

## Analysis & Design of Building Airport

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**Abstract:** Increasing passenger and cargo traffic will make further demands on airport improvement and construction. An International or Domestic airports the minimum area of land that is utilized is 1500 acres. To acquire such a huge area of land is herculean task for developers or government. The concept of BUILDING AIRPORT addresses all these concerns. In this runway is on top of the three storeys building i.e. top roof of the building. The land acquire for this type is only 300 acres thus reducing of land acquisition up to 1/5th of basic required.

**Keywords:** Runway, Wind rose, STAAD. Pro, Aircraft

### I. INTRODUCTION

The requirements of airports are increasing day to day. The Most efficient plan for an airport as a whole is that which provides the required capacity of aircraft, passenger, cargo and vehicle moments, with maximum passenger, operator and staff convenience. The lion's share of airport land is Runway. When a runway is on top of building we don't need much land at the cost of agriculture and environment. So, the concept of Building airport been used. Where in this Airport the basic needs of airport is full filled in all aspects such as cargo storage, aircraft shelter, and security consideration

### II. FORMULATION

**Load on Runway Building:** The Common forces are considered to design the model are as follows:

**Dead load:** The Dead carried by the girder or the member consists of its own weight and the portions of the weight of the superstructure and any fixed loads supported by the member. The dead load can be estimated fairly accurately during design and can be controlled during construction and service.

**Superimposed Dead Load:** The weight of superimposed dead load includes controlling chambers; Air craft shelter trusses, communication tower on the controlling chamber, lifts controlling chambers and fuel stations.

**Live load:** Live loads are those caused by vehicles which pass over the Runway and are transient in nature. These loads cannot be estimated precisely, and the designer has very little control over them once the Runway is opened to traffic. However, hypothetical loadings which are reasonably realistic need to be evolved and specified to serve as design criteria.

The main Load acting on runway is aircraft landing and takeoff. Considering  
The aircraft of ANTONOV An225  
Maximum takeoff weight of 1410958 pounds i.e. 6214 KN.  
Maximum landing weight of 591.7 pounds i.e. 2.6 KN  
Take of land of 2000m.  
Tire pressure is of 5514 KN.

**Wind Load:** The Load due to wind considered according to the area. Wind Rose: The design wind speed is determined from historical records using extreme value theory to predict future extreme wind speeds. Load consideration when an Impact load acting on Building will be two times the load acting.

**Dimensions of Building and Its Considerations:** The length of Building is 2000m and The Width of Building is 500m, out of 500m two runways of 125m, 10m for the Air traffic control and lift for the passengers from top to ground floor, and Aircraft Hangers of 260m with fuel filling stations and unloading chambers. fig.1 shows the layout of the Runway Building Airport. Fig.1 shows the layout of the Runway Building Airport



Fig.1 Analysis & Design can be done by using STAAD Pro, software

### III. GENERAL FEATURES OF BUILDING AIRPORT

- The area occupied is 300 acres.
- Lift facility for the Passengers and Control of air traffic at top of Building.
- Nearly of 40 aircrafts can shelter at a time.
- Cargo storage of 1 million square meter area is available at 2nd floor of building.
- The basic required features of waiting halls, toilets, hotels, restaurants and shopping malls are in this building.
- Nearly park vehicles of cars 150,000 and two wheelers of 100,000.
- Providing air and ground traffic control aids at building.
- Medical centers, flight catering kitchens, meteorological services, water supply and sanitation.
- Security considerations of land side and air side

#### IV. STRUCTURAL FEATURES OF BUILDING AIRPORT

- A warren truss provide for Aircraft Hanger.
- A Signaling tower is provided at the top of lift chamber.
- Noise absorbers are providing throughout edges of buildings.
- Providing of Cross Beams for Reduction of Buckling of columns
- Dampers will be provided at columns
- Bearings and Blowers are provided at junction of columns and Beams
- Providing of Geo synthetics in RUN WAY SLAB.
- Proving cables of 40mm diameter from top slab to pedestal.

#### V. CONCLUSIONS AND FUTURE WORK

Reducing of land acquisition up to 1/5th normal land required for an International or Domestic airport. Consumption of fuel for the Aircraft can also reduce. The environment impact can be reduced on land. An Engine failure case can also resist.

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