

Asphalt-Rubber has saved Casa Grande streets!

By Jeffrey R. Smith

“Every County Engineer, Public Works Director and City Engineer has the same dilemma, more roads and streets to rehabilitate than funds to do it with.” This quote has been true for at least the past 27 years that this author has been involved with pavement maintenance and rehabilitation.

In November of 1988 Southwest Contractor magazine published an article concerning the use of a specialized asphalt-rubber SAM (Stress Absorbing Membrane) to rehabilitate 91 streets, over twelve (12) miles of deteriorated pavement for the City of Casa Grande Arizona. The City had only one other alternative and that was reconstruction, which at the time would have been four times the cost of a recommended asphalt-rubber system.

Asphalt-rubber is generally defined as a combination of paving grade asphalt cement combined with recycled tire rubber (15 to 22 percent), then these two components are reacted for a specific period of time to achieve certain chemical and physical properties. Through this reaction one of the main benefits is the increased viscosity, which is between twenty to one hundred times that of conventional asphalt cement. This allows for the Stress Absorbing Membrane (SAM) application rates to be substantially increased to deal with extreme deterioration on roads and streets in the field. Other benefits include an increase in softening point of up to 50° F, the low temperature flexibility is greatly improved, elastic and rebound properties are substantially enhanced, tensile strength and toughness is increased and hardness due to aging over time is reduced up to five times that of conventional binder materials. What all of this translates to is what has happened in Casa Grande, streets that received a cost effective rehabilitation strategy compared to the alternative reconstruction. These same streets have performed over a long period of time with no maintenance at all, which has led to life cycle cost effectiveness that is off the charts.

This project actually began in the spring of 1985 and encompassed more than 400,000 square yards. The rehabilitation plan called for removal and replacement of base failed areas, skin patching of surface irregularities, crack sealing of all cracks 3/8 of an inch and wider along with the establishment of drainage consisting of the instillation of concrete aprons, valley gutters, alley entrances, curb and gutter. The application of the asphalt-rubber chip seal and a fog seal would be the final construction procedure and the wearing surface.

In 1985 the Public Works Director for the City of Casa Grande was Mr. Tom Long. He had worked with a consulting firm to establish the above criteria and with the project organized and the specifications written their hope was to extend the life of these deteriorated streets for at least 5 to 7 years, until enough funding could be accounted for to begin a reconstruction program, no one could have predicted how well this rehabilitation strategy was to perform.

The City of Casa Grande is still reaping the benefits as a result of the asphalt-rubber SAM rehabilitation system that was placed so long ago. It has now been over 18 years since the original project was done and many of the original streets that were surfaced then are still performing today. The City has continued to utilize this material over the years to solve some of the same problems on other streets that were treated during the duration of the original project.

I particularly appreciate the utilization of asphalt-rubber over the past 18 years in Casa Grande as I was the superintendent on that original project in 1985 and I had the pleasure to work with Mr. Tom Long to achieve and surpass our original goals. Has asphalt-rubber saved the City of Casa Grande money? There should be no doubt. How many chip seal applications will last 18 years? I know of only one asphalt-rubber, which continues to prove itself project after project. Can other agencies achieve the same success as the City of Casa Grande? If properly designed, constructed and inspected the answer is unequivocally, YES!



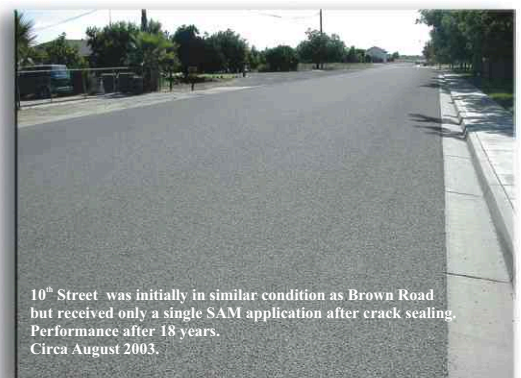
Surface condition - 1985



Brown Road surface condition after 18 years of performance. Circa August 2003



Date Street surface condition after 18 years of performance. Circa August 2003.



10th Street was initially in similar condition as Brown Road but received only a single SAM application after crack sealing. Performance after 18 years. Circa August 2003.