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EFFECT OF CONCRETE CRUSHING ON FLEXURAL STRENGTH OF STEEL-CONCRETE COMPOSITE GIRDERS
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The ultimate flexural strength of composite steel girders with compact sections is examined through experimental investigation and elasto-plastic finite displacement analyses to develop a reduction factor of the ultimate flexural strength. A two-point loading test of a composite girder was carried out to verify the numerical modeling by comparing the experimental and numerical results. Then, a parametric study was performed using finite element analyses to investigate the effect of concrete crushing on the flexural strength of composite girders constructed using SM570 grade steel. Observations made by comparison of the ultimate flexural strength obtained from the experimental and numerical results with that according to the AASHTO and Eurocode show that the existing reduction factor equations are conservative and can be relaxed when the strength is controlled by crushing of concrete slab. A new reduction factor for the ultimate flexural strength for composite I-girders under positive bending is proposed.

Key Words: reduction factor, ultimate flexural strength, composite I-girder, concrete crushing

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