



**TRIBHUVAN UNIVERSITY  
INSTITUTE OF ENGINEERING  
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**DEPARTMENT OF CIVIL ENGINEERING**

**M.Sc. Program in Structural Engineering**

Thesis no: S00101

**ANALYTICAL STUDY OF INFILL BRICK MASONRY  
WALL WITH OPENING UNDER IN-PLANE LATERAL  
LOAD**

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**March- 2009**

## **CERTIFICATE**

This is to certify that the work contained in this thesis entitled “Analytical Study of Infill Brick Masonry Wall With Opening Under In-Plane Lateral Load”, in partial fulfillment of the requirements for the degree of Master of Science in Structural Engineering, as a record of research work, has been carried out by Mr. Jibendra Misra (061/MSS/r/103) under my supervision and guidance in the institute of Engineering, Pulchowk Campus, Lalitpur. The work embodied in this thesis full fills the requirements relating to the nature and standard of the work for the award of M.Sc in Structural Engineering and no part of work has been published or submitted for the award of any degree elsewhere.

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## **ABSTRACT**

The effort of this research is focused on the study of brick masonry wall in reinforced concrete frame structure. The main objective of the study is to get the analytical behavior of models in static lateral load case. Five samples of infill frame and three samples of masonry panel wall without RC frame were prepared and studied numerically under lateral static load. The effect of opening size and stiffness of infill relative to the frame were studied in terms of lateral stiffness, rotational stiffness etc. It is observed that effect of opening size have large influence on the overall response of infill. The lateral stiffness of masonry panel is drastically improved if it bounded by reinforced concrete frame.

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## LIST OF ABBREVIATION

$a$	Width of equivalent strut
$h_{col}$	Column height between centerlines of beams
$h_{inf}$	Height of infill panel
$E_{fe}$	Expected modulus of elasticity of frame material
$E_{me}$	Expected modulus of elasticity of infill material
$I_{col}$	Moment of inertial of column
$L_{inf}$	Length of infill panel
$K$	Stiffness
$K$	Rotational Stiffness
	Angle whose tangent is the infill height-to-length
$E$	Young's modulus of elasticity
	Density
	Poisson's ratio