

Lobzang Dorji 2010: Seismic Evaluation of Existing Gravity Load Designed Building in Bhutan. Master of Engineering (Civil Engineering),  
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Thesis Advisor: Assistant Professor Kitjapat Phuvoravan, Ph.D. 148 pages.

The gravity load designed buildings are expected to undergo excursion in the nonlinear region under seismic force effect. To examine such behavior of the structures, the conventional linear seismic analysis cannot be adopted which demands nonlinear analysis approach. Most of the existing buildings in Bhutan are designed and constructed before the introduction of seismic design concept and it is required to evaluate the seismic performance of such existing structures. In this study, the seismic evaluation of one of the existing reinforced concrete buildings designed for gravity load has been evaluated by using nonlinear static pushover analysis. The selected gravity load designed building in this case study shows good resistance to seismic load, therefore it does not require structural intervention as the inelastic deformation of structural components are not so important to pose threat to the stability of the building. The study also shows that infill contributes to increase the initial stiffness of the structure while the ultimate lateral capacity and its corresponding roof displacement do not affect much. The effect on lateral capacity of the building due to variation of compressive strength of concrete was observed to be inconsequential. Increase in yield strength of reinforcement produces hefty increase in lateral capacity of the building but the initial stiffness remains all most constant. When shallow foundation of the building was modeled as hinge and flexible base (uncouple component model), the lateral capacity of the building gives underestimate results as compare to assumed fixed base foundation for seismic evaluation.

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