



## **FWD application to railway track-bed layers characterization**

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### **Abstract**

The evaluation of the railway track condition represents one of the most significant parts of maintenance planning. Generally, only the track geometry is measured and then, during the maintenance process, the parameters of the track layout are restored, through tamping and levelling processes. Nevertheless, one of the main causes of track geometry deterioration is related to the track-bed condition. An evaluation of track stiffness can contribute to identify foundation problems and to adopt adequate maintenance actions.

In order to identify structural problems, a continuous monitoring of the track through non-destructive load tests can be performed. The Falling Weight Deflectometer (FWD) equipment is commonly used to evaluate pavement's condition and, due to its advantages, has been recently used also for railway platform evaluation. Thus, various FWD tests were performed during the construction of a new railway section, designed for high speed traffic. Three test campaigns were undertaken on different months, aiming to study the climate effect, and also different load levels were applied on each test point, in order to analyse the non-linear response of the track-bed layers to load level.

Based on the FWD tests results, the elastic moduli of the track-bed layers are back-calculated and, consequently, the stiffness variation along the track can be estimated. This enables the identification of possible settlements caused by foundation.

The main results obtained so far are presented in this paper, together with proposals for future developments.

*Keywords: railway platform, non destructive tests, loading tests, Falling Weight Deflectometer, back-calculation*