

Numerical Modeling of Tensile Behaviour of Textile-Reinforced Concrete Composite Using a Cracking Model for Cementitious Matrix: Effect of Material Parameters

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Abstract

Over the past recent decades, textile-reinforced concrete composite (TRC) has been increasingly and widely applied in the civil engineering field. This paper presents obtained results of numerical modeling for TRC composite using the cracking behaviour model for the cementitious matrix used for TRC. As the results, the TRC composite presented a strain–hardening behaviour with the cracking phase characterizing by the drops in tensile stress on the stress-strain curve. This model also showed the failure mode by the multi-cracking on the surface of TRC specimen. Furthermore, the parametric studies could show the effect of several material parameters on the TRC tensile behaviour such as the reinforcement ratio, the configuration of textile mesh as well as the length and position of the measurement zone. In comparison with experimental results, a good agreement between both numerical and experimental results was found for all cases of this study.

Keywords

Textile reinforced concrete Numerical modeling Cracking model
Parametric study Stress-strain curve

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