EXPERIMENTAL STUDY OF THE BEHAVIOR OF COMPOSITE CONCRETE CASTELLATED STEEL BEAMS SUBJECTED TO PURE BENDING

The aim of this study is to investigate the behavior of composite castellatedbeam in which the concrete slab and steel beam connected together withheaded studs shear connectors. Four simply supported composite beamswith various degree of castellation were tested under two point static loads.One of these beams was built up using standard steel beam, i.e. without webopenings, to be a reference beam. The other three beams were fabricatedfrom the same steel I-section with various three castellation ratios, (25, 35,and 45) %. In all beams the concrete slab has the same section andproperties. Deflection at mid span of all beams was measured at each 10 kNload increment. The test results show that the castellation process leads toincrease the moment capacity of composite beams at permissible deflectionthat is (span/360) in the range of (11- 96) %. On the other hand, themaximum measured deflection was reduced in the range of (7.8 – 27.1) %