

A Study on the Coefficient of Transforming Relative Lateral Displacement under Linear Analysis of Structure to Its Real Relative Lateral Displacement

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Abstract : In recent years, analysis of structures is based on ductility design in contradictory to strength design in surveying earthquake effects on structures. ASCE07-10 code offers to intensify relative drifts calculated from a linear analysis with Cd which is called (Deflection Amplification Factor) to obtain the real relative drifts which can be calculated using nonlinear analysis. This lateral drift should be limited to the code boundaries. Calculation of this amplification factor for different structures, comparing with ASCE07-10 code and offering the best coefficient are the purposes of this research. Following our target, short and tall building steel structures with various earthquake resistant systems in linear and nonlinear analysis should be surveyed, so these questions will be answered: 1. Does the Response Modification Coefficient (R) have a meaningful relation to Deflection Amplification Factor? 2. Does structure height, seismic zone, response spectrum and similar parameters have an effect on the conversion coefficient of linear analysis to real drift of structure? The procedure has used to conduct this research includes: (a) Study on earthquake resistant systems, (b) Selection of systems and modeling, (c) Analyzing modeled systems using linear and nonlinear methods, (d) Calculating conversion coefficient for each system and (e) Comparing conversion coefficients with the code offered ones and concluding results.

Keywords : ASCE07-10 code, deflection amplification factor, earthquake engineering, lateral displacement of structures, response modification coefficient

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