INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

Name of the Student	:	**Pallab Jyoti Das**
Roll Number	:	**156104032**
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Name of Thesis Supervisor(s)	:	**Prof. Sajal Kanti Deb**
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SHORT ABSTRACT

This thesis presents experimental investigation on evaluation of seismic performance of a new hybrid buckling restrained brace (HyBRB) under cyclic load. Detailed design steps adopted for the HyBRB design are reported in this thesis. Analytical method for estimation of critical loads corresponding to buckling mode formation of the steel core inside the restrainer has been presented. The design targets achieved for HyBRB are: ease of inspection of detachable BRB core to facilitate replacement of steel core after a seismic event, if necessary and enhanced energy dissipation capacity through restrained buckling about both weak and strong axes of the core. The proposed HyBRB has displayed stable hysteretic behaviour with good energy dissipation capacity in low to high level of core strain range. Permanent deformation about strong axis of the core is observed on unfastening of the restrainers, although restrained buckling of the core is observed about weak axis in lower displacement amplitudes. Analytical simulation is carried out using a phenomenological model to simulate the experimental behaviour. Simulated axial force-deformation hysteresis loops are found to be in close agreement with those obtained from experimental investigation. Finally, nonlinear static pushover and time history analyses are performed to evaluate the seismic performance of the sample building before and after installation of HyBRBs.