

# **Evaluation of slurry seal performance in the Eastern Province of Saudi Arabia.**

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## **Abstract**

Slurry seal is utilized to maintain road in the Eastern Province of Saudi Arabia using local materials. In many cases deterioration of the slurry sealed surfaces failed within very short period.

The objective of this research is to investigate in the laboratory, the performance of slurry seal mixes as utilized in the Eastern Province of Saudi Arabia, and to find out problems associated with the utilized mixes. The main important factors that affect the performance of slurry seal are; 1) aggregate type, 2) emulsion type, 3) Portland cement content, 4) fine particles content and 5) testing temperature. These factors were studied at the following levels: eleven types of aggregate and aggregate combination, two types of emulsion (CSS-1h & SS-1h), three levels of cement content {0%, 2%, & (4-5%) }, two levels of fine content (10% & 16%), and two levels of temperature (23 & C 45 C). The Wet Track Abrasion Test was adopted to evaluate the performance of slurry seal.

Data obtained were analyzed. The analysis was carried out in three parts: 1) preliminary analysis, where the differences (the percentage of reduction or increasing) in the average wear value gained due to the effect of treatment (aggregate type, emulsion type, cement content, ...) were calculated and summarized in tables. 2) analysis of variance; in this part the average wear value were compared at 5% significant level. Multiple Duncan's test was carried out when necessary. 3) Multiple regression analysis was carried out to relate the dependent variable (wear value) to the independent variables (aggregate type, emulsion type, residual asphalt, cement content...) in a regression model.

Results from data analysis disclosed that the most important factor that cause the rapid deterioration is aggregate type. Analysis of variance disclosed that aggregate type, cement content and temperature have significant effect on wear value at 5% significant level, while emulsion type and fine particles content have significant effect. In the regression analysis the relationship between the dependent variable (wear value) and independent variables was found to be a logarithm relationship. The aggregate type, emulsion type, fine particles content and temperature were entered to the model as dummy variables.