FINITE ELEMENT MODELING OF COMPOSITE DECKS WITH FOLDED CORRUGATED REINFORCED AND PRESTRESSED PREACST PANEL

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Abstract:

Composite concrete deck slab is that type of structure system which consists of a precast panel either reinforced or prestressed and cast-in-situ layer to be casted after erection and alignment   of the precast panels in its position. The precast panel serves as permanent shuttering and at the same time acts integrally with the cast-in-situ layer. The composite slab not only has the advantage of saving costs but it also saves construction time. Most of composite slab design methods are achieved depending on either the results of experimental tests or analytical models based on the traditional reinforced concrete theories. Due to high expenses of these tests and the tedious procedures of the analytical models, the need for more reliable and less expensive   design methods was essential. In this paper, the finite element method was used to model such composite decks with either reinforced or prestressed panel. This modeling is achieved by using the multi-purposes finite element program (ANSYS). The analysis has been performed   for construction, service as well as ultimate stages. The results obtained from the present work are compared with the corresponding ones of the experimental models. This comparison showed the capability of the present model to introduce a good representation for such composite deck behavior and strength.