

Comparative Performance Study of Steel Plate Shear Wall with Reinforced Concrete Shear Wall

Authors : Amit S. Chauhan, S. Mandal

Abstract : The structural response of shear walls subjected to various types of loads is difficult to predict precisely. They are incorporated in buildings to resist lateral forces and support the gravity loads. The steel plate shear walls (SPSWs) are used as lateral load resisting systems for buildings and acts as an alternative to reinforced concrete shear walls (RCSWs). This paper compares the behavior of SPSW with the RCSW incorporated in a building frame having G+6 storey, located in Zone III, using the technique of Equivalent Static Method (ESM) as per Indian Standard Criteria For Earthquake Resistant Design of Structures IS 1893:2002. This paper intends to evaluate several parameters such as lateral displacement at tip, inter-storey drift, weight of steel and volume of concrete with the alteration of the shear wall with respect to different types viz., SPSW and RCSW. The strip model employed in this study is a widely accepted analytical tool for SPSW analysis. SPSW can be modelled as truss members by using a series of diagonal tension strips positioned at 45-degree angles. In this paper, by replacing the SPSWs with the tension strips, the G+6 building has been analyzed using STAAD.Pro V8i. Based on the present study, it can be concluded that structure with SPSWs is much better than structure with RCSWs.

Keywords : equivalent static method, inter-storey drift, lateral displacement, Steel plate shear wall, strip model

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020