

4.5 ELEMENTS OF TAXIWAY DESIGN

Taxiway

A taxiway is a path for aircraft at an airport connecting runways with aprons hangars terminals and other facilities.

Geometric Design Standards

- Turning radius
- Sight distance
- Rate of change of longitudinal gradient
- Transverse gradient
- Longitudinal gradient
- Width of safety area
- Width of taxiway
- Length of taxiway

Length of Taxiway

The speed of an aircraft on a taxiway is also less than the runway.

Width of taxiway is lower than the runway width.

No specifications are recommended by any organisation. Width of taxiway

It should be as short as practicable.

Longitudinal Gradient

ICAO recommends that the longitudinal gradient should not exceed 1.5% for A and B types and 3% for C D and E types.

A width of 7.5 m of shoulders adjacent to the pavement edges should be paved with light strength material.

Width of safety area

This area includes taxiway pavement on either side that may be partially paved plus the area that is graded and drained.

Rate of change of longitudinal gradient

ICAO recommends that the rate of change of slope in longitudinal direction should not exceed 1% per 30 m length of vertical curve for A,B and C types and 1.2% for D and E types of airports.

ICAO has recommended that the transverse gradient should not exceed 1.5% for A,B and C and C types and 2% for D and E types of airports.

Transverse Gradient

This is essential for quick drainage of water.

Sight distance

The radius of horizontal curve is obtained by : $R = \frac{V^2}{125f}$ V =speed in kmph
coefficient of friction $f = 0.13$

Whenever there is a change in the direction of taxiway a horizontal curve is provided .

ICAO has recommended that the surface of taxiway must be visible from 3m height for a distance of 300m for A,B and C types and distance of 250 m be visible for 2.1m height for D and E types of airports.

TURNING RADIUS**Horonjeff equation**

$$R = \frac{3.88W^2}{T^2 - S}$$

W=wheel base of taxiway in metre

T=width of taxiway pavement in metre

S =distance between midway point of main gears and the edge of the taxiway pavement in metre for super sonic planes it is taken as 180m and for sub sonic it is taken as 120m.

Taxiway design and geometrical design of taxiway

The speed of an aircraft on taxiway is much lower than its speed on a runway during the landing or take-off.} A taxiway is a path for aircraft at an airport connecting runways with aprons, hangars, terminals.

Factors controlling taxiway layout

Turning radius

Sight distance

Transverse gradient

Longitudinal gradient

Width of safety area

Width of taxiway

Length of taxiway

Bypass taxiway

Holding apron

Separation clearance

Fillets

Exit taxiways

Factors controlling exit taxiway

Aircraft leaves runway quicker

Intersection of taxiway and runway avoid

Taxiway-short distance

No interfere taxiway

Fillets

Distance between two parallel taxiway

Icao-recommends radius of fillet should not less than width of taxiway

Provide at junction of two runways, taxiway.

Fillets(radius) separation clearance

Also called turnaround taxiway

No parallel taxiway is recommended because is not economic

Checking process if any defects – change aircraft

Wait for turn to take-off

Holding apron bypass taxiway(more traffic)

