

عنوان مقاله:

Investigation of modelling for predicting the dynamic behavior of the environment due to subway crossing

محل انتشار:

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خلاصه مقاله:

One of the environmental challenges in the urban rail transportation industry is the vibrations and noise caused by the railway passage. Vibration prediction methods are divided into analytical, quasi-experimental, and numerical modelling methods. Factors such as higher train speed, rail joints, crossovers, wheel flats or rail corrugation, low soil damping and floor resonance, building walls and ceilings are the most critical factors that increase vibrations and factors such as increasing the diameter distance of the source receiving vibrations, the weight of the structures, the use of floating slabs are the essential factors in reducing vibrations. In this paper, various modellings and factors that affect it are investigated, and according to different hypotheses as other track conditions geology, their results are compared. This helps to decide the appropriate method for vibration insulation according to its application. This paper also concluded that Vibration in rock is damped at a lower rate than in soft soils. It has also been supposed that elastic supports can reduce vibrations by up to 6 dB and perform better near rails at low frequencies (less than 10 Hz). Still, for longer distances (e.g., ground level) or higher frequencies (100 to 160 Hz), floating slabs have a better performance. The trench depth should be equal to the Rayleigh wavelength's depth to achieve proper insulation by the trench. The effect of tunnel wall thickness on ground-level damping is negligible, and the impact of soil layer depth on vibrations is highly dependent on the excitation frequency.

کلمات کلیدی:

Subway, Numerical modeling, Slab track, Environmental effect, Finite element, Ground borne effect, Structure dynamic, Under ground train

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