Numerical Study on Effect of Barriers on Vibrations Induced by Construction Activities

Construction activities like pile driving, dynamic compaction, or blasting can be the sources of adverse effects on adjacent structures and sensitive installations. It is often suggested that vibrations can be interrupted using wave barriers. The properties of barriers affect on their efficiency. In this research, the performance of TDA in-filled open trenches, made of pieces of scrap tires, compared with geofoam in-filled barriers due to low cost of production and its benefits in road construction. Vibration transmission from the source to target is modeled by means of Finite Difference Method. Based on the presented models, the variation of amplitude reduction has been investigated. Finally, considering the impact of barriers to reduce vibrations, the suitable modes for barrier dimensions and distance from vibration source are investigated.

Keywords: Wave Barriers, Construction activities, FDM, Vibration Amplitude