



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS**

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Confined masonry (CM) building system has been in use in several earthquake-prone countries because confinement of the masonry walls with nominal tie-elements has been found to be very effective in resisting lateral earthquake loads. However, limited guidelines are available for the seismic analysis and design of these buildings. The primary objective of the present study is to investigate the behavior of CM walls under gravity and lateral loading and develop simple methodologies for their seismic analysis and design. Based on exhaustive experimental, analytical, and numerical studies, a new macro-model “V-D Strut Model” is developed in the present study for the analysis of CM walls under the action of both gravity and seismic loads. Methodologies are suggested for the development of generalized analytical backbone curve models for CM walls that may be used for their performance-based seismic analysis and design. Finally, to provide a readymade tool to the designers, a methodology is developed for the relative distribution of shear forces in tie-columns and masonry walls of CM walls under the action of lateral loading based on an extensive parametric finite element study considering the influence of several important parameters.