Chipseals -- used to extend the life of asphalt pavements -- are applied by evenly distributing a thin base of hot emulsion onto an existing pavement and then embedding well-graded aggregate. The aggregate is evenly distributed over the seal spray, then rolled into a smooth pavement surface.

CHIPSEAL DELIVERS LONGER LASTING ROADS, ECONOMICALLY, IN NEBRASKA PROJECT

When the Nebraska Department of Transportation needed a way to economically extend the life of 6 ½ miles of pavement on State Highway 61, they turned to a chipseal solution with expanded shale lightweight aggregate from Arcosa Lightweight, for both its excellent performance and its economical cost.

With nearly 10,000 miles in the Nebraska State Highway System and tough winters, durability is crucial. “In this day and age,” according to Matt Radke. The Highway Maintenance Supervisor for the Nebraska Department of Transportation explains, ”It’s all about preserving the life of the pavement. We’ve been moving to a program of more frequent maintenance. It’s about keeping water out of the asphalt.”

In the case of the Highway 61 project, just south of Ogallala, the Nebraska Department of Transportation used a new technique -- a heavier application of emulsion, and a “fogging” of the road surface with another round after the initial application of emulsion and aggregate had cured for 10 days. “We shot the emulsion at a considerably heavier rate than we normally do with chipseals, and then we applied the fog coating of emulsion,” Radke said.

After more than a year, the project, completed in June of 2015, made it through the tough Nebraska winter with flying colors and is performing and looking good, he said.

“It’s held up very well, with very little loss of aggregate and very little change in color. Because of the success of this project, we plan to do another eight miles of road with the same technique this year.”

The initial emulsion, CRS-2P, was applied at a rate of 0.43 gallons per square yard. The expanded shale was applied at an average of 14 to 15 lbs. per square yard. “We started the application at 18 lbs. per square yard and dropped the rate until we had no loose material on top.” Radke said.

“Compaction was key,” he added. “We ran three rollers. The roller operators were instructed to never stop rolling even while waiting for oil. We had them roll the entire length of the surface we had covered. We also didn’t sweep anything until the next day. What had been loose material the day before was now embedded in the oil.” After the chip seal had cured for 10 days, a fog seal of CSS-1H 50 was applied at the rate of 0.14 gallons per square yard.

ANGULAR-FACED AGGREGATE MEANS BETTER RETENTION

In north and central Nebraska, the supply of locally available coarse aggregate is very limited. And the available aggregate is typically spherical river rock-- not ideal for use in road sealing projects. Round-faced aggregates come loose more easily, meaning more chipped windshields and shorter pavement life.

The angular faces of lightweight aggregates mean higher retention rates, and longer lasting pavements. “The angular faced aggregate seems to sit tighter, with better retention,” Radke said. This means longer lasting pavements and particles that are much less likely to chip windshields if they do come loose.