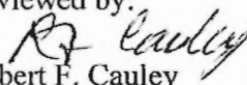



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RESEARCH UPDATE

Update U95-14

**CARBON BLACK MODIFIED PAVEMENT**  
 (FINAL REPORT)

**REFERENCE:** WP 86-R-6, Updates U88-1, U90-3, U93-2

**HISTORY:** In 1986 two 600 foot sections of Court Street (US 7) in Middlebury, one at School Street and the other at Charles Avenue, were reconstructed to alleviate severe wheelpath rutting. Different thicknesses of the original pavement were removed, stair step fashion, through the intersections to determine the minimum depth of replacement necessary to prevent recurrence of the original distress. The reconstruction used a high stability mix in the School Street intersection and the same mix modified with carbon black (MICROFIL 8) in the Charles Avenue intersection. Details of the mix designs and thicknesses were previously reported.

**COST:** The high stability mix cost \$35.00 per ton, while the carbon black modified mix cost \$78.00 per ton.

**STATUS:** Traffic volumes have increased in the test sections since 1985, with the ADT approximately 16,000 in 1994. Both sites were surveyed for rutting at various times during the past 9 years. The results of these rut surveys, in 1/16 inches, are listed below (CB denotes carbon black modified pavement, and Control is the high stability mix).

Depth (in.)	1987		1988		1989		1992		1995	
	CB	Control	CB	Control	CB	Control	CB	Control	CB	Control
1	3	-----	6	-----	6	-----	10	-----	10	-----
1.5	1	3	3	7	3	7	5	11	7	15
3	1	2	2	4	2	4	2	5	1	9
5.5	0.5	1	2	4	2	4	3	6	2	7
8	0.5	1	2	4	2	3	3	6	2	6

**CONCLUSIONS:** The carbon black modified pavement outperformed the high density pavement, with the average measured rut depths in the carbon black test area one half to one third as severe as the ruts in the high stability control area. The replacement of 1 to 1.5 inches of old pavement with the same amount of carbon black or high stability pavement failed to prevent rutting through nine years. The results suggest that replacement of 2 to 2.5 inches of old pavement with the same amount of carbon black modified mix would have been an effective treatment for correction of rutting throughout the project.

**FOLLOW UP:** No further evaluations will be conducted since the project was repaved in 1995 using a SHRP PG 70-28 high stability asphalt cement.