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**Vibration damage to existing masonry structures caused by construction activities**

H. Sooriyaarachchi, J. M. N. U. J. Menike, J. K. S. Gamage,  
P. A. M. Chandani and D. D. Edirisinghe

*Dept. of Civil and Environmental Engineering, Faculty of Engineering,  
University of Ruhuna, Sri Lanka*

Use of heavy machineries in construction projects close to existing structures are on the rise. Unreinforced masonry which is the main construction material of domestic houses are often subjected to cracking due to these increase vibration levels close to structures. Environmental authority has published guide lines for the maximum safe vibration level for existing structures as velocity 2mms-1 and frequency limit (10-50) Hz to limit the structural damages to masonry constructions. However there are still many complains of masonry damages at these threshold levels. First of all, it is not clear how a single vibration limit is applicable fro different masonry constructions unless the limit is based on the worse case of masonry construction. There are varieties of masonry structure in Sri Lanka. Burnt brick masonry 9" double brick 4" single brick and block masonry are the most commons type found in the country. Apart from masonry type, vibration impact also depends on the number of opening shape and size of the openings. Fixity condition of the wall panel is one other variable that influence the vibration. In this study primary wall panels with different openings that has sustained damages at the threshold vibration level during the construction activities of Colombo - Matara express way is analyzed to evaluate the relevance of current threshold limit on wall panels with different openings. Dynamic finite element analysis of the wall panel conducted with the actual vibration data from site strongly suggest that there is direct correlation of stress pattern of the dynamic analysis and actual crack pattern observed at site. Further analysis confirmed that the vibration has resulted stress combination out side the experimentally establish failure envelope for brick masonry. It can therefore be concluded the current vibration limit is unsafe and inadequate to safeguard cracking of the existing masonry.

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