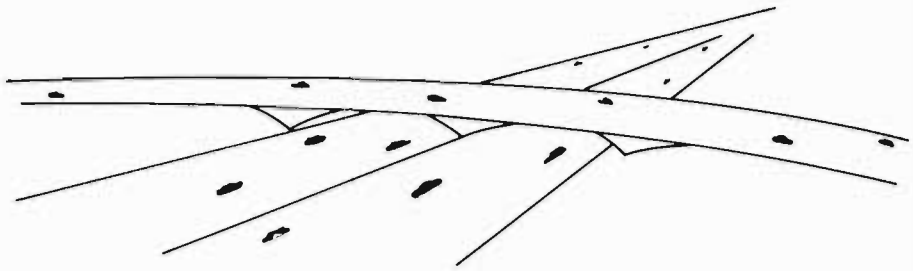

DEPARTMENTAL RESEARCH

Report Number SS 15.15

IN-PLACE SLURRY SEAL

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

IN-PLACE SLURRY SEAL

by

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Conducted by

District 8 - Abilene, Texas
State Department of Highways
and Public Transportation

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ERRATA

Texas State Department of Highways
and Public Transportation

SS Report 15.15

"In-Place Slurry Seal"

Abstract

Strike the first paragraph beginning "This report ....." through "..... the friction performance of pavements."

The second paragraph comprises the abstract of the report.

ABSTRACT

This report covers the results of the skid tests performed in various districts by the three Texas skid test trailers from June 1969 to June 1970. This report indicates results for various pavement types and surfaces, and studies the effect of the amount of binder and aggregate gradation upon the coefficient of friction. This report will be of specific interest to District, Maintenance, Design, and Resident Engineers and all other engineers interested in the friction performance of pavements.

This report describes a pavement maintenance technique with which highway personnel will be familiar, yet the process is unique. The technique is considered a temporary holding process. Pavements to receive the treatment are normally severely cracked and sufficient funds for adequate maintenance are not available. The process involves the application of a diluted emulsion followed by a small amount of concrete sand. The material is broomed, back and forth, until the cracks are filled. The report includes cost and construction information along with some performance observations.

IN-PLACE SLURRY SEAL

In February of this year our Scurry County Maintenance Foreman called to inform us that he had eight miles of U. S. 180, west of Snyder, that was deteriorating extremely fast. It was about 10 days after a hard freeze and the road had received intense freeze damage.

After inspecting the highway we decided that it would only last another ten days, at the most, so we had to do something fast. This section of U. S. 180 carries approximately 1500 VPD, most of which is some type of oil related equipment. It was also scheduled for a seal coat during the summer of 1982. What we had to do was to try to hold it together until the summer contract seal began.

We knew that we could seal the road with a cut-back (RC) asphalt but then we would have the other seal on it and we would spend the next three summers fighting bleeding pavement. If we let it go we would lose 100% of the eight miles so that would not be an alternative, and whatever we did it had to be done immmediately.

We studied our objective and it was our opinion that we needed to devise a method of sealing all the cracks so that no more moisture could get in the base beneath the surface. In order to accomplish this we had to cover the entire surface. Maybe this too would tend to revive the existing asphalt when the warm sun came out and just maybe it would get new life.

We arrived at the idea that we would resurrect slurry sealing but we did not want to build up material on top of the existing pavement. To do this, we would have to place a mixture of sand and emulsion so the sand would fill the cracks and clean the remaining sand and emulsion off the pavement. By doing this we might

be able to hold the highway until warm weather and then place a proper seal on the surface. Our objective was to try to save an almost hopeless highway.

We found an old abandoned wire brush "pony blade" drag broom in a junk pile at Big Spring and patched it up for a device to mix and spread the slurry. It was bolted to the bottom of a Ford tractor blade so it could be dragged behind a tractor, floating free. After this project was completed our shop made an improved design on the drag broom and constructed several more of these for use in other parts of the District. They cost us approximately $660.00 each and took 16 man-hours to build.

After approximately three hours of experimenting with emulsion (EA-11M) and concrete sand we believed we were ready to try a shot. We used a 600 gallon Roscoe asphalt pot with a 1200 gallon storage tank on the truck to apply the emulsion. It was heated to approximately 125 degrees F and placed at the rate of .15 gallons per square yard. The mixture was 30% EA-11M and 70% water.

Immediately behind this we spread concrete sand with a salt spreader. They drove directly into the emulsion and put out about 6 C.Y. per mile on a single 12' lane. It takes very little sand to make the slurry the consistancy needed. We used a total of 96 C.Y. of concrete sand.

Behind the sand application came the drag broom. This device does three things, it mixes the sand and emulsion, spreads a unifrom mixture over the cracked pavement, and then removes excess sand from the pavement. All we needed was sand and emulsion in the cracks. Two or three trips with the broom will remove most of the excess sand.

After the first day of experimenting we used six men and covered three miles per day, per lane. We had two flagmen, one dump truck driver, two men on the

asphalt pot and one tractor operator. The entire operation took four days for the eight miles of U. S. 180.

I guess the worst problem encountered was the handling of traffic because we had one lane of traffic shut completely down for a maximum of two hours and a minimum of forty-five minutes. To make this problem easier we used walkie-talkies and two flagmen. One flagman would hold traffic off the 1,000 foot land until the other flagman notified him to let them go and by alternating traffic flow it worked extremely well.

The complete cost of this four day operation was $20,000 or about 17.7¢ per square yard. Since this project was completed, we have performed more similar jobs and the cost varies according to the type of equipment used, etc. Some of the supervisors had better results with two or three brooms and some want to use just one, but the results have all been the same.

U. S. 180 is a project that has 12" of flexible base and a series of penetration seals. This slurry method works better on a sealed surface than it does on hot-mix. A hot-mix surface is slick and it is more difficult to fill the cracks because the slurry tends to drag across the cracks instead of flowing down into them. We estimate that 95% of the cracks are filled on the sealed surface and 75% on a hot-mix surface.

We do not believe that skid resistance is diminished on this type of work. We have not had any trouble with skidding or wrecks caused by this process.

After traffic flowed on this highway for a couple of days it was restriped and watched very closely until summer. The planned seal was applied in July and from all indications everything is back to normal.

We fully believe that this little $20,000 operation has saved the taxpayers approximately one million dollars and as a result we have adopted this procedure as another tool maintenance to use when the occasion arises.