

Title Flag Wall Systems to Improve the Seismic Performance of Tall Buildings

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Abstract

The seismic performance of high-rise buildings is primarily controlled by the stiffness of their lateral load-resisting system. All structural components contribute their individual stiffnesses to the overall system. In recent years, several new structural systems and techniques have been developed to improve the lateral stiffness and the seismic performance of reinforced concrete (RC) high-rise buildings. The use of flag wall system (RC walls in selected floors, not reaching the foundation) is among an efficient way to improve the resistance of high-rise buildings against lateral excitations. Partition walls, general made of brick masonry, are a necessary component of both commercial and residential high-rise buildings. However, they may not be used as outriggers due to discontinuity. These partition walls can be effectively replaced with RC walls and therefore, can be used as structural components. This study evaluates the seismic performance of such flag wall structural systems used as an alternative to the conventional outrigger system. Using a case study high-rise RC building, the detailed nonlinear structural analysis against earthquake is carried out for various configurations of flag walls. It is shown that the use of flag walls as part of lateral load-resisting system can significantly improve the structural performance of high-rise buildings.

Keywords High-rise buildings, Flag Wall Systems, Nonlinear Analysis, Partition Walls, Outrigger Systems.