The Impact of The Overstrength Factor on The Global Earthquake Performance of Reinforced Concrete Structures

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ABSTRACT

Designing earthquake-resistant structures based on performance has become popular in recent years. Today, the prediction of inelastic seismic responses and the evaluation of the seismic performance of a structural building are extremely important topics. The philosophy of capacity design is the subject of this investigation. EBCS EN 1998-1: 2014 specifies the criteria and requirements for the design of the building using capacity design philosophies. There are four structural parameters that are used to compare the overall seismic performance of the structures. ETABS 2016.1.0 software was used to model and analyze the structure of a ten-story regular framed reinforced building. Seismic action effects were analyzed using the lateral force method. In order to meet the code's requirements, the structure was designed using the capacity design philosophy and four different column-beam overstrength factors. To achieve the necessary energy dissipation, critical areas were meticulously detailed. Using static nonlinear analysis methods, the performance of the buildings was analyzed following the earthquake's design. Finally, the impact of the over-strength factor on the overall seismic performance of the structure was examined. The capacity curve, story displacement, interstory drift, and plastic hinge distribution of the building are used to evaluate the seismic performance of the structures.

Keywords: *Capacity DesignPerformance Level, Overstrength Factor, Plastic Hinge.*