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ABSTRACT

Vulnerable buildings and their rehabilitation are important problems for earthquake regions. In recent decades the goal of building rehabilitation and strengthening has gained research attention and numerous techniques have been developed to achieve this. However, most of these strengthening techniques disturb the occupants, who must vacate the building during renovation. In this present study, a new strengthening alternative for RC structures, namely exterior shear walls, has been discussed under reversed cyclic loading. Using the proposed technique, it is possible to strengthen structures without disturbing their users or vacating the building during renovation. In this technique, shear walls are installed in parallel direction to the buildings on exterior sides. It has been observed that the usage of exterior shear walls considerably improve the capacity and sway stiffness of RC structures, post attached exterior shear walls behaved as a monolithic member of the structure. Design considerations for the exterior shear wall-strengthened buildings have also been discussed according to Indian standards Code provision of IS 13920:1993.

This technique can be better utilized in India where we have a huge population and during renovation work of a building we have to vacate the building which ultimately disturbs the living life of humans. By this technique we not only strengthened the existing building quickly but this method also found to be more economical as compared to the other methods of Strengthening of vulnerable building or the buildings which was not constructed according to modern code provisions.

As day by day seismic zones are changing the buildings which are earlier not prone to Earthquake, now came in severe zones, so for them this method of strengthening can be done easily. And for those buildings which was not constructed as per modern code procedure, by inspecting them according to their importance value mentioned in code (IS 1893 part1:2002) we can in advance provide sufficient stiffness to those building to resist the lateral loads significantly by constructing exterior shear wall of adequate strength as per Code provisions.

In this study a symmetrical in plan, building model of (G+8) storey is created in E-tabs software and is subjected to lateral load (earthquake load only) .The building is subjected to different load

combinations as per the code recommends and base shear, displacement, drift values, time period, forces in columns and beams were obtained at different storey level. Later on, the same building model is strengthened by providing external shear wall in parallel direction of building plan and connecting the external shear wall with the beams and columns of existing building using links of (25 mm dia. steel Bars of Fe415) and again the building is subjected to the different load combination, now it is found that displacement, drift value have been decreased to a reasonable extent which is within the permissible limit. Also this time those members which was found to be weak in carrying the lateral forces due to less stiffness earlier, are now strong enough in carrying lateral load. Then finally the outcomes and results are stated, comparisons are made and different graphs have been plotted and their relations have also discussed in detail.

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