**Effect of Reinforcement Ratios on Time-Dependent Deflection of Hybrid GFRP/Steel Reinforced Concrete Beams**

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**Abstract.**

The influence of steel reinforcement ratio on time-dependent deflections in hybrid GFRP/steel RC beams was experimentally investigated in this paper. A total of three hybrid RC beams and one reference GFRP RC beam were cast and tested under sustained load during the period of 180 days under environmental conditions. The tested beams differed in longitudinal steel reinforcement, accordingly, steel reinforcement ratios varied from 0% to 1.01%. The results obtained revealed the influence of the steel reinforcement ratio on long-term deflections of hybrid GFRP/steel RC beams.

The measured experimental time-dependent deflections of hybrid GFRP/steel RC beams were compared to theoretical values calculated using available design equations from ACI 440.1R-06 and CSA-S806-02, and the CEB-FIP procedure. The outcome showed that these design standards overestimated the long-term deflection of hybrid RC beams. A method for predicting the time-dependent deflections of hybrid GFRP/steel RC beams was proposed and the predicted values were in good agreement with the experimental values.

**Keywords:** GFRP; Concrete beam; Time-dependent; Sustained load; Deflection, Reinforcement ratio.