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INTERFACIAL STRESSES IN EXTERNALLY FGM PLATED RC BEAMS

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In this paper, an improved theoretical solution for interfacial stress analysis is presented for simply supported concrete beam bonded with a sandwich FGM plate. Interfacial stress analysis is presented for simply supported concrete beam bonded with a sandwich plate. This improved solution is intended for application to beams made of all kinds of materials bonded with a thin plate, while all existing solutions have been developed focusing on the strengthening of reinforced concrete beams, which allowed the omission of certain terms. It is shown that both the normal and shear stresses at the interface are influenced by the material and geometry parameters of the composite beam. A numerical parametric study was performed for different simulated cases to assess the effect of several parameters. Numerical comparisons between the existing solutions and the present new solution enable a clear appreciation of the effects of various parameters. The results of this study indicated that the FGM sandwich panel strengthening systems are effective in enhancing flexural behavior of the strengthened RC beams.

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