SEISMIC EVALUATION OF REINFORCED HOLLOW CONCRETE BLOCK MASONRY BUILDING MODEL

(SPONSORED by KSCST)

Project submitted to

VISVESWARAYA TECHNOLOGICAL UNIVERSITY

Belgaum, Karnataka

In the partial fulfillment of the requirements for award of the degree of

BACHELOR OF ENGINEERING

IN

CIVIL ENGINEERING

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ABSTRACT

Engineered hollow concrete block masonry possess, relatively, lot many advantages when compared to conventional masonry. They are light in weight and can be easily strengthened by way of providing vertical reinforcement through its hollow core. Thus, the provision of reinforcement makes it amenable to perform as a good alternative to resist lateral dynamic loads. While its performance is well documented in developed countries, the same is scanty in India. In this project an attempt has been made to study the seismic performance of reinforced hollow concrete block masonry (RHCBM) building , through shock table tests.

As a part of the project, the basic strength and elastic properties of the RHCBM was obtained through a series of experiments. Later, a building model of size 3.63m X 2.83m X 2.63m was constructed on shock table to evaluate its seismic performance. The RHCBM building model was provided with horizontal RC bands at sill, lintel and roof level. Also vertical reinforcement was provided at all critical locations such as corners and adjacent to door and windows openings. The reinforcement through the hollow core was later grouted by self compacting concrete (SCC). This model was subjected to a series of base shocks of increasing magnitude. The crack pattern and the dynamic response were studied and have been presented in detail. An attempt has also been made to develop a finite element model and the results were encouraging.

A major highlight of this project is that RHCBM buildings are capable of withstanding significant lateral dynamic loads without losing its stability. No part of the building model developed any signs of insipient collapse.

The project report has been presented in 6 chapters. The first chapter gives a brief introduction to reinforced masonry and a brief literature review. The basic strength and elastic properties of RHCBM and its constituents are presented in chapter 2. Chapter 3 gives the details of the construction process of RHCBM model. The details of the free vibration tests (experimental and analytical) is presented in chapter 4.

The proceedings of the shock table test on the prototype model is presented in chapter 5. A broad set of concluding comments are presented in chapter 6, followed by the scope for further investigation and a list of references.