



Damping Characteristics of Next-Gen Masonry Infilled RC Panels: Experimental Investigations

Tushar Bhoraniya¹, Sharadkumar Purohit¹

¹Government Engineering College, Bhuj, Gujarat

²School of Engineering, Institute of Technology, Nirma University, Ahmedabad, Gujarat

Abstract

Current construction practices adopt next-gen masonry infilled Reinforced Concrete panels with Autoclaved Aerated Concrete (AAC) Block and Fly Ash Brick (FAB) replacing conventional Red Clay brick as masonry infill. Present paper aims to evaluate damping coefficient for RC panel infilled with various types of masonry materials. Scaled test specimens of RC panels infilled with FAB and AAC Block, cast non-integrally, have been prepared. Masonry infills are expected to alter the dynamic response of the RC panel due to varied damping characteristics of an individual element under dynamic loading. Pseudo-static or Pseudo-dynamic test are mostly performed to estimate equivalent viscous damping coefficient of infilled RC panel. However, damping estimation can be done through free vibration test for lightly damped linear systems. Experimental programme has been developed comprising of masonry prism and masonry infilled RC panel test specimens with relevant instrumentation to perform free vibration tests at Heavy Structures Laboratory (HSL). The programme has been extended further to investigate the variation of damping coefficient with ensuing damage in infill/RC elements due to pseudo-static testing with increasing force controlled loading protocol through hydraulic jack on infilled RC panel test specimens. Free vibration test has been performed before each cycle of loading protocol of pseudo-static testing by imparting initial velocity on test specimens. Free vibration test on masonry prisms revealed that inherent viscous damping coefficient of AAC block prisms for in-plane direction yields average 32% higher value than FAB block prisms. For RC infilled test specimens, the damping coefficient was found to increase with the progression of damage in infills and RC panels under pseudo-static testing. AAC block infilled RC panels yielded average damping coefficient values ~ 20% higher as compared to FAB infilled RC panels.

Keywords: Free vibration test, AAC masonry prism, Damping coefficient, Infilled RC panels, Pseudo-static test, Infilled RC panel