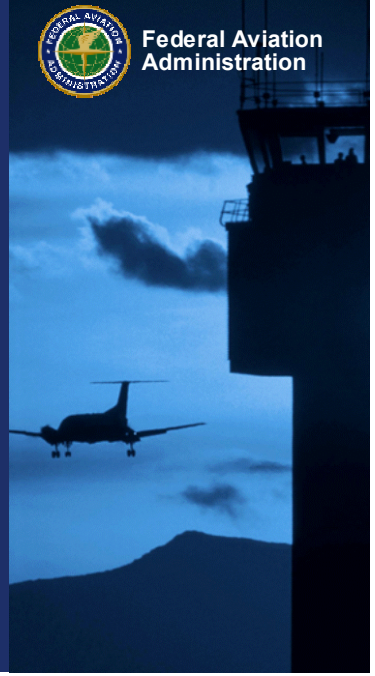
Advisory Circular Update

AC 150/5320-6E
AC 150/5380-9



Presented to: VI ALACPA Airport Pavements Seminar & IV FAA Workshop

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AC 150/5320-6E
Airport Pavement Design and Evaluation

- **Published September 30, 2009.**
- **Cancels AC 150/5320-6D.**
- **Completely revised in 2008.**
- **New design methodologies for rigid and flexible pavements.**
- **Software-dependent design procedures (FAARFIELD).**
- **Addresses modern airplane parameters.**

Chapter Overview

- **Chapter 2 - Soil Investigations and Evaluation**
- **Chapter 3 – Pavement Design for Airplanes Weighing More than 30,000 Pounds (13 608 kg)**
  - Section 1: Design Considerations
  - Section 2: Flexible Pavement Design
  - Section 3: Rigid Pavement Design
- **Chapter 4 – Airport Pavement Overlays and Reconstruction**
- **Chapter 5 – Pavement Design for Airplanes Weighing Less than 30,000 Pounds (13 608 kg)**
- **Chapter 6 – Pavement Evaluation**
- **Chapter 7 – Pavement Design for Airfield Shoulders**

Appendices

- **APPENDIX 1. ECONOMIC ANALYSIS**
- **APPENDIX 2. ORDER 5300.7**
  - Airplane Gear Naming Convention
- **APPENDIX 3. DESIGN OF STRUCTURES FOR HEAVY AIRPLANES**
- **APPENDIX 4. RELATED READING MATERIAL**
- **APPENDIX 5. AIRFIELD PAVEMENT DESIGN SOFTWARE**
  - Announces FAARFIELD software.
- **APPENDIX 6. FAARFIELD INTERNAL AIRPLANE LIBRARY**

Major Changes from AC 150/5320-6D

- **Design procedure now requires the use of computer program, i.e. FAARFIELD.**
- **Previous design charts based on CBR method (flexible) and Westergaard procedure (rigid) are no longer used.**
- **Traffic Models**
  - New procedures require that ALL anticipated traffic be included in the traffic model.
  - Concept of "design aircraft" is no longer used.
  - Cumulative Damage Factor (CDF) replaces need for design aircraft procedure.

Additional Changes

- **Subgrade compaction requirements (Table 3-4) updated, now include B777, A380.**
- **Gear types identified in accordance with FAA Order 5300.7 (Appendix 2).**
  - "Widebody" terminology eliminated.
- **Variable sections on runway pavements.**
  - 1% of normal traffic for outer edge thickness design.
  - Use arrival only traffic for high-speed turnoffs.

Subgrade Compaction Requirements

Subgrade Compaction Requirements

Determined by airplane (in the traffic mix) with greatest demand

CRITICAL AIRCRAFT	Gross Weight Lb.	NON-COHESIVE SOILS Depth of Compaction, inch				COHESIVE SOILS Depth of Compaction, inch			
		100%	95%	90%	85%	95%	90%	85%	80%
S	30,000	8	8-18	18-32	32-44	6	6-9	9-12	12-17
	50,000	10	10-24	24-36	36-48	6	6-9	9-16	16-20
	75,000	12	12-30	30-40	40-52	6	6-12	12-19	19-25
D (incls. 2S)	50,000	12	12-28	28-38	38-50	6	6-10	10-17	17-22
	100,000	17	17-30	30-42	42-55	6	6-12	12-19	19-25
	150,000	19	19-32	32-46	46-60	7	7-14	14-21	21-28
	200,000	21	21-37	37-53	53-69	9	8-16	16-24	24-32
2D/D1, 2D/2D1 (incls. B757, B767, A-300, DC-10, L1011,A-340)	100,000	14	14-26	26-38	38-49	5	6-10	10-17	17-22
	200,000	17	17-30	30-43	43-56	5	6-12	12-18	18-26
	300,000	20	20-34	34-48	48-63	7	7-14	14-22	22-29
	400,000 – 600,000	23	23-41	41-59	59-76	9	9-18	18-27	27-36
2D/2D2 (incls. B747 series)	800,000	23	23-41	41-59	59-76	9	9-18	18-27	27-36
	975,000	24	24-44	44-62	62-78	10	10-20	20-28	28-37
3D (incls. B777 series)	550,000	20	20-36	36-52	52-67	6	6-14	14-21	21-29
	650,000	22	22-39	39-56	56-70	7	7-16	16-22	22-30
	750,000	24	24-42	42-57	57-71	8	8-17	17-23	23-30
2D/3D2 (incls. A380 series)	1,250,000	24	24-42	42-61	61-78	9	9-18	18-27	27-36
	1,350,000	25	25-44	44-64	64-81	10	10-20	20-29	29-38

Additional Changes - Rigid

- **Joint Details have changed.**
  - Keyed joints eliminated.
  - New type A-1 reinforced isolation joint.
- **Maximum joint spacing 20 ft (6.1 m).**
- **Eliminated "reinforcement" terminology for embedded steel bars.**
- **Design Flexural Strength**
  - Lower design strengths recommended 600-700 psi.
  - Design Strength can be 5% greater than P-501 28-day strength.

Additional Changes - Overlays

- **All overlay design uses new FAARFIELD procedure.**
  - Thickness deficiency methods using C_r,C_b factors are no longer used.
  - SCI is used to characterize condition of existing rigid pavements.
- **Overlay on rubblized concrete pavement.**
  - Design similar to HMA on existing flexible.
  - Rubblized PCC layer available in FAARFIELD.
- **Deleted partially bonded PCC overlays.**

Additional Changes – Light Airplanes

- **Flexible pavement design procedure requires FAARFIELD.**
- **Rigid pavement design procedure – fixed thickness.**
- **New Aggregate -Turf pavement.**
- **FAARFIELD includes GA airplanes in library.**

AC 150/5380-9

Guidelines and Procedures for Measuring Airfield Pavement Roughness

- **Published September 30, 2009.**
- **Provides guidelines and procedures for measuring and evaluating runway roughness as identified by surface profile data of rigid and flexible airport pavements.**
- **Evaluation of single events using Boeing Bump procedure.**
- **Announces ProFAA software.**

Obtain Advisory Circulars

- **http://www.faa.gov/airports/resources/advisory_circulars/**
- **FAARFIELD 1.302:**
  - http://www.airporttech.tc.faa.gov/naptf/download/index1.asp#soft
- **ProFAA:**
  - http://www.airporttech.tc.faa.gov/Pavement/25rough.asp