SINJCHANDO TARASH HEMBRAM

5 Star Hotel

Bhopal, Madhya Pradesh, India

Dec, 2025

5 Star Hotel

Bhopal, Madhya Pradesh, India

BACHELOR OF ARCHITECTURE

BY

SINJCHANDO TARASH HEMBRAM

211110227



DEPARTMENT OF ARCHITECTURE AND PLANNING

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL

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5 Star Hotel

Bhopal, Madhya Pradesh, India

Submitted by:

Sinjchando Tarash Hembrma

211110227

B. ARCH

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UNDER THE GUIDANCE OF

Prof. Bulbul Shukla

DEPARTMENT OF ARCHITECTURE AND PLANNING

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY

BHOPAL (MP)-462003

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DEPARTMENT OF ARCHITECTURE AND PLANNING

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL

CANDIDATE DECLARATION

The Thesis Project in the subject ARC 511, entitled "**5 Star Hotel, Bhopal, Madhya 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 – 2nd Dec, 2025 **Sinjchando Tarash Hembram**

211110227

RECOMMENDATION

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

Date: 1st – 2nd Dec, 2025 **Faculty Name**
Prof. Bulbul Shukla

CERTIFICATION OF EXAMINATION

The Bachelor of Architecture Thesis Viva-Voce examination of Mr. Sinjchando Tarash Hembram Scholar No.211110227, was held on 1/12/2025 to 2/12/25.

Dr. Nakul Dhagat
Head of Department

Dr. Vicky Lalramsangi
Thesis Coordinator

ABSTRACT

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ACKNOWLEDGMENT

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CHAPTER 1: DESIGN BRIEF

1.1 INTRODUCTION

The proposed project site is located at the existing MPT Lake View Residency, situated in the heart of Bhopal, Madhya Pradesh. Overlooking the scenic Upper Lake and positioned near key landmarks such as the CM House and Secretariat, the site holds a prime and strategic urban location. Currently functioning as a state-run hospitality facility, the property reflects a significant potential for redevelopment. The vision is to transform it into a modern, 5-star luxury hotel that enhances its tourism appeal while offering upgraded amenities and increased capacity. This redevelopment aims to integrate contemporary design with heritage elements, ensuring long-term sustainability and scope for future expansion in line with the city's growing hospitality demands.

1.2 AIM OF THE PROJECT

To design a Minimum 5-star category Hotel at Bhopal in Madhya Pradesh.

1.3 OBJECTIVE

To develop at least 150 rooms and Banquet & Convention facility for at least 1,000 pax under the project.

The facilities may include:

1 Additional rooms to provide lodging facilities to the guests.

2 Theme Restaurants and Food Joints

3 Banquet & Convention Centres

4 Facilities in the Hotel for Social and Corporate events including weddings/exhibitions.

5 Facilities in the Hotel to Promote and Market fairs, local cuisine, culture, folk music, dance, costumes, products, art, handicraft and heritage tourism.

6 Food & Beverages (Cafes, Retro Lounges Heritage/Luxury Dining etc.)

7 Food Courts and/or Rooftop Restaurant

8 Any other projects as defined in Madhya Pradesh Tourism Policy 2025 as amended from time to time.

1.4 SITE LOCATION

2 **Name of the Project** **:** Proposed 5 Star Hotel
3 **Location** **:** Hotel Lake View Residency, Bhopal, Madhya Pradesh
4 **Site Coordinates** **:** 23°14'32"N 77°23'18"E

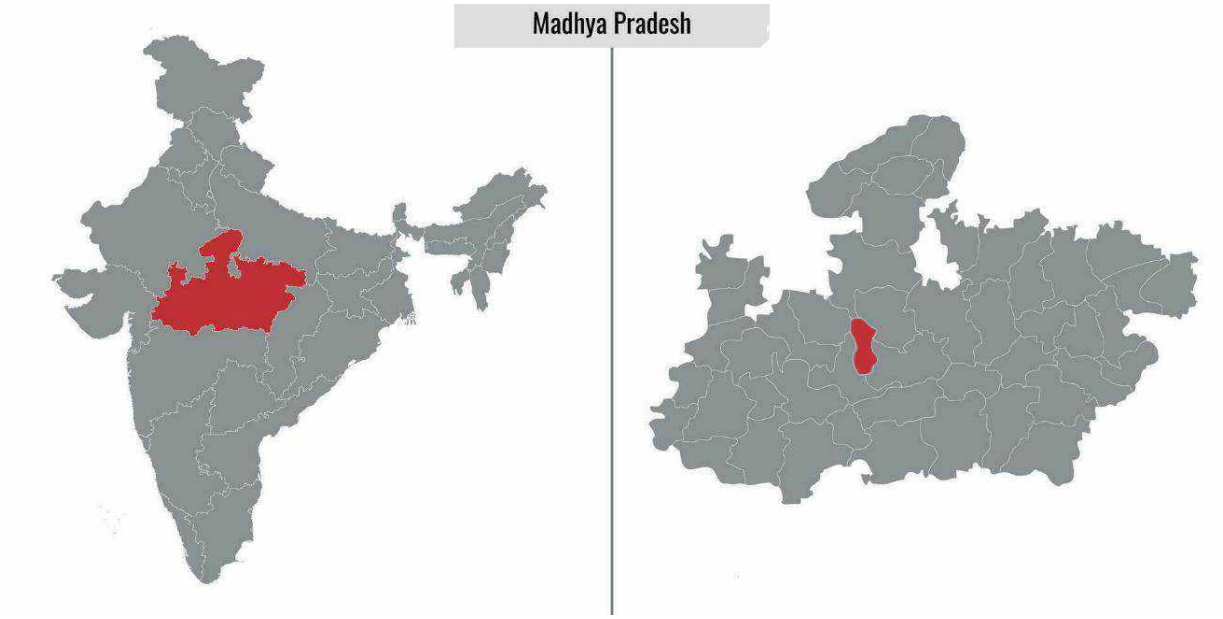


Figure 1: Site Location



Figure 2: Site Location in Google Maps

a. PROJECT DETAILS

- **Site Area**: 7.16 Acres (28,975.5 sqmt)
- **Project Proposed by**: Madhya Pradesh Tourism Department (MPT)
- **Budget:** 150 Cr (Exculsive of Land Value)
- **Proximity**: Bhopal Jn Railway Station 5.8 Km, RKMP Railway Station 7.1 Km, Raja Bhoj Int Airport 13 km, Polytechnic Metro Station 400 M, ISBT 8 Km

Area	Shyamala Hills, Bhopal
Site/Location	The subject property is located at Shyamala Hills, Bhopal, towards the eastern side of Upper Lake i.e., central region of Bhopal city. The subject location has many prominent government institutions and building. The prominent hospitality developments in vicinity of the subject site include Jehan Numa Palace, Ivy Suites, The Ten Suites etc. The subject micro-markets enjoys express connectivity via 24 m wide VIP Road (north) to the Bhopal Raja Bhoj Airport and other touristy places like Birla Museum, Sair Sapata, Interpretation Centre - Manav Sangrahalaya via 24 mts. wide Jehan Numa Palace Road.
Location Coordinates	**Latitude:** 23.243043872752793 **Longitude:** 77.38768911349595
Approach Road	24 mts. wide primary access road – Jehan Numa Palace Road
Site Boundaries	The subject property is surrounded by: • North: Green Zone adjacent to Bhopal Upper Lake • South: 24 mts. wide primary access road – Jehan Numah Palace Road • East: Other's property • West: Other's property
Land Area & Built-Up Area	The land area of the subject property admeasures approx. 7.16 acres while the total built-up area of the subject development admeasures approx. 87,521 sq. ft.

b. SITE PLAN AND ITS DIMENSIONS



Figure 3: Site Plan & its Dimensions

c. PROPOSING AGENCY

Name of the proposant: MPT Hotels and Resorts

d. SITE LOCATION IN MASTER PLAN



Figure 4: Site location in Bhopal Master-Plan

e. SCOPE OF WORK

1. **Full Site Demolition**:
   The Concessionaire must demolish all existing structures on site at their own cost, as per environmental and building regulations.

2. **Responsibility & Liability**:

   a. The Concessionaire is fully responsible for all demolition activities, whether executed directly or through third-party contractors.

   b. The Authority holds no liability for third-party work or quality compliance.

3. **Standards Compliance**:

   a. All works must meet required quality standards, laws, and regulations.

   b. Any shortcomings found must be corrected immediately at the Concessionaire's cost.

4. **Utility Coordination**:
   Before demolition, the Concessionaire must notify and disconnect all utility services (water, gas, electricity, etc.) and ensure all environmental clearances are secured.

5. **Condition of Structures**:
   The Authority is not responsible for the condition of existing structures.

6. **Movable Assets**:
   All movable items like furniture, fixtures, and equipment will be retained and removed by MPHCL as per contract.

7. **Waste Disposal**:

   a. All demolition debris must be cleared immediately post-demolition.

   b. Disposal must follow legal procedures and coordinate with local authorities.

(Resorts, 2025)

CHAPTER 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.

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 GUIDELINES FOR A 5 STAR HOTEL AS PER BHUMI VIKAS ADHINIYAM 2012

2.1.1 PARKING AND OTHER SITE AMENITIES

- Covered parking with a clear height of 2.4 meters may be provided within the permissible ground coverage on plots measuring 1200 sqmt. or more. Such area of parking shall not be counted towards Floor Area Ratio and permissible height calculations.
- In addition to the FAR as mentioned in above said table, additional FAR as Premium Floor Area Ratio may be provided over and above which shall not exceed 25% of the Base FAR. The rate of such Premium FAR shall be as may be decided by the State Government.

2.1.2 NORMS FOR PODIUM.

(1) Podium may be constructed, -

1. on a plot admeasuring at least 1000 sqmt.
2. in such manner that the clear height of each floor does not exceed 2.4 meters; and
3. with a maximum of three such floors above ground level.

(2) Podium shall not be counted in the calculation of the Floor Area Ratio and the building height. The uncovered roof top portion of the podium shall be counted towards the requirement of open spaces prescribed under rule 47 and rule 60.

(3) The restriction of 2.4 meters clear height mentioned in sub-rule 1 (b) may be relaxed according to the design needs of mechanized parking. The maximum permissible height of the podium in such cases shall not exceed 2.4 m x 3 Floors + designed thickness of beams and slabs in Podium Parking Floor.

(4) The uncovered roof top portion of the podium may be used for development of uncovered park, water / swimming pool, parking.

2.1.3 PARKING FLOORS. -

Where the plot size is not less than 1000 sqmt. covered parking with a clear height of not more than 2.4 meters may be permitted on any floor of the building according to the requirement of the project. Such parking shall not be included in the calculation of the FAR. If such parking is provided on the entire floor area, then such parking floor would not be included in the height of the building.

2.1.4 SERVICE FLOOR. -

Service floor may be provided in the building on plots having area 1000 square meters or more. The clear height of such service floor shall not exceed 2 meters and the same shall not be counted for the purpose of calculating Floor Area Ratio and the building height.

2.1.5 PLANTATION / LANDSCAPING. -

A plot having an area of 100 square meters or more shall be planted with trees after the completion of the construction of the building. The number of trees planted shall be one tree for every 100 square meters of individual plot. The occupancy certificate for the building will be issued only when the authority is satisfied that the provisions of this rule have been complied with. Every effort shall be made to protect the existing trees on the plot.

2.1.6 PLINTH

- The plinth of any building or out-house must ensure proper drainage and be raised at least 45 cm above the surrounding ground level.
- Interior courtyards must also be raised for adequate drainage.

2.1.7 HABITABLE ROOMS

- **Height**: Minimum 2.6 m from floor to ceiling. For air-conditioned rooms, a minimum of 2.4 m is acceptable.
- **Special Buildings**:
    - Educational: 3.6 m
    - Industrial: 3.6 m (3 m if air-conditioned)
- **Size**:
    - Single room: At least 9.5 sqmt with 2.4 m width
    - Two rooms: One 9.5 sqmt, other 7.5 sqmt with 2.1 m width
    - Hostels: Single occupancy room of 7.5 sqmt

2.1.8 KITCHEN

- **Height**: Minimum 2.6 m
- **Size**:
    - 5.0 sqmt (1.8 m width) if separate dining provided
    - 4.5 sqmt if separate store exists
    - 7.5 sqmt (2.1 m width) if used as kitchen cum dining
- **Requirements**: Impermeable floor, sink/wash area, flue (if needed), and ventilation

2.1.9 BATHROOM AND WATER CLOSETS

- **Height**: Minimum 2.2 m
- **Size**:
    - Bathroom: 1.5 sqmt
    - WC: 1.1 sqmt (0.9 m width)

- Combined bath/WC: 2.4 sqmt (1.2 m width)
- WC with wash basin: 1.3 sqmt

- **Ventilation & Construction**: Open to external/internal space, water-tight floors and walls, proper drainage slope, window/ventilator of at least 3 sqmt area

2.1.10 LEDGE OR TAND / LOFT

- **Height**: Minimum 1.5 m headroom
- **Size**: Max 25% of room floor area; loft in kitchen must leave 2.2 m headroom

2.1.11 MEZZANINE FLOOR

- **Height**: Minimum 2.2 m
- **Size**: Minimum 9.5 sq.m if used as living space; max 1/3 of plinth area
- **Requirements**: Open on one side, not subdivided, not used as kitchen

2.1.12 STORE ROOM

- **Height**: Minimum 2.2 m
- **Size**: Minimum 3 sq.m

2.1.13 GARAGE

- **Height**: Minimum 2.2 m
- **Size**:
  - Private: 2.5 m x 5.0 m
  - Public: Based on parking needs (see Rule 84)

2.1.14 BASEMENT

- Not for habitable use (exceptions apply)
- Conditions: Not within setback areas; max plinth height 0.45 m
- **Usage**: Storage, bank vaults, parking, equipment, limited commercial (with restrictions)
- **Design Requirements**:
  - Height: 2.4 m (3.6 m if commercial)
  - Ventilation: Natural or mechanical
  - Drainage protection, water-tight construction

- Independent access, ramps allowed if not blocking setbacks
- Max 3 basement levels for plots with minimum 21 m frontage and 30 m depth

2.1.15 PARAPET

- Minimum height: 1.05 m from finished floor level

2.1.16 BOUNDARY WALL

- **Height**:
  - Front: Max 1.5 m
  - Side/rear: Max 2 m (3 m if service road exists)
  - Corner plots: Side road wall max 1.5 m
  - Exceptions for institutional/utility buildings

2.1.17 SEPTIC TANK

- Located 18 m away from drinking water source
- **Design**:
  - Width: Min 75 cm; Depth: Min 1 m; Volume: 1 m^3
  - Effluent must be treated before discharge
  - Proper ventilation, anti-mosquito provisions

2.1.18 STAIRCASE

- **Width**:
  - Residential: 0.85 m
  - Hotels: 1.5 m
  - Assembly: 1.5 m
  - Educational: 1.5 m to 2.0 m
  - Institutional: 1.5 m to 2.0 m
- **Other Parameters**:
  - Landing width = 2 x tread + 25 cm
  - Tread: Min 25 cm (residential), 30 cm (others)
  - Riser: Max 17 cm (residential), 15 cm (others)

- Headroom: Min 2.2 m

2.1.19 ROOFS

- Designed for effective drainage with adequate rainwater pipes
- Rainwater harvesting mandatory for plots >140 sq.m

2.1.20 LIGHTING AND VENTILATION OF ROOMS

- Every room must have one or more openings, such as windows or ventilators, that open directly to the outside air or to an open verandah for light and air admission.
- If natural lighting and ventilation are insufficient, artificial lighting and mechanical ventilation must be provided as per the National Building Code (NBC), Part-VIII, Section 1.
- The total area of such openings, excluding doors and inclusive of frames, must be at least 10% of the floor area.
    - **Note 1:** Only the openable portion of a partly fixed window will be counted.
    - **Note 2:** Any room portion beyond 7.5 meters from an opening is not considered naturally lit.
    - **Note 3:** For kitchens, the required area of openings increases by 25%.

2.1.21 PROVISION OF LIFTS, ESCALATORS, OR MOVING WALKS

- Lifts must be provided in buildings taller than 12.5 meters. Their planning, design, and maintenance must follow NBC, Part-VIII, Section 5.
- Owners must submit installation details while applying for building permission.
- A completion report must be submitted before obtaining a building completion certificate. Each unit will be issued a unique registration number.
- Owners with existing lifts/escalators must register them within six months of the rule's enforcement, with a fee of ₹500 per unit. This may be extended by another six months.
- Residential users with private lifts are exempt from registration.
- Owners must insure the lift/escalator and its users through a recognized agency.
- Maintenance must be carried out according to the Lift Engineer's instructions.
- Owners are responsible for safe operation and must:

    - Not operate unsafe units.
    - Remove or secure non-functional lifts to prevent use.
    - Ensure ongoing compliance with NBC maintenance norms.
- A safety and audit report, signed by a Lift Engineer, must be submitted every six months. A certificate must be displayed in the unit. Private residential users are exempt.
- Non-compliance:
    - First offense: A warning with a two-month deadline.
    - Second offense: A show cause notice and potential operational ban.
- Accidents must be reported to the concerned authority within 24 hours.
- Authorities must maintain a digital and physical inventory of installed units.

2.1.22 PARKING SPACE REQUIREMENTS

- Parking norms on plots and elsewhere must follow designated standards.
- Standalone multi-level public parking is allowed in all land use types. Up to 5% of the built-up area may be used commercially.
    - **Front Margin:** 12 meters
    - **Other Sides:** 7.5 meters
    - **Ground Coverage:** Up to 80%
    - **Building Height:** Subject to approval by the Authority

2.1.23 EXIT REQUIREMENTS

Exit design must comply with standards defined in the national building code.

2.1.24 FIRE AND STRUCTURAL SAFETY

- Fire and structural safety requirements must follow the provisions of the NBC.
- Public buildings must be accessible to persons with disabilities as per NBC standards.

2.1.25 FIRE PROTECTION REQUIREMENTS

- A designated Fire Authority is responsible for fire safety approvals.
- High-rise buildings require clearance from the Fire Authority before building permission is granted.

- Fire safety norms from NBC Part IV are applicable.
- Additional safety rules:
    - No kitchens or cooking in basements or rooftops.
    - No inflammable materials on rooftops or in staircases, passages, etc.
    - Temporary inflammable roofing is prohibited.
    - Fire-resistant doors (≥1-hour rating) must be installed at stairway entrances if occupant count exceeds 10 per floor.
    - Gas banks must meet NBC standards.
    - Electrical panels in high-risk buildings must have clean agent gas suppression systems.
    - Smoke ventilation systems are mandatory for all corridors and staircases.

- Annual fire audits are mandatory. Owners must:
    - Submit audit reports by June 30 each year.
    - First-time failure: Warning with a 3-month compliance window.

Second-time failure: Show cause notice and possible Fire NOC cancellation.

2.2 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.

2.3 CLASSIFICATION / RECLASSIFICATION OF OPERATIONAL HOTELS

I. 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.

II. 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"

III. Star Category Classification/Reclassification fees in Rs.

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

2.3.1 AREA OF HOTELS

Table 1: 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 2: 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							Grade A cities: One Multi cuisine Restaurant cum 24 hr. coffee shop / all day diner, one Specialty Restaurant and 24 hr. room service. Grade B cities: 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							Grade A cities: One Multi cuisine Restaurant cum 24 hr. coffee shop/ all day diner, one Speciality restaurant and 24 hr. room service. Grade B cities: One Multi cuisine Restaurant cum coffee shop open from 7 a.m. to 11 p.m., one Speciality restaurant and 24 hr. room service.
Grade- A: Delhi * Mumbai, Kolkata, Chennai, Bangalore, Pune, Hyderabad/ Secunderabad. Grade– B: Cities in the rest of the country excluding Grade 'A' cities.			Note: 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

2.3.2 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.

2.3.3 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.

2.3.4 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'.

2.3.5 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.

2.3.6 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.

2.3.7 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.

2.4. CRITERION FOR 5 STAR HOTELS W.R.T. ITC HOTELS.

2.4.1. PARKING AND APPROACH TO BUILDING

There must be minimally one designated accessible parking space in every 25 parking spaces provided.

a) Location:

- The accessible parking bay should be located closest to the entrance, with an accessible route, that is level or gently sloping and minimally 1200mm wide, leading to the building entrance.
- The route to the entrance from the parking must not require the user to cross any vehicular monument.
- The parking and the route connecting it to the entrance should preferably be covered.
- In case of underground parking, accessible parking bays should be located closest to the elevator leading to the lobby levels.

b) Parking Space

1. Accessible parking bay should be 4800mm wide, out of which at least 1200mm, on both the sides, is used as transfer bays. Where there are two accessible parking bays adjoining each other, then the 1200mm transfer bay, on one side, may be shared by the two parking bays in between them.
2. Length of the accessible parking bay should preferably be 6000mm, including a 1200mm wide transfer zone at the rear to allow loading of the wheelchair. The transfer zones, both on the sides and the rear should have yellow or white cross-hatch road markings.

c) Signage

- There should be the international symbol of accessibility painted on the 2400mm wide area where the car is to be parked. The symbol should be large enough to be easily visible by person looking for the accessible parking. Recommended size being 1000mm x 1000mm but not larger than 1500mm x 1500mm. The sign painted on the floor should contrast with the floor color (preferred colors, white and blue)
- There should also be a signboard with the international symbol of accessibility at the height of 1200mm from the floor right at the end of the parking.
- The Symbol of Access should be displayed at approaches and entrances to car parks, to indicate the provision of an accessible parking lot, for people with disabilities within the vicinity.
- Directional signs should be displayed at points where there is a change of direction to direct people with disabilities to the accessible parking lot.
- Approach to the Building
- The approach to the building entrance should be clearly defined.
- The surfaces should be firm and even, with a finish which is slip resistant in all weather conditions.
- The width of paths should be appropriate to meet the needs of all users.
- A recommended clear width of 1800mm will allow two wheelchair users to pass each other on path, however where obstacles are unavoidable and 1800mm width cannot be provided, a clear width of at least 1200mm should be provided throughout the path.
- Any kerbs in the route should have appropriate drop kerbs to allow access to a wheelchair.

2.4.2. MAIN ENTRANCE

a) Entrance should be easy to locate and adequately signposted

b) Consider installing automatic or semi-automatic doors

c) Avoid thresholds; if unavoidable, they should be no higher than 6mm

d) There should be a landing of at least 1800mm x 1800mm immediately next to the door.

2.4.3. LOBBY, RECEPTION AND HOUSE PHONES

a) Lobby

1. The lobby should be levelled and split levels should be avoided.
2. It should have adequate circulation space for a guest on a wheelchair, parents with a double pram or a person with heavy luggage.
3. Any center piece that may be used in the lobby should be such that can be easily detected by a person with vision impairments. This can be achieved by making it contrast in color with the flooring and detectable by a white cane and by having its lower edge less than 300mm above the ground.

b) Reception

1. Location of the reception should be such that it is easily identifiable from the entrance. The approach to the reception should be obstacle free.
2. The reception should be designed, so as to accommodate both standing and sitting guests. This can be achieved by providing a seated section that is minimally 1500mm wide x 760mm high x 700mm deep with a 750mm high knee recess. The standing section should range from 950mm to 1100mm in height.
3. A minimum clear floor area of 1200mm depth and 1800 mm width is required in front of any reception desk or counter (with a provision of 500mm deep knee recess) to enable sufficient manoeuvring space for wheelchair users. If there is no knee recess provided, then the minimum manoeuvring space required is 1400mm deep and 2200mm wide.

2.5. TIMESAVERS AND ARDS (BUILDING TYPES) HOTEL

1. It must be borne in mind that, as far as planned circulation is concerned, there must never be aminglingofthefront-of-the-houseserviceswiththoseofthebackofthehouse.
2. The two functions must be kept separate and yet so interrelated that both functions smoothly and efficiently.
3. 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.
4. 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.

2.5.1 BACK OF THE HOUSE

1. 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.
2. 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.
3. 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
4. Tight, well-planned back of the house will have circulation patterns that will provide the utmost in control.
5. 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.
6. 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.
7. 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.

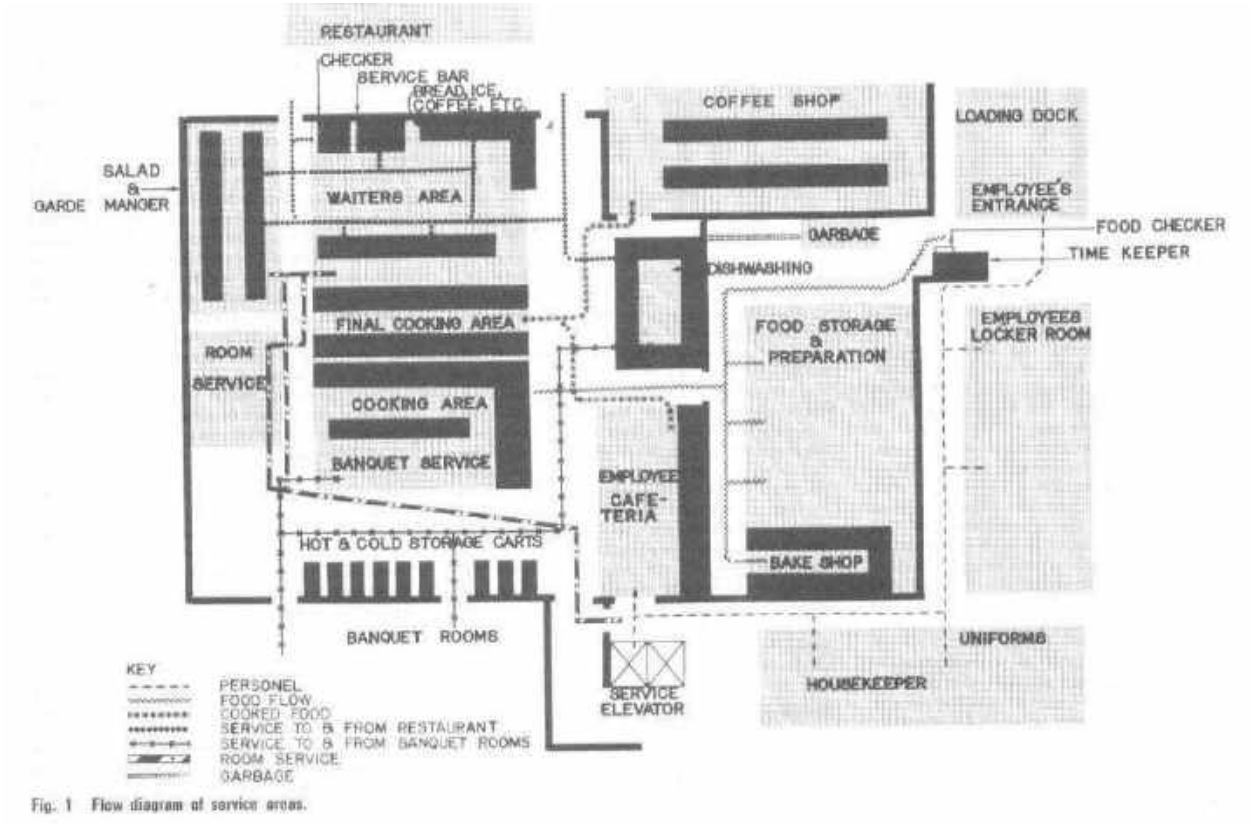


Figure 5 Flow Diagram of Service Area (ITC Hotel Manual)

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

2.5.2 LAUNDARY FACILITIES

1. A laundry is a usual adjunct of most good-sized hotels.
2. 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.
3. 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.

2.5.3 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.

2.5.4 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 6 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.

2.5.5 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.

2.5.6. 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.

2.5.7 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

2.5.8 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

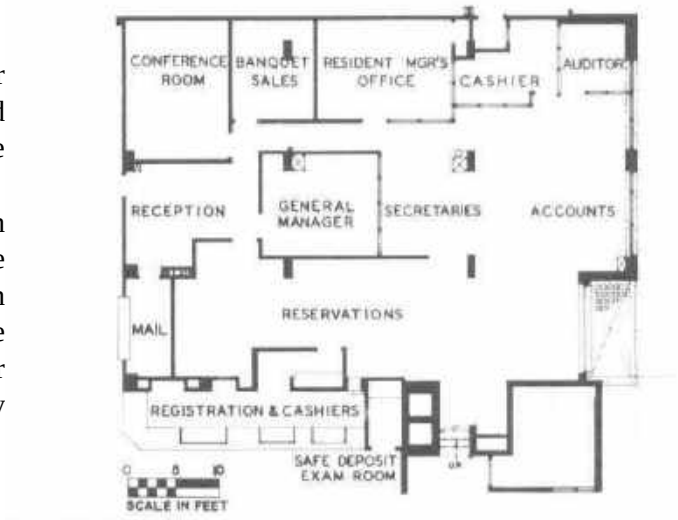


Figure 7 Admin Plan, Churchhill Hotel London

2.5.9 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.

2.5.10 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.

2.5.11 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.

2.5.12. 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.

2.5.13 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.

2.5.14 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.

2.5.15 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.

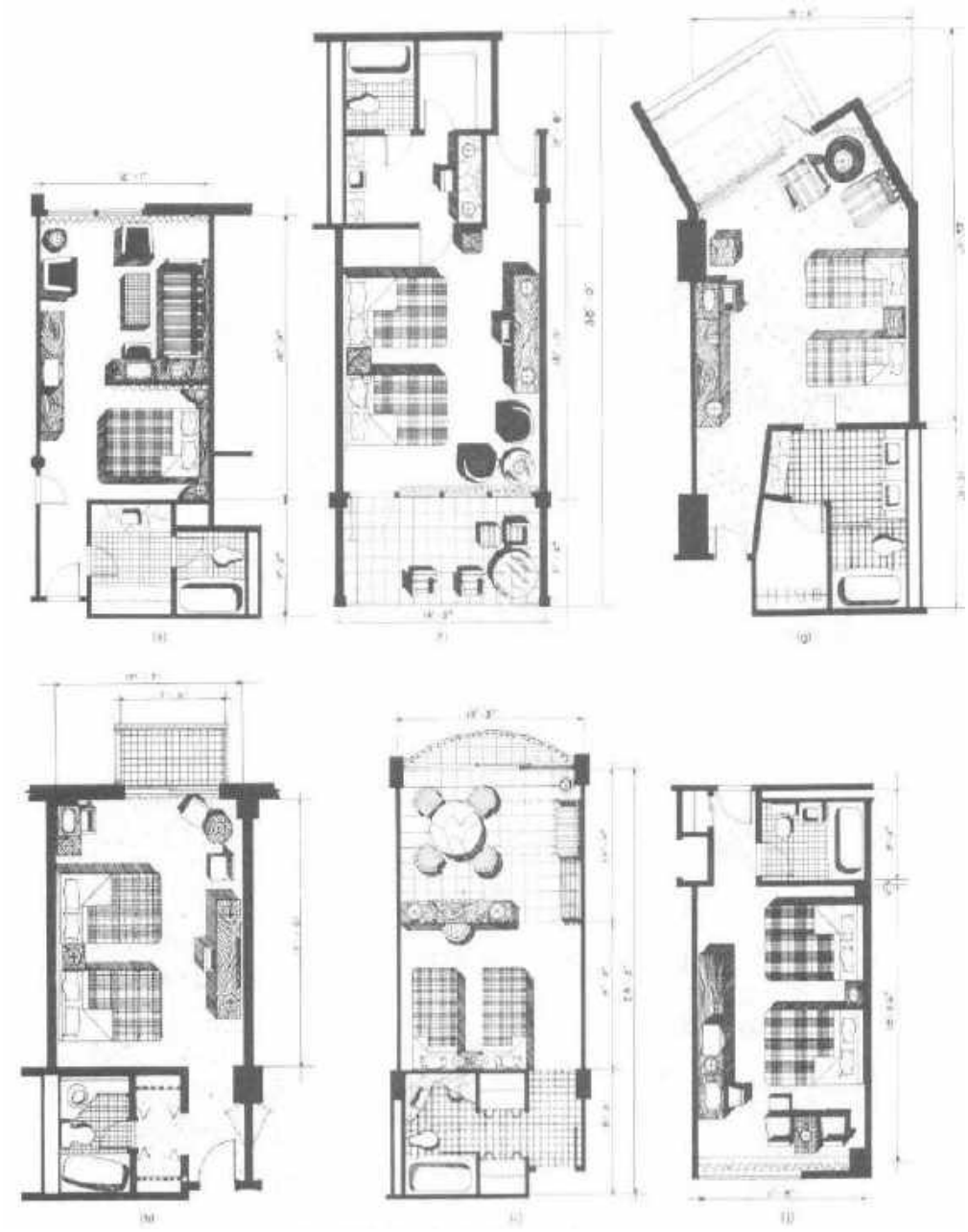


Figure 8 Guest room details (ITC Hotel Manual)

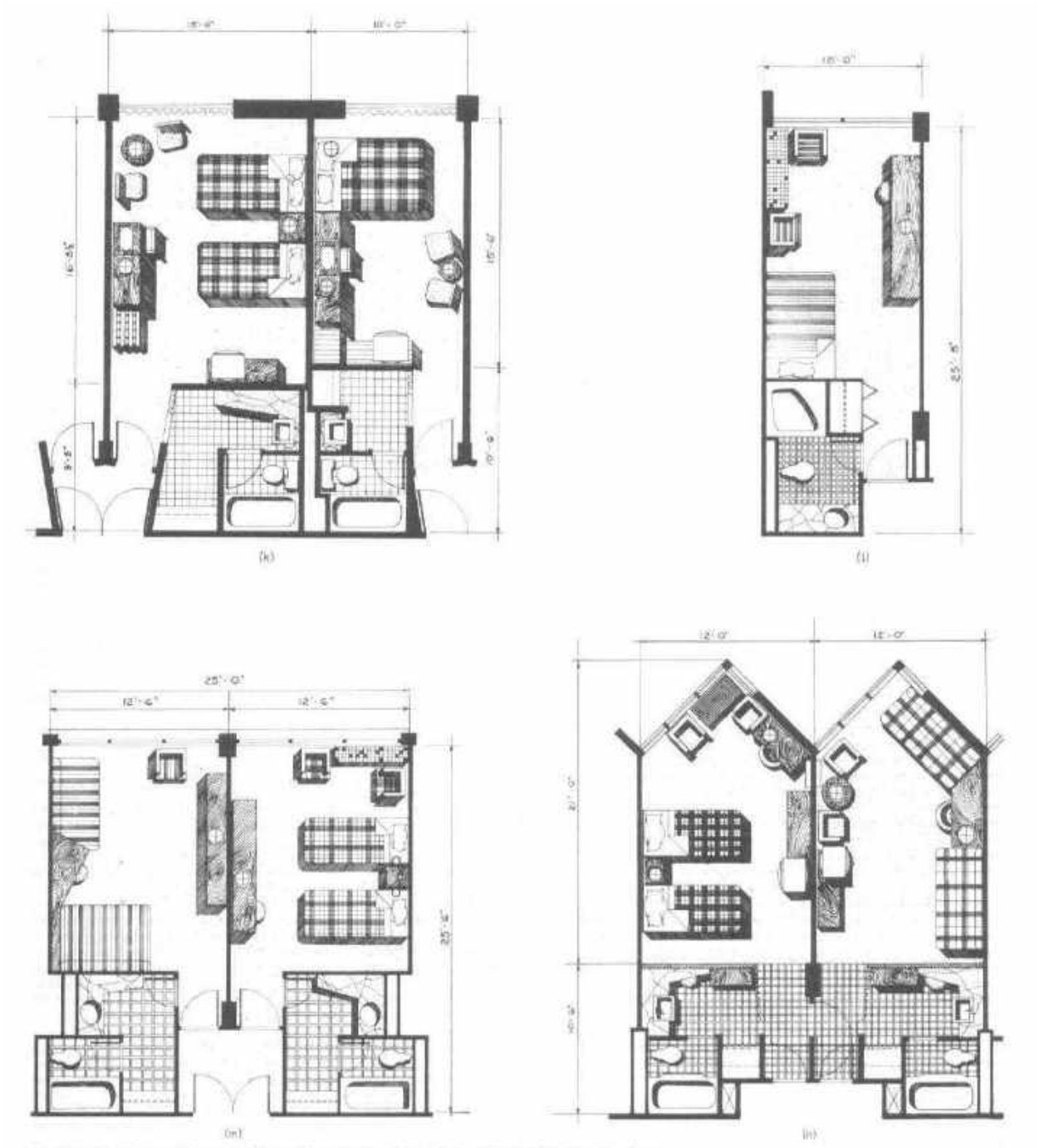


Fig. 5 (cont.) (k) Chicopee Motor Inn, Chicopee, Massachusetts. (l) and (m) Thomas Circle Motor Hotel, Washington, D.C. (n) Riverview Motor Hotel, New York.

Figure 9 Guest room details (ITC Hotel Manual)

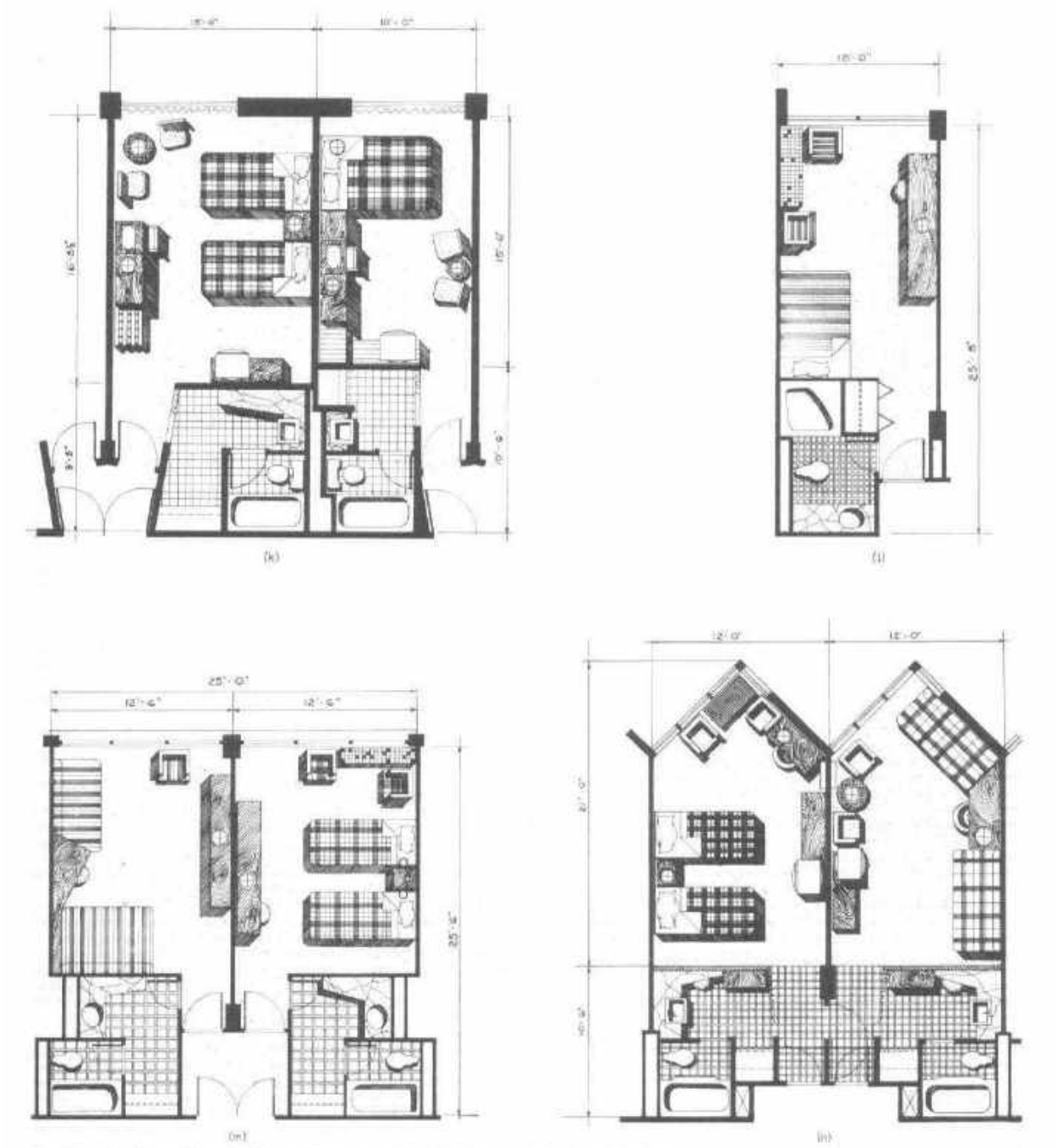


Fig. 5 (cont.) (k) Chicopee Motor Inn, Chicopee, Massachusetts. (l) and (m) Thomas Circle Motor Hotel, Washington, D.C. (n) Riverview Motor Hotel, New York.

Figure 10 Guest room details (ITC Hotel Manual)

2.5.16 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.

2.5.17 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.

2.5.18 GUEST FLOOR SERVICESPACES

- 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.

2.5.19 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.

2.6. TIME SAVER STANDARDS (BUILDING TYPES)-RESTAURANTS

2.6.1 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.

2.6.2 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 3 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 4 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.

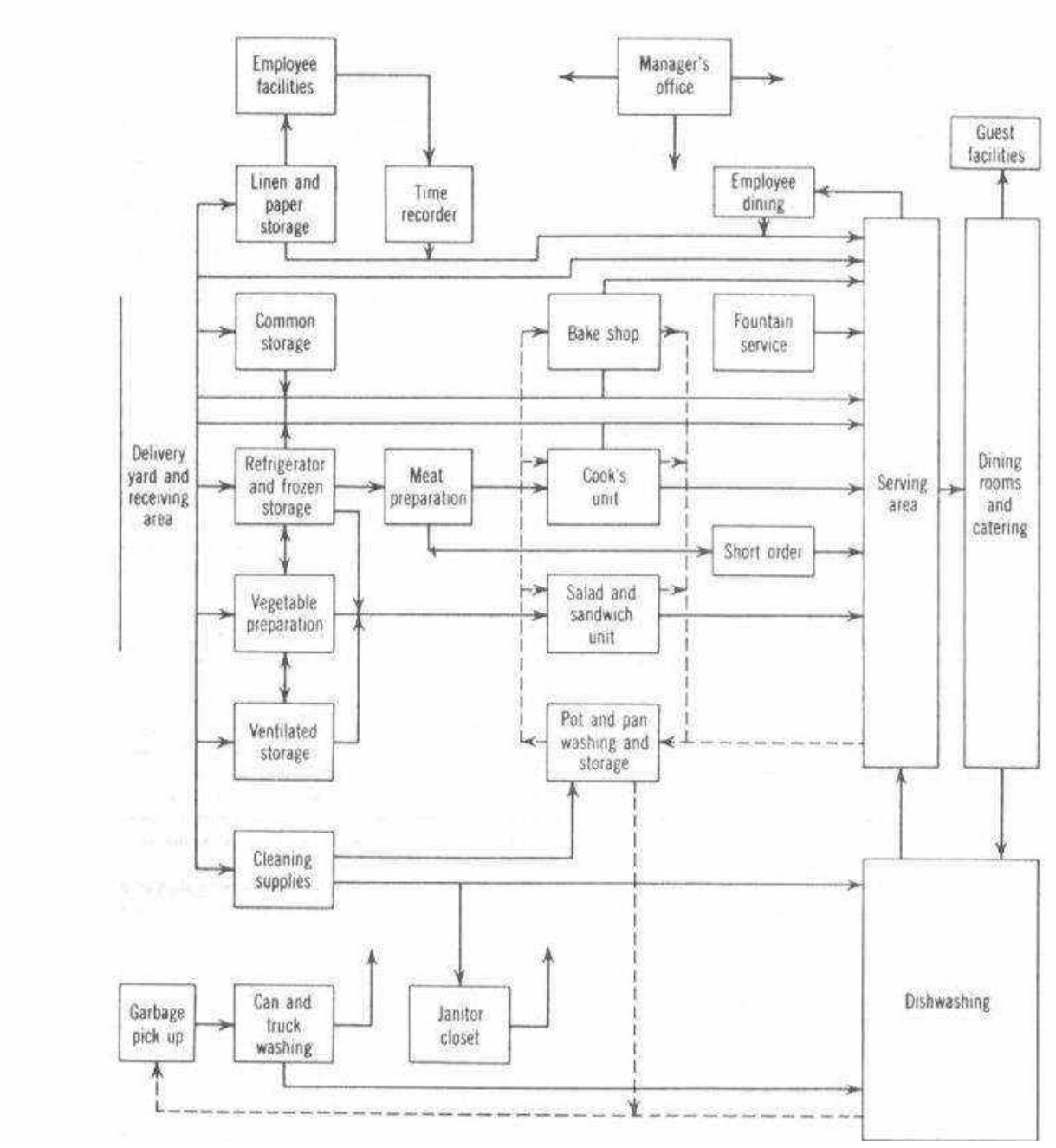


Figure 11 Flow Diagram Showing Functional Relationships (TSS)

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:
- Type of preparation and service
- Amount of the total production done in the unit
- Volume in terms of the number of meals serve
- Variety of foods offered in the menu
- Elaborateness of preparation and service
- Amount of individual service given, as in a hospital ltrey service
- Seating and service plan, whether on one floor or many

Table 5 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 6 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.

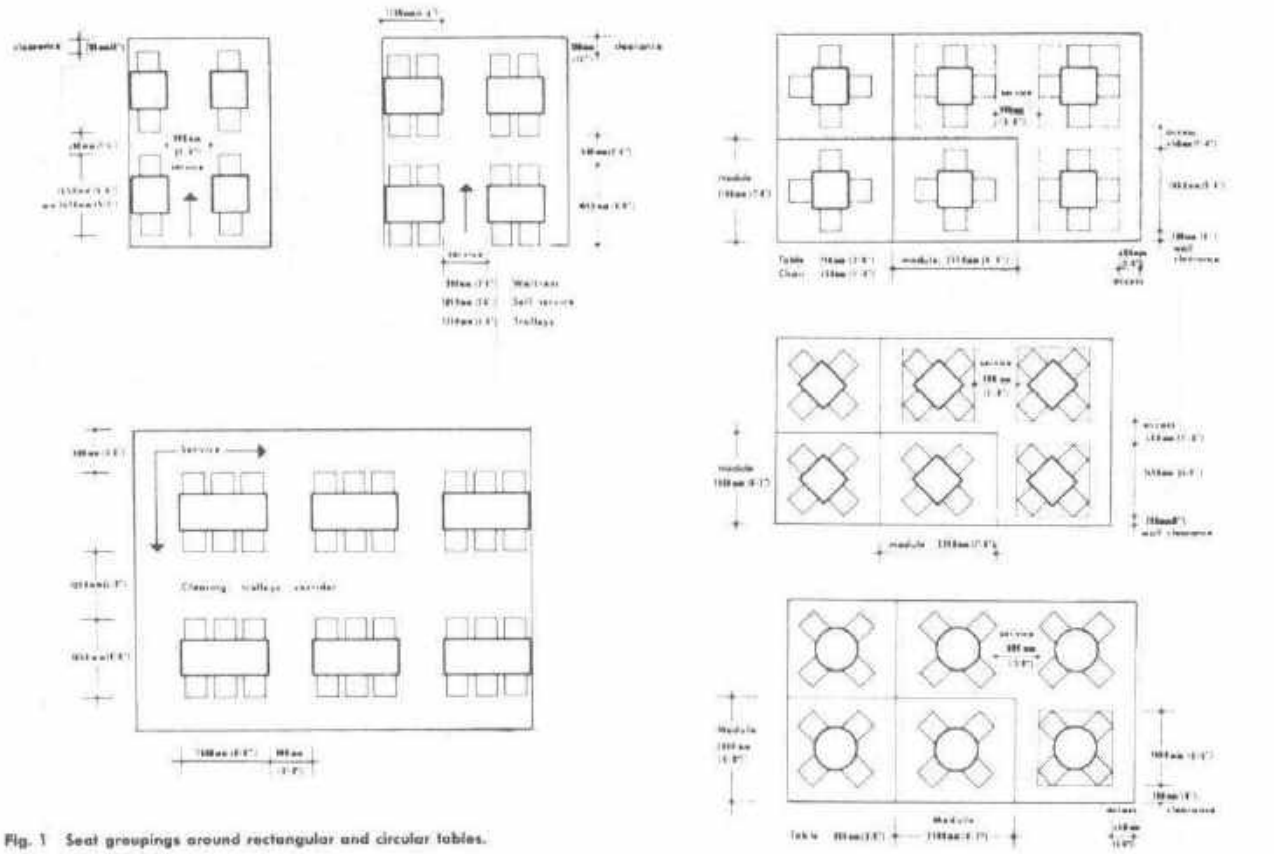


Fig. 1 Seat groupings around rectangular and circular tables.

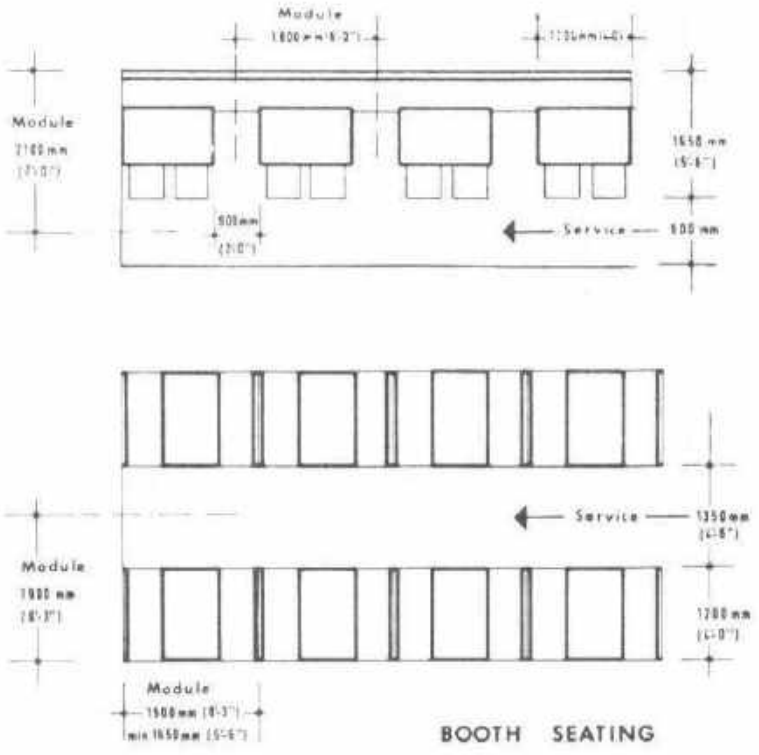
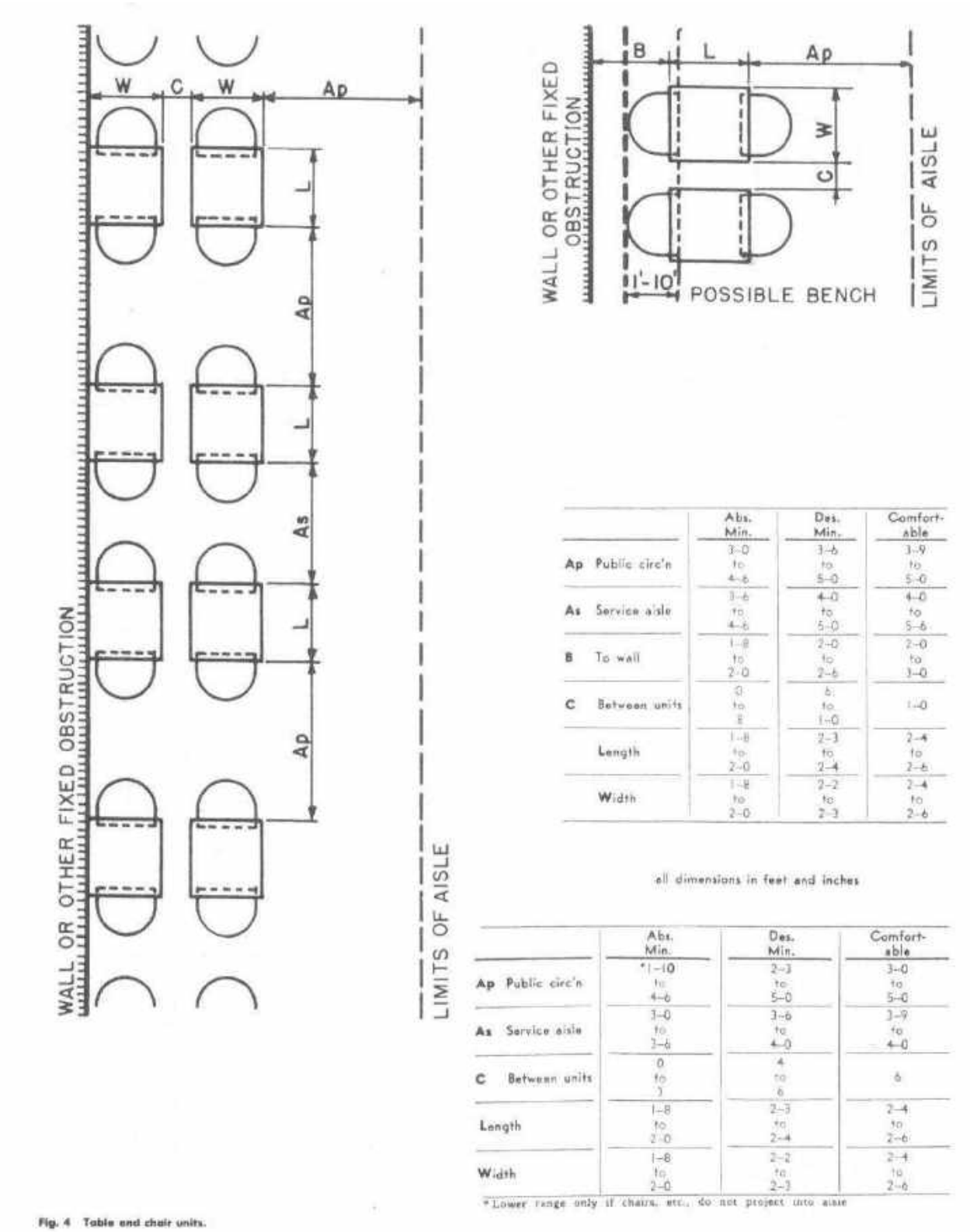


Fig. 2 Banquette seating arrangements and limiting dimensions including space for access and service.

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

Figure 12 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

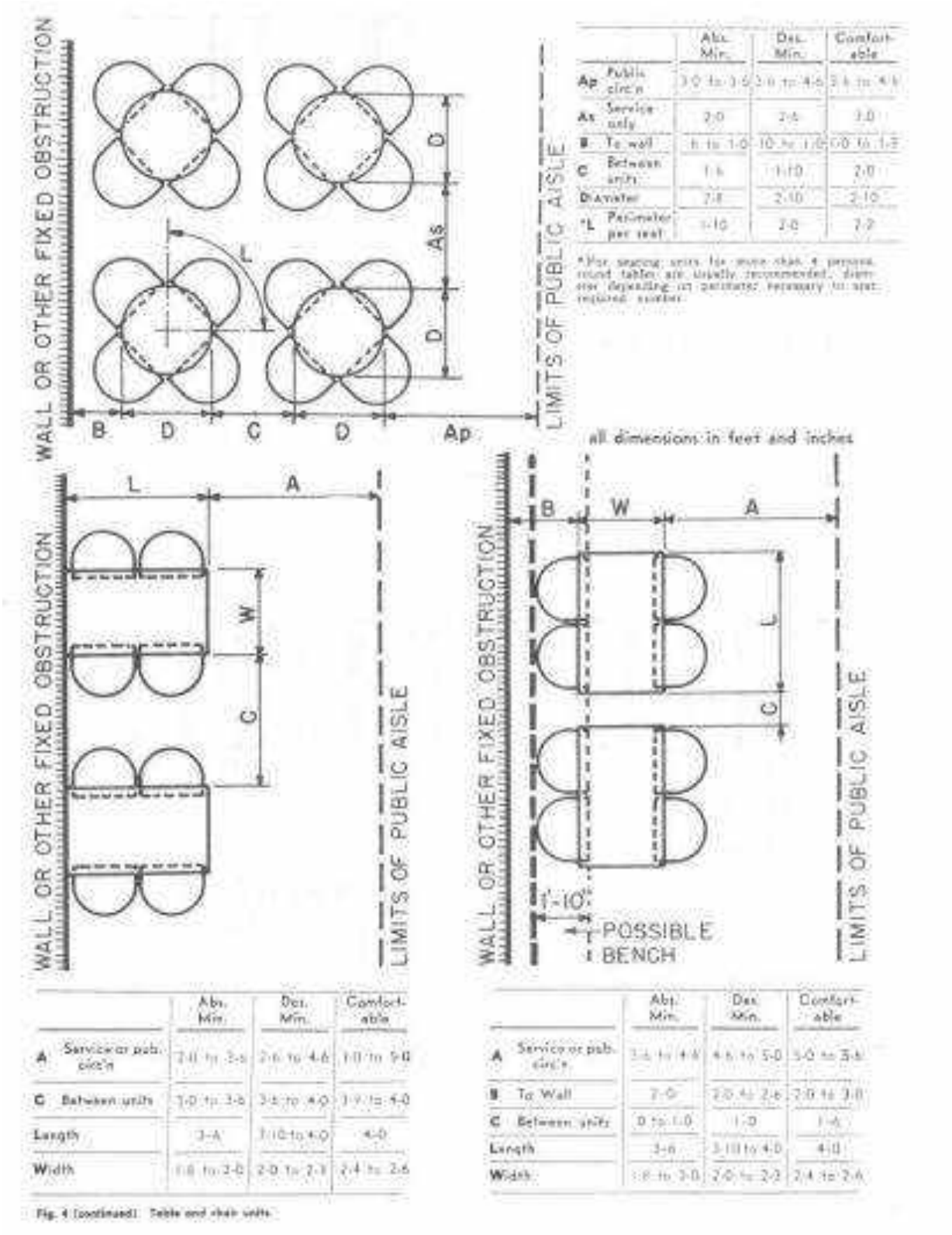
all dimensions in feet and inches

		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 13 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	1-6 to 1-0	1-0 to 1-6	1-0 to 1-3
C Between units	1-6	1-10	2-0
D Diameter	2-8	2-10	2-10
*L Perimeter per seat	1-10	2-0	2-2

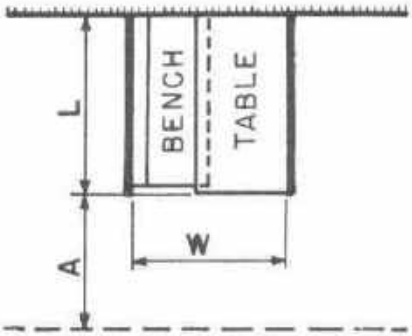
*For seating units for more than 4 persons, round tables are usually recommended, diameter depending on perimeter necessary to seat required number.

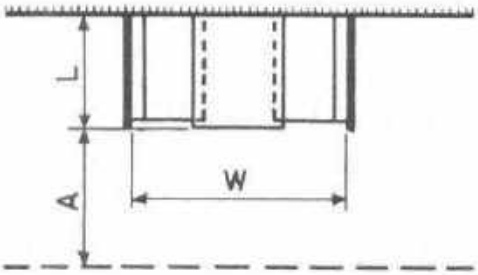
	Abs. Min.	Des. Min.	Comfortable
A Service or pub. circ'n	2-0 to 3-6	2-6 to 4-6	3-0 to 5-0
C Between units	1-0 to 3-6	3-6 to 4-0	3-9 to 4-0
Length	3-6	3-10 to 4-0	4-0
Width	1-6 to 2-0	2-0 to 2-3	2-4 to 2-6

	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	1-6 to 2-0	2-0 to 2-3	2-4 to 2-6

Fig. 4 (continued). Table and chair units.

Figure 16 Table & Units (TSS)





2 PERSONS SIDE BY SIDE

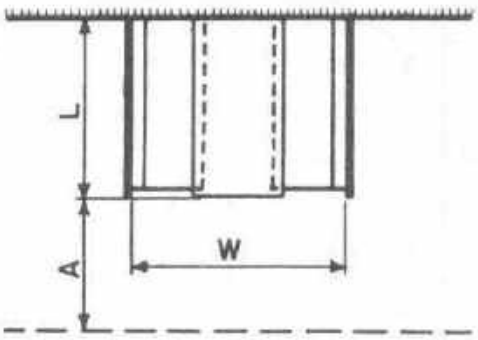
	Abs. Min.	Des. Min.	Comfortable
A Service and pub. circ'n	2-6	3-0	3-6
Length	3-6	3-9	4-0
Width	3-0	3-3	3-6

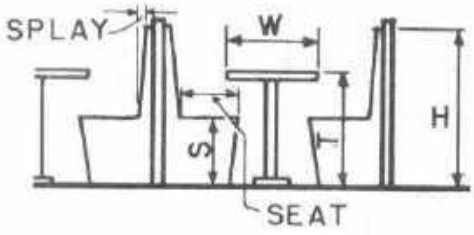
Note: This type not ordinarily recommended.

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

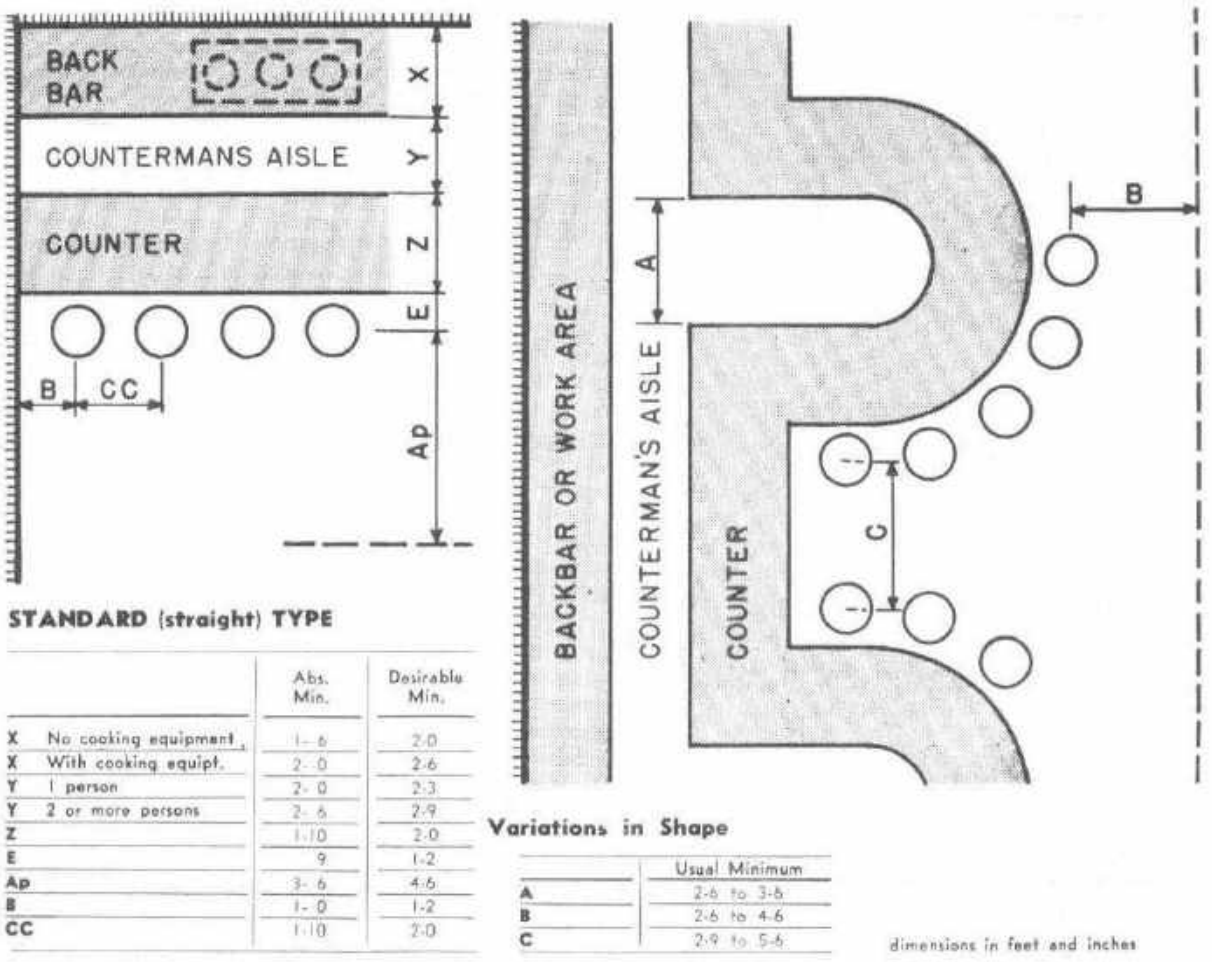
	Abs. Min.	Des. Min.	Comfortable
A Service and pub. circ'n	2-6 to 3-0	3-0 to 4-0	3-6 to 5-0
Length	3-6	3-9 to 4-0	4-0 to 4-2
Width	4-10 to 5-6	5-2 to 5-6	5-8 to 5-10

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 17 Booths (TSS)



STANDARD (straight) TYPE

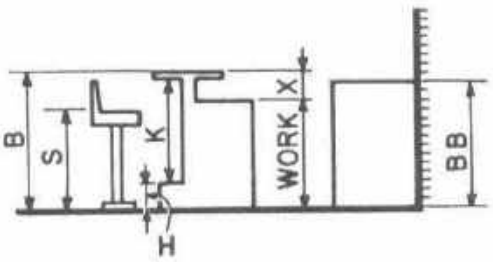
		Abs. Min.	Desirable Min.
X	No cooking equipment	1-6	2-0
X	With cooking equipt.	2-0	2-6
Y	1 person	2-0	2-3
Y	2 or more persons	2-6	2-9
Z		1-10	2-0
E		9	1-2
Ap		3-6	4-6
B		1-0	1-2
CC		1-10	2-0

Variations in Shape

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

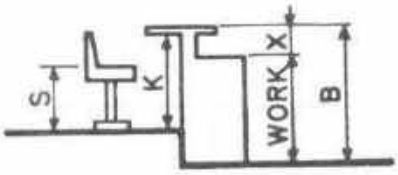
dimensions in feet and inches

HEIGHTS



LEVEL FLOOR

	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		



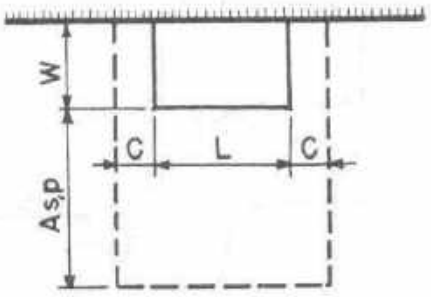
DROPPED FLOOR

	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 19 Food Bars (TSS)

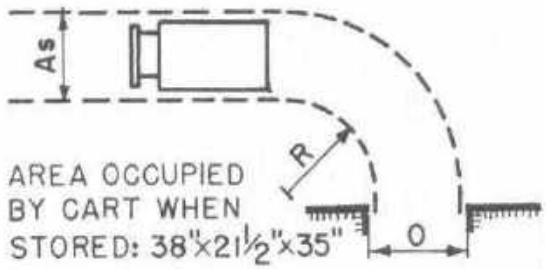
Serving Units



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" is 42" is average		

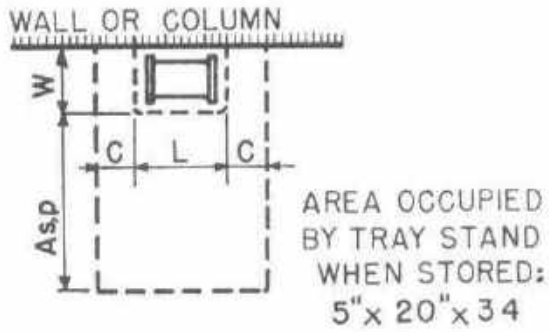
Display tables (hors d'oeuvres, etc.) usually 5'-0" x 2'-0"; (wines), 3'-0" round



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

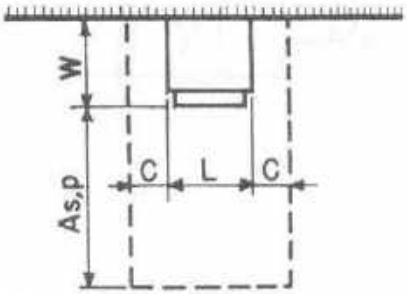
Approx. area when stored: 38" x 21½" x 35"



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 20 Serving Units (TSS)

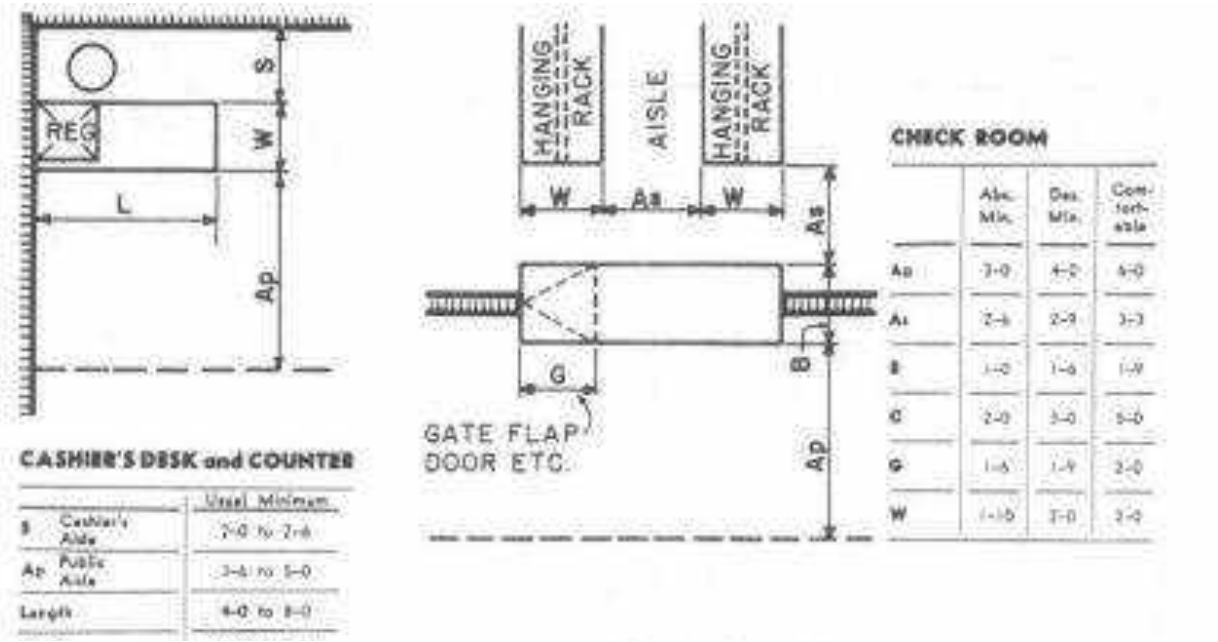


Figure 21 Nondining Spaces (TSS)

2.6.3 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 as30 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.

2.6.4 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.

2.6.5 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.

2.6.6 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.

2.6.7 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.

2.7 TIME SAVER STANDARDS (BUILDING TYPES)-KITCHENS



Figure 24 Traffic movement through aisle side

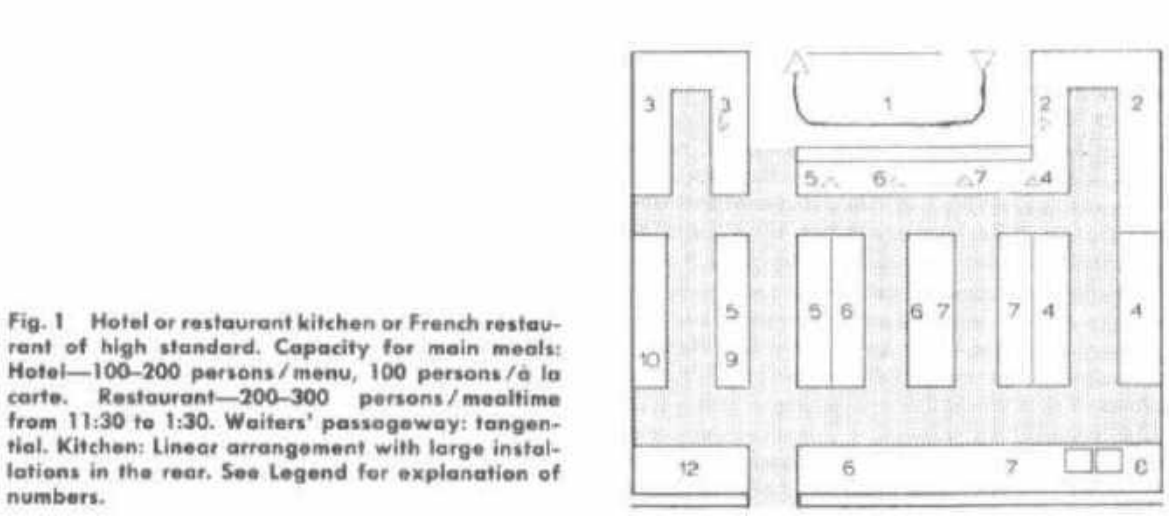


Figure 25 Kitchen for 100-200 Persons

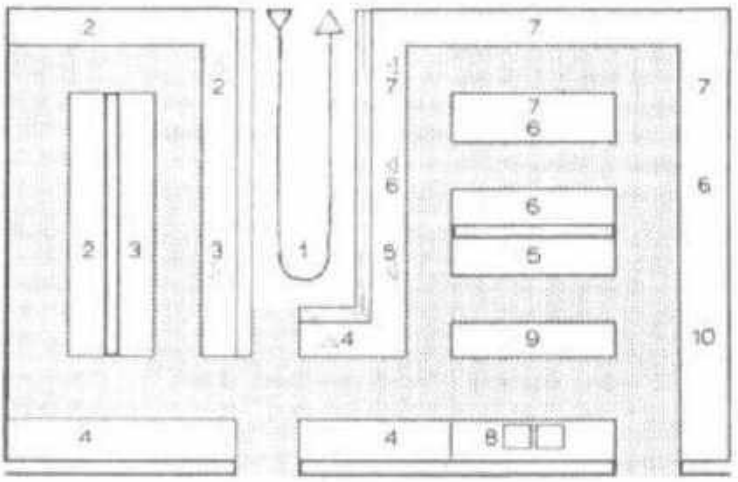


Fig. 2 Hotel or restaurant kitchen. Capacity: With this layout, a 200-seat restaurant will be able to handle three full sittings. This layout can also take care of a hotel with 100 guests and can also accommodate a restaurant open to the general public, an outdoor restaurant, and a private dining area 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.

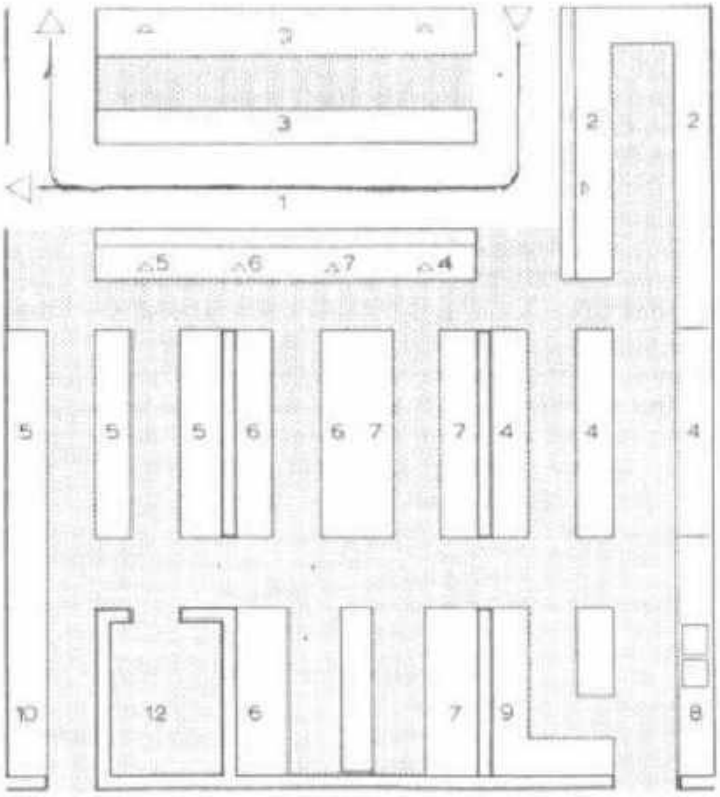
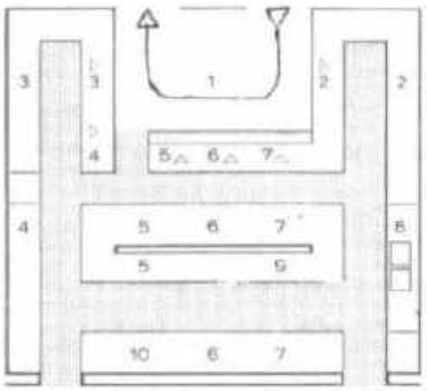


Fig. 3 Large restaurant kitchen for restaurants with many private party and conference facilities or with commissary and catering capacity for other businesses. Suitable also for large hotel with large restaurant for the general public. Capacity: 800–1,000 persons (e.g., 200 seats and fourfold reoccupancy). 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 26 Kitchen for 400 Persons (Up), and 800 persons (Down)



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—casseralier 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 27 Kitchen for Excursion Restaurants

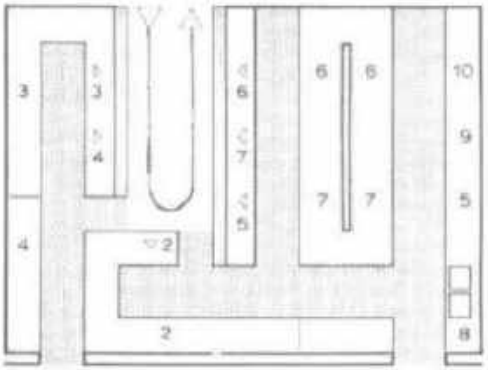


Figure 28 Kitchen for 600 persons, fourfold occupancy of 150 personsz

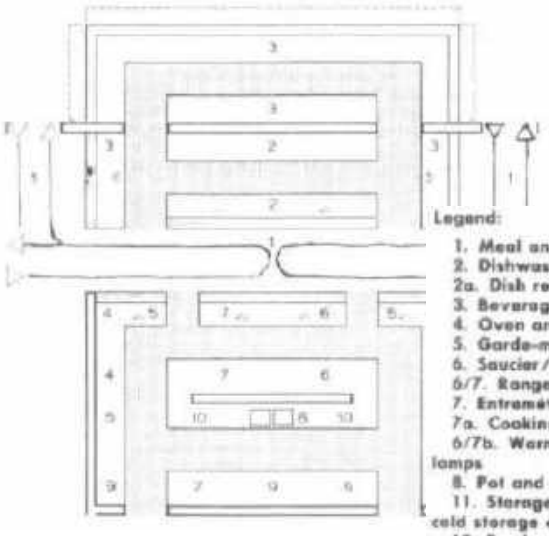


Figure 29 Snack Bar

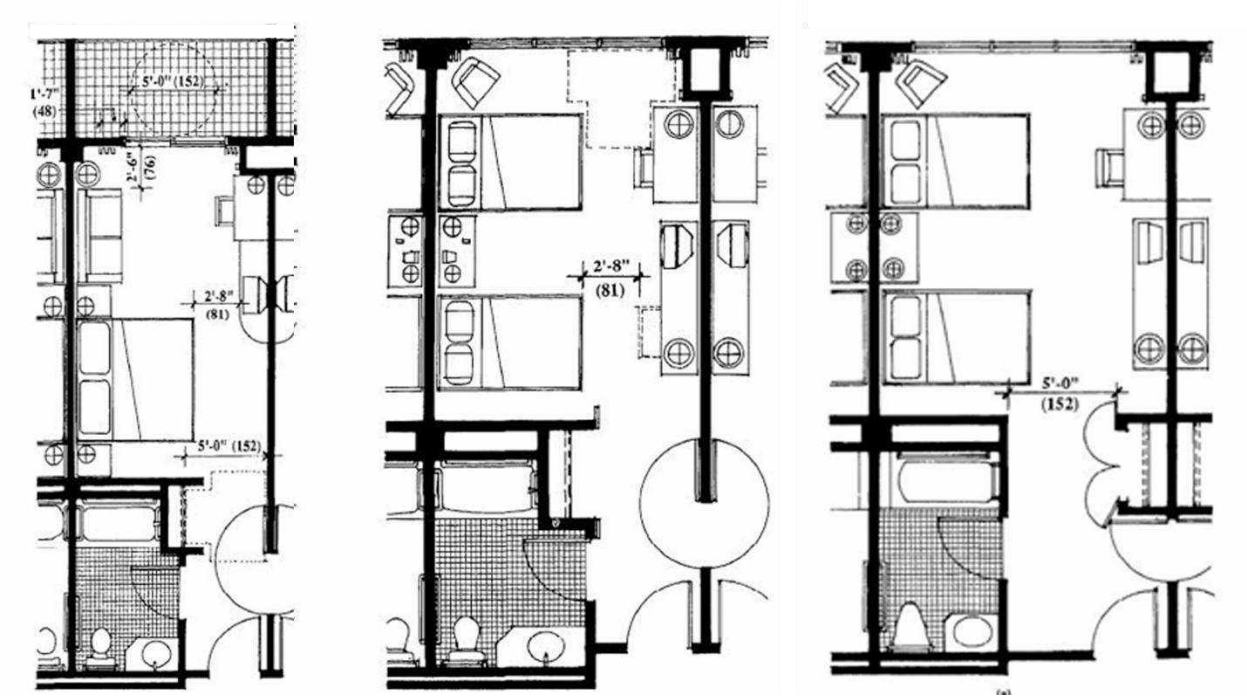
Legend:

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

Figure 30 Kitchen for 1000 Persons

2.8. TIME SAVER STANDARDS (INTERIOR DESIGN)

2.8.1 ROOM ARRANGEMENTS



ents with 12, 13 & 14 ft bay spacing

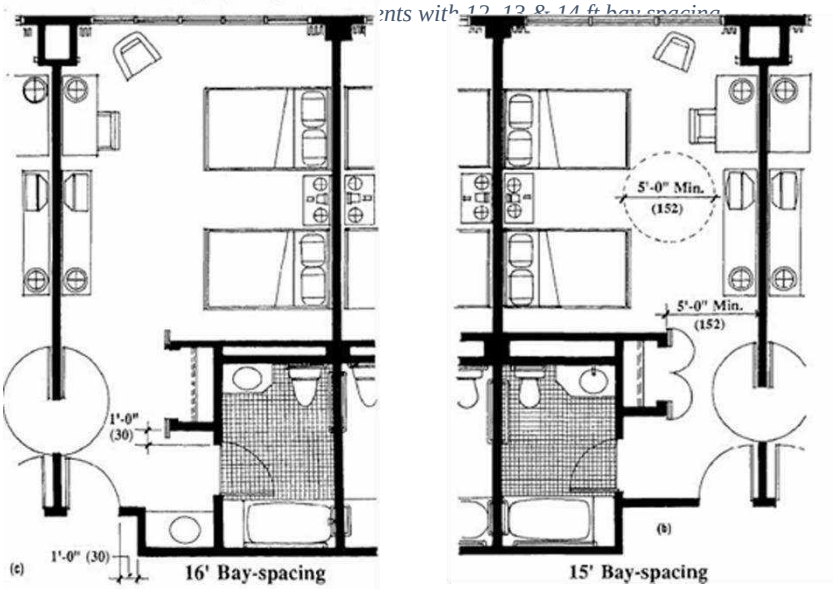
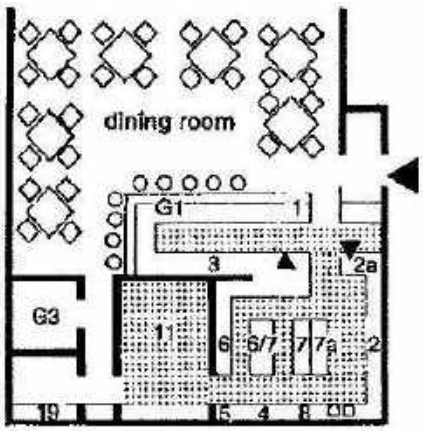


Figure 37 Room Arrangements with 16 & 15 ft Bay Spacing

2.8.2 SNACK BAR

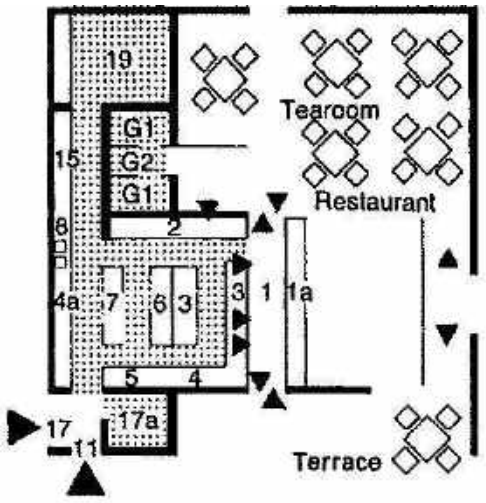
- Corner pub, cafe, restaurant: capacity 55-60 seats (2-4 place turnover at lunch time, 2 in evenings). Between lunch and evening meals: serving coffee, cakes and snacks. Kitchen: supplied predominantly with pre-prepared items. Storeroom need not be particularly large if deliveries are daily.



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 41 Snack Bar Arrangements

2.8.3 CAFE, RESTAURANT & KITCHEN



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 40 Cafe-restaurant Arrangement

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

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.

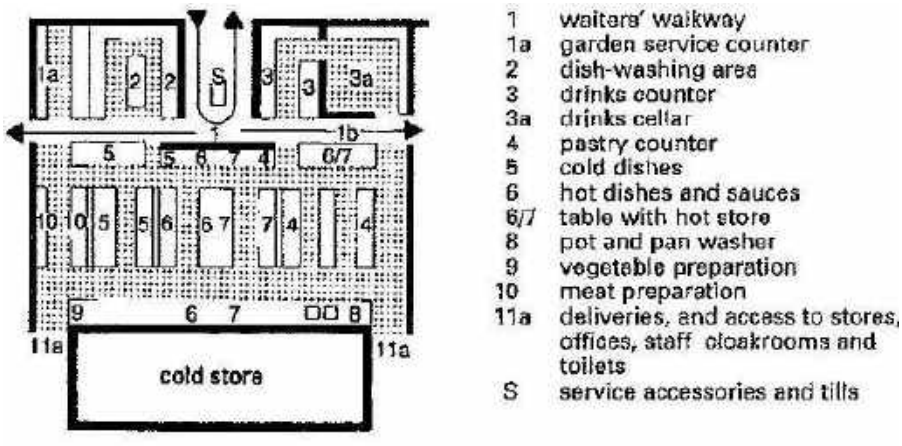


Figure 42 Large Hotel Restaurant Kitchen

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:

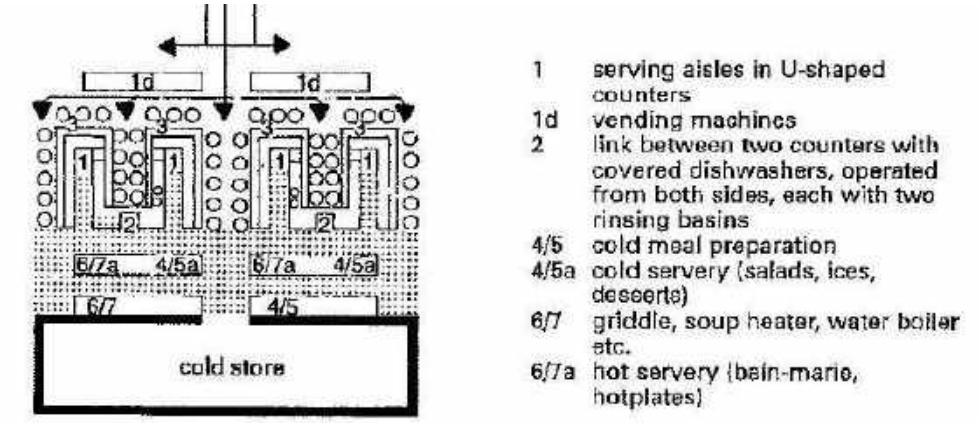


Figure 43 Restaurant with buffet and vending machine

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

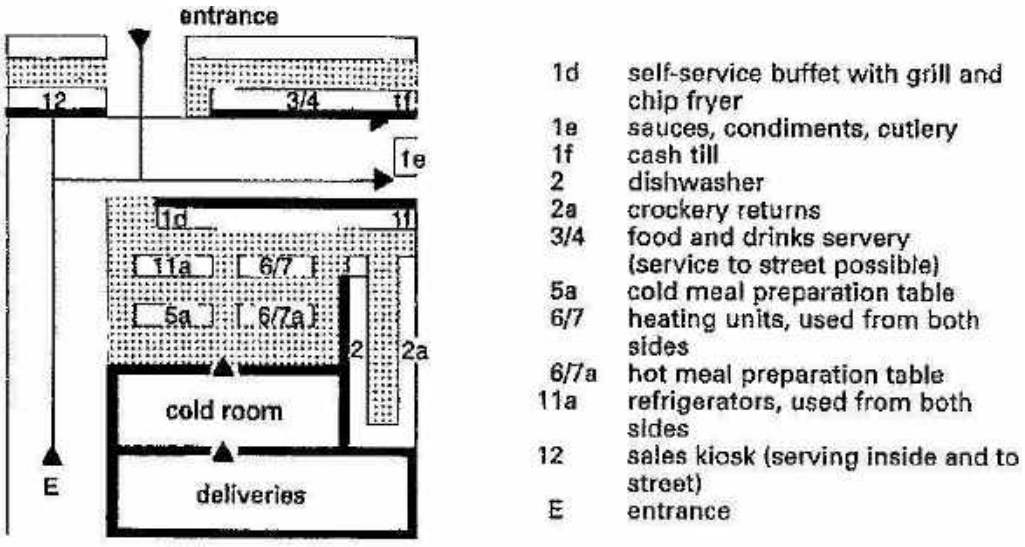
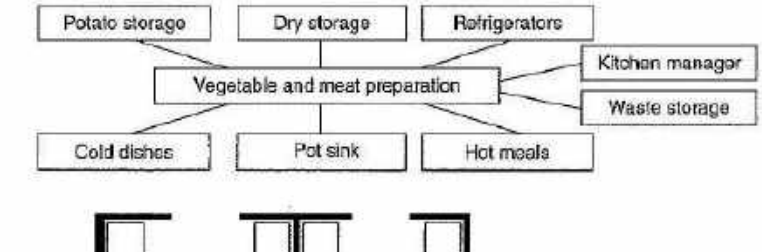


Figure 44 Self Service restaurant

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.



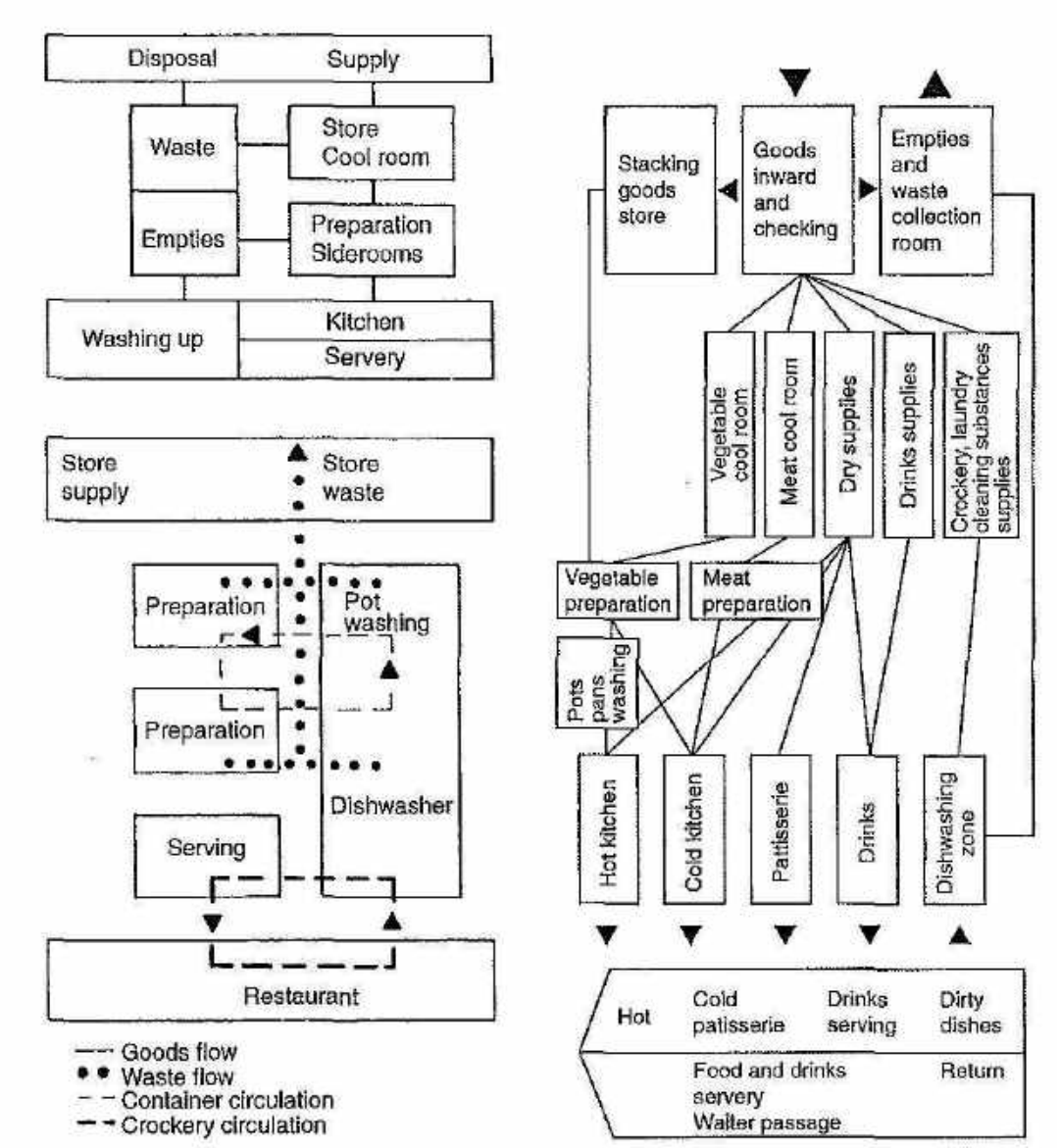


Figure 46 Restaurant Kitchen; Functions & Restaurant kitchen; Organisation

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.

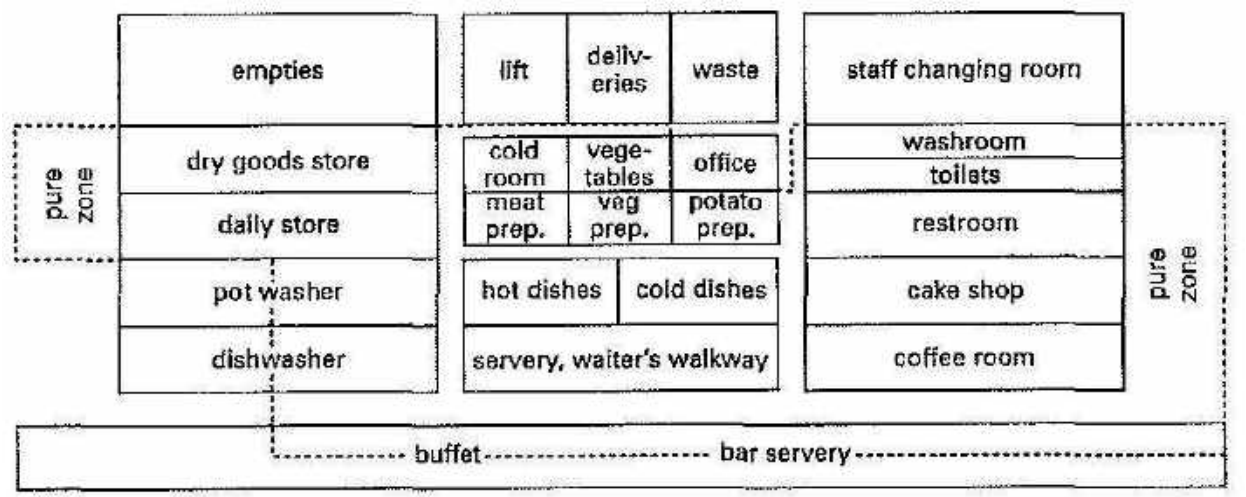
- Bistros, snack bars, small cafes - or specialty restaurants with 40-60 seats- are classified as small operations. Small to medium units (70-1 00 places) require on the other hand carefully zoned and fully equipped kitchen facilities. Large businesses (service areas, fast food restaurants, large hotel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

Table 7 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

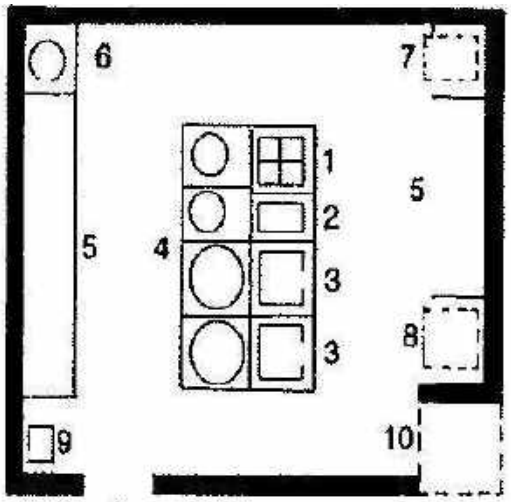
Table 8 Basis for dimensions and space requirements

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



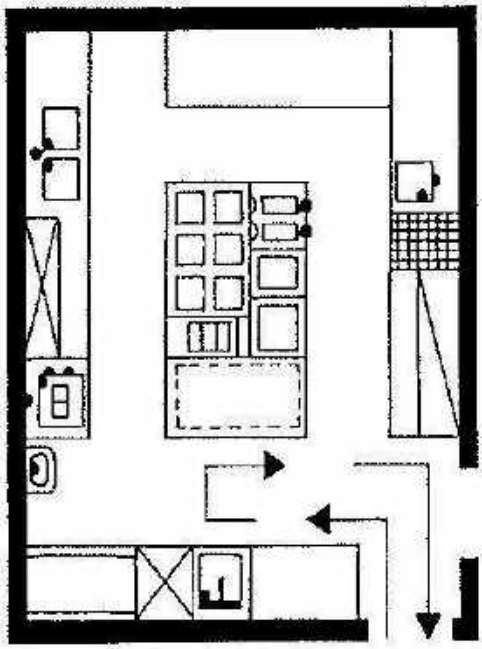
5 Kitchen areas: classification and relationships of functional areas in clean and unclean zones (if earth-covered vegetables are prepared, this must take place in a separate part of the unclean area!)

Figure 47 Funtionality of Kitchen Areas



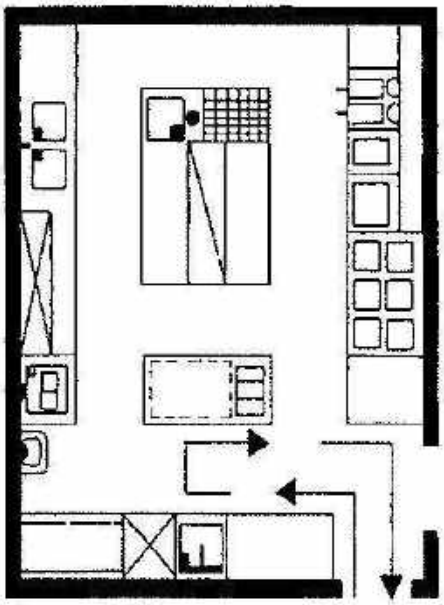
1 cooker
2 deep fat fryer
3 griddle
4 water boiler
5 work surface
6 cooker
7 double-deck oven
8 convectomat
9 hand basin
10 storage area

1 Basic organisation of the hot kitchen → **2** –**3**



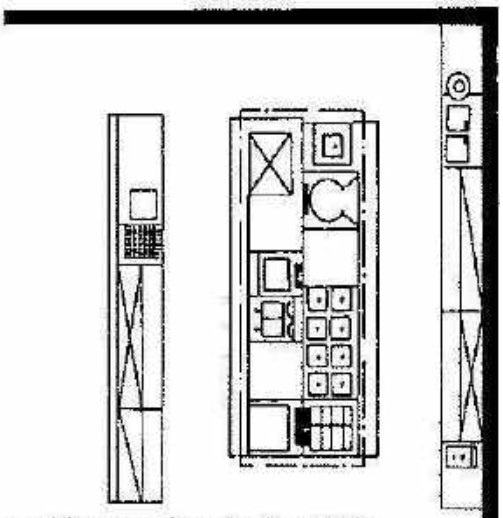
1. production in block

2 Kitchen for restaurant with 60–100 places



2. production in line

3 Kitchen for restaurant with 60–100 places



cooking: cooker, boiler (80 l), work surface, eight-ring hob, two ovens, bain-marie, hot cupboard
frying: griddle, work surface, twin deep fat fryer, frying pan, hot-air oven with table

4 Restaurant kitchen for 150–200 meals

Figure 48 Organization of Kitchen Spaces

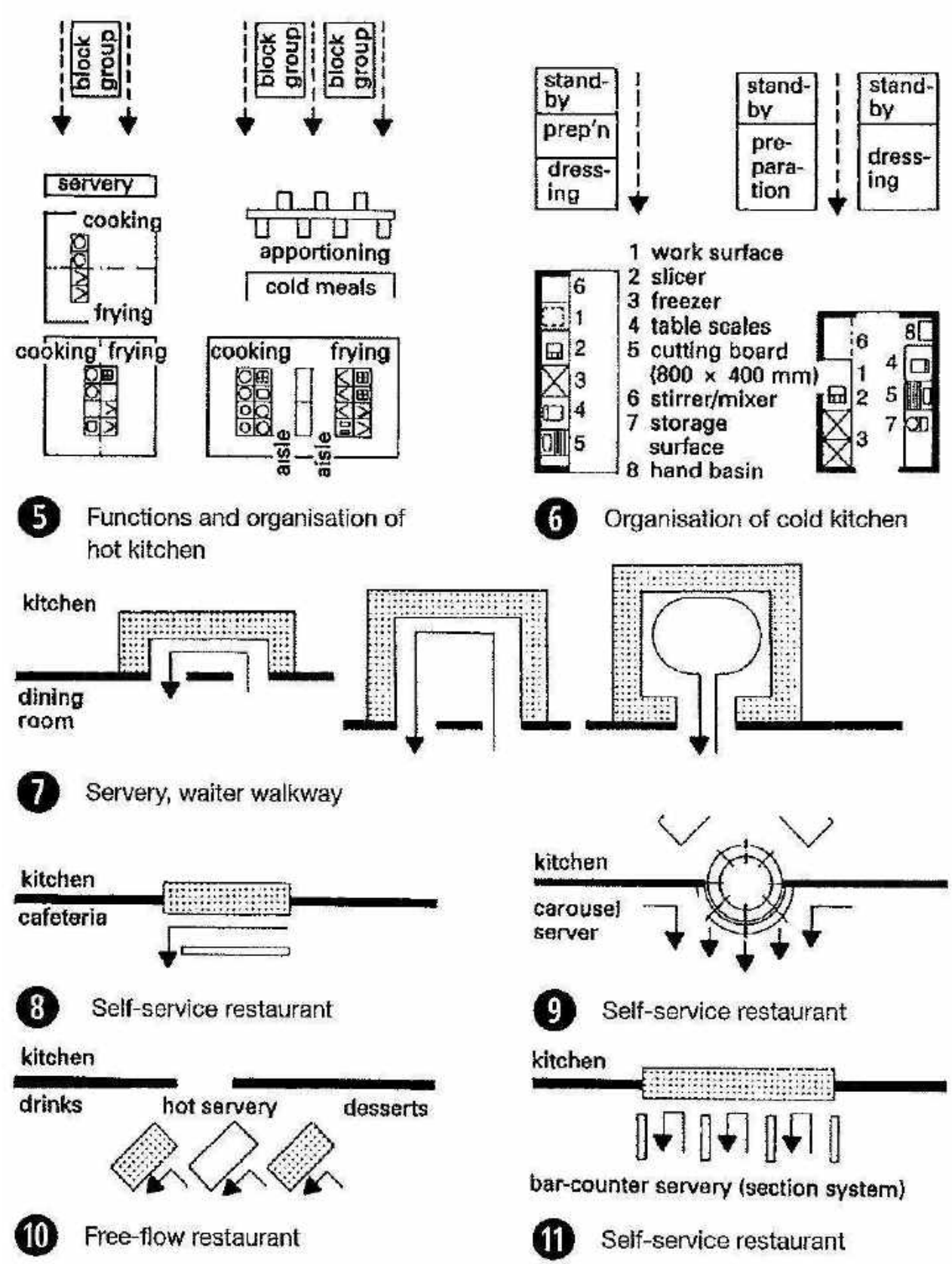


Figure 49 Functionality of Kitchen spaces through flow diagrams

2.8.4 BASIC SCHEMES OF HOTEL

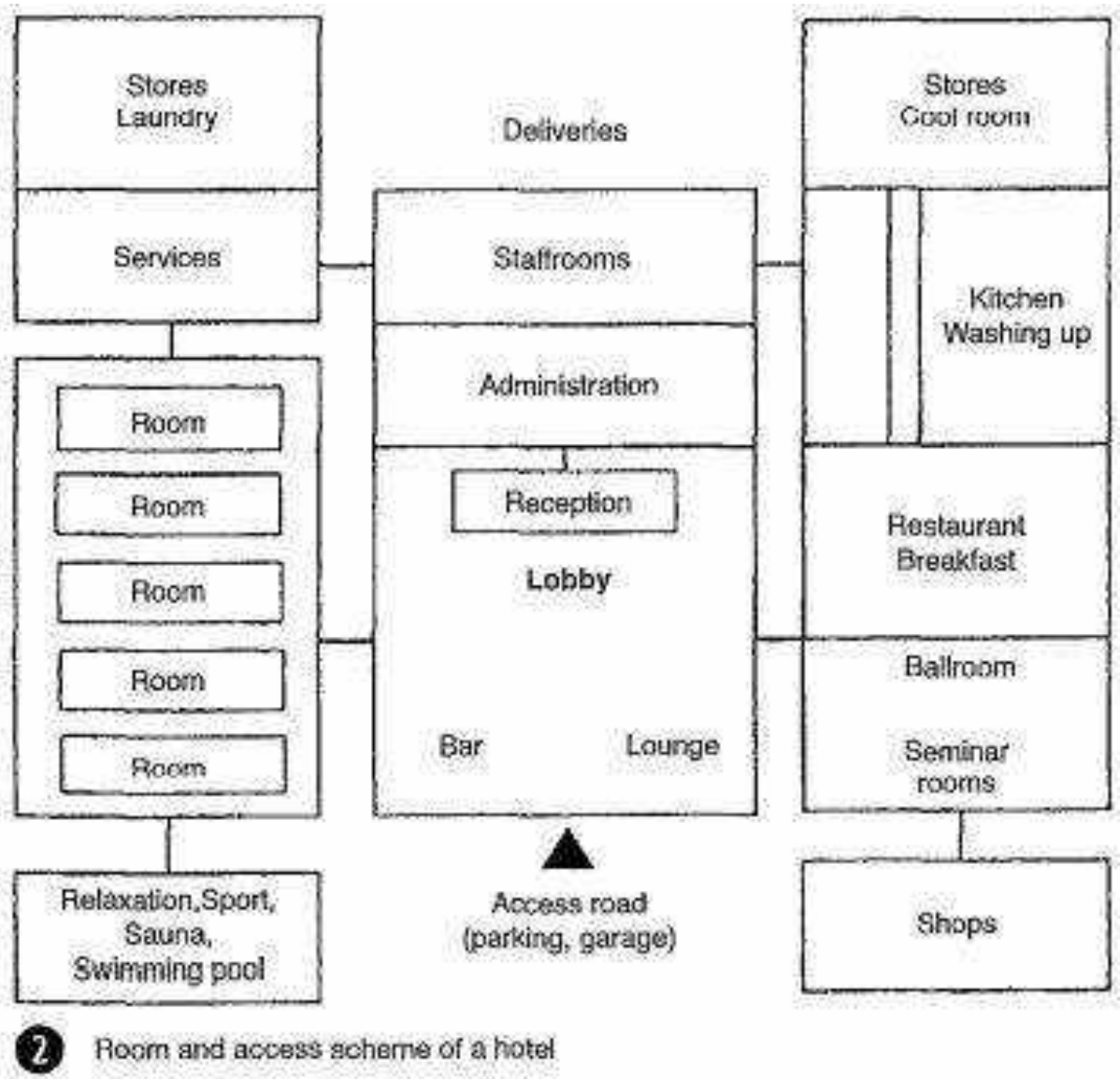


Figure 50 Route relationship between spaces

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

Table 9 Percentage of hotel area required

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

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.

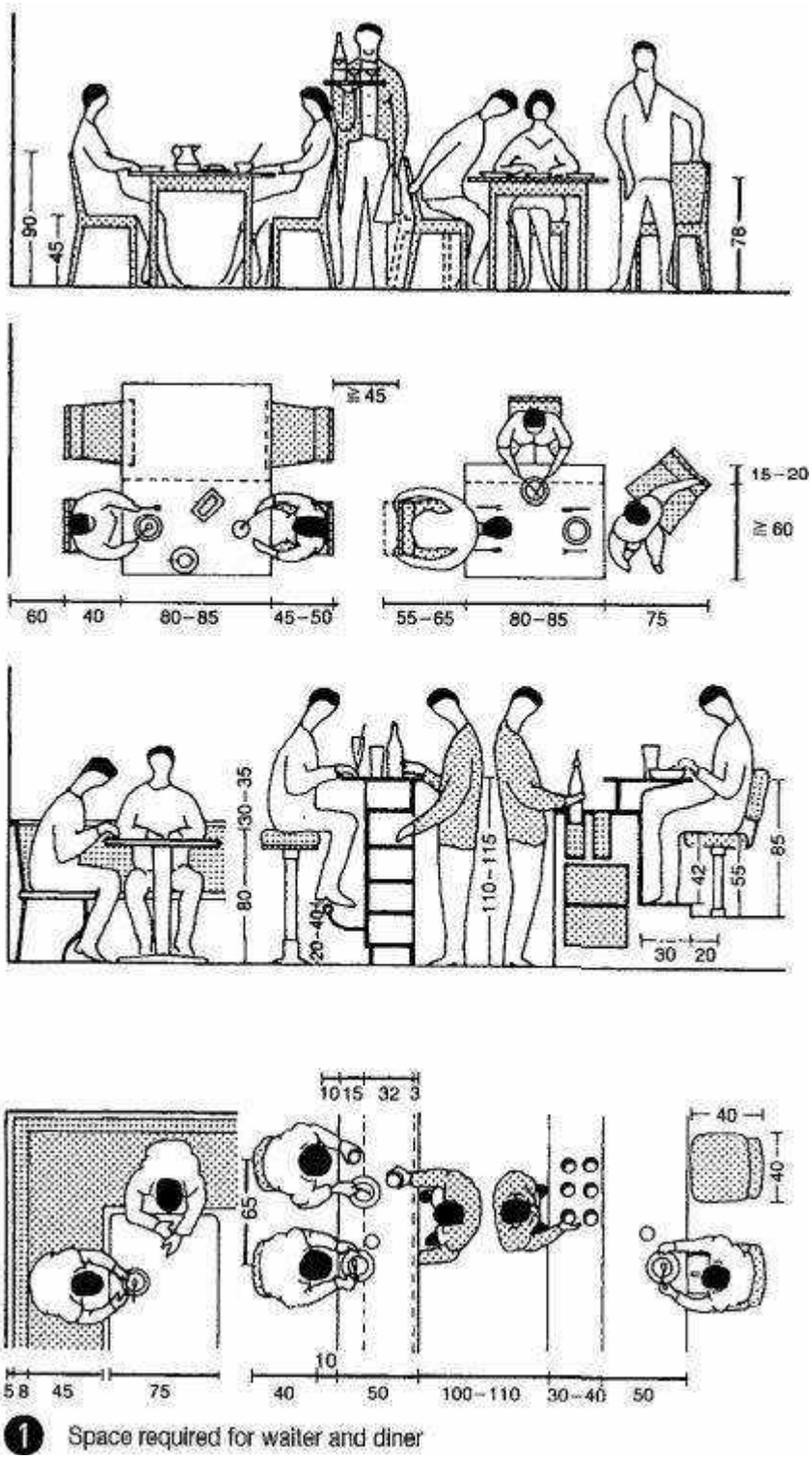
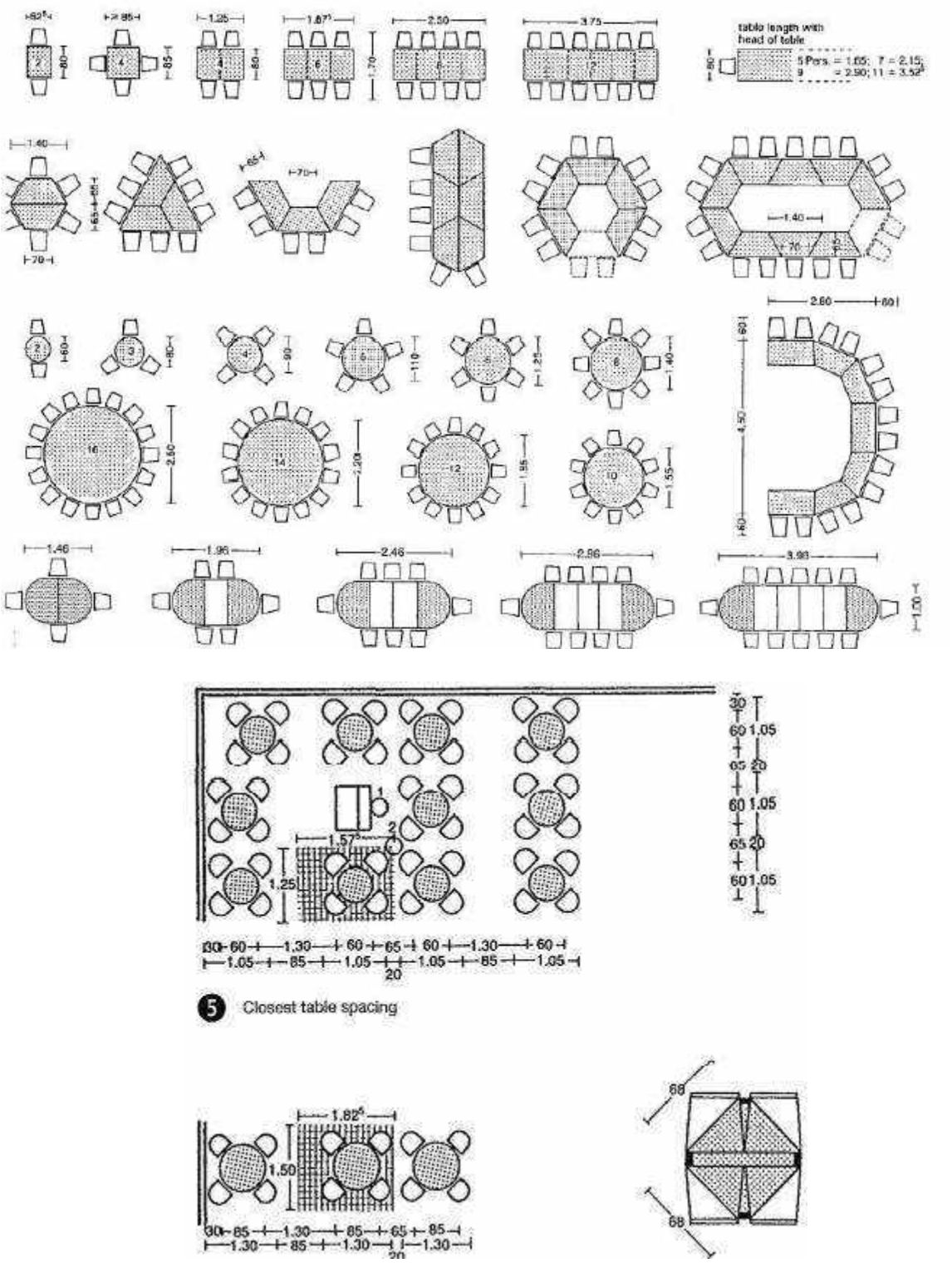


Figure 51 Space required for waiter and diner



5 Closest table spacing

Figure 52 Arrangements of dining tables

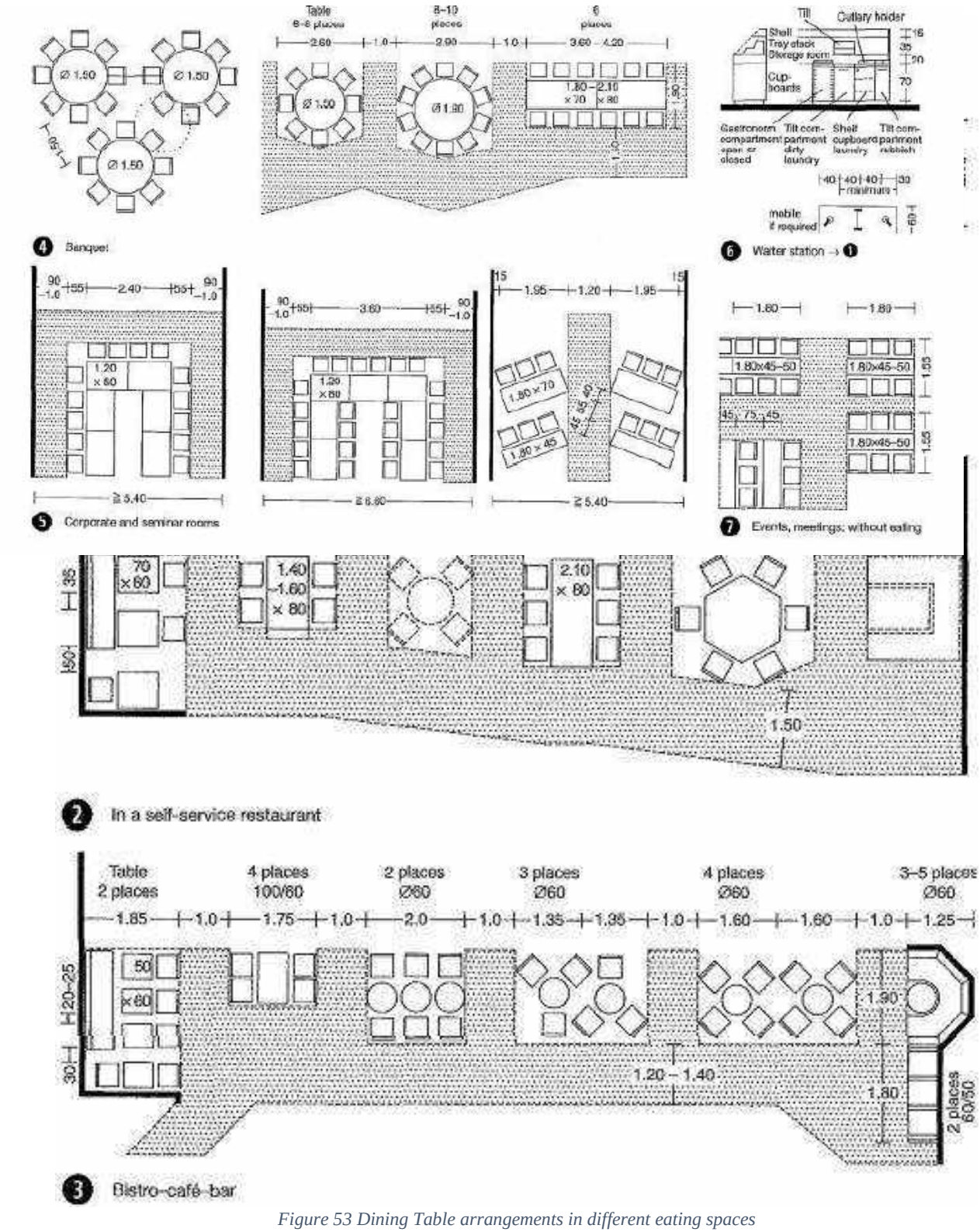


Figure 53 Dining Table arrangements in different eating spaces

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

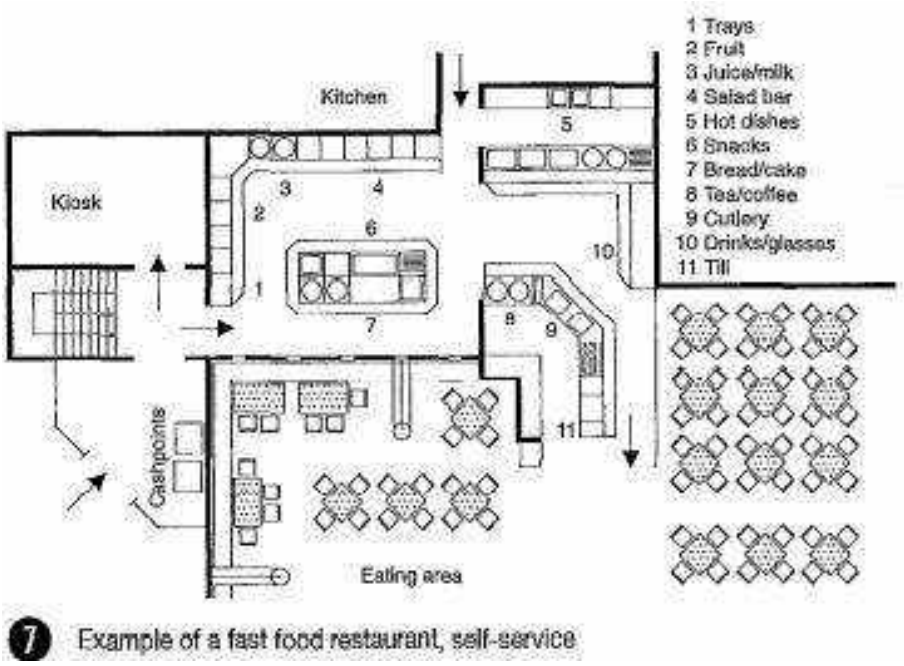


Figure 54 Dining table arrangements in different eating spaces with an example of self-service restaurant

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

2.9.1 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 10 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:

- 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.
- 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.
- The main entrance to the plot shall be of minimum 6 m width to allow easy access to fire engine.

2.9.2 PARKING

Table 11 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. For Population between 10-50 lakh – 1 car parking space for every 3 guest room. For Population more than 50 lakh – 1 car parking space for every 2 guest room[143].
	Service Market	2 ECS / 100 sqm of floor area	
	Community Centre / Non- hierarchical Commercial Centre	3 ECS / 100 sqm of floor area	
	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	
	Hotel	3 ECS / 100 sqm of floor area	

2.9.3 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 12 Minimum setbacks

2.9.4 SETBACKS WITH RESPECT TO ABUTTING ROAD WIDTH

Front Setback

Table 13 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	

			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.

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 14 Side & Rare setback w.r.t. abutting road width

Sr. No.	Height of Buildings (m)	Side and rear setbacks (m)	Other Controls
1.	10	3	➢ For buildings above 24 m in height, the minimum front setback shall be 6 m.
2.	15	5	➢ Where rooms do not derive light and ventilation from the exterior open space, the width of such space shall be reduced by 1 m subject to a minimum of 3 m and maximum of 6m.
3.	18	6	
4.	21	7	
5.	24	8	
6.	27	9	➢ Alternative setbacks for tower like structures
7.	30	10	○ Upto height of 24 m with one setback: Minimum 6m
8.	35	11	○ Between 24 m and 37.5 m with one setback: Minimum 9 m
9.	40	12	○ Above 37.5 m with two setbacks: Minimum 12 m
10.	45	13	
11.	50	14	
12.	55 and above	16	

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.

2.9.5 GORUND COVERAGE & FAR

Table 15 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	35	35	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

2.9.6 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

Table 16 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.

pressure required for fire-fighting would have to be boosted by fire engines.

2.9.7 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

2.9.8 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

Table 17 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

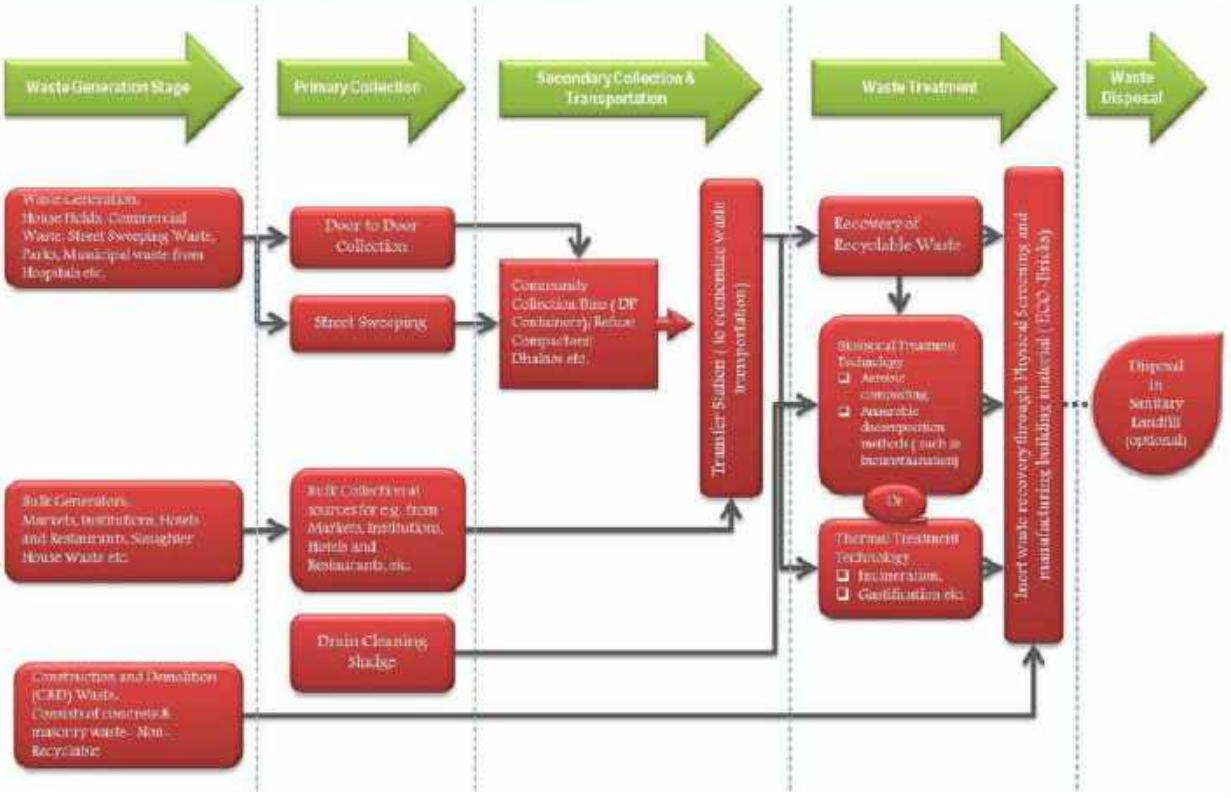


Figure 55 Flow diagram of waste disposal

disposal. The following table indicates the waste generation per capita per day for estimation and forecast of waste generation for future for planning purposes:

2.10 INDIAN STANDARD CODE FOR HOTELS AND RESTAURANTS

2.10.1 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.

2.10.2 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.

2.10.3 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.

2.10.4 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.

2.10.5 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

2.10.6 LIGHTING

Table 18 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.

2.10.7 VENTILATION

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

Table 19 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

2.10.8 WATERSUPPLY

1. 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 20 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.

2.10.9 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

Table 21 Drainage & Sanitation fitments in hotels- IS Codes

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 4 REQUIREMENTS OF DRAINAGE AND SANITATION FITMENTS IN HOTELS

(*Clause* 14.1.1)

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.

sons

Table 22 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

2.10.10 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

2.10.11 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 23 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.

2.10.12 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

2.10.13 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 24 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

CHAPTER 3: SITE INVENTORY

3.1 INTRODUCTION

• City Area: Approximately 463 square kilometers (179 square miles).

• Bhopal is one of the major cities in Central India, serving as the capital of Madhya Pradesh. With a population of over 2.5 million, it is known for its lakes, green spaces, and historical significance. While not as densely populated as metro cities, Bhopal is steadily growing due to expanding infrastructure, educational institutions, and government establishments



Figure 56: Group photograph of our site visit

3.1.1 ROADWAYS

- NH 46: A major highway passing through Bhopal, connecting it to Gwalior in the north and Betul in the south, facilitating connectivity within Madhya Pradesh.

- NH 146: Connects Bhopal to Sagar, enhancing regional connectivity.

- NH 52 (nearby): Though not directly passing through the city center, it links Bhopal to important cities like Indore and Kota via nearby junctions.

- Bhopal Bypass Road: Acts as an outer ring road that diverts heavy traffic around the city, reducing congestion and improving intercity connectivity.

- Regional Road Transport: MPSTDC and private bus operators provide road transport services connecting Bhopal to major cities such as Indore, Jabalpur, Nagpur, and Raipur, as well as to neighbouring states.

3.1.2 AIRWAYS

1 Raja Bhoj International Airport: Located around 15 km northwest of Bhopal city center.

2 Well-connected to domestic destinations such as Delhi, Mumbai, Bengaluru, Hyderabad, and Pune.

3 Offers limited international flights, primarily to destinations in the Middle East via connecting flights.

4 Serves as a regional hub for airlines like IndiGo, Air India, and Akasa Air, supporting both passenger and cargo operations.

3.1.3 RAILWAYS

- Bhopal Junction: A major railway station and one of the busiest in Madhya Pradesh, falling under the West Central Railway zone.
- Other key stations: Habibganj (India's first private and modernized railway station), Bairagarh, and Misrod.
- Direct rail connectivity to major cities such as Delhi, Mumbai, Kolkata, Chennai, Bengaluru, Hyderabad, Ahmedabad, and Jaipur.
- Suburban and local services: Bhopal is served by passenger and MEMU (Mainline Electric Multiple Unit) trains that connect the city to nearby towns and suburbs.

3.2 PROXIMITY

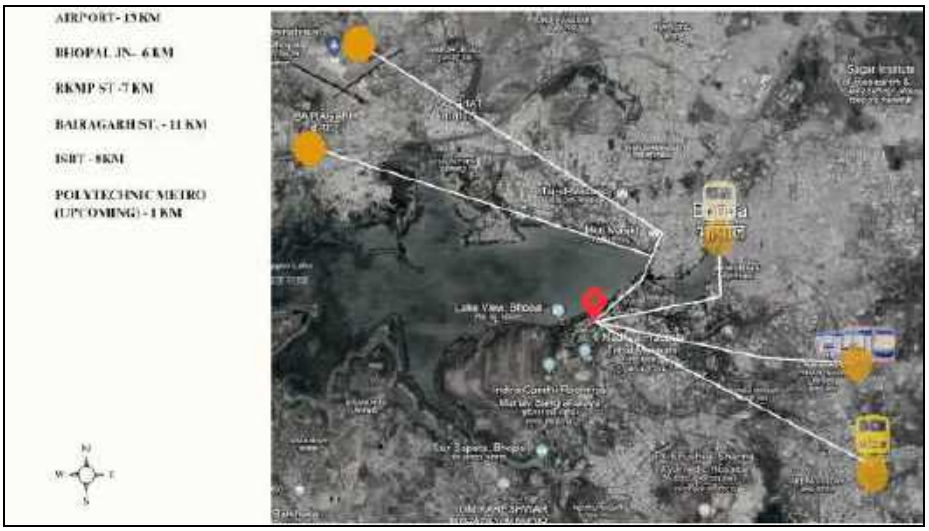


Figure 57: Proximity of important landmarks to the site

3.3 SITE ACCESSIBILITY AND TRAFFIC FLOW



Figure 58: Traffic flow near the site



Figure 59: Neighbourhood context, noise source to the site and accessibility to the site

Neighbourhood Context of Lake View Residency, Shyamala Hill

1 **Prime Location:** Situated in Bhopal's core administrative and elite residential area.

2 **Tourist Hub:** Close proximity to Upper Lake (500m) and Van Vihar National Park (1.2km).

3 **Government Proximity:** Just 1.5km from the MP Secretariat (Vallabh Bhawan).

4 **High-Profile Neighbours:** Surrounded by VIP bungalows, heritage homes, and luxury apartments.

5 **Commercial Access:** Well-connected to shopping areas – 3km from New Market, 4km from DB Mall.

6 **Education Hub:** Nearby prestigious institutions – IIFM (1km), NLIU (2km), and top schools.

7 **Healthcare Access:** Close to top hospitals – Chirayu, Bansal (within 2–3 km radius).

8 **Transport Links:** 5km to Habibganj Railway Station, 12km to Raja Bhoj Airport, 1km to BRTS route.

9 **Green & Serene:** Surrounded by dense greenery, lakefront views, and clean air.

10 **Future Growth:** Falls within the Bhopal Smart City development corridor, ensuring long-term value.

3.4 ARCHITECTURAL FEATURES

3.4.1 ARCHITECTURAL ELEMENTS OF BHOPAL'S HERITAGE STRUCTURES

Element	Description
Domes	Symbolic of Islamic & Mughal influence; found in mosques & palaces
Minarets	Slender towers used for calls to prayer; prominent in Taj-ul-Masjid
Arches (Cusped & Triangular)	Seen in Gohar Mahal, Shaukat Mahal; used in entryways and courtyards
Jharokhas & Balconies	Projecting enclosed windows/balconies seen in Gohar Mahal & Shaukat Mahal
Courtyards (Chowks)	Open-air internal spaces for light, ventilation, and cultural performances
Ornamental Brackets & Carvings	Decorative stone/wooden supports, floral and geometric detailing
Chhajjas	Overhangs above windows/doors to provide shade
Terraces & Stepped Roofs	Seen in Bharat Bhavan and older palaces, often used for views & airflow
Natural Materials	Lakhauri brick, sandstone, wood, lime plaster—adapted to climate and context

3.4.2 VISUAL AXES / VIEWPOINTS – SHYAMALA HILLS, BHOPAL

Visual Axis / Viewpoint	Direction	Description	Desirable / Undesirable	Remarks
View towards Upper Lake (Bhojtal)	West / Southwest	Panoramic lake views, lush greenery, tranquil water body	Desirable	Key natural feature; enhances aesthetics & value
View towards Jehan Numa Palace	Northwest	Historic palace architecture visible	Desirable	Adds cultural richness and heritage context
View along VIP Road	North	Wide, landscaped arterial road with smooth vehicular flow	Desirable	Good connectivity and urban outlook
View towards Birla Museum / Cultural Sites	Northwest / North-West	Tourist and cultural landmarks with landscaped surroundings	Desirable	Encourages cultural identity and placemaking
View of adjacent government buildings	East / Northeast	Institutional buildings, mostly low-rise and formal design	Neutral to Undesirable	Limited aesthetic appeal; may cause monotony
View of service roads / back alleys	Southeast / South-East	Minor roads, service areas, utility spaces	Undesirable	Typically cluttered, less maintained
View towards dense urban zones	East / Northeast	Built-up, commercial, or residential clusters	Neutral	Depends on building condition and urban quality
View of hills and greenery beyond site	North / North-West	Forested hills and natural vegetation	Desirable	Supports biophilic design and visual relief

3.4.3 HUMAN & CULTURAL

Attitude Towards New Development:
Bhopal has shown a balanced approach towards development, welcoming infrastructure projects, smart city initiatives, and modernization, especially in areas like transport, education, and housing. However, citizens often express concerns over heritage conservation, urban greenery, and water bodies, emphasizing the importance of sustainable growth that respects the city's ecological and cultural identity.

Population Density:
As of 2024, Bhopal's estimated urban population is around 2.5 million, with a moderate population density of approximately 5,400 people per square kilometer, allowing for relatively more open space compared to metro cities.

Family Size:
The average household size in Bhopal is typically 4 to 5 members, reflecting the structure of both nuclear and joint families.

Demographics and Ethnicity:

1 **Gender Ratio:** As per the 2011 Census, Bhopal had a sex ratio of 921 females per 1,000 males, slightly below the national average.

2 **Age Distribution:** Children aged 0–6 years comprised a notable segment of the population, indicative of a young demographic profile.

3 **Literacy Rate:** Bhopal has a high literacy rate of 85.24%, with male literacy at 89.2% and female literacy at 81%, significantly higher than the national average.

4 **Religious Composition:**

- 4.1 Hindus: 74%
- 4.2 Muslims: 22.6%
- 4.3 Christians: 1.1%
- 4.4 Jains: 1.2%
- **4.5** Others (Sikhs, Buddhists, etc.): Less than 1%

5 **Linguistic Diversity:** Hindi is the dominant language spoken in Bhopal. Other languages include Urdu, Marathi, Sindhi, and Punjabi, reflecting its mixed cultural roots**.**

6 **Ethnic Composition:** Bhopal has a diverse ethnic population, including native Hindustani-speaking communities, as well as Marathis, Sindhis, Bengalis, and Muslims with Persian, Afghan, and Central Asian ancestry. The city's Nawabi legacy continues to influence its cultural and social fabric.

3.10 VERNACULAR MATERIALS OF BHOPAL

1. **Stone:**
    - Sandstone: Abundantly available in the Malwa and Vindhya regions, used extensively for walls, columns, jharokhas, and chhatris in historical structures like the Shaukat Mahal and Taj-ul-Masjid.
    - Laterite: Found in some peripheral areas, used for load-bearing walls due to its workability and thermal properties.
2. **Lime:**
    - Lime Plaster: Used in Mughal and colonial-era buildings for smooth finishes and decorative detailing.
        - Lime Mortar: Used in binding stone and brick masonry, particularly in historic palaces and mosques.
3. **Timber:**
        - Used in traditional haveli construction for columns, beams, door/window frames, and jalis; local teak and sal wood were preferred for durability.
4. **Mud and Adobe:**
        - Widely used in rural dwellings; mud walls with bamboo or wooden frameworks provided excellent thermal insulation.
5. **Terracotta and Clay:**
    - Used for roof tiles, decorative jaalis, pots, and finials; found in both humble and ornamental architecture.
6. **Bamboo:**
    - Used for scaffolding and temporary structures; also found in tribal homes around forested regions of Madhya Pradesh.
7. **Marble:**
    - Used selectively in religious and royal architecture, such as in flooring, columns, and decorative panels in mosques and palaces.
8. **Metal:**
    - Wrought iron and brass were used in traditional railing work, gateways, and ornamentation, especially in Indo-Islamic and colonial structures.
9. **Chunam:**

- A fine lime-based plaster employed in Nawabi architecture for smooth, glossy wall finishes and floral detailing.

10. Thatch and Grass:

2. Still prevalent in tribal and rural dwellings for roofing, particularly in areas with hot and dry climates.

3.5 CLIMATE ANALYSIS

3.5.1 TEMPERATURE OF BHOPAL

AVERAGE HIGH AND LOW TEMPERATURES IN BHOPAL

The hot season lasts for 2.1 months, from April to June, with an average daily high temperature above 98°F. The hottest month of the year in Bhopal is May, with an average high of 104°F and low of 81°F.

The cool season lasts for 2.5 months, from November to February, with an average daily high temperature below 81°F. The coldest month of the year in Bhopal is January, with an average low of 54°F and high of 76°F.

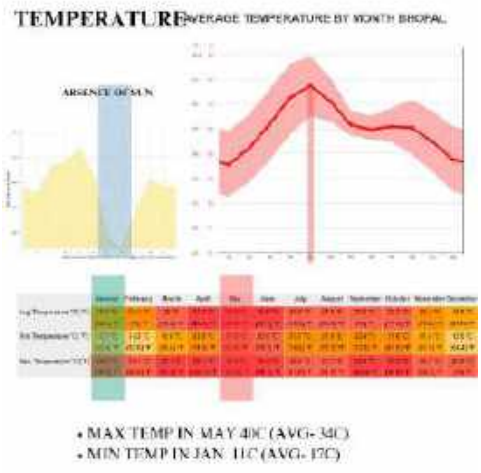


Figure 60: The Temperature graph of Bhopal

3.5.2 SUN PATH OF BHOPAL

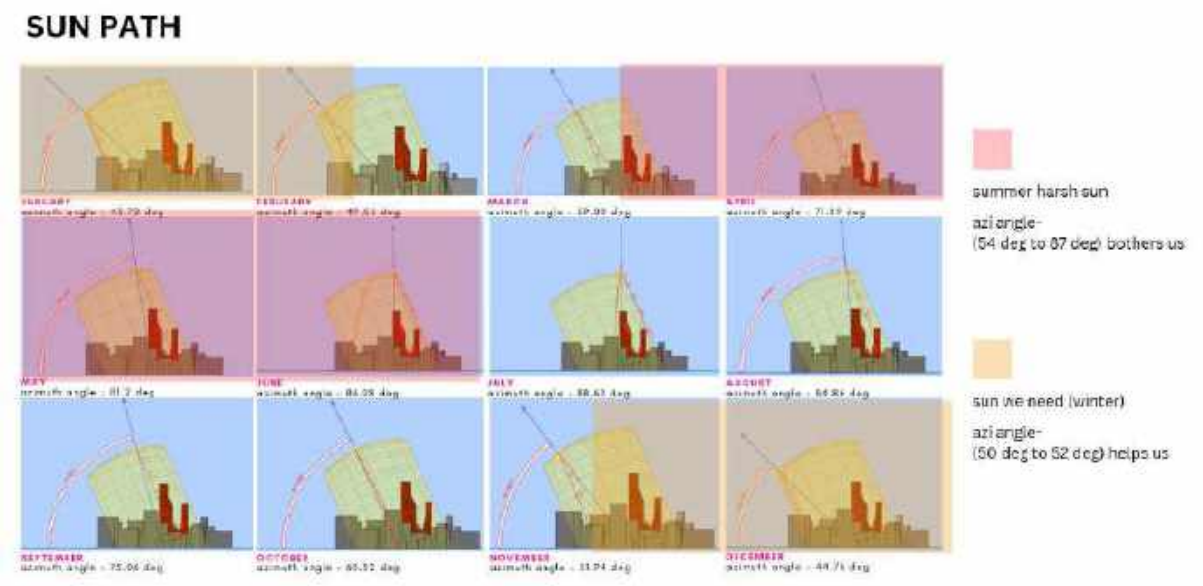


Figure 61: Sun path of Bhopal

3.5.3 WIND PATTERN OF BHOPAL

AVERAGE WIND SPEED IN BHOPAL

The windier part of the year lasts for 4.5 months, from April to August, with average wind speeds of more than 8.1 miles per hour. The windiest month of the year in Bhopal is June, with an average hourly wind speed of 10.8 miles per hour.

The calmer time of year lasts for 7.4 months, from August to April. The calmest month of the year in Bhopal is October, with an average hourly wind speed of 5.4 miles per hour

WIND DIRECTION IN BHOPAL

The wind is most often from the north for 1.3 months, from February to March, and for 2.0 weeks, from September to October, with a peak percentage of 37%. The wind is most often from the west for 6.3 months, from March to September, with a peak percentage of 79%. The wind is most often from the east for 3.9 months, from October to February, with a peak percentage of 49%.

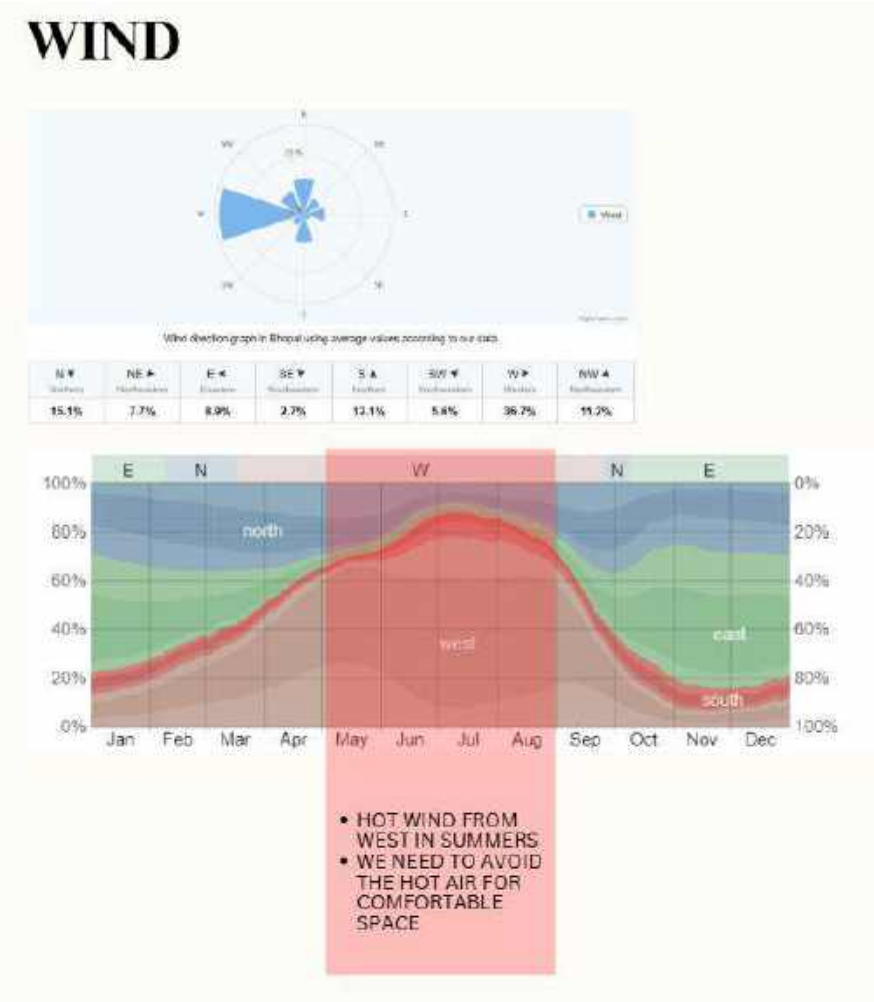


Figure 62: Wind Direction Graph of Bhopal

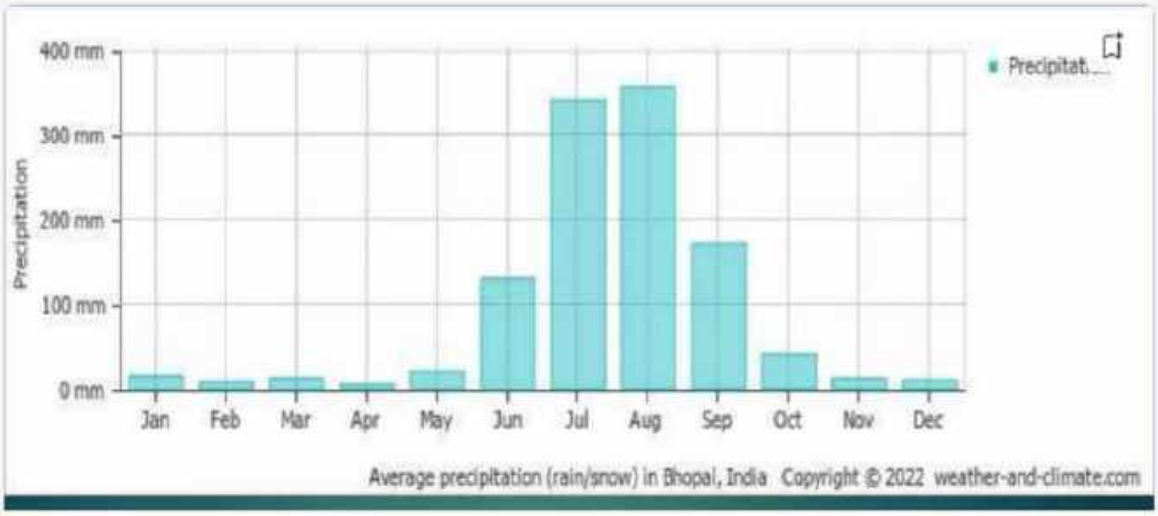
3.5.4 PRECIPITATION OF BHOPAL

AVERAGE MONTHLY RAINFALL IN BHOPAL

The rainy period of the year lasts for 5.9 months, from May to November, with a sliding 31-day rainfall of at least 0.5 inches. The month with the most rain in Bhopal is July, with an average rainfall of 13.6 inches.

The rainless period of the year lasts for 6.1 months, from November to May. The month with the least rain in Bhopal is April, with an average rainfall of 0.2 inches.

RAIN



- GOOD RAIN BUT NOT VEYRY HIGH PLINTH IS REQUIRED
- RAIN SHADE IS HEAVILY REQUIRED
- NOT MANY ACTIVITIES CAN BE PROVIDED IN OPEN SPACE
- GOOD SCOPE OF RAIN WATER HARVESTING

Figure 63: Rain graph of Bhopal

3.6 VEGETATION ON SITE



Figure 64: Image of all the vegetation present on site

Peepal Tree (*Ficus religiosa*)

3. Sacred in Hinduism and Buddhism; often planted near temples.
4. Excellent for air purification and provides deep shade.

Bougainvillea

5. Drought-tolerant flowering climber/shrub with vibrant bracts.
6. Often used as ornamental fencing or façade cover in hot climates.

Rain Tree (*Samanea saman*)

7. Large umbrella-shaped canopy ideal for road and avenue planting.
8. Fixes nitrogen in the soil, improving soil fertility.

Ashoka Tree (*Polyalthia longifolia*)

9. Narrow, columnar shape suitable for lining pathways and boundaries.
10. Evergreen tree with fragrant flowers; often used in urban landscaping.

Neem Tree (*Azadirachta indica*)

11. Medicinal tree known for antibacterial and anti-pest properties.
12. Hardy, drought-resistant, and provides good shade.

Thuja Tree (*Thuja occidentalis*)

13. Conical evergreen tree often used in hedging and privacy screens.
14. Requires regular pruning and prefers cooler climates.

Royal Palm Tree (*Roystonea regia*)

15. Elegant ornamental palm used in boulevards and luxury landscapes.
16. Fast-growing and thrives in tropical to sub-tropical climates.

Ficus Tree (*Ficus benjamina*)

17. Popular as both an indoor and outdoor decorative tree.
18. Requires pruning as it spreads quickly and grows dense foliage.

3.7 SITE CONTOUR ANALYSIS

The site is located adjacent to a 24-meter-wide road and is enclosed by a red boundary. The contour lines are drawn at 1-meter intervals, indicating a moderately hilly terrain. The topography reveals a central elevated mound rising to approximately 563 meters, surrounded by gradual slopes descending to around 540 meters along the site's lower southern and southeastern edges.

The highest point lies near the center, making it a natural focal point for structures such as viewpoints or landmark buildings. The western and northern edges show steeper gradients, while the southern portion near the road offers relatively gentle slopes, making it ideal for primary access, parking, and entrance-level infrastructure.

The natural topography provides opportunities for:

19. Passive drainage design
20. Terraced construction
21. Viewshed optimization
22. Minimal cut and fill if buildings are aligned with contours

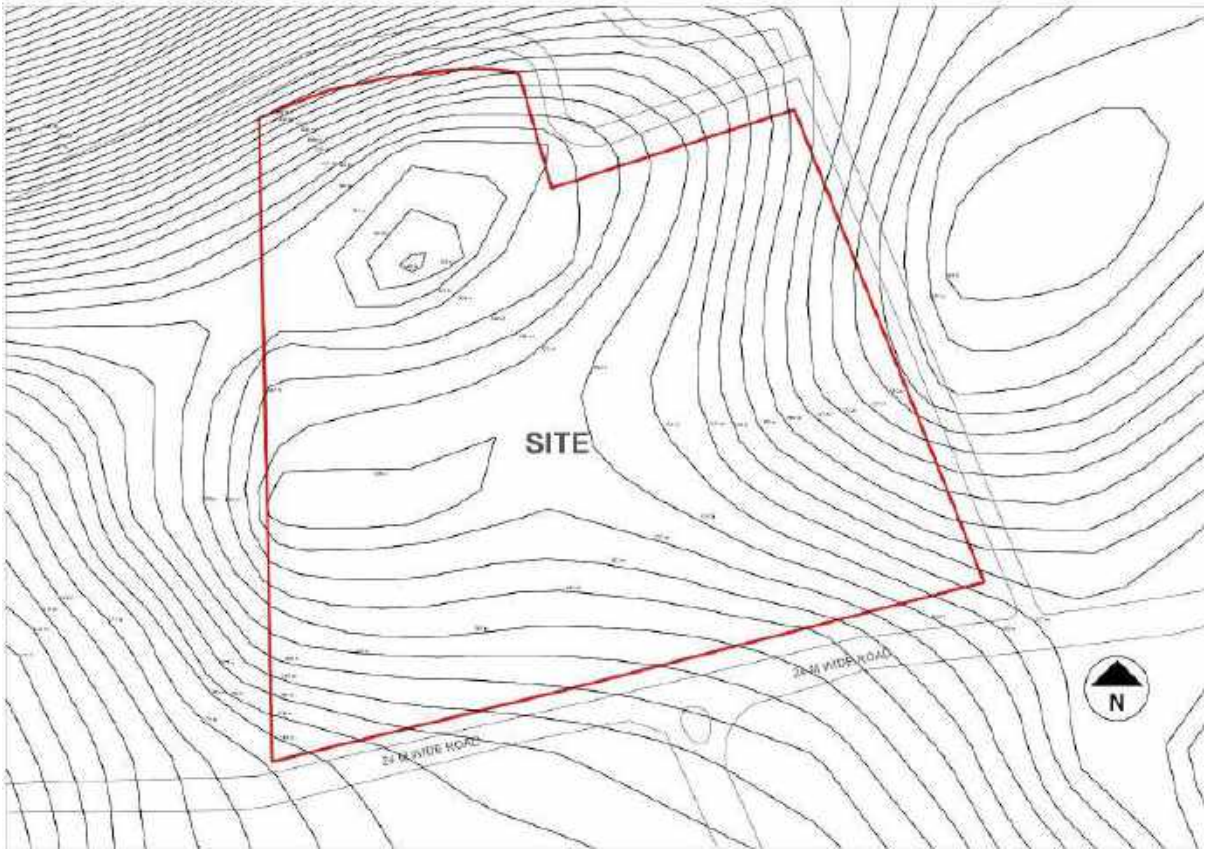


Figure 65: Contour Plan of the Site with an intervals of 1 m

3.8 SOIL PROFILE – BHOPAL (ALLUVIAL SOIL)

The Bhopal region features a mix of black cotton soil (Vertisols) and alluvial soils, especially along the lower-lying plains and near water bodies such as the Upper Lake and Betwa River basin.
Alluvial soils in Bhopal are typically found in floodplains and consist of a mix of silt, clay, and fine sand, deposited by rivers over time.

These soils are:

- Fertile and moisture-retentive, making them ideal for agriculture.
- Moderately suitable for construction, but may require soil stabilization or reinforcement, particularly in areas with high clay or silt content, which can expand or shift with moisture.
- Offer good workability and are generally easy to excavate.

In construction terms, proper drainage and foundation design are important in alluvial zones to avoid issues like settlement or swelling, especially during monsoon.

CHAPTER 4: CASE STUDY & DESK APPRAISALS

4.1 TAJ LAKEVIEW, BHOPAL (LIVE CASE STUDY)

4.1.1 INTRODUCTION

The Taj Lakefront, Bhopal epitomises true luxury. Overlooking the upper lake and just25 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 ofBhopal, 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 66: Taj Lakeview at night & group photo at case study visit

Details:

PROJECT	**TAJ LAKEFRONT**
LOCATION	BHOPAL
CLIMATE	Humid Subtropical
TOPOGRAPHY	PLAIN LAND
ARCHITECT	JOI DESIGN
COMPLITION YEAR	2021
NO. OF ROOMS	152
SITE AREA	4.77 ACRE
FAR	2

4.1.2 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.

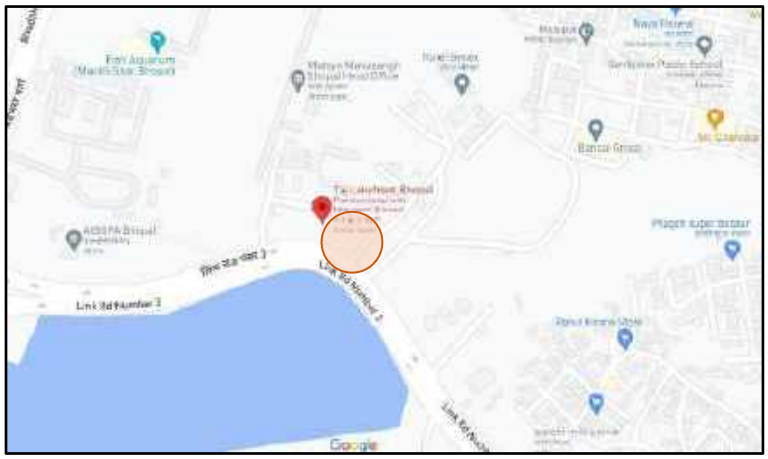


Figure 67 Location on google maps

4.1.3 SITE BOUNDARY



Figure 68 Site boundary

Site Boundary

Circulation within the Site

Site Characteristics:

- The site has kind of trapezium shape having curved edge in front.
- As we look into the site planning of taj the front part is designed with pleasing landscapeby 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.

4.1.4 FACILITIES

These are the following facilities and amenities that Hotel Taj is providing to their guests.

Outdoors
- ✓ Outdoor furniture
- ✓ Sun terrace
- ✓ Terrace
- ✓ Garden

Activities
- ✓ Evening entertainment
- ✓ Games room

Food & Drink
- ✓ Bar
- ✓ Restaurant

Internet

WiFi is available in all areas and is free of charge.

Parking

Free private parking is possible on site (reservation is not needed).
- ✓ Electric vehicle charging station

Reception services
- ✓ Invoice provided
- ✓ Concierge service
- ✓ Currency exchange
- ✓ Express check-in/check-out
- ✓ 24-hour front desk

Cleaning services
- ✓ Daily housekeeping
- ✓ Trouser press Additional charge
- ✓ Ironing service Additional charge
- ✓ Dry cleaning Additional charge
- ✓ Laundry Additional charge

Business facilities
- ✓ Business centre
- ✓ Meeting/banquet facilities

Safety & security
- ✓ Fire extinguishers
- ✓ CCTV outside property
- ✓ CCTV in common areas
- ✓ Smoke alarms
- ✓ Security alarm
- ✓ Key card access
- ✓ 24-hour security

General
- ✓ Air conditioning
- ✓ Lift
- ✓ Family rooms
- ✓ Non-smoking rooms
- ✓ Room service

Outdoor swimming pool

Free! All pools are free of charge
- ✓ Open all year
- ✓ Opening times
- ✓ All ages welcome
- ✓ Pool/beach towels
- ✓ Pool bar
- ✓ Infinity pool
- ✓ Pool is on rooftop

Wellness
- ✓ Fitness
- ✓ Full body massage
- ✓ Hand massage
- ✓ Head massage
- ✓ Couples massage
- ✓ Foot massage
- ✓ Neck massage
- ✓ Back massage
- ✓ Spa/wellness packages
- ✓ Spa lounge/relaxation area
- ✓ Spa facilities
- ✓ Pool/beach towels
- ✓ Massage
- ✓ Spa and wellness centre Additional charge
- ✓ Fitness centre

4.1.5 APPROACH ROAD

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



Figure 69 Approach Road

4.1.6 VERTICAL ZONING

Here is the conceptual section of the taj hotel to explain the vertical zoning.



Figure 70 Vertical Zoning

4.1.7 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

Figure 71 Area Statement Taj - 1

	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

Figure 72 Area Statement Taj - 2

	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

Figure 73 Area Statement Taj - 3

	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**				

Figure 74 Area Statement Taj - 4

	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**	

Figure 75 Area Statement Taj - 5

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	
	Scrubber for Kitchen Exhaust	1	5	5	
	Total Area (Sum)		186.4	384.4	

N.	Parking				
	Basement 2			1700	
	Basement 1			1420	
	Total Wall Thickness and Circulation			3120	

Figure 76 Area Statement Taj - 6

4.1.8 FLOOR PLANS

Basement 3:
WTP, Fire Pumps, and Domestic, raw and fire tanks

Basement 2 Plan:

Basement 2 is comprised with 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 77 Basement 2 Plan

Raw Water tank Capacity: 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/



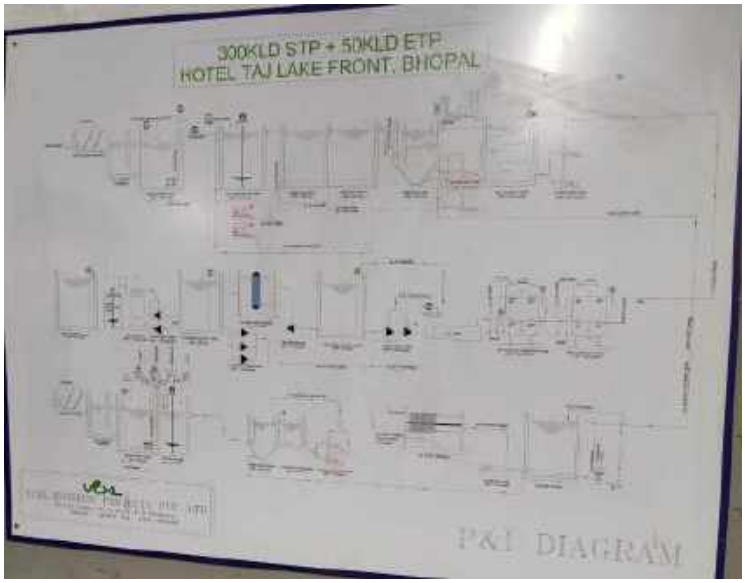


Figure 78 Basement 2

Basement 1 Plan:

- Basement 1 mainly consist of different types of Offices spaces like Housekeeping office , Finance Office, Sales office, Engg office and Canteen, Storage, Laundry spaces etc.
- 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 79 Basement 1 Plan

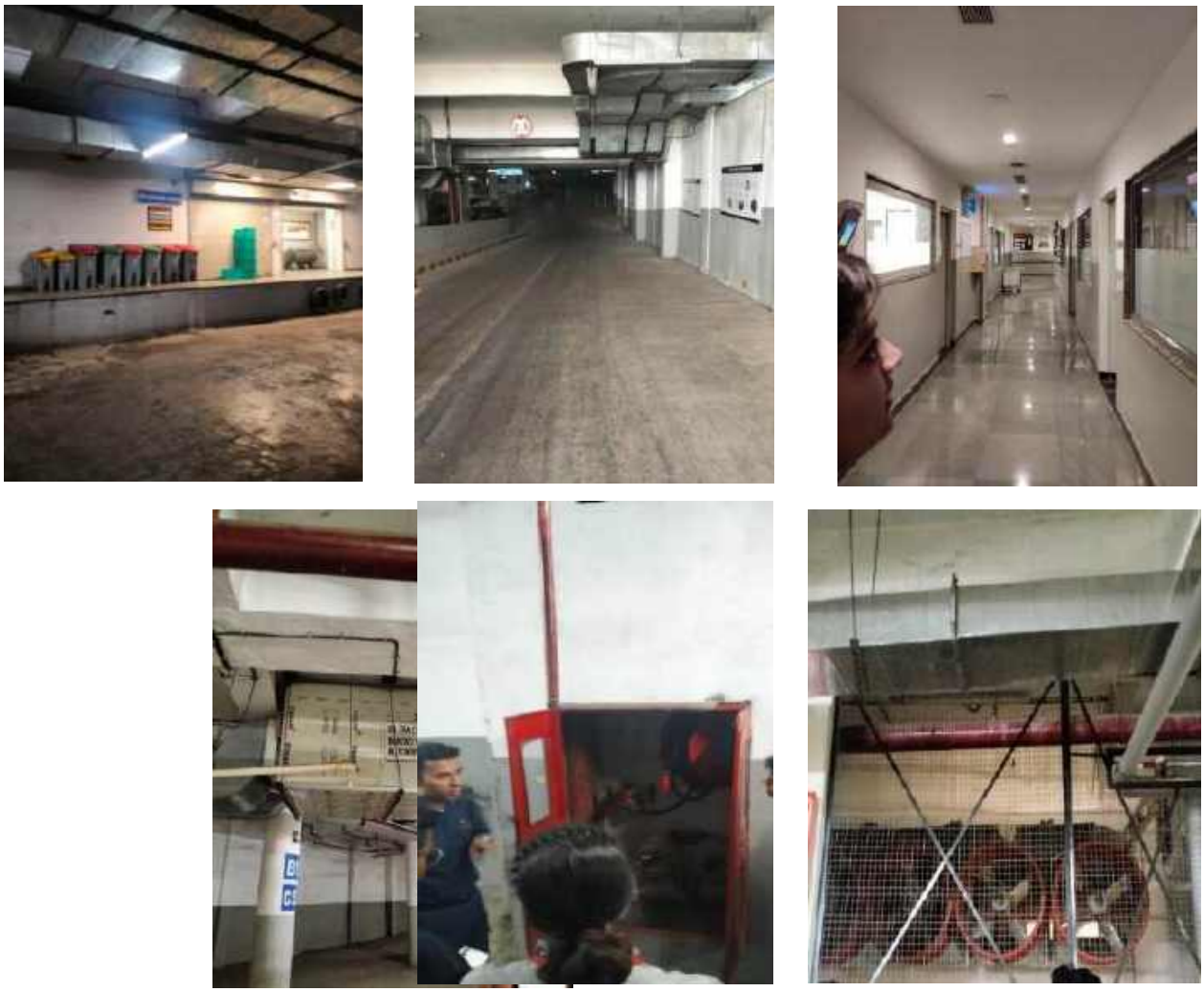


Figure 80 Services in Basement 1

Ground Floor Plan:

- The entrance lobby of the hotel has grand luxury feel as it has triple heightedspaces with very attractive false ceiling consist of cove lighting.
- There is a separate entrance has been provided including Banquet Hall, Meetingroom, 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 asa 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 81 Ground floor plan and pictures (reception, banquet, duct opening, UPS)

First Floor Plan:

- 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
- 3 Chillers 350 tons each



Figure 82 First floor plan and pictures (restaurant & chiller)

Second Floor Plan:

1. Restaurant Seating's are provided in this floor. Kitchen including cooking, store, washing space has been provided. Live kitchen is also there.

2. Amenities like Gym, Spa & sauna, Saloon etc. are provided with top classfacilitie



Figure 83 Second Floor plan

Service Floor 2.5:





Figure 84 Pipelines and other services in service floor

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

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

- Specialty of these typical floor is that interior of lobby and corridors are fullydifferent which gives different types of feeling at each different floor. FCU in Rooms 1.5 T, Suites 2 T



Figure 85 Typical FLoor plan 3rd to 7th



Figure 86 Guest room

8th Floor Plan:

- 15 guest rooms including Executive Suites, King Bedrooms and 1 presidentialsuite are there in this floor.



Figure 87 8th floor plan

- **9th Floor Plan:**
- 20 guest rooms including Executive Suites, Twin Bedrooms are there in this floor.



Figure 88 9th floor plan

9.5th Floor: Pool filtration, plumbing shafts end her & exhaust ducts of bathrooms end here

10th Floor Plan: Open terrace lounge, club area with the view of swimming pool is provided in the top f







Figure 89 10th floor plan and pictures (rooftop rest. bar & swimming pool)



4.1.9 GUEST ROOM TYPOLOGY

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

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

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.





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 90 Executive suite floor plan & photos

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.

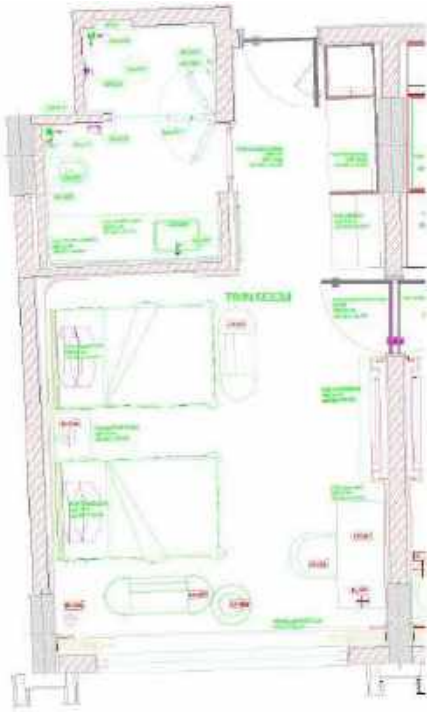




SIZE: 33 sq.m

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 91 Twin room plan & photos

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.



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

Presidential Suite

Figure 92 King room plan and photo

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.





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





Figure 93 Presidential suite photos

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

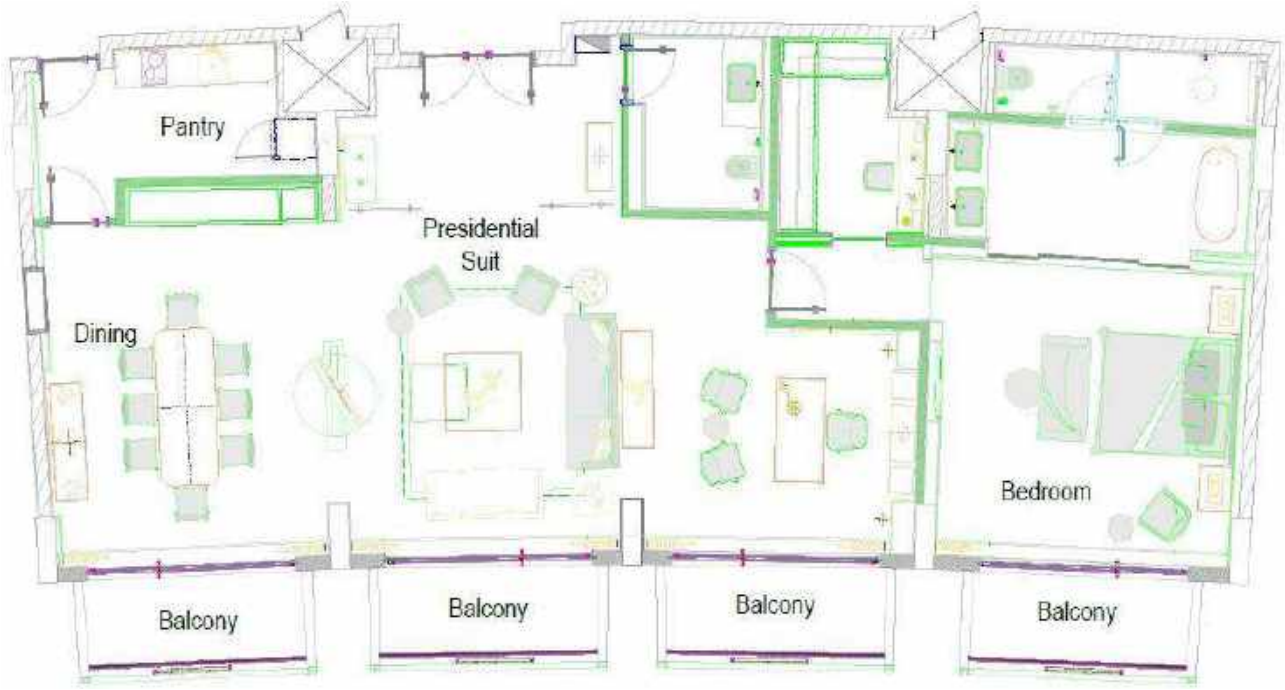


Figure 94 Presidential suite plan

4.1.10 VIEW/INTERIOR OF SPACES



Spa & Sauna



PDR



Banquet Hall



Swimming pool



Restaurant Seating



Lounge/Bar

4.1.11 SERVICES



Figure 95a LT & HT Panel Room, Fire Fighting & Electrical Tray

4.2 RADISSON BHOPAL, BHOPAL (LIVE CASE STUDY)

4.2.1. PROJECT OVERVIEW & LOCATION

1. Project Name: Radisson Bhopal
2. Location: Madhya Pradesh, India – centrally located in Bhopal city, ~40 min by road from Raja Bhoj International Airport, ~10 min from Habibganj Railway Station
3. Site Area: ~4,500 m² (~0.45 ha) with development area approximately 81,800 m²—exceeding allowable FAR due to special planning provisions or parking basements



Figure 96: Radisson Bhopal at daytime & Group photo of Case Study visit

4.2.2 Built-Up & FAR Parameters

Parameter	Value
Site Area	≈ 4,500 m²
Total Built-up Area	≈ 81,800 m²
Allowed FAR Area	≈ 61,188 m² (FAR limit 4.0)
Overall Building Height	Approx. 37.5 m (within 60 m limit)

- Multiple basement levels are used to accommodate services, parking, MEP plant rooms and circulation systems

4.2.3. Site Layout & Circulation

- Vehicular access and guest circulation are well Z-shaped, separating service and guest flows.

- Basements:
    - *Basement 1*: Centralised service shafts, HVAC AVC plant rooms, LT panels, DG rooms, laundry, pump rooms, duct distribution
    - *Basement 2*: Additional MEP rooms, storage, utility spaces.
- Above grade, guest lifts/staircases are separate from service corridors; vertical shafts extend from basement to typical floors.

4.2.4. Architectural & Internal Layout

- Ground Floor:
  Grand Neo-Gothic lobby (white-patterned tiles, black wall cladding, mirrors), with minimal furniture to enhance perceived scale
- Room Tower: Floors 6–12 stack guest rooms; guest floors arranged for efficient service zones and guest access
- Public spaces (Tea Lounge, pool deck, fitness centre) integrated with rooftop terrace overlooking city

4.2.5. MEP & HVAC Systems

1 HVAC (Heating, Ventilation, Air-Conditioning)

- Installed capacity approx. 2,000 TR refrigeration plant (central chilled water system) for guest rooms and common areas
- Ducting distributed via false ceilings; visible duct shafts and ceiling plenums in service areas
- Basement HVAC plant rooms centrally located for efficient vertical distribution to all floors

2 Power & Electrical

- Diesel generator backup capacity ~750 TR equivalent DG set for full hotel resiliency
- LT electrical panel rooms located in service basement with cable trays routed through false ceilings and risers

4.2.6. Water Supply, Sewage & STP

- Sewage Treatment Plant (STP) dispatch processes discharge treated water for reuse (e.g. banquet lawns, landscaping, HVAC/cooling make-up) – implied by sustainable design references
- Stormwater/drainage likely integrated via site grading and basements, though specific STP capacities are not public.

4.2.7. Fire Safety & Sanitation

- Fire hydrant cabinets (FHCs) located adjacent to every fire staircase.
- Automatic sprinkler systems, smoke detectors (Honeywell) cover public areas and guest floors
- Service plumbing infrastructure includes separate stacks for sanitary and drainage, centralized in service cores and basement.

4.2.8. Sustainability & Passive Design

- Building orientation: Tower façade tilted East-West to optimize day-light intake and minimize direct solar gain
- Passive solar design features, cross-ventilation corridors and low-energy lighting strategies reduce energy load.
- Treated water used as resource for irrigation and HVAC uses.

4.2.9. Summary: Key Service Capacities & Highlights

Service	Key Data / Feature
HVAC Capacity	~2,000 TR central chilled water system
DG Power Backup	~750 TR diesel generator
Fire Safety	Sprinklers, smoke detectors, FHC per staircase
STP & Treated Water	Reuse for landscaping, HVAC, banquet lawns
Electrical Distribution	Central LT panels in basement; cable trays
Sanitation & Sewage	Dual-stack systems + basement pump rooms

4.2.10. Conclusions & Best Practices

- Radisson Bhopal demonstrates a well-executed service planning strategy, with clear separation of service and guest circulation across multiple basements.
- Centralised MEP core design ensures efficiency in HVAC, electrical, and fire safety systems.
- Passive design and treated water reuse align with sustainable hospitality architecture aspirations.
- The hotel design balances regional identity (Gond art motifs) with modern engineering standards and robust infrastructure planning

4.3 RADISSON BLU, GUWAHATI (DESK APPRAISAL)

4.3.1 INTRODUCTION

The Radisson Blu Hotel in Guwahati, Assam, stands as a modern landmark that harmoniously blends contemporary luxury with the cultural richness of Northeast India. As a premier five-star property, it showcases thoughtful architectural planning, sustainable design practices, and a sensitive response to its local context. This case study explores the hotel's spatial organization, material palette, design language, and its integration with the natural landscape, offering valuable insights into urban hospitality architecture in a rapidly growing tier-II city. Analysing the Radisson Blu Guwahati helps in understanding how regional influences and global standards can coexist to create an inviting and efficient hospitality space.

4.3.2 LOCATION

National highway 37 gotanagar 781033 Guwahati, India

NEAR BY TRANSPORTATION:

Guwahati railway station 12km

Gau airport -15km

VIEWS:

Deepor beel, fresh water lake includes wildlife and bird sanctuary

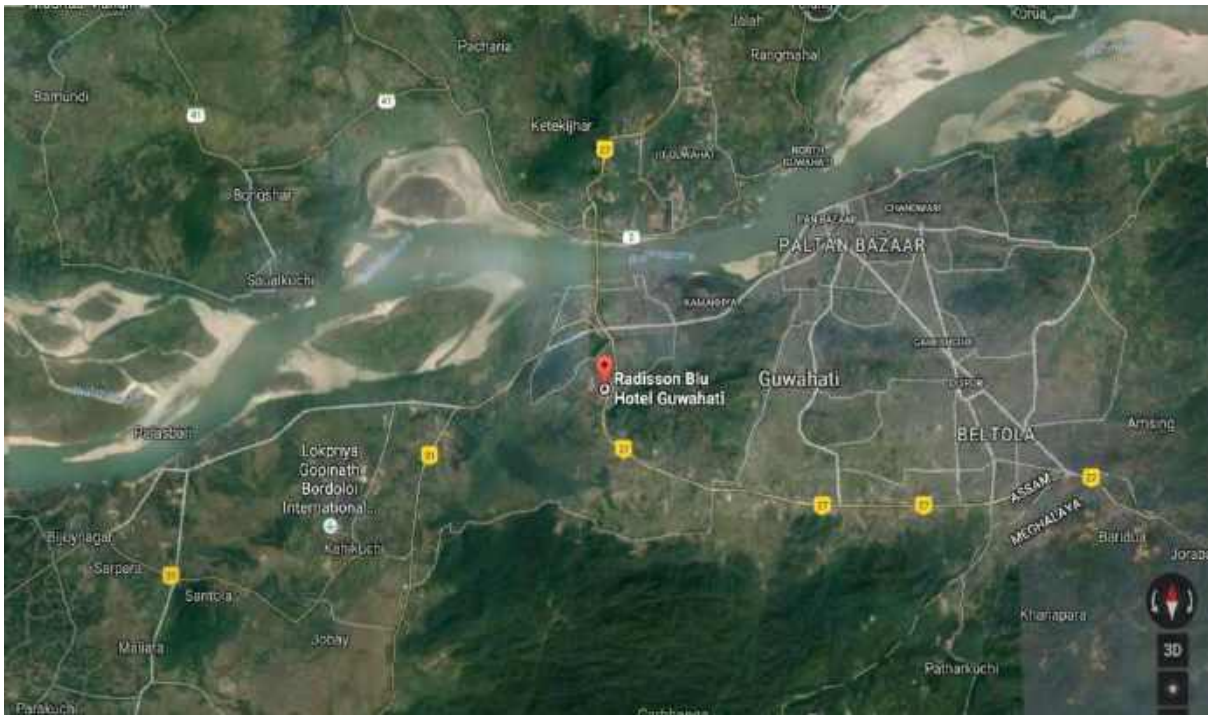


Figure 97: Location of the Radisson Blu, Guwahati

4.3.3 SITE PLANS & FLOOR PLANS

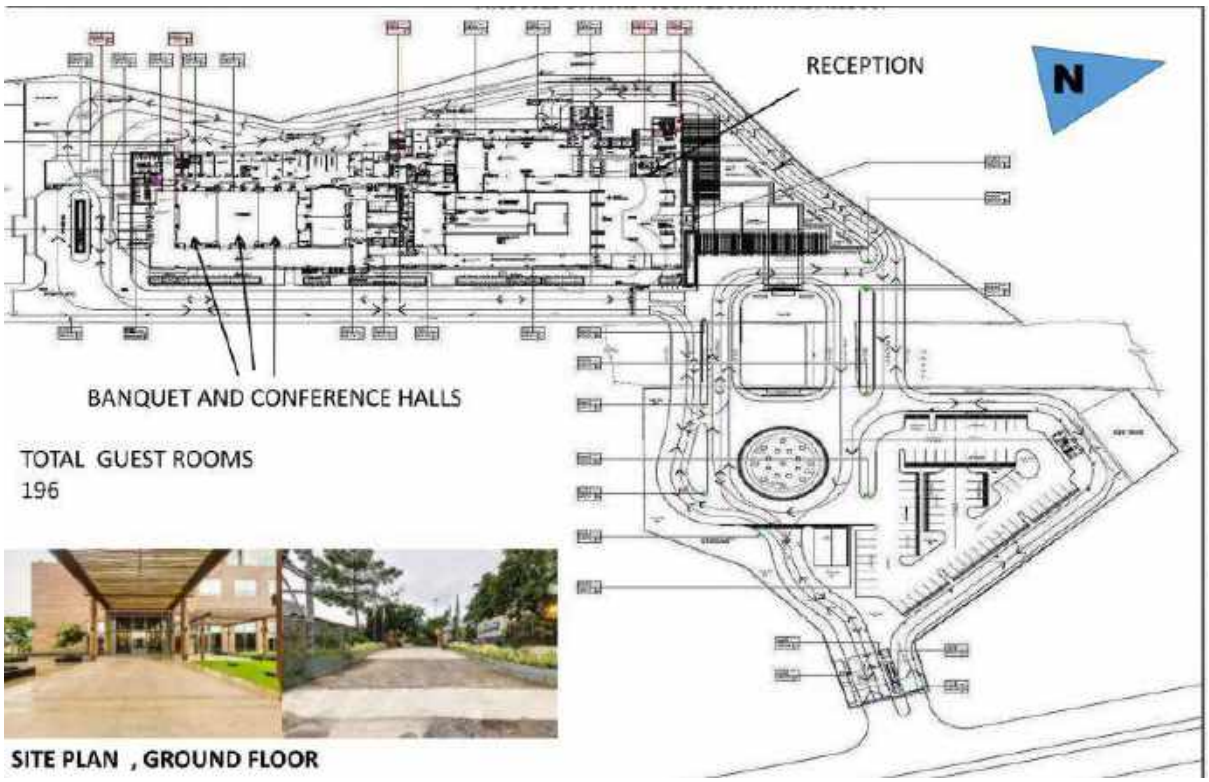


Figure 98: Site plan of the Radisson Blu, Guwahati

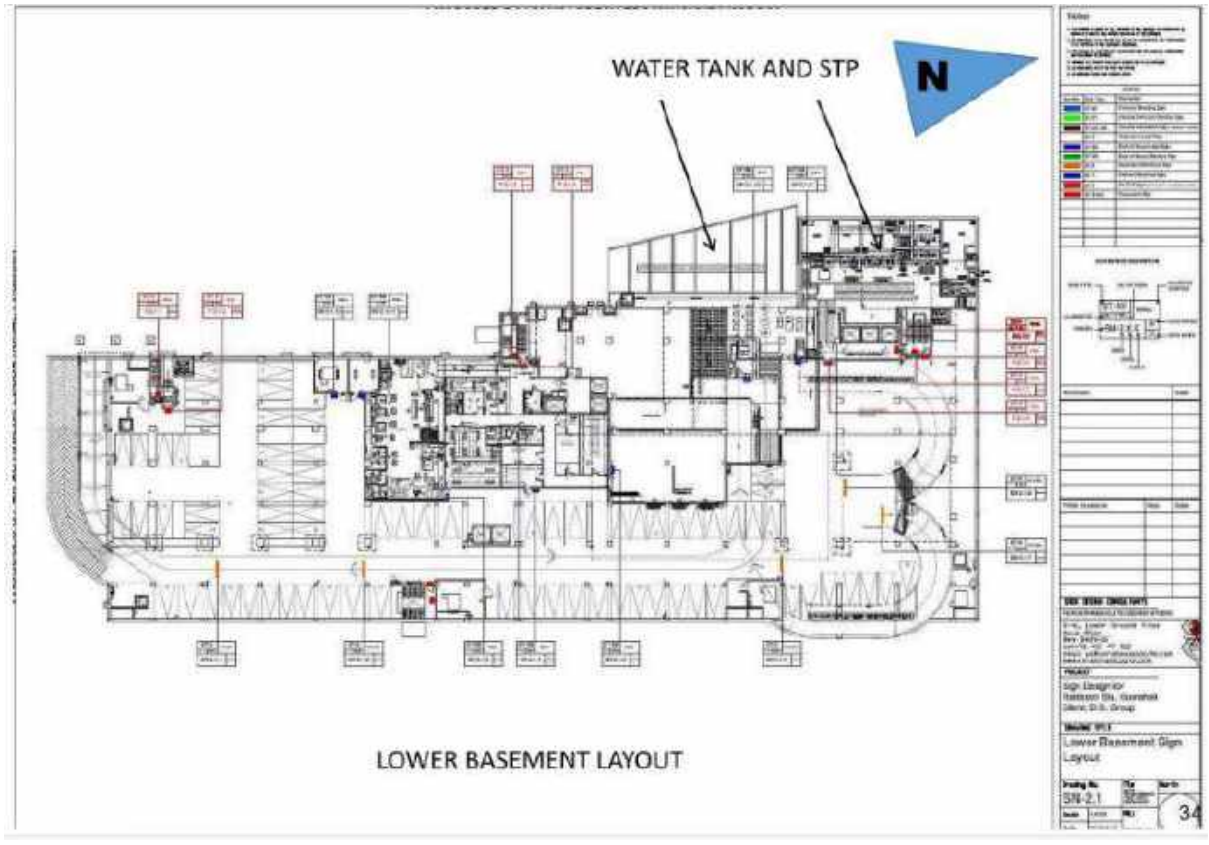


Figure 99: Lower Basement Plan

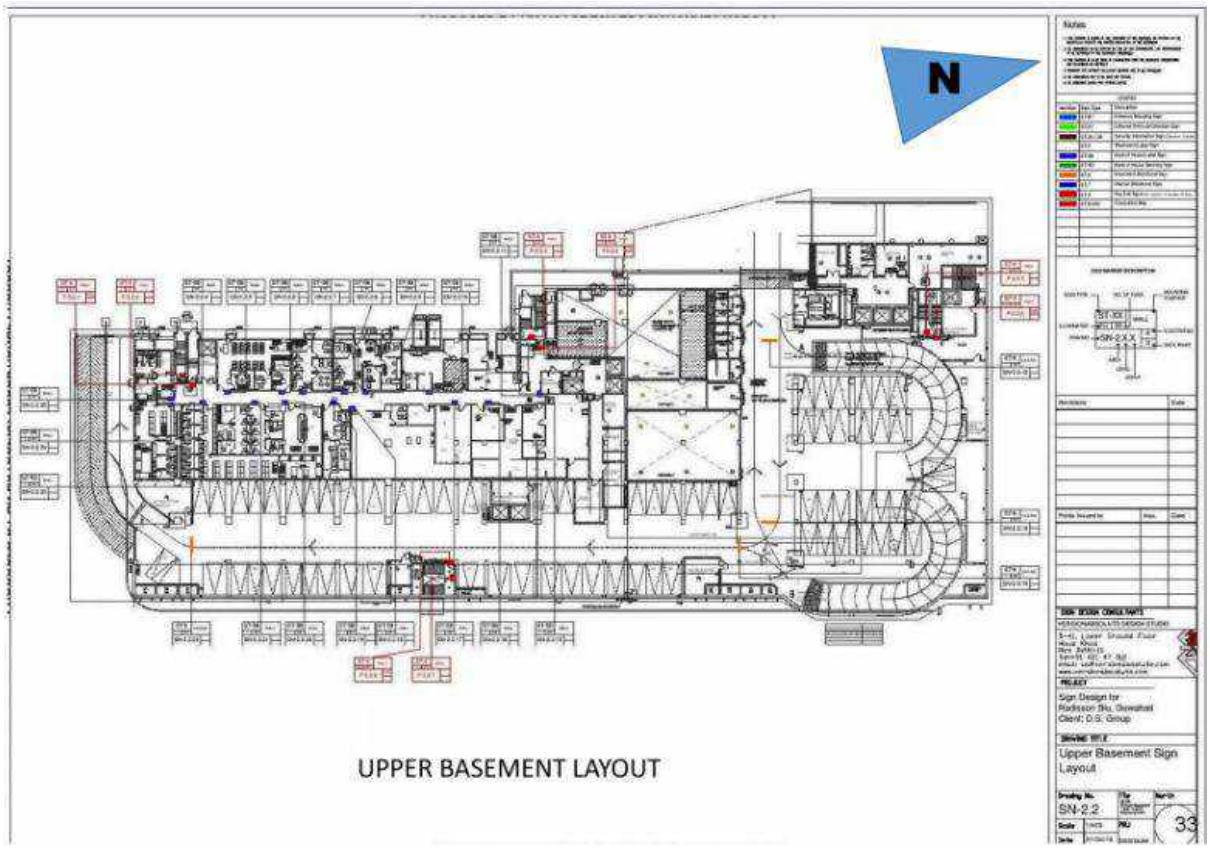


Figure 100: Upper Basement Layout

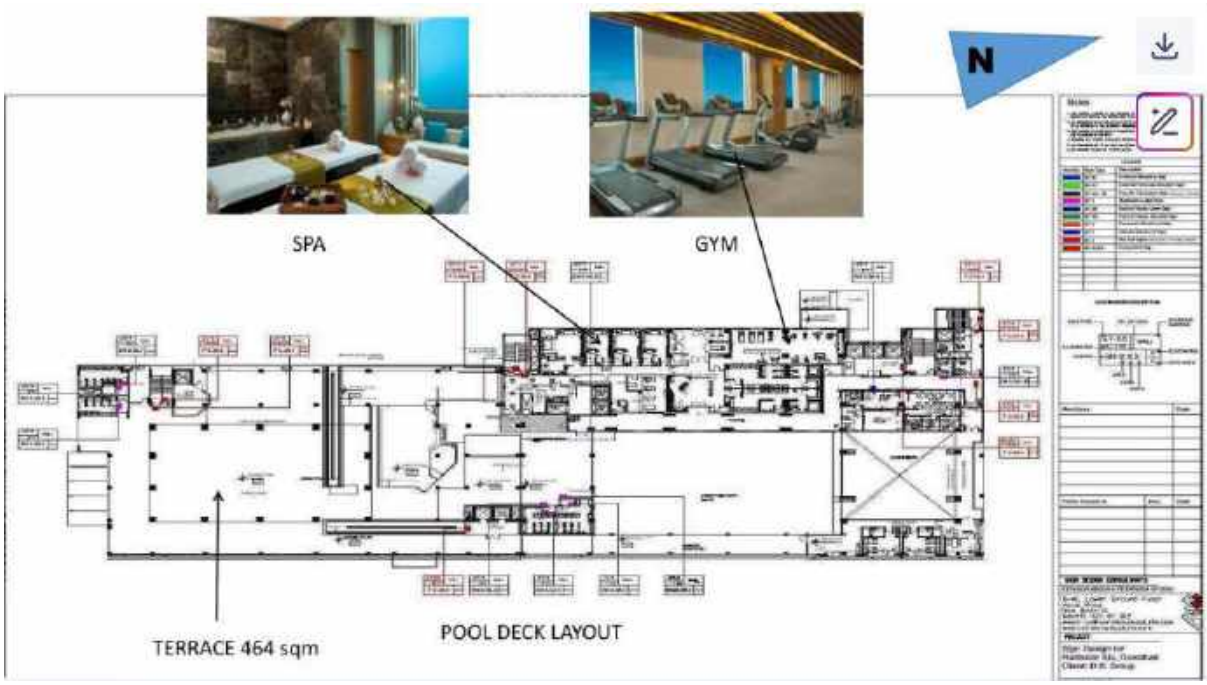


Figure 101: Pool Deck Layout



Figure 102: Floor Plan of Lvl 1 & 2



Figure 103:Floor Plan of Lvl 3 & 4



Figure 104: Floor Plan of lvl 5 & 6



Figure 105:Floor Plan of lvl 7 & 8



Figure 106:Floor Plan of lvl 9 & 10

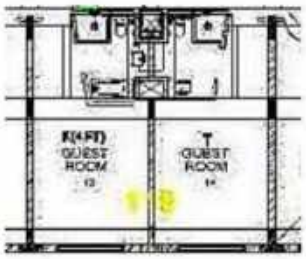


Figure 107: Front & Right side Elevation

4.3.4 TYPES OF ROOMS

TYPES OF ROOM

Type of Room	Special Rate	
	Single (₹)	Double (₹)
	5,500	6,500
	6,500	7,500
	8,500	9,500
	12,000	13,000
	16,000	16,000
	25,000	25,500







1. STANDARD ROOM

APPROXIMATE ROOM SIZE: 33 sq m
MAXIMUM GUEST: 4 ADULTS
FEATURE

- AN ARMCHAIR,
- DROP-DOWN LIGHTS,
- A LARGE WORK DESK WITH A CHAIR,
- A WALK-IN WARDROBE,
- AND THERMOSTAT-CONTROLLED AIR CONDITIONING AND HEATING.
- CHOOSE ONE KING BED OR TWO TWIN BEDS,
- LED SATELLITE TELEVISION,
- WIRELESS INTERNET,
- A COFFEE- AND TEA-MAKER, AN ELECTRONIC SAFE
- A BATHROOM WITH A SHOWER CUBICAL.

2. SUPERIOR ROOM

APPROXIMATE ROOM SIZE : 33 sqm
MAXIMUM NUMBER OF GUEST: 4 ADULTS





3. BUSINESS CLASS ROOM

APPROXIMATE ROOM SIZE: 35-38 sqm
MAXIMUM GUEST: 4 ADULT
LOCATED ON 9th AND 10th FLOOR



4. STUDIO SUITE

APPROXIMATE ROOM SIZE: 50 sqm



5. EXECUTIVE SUITE

- APPROXIMATE ROOM SIZE: 66 - 77 sqm
- KING SIZE BED
- SEPARATE LOUNGE ANG LIVING AREA







6. DELUXE SUITE

APPROXIMATE ROOM SIZE: 99 sqm






SEPARATE SLEEPING
LIVING AND DINING ROOM



CONFERENCE , MEETINGS ,BANQUET SPACES
4180sqm

TYPES
1.XOBHA
Xobha combines elegance and flexibility with over 464 square meters
.
It can accommodate up to 650 guests.
For smaller events of 50 to 200 guests,
Xobha can be divided into three sections with soundproof partitions.






BOARD ROOM
4- 12 PEOPLE



MEETING AND TRAINING ROOM

4.4 ITC ROYAL BENGAL, KOLKATA (DESK APPRAISAL)



4.4.1 INTRODUCTION:

The ITC Royal Bengal in Kolkata is not merely a hotel; it is a landmark embodiment of luxury hospitality deeply intertwined with a profound architectural narrative. It stands as a testament to ITC Hotels' philosophy of "Responsible Luxury," where opulence is seamlessly blended with environmental stewardship and a celebration of local heritage. This case study will deconstruct the hotel's architecture, planning, services, and design ethos to understand how it functions as a self-sustaining micro-city and a sensory homage to the region of Bengal.

4.4.2 PROJECT LOCATION AND SITE CONTEXT:

- Address: Plot No. JC-1 & 1/1, Action Area - II, New Town, Kolkata, West Bengal 700156, India.
- Urban Context:
    - New Town, Rajarhat: The hotel is strategically located in New Town, a planned satellite city and a major hub for Kolkata's IT and corporate sector. This location places it in close proximity to the Bengaluru International Airport (approx. 10 km) and major business parks like Sector V.
    - Accessibility: It is easily accessible from the airport and the city's major arterial roads, including the New Town Expressway and EM Bypass.

- Surroundings: The area is characterized by modern high-rises, tech parks, and upcoming residential complexes. The hotel's site was previously part of the East Kolkata Wetlands, a factor that influenced its sustainable design approach.

- Site Response: The architecture responds to its urban context by presenting a bold, contemporary form while using its vast site to create a secluded oasis. The building is set back significantly from the main road, creating a grand approach and a buffer from the urban hustle.

4.4.3 DESIGN PHILOSOPHY:

- Architects: The hotel was designed by the in-house architecture and design team of ITC Hotels.

- Design Philosophy:

  - Narrative Architecture: The core concept is a tribute to the Royal Bengal Tiger and the rich cultural history of West Bengal. The design tells a story, with every element—from the grand staircase to the textures on the walls—evoking the grace, strength, and stripes of the tiger, as well as motifs from Bengali art and literature.

  - Responsible Luxury: This is ITC's overarching ethos. It mandates that all properties are LEED® (Leadership in Energy and Environmental Design) Platinum certified, making ITC Royal Bengal one of the greenest luxury hotels in the world. The design prioritizes energy efficiency, water conservation, and waste management.

  - Sense of Place: The architecture avoids a generic international style. Instead, it is deeply rooted in its location, using materials, art, and spatial sequences that are intrinsically Bengali.

4.4.4 FLOOR PLANS:

The hotel's plan is organized vertically for functional efficiency and to maximize views.

Lower Ground Floor: Service and Support Core

- Back-of-House: Engineering plant rooms, electrical substations, laundry, staff locker rooms, and kitchens. This floor is the engine of the hotel, designed for optimal logistical flow, separating service deliveries (loading bay) from guest areas.

Ground Floor: The Public Heart

- Main Lobby: A double-height volume that creates an immediate "wow" factor. It features a stunning installation of dancing lights (representing a swarm of fireflies) and a grand staircase that mimics the fluid movement of a tiger.

- Reception & Concierge: Strategically placed for clear sightlines from the entrance.
- Pavilion Brasserie: The all-day dining restaurant, opening onto lush outdoor gardens and a pool deck, blurring the line between inside and outside.
- Royal Bengal Court: A dedicated lobby lounge for afternoon tea and casual meetings.
- Deli: A patisserie and retail outlet facing the exterior for easy access.
- Banquet Pre-Function Areas: Ample space for pre-event gatherings.
- Administrative Offices.

First Floor: Conference and Wellness

- Grand Ballroom: One of the largest in the city, divisible into smaller sections. Includes a separate entrance for large events and a pre-function area with a dedicated pantry.
- Meeting Rooms: Multiple, flexible meeting spaces (e.g., The Boardroom) with state-of-the-art technology.
- Kaya Kalp - The Spa: A sprawling wellness center with treatment rooms, hydrotherapy facilities, a salon, and yoga studios. Designed as a serene, secluded retreat.
- Fitness Center: Fully equipped gym with panoramic views.

Upper Floors (2nd to 8th): Guest Room Accommodations

- Layout: Typical floor plans are based on a central corridor system with guest rooms on either side.
- Room Types: A mix of ITC One Rooms (Premier), Suites (Executive, Grand, etc.), and the ultra-luxurious Presidential Suite.
- Tower Design: The corners of the building are leveraged for corner rooms with wrap-around windows and enhanced views. The central core houses elevators, service elevators, and housekeeping pantries.

Ninth Floor: Specialty Dining and Panoramic Views

- Dum Pukht: The signature fine-dining restaurant specializing in Awadhi cuisine, offering an intimate and opulent setting.
- Edo: The Japanese restaurant (Teppanyaki, Sushi, Robatayaki) with a modern, minimalist aesthetic.
- The Lounge Bar: A sophisticated bar with live music and stunning views of the New Town skyline.

Roof Level: Utilities and Sustainability Features

- Solar panels for renewable energy generation.
- Heat rejection units for the HVAC system.
- Water treatment plant outlets.

4.4.5 BUILDING SERVICES (MEP)

The hotel is a marvel of integrated engineering, crucial for its LEED Platinum certification.

- Mechanical (HVAC):
    - A central, energy-efficient HVAC plant with heat recovery systems.
    - Variable Frequency Drives (VFDs) on pumps and fans to reduce energy consumption based on load.
    - High-performance insulated glass to reduce heat gain.
- Electrical:
    - Dual power feed from the grid for redundancy.
    - On-site automatic diesel generator backup for critical loads.
    - Extensive LED lighting with smart control systems (motion sensors, daylight harvesting in public areas).
- Plumbing & Water Management:
    - Zero Water Discharge: The hotel has a 100% sewage treatment plant (STP). Treated water is reused for irrigation and cooling towers.
    - Rainwater Harvesting: Systems are integrated into the site design to recharge groundwater.
    - Low-flow fixtures (faucets, showers, toilets) throughout the hotel to reduce potable water consumption.
- Fire Safety:
    - A fully addressable fire detection and alarm system.
    - Automatic sprinkler systems throughout the building.
    - Pressurized stairwells, fire-rated doors and materials, and clearly marked escape routes.
- Building Management System (BMS): A central computer-based system monitors and controls all mechanical and electrical equipment, optimizing performance and energy use 24/7.

4.4.6 ACCESSIBILITY & CIRCULATION:

- External Accessibility: Easy access for cars and buses from the main road. Clear signage.
- Vertical Circulation:
    - Guest Elevators: Multiple high-speed elevators centrally located for easy access to all floors.
    - Service Elevators: Separate bank of elevators for staff, luggage, and service delivery, ensuring no cross-traffic with guests.
    - Staircases: Fire-rated emergency staircases at both ends of the building. The grand ceremonial staircase in the lobby is a design feature.
- Horizontal Circulation: Wide, well-lit corridors on guest room floors. Public areas have open plans to facilitate easy movement.
- Accessibility for Persons with Disability (PwD):
    - Ramps at all level changes at the entrance and throughout public areas.
    - Dedicated PwD-friendly guest rooms with roll-in showers, grab bars, and lower fittings.
    - Accessible elevators with Braille signage and auditory signals.
    - Tactile guiding paths on floors in public areas.

4.4.7 SUSTAINABILITY & GREEN FEATURES:

This is the cornerstone of the project's design. Key features contributing to its LEED Platinum rating include:

- High-Performance Building Envelope: Reduced glass-to-wall ratio and special glass to minimize heat ingress, reducing air-conditioning load.
- Solar Power: Installation of solar panels to meet a portion of the hotel's energy demand.
- Water Conservation: As mentioned, the STP and rainwater harvesting make the hotel nearly self-sufficient in water for non-potable uses.
- Waste Management: Comprehensive waste segregation and organic waste converters.
- Indoor Environmental Quality: Use of low-VOC (Volatile Organic Compound) paints, adhesives, and materials to ensure superior indoor air quality.
- Local Sourcing: Over 20% of materials were extracted and manufactured locally, reducing the carbon footprint from transportation.

4.4.8 CONCLUSION:

The ITC Royal Bengal is a paradigm of narrative-driven, sustainable architecture. It successfully demonstrates that extreme luxury and extreme environmental responsibility are not mutually exclusive but are, in fact, complementary. The architects have masterfully woven a story of the Bengal Tiger and local culture into every facet of the design, creating a deeply immersive and authentic experience for the guest. Beyond its aesthetic and experiential triumphs, the hotel functions with the precision of a finely tuned machine, its hidden services and engineering systems working in concert to set a global benchmark for sustainable practices in the hospitality industry. It is not just a place to stay; it is a destination that celebrates its place, its culture, and its commitment to the future.

S.NO	TYPE OF PARKING	NO. OF PARKING
1	2 WHEELER	134
2	4 WHEELER (CAR)	118
3	4 WHEELER (BUS)	3

SITE AREA: 28975 SQMT (7.16 ACRES)

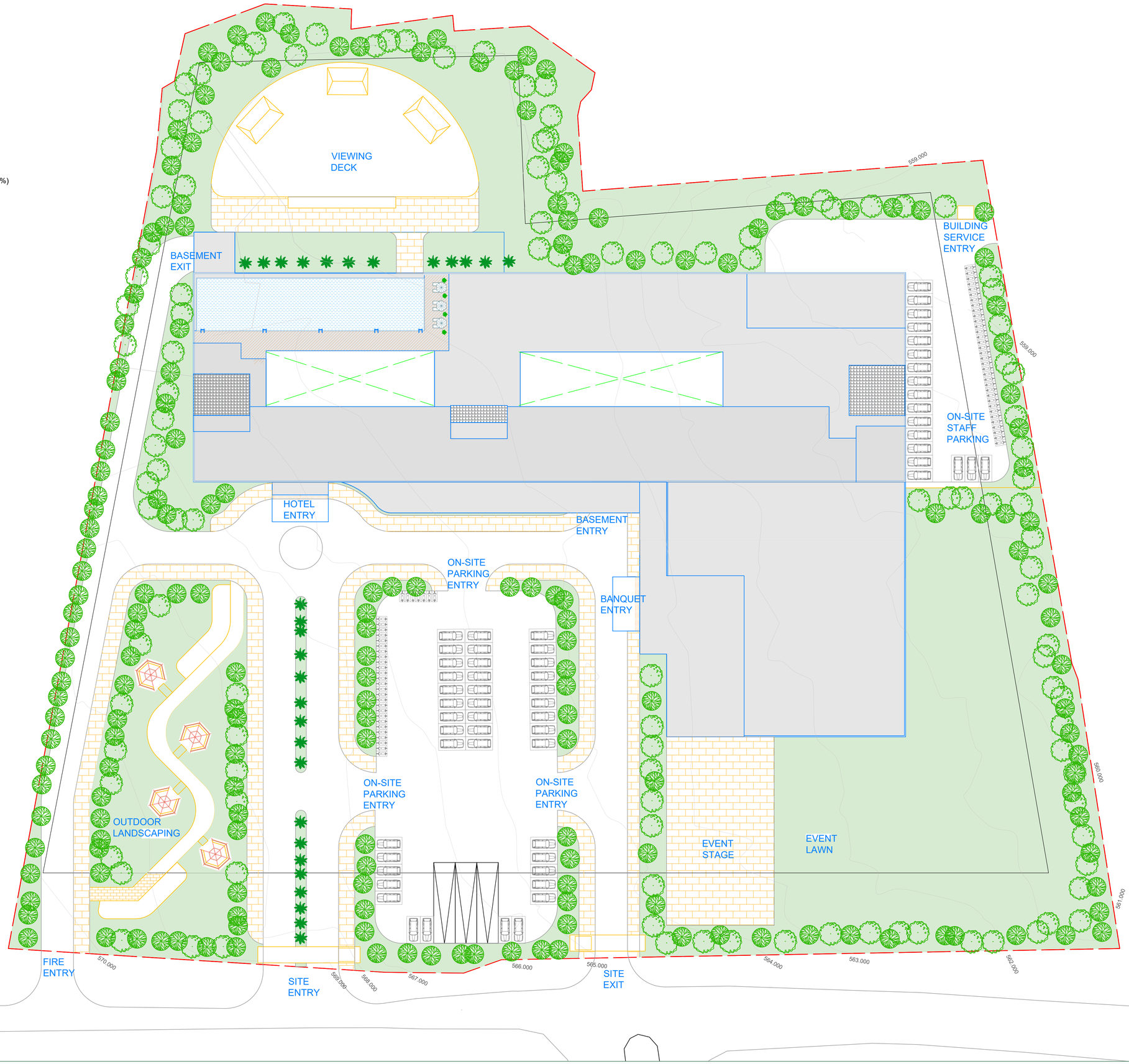
GROUND COVERAGE: 8,692 SQMT (30%)

TOTAL BUILTUP AREA: 57,950 SQMT

ACHIEVED GROUND COVERAGE AREA: 5,850 SQMT(20.1%)

AREA OF ROADS: 4280 SQMT (14.7%)

AREA PAVEMENTS: 2587 SQMT (20.9%)



DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC: 5 STAR HOTEL

SHEET TITLE: SITE PLAN

Note: The Plan is at a scale of 1:350

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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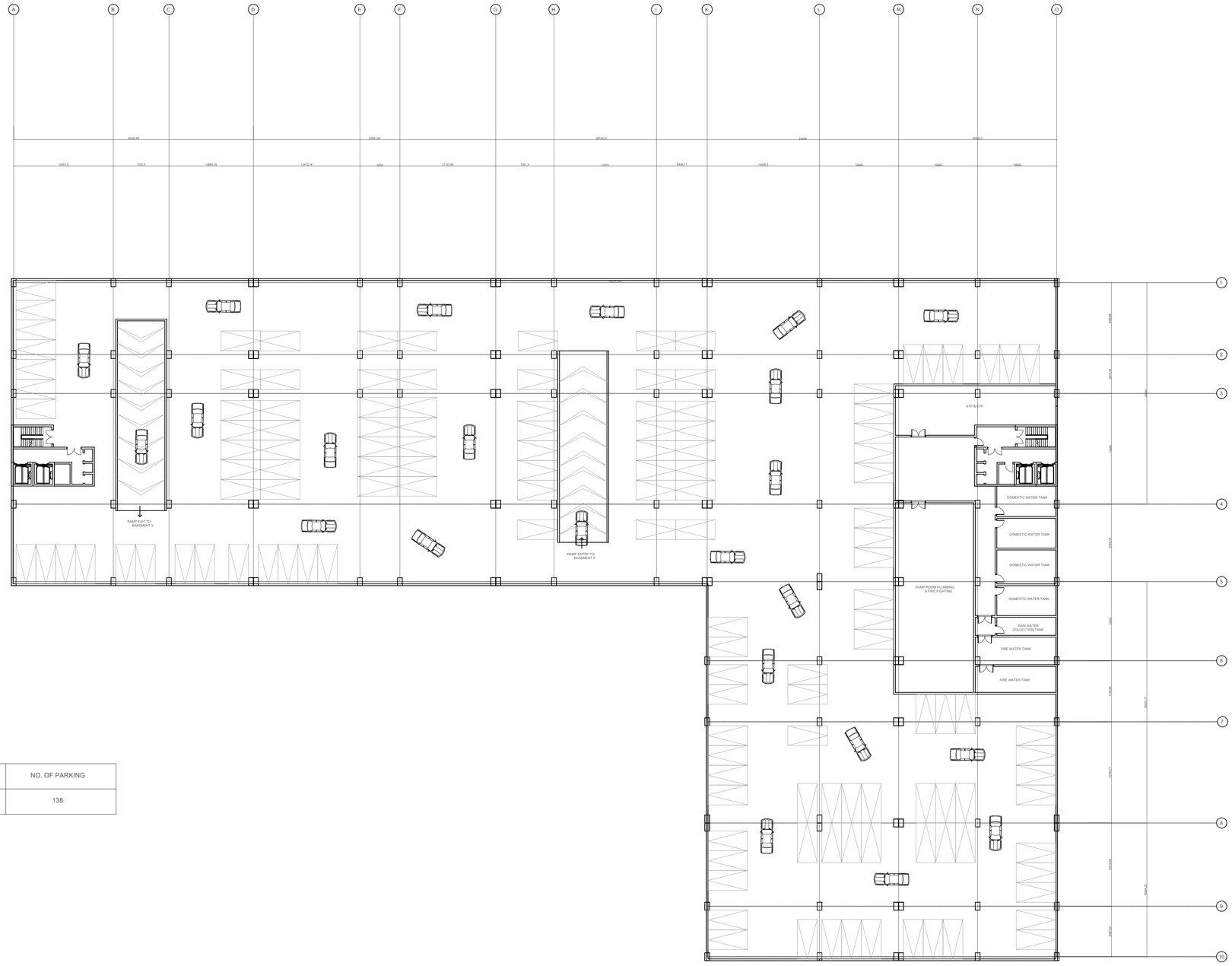

S.NO	TYPE OF PARKING	NO. OF PARKING
1	4 WHEELER	138

DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC:
5 STAR HOTEL

SHEET TITLE:
BASEMENT 3 PLAN

Note:
The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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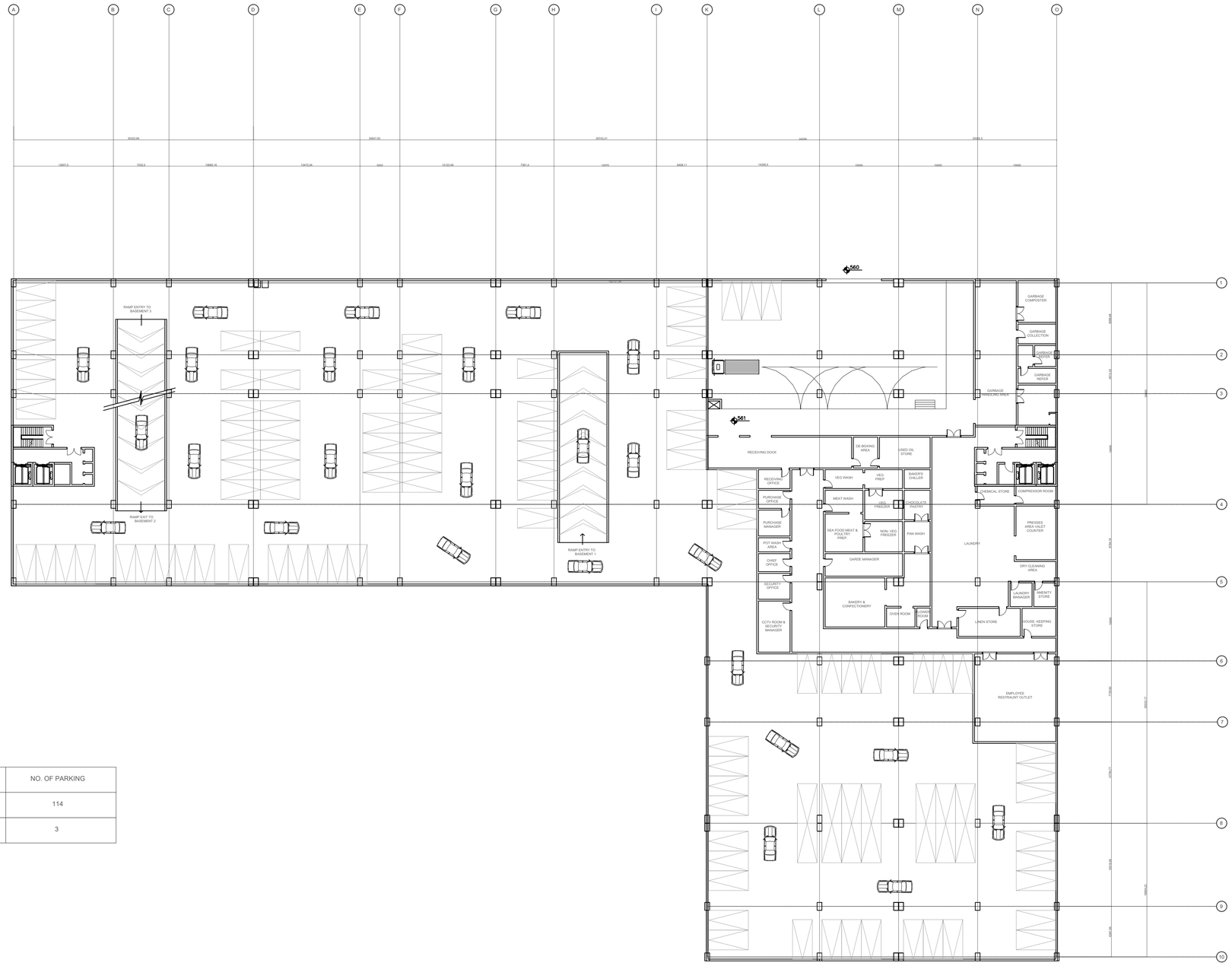
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12125.49
7361.4
12470
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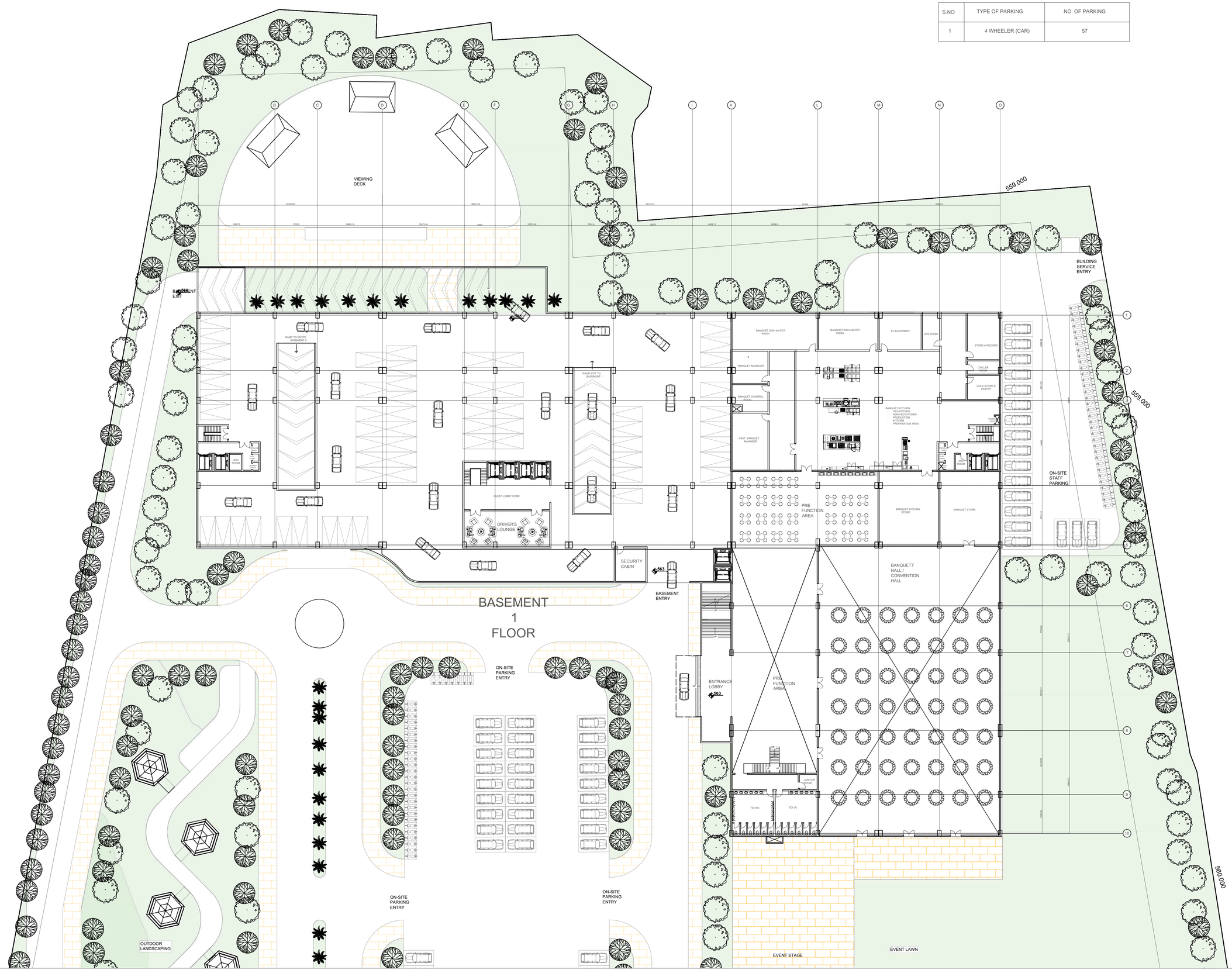
561
RAMP ENTRY TO BASEMENT 3
RAMP EXIT TO BASEMENT 2
RAMP ENTRY TO BASEMENT 1
RECEIVING DOCK
DE-BOXING AREA
USED OIL STORE
RECEIVING OFFICE
PURCHASE OFFICE
PURCHASE MANAGER
POT WASH AREA
CHEF OFFICE
SECURITY OFFICE
CCTV ROOM & SECURITY MANAGER
VEG WASH
VEG PREP
BAKER'S CHILLER
MEAT WASH
VEG FREEZER
CHOCOLATE PASTRY
SEA FOOD MEAT & POULTRY PREP
NON- VEG FREEZER
PAN WASH
GARDE MANGER
BAKERY & CONFECTIONERY
PARA ROOM
COVER ROOM
LAUNDRY
LINEN STORE
CHEMICAL STORE
COMPRESSOR ROOM
PRESSES AREA VALET COUNTER
DRY CLEANING AREA
LAUNDRY MANAGER
HOSIERY STORE
HOUSE- KEEPING STORE
EMPLOYEE RESTAURANT OUTLET
GARBAGE COMPOSTER
GARBAGE COLLECTION
GARBAGE WATER
GARBAGE WATER
GARBAGE SEGREGATING AREA
3000
3000
3000

S.NO	TYPE OF PARKING	NO. OF PARKING
1	4 WHEELER (CAR)	57



DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC: 5 STAR HOTEL

SHEET TITLE: BASEMENT 1 PLAN

Note:
The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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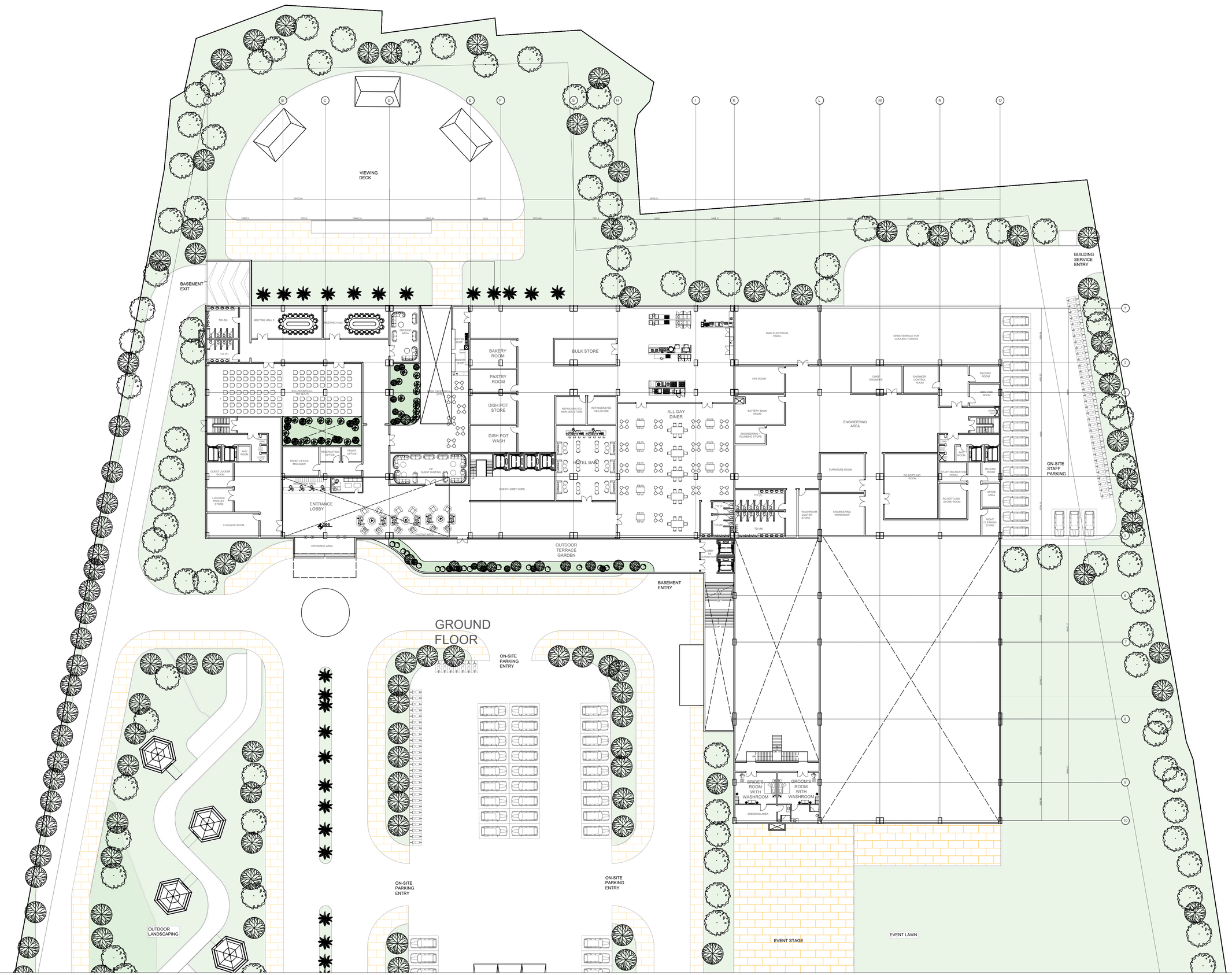

DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC: 5 STAR HOTEL

SHEET TITLE: GROUND FLOOR PLAN

Note:
The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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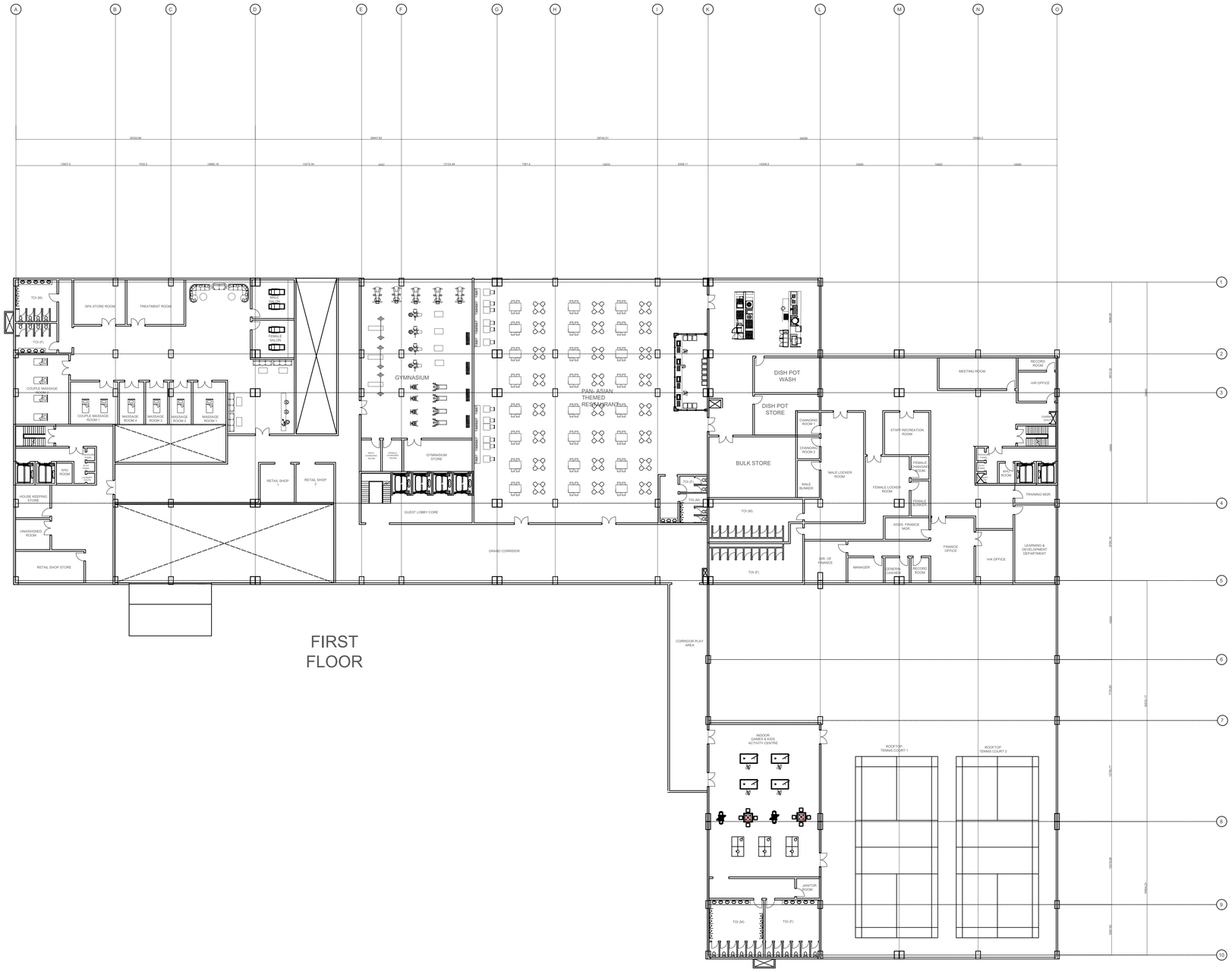

FIRST FLOOR

DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC: 5 STAR HOTEL

SHEET TITLE: FIRST FLOOR PLAN

Note:
The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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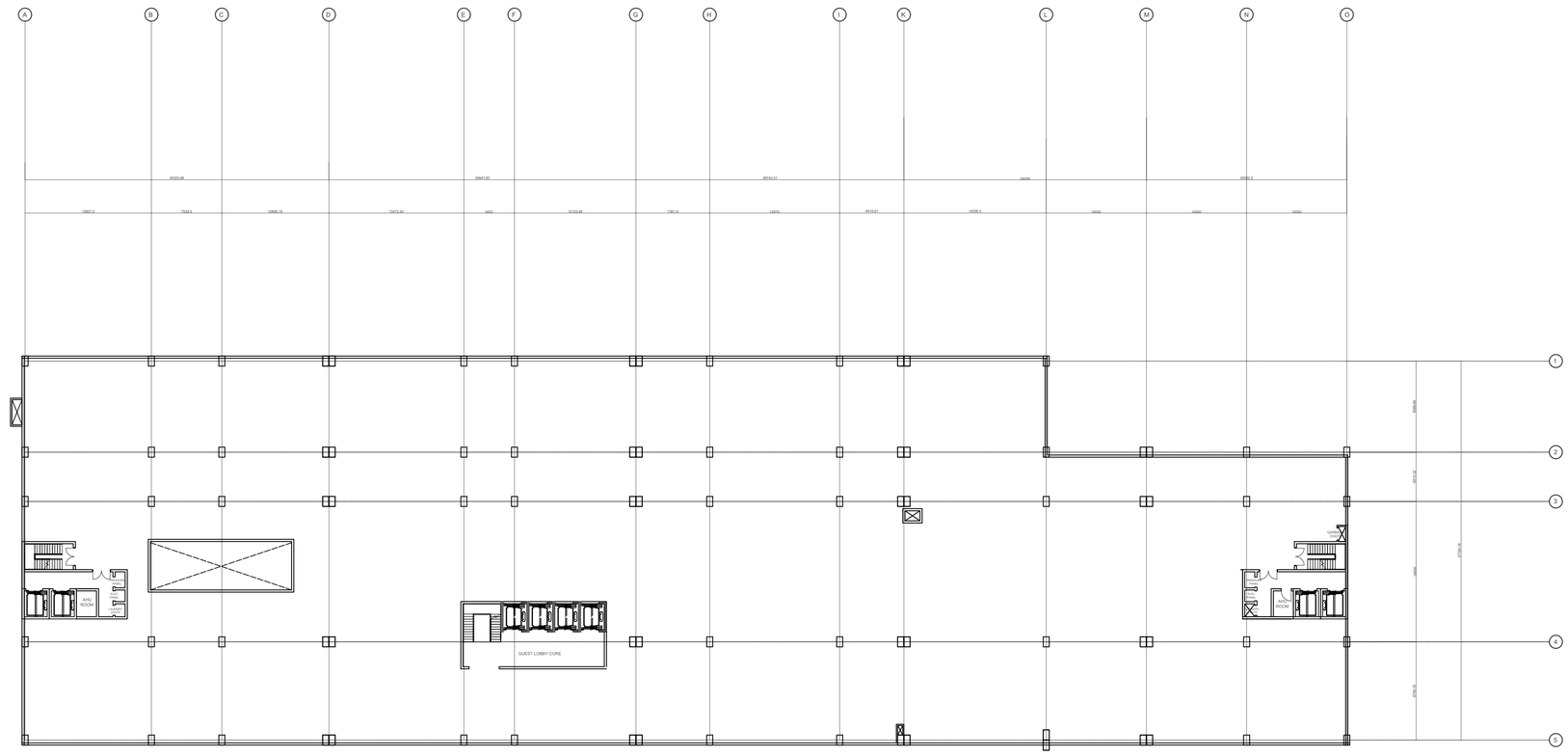

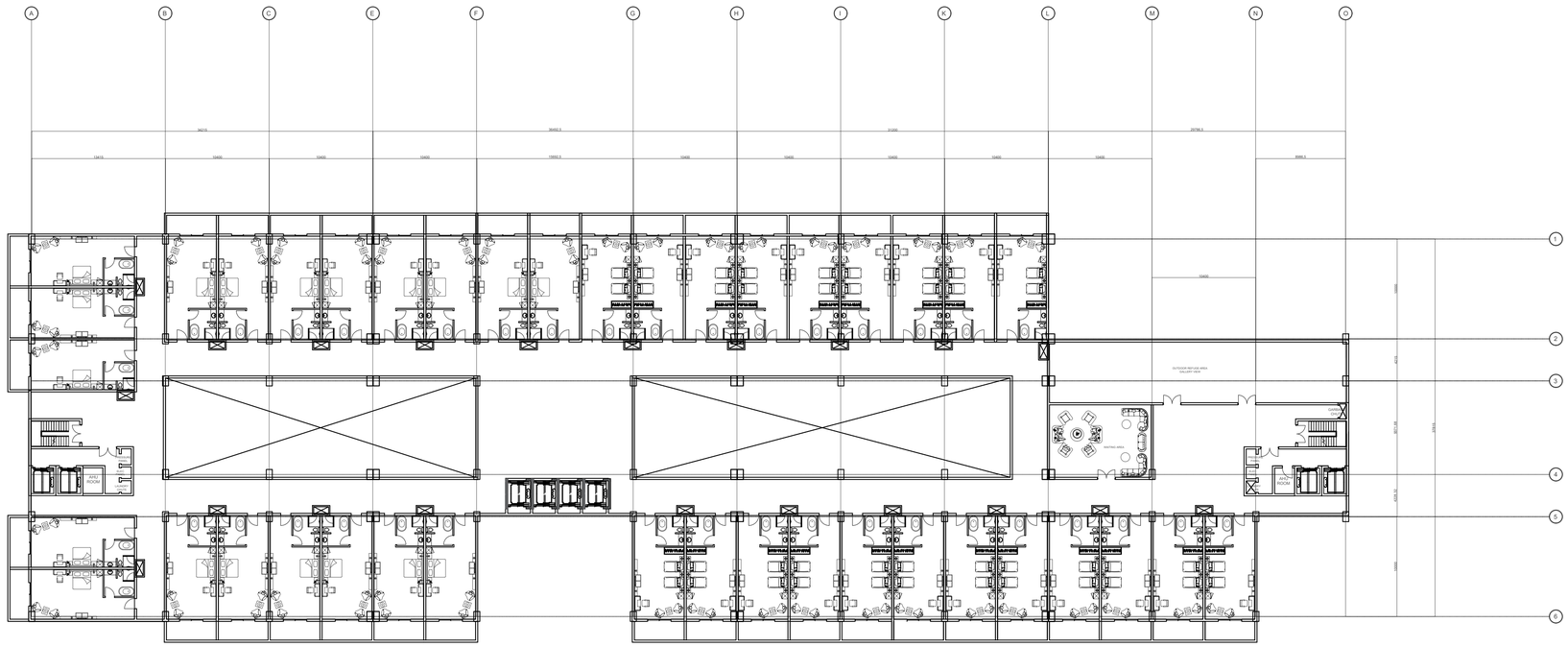

DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC:
5 STAR HOTEL

SHEET TITLE:
SERVICE FLOOR 1 PLAN
&
THIRD FLOOR PLAN

Note:
The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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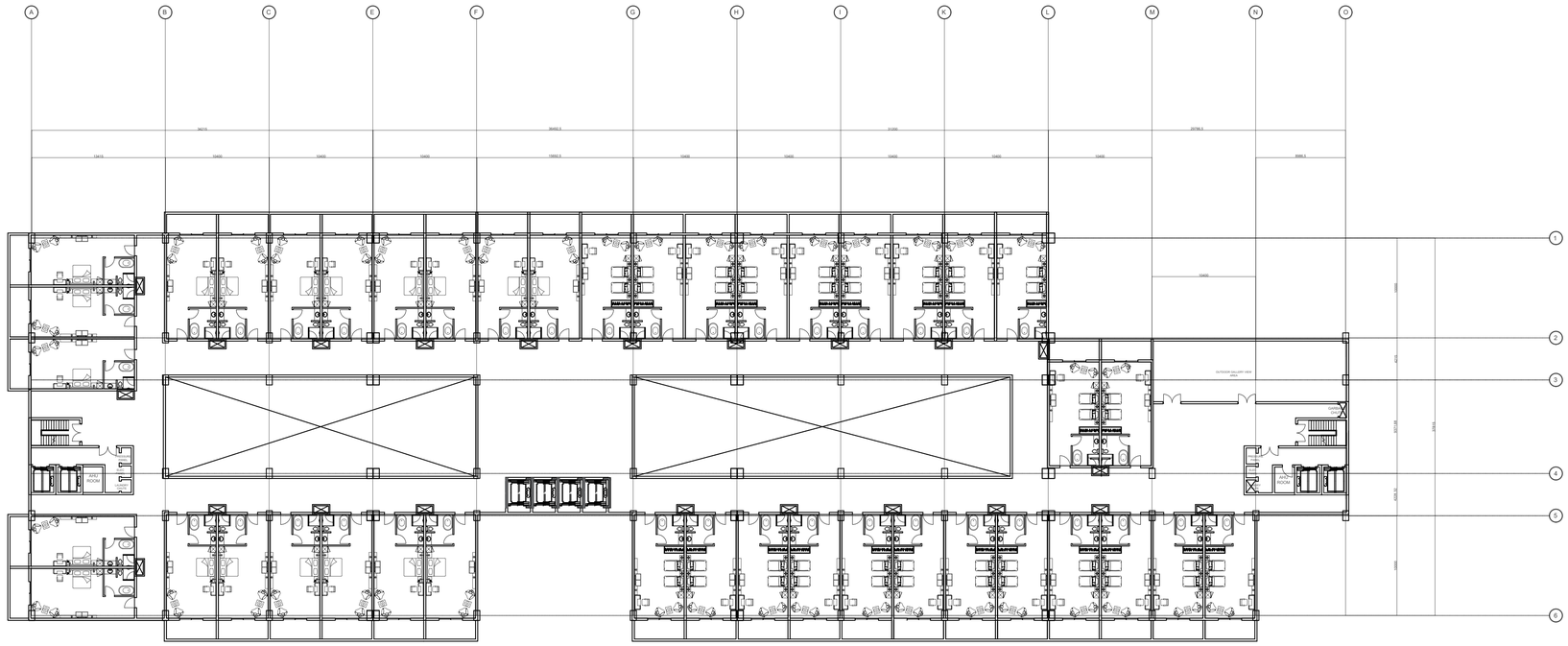
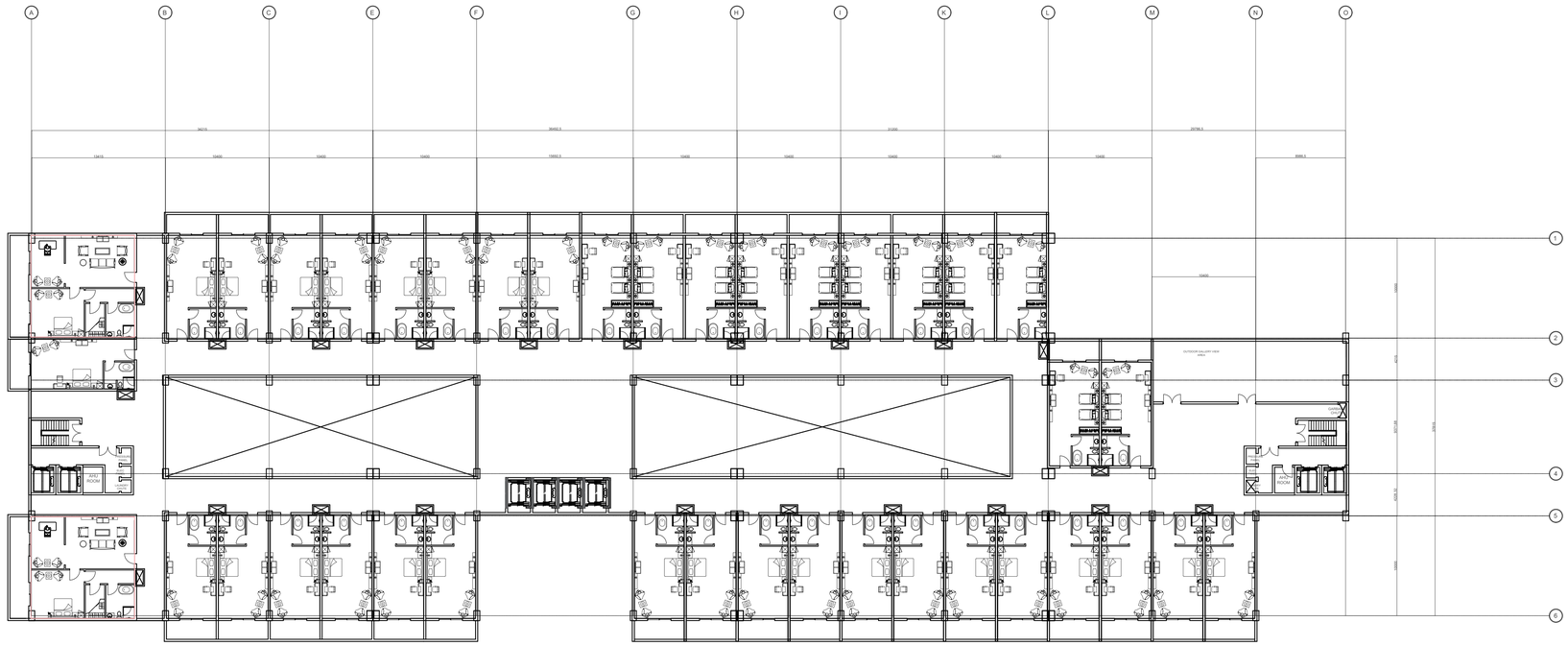


FOURTH
FLOOR



FIFTH
FLOOR

DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC:
5 STAR HOTEL

SHEET TITLE:
FOURTH FLOOR PLAN & FIFTH FLOOR PLAN

Note:
The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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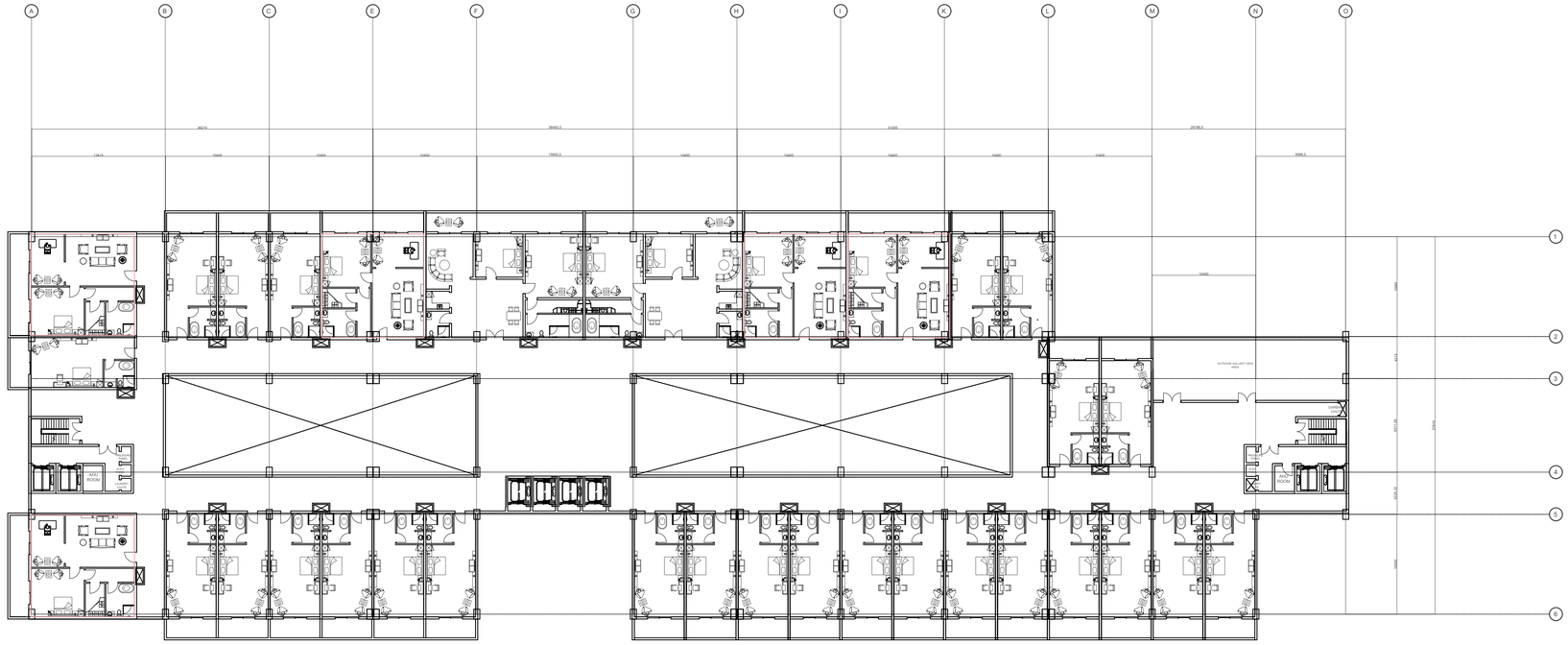
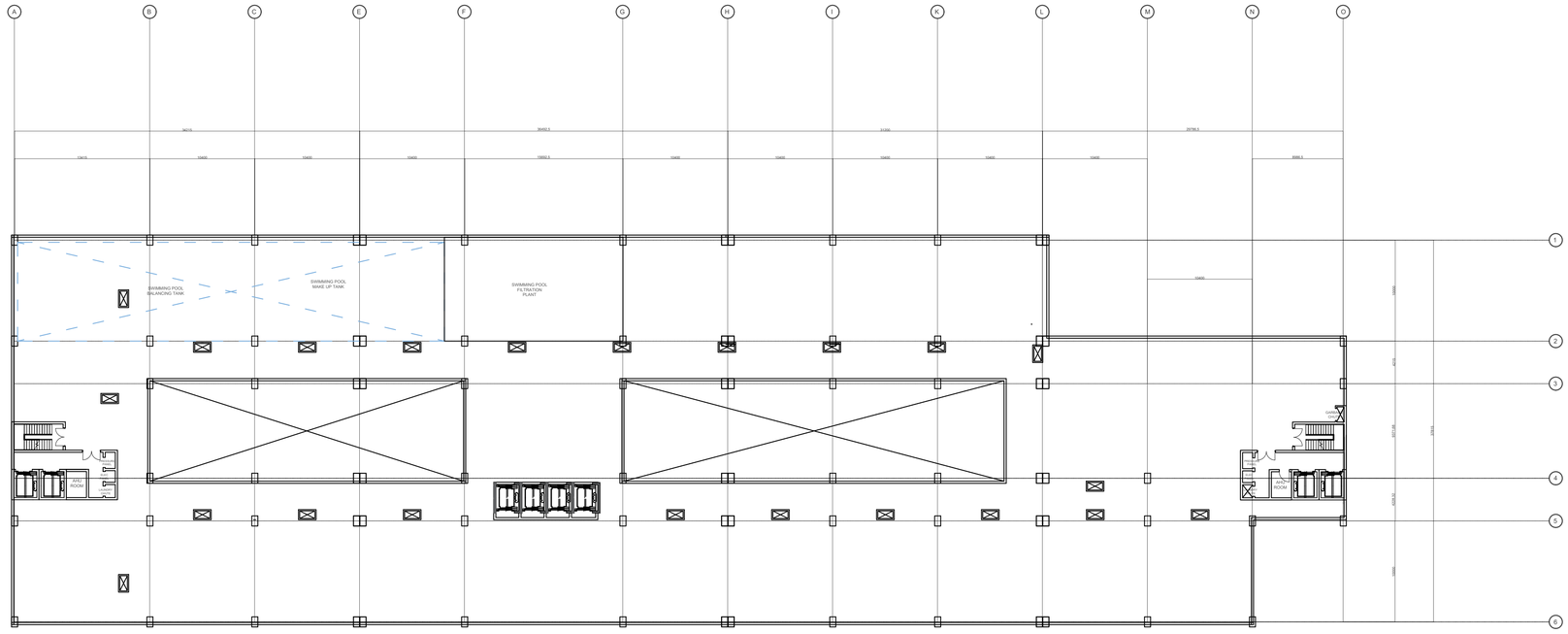


SIXTH
FLOOR



SERVICE
FLOOR
2

DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC:
5 STAR HOTEL

SHEET TITLE:
SIXTH FLOOR PLAN & SERVICE FLOOR PLAN

Note:
The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

MOTILAL VIJAY NATIONAL INSTITUTE OF TECHNOLOGY BHOPAL
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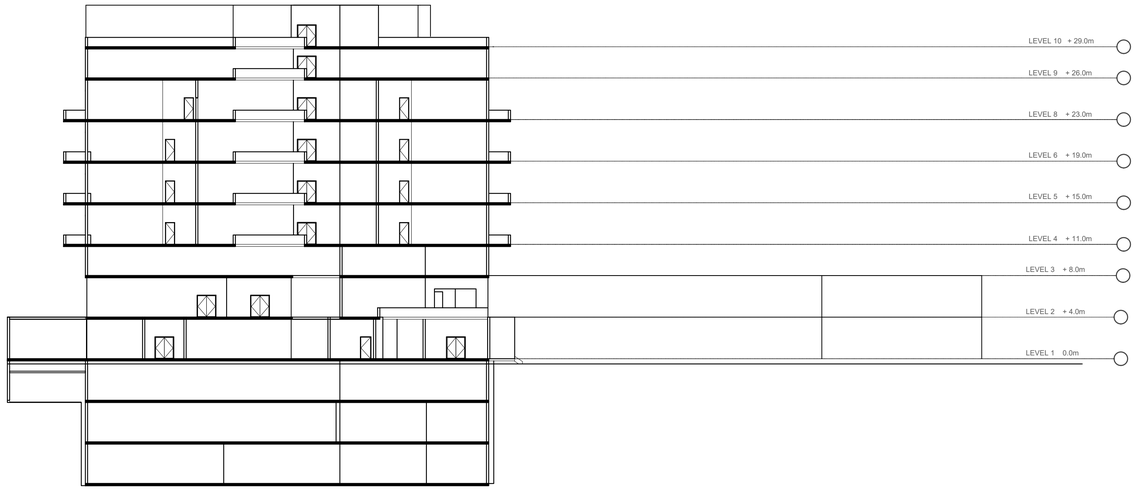
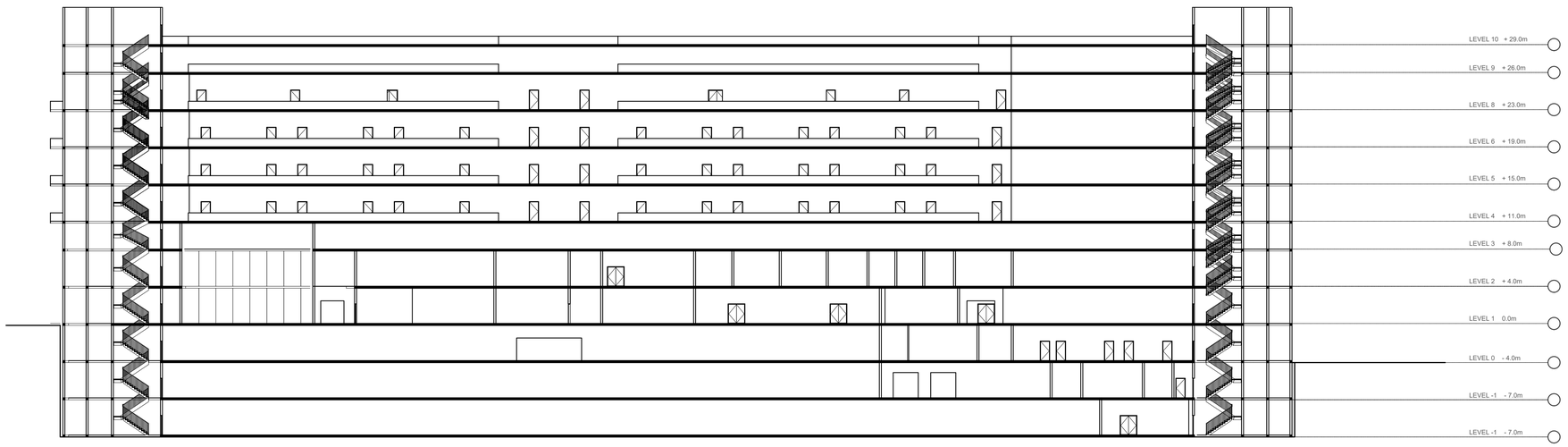


SECTION 1



SECTION 2

DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC: 5 STAR HOTEL

SHEET TITLE: SECTION 1 & SECTION 2

Note: The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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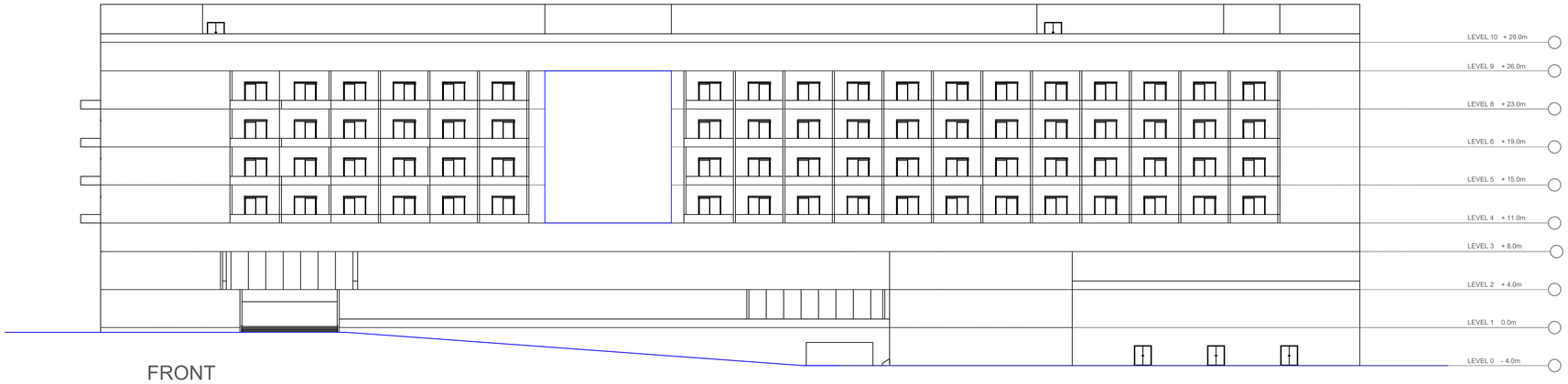
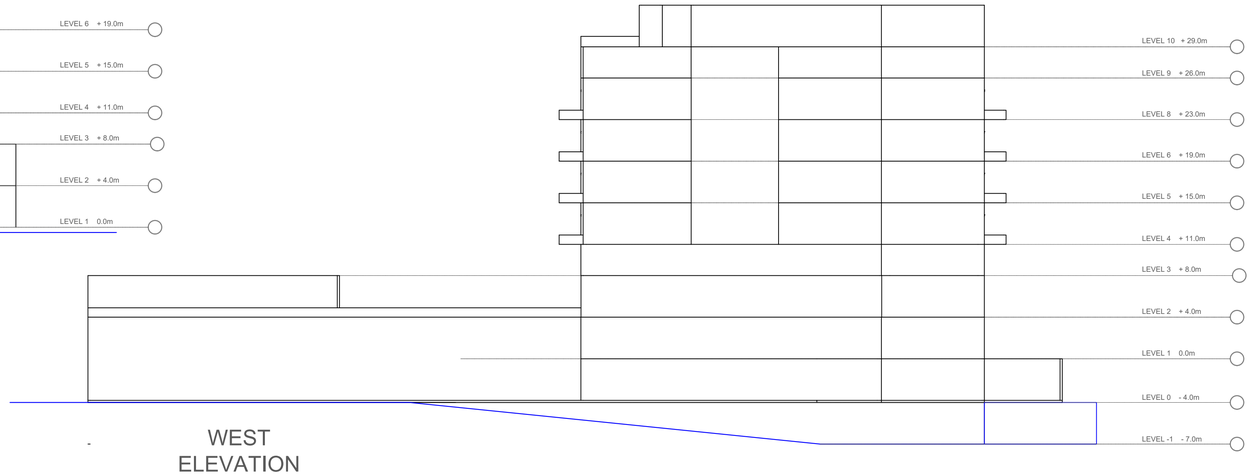


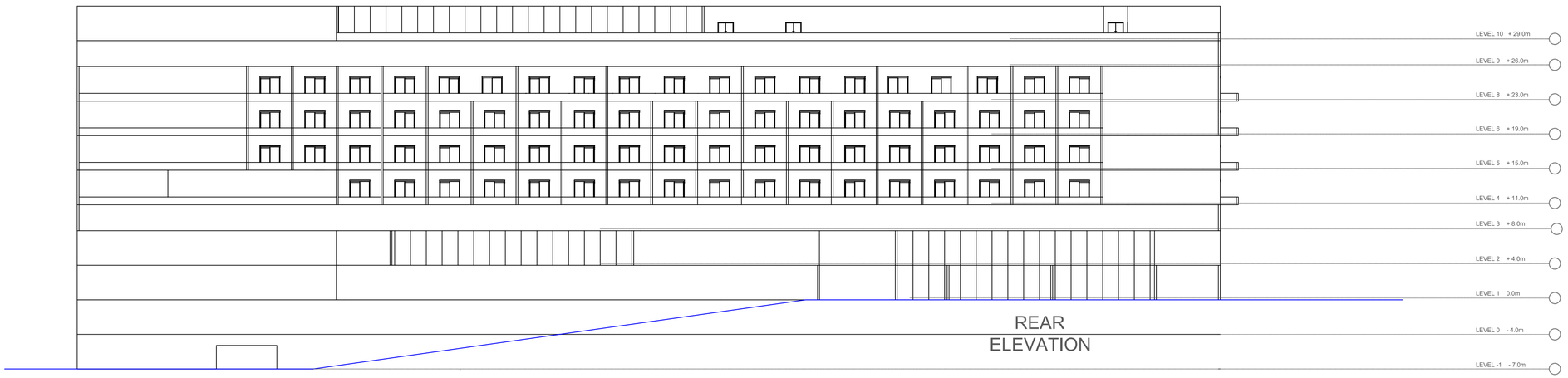
FRONT
ELEVATION



EAST
ELEVATION



WEST
ELEVATION



REAR
ELEVATION

DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC: 5 STAR HOTEL

SHEET TITLE: ALL ELEVATION

Note:
The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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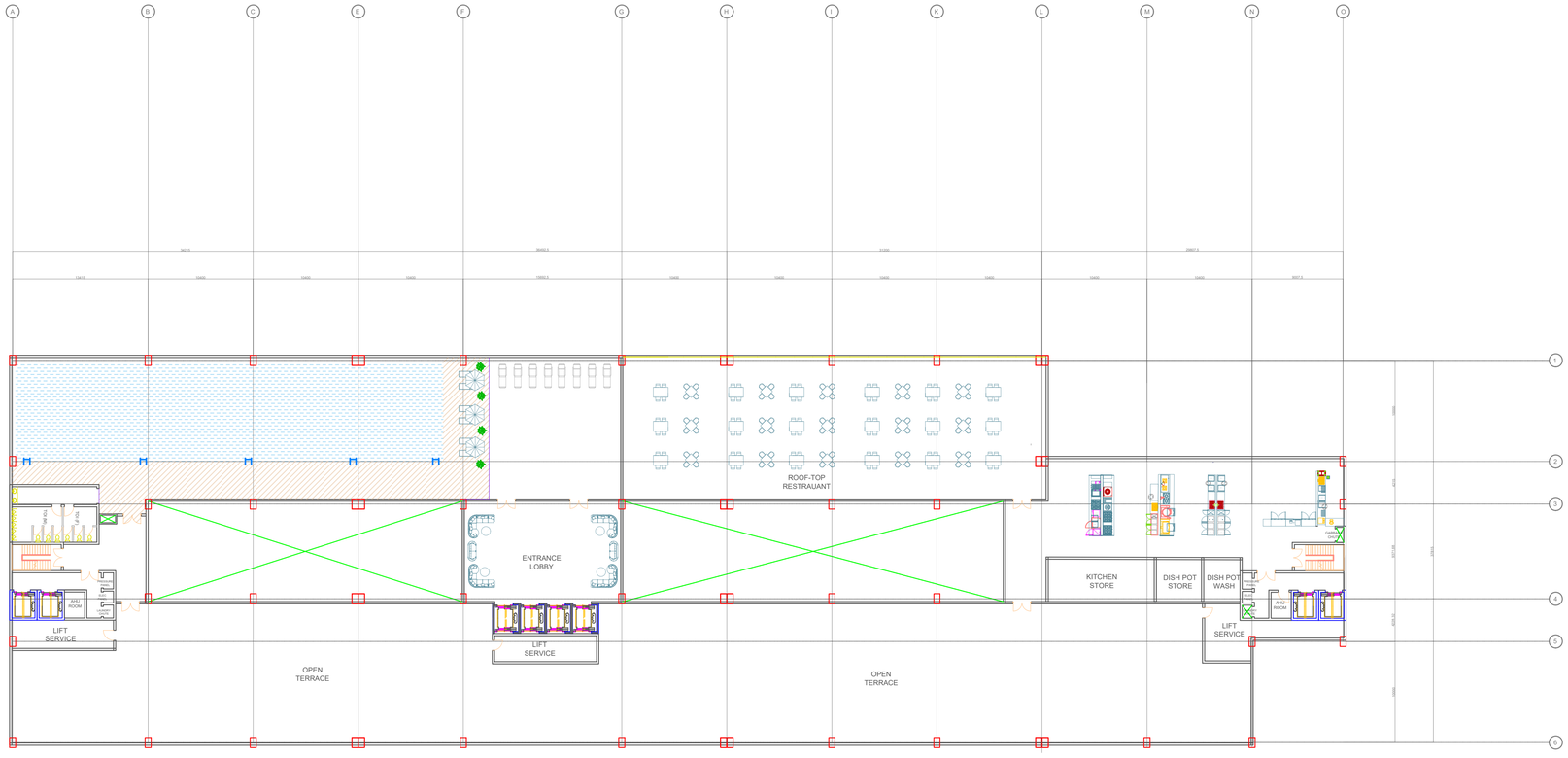

ROOF-TOP
FLOOR

DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC:
5 STAR HOTEL

SHEET TITLE:
ROOF TOP FLOOR PLAN

Note:
The plan is in the scale of 1:250

Remarks:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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SITE LOCATION:

Project proposed by: MPT Hotels & Resorts
Project Location: Near Jahnuma Palace, Shymla hills, Bhopal, Madhya Pradesh
Site Co-ordinates: Latitude: 23.243043872752793,
Longitude: 77.38768911349595



PROJECT DESCRIPTION:

The given site is located in Shyamla Hills, Bhopal. The given project is to Redevelop the entire site into a 5 star Hotel with larger capacity and better ammenities. The proposed project site is located at the existing MPT Lake View Residency, situated in the heart of Bhopal, Madhya Pradesh. Overlooking the scenic Upper Lake and positioned near key landmarks such as the CM House and Secretariat, the site holds a prime and strategic urban location. Currently functioning as a state-run hospitality facility.

S.no	Building Description	Built Up Area (Sq.ft)
1.	Ashoka Hotel Main Building	65,664
2.	MOA Spa	5,607
3.	Swimming Pool	2,236
4.	Railway Platform Restaurant	4,046
5.	Railway Coach Restaurant	5,768
6.	Hot & Cold Restaurant	892
7.	Open Area	777
8.	Services	2,531
	Total	87,521

CLIMATE ANALYSIS:

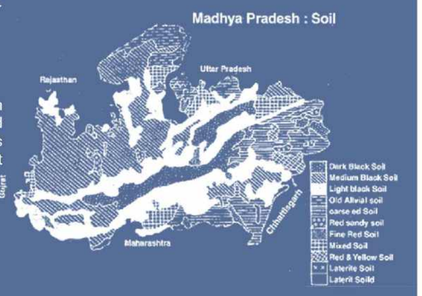
The climate of bhopal is humid subtropical in nature with hot and dry summers during March to May, heavy rainfall due to southwest monsoon during June to September, with cold and dry winters during December to February.

WINTER -12°C -17°C.
PEAK WINTERS - less than 10°C.
HUMIDITY-
High humidity during monsoon :74-79% in July-August.
Lower humidity :20-40% during summer and winter.

ANNUAL RAINFALL- approx. 1101mm.
SUMMER- 25°C-34°C
PEAK SUMMERS- more than 40°C.

SOIL ANALYSIS:

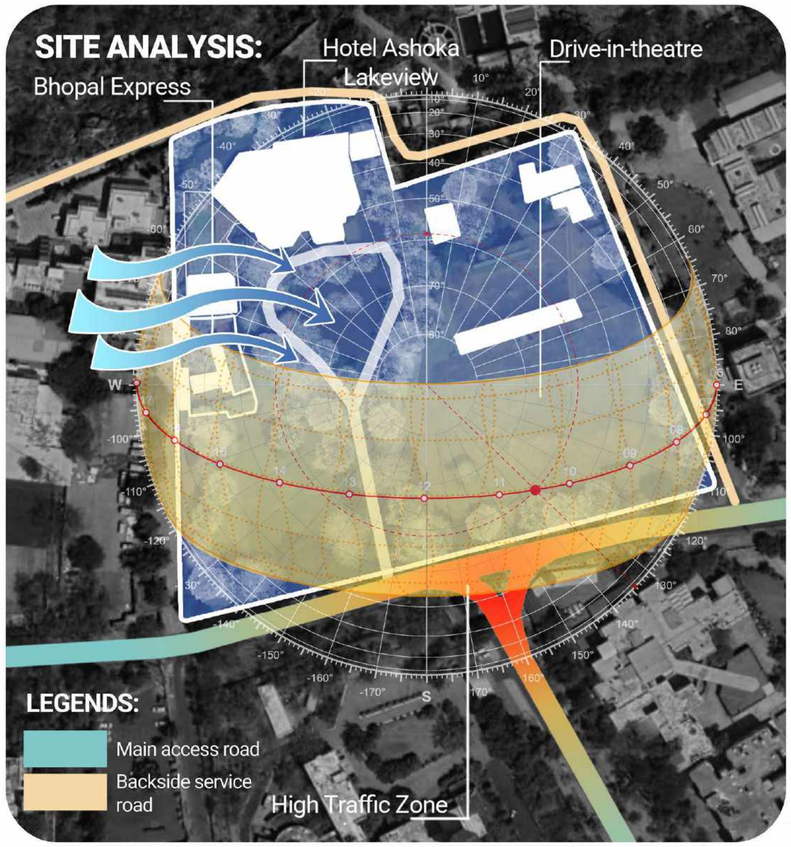
Vertisols ("black cotton soils"/regur) common in MP, with smectite clays showing shrink–swell and deep seasonal cracking—critical for foundations and pavements; near the lake margin expect colluvium/alluvium lenses with variable bearing.



SITE PROXIMITY:



SITE ANALYSIS:



SWOT ANALYSIS:

STRENGTH:
The site is located in a very strategic location, on top of the Shymla hills giving a panoramic view of Bada Talab (Upper Lake). It gives a proximity and direct access to natural and cultural hotspots. It has a well-linked through Jehan Numa Palace Road, ensuring good accessibility.

WEAKNESS:
Bhopal has fewer established attractions compared to popular destinations like Jaipur, Udaipur, Agra, and Puri. The city is largely known as an administrative hub rather than being marketed as a prime tourist destination.

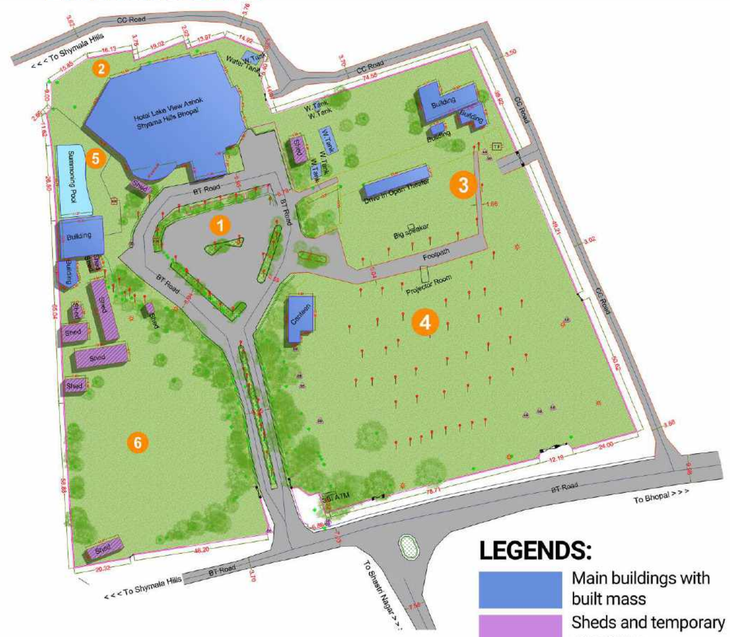
OPPORTUNITIES:
Growing emphasis on positioning Bhopal as a tourist city, with nearby UNESCO World Heritage Sites (Sanchi, Bhimbetka, Udayagiri), and Ratapani Tiger Reserve boosting its appeal. Increasing demand for destination weddings, conventions, and film tourism, offering strong business.

THREATS:
Proximity to Bada Talab requires mindful architectural and landscape development, ensuring no disruption to its natural and cultural aesthetics.

SITE PHOTOS:



EXISTING SITE:


CC Road
Hotel Lake View Ashok Shyamla Hills Bhopal
Swimming Pool
Building
Open Air Open Theater
Big Speaker
Footpath
Projector Room
Canteen
Shed
Sheds
Shed
Shed
Shed
Sheds
Shed
Shed
Shed

COMPARITIVE ANALYSIS:

Title	Taj Lakefront, Bhopal	Radisson, Bhopal	ITC Royal Bengal, Kolkata	Radisson Blu, Guwahati	Inferences for Proposed Hotel
Architect	Kushwa & Kushwa architects	Arjun Mallick	Hafeez contractor, Gaurav Shah	GPM Architects & Planners	
Site Area	17700 sqm	3729 sqm	38642 sqm	4180 sqm	
Location Context	Lakefront site with composite climate, panoramic views.	Urban setting in Arera Hills, connected to business zones.	Prime metro city, cultural capital, warm-humid climate.	Peripheral Guwahati, gateway to Northeast, tropical climate.	Design must balance natural edge (lake/green) with urban connectivity; use site as a branding tool.
Architectural Identity	Contemporary façade with regional craft infusion.	Simple modern block with glass and stone.	Neo-classical grandeur with monumental scale.	Functional-modern with regional cultural motifs.	Adopt a distinct architectural identity—modern + regional.
Planning & Massing	Terraced zoning towards the lake; banquet + restaurants in public edge.	Vertical tower blocks, centralized banquet/conference.	Grand atrium, monumental lobby, multiple F&B courts, large banquet halls.	Functional layout with banquet at podium, guest rooms in tower.	Use layered zoning: lobby arrival, podium banquet, stepped terraces, guest rooms stacked above.
Branding & Guest Profile	Leisure-luxury, lakeside tourism, high-end weddings.	Business + leisure mix, affordable luxury.	Ultra-luxury, global conferences, elite stays.	Regional gateway hotel—tourists + corporates.	Define brand positioning → eco-luxury lakeside hospitality, catering to both business + leisure.
Sustainability Approach	Basic landscape integration, not deeply passive.	Limited energy-efficiency; HVAC heavy.	LEED Platinum rated, strong green features (rainwater harvesting, solar, efficient HVAC).	Green landscape edges, emphasis on local materials.	Eco-conscious luxury: renewable energy, shaded glazing, natural ventilation, local finishes.
Material & Interiors	RCC + glazing + craft-based interiors.	RCC + glass façade, neutral interiors.	Stone cladding, marble, art-rich interiors.	Blend of glass + cultural motifs,	Use natural stone, earthy tones, and art installations tied
Event & Leisure Spaces	Infinity pool, spa, banquet halls, lawns.	Rooftop dining, banquet halls, fitness + pool.	Multiple grand banquet halls, convention center, luxury spa.	Large banquet + multipurpose hall, wellness amenities.	Provide multi-scale event spaces: lawns/terraces, large banquet for corporate gatherings.
Landscape & Outdoors	Lake-facing promenade, lawns.	Limited greens, rooftop terraces.	Courtyards, themed gardens.	Peripheral landscape, outdoor decks.	Step-terraces, ghats, shaded decks opening to lake—signature attraction.
Front Elevation					

INFERENCES:

1. THE ROOFTOP AND INFINITY POOLS:
Taking inspiration from the Taj Lakeview, where the architecture celebrates the lake through terraces and vantage points, our design extends this philosophy by introducing rooftop restaurants and infinity pools that open directly to panoramic vistas. While the Taj frames the shimmering Bhopal lake, our design also embraces the Van Vihar National Park, allowing guests to experience the lush green canopy and the rich wildlife heritage of the city from elevated decks.



2. THE PUNCTURE IN THE BUILDING BLOCK:
Inspired by the Radisson Blu Guwahati, where architecture integrates open voids and landscaped edges to bring nature into the built form, our design introduces a cut-out within the building block that functions as an elevated open garden. This spatial pause not only breaks the mass of the structure but also creates a seamless connection to nature, allowing light, air, and greenery to flow deep into the interiors.



3. THE STEPPED PROGRESSION:
Drawing inspiration from the stepped pyramidal form of ITC Royal Bengal, our design explores the idea of gradual growth and progression through its ascending massing. The stepped profile not only creates a dynamic skyline presence but also symbolizes an architectural journey—rising stage by stage to represent evolution and continuity. Complementing this form, the large-volume interior spaces are designed to evoke a strong sense of grandness and stature, offering guests an experience that is both monumental and welcoming.



DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC: 5 STAR HOTEL

SHEET TITLE: COMPARITIVE ANALYSIS AND INFERENCES

SHEET NO: AR 002

Note:

Remarks:

Guide's signature:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

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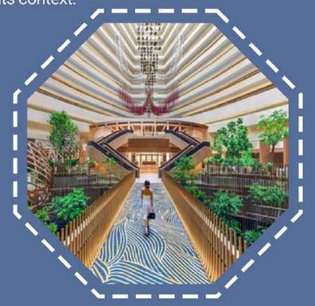
CONCEPT DESCRIPTION:

"BRIDGES TO THE SKIES"

It symbolizes the idea of creating a seamless connection between people, architecture, and nature. The vision is to craft a built environment where guests experience not just a stay, but a journey that elevates their senses towards openness, light, and greenery.

SKYBRIDGES AND OPEN SPACES:
Skybridges and open spaces, the design establishes dynamic linkages that connect various parts of the building while simultaneously framing breathtaking views of the skies and surrounding landscape. These skybridges act as experiential pathways, encouraging movement and discovery, while also becoming spaces of pause, interaction, and reflection.

ROOF TOP TERRACES AND SKY GARDENS:
The open spaces—be it terraces, green courts, or sky gardens—serve as natural breathing pockets that soften the built form and blur the boundary between the interior and the outdoors. Together, these elements create an architecture that is alive, immersive, and deeply connected to its context.





THEME DESCRIPTION:

MPT Hotels & Resorts weaves together Madhya Pradesh's rich cultural legacy and diverse natural beauty to offer guests authentic, immersive experiences. Whether situated amid colonial-era grandeur or wildlife-rich forests or serene rivers, each property invites travelers to discover the region's heritage, environment, and hospitality—crafted to suit seekers of history, spirituality, wellness, adventure, or comfort alike.



GREEN COVER:
The vegetation and the green cover, the beauty of MP's rich forest and wildlife is being complimented in the design.



LOCAL & TRIBAL ART :
As a hotel of MPT, it will celebrate the art and culture of Madhya Pradesh which will compliment the space.



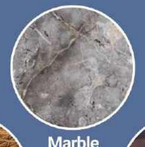
CULTURE:
This hotel and its design will also provide a positive platform for the promotion of MP's rich culture.

MATERIAL DESCRIPTION:

he project draws inspiration from Bhopal's vernacular materials, integrating their timeless aesthetic, climatic suitability, and cultural value into a contemporary hospitality setting. Locally available materials will be reinterpreted in modern forms—facades, jaalis, flooring, and decorative elements—while rooftop gardens and cutout spaces carry forward the tactile warmth of natural finishes. This approach not only roots the design in Bhopal's architectural heritage but also ensures sustainability, authenticity, and a strong connection to the region's identity. Some of the important materials that is going to be important for this design are as follows:


Stone


Terracota


Marble


Steel


Timber


Bamboo


Clay

SITE ZONING:

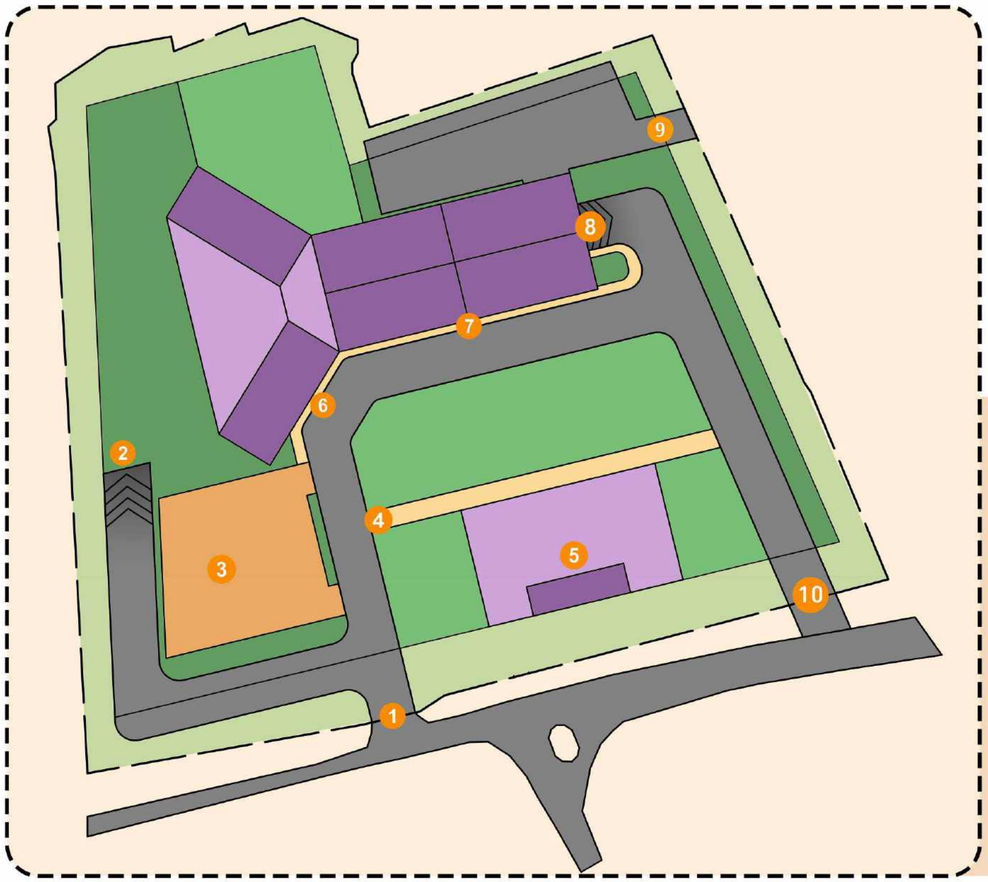
Site zoning organizes the hotel at the core, convention & banquet towards the frontage, themed restaurant as a landmark element, with parking and services strategically placed along the periphery.The site calculations helps us understand the space and area on site for our site zoning. The caluculation are as follows:

Site area: 7.16 Acres (28,975.5 sqmt)
Ground Coverage: 30% (8,692.5 sqmt)*
F.A.R : 2 *
Built up: 57, 950 sqmt

*information given by the Bhopal Vikas Adhiniyam

THE AREA STATEMENT:

Component	% of 8,692 sqm	Area (sqm)	Notes
5-star hotel (main block/tower footprint)	52%	4,520	Primary lobby, cores, the guest rooms, the tower rises above.
Convention hall (1,000 pax)	22%	1,912	Hall & parafunction edge; suits 1.0–1.5 sqm/pax planning at grade.
Themed restaurant (Bhopal rail coach)	6%	522	Coach & platform-style spill out, kitchen connect to BOH.
Outside parking (surface bays, drop-offs)	12%	1,043	Includes lay-bays, VIP/drop-off, aprons, pedestrian buffers.
Outdoor services (yards/utilities)	8%	695	Transformer yard, DG/setback, LPG bank, service court, ramps.
Total	100%	8,692	



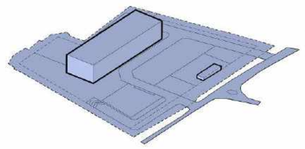
THE SITE LABELING:

1. Entrance to the Site
2. Entrance to the Basement
3. Outdoor Parking
4. Entrance to the Themed Restraunt
5. Themed Restraunt
6. Entry to the Extrenal Banquent hall
7. Entry to the Hotel
8. Exit to the Basement
9 Back Service Entry/ Exit
10. Exit to the Site

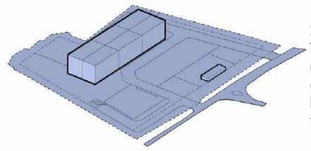
THE SITE LABELING:

- Major building
- Building footprint
- Footpath hardscape
- Outdoor Parking
- Site with setbacks
- Landscape with Public access
- Landscape for aesthetic purposes
- Roads

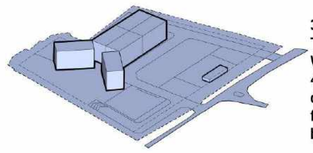
FORM EVOLUTION:



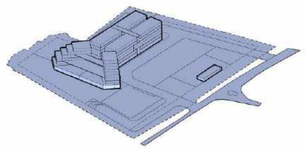
1.
The blocks are placed on the best position as it gets a good view vistas for the lakview and the city landscape.



2.
The bigger block is being divided in 6 parts as each block is going to have unique functionality.

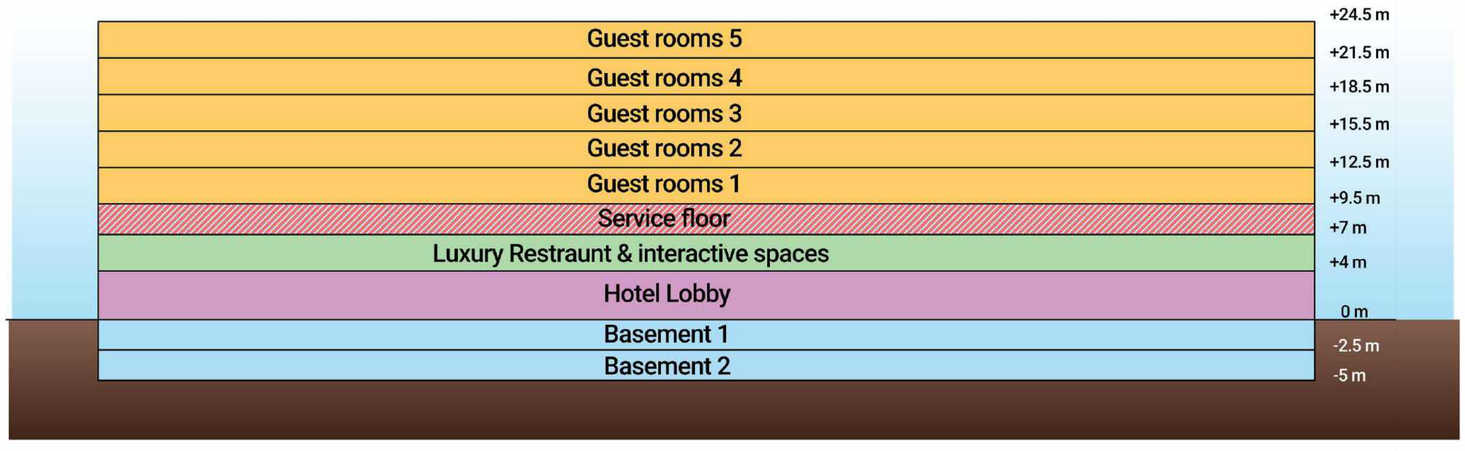


3.
Two block in the Western end is placed in 45 degrees diverging directions, to gather air flow inwards to the other blocks.



4.
Skybridges, open terrace gardens, and atriums are introducded in order to create a sense of gradure and openess.

VERTICLE ZONING:



DEPARTMENT OF ARCHITECTURE & PLANNING, MANIT BHOPAL

THESIS 2025

TOPIC: 5 STAR HOTEL

SHEET TITLE: CONCEPT & FORM EVOLUTION

SHEET NO: AR 003

Note:

Remarks:

Guide's signature:

Guided By:
AR. BULBUL SHUKLA

Project by:
SINJCHANDO TARASH HEMBRAM
211110227

MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY - BHOPAL
विद्या परं भूषणं