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Behavior of Building With Eccentrically Braced Frame and Infill Wall in the Sarpol-E Zahab Earthquake

The Behavior of eccentrically braced frame (EBF) in terms of stiffness and ductility is between moment resisting frame and concentrically braced frame. EBF should be designed in such a way that yielding is only concentrated in the link beam at the non-linear stage. Field survey after the Sarpol-e Zahab earthquake shows that despite several defects in structural design and construction of EBFs, they have remained stable. In this study, one of the damaged buildings in the Sarpol-e Zahab earthquake, in the form of a three-story four-bay frame was modeled in Etabs and its seismic behavior in two cases; with and without infill walls was studied. The results of the analyses show that the presence of diagonal struts of infill walls reduces the axial force of the braces, the shear force, and the bending moment of the link beams. Infill walls also reduce lateral displacement and period of EBF, and they increase the lateral stiffness. Therefore, in the condition that there are several defects in the design and construction of link beams and braces, connecting the infill walls to the structure has a positive achievement. In this condition, if there were not infill walls, there would be a possibility of structural collapse.

Keywords: Eccentrically braced frame, Infill wall, Sarpol-e Zahab earthquake, Linear analysis.

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