

# QUANTITATIVE DERIVATION OF THRESHOLDS OF DIFFERENT SEISMIC PERFORMANCE LEVELS FOR SATCHLE FRAMES USING PUSHOVER ANALYSIS

## **Abstract**

According to performance based design philosophy, utilization of damage indices defined as the interstory drifts of a frame, is an effective method to estimate structural damage due to earthquake.

The damage indices are not yet available for satchle frames. This is the incentive behind this research work in which two different performance levels are defined firstly as life safety and collapse prevention. Based on this definition and using the nonlinear static analysis (pushover), some performance criteria are described for 4, 6 and 8-story steel frames, on the basis of relative displacements (drifts). The substructure method is used here to model the frame elements including laticed columns, double beams, concentric cross braces and satchle joints.

The results show that a drift of 1.5% at the roof level is a suitable measure for the collapse prevention level of satchle frames. Also, systematic procedures are presented to retrofit these structures to enhance their seismic behavior varying the related parameters.