# Roadway Method Reaps Benefits for Lone Star Runway

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When the main runway at Lone Star Executive Airport in Conroe, Texas started to face frequent drainage issues and distress that required constant patching and replacement, officials turned to a technique more popular on roadways than runways.

Working with consultant PBS&J, they chose to use full-depth asphalt pavement reclamation (FDR) on most of the 6,000-foot Runway 14-32. FDR is a process where the existing asphalt pavement is ground up to a specific depth, then mixed with cement and reused as a base for the roadway or runway.

The process was not the officials' first inclination. The original idea was to overlay the existing asphalt pavement; improve drainage; replace the runway lights, signs and circuitry; and extend the runway safety area. An overlay, however, wouldn't solve some of the biggest issues facing the runway.

"During the preliminary investigation, it became apparent that an overlay would not address the drainage problems, correct the transverse cross fall problem or provide more than 10 years of serviceable pavement life," explains Airport Director, Scott Smith. Lone Star Executive Airport needed to find a way to make the runway project a success, as Runway 14-32 was ailing. "It was experiencing enough distress that the airport became engaged in constant patching and replacement activities, exacerbated by inadequate drainage that allowed storm water to sit and penetrate the sub grade and base material," Smith says. "Adding to the problem was the lack of a crown section to the runway, as the majority of the runway had a constant cross fall of less than one percent, allowing water to pool in the ruts created on the surface."

Poor drainage and grading issues led to the idea of asphalt reclamation, says William Stamper, Aviation Services Manager for PBS&J. "This method would allow an improvement to the transverse grades as well as eliminating reflective cracking from the existing pavement surface," Stamper says.

**Reclamation with Cement**

During the construction, the top layer of asphalt, which measured 4 to 8 inches deep, and a 6- to 12-inch layer of iron ore base were reclaimed and mixed into an 8-inch base layer for the reconstructed runway. The reclaimed material was used to help adjust the grading, creating a standard 1.5% crown section to solve the drainage problems. The reclaimed material was mixed with cement for the base course for the runway. It was then topped with 10 inches of Portland cement concrete to serve as the runway surface.

Charles Scruggs, the company's Project Engineer stated, "The full-depth excavation didn't change the approach taken by construction company W.W. Webber. It actually helped smooth the process along. The project was not affected in the beginning stages because we would have had to remove the full-depth asphalt anyway." Reclaiming the material did, however, save W.W. Webber from relying on an outside source for base material. The runway's safety area was also extended to meet Federal Aviation Administration (FAA) guidelines. That extension was graded with material gained during the reclamation process.

FDR has been used for a number of years in road projects, Stamper says, offering time and cost savings over full reconstruction. The same advantages were realized during the runway project, saving time and money as well as creating a finished project that will long outlast a simple asphalt overlay, Stamper says.

Stamper said, "This process has a cost and time savings compared with total reconstruction. It also has an advantage over just placing an asphalt overlay on the existing asphalt surface by eliminating reflective cracking - when cracks in the old asphalt reflect into the new overlay within three to four years." Reclamation also reduced the environmental impact of the project and earned the airport some Leadership in Energy and Environmental Design (LEED) points on the project. "In addition, reclamation allowed the airport to go with a concrete runway surface, its preference over an asphalt surface, which would have been the case in a traditional overlay," Smith says.

**Keeping the Peace**

The project took the primary runway out of service from October 2007 to August 2008. Smith and the airport relied on honest and open communication between the airport, the consultant, the construction company and the tenants to help offset the difficulties created by the closing of the runway for almost a year. "The challenge was to keep the airport operational while the primary runway was out of service, and minimize the impact on the tenants and users during construction," Smith says.

**FACTS & FIGURES**

**Project:**
Runway repair with full-depth asphalt reclamation

**Location:**
Lone Star Executive Airport, Conroe, TX

**Owner:**
Montgomery County

**Consultant:**
PBS&J

**Construction:**
W.W. Webber

**Size:**
5,000 ft. of the 6,000-ft. runway

**Cost:**
$7.5 million (including $425,000 electrical improvements)

**Construction Time:**
11 months

**The Need:**
Rehab of runway at the end of its useful life

Lone Star Executive Airport is home to three fixed-base operators and 13 other businesses. Airport officials held weekly meetings with those working on the runway construction project. Specific efforts were made to maximize coordination of efforts and to identify and address potential issues instead of losing time while waiting for the various parties to coordinate a response after issues popped up. After each meeting, tenants were informed of the project's progress via the airport website.

"The contractor and engineer did a great job focusing their resources to get this done," Smith says. Scruggs, of W.W. Webber, echoes that sentiment: "The Conroe Airport, state of Texas and PBS&J were a good team in making sure the project ran smoothly. The on-site project staff is to be congratulated for a job well done."

The airport also arranged a meeting with the tenants before construction began so they could see all of the phases of construction, view detailed safety plans and examine other parts of the construction process. Plans were simplified and reduced to standard typing paper size and distributed to tenants and users at various stages of construction. "These plans allowed us to better communicate required closures to all our tenants and their customers," notes Smith.

**More Growth Expected**

Located north of Houston, just 25 miles from George Bush Intercontinental Airport, Lone Star Executive sits within 10 miles of a booming residential and commercial area. The airport had about 86,000 total operations in 2002. That number is now greater then 90,000 and long-term projections indicate as many as 165,000 annual operations.