

LOCAL BEHAVIOURS ON WEB OF COMPOSITE BEAM WITH WEB OPENINGS SUBJECTED TO COMBINED HOGGING MOMENT AND AXIAL TENSION

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A numerical procedure for the analysis on web of composite beam by applying stiffness on web for strengthening is herein studied. The study accounts for nonlinear behaviour of materials used in steel concrete composite beam including three dimensional material components of steel and concrete. In particular, the mechanism of stress strain transition in material components due to the openings on the web, applying stiffness on the web and applying loads on combined vertical and horizontal directions are taken into account for the analysis. The accuracy and reliability of the developed numerical model for steel concrete composite beam subjected to combined hogging moment and axial tension were ensured within 15% of deviation in predicting applied vertical and axial loads including similar failure criteria by the existing experimental program. Then, the developed model was included with web openings and stiffeners and the analytical results were compared with corresponding beam without openings. The reported results demonstrated that, applying stiffness is a valid tool for postponing the failure criteria while web buckling is postponed or eliminated. The numerical procedure developed in this research allowed to predict the actual nonlinear behaviour of the steel beam and the shear transfer in the steel beam where the openings and stiffeners are located allowed to predict the local behaviour of the composite beam including failure criteria and ultimate strength of the steel concrete composite beam

Biography

Ma Bavan has completed his MSc in Civil and Structural Engineering from National University of Malaysia and Master of Engineering in Geotechnics from University Technology Malaysia. He is a Senior Engineer in Civil and Structural Engineering with 14 years of vast professional experiences and currently, he is enduring the research to pursue PhD. He has published more than 50 papers in reputed journals and international conferences.

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