STATE OF FLORIDA

AN EVALUATION OF A SEALER-REJUVENATOR TREATMENT

Research Report
FL/DOT/SMO/00-440

Gregory A. Sholar
James A. Musselman
Gale C. Page

April 2000

STATE MATERIALS OFFICE

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The State Materials Office (SMO) in cooperation with District 5 evaluated a sealer-rejuvenator product provided and applied by Asphalt Maintenance Co. of Orlando, FL. The purpose was to determine if the sealer-rejuvenator could seal and rejuvenate the pavement as claimed and to assess whether the treatment could be applied without adversely affecting the frictional properties of the pavement. The product applied was a coal tar based proprietary product named SR-20.

EXPERIMENTAL PLAN / APPLICATION / TESTING

A 500 feet long shoulder section on southbound SR 9 (I-95) between mileposts 218 and 219 was chosen as the test site. This shoulder had been resurfaced approximately 10 years prior. This shoulder was chosen because it exhibited some deterioration due to weathering and aging, yet appeared to be structurally sound (see **Figure 1**). The purpose for applying a sealer-rejuvenator to a shoulder would be to maintain its useful life for a longer period of time than the mainline roadway. This would prevent the shoulder from having to be milled and replaced at the same time the mainline was milled and replaced.

The day prior to the application of the sealer-rejuvenator, friction numbers were obtained by the Pavement Evaluation section of the SMO. The purpose of the friction numbers is to provide an index of the frictional properties of the asphalt pavement. Higher friction numbers indicate higher frictional resistance. A ribbed tire was used for this testing. On the same day that the sealer-rejuvenator was applied, six cores were obtained at equally spaced intervals within the 500 ft. test section (see **Figure 2**). The top ½" to ¾" of each core was cut off and this portion

Figure 1 - Test Section

Figure 2 - Coring Pavement Prior to Treatment

was used to obtain initial pretreatment viscosity and penetration values of the recovered asphalt binder from the cores.

The sealer-rejuvenator was applied at a spreadrate of 0.05 gal/sy as determined at the site by the Contractor (see **Figure 3**). The Contractor had a difficult time at the initial startup obtaining a uniform spray pattern (see **Figure 4**). Subsequently, the 500 ft. section was moved 200 ft. to the south and the Contractor, after fixing the equipment, was able to apply a uniform spray to this section. The weather conditions were sunny, approximately 70 °F with a slight breeze. The application occurred at approximately 10:30 am. The Contractor had indicated that if the weather conditions were optimal, that the sealer-rejuvenator may dry enough within a few hours that it could be friction tested again. However, after waiting four hours, the sealer-rejuvenator was not close to being dry enough to retest. It was decided that the friction numbers would be obtained the next day.

Additional friction testing was performed 1, 14 and 33 days after initial treatment to determine if

Figure 3 - Determining Application Rate

Figure 4 - Non-uniform Spray Pattern

the friction numbers would improve with time as the sealer-rejuvenator penetrated the asphalt surface. Cores were also taken 29 days after treatment to determine if any visual penetration had occurred. Additionally, the upper ½" to ¾" of the cores were tested for viscosity and penetration to see if the asphalt binder had become "rejuvenated" after treatment.

RESULTS

The friction numbers are presented in **Table 1** and the viscosity and penetration values are presented in **Table 2**. The friction numbers were very high (average of 70.9) before treatment. This is to be expected for a shoulder of this age that has had minimal traffic exposure. However, additional friction testing was performed 1, 14 and 33 days after initial treatment to determine if the friction numbers dropped to an average of 19.6 one day after treatment and increased to only 23.1 thirty-three days after treatment. These values are too low and pose a safety hazard. The minimum desirable value for new construction is 35. New roadways with friction values less than 30 are reviewed by the SMO with the potential for remediation, more frequent testing and the posting of warning signs.

Table 1 – Friction Numbers

	Friction Number			
Reading #	Before Treatment	1 Day After Treatment	14 Days After Treatment	33 Days After Treatment
1	67.6	20.7	25.6	24.5
2	72.8	17.8	21.0	22.0
3	70.5	21.5	22.5	24.1
4	72.5	18.5	19.5	21.6
Average	70.9	19.6	22.1	23.1

Table 2 – Viscosity and Penetration Values

	Viscosity (Poises)		Penetration (0.1 mm)	
Reading #	Before Treatment	29 Days After Treatment	Before Treatment	29 Days After Treatment
Cores 1, 2, 3	110,565	120,685	15	15
Cores 4, 5, 6	103,127	91,972	15	15
Average	106,846	106,329	15	15

Regarding the viscosity values, there was no significant change between the before treatment asphalt binder (106,846 Poises) and the asphalt binder 29 days after treatment (106,329 Poises). The penetration values did not change at all (15 penetration units before treatment and 15 penetration units 29 days after treatment). Through visual inspection there was no penetration of the sealer-rejuvenator into the surface of the cores. Admittedly, penetration of the sealer-rejuvenator into the surface may increase over time and after being exposed to the warmer months of spring and summer.

CONCLUSION

The sealer-rejuvenator did appear promising as a sealer and may potentially rejuvenate the pavement given more time, however, the friction numbers after application were far too low for this product to be considered as a routine maintenance procedure. Highway shoulders are often used in sudden stopping situations and it would be too dangerous, especially in wet conditions, to apply this sealer-rejuvenator to the shoulder. Based on the friction number criteria alone, the SMO does not recommend its use for State highway applications.