

Thesis title:

Investigate vibration effects on buildings due to train movements

Abstract:

Train induced vibrations is a major issue faced by the buildings located at the vicinity of the railway tracks. Excessive vibrations would cause damage to the buildings as well as create discomfort to the building occupants. The level of vibration depends on many parameters such as the distance to the building, weight of the train engine and the compartments, power of the train engine and the speed, type of soil in the ground, conditions of the railway slippers and the compaction of the soil/aggregates below the slippers. Limited research has been conducted to investigate the influence of above parameters on the vibration levels, highlighting the requirement of a comprehensive study on this field. On the other hand, some of these parameters such as weight of the engine, no of compartments, speed of the train, soil conditions may significantly vary according to the local conditions in Sri Lanka.

This research will therefore assess the influence of the above parameters by conducting an extensive field investigation. An electronic gadget using digital accelerometers will be developed to determine the ground vibration at several points simultaneously. Since the field measurements is a costly approach, validated numerical models will also be developed to predict the vibration induced with the train movement.