

Behavior of Composite Concrete-Castellated Steel Beams in Flexure

In this paper, the behavior of composite concrete-castellated steel beams in flexure was studied. The Finite Element Method was implemented for the analysis of the problem. Three-dimensional brick elements were used for concrete flange while shell elements were used to model castellated steel section. ANSYS 11 program was utilized for this purpose. A parametric study was conducted to clarify the behavior. The main parameter was the variation of castellation ratios. Three degrees of castellation ratio were taken into account; 25%, 35% and 45%. The results show a reduction in maximum mid-span deflection of composite castellated beams with the increase of castellation ratio. Moment capacity of the composite beam was increased with increasing of castellation ratio at the maximum permissible mid-span deflection. This increase was 18.4%, 51.5% and 93.8% for castellation ratios 25%, 35%, and 45% respectively.