **local building by-laws** (GVMC/VMRDA norms). CRZ does **not restrict FAR** in CRZ-II.
Height Restriction	As per **local development control rules (DCR)**.
Basement	Allowed only for **parking and services**, not habitable use.
Sewage Treatment	Mandatory **STP (Sewage Treatment Plant)** within the premises. No direct discharge into sea.
Solid Waste Management	Must follow **SWM Rules 2016**, and provide an in-house waste segregation system.
Rainwater Harvesting	Compulsory for buildings >1000 sqm.

2.11 CONVENTION CENTRE

A large civic building or group of buildings designed for conventions, industrial shows, and the like, having large unobstructed exhibit areas and often including conference rooms, hotel accommodations, restaurants, and other facilities. A convention center is generally defined as any property used in connection with a convention or meeting center, or similar facility, including auditoriums, exhibition halls, facilities for food preparation and serving, parking facilities, and administrative offices. A number of states have passed legislation enabling public funding to be used for convention centers in an effort to attract tourism and businesses to the local economy.

The term Convention is widely used in much discipline. A '**Convention**' word in general can be defined as

• A large formal assembly of a group with common interests, such as a political party or trade union

• The persons attending such an assembly

• (U.S. politics) an assembly of delegates of one party to select candidates for office

• (Diplomacy) an international agreement second only to a treaty in formality

• A telecommunications convention

• Any agreement, compact, or contract

• The most widely accepted or established view of what is thought to be proper behavior, good taste etc.

Convention – A large meeting of member of profession, a political party, etc.

Center- A place or an area where a lot of people live, a place where a lot of business and cultural activity takes place

• A convention centre is a large building that is designed to hold a convention where individuals and groups gather to promote and share common interests.

• A convention centre is designed, in most cases, for the purpose of conducting meetings, rallies, or seminars. It may also be adapted for specific events; such is appearances by wellknown speakers or musicians. In some cases, meetings or other events take place in centres or buildings not specifically designed for conventions, but large enough to accommodate attendees.

• Convention centres receive guests from local, national and international markets. The various market segments that visit these facilities are dictated by the types of events that are hosted.

2.11.1 AUDITORIUM DESIGN

The auditorium is the heart of building, where the primary activity of experiencing and presenting performances take place. Audience seating is arranged to view the stage and the stage is a platform from which the performer can be communicate to the audience. The relationship between the two is very crucial for the success of convention centers. Mostly auditorium is designed to fulfill no of purposes. The objective of designer will be to use 100% usage of space. Auditorium should be designed in such a way that every member should be able to see and hear the performance of stage.

The three-dimensional volume of an auditorium is conditioned by the need for all members of the audience to be able to see the whole of the platform or stage: and to hear the actor, singer, musician or speaker. Seating density, floor rake and seating layout are partly determined by this, partly to give the audience an appropriate level of comfort and essentially to ensure a means of escape in an emergency. Fire, within the time required by safety considerations and by legislation.

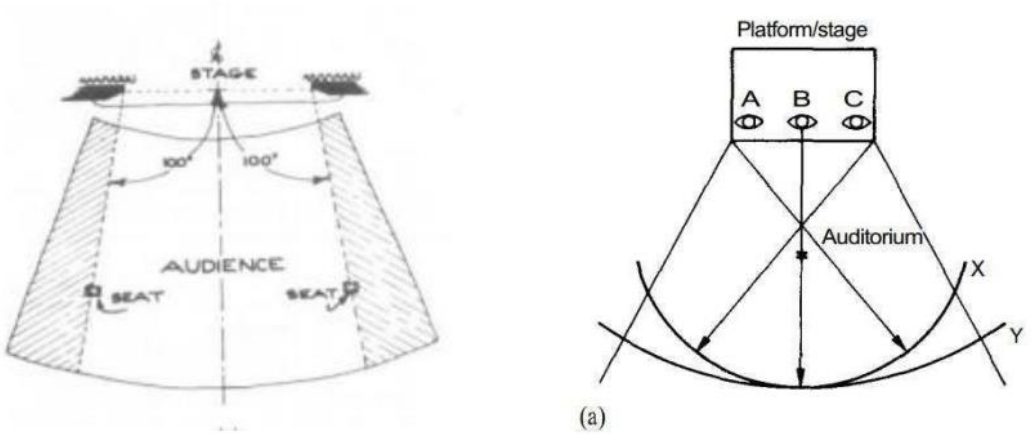


Figure 56 Auditorium design

2.11.2 AUDIENCE REQUIREMENTS

Every member of the audience should be able to see and hear clearly whatever is happening on every part of the stage or platform. The greater the encirclement of the audience of the platform or stage, the more people can be accommodated within the aural and visual limitations up to 180° encirclement. With a full encirclement, the distance from the platform or stage is restricted to six rows.

Proportions of the auditorium these are derived from the psychological awareness and angle of view of the spectator, or the requirement for a good view from all seats. Options are:

1. Good view, without moving head, but light eye movements of approx. 30°.

2. Good view with slight head movements and light eye movements of approx. 60°.

3. Max. Awareness angle without head movement approx. 110°, i.e., all actions in the field are 'in view'. Outside this field, there is uncertainty, because 'something' is out of view.

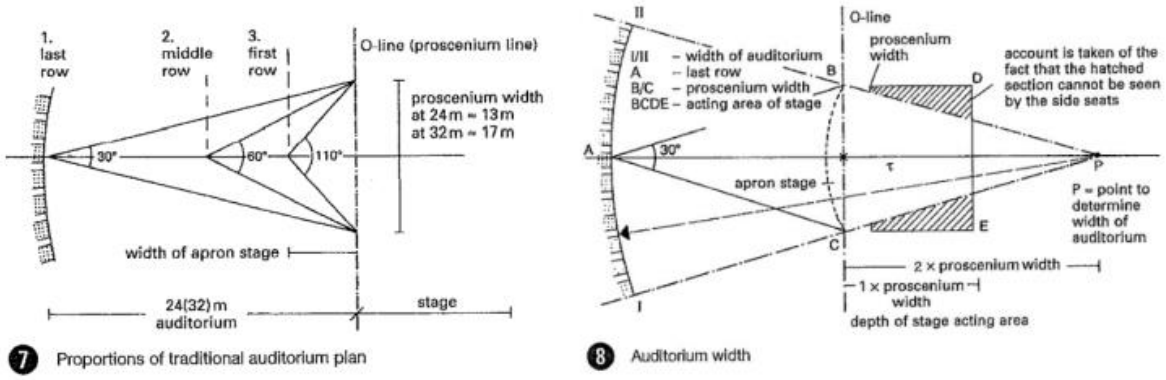


Figure 57 Audience req

4. Full head and shoulder movement allows an angle of view of 360°.

Proportions of the classic auditorium Opera, multi-purpose theatre, and traditional playhouse -7 0: distance of the furthest row from the start of the stage should not exceed: -

Playhouse, max. 24 m (max. distance for the recognition of facial expressions);

Opera, 32 m (large movements are still recognisable).

Auditorium width is determined by the spectators at the side being able to see the stage adequately -8.

The theatre situation is fundamentally one of the relationships between the performers and the audience. The audience wants to hear and see the show without distraction and in comfort and safety, as stated, but its ultimate objective in attending the show is to receive the utmost sensory stimulation toward the maximum emotional and intellectual experience.

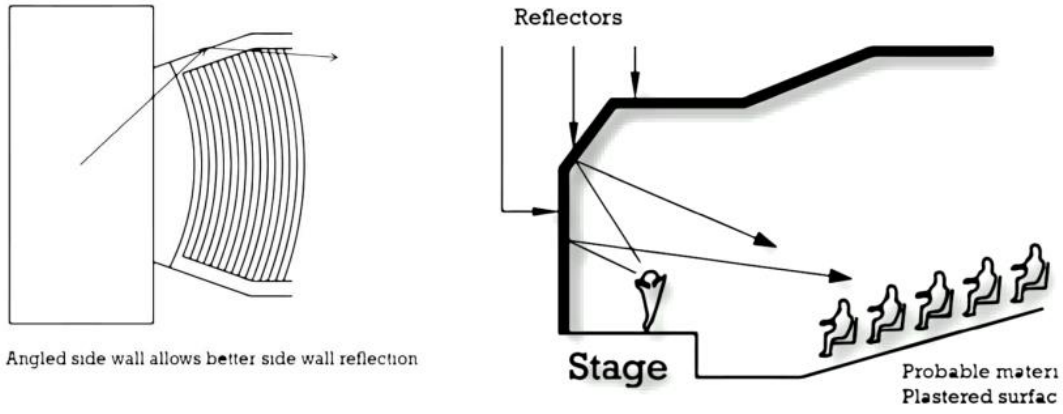
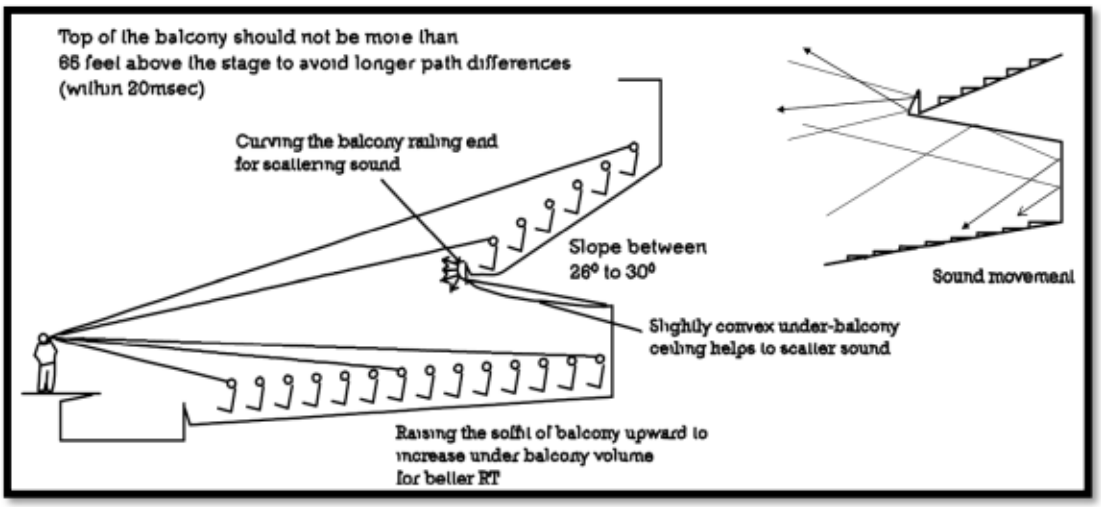
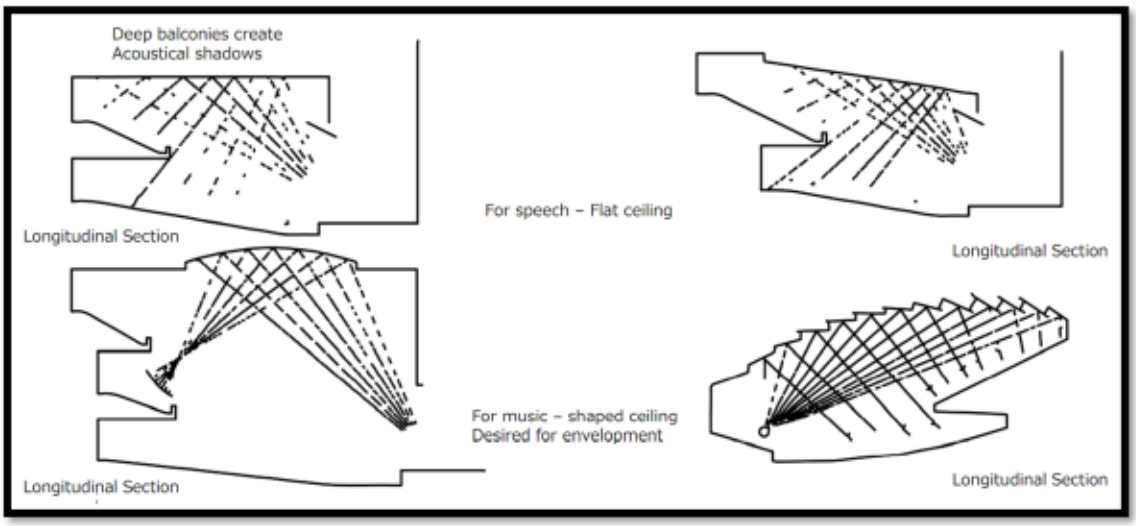
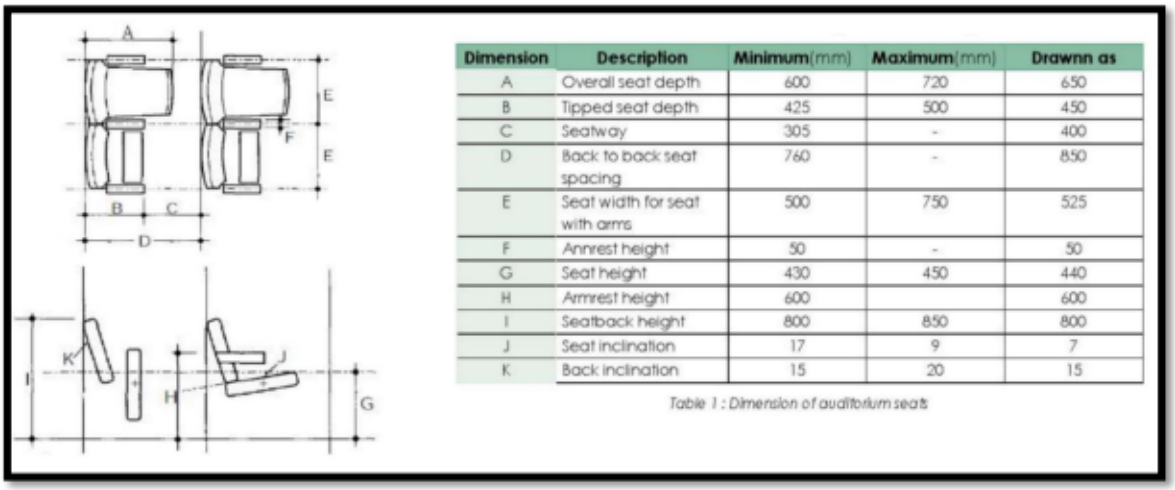


Figure 58 Auditorium reflectors







Dimension	Description	Minimum(mm)	Maximum(mm)	Drawnn as
A	Overall seat depth	600	720	650
B	Tipped seat depth	425	500	450
C	Seatway	305	-	400
D	Back to back seat spacing	760	-	850
E	Seat width for seat with arms	500	750	525
F	Annrest height	50	-	50
G	Seat height	430	450	440
H	Armrest height	600		600
I	Seatback height	800	850	800
J	Seat inclination	17	9	7
K	Back inclination	15	20	15

Table 1 : Dimension of auditorium seats

Figure 59 Seating for auditorium

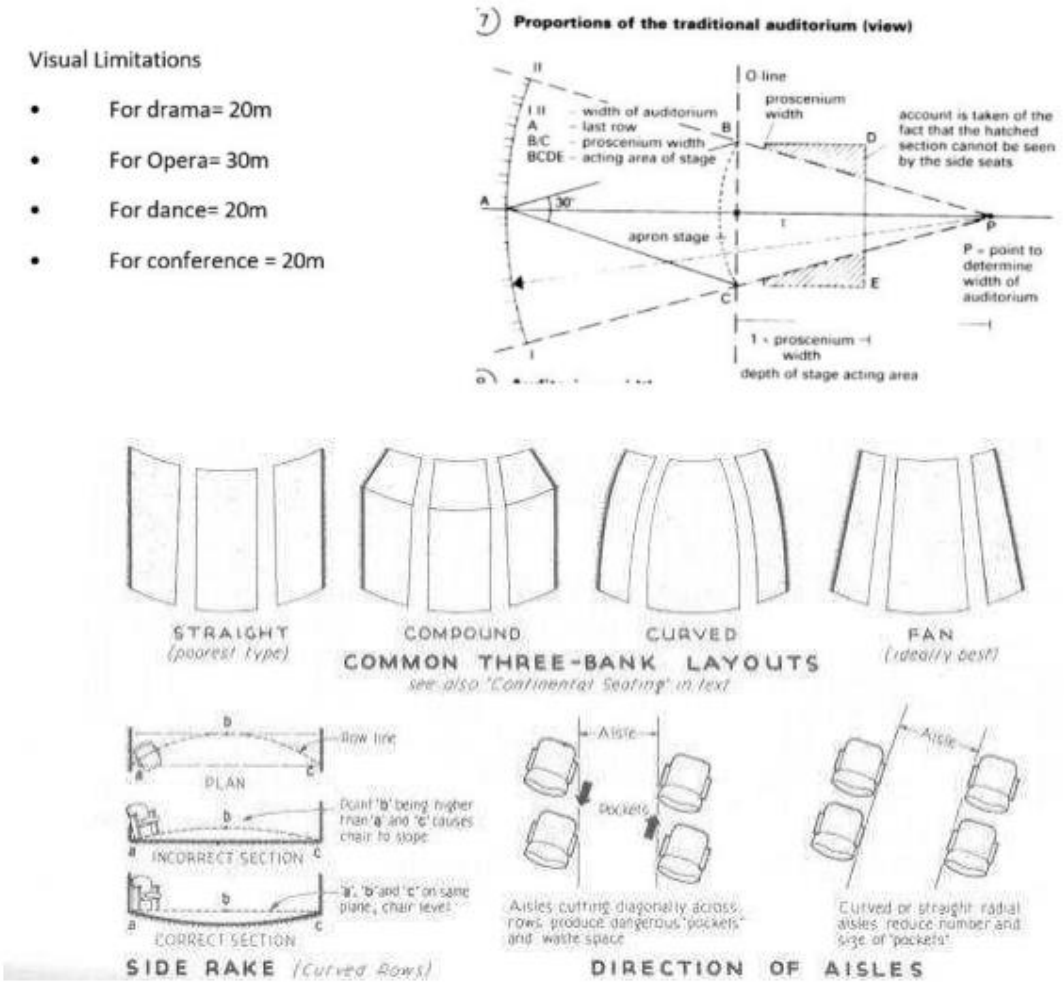


Figure 60 Auditorium seating arrangement

2.11.3 SEATING

With traditional seating, the maximum number is 22 if there are gangways at both ends of the row, and 11 for gangways at one end. Rows with more than 22 seats are permitted if the audience is not thereby imperiled.

• minimum Dimension of seating with arms =500mm Without arms =450mm

• Seat height = 430-450 mm

• Angle of inclination= 7-9 degree with horizontal Back Height = 800-850mm

• Angle of inclination = 15-20 degree

• Seat Depth= 600-720 mm, reduced to 425-500mm when the seat is tipped Other Factors affecting seating is,

• Acoustics: Upholstery to satisfy the acoustic requirements, usually the level of absorbency when unoccupied

• Ventilation & heating: Air supply or extract under a seat

• Upholstery: Thickness of padding should provide comfort & avoid fatigue, material of padding and finish must satisfy fire regulations

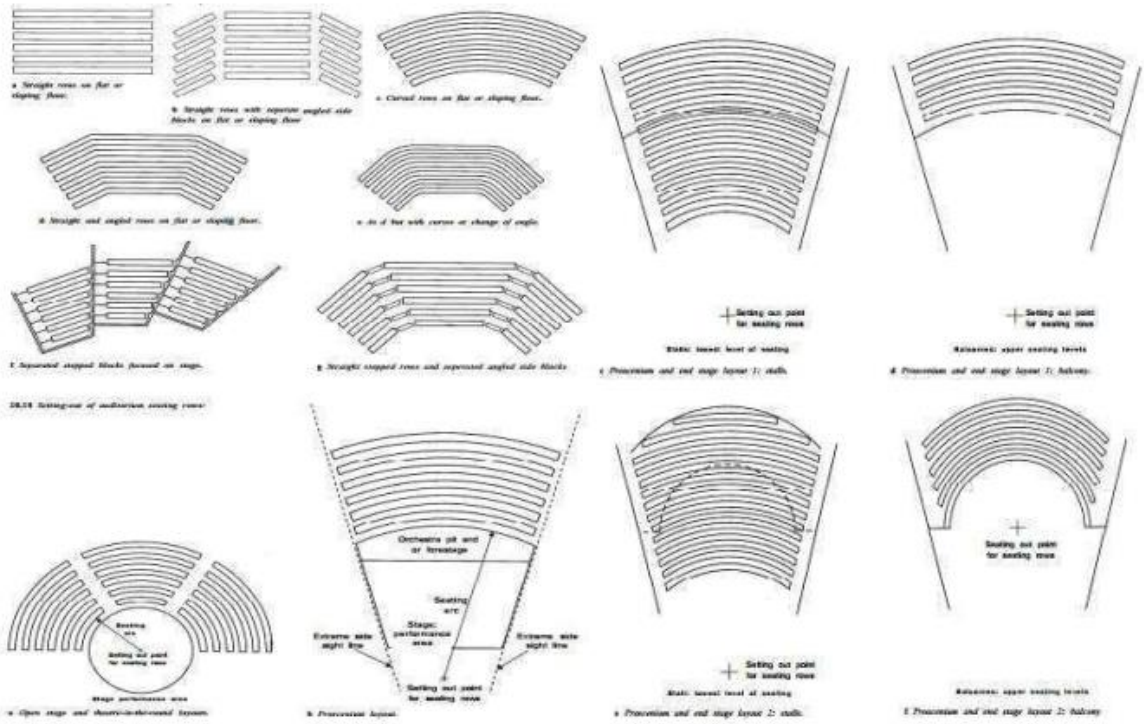


Figure 61 Seating

Seating geometry

Seating is usually laid out in straight or curved rows focused toward the platform or stage. Further forms are the angled row, straight row with the curved change of direction, and straight rows within emphasised blocks of seats.

Seating density

Seats with arms and tippable seat can occupy a space as small as 500 mm wide with a how-to-row dimension of 760 mm: but can be as large as 750 mm wide by 1400 mm. The area per seat therefore varies between 0.38 m² and 3.05 m².

Row to row spacing

Spacing is controlled by the clearway between the leading edge of the seat and the rear of the back of the seat in front. For traditional seating, the minimum clearway for people to pass along the row is 300 mm and this dimension increases with the number of seats in a row. For continental seating the clearway is not less than 400 mm and not more than 500 mm Gangways

As gangways are essential to escape routes, their widths are determined by the number of seats served. The minimum is 1100 mm. They can be ramped up to 10%. If the seating rake is steeper, gangways must-have steps extending the full width and these must have consistent treads and risers in each run

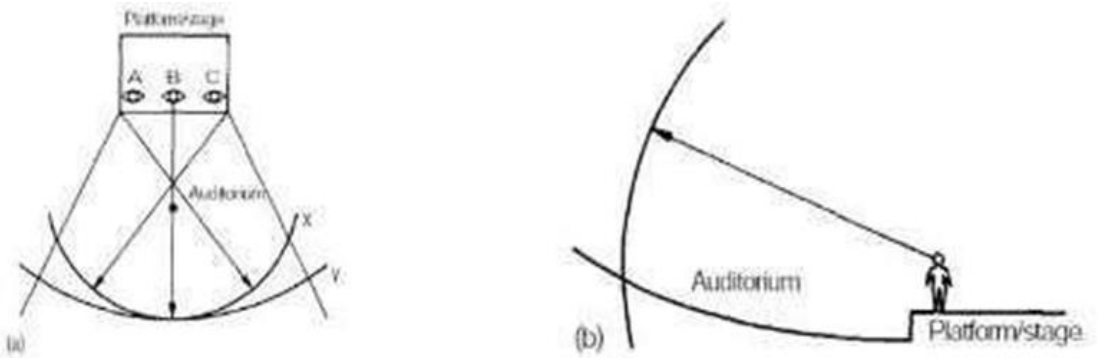


Figure 5: Visual and aural limitations: (a) Plan: for a performer at centre stage B there is an arc Y beyond which visual and aural perceptions are impaired. However, for performers nearer the sides of the stage at A and C produce more restrictive curves X. (b) Section: Similarly, visual and aural limits in section also set an arc centred on the performer.

Figure 62 Visual limitations

2.11.4 SIGHTLINES

Horizontal sightlines:

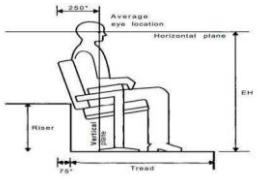
It is obtained from spectator's psychological perception & viewing angle.

- Good view without head movement= 30 degree
- Good view with head movement = 60 degree
- Maximum perception angle = 110 degree
- With full head & shoulder movement= 360 degree

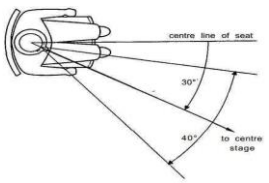
So, fan shape less than 100 degree is preferable due to Sightlines & Acoustic reason in Auditorium.

Vertical sightlines:

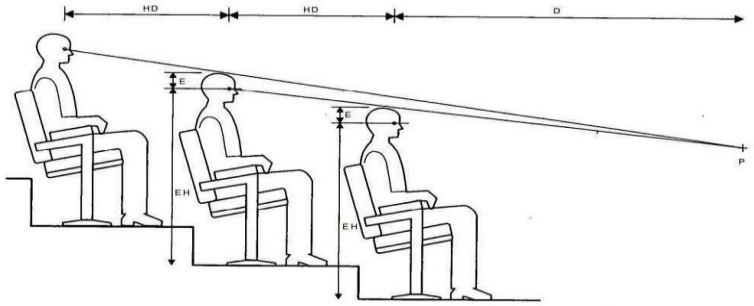
The longitudinal section is a parabolic stepped floor as a theoretical rake produced by the sightline calculation. This gives every member of the audience similar viewing conditions. This may be reduced to a single angle or series of angles when applied as described the rake will also be steep. This is satisfactory for a single tier of seating with no balconies and is especially appropriate for open-stage formats.



20.22 *Position of eye in relation to seat and stepped floor. Dimensions vary according to upholstery thickness, and inclinations of both seat and back. Working dimensions are starred **



20.25 a *The maximum comfortable amount the head can be turned from the seat centreline is 30°.*



20.21 *Graphic representation of vertical sightlines, P lowest and nearest point on stage clearly visible by audience, HD horizontal distance between eyes in successive audience rows, EH average audience eye height above floor, E height between eye and top of head, D distance from eye of person in front row to P*

Figure 63 Sightlines

2.11.5 Other Spaces

- It should have discrete access
- Be equipped with secure hanging space
- Have mirrors with good lighting over vanity tables Have separate toilets & showers
- Have audio/video feed from performance areas Be equipped with phones and power outlets

Rehearsal Rooms

- Enclosed space without natural light close to the dressing room
- Sound system, Lighting
- There should be at least one stage for the rehearsal of performances

Storage room

- 20-25% of playing area

Workshops for making scenery

- Should be exclude from main hall due to fire & limited space options
- 4-5 times the area of main stage

Technical utilities

- Transformer room
- Medium & low voltage switch room Power batteries
- HVAC plants
- Fire sprinkler system

Cloakrooms

- Minimum 4m2 per 100 people

2.11.6 Frequency and flexibility of change

Another key feature of sustainability is recycling. Buildings are relatively permanent, while the organisations and activities within them are continuously changing. Flexibility is hence very important for a building to be used to its maximum potential Frequency of change depicts the flexibility expected. To allow for maximum flexibility, different time scales of building briefing and design can be distinguished into separate functions off.

Building shell: The structure and enclosure of the building lasting 50- 75 years, while the functions within change many times over. The ability of the shell to allow for change 1s reflected in the depth of space, location of cores, floor-to-floor height to allow capacity for services, and the floor plate configuration.

Building services: The heating, ventilation, and cabling infrastructure of a building, which have a life span of 15 years or less before the technology, becomes obsolescent.

Scenery: The fitting- out components of a building, such as ceilings, lighting, finishes which adapt a building to a specific organisation's requirements. The life span of a fit-out is between 5 and 7 years.

Setting: The day-to- day re-arrangement of the furniture and equipment to meet changing needs.

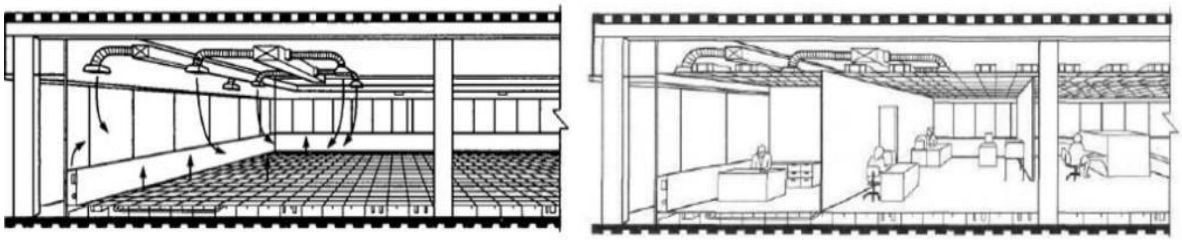
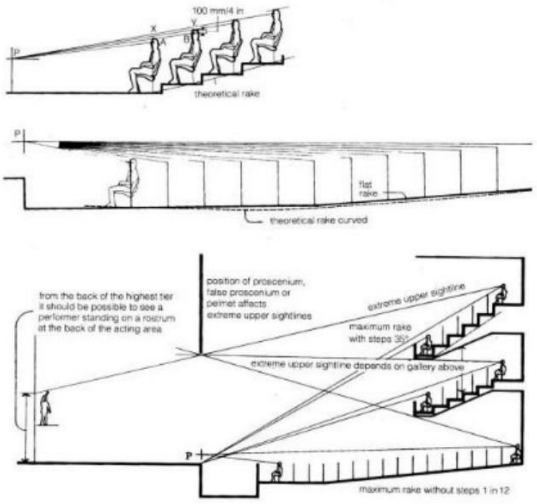
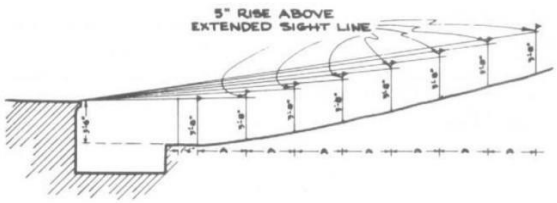
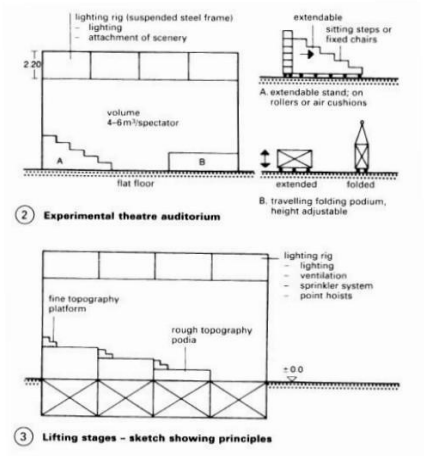


Figure 64 Flexibility of change



Seating angle is not uniform. It is determined by the viewing angle of audience members. [Source: Neufert]





Flexible seating in a blackbox theatre. Either the levels can module to become seating or it can remain flat, employing removable seats and chairs - arranged specific to the event. [Source: Neufert]

The viewing angle determines the auditorium width and wings division on the stage. [Source: Neufert]

Figure 65 Visual standards

Outdoor performing area

- Slope of seating should not be less than 12 Degrees.
- Wind direction is towards the audience from the stage.
- Backstage wall should be made reflective and broken into convex shaped surface.
- Depending on the ambient noise level of the site, orientation, layout and structural design should be arranged to provide necessary noise reduction so that the background noise level of not more than 40 to 45 dB

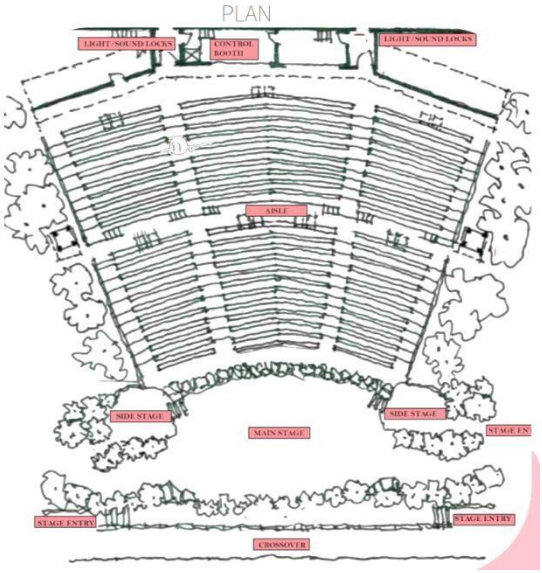
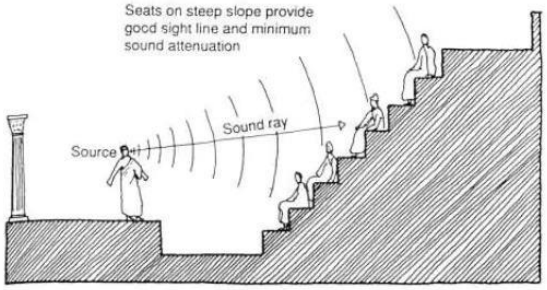
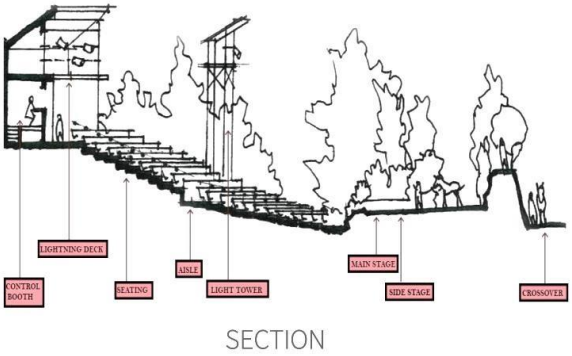


Figure 66 OAT





Shape - When the cavea of the theatre is modelled as sloped surfaces the theatre will resemble the shape of an inverse cone. This shape will tend to direct most of the reflections towards the open sky and therefore the energy will dissipate quickly leaving few late reflections. Curved or bowl-shaped, both behind the stage and behind the audience, creating an area which echoes or amplifies sound, making the amphitheatre ideal for musical or theatrical performances. Overall shape should be flat in plan; however, if it is desired to be concave. In order to begin planning a new facility one must have some general idea of potential audience size. It should be broken into convex surfaces which in either case should be of at least 90 to 180 m width.

Part 3: Site Inventory

3.1 Demographics of Vishakapatnam

Visakhapatnam is a major port city and the largest city in the state of Andhra Pradesh, India. It serves as the administrative headquarters of both Visakhapatnam district and Visakhapatnam Metropolitan Region.

- Population: The population of Visakhapatnam's urban area was approximately 2,278,000 in 2022 and is estimated to have reached 2,331,000 in 2023. According to the 2011 Census, the city proper had a population of 1,728,128, which has grown significantly since then due to urban expansion and migration.
- Literacy Rate: Visakhapatnam has an average literacy rate of 81.22% in urban areas as per the 2011 Census, with male literacy at 86.88% and female literacy at 75.51%. This makes it one of the more literate large cities in Andhra Pradesh, though it is still below New Delhi's rate.
- Religious Demographics (2011 Census): Hinduism is the predominant religion with 92.32% of the city's population, followed by Islam (3.85%), Christianity (3.07%), Jainism (0.11%), Sikhism (0.10%), and Buddhism (0.03%). Other communities, including those with no stated religion or other religions, constitute 0.54% of the population.

Visakhapatnam is also notable for its relatively balanced sex ratio, cultural diversity, and status as a rapidly growing urban center on India's eastern coast.

3.2 Topography

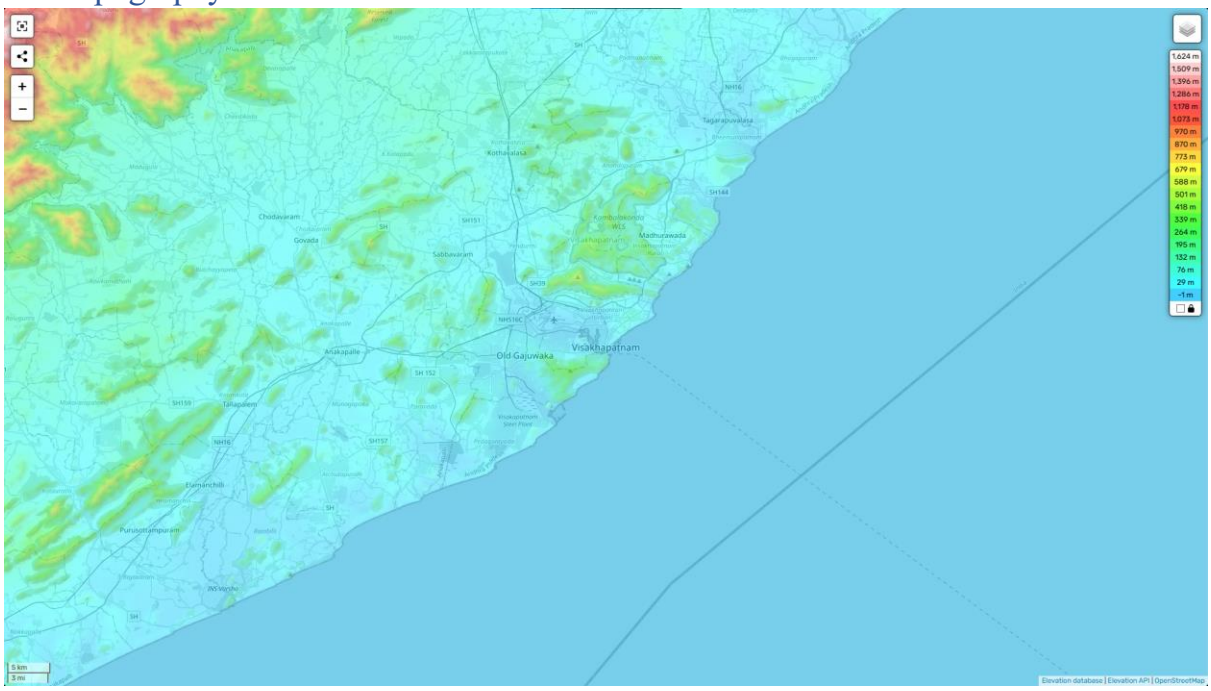


Figure 67 Vishakapatnam Topography

- The topography within 2–10 miles of the city includes moderate elevation changes due to hills, with a **maximum elevation difference of about 510m** (1,673ft). However, the urban coastal core is relatively flat (between 10–60m), with hills rising abruptly nearby745.
- The city lies in a **narrow plain along the Bay of Bengal**, bound by the Eastern Ghats (notably the Simhachalam, Dolphin's Nose, and Kailasagiri hills), creating a mosaic of flat coastal terrain and steep hills12. Unlike New Delhi's modest elevation changes, Vizag's

terrain rises more sharply into the hills, although the main urban sprawl is generally flat and close to sea level.

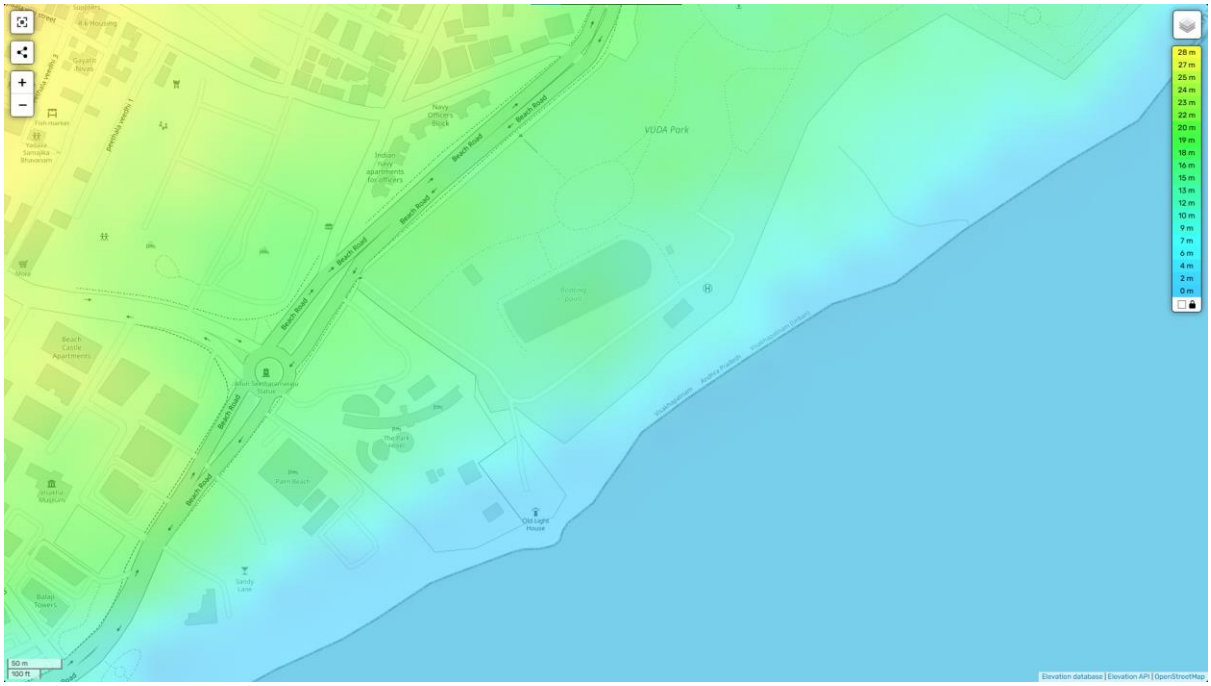


Figure 68 Site Topography

Latitude: 17°43'20.9"N

Longitude: 83°20'21.0"E

Maximum elevation: 20 m

3.3 Proximity of Site

3.3.1 Immediate Location and Adjacency

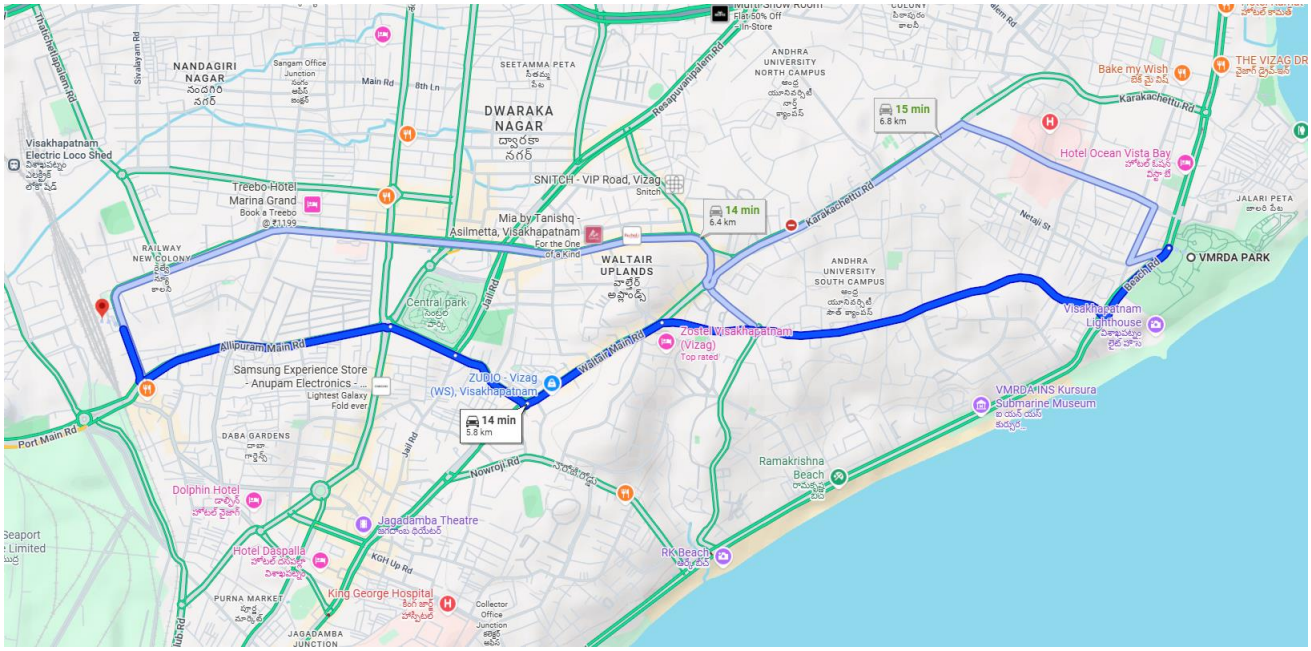
Address: VMRDA Park is situated on Beach Road, a major arterial road running parallel to the Bay of Bengal in central Visakhapatnam.

Primary Setting: Directly faces Ramakrishna Beach (RK Beach), with its main entrance on Beach Road. There are no significant barriers between the park and the beach—visitors can walk directly from the park to the seafront within minutes.

- Landmark Neighbors (within 250–500m):
- RK Beach (beach promenade, vendors, food stalls)
- Victory at Sea War Memoria
- Submarine Museum (INS Kursura)
- Matsya Darshini Aquarium
- Coastal eateries and boutique shops

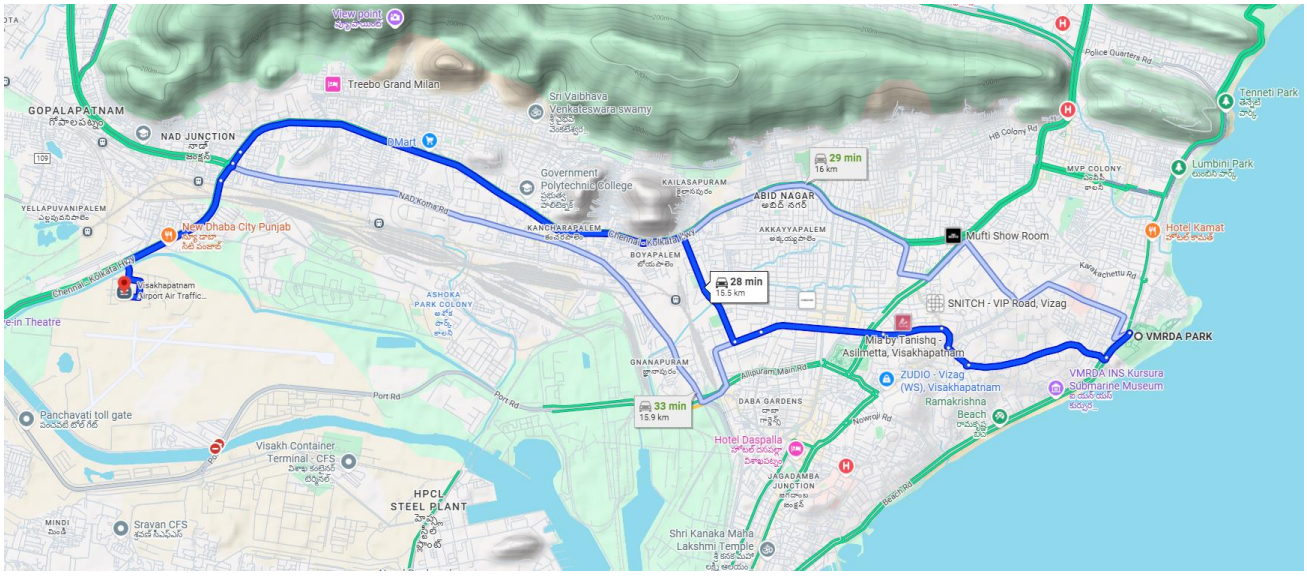
Visakhapatnam Railway Station

VMRDA Park (also known as VUDA Park) is about 6 km from Visakhapatnam Railway Station, making it a quick drive or a short public transport ride away along the Beach Road.



Visakhapatnam Airport

VMRDA Park is around 11 km from Visakhapatnam International Airport, typically taking about 30 minutes by road via Kancharapalem Main Road, NAD Kotha Road, or NH16, with easy taxi and bus options available.



Schools near VMRD Park, Visakhapatnam

- Oakridge Early Years Campus, Siripuram: Around 2.5–3km from VMRDA Park. Located in the Siripuram area, which is a short drive along Beach Road.
- Sanskriti Global Preschool, Lawsons Bay Colony: About 2.5km from VMRDA Park. This area is easily accessible and located further north along the coast.
- Gurusthanam (CBM Compound): Approximately 3–3.5km from VMRDA Park, depending on the exact address within CBM Compound, which is close to the city center.

- Ralla Bella International School, MVP Colony: Roughly 3–4km from the park, situated inland from Beach Road and easily reachable by a short drive.
- Helen O'Grady International Preschool, MVP Colony: Also about 3–4km from VMRDA Park, located in the educational hub of MVP Colony.
- Kidz Garden Public School, MVP Colony: Approximately 3.5–4.5km from VMRDA Park.
- Santhi Nikethan Global School & Rivendale Early Learning Centre: Both are found in residential zones within a 4–5km radius of the park.

Hospitals near VMRD Park, Visakhapatnam

- MGM SevenHills Hospital: About 3–3.5km from VMRDA Park, offering multi-specialty healthcare and emergency services.
- Apollo Hospitals, Ramnagar: Roughly 3.5km away, known for its advanced diagnostics and super-specialty departments.
- OMNI RK Multi Specialty Hospital: Also around 3.5km from the park, providing a wide range of general and specialty services.
- Bharathi Hospital: Approximately 3.7km from VMRDA Park; specializes in maternal and women's health.
- King George Hospital (KGH): About 4km away, this is the largest government hospital in the area, offering comprehensive emergency and general care.
- Venkatarama Hospital: Around 4km from the park, recognized for multi-speciality services and wheelchair accessibility.
- Andhra Hospital: 4.2km away, popular for its accessibility and varied onsite medical services.
- Vijetha Hospital: Roughly 4.3km from VMRDA Park, focusing on women's and children's health with family-friendly amenities.
- Viswam Superspeciality Hospitals: Located about 4.4km away, known for its specialty departments and modern facilities.
- Akshaya Hospital: About 5km from the park, offering general care and emergency services in a clean, accessible environment.

Colleges near VMRD Park, Visakhapatnam

- Andhra University: This major public university is one of the closest prominent institutions to VMRDA Park. It is situated about 2–3km away and accessible in roughly 5–10 minutes by car or auto-rickshaw, mainly via Beach Road or Waltair Main Road.
- Dr. Lankapalli Bullayya College: Also a well-known college in Visakhapatnam, it lies about 3km from VMRDA Park in the Dwarka Nagar area.
- GITAM University: Located further north in the Rushikonda locality, GITAM University is approximately 8–9km from VMRDA Park, making it a short drive along the coastal road.

Police Stations near VMRD Park, Visakhapatnam

- Andhra University: Andhra University is located about 2–3km from VMRDA Park, making it easily accessible via Beach Road or Waltair Main Road. This public university is one of the most significant educational institutions in the city and is within a 5–10 minute drive from the park.

- Dr. Lankapalli Bullayya College: Situated approximately 3km from VMRDA Park, in the Dwarka Nagar area, Dr. Lankapalli Bullayya College is also a short drive away, offering convenient access for students and visitors.
- GITAM University: Though farther than the above colleges, GITAM University is located about 8–9km from VMRDA Park in the Rushikonda area, accessible in 15–20 minutes by car along the scenic coastal road.

3.3.2 Distances to Major City Nodes

2. Distances to Major City Nodes		
Destination	**Approx. Distance from VMRDA Park**	**Mode/Notes**
RK Beach (main promenade)	200–250m	2–3 min walk, adjoining property
RTC Complex (Main City Bus Stand)	500m	5–7 min walk, direct access
Vishakapatnam Railway Station	~6km	15–20 min by car, auto, or city bus
Visakhapatnam International Airport	~11km	25–30 min by taxi or auto, direct city route
MVP Colony (major residential area)	3–4km	10 min by road, buses and autos available
Kailasagiri (viewpoint/hill park)	~5km	Along Beach Road, scenic drive, ~15 min
Dwaraka Nagar (City center/shopping)	1.5–2km	5–10 min drive or 20–25 min walk
Andhra University	3.5km	10–12 min by road, buses frequent
Jagadamba Junction (CBD/market)	2.5–3km	8–10 min drive, heart of city shopping and cinema

3.3.3 Transport and Access

Road Access: Excellent; located on a major city road with frequent public buses, autos, and easy car parking.

Pedestrian Access: Wide pavements and crossings connect the park to city bus stops, beachfront, and hotels.

Connectivity: VMRDA Park is a central node in Visakhapatnam's tourist corridor, with walkable or short-travel connections to several significant attractions, entertainment venues, cultural sites, and dining options.

3.3.4 Proximity to Events, Festivals, and Tourism Infrastructure

Events and Festivals: RK Beach road is the prime venue for beach festivals, concerts, New Year's and Republic Day celebrations, frequently spilling over into VMRDA Park due to its open lawns.

Hotels and Dining: Numerous hotels (ranging from luxury to budget) and seafood restaurants are within 1km, making the park a key part of the city's visitor infrastructure.

Family and Group Visits: Combined access to the beach, museums, and aquarium make it a hub for school outings, family picnics, and tourist groups.

3.3.5 Urban Context and Mapping

Urban Core: VMRDA Park forms the green "lung" of central Beach Road, providing vital open space amid urban density.

Landscape Integration: The park is visually continuous with RK Beach and nearby memorials, providing unbroken seafront green space along nearly 1km of the city's coastline.

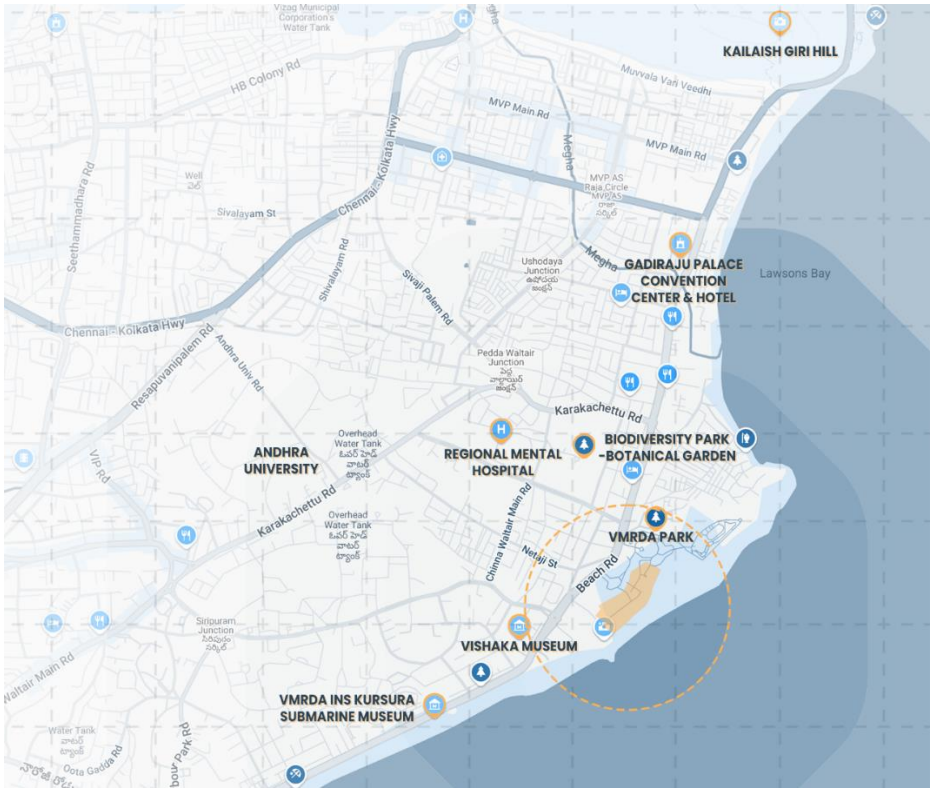


Figure 69 Site proximity



Figure 70 Typical traffic analysis

3.4 Site Contour Analysis

VMRDA (NTR/VUDA) Park, located on the beachfront along RK Beach, covers approximately 55 acres and is known for its lush lawns, recreational facilities, and scenic views of the Bay of Bengal. Its contour and topographical characteristics are crucial to both its usability and natural drainage.

General Terrain

The park is primarily flat to gently undulating, lying adjacent to the coastline with a gradual slope downward toward the Bay of Bengal.

Average elevation at the park entrance (Beach Road side) is about 11m above sea level, while the beachfront drops to about 4m. This yields a typical elevation difference of just 7m across a horizontal distance of 60–120m, resulting in a very gentle slope of roughly 7% from road to shore.

Contour Characteristics

Contours are widely spaced, reflecting minimal variation in elevation within the park itself. There are no abrupt dips, hills, or steep gradients.

The highest points are along the entrance (Beach Road), with gradual, almost imperceptible descent toward the back of the park and the seafront.

Landscaping elements (lawns, gardens) and amenities (paved walkways, cycling tracks) are positioned on these gentle grades, with no zones of sharp contour shifts.

Functional Implications

Accessibility: The gentle and almost level topography allows for easy movement for all age groups, including the elderly and children; wheelchair and stroller access is facilitated.

Drainage: Natural slope toward the sea supports good rainfall runoff and reduces risk of waterlogging, but the gentle gradient ensures there is no risk of slope instability or erosion under typical conditions.

Land Use: The park's nearly level contours support large, contiguous lawns, a musical fountain plaza, play areas, and event spaces, all without requiring significant grading or terracing.

Contrast With Surrounding Areas

Unlike Visakhapatnam's more hilly sites (e.g., Kailasagiri), VMRDA Park is developed on low-gradient, coastal land. Nearby city regions may show greater elevation variability, but the park itself is designed to remain accessible and hazard-free.

Mapping and Survey Data

The park sits within a large urban block with contour lines showing only modest elevation drops from the northwestern entrance (Beach Road) toward the sea. There is no significant contour compression (indicator of steepness), and most of the park remains at elevations between 4–11m.

City master plans and regional development surveys confirm this area as "coastal plain with gentle slope," categorized for open, public recreational use to take advantage of its benign relief and scenic value.

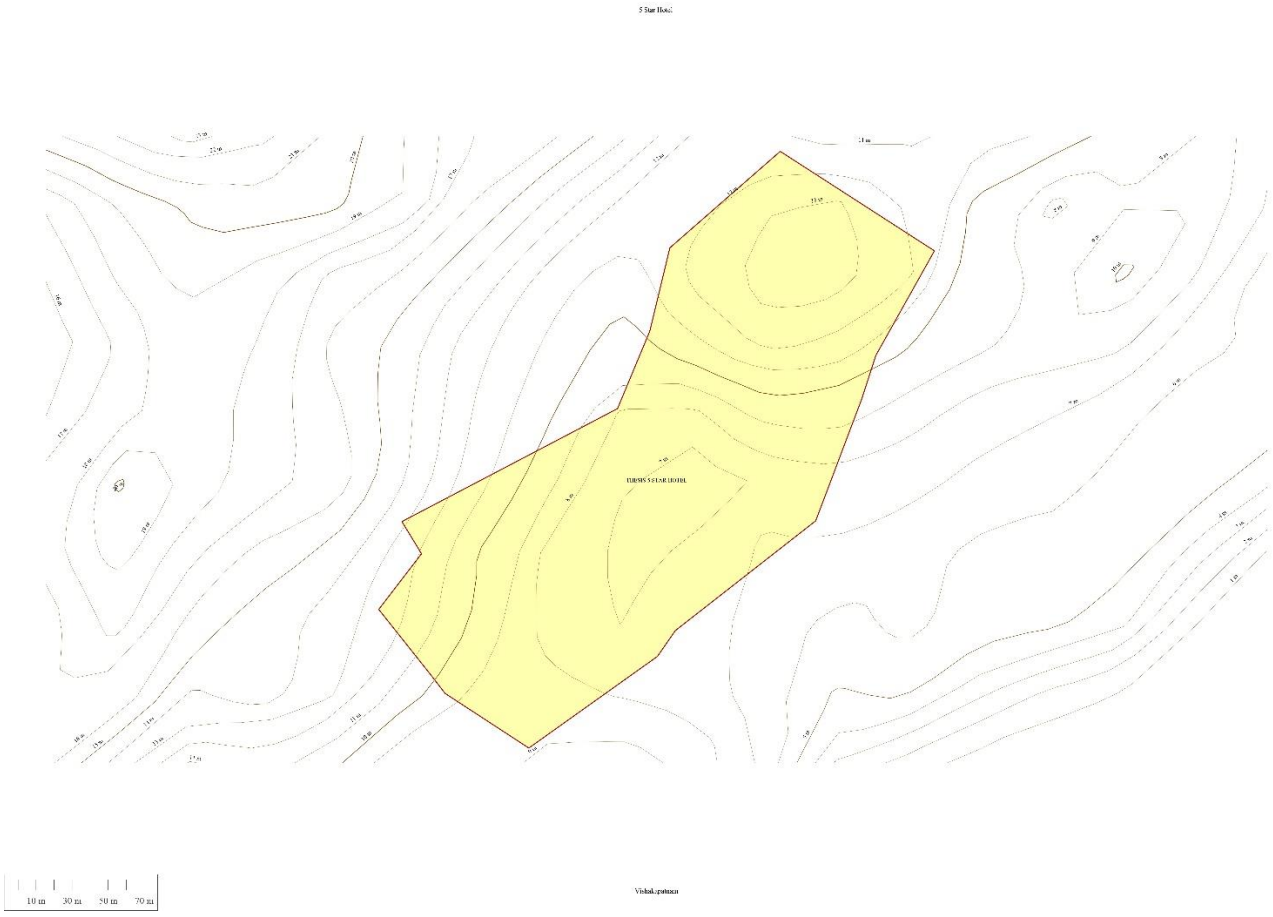


Figure 71 Site Contours

3.5 Site Section/Slope

Park Location and Terrain

VMRD Park is a coastal urban park covering about 55 acres, of which 37 acres consist of lawns and landscaping, adjacent to RK Beach and the Bay of Bengal.

Unlike the steeper Kailasagiri Hill (360ft high), VMRD Park is on largely flat to gently undulating terrain due to its immediate proximity to the sea, providing easy access and walkable expanses for visitors.

Slope Characteristics

The area is developed on beachfront land, which naturally has a low gradient. This ensures high usability, accessibility for children and the elderly, and minimal risk of erosion compared to hillside parks.

While references to “steep slope” exist in discussions of site selection for other VMRDA development projects (such as stadiums and hillside parks), such steep and varied elevation changes are not present in VMRD Park itself. The park benefits from a “gradually sloping” profile descending gently toward the sea.

The park features no significant hills, abrupt cliffs, or embankments. The minor slopes occurring within the park are carefully managed with landscaping, drainage systems, and paved walkways to facilitate comfort and safety for large crowds.

Flooding and Erosion

The coastal location does expose the park to salt spray, sand drift, cyclone-induced winds, and potential short-term waterlogging during monsoon storms or cyclones, but the gentle terrain lessens the risk of significant structural damage from slope failure.

Proper landscaping, with extensive lawns, flower beds, and shade trees, helps stabilize the surface soil, reduce runoff, and enhance drainage.

Park Design and Accessibility

The park's nearly level topography allows for open lawns, children's play areas, jogging and cycling tracks, outdoor gymnasiums, amphitheater seating, and musical fountain installations to be placed without significant modification of the natural grade.

Elevation at the road/park entrance

The average elevation of VMRDA Park is about 11m above sea level. This corresponds closely with the elevation of Beach Road, which runs directly in front of the park and parallel to the coast.

Elevation at the shoreline

The elevation at the shoreline near RK Beach, which is immediately across from VMRDA Park, is approximately 4m above sea level.

Horizontal distance

The distance from Beach Road (adjacent to the park entrance) to the water's edge ranges from 60m to 120m depending on tidal conditions, beach width, and landscaping features.

Slope gradient

Across this distance (roughly 100m), the elevation drops by about 7m, yielding an average slope of 7%. This is considered a very gentle, walkable slope, and much of the transition from the road to the sea is via lawns or paved paths.


Google Earth
Visakhapatnam Light House
MEM Park
El Cafe
VUDA Park Pool


Google Earth
MEM Park
El Cafe
VUDA Park Pool



Figure 72 Site sections

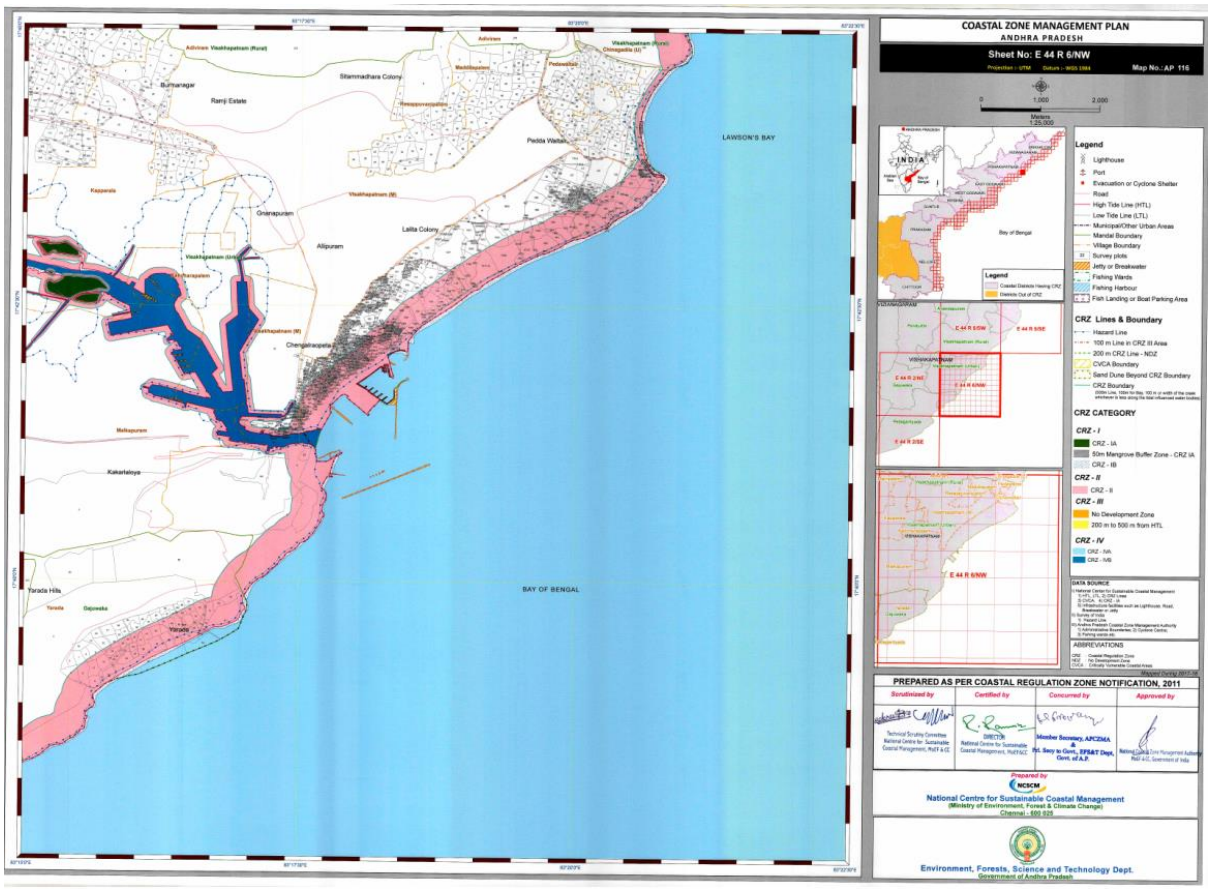


Figure 73 Vishakapatnam CRZ map

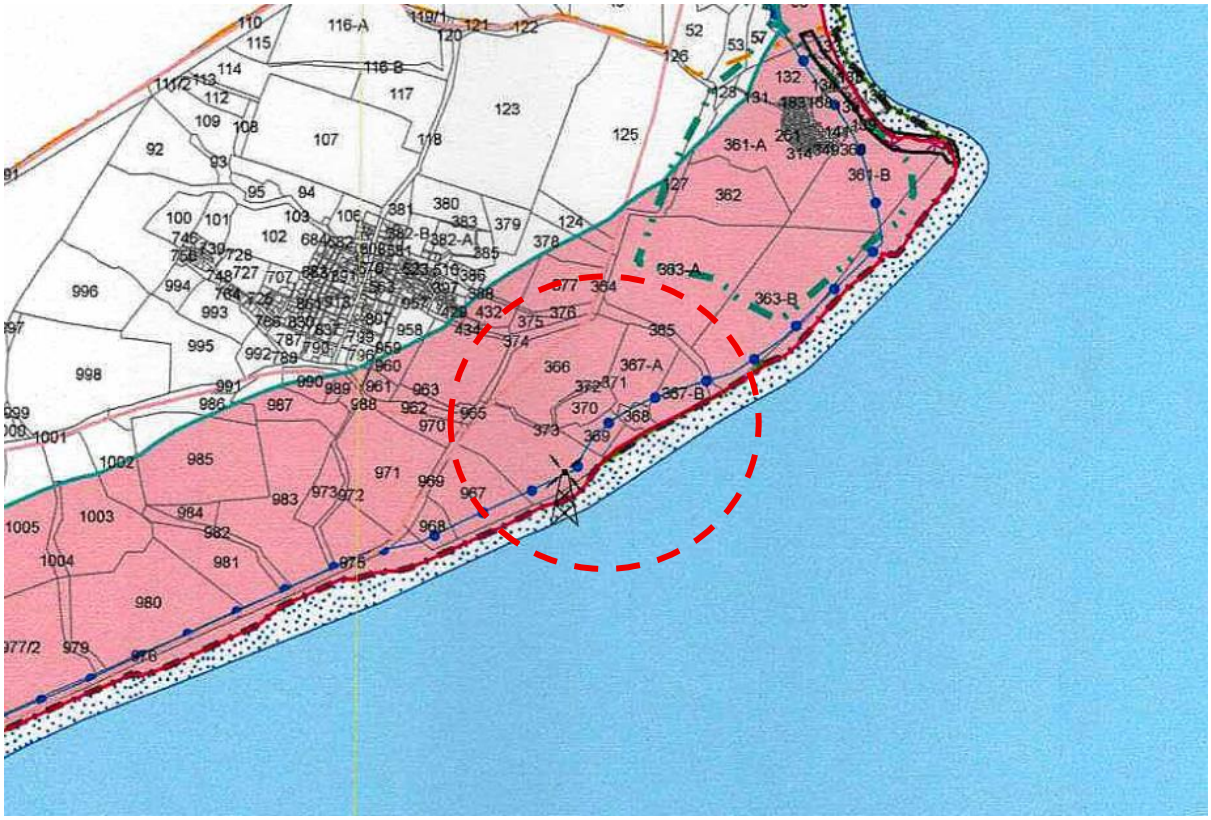


Figure 74 Site location in CRZ map

3.6 Vegetation & landscaping

Visakhapatnam, also known as Vizag, is a prominent coastal city located in the northeastern part of the Indian state of Andhra Pradesh. It is often referred to as the "City of Destiny" due to its unique geographic placement, scenic beauty, and rapid urban and industrial development. Nestled between the Eastern Ghats and the Bay of Bengal, Visakhapatnam possesses a highly diverse topography, which significantly influences the natural vegetation and landscaping patterns of the region. The city's terrain is a mix of undulating hills, flat coastal plains, and estuarine lowlands, creating microclimates that support a wide variety of native and introduced plant species.

Geographically, Visakhapatnam lies between **latitude 17.7°N and longitude 83.3°E**, covering an area of approximately **682 square kilometers**. The district itself extends from the Bay of Bengal on the east to the hilly terrain of the Eastern Ghats in the west. The region is drained by small seasonal rivers like Meghadrigedda, Gambhiram Gedda, and tributaries of the Sarada River, which support the local hydrology and natural vegetation. The presence of coastal features, hills, and river systems adds to the biodiversity richness of the area.

Visakhapatnam enjoys a tropical wet and dry climate, with hot summers, moderate to heavy monsoons, and mild winters. The city receives an average annual rainfall of around **1,100–1,200 mm**, primarily from the southwest monsoon. This seasonal rainfall, along with moderate temperatures, facilitates the growth of diverse forest types, including **moist deciduous**, **dry deciduous**, **tropical semi-evergreen**, and **dry evergreen** forests, in addition to **coastal strand vegetation** and **mangrove ecosystems**.

The city and its surrounding district are known for their rich biodiversity, with a variety of ecosystems ranging from **hill forests**, **coastal beaches**, and **urban green belts** to **estuarine mangrove swamps**. These natural systems are home to an array of flora and fauna, including endemic and medicinal plant species, birds, butterflies, reptiles, and small mammals. The **Eastern Ghats** that border the city act as

a significant biodiversity hotspot, with several protected areas such as the **Kambalakonda Wildlife Sanctuary** playing a vital role in the conservation of this natural wealth.

However, rapid urbanization, population growth, and industrial expansion have significantly impacted the city's natural landscape over the past two decades. The pressure to accommodate infrastructure, housing, and commercial development has led to a noticeable decline in green cover and open spaces, particularly in the urban and peri-urban zones. According to recent environmental assessments, Visakhapatnam has experienced a drastic reduction in both **forest cover** and **agricultural land**, accompanied by an increase in **built-up areas** and **industrial zones**. This trend poses a serious threat to the city's ecological balance and has prompted greater attention to conservation, sustainable landscaping, and the integration of green infrastructure into urban planning.

3.6.1 Vegetation Types & Ecosystem Zones

Visakhapatnam district encompasses a wide ecological gradient—from coastal plains and hill ranges to dry inland zones—resulting in diverse vegetation types. These range from tropical moist and dry deciduous forests in the Eastern Ghats to mangrove ecosystems along the coast. This chapter provides a zone-wise breakdown of native vegetation types, dominant species, and their ecological significance.

3.6.2 Tropical Moist Deciduous Forests

Moist deciduous forests are prominent in the northern and northwestern parts of Visakhapatnam, especially within and around the **Eastern Ghats hill ranges** (Simhachalam Hills, Anantagiri, Paderu region).

- **Altitude**: 300–900 meters
- **Soil type**: Loamy to red sandy loam
- **Annual rainfall**: 1200–1400 mm
- **Canopy structure**: Dense multi-layered canopy with high undergrowth

Dominant Tree Species:

- *Tectona grandis* (Teak)
- *Terminalia tomentosa* (Asan)
- *Diospyros melanoxylon* (Tendu)
- *Madhuca indica* (Mahua)
- *Shorea robusta* (Sal) – patchy distribution
- *Michelia champaca* – evergreen flowering species

Ecological Value: These forests serve as water catchments for major rivers like Gosthani and Tandava and provide habitat to leopards, porcupines, and several bat species. They are also rich in **non-timber forest products (NTFPs)** like mahua flowers, tendu leaves, and resin.

3.6.3 Tropical Dry Deciduous Forests

These forests dominate the **Pendurthi**, **Gajuwaka**, and **Araku valley foothill regions**, especially on low rainfall plateaus and inland slopes.

- **Altitude**: 100–500 meters
- **Soil type**: Shallow, gravelly red soil

- **Rainfall**: 900–1100 mm

Characteristic Flora:

- *Anogeissus latifolia*
- *Chloroxylon swietenia* (Satinwood)
- *Dendrocalamus strictus* (Male bamboo)
- *Boswellia serrata* (Indian frankincense)
- *Lannea coromandelica* (Jhingan)

Features:

- Trees shed leaves seasonally (Oct–Feb)
- Open canopy structure, promoting grass growth
- Habitat for herbivores such as sambar and barking deer

Human Use: These forests supply fuelwood and fodder to tribal communities (Konda Dora, Jatapu tribes).

3.6.4 Dry Evergreen Scrub Forests

Present in degraded hill slopes and **semi-arid coastal fringes**, especially around areas like **Bheemili**, **Sabbavaram**, and **Anakapalle**.

- **Soil**: Sandy-clay, poor in humus
- **Rainfall**: <900 mm
- **Canopy**: Low height shrubs and thorny bushes, with scattered trees

Key Vegetation:

- *Albizia amara*
- *Wrightia tinctoria*
- *Randia dumetorum*
- *Ziziphus mauritiana*
- *Capparis sepiaria*

Adaptations:

- Small leaves, thorns, deep root systems
- Drought-resistant, low water requirement

Concerns: Often mistaken for ‘wasteland’, these are ecologically important **xeric buffer zones** that control erosion and provide native habitat for reptiles and ground birds.

3.6.5 Mangrove Forests

Mangrove vegetation is found in brackish estuarine regions along the **Meghadrigedda**, **Varaha**, and **Bheemunipatnam** creeks.

- **Area under mangroves**: ~450 hectares (2023 estimate)
- **Soil type**: Silty clay, highly saline
- **Tidal influence**: Bi-daily flooding aids nutrient turnover

Common Mangrove Species:

- *Avicennia marina* (Grey mangrove)
- *Rhizophora mucronata*
- *Aegiceras corniculatum*
- *Excoecaria agallocha* (Blinding tree)
- *Sonneratia alba*

Functions:

- Buffer against storm surges, cyclones, and tsunamis
- Spawning grounds for prawns, crabs, and mollusks
- High carbon sequestration and nutrient cycling

Threats:

- Encroachment for shrimp farming
- Solid waste pollution from adjacent urban areas
- Lack of ecological fencing

3.6.6 Grasslands and Open Savannah Zones

Occurring near **airport zones**, **steel plant buffer lands**, and **Maddilapalem plains**, these are often **anthropogenically influenced habitats**.

Species Present:

- *Cenchrus ciliaris*
- *Heteropogon contortus*
- *Cymbopogon martinii* (Lemongrass)
- Shrubs: *Cassia auriculata*, *Calotropis gigantea*

Importance:

- Support avifauna like peacocks, lapwings, partridges
- Grazing support for livestock
- Acts as ecological buffers around urban zones

3.6.7 Plantation & Urban Greening Vegetation

These include **planted tree belts**, **parks**, **median plantations**, and **urban landscaping** led by GVMC, VMRDA, and other agencies.

Urban Species Used:

- *Delonix regia* (Gulmohar)
- *Azadirachta indica* (Neem)
- *Peltophorum pterocarpum*
- *Ficus religiosa* (Peepal)
- *Polyalthia longifolia* (Ashoka tree)

Trends:

- Invasive fast-growing species like *Prosopis juliflora* have entered buffer zones
- Increased use of exotic palms in commercial areas

Current Challenges:

- Limited soil depth in built-up areas
- Tree root damage from paving and infrastructure
- Low survival rate of relocated trees post-development

Summary Table: Vegetation Zones of Visakhapatnam

Zone Type	Location Examples	Dominant Species	Threats
Moist Deciduous Forest	Anantagiri, Simhachalam	Teak, Champaca, Mahua	Logging, forest fires
Dry Deciduous Forest	Araku foothills, Pendurthi	Anogeissus, Tendu, Boswellia	Fuelwood pressure, overgrazing
Scrub Forest	Bheemili, Sabbavaram	Albizia, Randia, Capparis	Urban encroachment
Mangrove Forests	Meghadrigedda, Varaha	Avicennia, Rhizophora	Shrimp farming, pollution
Grasslands	Airport zone, Steel Plant	Cenchrus, Cymbopogon, Cassia	Construction, trampling
Urban Landscaping	Kailasagiri, RTC Complex	Neem, Gulmohar, Ashoka	Root restriction, improper care

3.7 Land Use & Vegetation Trends (2000–2025)

3.7.1 Overview of Land Use Dynamics in Visakhapatnam

Over the past two and a half decades, Visakhapatnam has undergone rapid urbanization, resulting in substantial transformations in land use and vegetation patterns. Between 2000 and 2025, the city expanded significantly in terms of infrastructure, population, industrial activity, and transportation

networks. This growth has been accompanied by a marked shift in land use from predominantly forested and agricultural land to urban and industrial development.

The total geographical area of Visakhapatnam district is approximately **11,161 km²**, of which **urban Visakhapatnam city** occupies around **682 km²**. According to satellite imagery analyses and land use data provided by the Indian Space Research Organisation (ISRO) and the Andhra Pradesh State Remote Sensing Applications Centre (APSRAC), the following trends are evident:

Land Use Category	2000 (%)	2025 (%) (Est.)	Change (%)
Forest Cover	35.1 %	26.7 %	–8.4 %
Agricultural Land	37.4 %	26.3 %	–11.1 %
Built-Up Area	8.2 %	18.7 %	+10.5 %
Industrial Zones	1.3 %	10.3 %	+9.0 %
Barren/Unused Land	7.8 %	5.2 %	–2.6 %
Water Bodies	2.4 %	2.8 %	+0.4 %

(Source: APSRAC, TOI 2024 Reports, GFW Land Use Analytics)

This shift reflects a broader trend across urban India, but in Visakhapatnam, the pace has been especially rapid due to the expansion of the IT and pharmaceutical sectors, the development of the Visakhapatnam–Chennai Industrial Corridor, and the growth of the city under the **Smart City Mission**.

3.7.2 Decline in Forest and Agricultural Land

Forest Cover

Visakhapatnam's forested areas, which are part of the Eastern Ghats range, have seen a **decline of nearly 24 %** in forest density between 2000 and 2025. Several forest zones that once hosted tropical dry deciduous and semi-evergreen vegetation have been fragmented or cleared for development projects such as road widening, industrial expansion (e.g., around Parawada and Anakapalli), and urban housing.

Significant portions of the **Kambalakonda forest belt** and adjoining hills near Simhachalam and Kommadi have suffered encroachments and degradation, although some parts remain under protection.

Agricultural Land

Agricultural zones around **Madhurawada**, **Pendurthi**, **Anandapuram**, and **Bheemili** have been urbanized to accommodate residential colonies, apartment complexes, SEZs, and logistic parks. The **decline of over 11 %** in agricultural land reflects both population pressure and a decline in interest in farming among the urbanizing population.

3.7.3 Urban and Industrial Expansion

The built-up area has more than doubled since 2000. Key factors contributing to this rise include:

- The **expansion of IT parks**, especially in Rushikonda and Madhurawada
- Development of **transport corridors** such as the Beach Road–Bheemili corridor and the Anandapuram–Gajuwaka NH-16 bypass

- Growth of **residential townships** under public-private partnerships in Yendada, Kommadi, and PM Palem
- Establishment of large industrial complexes in **Parawada Pharma City**, **SEZs near Atchutapuram**, and **food processing zones**

These developments have not only replaced green spaces but have also led to **fragmentation of ecological corridors** that connect forest patches, especially affecting the movement of native fauna such as peafowl, civets, and monitor lizards.

3.7.4 Impact of Cyclone Hudhud (2014)

A major event that contributed to a sudden loss of vegetation was **Cyclone Hudhud**, which made landfall near Visakhapatnam on October 12, 2014. With wind speeds exceeding **200 km/h**, the cyclone caused widespread destruction of:

- **Over 2 lakh trees** across city parks and roadways
- **75 % canopy loss** in Biodiversity Park and Kailasagiri
- Uprooting of heritage trees along Beach Road and MVP Colony
- Destruction of avenue plantations and roadside green buffers

The aftermath led to increased awareness about the need for disaster-resilient tree species and **multi-tiered planting schemes** to reduce future damage.

3.7.5 Vegetation Replacement and Landscaping Trends

As natural forests declined, there was a parallel increase in ornamental planting and landscape beautification efforts in urban Visakhapatnam. These changes were marked by:

- Increased planting of **exotic and fast-growing species** like *Acacia auriculiformis*, *Delonix regia*, and *Tabebuia rosea*
- Decline in **native shade trees** such as *Tamarindus indica*, *Ficus benghalensis*, and *Terminalia chebula*
- Introduction of **seasonal flowering trees** along roads (e.g., Pink Trumpet Tree) for aesthetic purposes
- Green medians and urban lawn installations, especially in Smart City zones and VMRDA-controlled areas

Though these efforts improved the **visual landscaping**, ecologists warn that **non-native species do not support local biodiversity** and often disrupt ecological balances, including bird nesting, pollination, and soil nutrient cycles.

3.7.6 Summary of Trends (2000–2025)

Category	Key Change	Impact
Forest Area ↓	–8.4 %	Habitat loss, biodiversity decline
Agriculture ↓	–11.1 %	Reduction in rural greenery
Built-up ↑	+10.5 %	Fragmentation of green cover

Category	Key Change	Impact
Industries ↑	+9.0 %	Air & water pollution, green zone shrinkage
Landscaping ↑	+200 % (est.)	Visual greenery increased, ecological quality mixed
Tree Canopy Loss (2014)	>75 % in urban parks	Slow recovery post-Hudhud

3.8 Urban Landscaping in Visakhapatnam

Urban landscaping in Visakhapatnam is a coordinated effort aimed at improving environmental quality, visual appeal, and the well-being of residents. The city's diverse topography—ranging from coastal plains to hilly terrains—has made landscape planning both a challenge and an opportunity. Under the leadership of the **Greater Visakhapatnam Municipal Corporation (GVMC)**, the city has seen a progressive transformation of its green infrastructure.

3.8.1 Role of GVMC in Urban Landscaping

The **Greater Visakhapatnam Municipal Corporation (GVMC)** plays a pivotal role in planning, executing, and maintaining urban landscaping projects. Key roles include:

- **Development & Maintenance** of public parks, green belts, and urban forests
- **Promoting biodiversity** through native tree plantations and floral diversity
- **Beautification of roads** with avenue trees and medians
- **Encouraging citizen involvement** via terrace gardening and "green volunteer" schemes
- **Smart City Integration**: Landscape planning aligned with Visakhapatnam's Smart City vision, ensuring every resident has access to green space within 300 meters

GVMC works in collaboration with the **Visakhapatnam Metropolitan Region Development Authority (VMRDA)** and **horticulture and forest departments**, ensuring expert guidance and scientific implementation.

3.9 Landscape Planning Strategies in Visakhapatnam

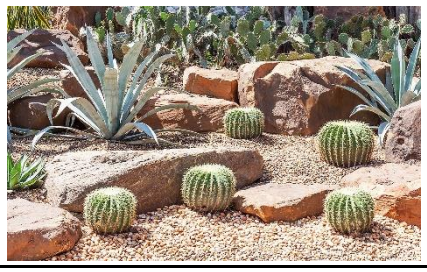
Landscape planning in Visakhapatnam reflects a thoughtful integration of ecological sensitivity, urban functionality, and aesthetic appeal. Due to its unique coastal geography, semi-tropical climate, and urban expansion pressures, the city has adopted strategic principles to make landscaping both sustainable and contextually appropriate.

3.9.1 Core Principles of Landscape Planning

Visakhapatnam's landscape design is guided by a set of ecological and climate-responsive principles aimed at long-term sustainability, visual harmony, and urban comfort.

a. Xeriscaping in Dry Zones

- **Xeriscaping** is a water-conserving landscaping method used in areas with low rainfall or limited irrigation.
- Deployed particularly in the **hilly areas of Simhachalam**, peripheral townships, and highway zones.
- Involves use of drought-tolerant species like:
    - *Agave americana*



- *Yucca*
- *Aloe vera*
- *Bougainvillea*

- Gravel mulch and local stone are used to reduce water evaporation and weed growth.

b. Native and Low-Maintenance Plant Selection

- Emphasis on using **indigenous species** that require less care and are better adapted to local soil and weather.
- Examples of native trees:
  - *Neem* (*Azadirachta indica*) – medicinal, pest-repelling
  - *Pongamia pinnata* – nitrogen fixer
  - *Indian Laburnum* (*Cassia fistula*) – aesthetic yellow flowering
  - *Ficus religiosa* – shade provider and culturally significant
- Low-maintenance ground cover such as *Wedelia*, *Lantana camara*, and *Portulaca* are used in medians and public gardens.

c. Use of Flowering and Shade Trees

- To enhance visual identity and reduce the urban heat island effect, planners prioritize:
  - **Deciduous trees**: Offer seasonal shade and light control (*Albizia lebbeck*, *Rain Tree*)
  - **Flowering trees**: Provide seasonal interest and biodiversity (*Tabebuia*, *Gulmohar*, *Jacaranda*)
  - **Evergreen shade trees**: Contribute to year-round cooling (*Banyan*, *Peepal*, *Mango*)

3.10 Site Vegetation

Lawn 1 Plantation & Landscaping

Tall palm trees are a distinct group of palm species known for their impressive height, often exceeding 15 meters (50 feet). These trees feature single, unbranched trunks that are usually straight and ringed with old leaf scars. Their crown is composed of large, showy leaves that may be either feather-like (pinnate) or fan-shaped (palmate), depending on the species. Due to their striking appearance, tall palms are commonly used in landscaping for tropical or coastal aesthetics, and many also hold cultural, economic, or ecological significance.



Lawn 2 Plantation & Landscaping



The Palmyra Palm (Borassus flabellifer) is a tall, robust palm species native to South and Southeast Asia, particularly widespread across India, Sri Lanka, and Thailand. Reaching heights of up to 30 meters, this palm is characterized by its thick, unbranched trunk marked with leaf scar rings and a crown of large, fan-shaped (palmate) leaves. Known for its exceptional drought tolerance, the Palmyra palm thrives in dry, sandy soils and plays a crucial ecological role in preventing soil erosion and providing shade in arid landscapes. It is culturally and economically significant, with nearly every part of the tree being utilized. The sweet sap extracted from its flower stalks is consumed fresh as *neera* or fermented into toddy, while its fruit, commonly known as ice apple or *nungu*, is a popular hydrating summer delicacy. The leaves are traditionally used for thatching, weaving mats, and even as writing material in ancient manuscripts. Its strong trunk wood is employed in rural construction. Long-lived and resilient, the Palmyra palm is not only a symbol of sustainability in rural livelihoods but also a vital species for landscape planning in hot, dry regions.



The Grey Mangrove (Avicennia marina) is a salt-tolerant mangrove species widely found along tropical and subtropical coastlines, especially in India, Southeast Asia, Australia, and East Africa. It is a medium-sized evergreen tree or shrub, typically growing up to 10 meters in height, though it can sometimes reach up to 15 meters under favorable conditions. The tree gets its name from the silvery-grey color of its leaves, which are thick, leathery, and salt-excreting. One of its most distinctive features is its pencil-like pneumatophores—aerial roots that protrude from the soil around the trunk, helping the tree breathe in oxygen-poor, waterlogged soils. Grey mangroves are incredibly resilient, thriving in saline tidal zones, estuaries, and mudflats, where they play a critical ecological role by stabilizing coastlines, reducing erosion, filtering pollutants, and providing habitat for numerous marine and bird species. They are also known for their high salt tolerance and ability to survive both submerged and exposed conditions due to daily tidal fluctuations. Traditionally, parts of the tree have been used in folk medicine, firewood, and fish trap construction. As a keystone species in mangrove ecosystems, the Grey Mangrove is essential for maintaining biodiversity and supporting the health of coastal environments.

Lawn 3 Plantation & Landscaping



Sonamukhi (scientific name: *Senna alexandrina*, formerly *Cassia angustifolia*) is a medicinal shrub native to arid regions of India, especially Rajasthan and Gujarat, as well as parts of North Africa. It belongs to the Fabaceae (legume) family. The plant is small and bushy, growing up to 1–1.5 meters tall, with compound leaves and small yellow flowers. Sonamukhi is widely known for its laxative properties, and its dried leaves and pods are commonly used in herbal medicines to treat constipation, skin disorders, indigestion, and sometimes detoxification therapies in Ayurveda and Unani medicine. The active compounds in the plant are

sennosides, which stimulate bowel movement by acting on the colon. It is also valued for being a drought-resistant plant, thriving in sandy, semi-arid soil with very little water, making it suitable for cultivation in dry and desert regions. In traditional Indian households, especially in rural areas, Sonamukhi tea is used as a natural remedy for digestion and purification. However, excessive or prolonged use is discouraged, as it may cause dependency or electrolyte imbalance.



Liriope (pronounced *lir-ee-oh-pee*) is a hardy, grass-like **groundcover plant** from the **Asparagaceae** family, native to East Asia (China, Japan, and Korea). Often referred to as **lilyturf** or **monkey grass**, Liriope is widely used in landscaping for **border edging**, **erosion control**, and **understory planting** due to its dense, clump-forming foliage and tolerance to a range of soil and light conditions. It features **narrow, arching green or variegated leaves** and produces attractive **purple, lavender, or white flower spikes** in late summer, followed by small black berries. There are two common species: **Liriope muscari**, which grows in neat clumps, and **Liriope spicata**, which spreads more aggressively through underground rhizomes. Liriope is highly valued for being **low-maintenance, drought-tolerant, pest-resistant**, and capable of thriving in both sun and shade. It also improves **soil structure** and helps reduce **surface runoff** in sloped areas. While primarily ornamental, it contributes to the ecological landscape by providing shelter to small insects and ground-dwelling fauna.

3.11 Climatic Data Analysis

3.11.1 Geographic Context

- **Location:** Eastern coastal India, in Andhra Pradesh.
- **Coordinates:** 17.6868° N, 83.2185° E
- **Elevation:** Approx. 45 meters above sea level
- **Proximity to Bay of Bengal:** Strong maritime influence on climate.

3.11.2 Climate Classification – Visakhapatnam

Köppen–Geiger Classification: Aw

- **"A" – Tropical climate:** All months have an average temperature above 18°C.
- **"w" – Dry winter season:** A distinct dry season during the low-sun months (winter), where **the driest month receives less than 60 mm of rainfall and less than 100−(meanannualrainfall÷25)100 − (mean annual rainfall ÷ 25)100−(meanannualrainfall÷25).**

Thus, "Aw" = Tropical Wet and Dry Climate (also called Tropical Savanna Climate).

General Climatic Characteristics

Feature	Description
Annual Temperature Range	Narrow, with monthly averages between 24°C and 31°C.
Seasonality	High; distinct wet and dry seasons.

Feature	Description
Monsoon Influence	Strong; heavy rainfall during June–October due to the South-West monsoon.
Humidity	High year-round, peaking during monsoon (80–90%).
Sunlight	Abundant sunshine except during monsoon.
Wind	Coastal breezes and cyclonic activity in post-monsoon period (Oct–Dec).

Seasonal Breakdown

Season	Duration	Climatic Traits
Summer	**March – June**	Hot and humid; temperature can reach 38–40°C; high discomfort index.
Monsoon	**June – October**	Heavy rainfall (avg. 1100–1200 mm/year); lush greenery; frequent storm activity.
Post-Monsoon	**Oct – Nov**	Intermittent rain with cyclone threats; receding humidity.
Winter	**Dec – Feb**	Mild and dry; temperatures range from 18–28°C; relatively pleasant weather.

Implications of "Aw" Climate on Architecture & Landscape

Factor	Implication
High Humidity	Encourage passive ventilation, large shaded openings, and breathable facades.
Heavy Rainfall	Require efficient stormwater drainage, sloped roofs, and water-resistant materials.
Dry Winters	Promote planting of drought-tolerant species for winter landscape continuity.
Temperature Consistency	Use of thermal mass and solar shading to maintain indoor comfort.
Cyclonic Risk	Strengthened roof anchoring, elevated plinths, and buffer green belts along coasts.

WEATHER DATA SUMMARY

LOCATION: **Vishakhapatnam, AP, IND**
Latitude/Longitude: 17.7217° North, 83.3292° East, **Time Zone from Greenwich** 5
Data Source: SRC-TMYx 431500 WMO Station Number, **Elevation** 66 m

MONTHLY MEANS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Global Horiz Radiation (Avg Hourly)	431	488	526	541	511	415	356	357	403	413	403	419	Wh/sq.m
Direct Normal Radiation (Avg Hourly)	507	531	544	536	486	317	235	233	289	378	447	509	Wh/sq.m
Diffuse Radiation (Avg Hourly)	108	111	127	126	130	163	167	170	176	139	117	109	Wh/sq.m
Global Horiz Radiation (Max Hourly)	836	873	957	969	966	924	860	868	892	871	822	768	Wh/sq.m
Direct Normal Radiation (Max Hourly)	894	902	875	858	834	804	676	690	775	819	858	874	Wh/sq.m
Diffuse Radiation (Max Hourly)	254	236	389	222	330	405	373	365	370	342	334	254	Wh/sq.m
Global Horiz Radiation (Avg Daily Total)	4777	5557	6274	6720	6575	5418	4610	4484	4885	4788	4500	4592	Wh/sq.m
Direct Normal Radiation (Avg Daily Total)	5613	6041	6483	6663	6243	4136	3044	2926	3497	4373	4988	5582	Wh/sq.m
Diffuse Radiation (Avg Daily Total)	1200	1270	1513	1575	1673	2130	2161	2140	2139	1616	1307	1200	Wh/sq.m
Global Horiz Illumination (Avg Hourly)	47540	53961	59131	59506	56025	45409	39370	39523	45056	46828	45524	46495	lux
Direct Normal Illumination (Avg Hourly)	55632	56632	52218	43933	37686	23256	16193	16292	21728	36801	47562	55387	lux
Dry Bulb Temperature (Avg Monthly)	23	26	27	29	30	30	28	28	28	28	26	24	degrees C
Dew Point Temperature (Avg Monthly)	18	20	23	24	26	24	25	24	25	23	20	18	degrees C
Relative Humidity (Avg Monthly)	71	72	77	76	78	73	81	81	81	76	71	70	percent
Wind Direction (Monthly Mode)	50	200	230	230	200	230	230	230	230	50	20	20	degrees
Wind Speed (Avg Monthly)	2	2	2	2	3	3	2	2	2	2	3	3	m/s
Ground Temperature (Avg Monthly of 3 Depths)	25	25	25	26	27	28	29	29	29	28	27	26	degrees C

Back Next

Figure 75 Vizag weather data summary

Monthly Climate Normals (1991–2020, IMD-based)

Based on official climatological tables, here's monthly data for Visakhapatnam:

Month	Avg Min Temp (°C)	Avg Max Temp (°C)	Avg Temp (°C)	Rainfall (mm)	Rainy Days
January	~20.5	~28.1	—	~10.8	—
February	~22.1	~29.6	—	~8.9	—
March	~24.6	~31.2	—	~8.9	—
April	~26.5	~32.1	—	~28.4	—
May	~27.8	~33.3	—	~73.6	—
June	~27.4	~32.8	—	~134.5	—
July	~26.4	~31.4	—	~133	—
August	~26.2	~31.5	—	~165.3	—
September	~26.0	~31.6	—	~194.9	—
October	~25.2	~31.5	—	~239.9	—
November	~23.2	~30.3	—	~101.7	—
December	~21.0	~28.7	—	~13.2	—
Annual	—	—	~24.7	~1113.1	—

Pulling details from international datasets

- **Average monthly temperature** ranges from ~24–25 °C in January to ~31 °C in May/June; annual mean ≈ 28 °C.
- **Monthly minimums**: ~19 °C in Jan, rising to ~28 °C in June–September.
- **Monthly rainfalls**:
    - Very low from Dec–Mar (<~15 mm),
    - Mild in Apr (~26 mm),
    - Rising sharply May (~70 mm),
    - Heavy from Jun through Oct (June ≈117–135 mm; Oct peaks at ~179–260 mm),
    - Post-monsoon in Nov (~115 mm), dry again in Dec (~9 mm).
- **Rainy days per month**, 1991–2020 normals: roughly 0.5 in dry season, rising to ~9–10 days in August/September, then ~5 in November.

- **Average relative humidity** monthly: lowest ~67% in December; highest ~78% in September; annual mean ~72%.

3.11.3 Temperature Data – Visakhapatnam

Visakhapatnam experiences a **moderate tropical temperature profile** throughout the year, with **minor seasonal variation** but **high humidity** levels due to its coastal location.

Seasonal Temperature Overview

Season	Avg Min Temp	Avg Max Temp	Description
Summer (Mar–Jun)	26°C	39°C	Hot temperatures; discomfort intensified by coastal humidity and minimal wind flow inland.
Monsoon (Jul–Sep)	25°C	34°C	Cooler than summer due to cloud cover and rainfall; humidity peaks during this time.
Winter (Dec–Feb)	18°C	29°C	Pleasant and mild; lowest humidity levels; ideal for outdoor activity.

- **Annual Average Temperature:** ~27.5°C
- **Temperature Extremes:** Historically ranges between **17°C (lowest)** in January to **41°C (highest)** in May.

Temperature Range (Monthly):

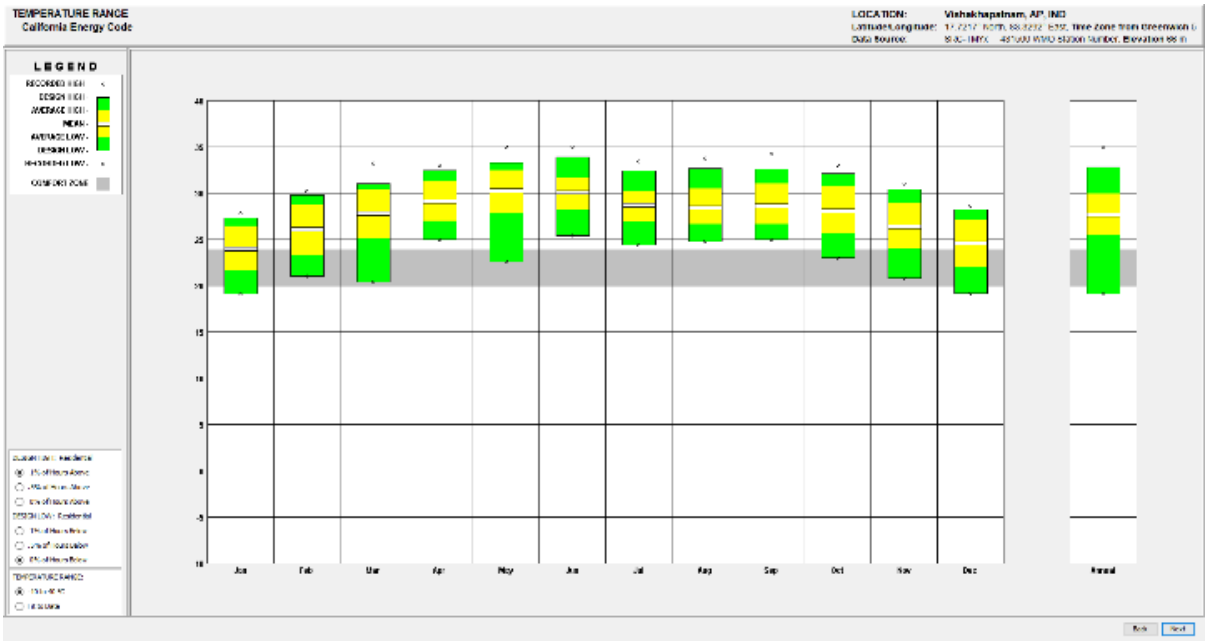


Figure 76 Temperature range

Architectural & Landscaping Implications of Temperature

Factor	Design Consideration
Summer heat	Use of shaded verandas, high ceilings, thermal insulation, and white/reflective surfaces.
Stable temperature	Enables consistent use of **passive cooling** and **natural ventilation** techniques.
Moderate winters	Allows year-round usability of outdoor spaces (terraces, courtyards, balconies).
High night temperatures	Promotes use of light, breathable materials (jalis, lattices, and ventilated facades).

3.11.4 Rainfall Patterns – Visakhapatnam

Visakhapatnam receives **moderate to heavy rainfall**, primarily due to the **Southwest monsoon**, with supplementary showers from the **Northeast monsoon**. Its coastal location also exposes it to **occasional cyclonic storms** during the post-monsoon period.

Seasonal Rainfall Distribution

Season	Monthly Avg Rainfall	Contribution to Annual Total	Remarks
Monsoon (Jun–Sep)	120–150 mm	70–75%	Peak rainfall months; essential for agriculture and groundwater recharge.
Post-Monsoon (Oct–Nov)	80–100 mm	15–20%	Often associated with cyclones and thunderstorms.
Pre-Monsoon & Winter (Dec–May)	10–30 mm	<10%	Mostly dry; occasional thunderstorms in April–May.

- **Annual Rainfall:** ~1100–1200 mm
- **Wettest Month:** October (up to 230–250 mm)
- **Driest Month:** January (~8–12 mm)

Rainfall Type & Sources

Monsoon Type	Period	Effect
Southwest Monsoon	June – September	Primary contributor; causes steady rain, cloud cover, and drop in temperature.
Northeast Monsoon	October – November	Secondary contributor; associated with short but intense showers and cyclones.

- **Cyclonic Influence:** Frequent in October and November (Bay of Bengal); can cause extreme rainfall in 24–48 hours.

Monthly Rainfall Breakdown (Averages)

(Based on 1991–2020 IMD records)

Month	Avg Rainfall (mm)
January	8–10 mm
February	6–8 mm
March	10–12 mm
April	20–30 mm
May	40–70 mm
June	120–140 mm
July	140–160 mm
August	150–180 mm
September	180–200 mm
October	220–250 mm
November	90–120 mm
December	15–25 mm

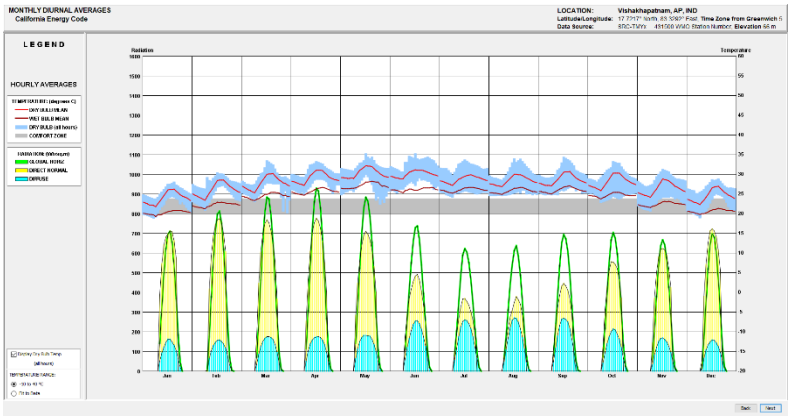


Figure 77Monthly Diurnal Averages

Landscape & Design Implications of Rainfall

Rainfall Feature	Design/Planning Consideration
Heavy monsoon rainfall	Provide sloped roofing, large gutters, and rainwater harvesting systems.
Short dry season	Use drought-tolerant native plants and soil moisture retention techniques.
Cyclone-prone months	Reinforce roofing structures; avoid large overhangs without supports.
Post-monsoon waterlogging	Ensure proper drainage design, especially in low-lying garden areas.
Consistent rainfall June–Nov	Good opportunity for cultivating lush, seasonal vegetation.

3.11.5 Wind Patterns – Visakhapatnam

Visakhapatnam, as a **coastal city**, experiences consistent breezes due to the **land-sea wind effect**, along with seasonal winds driven by **monsoonal systems** and **cyclonic circulation** in the Bay of Bengal. These wind patterns play a critical role in **passive ventilation**, **site orientation**, **urban planning**, and **landscape buffering**.

Seasonal Wind Data

Season	Dominant Wind Direction	Average Wind Speed (km/h)	Notes
Summer (Mar–Jun)	South-West	15–20 km/h	Onset of pre-monsoon winds; daytime breezes from sea to land.
Monsoon (Jul–Sep)	South-East	25–35 km/h	Strong, gusty winds; continuous flow brings moisture from Bay of Bengal.
Winter (Dec–Feb)	North-East	10–15 km/h	Dry, cool winds; associated with Northeast monsoon and clearer skies.

- **Peak Wind Months:** June–September
- **Cyclonic Wind Gusts (Oct–Nov):** Can reach **60–100 km/h** during storms.

Cyclonic Influence

- **Cyclone-prone Period:** October–December.
- **Wind Gusts:** May exceed 100 km/h during severe cyclonic storms.
- **Notable Events:** Cyclone Hudhud (2014) caused winds up to 195 km/h in Visakhapatnam — highlighting the need for **cyclone-resistant structures**.

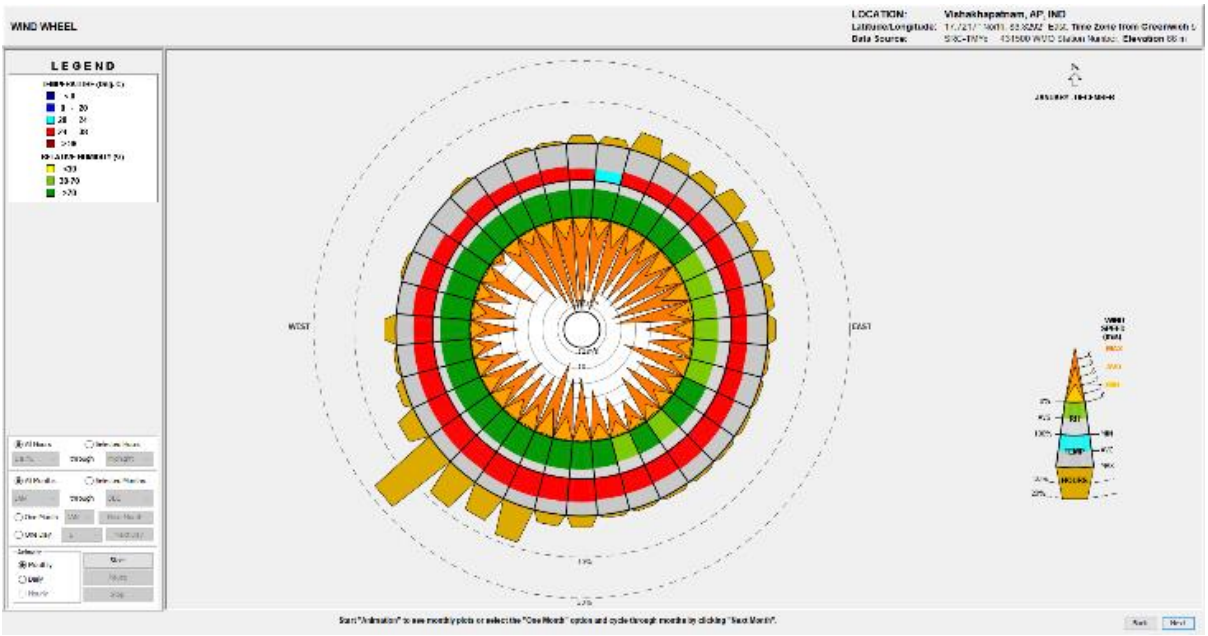


Figure 78 Wind wheel

Architectural Implications

Wind Feature	Design Response
Summer & monsoon breezes	Utilize for **passive cooling** by orienting openings towards S–W & S–E.
High-speed winds	Design **wind-breaks**, **recessed balconies**, and **sloped roofs**.
Cyclonic threats	Use **reinforced concrete roofs**, **anchored cladding**, and **storm shutters**.
Winter dry winds	Integrate **vegetative buffers** and **thermal mass** to reduce interior cooling.

3.11.6 Psychrometric Data – Visakhapatnam

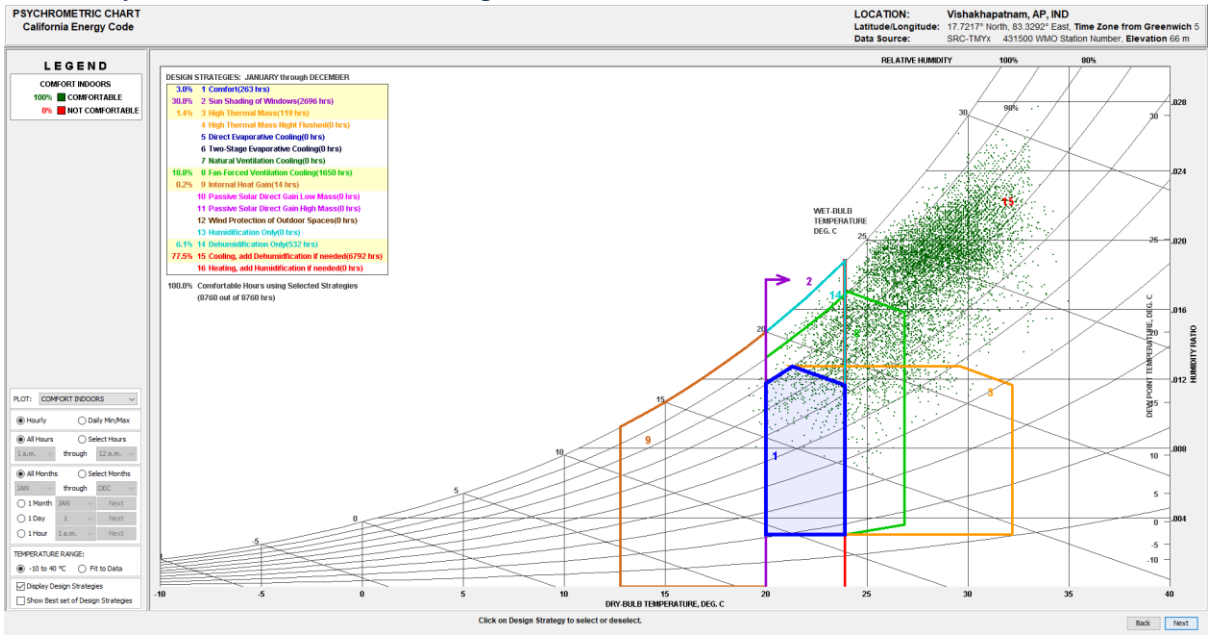


Figure 79 Psychometric chart

Psychrometric data refers to **climate information** such as **dry bulb temperature, wet bulb temperature, relative humidity, and dew point**, plotted on a **psychrometric chart**. It helps determine **thermal comfort**, **HVAC requirements**, and strategies for **passive or active cooling**.

Comfort Zone Insights (ASHRAE Standard 55)

- The **thermal comfort zone** lies roughly between:
    - **Dry bulb temp:** 23°C to 29°C
    - **Relative Humidity:** 40% to 70%

Implications for Visakhapatnam:

- For **6–7 months/year**, the city **lies outside the comfort zone**, due to **high humidity** and elevated temperatures.

- **Passive cooling** and **dehumidification strategies** are essential, especially from **April to October**.

Passive Design Strategies Based on Psychrometric Data

Climatic Issue	Recommended Strategy
High humidity	Use **cross ventilation**, **breathable walls**, and **desiccant-based cooling**.
High temperatures	Implement **shading devices**, **roof insulation**, **green roofs**, and **cool colors**.
Few cool/dry months	**Night ventilation**, **thermal mass**, and **evaporative cooling** (effective only in drier months).
Discomfort from solar gain	Use **sun-breakers**, **verandahs**, **courtyards**, and **north orientation**.

3.11.7 Design Guidelines (Visakhapatnam – Title 24 Adaptation)

1. **Use cool roofs** with high Solar Reflectance Index (SRI) and insulate roofs to reduce heat gain.
2. **Orient buildings to maximize natural ventilation**, using aligned openings for cross breezes.
3. **Incorporate external shading devices** like overhangs, fins, and pergolas to reduce solar heat gain.
4. **Install low-E double-glazed windows** with low Solar Heat Gain Coefficient (SHGC < 0.25).
5. **Apply wall insulation** especially on west and south façades to block radiant heat.
6. **Limit window-to-wall ratio to under 30%** and favor north/east openings for glare-free daylight.
7. **Install energy-efficient LED lighting** with occupancy sensors and daylight-responsive controls.
8. **Promote passive cooling** through courtyards, thermal mass, water features, and green spaces.
9. **Use solar water heating and rooftop PV panels** for energy independence and lower carbon impact.
10. **Design landscaping using native and drought-resistant species** to minimize water use.
11. **Capture rainwater and use permeable paving** to enhance groundwater recharge.
12. **Use light-colored exterior finishes** to reflect heat and reduce cooling loads.
13. **Integrate natural daylighting** using clerestory windows and light shelves.
14. **Adopt ECBC-compliant HVAC systems** with high ISEER-rated equipment and zone controls.
15. **Design breathable architecture** to manage high humidity and improve occupant comfort.

3.12 Site Photographs













Figure 80 Site photographs

Part 4: Case study/ Desk Appraisal

4.1 Novotel Visakhapatnam Varun Beach, Andhra Pradesh (Live Case Study)

4.1.1 Introduction

Novotel Visakhapatnam Varun Beach is a premier 5-star luxury hotel located along the scenic coastline of Visakhapatnam, offering uninterrupted views of the **Bay of Bengal**. Known for its contemporary architecture and seafront elegance, the hotel stands as a landmark in the city's hospitality landscape. Every room is designed with a minimalist, modern aesthetic and features expansive picture windows that frame the stunning ocean panorama, creating a serene and luxurious stay experience.

The hotel features a range of high-end amenities including an **infinity pool**, multiple **fine dining venues**, a **lavish buffet**, and well-equipped **banquet and conference facilities**, making it an ideal destination for both leisure and business travelers. Its city-centre location allows seamless access to key nodes such as **Visakhapatnam Railway Station**, **Vizag Port**, **Rushikonda Beach**, and **Visakhapatnam Airport**. Additionally, the popular **INS Kursura Submarine Museum** is within walking distance, enhancing the hotel's touristic appeal.

Novotel is part of a larger mixed-use development that includes an **INOX multiplex, a nightclub, and a shopping mall**, contributing to its vibrant, urban character. Notably, it is one of the very few ocean-facing hotels in Visakhapatnam, offering **panoramic sea views from nearly every part of the property**. Its unique location and comprehensive amenities make it a relevant case study for understanding the integration of luxury hospitality with urban coastal development.



Figure 81 Novotel Visakhapatnam Varun Beach



Figure 82 Lice case study at Novotel

Ownership: The Varun Group

Year Built: 2012

Brand: AccorHotels brand

Type: Hospitality **Use**

No. of keys: 225

4.1.2 Location

Location of the hotel is the most important business decision for the hotel. As Located adjacent to Varun Inox Multiplex and close to the airport, Novotel Visakhapatnam Varun Beach has a panoramic view of Bay of Bengal.

All 225 rooms overlook the Bay of Bengal, offering a comfortable environment to business and leisure travelers with Wi-Fi access, three restaurants, an executive lounge, bar and spa. With over 3600 sqm of indoor & outdoor space, the hotel provides the largest banqueting facility in the region, and is able to cater for business and social events of up to 4000 people.



Figure 83 Novotel Location

4.1.2.1 Urban Context:

- **Urban Beachfront Corridor:**
  The hotel is located on Dr. NTR Beach Road, a renowned urban corridor stretching nearly 32km from Visakhapatnam Port to Bheemili Beach. This stretch is central to the city's tourism, recreation, and urban life, hosting a mix of public parks, eco-sensitive zones, and cultural landmarks like Rajiv Smruthi Bhavan and the Annamayya Mandapam.

- **Beachfront Redevelopment:**
  The area has witnessed major urban transformation as part of city-led initiatives to rejuvenate the Beach Road, including:

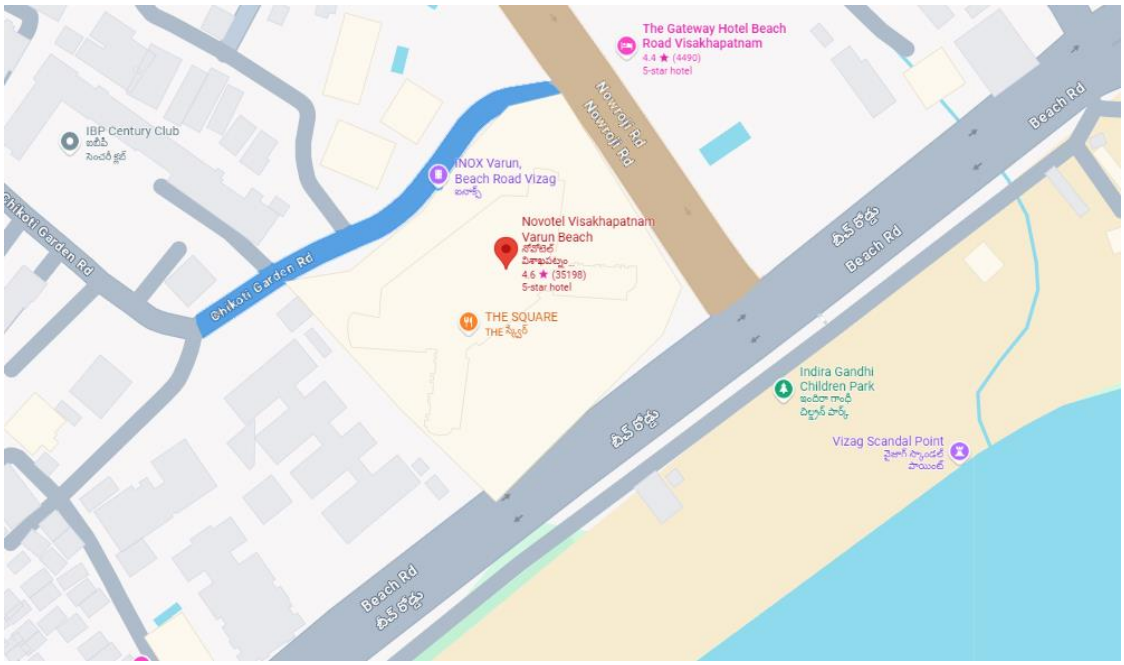
  - Enhanced public infrastructure (promenades, landscaping, disaster resilience)
  - New cycling/pedestrian tracks, plazas, and improved connections between the road and the beach.
  - Restoration efforts post the 2014 Hudhud Cyclone ensured the beachfront is resilient and vibrant for citizens and tourists alike.

4.1.2.2 City Integration:

Situated at the heart of Visakhapatnam, Novotel Varun Beach is well-integrated with the city's business, industrial, and leisure zones. The beachfront is both an urban and a recreational asset, and the hotel itself is recognized as a modern landmark within this evolving cityscape.

4.1.3 Accessibility

- 14 m wide main access road on NE side
- 7 m wide road for service entry on back side



14 m wide Main access road

12 m wide service lane

- Located on **Beach Road**, a major arterial and scenic coastal road in Visakhapatnam.
- **Approx. 5 km** from **Visakhapatnam Railway Station** (~10–15 minutes by car).
- **Approx. 13 km** from **Visakhapatnam International Airport** (~25–30 minutes by car).
- Well-connected by **public buses, taxis, and auto-rickshaws**.
- Situated in the **central commercial and tourist zone** of the city.
- Part of a **mixed-use complex** including a shopping mall, night club, and entertainment facilities.

4.1.4 Design philosophy

Design Philosophy & Architectural Style

- Contemporary, minimalist architectural style with clean lines and a calm, uncluttered aesthetic.
- Designed to create a tranquil environment using natural light, neutral tones, and sea-facing views.
- Focus on **seamless integration with the coastal setting**, reinforcing a luxury beachside experience.
- X shaped plan which helps achieve sea view from all rooms, 14 Floors on front wings and 7 Floors on back with a 15 m Lvl. difference in the site's front and back ends.

Site Planning & Waterfront Integration

- Located directly along **RK Beach** on **Beach Road**, Visakhapatnam.
- **All 225 rooms** are sea-facing, offering panoramic views of the **Bay of Bengal**.
- Site is part of a **mixed-use complex** (includes INOX multiplex, mall, nightclub).
- Key waterfront features:
    - Infinity-edge pool visually merging with the ocean.
    - Rooftop jogging track and terraces facing the sea.
    - Outdoor seating and lounges that maximize beach views.

Interior Design & Materials

- Use of **neutral tones** (taupe, brown, beige) with **Ginger quartz finishes** for warmth.
- Modern furnishings with wood, glass, and natural fabrics to create a cozy yet upscale atmosphere.
- Large picture windows in rooms and restaurants to blend indoor and outdoor spaces.
- Specialty restaurants (e.g., **Red Bowl**) incorporate regional materials like rattan and wood in a contemporary design.

Landscape & Public Realm

- Palm trees, native shrubs, and landscaped driveways provide a transition between city and coast.
- Pool deck and terraces designed with glass balustrades for unobstructed ocean views.
- Rooftop jogging/walking track with panoramic views.
- Landscaped garden spaces with art features near dining zones.

5-Star Functionality & Amenities

- **225 modern rooms** with luxury amenities and ergonomic workstations.
- Multiple sea-facing **restaurants and lounges** (Indian, Western, Pan-Asian cuisines).

- Large **banquet and convention facilities** with 56,000 sq.ft. of event space.
- Wellness features: Infinity pool, spa, gym, rooftop track, and kids' play area.
- Business + leisure layout catering to both MICE and resort tourism audiences.

Sustainability Features

- **Green Key Certified** for eco-friendly operations.
- Use of renewable energy (solar), water-saving fixtures, and efficient HVAC systems.
- Waste segregation and recycling programs in place.
- Landscaping designed for minimal irrigation and energy-efficient lighting.
- Local sourcing of food and materials to reduce carbon footprint.

Architect & Developer

- Developed by **Varun Group**; constructed by its arm **Varsha Builders**.
- Architectural work likely guided by local architects in alignment with **Accor's Novotel brand standards**.
- Project recognized for its award-winning construction and operational excellence.

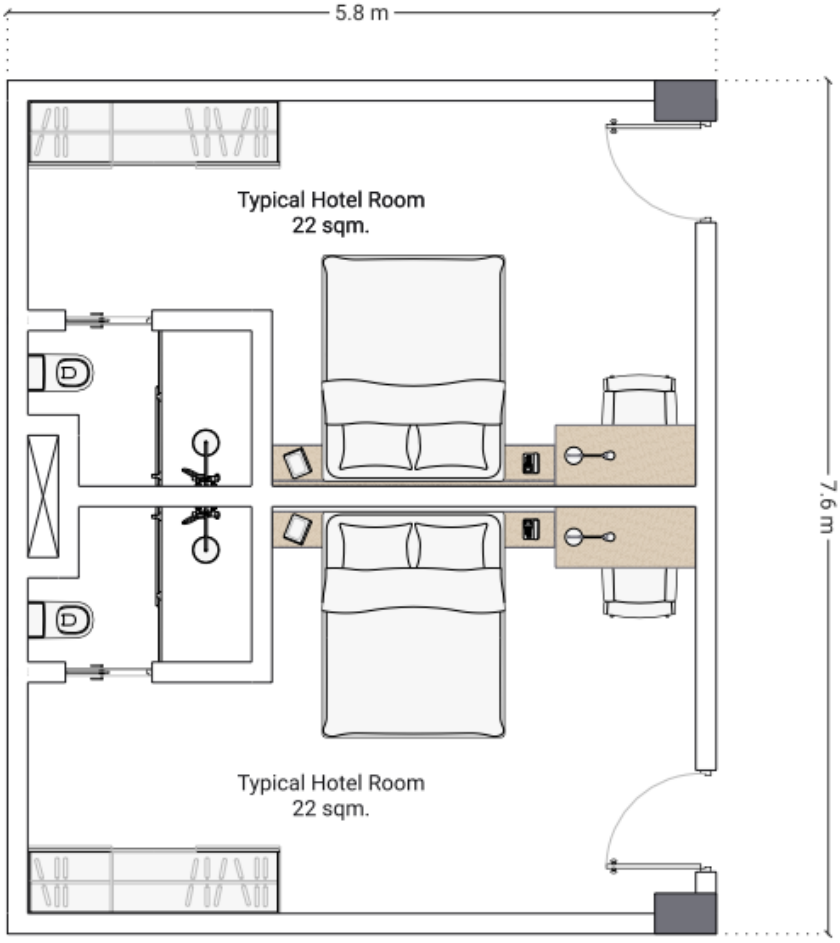


Figure 84 Typical room layout

4.1.4.1 Notable Infrastructure Highlights

Architectural Brilliance & Design

- **Oceanfront Structure:** The hotel is designed as a prominent, 10-floor contemporary building facing the Bay of Bengal, with all 225 rooms offering breathtaking, unobstructed ocean views—a rare distinction among city hotels.
- **Mixed-Use Urban Complex:** Novotel is integrated with a multiplex (INOX cinema), a night club, and a shopping mall, establishing it as a self-sustaining luxury and entertainment hub in Visakhapatnam.
- **Award-Winning Banquets:** The V-Convention hall stands as the largest pillar-less banquet facility in Andhra Pradesh, capable of accommodating up to 1,250 guests, with the overall banquet space spanning 56,000sq ft. The modular layout allows up to 12 separate event halls.

Engineering & Facilities

- **Infinity Rooftop Pool & Jogging Track:** The rooftop features an infinity swimming pool with panoramic views and a jogging track, both unique for the region. Guests can enjoy the sunrise or sunset along the coastline from these vantage points.
- **State-of-the-Art Event Spaces:** All event venues are equipped with advanced AV systems, digital lighting, and high-speed Wi-Fi. Dedicated pre-function lounges, private green rooms, and executive boardrooms are available for seamless event hosting.
- **High-Tech Guest Amenities:** Each room is smartly furnished with soundproofing, LED mood lighting, digital controls, eco-friendly amenities, and luxury comforts such as minibars and premium bedding. Suites feature separate living/dining, panoramic windows, and exclusive lounge access.
- **Recreation & Wellness:** Facilities include a modern gym with ocean vistas, a spa & salon with multiple therapy rooms, rooftop jogging track, dedicated kids' areas (indoor and outdoor), and accessible pool spaces for families and children.

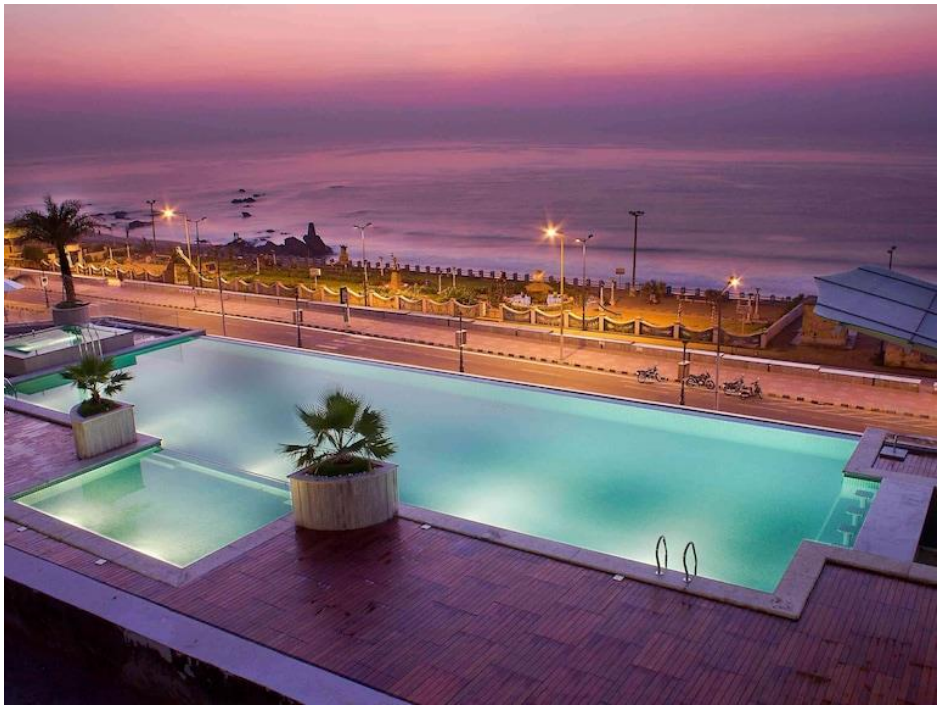


Figure 85 The Infinity Pool

4.1.5 Internal Spaces

Rooms: 225 rooms

- Superior Room
- Premier Room
- Executive suite
- Presidential Suite

Restaurant & Bar:

- The Square
- Zaffran
- Vue
- Infinity
- Sugarr café

A Health Gateway:

- Steam & Sauna
- Relaxation rooms
- Outdoor infinity pool with sunken bar
- Outdoor Jacuzzi overlooking the sea
- Beauty & salon spa with 4therapy rooms

Kids activity zone:

- Kids Play X-Box
- Rock Climbing
- Commando Net
- Slackline

Recreation facilities:

- Pool & sea facing gym
- Infinity pool
- Jogging track

Banquet halls:

- V-Convention Hall
- Pearl 1,2
- Coral 1,2,3
- Eureka & Summit

4.1.6 Floors and spaces

4.1.6.1 Level P1

- RO plant, Water tank
- Hydroneumatic system pumps fresh water to every floor
- 3 pumps (work one by one)
- Flush water tank 1,2 – 65 KL
- Fire Tank 1,2 105 KL
- Raw water tank 1,2 – 80 KL, 160 KL
- Treated water tank – 128 KL
- Fans provided at basements to remove Co2



Figure 86 Services at P1 Lvl.

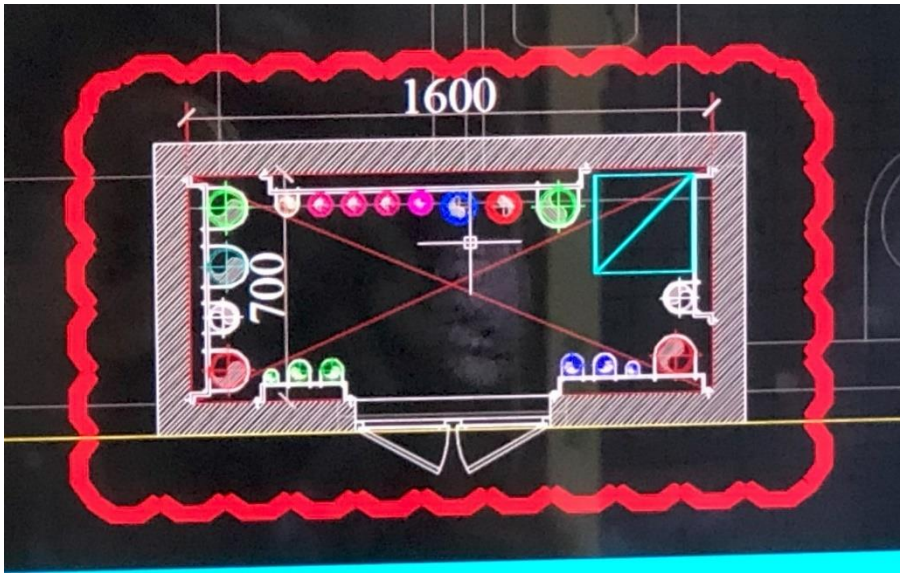


Figure 87 Plumbing chute drawing

4.1.6.2 Level P2

- Backup parking for Banquet
- 8 ft. Parking height (2.4 m)

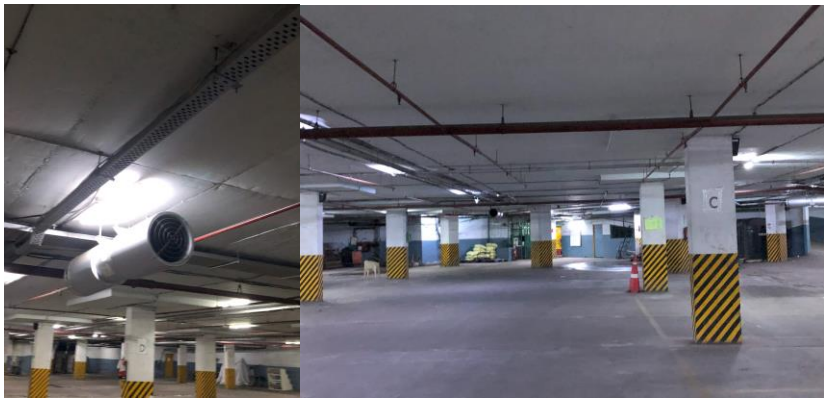


Figure 88 Exhaust fans for Excess Co2 Removal

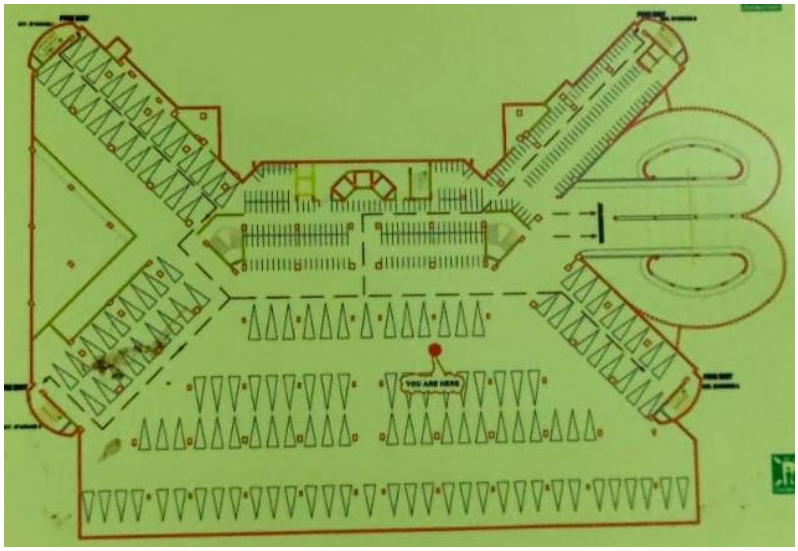


Figure 89 Lower basement floor plan

4.1.6.3 Banquet Level (B)

- 14 meeting rooms
- 20 m Column Span Aprox. (500 mm Columns)

- Coral – 3
- V Convention – 3
- Pearl – 2
- Business center – 1
- Banquet office – 1

- Banquet BOH spaces – Dishwashing, Cold storage, Chemical storage, Kitchen Store, Kitchen for Banquet




V-Convention Center 1, 2, 3

Largest Convention center in the Andra Pradesh

The 11200 sq.ft. magnificently designed column-free hall with pre-function area of 4500 sq. Ft. besides giving you the luxury of space also has highly sophisticated and equipped with modern equipment.
V-Convention can be divided into 3 halls to suit your needs.




Figure 90Convention

Figure 91 Movable sound insulated partition walls

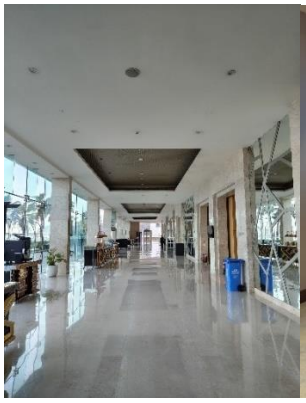




Figure 92 Pre event space *Figure 93 Pearl – meeting rooms*

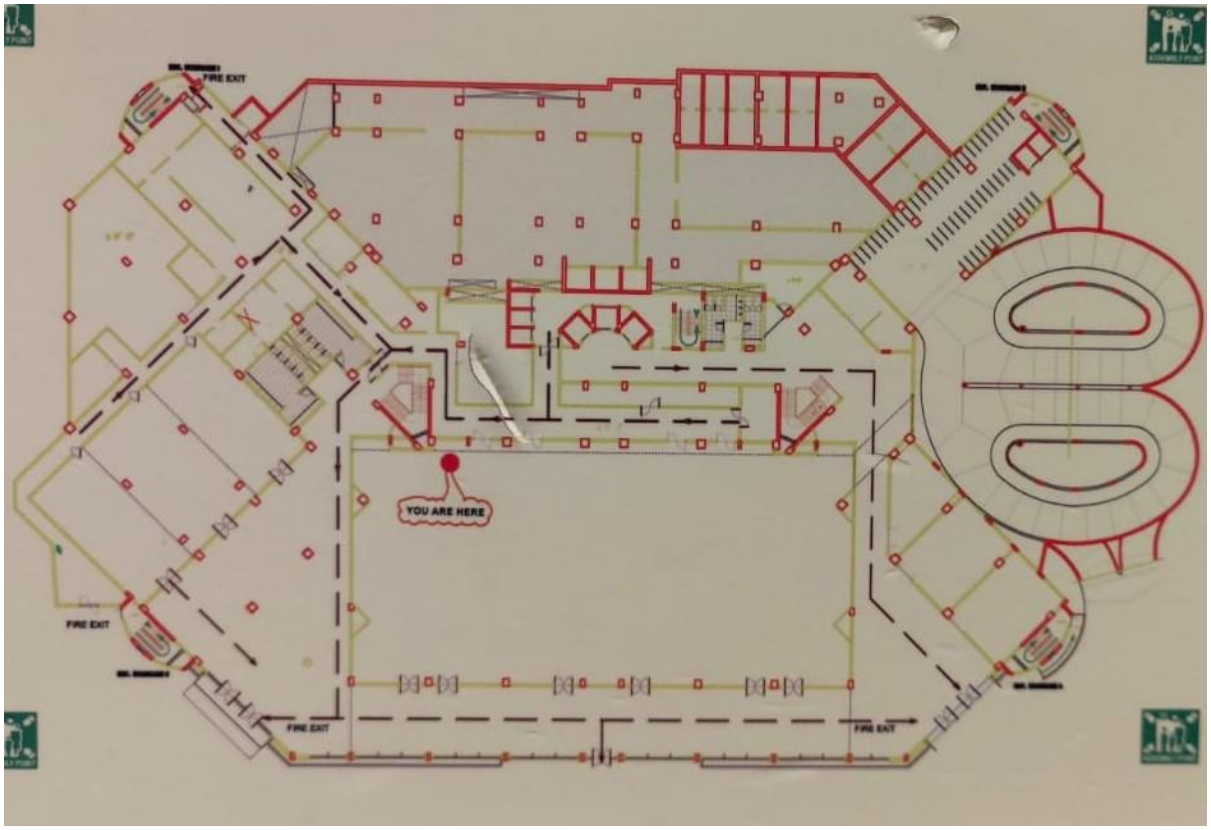


Figure 94 Banquet Level floor plan

4.1.6.4 Mezzanine Level (M)

- Beverage store, Liquor store
- Banquet AHU, IT Server room
- Grocery store, Minibar store
- Offices – G.M., Employee offices
- Laundry
- Cafeteria, TDR – Team Dining Room



Figure 95 Laundry

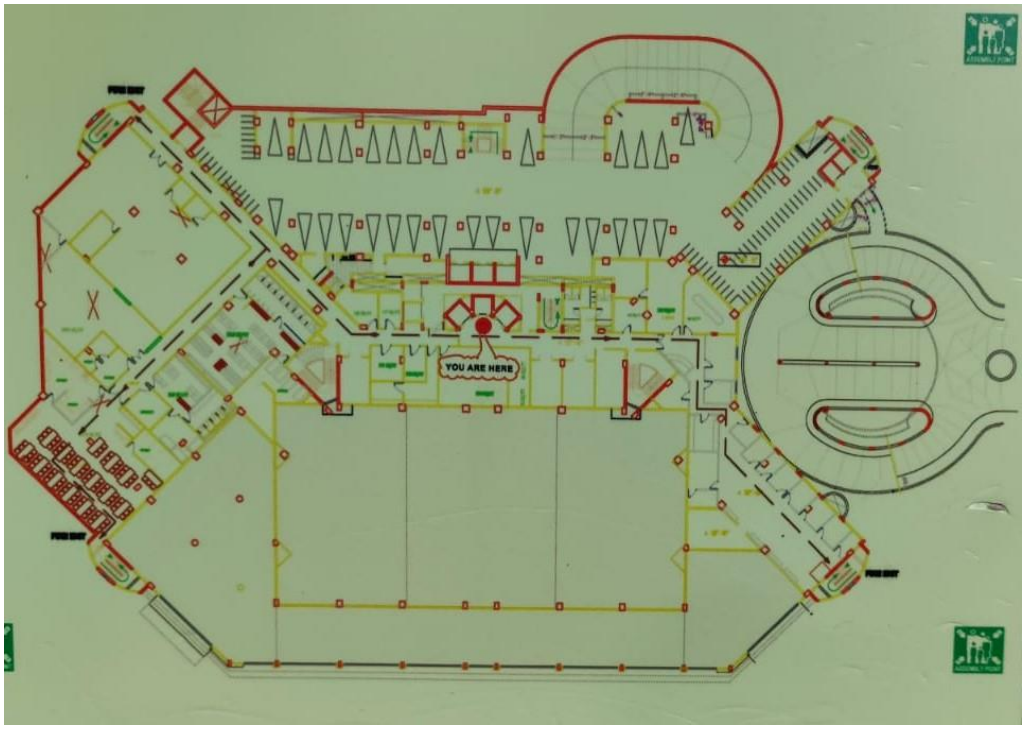


Figure 96 Mezzanine Floor plan

4.1.6.5 Lobby Level (L)

- Chief's office
- Kitchen for guest – South Indian, Continental, Dispense bar, Pantry, Meat, Fish
- Electrical room
- Zaffran restaurant, The Square (24/7) Restaurant can serve 200+ guests at the same time
- Infinity pool, Sunken bar



Figure 97 Kitchen



Figure 98 Lobby



Figure 99 Bar Interior



Figure 100 Zaffran Restaurant

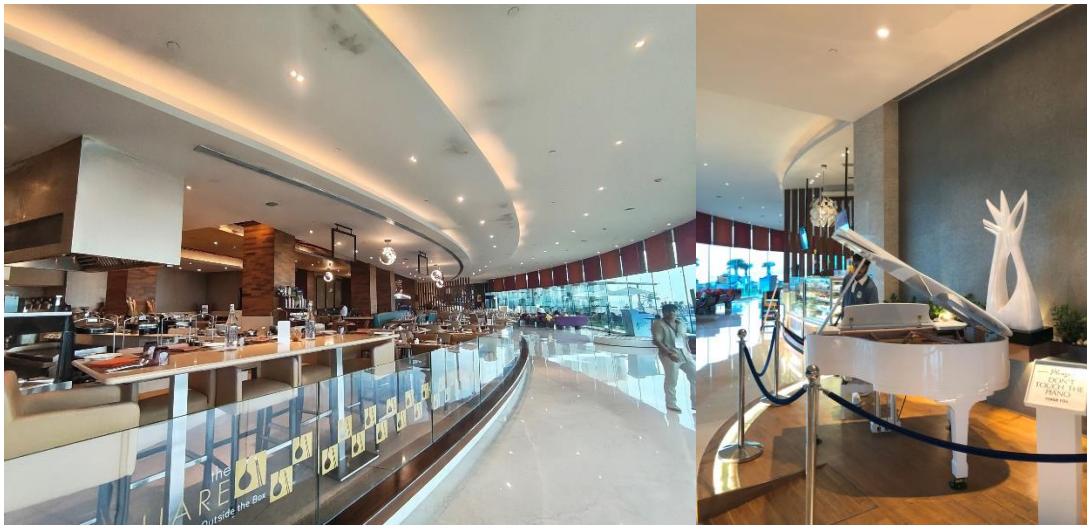


Figure 101 The Square restaurant

4.1.6.6 C Level (L)

- Gym with Washrooms and Sauna
- Nautica Hall - Nautica banquet hall can accomodate a seating capacity of 120 pax. This banquet has the view of Bay of Bengal
- Summit - As the name hold he meeting of “gathering leaders”. It is exactly the place what it means. Summit has an area of 598 sq ft which can hold aprrox 50 pax
- Eureka - Eureka is a signature meeting room of Novotel. Facing towrds the infinite view of the Bay of Bengal. Its capacity is upto 50 pax. A stunning place to hold a business meeting
- BOH Spaces – Manager, HR, Security control etc.
- 15 KV Transformer
- Generators
- LPG Storage
- 4 Service lifts, 1 Gym elevator, 2 Public lifts, 3 Guest lifts



Figure 102 Nautica Hall



Figure 103 Summit meeting room



Figure 104 Eureka meeting room



Figure 105 Gym



Figure 106 Service Entry



Figure 107 LPG Storage



Figure 108 Garbage composting area



Figure 109 Receiving dock

4.1.6.7 Floors 1 – 7

- Guest rooms
- Rooms are distributed equally in the 4 wings of the X shaped plan
- **Rooms**: 225 modern guest rooms and suites, all sea-facing. Options range from Superior King (312sq ft/29m²), Premier (355sq ft/33m²), to larger suites, with choices of king or twin beds

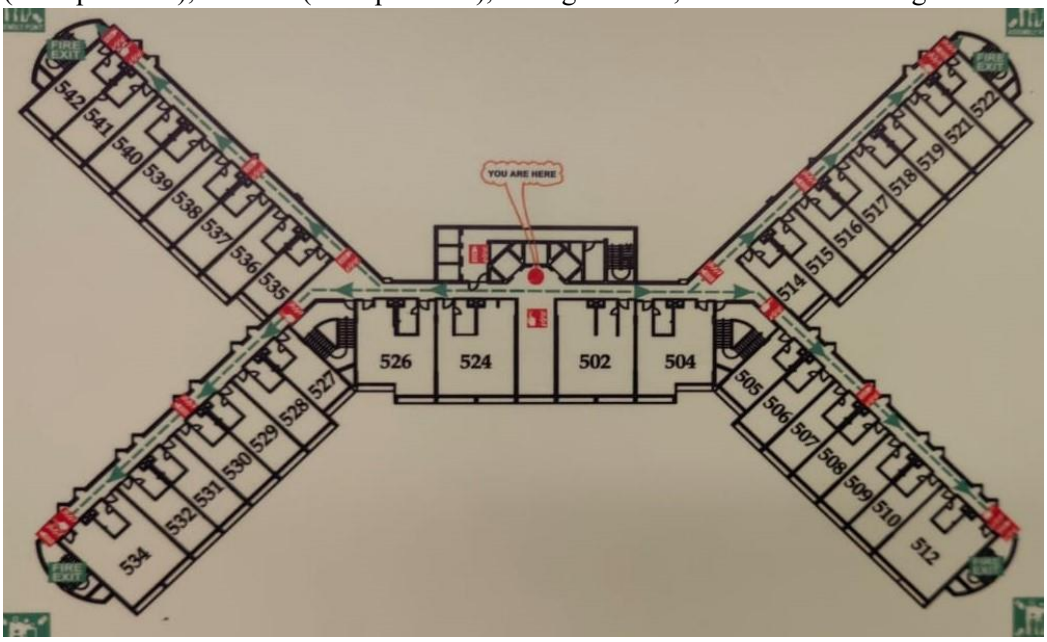


Figure 110 Fifth floor plan

4.1.6.8 Terrace floor

- Lift rooms, Cooling towers
- 240 m jogging track
- Avenue - Avenue has the breath-taking birds eye view of the sea and swimming pool, it's the ideal place to host your event, and dining under the stars. The area covered is 3584 sq ft. can accomodate 470 pax



Figure 111 Avenue

4.1.7 Facilities and Infrastructure

4.1.7.1 Accommodation

- **Rooms**: 225 modern guest rooms and suites, all sea-facing. Options range from Superior King (312sq ft/29m²), Premier (355sq ft/33m²), to larger suites, with choices of king or twin beds.
- **Features**: All rooms are equipped with smart controls, minibar, LED TV, hypoallergenic bedding, work desk, plush furnishings, soundproofing, and eco-friendly amenities. Suites offer additional space and lounge areas.

Room Type	Size (approx.)	Bedding	View	Notable Features
Superior Room, 1 King Bed	29m² / 312sq ft	1 King	City/Ocean*	Accessible, hypoallergenic
Superior Twin Room, 2 Single Beds	29m² / 312sq ft	2 Single	City/Ocean*	Soundproofed, accessible
Premier Room, 1 King Bed	33m² / 355sq ft	1 King	City/Ocean*	Enhanced amenities
Premier Twin Room, 2 Single Beds	33m² / 355sq ft	2 Single	City/Ocean*	Enhanced amenities
Executive Suite, 1 Double Bed	66m² / 710sq ft	1 Double	Ocean	Separate living & dining area
Presidential Suite	96m² / 1,035sq ft	King or Queen/Twin	Panoramic Ocean	Top floor, luxury features



Figure 112 Room interior

4.1.7.2 Key In-Room Features and Amenities

- **Living Comforts:** All rooms are air-conditioned, soundproofed, and feature blackout curtains for optimal privacy and rest. Separate sitting areas in most categories enhance relaxation and utility.
- **Technology & Entertainment:** Each room is equipped with a 43-inch LCD TV with premium channels and DVD player, free Wi-Fi, MP3 docking station, and direct-dial telephones.
- **Work & Storage:** Laptop-friendly workspaces, desks, wardrobes, and optional connecting rooms to suit families and business guests.
- **Sustainable Touches:** LED lighting, energy-saving switches, eco-friendly cleaning products, bulk dispensers for toiletries, and recycling bins as part of Green Key-certified practices.
- **Bedding:** Premium hypoallergenic bedding, down comforters, pillow menu, and free cots/infant beds on request.
- **Refreshments:** Complimentary tea/coffee makers, bottled water, mini-fridges, and minibars in every room.
- **Bathrooms:** Private bathrooms offer designer toiletries, rainfall showers, separate bathtubs in suites, bathrobes, slippers, bidets, and hair dryers. Suites have additional dressing areas and upgraded amenities.

4.1.7.3 Special Room Categories & Accessibility

- **Suites:** Executive and Presidential Suites include spacious living and dining areas, panoramic ocean views, and exclusive in-room features for luxury and extended stays.

- **Family Facilities:** Rollaway/extra beds (surcharge), free infant cots, and babysitting available.
- **Accessibility:** Rooms designed for differently-abled guests include wheelchair access and customized bathrooms with roll-in showers.



Figure 113 Suite room

4.1.7.4 Guest Services Related to Accommodation

- **Housekeeping:** Daily, with additional change of towels/bedsheets upon request.
- **Laundry/Dry Cleaning**: Available with express service.
- **Room Service:** 24-hour dining and beverage menu.
- **Security:** Digital safes, smoke alarms, and regular safety checks in all rooms.

Unique Features

- **All-Sea View:** Most rooms and suites offer direct, unobstructed sea views.
- **Soundproofing:** Enhanced soundproofing ensures tranquility even in a busy urban beachfront context.
- **Connected Experiences:** Guests have seamless access to the hotel's spa, gym, infinity pool, multiplex, shopping mall, and business center—all within the same complex.



Figure 114 Suite room interiors

4.1.7.5 Dining & Beverage Outlets

Novotel Visakhapatnam Varun Beach offers an extensive and diverse culinary landscape with a blend of fine dining, casual cafes, bars, and specialty eateries, many of which provide panoramic ocean views and a unique gastronomic experience.

Main Outlets

1. The Square

- **Type:** All-day Dining, Multi-cuisine
- **Ambience:** Spacious, contemporary, and ideal for family or business meals.
- **Cuisine:** Features lavish buffets and à la carte selections, including Indian, Asian, Mediterranean, Continental, and local Andhra specialties for breakfast, lunch, and dinner.
- **Notable Aspects:** Consistently rated among the city's top dining destinations, with live interactive food stations and themed dinner nights.

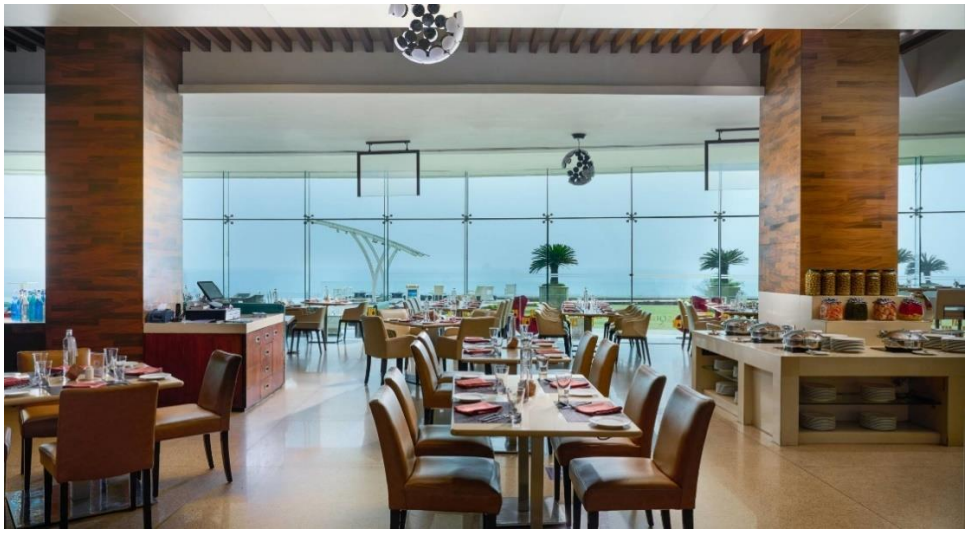


Figure 115 The Square

2. Zaffran

- **Type:** Indian Specialty Restaurant
- **Ambience:** Elegant interiors with royal-inspired art, plush seating, and a view of the Bay of Bengal.
- **Cuisine:** Focused on the culinary heritage of North and South India, featuring signature dishes such as kebabs, biryanis, thalis, and Mughlai preparations. The menu is crafted to highlight both vegetarian and non-vegetarian delicacies. Set by the pool, it provides both indoor and al fresco dining.
- **Special Features:** Private dining rooms for up to 10 guests each and a unique aesthetic with antique and artistic elements.



Figure 116 Zaffran

3. Red Bowl

- **Type:** Pan Asian Kitchen
- **Ambience:** Vibrant, stylish rooftop dining with contemporary Asian décor and expansive ocean views.
- **Cuisine:** Offers a curated menu of classic and contemporary dishes from Japan, China, Thailand, and Korea. Known for sushi, dim sum, stir-fries, and Pan Asian main courses. Designed for culinary enthusiasts and those looking for an immersive Asian dining experience.



Figure 117 Red Bowl

4. Sugarr

- **Type:** Patisserie & Café
- **Ambience:** Chic, lobby-level bakery.
- **Cuisine:** Serves fresh bakes, desserts, gourmet chocolates, pastries, breads, cakes, and premium coffee and tea. Ideal for quick bites, business meetings, or casual lounging.

5. Harbour Vue

- **Type:** Bar and Grill
- **Ambience:** Trendy, with indoor and poolside seating, live music, and panoramic views.
- **Cuisine:** Bar food, extensive mocktail and cocktail menu, seafood, and North Indian snacks. Known for party music and happy hours, making it a lively nightlife spot.
- **Special Features:** Live sports screening, happy hours, valet parking, occasional themed nights.

6. Infinity Bar & Kitchen (Rooftop)

- **Type:** Rooftop Lounge/Bar
- **Ambience:** Modern, open-air terrace 150ft above sea level, offering mesmerizing aerial views of the coastline.
- **Cuisine:** Multi-cuisine small plates and grilled specialties, as well as a broad selection of cocktails, wines, and spirits.
- **Highlights:** Popular for sunsets, evening entertainment, and exclusive mixology.



Figure 118 Bar interiors

4.1.7.6 Additional Dining Features

- **In-room Dining:** Available 24x7 with an extensive menu covering all cuisines listed above.
- **Kids' Menu:** Specially designed selections for younger guests.
- **Specialty Nights & Festivals:** The hotel regularly organizes culinary festivals (such as the Indonesian Food Festival in July), Sunday brunches, and themed buffets to showcase global and regional flavors.
- **Outdoor & Private Dining:** Poolside and beachfront options are available for private events and romantic dinners.

4.1.7.7 Signature Experiences

- **Lavish Buffet Spreads:** Offered daily at The Square, with live cooking and specialty counters for regional and international cuisine.
- **Tailored Culinary Events:** Zaffran hosts curated dinners celebrating India's culinary diversity, with the chef's signature touch.
- **Rooftop Sundowners:** The Infinity Bar hosts sundowner parties and evening events with live DJ/music and a vibrant crowd.

Outlet	Cuisine & Style	Specialty	Ambience
The Square	Multi-cuisine, Buffet/À la carte	Breakfast to dinner buffets	All-day, spacious
Zaffran	Indian Specialty	Kebabs, Biryani, Thalis	Elegant, pool view
Red Bowl	Pan Asian Kitchen	Sushi, Dim Sum, Asian mains	Rooftop, modern
Sugarr	Bakery/Café	Pastries, Chocolates, Coffee	Lobby-level, chic
Harbour Vue	Bar, Grills, Seafood	Mocktails, Cocktails, Snacks	Trendy, poolside
Infinity	Rooftop Bar & Grill	Small plates, Beverages	150ft high, open-air

4.1.8 Recreation & Wellness

Novotel Visakhapatnam Varun Beach offers a wide-ranging suite of recreation and wellness options, making it a leading lifestyle hotel in the region for both relaxation and active pursuits.

Infinity Swimming Pool

- **Location & View:** Rooftop, offering panoramic vistas of the Bay of Bengal and Visakhapatnam's coastline.
- **Features:** Sun decks with loungers, poolside bar/service, separate kids' splash area, ambient lighting for evening swims.
- **Ambience:** Designed for tranquil relaxation, sunset watching, and family pool time.



Figure 119 Infinity pool

Fitness Centre (In Balance Gym)

- **Setting:** State-of-the-art facility overlooking the ocean.
- **Equipment:** Latest in cardio (treadmills, cross trainers), free weights, resistance machines, and stretch zones.
- **Additional Offerings:** Yoga mats, personal trainers available upon request, separate areas for aerobics and bodyweight exercises.
- **Accessibility:** Open 24x7 to hotel guests, with towels and mineral water provided.

Spa & Salon (Calm – Salon and Spa)

- **Treatments:** Signature spa therapies (Vinotherapy, Balinese, Thai massage, Swedish), bespoke facials, body scrubs, wraps, and hydrotherapy.
- **Facilities:** Five treatment rooms, including couple's suites, steam/sauna, jacuzzi, and a wellness waiting lounge.
- **Salon Services:** Haircuts, styling, bridal makeup, manicure/pedicure, and full beauty care.
- **Ambience:** Serene, zen-inspired décor contributing to the relaxation experience.

Rooftop Jogging Track

- **Highlight:** Jogging and walking tracks at the rooftop with sunrise/sunset views over the ocean, perfect for outdoor enthusiasts.

Kids' Recreation

- **Indoor Play:** Dedicated kids' club/playroom with games, books, and scheduled activities (arts & crafts, movie hours).
- **Outdoor Play:** Secure jungle gym and play area beside the pool.

- **Family Services:** Children's pool, babysitting on request, family entertainment programming on holidays and weekends.

4.1.9 Other Leisure Facilities

- **Multiplex & Mall:** INOX six-screen cinema and a shopping mall directly connected, for entertainment and retail therapy.
- **Nightlife:** Rooftop bars and Harbor Vue lounge with live music, DJ nights, and themed events.
- **Special Activities:** Seasonal events such as beach yoga sessions, aqua aerobics, and wellness workshops.

4.1.10 Wellness & Safety Features

- **Cleanliness & Hygiene:** Regular disinfection, pool water management, therapists follow strict protocols.
- **Accessibility:** All wellness and recreational areas are designed to be accessible, including ramps, elevators, and adapted changing rooms.

4.1.11 Unique Experiences

- **Beachfront Wellness:** Direct access to RK Beach for jogging or group yoga.
- **Sustainable Practices:** Eco-friendly spa products, saltwater pool options, and plastic-free zones supporting the hotel's Green Key certification.

4.1.12 Banquets, Events, and Conference Infrastructure

Novotel Visakhapatnam Varun Beach is recognized as one of the premier venues in Eastern India for banquets, conferences, weddings, and social events, offering state-of-the-art, flexible infrastructure designed to accommodate gatherings of every scale with breathtaking ocean views.

V-Convention Center (VCC)

- **Description:** The largest and most versatile event space in the region.
- **Capacity:** Up to 2,000 guests (theater-style: 1,700; banquet: 800), divisible into VCC 1, 2, and 3 for simultaneous multi-event hosting.
- **Size:** Approximately 11,200sq ft of pillarless area, with a grand pre-function foyer overlooking the Bay of Bengal.
- **Features:** Advanced audio-visual (AV) systems, soundproofing, customizable lighting, and automated screens.

Avenue

- **Description:** Mid-sized banquet hall with ocean and pool views, ideal for weddings, seminars, and social gatherings.
- **Capacity:** Around 600 guests; flexible layout for banquets, cocktail parties, and exhibitions.
- **Size:** Roughly 3,584sq ft.
- **Unique Aspects:** Direct pool access, which is popular for pre-wedding events and evening galas.



Figure 120 V Convention

Coral (1-3)

- **Description:** Three interconnected banquet rooms suitable for conferences, mid-sized meetings, and workshops.
- **Capacity:** Up to 350 guests for a combined session; each section can serve 80–120 guests individually.
- **Size:** 1,960sq ft in total.

Additional Venues

- **Nautica, Summit, Pearl 1 & 2:** Boardrooms and meeting spaces for executive meetings, training sessions, and VIP gatherings—capacities from 20 to 200 attendees.
- **Lawns & Outdoor Spaces:** Beachfront pavilions and poolside terraces available for open-air weddings, cocktail receptions, and themed parties, offering a scenic backdrop and the flexibility for custom décor and staging.

Technology and Support

- **High-Speed Wi-Fi:** Seamless internet access throughout all event spaces.
- **AV Equipment:** Projectors, hi-definition video conferencing, digital podiums, wireless microphones, built-in speakers, and lighting controls.
- **Event Services:** On-site technical support, event planning teams, custom stage/set design, live streaming, and simultaneous translation (by prior arrangement).

- **Decor and Catering:** Themed décor, bespoke wedding setups, and world-class catering services—specializing in Indian, Pan Asian, global cuisines, and live culinary counters.

Special Features

- **Pre-Function/Lounge Areas:** Spacious, stylish lounges for registrations, networking, and refreshments.
- **Bridal Suites and Green Rooms:** Private preparation areas for wedding parties and VIP guests.
- **Accessibility:** Barrier-free venue access, wheelchair ramps, elevators, accessible washrooms.
- **Safety:** Fire safety protocols, security personnel, 24/7 surveillance, and dedicated event staff.

Signature Events Hosted

- **Conventions:** Annual corporate conclaves, product launches, medical and academic symposiums.
- **Weddings:** Lavish Indian/Western-style weddings, destination weddings, reception dinners, sangeet/mehendi functions, and beachside ceremonies.
- **Social Events:** Anniversary celebrations, milestone birthdays, award functions, charity galas, and cultural festivals.

Venue	Capacity (theater/banquet)	Area (sq ft)	Special Features
VCC 1/2/3	2,000/800	11,200	Pillarless, oceanview, pre-function space
Avenue	600/250	3,584	Pool/ocean view, pool access
Coral (1–3)	350/120 (each)	1,960	Interconnected, modular layout
Nautica/Summit	50–200	Varies	Executive boardrooms, small groups
Outdoor Lawns	Up to 1,000	7,500+	Seafront, open-air, customizable

4.1.13 Accessibility Features

Wheelchair Accessibility

- Multiple wheelchair-accessible rooms are available in each room type (Superior, Premier, Ocean View, Suites).
- Key public spaces—lobby, restaurants, gym, spa, pool, and banquet halls—are fully accessible with step-free entrances, ramps, and elevators.
- Wheelchair-accessible paths provided to all main facilities, public bathrooms, and parking areas.
- Adapted bathrooms with roll-in showers, grab bars, and emergency call systems available in designated accessible rooms.

Other Accessible Features

- Braille/raised signage in elevators and common areas.

- Visual fire alarms, hand-held showerheads, stair-free entrance, and wide doorways in accessible rooms.
- Staff trained to assist guests with disabilities and special needs, including check-in support and emergency assistance.
- Priority parking and valet services for guests with reduced mobility.

4.1.14 Additional Amenities

- **Business Centre**: 24/7 equipped workspace, printing, and IT support.
- **Multiplex & Shopping Mall**: Connected to an INOX 6-screen cinema and a shopping mall within the same complex.
- **Night Club & Lounge**: For evening entertainment.
- **Parking**: Private parking for 150 cars, valet and self-park options.
- **Transport**: Airport transfer, car rental, taxi/bus services on request.
- **Security & Safety**: 24-hour security, CCTV, emergency exits, fire extinguishers, doctor on call, and ATMs on site.
- **Eco-Initiatives**: Green Key eco-label for sustainable hospitality (LED lighting, waste reduction, water conservation, no single-use plastics, renewable energy code).



4.1.15 Iconic Features At-a-Glance

- All 225 rooms with direct Bay of Bengal views.
- India's only 5-star hotel complex in the city with multiplex, mall, and club on site.
- Largest pillar-less banquet/convention space in the state.
- Infinity pool, rooftop lounge, gym, spa, jogging track with ocean views.

- International sustainability recognition (Green Key).
- Smart technology in hospitality, event planning, and guest safety.

Area	Description
Rooms	225 sea-facing, modern rooms from 312sq ft; suites up to 710sq ft
Dining	4+ outlets: All-day dining, Indian, Pan Asian, bakery, poolside & rooftop bars
Recreation	Infinity pool, gym, spa, rooftop jogging track, kids' play area, multiplex, mall
Meetings/Events	56,000sq ft event space; largest hall seats 2,000; multiple banquet & conference rooms with hi-tech AV
Family/Children	Babysitting, kids' menu, playgrounds, kids' pool
Wellness/Spa	Calm Spa & Salon: massages, therapies, beauty, bridal packages, five treatment rooms
Parking/Transport	150+ car parking, airport shuttles, taxi and rental services
Amenities	24x7 business center, wheelchair accessible, security, on-site ATMs, multiple lounges
Eco-Focus	Green Key certified, energy and water-saving, plastic-free practices

4.1.16 Sustainability & Awards

Novotel Visakhapatnam Varun Beach is recognized as one of India's leading eco-conscious luxury hotels, integrating sustainability throughout its operations.

Green Key Certification

- **Awarded in 2025**, Novotel Visakhapatnam Varun Beach officially achieved the prestigious Green Key Certification, one of the world's most recognized eco-labels for environment-friendly hospitality.
    - This certification, bestowed by the Foundation for Environmental Education (FEE), signifies global best practices in sustainable tourism.
    - It also has recognition from the Global Sustainable Tourism Council (GSTC).

Key Green Practices

- **Exclusive Use of Green Energy:** The hotel purchases electricity from renewable sources.
- **Energy Efficiency:** Implementation of LED lighting, smart controls, and energy-saving appliances across the property.
- **Water Conservation:** Use of water-efficient fixtures, recycling, and responsible housekeeping protocols.
- **Waste Management:** Comprehensive recycling and composting programs, minimal single-use plastics, and eco-friendly procurement.
- **Sustainable Sourcing:** Preference for local, responsible suppliers and eco-certified products.

- **Community Engagement:** Collaboration with local communities and non-profits for social and environmental upliftment.
- **Guest Experience:** Eco-conscious amenities and education are integrated into the guest journey without compromising comfort or luxury.



4.1.17 SWOT Analysis

Strengths

- **Prime Location:** Situated on Beach Road with panoramic Bay of Bengal views, central to tourism, business districts, and major attractions (Submarine Museum, RK Beach).
- **Comprehensive Facilities:** 225 luxury sea-facing rooms, multiple specialty restaurants, infinity rooftop pool, state-of-the-art gym, spa, multiplex, and mall within the same complex—making it a self-contained urban resort.
- **Event Leadership:** Home to Andhra Pradesh's largest pillar-less convention facility (V-Convention), modular banquets, and outdoor venues, it is a recognized leader for MICE (Meetings, Incentives, Conferences, and Exhibitions) and weddings.
- **Sustainability & Awards:** Green Key eco-certification (2025), leadership in renewable energy use, waste and water management, minimal plastic footprint, and multiple industry awards for sustainability and hospitality.
- **Brand Reputation:** Flagship property of Accor in Eastern India; high guest satisfaction and loyalty, repeatedly rated 4.5+/5 across key review platforms; consistently wins regional and national awards for luxury and service excellence.
- **Family & Accessibility:** Comprehensive family amenities, accessible rooms and facilities, and robust safety and security protocols.
- **Operational Excellence:** Strong, experienced management team; data-driven revenue management; rigorous service staff training; integration of digital infrastructure and smart controls.

Weaknesses

- **Premium Pricing:** Room and event rates are perceived as high compared to local competitors, potentially reducing accessibility for some guest segments.
- **Service Variability:** Despite strong reviews, occasional guest feedback notes delays during peak service periods (check-in/out, room and F&B service).
- **Limited Local F&B Appeal:** Some critiques regarding regional menu variety and food consistency, especially at specialty outlets and for South Indian breakfast options.
- **Coastal Exposure:** Vulnerability to periodic cyclones or storms can disrupt operations and deter bookings, necessitating recurring disaster resilience investments.

Opportunities

- **Growing Tourism & Business:** Vizag is emerging as a major business and leisure hub, supported by government investment in coastal corridors, IT, shipping, and tourism infrastructure.
- **Destination Weddings & Luxury Events:** Rising demand for destination weddings and high-end events presents considerable growth potential—with Novotel's established infrastructure as a natural differentiator.
- **Sustainability Leadership:** Heightened global and local demand for sustainable hospitality allows Novotel to further promote and monetize its Green Key and eco-initiatives.
- **Digital Expansion:** Accor loyalty programs, direct online bookings, and smart room controls can be leveraged to attract new digital-native travelers and build stronger guest relationships.
- **Community & Cultural Engagement:** Opportunities to expand partnerships with local artisans, consciously source ingredients, and run socially responsible events to further strengthen the brand's place in the Vizag community.

Threats

- **Intensifying Competition:** New hotels and international brands entering Visakhapatnam, along with upscale boutique properties, heighten competition, especially for corporate and wedding clientele.
- **Economic Uncertainty:** Fluctuations in corporate travel budgets, inflation, or a slowdown in discretionary spending could weaken occupancy, ADR, and F&B revenue.
- **Environmental Risks:** Increased severity of extreme weather due to climate change could affect both operations and guest perceptions of safety.
- **Regulatory Shifts:** Changes in hospitality industry regulations, taxes, or local government policies can impact costs, operations, and event hosting.

4.1.18 Inferences

- Avoid Garbage chute considering fire safety
- Stack parking concept
- Building shape designed for views from all rooms
- Usage of level difference in site
- Site access and parking facilities planned such that banquet guest don't interfere with Hotel guests

4.2 The Taj Lakefront, Bhopal, Madhya Pradesh (Live Case Study)

4.2.1 Introduction

The Taj Lakefront, Bhopal epitomises true luxury. Overlooking the upper lake and just 25 minutes from the international airport, this iconic landmark symbolises the soul of Bhopal and its vision for tomorrow. The magnificent structure by the lakefront redefines fine living with its modern interiors, ornate and luxurious finishes. The design is intuitive to the region and inspired by the bell metal craft of Tikamgarh, the lakes and Zari work of Bhopal, the paisley prints of Bagh, the Durries of Sironj, and the Terracotta art of the state's tribal areas.

Ready to be the new landmark of the city, it opens its doors to the world with 152 guest rooms, multi-cuisine and award-winning restaurants, recreation facilities, Jiva spa, modern meeting spaces, well-equipped conference rooms, and the city's largest banqueting facilities

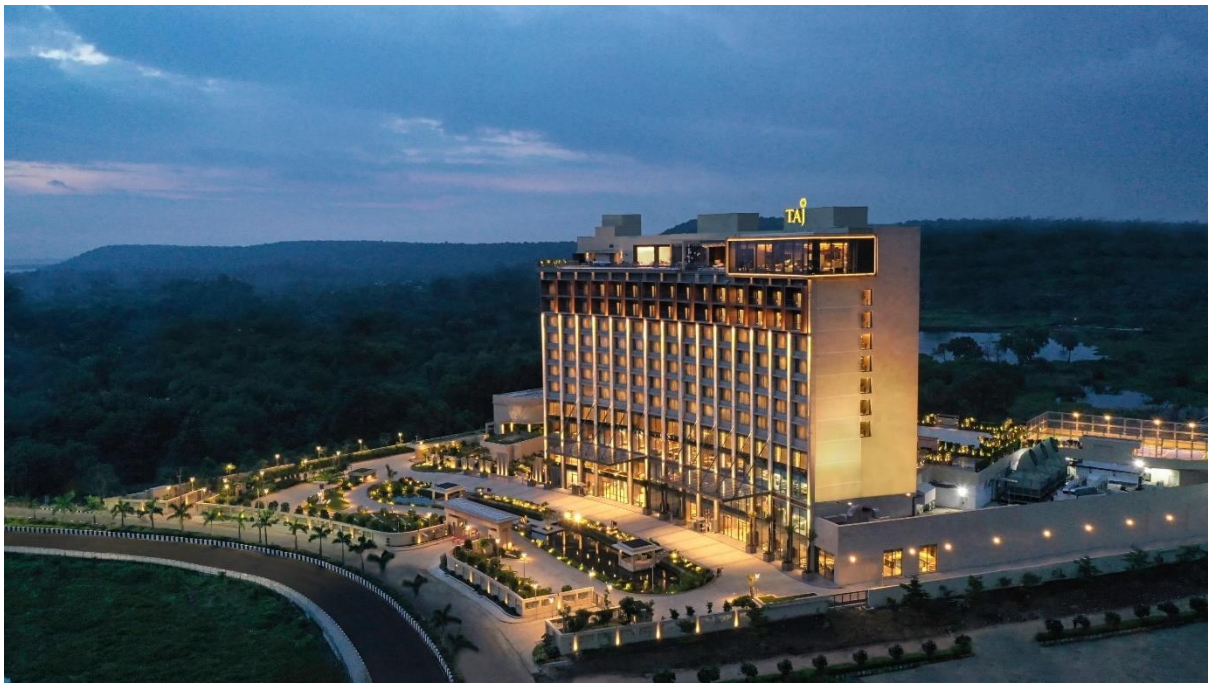


Figure 121 The Taj Lakefront, Bhopal

Architect: JOI Design **Founder:** IHCL Group

Type: Hospitality **Use:** Hotel **Location:** Bhopal

Status: operational, inaugurated in year 2021

Site area: 4.77 acres

FAR: 2

No. of keys: 152

4.2.2 Location

It is close to the Van Vihar National Park, Sanchi Stupa, National Museum of Mankind, Taj-ul-Masajid, and many such wonders of the city. Located near Bhadbhada Road Chauraha, Link Rd Number 3, Bhopal, Madhya Pradesh Overlooking the upper lake

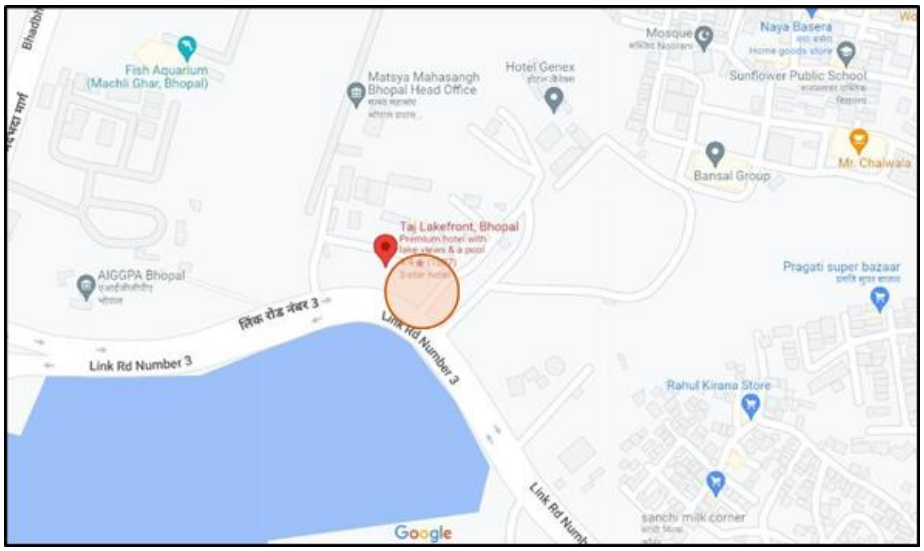
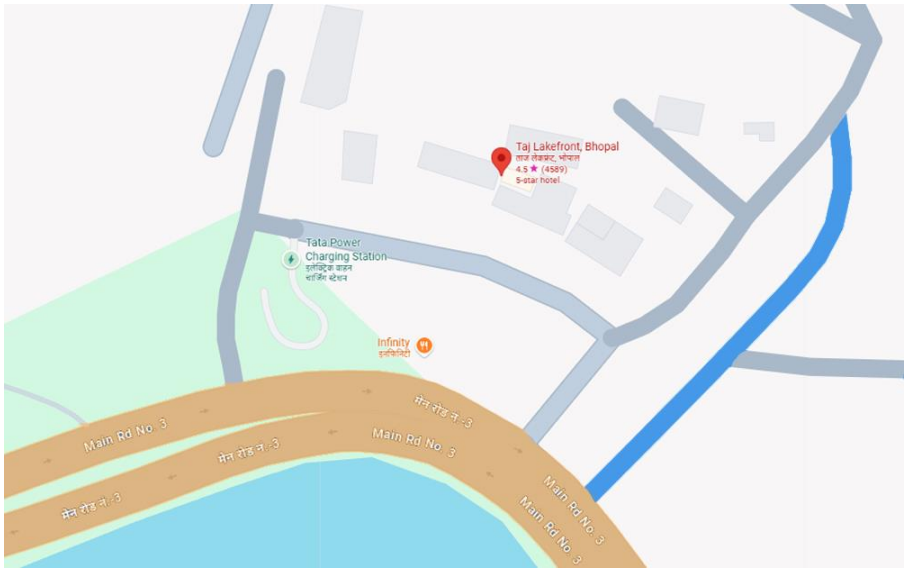


Figure 122 Taj Lakefront Location

4.2.3 Site Accessibility

- 18 m wide arterial road named Link RD number 3 is connecting the Taj hotel to the various locations of the city. 4.3KM
- 12 m wide service lane is given in the right side of the site.



18 m wide Arterial Road

12 m wide Service lane

4.2.4 Site Boundary and Characteristics



Figure 123 Site Boundary

Site Boundary
Circulation within the Site

Site Characteristics:

- The site has a trapezium shape having curved edge in front.
- As we look into the site planning, the front part is designed with pleasing landscape by which guests can connect with its lush greenery.
- Back part of the site is used for the services.
- The building shape is evolved by the curved front edge of the site.
- Circulation of the site is designed in that way so that no congestion will occur.

4.2.4 Design Philosophy

The Taj Lakefront, Bhopal epitomizes true luxury. Overlooking the upper lake and just 25 minutes from the international airport, this iconic landmark symbolizes the soul of Bhopal and its vision for tomorrow. The magnificent structure by the lakefront redefines fine living with its modern interiors, ornate and luxurious finishes. The design is intuitive to the region and inspired by the bell metal craft of Tikamgarh, the lakes and Zari work of Bhopal, the paisley prints of Bagh, the Durries of Sironj, and the Terracotta art of the state's tribal areas

4.2.4 Facilities

Below attached are a list of facilities and amenities provided to the guests at Taj Lakefront, Bhopal.

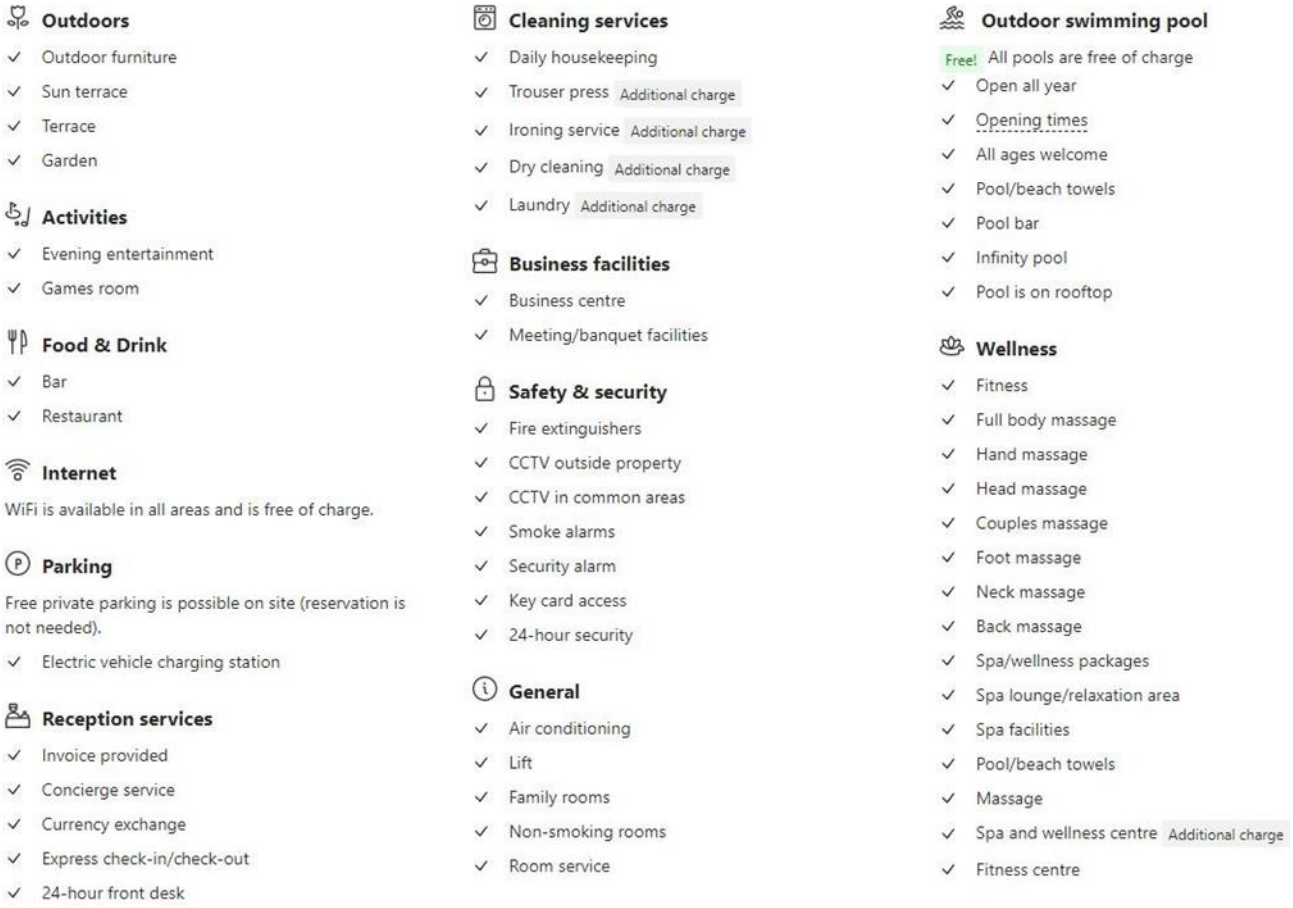


Figure 124 Taj Facilities

4.2.5 Area Statement

	Name	No. of Units	Area (sq.m.)	Total Area	%
	Total No. of Keys	152			
	No. of Floors	10			
A.	**Guest Room Mix**				
	Executive Suite	141	66	9306	80
	Twin Bedroom	5	33	165	10
	King bedroom	5	33	165	10
	Presidential Suite	1	152	152	
	Total Area (Sum)			**9788**	
B.	**Guest Floor Services**				
I	**Corridor Area**				
	Type Floor Corridor	1	180	**180**	30
II	**Housekeeping Static or Typical Floors**				
	Housekeeping Static or Typical Floors	1	185	**185**	32
III	**Lifts**				
	Guest Elevators	2	55	**110**	19
	Service Lift Lobby	2	55	**110**	19
IV	**Fire Protection**				
	Fire Escape Stairs	2	30	**60**	10
	Total Area (Sum)			**585**	
C.	**Public Areas**				
I	**Entrance Lobby**				
	Port Cochere	1	40	**40**	15
	Entrance Lobby Waiting Areas Front Desk	1	100	**100**	38
	Front Desk	1	40	**40**	14
	Luggage Store	1	15	**15**	6
	Bell Man	1	4	**4**	8
II	**Business Centre**				
	Store	1	36	**36**	13
			5	**5**	2
III	**Public Utilities**				

	Public Toilet	1	30	**30**	10
	Total Area (Sum)			**270**	
D.	**F&B Outlets**				
	Bar (Special) - 30 Covers	1	100	**100**	25
	Multi-Cuisine Restaurant - 120 Covers	1	300	**300**	75
	Total Area (Sum)			**400**	
E.	**Banquets**				
	Banquet Hall	2	225	**450**	62
	Pre-Function Area	2	80	**160**	22
	Conference Room	1	50	**50**	6
	Banquet Toilets	1	60	**60**	10
	Total Area (Sum)			**720**	
F.	**Recreation Facilities**				
	Swimming Pool	1	100	**100**	32
	Pool Change Room	1	50	**50**	16
	Gym	1	100	**100**	32
	Massage Room	1	6	**6**	10
	Saloon	1	50	**50**	10
	Total Area (Sum)			**306**	
G.	**Retail Archade**				
	Retail Shops	1	25	**25**	
	Total Area (Sum)			**25**	
	BOH				
A.	**Material Management**				
	Truck Dock	2	20	**40**	34
	Holding Area	1	38	**38**	34
	Veg Wash	1	2.5	**2.5**	2
	Purchase & Reciving Off	1	20	**20**	15
	Purchase Office Manager	1	18	**18**	15

	Total Area (Sum)			**118.5**	
B.	**Main Store**				
	General Store	1	120	**120**	75
	Linen	1	10	**10**	6
	Unassign Store	1	10	**10**	6
	Liquor	1	10	**10**	6
	Crockery	1	6	**6**	3
	Mis	1	2	**2**	2
	Fuel	1	2	**2**	2
	Total Area (Sum)			**160**	
C.	**Garbage**				
	Loading	1	20	**20**	30
	Trash Garbage(Dry)	1	8	**8**	12
	Trash Garbage Refrigerator (wet)	1	15	**15**	24
	Garbage Truck	1	12	**12**	18
	Coal Room	1	5	**5**	8
	Circulation Space	1	5	**5**	8
	Total Area (Sum)			**65**	
D.	**Front Office : Admi/Acc/IT**				
	GM	1	151	**151**	44
	Sec to GM	1	9	**9**	2
	FO Mgr Couples as duty manager)	1	5	**5**	1
	Revenue Manager	1	8	**8**	2
	Reservation Office	1	8	**8**	2
	Work Station	1	25	**25**	8
	Discussion Room (Commom Meeting)	1	4	**4**	1
	Chief Accountant- Refer Staff Reqmnt	1	15	**15**	5
	Credit Manager	1	8	**8**	2
	Cashier	1	5	**5**	1
	Controller	1	8	**8**	2
	Payroll Manager	1	5	**5**	1
	Account Record Room	1	10	**10**	2
	Meeting room	1	10	**10**	2
	Computer Room	1	17	**17**	8
	UPS	1	35	**35**	12

	Recorde	1	10	**10**	2
	Storage and Copy8ing	1	9	**9**	2
	Total Area (Sum)			**347**	
E.	**Sales**				
	Rooms Mgr	1	8	**8**	18
	Banquet Mgr	1	8	**8**	18
	Workstation	2	5	**10**	22
	Discussion Room	1	10	**10**	22
	Storage and Copying	1	8	**8**	20
	Total Area (Sum)			**44**	
F.	**F&B**				
	Multi Cuisine Main Kitchen	1	85	**85**	**20**
	Room Services Main Kitchen	1	20	**20**	5
	Pastery	1	32	**32**	7
	Bakery	1	20	**20**	4
	Commissary prep Kitchen	1	40	**40**	9
	Common Dishwash	1	20	**20**	5
	Central Potwash	1	12	**12**	2
	Pot Store	1	8	**8**	3
	Banquet BOH & Store	1	130	**130**	30
	Cold Kitchen	1	18	**18**	4
	Café Kitchen	1	12	**12**	2
	Show Kitchen\Back Pantry Area for bar	1	8	**8**	2
	Bar Counter	1	15	**15**	3
	Chief Counter	1	5	**5**	2
	Chief Office	1	8	**8**	2
	Total Area (Sum)			**433**	
G.	**House Keeping**				
	Issue / Trailer / Dirties Collection	1	5	**5**	4
	House Keeper Executive	1	10	**10**	10
	House Keeping Assistant	1	8	**8**	8
	Hsk Office + House Keeper (as per Ap.)	1	16	**16**	15
	Dead Store	1	30	**30**	28
	F&B Circulatipon	1	5	**5**	5

	Guest Supply Store	1	10	**10**	10
	Bulk Lenin Store	1	5	**5**	5
	Tailor	1	10	**10**	10
	Upholestry Store	1	5	**5**	5
	Lost & Found	1	5	**5**	5
	Total Area (Sum)			**104**	
H.	**Human Resources**				
	HR Mgr	1	8	**8**	14
	Sec	1	4	**4**	7
	Traing Room	1	20	**20**	35
	Training Mgr	1	4	**4**	7
	Discussion	1	20	**20**	35
	Total Area (Sum)			**56**	
K	**Security & Time Office**				
	Staff Entry & Time Keeper/cctv	1	10	**10**	
	Security Mgr	1	8	**8**	
	Total Area (Sum)			**18**	
L	**Repair and Maintenance**				
	Head of Engg	1	8	**8**	
	Asst Engg	1	8	**8**	
	Secured Store	1	10	**10**	
	Paint Shope	1	10	**10**	
	Engg Store	1	10	**10**	
	Carpentry	1	10	**10**	
	Spare Parts	1	5	**5**	
	Total Area (Sum)			**61**	
J.	**Staff Facility**				
	Male Toilets & Lockers	1	100	**100**	
	Male Executive Toilets and Lockers	0	0	**0**	
	Female Toilets and Lockers	1	70	**70**	
	Kitchen	1	25	**25**	

	Staff Cafeteria	1	90	**90**	
	Staff Recreation Area	1	15	**15**	
	Total Area (Sum)			**300**	
I.	**Miscelienouis**				
	Divers Rest Room	1	15	**15**	
	Drivers Toilet	1	22	**22**	
	Microbiologist	1	8	**8**	
	Total Area (Sum)			**45**	
M.	**Other BOH (exer mech)**				
I	**Mechanical Areas**				
	LV Room	1	56	**56**	
	Indoor Transformers	2	22	**44**	
	LT Panel	1	74	**74**	
	DG Generator Room	1	97	**97**	
	Chiller Plant Room	1	125	**125**	
	Rainwater Tank	105 Cubic Meter			
	Municipal Tank	123 Cubic Meter			
	Raw Water Tank	123 Cubic Meter			
	Fire Tank	105 Cubic Meter			
	Treated Water Tank	123 Cubic Meter			
	Salt Storage	1	12	**12**	
	Pump Room (Fire)	1	20	**20**	
	Pump Room (Raw + Soft + WTP)	1	60	**60**	
	Boiler Room with Pump and Heat	1	58	**58**	
	STP with Pump and Equipment's	1	80	**80**	
	Work Shop	1	22	**22**	
	Engineering Office	1	8	**8**	
	Engineering Store	1	10	**10**	
	Control Room	1	15	**15**	
	Underground Oil Storage Tank	1	190	**190**	
	Swimming Pool Filtration Plant	1	12	**12**	
	Total Area (Sum)			**487**	
II	**Mechanical; Areas on Terrace**				
	Cooling Towers	1	135	**135**	

	Overhead Tank	1	12	**12**	
	Ventilation/Exhaust Fans	14	12	**168**	
	Flushing Tanks/ Cooling Tower Tanks	3	9	**27**	
	Staircase Pressurisation Fans	3	11	**33**	
	Lift Pressurisation Fans	2	2.2	**4.4**	
	Sorubber for Kitchen Exhaust	1	5	**5**	
	Total Area (Sum)		186.4	**384.4**	
N.	**Parking**				
	Basement 2			1700	
	Basement 1			1420	
	Total Wall Thiockness and Circulation			**3120**	

4.2.6 Vertical Zoning

Conceptual section of the Taj hotel which explains the vertical zoning.

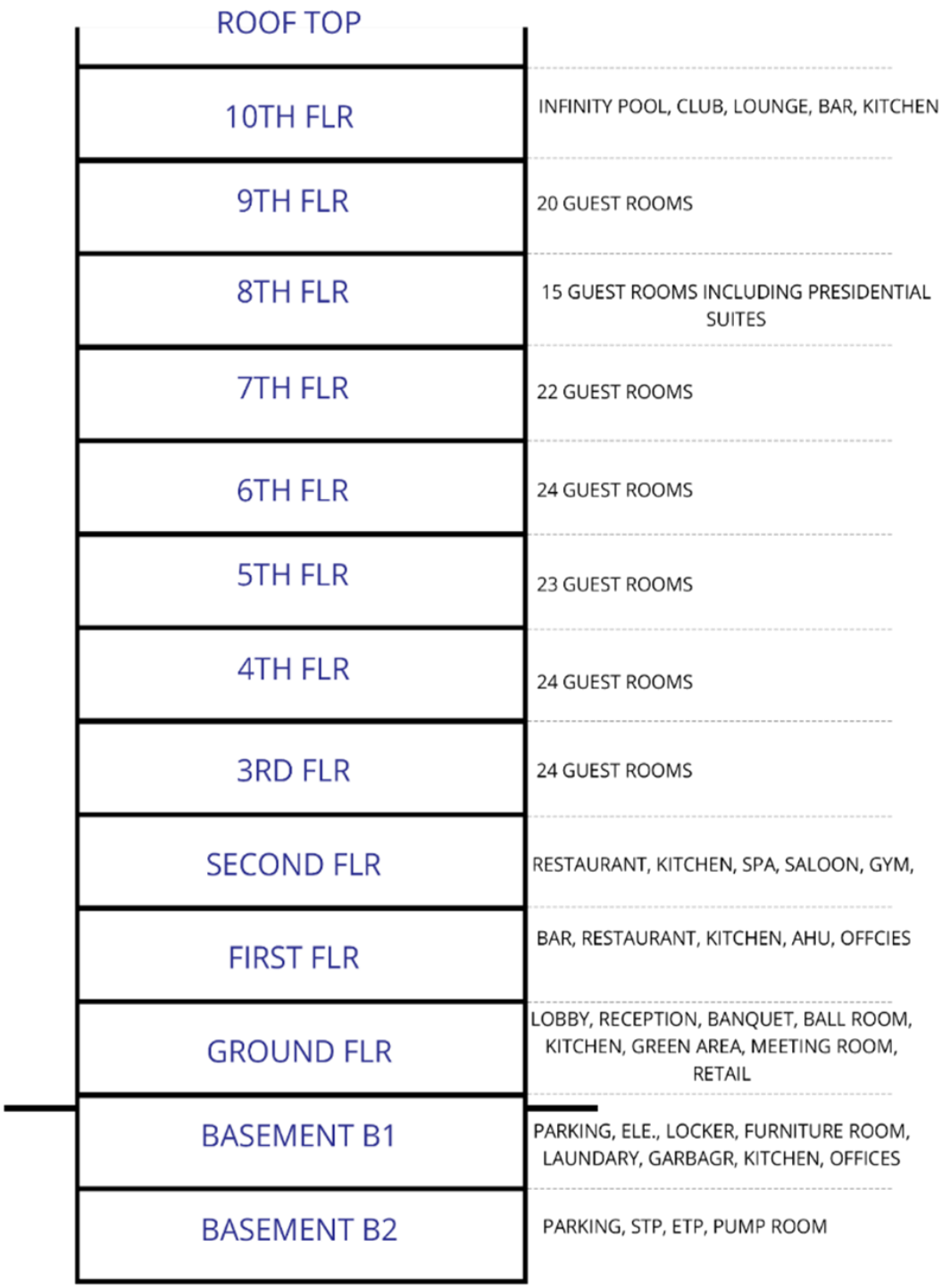


Figure 125 Taj Vertical Zoning

4.2.7 Floor Plans

4.2.7.1 Basement 3

- Spaces provided in this level include:
- WTP, Fire Pumps, and Domestic, raw and fire tanks
- Co2 sensors in basement that turns on jet fans in case of high co2 lvl, fan speed increases accordingly

4.2.7.2 Basement 2

- Basement 2 is comprised of service amenities like STP, ETP, WTP, fire tank, domestic water tank, etc., and parking spaces
- Car Parking Space = 350
- Sump Pumps (DG) to collect ground water and send it back to lake to save the foundation
- Water treated in STP is sent to chiller and gardening purpose.

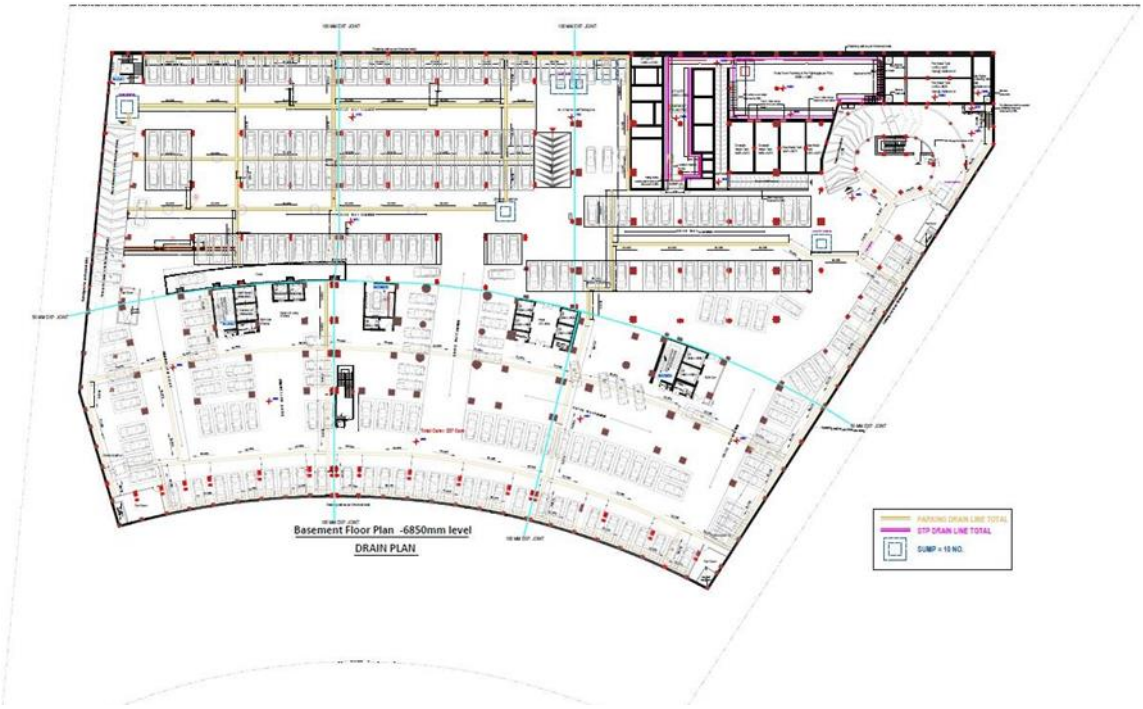


Figure 126 Basement 2 Plan

Raw Water tank Capicity: 90 KL & 125 KL

Domestic Water tank Capicity:118 KL & 123 KL

Fire Water tank Capicity: 1. 200 KL, 2. 200 KL

WTP Process:

Raw Water → Sand Filter → Activated Carbon → Hyper Filtration → Kitchen / Boilers

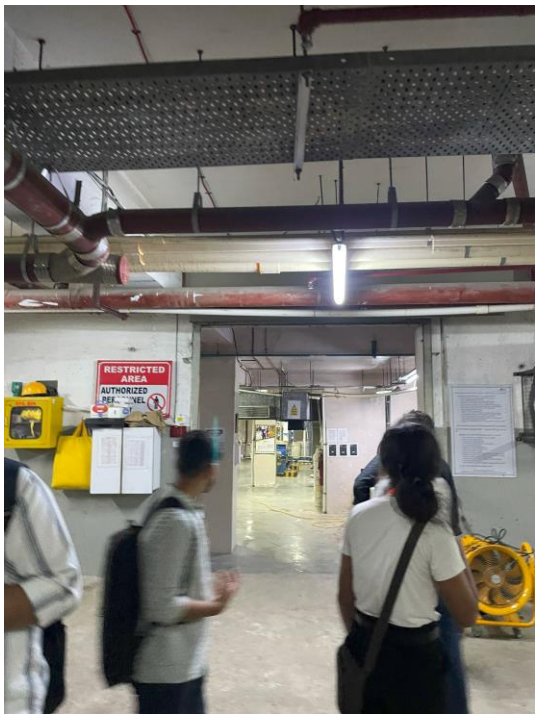


Figure 127 STP at B2 Lvl.

4.2.7.3 Basement 1

- Basement 1 mainly consists of different types of Offices spaces like Housekeeping office , Finance Office, Sales office, Engg. office and Canteen, Storage, Laundry, Bottling plant…
- It also has parking spaces and services outlet.
- All the staff of taj lakefront uses basement 1 as an entrance and parking space respectively.
- Car Parking Space: 250 ECS
- Grey Fans for fresh air, Red Fans for smoke extraction through fire shaft



Figure 128 Basement 1 Plan

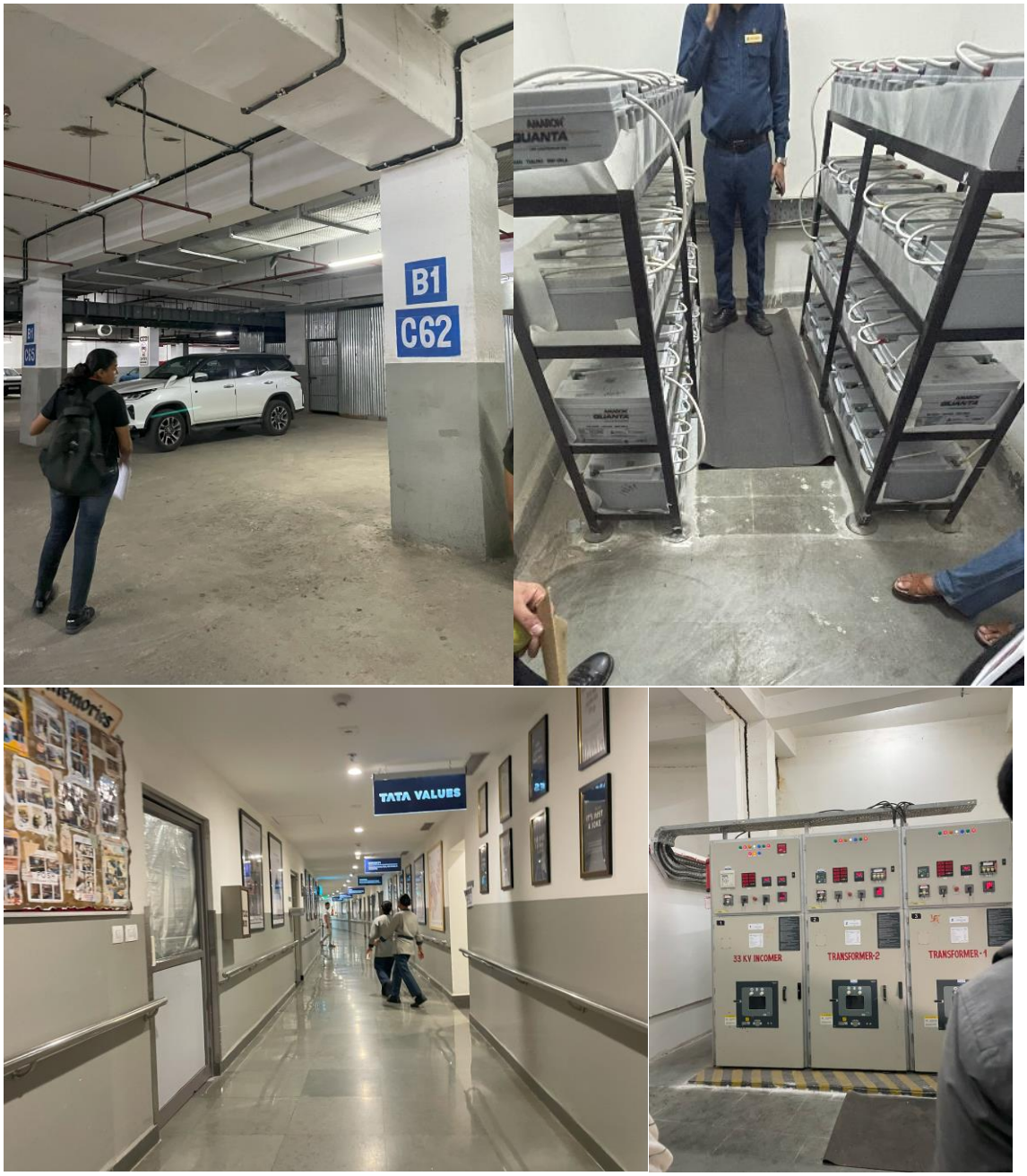


Figure 129 B1 Lvl. Services and spaces

4.2.7.4 Ground Floor

- The entrance lobby of the hotel has grand luxury feel as it has triple heighted spaces with very attractive false ceiling consist of cove lighting.
- There is a separate entrance has been provided including Banquet Hall, Meeting room, conference rooms.
- A Banquet Hall can be divided as 3 halls by automatic temporary panels. Washroom for Banquet guests is accessible from Pre-Function Area which act as a buffer space for guest.

- 2 Banquet Halls, Sheesh Mahal: Small banquet hall and Raj Mahal: Big Banquet Hall.
- 33kv Incoming line for transformer
- 2 DG, 1250 kVA and 1010 kVA, it take 8 seconds for backup and DG room is sound proof with the layering of glass fibre, reduces the sound from 95 dB to 65 dB and upto 45 dB in guest floors.

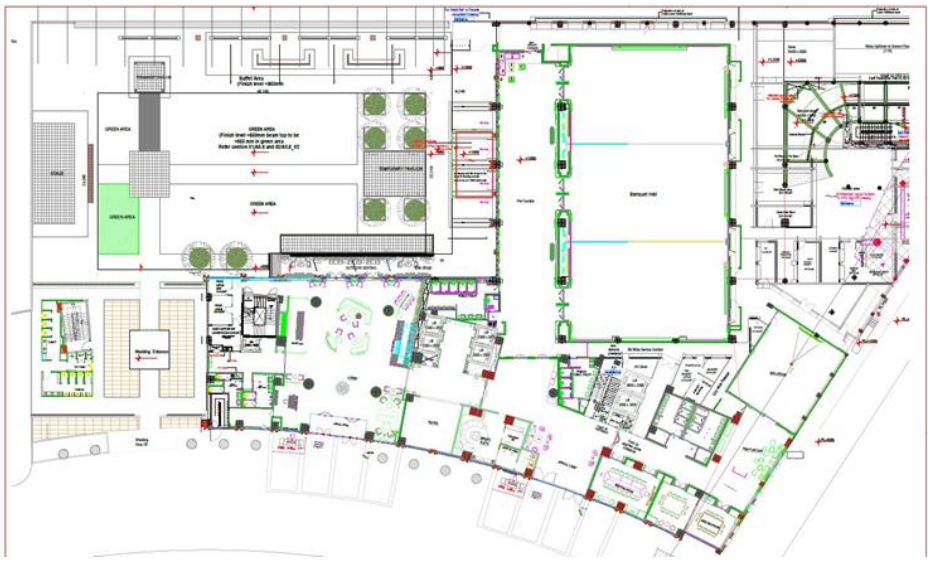


Figure 130 Ground floor plan

4.2.7.5 First Floor

- This floor has a Chinese Restaurant with a wonderful Chinese theme-based interiors Ming restaurant + Bar.
- Private Dining Restaurants are also provided in this floor.
- Chiller are located on the back terrace of first floor, 350 tons each

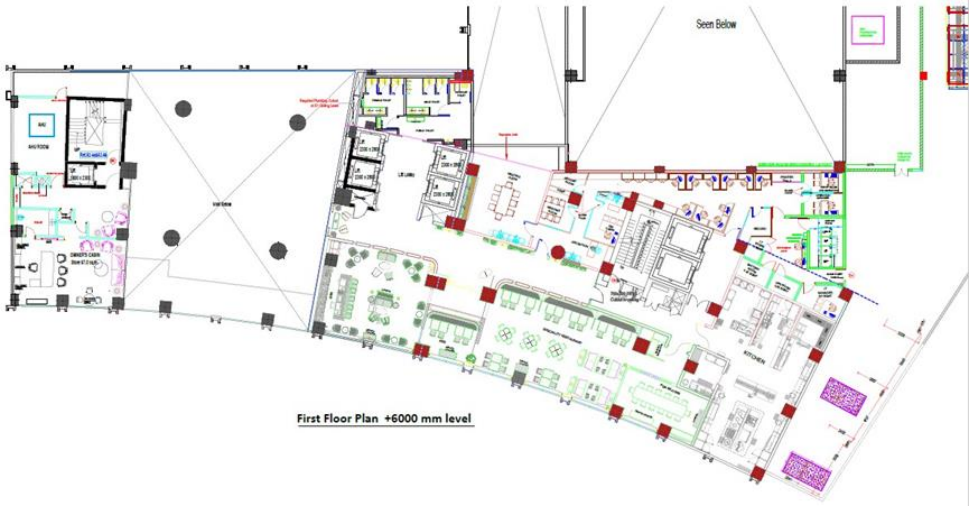


Figure 131 First floor plan



Figure 132 AHU at First floor

- Blue – FRLS (Flame Retardant Low Smoke) cables used at AHU room, can resist fire.

4.2.7.6 Second Floor

- Restaurant Seating's are provided in this floor. Kitchen including cooking, store, washing space has been provided. Live kitchen is also there.
- Kitchens include Machan live kitchen, Machan kitchen, In-room dining (no separate kitchen) most hotels have a separate kitchen for In-room dining with ready-made food.
- No food elevator provision
- Kitchen Nozzles are fitted with sensors which trigger a gas release in the kitchen in case of reaching 180 degree Temperature
- Amenities like Gym, Spa & sauna, Saloon etc. are provided with top class facilities



Figure 133 Second floor plan



Figure 134 Lightning conductors provided in corners at 2nd floor open area

4.2.7.7 Service Floor (2.5 Floor)

- HVAC of Machan restaurant (all day)
- Maintainable glass ceiling for ducts
- Electrical shaft in each floor accessed through maintenance side
- Server room at each floor - tele, cctv, tvs (lan port Tata sky)
- FCU - Fan coil unit
- Plumbing shafts between every 2 rooms
- Chilled water line
- Balcony area at Service floor for ducting and exhaust of kitchens below



Figure 135 HVAC Systems



Figure 136 Electrical Shaft



Figure 137 Balcony area with Exhausts + Ducting



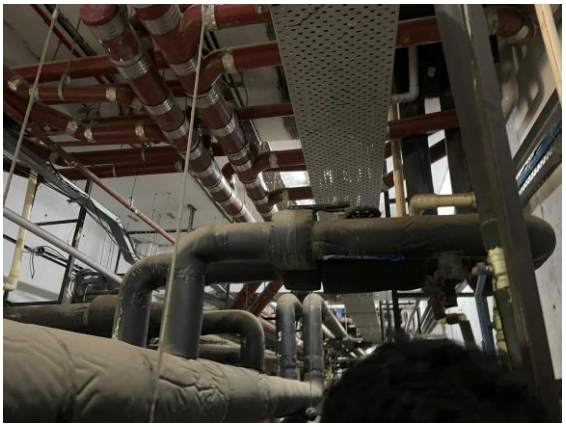


Figure 138 Plumbing Shaft

Figure 139 Pipelines at Service floor

- 5 Star standard demands for good network connectivity in all rooms
- Network area at service floor (with a split AC of 3 units), All network providers' cables come till this area and the hotel distributes it.
- Network cables from the network area connect to network booster domes at various areas.
- Every guest floor has a fire shaft with fire equipments.
- Plumbing shaft at each floor similarly as in Service floor but covered in cabinets.
- It is to be noticed that in the Plumbing shafts, In and Out both are given for Hot water pipelines so that Hot water is always readily available rather than the guest receiving a bit cold water before getting the hot one.

4.2.7.8 Typical Floor Plan (3rd to 7th Floor)



Figure 140 Typical floor plan (3rd - 7th Floor)

- 24 guest rooms including Executive Suites, Twin Bedrooms are there in this floor.
- Housekeeping Room are also provided.

- Specialty of these typical floors is that interior of lobby and corridors are fully different which gives different types of feeling at each different floor. FCU in Rooms 1.5 T, Suites 2 T.
- Provision of refugee areas in 5th and 6th floors.
- System that takes air from atmosphere and provides cooled version of it in rooms (20% fresh air for oxygen and to maintain smell, fungus etc) 80% air from HVAC is supplied to rooms
- Ac always on in rooms even without card to maintain room's odour etc.

4.2.7.9 Eighth floor



Figure 141 8th floor plan

- 15 guest rooms including Executive Suites, King Bedrooms and 1 presidential suite are there in this floor.
- No balconies or openings can be found below this floor.

4.2.7.10 Ninth floor

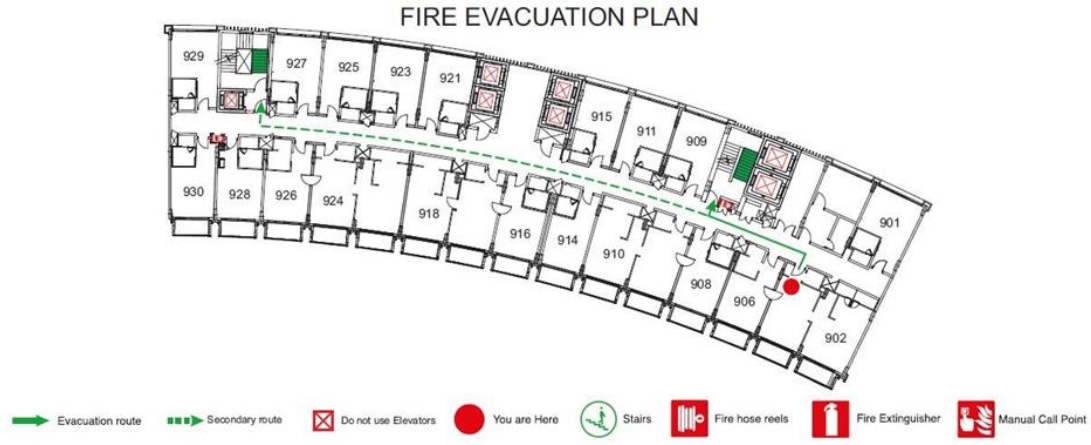


Figure 142 9th floor plan

- 20 guest rooms including Executive Suites, Twin Bedrooms are there in this floor.

4.2.7.11 9.5th Floor

- Plumbing shafts end here & exhaust ducts of bathrooms end at this level.
- Washroom exhaust - 3 units
- Plumbing shafts
- Swimming pool filtration unit
- No ventilation provided, No one works here for long hours so vent isn't compulsory.
- Issue: overflow of swimming pool water, room seepage through slab due to no proper drainage system for the pool specifically
- Paint color fades due to seepage and the new color won't match

4.2.7.12 Tenth floor



Figure 143 10th floor plan



Figure 144 10th floor Lounge area

- Open terrace lounge, club area with the view of swimming pool is provided in the top floor of this Hotel.

4.2.8 Guest rooms and their typology

Total there are 152 rooms which are majorly classified into 4 categories:

- Executive Suite
- Twin Room
- King Room
- Presidential Suite

4.2.8.1 Executive Suite

Tranquility and luxury unite in the Executive Suites at the Taj Lakefront, Bhopal. Extravagant and spacious, these suites, with the option of interconnecting rooms, are ideal for vacationing with family and friends. The breakfast table, the plush seating, a dressing area and state-of-the- art bathrooms are the perfect setting that your memories deserve. Indulge in the breath-taking views of the lake and Taj's signature service for a truly luxurious retreat.





Figure 145 Executive Suite Interior photos

Size: 66 sq.m

Signature Feature: Spacious two-room suites overlooking the lake

Occupancy Details: Up to 3 guests. Max Adults: 3, Max Children: 2

OTHER CONVENIENCES

- Tea-coffee maker
- Forest Essentials bath amenities
- Air conditioning
- Separate living area
- Electronic safe.
- WiFi
- Iron & ironing board
- In-room bottled water
- Minibar
- Newspaper
- Full-length mirror, hair dryer, weighingscale
- 49-inch Smart LED TV



Figure 146 Executive suite unit plan

4.2.8.2 Twin Room

Framed by the picturesque backdrop of the hills, the Deluxe Rooms are the epitome of tranquillity and relaxation. The decor seamlessly merges the aesthetic philosophy of Madhya Pradesh with a European flair. Fully-equipped with quality amenities, including digital connectivity with smart TV and Taj's signature service, the Deluxe Rooms offer an unmatched experience of comfort. Includes complimentary access to the hotel gym and wet areas.





Figure 147 Twin room photos

SIZE: 33 sq.m

SIGNATURE FEATURE: Spectacular vistas of the hills

Occupancy Details: Up to 3 guests. Max Adults: 3, Max Children: 2

OTHER CONVENIENCES

- Tea-coffee maker
- Forest Essentials bath amenities
- Choice of smoking & non-smoking accommodation
- Air conditioning
- WiFi
- Iron & ironing board
- In-room bottled water
- Minibar
- Newspaper
- Full-length mirror, hair dryer, weighing scale
- 49-inch Smart LED TV
- Shower Cubicle

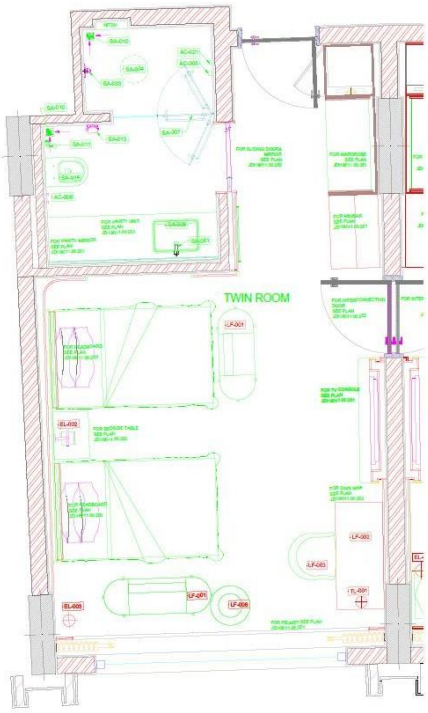


Figure 148 Twin room unit plan

4.2.8.3 King Room

Framed by the picturesque backdrop of the hills, the Deluxe Rooms are the epitome of tranquillity and relaxation. The decor seamlessly merges the aesthetic philosophy of Madhya Pradesh with a European flair. Fully equipped with quality amenities, including digital connectivity with smart TV and Taj's signature service, the Deluxe Rooms offer an unmatched experience of comfort. Includes complimentary access to the hotel gym and wet areas.



Figure 149 King room

SIZE: 33 sq.m

SIGNATURE FEATURE: Spectacular vistas of the hills

Occupancy Details: Up to 3 guests. Max Adults: 3, Max Children: 2

OTHER CONVENIENCES

- Tea-coffee maker
- Forest Essentials bath amenities
- Choice of smoking & non-smoking accommodation
- Air conditioning
- WiFi
- Iron & ironing board
- In-room bottled water
- Minibar
- Newspaper
- Full-length mirror, hair dryer, weighing scale
- 49-inch Smart LED TV

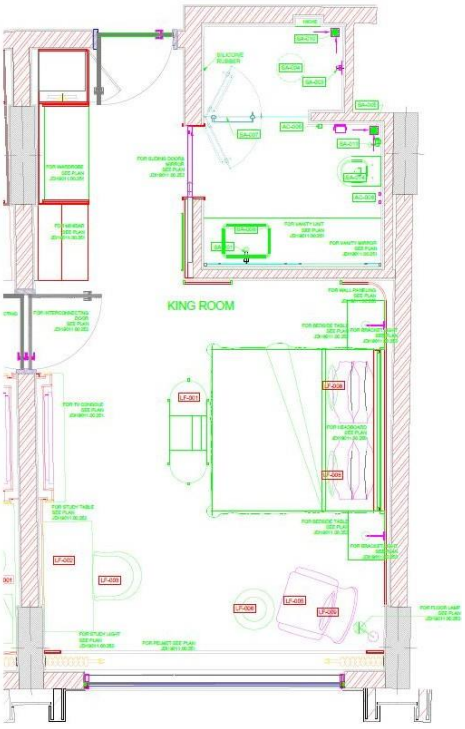


Figure 150 King room unit plan

4.2.8.4 Presidential Suite

Bhopal is the land of the Nawabs and Begums, and epitomizing this rich culture is the Presidential Suite of the Taj Lakefront, Bhopal. With interiors that give an ethereal glimpse into the bygone era and a private balcony in every room overlooking the glorious city, the Presidential Suite is a perfect union of the multitude of generations. A lavish experience, embodied by an elegant living room, a plush dining area and a palatial master bedroom, await your presence in the opulence of the Presidential Suite at the Taj Lakefront, Bhopal.

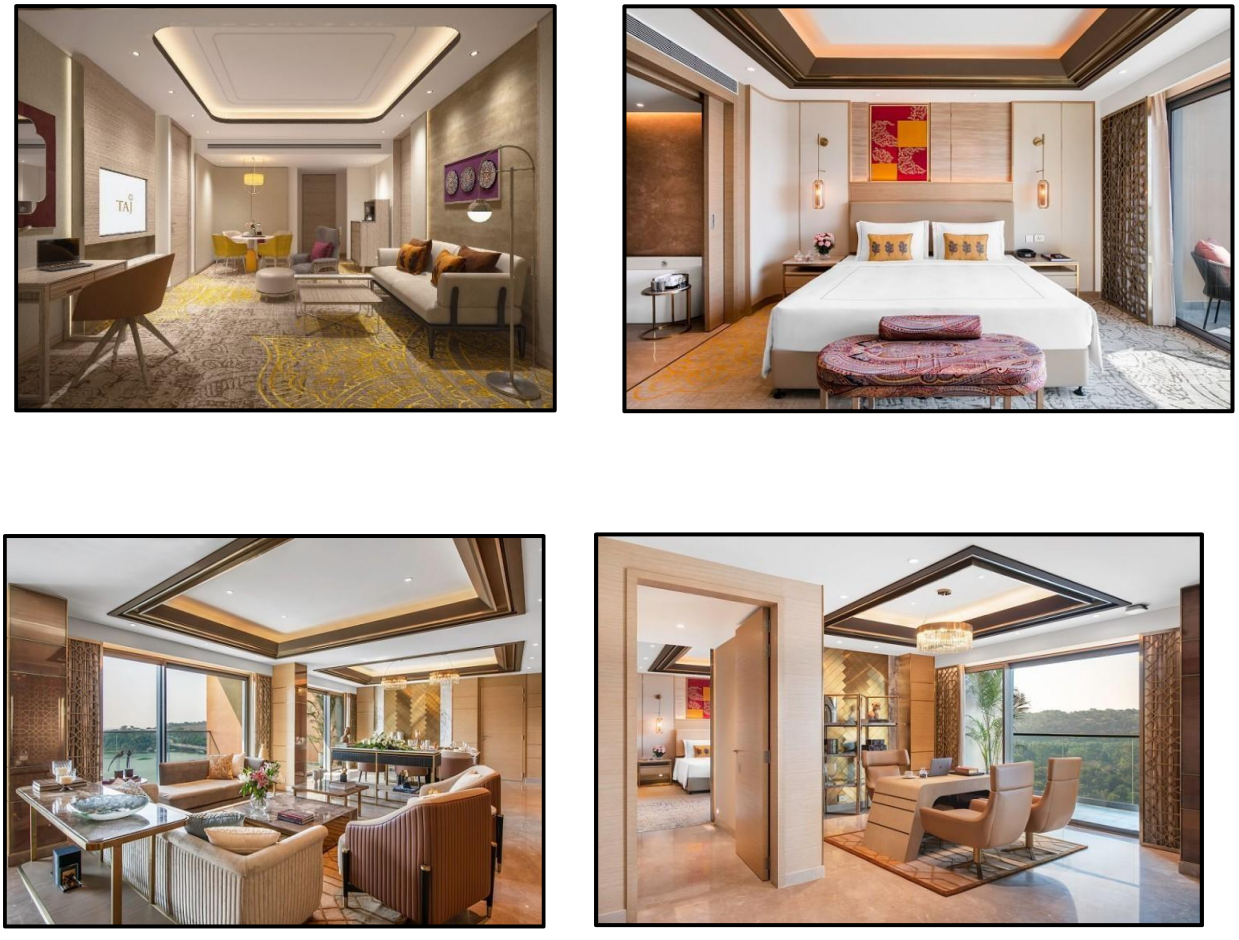


Figure 151 Presidential suite photos

SIZE: 152 sq.m

SIGNATURE FEATURE: A regal experience in the heart of the country

Occupancy Details: Up to 3 guests. Max Adults: 3, Max Children: 2

OTHER CONVENIENCES

- Forest Essentials bath amenities
- Air conditioning
- Bedroom with private balcony or verandah & bathroom
- Living room with dining area, bedroom & bathroom
- Electronic safe.
- Tea coffee maker
- WiFi
- Iron & ironing board
- In-room bottled water
- Minibar
- Newspaper
- Full-length mirror, hair dryer, weighing scale
- 49-inch Smart LED TV
- Lake View
- Private Pantry

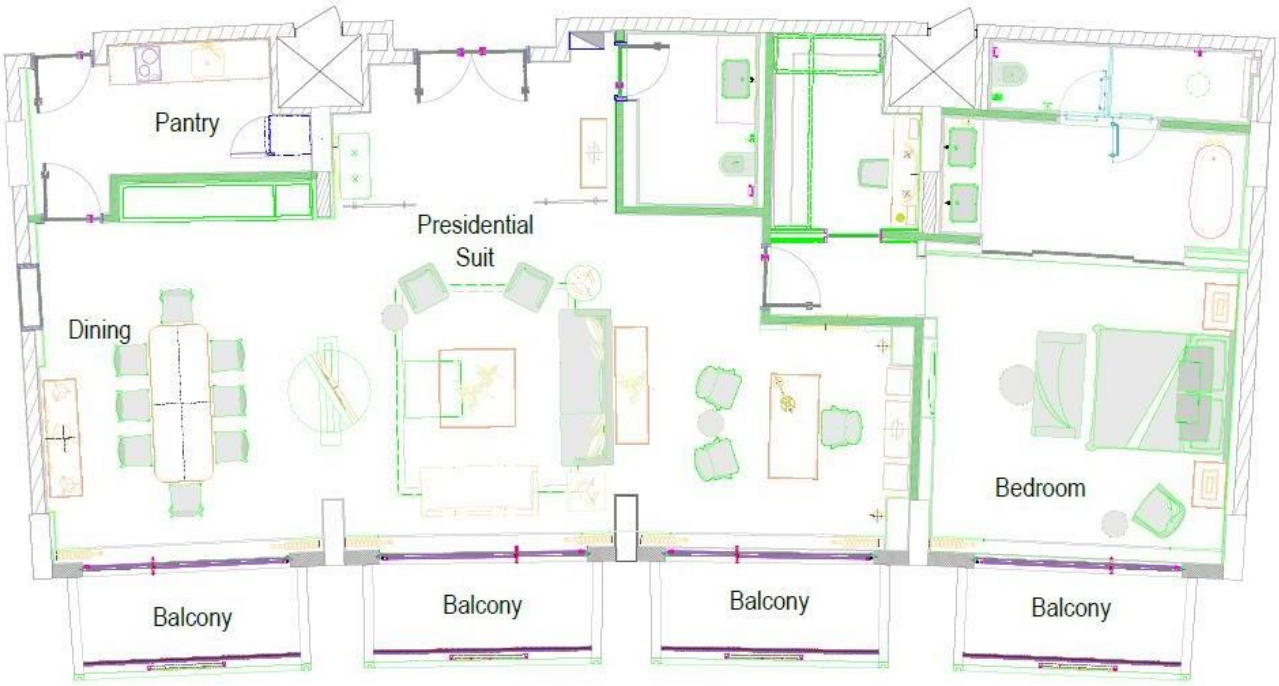


Figure 152 Presidential suite plan

4.2.9 Interior views of Spaces



Spa & Sauna



PDR



Banquet Hall



Swimming pool



Restaurant Seating



Lounge/Bar

Figure 153 Interior views

4.2.10 Services

4.2.10.1 Electrical Services and HVAC



Figure 154 LT Panel room - 60 sqm



Figure 160 HT Panel room - 20 sqm

Access width – 4 m



Figure 155 LT and HT panel room



Figure 156 LT and HT panel room; Height - 3.9 m



Figure 157 Fire fighting

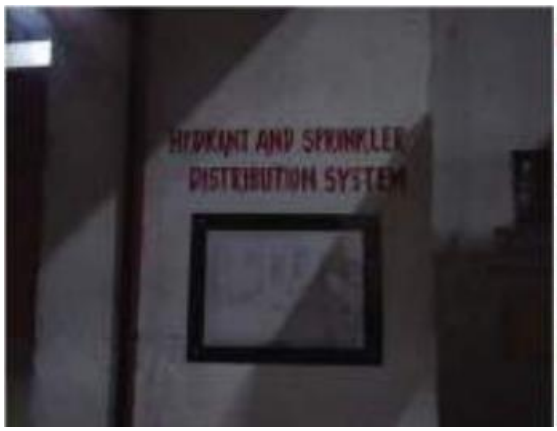


Figure 158 Fire fighting



Figure 159 Electrical tray

4.2.10.2 Chiller Plant





Figure 161 Chiller plant150 sqm Area; Access width – 1.8 m

4.2.10.3 Fire Pump



Figure 162 Control panel for fire room - 70 sqm



Figure 163 Water storage 20,00,000 L

4.2.10.3 Water Treatment



Figure 165 Water Storage Tank - Raw - 90 sqm





Figure 164 Swimming pool tank



Figure 166 Boiler room with pump and heat exchange



Figure 167 Overhead tank

4.2.10.4 STP and Cooling towers



Figure 169 STP



Figure 168 Cooling towers

4.2.10.5 Kitchen



4.2.10.6 Disposable area



Figure 170 Waste disposal

4.2.10.7 Laundry



Figure 171 Laundry

4.1.12 Inferences

- No staircase pressurisation
- Water tanks can be placed in basement with STP and WTP
- Duct opening can be treated with landscaping
- Large banquet halls can be provided with foldable partition panels to divide into 2 or more parts for more no. of events simultaneously
- Services should not be compromised
- Guest floors can be divided into different interior themes for having different identity and specialities.
- Different lanes for waiting, drop off and pickup.
- Expansion joints are to be avoided as much as possible as they are so problematic and not maintainable (water seepage etc.)
- Provide vent in electrical rooms like elevator room etc.
- No garbage chutes as they’re hard to clean and chances of garbage bags tearing out and creating a mess, also fire safety factors

4.3 Yashobhoomi India International Expo Convention Centre - IICC Dwarka (Live Case Study)

4.3.1 Introduction



Figure 172 Yashoboomi Convention Centre

Yashobhoomi Convention Centre, also known as India International Convention & Expo Centre (IICC), is a landmark project situated in Dwarka, New Delhi. It stands as one of India's most ambitious infrastructure endeavours, aimed at positioning the country as a global hub for conferences, exhibitions, and business events.

This state-of-the-art facility not only serves as a venue for large-scale events but also symbolizes India's growing prowess in the global MICE (Meetings, Incentives, Conferences, and Exhibitions) industry.

An unparalleled Convention Centre, the largest and most prestigious auditorium in the country. With a seating capacity of 6000, this state-of-the-art facility is designed to impress and inspire. Our Grand Ball Room, spanning over 3400 sqm, can effortlessly accommodate 2400 seats, providing an elegant setting for your special events. Additionally, we offer a range of 13 versatile meeting rooms, varying in size from mid to large scale, ensuring that every gathering is perfectly catered for. And to further elevate your experience, our in-house catering services will indulge your palate with a delectable selection of culinary delights. Discover an extraordinary venue where grandeur meets excellence at the Convention Centre.

4.3.2 Concept And Approach

The design and development of Yashobhoomi Convention Centre were driven by a holistic vision to blend modern architectural practices with India's cultural heritage. The concept focuses on creating a world-class convention and exhibition space that is both functional and symbolic of India's economic growth and cultural diversity.

The architectural approach is characterized by its emphasis on sustainability, flexibility, and technological integration. The design incorporates green building principles, aiming for a **LEED Platinum certification**. This is achieved through energy-efficient systems, water conservation strategies, and the use of locally sourced materials.

A critical aspect of the conceptual design is the centre's ability to host a wide variety of events, ranging from international conferences to large-scale exhibitions, concerts, and cultural events. The architecture is flexible, with spaces that can be easily adapted to different configurations and event types.

4.3.3 Proximity And Accessibility

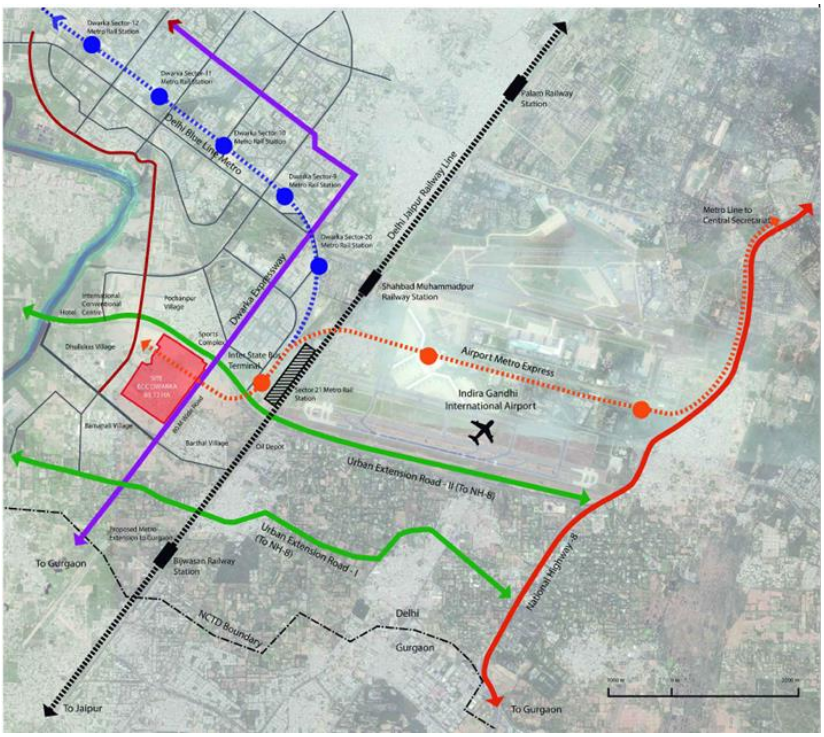


Figure 173 Site Proximity

- 11 Kms from Indra Gandhi International Airport
- 23 Kms from Connaught Place
- 26 Kms from New Delhi Railways Station
- 16 Kms from Gurugram
- Serviced by Public Transports (Buses, Cabs, Metros)



Figure 174 Metro connectivity

The Airport Metro Express from the airport offers direct internal access to YASHOBHOOMI. In order to create easier access by automobile, YASHOBHOOMI will be connected to the UER II(Urban Extension Road II) and Dwarka Expressway, while the Delhi Jaipur Railway Line and the Delhi Blue Line Metro are directly adjacent, thus offering the most convenient transportation infrastructure.

4.3.4 Site and internal Planning

The Master Plan structures the project in two differential sectors. It leaves the fairgrounds and Convention area to the West and the development of mixed use (Hotels, Offices, Retail Areas) to the East.



Figure 175 Yashobhoomi complex site planning



Figure 176 Site information plan

4.3.4.1 Typology of spaces

Typology	Capacity/Scale	Key Features
Auditorium	6,000 seats (divisible)	GALA system, multi-use, divisible
Grand Ballroom	3,000 (max)	Can be split, prefunction space
Meeting Rooms	13-15, seats 200–600 each	Dividable, AV equipped
Exhibition Halls	5 (Phase II), 51,000sqm+	Subdividable, large-scale events
Multipurpose Arena	20,000 (future phase)	Retractable roof, sports/events
VIP/Organiser Suites	Various	Private, secure access

Figure 177 Typology of spaces

4.3.4.1 Grand entrance / foyer

The covered & air-conditioned foyers in Hall 1 and 2 enhances the participants and attendees experience, it houses all the major support facilites like Registration Blocks, Organiser Rooms, VIP Lounges, Exclusive Lounges, Media Rooms and Cloak Rooms which makes Yashobhoomi a Plug & Play venue for the organisers.

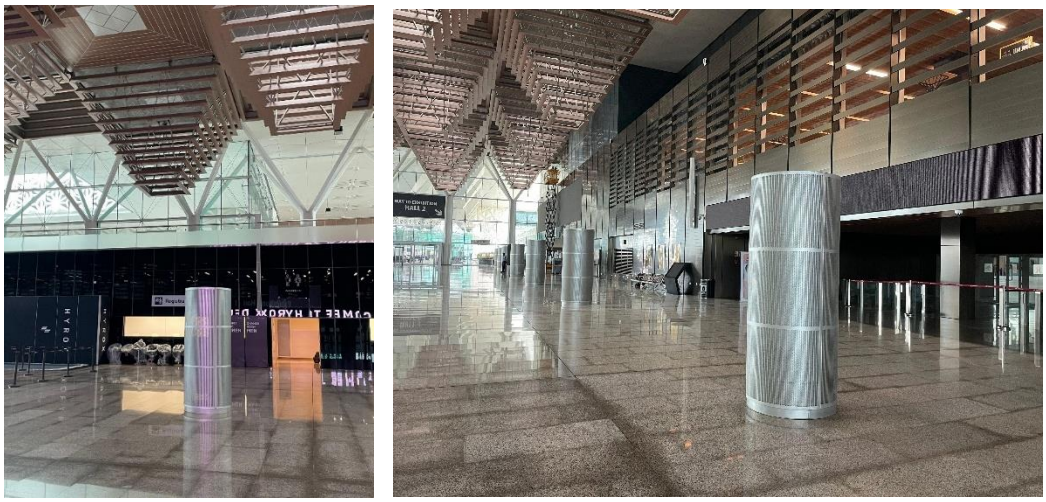


Figure 178 HVAC air supply tower like structures in the central area for cooling

4.3.4.2 Exhibition halls

There are 3 Exhibition Halls currently executed among a total of 5 Exhibition Halls

5 exhibition halls provide over 240000 sqm of built-up space with additional open exhibition area. Roof is decorated colourful panels and vibrant pattern which defines its character façade opens itself in an arch-like structure welcoming visitor. Each hall is equipped with flexibility to be converted into 4 small halls.

- Exhibition hall 1 divided into Four quadrants ABCD
- 15 m clear height
- Hall B and C are of equal area

- A 5200 sqm
- D 5800 sqm



Figure 179 Exhibition Halls 1 and 2

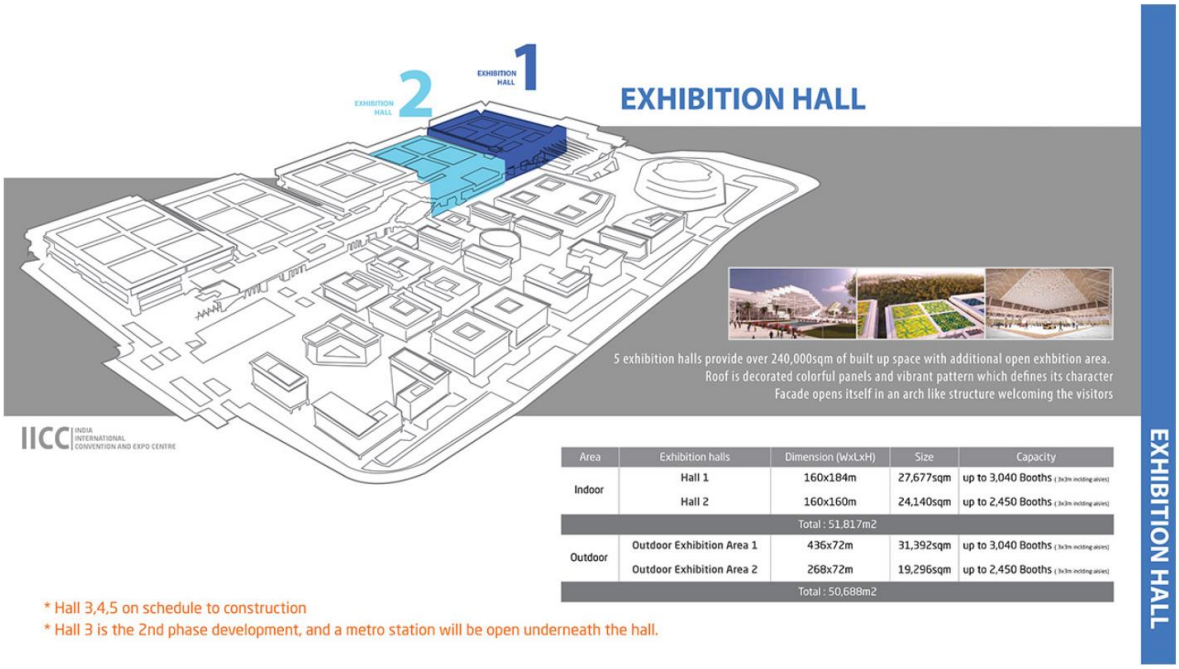


Figure 180 Exhibition halls details

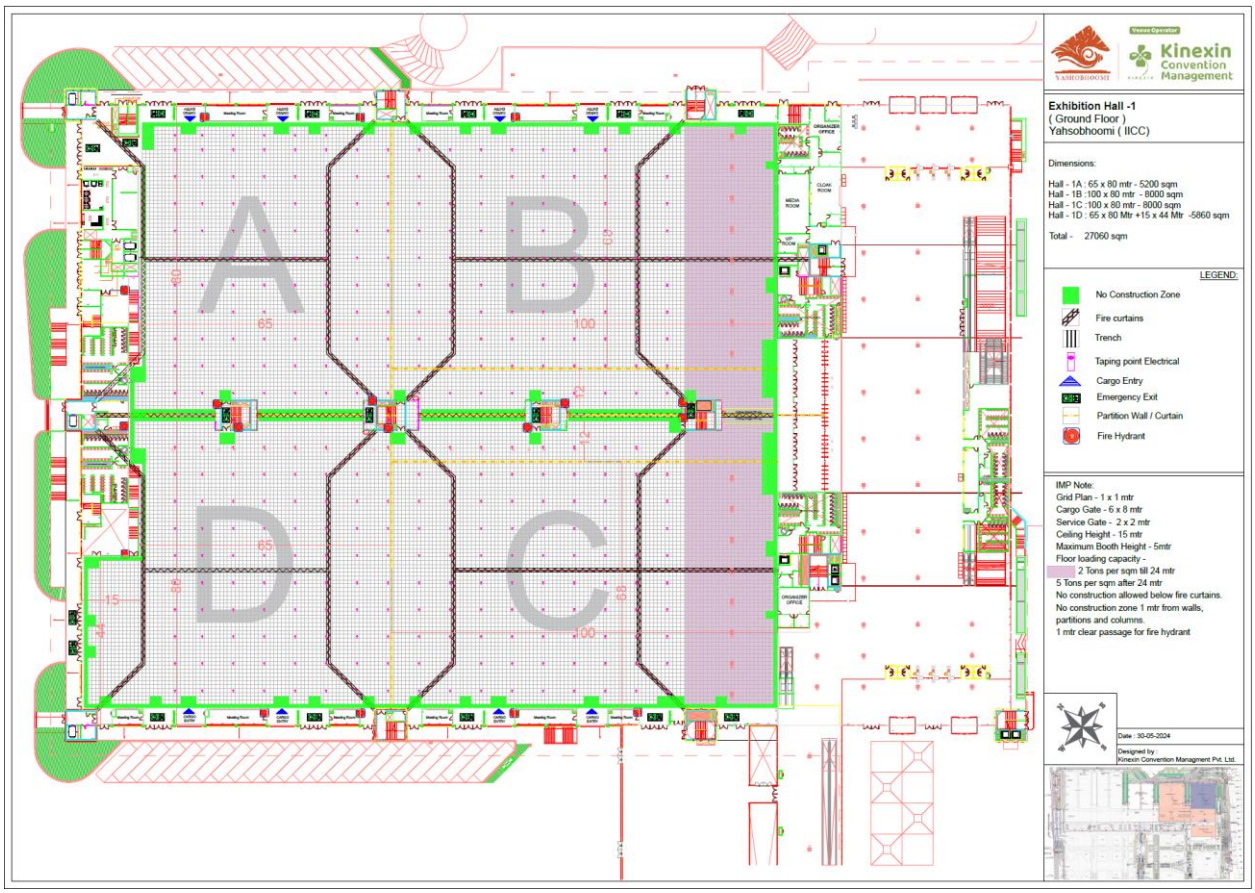


Figure 181 Detailed plans for exhibition hall 1

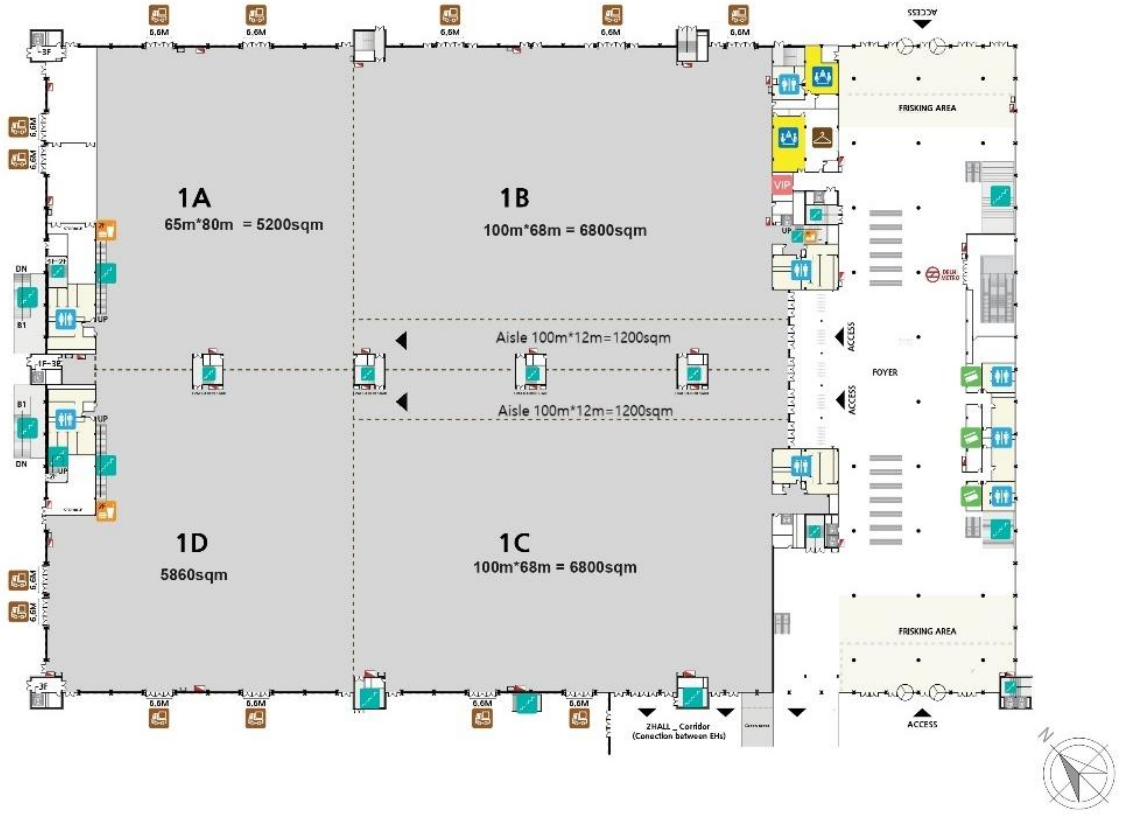


Figure 182 Ground floor plan : Exhibition hall 1

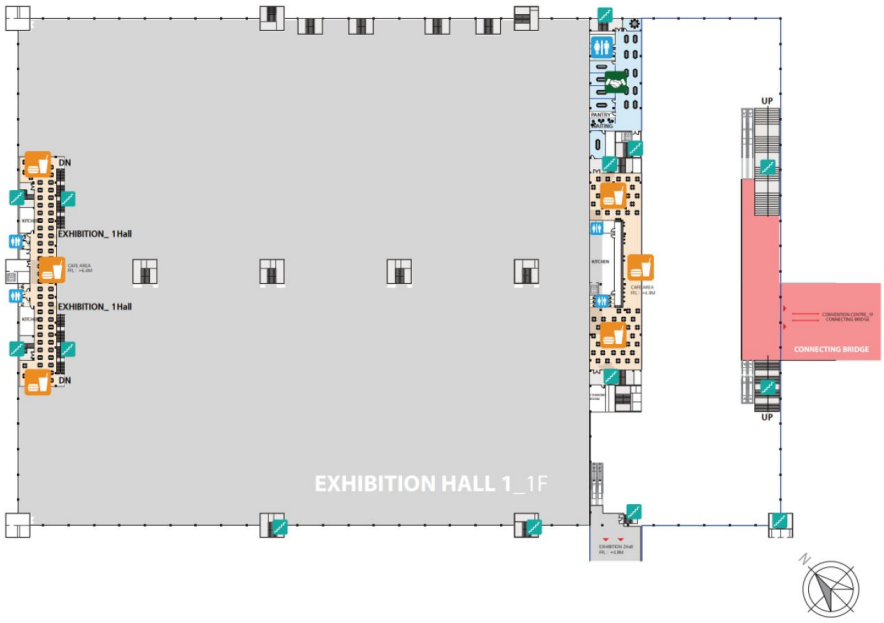


Figure 183 First floor plans : exhibition hall 2

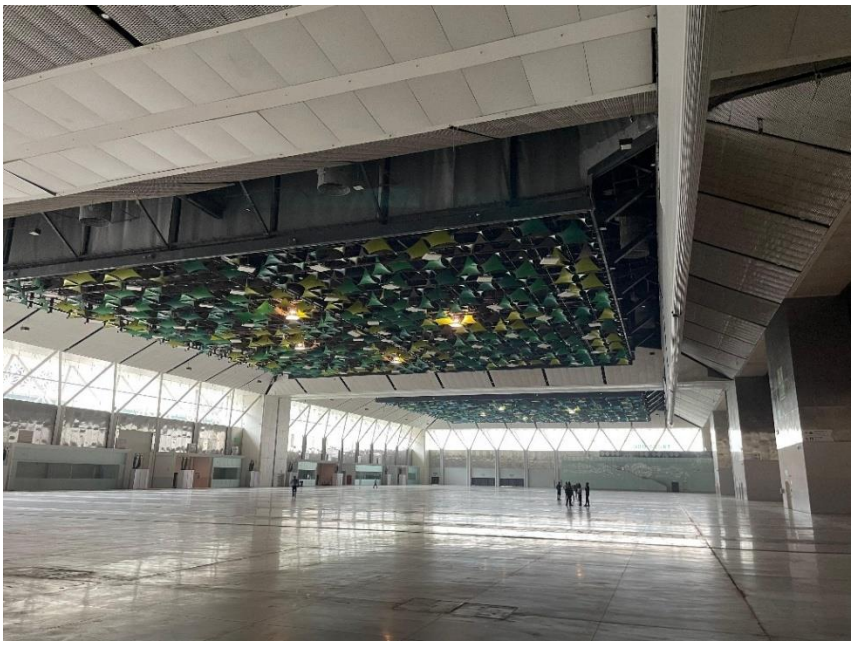


Figure 184 Exhibiton halls

- Exhibition hall with provisions for maximum natural light as the building is IGBC certified.
- Cargo gates for truck
- 18 gates in total for the premise
- Gate 10 for truck
- 9th gate for labors

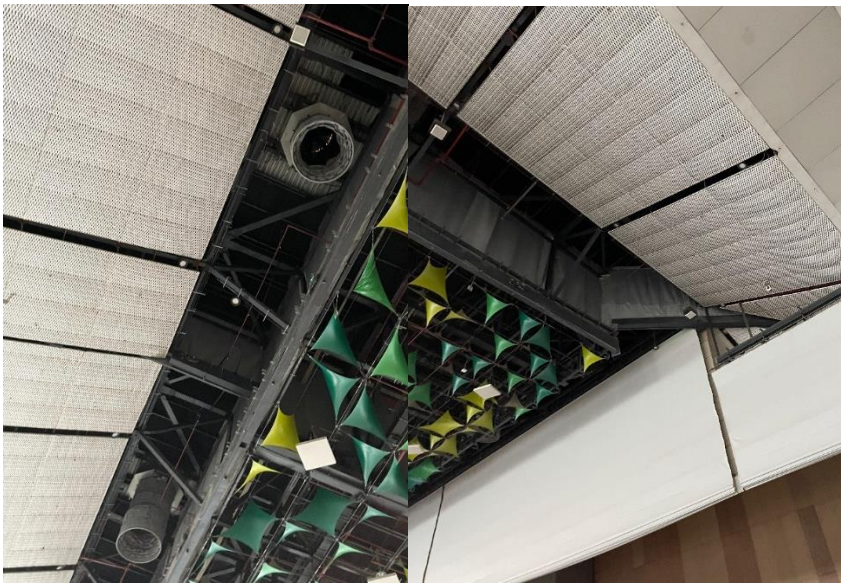


Figure 185Retractable ducts for fire fighting

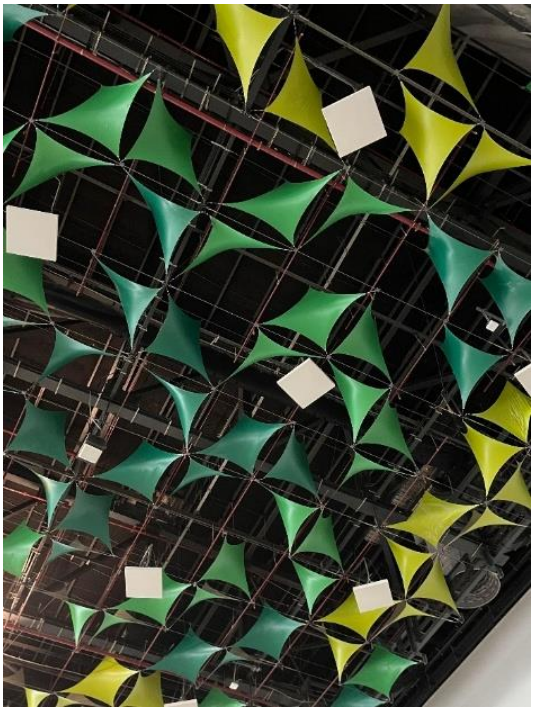
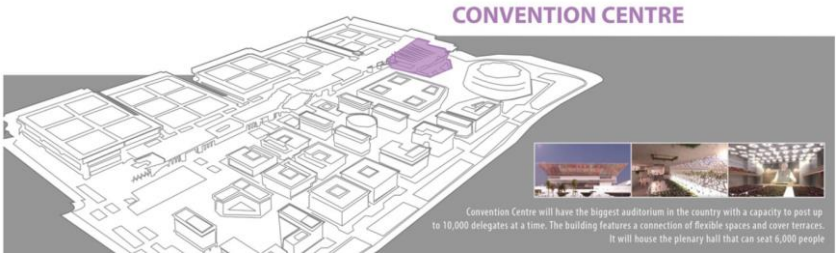


Figure 186Kites in the exhibition hall to anchor hangables



Figure 187 Partition to divide the exhibition hall entries when used separately

4.3.4.3 Convention centre

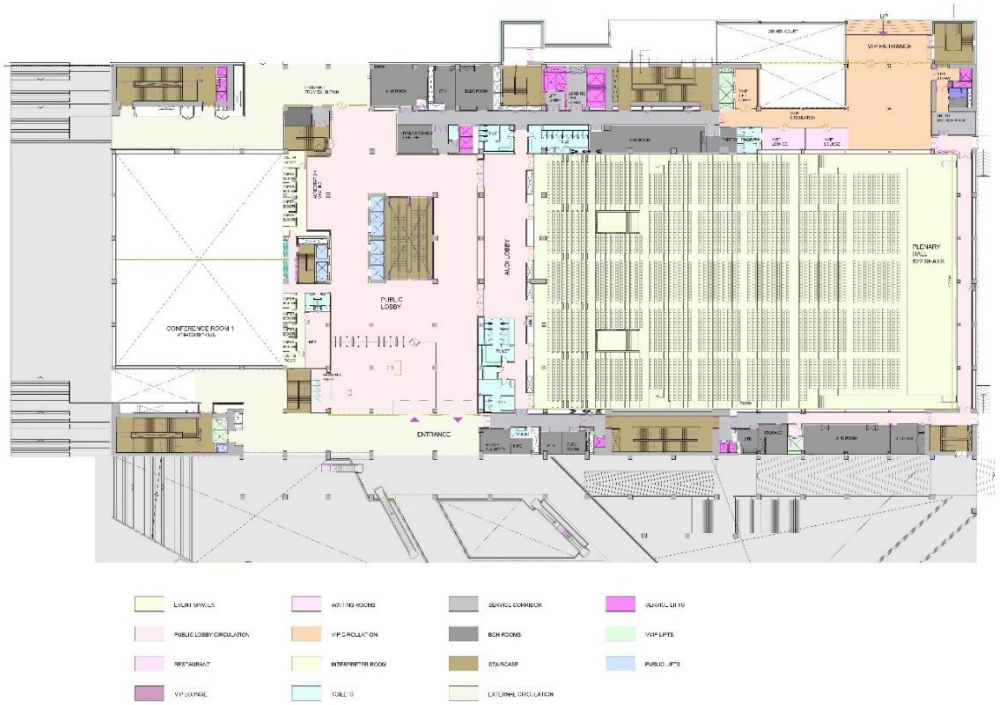


Floor	Hall Name	Room No.	Dimension in (m)		Dimension in (sqm.) Total Area	Height (m)	Seating (Banquet Type)	Seating (Theatre Type)	Seating (Classroom Type)
B1 Floor	Amaltas Hall	B101 A+B	39	30.42	1186.38	7.82	420	900	500
	Amaltas Hall A	B101 A	30.42	19.41	590.4522	7.82	253	507	306
	Amaltas Hall B	B101 B	30.42	19.41	590.4522	7.82	253	507	306
2nd Floor	Parijat Hall	201	23.01	13.67	314.5467	2.9	125	220	130
	Kesar Hall	202	14.94	13.7	204.678	2.9	70	120	80
3rd Floor	Kumudini Hall	301	19.5	10.89	212.355	2.9	112	200	125
	Gulmohar Hall	302	14.94	19.43	290.2842	2.9	112	230	130
	Javakusum Hall	303	10.34	13.78	142.4852	2.9	60	120	64
	Champa Hall	304	19.49	14.96	291.5704	2.9	125	250	151
	Neelkamal Hall	305	19.5	16.1	313.95	2.9	114	180	100
4th Floor	Suryamukhee Hall	401	12.39	11.37	140.8743	2.9	60	100	70
	Moulshree Hall	402	12.39	11.48	142.2372	2.9	60	100	70
	Suryamukhee Hall + Moulshree Hall	401 + 402	12.39	23	284.97	2.9	120	220	140
	Kaner Hall	403	11.36	10.76	122.2336	2.9	52	105	60
	Mogra Hall	404	14.95	22.93	342.8035	2.9	140	280	150
	Mogra Hall A	404 A	14.95	11.5	171.925	2.9	70	140	80
	Mogra Hall B	404 B	14.95	11.3	168.935	2.9	70	140	80
	Kadamb Hall	405	14.95	8.8	131.56	2.9	55	100	60
	Mogra Hall + Kadamb Hall	404A+B + 405	14.95	31.92	477.204	2.9	200	360	210
5th Floor	VIP Lounge		42.04	12.87	541.0548				
6th Floor	Palash Hall (GBR)		42	83	3486	8.73	1330	2400	1400
	GBR A		42	27.43	1152.06	8.73	400	700	400
	GBR B		42	27.65	1161.3	8.73	450	850	500
	GBR C		42	27.67	1162.14	8.73	450	850	500

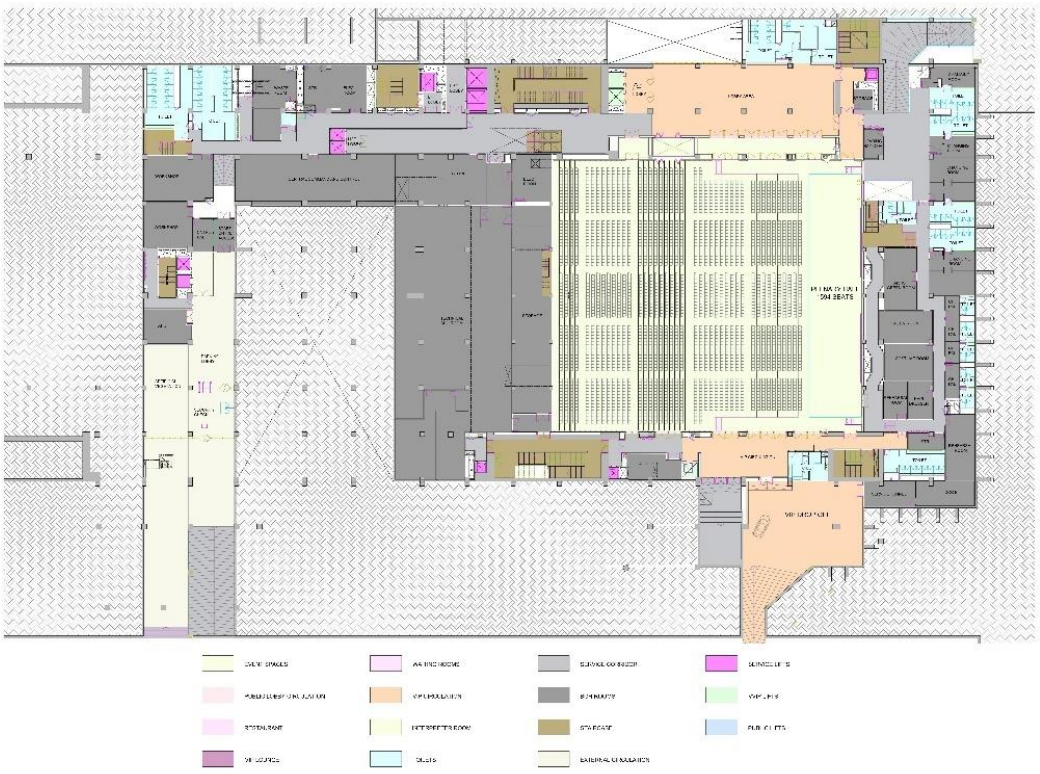
Figure 188 Convention center Area statement



Figure 189 Room typology



GROUND FLOOR LEVEL PLAN



BASEMENT B1 PLAN



BASEMENT B1 PLAN



7F LEVEL PLAN



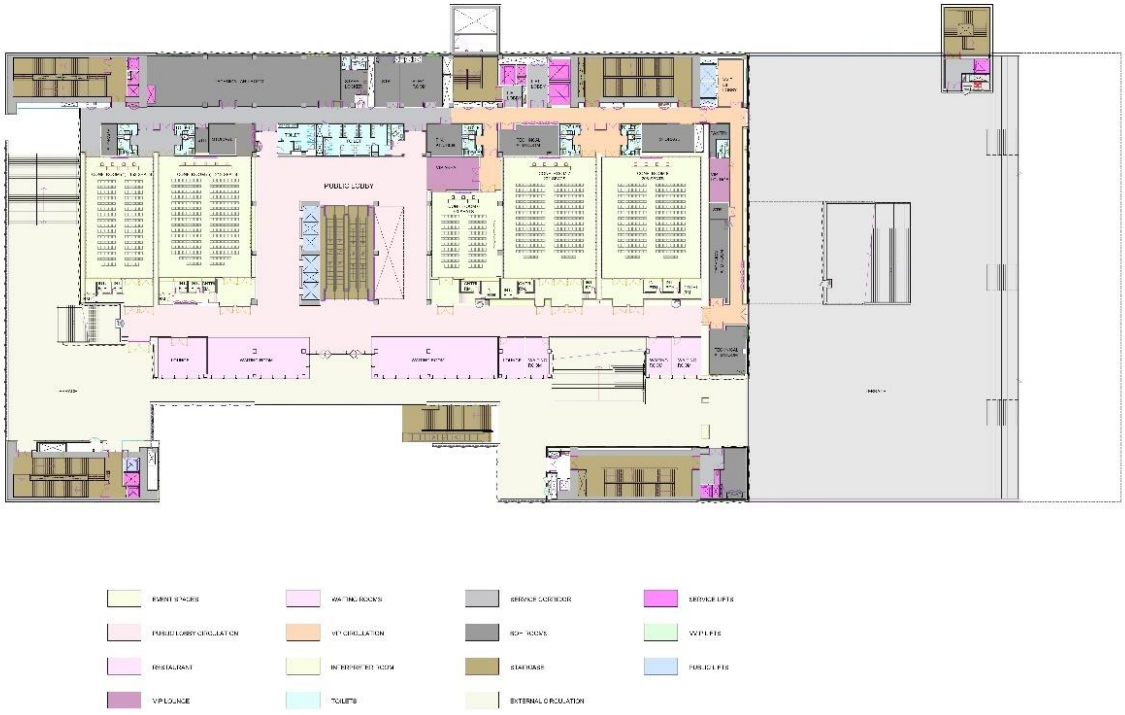
6F LEVEL PLAN



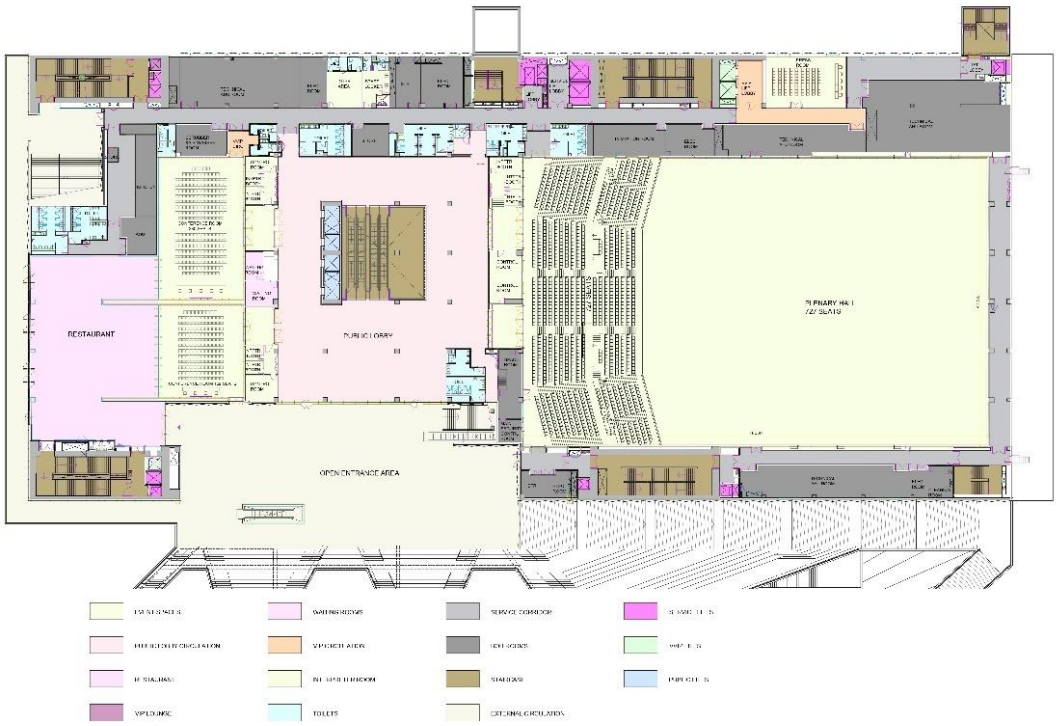
5F LEVEL PLAN



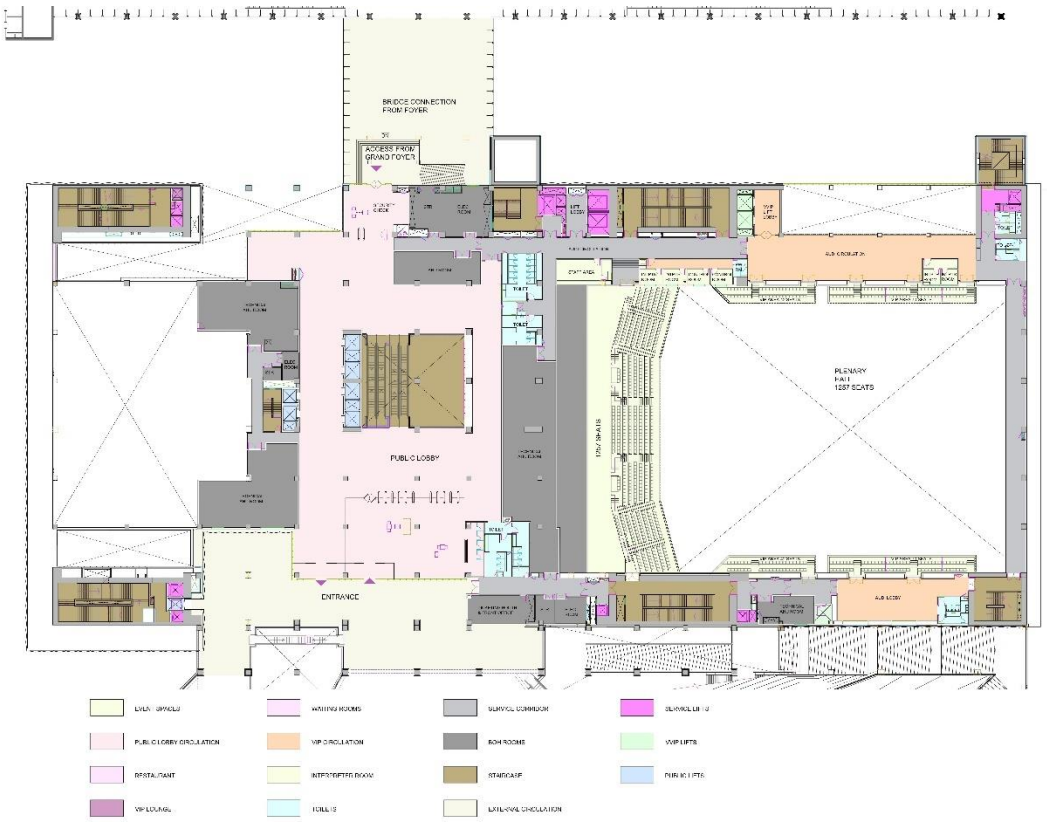
4F LEVEL PLAN



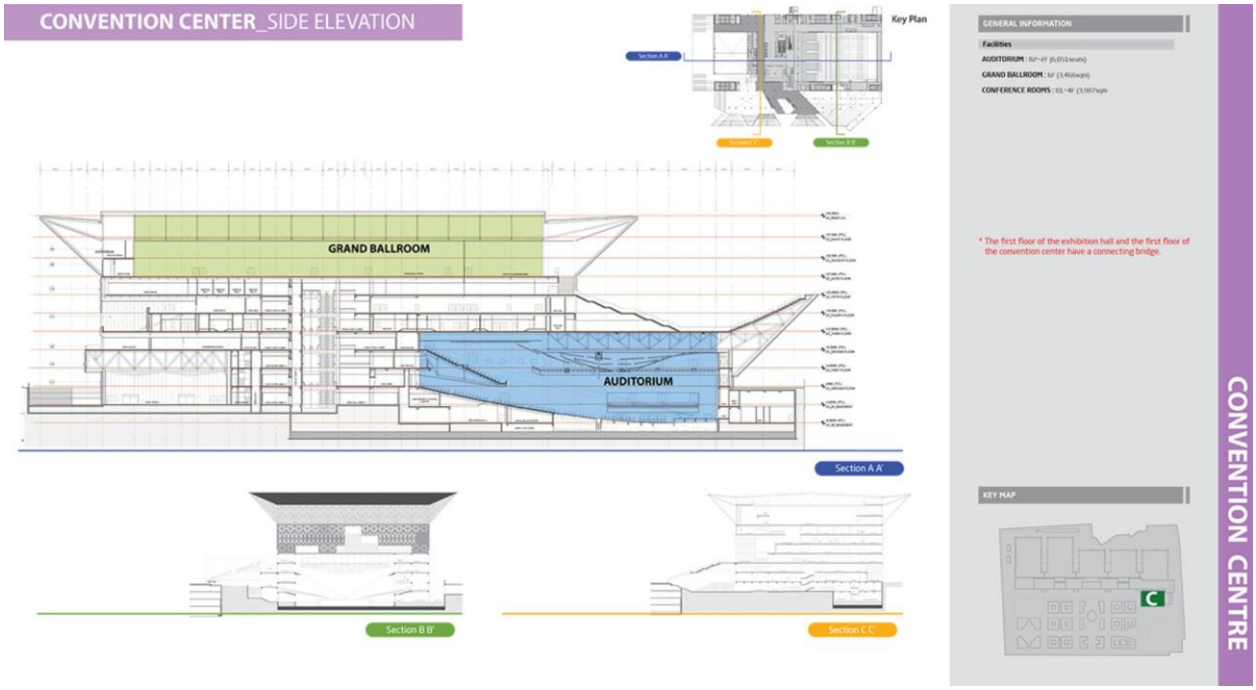
3F LEVEL PLAN



2F LEVEL PLAN



1F LEVEL PLAN



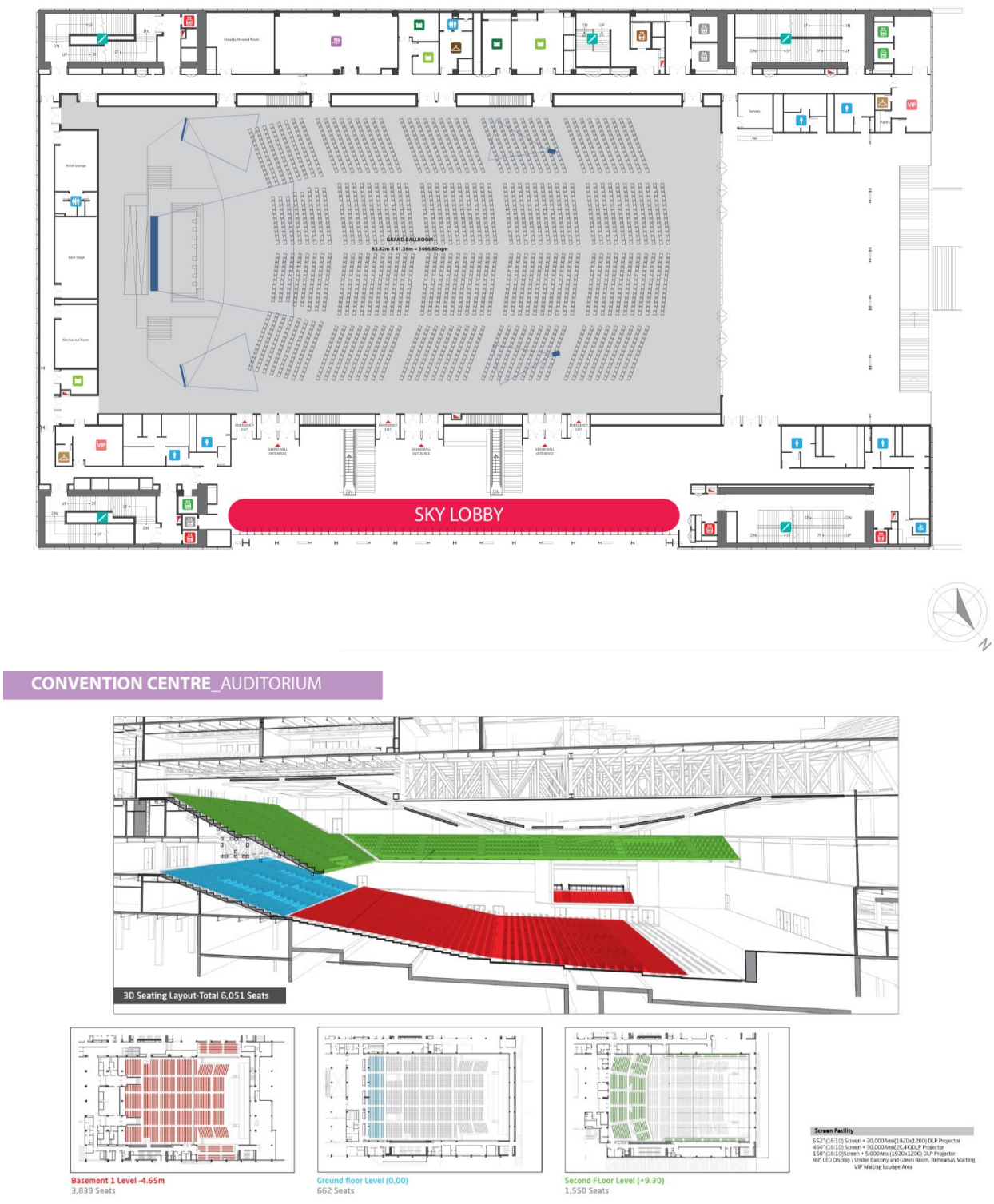


Figure 190 Floor plans - Convention center



Figure 191 AC vents behind seats and on floors

- Ac vents behind seats for the balcony floor in the auditorium rather than floor in other cases

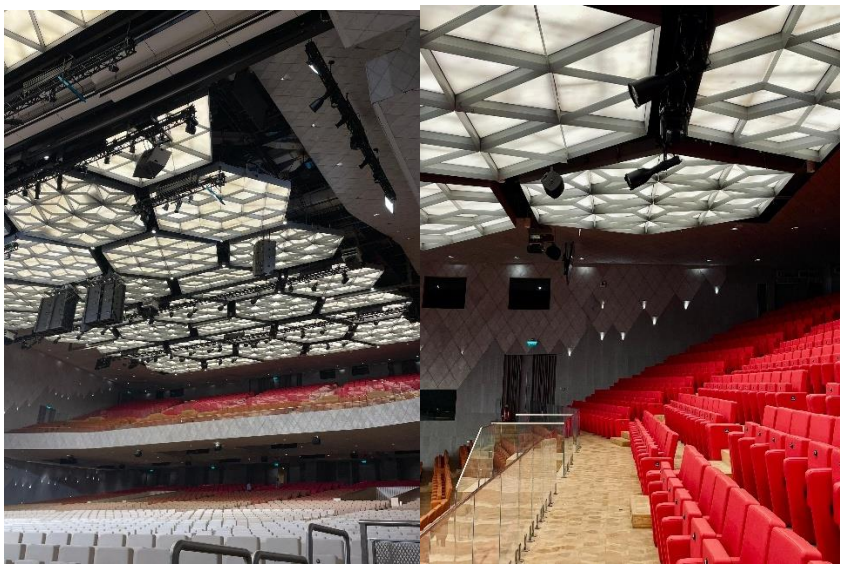


Figure 192 Ceiling panels

Auditorium

It is the core of the complex and it's equipped with a seating capacity of around 6000 people.

Other Features:

i LED Media Façade on both interior and exterior sides

ii Decoration inspired by Indian Culture

iii Terrazzo floors, metal sound absorbers, lit-up patterned walls

iv Innovative automated seating system (flat floor or tiered seating)

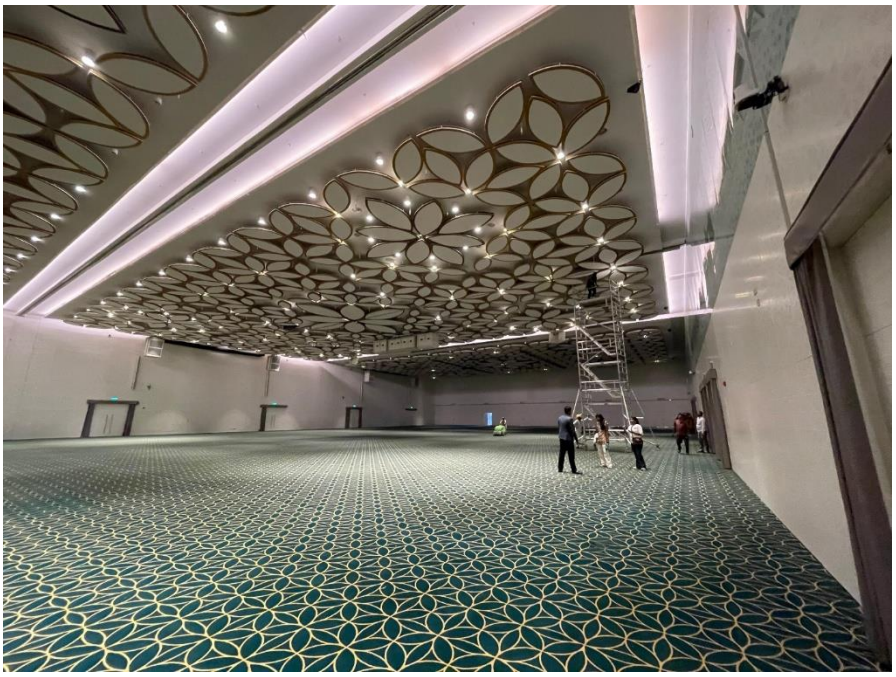


Figure 193LARGEST PILLARLESS HALL ON THE TOP FLOOR

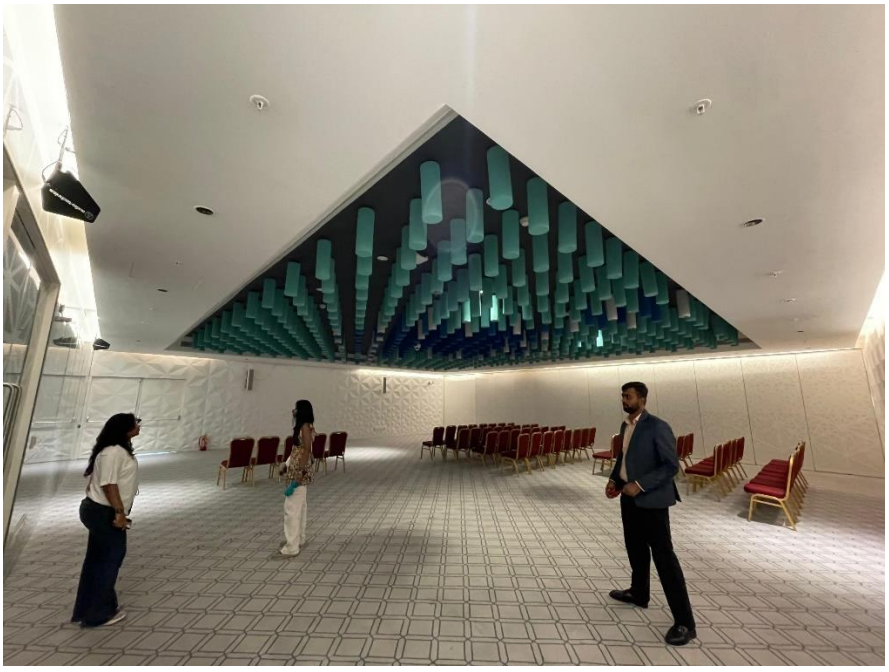


Figure 194 Meeting rooms with furniture



Figure 195 OAT FOR PERFORMANCES AND REFUGE AREA IN CASE OF FIRE EMERGENCY

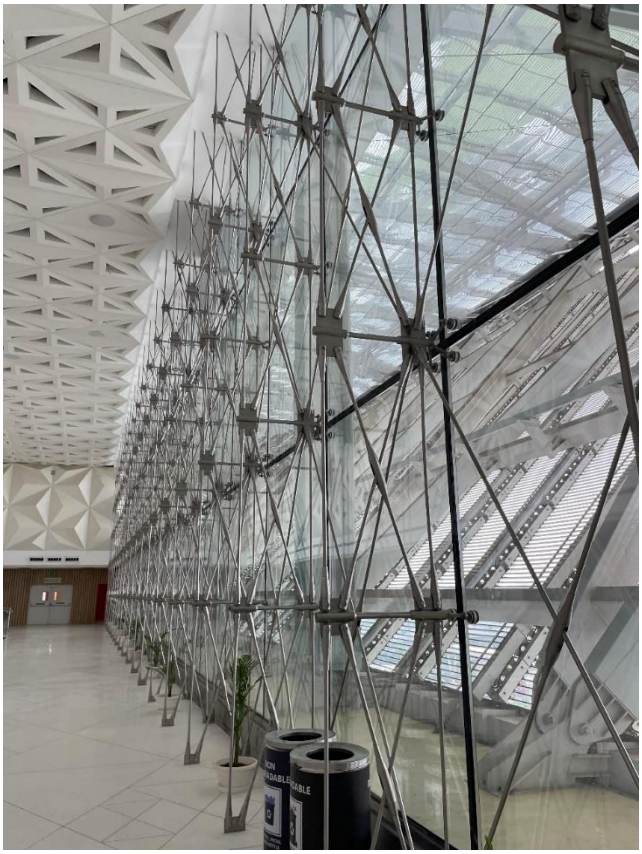


Figure 196 POINT SUPPPORTED GLASS CURTAIN



Figure 197Av and control booth behind the walls concealed via single on way see through mirror

4.3.4.2 Parking

Car Spaces Distribution

Parking is distributed across 4 basement levels, with a total of 6,294 ECS (Equivalent Car Spaces). These are spread across different facilities including hotels, offices, and retail areas.

A total of 168 preferred car spaces are designated across the four basements, providing convenient parking for specific categories, such as VIP or priority guests.

Various facilities such as retail, hotels, offices, and convention centres have dedicated parking spaces, with retail receiving the largest share, having 1,555 ECS in total.

4.3.5 Architectural Elements at Yashobhoomi: Materials and Key Features

4.3.5.1 Materials

- **Locally Sourced GRC (Glass Reinforced Concrete) Panels:** Used extensively on facades for geometric patterning, thermal efficiency, and durability. The GRC panels are inspired by traditional Indian motifs while being light and robust, reducing structural load and maintenance.

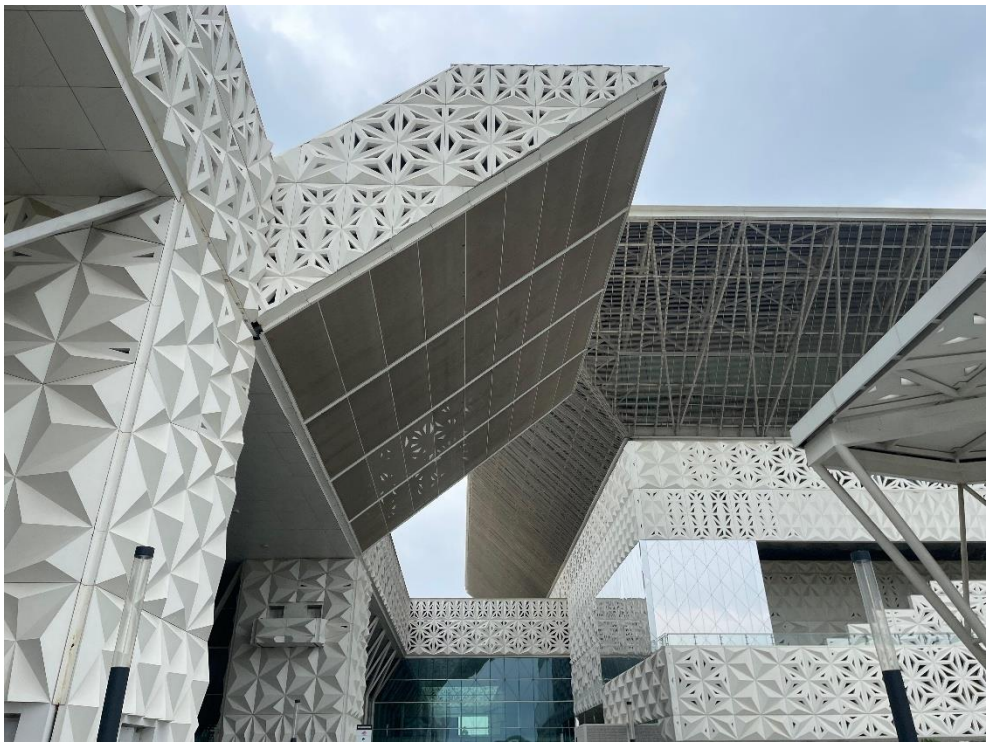
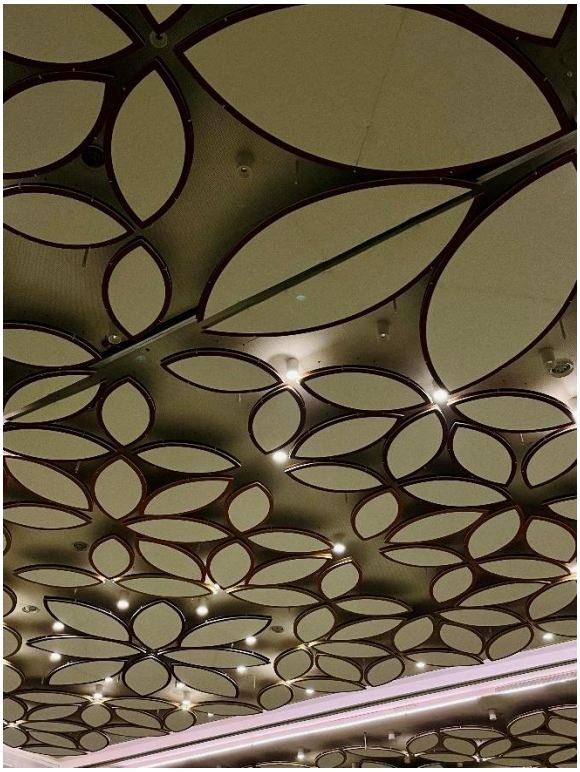


Figure 198 Facade elements

- **Terrazzo with Brass Inlay:** Public areas feature terrazzo floors with intricate brass inlays, evoking Indian rangoli patterns and ensuring heavy-duty, easy-to-clean surfaces.
- **Local Stone & Wood:** Regional stone is utilized in paving, hard landscape areas, and select wall claddings; locally sourced wood is prominent in meeting rooms and acoustic wall panels to provide warmth and a local touch.

4.3.5.2 Acoustic Panels

- **Custom Acoustic Wall and Ceiling Panels:** Conference rooms, ballrooms, and the auditorium employ sound-absorbing panels—often clad in wood or fabric—designed for speech clarity and noise mitigation.



- **Decorative Metal Cylinders:** Suspended acoustic baffles made from brass- or copper-toned aluminium alloys are both visually striking and functional, combining sound absorption with Indian decorative tradition.

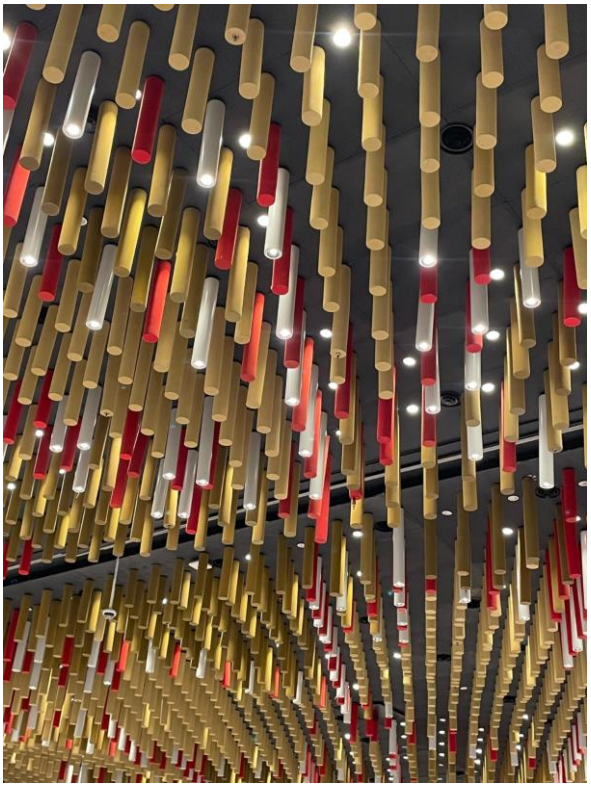


Figure 199 Ceiling elements

4.3.5.3 Lighting

- **Layered Lighting Systems:** Concealed linear LEDs, programmable theatrical lights, and daylighting are used for flexibility. Grand foyers and event spaces employ custom feature fixtures reflecting indigenous craft forms.



Figure 200 Audi lighting

- **Smart Controls:** Lighting design integrates daylight and occupancy sensors, allowing for energy-efficient operations and tailored ambience for a range of events.

4.3.5.4 Windows & Daylighting

- **Large Glazing and Skylights:** Generously sized windows and strategically placed skylights provide ample natural light to public, pre-function, and circulation spaces, reducing energy use and enhancing the visitor's experience.

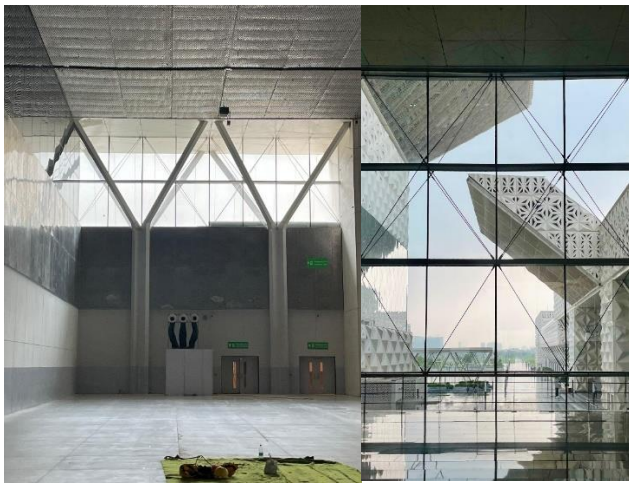


Figure 201 Solar control glass

- **Solar-Control Glass:** High-performance glazed systems manage heat gain while maintaining clear views.

4.3.5.5 Jalis (Latticed Screens)

- **Facade Jaali Screens:** Inspired by traditional Indian stonework but made from contemporary GRC, jaali elements are incorporated in the facade for passive cooling, privacy, and shadow play—creating comfortable and visually rich interiors.
- **Interior Use:** Smaller jaali elements function as space dividers or decorative features, supporting both cultural motif and operational privacy.

4.3.5.6 Other Elements

- **Green Landscaping Features:** Use of native plant species and shaded promenades for climate regulation and comfort.
- **Wayfinding & Signage:** Bold, legible signage systems, often in multiple languages, ensure intuitive navigation for international visitors.

4.3.5.7 Visual Overview

Element	**Features/Role**
GRC Panels	Lightweight, decorative, thermal/acoustic, Indian motifs
Acoustic Panels	Sound absorption, wood/metal finish, auditorium/meeting spaces
Lighting	LEDs, custom fixtures, smart controls, daylighting integration
Windows & Skylights	Solar-control glass, natural light, large views
Jaali Screens	GRC motifs, passive cooling, privacy, aesthetic connectivity
Local Stone & Wood	Floor/wall finishes, warmth, resilience, regional identity
Green Landscaping	Shaded avenues, native plants, microclimate management

Integrating such elements ensures Yashobhoomi is not just operationally excellent, but also visually, acoustically, and climatically comfortable—serving as a model for contemporary, contextually rooted international convention centres.

4.3.6 Inferences

Key Inferences from Yashobhoomi (IICC) Case Study

1. Materials & Sustainability

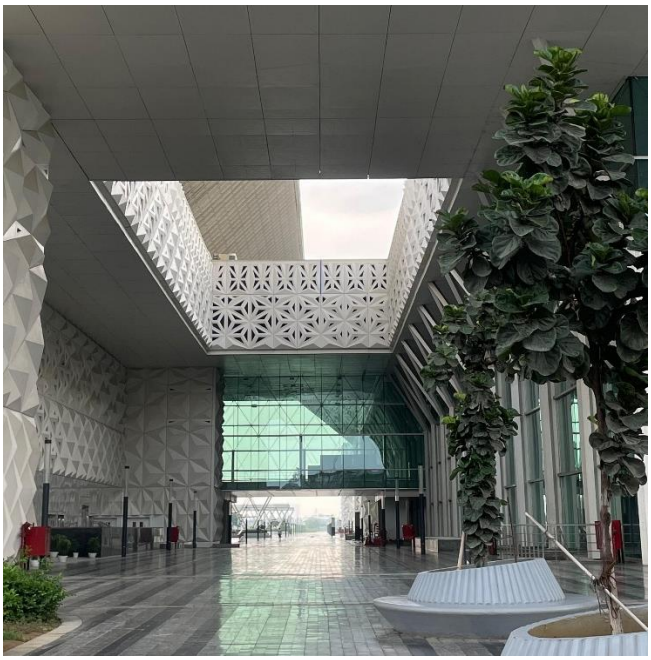
- Prioritizes locally sourced materials like GRC panels, terrazzo with brass inlays, local wood, and native stone to root the design in its context, reduce environmental impact, and ensure durability.
- Jaali screens and native landscaping enhance aesthetics and provide passive climate control, supporting sustainability.



Figure 202 Jali

2. Space Division & Flexibility

- Clearly zones convention (auditorium, ballrooms, meeting rooms) and exhibition spaces but connects them via bridges and shared concourses for smooth event flow.



- Large, pillarless, and divisible halls plus scalable meeting rooms enable easy adaptation for events of different sizes.

3. Operational Excellence

- Seamless access through direct metro connectivity, barrier-free routes, and car-free boulevards ensures ease of movement.
- Advanced AV, security, and sustainable systems make the centre future-ready for high-profile global events.

4. Urban & Cultural Relevance

- Acts as a catalyst for local development by integrating retail, hotels, and better transit, while architectural motifs reinforce cultural identity.

5. Design Takeaways

- Use local, durable, sustainable materials for identity and low maintenance.
- Prioritize flexible, clearly zoned, and connected spaces.
- Ensure intuitive circulation, ample daylight, and welcoming public areas.
- Blend operational efficiency with strong cultural and visual presence.

This summary distills the essential lessons for designing a world-class, flexible, and contextually rooted international convention centre.

4.4 Goldfinch Hotel, Mumbai (Desk Appraisal)

4.4.1 Introduction

Ideally located in the vibrant corporate enclave of Andheri East, Goldfinch Mumbai stands as a landmark of contemporary boutique hospitality. The hotel features 94 elegantly designed rooms and suites crafted for discerning business and leisure travelers, offering a seamless blend of comfort, style, and modern functionality. Each room is thoughtfully furnished, and the property is renowned for its heartfelt hospitality, attentive service, and efficient guest experience.

Distinct amenities include a rooftop swimming pool, a soothing spa, fully equipped gym, conference and banquet areas for business or celebratory gatherings, and a vertical garden oasis. Dining is elevated by the acclaimed Banjara Restaurant, known for its multi-cuisine excellence, regional specialties, and vibrant culinary events. With a commitment to creating memorable experiences and attention to detail in every space, Goldfinch Mumbai is a preferred destination for those seeking luxury with a personal touch in Mumbai's bustling cityscape.

Architects : Edifice Consultants. Mumbai

Project : Goldfinch Hotel, Mumbai

Type : Hospitality

Use : Hotel

Lcxation : Vashi, Mumbai

Status : Under Construction

Site Area : 3800 sq.m. (50 x 76 m)

Built-upArea : 19725 sq.m.



Figure 203 Goldfinch Mumbai

4.4.2 Design Philosophy

The design philosophy of Goldfinch Mumbai aims to create a strong brand identity through rational architecture, iconic design, and poetic elements.

- **Brand Identity:** Every detail reflects Goldfinch's signature look and feel, ensuring a cohesive and recognizable presence.
- **Rational Architecture:** The layout prioritizes guest comfort and operational efficiency with logical, functional planning.
- **Iconic Design:** Signature elements like gold bird-cage chandeliers and custom furniture serve as memorable visual markers.
- **Modular Grid System:** A grid-based approach ensures proportion, flexibility, and consistency throughout the hotel, from structure to interiors.
- **Poetry in Architecture:** Thoughtful use of light, space, and materials creates emotional, inspiring guest experiences.
- **Hospitality Focus:** Design supports a welcoming atmosphere and anticipates guest needs, reinforcing Goldfinch's commitment to exceptional service.

4.4.3 LOCATION AND CONNECTIVITY

- Located in Chakala Industrial Area (MIDC), Andheri East, Mumbai
- Approximately 2.5–4 km from Chhatrapati Shivaji International Airport
- Around 4 km from Andheri Railway Station
- Within walking distance (7–15 minutes) to Airport Road and Chakala metro stations (Metro Line 1)
- Well-connected by multiple bus routes to nearby areas like Gautam Nagar
- Close to major business hubs, shopping malls, restaurants, and entertainment spots
- Convenient shuttle services and strong public transit options for hassle-free city access

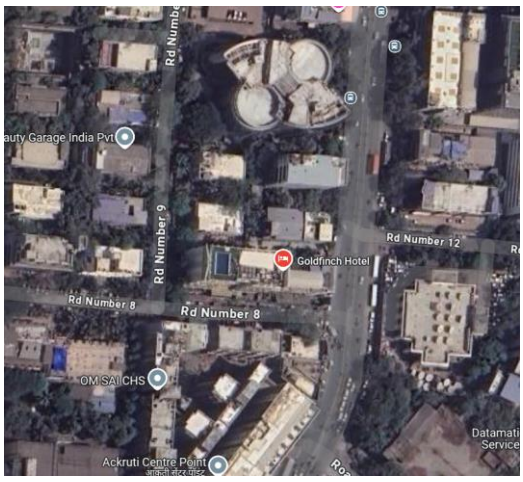


Figure 204 Locaiton on Google maps



Figure 205 Design strategies

4.4.4 Floor plans

Basement 1

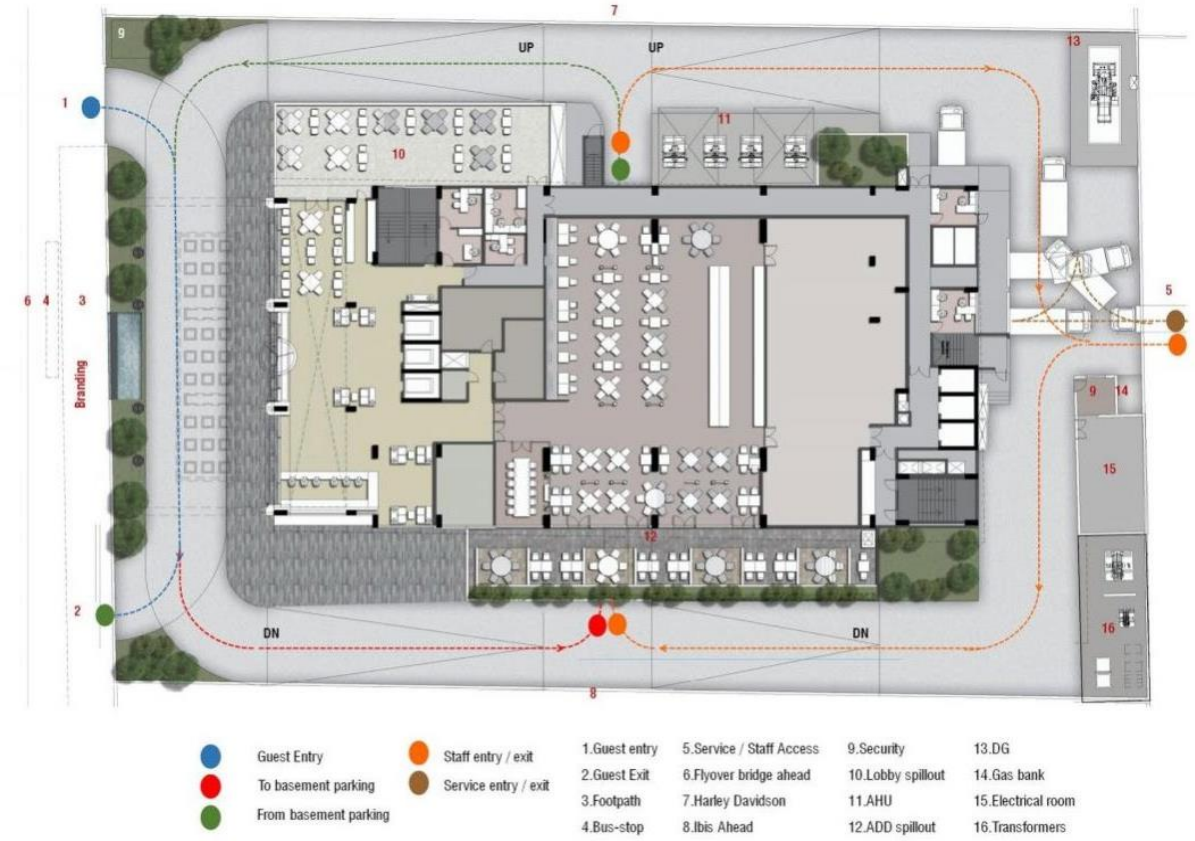


Figure 206 Basement 1 floor plan

Ground Floor Plan



Figure 207 Ground Floor plan

First Floor Plan





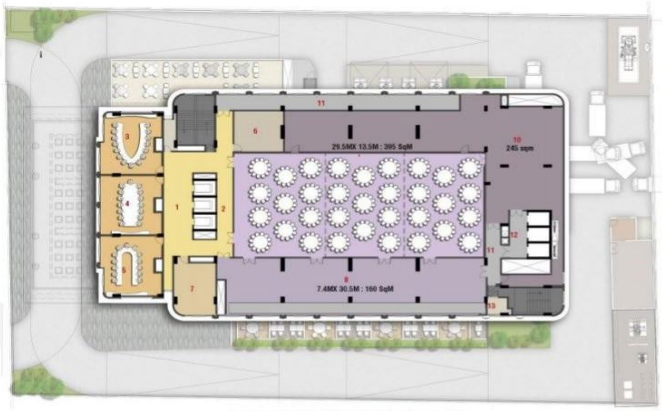
FIRST FLOOR		
	Area in sq.m.	Area in sq.f.t
2.01 Floor Plate	1551.5	16700.35
2.02 FSI	**1166.61**	**12557.39**
2.03 Restrooms	68	731.95
2.04 Banquet Manager	22	236.81
2.05 Prefunction	160	1722.24
2.06 Banquets	560	6027.84
2.07 Kitchen	125	1345.50

FIRST FLOOR PLAN

1.Guest lift lobby
2.Male restrooms
3.Female rest rooms
4.Sales & F/B Mang
5.Pre-function
6.Banquet : 490
7.Pantry
8.Service lift lobby
9.Service corridor
10.AHU equipment's above
11.TFA Room

Figure 208 First floor plan with area statement

Second Floor Plan



SECOND FLOOR PLAN

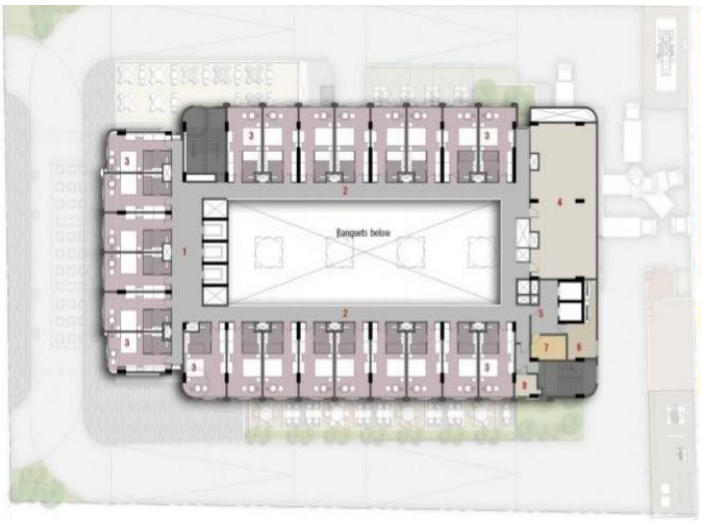


SECOND FLOOR		
	Area in sq.m.	Area in sq.f.t
3.01 Floor Plate	1595	17168.58
3.02 FSI	**199.56**	**2148.06**
3.03 Restrooms	68	731.95
3.04 Meeting room 1	50	538.20
3.05 Meeting room 2	55	592.02
3.06 Meeting room 3	50	538.20
3.07 Prefunction	160	1722.24
3.08 Banquet	395	4251.78
3.09 Kitchen	245	2637.18

1.Guest lift lobby
2.Guest Corridor
3.Meeting room-01: 50 sqm
4.Meeting room-02 : 55 sqm
5.Meeting room-03 : 50 sqm
6.Male restrooms : 22sqm
7.Female restrooms : 30 sqm
8.Pre-function : 225 sqm
9.Banquets : 396 pax
10.Pantry
11.Service corridor
12.Service lift lobby

Figure 209 Second floor plan with area statement

Sixth Floor Plan



SIXTH FLOOR PLAN



6TH FLOOR - Guest Floor 4		
	Area in sq.m.	Area in sq.f.t
3.01 Floor Plate	1595	17168.58
3.02 FSI	**806.6**	**8682.24**
3.03 Total Keys	23	
3.04 Maids Room	9.25	99.57
3.05 Electrical Room	16.6	178.68
3.06 TFA Room	5	53.82

1.Guest lift lobby
2.Guest corridor
3.Guest room
4.Refuge area
5.Service lift lobby
6.Electrical room
7.Mains room
8.TFA room

- **Total key at 6th floor :**

  23 keys

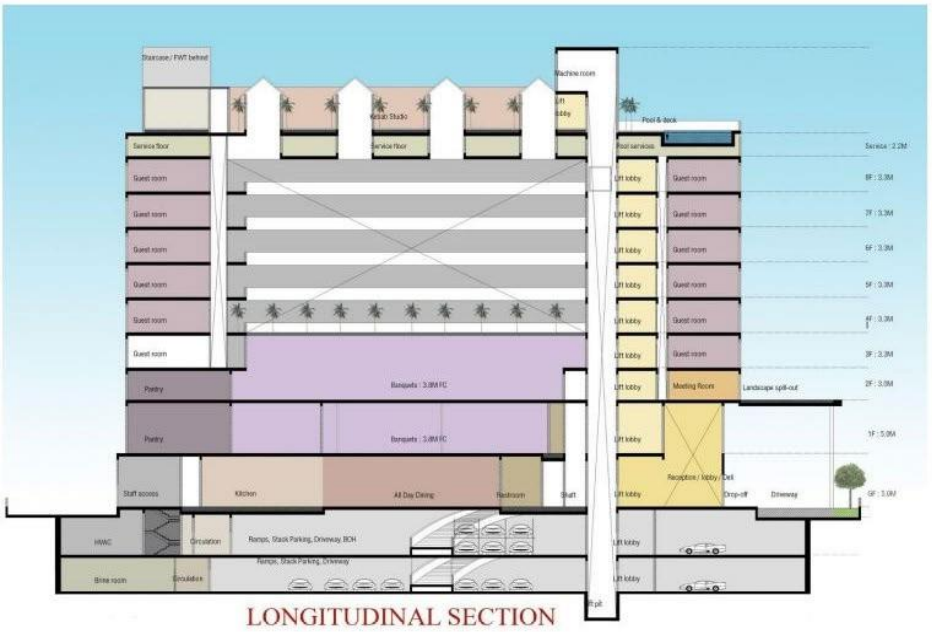
Figure 210 Sixth floor plan

Terrace Plan



Figure 211 6th Floor plan & terrace plan with area statement

4.4.5 SECTION



1. 38 M FROM GROUND TO TERRACE SLAB
2. 40.3 M FROM GROUND TILL TERRACE TEMP. ROOF TOP
3. LMR TOP : 8 M FROM TERRACE SLAB TOP
4. BASEMENTS 4.5 M & 3.5 M DEEP
5. TRIPLE HEIGHTED LOBBY OF 10 M

Figure 212 Longitudinal Section

4.4.6 Room typology and Area Statement



Figure 213 Guest room layout

TOTAL KEYS : 157 NUMBERS
TOOTAL GUEST FLOORS : 6 NUMBERS
FLOOR TO FLOOR HEIGHT : 3.3M

- THIRD FLOOR : 26 KEYS
- TOTAL KEYS AT 4TH, 5TH, 7TH & 8TH FLOOR : 27X4=108 KEYS
- SIXTH FLOOR : 23 KEYS
- CARPET AREA PER KEY: 26.735 SQM
- BUA PER KEY :29.26 SQM
- CORRIDOR :1.50M
- FLOOR TO FLOOR HEIGHT : 3.30M
- SILL HETGHT : 0.10M
- WINDOW WIDTH : 3.10M
- WINDOW HEIGHT : 2.30M
- SILL & LINTEL THICKNESS : 0.275M FINISHED.

Figure 214 Rooms typology

Total Area Statement					
Floor	Non FSI Area is sq.m.	FSI Area is sq.m.	Excess Balcony Area is sq.m.	10% encl. Balcony Area is sq.m.	Total BUA Area is sq.m.
1 Basement 2	2679.09				
2 Basement 1	2688.33				
3 Ground Floor		532.47			532.47
4 First Floor		1166.61			1166.61
5 Second Floor	785.99	199.56			199.56
6 3rd Floor		894.27	1.77	91.2	896.04
7 4th Floor		879.15	3.28	91.2	882.43
8 5th Floor		879.15	3.28	91.2	882.43
9 6th Floor	83.65	806.6		80.66	806.6
10 7th Floor		879.15	3.28	91.2	882.43
11 8th Floor		879.15	3.28	91.2	882.43
12 9th Floor	210.93	462.89			462.89
13 10th Floor					
Total	**6447.99**	**7579**	**14.89**	**536.66**	**7593.89**

GROUND FLOOR	Area in sq.m.	Area in sq.f.t
1.01 Floor Plate	1355.01	14585.33
1.02 FSI	**532.47**	**5731.51**
1.03 Lobby	160	1722.24
1.04 Deli	50	538.20
1.05 Outdoor Seating	120	1291.68
1.06 Retail	26	279.86
1.07 Restroom	48	516.67
1.08 ADD indoor	275	2960.10
1.09 ADD Buffett	110	1184.04
1.1 ADD Outdoor	150	1614.60
1.11 ADD Kitchen	230	2475.72
1.12 Front Office	38	409.03
1.13 Loading Unloading	75	807.30

FIRST FLOOR	Area in sq.m.	Area in sq.f.t
2.01 Floor Plate	1551.5	16700.35
2.02 FSI	**1166.61**	**12557.39**
2.03 Restrooms	68	731.95
2.04 Banquet Manager	22	236.81
2.05 Prefunction	160	1722.24
2.06 Banquets	560	6027.84
2.07 Kitchen	125	1345.50

SECOND FLOOR	Area in sq.m.	Area in sq.f.t
3.01 Floor Plate	1595	17168.58
3.02 FSI	**199.56**	**2148.06**
3.03 Restrooms	68	731.95
3.04 Meeting room 1	50	538.20
3.05 Meeting room 2	55	592.02
3.06 Meeting room 3	50	538.20
3.07 Prefunction	160	1722.24
3.08 Banquet	395	4251.78
3.09 Kitchen	245	2637.18

THIRD FLOOR - Guest Floor 1	Area in sq.m.	Area in sq.f.t
3.01 Floor Plate	1595	17168.58
3.02 FSI	**896.04**	**9644.97**
3.03 Total Keys	26	
3.04 Maids Room	9.25	99.57
3.05 Electrical Room	16.6	178.68
3.06 TFA Room	5	53.82

4,5,7,8 FLOOR - Guest Floor 2,3,5,6	Area in sq.m.	Area in sq.f.t	Total for 4 floors
4.01 Floor Plate	1595	17168.58	68674.32
4.02 FSI	**882.43**	**9498.48**	**37993.91**
4.03 Total Keys per floor	27	27.00	108
4.04 Maids Room	9.25	99.57	398.268
4.05 Electrical Room	16.6	178.68	714.7296
4.06 TFA Room	5	53.82	215.28

6TH FLOOR - Guest Floor 4	Area in sq.m.	Area in sq.f.t
3.01 Floor Plate	1595	17168.58
3.02 FSI	**806.6**	**8682.24**
3.03 Total Keys	23	
3.04 Maids Room	9.25	99.57
3.05 Electrical Room	16.6	178.68
3.06 TFA Room	5	53.82

10TH FLOOR - Terrace Floor	Area in sq.m.	Area in sq.f.t
10.01 Floor Plate	1595	17168.58
10.02 FSI	**462.89**	**4982.55**
10.03 Kebab Studio Indoor	232	2497.25
10.04 Kebab Studio Outdoor	30	322.92
10.05 Kitchen	115	1237.86
10.06 Kebab Studio Buffet	88	947.23
10.07 Restrooms	23	247.57
10.08 Café Mojo	135	1453.14
10.09 Gym	245	2637.18
10.1 Changing rooms	32.8	353.06
10.11 Pool	104	1119.46
10.12 Pool Deck	125	1345.50

Basement 1	Area in sq.m.	Area in sq.f.t
11.01 Floor Plate	2688.33	28937.18
11.02 FSI	**0**	**0.00**
11.03 Water tanks	230	2475.72
11.04 STP	160	1722.24
11.05 Chillers	241	2594.12
11.06 Services Rooms	30	322.92
11.07 Staff Facilities	300	3229.20
11.08 House Keeping	200	2152.80
11.09 Main Stores	105	1130.22
11.1 Main Preprep	78	839.59

Basement 2	Area in sq.m.	Area in sq.f.t
11.01 Floor Plate	2679.09	28837.72
11.02 FSI	**0**	**0.00**
11.03 Water tanks	230	2475.72
11.04 STP	160	1722.24
11.05 Brine	172	1851.41
11.06 Pump Room	92	990.29
11.07 Valet Laundry	25	269.10
Engineering		
11.08 Workshop	120	1291.68
11.09 Accounts	100	1076.40
11.1 Back of House spare	180	1937.52

Figure 215 Area statement

4.5 Vivanta by Taj, Whitefield, Bangalore (Desk Appraisal)

4.5.1 About

Vivanta Bengaluru, Whitefield is a contemporary hotel that usher global jetsetters into a dynamic lifestyle at the heart of India's technology capital. The hotel building is conceived as a 'landscaper' A green-roofed promenade swoops up in a mathematically inspired Möbius curve (infinite loop) and sweeps across the dynamic and inviting public spaces, blurring the distinction between architecture and landscape.

Architects: WOW Architects | Warner Wong Design

Area: 19638 m²

Year: 2009

Address:Whitefield, Bangalore, Karnataka, India

Country-India

State-Karnataka

Metro-Bangalore

•Government Body-BBMP

4.5.2 Connectivity

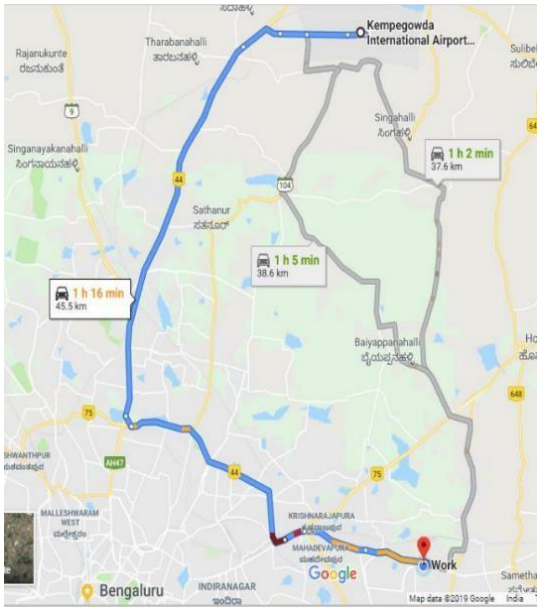
contemporary socio-cultural hub for both the IT Park and IT-based population in Whitefield.

Hotel To International Airport – 45 km

Hotel To Bengaluru Railway Station – 35 km

In the vicinity of International Tech Park Bangalore.

Close proximity to Business areas of EPIP Industrial Area and Prestige Shantiniketan.



4.5.3 Site plan and google earth view

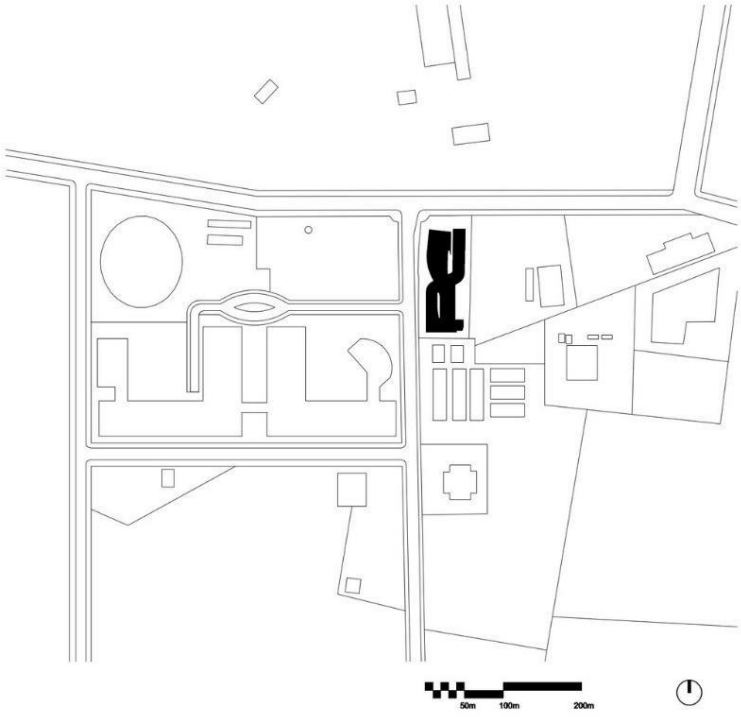


Figure 216 Site plan

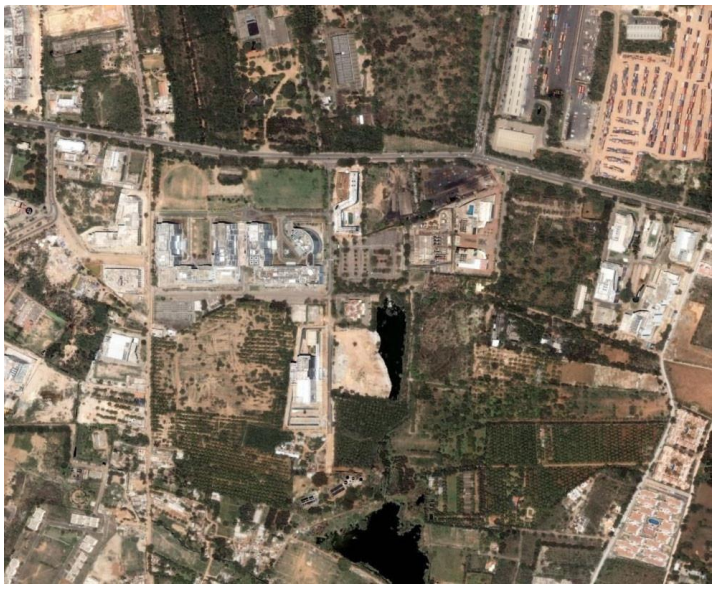
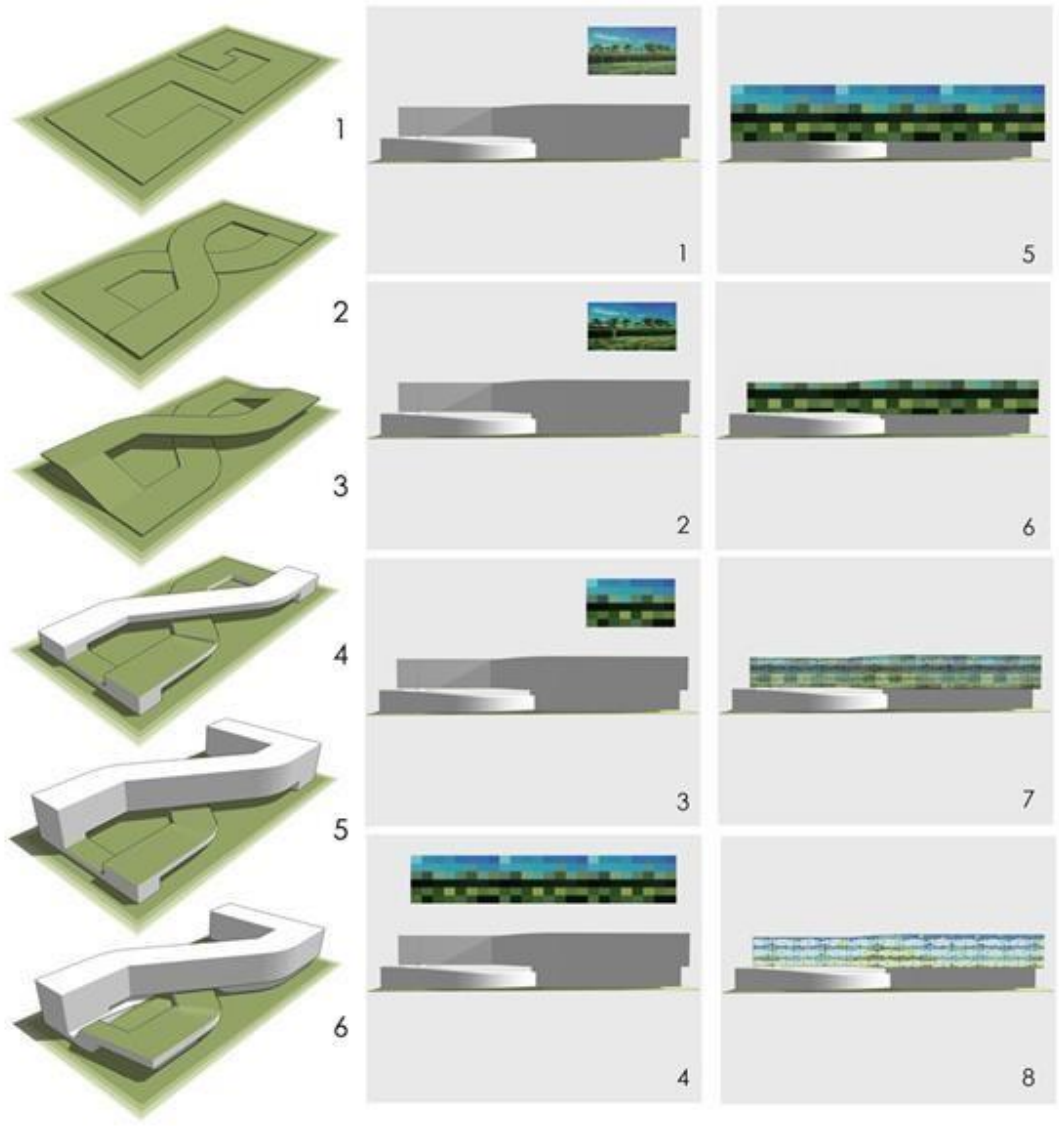


Figure 217 G Earth view

4.5.4 Concept



The hotel offers seven room categories:

- Superior Room City View Queen Bed
- Deluxe Room Garden View Queen Bed
- Premium Room Pool View Queen Bed
- Deluxe Suite City View King Bed
- Loft Suite Pool View King Bed
- Premium Suite Pool View King Bed
- Vivanta Suite Pool View King Bed

- 199 urbane rooms and suites - designed for discerning business travelers to work, play and unwind – appear to hover upon the green curve, as if suspended between the earth and sky.

4.5.5 Rooms and Suites

Room Type	No of Rooms
Superior Room City View Queen Bed	89
Deluxe Room Garden View Queen Bed	48
Premium Room Pool View Queen Bed	33
Deluxe Suite City View King Bed	21
Premium Suite Pool View King Bed	3
Premium Suite Pool View King Bed 3 Loft Suite Pool View King Bed	4
Vivanta Suite Pool View King Bed	1

Figure 218 Room typology

Superior Room

• Superior Rooms are ideal for the business traveler who seeks distinctive and smart design coupled with comfort and practicality.

• Deluxe Room

• Deluxe Rooms offer sweeping vistas of the hotel's remarkable exteriors and manicured garden. Space-saving design, cool marble flooring, a refined color palette with sophisticated furnishings, and ergonomic furniture go a long way in relieving jet lag and cocooning you in bliss.

• Premium Room Pool View

• Premium Rooms offer breezy views of the pool and badminton court. When not admiring the striking hotel exterior, guests can sink into the surprising warmth of furniture that is as aesthetic as it is ergonomically designed to de-stress fatigued travelers.

• Deluxe Suite City View

• Our 447 square feet Deluxe Suites are counted among Bengaluru's trendiest guest residences. A separate living room - with a two-seater sofa, dining table, and chic coffee table – leads to the bedroom with a king-sized bed and a Rest easy menu with a choice of pillows.

• Loft Suite Pool View

• For fans of the quintessential New York apartment, Vivanta Bengaluru, Whitefield's Loft Suite

offers a 925 square feet two-level, high-ceilinged, sun-bathed space with large windows to suit the design aesthetics of globe-trotting business executives.

• Premium Suite Pool View

• A contemporary haven of style and comfort, our 770 square feet Premium Suite is bathed in natural sunlight. The seamless design philosophy ensures smooth lines and easy access from the living room to the dining area, bedroom, and bathroom.

• Vivanta Suite Pool View

• An upscale, fully-wired residence that is high on sophisticated Indian aesthetics and minimalist design, the Vivanta Suite appeals to the sensibility of globetrotters and bon Vivanta. Extended over two levels, it offers privacy with surprising pockets of sun-kissed spaces that guests can choose to work at or lounge in.



Figure 219 Interior room views

4.5.6 Facilities and views



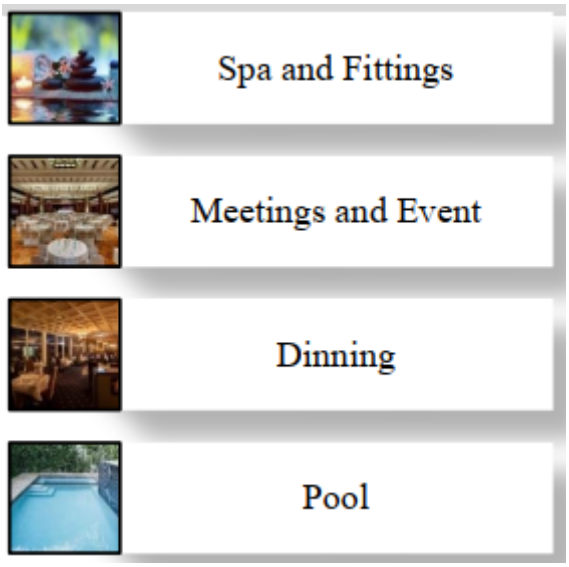


Figure 220 Facilities



Figure 221 Exterior views

Constraints prescribed by the low height restrictions and the high site coverage in the urban design guidelines were resolved through a 'landscraper' (as opposed to 'skyscraper') concept. To maximize the high site coverage, the ground plane of the site was conceptually manipulated into a Mobius strip that would constitute the podium of the hotel. The twists and folds of the strip extend the perception of space. As the landscape is introduced back to the folded ground plane, the podium seemingly dematerializes, blurring the distinction between architecture, interior, and landscape. The three-storey room block then extrudes from the ground plane, hovers above, and flexes its way around the site, lifting its way mid-air to enclose 200 rooms within its form.



Figure 222 Interior Views



Figure 223 Facade views

4.5.7 Interior and Curtain walls

Sustainability also takes on a poetic ideal emanating from the sculptured form. The landscaped ground ‘plane’ becomes the green roof, reducing heat (by adding mass and thermal resistance value) and cooling loads to the podium spaces beneath. Rainwater is also harvested from its ‘planes’ and channeled for reuse in landscape irrigation. By creatively composing highly reflective glass with dark and light tinted ones, this low-tech solution to the hotel facade not only alluded to the memory of the original site but also achieved its OTTV values without compromising views from the guest rooms.

4.5.8 Floor plans

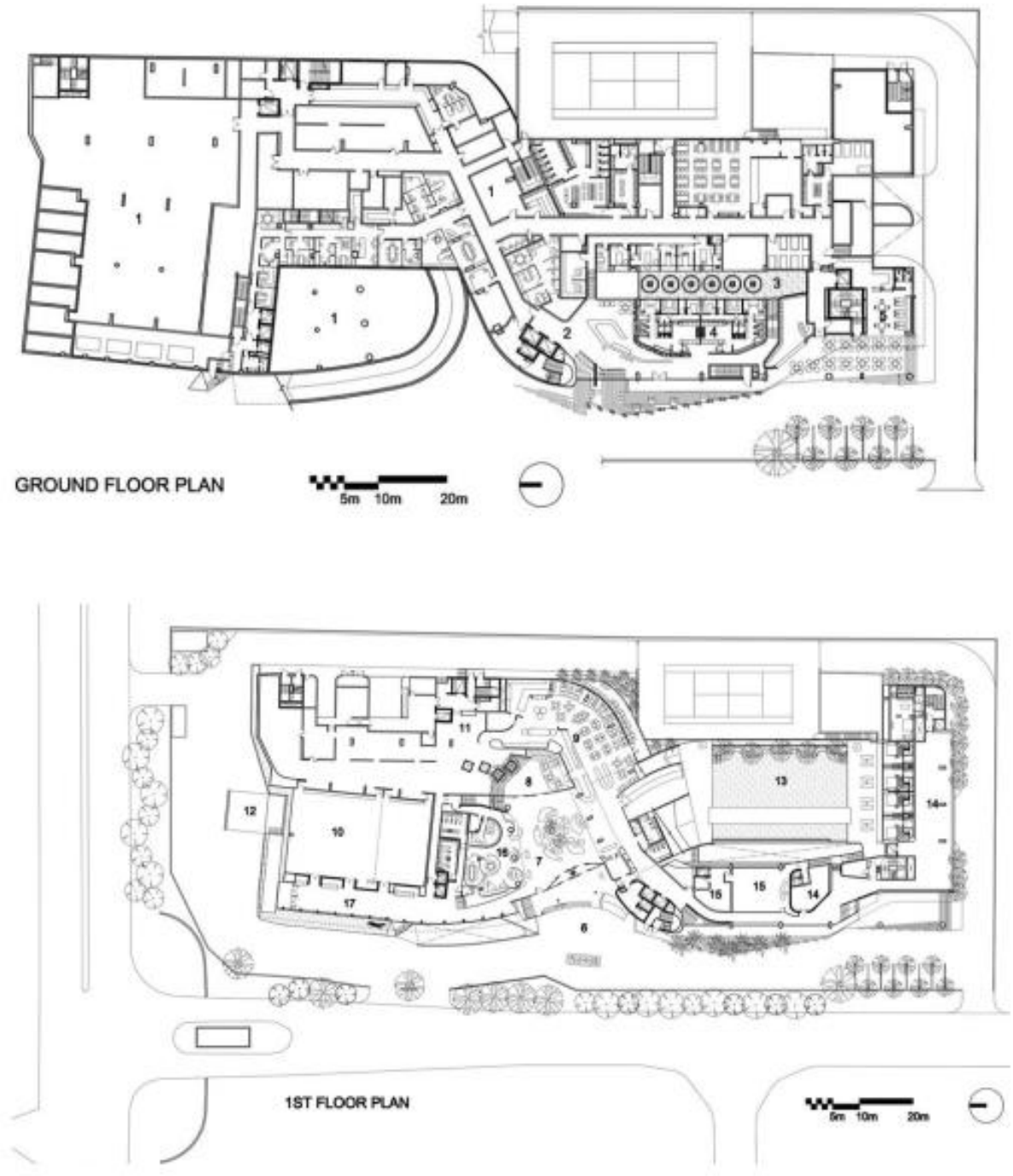
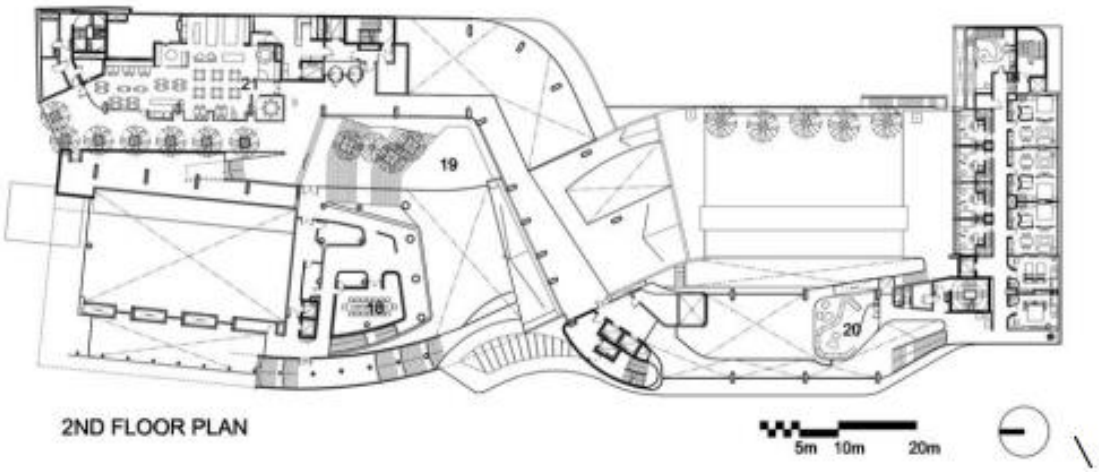
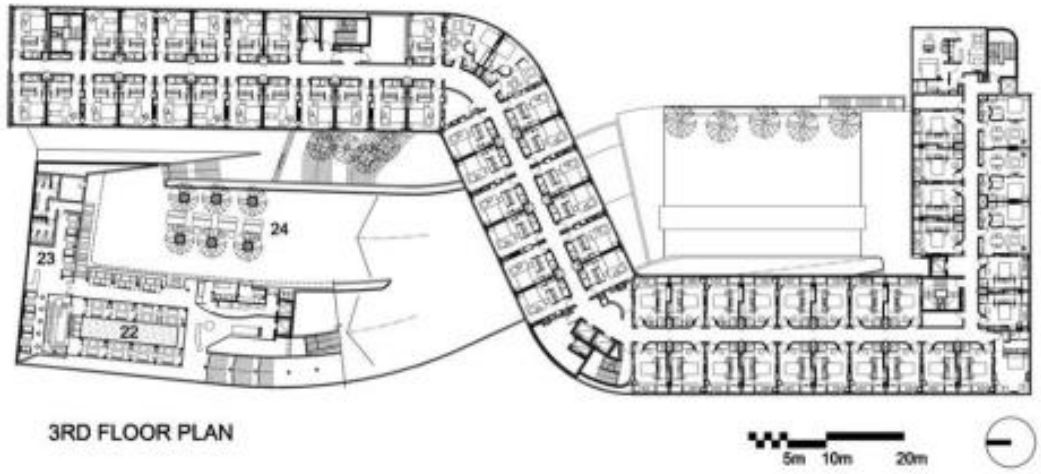


Figure 224 Ground floor + First floor plans





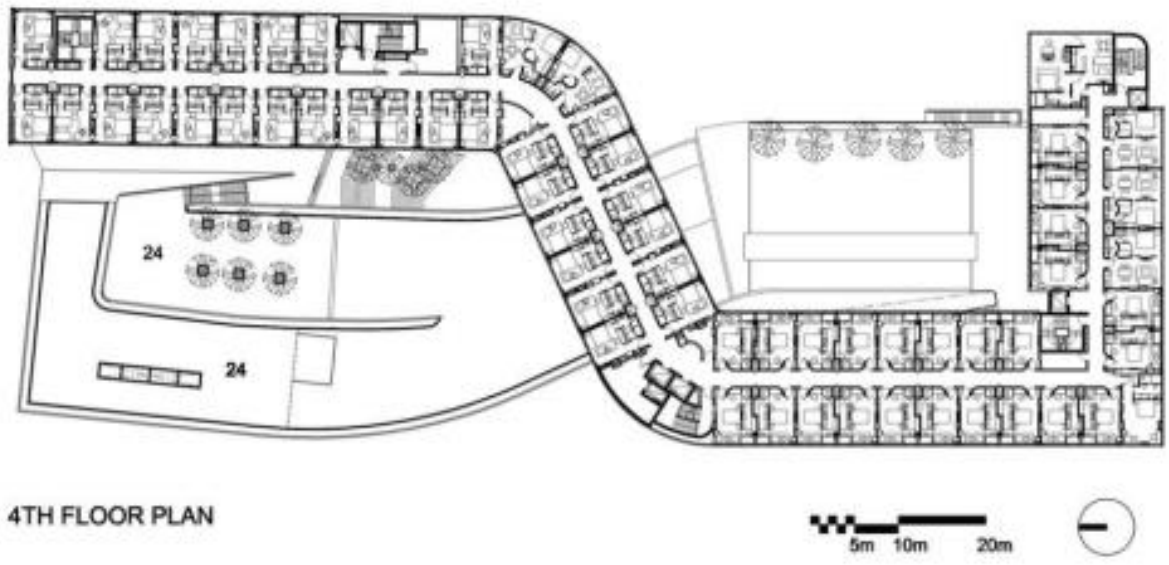


Figure 225 2nd , 3rd,4th floor plans

4.5.9 Elevations and Sections

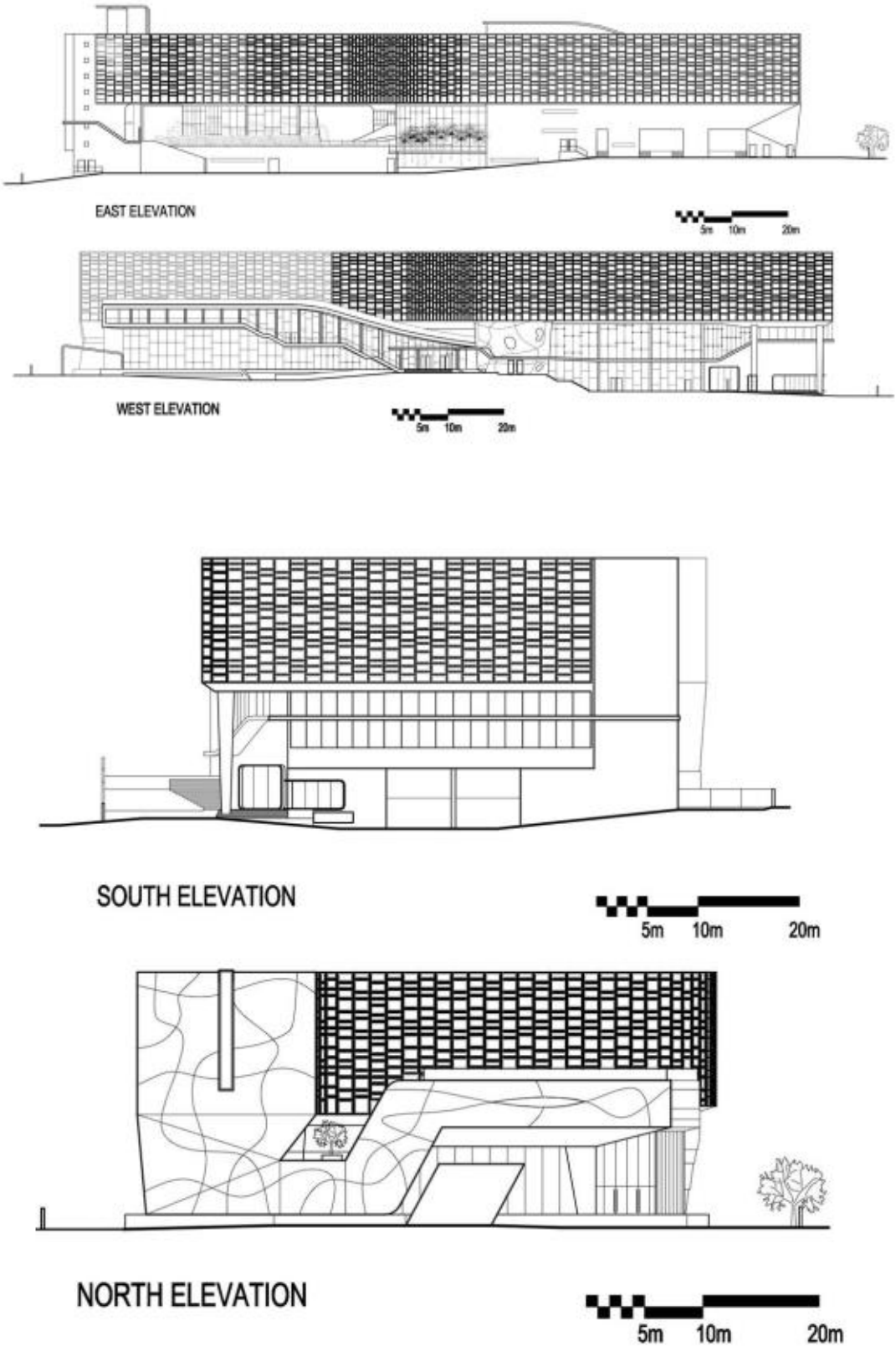
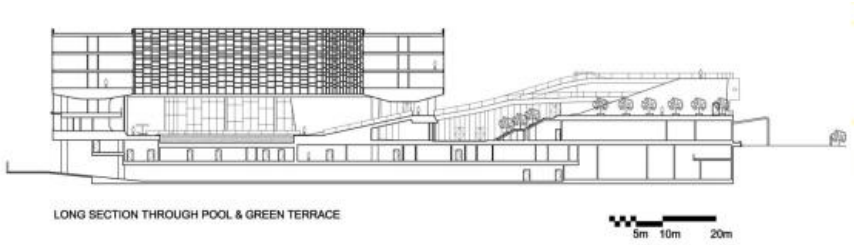
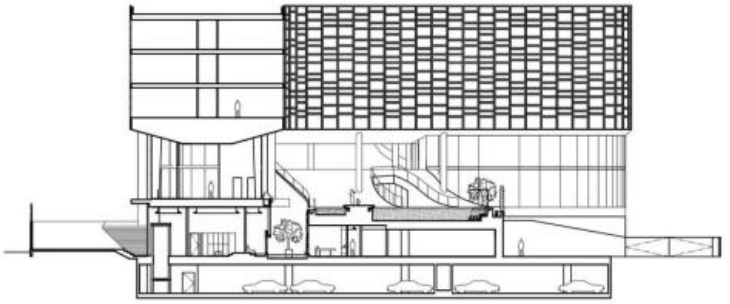
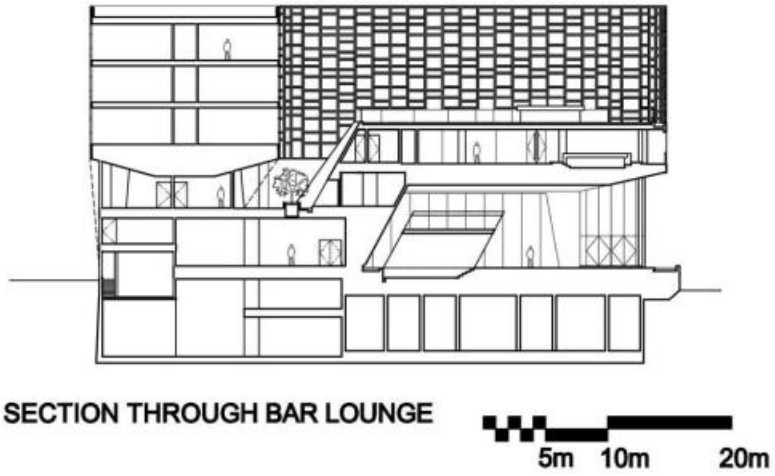


Figure 226 Elevations







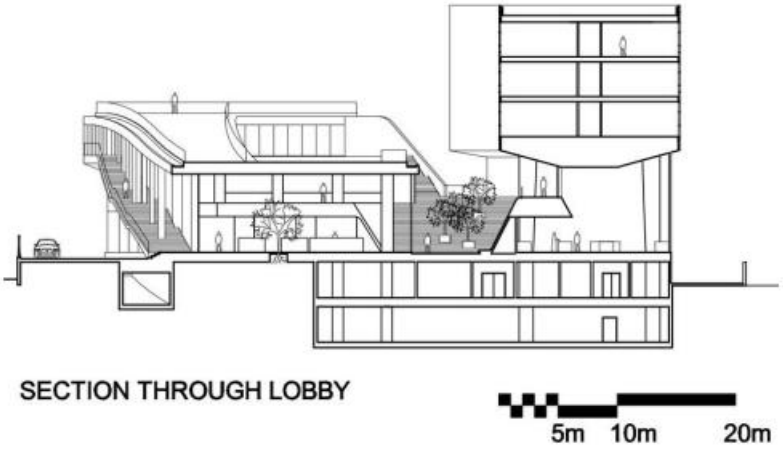


Figure 227 Sections

4.6 Comparative Analysis

Table 27 Case studies Comparison table

Parameter	Novotel Visakhapatnam Varun Beach	Taj Lakefront Bhopal	Yashobhomi India International Expo Centre	Goldfinch Hotel Mumbai	Vivanta by Taj Whitefield Bangalore	Inferences / Notes
Site Area	Part of mixed-use complex; exact not specified	4.77 acres	Large multi-sector site (exact acreage unspecified)	3,800 sq.m. (50 x 76 m)	19,638 sq.m.	Novotel part of mixed-use; Goldfinch smallest site
Structural Typology	Contemporary high-rise with X-shaped plan; 14 floors on front wings	10 floors; trapezium shaped building	Modern convention centre with large halls, GRC panels	Rational modular grid design; Art Deco finishes	'Landscraper' green-roofed promenade, 3 storeys + podium	Novotel uses level difference and sea views in design
Entry / Exit	14m main access road, 7m service road at back	18m arterial road & 12m service lane	Multiple access points via Urban extension roads and metro	Separate entries for residential/ non-residential guests	Forecourt access, multiple drop-offs	Separate entries for different user groups improve flow
Circulation	Designed to separate banquet and hotel guests	No congestion with planned circulation	Clear zoning with connecting bridges between halls	Vertical circulation with 3 passenger lifts and 2 service lifts	Integrated with hotel and IT park; podium circulation	Functional circulation, avoids conflict of user groups
Parking (ECS)	Backup parking in basement; total not specified	Basement B2 - 350 cars, B1 - 250 cars	6,294 ECS total across facility (including parking for hotels and retail)	Basement parking with stack parking concept	Not specified	Yashobhoomi has extensive parking, Goldfinch uses stack parking

Accessibility of Spaces	Wheelchair accessible rooms and public spaces	Fully accessible with ramps, elevators	Barrier-free routes, metro-connected	Accessibility features included (ramps, lifts)	Designed for accessibility, ramps included	All projects incorporate accessibility
No. of Keys / Rooms	225 sea-facing rooms	152 rooms	N/A (Convention facility)	94 rooms and suites	199 rooms and suites	Novotel and Vivanta larger hotels; Goldfinch smallest
FAR (Floor Area Ratio)	Not explicitly stated	2	Not specified	Not specified	Not specified	FAR listed for Taj
Ground Coverage (%)	Not specified	Not explicitly stated	Not specified	Not specified	Not specified	Insufficient data to compare
No. of Floors	14 floors front wing, 7 floors back wing	10 floors	Convention halls with multiple levels	Multiple floors including basement and terrace	Low rise, 3 storeys plus podium	Novotel taller in height; Vivanta low-rise
Facilities Checklist	Banquet halls, restaurants, spa, pool, gym, kids zone, multiplex, mall	Restaurants, spa, pool, bar, banquets, gym	Auditorium (6000 seats), grand ballroom, meeting rooms, exhibition halls, VIP lounges	Rooftop pool, spa, gym, banquet, restaurants, vertical garden	Restaurant, spa, pool, bar, meeting rooms	Novotel and Taj have extensive guest and MICE facilities
Architectural Features	X-plan for sea views, infinity pool, rooftop jogging track	Trapezium shape, curved façade inspired by local crafts	GRC facade panels with Indian motifs, LED media facade	Gold bird-cage chandeliers, Art Deco influences	'Landscraper' concept blending architecture and landscape	Integration of cultural elements seen in Taj and Yashobhoomi

Interior Design	Modern, minimalist, neutral tones, regional materials like rattan	Luxurious, ornate, inspired by regional crafts	Terrazzo floors with brass inlays, acoustic panels	Contemporary, modular, poetic architecture	Modern, ergonomic furnishings, emphasis on greenery	Luxury and regional identity carefully balanced
Positive Features	Ocean views from all rooms, largest banquet facility in region, mixed-use integration, sustainability (Green Key)	Central lakeside location with lake views, thematic interiors, large banquet halls, eco-friendly systems	Largest pillar-less halls, flexible event spaces, excellent connectivity, LEED Platinum intent	Boutique luxury, prime location, personalized service, iconic design	Unique 'landscraper' form, green roof, proximity to business hubs	Each project stands out in its category: Novotel for views/events, Taj for luxury, Yashobhoomi for scale, Goldfinch for boutique style, Vivanta for integration with IT park

5.1 Concept

5.1.1 The Painting



Figure 228 The Great wave off Kanagawa by Hokusai

The artwork depicts a gigantic curling wave dominating the scene. about to crash onto three long fishing boats battling turbulent seas. In the distant background sits Mount Fuji. smaller and serene framed perfectly beneath the crest of the wave. The wave's foamy crest resembles sharp claws. lending a sense of imminent danger.

5.1.2 Why this concept

Situated on Vizag's scenic coastline. the site faces the Bay of Bengal, where the sea's beauty meets its power. The Great Wave off Kanagawa embodies this relationship between nature's dynamism and human endurance. Translating the wave into the fluid, public-facing convention center and Mount Fuji into the grounded. service-focused hotel creates a design that is contextually rooted. symbolically rich. And resilient to the coastal climate. It reflects Vizag's identity while offering an immersive, memorable guest experience.

Symbolism:

1. Impermanence
2. Nature's Power vs. Human Resilience
3. Ukiyo (Floating World)
4. Shizen - Naturalness)
5. Hidden symbolism of Mount Fuji

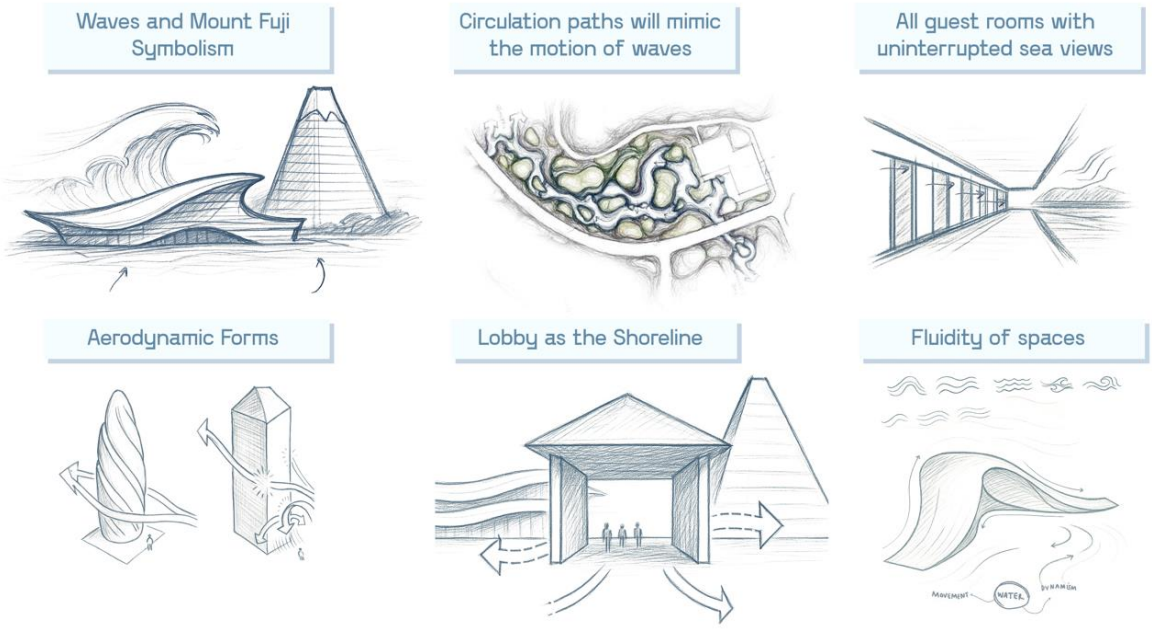


Figure 229 Initial Conceptual Development Sketches

5.1.3 Application

1. Site orientation Will frame uninterrupted views of the Bay of Bengal. reinforcing the visual connection between architecture and the sea.

2. Massing inspired by Hokusai's wave and Mount Fuji — the convention center as a fluid cresting form. the hotel as a grounded. vertical anchor.

3. Circulation paths will mimic the motion of waves. Creating dynamic and flowing visitor journeys.

4. Rooflines and facades will be designed with aerodynamic forms to withstand coastal winds and cyclonic conditions.

5. Material palette will blend coastal resilience with visual fluidity — weather-resistant cladding, reflective glass. light-toned concrete. and timber accents.

6. Landscape design will integrate terraced decks, reflective pools, and coastal vegetation to echo the movement of water.

7. Main lobby will act as the "shoreline" between wave (events) and Fuji (hospitality), welcoming guests into the narrative of motion and stillness.

8. All guest rooms will be singly banked to ensure uninterrupted sea views, making the ocean a constant visual and sensory element of the user experience.

9. Interiors will transition from dramatic, open volumes in the convention center to calm, intimate spaces in the hotel, reflecting the energy shift from crest to mountain.

10. Event flexibility — convention spaces adaptable for conferences, exhibitions, performances, and cultural festivals, reinforcing the wave's fluid identity.

5.2 Zoning

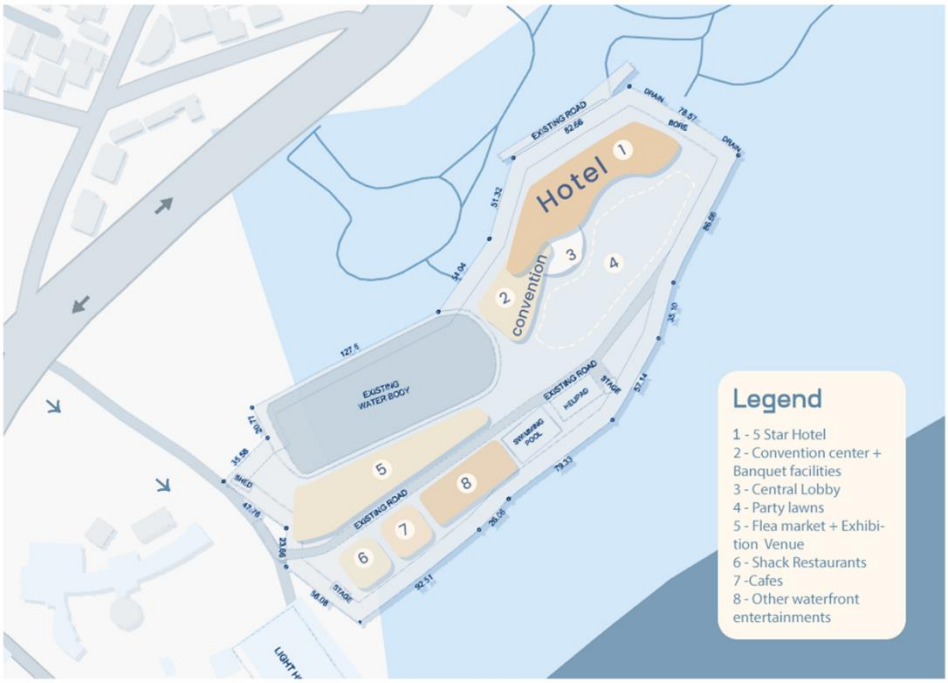


Figure 230 Initial Conceptual Zoning

Above attached was the initial site-level zoning prepared in response to the requirements outlined in the RFP, organizing the 5-star hotel, convention and banquet facilities, public waterfront uses, and support amenities according to the brief.

5.2.1 Site Zoning

The S-star hotel and convention center are connected through a central lobby. with party lawns opening to the waterfront. Public areas such as the flea market, Shack restaurants, cafés, and other entertainment spaces activate the promenade.

5.2.2 Vertical Zoning

Two basements and a Stilt level house parking and services. The ground, first and second floors contain the lobby, dining areas, administrative areas, BOH spaces and cafés, followed by a service floor. Guest rooms span from the Third to the Eleventh floor with ensuring smooth operations, guest comfort, and lively public interaction.

Part 6: References

6.1 Government Guidelines and Codes

1. **Ministry of Tourism, Government of India. (2017). *Guidelines for Classification of Hotels*. New Delhi: Government of India Press.**
2. **Ministry of Tourism, Government of India. (2020). *Andhra Pradesh Tourism Policy 2020-2025*. Amaravati: Government of Andhra Pradesh.**
3. **Bureau of Indian Standards. (2005). *National Building Code of India 2005*. New Delhi: Bureau of Indian Standards.**
4. **Bureau of Indian Standards. (2016). *IS 4963: Recommendations for Buildings and Facilities for Physically Handicapped*. New Delhi: BIS.**
5. **Government of Andhra Pradesh. (2017). *Andhra Pradesh Building Rules 2017*. Amaravati: AP Town and Country Planning Department.**
6. **Ministry of Environment, Forest and Climate Change. (2019). *Coastal Regulation Zone Notification 2019*. New Delhi: Government of India.**
7. **Town and Country Planning Organisation. (1996). *Urban and Regional Development Plans Formulation and Implementation Guidelines*. New Delhi: Ministry of Urban Development.**

6.2 Technical Standards and Codes

8. **Bureau of Indian Standards. (1985). *IS 4021: Code of Practice for General Requirements for Buildings in Hill Areas*. New Delhi: BIS.**
9. **Bureau of Indian Standards. (1963). *IS 2470 (Part I): Code of Practice for Design and Construction of Septic Tanks*. New Delhi: BIS.**
10. **Bureau of Indian Standards. (1966). *IS 3646 (Part II): Code of Practice for Interior Illumination*. New Delhi: BIS.**
11. **Central Public Health and Environmental Engineering Organisation. (2000). *Manual on Solid Waste Management*. New Delhi: Ministry of Urban Development.**
12. **Energy Conservation Building Code. (2017). *ECBC 2017: Energy Conservation Building Code*. New Delhi: Bureau of Energy Efficiency.**

6.3 Design References and Standards

13. **Neufert, Ernst and Neufert, Peter. (2012). *Architects' Data, Fourth Edition*. Oxford: Wiley-Blackwell.**
14. **Ramsey, Charles George and Sleeper, Harold Reeve. (2000). *Architectural Graphic Standards, 10th Edition*. New York: John Wiley & Sons.**
15. **Ching, Francis D.K. (2014). *Architecture: Form, Space, and Order, 4th Edition*. New York: Van Nostrand Reinhold.**
16. **DeKay, Mark and Brown, G.Z. (2014). *Sun, Wind, and Light: Architectural Design Strategies, 3rd Edition*. New York: John Wiley & Sons.**

6.4 Hospitality Industry References

17. **Lawson, Fred. (1973). *Restaurant Planning and Design*. London: The Architectural Press.**
18. **Rutes, Walter A., Penner, Richard H., and Adams, Lawrence. (2001). *Hotel Design, Planning, and Development*. New York: W. W. Norton & Company.**
19. **Hotel and Restaurant Association Classification Committee. (2018). *Hotel Classification Guidelines*. New Delhi: Ministry of Tourism.**
20. **ITC Hotels. (2010). *Hotel Design and Operations Manual*. Mumbai: ITC Limited.**

6.5 Climate and Environmental Data

21. **India Meteorological Department. (2020). *Climatological Tables 1991-2020: Visakhapatnam*. Pune: IMD.**
22. **Indian Space Research Organisation. (2019). *Land Use/Land Cover Database: Andhra Pradesh*. Hyderabad: National Remote Sensing Centre.**
23. **Andhra Pradesh State Remote Sensing Applications Centre. (2024). *Land Use Change***

Analysis: Visakhapatnam District 2000-2025. Hyderabad: APSRAC.

6.6 Case Study References

24. Novotel Visakhapatnam Varun Beach. (2023). *Hotel Information and Facilities Brochure*. Visakhapatnam: AccorHotels.
25. Taj Hotels. (2021). *The Taj Lakefront Bhopal: Design and Architecture*. Mumbai: Indian Hotels Company Limited.
26. India Trade Promotion Organisation. (2023). *Yashobhoomi India International Convention and Expo Centre: Project Report*. New Delhi: ITPO.
27. Goldfinch Hotels. (2020). *Goldfinch Hotel Mumbai: Architectural Design Documentation*. Mumbai: Edifice Consultants.
28. Taj Hotels. (2009). *Vivanta by Taj, Whitefield Bangalore: Design Concept*. Mumbai: Indian Hotels Company Limited.
29. WOW Architects. (2009). *Vivanta Bengaluru Whitefield: Architectural Design Report*. Singapore: Warner Wong Design.

6.7 Urban Planning and Development

30. Visakhapatnam Metropolitan Region Development Authority. (2021). *VMRDA Master Plan 2041*. Visakhapatnam: VMRDA.
31. Greater Visakhapatnam Municipal Corporation. (2020). *Smart City Development Plan*. Visakhapatnam: GVMC.
32. Andhra Pradesh Urban Infrastructure Asset Management Limited. (2022). *Project Documentation: Convention Centre Development*. Amaravati: APUIAML.

6.8 Sustainability and Green Building

33. Indian Green Building Council. (2019). *IGBC Green Hotels Rating System*. Hyderabad: Confederation of Indian Industry.
34. Foundation for Environmental Education. (2024). *Green Key Certification Standards*. Copenhagen: FEE International.
35. Global Sustainable Tourism Council. (2021). *GSTC Hotel Criteria*. Washington D.C.: GSTC.

6.9 Technical Journals and Publications

36. Architectural Review. (2018). "Sustainable Hotel Design in Tropical Climates." *Architectural Review*, 185(3), 45-52.
37. Journal of Hospitality Design. (2020). "Convention Centre Design: Modern Trends and Technologies." *JHD*, 12(4), 78-89.
38. Indian Architect & Builder. (2019). "Coastal Hotel Development: Challenges and Solutions." *IA&B*, 32(8), 112-120.

6.10 International Standards

39. American Society of Heating, Refrigerating and Air-Conditioning Engineers. (2017). *ASHRAE Standard 55: Thermal Environmental Conditions for Human Occupancy*. Atlanta: ASHRAE.
40. International Organization for Standardization. (2018). *ISO 21500: Project Management Guidelines*. Geneva: ISO.

6.11 Online Resources and Databases

41. Climate.OneBuilding.Org. (2023). *Climate Data: Visakhapatnam Weather Station*. Retrieved from www.climate.onebuilding.org
42. World Bank Group. (2020). *India Climate Change Action Program*. Retrieved from www.worldbank.org
43. National Sample Survey Office. (2019). *Tourism Statistics 2018-19*. New Delhi: Ministry of Statistics and Programme Implementation.