EXPERIMENTAL INVESTIGATION OF COMPOSITE DECK WITH REINFORCED CONCRETE FOLDED CORRUGATED PRECAST PANEL

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Abstract:

Composite deck slabs have been widely used in recent years for building and Highway Bridges due to its ease construction and economic advantages. In this paper an experimental investigation were carried out on composite deck consists of reinforced concrete folded corrugated precast panel and lightly reinforced concrete cast-in-situ layer. The precast panel contains the deck main reinforcement where the cast-ill-situ layer contains only shrinkage reinforcement. Concrete shear keys with different percentage were utilized to work as horizontal shear connection between the composite deck layers. Five composite decks with folded corrugated panels were tested under line and uniform loads to study the shear stress capacity as well as the overall behavior. The results were compared with the experimental results of a tested composite deck slab with flat plate having the same volume as the proposed composite deck. Deck deformation, cracking load, concrete compression strains, steel strains, relative slip between the composite layers, failure load as well as the failure pattern were recorded at different load levels. The experimental results reveal the importance of concrete shear keys in enhancing the overall behavior of such composite deck. Also, the results indicate that the proposed composite deck slab possess better overall structural behavior as compared to composite deck with flat plate.