



**ERGON**

Asphalt & Emulsions

SUCCESS STORY

**Ergon A&E Assists  
in FDR at Claremore,  
Oklahoma Regional**

## CHALLENGE

Replace existing pavement; account for clay underneath roadbed

## SOLUTION

Full Depth Reclamation with Engineered Emulsion



### LOCATION

Claremore Regional Airport; Claremore, Oklahoma



### DISTRESS

Longitudinal cracks, block and alligator cracks



### TRAFFIC

Consistent, heavy use (planes and cars)



### AGENCY

City of Claremore



### CONTRACTOR

APAC-Central



### SUPPLIER

Ergon Asphalt & Emulsions (FDR-EE)

**Background:** City-owned Claremore Regional Airport serves Rogers County, Oklahoma, and surrounding areas with general aviation services, complete with car rentals and a 5,200-foot asphalt runway (a total of 390,000 sq. ft. of pavement). Unfortunately, many years of heavy use, combined with a lack of resources and maintenance, left the old Claremore runway with major issues. Thanks to the ravages of time and heavy use, longitudinal cracks had appeared in the pavement, along with some block and alligator cracks. Some fissures were even big enough to hide a person's entire hand. Of course, as the cracks grew larger, both drainage and safety became larger issues. Steps to increase the drainage, tensile strength and structural capacity of the runway were sorely needed.

Based on the severity of the damage, and to meet the operational goals of the new runway, all of the existing pavement would have to be replaced. However, there was no need to haul away the old material, as it could still be utilized in a process known as full depth reclamation (FDR).

FDR is essentially a recycling method in which existing pavement is broken up, pulverized and mixed with additives such as cement, lime, calcium chloride or any number of chemical agents to create a new and vastly improved base course. The process saves time and money that might otherwise be spent sourcing, delivering and preparing new material, and it also keeps waste from going to landfills. Likewise, FDR can be performed more quickly than a traditional full depth removal and replacement.

The project was scheduled for 10" of in-place FDR. Typically, FDR requires a minimum of 6" to 12" of available material, with some depths (although uncommon) approaching 18", depending on a wide variety of factors, including temperature, type and density of traffic, and others. The Coughlin Company, subcontractor for project leader APAC-Central, chose to apply FDR with an engineered emulsion supplied by Ergon A&E, as a commodity emulsion would not be adequate for this particular project. The additional benefit of using an engineered emulsion over commodity is increased resistance to heavy traffic early on, which is critical for airports as there is constant high and heavy traffic. The mix design was conducted by Paragon Technical Services, Inc. (PTSi).

**Challenge:** Unfortunately, the airport's FDR plans suffered an early setback a mere 60 feet into the first pass. The construction vehicles — heavier by far than the runway's usual aircraft traffic — had begun sinking into the pavement. Much to the dismay of contractors, airport leadership and government officials alike, it

was found that the original roadbed was only 9" deep with layers of clay underneath. This meant that a limited amount of material was available for pulverizing and blending into a properly stabilized foundation.

Fully crewed and ready to roll, the Coughlin Company had no choice but to shut down construction. They then met with airport officials, an engineering firm, the Federal Aviation Administration and PTSi to discuss. The group decided to make the project 9" (instead of the originally scheduled 10") in order to stay out of the clay. The reasoning was there would be no diminishing or detrimental effects by reducing the FDR material by 1" as compared to either incorporating the clay instead of granular base, or having to bring in the granular base and do a whole new design. Two days following the shutdown, it was time to get back to work.

**Application Highlights:** The mix design conducted by PTSi utilized millings of the reclaimed asphalt pavement (RAP) along with high-quality surfactants and cement. The targeted amounts of 2.9% asphalt emulsion to 0.75% cement were finalized by adjusting mix parameters within tolerances of the design. FDR was performed along the entire length and width of the runway. The existing asphalt material was pulverized and graded, then stabilized before being compacted from the bottom up to form a new and improved roadbed. The work was completed in short order while takeoffs and landings were temporarily moved to a taxiway so that the airport could remain open. Ergon A&E support personnel spent two days on-site, a fraction of the project's total two-week timeline — but an important two days to be sure.

Thanks in part to Ergon A&E, the project was a technical success, winning various awards for the quality of the work and, in particular, the smoothness of the wearing course. "All emulsions aren't created equal," said Darren Coughlin, president of the Coughlin Company. "We know we can always count on Ergon A&E for quality, outstanding service and expert technical support throughout every project. Ergon works with us on jobs from California to Kansas, and everywhere in between. From construction to follow-up, there's nobody better — they lead the way in promoting excellence in our industry." Congratulations are due to APAC and the Coughlin Company for completing such a difficult project.

Students and faculty from the University of Arkansas visited the Claremore site regularly during construction to study the efficacy and environmental impact of the work, a research endeavor in which Ergon A&E remains pleased to be involved.