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Behavior of Composite Construction Precast Reactive Powder RC Girder and Ordinary RC Deck Slab

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Abstract : This study present an experimental investigation of composite behavior for hybrid reinforced concrete slab on girder from locale material in Iraq, ordinary concrete, NC, in slab and reactive powder concrete in girder ,RPC, with steel fibers of different types(straight, hook, and mix between its), tested as simply supported span subjected under two point loading, also study effects on overall behavior such as the ultimate load, crack width and deflection. The result shows that the most suitable for production girder from RPC by using 2% micro straight steel fiber, in terms of ultimate strength and min crack width. Also the results shows that using RPC in girder of composite section increased ultimate load by 79% when compared with same section made of NC, and increased the shear strength which erased the effect of changing reinforcement in shear, and using RPC in girder and epoxy (in shear transfer between composite section) (meaning no stirrups) equivalent presence of shear reinforcement by 90% when compared with same section using Φ8@100 as shear reinforcement. And the result shows that changing the cross section girder shape of the composite section to inverted T, with same section area, increased the ultimate load by 5% when compared with same section of rectangular shape girder.

Keywords : reactive powder concrete, RPC, hybrid concrete, composite section, RC girder, RC slab, shear connecters, inverted T section, shear reinforcment, shear span over effective depth
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