

**COMPARATIVE EVALUATION OF ELASTIC DESIGN AND  
PERFORMANCE BASED PLASTIC DESIGN METHOD FOR A STEEL  
MOMENT RESISTING FRAME**

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**ABSTRACT**

Presented in this paper is the comparative evaluation of Performance Based Plastic Design (PBSD) method Elastic Design (ED) method in terms of lateral force distribution, design, strength and economy. For this, a steel moment resisting frame is first designed using the Elastic Design method and then using the Performance Based Plastic Design Method. The Lateral forces in the Elastic Design method are calculated using the Elastic Design Spectra and all the structural members are designed as elastic beam-columns based on Limit State Design Philosophy. The Lateral forces in the Performance Based Plastic Design Method are calculated using the inelastic spectral acceleration which is obtained by applying proper reduction factors. Results prove the superiority of the PBSD method over the Elastic Design method in terms of safety and overall economy.

**KEYWORDS:** Elastic Design Method, Performance Based Plastic Design Method, Target and Yield Mechanism.