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Abstract

The aim of this thesis is comparison of experimentally obtained strain of concrete structure with strain obtained from mathematical models published in literature. The analysis of commonly used models of creep and shrinkage prediction, e. g. ACI model, CEB-FIP Model Code, B3 model and model ČSN EN 1992-1-1, was carry out within literature search. Model ČSN EN 1992-1-1 was chosen for strain course calculation by reason of simple application, adequate accuracy and sufficient number of important parameters. Structure stain prediction according to model ČSN EN 1992-1-1 was compare with experimentally obtained strain of prestressed reinforces concrete sleeper B91 S, produced by ŽPSV a. s. Nové Hradý. Total strain of monitored prestressed sleeper was measured by long-gauge optical fibres SOFO. This type of sensors was chosen by reason of possibility installation them into body of the structure, adequate accuracy and mainly ability of strein measurement along the stucture, not only local. The parameters of chosen mathematical model for stain prediction were obtained by experimens carries out on fundamental concrete elements made from same concrete recipe as monitored structure. These parameters were used for stain prediction of reinforced concrete sleeper B91 S according to model ČSN EN 1992-1-1. The comparison of experiment and chosen model proved the applicability of this model ČSN EN 1992-1-1 with adequate accuracy for strain describing structures with same concrete recipe. Above mentioned mathematical model can be used for calculation other characteristics of prestressed reinforced concrete sleeper.