

“SEISMIC EVALUATION OF AN EXISTING BUILDING USING PUSHOVER ANALYSIS”

A Dissertation submitted in partial fulfillment of the requirement for the
Award of degree of

**MASTER OF TECHNOLOGY
IN
STRUCTURAL ENGINEERING**

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JULY 2015
CERTIFICATE

This is to certify that the dissertation entitled “**Seismic Evaluation of an existing building using Push over analysis**” being submitted by me, to the **Delhi Technological University, New Delhi**, for the award of degree of Master of Technology in **Structural Engineering** is a bonafide work carried out by me. The research reports and the results presented in this thesis have not been submitted in parts or in full to any other University or Institute for the award of any degree.

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I specially thank all the people who are active in this field. Reference material (pictures, tables and forms) from various national and international reports and journals, are included in this report as per the requirements and all these are quoted under the reference section at the last of this project report.

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Abstract

Pushover analysis is a static, nonlinear procedure using simplified nonlinear technique to estimate seismic structural deformations. It is an incremental static analysis used to determine the force-displacement relationship, or the capacity curve, for a structure or structural element. The analysis involves applying horizontal loads, in a prescribed pattern, to the structure incrementally, i.e. pushing the structure and plotting the total applied shear force and associated lateral displacement at each increment, until the structure or collapse condition. In technique a computer model of the building is subjected to a lateral load of a certain shape (i.e., inverted triangular or uniform). The intensity of the lateral load is slowly increased and the sequence of cracks, yielding, plastic hinge formation, and failure of various structural components is recorded. Pushover analysis can provide a significant insight into the weak links in seismic performance of a structure. The performance criteria for pushover analysis are generally established as the desired state of the building given roof-top or spectral displacement amplitude. The seismic response of RC building frame in terms of performance point and the effect of earthquake forces on multi story building frame with the help of pushover analysis is carried out in this paper. In the present study a building frame is designed as per Indian standard i.e. IS 456:2000 and IS 1893:2002. The main objective of this study is to check the kind of performance a building can give when designed as per Indian Standards. The pushover analysis of the building frame is carried out by using structural analysis and design software SAP 2000.

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