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Seismic Evaluation and Retrofitting of Reinforced Concrete Building Using Multiple Combination of FRP Wraps

Mayuri R Atal[1], Ratnesh Kumar[2], Onkar G Kumbhar[3], Sachin V Bakre[2]

[1]M.Tech. Student, Dept. of Applied Mechanics, VNIT Nagpur
[2]Professor, Dept. of Applied Mechanics, VNIT Nagpur
[3]PhD. Student, Dept. of Applied Mechanics, VNIT Nagpur

Abstract

Seismic retrofitting of vulnerable structures is critical for reducing risk. Seismic retrofitting is the upgradation of existing structures to make them more resilient to future seismic events. Among various seismic retrofitting techniques, the FRP wraping have been proved to be very promising with respect to the ease and effectiveness. This study explores the effectiveness of multiple combination of different types of fiber reinforced polymers laminates (FRP) viz. basalt fiber reinforced polymer (BFRP), carbon fiber reinforced polymer (CFRP), and glass fiber reinforced polymer (GFRP). The effectiveness of different combinations of FRPs have been assessed by comparing the capacity curve for the retrofitted building. Further, the assessment of cost efficiency vis-à-vis their effectiveness in the level of increase in seismic protection. From above study it can be concluded that these innovative materials are good in strength and they have impressive ductile property. Combinations of these innovative materials is efficient in retrofitting the existing RC buildings as well they are economical for application.

Keywords: Retrofitting, Carbon fiber reinforced polymer, Glass fiber reinforced polymer, Basalt fiber reinforced polymer