

High Rise Building Vibration Control Using Tuned Mass Damper

Authors : T. Vikneshvaran, A. Aminudin, U. Alyaa Hashim, Waziralilah N. Fathiah, D. Shakirah Shukor

Abstract : This paper presents the experimental study conducted on a structure of three-floor height building model. Most vibrations are undesirable and can cause damages to the buildings, machines and people all around us. The vibration wave from earthquakes, construction and winds have high potential to bring damage to the buildings. Excessive vibrations can result in structural and machinery failures. This failure is related to the human life and environment around it. The effect of vibration which causes failure and damage to the high rise buildings can be controlled in real life by implementing tuned mass damper (TMD) into the structure of the buildings. This research aims to study the effect and performance improvement achieved by applying TMD into the building structure. A structure model of three degrees of freedom (3DOF) is designed to demonstrate the performance of TMD to the designed model. The model designed is the physical representation of actual building structure in real life. It is constructed at a reduced scale and will be used for the experiment. Thus, the result obtained will be more accurate to compared with the real life effect. Based on the result from experimental study, by applying TMD to the structure model, the forces of vibration and the displacement mode of the building reduced. Thus, the reduced in vibration of the building helps to maintain the good condition of the building.

Keywords : degrees-of-freedom, displacement mode, natural frequency, tuned mass damper

Conference Title : ICNV 2017 : International Conference on Noise and Vibration

Conference Location : Singapore, Singapore

Conference Dates : January 08-09, 2017