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STATISTICAL SIMULATION OF BOND BEHAVIOUR OF STEEL REBARS IN SELF-COMPACTING CONCRETE BEAMS

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Abstract:
This paper presents a generalised bond stress-slip model for deformed reinforcing bars embedded in flexural members made with self-compacting concrete (SCC) subjected to monotonic loading. The proposed model is based on experimental bond stress distribution obtained using varying bonded lengths. The accuracy of this proposed model was verified by comparing the analytical and the experimental results. The maximum difference of bond stress and slip values between the proposed unified model and the observed results (for the pre-peak segment) was found to be nearly seventeen percent. Nonlinear analyses were performed in ANSYS using the data from the proposed model to study the flexural behaviours of beams. The maximum difference in the predicted load and deflection compared to the observed data came out to be fourteen percent. The proposed bond slip expression was also used to assess the behaviour of the beams tested by other researcher. Good match of the results validity of the proposed model and approach.

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