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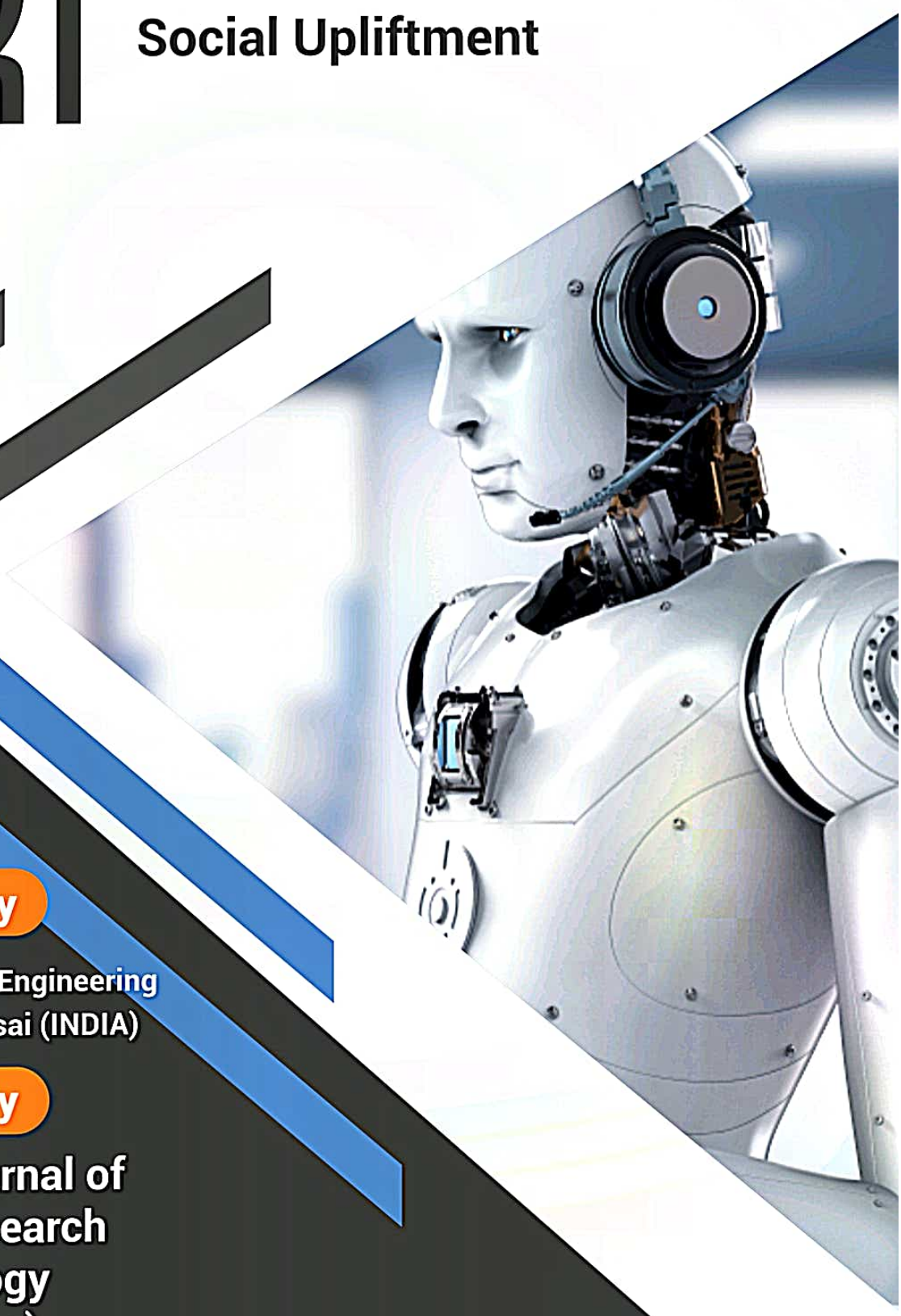

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Abstract This study is based on comparative analysis. Shear walls are reinforced concrete structural walls which resists lateral loads. Shear wall system is one of the most commonly used lateral load resisting technique in high-rise structures. This paper presents the study and comparison difference in earthquake and wind force behavior on a building with and without shear wall along with the change in column orientation of a G+13 multistoried building in STAAD pro. The structure is assumed to be located in seismic zone -III (Mumbai). The floor to floor height has been taken as 3.5m. Damping ratio is taken as 0.05. Response reduction factor is taken as 1.5.

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***Abstract*— This study is based on comparative analysis. Shear walls are reinforced concrete structural walls which resists lateral loads. Shear wall system is one of the most commonly used lateral load resisting technique in high-rise structures. This paper presents the study and comparison difference in earthquake and wind force behavior on a building with and without shear wall along with the change in column orientation of a G+13 multistoried building in STAAD pro. The structure is assumed to be located in seismic zone -III (Mumbai). The floor to floor height has been taken as 3.5m. Damping ratio is taken as 0.05. Response reduction factor is taken as 1.5. The Importance factor is 1. The load calculations are based on Indian standards for wind (IS 875:2015 (part 3)) and for seismic (1893:2002 (part 1)). Eight different models with same loading structure is taken into consideration. Graphical representation is done based on the results and analysis. A comparative analysis is done in terms of lateral Displacement, Storey drift, Quantity of concrete in m3.**

Keywords*— *Staad pro, Lateral displacement, Storey drift, Shear wall, seismic load, wind load, etc.

INTRODUCTION

Earthquake is one of the most disastrous natural calamities faced by mankind. History has been evident of various techniques and technologies being implemented by engineers and architects of the past to tackle and to reduce the impact of this catastrophe on various structures. To design a structure seismic resistant, it is important to understand the reason for seismicity as well as the propagation, nature and type of seismic waves being emitted.

Earthquakes are caused by sudden slip on the fault. This sudden slip emits a tremendous amount of energy which propagates in the form of waves throughout the medium. These waves can be differentiated as body waves and surface waves. Surface waves are like sound waves, they move along the surface of the earth. Body waves, on the other hand, goes through the earth's interior.

Structures undergo lateral movement when under seismic waves, if these structures are designed only for vertical loads (dead load and live load) then under seismic activity due to lateral loads they might collapse. Hence to eradicate a probable risk of structures, they are designed to resist lateral loads. The design is specified depending upon the Zone in which the structure lie.IS code 1893 has specified zones as II, III, IV, V.

As with the construction of high-rise structures, the wind load became a problem. It was observed that as the height of structure increases the wind load characteristics has to be implemented in design.IS 875 specifies the design for wind loads. Hence the stiffness of structure was observed while designing for wind and seismic resistance.

Shear walls are one of the lateral load resisting elements. It was first started to be in use from 1940.They are deeply cantilevered reinforced concrete beams. They resist both vertical and lateral forces on a structure due to wind and earthquake. Structural walls are considerably deeper than typical beams or columns, this attribute gives a considerable in-plane stiffness which makes these walls a natural popular choice for resisting lateral loads. Shear wall size can vary from 150 mm to 400 mm in thickness. They are commonly located

along the lift, staircase and core regions. The buildings incorporated with properly designed and detailed shear walls increases safety and lowers the property damage during earthquakes. Behavior of structure during earthquake motion depends on distribution of weight, stiffness and strength in both horizontal and vertical planes of building. When shear walls are situated in advantageous positions, they can form an efficient lateral force resisting system.

I. LITRATURE REVIEW

P. P. Chandurkar, Dr. P. S. Pajgade, Seismic Analysis of RCC Building with and Without Shear Wall. In this paper a study was conducted on seismic analysis of RCC building with and without shear walls using Etabs. They have selected a ten storied building located in zone II, zone III, zone IV and zone V Effectiveness of shear wall is studied using four different models. Parameters like Lateral displacement, story drift and total cost required for ground floor are calculated.