

Flexural Behavior of Heat-Damaged Concrete Beams Reinforced with Fiber Reinforced Polymer (FRP) Bars

Authors : Mohammad R. Irshidat, Rami H. Haddad, Hanadi Al-Mahmoud

Abstract : Reinforced concrete (RC) is the most common used material for construction in the world. In the past decades, fiber reinforced polymer (FRP) bars had been widely used to substitute the steel bars due to their high resistance to corrosion, high tensile capacity, and low weight in comparison with steel. Experimental studies on the behavior of FRP bar reinforced concrete beams had been carried out worldwide for a few decades. While the research on such structural members under elevated temperatures is still very limited. In this research, the flexural behavior of heat-damaged concrete beams reinforced with FRP bars is studied. Two types of FRP rebar namely, carbon fiber reinforced polymer (CFRP) and glass fiber reinforced polymer (GFRP), are used. The beams are subjected to four levels of temperature before tested to monitor their flexural behavior. The results are compared with other concrete beams reinforced with regular steel bars. The results show that the beams reinforced with CFRP bars and GFRP bars had higher flexural capacity than the beams reinforced with steel bars even if heated up to 400°C and 300°C, respectively. After that the beams reinforced with steel bars had the superiority.

Keywords : concrete beams, FRP rebar, flexural behavior, heat-damaged

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020