SM2L_10718

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

FE Analysis of Bond for Smooth FRP Rods Embedded in Concrete

Hamid Reza Irannejad, Amir Reza Khoei

Sharif University of Technology, Tehran, Iran

Application of FRP reinforcement in modern concrete structures is increasing in comparison with common techniques to inhibit corrosion. The main objective; in this paper, is to propose a reliable method for numerical analysis of the bond between FRP composites and concrete. Note that the proposed model is based on a FE simulation of a tentative test carried out by other researchers. The composite material has been assumed transversely isotropic. Major causes of bond between the smooth rod and concrete are assumed to be friction and chemical adhesion in modelling, as well as reality. The procedure of evaluation, calibration, and validation of contact parameters is summarized. Some obtained numerical graphs are compared with the corresponding tentative ones as a validation. Curves indicating changes in tangential and normal statue of the interface between two materials are shown and justified. Finally, it has been concluded that the suggested method can be effectively used for simulation of bond behaviour of smooth FRP rods with concrete.

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