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Long Term Monitoring of a Continuous Reinforced Pavement Highway

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The continuous reinforced concrete pavement (CRCP) has been proposed as an alternative for high speed roadways with heavy traffic. Compared to others, advantages are expected on cost, durability, and performance; but particularly on the tolerance to concrete cracking, while it is designed to transmit loads to the steel reinforcement. A long term monitoring system was developed to evaluate a particular CRCP design. Sensors based on fibre optics technology and were embedded in the concrete pavement to measure temperature gradients and strains in the concrete and steel reinforcement. An experimental 300 meters test bed was built on the highway that reports the heaviest traffic in Mexico. In this case, stabilized and hydraulic soil bases were compared and a large crack was induced to simulate a damaged condition. After one year of periodic monitoring, temperature variations and gradients have been obtained for different seasons and weather conditions. The overall load-strain performance of the pavement system (concrete-steel) has been evaluated under different load conditions. In general, it has been found that the main driving parameter that defines the overall structural performance of the CRCP is temperature, affecting the boundary conditions interaction with the base, producing different strain amplitudes for the same load traffic condition during one day period.

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Ключевые слова:

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Abstract

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References