

## **Strengthening of RC Concrete Bridge Pier Using Carbon Fiber Reinforced Polymer (CFRP)**

**Abstract**—This paper grants the results of an analytical results of RC concrete circular bridge pier strengthened with Carbon fiber reinforced polymer (CFRP). To work out the seismic performance of bridge pier Nonlinear analysis has been done. Nonlinear static (Pushover) analysis is used to govern the capacity of the bridge pier. A RC circular bridge pier, modelled in SAP2000 (v.20) is used for this study. Damage on the pier is set up out by using the result of Pushover analysis. Providing supplementary confinement by external CFRP wrapping is one among the prime common and active techniques for the retrofit of prevailing RC Bridge piers, which condenses the damage and avoiding the failure piers under different loading atmospheres. Retrofitting practice is considered as the cost-effective justifiable approach to strengthen repair damaged bridges or older deficient bridges. CFRP has been recognized to be an effective in increasing the axial strength of concrete pier column. After retrofitting by the CFRP wrapping, the load carrying capacity of the bridge pier was enriched. It is proved that the strengthen model can sustain the load enacted on it. Using this pushover curves, it is concluded that the weaker initial pier is strengthen to Life Safety (LS) level from Collapse Prevention (CP) by using CFRP wrapping.

**Keywords**— *CFRP, Capacity Curve, Bridge pier, Performance Point, Pushover curve, Life Safety, Collapse Prevention, ductility criteria*