Title Seismic Performance of Hybrid Concrete Steel Structural System Building

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Abstract

The selection of structural system is a basic important factor on appearance and functioning of the building and its constructability. The structural system is designed to carry vertical load and also to resist lateral load. To increase in building stiffness and to minimize the long-term effects of axial shortening, mixed systems and multiple materials are to be used in lateral load resisting system. Hybrid structure has become feasible, and it has been become widely to use with its unique advantages due to the combination of the advantages of individual material, steel and concrete. In hybrid structure design, decision on the selection of mixed structural systems is the most important factor. This study is especially focused on seismic performance of hybrid structure under severe earthquakes. Three different kinds of the buildings with conventional reinforced concrete frame with shear walls, steel moment connection frame with braces, and hybrid moment frame with concrete shear wall are analyzed with linear static analysis, response spectrum analysis, nonlinear static analysis, and nonlinear time history analysis to obtain the structural responses of story drift, story shear, story displacement and story moment. The analysis results of three different structural systems with same building configuration are compared .From the analysis results, it is found that the story drift of hybrid frame is significantly higher and predominantly flexible within the acceptable limit .No shear failure of columns is occurred in nonlinear analysis. Lateral load is resisted by the shear wall of hybrid frame building.

Keywords Vertical Load, Lateral Load, Hybrid Structure , Seismic Performance, Response Spectrum Analysis, Nonlinear Static Analysis, Nonlinear Time History Analysis, Structural Responses