

[Behaviour of a new graded beam reinforced with externally bonded composite sheets: theoretical and experimental studies](#)

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Description

Starting from an eco-friendly design based on bio-natural resource development, a new generation of graded beams reinforced with bonded GFRP sheets was introduced in this study. The proposed beam design consists to partially substitute the strained Portland cement-based concrete by a clay-based modified concrete. An experimental investigation complemented by analytical modelling based on classical beams theory are carried out to assess and to predict the mechanical performances of the new beam. The emphasised test and theoretical results show clearly the enhancement in terms of strength, ductility and flexural stiffness of the strengthened composite beams compared to conventional concrete ones.