



Evaluation of a highway pavement using non destructive tests: Falling Weight Deflectometer and Ground Penetrating Radar

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This paper presents the results of the application of Falling Weight Deflectometer (FWD) and Ground Penetrating Radar (GPR) to assess the bearing capacity of a rehabilitated flexible highway pavement that began to show the occurrence of cracks in the surface layer, about one year after the improvement works.

A visual inspection of the surface of the pavement was performed to identify and characterize the cracks. Several core drills were done to analyse the cracks propagation in depth, these cores were also used for GPR data calibration. From the visual inspection it was concluded that the development of the cracks were top-down and that the cracks were located predominantly in the wheel paths.

To determine the thickness of the bituminous and granular layers GPR tests were carried out using two horn antennas of 1,0 GHz and 1,8 GHz and a radar control unit SIR-20, both from GSSI.

FWD load tests were performed on the wheel paths and structural models were established, based on the deflections measured, through back calculation. The deformation modulus of the layers was calculated and the bearing capacity of the pavement was determined.

Summing up, within this study the GPR was used to continuously detect the layer thickness and the GPR survey data was calibrated with core drills. The results showed variations in the bituminous layer thickness in comparison to project data.

From the load tests it was concluded that the deformation modulus of the bituminous layers were also vary variable. Limitations on the pavement bearing capacity were detected in the areas with the lower deformation modulus.

This abstract is of interest for COST Action TU1208 Civil Engineering Applications of Ground Penetrating Radar.