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Seismic Analysis of Building Using Modified Shear Wall

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Abstract – The shear wall plays important roles in the earthquake resistant buildings. The paper deals with the shear wall and modified shear wall for earthquake resistant building. The analysis of building has been done for shear wall and modified shear wall 12 storied building frame of by thickness 230mm,250mm & 300mm & it is observed that the resistance in vertical deflections decreases respectively. It is also observed that the reduction in base shear for 230mm,250mm & 300mm respectively.

Keywords: Base shear, Modified shear wall

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1. INTRODUCTION

Modified shear wall is very much essential in case of rehabilitation of seismic zones, sensitive earthquake regions & old RCC buildings etc. The building can be made seismic resistant by providing shear wall & the shear wall can be strengthened by retrofitting like steel jacketing, increasing the thickness of shear wall etc. Modified shear wall is very much essential in case of rehabilitation of seismic zones, sensitive earthquake regions & old RCC buildings etc. The building can be made seismic resistant by providing shear wall & the shear wall can be strengthened by retrofitting like steel jacketing, increasing the thickness of shear wall etc.

Earthquake is one of the greatest hazard with adversely affect human life and property since ancient times.Earthquake is sudden an unexpected shaking causes by the release of huge stored strain energy at the interface of tectonic plates.

Not only earthquake but also unsafe building is responsible for the wide spread devastation. If the building is priorly constructed as earthquake resistant then the devastation can be mitigated.

2. REVIEW OF LITERATURE

EARTHQUAKE VIBRATION CONTROL USING MODIFY FRAMES SHEAR WALL-PRAMOD SHARAN (2016)

PramodSharan conclude that the buildings can be strengthen by determining the degree by their susceptibility to weaken ,by using the external shear wall along with the parallel side of building .By using the external shear wall structure can be made stiffer

As most of the lateral load is taken by the shear wall and thus prevent structure from damage.

EARTHWAKE RESISTANCE DESIGN OF BUILDING USING SHEAR WALL,B.RAMAMOHANAREDDY AND M.VISHWESHWARA (2015)

B.Ramamohana and M.Vishweshwara conclude that the column,beam,slabs, of the buildings is also analyzed with " STADD-PRO" and it is found that the existing dimensions and reinforcement are sufficient to take care of the strength requirements devolped due to dead load,seismic-load,and live load.

Dr. Sarawade W.K (2012): in his paper displayed a reasonable connection among green marketing, natural equity, and modern environment. It contends for more noteworthy familiarity with natural equity in the training for green marketing. An exploration plan is at last proposed to decide purchaser's consciousness of ecological equity, and their ability to endure the expenses related withit.

TO STUDY ON EARTHQUAKE RESISTANCE CONSTRUTIONTECHNIQUES, MOHAMMAD ADIL DAR (2014)

Mohammad Adil Dar conclude that's technology is available to drastically mitigate the earthquake related disasters. Moderate earthquakes cause huge devastation in developing the countries has been obs**erved in recent earthquake. The** administration

system is efficient and effective in developed countries, and its not the same in developing countries so that government should ensure the implementation of earthquake resistance design guidelines.

RECENT ADVANCEMENT IN RETROFIT OF RC SHEAR WALLS, K. GALAL AND H.EI-SOKKARY

RC walls are classified according to CSA(2014) as bearing walls,non-bearing walls,shear walls ,flexural shear walls and squat shear walls.Shear walls are the parts of lateral force resisting system that carry vertical load ,bending moments about the wall strong axis,the shear forces parallel to the wall length.Shear wall system is one of the most common and effective lateral load resisting that is widely used in medium-to high-rise buildings.

SEISMIC RETROFITING OF RC-BUILDING BY ADDDING STEEL PLATE SHEAR WALLS

This paper discusses Seismic retrofitting of a typically residential building in the Sudan which have been design and constructed without any seismic provisions. Seismic retrofitting is a modification of the structural and non-structural components in a building that aims to improve the building performance in future earthquake. Adding structural walls is one of the most common structure level retrofitting method to strengthen existing structure.

3. MODELING:

Modeling of the building structure is done with the assumption that the building is in ideal condition. Shear wall can be provided at the outer wall of building structure.

The criteria on which the building structure can model & asnalysis in STADD.Pro V8i.

4. DESCRIPTION OF BUILDING MODEL-

An G+12 Building model having height 40.66m having length 19.66m & width 16.19m is adopted for this study.

Three building models can be prepared having thickness of shear wall of 1st model is 0.23, 2nd model 0.25, 3rd model 0.3 is provided.

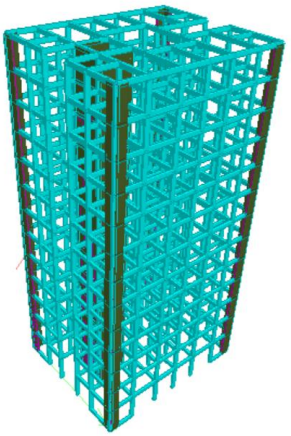
Table: Details of building model:

1) shear wall thickness (outer)	1) 0.23 2) 0.25 3) 0.3
2) Beam dimension	0.45*0.23
3) Building Height	40.66m
4) Building width	19.66m
5) Floor to floor height	30m
6) Ground floor height	3.4m

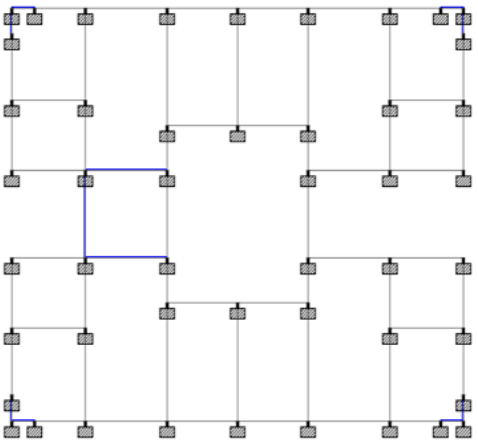
Applied load:

Seismic load	X-direction Y-Direction
Dead load	Self weight of building
Live load	Floor load
Load combinations	Indian load(auto load

5.3 D view of model:



Picture 1:



Picture 2- Top view

6. RESULTS AND DISCUSSION

In the present work the variation of the node displacement, Reaction of three models have been studied. Models are analyzed for seismic load , dead load, floor load. The effect of these loading on the parameters with respect to max displacement, Reaction and has been observed and discussed.

Table of Displacement:

For X- direction

	0.23	0.25	0.3
Maximum-X	0.559	12.542	10.225

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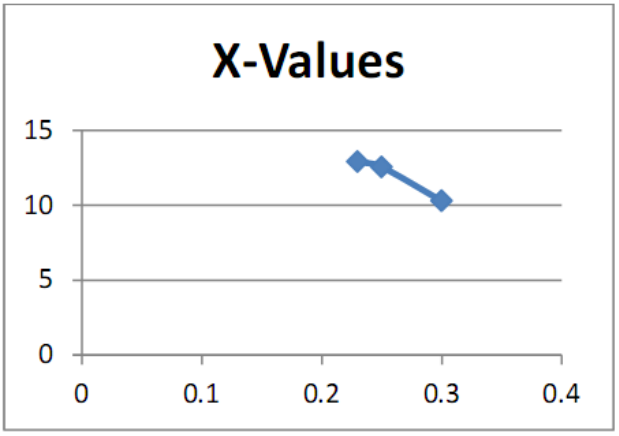
For X- direction



For Z- Direction:

	0.23	0.25	0.3
Maximum -Z	24.442	24.220	19.759

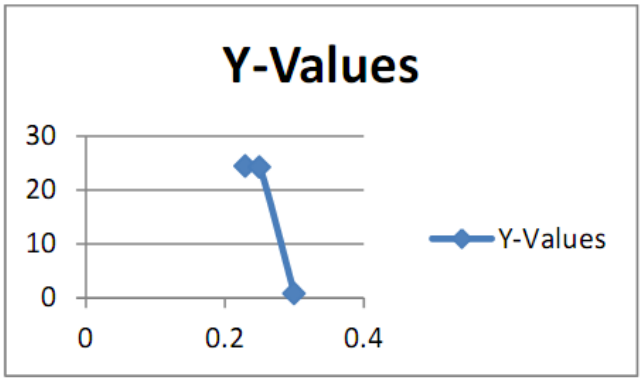


Table of Reaction:

For X-Direction:

	0.23	0.25	0.3
Max. X	429.275	429.20	429.17

	0.23	0.25	0.3
Max Y	2363.785	2332.70	404.390

	0.23	0.25	0.3
Max. Z	429.17	2229.48	382.552

7. CONCLUSION

The displacement of node in the building models can be reduced drastically by increasing the thickness of shear wall.

By modifying the 0.23 thickness wall to 0.25 thickness displacement can be reduced to 6% to 8%.

By modifying 0.23 thickness wall to 0.3 thickness displacement can be reduce to 22% to 25%

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