THESIS REPORT
ON
" JEWAR INTERNATIONAL AIRPORT AT NOIDA"

2019-2020

A Thesis Submitted

In Partial Fulfilment of the Requirements for the Degrees

of

BACHELOR OF ARCHITECTURE

UTTAR PRADESH TECHNICAL UNIVERSITY, LUCKNOW

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CERTIFICATE

I hereby recommend that the thesis, entitled" **International airport at jewar noida,u.p.",** prepared by Mr/Ms. **Nidhi Giri** undaer my supervision, is the bonafide work of the student and be accepted as a partial fulfilment for the award of Bachelors Degree in Architecture, **School of Architecture BBDU, Lucknow.**

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Signature of the guide

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Recommendation

Accepted
Not Accepted

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BABU BANARSI DAS UNIVERSITY
LUCKNOW, U.P.

B.arch. thesis 2019

“AEROTROPOLIS”

JEWAR INTERNATIONAL AIRPORT

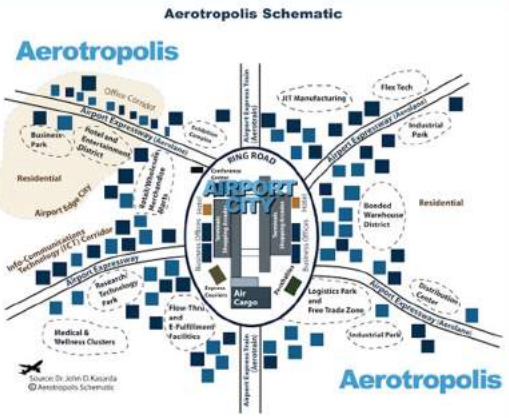
Noida, U.P.

by
Nidhi Giri

CONTENTS

INTRODUCTION

“AEROTROPOLIS”.....
JEWAR INTERNATIONAL AIRPORT,NOIDA



“Jewar International Airport, Noida, is proposed to be the second airport in the National Capital Region (NCR) of

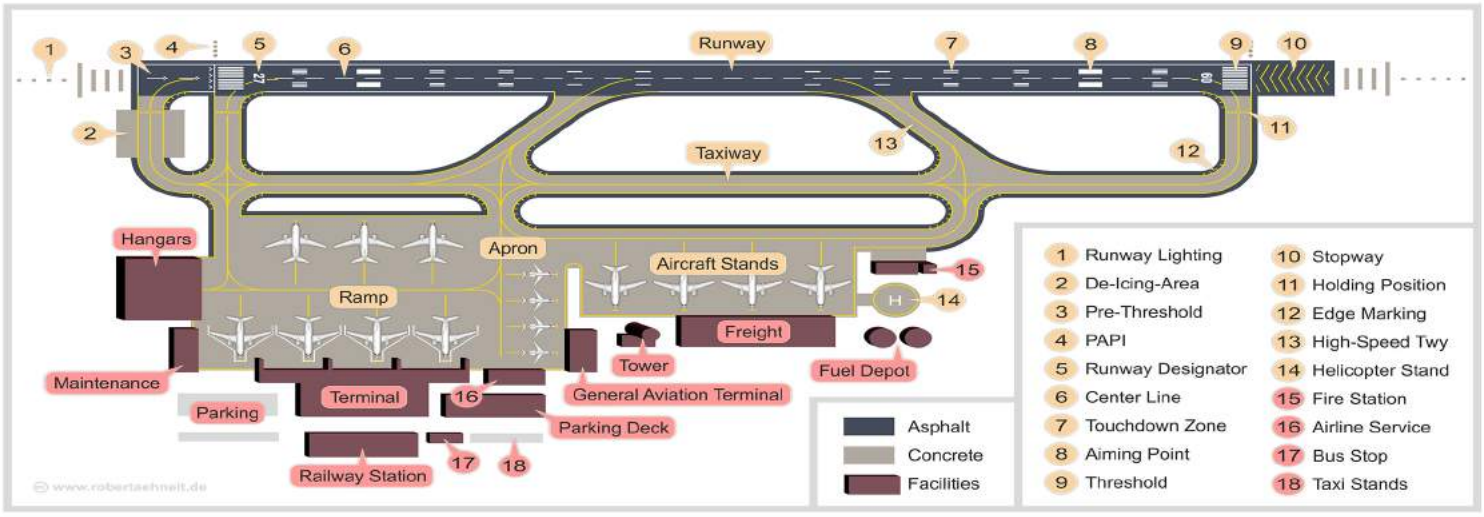
INTRODUCTION

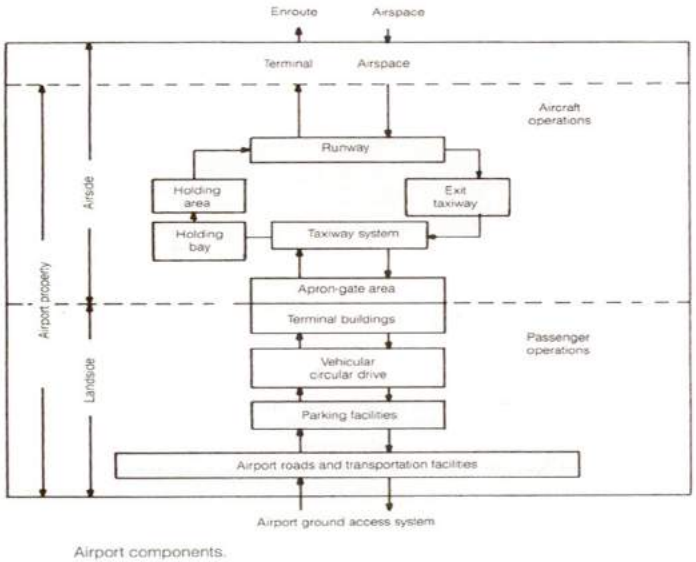
"An airport can be described as an AERODROME FOR THE ARRIVAL AND DPARTURE OF PASSENGERS AND GOODS" and can be termed as the"GATEWAYS TO COUNTRIES".
An airport is a location where aircraft such as fixed-wing aircraft, helicopters, and blimps take off and land. Aircraft may be stored or maintained at an airport. An airport consists of at least one surface such as a runway for a plane to take off and land, a helipad.or water for takeoffs and landings, and often includes buildings such as control towers, hangars, and terminal buildings.

AN AIRPORT IS LIKE A TOTAL CITY DEVOTED TO DYNAMIC MOVEMENT...
Airports are among the busiest transportation centers.

Although airports are now recognized as major Economic drivers, the airport itself still lacks a sense of place

TYPICAL AIRPORT LAYOUT

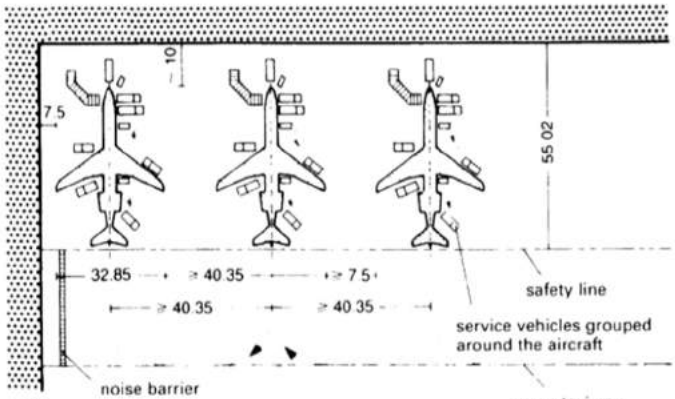




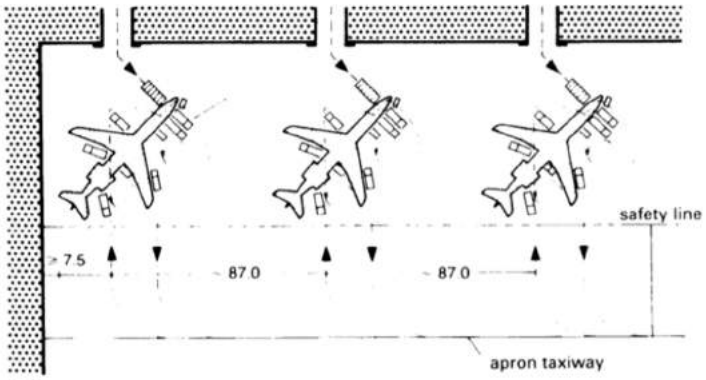
Airport components.

CIRCULATION DIAGRAM

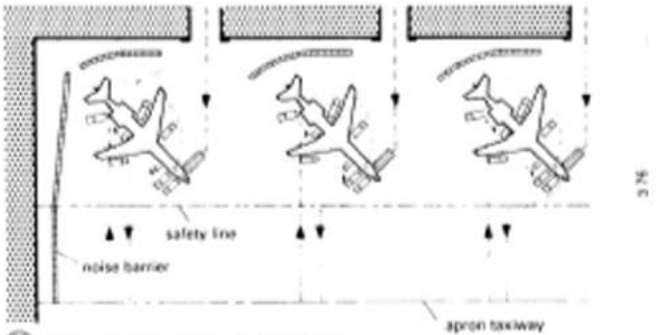
PLANNING AND PARKING



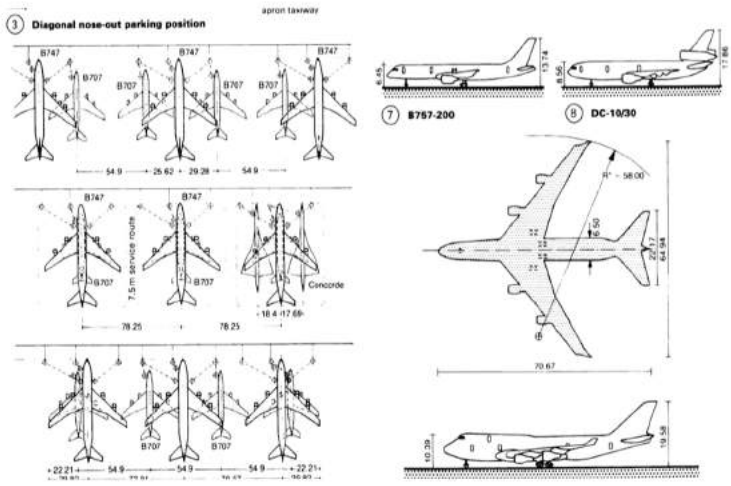
(1) **Nose-in parking position**

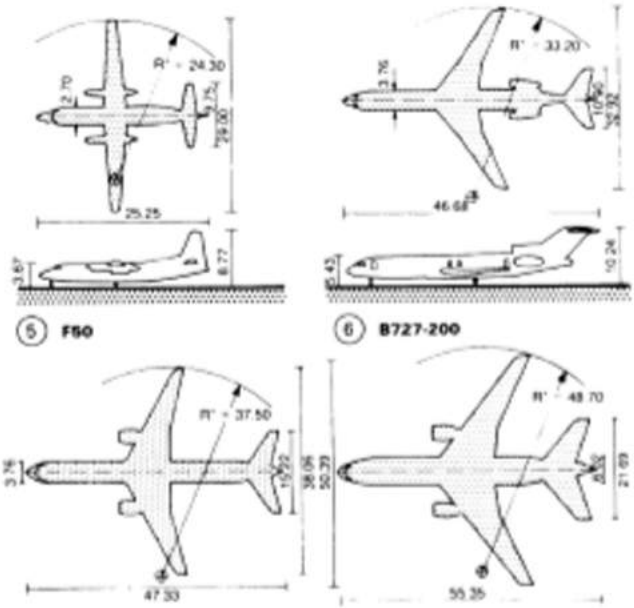


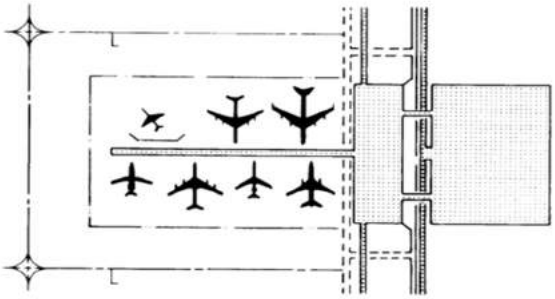
(2) **Diagonal nose-in parking position**



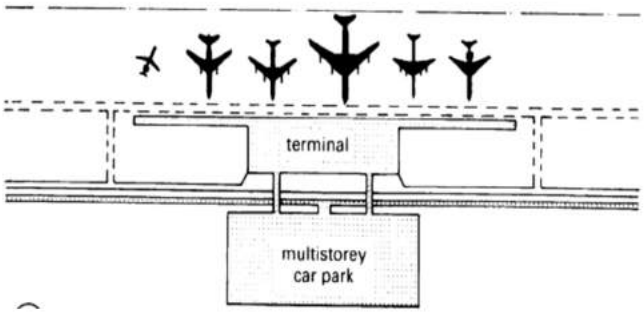
(3) **Diagonal nose-out parking position**



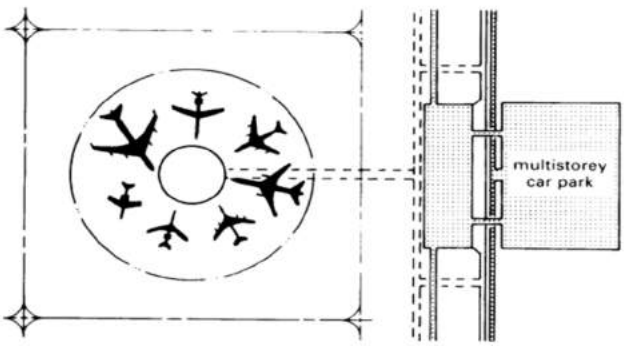




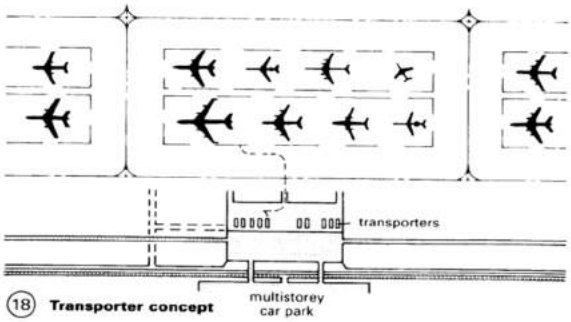
TRANSPORTER CONCEPT



SATELLITE CONCEPT



PIER CONCEPT



LLINERAR CONCEPT

CHAPTER 2

LITERATURE REVIEW

INTRODUCTION

1.2. AIRPORT SYSTEM

For the purpose of identifying the location of functions, an airport can be considered to consist of fivo areas:
"An airport can be described a.' an "aerodrome for the arrival and departure of passenger: and good' " and can be termed a: the "gateways to countries "
An airport is a location where aircraft such as fixed-wing aircraft, helicopters, and blimps take off and land. Aircraft may be stored or maintained at an airport. An airport consists of at
least one surface such as a runway for a plane to take off and land, a helipad, or water for takeoffs and landings, and often includes buildings such as control towers, hangars and termin buildings _
Airprt is like a total city devoted to dynamic movement. Airprts are among the busiest transportation centers, The Unitecl States has by far the greatest number of airports in the
world. More than half the world's airports and more than two-thirds of the world's 400busiest
airports are lc,cated in the United States. There are more than 19,000 civil landing areas in the
United States, including heliports, seaplane bases, and "fixed-wing" landing facilities. Most
of these facilities are privately owned, and for private use only:
Since its beginning in the early twentieth century, civil aviation has become one of the most
fascinating, important, and complex industries in the world. The civil aviation system, particularly its airports,
has come to be the backbone of world translnrt and a necessity to twenty-first-century trade
and commerce. In 2008, the commercial service segment of civil aviation, consisting of more
than 900 airlines and 22,000 aircraft, carried more than 2 billion passengers and SS million tons Of cargo on more than
74 million flights to more than 1700 airports in more than I SO countries worldwide. Millions
more private, corporate, and charter "general aviation" operations were conducted at thousands Of commercial and general aviation airports throughout the world. In many parts Of
the world, commercial service and general aviation sert* as the primary, if not the only method Of transportation between
communities

2.1. GENERAL BACKGROUND

Transportation sector is one of the most important branches of planning which shouldn't be taken in hand independently from other sectors. It is necessary to evaluate also all modes of transportation together because of their interdependency. This attitude should be valid for preparation of macro level plans at different scales. Air transport is the newest mode of transport and safety, speed and comfort makes it preferable. Its incredible growth trend in less than a century shows that, it will be more widespread means of transport in the future.

2.1.1. HISTORY OF AVIATION

French Joseph and Etienne Montgolfier Brothers invented that an object which is lighter than air can fly and by using hydrogen and helium gases they succeeded to hover a balloon to 5000 m height which had 12 m radius and 750 m3 volume in June, 4, 1783. All aircraft which sustain their weight by displacing an equal weight of air is called as lighter than air.

The two milestones of aviation generated by lighter than air craft; the first control able flight by an aircraft was succeeded by a non-rigid airship and in the 1850s and the first passenger air service was generated by zeppelins. Zeppelin Company and its subsidiary Delag began carrying passengers on flights within Germany in 1910 and from 1929 to 1937 provided a unique transatlantic air service, but their weakness against strong winds because of their large body and the use of easily burned gases such as hydrogen and helium caused several accidents.

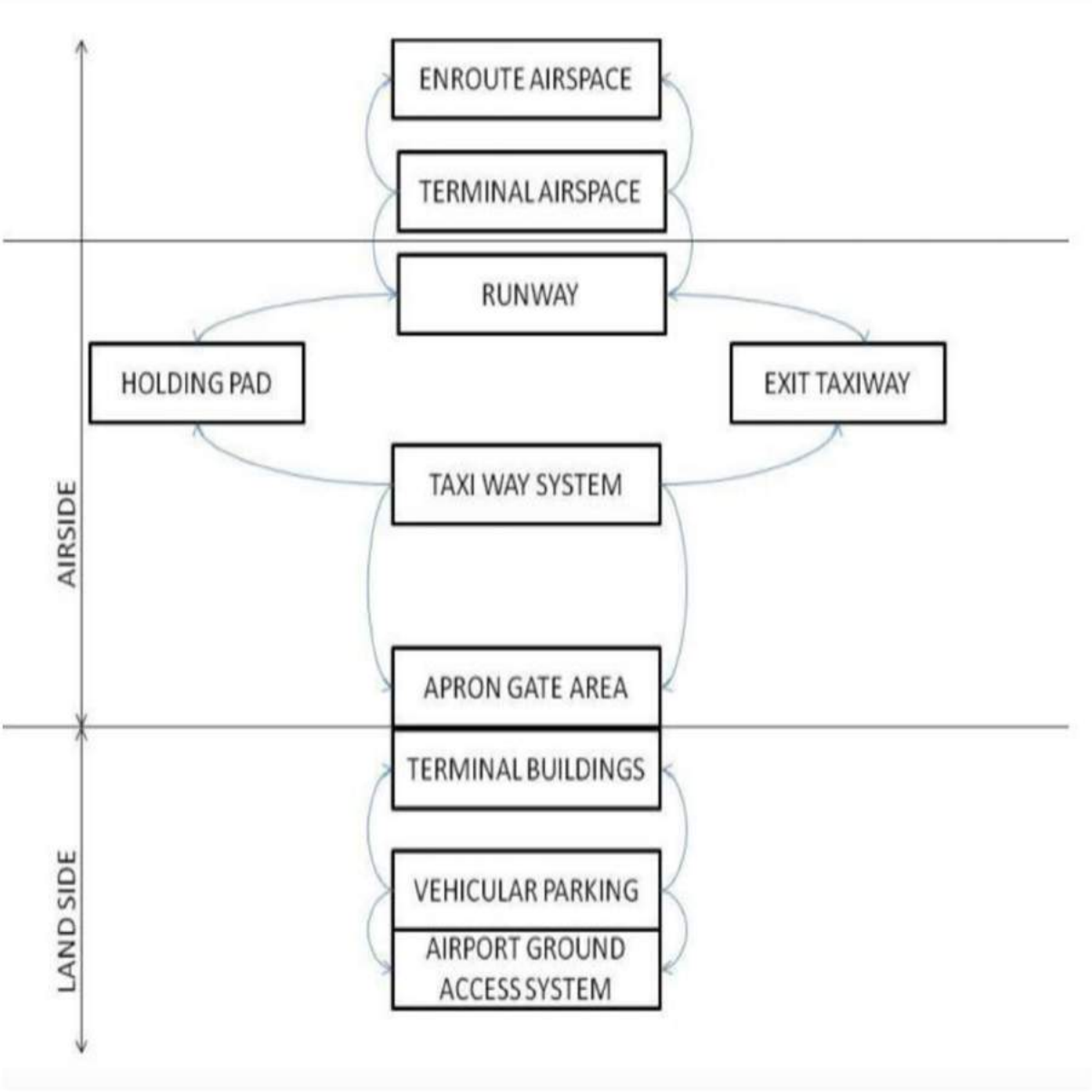
Modem airship vehicle concepts are partly heavier than air and partly lighter than air and theyare used for STOL (short take-off and landing) vehicles or some have VTOL (vertical take-off and landing) capability.

First flight of a heavier-than-air craft was succeeded by Otto Litienthal (1848-1896) by a
glider in 1890. He determined the methods and techniques for flight of a heavier than-air craft so became the pioneer of the passage from glider to plane. Clement Ader who was the real pioneer of aviation history had flown 50 m with his glider in 1890. The first powered flight in a heavier-than air aircraft was succeeded by Orville Wright on
December 17, 1903, in North Caroline. This 120 ft. flight was the first such statistic recorded in aviation history and bicycle repairer Wright Brothers' success was a real surprise In the aviation world.

2.2. AIRPORT PLANNING

2.2.1. INTRODUCTION

Airport planning may be defined as the employment of an organized strategy for the future management of airport operations, facilities designs, airfield configurations, financial allocations and revenues, environmental impacts, and organizational structures. Airport planning requires more intensive study and forethought as compared to planning of other modes of transport. This is because aviation is the most dynamic industry and its forecast is quite complex. It is very difficult to predict for the airport, satisfying the present needs, whether this airport shall prove adequate for the new types of aircrafts which may emerge after 10 years. The airport design engineers, therefore, is required to keep in touch with the recent trends and also with likely future projections in the aviation activities



In July 25, 1909, French engineer Bleriot had flown over the English Channel (la Manche). Then for the construction of aircraft aluminum had begun used instead of wood and cloth. By using aluminum in bodies and wings and by adding high power engines, the time, speed and capacity of flight increased. Parallel to this growth in 1920 the first scheduled flights had begun between Hamburg-Copenhagen-Amsterdam. In May 21, 1921, Charles Lindberg became the first man who crossed the Atlantic Ocean with his aircraft named as 'Sprit of St. Louis'. His 5 883 Ian travel between New York and Paris had lasted 33 h 39 min and then aircraft have begun a safe and speedy transport means for human and freight.

In 1930s the necessity of ground facilities for passenger became important and first air station was built in 1925, in Berlin and after 1930 during the 2nd World War, civil and military aviation had grown rapidly. By the introduction of jets into the arena airfields had turned to airports. Air transport is the newest mode of travel, safest, most expensive, and most speedy and also it uses the latest developments of related industries especially electronic at a maximum level. Higher prices caused by high costs of alrcraft and by high construction costs of airports

2.1.2. AVIATION ORGANIZATIONS

ICAO is the most important international agency concerned with airport development which was formed during a conference of 52 nations held in Chicago in 1944. Annex 14 published by ICAO contains the international design standards and recommended practices for applicable to all commercial airports.
There are also so many groups involved in technical and promotional aspects of aviation at international level such as HAI, ACI and IATA 400 large airports and airport authorities throughout the world are members of the Airports Council International (CACI) which is based in Geneva, Switzerland. The Helicopter Association International (HAI) is an association represents the Interests of each manufacturers and users and located in Alexandria, Virginia. The International Air Transport Association (IATA) is an association of scheduled carriers In International air transportation with headquarters In Montreal, Canada.

2.3. AIRPORT MASTER PLAN

An ailP01t master plan presents the planner's conception of the ultimate development of a specific airport. It effectively presents the research and logic from which the plan was evolved and afifully displays the plan in a graphic and written repofi. The typical ailPOLt master plan has a planning horizon of 20 years. The Federal Aviation Administration notes that for a master plan to be considered valid it must be updated every 20 years or when changes in the ailport or sun-ounding envirnment occur, or when moderate and major constmction may require federal funding. The objectives of the master plan according to
FAA are:

1 To provide an effective graphic presentation of the ultimate development of the ailV01t and of anticipated land uses adjacent to the airport.

2 To establish a schedule of priorities and phasing for the various improvements proposed in the plan.

3 To present the peltinent backup information and data that was essential to the development of the master plan.

4 To describe the various concepts and altematives those were considered in the establishment of the proposed plan.

5 To provide a concise and descriptive report so that the impact and logic of its recommendations can be clearly understood by the community the airport serves and by those authorities and public agencies that are charged with the approval, promotion, and funding of the improvements proposed in the airport master plan.

2.3.1. FACILITY REQUIREMENTS

They type of new facilities required, their scale, and the staging of their construction are determined as a result of the demand-capacity analysis. These elements are developed according to FAA standards in the United States and according to ICAO or applicable national standards elsewhere. The facilities required and the elements requiting consideration are as follows:

1. Runway: length, width, clearance, clear zone, approach slopes, orientation, cross-wind runway provision, grades, capacity, staged construction, cost implications of delay to aircraft, and cost effectiveness.

2. Taxiway: Width, location, clearances, design and location of exits, grades, effect on

General

Other transpofiation and major development plans in the environs of the airpolt site
Commercial, tourist, industrial and govemmental development plans

2.4. GENERAL BACKGROUND

The tenn "AilQ01t" comes under the board heading of "Civil Aviation". The civil aviation can be divided into four types. They are;

I. Commercial service aviation(Primary Airport): These are those type which serves more than 10000 enplaned pax/yr.

2. Air cargo: These are those type which carry freights only.

3. General aviation: These range from local recreational flying to global business transport,performed on aircraft not operating under the federal aviation regulations for commercial air caniers. They seves less than 2500 enplaned pax/yr.

4. Reliever airport:

They do not serve regularly. They come as alternative airport to general
and commercial aviation when passenger enplanements exceed 250.000 annually.

2.5. AIRPORT CLASSIFICATION AND CODE STANDARD

There are two governing bodies for the ailport design standard. They are Federal Avaiation Administration(FAA) and International Civil Avaition Organisation(ICAO). FAA is body of United States Of America(USA) while ICAO is devised by UN. They both have their own design standards and are very much similar.
Both have devised codes of ailP01t categow based on ancraft parts and reference length. They are as follows;

2.5.1. ICAO CODE

For any type of airplane,the first element of the ICAO code is determined by the airplane reference field length, the minimum field length required by that aircraft for takeoff at maximum ceftificated takeoff weight (M TOW), sea level, standard atmospheric conditions, * no wind, and level runway. The second element is determined by the most demanding of two physical characteristics of the airplane: its wingspan and the distance between the outside edges of the wheels of the main gear. The reference code of an airport thus corresponds to the code for the most demanding type of aircraft ("criti :al aeroplane") served by the ailport in each element.

ICAO code element 1		ICAO code element 2		
Code number	Aeroplane reference field length (RFL)	Code letter	Wing span (WS)	Outer main gear wheel span (OMG)
1	RFL < 800 m	A	WS < 15 m	OMG < 4.5 m
2	800 m ≤ RFL < 1200 m	B	15 m ≤ WS < 24 m	4.5 m ≤ OMG < 6 m
3	1200 m ≤ RFL < 1800 m	C	24 m ≤ WS < 36 m	4.5 m ≤ OMG < 9 m
4	1800 m ≤ RFL	D	36 m ≤ WS < 52 m	9 m ≤ OMG < 14 m
		E	52 m ≤ WS < 65 m	9 m ≤ OMG < 14 m
		F	65 m ≤ WS < 80 m	14 m ≤ OMG < 16 m

Figure 2-21CAO code for Airport

2.5.2. AIRPORT CAPACITY

Regional	Up to 1 million passengers per year	Single deck road, single or 1 ½ level terminal, apron access to aircraft
National	1-5 million passengers per year	Single deck road, double level terminal, elevated access to aircraft
International	Over 5 million passengers per year	Single deck road, two to four storey terminal, elevated access to aircraft

2.6. AIRPORT SITE SELECTION

The location of an airport will be influenced by the following factors;

• Type of Development Of The Surrounding Area
A study of current and prospective uses of land adjacent to an airport site is essential. Proximity to residential area and school should be avoided whenever possible. If the site is sparsely developed, enactment of zoning ordinances controlling the use of land adjacent to the airport should be considered in order to avoid future conflicts. It is desirable to provide buffer zones between the runways, taxiways and aprons etc. and

the boundary of the airport property. Noise is also an extremely important factor where jet aircraft operations are anticipated. In several large urban areas the FAA has
prescribed specific flight patterns for aircraft arriving and departing from the airport.

Atmospheric Conditions

The presence of fog, haze and smoke reduces visibility and thereby has the effect of lowering the traffic capacity of the airport, since the capacity when the visibility is poor is less than that when the visibility is good.

Accessibility to Ground Transport

Transit time from the passengers' point of origin to the airport is a matter of major concern. The lack of concentration of origins and destinations of air passengers in a metropolitan area and the popularity of the automobile as a personal means of transportation, the use of public transit up to now has not been large. In large urban areas whenever the normal peak vehicular traffic periods coincide with the peak traffic periods at the airport, some cities a train connects the airport with a downtown terminal. In any event, the private automobile will continue to be an important means of transportation to the airport; consequently the planning of streets and highways to the airport and parking at the airport are important factors which must be given consideration

Availability of land for Expansion

It is necessary to acquire in advance or be able to acquire sufficient real estate in the
future for expanding the airport plant. Runways have had to be lengthened, Tenninal facilities expanded and additional suppolt facilities provided.

Presence of other Airports in the General Area

Presence of other ailpolts in the general area must be given consideration when a site for a new ailP01t is being selected or when additional runways are provided at an existing aill)01t. Airpofts should be located at a sufficient distance from each other to prevent aircraft which are manoeuvring for a landing at one airport from interfering with the movements of aircraft at other aill)01ts.

Surrounding Obstructions

Sites for ailpolts should be so selected that approaches necessa1Y for the ultimate development of the site are free of obstructions or can be cleared if obstruc**tions** exist.
The provision and protection of adequate approach to an airport will necessitate height restrictions in the ailP01t turning zones and in line with the runways.

Economy of Constructions

If alternative sites are available and they are equally adequate, the site which is more economical to construct should be given considerations. Sites lying on submerged lands are much more costly to develop than those on dry land.

Availability of Utilities

An airport requires large quantities of water, natural gas or oil, electric power, and fuel for aircraft and surface vehicles. Most of these utilities will have to be transported to the airport by truck, rail or sea. In the case of electric power, most large airports must provide generating plants of their own to be used in emergency in the event a commercial source fails.

Proximity to Aeronautical Demand

In the selection of a new airport site it is quite important that the location be such as to result in the shortest access time possible. Locating an airport a considerable distance from the centre of population not only generates the increased speed provided by short range turbojet transports but results in loss patronage as well.

2.7. LAND USE PLANNING

The land use plan on and off the airport is an integral part of an area wide comprehensive planning program, and therefore it must be coordinated with the objectives, policies and programs for the area which the airport is to serve. Zoning is used as a method for controlling land use adjacent to an airport; it is not effective in areas which are already built up. Airports become involved in two types of zoning. One type is height and hazard zoning. The extent of land use in the airport depends a great deal on the amount of acreage available. Uses can be classified as either closely related to aviation or remote. Those closely related to aviation use include the runways, taxiways, aprons, terminal buildings, parking and maintenance facilities. Non-aviation uses include space for recreational, industrial, and commercial activities. Recreational facilities such as golf courses may be suitable within the airport boundary. Certain agricultural uses are also appropriate as long as they do not attract birds.

The principal objectives of the land use plan for areas outside the airport boundary is to minimize the disturbing effect of noise, the zoning define the area which are or are not suitable for residential use and likewise those which are suitable for light industrial, commercial or recreational activity.

2.7.1. ENVIRONMENTAL STUDY

Environmental factors must be considered carefully in the development of a new airpolt or the expansion of an existing one. Studies of the impact of the constmction and operation of a new ailP01t or the expansion of an existing one upon acceptable level of air and water quality, noise levels, ecological processes, and demographic development of the region must be conducted to detennine how the ailP01t requirements can best be accomplished.

Effective means of reducing noise is through proper planning of land use for areas adjacent to the ailport. For an existing airport this may be difficult as the land may have already been built up. Every effort should be made to orient air traffic away from built up areas.
Other important factors include air and water pollution, industrial wastes, and domestic sewage originating at the airport, and the disturbance of natural environmental values.

The construction of a new ailP01t or expansion of an existing one may have major impacts on the natural environment. This is particularly tme for large developments where streams and major drainage courses may be changed, the habitats of wildlife may be disrupted, and wildemess and recreational areas may be reshaped. The environmental study should indicate how these dismptions may be alleviated.

2.7.2. GROUND ACCESS

Statistics have shown that the private automobile is the major fonn of access to the airport; this includes air passengers and employees. It is expected that this trend will continue in the future despite the greater availability of mass transit.

The number of trips the airport employees is often larger than the number generated by the airline passengers.

The circulation of traffic in an airport should generally be one way and counter clockwise. The roads should be wide enough to pennit passing. Direction information to locations of specific airlines anivals and departures and public parking facilities should be adequate in number, size, and legibility.

Pedestrian routes should be direct, well-marked, and adequately lighted. Covered walkways from public parking lots or to entrance of the terminal building should be considered if bad weather occurs a substantial amount of the time and walking distances are long.

2.7.3. VECHILE PARKING

A major goal for locating parking facilities for airline passengers is to minimize walking distances and therefore bring the auto mobile as close as possible to the aircraft.
Parking at an airport must be provided for

a. airline passengers
b. visitors accompanying passengers
c. spectators
d. people employed at the airport
e. car rentals and limousines and
f. People having business with the airport tenants.
Separate parking areas should be provided to the employees. They should be located as close as possible to the facilities in which they work. It is desirable to locate car rental parking areas as close as possible to the terminal building in order to minimize the passengers walking distance.

The recommended basic parking stall is 8ft 6 in. wide and 18 ft. long. The choice of pattern for parking is dictated by the shape of the area available. For 90' parking about 300 sq. ft. is required per parking space

2.8. CIRCULATION SYSTEM CONFIGURATIONS

The layout and types of terminal concepts at an airport determine the integration of the components to form the airport circulation system. The following paragraphs discuss some of
the more typical airport circulation configurations:

a. Centralized Layout

When the terminal complex consists of a single building or a contiguous series of buildings, the ground transportation system usually consists of sequentially and centrally located components. Except for vertical or horizontal separation, which may exist for originating and terminating passenger vehicles, all passenger-related vehicles normally pass through the same series of roadways. Also, public parking and car rental facilities are centrally located.

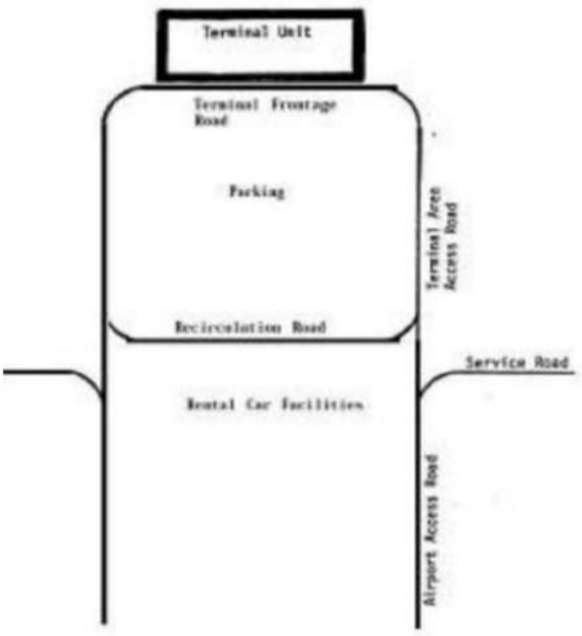


Figure 2-3 Centralized Layout

b. Segmented Layout

Division of the terminal building into originating grouping of airlines on either side of the building achieves flow separation on a horizontal basis. Originating passengers use one set of terminal frontage roads and terminating passengers the other; or specific airlines may group themselves on either side of the terminal unit. Orlando International, Jacksonville, and Greater Cincinnati airports use this type of ground access system layout called the segmented ground access concept.

c. Decentralised layout

When the terminal complex consists of unit terminal buildings, vehicle flow separation on terminal access and frontage roads is possible. Aill)01t access and tenninal access roads funnel traffic to and from separate tenninal facilities. Parking and car rental facilities are grouped on a tenninal unit basis. Examples of this type of system use, the decentralized ground access concept, include Kennedy International and Kansas City International airports.

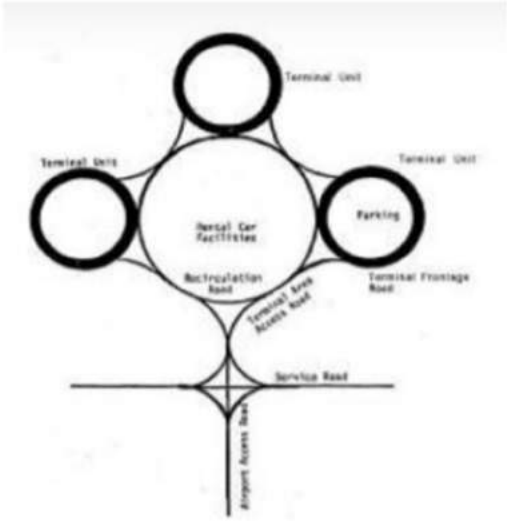
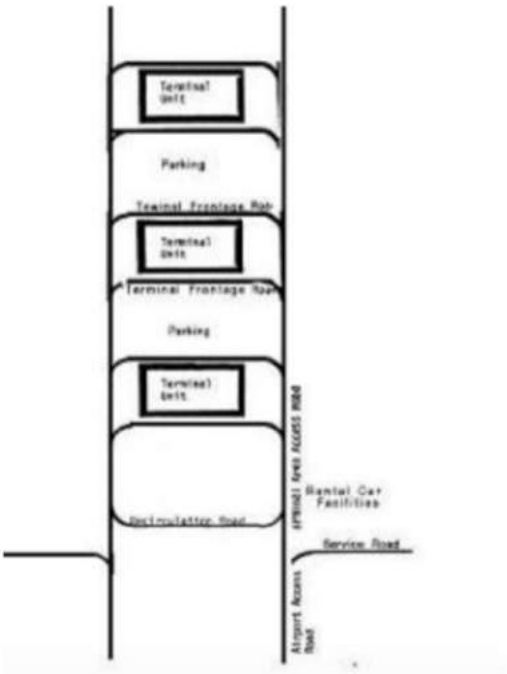


Figure 2-5 Decentralized Layout

d. Unitized Layout

In some cases, the terminal system' may consist of a series of terminal building located in linear fashion. Access is from a centrally 'located roadway. Dallas-Fort-Worth International and Houston Intercontinental airports use this type of system, the unitized ground access system concept.



2.8.1. OBSTRUCTION CLEARANCE REQUIREMENT

When aircraft is landing or taking off, it loses or gains altitude very slowly as compared to the forward speed. For this reason, long clearance areas are provided on either side of runway known as approach areas over which the aircraft can safely gain or lose altitude. The areas should be kept free of obstructions. The obstructions may consist of fences, trees, pole lines, building and other natural or many made objects. Sometimes the ground itself may slope upward from the end of the runway to such an extent that it fonns an obstmction to the aircraft operation. If obstruction exists around a site over which an airport is to be built, the removal is imperative at any cost. The future growth of undesirable stmctures is controlled by zoning laws.

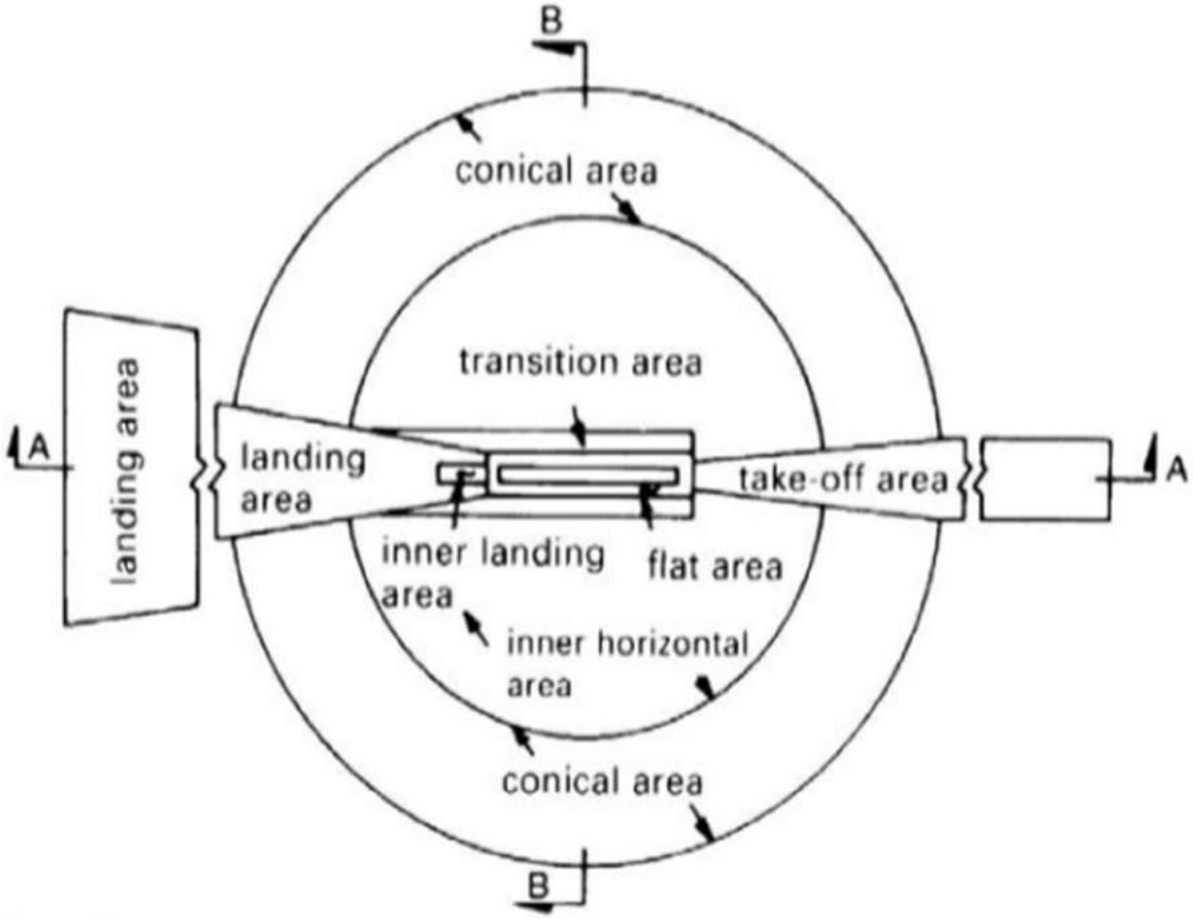
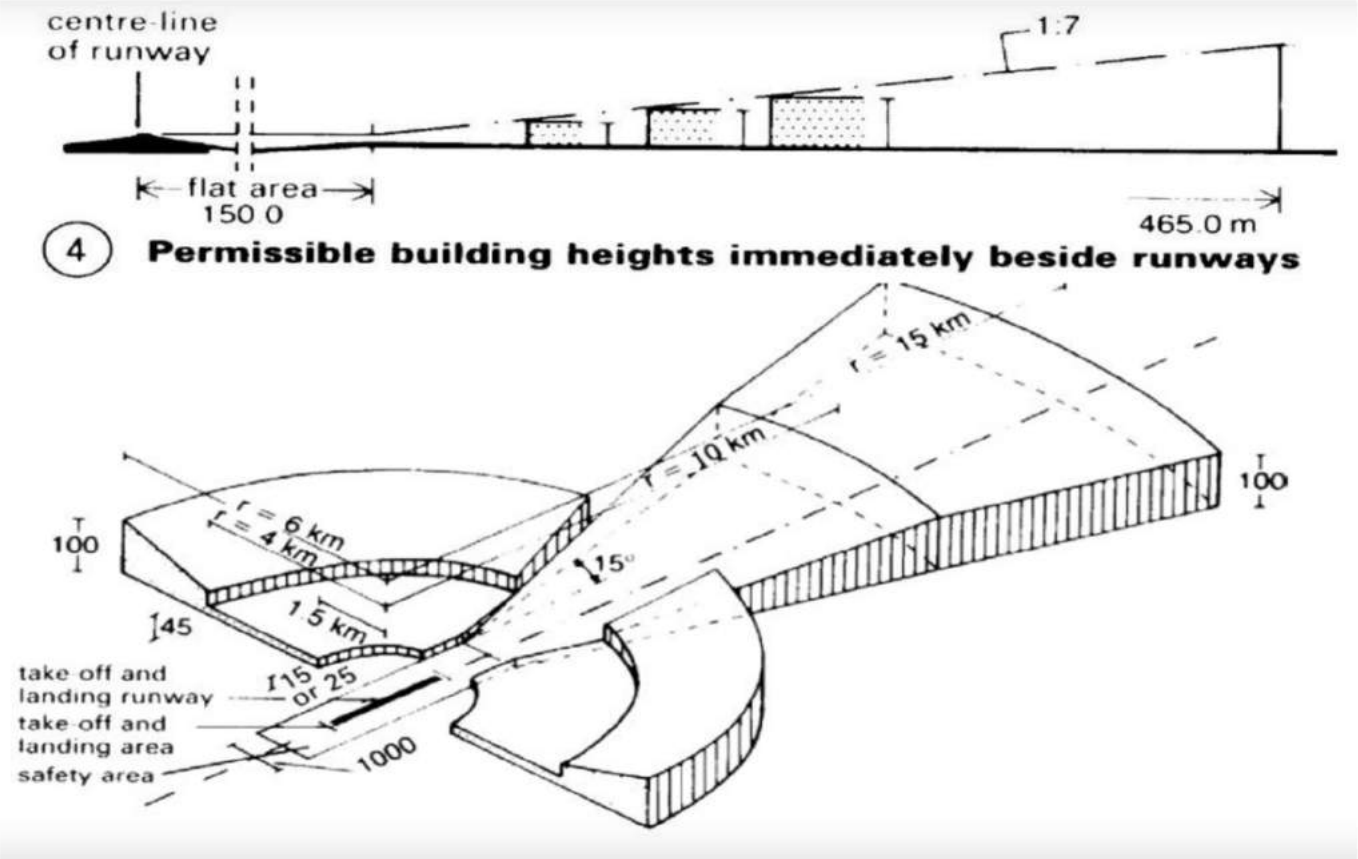


Figure 2-7: Required Obstruction free areas for take-off/landing, Plan View

(Source: Ernst and Peter Neufert Architect's Data, Blackwell Series)



Building Protection areas for an airport with instrument landing

2.8.2. EVALUATION OF NOISE

The effect of noise from aircraft operations on communities surrounding airports presents a serious problem to aviation. The extent of noise depends upon the climb-out path of aircraft,type of engine propulsion and the gross weight of aircraft. The problem becomes more acute with jet engine aircrafts. Therefore, the site should be so selected that the landing and takeoff paths of the aircrafts pass over the land which is free from residential or industrial development. Sometimes Buffer zone may have to be provided between the takeoff end of a runway and a nearby residential area. If buffer zone cannot be provided, some acoustical barrier may have to be installed. Federal Aviation Agency (FAA) recommends that to minimize community disturbance due to noise should be kept free from the residential development and places of public assembly

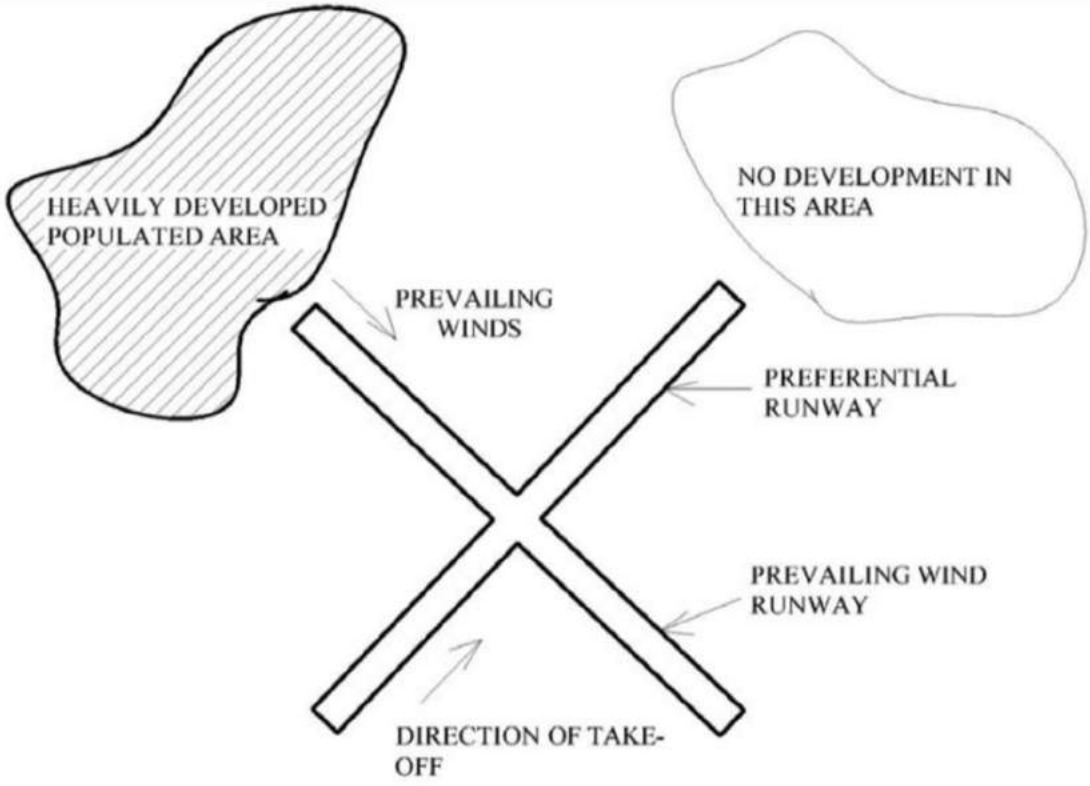


Figure 2-9: Preferential Runway for Noise Abatement

(Source: Airport Planning Design, Khanna S.K., Arora M.G., Jain S.S.)

Sometimes it so happens that the area under the flight path which is oriented along the direction of prevailing winds is highly developed with residences and industries. However, if nmway is constructed at right angles to the previous direction, the area is found to be scarcely developed. If the wind intensity over the site is low for large percentage of time, it will be possible to use the latter direction ofnmway for take-off. This is explained in the given figure below. Thus, sometimes an extra runway may have to be constructed merely to reduce the noise nuisance.

2.9.DESIGN METHODOLOGIES

2.9.1.GENERAL

Effective planning and design of the terminal area involve the active palticipation of airport Management, the airlines, concessionaires, and the consultants engaged by the parties. The process normally includes: compiling surveys, questionnaires, and forecasts, usually for short

and intermediate periods; developing design day and peak hour activity tables; establishing passenger, aircraft, and vehicular traffic relationships; taking inventory and evaluating existing facilities; analyzlng space requirements for alternative layouts; and estimating costs and developing financial plans.

2.9.2. FORECAST

AilQ01t master plans are developed on the basis of forecasts. From forecasts, the relationships between demand and the capacity of an airport's various facilities can be established and airport requirements can be determined. Short-, intermediate-, and long-range (approximately 5-, 10-, and 20-year) forecasts are made to enable the planner to establish a schedule of development for improvements proposed in the master plan. Depending on the various types of facilities being planned, the principal annual forecasts include passenger enplanements, passenger originations, and aircraft movements (by aircraft size). The most useful sources for this information include: the current airport master plan; the FAA published tenninal area forecasts; forecasts developed by the Air Transport Association (AT A); and those forecasts developed by the individual airlines sewing the ailP01t. The airlines should be consulted for assumptions on trend changes in the ratio of originators to enplanements m scheduled service.
Normally, nonscheduled operations are not considered the prlmary basis for terminal plannmg and should be evaluated separatel

2.9.3. TRANSLATING FORECAST TO PEAK DEMAND

AilQ01t tenninal facilities are planned, sized, and designed to accommodate peak passenger demands for a selected forecast period. Generally, the initial stage of constmction is designed for a selected year (or years) within 5 to 10 years of the cun•ent period. Master plans look 20 years into the future. Planning for absolute peak demands, i.e., the greatest demands anticipated, will result in facilities impractically oversized and underutilized. Accordingly, the planner should be cautious in the use of data on absolute peak traffic volumes.

2.9.4. PEAK DAILY ACTIVITY

The Average Day/Peak Month (ADPM) represents the most common method of converting planning statistics to a daily and ultimately to an hourly demand baseline. A determination of the ADPM demand for the design year involves first identifying peak month enplanements as a percent of annual enplanements based on historical data. This percentage may be adjusted up or down as local circumstances and/or other factors dictate (seldom necessary). Applying this percentage to the annual enplanement forecast for the design year results in a peak month
demand forecast for that year. Demand for the average day of the peak month of the design year is determined simply by dividing the peak month demand by the number of days in that month. The same ratio of annual originating passengers (or transfers) to annual enplanements
can be assumed for ADPM passengers unless Indicated otherwise by seasonal data or surveys. This ratio may vary during the peak hour at some anpolts.

2.9.5. PEAK HOURLY ACTIVITY

Many aspects of terminal facility planning require hourly volumes or statistics consistent with the average day baseline. An ailport may have peak hour operations as high as 12 to 20 percent of daily total operations. As schedules increase, peaks tend to spread out over the day.

A theoretical absolute low is 6.25 percent which assumes uniform distribution of domestic operations over 16 hours. Such a theoretical low nonnally never happens. In actual practice, some peakmg will always occur, both in aircraft movements and, even more so, in passenger activity. The latter occurs even with a relatively uniform distribution of aircraft movements, since larger aircraft are nonnally scheduled in the prime hours of the day so as to best meet public demand.

2.9.6. EQUIVALENT AIRCRAFT (EQA) FACTORS

a. The sizing of most tenninal elements is based on passenger volumes for a selected design hour or some part thereof--enplanements, deplanements, peak 20 minutes, etc. However, forecasts of these activities are not always readily available. When they are not, approximations can be developed by considering aircraft seating capacities, as estimated for the peak hour of the average day-peak month. Applying EQA factors, which represent the aircraft's passenger capacity (seats divided by 100), is useful in estimating the impact of future growth on various tenninal components.

b. The EQA methodology is based on aircraft movements as the primary generators of passenger flows. The magnitude of each flow is related to aircraft seating capacities and load factors. However, average seats per aircraft movement Increase m future years, often with larger aircraft being introduced first during peaks for prime time flights.

c. The EQA technique provides a common denominator for numbers of gates and aircraft seats useful for sizing terminal components and evaluating capacities In anpolt master planning. Specific sizmg applications of EQA in this document include airline ticket office, ticket counter frontage areas, baggage areas, lobbies, departure lounges, etc.

Aircraft Seating Capacity	No. of Active Positions	EQA Conversion Factor	GATE EQA	Aircraft Type
421 to 500	_ _	4.8	= _ _	B747 (high dens./stretch)
341 to 420	_ _	3.9	= _ _	B747
281 to 340	_ _	3.4	= _ _	DC-10/L1011 (high dens./stretch)
221 to 280	_ _	2.7	= _ _	B747 -SP/DC-10/L1011
161 to 220	_ _	2.0	= _ _	DC-8-61/A300/B767/B757
111 to 160	_ _	1.4	= _ _	DC-8/B707/B727-200/DC-9-50
81 to 110	_ _	1.0	= _ _	B737/DC-9-30/BAE-146-100&200
61 to 80	_ _	0.7	= _ _	DC-9-10/BAC-111
1 to 60	_ _	0.5	= _ _	CV-580/DHC-7/SD3-30&60/F-227/F-28
Base Year Total = GATE EQA				

Table 2-1: Base Year Total Gate EQA Computation

(Source: Planning and Designing Guidelines for Airport Terminal Facilities)

2.10. AEROPLANE BASIC PART

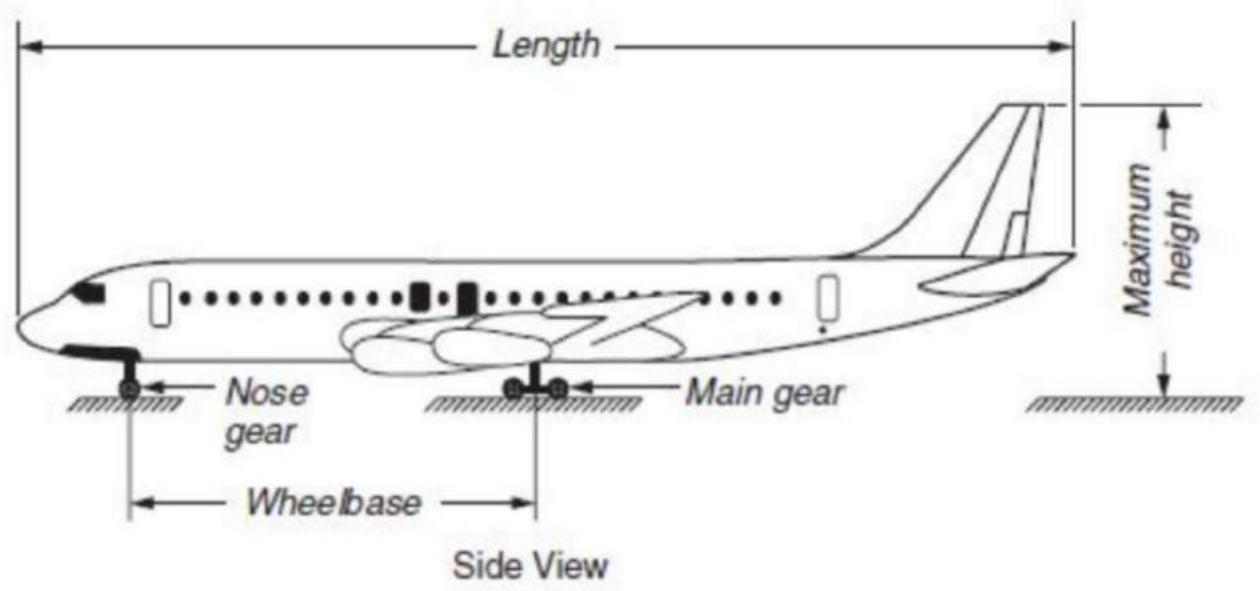


Figure 2-10: Length and wheel base of aircraft

The length of the airplane is the length from the tip of the nose to the tip of the tail. Thewheel base of the airplane is the length from the center line of nose gear to center line of main gear.

2.11. AIRSIDE AREA

The airside area basically consists of the following area;

1.Runway
2.Apron
3.Taxiway
4.Hanger
6.Holding area
7.Control Tower

2.12.1.2. CONFIGURATION OF TERMINAL BUILDING

There are 5 tyoes of configurations or concept of terminal building. They are as follows;

1. Linear Concept: It is simply an extension of the simple terminal concept providing more gates and more room within the tenninal for ticketing and passenger processing. The Concourses connect the various terminal functions with the aircraft gate positions

Figure 2-23: Linear Concept

Advantages

Shortest walking distances from landside and airside
Clear orientation
Simple construction
Lower baggage systems costs(eonveying/sorting) using decentralized system
Eg; Munich airport

Disadvantages

Longer walking distances for transfer pax
Special logistics for handling oftransfer bags

2Finger/ Pier Concept : It is the type where passengers are usually processed at the simple terminal location and then routed down a "pier" where aircraft are parked in the "finger" slots or gates for boarding. The access to the terminal area is at the base of the connector (pier).

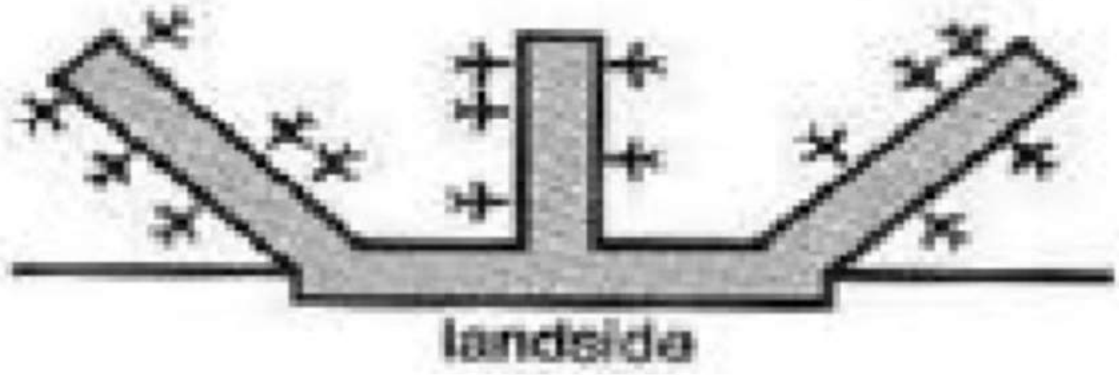


Figure 2-24:Finger/Pier Concept

Advantages

Centralized resources, economies of scale (human, facilities, amenities)
Efficient use of land
Preferable when transfer traffic is low

Disadvantages

Long walking distances
Reduced aircraft circulation & manoeuvrability
Limited compatibility of future aircraft design development

3. Satellite Concept: It consists ofa building, surrounded by aircraft, which is separated from the tenninal and usually reached by a surface, underground, or above-grade connector, may be mechanical system. The satellite can have common or separate departure lounges.

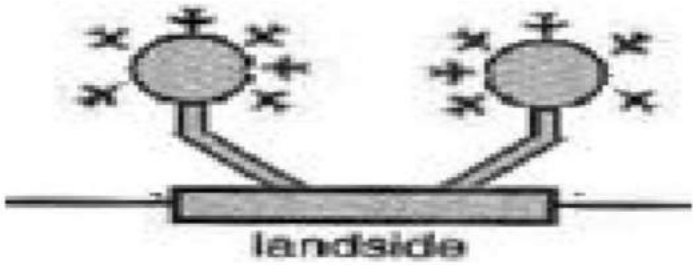


Figure 2-25:Satellite Concept

Advantages

Centralized resources (human,facilities and amenities)
Facilitates pax management
Additional satellites can be designed to accommodate future aircraft design developments

Disadvantages

Requires high technology, underground transportation System
High capital, maintenance & operating cost

4. Midfield Concept : Airerafts are parked along the concourse. There is no connection between terminal building and aircraft.

Advantages

Very efficient for aircraft parking and taxiing
Suitable for transfer pax

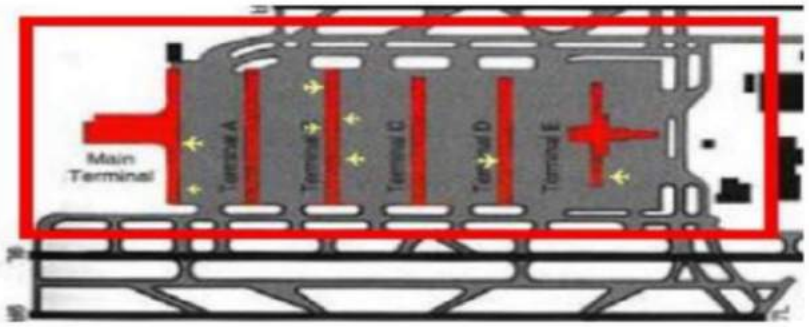


Figure 2-26: Midfield Concept

Disadvantages

Requires high technology, underground transportation System
High capital, maintenance & operating cost

5Transporter Concept: Aircraft and aircraft-servicing functions in the transporter concept are remotely located from the terminal. The connection to the terminal is by vehicular transport.

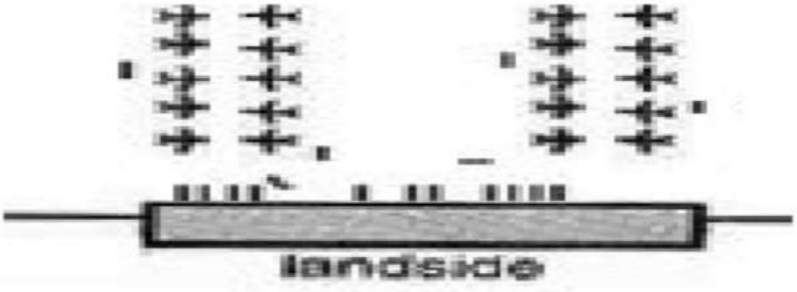


Figure 2-27: Transporter Concept

Advantages

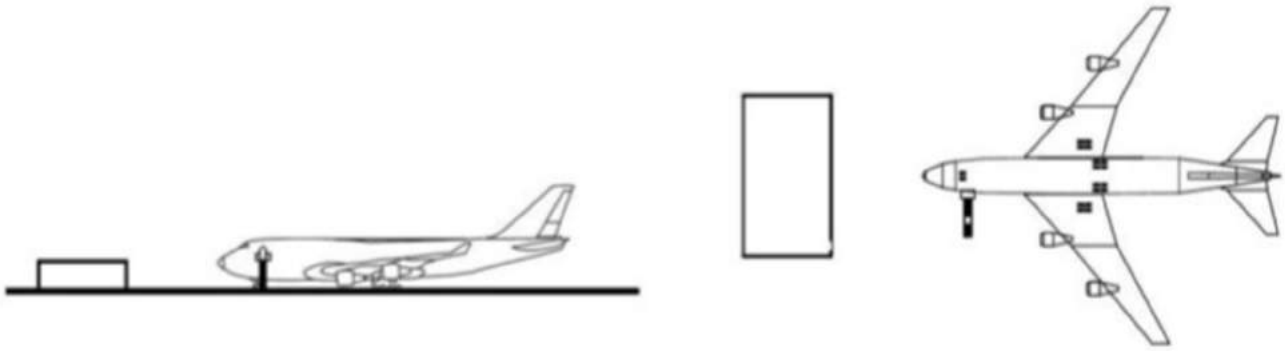
Easy compatibility of terminal/ apron geometry and future aircraft design development
Ease of aircraft manoeuvrability
Ease of expansion capability for aircraft stands
Simple and smaller central terminal
Cost savings

Disadvantage

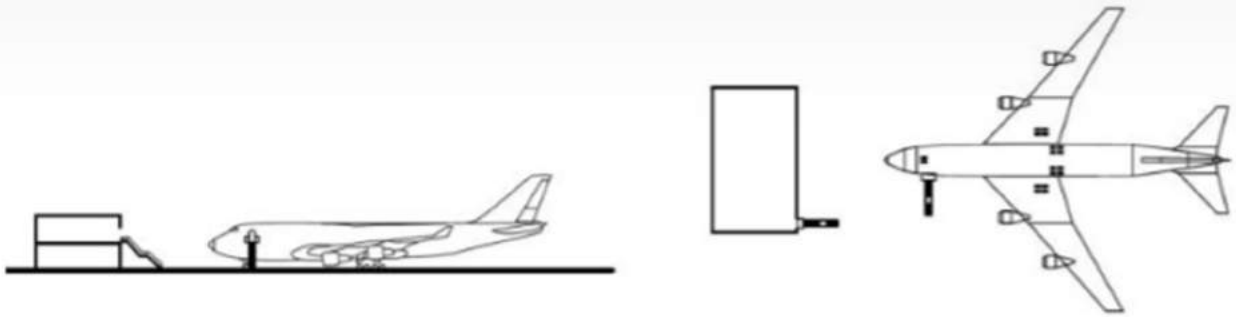
High capital, maintenance & operating costs
Susceptible to industrial disputes with vehicle drivers
Increased vehicular movement

.PASSENGER LOADING METHODS FROM TERMINAL BUILDING TO AIRCRAFT

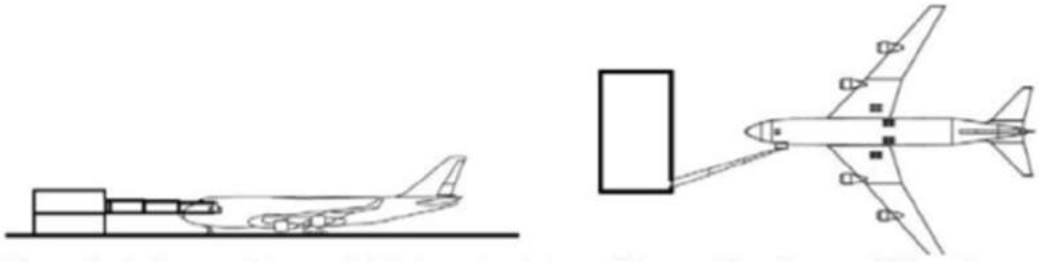
(A).From the single level tenninal building the passengers walk across the apron to the aircraft. This method is presently being employed by many airports in use today.



(B) From the two level terminal building the passengers walk down a flight Of stairs and then across the apron to the aircraft. This is an intermediate phase in use, where the future

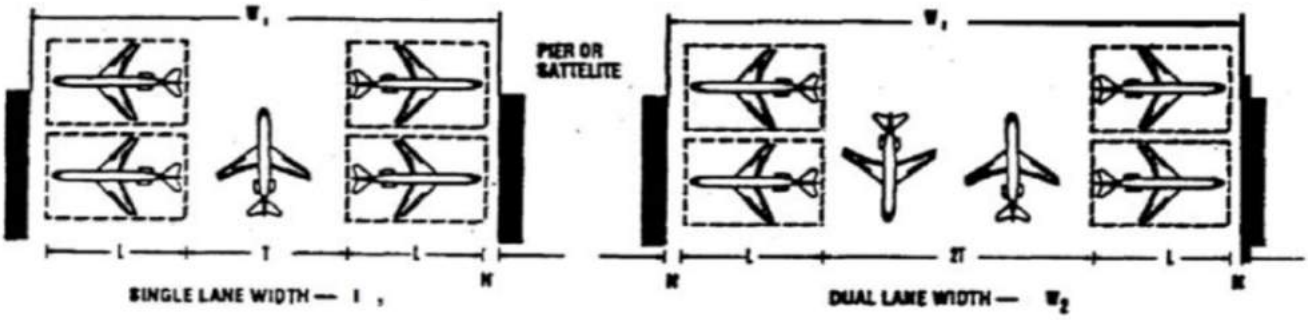


(C) This methc.xl shows a jetway which is rotates into Fx»sition and has the capability of telescoping to the interface aircraft of different sill height. This diagram demonstrates a 'X)wer-in, push-out rate position



(D) This is the same as method (C) atme; however, it differs only in that this diagram demonstrates a m»wer-in, B)wer-out gate vx»sitions.

2.13. AIRCRAFT GROUND HANDLING



TERMINAL CONCEPT COMBINATION AND VARIATION

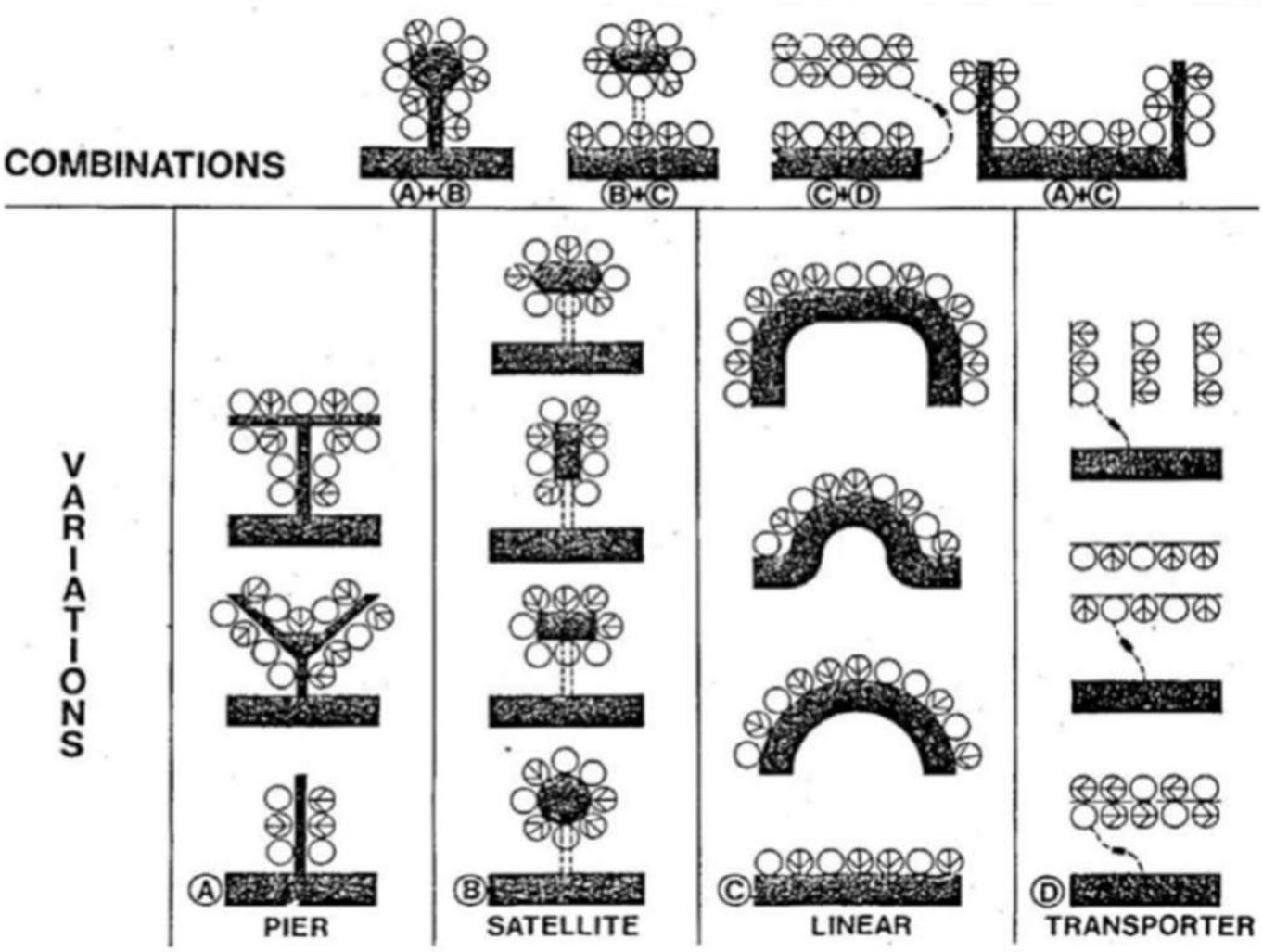
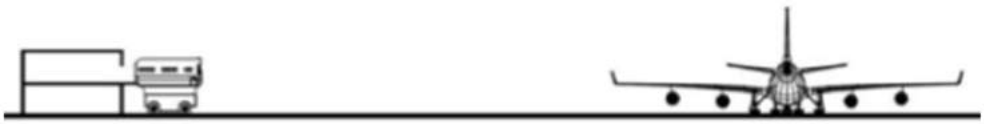


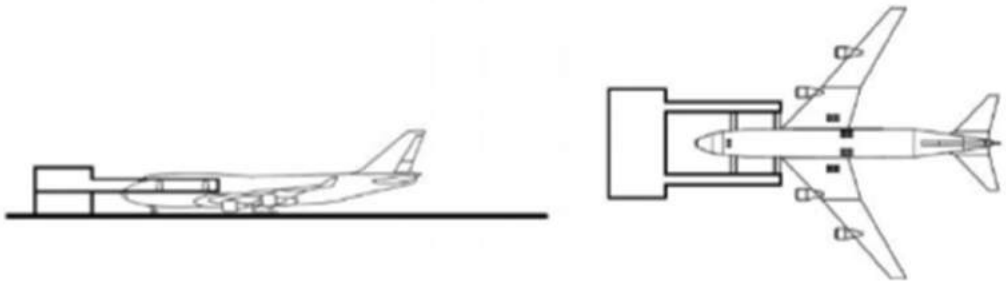
Figure 2-34: Concept Combination and Variation

(E) This diagram demonstrates a fixed jet way of short length and with a small amount of telescoping capability. This jetway also has the capability of making x»rne adjustments in sill height The gate m,hition can only a power-in, push-out condition.

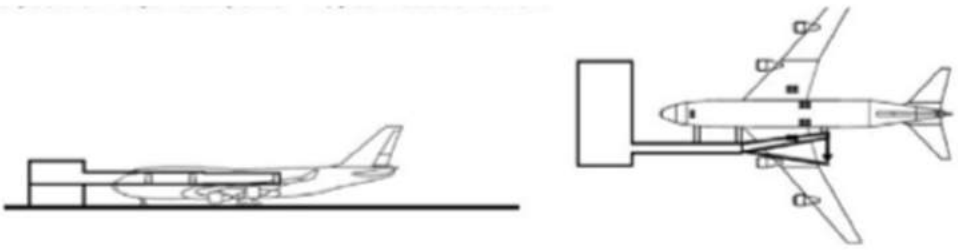
(F) This method "tlich is used in present-day aiq»rts consists ofa train of carts dcsigncd to carry or it may consists of the ofbuscd to deliver the pasengers to a aircraft parking positiom terminal building can eider a one —level or two-level stnxture



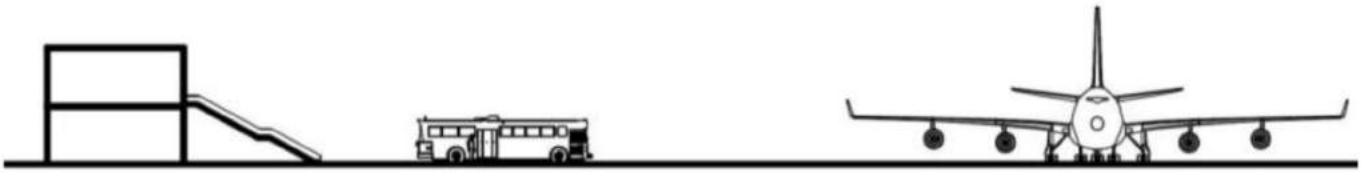
(G) Ihis is known as Mobile-lounge and consist of a elaborately furnished bus with a lift a telescoping front to achieve the the aircraft arul tix terminal building •IIIC aircran is parked at a remote position from the terminal



(H) This meth«l is used for the wide t»dies aircraft and will accept tix [X. 10 L- 1011. main corridors are fixed in tirir however, the four short jetways have telescoping capability in to achieve interface With the aircraft. gate tx»sition reauires a txnser-in. Dush-out condition.



(l) This meth«l is also for wide-Exxlies aircraft and Will all aircrafts as listed above. It is based the concept of cantilevered jet way over the wing to reach

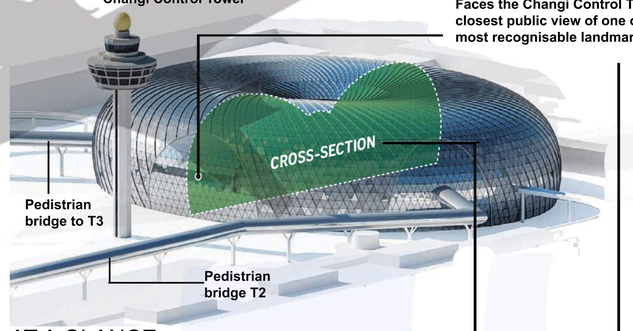


LITERATURE STUDY

LITERATURE STUDY

THE CROWN JEWEL OF CHANGI AIRPORT, SINGAPOR

The long-awaited Jewel Changi Airport will officially open its doors to the world next Wednesday. About half a million people have signed up for the public preview currently being held from April 11-16, with about 60,000 visiting on the firstday. Visitors can now shop and dine at about 90 per cent of Jewel's 280 shops and food and beverage outlets. They canalso check out other attractions, including an indoor garden that spans four sto-reys and the world's tallest indoor waterfall. The Straits Times explores the ins and outs of Jewel.



South Gatewat Garden
Faces the Changi Control Tower.offers the closest public view of one of Singapore's most recognisable landmarks.

AT A GLANCE

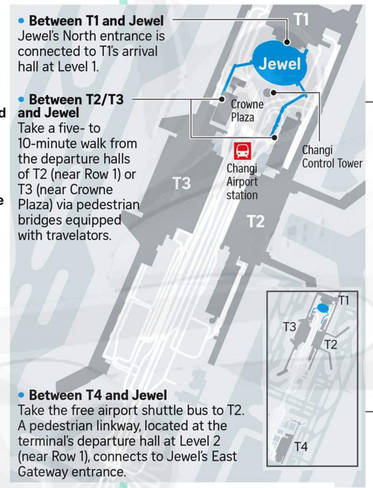
Levels
Total
10 storeys
(5 above ground
5 below ground)

Retail and F & B
7 STOREYS
Carpark
5 STOREYS

AREA
TOTAL: 135,700 SQ M
Retail
53,600 sq m
Indoor gardens and attractions
21100 sq m

Facilities for airport services
19,400 sq m
cost
$1.7 billion

GETTING AROUND

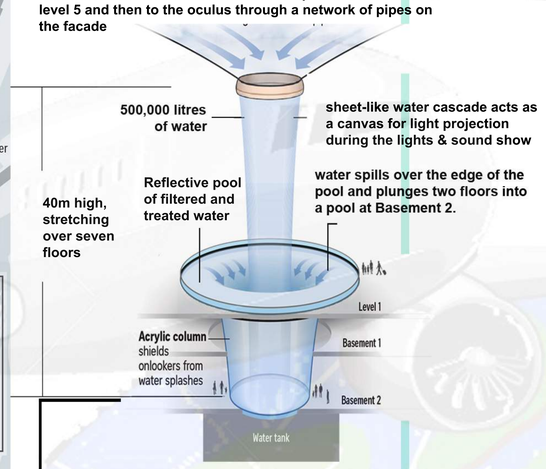


- **Between T1 and Jewel**
Jewel's North entrance is connected to T1's arrival hall at Level 1.
- **Between T2/T3 and Jewel**
Take a five- to 10-minute walk from the departure halls of T2 (near Row 1) or T3 (near Crowne Plaza) via pedestrian bridges equipped with travelators.
- **Between T4 and Jewel**
Take the free airport shuttle bus to T2. A pedestrian linkway, located at the terminal's departure hall at Level 2 (near Row 1), connects to Jewel's East Gateway entrance.

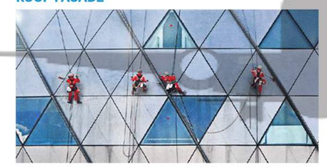
NOTE: Terminal 1,2 and 3 are connected by the skytrain service in both the transit and public areas. The Skytrain between T2 and T3 passes through Jewel without making a stop.

HSBC RAIN VORTEX

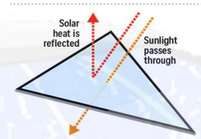
continuous waterfall
Rainwater collected will be channelled up from Basement 3 to level 5 and then to the oculus through a network of pipes on the facade



ROOF FACADE



- Weight of the facade
3,500 tonnes
(about the weight of six Airbus A-380 planes)
- Time it took to install the roof
>1 year
- Number of glass panels
>9,000
- Each panel has an air gap of 16mm to insulate the interior from noise emitted by aircraft.



- The special glass has the dual ability of transmitting light, which allows plants in Jewel to thrive, while reducing heat gain.

- The facade is supported by 14 tree-like structures, each 12m tall.
- This allows the Shiseido Forest Valley and the Canopy Park to be column-free.

Cloud9 Piazza
An event plaza space large enough to serve 1,000 people.

Canopy Bridge

North entrance
This is connected to the T1 Arrival Hall. erminal 1

Skytrain
The Skytrain between T2 and T3 will run through Jewel, offering passengers a spectacular view of the Shiseido Forest Valley and the HSBC Rain Vortex.

Carpark
The carpark spans five basement levels, from B2M to B5, with a total of 2,500 parking spaces. It provides more than thrice the number of spaces, compared with the previous open-air carpark at T1

1 Outdoor terrace dining
Relax and dine in airy terraces set in pleasant gardens while enjoying the view. Terrace dining will be open during the public preview from April 11-16.

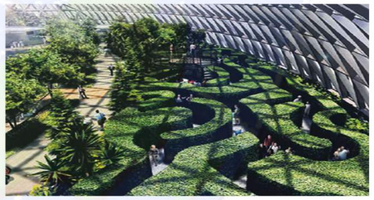
2 Manulife Sky Nets
This attraction combines a 50m-long walking net and a 250m-long bouncing net. The highlight is an 8m-high lookout at its highest point.

CANOPY PARK (OPENING ON JUNE 10)

Jewel's top floor is a 14,000 sq m of recreational space. From playgrounds to dining, there is something for everyone. Here are some highlights.

3 Canopy Bridge
Suspended 23m above ground, with a glass bottom at the centre, the Canopy Bridge is a great vantage point.

4 Hedge Maze
Visitors can take a walk in Singapore's largest hedge maze. At its core, an elevated watch tower offers a bird's eye view of the maze.



5 Discovery Slides
A four-slides-in-one sculptural playscape that doubles as an art sculpture. Visitors can stand atop a 6.5m-high platform to enjoy a view of the Shiseido Forest Valley.

FOR TRAVELLERS

EARLY CHECK-IN

- 26 airlines offer early check-in options for passengers.
- This represents 60 per cent of departing flights at Changi.

CHANGI LOUNGE

A dedicated lounge for fly-cruise and fly-ferry passengers.
- Comfortable waiting area with refreshments and business facilties. Travel services such as ticketing and shuttle services to the cruise/ferry ter-minal.

YOTELAIR SINGAPORE CHANGI AIRPORT

- Yotel, a chain of hotels, opened at Jewel yesterday with rooms for short daytime layovers and overnight stays.
- Branded YotelAir Singapore Changi Airport,

SHISEIDO FOREST VALLEY AND GARDENS IN JEWEL

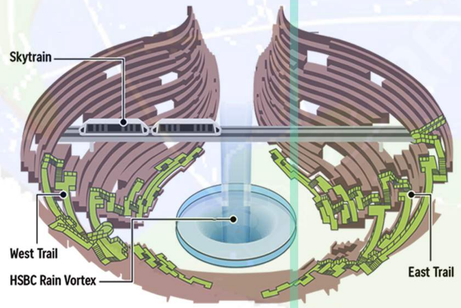
Plant collection
Jewel will have one of the largest indoor collections of plants in Singapore.

More than
2,000
trees and palms

100,000
shrubs

Walking trails
Visitors can take a gentle hike up two cobblestoned walking trails, the East and West Trail, punctuated by idyllic cascading waterfalls and mist clouds.

160m
Length of each trail



AIRPORT

NIDHI GIRI
1150101048
BABU BANARSI DAS UNIVERSITY, LUCKNOW

THE CROWN JEWEL OF CHANGI AIRPORT, SINGAPOR

LITERATURE STUDY

YEAR OF CONSTRUCTION :2014-2019
FLOOR AREA: 1,35,700 SQ M
CONSTRUCTION COST: 1.7 BILLION S$

TYPOLOGY OF THE STRUCTURE

NEO FUTURISTIC STRUCTURE

The Geometry of jewel is based on a semi-inverted toroidal dome roof. measuring 200 meters across at the longest span, and supported only intermittently along the rim of the garden. Due to this geometry, the facade system allows for a near column-free interior.

EVOLUTION OF TYPOLOGY

NEO FUTURISM

Neo futurism is a style that articulates a clear enthusiasm for technology and the space age.

Challenge design conventions, and design structures, boundries of more traditional structures.

it evolved out of high tech architecture developing some of the same themes

CONSTRUCTION FACTS

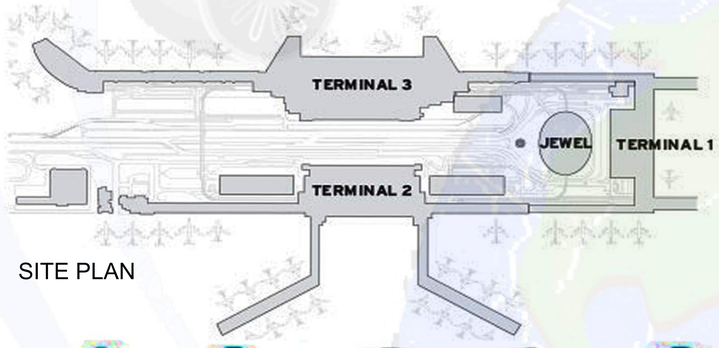
JEWEL'S ROOF FACADE

A Continous grid shell that weight 4,000 tonnes, equivalent to the weight of about six air bus 380 planes.

The roof spans an area of 23,410 sq m -roughly the floor space of 213 H five-room flats.

It is 200M at its longest and 150 M at its widest, and supported by a ring of 14

12M- tall tree like column.



SITE PLAN

PROJECT COST
$ 1.7 billion

TOTAL SITE
3.5 ha

TOTAL GROUND FLOOR AREA
134,00 sq m

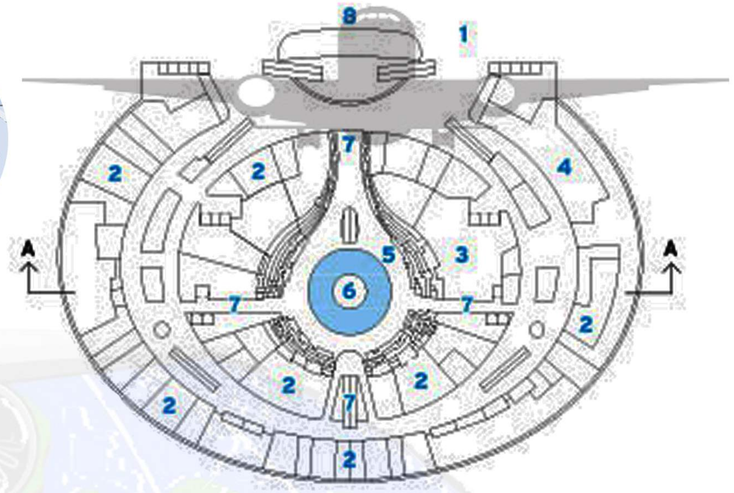
FACILITIES FOR AIPORT OPERATIONS
18,500 sq m

INDOOR GARDENS AND ATTRACTIONS
21,700 sq m

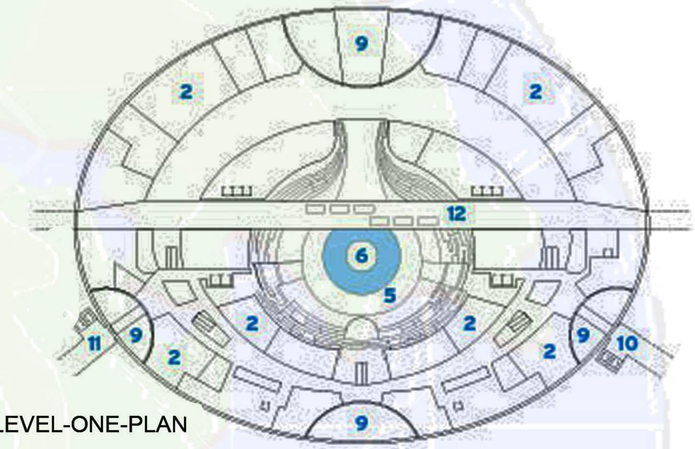
RETAIL
53,800 sq m (about 300 shops and resturants)

REQUIREMENT

1. GREETER HALL
2. RETAIL
3. LOUNGE
4. EARLY CHECK-IN
5. FOREST VALLEY
6. RAIN VORTEX
7. CANYON
8. TERMINAL 1
9. GATEWAY GARDEN
10. TERMINAL 2 LINK
11. TERMINAL 3 LINK
12. PEOPLE MOVER TRACKS
13. CANOPY PARK
14. MOVIE THEATER
15 FOOD HALL
16. IMMERSION GARDEN
17. PARKING
18. BUS STATION

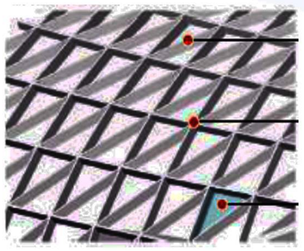


LEVEL-THREE PLAN



LEVEL-ONE-PLAN

THE FACADE IS MADE UP OF:



Close to18,000 Pieces of steel Beams

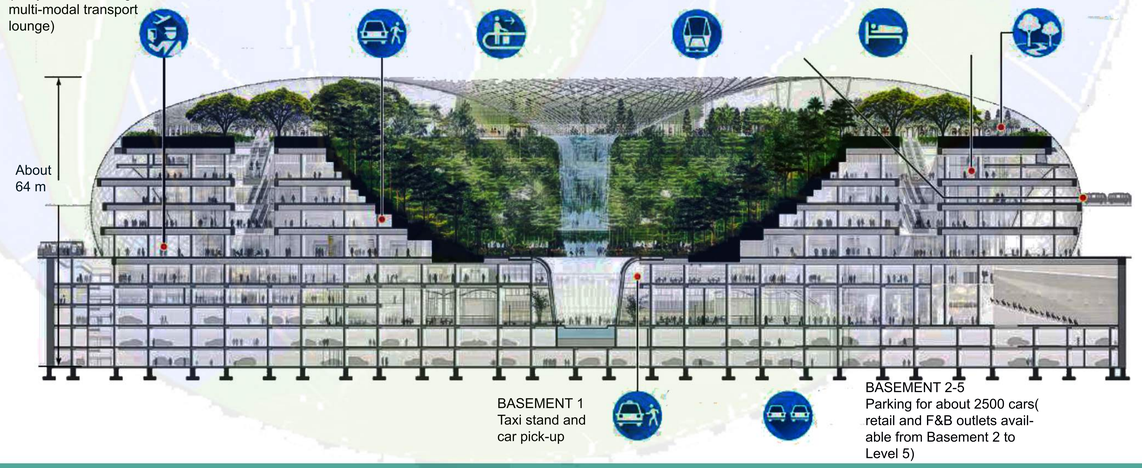
Over 6,000 steel nodes-pieces that connect the steel beams and glass panels

Over 9,600 pieces of specially manufactured glass

The glass, manufactured in the US, can transmit light- for plant growth while reducing heat gain to ensue sustainable cooling of the interior.

The entire study, engineering and shortlisting of the glass material alone took nearly two years to complete.

CROSS-SECTIONAL VIEW



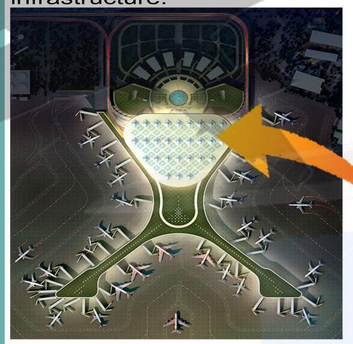
AIRPORT

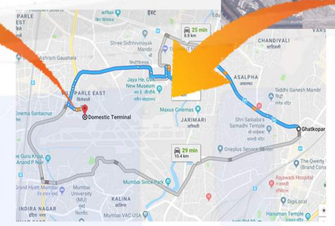
NIDHI GIRI
1150101048
BABU BANARSI DAS UNIVERSITY, LUCKNOW

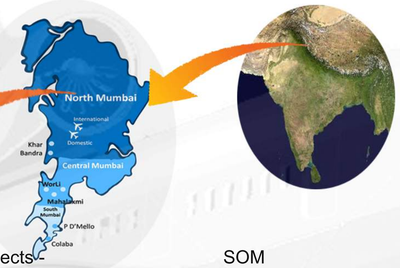
LITERATURE STUDY

CHHATRAPATI SHIVA JI INTERNATIONAL AIRPORT, MUMBAI

If airports reflect the Character and personality of a city, then the new Mumbai International Airport is proud to have created a gateway for the world that is truly a landmark of the future. Inspired by the dancing peacock, India's national bird, terminal 2 seems picturesque (unique, pictorial) and resplendent icon of modern infrastructure.



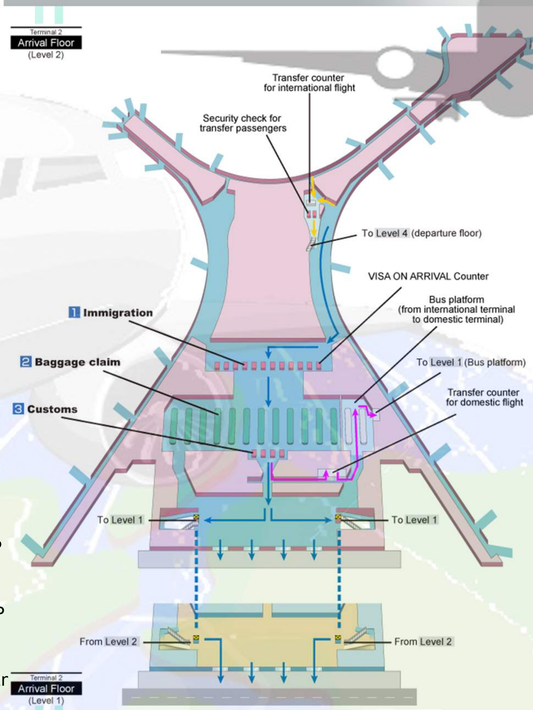




TOTAL AREA - 15,00acre (610ha)
Terminal 2 - 210,000 sqm

Architects -	SOM
Design Partner -	Roger Duffy
Senior Design Architect -	Scott Duncan
Design Architect -	Peter Lefkovits
Technical Architect -	Narin Gobindranauth
Senior Aviation Planner -	Derek Moore
Project Year -	2014
Manufacturers -	Lindner
Managing Partner -	Anthony Vacchione
Structural Director -	Charles Besjak
Structural Engineer -	Preetam Biswas
Structural Engineering -	Skidmore, Owings & Merrill LLP
Project Manager, Director -	Laura Ettelman
Architect and Engineer of Record -	Larsen & Toubro Limited,
MEP Engineer -	Skidmore, Owings & Merrill LLP
Lighting Design -	Brandston Partnership Inc.
Acoustics -	Cerami & Associates
Communication, IT, Security & Special Sustems -	Mulvey & Banar
Baggage Handling -	BNP Associates
Verical Transportation -	Van Deusen & Associates
Cultural Design Collaboration -	Abu Jani - Sandeep Khosla

TERMINAL 2



FACILITIES

14 baggage carousels
192 check-in counters
60 immigration counters for departing passengers,
76 immigration counters for arriving passengers.
5 levels of security screening
87 elevators
55 escalators
42 tra velators
52 passenger boarding bridges
1,98,000 sq.mgranite for flooring
161 58 self-check-in kiosks
50 feet high check-in hall
70 m wide departure bay
40,000 sq.m canopy
21,000 sq.m of retail shopping
Material sourced from 25 countries elevators

CONCEPTUAL DEVELOPMENT OF CHHATRAPATI SHIVAJI INTERNATIONAL AIRPORT

The entire shopping, eating and drinking experience has been carefully planned throughout the terminal, with color and form used to create distinct spaces to relax and enjoy the experience

The international departure lounge integrates a cool lighting concept to create a soothing retail environment.

DESIGN VALUES:- The following pages present the values that have informed the design of the new terminal and the total experience we wish our customers to enjoy. Please take the time to reflect on them and consider how you might be able to bring them to life in all aspects of your submission.
•Mumbai is a cosmopolitan city - a city that welcomes people from all over India and the world.it comfortably respects tradition while celebrating the new.

The stunning architecture of the new terminal is more than a decorative shell. It is a deep expression of Mumbai, and of India. It is a place inspired by a heritage of creativity, craft and innovation. It feeds the imagination and creates new possibilities.
throughout the terminal, jalli filters direct sunlight, helping to keep the building cool and reinforcing the special Indian character

OPEN SPACE:- The layout of the international departure lounge is an elegant planning solution that balances circulation, seating and shopping needs in a unique Indian inspired format.

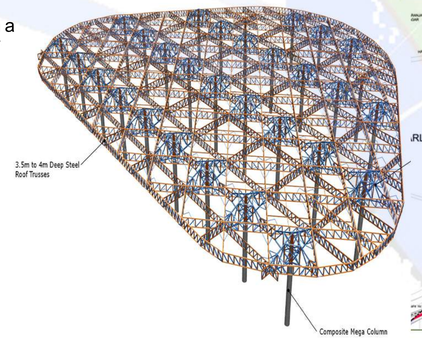
Topiary and seating have been integrated to create relaxing waiting areas for the domestic.

The domestic departure lounge creates an inviting environment by using a vibrant, warm lighting concept

STRUCTURE

The airport consists of two passenger terminals: Terminal 1 Santacruz fordomestic flights and Terminal 2 Sahar for both international and domestic flights.
While both terminals use the same airside facilities, they are physically separated,6km on the city side, requiring a 15–20-minute (landside) drive between them.
MIAL operates coach shuttle services between the two terminals for the convenience of transit passengers.

Facilities	Existing	Planned
Area for Passenger Terminals		
Santacruz	64,000 sq.m	1,08,000 sq.m
Sahar	94,000 sq.m *	4,39,204 sq.m
Total	1,58,000 sq.m	5,47,204 sq.m
Passenger Boarding Bridges at CSIA		
Santacruz	5 gate houses/6 bridges	10 gate houses/11 bridges
Sahar	13 gate houses/ 22 bridges	25 gate houses / 52 bridges
Car Parking Spaces		
Santacruz	1,050	1,050
Sahar	1,240	5,000



AIRPORT

NIDHI GIRI
1150101048
BABU BANARSI DAS UNIVERSITY, LUCKNOW

CASE STUDY

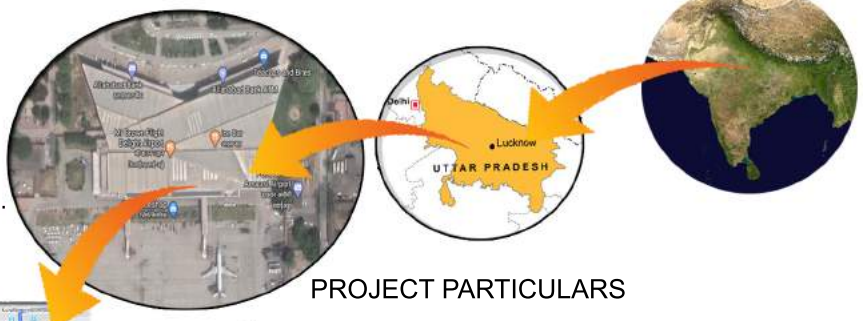
CHAUDHARY CHARAN SINGH INTERNATIONAL AIRPORT LUCKNOW

INTRODUCTION

Chaudhary Charan Singh International Airport (IATA: LKO, ICAO: VILK) is an airport serving Lucknow, the capital of the Indian state of Uttar Pradesh. It is situated in Amausl in the city of Lucknow, and was earlier known as Amausi Airp ort before being renamed after Chaudhary Charan Singh, the fifth prime minister of India. L ucknow Airport is the 10th Busiest Airport in India and is the largest in Central India and second largest in North India. It handled abo ut 3.97 million passengers in 2016-17. It was awarded Has the second best airport in the world in category of 2-5 million passengers . It is also a focus city for IndiGo.

CHAUDHARY CHARAN SINGH INTERNATIONAL AIRPORT CITY SIDE VIEW

ROUTE FROM CHARBAGH JUNCTION



Other Airport in vicinity

Name of the Airport	Distance
Varansi Airport	285Kms
New Delhi	500Kms

PROJECT PARTICULARS

Airport Name	Chaudhary Charan Singh Airpport
Initial Name	Amausi International Airport
Airport type	Public
Operator	Airports Authority of India (AAN W
Serves	Lucknow
Location	Lucknow, Uttar Pradesh, India
Focus city for	IndGo
Elevation	AMSL 123 m/404 ft
Coordinates	26°45'43'N 080 5300°E
Distance from city	10 Kms. from Main Railway Station
Commencement Date:	December 2007
Completion Date:	June 2010
Approx. Cost:	Rs. 125 Crore
Architects:	S. Ghosh & Associates
Principal Designer:	Sudipta Ghosh
Associate Designer:	Mitesh Kapadia, Rshmi Vkharia, Naer Ashnaiwala, Ketan Bhartia
Structural Consultant:	Descon United P. Ltd

SITE PLAN

CONNECTIVITY

Lucknow Airport (LKO) is located about 30 minutes by car and 1 hour by public transport (12 km) from Lucknow city centre. LKO Airport is situated in the Lucknow suburb of Amausi. To go from LKO Airport to Lucknow city centre you have a few transport aptions: by Bus, Tax, Autonckshaw ar Caricar rental.Train The nearest major railway station, Lucknow Charbagh railway station which is roughly 10 km from the airport campus is well connected with the cab service.Bus 13.6 km from Sector 17 Chd. Taxd/Rickshaw Readily available outside the term- nal Car rental The following local car rental companies which are available at Lucknow Airport Avis, Dollar and Hertz Metro CCS International Airport will be connected through Lucknow Metra by a terminal station on the North-South Corndor Line, Metra oonnection will make it easy for passengers to commute to and from the airport

BUILT FROM ANALYSIS

Site Area : 1186.96 acres (4803457m2)
Built-Up Area:
Domestic Terminal - 20,000 mil
International Terminal - 9,500 m2
Passenger Capacity:
Domestic terminal - 1250 pax at peak hours (235+235)
International Terminal - 470 pax at peak hours (625-825)

CONCEPT OF PLANNING

Lucknow Airport, previously called Amausi International Airport is now renamed as Chaudhary Charan Singh International Air- port. It was constructed with the purpose of facildating VVIPs. It was only in 2005 when the AAI took decision to upgrade the Airport owing to increased number of passengers and also be- cause of introduction of private operators in the sector. A new terminal, equipped with latest technol- ogy, at Lucknow's Chaudhary Charan singh Airport is operative since 2 June2012. It is being used both for arrivals and departures of domestic and international flights. The new terminal is a three-tier bulding which can accommodate around 650 passengers at a time.

BUILT FROM ANALYSIS

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Domestic terminal - 1250 pax at peak hours (235+235)
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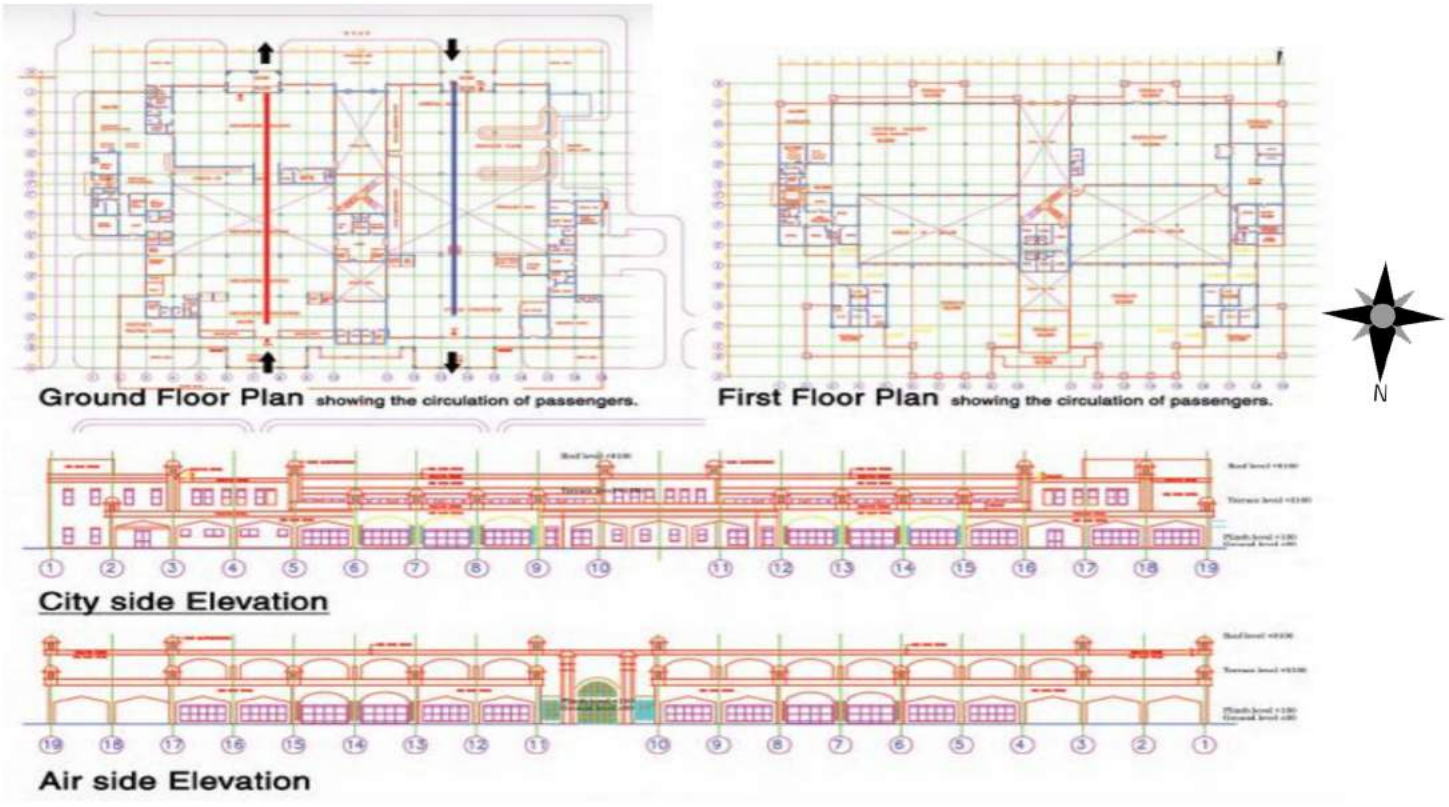
T1 - INTERNATIONAL TERMINAL

The airport was constructed in 1986 to facilitate corporate and government officials,
The terminal building design depicts the traditions and culture of Lucknow as the Lucknow architecture and design uses the famous craftsman style and the fusion of the arts into its architecture.
It creates an undeniable aura of the past rich cultural heritage of Lucknow - the city of Nawabs and also fondly remembered as Awadh, the city of culture, poets, artists and the fabled Umrao Jaan



STRUCTURE

The project has 2 different types of buldings in terminal T1 & T2 where is the old terminal with Stone construction and T2 is t he new terminal composed of glass and steel

Runway
The arport has a sngle runway that is 2.800 metres (9.200 m) l ong asl has also planned for runway expansion at Lucknow airport

Parking Capacity and Rates

Terminal	Capacity
T-2	312 Cars and 10 Buses
T-1	100 Cars

Charges

Bus	Car	others
Rs. 70/-	Rs. 60/-	Two-wheeler Rs. 15/-
	Rs. 60/-	Two-wheeler Rs. 15/-

CHAUDHARY CHARAN SINGH INTERNATIONAL AIRPORT, LUCKNOW

T2 - DOMESTIC TERMINAL

CONCEPT PLANNING

Terminal 2 is the newest and operates with domestic Indian flights. Unlike other buildings in the city that bears local influances, the Airport Terminal is an ode to man's rather new ambition - flying
The notion of flight and man's fascination with it captures every child, as he folds his paper plane to launch it into sky - that paper plane became the starting point for the design of the Lucknow Airport

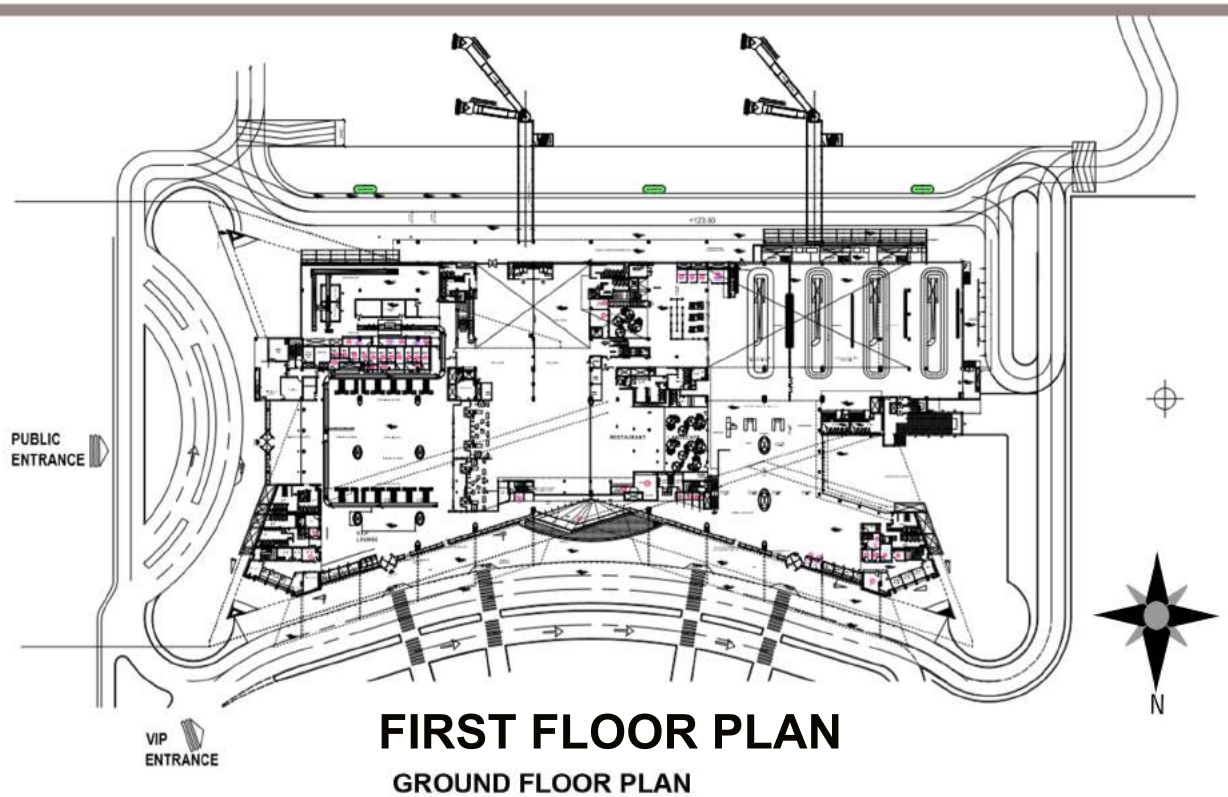
The paper plane with its, folded wings - a symbol for that elemental flight that catches our fancy as chidren, inspire an airport that holds new promise for
a historic city.

AREA ANALYSIS

The terminal is designed as a one and a half floor integrated terminalfor international and domestic travellers in an area of 20,000 sq. m. There are two security holds on ground floo r for connectivity by busand two on the first floor for approach to the aircraft through passenger boarding bridges.
Three passenger
claim belts of 60 m lengths have been provided for the arriving passengers. These not only bring revenue to the airport but also make flying a much more pleasurable experience.The ground floor consists of a cafeteria of 4415 sq. ft. retail areas of 3440 8. IL and business centre in an area of 245 sq.
IL whereas the first noor has a VIP lounge in an area of 720 sq. ft. and a snack bar in 440 sall area

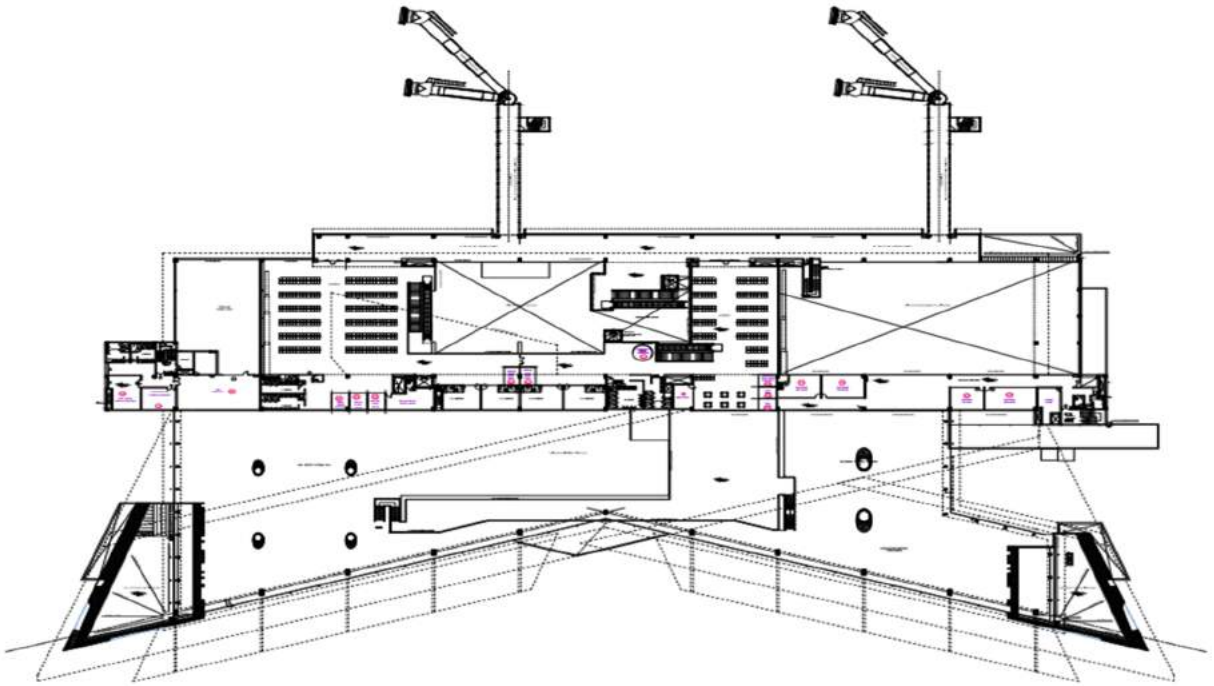
Materials Exteriors

• Steel and glass has been very smartly used along with a touch of Lakhori bircks to give the state-of-art equipment a re-gional feel along with its International standards. The roofing is finished in 'seamless' aluminium profile, with
provisions for skylights The building is clad in laminated glazing along its vertica surface, which not only makes it aesthetically pleasing but also makes it heat resilient. Interiors The airport in-teriors have a combination of warm colors making it very sooth-ing Aluminium composite panels, toughened glass panels, acoustic tile at ceiling in low height areas. Ceramic tiles of beige colour have been used giving it a fin-ished apearance
Inter



FIRST FLOOR PLAN

GROUND FLOOR PLAN
showing the circulation of passenger



SECOND FLOOR PLAN

CONSTRUCTION SYSTEM

The structure is formed by a set of van able span portals with fored connections spanned across by variable space trusses that form the final form of the 'wings'.
• The design of the section of the portal has been arrived at using composite rolled sections forming an overal dimension of 733 mm by 375 mm The maximum span of the potals is roughly 43 m.• The maximum cantilever achieved by the space trusses is 24m. Two corner blocks, towards the north east and north-west of the terminal building portray the load bearing lakhoni brick buildngs of the Residency in Lucknow• With th intricate patterns of chikankan -Lucknow's tamous embroidery emulated in glazing, this is as rooted in the city it serves as it is poised to take flights

INTER-RELATIONSHIP OF SPACES

The terminal's Interiors is very expressive, it seems as if it speaks for itself, the circulation pattern is simple and efficient The huge lobby connecting the visitor's area is generously designed nd gives an amazing view of the arrival as well as the departure concourse to the Visitor's

SERVICES

Skylights have been provided, which light the interiors

- The metal sheeting on the ceiling was designed for iso-lation and absorption of characteristics by providing slit holes and ribs with open areas of more than 25%.

- Solar panels are used to generate energy on the site.

The HVAC system is covered using the false ceiling tiles, which is about 2m in depth.

- There is provision for fire safety as Fire Hydrants, Fire Extinguishers and Fire Control rooms are present at regular Intervals and are in reach of all the pucblic areas,

- The reserved lounge is well furnished with additional AC System incase there is any issue with the centralised HVAC system then they will be uspportive to maintain a comfortable temperature.

Energy Efficient Features

Skylights have been provided, which light the interiors The metal sheeting on the ceiling was designed for isolation and absorption of characteristics by providing slit holes and ribs with open areas of more than 25%.Solar panels are used to generate energy on the site.

- The frond glass facade lets the north light inside the building resulting in no use or artificial lighting during the day

COMPARATIVE ANALYSIS

	IGI INTRNATIONAL AIRPORT, DELHI	CCS (NEW TERMINAL) LUCKNOW
LOCATION	DELHI , INDIA	LUCKNOW, INDIA
TYPES OF AIR-PORT	INTERNATIONAL	DOMESTIC
COORDINATES	28*34'07"06'44"E	29*35'32.85"N
ELEVATION	237M	1400M
TOTAL AREA	5,40,000 SQ M (2.61% OF TORAL AREA)	25020 SQ M
PEAK HOUR CAPACITY	3,4000PAX/HR	24.6 MILLION/PER YEAR
AIRCRAFT MOVE-MENT	290772	19682
TYPES OF AIR-CRAFT	ALL TYPES OF NARROW BODY & WIDE BODY AIRCRAFTS	B-737, B-707, B-747, B-767, A-310, A-320 ETC.
DESIGN	MODERN DESIGN WITH CUR-TAIN WALLS AND AN ECO FRIENDLY CONTEMPORARY DESSIGN	FROSTED ETCHINGS ON THE GLASS FACADE OF THE BUILD-ING BEAR THE INTRICATE PAT-TERN LOF CHINKARI WORK
PARKING	PROVIDING A MULTI STOREY BUILDING FOR PARKING PUR-POSE	
RUNWAY	TWO PARALLEL PARKING	
TERMINAL BUILD-ING TYPE	FINGER/PIER CONCEPT TYPE	LINEAR CONCEPT TYPE
REFULI NG FACILI-TY	AVAILABLE	AVAILABLE
IMMIGRATION AND CUSTOM	AVAILABLE	AVAILABLE
HEALTH FACILITY	AVAILABLE	AVAILABLE
PASSENGER CA-PACITY	34MILLIONS/ ANNUM	AVAILABLE
SERVICES	PARKING, CUSTOMS, DUTY FREE, SHOPS, SNAKS, KIOSK, BARS ETC.	5 MILLIONS/ ANNUM

COMPARATIVE ANALYSIS

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“AEROTROPOLIS”.....
JEWAR INTERNATIONAL AIRPORT, NOIDA, U.P.

SITE ANALYSIS

"AEROTROPOLIS".....
JEWAR INTERNATIONAL AIRPORT,NOIDA

INTRODUCTION

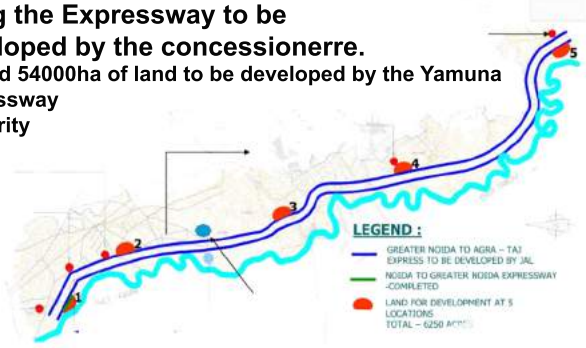
• Jewar sa city and a nagar panchayat in Gautam Buddha Nagar District in the Indian state of Uttar PradeshJewar is located in the suburbs of Greater Noida about 60 km. from Noida 40 km from Greater Noida. 33 km fro Gautam Buddha University and 35 km from Khair. It is situated on the northeast bank of the Yamuna Aver. It is located between 28 23° North latnude and 77.31 East longitude at a height of 195 metres (639 feet above mean sea level. • it is located in the outskirts of Greater Noica, the district headquarters are located in New Okhla Indus-trial Development Authority (Noida) iselt It is about 35 km (22 m) away from Noida, and one can come via Dankaur, Rabupura. An eight lane Yamuna Expressway connects Jewar trom Greater Noida and Agra.

• This whole district including Noida Greater Noida is said to be one of the most fast devel-oping areas of

PROJECT PARTICULARS

irport Name	Jewar International Airport
rport type	Public
erator	Airports Authority of India
erves	NCA Delhi, India
ocation	Jewar, Greater Noida UP
Elevation AMSL	195 m
Coordinates	314228'N 074°47'57'E
Distance from city	
Approx. Cost:	Rs. 15.000 - 20,000 Crore

MPIUINA CAPRESSWAY PROJECT
185 km long 6 Lane Access Controlled Ex-pressway connecting Noida to Agra
Rights to concessionaire for 36 years
Development of 25 Million Sq Mtrs of land along the Expressway to be developed by the concessionerre.
Around 54000ha of land to be developed by the Yamuna Expressway Authority



METRO

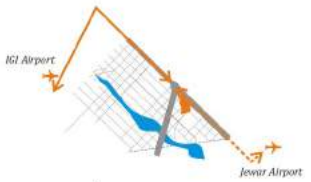
• METRO rail's proposed Line will add a stop at adjacent to the site along the river Yamuna.
Existing metro is
• Will make the area highly accessible to all residents within the loop.

EXISTING RAILWAYS

• Nearest station is Dankaur Station which lies on New-Delhi-Howarh Main line.
• Khurja junction is upcoming station to deal with the freight services of Greater Noida,

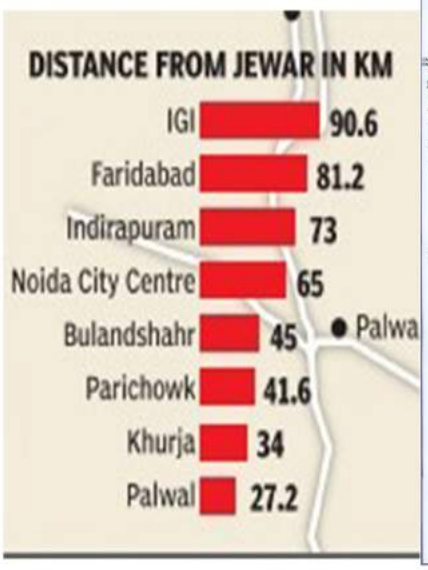
AUTOMOBILE and BUS Route

• The Taj expressway is under development where it connects the Noida and Agra by 165 kms in length.
•This project claims to cover the new International Airport at Jewar which will take 100 min to Agra and is 12 kms away from the site



Airport

• Existing airport that is Indra Gandhi International Airport is 110 min apart from the site.
•The proposed airport at Jewar District is only 12 kms south towards Agra.



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PROPOSED JEWAR AIRPORT AREA

PROPOSED AIRPORT
3000 HECTARES

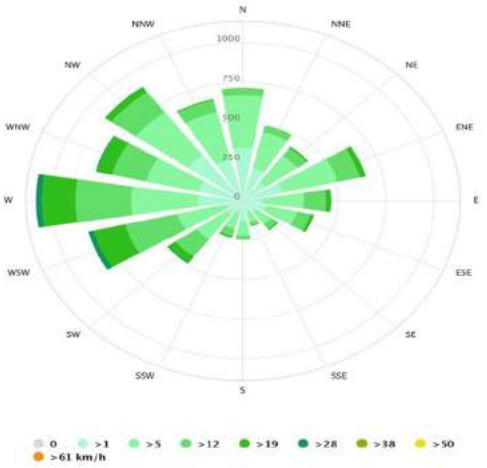
FIRST PHASE LAND
1327.9903 HECTARES

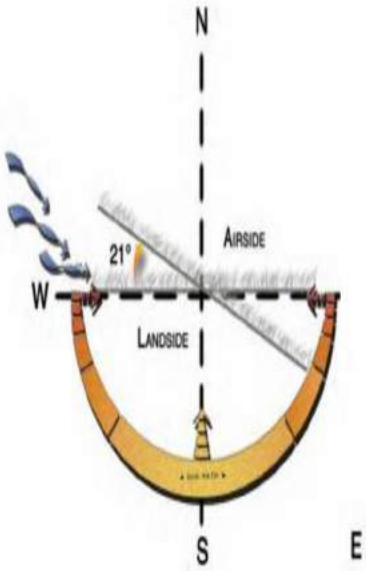
In the first phase of development
8 villagese to be acquired

- Rohini
- Ranhera
- Parohi
- Banwaribas
- Dayantpur
- Kishorpur
- Mukimpur Shivara
- Ramner

CLIMATE ANALYSIS

WIND ROSE DIAGRAM





According to the Wind Rose DIAGRAM

The Runway direction comes out to be 21° from West.
BUT
Practically the Runway directoin will be 27/09 due to the site boundary constriants

IMPORTANCE OF WIND ROSE DIAGRAM

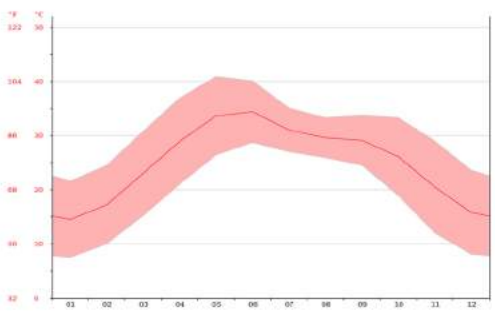
THE ORIENTATION OF A RUNWAY DEPENDS UPON THE DIRECTION OF THE WIND AND TO SOME EXTENT ON THE AREA AVAILABLE FOR DEVELOPMENT

Runways are always orientated in the direction of the prevailing winds, so that we can utilize the force of the wind during take-off and landing operations.

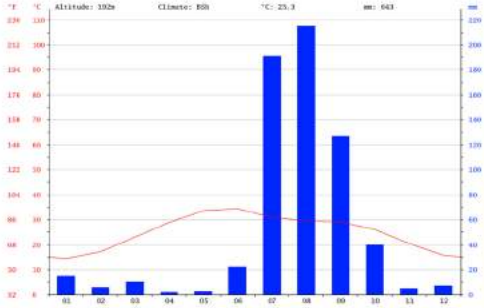
In the case of take-off operations, this wind will help us in generating the lift, whereas during the landing operations the same wind will help in generating the drag, so as to stop the landing aircraft. So, that is what is important as far as the orientation of runway is concerned.

WEATHER DATA CHART

JEWAR CLIMATE GRAPH // WEATHER BY MONTH

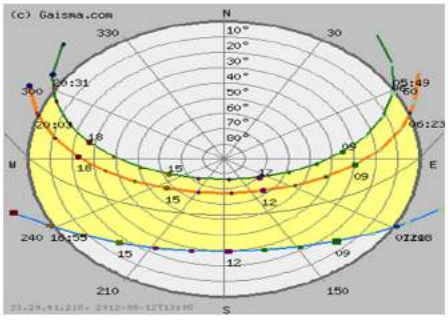


JEWAR AVERAGE TEMPERATURE



TEMPERATURE RANGE

SUNPATH DIAGRAM



There is a difference of 213 mm | 8 inch of precipitation between the driest and wettest months.
The variation in annual temperature is around 19.9 °C | 67.8 °

JEWAR WEATHER BY MONTH // WEATHER AVERAGES

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	14.5	17.2	23	28.9	33.6	34.4	31	29.6	29.1	26.1	20.5	15.8
Min. Temperature (°C)	7.5	10	15.2	21	26.4	28.7	27	25.9	24.5	18.9	12	8.1
Max. Temperature (°C)	21.6	24.5	30.8	36.9	40.9	40.1	35.1	33.3	33.8	33.3	29	23.6
Avg. Temperature (°F)	58.1	63.0	73.4	84.0	92.5	93.9	87.8	85.3	84.4	79.0	68.9	60.4
Min. Temperature (°F)	45.5	50.0	59.4	69.8	79.5	83.7	80.6	78.6	76.1	66.0	53.6	46.6
Max. Temperature (°F)	70.9	76.1	87.4	98.4	105.6	104.2	95.2	91.9	92.8	91.9	84.2	74.5
Precipitation / Rainfall (mm)	15	6	10	2	3	22	191	215	127	40	5	7

DISASTER

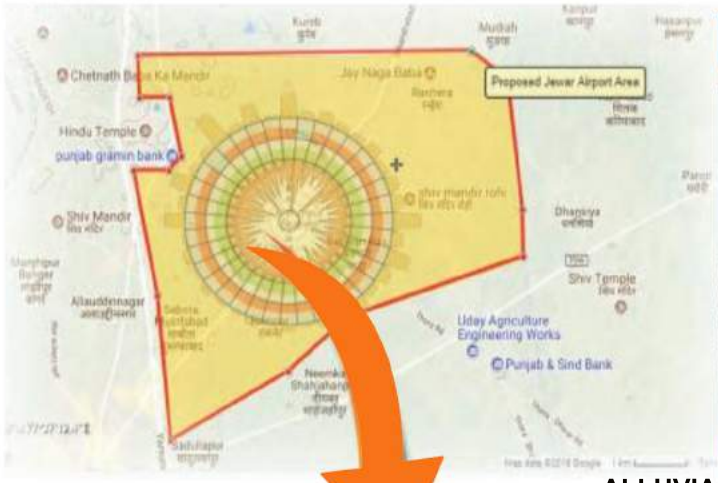
SEISMIC ZONE 4

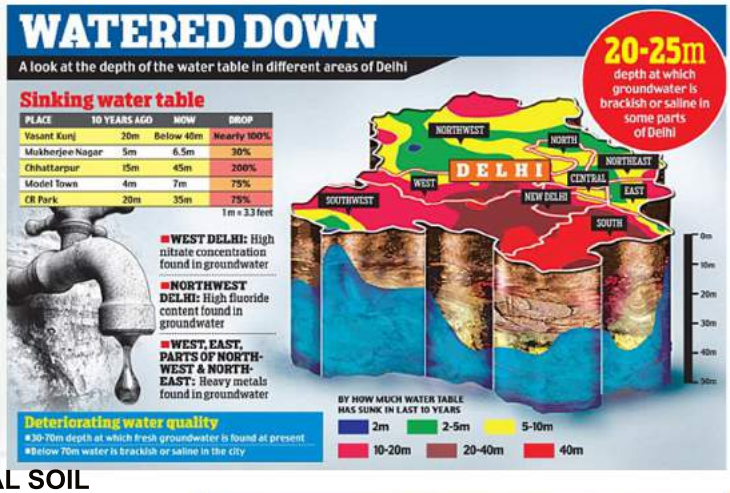
It is relerred to as the Very High Damage Risk Zone. The region of Kashmit, the Western and Central Himalayas, North and Middle Bihar, the North-East Indian region, the Aann af Kutch and the Andaman and Nicobar group of islands fall in this zone,Himalayas an and Nir Indian ree
Given below are some of the requisites for seismic zone 4 com-plained buildings mentioned in IS 4326-1993 code of practice by.-bureau of Indian standards

1) Horizontal seismic bands, consisting of reinforced concrete,
through all and external masonry walls.
2) Vertical reinforcing bars embedded in brick masonry at corners
of all romms and side of door openings.
3) Vertical reinforcing bars for windows opening for openings than 60cm.
4) Cement mortar in preferable ratio 1:4 and 1:6(Cement, sand

“AEROTROPOLIS”.....
JEWAR INTERNATIONAL AIRPORT,NOIDA

INTRODUCTION





ALLUVIAL SOIL

Alluvial Soil - a fine-grained \fertile soil deposited by water flowing over flood plains or in river beds,alluvial deposit, alluvial sediment, alluvium, alluvion - clay or silt or gravel carried by rushing streams and deposited where the stream slows down.

EXISTING BIRDS

LAND USE

The Uttar Pradesh Mil aviation department has directed the Yamuna Expressway Industrial Development Authority (YEIDA) to immedi ately change the land use of 3,000 hectares of agricultural land for Jewar airport project.

The Uttar Pradesh government headed by chiul minister Yogi Aditya-nath wants officials to tam track the airport project as it will help bring in investments to the state and facilitate the setting up of in-dustries, thereby generating employment

The Noida International airport project in Jowar will boost economic growth

The Union civil aviation ministry on June 24 gave a green signal for an international airport in Jowar, along the 165 km Yamuna Express. way. The YEIDA has also asked for a fund of Rs 2,000 crore and a dedicated team to begin land acquisition for the project. To begin with, the YEIDA will acquire 1.000 hectares of agricultural land.

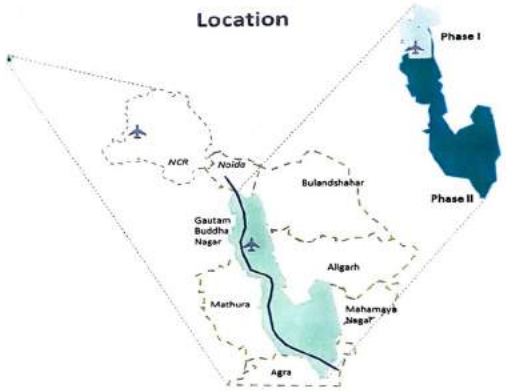
A day after the ministry of civil aviation gave its in-principle approval for the greenfield Noida international airport in Jewar, the UP gov emment has decided to directly purchase and from farmers instead of acquiring by invoking the land acquisition Act, 2013,

The motive behind the move is to buy and quickly and not to take the longer route of land acquisition by using the Right to Fair Com pensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. The Act regulates land acquisition and lays down the procedure and rules for granting compensation, rehabilita-tion and resettlement of affected persons.

According to the GBU survey, a majority of farmers wants to give their land for the airport project as it will positively impact their eco-nomie condition and bring about a social change

EXISTING VEGETATION

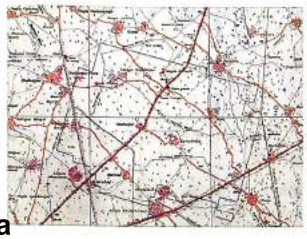
JEWAR INTERNATIONAL AIRPORT,NOIDA



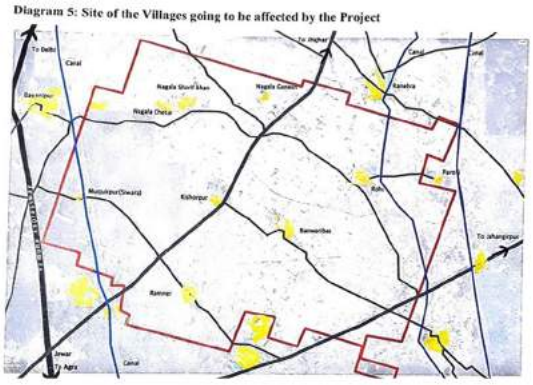
The project is proposed to be located in Gautam Budh Nagar District of Uttar Pradesh. The site isstrategically located near Jewar Town and is adjacent to Yamuna Expressway. It is well connected to Noida, Greater Noida, Delhi and major tourist destinations i.e. Agra, Mathura and Vrindavan.

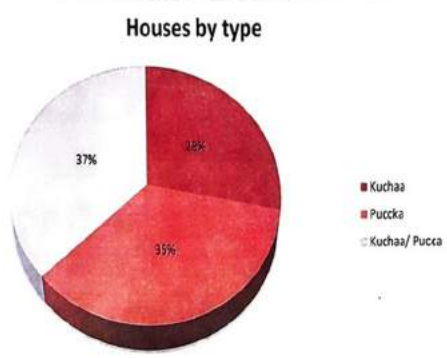
In the first phase of development, 8 villages to be acquired for the purpose of development, namely:

- Rohi
- Ranhera
- Parohi
- Banwaribas
- Dayantpur
- Kishorpur
- Mukimpur Shivara
- Ramner



SITE OF VILLAGES GOING TO BE AFFECTED





DETAILS OF TYPE OF LAND

TYPE OF LAND	AREA (IN PERCENTAGE)
IRRIGATED LAND	87.5
UNIRRIGATED LAND	4.85
BARREN LAND	7.65

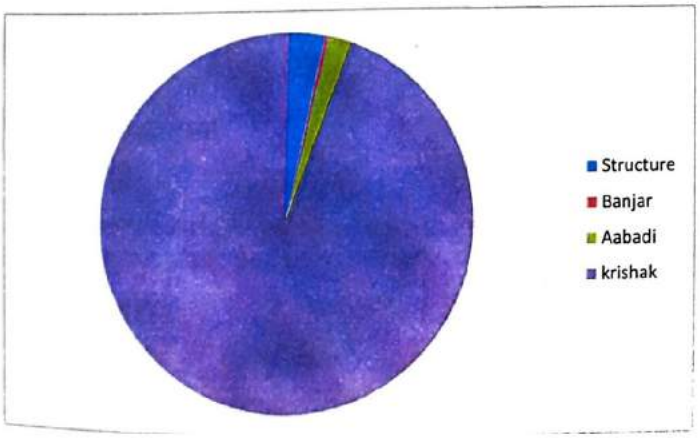
DISTRIBUTION OF MAJOR CROPS BY AREA

PRINCIPAL CROPS	AREA OCCUPIED (IN %)
Wheat	54.4
Paddy	12.2
Millet (Bajara + Jwar)	14.7
Maize	9.4
Pulses (Mung)	3.9
Sugracane	3.3
Mustard	1.0
Others	1.1

LAND HOLDINGS IN THE AFFECTED AREA

PRINCIPAL CROPS	AREA OCCUPIED (IN %)
< 1 Bigha	33.9
1-10 Bigha	39.6
10-20 Bigha	15.7
20-30 Bigha	5.1
30-50 Bigha	3.1
50-100 Bigha	1.7
> 100 Bigha	0.9
Total	100

LAND DISTRIBUTION



Land Distribution

The villagers in Mukimpur follow Hinduism of which were of general and OBC group. The number of members in each household ranged between 5 to 9.Gender-wise, males are more than female per family. The women's role was recorded as house helper only. Age-wise, only one person was recorded in above 60 years category. Land distribution is shown below

INTERNATIONAL GREENFIELD AIRPORT

JEWAR INTERNATIONAL AIRPORT OR NOIDA AIRPORT IS PROPOSED AIRPORT TO BE CONSTRUCTED IN JEWAR IN GAUTAM BUDH NAGAR DISTRICT OF U.P.

PROPOSED JEWAR AIRPORT AREA 3000 HECTARES
FIRST PHASE LAND - 1096.6 HECTARES

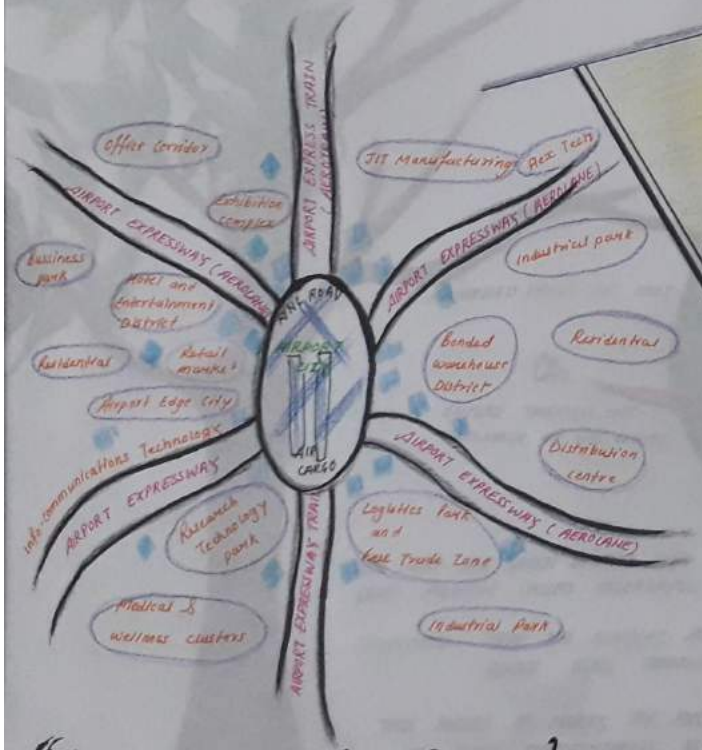
"AEROTROPOLIS"

JEWAR INTERNATIONAL AIRPORT, NOIDA, IS PROPOSED TO BE THE SECOND AIRPORT IN THE NATIONAL CAPITAL REGION (NCR) OF DELHI. IT WILL BE THE FIRST AEROTROPOLIS TO BE PLANNED IN INDIA.

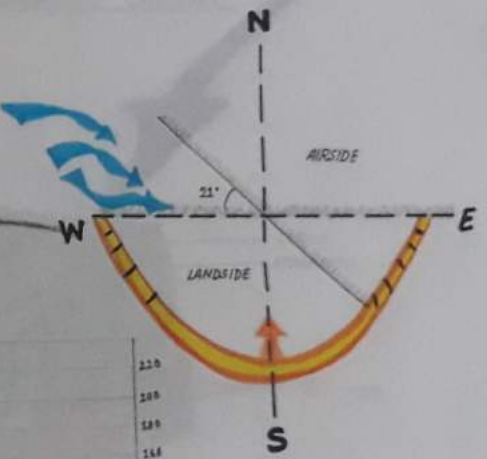
SITE ANALYSIS

PROJECT PARTICULARS

AIRPORT NAME : JEWAR INTERNATIONAL AIRPORT
AIRPORT TYPE : PUBLIC
OPERATOR : AIRPORT AUTHORITY OF INDIA
SERVES : NCR DELHI, INDIA
LOCATION : JEWAR GREATER, NOIDA, U.P.



"A City or Urban Area Centred Around an Airport."



ACCORDING TO WIND ROSE DIAGRAM

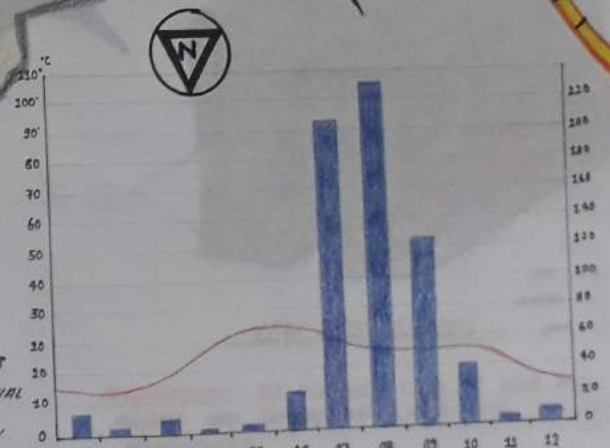
THE RUNWAY DIRECTION COMES TO BE 21° FROM WEST.

BUT

PRACTICALLY THE RUNWAY DIRECTION BE 27/09 TO THE SITE BOUNDARY CONSTRAINTS.

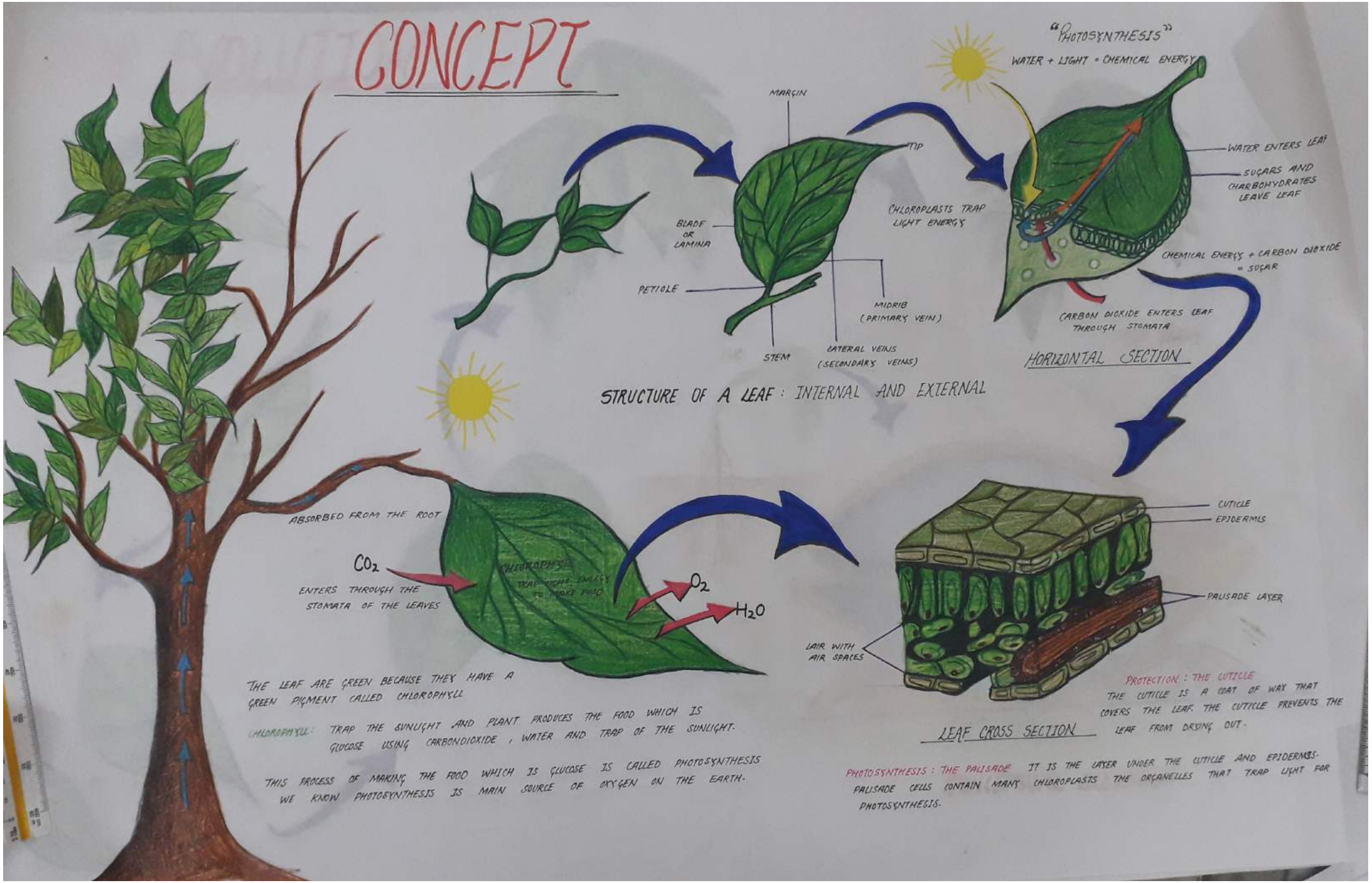
ALLUVIAL SOIL

ALLUVIAL SOIL - A FINE GRAINED FERTILE SOIL DEPOSITED BY WATER FLOWING OVER FLOOD PLAINS OR IN RIVER BEDS, ALLUVIAL DEPOSIT, ALLUVIAL SEDEMENT, ALLUVIAL, ALLUVION - CLAY OR SITE OR GRAVEL CARRIED BY RUSHING STREAMS AND DEPOSITED WHERE THE STREAM SLOWS DOWN.



AVERAGE TEMPERATURE

CONCEPT



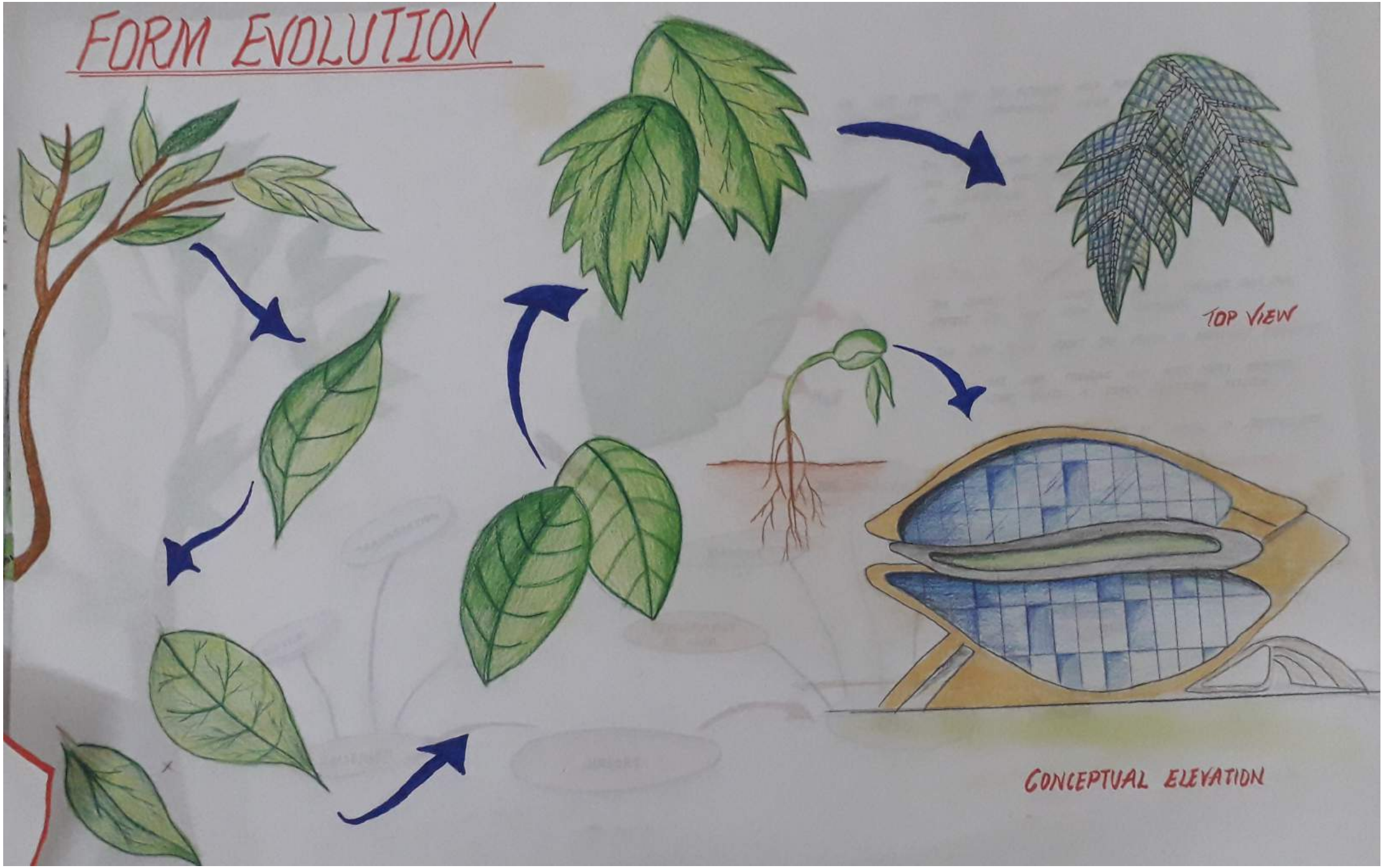
THE LEAF ARE GREEN BECAUSE THEY HAVE A GREEN PIGMENT CALLED CHLOROPHYLL

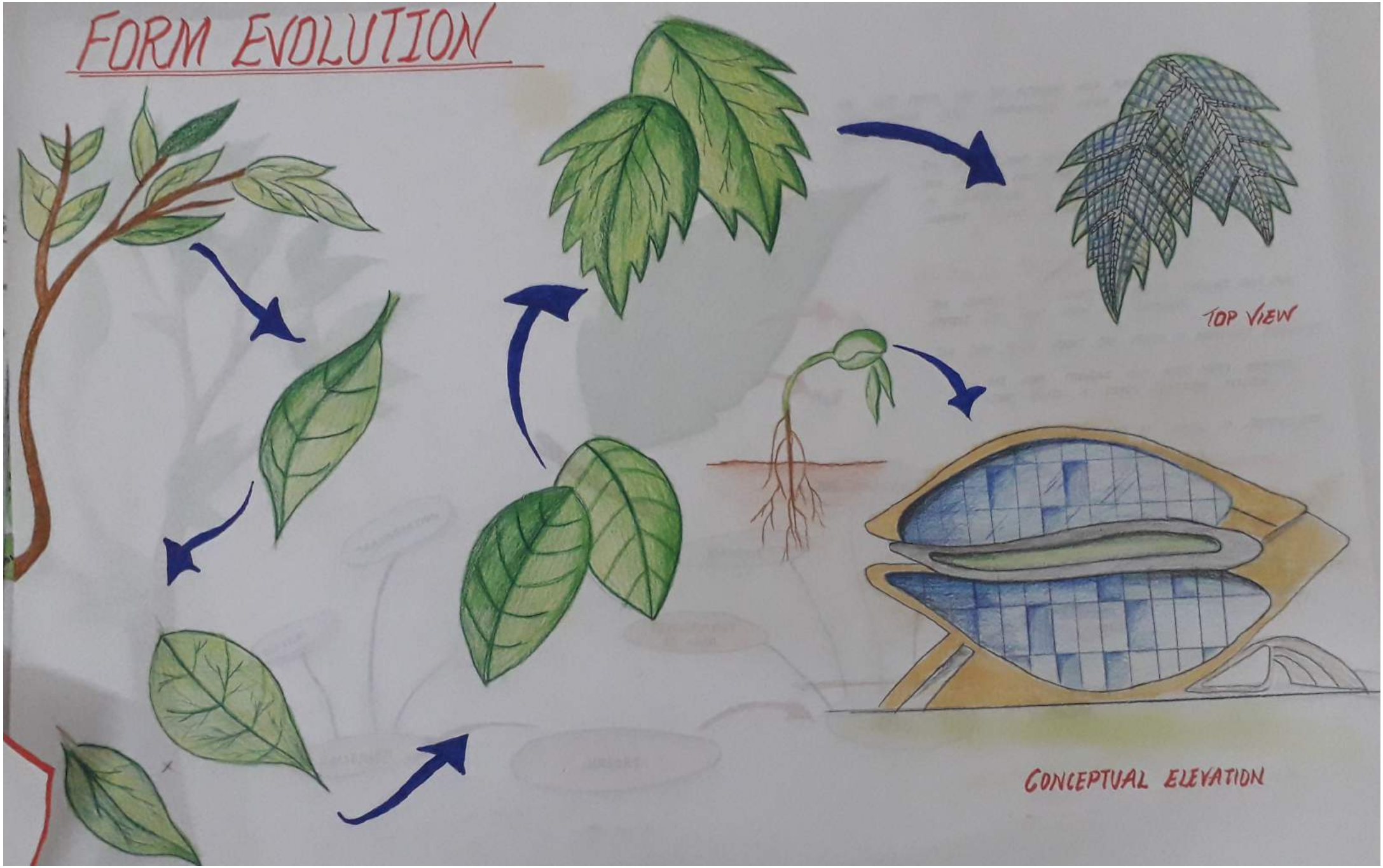
CHLOROPHYLL : TRAP THE SUNLIGHT AND PLANT PRODUCES THE FOOD WHICH IS GLUCOSE USING CARBONDIOXIDE , WATER AND TRAP OF THE SUNLIGHT.

THIS PROCESS OF MAKING THE FOOD WHICH IS GLUCOSE IS CALLED PHOTOSYNTHESIS WE KNOW PHOTOSYNTHESIS IS MAIN SOURCE OF OXYGEN ON THE EARTH.

PROTECTION : THE CUTICLE
THE CUTICLE IS A COAT OF WAX THAT COVERS THE LEAF. THE CUTICLE PREVENTS THE LEAF FROM DRYING OUT.

PHOTOSYNTHESIS : THE PALISADE IT IS THE LAYER UNDER THE CUTICLE AND EPIDERMIS. PALISADE CELLS CONTAIN MANY CHLOROPLASTS THE ORGANELLES THAT TRAP LIGHT FOR PHOTOSYNTHESIS.


FORM EVOLUTION
TOP VIEW
CONCEPTUAL ELEVATION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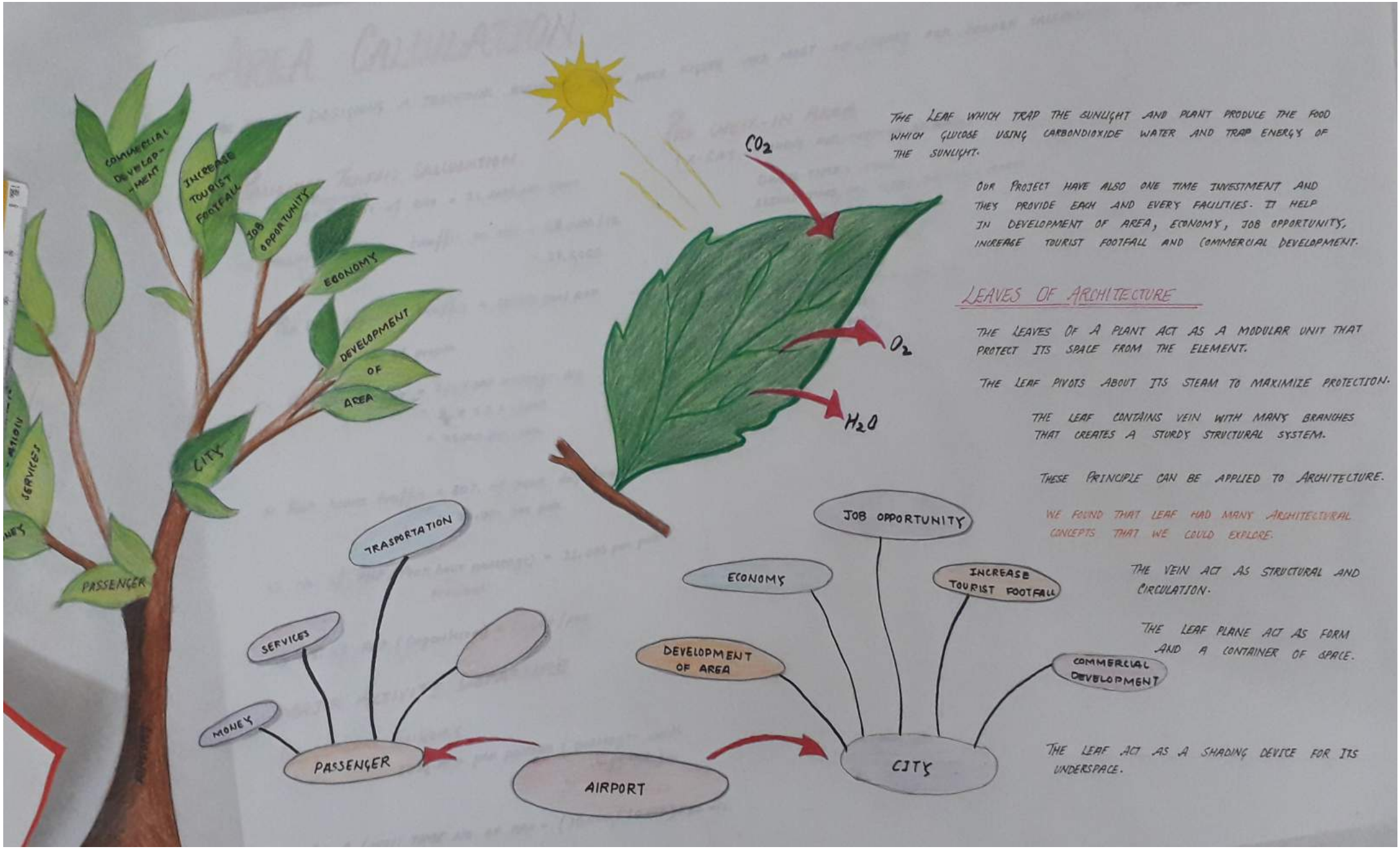

THE LEAF WHICH TRAP THE SUNLIGHT AND PLANT PRODUCE THE FOOD WHICH GLUCOSE USING CARBONDIOXIDE WATER AND TRAP ENERGY OF THE SUNLIGHT.

OUR PROJECT HAVE ALSO ONE TIME INVESTMENT AND THEY PROVIDE EACH AND EVERY FACILITIES. IT HELP IN DEVELOPMENT OF AREA, ECONOMY, JOB OPPORTUNITY, INCREASE TOURIST FOOTFALL AND COMMERCIAL DEVELOPMENT.

LEAVES OF ARCHITECTURE

THE LEAVES OF A PLANT ACT AS A MODULAR UNIT THAT PROTECT ITS SPACE FROM THE ELEMENT.

THE LEAF PIVOTS ABOUT ITS STEAM TO MAXIMIZE PROTECTION.

THE LEAF CONTAINS VEIN WITH MANY BRANCHES THAT CREATES A STURDY STRUCTURAL SYSTEM.

THESE PRINCIPLE CAN BE APPLIED TO ARCHITECTURE.

WE FOUND THAT LEAF HAD MANY ARCHITECTURAL CONCEPTS THAT WE COULD EXPLORE.

THE VEIN ACT AS STRUCTURAL AND CIRCULATION.

THE LEAF PLANE ACT AS FORM AND A CONTAINER OF SPACE.

THE LEAF ACT AS A SHADING DEVICE FOR ITS UNDERSPACE.

“AEROTROPOLIS”.....
JEWAR INTERNATIONAL AIRPORT,NOIDA

AREA SYNTHESIS_ _ _ _ _

- WHILE DESIGNING A TERMINAL BUILDING, PEACK HOURS FIGURES ARE MOST NECESSARY FOR PROPER CALCULAION AND ALL LOCATION OF SPSCE. THE CALCULATION PROCESS INVOLVES ESTIMATING THE VOLUME OF PASSENGERS FOR THE PEAK TRAFFIC AND THE PEAK HOURS TRAFFIC BASED ON THE FORMULA THAT PEAK DAY TRAFFIC WILL BE 1.2 TIME OF THE AVERAGE DAY TRAFFIC AND THE PEAK HOURS TRAFFIC WILL BE 30% OF THE PEAK DAY TRAFFIC.
- A TARGETED ANNUAL TOURIST TRAFFIC OF 19 LAC PER YEAR IS ANTICIPATED.
- PROJECTED PASSENGER TRFFIC BY THE YRAR AT AIRPORT AND ADVANCED MODEL OF AIRCRAFT ARE COMING IN TO SERVICE WILL BE 6,93,000 PAX.
- AVERAGE DAY PASSENGER TRAFFIC (ARRIVAL, DEPARTURE, TRANSIT) = 65,000 PAX .
- PEAK DAY PASSENGER TRAFFIC (ARRIVAL, DEPARTURE, TRANSIT) = 78,000 PAX.
- PEAK HOURS PASSENGER TRAFFIC (ARRIVAL, DEPARTURE, TRANSIT) = 23,000 PAX .
- NUMBER OF PEAK HOURS ARRIVING PASSENGER = 11,000 PAX .
- NUMBER OF PEAK HOURS DEPARTING PASSENGER = 11,000 PAX .
- ON THE BASIC OF PEAK HOURS ARRIVING AND DEPARTING PASSENGERS, VARIOUS AREAS ARE CALCUATED .
- TOTAL AREA OF SITE IS 1093 HA.(2700 Acres & 1.09.30.000 SQM .
- WIDTH OF RUNWAY IS 45 M , WITH 3200 M LENGTH AND LANDING AND TAKE OFF WILL BE TAKEN PLACE BOTH OF THE SIDE.
- WIDTH OF TAXIWAY WILL BE 23 M .

NOTE - ALL CALCULATION HAVING DOEN CONSDERING YEAR 2020AS THE CRITICAL YEAR OF DESIGEN

- TOTAL AREA OF SITE = 7200 ACRE
- AIRPORT SITE DIVIDE IN FOUR PHASE
- FIRST PHASE AREA = 1093 HECTARE

“AEROTROPOLIS”.....
JEWAR INTERNATIONAL AIRPORT,NOIDA

MAJOR ACTIVITY	SUB ACTIVITY	DESCRIPTION	BASIC STANDARD AND CALCULATION	AREA IN SQM.
➢ SERVICES	01. ELECTRICAL SUB,STANTION & MAINTAINCE WORKSHOP.		ADOPTED AS GIVEN BY AAI	352 SQM
	02. FIRE CONTROL ROOM	AREA WHERE OUTPUT OF ALL FIRE DETECOR IS RECEIVED	A ROOM FOR BOARD PANEL & 3 EMPLOYES	250 SQM
	03. CLOSE CIRCUIT TV ROOM		FOR 4 NOS. OF EMPLOYEES	150 SQM
	04. AC PLANT ROOM		1 TON /SQ FT	
	05. CIRCUTION		15% OF AREA 1 TO 4 =(352+250+150+2500) 15%	2500 SQM

IN ADDITION TO THE ABOVE FACTILITIES,A.H.U. & SWITCH ROOM TO BE PROVIED BEPENDING UPON LAYOUT

➢ SERVICES	01. INDIAN AIRLINE OPERATIONAL DEPTT. OF CIVIL AVIATION		ADOPTED AS GIVEN BY AAI	200 SQM
	02. AIRPORT MANAGER	HEAD OF AIRPORT		40 SQM
	03. TWO SENIOR AERODROME OFFICERS	INCHARGE OF OPERATIONS	30 SQM PER OFFICE	60 SQM
	04. SIX AERODROME OFFICERS	INCHARGE OF AIRTFIC SERVICE	25 SQM PER EACH	150 SQM
	05. FIFEEN ASST. AERODROMES OFFICE		10 SQM PER EACH	150 SQM
➢ AERODROME COM MUNICTION SERV	06. SECVIEN TECH. OFFICES	MAINTAINANTION OF TION AIDS	15 SQM. PER EACH	105 SQM
	07. ONE SENIOR COMMUNICATION OFFICE	OVERALL INCHARGE OF COM NICATION SERVICES		30 SQM
	08. OFFICE FOR MAINTENCE OF NAVIGATIONAL AIDS (90 PERSONS)	MAINTAINANCE WORK TECNICAL OFFICE	6 SQM. PER EACH	540 SQM
	09. SIX COMM., ELECTRONIC OFFICERS	OPERATION FOR COMM. SERVICES	15 SQM. PER EACH	90 SQM
	10. 40 ASST.		6 SQM. PER EACH	240 SQM
	11. METEROLOGICAL & BRIFE ROOM (2 NOS)		40 SQM. PER EACH	80 SQM
	12. ELECTRONIC EQUIPTMENT ROOM (2NOS.)		30 SQM PER EACH	60 SQM
	13. AERONAUTICAL CONTROAL ROOM		PROVIDED BY AAI	40 SQM.
	14. AIR TRAFFICE CONTROAL ROOM			100 SQM.
	15. GROUND CONTROAL ENGG. DEPARTMENT			100 SQM.
	16. EIGHT ASST. ENGINEERS	4 ELECT. AND 4 CIVIL .	15 SQM PER EACH.	120 SQM.
	17. 16 JUNIOR ENGINEERS	8 ELECT.AND 8 CIVIL.	10 SQM PER EACH	160 SQM.
	18. POLICE AND SECURITY			200 SQM.
	19. STAFF CANTEEN AND KITCHEN			160 SQM.
	20. TOILERS	10% OF AREA	(2625)* 10%	260 SQM.
	21. CIRCULATION	15% OF AREA		390 SQM.
	21. TOTAL AIRPORT SERVICE AREA			3275 SQM.

"AEROTROPOLIS".....
JEWAR INTERNATIONAL AIRPORT,NOIDA

MAJOR ACTIVITY	SUB ACTIVITY	DESCRIPTION	BASIC STANDARD AND CALCULATION	AREA IN SQM.
➢ DEPARTURE	01. GENERAL ENQUIRY 02. VISITOR AND PASSENGER CONCOURSE	PASSENGER WITH LUGGUAGE	FOR 2 PERSON-------- RATIO FOR PAX TO VISITOR = 1:1 NO. OF PAX = 11,000 D WELL TIME - PAX = 10 MIN. PASSENGER = 20.MIN AREA/PAX = 2 SQM AREA/PASSENGER = 1.5 SQM AT A GIVEN TIME NO. OF PAX = (11,000/60)*10 => 1833 AT A GIVEN TIME NO. OF VISITOR = (11,000/60)*20 => 3666) AREA REQUIRED = {1833*2}+(3666*1.5)=> 9,135 SQM.	20 SQM 9,135SQM
	03. PRE CHECK-IN AREA	X-RAY MACHINE FOR CHECKING OF BAGS	D WELL TIME - PAX = 10 MIN. SERVISE TIME FOR X-RAY MACHINE=15 MIN AREA/MACHINE = 35 SQM AREA/PAX = 2 SQM ONE MACHINE CLEAR IN 1 HOURS = (60/25)*60 => 144 PAX NO. MACHINE REQUIRED = 11,000/144 => 76 MACHINE NO. PAX CLEANED AT GIVEN TIME = 10(60/25)*76 => 1824 PAX AREA FOR 1864 PAX = 1824*2 => 3648 SQM. AREA FOR 76 MACHINE = 76*35 => 2660 SQM. NET AREA REQUIRED = 2660+3648 => 6308 SQM.	6,308 SQM
➢ DEPARTURE	04. CHECK-IN AREA	CONFIRMATION OF TICKETS AND BAGGAGE BOOKING	D WELL TIME - PAX = 21 MIN. SERVISE TIME = 1 MIN QUEUE LENGTH PER PAX = 1 M NO. OF PEAK HR. PAX = 11,000 AT A GIVEN TIME , NO. OF PAX CLEANED PER COUNTER = (60*60)/60 => 60 PAX NO. OF COUNTER REQUIRED = 11,000/60 => 186 NOS NO. OF PAX IN QUEUE LENGTH PER COUNTER => 21 M NET AREA REQUIRED = (5+21+3)*183.3*21 => 11,145 SQM.	11,145 SQM
➢ DEPARTURE	05. DEPARTURE AREA	AFTER CHECK IN PAX WAITING	10% OF PAX SITTING HERE AREA/PERSON = 2 SQM THUS AREA = 2*1100 => 2200 SQM	2,200 SQM
➢ DEPARTURE	06. SECURITY HOLD AREA	PAX WAIT TILL THE ARRIVAL OF FLIGHT.	DWELL TIME = 40 MIN. AREA/PERSON SITTING = 2 SQM. AREA/PERSON STANDING = 1.5 SQM. AT A GIVEN TIME NO. OF = (11,000 /60)*40 => 7333SQM. 70% OF SITTING = 7,700 PAX. 30% OF STANDING = 3,300 PAX . TOTAL AREA = (7700*2)+(3300*1.5) => 20350SQM.	20350 SQM
	07. SECURITY CHECK AREA	FINAL CHECKING OF HAND BAGS PASSENGERS PASS THROUGH METAL DECTECTORS.	DWELL TIME = 8 MIN. SERVICE TIME = 12 SEC. QUEUR LENGTH PER PAX = 1 SQM. NO. OF PX CLEARED PER GATE IN ONE HOURS = 60*60/12 => 300 SQM. NO OF PAX IN QUEUR = 8*60/12 => 40 PAX QUEUR LENGTH AGAINED EACH GATE	473 SQM
	08. CONCESSIONARE (SHOPS, RESTAURANTS, SNACKS ,BARS ,TELEPHONES	FINAL CHECKING OF HAND BAGS PASSENGERS PASS THROUGH METAL DECTECTORS.	10% OF THE AREA OF ITEM 1 TO 7	4661 SQM
	09. CONCESSIONARE (SHOPS, RESTAURANTS, SNACKS ,BARS ,TELEPHONES	FINAL CHECKING OF HAND BAGS PASSENGERS PASS THROUGH METAL DECTECTORS.	GIVEN BY THE AIRPORT AUTHORITY OF INDIA	
	10. POST AND TELIGRAPHIC OFFICE	FOR 400 PASSENGERS	10% OF THE AREA 1 TO 11	5000 SQM

"AEROTROPOLIS".....
JEWAR INTERNATIONAL AIRPORT,NOIDA

MAJOR ACTIVITY	SUB ACTIVITY	DESCRIPTION	BASIC STANDARD AND CALCULATION	AREA IN SQM.
	11. RESERVED OR VIP LOUNG	FOR 90 PASSENGERS	10% OF THE AREA 1 TO 11	5000 SQM
	12. TOILETS		FOR PASSENGER & VISITOR	7000 SQM
	13. CIRCULATION	CORRIDOR & CONNECTING SPACES		3000 SQM
	14. IMMIGRATION		40 COUNTER	3000 SQM
➢ ARRIVAL	01. ARRIVAL HALL		D WELL TIME - PAX = 10 MIN. AREA PER PAX = 2 SQM. NO. OF PEAK HOURS PAX = 11,000 AT A GIVEN TIME NO. OF PAX = 11,000/60*10 => 1833 PAX AREA REQUIRED = 1833*2 => 3666 SQM	3666 SQM
	02. BAGGAGE CLAIM AREA	AREA PROVIED FOR CLAIMIMG OF CHECKED FROM AIRLINES BY PAS-SENGERS ON ARRIVING.	D WELL TIME - PAX = 30 MIN. AVEAGE NO. OF CONVEYOR BILT AT A GIVEN =(11,000/60)*(30/150) => 36 FOR 36 BELT AREA REQUIED = 17,440 SQM	17,440 SQM
	03. PUBLIC CONCOURSE	VISITOR AND PASSENGERS	NO. OF PEAK HOURS VIVITOR = 11,000 NO. OF PEACK HOURS PAX = 11,000 DWELL TIME -PAX = 5 MIN. VISITOR = 30 MIN. AREA/PAX = 2 SQM. AT A TIME NO. OF PAX = (11,000/60)*5 => 915 SQM. AT A GIVEN TIME NO.OF VISITOR = (11,000/60)*30 =>5500 SQM. NET AREA = 6500 SQM.	6500 SQM
	04. VIP LOUNGE	FOR 500 PERSON	AREA PER PERSON 2 SQM.	1000 SQM
	05. CONCESSION AREA	SHOP, SNACKS, BAR, BOOTHS, TOURISIT INFORMATION, TAXI-CAR HIKE ETC	MAXIMUM 10% OF AREA 1 TO 4	2850 SQM
	06. CLOCK ROOM			120 SQM
	07. REST ROOM & RETIRING ROOM	100 ROOMS	15 SQM PER ROOM = 15*100 => 1500 SQM	1500 SQM
	08. TOILETS		10% OF AREA OF 1 TO 7	3307 SQM
	09. CIRCULATION		15 % OF AREA OF 1 TO 8	5450 SQM
	10. IMMIGARITON	50 NOS. OF COUNTER	60 SQM PER COUNTER	3000 SQM
	11. OFFICE	IMMIGARTION & HEALTH	SUBJECT TO USE DEPTT.	800 SQM
➢ GROUND FLOOR	01. BAGGAGE MAKE-UP AREA	AREA WHERE BAGGAGE FOR DE-PARITING FLIGHT IS LOADED INTO BAGGAGE CHART	1 SQM / ARRIVING PASSENGER (FOR TOTAL NO.OF PEAK HR. PAX	11,000 SQM
	02. BAGGAGE DOWN-UP AREA	AREA WHERE BAGGAGE FOR DE-PARITING FLIGHT IS UN LOADEI INTO BAGGAGE CHART	0.5 SQM / ARRIVING PASSENGER (FOR TOTAL NO.OF PEAK HR. PAX	5500 SQM
	03. BUS LOUNGE	FOR 40 BUSES	35 SQM FOR EACH = 35 *40	1400 SQM
	04. SERVICE EQUIPTMENT & SUPPORTING OFFCE	FOR SERVICE VEHICLES TO CRAFT	SUBEJECT TO AIRPORT OPERTIONAL DEPARTMENT (11000*0.86)	9500 SQM
	05. TOILETS & REST ROOM LOADERS		SUBEJECT TO AIRPORT OPERTIONAL DEPARTMENT (11000*0.12)	1350 SQM
	06. CAIRCULATION		15% OF THE AREA1 TO 5 (11000+550+1400+9501350) 15%	3570 SQM
			TOTAL GROUND SERVICE AREA(11000+550+1400+9501350+3570)	27370 SQM.

"AEROTROPOLIS".....
JEWAR INTERNATIONAL AIRPORT,NOIDA

MAJOR ACTIVITY	SUB ACTIVITY	DESCRIPTION	BASIC STANDARD AND CALCULATION	AREA IN SQM.
➢ APRON PARKING	PARKING FOR AIRCAFT	ARKING FOR 30 AIRCAFT	500 SQM. PER WAYS	15000 SQM
	20 REMOTE PARKING WAYS		1500 SQM. PER WAYS	30,000 SQM

NOTE :-

01. AREA NOT INCLUDED ARE HAVC PLANT ROOM AND SUB STACION ,WHICH IS SEPRATED AND COMPUTES FOR WHOLE PASSENGER TERMILAL COMPELX.
02. ALL BASIC STANDARDS AND DATA PROVIDED BY THE AIRPORT AUTHORITY OF INDIA- NEW DELHI.

➢ GENRAL PARKING	01. PUBLIC PARKING	FOR PRIVATE VECHICLES NOT CLUDING HIRED MODE	NO.OF VEHICLES @ 25SQM . 1000 @ 25 SQM. (25% OF PHP)	25,000SQM
	02. HIRED MODE PARKING	FOR TEXI & RENTED CAR	NO.OF VEHICLES @ 25SQM . 400 @ 25 SQM. 8% to 10%OF (PHP)	25,000SQM
	03. BUSES & AIRLINE PARKING	50 NUMBER OF BUSES	AREA @ 35SQM.PER EACH	1750 SQM.
	04. STAFF CAR PARKING	PARKING SPACE FOR EMPLOYEES WORKING FOR SUPPORTING AND RUNIN AGENCIES.	FOR CAR, TWO-WHEELERS & CYCLES	5000 SQM
➢ ADDITIONAL AREAS FOR OTHER THAN TERMINAL BUILDING	01. ATC TOWER	FOR NAVIGATION AND COMM.		1,500 SQM
	02. GROUND SUPPORT EQUIPTMENT	LOADER, TROLLY , TRACTORS, LOADING STAIRS ETC.		8,000 SQM
	03. FUEL FARM	FOR REFILLING OF AIRCRAFT	90 SQM PER HEC.	98,000 SQM
	04. SUB STATION		5 SQM PER HEC.	5,000 SQM
	05. FIRE STATION	FOR FIRE PROCTION & FIRE ROS	2.5 SQM. PER EACH	2500 SQM
			TOTAL ADDITIONAL AREA	115000 SQM

AREA CALCULATION AND PERCENTAGE

TOTAL SITE : 1093 HECTARE
TOTAL TERMINAL BUILDING AREA :
TERMINAL BUILDING RATIO : OF TOTAL SITE AREA
ARRIVAL AREA :
DEPARTURE AREA :
SERVICES AREA :

PARKING
APRON PARKING :
:
PARKING RATIOO : OF TOTAL SITE AREA
GENERAL PARKING AREA :
:
RATIO OF GENERAL PARKING : OF TOTAL SITE AREA
ADDITIONAL AREA :
:
RATIO OF ADDITIONAL AREA : OF TOTAL SITE AREA

“AEROTROPOLIS”.....
JEWAR INTERNATIONAL AIRPORT,NOIDA

MAJOR ACTIVITY	SUB ACTIVITY	DESCRIPTION	BASIC STANDARD AND CALCULATION	AREA IN SQM.
➢ APRON PARKING	PARKING FOR AIRCAFT	ARKING FOR 30 AIRCAFT	500 SQM. PER WAYS	15000 SQM
	20 REMOTE PARKING WAYS		1500 SQM. PER WAYS	30,000 SQM

NOTE :-

01. AREA NOT INCLUDED ARE HAVC PLANT ROOM AND SUB STACION ,WHICH IS SEPRATED AND COMPUTES FOR WHOLE PASSENGER TERMILAL COMPELX.
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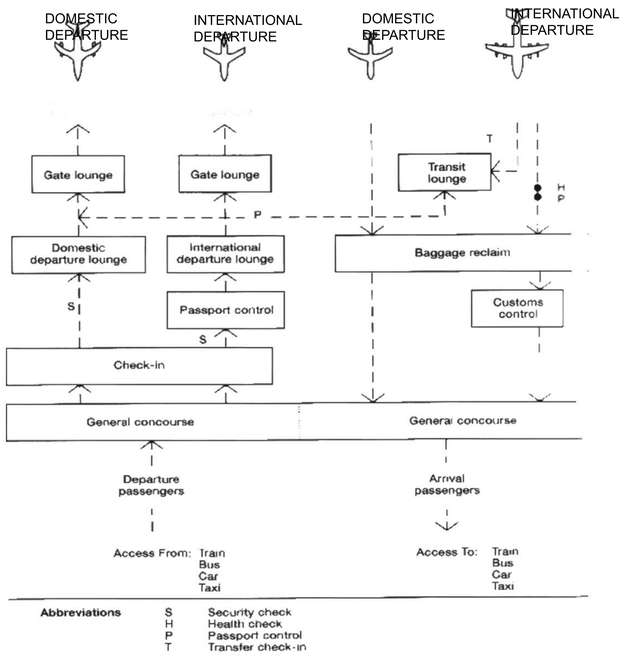
➢ ADDITIONAL AREAS FOR OTHER THAN TERMINAL BUILDING	01. ATC TOWER	FOR NAVIGATION AND COMM.		1,500 SQM
	02. GROUND SUPPORT EQUIPTMENT	LOADER, TROLLY , TRACTORS, LOADING STAIRS ETC.		8,000 SQM
	03. FUEL FARM	FOR REFILLING OF AIRCRAFT	90 SQM PER HEC.	98,000 SQM
	04. SUB STATION		5 SQM PER HEC.	5,000 SQM
	05. FIRE STATION	FOR FIRE PROCTION & FIRE ROS	2.5 SQM. PER EACH	2500 SQM
			TOTAL ADDITIONAL AREA	115000 SQM

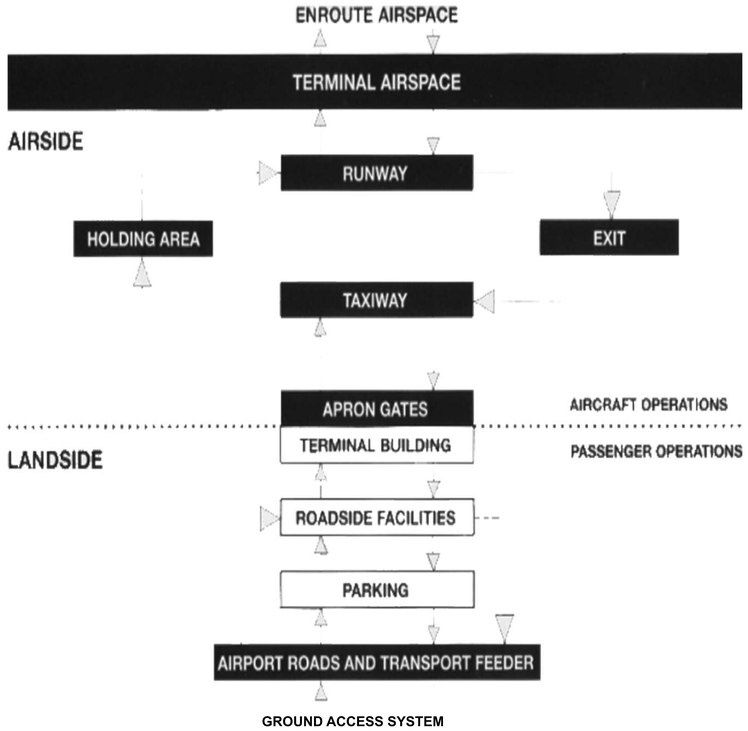
AREA CALCULATION AND PERCENTAGE

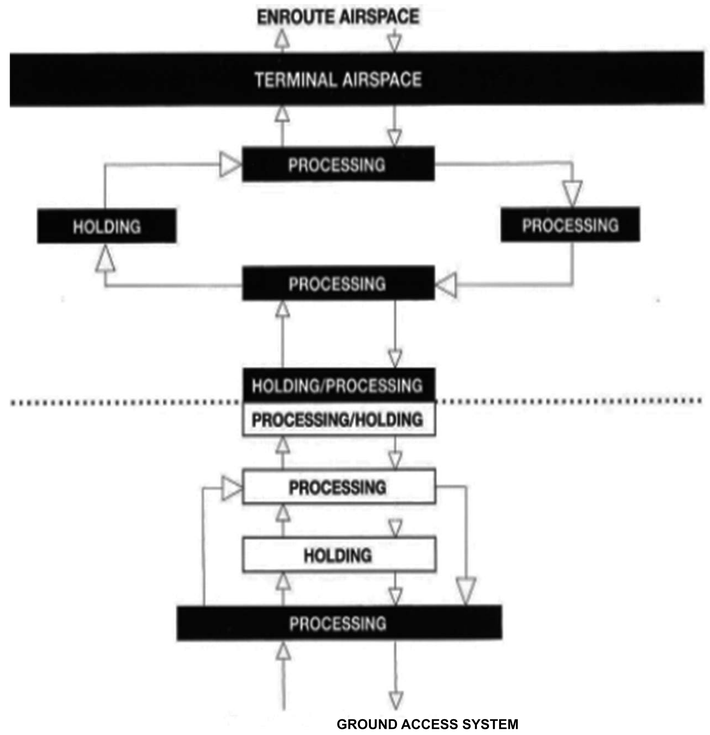
TOTAL SITE : 1093 HECTARE
TOTAL TERMINAL BUILDING AREA : 156782 SQM
TERMINAL BUILDING RATIO : 0.014% OF TOTAL SITE AREA
ARRIVAL AREA : 73003 SQM
DEPARTURE AREA : 77252 SQM
SERVICES AREA : 6527 SQM

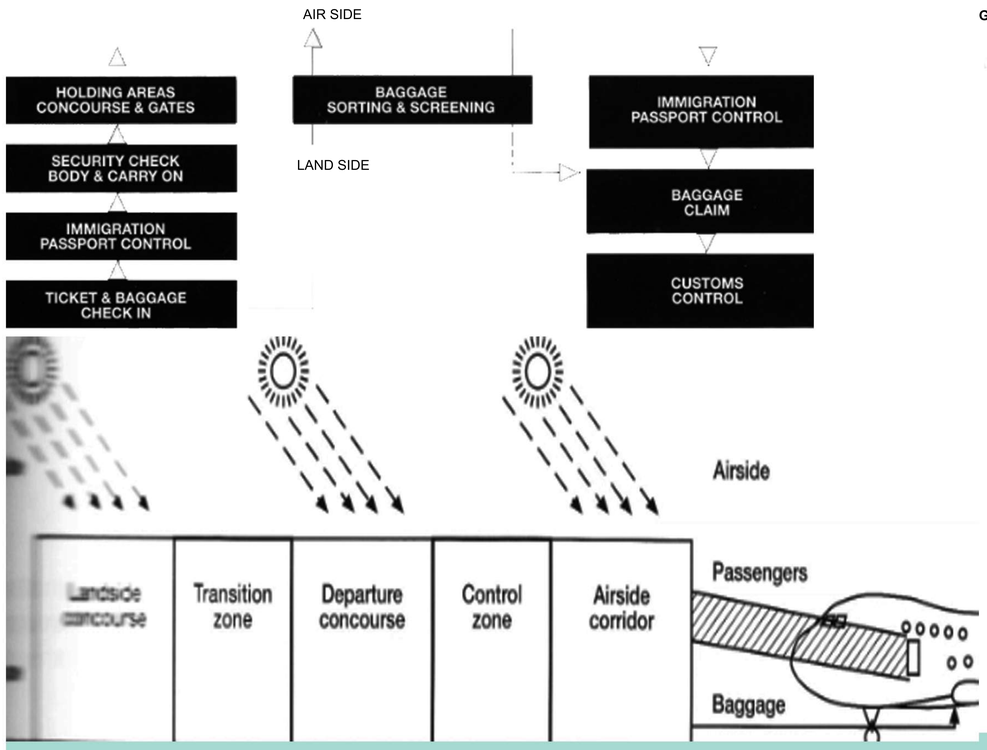
PARKING
APRON PARKING : 45,000 SQM
: 4.5 HECTARE
PARKING RATIOO : 0.0041% OF TOTAL SITE AREA
GENERAL PARKING AREA : 56750 SQM
:5.675 HECTARE
RATIO OF GENERAL PARKING : O.0052% OF TOTAL SITE AREA
ADDITIONAL AREA : 11,5000 SQM
: 11.5 HECTARE
RATIO OF ADDITIONAL AREA : 0.01% OF TOTAL SITE AREA

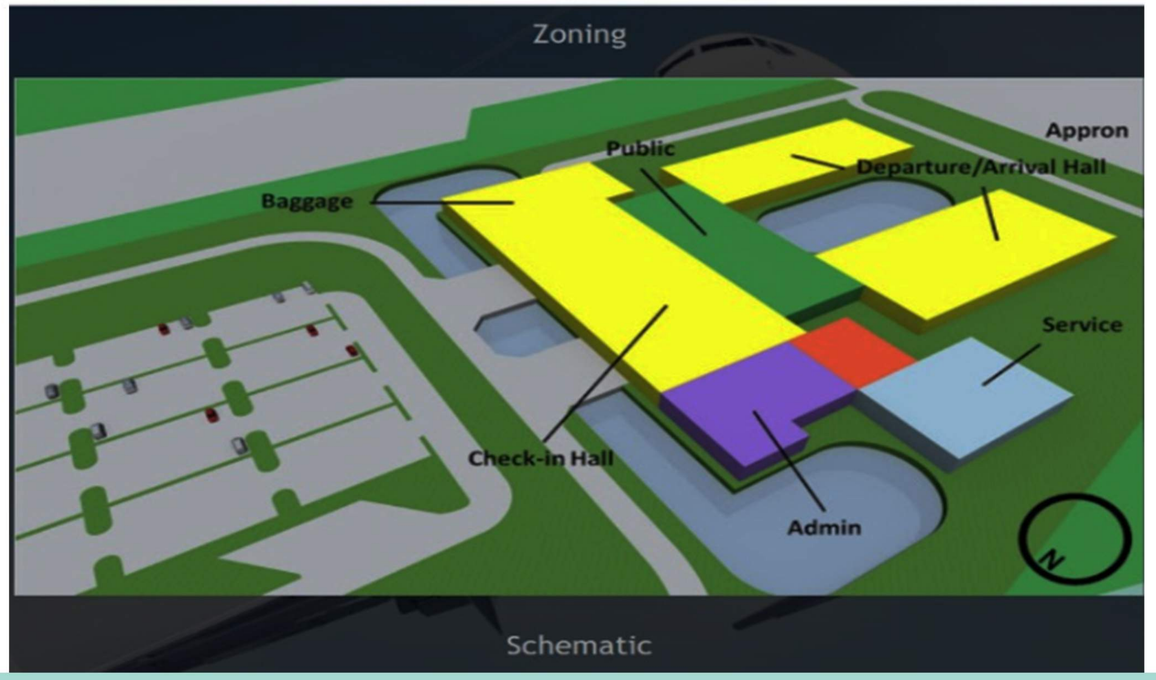
FLOW DIAGRAM OF TERMINAL BUILDING



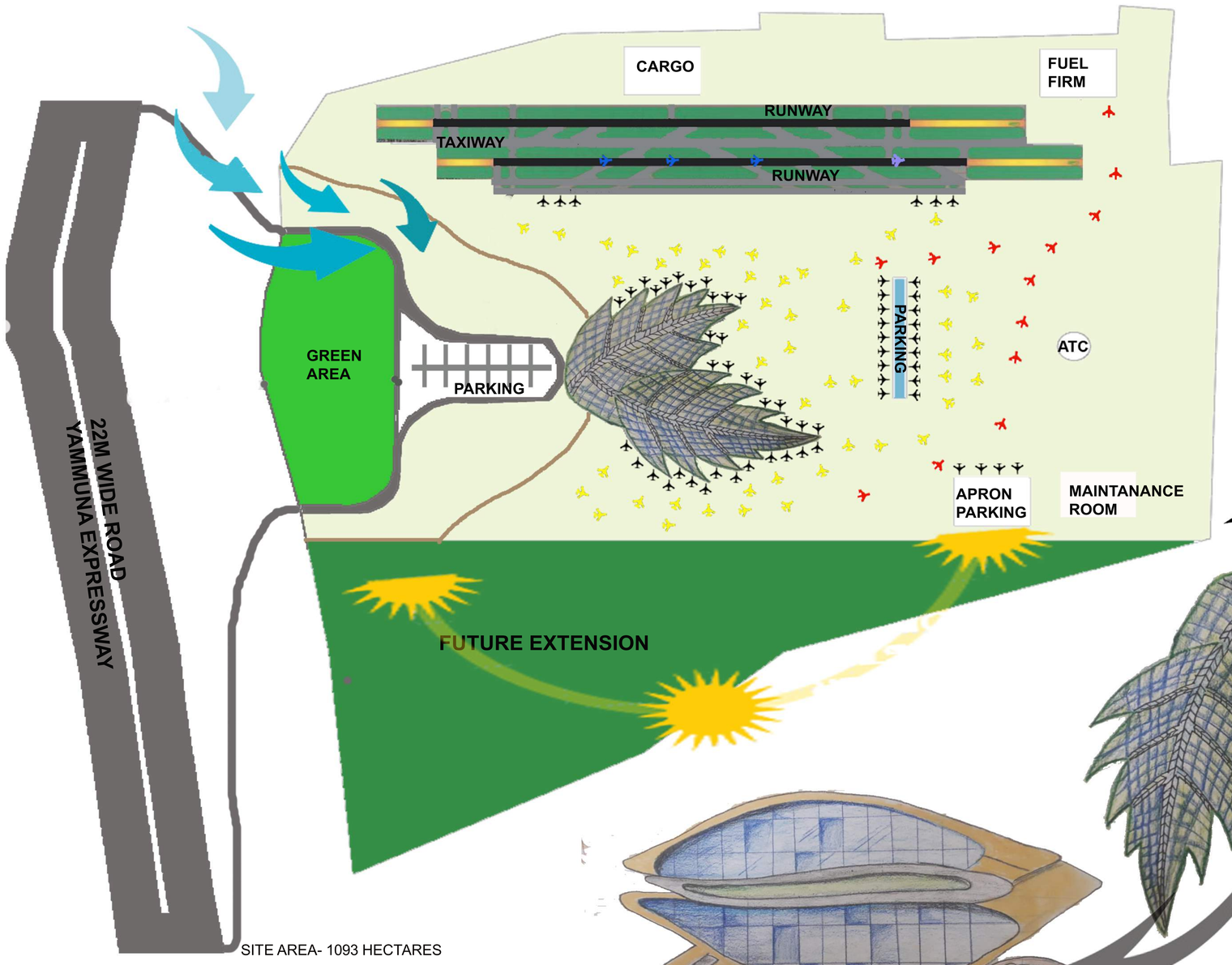


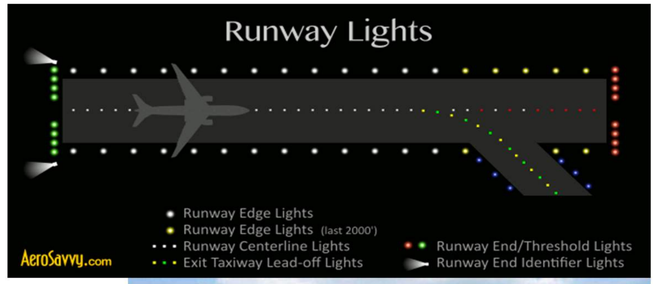


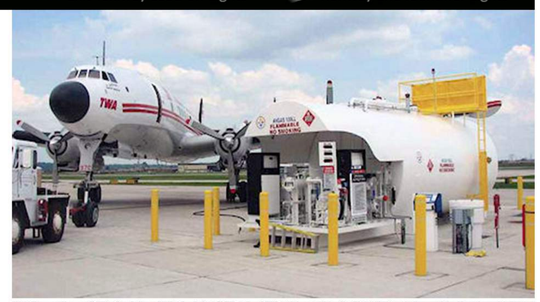


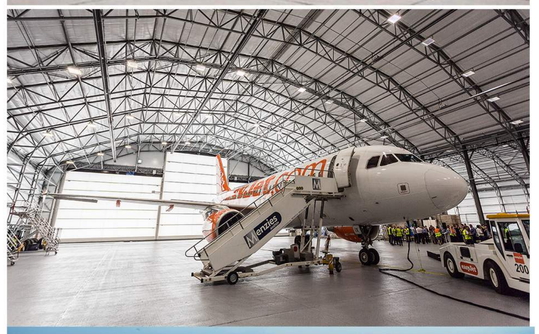


"AEROTROPOLIS"
GREENFIELD INTERNATIONAL AIRPORT, NOIDA









ROOF PLAN

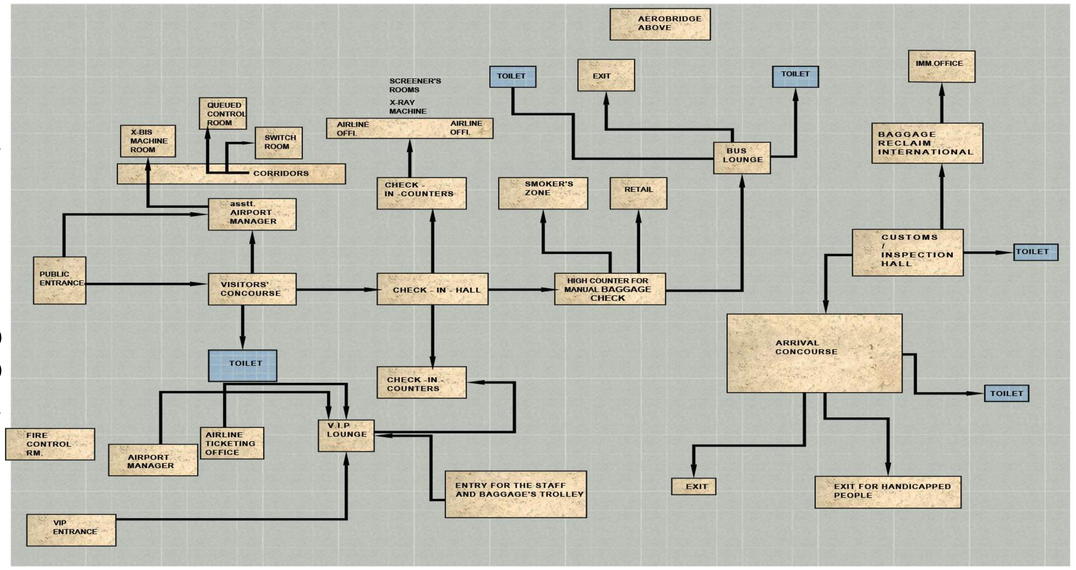
CONCEPTUAL ELEVATION

SITE AREA- 1093 HECTARES

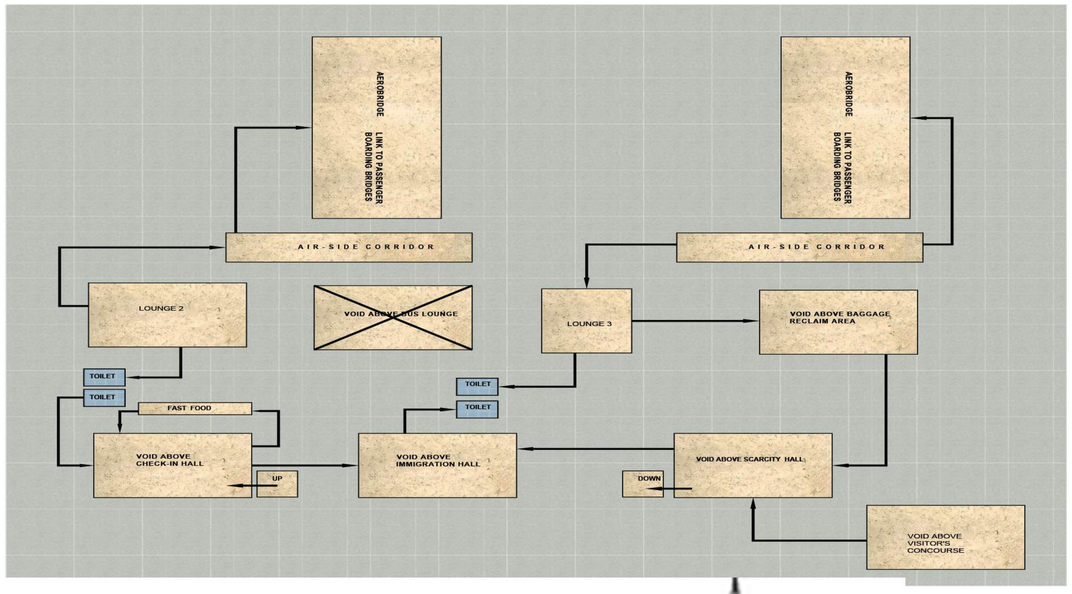
TERMINAL RATIO = 0.014% OF TOTAL SITE
APRON PARKING = 0.0041% OF TOTAL SITE
GENERAL PARKING = 0.0052% OF TOTAL SITE
ADDITIONAL AREA = 0.01% OF TOTAL SITE

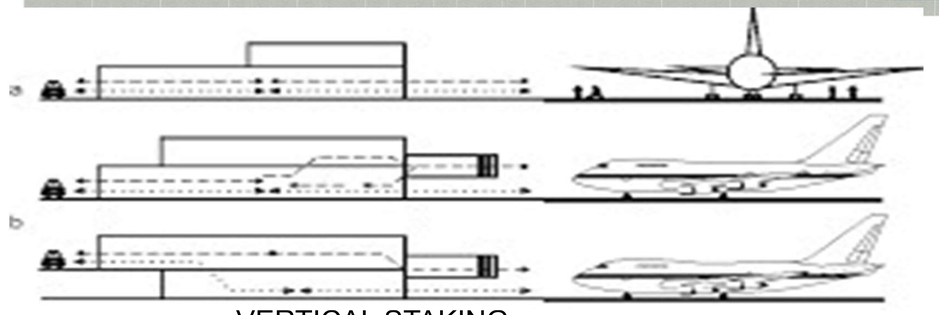
RUNWAY AREA
PRIMARY RUNWAY = 4500M X 60M

FIRST FLOOR



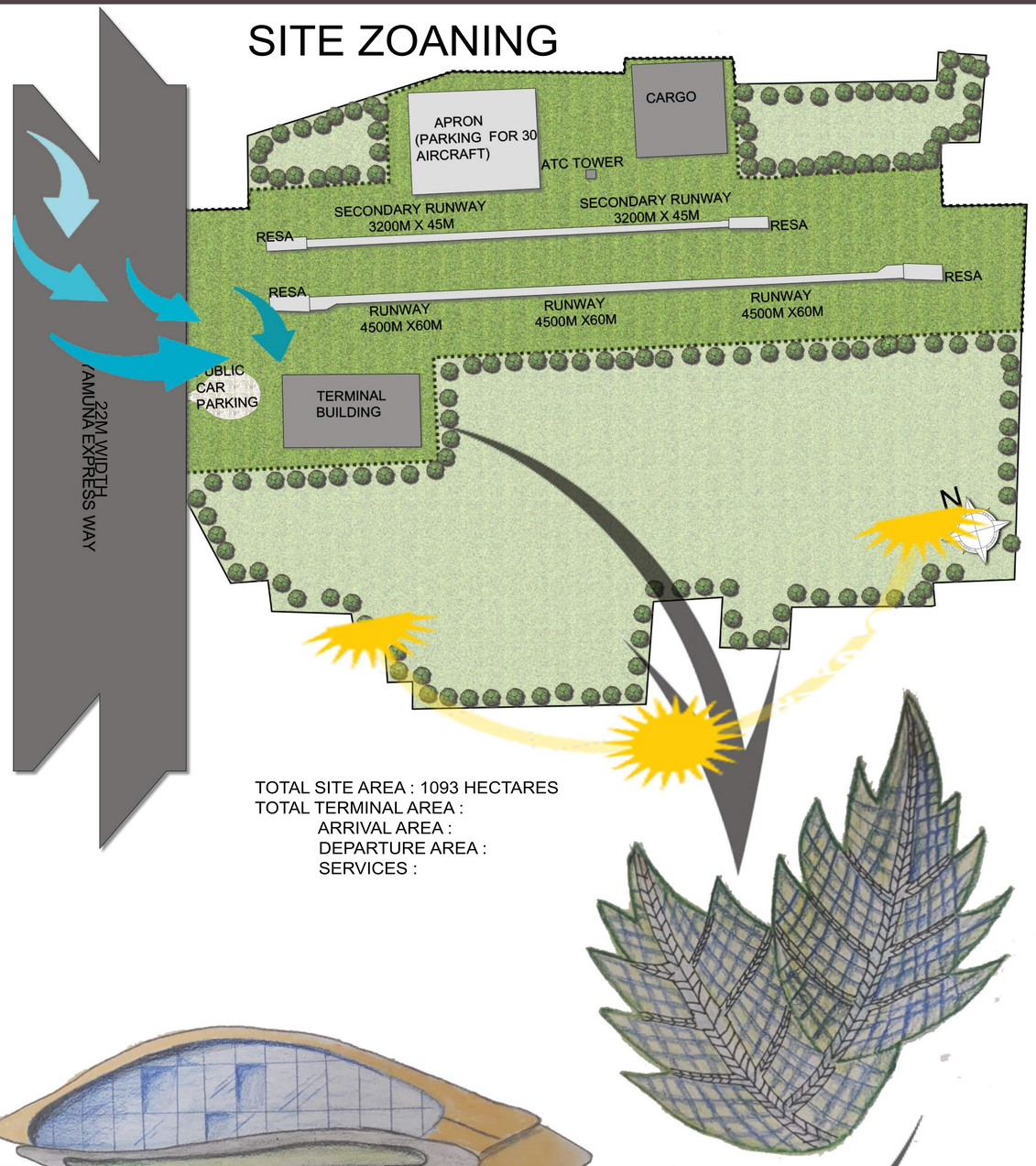
SECOND FLOOR



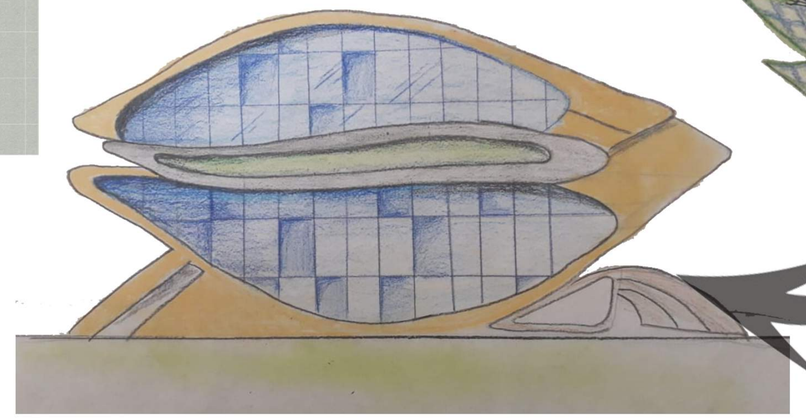


VERTICAL STAKING

SITE ZOANING



TOTAL SITE AREA : 1093 HECTARES
TOTAL TERMINAL AREA :
ARRIVAL AREA :
DEPARTURE AREA :
SERVICES :



CONCEPTULAL ELEVATION OF TERMINAL BUILDING

TOP ROOF OF TERMINAL BUILDING

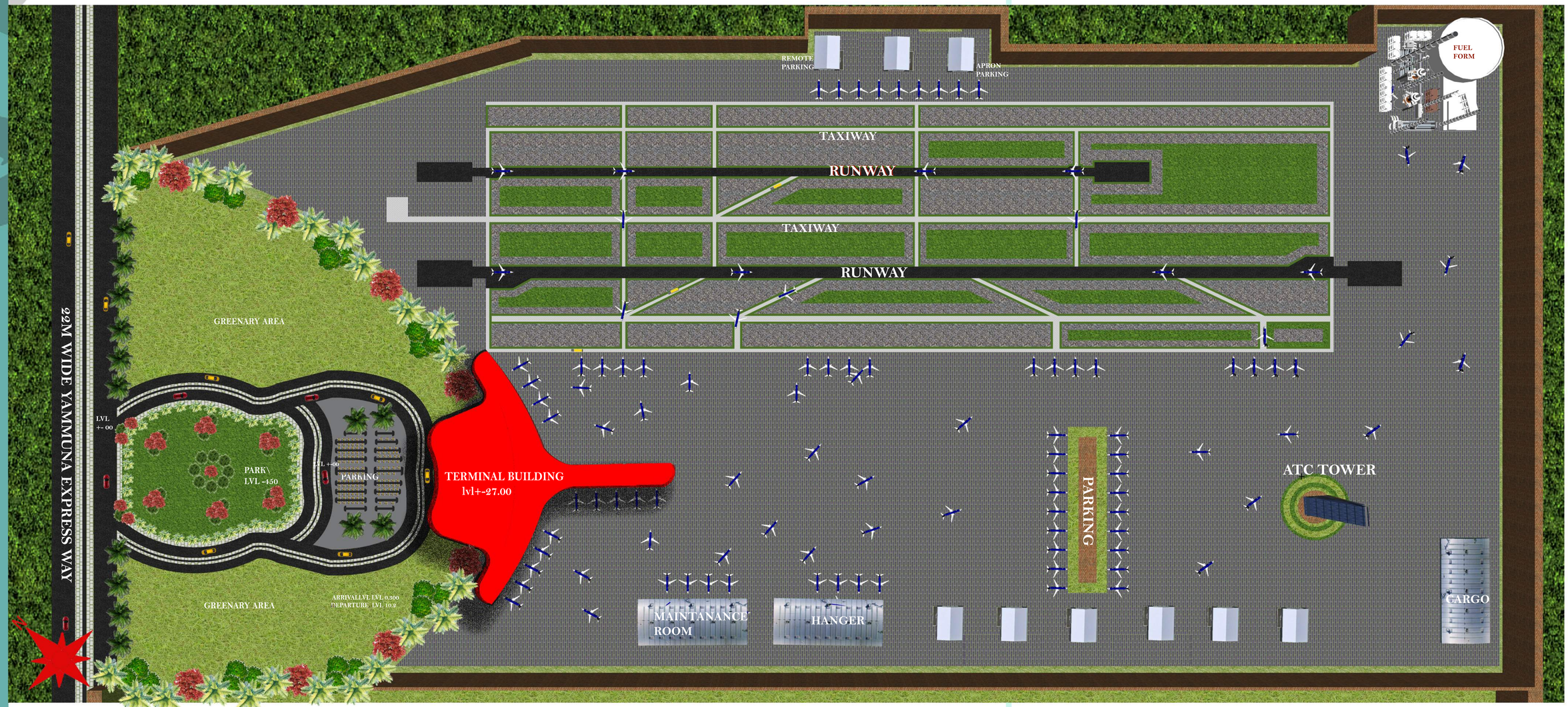
AIRPORT PASSENGER TERMINAL PLANNING STANDARDS

PLANNING ELEMENT	PLANNING STANDARDS FOR A TYPICAL BUSY DAY
AIRPORT ACCESS	90% Of passsengers can access the airport within 30-45minutes of the CBD.
CHECK-IN HALL	Bussiness class- Maximum Queuing time of 3-5min, Economy class- Maximum queuing time of 15-20min. Tourist(Charter/ No frills) class Maximum Queuing time of 25-30min. For additional information on minimum and maximum check-in waiting times. Space- for passengers waiting up to 30minutes, 1.8sqm per international passsengers. 1.3sqm for domestic passengers, including international seating for 5% of passengers.
SECURITY SCREENING	Maximum Queuing Time of 3-5min. space for passengers waiting up to 10min. 1.0sqm per passengers.
OUTBOUND PASSPORT CONTROL	Maximum Queuing times of 5min. space- for passenger waiting up to 10min. 1.0sqm per passenger.
CIP LOUNGE	4aqm per passenger
DEPARTURE LOUNGE	Space - 1.2sqm per pessenger standing & 1.7 sqm per passenger seated . seating for 10% of passenger where passenger do not have to wait, 60% where passenger do have to wait.
DEPARTURE GATE LOUNGE	Space - 1.2 sqm per passsenger standing & 1.7sqm per passenger seated setting- 70% of passengers should have access to seating, including seating of F&B (FOOD & BEVERAGES) consessions walking distances maximum of 250 300m unaided & 850m with moving walkways (of which not more than 200m unaided)
PASSENGER BOARDING BRIDGES	90 - 95% of passengers (on an annual basis) will be served by a passenger boarding bridges. PBB justified with minimum of 4-6 aircraft operations / day
INBOUND PASSPORT CONTROL	Maximum queuing time of 10min. space- for padssenger waiting upto to 30minutes. 1.0sqm per pessengers
BAGGAGE CLAIM HALL	Wheel stop to last bag Business class NB- 15mi. WB 20min Economy class NB - 25min. WB - 40min Space - 1.7sqm per pessenger (excluding baggage claim unit)

PASSENGER ARRIVAL - WHEEL STOP TO CURBSIDE ICAO RECOMMENDED PRACTICE IS 45 MINUTES	Bussiness Class - passengers on the curbside 20-25 minutes after aircraft arrival. Economy class - passengers on the curbside 40 - 45 minutes after aircraft arrival.
AIRLINE OFFICES	10sqm per staff member rule of thumb & check-in counter X 10 sqm
PASSENGERS WITH DISABILITIES	Airport facilities must comply with national building code.
MCT (MINIMUM CONNECTING TIME)	Domestic - Domestic - 35 - 45min. Domestic - International - 35-45 min International - Domestic - 45-60 min. International - International - 45-60min. for specific baggage connecting times. Transfer counter - Maximum queuing time of 5-10 min. spaces for passengers waiting up to 30minutes. 1.2 sqm per passenger, including interquene space and baggage trolleys. Seating for 5% pf passengers

"AEROTROPOLIS"....
JEWAR INTERNATIONAL AIRPORT, NOIDA

SITE PLAN



SITE AREA- 1093 HECTARES

TOTAL TERMINAL AREA=156782 SQM
TERMINAL RATIO = 0.014% OF TOTAL SITE
APRON PARKING= 45,000 SQM
APRON PARKING = 0.0041% OF TOTAL SITE
GENERAL PARKING= 56750 SQM
GENERAL PARKING = 0.0052% OF TOTAL SITE
ADDITIONAL AREA = 11,500 SQM
ADDITIONAL AREA = 0.01% OF TOTAL SITE

PRIMARY RUNWAY = 4500M X 60M
SECONDARY RUNWAY=3200 X 45M

AREA SYNTHESIS

TOTAL

TOTAL ANNUAL PASSENGER(ARRIVAL , DEPARTURE, TRANSIT) = 693,000 PAX

AVERAGE DAY PASSENGER= 65,000 PAX
PEAK DAY PASSENGER= 78,000 PAX
PEAK HOUR PASSENGER= 23,000 PAX
NUMBER OF PEAK HOUR ARRIVAL=11,000 PAX
NUMBER OF PEAK HOUR DEPARTURE = 11,000 PAX

AIRPORT

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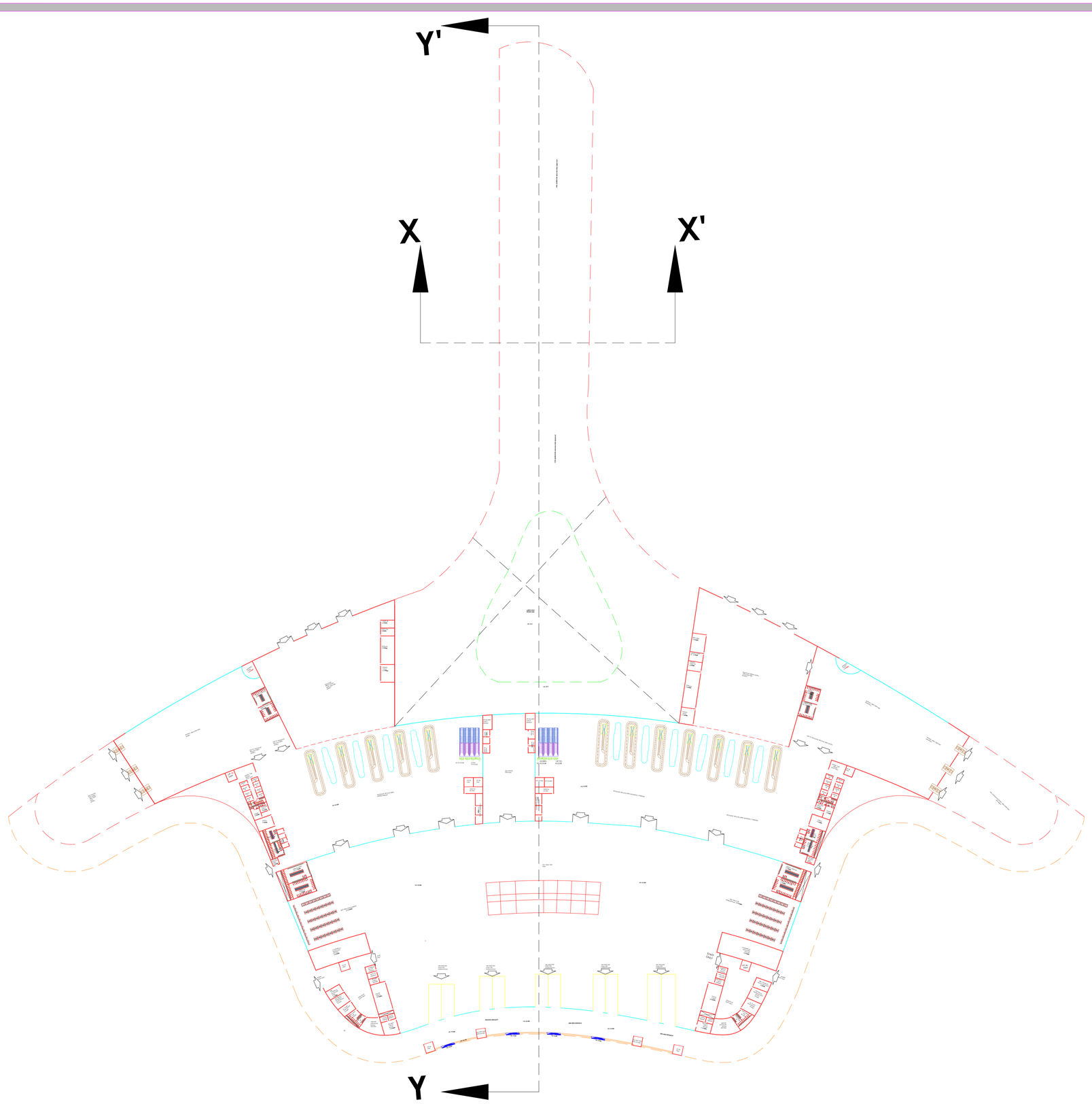

LEGENDS

MAIN HALL -29445SQM

DOMESTIC	INTERNATIONAL
REST AREA FOR DOMESTIC **-3700SQM**	REST AREA FOR INTERNATIONAL **-3700SQM**
BAGGAGE RECLAIM AREA FOR DOMES.. **-17000SQM**	BAGGAGE RECLAIM AREA FOR INTER. **-12000SQM**
BAGGAGE BREAKDOWN AREA **-6000SQM**	BAGGAGE BREAKDOWN AREA **-5500SQM**
WAITING AREA **7000SQM**	WAITING AREA- **5000SQM**
BUS LOUNGE- **3500SQM**	BUS LOUNGE- **2500SQM**

DEPARTURE FLOOR

ARRIVAL FLOOR PLAN
-128050 SQM

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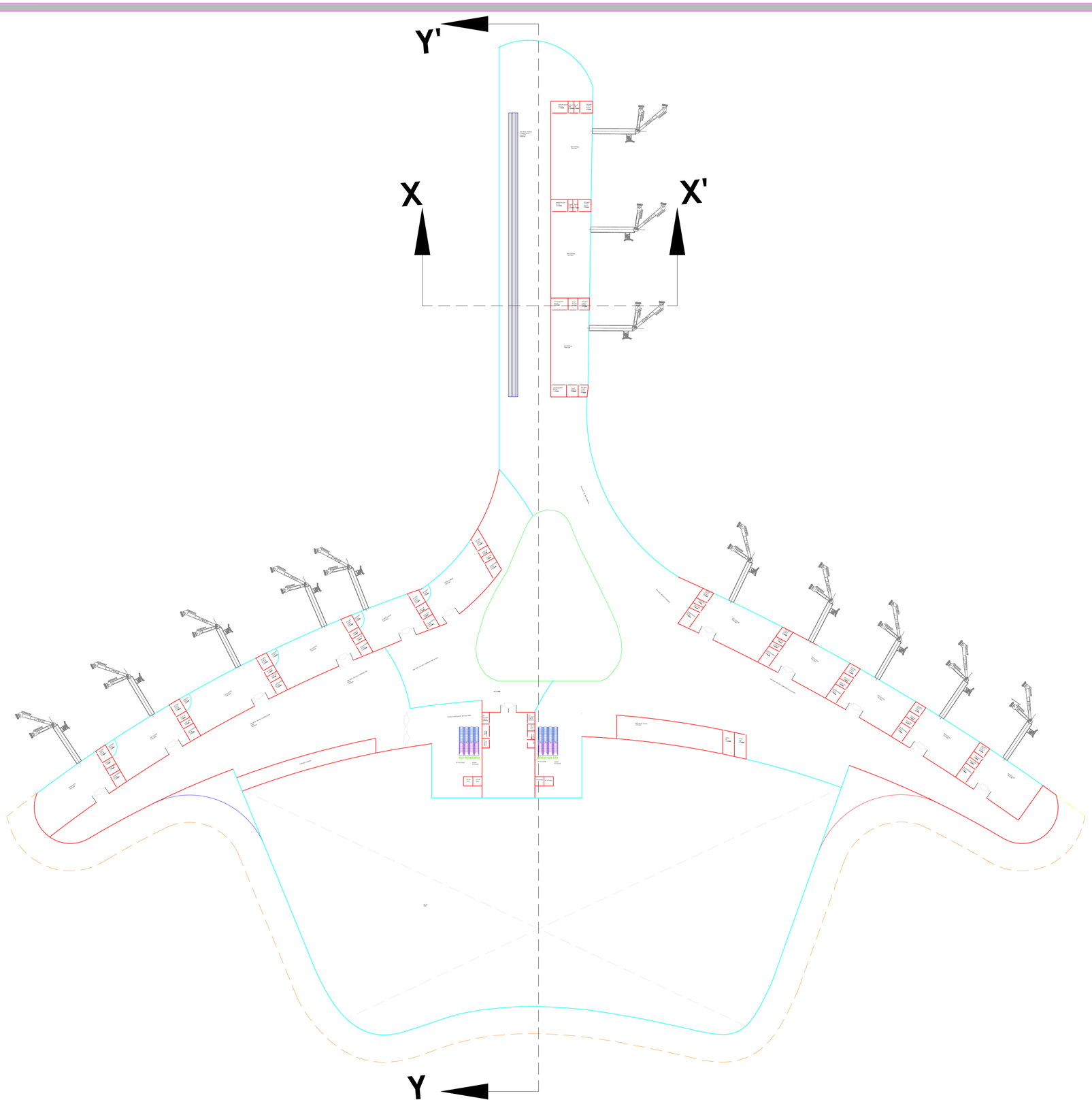

LEGENDS

MAIN HALL -29445SQM

DOMESTIC	INTERNATIONAL
REST AREA FOR DOMESTIC **-3700SQM**	REST AREA FOR INTERNATIONAL **-3700SQM**
BAGGAGE RECLAIM AREA FOR DOMES.. **-17000SQM**	BAGGAGE RECLAIM AREA FOR INTER. **-12000SQM**
BAGGAGE BREAKDOWN AREA **-6000SQM**	BAGGAGE BREAKDOWN AREA **-5500SQM**
WAITING AREA **7000SQM**	WAITING AREA- **5000SQM**
BUS LOUNGE- **3500SQM**	BUS LOUNGE- **2500SQM**

MEZEANINE FLOOR

BUS LOUNGE- **1564SQM**	BUS LOUNGE- **1564SQM**

MEZANNINE FLOOR

MEZEANINE FLOOR PLAN -103317 SQM

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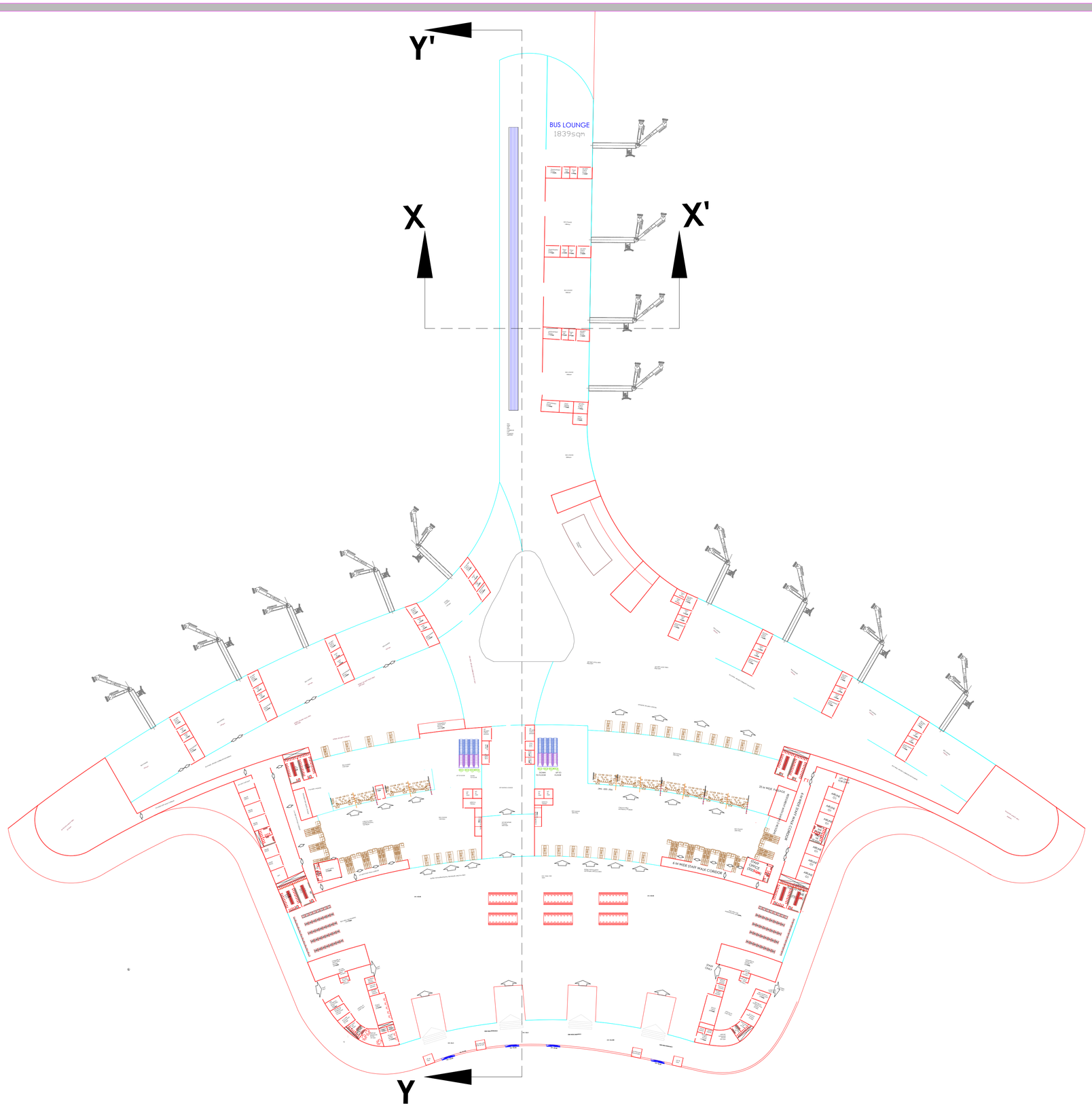
PRODUCED BY AN AUTODESK STUDENT VERSION



LEGENDS

MAIN HALL -29445SQM	
DOMESTIC	INTERNATIONAL
REST AREA FOR DOMESTIC -**3700SQM**	REST AREA FOR INTERNATIONAL -**3700SQM**
CHECK IN AREA (DOMESTIC) 17918SQM	CHECK IN AREA (INTERNATIONAL) 10918SQM
BUS LOUNGE(CHECK IN AREA) 2000 SQM	BUS LOUNGE(CHECK IN AREA) 1500 SQM
PASPORT CHECK 2200 SQM	PASPORT CHECK 1600 SQM
BUS LOUNGE- **3500SQM**	BUS LOUNGE- **2100SQM**
SECURITY HOLD AREA 3000 SQM	SECURITY HOLD AREA 5000 SQM
BUS LOUNGE- **1564SQM**	BUS LOUNGE- **1564SQM**
BAGGAGE MAEKUP AREA-**2244SQM**	BAGGAGE MAEKUP AREA-**2244SQM**

DEPARTURE FLOOR

DEPARCHER FLOOR
PLAN -149232 SQM

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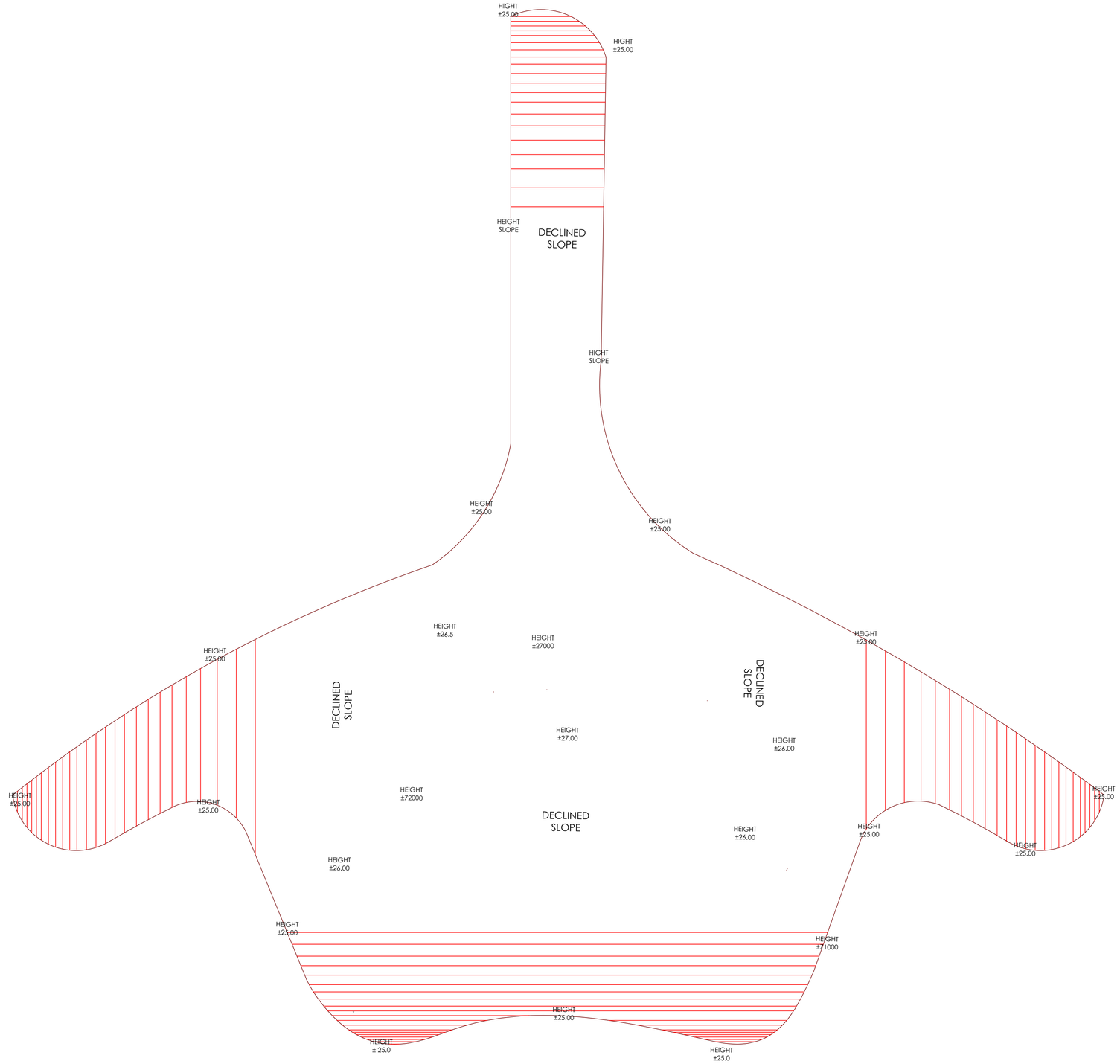

ROOF PLAN

NIDHI GIRI
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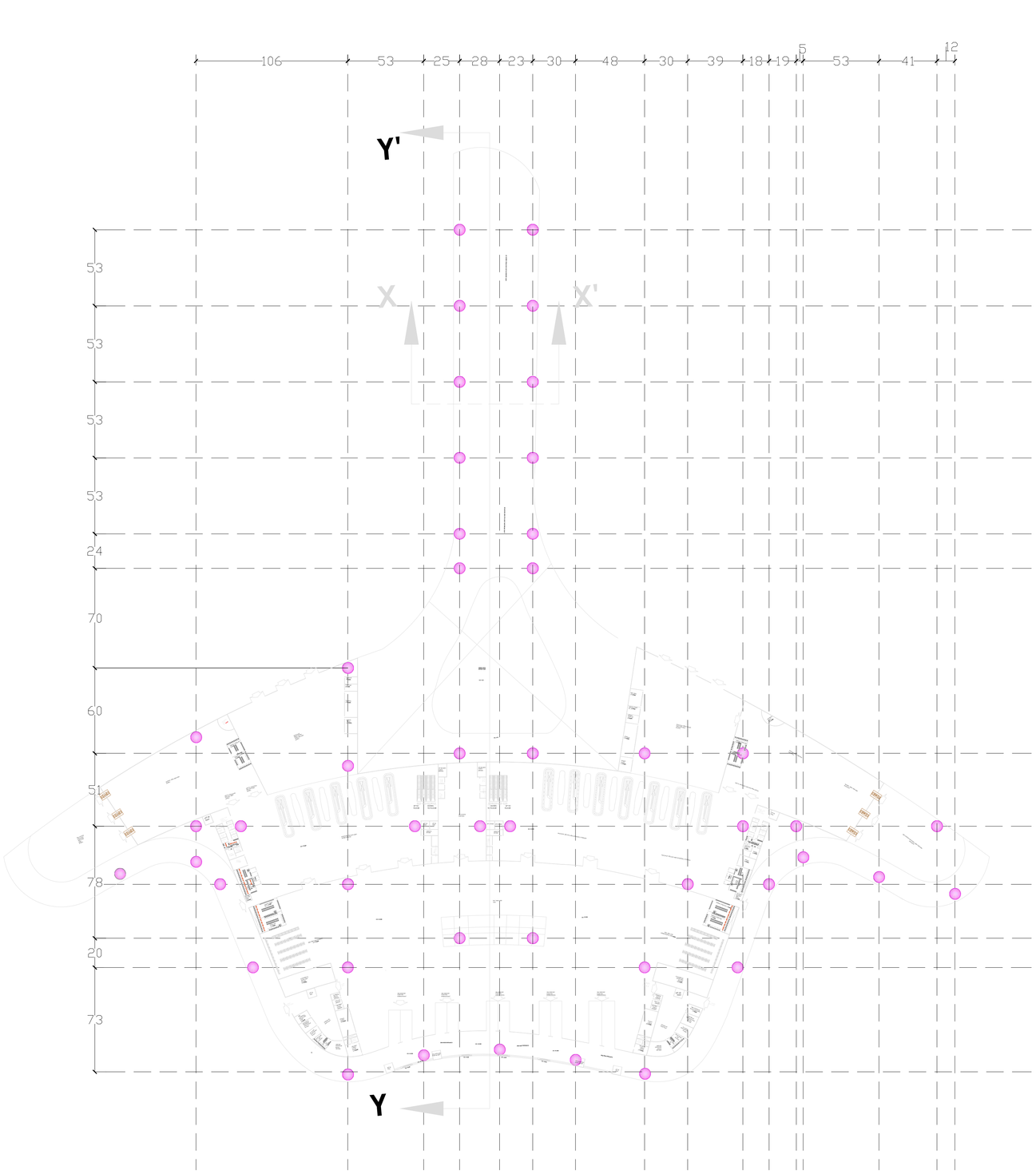
PRODUCED BY AN AUTODESK STUDENT VERSION



LEGENDS

MAIN HALL -29445SQM

DOMESTIC	INTERNATIONAL
REST AREA FOR DOMESTIC -**3700SQM**	REST AREA FOR INTERNATIONAL -**3700SQM**
BAGGAGE RECLAIM AREA FOR DOMES.. -**17000SQM**	BAGGAGE RECLAIM AREA FOR INTER. -**12000SQM**
BAGGAGE BREAKDOWN AREA -**6000SQM**	BAGGAGE BREAKDOWN AREA -**5500SQM**
WAITING AREA **7000SQM**	WAITING AREA- **5000SQM**
BUS LOUNGE- **3500SQM**	BUS LOUNGE- **2500SQM**

DEPARTURE FLOOR COLUMN GRID

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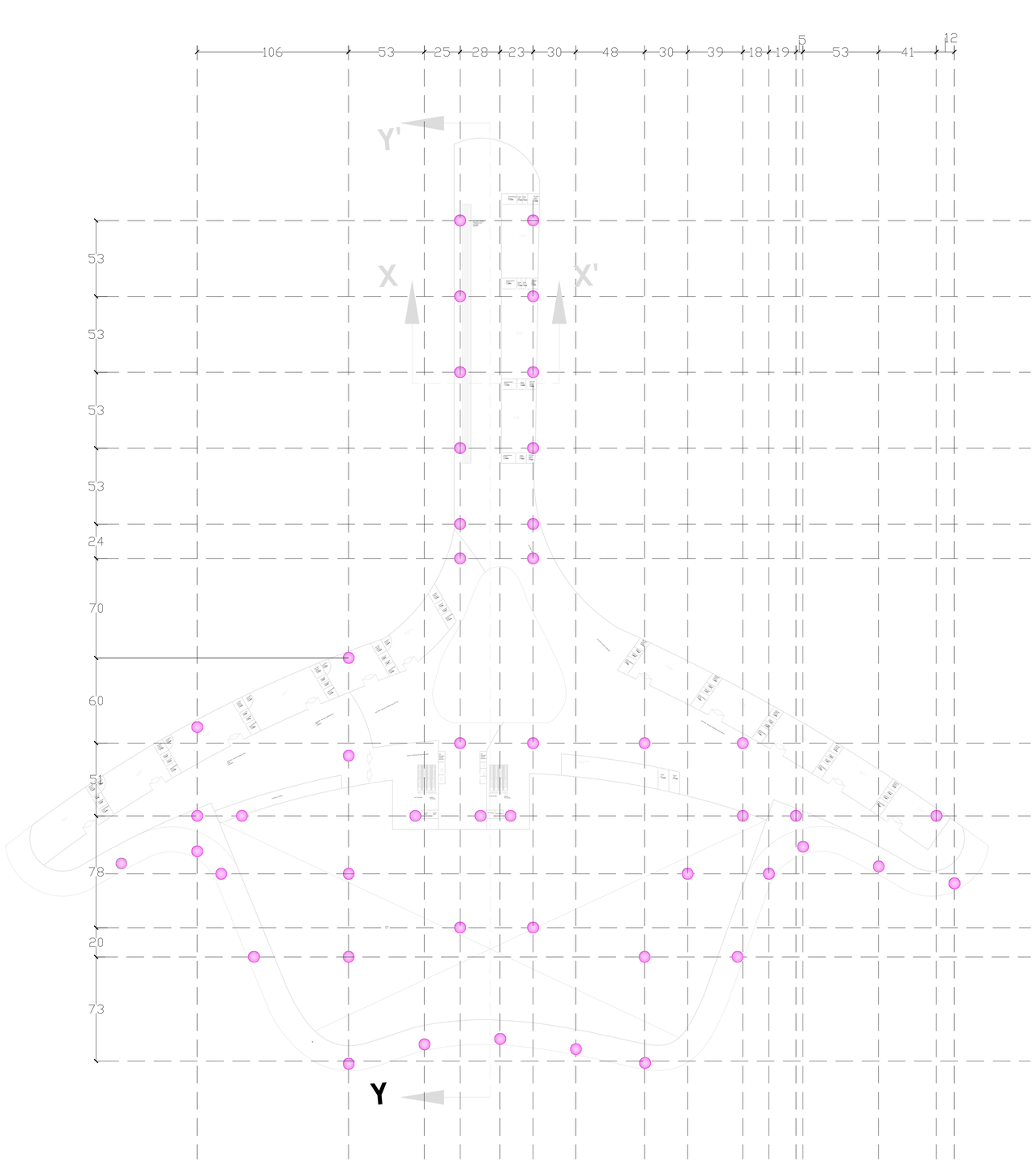

LEGENDS

MAIN HALL -29445SQM

DOMESTIC	INTERNATIONAL
REST AREA FOR DOMESTIC -**3700SQM**	REST AREA FOR INTERNATIONAL -**3700SQM**
BAGGAGE RECLAIM AREA FOR DOMES.. -**17000SQM**	BAGGAGE RECLAIM AREA FOR INTER. -**12000SQM**
BAGGAGE BREAKDOWN AREA -**6000SQM**	BAGGAGE BREAKDOWN AREA -**5500SQM**
WAITING AREA **7000SQM**	WAITING AREA- **5000SQM**
BUS LOUNGE- **3500SQM**	BUS LOUNGE- **2500SQM**

MEZEANINE FLOOR

BUS LOUNGE- **1564SQM**	BUS LOUNGE- **1564SQM**

MEZANNINE FLOOR COLUMN GRID

NIDHI GIRI
5.1
1150101048
BABU BANARSI DAS UNIVERSITY

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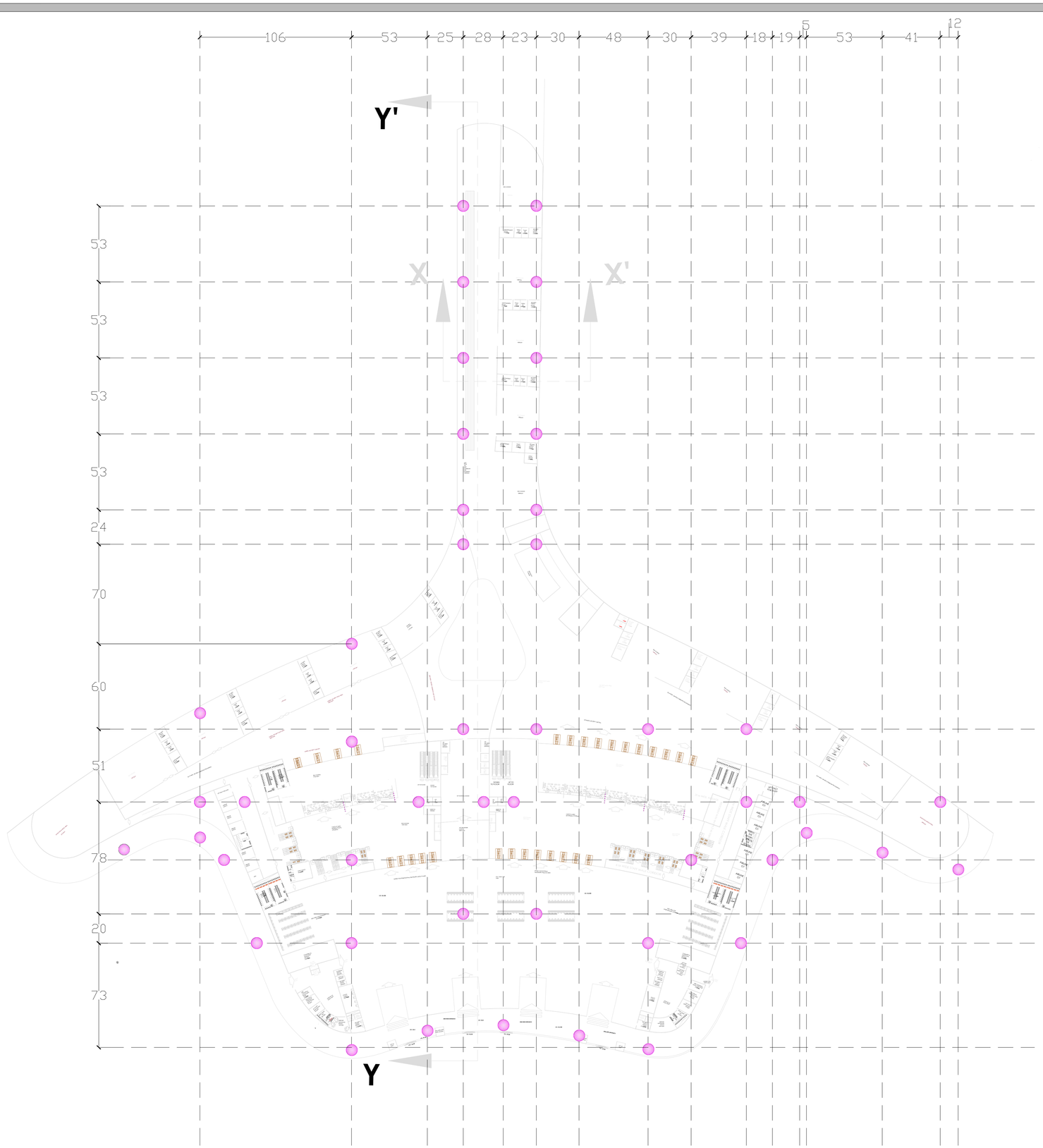

LEGENDS

MAIN HALL -29445SQM

DOMESTIC	INTERNATIONAL
REST AREA FOR DOMESTIC -**3700SQM**	REST AREA FOR INTERNATIONAL -**3700SQM**
CHECK IN AREA (DOMESTIC) 17918SQM	CHECK IN AREA (INTERNATIONAL) 10918SQM
BUS LOUNGE(CHECK IN AREA) 2000 SQM	BUS LOUNGE(CHECK IN AREA) 1500 SQM
PASPORT CHECK 2200 SQM	PASPORT CHECK 1600 SQM
BUS LOUNGE- **3500SQM**	BUS LOUNGE- **2100SQM**
SECURITY HOLD AREA 3000 SQM	SECURITY HOLD AREA 5000 SQM
BUS LOUNGE- **1564SQM**	BUS LOUNGE- **1564SQM**
BAGGAGE MAEKUP AREA-**2244SQM**	BAGGAGE MAEKUP AREA-**2244SQM**

DEPARTURE FLOOR COLUMN GRID

NIDHI GIRI
5.1
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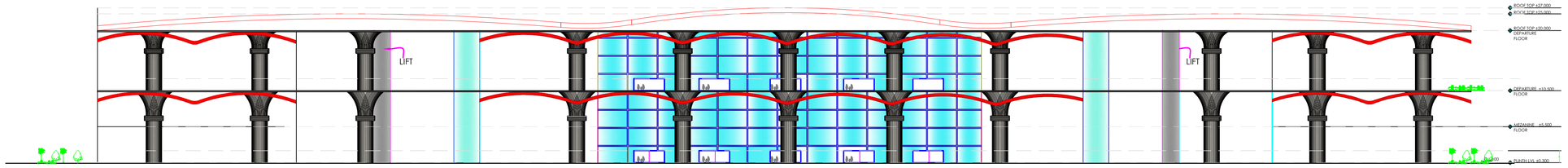
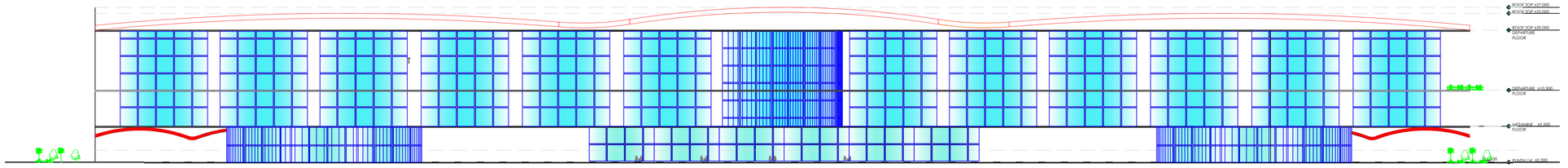
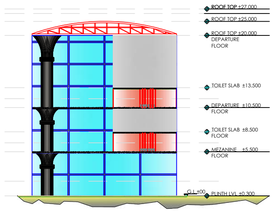


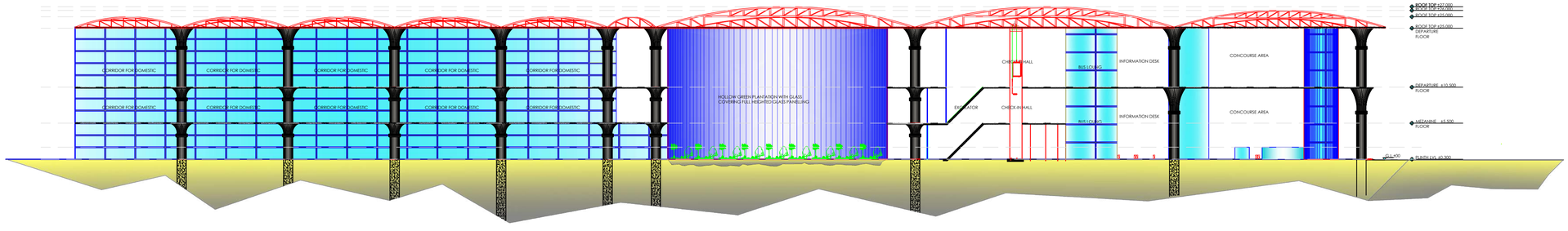
FRONT ELEVATION



REAR ELEVATION



SECTION-> X-X'



SECTION-> Y-Y'

ELEVATION & SECTION DETAIL

NIDHI GIRI
5.1
1150101048
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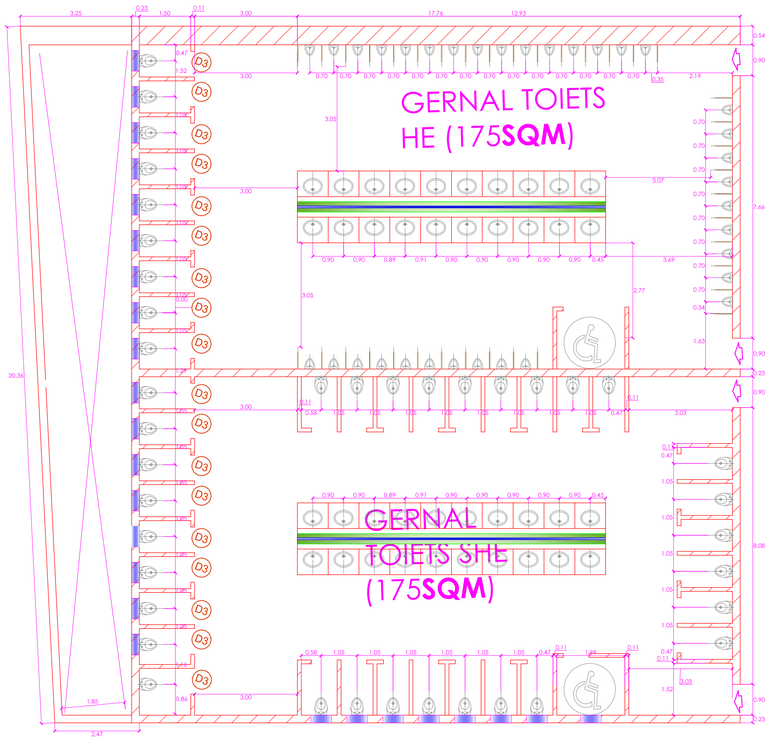
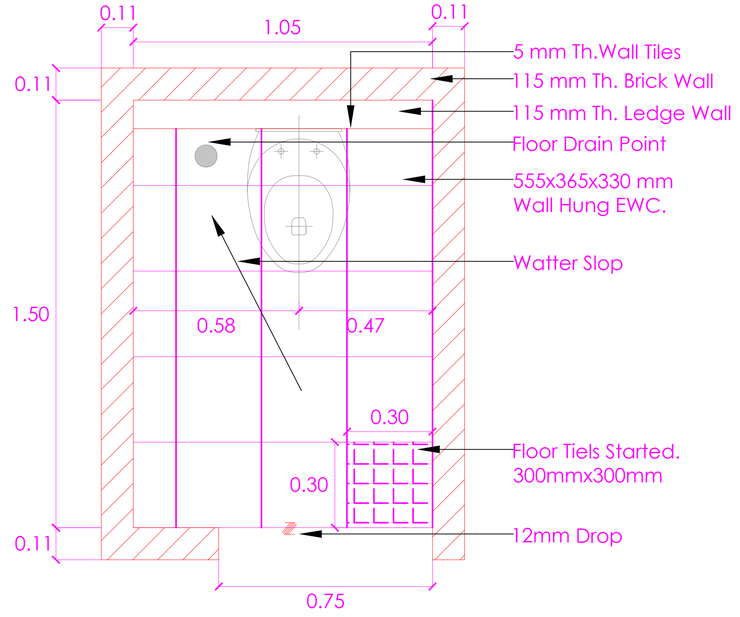


GENERAL TOILET WORKING DRAWING



PLAN

GENERAL TOILET FLOOR TILES DETAIL

SECTION

TOILET DETAIL

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5.1
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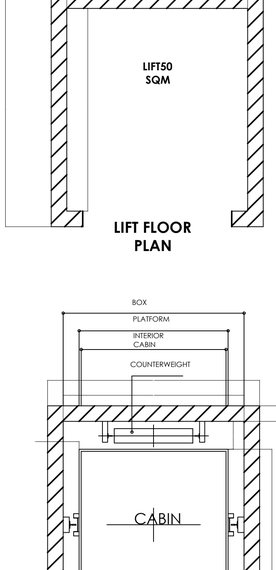
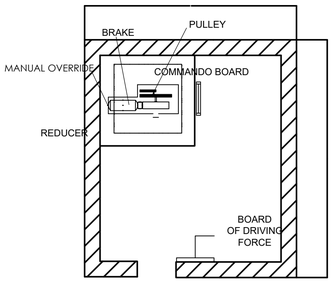
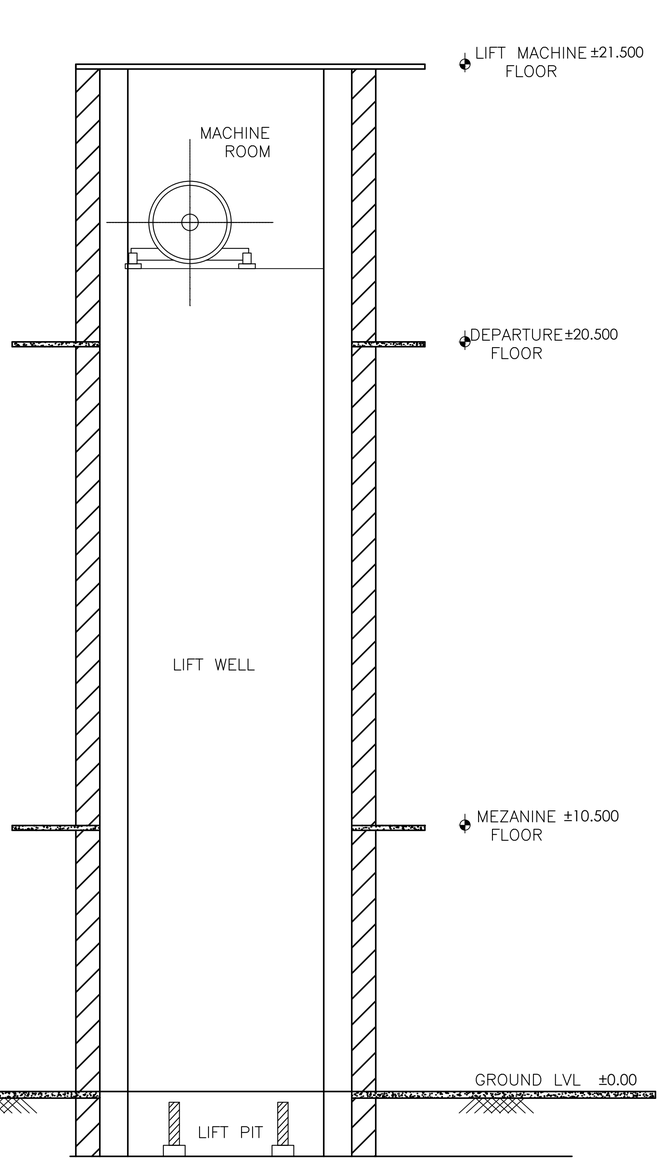
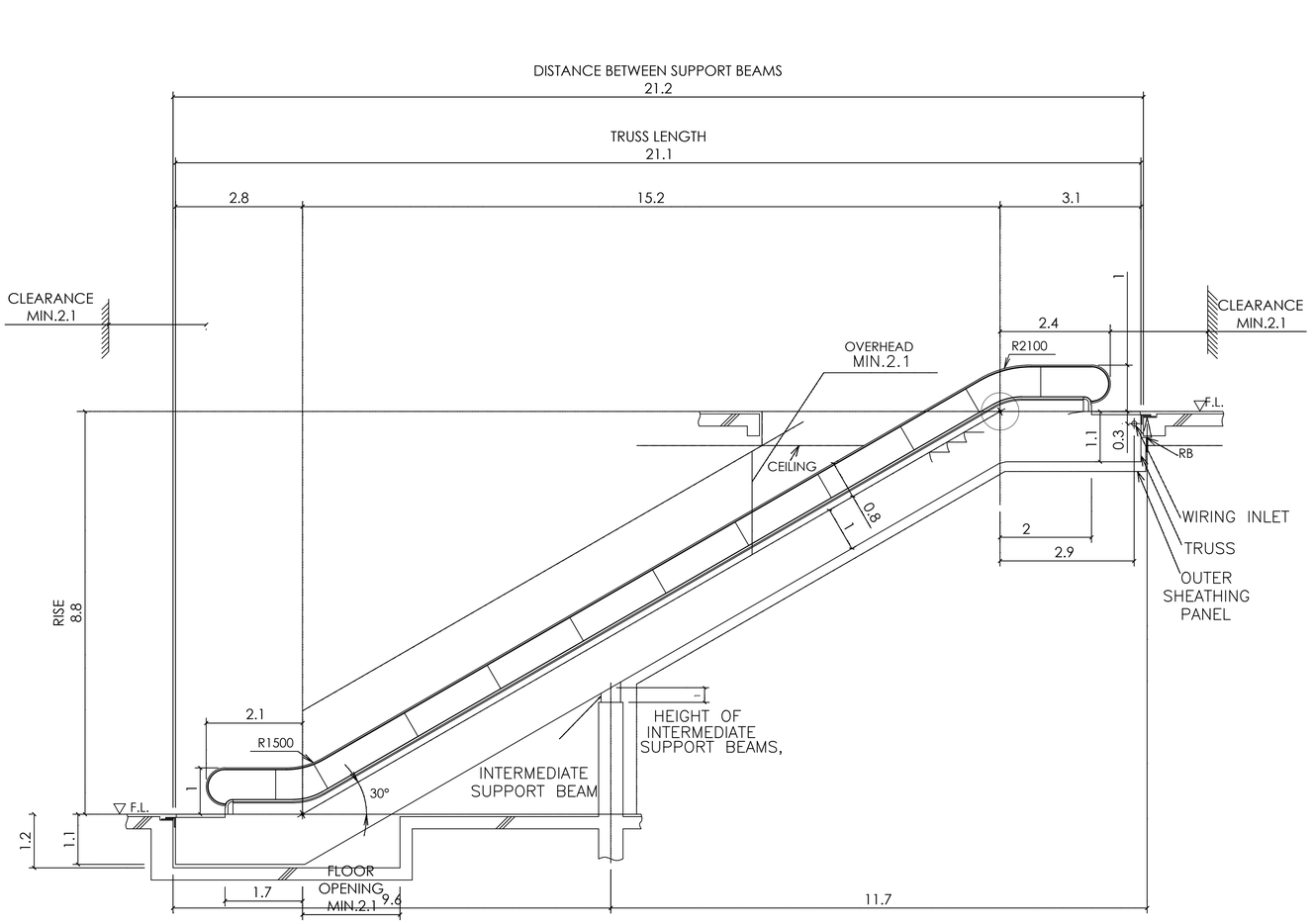


LIFT DETAIL
FLOOR PLAN



LIFT DETAIL
MACHINEROOM
PLAN





LIFT & ELEVATOR DETAIL

NIDHI GIRI
5.1
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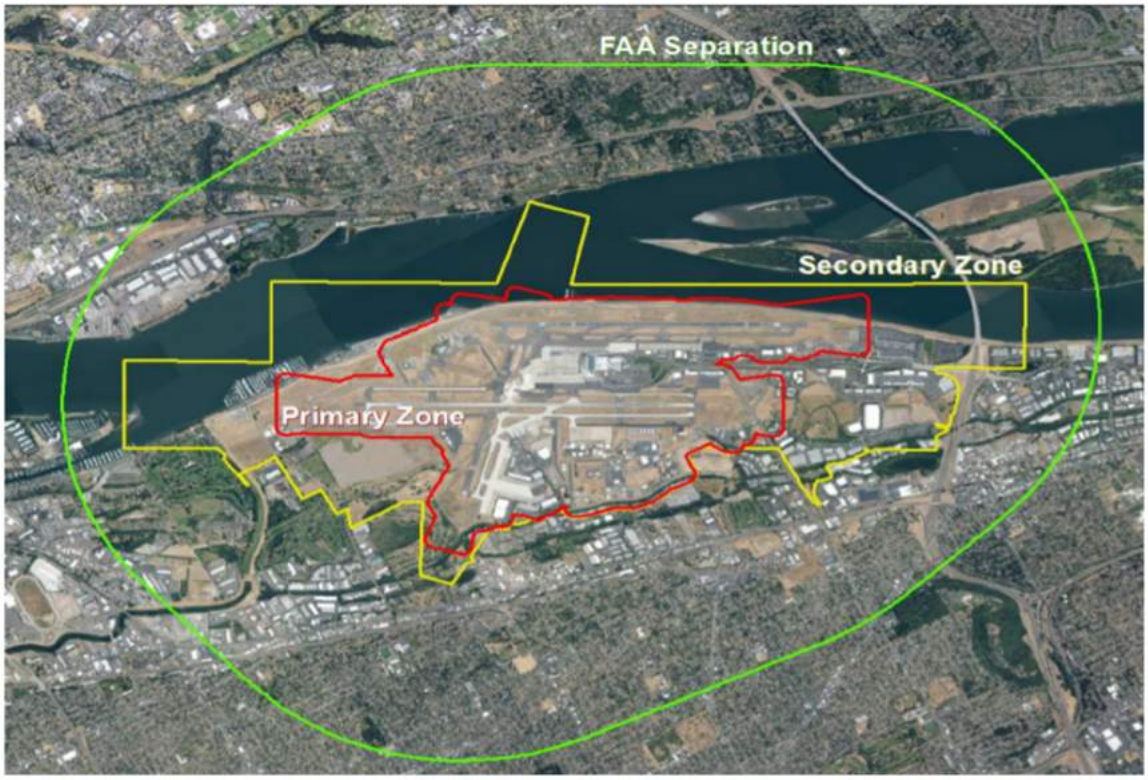
LANDSCAPING

LANDSCAPE MANAGEMENT



For the purpose of these guidelines please reference the following definitions of trees and shrubs taken from the Utah State University Agricultural Extension Office. A plant will be defined as a tree based on having the characteristics of being a woody plant having one erect
perennial stem (trunk) at least 3 inches in diameter at a height of 4 ½ feet above the ground, a
definitely formed crown of foliage, and a mature height of at least 13 feet. A plant will be considered a shrub if it is a woody plant with several perennial stems that may be erect or may lay close to the ground, usually having a mature height less than 13 feet and stems no more than around 3 inches in diameter.

Primary Zone

The PDX Primary Zone is within the Airport Sub-district (Title 33, Planning & Zoning, chapter 33.565) of city code, and currently exempt from City of Portland landscaping requirements. No City of Portland environmental zones are located within the Primary Zone. All landscape management within the all three Primary Zones will be driven by the operational and safety needs. Airport Landscaping Standards for the Primary Zones are as follows:

Existing Landscaping

 Existing trees, shrubs, and other landscaping will be assessed. Any landscaping that is documented to pose a significant wildlife hazard to safe aircraft operations will be immediately removed.

New Landscaping

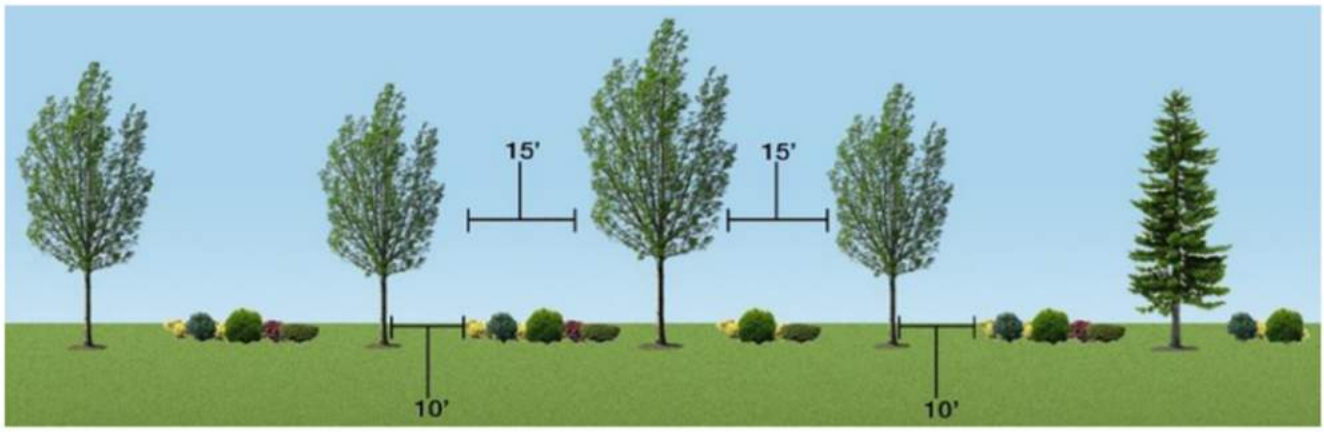
1. Each new landscaping project within the Primary Zone will be reviewed by the Aviation Wildlife Manager and other Port staff before landscaping designs are finalized.

2. Landscaped areas within the Primary Zone, including tenant landscaping, will only include shrubs and groundcover. No new trees will be allowed. Vegetation species must be represented on the Port's Airport Plant List. Design of the landscaping must also comply with the standards outlined in this document.

3. Trees that penetrate 14 CFR Part 77 Transitional Surfaces, and are demonstrated as contributing to hazardous wildlife conditions, will be removed rather than topped. Topping of trees creates an attractive platform for raptor nests, exacerbating bird strike potential.

4. No shrubs will be allowed within ten (10) feet of the airfield perimeter fence. This requirement addresses security concerns as well as vertical structure and wildlife hazards.

5. Shrubs may be planted adjacent to each other in groups of up to five. If there is more than one group of shrubs, there must be at least 10 feet between each group. If shrubs are not planted in groups, there must be at least 10 feet between each shrub.



e 5: Conceptual landscaping design for the Secondary Zone.

Figure 4: Overlapping crown structures that allow birds to move safely from tree to tree without exposure to predators or weather.

Figure 6: An example of a tree species that is attractive to birds because of its horizontal branching structure.

Figure 7: An example of an ideal tree because it has minimal opportunities for perching and nesting due to its vertical branching structure.

SCIENTIFIC NAME	Berberis verruculosa
COMMON NAME	Warty Barberry
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	3-5
MAXIMUM SPREAD AT MATURITY	3-5

SCIENTIFIC NAME	CORNUS
COMMON NAME	Warty barberry
TYPE	Decidous
MAXIMUM HEIGHT MATURITY (ft)	3
MAXIMUM SPREAD AT MATURITY	3

SCIENTIFIC NAME	Iiex
COMMON NAME	Heller japanese Holly
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	4
MAXIMUM SPREAD AT MATURITY	4

SCIENTIFIC NAME	Lavandule
COMMON NAME	English laveder
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	2-3
MAXIMUM SPREAD AT MATURITY	2-4

SCIENTIFIC NAME	Rhondodendron X
COMMON NAME	Girard's Purple azalea
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	3-4
MAXIMUM SPREAD AT MATURITY	2-4

SCIENTIFIC NAME	Rosa
COMMON NAME	Meidiland rose varieties
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	2.5-3
MAXIMUM SPREAD AT MATURITY	

SCIENTIFIC NAME	Rosa
COMMON NAME	Red flower carpet
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	2.5
MAXIMUM SPREAD AT MATURITY	

SCIENTIFIC NAME	Rosa
COMMON NAME	Double knock out rose
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	3-4
MAXIMUM SPREAD AT MATURITY	3-4

SCIENTIFIC NAME	ISpiraea
COMMON NAME	Birchleaf spiraea
TYPE	Decidious
MAXIMUM HEIGHT MATURITY (ft)	3
MAXIMUM SPREAD AT MATURITY	3

SCIENTIFIC NAME	Ajuga
COMMON NAME	Carpet bugle
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	5
MAXIMUM SPREAD AT MATURITY	

SCIENTIFIC NAME	Calluna
COMMON NAME	Scotch Heather
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	5-2
MAXIMUM SPREAD AT MATURITY	2+

SCIENTIFIC NAME	Ceanothus
COMMON NAME	Mahala Mat
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	.5
MAXIMUM SPREAD AT MATURITY	

SCIENTIFIC NAME	Walstenia
COMMON NAME	Bareen strawberry
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	.5
MAXIMUM SPREAD AT MATURITY	

SCIENTIFIC NAME	Calamagrostis
COMMON NAME	Feather reed grass
TYPE	
MAXIMUM HEIGHT MATURITY (ft)	2.5-3
MAXIMUM SPREAD AT MATURITY	1.5-2

SCIENTIFIC NAME	Festuca
COMMON NAME	Blue fescue
TYPE	
MAXIMUM HEIGHT MATURITY (ft)	1
MAXIMUM SPREAD AT MATURITY	1

SCIENTIFIC NAME	Ophiopogon
COMMON NAME	Dwarf Mondo Grass
TYPE	N/A
MAXIMUM HEIGHT MATURITY (ft)	
MAXIMUM SPREAD AT MATURITY	

SCIENTIFIC NAME	Ophiopogon
COMMON NAME	Black monodo grass
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	.75-1
MAXIMUM SPREAD AT MATURITY	.75-1

SCIENTIFIC NAME	Pennisetum
COMMON NAME	Hemeln fountain grass
TYPE	
MAXIMUM HEIGHT MATURITY (ft)	1.5-2.5
MAXIMUM SPREAD AT MATURITY	1.5-2.5

SCIENTIFIC NAME	Dicentra
COMMON NAME	Pacific bleeding heart
TYPE	N/A
MAXIMUM HEIGHT MATURITY (ft)	2
MAXIMUM SPREAD AT MATURITY	2

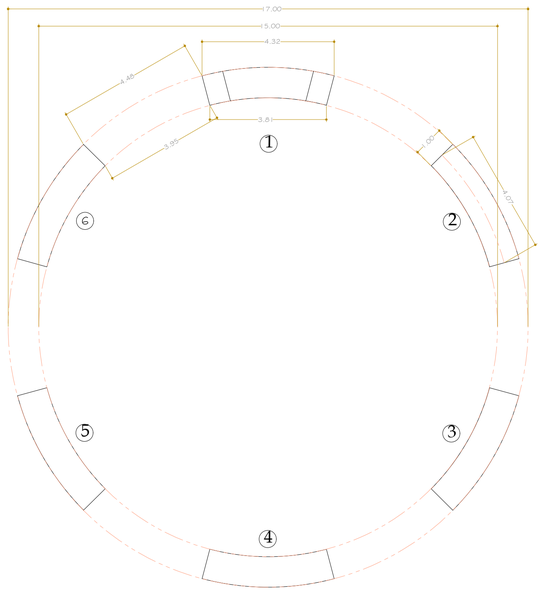
SCIENTIFIC NAME	Echinacea
COMMON NAME	Purple coneflower
TYPE	N/A
MAXIMUM HEIGHT MATURITY (ft)	2
MAXIMUM SPREAD AT MATURITY	2

SCIENTIFIC NAME	Juiperus
COMMON NAME	creeping juniper
TYPE	Evergrenn
MAXIMUM HEIGHT MATURITY (ft)	1-1.5
MAXIMUM SPREAD AT MATURITY	10

SCIENTIFIC NAME	Phlox
COMMON NAME	Native Phlox
TYPE	N/A
MAXIMUM HEIGHT MATURITY (ft)	5-2
MAXIMUM SPREAD AT MATURITY	

SCIENTIFIC NAME	Phyllodoce
COMMON NAME	Mountain Heather
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	5-1.5
MAXIMUM SPREAD AT MATURITY	5-1.5

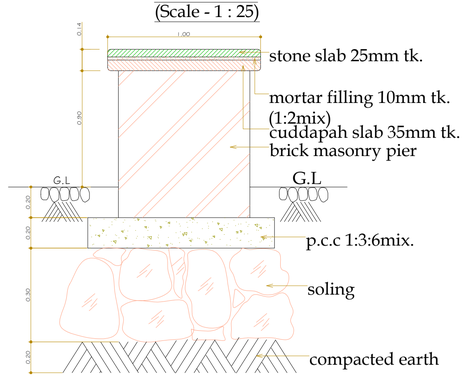
SCIENTIFIC NAME	Polystichum
COMMON NAME	Sword fern
TYPE	Evergreen
MAXIMUM HEIGHT MATURITY (ft)	4
MAXIMUM SPREAD AT MATURITY	7



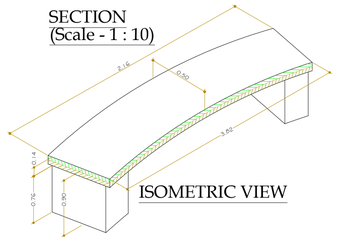
PLAN
(Scale - 1 : 50)

CURVED BENCH

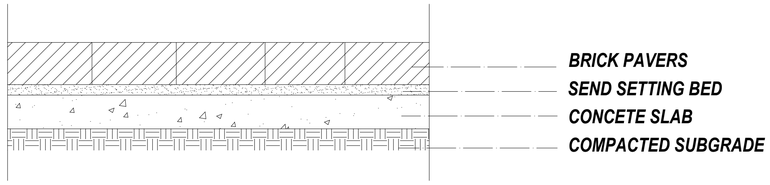
ELEVATION
(Scale - 1 : 25)



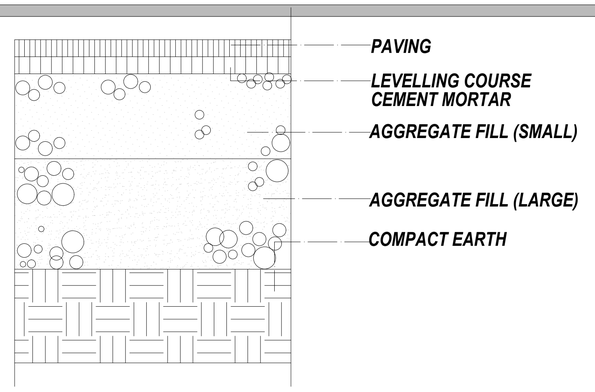
SECTION
(Scale - 1 : 10)



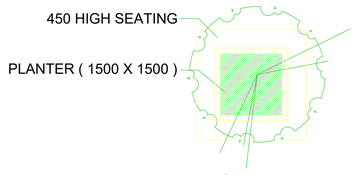
ISOMETRIC VIEW

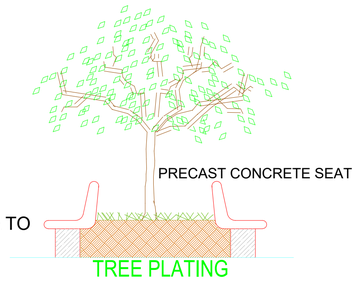


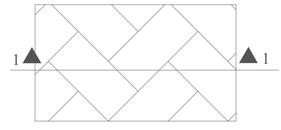
BRICK PAVING ON SAND AND CONCRETE SLABE



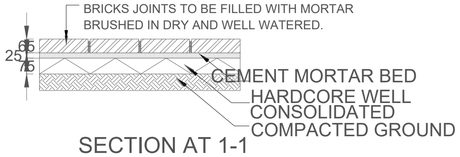
PAVING DETAIL





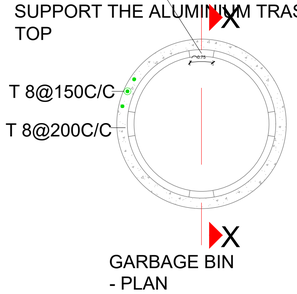


PLAN
PEDESTRIAN PAVING

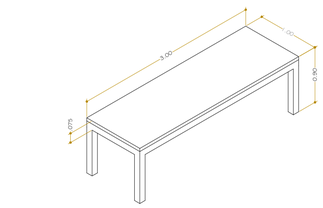


SECTION AT 1-1

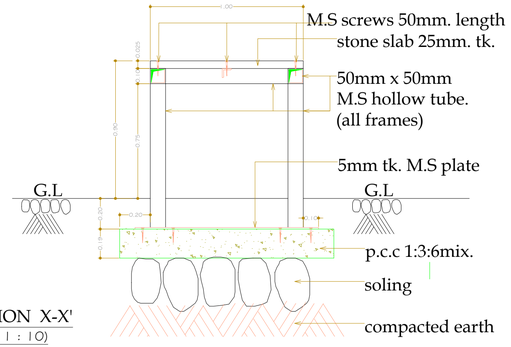
CONCRETE SHELVES AT QUATER BASE POINTS OF CONCRETE BASE TO SUPPORT THE ALUMINUM TRASH TOP



GARBAGE BIN
- PLAN

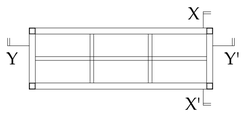


ISOMETRIC VIEW
(Scale - 1 : 25)



SECTION X-X'
(Scale - 1 : 10)

ELEVATION
(Scale - 1 : 25)



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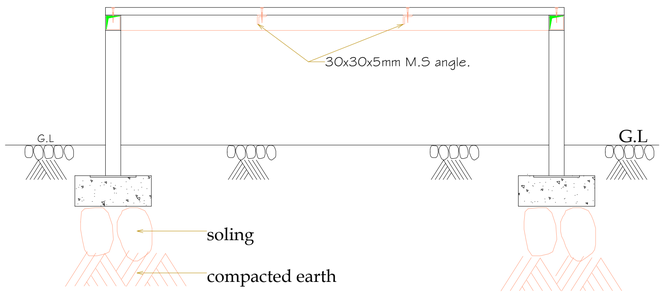
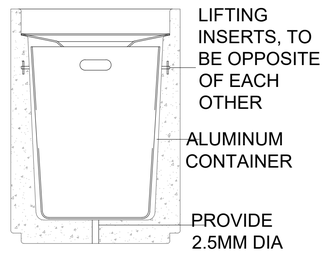
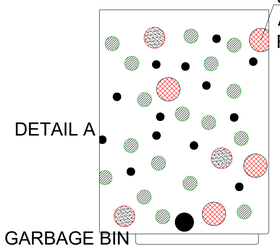


SECTION Y-Y'
(Scale - 1 : 10)

RECTANGULAR BENCH

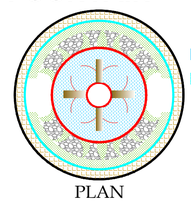


SECTION X

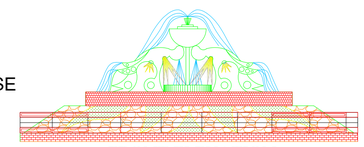


GARBAGE BIN

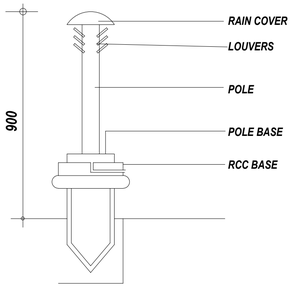
FOUNTAIN



PLAN

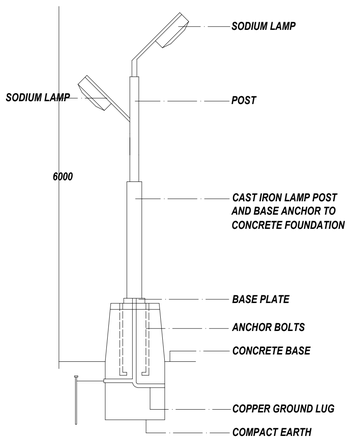


FRONT ELEVATION



PEDESTRIAN LIGHT NO GLARE ON EYE

1. HEIGHTS BELOW EYE LEVEL.
2. VERT FINITE PATTERNS WITH LOW WATTAGE CAPABILITIES.
3. INCANDESCENT, FLUORESCENT, AND HIGH PRESSURE SODIUM 5 TO 150 WATT LAMPS.
4. LOWEST MAINTAINENCE REQUIREMENTS, BUT HIGHLY SUSCEPTABLE TO VANDALS.



LIGHT POLE AT PARKING

1. AVERAGE HEIGHT - 6 M TO 15M.
2. INSTALLED ALONG THE ROAD SIDE.
3. MERCURY, METAL HALIDE OR HIGH PRESSURE SODIUM, 400 TO 1000 WATTS LAMPS
4. FIXTURES MAINTAINED BY GENTRY

LANDSCAPING DETAIL

NIDHI GIRI
5.1
1150101048
BABU BANARSI DAS UNIVERSITY

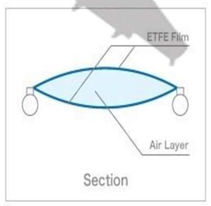
“AEROTROPOLIS”.....
JEWAR INTERNATIONAL AIRPORT, NOIDA

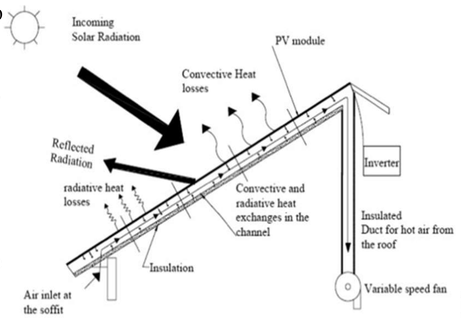
MATERIAL SPECIFICATION

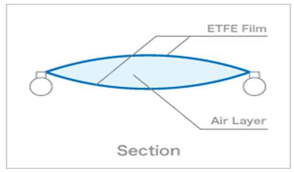
Photovoltaics are best known as a method for generating electric power by using solar cells to convert energy from the sun into a flow of electrons by the photovoltaic effect.

Solar cells produce direct current electricity from sunlight which can be used to power equipment or to recharge a battery.
It can be made softer and more flexible by the addition ofplasticizers, the most widely used being phthlates. in this form, it is also used in plumbing, electrical cable insulation, imitation leather, flooring and many application where it replace rubber.

Wood glue is an adhesive used to tightly bond pieces of wood together. many substances have been used in glue.

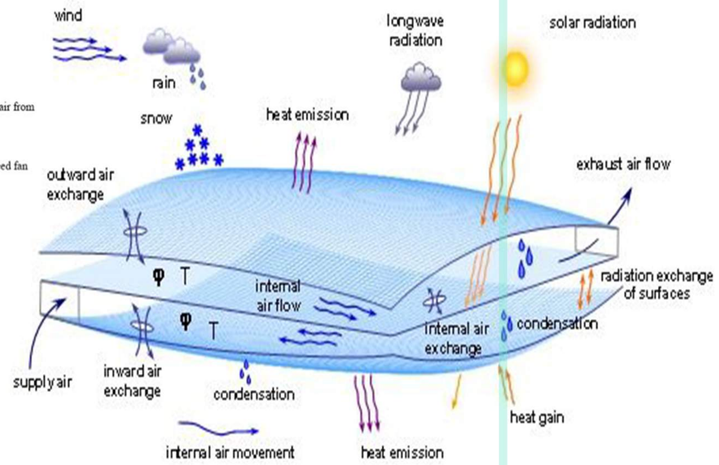






ETFE (Ethylene tetrafluoroethylene) FILM

Pyramid steel offer a complete steel service for any requirement large or small. As a steel stockholder and fabricator we specialise in the distribution of structural steel and other steel products throughout

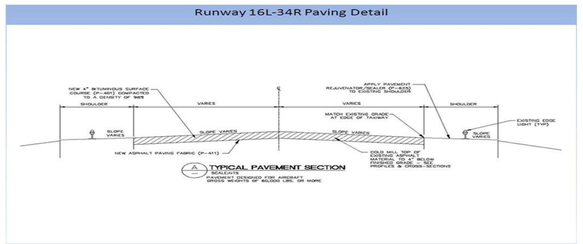


FLUON ETHYLENE TETRAFLUOROETHYLENE(ETFE) is the high-performance fluorine-based plastic film that roofs the station. Despite being lighter than glass, ETFE film provides superior durability and a wide range of benefits for outdoor use.

* High tensile elongation
*Temperature resistance over 200C
*Light transmission higher than 90%
*Superior tear strength
*Long term weatherability
*Noise Absorption
*Nonflammable
The durable lattice roof shelter a roof top garden that lets in light and rain for natural irrigation, while the transparent air pillows allow direct buildingviews in and out of the builing.

overall, ETFE film provides a functional and cost effective r00f.

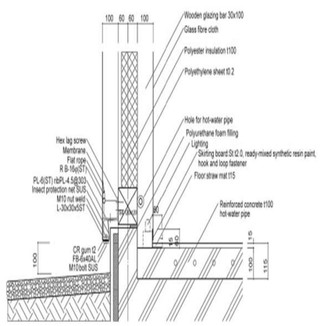
ASPHALT RUNWAY DETAIL



CONCRETE FLOORING

is incridbly hard and strong-Concrete flooring has many benefits, compare them to the drawbacks below to determine if concrete is the right option for you.

A concrete floor is extremely strong and durable, and if it is properly installed and maintained, it can last for as long as you own the house



GLASS CURTAIN WALL

A Curtain wall is defined as thin , usually aluminium - framed wall, containing in fills of glass, metal panels, or thin stone.the frameing is attached to the building structure and does not carry the floor or roof loads of the curtain wall are transfered to the building structure, typically at the floor line. Aluminium framed wall systems date back to the 1930's , and developed rapidly after world war 2 when the supply of aluminium became available for non-military use.

curtain wall systems range from manufacture's standard calcing system to specialized custom walls. custom walls become cost competative with standard systems as the wall area increases. the section incorpates comments about standards and custom systems . it is recommended that consultants be hired with an expertise in custom curtain wall design for projects that incorprate these systems

LIGHT WEIGHT CONCRETE

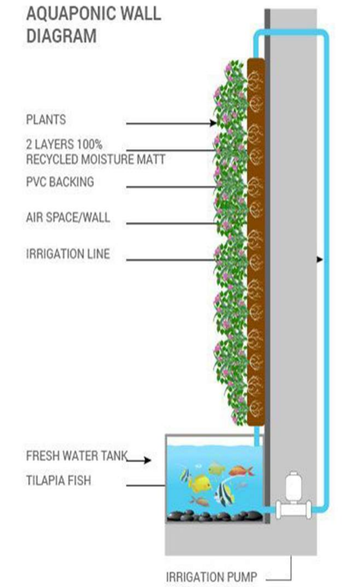
Lightweight aggregate concrete can be produced using a variety of leightweight aggregates light weight aggregates originates from either:
***Natural materials like volcanic pumice.**
***The terminal treatment of natural raw materials like day,**
***Manufacturing from industrial by products such as fly ash.**
***The required properties of the leightweight concrete will have a bearing on best type leight weight aggregate to use.**

GLASS CURTAIN WALL

A vertical garden is a method to grow plants on walls.
Found in nature and ancient civilizations, vertical gardens have been theving for centuries on walls all over the world

Vertical gardens are a wonderful alternative to potted plants in the office space. While potted plants have the advantage of being placed anywhere, they can take up space and require lots of maintenance.

Vertical gardens can be placed in hotel lobbies, major corporation headquarters, or even a small residential backyard. Vertical gardens not only look impressive,



AIRPORT

NIDHI GIRI
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