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	Engineering and Design THICKNESS DESIGN OF ROLLER-COMPACTED CONCRETE PAVEMENTS FOR AIRFIELDS, ROADS, STREETS, AND PARKING AREAS	
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DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
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Engineer Technical
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29 January 1988

Engineering and Design
THICKNESS DESIGN OF ROLLER-COMPACTED CONCRETE PAVEMENTS FOR AIRFIELDS, ROADS, STREETS, AND PARKING AREAS

1. Purpose. This letter describes the procedures used to design the thickness of roller-compacted concrete pavements (RCCP) for airfields, roads, streets, and open storage areas.

2. Applicability. This letter applies to all HQUSACE/OCE elements and all field operating activities (FOA) having military construction and civil works design responsibility.

3. References.

a. TM 5-822-7

b. TM 5-825-3

4. Discussion.

a. Roller-compacted concrete pavement is a construction method using a zero-slump portland cement concrete mixture that is placed with an asphalt concrete paving machine and compacted with vibratory and rubber-tired rollers. For additional details on properties of roller compacted concrete for pavements, see TM 5-822-7, appendix D.

b. A major difference exists in the assumptions of load transfer at joints made for conventional concrete pavements and RCCP, which directly effects the design stress and the thickness of the pavement. RCCP has typically been allowed to crack naturally, and the spacings between these cracks are usually irregular, ranging from 40 to 70 feet apart (although spacings much greater and much lower than these have been reported). Consequently, the width of the crack opening will‘be greater and the load transfer developed from aggregate interlock at the cracks will be highly variable, if not totally lost. Limited tests at Ft. Hood, TX and Ft. Stewart, GA, have revealed average load transfer at transverse contraction cracks of 18.6 percent (standard deviation of 6.7 percent) and 16.7 percent (standard deviation of 5.9 percent), respectively. Tests on longitudinal and transverse construction joints revealed even less load transfer. Therefore, the assumption of 25 percent load transfer at joints in open storage areas and airfields constructed of plain concrete may not be valid for RCCP thickness design. Therefore, the approach is to base the thickness design of RCCP on no load transfer at the joints, i.e., assuming all joints/cracks to be a free edge condition.

5. Action to be Taken.

a. For roads and streets, open storage areas and parking areas, the thickness design curves attached in Enclosure 1 will be used.

b. The thickness design curves for conventional concrete airfield pavement in TM 5-825-3/AFM 88-6, Chap. 3, will be used also to design RCCP airfields, with one modification. To account for no load transfer at joints in RCCP, multiply the flexural strength by 0.75, and use the product as the design flexural strength to enter the thickness design curves. This will in effect remove the load transfer assumption from the curves.

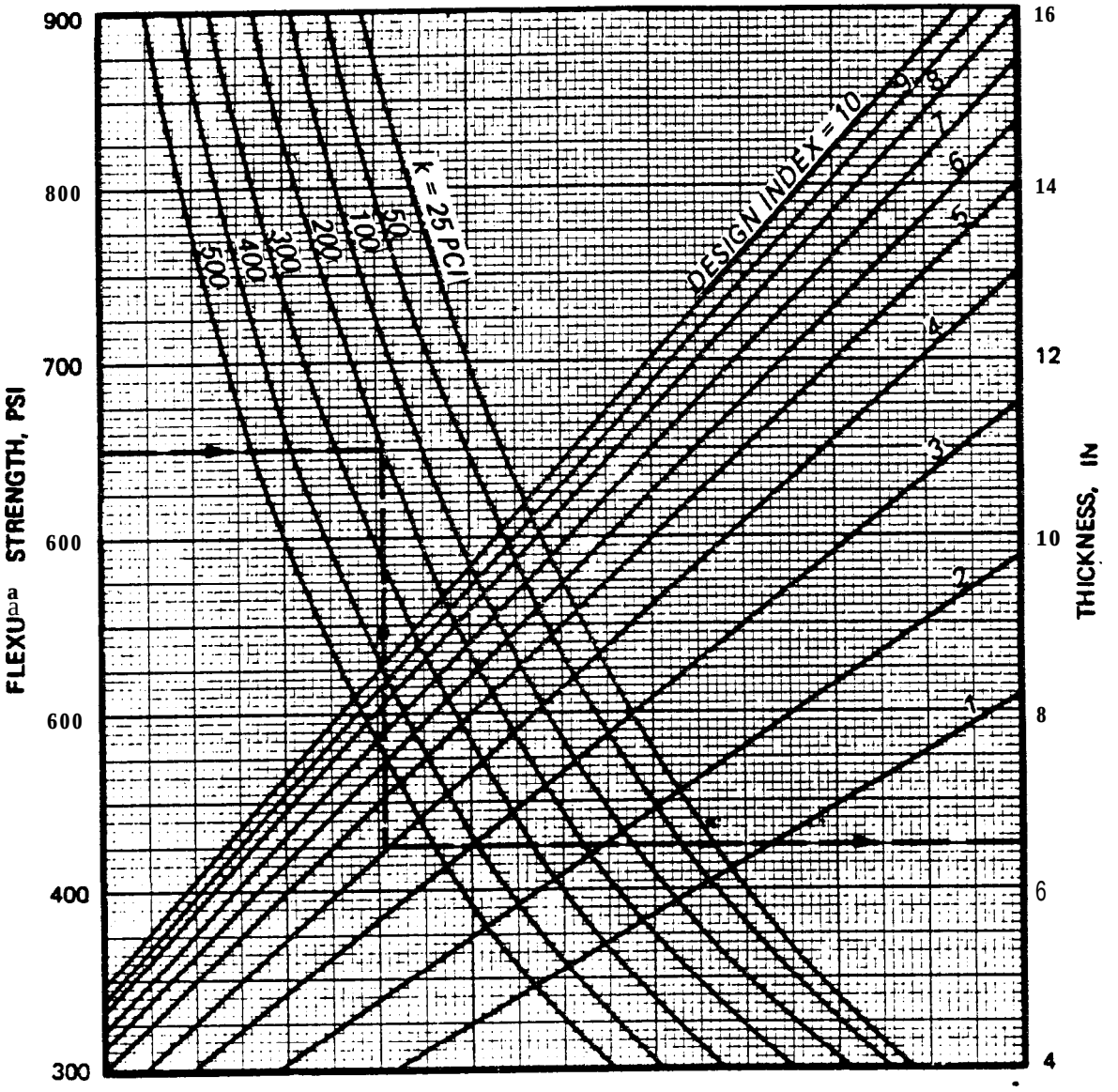
c. Transverse contraction joints, when needed, should be spaced at 30 to 60 feet, primarily to create a more aesthically pleasing and easily maintained joints. The sawcuts are typically made 12 to 20 hours or later after compaction and penetrate to one-third the pavement thickness.

6. Implementation. This letter will have routine application as defined in paragraph 6c, ER 1110-345-100.

FOR THE COMMANDER:

Encl

HERBERT H. KENNON
Chief, Engineering Division
Directorate of Engineering
and Construction



Design Curves for RCCP Roads, Streets, Open Storage Areas, and Parking Areas

Enclosure 1