

## GROUND-BORNE VIBRATION FROM TRAINS – A THREE DIMENSIONAL MODEL

The report describes a mathematical model used to predict the vertical transfer receptance from a harmonic load on a track, to a point on the surface of the ground. The aim of the work was to produce a model, which could corroborate previous experiments that showed an attenuation of vibration at low frequencies when the track structure was built on a concrete slab resting on the surface of the ground.

It was thought that the effects of bending waves in the concrete beam carrying energy away along the track were responsible for the reduction in vibration levels observed at the trackside. The model, therefore, incorporates the track as a two-dimensional layered structure, which includes the bending properties of both the rail and concrete beam. All components of the track structure are represented as infinite and continuous in the direction along the track; therefore no account is taken of periodic supports (sleepers etc).

The report concludes with a summary of the usefulness of the model and the findings of the study using a half-space model for various track constructions.