ISSN: 2347-6540

International Journal of Latest Research In Engineering and Computing (IJLREC)
Volume 5, Issue 4 , Page No. 10-12 July-August 2017
www.ijlrec.com

REVIEW ON ANALYSIS OF SEISMIC RETROFITTING OF STRUCTURES

[1]Er. Arif Rasool ,[2]Er. Kshipra Kapoor
[1]M.Tech Scholar, Department of Civil Engineering,
Universal Institutions of Engineering and Technology, Lalru
[2]Assistant Prof. & Head, Department of Civil Engineering,
Universal Institutions of Engineering and Technology, Lalru

Abstract:
Many parts of the country have suffered earthquake in last three decades. In costal part of South India faced Tsunami. In first three earthquakes it was found that many of damaged structures were built in non-engineered masonry techniques. Unreinforced masonry structures are the most vulnerable during an earthquake. Normally they are designed for vertical loads and since masonry has adequate compressive strength, the structures behave well as long as the loads are vertical. When such a masonry structure is subjected to lateral inertial loads during an earthquake, the walls develop shear and flexural stresses. The strength of masonry under these conditions often depends on the bond between brick and mortar (or stone and mortar), which is quite poor. This bond is also often very poor when lime mortars or mud mortars are used. A masonry wall can also undergo failure in-plane shear, if the inertial forces are in the plane of the wall. Shear failure in the form of diagonal cracks is observed due to this. However, catastrophic collapses take place when the wall experiences out-ofplane flexure. This can bring down a roof and cause more damage. Masonry buildings with light roofs such as tiled roofs are more vulnerable to out-of-plane vibrations since the top edge can undergo large deformations. It is always useful to investigate the behaviour of masonry buildings after an earthquake, so as to identify any inadequacies in earthquake resistant design. Studying types of masonry construction, their performance and failure patterns helps in improving the design and detailing aspects. In previous earthquakes many R.C.C buildings have also collapsed and are found unsafe due to faulty workmanship. Many other causes are responsible for major collapse and damage to the R.C.C structures.

Keywords: jacketing **,** bracings, Engineering performance

INTRODUCTION

A large number of existing structures in India are not compatible with seismic forces and their number increases constantly. Past earthquakes are witness for the disaster either in Bhuj earthquake or Nepal earthquake. It is partially challenging to retrofit the existing structures due to complex behaviour of RC composite material buildings Seismic Vulnerability is a quite complex task, considered both design and damage of building, the seismic weakness of building is related with the seismic deficiencies of structural elements in building include Columns, Beams, Foundation and Floor slabs. The seismic deficiencies is defined as the conditions which objections the building to meet the required performance level. For such buildings some steps must be taken so they can with-stand with these Hazards and very limited damage to both structural and non-structural components.

The seismic deficiencies in the building are categories to following.

- Discontinuity in the load path, which transfers the load from super structure to sub structure.
- For lateral load system, strength is low such as weak stories.
- Low stiffness to resist the lateral load system e.g. soft storey condition.
- Low ductility of lateral load system elements.
- Lack of multiple continuous load path in structure (lack of Redundancy.)
- Irregularity in structures both vertical irregularity (Stiffness irregularity, Mass irregularity, Geometric irregularity, Discontinuity in load path) as well as Horizontal Irregularity (Torsional irregularity, Diaphragm discontinuity irregularity, Re-entrant corner irregularity)
- Material deterioration of structures.
- Ponding action, occurs when insufficient gap between buildings.
- Foundation deficiencies.

The objective of this study is increase in knowledge regarding seismic retrofitting and proficiency in analysing seismic vulnerability elements in structure and their retrofitting techniques. The main aim of this research are:

- To investigate the seismic vulnerability of structural elements in building.
- to analyse performance based design and compare different seismic analysis method
- To model a real building with a structural analysis software and investigate the earthquake effects with different analysis methods prescribed in codes & standards and propose appropriate rehabilitation methods in terms of the performance.

LITERATURE REVIEW:

Newmark & Veletsos 1960: Most of the analytical and experimental work investigating inelastic behaviour began approximately in the 1960s reinforcing techniques were involved in order to specialized intercessions in the auxiliary arrangement of a building that enhances its seismic resistance by expanding the quality, stiffness and/or ductility

McCormick, 2009: Wood is a conservative decision building material s compared to the higher priced steel and concrete structural components. The general scope of the utilization of wood structures to add up to structures is throughout to be in the vicinity of 80% and 90% in all regions of the Jammu and Kashmir and the majority relies on wood shear walls which makes it the most common of the elements discussed here Therefore, their ability to adequately resist random and cyclic lateral forces is critical to the safety of the inhabitants and to the soundness of our residential infrastructure. When properly constructed, its performance in past earthquakes has typically been reliable. The strength of the shear wall depends on the combined strengths of its three components: lumber, sheathing and fasteners. When all of the components are properly in place, the shear wall can provide its intended strength (McCormick, 2009).

Dr. Durgesh C Rai 2013:A higher degree of damage in a building is expected during an earthquake if the seismic resistance of the building is inadequate. The decision to strengthen it before an earthquake occurs depends on the building's seismic resistance. The structural system of deficient building should be adequately strengthened in order to attain the desired level of seismic resistance. The term strengthening comprises technical interventions in the structural system of a building that improves its seismic resistance by increasing the strength, stiffness and/or ductility.

Dr. Abhay Sharma (met bopal)2015: Steel bracing system is one of the effective measures for resisting the horizontal forces like seismic and wind forces in reinforced concrete multistory buildings. Bracing member's are subjected to tension and compression; subsequently they are provided to take these forces. Steel bracing framework expands the stiffness and strength of the RC multistory building and reduces their deformation. Present study is based on seismic analysis of RC building frames with V type bracing and inverted V type bracing. Seismic coefficient method (linear static analysis) has been conducted to evaluate the effect of different arrangements of bracing members in the building frame and influence of the different steel cross-section.

CONCLUSION:

The most of the RCC buildings were failed Iain the past due to lateral load. Bracings systems are one of the lateral load resisting systems which have got structural importance specially in reinforced concrete buildings. Different bracing systems are efficient enough for seismic responses. Steel bracing systems have both practical and economical advantages. The application of steel bracings is faster to execute. The steel bracings are usually installed between existing vertical members. The purpose of the study of seismic response of a building is to design and build a structure in which the damage to the structure and its structure component by earthquake is minimized.

Based on analysis results following conclusion are drawn

1. The displacement of the building decreases depending upon the different bracing system employed and the bracing sizes.
2. The storey drift of the braced building decreases as compared to the un braced building which indicates that the overall response of the building decreases.
3. It was also observed that as the size bracing section increases the displacements and storey drifts decreases for the braced buildings.
4. The overall performance of X braced building better than other two types of braced building.

REFERENCES

1. Adams, Scott Michael (2010); "Performance-Based Analysis of Steel Buildings: Special Concentric Braced Frame", California Polytechnic State University. Agarwal, Pankaj & Shrikhandle, Manish (2006); "Earthquake Resistant Design of Structures", New Delhi, Prentice Hall.
2. AISC 13th Edition (2006); "Steel Construction Manual", American Institute of Steel Construction
3. Ambrose,J. & Vergun,D (1999); "Design for Earthquakes", John Wiley & Sons, Inc., USA.
4. ASCE 41-06; "Seismic Rehabilitation of Existing Buildings", American Society of Civil Engineers, VI, USA.

5. FEMA 350 (2000); "Recommended Seismic Design Criteria for New Steel Moment-Frame Buildings", Federal Emergency Management Agency, Washington, D.C.

6. BIA (1996), "The Assessment and Improvement of the Structural Performance of Earthquake Risk Buildings – Draft for General Release", New Zealand National Society for Earthquake Engineering

7. CEN (2001), "Eurocode 8 – Design Provisions for Earthquake Resistance of Structures – Part 3", Brussels