

Asphalt-Rubber vs. Rejuvenating Emulsion

Merced County, California

By Jeffrey R. Smith

In 2000, Western States Surfacing (WSS), now International Surfacing Systems (ISS) was the low bid contractor on a Rejuvenating Emulsion project in Merced County California. After the contract was awarded, WSS asked permission from the County to place a side by side test section, comparing A-R (Asphalt-Rubber) chip seal with the Rejuvenating Emulsion Scrub Seal process within the designated project limits. The objective of this test section was to evaluate not only the initial cost of two very different pavement preservation strategies, but to also verify the binder manufacturers claims concerning long term performance on badly deteriorated pavements. It is important to note that the County chose not to perform any pre-maintenance to the existing pavement prior to these two pavement preservation applications.

The various test sections were laid out within a 2,000 lineal foot section on Turlock Road between Oakdale Road and Looney Road. The two binder materials utilized for the chip seal applications on these test sections were applied according to the manufactures recommendations. The A-R binder was applied at 0.65 gallons per square yard and a hot pre-coated aggregate was placed at 30 pounds per square yard. Due to the high viscosity of the A-R binder, WSS was able to recommend the heavy application based on the badly deteriorated condition of the existing pavement. As a result of this high binder application a large 1/2 inch aggregate gradation had to be utilized to match up properly with the application rate of the A-R binder. The Rejuvenating Emulsion Scrub Seal was applied at 0.32 gallons per square yard and a non-coated 3/8 x No. 6 aggregate was placed at 18 pounds per square yard. WSS tried to apply the Rejuvenating Emulsion binder at heavier application rates but found that due to its low viscosity the Rejuvenating Emulsion ran off the roadway. The test sections were placed side by side in a checker board pattern to allow for equal traffic conditions.

Over the years these test sections have been monitored by County personnel, WSS and now ISS. After nearly 10 years of performance or lack there of, we see a significant difference in long term performance. The photos to the right testify as to how an asphalt-rubber binder type can effectively deal with extreme pavement deterioration and give the specifying agency very good long term performance. The Rejuvenating Emulsion section obviously has not performed very well on this type of pavement so care should be taken when specifying a binder that is not appropriate on pavements that show this type of distress.

Based on the performance of the asphalt-rubber chip seal (SAM) on this project along with data that is available from hundreds of other projects that have been placed over the past 25 years, ISS is currently recommending to municipal agencies and state DOT's that binder type should be specified based on pavement condition index (PCI), to achieve the desired short and long term performance. Even though the Rejuvenating Emulsion Scrub Seal system was \$1.22 per square yard cheaper at the time of application, it is obvious the performance of the A-R section has saved the County money over the long term, as the Rejuvenating Emulsion section only lasted for three years before showing signs of distress and is currently in need of another surface treatment or even re-construction. It is also obvious that the A-R section will continue to perform for many years to come. Would it be prudent for the County to continue their use of asphalt-rubber pavement preservation systems on future projects and on pavement types similar to this? The answer is unequivocally, **YES!**



PASS Scrub Seal

A-R Chip Seal



These pictures illustrate the comparison of a PASS Scrub Seal (on the left side) and an Asphalt-Rubber chip seal (on the right side).