4.1 GEOMETRIC DESIGN OF RUNWAY

Length

Longitudinal and Effective gradient

Safety Area

Sight Distance

Transverse Gradient

Width

Length of Runway

The Basic runway length is given by ICAO in accordance with the classification of airports.

The actual runway length is computed after applying corrections in length for: –

Elevation

Temperature, and

Gradient

Longitudinal and Effective gradient

The longitudinal gradient increases the runway length

Fuel consumption of aircraft increases on uphill slope climbing during takeoff.

Safety Area

It includes runway, shoulders on either side of runway, and additional length

The shoulders are generally unpaved

They are only used in case of emergency

They are generally turfed or made of stabilized soil

Shoulders provide a sense of openness and vastness to pilot

The length of safety area should extend by 60m on either side beyond runway ends

The total length of safety area is = Runway Length +120

Stopway

A stopway is an area beyond the runway to decelerating an aircraft in case of an aborted takeoff.

It must be at least as wide as the runway and must be capable of supporting an airplane without causing structural damage to it.

Clearway

A clearway is a defined area connected to the end of a runway

It increases the allowable airplane operating takeoff weight without increasing runway length.

Runway:

Design Criteria

It should be designed keeping in view the characteristics of critical aircraft.

The major design guidelines:

Length, width, and orientation (direction),

configuration (multiple runways),

Slope (Longitudinal and cross)

Pavement thickness of runways

Immediate airfield area surrounding the runways obstructions

Function of Taxiways

They connect runways with other areas, like terminal building, cargo, and parking areas. Taxiways gives access for aircraft to and from the runways

Types of taxiways

Parallel taxiway

Provided parallel to an adjacent runway, It facilitates aircrafts to reach the apron area from runway after landing and from apron area to runway for take-off.

Entrance taxiway

Located near the runway threshold. It facilitates entry of an aircraft to runway for take-off operation.

Exit taxiways

Located at various points along the runway to allow landing aircraft to efficiently exit the runway after landing.

Bypass taxiways

Provided to give way to aircraft, Located at areas of congestion at busy airports.

Taxiways:

Design Criteria

Provide each runway with a parallel taxiway

Design taxiways of optimum length

Provide bypass capability or multiple accesses to runway ends

Minimize crossing runways

Provide large curves and fillet radii for easier maneuvering of aircrafts.

Provide airport traffic control tower line-of-sight