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Modified Tendon Model Considered Structural Nonlinearity in PSC Structures

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Abstract : Nonlinear tendon constitutive model for nonlinear analysis of pre-stressed concrete structures are presented. Since the post-cracking behavior of concrete structures, in which bonded reinforcements such as tendons and/or reinforcing steels are embedded, depends on many influencing factors(the tensile strength of concrete, anchorage length of reinforcements, concrete cover, and steel spacing) that are deeply related to the bond characteristics between concrete and reinforcements, consideration of the tension stiffening effect on the basis of the bond-slip mechanism is necessary to evaluate ultimate resisting capacity of structures. In this paper, an improved tendon model, which considering the slip effect between concrete and tendon, and effect of tension stiffening, is suggested. The validity of the proposed models is established by comparing between the analytical results and experimental results in pre-stressed concrete beams.

Keywords : bond-slip, prestressed concrete, tendon, ultimate strength
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