

# **Analytical study of building height effects over Steel Plate Shear Wall Behavior**

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## **Abstract**

In the latest three decades, the steel plate shear walls (SPSW) system has emerged as a promising lateral load resisting system for both construction new buildings and retrofit of existing buildings. This system has acceptable stiffness for control of structure displacement, ductile failure mechanism and high energy absorption. This paper will quantify the effect of increasing the height over analytical behavior of SPSW (height effect). Considering abundant emergence of high-rise buildings all over the world in recent years and their need for strengthening, the importance of the studies presented in this paper cannot be overemphasized for optimum height usage of SPSW lateral resisting system. The study was performed through design of four models of dual system with special moment frames capable of resisting at least 25% of prescribed seismic forces. In this article, structure buildings consisting of 5, 10, 15 and 20 stories have been modelled. Results consisting of story shear absorption, support reaction forces, lateral story displacement and drift index have investigated for different cases. Results show that SPSW absorbs more shears at the lower stories than top stories. Furthermore, axial reaction of edge supports experience decreasing rate corresponding to increase in the story numbers. Drift magnitude of steel plate shear wall with the 5 stories has the maximum value at the top story while the systems with the 10 and the 15 stories have maximum drift at lower stories.

**Keywords:** Steel Plate Shear Wall (SPSW), dual system, high-rise buildings

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