

STRENGTHENING OF COMPOSITE BEAM WITH WEB OPENINGS SUBJECTED TO COMBINED HOGGING MOMENT AND AXIAL TENSION

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This paper describes the strengthening of composite beam by providing openings on web of composite beam subjected to hogging moment and axial tension. A nonlinear three-dimensional numerical model was developed for steel concrete composite beam subjected to combined hogging moment and axial tension and the predicted applied vertical and axial loads were found within 15% of deviation including similar failure criteria. Failure of the bond between studs and surrounding concrete was observed due to the extensive axial loads and flexural stiffness of studs became smaller as the increase of axial loads. Web openings were applied subsequently and it was found that web openings have influenced the failure criteria and ultimate strength of the composite beam. In addition, a parametric study, by applying stiffness on the web of the composite beam including the various parameter of stiffness, was then carried out in the developed numerical model. As a result, applying stiffness on the web of the composite beam generally gives much better ultimate strength, including postponing first failure mode, which presented herein as conclusive of strengthening method

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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