

200.00 BU

is also added.

Chapter 2

Chapter 3

Chapter 4

Chapter 5

Chapter 6

Chapter 7

Chapter 8

Chapter 9

The outline of the book is:

skies policy and more.

# AIRPORT ENGINEERING



Charotar Publishing House Pvt. Ltd. Opposite Amul Dairy, Old Civil Court Road, Anand 388 001 India 💽 +91 99249 78998 🖾 charotar@cphbooks.com, 🛞 https://cphbooks.in

(f) /charotar (y) /cphpl1511 () /charotarpub (in) /in/charotar/

Follow us:

Catalogue

Checklist

#### AIRPORT ENGINEERING **DETAILED CONTENTS**

# **Chapter 1 INTRODUCTION**

1-1. General

1-2.

- (1) Collective demand
- (2) Efficient and adequate supply
- (3) Power of discrimination
- Significance of transport
- 1-2-1. Economic significance of transport
  - (1) Agriculture (8) Price stabilization
  - (2) Competition (9) Production

of labour

(35) Heliport

(36) Holding apron

(37) Horizontal surface

System (ILS)

(39) Instrument runway

(41) International air

service

(42) Landing area

(43) Landing strip

(44) Mach number

(46) Parachute

(48) Rudder

(49) Runway

(45) Missed approach

(47) Pressure altitude

(50) Runway end safety

(51) Standard atmosphere

area (RESA)

(40) International airport

(38) Instrument Landing

- (3) Consumption (10) Scale of production
- (4) Distribution (11) Territorial division
- (5) Exchange
- (6) Industrial development (12) Utility
- (7) Land utilization
- 1-2-2. Political significance of transport
- (2) National unity (1) National defence
- 1-2-3. Social significance of transport
  - (1) Concentration of population
  - (2) Elimination of cottage scale production
  - (3) Loss of distinguishing characteristics
  - (4) Mass destruction
  - (5) Restrictions on international transport
- 1-3. Modes of transport
  - (1) Land transport (3) Air transport
  - (2) Water transport
- History of aviation 1-4.
- Air transportation in India 1-5.
  - (1) Indian Airlines Corporation
  - (2) Air India International Corporation
    - International airport authority of India (IAAI)
- 1-7. Civil aviation department
- 1-8. Airport authority of india (AAI)
- 1-9. Open skIES policy

1-6.

- Airport terminology 1-10.
  - (1) Aerodrome
  - (2) Aeroplane
  - (3) Aircraft
  - (4) Airfield
  - (5) Airport
  - (6) Airport capacity
  - (7) Airport established
  - elevation
  - (8) Airships
  - (9) Air traffic control (ATC)
  - (10) Approach area or
  - approach zone
  - (11) Approach surface
  - (12) Apron
  - (13) Balloon
  - (14) Beaufort scale
  - (15) Blast pads
  - (16) Boundary lights
  - (17) Boundary markers
  - (18) Calm period
  - (19) Cargo
  - (20) Clearway (21) Conical surface
  - (22) Control area
  - (23) Control tower
  - (24) Control zone
  - (25) Ctol
  - (26) Design landing weight
  - (28) Elevator
  - (29) Flight time
  - (30) Flight visibility
  - (31) Fuselage
  - (32) Gate position
  - (33) Hangar
  - (34) Helicopter
- 1-11. Component parts of aeroplane
  - (1) Engine
  - (2) Flaps
  - (3) Fuselage (4) Propeller
- (53) Stolport (54) Stopway (55) Surveillance radar (56) Taxiway (57) Terminal area (58) Terminal building (59) Threshold (60) Displaced threshold (DTHR) (61) Transition surface (62) Visual Flight Rules (VFR) (63) Visibility (64) Wind rose (65) Zero fuel weight (66) Zoning (5) Three controls (6) Tricycle undercarriage (7) Wings

Charotar Publishing House Pvt. Ltd. Opposite Amul Dairy, Old Civil Court Road, Anand 388 001 India

🔕 +91 99249 78998 🖾 charotar@cphbooks.com, 🗠 https://cphbooks.in

- 1-12. Aircraft characteristics
- (1) Aircraft capacity
  - (2) Aircraft speed (3) Aircraft weight and
  - wheel arrangement

(7) Minimum turning radius

(11) Take off and landing distances

(13) Tyre pressure and contact

(8) Noise

(9) Range

area

(6) Noise

(5) Hot blasts

(10) Size of aircraft

(12) Type of propulsion

(7) Porpoising effect

(9) Sucking effect

(5) Soil survey

(7) Traffic survey

(5) Obstruction plan

(7) Topographic plan

(6) Paving plan

(12) Use of airport

(2) Land-use zoning

Population

Topographical features

(3)

(4)

Follow us:

(f) /charotar (y) /cphpl1511 (2) /charotarpub (in) /in/charotar/

(6) Topographical survey

(8) Pumping of the joints

- (4) Fuel spilling
- (5) Jet blast
- (6) Minimum circling radius
- 1-13. Characteristics of the jet aircraf
  - (1) Channelization
    - (2) Fuel spilling
    - (3) High-pressure tyres
  - and small contact areas
- (4) High velocities 1-14. Civil and military aircrafts
- 1-15. Classification of aerodromes
- 1-16. Classification of airports
- 1-17. Flying activities
  - (1) Military operational flights
  - (2) Non-scheduled commercial flights
  - (3) Personal flights
  - (4) Scheduled commercial flights
- **Questions** 1

#### Chapter 2 AIRPORT SURVEYS

(2) Drainage survey

Drawings to be prepared

(1) Drainage plan

(2) Grading plan

(3) Lighting plan

**Chapter 3 AIRPORT PLANNING** 

(3) Traffic forecast

Airport site selection

Improvement of existing airport

(4) Planning a new airport

(3) Availability of utilities

(6) Ground accessibility

(9) Soil characteristics

(8) Regional plan

(11) Topography

Airport capacity

Airport size

Clear zone

Turning zone 3-10. Zoning laws

3-11. Regional planning (1) Air traffic

(2)

(5) Economy of construction

(7) Presence of other airports

(10) Surrounding obstructions

(1) Elevation of the airport site

(3) Performance characteristics of aircrafts(4) Volume of traffic

(2) Meteorological conditions

Forecasting in aviation

(1) Imaginary surfaces (2) Objects with actual heights

Existing airports

Airport obstructions

(1) Height zoning

(1) Capacity of existing airport

(2) Improving the existing capacity

(2) Availability of land for expansion

(4) Development of the surrounding area

(1) Atmospheric and meteorological conditions

(4) Master plan

(1) Approach zone survey

(3) Meteorological survey

(4) Natural resources survey

General 2-1.

2-4.

3-1.

3-2.

3-3.

3-4.

3-5.

3-6.

3-7.

3-8.

3-9

Questions 2

General

2-2. Objects of surveys 2-3. Types of surveys

### AIRPORT ENGINEERING **DETAILED CONTENTS**

3-12.	Airport architecture				Chap	ter 6	TAXIWAY DESIGN		
	(1) Features of building	(4)	Plants		6-1.	Gen	eral		
	(2) International airport	(5)	Seating arrange	ements	6-2.	Lay	out of taxiways		TT' 1 .
2.12	(3) Materials of construction	(6)	Utilization of s	pace		(1)	Arrangement	(4)	Higher turn-
3-13.	Typical airport layouts					(2)	Busy airports	(5)	Route
3-14.	Layout of military airports				6.2	(3)	Crossing		
5-15.	(1) Environmental impact a		ment (FIA)		0-3.	for	animon stanuarus		
	(1) Environmental impact a	toten	hent (EIA)			(1)	Length of taxiway	(5)	Transverse a
	(2) Environmental managen	nent	nlan (FMP)			(1) (2)	Longitudinal gradient	(5)	Turning radi
3-16.	Factors influenced by airport	acti	vitv			(2)	Rate of change of	(0) (7)	Width of saf
0 10.	(1) Ecological factors	aou				(0)	longitudinal gradient	(8)	Width of tax
	(2) Engineering and econom	nic f	actors			(4)	Sight distance	(-)	
	(3) Pollution factors	(4)	Social factors		6-4.	Exit	taxiways		
3-17.	Measures to control adverse	impa	icts			(1)	Air traffic control	(5)	Pilot variabil
	(1) Measures to control noi	se ir	npact			(2)	Exit speed	(6)	Topographica
	(2) Measures to control soil	l and	l geology impact			(3)	Location of runways	(7)	Types of air
	(3) Measures to control hyd	lrolo	gy and water im	pact:		(4)	Number of exits	(8)	Weather con
	(4) Measures to control air	qual	ity impact		6-5.	Opti	mum location of exit ta	xiway	/S
Quest	ions 3				6-6.	Desi	gn of exit taxiways		
Chap	oter 4 PLANNING AND DE	SIG	N OF TERMINA	AL AREA		(1)	Angle of turn	(5)	Occupancy the
4-1.	General					(2)	Compound curve	(6)	Shape of tax
4-2.	Terminal building					(3)	Exit speed	(/)	Stopping dis
	(1) Design objectives	(4)	Planning consid	derations	67	(4) L oo	Lengths $L_1$ and $L_2$	(8)	Turning radi
	(2) Facilities to be provided	(5)	Site selection		6.8	Hol	ling aprons		
	(3) Noise control				0-0.	(1)	Configuration	(4)	Holding bays
4.2	(6) Space requirements					(1)	Entry to the runway	(-7)	Location
4-3.	Passenger flow	(4)	Constitution of the	1		(2)	Eacility of hypass	(5)	Peak demand
	(1) Affival (2) Check in	(4)	Departure	ing	6-9.	Fille	ets	(0)	I cuit demune
	(2) CHECK-III (3) Waiting	(5)	Deplaning		6-10.	Sepa	aration clearance		
4_4	(3) Watting Parking of vehicles	(0)	Deplaining		6-11.	Byp	ass or turnaround taxiwa	ay	
	(1) Short-term	(3)	Remote		Questi	ions	5	•	
	(1) Short term (2) Long-term	(5)	Remote		Chap	ter 7	AVIATION FUEL		
4-5.	Size of apron				7-1.	Gen	eral		
	(1) Gate position	(3)	Systems of airc	raft parking	7-2.	Typ	es of aviation fuels		
	(2) Number of gates					(1)	Jet Fuel	(2)	Avgas
4-6.	Apron turntable				7-3.	Cha	racteristics of aviation f	uel	
4-7.	Hangars					(1)	Heat value of fuel	(3)	Static electri
	(1) Nose hangars	(2)	T-hangars			(2)	Volatility of fuel		
4-8.	Protection from jet blast		$\mathbf{Y} \in \mathbf{Y}$		7-4.	Refi	elling process		
0	(1) Blast fences	(2)	Erosion control			(1)	Delivering fuel	(3)	Distributing
Quest	tions 4				7.5	(2) DE	Storage of fuel		refuelling pro
Chap	oter 5 RUNWAY DESIGN				7-5.	DE-	ty process	uallin	a/Do fuolling
5-1.	General				/-0. Questi	ions '	Ty precautions during F	Jenni	g/De-fuening
5-2.	Runway orientation		G		Quest				FOLON
	(1) Preliminary information	(3)	Cross wind cor	nponent	Chap	ter 8	AIRPORT PAVEME	NI D	ESIGN
	required	(4)	Wind coverage		8-1.	Gen	eral		
5 2	(2) Head wind Change in direction of runws	(5)	wind rose		8-2.	Typ	ible or exphalt or bitum	inous	novomanta
5-5.	(1) Excessive grading	(3)	Obstructions		0-2-1.	(1)	General	mous	pavements
	(1) Excessive grading (2) Noise nuisance	$(\mathbf{J})$	Obstructions			(1) (2)	Lavers of flexible pave	ment	c
5-4.	Basic runway length				8-2-2.	Rigi	d or concrete pavements	S	5
· · ·	(1) Normal landing	(3)	Stopping in em	ergency	1 <b>1</b> 2	(1)	General		
	(2) Normal take off	(-)	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	8		(2)	Choice of the type of	paven	nent
5-5.	Corrections to basic runway	leng	th and the second se		8-2-3.	Sem	i-rigid or composite pay	emen	ts
	(1) Correction for elevation	(3)	Correction for t	emperature	8-3.	Diff	erence between flexible	and r	igid pavement
	(2) Correction for gradient				8-4.	Desi	gn factors or requireme	nts	
5-6.	Geometric design of runways					(1)	Characteristics of cons	tructio	on materials
	(1) Length					(2)	Subgrade soil	(3)	Wheel load
	(2) Longitudinal and effecti	ve g	radient		8-5.	Desi	gn of flexible pavement	is	
	(3) Rate of change of longi	tudiı	nal gradient		8-5-1.	Cali	fornia Bearing Ratio (C	.B.R.)	method
	(4) Runway End Safety Are	ea (F	RESA)		8-5-2.	McL	leod method		
	(5) Sight distance		TTT: 1.1		8-5-3.	Buri	nister method		
	(6) Transverse gradient	(7)	Width		8-5-4.	Ana	lytical design method		
J-/.	Balanced field concept				8-5-5.	Con	iputer Aided Design Ap	piicati	$OE$ = $a^{1}$ = $1$
5-8.	Kunway patterns				8-5-6. 0 = 7	U.S.	Army corps of enginee	ion (C	(UE) method
	(1) Single Tullway (2) Parallal rupyova				0-3-7.	The	asphalt institute method	1011 (F 1	AA) method
	(2)  I at a first 1 ull ways $(3)  Intersecting runways$				0-J-8. 8 6	Dec	asphan institute inclined	1	
	(4) Divergent or open V run	ทพวง	/\$		8-6-1	Met	hod based on Westergas	ard's s	nalvsis
5-9.	Comparison of runway patter	ms	~		8-6-2	Port	land Cement Association	n (PC	A) method
5-10	Geometric design of runway	inter	section		8-6-3	Fede	eral Aviation Administra	tion (	(FAA) method
Quest	tions 5				8-6-4.	U.S.	Army Corps of Engine	ers (C	COE) method

Busy airports (5) Route Crossing etric standards iway Length of taxiway (5)Transverse gradient ongitudinal gradient (6) Turning radius Rate of change of (7)Width of safety area ongitudinal gradient Width of taxiway (8) Sight distance axiways Air traffic control Pilot variability (5)Topographical features Exit speed (6) Location of runways (7)Types of aircraft Number of exits (8) Weather conditions um location of exit taxiways n of exit taxiways Angle of turn Occupancy time (5)Compound curve (6) Shape of taxiway Exit speed Stopping distance (7)Lengths  $L_1$  and  $L_2$ (8) Turning radius ng aprons g aprons Configuration (4)Holding bays Entry to the runway (5)Location acility of bypass Peak demands (6) tion clearance s or turnaround taxiway AVIATION FUEL al of aviation fuels et Fuel (2)Avgas cteristics of aviation fuel Heat value of fuel (3) Static electricity olatility of fuel ling process Delivering fuel Distributing and (3)torage of fuel refuelling process elling process precautions during Fuelling/De-fuelling AIRPORT PAVEMENT DESIGN a1 of pavements le or asphalt or bituminous pavements General layers of flexible pavements or concrete pavements General Choice of the type of pavement rigid or composite pavements ence between flexible and rigid pavements n factors or requirements Characteristics of construction materials (3) Wheel load Subgrade soil n of flexible pavements rnia Bearing Ratio (C.B.R.) method od method ster method tical design method uter Aided Design Application Army corps of engineers (COE) method al aviation administration (FAA) method sphalt institute method n of rigid pavements d based on Westergaard's analysis nd Cement Association (PCA) method

Higher turn-off speeds

Charotar Publishing House Pvt. Ltd. Opposite Amul Dairy, Old Civil Court Road, Anand 388 001 India 🔕 +91 99249 78998 🖾 charotar@cphbooks.com, 🗠 https://cphbooks.in

Follow us:

( f ) /charotar ( 🎔 ) /cphpl1511 ( 🚳 ) /charotarpub ( in ) /in/charotar/

## **AIRPORT ENGINEERING DETAILED CONTENTS**

07	Load alassification number (LCN) method of never ment design	Chapter 10 VISUAL AIDS
8-7.	(1) I CN for floxible never ent	10.1 Conorol
	(1) LCN for rigid payament	10.2 Pequirements of pilots for visual aids
0 0	(2) Let for fight pavements	(1) Davtime with clear weather
0-0.	(1) Design of floxible overlay	(1) Daytime with clear weather (2) Night and daytime with had weather
	(1) Design of rigid eventor	(2) Night and daytime with bad weather
0.0	(2) Design of right overlay	10-5. Airport markings
8-9.	Causes of failure of pavements	(1) Apron marking (4) Shoulder marking
	(1) Failures in flexible pavements	(2) Landing direction indicator (5) Taxiway marking
0.10	(2) Failures in rigid pavements	(3) Runway marking (6) Wind direction indicator
8-10.	Typical flexible pavement failures	10-4. Guidance to pilots during landing
	(1) Alligator or map cracking	(1) Alignment guidance (3) Visual parameters
	(2) Consolidation of pavement layers	(2) Height information
	(3) Formation of waves	10-5. Factors affecting airport lighting
	(4) Frost heaving	10-6. Elements of airport lighting
	(5) Lack of binding with the lower course	(1) Airport beacon (7) Runway lighting
	(6) Longitudinal cracking (7) Reflection cracking	(2) Approach lighting (8) Taxiway lighting
8-11.	Typical rigid pavement failures	(3) Apron and hangar lighting (9) Threshold lighting
	(1) Mud pumping (4) Spalling of joints	(4) Boundary lighting (10) Visual approach slope
	(2) Scaling of cement concrete(5) Structural cracks	(5) Lighting of landing indicator (VASI)
	(3) Shrinkage cracks (6) Warping cracks	direction indicator (11) Precision approach path
8-12.	Maintenance and evaluation of airport pavements	(6) Lighting of wind indicator (PAPI)
8-13.	Aircraft-pavement classification number system	direction indicator
8-14.	Joints in cement concrete pavements	10-7. Other associated visual aids
	(1) Reasons for providing joints	10-8. Visibility
	(2) Requirements of a good joint	Questions 10
	<ul><li>(2) Transverse joints</li></ul>	
8-15	Ioint fillers and sealers	Chapter 11 AIR TRAFFIC CONTROL
8-16	Pumning	11-1. General
8 17	Pavements for light aircraft	11-2. Importance of air traffic control
0-17.	(1) Elevible payement (2) Rigid payement	11-3. Flight rules
8 18	Airport pavement design softwares	(1) Meaning (3) Responsibility
0-10.	(1) Ladfan software (2) Enerfield software	(2) Principle (4) Type of control
8 10	(1) Leulaa software (2) Franneid software	11-4 Air traffic control network
0-19. 0 20	Coosynthetic materials for airport nevements	(1) Control centres (3) Flight service stations
6-20.	(1) Sequerid (2) Carbofal (2) Secure	(1) Control towers
Ouest	(1) Secugita (2) Carborol (5) Securex	11-5 Air traffic control aids
Quest	IOIIS 8	(1) En route aide or airway aide
Chap	ter 9 AIRPORT GRADING AND DRAINAGE	(1) Landing aids or terminal aids
9-1.	General	11-6 Automation in air traffic control aids
9-2.	Importance of grading	11.7 Air Traffic Control by Global positioning system (GPS)
9-3.	General requirements of grading 207	11.8 Free flight air traffic control
	(1) Cuts and fills (5) Grading plans	(1) Concrel
	(2) Drainage (6) Ground near landing strips	(1)  Orderal
	(3) Equipment (7) Intersection	(2) Different approaches of free flight
	(4) Grade lines (8) Subgrade soils	(5) Different approaches of free fright
9-4.	Operations of grading	Questions 11
9-5.	Earthwork computations	CHAPTER 12: HELIPORTS AND STOLPORTS
	(1) Cross-sectional method	12.1 General
	(2) Mass-haul curve method	12-1. Otheral
9-6.	Aims of airport drainage	(1) Red weather (4) Soving in time
9-7	Functions of airport drainage	(1) Dad weather (4) Saving in time
9-8	Special characteristics of airport drainage	(2) Future prospects (5) Other
9_9	Basic requirements of airport drainage system	(3) Military operation
/ /.	(1) Capacity (3) Rapid drainage	12-3. Characteristics of helicopter
	(2) Future expansion (4) Strength	(1) Flight characteristics (2) Physical characteristics
0 10	Surface drainage	12-4. Planning of heliports
9-10.	(1) Objectives of surface (2) Estimating runoff	(1) Selection of site (5) Obstruction clearance
	(1) Objectives of surface (3) Estimating fution drainage (4) Design proceeding	(2) Size of landing area requirements
	(2) Time of concentration (5) Levent of surface drainage	(3) Orientation of landing area (6) Marking of heliports
0.11	(2) This of concentration (3) Layout of surface dramage	(4) Terminal area (7) Lighting of heliports
9-11.	Ponding	12-5. Elevated heliports
	(1) Meaning of the term (4) Location	12-6. Heliports at airports
	(2) Inecessity (3) Design process	12-7. Characteristics of stol aircraft
0.15	(3) Importance	12-8. Advantages of stol aircraft
9-12.	Sub-surface drainage	(1) Intercity transportation (4) Runway length
	(1) Functions of sub-surface drainage	(2) Noise (5) Use of airspace
	(2) Changes in moisture content	(3) Operation
	(3) Base course and subgrade drainage	12-9. Planning of stolports
	(4) Intercepting drainage	(1) Obstruction clearance (4) Taxiway width
	(5) Drainability of soils	requirements (5) Marking of stolports
	(6) Methods of sub-surface drainage	(2) Runway length (6) Lighting of stolports
9-13.	Types of pipes	(3) Runway width
	(1) Bell and spigot pipes (3) Porous concrete pipes	Questions 12
	(2) Perforated pipes (4) Skip pipes	Annendix: AIR TRAFFIC CONTROL
9-14.	Filter materials	Appendix, fill fight field controll

Questions 9

\_\_\_\_\_ Charotar Publishing House Pvt. Ltd. Opposite Amul Dairy, Old Civil Court Road, Anand 388 001 India 💿 +91 99249 78998 💿 charotar@cphbooks.com, 🍩 https://cphbooks.in

-----

Follow us:

(f) /charotar (y) /cphpl1511 () /charotarpub (in) /in/charotar/

- ing indicator
- eters

- cteristics
- earance
- liports liports

- е
- - lports
- lports

INDEX1