

Engineering Brief # 32

July 14, 1983

Subject INFORMATION: Engineering Brief No. 32, Surface
Recycling and Thin Overlay of Bituminous Pavements

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

Attn: Managers, Airports Division

Engineering Brief No. 32 describes a process whereby existing bituminous pavement surfaces are recycled and then overlaid with a thin surfacing layer. The process would have application in instances where pavements need more than a seal coat but less than a structural overlay for repair.

The purpose of Engineering Briefs is to keep FAA field offices informed of construction techniques which may not be widely known. Any comments you care to offer will be appreciated.

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Attachment

Engineering Brief No. 32
Surface Recycling and Thin Overlay of Bituminous Pavements

On April 19-21, a trip was made to the Fort Myers, Florida, area to observe pavement repair of asphaltic concrete pavements by a combination of surface recycling and thin overlay. About 4 1/2 miles of county roads, north and slightly east of Fort Myers, were being reworked. Lee County sponsored the project. The existing road surface was badly oxidized and cracked with some patching and moderate rutting. The pavement section was one inch of asphaltic surfacing on about three inches of limerock base over a sand subgrade. Driving over the existing surface in an automobile at 50 mph resulted in fair to poor rideability. Driving over portions of the pavement which had been reworked showed in a marked improvement in ride.

The pavement repair technique employed on this project was the Cutler-Repave process. The Cutler-Repave process is accomplished in a single pass of a specially constructed machine which performs the surface recycling and overlay placement. (See Figure 1). The machine heats the existing surface with propane fueled infra-red heaters. Immediately after heating, the surface is scarified by closely spaced vertical tines which are held in position by air pressure. The use of air pressure for controlling tine depth allows the tines to ride over in-pavement facilities such as manhole covers, etc. without damage to either the tines or the facilities. If required, an asphalt softener (rejuvenator) is sprayed into the

scarified material. The material is then distributed and leveled with an auger and blade. New hot mix is carried from a hopper at the front of the machine by a conveyor and deposited near the rear of the machine on top of the recycled material. A vibratory screed then strikes off the material and provides initial compaction. Conventional rollers are then used for breakdown and final compaction. By combining surface recycling and thin overlay, cost savings can sometimes be realized. The incidence of reflection cracking should be reduced by recycling the existing surfaces. Multiple passes can be made to provide a greater depth of scarification if necessary.

A general aviation airport in Winter Haven, Florida, was contemplating use of the technique on a locally funded repair project of Runway 11-29. Bid prices on three alternatives for this project which involved 32,500 square yards were as follows.

- a. One inch overlay - \$1.83 per square yard.
- b. Combined surface recycling and thin overlay - \$1.88 per square yard. (\$1.13 for surface recycling + \$0.75 for thin overlay - combined thickness 1 1/2 inches.)
- c. Slurry seal - \$1.64 per square yard

This type of process appears to have application on airport pavements in instances where a seal coat would not be sufficient and a strengthening overlay is not required. Small corrections to grade and transverse slope can be accomplished with a minimum amount of new material. The process can only be used on bituminous surfaces. The county road repair project described above used only 60 pounds per square yard of new bituminous materials.

Surface recycling and thin overlay is eligible for AIP funding as a pavement repair technique. The properties of the recycled materials and the new hot mix material should be in accordance with Item P-401, Bituminous Surface Course, of Advisory Circular 150/5370-10, Standards for Specifying Construction at Airports. Extra care will be required to produce an acceptable mix when very thin overlay thicknesses are used. Thin overlays will limit the size of the aggregate which can be used and mix stability may be a problem.