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MIDWEST CONTRACTOR

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Serving Iowa, Kansas, Nebraska and West Missouri Since 1901

NEBRASKA COUNTY ROADS "ARMOR COATED"

Sta-bilt Construction Co. chip seals Madison County local roads using innovative polymer-modified asphalt emulsion supplied by **Jebro Inc.**

By Paul Fournier

Nebraska's Madison County recently completed chip sealing a network of local roads near Norfolk, the county's largest city, using technologically advanced polymer-modified asphalt emulsion.

Under contract with the Madison County Highway Department, Sta-bilt Construction Co. of Harlan, Iowa applied the chip seal – also referred to as armor coating – near the north end of Norfolk in District Two of the department's three service districts. Sta-bilt's contract covered 45 miles of roads that carry local traffic as well as a major arterial that links the area with heavily travelled U.S. 81. This busy expressway passes through Norfolk, becoming an undivided two-lane highway north of the city. (Built well before the Interstate system – its construction began in the 1920s – the highway is more than 1,200 miles long and extends from Forth Worth, Texas to the North Dakota/Canadian border.)

Nebraska relies on chip seal as one of several preventive maintenance strategies seen as key to pavement preservation. Typically applied to pavements in good condition, chip seal is a surface treatment that extends the service life of structurally sound pavements. It consists of spraying asphalt emulsion over a prepared pavement surface, covering the emulsion with aggregate and embedding the aggregate in the emulsion with pneumatic rollers.



Sta-bilt Construction's Etnyre chip spreader broadcasts stone over asphalt emulsion during chip seal of a Madison County, Neb. road.

I'll Huff and I'll Puff...

And blow your house down... and so he (the GOP, Tea Party, Angry America, etc.) did in the mid-term elections. This immediately brings to mind an "old saw," "Be careful of what you ask for. You may get it."

It has been a rough year on top of a rough year and it looks like another rough year ahead. The country is angry, upset, disenchanted, disillusioned, insulted, humiliated, embarrassed and anything and everything else you can think of or say.



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Affecting the Construction Industry**

Nebraska County Roads “Armor Coated”



Owner: Madison County Highway Department

General Contractor: Sta-bilt Construction Co.



Contractor applied 150,000 gallons of CRS-2P that was produced by Jebro Inc. using asphalt pre-modified with Kraton's SBS copolymer.

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Armor Coating With Polymer

Madison County follows specifications and guidelines issued by the state's Department of Roads (DOR) for chip seal, also labeled "armor coat," in the state agency's Pavement Maintenance Manual. According to DOR, chip seal is recommended in cases where light to moderate cracking, raveling, polishing or flushing is evident, noting that the technique provides skid resistance, improves ride quality and seals the roadway.

For chip seal applications, the state typically requires the use of cationic rapid-setting polymer-modified asphalt emulsion (CRS-2P) on most roads. The modifier is a styrene-butadiene-styrene (SBS) polymer.

The CRS-2P employed on Sta-bilt's contract was supplied by Jebro Inc. of Sioux City, Iowa. Jebro produces CRS-2P emulsion using base asphalt that has been pre-blended with SBS polymer before the emulsification process. Developed and manufactured by Kraton Polymers LLC, the SBS block copolymer is usually supplied in pellet form. It is employed in pavement construction and surface treatment applications to impart a wide range of rheological properties as well as low viscosity to base asphalt.

Jebro makes CRS-2P at its sprawling headquarters and manufacturing facility in Sioux City. The company manufactures and supplies more than 40 grades of asphalt products, among them: asphalt cements, performance-graded asphalts, polymer-modified asphalts, cutback asphalts and asphalt emulsions. Jebro has three tank terminals and a network of barges, railcars and truck transports serving contractors and government agencies in Iowa, South Dakota, Nebraska, Minnesota and Texas.

In addition, the company has a fully equipped laboratory that is regularly inspected and accredited for technical proficiency and equipment accuracy by the Materials Reference Laboratory of the American Association of State Highway and Transportation Officials (AASHTO). Under the supervision of Jebro's technical services director Kevin Carlson, the lab supports the company's quality control plan, testing each of its products and correlating results with other laboratories on a routine basis.

Opening A Closed Market

One of the difficulties in producing conventional SBS polymer-modified asphalt emulsion is the need for elevated emulsion production temperatures (212-degrees Fahrenheit or greater). Others include requirements for a heavy duty mill for shearing modified asphalt to produce the emulsion and a cooling system to lower the emulsion temperature below 212-degrees Fahrenheit. Energy and equipment costs are relatively high.

Jebro had decided not to enter this market, and chose instead to manufacture polymer-modified asphalt emulsion using styrene-butadiene-rubber (SBR) latex polymer. This manufacturing process was simpler and less costly by comparison. However, in 2008 Nebraska specified that asphalt emulsion used for chip seal had to be modified with SBS polymer, effectively closing this market to the manufacturer.

But this changed when Jebro made the decision to manufacture SBS polymer-modified asphalt emulsion using an improved SBS copolymer from Kraton.

"This opened up a market that had been closed to Jebro," said Chris Lubbers, Kraton technical sales manager and representative to Jebro. "They began producing the SBS polymer-modified emulsion in 2008 and the market has quickly expanded for them," said Lubbers.

Lowering Costs, Adding Stability

At the Sioux City plant, Jebro mixes SBS copolymer with base asphalt and sends the pre-blended product to the company's emulsion facility. Emulsification of the Kraton SBS product is easier and less costly than manufacturing emulsion using asphalt pre-blended with a more conventional SBS polymer. A heavier-duty mill for shearing asphalt and significantly high temperature is required to emulsify asphalt pre-blended with conventional SBS polymer than asphalt blended with the improved SBS copolymer from Kraton – at substantially higher energy and equipment costs.

Additionally, emulsion product made using the Kraton copolymer can be stored for extensive periods at 180-degrees Fahrenheit without continuous agitation. It will remain stable and ready to use on demand.

"We have stored SBS polymer-modified asphalt emulsion for up to two weeks without any loss of stability," said Carlson, who shepherded the establishment and fine tuning of testing, production and storage procedures for the new product. "Even with good storage stability, the emulsion bonds with the cover aggregate very quickly after application. This helps the chip seal develop strength shortly after application and minimizes the chance of aggregate loss," he said.

Carlson noted that their business has grown substantially since they began using Kraton polymers to make their asphalt emulsion. The Sta-bilt project in Madison County, alone, required 150,000 gallons of CRS-2P emulsion.



Observing chip seal progress are, (left to right): Greg Johnson and Kevin Carlson of Jebro Inc. and Keith Burchett of Sta-bilt Construction Co.

Page 4: A 3,900-gallon Etnyre distributor mounted on a Sterling chassis applies CRS-2P SBS polymer-modified asphalt emulsion on a local road.

Placing The Chip Seal

Keith Burchett, Sta-bilt vice president and one of four brothers who co-own the company, supervised the Madison County chip seal project. Keith pointed out that the County Highway Department had prepared the road, including crack sealing, for placement of chip seal. He said roads in the Norfolk area in particular needed the maintenance this year because they had had a “horrible winter, with low temperatures and a lot of snow, and then a very wet spring. There was a lot of flooding and Norfolk even lost a bridge,” he said.

Sta-bilt used a 3,900-gallon Etnyre distributor mounted on a Sterling chassis to apply Jebro’s CRS-2P emulsion, with refills supplied by a 7,300-gallon transport trailer. Emulsion kept heated in the distributor to approximately 175-degrees Fahrenheit was sprayed at the rate of 0.25 gallons per sq. yd. This was followed immediately by the contractor’s Etnyre chip spreader, which broadcast crushed gravel chips, or armor stone, at the rate of 22 to 25 lbs. per sq. yd. Matteo Sand & Gravel of Norfolk supplied about 7,600 tons of clean crushed gravel with 100-percent passing a 3/8-inch sieve and only three-percent passing a #200 sieve. Two Ferguson pneumatic rollers pressed aggregate into the emulsion.



Stone chips are embedded in asphalt emulsion by one of two Ferguson pneumatic rollers used for the project.



Jebro's Bob Beals is chief operator at company's asphalt emulsion plant.

Kinder Technology

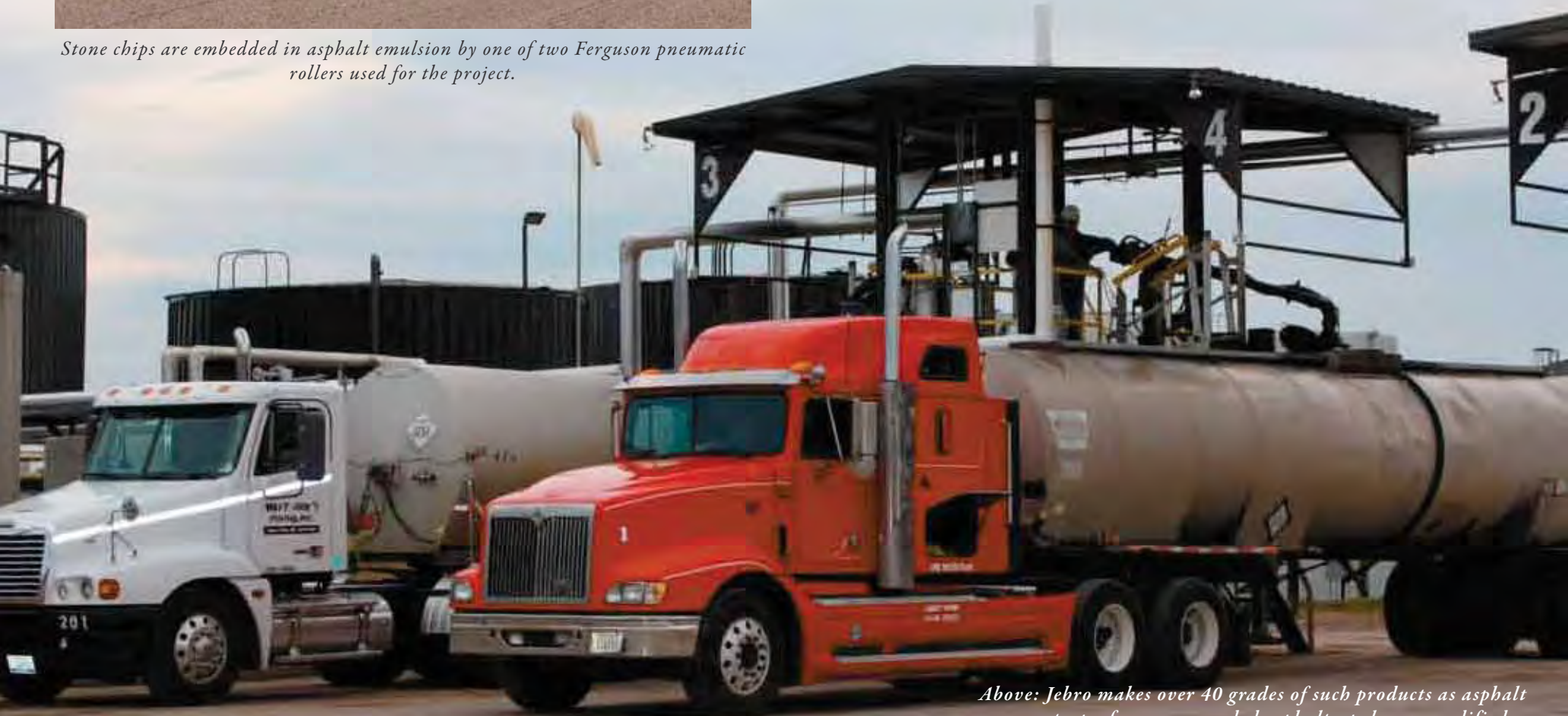
Established in 1959 by the brothers' late father, Wade Burchett, Sta-bilt has been involved in every type of asphalt pavement-related construction and repair over the years, including micro surfacing, slurry seal, chip seal, base stabilization, crack sealing and specialty paving. The brothers have seen it all.

Keith commented on this and the performance of the new polymer-modified asphalt emulsion from Jebro:

“We’ve seen the technology in this business change a lot over the years,” he said. “For example, in the old days we worked with cutback asphalts. They were made with fuel oils. Then they developed asphalt emulsions, which were better for the environment. Later came the polymer-modified emulsions, both SBS and the latex type, which held the stone better.

“Now we’re working with this new type of SBS polymer-modified emulsion from Jebro. It isn’t gummy, it’s less viscous and it doesn’t come off the distributor nozzle in strings on a windy day like some emulsions do. Also, since the Etnyre spray bar has a three-nozzle overlap design, many times we’d get a three-layer pattern of lines of emulsion of different widths – something we call drilling. We get a lot less drilling, now.

“This asphalt technology keeps getting kinder for the contractor as well as the environment,” he concluded. 🧐



Above: Jebro makes over 40 grades of such products as asphalt cements, performance-graded asphalts, polymer-modified asphalts, cutback asphalts and asphalt emulsions.