THESIS REPORT ON

INTERSTATE BUS TERMINAL DIGHA, BIHAR

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF:

BACHELOR OF ARCHITECTURE

BY

RITESH KUMAR YADAV
1180101038

THESIS GUIDE

AR. SAILESH YADAV

SESSION

2022-2023

TO THE

SCHOOL OF ARCHITECTURE AND PLANNING

BABU BANARASI DAS UNIVERSITY

LUCKNOW.

SCHOOL OF ARCHITECTURE AND PLANNING

BABU BANARASI DAS UNIVERSITY, LUCKNOW (U.P.).

CERTIFICATE

I hereby recommend that the thesis entitled **INTERSTATE BUS TERMINAL DIGHA, BIHAR** under the supervision, is the bonafide work of the students and can be accepted as partial fulfillment of the requirement for the degree of Bachelor's degree in architecture, school of Architecture and Planning, BBDU, Lucknow.

Prof. Mohit Kumar Agarwal Dean of Department	Prof. Sangeeta Sharma Head of Department

Recommendation Accepted

Not Accepted

External Examiner	External Examiner

BABU BANARASI DAS UNIVERSITY, LUCKNOW (U.P.).

Certificate of thesis submission for evaluation

1. **Name** : **RITESH KUMAR YADAV**
2. **Roll No.** : **1180101038**
3. **Thesis Title** **INTERSTATE BUS TERMINAL DIGHA, BIHAR**
4. **Degree for which the thesis is submitted: B.ARCH**
5. **Faculty of University to which the thesis is submitted:** **Yes / No**
6. **Thesis preparation guide was referred to for preparing the thesis.** **Yes / No**
7. **Specification regarding thesis format have been closely followed.** **Yes / No**
8. **The content of the thesis have been organized based on the guidelines.** **Yes / No**
9. **The thesis has been prepared without resorting to plagiarism** **Yes / No**
10. **All the sources used have been cited appropriately** **Yes / No**
11. **The thesis has not been submitted elsewhere for a degree.** **Yes / No**
12. **Submitted 3 hard bound copied plus one CD** **Yes / No**

…….....
(Signature(s) of the supervisor)
Name:

…….....
(Signature of the Candidate)
Name: RITESH KUMAR YADAV
Roll No.: 1180101038

This page has been intentionally left blank...

ACKNOWLEDGEMENT

The completion of this thesis project has been one of the most significant academic challenges I have ever taken. I would like to acknowledge some people who have helped me throughout in accomplishing the Thesis Project.

At this moment of accomplishment, first of all I would like to thank my Thesis Guide, Ar. SHAILESH YADAV. This work would not have been possible without his guidance, support and encouragement. Under her guidance, I successfully overcame many difficulties and learned a lot. His valuable suggestions helped me to make my work better.

Heartiest thanks to my friends **HITESH MOTIWALA** and **ANVIT GUPTA,DEVANSH JAIN** for their constant support helped me to improve my work, with their suggestions and encouragement.

I would never have been able to finish my Thesis without the support of my seniors AR. ABHISHEK BANERJEE and Ar. TANEESHA SINGH for all the support through out this thesis.

Regards
RITESH KUMAR
YADAV
1180101039
B. Arch. V Year.

DEDICATION

This research endeavour is dedicated to my family who have graciously supported me all the way through this entire process. Without their motivation, support and sustained help, this effort would not have been achievable. I would like to dedicate this to my parents who laid the foundation by inculcating in me the principles, ethics and discipline that have served me well in all aspects of life.

I proffer a special thank you to each.

ABSTRACT

This research is on **INTERSTATE BUS TERMINAL DIGHA, BIHAR** which includes case studies on bus terminal . The casestudies are of two bus terminal who are totally different from each other that is based on vertical planning. The main motive of my design is how we can do landcaping and to understand movement . The literature study is also done. Study of plans and sections of terminal is done in the research.

After doing so much study on terminal . I have implemented my own design along with my own concept. The concept is melting of ice cube and my theme is art barli is an early tenth century art movement which brought western painting and sculptures. Tried to combine few cubes together to built up the form. Form is centered on the dissolution and reconstitution of three- dimensional form, using simply geometry.angular forms are also thus created to connect the space. In this way design is implemented and planning is done keeping in mind the comfort of the user and also keeping in mind the environmental conditions.

C O N T E N T S

INTERODUCTION

TRANSPORTATION IS AN INTEGRAL PART OF THE FUNCTIONING OF THESOCIETY. THE TRANSPORT SYSTEM IMPROVES THE SOCIAL, ECONOMIC.INDUSTRIAL, COMMERCIAL PROGRESS AND TRANSFERS THE SOCIETY INTO AN ORGANIZED ONESITISONE OF THE MOST ESSENTIAL SERVIERS. VITALFORCE FOR DETERMINING THE DIRECTION OF DEVELOPMENT. TO ACHIEVETHE DESIRCO TRANSPORTATION BALANCE AND THE SYSTEM TO PREFFICIENT. ITS ESSENTIAL TO PROVIDE ORGANIZED FACICITIES IN THESYSTEM, ONE SUCH FACILITY IS A BUS TERMINAL.AS TRANSPORTATION INVOLVES THE MOVEMENT OF THE PEOPLE ANDGOODS, THERE IS A NEED OF AN "ACCESS POINT" IN TRANSPORT SYSTEM TO USE IT. THESE ACCESS POINTS ARE KNOWN AS TERMINALS OR THE FIXED FACILITIES. TERMINALS ARE ONE OF THE MAIN COMPONENTS OF ANYMODE OF TRANSPORTATION.

NEED AND SCOPE:

NESO OF THE TERMINAL ARISES WITH INCREASE IN the DEMAND ANORGANIZED RISTERMINA SHOULO MEET THE FOLLOWING° REQUIREMENTS

- ACCESSBILITY
- COMFORT AND CONVENIENCE

SITE ANALYSIS

BIHAR : THE STATE

•**Bihar** is a state considered to be a part of Eastern as well as Northern India.

•It is the 13th-largest state of India, with an area of 94,163 km^2 (36,357 sq mi) and the third-largest state of India by population.

•It is bordered by Uttar Pradesh to its west , Nepal to the north, the northern part of West Bengal to the east, with Jharkhand to the south.

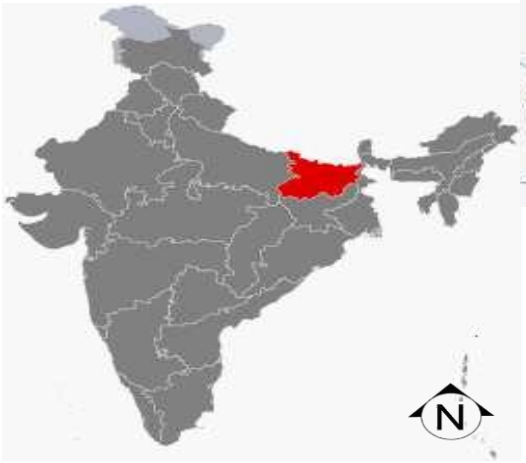
•The city of Patna is its capital as well as the largest city of the state.

• The state is an amalgamation of three main distinct regions, these are Magadh , Mithila and Bhojpur.

1. City of Patna

2. City of Muzaffarpur

3. City of Madhubani



5. City of Gaya

4. City of Buxar

NAME: RITESH KUMAR YADAV **ISBT** GUIDANCE BY: AR. SHAILESH KUMAR YADAV

PATNA – THE CITY

Patna is the capital and largest city of the state of Bihar in India. Patna is the second-largest city in eastern India after Kolkata. It had an estimated population of 1.68 million in 2011, making it the 19th largest city in India. With over 2 million people, its urban agglomeration is the 18th largest in India. Patna also serves as the seat of Patna High Court.

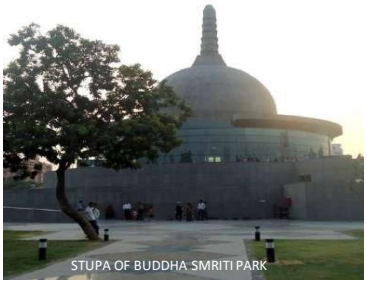
One of the oldest continuously inhabited places in the world. Patna was founded in 490 BCE by the king of Magadha. Ancient Patna, known as Pataliputra, was the capital of the Magadha Empire under the Haryanka, Nanda, Mauryan, Shunga, Gupta and Pala empires. Pataliputra was a seat of learning and fine arts. Patliputra was home to many astrologists and scholars including Aryabhata, Panini, Vātsyāyana, Chanakya and Kālidāsa. Its population during the Maurya period (around 300 BCE) was about 400,000. Patna served as the seat of power, political and cultural centre of Indian subcontinent during the Maurya and Gupta empires. With the fall of Gupta Empire, Patna lost its glory. It was revived again in 17th century by the British as a centre of international trade. Following the partion of Bengal presidency in 1912, Patna became the capital of Bihar and Orissa province.

BUILDINGS IN PATNA


PATNA MUSEUM

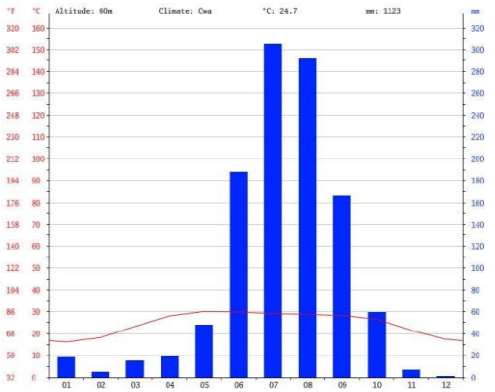

STATUE OF MAHATMA G. IN GANDHI MAI


SKYLINE NEAR GANDHI MAIDAN

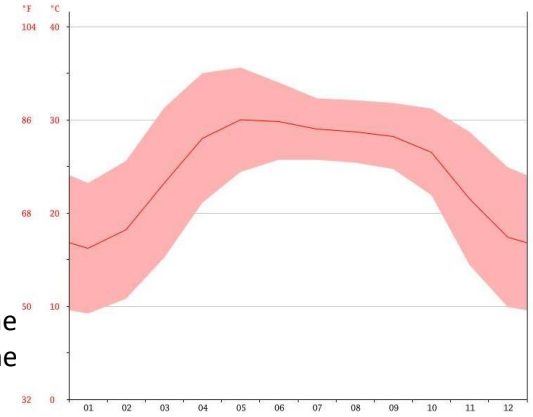

STUPA OF BUDDHA SMRITI PARK

CLIMATE STUDY

- The climate here is mild, and generally warm and temperate.
- When compared with winter, the summers have much more rainfall.
- The average annual temperature in Madhubani is 24.7 °C. The rainfall here averages 1123 mm.
- The cold weather commences early in November and comes to an end in the middle of March.
- The climate in the October and November is pleasant.
- The days are bright and warm and the sun is not too hot.
- As soon as the sun sets the temperature falls and the heat of the day yields place to a sharp bracing cold.
- The temperature in Winter all over Bihar varies from 0–10 °C.
- December and January are the coldest month in Bihar.
- The hot weather sets in March and lasts until the middle of June.
- The highest temperature is often registered in May which is the hottest month in the state.
- Like the rest of the northern India, Bihar also experiences dust-storms, thunder-storms and dust-raising winds during the hot season.
- Dust storms having a velocity of 48–64 km/hour are most frequent in May and with second maximum in April and June.
- The hot winds (loo) of Bihar plains blow during April and May with an average velocity of 8–16 km/hour.
- This hot winds greatly affects human comfort during this season.
- Soon after Mid June this the rainy season commences and continues till the end of September, the beginning of this season occurs when a storm from the Bay of Bengal passes over Bihar.
- The commencement of monsoon may be as early as the last week of May or as the first or second week of July.
- The rainiest months are July and August.



Climate Chart, Bihar, India



Temperature Chart, Bihar, India

CLIMATE STUDY

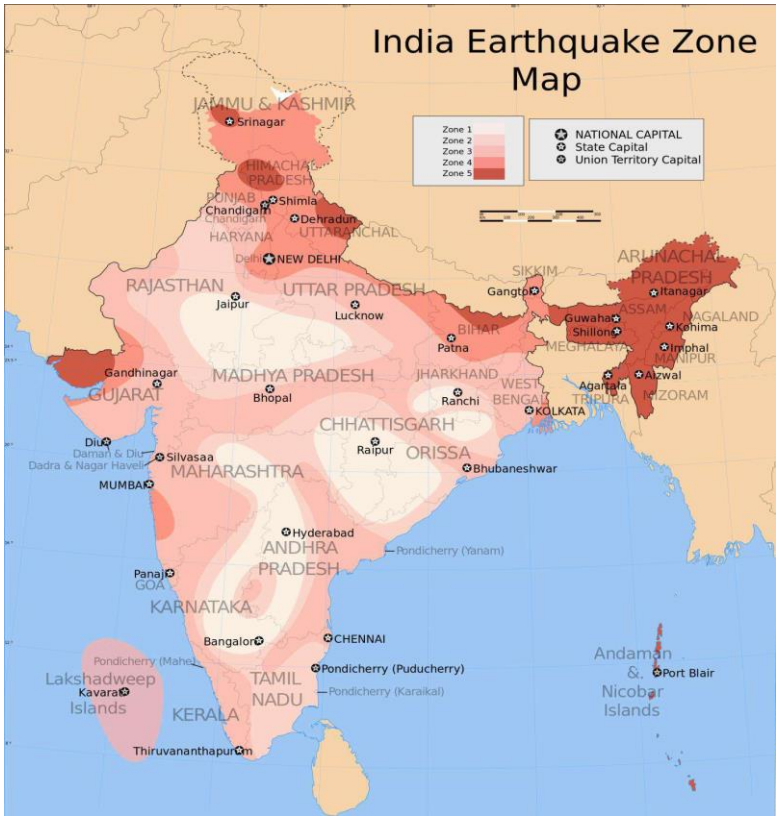
PATNA HAS A HUMID SUBTROPICAL CLIMATE UNDER THE KÖPPEN CLIMATE CLASSIFICATION: (CWA)(KÖPPEN CLIMATE CLASSIFICATION IS ONE OF THE MOST WIDELY USED CLIMATE CLASSIFICATION SYSTEMS. IT WAS FIRST PUBLISHED BY RUSSIAN GERMAN CLIMATOLOGIST WLADIMIR KÖPPEN IN 1884.) WITH EXTREMELY HOT SUMMERS FROM LATE MARCH TO EARLY JUNE, THE MONSOON SEASON FROM LATE JUNE TO LATE SEPTEMBER AND CHILLY WINTER NIGHTS AND FOGGY OR SUNNY DAYS FROM NOVEMBER TO FEBRUARY HIGHEST TEMPERATURE EVER RECORDED WAS 46.6 °C (115.9 °F), IN THE YEAR 1966, THE LOWEST EVER WAS 1.1 °C (34 °F), ON 9 JANUARY 2013, AND HIGHEST RAINFALL WAS 204.5 MM (8.05 IN), IN THE YEAR 1997.

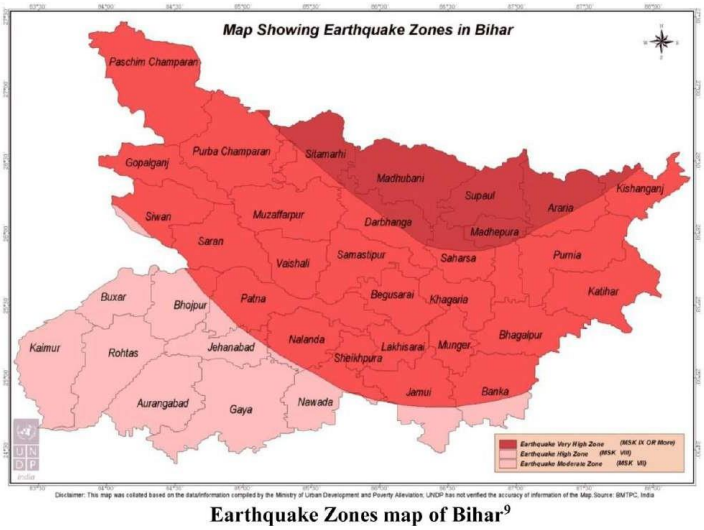
Climate data

Climate data for Patna [hide]													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	30.0 (86)	35.1 (95.2)	41.4 (106.5)	44.6 (112.3)	45.6 (114.1)	46.6 (115.9)	41.2 (106.2)	39.7 (103.5)	37.5 (99.5)	37.2 (99)	34.1 (93.4)	30.5 (86.9)	46.6 (115.9)
Average high °C (°F)	23 (73)	26.1 (79)	32.4 (90.3)	37.4 (99.3)	38.4 (101.1)	36.7 (98.1)	32.9 (91.2)	32.5 (90.5)	32.2 (90)	31.7 (89.1)	28.9 (84)	24.6 (76.3)	31.4 (88.49)
Daily mean °C (°F)	16.2 (61.2)	18.9 (66)	24.4 (75.9)	29.8 (85.6)	31.8 (89.2)	31.7 (89.1)	29.5 (85.1)	29.3 (84.7)	28.8 (83.8)	26.7 (80.1)	21.9 (71.4)	19.7 (67.5)	25.3 (77.5)
Average low °C (°F)	9.3 (48.7)	11.6 (52.9)	16.4 (61.5)	22.1 (71.8)	25.1 (77.2)	26.7 (80.1)	26.1 (79)	26.1 (79)	25.3 (77.5)	21.6 (70.9)	14.8 (58.6)	10.1 (50.2)	19.6 (67.28)
Record low °C (°F)	1.1 (34)	3.4 (38.1)	8.2 (46.8)	13.3 (55.9)	17.7 (63.9)	19.3 (66.7)	21.1 (70)	20.5 (68.9)	19.0 (66.2)	12.0 (53.6)	7.7 (45.9)	2.2 (36)	1.1 (34)
Average precipitation mm (inches)	15.2 (0.598)	11.1 (0.437)	11.4 (0.449)	9 (0.35)	35.6 (1.402)	133.5 (5.256)	302.4 (11.906)	266.3 (10.484)	194.7 (7.665)	24.6 (0.969)	8.2 (0.323)	7.4 (0.291)	1,019.4 (40.13)
Average rainfall mm (inches)	12.2 (0.48)	14.1 (0.555)	09.4 (0.37)	10.8 (0.425)	38.1 (1.5)	142.5 (5.61)	381.0 (15)	281.6 (11.087)	229.3 (9.028)	78.6 (3.094)	8.7 (0.343)	7.0 (0.276)	1,213.3 (47.768)
Average rainy days	1.3	1.2	0.7	1.0	2.7	6.5	14.9	12.8	10.2	3.3	0.6	0.7	55.9
Source #1: India Meteorological Department (Period 1901–2000, record high and low up to 2010)[69][70] (rainfall 1971-2000[71]													
Source #2: worldweather.org[72]													

NAME: RITESH KUMAR YADAV **ISBT** GUIDANCE BY: AR. SHAILESH KUMAR YADAV

SEISMIC ZONE



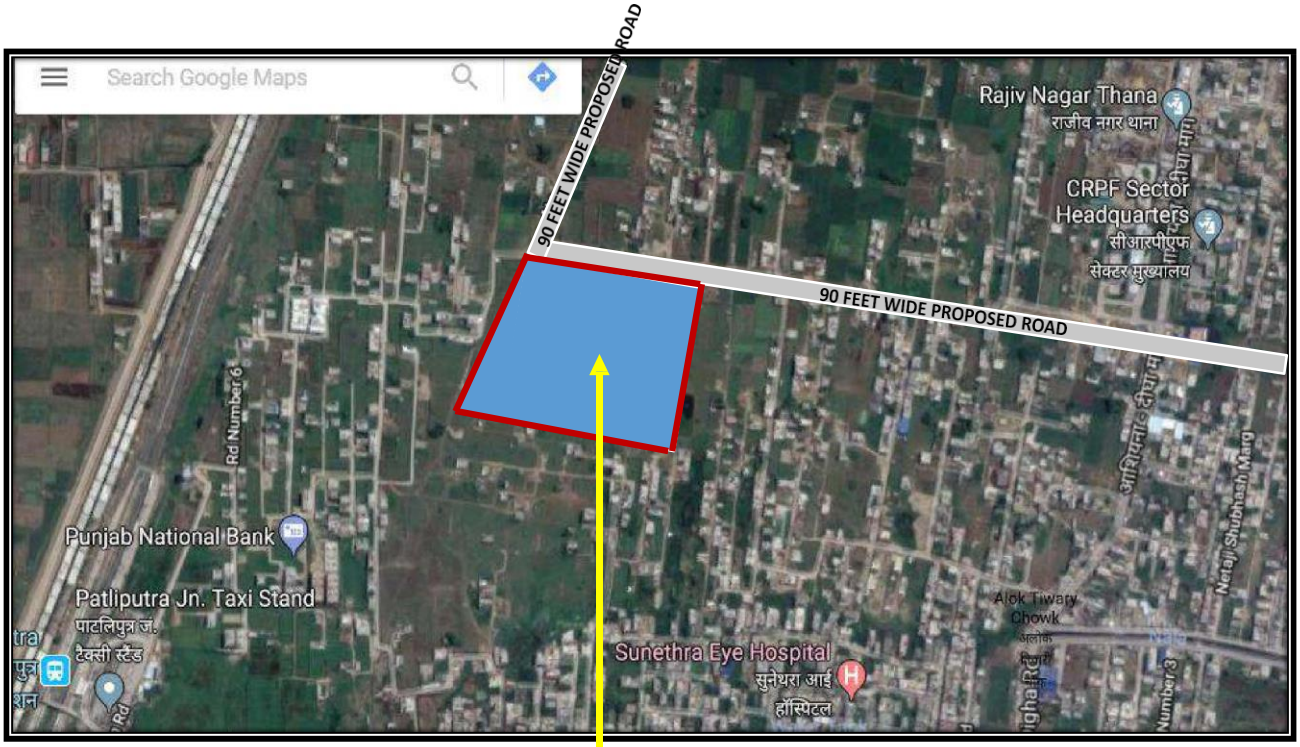


Earthquake Zones map of Bihar[9]

SEISMIC ZONE MAP AS PER IS 1893(PART-1) 2002

NAME: RITESH KUMAR YADAV **ISBT** GUIDANCE BY: AR. SHAILESH KUMAR YADAV

SITE STUDY



N

ISBT, DIGHA

PROPOSED LAND FOR ISBT, DIGHA, PATNA
SITE AREA=20.4413 ACRES (82723.0 SQ.MTS)

NAME: RITESH KUMAR YADAV

ISBT

GUIDANCE BY: AR. SHAILESH KUMAR YADAV

SITE CURRENT CONDITIONS






NAME: RITESH KUMAR YADAV **ISBT** GUIDANCE BY: AR. SHAILESH KUMAR YADAV

SITE CURRENT CONDITIONS

NAME: RITESH KUMAR YADAV

ISBT

GUIDANCE BY: AR. SHAILESH KUMAR YADAV

User Premises	Activity Permitted	Development Controls
ISBT	All facilities related to Bus & Passengers, parking including watch ward, Bus Terminal, Soft Drink & Snack Stall, Administrative Office, hotel.	a. **Ground coverage: 25% &** b. **FAR: 100,** subject to the following 1. FAR shall be available on a **maximum area of 10 ha.** or area of site whichever is less. 2. ISBT, including operational structures **Maximum FAR 70** 3. Hotel/ passenger accommodation and facilities **Maximum FAR 30.** c. **Parking:** In addition to the requirement of parking for ISBT/buses, parking for Hotel/ passenger accommodation and facilities shall be **at the rate of 2 ECS per 100 Sq. M. of floor area.** d. The development shall be undertaken in a **composite manner.**
The F.A.R. is to be calculated on the Building Plot. Area under Bus Shelter not to be included in FAR.		

Planning Norms for Informal Shops

S. No.	Use Zones/ Use Premise	No. of Informal Shops/ Units
1	Bus Terminal	1 Unit for Two Bus Bay

CASE STUDY 1 – MAHARANA PRATAP INTERSTATE BUS TERMINAL

THE MAHARANA PRATAP INTER-STATE BUS TERMINAL OR MMTC AT KASHMERE GATE IS THE OLDEST AND THE LARGEST IN INDIA CATERING TO BUSES FROM DELHI AND SIX OTHER STATES I.E. HARYANA, PUNJAB, HIMANCHAL PRADESH, JAMMU AND KASHMIR, UTTAR PRADESH AND RAJASTHAN. KASHMERE GATE IS LOCATED IN NORTH DELHI IN THE OLD DELHI AREA IN CLOSE VICINITY TO THE RED FORT AND THE OLD RAILWAY STATION.

ARCHITECT - V.P. DHAMIJA & RAJINDER KUMAR
COMPLETED - 1973
SITE AREA - 53,126 SQM.
RENOVATION - SIKKA ASSOCIATES

LOCATION

MAHARANA PRATAP INTER-STATE BUS TERMINUS AT MEETING POINT OF TWO NH-1 AND NH-24 (N-28 DEGREE.48' & E-77 DEG.13')

SERVICES

CHILLER PLANT- A CHILLER PLANT IS PROVIDED NEAR THE ARRIVAL BLOCK IN THE SITE WHICH IS USED ONLY FOR ISBT THERE ARE THREE COOLING TOWERS OF 250 TR. EACH.
LT PANEL ROOM WAS PROVIDED IN THE CHILLER PLANT FOR AC HANDLING.

ELECTRIC SUBSTATION – 11KV ELECTRIC TRANSFORMER IS PROVIDED FOR ELECTRICITY.

DIESEL GENERATOR – 75 KVA DIESEL GENERATOR IS PROVIDED FOR BACKUP.

SEWAGE TREATMENT PLANT – STP IS ALSO PROVIDED WHICH IS USED FOR IRRIGATION PURPOSE, IN FLUSHING WATER AND CHILLER PLANT.

GARBGE DUMP AREA – THERE IS SEPARATE AREA PROVIDED FOR DUMPING GARBAGE INSIDE THE COMPLEX ITSELF NEAR THE EXIT OF BUSES.

A.C. DUCTS – VERTICAL A.C DUCTS ARE PROVIDED IN WAITING AREA AT DEPARTURE BLOCK.
A.C. DUCTS ARE PROVIDED IN LONG BLOCK AT ENQUIRY COUNTER.

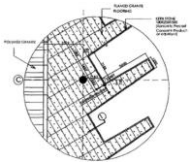
CHILLER PLANT

CIRCULATION AND MOVEMENT

1. AN EFFICIENT CIRCULATION PATTERN IS FOLLOWED IN THE ISBT THERE IS SEGREGATION OF BUSES AND OTHER LIGHT VEHICLES UE TO THE DIFFERENCE IN MOVEMENT CHARACTER.
2. THERE IS A SEPARATE ENTRY AND EXIT POINT FOR INTER-CITY AND LOCAL BUSES.
3. THERE IS APROPER SEGREGATION FOR VEHICULAR AND PEDESTRIAN MOVEMENT.

THERMAL COMFORT AND DAYLIGHTING

1. THE ENTIRE BUILDING IS QUITE COOL IN THE SUMMER BECAUSE IT IS HEAVILY LOUVERED ON ALL SIDES WHICH PREVENT THE DIRECT SUNLIGHT, PREVENTING DIRECT HEATING OF INTERNAL AREAS.
2. THE MASSIVE ROOF LIGHTS OVER THE DEPARTURE AREA AID IN NATURAL LIGHTING.
3. THE BUILDING BECOMES VERY CHILL IN THE WINTERS, SINCE IT IS OPEN ON ALL SIDES, AND THERE IS NO PROTECTION FROM THE COLD DRAUGHT.
4. SINCE THE LOADING AND UNLOADING AREAS ARE PARTIALLY COVERED, THIS LEADS TO A LOT OF THE POLLUTED AIR GETTING TRAPPED INSIDE TRAPPED INSIDE THE WAITING AREAS.



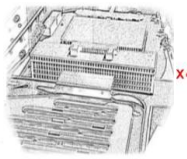
DESIGN PRINCIPLE

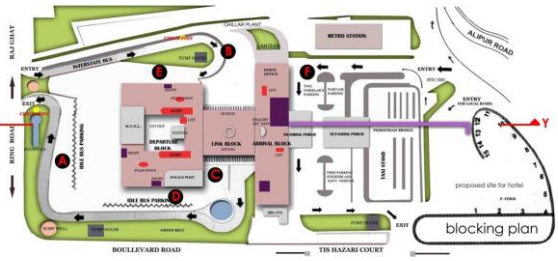
THERE IS A PROPER SEGREGATION FOR VEHICULAR AND PEDESTRIAN MOVEMENT, LOADING AND UNLOADING PLATFORMS, AND INCOMING AND PASSENGERS AT TWO LEVELS FOR SMOOTH FUNCTIONING.

STRUCTURAL SYSTEM

THE BUILDING IS A COLUMN BEAM BASED STRUCTURE, USECOFFERED SLAB TO ACHIEVE LARGE SPAN THEREBY
REDUCING THE NUMBER OF COULUM AND INCREASING THE FREE SPACE INSIDE.

SITE AMENITIES





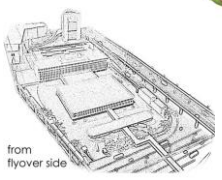
64 BAYS WITH 1800-2000 DEPARTURES/DAY.
1.5 LAC. ON AVERAGE PUBLIC/DAY.
UNDERGROUND WATER TANK.
SEPERATE SEWAGE TREATMENT AND RAIN WATER TREATMENT PLANTS.
CHILLAR PLANT.
TEMPORARY CANTEENS.
PUBLIC AND STAFF PARKING.

FLYOVER SIDE:-
1 POLICE POST
4 FOOD COURT
4 SHOPS.
BOMB SQUAD DEPARTMENT
CRIME INVESTIGATION DEPARTMENT OFFICE.
CONSUMER COURT.

METRO SIDE :-
4 RESTAURANT
FOOD COURT

FRONT SIDE :-
DELHI ADMINISTRATIVE

GAS SERVICE OFFICE.



RITESH KUMAR YADAV
1180101038

CASE STUDY 2 – MEERUT BUS TERMINUS

INTRODUCTION

THE MEERUT BUS TERMINUS IS ALSO KNOWN AS DELHI BUS STAND. IT CATERS THE BUSES OF MAXIMUM NUMBER OF STATES OF NORTH INDIA AND DELHI NCR. IT WORKING SINCE 1956.
UTTAR PRADESH, RAJASTHAN, UTTRANCHAL, PUNJAB, DELHI NCR.
IT CATERS UPTO 1200 DEPARTURES AND FOOTFALL OF 60-70 THOUSAND PASSENGERS IN A DAY.
PEAK HOUR-6000.
IT IS HAVING ONE OF THE LARGEST DEPOT IN UTTARPRADESH OF 6.5 ACRES.
TOTAL AREA IS 10 ACRE.

LOCATION

IT LIES ON NH-119 (DELHI ROAD)-45 M WIDE, THAPAR NAGAR, MEERUT.
(N-28 DEG.59' & E-77 DEG.41')
IT IS ABOUT 5 KMS AWAY FROM CITY RAILWAY STATION AND 3 KMS FROM MEERUT CANTONMENT.
IT IS ABOUT 0.5 KMS FROM BEGUM PUL WHICH IS THE MAIN INDUSTRIAL JUNCTION OF THE CITY.

DESIGN PRINCIPLE

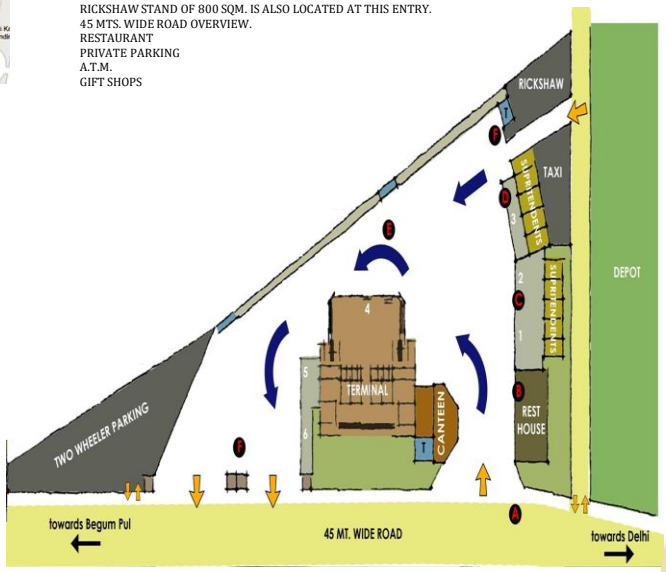
THE PEDESTRIAN MOVEMENT ARE TRIED TO BE SEGREGATED FROM VEHICULAR MOVEMENT.

ON SITE

6 PLATFORMS FOR PASSENGERS TO WAIT FOR BUSES OF DIFFERENT STATE
90 DEG. PARKING
TOILETS FOR GENERAL PUBLIC (PAID/FREE).
UNDERGROUND WATER TANK.
TWO WHEELER PARKING (1000 NOS.)
FOUR WHEELER PARKING IS MISSING AND CARS ARE BEING PARKED ON ENCHROACHED AREAS.
MAIN TERMINAL BUILDING.
RESTROOM FOR BUS AND TERMINAL STAFF.
RICKSHAW STAND.
BUS DEPOT.
SHOPS AND A CANTEEN.

ON SITE

THE SITE IS ALMOST TRIANGULAR IN SHAPE AND IS SEPERATED FROM DEPOT WITH A 8M. WIDE SERVICE ROAD. (TOTAL AREA = 10 ACRE)
THE BUILDING IS EAST-WEST ORIENTED WITH A BUILTUP AREA OF 4000 SQM.
THE ENTRY AND EXIT ARE FROM THE NH-119 TOWARDS WEST WHICH IS 45M. WIDE TWO WAY ROAD.
THE DEPOT IS ON THE SOUTH SIDE.(AREA = 6.67 ACRE)
THE TWO WHEELER PARKING IS ON THE NORTH SIDE FOR 1000 TWO-WHEELER. (AREA=1500 SQM.)
BUS PARKING = 70 AT TERMINAL + 156 AT DEPOT.
TOWARDS EAST IS THE NATIONAL INSTITUTION OF PERFORMING ART.
ON OPPOSITE SIDE OF NH-119 THERE ARE PRIVATE RESTAURANT AND HOTELS FOR THE PASSENGERS.
THERE IS ALSO AN ENTRY TO TERMINAL FOR BUSES FROM DEPOT ON THE THE SOUTH SIDE.
RICKSHAW STAND OF 800 SQM. IS ALSO LOCATED AT THIS ENTRY.
45 MTS. WIDE ROAD OVERVIEW.
RESTAURANT
PRIVATE PARKING
A.T.M.
GIFT SHOPS



RITESH KUMAR YADAV
1180101038

CASE STUDY 2 – MEERUT BUS TERMINUS

WAITING AREA

THERE ARE DIFFERENT WAITING AREAS FOR PASSANGER ON DIFFERENT PLATFORMS, BUT THE MAIN WAITING AREA WITHIN THE COMPLEX IS 500 SQM. COVERED BY DOUBLE HEIGHTENED TEMPORARY ROOF. WAITING AREAS ARE EQUIPPED WITH BENCHES AND ENQUIRY COUNTERS.

TICKET COUNTERS

THERE ARE 8 TICKET COUNTERS OF 6 SQM EACH.
THE TICKETS ARE ALSO BEEN ISSUED NEAR THE BUS ALSO.

ENQUIRY COUNTERS

THERE ARE 2 ENQUIRY COUNTERS OF 4 SQM. EACH.
WHEELCHAIRS ARE PROVIDED FOR HANDICAPPED.

ADMINISTRATION

450 SQM. AREA IS BEEN ALLOTED TO ADMINISTRATION WHICH INCLUDES OFFICES OF ARM, STATION SUPERITENDANT, 2 SSI, 4 JSI.

TOILETS

50 SQM. AREA IS BEEN ALLOTED TO TOILETS ARE MALE/FEMALE SEPERATED. THESE TOILETS ARE
SHARD BETWEEN ADMINISTRATION AND CANTEEN.

SHOPS

THERE ARE SHOPS EHICH INCLUDES AN ATM, ANDD EATERIES.

RESTAURANT/ CANTEEN

260 SQM. IS FOR RESTAURANT IN WHICH KITCHEN AREA IS 100 SQM.

SERVICES

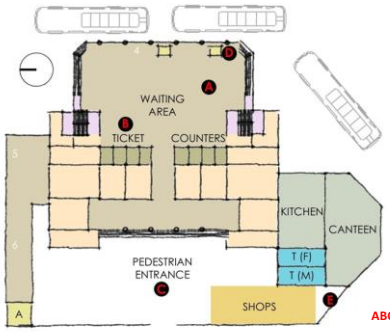
2 STAIRCASE OF 25 SQM. EACH ARE AN OPPOSITE SIDES OF THE TERMINAL WHICH LEAADS TO FIRST FLOOR TO RESTROOMS FOR PASSENGER.
A 10000 L. CAPACITY WATER TANK IS INSTALLED ON TERRACE FOR DRINKING/WASHING.

RESTROOMS

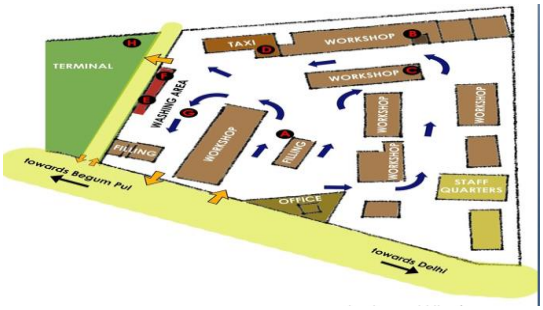
150 BEDED TOTAL 550 SQM. AREA IS FOR DORMITORIES FOR PASSENGERS.
THERE ARE 4 DOMINTORIES WITH TWO COMMON TOILETS ADJACENT TO CORRIDOR

STRUCTURES

ALL PLATFORMS AND BUSES SHELTERS ARE COVERED WITH TRUSS SYSTEM.
THE ENQUIRY COUNTERS AND KIOSKS ARE IN HOUSE



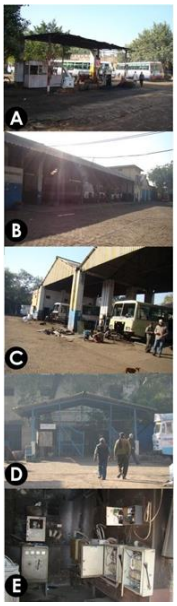
GROUND FLOOR PLAN



ABOUT

DIFFERENT MECHANICAL OPERATIONS ARE BEEN PERFORMED AT THE DEPOT-

- FOREMEN WORKSHOPS.
- STORE ACESSORIES.
-TYRES REPAIRING.
-BODY REPAIRING.
-FILING STATION.
-AUTOMATED WASHING PLANT.
-GENERATOR ROOM AND POWER MCB'S
-HIRED TAXIS FOR VIP & VVIP'S
-REGIONAL WORKSHOP
-OFFICE AREA (SENIOR ENGINEER, REGIONAL MANAGER, ASST. REGIONAL MANAGER)
-STAFF QUATERS
THE ENTANCE/ EXIT IS FROM NH- 119. THERE IS ALSO A DIRECT ACCESS TO THE
TERMINAL FROM NORTH SIDE SO THAT THE BUS COULD GO DIRECTLY UPTO THE PLATFORM AFTER BEING WASHED AND SERVICED.
THERE IS AFILLING STATION TO REFULE THE BUS.
A TAXI GARAGE ONLY FOR VIP'S AND VVIP'S SO THAT ANY MINISTER OR OFFICER COMING BY BUS COULD GET THE SERVICE OF TAXI.



RITESH KUMAR YADAV
1180101038

LITERATURE STUDY 1- VADODRA BUS TERMINAL

THE SITE AREA OF BUS TERMINAL AT VADODARA IS 22,325 SQMT AND BUILTUP AREA IS 1.8 TIMES THE SITE AREA (40,150 SQMT) AS IT ALSO INCORPRATES SHOPPING MALL. IT WAS INAUGURATED ON 14TH FEBUARY,2014 BY OUR PRIME-MINISTER SHREE NARENDRA MODI. RIGHT NOW , THE TERMINUS ALREADY HANDLES OVER 800 BUSES AND AS MANY AS 28,000 TO 35,000 PASSENGERS DAILY. IT IS BUILT UNDER A PUBLIC-PRIVATE PARTNERSHIP BETWEEN THE GUJRAT STATE ROAD TRANSPORT CORPORATION (GSRTC) AND REALTY FIRM CUBE CONSTRUCTION.

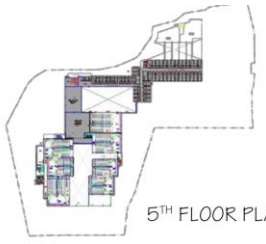
THE TERMINAL HAS 4 ACCESSES:

1ST IS FOR BUS ENTRY
2ND IS FOR BUS EXIT
3RD IS FOR PUBLIC ENTRY DIRECTLY TO THE TERMINAL
4TH IS THROUGH THE SHOPPING AREA

THE SITE IS WEST FACING AND ROAD WIDTH IS 18M. RAILWAY STATION IS LOCATED JUST OPPOSITE TO THE ACCESS ROAD (0.2 KM) AND AIRPORT IS 5.2KM AWAY FROM THE BUS TERMINUS.

CENTRAL BUS STATION, VADODARA

4TH FLOOR PLAN



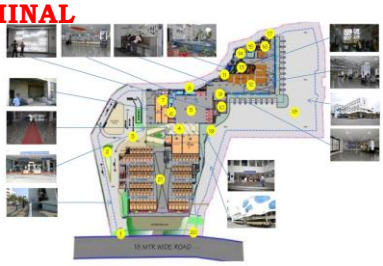
5TH FLOOR PLAN

BUILDING IS BASED UPON R.C.C. FRAME STRUCTURE. THE PATHWAYS ARE COVERED WITH FERROCEMENT STRUCTURE. ITS FACADE IS INSPIRED BY BANYAN TREE.

THE OPENINGS ARE COVERED WITH FERROCEMENT STRUCTURE AND A BEAM IS PROVIDED THROUGH PLATFORMS TO STOP THE TYRE OF BUSES.

GLASS FACADE AT THE FRONT.

A CAFETERIA WITH SEATING FOR 15 PEOPLE IS THERE TO SERVE PEOPLE 24X7.

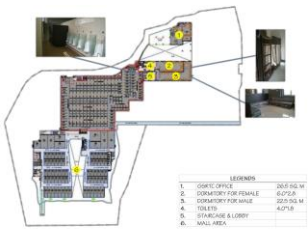


GROUND FLOOR PLAN

LEGENDS		
1.	PUBLIC ENTRANCE	4.5 MWIDE
2.	AUTO STAND	15 AUTOS
3.	DROP/PICKUP POINT	
4.	CORRIDOR	13.5*3
5.	TICKET GALLERY	8.0*8.0
6.	GUJARAT TOURISM CABIN	1.8*1.8
7.	SECURITY MANAGER	1.2*1.4
8.	TICKET COUNTER	6.0*1.2
9.	CLOAK ROOM	3.5*1.8
10.	MALE TOILET	3.5*4.5
11.	STAIRCASE	1 M WIDE
12.	WAITING + CIRCULATION AREA	90 SQ. M
13.	WATER BODY	6.5*2.5
14.	CAFETERIA	3.5*2.5
15.	PARCEL OFFICE	2.0*3.5
16.	FEMALE TOILET	2.5*1.8
17.	MALE TOILET	2.8*1.5
18.	CIRCULATION & PARKING SPACES FOR BUSES	425 SQ. M
19.	DROP POINT (BUS)	
20.	BUS ENTRANCE	5.5 M WIDE
21.	COMMERCIAL AREA	335 SQ. M

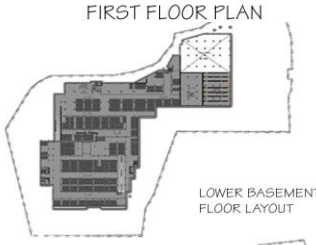
LEGENDS		
1.	GSRTC OFFICE	52 SQ. M
2.	1ST CLASS WAITING LOUNGE	6.0*2.8
3.	AHU ROOM	
4.	TOILETS	2.0*2.8
5.	GUEST ROOMS	36 SQ. M
6.	MALL AREA	

FIRST FLOOR PLAN



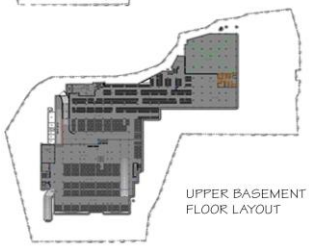
LEGENDS		
1.	GSRTC OFFICE	20.0 SQ. M
2.	DORMITORY FOR FEMALE	6.0*2.8
3.	DORMITORY FOR MALE	22.0 SQ. M
4.	TOILETS	4.0*1.8
5.	STAIRCASE & LOBBY	
6.	MALL AREA	

SECOND FLOOR PLAN



LOWER BASEMENT FLOOR LAYOUT

THIRD FLOOR PLAN



UPPER BASEMENT FLOOR LAYOUT

FEATURES OF BUS TERMINAL

1.	20 PLATFORMS
2.	10 IDLE BUS PARKING
3.	ENQUIRY COUNTER
4.	8 TICKET COUNTERS
5.	WAITING AREA FOR 200 PEOPLE
6.	CAFETARIA (24x7)
7.	CLOAK ROOM
8.	12 SHOPS
9.	MEDICAL SHOP
10.	TOURIST INFORMATION CABIN
11.	PARCEL OFFICE
12.	WATER BODY IN SEMI OPEN AREA
13.	GUEST ROOM DORMITORIES FOR 120 MALE & 80 FEMALE
14.	1st CLASS WAITING HALL FOR 200 PEOPLE
15.	ADMINISTRATIVE DEPARTMENT
16.	POTABLE WATER AREA
17.	TOILETS FOR MALE & FEMALE
18.	GSRTC OFFICE
19.	PARKING FOR 275 FOUR-WHEELERS & 400 TWO- WHEELERS
20.	AUTO STAND FOR 15 AUTOS

SITE SURROUNDINGS

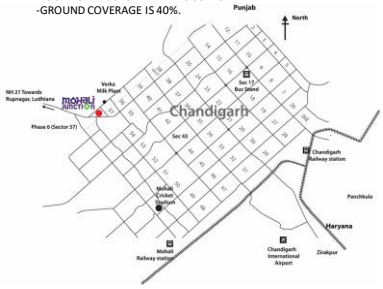
NORTH : COMMERCIAL SHOPS
EAST : MAHARAJA SAYAJIRAO UNIVERSITY
SOUTH : COMMERCIAL SHOPS/ FUEL FILLING STATION
WEST : ROAD(18M WIDE)

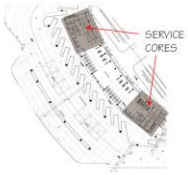
RITESH KUMAR YADAV
1180101038

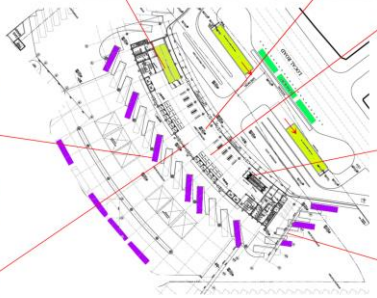
LITERATURE STUDY 2 – MOHALI BUS TERMINAL

THE FIRST OF ITS KIND BANDA SINGH BAHADUR INTERSTATE BUS TERMINAL MOHALI WAS ESTABLISHED
IN 2016. IT IS EQUIPPED WITH STATE OF THE ART FACILITIES. BANDA SINGH BAHADUR ISBT MOHALI HAS MANY BUILT IN FACILITIES FOR THE DAILY COMMUTERS.

-TRIANGULAR PLOT WITH A LAND PARCEL OF 7.02 ACRES.
- LOCATED ON THE MAIN NH-21 HIGHWAY.
-LOCATED ON THE GROWTH VECTOR OF CHANDIGARH TRI-CITY AREA.
-SURROUNDING AREA COMPLETELY DEVELOPED AND INHABITED.
-DENSE POPULATION IN THE CATCHMENT AREA.
-LOCATED IN SOUTH WESTERN CHANDIGARH TRI-CITY AREA WHICH IS THE MOST SORT AFTER PROPERTY IN THE REGION.
-FUTURE METRO LINE & STATION ADJIONING THE PROJECT.
-20 MINUTES DRIVE FROM THE NEW PROPOSED INTERNATIONALAIRPORT.
-LOCATION ENJOYS TERMENDOUS VISIBILITY.
-GROUND COVERAGE IS 40%.







FEATURES

1. 3 TOWERS ENJOY EXCELLENT VISIBILITY
   TOWER A : "C&C TERMINUS"
   TOWER B : "C&C ROYALE"
   TOWER C : "C&C CAPITAL"
2. INTER-CONNECTED AC SKY BRIDGES CONNECTING ALL TOWERS.
3. SEPARATE ENTRY AND EXIT TO ROADS ON ALL 3 SIDES.
4. 3 BASEMENT (1600 NO.) : AUTOMATED/STACK CAR PARKING SYSTEM.
5. STATE OF ART TECHNOLOGY USED IN CONSTRUCTION.
6. HIGH SPEED DEDICATED LIFTS AND ESCALATORS.

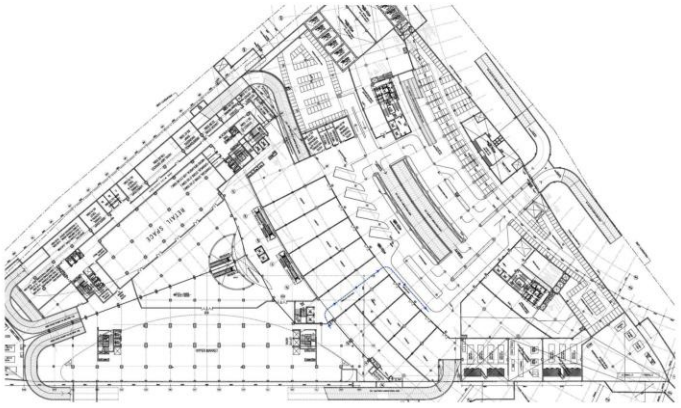
C&C TERMINUS :

COMPONENTS OF C&C TERMINUS ARE:
1. AC BUS TERMINUS
2. ENTERTAINMENT ZONE
3. 10 SCREEN MULTIPLEX BY CINEPOLIS

HIGHLIGHTS:

1. REGION'S FIRST STATE-OF-ART AC BUS TERMINUS BASED ON AN ACCLAIMED INTERNATIONAL CONCEPT.
2. REGION'S FIRST 10 SCREEN MULTIPLEX BY CINEPOLIS-WORLD'S 4TH LARGEST MULTIPLEX CHAIN.
3. A MULTI CUSINE FOOD CHAIN.
4. SHOPPING EXPERIENCE AT THE AMAZING ARRAY OF KIOSK SHOPS.
5. ENTERTAINMENT ZONE COMPRISING OF PUBS, LOUNGE, BOWLING, ALLEY ALL UNDER ONE ROOF OFFERS.
6. 2.5 AUTOMATED MULTI-LEVEL PARKING SPACE.

LANDMARK	APPROX. DISTANCE FROM SUBJECT SITE (IN KMS)
MOHALI RAILWAY STATION	14.0
SECTOR 17 – ISBT AND CBD	10.0
SECTOR 43 BUS STAND	5.0
PANCHKULA	18.0
MOHALI CRICKET STADIUM	7.0
PCA	9.0

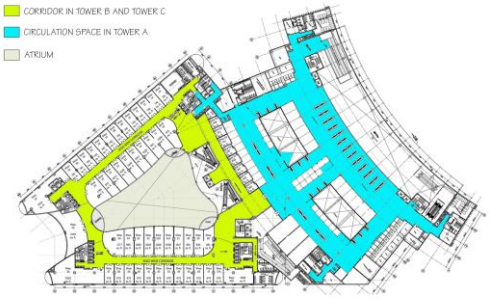


LOWER GROUND FLOOR PLAN PLAN

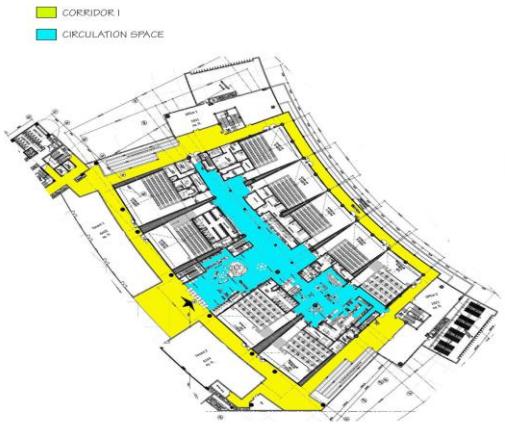
RITESH KUMAR YADAV
1180101038

LITERATURE STUDY 2 – MOHALI BUS TERMINAL

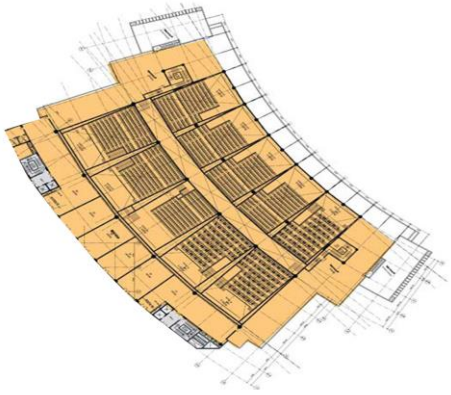
SECOND FLOOR PLAN



FIRST FLOOR PLAN



THIRD FLOOR PLAN

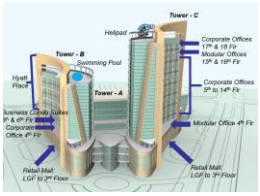


FOURTH FLOOR PLAN

SIDE VIEW

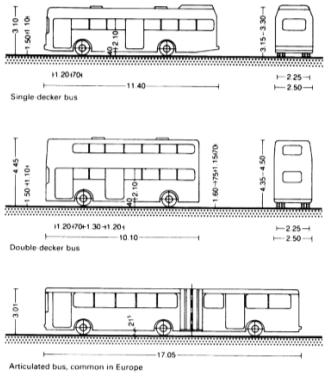
SERVICES

1. IT HAS SERVICE CORE ON BOTH ENDS OF THE BUILDING.
2. THERE ARE 4 LIFTS IN THE BUILDING, OUT OF WHICH 3 ARE PASSENGERS LIFT AND ONE IS SERVICE LIFT.
3. IT HAS TWO FIRE STAIRCASE AND 3 MT. WIDE RAMP ON THE RIGHT SIDE OF BUILDING WHUCH IS USED AS FIRE EXIT.
4. LT PANEL ROOM, HVAC PLANT ETC. ARE IN THE BASEMENT.
5. BMS SYSTEM IS INSTALLED IN THE BUILDING, ITS CONTROL ROOM IS IN GROUND FLOOR NEAR ESCALATOR.
6. TWO MALE AND TWO FEMALE TOILET PROVIDED.
   FEMALE TOILET – 5 WC AND 4 WB
   MALE TOILET – 6 URINNAL, 3 WC AND 5 WB.
7. ONE DISABLED TOILET IS PROVIDED.
8. ADMIN OFFICE AT LOWER GROUND FLOOR.
9. SPRINKLERS AND SMOKE DETECTORS ARE INSTALLED.
10. THERE ARE FIRE EXTINGUISHERS AND FIRE HOSEREEL AT EVERY FLOOR.
11. FOR LIGHTING THE CEILING IS EQUIPPED WITH LIGHTS ALL OVER IT.

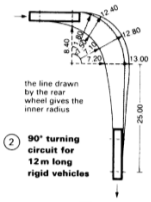


RITESH KUMAR YADAV
1180101038

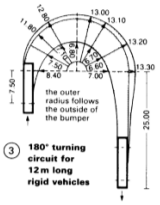
STANDARD STUDY



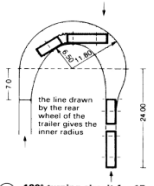
1 **Bus dimensions**



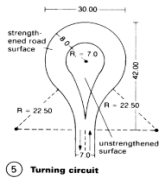
2 **90° turning circuit for 12 m long rigid vehicles**



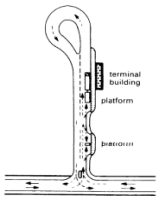
3 **180° turning circuit for 12 m long rigid vehicles**



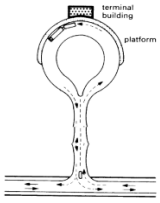
4 **180° turning circuit for 17 m long articulated vehicles**



5 **Turning circuit**



6 **Small turn-around station**



7 **Platform on the outside of the turning loop**

A- GROUND COVERAGE – 25%

B- FAR: 100 , SUBJECT TO THE FOLLOWING:
(i)FAR; SHALL BE AVAILABLE ON A MAXIMUM AREA OF 10 HA. OR AREA OF SITE WHICH IS LESS.
(ii) ISBT, INCLUDING OPERATIONAL STRUCTURES MAXIMUM FAR 70
(iii) HOTEL/PASSENGERS ACCOMODATION FACILITIES MAXIMUM FAR 30.

C- PARKING: IN ADDITION TO THE REQUIREMENT OF PARKING FOR ISBT/BUSED, PARKING FOR HOTEL/ PASSENGER ACCOMODATION AND FACILITIES SHALL BE AT THE RATE OF 2 ECS PER 100 SQ.M. OF FLOOR AREA.

D- BASEMENT(S) UPTO THE SETBACK LINE MAXIMUM EQUIVALENT TO PARKING AND SERVICES REQUIREMENT, SUCH A AIR-CONDITIONING PLANT AND EQUIPMENT, WATER STORAGE, BOILER, ELECTRIC SUB-STATION HT AND LT PANEL ROOMS. TRANSFORMERS COMPARTMENTS, CONTROL ROOMS, PUMP HOUSE, GENERATOR ROOMS AND OTHER MECHANICAL SERVICES AND INSTALLATION OF ELECTRICAL AND FIRE FIGHTING EQUIPMENTS, AND OTHER SERVICES COULD BE PERMITTED AND NOT TO BE COUNTED IN FAR. HOWEVER , THE AREA PROVIDED FOR SERVICES SHOULD NO

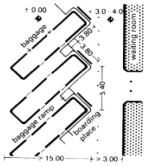
8 **Bus stop**

platform shape	without passing lane			with passing lane		
	Aa	Ab	Ac	Ba	Bb	Bc
layout of arrival line	parallel	at 45°	at 90°	parallel	at 45°	at 90°
platform length (m)	24	24	24	36–60	36–60	36–69
platform width (m)	3	3	3	3.5–4	3.5–4	3.5–4
number of loading points						
a) for buses	2	2	2	2–3	2–3	2–3
b) artic. buses	1	1	1	1–2	1–2	1–2
area of platform, roadway and arrival spur in m²						
a) for buses	138	176	189	293	296	313
b) artic. buses	276	340	378	439	444	470

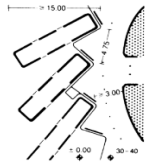
9 **Space requirement for platforms**

relation to line of arrival	parallel	at 45°		at 90°	
length of parking space (m)	32	12	24	12	24
parking options	1 artic. bus or 2 buses	1 bus	1 artic. bus or 2 buses	1 bus	1 artic. bus or 2 buses
width of parking space (m)	3.5	3.5	3.5	3.5	3.5
width of arrival lane (m)	4.0	8.0	8.0	14	14
parking area incl. roadway area in m²					
a) per bus	88	135	89	140	91
b) artic. bus	176		178		182

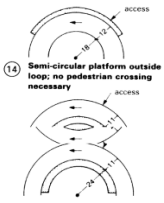
10 **Space for parking spaces**



11 **Standard interlocking layout**



12 **Radial layout providing more room at the front**



13 **Platform inside the turning loop**

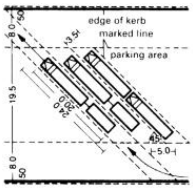
14 **Semi-circular platform outside loop; no pedestrian crossing necessary**

15 **Semi-circular platform inside loop; accessible only by crossing the road**

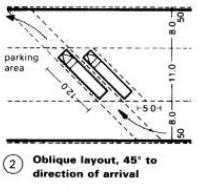
SPECIAL PROVISION HAS TO BE MADE FOR THE WIDENING OF CURVES TO MATCH THE TURNING CIRCLES OF BUSES= 2-15. BUS STOPS REQUIRE SHELTERS AND SPECIAL LAYOUTS.

RAMPS SHOULD BE PROVIDED AT THE FRONT TO ALLOW EASY ACCESS UPTO A 30-40 CM HIGH STEPS= 11-12

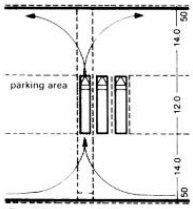
SHORTS-STAY CAR PARKING SPACE SHOULD BE INCORPORATED FOR PASSENGERS ON THE EDGE OF TOWNS (PARKS AND RIDE).



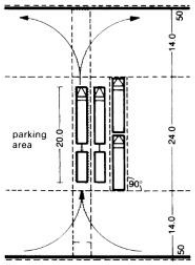
1 **Parking places for buses and articulated buses**



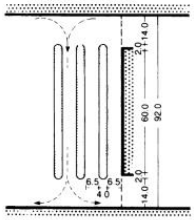
2 **Oblique layout, 45° to direction of arrival**



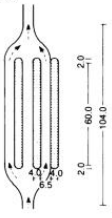
3 **Parking at right-angles to direction of arrival**



4 **For buses and articulated buses**

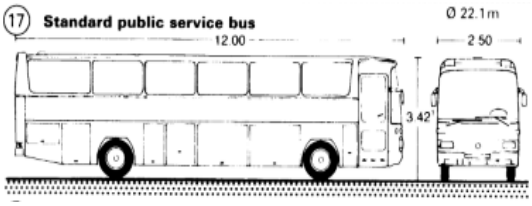


5 **Platforms at right-angles to direction of arrival**



6 **Long platforms with passing lanes**

17 **Standard public service bus**



RITESH KUMAR YADAV
1180101038

CONCEPT

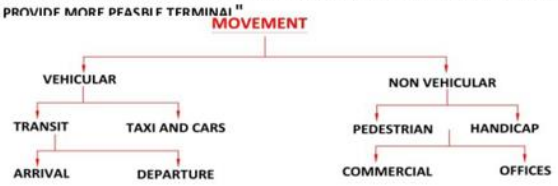
INTERSTATE BUS TERMINAL

MELTING OF ICE CUBE

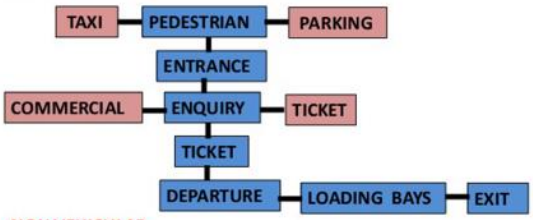
THE ICE CUBE HAS SOLID FORM AND IT TURNED INTO THE LIQUID WATER BY THE CHANGING TEMPERATURE(WARM AIR).
THEN LIQUID WATER IS FLOW ACCORDING TO THE SLOPE AND CURVATURE OF SURFACE.THEY DID NOT HAVE FIXED SHAPE AND THEY CAN MOVE ACCORDING TO FLOW OF FORCE.

SEGREGATION OF MOVEMENT

THE FLOW OF WATER IS SEGREGATED BY THE MELTING AND NATURE OF THE SURFACE
IN THE BUS TERMINAL SEGREGATION OF MOVEMENT IS ACCORDING TO THE USERS.
BUS TERMINUS DESIN BASICALLY VEHICULAR AND NON VEHICULAR MOVEMENT AND DEALING WITH THE PEOPLE IN ORDER TO AVOID INTRACTION BETWEEN PEDESTRIAN AND TRANSIT AND PROVIDE MORE FEASIBLE TERMINAL"



MOVEMENT OF USERS TROUGH THE LENGTH



NON VEHICULAR

- THE NON VEHICULAR TRAFFIC WILL BE PEDESTRIAN AND HANDICAP
- THE PEDSTRIAN MOVEMENT WILL FOLLOW PASSENGERS AND STAFF,SECURITY.
- THE NON VEHCULAR WILL BE CONNECTED TWO THE COMMERCIAL AND OFFICE AREA.
- THESE AREA WILL BE CONNECTED BY STAIRS , ESCALATORS ,ELEVATOR AND RAMP

NON VEHICULAR

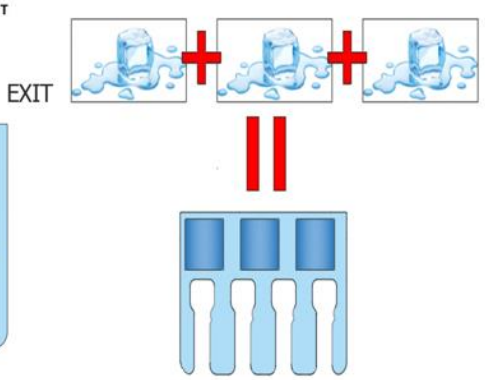
- THE NON VEHICULAR TRAFFIC WILL BE PEDESTRIAN AND HANDICAP
- THE PEDSTRIAN MOVEMENT WILL FOLLOW PASSENGERS AND STAFF,SECURITY.
- THE NON VEHCULAR WILL BE CONNECTED TWO THE COMMERCIAL AND OFFICE AREA.
- THESE AREA WILL BE CONNECTED BY STAIRS , ESCALATORS ,ELEVATOR AND RAMP

AIMS AND OBJECTIVES

TO ACHIEVE DESIGN EXCELLENCE AND COME WITH PROTOTYPE DESIGN OF BUS TERMINAL FOR FUTURE AND URBAN SCENARIO WHERE THE SPACE AND SEGREGATION OF MOVEMENT PROPERLY DEFINED.THE COMMERCIAL ACTIVITIES WILL BE INCORPORATE WITH THE BUS TERMINAL AND PROMOTE THE FAST AND UNDERSTANDING FLOW OF TRAFFIC IN BUS TERMINUS

- ·THE STATION AREA SHOULD PROVIDE A SENCE OF ORDER AND ORIENTATION
- ·TO PROMOTE OPTIMUM CONNECTIONS BETWEEN ALL ELEMENTS AND SPACES,AND. CLEAR CONNECTION OF FUNCTIONS.
- ·ACHIEVE ORIENTATION OF THE TERMINAL BUILDING AS EAST AND WEST HENCE SOUTH FACADE WILL BE TREATED WITH HEAT RESISTANCE ELEMENTS AND MATERIAL .
- ·TO MAKE LOW ENERGY EFFICIENT BUILDING
- ·TO MAKE THE PROJECT FINANCIALLY SUSTAINABLE
- ·TO MAKE THE TERMINAL BARRIER FREE
- ·TO MAKE THE PADESTRIAN FRIENDLY ENVIRONMENT

EVOLUTION OF FORM



"THE CONCEPT FORM IS BASICALLY BASED ON THE MOVEMENT OF SEGREGATION .THE FORM IS DEVELOPED BY A RECTANGULAR AND V SHAPE BLOCK THAT IS USED AS OFFICE AND COMMERCIAL BUILDING .THE PASSENGERS ENTRY WILL BE THROUGH ENTRANCE BLOCK
THE V SHAPED FORM IS USED FOR VEHICULAR MOVEMENT FOR INCOMMING AND OUTGOING BUSES WILL STAND THERE"
"THE FRONT BLOCK OR DEPARTURE BLOCK WILL BE USED AS OFFICE BUILDING AND THE EXTERNAL FAÇADE WILL BE TREATED WITH CURTAIN WALL FOR NATURAL LIGHT AND USED FOR MAXIMUM DAYLIGHT INSIDE THE BUILDING

ALL FLOOR PLANS

ELEVATION , SESSION