



Preservation Process Buys Duluth Int'l Time Before Runway Reconstruction

By Robert Nordstrom

Like many airports across the country, Duluth International Airport (DLH) is caught in the cross hairs of aging runway infrastructure and tight federal funding. At the same time, it also faces scheduling and budget complications associated with construction of a new terminal. A few years ago, however, it found a way to stave off a major reconstruction; and a rehabilitation project earlier this year validated the strategy.



Brian Grefe

"We needed to buy some time (because) we didn't have the funds for a complete reconstruction," explains Brian Grefe, DLH's director of operations.

In 2006, pavement on the airport's crosswind runway showed severe deterioration. Aircraft were incurring foreign object damage when the disintegrating surface was blown up and ingested by jet engines. The maintenance problems were particularly serious for the Minnesota Air National Guard's F-16s.

Facilities and infrastructure consulting firm RS&H recommended that the airport apply a sealer binder product called GSB-88 based on

the successful use of the product the year before on the airport's main Taxiway Alpha, which had also showed severe deterioration.

John Hippchen, RS&H senior aviation engineer, explains that although the GSB-88 product is ideally suited to preserve pavements that are still in pretty good shape, the product can also be used as a short-term fix to bind more severely deteriorating pavement.



John Hippchen

"We knew we couldn't fix the large thermal cracking issues with a sealcoat," Hippchen explains, "but we wanted to buy two or three years until we could come back and reconstruct the pavement. The product performed very well."

In 2009, the runway was rehabilitated using cold in-place recycling, which removed and disposed the top 4 inches of asphalt, then mixed the next 4 inches with an asphalt binder. After the mixed materials were compacted to the desired depth, the runway was resurfaced with 4 inches of new asphalt.

"When we tore up the pavement," Grefe recalls, "the [GSB-88] product definitely had

► Facts & Figures

Project: Taxiway/Runway Preservation

Location: Duluth (MN) International Airport

Product: Gilsonite Sealer/Binder (GSB-88)

Cost: Approximately \$1/sq. yard (price varies depending on region and square footage)

Consultant: RS&H

Contractor: Gee Asphalt Systems



preserved what was there. The asphalt was still black where it had penetrated through. It did what we wanted it to do.”

What Is It?

GSB stands for gilsonite sealer binder — a liquid penetrating sealer with oils that penetrate the asphalt surface and bind the sand and rock together so water cannot penetrate and oils do not bake out. GSB is designed to keep pavements flexible so they last longer.

Gee Asphalt Systems applied GSB-88 to DLH’s pavements. “GSB basically reglues everything together,” says owner Dan Gee.

The important difference between slurry sealcoats and GSB, Gee says, lies in how they act on an asphalt surface. A slurry sealcoat is an asphalt emulsion mixed with aggregate that is applied with a squeegee to asphalt surfaces. It sits on top of the surface, Gee explains, which leaves it vulnerable to the friction wear of plows and tires. Gilsonite, GSB’s main binding agent, is a resinous hydrocarbon that penetrates the surface and binds the asphalt materials; so it cannot be removed by friction or snow plows, he notes.

A recent study by the Naval Facilities Engineering Command (NAVFAC) found that asphalt pavement distresses were one of the leading causes of increased maintenance costs and foreign object debris on Department of Defense airfields. The study also found that GSB-88 Sealer/Binder showed “better than expected results” and significantly extended the useable life of treated airfield pavements.

In addition, the NAVFAC study noted that GSB-88’s relatively low cost of approximately \$1/square yard (applied) could save the Department of Defense hundreds of millions of dollars annually.

Rehab or Preserve?

During flush economic times, runway rehabilitation often precludes preservation. Recent economic woes, however, have more airports interested in preserving their infrastructure.

Gee encourages airports to consider the overall lifecycle costs of pavement options. A 2-inch asphalt overlay lasts approximately twice as long as a GSB product, he says, but it costs approximately 10 times more on a per-year basis.

“With our funding and budgets broken and our infrastructure aging,” Gee says, “this is an appropriate conversation to have.”

Maintaining the Old, Preserving the New

The recent cold in-place recycling project on DHL’s crosswind runway is not a permanent fix. “We won’t get 25 years out of it like you would a new asphalt reconstruction project,” explains Grefe. “We wanted to get through construction of our new terminal over the next five years, as well as the redesign and extension of a taxiway and runway, and then replace the crosswind runway in 8 to 10 years. The subbase is still in pretty rough shape. It’s only a matter of time before the reflection cracks come through.”



Grefe says the airport will consider applying GSB-88 to the rehabilitated crosswinds runway to preserve it until the new terminal is built. “We are definitely impressed with the product and plan on using it whenever we can,” he reports.



Dan Gee

Following the product’s four- to six-year application guidelines, Gee says, it would take ten treatments to equal the cost of one 2-inch asphalt overlay. “We have GSB-treated pavements that are approaching 40 years old, have never been replaced, and are like brand new,” he reports. ✈️

OK with the FAA?

Application of GSB-88 requires a request for modification of FAA specification P-609, which describes guidelines for sealcoats and bituminous surface treatments of airport pavements. Such permission, however, is not hard to obtain, says Dan Gee, owner of Gee Asphalt Systems.

“I’m not aware of a single instance in which the FAA rejected our request to modify the specification,” reports Gee. He further estimates that 40 million square yards of GSB have been applied at U.S. airports, and two-thirds of those projects received FAA funds.

Fog seal, which is included in the P-609 spec, is a topcoat asphalt emulsion blended without aggregate. Its short-coming, says Gee, is that it does not penetrate and can be scraped off by plows and worn away by friction and oxidizes very quickly. GSB-88, he notes, penetrates the pavement surface and adds oils to the existing aggregates. When applied correctly, Gee explains, surface friction is maintained by using a micro textural slag material that is broadcast and bonded on top of the fresh oil.

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