

VIKING CONSTRUCTION

Micro Surfacing With Akzo Nobel

Bexar County maintains streets surrounding the city of San Antonio

Bexar County's Infrastructure Services Department (ISD) wrapped up its 2007 pavement surface maintenance treatment season with the micro surfacing of arterials and residential streets near San Antonio, and is currently preparing roads for its 2008 pavement maintenance program.

Viking Construction, based in Georgetown, Texas, applied about 150,000 square yards of the product, a mixture of latex polymer-modified asphalt emulsion, mineral aggregate and Portland cement during 2007. Micro surfacing is one of three principal surface treatments utilized by the Streets and Drainage Section, a unit of ISD's Public Works Division, as part of the County's pavement preservation program.

Streets and Drainage is responsible for the operation and maintenance of more than 980 miles of public roads and rights-of-way within the 1,250-square-mile Bexar County, the state's fourth largest county by population (1.4 million). The section employs several types of pavement surface treatments including seal coating (chip seal), usually applied by county forces with county equipment; slurry seal and micro surfacing, installed by private contractors.

Micro Surfacing Broad And Narrow

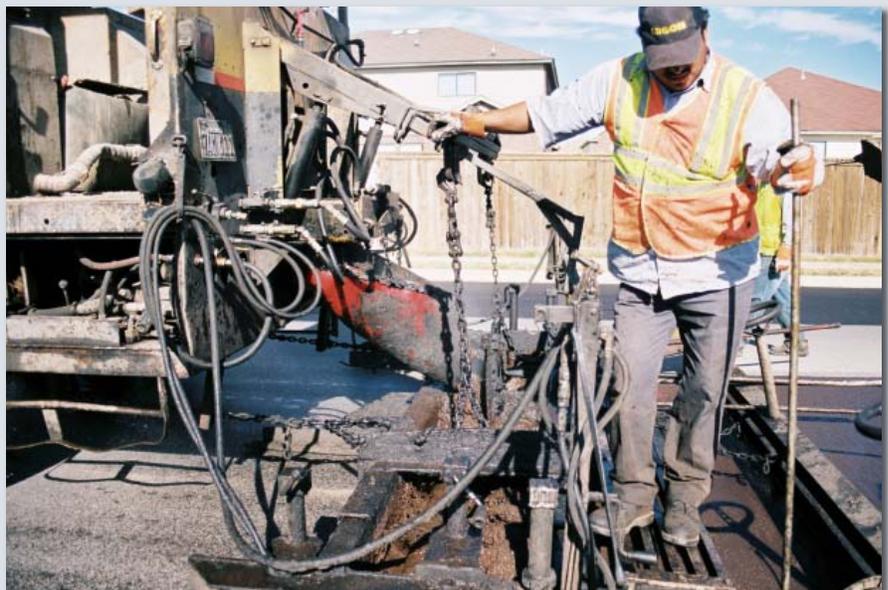
Viking Construction was awarded the contract for the County's 2007 application of micro surfacing. A small



Above: Viking Construction crew uses an Akzo Nobel machine to apply micro surfacing on an arterial on the outskirts of San Antonio.



Right: As water in slurry mixture evaporates, micro surface color changes from brick-red to black.



Blended mixture of latex-modified asphalt emulsion, 3/8-inch aggregate and Portland cement filler discharges to spreader box for road application.



At Ergon's Waco plant, Knife River's Etnyre tanker takes on a load of asphalt emulsion.



Checking progress at the Bexar County project are, l. to r.: Joss Logue, Viking job supt.; Brad Pearce, Viking general supt.; Thurman Peterson, Bexar County paving foreman; and David Stroud, Ergon regional sales manager.

company with about 10 full-time employees and about 40 seasonal workers, Viking was originally established to test new equipment produced by Akzo Nobel, the makers of micro surfacing mixing and application equipment. In 1992, the manufacturer sold the specialty company to Barry Dunn, the present-day owner. According to Joss Logue, job superintendent, each year the company installs about 40,000 tons of micro surfacing on county roads, and approximately 1.5 million square yards on residential streets.

Logue directed the Viking crew that applied the micro surfacing on the outskirts of San Antonio. They treated two major arterials in the area ranging in width from 41 feet to 54 feet, and a dozen streets within a residential subdivision averaging 29 feet in width.

Using an Akzo Nobel machine with an adjustable width between 9 feet and 14 feet, Viking applied the 3/8-inch stone mixture at a rate varying between 22 and 27 pounds per square yard. To ensure the micro surfacing machine kept a steady pace, the contractor had seven "feeder" or "nurse" trucks constantly feeding the machine raw materials. The carefully orchestrated process yielded a 7/16-inch-thick application. No rolling was needed, and as the water in the slurry evaporated, the color of the material changed from a brick-red to black. Streets and Drainage allowed traffic back on the finished surface in 30 minutes to an hour.

Logue, who has supervised the placement of surface treatments such as this application on hundreds of miles of pavement, observed that the county has an effective maintenance program and its roads are in good condition.

Pavement Preservation Program

Bexar County utilizes such maintenance treatments as micro surfacing, slurry seal and sealcoating (chip seal) to protect and preserve its existing road pavement. According

to Thurman Peterson, a 21-year veteran with the county and paving foreman for Streets and Drainage, county officials choose the treatment to be used on each road based on an inventory by private consultants that records the type of structure and condition of the pavement, the amount and type of traffic it bears, climate, and other factors. He said the data is analyzed using a computerized Pavement Management System that helps consultants produce recommendations for the optimum treatment for each road.

Peterson heads up a county crew of about 20 that applies sealcoating (chip seal), one of the major surface treatments.

"Our own crew applies the sealcoat," he said. "We do about 130 miles of roads each year. The other treatments, slurry seal and micro surfacing, are done by private companies under contract with the county."

Bexar County's approach to pavement preservation falls in line with the recommendations of the Federal Highway Administration (FHWA), which is promoting pavement preservation as a way to extend the service life of the nation's roads. The agency has expressed concern over the sustainability of construction materials and practices used to preserve infrastructure, and the county's use of emulsified asphalt technologies reflects that same concern and is seen as a move in the right direction.

Every type of surface treatment has a useful service life. Bexar County officials find that sealcoating (chip seal) provides up to eight years of protection while micro surfacing promises the longest useful life, up to 10 years, depending on such factors as quality of aggregate and modified emulsion.

Latex Improves Performance

A cold-mix material, micro surfacing usually consists of mineral aggregate of which 100 percent passes a 3/8-inch sieve, Portland cement, and a latex polymer-modified asphalt

Viking Construction



emulsion. This treatment is used to protect underlying pavement from further distress and oxidation, and to maintain high friction resistance to improve traffic safety. It can be spread in variable thicknesses; for example, to fill wheel ruts and provide leveling, and it is designed to be a quick-traffic system. In line with this, a one-half-inch-thick micro surface is ready to accept traffic within an hour. No rolling is required – that’s provided by vehicle traffic. And a tack coat is usually unnecessary before micro surfacing, unless the existing pavement is concrete, according to Viking’s Logue.

The micro surfacing emulsion for Viking’s project was supplied by the Waco plant of Ergon Asphalt & Emulsions Inc., a unit of Jackson, Miss.-based Ergon Inc. The manufacturer has two other emulsion plants in Texas – in Pleasanton and Mt. Pleasant – but according to David Stroud, regional sales manager, the Waco plant is the sole supplier of the company’s cationic polymer-modified asphalt emulsion used for micro surfacing customers.

Stroud said the Waco plant was originally opened in 1989 to supply quick-time cationic emulsions for the applications of slurry seal and the then-emerging micro surfacing process, but by 1993 the facility had been expanded to include the manufacture of at least six other types of emulsions. Waco produces about 10 million gallons of product each year, all of it tested and certified to meet Texas Department of Transportation specifications. Anywhere between 3 million and 4 million gallons are earmarked for slurry seal applications, while some 2 million gallons of latex-modified emulsion is slated for the micro surfacing market.

Latex, supplied by BASF Corporation, is blended with the asphalt at the plant before emulsification, usually at a minimum proportion of about 3-percent solids based on asphalt

weight. The polymer is added to improve asphalt performance in a number of ways: It is designed to help create early strength, increase flexibility and viscosity, boost resistance to oxidation, and allow the use of larger stone (as compared to slurry seal) without raveling, among other benefits.

Tailoring Emulsions To The Job

Other additives are combined with the asphalt in the plant or added in the field as needed, he noted. For example, to slow down the setting or “breaking” of the quick-time emulsion during periods of rapidly rising temperatures, a retardant may be added.

“We’ve had enough experience working with contractors so we can help them by tailoring the product for field conditions, while still meeting TxDOT specs,” he said. “Let’s say that in the morning the temperature is 75 and the emulsion we send to the job is working fine at first, but then it starts getting hot and the product begins to set too fast for them to get the handwork done in time. The contractor calls us and says ‘We’re adding a lot of retardant.’

“At that point we’ll change the formulation. It’s easier, more efficient and less costly for the contractor if we add the retardant at the plant,” said Stroud. He also noted that some aggregates perform better with one type of emulsion than another, so Ergon works with contractors to tailor emulsions to the aggregates they’re going to use.

“We ask the contractor to send our lab a sample of the aggregate he’s going to use on the job. He might have three or four different aggregate suppliers. We know from experience, or we’ll test to find out, what kind of asphalt works best with a particular stone and we’ll buy that asphalt to make the right emulsion for his job.” ■