Assessment of Relationship Between Static and Dynamic Load Using Regression Analysis and Artificial Neural Network Model

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Abstract

The Light Falling Weight Deflectometer (LFWD) load test has been developed to directly estimate the in-situ elastic modulus of near surface profiles as foundation, and subgrade layers is presented in this paper. For this purpose, field tests were conducted on selected sections from landfill project within Anbar province. In addition, forty test sections were constructed and tested at the Civil Engineering Department- University of Anbar. All sections were tested using the ZFG 3000 model - LFWD in companion with the Plate Load Test (PLT) that were used as reference measurements. Regression analyses were conducted to determine the best correlations between the elastic modulus obtained from LFWD and PLT tests., Evd. ANN model is used to calculate dynamic deformation modulus, Evd and comparing with the regression statistical model. The results indicate that ANN model have the capability of predicting dynamic deformation modulus, Evd with a high degree of accuracy. Good correlations were obtained, which demonstrated that the LFWD can be reliably used to predict the modules obtained from plate load test and degree of compaction values, and hence can be used to evaluate the stiffness/strength parameters of shallow subgrade layers.