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Experimental Verification of Different Types of Shear Connectors on Composite Slab

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Abstract : Cold-formed steel sheets are widely used as primary tension reinforcement in composite slabs. It also performs as formwork for concreting and better ceiling surface. The major type of failure occurring in composite slab is shear failure. When the composite slab is flexurally loaded, the longitudinal shear is generated and transferred to the steel sheet concrete interface. When the load increases, the interface slip occurs. The slip failure can be resisted by mechanical interface interlock by shear studs. In this paper, the slip failure has been resisted by shear connectors and geometry of the steel sheet alone. The geometry of the sheet is kept constant for all the specimens and the type of shear connectors has been varied. Totally, three types of shear connectors (viz., straight headed, U and J) are bolted to the trapezoidal profile sheet and the concrete is casted over it. After curing, the composite slab is subjected to flexure load and the test results are compared with the numerical results analysed by ABAQUS software. The test result shows that the U-shaped bolted stud has higher flexure strength than the other two types of shear connectors.

Keywords : cold formed steel sheet, headed studs, mechanical interlock, shear connectors, shear failure, slip failure
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