Change 13
18 March 2002

CHAPTER 4
PAVEMENT CRITERIA

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CHAPTER 4
PAVEMENT CRITERIA

1. APPLICABILITY OF CRITERIA. This chapter outlines engineering criteria for use in designing pavements for facilities at Army installations. **\13** Pavements shall be provided with a drainage layer as required by Engineering Instruction 02C202. **/13/** Pavement design criteria and guidance for military facilities are contained in the following documents:
\13 EI 02C202 Subsurface Drainage **/13/ \13\ /13/**
\13 TM 5-818-8 **/13/** Engineering Use of Geotextiles
\13 TM 5-820-4 Drainage fro Areas other than Airfields
TM 5-820-1 Surface Drainage Facilities for Airfields and Heliports
TM 5-82202 General Provisions and Geometric Design for Roads, Streets, Walks, and Open Storage Areas **/13/**
\13 TM 5-822-5 **/13/** Pavement Design for Roads, Streets, Walks & Open Storage Areas
\13 TM 5-822-7 **/13/** Standard Practice for Rigid Pavements
\13 TM 5-822-9 **/13/** Repair of Rigid Pavements Using Epoxy Resin Grouts, Mortars & Concretes
\13 TM 5-822-11 **/13/** Standard Practice for Sealing Joints & Cracks in Rigid & Flexible Pavements
\13 TM5-822-14 Soil Stabilization for Pavements **/13/**
\13 TM 5-823-4 Marking Army Airfields & Heliports O&M Facilities
TM 5-826-6 **/13/** Procedures for U.S. Army & U.S. Air Force Airfield Pavement Condition Surveys
\13 UFC 3-260-01 Airfield & Heliport Planning & Design Criteria
UFC 3-260-02 Airfield Pavement Design

UFC 3-250-03 Standard Practice for Flexible Pavements **/13/**

2. AIRFIELD PAVEMENTS.

a. Types of Pavements. Flexible-type and rigid-type pavements are generally satisfactory for fixed-wing and rotary-wing operations. **\13** UFC 3-260-02 provides guidance on type of pavement by function. **/13/**

b. Paved Shoulders. Paved shoulders will be provided **\13** in accordance with UFC 3-260-01. **/13/**

3. VEHICULAR AND PEDESTRIAN PAVEMENTS.

a. Design. The design of vehicular and pedestrian pavements will be in accordance with the applicable **\13** criteria issued by HQUSACE. Alternative concepts and materials, such as roller compacted concrete, resin modified pavement, paving blocks and asphalt additives, can be utilized when the benefits have been documented and lower life cycle cost can be shown. **/13/**

b. Type of Pavement. The type of pavement to be considered for vehicular traffic will be determined by the intended use and the initial and maintenance costs. Rigid pavements are required in certain critical areas including:

(1) Aprons adjacent to maintenance shops.

(2) Fueling aprons.

(3) Maintenance areas.

(4) Open storage areas using heavy-duty loaders.

(5) Tracked vehicle parking and turning areas.

(6) Wash racks.

c. Curbs and Gutters. Curbs and gutters, when required, will be of portland cement concrete in CONUS. Other types of materials may be provided in OCONUS locations as appropriate.

d. Roads and Streets.

(1) The pavement design will be based on the maximum loads and traffic anticipated for each individual segment in the road and street system. In addition to the pneumatic tired vehicles, some roads and streets will be required to sustain traffic of half- or full-track vehicles having variable weights up to **\13** 64,000 kg (140,000 pounds) **/13/** or better.

(2) Flexible type pavements for roads and streets for tracked vehicles will be based on current criteria for high-pressure tires. The design of rigid type pavements will require particular attention to joint types and spacing, and reinforcement due to a variety of conditions.

e. Parking Areas.

(1) Non-organizational Vehicles.

(a) Layout. Parking for non-organizational vehicles will normally be off of the street (see chapter 3).

(b) Wheel loads. Pavement design will be based on the maximum loads anticipated for each area, but in no case will pavements be designed for less than a 1 814.4 kg (4,000 pound) wheel load and 275 kPa (40 psi) tire pressure, or Design Index 1 from TM 5-822-5, AFM 88-7, Chapter 3 (reference 4-1)7 .

(2) Organizational Vehicles.

(a) Parking for cars and light trucks should be similar to non-organizational parking. Heavy trucks, specialized vehicles, and tanks will require special designs.

(b) All organizational vehicle parking will be rigid pavement. If identified in the project DD Form 1391 by the using service, paved areas for organizational vehicles will be designed for the heaviest vehicle at the installation.

4. MAJOR REPAIR OF PAVEMENTS.

a. General. Both airfield and vehicular pavements constructed in the past under criteria that were applicable at the time often failed under modern traffic loadings. Projects for repair of these pavements often have a cost that exceeds many major new construction projects. Therefore, it is important to define those types of projects that may be properly considered repair, as differentiated from new construction, which may be MCA, OM&A, or other types of funding.

b. Policy. Pavement repairs may be designed to accommodate accumulated normal growth and evolution of missions, equipment, and facilities. However, changes in design to accommodate a change in mission may not be incorporated into repairs if the cost of the repairs is increased. Restoration of a pavement facility following deterioration, damage or failure, which comprises complete replacement or reconstruction of the facility, may not be accomplished as repair.

c. Pavement Defects. Typical types of pavement deterioration, which may be corrected by repair, are:

(1) Structural defects, such as fatigue cracking, rutting, or multiple cracked slabs, that reduce the life or the load carrying capacity of the pavement.

(2) Surface defects, such as defective joint seals, spalling, scaling or ravelling, which may be a source of foreign object damage to aircraft engines.

(3) Oxidation and weathering of the pavement from climatic conditions.

(4) Nonuniform settlement or heave of a portion of a pavement that creates objectionable conditions.

(5) Polishing or other loss of surface texture that may create a skid hazard.

d. Repair Methods. When designing pavement repair projects, extreme care should be taken not to provide only a surface repair on a pavement that has failed because of subsurface defects or weakness when such a surface repair would result in only temporary correction of the situation. The following are typical examples of pavement repair work. A specific repair project may include various combinations of these examples:

(1) Spot Repair. The repair or replacement of failed or deteriorated rigid slabs or of isolated flexible pavement areas by removing and replacing portions of the pavement surface, base, subbase, and appurtenances as necessary to maintain operational serviceability.

(2) Overlay. Complete or partial new surfacing over an existing pavement surface to maintain operational

serviceability. It will include spot repairs, as necessary, to correct severe localized failures prior to overlay.

(3) Resurfacing. Replacement or recycling of a flexible or rigid pavement surface, including spot repair of the existing base, subbase, drainage, and appurtenances as necessary to support traffic after the new or recycled surface has been placed.

(4) Joint and Spalling Repair. This type of repair is intended to re-seal joints and to repair concrete spalls in order to reduce water infiltration and to reduce the potential for foreign object damage to aircraft engines. These repairs may be combined with selective replacement of seriously distressed concrete slabs.

(5) Seal Coats. Seal coats are commonly used on bituminous pavements to reduce the rate of oxidation and weathering. These are a means of preventative maintenance. **\13** Because aircraft can cause a rapid deterioration of the slurry seal, slurry seals should not be applied to airfields. **/13/**

5. REFERENCES.

\13 4-1 TM 5- 822-5, AFM 88-7, Chapter 1, Pavement Design for Roads, Streets, Walks, and Open Storage Areas, June 1992

4-2 UFC 3-260-01 Airfield & Heliport Planning & Design Criteria

4-3 UFC 3-260-02 Airfield Pavement Design **/13/**