FIELD PERFORMANCE EVALUATION OF CRAFCO 'ROADSAVER' SELF-LEVELING SEALANT

Final Report
October, 1998

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16. ABSTRACT

On July 24, 1995, joints in a 61 m (200 ft.) test section on project STP-324(78) were sealed with Crafco Roadsaver. Crafco Roadsaver is a self-leveling silicone sealant. Joints in the remainder of the project were sealed with an approved self-leveling sealant. A 61 m (200 ft.) control section, with joints sealed with the approved sealant, was selected for comparison.

According to contractor's employees who applied the sealant, there was no noticeable difference in the difficulty of application between the two sealants.

The Crafco Roadsaver sealant appeared to have good adhesion to the sides of the joints. Bubbles formed in the Crafco Roadsaver sealant over most (approximately 60%) of the test section but were later found to be only a surface problem.

Both the test and control sections were monitored over a three year evaluation period. Both sealants performed well and had no failures during the evaluation period. The conclusion of this author is that no reason can be found for the specifications for use of self-leveling silicone sealants not to be rewritten to include Crafco Roadsaver Sealant.

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SI (METRIC) CONVERSION FACTORS

Approximate Conversions to SI Units

Symbol	When you know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	25.40	millimeters	mm
ft	feet	0.3048	meters	m
yd	yards	0.9144	meters	m
mi	miles	1.609	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm
ft^2	square feet	0.0929	square meters	m^2
yd^2	square yards	0.8361	square meters	m^2
ac	acres	0.4047	hectares	ha
mi^2	square miles	2.590	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.0283	cubic meters	m^3
yd^3	cubic yards	0.7645	cubic meters	m^3
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.4536	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams	Mg
		TEMPERATURE (exact)		
°F	degrees Fahrenheit	(°F-32) / 1.8	degrees Celsius	°C
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.448	Newtons	N
lbf/in^2	poundforce per square inch	6.895	kilopascals	kPa

Approximate Conversions from SI Units

Symbol	When you know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.0394	inches	in
m	meters	3.281	feet	ft
m	meters	1.094	yards	yd
km	kilometers	0.6214	miles	mi
		AREA		
mm^2	square millimeters	0.00155	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.196	square yards	yd^2
ha	hectares	2.471	acres	ac
km^2	square kilometers	0.3861	square miles	mi^2
		VOLUME		
mL	milliliters	0.0338	fluid ounces	fl oz
L	liters	0.2642	gallons	gal
m^3	cubic meters	35.315	cubic feet	ft^3
m^3	cubic meters	1.308	cubic yards	yd^3
		MASS		
g	grams	0.0353	ounces	oz
kg	kilograms	2.205	pounds	lb
Mg	megagrams	1.1023	short tons (2000 lb)	T
		TEMPERATURE (exact)		
°C	degrees Celsius	9/5+32	degrees Fahrenheit	°F
		FORCE and PRESSURE or STRESS		
N	Newtons	0.2248	poundforce	lbf
kPa	kilopascals	0.1450	poundforce per square inch	lbf/in^2

Field Performance Evaluation of Crafco 'Roadsaver' Self-leveling Sealant

FINAL REPORT

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EXECUTIVE SUMMARY

The Oklahoma Department of Transportation (ODOT) has been sealing joints in Portland Cement Concrete (PCC) with self-leveling silicone sealants since 1987. Since that time, two specific low modulus silicone sealants have been used on almost all ODOT projects with joint sealing requirements. Both have demonstrated good field performance and, according to ODOT contractors responsible for joint sealing, both are relatively easy to apply.

The only drawback is that both sealants are made by the same corporation. In an effort to increase competition among suppliers that may result in lower prices in the future, ODOT Materials and Research Division agreed to evaluate a sealant produced by the Crafco Corporation called Roadsaver. The evaluation required two sections, a control section consisting of an already approved sealant (Dow/Corning 890SL) and a test section of Crafco Roadsaver. Each section consisted of 13 transverse and two longitudinal joints. The joints were inspected for failures at six month intervals (summer and winter).

After three years of evaluation, neither section has shown any failure. This performance leads to the conclusion that the Crafco product should be considered as a viable alternative to the Dow/Corning sealant.

In order to implement the results of this research, changes will need to be made to the current specifications, and both the changes and this report will need to be made available to field divisions.

Introduction

The Oklahoma Department of Transportation (ODOT) has been sealing joints in Portland Cement Concrete (PCC) with self-leveling silicone sealants since 1987. Since that time, two specific low modulus silicone sealants have been used on almost all ODOT projects with joint sealing requirements. Both have demonstrated good field performance and, according to ODOT contractors responsible for joint sealing, both are relatively easy to apply.

Both sealants referred to above are produced by the same corporation. In an effort to increase competition among suppliers that may result in lower prices in the future, ODOT initiated an evaluation of CRAFCO ROADSAVER. The evaluation was scheduled to last three years and has been completed as of August 1998.

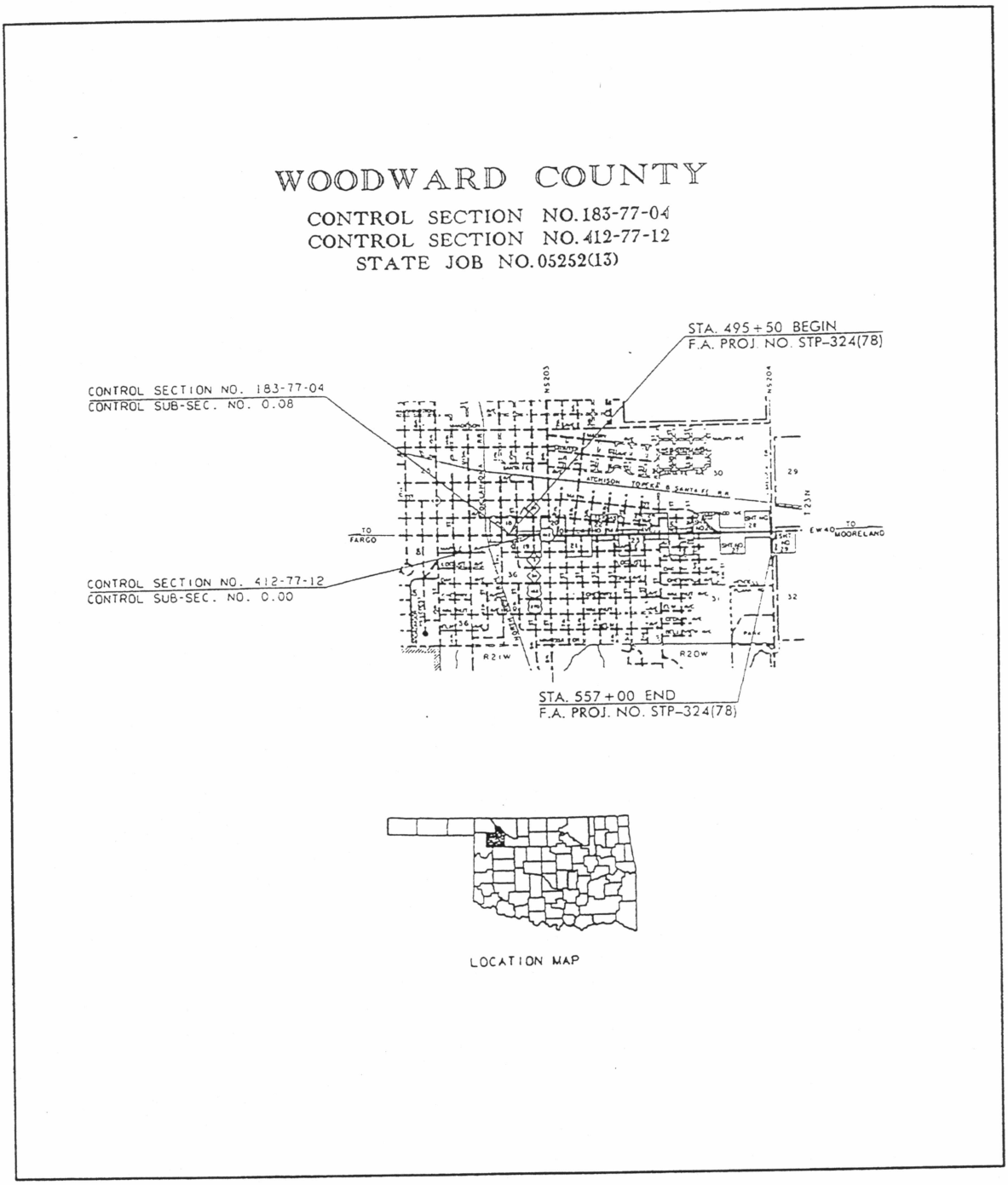

Figure 1. Site Location Map

Joints have been sealed with CRAFCO Roadsaver in a 61 meter (200 foot) test section on project STP-324(78) (Figure 1). STP-324(78) is located on U.S. Highway 412, east of the City of Woodward, beginning at the intersection of Lakeview drive and extending west (Figure 2).

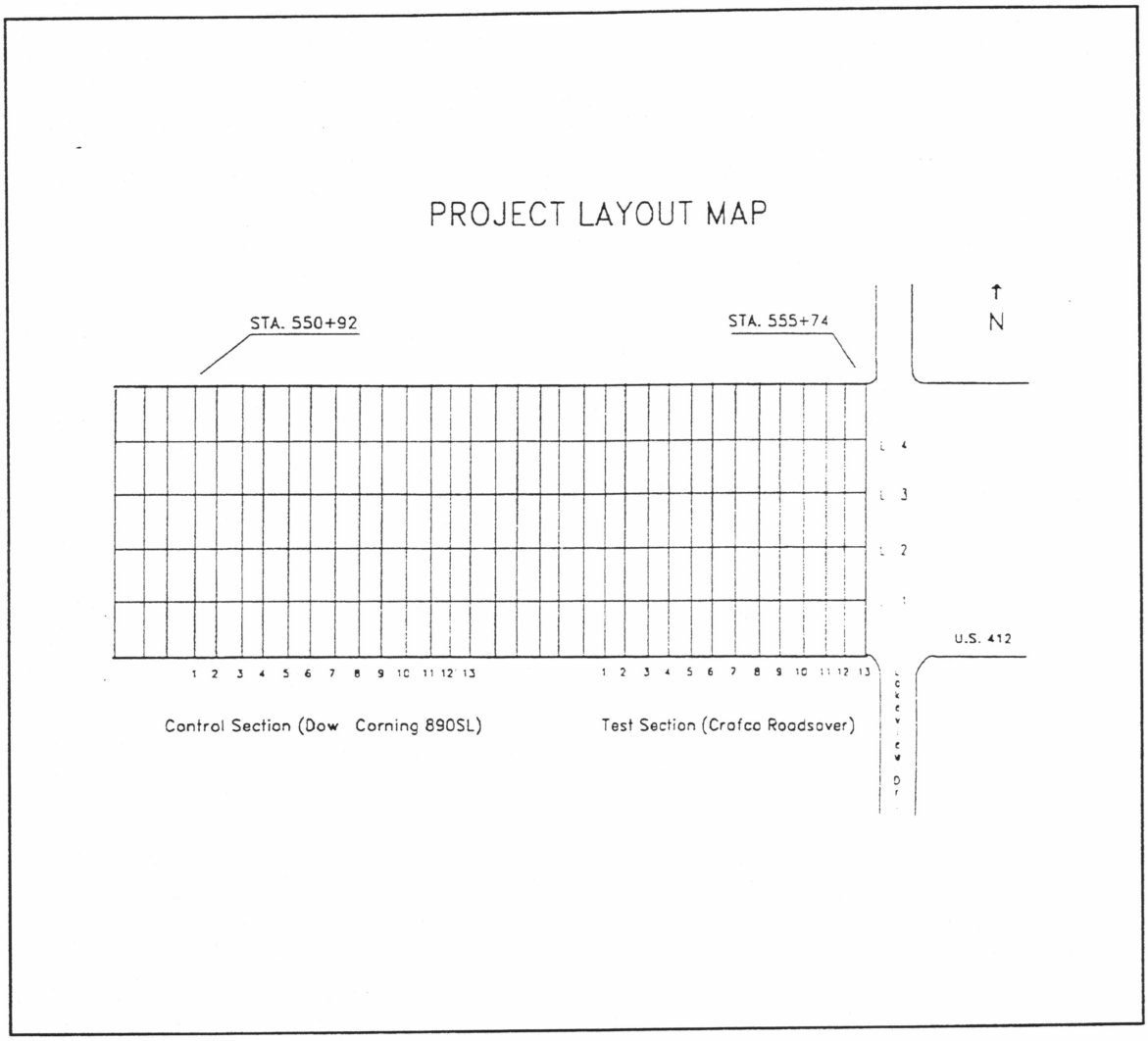

Figure 2. Project Diagram

Highway 412 in this area has four travel lanes and a turning lane in the center. The control and test sections are located in the two eastbound lanes and comprise 13 transverse and two longitudinal joints each. Both longitudinal joints (L1 and L2) are located in the driving area. Curbs make up the outside edges of the roadway (Fig. 3). The area between the control and test sections was sealed with a mixture of Crafco and Dow/ Corning sealants. The Control Section starts at Sta. 550+92 and ends at Sta. 552+72. The Test Section starts at Sta. 553+94 and ends at Sta. 555+74.

Project Description

Project STP- 324(78) consisted of grading, drainage, and surfacing of U.S. 412. Figure 3 shows the typical section in the area where the Crafco Roadsaver Test Section and the Control Section (sealed with Dow/Corning 890-SL) are located. 890-SL is a self-leveling sealant which has been accepted for use on ODOT projects. The sawing and sealing operations were conducted by employees of the general contractor.

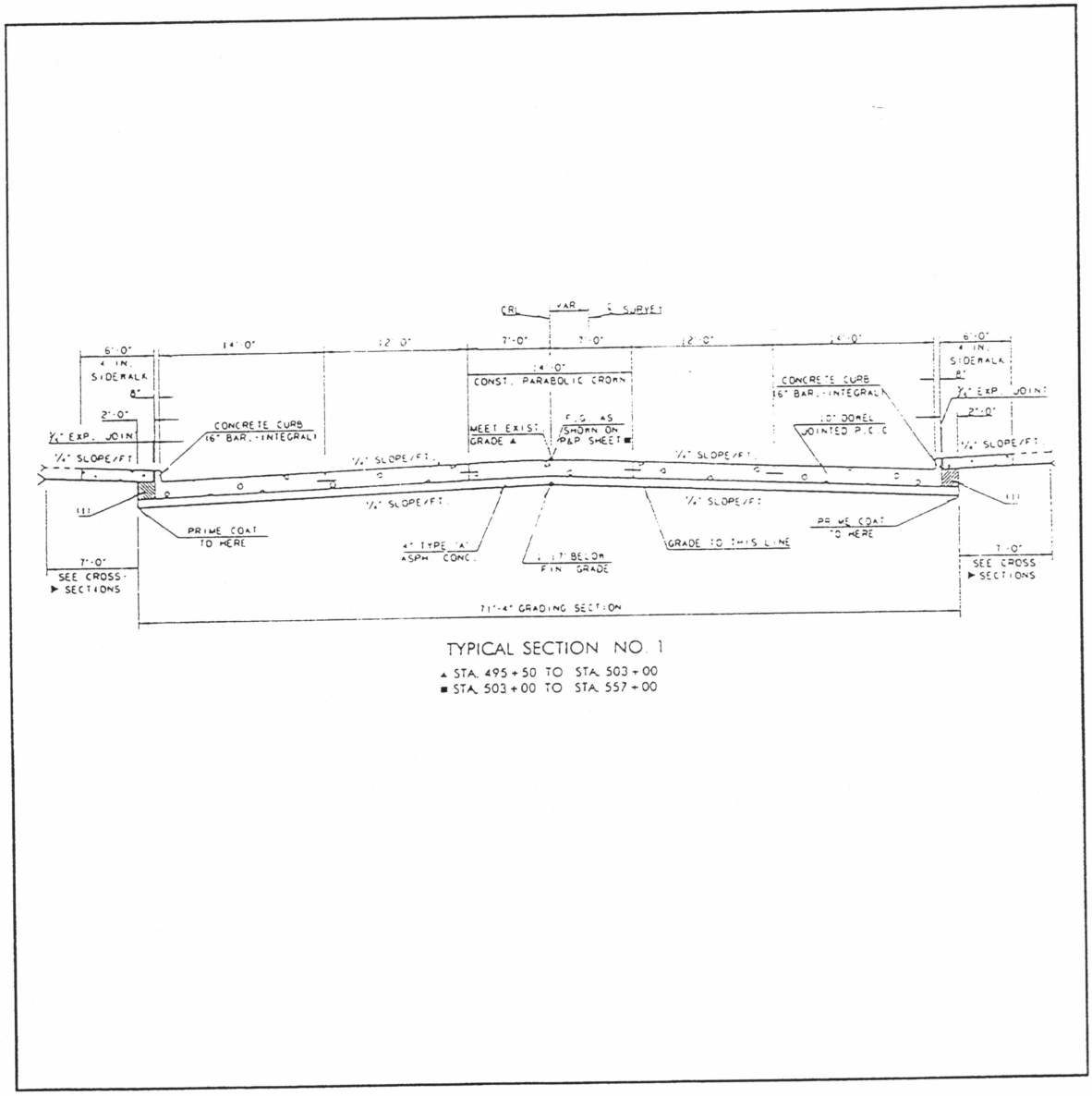

Figure 3. Typical Section

Joint Preparation and Sealant Application

Joint Preparation:

Before Roadsaver is applied, the manufacturer requires that the joints to be sealed be sawed and flushed with water immediately after the sawing operation. The contractor did this three days prior to the sealing operation. Crafco also requires the joints to be sandblasted and cleaned with compressed air before the backer rod is placed. The contractor placed the backer rod immediately after the sandblasting and tooled it into place. After the backer rod was in place the contractor used compressed air to clean the joint and backer rod. The sealant was then applied.

Sealant Application:

Crafco Roadsaver is a one component, low modulus, self-leveling silicone sealant. The manufacturer recommends that application be made in temperatures above 40° F. The temperature at the time of application, on July 24, 1995, was 29°C (85°F). Proper joint sealant application can be found in the plans (Fig. 4).

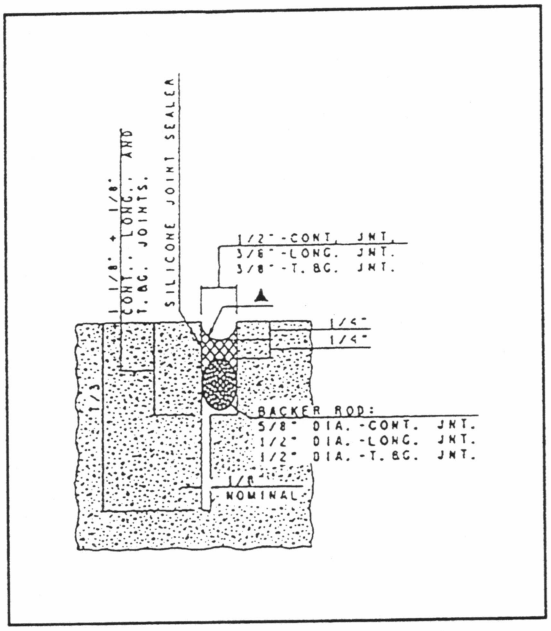

Figure 4. Joint sealant application

The contractor did not clear the pump and hose of the Dow 890-SL before sealing with the Crafco sealant. Because of this, five transverse joints between the control and test sections were sealed with a mixture of both sealants. These joints were not included in either section.

During the sealing operation, one worker used a high pressure hose to clean the joints while another worker followed with the sealant applicator wand. The sealant was applied to the joint using a Pyles air powered bulk dispensing machine (Fig. 5) with a hand held wand (Fig. 6) at a slow walk.

The contractor stated that he thought the Roadsaver sealant will work well and had no problems with applying it. He also said that it was thicker than the Dow 890-SL that he had been using.

Post Application Inspection:

The day after the sealant was installed a survey of the test joints was made. The sealant seemed to have good adhesion to the pavement. Locations where bubbles had formed were present through most of the test section (Fig. 7). No bubbles had formed in the control section.

Monitoring, Evaluation, Conclusions, and Recommendations

Monitoring:

Failure location, type of failure (adhesion or cohesion), size of the failure, and any other information considered significant by the investigator was recorded. None were found.

Evaluation:

Test and control sections were surveyed at six month intervals for three years. No failures occured during this time. The bubbles noticed after construction were surface in nature and did not seem to cause any problems with the overall performance of the Crafco product. Performance of the two sealants have been compared on the basis of the number, type, and size of failures occurring and both appear to be suitable for highway joint sealing operations.

Conclusions:

No failures were recorded in either section during the three year evaluation. The performance of Crafco Roadsaver has proven that there are other products available for joint sealant work. This should allow for a more competitive market, provided that ODOT specifications are changed to allow the use of this product.

Recommendations:

This author recommends that all applicable specifications be changed to allow a product with the characteristics of Crafco Roadsaver to be used in highway joint sealant work.

Project Photos

Figure 5. Pyles air powered bulk dispensing machine

Figure 6. Sealant application

Figure 7. Bubbles in sealant

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