

An Investigation on Various Methods of Modeling of Connection Between Steel Sheet and Surrounding Frame in Light Steel Plate Shear Wall Frame

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Benefits such as speed of construction, reversibility, capability of architecture, etc. lead public interest to use light steel frames as a new approach in building system. One approach to face lateral forces caused by wind or earthquake in these systems is applying shear panels. These panels are constructed of various types of coatings such as plaster, plywood, steel sheets, or various forms of braces cross braces. Braces and covers are joined to perimeter frame using pen-screws. But it is not useful to apply common coatings in seismically active regions like Iran so we had to use steel sheets as lateral restraint system. The use of these panels accompanies some drawbacks; the basis of the relevant regulations is based on limited experimental observations and the lack of extensive research by the numerical modeling. Therefore, in this thesis a model of software has been introduced which offers the actual behavior of the system as a numerical model. Tentative samples Cheng Yu (2009), which are constituted current regulations, have been utilized in a model for this purpose. In this model the cover has been assumed as a thin plate and in order to modeling the connection effect three various methods have been proposed and evaluated including: continues connection model, discrete rigid connection, and discrete semi-rigid connection (using a spring at the connection point); each of these models' theoretical principals and modeling approaches are explained and final models are introduced, verified, and compared after various sensitivity analysis. Screw's internal forces and expressing methods' abilities as software's output reports indicate that however the discrete semi-rigid model has the best accommodation with the reality, but with regard to the percentage error, each of these models has its own usages in particular situations.

Keywords: light steel frame, shear panels covered by steel plate, connection modeling, continuous, rigid and semi-rigid connection.