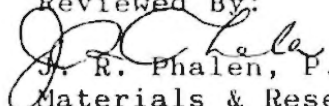
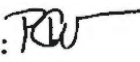


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 March 25, 1988  
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RESEARCH UPDATE

NUMBER 88-8

COST EFFECTIVENESS OF ASPHALT-RUBBER SURFACE TREATMENT ON I-91  
 SPRINGFIELD-WEATHERSFIELD

REFERENCE:

Initial Report 79-6; Interim Report #1, 81-4; Interim Report #2, 83-6

HISTORY:

In 1979 a section of Interstate 91 in the towns of Springfield and Weathersfield from MM 41.9 northerly to MM 51.5 was overlaid. The 9.73 miles of the N.B. lane were repaved with a standard 2" bituminous overlay which followed crack filling and a 1/2" leveling course. The cost of this section, which became the control, was \$3.82/sy.

The S.B. lane from MM 41.9 northerly for 0.97 miles received crack filling, a 1/2" leveling course, an asphalt rubber treatment as a stress relieving interlayer (ARI), and a 1" bituminous overlay at a cost of \$4.39/sy.

The remaining 8.4 miles of the S.B. lane on the project were treated with crack filling, a 1/2" leveling course and an asphalt rubber surface treatment (ARST) at a cost of \$2.86/sy.

The performance of asphalt-rubber as a surface treatment and as a stress absorbing interlayer for reflective crack control were reported in the referenced reports. An initial problem with loss of stone from the ARST was reported which eventually resulted in a substantial cost for replacement of broken windshields.

The following table compares the performance of the three sections for various factors in 1982, after three years in service.

FACTOR	Control	ARI	ARST
Reflective Cracking	51%	93%	100%
Pavement Rutting (1983)			
Travel Lane	5/32"	2/32"	3/32"
Passing Lane	3/32"	1/32"	2/32"
Riding Quality (Inch/Mile)	50 (Good)	47 (Good)	79 (Fair)
Friction Values(@ 40 MPH)	43	47	47*(3/8")

\* 48 where 1/2" stone was applied.

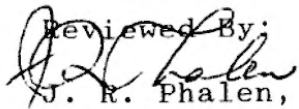
STATUS:


As was apparent in the 1983 interim report, the use of asphalt-rubber as a reflective crack prevention measure was not successful. The ARST was 25% less expensive to produce and apply than the control treatment and, when last tested in 1982 had produced an acceptable riding quality. The question of cost effectiveness could not be answered until both pavements had completed their respective life cycles.

The S.B. lane (ARI & ARST) was repaved in 1985. The annualized cost for the ARST was therefore \$0.48/sy. The annualized cost for the ARI was \$0.78/sy. The N.B. lane (control) is to be repaved in 1988. The annualized cost for the standard treatment will be \$0.42/sy which is 16% less than the ARST.

CONCLUSION

Based on annualized cost and quality of performance, it must be concluded that this application of asphalt-rubber as a surface treatment and as an interlayer, was not cost effective.

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NUMBER U88-9

## PERFORMANCE OF LIQUID LATEX (ULTRAPAVE) IN A CHIP SEAL

### HISTORY:

In September of 1987, District #4 forces applied a CRS-2 emulsion chip seal on approximately 1.8 miles of Vt Rte 12A in the town of Braintree. One distributor truck load of the CRS-2 emulsion was modified on the morning of Sep. 15th by the addition of 3% Ultrapave, a liquid latex additive which was being used experimentally to evaluate its ability to reduce the loss of surface stone. The most southerly section of the project was sealed with that load beginning at 8 AM with the air temperature 45 deg.F. and rising. Both lanes of the highway were completed with the modified pavement by 9:50 AM when the temperature had risen to 59 deg.F. The remainder of that tanker of emulsion and part of a second load were used to complete sealing northerly to the Braintree-Granville town line.

### STATUS:

A field inspection on March 22, 1988 revealed that significant stone loss had occurred especially between wheel paths in the southbound lane. Overall, stone loss has been greater from the standard seal. In the area with standard emulsion the aggregate could easily be popped out of the surface or dislodged by scuffing with a boot. In the area where the Ultrapave was added the small stones could be pried out but it required more effort due to the adhesive quality of the binder.

The manufacturer's representative revealed that during the 1987 construction season the bid price for emulsion for chip seal in the northeast was approximately 70 to 74 cents per gallon. The addition of Ultrapave in those states which used it in significant amounts added approximately 25 cents to the per gallon cost.

Using the cost figures above and an application rate of 3 sy./gallon, the additional cost for 1 mile of 22' wide roadway would be approximately \$3,200.00.

### RECOMMENDATION:

Based on the preliminary observations made on the Rte. 12-A application, consideration should be given to the addition of a liquid latex where experience indicates significant stone loss could be anticipated.

Dist. A,B,C,D,E