

HR-341 Bond Enhancement Techniques For PCC Whitetopping

Key Words: Whitetopping, Pavement bonding, Overlays, Rehabilitation

This research was initiated in 1991 as a part of a whitetopping project to study the effectiveness of various techniques to enhance bond strength between a new portland cement concrete (PCC) overlay and an existing asphalt cement concrete (ACC) pavement surface. A 1,676 m (5,500 ft) section of county road R16 in Dallas County was divided into 12 test sections. The various techniques used to enhance bond were power brooming, power brooming with air blast, milling, cement and water grout, and emulsion tack coat. Also, two sections were planed to a uniform cross-section, two pavement thicknesses were placed, and two different concrete mix proportions were used. Bond strength was perceived to be the key to determining an appropriate design procedure for whitetopping. If adequate bond is achieved, a bonded PCC overlay technique can be used for design. Otherwise, an unbonded overlay procedure may be more appropriate.

Conclusions:

1. Bond Strength Differences. Milling increased bond strength versus no milling. Tack coat showed increased bond strength versus no tack coat. Planing, Air Blast and Grouting did not provide noticeable improvements in bond strength; nor did different PCC types or thicknesses affect bond strength significantly.

2. Structure. Structural measurements correlated strongly with the wide variation in pavement thicknesses. They did not provide enough information to determine the strength of bonding or the level of support being provided by the ACC layer. Longitudinal cracking correlated with PCC thicknesses and with planing

3. Bonding Over Time. The bond between PCC and ACC layers is degrading over time in the outside wheel path in all of the sections except tack coat (section 12). The bond strength in the section with tack coat was lower than the others, but remained relatively steady.