Bending capacity of precast prestressed hollow core slabs with concrete toppings

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Abstrak

This paper presents the effect of surface roughness (smooth and rough) and surface condition (ponded and optimum wet) on the bending capacity of precast prestressed hollow core slabs with in-situ concrete toppings by a series of full-scale experimental tests. Interface slip was also measured throughout the test to observe the composite behaviour of the test specimens. The tests result show that the ultimate bending capacity for the ponded condition for the smooth and rough surfaces was 3 to 5% less than that of the optimum wet even though they were still higher than the calculated values. A slip of 0.08 mm was observed for the smooth-ponded specimen. It was later found that by roughening the top surface of the precast prestressed hollow core slab, full composite action can be achieved if the interface slip is reduced or eliminated. A theoretical method to predict the deflection with partial interaction is also presented in this paper based on the experimental strain gradient. From the theoretical approach, the findings suggest that an interface slip still may had occurred near the mid-span region although it was not detected by the slip gauge located at both ends of the specimen