Engineering Brief # 6

Date: September 12, 1975

In Reply Refer To: AAS-580

Subject: Engineering Briefs Numbers 6, 7, and 8

From: Acting Chief, Airports Engineering Division, AAS-500
To: All Regions

Attn: Chiefs, Airports Divisions

The subject engineering briefs are enclosed for your information. Engineering Brief No. 6 describes the use of a heater planer to correct pavement unevenness at San Juan International Airport, Puerto Rico. Engineering Brief No. 7 describes the procedures used in the construction of a rubber asphalt friction course at Peterson Field, Colorado Springs, Colorado. Engineering Brief No. 8 reports on the condition of porous friction course runways at Hot Springs, Virginia, and Greensboro, North Carolina.

The purpose of engineering briefs is to keep FAA field offices informed of airport construction methods which are being tried in one or more regions, but which are not necessarily known to other regions or ADO's. The information contained in the briefs is not to be construed as a general approval by Airports Service of the described technique. Instead, it will usually indicate that the technique has been approved by the region on a trial basis after concurrence by Airports Service.

ORIGINAL SIGNED BY:
E. DONALD BAUER

Enclosures

ENGINEERING BRIEF NO. 6
USE OF HEATER PLANER TO CORRECT PAVEMENT UNEVENNESS
AT SAN JUAN INTERNATIONAL AIRPORT, PUERTO RICO

Runway 7-25 at San Juan International Airport was overlayed in the fall of 1974. Assistance for the project was provided under ADAP. This is the older runway at San Juan and is used primarily for takeoff because of noise problems. Runway 10-28 was constructed in 1972 and is used primarily for landings. After completion of the runway 7-25 overlay there were numerous complaints about pavement unevenness, particularly from pilots of L-lOlls and certain military aircraft.

When the contractor prepared plots of as-built profiles and cross sections and they were examined by the Puerto Rican Port Authority and the FAA, the nature of the unevenness was revealed. The major deviations from planned finish pavement grades occurred at intervals of about 800 feet. The fairly even spacing of irregularities jibed with the fact that complaints about runway

roughness were coming from pilots of certain types of aircraft. Current FAA research studies on pavement roughness indicate this phenomena is to be expected under even spacing circumstances.

On March 4, 1975, I went to San Juan to explore possible resolutions of the runway 7-25 roughness problem with representatives of the Southern Region (Horry Johns, ASO-500 and Nick Leo, Miami ADO), the Puerto Rican Port Authority, and their paving contractor, Better Roads Asphalt. T@e method which had been proposed for correcting the unevenness was by use of a heater planer owned by Jim Jackson, Contractor, of Little Rock, Arkansas. The heater planer was being assembled at the airport when we arrived in San Juan.

An official for the general contractor explained how the evenly spaced paving irregularities had come about. At the end of each days paving operation a lengthy wedge had to be constructed between the overlay and existing surface so that aircraft operations could be resumed. The wedge usually tapered from 4 inches to nothing in about 100 feet. When paving operations were resumed the next day the contractor did not remove the wedge but only cut out a notch of about 1 inch to prevent a feathered edge at the overlay.

The contractor then paved over the wedge with asphalt of varying thickness until full thickness overlay was being placed at the end of the wedge. It was in areas of the wedge that the contractor had trouble compacting the overlay to the required finish grade. Since the contractor placed about 800 feet of overlay each day the runway roughness occurred at regularly spaced intervals.

Based on an earlier demonstration in Cameron Naval Air Station, Louisiana, it was anticipated that surface irregularities in runway 7-25 could be corrected by removing high spots with the heater planer and rolling the exposed surface. After the heater planer had been assembled, the Jim Jackson Company experimented with this process on the runway 7-25 overlay. Their heater planer did a good job of removing surface irregularities by planing off high points at about 1/4 inch in one pass. Tn so doing it heated the pavement to a depth of about 1/2 inch and left the immediate surface in a loosened condition, i.e. , the aggregate near the surface was not held tightly by the existing asphalt binder and had an open-graded appearance. The foreman for Jim Jackson attributed this displacement to the toughness of the aggregate used in the overlay. He indicated that softer aggregates are sheared off by the heater planer without displacement.

It was hoped that a tight surface could be restored by pneumatic rolling. The pavement was improved by this compactive effort, but it did not restore the surface to its original tight condition.

The final solution for the runway 7-25 roughness consisted of removing high spots by heater planing and then restoring surface texture by placement of a 1-l/2 inch overlay. These corrections were made for the western 4,000 feet of runway 7-25. The eastern 6,000 feet did not require correction. The heater planing and overlay work was completed on April 30.

We would appreciate any comments you have on the use of the heater planer for the correction of pavement roughness.

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AAS-580