

DYNAMIC ANALYSES OF VIBRATION ISOLATING TRACKS FOR TUNNELS

The method of reducing troublesome ground borne vibrations (due to rail traffic in tunnels) by supporting tracks on resilient materials is studied. A dynamic analysis of 'floating tracks' is presented. It is assumed that the excitation force on rails is due to the movement of the unsprung mass over an uneven rail profile. The performance of floating tracks is compared with that of non-floating tracks.

The effect of damping in resilient supports on the vibration isolation deficiency is studied. It is shown that the efficiency increases with decrease in damping, in medium and high frequencies. Even at its 'resonant' frequency, the floating track can fare better than the non-floating track if the system is designed correctly for damping. An analysis for attenuation of vibrations in soils surrounding tunnels is also presented in this report.

It is shown that long floating tracks are more effective than short floating sleepers in reducing ground borne vibrations. The use of resilient wheels on non-floating tracks is less effective than long floating tracks.