

Experimental Investigation of Damaged Reinforced Concrete Beams Repaired with Carbon Fibre Reinforced Polymer (CFRP) Strip under Impact Loading

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Abstract : Many buildings and bridges are damaged due to impact loading, explosions, terrorist attacks and wars. Most of the damaged structures members such as beams, columns and slabs are not totally failed and it can be repaired. Nowadays, carbon fibre reinforced polymer CFRP has been widely used in strengthening and retrofitting the structures members. CFRP can restore the load carrying capacity of the damaged structures members to make them serviceable. An experimental investigation was conducted to investigate the impact behaviour of the damaged beams repaired with CFRP. The tested beams had different degrees of damage and near surface mounted technique NSM was used to install the CFRP. A heavy drop weight impact test machine was used to conduct the experimental work. The study investigated the impact strength, stiffness, cracks and deflection of the CFRP repaired beams. The results show that CFRP significantly increased the impact resistance of the damaged beams. CFRP increased the damaged beams stiffness and reduced the deflection. The results showed that the NSM technique is more effective in repairing beams and preventing the debonding of the CFRP.

Keywords : damaged, concrete, impact, repaired

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