

Understanding Seismic Behavior of Masonry Buildings in Earthquake

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Abstract : Unreinforced Masonry (URM) wall is vulnerable in resisting horizontal load such as wind and seismic loading. It is due to the low tensile strength of masonry, the mortar connection between the brick units. URM structures are still widely used in the world as an infill wall and commonly constructed with door and window openings. This research aimed to investigate the behavior of URM wall with openings when horizontal load acting on it and developed load-drift relationship of the wall. The finite element (FE) method was chosen to numerically simulate the behavior of URM with openings. In this research, ABAQUS, commercially available FE software with explicit solver was employed. In order to ensure the numerical model can accurately represent the behavior of an URM wall, the model was validated for URM wall without openings using available experimental results. Load-displacement relationship of numerical model is well agreed with experimental results. Evidence shows the same load displacement curve shape obtained from the FE model. After validating the model, parametric study conducted on URM wall with openings to investigate the influence of area of openings and pre-compressive load on the horizontal load capacity of the wall. The result showed that the increasing of area of openings decreases the capacity of the wall in resisting horizontal loading. It is also well observed from the result that capacity of the wall increased with the increasing of pre-compressive load applied on the top of the walls.

Keywords : masonry constructions, performance at earthquake, MSJC-08 (ASD), bearing wall, tie-column

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