Analysis of Confined Masonry Building

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Abstract

The paper elaborates the seismic behavior of a typical masonry building in B&H built in the 60th without any seismic guidelines. Numerical modeling had been done in single software packages, namely 3MURI. In this approaches, adequate and constitutive assumptions were assumed to take into account of the nonlinear behavior of masonry. Seismic vulnerability had been conducted by performing pushover and time history analyses. A comparison in terms of dynamic properties due to earthquake load, crack pattern generated and capacity curves were done and a good agreement has been found between the 3 Muri software analyses. The research paper's aim was to assess the seismic safety of this type of construction. A further objective was to investigate if simple software packages could be as used for the assessment of these buildings. As a wide stock of this type of buildings is located through the former territory of and based on masonry , this work would enable a better understanding of this type of structures and quick overview of their actual seismic behavior. We are going to comparison between different analyzes and loading acted different direction of masonry wall like lateral displacement in x ,y and z direction walls and failure case by taking different opening

Keywords: *Masonry, nonlinear analysis, B&H residential masonry buildings, pushover, time-history analysis*

1. Introduction

Four Seismic zone divination just we are taking example Pakistan shrinagar .Confined masonry is best suitable at seismic zone according economically point of view in seismic zone lot of building were damage by the using unreinforced masonry in past earthquake therefore to improve the horizontal load bearing capacity, strength and seismic reliability of masonry building . We can avoid using to sufficient strength improve by using tie –beam and column .confined resist both lateral and gravity load also. tie beam resisting overturning moment and confinement effect due to tie beam and column. They improve wall displacement capacity and seismic cyclic load. More stiffness and mass distribution in building

2. Analytical Model

Tie beam and column prevents and resisted diagonal cracks and also surface area restricted by the tie beam and column between bands. Experimental results show that horizontal bearing capacity wall was better of RC wall. It was best more than mortar joints reinforce. Column provided in the structures was also increase the horizontal and vertical load bearing capacity and strength of the wall and it given the partial method on the improvement of ductility, strength and bearing capacity of was masonry building. The confining members was reduce the brittleness of the masonry wall under seismic earthquake load and hence improving by the earthquake performance

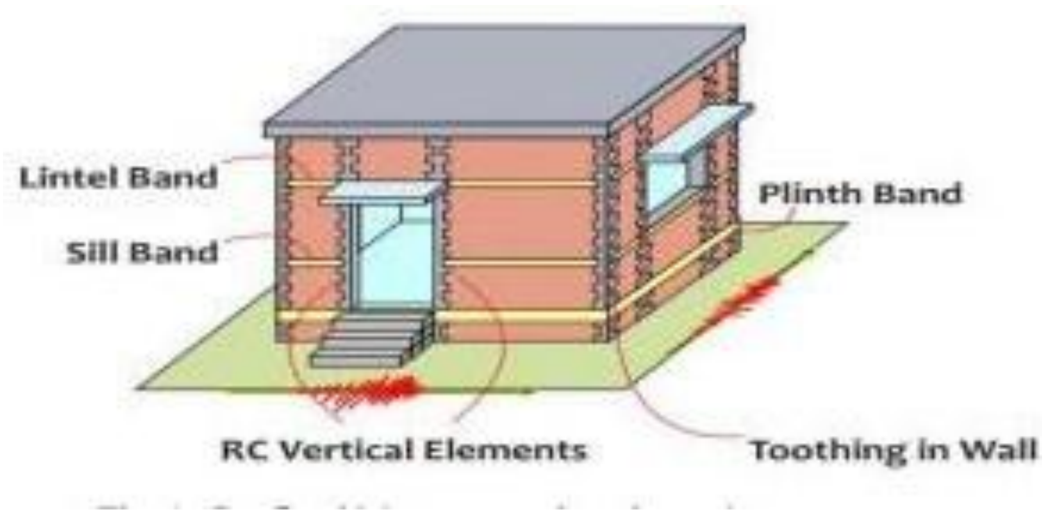


Figure 1: Confined Masonry Earthquake Resistant Structure

In my current work I am going to research study on seismic behavior of confined masonry by using euro code 8 on 3 muri software:-

1. Software analysis in 3 Muri

a) Opening provided at wall at different locations for better enhancing stability integrity strength and ductility of confined wall

b) To take best location of opening for differentiate displacement at different analyses the wall

2. Effect on parameter due to load unreinforced masonry (URM)

Walls are pushed sideways during a strong earthquake, along their length and thickness directions. When shaken along their length, they develop diagonal cracks along their length and/or separate at wall junctions.

When walls collapse, they bring down the roof along with them. This is the main reason for large loss of lives during earthquakes that have occurred in different regions of the country.

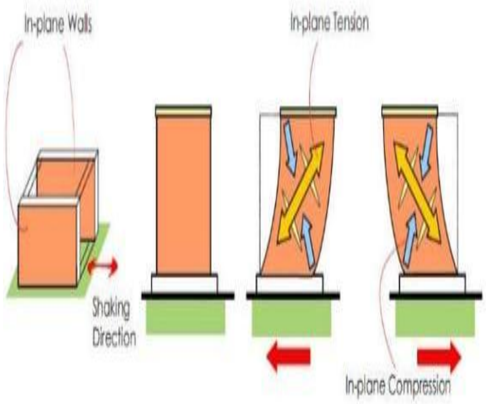


Figure 2: Shaking due seismic earthquake along length direction of masonry wall results in diagonal cracking

Figure 4 : Oaxaca quake, September 1999

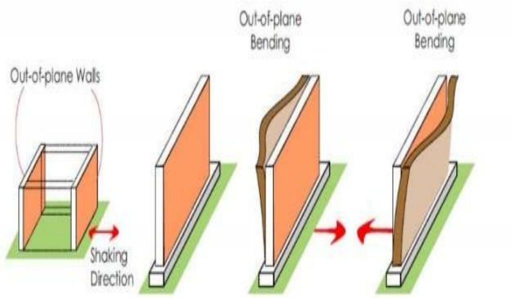
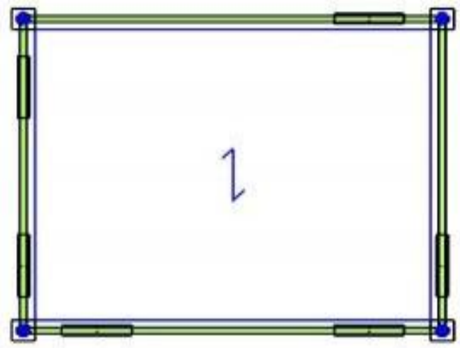


Figure 3: Shaking due to seismic load along thickness direction of masonry wall can result in collapse

Figure 5: Japan quake, September 1999

3. Geometric modeling

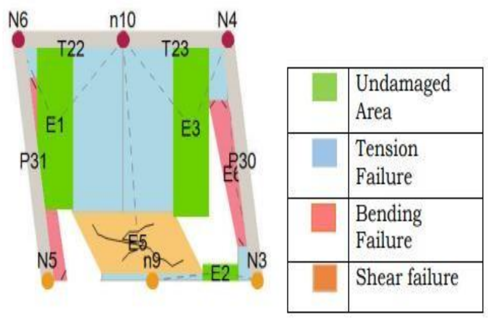


4. Compression between double and single opening in wall

Figure 6 : Wall 1 opening with two different size Figure 4, 5: wall 3 single

5. Result analysis

a) Wall 1



a) Figure 7: Collapse mechanism when during –x direcrion loading in –x direction at wall 1

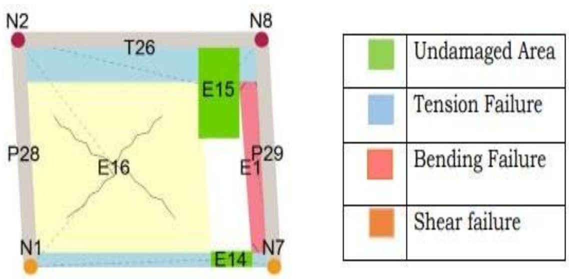


Figure 8: Collapse mechanism of third wall loading

(b) Wall 3

(c) Result description wall 1

1) About 25% area of wall was undamaged condition when I take opening 8.33% of total wall area

2) About 13% area of wall was failure in bending during seismic loading in –x direction

3) Rc beam always be failure in tension failure because its horizontal to take vertical load

4) If moment of inertia is less then stiffness of walls be also less and displacement be more then (displacement=P/K)

5) Its depend on wall area then axial loading case k=AE/L) it means E is constant but length of wall is increase then displacement of wall also be 3 4 5 6 9 Displacement Node Ux[mm] Uy[mm] Uz[mm] increase and but in case of area of wall is increase then stiffness is also more their displacement obtain less

5) Opening area of wall is 8.33% of total wall area(3.6mx3.0m)

6) Maximum displacement 11.96 at node 4, and node 6 because seismic loading act in –x direction

(d) Result description wall 3

1) About most significant of legend color 55% area of wall was failure in shear during opening maintain 8.33% of total wall area seismic loading in –x direction
2) There in wall only was undamaged 8.33% of total area when opening percentage maintain 8.33% of total wall
3) Wall 3 ,failure in bending 6.8% area of total wall
4) Rc beam only tension failure in all case of wall
5) 0pening contain 8.33% of total wall size(3.60mx3.0m) Displacement wall node 2, 8 is -4.40mm displacement in x direction when displacement in y direction at node 8 is -8.83 more than other value because shear failure 55% and opening only 8.33%

6. Conclusions

1. Mostly shear failure of the wall can be reduced by avoiding large opening in wall and number of opening in wall because due opening reduces moment of inertia of the wall which reduces the stiffness of the wall. This increases possibility of shear failure in the wall more probability
2. Due to Large opening in masonry walls building increases flexibility which increases top displacement in the wall.
3. Different stiffness of walls provided in a building cause twisting moment in the structure which causes bending failure of the masonry wall. Because of different stiffness in walls, the centre of rotation will displace from the centre of gravity of the structure and structure will move and displace at a same time which increases top storey displacement in the wall.
4. The length of wall also affects the stiffness of the wall because length of wall is inversely proportional to the stiffness of the wall, so we should avoided large length

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