



## A Comparative Study of Seismic Performance of RC Frame-Wall Structures Designed as Per Various Inter-National Codes

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### Abstract

The structures now are rapidly growing vertically instead of horizontally and for taller buildings, consideration of lateral load is extremely important. Earthquakes are one of the most disastrous forces, which has caused immense loss of life and property in past decades. Seismic design of building has been undergoing a major revolution in recent years, with importance changing from strength to performance. The present study focuses on comparison of seismic performance of RC frame-wall building designed as per three national seismic design codes viz. Indian Code (IS 1893 Part I-2016), American Code (ASCE 7-10), and European Code (EN 1998-1 2004, Eurocode 8). Illustrative problems of 15, 18, 22, and 26 storey frames are analyzed and designed for Indian, American and European design provisions, considering both seismic and gravity loads. Performance evaluation of frames are done using nonlinear static pushover analysis and non linear time history analysis (NLTHA) using SeismoStruct software for set of 6 spectrum compatible artificial ground motions and a strong and weak ground motion of past earthquakes of India, America and Europe. It is observed from results of NLTHA that drift limit in terms of interstorey drift ratio has not exceeded the drift limit of 2%. Hence, buildings showed satisfactory performance when evaluated by a set of artificial as well as natural ground motions.

**Keywords:** Performance evaluation, International codes, RC frame-wall structures, Non-linear time history analysis, Static pushover analysis