

Time dependent behaviour of composite beams with partial interaction for different types of shear connectors

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Abstract

The structural behavior of composite steel concrete beams with long term deflection was investigated, taking in considerations several variables including degree of shear connectors 50%, 75%, 100%, and type of connectors including headed and hooked studs smooth or deformed. Five composite steel-concrete beams were tested each consist of steel section W12x35 and 300x100 concrete slabs. The composite beams were tested under uniformly distributed loads for different time interval up to 180 days. The results showed that the degree of interaction have significant influence on the long- term behavior of the composite steel concrete beam . When the degree of interaction decreased from 100% to 75% then to 50% the maximum long-term mid span deflection increased about 35.1% and 65.9% respectively at 180 days after loading. Also, the end slip increased about 67.5% and 112.4% respectively at 180 days after loading. The results showed that the type of the used shear connectors has slight influence on the long-term behavior of the composite steel concrete beams. For certain degree of interaction (75%)with using headed and hooked studs smooth or deformed the maximum long-term mid span deflection decreased about 7.1% and 11.7%at 180 days after loading, and the end slip decreased about 4.8% and 12.5% at 180 days after loading.