

# Rare Double Fog Seal Among Techniques for Oklahoma Road

By Russell Heritage

A combination of pavement preservation products and best practices, along with a rare double fog seal, resulted in one of the finest roads in Oklahoma, that to Chickasaw Children's Village.

South Central Oklahoma is Chickasaw country. The mile-long stretch leading to the Chickasaw Children's Village, a residential and educational campus in Kingston, Okla., that houses Native American children from troubled homes, is a scenic roadway that was constructed over a decade ago.

Surrounded on both sides by open fields and a pristine white rail fence, the road eventually began to deteriorate from cracking and oxidation, causing it to stand in stark contrast to its well-kept surroundings. A two-year drought in Oklahoma only served to quicken the pavement's deterioration, prompting longitudinal cracks to appear even more frequently. Working with Ergon Asphalt & Emulsions, Inc., the Chickasaw Nation Roads Department sought to repair these distresses before they got worse and provide a roadway that would once again do justice to the grounds of the Children's Village.

"Our inspector, Brad Williams, had recently visited the site and saw that the road was significantly cracked and in need of repair," said Nick Woodward, special projects manager for the Chickasaw Nation Roads Department. Along with Chickasaw Nation Roads director Bo Ellis, and Ergon's Johnny Roe, Woodward evaluated his options for

repairing the pavement, and found the Children's Village road was a perfect candidate to receive federal funding for preservation.

"We were in a situation where we could spend \$140,000 on a one-mile, 1 1/2-in. hot mix asphalt overlay, or use preservation treatments to completely restore the pavement at a drastically lower cost," said Woodward. "We elected to rehabilitate the pavement and spread the money that we didn't spend on an overlay to other projects."

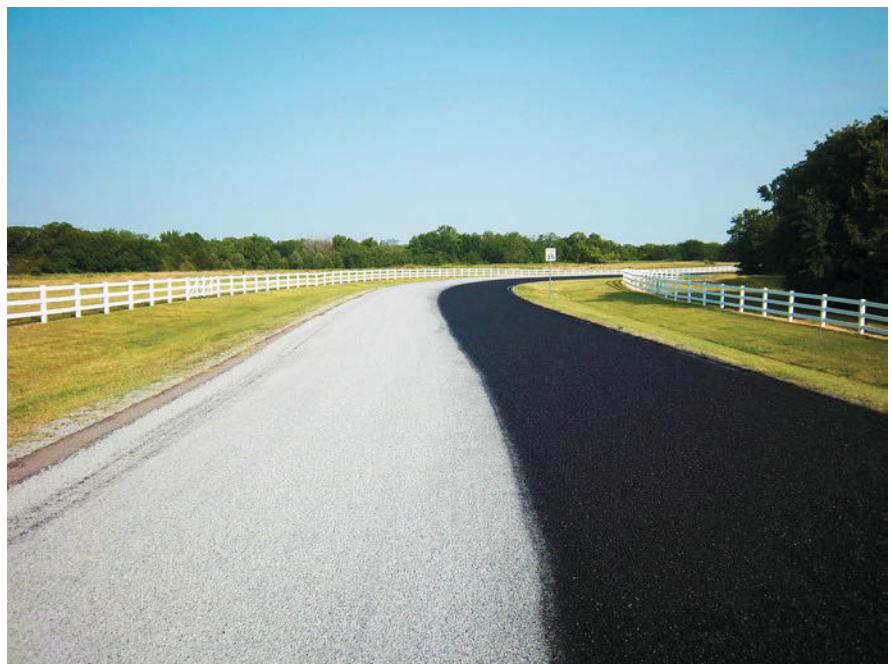
"Responsible stewardship is something the tribes have practiced for years; not only of our financial resources, but also our natural resources," said Ellis. "For us in the Roads Program, pavement preservation is the most responsible

way to extend the service life of the infrastructure we have. That stewardship is what drove our decision making on the Children's Village road."

## PROACTIVE MEASURES

Although Village Road was suffering from a high number of cracks, it was far from beyond repair. One of the most recommended, but often overlooked, steps in preserving a pavement is to seal existing cracks. Doing so locks out moisture, keeps cracks from widening, and prevents the otherwise inevitable decay of the underlying structure.

"Crack sealing a pavement before applying a chip seal is a benefit to the road in several ways," said



*A 3/8-in. limestone was used as the chip seal aggregate, with polymer-modified CRS-2+ emulsion holding it in place*



Final product: crack seal, chip seal, and a double fog seal were used to repair this pavement leading to the Chickasaw Children's Village in Kingston, Okla.

Zach Burkey, sales rep for Paving Maintenance Supply, Inc. (PMSI). "You're sealing out the moisture to help protect your base, and you're filling the voids in between the cracks. That gives the road a smooth surface to apply a chip seal on, which will improve ride quality and prevent reflective cracking in the future. It makes for a better end product that lasts much longer."

Using a Crafcro Super Shot 125 Melter/Applicator purchased from PMSI, an crew from the Chickasaw Nation Roads Department sealed the

pavement's cracks using 2,600 lbs. of Crafcro Road Saver 515 crack sealant. Without taking this measure, the cracks would have eventually worked their way back to the surface.

Chip seals are one of the most versatile tools in the pavement preservation toolbox. Woodward chose to chip-seal Village Road using the polymer-modified asphalt emulsion, CRS-2+. The emulsion was chosen based on the amount of traffic the road receives, as well as the Chickasaw Nation's prior positive experiences with the product. It's

produced at Ergon's facility in Lawton, Okla., and has become the Chickasaw Nation's preferred chip sealing emulsion. The selected aggregate was a 3/8-in. limestone from the Dolese Quarry in Coleman, Okla., and PSI Seal Masters, Inc. of Davis, Okla., was the contractor.

### DOUBLE FOG SEAL SOLVES MIX-UP

On the front end of the job, a calibration issue with the distributor's onboard computer caused the binder application rate to be lighter than the expected 0.4 gal./sq. yd. The issue was quickly corrected, but a portion of the pavement received only 3/4 of the material needed to securely hold the aggregate to the surface of the roadway. Woodward and Roe had planned to apply a heavy fog seal at 0.15 gal./sq. yd., which would compensate for the lost binder and improve the overall aesthetics of the surface. But on the day of application, they devised a superior solution.

"We had enough material to apply a double fog seal," said Roe. "It would provide better coverage. It would last longer and look better. And by applying two layers at one tenth of a gallon per square yard each, we could utilize more material while greatly reducing the risk of runoff."

The specified fog seal was CQS-1F, an Ergon Asphalt & Emulsions product produced in Catoosa,

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Oklahoma. CQS-1F provides twice the residual of its regional alternative, SS-1, and gives surfaces a noticeably darker appearance. Perhaps most importantly, CQS-1F cures in under an hour, compared to anywhere from two to four hours with SS-1. These properties made it a desirable pick for the Children's Village road. The product's quick curing ability made the possibility of a double fog seal much more tangible.

PSI Seal Masters, Inc. shot the CQS-1F on one side of the mile-long road at 0.10 gal./sq. yd. They then returned to their starting point and applied the fog seal to the other side of the pavement at the same rate. Weather conditions were ideal. Warm temperatures and a strong breeze allowed the fog seal to cure in approximately 20 minutes, far quicker than average. Once the material had cured, crews immediately applied a second coat at 0.10 gal./sq. yd. Dry weather and the engineered fast cure times helped the material break quickly, preventing any runoff. And the results looked astonishing.

Chickasaw Roads Director Bo Ellis firmly believes in the benefits of fog seals. "I've seen chip seals that are still losing rock a few weeks after they were applied," he said. "The fog seal really bonds the whole thing together and locks in your driving surface, giving you more bang for your buck."

#### DOING THE MATH


Properly crack sealing, chip sealing and fog sealing can add years of service life to a pavement. Given the extra protection afforded by the double fog seal, it's anticipated that the Children's Village road will last even longer than originally expected. With timely maintenance, the chip seal should have no trouble achieving a 10-13 year lifespan. And the cost to achieve those extra years is impressively low.

"In Oklahoma, 2,600 lbs. of crack sealant averages about \$3,600. The cost of a single CQS-1F fog seal is typically \$3,000 per mile on a 24-ft.-wide road, or about 0.20 cents per square yard. A chip seal is approximately \$2.00 per

square yard," said Roe. "That's about \$45,000 in total for these preservation treatments in comparison to \$140,000 for a mile-long hot mix asphalt overlay, which would typically require an additional \$25,000 for milling."

The combination of pavement preservation best practices and products, as well as the on-hand expertise of Roe and Woodward, produced one of the finest pavements in the state of Oklahoma—for a fraction of the cost of an overlay. And

the fruit of the Chickasaw Nation's pavement preservation efforts has stimulated a high level of interest among other tribes.

"I wouldn't say that a double fog seal is the right choice for every pavement," said Roe, "but given the right road, and the right circumstances like we've seen on these projects, it can make a very substantial difference in both quality and appearance." 

*Heritage is staff writer, Ergon, Inc.*



  
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