

Engineering Brief # 27

Date : June 18, 1981

In Reply Refer To: AAS-200

Subject: INFORMATION: Engineering Brief No. 27 - Joint Design for
Light Duty Rigid Pavements

From: Chief, Engineering and Specifications Division, AAS-200
To: All Regions

Attn: Airports Division Chiefs

Engineering Brief No. 27, "Joint Design for Light Duty Rigid Pavements", was prepared to inform all regions of two pilot projects planned for construction this summer in the Central Region. The pilot projects will involve non-standard jointing plans for light duty rigid pavements. The non-standard jointing plans appear to offer adequate joint performance at less cost than the standard jointing configuration. We are contemplating a change in the standard jointing plan for light duty rigid pavements if these pilot projects work out well.

Any comments you wish to make on the engineering brief would be appreciated.

ORIGINAL SIGNED BY:
EDWARD AIKMAN

Enclosure

ENGINEERING BRIEF NO. 27

JOINT DESIGN FOR LIGHT DUTY RIGID PAVEMENTS

The Central Region is planning to construct two pilot projects this summer utilizing non-standard jointing designs on light duty rigid pavements. We feel the non-standard jointing design will offer good performance and cost less than the standard jointing design described in Chapter 5 of Advisory Circular 150/5320-6C. The purpose of this Engineering Brief is to advise other regions about the details of the pilot projects to be constructed in the Central Region.

The non-standard jointing design applies to rigid pavements designed to serve aircraft weighing less than 30,000 pounds. The concept behind the design is the creation of a "tension ring" around the perimeter of the pavement which will act to hold joints within the interior of the paved area tightly closed. A joint which is held tightly closed will function much better than a joint which is allowed to open. Load transfer is much easier to accomplish in a tightly closed joint.

A list of the changes to the standard jointing design is given

below:

- (1) The use of dowels is required for transverse construction joints only.
- (2) A half round key is used for load transfer in longitudinal construction joints.
- (3) The last three contraction joints and longitudinal construction joints at the free edge of the pavement are tied with #4 deformed bars, 20-inches long, spaced at 36-inches center to center (see Type C joint, page 130 of AC 150/5320-6C). There is a possibility of inducing cracks in some of the panels at the end of the pavement by tying the last four contraction joints. Any cracks which do develop should be sealed. We feel the risk of developing cracks is worth taking to keep the interior joints tightly closed. All other contraction joints are dummy groove untied (see Type E joint, page 30 of AC 150/5320-6C).
- (4) The longitudinal joint closest to the edge of the pavement is tied with #4 deformed bars, 20-inches long, spaced at 36-inches center to center.
- (5) At the ends of the pavement and in locations on the edge where vehicular or aircraft traffic would move @onto or off the pavement, a thickened edge should be constructed. The thickened edge should be 1.5 times the design thickness of the slab and should taper to the design thickness over a distance of three feet.
- (6) The joint sealant reservoir should have a minimum depth of 1/4 the thickness of the slab and be 3/8-inches wide. A backup material should be used at the bottom of the reservoir to provide a sealant depth of at least 3/8-inch with 1/2-inch depth preferred.
- (7) If possible, slab size in feet should not exceed twice the slab thickness in inches, i.e., 6 inch slabs should be on the order of 12 feet by 12 feet.

Sketches illustrating these changes are shown in the attached Figures 1 and 2. We feel these changes to the standard jointing design will result in cost savings and should provide adequate performance. We plan to incorporate these revisions in our next change to AC 150/5320-6C if the pilot projects work out well. Any other regions wishing to apply these revisions to a project should request permission for a modification to design standards from AAS-200.

ORIGINAL SIGNED BY:
JOHN L. RICE

Figure 1 - Sketch of 50' Wide Pavement

Figure 2 - Sketch of 60' Wide Pavement