

Non destructive tests for railway infrastructure stiffness evaluation

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The maintenance of railways has a significant impact, not only economically, but also as a result of traffic restrictions during operation. An important part for a proper maintenance policy is the evaluation of the condition of the railway track. Nowadays, the parameters measured during the railway monitoring are mainly related to the track layout and rail wearing. Recently, the use of non destructive techniques for railway substructure evaluation has increased as a result of advantages in the monitoring methods being present. Equipment that is used successfully for pavement evaluation, such as the ground penetrating radar (GPR) [1,2] and the falling weight deflectometer (FWD), are adapted to the specific requirements of railway infrastructure.

A test section was studied [3,4] in order to define the procedure to be applied for data analysis along the track. Loading tests and layer thickness measurements were used for backcalculation and evaluation of railway platform bearing capacity. Some of the results obtained for structural characterisation of this test section are presented in this paper.

In this way, it is possible to identify the causes of stiffness variation along the infrastructure and to correlate the future in service behaviour with the real causes of possible pathologies, such as track settlements.

Based on the tests performed during this study, it will be possible to define testing procedures for FWD and GPR measurements, to study the substructure response under different load levels and water content conditions and to correlate the FWD test with other loading tests performed in situ, such as portable falling weight tests and plate load tests.

The application of non-destructive testing has proven to be an efficient way to obtain continuous information of the platform condition.

References

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